

Products 2009

I/Os, Fieldbusses and Controllers

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I/O, Fieldbusses and Controllers

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B&R was founded in 1979 by Erwin Bernecker and Josef Rainer. Since then it has become one of the largest privately owned automation companies in the world, employing more than 1700 people. A network of subsidiaries and international sales and support offices in more than 60 countries around the world guarantees global know-how at a local level. B&R customers are leaders in their respective industrial sectors. Flexible solutions and systems for individual automation projects greatly contribute to their companies' success. Continual innovation guarantees B&R customers the competitive edge. Since the company's founding, all innovations and investments have concentrated on one core area: solutions for industrial automation. As a privately owned company, all financial decisions are made independently of external investors or shareholders. This autonomy is the cornerstone for flexibility and dynamics – constant product innovations are the result.

Custom-made

Using standard components is not always the best approach. A demand for specialized solutions also exists. Willingness and ability to perform customer-oriented research and development has established B&R's position in the market. The developers at B&R work together with the customer in project teams to create custom-made solutions. This flexible and innovative approach for creating uncommon solutions is the foundation for expanding our customers' market lead. In addition to functional aspects, aesthetic design is becoming a decisive factor in all product segments as well. On request, we can manage the layout and design of operating and visualization units based on the customer's corporate design.

Support for series production

Not every machine manufacturing company has the possibility to program and extensively test all controllers for a complete production series. It isn't even necessary to assign personnel and important resources for this purpose. B&R provides just-in-time delivery of automation solutions that are completely programmed and tested, configured according to customer specifications for series production. This is done by excellently trained personnel using the most modern programming and testing systems. The customer just has to install the preconfigured components in the machine and test the entire system. This allows the customer to concentrate on the core area of expertise in machine manufacturing and achieve increased efficiency and freedom for innovation."

Solutions for all industries

Companies specializing in packaging, plastics, printing and paper, textiles, automobile, food and beverages, semiconductors, wood, metal and mining, pharmaceuticals, chemicals and building automation rely on B&R know-how. Our complete solutions help customers from all industries achieve a decisive competitive edge. Orientation towards applications in all areas of machine automation and process control technology builds the foundation that makes us a strong partner. We offer our customers a complete automation solution from one source: No unnecessary interfaces, maximum flexibility and the highest level of profitability.





Individual solutions for all industries

Outstanding solutions with distinctive technology and designs are becoming increasingly important in today's capital goods industry. In these cases, specially developed technical solutions for the application are required. A uniform appearance is also essential in representing the corporate identity. In the eyes of the user, this begins with the human-machine interface. In addition to an extensive range of standard products, B&R always offers the right automation solutions, ranging from freely configurable, customized user interfaces to specially developed electronic components and software.

Application programming

The programming required for machine controllers is constantly becoming more extensive. Machine manufacturing companies seldom have the resources needed to program and maintain software. Economics and the need to focus on the main area of expertise often make it impossible to establish these resources. B&R application experts and service partners can help. Together with the customer, specifications are made, the ideal system architecture is developed, the software is programmed and the system is tested. The customer can concentrate on making sure the application functions as desired. The well trained B&R specialists implement the application requirements and provide service for machine and system manufacturing companies all over the world throughout the entire product lifespan.

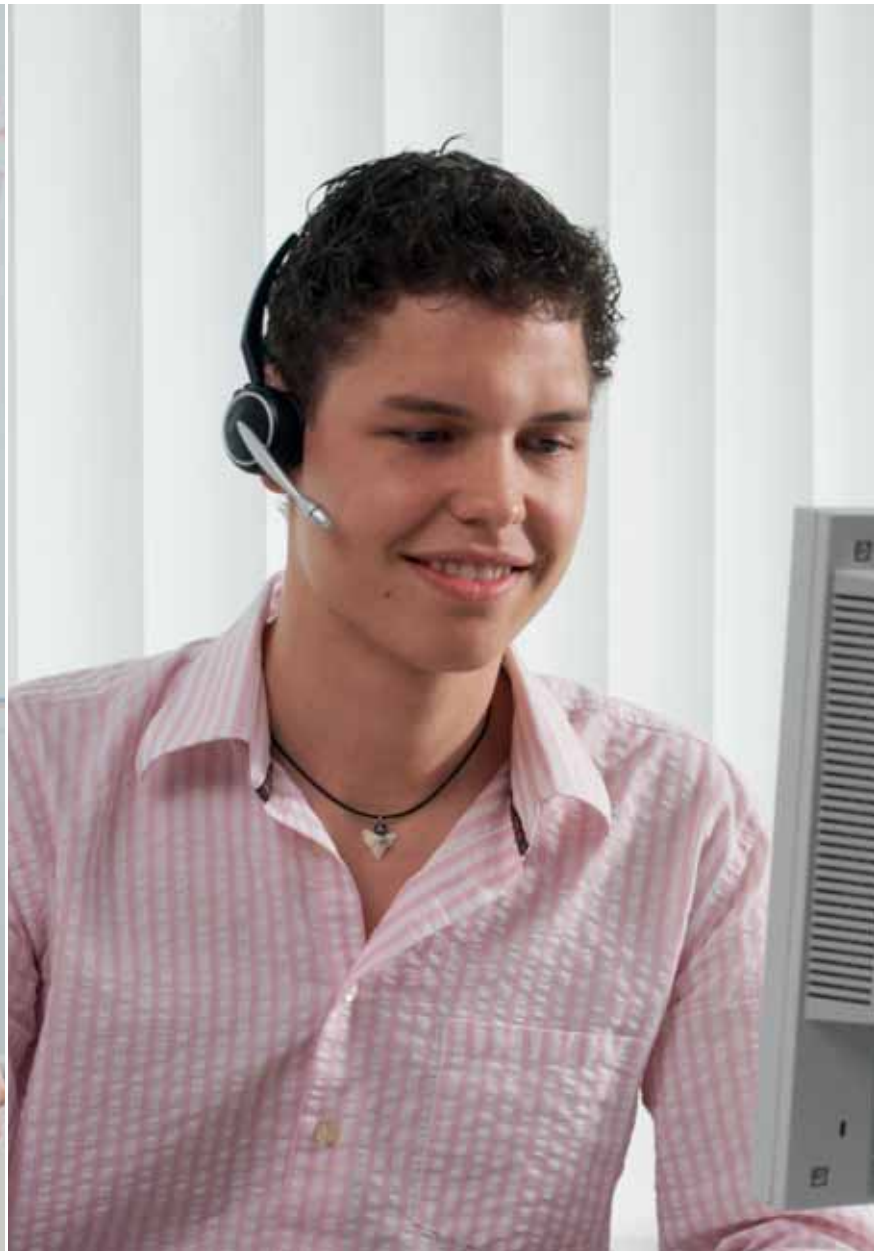
Seminars and training

Skilled employees are the foundation of a company's success. Continued training provides a competitive advantage. B&R offers an extensive seminar and training program at all locations and on-site at the customer's location. The B&R training calendar contains customized, compact training solutions ranging from introduction courses to special automation technology courses. Individual problems can be examined in clearly defined groups. Experienced trainers provide theoretical and practical information. Realistic exercises allow automation solutions to be created on modern systems. In addition to the standard program, company-specific trainings are also offered that match the tasks the participants will be carrying out in the future.

Hotline support

Quality not only refers to the product; it also refers to the support provided when implementing a product so that a task can be completed in the most ideal way possible. Question must be answered quickly, and any unclear situations must be cleared up fast to reach goals and meet deadlines. B&R customers receive hotline support for all products via email and telephone. Personal contact allows knowledgeable answers to be given and solutions to be worked out quickly. Skilled and experienced technicians work on the problem until a solution is found. They work closely with development and production to continually improve our products based on customer inquiries and prevent unclear situations in the future.





Understanding and supporting the customer

Every application is a challenge. Solving problems means being able to listen. Once contact has been made, qualified and comprehensively trained staff put themselves in the customer's frame of mind. Engagement with our customers doesn't end when the sale is finalized. To us, this period is just the start of a commitment that will last over the entire working relationship. Customer specialists for technical support, application engineering and training are available at all locations worldwide. The most modern software and infrastructure guarantee fast response times and access to information from the entire company. Easy availability, clearly assigned roles, keeping promises and personal commitment all guarantee the highest level of service quality worldwide.



Perfection in Automation

Innovative software
Sleek hardware
Real-time Ethernet



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Product overview

Control systems

Scalable from space-saving, cost-effective machine controllers to large systems with distributed intelligence. A wide range of I/O components and attachment modules always allow for the right connections.

X20 System - Slice-based I/O and control system	37
Power Panel - Integrated control, operation and visualization	787
Mobile Panel - More than just mobile operation and monitoring	873

Industrial PCs

Fully scalable industrial PC solutions for high-performance applications. Computing power, displays, operational elements, operating systems and interfaces can be optimized for the individual requirements.

Automation PC APC620 - Modular, fan-free industrial PCs	911
Automation PC APC810 - Highest-level performance with Intel® Core™ 2 Duo processors	945
Panel PC - Integrated operation and PC	985
PC Software - Operating system and software components	1109
Panel PC 300 - Makes any Automation Panel 900 into an embedded PC.	973

Visualization and operation

From two-line displays to high-resolution graphics with touch screen. The right HMI for every application.

Power Panel - Integrated control, operation and visualization	787
Mobile Panel - More than just mobile operation and monitoring	873
Automation PC APC620 - Modular, fan-free industrial PCs	911
Automation PC APC810 - Highest-level performance with Intel® Core™ 2 Duo processors	945
Panel PC - Integrated operation and PC	985
Customized HMI systems	1013
Automation Panel - A new dimension in machine visualization	1055/1077
PANELWARE - Compact operator panels	773
Panel PC 300 - Makes any Automation Panel 900 into an embedded PC.	973

Motion control

Speed and precision to meet the highest demands with built-in technology functions for flexible operation. Safety functions and "Plug & Play" in the power transmission system allow for solutions that will set you in motion.

ACOPOSmicro - Compact drive system	1221
ACOPOS - Intelligent servo drives	1251
ACOPOSmulti - Modular drive system	1321
Synchronous motors (8LS)	1459
8JS synchronous motors	1585
8LT synchronous motors	1645
Stepper motors	1443
ARNCO - Integrated CNC	1681

Remote I/O systems

Switching cabinets are becoming obsolete – flexible and configurable distributed I/O systems reduce wiring, increase stability and can be adapted to any environment.

X20 System - Slice-based I/O and control system	37
X67 System - Remote I/O with IP67 protection	419
Compact I/O System - Save space when connecting peripheral devices	581
XV valve connections - Economical usage of peripheral space	569

Integrated safety technology

Safety shut-offs do not always have to involve a full machine shutdown. Smart, safe reactions to various situations provide safety without always stopping the production process. Intelligent, decentralized and integrated safety technology that is simple to operate and that reaches extremely high reaction times opens up an entirely new range of machine safety concepts.

X20 System - Slice-based I/O and control system	37
Integrated Safety Technology - Decentralized and intelligent functional safety	537
SafeDESIGNER	1877

Programming and training

Automation Studio provides scalability, multi-platform capability, and the flexibility to meet all programming requirements. From the simplest machine to the most complex process, this single configuration and programming tool covers all tasks and system platforms. B&R also provides a modular training program that can be tailored to your needs.

Automation Studio	1805
SafeDESIGNER	1877
FieldbusDESIGNER	1887
Automation training	1893

Communication

Fieldbus and IT networks are standard components of automation solutions. With POWERLINK, a system-wide real-time network is available.

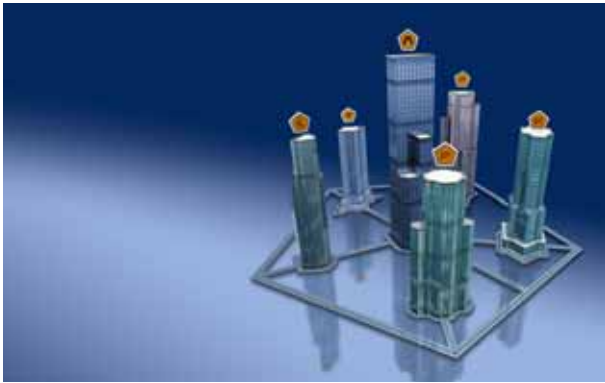
Flexible communication	611
Real-time industrial Ethernet	611
FieldbusDESIGNER	1887

Accessories, documentation

As system supplier for automation solutions, we cover the entire product spectrum - everything from configuration tool to terminal blocks.

Terminal blocks, cables, memory cards, etc.	669
Switching Power Supplies and Accessories for Mounting Rail Installation	645
Manuals and brochures	1929

News



Integrated automation for increased profitability

Complete machine automation using one intelligent tool to implement the entire automation system – this has long been the philosophy of the Austrian automation specialists at B&R. B&R recognized early that the market is not only searching for components such as controllers, visualization devices, industrial PCs and drive systems, an integral software tool is desired that covers all automation tasks. Total solutions provide enormous savings potential, which is recognized by many machine manufacturers as an important competitive edge.

Not only that, software needs to be flexible when it comes to machine configurations and options. Connecting ERP systems, E-CAD tools and automation tools enables the creation of individual machine software based on automated processes. With Automation Studio, B&R provides a single development environment for control, visualization, motion control, and communication tasks – in short, everything that has to do with automation.

In times when cost pressures continue to mount, it's extremely important for machine and systems manufacturers to concentrate on their main areas of expertise. By using a single comprehensive tool, machine manufacturers no longer have to spend vast amounts of money to implement interfaces between the controllers, drives, and visualization application.

All standardized IEC editors, a completely integrated ANSI C compiler and debugger, graphic configuration for I/O points and axes, and integrated configuration of machine visualization systems accompany the customer from the programming and commissioning phases all the way to production and service. Many advanced functions for temperature control, drive technology and fieldbus communication are already included in the standard Automation Studio package. Automation Studio users can now develop their automation projects faster and the open software design provides a system that can be integrated seamlessly into existing processes.

A network-wide real-time communication system is needed in addition to a software tool. With POWER-LINK, B&R has offered Ethernet-based real-time communication for the last five years. This technology has now established itself on the market. In the meantime, more than 40,000 series production machines have been set up and are being used in various industries. In addition to B&R, many leading automation manufacturers are relying on this open and pioneering technology.

Remaining true to the guiding principle "Perfection in Automation," B&R offers technologically advanced total solutions for hardware and software as well as knowledgeable customer-oriented support in all areas of automation. Total solutions offered by a single source provide considerable savings potential for customers throughout the entire lifespan of the machines and systems.



Positioning precision taken to new dimensions

For drives, efficient machine design and compact size are the basic principles for providing maximum flexibility.

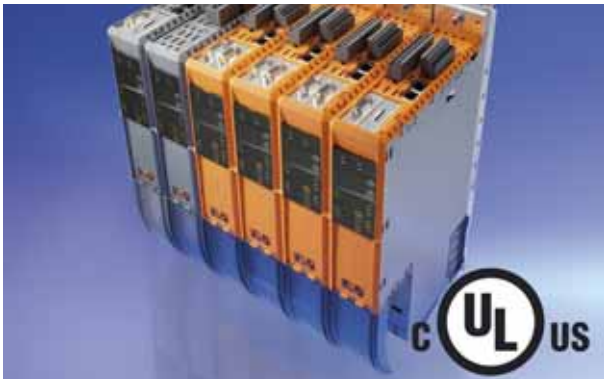
The new 8LT series three-phase synchronous motors from B&R provide machine and system manufacturers with a compact solution for the most demanding applications. Excellent dynamic properties and positioning precision help users easily master even the most difficult tasks.

The permanently excited high-torque motors are available with self-cooled or externally-cooled options. The short, compact design of the motors can eliminate the need for angular gears in many cases. Thanks to the special design of the motor components, all motors are maintenance-free.

The supply voltage of the high-torque motors ranges from 400 to 480 VAC. With a rated power of 1.51 to 32.4 kW, the motors can be easily integrated in a wide range of applications. The motors have an especially high power rating with a stall torque of 50 to 408 Nm.

Embedded parameter chip for reliable identification

All torque motors are equipped with an embedded parameter chip, which guarantees seamless identification of all device data. Using the integrated chip, important information such as serial number, type, manufacturer data, etc. can be read and registered electronically. As a result, it isn't necessary to remove components for identification.



UL certification for ACOPOSmulti

The energy efficient B&R drive system ACOPOSmulti was awarded a UL certificate from the Underwriters Laboratories. In addition to meeting all criteria for a UL compliant construction, the drive distinguishes itself through an innovative energy concept and a high level of dependability. A fundamental entry requirement for the North American automation market, the UL certification serves as an important step for the international sales of B&R innovative technology.

A high level of efficiency and dependability allow ACOPOSmulti to meet the special demands of modern Motion Control products. Active power supply modules with Power Factor Correction and the ability for power regeneration ensure the most efficient energy usage while simultaneously protecting valuable resources.

News



Small, flexible, unique - ACOPOSmicro is setting the pace

Complex CNC applications are increasingly implementing stepper motor technology. In addition, more and more pneumatic systems are being replaced by electrical drives. ACOPOSmicro – an extremely compact drive for operating stepper and servo motors in the lower performance range – provides an innovative and impressive solution. ACOPOSmicro is an addition to the successful ACOPOS and ACOPOSmulti product range.

At only 63 mm wide, it saves space in the switching cabinet. An 80 VDC version is available in order to achieve higher torque at high speeds. The performance ranges between 50 W and 1 kW. POWERLINK and the X2X remote backplane are onboard as fieldbus interfaces.

A clever cooling design, like the one already used for ACOPOSmulti, provides advantages for the environment. Side and back wall mounting are possible. Cold plate mounting with oil or water cooling is available in addition to wall and feed-through mounting. This cooling design reduces costs by eliminating the need to carry out additional work for climate-control and the related service tasks.

Using standardized PLCopen motion control function blocks and CNC robotics libraries, all motor types supported by ACOPOSmicro can be controlled via B&R Automation Studio without problems.

ACOPOSmicro is often implemented in the semiconductor, packaging, textile and printing industries.



Unlimited flexibility for machine manufacturing

A new member has been introduced to the industrial PC generation from B&R. The product range has been expanded with the APC620 embedded. Windows XP embedded with real-time extension is the system platform used. Windows XP embedded offers advantages for applications with a minimal operating system size.

Intel processors from Celeron M to Pentium M 1.4 GHz provide requirement-oriented, scalable computing power. POWERLINK and CAN as well as the X2X remote backplane are onboard as fieldbus interfaces. The CPU has 256 KB of battery-buffered SRAM memory.

Like its big brothers, the APC620 has an integrated Smart Display Link that can be used to operate a remote line with four displays at distances up to 160 m.

The APC family is the most innovative industrial PC generation on the market. Fan-free, compact, scalable and economical – these are the key features that provide machine manufacturers the highest level of flexibility.



TÜV Certificate for B&R Integrated Safety Technology

The safety-related products from B&R have been certified by TÜV Rheinland for use in safety-oriented applications. In addition to meeting all specified safety criteria, B&R safety technology also has the major advantage of seamless integration in existing automation infrastructure. Flexible adjustment of the safety behavior to the requirements of the machine ensures optimum safety reactions. Safety technology integration

B&R safety products enable simple integration of safety technology in the functional application. Fixed wiring is replaced by safe data transfer via the existing machine bus system. Flexibly configured or programmed safety behavior adapts optimally to various situations. Complete diagnostics of safety components via the machine bus system provide detailed data about the status of the machine.

Safety cut-offs do not always have to involve shutting down the machine. When opening a protective cover, for example, it is often sufficient to reduce the speed. Smart, safe reactions to various situations provide safety without stopping the production process. This means that the machine does not have to be run without load or set up again, and manipulation is no longer necessary. This results in real advantages for the user that can be easily implemented with programmable safety behavior.

Rapid advancements in technology make it necessary to continually update the safety regulations. Adapting safety products to the current regulations in the area of safety technology has the highest priority at B&R. The safety-related products SafeDESIGNER, SafeLOGIC, X20 SafeIO and POWERLINK Safety fulfill ISO 13849 (PL e) IEC 62061 (SIL 3) and IEC 61508 (SIL 3) standards.

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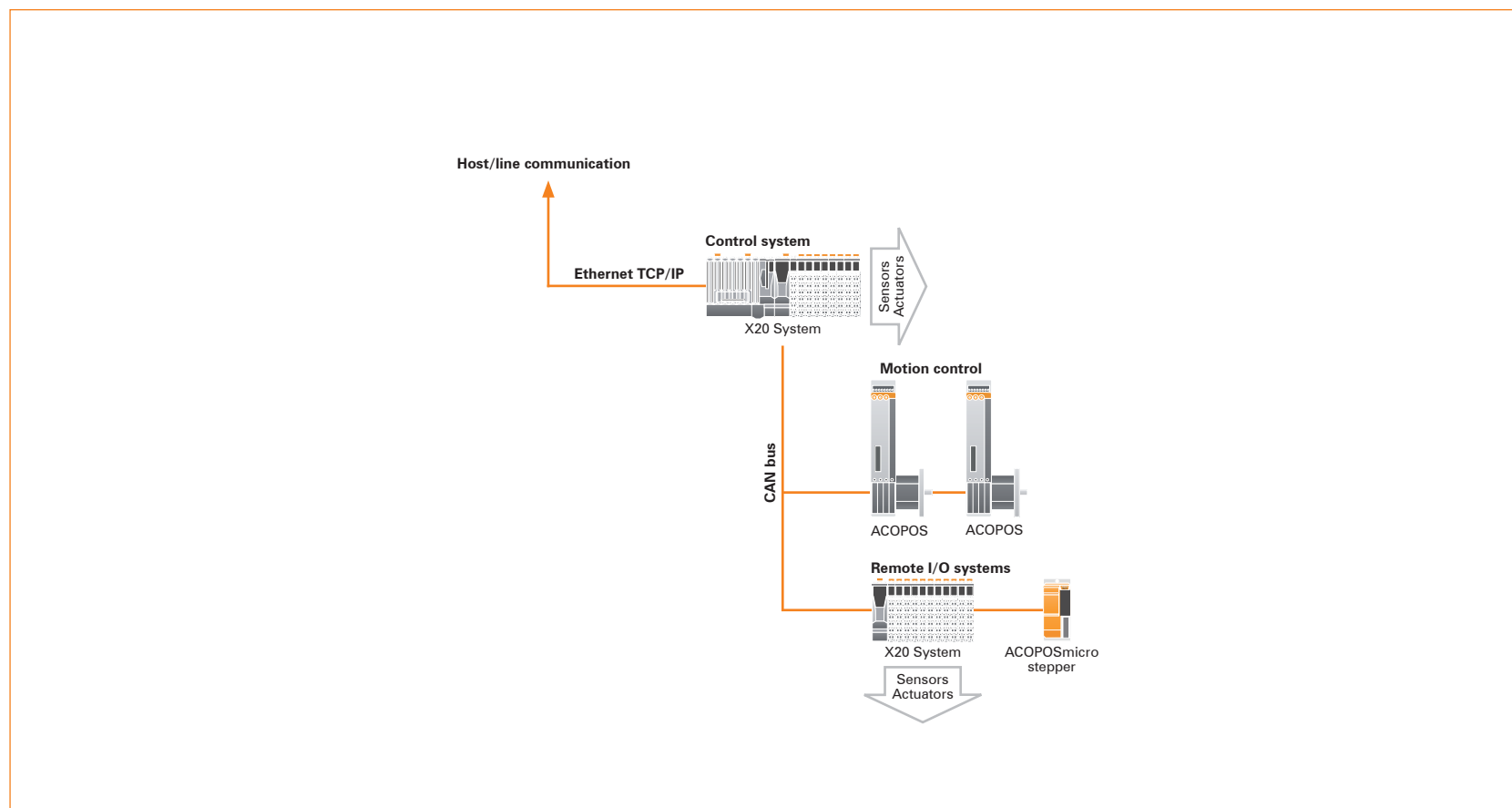
Compact automation in a line system

Short description

The machine should be able to communicate with the outside world. The compact controller is connected with the higher-level plant network via Ethernet TCP/IP. Data can be read from the machine controller and commands can be given over the plant network. Internal machine communication to drives and remote I/O systems takes place via CAN bus.

Properties

- Connection to the line system and plant network
- Compact
- Economical
- Scalable for average demands



Components and technologies

Control system	X20 System: Slice-based I/O and control system	37
Motion control	ACOPOSmicro: Compact drive system	1221
	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
	Stepper motors	1443
Remote I/O systems	X20 System: Slice-based I/O and control system	37
Networks and fieldbuses	CAN bus	611
	Ethernet TCP/IP	611

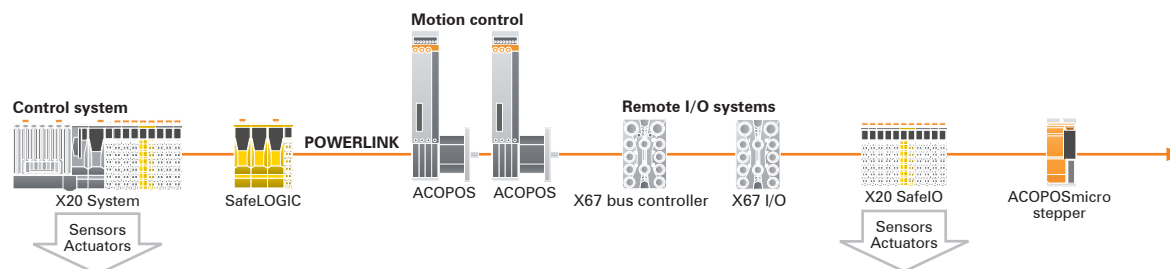
High-performance compact automation

Short description

Space in the switching cabinet is highly valuable. Reducing PLC dimensions should not reduce automation performance. The CPU with local I/O is connected with various distributed components via a high-performance network. This results in a high-performance system that allows optimal solutions to be implemented for more complex tasks in spite of the compact dimensions.

Properties

- Scalable performance
- Highly economical
- Compact dimensions
- Sufficient network reserves for expansions
- Customized solutions for complex tasks



Components and technologies

Control system	X20 System: Slice-based I/O and control system	37
Motion control	ACOPOSmicro: Compact drive system	1221
	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
	Stepper motors	1443
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419
Safety technology	Integrated safety technology	537
Networks and fieldbuses	POWERLINK	611

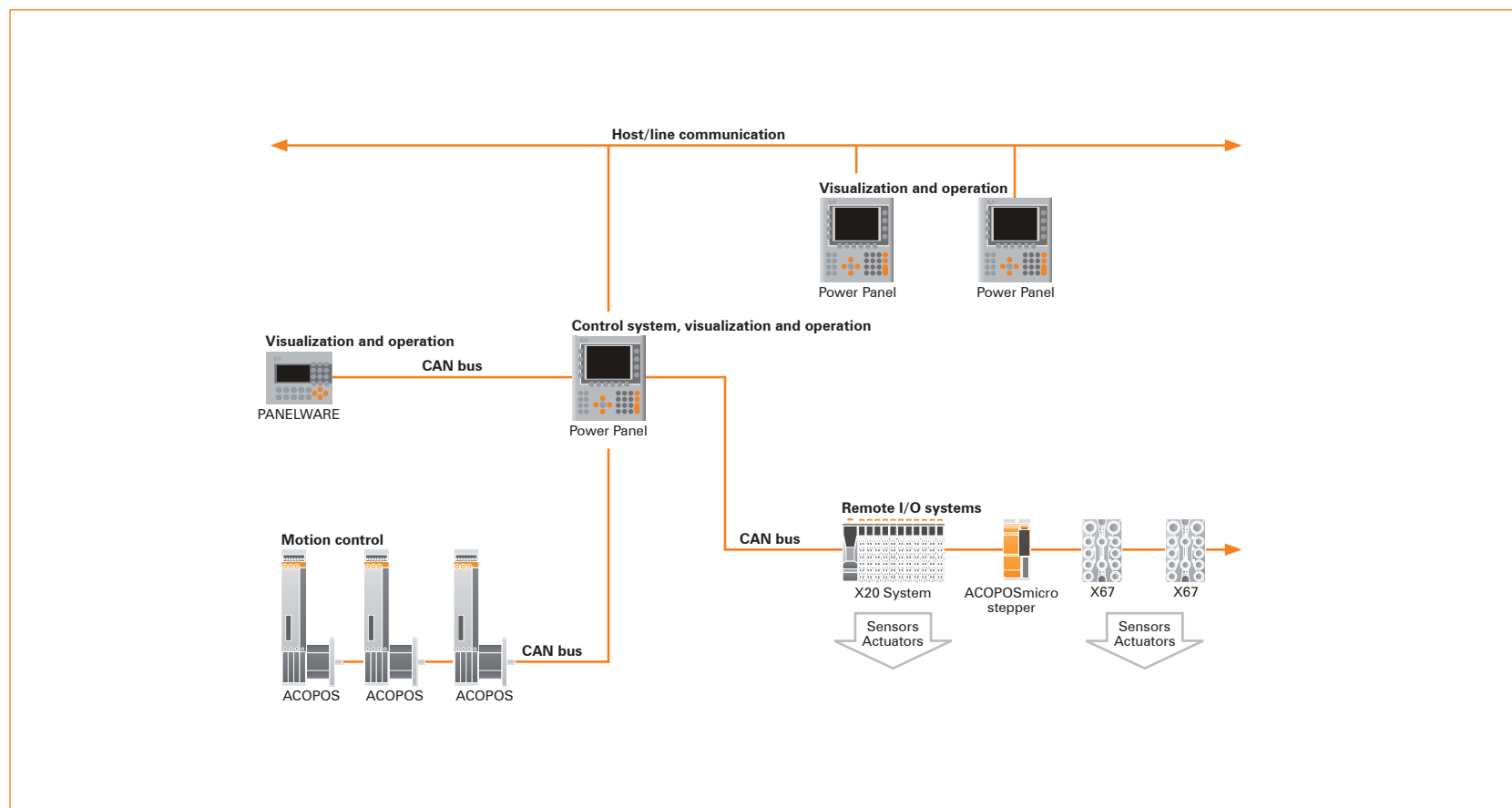
Panel-based automation

Short description

Operation, visualization and control are integrated. Host/line connections can be used for additional operator stations. The drives are networked with each other so that multi-axis movements can be synchronized. I/O signals are connected in the machine room or in the switching cabinet.

Properties

- Compact dimensions
- Flexible operating concepts
- Clear networking
- Modularly expandable



Components and technologies

Control system	Power Panel: Integrated control, operation, and visualization	787
Visualization and operation	Power Panel: Integrated control, operation, and visualization PANELWARE: Compact Operator Panel	787 773
Motion control	ACOPOSmicro: Compact drive system ACOPOS: Intelligent servo drives ACOPOSmulti: Modular drive system Synchronous Motors: Dynamic precision drives Stepper motors	1221 1251 1321 1459/1585/1645 1443
Remote I/O systems	X20 System: Slice-based I/O and control system X67 System: Remote I/O with IP67 protection	37 419
Networks and fieldbuses	Inside the machine: CAN bus Host/line communication: Ethernet TCP/IP	611 611

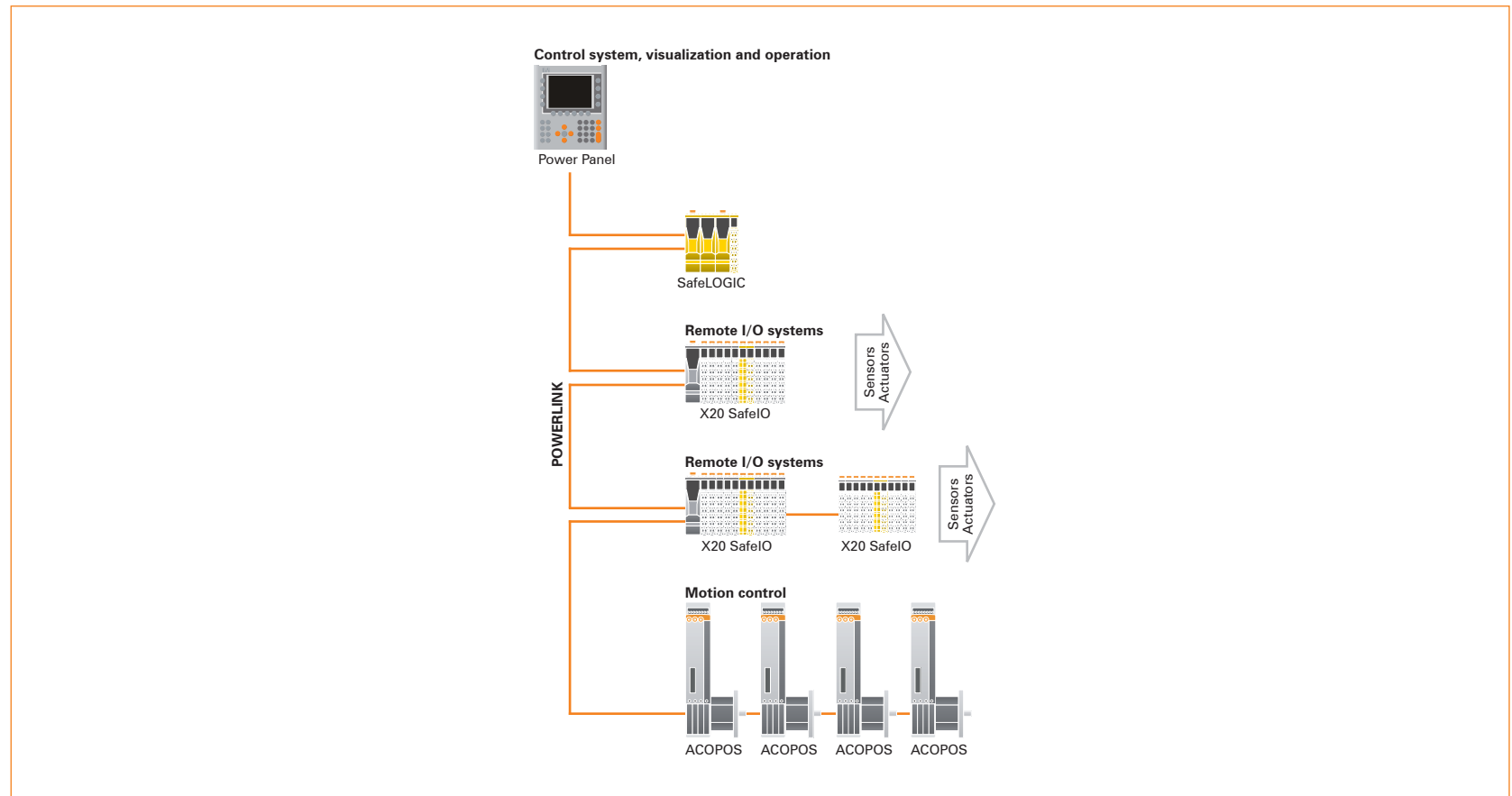
Panel-based automation with a uniform high-performance network

Short description

The operator panel is the central controller. All components, such as I/O systems, safety technology and drives, are connected via a high-performance network. With POWERLINK, the system is set up to handle the highest real-time demands.

Properties

- Modular and scalable machine modules
- Highest performance class for real-time applications
- Precise synchronization of multi-axis movements and I/O signals
- Exceptionally large rated torque



Components and technologies

Control system	Power Panel: Integrated control, operation, and visualization	787
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
Motion control	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
	X20 System: Slice-based I/O and control system	37
Remote I/O systems	X20 System: Slice-based I/O and control system	37
Safety technology	Integrated safety technology	537
Networks and fieldbuses	POWERLINK	611

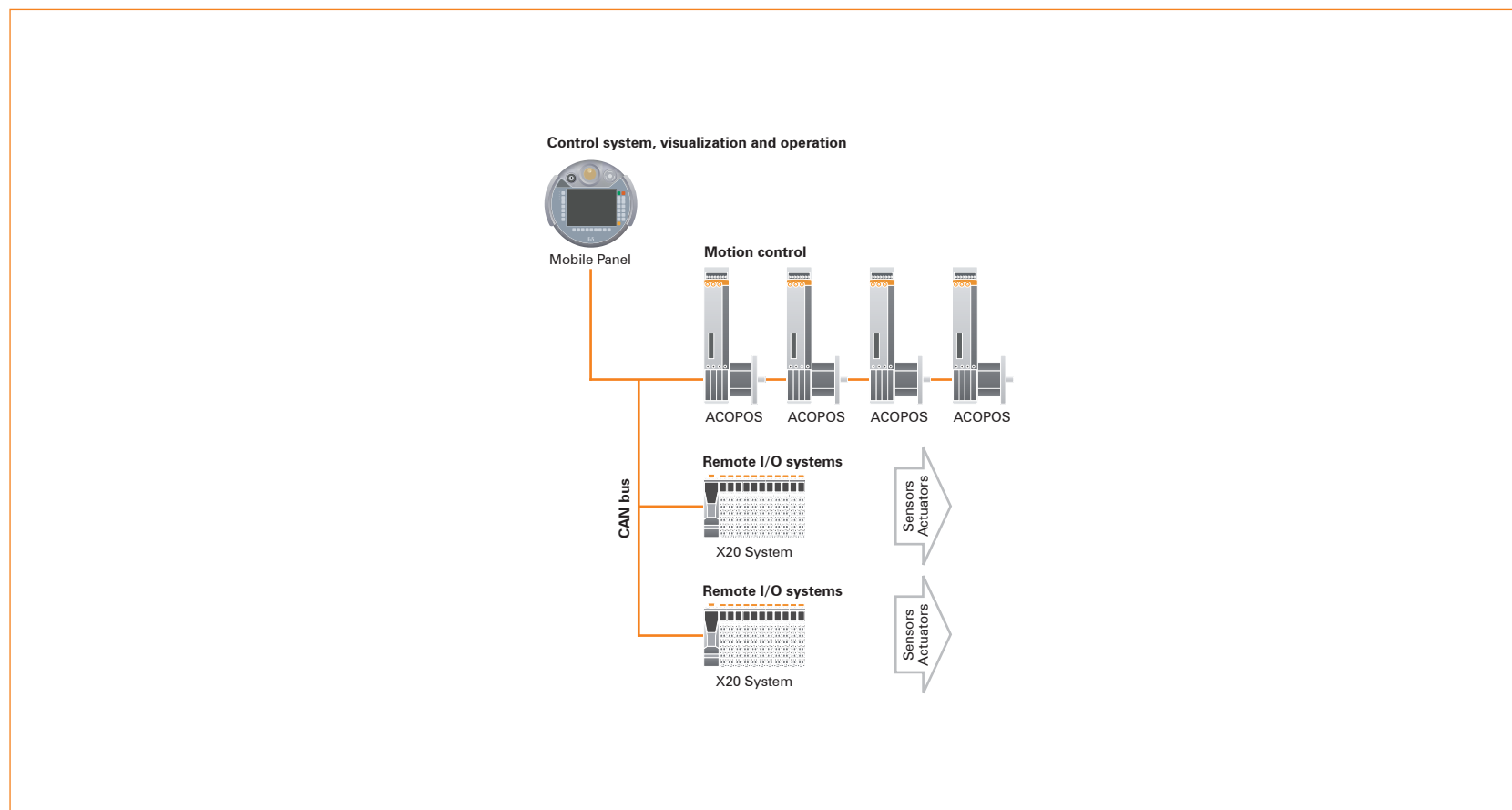
Mobile automation

Short description

The challenge is to provide automation with an optimal price/performance ratio, compact size and mobile operation. The controller is integrated in the mobile operating device. Remote I/O systems and drives are connected efficiently via CAN bus. The result is a flexible, economical system for average performance demands.

Properties

- Mobile operation with integrated control
- Compact
- Economical
- Scalable for average demands



Components and technologies

Control system	Mobile Panel - More than just mobile operation and monitoring	873
Visualization and operation	Mobile Panel - More than just mobile operation and monitoring	873
Motion control	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
Remote I/O systems	X20 System: Slice-based I/O and control system	37
Networks and fieldbuses	CAN bus	611

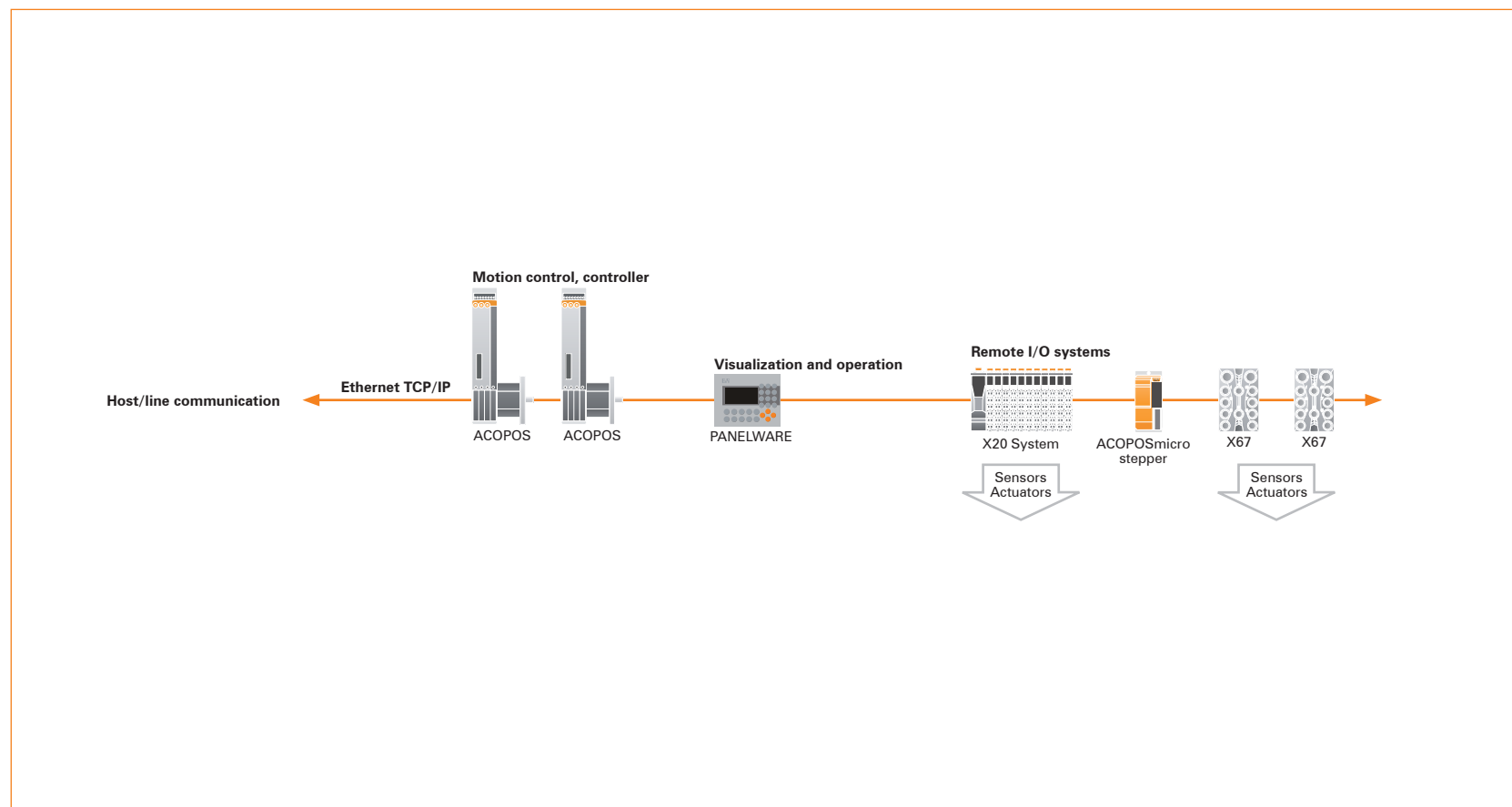
Drive-based automation

Short description

The drive is the controller. The controller is centrally located in one drive or distributed over several drives. The drives are connected with each other so that multi-axis movements can be synchronized. Operation is handled in a simple manner. Returned messages are shown on simple text or graphic displays. I/O signals are connected in the switching cabinet or directly in the machine room.

Properties

- Compact dimensions
- Moderate space requirements in the switching cabinet
- Simple operating concepts
- Minimal wiring
- Modular and scalable



Components and technologies

Control system	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	PANELWARE: Compact Operator Panel	773
Visualization and operation		
Motion control	ACOPOSmicro: Compact drive system	1221
	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
	Stepper motors	1443
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419
Networks and fieldbuses	Inside the machine: CAN bus	611
	Host/line communication: Ethernet TCP/IP	611

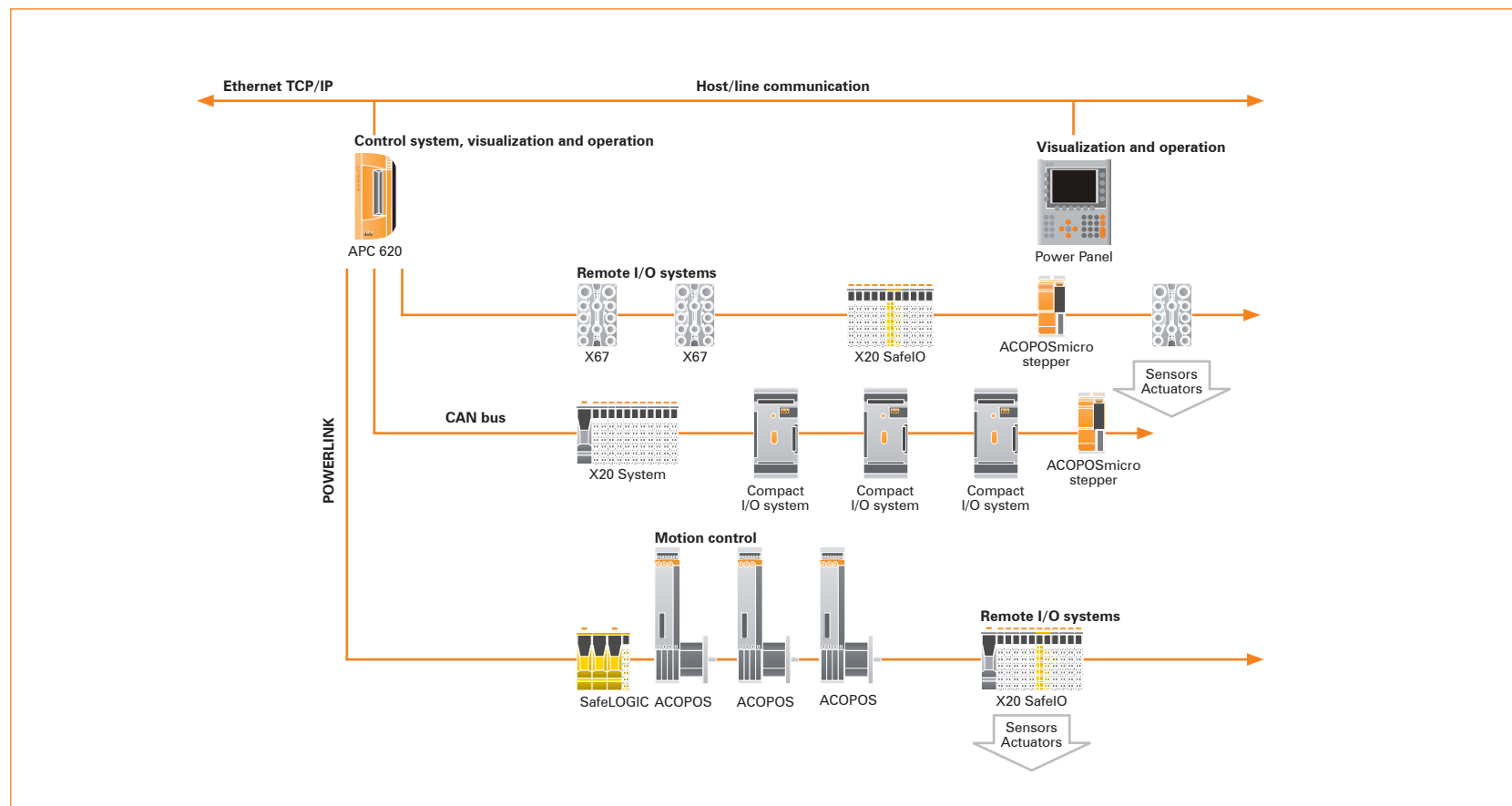
Open PC-based automation

Short description

Automation with standard PC architecture. The industrial PC handles all automation tasks centrally. I/O peripherals, safety technology and drives are connected via fieldbuses and networks. Operation and visualization takes place using a local or remote display unit. Additionally, host/line connections can be used for additional operator stations.

Properties

- Central control concept
- Clear networking
- Scalable performance
- High-performance operating concepts
- Standard PC software can be used



Components and technologies

Control system	APC 620 / APC 810: Automation PC	911/945
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
Motion control	ACOPOSmicro: Compact drive system	1221
	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
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	X67 System: Remote I/O with IP67 protection	419
	Compact I/O System: Economical usage of peripheral space	581
Safety technology	Integrated safety technology	537
Networks and fieldbuses	POWERLINK	611
	Ethernet TCP/IP	611
	CAN bus	611

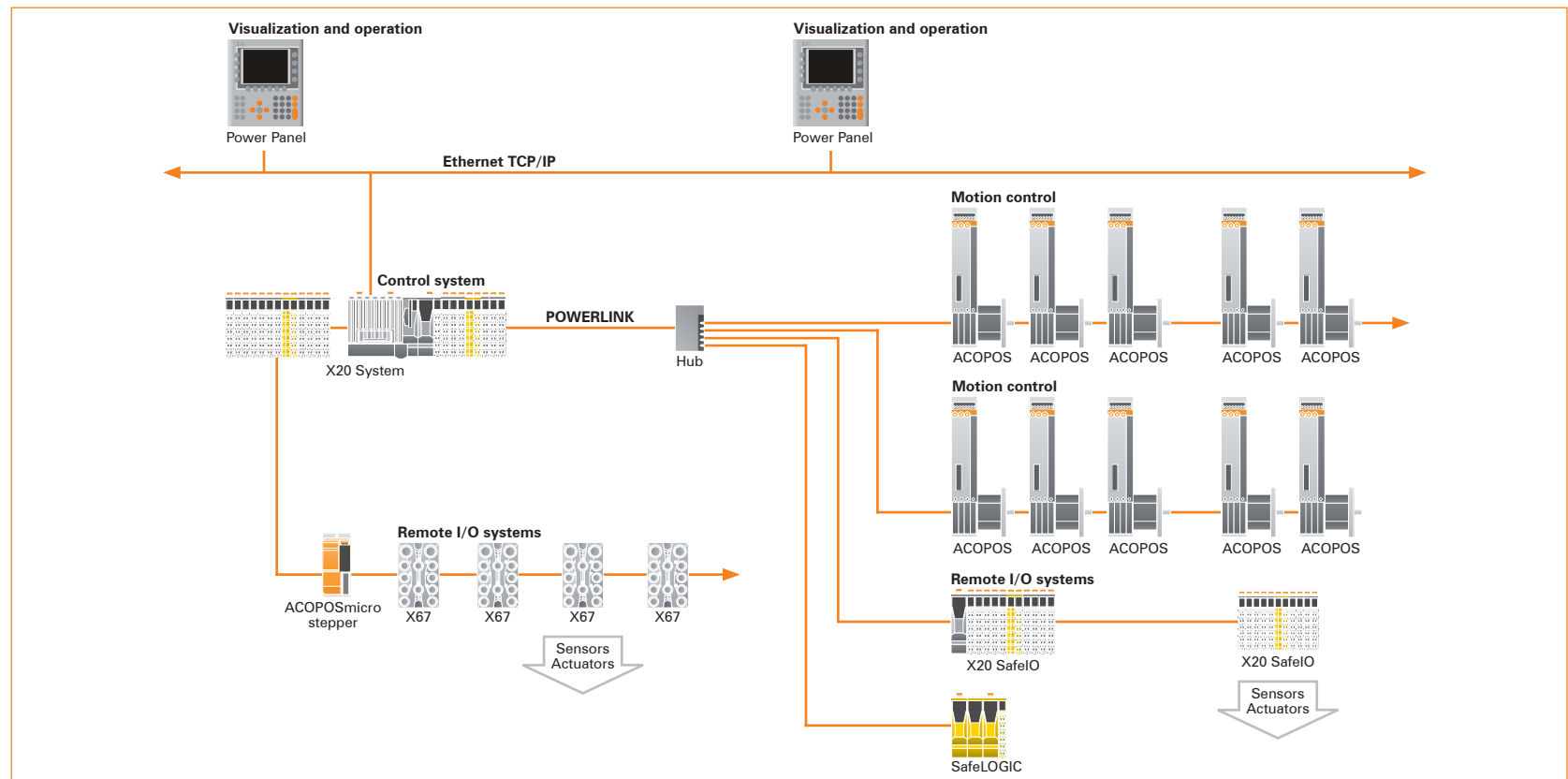
Embedded PC-based automation for high-performance machines

Short description

Large machines and systems place high demands on the functionality and performance of automation components. Flexibility, expandability and scalable performance classes allow the most modern machine concepts to be realized. High-performance PLC with PC architecture as the controller, central and distributed expansions for I/O channels, open network standards and operator panels using the newest ergonomic designs. The example from the packaging industry combines decentralized operation, 50 drives, and 50 remote I/O systems as well as more than 60 I/O modules with IP20 and IP67 protection distributed throughout the machine room.

Properties

- Scalable performance and I/O capacity
- Mixture of central and distributed architecture
- Clear concept and servicing
- Greatly reduced wiring
- Integrated safety technology



Components and technologies

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Networks and fieldbuses	POWERLINK	611
	Ethernet TCP/IP	611

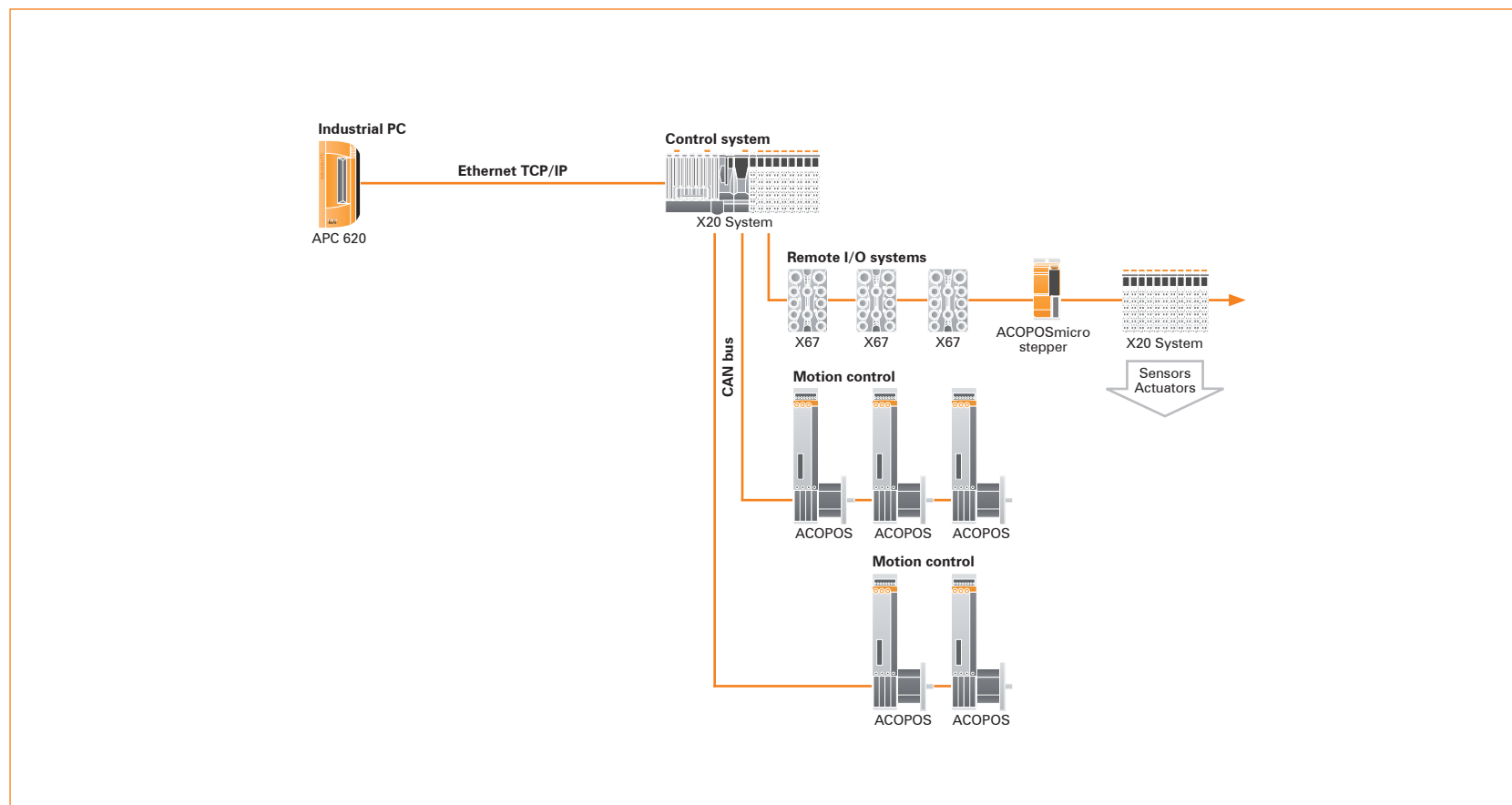
Open and embedded PC-based automation

Short description

The Windows-based visualization and data management are handled by an industrial PC. The machine is controlled centrally by the PLC. Several fieldbus lines connect drives and I/O systems to the PLC. In addition to the local PLC I/O systems, there are also distributed I/O modules with IP67 protection outside the switching cabinet in the machine room.

Properties

- Customized use of central and distributed components
- High-performance, open operating and management concepts



Components and technologies

Control system	X20 System: Slice-based I/O and control system	37
Industrial PC	APC 620 / APC 810: Automation PC	911/945
Motion control	ACOPOSmicro: Compact drive system	1221
	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
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Remote I/O systems	X20 System: Slice-based I/O and control system	37
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Networks and fieldbuses	Ethernet TCP/IP	611
	CAN bus	611

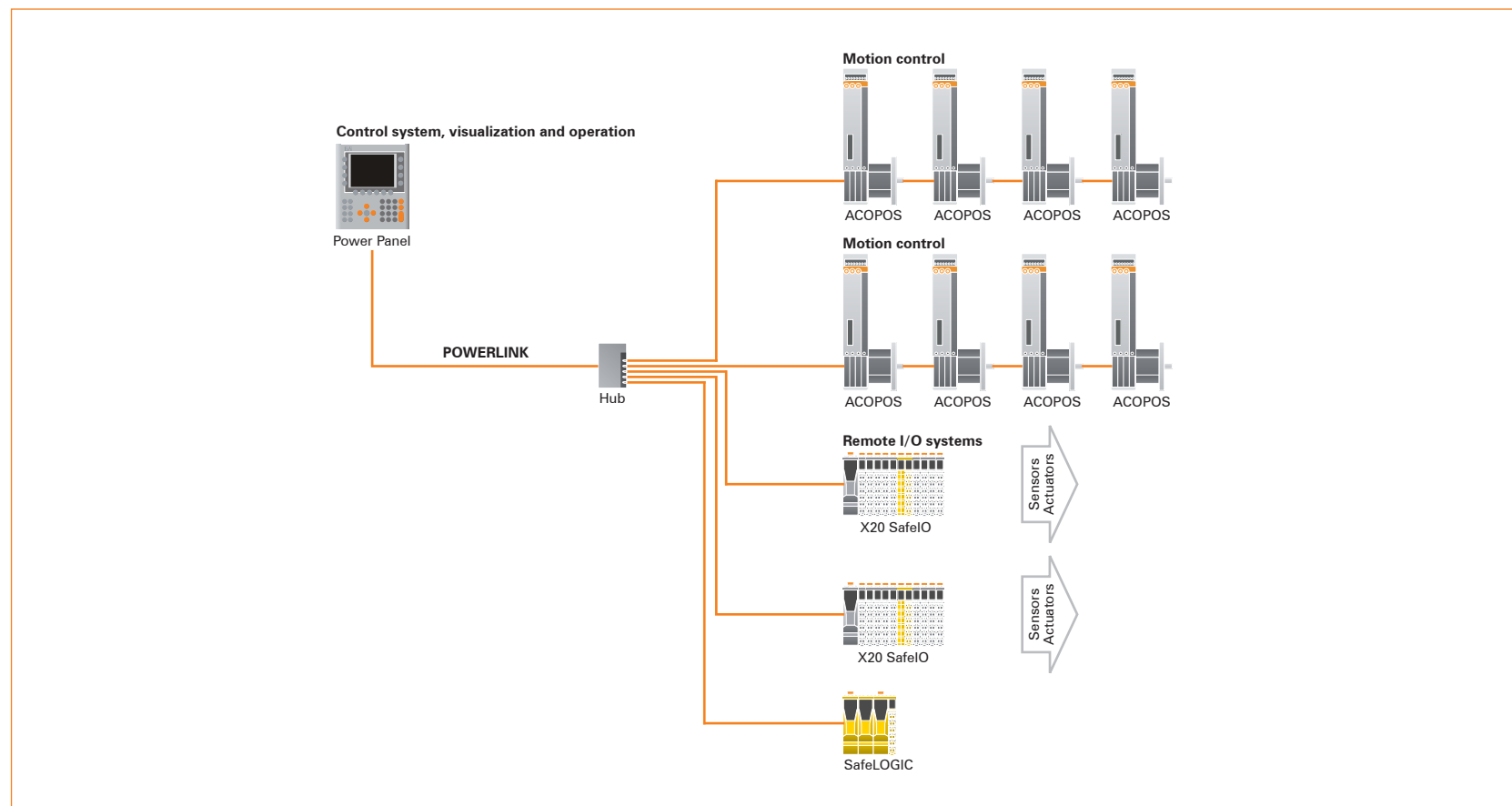
Central automation of modular machines

Short description

For modular machine concepts with many similar elements, a central controller is often more economical than a distributed solution. Compact controllers with integrated visualization also meet high demands. Connecting intelligent drives and I/O systems using a powerful POWERLINK network sets no limits for expandability, precision and performance.

Properties

- Compact central operating and control unit
- Precise synchronization of highly dynamic multi-axis systems
- High degree of flexibility for (future) expansions
- Configurable safety-related machine options



Components and technologies

Control system	Power Panel: Integrated control, operation, and visualization	787
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
Motion control	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
Remote I/O systems	X20 System: Slice-based I/O and control system	37
Safety technology	Integrated safety technology	537
Networks and fieldbuses	POWERLINK	611

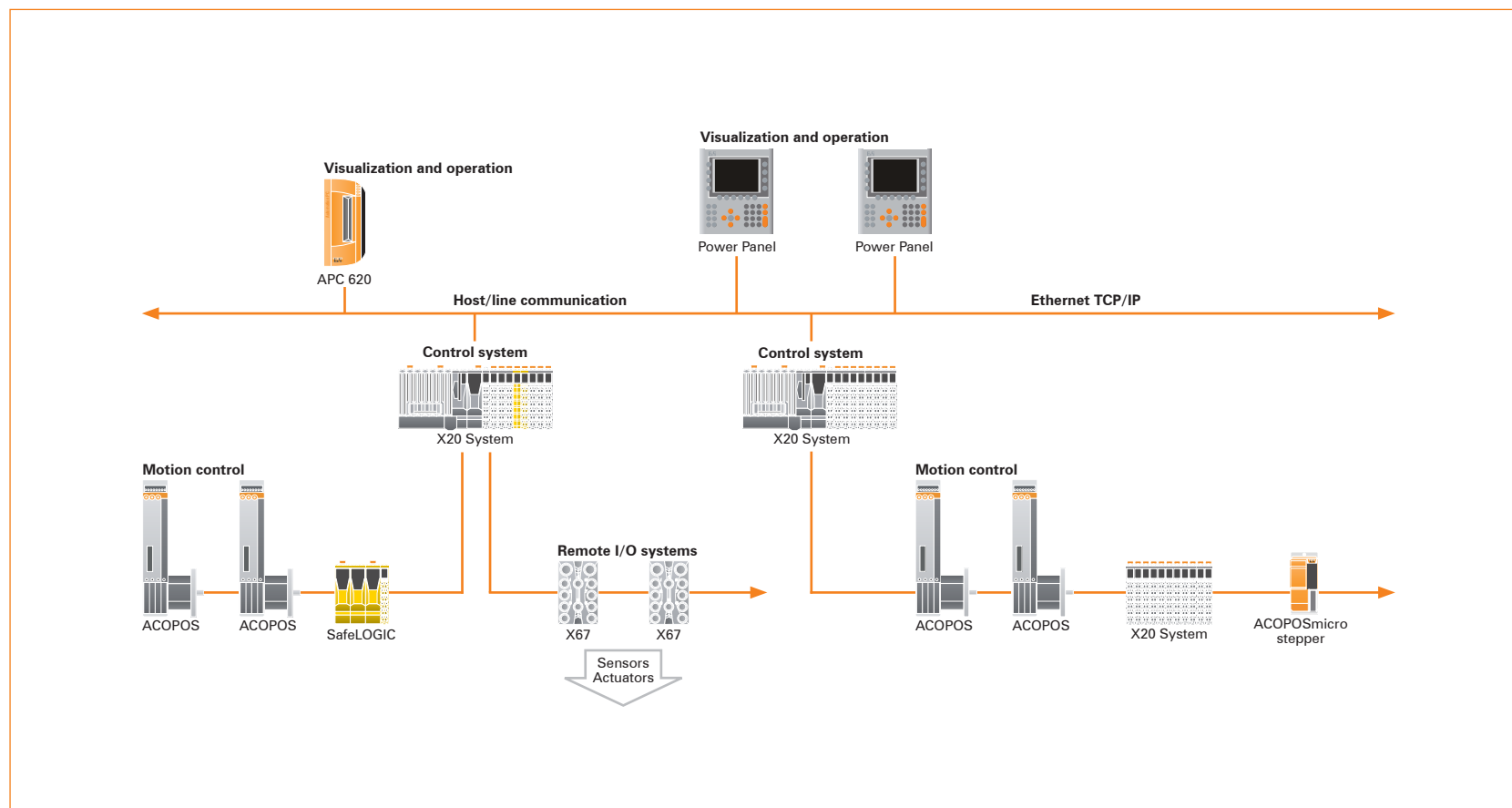
SCADA systems and PC visualization

Short description

This represents the classic approach of using programmable logic controllers for I/O systems and drives and higher-level industrial PCs for management, data handling and visualization. Normally, a SCADA application runs on the industrial PC. Expansion options are possible for several clients that are connected via Ethernet and exchange data using OPC mechanisms.

Properties

- Centrally monitored production and manufacturing processes
- Embedded in plant networks
- High-performance operating and control concepts



Components and technologies

Control system	X20 System: Slice-based I/O and control system	37
Industrial PC	APC 620 / APC 810: Automation PC	911/945
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
Motion control	ACOPOSmicro: Compact drive system	1221
	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
	Stepper motors	1443
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419
Safety technology	Integrated safety technology	537
Networks and fieldbuses	POWERLINK	611
	Ethernet TCP/IP	611
	CAN bus	611

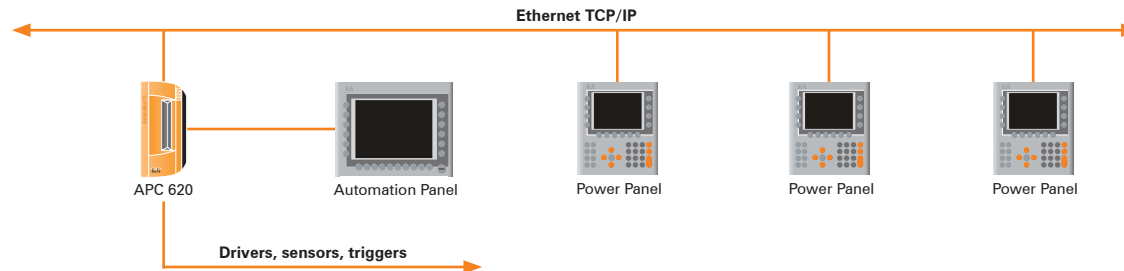
Distributed machine operation with thin clients

Short description

Machine operation should alternate between several different locations. Application and control programs run centrally on an industrial PC. Several cost-effective operator stations (thin clients) are connected via Ethernet. All operator stations offer uniform operational elements and interfaces e.g. for the use of transportable memory media.

Properties

- High-performance and economical operating concepts
- Distribution of machine operation as desired
- Flexible expansions
- Local use of transportable memory media (USB, Disk-on-Key)



Components and technologies

Industrial PC	APC 620 / APC 810: Automation PC	911/945
Visualization and operation	Power Panel: Integrated control, operation, and visualization Automation Panel	787 1055/1077
Networks and fieldbuses	Ethernet TCP/IP	611

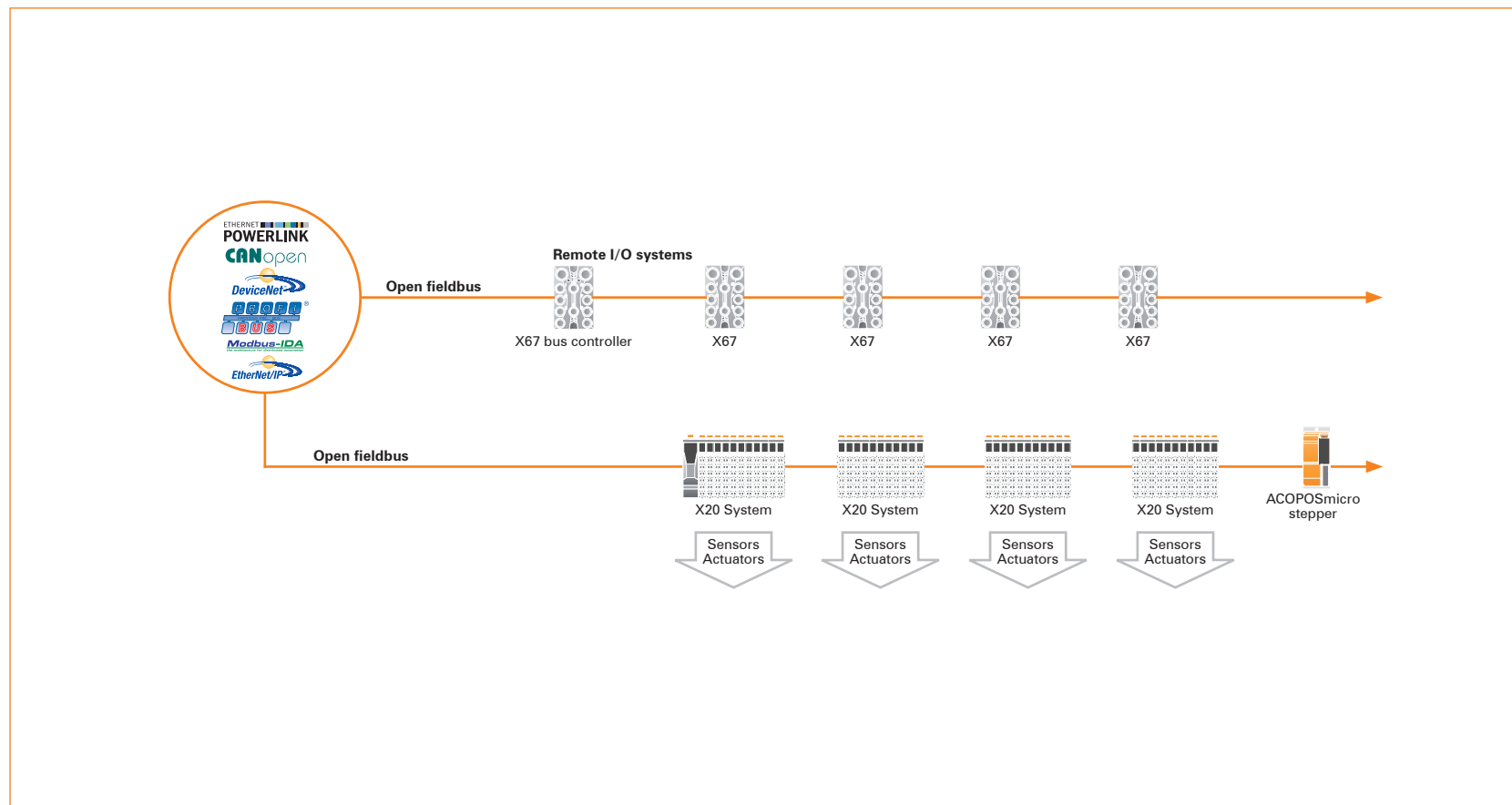
Distributed I/O on open fieldbuses

Short description

Distributed connections of sensors and actuators to the controller should be made directly in the machine room. The components require a certain specified class of protection against dirt, dust and moisture. Open fieldbuses such as CANopen, DeviceNet, Profibus DP and POWERLINK have established themselves for distributed automation.

Properties

- Open for connection to standardized fieldbuses
- Flexible handling of I/O directly in the machine room
- High transfer rates and built-in technology functions
- Robust and resistant to disturbances
- Simple wiring, no cable trees



Components and technologies

Motion control	ACOPOSmicro: Compact drive system	1221
	Stepper motors	1443
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419
Networks and fieldbuses	POWERLINK	611
	CAN bus and CANopen	611
	DeviceNet	611
	Profibus DP	611

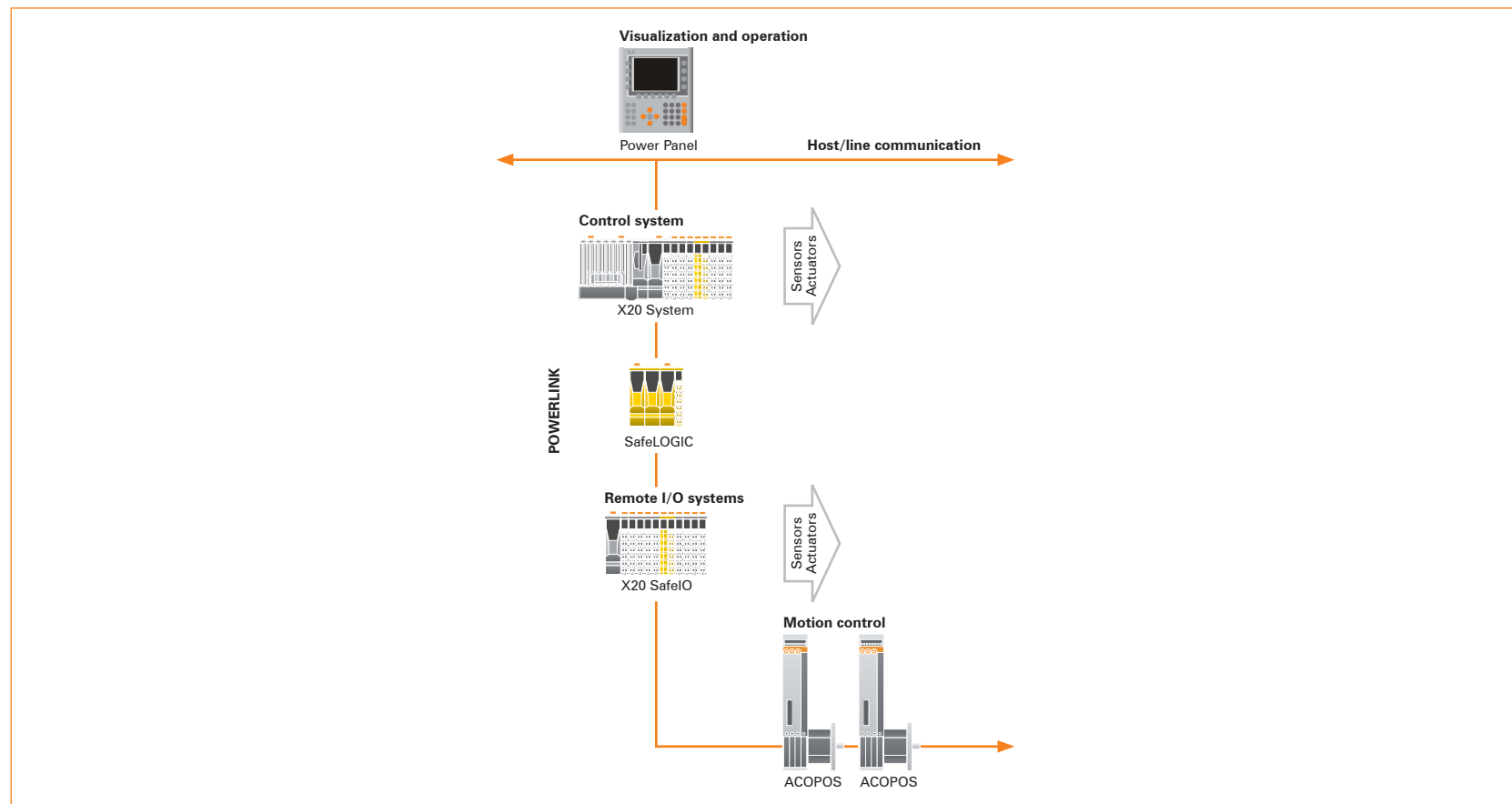
Complete networking with industrial Ethernet

Short description

Ethernet is the worldwide IT standard for networks. Complete connection of the production line to the plant network promises transparency and cost reductions for maintenance and operation. Ethernet is becoming more important as a fieldbus replacement for the automation of machines and systems. The connection of visualization systems and networking for time-critical data communication to I/O systems, safety technology and drives takes place using Ethernet TCP/IP protocols, POWERLINK and POWERLINK Safety.

Properties

- Open network standard
- Transparent communication for management, process and field levels
- Seamless integration in line networks and the IT infrastructure
- Highest level of safety (SIL 3 according to IEC 61508)



Components and technologies

Control system	X20 System: Slice-based I/O and control system	37
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
Motion control	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
Remote I/O systems	X20 System: Slice-based I/O and control system	37
Safety technology	Integrated safety technology	537
Networks and fieldbuses	POWERLINK	611
	Ethernet TCP/IP	611

X20 System Slice-based I/O and control system

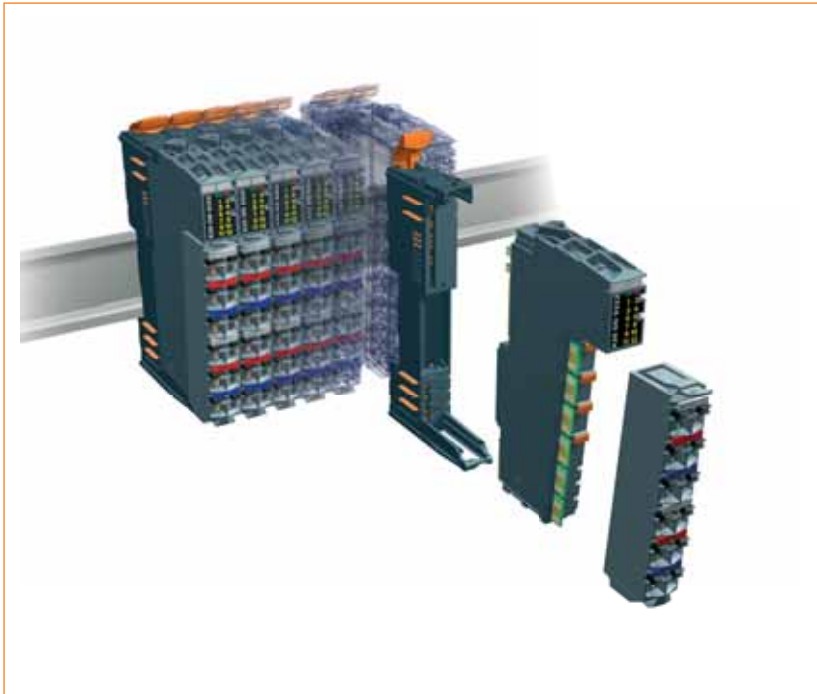
There are many different slice based I/O and control systems.
With the X20 System, B&R is setting new standards
according to the motto "Perfection in Automation".



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System characteristics	40
Product overview	68
Product data sheets	86
Accessories	388
Mechanical and electrical configuration	392

System characteristics



The new standard for automation

There are many different I/O slice systems. With the X20 System, B&R is setting new standards according to the motto "Perfection in Automation". Born from experience gained from applications all over the world, numerous conversations with customers, and with the aim for more simple, economical and secure usage, the X20 System is the new universal solution for any automation task in machine and system manufacturing.

More than just I/O

With well thought-out details and a sophisticated ergonomic design, the X20 System is more than a remote I/O system, it is a complete control solution. The X20 System family makes it possible to combine the exact components necessary depending on the user's demands and individual application requirements.

- The X20 System is the ideal addition to a standard fieldbus and expands the possibilities of standard control systems. Simply connect it and configure it.
- Teamed up with other B&R components, the X20 System achieves its full potential and allows the implementation of applications with unimagined performance and flexibility. Seamless integration is a major advantage.

3 x 1 = One

Three basic elements result in one module:

Terminal block – Electronic module – Bus module

This modularity results in a system that combines the advantages of both rack and I/O slice systems:

- Prewiring without the module
- Hot pluggable electronics
- Extra bus slots for added options

The X20 System is distinguished by a 50% increase in component density, perfected connection technology and optimal granularity.

• Added value

12 channels with a width of 12.5 mm allow a component density never before achieved with optimal terminal ergonomics. As a result, the X20 System offers 50% more channels than conventional slice systems. And this without sacrificing terminal connections.

• Continuity

Consistent implementation of 1-wire, 2-wire or 3-wire connections - no additional jumper terminals needed.

• Granularity

One channel and two channel modules: Maximum flexibility so you only have to pay for what you really need.



Optimally designed

X20 modules are divided into three parts to guarantee the simplest applicability throughout their entire lifecycle. The division into bus module, electronic module and terminal block provides many advantages.

- **Preconfigured for different machine types**

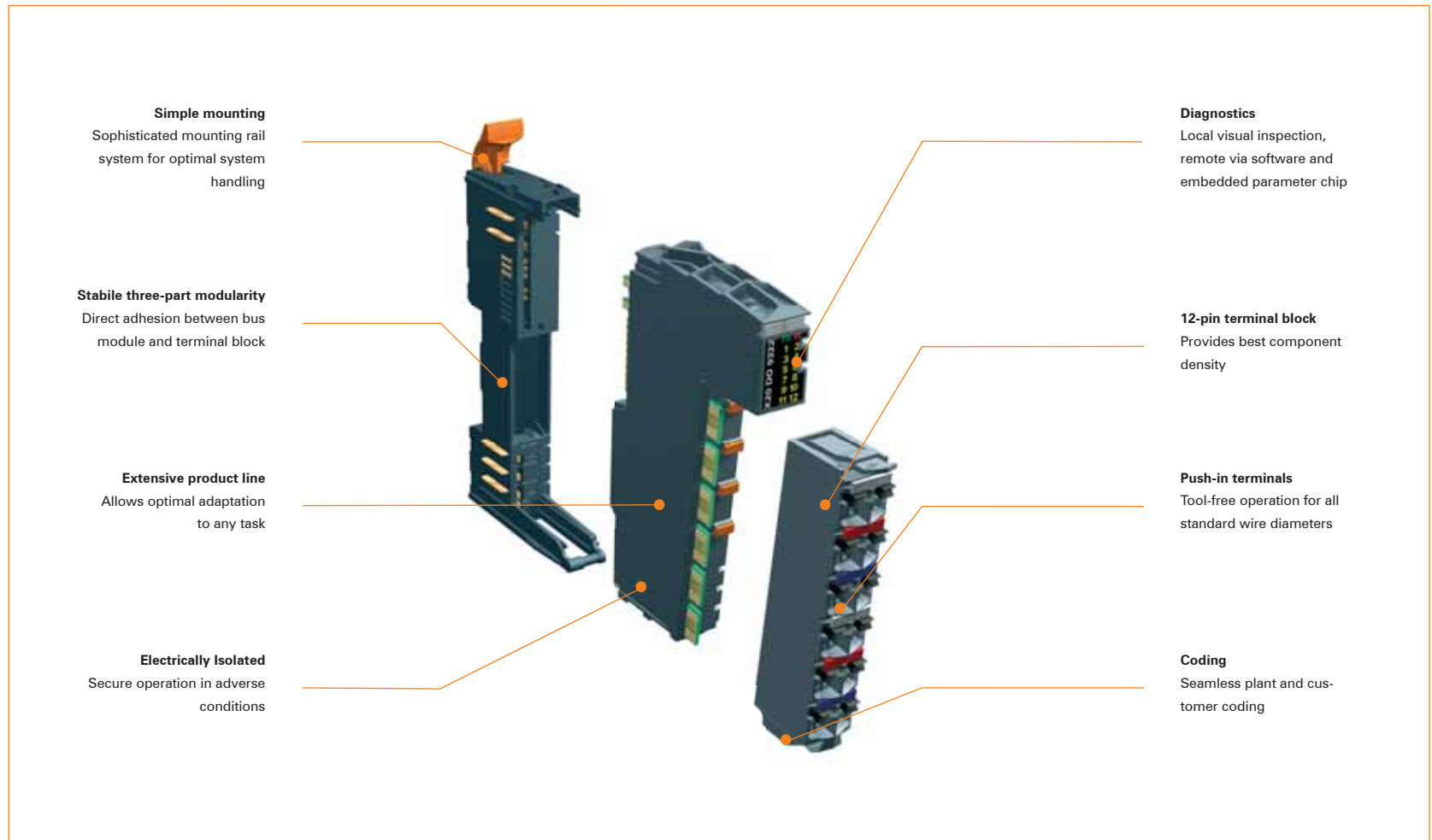
The X20 System bus modules are the basic platform for many machine variations. The design of the machine determines which electronics modules are used. The software recognizes the layout automatically and provides the necessary functions. Handling a range of machine types couldn't be easier.

- **Industrial switching cabinet construction**

The X20 System terminal blocks, which are separated from the electronics modules, make it possible to prewire complete switching cabinets. Ideal for series production machines.

- **Easy maintenance**

X20 modules can be easily exchanged to simplify troubleshooting. The electronic modules can be exchanged without interrupting operation. The wiring stays the same thanks to the separate terminal blocks. Being able to exchange the automation components quickly reduces down-time.



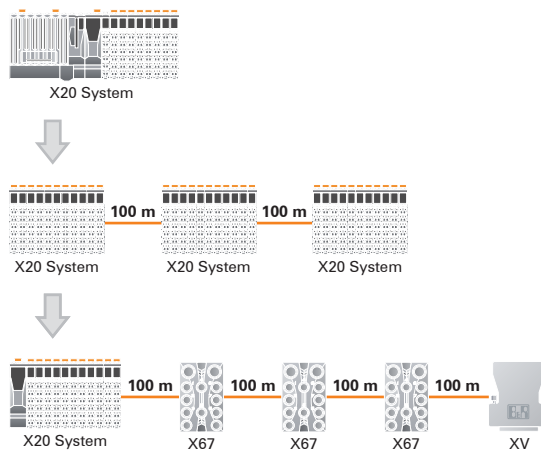
System characteristics

Remote backplane

The main idea: Decentralized backplane for a rack system - in other words, the cable is the backplane. All modules are connected using a uniform backplane (X2X Link). Directly connected X20, X67 or XV modules can each be placed at a distance of up to 100 m outside the confines of the switching cabinet. X2X Link guarantees the highest possible level of resistance to disturbances based on twisted copper cables.

This results in a universal remote backplane that handles communication between bus modules as well as communication via the X2X Link cable, without converters or any loss in performance. A unique feature of the X20 is the possibility to later integrate machine options on bus modules that are not yet being used without having to change the software addressing.

Note: A 100 m X2X Link cable is available from B&R for custom prefabrication (model number: X67CA0X99.1000).



X20 CPUs

General information

The new, optimally scaled X20 System CPU line satisfies a wide range of needs. It can be implemented anywhere, from standard applications to the most demanding applications with the highest performance requirements. It can even effectively handle cycle times of 200 μ s.

At B&R, RS232, Ethernet and USB are already standard equipment. Network capability and connecting USB devices are therefore possible at no additional cost. In addition, every CPU has a POWERLINK connection for real-time communication. The possibility to directly connect axes is already integrated. Although most demands are met by a standard CPU, there are up to three multipurpose slots for additional interface modules.

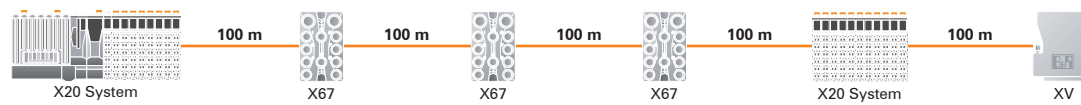
Because the X20 CPU was designed for mounting rail installation in a switching cabinet, up to 250 X20 I/O modules - 3000 channels - can be connected directly. This provides the highest performance as well as the advantages of the remote backplane.



System characteristics

Remote backplane

A power supply integrated in the CPU with I/O supply terminals provides power for the backplane and I/O sensors and actuators, eliminating the need for additional system components. With a direct I/O connection to an X20 CPU, you get all the advantages of the remote backplane, i.e. the ability to repeatedly place I/O line sections anywhere within 100 m using a cable or to add modules with IP67 protection.



B&R Automation Studio

B&R Automation Studio is the only programming tool needed for all platforms. All relevant IEC61131-3 languages and C can be used to create the application software. Integrated visualization, NC and soft CNC functions and Web server technologies complete the range of useful features.

PC-based technology

Based on the latest Intel Celeron processor technology, the X20 CPUs can utilize 200 μ s cycle times.

Large amounts of RAM grant the user unrestricted freedom with applications. It is complemented by a battery buffered non-volatile SRAM for task specific data and remanent variables. In the case of a power outage, variables that have been declared as being remanent are automatically copied from the fast RAM to the secure SRAM. The data content remains in tact until the controller is restarted, and the process can simply be resumed. In addition, a slot for CompactFlash cards is integrated in the system for saving programs or application data, such as recipes.



System characteristics

Suitable for industrial use

Providing the highest performance, with many standard interfaces and interface modules for expansions, yet the dimensions are unbelievably compact. The dimensions of the CPU match those of the X20 modules, which prevents unnecessary waste of space in the switching cabinet.

Fan-free operation - a demand the X20 CPUs can satisfy. None of the processors requires a fan, which makes them virtually maintenance-free. To permit the Celeron 650 CPU to operate over the entire temperature range, it comes with a fan.

Preventative maintenance is possible thanks to monitoring the function of the fan, monitoring the temperature of the processor and the ability to exchange the fan from the outside without a tool and without removing the CPU.



X20 Compact CPUs

General information

With a width of 37.5 mm the new X20 Compact CPUs are extremely compact, yet surprisingly powerful. Less powerful than the PC-based CPUs, there are several models of Compact CPU available in two performance classes.

The Compact CPUs are ideal for situations where cycle times in the millisecond range are acceptable and value is the deciding factor. A range of models with CAN and Ethernet can adapt optimally to all demands. The result: extremely sleek automation solutions.

The Compact CPU's design and dimensions correspond to the X20 System. The X20 I/O modules are connected directly to the CPU.

These are attached seamlessly to the CPU, making the entire system an extreme space saver in the switching cabinet. Despite the sleek profile, the CPU supply, the X2X Link supply, and the I/O module supply are integrated in the system. No additional power modules are necessary.

All CPUs have at least two things in common: multitasking capability and programming with B&R Automation Studio using all relevant IEC61131-3 languages and C.

Product range

The product range begins with the sleekest solution, the X20 Compact CPU equipped with an RS232 online interface and the integrated X20 module connection. Selecting another bus module adds a CAN interface to the solution. The top end of the product range includes CPUs with a Fast Ethernet interface. The design with Ethernet is also available as a variant with approximately 60% more processing power.



System characteristics

X20 fieldbus CPUs with integrated fieldbus connection

General information

Remote design of I/O systems is one of the standard topologies used in automation solutions for machines and equipment. In addition, fieldbuses with bus controllers are normally used. Larger topologies or standard fieldbuses like CANopen, Profibus DP, or DeviceNet can cause relatively long reaction times.

An input must travel via the bus controller to the CPU before it is processed. The output data must then return on the same path. This is sufficient for most I/O functions. However, this reaction time is too long for some functions. The best solution is for the bus controller to process the data. This type of data preprocessing is usually associated with limited CPU function in the programmable bus controller.

Fieldbus CPUs with integrated fieldbus connection overcome these limitations. Fieldbus CPUs are variations of Compact CPUs. In addition to these features, there is also the option of connecting fieldbus modules to the left side. The full CPU function of the Compact CPUs plus a plug-in fieldbus module create many more possibilities than simply data preprocessing. There are enough reserves for relatively complex application processing. Intelligent substations are another area of use. That means a part of the machine must continue to function, even when separated from the main controller.

Based on the Compact CPU platform with up to two plug-in interface modules for the respective fieldbus connection, this results in a very compact (62.5 mm), powerful, and intelligent fieldbus controller.

Product range

As with Compact CPUs, the new CPUs with fieldbus connection are available in two performance classes. Depending on the bus module being used, the CPU has an RS232 interface or an RS232 interface supplemented with a CAN interface. The CPU with higher processing power is available with or without an Ethernet onboard interface. Various fieldbus modules are available.

Programming

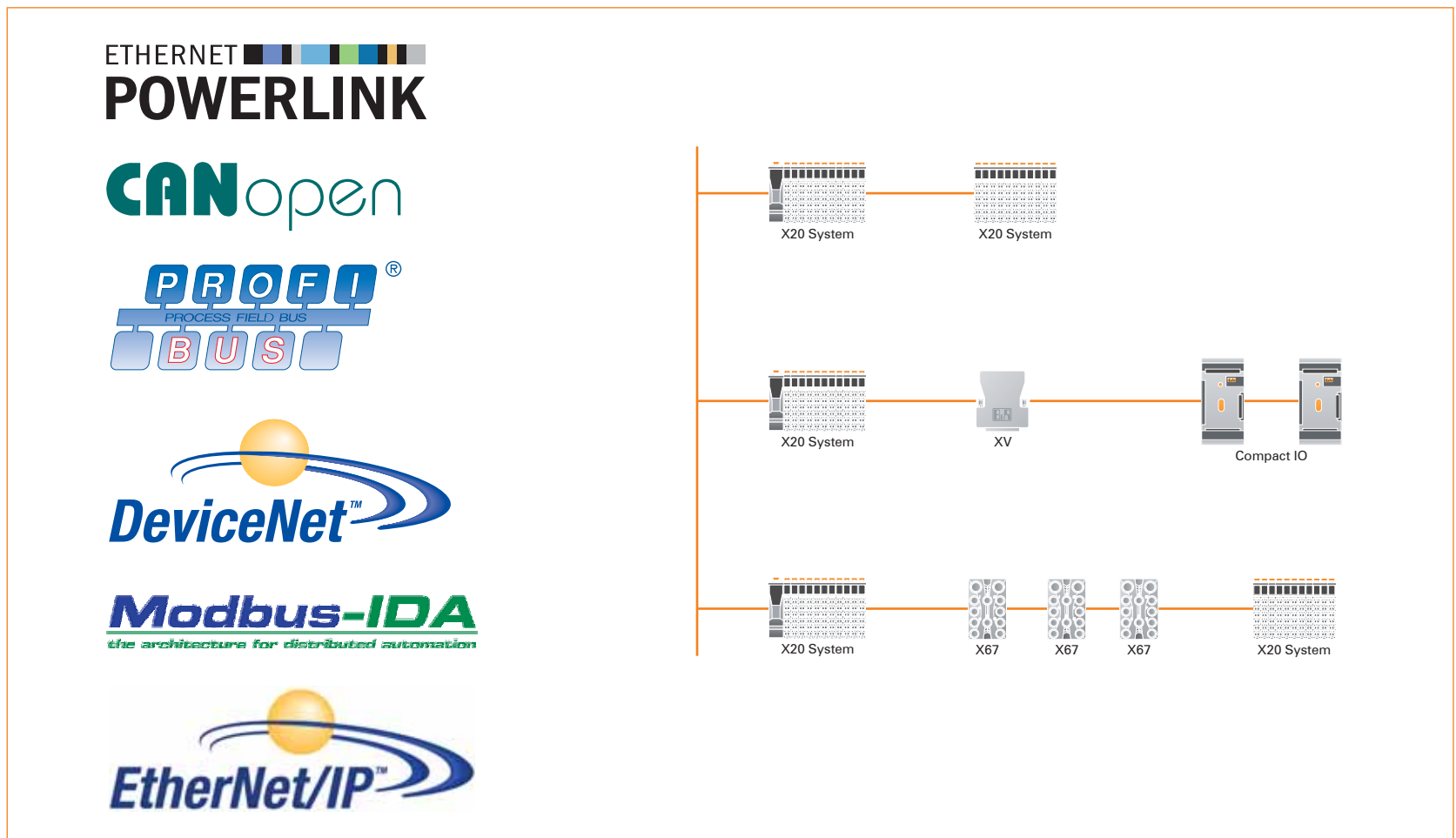
All CPUs have several features in common, including integrated connection of X20 modules and system multitasking capability. With B&R Automation Studio, programming can be done in all IEC 61131-3 languages and in C.



Integration of all standard fieldbuses

The X20 System is ideally suited for expanding existing control systems using standard fieldbus technology.

Using bus controllers, the X20 System can be used as a powerful I/O expansion unit. Standardized EDS or GSD description files allow X20 System components to be easily integrated, configured, and programmed in a non-B&R system programming environment.



System characteristics

Complete system

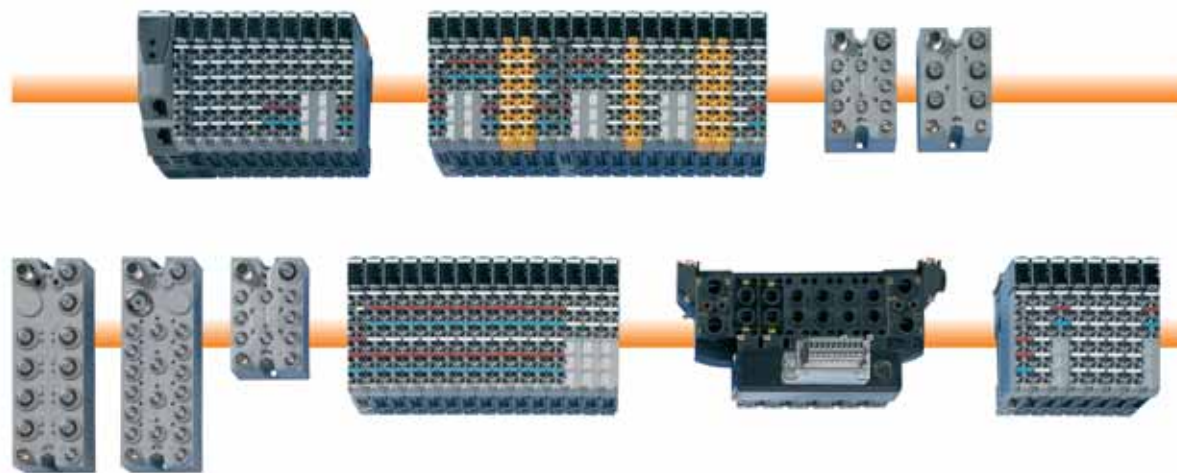
X67 - with IP67 protection

The X67 is the more robust version of the X20 for use outside the switching cabinet. The same basic technology, with an extremely robust housing and 4 to 32 channel modules, guarantees economical solutions in the roughest conditions (X67 System, [419](#)).

Integrated valve manifold control

The development of the XV system now allows direct and manufacturer-independent control of valve manifolds. A complete digital output module in a size and form comparable with a normal DSUB connector. XV allows any valve manifold manufacturer to be selected because it is connected directly to the standardized multiple pin connector on the valve manifold. Fully integrated in the remote backplane, it rounds off the X20 and X67 for complete automation solutions (XV System, [569](#)).

One system, several variations - advantages that pay off. You select your automation components and distribute them as needed inside and outside the switching cabinet.



Easy wiring

Industrial switching cabinet construction streamlines production cycles. Prefabricated cable trees enable faster and easier assembly directly on the machine or system. The X20 System supports efficient prewiring of the entire switching cabinet using separate terminal blocks. The complete X20 System configuration is mounted in the switching cabinet and connected to the prewired cable trees. The supply of the X20 modules and the supply of the sensors and actuators do not add any requirements for energy distribution. The X20 System reduces manual wiring to a minimum.

Install the wires, plug it in, and it's ready to go

Simple, tool-free wiring for fast installation. The X20 System terminal blocks use a fully-integrated and proven push-in connector system. Each terminal can also handle double wire sleeves up to a diameter of $2 \times 0.75 \text{ mm}^2$. The user saves time wiring the system and distributing the signals. The wire connections can be removed with a screwdriver. Each terminal also has an access point for a measurement probe. A great deal of thought was given to designing every aspect the X20 System. Right down to the wire connectors.



Detached

The terminals can be prewired apart from the actual I/O module. This provides many advantages for switching cabinet construction. Separate manufacturing, just-in-time logistics and the installation of preassembled systems during start-up become reality.



Tool-free

Simple, tool-free wiring for fast installation. The X20 System terminals use a fully-integrated and proven push-in connector system. Available with 6-pin and extremely compact 12-pin terminals.



Coded in the system

Factory coding prevents dangerous mix-ups. Coding guarantees that only parts that are permitted to be combined can be combined. Intuitively and without additional work.



Ergonomic

Component density must not come at the expense of ergonomics. With terminal spacing of more than 5 mm, this was handled optimally on the X20 System. Experience gained in the field - used in the field.



Coded in the application

Incorrectly inserting terminals does not necessarily damage the electronics, but always causes faulty functioning of the system. Application coding prevents this problem.



Clarity

Distinct forms intuitively define various functions, such as clearly assigned latching and unlatching functions for terminals. This prevents errors from the very beginning.



Labeling

Each terminal is clearly labeled, directly in the plastic. Additional label tabs are available as system accessories including a printer with ECAD connection.



Easy servicing

A system's strengths can be seen in its details: In addition to the terminal connector and unlocking mechanism, each terminal has an access point for a test probe. You can easily measure the terminal potential without disconnecting the wire.

System characteristics



Sophisticated mechanics

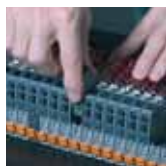
The name B&R stands for many years of experience in developing and manufacturing industrial electronics. But it's also the mechanics of the X20 System that have been thought through to the last detail. Its robust design, long guides, and strengthened housing guarantee the stability it needs in industrial environments. These features allow the X20 System to be mounted on a rail with the same ease as a rack system. They also make it just as simple to remove it from the rail. The sophisticated mechanics of the X20 are needed not just to provide this type of handling, but also to be able to quickly and easily remove I/O slices from the entire system.



Unlocking mechanism with two positions
Closed for secure fit on the mounting rail.



Defined open position makes the difference
Open to remove a module or the entire system.



Removing a single module from the system
Remove or re-insert vertically.



Mount the entire system as a whole
Or just as easily remove the the entire system.

Diagnostics

Only with outstanding diagnostic options can errors be found quickly. The X20 System offers several levels of diagnostics:

- Directly on the module using visual LED displays. Bus status, I/O status and channel states are displayed in direct relationship to the channels or the function. The different states are displayed in different ways, e.g. green for OK, red for error.
- Via software in the cyclical data image. With the X20 System, status data does not result in additional communication load, which would result in considerable differences between theoretically possible bus speeds and real requirements during operation. All necessary status data is always transferred cyclically, with no exceptions.
- Expanded diagnostic data in non-cyclic data traffic without loss in performance. If a problem occurs, detailed diagnostic data can be requested from the application by the respective module using an asynchronous channel. There is no additional communication load whatsoever, and cycle times remain unchanged.



Embedded parameter chip

Information such as module type, serial number, functionality and version number is contained in the embedded parameter chip of the X20 module. This information is automatically evaluated by the programming environment (Automation Studio) and by the application program. This prevents errors, during both commissioning and service. In addition, the system configuration is automated and flexible variations are made possible.

Serial numbers of modules that are defined worldwide are gaining increasing significance in validated systems as demanded, for example, in the FDA.

System characteristics

Space for options

The X20 System family makes it possible to combine the exact components necessary depending on the user's demands and individual application requirements. This allows machine options to be implemented easily and flexibly. Bus modules provide the base, and are more or less a rack replacement. Depending on the option, the necessary electronics modules are then inserted in the predefined slots. Addresses are assigned implicitly via the slot. Software that has been developed once is valid for all versions and does not need to be changed. This is even possible for later machine expansion. The I/O modules are simply inserted in the defined bus modules, and assigned to the corresponding potential groups and E-stop groups. To prevent unwanted expansion, each module can be identified and then enabled using the application software.

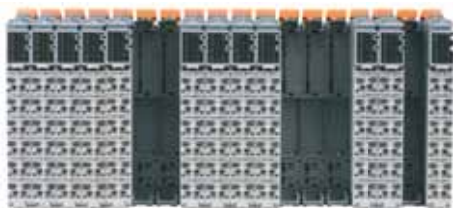
Flexibility for options

The implementation of different machine variations using free bus modules is only one of the many features that the X20 System offers. With the support of B&R Automation Studio (ID 1805), there is an optimized solution using I/O configuration. What does this mean?

Each I/O configuration is created optimally according to the actual requirements. However, the application software is already designed for all options. Only the I/O channels that are actually available are configured in the application program. If an expansion is required, then the additional hardware needed can be easily connected and the I/O configuration changed. This is done without having to compile the application software.

It doesn't matter how the I/O configuration list is created:

- Manually in B&R Automation Studio
- With tools, e.g. using a database or a spreadsheet program
- Directly from an ERP system, exactly like with the parts list for the machine
- Automatically in the application software, regardless of the hardware being used



Machine variation A

The possibilities of the X20 System can be explained using examples. This is a machine constellation with two variations, A and B. All of the necessary electronics modules for machine variation A are shown in the picture to the left. The bus modules needed for variation B are also present, but without electronic modules.



Machine variation B

Variation B shows the necessary electronic modules but the modules necessary for variation A are missing. The distribution of the free bus modules for the variations is also clear: The variable I/O modules can be very easily connected to the required electrically isolated groups and don't need to be attached in the back. The extensive process of taking apart the configuration to expand existing electrically isolated groups is also eliminated. Simply insert the electronic module and put on the terminal block.



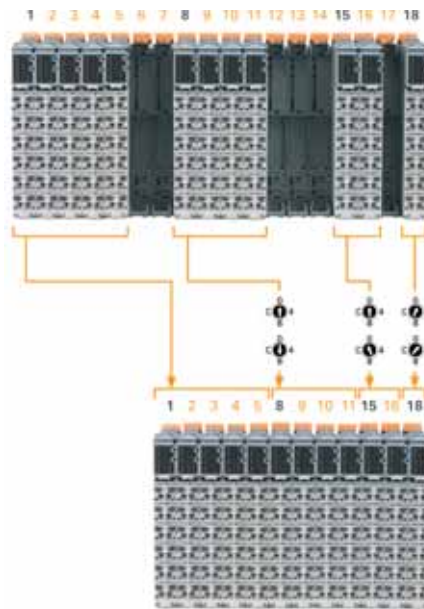
Machine variation A - optimized

The features included in Automation Studio can also be used to achieve completely optimized hardware configuration without losing the advantage of comprehensive application software for all variations. As described earlier, simply switching physical I/O points to the application program makes it extremely easy to optimize the hardware variations without even requiring compilation.

Definable X2X Link address

The decentralized X2X Link backplane, which connects the individual I/O modules with each other, is set up to be self-addressing. It is not necessary to set the node numbers. The module address is assigned according to its position in the X2X Link line. In certain cases, e.g. when configurations of modular machines change, it is necessary to define specific module groups at a fixed address, regardless of the preceding modules in the line. For this purpose, there are modules in both the X20 System and the X67 System with node number switches, which allow you to set the X2X Link address. All subsequent modules refer to this offset and are addressed again automatically.

X20 System



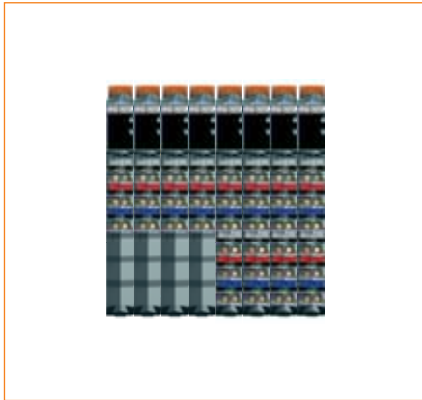
X67 System



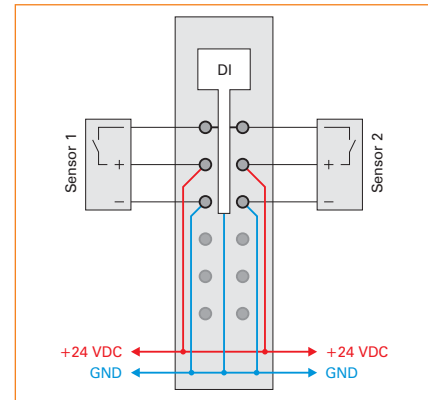
System characteristics

Universal 1, 2, or 3 wire technology

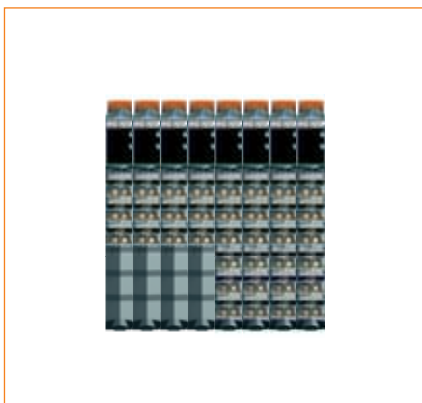
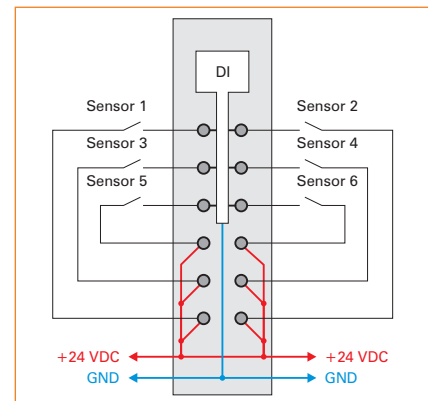
Consistent connection types for all requirements – no additional jumper terminals are needed.
All connection types can also be mixed and matched.



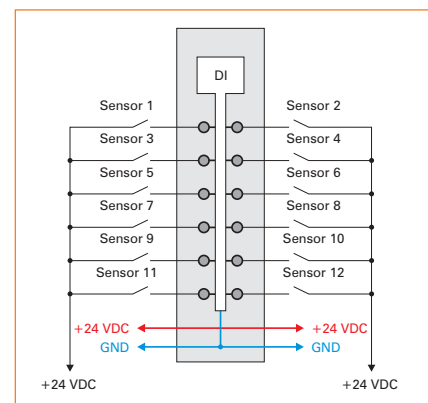
Universal 3-wire connections
Integrated supply and ground for sensors and actuators.



Universal 2-wire connections
Extra terminals are not needed.



Universal 1-wire connections
12 channels - unequaled component density



POWERLINK cable redundancy system

It is often indispensable to have redundant network cabling, especially in systems that handle technical processes. The potential for danger, especially to the lines that run through the system, is disproportionately high in relation to the need to keep communication active in all operating situations. This risk is effectively reduced with double cabling that is routed separately. The POWERLINK cable redundancy system is based on the principle of doubling the transfer routing as well as providing continual and simultaneous monitoring. That means data is simultaneously fed into two cable lines using a corresponding mechanism. The same mechanisms are used to receive these telegrams from the redundant network.

X20 redundancy system

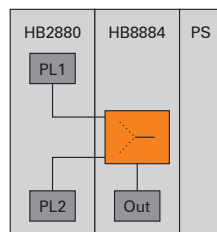
For the POWERLINK cable redundancy system, the following devices were developed based on the X20 System with link selector:

- X20HB8884 compact link selector
- X20BC8084 bus controller

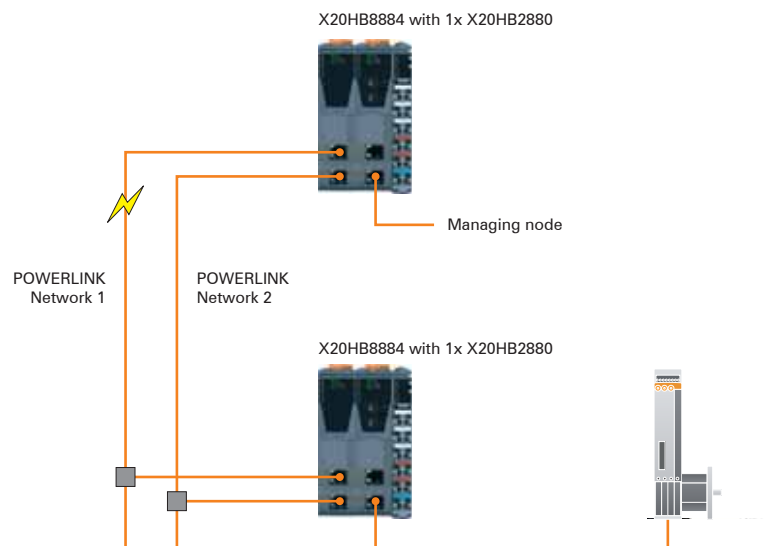
System characteristics

Compact link selector HB8884

The compact link selector was developed for connecting POWERLINK V2 controlled nodes. The device structure follows the proven X20 philosophy. The 62.5 mm wide module is operated as a stand-alone unit. That makes it possible to operate all types of POWERLINK V2 devices on a network with cable redundancy.



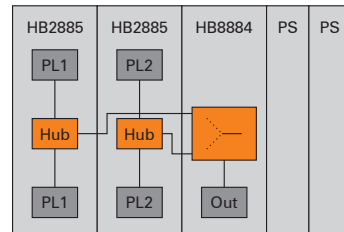
Function principle of the HB8884 compact link selector



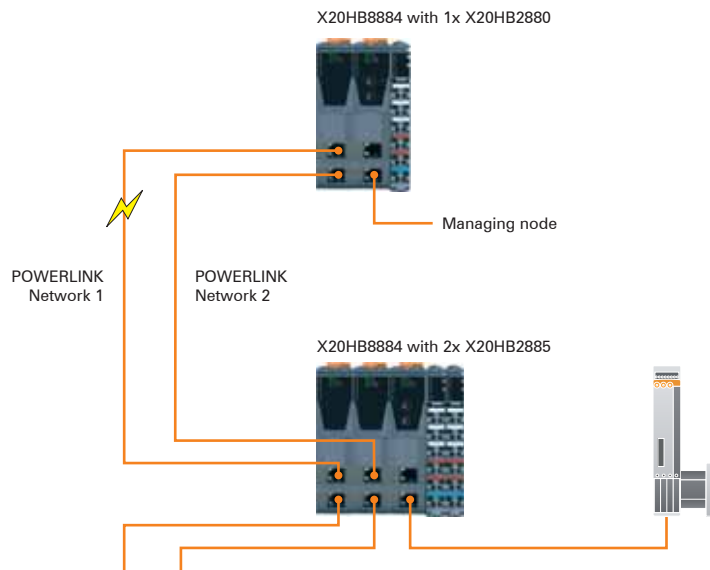
HB8884 with external hubs

HB8884 with hub expansion modules

Expanding the HB8884 with two active X20HB2885 hub modules eliminates the need to connect external hubs. Two hot-swap capable modules are required so that devices on the out-port can continue operating uninterrupted even when a hub is replaced. Additionally, a redundant supply voltage for the system can be easily implemented using two X20 supply modules.



Function principle of the HB8884 compact link selector with hub expansion modules

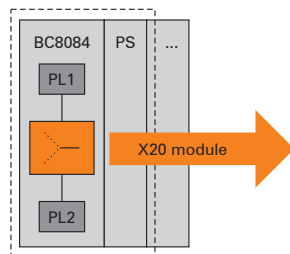


HB8884 with hub expansion modules

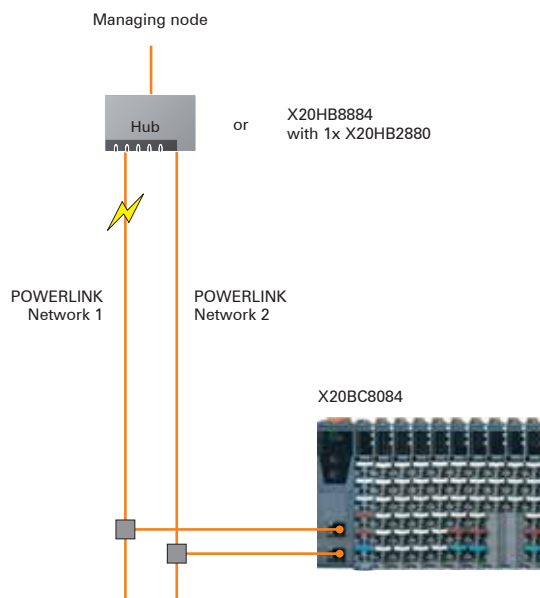
System characteristics

BC8084 bus controller

For connecting an X20 System, the link selector function is integrated in the X20 bus controller BC8084. The bus controller is connected to the POWERLINK network via external hubs.



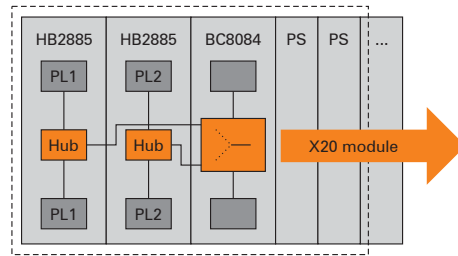
Function principle of the BC8084 bus controller



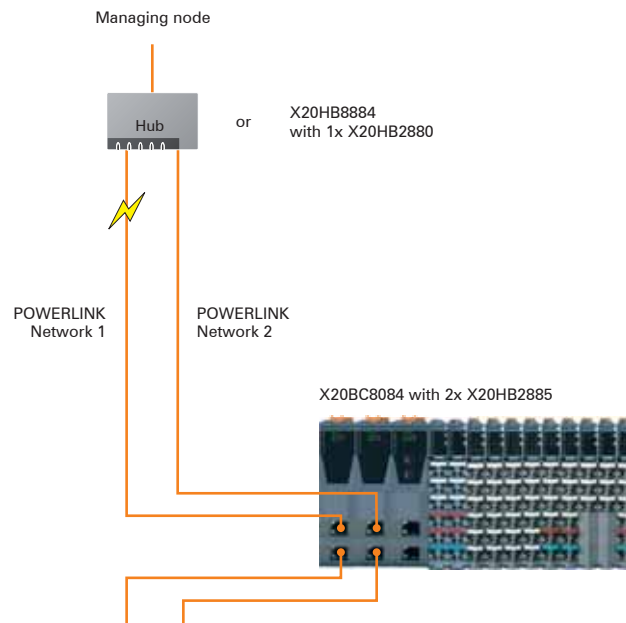
BC8084 with external hubs

BC8084 with hub expansion modules

Expanding the BC8084 with two active X20HB2885 hub modules eliminates the need to connect external hubs. Two hot-swap capable modules are required so that the I/O can continue operating uninterrupted even when a hub is replaced. Additionally, a redundant supply voltage for the system can be easily implemented using two X20 supply modules.



Function principle of the BC8084 bus controller with hub expansion modules



BC8084 with hub expansion modules

System characteristics

Redundancy

Redundancy is often only associated with process automation. However, this subject is much broader, as are the necessary solutions for redundancy tasks. While process automation often utilizes complete cable redundancy in networks, ring redundancy is used in machine manufacturing for dependable data transfer.

Ring redundancy

Cost-effective wiring methods and ring redundancy often lead to a conflict of objectives. When taking a better look at the actual requirements, many tasks could be much better solved using partial ring topologies. POWERLINK offers these solutions.

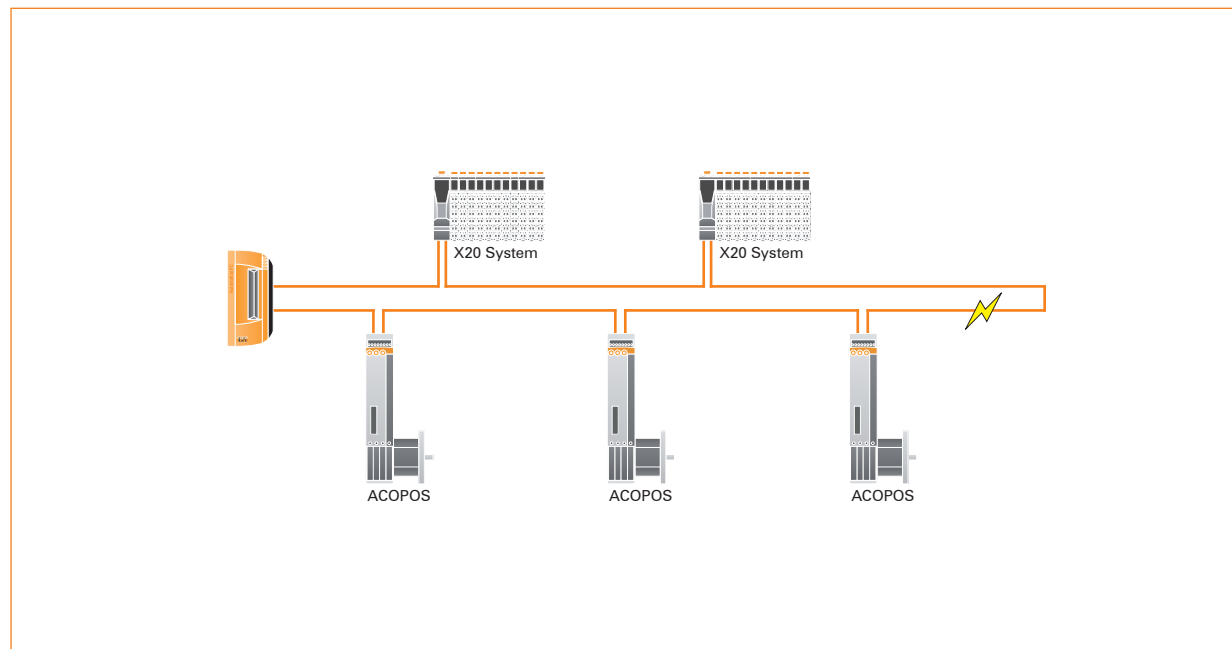
Ring redundancy does not require additional devices. It is simply a configurable property of the B&R POWERLINK Manager with integrated hub. The two ports work either as hub hosting two branches of a POWERLINK network or a port is used for line looping to close the ring for redundant data transfer.

There is no limit to the number of times the ring itself can branch. That means that with just one additional cable, ring redundancy is possible up to the exact point in the network where it is needed. At the same time, the user retains all the freedom of branched cabling on the rest of the machine - redundancy has never been so economical.

- Switching speeds in the μs range
- Partial ring
- Cost-effective redundancy systems
- Configurable with software

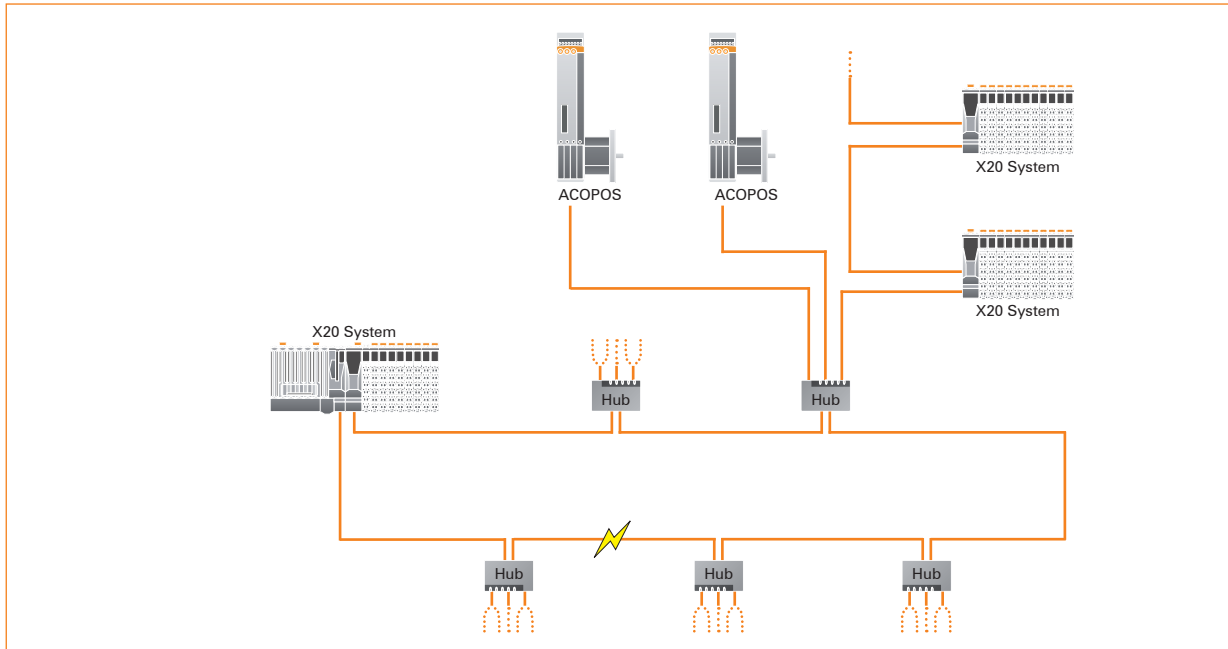
Classic ring redundancy

Classic ring redundancy incorporates every participant in the ring. In the event of a disruption (e.g. caused by line interruption), communication is supplied from both sides.



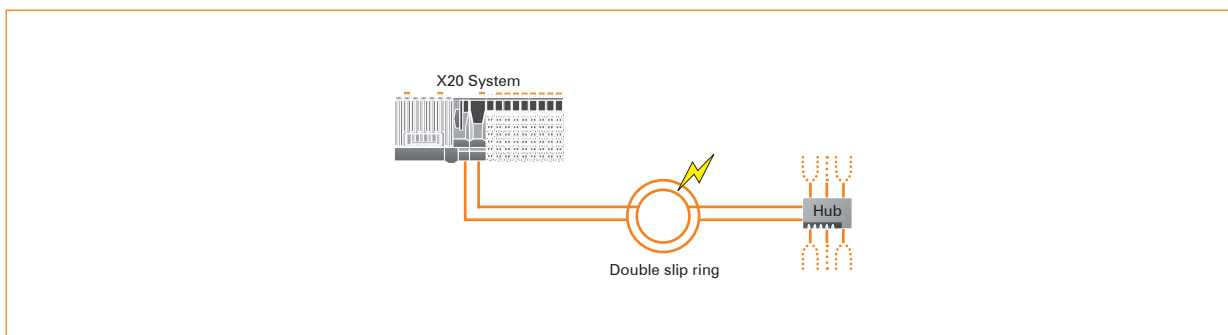
Partial ring redundancy

Only one part of the topology is implemented as ring with redundancy properties. Hubs can be used to dock all standard topologies such as star, tree or line on the ring.



Ring redundancy via slip ring

A practical example for the use of partial ring redundancy: Data transfer via a slip ring should be made redundant for reasons of operational safety. Redundancy on the actual rotating parts of the machine is not necessary. Ring cabling would actually be relatively difficult and uneconomical due to the required looping and inability for branching. That is why this part is implemented as tree with line structure in the branches.

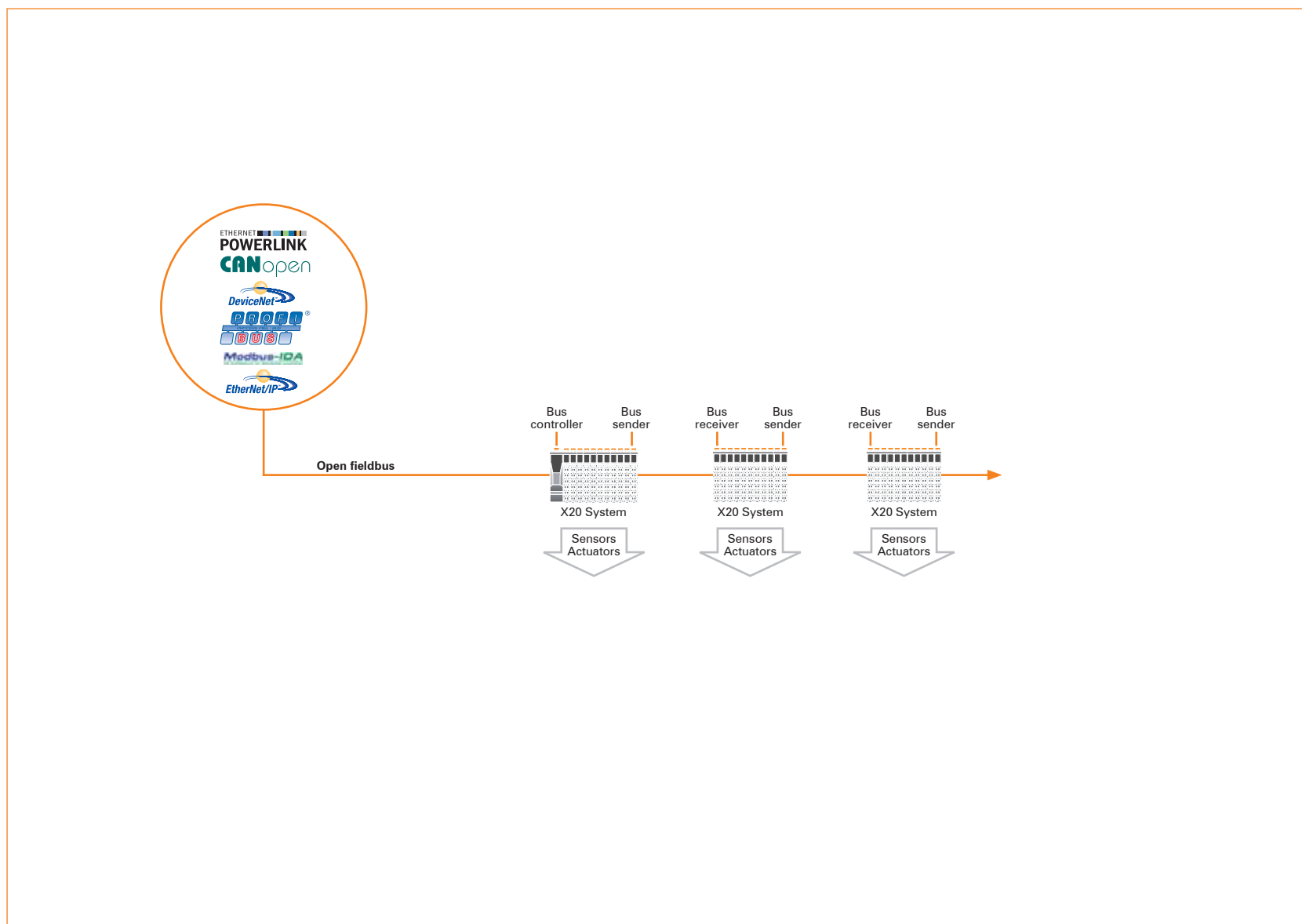


System characteristics

X20 System configuration

The X20 System is designed so that can be connected to either standard fieldbuses (with a bus controller) or the remote X2X Link backplane (with a bus receiver). The connection to the next station is made with a bus transmitter. Supply modules and I/O modules are placed between the bus receiver or bus controller and the bus transmitter as needed.

The power supply design for the X20 is explained in section "Mechanical and Electrical Configuration" (392).

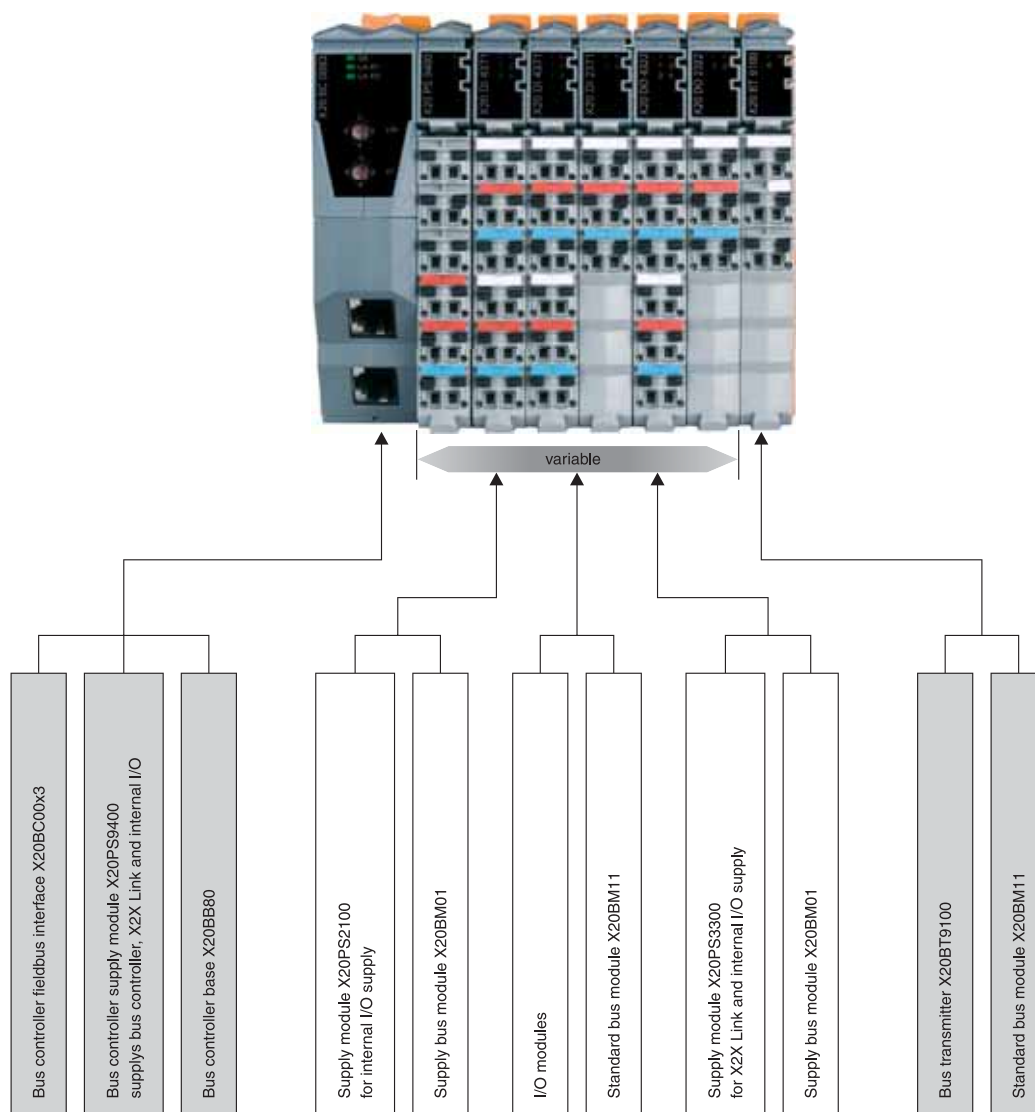




System characteristics

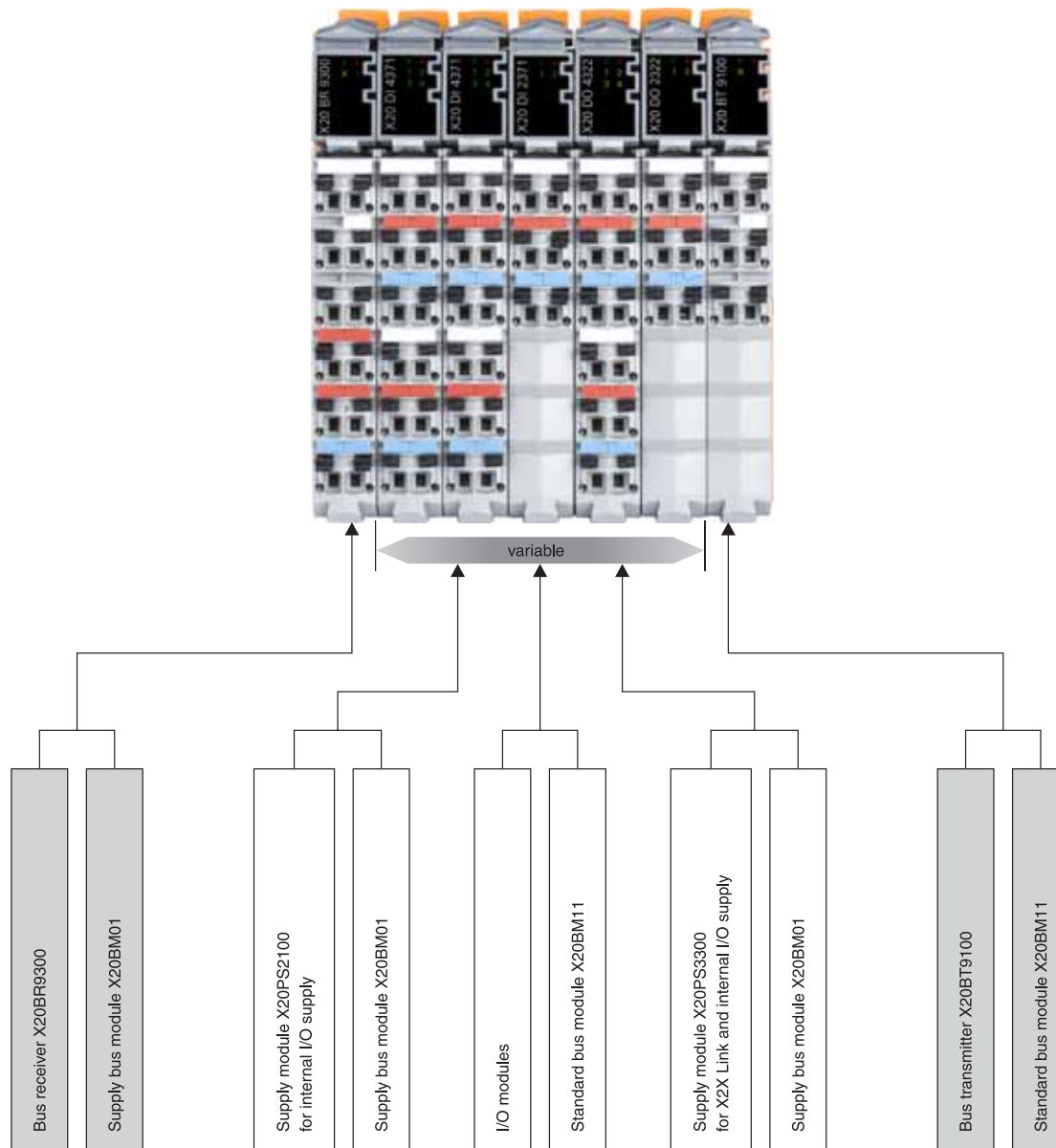
Fieldbus connection

Several bus controllers for standard fieldbus technologies like POWERLINK, DeviceNet, Profibus, CANopen, Modbus/TCP or EtherNet/IP are available to connect X20 modules to existing control systems. Fieldbus configurations transparently integrate the X20 System into the 3rd-party development environment.



Connection to X2X Link backplane

The bus receiver BR9300 is used to connect the X20 System directly to the remote X2X link backplane.



Product overview

Bus modules



Model number	Short description	
X20BM01	X20 supply bus module, internal I/O supply is isolated to the left	86
X20BM05	X20 supply bus module with node number switch, internal I/O supply is isolated to the left	87
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88
X20BM12	X20 bus module, 240 V coded, internal I/O supply is interconnected	89
X20BM15	X20 bus module with node number switches, internal I/O supply is interconnected	90
X20BM21	X20 bus module for double-width modules, internal I/O supply is isolated to the left	91
X20BM31	X20 bus module for double-width modules, internal I/O supply is interconnected	92

Terminal blocks



Model number	Short description	
X20TB06	X20 terminal block, 6-pin, 24 V coded	94
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20TB32	X20 terminal block, 12-pin, 240 V coded	95

Selection table CPUs

	CP1483	CP1484 / CP3484	CP1485 / CP3485	CP1486 / CP3486
Processor	x86 100 comp.	Celeron 266 comp.	Celeron 400	Celeron 650
Fastest task class	1 ms	800 μ s	400 μ s	200 μ s
Cache	L1: 16 KB L2: -	L1: 2x 16 KB L2: -	L1: 2x 16 KB L2: 256 KB	L1: 2x 16 KB L2: 256 KB
RAM	32 MB SDRAM	32 MB SDRAM	64 MB SDRAM	64 MB SDRAM
User RAM	128 KB SRAM	1 MB SRAM	1 MB SRAM	1 MB SRAM
Remanent variables	32 KB	64 KB	256 KB	256 KB
Interface slots	1	1 / 3	1 / 3	1 / 3
Cooling	Fan-free	Fan-free	Fan-free	Fan-free derating / exchangeable fan
Processor support	Integrated I/O processor	Integrated I/O processor	Integrated I/O processor	Integrated I/O processor
Onboard interfaces	RS232, on X20 standard terminals, 115.2 kBit/s Ethernet, RJ45, 10/100 MBit/s POWERLINK, RJ45, 100 MBit/s 2x USB 1.1 1x X2X Link	RS232, on X20 standard terminals, 115.2 kBit/s Ethernet, RJ45, 10/100 MBit/s POWERLINK, RJ45, 100 MBit/s 2x USB 1.1 1x X2X Link	RS232, on X20 standard terminals, 115.2 kBit/s Ethernet, RJ45, 10/100 MBit/s POWERLINK, RJ45, 100 MBit/s 2x USB 1.1 1x X2X Link	RS232, on X20 standard terminals, 115.2 kBit/s Ethernet, RJ45, 10/100 MBit/s POWERLINK, RJ45, 100 MBit/s 2x USB 1.1 1x X2X Link
Dimensions (WxHxD) mm	150 x 99 x 85	150 / 200 x 99 x 85	150 / 200 x 99 x 85	150 / 200 x 99 x 85
Page	120	116 112	108 104	100 96

CPUs



Model number	Short description	
X20CP3486	X20 CPU, Celeron 650, 64 MB DRAM, 1 MB SRAM, exchangeable application memory: CompactFlash, 3 insert slots for X20IF modules, 2 USB interfaces, 1 RS232 interface, 1 Ethernet interface 10/100 Base T, 1 POWERLINK V1/V2 interface, order program memory separately.	96
X20CP1486	X20 CPU, Celeron 650, 64 MB DRAM, 1 MB SRAM, exchangeable application memory: CompactFlash, 1 insert slot for X20IF modules, 2 USB interfaces, 1 RS232 interface, 1 Ethernet interface 10/100 Base T, 1 POWERLINK V1/V2 interface, order program memory separately.	100
X20CP3485-1	X20 CPU, Celeron 400, 64 MB DRAM, 1 MB SRAM, exchangeable application memory: CompactFlash, 3 insert slots for X20IF modules, 2 USB interfaces, 1 RS232 interface, 1 Ethernet interface 10/100 Base T, 1 POWERLINK V1/V2 interface, order program memory separately.	104
X20CP1485-1	X20 CPU, Celeron 400, 64 MB DRAM, 1 MB SRAM, exchangeable application memory: CompactFlash, 1 insert slot for X20IF modules, 2 USB interfaces, 1 RS232 interface, 1 Ethernet interface 10/100 Base T, 1 POWERLINK V1/V2 interface, order program memory separately.	108
X20CP3484	X20 CPU, Celeron 266 compatible, 32 MB DRAM, 1 MB SRAM, exchangeable application memory: CompactFlash, 3 insert slots for X20IF modules, 2 USB interfaces, 1 RS232 interface, 1 Ethernet interface 10/100 Base T, 1 POWERLINK V1/V2 interface, order program memory separately.	112
X20CP1484	X20 CPU, Celeron 266 compatible, 32 MB DRAM, 1 MB SRAM, exchangeable application memory: CompactFlash, 1 insert slot for X20IF modules, 2 USB interfaces, 1 RS232 interface, 1 Ethernet interface 10/100 Base T, 1 POWERLINK V1/V2 interface, order program memory separately.	116
X20CP1483	X20 CPU, x86 100 MHz Intel compatible, 32 MB DRAM, 128 KB SRAM, exchangeable application memory: CompactFlash, 1 insert slot for X20IF modules, 2 USB interfaces, 1 RS232 interface, 1 Ethernet interface 10/100 Base-T, 1 POWERLINK V1/V2 interface, order program memory separately.	120

Product overview

Compact CPUs



Model number	Short description	
X20CP0292	X20 CPU, Compact CPU μ P 25, 750 KB SRAM, 3 MB FlashPROM, RS232 and CAN support corresponds to Compact CPU base, 1 Ethernet interface 100 Base-T	126
X20CP0291	X20 CPU, Compact CPU μ P 16, 100 KB SRAM, 1 MB FlashPROM, RS232 and CAN support corresponds to Compact CPU base, 1 Ethernet interface 100 Base-T	128
X20CP0201	X20 CPU, Compact CPU μ P 16, 100 KB SRAM, 1 MB FlashPROM, RS232 and CAN support corresponds to Compact CPU base	130

Compact CPU - system modules



Model number	Short description	
X20BB22	X20 Compact CPU base, for Compact CPU and Compact CPU supply module, base for integrated RS232 interface, X20 connection, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	132
X20BB27	X20 Compact CPU base, for Compact CPU and Compact CPU supply module, base for integrated RS232 and CAN interface, X20 connection, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	133
X20PS9500	X20 supply module for Compact and fieldbus CPUs and internal I/O supply, X2X Link bus supply	134
X20PS9502	X20 supply module for Compact and fieldbus CPUs and internal I/O supply, X2X Link bus supply, supply feed not electrically isolated	138

Fieldbus CPUs



Model number	Short description	
X20XC0292	X20 CPU, Fieldbus CPU μ P 25, 750 KB SRAM, 3 MB FlashPROM, RS232, CAN and IF support, corresponds to fieldbus Compact CPU base, 1 Ethernet interface 100 Base-T	142
X20XC0202	X20 CPU, Fieldbus CPU μ P 25, 750 KB SRAM, 3 MB FlashPROM, RS232, CAN and IF support, corresponds to Fieldbus CPU base	146
X20XC0201	X20 CPU, Fieldbus CPU μ P 16, 100 KB SRAM, 1 MB FlashPROM, RS232, CAN and IF support, corresponds to Fieldbus CPU base	148

Fieldbus CPU system modules



Model number	Short description	
X20BB32	X20 Fieldbus CPU base, for Fieldbus CPU and Compact CPU supply module, base for integrated RS232 interface, slot for X20 interface module, X20 connection, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	150
X20BB37	X20 Fieldbus CPU base, for Fieldbus CPU and Compact CPU supply module, base for integrated RS232 and CAN interface, slot for X20 interface module, X20 connection, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	151
X20BB42	X20 Fieldbus CPU base, for Fieldbus CPU and Compact CPU supply module, base for integrated RS232 interface, 2x slots for X20 interface module, X20 connection, X20 end plates (left and right) X20AC0SL1/X20AC0SR1 included	152
X20BB47	X20 Fieldbus CPU base, for Fieldbus CPU and Compact CPU supply module, base for integrated RS232 and CAN interface, 2x slots for X20 interface modules, X20 connection, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	153
X20PS9500	X20 supply module for Compact and fieldbus CPUs and internal I/O supply, X2X Link bus supply	134
X20PS9502	X20 supply module for Compact and fieldbus CPUs and internal I/O supply, X2X Link bus supply, Supply not electrically isolated	138
X20IF1020	X20 interface module, 1 RS232, max. 115.2 kBit/s, electrically isolated	189
X20IF1030	X20 interface module, 1 RS485/RS422, max. 115.2 kBit/s, electrically isolated	190
X20IF1061	X20 interface module, 1 Profibus DP master interface, max. 12 MBit/s, max. 3.5 KB input data and max. 3.5 KB output data, electrically isolated	191
X20IF1063	X20 interface module, 1 Profibus DP slave interface, max. 12 MBit/s, electrically isolated	192
X20IF1074	X20 IF interface module for SGC, 1CAN interface, max. 1MBit/s, electrically isolated, order 1x TB2105 terminal block separately.	154

Bus controller



Model number	Short description	
X20BC0043	X20 bus controller fieldbus interface, 1 CANopen interface, status indicator LEDs, order 1x TB2105 terminal block separately.	156
X20BC0053	X20 bus controller fieldbus interface, 1 DeviceNet interface, status indicator LEDs, order 1x TB2105 terminal block separately.	158
X20BC0063	X20 bus controller fieldbus interface, 1 Profibus DP interface, status indicator LEDs, 9-pin DSUB connection	160
X20BC0073	X20 bus controller fieldbus interface, 1 CAN I/O interface, status indicator LEDs, order 1x TB2105 terminal block separately.	162
X20BC0083	X20 bus controller fieldbus interface, POWERLINK V1/V2 interface, integrated 2x hub, status indicator LEDs, 2x RJ45 connection	164
X20BC0087	X20 bus controller fieldbus interface, Modbus/TCP interface, integrated 2x switch, status indicator LEDs, 2x RJ45 connection	166
X20BC0088	X20 bus controller fieldbus interface, EtherNet/IP interface, LEDs for status display, 2x RJ45 connection	168

Bus controller system modules



Model number	Short description	
X20BB80	X20 bus base, for X20 base module (BC, HB, etc.) and X20 supply module, X20 end plates (left and right) X20AC0SL1/X20AC0SR1 included	170
X20PS9400	X20 supply module for bus controller and internal I/O supply, X2X link bus supply	172
X20PS9402	X20 supply module for bus controller and internal I/O supply, X2X link bus supply, supply feed not electrically isolated	174

Expandable bus controllers



Model number	Short description	
X20BC1083	X20 bus controller fieldbus interface, POWERLINK V1/V2 interface, integrated 2x hub, supports expansion with X20 status indicator LEDs, 2x RJ45 connection	178
X20BC8083	X20 bus controller fieldbus interface, POWERLINK V1/V2 interface, integrated 2x hub, supports expansion with X20 hub modules, status indicator LEDs, 2x RJ45 connection	180
X20BC8084	X20 bus controller fieldbus interface, POWERLINK V1/V2 interface, integrated Compact Link Selector, supports expansion with active X20 hub modules, status indicator LEDs, 2x RJ45 connection	182

Expandable bus controller system modules



Model number	Short description	
X20BB81	X20 bus base with 1 expansion slot, for X20 base module (BC, HB, etc.) and an X20 auxiliary module (IF, HB, etc.) and X20 supply module, X20 end plates (left and right) X20AC0SL1/X20AC0SR1 included	184
X20BB82	X20 bus base with 2 expansion slots, for X20 base module (BC, HB, etc.) and two X20 auxiliary modules (IF, HB, etc.) and X20 supply module, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	185
X20PS9400	X20 supply module for bus controller and internal I/O supply, X2X link bus supply	172
X20PS9402	X20 supply module for bus controller and internal I/O supply, X2X link bus supply, supply feed not electrically isolated	174
X20IF1091-1	X20 IF interface module for expandable bus controller, 1X2X Link master interface, electrically isolated, Order 1x TB704 terminal block separately.	186
X20HB2880	X20 hub expansion module, 2x hub connection, status indicator LEDs, 2x RJ45 connection	187
X20HB2885	X20 hub expansion module, integrated active 2x hub, status indicator LEDs, 2x RJ45 connection	188

Product overview

Selection table according to interfaces

	RS232	RS485/RS422	Profibus DP master	Profibus DP slave	CAN bus	X2X	Ethernet POWERLINK	
X20IF1020	1	-	-	-	-	-	-	189
X20IF1030	-	1	-	-	-	-	-	190
X20IF1061	-	-	1	-	-	-	-	191
X20IF1063	-	-	-	1	-	-	-	192
X20IF1072	-	-	-	-	1	-	-	193
X20IF1082	-	-	-	-	-	-	1	194
X20IF1091	-	-	-	-	-	1	-	195
X20IF2772	-	-	-	-	2	-	-	196
X20IF2792	-	-	-	-	1	1	-	197

Communication in the X20 IF module

The IF modules are added to the X20 CPU as an application-specific interface expansion.



Model number	Short description	
X20IF1020	X20 interface module, 1 RS232, max. 115.2 kBit/s, electrically isolated	189
X20IF1030	X20 interface module, 1 RS485/RS422, max. 115.2 kBit/s, electrically isolated	190
X20IF1061	X20 interface module, 1 Profibus DP master interface, max. 12 MBit/s, max. 3.5 KB input data and max. 3.5 KB output data, electrically isolated	191
X20IF1063	X20 interface module, 1 Profibus DP slave interface, max. 12 MBit/s, electrically isolated	192
X20IF1072	X20 interface module, 1 CAN interface, max. 1 MBit/s, electrically isolated, order 1x TB2105 terminal block separately.	193
X20IF1082	X20 interface module, 1 POWERLINK V1/V2 interface, managing or controlled node, integrated 2x hub	194
X20IF1091	X20 interface module, 1 X2X Link master interface, electrically isolated, order 1x TB704 terminal block separately.	195
X20IF2772	X20 interface module, 2 CAN interfaces, max. 1 MBit/s, electrically isolated, order 2x TB2105 terminal block separately.	196
X20IF2792	X20 interface module, 1 CAN interface, max. 1 MBit/s, electrically isolated, 1 X2X Link master interface, electrically isolated, order 1x TB2105 and 1x TB704 terminal block separately.	197

Communication in the X20 electronics module

The CS modules allow complex devices to be remotely connected to the X20 System via a serial interface.



Model number	Short description	
X20CS1011	X20 interface module, 1x Moeller SmartWire	198
X20CS1020	X20 interface module, 1x RS232, max. 115.2 kBit/s	200
X20CS1030	X20 interface module, 1x RS485/RS422, max. 250 kBit/s	202
X20CS1070	X20 interface module, 1x CAN, max. 1 MBit/s, object buffers in both send and receive directions	204
X20CS2770	X20 interface module, 2x CAN, max. 1 MBit/s, object buffers in both send and receive directions	206

Bus receivers / transmitters



Model number	Short description	
X20BR9300	X20 bus receiver (X2X Link) with feed for internal I/O supply, and X2X Link bus supply	208
X20BT9100	X20 bus transmitter (X2X Link)	210
X20BT9400	X20 bus sender X2X Link, X2X Link supply for X67 modules, reverse polarity protection, short circuit protection, overload protection, parallel connection possible, redundancy operation possible	212

Supply modules



Model number	Short description	
X20PS2100	X20 supply module for internal I/O supply	214
X20PS2110	X20 supply module for internal I/O supply, integrated microfuse	216
X20PS3300	X20 supply module for internal I/O supply, X2X link supply	218
X20PS3310	X20 supply module for internal I/O supply, X2X Link bus supply, integrated microfuse	220

Dummy module



Model number	Short description	
X20ZF0000	Dummy X20 module (non-functional)	380

X20 hub system



Model number	Short description	
X20BC8083	X20 bus controller fieldbus interface, POWERLINK V1/V2 interface, integrated 2x hub, supports expansion with X20 hub modules, status indicator LEDs, 2x RJ45 connection	180
X20HB8880	X20 hub base module, integrated 2x hub, status indicator LEDs, 2x RJ45 connection	382

Product overview

System modules for the X20 hub system



Model number	Short description	
X20BB80	X20 bus base, for X20 base module (BC, HB, etc.) and X20 supply module, X20 end plates (left and right) X20AC0SL1/X20AC0SR1 included	170
X20BB81	X20 bus base with 1 expansion slot, for X20 base module (BC, HB, etc.) and one X20 auxiliary module (IF, HB, etc.) and X20 supply module, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	184
X20BB82	X20 bus base with 2 expansion slots, for X20 base module (BC, HB, etc.) and two X20 auxiliary modules (IF, HB, etc.) and X20 supply module, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	185
X20HB2880	X20 hub expansion module, 2x hub connection, status indicator LEDs, 2x RJ45 connection	187
X20PS8002	X20 supply module for stand alone hub and compact link selector	384
X20PS9400	X20 supply module for bus controller and internal I/O supply, X2X link bus supply	172
X20PS9402	X20 supply module for bus controller and internal I/O supply, X2X link bus supply, supply feed not electrically isolated	174

X20 redundancy system



Model number	Short description	
X20BC8084	X20 bus controller fieldbus interface, POWERLINK V1/V2 interface, integrated Compact Link Selector, supports expansion with active X20 hub modules, status indicator LEDs, 2x RJ45 connection	182
X20HB8884	X20 compact link selector, status indicator LEDs, 2x RJ45 connection, order bus base, supply module and terminal block separately!	386

System modules for the X20 redundancy system



Model number	Short description	
X20BB80	X20 bus base, for X20 base module (BC, HB, etc.) and X20 supply module, X20 end plates (left and right) X20AC0SL1/X20AC0SR1 included	170
X20BB81	X20 bus base with 1 expansion slot, for X20 base module (BC, HB, etc.) and one X20 auxiliary module (IF, HB, etc.) and X20 supply module, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	184
X20BB82	X20 bus base with 2 expansion slots, for X20 base module (BC, HB, etc.) and two X20 auxiliary modules (IF, HB, etc.) and X20 supply module, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	185
X20HB2880	X20 hub expansion module, 2x hub connection, status indicator LEDs, 2x RJ45 connection	187
X20HB2885	X20 hub expansion module, integrated active 2x hub, status indicator LEDs, 2x RJ45 connection	188
X20PS8002	X20 supply module for stand alone hub and compact link selector	384
X20PS9400	X20 supply module for bus controller and internal I/O supply, X2X link bus supply	172
X20PS9402	X20 supply module for bus controller and internal I/O supply, X2X link bus supply, supply feed not electrically isolated	174

Accessories

Short description

Terminal locking clip, plain text cover, locking plate, etc.

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Function	X20DI4653	X20DI4760	X20DI6371	X20DI6372	X20DI6553	X20DI6371	X20DI6371	X20DI6372	X20DM9324	X20DO2321	X20DO2322	X20DO2623	X20DO2649	X20DO4321	X20DO4322	X20DO4331	X20DO4332	X20DO4529	X20DO4623	X20DO6321	X20DO6322	X20DO6529	X20DO8322	X20DO8331	X20DO8332	X20DO9321	X20DO9322	X20DS1119	X20DS1319	X20MM2436	X20MM4456	X20PD0011	X20PD0012	X20PD0016	X20PD2113	X20FS4951	X20SM1426	X20SM1436			
Digital input	4		6	6	6	8	12	12	8																			(5)	(8)	(4)	(16)							(4)	(4)		
Digital output									4	2	2	2	2	4	4	4	4	4	4	6	6	6	8	8	8	12	12	(3)	(4)												
Analog input																																									
Analog output																																									
Temperature																																									
Event counter																												(2)	(2)												
Up/Down counter																												(1)	(1)												
AB incr. encoder 5 V																												(1)													
ABR incremental encoder 5 V																																									
AB incremental encoder 24 V																																									
ABR incremental encoder 24 V																																									
SSI absolute encoder 5 V																												(1)													
SSI abs. encoder 24 V																																									
Gate measurement																																									
Full-bridge strain gauge																																									
Ultrasonic path meas.																																									
NAMUR input		4																																							
Resolver input																																									
Potentiometer supply																																									4
PWM output																																									
Stepper motor control																																									
ABR output 5 V																																									
Potential distributor																																									
Linear movement generator																																									
2-speed control with change of direction																																									
Energy measurement																																									
Mains synchronization																																									
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Numbers in brackets represent a multiple assignment. Check the specifications in the data sheet for configuration.

Product overview

Digital input



Model number	Short description	
X20DI2371	X20 digital input module, 2 inputs, 24 VDC, sink, configurable input filter, 3-line connections	222
X20DI2372	X20 digital input module, 2 inputs, 24 VDC, source, configurable input filter, 3-line connections	224
X20DI2377	X20 digital input module, 2 inputs, 24 VDC, sink, configurable input filter, 2 event counters 50kHz	226
X20DI2653	X20 digital input module, 2 inputs, 100-240 VAC, 240 V coded, 3-line connections	228
X20DI4371	X20 digital input module, 4 inputs, 24 VDC, sink, configurable input filter, 3-line connections	230
X20DI4372	X20 digital input module, 4 inputs, 24 VDC, source, configurable input filter, 3-line connections	232
X20DI4653	X20 digital input module, 4 inputs, 100-240 VAC, 240 V coded, 2-line connections	234
X20DI4760	X20 digital input module, 4 NAMUR inputs, 8.05 VDC	236
X20DI6371	X20 digital input module, 6 inputs, 24 VDC, sink, configurable input filter, 2-line connections	238
X20DI6372	X20 digital input module, 6 inputs, 24 VDC, source, configurable input filter, 2-line connections	240
X20DI6553	X20 digital input module, 6 inputs, 100-120 VAC, 240 V coded, 1-line connections	242
X20DI8371	X20 digital input module, 8 inputs, 24 VDC, sink, configurable input filter, 1-line connections	244
X20DI9371	X20 digital input module, 12 inputs, 24 VDC, sink, configurable input filter, 1-line connections	246
X20DI9372	X20 digital input module, 12 inputs, 24 VDC, source, configurable input filter, 1-line connections	248

Digital output



Model number	Short description	
X20DO2321	X20 digital output module, 2 outputs, 24 VDC, 0.5 A, sink, 3-line connections	250
X20DO2322	X20 digital output module, 2 outputs, 24 VDC, 0.5 A, source, 3-line connections	252
X20DO2623	X20 digital output module, 2 outputs, 100-240 VAC, 1.0 A, source, 240 V coded, 3-line connections	254
X20DO2649	X20 digital output module, 2 relays, change-over contacts, 230 VAC / 5 A, 30 VDC / 5 A	256
X20DO4321	X20 digital output module, 4 outputs, 24 VDC, 0.5 A, sink, 3-line connections	258
X20DO4322	X20 digital output module, 4 outputs, 24 VDC, 0.5 A, source, 3-line connections	260
X20DO4331	X20 digital output module, 4 outputs, 24 VDC, 2.0 A, sink, 3-line connections	262
X20DO4332	X20 digital output module, 4 outputs, 24 VDC, 2.0 A, source, 3-line connections	264
X20DO4529	X20 digital output module, 4 relays, change-over contacts, 115 VAC / 0.5 A, 30 VDC / 1 A	266
X20DO4623	X20 digital output module, 4 outputs, 100-240 VAC, 0.5 A, source, 240 V coded, 2-line connections	268
X20DO6321	X20 digital output module, 6 outputs, 24 VDC, 0.5 A, sink, 2-line connections	270
X20DO6322	X20 digital output module, 6 outputs, 24 VDC, 0.5 A, source, 2-line connections	272
X20DO6529	X20 digital output module, 6 relays, N.O. contacts, 115 VAC / 0.5 A, 30 VDC / 1 A	274
X20DO8322	X20 digital output module, 8 outputs, 24 VDC, 0.5 A, source, 1-line connections	276
X20DO8331	X20 digital output module, 8 outputs, 24 VDC, 2.0 A, sink, feed directly on module, 1-line connections	278
X20DO8332	X20 digital output module, 8 outputs, 24 VDC, 2.0 A, source, feed directly on module, 1-line connections	280
X20DO9321	X20 digital output module, 12 outputs, 24 VDC, 0.5 A, sink, 1-line connections	282
X20DO9322	X20 digital output module, 12 outputs, 24 VDC, 0.5 A, source, 1-line connections	284

Digital inputs and outputs



Model number	Short description	
X20DM9324	X20 digital mixed module, 8 inputs, 24 VDC, sink, configurable input filter, 4 outputs, 24 VDC, 0.5 A, source, 1-wire connections	286

Analog input



Model number	Short description	
X20AI1744	1 DMS input, 24-bit converter resolution, external filter modeling	288
X20AI2622	X20 analog input module, 2 inputs, ± 10 V or 0 to 20 mA / 4 to 20 mA, 12-bit resolution, configurable input filter	290
X20AI2632	X20 analog input module, 2 inputs, ± 10 V / 0 to 20 mA, 16-bit resolution, configurable input filter	292
X20AI2632-1	X20 analog input module, 2 inputs, ± 11 V / 0 to 22 mA, 16-bit resolution, configurable input filter	294
X20AI4622	X20 analog input module, 4 inputs, ± 10 V or 0 to 20 mA / 4 to 20 mA, 12-bit resolution, configurable input filter	296
X20AI4632	X20 analog input module, 4 inputs, ± 10 V / 0 to 20 mA, 16-bit resolution, configurable input filter	298
X20AI4632-1	X20 analog input module, 4 inputs, ± 11 V / 0 to 22 mA, 16-bit resolution, configurable input filter	300

Analog output



Model number	Short description	
X20AO2622	X20 analog output module, 2 outputs, ± 10 V / 0 to 20 mA, 12-bit resolution	302
X20AO2632	X20 analog output module, 2 outputs, ± 10 V / 0 to 20 mA, 16-bit resolution	304
X20AO4622	X20 analog output module, 4 outputs, ± 10 V / 0 to 20 mA, 12-bit resolution	306
X20AO4632	X20 analog output module, 4 outputs, ± 10 V / 0 to 20 mA, 16-bit resolution	308

Product overview

Temperature



Model number	Short description	
X20AT2222	X20 temperature input module, 2 resistance measurement inputs, PT100, PT1000, resolution 0.1 K, 3-line connections	310
X20AT2311	X20 temperature input module, 2 resistance measurement inputs, PT100, resolution 1.0 mK, 4-line connections	314
X20AT2402	X20 temperature input module, 2 thermocouple inputs, type J,K,N,S, resolution 0.1 K	316
X20AT4222	X20 temperature input module, 4 resistance measurement inputs, PT100, PT1000, resolution 0.1 K, 3-line connections	312
X20AT6402	X20 temperature input module, 6 thermocouple inputs, type J,K,N,S, resolution 0.1 K	318

Motor module



Model number	Short description	
X20MM2436	X20 PWM motor bridge module, 24 - 39 VDC \pm 25% module supply, 2x PWM motor bridges, 3 A, 4x digital inputs can be configured as incremental encoders	320
X20MM4456	X20 PWM motor bridge module, 24 - 48 VDC \pm 25% module supply, 4x PWM motor bridges, 6 A, 4x 4 digital inputs can be configured as incremental encoders	322
X20SM1426	X20 stepper motor module, 24 VDC supply, 1x motor connection, 1 A, 1.2 A max., 4x digital input 24 VDC, sink, can be used as incremental encoders	324
X20SM1436	X20 stepper motor module, 24 - 39 VDC \pm 25% supply, 1x motor connection, 3 A, 3.5 A max., 4x digital input 24 VDC, sink, can be used as incremental encoders	326

Other functions



Model number	Short description	
X20CM0985	X20 digital/analog mixed module, multi-measurement transformer/synchronization module, 5x DO, 24 VDC, 0.5 A, source, 1 relay 0.5 A, 8x AI \pm 480 V/120 V, 16-bit converter resolution, 3x AI \pm 5 A/1 A, 16-bit converter resolution	328
X20CM1201	X20 combination module, 1x AB incremental encoder 24 V, 4x digital inputs 24 V, 4 channels, 24 V can be configured as input or output, flexible digital controller logic	332
X20CM8281	X20 universal mixed module, 4 outputs, 24 VDC, sink, 1-line connections, 2 digital outputs, 0.5 A, source, 1-line connections, 1 analog input, \pm 10 V or 0 to 20 mA / 4 to 20 mA, 12-bit resolution, 1 analog output, \pm 10 V / 0 to 20 mA, 12-bit resolution, 2 counters as event counters or gate measurement	334
X20CM8323	X20 PWM module, 8 digital outputs for switching electromechanical loads, 0.6 A continuous current, 2 A peak current, current monitoring, switching time detection	338
X20PD0011	X20 potential distributor, 12x GND, integrated microfuse	340
X20PD0012	X20 potential distributor, 12x 24 VDC, integrated microfuse	342
X20PD0016	X20 potential distributor, 5x GND, 5x 24 VDC, each with 1x potential-free feed, integrated microfuse	344
X20PD2113	X20 potential distributor, 6x GND, 6x 24 VDC, with feed possibility, integrated microfuse	346
X20PS4951	X20 supply module for potentiometers, 4x \pm 10 V potentiometer supply	348

Counting



Model number	Short description	
X20CM1941	X20 resolver module, 14-bit resolver input, up to 12-bit ABR output	350
X20DC1196	X20 digital counter module, 1 channel ABR, 5 V, 250 kHz input frequency, 4x evaluation	352
X20DC1198	X20 digital counter module, 1 channel SSI, 5 V, 1 MBit/s, 32-bit	354
X20DC1396	X20 digital counter module, 1 channel ABR, 24 V, 100 kHz input frequency, 4x evaluation	356
X20DC1398	X20 digital counter module, 1 channel SSI, 24 V, 125 MBit/s, 32-bit	358
X20DC2190	X20 digital counter module, ultrasonic transducer module, interfaces: EP Start/Stop, DPI/IP, 2 transducer rods, 4 path evaluation	360
X20DC2396	X20 digital counter module, 2 channel ABR, 24 V, 100 kHz input frequency, 4x evaluation	362
X20DC2398	X20 digital counter module, 2 channel SSI, 24 V, 125 MBit/s, 32-bit	364
X20DC2395	X20 digital counter module, 1x SSI absolute encoder, 24 V, 1x ABR incremental encoder, 24 V, 2x AB incremental encoder, 24 V, 4x event counter or 2x PWM, local time measurement functions	366
X20DC4395	X20 digital counter module, 2x SSI absolute encoder, 24 V, 2x ABR incremental encoder, 24 V, 4x AB incremental encoder, 24 V, 8x event counter or 4x PWM, local time measurement functions	370
X20DS1119	X20 multi-function digital signal processor, 3 digital 5 V (symmetric) channels, can be configured as inputs or outputs, 2 digital 24 V (asymmetric) input channels, up to 2 event counters, universal counter pair as A/B counter or up/down counter, linear movement generator (A/B; direction/frequency) with one reference pulse, SSI absolute encoder	374
X20DS1319	X20 multi-function digital signal processor, 4 digital input channels, 4 digital channels that can be configured as inputs or outputs, up to 2 event counters, universal counter pair as A/B counter or up/down counter, linear movement generator (A/B; direction/frequency) with up to 2 reference pulses, SSI absolute encoder	378

Product overview

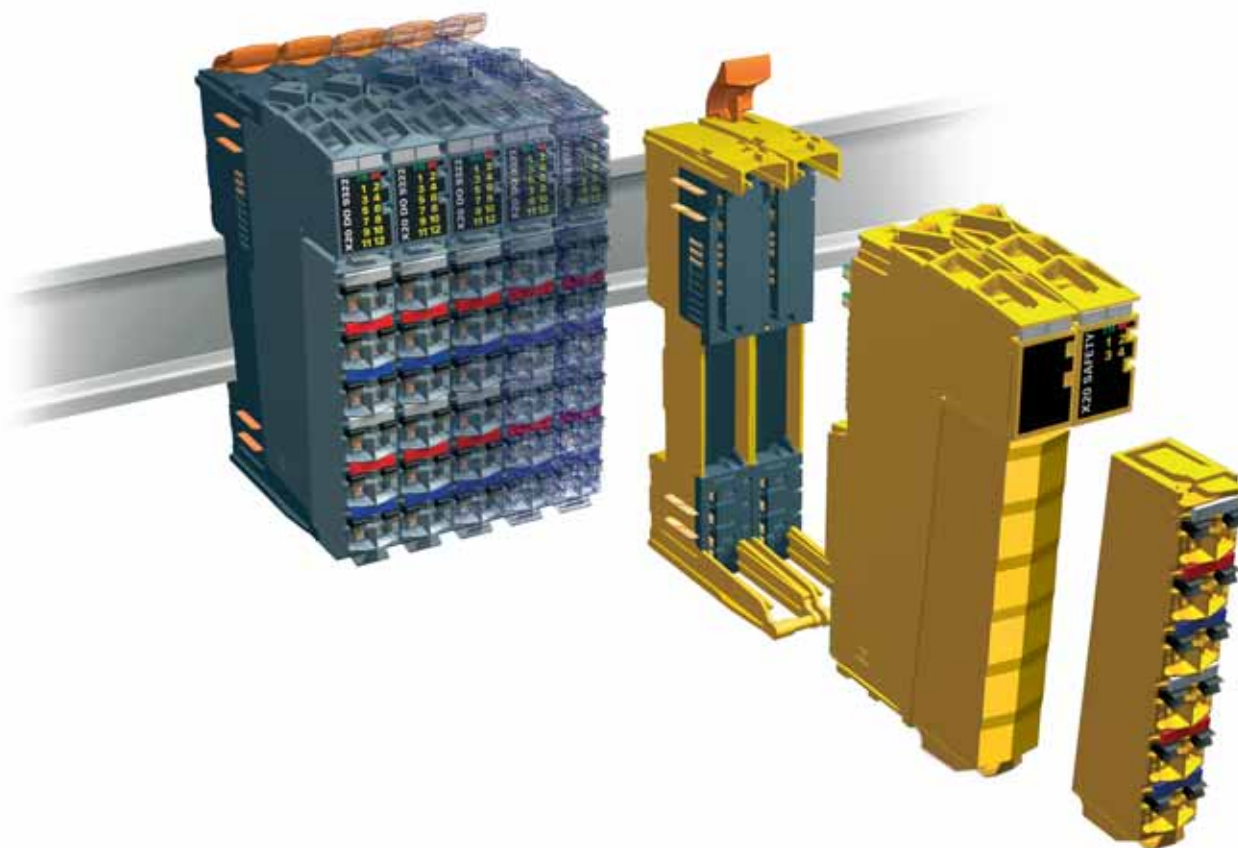
Integrated safety technology

The addition of the Integrated Safety Technology programs to the X20 System help it satisfy all requirements of safety-related applications.

The Integrated Safety Technology products include:

- Safe digital input modules
- Safe digital output modules
- SafeLOGIC

The following pages contain a product overview of all X20 safety modules. More detailed information can be found in chapter 4, Integrated Safety Technology.





Product overview

Bus modules



Model number	Short description	
X20BM33	X20 bus module, safety coded, internal I/O supply is interconnected	546

Terminal blocks



Model number	Short description	
X20TB52	X20 terminal block, 12-pin, safety coded	547

Safe CPUs



Model number	Short description	
X20SL8000	X20 SafeLOGIC, Safety CPU standard, exchangeable User RAM: memory key, 1 POWERLINK V2 interface, Controlled Node, integrated 2x hub, incl. supply module, terminal block X20TB52, X20 locking plate (right), order memory key separately.	548
X20SL8001	X20 SafeLOGIC, Safety CPU plus, exchangeable User RAM: memory key, 1 POWERLINK V2 interface, Controlled Node, integrated 2x hub, incl. supply module, terminal block X20TB52, X20 locking plate (right), order memory key separately.	550

Safe digital input



Model number	Short description	
X20SI2100	X20 safe digital input module, 2 failsafe inputs, 2 pulse outputs, 24 VDC, configurable input filters	552
X20SI4100	X20 safe digital input module, 4 failsafe inputs, 4 pulse outputs, 24 VDC, configurable input filters	554

Safe digital output



Model number	Short description	
X20SO2110	X20 safe digital output module, 2 failsafe semiconductor outputs with current monitoring, 24 VDC, 0.5 A	556
X20SO2120	X20 safe digital output module, 2 failsafe semiconductor outputs with current monitoring, 24 VDC, 2 A	558
X20SO4110	X20 safe digital output module, 4 failsafe semiconductor outputs with current monitoring, 24 VDC, 0.5 A	560
X20SO4120	X20 safe digital output module, 4 failsafe semiconductor outputs with current monitoring, 24 VDC, 2 A	562

Accessories



Model number	Short description	
X20MK0201	X20 memory key, 2 MB	564
X20MK0203	X20 memory key, 8 MB	564

Bus module BM01

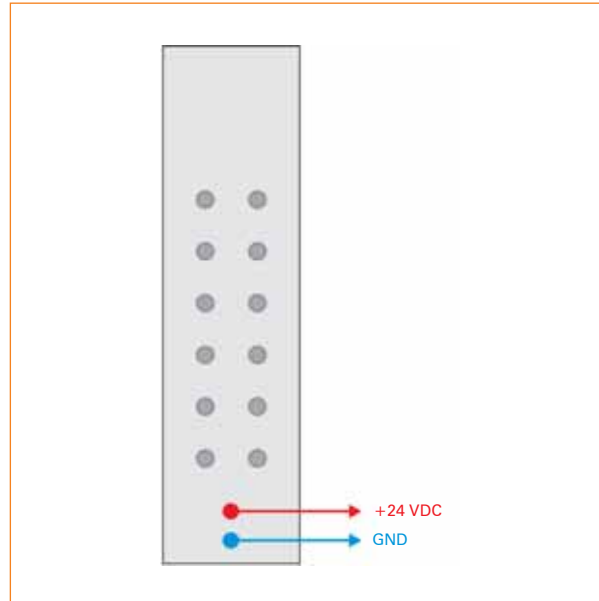


The BM01 bus module is the base for all X20 supply modules.

- Base for all X20 supply modules
- For creating electrical potential groups
- The internal I/O supply is interrupted to the left

Short description	X20BM01
Bus module	Supply bus module, internal I/O supply is isolated to the left
General information	X20BM01
Power consumption	
Bus	0.13 W
I/O internal	-
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20BM01
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20BM01
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20BM01
Spacing	12.5 ^{+0.2} mm

Potential control



Bus module BM05

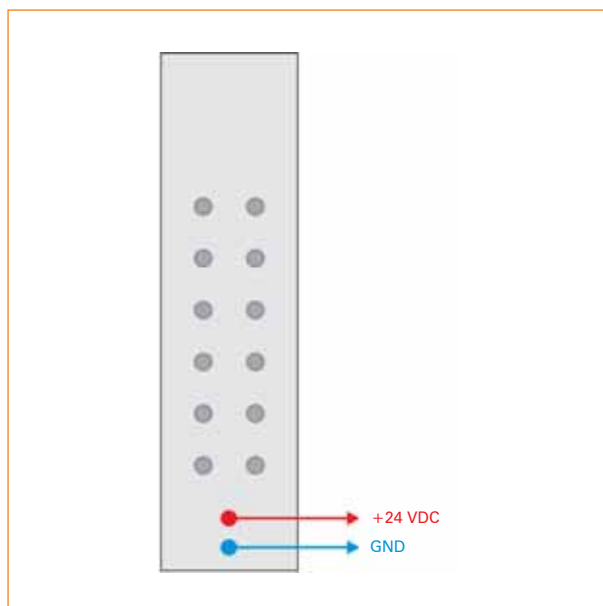


The BM05 bus module is the base for all X20 supply modules. This bus module is also used to determine a unique address using node number switches.

- The BM05 is the base for all X20 supply modules.
- For creating electrical potential groups
- The internal I/O supply is isolated to the left
- Manual node number assignment
- Independent of electronics module
- Manual and automatic addressing can be mixed as desired

Short description	X20BM05
Bus module	Supply bus module, internal I/O supply is isolated to the left, manual node number assignment
General information	X20BM05
Power consumption	
Bus	0.13 W
I/O internal	–
Certification	CE, C-UL-US (in development), GOST-R
Operational conditions	X20BM05
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20BM05
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20BM05
Spacing	12.5 ^{+0.2} mm

Potential control



Bus module BM11

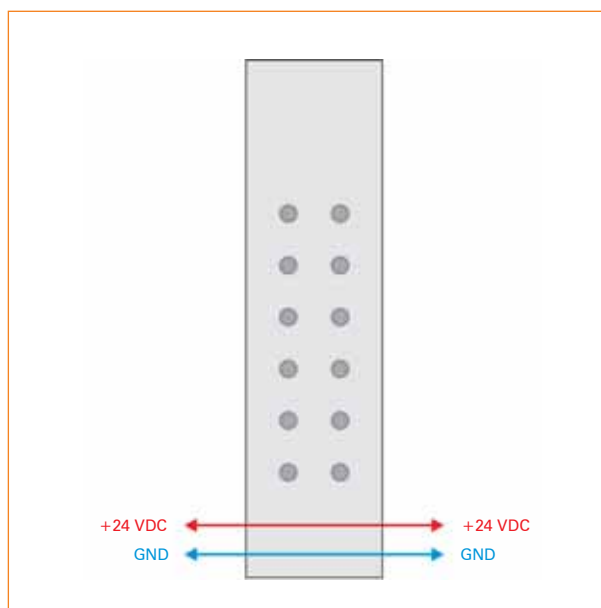


The BM11 bus module serves as the base for all 24 VDC X20 I/O modules.

- Bus module for 24 VDC I/O modules
- The internal I/O supply is interconnected

Short description	X20BM11
Bus module	Bus module for 24 VDC I/O modules, the internal I/O supply is interconnected
General information	X20BM11
Power consumption	
Bus	0.13 W
I/O internal	-
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20BM11
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20BM11
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20BM11
Spacing	12.5 ^{+0.2} mm

Potential control



Bus module BM12

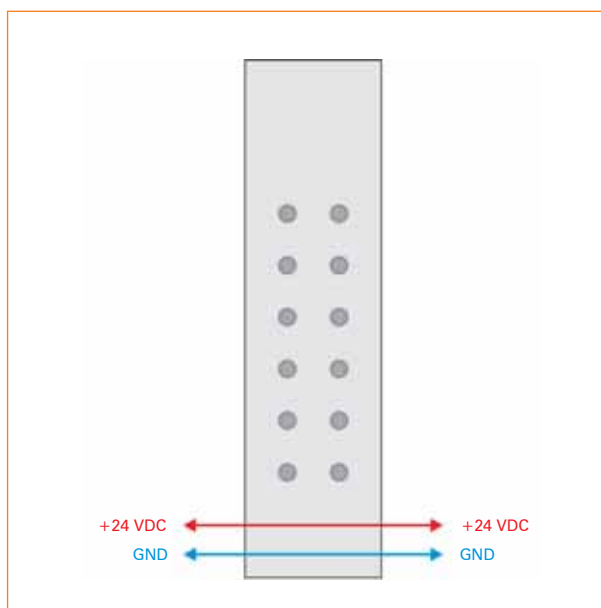


The BM12 bus module serves as the base for all 240 VAC X20 I/O modules. The internal I/O supply is interconnected.

- Bus module for 240 VAC I/O modules
- The internal I/O supply is interconnected
- Special color
- 240 V coding for bus module, electronic module and terminal block

Short description	X20BM12
Bus module	Bus module for 240 VAC I/O modules, the internal I/O supply is interconnected
General information	X20BM12
Power consumption	
Bus	0.13 W
I/O internal	–
Certification	CE, C-UL-US (in development), GOST-R
Operational conditions	X20BM12
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20BM12
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20BM12
Spacing	12,5 ^{+0.2} mm

Potential control



Bus module BM15

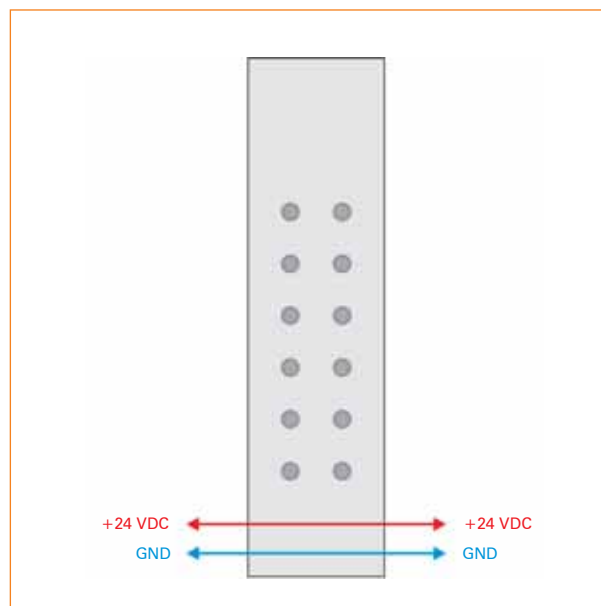


The BM15 bus module serves as the base for all 24 VDC X20 I/O modules. This bus module is also used to determine a unique address using node number switches.

- The BM15 is the base for all X20 24 VDC I/O modules.
- The internal I/O supply is interconnected
- Manual node number assignment
- Independent of electronics module
- Manual and automatic addressing can be mixed as desired

Short description	X20BM15
Bus module	Bus module for 24 VDC I/O modules, the internal I/O supply is interconnected, manual node number assignment
General information	X20BM15
Power consumption	
Bus	0.13 W
I/O internal	–
Certification	CE, C-UL-US (in development), GOST-R
Operational conditions	X20BM15
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20BM15
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20BM15
Spacing	12.5 ^{+0.2} mm

Potential control



Bus module BM21

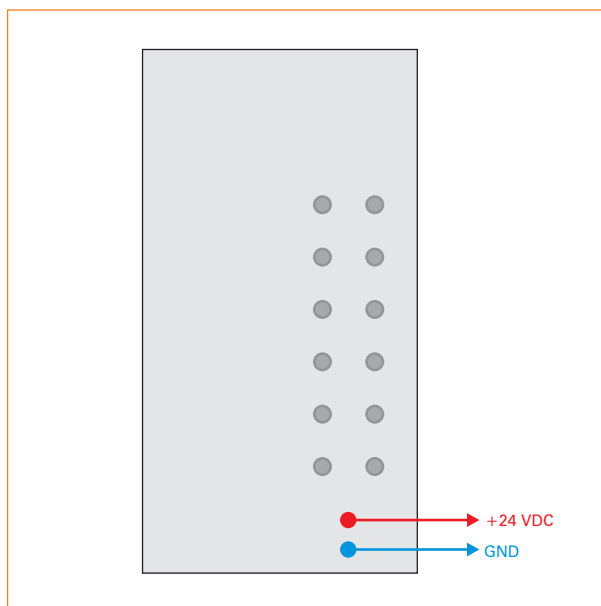


The BM21 bus module serves as a base for all double-width X20 I/O modules. The internal I/O supply is isolated to the left. This allows the BM21 bus module to be used to set up a separate potential group, if the BT9100 bus transmitter is used for the supply.

- For creating electrical potential groups
- The internal I/O supply is isolated to the left

Short description	X20BM21
Bus module	Double-width bus module, internal I/O supply is isolated to the left
General information	X20BM21
Power consumption	
Bus	0.13 W
I/O internal	-
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20BM21
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20BM21
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20BM21
Spacing	25 ^{+0.2} mm

Potential control



Bus module BM31

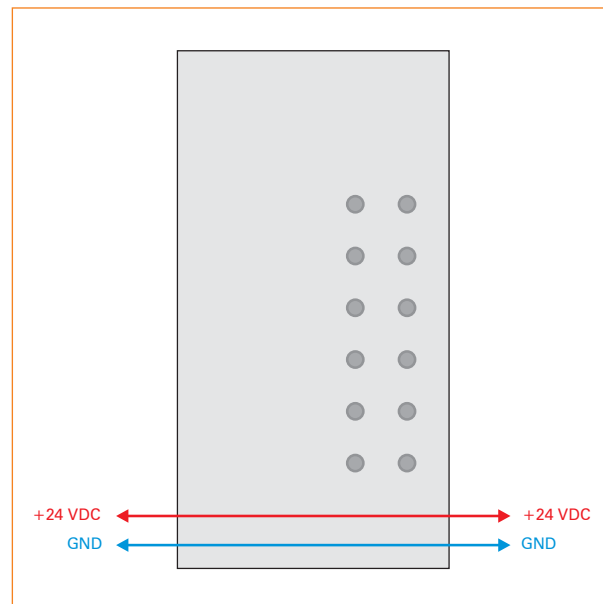


The BM31 bus module serves as a base for all double-width X20 I/O modules. The internal I/O supply is interconnected.

- Bus module for double-width I/O modules
- The internal I/O supply is interconnected

Short description	X20BM31
Bus module	Double-width bus module, the internal I/O supply is interconnected
General information	X20BM31
Power consumption	
Bus	0.13 W
I/O internal	-
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20BM31
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20BM31
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20BM31
Spacing	25 ^{+0.2} mm

Potential control





6/12-pin terminal block TB06/TB12

The X20 24 VDC modules are wired using the TB06 and TB12 terminal blocks.

- Tool-free wiring thanks to push-in construction
- Simple wire release using lever
- Identification option for each terminal
- Plain text labeling also possible
- Test access for standard probes
- Can be customer-coded



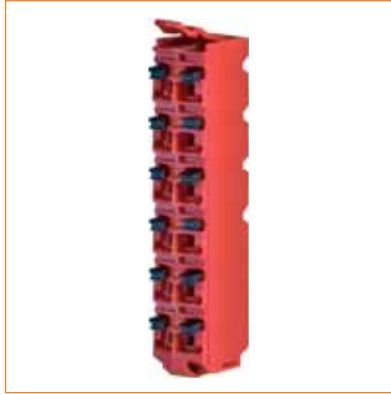
Short description	X20TB06	X20TB12
Terminal block	6-pin	12-pin
Terminal block	X20TB06	X20TB12
Type of terminal	Push-in terminal	Push-in terminal
Distance between contacts		
Left - right	4.2 mm	4.2 mm
Above - below	10.96 mm	10.96 mm
Contact resistance	≤5 mΩ	≤5 mΩ
Rated voltage	230 VAC	230 VAC
Rated Current ¹⁾	10 A / contact	10 A / contact
Connection cross section		
Solid wire line	0.08 mm ² - 2.5 mm ² / AWG 28 - 14	0.08 mm ² - 2.5 mm ² / AWG 28 - 14
Fine wire line	0.25 mm ² - 2.5 mm ² / AWG 24 - 14	0.25 mm ² - 2.5 mm ² / AWG 24 - 14
With wire tip sleeves	0.25 mm ² - 1.5 mm ² / AWG 24 - 16	0.25 mm ² - 1.5 mm ² / AWG 24 - 16
	Up to 2x 0.75 mm ² for double wire tip sleeves	Up to 2x 0.75 mm ² for double wire tip sleeves
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)

1) The respective limit data for the I/O modules must be taken into consideration.

12-pin terminal block TB32

The X20 240 VAC modules are wired using TB32 terminal blocks.

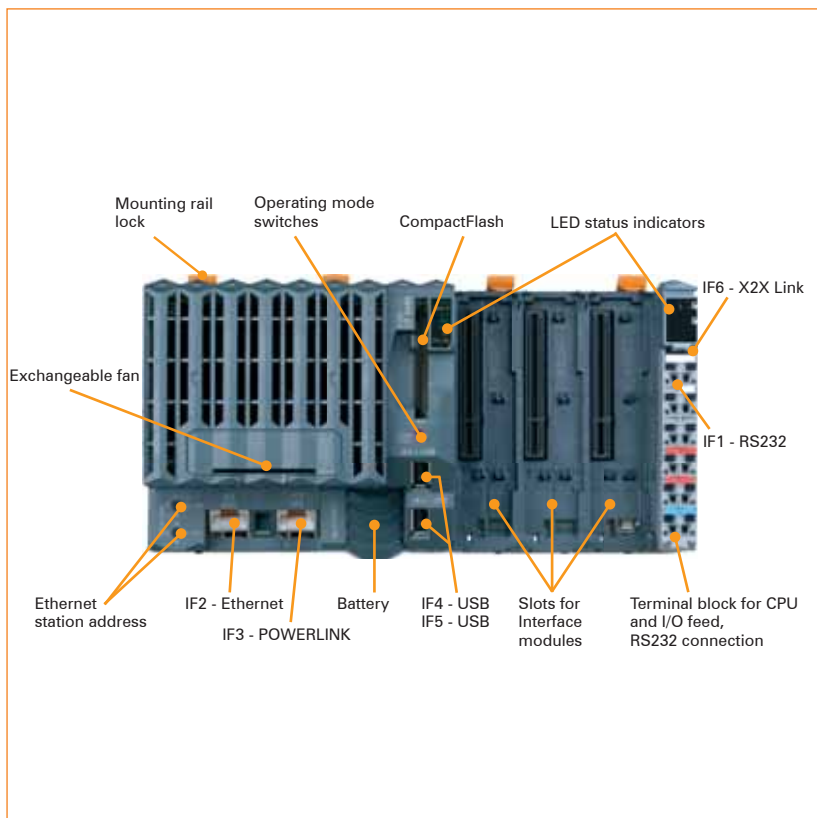
- Tool-free wiring with push-in technology
- Simple wire release using lever
- Ability to label each terminal
- Plain text labeling also possible
- Test access for standard probes
- Can be customer-coded
- Special color
- 240 V coding



Short description	X20TB32
Terminal block	12-pin terminal block for 240 VAC I/O modules
Terminal block	X20TB32
Type of terminal	Push-in terminal
Distance between contacts	
Left - right	4.2 mm
Above - below	10.96 mm
Contact resistance	≤5 mΩ
Rated voltage	230 VAC
Rated Current ¹⁾	10 A / contact
Connection cross section	
Solid wire line	0.08 mm ² - 2.5 mm ² / AWG 28 - 14
Fine wire line	0.25 mm ² - 2.5 mm ² / AWG 24 - 14
With wire tip sleeves	0.25 mm ² - 1.5 mm ² / AWG 24 - 16
	Up to 2x 0.75 mm ² for double wire tip sleeves
Cable type	Copper wires only (no aluminum wires!)

1) The respective limit data for the I/O modules must be taken into consideration.

CPU CP3486



The CP3486 is a high-performance CPU for the X20 System. This CPU can be used anywhere from high-end applications in machine manufacturing to demanding tasks in process control.

Ethernet and USB are onboard. In addition, the CPU has a POWERLINK V1/V2 connection for real-time communication. In addition, there are three multi-purpose slots for additional interface modules.

- Intel Celeron 650 Performance with additional I/O processor
- Ethernet, POWERLINK V1/V2 and USB onboard
- 3 slots for modular interface expansion
- Compact Flash as removable application memory
- Fan can be exchanged from the outside, tool-free
- Extremely compact

ETHERNET 
POWERLINK



Short description	X20CP3486
System module	CPU
Processor	Celeron 650
Interfaces	1x RS232, 1x Ethernet, 1x POWERLINK V1/V2, 2x USB, 1x X2X Link
Controller	X20CP3486
Fastest task class cycle time	200 μ s
Typical instruction cycle time	0.01 μ s
L1 cache for data and program code	2x 16 KB
L2 cache	256 KB
Standard memory	
Working memory (SDRAM)	64 MB SDRAM
User RAM (SRAM)	1 MB SRAM
Remanent variables	256 KB
FPU	Yes
Integrated I/O processor	Processes I/O data points in the background
Data buffering	
Lithium battery	At least 3 years
Battery monitoring	Yes
CompactFlash slot	1
Real-time clock	Nonvolatile memory, resolution 1 second
Modular interface slots	3

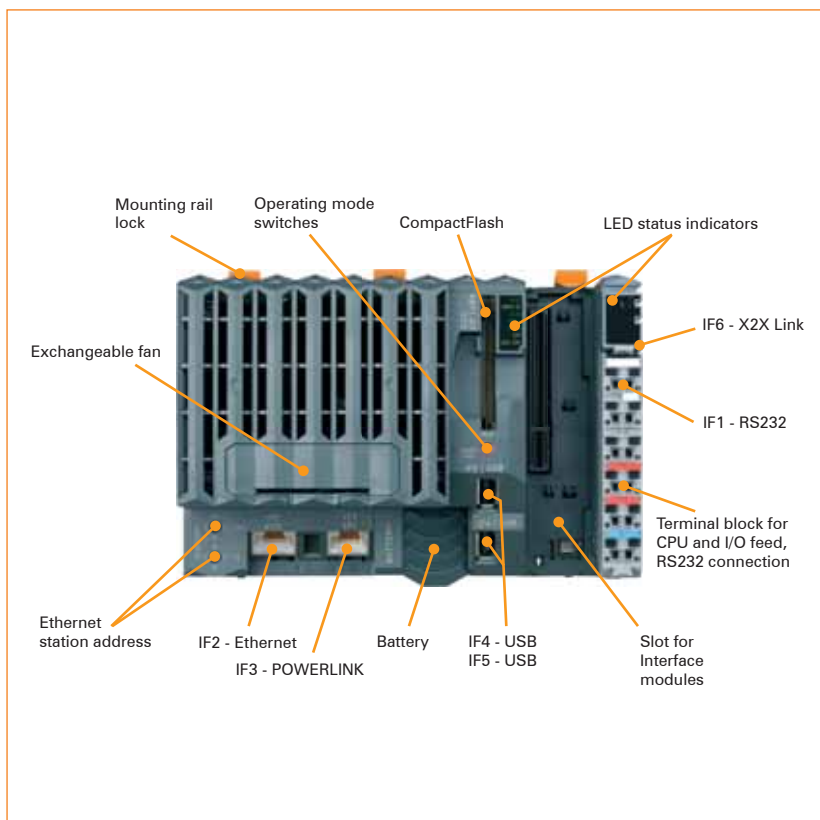
Interfaces		X20CP3486
Interface IF1		
Type		RS232
Design		Contact via 12-pin terminal block TB12
Maximum transfer rate		115.2 kBit/s
Interface IF2		
Type		Ethernet
Design		Shielded RJ45 port
Transfer rate		10/100 MBit/s
Cable length		Max. 100 m between two stations (segment length)
Interface IF3		
Fieldbus		POWERLINK V1/V2
Type		100 Base-T (ANSI/IEEE 802.3)
Design		Shielded RJ45 port
Transfer rate		100 MBit/s
Cable length		Max. 100 m between two stations (segment length)
Interfaces IF4 and IF5		USB Rev. 1.1
IF6 interface		X2X Link
CPU and X2X Link supply		X20CP3486
Input voltage		24 VDC (-15% / +20%)
Input current		Max. 2.2 A
Reverse polarity protection		Yes
Fuse		Integrated, cannot be exchanged
X2X Link supply output		X20CP3486
Rated output power		7.0 W
Parallel operation		Yes ¹⁾
Redundant operation of X2X Link supply		Yes
1) In parallel operation, only 75% of the rated power can be assumed. Please ensure that all parallel operating power supplies are switched on and off simultaneously.		
Input I/O supply		X20CP3486
Input voltage		24 VDC (-15% / +20%)
Fuse		Recommended pre-fusing max. 10 A slow-blow
Output I/O supply		X20CP3486
Rated output voltage		24 VDC
Permitted contact load		10.0 A
General supply		X20CP3486
Status indicators		Overload, operating status, module status, RS232 data transfer
Diagnostics		
Module run/error		Yes, with status LED and software status
Overload		Yes, with status LED and software status
RS232 data transfer		Yes, with status LED
Electrical isolation		
X2X bus supply		Yes
I/O supply		No

CPU CP3486

General information		X20CP3486
Status indicators	CPU function, overtemperature, Ethernet, Ethernet POWERLINK, CompactFlash, battery	
Diagnostics		
CPU function	Yes, with status LED	
Over-temperature	Yes, with status LED	
Ethernet	Yes, with status LED	
Ethernet POWERLINK	Yes, with status LED	
CompactFlash	Yes, with status LED	
Battery	Yes, with status LED and software status	
Fans	Yes, with software status	
Visual Components capability	Yes	
ACOPOS capability	Yes	
Cooling		
	Fan-free with derating (see operational conditions)	
	Exchangeable fans for entire temperature range	
	Fan is monitored	
Electrical isolation		
PLC - IF1/IF4/IF5	No	
PLC - IF2/IF3/IF6	Yes	
IF1/IF4/IF5 - IF2/IF3/IF6	Yes	
IF1 - IF4/IF5	No	
IF4 - IF5	No	
Power consumption, without memory card, without interface module and USB	13.5 W	
Internal power consumption of the X2X Link and I/O supply ¹⁾		
Bus	1.42 W	
I/O internal	0.6 W	
Certification	CE, C-UL-US, GOST-R	
1) The specified values are maximum values. The exact calculation is available for download as a data sheet with the other module documentation on the B8R homepage.		
Operational conditions		X20CP3486
Operating temperature		
Horizontal installation	0°C to +55°C, fan-free: 0°C to +45°C	
Vertical installation	0°C to +55°C, fan-free not permitted	
Relative humidity	5 to 95%, non-condensing	
Mounting orientation	Horizontal or vertical	
Installation at altitudes above sea level		
0 - 2000 m	No derating	
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m	
Protection type	IP20	
Storage and transport conditions		X20CP3486
Temperature	-25°C to +70°C	
Relative humidity	5 to 95%, non-condensing	
Mechanical characteristics		X20CP3486
Dimensions (W x H x D)	200 x 99 x 85 mm	
Comment	Order application memory (CompactFlash) separately Backup battery included in delivery X20 locking plate (right) included in delivery X20 terminal block (12-pin) included in delivery Interface module slot covers included in the delivery	

Required accessories	
5CFCRD.0064-03	CompactFlash 64 MB ATA/IDE SiliconSystems
5CFCRD.0128-03	CompactFlash 128 MB ATA/IDE SiliconSystems
5CFCRD.0256-03	CompactFlash 256 MB ATA/IDE SiliconSystems
5CFCRD.0512-03	CompactFlash 512 MB ATA/IDE SiliconSystems
5CFCRD.1024-03	CompactFlash 1024 MB ATA/IDE SiliconSystems
5CFCRD.2048-03	CompactFlash 2048 MB ATA/IDE SiliconSystems
5CFCRD.4096-03	CompactFlash 4096 MB ATA/IDE SiliconSystems
5CFCRD.8192-03	CompactFlash 8192 MB ATA/IDE SiliconSystems
Optional accessories	
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell
0AC201.9	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell
X20IFxxxx	Communication with Ethernet POWERLINK, X2X Link, CAN bus, Profibus DP, RS232, RS422, RS485
X20AC0EF1	X20 CPU exchangeable fan

CPU CP1486



The CP1486 is a high-performance CPU for the X20 System. This CPU can be used anywhere from high-end applications in machine manufacturing to demanding tasks in process control.

Ethernet and USB are onboard. In addition, the CPU has a POWERLINK V1/V2 connection for real-time communication. The only differences from the CP3486 are that the CP1486 only has one slot for interface modules and a smaller width.

- Intel Celeron 650 Performance with additional I/O processor
- Ethernet, POWERLINK V1/V2 and USB onboard
- 1 slot for modular interface expansion
- Compact Flash as removable application memory
- Fan can be exchanged from the outside, tool-free
- Extremely compact

ETHERNET 
POWERLINK



Short description	X20CP1486
System module	CPU
Processor	Celeron 650
Interfaces	1x RS232, 1x Ethernet, 1x POWERLINK V1/V2, 2x USB, 1x X2X Link
Controller	X20CP1486
Fastest task class cycle time	200 μ s
Typical instruction cycle time	0.01 μ s
L1 cache for data and program code	2x 16 KB
L2 cache	256 KB
Standard memory	
Working memory (SDRAM)	64 MB SDRAM
User RAM (SRAM)	1 MB SRAM
Remanent variables	256 KB
FPU	Yes
Integrated I/O processor	Processes I/O data points in the background
Data buffering	
Lithium battery	At least 3 years
Battery monitoring	Yes
CompactFlash slot	1
Real-time clock	Nonvolatile memory, resolution 1 second
Modular interface slots	1

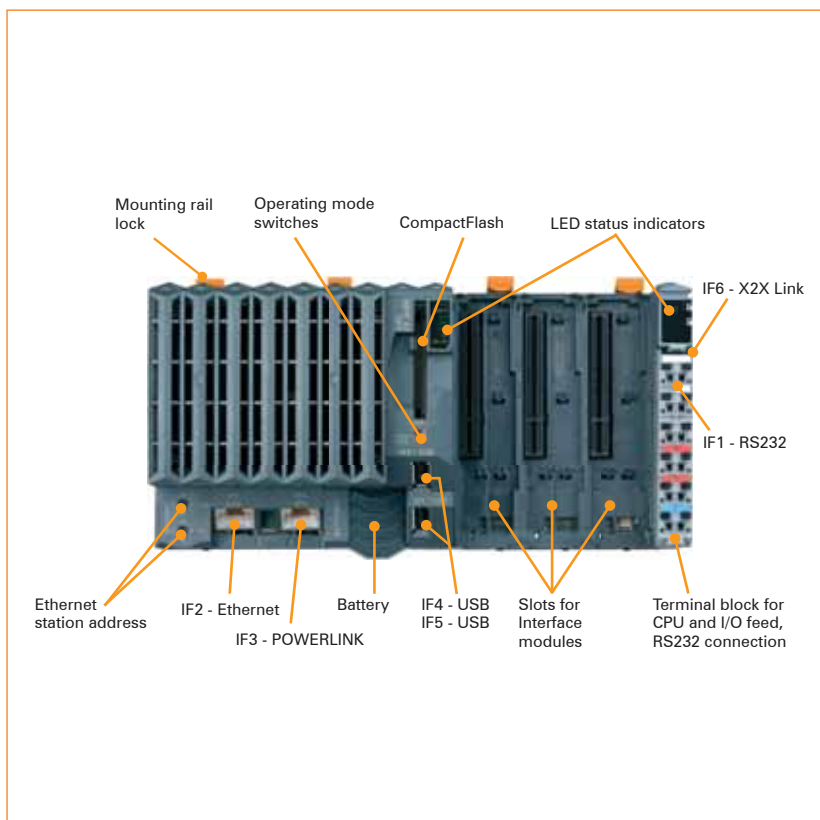
Interfaces		X20CP1486
Interface IF1		
Type		RS232
Design		Contact via 12-pin terminal block TB12
Maximum transfer rate		115.2 kBit/s
Interface IF2		
Type		Ethernet
Design		Shielded RJ45 port
Transfer rate		10/100 MBit/s
Cable length		Max. 100 m between two stations (segment length)
Interface IF3		
Fieldbus		POWERLINK V1/V2
Type		100 Base-T (ANSI/IEEE 802.3)
Design		Shielded RJ45 port
Transfer rate		100 MBit/s
Cable length		Max. 100 m between two stations (segment length)
Interfaces IF4 and IF5		USB Rev. 1.1
IF6 interface		X2X Link
CPU and X2X Link supply		X20CP1486
Input voltage		24 VDC (-15% / +20%)
Input current		Max. 2.2 A
Reverse polarity protection		Yes
Fuse		Integrated, cannot be exchanged
X2X Link supply output		X20CP1486
Rated output power		7.0 W
Parallel operation		Yes ¹⁾
Redundant operation of X2X Link supply		Yes
1) In parallel operation, only 75% of the rated power can be assumed. Please ensure that all parallel operating power supplies are switched on and off simultaneously.		
Input I/O supply		X20CP1486
Input voltage		24 VDC (-15% / +20%)
Fuse		Recommended pre-fusing max. 10 A slow-blow
Output I/O supply		X20CP1486
Rated output voltage		24 VDC
Permitted contact load		10.0 A
General supply		X20CP1486
Status indicators		Overload, operating status, module status, RS232 data transfer
Diagnostics		
Module run/error		Yes, with status LED and software status
Overload		Yes, with status LED and software status
RS232 data transfer		Yes, with status LED
Electrical isolation		
X2X bus supply		Yes
I/O supply		No

CPU CP1486

General information		X20CP1486
Status indicators	CPU function, overtemperature, Ethernet, Ethernet POWERLINK, CompactFlash, battery	
Diagnostics		
CPU function	Yes, with status LED	
Over-temperature	Yes, with status LED	
Ethernet	Yes, with status LED	
Ethernet POWERLINK	Yes, with status LED	
CompactFlash	Yes, with status LED	
Battery	Yes, with status LED and software status	
Fans	Yes, with software status	
Visual Components capability	Yes	
ACOPOS capability	Yes	
Cooling		
	Fan-free with derating (see operational conditions)	
	Exchangeable fans for entire temperature range	
	Fan is monitored	
Electrical isolation		
PLC - IF1/IF4/IF5	No	
PLC - IF2/IF3/IF6	Yes	
IF1/IF4/IF5 - IF2/IF3/IF6	Yes	
IF1 - IF4/IF5	No	
IF4 - IF5	No	
Power consumption, without memory card, without interface module and USB	13.5 W	
Internal power consumption of the X2X Link and I/O supply ¹⁾		
Bus	1.42 W	
I/O internal	0.6 W	
Certification	CE, C-UL-US, GOST-R	
1) The specified values are maximum values. The exact calculation is available for download as a data sheet with the other module documentation on the B8R homepage.		
Operational conditions		X20CP1486
Operating temperature		
Horizontal installation	0°C to +55°C, fan-free: 0°C to +45°C	
Vertical installation	0°C to +55°C, fan-free not permitted	
Relative humidity	5 to 95%, non-condensing	
Mounting orientation	Horizontal or vertical	
Installation at altitudes above sea level		
0 - 2000 m	No derating	
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m	
Protection type	IP20	
Storage and transport conditions		X20CP1486
Temperature	-25°C to +70°C	
Relative humidity	5 to 95%, non-condensing	
Mechanical characteristics		X20CP1486
Dimensions (W x H x D)	150 x 99 x 85 mm	
Comment	Order application memory (CompactFlash) separately Backup battery included in delivery X20 locking plate (right) included in delivery X20 terminal block (12-pin) included in delivery Interface module slot covers included in the delivery	

Required accessories	
5CFCRD.0064-03	CompactFlash 64 MB ATA/IDE SiliconSystems
5CFCRD.0128-03	CompactFlash 128 MB ATA/IDE SiliconSystems
5CFCRD.0256-03	CompactFlash 256 MB ATA/IDE SiliconSystems
5CFCRD.0512-03	CompactFlash 512 MB ATA/IDE SiliconSystems
5CFCRD.1024-03	CompactFlash 1024 MB ATA/IDE SiliconSystems
5CFCRD.2048-03	CompactFlash 2048 MB ATA/IDE SiliconSystems
5CFCRD.4096-03	CompactFlash 4096 MB ATA/IDE SiliconSystems
5CFCRD.8192-03	CompactFlash 8192 MB ATA/IDE SiliconSystems
Optional accessories	
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell
0AC201.9	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell
X20IFxxxx	Communication with Ethernet POWERLINK, X2X Link, CAN bus, Profibus DP, RS232, RS422, RS485
X20AC0EF1	X20 CPU exchangeable fan

CPU CP3485



The CP3485 is a powerful CPU for the X20 System. This CPU is especially useful for applications which require short cycle times, have to process very large amounts of data, or carry out floating point operations.

Ethernet and USB are onboard. In addition, the CPU has a POWERLINK V1/V2 connection for real-time communication. In addition, there are three multi-purpose slots for additional interface modules.

- Intel Celeron 400 Performance with additional I/O processor
- Ethernet, POWERLINK V1/V2 and USB onboard
- 3 slots for modular interface expansion
- Compact Flash as removable application memory
- Fan-free
- Extremely compact

ETHERNET 
POWERLINK



Short description	X20CP3485-1
System module	CPU
Processor	Celeron 400
Interfaces	1x RS232, 1x Ethernet, 1x POWERLINK V1/V2, 2x USB, 1x X2X Link
Controller	X20CP3485-1
Fastest task class cycle time	400 μ s
Typical instruction cycle time	0.015 μ s
L1 cache for data and program code	2x 16 KB
L2 cache	256 KB
Standard memory	
Working memory (SDRAM)	64 MB SDRAM
User RAM (SRAM)	1 MB SRAM
Remanent variables	256 KB
FPU	Yes
Integrated I/O processor	Processes I/O data points in the background
Data buffering	
Lithium battery	At least 3 years
Battery monitoring	Yes
CompactFlash slot	1
Real-time clock	Nonvolatile memory, resolution 1 second
Modular interface slots	3

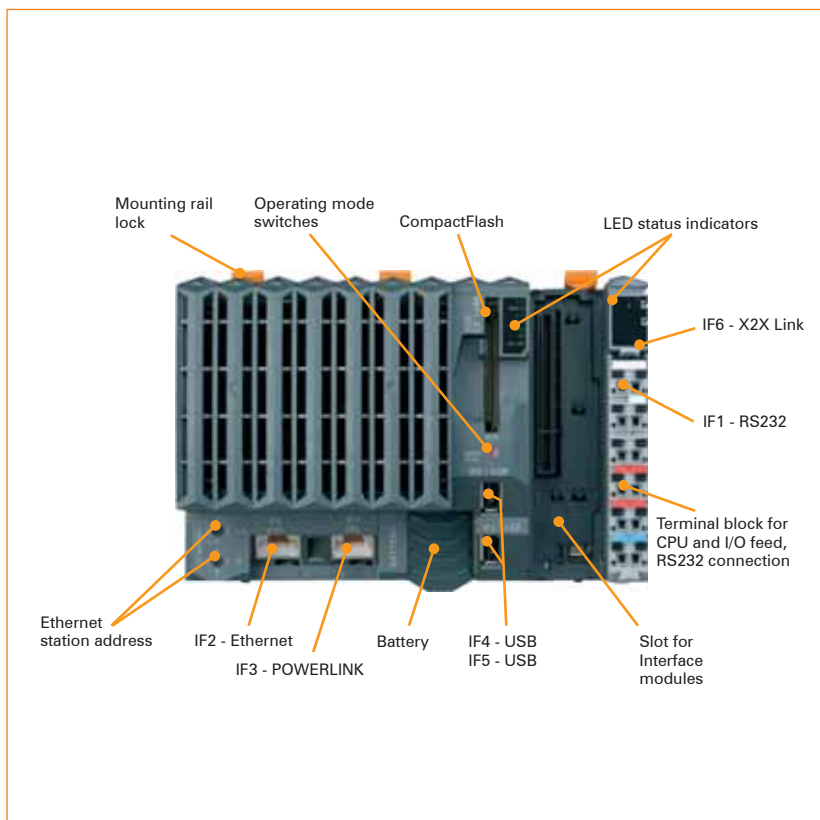
Interfaces		X20CP3485-1
Interface IF1		
Type		RS232
Design		Contact via 12-pin terminal block TB12
Maximum transfer rate		115.2 kBit/s
Interface IF2		
Type		Ethernet
Design		Shielded RJ45 port
Transfer rate		10/100 MBit/s
Cable length		Max. 100 m between two stations (segment length)
Interface IF3		
Fieldbus		POWERLINK V1/V2
Type		100 Base-T (ANSI/IEEE 802.3)
Design		Shielded RJ45 port
Transfer rate		100 MBit/s
Cable length		Max. 100 m between two stations (segment length)
Interfaces IF4 and IF5		USB Rev. 1.1
IF6 interface		X2X Link
CPU and X2X Link supply		X20CP3485-1
Input voltage		24 VDC (-15% / +20%)
Input current		Max. 2.2 A
Reverse polarity protection		Yes
Fuse		Integrated, cannot be exchanged
X2X Link supply output		X20CP3485-1
Rated output power		7.0 W
Parallel operation		Yes ¹⁾
Redundant operation of X2X Link supply		Yes
1) In parallel operation, only 75% of the rated power can be assumed. Please ensure that all parallel operating power supplies are switched on and off simultaneously.		
Input I/O supply		X20CP3485-1
Input voltage		24 VDC (-15% / +20%)
Fuse		Recommended pre-fusing max. 10 A slow-blow
Output I/O supply		X20CP3485-1
Rated output voltage		24 VDC
Permitted contact load		10.0 A
General supply		X20CP3485-1
Status indicators		Overload, operating status, module status, RS232 data transfer
Diagnostics		
Module run/error		Yes, with status LED and software status
Overload		Yes, with status LED and software status
RS232 data transfer		Yes, with status LED
Electrical isolation		
X2X bus supply		Yes
I/O supply		No

CPU CP3485

General information		X20CP3485-1
Status indicators		CPU function, overtemperature, Ethernet, Ethernet POWERLINK, CompactFlash, battery
Diagnostics		
CPU function		Yes, with status LED
Over-temperature		Yes, with status LED
Ethernet		Yes, with status LED
Ethernet POWERLINK		Yes, with status LED
CompactFlash		Yes, with status LED
Battery		Yes, with status LED and software status
Visual Components capability		Yes
ACOPOS capability		Yes
Cooling		Fan-free
Electrical isolation		
PLC - IF1/IF4/IF5		No
PLC - IF2/IF3/IF6		Yes
IF1/IF4/IF5 - IF2/IF3/IF6		Yes
IF1 - IF4/IF5		No
IF4 - IF5		No
Power consumption, without memory card, without interface module and USB		10.5 W
Internal power consumption of X2X Link and I/O supply ¹⁾		
Bus		1.42 W
I/O internal		0.6 W
Certification		CE, C-UL-US, GOST-R
1) The specified values are maximum values. The exact calculation is available for download as a data sheet with the other module documentation on the B&R homepage.		
Operational conditions		X20CP3485-1
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20CP3485-1
Temperature		-25°C to +70°C
Relative humidity		5 to 95%, non-condensing
Mechanical characteristics		X20CP3485-1
Dimensions (W x H x D)		200 x 99 x 85 mm
Comment		Order application memory (CompactFlash) separately Backup battery included in delivery X20 locking plate (right) included in delivery X20 terminal block (12-pin) included in delivery Interface module slot covers included in the delivery

Required accessories	
5CFCRD.0064-03	CompactFlash 64 MB ATA/IDE SiliconSystems
5CFCRD.0128-03	CompactFlash 128 MB ATA/IDE SiliconSystems
5CFCRD.0256-03	CompactFlash 256 MB ATA/IDE SiliconSystems
5CFCRD.0512-03	CompactFlash 512 MB ATA/IDE SiliconSystems
5CFCRD.1024-03	CompactFlash 1024 MB ATA/IDE SiliconSystems
5CFCRD.2048-03	CompactFlash 2048 MB ATA/IDE SiliconSystems
5CFCRD.4096-03	CompactFlash 4096 MB ATA/IDE SiliconSystems
5CFCRD.8192-03	CompactFlash 8192 MB ATA/IDE SiliconSystems
Optional accessories	
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell
0AC201.9	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell
X20IFxxxx	Communication with Ethernet POWERLINK, X2X Link, CAN bus, Profibus DP, RS232, RS422, RS485

CPU CP1485



The CP1485 is a powerful CPU for the X20 System. This CPU is especially useful for applications which require short cycle times, have to process very large amounts of data, or carry out floating point operations.

Ethernet and USB are onboard. In addition, the CPU has a POWERLINK V1/V2 connection for real-time communication. The only differences from the CP3485 are that the CP1485 only has one slot for interface modules and a smaller width.

- Intel Celeron 400 Performance with additional I/O processor
- Ethernet, POWERLINK V1/V2 and USB onboard
- 1 slot for modular interface expansion
- Compact Flash as removable application memory
- Fan-free
- Extremely compact

ETHERNET 
POWERLINK



Short description	X20CP1485-1
System module	CPU
Processor	Celeron 400
Interfaces	1x RS232, 1x POWERLINK V1/V2, 2x USB, 1x X2X Link
Controller	X20CP1485-1
Fastest task class cycle time	400 μ s
Typical instruction cycle time	0.015 μ s
L1 cache for data and program code	2x 16 KB
L2 cache	256 KB
Standard memory	
Working memory (SDRAM)	64 MB SDRAM
User RAM (SRAM)	1 MB SRAM
Remanent variables	256 KB
FPU	Yes
Integrated I/O processor	Processes I/O data points in the background
Data buffering	
Lithium battery	At least 3 years
Battery monitoring	Yes
CompactFlash slot	1
Real-time clock	Nonvolatile memory, resolution 1 second
Modular interface slots	1

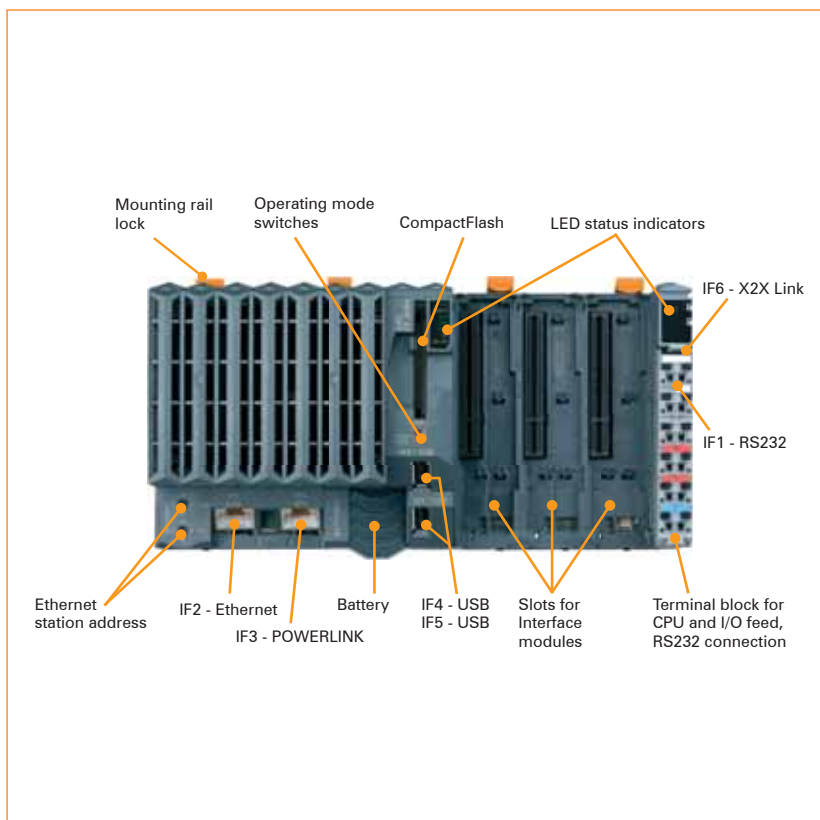
Interfaces		X20CP1485-1
Interface IF1		
Type		RS232
Design		Contact via 12-pin terminal block TB12
Maximum transfer rate		115.2 kBit/s
Interface IF2		
Type		Ethernet
Design		Shielded RJ45 port
Transfer rate		10/100 MBit/s
Cable length		Max. 100 m between two stations (segment length)
Interface IF3		
Fieldbus		POWERLINK V1/V2
Type		100 Base-T (ANSI/IEEE 802.3)
Design		Shielded RJ45 port
Transfer rate		100 MBit/s
Cable length		Max. 100 m between two stations (segment length)
Interfaces IF4 and IF5		USB Rev. 1.1
IF6 interface		X2X Link
CPU and X2X Link supply		X20CP1485-1
Input voltage		24 VDC (-15% / +20%)
Input current		Max. 2.2 A
Reverse polarity protection		Yes
Fuse		Integrated, cannot be exchanged
X2X Link supply output		X20CP1485-1
Rated output power		7.0 W
Parallel operation		Yes ¹⁾
Redundant operation of X2X Link supply		Yes
1) In parallel operation, only 75% of the rated power can be assumed. Please ensure that all parallel operating power supplies are switched on and off simultaneously.		
Input I/O supply		X20CP1485-1
Input voltage		24 VDC (-15% / +20%)
Fuse		Recommended pre-fusing max. 10 A slow-blow
Output I/O supply		X20CP1485-1
Rated output voltage		24 VDC
Permitted contact load		10.0 A
General supply		X20CP1485-1
Status indicators		Overload, operating status, module status, RS232 data transfer
Diagnostics		
Module run/error		Yes, with status LED and software status
Overload		Yes, with status LED and software status
RS232 data transfer		Yes, with status LED
Electrical isolation		
X2X bus supply		Yes
I/O supply		No

CPU CP1485

General information		X20CP1485-1
Status indicators	CPU function, overtemperature, Ethernet, Ethernet POWERLINK, CompactFlash, battery	
Diagnostics		
CPU function	Yes, with status LED	
Over-temperature	Yes, with status LED	
Ethernet	Yes, with status LED	
Ethernet POWERLINK	Yes, with status LED	
CompactFlash	Yes, with status LED	
Battery	Yes, with status LED and software status	
Visual Components capability	Yes	
ACOPOS capability	Yes	
Cooling	Fan-free	
Electrical isolation		
PLC - IF1/IF4/IF5	No	
PLC - IF2/IF3/IF6	Yes	
IF1/IF4/IF5 - IF2/IF3/IF6	Yes	
IF1 - IF4/IF5	No	
IF4 - IF5	No	
Power consumption, without memory card, without interface module and USB	10.5 W	
Internal power consumption of X2X Link and I/O supply ¹⁾		
Bus	1.42 W	
I/O internal	0.6 W	
Certification	CE, C-UL-US, GOST-R	
1) The specified values are maximum values. The exact calculation is available for download as a data sheet with the other module documentation on the B&R homepage.		
Operational conditions		X20CP1485-1
Operating temperature		
Horizontal installation	0°C to +55°C	
Vertical installation	0°C to +50°C	
Relative humidity	5 to 95%, non-condensing	
Mounting orientation	Horizontal or vertical	
Installation at altitudes above sea level		
0 - 2000 m	No derating	
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m	
Protection type	IP20	
Storage and transport conditions		X20CP1485-1
Temperature	-25°C to +70°C	
Relative humidity	5 to 95%, non-condensing	
Mechanical characteristics		X20CP1485-1
Dimensions (W x H x D)	150 x 99 x 85 mm	
Comment	Order application memory (CompactFlash) separately Backup battery included in delivery X20 locking plate (right) included in delivery X20 terminal block (12-pin) included in delivery Interface module slot covers included in the delivery	

Required accessories	
5CFCRD.0064-03	CompactFlash 64 MB ATA/IDE SiliconSystems
5CFCRD.0128-03	CompactFlash 128 MB ATA/IDE SiliconSystems
5CFCRD.0256-03	CompactFlash 256 MB ATA/IDE SiliconSystems
5CFCRD.0512-03	CompactFlash 512 MB ATA/IDE SiliconSystems
5CFCRD.1024-03	CompactFlash 1024 MB ATA/IDE SiliconSystems
5CFCRD.2048-03	CompactFlash 2048 MB ATA/IDE SiliconSystems
5CFCRD.4096-03	CompactFlash 4096 MB ATA/IDE SiliconSystems
5CFCRD.8192-03	CompactFlash 8192 MB ATA/IDE SiliconSystems
Optional accessories	
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell
0AC201.9	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell
X20IFxxxx	Communication with Ethernet POWERLINK, X2X Link, CAN bus, Profibus DP, RS232, RS422, RS485 72

CPU CP3484



The CP3484 is the smallest Celeron based CPU for the X20 System. However, its shortest cycle time of 800 μ s still shows its power. The basic features are the same as those of the larger types.

Ethernet and USB are onboard. In addition, the CPU has a POWERLINK V1/V2 connection for real-time communication. In addition, there are three multi-purpose slots for additional interface modules.

- Intel Celeron 266 Performance with additional I/O processor
- Ethernet, POWERLINK V1/V2 and USB onboard
- 3 slots for modular interface expansion
- Compact Flash as removable application memory
- Fan-free
- Extremely compact

ETHERNET 
POWERLINK



Short description	X20CP3484
System module	CPU
Processor	Celeron 266 comp.
Interfaces	1x RS232, 1x Ethernet, 1x POWERLINK V1/V2, 2x USB, 1x X2X Link
Controller	X20CP3484
Fastest task class cycle time	800 μ s
Typical instruction cycle time	0.022 μ s
L1 cache for data and program code	2x 16 KB
L2 cache	-
Standard memory	
Working memory (SDRAM)	32 MB SDRAM
User RAM (SRAM)	1 MB SRAM
Remanent variables	64 KB
FPU	Yes
Integrated I/O processor	Processes I/O data points in the background
Data buffering	
Lithium battery	At least 3 years
Battery monitoring	Yes
CompactFlash slot	1
Real-time clock	Nonvolatile memory, resolution 1 second
Modular interface slots	3

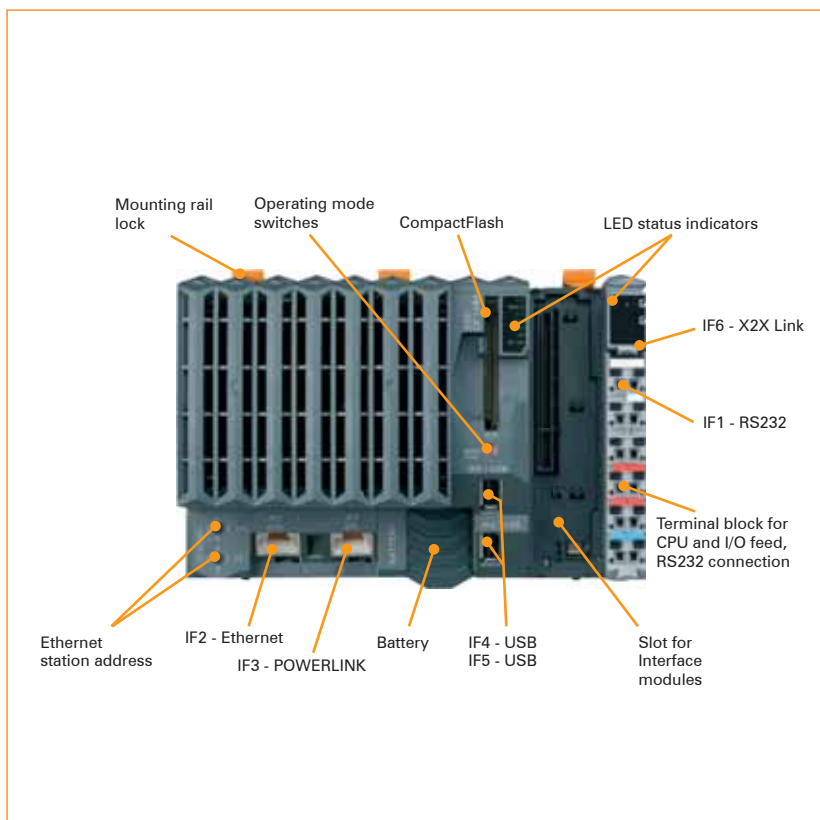
Interfaces		X20CP3484
Interface IF1		
Type		RS232
Design		Contact via 12-pin terminal block TB12
Maximum transfer rate		115.2 kBit/s
Interface IF2		
Type		Ethernet
Design		Shielded RJ45 port
Transfer rate		10/100 MBit/s
Cable length		Max. 100 m between two stations (segment length)
Interface IF3		
Fieldbus		POWERLINK V1/V2
Type		100 Base-T (ANSI/IEEE 802.3)
Design		Shielded RJ45 port
Transfer rate		100 MBit/s
Cable length		Max. 100 m between two stations (segment length)
Interfaces IF4 and IF5		USB Rev. 1.1
IF6 interface		X2X Link
CPU and X2X Link supply		X20CP3484
Input voltage		24 VDC (-15% / +20%)
Input current		Max. 2.2 A
Reverse polarity protection		Yes
Fuse		Integrated, cannot be exchanged
X2X Link supply output		X20CP3484
Rated output power		7.0 W
Parallel operation		Yes ¹⁾
Redundant operation of X2X Link supply		Yes
<small>1) In parallel operation, only 75% of the rated power can be assumed. Please ensure that all parallel operating power supplies are switched on and off simultaneously.</small>		
Input I/O supply		X20CP3484
Input voltage		24 VDC (-15% / +20%)
Fuse		Recommended pre-fusing max. 10 A slow-blow
Output I/O supply		X20CP3484
Rated output voltage		24 VDC
Permitted contact load		10.0 A
General supply		X20CP3484
Status indicators		Overload, operating status, module status, RS232 data transfer
Diagnostics		
Module run/error		Yes, with status LED and software status
Overload		Yes, with status LED and software status
RS232 data transfer		Yes, with status LED
Electrical isolation		
X2X bus supply		Yes
I/O supply		No

CPU CP3484

General information		X20CP3484
Status indicators		CPU function, overtemperature, Ethernet, Ethernet POWERLINK, CompactFlash, battery
Diagnostics		
CPU function		Yes, with status LED
Over-temperature		Yes, with status LED
Ethernet		Yes, with status LED
Ethernet POWERLINK		Yes, with status LED
CompactFlash		Yes, with status LED
Battery		Yes, with status LED and software status
Visual Components capability		Yes
ACOPOS capability		Yes
Cooling		Fan-free
Electrical isolation		
PLC - IF1/IF4/IF5		No
PLC - IF2/IF3/IF6		Yes
IF1/IF4/IF5 - IF2/IF3/IF6		Yes
IF1 - IF4/IF5		No
IF4 - IF5		No
Power consumption, without memory card, without interface module and USB		10.5 W
Internal power consumption of X2X Link and I/O supply ¹⁾		
Bus		1.42 W
I/O internal		0.6 W
Certification		CE, C-UL-US, GOST-R
1) The specified values are maximum values. The exact calculation is available for download as a data sheet with the other module documentation on the B&R homepage.		
Operational conditions		X20CP3484
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20CP3484
Temperature		-25°C to +70°C
Relative humidity		5 to 95%, non-condensing
Mechanical characteristics		X20CP3484
Dimensions (W x H x D)		200 x 99 x 85 mm
Comment		Order application memory (CompactFlash) separately Backup battery included in delivery X20 locking plate (right) included in delivery X20 terminal block (12-pin) included in delivery Interface module slot covers included in the delivery

Required accessories	
5CFCRD.0064-03	CompactFlash 64 MB ATA/IDE SiliconSystems
5CFCRD.0128-03	CompactFlash 128 MB ATA/IDE SiliconSystems
5CFCRD.0256-03	CompactFlash 256 MB ATA/IDE SiliconSystems
5CFCRD.0512-03	CompactFlash 512 MB ATA/IDE SiliconSystems
5CFCRD.1024-03	CompactFlash 1024 MB ATA/IDE SiliconSystems
5CFCRD.2048-03	CompactFlash 2048 MB ATA/IDE SiliconSystems
5CFCRD.4096-03	CompactFlash 4096 MB ATA/IDE SiliconSystems
5CFCRD.8192-03	CompactFlash 8192 MB ATA/IDE SiliconSystems
Optional accessories	
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell
0AC201.9	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell
X20IFxxxx	Communication with Ethernet POWERLINK, X2X Link, CAN bus, Profibus DP, RS232, RS422, RS485 72

CPU CP1484



The CP1484 is the smallest Celeron based CPU for the X20 System. However, its shortest cycle time of 800 μ s still shows its power. The basic features are the same as those of the larger types.

Ethernet and USB are onboard. In addition, the CPU has a POWERLINK V1/V2 connection for real-time communication. The only differences from the CP3484 are that the CP1484 only has one slot for interface modules and a smaller width.

- Intel Celeron 266 Performance with additional I/O processor
- Ethernet, POWERLINK V1/V2 and USB onboard
- 1 slot for modular interface expansion
- Compact Flash as removable application memory
- Fan-free
- Extremely compact

ETHERNET 
POWERLINK



Short description	X20CP1484
System module	CPU
Processor	Celeron 266 comp.
Interfaces	1x RS232, 1x Ethernet, 1x POWERLINK V1/V2, 2x USB, 1x X2X Link
Controller	X20CP1484
Fastest task class cycle time	800 μ s
Typical instruction cycle time	0.022 μ s
L1 cache for data and program code	2x 16 KB
L2 cache	-
Standard memory	
Working memory (SDRAM)	32 MB SDRAM
User RAM (SRAM)	1 MB SRAM
Remanent variables	64 KB
FPU	Yes
Integrated I/O processor	Processes I/O data points in the background
Data buffering	
Lithium battery	At least 3 years
Battery monitoring	Yes
CompactFlash slot	1
Real-time clock	Nonvolatile memory, resolution 1 second
Modular interface slots	1

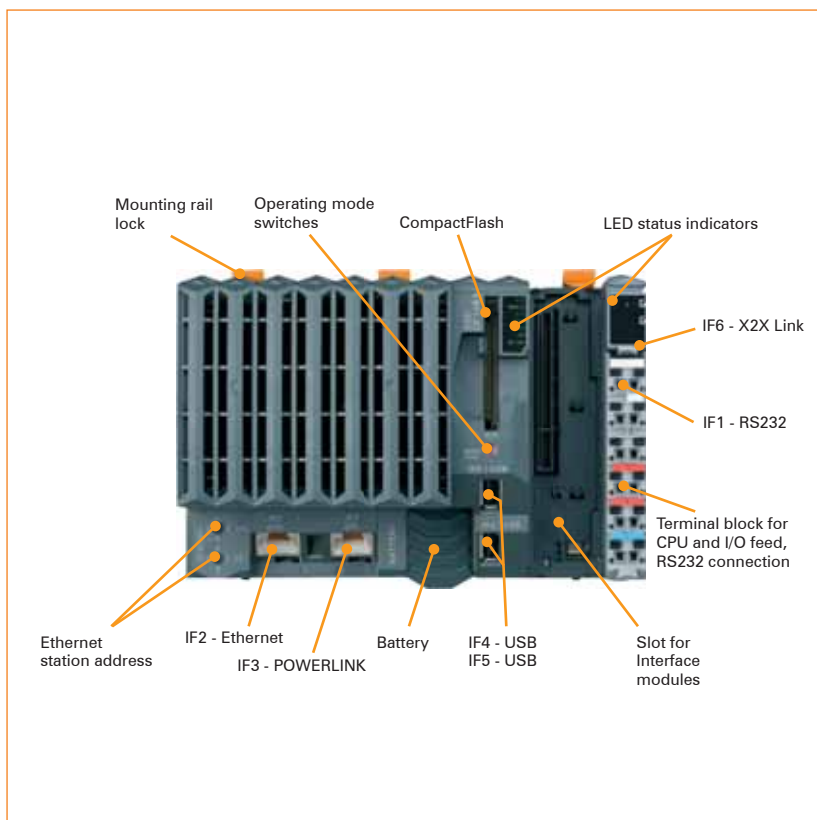
Interfaces		X20CP1484
Interface IF1		
Type		RS232
Design		Contact via 12-pin terminal block TB12
Maximum transfer rate		115.2 kBit/s
Interface IF2		
Type		Ethernet
Design		Shielded RJ45 port
Transfer rate		10/100 MBit/s
Cable length		Max. 100 m between two stations (segment length)
Interface IF3		
Fieldbus		POWERLINK V1/V2
Type		100 Base-T (ANSI/IEEE 802.3)
Design		Shielded RJ45 port
Transfer rate		100 MBit/s
Cable length		Max. 100 m between two stations (segment length)
Interfaces IF4 and IF5		USB Rev. 1.1
IF6 interface		X2X Link
CPU and X2X Link supply		X20CP1484
Input voltage		24 VDC (-15% / +20%)
Input current		Max. 2.2 A
Reverse polarity protection		Yes
Fuse		Integrated, cannot be exchanged
X2X Link supply output		X20CP1484
Rated output power		7.0 W
Parallel operation		Yes ¹⁾
Redundant operation of X2X Link supply		Yes
1) In parallel operation, only 75% of the rated power can be assumed. Please ensure that all parallel operating power supplies are switched on and off simultaneously.		
Input I/O supply		X20CP1484
Input voltage		24 VDC (-15% / +20%)
Fuse		Recommended pre-fusing max. 10 A slow-blow
Output I/O supply		X20CP1484
Rated output voltage		24 VDC
Permitted contact load		10.0 A
General supply		X20CP1484
Status indicators		Overload, operating status, module status, RS232 data transfer
Diagnostics		
Module run/error		Yes, with status LED and software status
Overload		Yes, with status LED and software status
RS232 data transfer		Yes, with status LED
Electrical isolation		
X2X bus supply		Yes
I/O supply		No

CPU CP1484

General information		X20CP1484
Status indicators		CPU function, overtemperature, Ethernet, Ethernet POWERLINK, CompactFlash, battery
Diagnostics		
CPU function		Yes, with status LED
Over-temperature		Yes, with status LED
Ethernet		Yes, with status LED
Ethernet POWERLINK		Yes, with status LED
CompactFlash		Yes, with status LED
Battery		Yes, with status LED and software status
Visual Components capability		Yes
ACOPOS capability		Yes
Cooling		Fan-free
Electrical isolation		
PLC - IF1/IF4/IF5		No
PLC - IF2/IF3/IF6		Yes
IF1/IF4/IF5 - IF2/IF3/IF6		Yes
IF1 - IF4/IF5		No
IF4 - IF5		No
Power consumption, without memory card, without interface module and USB		10.5 W
Internal power consumption of X2X Link and I/O supply ¹⁾		
Bus		1.42 W
I/O internal		0.6 W
Certification		CE, C-UL-US, GOST-R
1) The specified values are maximum values. The exact calculation is available for download as a data sheet with the other module documentation on the B&R homepage.		
Operational conditions		X20CP1484
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20CP1484
Temperature		-25°C to +70°C
Relative humidity		5 to 95%, non-condensing
Mechanical characteristics		X20CP1484
Dimensions (W x H x D)		150 x 99 x 85 mm
Comment		Order application memory (CompactFlash) separately Backup battery included in delivery X20 locking plate (right) included in delivery X20 terminal block (12-pin) included in delivery Interface module slot covers included in the delivery

Required accessories	
5CFCRD.0064-03	CompactFlash 64 MB ATA/IDE SiliconSystems
5CFCRD.0128-03	CompactFlash 128 MB ATA/IDE SiliconSystems
5CFCRD.0256-03	CompactFlash 256 MB ATA/IDE SiliconSystems
5CFCRD.0512-03	CompactFlash 512 MB ATA/IDE SiliconSystems
5CFCRD.1024-03	CompactFlash 1024 MB ATA/IDE SiliconSystems
5CFCRD.2048-03	CompactFlash 2048 MB ATA/IDE SiliconSystems
5CFCRD.4096-03	CompactFlash 4096 MB ATA/IDE SiliconSystems
5CFCRD.8192-03	CompactFlash 8192 MB ATA/IDE SiliconSystems
Optional accessories	
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell
0AC201.9	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell
X20IFxxxx	Communication with Ethernet POWERLINK, X2X Link, CAN bus, Profibus DP, RS232, RS422, RS485 72

CPU CP1483



The x86 100 MHz-compatible CP1483 is the entry-level X20 CPU. With an optimum price/performance ratio, it has the same basic features as all of the larger CPUs.

Ethernet and USB are onboard. In addition, the CPU has a POWERLINK V1/V2 connection for real-time communication. In addition, a multi-purpose slot is provided for an additional interface module.

- Intel x86 100 MHz-compatible with additional I/O processor
- Ethernet, POWERLINK V1/V2 and USB onboard
- 1 slot for modular interface expansion
- Compact Flash as removable application memory
- Fan-free
- Extremely compact

ETHERNET 
POWERLINK



Short description	X20CP1483
System module	CPU
Processor	x86 100 comp.
Interfaces	1x RS232, 1x Ethernet, 1x POWERLINK V1/V2, 2x USB, 1x X2X Link
Controller	X20CP1483
Fastest task class cycle time	1 ms
Typical instruction cycle time	0.076 μ s
L1 cache for data and program code	16 KB
L2 cache	-
Standard memory	
Working memory (SDRAM)	32 MByte
User RAM (SRAM)	128 KB
Remanent variables	32 KB
FPU	Yes
Integrated I/O processor	Processes I/O data points in the background
Data buffering	
Lithium battery	At least 3 years
Battery monitoring	Yes
CompactFlash slot	1
Real-time clock	Nonvolatile memory, resolution 1 second
Modular interface slots	1

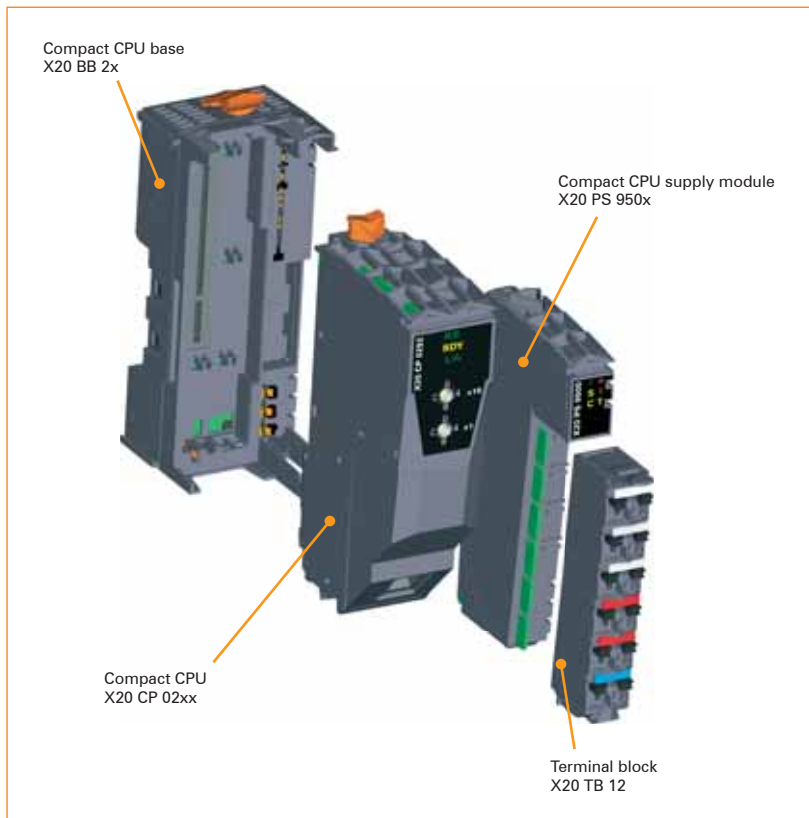
Interfaces		X20CP1483
Interface IF1		
Type		RS232
Design		Contact via 12-pin terminal block TB12
Maximum transfer rate		115.2 kBit/s
Interface IF2		
Type		Ethernet
Design		Shielded RJ45 port
Transfer rate		10/100 MBit/s
Cable length		Max. 100 m between two stations (segment length)
Interface IF3		
Fieldbus		POWERLINK V1/V2
Type		100 Base-T (ANSI/IEEE 802.3)
Design		Shielded RJ45 port
Transfer rate		100 MBit/s
Cable length		Max. 100 m between two stations (segment length)
Interfaces IF4 and IF5		USB Rev. 1.1
IF6 interface		X2X Link
CPU and X2X Link supply		X20CP1483
Input voltage		24 VDC (-15% / +20%)
Input current		Max. 2.2 A
Reverse polarity protection		Yes
Fuse		Integrated, cannot be exchanged
X2X Link supply output		X20CP1483
Rated output power		7.0 W
Parallel operation		Yes ¹⁾
Redundant operation of X2X Link supply		Yes
1) In parallel operation, only 75% of the rated power can be assumed. Please ensure that all parallel operating power supplies are switched on and off simultaneously.		
Input I/O supply		X20CP1483
Input voltage		24 VDC (-15% / +20%)
Fuse		Recommended pre-fusing max. 10 A slow-blow
Output I/O supply		X20CP1483
Rated output voltage		24 VDC
Permitted contact load		10.0 A
General supply		X20CP1483
Status indicators		Overload, operating status, module status, RS232 data transfer
Diagnostics		
Module run/error		Yes, with status LED and software status
Overload		Yes, with status LED and software status
RS232 data transfer		Yes, with status LED
Electrical isolation		
X2X bus supply		Yes
I/O supply		No

CPU CP1483

General information		X20CP1483
Status indicators		CPU function, overtemperature, Ethernet, Ethernet POWERLINK, CompactFlash, battery
Diagnostics		
CPU function		Yes, with status LED
Over-temperature		Yes, with status LED
Ethernet		Yes, with status LED
Ethernet POWERLINK		Yes, with status LED
CompactFlash		Yes, with status LED
Battery		Yes, with status LED and software status
Fan diagnostics		-
Visual Components capability		Yes
ACOPOS capability		Yes
Cooling		Fan-free
Electrical isolation		
PLC - IF1/IF4/IF5		No
PLC - IF2/IF3/IF6		Yes
IF1/IF4/IF5 - IF2/IF3/IF6		Yes
IF1 - IF4/IF5		No
IF4 - IF5		No
Power consumption, without memory card, without interface module and USB		TBD
Internal power consumption of X2X Link and I/O supply ¹⁾		
Bus		1.22 W
I/O internal		0.6 W
Certification		CE, C-UL-US (in development), GOST-R
1) The specified values are maximum values. The exact calculation is available for download as a data sheet with the other module documentation on the B&R homepage.		
Operational conditions		X20CP1483
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20CP1483
Temperature		-25°C to +70°C
Relative humidity		5 to 95%, non-condensing
Mechanical characteristics		X20CP1483
Dimensions (W x H x D)		150 x 99 x 85 mm
Comment		Order application memory (CompactFlash) separately Backup battery included in delivery X20 locking plate (right) included in delivery X20 terminal block (12-pin) included in delivery Interface module slot covers included in the delivery

Required accessories	
5CFCRD.0064-03	CompactFlash 64 MB ATA/IDE SiliconSystems
5CFCRD.0128-03	CompactFlash 128 MB ATA/IDE SiliconSystems
5CFCRD.0256-03	CompactFlash 256 MB ATA/IDE SiliconSystems
5CFCRD.0512-03	CompactFlash 512 MB ATA/IDE SiliconSystems
5CFCRD.1024-03	CompactFlash 1024 MB ATA/IDE SiliconSystems
5CFCRD.2048-03	CompactFlash 2048 MB ATA/IDE SiliconSystems
5CFCRD.4096-03	CompactFlash 4096 MB ATA/IDE SiliconSystems
5CFCRD.8192-03	CompactFlash 8192 MB ATA/IDE SiliconSystems
Optional accessories	
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell
0AC201.9	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell
X20IFxxxx	Communication with Ethernet POWERLINK, X2X Link, CAN bus, Profibus DP, RS232, RS422, RS485 72

Compact CPUs



Compact CPUs with a modular design

The completely modular structure of the Compact CPUs allows the user to assemble a CPU that meets the unique power supply and interface requirements.

Compact CPU

- Embedded μ P 25 with Ethernet on-board
- Embedded μ P 16 with or without Ethernet on-board

Bus module

- Bus module with RS232 connection
- Bus module with RS232 and CAN bus connections

Supply module

- Supply module for Compact CPU, X2X Link bus supply and I/O
- RS232 interface
- CAN bus
- Without or without electrical isolation of the CPU/X2X Link supply

Terminal block

- 12-pin terminal block

The battery-free CPU

To meet the high demands of the market, the Compact CPU was designed to run without a battery. The following features make operation without a buffer battery possible.

Real-time clock

The real-time clock is buffered for approx. 1000 hours by a gold foil capacitor.

FRAM instead of SRAM for remanent variables

This FRAM stores its contents ferromagnetically. Unlike normal SRAM, this does not require a battery.

Compact design

Despite the sleek profile of only 37.5 mm, the CPU feed, the X2X Link bus supply, and the I/O module feed are integrated in the CPU. No additional power modules are necessary.



Compact CPU CP0292



The structure of the X20 Compact CPU is described on page 124. In addition to the structure, other general information is also provided.

The CP0292 is the most powerful of the X20 Compact CPUs. Equipped with Embedded μ P 25 and additional memory, it is predestined for drive and visualization applications.

The CPU is network-capable due to an onboard Ethernet interface.

- Embedded μ P 25
- 750 KB User SRAM
- 3 MB User FlashPROM
- Ethernet on-board
- Only 37.5 mm wide
- Battery-free



Short description	X20CP0292
System module	CPU
Processor	Embedded μ P 25
Interfaces	1x Ethernet onboard
Controller	X20CP0292
Fastest task class cycle time	2 ms
Typical instruction cycle time	0.5 μ s
Standard memory	
User RAM	750 KByte SRAM ¹⁾
User PROM	3 MB FlashPROM
Remanent variables	2.75 KByte FRAM ²⁾
Backup battery	No
Integrated I/O processor	Processes I/O data points in the background
Real-time clock ³⁾	Yes, resolution 1 s

1) Not buffered.

2) The FRAM stores its contents ferromagnetically. Therefore, no buffer battery is needed.

3) The real-time clock is buffered for approx. 1000 hours by a gold foil capacitor. The gold foil capacitor is completely loaded after 18 continuous hours of operation.

Interfaces		X20CP0292
Interface IF2		
Type	Ethernet	
Design	Shielded RJ45 port	
Transfer rate	100 MBit/s	
Cable length	Max. 100 m between two stations (segment length)	
Additional interfaces		
X20BB22	Compact CPU base module with integrated RS232 interface	
X20BB27	Compact CPU base module with integrated RS232 and CAN interfaces	
General information		X20CP0292
Status indicators		
CPU function, Ethernet		
Diagnostics		
CPU function	Yes, with status LED	
Ethernet	Yes, with status LED	
Over-temperature	Yes, with software status	
Visual Components capability	Yes	
ACOPOS capability	Yes	
Temperature sensor	Yes	
Electrical isolation		
PLC - IF2	Yes	
Power consumption	3.0 W	
Certification	CE, C-UL-US, GOST-R	
Operational conditions		X20CP0292
Operating temperature		
Horizontal installation	0°C to +55°C	
Vertical installation	0°C to +50°C	
Relative humidity	5 to 95%, non-condensing	
Mounting orientation	Horizontal or vertical	
Installation at altitudes above sea level		
0 - 2000 m	No derating	
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m	
Protection type	IP20	
Storage and transport conditions		X20CP0292
Temperature		
-25°C to +70°C		
Relative humidity		
5 to 95%, non-condensing		
Mechanical characteristics		X20CP0292
Grid size ¹⁾	37.5 ^{+0.2} mm	
Comment		
Order terminal block 1x X20TB12 separately		
Order supply module 1x X20PS9500 or X20PS9502 separately		
Order Compact CPU base 1x X20BB22 or X20BB27 separately		

1) Spacing is based on the width of the Compact CPU base X20BB22 or X20BB27. An X20PS9500 or X20PS9502 supply module is also always required for the CPU.

Required accessories		
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BB22	X20 Compact CPU base, for Compact CPU and Compact CPU supply module, base for integrated RS232 interface, X20 connection, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	132
X20BB27	X20 Compact CPU base, for Compact CPU and Compact CPU supply module, base for integrated RS232 and CAN interfaces, X20 connection, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	133
X20PS9500	X20 supply module for Compact and fieldbus CPUs and internal I/O supply, X2X Link bus supply	134
X20PS9502	X20 supply module for Compact and fieldbus CPUs and internal I/O supply, X2X Link bus supply, supply feed not electrically isolated	138

Compact CPU CP0291



The structure of the X20 Compact CPU is described on page 124. In addition to the structure, other general information is also provided.

With the same processor and the same amount of memory, the CP0291 is just as powerful as the CP0201.

The CP0291, however, also has an onboard Ethernet interface.

- Embedded μ P 16
- 100 KB User SRAM
- 1 MB User FlashPROM
- Ethernet on-board
- Only 37.5 mm wide
- Battery-free



Short description	X20CP0291
System module	CPU
Processor	Embedded μ P 16
Interfaces	1x Ethernet onboard
Controller	X20CP0291
Fastest task class cycle time	4 ms
Typical instruction cycle time	0.8 μ s
Standard memory	
User RAM	100 KByte SRAM ¹⁾
User PROM	1 MB FlashPROM
Remanent variables	2.75 KByte FRAM ²⁾
Backup battery	No
Integrated I/O processor	Processes I/O data points in the background
Real-time clock ³⁾	Yes, resolution 1 s

1) Not buffered.

2) The FRAM stores its contents ferromagnetically. Therefore, no buffer battery is needed.

3) The real-time clock is buffered for approx. 1000 hours by a gold foil capacitor. The gold foil capacitor is completely loaded after 18 continuous hours of operation.

Interfaces		X20CP0291
Interface IF2		
Type	Ethernet	
Design	Shielded RJ45 port	
Transfer rate	100 MBit/s	
Cable length	Max. 100 m between two stations (segment length)	
Additional interfaces		
X20BB22	Compact CPU base module with integrated RS232 interface	
X20BB27	Compact CPU base module with integrated RS232 and CAN interfaces	
General information		X20CP0291
Status indicators		
CPU function, Ethernet		
Diagnostics		
CPU function	Yes, with status LED	
Ethernet	Yes, with status LED	
Visual Components capability		
Limited (User PROM)		
ACOPOS capability		
Limited (User PROM)		
Temperature sensor		
No		
Electrical isolation		
PLC - IF2	Yes	
Power consumption		
2.7 W		
Certification		
CE, C-UL-US, GOST-R		
Operational conditions		X20CP0291
Operating temperature		
Horizontal installation	0°C to +55°C	
Vertical installation	0°C to +50°C	
Relative humidity		
5 to 95%, non-condensing		
Mounting orientation		
Horizontal or vertical		
Installation at altitudes above sea level		
0 - 2000 m	No derating	
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m	
Protection type		
IP20		
Storage and transport conditions		X20CP0291
Temperature		
-25°C to +70°C		
Relative humidity		
5 to 95%, non-condensing		
Mechanical characteristics		X20CP0291
Grid size ¹⁾		
37,5 ^{+0.2} mm		
Comment		
Order terminal block 1x X20TB12 separately		
Order supply module 1x X20PS9500 or X20PS9502 separately		
Order Compact CPU base 1x X20BB22 or X20BB27 separately		

1) Spacing is based on the width of the Compact CPU base X20BB22 or X20BB27. An X20PS9500 or X20PS9502 supply module is also always required for the CPU.

Required accessories		
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BB22	X20 Compact CPU base, for Compact CPU and Compact CPU supply module, base for integrated RS232 interface, X20 connection, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	132
X20BB27	X20 Compact CPU base, for Compact CPU and Compact CPU supply module, base for integrated RS232 and CAN interfaces, X20 connection, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	133
X20PS9500	X20 supply module for Compact and fieldbus CPUs and internal I/O supply, X2X Link bus supply	134
X20PS9502	X20 supply module for Compact and fieldbus CPUs and internal I/O supply, X2X Link bus supply, supply feed not electrically isolated	138

Compact CPU CP0201



The structure of the X20 Compact CPU is described on page 124. In addition to the structure, other general information is also provided.

The CP0201 is the entry-level X20 Compact CPU. This CPU is used when a cycle time of 2 ms (typ. 5 ms) is sufficient and the cost/performance ratio is a key factor.

Going without an onboard Ethernet interface additionally reduces costs for the CP0201.

- Embedded μ P 16
- 100 KB User SRAM
- 1 MB User FlashPROM
- Only 37.5 mm wide
- Battery-free



Short description	X20CP0201
System module	CPU
Processor	Embedded μ P 16
Controller	X20CP0201
Fastest task class cycle time	4 ms
Typical instruction cycle time	0.8 μ s
Standard memory	
User RAM	100 KByte SRAM ¹⁾
User PROM	1 MB FlashPROM
Remanent variables	2.75 KByte FRAM ²⁾
Backup battery	No
Integrated I/O processor	Processes I/O data points in the background
Real-time clock ³⁾	Yes, resolution 1 s

1) Not buffered.

2) The FRAM stores its contents ferromagnetically. Therefore, no buffer battery is needed.

3) The real-time clock is buffered for approx. 1000 hours by a gold foil capacitor. The gold foil capacitor is completely loaded after 18 continuous hours of operation.

Interfaces		X20CP0201
Interfaces are located on the base module		
X20BB22		Compact CPU base module with integrated RS232 interface
X20BB27		Compact CPU base module with integrated RS232 and CAN interfaces
General information		X20CP0201
Status indicators		CPU function
Diagnostics		
CPU function		Yes, with status LED
Visual Components capability		Limited (User PROM)
ACOPOS capability		Limited (User PROM)
Temperature sensor		No
Power consumption		2.2 W
Certification		CE, C-UL-US, GOST-R
Operational conditions		X20CP0201
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		
		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20CP0201
Temperature		-25°C to +70°C
Relative humidity		5 to 95%, non-condensing
Mechanical characteristics		X20CP0201
Grid size ¹⁾		37.5 ^{+0.2} mm
Comment		
		Order terminal block 1x X20TB12 separately
		Order supply module 1x X20PS9500 or X20PS9502 separately
		Order Compact CPU base 1x X20BB22 or X20BB27 separately

1) Spacing is based on the width of the Compact CPU base X20BB22 or X20BB27. An X20PS9500 or X20PS9502 supply module is also always required for the CPU.

Required accessories		
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BB22	X20 Compact CPU base, for Compact CPU and Compact CPU supply module, base for integrated RS232 interface, X20 connection, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	132
X20BB27	X20 Compact CPU base, for Compact CPU and Compact CPU supply module, base for integrated RS232 and CAN interfaces, X20 connection, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	133
X20PS9500	X20 supply module for Compact and fieldbus CPUs and internal I/O supply, X2X Link bus supply	134
X20PS9502	X20 supply module for Compact and fieldbus CPUs and internal I/O supply, X2X Link bus supply, supply feed not electrically isolated	138

Bus module BB22

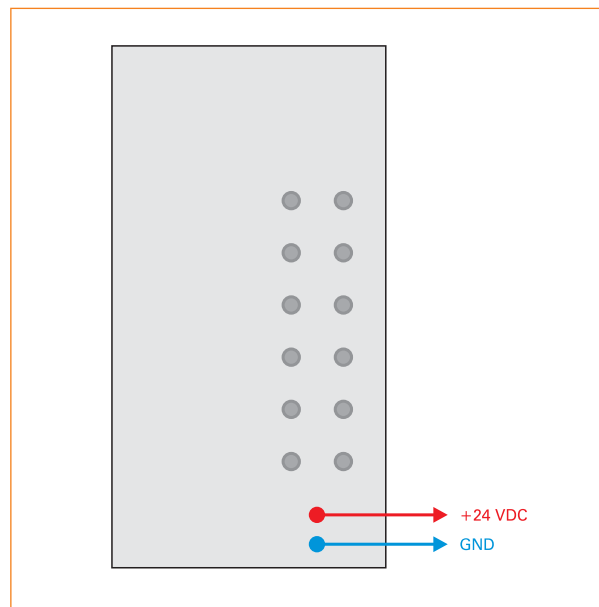


The BB22 bus module is the base for all X20 Compact CPUs. The left and right locking plates are included in the delivery.

- Base for all X20 Compact CPUs
- RS232 connection

Short description	X20BB22
Bus module	X20 Compact CPU base - backplane for Compact CPU and Compact CPU supply module
Interfaces	1x RS232 connection
General information	X20BB22
Electrical isolation	
Bus - RS232	No
Power consumption	
Bus	0.32 W
I/O internal	-
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20BB22
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20BB22
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20BB22
Spacing	37.5 ^{+0.2} mm
Comment	Left and right X20 end plates included in delivery

Potential control



Bus module BB27

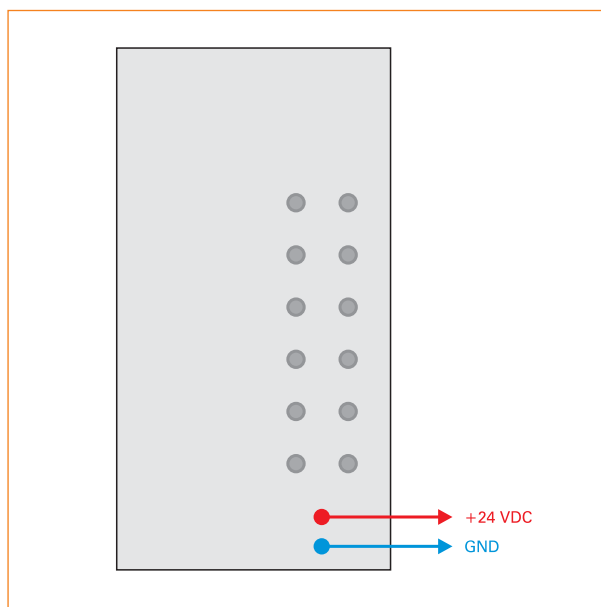


The BB27 bus module is the base for all X20 Compact CPUs. The left and right locking plates are included in the delivery.

- Base for all X20 Compact CPUs
- RS232 connection
- CAN bus connection
- Integrated terminating resistor for CAN bus

Short description	X20BB27
Bus module	X20 Compact CPU base - backplane for Compact CPU and Compact CPU supply module
Interfaces	1x RS232 connection, 1x CAN bus connection
General information	X20BB27
Electrical isolation	
Bus - RS232	No
Bus - CAN bus	No
RS232 - CAN bus	No
Power consumption	
Bus	0.53 W
I/O internal	-
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20BB27
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20BB27
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20BB27
Spacing	37.5 ^{+0.2} mm
Comment	Left and right X20 end plates included in delivery

Potential control



Supply module PS9500



The supply module PS9500 is used together with an X20 Compact or Fieldbus CPU. It is equipped with a feed for the CPU, the X2X Link, and the internal I/O supply.

- Supply for the Compact or Fieldbus CPU, X2X Link, and internal I/O supply
- Electrical isolation of feed and CPU / X2X Link supply
- Redundancy of CPU / X2X Link supply possible by operating multiple supply modules simultaneously
- RS232 can be configured as an online interface
- CAN bus

Short description	X20PS9500
Power supply module	24 VDC supply module for Compact or Fieldbus CPUs, X2X Link bus supply and I/O
Interfaces	1x RS232, 1x CAN bus ¹⁾
1) CAN bus only together with the X20BB27 X20BB37 or X20BB47 bus module.	
CPU / X2X Link supply input	X20PS9500
Input voltage	24 VDC (-15% / +20%)
Input current	Max. 0.7 A
Reverse polarity protection	Yes
Fuse	Integrated, cannot be exchanged
CPU / X2X Link supply output	X20PS9500
Rated output power	7.0 W
Parallel operation	Yes ¹⁾
Redundant operation of the CPU / X2X Link supply	Yes
1) In parallel operation, only 75% of the rated power can be assumed. Please ensure that all parallel operating power supplies are switched on and off simultaneously.	
Input I/O supply	X20PS9500
Input voltage	24 VDC (-15% / +20%)
Fuse	Recommended pre-fusing max. 10 A slow-blow
Output I/O supply	X20PS9500
Rated output voltage	24 VDC
Permitted contact load	10.0 A
Interfaces	X20PS9500
Interface IF1	
Type	RS232
Design	Contact via 12-pin terminal block TB12
Maximum transfer rate	115.2 kBit/s
Interface IF3 ¹⁾	
Type	CAN bus
Design	Contact via 12-pin terminal block TB12
Maximum transfer rate	1 MBit/s
1) CAN bus only together with the X20BB27 X20BB37 or X20BB47 bus module.	
General information	X20PS9500
Status indicators	Overload, operating status, module status, RS232, CAN bus ¹⁾
Diagnostics	
Module run/error	Yes, with status LED and software status
Overload	Yes, with status LED and software status
RS232 data transfer	Yes, with status LED
CAN bus data transfer ¹⁾	Yes, with status LED
Electrical isolation	
CPU / X2X bus supply	Yes
I/O supply	No
Power consumption ²⁾	
Bus	1.42 W
I/O internal	0.6 W
Certification	CE, C-UL-US, GOST-R

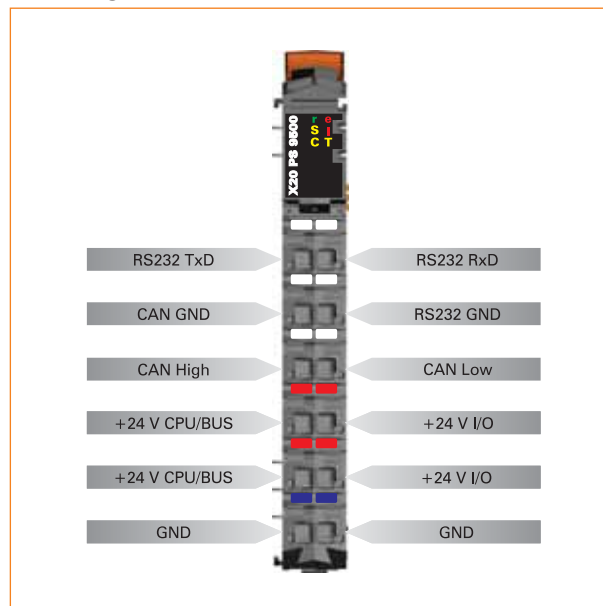
1) CAN bus only together with the X20BB27 X20BB37 or X20BB47 bus module.

2) The specified values are maximum values. The exact calculation is available for download as a data sheet with the other module documentation on the B&R homepage.

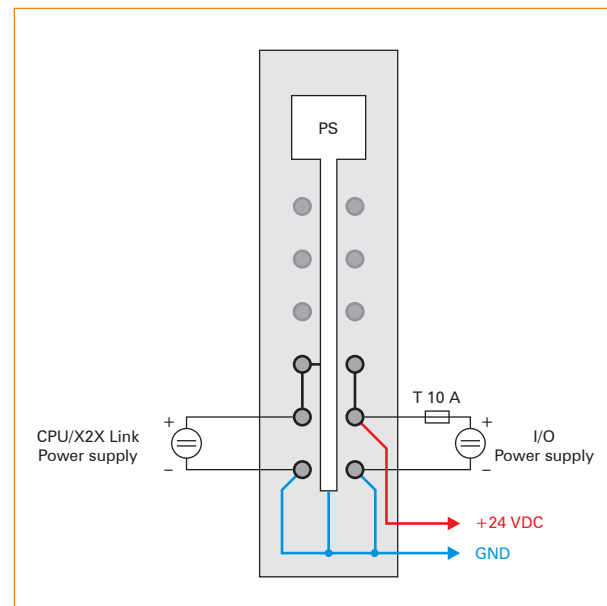
Operational conditions		X20PS9500
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20PS9500
Temperature		
		-25°C to +70°C
Relative humidity		5 to 95%, non-condensing
Mechanical characteristics		X20PS9500
Spacing		12.5 ^{+0.2} mm
Comment		
		Order terminal block 1x X20TB12 separately
		Order Compact CPU base 1x X20BB22 or X20BB27 separately
		Order Fieldbus CPU base 1x X20BB3x/4x separately

Supply module PS9500

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BB22	X20 Compact CPU base, for Compact CPU and Compact CPU supply module, base for integrated RS232 interface, X20 connection, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	132
X20BB27	X20 Compact CPU base, for Compact CPU and Compact CPU supply module, base for integrated RS232 and CAN interfaces, X20 connection, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	133
X20BB32	X20 Fieldbus CPU base, for Fieldbus CPU and Compact CPU supply module, base for integrated RS232 interface, slot for X20 interface module, X20 connection, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	150
X20BB37	X20 Fieldbus CPU base, for Fieldbus CPU and Compact CPU supply module, base for integrated RS232 and CAN interface, slot for X20 interface module, X20 connection, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	151
X20BB42	X20 Fieldbus CPU base, for Fieldbus CPU and Compact CPU supply module, base for integrated RS232 interface, 2x slots for X20 interface modules, X20 connection, X20 end plates (left and right) X20AC0SL1/X20AC0SR1 included	152
X20BB47	X20 Fieldbus CPU base, for Fieldbus CPU and Compact CPU supply module, base for integrated RS232 and CAN interface, 2x slots for X20 interface modules, X20 connection, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	153



Supply module PS9502



The supply module PS9502 is used together with an X20 Compact or Fieldbus CPU. It is equipped with a feed for the Compact or Fieldbus CPU, the X2X Link and the internal I/O supply.

The module is intended as a low-cost supply module for small X20 systems. Potential groups are able to be formed. An expansion or redundancy of the X2X Link with the PS3300 or PS3310 supply module is not possible. Expansion of the X20 system with a bus transmitter is not permitted either.

- Supply for the Compact or Fieldbus CPU, X2X Link, and internal I/O supply
- Low-cost supply module for small X20 systems
- No electrical isolation of feed and CPU / X2X Link supply
- Expansion or redundancy of CPU / X2X Link supply not possible by operating multiple supply modules simultaneously
- RS232 can be configured as an online interface
- CAN bus

Short description	X20PS9502
Power supply module	24 VDC supply module for Compact or Fieldbus CPU, X2X Link bus supply and I/O
Interfaces	1x RS232, 1x CAN bus ¹⁾
1) CAN bus only together with the X20BB27 or X20BB37 bus module.	
CPU / X2X Link supply input	X20PS9502
Input voltage	24 VDC (-15% / +20%)
Input current	Max. 0.7 A
Reverse polarity protection	Yes
Fuse	Integrated, cannot be exchanged
CPU / X2X Link supply output	X20PS9502
Rated output power	
Horizontal installation	7.0 W at 45°C and 5.0 W at 55°C
Vertical installation	7.0 W at 40°C and 5.0 W at 50°C
Parallel operation	No
Redundant operation of the CPU / X2X Link supply	No
Input I/O supply	X20PS9502
Input voltage	24 VDC (-15% / +20%)
Fuse	Recommended pre-fusing max. 10 A slow-blow
Output I/O supply	X20PS9502
Rated output voltage	24 VDC
Permitted contact load	10.0 A
Interfaces	X20PS9502
Interface IF1	
Type	RS232
Design	Contact via 12-pin terminal block TB12
Maximum transfer rate	115.2 kBit/s
Interface IF3 ¹⁾	
Type	CAN bus
Design	Contact via 12-pin terminal block TB12
Maximum transfer rate	1 MBit/s
1) CAN bus only together with the X20BB27 or X20BB37 bus module.	
General information	X20PS9502
Status indicators	Operating status, module status, RS232, CAN bus ¹⁾
Diagnostics	
Module run/error	Yes, with status LED and software status
Overload	Yes, with status LED and software status
RS232 data transfer	Yes, with status LED
CAN bus data transfer ¹⁾	Yes, with status LED
Electrical isolation	
CPU / X2X bus supply	No
I/O supply	No
Power consumption ²⁾	
Bus	1.44 W
I/O internal	0.6 W
Certification	CE, C-UL-US (in development), GOST-R

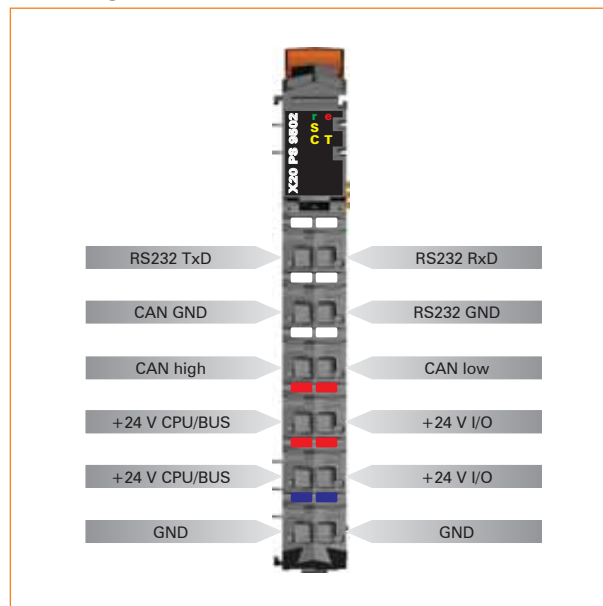
1) CAN bus only together with the X20BB27 or X20BB37 bus module.

2) The specified values are maximum values. The exact calculation is available for download as a data sheet with the other module documentation on the B&R homepage.

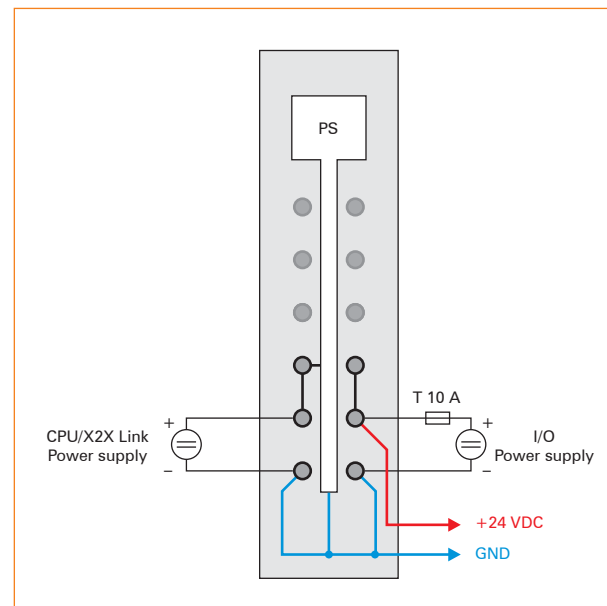
Operational conditions		X20PS9502
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20PS9502
Temperature		
		-25°C to +70°C
Relative humidity		5 to 95%, non-condensing
Mechanical characteristics		X20PS9502
Spacing		12.5 ^{+0.2} mm
Comment		Order terminal block 1x X20TB12 separately Order Compact CPU base 1x X20BB22 or X20BB27 separately Order Fieldbus CPU base 1x X20BB32 or X20BB37 separately

Supply module PS9502

Pin assignments



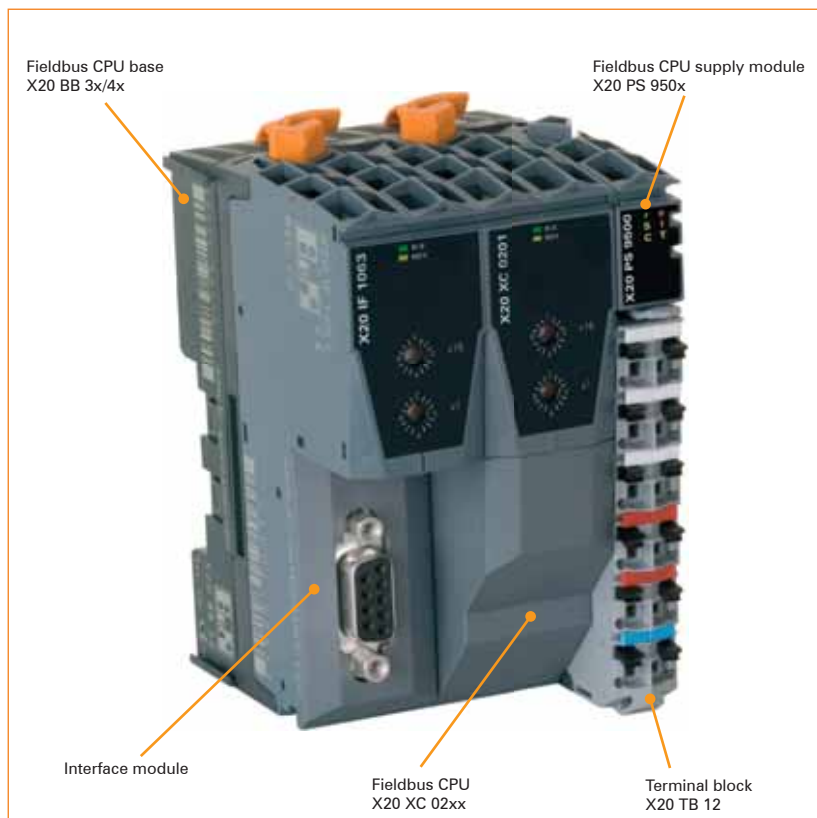
Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BB22	X20 Compact CPU base, for Compact CPU and Compact CPU supply module, base for integrated RS232 interface, X20 connection, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	132
X20BB27	X20 Compact CPU base, for Compact CPU and Compact CPU supply module, base for integrated RS232 and CAN interfaces, X20 connection, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	133
X20BB32	X20 Fieldbus CPU base, for Fieldbus CPU and Compact CPU supply module, base for integrated RS232 interface, slot for X20 interface module, X20 connection, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	150
X20BB37	X20 Fieldbus CPU base, for Fieldbus CPU and Compact CPU supply module, base for integrated RS232 and CAN interface, slot for X20 interface module, X20 connection, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	151
X20BB42	X20 Fieldbus CPU base, for Fieldbus CPU and Compact CPU supply module, base for integrated RS232 interface, 2 slots for X20 interface smodule, X20 connection, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	152
X20BB47	X20 Fieldbus CPU base, for Fieldbus CPU and Compact CPU supply module, base for integrated RS232 and CAN interface, 2 slots for X20 interface modules, X20 connection, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	153

Fieldbus CPUs



Adaptable to individual requirements

Fieldbus CPUs are a variation of Compact CPUs. Their modular structure makes it easy to meet the individual requirements of an application.

Fieldbus CPU

- Embedded μ P 25 with or without Ethernet on-board
- Embedded μ P 16

Interface module

- Profibus DP master
- Profibus DP slave
- CAN bus
- RS232
- RS485/RS422

Bus module

- Bus module with RS232 connection
- Bus module with RS232 and CAN bus connections
- Both versions with one or two slots for interface modules

Supply module

- Supply module for Fieldbus CPU, X2X Link bus supply and I/O
- RS232 interface connection
- CAN bus connection
- Without or without electrical isolation of the CPU/X2X Link supply

Terminal block

- 12-pin terminal block

The battery-free CPU

To meet the high demands of the market, the Fieldbus CPU was designed to run without a battery. This makes it completely maintenance-free. The following features make operation without a buffer battery possible.

Real-time clock

The real-time clock is buffered for approx. 1000 hours by a gold foil capacitor.

FRAM instead of SRAM for remanent variables

This FRAM stores its contents ferroelectrically. Unlike normal SRAM, this does not require a battery.

Compact design

Despite the sleek profile of only 62.5 mm, the CPU supply, the X2X Link bus supply, and the I/O module supply are integrated in the CPU. No additional power supply modules are necessary.

Fieldbus CPU XC0292



The structure of the X20 Fieldbus CPU is described on page 141. In addition to the structure, other general information is also provided.

Fieldbus CPUs are variations of Compact CPUs. In addition to these features, there is also the option of connecting fieldbus modules to the left side. These CPUs make applications possible in which data preprocessing has to take place remotely within the I/O bus connection.

Equipped with Embedded μ P 25 and additional memory, the XC0292 is predestined for drive and visualization applications. Unlike XC0202, the XC0292 is equipped with an Ethernet on-board interface.

- Embedded μ P 25
- 750 KB User SRAM
- 3 MB User FlashPROM
- Ethernet on-board
- Up to two slots for fieldbus modules
- Only 62.5 mm wide
- Battery-free



Short description	X20XC0292
System module	CPU
Processor	Embedded μ P 25
Interfaces	1x Ethernet onboard
Controller	X20XC0292
Fastest task class cycle time	2 ms
Typical instruction cycle time	0.5 μ s
Standard memory	
User RAM	750 KByte SRAM ¹⁾
User PROM	3 MB FlashPROM
Permanent variables	2.75 KByte FRAM ²⁾
Backup battery	No
Integrated I/O processor	Processes I/O data points in the background
Real-time clock ³⁾	Yes, resolution 1 s
Slots for fieldbus modules	
X20BB3x	1
X20BB4x	2

1) Not buffered.

2) The FRAM stores its contents ferromagnetically. Therefore, no buffer battery is needed.

3) The real-time clock is buffered for approx. 1000 hours by a gold foil capacitor. The gold foil capacitor is completely loaded after 18 continuous hours of operation.

Interfaces		X20XC0292
Interface IF2		
Type		Ethernet
Design		Shielded RJ45 port
Transfer rate		100 MBit/s
Cable length		Max. 100 m between two stations (segment length)
Additional interfaces		
X20BB32 and X20BB42		Fieldbus CPU base module with integrated RS232 interface
X20BB37 and X20BB47		Fieldbus CPU base module with integrated RS232 and CAN interfaces
General information		X20XC0292
Status indicators		
		CPU function, Ethernet
Diagnostics		
CPU function		Yes, with status LED
Ethernet		Yes, with status LED
Over-temperature		Yes, with software status
Visual Components capability		Yes
ACOPOS capability		Yes
Temperature sensor		Yes
Power consumption		2.8 W
Certification		CE, C-UL-US (in development), GOST-R
Operational conditions		X20XC0292
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		
		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20XC0292
Temperature		
		-25°C to +70°C
Relative humidity		
		5 to 95%, non-condensing
Mechanical characteristics		X20XC0292
Grid size ¹⁾		
X20BB3x		62.5 ^{+0.2} mm
X20BB4x		87.5 ^{+0.2} mm
Comment		
		Order terminal block 1x X20TB12 separately
		Order supply module 1x X20PS9500 or X20PS9502 separately
		Order Fieldbus CPU base 1x X20BB3x/4x separately

1) Spacing is based on the width of the Fieldbus CPU base X20BB3x/4x. The CPU always requires up to two fieldbus modules and one supply module X20PS9500 or X20PS9502.

Fieldbus CPU XC0292

Required accessories		
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BB32	X20 Fieldbus CPU base, for Fieldbus CPU and Compact CPU supply module, base for integrated RS232 interface, slot for X20 interface module, X20 connection, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	150
X20BB37	X20 Fieldbus CPU base, for Fieldbus CPU and Compact CPU supply module, base for integrated RS232 and CAN interface, slot for X20 interface module, X20 connection, X20 end plates (left and right) X20AC0SL1/X20AC0SR1 included	151
X20BB42	X20 Fieldbus CPU base, for Fieldbus CPU and Compact CPU supply module, base for integrated RS232 interface, 2 slots for X20 interface smodule, X20 connection, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	152
X20BB47	X20 Fieldbus CPU base, for Fieldbus CPU and Compact CPU supply module, base for integrated RS232 and CAN interface, 2 slots for X20 interface modules, X20 connection, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	153
X20PS9500	X20 supply module for Compact and fieldbus CPUs and internal I/O supply, X2X Link bus supply	134
X20PS9502	X20 supply module for Compact and fieldbus CPUs and internal I/O supply, X2X Link bus supply, Supply not electrically isolated	138
Optional accessories		
X20IFxxxx	Communication with CAN bus, Profibus DP, RS232, RS422, RS485	70



Fieldbus CPU XC0202



The structure of the X20 Fieldbus CPU is described on page 141. In addition to the structure, other general information is also provided.

Fieldbus CPUs are variations of Compact CPUs. In addition to these features, there is also the option of connecting fieldbus modules to the left side. These CPUs make applications possible in which data preprocessing has to take place remotely within the I/O bus connection.

Equipped with Embedded μ P 25 and additional memory, the XC0202 is predestined for drive and visualization applications.

- Embedded μ P 25
- 750 KB User SRAM
- 3 MB User FlashPROM
- Up to two slots for fieldbus modules
- Only 62.5 mm wide
- Battery-free



Short description	X20XC0202
System module	CPU
Processor	Embedded μ P 25
Controller	X20XC0202
Fastest task class cycle time	2 ms
Typical instruction cycle time	0.5 μ s
Standard memory	
User RAM	750 KByte SRAM ¹⁾
User PROM	3 MB FlashPROM
Permanent variables	2.75 KByte FRAM ²⁾
Backup battery	No
Integrated I/O processor	Processes I/O data points in the background
Real-time clock ³⁾	Yes, resolution 1 s
Slots for fieldbus modules	
X20BB3x	1
X20BB4x	2

1) Not buffered.

2) The FRAM stores its contents ferromagnetically. Therefore, no buffer battery is needed.

3) The real-time clock is buffered for approx. 1000 hours by a gold foil capacitor. The gold foil capacitor is completely loaded after 18 continuous hours of operation.

Interfaces	X20XC0202
Interfaces (located on the base module)	
X20BB32 and X20BB42	Fieldbus CPU base module with integrated RS232 interface
X20BB37 and X20BB47	Fieldbus CPU base module with integrated RS232 and CAN interfaces

General information		X20XC0202
Status indicators		CPU function
Diagnostics		
CPU function		Yes, with status LED
Over-temperature		Yes, with software status
Visual Components capability		Yes
ACOPOS capability		Yes
Temperature sensor		Yes
Power consumption		2.2 W
Certification		CE, C-UL-US, GOST-R
Operational conditions		X20XC0202
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20XC0202
Temperature		-25°C to +70°C
Relative humidity		5 to 95%, non-condensing
Mechanical characteristics		X20XC0202
Grid size ¹⁾		
X20BB3x		62.5 ^{+0.2} mm
X20BB4x		87.5 ^{+0.2} mm
Comment		Order terminal block 1x X20TB12 separately Order supply module 1x X20PS9500 or X20PS9502 separately Order Fieldbus CPU base 1x X20BB3x/4x separately

1) Spacing is based on the width of the Fieldbus CPU base X20BB3x/4x. The CPU always requires up to two fieldbus modules and one supply module X20PS9500 or X20PS9502.

Required accessories		
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BB32	X20 Fieldbus CPU base, for Fieldbus CPU and Compact CPU supply module, base for integrated RS232 interface, slot for X20 interface module, X20 connection, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	150
X20BB37	X20 Fieldbus CPU base, for Fieldbus CPU and Compact CPU supply module, base for integrated RS232 and CAN interface, slot for X20 interface module, X20 connection, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	151
X20BB42	X20 Fieldbus CPU base, for Fieldbus CPU and Compact CPU supply module, base for integrated RS232 interface, 2x slots for X20 interface module, X20 connection, X20 end plates (left and right) X20AC0SL1/X20AC0SR1 included	152
X20BB47	X20 Fieldbus CPU base, for Fieldbus CPU and Compact CPU supply module, base for integrated RS232 and CAN interface, 2x slots for X20 interface module, X20 connection, X20 end plates (left and right) X20AC0SL1/X20AC0SR1 included	153
X20PS9500	X20 supply module for Compact and fieldbus CPUs and internal I/O supply, X2X Link bus supply	134
X20PS9502	X20 supply module for Compact and fieldbus CPUs and internal I/O supply, X2X Link bus supply, supply feed not electrically isolated	138
Optional accessories		
X20IFxxx	Communication with CAN bus, Profibus DP, RS232, RS422, RS485	70

Fieldbus CPU XC0201



The structure of the X20 Fieldbus CPU is described on page 141. In addition to the structure, other general information is also provided.

Fieldbus CPUs are variations of Compact CPUs. In addition to these features, there is also the option of connecting fieldbus modules to the left side. These CPUs make applications possible in which data preprocessing has to take place remotely within the I/O bus connection.

The XC201 is the entry-level X20 Fieldbus CPU. This CPU is used when a cycle time of 2 ms (typ. 5 ms) is sufficient and the cost/performance ratio is a key factor.

- Embedded μ P 16
- 100 KB User SRAM
- 1 MB User FlashPROM
- Up to two slots for fieldbus modules
- Only 62.5 mm wide
- Battery-free



Short description	X20XC0201
System module	CPU
Processor	Embedded μ P 16
Controller	X20XC0201
Fastest task class cycle time	4 ms
Typical instruction cycle time	0.8 μ s
Standard memory	
User RAM	100 KByte SRAM ¹⁾
User PROM	1 MB FlashPROM
Permanent variables	2.75 KByte FRAM ²⁾
Backup battery	No
Integrated I/O processor	Processes I/O data points in the background
Real-time clock ³⁾	Yes, resolution 1 s
Slots for fieldbus modules	
X20BB3x	1
X20BB4x	2

1) Not buffered.

2) The FRAM stores its contents ferromagnetically. Therefore, no buffer battery is needed.

3) The real-time clock is buffered for approx. 1000 hours by a gold foil capacitor. The gold foil capacitor is completely loaded after 18 continuous hours of operation.

Interfaces	X20XC0201
Interfaces (located on the base module)	
X20BB32 and X20BB42	Fieldbus CPU base module with integrated RS232 interface
X20BB37 and X20BB47	Fieldbus CPU base module with integrated RS232 and CAN interfaces

General information		X20XC0201
Status indicators		CPU function
Diagnostics		
CPU function		Yes, with status LED
Visual Components capability		Limited (User PROM)
ACOPOS capability		Limited (User PROM)
Temperature sensor		No
Power consumption		2.0 W
Certification		CE, C-UL-US, GOST-R
Operational conditions		X20XC0201
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
> 2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20XC0201
Temperature		-25°C to +70°C
Relative humidity		5 to 95%, non-condensing
Mechanical characteristics		X20XC0201
Grid size ¹⁾		
X20BB3x		62.5 ^{+0.2} mm
X20BB4x		87.5 ^{+0.2} mm
Comment		Order terminal block 1x X20TB12 separately Order supply module 1x X20PS9500 or X20PS9502 separately Order Fieldbus CPU base 1x X20BB3x/4x separately

1) Spacing is based on the width of the Fieldbus CPU base X20BB3x/4x. The CPU always requires up to two fieldbus modules and one supply module X20PS9500 or X20PS9502.

Required accessories		
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BB32	X20 Fieldbus CPU base, for Fieldbus CPU and Compact CPU supply module, base for integrated RS232 interface, slot for X20 interface module, X20 connection, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	150
X20BB37	X20 Fieldbus CPU base, for Fieldbus CPU and Compact CPU supply module, base for integrated RS232 and CAN interface, slot for X20 interface module, X20 connection, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	151
X20BB42	X20 Fieldbus CPU base, for Fieldbus CPU and Compact CPU supply module, base for integrated RS232 interface, 2x slots for X20 interface module, X20 connection, X20 end plates (left and right) X20AC0SL1/X20AC0SR1 included	152
X20BB47	X20 Fieldbus CPU base, for Fieldbus CPU and Compact CPU supply module, base for integrated RS232 and CAN interface, 2x slots for X20 interface module, X20 connection, X20 end plates (left and right) X20AC0SL1/X20AC0SR1 included	153
X20PS9500	X20 supply module for Compact and fieldbus CPUs and internal I/O supply, X2X Link bus supply	134
X20PS9502	X20 supply module for Compact and fieldbus CPUs and internal I/O supply, X2X Link bus supply, supply feed not electrically isolated	138
Optional accessories		
X20IFxxx	Communication with CAN bus, Profibus DP, RS232, RS422, RS485	70

Bus module BB32

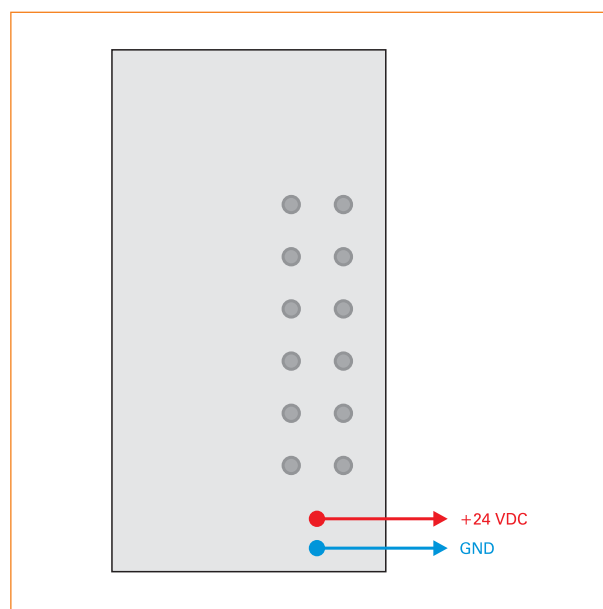


The BB32 bus module is the base for all X20 Fieldbus CPUs. The left and right locking plates are included in the delivery.

- Base for all X20 Fieldbus CPUs
- RS232 connection

Short description	X20BB32
Bus module	X20 Fieldbus CPU base, backplane for Fieldbus CPU, Fieldbus CPU supply module and interface module
Interfaces	1x RS232 connection
General information	X20BB32
Electrical isolation	
Bus - RS232	No
Power consumption	
Bus	0.35 W
I/O internal	-
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20BB32
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20BB32
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20BB32
Spacing	62.5 ^{+0.2} mm
Comment	Left and right X20 end plates included in delivery

Potential control



Bus module BB37

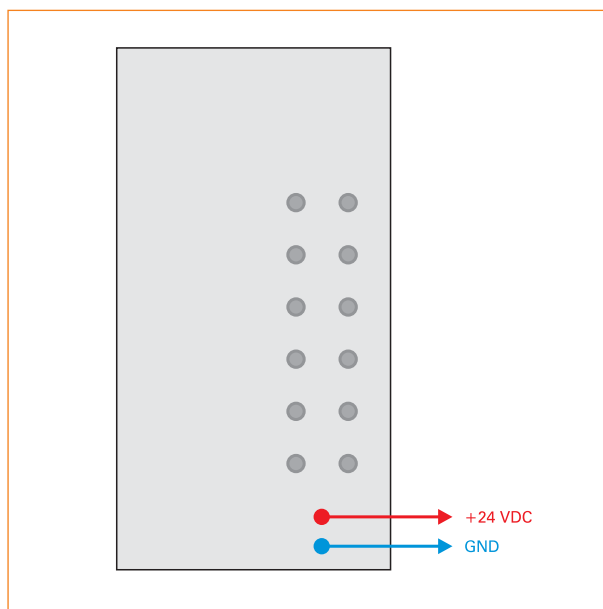


The BB37 bus module is the base for all X20 Fieldbus CPUs. The left and right locking plates are included in the delivery.

- Base for all X20 Fieldbus CPUs
- RS232 connection
- CAN bus connection
- Integrated terminating resistor for CAN bus

Short description	X20BB37
Bus module	X20 Fieldbus CPU base, backplane for Fieldbus CPU, Fieldbus CPU supply module and interface module
Interfaces	1x RS232 connection, 1x CAN bus connection
General information	X20BB37
Electrical isolation	
Bus - RS232	No
Bus - CAN bus	No
RS232 - CAN bus	No
Power consumption	
Bus	0.56 W
I/O internal	-
Certification	CE, C-UL-US (in development), GOST-R
Operational conditions	X20BB37
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20BB37
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20BB37
Spacing	62.5 ^{+0.2} mm
Comment	Left and right X20 end plates included in delivery

Potential control



Bus module BB42

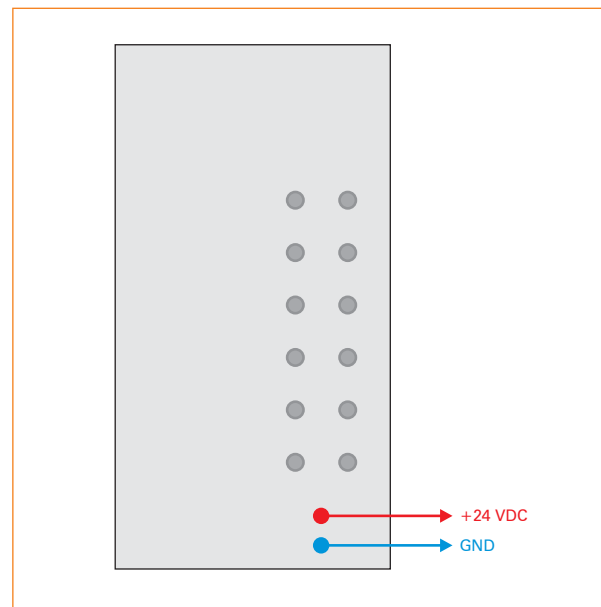


The BB42 bus module is a base for all X20 Fieldbus CPUs. It is equipped with two slots for interface modules. The left and right locking plates are included in the delivery.

- Base for all X20 Fieldbus CPUs
- Two slots for interface modules
- RS232 connection

Short description	X20BB42
Bus module	X20 Fieldbus CPU base, backplane for Fieldbus CPU, Fieldbus CPU supply module and two interface modules
Interfaces	1x RS232 connection
General information	X20BB42
Electrical isolation	
Bus - RS232	No
Power consumption	
Bus	TBD
I/O internal	-
Certification	CE, C-UL-US (in development), GOST-R
Operational conditions	X20BB42
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20BB42
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20BB42
Spacing	87.5 ^{+0.2} mm
Comment	Left and right X20 end plates included in delivery

Potential control



Bus module BB47

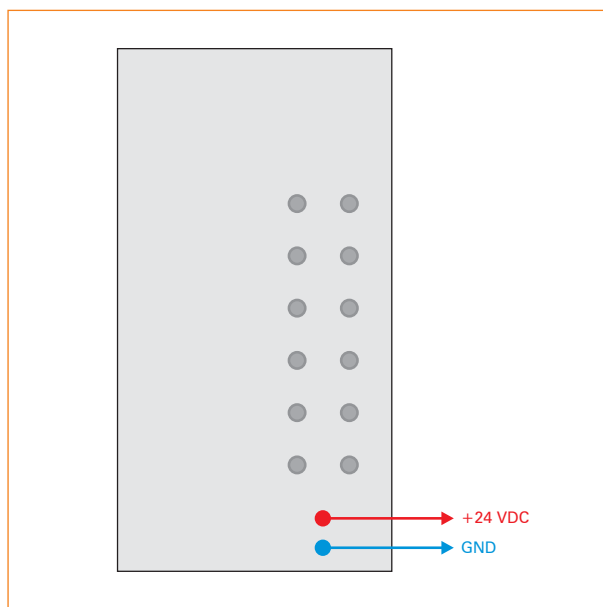


The BB47 bus module is a base for all X20 Fieldbus CPUs. It is equipped with two slots for interface modules. The left and right locking plates are included in the delivery.

- Base for all X20 Fieldbus CPUs
- Two slots for interface modules
- RS232 connection
- CAN bus connection
- Integrated terminating resistor for CAN bus

Short description	X20BB47
Bus module	X20 Fieldbus CPU base, backplane for Fieldbus CPU, Fieldbus CPU supply module and two interface modules
Interfaces	1x RS232 connection, 1x CAN bus connection
General information	X20BB47
Electrical isolation	
Bus - RS232	No
Bus - CAN bus	No
RS232 - CAN bus	No
Power consumption	
Bus	TBD
I/O internal	-
Certification	CE, C-UL-US (in development), GOST-R
Operational conditions	X20BB47
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20BB47
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20BB47
Spacing	87.5 ^{+0.2} mm
Comment	Left and right X20 end plates included in delivery

Potential control



Interface module IF1074



The IF1074 module is an interface module for the X20 fieldbus CPU.

- CAN bus connection
- Integrated terminating resistor

CAN

Short description		X20IF1074
Communication module		1x CAN bus
Interfaces		X20IF1074
Interface IF1		
Type		CAN bus
Design		5-pin multipoint connector
Maximum transfer rate		1 MBit/s
General information		X20IF1074
Status indicators		Module status, data transfer, terminating resistor
Diagnostics		
Module status		Yes, with status LED
Data transfer		Yes, with status LED
Terminating resistor		Yes, with status LED
Electrical isolation		
PLC - IF1		Yes
Power consumption		0.69 W
Certification		CE, C-UL-US (in development), GOST-R
Operational conditions		X20IF1074
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20IF1074
Temperature		-25°C to +70°C
Relative humidity		5 to 95%, non-condensing
Mechanical characteristics		X20IF1074
Slot		In X20 fieldbus CPU
Comment		Order 1x TB2105 terminal block separately

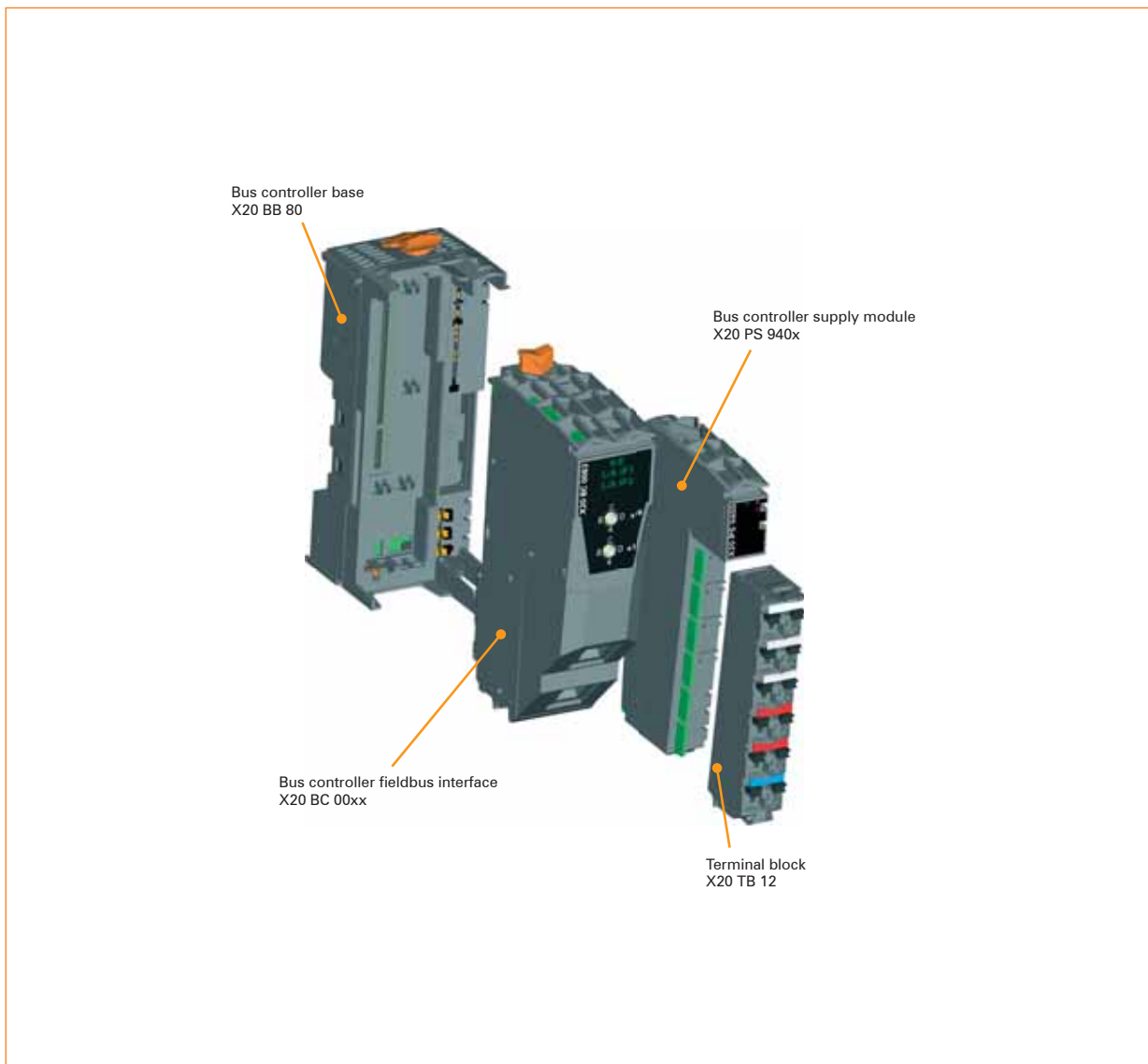
Required accessories		
0TB2105.9010	Accessory terminal block, 5-pin, screw clamp, 1.5 mm ²	681
0TB2105.9110	Accessory terminal block, 5-pin, cage clamp, 2.5 mm ²	681

Bus controller

X20 bus controllers

The bus controllers are a continuation of the completely modular strategy used for the I/O slices. Made up of a base module, a supply module to supply the voltage for the entire system, and a fieldbus interface, the bus controller is an extremely flexible fieldbus connection.

The entire backplane can be preinstalled. With the removable terminals, the entire system can be wired separately from the electronics module. The individual modules are put in place during commissioning. This is where the I/O system is adapted to the fieldbus being used. Unlike the Compact CPU with integrated fieldbus connection, the bus controller does not need to be programmed in order to transfer or receive the I/O data on the fieldbus. It can be configured on the fieldbus master.



CANopen bus controller BC0043



The structure of the X20 bus controller is described on page 155. In addition to the structure, other general information is also provided.

CAN (Controller Area Network) has spread considerably in automation technology. CAN topology is based on a line structure and uses twisted pair wires for data transfer. CANopen is a higher-layer protocol based on CAN. This standardized protocol offers highly flexible configuration possibilities.

The BC0043 bus controller makes it possible to connect X2X Link I/O nodes to CANopen. It has automatic transfer rate detection and auto-mapping of the I/O modules connected with X2X Link. All CANopen operating modes such as synchronous, event, and polling modes are supported together with PDO linking, life/node guarding, emergency objects, and much more.

- Fieldbus: CANopen
- I/O configuration via the fieldbus
- 20 Receive PDOs and 20 Transmit PDOs
- Select between entry of a fixed transfer rate or automatic transfer rate detection.
- Integrated terminating resistor



Short description	X20BC0043
Bus controller	CANopen
Fieldbus	X20BC0043
Type	CANopen
Design	5-pin multipoint connector
Maximum distance	1000 m
Maximum transfer rate	1 MBit/s
Determination of transfer rate	Automatic transfer rate detection or fixed rate setting
General information	X20BC0043
Status indicators	Module status, bus function, data transfer, terminating resistor
Diagnostics	
Module status	Yes, with status LED and software status
Bus function	Yes, with status LED
Data transfer	Yes, with status LED
Terminating resistor	Yes, with status LED
Electrical isolation	
Fieldbus - X2X bus	No
Fieldbus - I/O	Yes
Power consumption of the bus	1.5 W
Certification	CE, C-UL-US, GOST-R

CANopen

Operational conditions		X20BC0043
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20BC0043
Temperature		
		-25°C to +70°C
Relative humidity		5 to 95%, non-condensing
Mechanical characteristics		X20BC0043
Grid size ¹⁾		37.5 ^{+0.2} mm
Comment		Order 1x TB2105 terminal block separately Order terminal block 1x X20TB12 separately Order supply module 1x X20PS9400 or X20PS9402 separately Order 1x X20BB80 bus base separately

1) The spacing is based on the width of the X20BB80 bus base. An X20PS9400 or X20PS9402 supply module is also always required for the bus controller.

Note: This bus controller only supports the default function model of multi-function modules. The default function model is explained in the description for each multi-function module.

Required accessories		
0TB2105.9010	Accessory terminal block, 5-pin, screw clamp, 1.5 mm ²	681
0TB2105.9110	Accessory terminal block, 5-pin, cage clamps, 2.5 mm ²	681
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20PS9400	X20 supply module for bus controller and internal I/O supply, X2X link bus supply	172
X20PS9402	X20 supply module for bus controller and internal I/O supply, X2X link bus supply, Supply not electrically isolated	174
X20BB80	X20 bus base, for X20 base module (BC, HB, etc.) and X20 supply module, X20 end plates (left and right) X20AC0SL1/X20AC0SR1 included	170

DeviceNet bus controller BC0053



The structure of the X20 bus controller is described on page 155. In addition to the structure, other general information is also provided.

DeviceNet was developed by Allen Bradley as a CAN bus based automation network. It is based on a producer/consumer protocol. From the user's point of view, all data is handled separately from CAN bus transfer possibilities (e.g. longer data packets are automatically fragmented by DeviceNet). Access occurs using I/O messages with defined priorities.

The BC0053 bus controller makes it possible to connect X2X Link I/O nodes to DeviceNet. It has automatic transfer rate detection and auto-mapping of the I/O modules connected with X2X Link. Explicit messaging, change of state, cyclic, polled and bit strobe are supported as DeviceNet operating modes. In addition to the standard communication objects, there are also a number of manufacturer-specific objects.

X20 or other modules that are based on X2X Link can be connected to the bus controller. The entire configuration of this type of modular system is supported by the DeviceNet standard. Allen Bradley developed this modular I/O configuration to simplify the necessary configuration steps and to achieve the required configuration of a modular DeviceNet device intuitively on a flat and very user-friendly interface. The X20 DeviceNet bus controller from B&R also supports this type of configuration.

- Fieldbus: DeviceNet
- I/O configuration via the fieldbus
- Support of both linear and modular systems (Allen Bradley)
- Integrated terminating resistor



Short description	X20BC0053
Bus controller	DeviceNet
Fieldbus	X20BC0053
Type	DeviceNet
Design	5-pin multipoint connector
Maximum distance	500 m at 125 kBit/sec
Maximum transfer rate	500 kBit/s
Determination of transfer rate	Automatic transfer rate detection
General information	X20BC0053
Status indicators	Module status, bus function, 24 V DeviceNet voltage, data transfer, terminating resistor
Diagnostics	
Module status	Yes, with status LED and software status
Bus function	Yes, with status LED
24 V DeviceNet voltage	Yes, with status LED
Data transfer	Yes, with status LED
Terminating resistor	Yes, with status LED
Electrical isolation	
Fieldbus - X2X bus	No
Fieldbus - I/O	Yes
Power consumption of the bus	1.5 W
Certification	CE, C-UL-US, GOST-R



Operational conditions		X20BC0053
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20BC0053
Temperature		
		-25°C to +70°C
Relative humidity		
		5 to 95%, non-condensing
Mechanical characteristics		X20BC0053
Grid size ¹⁾		
		37.5 ^{+0.2} mm
Comment		
		Order 1x TB2105 terminal block separately
		Order terminal block 1x X20TB12 separately
		Order supply module 1x X20PS9400 or X20PS9402 separately
		Order 1x X20BB80 bus base separately

1) The spacing is based on the width of the X20BB80 bus base. An X20PS9400 or X20PS9402 supply module is also always required for the bus controller.

Note: This bus controller only supports the default function model of multi-function modules. The default function model is explained in the description for each multi-function module.

Required accessories		
0TB2105.9010	Accessory terminal block, 5-pin, screw clamp, 1.5 mm ²	681
0TB2105.9110	Accessory terminal block, 5-pin, cage clamps, 2.5 mm ²	681
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20PS9400	X20 supply module for bus controller and internal I/O supply, X2X link bus supply	172
X20PS9402	X20 supply module for bus controller and internal I/O supply, X2X link bus supply, Supply not electrically isolated	174
X20BB80	X20 bus base, for X20 base module (BC, HB, etc.) and X20 supply module, X20 end plates (left and right) X20AC0SL1/X20AC0SR1 included	170

Profibus DP bus controller BC0063



The structure of the X20 bus controller is described on page 155. In addition to the structure, other general information is also provided.

Profibus DP is based on the physics of the RS485 interface. Data transfer is controlled using a hybrid bus access procedure. Active stations receive communication rights via a token passing procedure and can then access all stations on the network according to the master-slave principle. The maximum time of circulation for a token can be configured, which results in a defined cycle time.

Access represents various services for the user, for cyclic and for acyclic data transfer.

The BC0063 bus controller makes it possible to connect X2X Link I/O nodes to Profibus DP. It supports Profibus DP with all of its options and other additional properties. In addition to the device, module, and channel diagnostics provided in the Profibus standard, it is also possible, for example, to switch to the slot diagnostics option in S7 format. X20 or other modules that are based on X2X Link can be connected to the bus controller. The modular system configuration is optimally supported by Profibus DP.

- Fieldbus: Profibus DP
- I/O configuration via the fieldbus
- Extensive device, module, and channel diagnosis according to Profibus DP standard
- Communication with X2X Link I/O nodes even works when some nodes are missing or without power



Short description	X20BC0063
Bus controller	Profibus DP slave
Fieldbus	X20BC0063
Type	Profibus DP slave
Design	9-pin DSUB socket
Maximum distance	See Profibus DP specifications
Maximum transfer rate	12 MBit/s
Determination of transfer rate	Automatic transfer rate detection
General information	X20BC0063
Status indicators	Module status, bus function, data transfer
Diagnostics	
Module status	Yes, with status LED and software status
Bus function	Yes, with status LED
Data transfer	Yes, with status LED
Electrical isolation	
Fieldbus - X2X bus	No
Fieldbus - I/O	Yes
Power consumption of the bus	2.3 W
Certification	CE, C-UL-US, GOST-R



Operational conditions		X20BC0063
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20BC0063
Temperature		
		-25°C to +70°C
Relative humidity		
		5 to 95%, non-condensing
Mechanical characteristics		X20BC0063
Grid size ¹⁾		
		37.5 ^{+0.2} mm
Comment		
		Order terminal block 1x X20TB12 separately
		Order supply module 1x X20PS9400 or X20PS9402 separately
		Order 1x X20BB80 bus base separately

1) The spacing is based on the width of the X20BB80 bus base. An X20PS9400 or X20PS9402 supply module is also always required for the bus controller.

Note: This bus controller only supports the default function model of multi-function modules. The default function model is explained in the description for each multi-function module.

Required accessories		
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20PS9400	X20 supply module for bus controller and internal I/O supply, X2X link bus supply	172
X20PS9402	X20 supply module for bus controller and internal I/O supply, X2X link bus supply, Supply not electrically isolated	174
X20BB80	X20 bus base, for X20 base module (BC, HB, etc.) and X20 supply module, X20 end plates (left and right) X20AC0SL1/X20AC0SR1 included	170
Optional accessories		
OG1000.00-090	Bus connector, RS485, for Profibus networks	690

CAN I/O bus controller BC0073



The structure of the X20 bus controller is described on page 155. In addition to the structure, other general information is also provided.

The bus controller BC0073 lets you connect X2X Link I/O nodes to CAN I/O. CAN I/O is a transfer protocol based on the CAN bus standard and is fully integrated into the B&R system. From the user's point of view, it doesn't matter if I/O points are operated locally or remotely via CAN I/O.

Up to 43 I/O modules can be connected to the bus controller. Up to 16 of them can be analog modules.

- Fieldbus: CAN bus
- Automatic firmware update via the fieldbus
- Integrated I/O access in B&R Automation Studio
- Integrated terminating resistor



Short description	X20BC0073
Bus controller	CAN I/O slave
Fieldbus	X20BC0073
Type	CAN I/O slave
Design	5-pin multipoint connector
Maximum distance	1000 m
Maximum transfer rate	1 MBit/s
Determination of transfer rate	Automatic transfer rate detection, permanently set or from internal EEPROM
General information	X20BC0073
Status indicators	Module status, bus function, data transfer, terminating resistor
Diagnostics	
Module status	Yes, with status LED and software status
Bus function	Yes, with status LED
Data transfer	Yes, with status LED
Terminating resistor	Yes, with status LED
Electrical isolation	
Fieldbus - X2X bus	No
Fieldbus - I/O	Yes
Power consumption of the bus	1.5 W
Certification	CE, C-UL-US, GOST-R

CAN

Operational conditions		X20BC0073
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20BC0073
Temperature		
		-25°C to +70°C
Relative humidity		
		5 to 95%, non-condensing
Mechanical characteristics		X20BC0073
Grid size ¹⁾		
		37.5 ^{+0.2} mm
Comment		
		Order 1x TB2105 terminal block separately
		Order terminal block 1x X20TB12 separately
		Order supply module 1x X20PS9400 or X20PS9402 separately
		Order 1x X20BB80 bus base separately

1) The spacing is based on the width of the X20BB80 bus base. An X20PS9400 or X20PS9402 supply module is also always required for the bus controller.

Note: This bus controller only supports the default function model of multi-function modules. The default function model is explained in the description for each multi-function module.

Required accessories		
0TB2105.9010	Accessory terminal block, 5-pin, screw clamp, 1.5 mm ²	681
0TB2105.9110	Accessory terminal block, 5-pin, cage clamps, 2.5 mm ²	681
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20PS9400	X20 supply module for bus controller and internal I/O supply, X2X link bus supply	172
X20PS9402	X20 supply module for bus controller and internal I/O supply, X2X link bus supply, Supply not electrically isolated	174
X20BB80	X20 bus base, for X20 base module (BC, HB, etc.) and X20 supply module, X20 end plates (left and right) X20AC0SL1/X20AC0SR1 included	170

Ethernet POWERLINK bus controller BC0083



The structure of the X20 bus controller is described on page 155. In addition to the structure, other general information is also provided.

The BC0083 bus controller makes it possible to connect X2X Link I/O nodes to POWERLINK V1/V2. It is also possible to operate the X2X Link cycle synchronously 1:1 or synchronous to POWERLINK using a prescaler.

POWERLINK is a standard protocol for Fast Ethernet with true real-time properties. The Ethernet POWERLINK Standardization Group (EPSG, www.ethernet-powerlink.org) ensures that the standard remains open and is continually developed.

- POWERLINK V1/V2
- I/O configuration and firmware update via the fieldbus
- Integrated hub for efficient cabling



Short description	X20BC0083
Bus controller	POWERLINK V1/V2 controlled node
Fieldbus	X20BC0083
Type	POWERLINK V1/V2 100 Base-T (ANSI/IEE 802.3)
Design	Internal 2x hub, 2x shielded RJ45 port
Cable length	Max. 100 m between two stations (segment length)
Transfer rate	100 MBit/s
General information	X20BC0083
Status indicators	Module status, bus function
Diagnostics	
Module status	Yes, with status LED and software status
Bus function	Yes, with status LED and software status
Electrical isolation	
Fieldbus - X2X bus	Yes
Fieldbus - I/O	Yes
Power consumption of the bus	2.0 W
Certification	CE, C-UL-US, GOST-R

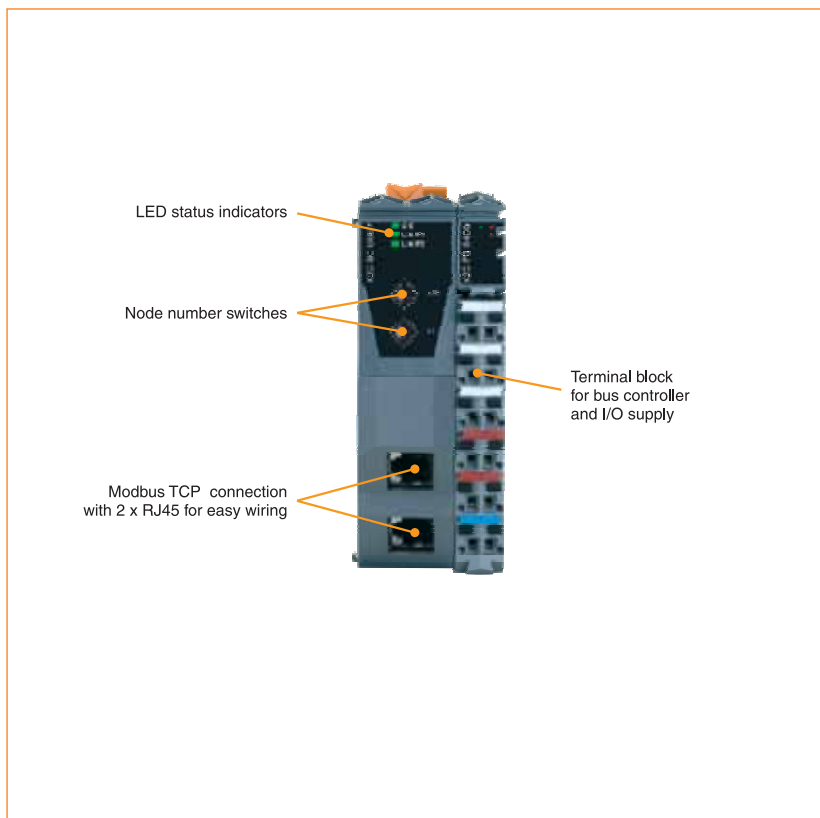
ETHERNET
POWERLINK

Operational conditions		X20BC0083
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20BC0083
Temperature		
		-25°C to +70°C
Relative humidity		5 to 95%, non-condensing
Mechanical characteristics		X20BC0083
Grid size ¹⁾		37.5 ^{+0.2} mm
Comment		Order terminal block 1x X20TB12 separately Order supply module 1x X20PS9400 or X20PS9402 separately Order 1x X20BB80 bus base separately

1) The spacing is based on the width of the X20BB80 bus base. An X20PS9400 or X20PS9402 supply module is also always required for the bus controller.

Required accessories		
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20PS9400	X20 supply module for bus controller and internal I/O supply, X2X link bus supply	172
X20PS9402	X20 supply module for bus controller and internal I/O supply, X2X link bus supply, Supply not electrically isolated	174
X20BB80	X20 bus base, for X20 base module (BC, HB, etc.) and X20 supply module, X20 end plates (left and right) X20AC0SL1/X20AC0SR1 included	170

Bus controller Modbus/TCP BC0087



The structure of the X20 bus controller is described on page 155. In addition to the structure, other general information is also provided.

Ethernet TCP/IP has been permitted as an additional transfer method for Modbus protocol, which has been around since 1979. Today, Modbus/TCP is an open internet draft standard that Schneider Automation has introduced to the IETF (Internet Engineering Task Force), the organization responsible for Internet standardization. The Modbus services and the object model that have been preserved since the original have been kept unchanged for use with TCP/IP as the transfer medium.

Thus, a new member has been added to the Modbus family, which now consists of the classic Modbus RTU (asynchronous transfer via RS232 or RS485), Modbus Plus (high speed communication via a token passing network) and Modbus/TCP (Ethernet TCP/IP based client-server communication). All the variations share a common application protocol, which defines a universal object model for automation data and communication services for access.

The BC0087 bus controller makes it possible to connect X2X Link I/O nodes to Modbus/TCP. The bus controller is operated with the Modbus/TCP library or by external systems with a Modbus/TCP master function.

- Fieldbus: Modbus/TCP
- I/O configuration via the fieldbus
- DHCP capable
- Integrated 2x switch for efficient cabling
- Configurable I/O cycle (0,5 - 4 ms)
- Response time: 1 - 8 ms (depending on the load on the integrated switch)



Short description	X20BC0087
Bus controller	Modbus/TCP
Fieldbus	X20BC0087
Type	Ethernet
Design	Internal 2x switch, 2x shielded RJ45 port
Cable length	Max. 100 m between two stations (segment length)
Transfer rate	100 MBit/s, auto-negotiation (automatic recognition of full-duplex/half-duplex), Auto-MDI/MDIX
General information	X20BC0087
Status indicators	Module status, bus function
Diagnostics	
Module status	Yes, with status LED and software status
Bus function	Yes, with status LED and software status
Electrical isolation	
Fieldbus - X2X bus	Yes
Fieldbus - I/O	Yes
Power consumption of the bus	2.0 W
Certification	CE, C-UL-US, GOST-R

Modbus-IDA
the architecture for distributed automation

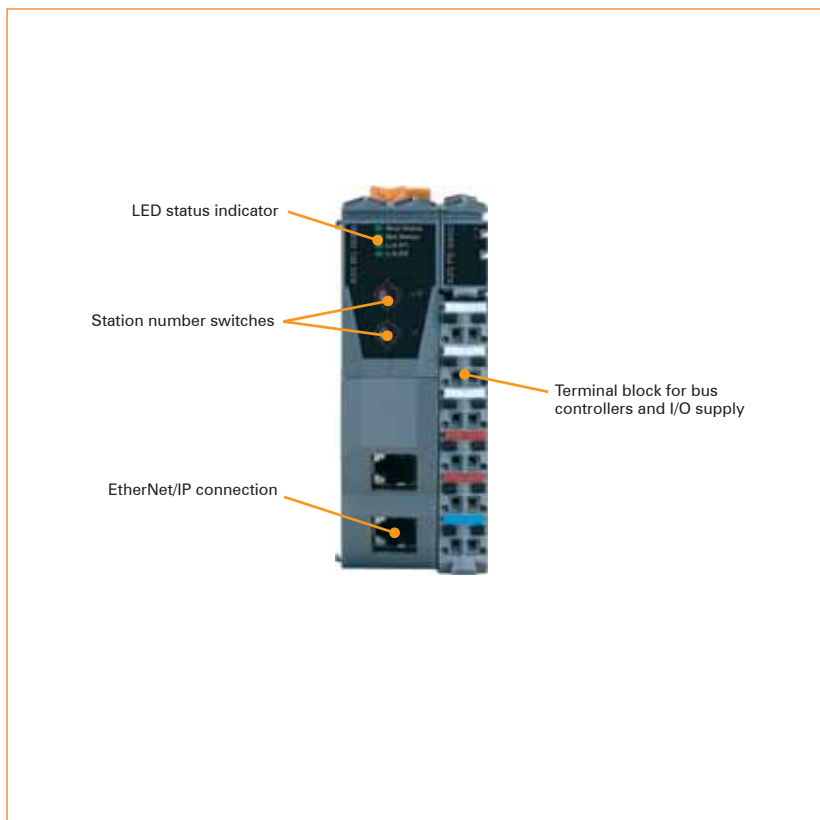
Operational conditions		X20BC0087
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20BC0087
Temperature		
		-25°C to +70°C
Relative humidity		
		5 to 95%, non-condensing
Mechanical characteristics		X20BC0087
Grid size ¹⁾		
		37.5 ^{+0.2} mm
Comment		
		Order terminal block 1x X20TB12 separately
		Order supply module 1x X20PS9400 or X20PS9402 separately
		Order 1x X20BB80 bus base separately

1) The spacing is based on the width of the X20BB80 bus base. An X20PS9400 or X20PS9402 supply module is also always required for the bus controller.

Note: Only the default function model is supported (see respective module description) when the bus controller automatically configures multi-function modules. All other function models are supported when configured accordingly (see BC0087 User's Manual).

Required accessories		
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20PS9400	X20 supply module for bus controller and internal I/O supply, X2X link bus supply	172
X20PS9402	X20 supply module for bus controller and internal I/O supply, X2X link bus supply, Supply not electrically isolated	174
X20BB80	X20 bus base, for X20 base module (BC, HB, etc.) and X20 supply module, X20 end plates (left and right) X20AC0SL1/X20AC0SR1 included	170

Bus controller EtherNet/IP BC0088



The structure of the X20 bus controller is described on page 155. In addition to the structure, other general information is also provided.

EtherNet/IP is a fieldbus based on Ethernet. EtherNet/IP was developed by Allen-Bradley (part of Rockwell Automation) and later transferred to the Open DeviceNet Vendor Association (ODVA) as open standard. In 1998 a ControlNet International working group designed a procedure to set the already released application protocol, Common Industrial Protocol, to Ethernet. EtherNet/IP was released in March 2000 as open industry standard based on this procedure.

The BC0088 bus controller makes it possible to connect X2X Link I/O nodes to Ethernet/IP. The bus controller is operated via the corresponding X20 interface module or with external systems that have an EtherNet/IP scanner function.

- Fieldbus: EtherNet/IP
- Integrated 3-port switch for efficient cabling
- Auto configuration of the I/O modules
- Can be configured by the scanner (master) using configuration assembly
- DHCP capable
- Configurable I/O cycle (0,5 - 4 ms)
- Minimum fieldbus cycle time (also Request Packet Interval or RPI): 1 ms



Short description	X20BC0088
Bus controller	EtherNet/IP
Fieldbus	X20BC0088
Type	Ethernet
Design	Internal 2-port hardware switch, 2x shielded RJ45 port
Cable length	Max. 100 m between two stations (segment length)
Transfer rate	10/100 MBit/s
	Full-duplex / half-duplex
	Auto negotiation
	Auto-MDI/MDIX
General information	X20BC0088
Status indicators	Module status, network status, bus function
Diagnostics	
Module status	Yes, with status LED and software status
Network status	Yes, with status LED and software status
Bus function	Yes, with status LED and software status
Electrical isolation	
Fieldbus - X2X bus	Yes
Fieldbus - I/O	Yes
Power consumption of the bus	2.0 W
Certification	CE, C-UL-US, GOST-R



Operational conditions		X20BC0088
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20BC0088
Temperature		
		-25°C to +70°C
Relative humidity		
		5 to 95%, non-condensing
Mechanical characteristics		X20BC0088
Grid size ¹⁾		
		37.5 ^{+0.2} mm
Comment		
		Order terminal block 1x X20TB12 separately
		Order supply module 1x X20PS9400 or X20PS9402 separately
		Order 1x X20BB80 bus base separately

1) The spacing is based on the width of the X20BB80 bus base. An X20PS9400 or X20PS9402 supply module is also always required for the bus controller.

Note: Only the default function model is supported (see respective module description) when the bus controller automatically configures multi-function modules. Configuration assemblies can be created by using the B&R FieldbusDESIGNER. All other function models are supported when using a configuration assembly.

Required accessories		
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20PS9400	X20 supply module for bus controller and internal I/O supply, X2X link bus supply	172
X20PS9402	X20 supply module for bus controller and internal I/O supply, X2X link bus supply, Supply not electrically isolated	174
X20BB80	X20 bus base, for X20 base module (BC, HB, etc.) and X20 supply module, X20 end plates (left and right) X20AC0SL1/X20AC0SR1 included	170

Bus module BB80



The following expansion modules are used on the BB80 bus module:

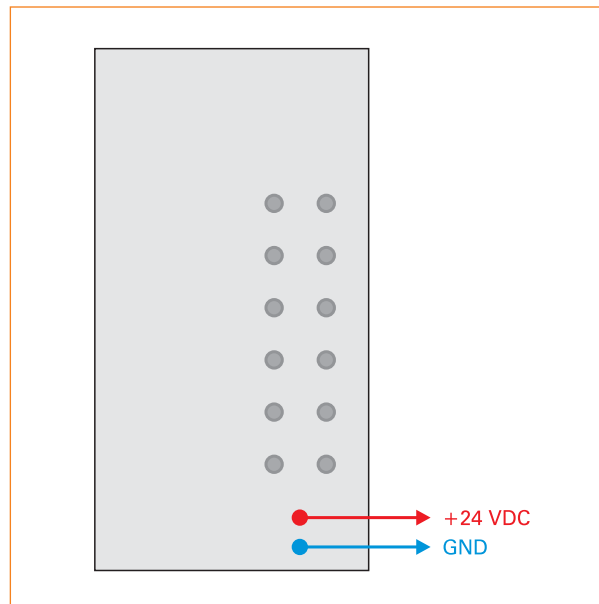
- X20 base module (BC, HB, etc.)
- X20 supply module

The left and right locking plates are included in the delivery.

- X20 bus base

Short description	X20BB80
Bus module	Bus base - backplane for bus controller fieldbus interface and bus controller supply module
General information	X20BB80
Power consumption	
Bus	-
I/O internal	-
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20BB80
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20BB80
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20BB80
Spacing	37.5 ^{+0.2} mm
Comment	Left and right X20 end plates included in delivery

Potential control





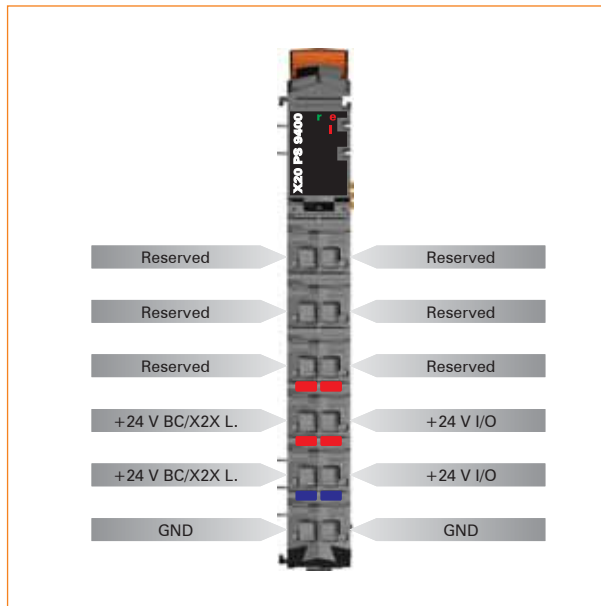
Supply module PS9400



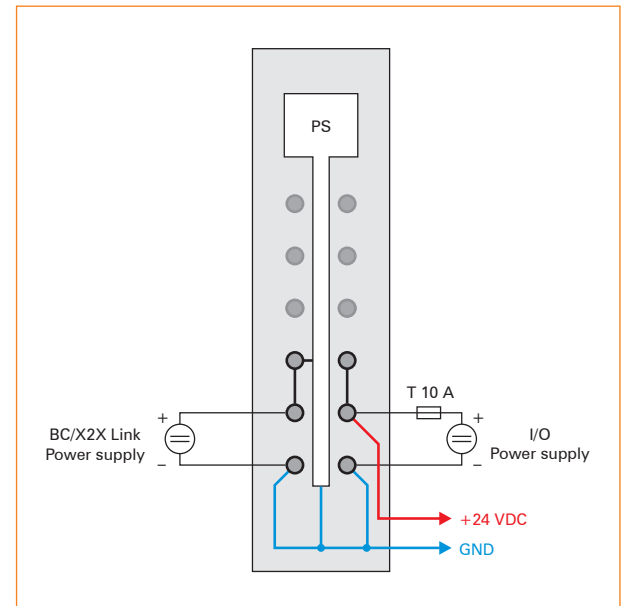
- Supply for the bus controller, X2X Link, and internal I/O supply
- Feed and bus controller / X2X Link supply electrically isolated
- Redundancy of bus controller / X2X Link supply possible by operating multiple supply modules simultaneously

Short description	X20PS9400
Power supply module	24 VDC supply module for bus controller, X2X Link bus supply and I/O
Bus controller / X2X Link supply input	X20PS9400
Input voltage	24 VDC (-15% / +20%)
Input current	Max. 0.7 A
Reverse polarity protection	Yes
Fuse	Integrated, cannot be exchanged
Bus controller / X2X Link supply output	X20PS9400
Rated output power	7.0 W
Parallel operation	Yes ¹⁾
Redundant operation of bus controller / X2X Link supply	Yes
<small>1) In parallel operation, only 75% of the rated power can be assumed. Please ensure that all parallel operating power supplies are switched on and off simultaneously.</small>	
Input I/O supply	X20PS9400
Input voltage	24 VDC (-15% / +20%)
Fuse	Recommended pre-fusing max. 10 A slow-blow
Output I/O supply	X20PS9400
Rated output voltage	24 VDC
Permitted contact load	10.0 A
General information	X20PS9400
Status indicators	Overload, operating status, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Overload	Yes, with status LED and software status
Electrical isolation	
Bus controller / X2X bus supply	Yes
I/O supply	No
Power consumption ¹⁾	
Bus	1.42 W
I/O internal	0.6 W
Certification	CE, C-UL-US, GOST-R
<small>1) The specified values are maximum values. The exact calculation is available for download as a data sheet with the other module documentation on the B&R homepage.</small>	
Operational conditions	X20PS9400
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20PS9400
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20PS9400
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order 1x X20BB8x bus base separately

Pin assignments



Connection example



Required accessories		
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BB80	X20 bus base, for X20 base module (BC, HB, etc.) and X20 supply module, X20 end plates (left and right) X20AC0SL1/X20AC0SR1 included	170
X20BB81	X20 bus base with 1 expansion slot, for X20 base module (BC, HB, etc.) and one X20 auxiliary module (IF, HB, etc.) and X20 supply module, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	184
X20BB82	X20 bus base with 2 expansion slots, for X20 base module (BC, HB, etc.) and two X20 auxiliary modules (IF, HB, etc.) and X20 supply module, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	185

Supply module PS9402



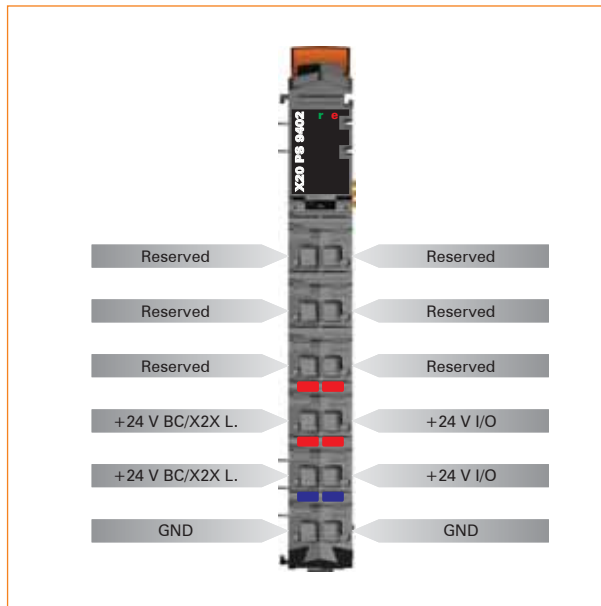
The supply module PS9402 is used together with an X20 bus controller. It is equipped with a feed for the bus controller, the X2X Link, and the internal I/O supply.

The module is intended as a low-cost supply module for small X20 systems. Potential groups are able to be formed. An expansion or redundancy of the X2X Link with the PS3300 or PS3310 supply module is not possible. Expansion of the X20 system with a bus transmitter is not allowed either.

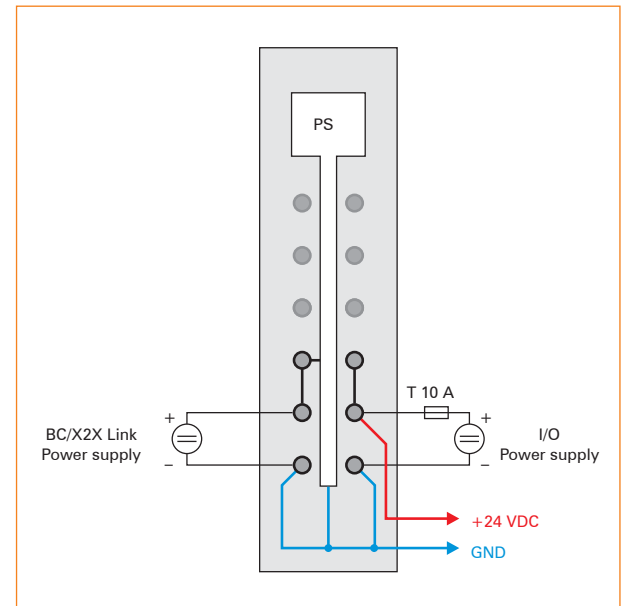
- Supply for the bus controller, X2X Link, and internal I/O supply
- Low-cost supply module for small X20 systems
- Feed and bus controller / X2X Link supply not electrically isolated
- Expansion or redundancy of bus controller / X2X Link supply not possible by operating multiple supply modules simultaneously

Short description	X20PS9402
Power supply module	24 VDC supply module for bus controller, X2X Link bus supply and I/O
Bus controller / X2X Link supply input	X20PS9402
Input voltage	24 VDC (-15% / +20%)
Input current	Max. 0.7 A
Reverse polarity protection	Yes
Fuse	Integrated, cannot be exchanged
Bus controller / X2X Link supply output	X20PS9402
Rated output power	
Horizontal installation	7.0 W at 45°C and 5.0 W at 55°C
Vertical installation	7.0 W at 40°C and 5.0 W at 50°C
Parallel operation	No
Redundant operation of bus controller / X2X Link supply	No
Input I/O supply	X20PS9402
Input voltage	24 VDC (-15% / +20%)
Fuse	Recommended pre-fusing max. 10 A slow-blow
Output I/O supply	X20PS9402
Rated output voltage	24 VDC
Permitted contact load	10.0 A
General information	X20PS9402
Status indicators	Operating status, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Overload	Yes, with status LED and software status
Electrical isolation	
Bus controller / X2X bus supply	No
I/O supply	No
Power consumption ¹⁾	
Bus	1.44 W
I/O internal	0.6 W
Certification	CE, C-UL-US (in development), GOST-R
1) The specified values are maximum values. The exact calculation is also available for download as a data sheet with the other module documentation on the B&R homepage.	
Operational conditions	X20PS9402
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20PS9402
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20PS9402
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order 1x X20BB8x bus base separately

Pin assignments



Connection example



Required accessories

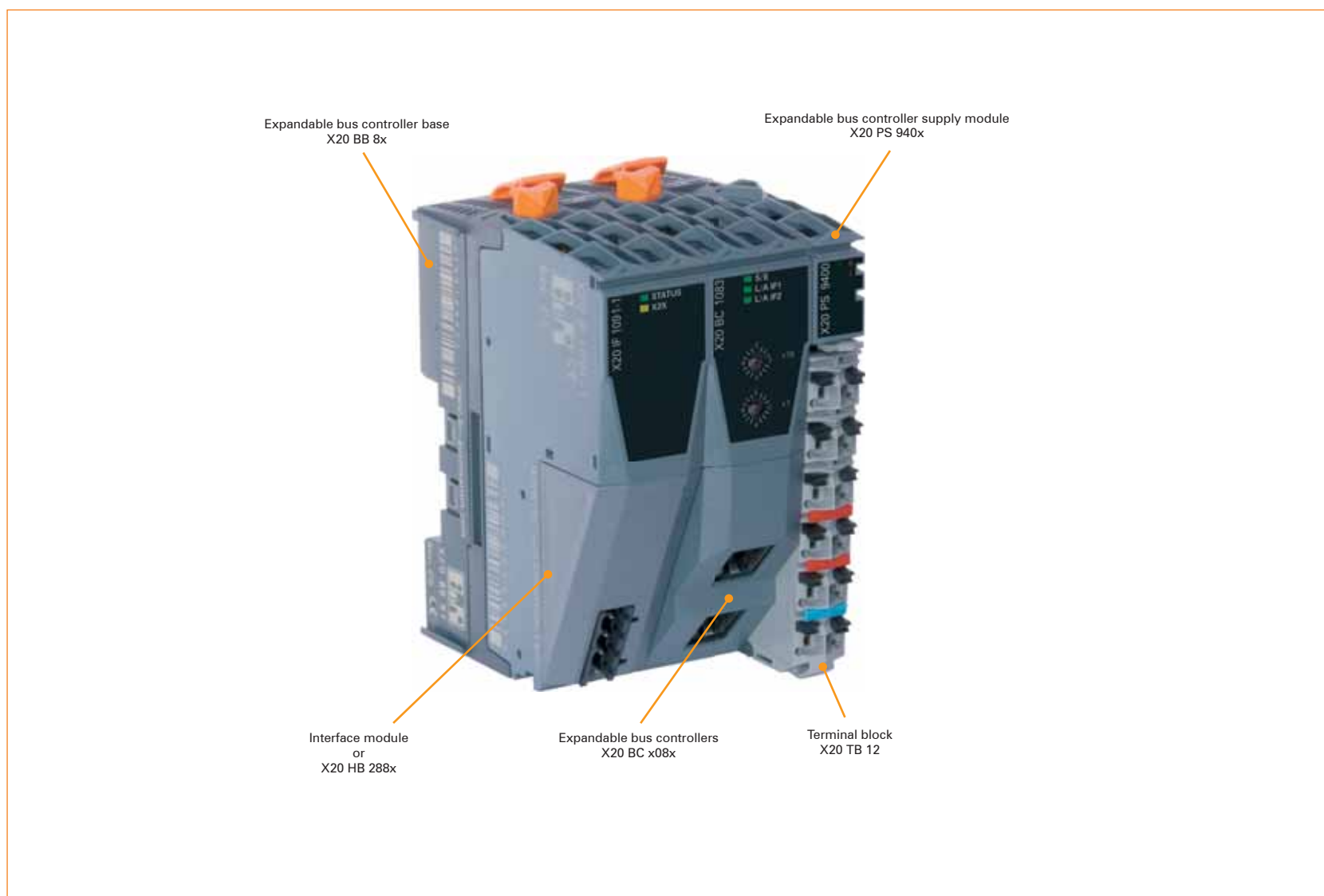
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BB80	X20 bus base, for X20 base module (BC, HB, etc.) and X20 supply module, X20 end plates (left and right) X20AC0SL1/X20AC0SR1 included	170
X20BB81	X20 bus base with 1 expansion slot, for X20 base module (BC, HB, etc.) and one X20 auxiliary module (IF, HB, etc.) and X20 supply module, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	184

Expandable bus controllers

Expandable bus controllers

The expandable bus controller is based on the POWERLINK bus controller BC0083. The expanded bus modules allow up to two interface or hub expansion modules to be mounted depending on the bus controller.

Despite the sleek profile of only 62.5 mm and 87.5 mm, the bus controller feed, the X2X Link bus supply, and the I/O module feed are integrated in the bus controller. No additional power modules are necessary.





Expandable bus controllers

BC1083



The structure of the expandable bus controller is described on page 176. In addition to the structure, other general information is also provided.

The BC1083 bus controller makes it possible to connect X2X Link I/O nodes to POWERLINK V1/V2. It is also possible to operate the X2X Link cycle synchronously 1:1 or synchronous to POWERLINK using a prescaler.

POWERLINK is a standard protocol for Fast Ethernet with true real-time properties. The Ethernet POWERLINK Standardization Group (EPSG, www.ethernet-powerlink.org) ensures that the standard remains open and is continually developed.

- POWERLINK V1/V2
- I/O configuration and firmware update via the fieldbus
- Integrated hub for efficient cabling
- Up to two slots for interface modules



Short description	X20BC1083
Bus controller	POWERLINK V1/V2 Controlled Node with up to two slots for interface modules
Fieldbus	X20BC1083
Type	POWERLINK V1/V2 100 Base-T (ANSI/IEE 802.3)
Design	Internal 2x hub, 2x shielded RJ45 port
Cable length	Max. 100 m between two stations (segment length)
Transfer rate	100 MBit/s
General information	X20BC1083
Status indicators	Module status, bus function
Diagnosics	
Module status	Yes, with status LED and software status
Bus function	Yes, with status LED and software status
Electrical isolation	
Fieldbus - X2X bus	Yes
Fieldbus - I/O	Yes
Power consumption of the bus	2.0 W
Certification	CE, C-UL-US, GOST-R

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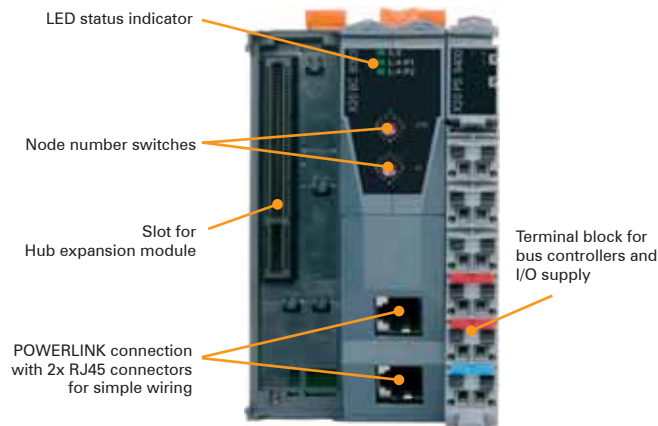
Operational conditions		X20BC1083
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20BC1083
Temperature		
		-25°C to +70°C
Relative humidity		
		5 to 95%, non-condensing
Mechanical characteristics		X20BC1083
Grid size ¹⁾		
X20BB81		62.5 ^{+0.2} mm
X20BB82		87.5 ^{+0.2} mm
Comment		
		Order terminal block 1x X20TB12 separately
		Order supply module 1x X20PS9400 or X20PS9402 separately
		Order 1x X20BB81 or X20BB82 bus base separately

1) The spacing is based on the width of the X20BB81 or X20BB82 bus base. Up to two interfaces modules and one X20PS9400 or X20PS9402 supply module are also always required for the bus controller.

Required accessories		
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20PS9400	X20 supply module for bus controller and internal I/O supply, X2X link bus supply	172
X20PS9402	X20 supply module for bus controller and internal I/O supply, X2X link bus supply, Supply not electrically isolated	174
X20BB81	X20 bus base with 1 expansion slot, for X20 base module (BC, HB, etc.) and one X20 auxiliary module (IF, HB, etc.) and X20 supply module, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	184
X20BB82	X20 bus base with 2 expansion slots, for X20 base module (BC, HB, etc.) and two X20 auxiliary modules (IF, HB, etc.) and X20 supply module, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	185
Optional accessories		
X20IF1091-1	X20 interface module for expandable bus controller, 1 X2X Link master interface, electrically isolated, order 1x TB704 terminal block separately.	186

Expandable bus controllers

BC8083



The structure of the expandable bus controller is described on page 176. In addition to the structure, other general information is also provided.

The BC8083 bus controller makes it possible to connect X2X Link I/O nodes to POWERLINK V1 and V2. It is also possible to operate the X2X Link cycle synchronously 1:1 or synchronous to POWERLINK using a prescaler.

POWERLINK is a standard protocol for Fast Ethernet with true real-time properties. The Ethernet POWERLINK Standardization Group (EPSG, www.ethernet-powerlink.org) ensures that the standard remains open and is continually developed.

The expanded bus modules allow up to two hub expansion modules to be mounted next to the bus controller. Each expansion module is equipped with two RJ45 connections. Together with the main device, this means that up to six hub ports are available.

- POWERLINK V1/V2
- I/O configuration and firmware update via the fieldbus
- Integrated hub for efficient cabling
- Up to two slots for hub expansion modules
- 2/4/6x Fast Ethernet Hub



Short description	X20BC8083
Bus controller	POWERLINK V1/V2 Controlled Node with up to two slots for hub expansion modules
Fieldbus	X20BC8083
Type	POWERLINK V1/V2 100 Base-T (ANSI/IEE 802.3)
Design	Internal 2x hub, 2x shielded RJ45 port
Cable length	Max. 100 m between two stations (segment length)
Transfer rate	100 MBit/s
General information	X20BC8083
Status indicators	Module status, bus function
Diagnosics	
Module status	Yes, with status LED and software status
Bus function	Yes, with status LED and software status
Electrical isolation	
Fieldbus - X2X bus	Yes
Fieldbus - I/O	Yes
Power consumption of the bus	2.0 W
Certification	CE, C-UL-US (in development), GOST-R

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Operational conditions		X20BC8083
Operating temperature		
Horizontal installation	0°C to +55°C	
Vertical installation	0°C to +50°C	
Relative humidity	5 to 95%, non-condensing	
Mounting orientation	Horizontal or vertical	
Installation at altitudes above sea level		
0 - 2000 m	No derating	
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m	
Protection type	IP20	
Storage and transport conditions		X20BC8083
Temperature		
-25°C to +70°C		
Relative humidity		
5 to 95%, non-condensing		
Mechanical characteristics		X20BC8083
Grid size ¹⁾		
X20BB80	37.5 ^{+0.2} mm	
X20BB81	62.5 ^{+0.2} mm	
X20BB82	87.5 ^{+0.2} mm	
Comment		
Order terminal block 1x X20TB12 separately		
Order supply module 1x X20PS9400 or X20PS9402 separately		
Order 1x X20BB8x bus base separately		

1) The spacing is based on the width of the X20BB8x bus base. Up to two X20HB2880 hub expansion modules and one X20PS9400 or X20PS9402 supply module are also always required for the bus controller.

Required accessories		
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20PS9400	X20 supply module for bus controller and internal I/O supply, X2X link bus supply	172
X20PS9402	X20 supply module for bus controller and internal I/O supply, X2X link bus supply, Supply not electrically isolated	174
X20BB80	X20 bus base, for X20 base module (BC, HB, etc.) and X20 supply module, X20 end plates (left and right) X20AC0SL1/X20AC0SR1 included	170
X20BB81	X20 bus base with 1 expansion slot, for X20 base module (BC, HB, etc.) and one X20 auxiliary module (IF, HB, etc.) and X20 supply module, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	184
X20BB82	X20 bus base with 2 expansion slots, for X20 base module (BC, HB, etc.) and two X20 auxiliary modules (IF, HB, etc.) and X20 supply module, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	185
Optional accessories		
X20HB2880	X20 hub expansion module, integrated 2x hub, status indicator LEDs, 2x RJ45 connection	187

Expandable bus controllers

BC8084



The structure of the expandable bus controller is described on page 176. In addition to the structure, other general information is also provided.

The BC8084 bus controller makes it possible to connect X2X Link I/O nodes to POWERLINK V1 and V2. It is also possible to operate the X2X Link cycle synchronously 1:1 or synchronous to POWERLINK using a prescaler.

POWERLINK is a standard protocol for Fast Ethernet with true real-time properties. The Ethernet POWERLINK Standardization Group (EPSG, www.ethernet-powerlink.org) ensures that the standard remains open and is continually developed.

Using POWERLINK, systems with redundant cabling can be implemented. Unlike ring redundancy, cable looping, which can sometimes be problematic, is not required for cable redundancy. This allows the creation of all types of tree structures. When using a device with the link selector function, data is always transferred via the highest quality network lines. The Link Selector function is integrated in the BC8084 bus controller (see section "POWERLINK cable redundancy section", on page 57 and "X20 redundancy system", on page 57).

- POWERLINK V1/V2
- I/O configuration and firmware update via the fieldbus
- Integrated compact link selector function
- Two active hub expansion modules can be connected to the bus controller
- Redundant supply possible



Short description	X20BC8084
Bus controller	POWERLINK V1/V2 Controlled Node with Compact Link Selector
Fieldbus	X20BC8084
Type	POWERLINK V1/V2 100 Base-T (ANSI/IEE 802.3)
Design	Internal 2x hub, 2x shielded RJ45 port
Cable length	Max. 100 m between two stations (segment length)
Transfer rate	100 MBit/s
General information	X20BC8084
Status indicators	Module status, bus function
Diagnostics	
Module status	Yes, with status LED and software status
Bus function	Yes, with status LED and software status
Electrical isolation	
Fieldbus - X2X bus	Yes
Fieldbus - I/O	Yes
Power consumption of the bus	2.0 W
Certification	CE, C-UL-US (in development), GOST-R

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Operational conditions		X20BC8084
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20BC8084
Temperature		
		-25°C to +70°C
Relative humidity		
		5 to 95%, non-condensing
Mechanical characteristics		X20BC8084
Grid size ¹⁾		
X20BB81		62.5 ^{+0.2} mm
X20BB82		87.5 ^{+0.2} mm
Comment		
		Order terminal block 1x X20TB12 separately
		Order supply module 1x X20PS9400 or X20PS9402 separately
		Order 1x X20BB81 or X20BB82 bus base separately

1) The spacing is based on the width of the X20BB81 or X20BB82 bus base. Up to two X20HB2885 hub expansion modules and one X20PS9400 or X20PS9402 supply module are also always required for the bus controller.

Required accessories		
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20PS9400	X20 supply module for bus controller and internal I/O supply, X2X link bus supply	172
X20PS9402	X20 supply module for bus controller and internal I/O supply, X2X link bus supply, Supply not electrically isolated	174
X20BB80	X20 bus base, for X20 base module (BC, HB, etc.) and X20 supply module, X20 end plates (left and right) X20AC0SL1/X20AC0SR1 included	170
X20BB82	X20 bus base with 2 expansion slots, for X20 base module (BC, HB, etc.) and two X20 auxiliary modules (IF, HB, etc.) and X20 supply module, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	185
Optional accessories		
X20HB2885	X20 hub expansion module, integrated active 2x hub, status indicator LEDs, 2x RJ45 connection	188

Bus module BB81



The BB81 bus module has an expansion slot. The following expansion modules are used on the module:

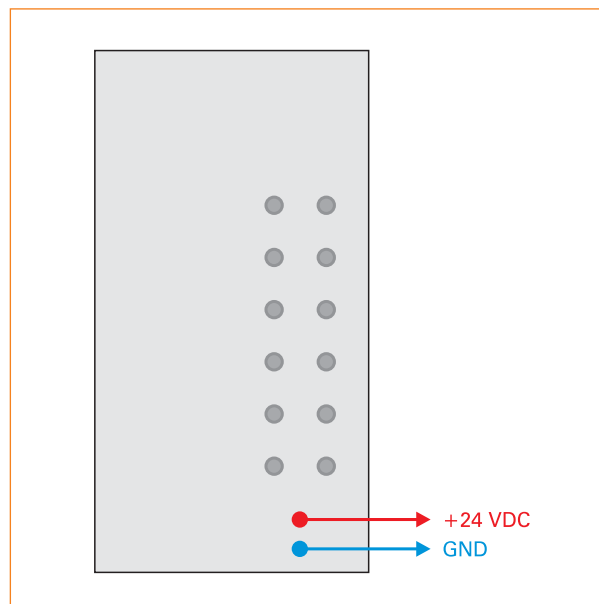
- X20 base module (BC, HB, etc.)
- X20 add-on module (IF, HB, etc.)
- X20 supply module

The left and right locking plates are included in the delivery.

- X20 bus base with one expansion slot

Short description	X20BB81
Bus module	X20 bus base with one expansion slot
General information	X20BB81
Power consumption	
Bus	-
I/O internal	-
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20BB81
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20BB81
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20BB81
Spacing	62.5 ^{+0.2} mm
Comment	Left and right X20 end plates included in delivery

Potential control



Bus module BB82



The BB82 bus module has two expansion slots. The following expansion modules are used on the module:

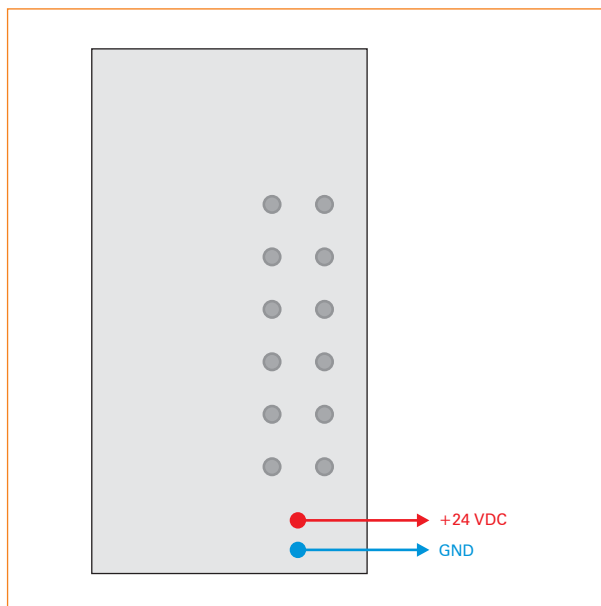
- X20 base module (BC, HB, etc.)
- Two X20 add-on module (IF, HB, etc.)
- X20 supply module

The left and right locking plates are included in the delivery.

- X20 bus base with two expansion slots

Short description	X20BB82
Bus module	Bus base with two expansion slots
General information	X20BB82
Power consumption	
Bus	-
I/O internal	-
Certification	CE, C-UL-US (in development), GOST-R
Operational conditions	X20BB82
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20BB82
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20BB82
Spacing	87.5 ^{+0.2} mm
Comment	Left and right X20 end plates included in delivery

Potential control



Interface module IF1091-1



The IF1091-1 interface module is operated in the BC1083 expandable bus controller. It is equipped with an X2X Link master interface.

- X2X Link Connection

Short description		X20IF1091-1
Communication module		1x X2X Link master
Interfaces		X20IF1091-1
Interface IF1		
Type		X2X Link master
Design		4-pin multipoint connector
General information		X20IF1091-1
Status indicators		Module status, data transfer
Diagnostics		
Module status		Yes, with status LED
Data transfer		Yes, with status LED
Electrical isolation		
PLC - IF1		Yes
Power consumption		1.29 W
Certification		CE, C-UL-US (in development), GOST-R
Operational conditions		X20IF1091-1
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20IF1091-1
Temperature		-25°C to +70°C
Relative humidity		5 to 95%, non-condensing
Mechanical characteristics		X20IF1091-1
Slot		In expandable bus controllers
Comment		Order 1x TB704 terminal block separately

Required accessories		
0TB704.9	Accessory terminal block, 4-pin, screw clamp, 1.5 mm ²	680
0TB704.91	Accessory terminal block, 4-pin, cage clamp, 2.5 mm ²	680

Hub expansion module HB2880



The BC8083 POWERLINK bus controller and the HB8880 stand alone hub are equipped with a modular hub expansion. Depending on the bus base used, one or two additional slots are available. The HB2880 hub expansion module can be operated in these slots.

The HB2880 hub expansion module is equipped with an integrated 2x hub. The Ethernet connections are made using RJ45 connectors. The module and network status is indicated using LEDs.

- Hub expansion module
- 2x Fast Ethernet hub

Short description	X20HB2880
Hub	2x Fast Ethernet hub for hub expansion
Interfaces	X20HB2880
Type	Ethernet
Standard (compliance)	ANSI/IEEE 802.3
Signal	10/100 Base-T
Port design	Shielded RJ45 ports
Transfer rate	10 MBit/s or 100 MBit/s Devices with 10/100 MBit/s auto-negotiation are operated at 100 MBit/s ¹⁾
Cable length	Max. 100 m between two stations (segment length)
1) If devices that use 10 MBit/s as well as 100 MBit/s are connected, then there is no communication between these devices. Devices with 10/100 MBit/s auto-negotiation are always operated with 100 MBit/s on the hub.	
General information	X20HB2880
Status indicators	Module status, bus function
Diagnostics	
Module status	Yes, with status LED
Bus function	Yes, with status LED
Electrical isolation	
Fieldbus supply	Yes
Power consumption	TBD
Certification	CE, C-UL-US (in development), GOST-R
Operational conditions	X20HB2880
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20HB2880
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20HB2880
Slot	Hub expansion for BC8083 and HB8880

Hub expansion module HB2885



The HB2885 hub expansion module can be operated on the BC8084 POWERLINK bus controller and on the HB8884 compact link selector. It is equipped with an integrated 2x hub. The Ethernet connections are made using RJ45 connectors. The module and network status is indicated using LEDs.

- Hub expansion module
- 2x Fast Ethernet hub
- Hot-swap capable

Short description	X20HB2885
Hub	2x Fast Ethernet hub for hub expansion
Interfaces	X20HB2885
Type	Ethernet
Standard (compliance)	ANSI/IEEE 802.3
Signal	10/100 Base-T
Port design	Shielded RJ45 ports
Transfer rate	10 MBit/s or 100 MBit/s
Cable length	Max. 100 m between two stations (segment length)
1) If devices that use 10 MBit/s as well as 100 MBit/s are connected, then there is no communication between these devices. Devices with 10/100 MBit/s auto-negotiation are always operated with 100 MBit/s on the hub.	
General information	X20HB2885
Status indicators	Module status, bus function
Diagnostics	
Module status	Yes, with status LED
Bus function	Yes, with status LED
Electrical isolation	
Fieldbus supply	Yes
Power consumption	TBD
Certification	CE, C-UL-US (in development), GOST-R
Operational conditions	X20HB2885
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20HB2885
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20HB2885
Slot	Hub expansion for BC8084 and HB8884

Interface module IF1020



- RS232 interface configurable as online interface

Short description	X20IF1020
Communication module	1x RS232
Interfaces	X20IF1020
Interface IF1	
Type	RS232
Design	9-pin DSUB plug
Maximum transfer rate	115.2 kBit/s
General information	X20IF1020
Status indicators	Module status, data transfer
Diagnostics	
Module status	Yes, with status LED
Data transfer	Yes, with status LED
Electrical isolation	
PLC - IF1	Yes
Power consumption	0.33 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20IF1020
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20IF1020
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20IF1020
Slot	In X20 CPU

Optional accessories	
0G0001.00-090	Cable PC <-> PLC/PW, RS232, online cable

Interface module IF1030



- RS485/RS422 connection

Short description	X20IF1030
Communication module	1x RS485/RS422
Interfaces	X20IF1030
Interface IF1	
Type	RS485/RS422
Design	9-pin DSUB socket
Maximum transfer rate	115.2 kBit/s
General information	X20IF1030
Status indicators	Module status, data transfer
Diagnostics	
Module status	Yes, with status LED
Data transfer	Yes, with status LED
Electrical isolation	
PLC - IF1	Yes
Power consumption	0.4 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20IF1030
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20IF1030
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20IF1030
Slot	In X20 CPU

Optional accessories	
0G1000.00-090	Bus connector, RS485, for Profibus networks

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Interface module IF1061



- Profibus DP master



Short description		X20IF1061
Communication module		1x Profibus DP master
Interfaces		X20IF1061
Interface IF1		
Fieldbus		Profibus DP master
Type		RS485
Design		9-pin DSUB socket
Maximum transfer rate		12 MBit/s
General information		X20IF1061
Status indicators		Module status, bus status
Diagnostics		
Module status		Yes, with status LED and software status
Bus status		Yes, with status LED and software status
Electrical isolation		
PLC - IF1		Yes
Power consumption		1.4 W
Certification		CE, C-UL-US, GOST-R
Operational conditions		X20IF1061
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20IF1061
Temperature		-25°C to +70°C
Relative humidity		5 to 95%, non-condensing
Mechanical characteristics		X20IF1061
Slot		In X20 CPU

Optional accessories

OG1000.00-090 Bus connector, RS485, for Profibus networks

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Interface module IF1063



- Profibus DP Slave connection



Short description		X20IF1063
Communication module		1x Profibus DP slave
Interfaces		X20IF1063
Interface IF1		
Fieldbus		Profibus DP slave
Type		RS485
Design		9-pin DSUB socket
Maximum transfer rate		12 MBit/s
General information		X20IF1063
Status indicators		Module status, data transfer
Diagnostics		
Module status		Yes, with status LED
Data transfer		Yes, with status LED
Electrical isolation		
PLC - IF1		Yes
Power consumption		0.87 W
Certification		CE, C-UL-US, GOST-R
Operational conditions		X20IF1063
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20IF1063
Temperature		-25°C to +70°C
Relative humidity		5 to 95%, non-condensing
Mechanical characteristics		X20IF1063
Slot		In X20 CPU

Optional accessories		
OG1000.00-090	Bus connector, RS485, for Profibus networks	690

Interface module IF1072



- CAN Bus Connection
- Integrated terminating resistor

CAN

Short description	X20IF1072
Communication module	1x CAN bus
Interfaces	X20IF1072
Interface IF1	
Type	CAN bus
Design	5-pin multipoint connector
Maximum transfer rate	1 MBit/s
General information	X20IF1072
Status indicators	Module status, data transfer, terminating resistor
Diagnostics	
Module status	Yes, with status LED
Data transfer	Yes, with status LED
Terminating resistor	Yes, with status LED
Electrical isolation	
PLC - IF1	Yes
Power consumption	0.79 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20IF1072
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20IF1072
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20IF1072
Slot	In X20 CPU
Comment	Order 1x TB2105 terminal block separately

Required accessories		
0TB2105.9010	Accessory terminal block, 5-pin, screw clamp, 1.5 mm ²	681
0TB2105.9110	Accessory terminal block, 5-pin, cage clamp, 2.5 mm ²	681

Interface module IF1082



- POWERLINK V1/V2 for real-time Ethernet communication
- Integrated hub for efficient cabling
- Configurable ring redundancy

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Short description	X20IF1082
Communication module	1x POWERLINK V1/V2 managing or controlled node
Interfaces	X20IF1082
Interface IF1	
Fieldbus	POWERLINK V1/V2
Type	100 Base-T (ANSI/IEEE 802.3)
Design	Internal 2x hub, 2x shielded RJ45 port
Transfer rate	100 MBit/s
Cable length	Max. 100 m between two stations (segment length)
General information	X20IF1082
Status indicators	Module status, bus function
Diagnostics	
Module status	Yes, with status LED and software status
Bus function	Yes, with status LED and software status
Electrical isolation	
PLC - IF1	Yes
Power consumption	2.0 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20IF1082
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20IF1082
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20IF1082
Slot	In X20 CPU

Optional accessories		
X20CA0E61.xxxx	POWERLINK connection cable - RJ45 to RJ45	391
X67CA0E41.xxxx	POWERLINK attachment cable - RJ45 to M12	391

Interface module IF1091



- X2X Link Connection

Short description		X20IF1091
Communication module		1x X2X Link master
Interfaces		X20IF1091
Interface IF1		
Type		X2X Link master
Design		4-pin multipoint connector
General information		X20IF1091
Status indicators		Module status, data transfer
Diagnostics		
Module status		Yes, with status LED
Data transfer		Yes, with status LED
Electrical isolation		
PLC - IF1		Yes
Power consumption		0.97 W
Certification		CE, C-UL-US, GOST-R
Operational conditions		X20IF1091
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20IF1091
Temperature		-25°C to +70°C
Relative humidity		5 to 95%, non-condensing
Mechanical characteristics		X20IF1091
Slot		In X20 CPU
Comment		Order 1x TB704 terminal block separately

Required accessories		
0TB704.9	Accessory terminal block, 4-pin, screw clamp, 1.5 mm ²	680
0TB704.91	Accessory terminal block, 4-pin, cage clamp, 2.5 mm ²	680

Interface module IF2772



- Dual CAN bus connection
- Integrated terminating resistors

CAN

Short description	X20IF2772
Communication module	2x CAN bus
Interfaces	X20IF2772
Interfaces IF1 and IF2	
Type	CAN bus
Design	2x 5-pin multipoint connector
Maximum transfer rate	1 MBit/s
General information	X20IF2772
Status indicators	Module status, data transfer, terminating resistor
Diagnostics	
Module status	Yes, with status LED
Data transfer	Yes, with status LED
Terminating resistor	Yes, with status LED
Electrical isolation	
PLC - IF1/IF2	Yes
IF1 - IF2	Yes
Power consumption	1.2 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20IF2772
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20IF2772
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20IF2772
Slot	In X20 CPU
Comment	Order 2x TB718 terminal blocks separately

Required accessories		
0TB2105.9010	Accessory terminal block, 5-pin, screw clamp, 1.5 mm ²	681
0TB2105.9110	Accessory terminal block, 5-pin, cage clamp, 2.5 mm ²	681

Interface module IF2792



- X2X Link connection
- CAN bus connection
- Integrated terminating resistor

CAN

Short description		X20IF2792
Communication module		1x X2X Link master, 1x CAN bus
Interfaces		X20IF2792
Interface IF1		
Type		X2X Link master
Design		4-pin multipoint connector
Interface IF2		
Type		CAN bus
Design		5-pin multipoint connector
Maximum transfer rate		1 MBit/s
General information		X20IF2792
Status indicators		Module status, data transfer, terminating resistor
Diagnostics		
Module status		Yes, with status LED
Data transfer		Yes, with status LED
Terminating resistor		Yes, with status LED
Electrical isolation		
PLC - IF1/IF2		Yes
IF1 - IF2		Yes
Power consumption		1.51 W
Certification		CE, C-UL-US, GOST-R
Operational conditions		X20IF2792
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20IF2792
Temperature		-25°C to +70°C
Relative humidity		5 to 95%, non-condensing
Mechanical characteristics		X20IF2792
Slot		In X20 CPU
Comment		Order 1x TB704 and 1x TB2105 terminal blocks separately

Required accessories		
0TB704.9	Accessory terminal block, 4-pin, screw clamp, 1.5 mm ²	680
0TB704.91	Accessory terminal block, 4-pin, cage clamp, 2.5 mm ²	680
0TB2105.9010	Accessory terminal block, 5-pin, screw clamp, 1.5 mm ²	681
0TB2105.9110	Accessory terminal block, 5-pin, cage clamp, 2.5 mm ²	681

Interface module CS1011

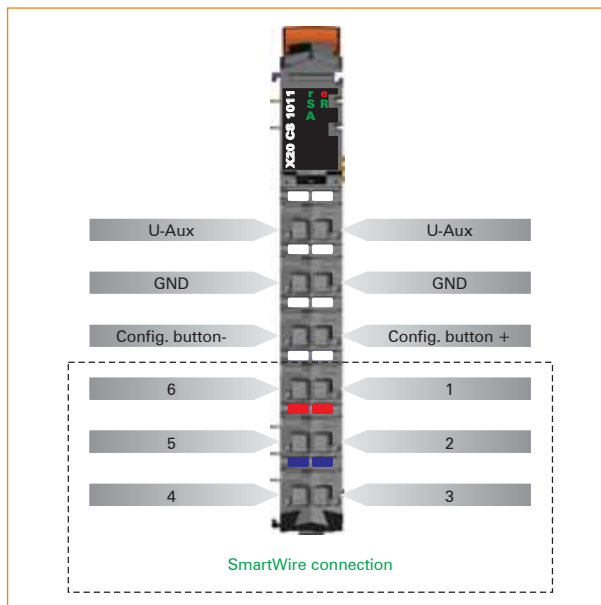


- X2X SmartWire master for controlling up to 16 SmartWire slaves
- External 24 VDC feed protected against reverse polarity for supplying the slave application (e.g. Moeller xStart protection DILM)

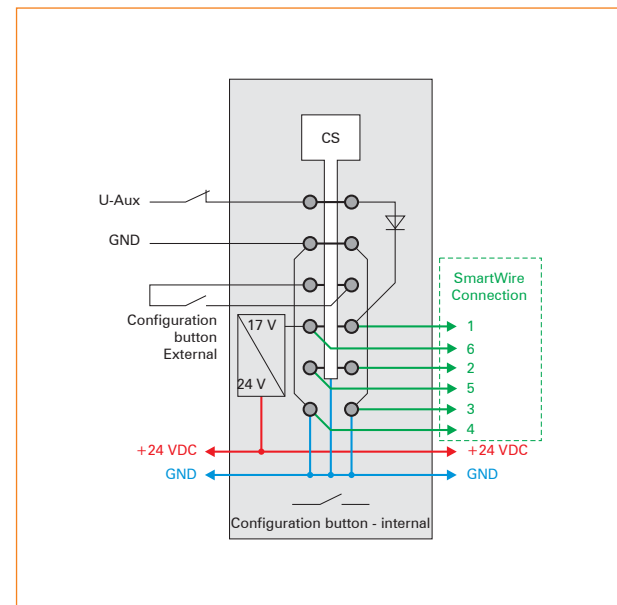
Short description	X20CS1011
Communication module	1 SmartWire master for controlling up to 16 slaves
SmartWire master	X20CS1011
Transfer rate	19200 Bit/s
Data format	1 start bit, 8 data bits, no parity bit, 1 stop bit
Bus level	17 V (recessive), 0 V (dominant)
SWIRE terminal 2	0 V / 5 V (active), CMOS level
SWIRE terminal 6 (17 VDC)	
Section	16.3 VDC to 16.8 VDC
Typical	16.6 VDC
Load	Max. 400 mA for 16 SmartWire slaves
Short circuit protection	Yes
U-Aux (24 VDC aux supply)	
Input voltage	24 VDC (-15% / +20%)
Reverse polarity protection	Yes
Connection	External via terminal block ¹⁾
Fuse	Recommended pre-fusing max. 3 A slow-blow
SWIRE terminal 1 (24 VDC)	
Section	Supply like feed
Load	Maximum 3 A for supplying 16 SmartWire slave auxiliary
Short circuit protection	No
Bus extension	Maximum 4 m
Configuration button	
Internal	On the front of the X20CS1011 module
External	Connection via terminal block
1) Using an external feed makes it possible to shut down via E-stop or switching relay	
General information	X20CS1011
Status indicators	SmartWire bus function, external supply voltage, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
SmartWire operating state	Yes, with status LED and software status
U Aux	Yes, with status LED
Certification	CE, C-UL-US (in development), GOST-R
Electrical isolation	
SmartWire bus - X2X bus	Yes
SmartWire supply (17 VDC) -	No
Bus supply (24 VDC)	
Power consumption	
Bus	0.01 W
I/O internal	1.0 W
Power output	
I/O internal	6.8 W for supplying external slaves (equal to 16 slaves each with 0.425 W)
Operational conditions	X20CS1011
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20

Storage and transport conditions	X20CS1011
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20CS1011
Spacing	12.5 ^{+0.2} mm
Comment	Order SmartWire connection cable X20CA4S00.00xx separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20CA4S00.0005	SmartWire connection cable, X20TB12 on SmartWire plug, 0.5 m
X20CA4S00.0015	SmartWire connection cable, X20TB12 on SmartWire plug, 1.5 m
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected

88

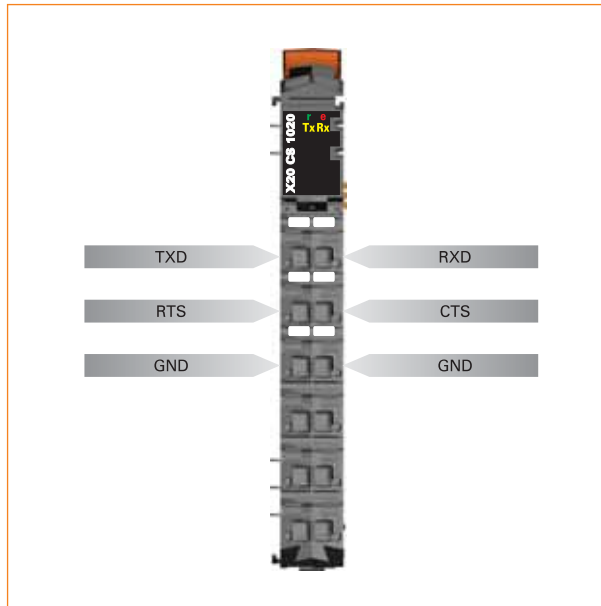
Interface module CS1020



- RS232 interface for serial, remote connection of complex devices to the X20 System

Short description		X20CS1020
Communication module		1x RS232
Interfaces		X20CS1020
Interface IF1		
Type		RS232
Design		Contact via 12-pin terminal block TB12
Maximum transfer rate		115.2 kBit/s
General information		X20CS1020
Status indicators		Data transfer, operating status, module status
Diagnostics		
Module run/error		Yes, with status LED and software status
Data transfer		Yes, with status LED
Electrical isolation		
IF1 - Bus		Yes
IF1 - I/O supply		No
Power consumption		
Bus		0.01 W
I/O internal		1.44 W
Certification		CE, C-UL-US, GOST-R
Operational conditions		X20CS1020
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20CS1020
Temperature		-25°C to +70°C
Relative humidity		5 to 95%, non-condensing
Mechanical characteristics		X20CS1020
Spacing		12.5 ^{+0.2} mm
Comment		Order terminal block 1x X20TB06 or X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Required accessories

X20TB06	X20 terminal block, 6-pin, 24 V coded	94
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

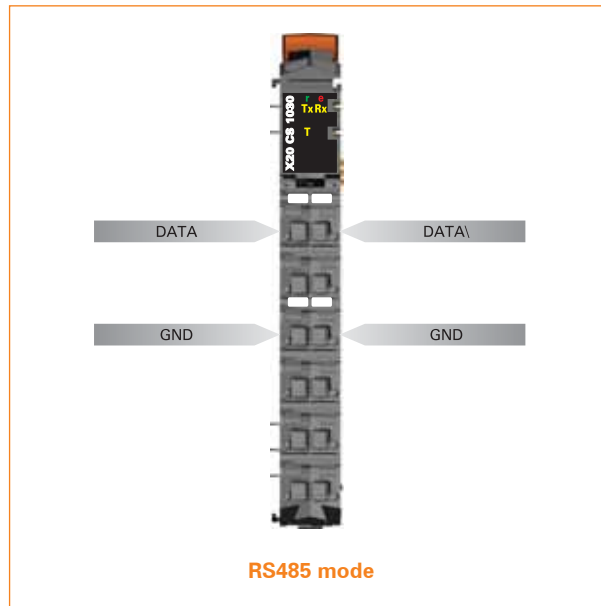
Interface module CS1030



- RS485/RS422 interface for serial, remote connection of complex devices to the X20 System
- Integrated terminating resistor

Short description	X20CS1030
Communication module	1x RS485/RS422
Interfaces	X20CS1030
Interface IF1	
Type	RS485/RS422
Design	Contact via 12-pin terminal block TB12
Maximum transfer rate	250 kBit/s
General information	X20CS1030
Status indicators	Data transfer, terminating resistor, operating status, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Data transfer	Yes, with status LED
Terminating resistor	Yes, with status LED
Electrical isolation	
IF1 - Bus	Yes
IF1 - I/O supply	Yes
Power consumption	
Bus	0.01 W
I/O internal	1.44 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20CS1030
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20CS1030
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20CS1030
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB06 or X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Required accessories

X20TB06	X20 terminal block, 6-pin, 24 V coded	94
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Interface module CS1070

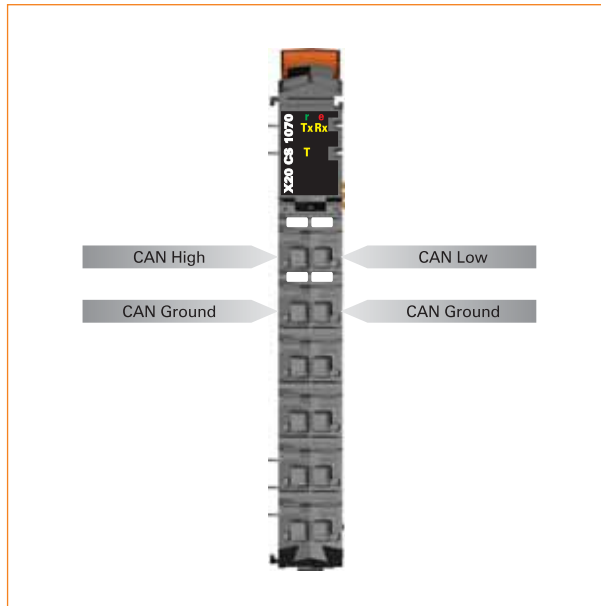


- CAN bus interface for serial, remote connection of complex devices to the X20 System
- Integrated terminating resistor

CAN

Short description	X20CS1070
Communication module	1x CAN bus
Interfaces	X20CS1070
Interface IF1	
Type	CAN bus
Design	Contact via 12-pin terminal block TB12
Maximum transfer rate	1 MBit/s
General information	X20CS1070
Status indicators	Data transfer, terminating resistor, operating status, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Data transfer	Yes, with status LED
Terminating resistor	Yes, with status LED
Electrical isolation	
IF1 - Bus	Yes
IF1 - I/O supply	Yes
Power consumption	
Bus	0.01 W
I/O internal	1.44 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20CS1070
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20CS1070
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20CS1070
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB06 or X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Required accessories

X20TB06	X20 terminal block, 6-pin, 24 V coded	94
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Interface module CS2770

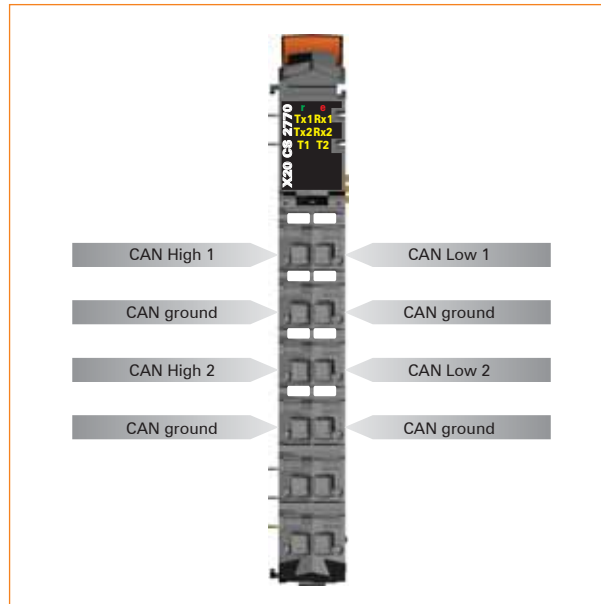


- 2 CAN bus interfaces for serial, remote connection of complex devices to the X20 System
- Integrated terminating resistors

CAN

Short description	X20CS2770
Communication module	2x CAN bus
Interfaces	X20CS2770
Interface IF1	
Type	CAN bus
Design	Contact via 12-pin terminal block TB12
Maximum transfer rate	1 MBit/s
Interface IF2	
Type	CAN bus
Design	Contact via 12-pin terminal block TB12
Maximum transfer rate	1 MBit/s
General information	X20CS2770
Status indicators	Data transfer, terminating resistor, operating status, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Data transfer	Yes, with status LED
Terminating resistor	Yes, with status LED
Electrical isolation	
IF1/F2 - Bus	Yes
IF1/F2 - I/O supply	Yes
IF1 - IF2	Yes
Power consumption	
Bus	0.01 W
I/O internal	1.5 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20CS2770
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20CS2770
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20CS2770
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Bus receivers BR9300



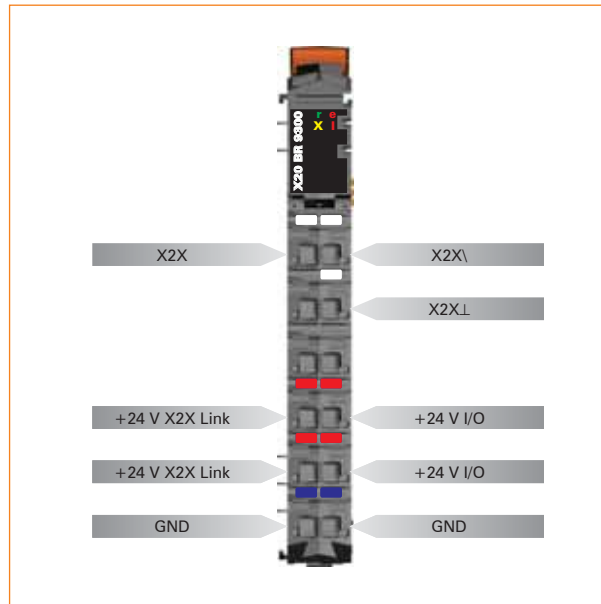
The bus receiver BR9300 is used to connect the X20 system to the X2X link. The module is equipped with a feed for the X2X Link as well as the internal I/O supply.

The left and right locking plates are included in the delivery.

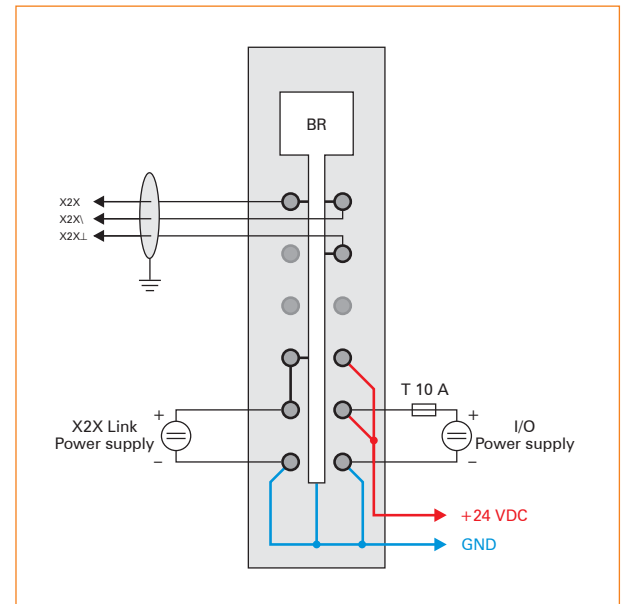
- X2X Link bus receiver
- Supply for X2X Link and internal I/O supply
- Electrical isolation of feed and X2X Link supply
- X2X Link supply redundancy possible by using several supply modules at the same time

Short description	X20BR9300
Bus receivers	X2X Link bus receiver with supply for I/O and bus
X2X Link supply input	X20BR9300
Input voltage	24 VDC (-15% / +20%)
Input current	Max. 0.7 A
Reverse polarity protection	Yes
Fuse	Integrated, cannot be exchanged
X2X Link supply output	X20BR9300
Rated output power	7.0 W
Parallel operation	Yes ¹⁾
Redundant operation	Yes
1) In parallel operation, only 75% of the rated power can be assumed. Please ensure that all parallel operating power supplies are switched on and off simultaneously.	
Input I/O supply	X20BR9300
Input voltage	24 VDC (-15% / +20%)
Fuse	Recommended pre-fusing max. 10 A slow-blow
Output I/O supply	X20BR9300
Rated output voltage	24 VDC
Permitted contact load	10.0 A
General information	X20BR9300
Status indicators	X2X bus function, overload, operating status, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
X2X bus function	Yes, with status LED
Overload	Yes, with status LED and software status
Electrical isolation	
X2X Link supply	Yes
I/O supply	No
Power consumption ¹⁾	
Bus	1.62 W
I/O internal	0.6 W
Certification	CE, C-UL-US, GOST-R
1) The specified values are maximum values. The exact calculation is available for download as a data sheet with the other module documentation on the B&R homepage.	
Operational conditions	X20BR9300
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20BR9300
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20BR9300
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order supply bus module 1x X20BM01 separately Left and right X20 end plates included in delivery

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM01	X20 supply bus module, internal I/O supply is isolated to the left	86

Optional accessories

X67CA0X99.1000	Cable for custom prefabrication, 100.0 m
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Bus transmitters

BT9100



The bus transmitter BT9100 provides for the seamless expansion of the X20 system. The stations can be up to 100 m away from each other.

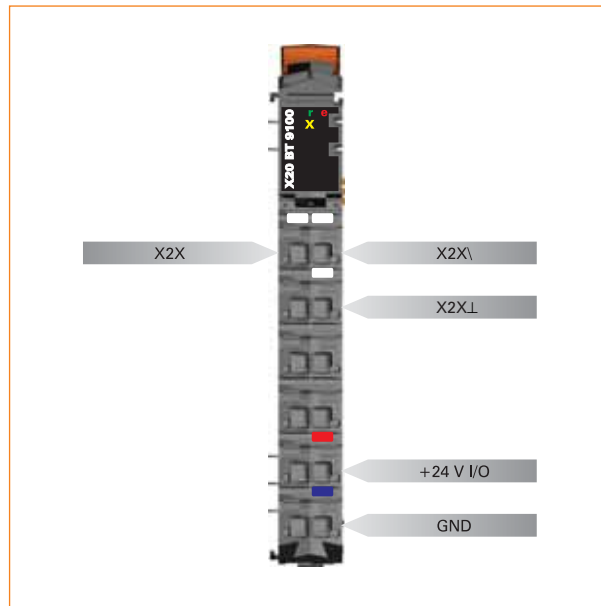
- X2X Link bus transmitter
- For seamless expansion of the systems
- Up to 100 m segment lengths
- Feed for internal I/O power supply

Note:

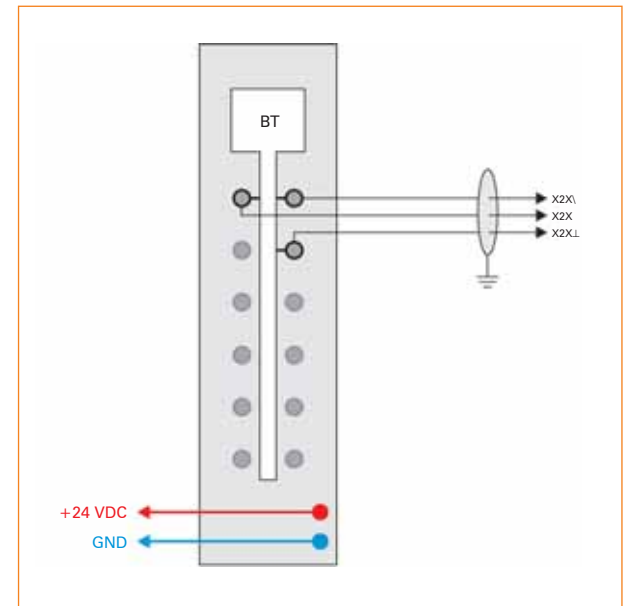
If the feed is being used for internal I/O supply, this potential group cannot be supplied by any other module. An I/O module with bus module BM01 should be used to separate the potential group (see section "Supply feed via bus transmitter", on page 404).

Short description	X20BT9100
Bus transmitters	X2X Link bus transmitter with supply for I/O
Input I/O supply	X20BT9100
Input voltage	24 VDC (-15% / +20%)
Fuse	Recommended pre-fusing max. 10 A slow-blow
Output I/O supply	X20BT9100
Rated output voltage	24 VDC
Permitted contact load	10.0 A
General information	X20BT9100
Status indicators	X2X bus function, operating status, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
X2X bus function	Yes, with status LED
Power consumption ¹⁾	
Bus	0.5 W
I/O internal	
as bus transmitter	0.1 W
additionally as supply module	0.6 W
Certification	CE, C-UL-US, GOST-R
1) The specified values are maximum values. The exact calculation is available for download as a data sheet with the other module documentation on the B&R homepage.	
Operational conditions	X20BT9100
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20BT9100
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20BT9100
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB06 or X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB06	X20 terminal block, 6-pin, 24 V coded	94
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Optional accessories

X67CA0X99.1000	Cable for custom prefabrication, 100.0 m
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Bus transmitters BT9400



To make a connection from an X20 System to an X67 System, a bus transmitter is simply plugged into the end of the X20 block in order to connect the X2X Link cable. The BT9400 bus transmitter also provides the X2X supply voltage for the X67 System. The X67 system supply module that was previously required is no longer needed.

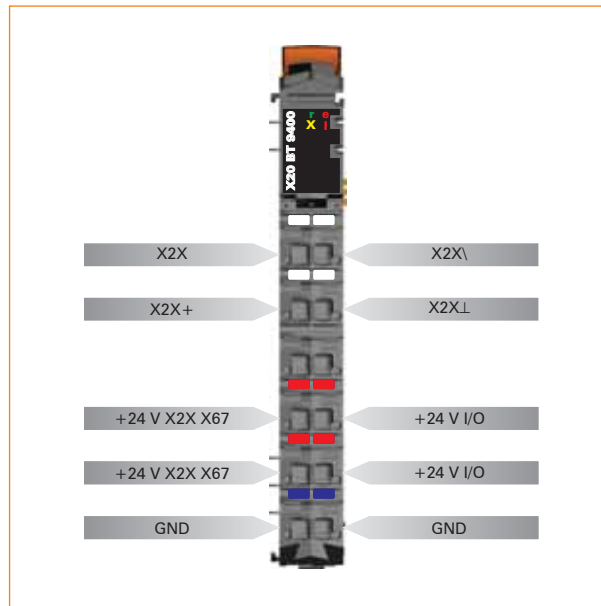
- X2X Link bus transmitter
- For seamless expansion of the systems
- Up to 100 m segment lengths
- Feed for internal I/O power supply
- Integrated X2X Link supply for the X67 System

Note:

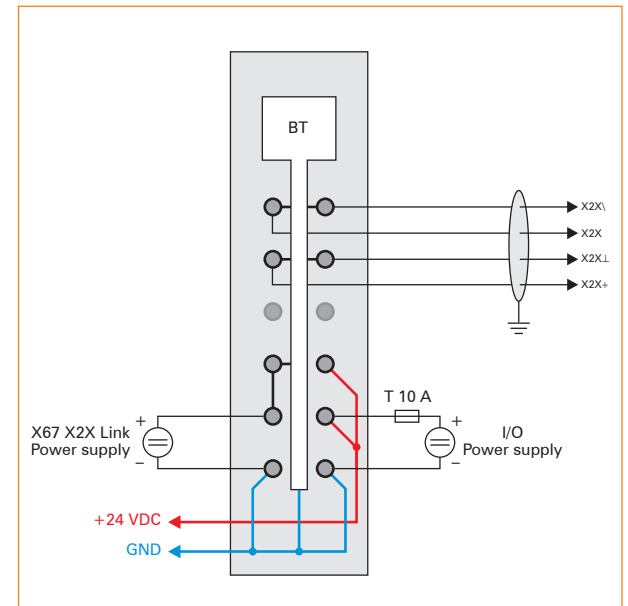
If the feed is being used for internal I/O supply, this potential group cannot be supplied by any other module. An I/O module with bus module BM01 should be used to separate the potential group (see section "Supply feed via bus transmitter", on page 404).

Short description	X20BT9400
Bus transmitters	X2X Link bus transmitter with supply for I/O and integrated X67 System supply
X67 X2X Link supply input	X20BT9400
Input voltage	24 VDC (-15% / +20%)
Input current	Max. 0.5 A
Reverse polarity protection	Yes
Fuse	Integrated, cannot be exchanged
X67 X2X Link supply output	X20BT9400
Number of X67 modules	
Horizontal installation	Max. 8
Vertical installation	Max. 6
Parallel connection with X67PS1300	Yes ¹⁾
1) Only the PS1300 can be used for calculating the total number of X67 modules.	
Input I/O supply	X20BT9400
Input voltage	24 VDC (-15% / +20%)
Fuse	Recommended pre-fusing max. 10 A slow-blow
Output I/O supply	X20BT9400
Rated output voltage	24 VDC
Permitted contact load	10.0 A
General information	X20BT9400
Status indicators	X2X bus function, operating status, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
X2X bus function	Yes, with status LED
Power consumption ¹⁾	
Bus	0.5 W
I/O internal	
as bus transmitter	0.1 W
additionally as supply module	0.6 W
X67 X2X Link (internal)	1.38 W
Certification	CE, C-UL-US (in development), GOST-R
1) The specified values are maximum values. The exact calculation is available for download as a data sheet with the other module documentation on the B&R homepage.	
Operational conditions	X20BT9400
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20BT9400
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20BT9400
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Optional accessories

X67CA0X99.1000	Cable for custom prefabrication, 100.0 m
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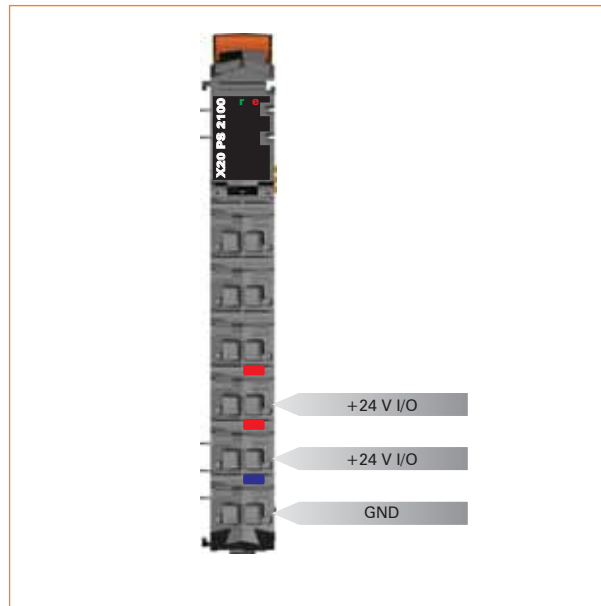
Supply module PS2100



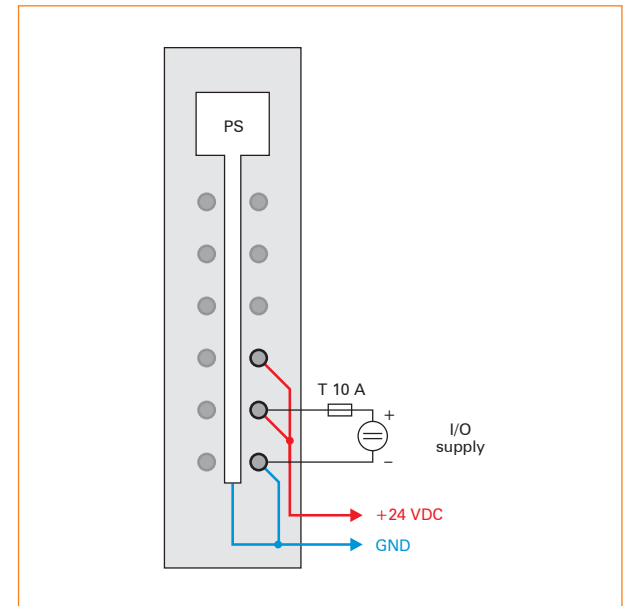
- 24 VDC supply module for internal I/O supply

Short description	X20PS2100
Power supply module	24 VDC supply module for internal I/O supply
Input I/O supply	X20PS2100
Input voltage	24 VDC (-15% / +20%)
Fuse	Recommended pre-fusing max. 10 A slow-blow
Output I/O supply	X20PS2100
Rated output voltage	24 VDC
Permitted contact load	10.0 A
General information	X20PS2100
Status indicators	Operating status, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Electrical isolation	
I/O supply	No
Power consumption ¹⁾	
Bus	0.2 W
I/O internal	0.6 W
Certification	CE, C-UL-US, GOST-R, BG-PRÜFZERT ²⁾
1) The specified values are maximum values. The exact calculation is available for download as a data sheet with the other module documentation on the B&R homepage.	
2) Operating principle checked: Shutdown initiated by external safety switching device	
Operational conditions	X20PS2100
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20PS2100
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20PS2100
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order supply bus module 1x X20BM01 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM01	X20 supply bus module, internal I/O supply is isolated to the left	86

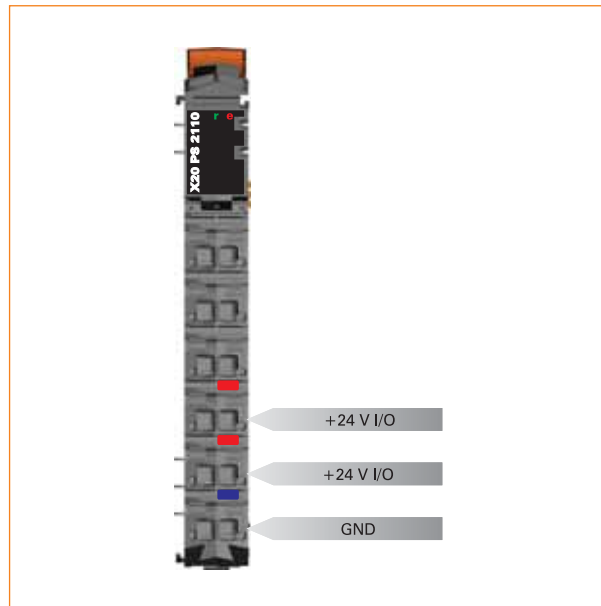
Supply module PS2110



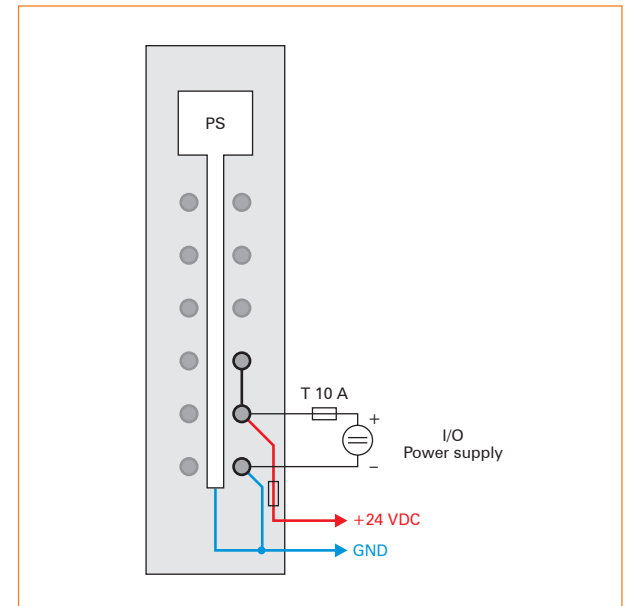
- 24 VDC supply module for internal I/O supply
- Fuse for I/O supply integrated in module

Short description	X20PS2110
Power supply module	24 VDC supply module for internal I/O supply
Input I/O supply	X20PS2110
Input voltage	24 VDC (-15% / +20%)
Fuse	Integrated T 6.3 A, exchangeable
Output I/O supply	X20PS2110
Rated output voltage	24 VDC
Permitted contact load	10.0 A
General information	X20PS2110
Status indicators	Operating status, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Electrical isolation	
I/O supply	No
Power consumption ¹⁾	
Bus	0.2 W
I/O internal	0.82 W
Certification	CE, C-UL-US, GOST-R, BG-PRÜFZERT ²⁾
<p>1) The specified values are maximum values. The exact calculation is available for download as a data sheet with the other module documentation on the B&R homepage.</p> <p>2) Operating principle checked: Shutdown initiated by external safety switching device</p>	
Operational conditions	X20PS2110
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20PS2110
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20PS2110
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order supply bus module 1x X20BM01 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM01	X20 supply bus module, internal I/O supply is isolated to the left	86

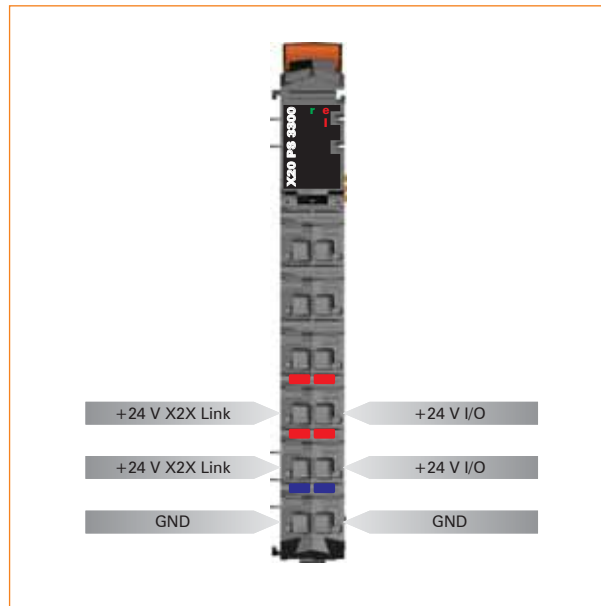
Supply module PS3300



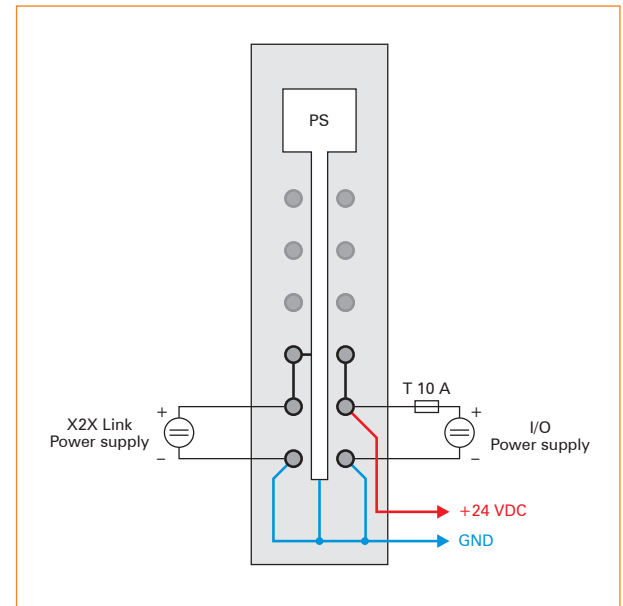
- Supply for X2X Link and internal I/O supply
- Electrical isolation of feed and X2X Link supply
- Redundancy of X2X Link supply possible by operating multiple supply modules at the same time

Short description	X20PS3300
Power supply module	24 VDC supply module for I/O and bus
X2X Link supply input	X20PS3300
Input voltage	24 VDC (-15% / +20%)
Input current	Max. 0.7 A
Reverse polarity protection	Yes
Fuse	Integrated, cannot be exchanged
X2X Link supply output	X20PS3300
Rated output power	7.0 W
Parallel operation	Yes ¹⁾
Redundant operation	Yes
<small>1) In parallel operation, only 75% of the rated power can be assumed. Please ensure that all parallel operating power supplies are switched on and off simultaneously.</small>	
Input I/O supply	X20PS3300
Input voltage	24 VDC (-15% / +20%)
Fuse	Recommended pre-fusing max. 10 A slow-blow
Output I/O supply	X20PS3300
Rated output voltage	24 VDC
Permitted contact load	10.0 A
General information	X20PS3300
Status indicators	Overload, operating status, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Overload	Yes, with status LED and software status
Electrical isolation	
X2X Link supply	Yes
I/O supply	No
Power consumption ¹⁾	
Bus	1.31 W
I/O internal	0.6 W
Certification	CE, C-UL-US, GOST-R
<small>1) The specified values are maximum values. The exact calculation is available for download as a data sheet with the other module documentation on the B&R homepage.</small>	
Operational conditions	X20PS3300
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20PS3300
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20PS3300
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order supply bus module 1x X20BM01 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM01	X20 supply bus module, internal I/O supply is isolated to the left	86

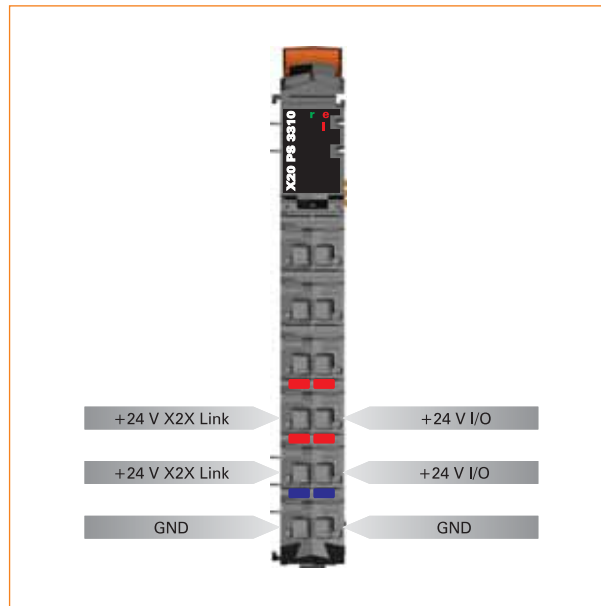
Supply module PS3310



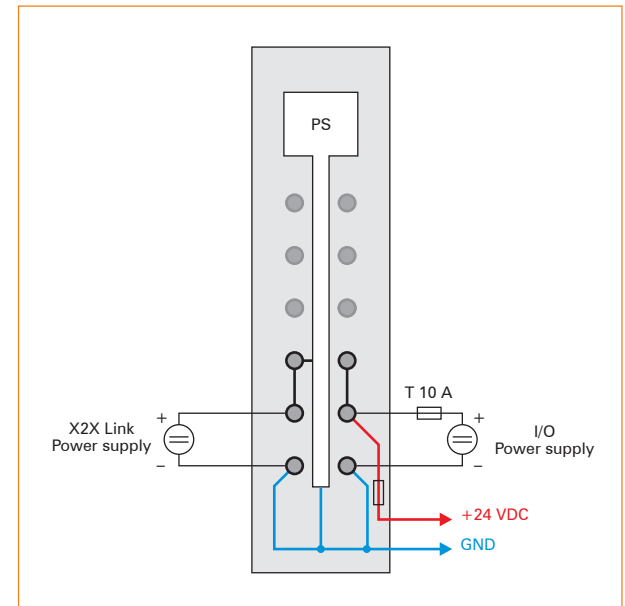
- Supply for X2X Link and internal I/O supply
- Electrical isolation of feed and X2X Link supply
- Redundancy of X2X Link supply possible by operating multiple supply modules at the same time
- Fuse for I/O supply integrated in module

Short description	X20PS3310
Power supply module	24 VDC supply module for I/O and bus
Input X2X bus supply	X20PS3310
Input voltage	24 VDC (-15% / +20%)
Input current	Max. 0.7 A
Reverse polarity protection	Yes
Fuse	Integrated, cannot be exchanged
Output X2X bus supply	X20PS3310
Rated output power	7.0 W
Parallel operation	Yes ¹⁾
Redundant operation	Yes
1) In parallel operation, only 75% of the rated power can be assumed. Please ensure that all parallel operating power supplies are switched on and off simultaneously.	
Input I/O supply	X20PS3310
Input voltage	24 VDC (-15% / +20%)
Fuse	Integrated T 6.3 A, exchangeable
Output I/O supply	X20PS3310
Rated output voltage	24 VDC
Permitted contact load	10.0 A
General information	X20PS3310
Status indicators	Overload, operating status, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Overload	Yes, with status LED and software status
Electrical isolation	
X2X bus supply	Yes
I/O supply	No
Power consumption ¹⁾	
Bus	1.31 W
I/O internal	0.82 W
Certification	CE, C-UL-US, GOST-R
1) The specified values are maximum values. The exact calculation is available for download as a data sheet with the other module documentation on the B&R homepage.	
Operational conditions	X20PS3310
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20PS3310
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20PS3310
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order supply bus module 1x X20BM01 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM01	X20 supply bus module, internal I/O supply is isolated to the left	86

Digital input module DI2371

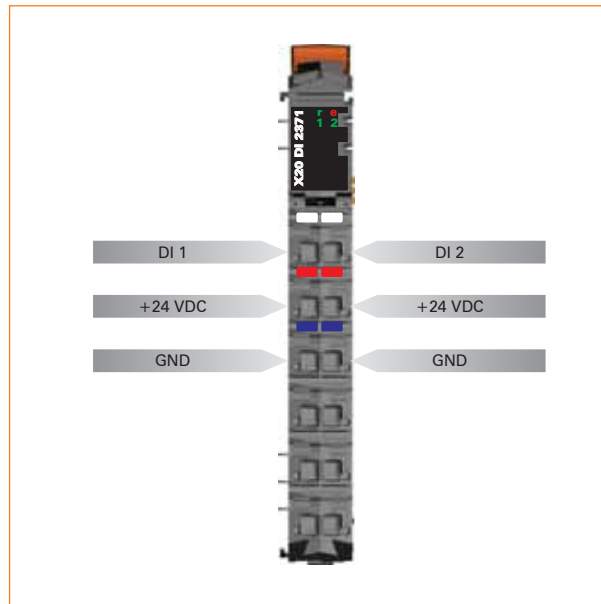


- 2 digital inputs
- Sink connection
- 3-wire connection
- 24 VDC and GND for sensor supply
- Software input filter can be configured for the entire module

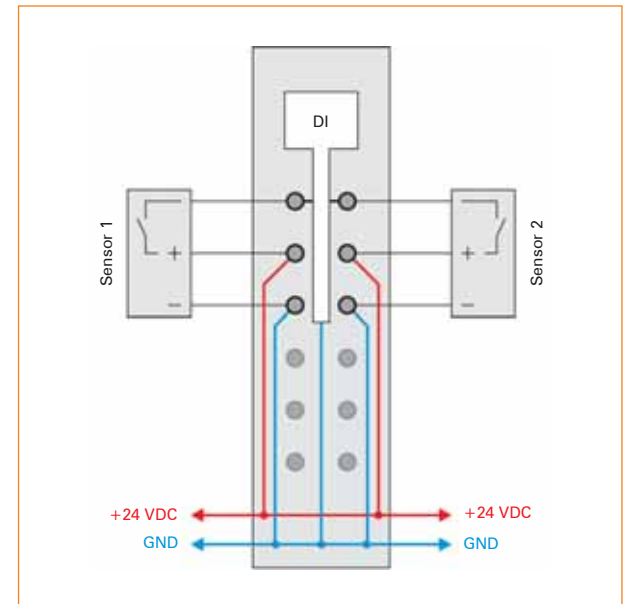
Short description	X20DI2371
I/O module	Two 24 VDC digital inputs for 3-line connections
Digital inputs	X20DI2371
Rated voltage	24 VDC
Input filter	
Hardware	≤ 100 μs
Software	Default 1 ms, can be configured between 0 and 25 ms in 0.2 ms intervals
Connection type	3-line connections
Input circuit	Sink
Sensor supply	0.5 A total current
General information	X20DI2371
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.12 W
I/O internal	0.29 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20DI2371
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DI2371
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DI2371
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB06 or X20TB12 separately Order bus module 1x X20BM11 separately

The module is designed for X20 6-pin terminal blocks. However, the 12-pin terminal block can also be used.

Pin assignments



Connection example



Required accessories

X20TB06	X20 terminal block, 6-pin, 24 V coded	94
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Digital input module DI2372

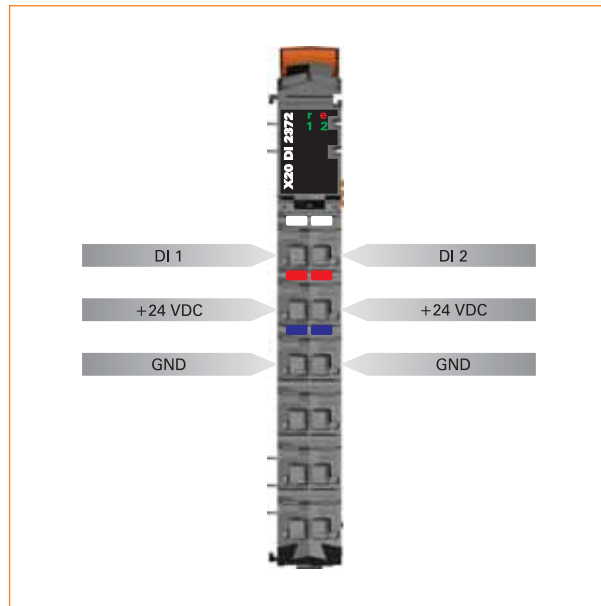


- 2 digital inputs
- source connection
- 3-wire connection
- 24 VDC and GND for sensor supply
- Software input filter can be configured for the entire module

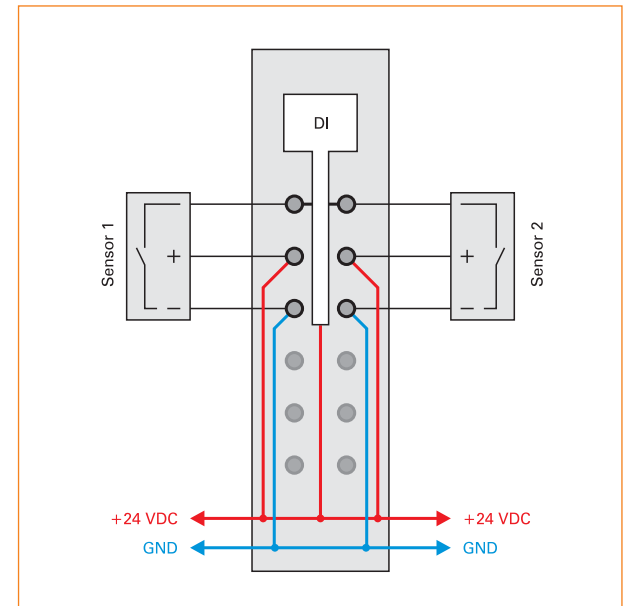
Short description	X20DI2372
I/O module	Two 24 VDC digital inputs for 3-line connections
Digital inputs	X20DI2372
Rated voltage	24 VDC
Input filter	
Hardware	≤ 100 μs
Software	Default 1 ms, can be configured between 0 and 25 ms in 0.2 ms intervals
Connection type	3-line connections
Input circuit	Source
Sensor supply	0.5 A total current
General information	X20DI2372
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.12 W
I/O internal	0.29 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20DI2372
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DI2372
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DI2372
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB06 or X20TB12 separately Order bus module 1x X20BM11 separately

The module is designed for X20 6-pin terminal blocks. However, the 12-pin terminal block can also be used.

Pin assignments



Connection example



Required accessories

X20TB06	X20 terminal block, 6-pin, 24 V coded	94
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Digital input module DI2377

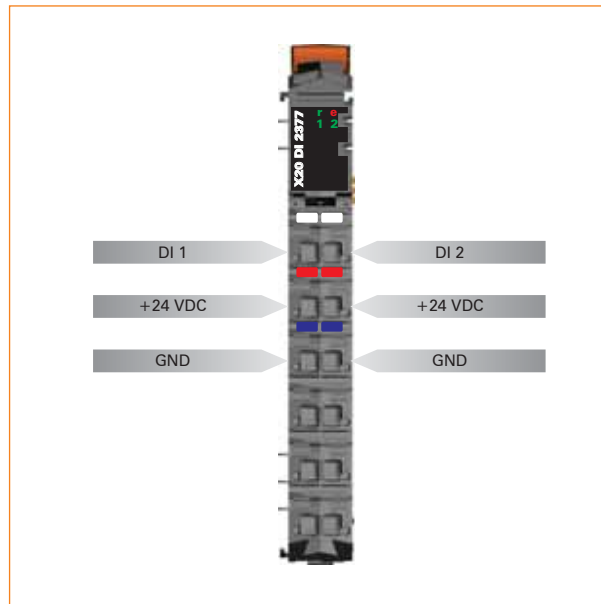


- 2 digital inputs
- Sink connection
- 3-wire connection
- 2 counter inputs with 50 kHz counter frequency
- Gate measurement
- 24 VDC and GND for sensor supply
- Software input filter can be configured for the entire module

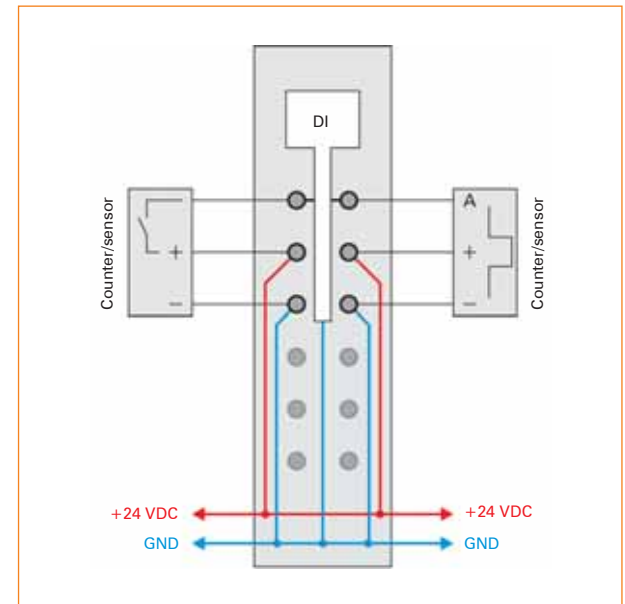
Short description	X20DI2377
I/O module	Two 24 VDC digital inputs for 3-line connections, special functions
Digital inputs	X20DI2377
Rated voltage	24 VDC
Input filter	
Hardware	≤10 μs
Software	Default 0 ms, can be configured between 0 and 25 ms in 0.2 ms intervals
Connection type	3-line connections
Input circuit	Sink
Additional functions for inputs	50 kHz event counting, gate measurement
Sensor supply	0.5 A total current
General information	X20DI2377
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.15 W
I/O internal	0.82 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20DI2377
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DI2377
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DI2377
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB06 or X20TB12 separately Order bus module 1x X20BM11 separately

The module is designed for X20 6-pin terminal blocks. However, the 12-pin terminal block can also be used.

Pin assignments



Connection example



Required accessories

X20TB06	X20 terminal block, 6-pin, 24 V coded	94
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

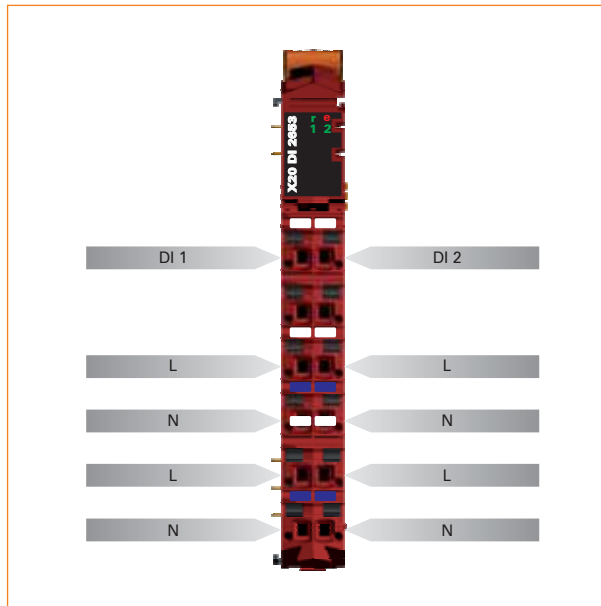
Digital input module DI2653



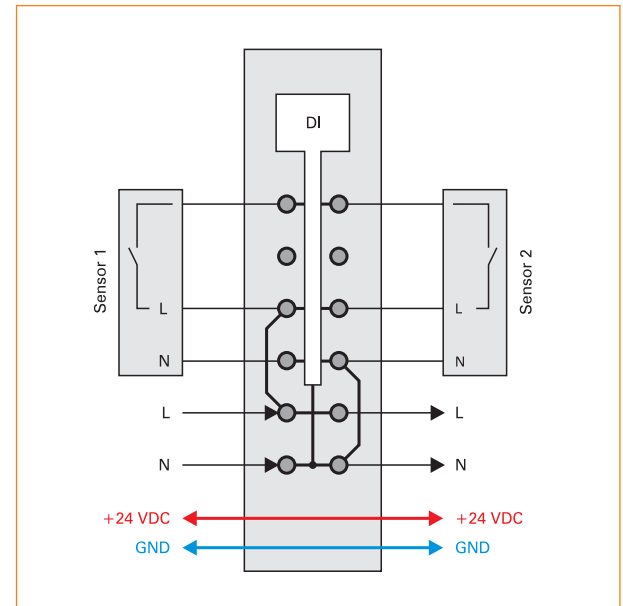
- 2 digital inputs
- 120/240 VAC inputs
- 50 Hz or 60 Hz
- 3-wire connection
- Special color
- 240 V coded

Short description	X20DI2653
I/O module	2 digital inputs for 100 - 240 VAC, 3-line connections
Digital inputs	X20DI2653
Rated voltage	100 - 240 VAC
Rated frequency	47 - 63 Hz
Input filter	
Hardware	
0 → 1	≤40 ms
1 → 0	≤30 ms
Software	Default 1 ms. Can be configured between 0 and 25 ms in 0.2 ms intervals
Connection type	3-line connections
General information	X20DI2653
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
I/O external supply	Yes, with software status (typical threshold 85 VAC)
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.14 W
I/O internal	–
I/O external	0.55 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20DI2653
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DI2653
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DI2653
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB32 separately Order bus module 1x X20BM12 separately

Pin assignments



Connection example



Required accessories

X20TB32	X20 terminal block, 12-pin, 240 V coded	95
X20BM12	X20 bus module, 240 V coded, internal I/O supply is interconnected	89

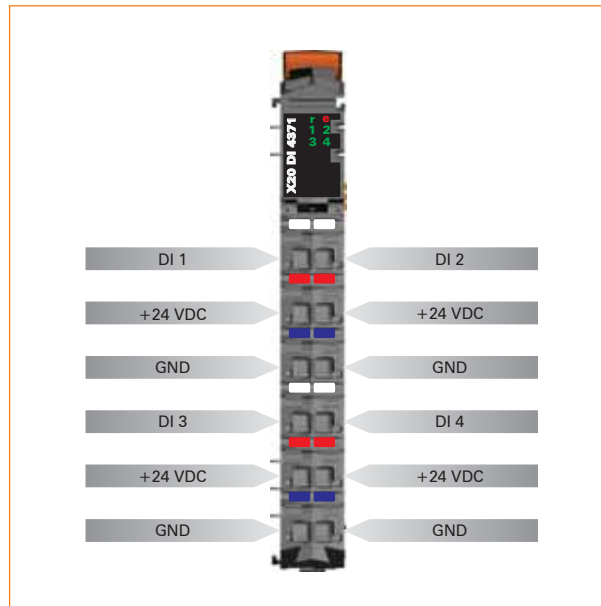
Digital input module DI4371



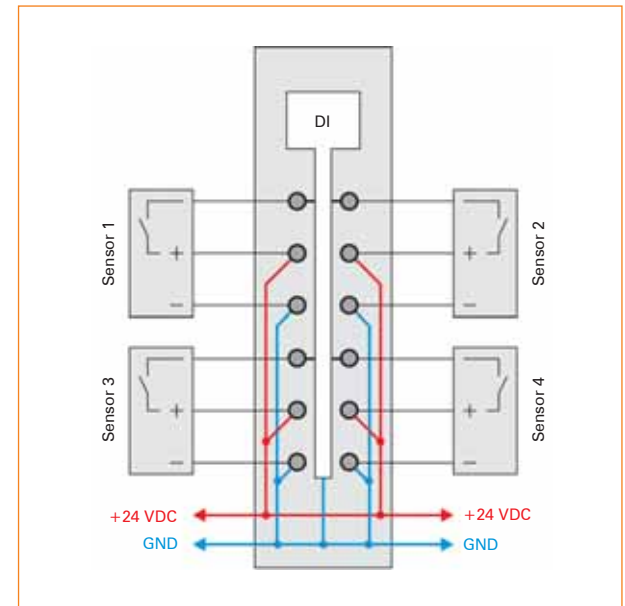
- 4 digital inputs
- Sink connection
- 3-wire connection
- 24 VDC and GND for sensor supply
- Software input filter can be configured for the entire module

Short description	X20DI4371
I/O module	Four 24 VDC digital inputs for 3-line connections
Digital inputs	X20DI4371
Rated voltage	24 VDC
Input filter	
Hardware	≤100 μs
Software	Default 1 ms, can be configured between 0 and 25 ms in 0.2 ms intervals
Connection type	3-line connections
Input circuit	Sink
Sensor supply	0.5 A total current
General information	X20DI4371
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.14 W
I/O internal	0.59 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20DI4371
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DI4371
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DI4371
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

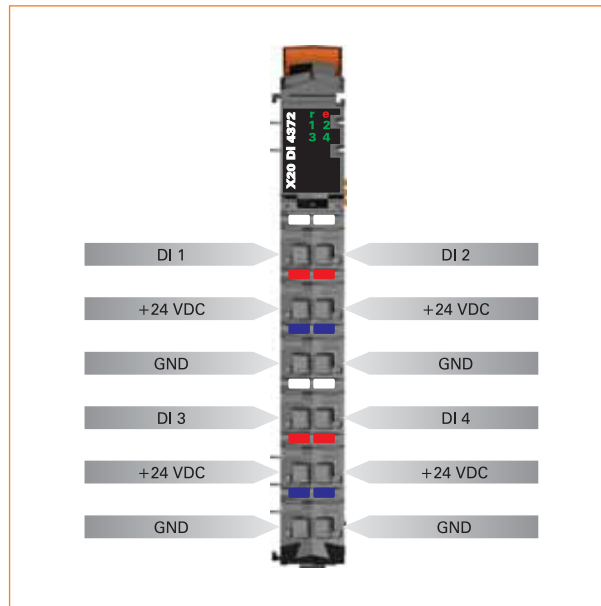
Digital input module DI4372



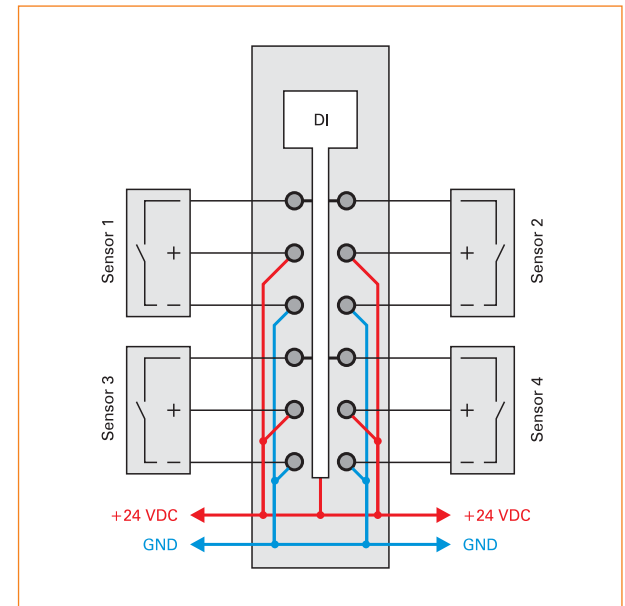
- 4 digital inputs
- source connection
- 3-wire connection
- 24 VDC and GND for sensor supply
- Software input filter can be configured for the entire module

Short description	X20DI4372
I/O module	Four 24 VDC digital inputs for 3-line connections
Digital inputs	X20DI4372
Rated voltage	24 VDC
Input filter	
Hardware	≤100 μs
Software	Default 1 ms, can be configured between 0 and 25 ms in 0.2 ms intervals
Connection type	3-line connections
Input circuit	Source
Sensor supply	0.5 A total current
General information	X20DI4372
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.14 W
I/O internal	0.59 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20DI4372
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DI4372
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DI4372
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

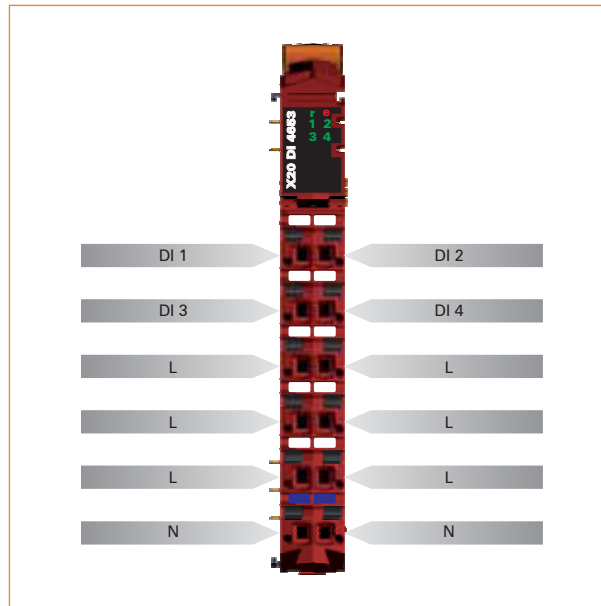
Digital input module DI4653



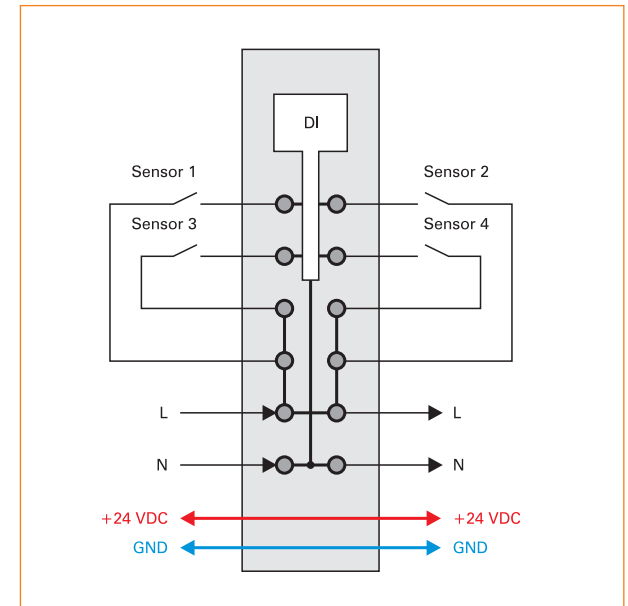
- 4 digital inputs
- 120/240 VAC inputs
- 50 Hz or 60 Hz
- 2-wire connection
- Special color
- 240 V coded

Short description	X20DI4653
I/O module	4 digital inputs for 100 - 240 VAC, 2-line connections
Digital inputs	X20DI4653
Rated voltage	100 - 240 VAC
Rated frequency	47 - 63 Hz
Input filter	
Hardware	
0 → 1	≤40 ms
1 → 0	≤30 ms
Software	Default 1 ms, can be configured between 0 and 25 ms in 0.2 ms intervals
Connection type	2-line connections
General information	X20DI4653
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
I/O external supply	Yes, with software status (typical threshold 85 VAC)
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.17 W
I/O internal	–
I/O external	0.91 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20DI4653
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DI4653
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DI4653
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB32 separately Order bus module 1x X20BM12 separately

Pin assignments



Connection example



Required accessories

X20TB32	X20 terminal block, 12-pin, 240 V coded	95
X20BM12	X20 bus module, 240 V coded, internal I/O supply is interconnected	89

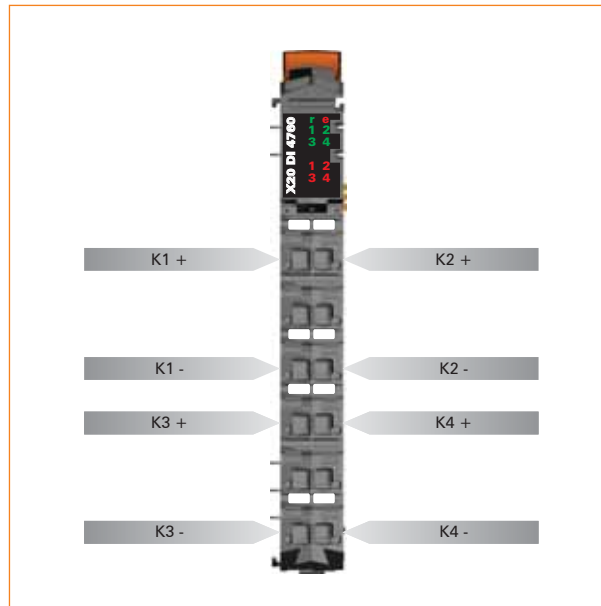
Digital input module DI4760



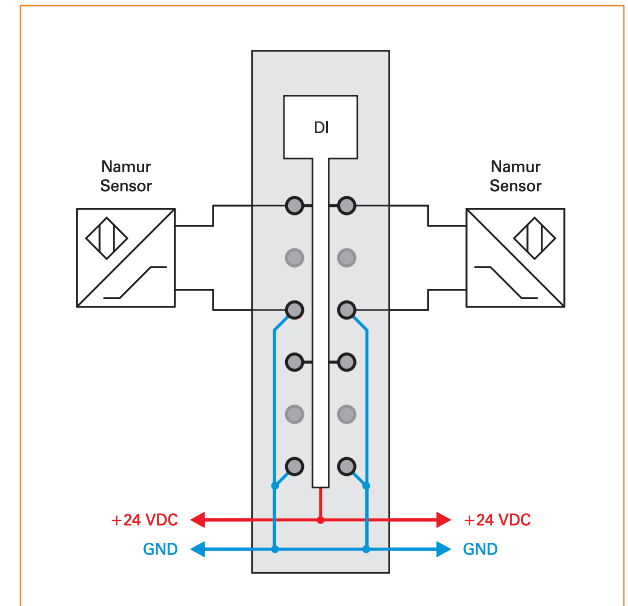
- 4 digital inputs
- Input module for NAMUR encoders
- Open connection and short-circuit detection
- Every input can be used as a counter input

Short description	X20DI4760
I/O module	4 NAMUR inputs, special function
NAMUR inputs	X20DI4760
No load voltage	8.05 V ± 0.33%
Input delay	
1 input active	≤310 μs
2 inputs active	≤450 μs
3 inputs active	≤570 μs
4 inputs active	≤735 μs
Input circuit	For NAMUR encoders according to EN 60947-5-6
Event counter	X20DI4760
Amount	4
Counter size	8-bit
Input frequency	
1 input active	Max. 1600 Hz
2 inputs active	Max. 1100 Hz
3 inputs active	Max. 870 Hz
4 inputs active	Max. 680 Hz
Evaluation	Every positive edge, cyclic counter
Signal form	Symmetric square wave pulse or corresponding minimum pulse duration ¹⁾
1) Minimum pulse duration:	$t[s] \geq \frac{1}{2 \cdot f_{\max}[\text{Hz}]}$
General information	X20DI4760
Status indicators	I/O function by channel, open line and short circuit detection by channel, operating status, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Open line	Yes, with status LED and software status
Short circuit	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.01 W
I/O internal	1.5 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20DI4760
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	Values derated when mounted vertically
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DI4760
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DI4760
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Digital input module DI6371

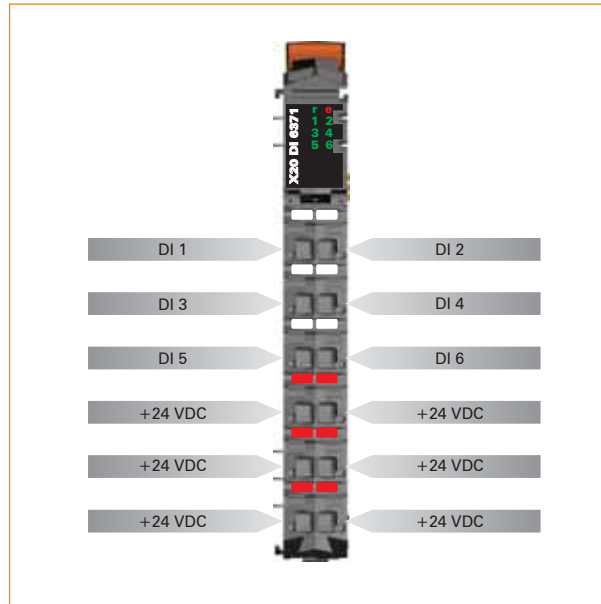


- 6 digital inputs
- Sink connection
- 2-wire connection
- 24 VDC for sensor supply
- Software input filter can be configured for the entire module
- 1-line connection with 6-pin terminal block

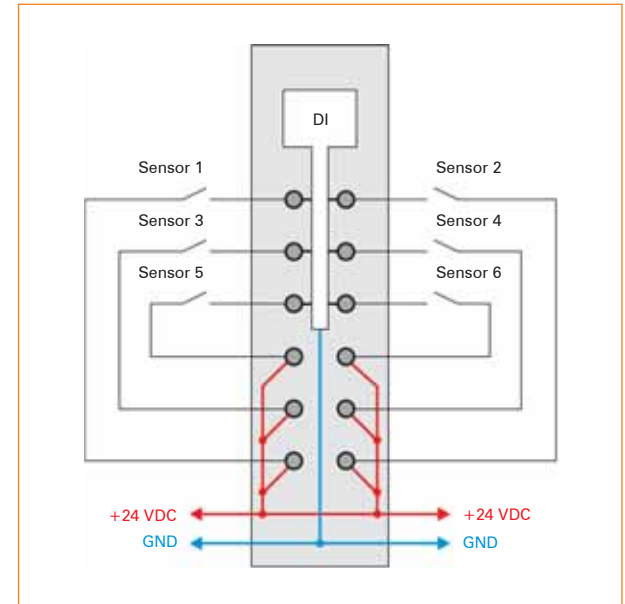
Short description	X20DI6371
I/O module	Six 24 VDC digital inputs for 1 or 2-wire connections
Digital inputs	X20DI6371
Rated voltage	24 VDC
Input filter	
Hardware	≤100 μs
Software	Default 1 ms, can be configured between 0 and 25 ms in 0.2 ms intervals
Connection type	1 or 2 line connection
Input circuit	Sink
General information	X20DI6371
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.15 W
I/O internal	0.88 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20DI6371
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DI6371
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DI6371
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB06 or X20TB12 separately Order bus module 1x X20BM11 separately

*The X20 6-pin terminal block can be used for universal 1-line wiring.
Two-line wiring can be implemented using the 12-pin terminal block.*

Pin assignments



Connection example



Required accessories

X20TB06	X20 terminal block, 6-pin, 24 V coded	94
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Digital input module DI6372

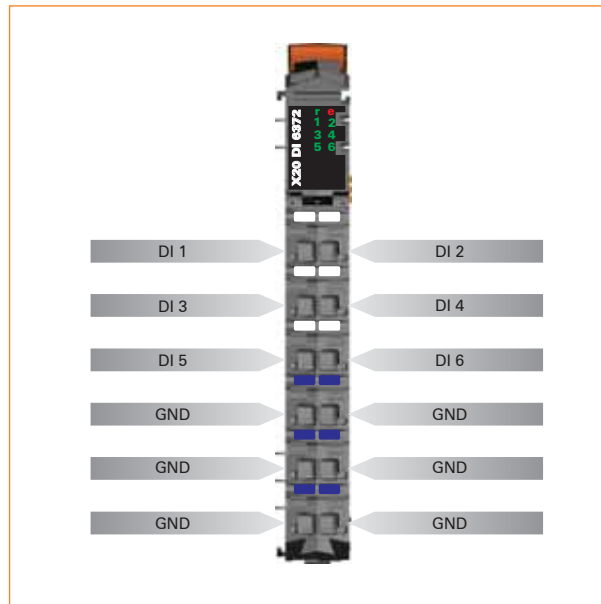


- 6 digital inputs
- source connection
- 2-wire connection
- 24 VDC for sensor supply
- Software input filter can be configured for the entire module
- 1-line connection with 6-pin terminal block

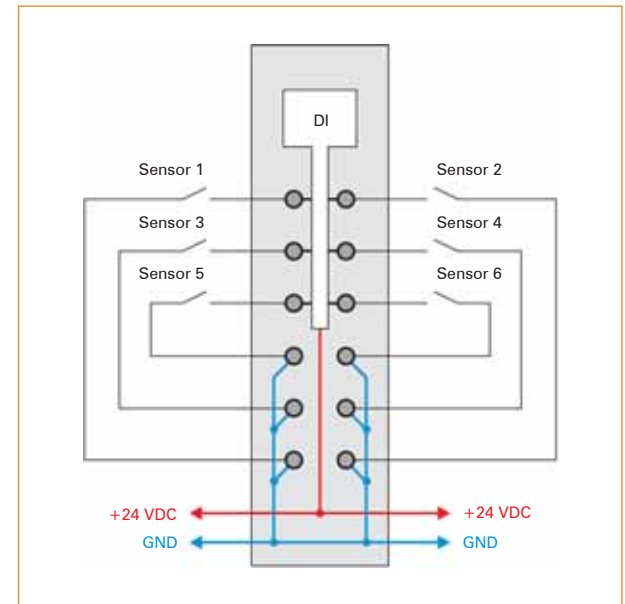
Short description	X20DI6372
I/O module	Six 24 VDC digital inputs for 1 or 2-wire connections
Digital inputs	X20DI6372
Rated voltage	24 VDC
Input filter	
Hardware	≤100 μs
Software	Default 1 ms, can be configured between 0 and 25 ms in 0.2 ms intervals
Connection type	1 or 2 line connection
Input circuit	Source
General information	X20DI6372
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.15 W
I/O internal	0.88 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20DI6372
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DI6372
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DI6372
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB06 or X20TB12 separately Order bus module 1x X20BM11 separately

*The X20 6-pin terminal block can be used for universal 1-line wiring.
Two-line wiring can be implemented using the 12-pin terminal block.*

Pin assignments



Connection example



Required accessories

X20TB06	X20 terminal block, 6-pin, 24 V coded	94
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

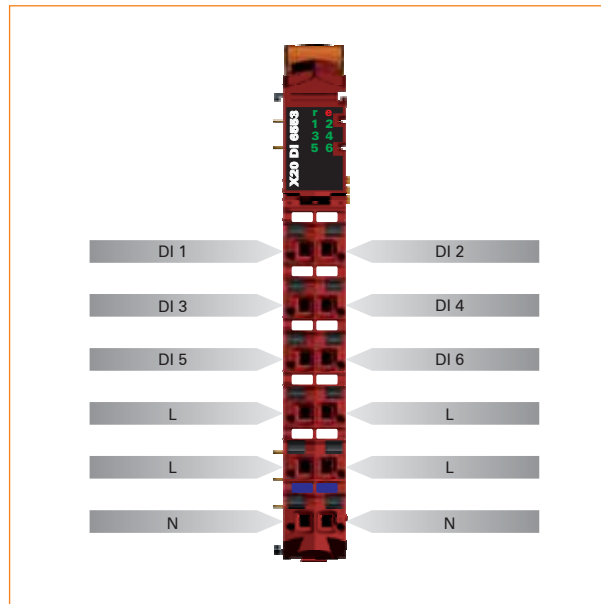
Digital input module DI6553



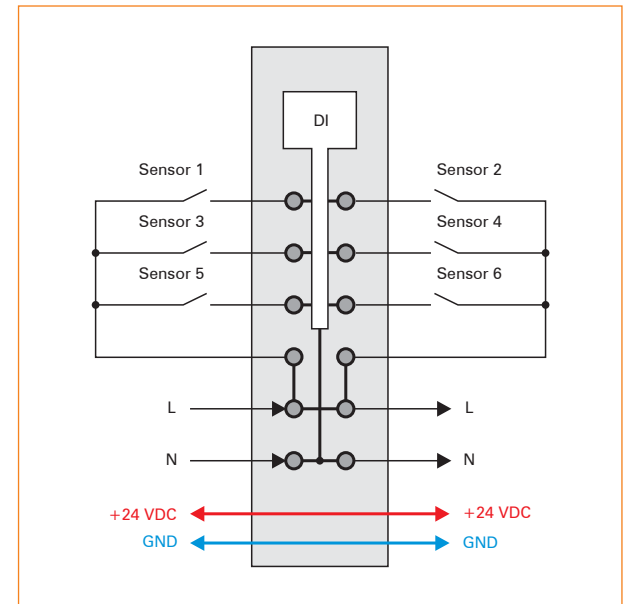
- 6 digital inputs
- 120 VAC inputs
- 50 Hz or 60 Hz
- 1-wire connection
- Special color
- 240 V coded

Short description	X20DI6553
I/O module	6 digital inputs for 100 - 120 VAC, 1-line connections
Digital inputs	X20DI6553
Rated voltage	100 - 120 VAC
Rated frequency	47 - 63 Hz
Input filter	
Hardware	
0 → 1	≤15 ms
1 → 0	≤30 ms
Software	Default 1 ms, can be configured between 0 and 25 ms in 0.2 ms intervals
Connection type	1-line connections
General information	X20DI6553
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
I/O external supply	Yes, with software status (typical threshold 85 VAC)
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.21 W
I/O internal	-
I/O external	0.68 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20DI6553
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DI6553
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DI6553
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB32 separately Order bus module 1x X20BM12 separately

Pin assignments



Connection example



Required accessories

X20TB32	X20 terminal block, 12-pin, 240 V coded	95
X20BM12	X20 bus module, 240 V coded, internal I/O supply is interconnected	89

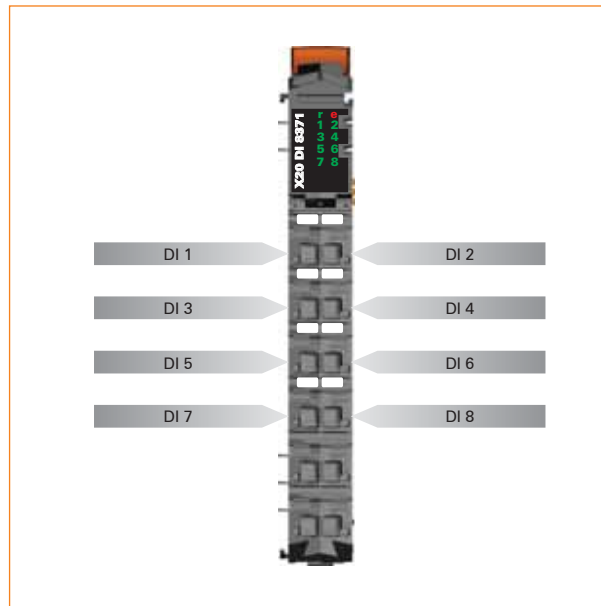
Digital input module DI8371



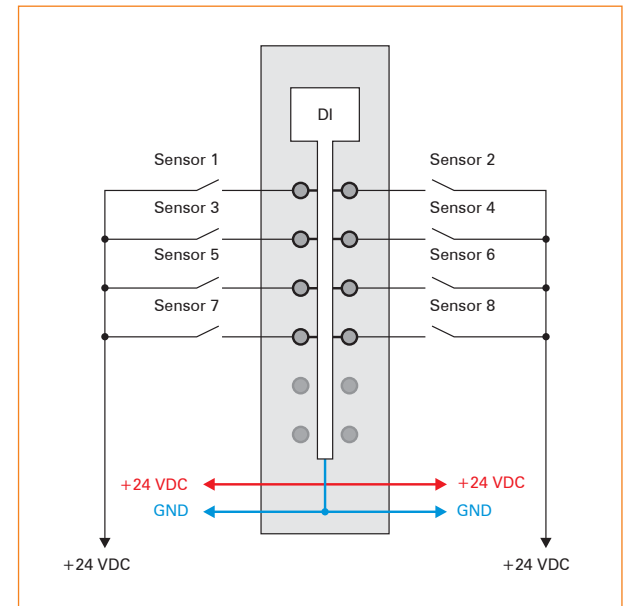
- 8 digital inputs
- Sink connection
- 1-wire connection
- Software input filter can be configured for the entire module

Short description	X20DI8371
I/O module	Eight 24 VDC digital inputs for 1-line connections
Digital inputs	X20DI8371
Rated voltage	24 VDC
Input filter	
Hardware	≤ 100 μs
Software	Default 1 ms, can be configured between 0 and 25 ms in 0.2 ms intervals
Connection type	1-line connections
Input circuit	Sink
General information	X20DI8371
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.18 W
I/O internal	-
I/O external	1.2 W
Certification	CE, C-UL-US (in development), GOST-R
Operational conditions	X20DI8371
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DI8371
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DI8371
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

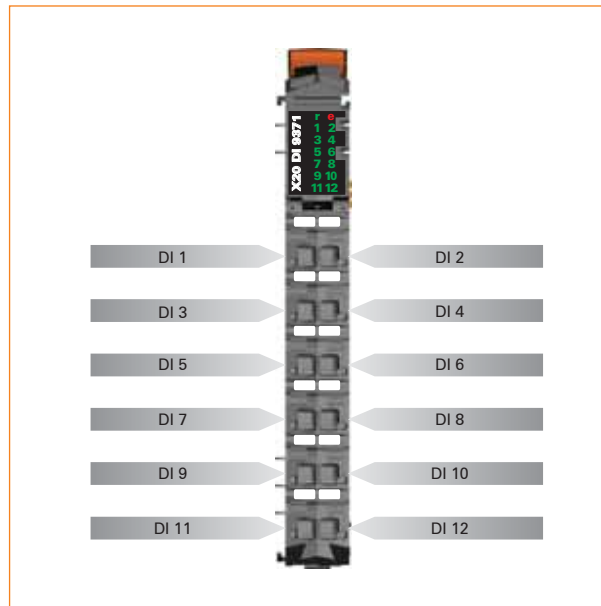
Digital input module DI9371



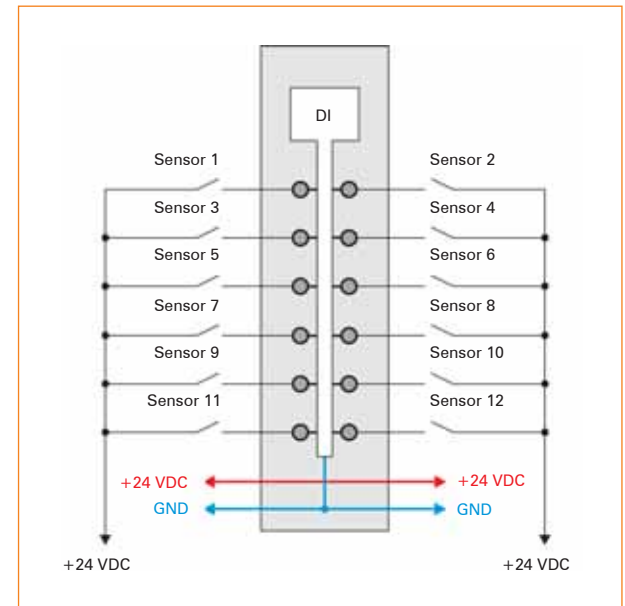
- 12 digital inputs
- Sink connection
- 1-wire connection
- Software input filter can be configured for the entire module

Short description	X20DI9371
I/O module	Twelve 24 VDC digital inputs for 1-wire connections
Digital inputs	X20DI9371
Rated voltage	24 VDC
Input filter	
Hardware	≤100 μs
Software	Default 1 ms, can be configured between 0 and 25 ms in 0.2 ms intervals
Connection type	1-line connections
Input circuit	Sink
Simultaneousness	
With 24 V I/O supply	100%
With 28.8 V I/O supply	75%
General information	X20DI9371
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.18 W
I/O internal	–
I/O external	1.75 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20DI9371
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DI9371
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DI9371
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

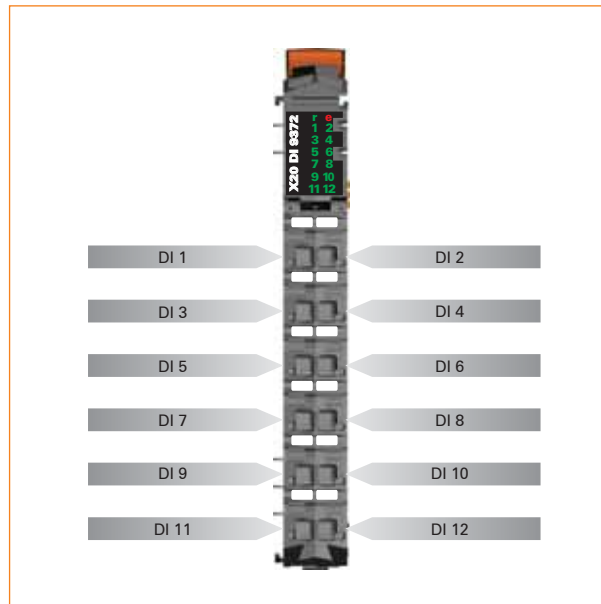
Digital input module DI9372



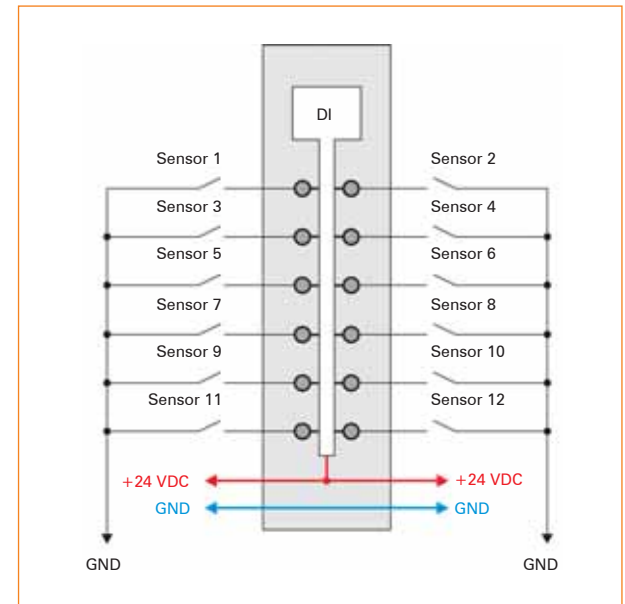
- 12 digital inputs
- source connection
- 1-wire connection
- Software input filter can be configured for the entire module

Short description	X20DI9372
I/O module	Twelve 24 VDC digital inputs for 1-wire connections
Digital inputs	X20DI9372
Rated voltage	24 VDC
Input filter	
Hardware	≤100 μs
Software	Default 1 ms, can be configured between 0 and 25 ms in 0.2 ms intervals
Connection type	1-line connections
Input circuit	Source
Simultaneousness	
With 24 V I/O supply	100%
With 28.8 V I/O supply	75%
General information	X20DI9372
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.18 W
I/O internal	1.75 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20DI9372
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DI9372
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DI9372
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Digital output module DO2321

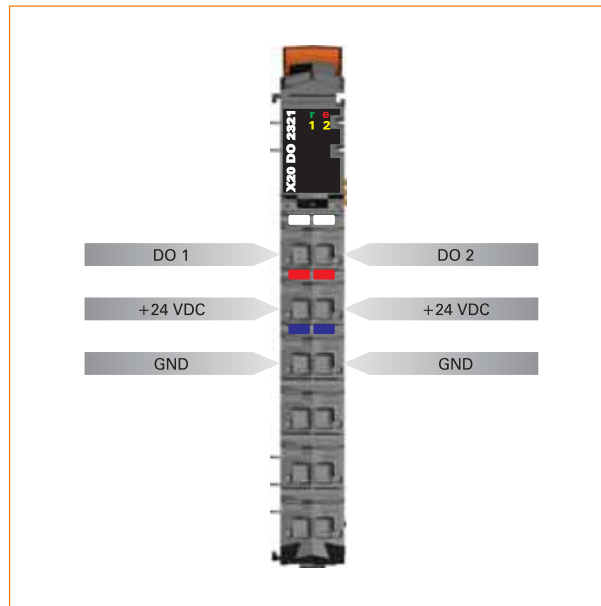


- 2 digital outputs
- Sink connection
- 3-wire connection
- 24 VDC and GND for actuator supply
- Integrated output protection

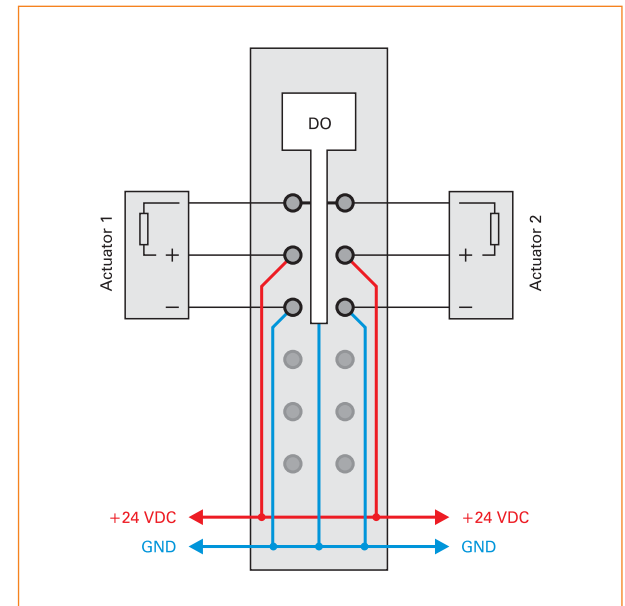
Short description	X20DO2321
I/O module	Two 24 VDC digital outputs for 3-line connections
Digital outputs	X20DO2321
Rated voltage	24 VDC
Rated output current	0.5 A
Total current	1.0 A
Connection type	3-line connections
Output circuit	Sink
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances
Actuator supply	0.5 A in total for output-independent actuator supply
General information	X20DO2321
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Outputs	Yes, with status LED and software status (output error status)
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.13 W
I/O internal	0.3 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20DO2321
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DO2321
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DO2321
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB06 or X20TB12 separately Order bus module 1x X20BM11 separately

The module is designed for X20 6-pin terminal blocks. However, the 12-pin terminal block can also be used.

Pin assignments



Connection example



Required accessories

X20TB06	X20 terminal block, 6-pin, 24 V coded	94
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Digital output module DO2322

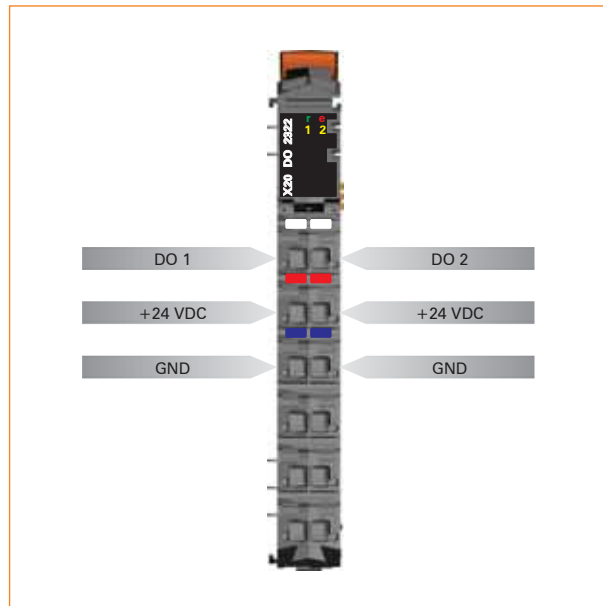


- 2 digital outputs
- source connection
- 3-wire connection
- 24 VDC and GND for actuator supply
- Integrated output protection

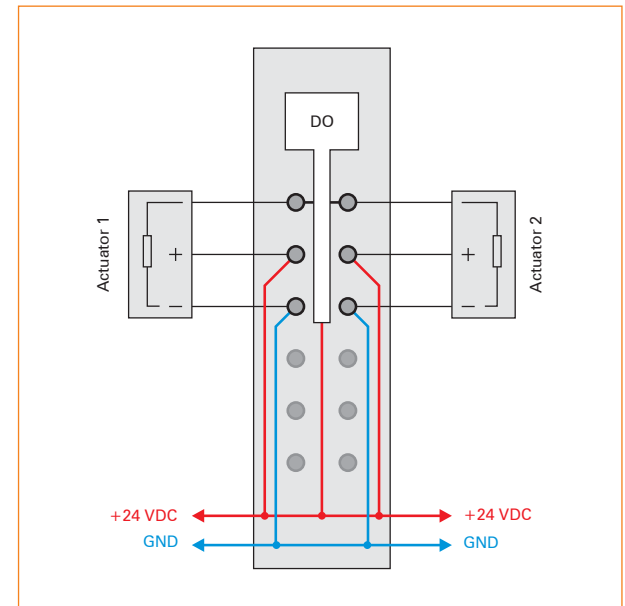
Short description	X20DO2322
I/O module	Two 24 VDC digital outputs for 3-line connections
Digital outputs	X20DO2322
Rated voltage	24 VDC
Rated output current	0.5 A
Total current	1.0 A
Connection type	3-line connections
Output circuit	Source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances
Actuator supply	0.5 A in total for output-independent actuator supply
General information	X20DO2322
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Outputs	Yes, with status LED and software status (output error status)
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.13 W
I/O internal	0.33 W
Certification	CE, C-UL-US, GOST-R, BG-PRÜFZERT ¹⁾
1) Operating principle checked: Shutdown initiated by external safety switching device	
Operational conditions	X20DO2322
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DO2322
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DO2322
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB06 or X20TB12 separately Order bus module 1x X20BM11 separately

The module is designed for X20 6-pin terminal blocks. However, the 12-pin terminal block can also be used.

Pin assignments



Connection example



Required accessories

X20TB06	X20 terminal block, 6-pin, 24 V coded	94
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

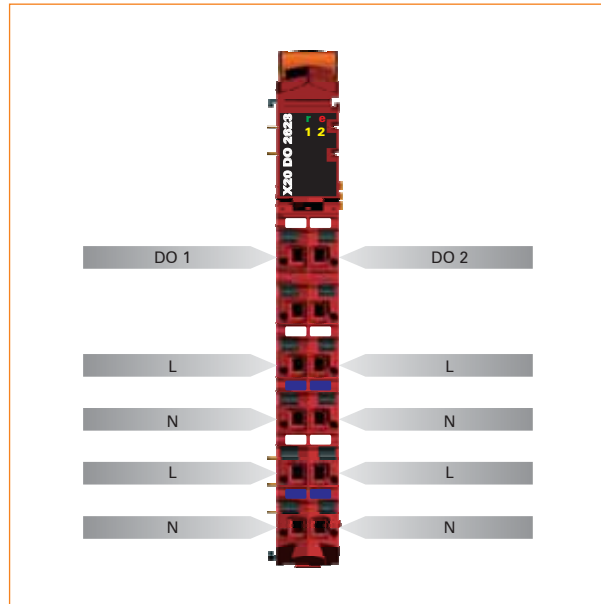
Digital output module DO2623



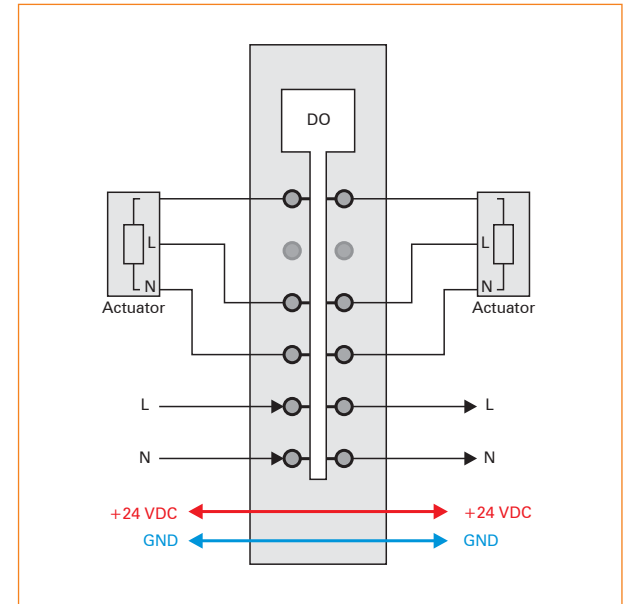
- 2 digital outputs
- Outputs with integrated snubber circuit
- Outputs with 100 - 240 VAC
- L switching
- 50 Hz or 60 Hz
- 3-wire connection
- Integrated full-wave control
- Special color
- 240 V coding

Short description	X20DO2623
I/O module	2 digital SSR outputs 100 - 240 VAC, 3-line connections
Digital outputs	X20DO2623
Design	SSR
Wiring	L switching
Rated voltage	100 - 240 VAC
Rated frequency	47 to 63 Hz
Rated output current	1.0 A
Total current	1.0 A
Surge current	40 A (20 ms), 10 A (1 s)
Connection type	3-line connections
Zero cross-over switches	Yes
General information	X20DO2623
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Outputs	Yes, with status LED
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.35 W
I/O internal	-
I/O external	0.38 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20DO2623
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DO2623
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DO2623
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB32 separately Order bus module 1x X20BM12 separately

Pin assignments



Connection example



Required accessories

X20TB32	X20 terminal block, 12-pin, 240 V coded	95
X20BM12	X20 bus module, 240 V coded, internal I/O supply is interconnected	89

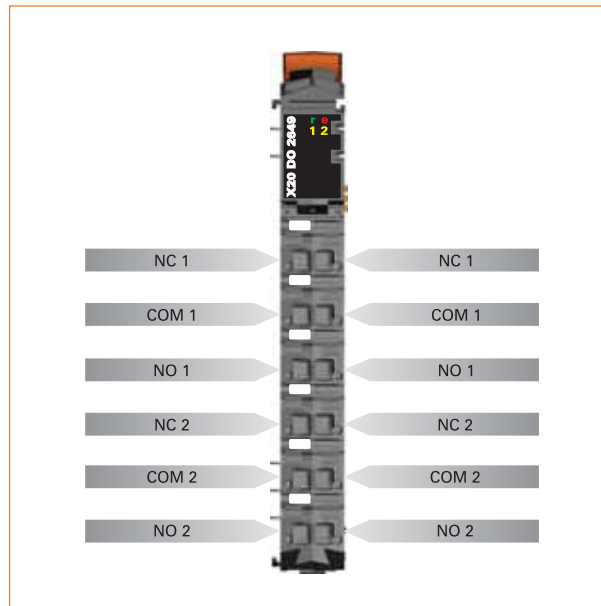
Digital output module DO2649



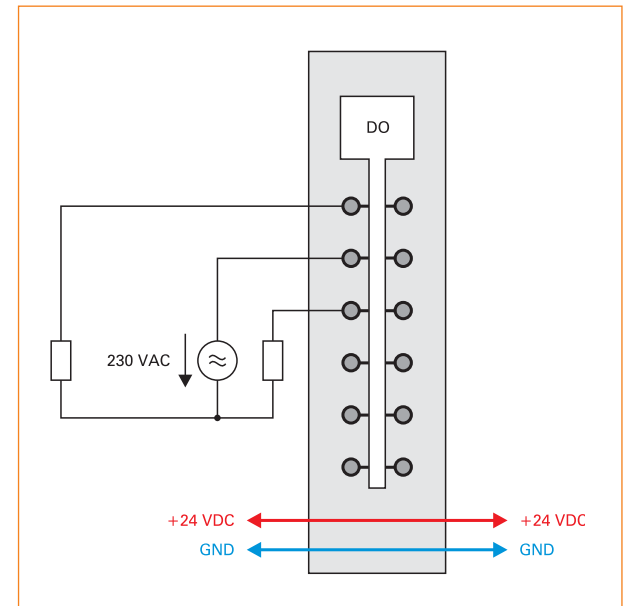
- 2 digital outputs
- Relay module for 230 VAC
- 2 change over contacts
- Outputs single channel isolated

Short description	X20DO2649
I/O module	2 digital outputs 30 VDC / 230 VAC, outputs are single-channel isolated
Digital outputs	X20DO2649
Design	Relay / Change-over Channels are single-channel isolated
Rated voltage	30 VDC / 230 VAC
Rated frequency	DC / 45 to 63 Hz
Rated output current	5.0 A at 30 VDC / 5.0 A at 230 VAC
Total current	10.0 A at 30 VDC / 10.0 A at 115 VAC
Switching capacity	
Minimum	10 mA / 5 VDC
Maximum	180 W / 1500 VA
Actuator supply	External
General information	X20DO2649
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Outputs	Yes, with status LED
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	Yes
Power consumption	
Bus	0.45 W
I/O internal	-
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20DO2649
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DO2649
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DO2649
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

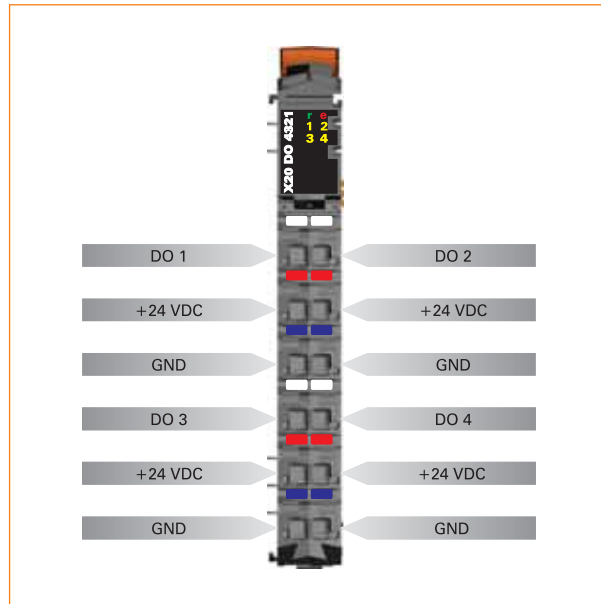
Digital output module DO4321



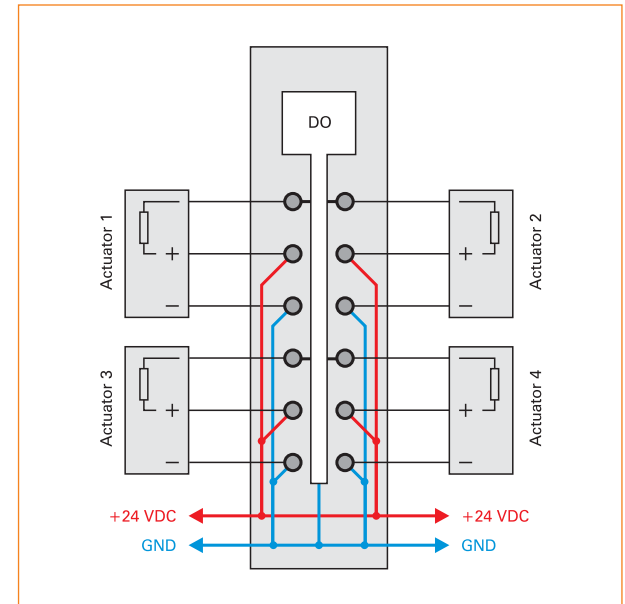
- 4 digital outputs
- Sink connection
- 3-wire connection
- 24 VDC and GND for actuator supply
- Integrated output protection

Short description	X20DO4321
I/O module	Four 24 VDC digital outputs for 3-line connections
Digital outputs	X20DO4321
Rated voltage	24 VDC
Rated output current	0.5 A
Total current	2.0 A
Connection type	3-line connections
Output circuit	Sink
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances
Actuator supply	0.5 A in total for output-independent actuator supply
General information	X20DO4321
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Outputs	Yes, with status LED and software status (output error status)
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.16 W
I/O internal	0.49 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20DO4321
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DO4321
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DO4321
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

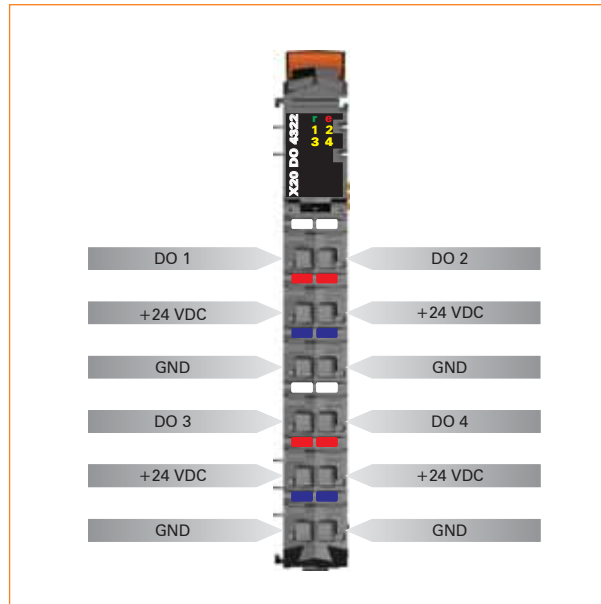
Digital output module DO4322



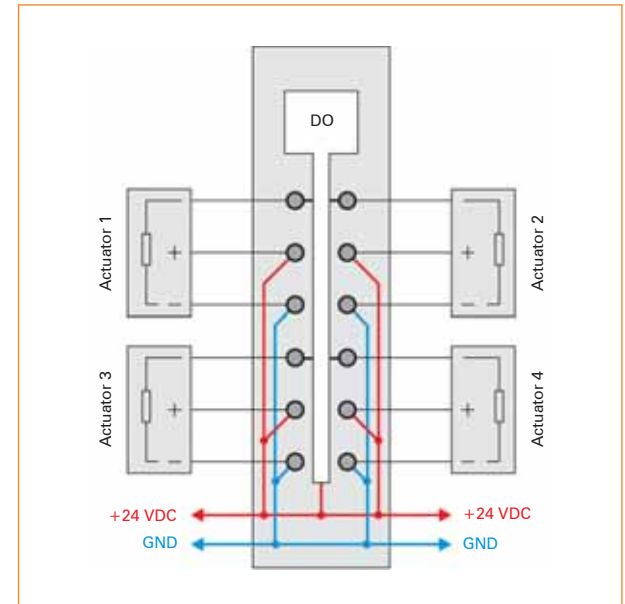
- 4 digital outputs
- source connection
- 3-wire connection
- 24 VDC and GND for actuator supply
- Integrated output protection

Short description	X20DO4322
I/O module	Four 24 VDC digital outputs for 3-line connections
Digital outputs	X20DO4322
Rated voltage	24 VDC
Rated output current	0.5 A
Total current	2.0 A
Connection type	3-line connections
Output circuit	Source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances
Actuator supply	0.5 A in total for output-independent actuator supply
General information	X20DO4322
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Outputs	Yes, with status LED and software status (output error status)
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.16 W
I/O internal	0.49 W
Certification	CE, C-UL-US, GOST-R, BG-PRÜFZERT ¹⁾
1) Operating principle checked: Shutdown initiated by external safety switching device	
Operational conditions	X20DO4322
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DO4322
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DO4322
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

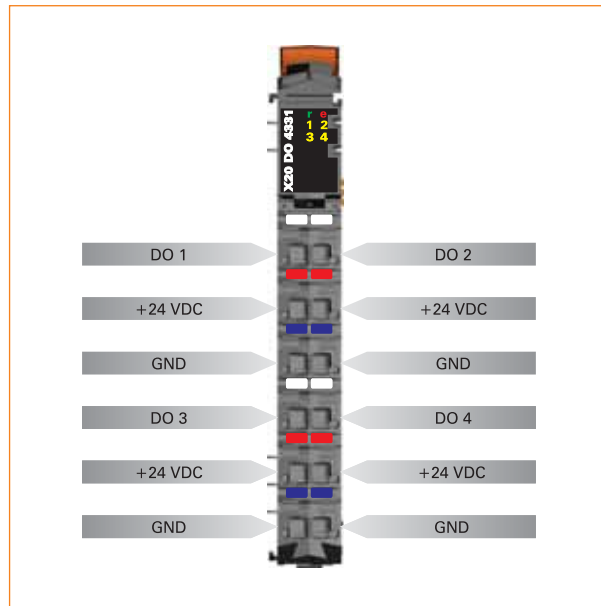
Digital output module DO4331



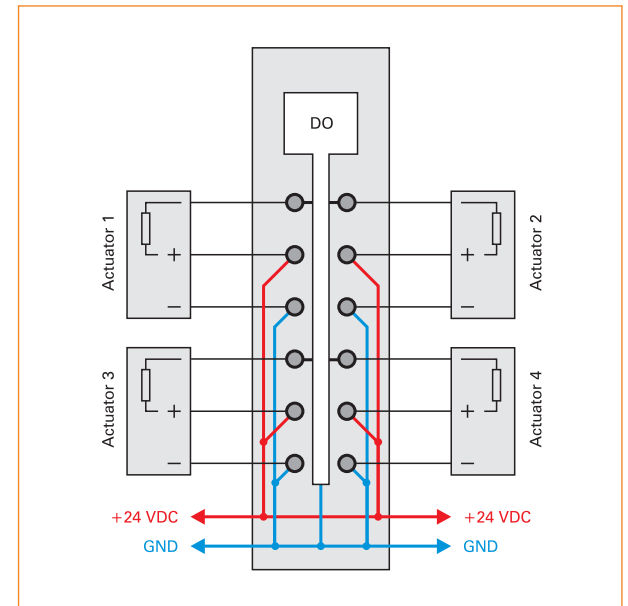
- 4 digital outputs with 2 A
- Sink connection
- 3-wire connection
- 24 VDC and GND for actuator supply
- Integrated output protection

Short description	X20DO4331
I/O module	Four 24 VDC digital outputs for 3-line connections
Digital outputs	X20DO4331
Rated voltage	24 VDC
Rated output current	2.0 A
Total current	8.0 A
Connection type	3-line connections
Output circuit	Sink
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances
Additional functions for outputs	To increase the output current, outputs can be switched in parallel
Actuator supply	0.5 A in total for output-independent actuator supply
General information	X20DO4331
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Outputs	Yes, with status LED and software status (output error status)
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.16 W
I/O internal	0.49 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20DO4331
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DO4331
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DO4331
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

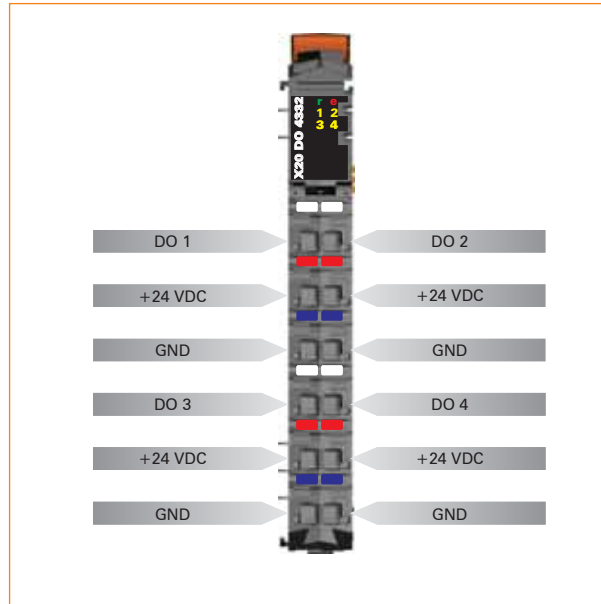
Digital output module DO4332



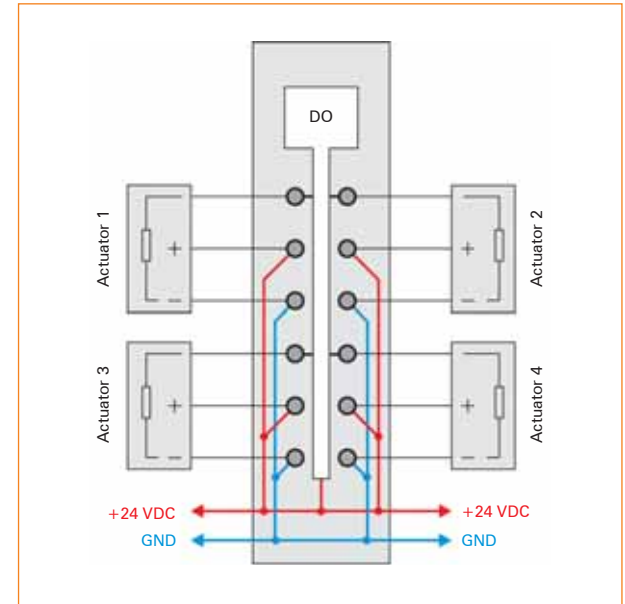
- 4 digital outputs with 2 A
- source connection
- 3-wire connection
- 24 VDC and GND for actuator supply
- Integrated output protection

Short description	X20DO4332
I/O module	Four 24 VDC digital outputs for 3-line connections
Digital outputs	X20DO4332
Rated voltage	24 VDC
Rated output current	2.0 A
Total current	4.0 A
Connection type	3-line connections
Output circuit	Source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances
Additional functions for outputs	To increase the output current, outputs can be switched in parallel
Actuator supply	0.5 A in total for output-independent actuator supply
General information	X20DO4332
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Outputs	Yes, with status LED and software status (output error status)
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.16 W
I/O internal	0.5 W
Certification	CE, C-UL-US, GOST-R, BG-PRÜFZERT ¹⁾
<small>1) Operating principle checked: Shutdown initiated by external safety switching device</small>	
Operational conditions	X20DO4332
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DO4332
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DO4332
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

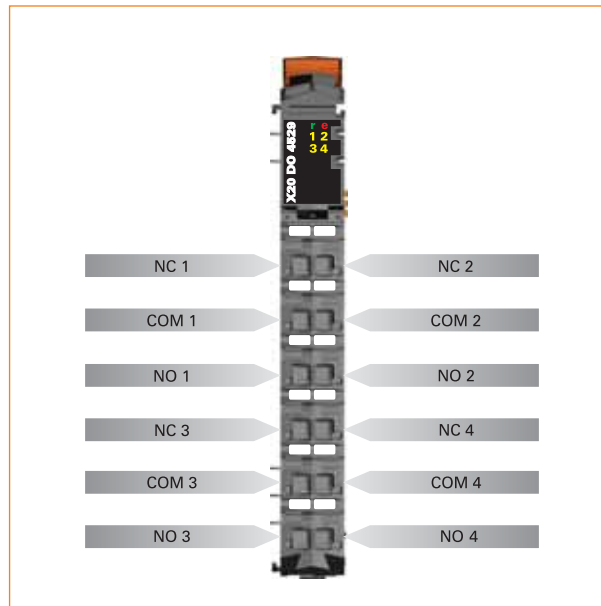
Digital output module DO4529



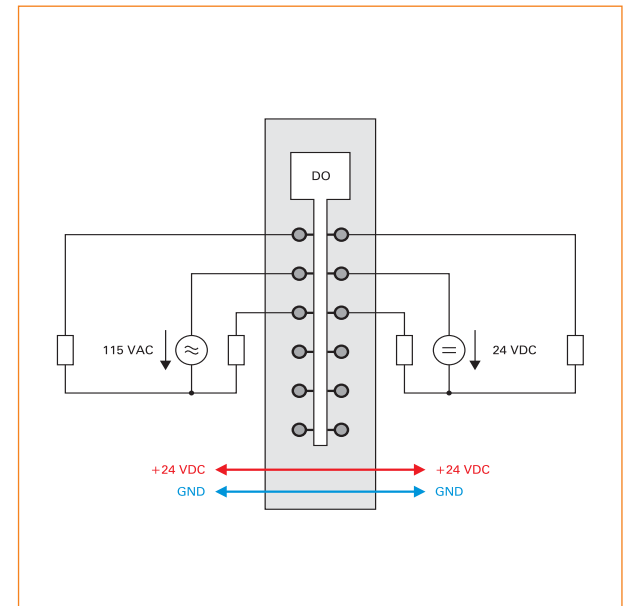
- 4 digital outputs
- Relay module for 115 VAC
- 4 change over contacts
- Outputs single channel isolated

Short description	X20DO4529
I/O module	4 digital outputs 30 VDC / 115 VAC, outputs are single-channel isolated
Digital outputs	X20DO4529
Design	Relay / Change-over Channels are single-channel isolated
Rated voltage	30 VDC / 115 VAC
Rated frequency	DC / 45 to 63 Hz
Rated output current	1.0 A at 30 VDC / 0.5 A at 115 VAC
Total current	4.0 A at 30 VDC / 2.0 A at 115 VAC
Switching capacity	
Minimum	0.01 mA / 10 mV DC
Maximum	30 W / 62.5 VA
Actuator supply	External
General information	X20DO4529
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Outputs	Yes, with status LED
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	Yes
Power consumption	
Bus	0.8 W
I/O internal	-
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20DO4529
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DO4529
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DO4529
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

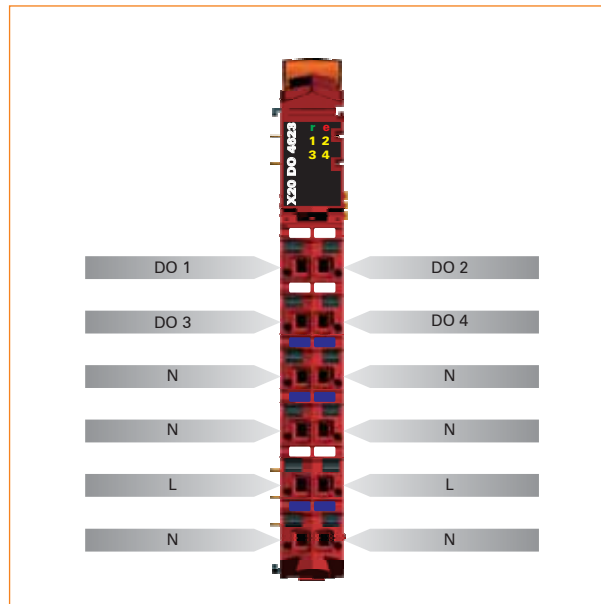
Digital output module DO4623



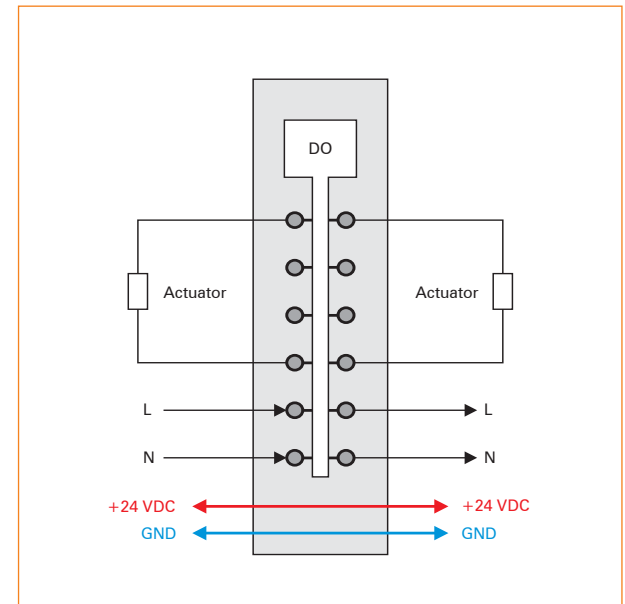
- 4 digital outputs
- Outputs with integrated snubber circuit
- Outputs with 100 - 240 VAC
- L switching
- 50 Hz or 60 Hz
- 2-wire connection
- Integrated full-wave control
- Special color
- 240 V coding

Short description	X20DO4623
I/O module	4 digital SSR outputs 100 - 240 VAC, 2-line connections
Digital outputs	X20DO4623
Design	SSR
Wiring	L switching
Rated voltage	100 - 240 VAC
Rated frequency	47 to 63 Hz
Rated output current	0.5 A
Total current	1.0 A
Surge current	7 A (20 ms), 2 A (1 s)
Connection type	2-line connections
Zero cross-over switches	Yes
General information	X20DO4623
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Outputs	Yes, with status LED
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.52 W
I/O internal	-
I/O external	0.38 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20DO4623
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DO4623
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DO4623
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB32 separately Order bus module 1x X20BM12 separately

Pin assignments



Connection example



Required accessories

X20TB32	X20 terminal block, 12-pin, 240 V coded	95
X20BM12	X20 bus module, 240 V coded, internal I/O supply is interconnected	89

Digital output module DO6321

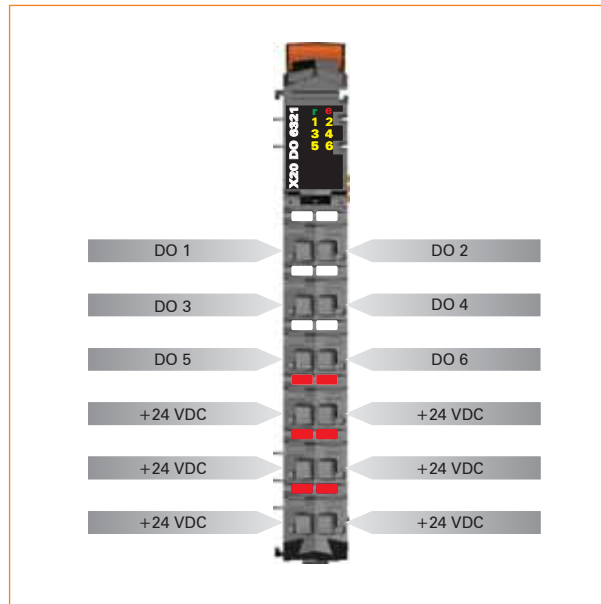


- 6 digital outputs
- Sink connection
- 24 VDC for signal supply
- Integrated output protection
- 1-line connection with 6-pin terminal block

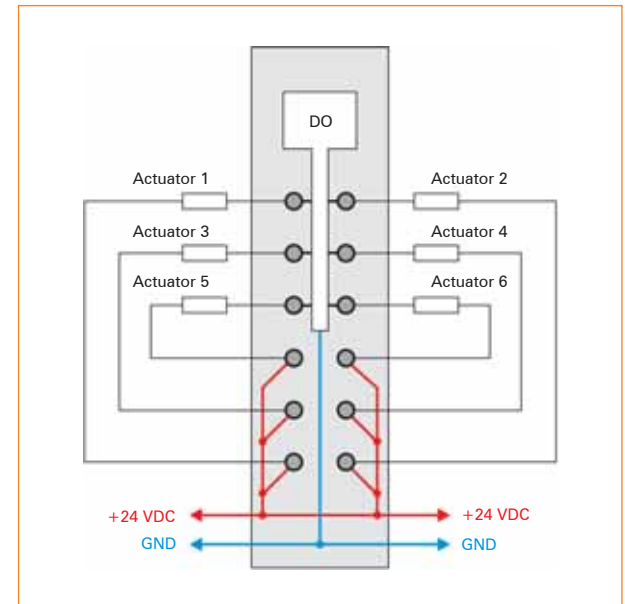
Short description	X20DO6321
I/O module	Six 24 VDC digital outputs for 1 or 2-wire connections
Digital outputs	X20DO6321
Rated voltage	24 VDC
Rated output current	0.5 A
Total current	3.0 A
Connection type	1 or 2 line connection
Output circuit	Sink
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances
General information	X20DO6321
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Outputs	Yes, with status LED and software status (output error status)
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.2 W
I/O internal	0.59 W
Certification	CE, C-UL-US, GOST-R, BG-PRÜFZERT ¹⁾
1) Operating principle checked: Shutdown initiated by external safety switching device	
Operational conditions	X20DO6321
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DO6321
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DO6321
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB06 or X20TB12 separately Order bus module 1x X20BM11 separately

*The X20 6-pin terminal block can be used for universal 1-line wiring.
Two-line wiring can be implemented using the 12-pin terminal block.*

Pin assignments



Connection example



Required accessories

X20TB06	X20 terminal block, 6-pin, 24 V coded	94
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Digital output module DO6322

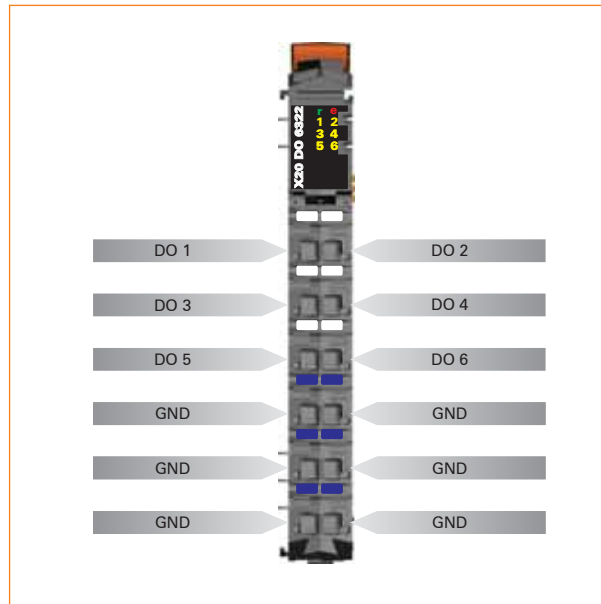


- 6 digital outputs
- Source connection
- 2-wire connection
- GND for signal supply
- Integrated output protection
- 1-line connection with 6-pin terminal block

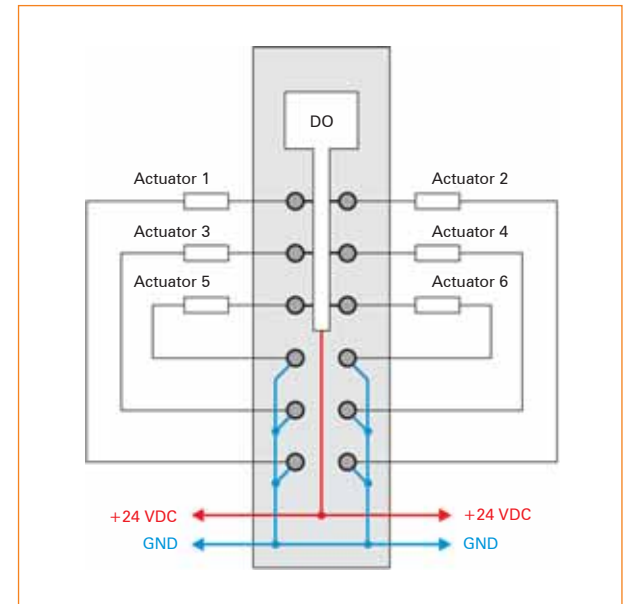
Short description	X20DO6322
I/O module	Six 24 VDC digital outputs for 1 or 2-wire connections
Digital outputs	X20DO6322
Rated voltage	24 VDC
Rated output current	0.5 A
Total current	3.0 A
Connection type	1 or 2 line connection
Output circuit	Source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances
General information	X20DO6322
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Outputs	Yes, with status LED and software status (output error status)
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.18 W
I/O internal	0.71 W
Certification	CE, C-UL-US, GOST-R, BG-PRÜFZERT ¹⁾
1) Operating principle checked: Shutdown initiated by external safety switching device	
Operational conditions	X20DO6322
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DO6322
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DO6322
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB06 or X20TB12 separately Order bus module 1x X20BM11 separately

*The X20 6-pin terminal block can be used for universal 1-line wiring.
Two-line wiring can be implemented using the 12-pin terminal block.*

Pin assignments



Connection example



Required accessories

X20TB06	X20 terminal block, 6-pin, 24 V coded	94
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

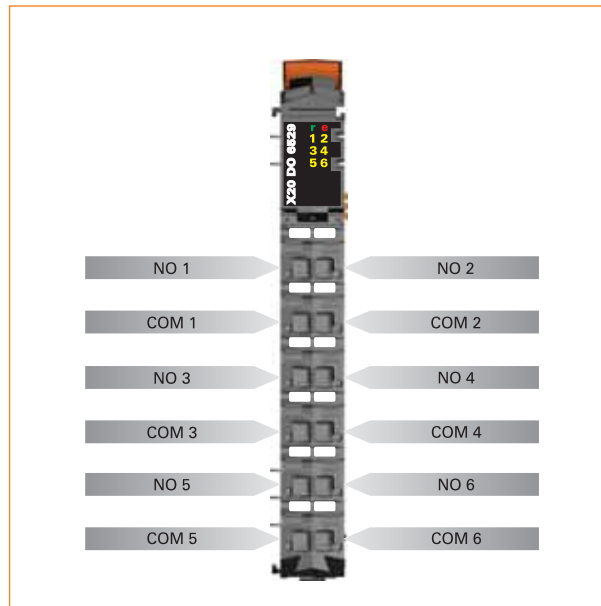
Digital output module DO6529



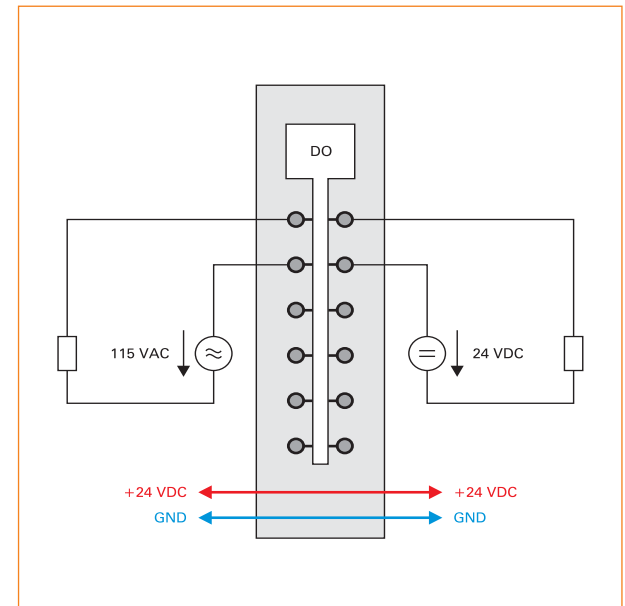
- 6 digital outputs
- Relay module for 115 VAC
- 6 normally open contact
- Outputs single channel isolated

Short description	X20DO6529
I/O module	6 digital outputs 30 VDC / 115 VAC, outputs are single-channel isolated
Digital outputs	X20DO6529
Design	Relay / N.O. Channels are single-channel isolated
Rated voltage	30 VDC / 115 VAC
Rated frequency	DC / 45 to 63 Hz
Rated output current	1.0 A at 30 VDC / 0.5 A at 115 VAC
Total current	6.0 A at 30 VDC / 3.0 A at 115 VAC
Switching capacity	
Minimum	0.01 mA / 10 mV DC
Maximum	30 W / 62.5 VA
Actuator supply	External
General information	X20DO6529
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Outputs	Yes, with status LED
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	Yes
Power consumption	
Bus	1.1 W
I/O internal	-
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20DO6529
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DO6529
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DO6529
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

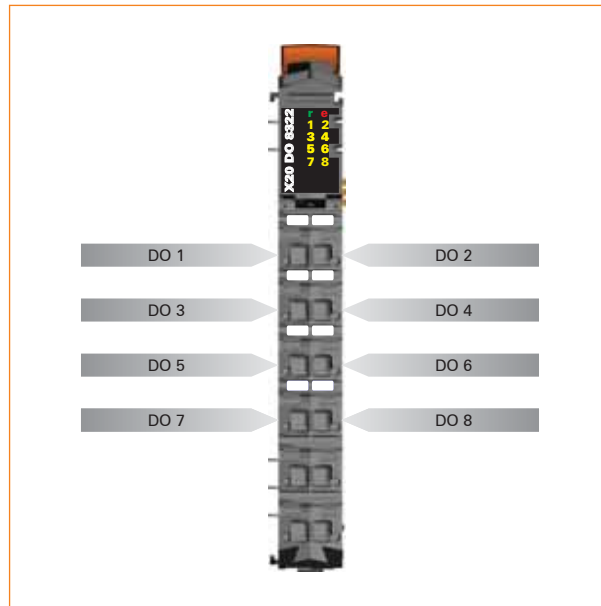
Digital output module DO8322



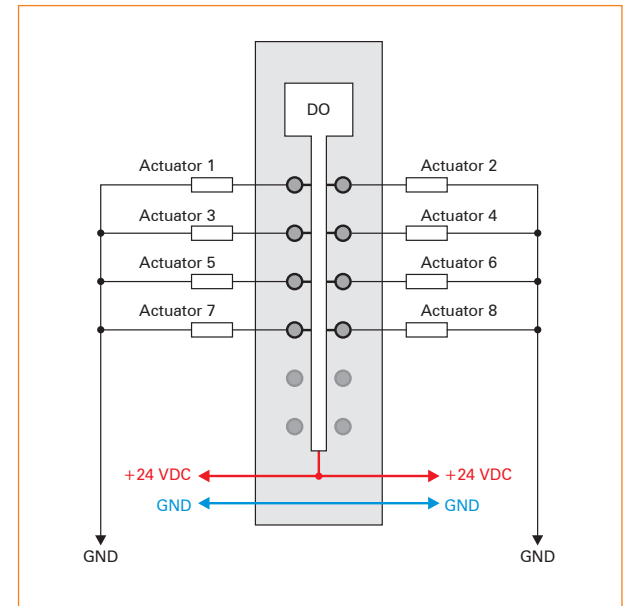
- 8 digital outputs
- Source connection
- 1-wire connection
- Integrated output protection

Short description	X20DO8322
I/O module	Eight 24 VDC digital outputs for 1-wire connections
Digital outputs	X20DO8322
Rated voltage	24 VDC
Rated output current	0.5 A
Total current	4.0 A
Connection type	1-line connections
Output circuit	Source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances
General information	X20DO8322
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Outputs	Yes, with status LED and software status (output error status)
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.26 W
I/O internal	0.8 W
Certification	CE, C-UL-US in preparation, GOST-R, BG-PRÜFZERT ¹⁾
1) Operating principle checked: Shutdown initiated by external safety switching device	
Operational conditions	X20DO8322
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DO8322
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DO8322
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Digital output module DO8331

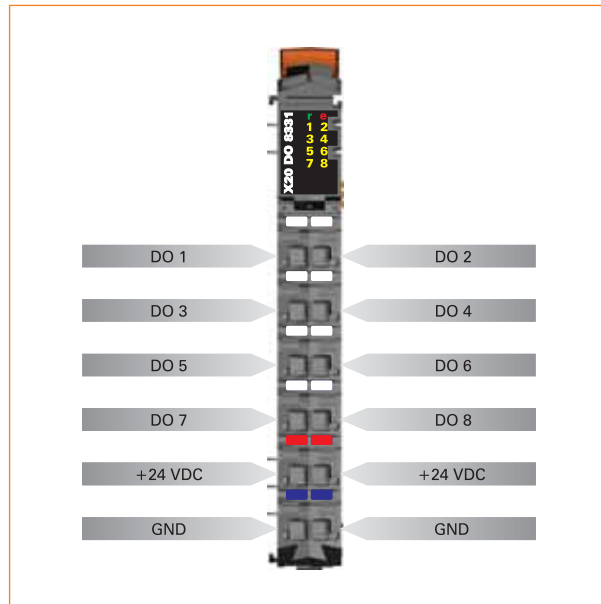


- 8 digital outputs with 2 A
- Sink connection
- 1-wire connection
- Power supply integrated in the module integrated
- Integrated output protection

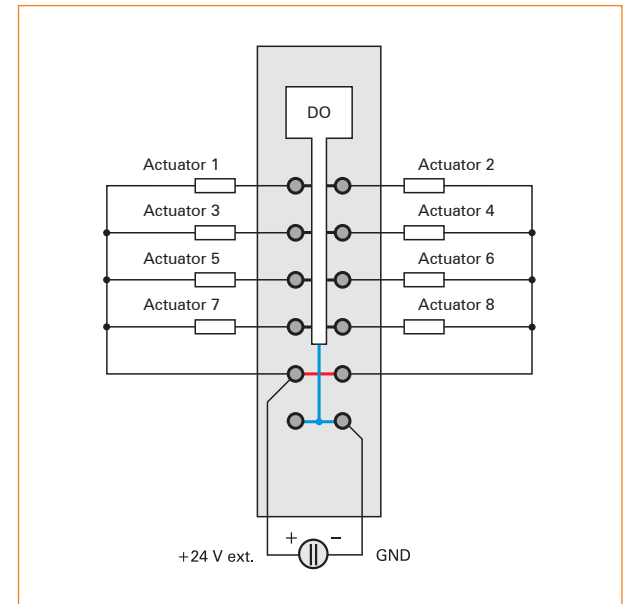
Short description	X20DO8331
I/O module	Eight 24 VDC digital outputs for 1-wire connections
Digital outputs	X20DO8331
Rated voltage	24 VDC
Rated output current	2.0 A
Total current	8.0 A
Connection type	1-line connections
Output circuit	Sink
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for supply voltage
Additional functions for outputs	To increase the output current, outputs can be switched in parallel
General information	X20DO8331
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Outputs	Yes, with status LED and software status (output error status)
Supply voltage monitoring	Yes, with software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.22 W
I/O internal	-
I/O external	0.9 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20DO8331
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DO8331
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DO8331
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

The output supply is fed directly to the module. An additional supply module is not needed. There is no connection between the module and the I/O supply potential on the bus module.

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Digital output module DO8332

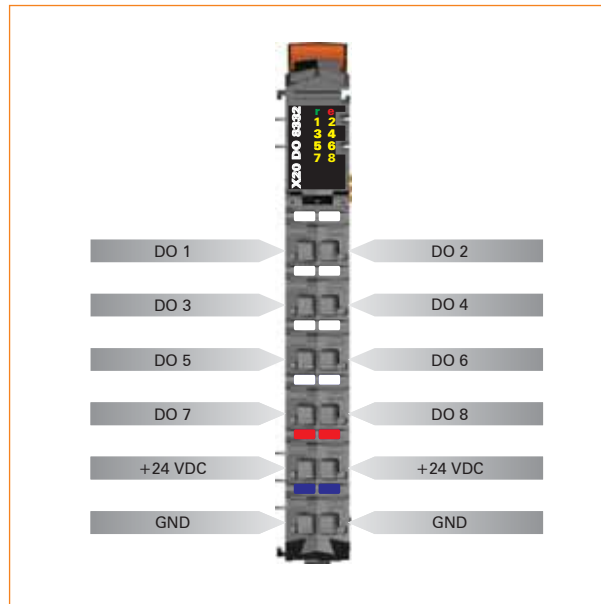


- 8 digital outputs with 2 A
- source connection
- 1-wire connection
- Power supply integrated in the module integrated
- Integrated output protection

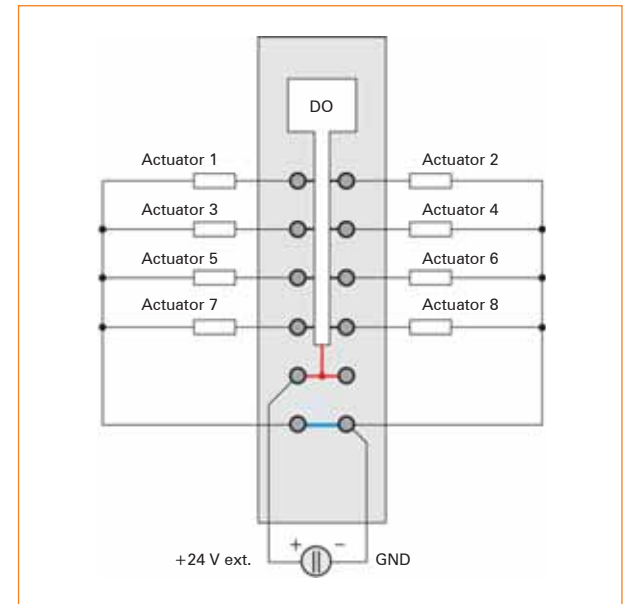
Short description	X20DO8332
I/O module	Eight 24 VDC digital outputs for 1-wire connections
Digital outputs	X20DO8332
Rated voltage	24 VDC
Rated output current	2.0 A
Total current	8.0 A
Connection type	1-line connections
Output circuit	Source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for supply voltage
Additional functions for outputs	To increase the output current, outputs can be switched in parallel
General information	X20DO8332
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Outputs	Yes, with status LED and software status (output error status)
Supply voltage monitoring	Yes, with software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.22 W
I/O internal	–
I/O external	0.92 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20DO8332
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DO8332
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DO8332
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

The output supply is fed directly to the module. An additional supply module is not needed. There is no connection between the module and the I/O supply potential on the bus module.

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

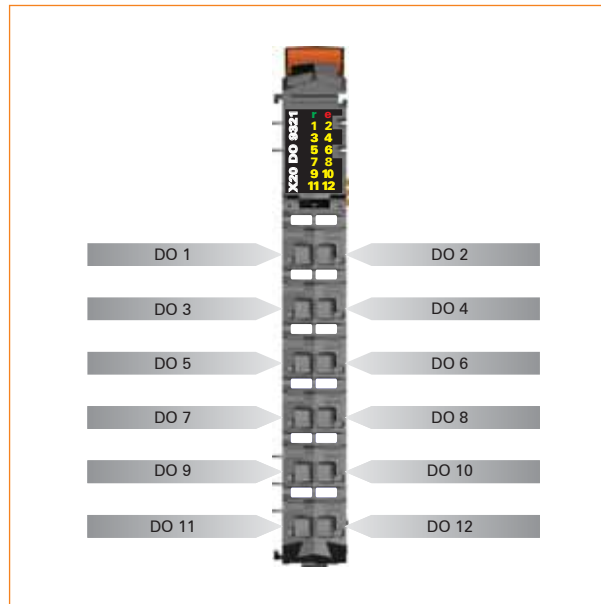
Digital output module DO9321



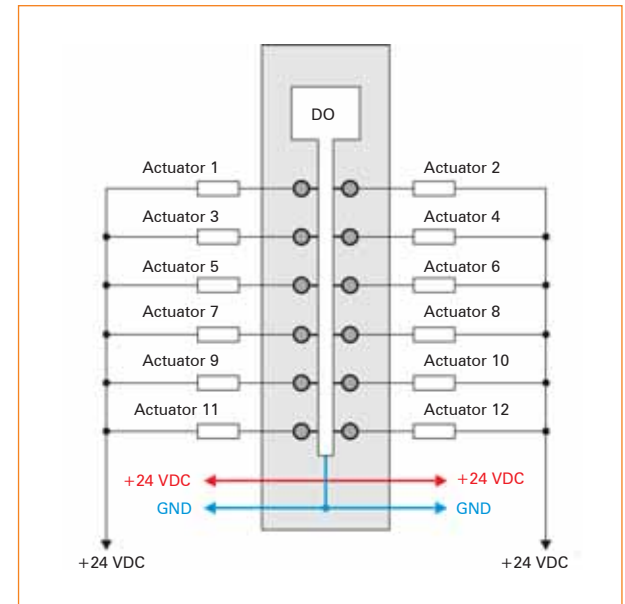
- 12 digital outputs
- Sink connection
- 1-wire connection
- Integrated output protection

Short description	X20DO9321
I/O module	Twelve 24 VDC digital outputs for 1-wire connections
Digital outputs	X20DO9321
Rated voltage	24 VDC
Rated output current	0.5 A
Total current	6.0 A
Connection type	1-line connections
Output circuit	Sink
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances
General information	X20DO9321
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Outputs	Yes, with status LED and software status (output error status)
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.26 W
I/O internal	0.99 W
Certification	CE, C-UL-US, GOST-R, BG-PRÜFZERT ¹⁾
1) Operating principle checked: Shutdown initiated by external safety switching device	
Operational conditions	X20DO9321
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DO9321
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DO9321
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

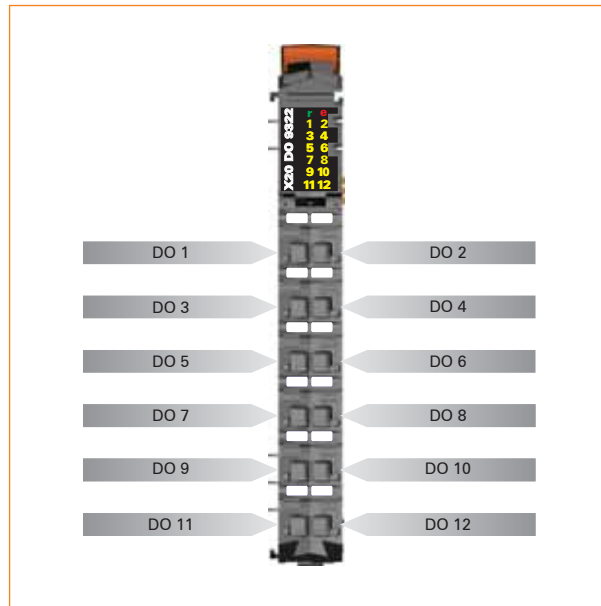
Digital output module DO9322



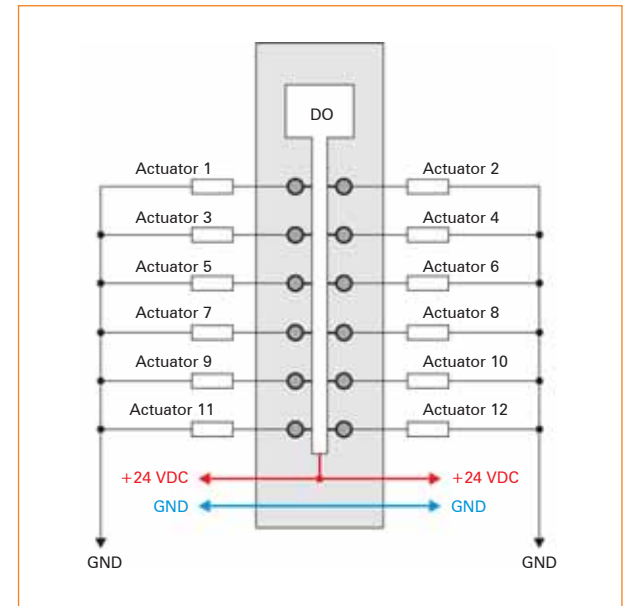
- 12 digital outputs
- Source connection
- 1-wire connection
- Integrated output protection

Short description	X20DO9322
I/O module	Twelve 24 VDC digital outputs for 1-wire connections
Digital outputs	X20DO9322
Rated voltage	24 VDC
Rated output current	0.5 A
Total current	6.0 A
Connection type	1-line connections
Output circuit	Source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances
General information	X20DO9322
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Outputs	Yes, with status LED and software status (output error status)
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.26 W
I/O internal	1.15 W
Certification	CE, C-UL-US, GOST-R, BG-PRÜFZERT ¹⁾
1) Operating principle checked: Shutdown initiated by external safety switching device	
Operational conditions	X20DO9322
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DO9322
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DO9322
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

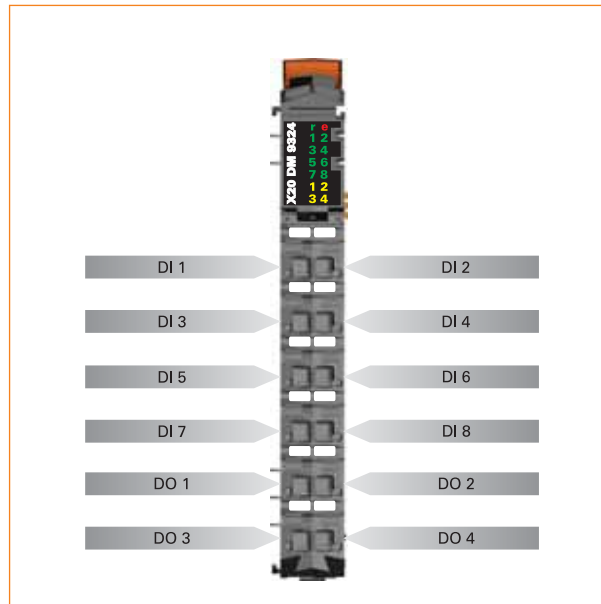
Digital mixed module DM9324



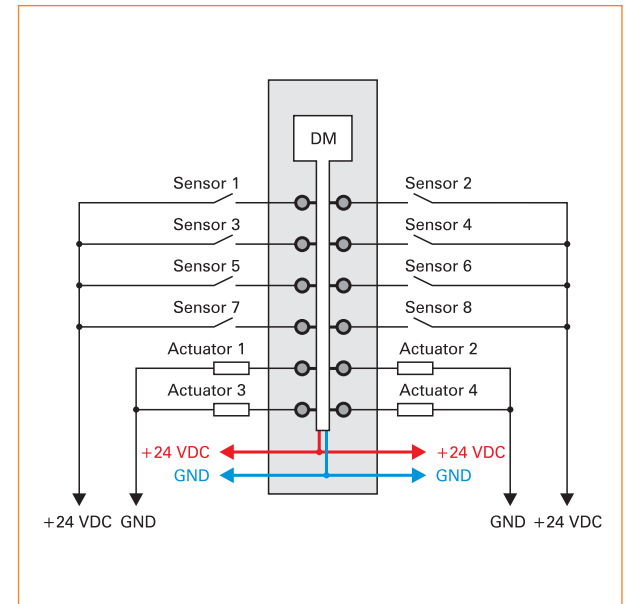
- 8 digital inputs, sink connection
- 4 digital outputs, source connection
- 1-wire connection
- Software input filter can be configured for the entire module
- Integrated output protection

Short description	X20DM9324
I/O module	Eight 24 VDC digital inputs for 1-wire connections, four 24 VDC digital outputs for 1-wire connections
Rated voltage	24 VDC
Digital inputs	X20DM9324
Input filter	
Hardware	≤100 μs
Software	Default 1 ms, can be configured between 0 and 25 ms in 0.2 ms intervals
Connection type	1-line connections
Input circuit	Sink
Digital outputs	X20DM9324
Rated output current	0.5 A
Total current	2.0 A
Connection type	1-line connections
Output circuit	Source
Output protection	Thermal cutoff for overcurrent or short circuit, integrated protection for switching inductances
General information	X20DM9324
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Outputs	Yes, with status LED and software status (output error status)
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.21 W
I/O internal	0.5 W
I/O external	1.17 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20DM9324
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DM9324
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DM9324
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

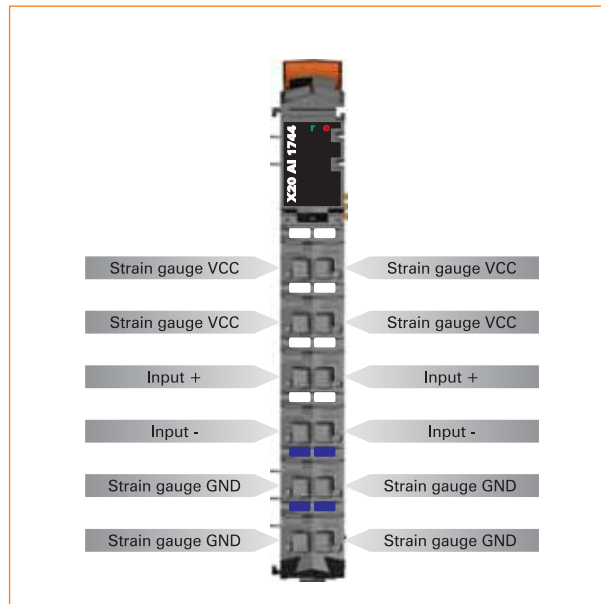
Analog input module AI1744



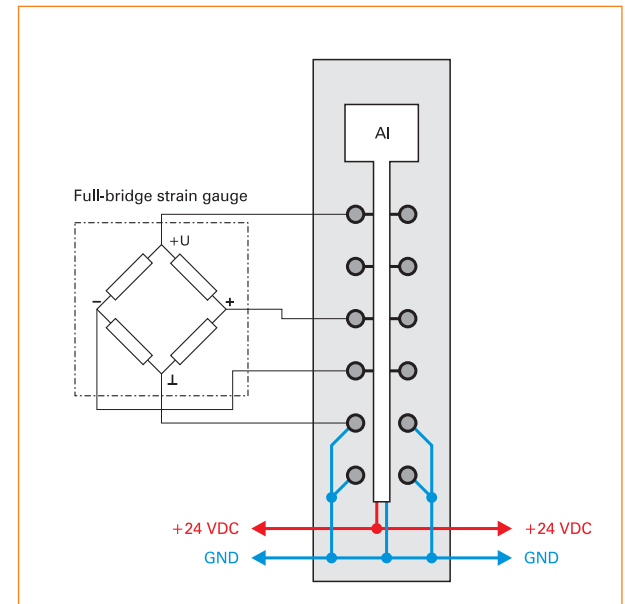
- 1 full-bridge strain gauge input
- Advanced filter functions
- Data output rate up to 7.5 kHz

Short description	X20AI1744
I/O module	1 full-bridge strain gauge input
Full-bridge strain gauge	X20AI1744
Measurement area	± 2 to ± 16 mV/V, set using software
Digital converter resolution	24-bit
Data output rate	2.5 - 7500 scans per second, can be set using software
Operating range / measurement sensor	85 to 5000 Ω
Bridge voltage	5.5 VDC / max. 65 mA
Short circuit, overload protection	Yes
Connection	4-wire connection
General information	X20AI1744
Status indicators	Channel status, operating status, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Input	Yes, with status LED and software status
Wire break	Yes, with software status
Electrical isolation	
Bus - Analog input	Yes
Bus - Bridge supply voltage	Yes
Power consumption	
Bus	0.01 W
I/O internal	1.25 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20AI1744
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20AI1744
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20AI1744
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Analog input module AI2622

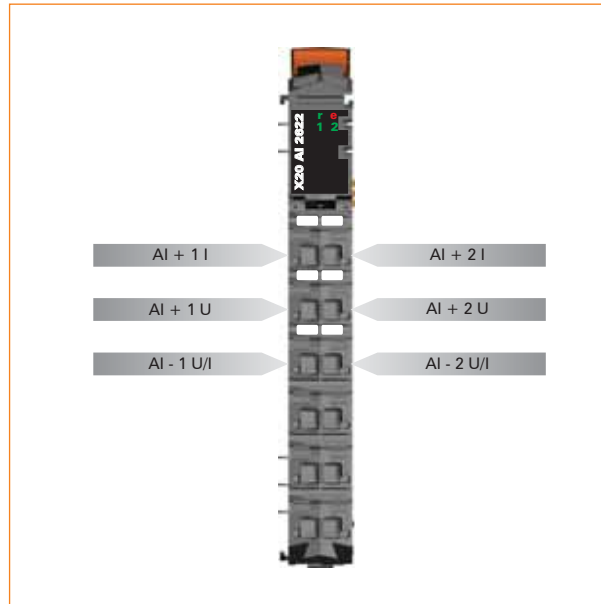


- 2 analog inputs
- Either current or voltage signal
- 13-bit digital converter resolution

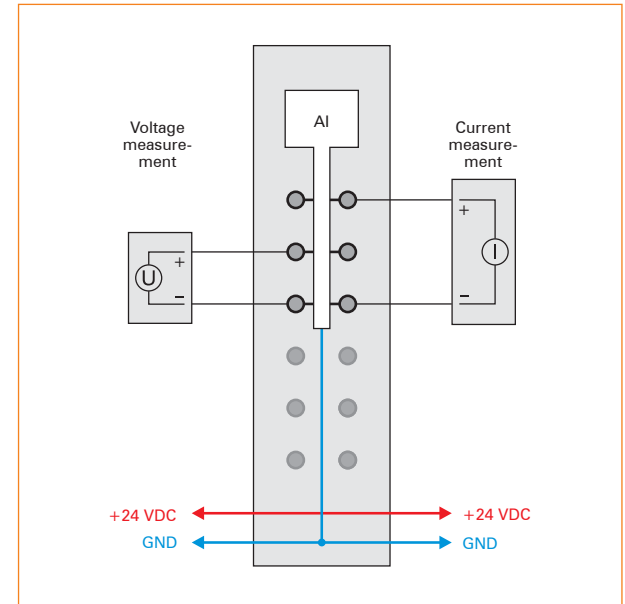
Short description		X20AI2622	
I/O module	2 analog inputs ± 10 V or 0 to 20 mA / 4 to 20 mA		
Analog inputs		Voltage	Current
Input	± 10 V or 0 to 20 mA/4 to 20 mA, using different connection terminal points		
Input type	Differential input		
Digital converter resolution	± 12 -bit	12-bit	
Conversion time	300 μ s for all inputs		
Output format	UINT		
Input impedance in signal range	20 M Ω	-	
Load	-	< 400 Ω	
Maximum error at 25°C			
Gain	0.08% ¹⁾	0 to 20 mA = 0.08% ¹⁾ / 4 to 20 mA = 0.1% ¹⁾	
Offset	0.015% ²⁾	0 to 20 mA = 0.03% ³⁾ / 4 to 20 mA = 0.0375% ³⁾	
Input protection	Protection against wiring with supply voltage		
1) Based on the current measurement value.			
2) Refers to the 20 V measurement range.			
3) Refers to the 20 mA measurement range.			
General information		X20AI2622	
Status indicators	I/O function per channel, operating state, module status		
Diagnostics			
Module run/error	Yes, with status LED and software status		
Inputs	Yes, with status LED and software status		
Channel type	Yes, with software status		
Electrical isolation			
Channel - Bus	Yes		
Channel - Channel	No		
Power consumption			
Bus	0.01 W		
I/O internal	0.8 W		
Certification	CE, C-UL-US, GOST-R		
Operational conditions		X20AI2622	
Operating temperature			
Horizontal installation	0°C to +55°C		
Vertical installation	0°C to +50°C		
Relative humidity	5 to 95%, non-condensing		
Mounting orientation	Horizontal or vertical		
Installation at altitudes above sea level			
0 - 2000 m	No derating		
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m		
Protection type	IP20		
Storage and transport conditions		X20AI2622	
Temperature	-25°C to +70°C		
Relative humidity	5 to 95%, non-condensing		
Mechanical characteristics		X20AI2622	
Spacing	12.5 ^{+0.2} mm		
Comment	Order terminal block 1x X20TB06 or X20TB12 separately Order bus module 1x X20BM11 separately		

The module is designed for X20 6-pin terminal blocks. However, the 12-pin terminal block can also be used.

Pin assignments



Connection example



Required accessories

X20TB06	X20 terminal block, 6-pin, 24 V coded	94
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Analog input module AI2632

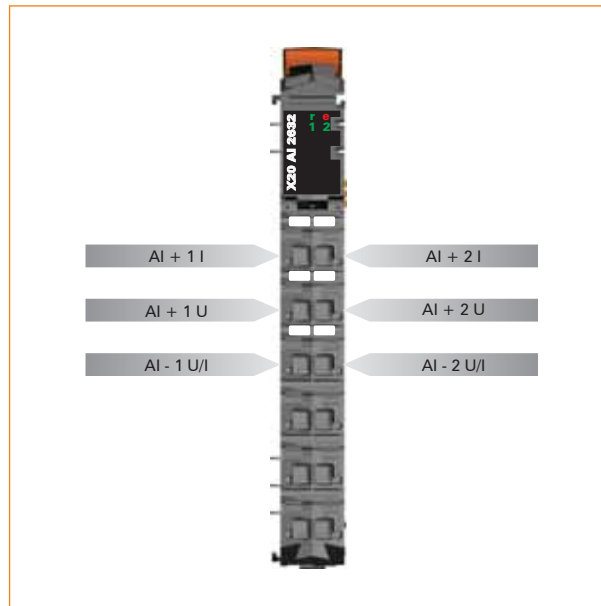


- 2 analog inputs
- Either current or voltage signal
- 16-bit digital converter resolution
- Simultaneous input conversion
- Very fast conversion time

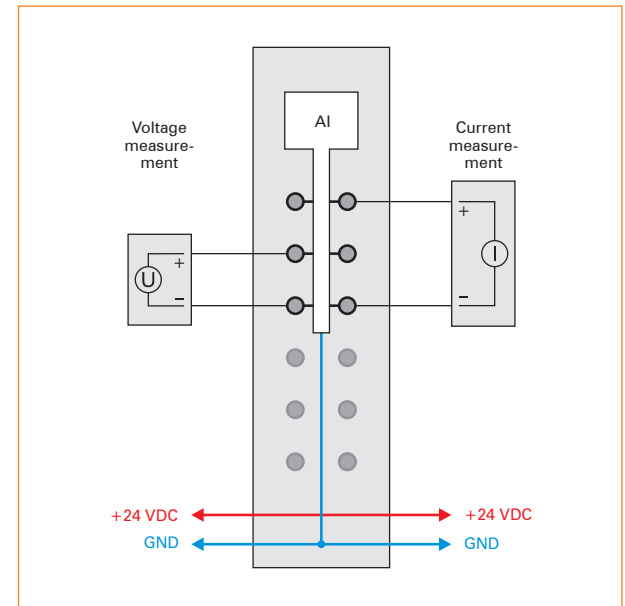
Short description		X20AI2632	
I/O module	2 analog inputs, ± 10 V or 0 to 20 mA		
Analog inputs		Voltage	Current
Input	± 10 V or 0 to 20 mA, using different connection terminal points		
Input type	Differential input		
Digital converter resolution	± 15 -bit	15-bit	
Conversion time	50 μ s for all inputs		
Output format	UINT		
Input impedance in signal range	20 M Ω	-	
Load	-	< 400 Ω	
Maximum error at 25°C			
Gain	0.08% ¹⁾	0.08% ¹⁾	
Offset	0.01% ²⁾	0.02% ³⁾	
Input protection	Protection against wiring with supply voltage		
1) Based on the current measurement value.			
2) Refers to the 20 V measurement range.			
3) Refers to the 20 mA measurement range.			
General information		X20AI2632	
Status indicators	I/O function per channel, operating state, module status		
Diagnostics			
Module run/error	Yes, with status LED and software status		
Inputs	Yes, with status LED and software status		
Channel type	Yes, with software status		
Electrical isolation			
Channel - Bus	Yes		
Channel - Channel	No		
Power consumption			
Bus	0.01 W		
I/O internal	1.2 W		
Certification	CE, C-UL-US, GOST-R		
Operational conditions		X20AI2632	
Operating temperature			
Horizontal installation	0°C to +55°C		
Vertical installation	0°C to +50°C		
Relative humidity	5 to 95%, non-condensing		
Mounting orientation	Horizontal or vertical		
Installation at altitudes above sea level			
0 - 2000 m	No derating		
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m		
Protection type	IP20		
Storage and transport conditions		X20AI2632	
Temperature	-25°C to +70°C		
Relative humidity	5 to 95%, non-condensing		
Mechanical characteristics		X20AI2632	
Spacing	12.5 ^{+0.2} mm		
Comment	Order terminal block 1x X20TB06 or X20TB12 separately Order bus module 1x X20BM11 separately		

The module is designed for X20 6-pin terminal blocks. However, the 12-pin terminal block can also be used.

Pin assignments



Connection example



Required accessories

X20TB06	X20 terminal block, 6-pin, 24 V coded	94
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Analog input module

AI2632-1

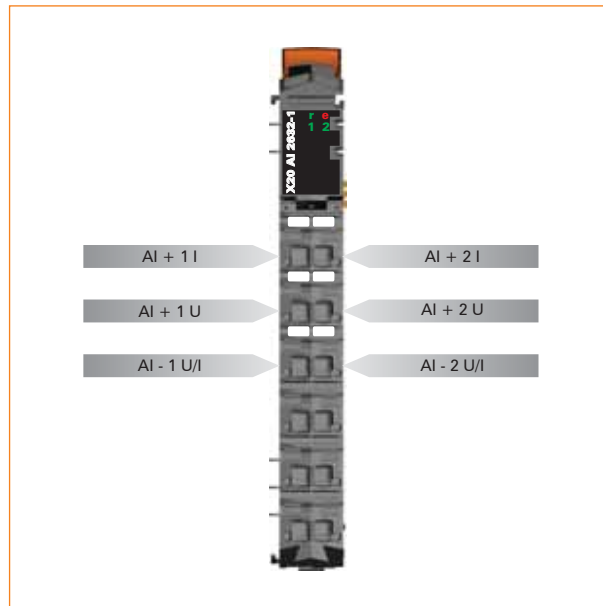


- 2 analog inputs
- Either current or voltage signal
- 16-bit digital converter resolution
- Simultaneous input conversion
- Very fast conversion time

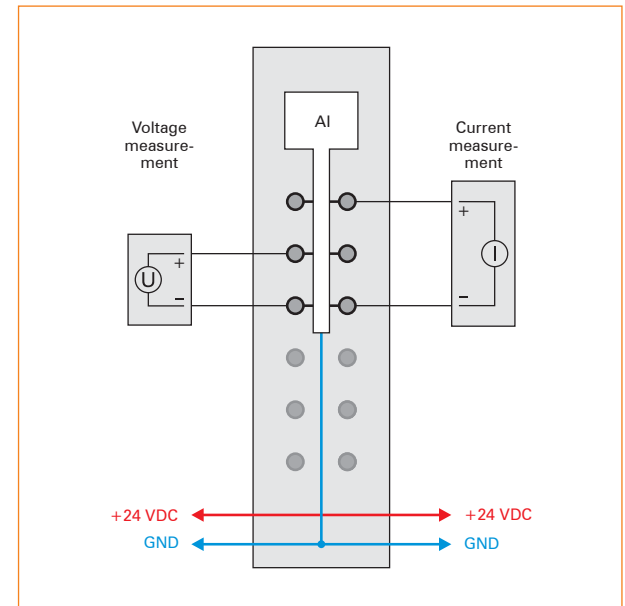
Short description		X20AI2632-1	
I/O module	2 analog inputs, ± 11 V or 0 to 22 mA		
Analog inputs		Voltage	Current
Input	± 11 V or 0 to 22 mA, using different connection terminal points		
Input type	Differential input		
Digital converter resolution	± 15 -bit	15-bit	
Conversion time	50 μ s for all inputs		
Output format	UINT		
Input impedance in signal range	20 M Ω	-	
Load	-	< 400 Ω	
Maximum error at 25°C			
Gain	0.08% ¹⁾	0.08% ¹⁾	
Offset	0.01% ²⁾	0.02% ³⁾	
Input protection	Protection against wiring with supply voltage		
1) Based on the current measurement value.			
2) Refers to the 22 V measurement range.			
3) Refers to the 22 mA measurement range.			
General information		X20AI2632-1	
Status indicators	I/O function per channel, operating state, module status		
Diagnostics			
Module run/error	Yes, with status LED and software status		
Inputs	Yes, with status LED and software status		
Channel type	Yes, with software status		
Electrical isolation			
Channel - Bus	Yes		
Channel - Channel	No		
Power consumption			
Bus	0.01 W		
I/O internal	1.2 W		
Certification	CE, C-UL-US, GOST-R		
Operational conditions		X20AI2632-1	
Operating temperature			
Horizontal installation	0°C to +55°C		
Vertical installation	0°C to +50°C		
Relative humidity	5 to 95%, non-condensing		
Mounting orientation	Horizontal or vertical		
Installation at altitudes above sea level			
0 - 2000 m	No derating		
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m		
Protection type	IP20		
Storage and transport conditions		X20AI2632-1	
Temperature	-25°C to +70°C		
Relative humidity	5 to 95%, non-condensing		
Mechanical characteristics		X20AI2632-1	
Spacing	12.5 ^{+0.2} mm		
Comment	Order terminal block 1x X20TB06 or X20TB12 separately Order bus module 1x X20BM11 separately		

The module is designed for X20 6-pin terminal blocks. However, the 12-pin terminal block can also be used.

Pin assignments



Connection example



Required accessories

X20TB06	X20 terminal block, 6-pin, 24 V coded	94
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

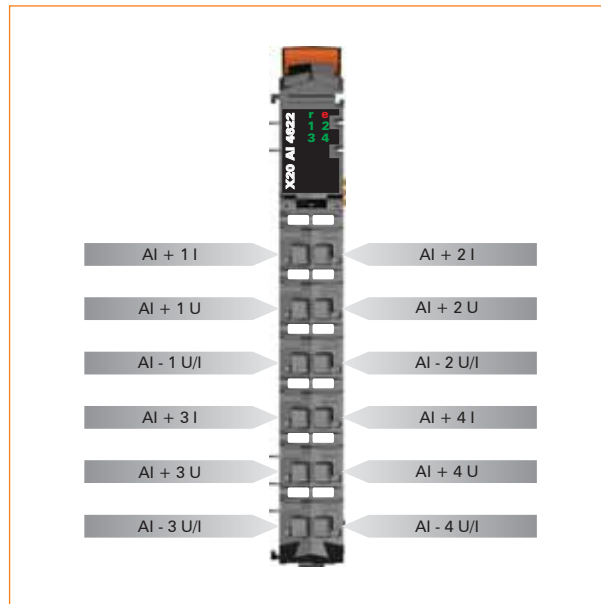
Analog input module AI4622



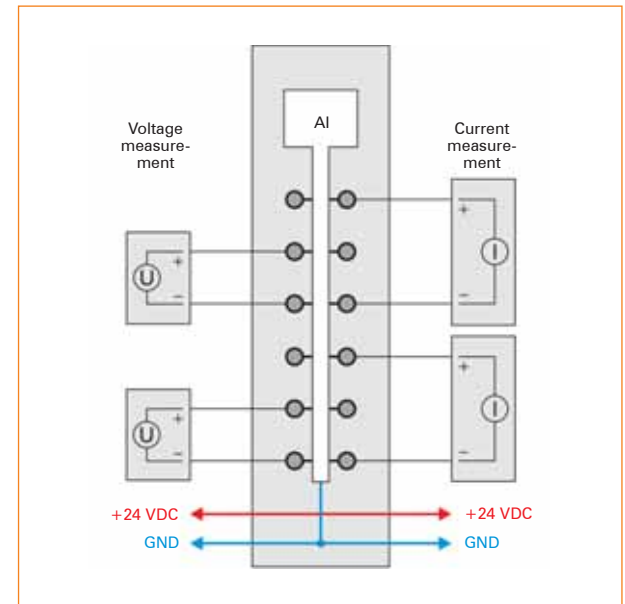
- 4 analog inputs
- Either current or voltage signal
- 13-bit digital converter resolution

Short description		X20AI4622	
I/O module	4 analog inputs ± 10 V or 0 to 20 mA / 4 to 20 mA		
Analog inputs		Voltage	Current
Input	± 10 V or 0 to 20 mA/4 to 20 mA, using different connection terminal points		
Input type	Differential input		
Digital converter resolution	± 12 -bit	12-bit	
Conversion time	400 μ s for all inputs		
Output format	UINT		
Input impedance in signal range	20 M Ω	-	
Load	-	< 400 Ω	
Maximum error at 25°C			
Gain	0.08% ¹⁾	0 to 20 mA = 0.08% ¹⁾ / 4 to 20 mA = 0.1% ¹⁾	
Offset	0.015% ²⁾	0 to 20 mA = 0.03% ³⁾ / 4 to 20 mA = 0.0375% ³⁾	
Input protection	Protection against wiring with supply voltage		
1) Based on the current measurement value.			
2) Refers to the 20 V measurement range.			
3) Refers to the 20 mA measurement range.			
General information		X20AI4622	
Status indicators	I/O function per channel, operating state, module status		
Diagnostics			
Module run/error	Yes, with status LED and software status		
Inputs	Yes, with status LED and software status		
Channel type	Yes, with software status		
Electrical isolation			
Channel - Bus	Yes		
Channel - Channel	No		
Power consumption			
Bus	0.01 W		
I/O internal	1.1 W		
Certification	CE, C-UL-US, GOST-R		
Operational conditions		X20AI4622	
Operating temperature			
Horizontal installation	0°C to +55°C		
Vertical installation	0°C to +50°C		
Relative humidity	5 to 95%, non-condensing		
Mounting orientation	Horizontal or vertical		
Installation at altitudes above sea level			
0 - 2000 m	No derating		
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m		
Protection type	IP20		
Storage and transport conditions		X20AI4622	
Temperature	-25°C to +70°C		
Relative humidity	5 to 95%, non-condensing		
Mechanical characteristics		X20AI4622	
Spacing	12.5 ^{+0.2} mm		
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately		

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

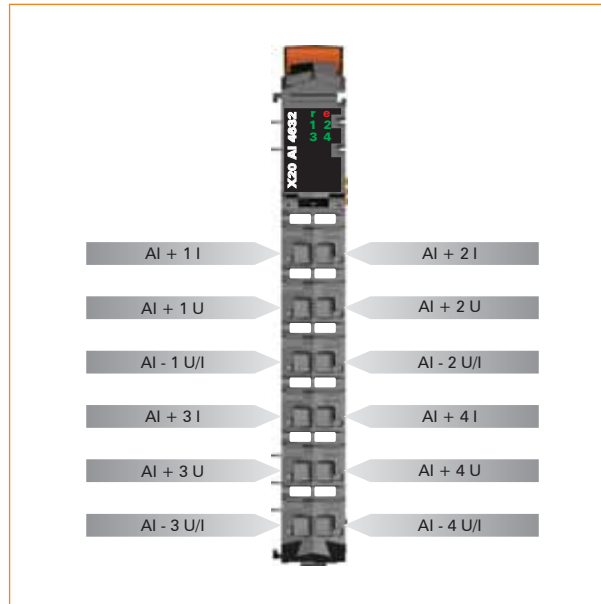
Analog input module AI4632



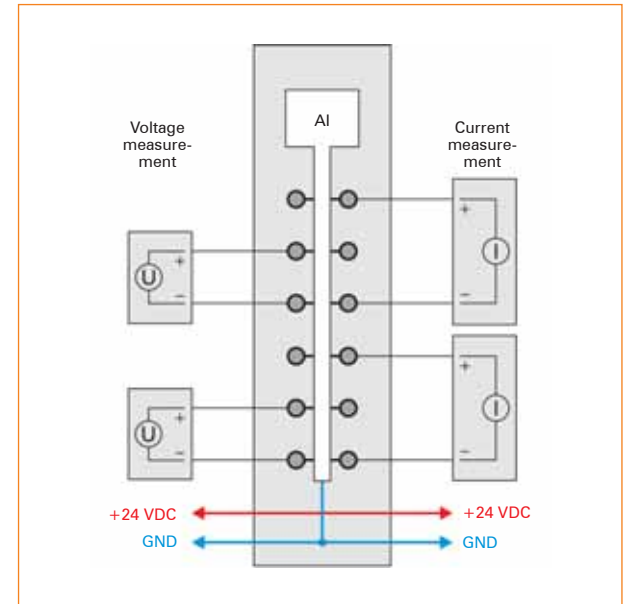
- 4 analog inputs
- Either current or voltage signal
- 16-bit digital converter resolution
- Simultaneous conversion of the inputs
- Very fast conversion time

Short description		X20AI4632	
I/O module	4 analog inputs, ± 10 V or 0 to 20 mA		
Analog inputs		Voltage	Current
Input	± 10 V or 0 to 20 mA, using different connection terminal points		
Input type	Differential input		
Digital converter resolution	± 15 -bit	15-bit	
Conversion time	50 μ s for all inputs		
Output format	UINT		
Input impedance in signal range	20 M Ω	-	
Load	-	< 400 Ω	
Maximum error at 25°C			
Gain	0.08% ¹⁾	0.08% ¹⁾	
Offset	0.01% ²⁾	0.02% ³⁾	
Input protection	Protection against wiring with supply voltage		
1) Based on the current measurement value.			
2) Refers to the 20 V measurement range.			
3) Refers to the 20 mA measurement range.			
General information		X20AI4632	
Status indicators	I/O function per channel, operating state, module status		
Diagnostics			
Module run/error	Yes, with status LED and software status		
Inputs	Yes, with status LED and software status		
Channel type	Yes, with software status		
Electrical isolation			
Channel - Bus	Yes		
Channel - Channel	No		
Power consumption			
Bus	0.01 W		
I/O internal	1.5 W		
Certification	CE, C-UL-US, GOST-R		
Operational conditions		X20AI4632	
Operating temperature			
Horizontal installation	0°C to +55°C		
Vertical installation	0°C to +50°C		
Relative humidity	5 to 95%, non-condensing		
Mounting orientation	Horizontal or vertical		
Installation at altitudes above sea level			
0 - 2000 m	No derating		
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m		
Protection type	IP20		
Storage and transport conditions		X20AI4632	
Temperature	-25°C to +70°C		
Relative humidity	5 to 95%, non-condensing		
Mechanical characteristics		X20AI4632	
Spacing	12.5 ^{+0.2} mm		
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately		

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Analog input module

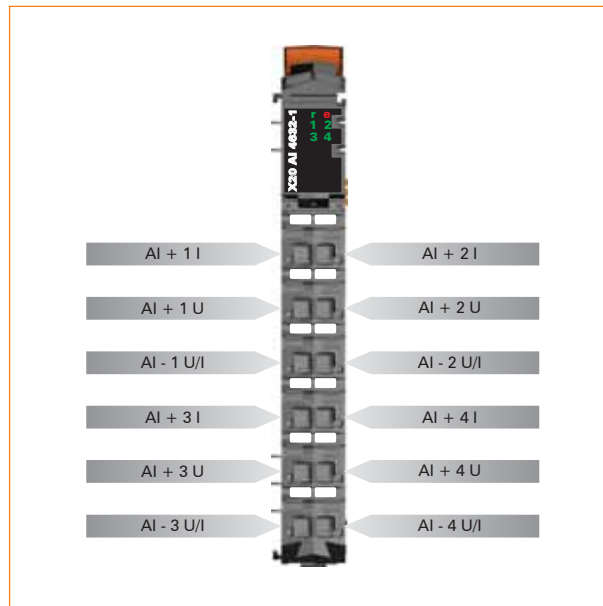
AI4632-1



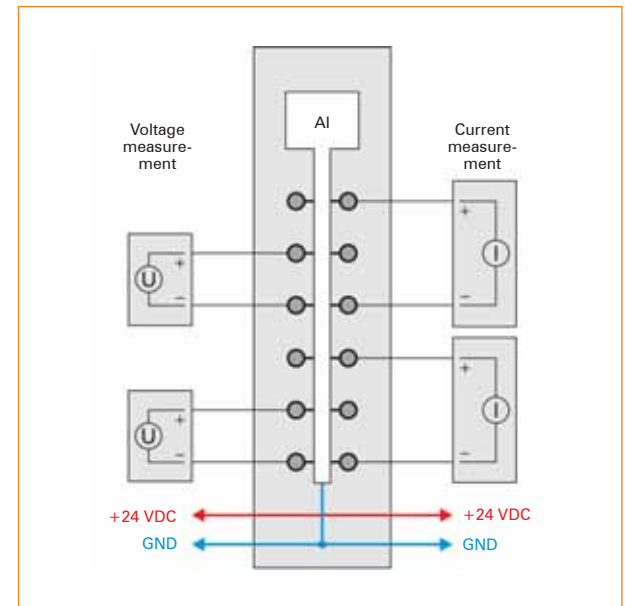
- 4 analog inputs
- Either current or voltage signal
- 16-bit digital converter resolution
- Simultaneous conversion of the inputs
- Very fast conversion time

Short description		X20AI4632-1	
I/O module	4 analog inputs, ± 11 V or 0 to 22 mA		
Analog inputs		Voltage	Current
Input	± 11 V or 0 to 22 mA, using different connection terminal points		
Input type	Differential input		
Digital converter resolution	± 15 -bit	15-bit	
Conversion time	50 μ s for all inputs		
Output format	UINT		
Input impedance in signal range	20 M Ω	-	
Load	-	< 400 Ω	
Maximum error at 25°C			
Gain	0.08% ¹⁾	0.08% ¹⁾	
Offset	0.01% ²⁾	0.02% ³⁾	
Input protection	Protection against wiring with supply voltage		
1) Based on the current measurement value.			
2) Refers to the 22 V measurement range.			
3) Refers to the 22 mA measurement range.			
General information		X20AI4632-1	
Status indicators	I/O function per channel, operating state, module status		
Diagnostics			
Module run/error	Yes, with status LED and software status		
Inputs	Yes, with status LED and software status		
Channel type	Yes, with software status		
Electrical isolation			
Channel - Bus	Yes		
Channel - Channel	No		
Power consumption			
Bus	0.01 W		
I/O internal	1.5 W		
Certification	CE, C-UL-US, GOST-R		
Operational conditions		X20AI4632-1	
Operating temperature			
Horizontal installation	0°C to +55°C		
Vertical installation	0°C to +50°C		
Relative humidity	5 to 95%, non-condensing		
Mounting orientation	Horizontal or vertical		
Installation at altitudes above sea level			
0 - 2000 m	No derating		
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m		
Protection type	IP20		
Storage and transport conditions		X20AI4632-1	
Temperature	-25°C to +70°C		
Relative humidity	5 to 95%, non-condensing		
Mechanical characteristics		X20AI4632-1	
Spacing	12.5 ^{+0.2} mm		
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately		

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Analog output module AO2622

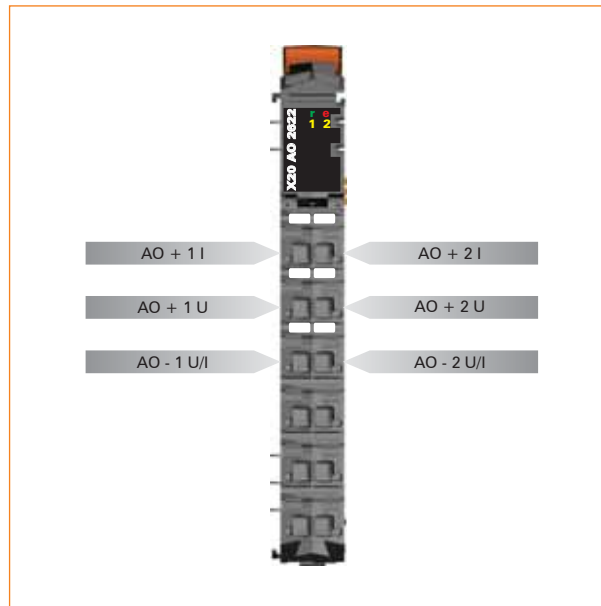


- 2 analog outputs
- Either current or voltage signal
- 12-bit digital converter resolution

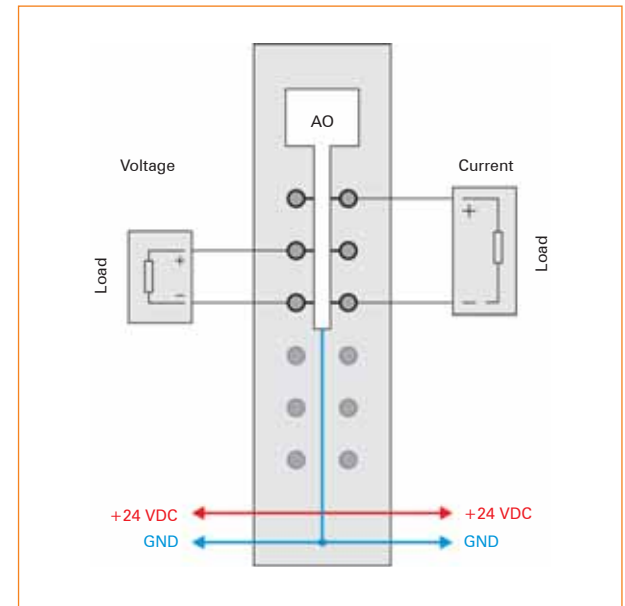
Short description	X20AO2622
I/O module	2 analog outputs, ± 10 V or 0 to 20 mA
Analog outputs	X20AO2622
Output	± 10 V or 0 to 20 mA, using different connection terminal points
Digital converter resolution	12-bit
Conversion time	200 μ s for all outputs
Power on/off behavior	Internal enable relay for boot procedure and errors
Maximum error at 25°C	
Gain	0.15%, based on the current output value
Offset	0.05%, based on the entire output range
Output protection	Short circuit protection
General information	X20AO2622
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Channel type	Yes, with software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.01 W
I/O internal	1.1 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20AO2622
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20AO2622
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20AO2622
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB06 or X20TB12 separately Order bus module 1x X20BM11 separately

The module is designed for X20 6-pin terminal blocks. However, the 12-pin terminal block can also be used.

Pin assignments



Connection example



Required accessories

X20TB06	X20 terminal block, 6-pin, 24 V coded	94
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Analog output module AO2632

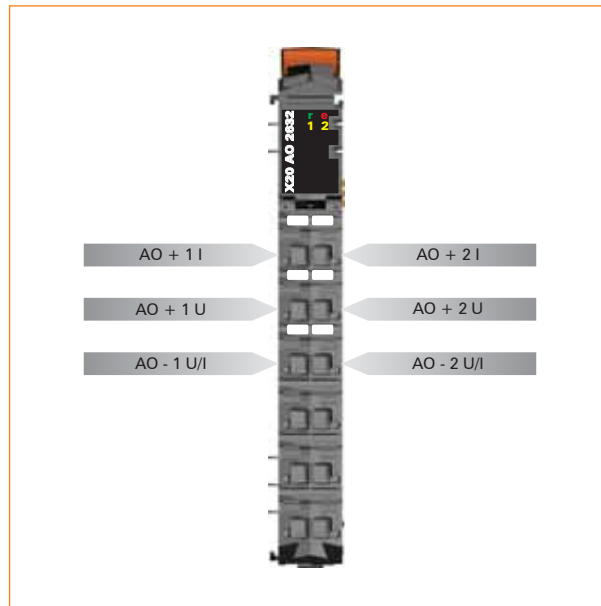


- 2 analog outputs
- Either current or voltage signal
- 16-bit digital converter resolution

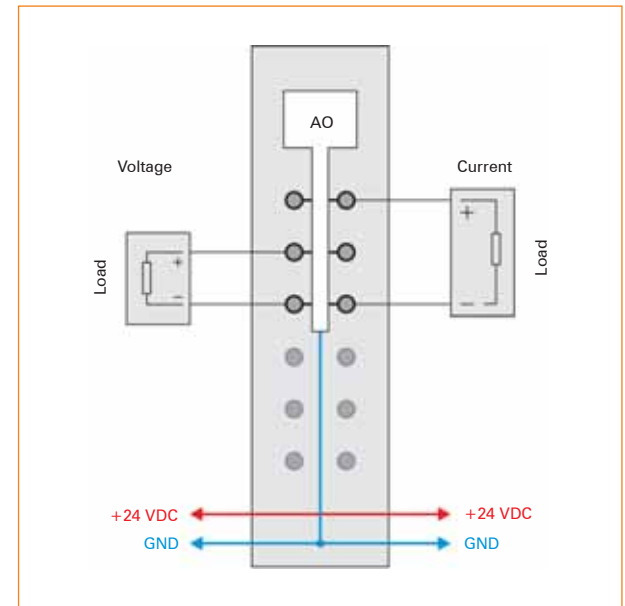
Short description	X20AO2632	
I/O module	2 analog outputs, ± 10 V or 0 to 20 mA	
Analog outputs	X20AO2632	
Output	± 10 V or 0 to 20 mA, using different connection terminal points	
Digital converter resolution	16-bit	
Conversion time	50 μ s for all outputs	
Power on/off behavior	Internal enable relay for boot procedure and errors	
Maximum error at 25°C		
Gain	0.045%, based on the current output value	
Offset	0.025%, based on the entire output range	
Output protection	Short circuit protection	
General information	X20AO2632	
Status indicators	I/O function per channel, operating state, module status	
Diagnostics		
Module run/error	Yes, with status LED and software status	
Channel type	Yes, with software status	
Electrical isolation		
Channel - Bus	Yes	
Channel - Channel	No	
Power consumption	Rev. <B0	Rev. \geq B0
Bus	0.01 W	0.01 W
I/O internal	1.6 W	1.2 W
Certification	CE, C-UL-US, GOST-R	
Operational conditions	X20AO2632	
Operating temperature	Rev. <B0	Rev. \geq B0
Horizontal installation	0°C to +50°C	0°C to +55°C
Vertical installation	0°C to +45°C	0°C to +50°C
Relative humidity	5 to 95%, non-condensing	
Mounting orientation	Horizontal or vertical	
Installation at altitudes above sea level		
0 - 2000 m	No derating	
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m	
Protection type	IP20	
Storage and transport conditions	X20AO2632	
Temperature	-25°C to +70°C	
Relative humidity	5 to 95%, non-condensing	
Mechanical characteristics	X20AO2632	
Spacing	12.5 ^{+0.2} mm	
Comment	Order terminal block 1x X20TB06 or X20TB12 separately Order bus module 1x X20BM11 separately	

The module is designed for X20 6-pin terminal blocks. However, the 12-pin terminal block can also be used.

Pin assignments



Connection example



Required accessories

X20TB06	X20 terminal block, 6-pin, 24 V coded	94
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

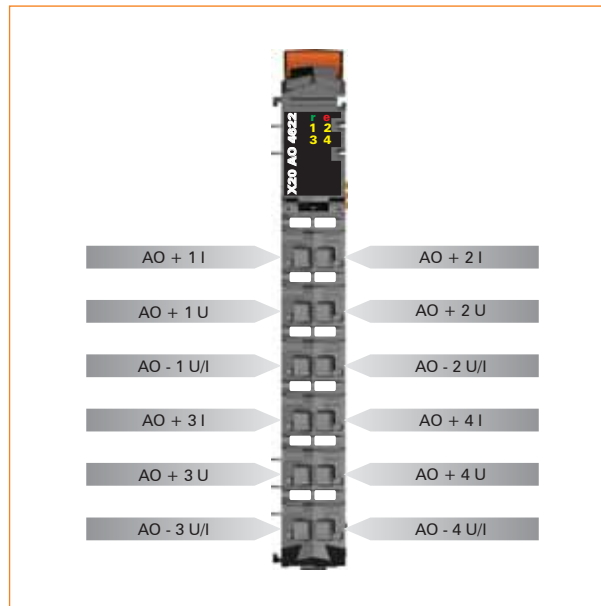
Analog output module AO4622



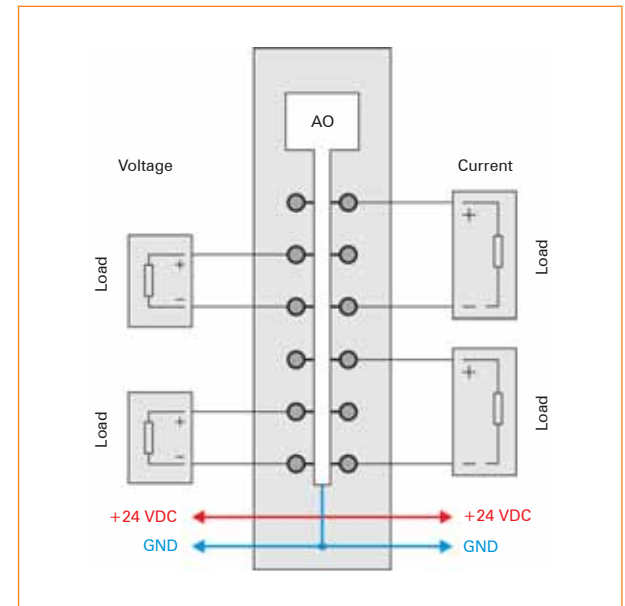
- 4 analog outputs
- Either current or voltage signal
- 12-bit digital converter resolution

Short description	X20AO4622
I/O module	4 analog outputs, ± 10 V or 0 to 20 mA
Analog outputs	X20AO4622
Output	± 10 V or 0 to 20 mA, using different connection terminal points
Digital converter resolution	12-bit
Conversion time	300 μ s for all outputs
Power on/off behavior	Internal enable relay for boot procedure and errors
Maximum error at 25°C	
Gain	0.080%, based on the current output value
Offset	0.050%, based on the entire output range
Output protection	Short circuit protection
General information	X20AO4622
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Channel type	Yes, with software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.01 W
I/O internal	1.5 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20AO4622
Operating temperature ¹⁾	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +45°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
1) See notes regarding derating and mixed operation in the module data sheet.	
Storage and transport conditions	X20AO4622
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20AO4622
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

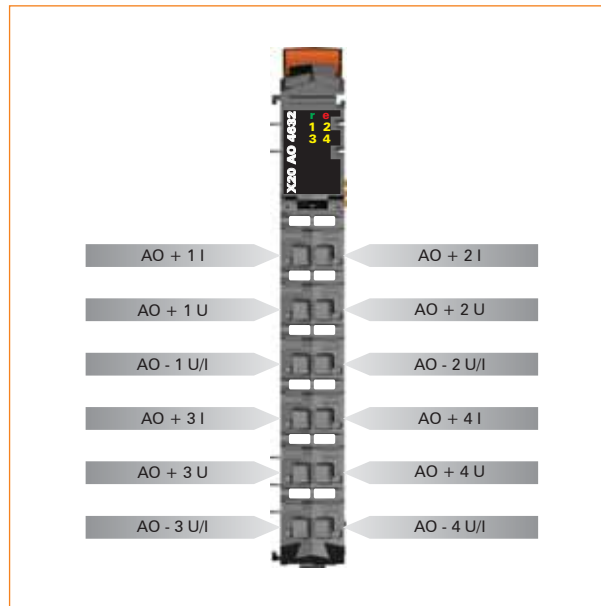
Analog output module AO4632



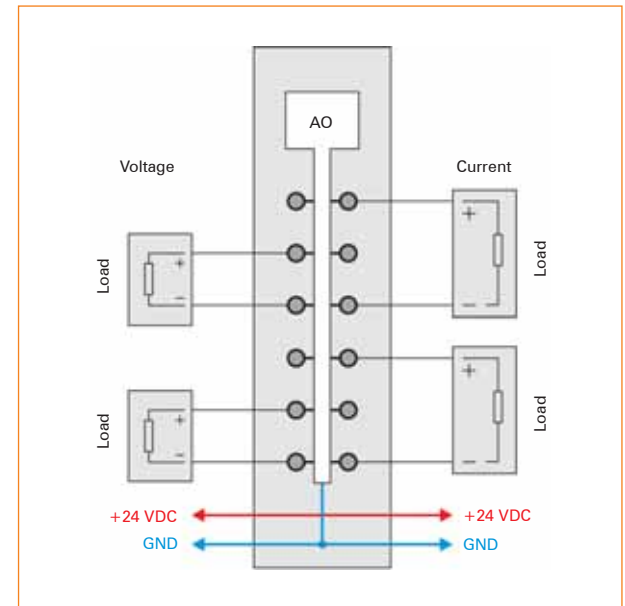
- 4 analog outputs
- Either current or voltage signal
- 16-bit digital converter resolution

Short description	X20AO4632	
I/O module	4 analog outputs, ± 10 V or 0 to 20 mA	
Analog outputs	X20AO4632	
Output	± 10 V or 0 to 20 mA, using different connection terminal points	
Digital converter resolution	16-bit	
Conversion time	50 μ s for all outputs	
Power on/off behavior	Internal enable relay for boot procedure and errors	
Maximum error at 25°C		
Gain	0.040%, based on the current output value	
Offset	0.022%, based on the entire output range	
Output protection	Short circuit protection	
General information	X20AO4632	
Status indicators	I/O function per channel, operating state, module status	
Diagnostics		
Module run/error	Yes, with status LED and software status	
Channel type	Yes, with software status	
Electrical isolation		
Channel - Bus	Yes	
Channel - Channel	No	
Power consumption	Rev. <B0	Rev. \geq B0
Bus	0.01 W	0.01 W
I/O internal	2.0 W	1.5 W
Certification	CE, C-UL-US, GOST-R	
Operational conditions	X20AO4632	
Operating temperature	Rev. <B0	Rev. \geq B0 ¹⁾
Horizontal installation	0°C to +45°C	0°C to +55°C
Vertical installation	0°C to +40°C	0°C to +45°C
Relative humidity	5 to 95%, non-condensing	
Mounting orientation	Horizontal or vertical	
Installation at altitudes above sea level		
0 - 2000 m	No derating	
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m	
Protection type	IP20	
1) See notes regarding derating and mixed operation in the module data sheet.		
Storage and transport conditions	X20AO4632	
Temperature	-25°C to +70°C	
Relative humidity	5 to 95%, non-condensing	
Mechanical characteristics	X20AO4632	
Spacing	12.5 ^{+0.2} mm	
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately	

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Temperature module AT2222

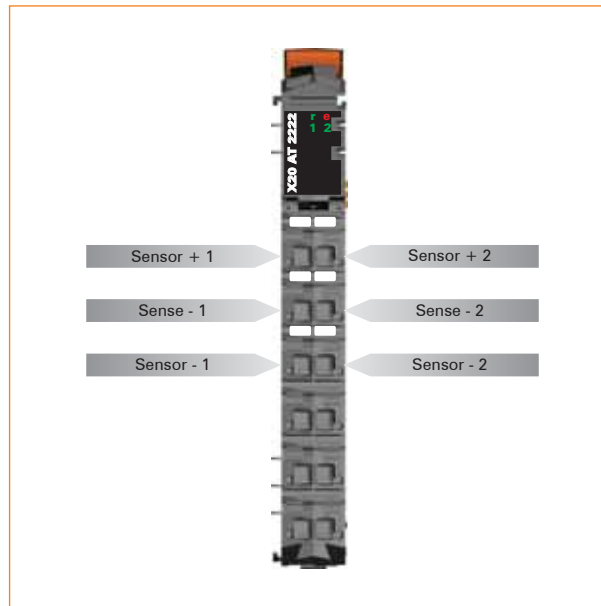


- 2 inputs for resistance temperature measurement
- For PT100 and PT1000
- Sensor type can be set for each channel
- Direct resistance measurement
- 2 or 3-line connection can be configured for each module
- Filter time can be configured

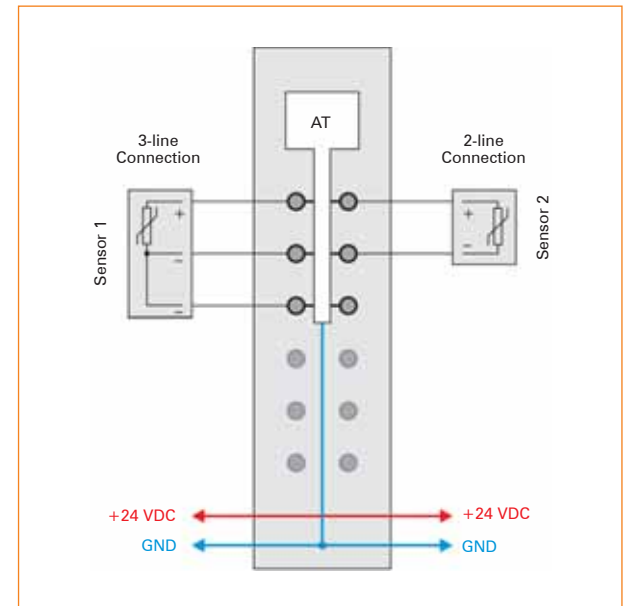
Short description	X20AT2222
I/O module	2 inputs for PT100 or PT1000 resistance temperature measurement
Temperature inputs resistance measurement	X20AT2222
Input	Resistance measurement with constant current supply for 2 or 3-wire connections
Digital converter resolution	16-bit
Filter time	Configurable between 1 ms and 66.7 ms
Conversion time	
1 channel	20 ms at 50 Hz filter
2 channels	80 ms at 50 Hz filter
Output format	INT or UINT for resistance measurement
Maximum error at 25°C	
Gain	0.037%, based on the current resistance value
Offset	0.0015%, based on the entire resistance range
Sensor	Can be set per channel
PT100	-200°C to +850°C
PT1000	-200°C to +850°C
Resistance measurement range	0.1 Ω to 4500 Ω / 0.05 Ω to 2250 Ω
General information	X20AT2222
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Inputs	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.01 W
I/O internal	1.1 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20AT2222
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20AT2222
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20AT2222
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB06 or X20TB12 separately Order bus module 1x X20BM11 separately

The module is designed for X20 6-pin terminal blocks. However, the 12-pin terminal block can also be used.

Pin assignments



Connection example



Required accessories

X20TB06	X20 terminal block, 6-pin, 24 V coded	94
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

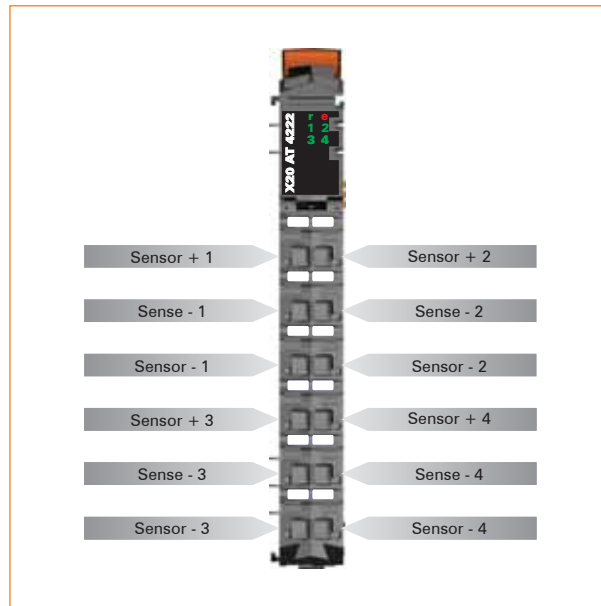
Temperature module AT4222



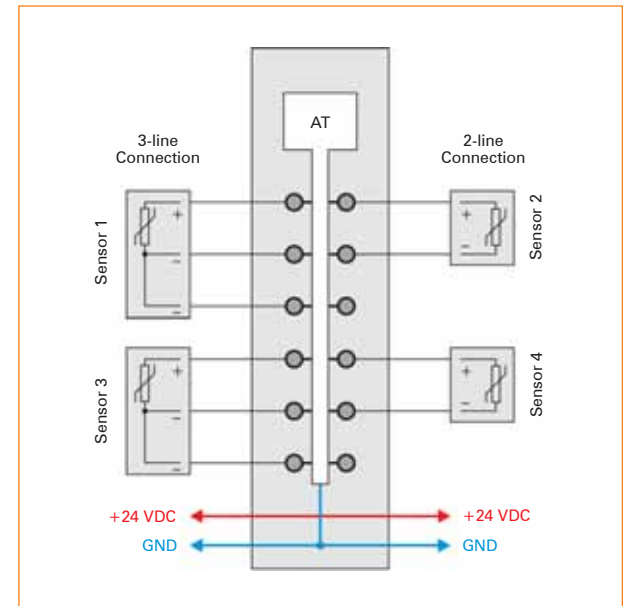
- 4 inputs for resistance temperature measurement
- For PT100 and PT1000
- Sensor type can be set for each channel
- Direct resistance measurement
- 2 or 3-line connection can be configured for each module
- Filter time can be configured

Short description	X20AT4222
I/O module	4 inputs for PT100 or PT1000 resistance temperature measurement
Temperature inputs resistance measurement	X20AT4222
Input	Resistance measurement with constant current supply for 2 or 3-wire connections
Digital converter resolution	16-bit
Filter time	Configurable between 1 ms and 66.7 ms
Conversion time	
1 channel	20 ms at 50 Hz filter
2 - 4 channels	40 ms per channel with 50 Hz filter
Output format	INT or UINT for resistance measurement
Maximum error at 25°C	
Gain	0.037%, based on the current resistance value
Offset	0.0015%, based on the entire resistance range
Sensor	Can be set per channel
PT100	-200°C to +850°C
PT1000	-200°C to +850°C
Resistance measurement range	0.1 Ω to 4500 Ω / 0.05 Ω to 2250 Ω
General information	X20AT4222
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Inputs	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.01 W
I/O internal	1.1 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20AT4222
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20AT4222
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20AT4222
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

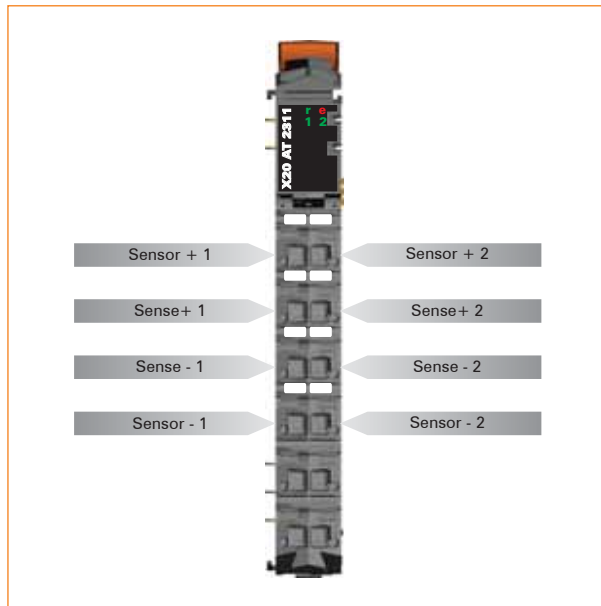
Temperature module AT2311



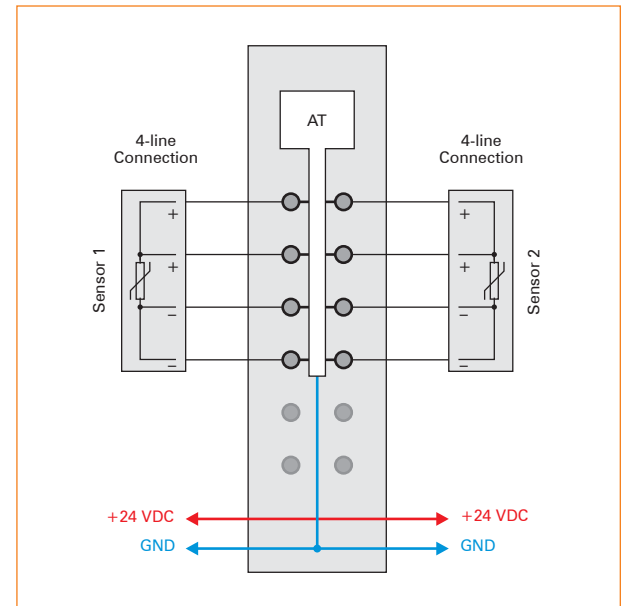
- 2 inputs for resistance temperature measurement
- PT100 sensor
- Direct resistance measurement
- 4-line measurement
- Filter time can be configured

Short description	X20AT2311
I/O module	2 inputs for PT100 resistance temperature measurement
Temperature inputs resistance measurement	X20AT2311
Input	Resistance measurement with constant current supply for 4 wire connection
Digital converter resolution	24-bit
Filter time	Configurable between 1 ms and 400 ms
Conversion time	
50 Hz filter	20 ms for all inputs
1000 Hz filter	1 ms for all inputs
Output format	DINT or UDINT for resistance measurement
Maximum error at 25°C	
Gain	0.0059%, based on the current resistance value
Offset	0.0015%, based on the entire resistance range
Temperature measurement range	-200°C to +850°C
Resistance measurement range	0.5 Ω to 390 Ω
General information	X20AT2311
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Inputs	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	Yes
Power consumption	
Bus	0.35 W
I/O internal	0.85 W
Certification	CE, C-UL-US (in development), GOST-R
Operational conditions	X20AT2311
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20AT2311
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20AT2311
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Temperature module AT2402



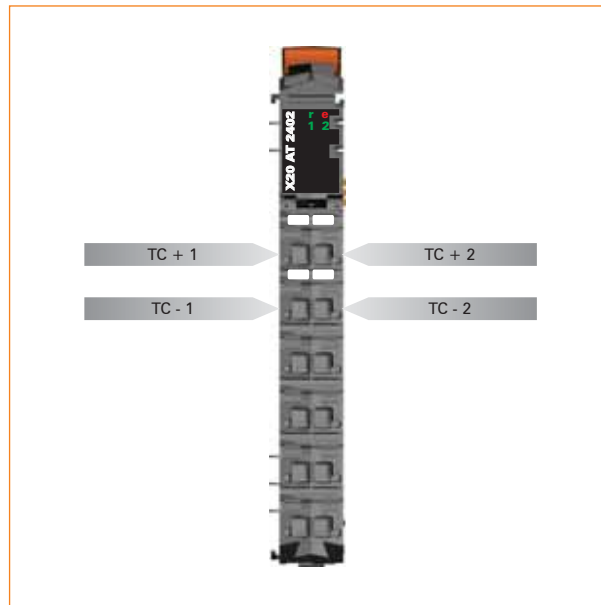
- 2 inputs for thermocouples
- For sensor types J, K, N, S
- Additional direct raw value measurement
- Integrated terminal temperature compensation
- Filter time can be configured

Short description	X20AT2402
I/O module	2 inputs for thermocouples
Thermocouple temperature inputs	X20AT2402
Input	Thermocouple
Digital converter resolution	16-bit
Filter time	Configurable between 1 ms and 66.7 ms
Conversion time	
1 channel	80.4 ms at 50 Hz filter
2 channels	120.6 ms at 50 Hz filter
Output format	UINT
Basic accuracy	
Type J	±0.10% at 25°C ¹⁾
Type K	±0.11% at 25°C ¹⁾
Type N (Rev. ≥D0)	±0.11% at 25°C ¹⁾
Type S	±0.17% at 25°C ¹⁾
Measurement area	
Sensor temperature	
FeCuNi: Type J	-210°C to +1200°C
NiCrNi: Type K	-270°C to +1372°C
NiCrSi: Type N (Rev. ≥D0)	-270°C to +1300°C
PtRhPt: Type S	-50°C to +1768°C
Terminal temperature	-25°C to +85°C
Raw value	±65.534 mV
Terminal temperature compensation	Internal
<small>1) Refers to the measurement range without consideration of the reference junction measurement error</small>	
General information	X20AT2402
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Inputs	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.01 W
I/O internal	0.72 W
Certification	CE, C-UL-US, GOST-R

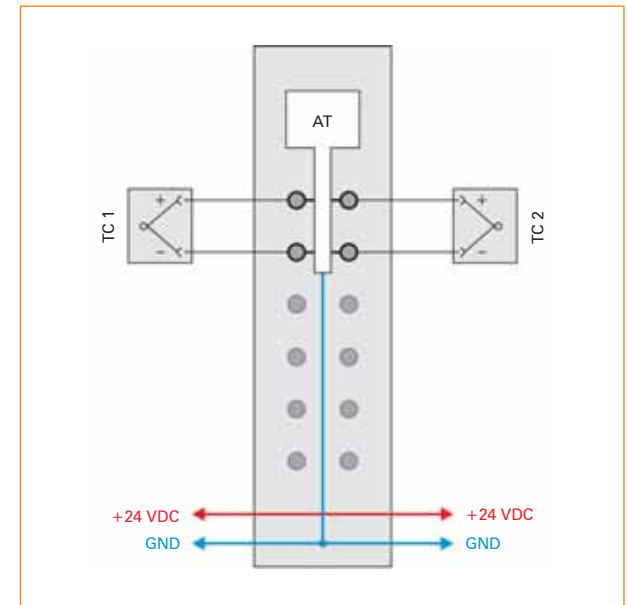
The module is designed for X20 6-pin terminal blocks. However, the 12-pin terminal block can also be used.

Operational conditions		X20AT2402
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20AT2402
Temperature		
		-25°C to +70°C
Relative humidity		
		5 to 95%, non-condensing
Mechanical characteristics		X20AT2402
Spacing		
		12.5 ^{+0.2} mm
Comment		
		Order terminal block 1x X20TB06 or X20TB12 separately
		Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories		
X20TB06	X20 terminal block, 6-pin, 24 V coded	94
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Temperature module AT6402

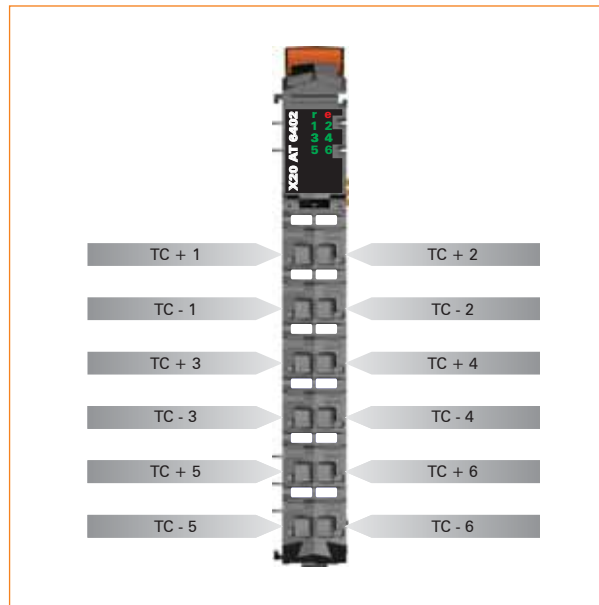


- 6 inputs for thermocouples
- For sensor types J, K, N, S
- Additional direct raw value measurement
- Integrated terminal temperature compensation
- Filter time can be configured

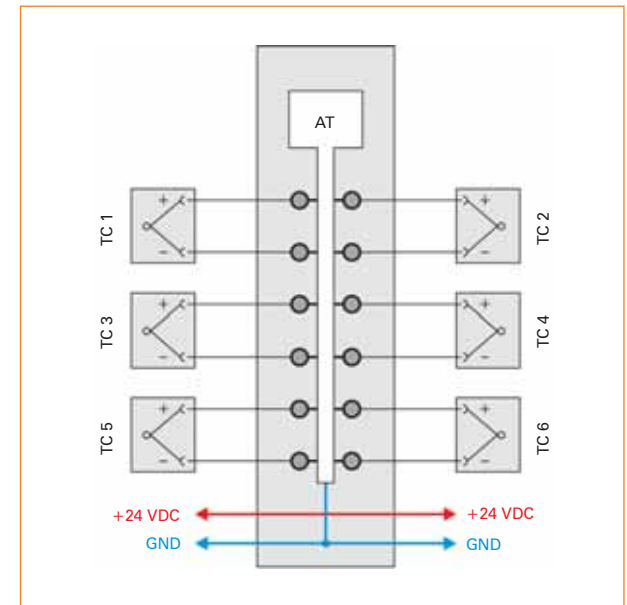
Short description	X20AT6402
I/O module	6 inputs for thermocouples
Thermocouple temperature inputs	X20AT6402
Input	Thermocouple
Digital converter resolution	16-bit
Filter time	Configurable between 1 ms and 66.7 ms
Conversion time	
1 channel	80.4 ms at 50 Hz filter
n channels	(n + 1) x 40.2 ms at 50 Hz filter
Output format	UINT
Basic accuracy	
Type J	±0.10% at 25°C ¹⁾
Type K	±0.11% at 25°C ¹⁾
Type N (Rev. ≥D0)	±0.11% at 25°C ¹⁾
Type S	±0.17% at 25°C ¹⁾
Measurement area	
Sensor temperature	
FeCuNi: Type J	-210°C to +1200°C
NiCrNi: Type K	-270°C to +1372°C
NiCrSi: Type N (Rev. ≥D0)	-270°C to +1300°C
PtRhPt: Type S	-50°C to +1768°C
Terminal temperature	-25°C to +85°C
Raw value	±65.534 mV
Terminal temperature compensation	Internal
<small>1) Refers to the measurement range without consideration of the reference junction measurement error</small>	
General information	X20AT6402
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Inputs	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.01 W
I/O internal	0.91 W
Certification	CE, C-UL-US, GOST-R

Operational conditions		X20AT6402
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20AT6402
Temperature		
		-25°C to +70°C
Relative humidity		5 to 95%, non-condensing
Mechanical characteristics		X20AT6402
Spacing		
		12.5 ^{+0.2} mm
Comment		
		Order terminal block 1x X20TB12 separately
		Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories		
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

PWM motor bridge MM2436



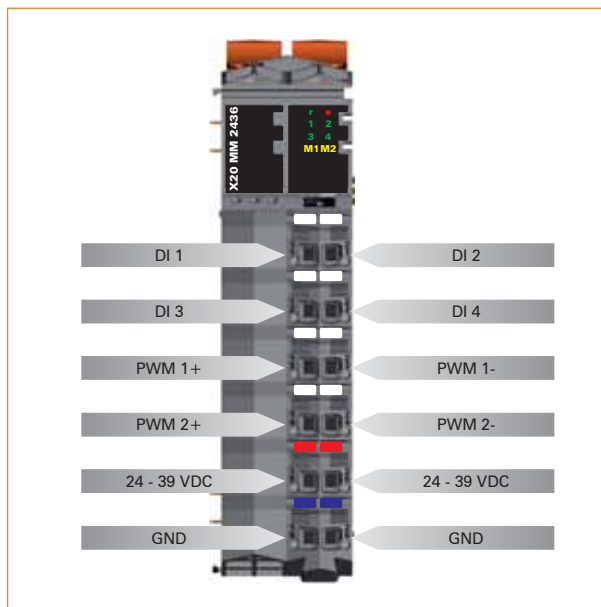
The MM2436 PWM module can be used in many different ways. One use is the control of DC motors in the middle power range. The module can drive two single-phase brush-type DC motors. The module is designed for a rated voltage of 24 VDC to 39 VDC $\pm 25\%$ at a rated current of 3 A (maximum current 3.5 A for 2 s).

- Controlling motors, valves and resistive loads
- Two outputs for constant current or PWM
- Adjustable dither
- Four inputs for digital input signals or for two AB encoders
- Power feed integrated in the module

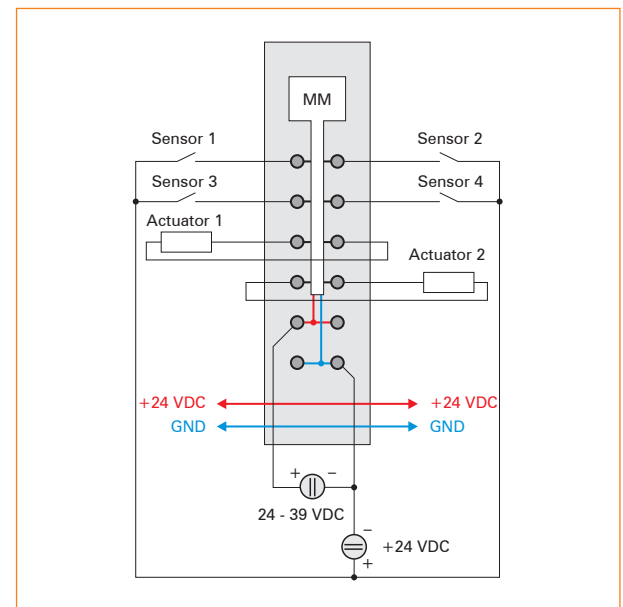
Short description	X20MM2436
I/O module	2-channel PWM motor bridge, 2 AB incremental encoders
Digital inputs	X20MM2436
Number of channels	4
Rated voltage	24 VDC
Input filter	
Hardware	< 5 μ s
Software	-
Connection type	1-line connections
Input circuit	Sink
Additional functions for inputs	2x AB incremental encoder
AB incremental encoders	X20MM2436
Amount	2
Encoder inputs	24 V, asymmetrical
Counter size	16-bit
Input frequency (max.)	50 kHz
Evaluation	4x
PWM output	X20MM2436
Amount	2
Rated voltage	24 VDC - 39 VDC ($\pm 25\%$)
Rated current	3.0 A
Maximum current	3.5 A (2 s)
PWM frequency	15 Hz - 50 kHz
Output protection	No reverse polarity protection for supply voltage
General information	X20MM2436
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Output	Yes, with status LED and software status
I/O supply	Yes, with software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.01 W
I/O internal	-
I/O external	
24 VDC	2.45 W
48 VDC	3.15 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20MM2436
Operating temperature	
Horizontal installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20

Storage and transport conditions	X20MM2436
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20MM2436
Spacing	25 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM31 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM31	X20 bus module for double-width modules, internal I/O supply is interconnected	92

PWM motor bridge MM4456

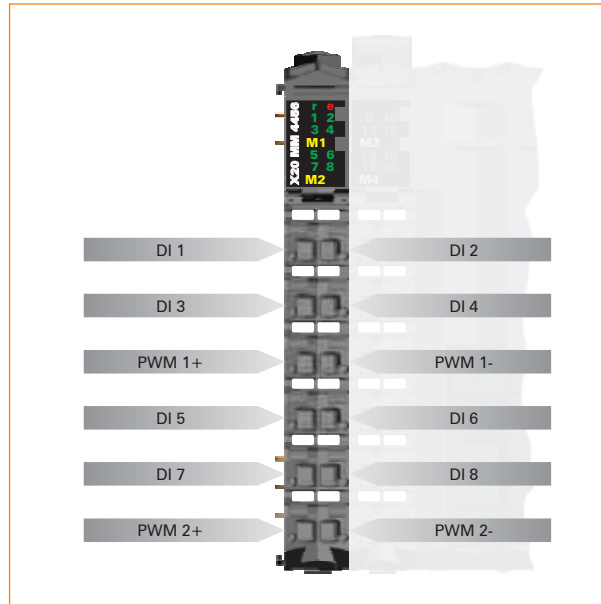


The MM4456 PWM module can be used in many different ways. One use is the control of DC motors in various power classes. The module can drive four single-phase brush-type DC motors. The module is designed for a rated voltage of 24 VDC to 48 VDC $\pm 25\%$ at a rated current of 6 A (maximum current 10 A for 2 s).

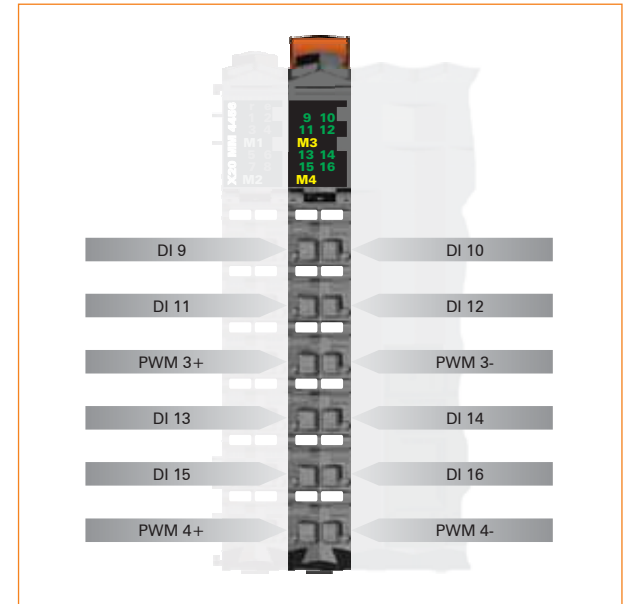
- Controlling motors, valves and resistive loads
- Four outputs for constant current or PWM
- Adjustable dither
- 16 inputs for digital input signals or for four AB encoders
- Power feed integrated in the module

Short description	X20MM4456
I/O module	4-channel PWM motor bridges, 16 digital inputs, special functions
Digital inputs	X20MM4456
Number of channels	16
Rated voltage	24 VDC
Input filter	
Hardware	< 5 μ s
Software	-
Connection type	1-line connections
Input circuit	Sink
Additional functions for inputs	4x ABR incremental encoder
ABR incremental encoder	X20MM4456
Amount	4
Encoder inputs	24 V, asymmetrical
Counter size	16-bit
Input frequency (max.)	50 kHz
Evaluation	4x
PWM output	X20MM4456
Amount	4
Rated voltage	24 VDC - 48 VDC ($\pm 25\%$)
Rated current	6.0 A
Maximum current	10 A (2 s)
PWM frequency	15 Hz - 50 kHz
Output protection	No reverse polarity protection for supply voltage
General information	X20MM4456
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Output	Yes, with status LED and software status
I/O supply	Yes, with software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.01 W
I/O internal	2.0 W
I/O external	
24 VDC	0.01 W
48 VDC	0.01 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20MM4456
Operating temperature	
Horizontal installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20MM4456
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20MM4456
Spacing	87.5 $^{+0.2}$ mm
Comment	Order terminal block 2x X20TB12 separately Order terminal block 1x 0TB3103-7020 separately

Pin assignments for DI 1 - 8 / PWM 1 + 2



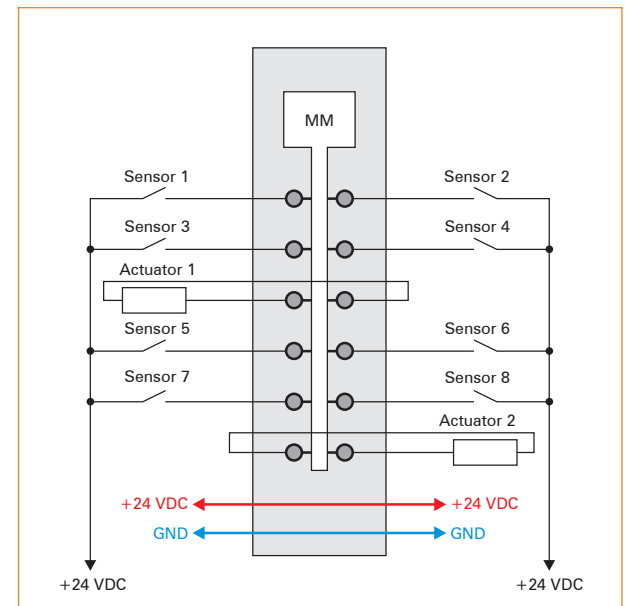
Pin assignments for DI 9 - 16 / PWM 3 + 4



Pin assignments for module supply



Connection example for X1 terminal block



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
OTB3103-7020	Accessory terminal block, 3-pin, screw clamp 6 mm ²	678

Stepper motor module SM1426



The stepper motor module SM1426 is used for controlling a stepper motor with a rated voltage of 24 VDC at a motor rated current of 1 A (maximum current 1.2 A for 2 s).

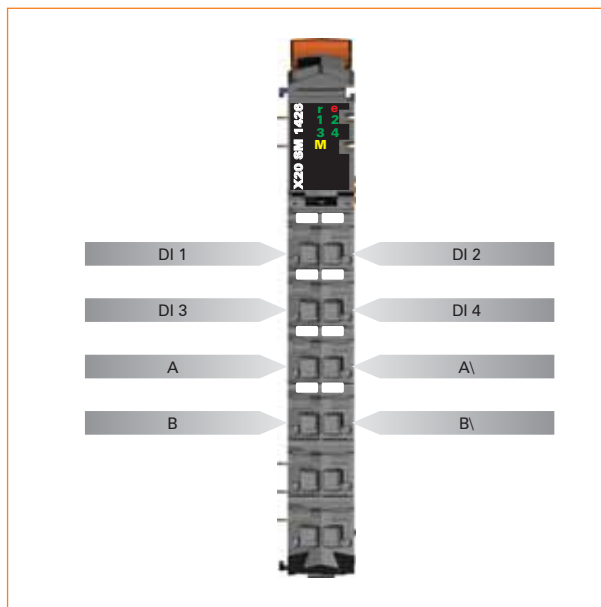
The module can resolve each full step into up to 256 microsteps. The module always carries out the maximum number of microsteps possible at a particular step frequency. On the one hand this increases the positioning precision, and on the other it makes operation much smoother. This considerably reduces the resonance effects common to stepper motors.

- Stepper motor control for motors with 24 VDC and 1 A (max. 1.2 A for 2 s)
- 256 microsteps per step
- Four inputs for limit switches or ABR incremental encoder
- Holding, boost and continuous current can be defined independent of one another
- Automatic motor detection
- Stall detection

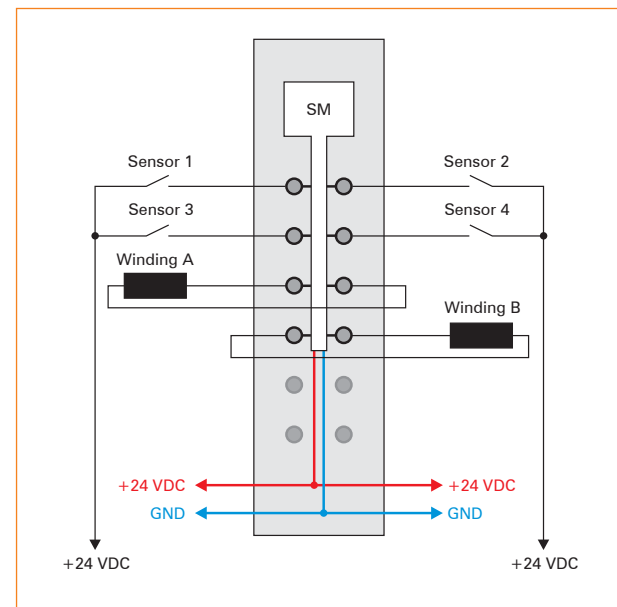
Short description	X20SM1426
I/O module	1 full bridge for controlling stepper motors
Digital inputs	X20SM1426
Number of channels	4
Rated voltage	24 VDC
Input filter	
Hardware	< 5 μ s
Software	-
Connection type	1-line connections
Input circuit	Sink
Additional functions for inputs	1x ABR incremental encoder
ABR incremental encoder	X20SM1426
Amount	1
Encoder inputs	24 V, asymmetrical
Counter size	16-bit
Input frequency (max.)	50 kHz
Evaluation	4x
Motor bridge - power element	X20SM1426
Amount	1
Rated voltage	24 VDC
Rated current	1.0 A
Maximum current	1.2 A (2 s)
Controller frequency	38.4 kHz
Step resolution	Max. 256 microsteps per step
General information	X20SM1426
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Output	Yes, with status LED and software status
I/O supply	Yes, with software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.01 W
I/O internal	1.8 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20SM1426
Operating temperature	
Horizontal installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20

Storage and transport conditions		X20SM1426
Temperature	-25°C to +70°C	
Relative humidity	5 to 95%, non-condensing	
Mechanical characteristics		X20SM1426
Spacing	12.5 ^{+0.2} mm	
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately	

Pin assignments



Connection example



Required accessories		
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Stepper motor module SM1436



The stepper motor module SM1436 is used for controlling a stepper motor with a rated voltage of 24 VDC to 39 VDC $\pm 25\%$ at a motor rated current of 3 A (maximum current 3.5 A for 2 s). The module supply is fed directly to the module. An additional supply module is not needed.

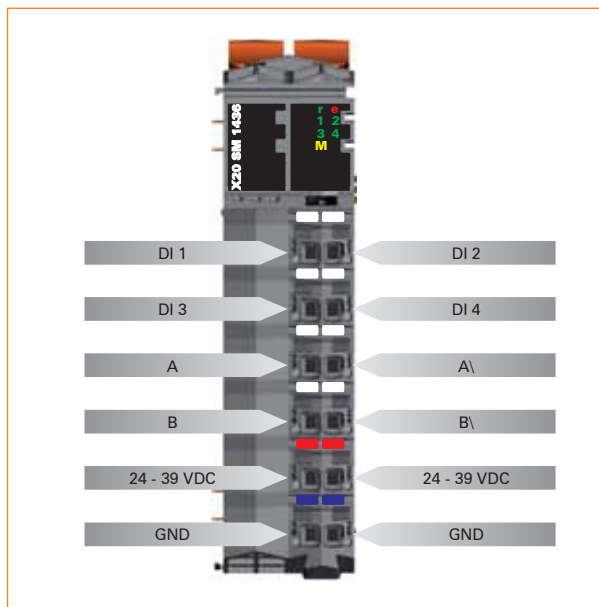
The module can resolve each full step into up to 256 microsteps. The module always carries out the maximum number of microsteps possible at a particular step frequency. On the one hand this increases the positioning precision, and on the other it makes operation much smoother. This considerably reduces the resonance effects common to stepper motors.

- Stepper motor control for motors with 24 VDC to 39 VDC $\pm 25\%$ and 3 A (max. 3.5 A for 2 s)
- 256 microsteps per step
- Four inputs for limit switches or ABR incremental encoder
- Holding, boost and continuous current can be defined independent of one another
- Automatic motor detection
- Stall detection
- Power feed integrated in the module

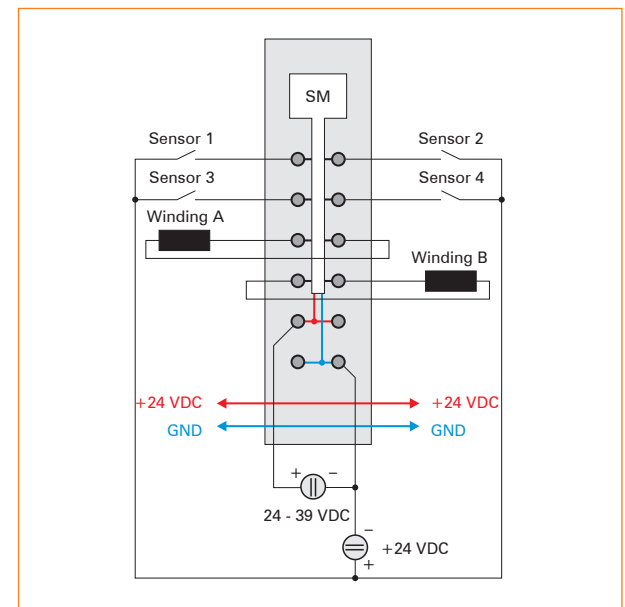
Short description	X20SM1436
I/O module	1 full bridge for controlling stepper motors
Digital inputs	X20SM1436
Number of channels	4
Rated voltage	24 VDC
Input filter	
Hardware	< 5 μ s
Software	-
Connection type	1-line connections
Input circuit	Sink
Additional functions for inputs	1x ABR incremental encoder
ABR incremental encoder	X20SM1436
Amount	1
Encoder inputs	24 V, asymmetrical
Counter size	16-bit
Input frequency (max.)	50 kHz
Evaluation	4x
Motor bridge - power element	X20SM1436
Amount	1
Rated voltage	24 VDC - 39 VDC ($\pm 25\%$)
Rated current	3.0 A
Maximum current	3.5 A (2 s)
Controller frequency	38.4 kHz
Step resolution	Max. 256 microsteps per step
Output protection	No reverse polarity protection for supply voltage
General information	X20SM1436
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Output	Yes, with status LED and software status
I/O supply	Yes, with software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.01 W
I/O internal	-
I/O external	
24 VDC	2.45 W
48 VDC	3.15 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20SM1436
Operating temperature	
Horizontal installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20

Storage and transport conditions		X20SM1436
Temperature	-25°C to +70°C	
Relative humidity	5 to 95%, non-condensing	
Mechanical characteristics		X20SM1436
Spacing	25 ^{+0.2} mm	
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM31 separately	

Pin assignments

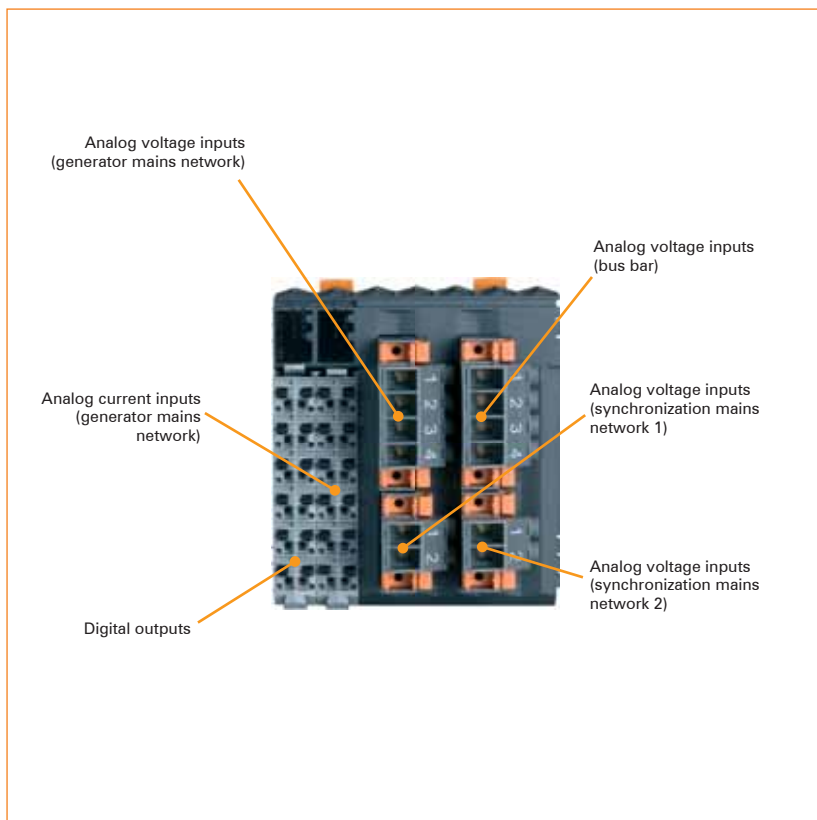


Connection example



Required accessories		
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM31	X20 bus module for double-width modules, internal I/O supply is interconnected	92

Multi-measurement transformer / synchronization module CM0985



Energy measurement and network synchronization

The CM0985 has a compact size and combines a power measurement module that has special features with a synchronization unit that is able to meet all demands.

- Energy measurement for 120 VAC to 480 VAC
- Simultaneous measurement of two AC networks plus two additional voltages
- For multifunctional measurement tasks
- Intelligent mains network synchronization unit

In the measurement unit, the three current inputs are suitable for both X:1 A and also X:5 A current transformers. The excellent overcurrent resistance as well as the high resolution of the measurement unit round off the features. For the voltage inputs, the value range can be configured between 480 VAC and 120 VAC.

The area of use includes 4-wire AC networks with a phase conductor voltage up to 480 VAC and 3-wire systems, whereas L2 can be grounded (V-connection). The module can also handle an Aron measuring circuit.

The resulting measurement values range from pure phase current and phase conductor/line voltage to active current, reactive current and apparent power components, mains frequency, power factor and much more. Additionally, peak values and work counters are saved on the module in nonvolatile memory. Depending on the configuration, a digital output with scalable rating can also be used as pulse encoder for an external energy counter.

The synchronization unit not only takes the phase position and phase voltage into consideration, built-in intelligence also takes the change speed and other parameters into consideration and allows them to influence the decision for switching the synchronization output. Monitoring of a generator is possible with a large number of additional conditions. A total of four voltage inputs provide the needed flexibility.

Monitoring functions extend the features of the module. Thermal overload protection is included, which uses the thermal capacity of the motor/generators to allow short overloads and still provides full protection. Unbalanced load monitoring, which is used to protect three-phase producers and three-phase networks from an unbalanced load, can be adjusted to the characteristics of different generator types using parameters while taking its special thermal time constants into consideration.

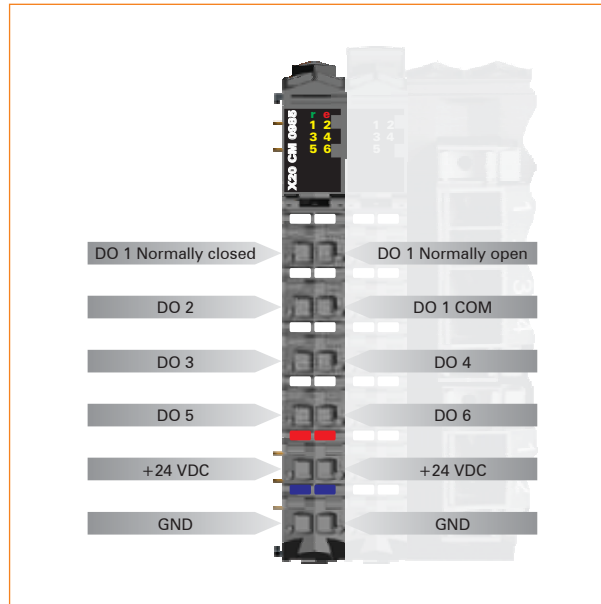


Short description	X20CM0985
I/O module	X20 energy measurement and mains network synchronization module
Digital outputs	X20CM0985
Channels	5
Rated voltage	24 VDC
Rated output current	0.1 A
Total current	0.5 A
Connection type	1-line connections
Output circuit	Source
Output protection	Overload protection, short circuit protection
Relay outputs	X20CM0985
Channels	1
Relay contacts	Max. 230 VAC / 0.5 A
Surge withstand capability of contacts	500 V
Analog inputs - voltage	X20CM0985
Channels	8
Input	$\pm 120 \text{ VAC} + 10\% / \pm 480 \text{ VAC} + 10\%$ (can be configured)
Digital converter resolution	16-bit
Output format	UINT
Input impedance	Approx. 3 M Ω
Input filter	
Limit frequency	10 kHz
Attenuation	60 dB
Basic accuracy	0.5% ¹⁾
1) Refers to the measurement range limit	
Analog inputs - current	X20CM0985
Channels	3
Input	$\pm 1 \text{ A} / \pm 5 \text{ A}$ (can be configured)
Digital converter resolution	16-bit
Output format	UINT
Input filter	
Limit frequency	10 kHz
Attenuation	60 dB
Basic accuracy	0.5% ¹⁾
Thermal over-current	$15 \times I_{\text{Rated}}$ for 0.2 s
Monitored over-current	$4 \times I_{\text{Rated}}$
1) Refers to the measurement range limit	
General information	X20CM0985
Status indicators	Channel status, operating status, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Digital outputs	Yes, with status LED and software status
Analog inputs	Yes, with status LED (measurement range of analog inputs)
Electrical isolation	
Bus inputs/outputs	Yes
Digital - Analog	Yes
Bus - I/O supply	Yes
Power consumption	
Bus	1.4 W
I/O internal	4 W
Certification	CE, C-UL-US, GOST-R

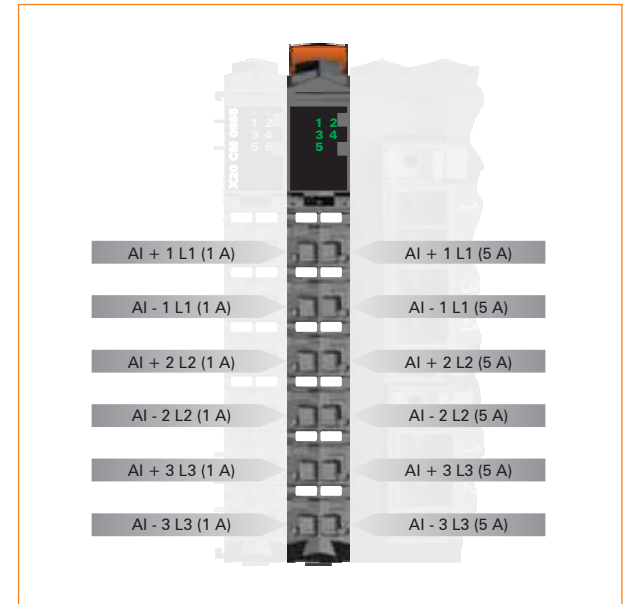
Multi-measurement transformer / synchronization module CM0985

Operational conditions	X20CM0985
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20CM0985
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20CM0985
Spacing	87.5 ^{+0.2} mm
Comment	Order terminal block 2x X20TB12 separately Order screw clamps 2x TB3102 and 2x TB3104 separately

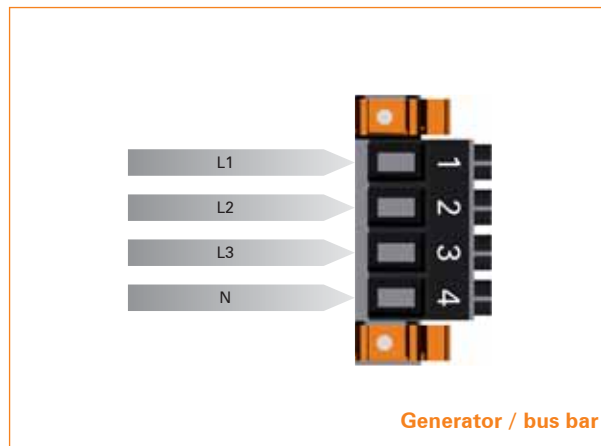
Digital outputs - Pin assignments



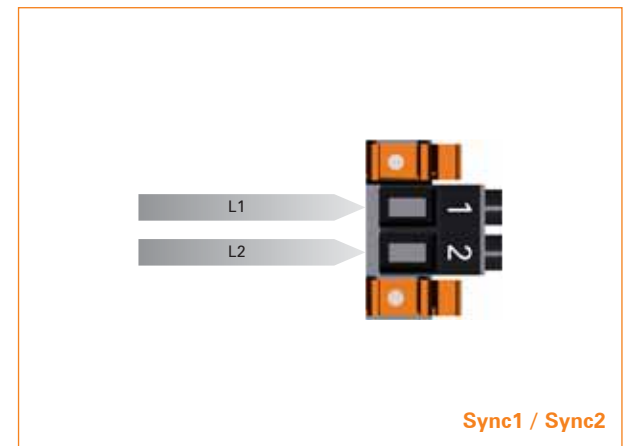
Analog current inputs - Pin assignments



Tension clamps X3 and X5 - Pin assignments



Tension clamps X4 and X6 - Pin assignments



Required accessories

0TB3102-7011	Accessory terminal block, 2-pin, A coded, screw clamp, 6 mm ²	676
0TB3102-7012	Accessory terminal block, 2-pin, B coded, screw clamp, 6 mm ²	676
0TB3104-7011	Accessory terminal block, 4-pin, A coded, screw clamp, 6 mm ²	679
0TB3104-7012	Accessory terminal block, 4-pin, B coded, screw clamp, 6 mm ²	679
X20TB12	X20 terminal block, 12-pin, 24 V coded	94

Combination module CM1201



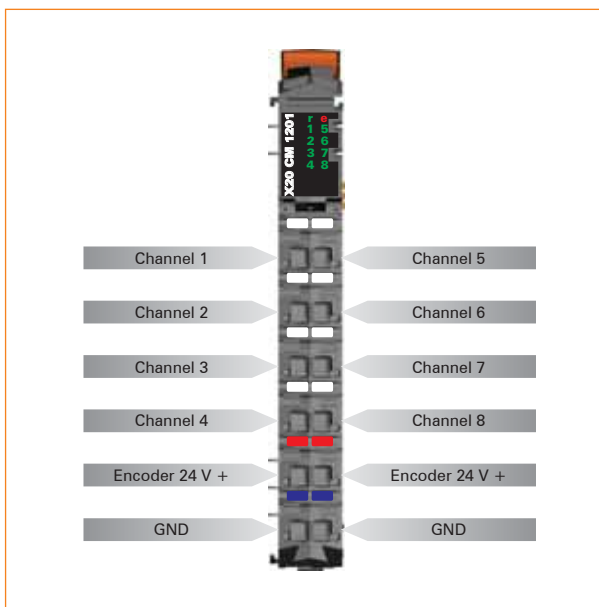
The CM1201 can be used to configure and carry out simple movements. For this purpose, the module has an AB encoder input and a total of eight digital channels. Four of them are inputs, and the other four can be set as either inputs or outputs. Various output bit patterns can be set easily in the module itself. The CM1201 is perfectly suited for easy to create drive control tasks for program and event controlled motor movements. Feed movements using drives with two speeds and forward/reverse movement are created easily and efficiently.

- Command dependent digital output patterns
- Counter dependent output switch
- Event controlled abort criteria
- 4 digital inputs
- 4 digital channels, can be configured as inputs or outputs

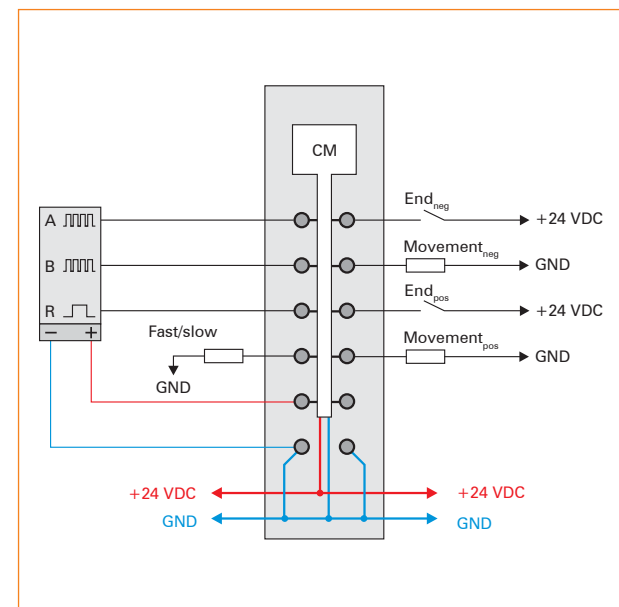
Short description	X20CM1201
I/O module	1 AB incremental encoder, 24 V, 4 digital inputs, 4 channels can be configured as inputs or outputs
AB incremental encoders	X20CM1201
Amount	1
Encoder inputs	24 V, asymmetrical
Counter size	32-bit
Input frequency (max.)	100 kHz
Evaluation	4x
Encoder supply	Module-internal, max. 600 mA
Digital inputs	X20CM1201
Amount	4 + 4 additional channels, can be configured as input or output
Rated voltage	24 VDC
Input filter	
Hardware	≤2 μs
Software	-
Connection type	1-line connections
Input circuit	Sink
Digital outputs	X20CM1201
Amount	Up to 4, configuration as input or output takes place using software
Rated voltage	24 VDC
Rated output current	0.1 A
Total current	0.4 A
Connection type	1-line connections
Output circuit	Sink or source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances
Actuator supply	Module-internal, max. 600 mA
General information	X20CM1201
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Outputs	Yes, with status LED and software status (output status)
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.01 W
I/O internal	1.5 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20CM1201
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20

Storage and transport conditions	X20CM1201
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20CM1201
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories		
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Universal mixed module CM8281



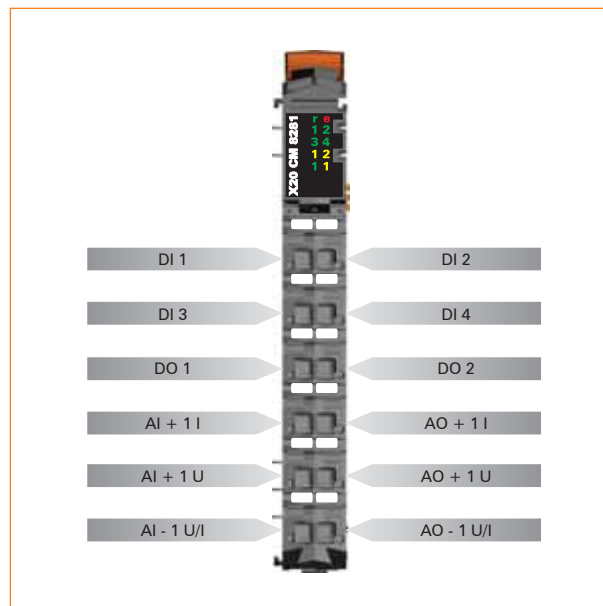
- Digital and analog channels
- Selectable current and voltage for AI and AO
- Counter functions

Short description	X20CM8281	
I/O module	4 digital inputs, 2 digital outputs, 1 analog input, 1 analog output, special functions	
Digital inputs	X20CM8281	
Number of channels	4	
Rated voltage	24 VDC	
Input filter		
Hardware	$\leq 2 \mu\text{s}$	
Software	Default 1 ms, can be configured between 0 and 25 ms in 0.2 ms intervals	
Connection type	1-line connections	
Input circuit	Sink	
Additional functions for inputs	20 kHz event counting, gate measurement	
Digital outputs	X20CM8281	
Number of channels	2	
Rated voltage	24 VDC	
Rated output current	0.5 A	
Total current	1.0 A	
Connection type	1-line connections	
Output circuit	Source	
Output protection	Thermal cutoff for overcurrent or short circuit, integrated protection for switching inductances, reverse polarity protection	
Analog inputs	Voltage	Current
Number of channels	1	
Input	$\pm 10 \text{ V}$ or 0 to 20 mA/4 to 20 mA, using different connection terminal points	
Input type	Single ended	
Digital converter resolution	± 12 -bit	12-bit
Conversion time	400 μs , conversion runs asynch. to X2X Link cycle	
Output format	UINT	
Input impedance in signal range	$> 1 \text{ M}\Omega$	-
Load	-	$< 300 \Omega$
Maximum error at 25°C		
Gain	0.03% ¹⁾	0 to 20 mA = 0.065% ¹⁾ / 4 to 20 mA = 0.0813% ¹⁾
Offset	0.01% ²⁾	0 to 20 mA = 0.02% ³⁾ / 4 to 20 mA = 0.025% ³⁾
Input protection	Protection against wiring with supply voltage	
1) Based on the current measurement value.		
2) Based on the 20 V measurement range.		
3) Based on the 20 mA measurement range.		
Analog outputs	X20CM8281	
Number of channels	1	
Output	$\pm 10 \text{ V}$ or 0 to 20 mA, using different connection terminal points	
Digital converter resolution	12-bit	
Conversion time	300 μs , conversion runs asynchronous to the X2X Link cycle	
Power on/off behavior	Internal enable relay for boot procedure and errors	
Maximum error at 25°C		
Gain	0.04% ¹⁾	0.05% ¹⁾
Offset	0.0225% ²⁾	0.0125% ²⁾
Output protection	Short circuit protection	
1) Based on the current output value.		
2) Based on the entire output range.		

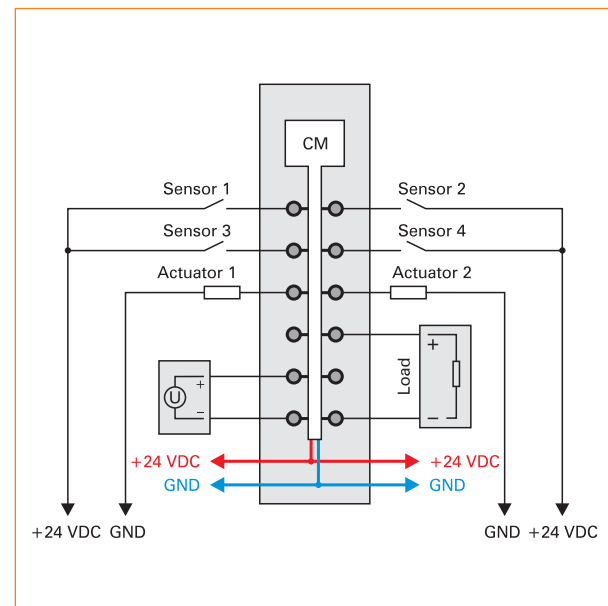
General information	X20CM8281
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Digital outputs	Yes, with status LED and software status (output error status)
Analog inputs	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.01 W
I/O internal	1.75 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20CM8281
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20CM8281
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20CM8281
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Universal mixed module CM8281

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88



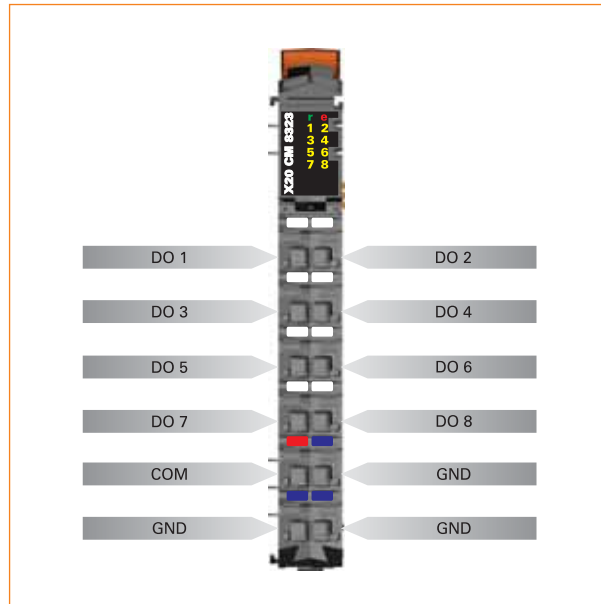
PWM module with current monitoring CM8323



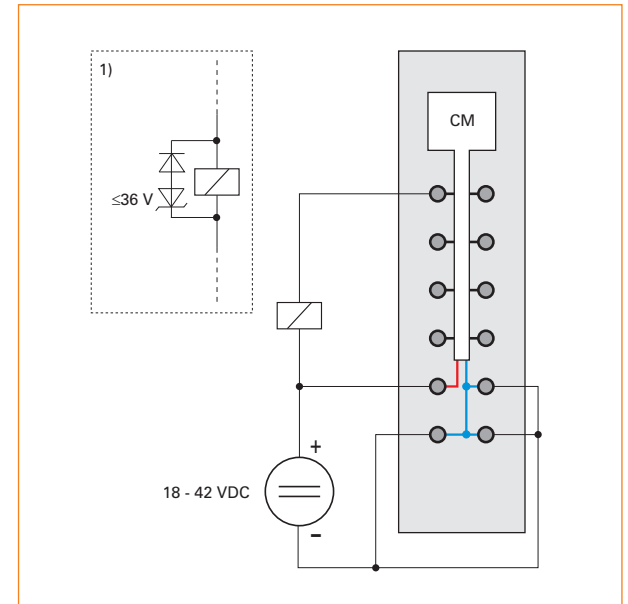
- 8 digital outputs
- Current trace
- Switching time detection
- Pulse width modulation

Short description	X20CM8323
I/O module	8 digital outputs for switching electromechanical loads, current trace, switching time detection, pulse width modulation
Digital outputs	X20CM8323
Rated voltage	24 VDC
Rated output current	0.6 A
Starting current	Max. 2.0 A
Total current	4.8 A
Connection type	1-line connections
Output circuit	Sink
Output protection	Thermal cutoff for overcurrent or short circuit, integrated protection for switching inductances
Braking Voltage when Switching Off	39 VDC
General information	X20CM8323
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Outputs	Yes, with status LED and software status (output error status)
Electrical isolation	
Channel - Bus	Yes
Channel - Module supply	No
Channel - Channel	No
Power consumption	
Bus	0.01 W
I/O internal	1.5 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20CM8323
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20CM8323
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20CM8323
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



1) If larger inductances or more current are used; the "transil-diode combination" must be placed externally on the relay/valve.

Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Potential distributor module PD0011



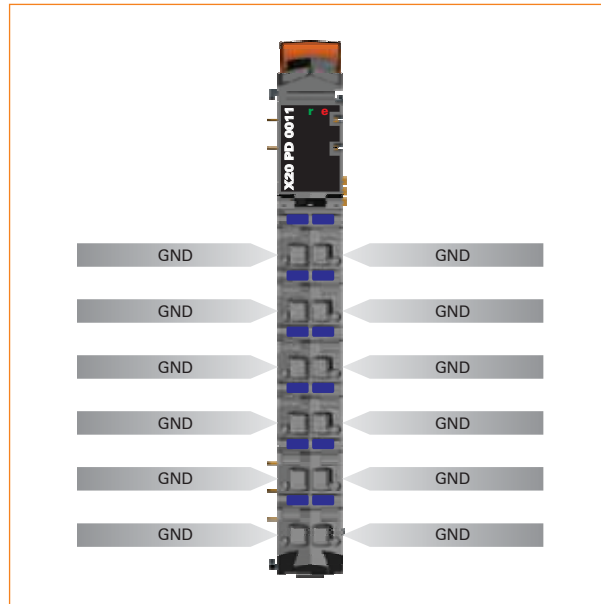
The PD0011 potential distributor module provides 12 ground connections (from the internal I/O supply) at the terminals, which opens up additional wiring possibilities for sensors and actuators. The module is equipped with an exchangeable microfuse between the GND potential on the terminal block and the X20 System I/O supply. The function of the fuse is monitored.

- Integrated exchangeable microfuse
- Monitoring of the fuse
- Potential for routing as needed

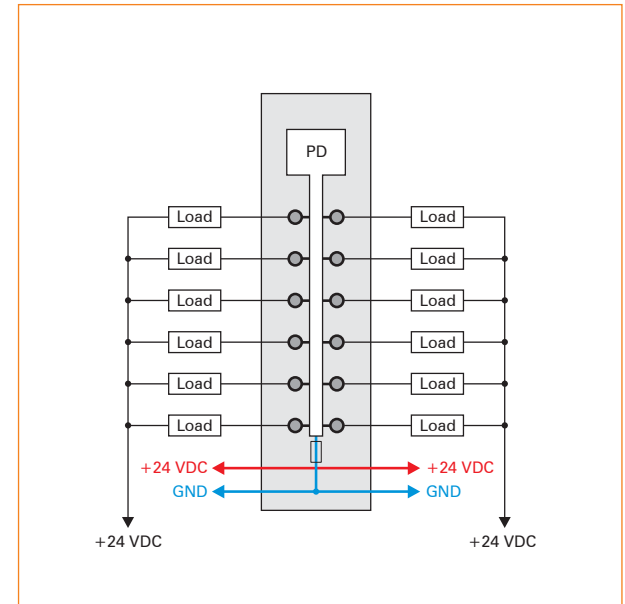
Note:
The wired load must be supplied with 24 VDC.

Short description	X20PD0011
Potential distributor module	12x ground on the terminal points
Output I/O supply	X20PD0011
Rated output voltage	Ground from the internal I/O supply
Fuse	Integrated T 6.3 A, exchangeable
Permitted contact load	10.0 A
General information	X20PD0011
Status indicators	Operating status, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Fuse monitoring	Yes, with status LED and software status
Power consumption ¹⁾	
Bus	0.12 W
I/O internal	-
I/O external	1.0 W
Certification	CE, C-UL-US (in development), GOST-R
1) The specified values are maximum values. The exact calculation is available for download as a data sheet with the other module documentation on the B&R homepage.	
Operational conditions	X20PD0011
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20PD0011
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20PD0011
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Potential distributor module PD0012

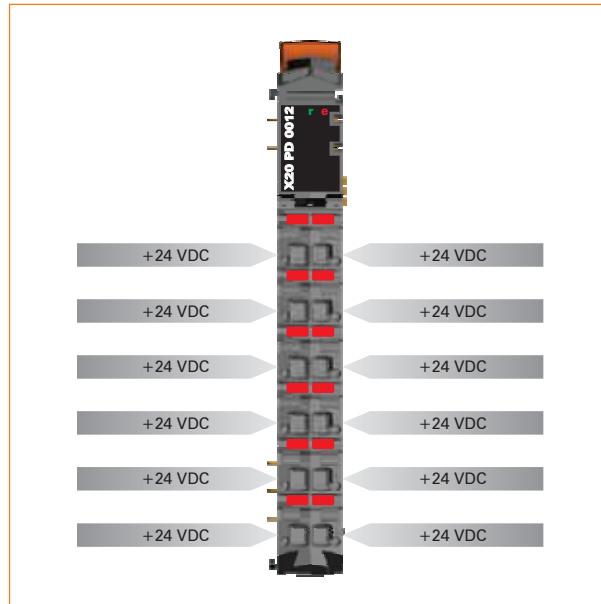


The PD0012 potential distributor module provides twelve 24 VDC connections (from the internal I/O supply) at the terminals, which opens up additional wiring possibilities for sensors and actuators. The module is equipped with an exchangeable microfuse between the 24 VDC potential on the terminal block and the X20 System I/O supply. The function of the fuse is monitored.

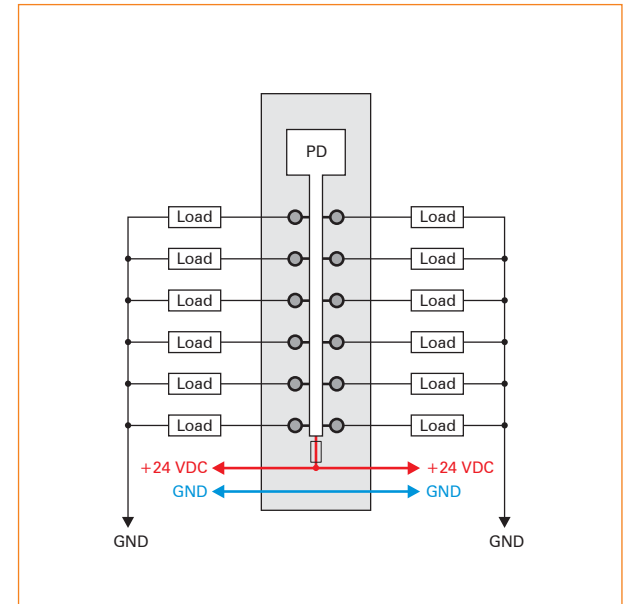
- Integrated exchangeable microfuse
- Monitoring of the fuse
- Potential for routing as needed

Short description	X20PD0012
Potential distributor module	12x 24 VDC on the terminals
Output I/O supply	X20PD0012
Rated output voltage	24 VDC from the internal I/O supply
Fuse	Integrated T 6.3 A, exchangeable
Permitted contact load	10.0 A
General information	X20PD0012
Status indicators	Operating status, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Fuse monitoring	Yes, with status LED and software status
Power consumption ¹⁾	
Bus	0.12 W
I/O internal	1.0 W
Certification	CE, C-UL-US (in development), GOST-R
1) The specified values are maximum values. The exact calculation is available for download as a data sheet with the other module documentation on the B&R homepage.	
Operational conditions	X20PD0012
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20PD0012
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20PD0012
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Potential distributor module PD0016

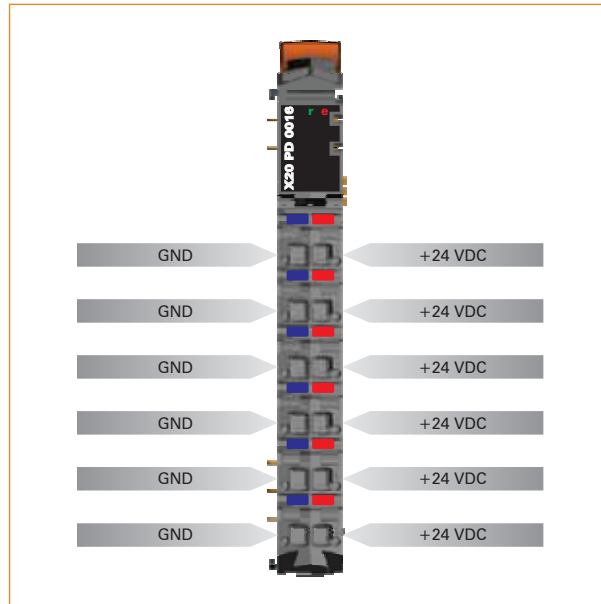


The PD0016 potential distributor module provides 5x 24 VDC and 5x ground connections (from an external supply) at the terminals. There is no connection to the internal I/O supply, so this module only serves to distribute an external supply for the load and electronics supply. The externally fed 24 VDC supply is provided on the terminal points through an exchangeable microfuse. The 24 VDC feed and the function of the fuse are monitored.

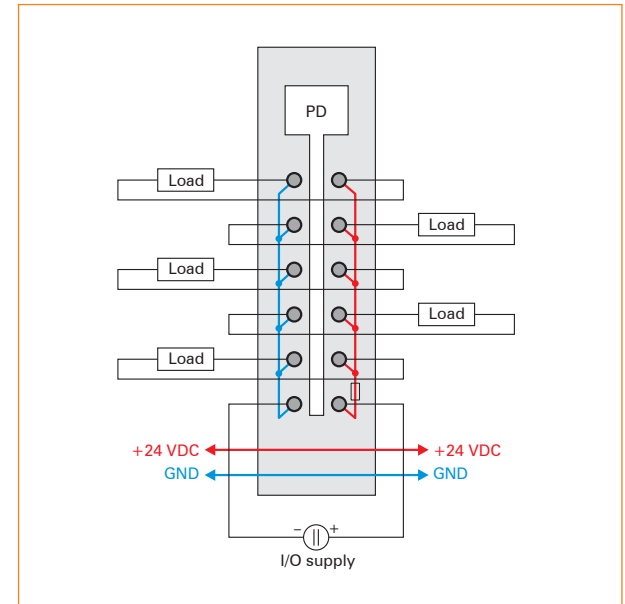
- Integrated exchangeable microfuse
- Monitoring of the fuse
- Potential for routing as needed
- Distribution of the load and electronics supply
- Isolation from the internal I/O supply

Short description	X20PD0016
Potential distributor module	5 x 24 VDC on the terminal points, 5 x ground on the terminal points
Input supply	X20PD0016
Nominal input voltage	24 VDC (-15% / +20%) external, external ground
Fuse	Integrated T 6.3 A, exchangeable
output supply.	X20PD0016
Rated output voltage	24 VDC, ground
Permitted contact load	10.0 A
General information	X20PD0016
Status indicators	Operating status, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Fuse monitoring	Yes, with status LED and software status
Power consumption ¹⁾	
Bus	0.12 W
I/O internal	-
I/O external	1.15 W
Certification	CE, C-UL-US (in development), GOST-R
<small>1) The specified values are maximum values. The exact calculation is available for download as a data sheet with the other module documentation on the B&R homepage.</small>	
Operational conditions	X20PD0016
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20PD0016
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20PD0016
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Potential distributor module PD2113



The PD2113 potential distributor module with feed can provide 6x 24 VDC and 6x ground connections from the internal I/O supply on the terminals. This module can also be used instead of a special feed module for the internal I/O supply. The internal 24 VDC supply is protected through an exchangeable microfuse to the terminal points. The 24 VDC feed and the function of the fuse are monitored.

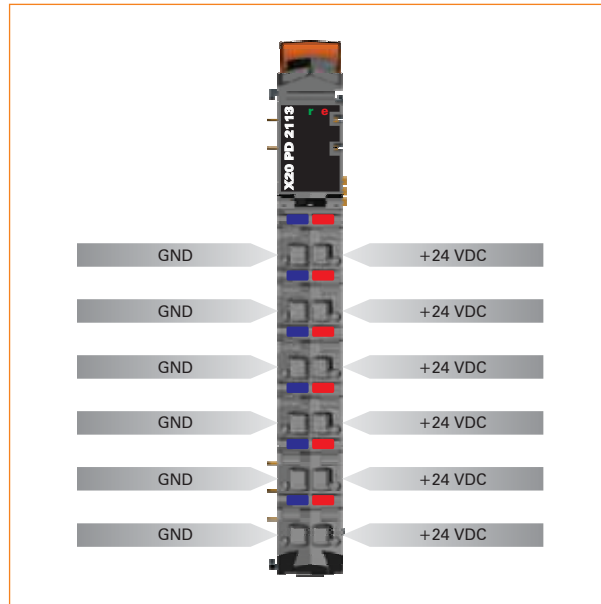
- Integrated exchangeable microfuse
- Monitoring of the fuse
- Potential for routing as needed
- Can be used as feed module for the I/O supply

Note:

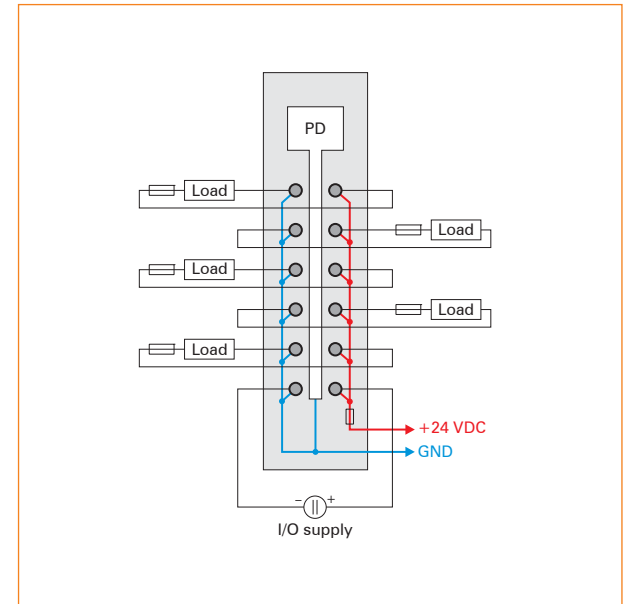
Because the 6x 24 VDC terminals are connected together and the fuse is between the terminal points and the internal I/O supply, the terminal potentials do not have short-circuit protection if an external feed is used. Therefore the respective 24 VDC terminal points must be protected with an external fuse if an external feed is used. A BM01 bus module should be used in this situation.

Short description	X20PD2113
Potential distributor module with feed	6x 24 VDC on the terminals, 6x ground on the terminals
Input supply with feed	X20PD2113
Nominal input voltage	24 VDC (-15% / +20%) external, external ground
Fuse	Integrated T 6.3 A, exchangeable
Output I/O supply	X20PD2113
Rated output voltage	24 VDC, ground
Permitted contact load	10.0 A
Fuse	Integrated T 6.3 A, exchangeable
General information	X20PD2113
Status indicators	Operating status, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Fuse monitoring	Yes, with status LED and software status
Power consumption ¹⁾	
Bus	0.12 W
I/O internal	-
I/O external	1.15 W
Certification	CE, C-UL-US (in development), GOST-R
1) The specified values are maximum values. The exact calculation is also available for download as a data sheet with the other module documentation on the B&R homepage.	
Operational conditions	X20PD2113
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20PD2113
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20PD2113
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM01 or X20BM11 separately

Pin assignments



Connection example with external supply



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM01	X20 supply bus module, internal I/O supply is isolated to the left	86
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Potentiometer supply module PS4951

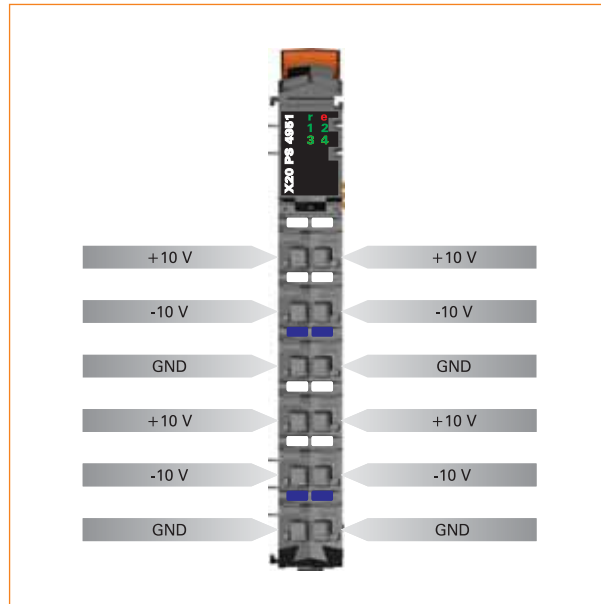


To connect a potentiometer, you need a module with the right power supply. The potentiometer supply module PS4951 can be used to supply four potentiometers with ± 10 V. The values are evaluated using standard analog input modules.

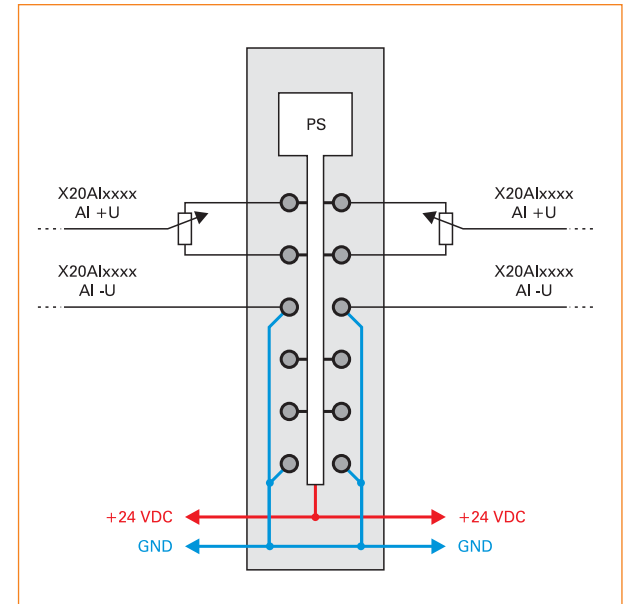
- Open connection and short-circuit detection
- Simple implementation of potentiometer inputs
- 4x supply

Short description	X20PS4951
System module	Supply of four potentiometers with ± 10 V
Potentiometer supply	X20PS4951
Number of supplies	4
Voltage	± 10 V
Potentiometer resistance	1 k Ω to 10 k Ω
Load	Max. 20 mA per supply channel
Short circuit protection	Yes
Basic accuracy	
+10 V	$\pm 0.12\%$ at 25°C
-10 V	$\pm 0.21\%$ at 25°C
General information	X20PS4951
Status indicators	Potentiometer supply monitoring by channel, operating status, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Overload	Yes, with status LED and software status
Wire break	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.01 W
I/O internal	1.8 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20PS4951
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	Values derated when mounted vertically
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20PS4951
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20PS4951
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

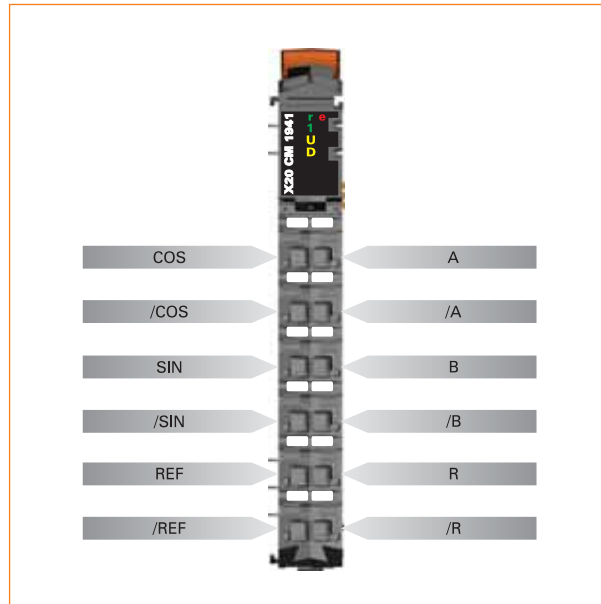
Resolver interface with ABR output CM1941



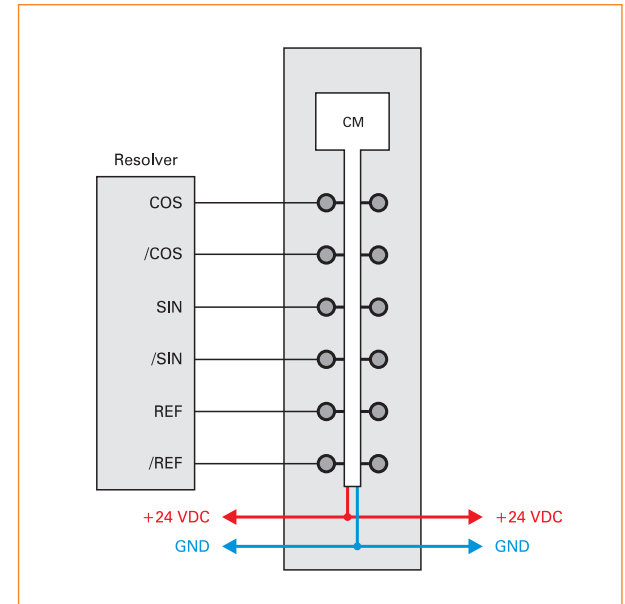
- Resolver input (differential), with angular position and cyclic counter
- 14-bit resolution for the angular position
- ABR output (configurable)

Short description	X20CM1941
I/O module	1 resolver input, 1 ABR output
Resolver input	X20CM1941
Resolver gear ratio	0.5 ($\pm 10\%$)
Frequency (reference output)	10 kHz
Type	Differential
Angular position resolution	14-bit
Short circuit protection (reference output)	Yes
ABR output	X20CM1941
Encoder signal	RS422
Type	ABR differential
ABR output (up to Firmware version 4)	Configurable
8-bit	Max. 2343 revolutions
9-bit	Max. 1171 revolutions
10-bit	Max. 585 revolutions
ABR output (starting at Firmware version 5)	
8-bit ... 12-bit	3500 revolutions
Short circuit protection (reference output)	Yes
General information	X20CM1941
Status indicators	Input, output, operating status, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Resolver input (OK, wire break)	Yes, with status LED and software status
Resolver input (counter direction)	Yes, with status LED and software status
Electrical isolation	
Input/output bus	Yes
Input/output - module supply	No
Channel - Channel	No
Power consumption	
Bus	0.01 W
I/O internal	1.5 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20CM1941
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20CM1941
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20CM1941
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

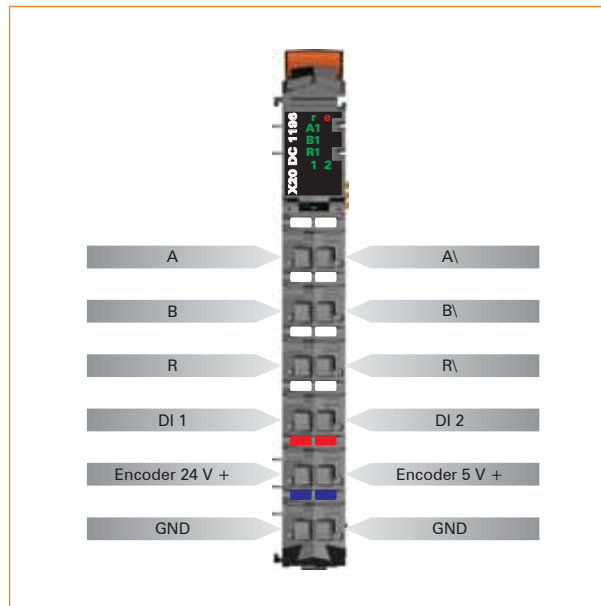
Counter module DC1196



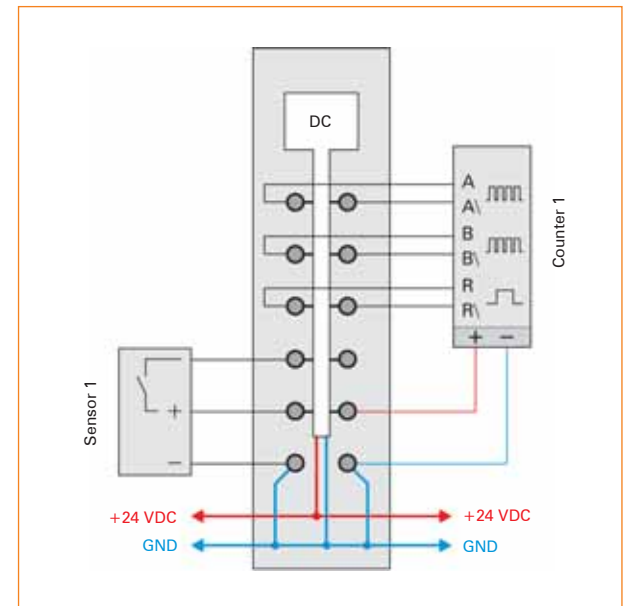
- One 5 V ABR incremental encoder
- 2 additional inputs e.g. for reference enable switch
- 5 VDC, 24 VDC and GND for Encoder supply

Short description	X20DC1196
I/O module	One 5 V ABR incremental encoder
ABR incremental encoder	X20DC1196
Encoder inputs	5 V, symmetrical
Counter size	16/32-bit
Input frequency (max.)	250 kHz
Evaluation	4x
Encoder supply	
5 V	Module-internal, max. 300 mA
24 V	Module-internal, max. 300 mA
Digital inputs	X20DC1196
Amount	2
Rated voltage	24 VDC
Input filter	
Hardware	≤2 μs
Software	-
Connection type	3-line connections
Input circuit	Sink
Additional functions	Reference enable switch
General information	X20DC1196
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Electrical isolation	
Encoder - Bus	Yes
Channel - Bus	Yes
Channel - Encoder	No
Channel - Channel	No
Power consumption	
Bus	0.01 W
I/O internal	1.5 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20DC1196
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DC1196
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DC1196
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

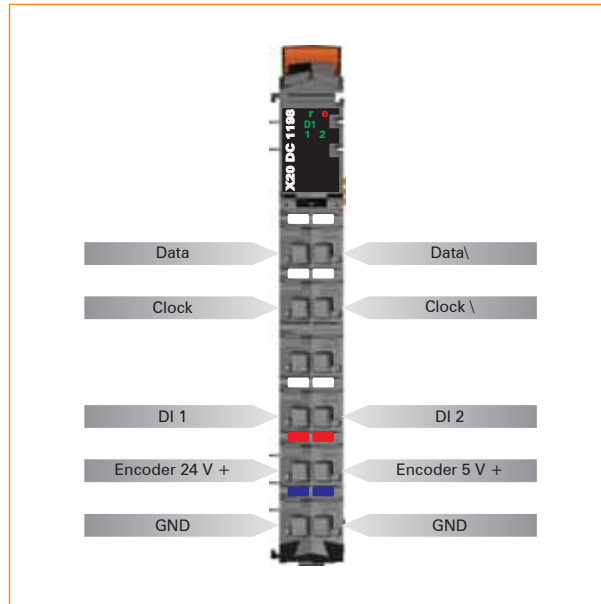
Counter module DC1198



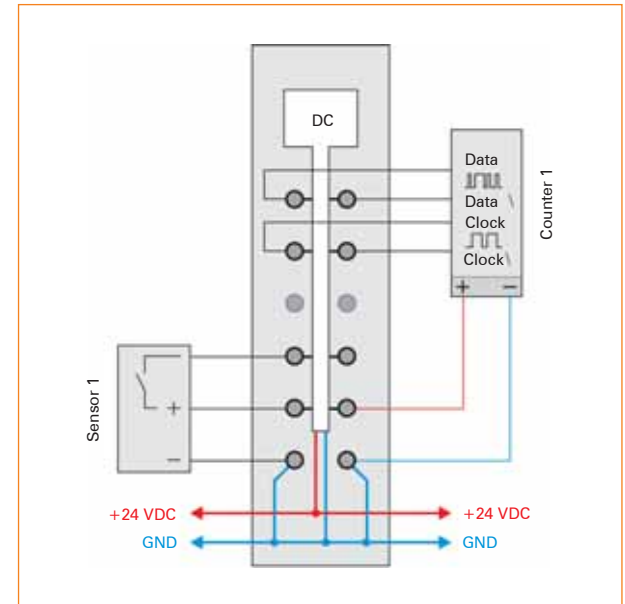
- 1 5 V SSI absolute encoders
- 2 additional inputs
- 5 VDC, 24 VDC and GND for encoder supply

Short description	X20DC1198
I/O module	1 5 V SSI absolute encoders
SSI absolute encoder	X20DC1198
Encoder inputs	5 V, symmetrical
Counter size	32-bit
Maximum transfer rate	1 MBit/s
Encoder supply	
5 V	Module-internal, max. 300 mA
24 V	Module-internal, max. 300 mA
Digital inputs	X20DC1198
Amount	2
Rated voltage	24 VDC
Input filter	
Hardware	≤2 μs
Software	-
Connection type	3-line connections
Input circuit	Sink
General information	X20DC1198
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Electrical isolation	
Encoder - Bus	Yes
Channel - Bus	Yes
Channel - Encoder	No
Channel - Channel	No
Power consumption	
Bus	0.01 W
I/O internal	1.5 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20DC1198
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DC1198
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DC1198
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

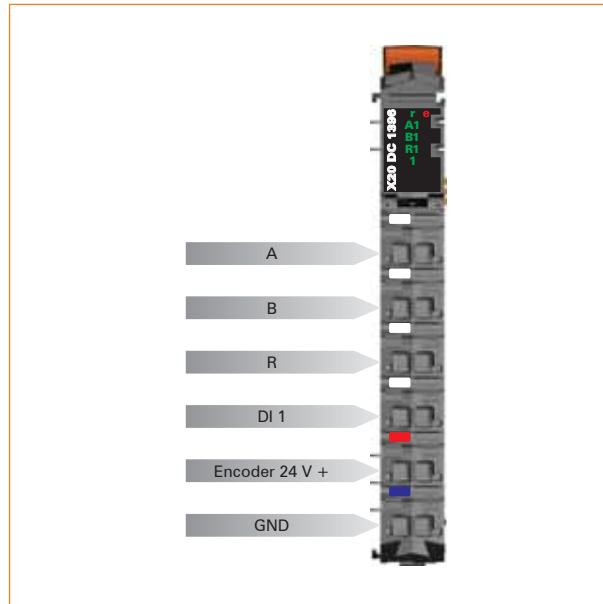
Counter module DC1396



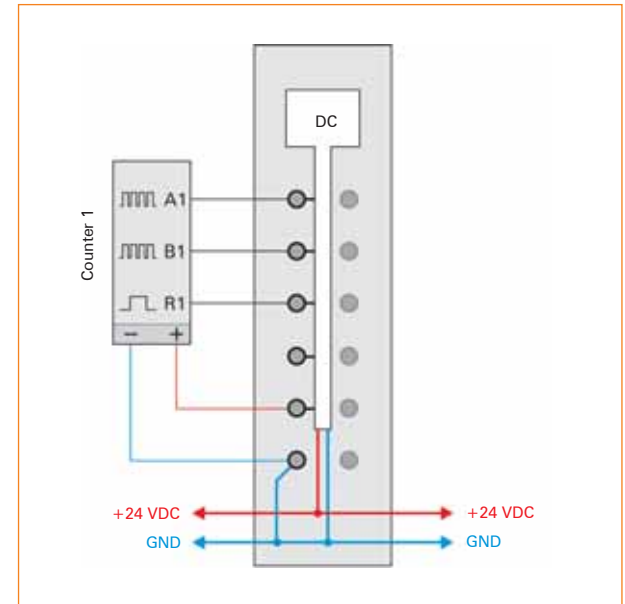
- One 24 V ABR incremental encoder
- 1 additional input, e.g. for reference enable switch
- 24 VDC and GND for encoder supply

Short description	X20DC1396
I/O module	One 24 V ABR incremental encoder
ABR incremental encoder	X20DC1396
Encoder inputs	24 V, asymmetrical
Counter size	16/32-bit
Input frequency (max.)	100 kHz
Evaluation	4x
Encoder supply	Module-internal, max. 600 mA
Reference enable switch	X20DC1396
Amount	1
Rated voltage	24 VDC
Input filter	
Hardware	≤2 μs
Software	-
Connection type	3-line connections
Input circuit	Sink
General information	X20DC1396
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Electrical isolation	
Encoder - Bus	Yes
Reference enable switch - Bus	Yes
Reference enable switch - Encoder	No
Power consumption	
Bus	0.01 W
I/O internal	1.4 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20DC1396
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DC1396
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DC1396
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

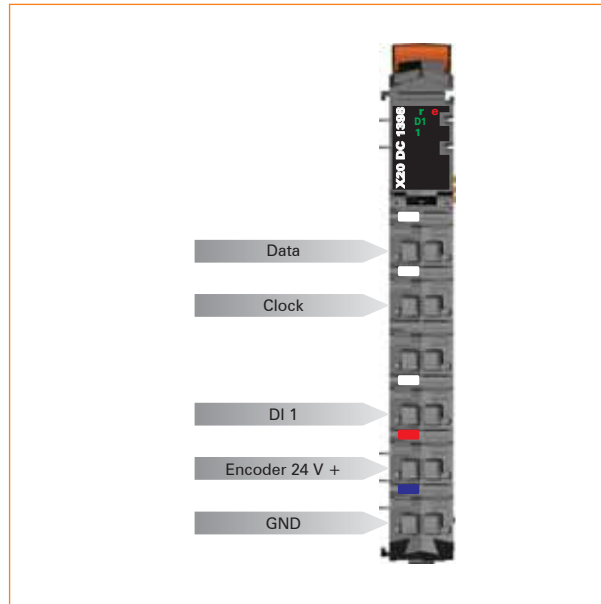
Counter module DC1398



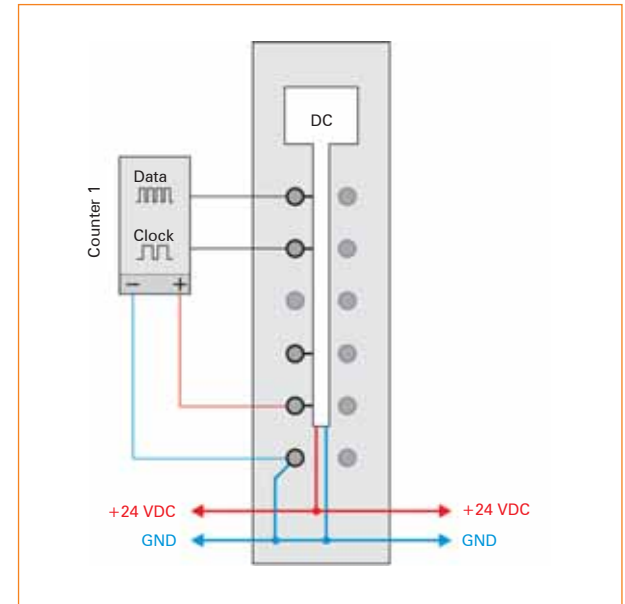
- 1 24 V SSI absolute encoders
- 1 additional input
- 24 VDC and GND for encoder supply

Short description	X20DC1398
I/O module	1 24 V SSI absolute encoders
SSI absolute encoder	X20DC1398
Encoder inputs	24 V, asymmetrical
Counter size	32-bit
Maximum transfer rate	125 kBit/s
Encoder supply	Module-internal, max. 600 mA
Digital inputs	X20DC1398
Amount	1
Rated voltage	24 VDC
Input filter	
Hardware	≤2 μs
Software	-
Connection type	3-line connections
Input circuit	Sink
General information	X20DC1398
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Electrical isolation	
Encoder - Bus	Yes
Channel - Bus	Yes
Channel - Encoder	No
Power consumption	
Bus	0.01 W
I/O internal	1.3 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20DC1398
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DC1398
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DC1398
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

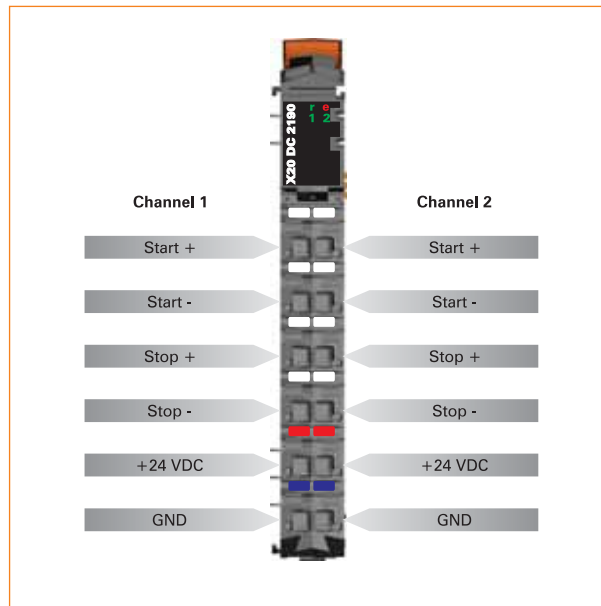
Counter module DC2190



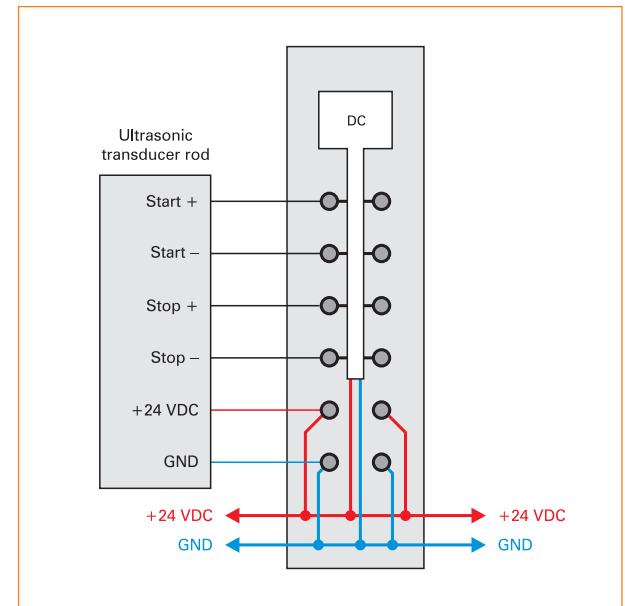
- Ultrasonic transducer module
- Path measurement (resolution at least 10 μm)
- Speed measurement (resolution at least 100 $\mu\text{m/s}$)
- 1, 2, 3 and 4 magnetic bar measurements possible
- DPI/IP protocol supported

Short description	X20DC2190
I/O module	Ultrasonic transducer module, 2 transducer rods, 4 path evaluation, speed measurement
Channels for path and speed measurements	X20DC2190
Number of channels	2
Supported encoder types	Start/Stop interface EP start/stop - interface DPI/IP interface
Encoder supply	24 VDC internal supply, with configurable overvoltage/undervoltage monitoring ($\pm 10\%$, $\pm 15\%$, $\pm 20\%$, $\pm 25\%$)
Input and output level	RS422 differential level
Multi-magnet measurement	Yes, in combinations per rod, max. 4 magnets total
Outputs	1.6 μs durational initialization pulse
Inputs	
Path measurement	Resolution = 0.01 mm, measurement range = ± 5.2 m
Speed measurement	Resolution = 0.1 mm/s, measurement range = ± 3.2 m/s
Accuracy	± 50 ppm ± 5 ppm/year
General information	X20DC2190
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.01 W
I/O internal	1.1 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20DC2190
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DC2190
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DC2190
Spacing	12.5 $^{+0.2}$ mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

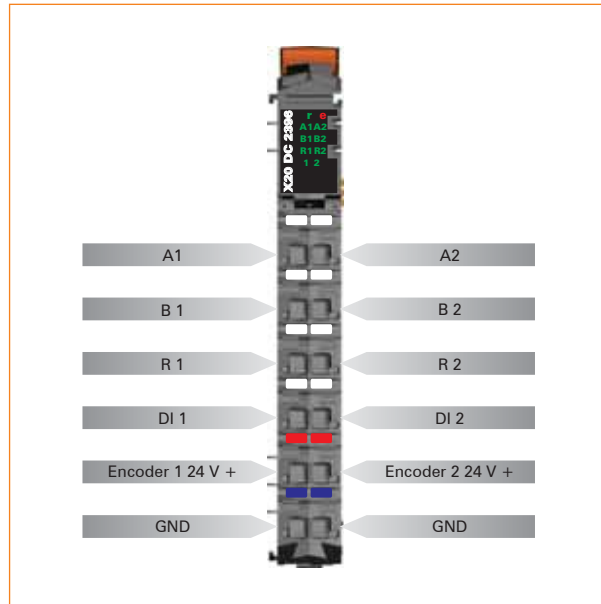
Counter module DC2396



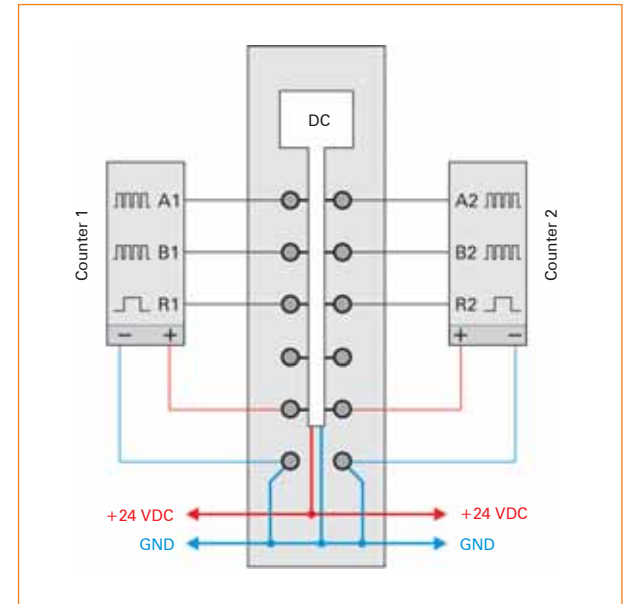
- Two 24 V ABR incremental encoders
- 2 additional inputs, e.g. for Reference enable switch
- 24 VDC and GND for encoder supply

Short description	X20DC2396
I/O module	Two 24 V ABR incremental encoders
ABR incremental encoder	X20DC2396
Encoder inputs	24 V, asymmetrical
Counter size	16/32-bit
Input frequency (max.)	100 kHz
Evaluation	4x
Encoder supply	Module-internal, max. 600 mA
Reference enable switch	X20DC2396
Amount	2
Rated voltage	24 VDC
Input filter	
Hardware	≤2 μs
Software	–
Connection type	3-line connections
Input circuit	Sink
General information	X20DC2396
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Electrical isolation	
Encoder - Bus	Yes
Reference enable switch - Bus	Yes
Reference enable switch - Encoder	No
Encoder - Encoder	No
Reference switch - Reference switch	No
Power consumption	
Bus	0.01 W
I/O internal	1.5 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20DC2396
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DC2396
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DC2396
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

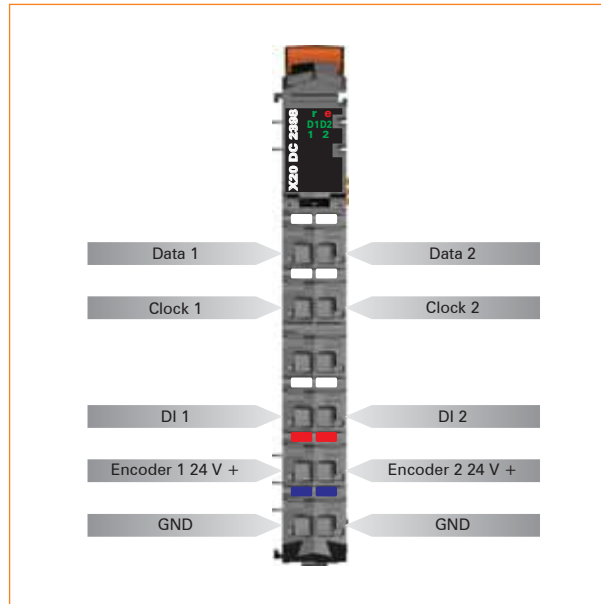
Counter module DC2398



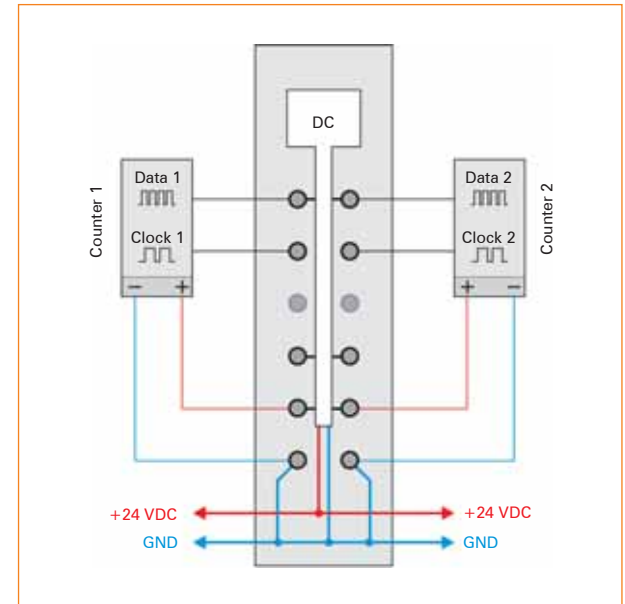
- 2 24 V SSI absolute encoders
- 2 additional inputs
- 24 VDC and GND for encoder supply

Short description	X20DC2398
I/O module	2 24 V SSI absolute encoders
SSI absolute encoder	X20DC2398
Encoder inputs	24 V, asymmetrical
Counter size	32-bit
Maximum transfer rate	125 kBit/s
Encoder supply	Module-internal, max. 600 mA
Digital inputs	X20DC2398
Amount	2
Rated voltage	24 VDC
Input filter	
Hardware	≤2 μs
Software	-
Connection type	3-line connections
Input circuit	Sink
General information	X20DC2398
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Electrical isolation	
Encoder - Bus	Yes
Channel - Bus	Yes
Channel - Encoder	No
Encoder - Encoder	No
Channel - Channel	No
Power consumption	
Bus	0.01 W
I/O internal	1.4 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20DC2398
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DC2398
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DC2398
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Counter module DC2395



The DC2395 module is a multifunctional counter module. It can be connected to an SSI encoder, an ABR encoder, two AB encoders, or four event counters. Two outputs are available for pulse width modulation. The functions can also be mixed.

- 24 VDC encoder inputs
- SSI, ABR, AB or event counters for inputs
- Pulse width modulation for outputs
- 24 VDC and GND for encoder supply

Short description	X20DC2395
I/O module	1 SSI absolute encoders, 24 V, 1 ABR incremental encoders, 24 V, 2 AB incremental encoders, 24 V, 4x event counters or 2x pulse width modulation, time measurement, relative time stamp
SSI absolute encoder	X20DC2395
Amount	1
Encoder inputs	24 V, asymmetrical
Counter size	32-bit
Maximum transfer rate	125 kBit/s
Encoder supply	Module-internal, max. 600 mA
Incremental encoder	X20DC2395
Amount	2
Encoder inputs	24 V, asymmetrical
Counter size	16/32-bit
Input frequency (max.)	100 kHz
Evaluation	4x
Encoder supply	Module-internal, max. 600 mA
Event counter	X20DC2395
Amount	4
Rated voltage	24 VDC
Counter size	16-bit
Input frequency (max.)	100 kHz
Evaluation	Each edge, cyclic counter
Signal form	Square wave pulse
Time measurement	X20DC2395
Possible measurements	Gate time, period duration, edge offset for various channels
Measurements per module	Up to 9
Measurements per channel	Up to 2
Counter size	16-bit
Internal counter frequency	8 MHz, 4 MHz, 2 MHz, 1 MHz, 500 kHz, 250 kHz, 125 kHz, 62.5 kHz
Signal form	Square wave pulse
Measurement type	Continuous or triggered
Digital outputs	X20DC2395
Amount	2
Rated voltage	24 VDC
Rated output current	0.1 A
Total current	0.2 A
Output circuit	Sink or source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances
Pulse width modulation ¹⁾	
Period duration	41.6 μ s to 1.36 s
Factor for period duration	n/48000 s, n = 2 to 65535
Pulse length	0 to 100%
Resolution for pulse length	0.1%
Actuator supply	Module-internal, max. 600 mA

1) Dead time when switching between push and pull: Max 1.5 μ s

General information	X20DC2395
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Outputs	Yes, with status LED and software status (output status)
Electrical isolation	
Encoder - Bus	Yes
Output - Bus	Yes
Output - Encoder	No
Encoder - Encoder	No
Output - Output	No
Power consumption	
Bus	0.01 W
I/O internal	1.4 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20DC2395
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
> 2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DC2395
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DC2395
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

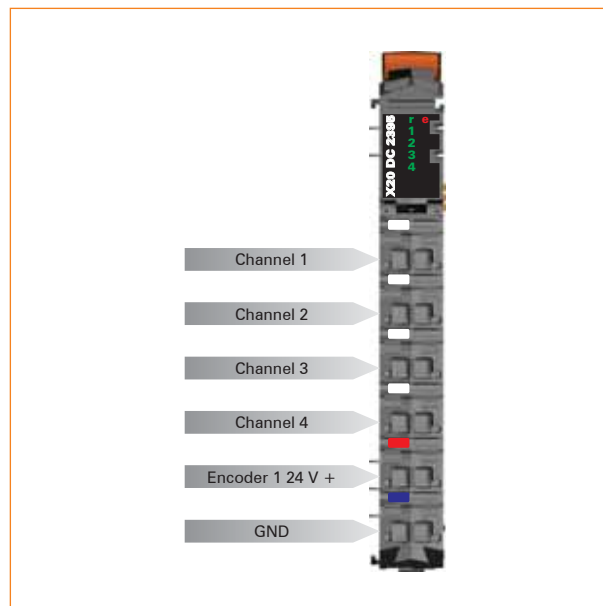
Note: This module is a multi-function module. Some bus controllers only support the default function model described below. This is indicated in the documentation for the individual bus controllers.

Default function model:

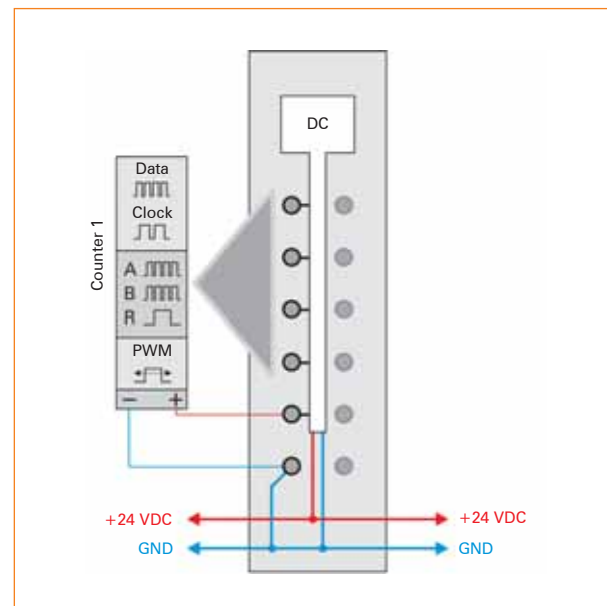
- 2x event counter (24 V)
- 2x PWM output (24 V)

Counter module DC2395

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88



Counter module DC4395



The DC4395 module is a multifunctional counter module. It can be connected to two SSI encoders, two ABR encoders, four AB encoders, or eight event counters.

Four outputs are available for pulse width modulation. The functions can also be mixed.

- 24 VDC encoder inputs
- SSI, ABR, AB or event counters for inputs
- Pulse width modulation for outputs
- 24 VDC and GND for encoder supply

Short description	X20DC4395
I/O module	2 SSI absolute encoders, 24 V, 2 ABR incremental encoders, 24 V, 4 AB incremental encoders, 24 V, 8x event counters or 4x pulse width modulation, time measurement, relative time stamp
SSI absolute encoder	X20DC4395
Amount	2
Encoder inputs	24 V, asymmetrical
Counter size	32-bit
Maximum transfer rate	125 kBit/s
Encoder supply	Module-internal, max. 600 mA
Incremental encoder	X20DC4395
Amount	4
Encoder inputs	24 V, asymmetrical
Counter size	16/32-bit
Input frequency (max.)	100 kHz
Evaluation	4x
Encoder supply	Module-internal, max. 600 mA
Event counter	X20DC4395
Amount	8
Rated voltage	24 VDC
Counter size	16-bit
Input frequency (max.)	100 kHz
Evaluation	Each edge, cyclic counter
Signal form	Square wave pulse
Time measurement	X20DC4395
Possible measurements	Gate time, period duration, edge offset for various channels
Measurements per module	Up to 9
Measurements per channel	Up to 2
Counter size	16-bit
Internal counter frequency	8 MHz, 4 MHz, 2 MHz, 1 MHz, 500 kHz, 250 kHz, 125 kHz, 62.5 kHz
Signal form	Square wave pulse
Measurement type	Continuous or triggered
Digital outputs	X20DC4395
Amount	4
Rated voltage	24 VDC
Rated output current	0.1 A
Total current	0.4 A
Output circuit	Sink or source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances
Pulse width modulation ¹⁾	
Period duration	41.6 μ s to 1.36 s
Factor for period duration	n/48000 s, n = 2 to 65535
Pulse length	0 to 100%
Resolution for pulse length	0.1%
Actuator supply	Module-internal, max. 600 mA

1) Dead time when switching between push and pull: Max 1.5 μ s

General information	X20DC4395
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Outputs	Yes, with status LED and software status (output status)
Electrical isolation	
Encoder - Bus	Yes
Output - Bus	Yes
Output - Encoder	No
Encoder - Encoder	No
Output - Output	No
Power consumption	
Bus	0.01 W
I/O internal	1.5 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20DC4395
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
> 2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DC4395
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DC4395
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

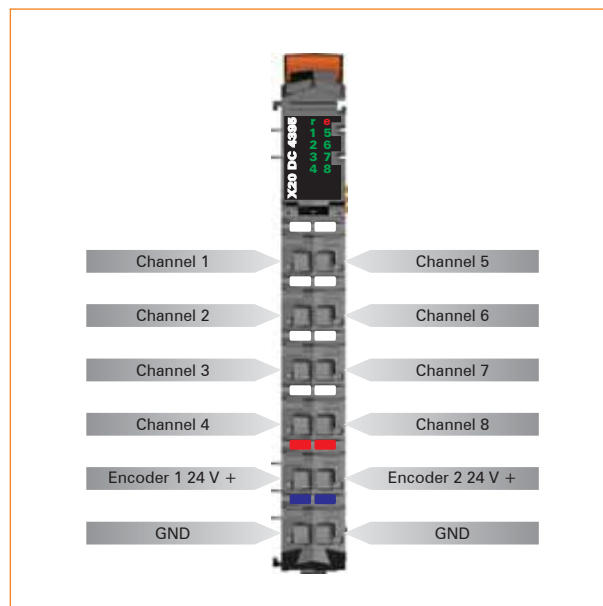
Note: This module is a multi-function module. Some bus controllers only support the default function model described below. This is indicated in the documentation for the individual bus controllers.

Default function model:

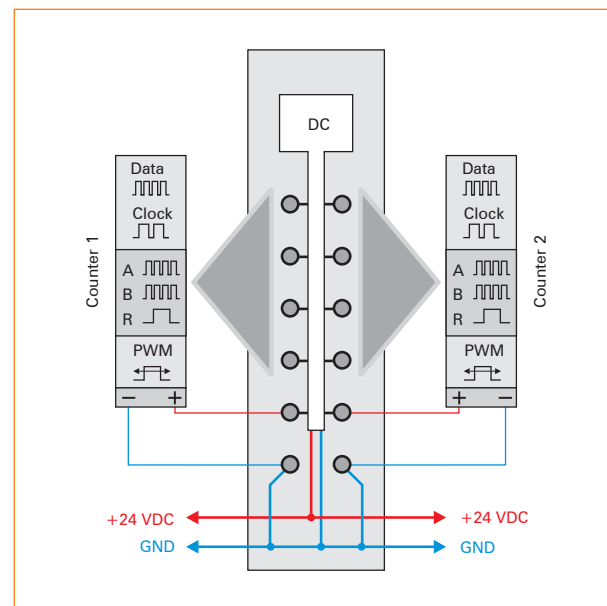
- 1x ABR incremental encoder (24 V)
- 1x SSI absolute encoder (24 V)
- 1x event counter (24 V)
- 2x PWM output (24 V)

Counter module DC4395

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88



Counter module DS1119



The DS1119 is a multifunctional digital signal processor module. Its flexibility allows it to be implemented for a wide range of tasks involving the creation or processing of digital signals. For example, two main uses include encoder emulation and controlling stepper output stages with pulse and direction signals. When used for encoder emulation, frequency inverters or servo axes with the speed follow function can follow a real or virtual master axis.

A further important feature is the time stamp function, which is integrated in the module. It can be used, for example, to create ramp curves for the counter in the encoder emulation virtually independent of bus cycle times. Only the target counter value and the time that it should be reached must be entered. The module generates the appropriate counter values, precisely in microsecond resolution and independently of the bus clock.

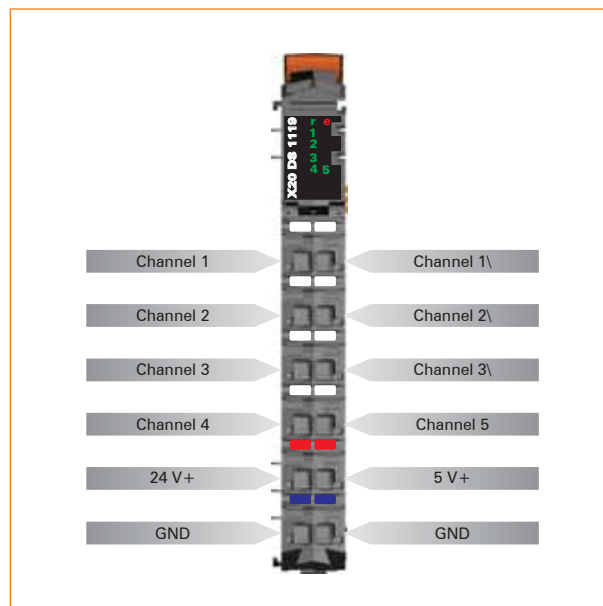
- 3 digital 5 V channels, can be configured as input or output
- 2 digital 24 V input channels
- Up to 2 event counters
- 1 universal counter pair, can be configured as A/B counter or as up/down counter
- Linear movement generator (A/B; direction/frequency) with one reference pulse
- SSI absolute encoder

Short description	X20DS1119
I/O module	3 digital 5 V (symmetric) channels that can be configured as inputs or outputs, 2 digital 24 V (asymmetric) input channels, max. 2 event counters, 1 universal counter pair that can be configured as A/B counter or up/down counter, linear movement generator (A/B; dir./freq.) with one reference pulse, SSI absolute encoder
Digital inputs 5 VDC	X20DS1119
Amount	Up to 3, configuration as input or output takes place using software
Rated voltage	5 VDC differential signal, EIA RS-485 standard
Input frequency	250 kHz
Additional functions for inputs	AB counter, SSI absolute encoder, event counter, up/down counter
Digital inputs 24 VDC	X20DS1119
Amount	2
Rated voltage	24 VDC
Input frequency	100 kHz
Input circuit	Sink
Additional functions for inputs	Reference enable input for A/B, event counting, latch function
Digital outputs 5 VDC	X20DS1119
Amount	Up to 3, configuration as input or output takes place using software
Type	5 VDC differential signal, EIA RS-485 standard
Output circuit	Sink and/or source
Output protection	Short circuit protection
Universal counter pair	X20DS1119
Amount	1
Operating mode	2x event counter, up/down counter, A/B counter
Encoder inputs	5 V, symmetrical
Counter size	16/32-bit
Input frequency (max.)	250 kHz
Evaluation	
AB counter	4x
Up/down counter, event counter	2x
Encoder supply	
5 VDC	Module-internal, max. 300 mA
24 VDC	Module-internal, max. 300 mA
SSI absolute encoder	X20DS1119
Amount	1
Encoder inputs	5 V, symmetrical
Counter size	16/32-bit
Maximum transfer rate	1 MBit/s
Encoder supply	
5 VDC	Module-internal, max. 300 mA
24 VDC	Module-internal, max. 300 mA
Linear movement generator	X20DS1119
Amount	1
Encoder outputs	5 V, symmetric (A/B; direction/frequency)
Counter size	16/32-bit

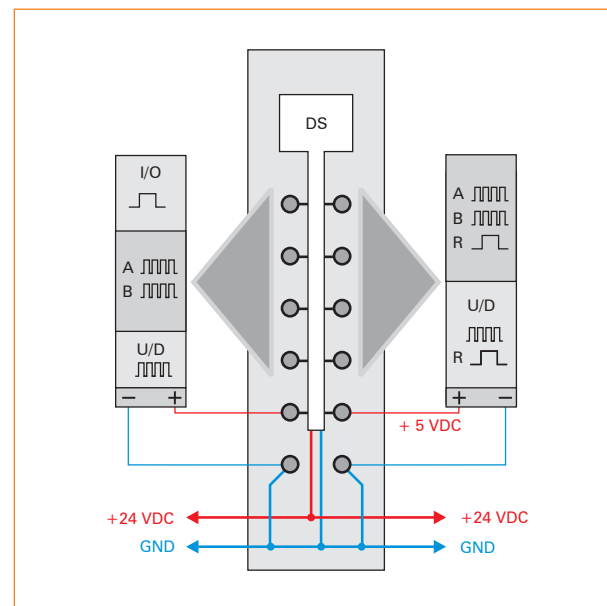
General information	X20DS1119
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Inputs/outputs	Yes, with status LED
Electrical isolation	
Encoder - Bus	Yes
Output - Bus	Yes
Output - Encoder	No
Encoder - Encoder	No
Output - Output	No
Power consumption	
Bus	Typ. 0.01 W
I/O internal	Typ. 1.5 W
Certification	CE, C-UL-US (in development), GOST-R
Operational conditions	X20DS1119
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DS1119
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20DS1119
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately Order bus module 1x X20BM11 separately

Counter module DS1119

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88



Counter module DS1319



The DS1319 is a multifunctional digital signal processor module. Its flexibility allows it to be implemented for a wide range of tasks involving the creation or processing of digital signals. For example, two main uses include encoder emulation and controlling stepper output stages with pulse and direction signals. When used for encoder emulation, frequency inverters or servo axes with the speed follow function can follow a real or virtual master axis.

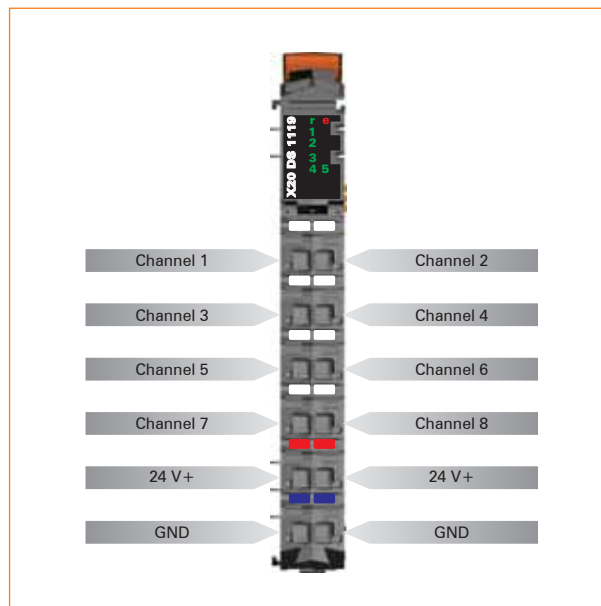
A further important feature is the time stamp function, which is integrated in the module. It can be used, for example, to create ramp curves for the counter in the encoder emulation virtually independent of bus cycle times. Only the target counter value and the time that it should be reached must be entered. The module generates the appropriate counter values, precisely in microsecond resolution and independently of the bus clock.

- 4 digital input channels
- 4 digital channels, can be configured as inputs or outputs
- Up to 2 event counters
- 1 universal counter pair, can be configured as A/B counter or as up/down counter
- Linear movement generator (A/B; direction/frequency) with up to two reference pulses
- SSI absolute encoder

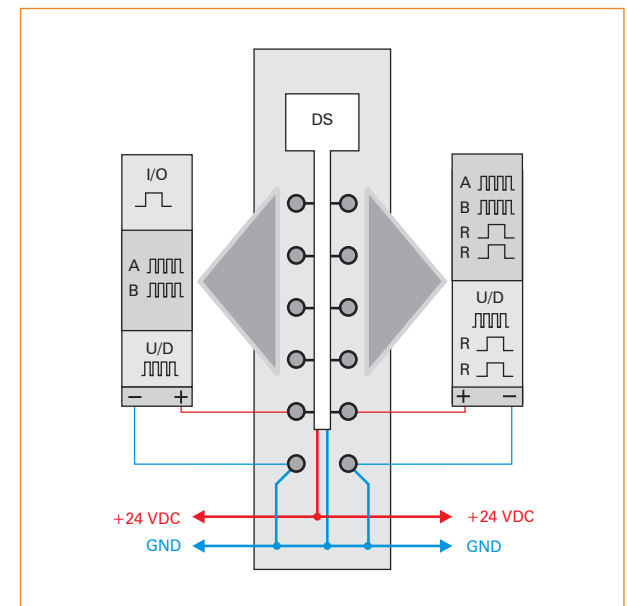
Short description	X20DS1319
I/O module	4 digital input channels, 4 digital channels that can be configured as input or output, max. 2 event counters, 1 universal counter pair that can be configured as A/B encoder or up/down counter, linear movement generator (A/B; direction/frequency) with up to two reference pulses, SSI absolute encoder
Digital inputs	X20DS1319
Amount	8
Rated voltage	24 VDC
Input frequency	100 kHz
Input circuit	Sink
Additional functions for inputs	AB counter, SSI abs. encoder, event counter, up/down counter, ref. enable for A/B counter, latch function
Digital outputs	X20DS1319
Amount	4
Rated voltage	24 VDC
Rated output current	0.1 A
Total current	0.4 A
Output circuit	Sink and/or source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances
Universal counter pair	X20DS1319
Amount	1
Operating mode	2x event counter, up/down counter, A/B counter
Encoder inputs	24 V, asymmetrical
Counter size	16/32-bit
Input frequency (max.)	100 kHz
Evaluation	
AB counter	4x
Up/down counter, event counter	2x
Signal form	Square wave pulse
Encoder supply	Module-internal, max. 600 mA
SSI absolute encoder	X20DS1319
Amount	1
Rated voltage	24 V, asymmetrical
Counter size	16/32-bit
Maximum transfer rate	125 kBit/s
Encoder supply	Module-internal, max. 600 mA
Linear movement generator	X20DS1319
Amount	1
Encoder outputs	24 V, asymmetric (A/B; direction/frequency)
Counter size	16/32-bit
General information	X20DS1319
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Inputs/outputs	Yes, with status LED
Electrical isolation	
Encoder - Bus	Yes
Output - Bus	Yes
Output - Encoder	No
Encoder - Encoder	No
Output - Output	No
Power consumption	
Bus	Typ. 0.01 W
I/O internal	Typ. 1.5 W
Certification	CE, C-UL-US, GOST-R

Operational conditions		X20DS1319
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20DS1319
Temperature		
		-25°C to +70°C
Relative humidity		
		5 to 95%, non-condensing
Mechanical characteristics		X20DS1319
Spacing		
		12.5 ^{+0.2} mm
Comment		
		Order terminal block 1x X20TB12 separately
		Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories		
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Dummy module ZF0000



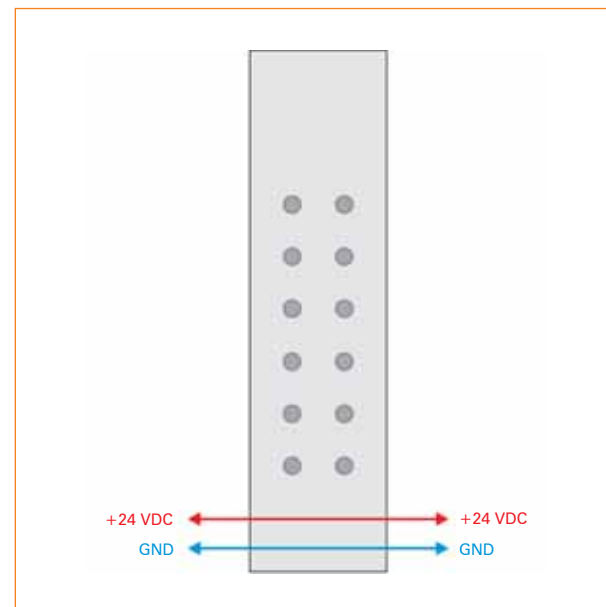
- Place holder for later system expansion
- Used as a terminal holder
- Module with no electrical function

Short description	X20ZF0000
Accessories	Non-functional dummy module
Operational conditions	X20ZF0000
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20ZF0000
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20ZF0000
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB06 or X20TB12 separately Order bus module 1x X20BM11 or supply bus module 1x X20BM01 separately

Pin assignments



Connection example



Required accessories		
X20TB06	X20 terminal block, 6-pin, 24 V coded	94
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM01	X20 supply bus module, internal I/O supply is isolated to the left	86
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88



Hub base module HB8880



The X20 hub HB8880 is a device that can be used universally in standard Ethernet networks or POWERLINK networks. It is suitable for 100 MBit/s (Fast Ethernet) networks.

The Ethernet connections are made using RJ45 connectors. The expanded bus modules allow up to two hub expansion modules to be mounted next to the hub base module. Each expansion module is equipped with two RJ45 connections. Together with the main device, this means that up to six hub ports are available.

- 2/4/6x Fast Ethernet Hub
- Modular design
- Easily expandable



Short description	X20HB8880
Hub	Modular X20 hub with up to two slots for hub expansion modules
Interface	X20HB8880
Type	Ethernet
Signal	100 Base-TX
Port design	Shielded RJ45 ports
Transfer rate	100 MBit/s
Cable length	Auto-MDI/MDIX
	Max. 100 m between two stations (segment length)
General information	X20HB8880
Status indicators	Module status, bus function
Diagnostics	
Module status	Yes, with status LED
Bus function	Yes, with status LED
Electrical isolation	
Fieldbus supply	Yes
Power consumption	2.0 W
Certification	CE, C-UL-US (in development), GOST-R

Operational conditions		X20HB8880
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20HB8880
Temperature		
		-25°C to +70°C
Relative humidity		
		5 to 95%, non-condensing
Mechanical characteristics		X20HB8880
Grid size ¹⁾		
X20BB80		37.5 ^{+0.2} mm
X20BB81		62.5 ^{+0.2} mm
X20BB82		87.5 ^{+0.2} mm
Comment		
		Order terminal block 1x X20TB12 separately
		Order supply module 1x X20PS8002 separately
		Order 1x X20BB8x bus base separately

1) The spacing is based on the width of the X20BB8x bus base. Up to two X20HB2880 hub expansion modules and one X20PS8002 supply module are also always required for the hub.

Required accessories		
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20PS8002	X20 supply module for stand alone hub and compact link selector	384
X20BB80	X20 bus base, for X20 base module (BC, HB, etc.) and X20 supply module, X20 end plates (left and right) X20AC0SL1/X20AC0SR1 included	170
X20BB81	X20 bus base with 1 expansion slot, for X20 base module (BC, HB, etc.) and one X20 auxiliary module (IF, HB, etc.) and X20 supply module, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	184
X20BB82	X20 bus base with 2 expansion slots, for X20 base module (BC, HB, etc.) and two X20 auxiliary modules (IF, HB, etc.) and X20 supply module, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	185
Optional accessories		
X20HB2880	X20 hub expansion module, 2x hub connection, status indicator LEDs, 2x RJ45 connection	187

Supply module PS8002

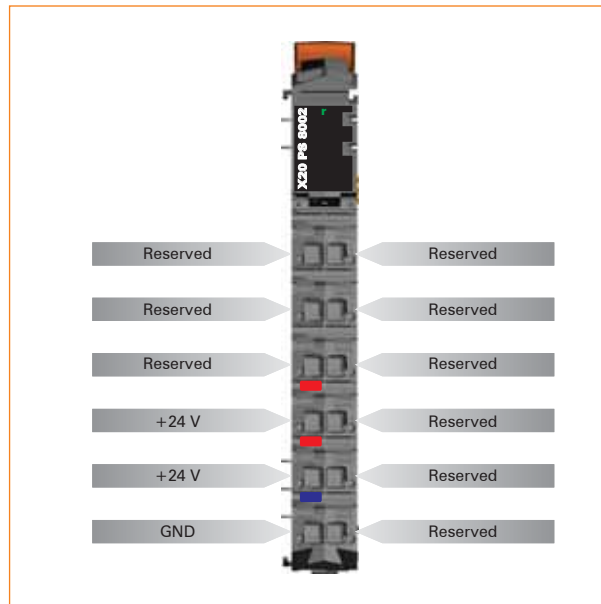


The PS8002 supply module is used to supply X20 stand-alone devices. These include e.g. the HB8884 X20 POWER-LINK compact link selector and the HB8880 X20 stand-alone hub.

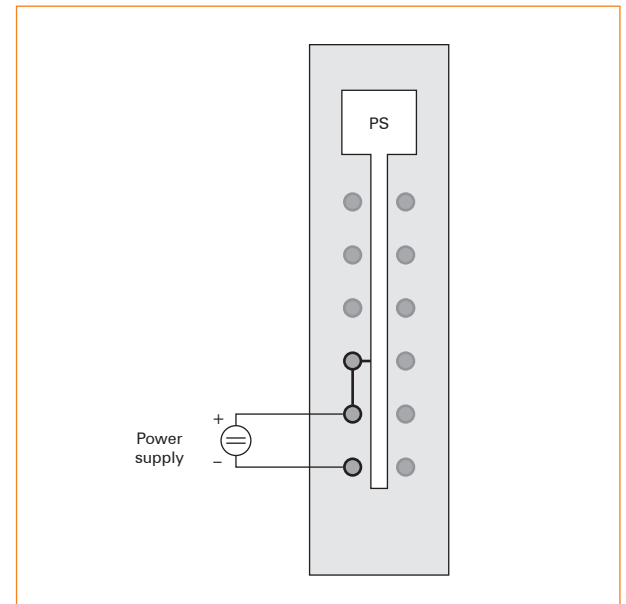
- Supply for X20 stand alone devices
- No electrical isolation between the module supply and the device supply

Short description	X20PS8002
Power supply module	24 VDC supply module for X20 stand alone devices
Input supply	X20PS8002
Input voltage	24 VDC (-15% / +20%)
Input current	Max. 0.7 A
Reverse polarity protection	Yes
Fuse	Integrated, cannot be exchanged
Output supply	X20PS8002
Rated output power	
Horizontal installation	7.0 W at 45°C and 5.0 W at 55°C
Vertical installation	7.0 W at 40°C and 5.0 W at 50°C
General information	X20PS8002
Status indicators	Operating status, module status
Diagnostics	
Module run/error	Yes, with status LED
Overload	Yes, with status LED
Electrical isolation	
Module supply - device supply	No
Power consumption ¹⁾	1.34 W
Certification	CE, C-UL-US (in development), GOST-R
<small>1) The specified values are maximum values. The exact calculation is available for download as a data sheet with the other module documentation on the B&R homepage.</small>	
Operational conditions	X20PS8002
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20PS8002
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20PS8002
Spacing	12.5 ^{+0.2} mm
Comment	Order terminal block 1x X20TB12 separately

Pin assignments



Connection example



Required accessories

X20TB12

X20 terminal block, 12-pin, 24 V coded

94

POWERLINK compact link selector HB8884



POWERLINK is a standard protocol for Fast Ethernet with true real-time properties. The Ethernet POWERLINK Standardization Group (EPSG, www.ethernet-powerlink.org) ensures that the standard remains open and is continually developed.

Using POWERLINK, systems with redundant cabling can be implemented. Unlike ring redundancy, cable looping, which can sometimes be problematic, is not required for cable redundancy. This allows the creation of all types of tree structures. When using a device with the link selector function, data is always transferred via the highest quality network lines. The link selector function is integrated in the HB8884 compact link selector. This makes it easy to connect any POWERLINK V2 device to a redundant POWERLINK V2 network (see sections "POWERLINK cable redundancy system", on page 57 and "X20 redundancy system", on page 57).

- Connecting POWERLINK V2 devices to the POWERLINK cable redundancy system
- Integrated compact link selector function



Short description	X20HB8884
POWERLINK compact link selector	Connecting POWERLINK V2 devices to a redundant POWERLINK V2 network
Fieldbus	X20HB8884
Type	POWERLINK V2 100 Base-T (ANSI/IEE 802.3)
Design	Internal 2x hub, 2x shielded RJ45 port
Cable length	Max. 100 m between two stations (segment length)
Transfer rate	100 MBit/s
General information	X20HB8884
Status indicators	Module status, bus function
Diagnosics	
Module status	Yes, with status LED
Bus function	Yes, with status LED
Electrical isolation	
Fieldbus supply	Yes
Power consumption of the bus	2.0 W
Certification	CE, C-UL-US (in development), GOST-R

ETHERNET 
POWERLINK

Operational conditions		X20HB8884
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20HB8884
Temperature		
		-25°C to +70°C
Relative humidity		
		5 to 95%, non-condensing
Mechanical characteristics		X20HB8884
Grid size ¹⁾		
X20BB81		62.5 ^{+0.2} mm
X20BB82		87.5 ^{+0.2} mm
Comment		
		Order terminal block 1x X20TB12 separately
		Order supply module 1x X20PS8002 separately
		Order 1x X20HB2880 or 2x X20HB2885 hub expansion module separately
		Order 1x X20BB81 or X20BB82 bus base separately

1) The spacing is based on the width of the X20BB81 or X20BB82 bus base. One X20HB2880 hub expansion module or two X20HB2885 hub expansion modules and an X20PS8002 supply module are also always required for the compact link selector.

Required accessories		
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20PS8002	X20 supply module for stand alone hub and compact link selector	384
X20HB2880	X20 hub expansion module, 2x hub connection, status indicator LEDs, 2x RJ45 connection	187
X20HB2885	X20 hub expansion module, integrated active 2x hub, status indicator LEDs, 2x RJ45 connection	188
X20BB81	X20 bus base with 1 expansion slot, for X20 base module (BC, HB, etc.) and one X20 auxiliary module (IF, HB, etc.) and X20 supply module, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	184
X20BB82	X20 bus base with 2 expansion slots, for X20 base module (BC, HB, etc.) and two X20 auxiliary modules (IF, HB, etc.) and X20 supply module, X20 end plates (left and right), X20AC0SL1/X20AC0SR1 included	185

Accessories



Cover holder, terminal locking clip



Model number	Short description
X20AC0SC1	X20 terminal locking clip and cover holder for plain text cover.
X20AC0SC1.0100	X20 terminal locking clip and cover holder for plain text cover, 100 pcs. package

Plain text cover



Model number	Short description
X20AC0SH1	X20 plain text cover
X20AC0SH1.0100	X20 plain text insert, 100 pcs. package
X20AC0LB1.0100	X20 legend strips for X20 plain text cover, paper, white, perforated, 96 strips on A4 sheets, 100 sheets per package

Additional locking clip



Model number	Short description
X20AC0AX1	X20 additional locking clip
X20AC0AX1.0100	X20 additional locking clip, 100 pcs. package

Locking plate



Model number	Short description
X20AC0SL1	X20 locking plate (left)
X20AC0SR1	X20 locking plate (right)
X20AC0SL1.0010	X20 locking plate (left), 10 pcs. package
X20AC0SR1.0010	X20 locking plate (right), 10 pcs. package

Cable shielding plate



Model number	Short description
X20AC0SG1.0010	X20 cable shield grounding plate, 10 pcs. package
X20AC0SG1.0100	X20 cable shield grounding plate, 100 pcs. package

Terminal labeling



Model number	Short description
X20AC0M01	Blank X20 label tabs, white, set for 16 modules
X20AC0M02	Blank X20 label tabs, red, set for 16 modules
X20AC0M03	Blank X20 label tabs, blue, set for 16 modules
X20AC0M04	Blank X20 label tabs, orange, set for 16 modules
X20AC0M11	Printed X20 label tabs, white, set for 16 modules. Text: Module (module 1 - 16), Terminal (1 - 192)
X20AC0M12	Printed X20 label tabs, red, set for 16 modules. Text: +24V
X20AC0M13	Printed X20 label tabs, blue, set for 16 modules. Text: GND
X20AC0M14	Printed X20 label tabs, orange, set for 16 modules. Text: Module (module 1 - 16), Terminal (1 - 192)
X20AC0M01.0010	Blank X20 label tabs, white, set for 16 modules, 10 pcs. package
X20AC0M02.0010	Blank X20 label tabs, red, set for 16 modules, 10 pcs. package
X20AC0M03.0010	Blank X20 label tabs, blue, set for 16 modules, 10 pcs. package
X20AC0M04.0010	Blank X20 label tabs, orange, set for 16 modules, 10 pcs. package
X20AC0M11.0010	Printed X20 label tabs, white, set for 16 modules, 10 pcs. / package. Text: Module (module 1 - 16), Terminal (1 - 192)
X20AC0M12.0010	Printed X20 label tabs, red, set for 16 modules, 10 pcs. / package. Text: +24V
X20AC0M13.0010	Printed X20 label tabs, blue, set for 16 modules, 10 pcs. / package. Text: GND
X20AC0M14.0010	Printed X20 label tabs, orange, set for 16 modules, 10 pcs. / package. Text: Module (module 1 - 16), Terminal (1 - 192)
X20AC0M21	Large blank X20 label tabs, white, set for 48 modules
X20AC0M21.0010	Large blank X20 label tabs, white, set for 48 modules, 10 pcs. package

Accessories

Labeling tool



Model number	Short description
X20AC0MT1	X20 labeling tool for the X20 label tabs

X2X Link cable



Model number	Short description
X67CA0X99.1000	Cable for custom prefabrication, 100.0 m

Ethernet POWERLINK cable RJ45 to RJ45



Length	Connection cable Model number	Short description
0.2 m	X20CA0E61.0002	POWERLINK connection cable RJ45 to RJ45, 0.2 m
1.0 m	X20CA0E61.0010	POWERLINK connection cable RJ45 to RJ45, 1.0 m
2.0 m	X20CA0E61.0020	POWERLINK connection cable RJ45 to RJ45, 2.0 m
5.0 m	X20CA0E61.0050	POWERLINK connection cable RJ45 to RJ45, 5.0 m
10.0 m	X20CA0E61.0100	POWERLINK connection cable RJ45 to RJ45, 10.0 m
15.0 m	X20CA0E61.0150	POWERLINK connection cable RJ45 to RJ45, 15.0 m
50.0 m	X20CA0E61.0500	POWERLINK connection cable RJ45 to RJ45, 50.0 m

Ethernet POWERLINK cable RJ45 to M12



Length	Attachment cable Model number	Short description
5 m	X67CA0E41.0050	POWERLINK attachment cable RJ45 to M12, 5.0 m
15 m	X67CA0E41.0150	POWERLINK attachment cable RJ45 to M12, 15.0 m
50 m	X67CA0E41.0500	POWERLINK attachment cable RJ45 to M12, 50.0 m

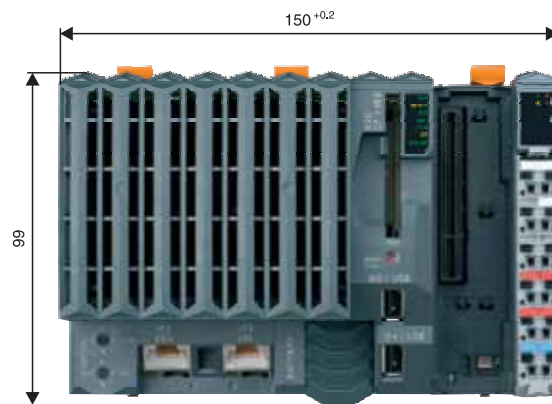
For detailed information and support: www.br-automation.com

Mechanical and electrical configuration

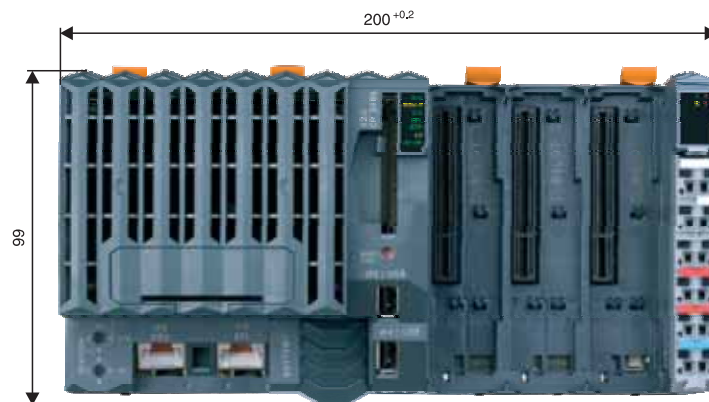
Dimensions

The dimensions are in 2D with the ECAD macros for CAD support . STEP data is provided for 3D representation.

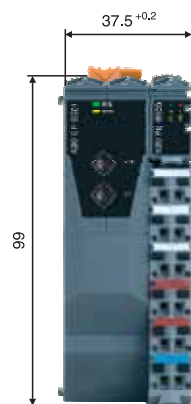
The STEP data can be downloaded from the B&R website (www.br-automation.com) under Services.



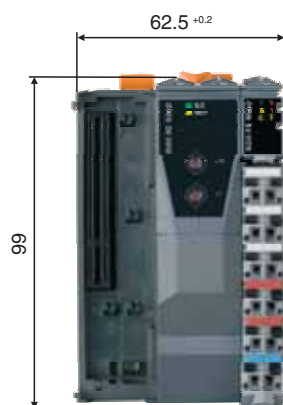
X20 CPUs with one slot for interface modules



X20 CPUs with three slots for interface modules

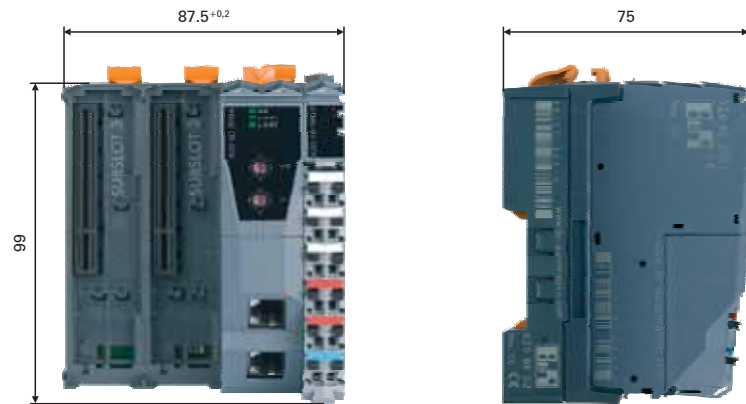


Compact CPUs and bus controllers

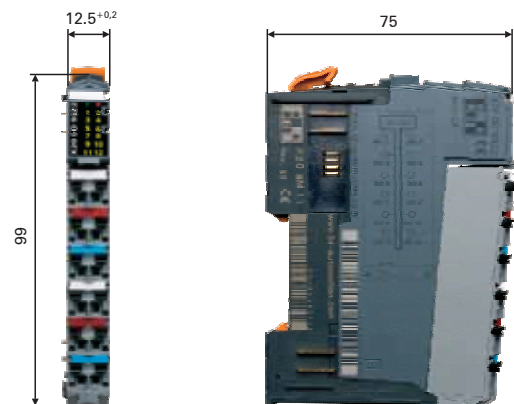


Fieldbus CPUs and expandable bus controller with one additional slot

Mechanical and electrical configuration



Fieldbus CPUs and expandable bus controller with two additional slots



I/O modules

Construction support

Macros for ECAD systems

The electronics in a machine must be designed in a manner which optimally utilizes the materials and space available. Graphic ECAD systems have established themselves as the right tool for the job. Every module in the X20 System comes with preset electronic descriptions of the mechanical dimensions, electrical signals and module functions. These macros are loaded directly to well-established ECAD systems. The wiring plans are automatically applied by the configuration and programming system, Automation Studio. Design and changes are immediately reflected at all levels of development. This saves time for the more important tasks and prevents errors right from the start. The accelerated development, programming, maintenance and documentation involved with the X20 System mean lower costs, enhanced quality and increased sales by earlier entry into the market.

Printing support

System printers and standard identification labels are supported by the appropriate printer software. Printing manually, from table calculations, or directly from ECAD software – all methods are supported. The software and printer systems are from the company Weidmüller.

Mechanical and electrical configuration

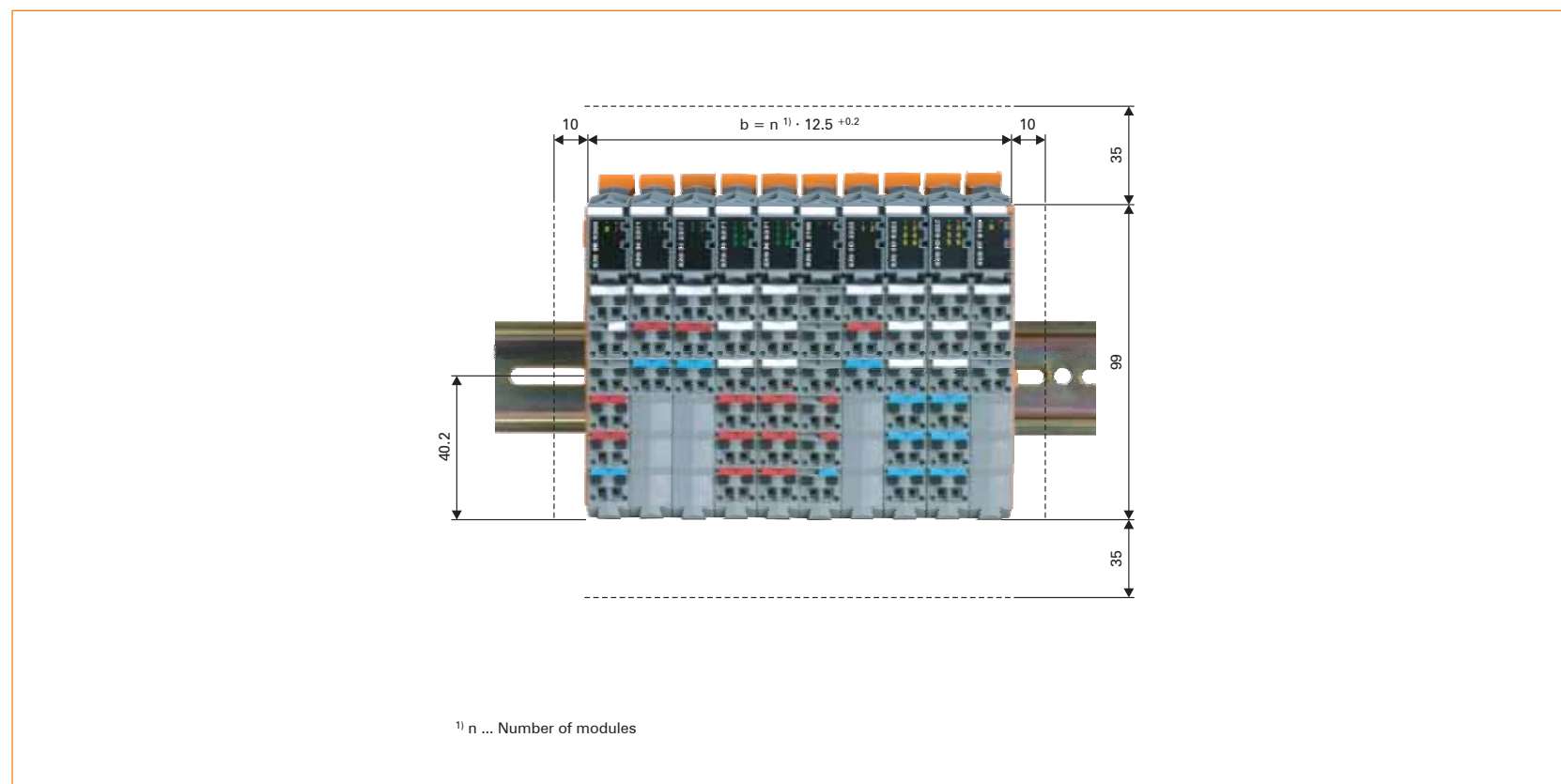
Installation

A mounting rail conforming to the EN60715 standard (TH35-7.5) is required to mount the PLC. The mounting rail is fastened to the back wall of the switching cabinet.

The entire system including all individual modules is hung in the desired location on the mounting rail with the unlocking mechanisms open and locked in place by closing the unlocking mechanisms. Finally, the prewired terminal blocks are connected to the modules.

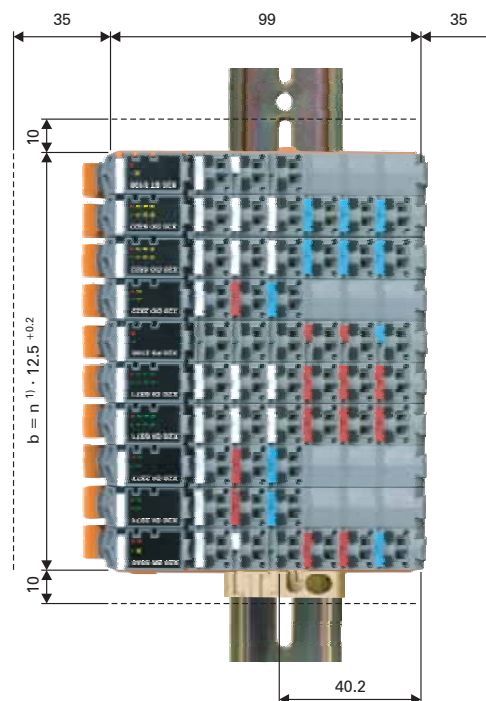
Note: Mounting orientations other than horizontal and vertical are not possible.

Horizontal installation



For optimal cooling and air circulation, there must be at least 35 mm free space above the modules. To the left and right of the X20 System, there must be at least 10 mm of free space. Underneath the module, 35 mm space must be left free for the input, output and supply cables.

Vertical installation



¹⁾ n ... Number of modules

For optimal cooling and air circulation, there must be at least 35 mm free space to the left of the modules. Above and below the X20 System, there must be at least 10 mm of free space. To the right of the module, 35 mm space must be left free for the input, output and supply cables.

The modules must be arranged so that the controller is on the lower end of the system. The temperature range is limited to 0 - 50°C when installing modules vertically.

Note: The controller must be secured against slipping. An end bracket or ground terminal can be used for securing.

Mechanical and electrical configuration



Stress relief using cable ties

The X20 System terminal blocks have slots for the cable ties. If needed, a cable tie can be fed through these slots to reduce the stress on the cable.

Cable tie dimensions: Width \leq 4.0 mm
 Thickness \leq 1.2 mm



Shielding

In principle, the shield must be grounded in all shielded cables:

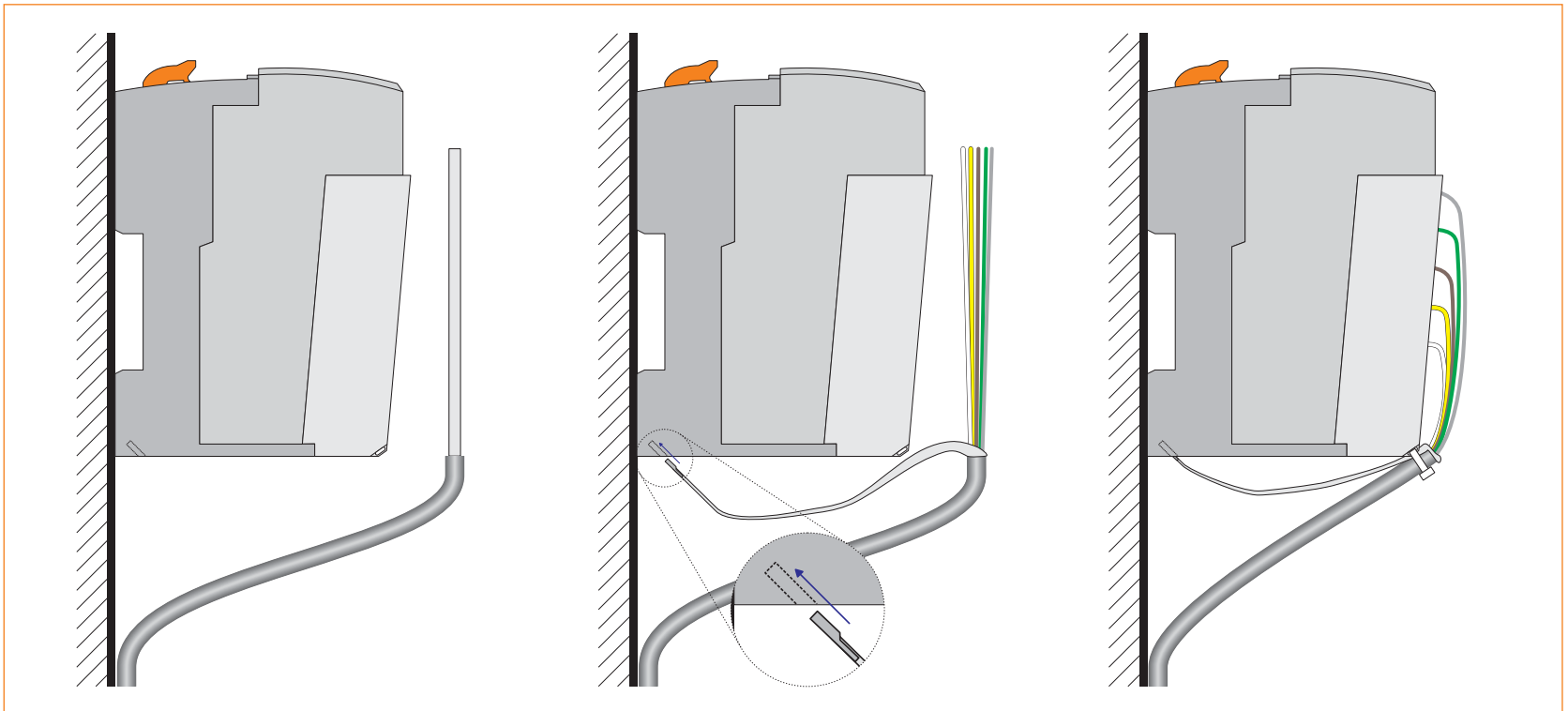
- Analog signals (In/Out)
- Interface modules
- Counter modules
- X2X Link cable

In general, the following guidelines apply for shielding:

- The X20 mounting rail must always be mounted to a conductive backplane
- Shielded cables must be grounded on both sides

Direct shielding connection

The shield is twisted and connected to the bus module's ground connection using a cable lug (2.8 x 0.5 mm). The cable is additionally secured to the terminal block using a cable tie (stress relief).

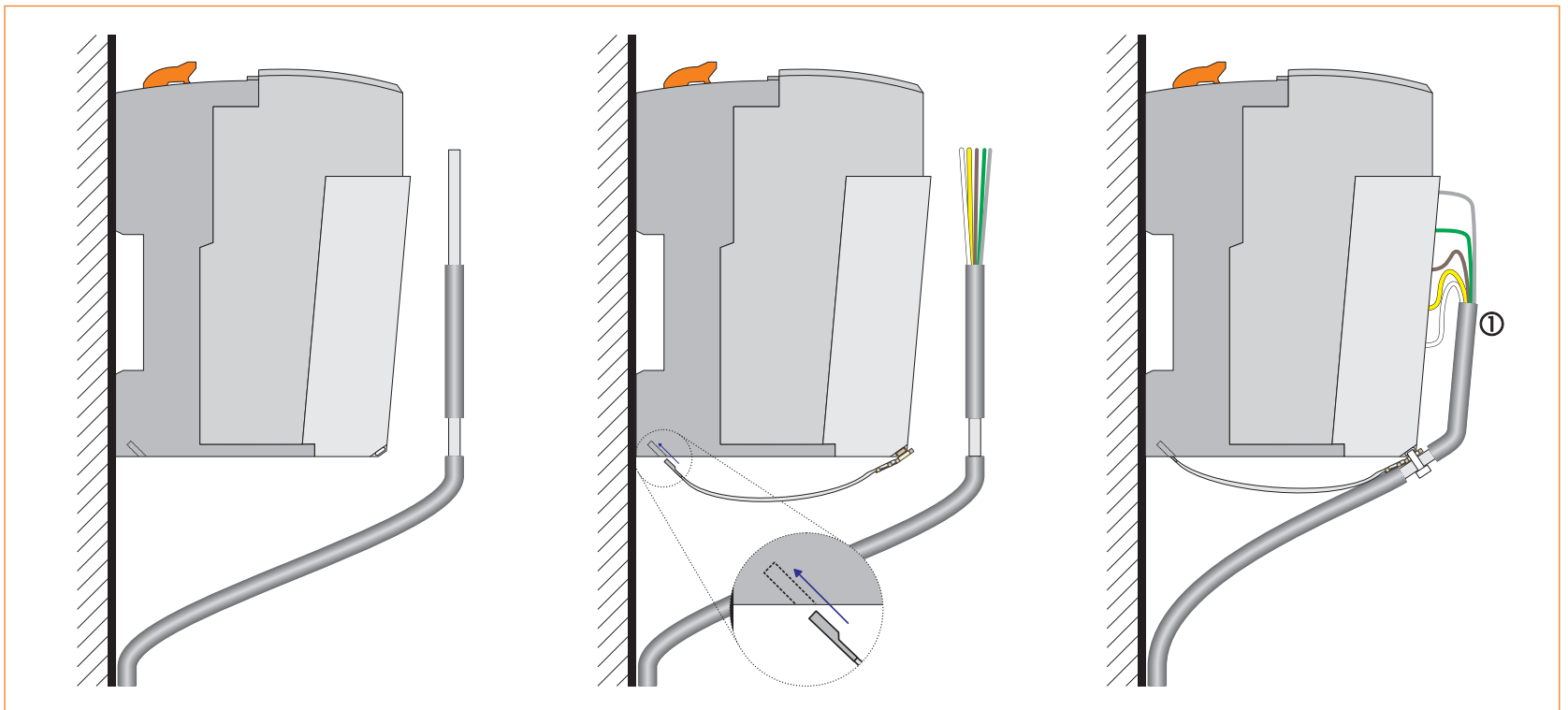


Note: The ground connection should be made as short, and with as little resistance, as possible.

Mechanical and electrical Configuration

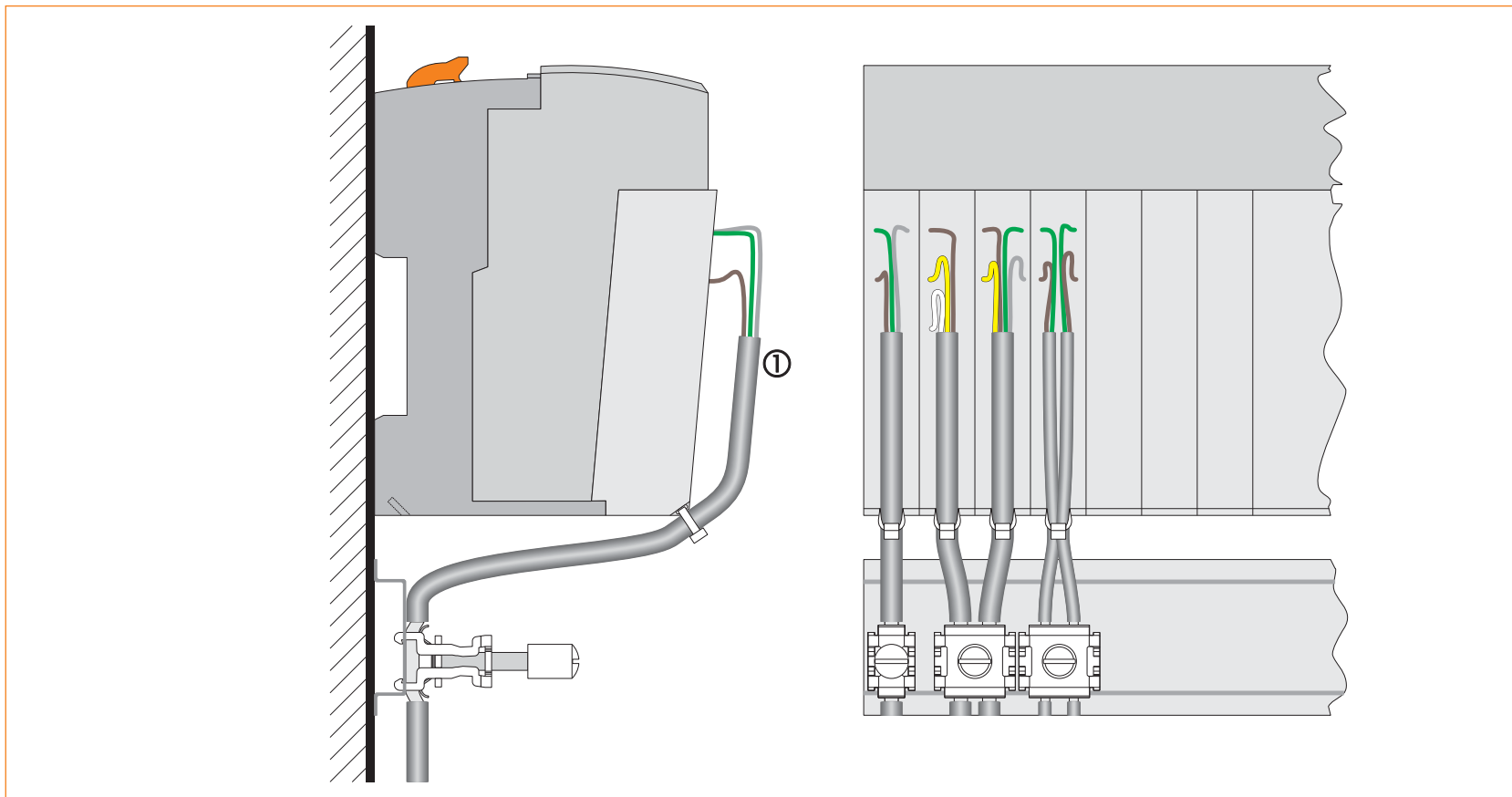
X20 cable shielding plate

The X20 cable shielding plate (available starting in the 3rd quarter 2007, model number X20AC0SG1) is latched to the terminal block and connected to the bus module's ground connection using a cable lug. Cable ties are used to press the shield against the grounding plate.



To reduce the EMC emissions most effectively, the cable shield must reach as high as possible after the cable tie (see ① in the diagram above).

Shielding with grounding terminals



Grounding terminals from other manufacturers (such as GOGATEC) can be used to achieve shielding right on the mounting rail or on special bus bars directly below the controller.

- B&R recommends **always** using a grounding terminal via the mounting rail to connect the X2X Link cable shield directly with the conductive and grounded backplane. This will generally exceed the specified EMC minimal requirements.
- The shielded cables from other modules can be grouped and clamped together. This may also be necessary due to space limitations. A different number of cables can be grounded together with a single terminal depending on the grounding terminals being used.

To reduce the EMC emissions most effectively, the cable shield must reach as high as possible after the cable tie (see ① in the diagram above).

Mechanical and electrical configuration

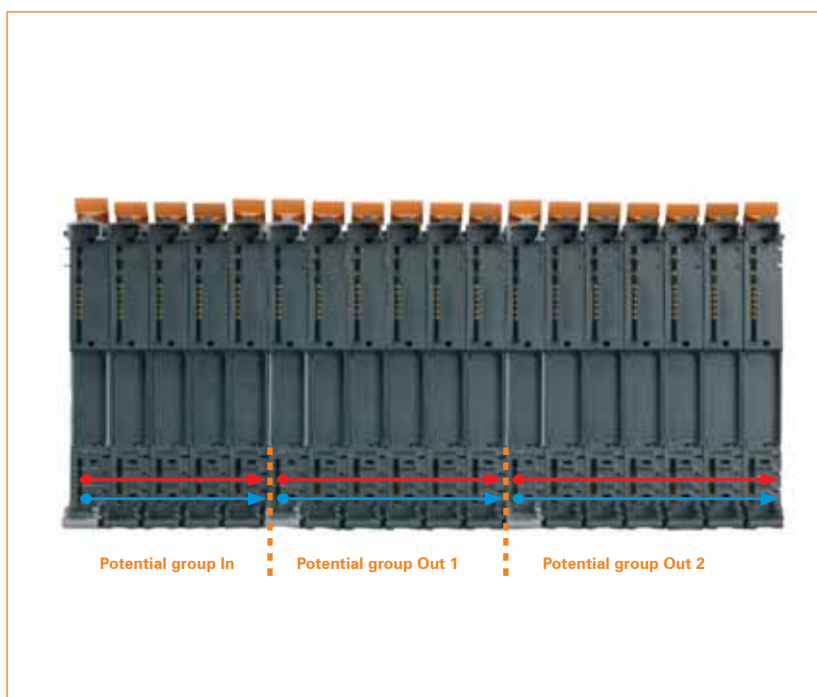


The power supply design

Bus module rack replacement

The bus module is the backbone of the X20 System regarding the bus supply and bus data and also the I/O supply for the electronics modules. Each bus module is an active bus station, even without electronics module. There are two variations of the bus module:

- Interconnected I/O supply
- Supply module with the I/O supply isolated to the left



X20 System infrastructure

Different potential groups can be implemented with the appropriate arrangement of supply bus modules, (e.g. for input groups or different E-stop circuits on the outputs). The I/O supply is fed from supply modules.

Bus supply

The X2X Link supply must be connected in specific locations because the decentralized X2X Link backplane and the I/O electronics are completely electrically isolated. To start, the bus receiver takes on this task. Another supply must be connected after approximately 30¹⁾ modules. A supply module must be used for the X2X Link. On the same module, a separate feed for the I/O supply can also be connected.

Potential groups

The I/O supply is connected via the bus modules. The feed is connected via corresponding supply modules. This makes it possible to implement simple potential groups (e.g. for input groups or different output groups). For isolation, the corresponding bus module is also necessary, which provides isolation of the internal I/O supply.

Output modules with supply

Generally, a supply module is also necessary for current output modules with many channels such as the 8 channel output module with 2 amp outputs. This is not the case with the X20 System. With this module, the supply feed is directly on the module, thereby saving supply modules and construction width.

Bus receiver with supply

The BR9300 bus receiver for the X20 System is equipped with a feed for the X2X Link as well as the internal I/O supply. This way, no additional supply module is needed.

Supply module for internal I/O supply

The first I/O modules of an X20 System are supplied by the bus receiver. The internal I/O supply is refreshed via the PS2100 supply module.

Supply module for internal I/O supply and bus supply

The X2X Link is fed by the BR9300 bus receiver. After approx. 30¹⁾ modules, an additional supply must be connected. The PS3300 supply module is used for this purpose. This module is equipped with a feed for the X2X link as well as the internal I/O supply.

Bus transmitter with supply

The BT9100 bus transmitter has an integrated I/O supply feed. This saves a supply module for the last potential group.

1) For an exact calculation, see section "Power output table" (▣ 411).

Mechanical and electrical configuration

Safe cut-off

The total separation of the power supply from the communication and I/O makes it possible to safely turn off all outputs in the power circuit with an E-stop switching device without communication being disturbed. The X20 System has been certified and approved for this behavior by the German occupational safety and health commission (Berufsgenossenschaft - BG) in accordance to the following standards:

- DIN EN 954-1 up to Category 4
- DIN EN ISO 13849-1 up to Category 4, Performance level "e"
- DIN EN 62061 up to SILCL 3

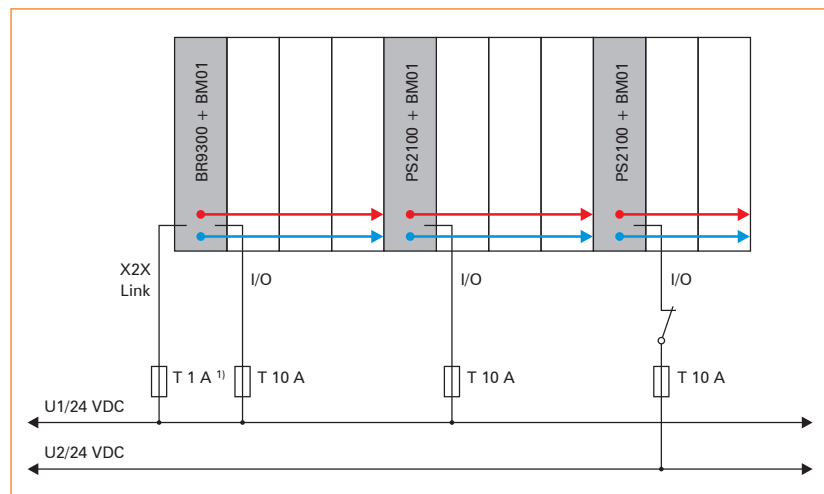
The safety level achieved is determined by the safety level of the external safety switching device. The modules and revisions approved for this operating principle must be taken into consideration.

X20 System protection

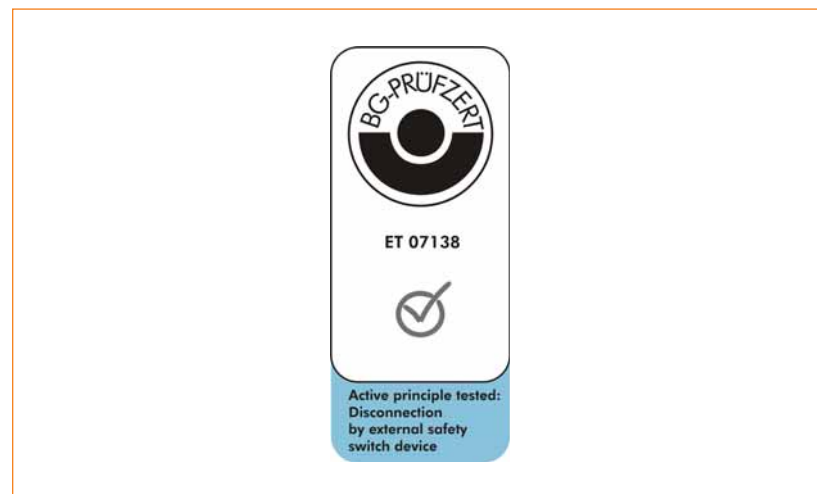
The X20 system is protected according to the power supply design.

Potential groups

Different potential groups can be implemented using the BM01 bus module, and with the appropriate arrangement of supply bus modules, (e.g. for input groups or different power circuits on the outputs).



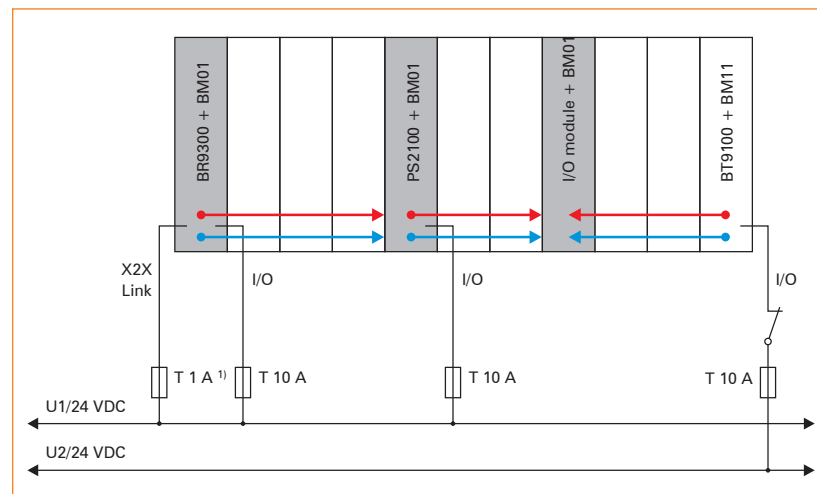
1) Recommended for line protection.



Supply feed via bus transmitter

The BT9100 bus transmitter has an integrated internal I/O supply feed. This saves a supply module for the last potential group.

Keep in mind: this potential group is separated from the rest of the potential groups by an I/O module with the BM01 bus module.



1) Recommended for line protection.

Expanded and redundant X2X Link supply

The remote backplane X2X Link is supplied separately from the I/O. This ensures that if there is a power outage on the I/O side (e.g. E-stop) the remote backplane will not be affected. After approx. 30 modules, a supply module for the X2X Link must be added.

To provide increased supply protection, it is possible to make the X2X Link supply redundant. To do this, at least one extra X2X supply module than would be needed to provide the required X2X Link performance must be used. This guarantees the function of the remote backplane even when one X2X Link supply goes down.

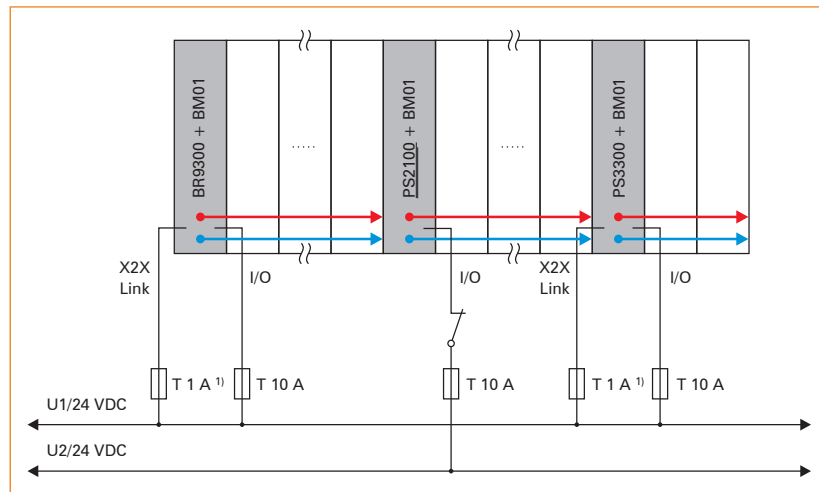
For proper calculation, note the following point:

- To determine the required X2X Link performance, calculate using 75% of the supply module's rated power, during parallel operation.

Note: If the X2X Link supply is not redundant or if the X2X Link supply of an X20 block is shut off completely, this should happen simultaneously for all supply modules.

Example of expanded X2X Link supply

Potential groups can be formed by the use of different types of supplies for the supply modules.

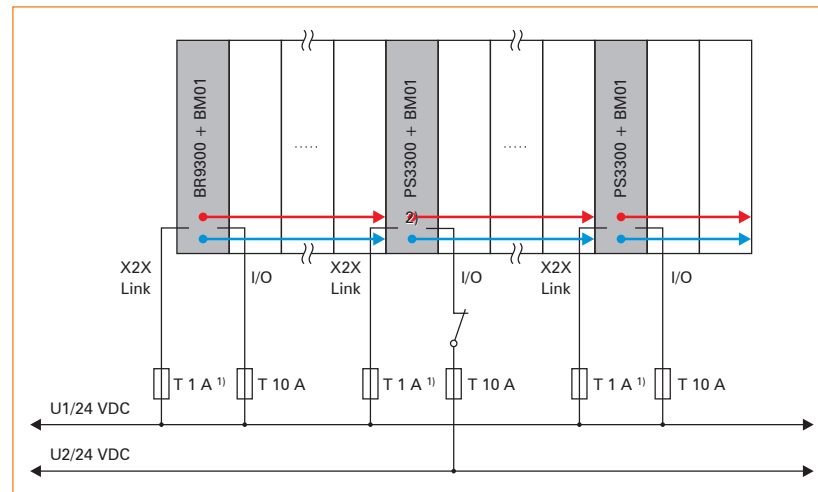


1) Recommended for line protection.

The PS3300 supply module supplies both the X2X Link and I/O, the PS2100 supply module only supplies the I/O.

Example of redundant X2X Link supply

Multiple PS3300 supply modules can be set up in parallel. Potential groups can be formed by the use of different types of supplies.



1) Recommended for line protection.

2) With split supplies, the two reference potentials (GND_1 and GND_2) are combined via the terminal block of the PS3300.

The PS3300 supply module supplies both X2X Link and the I/O.

Mechanical and electrical configuration

Combining X2X Link-based systems

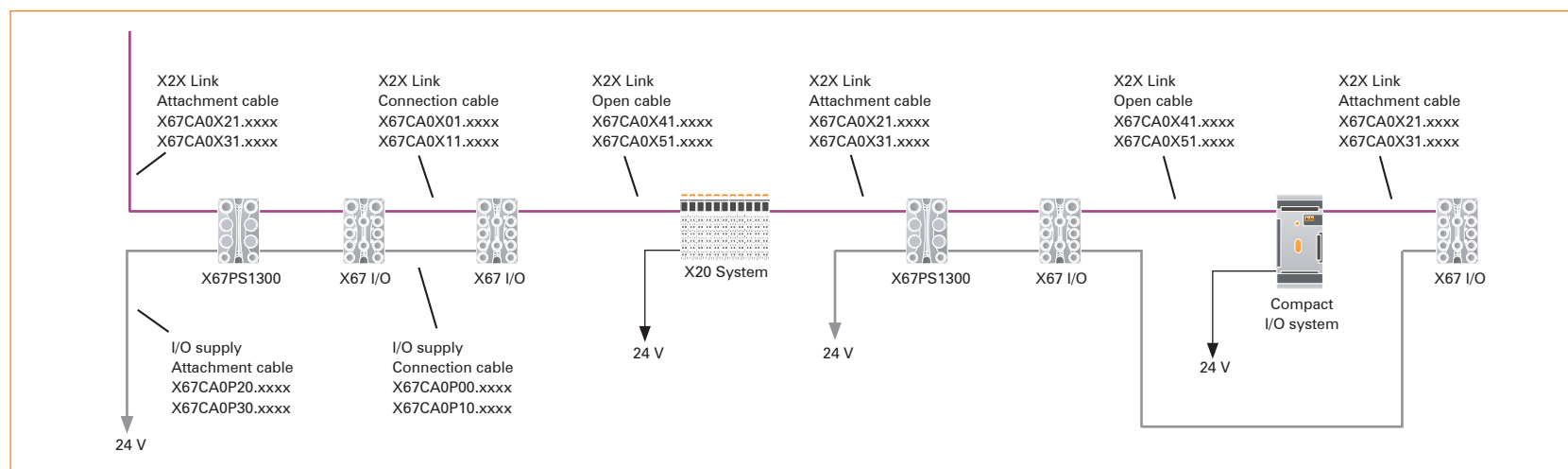
General information

The X2X Link provides a complete backplane, which is used for communicating between bus modules and over the X2X Link cable. Systems based on X2X Link can be combined with one another as needed.

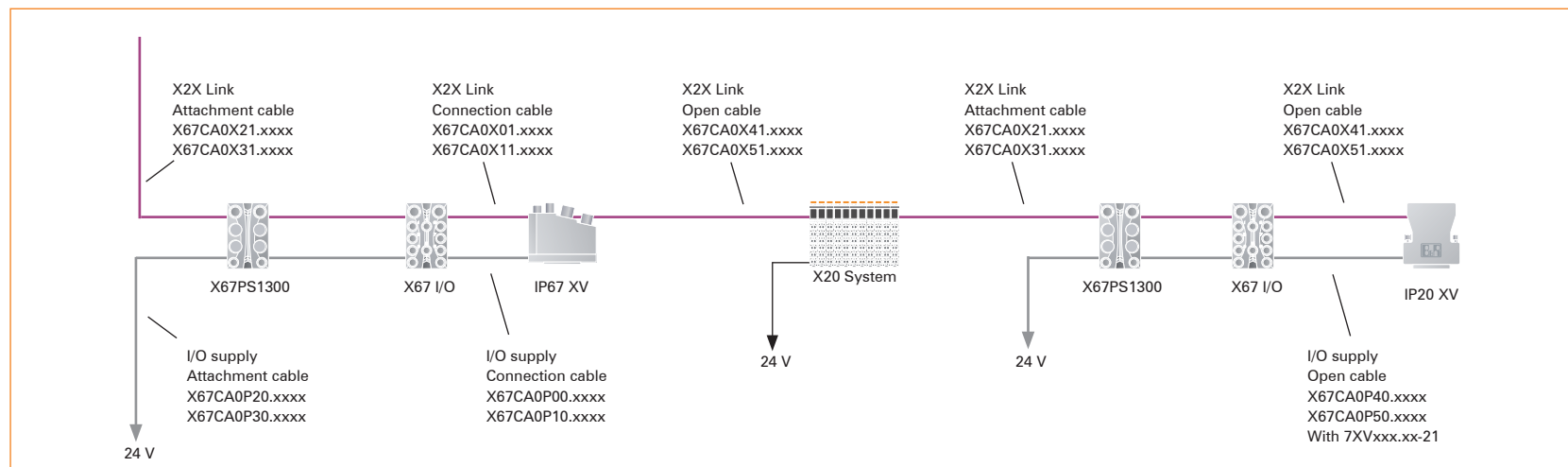
Overview of pin connections

The following connection overviews illustrate combinations of different systems that are based on X2X Link. The model numbers indicate which standard cables available from B&R can be used to connect with one another.

Combining X20, X67 and Compact I/O systems





Combining X20, X67 and valve manifold connections

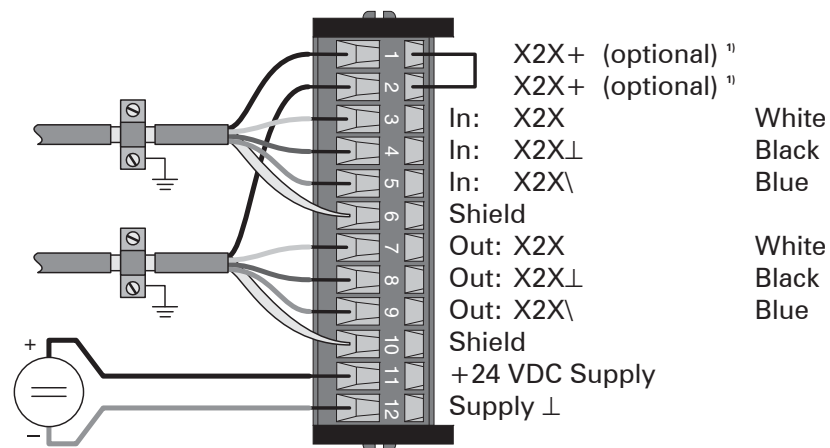


X20 System - Connection examples

Connection examples can be found under the module description:

- Bus receiver BR9300:  208
- Bus transmitter BT9100:  210

Connection example for the Compact I/O system



1) Used to forward the X2X Link supply when using IP67 modules.

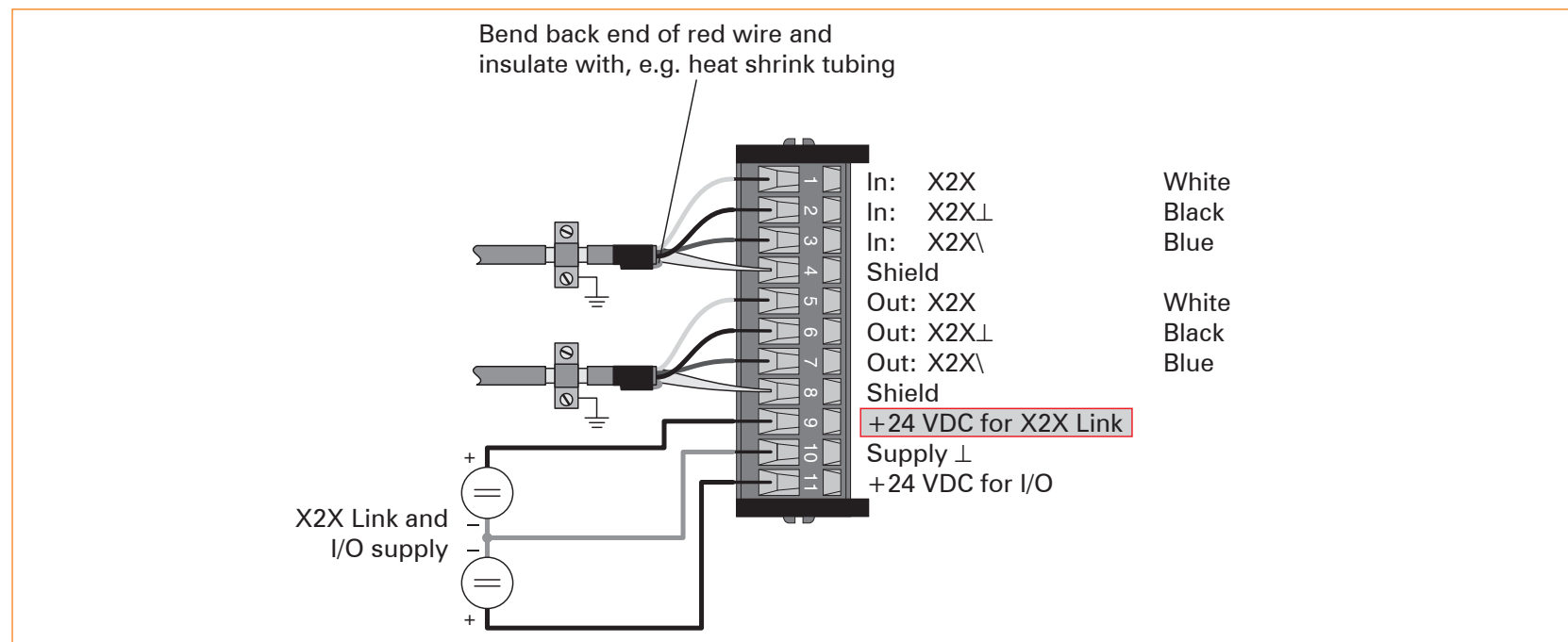
Signal	Cable type	Model number
X2X Link In	Open cable ¹⁾	X67CA0X41.xxxx
		X67CA0X51.xxxx
X2X Link Out	Attachment cable ¹⁾	X67CA0X21.xxxx
		X67CA0X31.xxxx
X2X Link In/Out	Cable for custom prefabrication, 100 m	X67CA0X99.1000

1) Bridge for X2X+ together with X67 modules.

Mechanical and electrical configuration

Valve - Connection examples

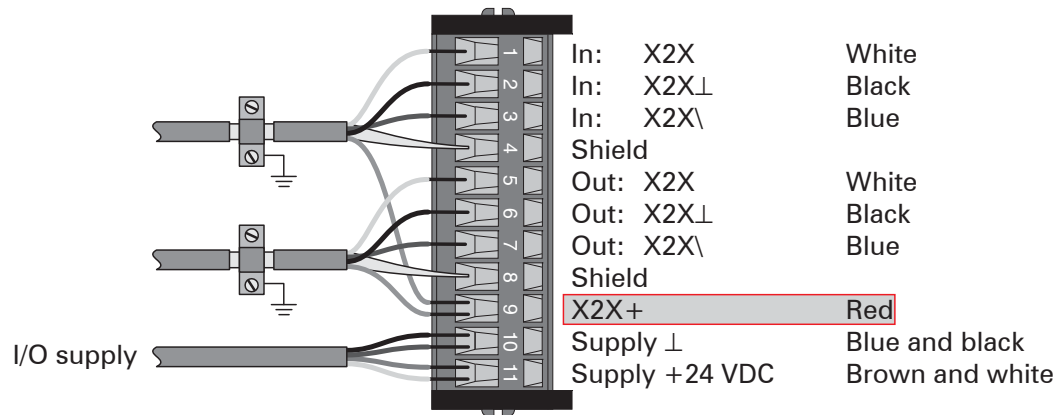
Connection example with 7XVxxx.xx-11/-12



Signal	Cable type	Model number
X2X Link In	Open cable ¹⁾	X67CA0X41.xxxx X67CA0X51.xxxx
X2X Link Out	Attachment cable ¹⁾	X67CA0X21.xxxx X67CA0X31.xxxx
X2X Link In/Out	Cable for custom prefabrication, 100 m	X67CA0X99.1000

1) In connection with X67 modules.

Connection example with 7XVxxx.xx-21

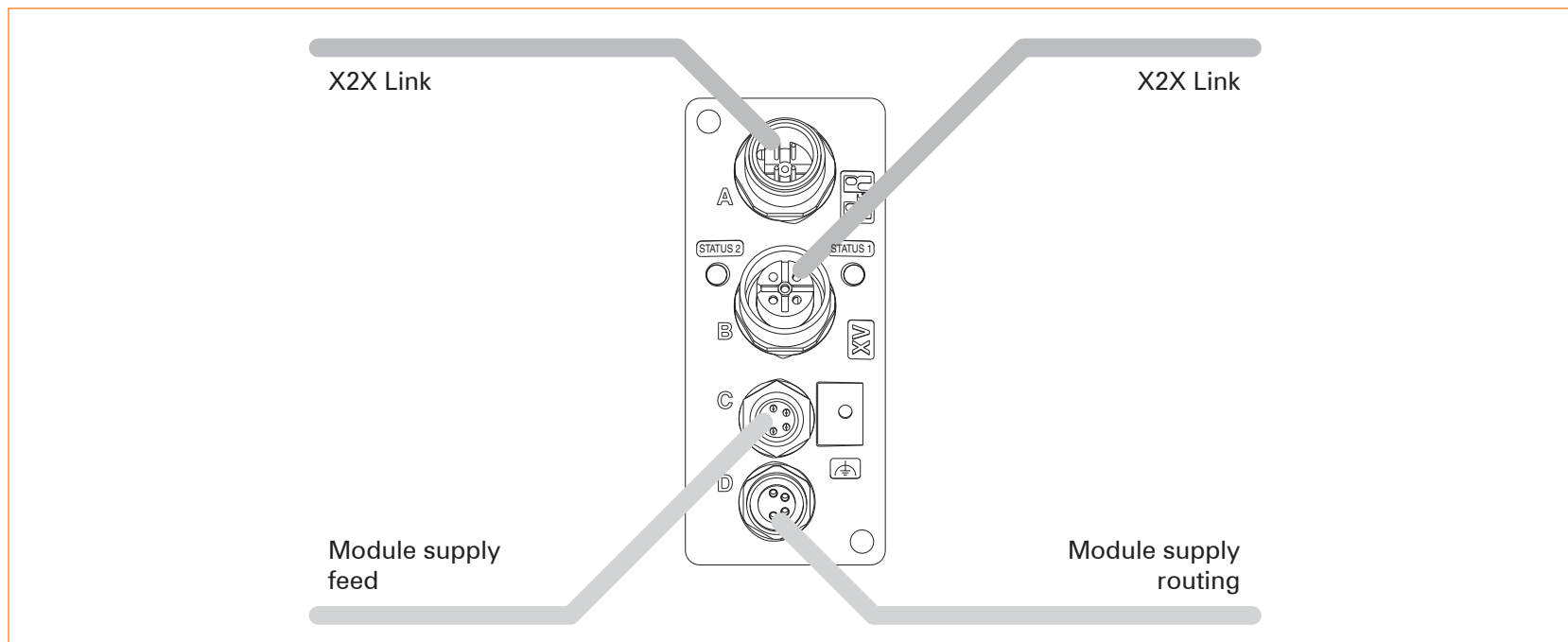


Signal	Cable type	Model number
X2X Link In	Open cable ¹⁾	X67CA0X41.xxxx X67CA0X51.xxxx
X2X Link Out	Attachment cable ¹⁾	X67CA0X21.xxxx X67CA0X31.xxxx
X2X Link In/Out	Cable for custom prefabrication, 100 m	X67CA0X99.1000
I/O supply	Open cable ¹⁾	X67CA0P40.xxxx X67CA0P50.xxxx

¹⁾ In connection with X67 modules.

Mechanical and electrical configuration

Connection example with 7XVxxx.xx-51/-62



Signal	Cable type	Model number
X2X Link	Connection cable ¹⁾	X67CA0X01.xxxx X67CA0X11.xxxx
I/O supply	Connection cable ¹⁾	X67CA0P00.xxxx X67CA0P10.xxxx

1) In connection with X67 modules.

Power output table

The "Bus power" and "Internal I/O power" columns specify values for the power provided by the module or the power required by the module. This allows a power output table to be calculated quickly and easily for a particular hardware configuration.

The values in the "Bus power" column refer to the power table for the X2X Link. The power supplied by the X20 CPU, the bus receiver or the supply module is labeled with "+". The power required by modules is shown with a "-" sign. To calculate the power balance, the positive and negative power values should be added together. The sum may not be less than zero.

The values in the "Internal I/O power" column refer to the internal power requirements of the I/O modules using the 24 VDC I/O supply.

Product ID	Model number	Bus power [W] ¹⁾	Internal I/O power [W]
AI1744	X20AI1744	-0.01	-1.25
AI2622	X20AI2622	-0.01	-0.8
AI2632	X20AI2632	-0.01	-1.2
AI2632-1	X20AI2632-1	-0.01	-1.2
AI4622	X20AI4622	-0.01	-1.1
AI4632	X20AI4632	-0.01	-1.5
AI4632-1	X20AI4632-1	-0.01	-1.5
AO2622	X20AO2622	-0.01	-1.1
AO2632	X20AO2632	-0.01	-1.2
AO4622	X20AO4622	-0.01	-1.5
AO4632	X20AO4632	-0.01	-1.5
AT2222	X20AT2222	-0.01	-1.1
AT2311	X20AT2311	-0.35	-0.85
AT2402	X20AT2402	-0.01	-0.72
AT4222	X20AT4222	-0.01	-1.1
AT6402	X20AT6402	-0.01	-0.91
BB22	X20BB22	-0.32	-
BB27	X20BB27	-0.53	-
BB32	X20BB32	-0.35	-
BB37	X20BB37	-0.56	-
BB80	X20BB80	-	-
BB81	X20BB81	-	-
BB82	X20BB82	-	-
BC0043	X20BC0043	-1.5	-
BC0053	X20BC0053	-1.5	-
BC0063	X20BC0063	-2.3	-
BC0073	X20BC0073	-1.5	-
BC0083	X20BC0083	-2.0	-
BC0087	X20BC0087	-2.0	-
BC0088	X20BC0088	-2.0	-
BC1083	X20BC1083	-2.0	-
BC8083	X20BC8083	-2.0	-
BC8084	X20BC8084	-2.0	-
BM01	X20BM01	-0.13	-
BM05	X20BM05	-0.13	-
BM11	X20BM11	-0.13	-
BM12	X20BM12	-0.13	-
BM15	X20BM15	-0.13	-
BR9300	X20BR9300	+7.0	+240.0 ²⁾
BT9100	X20BT9100	-0.5	-0.1 ⁴⁾ / +240 ^{2) 5)}
BT9400	X20BT9400	-0.5	-0.1 ⁴⁾ / +240 ^{2) 5)}
CM0985	X20CM0985	-1.4	-4.0
CM1201	X20CM1201	-0.01	-1.5

Mechanical and electrical configuration

Product ID	Model number	Bus power [W] ¹⁾	Internal I/O power [W]
CM1941	X20CM1941	-0.01	-1.5
CM8281	X20CM8281	-0.01	-1.75
CM8323	X20CM8323	-0.01	-1.5
CP0201	X20CP0201	-2.2	-
CP0291	X20CP0291	-2.7	-
CP0292	X20CP0292	-3.0	-
CP1483	X20CP1483	+7.0	+240.0 ²⁾
CP1484	X20CP1484	+7.0	+240.0 ²⁾
CP1485	X20CP1485	+7.0	+240.0 ²⁾
CP1486	X20CP1486	+7.0	+240.0 ²⁾
CP3484	X20CP3484	+7.0	+240.0 ²⁾
CP3485	X20CP3485	+7.0	+240.0 ²⁾
CP3486	X20CP3486	+7.0	+240.0 ²⁾
CS1011	X20CS1011	-0.01	-1.0
CS1020	X20CS1020	-0.01	-1.44
CS1030	X20CS1030	-0.01	-1.44
CS1070	X20CS1070	-0.01	-1.44
CS2770	X20CS2770	-0.01	-1.5
DC1196	X20DC1196	-0.01	-1.5
DC1198	X20DC1198	-0.01	-1.5
DC1396	X20DC1396	-0.01	-1.4
DC1398	X20DC1398	-0.01	-1.3
DC2190	X20DC2190	-0.01	-1.1
DC2395	X20DC2395	-0.01	-1.4
DC2396	X20DC2396	-0.01	-1.5
DC2398	X20DC2398	-0.01	-1.4
DC4395	X20DC4395	-0.01	-1.5
DI2371	X20DI2371	-0.12	-0.29
DI2372	X20DI2372	-0.12	-0.29
DI2377	X20DI2377	-0.15	-0.82
DI2653 ³⁾	X20DI2653	-0.14	-
DI4371	X20DI4371	-0.14	-0.59
DI4372	X20DI4372	-0.14	-0.59
DI4653 ³⁾	X20DI4653	-0.17	-
DI4760	X20DI4760	-0.01	-1.5
DI6371	X20DI6371	-0.15	-0.88
DI6372	X20DI6372	-0.15	-0.88
DI6553 ³⁾	X20DI6553	-0.21	-
DI8371 ³⁾	X20DI8371	-0.18	-
DI9371 ³⁾	X20DI9371	-0.18	-
DI9372	X20DI9372	-0.18	-1.75
DM9324 ³⁾	X20DM9324	-0.21	-0.5
DO2321	X20DO2321	-0.13	-0.3
DO2322	X20DO2322	-0.13	-0.33
DO2623 ³⁾	X20DO2623	-0.35	-
DO2649	X20DO2649	-0.45	-
DO4321	X20DO4321	-0.16	-0.49
DO4322	X20DO4322	-0.16	-0.49
DO4331	X20DO4331	-0.16	-0.49
DO4332	X20DO4332	-0.16	-0.5
DO4529	X20DO4529	-0.8	-
DO4623 ³⁾	X20DO4623	-0.52	-
DO6321	X20DO6321	-0.2	-0.59
DO6322	X20DO6322	-0.18	-0.71

Product ID	Model number	Bus power [W] ¹⁾	Internal I/O power [W]
DO6529	X20DO6529	-1.1	-
DO8322	X20DO8322	-0.26	-0.8
DO8331 ³⁾	X20DO8331	-0.22	-
DO8332 ³⁾	X20DO8332	-0.22	-
DO9321	X20DO9321	-0.26	-0.99
DO9322	X20DO9322	-0.26	-1.15
DS1119	X20DS1119	-0.01	-1.5
DS1319	X20DS1319	-0.01	-1.5
HB2880	X20HB2880	TBD	-
HB2885	X20HB2885	TBD	-
IF1020	X20IF1020	-0.33	-
IF1030	X20IF1030	-0.4	-
IF1061	X20IF1061	-1.4	-
IF1063	X20IF1063	-0.87	-
IF1072	X20IF1072	-0.79	-
IF1074	X20IF1074	-0.69	-
IF1082	X20IF1082	-2.0	-
IF1091	X20IF1091	-0.97	-
IF1091-1	X20IF1091-1	-1.29	-
IF2772	X20IF2772	-1.2	-
IF2792	X20IF2792	-1.51	-
MM2436 ³⁾	X20MM2436	-0.01	-
MM4456 ³⁾	X20MM4456	-0.01	-2.0
PD0011 ³⁾	X20PD0011	-0.12	-
PD0012	X20PD0012	-0.12	-1.0
PD0016 ³⁾	X20PD0016	-0.12	-
PD2113 ³⁾	X20PD2113	-0.12	-
PS2100	X20PS2100	-0.2	+240.0 ²⁾
PS2110	X20PS2110	-0.2	+240.0 ²⁾
PS3300	X20PS3300	+7.0	+240.0 ²⁾
PS3310	X20PS3310	+7.0	+240.0 ²⁾
PS4951	X20PS4951	-0.01	-1.80
PS9400	X20PS9400	+7.0	+240.0 ²⁾
PS9402	X20PS9402	+7.0	+240.0 ²⁾
PS9500	X20PS9500	+7.0	+240.0 ²⁾
PS9502	X20PS9502	+7.0	+240.0 ²⁾
SM1426	X20SM1426	-0.01	-1.8
SM1436 ³⁾	X20SM1436	-0.01	-
XC0201	X20XC0201	-2.0	-
XC0202	X20XC0202	-2.2	-
XC0292	X20XC0292	-2.8	-

For modules with 0.01 W power requirement, the embedded parameter chip can only be read if the I/O supply is also present.

The embedded parameter chip is described in the section "Embedded parameter chip", on page 53.

2) Rated power at 24 VDC and 10.0 A.

3) The module's power consumption can be found on the technical data sheet.

4) When used as bus transmitter.

5) When used as bus transmitter and I/O supply module.

Note: Please observe the example calculations on the following pages.

Mechanical and electrical configuration

Example 1

Calculation of the power output table for the bus and 24 VDC I/O supply with the following hardware configuration:

Module	Bus power [W]	Internal I/O power [W]	External I/O power [W]	Sensor/actuator supply [W] ¹⁾
DI4371	0.14	0.59	-	12
DI2371	0.12	0.29	-	12
DO4322	0.16	0.49	48 ²⁾	12
DO4322	0.16	0.49	48 ²⁾	12
BT9100	0.5	0.1	-	-
Subtotal		1.96	96	48
Sum	1.08	145.96 (= 1.96 + 96 + 48)		

1) Rated power at 24 VDC and 0.5 A.

2) Rated power at 24 VDC and 100% simultaneousness.

The total power to be supplied by the 24 VDC I/O supply is 145.96 W. One supply module is already integrated in the BR9300 bus receiver. The power comparison indicates that the power provided by the supply module is sufficient.

	Bus power [W]	24 VDC I/O supply power [W]
BR9300	+7.0	+240.0 ¹⁾
Power required by I/O modules	-1.08	-145.96
Power required by all bus modules	-0.78	-
Residual power	+5.14	+94.04

1) Rated power at 24 VDC and 10.0 A.

Example 2

In this example, the I/O modules are separated into three potential groups:

- Potential group 1: Digital input modules
- Potential group 2: Digital output modules
- Potential group 3: Analog input modules and temperature modules

Calculation of the power output table for the bus and 24 VDC I/O supply for each potential group with the following hardware configuration:

Potential group 1				
Module	Bus power [W]	Internal I/O power [W]	External I/O power [W]	Sensor/actuator supply [W] ¹⁾
DI6371	0.15	0.88	-	-
DI6371	0.15	0.88	-	-
DI2377	0.15	0.82	-	12
Subtotal		2.58	-	12
Sum	0.45	14.58 (= 2.58 + 12)		

1) Rated power at 24 VDC and 0.5 A.

Potential group 2				
Module	Bus power [W]	Internal I/O power [W]	External I/O power [W] ¹⁾	Sensor/actuator supply [W] ²⁾
DO2322	0.13	0.33	24	12
DO6322	0.18	0.71	72	-
DO8332	0.22	-	- ³⁾	-
Subtotal		1.04	96	12
Sum	0.53	109.04 (= 1.04 + 96 + 12)		

1) Rated power at 24 VDC and 100% simultaneousness.

2) Rated power at 24 VDC and 0.5 A.

3) The power supply is integrated in the module.

Potential group 3				
Module	Bus power [W]	Internal I/O power [W]	External I/O power [W]	Sensor/actuator supply [W]
AI4622	0.01	1.1	-	-
AI4622	0.01	1.1	-	-
AT4222	0.01	1.1	-	-
AT2402	0.01	0.72	-	-
BT9100	0.5	0.1	-	-
Subtotal		4.12	-	-
Sum	0.54	4.12		

Mechanical and electrical configuration

Next, a power comparison must be made between the power required by the I/O modules and the power delivered by the supply modules.

Potential group 1 is supplied by the supply module integrated in the BR9300 bus receiver. The total power to be supplied by all the bus modules is 3.34 W. The total power to be supplied by the 24 VDC I/O supply for potential group 1 is 14.3 W.

The power comparison indicates that the power provided by the supply module integrated in the BR9300 is sufficient.

Potential group 1	Bus power [W]	24 VDC I/O supply power [W]
BR9300	+7.0	+240.0 ¹⁾
Power required by I/O modules	-1.22 ²⁾	-14.58 ³⁾
Power required by all bus modules	-1.82	-
Residual power	+3.96	+225.42

1) Rated power at 24 VDC and 10.0 A.

2) Bus power to be supplied for all I/O modules.

3) 24 VDC I/O supply to be provided for potential group 1.

In potential groups 2 and 3, the 24 VDC I/O supply is fed via the PS2100 supply module. A supply module is required for each potential group.

The power comparison indicates that the power provided by the PS2100 is sufficient.

Potential group 2	24 VDC I/O supply power [W]
PS2100	+240.0 ¹⁾
Power required by I/O modules	-109.04
Residual power	+130.96

1) Rated power at 24 VDC and 10.0 A.

Potential group 3	24 VDC I/O supply power [W]
PS2100	+240.0 ¹⁾
Power required by I/O modules	-4.12
Residual power	+235.88

1) Rated power at 24 VDC and 10.0 A.












X67 System Remote I/O with IP67 protection

Mount, connect and you're ready to go.
A new dimension for remote I/O mounted directly on the machine.
Credit card size for mounting in the smallest areas. No space required in the cabinet.
IP67 protection withstands the harshest environments. As fast as a central solution.
Connections are made using open fieldbus systems.



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System characteristics

Remote I/O system with IP67 protection

Classic I/O systems are located centrally in the switching cabinet. Extensive wiring is required for sensors and actuators. Modular machine designs additionally require interconnections with bulkhead connectors. Remote I/O modules can reach their full potential only if additional distribution boxes can be completely eliminated. And that's why I/O modules with IP67 protection that can be used in rough industrial environments are the optimal solution.

Cost reductions

Reduced wiring

Instead of having to extensively wire each individual sensor or actuator to the switching cabinet over long distances, the X67 System reduces the amount of work down to a single bus cable and a 24 VDC power supply. This applies to the entire machine. Considerable savings potential exists even when compared to passive distributors. This is because plugging a sensor into the X67 replaces the entire input wiring in the switching cabinet.

The shortest commissioning times

Prefabricated standard cables make it possible for the mechanic to make the connection. Wiring errors are a thing of the past. Preparation for operation starts with the construction of the machine. Lengthy inspection of the wiring is no longer necessary.

The lowest service costs

Correcting errors is easy since individual sensors and actuators can be quickly replaced using plug connections. Extensive diagnostic functions allow errors to be detected immediately.

ETHERNET 
POWERLINK

CANopen


DeviceNet™

PROFI®
PROCESS FIELD BUS
BUS

Flexibility

One system for all machine designs

Whether a compact machine or an extensive system, the I/O system adapts to the machine's architecture regardless of whether moderate or the highest performance demands must be met. The X67 System offers every freedom.

Open communication

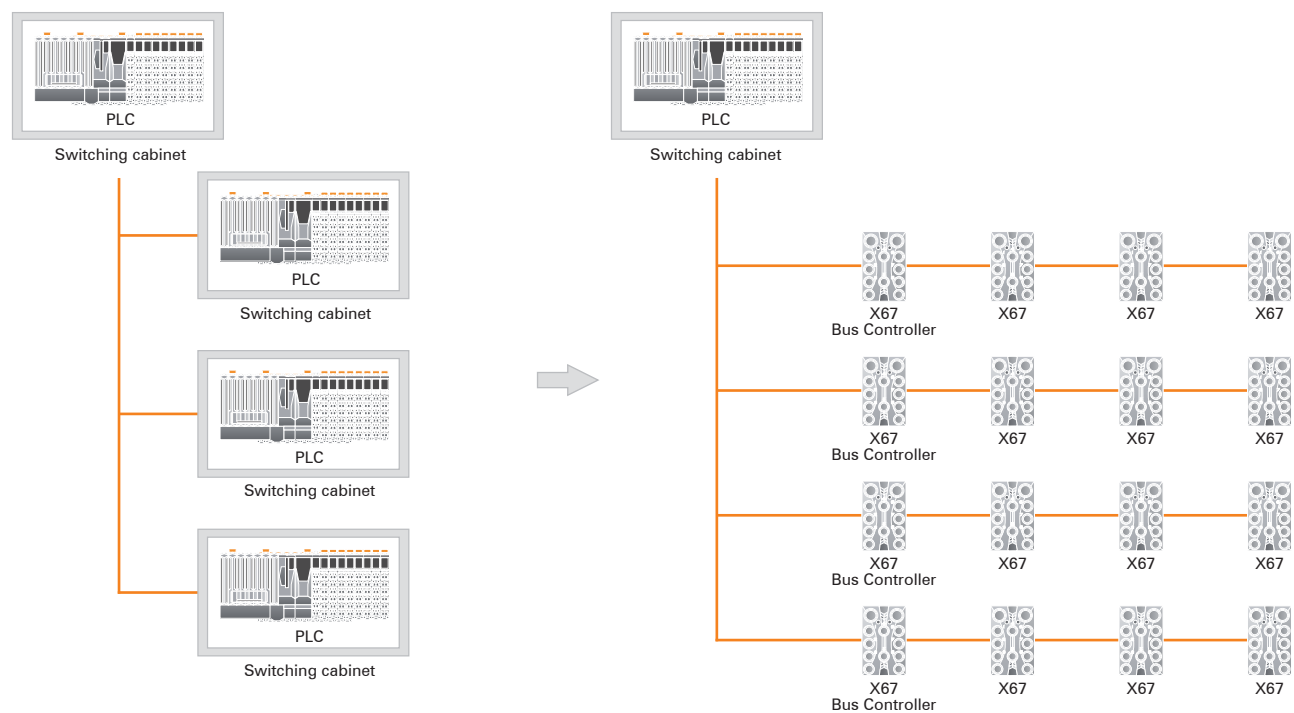
POWERLINK, CAN bus, CANopen, DeviceNet, Profibus DP: The I/O system always remains the X67 regardless of the fieldbus system selected.

Expanded as necessary

The X67 System is highly flexible. Machines with exchangeable modules, additional expansions and even supplementary changes in the machine layout are all easily possible.

Minimum switching cabinet space

The space required for the cable placement, terminals and I/O modules is saved as well as additional junction boxes.



The X67 System provides an alternative to standard switching cabinet expansion.

System characteristics



Open

The X67 system is an I/O system for all standard fieldbus systems or for direct connection to B&R controllers. The I/O system always remains the same; only the connection changes.



Adaptability

Digital channels that can be configured as inputs or outputs allow tailored adaptation to requirements while reducing both the number and variety of modules.



Compact

Operation and monitoring with a compact design. This allows the X67 System to fit anywhere on the machine.



Clarity

Visual status displays on the modules and advanced status messages via the bus enable clear-cut diagnostics on the device. Warning and error thresholds for I/O supply, single channel diagnostics, and open circuit detection are just a few examples.



Flexibility

100 m between modules (no limitations) provides plenty of reserves. This makes it easy to overcome any configuration, regardless of whether modules are placed directly next to one another or located further away.



Robust

Completely sealed modules provide the external characteristic for robustness. Features for providing maximum electromagnetic immunity (EMC) are concealed on the inside.



Fast

Cycle times well below a millisecond guarantee the necessary reserves for your application. Of course, synchronous I/O processing is standard.



Plug and run

Prefabricated standard cable and automatic module identification reduce mounting and start-up preparation to a minimum.

**Safe**

Communication and I/O are completely isolated electrically. Disturbances or voltage dips on the I/O side do not affect how the bus functions. Diagnosis is always possible.

**Protection**

Integrated reverse polarity protection, short circuit protection, protection when switching inductances, and the highest level of protection for the electronics as well.

**Strong**

I/O supply via two pairs of leads: this provides up to 8 amps for outputs or for supplying additional modules.

**Well supplied**

Many sensors and actuators require a 24 VDC power supply. On X67 modules, this is integrated in all digital connections and protected against short circuit.

**Shielded**

Seamless 360° shielding dissipation from the cable over the plug directly on the thread of the M12 connector, through to the metal backplane of the module and over the mounting screws straight to the machine. Complete ground connection for the bus and all analog signals.

**Expandable**

X67 can be expanded: up to 250 modules with up to 100 m distance between individual modules.

**Centered**

The central position of both mounting screws prevents the wedge nut mounting in standard aluminum profiles from tilting.

**Multi-talented**

Synchronous I/O processing, adjustable software filter, integrated counter functions, flexible standard functions, etc. Intelligent products for versatile application.

Extremely compact, extremely robust and extremely fast.

System characteristics

The X67 System consists of bus controller modules, I/O modules, function modules and system supply modules wired using standard M8 and M12 connection technology.



Freely accessible node number switches with IP67 protection

Bus controllers

Bus controllers are the components used to connect to the world of field bus systems. Being equipped with digital connections, which can be configured as inputs or outputs, makes them powerful I/O modules.

The option of connecting additional modules proves the extreme flexibility and efficiency of bus controllers. The fieldbus device can be expanded like a modular system. From the view of the fieldbus, it remains a device. The integrated X2X Link connection allows different X67 modules to be easily connected even over long distances.

The X67 system is an extremely high-performance and cost-effective system. If the fieldbus needs to be changed, only the bus controller changes and the rest stays the same – on the machine and in the entire documentation.



8 amps for I/O

Digital modules

X67 digital modules are available in many different designs:

- 8/16-channel input modules
- 8-channel output modules. Each channel is supplied with 2 amps. Maximum total supply is 8 amps.
- 8/16-channel mixed modules with individually configurable channels
- Valve control modules
- Motor modules

This flexibility reduces the number of modules and simplifies logistics and storage. The number of inputs and outputs is always tailored to your needs.



Current, voltage, and temperature measurement

Analog modules

The X67 System offers input and output modules, as well as mixed modules with four channels each for measuring current or voltage signals.

Modules for recording temperatures using resistance or a thermocouple element round out the product line. A special M12 plug for temperature compensation of the measurement point is also available as an accessory for these modules.

One feature common to all analog modules is the complete shielding. The cable shielding is a seamless 360°, in contact with the shielding on the module.



Rotational encoder connection for SSI and ABR

Function modules

The X67 System offers special function modules:

- Multifunctional counter module for absolute and incremental encode and more
- Communication module: Combining RS232 or RS485/RS422 and digital I/O is a compact solution for many types of applications. This makes it possible to connect barcode readers and the trigger sensor with just one module.

System characteristics



System supply

System supply

The ability to perform diagnostic functions must remain in every operating mode. This is an extremely important aspect of operational safety for the entire machine. That is why the power supply for I/O is completely separate from communication on the X67 System. Even if the I/O supply is interrupted, communication and diagnostic capabilities remain. Flexible system supply modules are used for this purpose.

A system supply module can provide power to two lines. Any number of system supply modules can be used in an X67 installation, allowing maximum availability by implementing a redundant supply design.



The total separation of the power supply from the communication and I/O makes it possible to safely turn off all outputs in the power circuit with an E-stop switching device without communication being disturbed. The X67 System has been certified and approved by the German occupational safety and health commission (Berufsgenossenschaft - BG) according to the following standard:

- DIN EN 954-1 up to category 4

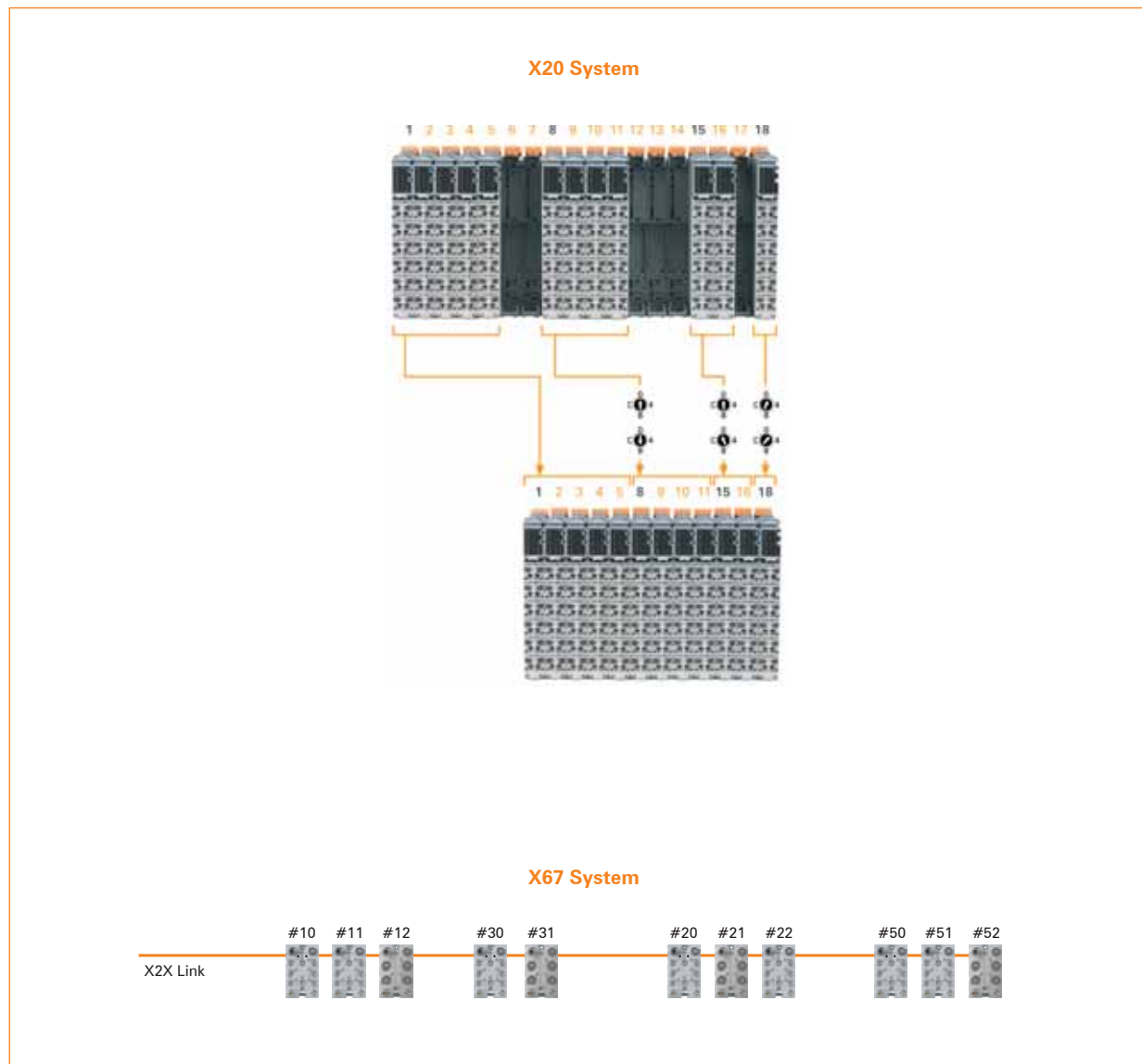
The safety level achieved is determined by the safety level of the external safety switching device. The modules and revisions approved for this operating principle must be taken into consideration.

Definable X2X Link address

The decentralized X2X Link backplane, which connects the individual I/O modules with each other, is set up to be self-addressing. It is not necessary to set the node numbers. The module address is assigned according to its position in the X2X Link line.

In certain cases, e.g. when configurations of modular machines change, it is necessary to define specific module groups at a fixed address, regardless of the preceding modules in the line.

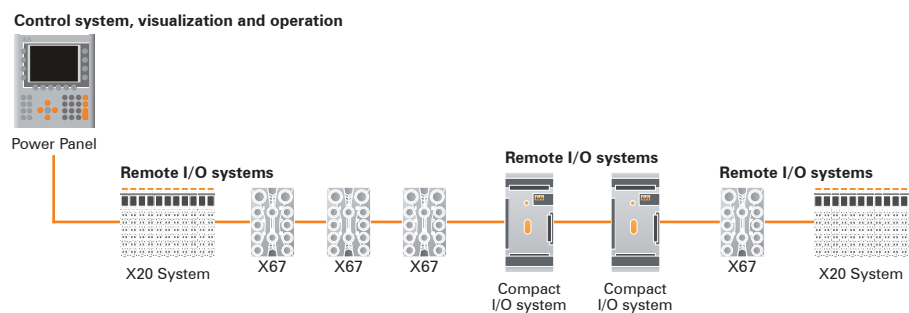
For this purpose, there are modules in both the X20 System and the X67 System with node number switches, which allow you to set the X2X Link address. All subsequent modules refer to this offset and are addressed again automatically.



Typical topologies

Compact solution for small and mid-sized machines

The X67 system is connected directly to a B&R controller system. This is the most compact solution for remote and distributed I/O systems. The X67 System, Compact I/O System, X20 System and simple operating panels can be operated on the same line.

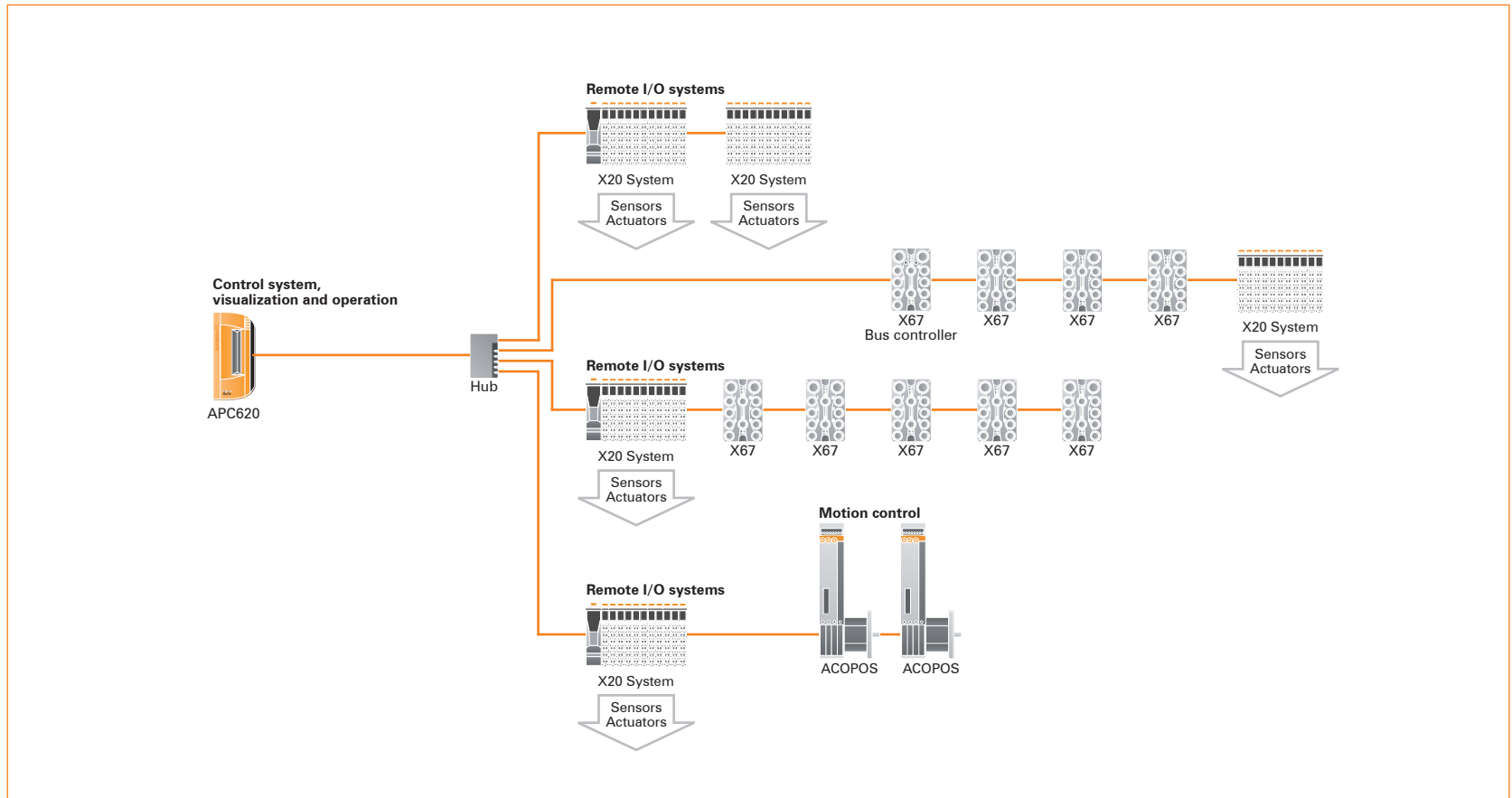


Components and technologies

Control system	Power Panel: Integrated control, operation, and visualization	787
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419
	Compact I/O system and valve connections: Economical usage of peripheral space	581

Remote system for larger machines and systems

Total freedom for topology without limiting performance is a defining characteristic of a POWERLINK-based system. Servo drives with a POWERLINK connection and X67 modules connected over a bus controller are the ideal combination for a high-performance distributed machine automation solution. POWERLINK is used for reading, writing, and synchronizing I/O.



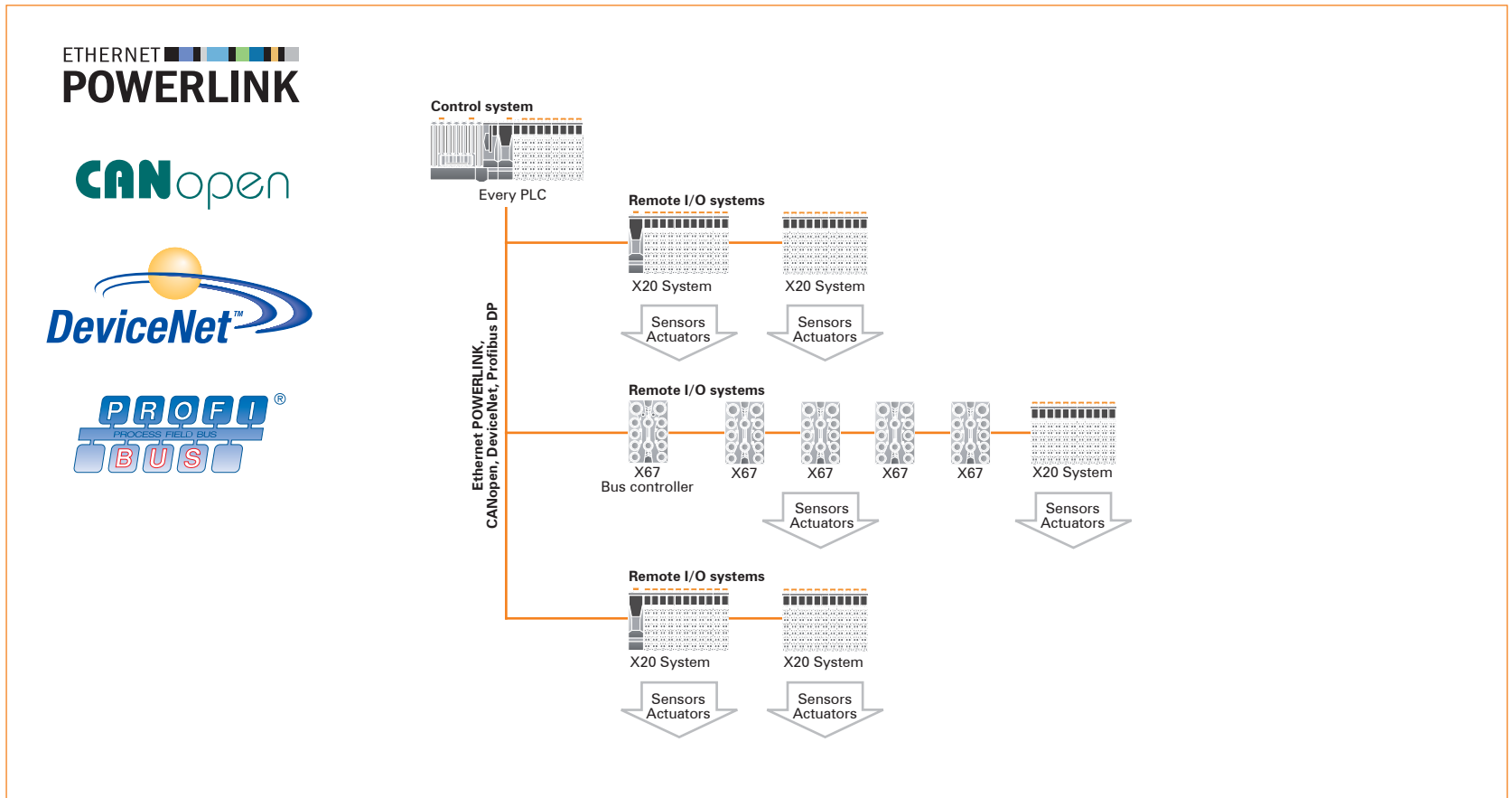
Components and technologies

Control system	Automation PC APC620/APC810: Industrial PC	911/945
	Panel PC: Operation and PC integrated	973/985
Visualization and operation	Panel PC: Operation and PC integrated	973/985
	Automation Panel: A new dimension in machine visualization	1055/1077
Motion control	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous motors: Dynamic precision drives	1459/1585/1645
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419
Network and fieldbus modules	Ethernet POWERLINK	611

Typical topologies

Fieldbus-based remote I/O system

POWERLINK, CANopen, DeviceNet and Profibus DP are all supported by the X67 system. The fieldbus is connected to the respective bus controller, the node numbers are set, the configuration is loaded and the X67 system is operational.

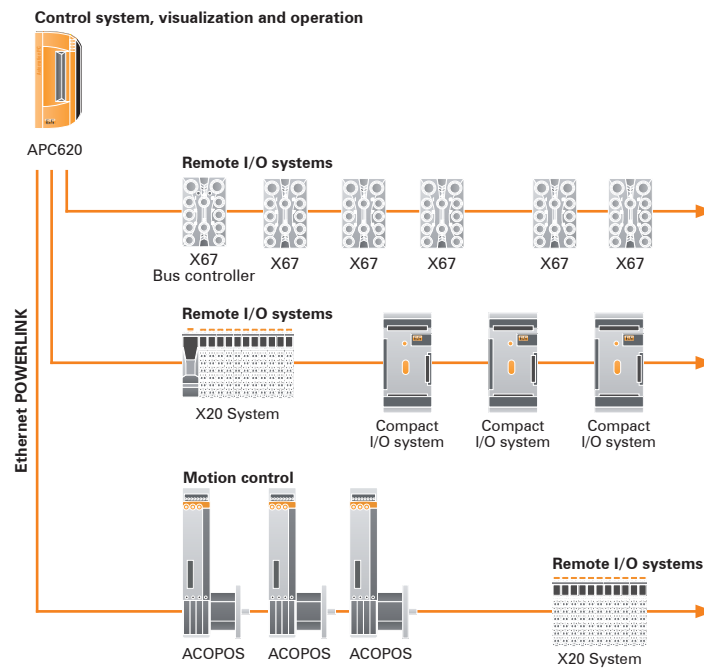


Components and technologies

Control system	X20 System: Slice-based I/O and control system	37
	Power Panel: Integrated control, operation, and visualization	787
	Automation PC APC620/APC810: Industrial PC	911/945
	Panel PC: Operation and PC integrated	973/985
	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419
Network and fieldbus modules	Various fieldbus modules	611

Custom-fit system combinations

Optimized machine designs require customized implementation of fieldbus systems. With the flexibility of the X67 system and the openness of B&R's system components, the automation can adapt ideally to the cost and performance demands of the application.



Components and technologies

Control system	Automation PC APC620/APC810: Industrial PC	911/945
	Panel PC: Operation and PC integrated	973/985
Visualization and operation	Panel PC: Operation and PC integrated	973/985
	Automation Panel: A new dimension in machine visualization	1055/1077
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Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419
	Compact I/O system and valve switching: Economical usage of peripheral space	581
Network and fieldbus modules	Various fieldbus modules	611

Product overview

Bus controller selection table

Function	X67BC4321	X67BC5321	X67BC6321	X67BC6321.L08	X67BC6321.L12	X67BC7321-1	X67BC8321-1
CANopen	1						
DeviceNet		1					
Profibus DP			1	1	1		
CAN I/O						1	
Ethernet POWERLINK							1
Digital input	(8)	(8)	(8)	(16)	(16)	(8)	(8)
Digital output	(8)	(8)	(8)	(16)	(16)	(8)	(8)
Event counter		(2)	(2)	(2)	(2)	(2)	(2)
Gate measurement		(1)	(1)	(1)	(1)	(1)	(1)
Page	444	447	452	454	456	458	461

Numbers in brackets represent a multiple assignment. Check the specifications in the data sheet for the exact configuration.

Bus controllers



Model number	Short description	
X67BC4321	X67 CANopen bus controller, X2X Link supply 3 W, 8 digital channels can be configured as inputs or outputs, 24 VDC, 0.5 A	444
X67BC5321	X67 DeviceNet bus controller, X2X Link supply 3 W, 8 digital channels can be configured as inputs or outputs, 24 VDC, 0.5 A	447
X67BC6321	X67 Profibus DP bus controller, X2X Link supply 3 W, 8 digital channels can be configured as inputs or outputs, 24 VDC, 0.5 A	452
X67BC6321.L08	X67 Profibus DP bus controller, X2X Link supply 15 W, 16 digital channels can be configured as inputs or outputs, 24 VDC, 0.5 A, M8 connectors	454
X67BC6321.L12	X67 Profibus DP bus controller, X2X Link supply 15 W, 16 digital channels can be configured as inputs or outputs, 24 VDC, 0.5 A, M12 connectors	456
X67BC7321-1	X67 CAN I/O bus controller, expanded CAN I/O functionality, X2X Link supply 3 W, 8 digital channels can be configured as inputs or outputs, 24 VDC, 0.5 A	458
X67BC8321-1	X67 POWERLINK V1/V2 bus controller, X2X Link supply 3 W, 8 digital channels can be configured as inputs or outputs, 24 VDC, 0.5 A	461

System supply



Model number	Short description	
X67PS1300	X67 System supply 24 VDC, X2X Link supply 15 W, reverse polarity protection, short circuit protection, overload protection, parallel connection possible	464

Product overview

I/O module selection table

Function	X67AI1223	X67AI1323	X67AI2744	X67AI4850	X67AM1223	X67AM1323	X67AO1223	X67AO1323	X67AT1322	X67AT1402	X67DC1198	X67DC2322	X67DI1371	X67DI1371.L08	X67DI1371.L12
Digital input											(8)	2	8	16	16
Digital output											(8)	2			
Analog input	4	4			2	2									
Analog output					2	2	4	4							
Temperature									4	4					
Event counter															
ABR incr. encoder 24 V															
AB incr. encoder 24 V											(4)				
ABR incr. encoder 5 V											(2)				
SSI abs. encoder 5 V											(2)				
Gate measurement															
Full-bridge strain gauge			2												
Resolver input												2			
Potentiometer displacement gauge				4											
PWM output											(2)				
Motor (H) bridges															
Stepper motor control															
Valve control															
RS232															
RS485/RS422															
Page	478	479	480	481	484	486	482	483	488	489	498	502	465	466	467

Numbers in brackets represent a multiple assignment. Check the specifications in the data sheet for the exact configuration.

Function	X67DMI1321	X67DMI1321.L08	X67DMI1321.L12	X67DM9321	X67DM9331.L12	X67DO1332	X67DO9332.L12	X67DV1311.L08	X67DV1311.L12	X67IF1121	X67MM2436	X67SM2436	X67SM4320	X67UM1352
Digital input	(8)	(16)	(16)	(8)	(8)			16	16	(4)	(6)	(6)		4
Digital output	(8)	(16)	(16)	(8)	(8)	8	8			(2)				2
Analog input														
Analog output														
Temperature														
Event counter	(2)	(2)	(2)	(2)										
ABR incr. encoder 24 V											(2)	(2)		
AB incr. encoder 24 V														
ABR incr. encoder 5 V														
SSI abs. encoder 5 V														
Gate measurement	(1)	(1)	(1)	(1)										
Full-bridge strain gauge														1
Resolver input														
Potentiometer Displacement Gauge														
PWM output														
Motor (H) bridges											2			
Stepper motor control												2	4	
Valve control								16	16					
RS232										(1)				
RS485/RS422										(1)				
Page	470	471	472	473	474	468	469	476	477	504	490	492	494	496

Numbers in brackets represent a multiple assignment. Check the specifications in the data sheet for the exact configuration.

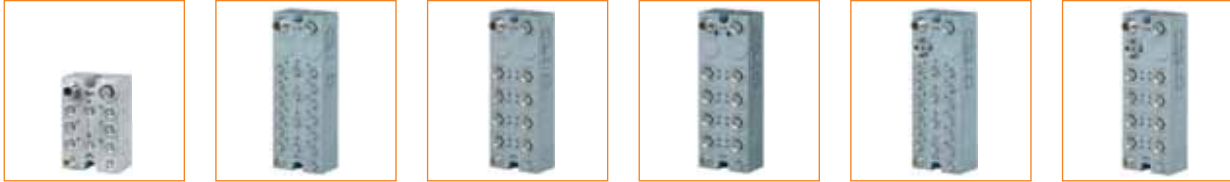
Product overview

Digital input



Model number	Short description	
X67DI1371	X67 digital input module, 8 inputs 24 VDC, sink, 1ms input filter	465
X67DI1371.L08	X67 digital input module, 16 inputs 24 VDC, sink, 1ms input filter, M8 connectors	466
X67DI1371.L12	X67 digital input module, 16 inputs 24 VDC, sink, 1ms input filter, M12 connectors	467
X67DM1321	X67 digital mixed module, 8 channels can be configured as inputs or outputs, 24 VDC, 0.5 A, configurable input filter, 2x 50 kHz event counters	470
X67DM1321.L08	X67 digital mixed module, 16 channels can be configured as inputs or outputs, 24 VDC, 0.5 A, configurable input filter, 2x 50 kHz event counters, M8 connectors	471
X67DM1321.L12	X67 digital mixed module, 16 channels can be configured as inputs or outputs, 24 VDC, 0.5 A, configurable input filter, 2x 50 kHz event counters, M12 connectors	472
X67DM9321	X67 digital mixed module, 8 channels can be configured as inputs or outputs, 24 VDC, 0.5 A, configurable input filter, 2x 50 kHz event counters, X2X Link address switch	473
X67DM9331.L12	X67 digital mixed module, 8 channels can be configured as input or output, 24 VDC, 2 A, configurable input filter, single-channel sensor supply monitoring, M12 connectors, X2X Link address switch	474
X67UM1352	X67 universal mixed module, 1 input to evaluate a full-bridge strain gauge, 24-bit, 4x 24 VDC digital inputs, sink, 1 digital output, 0.5 A, source, 1 digital output, 1 A, source	496

Digital output



Model number	Short description	
X67DO1332	X67 digital output module, 8 outputs, 24 VDC, 2.0 A, output status can be read	468
X67DO9332.L12	X67 digital output module, 8 outputs, 24 VDC, 2 A, single-channel actuator supply monitoring, M12 connectors, X2X Link address switch	469
X67DM1321	X67 digital mixed module, 8 channels can be configured as inputs or outputs, 24 VDC, 0.5 A, configurable input filter, 2x 50 kHz event counters	470
X67DM1321.L08	X67 digital mixed module, 16 channels can be configured as inputs or outputs, 24 VDC, 0.5 A, configurable input filter, 2x 50 kHz event counters, M8 connectors	471
X67DM1321.L12	X67 digital mixed module, 16 channels can be configured as inputs or outputs, 24 VDC, 0.5 A, configurable input filter, 2x 50 kHz event counters, M12 connectors	472
X67DM9321	X67 digital mixed module, 8 channels can be configured as inputs or outputs, 24 VDC, 0.5 A, configurable input filter, 2x 50 kHz event counters, X2X Link address switch	473
X67DM9331.L12	X67 digital mixed module, 8 channels can be configured as input or output, 24 VDC, 2 A, configurable input filter, single-channel sensor supply monitoring, M12 connectors, X2X Link address switch	474
X67UM1352	X67 universal mixed module, 1 input to evaluate a full-bridge strain gauge, 24-bit, 4x 24 VDC digital inputs, sink, 1 digital output, 0.5 A, source, 1 digital output, 1 A, source	496
X67DV1311.L08	X67 digital valve control module, 16 digital outputs, 24 VDC, 0.1 A, 1x M16 connector, 16x 24 VDC digital inputs, sink, configurable input filter, M8 connectors	476
X67DV1311.L12	X67 digital valve control module, 16 digital outputs, 24 VDC, 0.1 A, 1x M16 connector, 16x 24 VDC digital inputs, sink, configurable input filter, M12 connectors	477
X67MM2436	X67 PWM motor bridge module, 18 - 48 VDC module supply, 2x PWM motor bridges, 3 A, 2x 3 digital inputs can be configured as incremental encoders	490
X67SM2436	X67 stepper motor module, 18 - 48 VDC supply, 8 A max., 2 motor connections, 3 A, 5 A max., 2x 3 digital inputs (24 VDC), sink, can be used as 2 incremental encoders	492
X67SM4320	X67 stepper motor module, 18 - 30 VDC supply, 4 motor connections, 1 A, 1.5 A max.	494

Product overview

Digital inputs and outputs



Model number	Short description	
X67DM1321	X67 digital mixed module, 8 channels can be configured as inputs or outputs, 24 VDC, 0.5 A, configurable input filter, 2x 50 kHz event counters	470
X67DM1321.L08	X67 digital mixed module, 16 channels can be configured as inputs or outputs, 24 VDC, 0.5 A, configurable input filter, 2x 50 kHz event counters, M8 connectors	471
X67DM1321.L12	X67 digital mixed module, 16 channels can be configured as inputs or outputs, 24 VDC, 0.5 A, configurable input filter, 2x 50 kHz event counters, M12 connectors	472
X67DM9321	X67 digital mixed module, 8 channels can be configured as inputs or outputs, 24 VDC, 0.5 A, configurable input filter, 2x 50 kHz event counters, X2X Link address switch	473
X67DM9331.L12	X67 digital mixed module, 8 channels can be configured as input or output, 24 VDC, 2 A, configurable input filter, single-channel sensor supply monitoring, M12 connectors, X2X Link address switch	474
X67UM1352	X67 universal mixed module, 1 input to evaluate a full-bridge strain gauge, 24-bit, 4x 24 VDC digital inputs, sink, 1 digital output, 0.5 A, source, 1 digital output, 1 A, source	496

Valve control



Model number	Short description	
X67DV1311.L08	X67 digital valve control module, 16 digital outputs, 24 VDC, 0.1 A, 1x M16 connector, 16x 24 VDC digital inputs, sink, configurable input filter, M8 connectors	476
X67DV1311.L12	X67 digital valve control module, 16 digital outputs, 24 VDC, 0.1 A, 1x M16 connector, 16x 24 VDC digital inputs, sink, configurable input filter, M12 connectors	477

Analog input



Model number	Short description	
X67AI1223	X67 analog input module, 4 inputs, ± 10 V, 12-bit resolution, configurable input filter, open circuit detection	478
X67AI1323	X67 analog input module, 4 inputs, 0 to 20 mA, 12-bit resolution, configurable input filter	479
X67AI2744	X67 analog input module, 2 inputs for evaluation of a full-bridge strain gauge, 24-bit converter resolution	480
X67AI4850	X67 analog input module, 4 analog inputs (potentiometer displacement gauge)	481
X67AM1223	X67 analog mixed module, 2 inputs, 2 outputs, ± 10 V, 12-bit resolution, configurable input filter	484
X67AM1323	X67 analog mixed module, 2 inputs, 2 outputs, 0 to 20 mA, 12-bit resolution, configurable input filter	486
X67UM1352	X67 universal mixed module, 1 input to evaluate a full-bridge strain gauge, 24-bit, 4x 24 VDC digital inputs, sink, 1 digital output, 0.5 A, source, 1 digital output, 1 A, source	496

Analog output



Model number	Short description	
X67AO1223	X67 analog output module, 4 outputs, ± 10 V, 12-bit resolution	482
X67AO1323	X67 analog output module, 4 outputs, 0 to 20 mA, 12-bit resolution	483
X67AM1223	X67 analog mixed module, 2 inputs, 2 outputs, ± 10 V, 12-bit resolution, configurable input filter	484
X67AM1323	X67 analog mixed module, 2 inputs, 2 outputs, 0 to 20 mA, 12-bit resolution, configurable input filter	486

Product overview

Analog inputs and outputs



Model number	Short description	
X67AM1223	X67 analog mixed module, 2 inputs, 2 outputs, $\pm 10V$, 12-bit resolution, configurable input filter	484
X67AM1323	X67 analog mixed module, 2 inputs, 2 outputs, 0 to 20 mA, 12-bit resolution, configurable input filter	486

Temperature



Model number	Short description	
X67AT1322	X67 temperature input module, 4 inputs, resistance measurement, 2 or 4 wire connections, PT100, PT1000, KTY10, KTY84, 0.1 K resolution	488
X67AT1402	X67 temperature input module, 4 thermocouple inputs, type J,K,S, resolution 0.1K	489

Motor module



Model number	Short description	
X67MM2436	X67 PWM motor bridge module, 18 - 48 VDC module supply, 2x PWM motor bridges, 3 A, 2x 3 digital inputs can be configured as incremental encoders	490
X67SM2436	X67 stepper motor module, 18 - 48 VDC supply, 8 A max., 2 motor connections, 3 A, 5 A max., 2x 3 digital inputs (24 VDC), sink, can be used as 2 incremental encoders	492
X67SM4320	X67 stepper motor module, 18 - 30 VDC supply, 4 motor connections, 1 A, 1.5 A max.	494

Other functions



Model number	Short description	
X67UM1352	X67 universal mixed module, 1 input to evaluate a full-bridge strain gauge, 24-bit, 4x 24 VDC digital inputs, sink, 1 digital output, 0.5 A, source, 1 digital output, 1 A, source	496

Counting



Model number	Short description	
X67DC1198	X67 digital counter module, 2x 3 inputs 5 V for SSI 1 MBit/s or ABR 250 kHz, 8 digital channels 24 VDC, 0.1 A, can be configured as an input or output or 4x AB counter 100 kHz or 4x comparator output or 2x PWM outputs, local time measurement functions	498
X67DC2322	X67 resolver module, 2x 14-bit resolver input BRX/BRT, 2 digital inputs, 24 VDC, sink, 2 digital outputs, 0.5 A, source	502
X67DM1321	X67 digital mixed module, 8 channels can be configured as inputs or outputs, 24 VDC, 0.5 A, configurable input filter, 2x 50 kHz event counters	470
X67DM1321.L08	X67 digital mixed module, 16 channels can be configured as inputs or outputs, 24 VDC, 0.5 A, configurable input filter, 2x 50 kHz event counters, M8 connectors	471
X67DM1321.L12	X67 digital mixed module, 16 channels can be configured as inputs or outputs, 24 VDC, 0.5 A, configurable input filter, 2x 50 kHz event counters, M12 connectors	472
X67DM9321	X67 digital mixed module, 8 channels can be configured as inputs or outputs, 24 VDC, 0.5 A, configurable input filter, 2x 50 kHz event counters, X2X Link address switch	473

Multi-function



Model number	Short description	
X67DC1198	X67 digital counter module, 2x 3 inputs 5 V for SSI 1 MBit/s or ABR 250 kHz, 8 digital channels 24 VDC, 0.1 A, can be configured as an input or output or 4x AB counter 100 kHz or 4x comparator output or 2x PWM outputs, local time measurement functions	498

Communication



Model number	Short description	
X67IF1121	X67 interface module, 1x RS232 or 1x RS485/RS422, 2 digital channels can be selected as input or output, 24 VDC, 0.5 A, configurable input filter	504

Accessories

Short description	
Prefabricated cables	508
Field-prefabricated connectors	522
Other accessories	524

CANopen bus controller BC4321



CANopen

CANopen

CAN (Controller Area Network) has spread considerably in automation technology. Topologically based on a line structure, CAN uses twisted pair wires for data transfer (see chapter "Network and Fieldbus Modules", page 611). CANopen is a higher-layer protocol based on CAN. This standardized protocol offers highly flexible configuration possibilities.

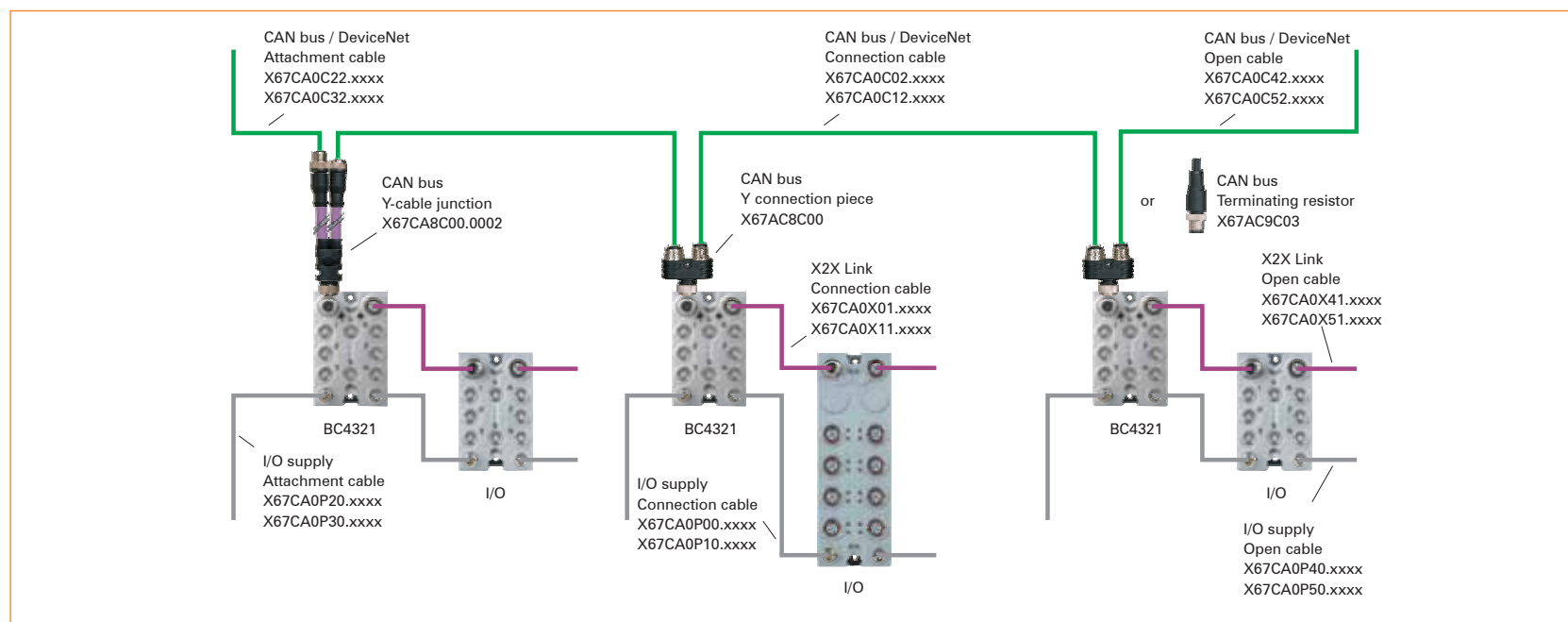
X67 CANopen bus controller

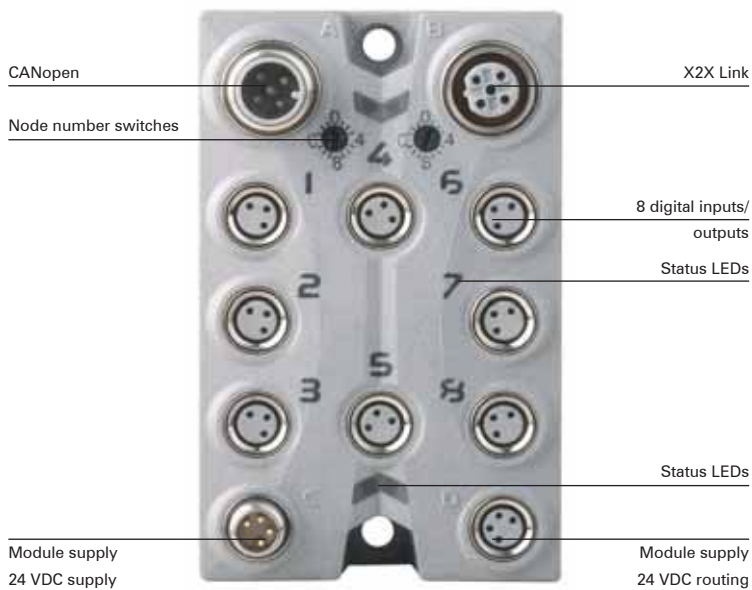
- Fieldbus: CANopen
- 8 digital channels that can be configured as inputs or outputs
- Simple I/O configuration via the fieldbus
- Integrated connection to local expansion via X2X Link for 39 additional modules (including up to 16 analog modules)
- 1 ms cycle time for local expansion

The BC4321 bus controller meets the latest CANopen specifications DS 301 V4.02 and DS 401 V2.1. This controller is equipped with automatic transfer rate detection and AutoMapping of the I/O modules connected via X2X Link. All CANopen operating modes such as synchronous, event, and polling modes are supported together with PDO linking, life/node guarding, emergency objects, and much more. Additional X67 modules or other modules that are based on X2X Link can be attached with the integrated X2X Link connection.

Detailed information and support regarding selection, possible configurations, and combinations of digital and analog modules is available on the B&R homepage: www.br-automation.com

Required cables and connectors





Short description	X67BC4321
Bus controller	CANopen
Inputs/outputs	8 digital channels, configured as inputs or outputs using software, inputs with special functions
Rated voltage	24 VDC
Fieldbus	X67BC4321
Type	CANopen
Design	M12 circular plugs (plug on the module)
Maximum distance	1000 m
Maximum transfer rate	1 MBit/s, automatic transfer rate detection
Digital inputs	X67BC4321
Input filter	
Hardware	$\leq 10 \mu\text{s}$ (channel 1 - 4) / $\leq 70 \mu\text{s}$ (channel 5 - 8)
Software	Default 0 ms, configured between 0 and 25 ms in 0.2 ms intervals
Input circuit	Sink
Additional functions for inputs	50 kHz event counting, gate measurement
Digital outputs	X67BC4321
Rated output current	0.5 A
Total current	4.0 A
Output circuit	Source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for the output supply.
General information	X67BC4321
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED and software status
Outputs	Yes, with status LED and software status
Electrical isolation	
Fieldbus - X2X Link	No
Channel - Bus	Yes (CAN and X2X)
Channel - Channel	No
Sensor/actuator supply	0.5 A total current
Power consumption	
Fieldbus	2.1 W
I/O internal	2.0 W
X2X Link supply	4.1 W at maximum power output for connected I/O modules
Power output	3.0 W X2X Link supply for I/O modules
Connection type	
Fieldbus	M12 (A coded)
X2X Link	M12 (B coded)
Inputs/outputs	M8 (3-pin)
Module supply	M8 (4-pin)
Certification	CE, cRUus, GOST-R
Ex zone 2	II 3G EEx nA II T5, IP67, Ta = 0 - 60°C

CANopen bus controller BC4321

Operational conditions	X67BC4321
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67BC4321
Temperature	-25°C to +85°C
Mechanical characteristics	X67BC4321
Dimensions (W x H x D)	53 x 85 x 42 mm
Weight	195 g
Torque for connections	
M8	Max. 0.4 Nm
M12	Max. 0.6 Nm

Note: This bus controller only supports the default function model of multi-function modules. The default function model is explained in the description for each multi-function module.

DeviceNet bus controller BC5321



DeviceNet

DeviceNet was developed by Allen Bradley as a CAN bus based automation network. It is based on a producer/consumer protocol. From the user's point of view, all data is handled separately from CAN bus transfer possibilities (e.g. longer data packets are automatically fragmented by DeviceNet). Access occurs using I/O messages with defined properties.

X67 DeviceNet bus controller

- Fieldbus: DeviceNet
- 8 digital channels, can be configured as input or output
- Simple I/O configuration via the fieldbus
- Integrated connection to local expansion via X2X Link for 39 additional modules (including up to 16 analog modules)
- 1 ms cycle time for local expansion

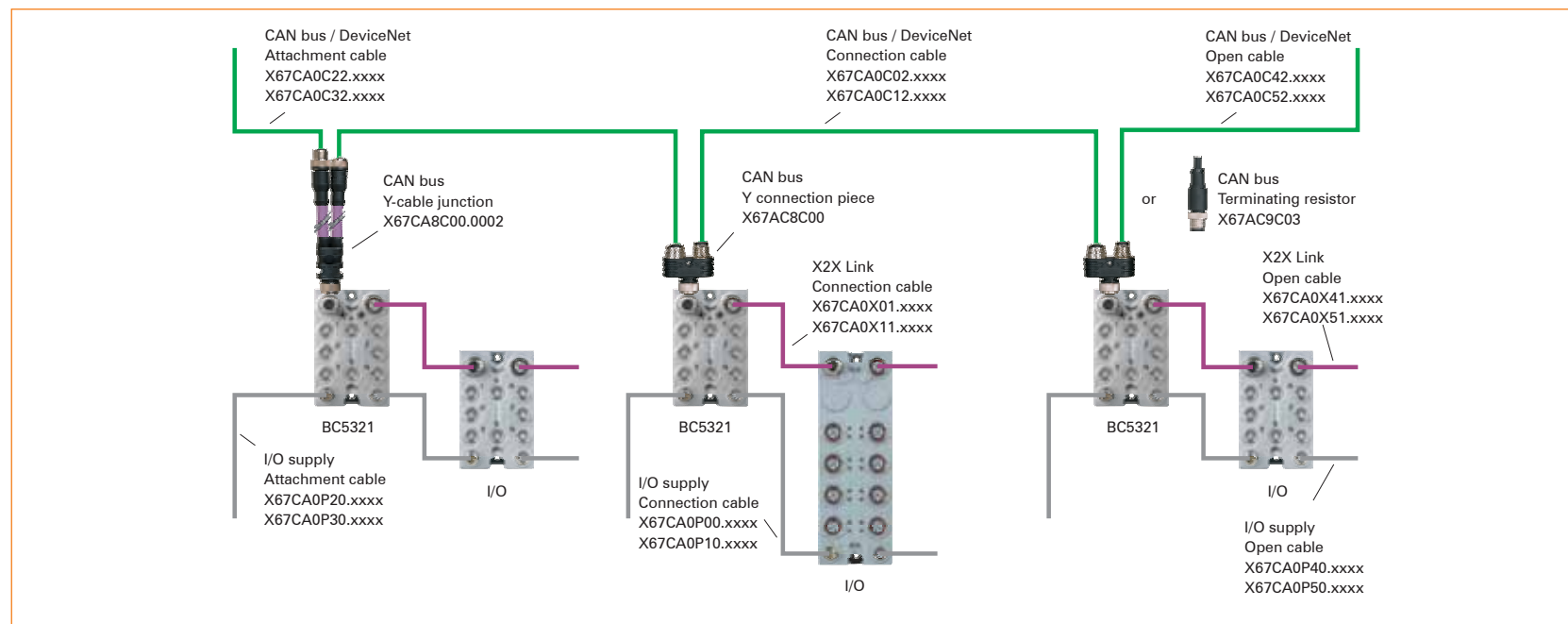
The BC5321 bus controller meets the latest DeviceNet specifications: Rev. 2.0 Errata 5, Group2 only server. Just like CANopen, the DeviceNet device is also equipped with automatic transfer rate detection and auto-mapping for the I/O modules connected via X2X Link.

Explicit messaging, change of state, cyclic, polled and bit strobe are supported as DeviceNet operating modes. In addition to the standard communication objects, there are also a number of manufacturer-specific objects.

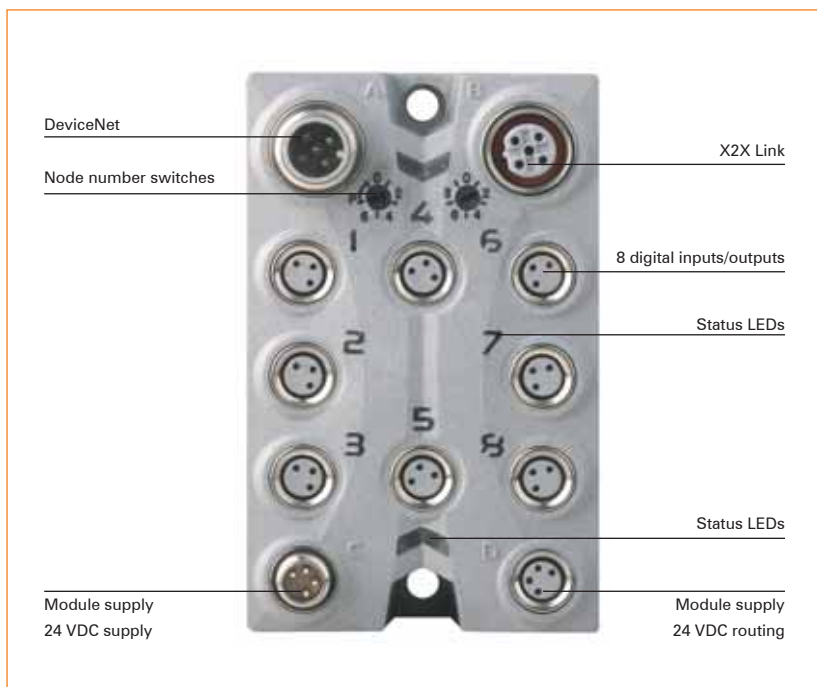
Additional X67 modules or other modules that are based on X2X Link can be attached with the integrated X2X Link connection. The entire configuration of this type of modular system is supported by the DeviceNet standard. Allen Bradley developed this modular I/O configuration to simplify the necessary configuration steps and to achieve the required configuration of a modular DeviceNet device intuitively on a flat and very user-friendly interface. The X67 DeviceNet bus controller from B&R also supports this type of configuration.



Required cables and connectors



DeviceNet bus controller BC5321



Short description	X67BC5321
Bus controller	DeviceNet
Inputs/outputs	8 digital channels, configured as inputs or outputs using software, inputs with special functions
Rated voltage	24 VDC
Fieldbus	X67BC5321
Type	DeviceNet
Design	M12 circular plugs (plug on the module)
Maximum distance	500 m at 125 kBit/sec
Maximum transfer rate	500 kBit/s, automatic transfer rate detection
Digital inputs	X67BC5321
Input filter	
Hardware	≤ 10 μs (channel 1 - 4) / ≤ 70 μs (channel 5 - 8)
Software	Default 0 ms, configured between 0 and 25 ms in 0.2 ms intervals
Input circuit	Sink
Additional functions for inputs	50 kHz event counting, gate measurement
Digital outputs	X67BC5321
Rated output current	0.5 A
Total current	4.0 A
Output circuit	Source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for the output supply.
General information	X67BC5321
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED and software status
Outputs	Yes, with status LED and software status
Electrical isolation	
Fieldbus - X2X Link	No
Channel - Bus	Yes (DeviceNet and X2X)
Channel - Channel	No
Sensor/actuator supply	0.5 A total current
Power consumption	
Fieldbus	2.7 W
I/O internal	2.0 W
X2X Link supply	3.9 W at maximum power output for connected I/O modules
Power output	3.0 W X2X Link supply for I/O modules
Connection type	
Fieldbus	M12 (A coded)
X2X Link	M12 (B coded)
Inputs/outputs	M8 (3-pin)
Module supply	M8 (4-pin)
Certification	CE, cRUus, GOST-R
Ex zone 2	II 3G EEx nA II T5, IP67, Ta = 0 - 60°C

Detailed information and support regarding selection, possible configurations and combinations of digital and analog modules is available on the B&R homepage: www.br-automation.com

Operational conditions		X67BC5321
Operating temperature	0°C to +60°C	
Mounting orientation	Any	
Installation at altitudes above sea level		
0 - 2000 m	No derating	
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m	
Protection type	IP67	
Storage and transport conditions		X67BC5321
Temperature	-25°C to +85°C	
Mechanical characteristics		X67BC5321
Dimensions (W x H x D)	53 x 85 x 42 mm	
Weight	195 g	
Torque for connections		
M8	Max. 0.4 Nm	
M12	Max. 0.6 Nm	

Note: This bus controller only supports the default function model of multi-function modules. The default function model is explained in the description for each multi-function module.

Profibus DP bus controller

General information

Profibus DP

Profibus DP is based on the physics of the RS485 interface. Data transfer is controlled using a hybrid bus access procedure. Active stations receive communication rights via a token passing procedure and can then access all stations on the network according to the master-slave principle. The maximum time of circulation for a token can be configured, which results in a defined cycle time.

Access represents various services for the user, for cyclic and for acyclic data transfer.

X67 bus controllers - Profibus DP

The X67 bus controllers support all of the possibilities of Profibus DP as well as any subsequent properties. In addition to the device, module, and channel diagnostics provided in the Profibus standard, it is also possible, for example, to switch to the slot diagnostics option in S7 format. A latch function that can be scanned via digital mixed modules has also been implemented for high-speed events. These and other X2X Link-based modules can easily be connected via the integrated X2X Link connection. The modular system configuration is optimally supported by Profibus DP.

The bus controllers are available in several different variations. They vary in the number of I/O channels and in the types of connections.



Detailed information and support regarding selection, possible configurations, and combinations of digital and analog modules is available on the B&R homepage: www.br-automation.com



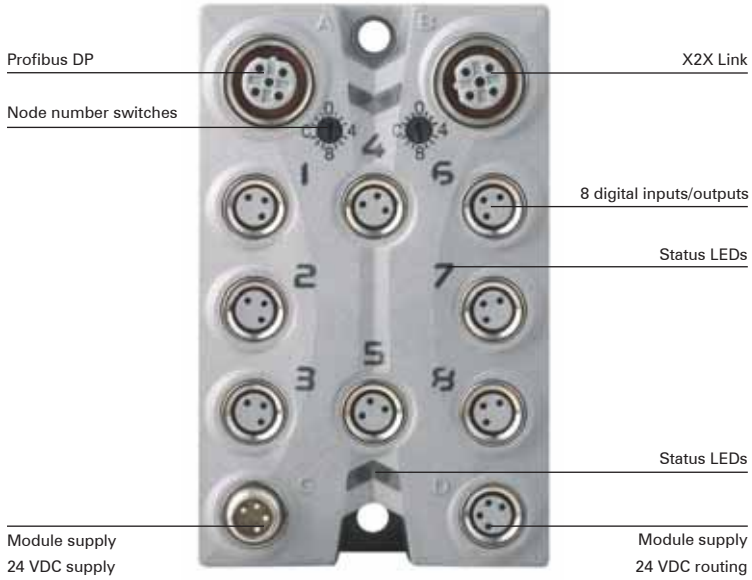
Profibus DP bus controller BC6321



General information about Profibus DP fieldbus and about the X67 Profibus DP bus controllers can be found on page 450.

- Fieldbus: Profibus DP
- 8 digital channels that can be configured as inputs or outputs
- Simple I/O configuration via the fieldbus
- Integrated connection to the local expansion via X2X Link for 59 additional modules
- Configurable cycle time for local expansion: 200 μ s to 1 ms

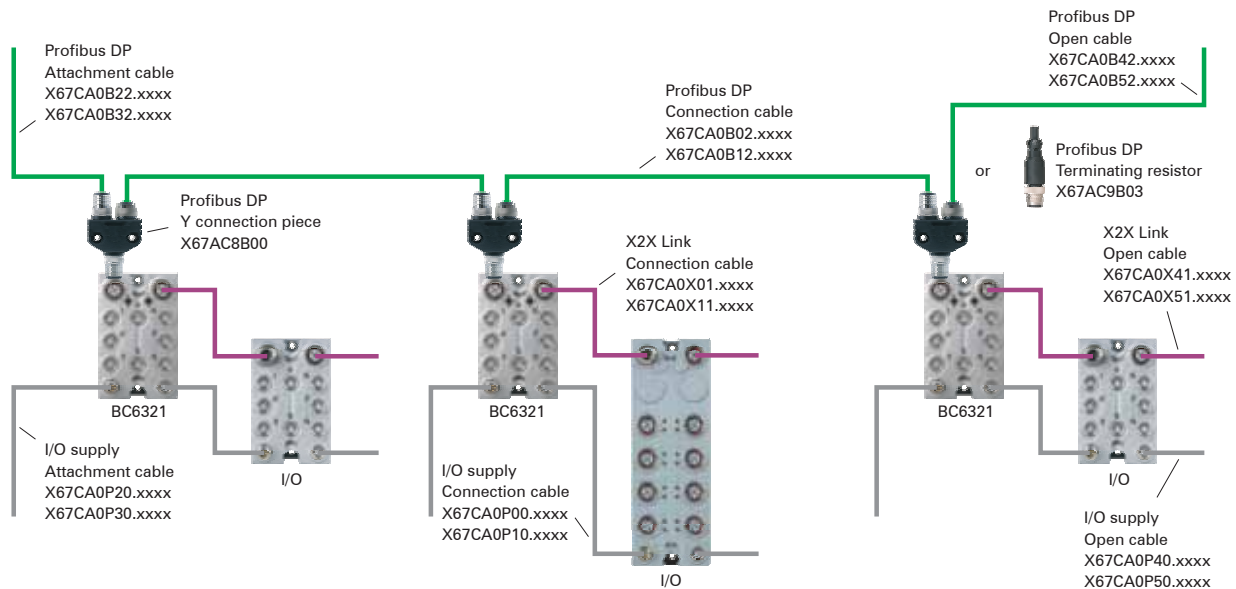
Short description	X67BC6321
Bus controller	Profibus DP slave
Inputs/outputs	8 digital channels, configured as inputs or outputs using software, inputs with special functions
Rated voltage	24 VDC
Fieldbus	X67BC6321
Type	Profibus DP slave
Design	M12 circular connector (socket on the module)
Maximum distance	See Profibus DP specifications
Maximum transfer rate	12 MBit/s, automatic transfer rate detection
Digital inputs	X67BC6321
Input filter	
Hardware	$\leq 10 \mu$ s (channel 1 - 4) / $\leq 70 \mu$ s (channel 5 - 8)
Software	Default 0 ms, can be configured between 0 and 25 ms in 0.2 ms intervals
Input circuit	Sink
Additional functions for inputs	50 kHz event counting, gate measurement
Digital outputs	X67BC6321
Rated output current	0.5 A
Total current	4.0 A
Output circuit	Source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for output supply
General information	X67BC6321
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED and software status
Outputs	Yes, with status LED and software status
Electrical isolation	
Fieldbus - X2X Link	No
Channel - Bus	Yes (Profibus DP and X2X)
Channel - Channel	No
Sensor/actuator supply	0.5 A total current
Power consumption	
Fieldbus	3.8 W
I/O internal	2.0 W
X2X Link supply	3.7 W at maximum power output for connected I/O modules
Power output	3.0 W X2X Link supply for I/O modules
Connection type	
Fieldbus	M12 (B coded)
X2X Link	M12 (B coded)
Inputs/outputs	M8 (3-pin)
Module supply	M8 (4-pin)
Certification	CE, cRUus, GOST-R
Ex zone 2	II 3G EEx nA II T5, IP67, Ta = 0 - 60°C
Operational conditions	X67BC6321
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67BC6321
Temperature	-25°C to +85°C
Mechanical characteristics	X67BC6321
Dimensions (W x H x D)	53 x 85 x 42 mm
Weight	195 g
Torque for connections	M8: Max. 0.4 Nm / M12: Max. 0.6 Nm



Note:

This bus controller only supports the default function model of multi-function modules. The default function model is explained in the description for each multi-function module.

Required cables and connectors



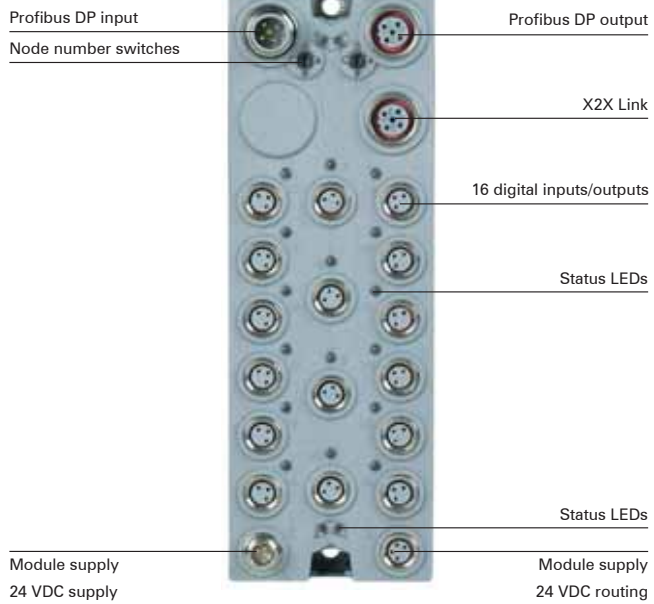
Profibus DP bus controller BC6321.L08



General information about Profibus DP fieldbus and about the X67 Profibus DP bus controllers can be found on page 450.

- Fieldbus: Profibus DP
- Integrated T-connector for fieldbus connection
- 16 digital channels, can be configured as inputs or outputs
- Simple I/O configuration via the fieldbus
- Integrated connection for local expansion via X2X Link for 63 additional modules
- Cycle time for local expansion can be configured: 200 μ s to 1 ms

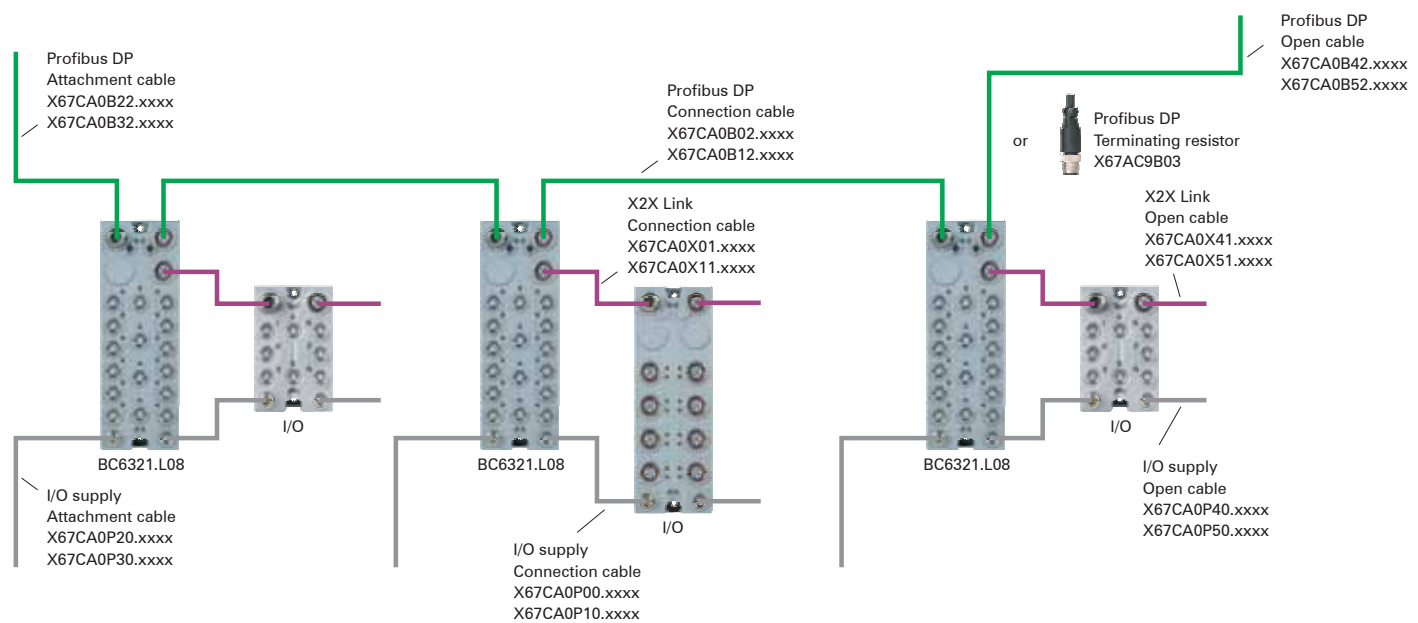
Short description	X67BC6321.L08
Bus controller	Profibus DP slave
Inputs/outputs	16 digital channels, configured as inputs or outputs using software, inputs with special functions
Rated voltage	24 VDC
Fieldbus	X67BC6321.L08
Type	Profibus DP slave
Design	M12 round plug 1x plug and 1x socket for the integrated T-connector
Maximum distance	See Profibus DP specifications
Maximum transfer rate	12 MBit/s, automatic transfer rate detection
Digital inputs	X67BC6321.L08
Input filter	
Hardware	$\leq 10 \mu$ s (channels 1 - 4) / $\leq 70 \mu$ s (channels 5 - 16)
Software	Default 0 ms, can be configured between 0 and 25 ms in 0.2 ms intervals
Input circuit	Sink
Additional functions for inputs	50 kHz event counting, gate measurement
Digital outputs	X67BC6321.L08
Rated output current	0.5 A
Total current	8.0 A
Output circuit	Source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for output supply
General information	X67BC6321.L08
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED and software status
Outputs	Yes, with status LED and software status
Electrical isolation	
Fieldbus - X2X Link	No
Channel - Bus	Yes (Profibus DP and X2X)
Channel - Channel	No
Sensor/actuator supply	0.5 A total current
Power consumption	
Fieldbus	3.25 W
I/O internal	2.04 W
X2X Link supply	23.63 W at maximum power output for connected I/O modules
Power output	15.0 W X2X Link supply for I/O modules
Connection type	
Fieldbus	M12 (B coded)
X2X Link	M12 (B coded)
Inputs/outputs	M8 (3-pin)
Module supply	M8 (4-pin)
Certification	CE, cRUus, GOST-R
Ex zone 2	II 3G EEx nA II T5, IP67, Ta = 0 - 60°C
Operational conditions	X67BC6321.L08
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67BC6321.L08
Temperature	-25°C to +85°C
Mechanical characteristics	X67BC6321.L08
Dimensions (W x H x D)	53 x 155 x 42 mm
Weight	320 g
Torque for connections	M8: Max. 0.4 Nm / M12: Max. 0.6 Nm



Note:

This bus controller only supports the default function model of multi-function modules. The default function model is explained in the description for each multi-function module.

Required cables and connectors



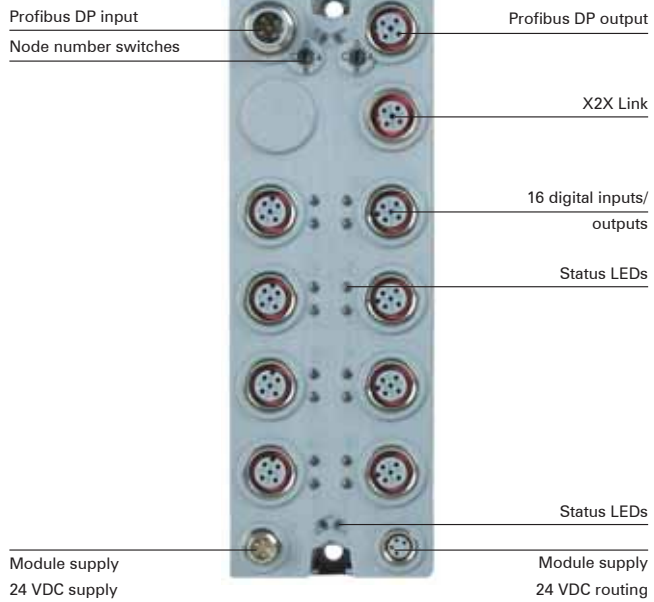
Profibus DP bus controller BC6321.L12



General information about Profibus DP fieldbus and about the X67 Profibus DP bus controllers can be found on page 450.

- Fieldbus: Profibus DP
- Integrated T-connector for fieldbus connection
- 16 digital channels, can be configured as inputs or outputs
- Simple I/O configuration via the fieldbus
- Integrated connection for local expansion via X2X Link for 63 additional modules
- Cycle time for local expansion can be configured: 200 μ s to 1 ms

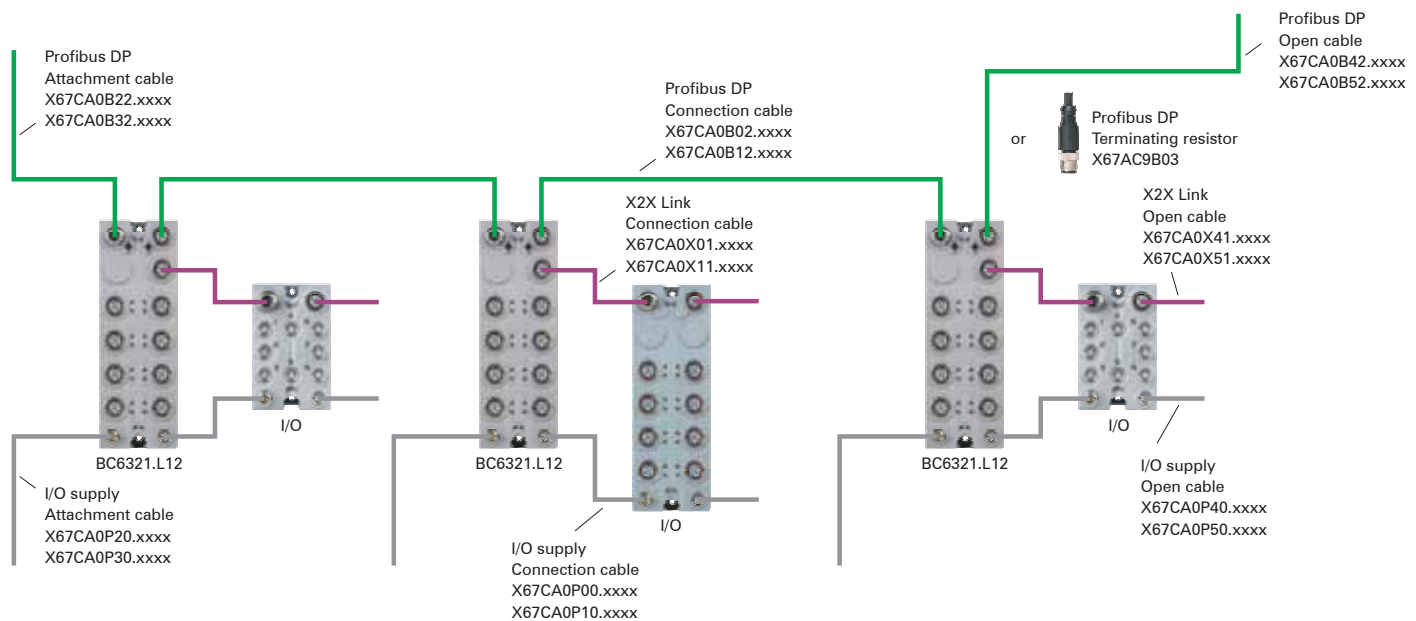
Short description	X67BC6321.L12
Bus controller	Profibus DP slave
Inputs/outputs	16 digital channels, configured as inputs or outputs using software, inputs with special functions
Rated voltage	24 VDC
Fieldbus	X67BC6321.L12
Type	Profibus DP slave
Design	M12 round plug 1x plug and 1x socket for the integrated T-connector
Maximum distance	See Profibus DP specifications
Maximum transfer rate	12 MBit/s, automatic transfer rate detection
Digital inputs	X67BC6321.L12
Input filter	
Hardware	$\leq 10 \mu$ s (channels 1 - 4) / $\leq 70 \mu$ s (channels 5 - 16)
Software	Default 0 ms, can be configured between 0 and 25 ms in 0.2 ms intervals
Input circuit	Sink
Additional functions for inputs	50 kHz event counting, gate measurement
Digital outputs	X67BC6321.L12
Rated output current	0.5 A
Total current	8.0 A
Output circuit	Source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for output supply
General information	X67BC6321.L12
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED and software status
Outputs	Yes, with status LED and software status
Electrical isolation	
Fieldbus - X2X Link	No
Channel - Bus	Yes (Profibus DP and X2X)
Channel - Channel	No
Sensor/actuator supply	0.5 A total current
Power consumption	
Fieldbus	3.25 W
I/O internal	2.04 W
X2X Link supply	23.63 W at maximum power output for connected I/O modules
Power output	15.0 W X2X Link supply for I/O modules
Connection type	
Fieldbus	M12 (B coded)
X2X Link	M12 (B coded)
Inputs/outputs	M12 (A coded)
Module supply	M8 (4-pin)
Certification	CE, cRUus, GOST-R
Ex zone 2	II 3G EEx nA II T5, IP67, Ta = 0 - 60°C
Operational conditions	X67BC6321.L12
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67BC6321.L12
Temperature	-25°C to +85°C
Mechanical characteristics	X67BC6321.L12
Dimensions (W x H x D)	53 x 155 x 42 mm
Weight	320 g
Torque for connections	M8: Max. 0.4 Nm / M12: Max. 0.6 Nm



Note:

This bus controller only supports the default function model of multi-function modules. The default function model is explained in the description for each multi-function module.

Required cables and connectors



CAN I/O bus controller BC7321-1



CAN

CAN I/O

CAN I/O is a transfer protocol based on the CAN bus standard and is fully integrated in the B&R system. From the user's point of view, it doesn't matter if I/O points are operated locally or remotely via CAN I/O.

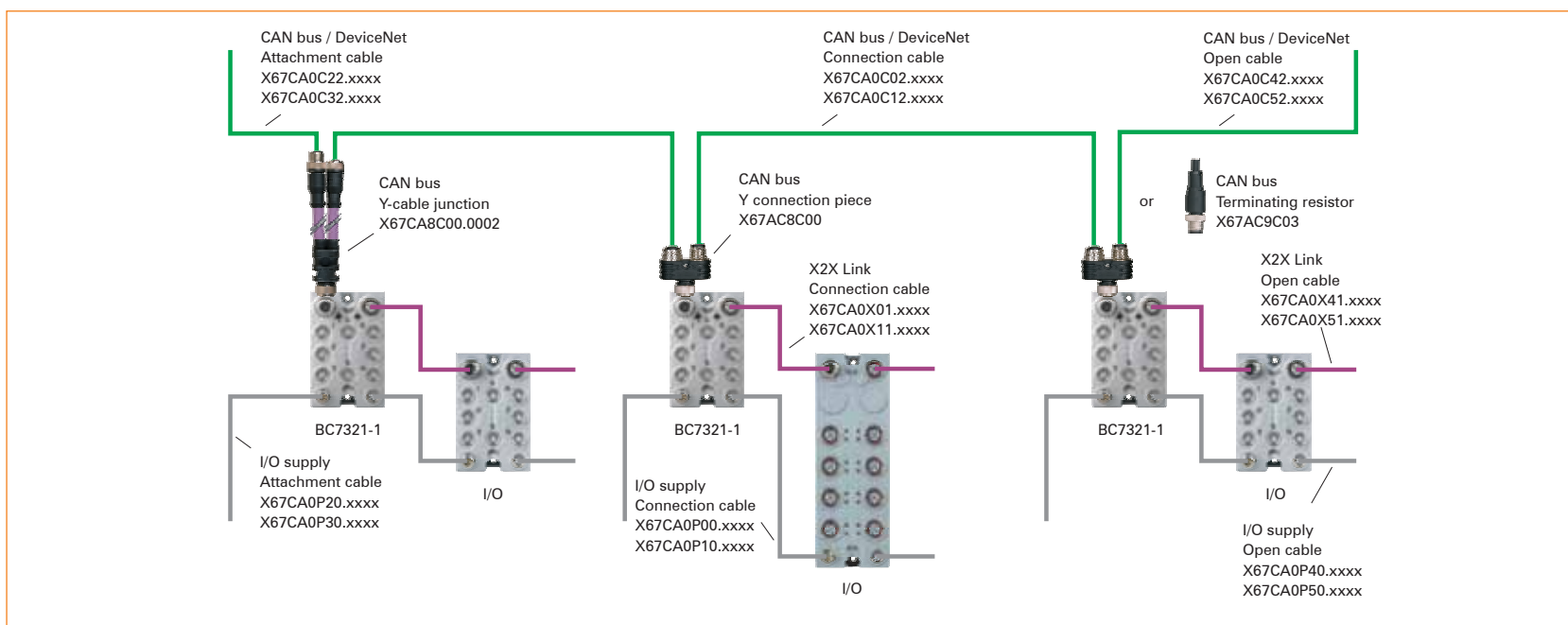
X67 CAN I/O bus controller

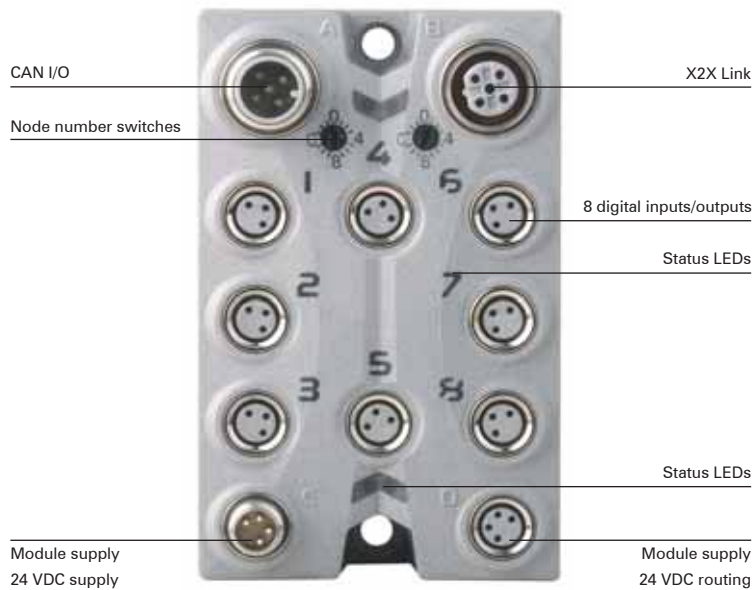
- Fieldbus: CAN bus
- 8 digital channels that can be configured as inputs or outputs
- Integrated I/O access in B&R Automation Studio
- Automatic firmware update via the fieldbus
- X67 connection possibility for all B&R CPUs

The BC7321-1 bus controller is supported by CAN I/O master versions beginning with CANIO library V1.20.4 (part of Automation Studio V2.4). Up to 43 I/O modules can be connected to the bus controller. Up to 16 of them can be analog modules.

Detailed information and support regarding selection, possible configurations, and combinations of digital and analog modules is available on the B&R homepage: www.br-automation.com

Required cables and connectors





Short description	X67BC7321-1
Bus controller	CAN I/O slave
Inputs/outputs	8 digital channels, configured as inputs or outputs using software, inputs with special functions
Rated voltage	24 VDC
Fieldbus	X67BC7321-1
Type	CAN I/O slave
Design	M12 circular plugs (plug on the module)
Maximum distance	1000 m
Maximum transfer rate	1 MBit/s, automatic transfer rate detection
Digital inputs	X67BC7321-1
Input filter	
Hardware	$\leq 10 \mu\text{s}$ (channel 1 - 4) / $\leq 70 \mu\text{s}$ (channel 5 - 8)
Software	Default 0 ms, configured between 0 and 25 ms in 0.2 ms intervals
Input circuit	Sink
Additional functions for inputs	50 kHz event counting, gate measurement
Digital outputs	X67BC7321-1
Rated output current	0.5 A
Total current	4.0 A
Output circuit	Source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for the output supply.
General information	X67BC7321-1
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED and software status
Outputs	Yes, with status LED and software status
Electrical isolation	
Fieldbus - X2X Link	No
Channel - Bus	Yes (CAN bus and X2X)
Channel - Channel	No
Sensor/actuator supply	0.5 A total current
Power consumption	
Fieldbus	2.1 W
I/O internal	2.0 W
X2X Link supply	4.1 W at maximum power output for connected I/O modules
Power output	3.0 W X2X Link supply for I/O modules
Connection type	
Fieldbus	M12 (A coded)
X2X Link	M12 (B coded)
Inputs/outputs	M8 (3-pin)
Module supply	M8 (4-pin)
Certification	CE, cRUus, GOST-R
Ex zone 2	II 3G EEx nA II T5, IP67, Ta = 0 - 60°C

CAN I/O bus controller BC7321-1

Operational conditions	X67BC7321-1
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67BC7321-1
Temperature	-25°C to +85°C
Mechanical characteristics	X67BC7321-1
Dimensions (W x H x D)	53 x 85 x 42 mm
Weight	195 g
Torque for connections	
M8	Max. 0.4 Nm
M12	Max. 0.6 Nm

Note: This bus controller only supports the default function model of multi-function modules. The default function model is explained in the description for each multi-function module.

Ethernet POWERLINK bus controller BC8321-1



ETHERNET
POWERLINK

Ethernet POWERLINK

POWERLINK is a standard protocol for Fast Ethernet which has proven its true real-time characteristics in thousands of applications. The Ethernet POWERLINK Standardization Group (EPSG, www.ethernet-powerlink.org) ensures that the standard remains open and is continually developed.

POWERLINK represents the second generation of the fieldbus based on standard Ethernet. For the first time, this makes it possible to apply the full power of IT technologies to the automation field.

X67 bus controller POWERLINK

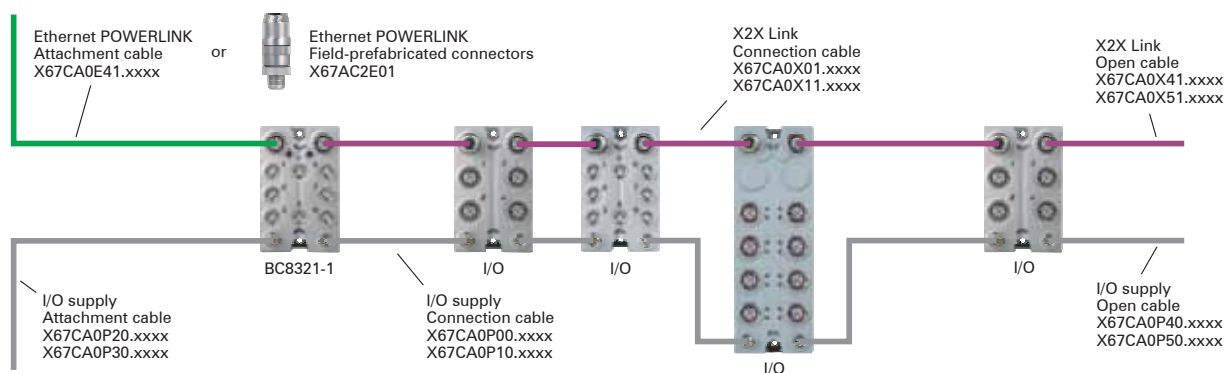
- POWERLINK V1/V2
- 8 digital channels that can be configured as inputs or outputs
- I/O configuration and firmware update via the fieldbus
- Integrated connection to the local expansion via X2X Link for up to 250 additional modules
- Configurable cycle time for local expansion from 200 μ s

The BC8321-1 bus controller makes it possible to connect X2X Link I/O nodes to POWERLINK V1/V2. Additional X67 modules and other modules that are based on X2X Link can be attached using the integrated X2X Link connection. It is also possible to operate the X2X Link cycle synchronously 1:1 or synchronous to POWERLINK using a prescaler.

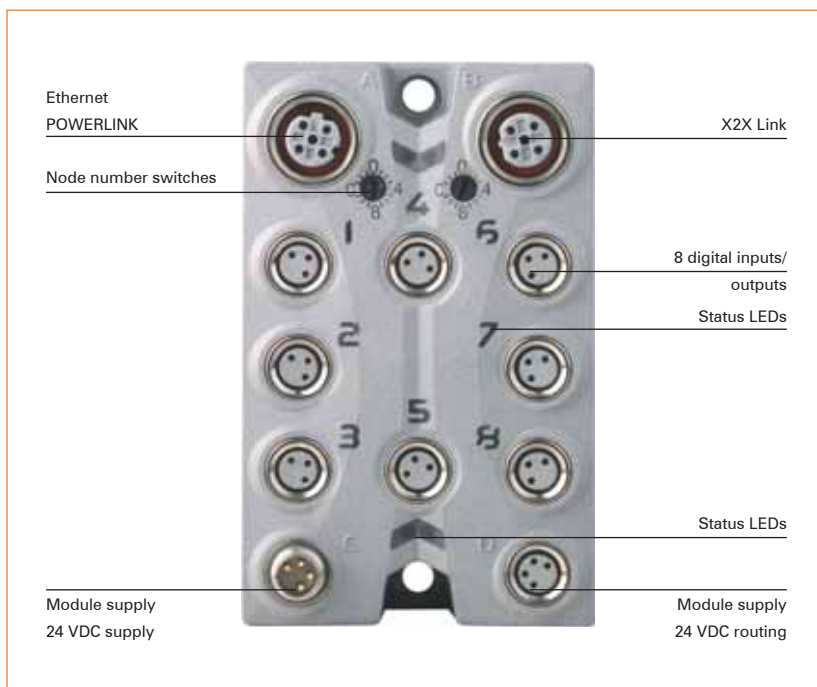
Mechanically, POWERLINK is connected via the new IP67 Ethernet Standard M12 connector with D coding.

Detailed information and support regarding selection, possible configurations, and combinations of digital and analog modules is available on the B&R homepage: www.br-automation.com

Required cables and connectors



Ethernet POWERLINK bus controller BC8321-1



Short description	X67BC8321-1
Bus controller	POWERLINK V1/V2 controlled node
Inputs/outputs	8 digital channels, configured as inputs or outputs using software, inputs with special functions
Rated voltage	24 VDC
Fieldbus	X67BC8321-1
Type	POWERLINK V1/V2 100 Base-T (ANSI/IEE 802.3)
Design	M12 circular connector (socket on the module)
Cable length	Max. 100 m between two stations (segment length)
Transfer rate	100 MBit/s
Digital inputs	X67BC8321-1
Input filter	
Hardware	$\leq 10 \mu\text{s}$ (channel 1 - 4) / $\leq 70 \mu\text{s}$ (channel 5 - 8)
Software	Default 0 ms, configured between 0 and 25 ms in 0.2 ms intervals
Input circuit	Sink
Additional functions for inputs	50 kHz event counting, gate measurement
Digital outputs	X67BC8321-1
Rated output current	0.5 A
Total current	4.0 A
Output circuit	Source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for the output supply.
General information	X67BC8321-1
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED and software status
Outputs	Yes, with status LED and software status
Electrical isolation	
Fieldbus - X2X Link	Yes
Channel - Bus	Yes (POWERLINK and X2X)
Channel - Channel	No
Sensor/actuator supply	0.5 A total current
Power consumption	
Fieldbus	3.5 W
I/O internal	2.5 W
X2X Link supply	4.2 W at maximum power output for connected I/O modules
Power output	3.0 W X2X Link supply for I/O modules
Connection type	
Fieldbus	M12 (D coded)
X2X Link	M12 (B coded)
Inputs/outputs	M8 (3-pin)
Module supply	M8 (4-pin)
Certification	CE, cRUus, GOST-R
Ex zone 2	II 3G EEx nA II T5, IP67, Ta = 0 - 60°C

Operational conditions	X67BC8321-1
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67BC8321-1
Temperature	-25°C to +85°C
Mechanical characteristics	X67BC8321-1
Dimensions (W x H x D)	53 x 85 x 42 mm
Weight	195 g
Torque for connections	
M8	Max. 0.4 Nm
M12	Max. 0.6 Nm

System supply PS1300



The PS1300 system supply module uses 24 VDC industrial voltage to generate power for the electrically isolated X2X Link. This system supply module also provides 15 W of output power for additional stations on the bus.

- Electrical isolation from feed and X2X Link Supply
- Protection through redundancy during parallel operation of multiple power supply modules
- Short circuit protection
- Overload protection

Short description	X67PS1300
System supply	Creates electrically isolated X2X Link supply
X2X Link supply input	X67PS1300
Rated voltage	24 VDC
Voltage range	18 VDC to 30 VDC
Rated current	0.75 A
Fuse	Integrated
X2X Link supply output	X67PS1300
Rated output power	15.0 W
Overload behavior	Short circuit protection, overload protection
Parallel operation	Yes
Redundant operation	Yes, when input voltages are the same
General information	X67PS1300
Status indicators	Input voltage OK, output voltage OK
Electrical isolation	
Input - Output	Yes
Connection type	
X2X Link supply input	M8 (4-pin)
X2X Link supply output	M12 (B coded)
Certification	CE, cRUus, GOST-R
Ex zone 2	II 3G EEx nA II T5, IP67, Ta = 0 - 60°C
Operational conditions	X67PS1300
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67PS1300
Temperature	-25°C to +85°C
Mechanical characteristics	X67PS1300
Dimensions (W x H x D)	53 x 85 x 42 mm
Weight	190 g
Torque for connections	
M8	Max. 0.4 Nm
M12	Max. 0.6 Nm

Required accessories

See overview of pin connections

506

Digital input module DI1371



- For all standard sensors with an M8 connection
- Extremely short cycle times
- Integrated short circuit protected sensor supply

Short description	X67DI1371
I/O module	8 digital inputs - 24 VDC
Digital inputs	X67DI1371
Rated voltage	24 VDC
Input filter	
Hardware	≤100 μs
Software	1 ms
Input circuit	Sink
Sensor supply	0.5 A total current
General information	X67DI1371
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
X2X Link supply	1.0 W
I/O internal	1.0 W
Connection type	
X2X Link	M12 (B coded)
Inputs	M8 (3-pin)
Module supply	M8 (4-pin)
Certification	CE, cRUus, GOST-R
Ex zone 2	II 3G EEx nA II T5, IP67, Ta = 0 - 60°C
Operational conditions	X67DI1371
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67DI1371
Temperature	-25°C to +85°C
Mechanical characteristics	X67DI1371
Dimensions (W x H x D)	53 x 85 x 42 mm
Weight	180 g
Torque for connections	
M8	Max. 0.4 Nm
M12	Max. 0.6 Nm

Required accessories

See overview of pin connections

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Digital input module

DI1371.L08



- 16 digital inputs
- For all standard sensors with an M8 connection
- 1:1 replacement of passive distributors
- Extremely short cycle times
- Integrated short circuit protected sensor supply

Short description	X67DI1371.L08
I/O module	16 digital inputs - 24 VDC
Digital inputs	X67DI1371.L08
Rated voltage	24 VDC
Input filter	
Hardware	≤100 μs
Software	1 ms
Input circuit	Sink
Sensor supply	0.5 A total current
General information	X67DI1371.L08
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
X2X Link supply	0.75 W
I/O internal	0.5 W
Connection type	
X2X Link	M12 (B coded)
Inputs	M8 (3-pin)
Module supply	M8 (4-pin)
Certification	CE, cRUus, GOST-R
Ex zone 2	II 3G EEx nA II T5, IP67, Ta = 0 - 60°C
Operational conditions	X67DI1371.L08
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
> 2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67DI1371.L08
Temperature	-25°C to +85°C
Mechanical characteristics	X67DI1371.L08
Dimensions (W x H x D)	53 x 155 x 42 mm
Weight	320 g
Torque for connections	
M8	Max. 0.4 Nm
M12	Max. 0.6 Nm

Required accessories

See overview of pin connections

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Digital input module DI1371.L12



- 16 digital inputs
- For all standard sensors with an M12 connection
- 1:1 replacement of passive distributors
- Extremely short cycle times
- Integrated short circuit protected sensor supply

Short description	X67DI1371.L12
I/O module	16 digital inputs - 24 VDC
Digital inputs	X67DI1371.L12
Rated voltage	24 VDC
Input filter	
Hardware	≤100 μs
Software	1 ms
Input circuit	Sink
Sensor supply	0.5 A total current
General information	X67DI1371.L12
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
X2X Link supply	0.75 W
I/O internal	0.5 W
Connection type	
X2X Link	M12 (B coded)
Inputs	M12 (A coded)
Module supply	M8 (4-pin)
Certification	CE, cRUus, GOST-R
Ex zone 2	II 3G EEx nA II T5, IP67, Ta = 0 - 60°C
Operational conditions	X67DI1371.L12
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67DI1371.L12
Temperature	-25°C to +85°C
Mechanical characteristics	X67DI1371.L12
Dimensions (W x H x D)	53 x 155 x 42 mm
Weight	320 g
Torque for connections	
M8	Max. 0.4 Nm
M12	Max. 0.6 Nm

Required accessories

See overview of pin connections

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Digital output module DO1332



- 8 A total current per module
- All outputs with single channel diagnostics for short circuit or overload
- Extremely short cycle times
- Outputs with short-circuit protection
- Integrated protection for switching inductances

Short description	X67DO1332
I/O module	8 digital outputs 24 VDC
Digital outputs	X67DO1332
Rated voltage	24 VDC
Rated output current	2.0 A
Total current	8.0 A
Output circuit	Source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for output supply
Actuator supply	0.5 A total current
General information	X67DO1332
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED
Outputs	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
X2X Link supply	1.0 W
I/O internal	2.0 W
Connection type	
X2X Link	M12 (B coded)
Outputs	M8 (3-pin)
Module supply	M8 (4-pin)
Certification	CE, cRUus, GOST-R
Ex zone 2	II 3G EEx nA II T5, IP67, Ta = 0 - 60°C
Operational conditions	X67DO1332
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67DO1332
Temperature	-25°C to +85°C
Mechanical characteristics	X67DO1332
Dimensions (W x H x D)	53 x 85 x 42 mm
Weight	185 g
Torque for connections	
M8	Max. 0.4 Nm
M12	Max. 0.6 Nm

Required accessories

See overview of pin connections

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Digital output module DO9332.L12



A unique feature of the DO9332.L12 is the node number switch for setting the X2X Link address. Also see section "Definable X2X Link address", on page 429.

- 8 digital outputs
- Outputs can handle up to 2 A
- Node number switch for setting the X2X Link address
- 1:1 replacement of passive distributors
- All outputs with single channel diagnostics
- Extensive additional status information

Short description	X67DO9332.L12
I/O module	8 digital outputs 24 VDC
Digital outputs	X67DO9332.L12
Rated voltage	24 VDC
Rated output current	2.0 A
Total current	8.0 A
Output circuit	Source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for output supply
Actuator supply	
Actuator current	0.1 A
Total current	0.5 A
General information	X67DO9332.L12
Status indicators	I/O function for each channel, actuator supply for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED and software status
Outputs	Yes, with status LED and software status
Actuator supply	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
X2X Link supply	0.75 W
I/O internal	1.7 W
Connection type	
X2X Link	M12 (B coded)
Inputs/outputs	M12 (A coded)
Module supply	M8 (4-pin)
Certification	CE, cRUus in preparation, GOST-R
Ex zone 2	II 3G EEx nA II T5, IP67, Ta = 0 - 60°C
Operational conditions	X67DO9332.L12
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67DO9332.L12
Temperature	-25°C to +85°C
Mechanical characteristics	X67DO9332.L12
Dimensions (W x H x D)	53 x 155 x 42 mm
Weight	320 g
Torque for connections	
M8	Max. 0.4 Nm
M12	Max. 0.6 Nm

Required accessories


See overview of pin connections

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Digital mixed module DM1321



- All channels can be configured as inputs or outputs
- Configurable digital input filters
- 2 channels also with counter functions
- All outputs with single channel diagnostics
- Extensive additional status information

Short description	X67DM1321
I/O module	8 digital channels, configured as inputs or outputs using software, inputs with special functions
Rated voltage	24 VDC
Digital inputs	X67DM1321
Input filter	
Hardware	$\leq 10 \mu\text{s}$ (channel 1 - 4) / $\leq 70 \mu\text{s}$ (channel 5 - 8)
Software	Default 0 ms, can be configured between 0 and 25 ms in 0.2 ms intervals
Input circuit	Sink
Additional functions for inputs	50 kHz event counting, gate measurement
Digital outputs	X67DM1321
Rated output current	0.5 A
Total current	4.0 A
Output circuit	Source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for output supply
General information	X67DM1321
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED and software status
Outputs	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Sensor/actuator supply	0.5 A total current
Power consumption	
X2X Link supply	1.0 W
I/O internal	2.5 W
Connection type	
X2X Link	M12 (B coded)
Inputs/outputs	M8 (3-pin)
Module supply	M8 (4-pin)
Certification	CE, cRUus, GOST-R
Ex zone 2	II 3G EEx nA II T5, IP67, Ta = 0 - 60°C
Operational conditions	X67DM1321
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67DM1321
Temperature	-25°C to +85°C
Mechanical characteristics	X67DM1321
Dimensions (W x H x D)	53 x 85 x 42 mm
Weight	190 g
Torque for connections	
M8	Max. 0.4 Nm
M12	Max. 0.6 Nm
Required accessories	
See overview of pin connections	 506

Digital mixed module DM1321.L08



- 16 digital mixed channels can be configured as inputs or outputs
- 1:1 replacement of passive distributors
- Configurable digital input filter
- 2 channels also with counter functions
- All outputs with single channel diagnostics
- Extensive additional status information

Short description	X67DM1321.L08
I/O module	16 digital channels, configured as inputs or outputs using software, inputs with special functions
Rated voltage	24 VDC
Digital inputs	X67DM1321.L08
Input filter	
Hardware	$\leq 10 \mu\text{s}$ (channels 1 - 4) / $\leq 70 \mu\text{s}$ (channels 5 - 16)
Software	Default 0 ms, can be configured between 0 and 25 ms in 0.2 ms intervals
Input circuit	Sink
Additional functions for inputs	50 kHz event counting, gate measurement
Digital outputs	X67DM1321.L08
Rated output current	0.5 A
Total current	8.0 A
Output circuit	Source
Output protection	Thermal cutoff for overcurrent or short circuit, integrated protection for for switching inductances, reverse polarity protection for output supply
General information	X67DM1321.L08
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED and software status
Outputs	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Sensor/actuator supply	0.5 A total current
Power consumption	
X2X Link supply	0.75 W
I/O internal	3.0 W
Connection type	
X2X Link	M12 (B coded)
Inputs/outputs	M8 (3-pin)
Module supply	M8 (4-pin)
Certification	CE, cRUus, GOST-R
Ex zone 2	II 3G EEx nA II T5, IP67, Ta = 0 - 60°C
Operational conditions	X67DM1321.L08
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67DM1321.L08
Temperature	-25°C to +85°C
Mechanical characteristics	X67DM1321.L08
Dimensions (W x H x D)	53 x 155 x 42 mm
Weight	320 g
Torque for connections	
M8	Max. 0.4 Nm
M12	Max. 0.6 Nm
Required accessories	
See overview of pin connections	506

Digital mixed module DM1321.L12



- 16 digital mixed channels can be configured as inputs or outputs
- 1:1 replacement of passive distributors
- Configurable digital input filter
- 2 channels also with counter functions
- All outputs with single channel diagnostics
- Extensive additional status information

Short description	X67DM1321.L12
I/O module	16 digital channels, configured as inputs or outputs using software, inputs with special functions
Rated voltage	24 VDC
Digital inputs	X67DM1321.L12
Input filter	
Hardware	$\leq 10 \mu\text{s}$ (channels 1 - 4) / $\leq 70 \mu\text{s}$ (channels 5 - 16)
Software	Default 0 ms, can be configured between 0 and 25 ms in 0.2 ms intervals
Input circuit	Sink
Additional functions for inputs	50 kHz event counting, gate measurement
Digital outputs	X67DM1321.L12
Rated output current	0.5 A
Total current	8.0 A
Output circuit	Source
Output protection	Thermal cutoff for overcurrent or short circuit, integrated protection for switching inductances, reverse polarity protection for output supply
General information	X67DM1321.L12
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED and software status
Outputs	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Sensor/actuator supply	0.5 A total current
Power consumption	
X2X Link supply	0.75 W
I/O internal	3.0 W
Connection type	
X2X Link	M12 (B coded)
Inputs/outputs	M12 (A coded)
Module supply	M8 (4-pin)
Certification	CE, cRUus, GOST-R
Ex zone 2	II 3G EEx nA II T5, IP67, Ta = 0 - 60°C
Operational conditions	X67DM1321.L12
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
> 2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67DM1321.L12
Temperature	-25°C to +85°C
Mechanical characteristics	X67DM1321.L12
Dimensions (W x H x D)	53 x 155 x 42 mm
Weight	320 g
Torque for connections	
M8	Max. 0.4 Nm
M12	Max. 0.6 Nm

Required accessories

See overview of pin connections

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Digital mixed module DM9321



A unique feature of the DM9321 is the node number switch for setting the X2X Link address. Also see section "Definable X2X Link address", on page 429.

- All channels can be configured as inputs or outputs
- Node number switch for setting the X2X Link address
- Configurable digital input filters
- 2 channels also with counter functions
- All outputs with single channel diagnostics
- Extensive additional status information

Short description	X67DM9321
I/O module	8 digital channels, configured as inputs or outputs using software, inputs with special functions
Rated voltage	24 VDC
Digital inputs	X67DM9321
Input filter	
Hardware	$\leq 10 \mu\text{s}$ (channel 1 - 4) / $\leq 70 \mu\text{s}$ (channel 5 - 8)
Software	Default 0 ms, can be configured between 0 and 25 ms in 0.2 ms intervals
Input circuit	Sink
Additional functions for inputs	50 kHz event counting, gate measurement
Digital outputs	X67DM9321
Rated output current	0.5 A
Total current	4.0 A
Output circuit	Source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for output supply
General information	X67DM9321
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED and software status
Outputs	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Sensor/actuator supply	0.5 A total current
Power consumption	
X2X Link supply	1.0 W
I/O internal	2.5 W
Connection type	
X2X Link	M12 (B coded)
Inputs/outputs	M8 (3-pin)
Module supply	M8 (4-pin)
Certification	CE, cRUus, GOST-R
Ex zone 2	II 3G EEx nA II T5, IP67, Ta = 0 - 60°C
Operational conditions	X67DM9321
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67DM9321
Temperature	-25°C to +85°C
Mechanical characteristics	X67DM9321
Dimensions (W x H x D)	53 x 85 x 42 mm
Weight	190 g
Torque for connections	
M8	Max. 0.4 Nm
M12	Max. 0.6 Nm
Required accessories	
See overview of pin connections	506

Digital mixed module DM9331.L12



A unique feature of the DM9331.L12 is the node number switch for setting the X2X Link address. Also see section "Definable X2X Link address", on page 429.

- 8 digital mixed channels can be configured as inputs or outputs
- Outputs can handle up to 2 A
- Node number switch for setting the X2X Link address
- 1:1 replacement of passive distributors
- Configurable digital input filter
- All outputs with single channel diagnostics
- Extensive additional status information

Short description	X67DM9331.L12
I/O module	8 digital channels, configured as inputs or outputs using software
Rated voltage	24 VDC
Digital inputs	X67DM9331.L12
Input filter	
Hardware	≤70 μs
Software	Default 0 ms, can be configured between 0 and 25 ms in 0.2 ms intervals
Input circuit	Sink
Digital outputs	X67DM9331.L12
Rated output current	2.0 A
Total current	8.0 A
Output circuit	Source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for output supply
General information	X67DM9331.L12
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED and software status
Outputs	Yes, with status LED and software status
Sensor/actuator supply	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Sensor/actuator supply	
Sensor/actuator current	0.1 A
Total current	0.5 A
Power consumption	
X2X Link supply	0.75 W
I/O internal	1.7 W
Connection type	
X2X Link	M12 (B coded)
Inputs/outputs	M12 (A coded)
Module supply	M8 (4-pin)
Certification	CE, cRUus, GOST-R
Ex zone 2	II 3G EEx nA II T5, IP67, Ta = 0 - 60°C
Operational conditions	X67DM9331.L12
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67DM9331.L12
Temperature	-25°C to +85°C
Mechanical characteristics	X67DM9331.L12
Dimensions (W x H x D)	53 x 155 x 42 mm
Weight	320 g
Torque for connections	
M8	Max. 0.4 Nm
M12	Max. 0.6 Nm

Required accessories

See overview of pin connections

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Digital valve control module DV1311.L08



The DV1311.L08 module lets you control valve manifolds using multi-pin technology. Multi-pin is a simple way of connecting valve manifolds. Digital outputs are connected here via the 25-pin DSUB connector, which then switch the valves. The DV1311.L08 module uses an M16 plug to connect to the multi-pin socket. This lets you control up to 16 valves with a simple cable connection. The current can be a maximum of 100 mA. feedback signals of piston positions or other manipulated variables are possible using 16 standard digital inputs on the same module.

- Controlling valve manifolds using multi-pin technology
- Up to 16 valves per valve manifold
- 16 digital inputs for return messages
- Separate feeds for inputs and valve coils
- Configurable digital input filter
- All outputs with single channel diagnostics
- Extensive additional status information

Short description	X67DV1311.L08
I/O module	16 digital outputs for controlling valve manifolds with multi-pin technology 16 digital inputs for feedback
Rated voltage	24 VDC
Digital inputs	X67DV1311.L08
Input filter	
Hardware	≤ 100 μs
Software	Default 0 ms, can be configured between 0 and 25 ms in 0.2 ms intervals
Input circuit	Sink
Sensor supply	0.5 A total current
Digital outputs	X67DV1311.L08
Rated output current	0.1 A
Total current	1.6 A
Output circuit	Source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for output supply
General information	X67DV1311.L08
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED and software status
Outputs	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
X2X Link supply	0.75 W
I/O internal	1.3 W
Connection type	
X2X Link	M12 (B coded)
Inputs	M8 (3-pin)
Outputs	M16 (19-pin)
Module supply	M8 (4-pin)
Certification	CE, cRUus, GOST-R
Ex zone 2	II 3G EEx nA II T5, IP67, Ta = 0 - 60°C
Operational conditions	X67DV1311.L08
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67DV1311.L08
Temperature	-25°C to +85°C
Mechanical characteristics	X67DV1311.L08
Dimensions (W x H x D)	53 x 155 x 42 mm
Weight	320 g
Torque for connections	
M8	Max. 0.4 Nm
M12	Max. 0.6 Nm
M16	Max. 1.0 Nm
Required accessories	
See overview of pin connections	

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
Digital valve control module DV1311.L12



The DV1311.L12 module lets you control valve manifolds using multi-pin technology.

Multi-pin is a simple way of connecting valve manifolds. Digital outputs are connected here via the 25-pin DSUB connector, which then switch the valves. The DV1311.L12 module uses an M16 plug to connect to the multi-pin socket. This lets you control up to 16 valves with a simple cable connection. The current can be a maximum of 100 mA. feedback signals of piston positions or other manipulated variables are possible using 16 standard digital inputs on the same module.

- Controlling valve manifolds using multi-pin technology
- Up to 16 valves per valve manifold
- 16 digital inputs for return messages
- Separate feeds for inputs and valve coils
- Configurable digital input filter
- All outputs with single channel diagnostics
- Extensive additional status information

Short description	X67DV1311.L12
I/O module	16 digital outputs for controlling valve manifolds with multi-pin technology 16 digital inputs for feedback
Rated voltage	24 VDC
Digital inputs	X67DV1311.L12
Input filter	
Hardware	≤100 μs
Software	Default 0 ms, can be configured between 0 and 25 ms in 0.2 ms intervals
Input circuit	Sink
Sensor supply	0.5 A total current
Digital outputs	X67DV1311.L12
Rated output current	0.1 A
Total current	1.6 A
Output circuit	Source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for output supply
General information	X67DV1311.L12
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED and software status
Outputs	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
X2X Link supply	0.75 W
I/O internal	1.3 W
Connection type	
X2X Link	M12 (B coded)
Inputs	M12 (A coded)
Outputs	M16 (19-pin)
Module supply	M8 (4-pin)
Certification	CE, cRUus, GOST-R
Ex zone 2	II 3G EEx nA II T5, IP67, Ta = 0 - 60°C
Operational conditions	X67DV1311.L12
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67DV1311.L12
Temperature	-25°C to +85°C
Mechanical characteristics	X67DV1311.L12
Dimensions (W x H x D)	53 x 155 x 42 mm
Weight	320 g
Torque for connections	
M8	Max. 0.4 Nm
M12	Max. 0.6 Nm
M16	Max. 1.0 Nm
Required accessories	
See overview of pin connections	 506

Analog input module

AI1223



- 4 analog inputs ± 10 V
- Open circuit and limit detection
- Configurable digital input filters
- Very short cycle times
- Optimal shielding dissipation on all channels

Short description	X67AI1223
I/O module	4 analog inputs ± 10 V
Analog inputs	X67AI1223
Input	± 10 V
Input type	Differential input
Digital converter resolution	12-bit
Conversion time	400 μ s for all inputs
Output format	UINT
Input impedance in signal range	20 M Ω
Maximum error at 25°C	
Gain	0.1%, based on current measurement value
Offset	0.05%, based on the entire measurement range
Input protection	Protection against wiring with supply voltage
General information	X67AI1223
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED and software status
Inputs	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
X2X Link supply	1.0 W
I/O internal	3.0 W
Connection type	
X2X Link	M12 (B coded)
Inputs	M12 (A coded)
Module supply	M8 (4-pin)
Certification	CE, cRUus, GOST-R
Ex zone 2	II 3G EEx nA II T5, IP67, Ta = 0 - 60°C
Operational conditions	X67AI1223
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67AI1223
Temperature	-25°C to +85°C
Mechanical characteristics	X67AI1223
Dimensions (W x H x D)	53 x 85 x 42 mm
Weight	200 g
Torque for connections	
M8	Max. 0.4 Nm
M12	Max. 0.6 Nm

Required accessories

See overview of pin connections

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Analog input module AI1323



- 4 analog inputs at 0 to 20 mA
- Open circuit recognition
- Configurable digital input filters
- Very short cycle times
- Optimal shielding dissipation on all channels

Short description	X67AI1323
I/O module	4 analog inputs 0 to 20 mA
Analog inputs	X67AI1323
Input	0 to 20 mA
Input type	Differential input
Digital converter resolution	12-bit
Conversion time	400 μ s for all inputs
Output format	UINT
Load	< 300 Ω
Maximum error at 25°C	
Gain	0.1%, based on current measurement value
Offset	0.05%, based on the entire measurement range
Input protection	Protection against wiring with supply voltage
General information	X67AI1323
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED and software status
Inputs	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
X2X Link supply	1.0 W
I/O internal	3.0 W
Connection type	
X2X Link	M12 (B coded)
Inputs	M12 (A coded)
Module supply	M8 (4-pin)
Certification	CE, cRUus, GOST-R
Ex zone 2	II 3G EEx nA II T5, IP67, Ta = 0 - 60°C
Operational conditions	X67AI1323
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67AI1323
Temperature	-25°C to +85°C
Mechanical characteristics	X67AI1323
Dimensions (W x H x D)	53 x 85 x 42 mm
Weight	195 g
Torque for connections	
M8	Max. 0.4 Nm
M12	Max. 0.6 Nm

Required accessories

See overview of pin connections

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Analog input module AI2744



- 2 full-bridge strain gauge inputs
- Data output rate up to 7.5 kHz

Short description	X67AI2744
I/O module	2 full-bridge strain gauge inputs
Full-bridge strain gauge	X67AI2744
Measurement area	± 2 to ± 16 mV/V, set using software
Input type	Differential, used to evaluate a full-bridge strain gauge
Digital converter resolution	24-bit
Conversion time	Depending on the set data output rate
Data output rate	2.5 - 7500 scans per second, can be set using software
Input Filter Characteristics	
Cut-off frequency	5 kHz
Order/attenuation	3 / 60 dB
Operating range / measurement sensor	85 to 5,000 Ω
Bridge voltage	5.5 VDC / max. 65 mA
Short circuit, overload protection	Yes
Connection	4-wire connection
Input protection	RC protection
General information	X67AI2744
Status indicators	Channel status, operating status, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Input	Yes, with status LED and software status
Wire break	Yes, with software status
Electrical isolation	
Bus - Analog input	Yes
Bus - Bridge supply voltage	Yes
Power consumption	
Bus	0.75 W
I/O internal	1.6 W
Certification	CE, cRUus, GOST-R
Operational conditions	X67AI2744
Operating temperature	0°C to +60°C
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
> 2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67AI2744
Temperature	-25°C to +85°C
Mechanical characteristics	X67AI2744
Dimensions (W x H x D)	53 x 85 x 42 mm
Weight	190 g
Torque for connections	
M8	Max. 0.4 Nm
M12	Max. 0.6 Nm

Required accessories	
See overview of pin connections	 506

Analog input module

AI4850



- 4 inputs for potentiometer displacement gauge

Short description	X67AI4850
I/O module	4 inputs for potentiometer displacement gauge
Potentiometer Displacement Gauge	X67AI4850
Input type	Single ended input in the range from 0 to U_{pot}
Digital converter resolution	14-bit
Measurement sensor	0.5 k Ω to 10 k Ω , potentiometer
Conversion time	<200 μ s for all channels
Output format	UINT
Short circuit protection U_{pot}	Yes
General information	X67AI4850
Status indicators	Channel status, operating status, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Input	Yes, with status LED and software status
Electrical isolation	
Bus - Analog input	Yes
Power consumption	
Bus	0.75 W
I/O internal	2.0 W
Certification	CE, cRUus, GOST-R
Operational conditions	X67AI4850
Operating temperature	0°C to +60°C
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67AI4850
Temperature	-25°C to +85°C
Mechanical characteristics	X67AI4850
Dimensions (W x H x D)	53 x 85 x 42 mm
Weight	195 g
Torque for connections	
M8	Max. 0.4 Nm
M12	Max. 0.6 Nm

Required accessories

See overview of pin connections

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Analog output module AO1223



- 4 analog outputs ± 10 V
- Integrated enable relay for initial phase
- Very short cycle times
- Optimal shielding dissipation on all channels

Short description	X67AO1223
I/O module	4 analog outputs ± 10 V
Analog outputs	X67AO1223
Output	± 10 V
Digital converter resolution	12-bit
Conversion time	400 μ s for all outputs
Power on/off behavior	Internal enable relay for boot procedure and errors
Maximum error at 25°C and with 10 k Ω load	
Gain	0.15%, based on the current output value
Offset	0.05%, based on the entire output range
Output protection	Protection against wiring with supply voltage, short-circuit protection
General information	X67AO1223
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
X2X Link supply	1.0 W
I/O internal	4.0 W
Connection type	
X2X Link	M12 (B coded)
Outputs	M12 (A coded)
Module supply	M8 (4-pin)
Certification	CE, cRUus, GOST-R
Ex zone 2	II 3G EEx nA II T5, IP67, Ta = 0 - 60°C
Operational conditions	X67AO1223
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67AO1223
Temperature	-25°C to +85°C
Mechanical characteristics	X67AO1223
Dimensions (W x H x D)	53 x 85 x 42 mm
Weight	200 g
Torque for connections	
M8	Max. 0.4 Nm
M12	Max. 0.6 Nm

Required accessories
See overview of pin connections

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Analog output module AO1323



- 4 analog outputs at 0 to 20 mA
- Integrated enable relay for initial phase
- Very short cycle times
- Optimal shielding dissipation on all channels

Short description	X67AO1323
I/O module	4 analog outputs 0 to 20 mA
Analog outputs	X67AO1323
Output	0 to 20 mA
Digital converter resolution	12-bit
Conversion time	400 μ s for all outputs
Power on/off behavior	Internal enable relay for boot procedure and errors
Maximum error at 25°C and with 50 Ω load	
Gain	0.2%, based on the current output value
Offset	0.05%, based on the entire output range
Output protection	Protection against wiring with supply voltage, short-circuit protection
General information	X67AO1323
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
X2X Link supply	1.0 W
I/O internal	4.5 W
Connection type	
X2X Link	M12 (B coded)
Outputs	M12 (A coded)
Module supply	M8 (4-pin)
Certification	CE, cRUus, GOST-R
Ex zone 2	II 3G EEx nA II T5, IP67, Ta = 0 - 60°C
Operational conditions	X67AO1323
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67AO1323
Temperature	-25°C to +85°C
Mechanical characteristics	X67AO1323
Dimensions (W x H x D)	53 x 85 x 42 mm
Weight	200 g
Torque for connections	
M8	Max. 0.4 Nm
M12	Max. 0.6 Nm

Required accessories

See overview of pin connections

506

Analog mixed module AM1223



- 2 analog inputs, 2 analog outputs ± 10 V
- Open circuit recognition at the inputs
- Configurable digital input filters
- Very short cycle times
- Optimal shielding dissipation on all channels

Short description	X67AM1223
I/O module	2 inputs, 2 outputs
Analog inputs	X67AM1223
Input	± 10 V
Input type	Differential input
Digital converter resolution	12-bit
Conversion time	300 μ s for both inputs
Output format	UINT
Input impedance in signal range	20 M Ω
Maximum error at 25°C	
Gain	0.1%, based on current measurement value
Offset	0.05%, based on the entire measurement range
Input protection	Protection against wiring with supply voltage
Analog outputs	X67AM1223
Output	± 10 V
Digital converter resolution	12-bit
Conversion time	300 μ s for both outputs
Power on/off behavior	Internal enable relay for boot procedure and errors
Maximum error at 25°C and with 10 k Ω load	
Gain	0.15%, based on the current output value
Offset	0.05%, based on the entire output range
Output protection	Protection against wiring with supply voltage, short-circuit protection
General information	X67AM1223
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED and software status
Inputs	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
X2X Link supply	1.0 W
I/O internal	3.0 W
Connection type	
X2X Link	M12 (B coded)
Inputs/outputs	M12 (A coded)
Module supply	M8 (4-pin)
Certification	CE, cRUus, GOST-R
Ex zone 2	II 3G EEx nA II T5, IP67, Ta = 0 - 60°C

Operational conditions		X67AM1223
Operating temperature		0°C to +60°C
Mounting orientation		Any
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP67
Storage and transport conditions		X67AM1223
Temperature		-25°C to +85°C
Mechanical characteristics		X67AM1223
Dimensions (W x H x D)		53 x 85 x 42 mm
Weight		200 g
Torque for connections		
M8		Max. 0.4 Nm
M12		Max. 0.6 Nm

Required accessories	
See overview of pin connections	506

Analog mixed module AM1323



- 2 analog inputs, 2 analog outputs 0 to 20 mA
- Open circuit recognition at the inputs
- Configurable digital input filters
- Very short cycle times
- Optimal shielding dissipation on all channels

Short description	X67AM1323
I/O module	2 inputs, 2 outputs
Analog inputs	X67AM1323
Input	0 to 20 mA
Input type	Differential input
Digital converter resolution	12-bit
Conversion time	300 μ s for both inputs
Output format	UINT
Load	< 300 Ω
Maximum error at 25°C	
Gain	0.1%, based on current measurement value
Offset	0.05%, based on the entire measurement range
Input protection	Protection against wiring with supply voltage
Analog outputs	X67AM1323
Output	0 to 20 mA
Digital converter resolution	12-bit
Conversion time	300 μ s for both outputs
Power on/off behavior	Internal enable relay for boot procedure and errors
Maximum error at 25°C and with 50 Ω load	
Gain	0.2%, based on the current output value
Offset	0.05%, based on the entire output range
Output protection	Protection against wiring with supply voltage, short-circuit protection
General information	X67AM1323
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED and software status
Inputs	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
X2X Link supply	1.0 W
I/O internal	3.0 W
Connection type	
X2X Link	M12 (B coded)
Inputs/outputs	M12 (A coded)
Module supply	M8 (4-pin)
Certification	CE, cRUus, GOST-R
Ex zone 2	II 3G EEx nA II T5, IP67, Ta = 0 - 60°C

Operational conditions		X67AM1323
Operating temperature		0°C to +60°C
Mounting orientation		Any
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP67
Storage and transport conditions		X67AM1323
Temperature		-25°C to +85°C
Mechanical characteristics		X67AM1323
Dimensions (W x H x D)		53 x 85 x 42 mm
Weight		200 g
Torque for connections		
M8		Max. 0.4 Nm
M12		Max. 0.6 Nm

Required accessories	
See overview of pin connections	506

Temperature module AT1322



- 4 inputs for resistance temperature measurement
- For PT100, PT1000 and others
- Also, direct resistance measurement
- Sensor type configurable for each channel
- 2 and 4 wire connection

Short description		X67AT1322
I/O module		4 inputs for KTY10-6, KTY84-130, PT100 or PT1000 resistance temperature measurement
Temperature inputs resistance measurement		X67AT1322
Input		Resistance measurement with constant current supply for 2 or 4-wire connections
Digital converter resolution		16-bit
Filter time		Configurable between 2 ms and 20 ms
Conversion time		
Same sensor types		75 ms per channel with 50 Hz filter
When switching sensor type		195 ms per channel with 50 Hz filter
Output format		INT or UINT for resistance measurement
Maximum error at 25°C		
Gain		0.01%, based on the current resistance value
Offset		0.015%, based on the entire resistance range
Sensor		Can be set per channel
KTY10-6		-50°C to +145°C
KTY84-130		-40°C to +300°C
PT100		-200°C to +850°C
PT1000		-200°C to +850°C
Resistance measurement range		0.1 Ω to 4500 Ω / 0.05 Ω to 2250 Ω
General information		X67AT1322
Status indicators		I/O function for each channel, supply voltage, bus function
Diagnostics		
I/O supply		Yes, with status LED and software status
Inputs		Yes, with status LED and software status
Electrical isolation		
Channel - Bus		Yes
Channel - Channel		No
Power consumption		
X2X Link supply		1.0 W
I/O internal		1.5 W
Connection type		
X2X Link		M12 (B coded)
Inputs		M12 (A coded)
Module supply		M8 (4-pin)
Certification		CE, cRUus, GOST-R
Ex zone 2		II 3G EEx nA II T5, IP67, Ta = 0 - 60°C
Operational conditions		X67AT1322
Operating temperature		0°C to +60°C
Mounting orientation		Any
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP67
Storage and transport conditions		X67AT1322
Temperature		-25°C to +85°C
Mechanical characteristics		X67AT1322
Dimensions (W x H x D)		53 x 85 x 42 mm
Weight		195 g
Torque for connections		
M8		Max. 0.4 Nm
M12		Max. 0.6 Nm

Temperature module AT1402



- 4 inputs for thermocouples
- For sensor types J, K, S
- Additional direct raw value measurement for other sensor types
- Terminal temperature compensation

Short description	X67AT1402
I/O module	4 inputs for thermocouples
Thermocouple temperature inputs	X67AT1402
Input	Thermocouple
Digital converter resolution	16-bit
Filter time	Configurable between 2 ms and 20 ms
Conversion time	62 ms per channel with 50 Hz filter + 62 ms per cycle for terminal temperature measurement with 50 Hz filter
Output format	UINT
Basic accuracy	
Type J	±0.064% at 25°C ¹⁾
Type K	±0.070% at 25°C ¹⁾
Type S	±0.128% at 25°C ¹⁾
Measurement area	
Sensor temperature	
FeCuNi: Type J	-210°C to +1200°C
NiCrNi: Type K	-270°C to +1372°C
PtRhPt: Type S	-50°C to +1768°C
Terminal temperature	-25°C to +85°C
Raw value	±65,534 mV
Terminal temperature compensation	Using an X67AC9A02 thermocouple plug (accessory) ²⁾
1) Refers to the measurement range without consideration of the reference junction measurement error	
2) At least one terminal temperature sensor is required to determine the temperature measured at the J, K and S thermocouple sensors.	
General information	X67AT1402
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED and software status
Inputs	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
X2X Link supply	1.0 W
I/O internal	2.6 W
Connection type	
X2X Link	M12 (B coded)
Inputs	M12 (A coded)
Module supply	M8 (4-pin)
Certification	CE, cRUus, GOST-R
Ex zone 2	II 3G EEx nA II T5, IP67, Ta = 0 - 60°C
Operational conditions	X67AT1402
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67AT1402
Temperature	-25°C to +85°C
Mechanical characteristics	X67AT1402
Dimensions (W x H x D)	53 x 85 x 42 mm
Weight	200 g
Torque for connections	M8: Max. 0.4 Nm / M12: Max. 0.6 Nm
Optional accessories	
X67AC9A02	X67 M12 thermocouple plug for temperature compensation at measurement points, screw clamp

PWM motor bridge MM2436



The motor bridge module MM2436 is used to control two DC motors with a nominal voltage of 18-48 VDC at a nominal current up to 3 A. The module can be reconfigured and used in current controller mode for controlling inductive loads. The module is also equipped with six digital inputs, which can be used as incremental counters. Each motor is controlled with a full-bridge (H-bridge). Therefore the motors can be moved in both directions.

- 2 outputs (H bridge) with PWM control and 24 VDC - 39 VDC \pm 25% supply
- 3 A rated current (5 A max current)
- 15 Hz - 50 kHz frequency, 16-bit
- PWM resolution 15-bit + sign
- Dither can be adjusted
- 2x 3 inputs 24 VDC, can be configured as ABR
- Integrated encoder supply with short-circuit protection

Short description	X67MM2436
I/O module	2 channel PWM output (H bridge) 2x 3 inputs for ABR incremental encoder
Digital inputs	X67MM2436
Number of channels	6
Rated voltage	24 VDC
Input filter	
Hardware	<5 μ s
Software	-
Input circuit	Sink
Additional functions for inputs	2x ABR incremental encoders (+24 VDC)
ABR incremental encoder	X67MM2436
Amount	2
Encoder inputs	24 VDC, asymmetric
Counter size	16-bit
Input frequency (max.)	50 kHz
Evaluation	4x
Encoder supply	Module-internal, max. 20 mA per encoder
PWM output	X67MM2436
Type	H bridge
Rated voltage	24 - 39 VDC \pm 25%
Output current	
Rated current	3.0 A
Max. current / output	5.0 A (2 s)
Max. current / module	8.0 A
PWM frequency	15 Hz - 50 kHz
General information	X67MM2436
Status indicators	
Output	Per channel
Input	Per group (3 inputs)
Miscellaneous	Supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED and software status
Outputs	Yes, broken connection with software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Sensor/actuator supply	Max. 0.02 A per Group
Power consumption	
X2X Link supply	0.75 W
I/O internal	1.0 W
Connection type	
X2X Link	M12 (B coded)
Inputs/outputs	M12 (A coded)
Module supply	M8 (4-pin)
Certification	CE, cRUus, GOST-R
Ex zone 2	In preparation

Operational conditions		X67MM2436
Operating temperature		0°C to +55°C
Mounting orientation		Any
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP67
Storage and transport conditions		X67MM2436
Temperature		-25°C to +85°C
Mechanical characteristics		X67MM2436
Dimensions (W x H x D)		53 x 85 x 42 mm
Weight		190 g
Torque for connections		
M8		Max. 0.4 Nm
M12		Max. 0.6 Nm

Required accessories	
See overview of pin connections	506

Stepper motor module SM2436



The stepper motor module SM2436 is used to control up to two stepper motors with a rated voltage of 24 VDC - 39 VDC $\pm 25\%$ at a motor current up to 3 A (5 A peak). Additionally, this module has six digital inputs that can be used as limit switches or as encoder inputs.

- 2 stepper motors, 24 VDC - 39 VDC $\pm 25\%$, 3 A (5 A peak)
- Current values resolution of 1%
- Boost, rated and holding current configured independent of each other
- 38.5 kHz PWM frequency
- Integrated motor detection
- 256 micro steps
- Stall detection
- Complete integration in Automation Studio and CNC
- 2x 3 inputs 24 VDC, can be configured as ABR
- Integrated encoder supply with short-circuit protection

Short description	X67SM2436
I/O module	2 full bridges for controlling stepper motors
Digital inputs	X67SM2436
Number of channels	6
Rated voltage	24 VDC
Input filter	
Hardware	<5 μ s
Software	-
Input circuit	Sink
Additional functions for inputs	2x ABR incremental encoder
ABR incremental encoder	X67SM2436
Amount	2
Encoder inputs	24 VDC, asymmetric
Counter size	16-bit
Input frequency (max.)	50 kHz
Evaluation	4x
Encoder supply	Module-internal, max. 20 mA per encoder
Motor bridge - power element	X67SM2436
Amount	2
Rated voltage	24 - 39 VDC $\pm 25\%$
Rated current	3.0 A
Maximum current / motor	5.0 A (2 s)
Maximum current / module	8.0 A
Controller frequency	38.5 kHz
Step resolution	256 micro-steps per step
General information	X67SM2436
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED and software status
Motor status	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
X2X Link supply	0.75 W
I/O internal	2.0 W
Connection type	
X2X Link	M12 (B coded)
Inputs/outputs	M12 (A coded)
Module supply	M8 (4-pin)
Certification	CE, cRUus, GOST-R
Ex zone 2	In preparation

Operational conditions		X67SM2436
Operating temperature		0°C to +55°C
Mounting orientation		Any
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP67
Storage and transport conditions		X67SM2436
Temperature		-25°C to +85°C
Mechanical characteristics		X67SM2436
Dimensions (W x H x D)		53 x 85 x 42 mm
Weight		200 g
Torque for connections		
M8		Max. 0.4 Nm
M12		Max. 0.6 Nm

Required accessories	
See overview of pin connections	506

Stepper motor module SM4320



The stepper motor module SM4320 is used to control up to four stepper motors with a rated voltage of 24 VDC \pm 25% at a motor current up to 1 A (1.5 A peak).

- 4 stepper motors, 24 VDC \pm 25%, 1 A (1.5 A peak)
- Current values resolution of 1%
- Boost, rated and holding current configured independent of each other
- 38.5 kHz PWM frequency
- 64 micro steps
- Stall detection
- Complete integration in Automation Studio and CNC

Short description	X67SM4320
I/O module	4 full bridges for controlling stepper motors
Motor bridge - power element	X67SM4320
Amount	4
Rated voltage	24 VDC \pm 25%
Rated current	1.0 A
Maximum current / motor	1.5 A
Maximum current / module	6.0 A
Controller frequency	38.5 kHz
Step resolution	256 micro-steps per step
General information	X67SM4320
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED and software status
Motor status	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
X2X Link supply	0.75 W
I/O internal	2.0 W
Connection type	
X2X Link	M12 (B coded)
Outputs	M12 (A coded)
Module supply	M8 (4-pin)
Certification	CE, cRUus, GOST-R
Ex zone 2	In preparation
Operational conditions	X67SM4320
Operating temperature	0°C to +55°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67SM4320
Temperature	-25°C to +85°C
Mechanical characteristics	X67SM4320
Dimensions (W x H x D)	53 x 85 x 42 mm
Weight	200 g
Torque for connections	
M8	Max. 0.4 Nm
M12	Max. 0.6 Nm

Required accessories

See overview of pin connections

506



Universal mixed module UM1352



The UM1352 module enables remote connection of a strain gauge with an up to 24-bit converter resolution. The data rate can be set from 0.26 ms to 100 ms. Additionally the module has four digital inputs and two digital outputs.

- 1 strain gauge input with 24-bit resolution
- High data output rate (10 Hz - 3750 Hz)
- Adjustable gain
- 1 push/pull output 24 VDC / 1 A
- 1 high-side output 24 VDC / 0.5 A

Short description	X67UM1352
I/O module	4 digital inputs, 2 digital outputs, 1 full-bridge strain gauge input
Digital inputs	X67UM1352
Rated voltage	24 VDC
Input filter	
Hardware	<1 ms
Software	-
Input circuit	Sink
Digital outputs	X67UM1352
Rated voltage	24 VDC
Rated output current	
Output 1	0.5 A
Output 2	1.0 A
Output circuit	Source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for output supply
Actuator supply	External
Full-bridge strain gauge	X67UM1352
Measurement area	± 15.625 to ± 125 mV/V, set using software
Input current	<100 nA
Digital converter resolution	24-bit
Operating range / measurement sensor	75 to 5,000 Ω
Bridge voltage	4.5 VDC / max. 60 mA
Short circuit, overload protection	Yes
Connection	4-wire connection
General information	X67UM1352
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED and software status
Outputs	Yes, with status LED
Electrical isolation	
Channel - Bus	Yes
Digital - Analog	Yes
Digital - Module supply	No
Power consumption	
X2X Link supply	0.75 W
I/O internal	0.9 W
Connection type	
X2X Link	M12 (B coded)
Inputs/outputs	M12 (A coded)
Module supply	M8 (4-pin)
Certification	CE, cRUus, GOST-R
Ex zone 2	II 3G EEx nA II T5, IP67, Ta = 0 - 60°C

Operational conditions	X67UM1352
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67UM1352
Temperature	-25°C to +85°C
Mechanical characteristics	X67UM1352
Dimensions (W x H x D)	53 x 85 x 42 mm
Weight	200 g
Torque for connections	
M8	Max. 0.4 Nm
M12	Max. 0.6 Nm

Required accessories	
See overview of pin connections	506

Counter module DC1198



- 2 incremental or SSI 5 V encoder inputs
- 2 digital channels 24 V per connection, can be configured as inputs or outputs
- 4 AB counters on the digital inputs
- Pulse width modulation of the digital outputs
- Encoder supply 5 V and 24 V integrated in the encoder connection

Short description	X67DC1198
I/O module	2 SSI abs. encoders (5 V) or 2 ABR incr. encoders (5 V), 4 AB counters or 4 up/down counters (24 V), 2x pulse width modulation, time measurement, relative time stamp
SSI absolute encoder	X67DC1198
Amount	2
Encoder inputs	5 V, symmetrical
Counter size	32-bit
Maximum transfer rate	1 MBit/s
Encoder supply	
5 VDC	Module-internal, max. 300 mA total current
24 VDC	Module-internal, max. 500 mA total current
ABR incremental encoder	X67DC1198
Amount	2
Encoder inputs	5 V, symmetrical
Counter size	16/32-bit
Input frequency (max.)	250 kHz
Evaluation	4x
Encoder supply	
5 VDC	Module-internal, max. 300 mA total current
24 VDC	Module-internal, max. 500 mA total current
AB counter, up/down counter, event counter	X67DC1198
Amount	
AB counter, up/down counter	4
Event counter	8
Encoder inputs	24 V, asymmetrical
Counter size	16/32-bit
Input frequency (max.)	100 kHz
Evaluation	
AB counter	4x
Up/down counter, event counter	2x
Encoder supply 24 VDC	Module-internal, max. 500 mA total current
Time measurement	X67DC1198
Possible measurements	Gate time, period duration, edge offset for various channels
Measurements per module	Up to 9
Measurements per channel	Up to 2
Counter size	16-bit
Internal counter frequency	8 MHz, 4 MHz, 2 MHz, 1 MHz, 500 kHz, 250 kHz, 125 kHz, 62.5 kHz
Signal form	Square wave pulse
Measurement type	Continuous or triggered
Digital inputs 5 VDC	X67DC1198
Amount	Up to 6, configuration as input or output takes place using software
Rated voltage	5 VDC differential signal, EIA RS-485 standard
Input filter	
Hardware	200 ns
Software	-
Additional functions for inputs	ABR incremental encoder, SSI absolute encoder, event counting, time measurement, relative time stamp
Digital outputs 5 VDC	X67DC1198
Amount	Up to 6, configuration as input or output takes place using software
Type	5 VDC differential signal, EIA RS-485 standard
Output circuit	Sink or source
Output protection	Short circuit protection

Digital inputs 24 VDC		X67DC1198
Amount	Up to 8, configuration as input or output takes place using software	
Rated voltage	24 VDC	
Input filter		
Hardware	≤2 μs	
Software	-	
Input circuit	Sink	
Additional functions for inputs	Reference enable inputs for ABR, event counting, latch function, time measurement, relative time stamp	
Digital outputs 24 VDC		X67DC1198
Amount	Up to 8, configuration as input or output takes place using software	
Rated voltage	24 VDC	
Rated output current	0.1 A	
Total current	0.8 A	
Output circuit	Sink or source	
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for output supply	
Pulse width modulation ¹⁾		
Period duration	41.6 μs to 500 ms	
Pulse length	0 to 100%	
Resolution	0.1%	
Additional functions for outputs	Pulse width modulation, comparator function	
1) Dead time when switching between push and pull: Max. 1.5 μs		
General information		X67DC1198
Status indicators	I/O function for each channel, supply voltage, bus function	
Diagnostics		
I/O supply	Yes, with status LED and software status	
Outputs	Yes, with status LED and software status	
Electrical isolation		
Encoder - Bus	Yes	
Channel - Bus	Yes	
Encoder - Encoder	No	
Encoder - Channel	No	
Channel - Channel	No	
Sensor/actuator supply	0.5 A total current	
Power consumption		
X2X Link supply	0.75 W	
I/O internal	2.8 W	
Connection type		
X2X Link	M12 (B coded)	
SSI/ABR encoder	M12 12-pin (A coded)	
Inputs/outputs	M12 5-pin (A coded)	
Module supply	M8 (4-pin)	
Certification	CE, cRUus, GOST-R	
Ex zone 2	II 3G EEx nA II T5, IP67, T _a = 0 - 60°C	

Counter module DC1198

Operational conditions	X67DC1198
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67DC1198
Temperature	-25°C to +85°C
Mechanical characteristics	X67DC1198
Dimensions (W x H x D)	53 x 85 x 42 mm
Weight	200 g
Torque for connections	
M8	Max. 0.4 Nm
M12	Max. 0.6 Nm

Note: This module is a multi-function module. Some bus controllers only support the default function model described below. This is indicated in the documentation for the individual bus controllers.

Default function model:

- 1x ABR incremental encoder (5 V)
- 1x SSI absolute encoder (5 V)
- 1x PWM output (24 V)
- 1x up/down counter (24 V)
- 3x AB counters (24 V)

Required accessories

See overview of pin connections

506



Resolver module DC2322



- 2 resolver inputs (differential), with angular position and cyclic counter
- 14-bit resolution for the angular position
- 2 digital inputs
- 2 digital outputs

Short description	X67DC2322
I/O module	2 resolver inputs, 2 digital inputs, 2 digital outputs
Resolver inputs	X67DC2322
Amount	2
Resolver gear ratio	
BRX	0.5 (±10%)
BRT	1.0 (±10%)
Frequency (reference output)	10 kHz
Type	Differential
Angular position resolution	14-bit
Short circuit protection (reference output)	Yes
Digital inputs	X67DC2322
Amount	2
Rated voltage	24 VDC
Input filter	
Hardware	≤20 μs
Software	-
Input circuit	Sink
Sensor supply	0.5 A total current
Digital outputs	X67DC2322
Amount	2
Rated voltage	24 VDC
Rated output current	0.5 A
Total current	1.0 A
Output circuit	Source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for output supply
General information	X67DC2322
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
Outputs	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.75 W
I/O internal	2.0 W
Certification	CE, cRUus in preparation, GOST-R
Ex zone 2	II 3G EEx nA II T5, IP67, Ta = 0 - 60°C

Operational conditions		X67DC2322
Operating temperature		0°C to +60°C
Mounting orientation		Any
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP67
Storage and transport conditions		X67DC2322
Temperature		-25°C to +85°C
Mechanical characteristics		X67DC2322
Dimensions (W x H x D)		53 x 85 x 42 mm
Weight		195 g
Torque for connections		
M8		Max. 0.4 Nm
M12		Max. 0.6 Nm

Required accessories	
See overview of pin connections	506

Interface module IF1121



- Can be used as RS232 or RS485/RS422
- 2 digital channels, can be configured as inputs or outputs
- 2 digital inputs
- Connection of barcode scanners, ID systems, and sensors on a module

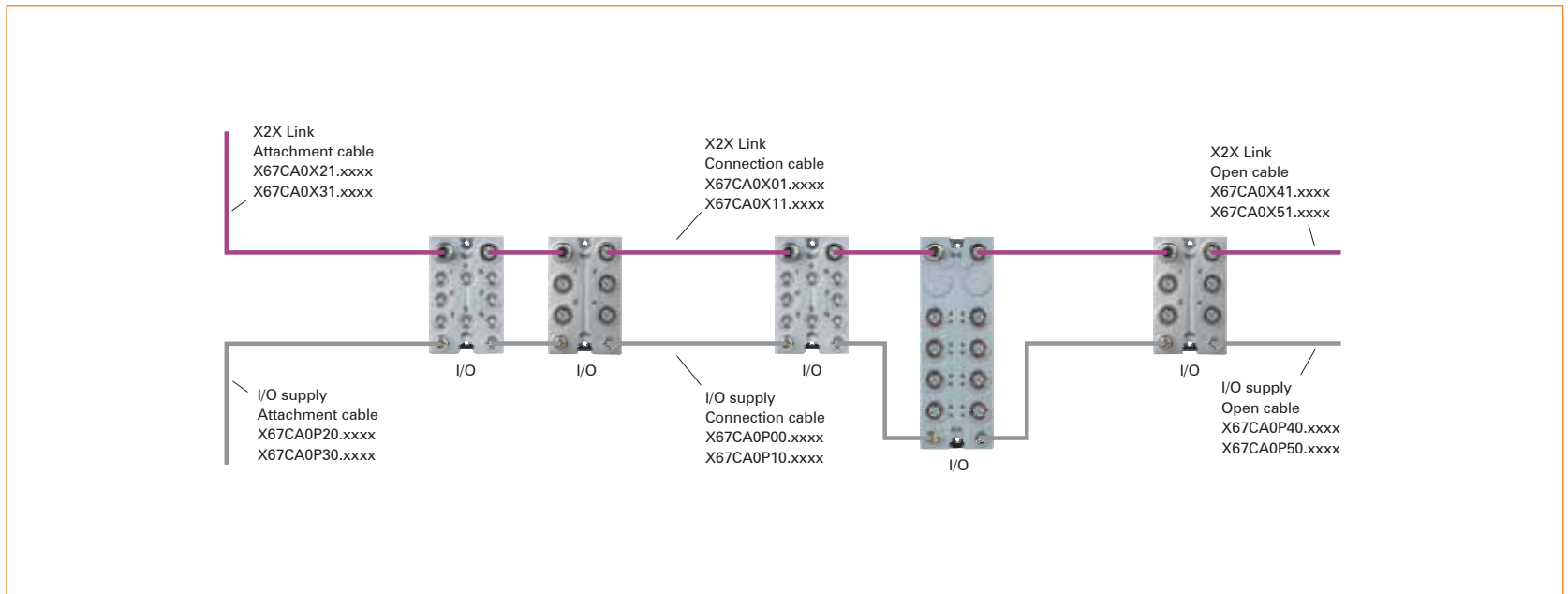
Short description	X67IF1121
Communication module	1x RS232 or 1x RS485/RS422, 2 digital inputs, 2 digital channels can be configured (using software) as inputs or outputs
Interfaces	X67IF1121
Interface IF1	
Type	RS232 or RS485/RS422
Maximum transfer rate	115.2 kBit/s
Digital inputs	X67IF1121
Amount	Up to 4, if the 2 digital channels are used as digital inputs
Rated voltage	24 VDC
Input filter	
Hardware	≤ 100 μs
Software	Default 0 ms, can be configured between 0 and 25 ms in 0.2 ms intervals
Input circuit	Sink
Digital outputs	X67IF1121
Amount	Up to 2, if the 2 digital channels are used as digital outputs
Rated voltage	24 VDC
Rated output current	0.5 A
Total current	1.0 A
Output circuit	Source
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection for output supply
General information	X67IF1121
Status indicators	RS232, RS485/RS422, I/O function for each channel, supply voltage, bus function
Diagnostics	
RS232	Yes, with status LED
RS485/RS422	Yes, with status LED
I/O supply	Yes, with status LED and software status
Outputs	Yes, with status LED and software status
Electrical isolation	
IF - Bus	Yes
Channel - Bus	Yes
IF - Channel	No
Channel - Channel	No
Sensor/actuator supply	0.5 A total current
Power consumption	
X2X Link supply	0.75 W
I/O internal	2.4 W
Connection type	
X2X Link	M12 (B coded)
Interfaces and inputs/outputs	M12 (A coded)
Module supply	M8 (4-pin)
Certification	CE, cRUus, GOST-R
Ex zone 2	II 3G EEx nA II T5, IP67, Ta = 0 - 60°C

Operational conditions	X67IF1121
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67IF1121
Temperature	-25°C to +85°C
Mechanical characteristics	X67IF1121
Dimensions (W x H x D)	53 x 85 x 42 mm
Weight	190 g
Torque for connections	
M8	Max. 0.4 Nm
M12	Max. 0.6 Nm

Required accessories	
See overview of pin connections	 506

Overview of pin connections

X2X Link and I/O supply

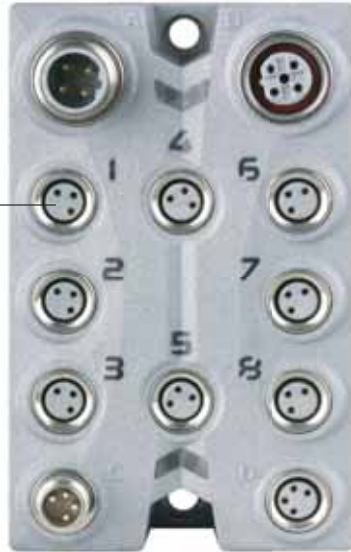


Fieldbus and I/O supply

Instructions for integrating the bus controller into the fieldbus, and the cables required, can be found in the data sheet for the respective bus controller.

Digital inputs/outputs

M8 attachment cable, 3-pin
X67CA0D40.xxxx
X67CA0D50.xxxx



Digital and analog inputs and outputs, motor, communication

M12 attachment cable, 5-pin
X67CA0A41.xxxx
X67CA0A51.xxxx



Counting

M12 attachment cable, 12-pin
X67CA0I41.xxxx
X67CA0I51.xxxx



Valve manifold

M16 attachment cable, 19-pin
X67CA0V40.xxxx
X67CA0V50.xxxx



Prefabricated cables

Ethernet POWERLINK cable RJ45 to M12



Length	Attachment cable Model number	Short description
5 m	X67CA0E41.0050	POWERLINK attachment cable RJ45 to M12, 5.0 m
15 m	X67CA0E41.0150	POWERLINK attachment cable RJ45 to M12, 15.0 m
50 m	X67CA0E41.0500	POWERLINK attachment cable RJ45 to M12, 50.0 m

Ethernet POWERLINK cable M12 – M12



Length	Connection cable Model number	Short description
2 m	X67CA0E61.0020	POWERLINK connection cable M12 to M12, 2.0 m
5 m	X67CA0E61.0050	POWERLINK connection cable M12 to M12, 5.0 m
10 m	X67CA0E61.0100	POWERLINK connection cable M12 to M12, 10.0 m
15 m	X67CA0E61.0150	POWERLINK connection cable M12 to M12, 15.0 m

For detailed information and support: www.br-automation.com

Ethernet POWERLINK cable RJ45 to RJ45



Length	Connection cable	
	Model number	Short description
0.2 m	X20CA0E61.0002	POWERLINK connection cable RJ45 to RJ45, 0.2 m
1.0 m	X20CA0E61.0010	POWERLINK connection cable RJ45 to RJ45, 1.0 m
2.0 m	X20CA0E61.0020	POWERLINK connection cable RJ45 to RJ45, 2.0 m
5.0 m	X20CA0E61.0050	POWERLINK connection cable RJ45 to RJ45, 5.0 m
10.0 m	X20CA0E61.0100	POWERLINK connection cable RJ45 to RJ45, 10.0 m
15.0 m	X20CA0E61.0150	POWERLINK connection cable RJ45 to RJ45, 15.0 m
50.0 m	X20CA0E61.0500	POWERLINK connection cable RJ45 to RJ45, 50.0 m

For detailed information and support: www.br-automation.com

Prefabricated cables

CAN bus / DeviceNet straight cables



Length	Attachment cable		Connection cable	
	Model number	Short description	Model number	Short description
2 m	-	-	X67CA0C02.0020	CAN Bus/DeviceNet connection cable, 2.0 m
5 m	X67CA0C22.0050	CAN Bus/DeviceNet attachment cable, 5.0 m	X67CA0C02.0050	CAN Bus/DeviceNet connection cable, 5.0 m
10 m	-	-	X67CA0C02.0100	CAN Bus/DeviceNet connection cable, 10.0 m
15 m	X67CA0C22.0150	CAN Bus/DeviceNet attachment cable, 15.0 m	X67CA0C02.0150	CAN Bus/DeviceNet connection cable, 15.0 m
50 m	X67CA0C22.0500	CAN Bus/DeviceNet attachment cable, 50.0 m	-	-

CAN bus / DeviceNet angled cables



Length	Attachment cable		Connection cable	
	Model number	Short description	Model number	Short description
2 m	-	-	X67CA0C12.0020	CAN bus / DeviceNet connection cable, angled, 2.0 m
5 m	X67CA0C32.0050	CAN bus / DeviceNet attachment cable, angled, 5.0 m	X67CA0C12.0050	CAN bus / DeviceNet connection cable, angled, 5.0 m
10 m	-	-	X67CA0C12.0100	CAN bus / DeviceNet connection cable, angled, 10.0 m
15 m	X67CA0C32.0150	CAN bus / DeviceNet attachment cable, angled, 15.0 m	X67CA0C12.0150	CAN bus / DeviceNet connection cable, angled, 15.0 m
50 m	X67CA0C32.0500	CAN bus / DeviceNet attachment cable, angled, 50.0 m	-	-

For detailed information and support: www.br-automation.com

CAN bus / DeviceNet straight cables (continued)



Length	Open cable	
	Model number	Short description
2 m	X67CA0C42.0020	CAN bus / DeviceNet open cable, 2.0 m
5 m	X67CA0C42.0050	CAN bus / DeviceNet open cable, 5.0 m
10 m	-	-
15 m	-	-
50 m	-	-

CAN bus / DeviceNet angled cables (continued)



Length	Open cable	
	Model number	Short description
2 m	X67CA0C52.0020	CAN bus / DeviceNet open cable, angled, 2.0 m
5 m	X67CA0C52.0050	CAN bus / DeviceNet open cable, angled, 5.0 m
10 m	-	-
15 m	-	-
50 m	-	-

For detailed information and support: www.br-automation.com

Prefabricated cables

Profibus DP straight cables



Length	Attachment cable		Connection cable	
	Model number	Short description	Model number	Short description
2 m	-	-	X67CA0B02.0020	Profibus DP connection cable, 2.0 m
5 m	X67CA0B22.0050	Profibus DP attachment cable, 5.0 m	X67CA0B02.0050	Profibus DP connection cable, 5.0 m
10 m	-	-	X67CA0B02.0100	Profibus DP connection cable, 10.0 m
15 m	X67CA0B22.0150	Profibus DP attachment cable, 15.0 m	X67CA0B02.0150	Profibus DP connection cable, 15.0 m
50 m	X67CA0B22.0500	Profibus DP attachment cable, 50.0 m	-	-

Profibus DP angled cables



Length	Attachment cable		Connection cable	
	Model number	Short description	Model number	Short description
2 m	-	-	X67CA0B12.0020	Profibus DP connection cable, angled, 2.0 m
5 m	X67CA0B32.0050	Profibus DP attachment cable, angled, 5.0 m	X67CA0B12.0050	Profibus DP connection cable, angled, 5.0 m
10 m	-	-	X67CA0B12.0100	Profibus DP connection cable, angled, 10.0 m
15 m	X67CA0B32.0150	Profibus DP attachment cable, angled, 15.0 m	X67CA0B12.0150	Profibus DP connection cable, angled, 15.0 m
50 m	X67CA0B32.0500	Profibus DP attachment cable, angled, 50.0 m	-	-

For detailed information and support: www.br-automation.com

Profibus DP straight cables (continued)



Length	Open cable	
	Model number	Short description
2 m	-	-
5 m	X67CA0B42.0050	Profibus DP open cable, 5.0m
10 m	-	-
15 m	X67CA0B42.0150	Profibus DP open cable, 15.0 m
50 m	X67CA0B42.0500	Profibus DP open cable, 50.0 m

Profibus DP angled cables (continued)



Length	Open cable	
	Model number	Short description
2 m	-	-
5 m	X67CA0B52.0050	Profibus DP open cable, angled, 5.0m
10 m	-	-
15 m	X67CA0B52.0150	Profibus DP open cable, angled, 15.0 m
50 m	X67CA0B52.0500	Profibus DP open cable, angled, 50.0 m

For detailed information and support: www.br-automation.com

Prefabricated cables

X2X Link straight cables



Length	Attachment cable		Connection cable	
	Model number	Short description	Model number	Short description
0.2 m	-	-	X67CA0X01.0002	X2X Link connection cable, 0.2 m
1 m	-	-	X67CA0X01.0010	X2X Link connection cable, 1.0 m
1.5 m	-	-	X67CA0X01.0015	X2X Link connection cable, 1.5 m
2 m	X67CA0X21.0020	X2X Link attachment cable, 2.0 m	X67CA0X01.0020	X2X Link connection cable, 2.0 m
5 m	X67CA0X21.0050	X2X Link attachment cable, 5.0 m	X67CA0X01.0050	X2X Link connection cable, 5.0 m
10 m	-	-	X67CA0X01.0100	X2X Link connection cable, 10.0 m
15 m	X67CA0X21.0150	X2X Link attachment cable, 15.0 m	X67CA0X01.0150	X2X Link connection cable, 15.0 m
25 m	-	-	X67CA0X01.0250	X2X Link connection cable, 25.0 m
50 m	X67CA0X21.0500	X2X Link attachment cable, 50.0 m	X67CA0X01.0500	X2X Link connection cable, 50.0 m

X2X Link angled cables



Length	Attachment cable		Connection cable	
	Model number	Short description	Model number	Short description
0.2 m	-	-	X67CA0X11.0002	X2X Link connection cable, angled, 0.2 m
1 m	-	-	X67CA0X11.0010	X2X Link connection cable, angled, 1.0 m
2 m	-	-	X67CA0X11.0020	X2X Link connection cable, angled, 2.0 m
5 m	X67CA0X31.0050	X2X Link attachment cable, angled, 5.0 m	X67CA0X11.0050	X2X Link connection cable, angled, 5.0 m
10 m	-	-	X67CA0X11.0100	X2X Link connection cable, angled, 10.0 m
15 m	X67CA0X31.0150	X2X Link attachment cable, angled, 15.0 m	X67CA0X11.0150	X2X Link connection cable, angled, 15.0 m
25 m	-	-	X67CA0X11.0250	X2X Link connection cable, angled, 25.0 m
50 m	X67CA0X31.0500	X2X Link attachment cable, angled, 50.0 m	X67CA0X11.0500	X2X Link connection cable, angled, 50.0 m

X2X Link straight cables (continued)



Length	Open cable	
	Model number	Short description
0.2 m	-	-
1 m	-	-
1.5 m	-	-
2 m	X67CA0X41.0020	X2X Link open cable, 2.0 m
5 m	X67CA0X41.0050	X2X Link open cable, 5.0 m
10 m	-	-
15 m	-	-
25 m	-	-
50 m	-	-

X2X Link angled cables (continued)



Length	Open cable	
	Model number	Short description
0.2 m	-	-
1 m	-	-
2 m	X67CA0X51.0020	X2X Link open cable, angled, 2.0 m
5 m	X67CA0X51.0050	X2X Link open cable, angled, 5.0 m
10 m	-	-
15 m	-	-
25 m	-	-
50 m	-	-

Prefabricated cables

I/O supply straight cables



Length	Attachment cable		Connection cable	
	Model number	Short description	Model number	Short description
0.2 m	X67CA0P20.0002	Power attachment cable, 0.2 m	X67CA0P00.0002	Power connection cable, 0.2 m
1 m	-	-	X67CA0P00.0010	Power connection cable, 1.0 m
2 m	X67CA0P20.0020	Power attachment cable, 2.0 m	X67CA0P00.0020	Power connection cable, 2.0 m
5 m	X67CA0P20.0050	Power attachment cable, 5.0 m	X67CA0P00.0050	Power connection cable, 5.0 m
10 m	-	-	X67CA0P00.0100	Power connection cable, 10.0 m
15 m	X67CA0P20.0150	Power attachment cable, 15.0 m	X67CA0P00.0150	Power connection cable, 15.0 m
50 m	X67CA0P20.0500	Power attachment cable, 50.0 m	-	-

I/O supply angled cables



Length	Attachment cable		Connection cable	
	Model number	Short description	Model number	Short description
0.2 m	X67CA0P30.0002	Power attachment cable, angled, 0.2 m	X67CA0P10.0002	Power connection cable, angled, 0.2 m
1 m	-	-	X67CA0P10.0010	Power connection cable, angled, 1.0 m
2 m	-	-	X67CA0P10.0020	Power connection cable, angled, 2.0 m
5 m	X67CA0P30.0050	Power attachment cable, angled, 5.0 m	X67CA0P10.0050	Power connection cable, angled, 5.0 m
10 m	-	-	X67CA0P10.0100	Power connection cable, angled, 10.0 m
15 m	X67CA0P30.0150	Power attachment cable, angled, 15.0 m	X67CA0P10.0150	Power connection cable, angled, 15.0 m
50 m	X67CA0P30.0500	Power attachment cable, angled, 50.0 m	-	-

For detailed information and support: www.br-automation.com

I/O supply straight cables (continued)



Length	Open cable	
	Model number	Short description
0.2 m	X67CA0P40.0002	Power open cable, 0.2m
1 m	-	-
2 m	X67CA0P40.0020	Power open cable, 2.0 m
5 m	X67CA0P40.0050	Power open cable, 5.0 m
10 m	-	-
15 m	-	-
50 m	-	-

I/O supply angled cables (continued)



Length	Open cable	
	Model number	Short description
0.2 m	X67CA0P50.0002	Power open cable, angled, 0.2 m
1 m	-	-
2 m	X67CA0P50.0020	Power open cable, angled, 2.0 m
5 m	X67CA0P50.0050	Power open cable, angled, 5.0 m
10 m	-	-
15 m	-	-
50 m	-	-

For detailed information and support: www.br-automation.com

Prefabricated cables

I/O supply
straight cables,
can be used in cable drag chains



Length	Attachment cable		Connection cable	
	Model number	Short description	Model number	Short description
5 m	-	-	X67CA3P00.0050	Power connection cable, can be used in cable drag chains, 5.0 m
10 m	-	-	X67CA3P00.0100	Power connection cable, can be used in cable drag chains, 10.0 m
20 m	X67CA3P20.0200	Power attachment cable, can be used in cable drag chains, 20.0 m	-	-

I/O supply
angled cables,
can be used in cable drag chains



Length	Attachment cable		Connection cable	
	Model number	Short description	Model number	Short description
5 m	-	-	X67CA3P10.0050	Power connection cable, can be used in cable drag chains, angled, 5.0 m
10 m	-	-	X67CA3P10.0100	Power connection cable, can be used in cable drag chains, angled, 10.0 m
20 m	X67CA3P30.0200	Power attachment cable, can be used in cable drag chains, angled, 20.0 m	-	-

For detailed information and support: www.br-automation.com

M8 sensor cables



Length	M8 straight attachment cable		M8 angled attachment cable	
	Model number	Short description	Model number	Short description
2 m	X67CA0D40.0020	M8 sensor cable, 2.0 m	X67CA0D50.0020	M8 sensor cable, angled, 2.0 m
5 m	X67CA0D40.0050	M8 sensor cable, 5.0 m	X67CA0D50.0050	M8 sensor cable, angled, 5.0 m
10 m	X67CA0D40.0100	M8 sensor cable, 10.0 m	X67CA0D50.0100	M8 sensor cable, angled, 10.0 m
15 m	X67CA0D40.0150	M8 sensor cable, 15.0 m	X67CA0D50.0150	M8 sensor cable, angled, 15.0 m
20 m	X67CA0D40.0200	M8 sensor cable, 20.0 m	X67CA0D50.0200	M8 sensor cable, angled, 20.0 m

M12 sensor cables



Length	M12 straight attachment cable		M12 angled attachment cable	
	Model number	Short description	Model number	Short description
2 m	X67CA0A41.0020	M12 sensor cable, 2.0 m	X67CA0A51.0020	M12 sensor cable, angled, 2.0 m
5 m	X67CA0A41.0050	M12 sensor cable, 5.0 m	X67CA0A51.0050	M12 sensor cable, angled, 5.0 m
10 m	X67CA0A41.0100	M12 sensor cable, 10.0 m	X67CA0A51.0100	M12 sensor cable, angled, 10.0 m
15 m	X67CA0A41.0150	M12 sensor cable, 15.0 m	X67CA0A51.0150	M12 sensor cable, angled, 15.0 m
20 m	X67CA0A41.0200	M12 sensor cable, 20.0 m	X67CA0A51.0200	M12 sensor cable, angled, 20.0 m

For detailed information and support: www.br-automation.com

Prefabricated cables

Multi-function module cables



Length	M12 attachment cable - straight, 12-pin		M12 attachment cable - angled, 12-pin	
	Model number	Short description	Model number	Short description
2 m	X67CA0I41.0020	Multi-function attachment cable, 2.0 m	X67CA0I51.0020	Multi-function attachment cable, angled, 2.0 m
5 m	X67CA0I41.0050	Multi-function attachment cable, 5.0 m	X67CA0I51.0050	Multi-function attachment cable, angled, 5.0 m

Valve manifold cables



Length	M16 attachment cable - straight, 19-pin		M16 attachment cable - angled, 19-pin	
	Model number	Short description	Model number	Short description
2 m	X67CA0V40.0020	Valve manifold attachment cable, 2.0 m	X67CA0V50.0020	Valve manifold attachment cable, angled, 2.0 m
5 m	X67CA0V40.0050	Valve manifold attachment cable, 5.0 m	X67CA0V50.0050	Valve manifold attachment cable, angled, 5.0 m

For detailed information and support: www.br-automation.com



Field-prefabricated connectors

CAN bus / DeviceNet



Model number	X67AC0C01	X67AC2C01	X67AC0C21	X67AC2C21
Short description	X67 M12 plug, 5-pin, A coded, shielded, cage clamp	X67 M12 plug, 5-pin, A coded, shielded, screw clamp	X67 M12 coupling, 5-pin, A coded, shielded, cage clamp	X67 M12 coupling, 5-pin, A coded, shielded, screw clamp
Connection	M12 plug	M12 plug	M12 socket	M12 socket
Number of poles	5-pin	5-pin	5-pin	5-pin
Coding	A coded	A coded	A coded	A coded
Shielding	Yes	Yes	Yes	Yes
Terminal	cage clamps	screw clamps	cage clamps	screw clamps

Profibus DP / X2X Link



Model number	X67AC0X01	X67AC2X01	X67AC0X21	X67AC2X21
Short description	X67 M12 plug, 5-pin, B coded, shielded, cage clamp	X67 M12 plug, 5-pin, B coded, shielded, screw clamp	X67 M12 coupling, 5-pin, B coded, shielded, cage clamp	X67 M12 coupling, 5-pin, B coded, shielded, screw clamp
Connection	M12 plug	M12 plug	M12 socket	M12 socket
Number of poles	5-pin	5-pin	5-pin	5-pin
Coding	B coded	B coded	B coded	B coded
Shielding	Yes	Yes	Yes	Yes
Terminal	cage clamps	screw clamps	cage clamps	screw clamps

Ethernet POWERLINK



Model number	X67AC2E01
Short description	X67 plug M12, 4-pin, D coded, shielded, insulation displacement clamp
Connection	M12 plug
Number of poles	4-pin
Coding	D coded
Shielding	Yes
Terminal	Insulation displacement clamps

I/O supply



Model number	X67AC0P00	X67AC0P20
Short description	X67 M8 plug, 4-pin, piercing connection	X67 M8 plug, 4-pin, piercing connection
Connection	M8 plug	M8 socket
Number of poles	4-pin	4-pin
Coding	-	-
Shielding	-	-
Terminal	Piercing connection	Piercing connection

Sensors/Actuators



Model number	X67AC0D00	X67AC0A00	X67AC2A00
Short description	X67 M8 plug, 3-pin, Piercing connection	X67 M12 plug, 5-pin, A coded, cage clamp	X67 M12 plug, 5-pin, A coded, screw clamp
Connection	M8 plug	M12 plug	M12 plug
Number of poles	3-pin	5-pin	5-pin
Coding	-	A coded	A coded
Shielding	-	-	-
Terminal	Piercing connection	cage clamps	screw clamps

Special plugs



X2X Link cable



Model number	X67AC9A02	X67CA0X99.1000
Short description	X67 M12 thermocouple plug, for measurement point temperature compensation, screw clamp	Cable for custom prefabrication, 100.0 m
Connection	M12 plug	
Number of poles	5-pin	
Coding	A coded	
Shielding	-	
Terminal	screw clamps	
Comment	Connector for an external thermocouple sensor. A PT1000 sensor for internal measurement point compensation is integrated in the plug.	

Other accessories

Terminating resistor



Model number	X67AC9C03	X67AC9B03
Short description	X67 CAN bus terminating resistor M12	X67 Profibus DP terminating resistor M12
Connection	M12	M12
Number of poles	CAN bus	Profibus DP
Coding	-	-
Shielding	-	-

Connection pieces



Model number	X67AC8C00	X67CA8C00.0002	X67AC8B00
Short description	X67 CAN bus Y-connector	X67 CAN bus Y-cable junction	X67 Profibus DP Y-connector
Connection	M12	M12	M12
Number of poles	CAN bus	CAN bus	Profibus DP
Coding	Y-connector	Y-cable junction	Y-connector
Shielding	-	2x 0.2 m	-

Threaded caps



Model number	X67AC0M08	X67AC0M12
Short description	X67 threaded caps M8, 50 pcs.	X67 threaded caps M12, 50 pcs.
Connection	M8	M12
Comment	package of 50 pcs.	package of 50 pcs.

Mounting plates for DIN rails



Model number	X67ACTS35	X67ACTS35.0010
Short description	X67 DIN rail mounting plate	X67 DIN rail mounting plate, 10 pcs.
Installation	For TS 35 DIN rails	For TS 35 DIN rails
Comment	Includes mounting screws, package of 1 pcs.	Includes mounting screws, package of 10 pcs.

Mounting tools

The plugs and couplings for prefabricated X67 cable have additional hex head dimensions on the knurled screw for a mounting tool. Two torque wrenches (M8 and M12) are included as accessories to make mounting easy. They enable an absolutely reliable connection to the X67 module.



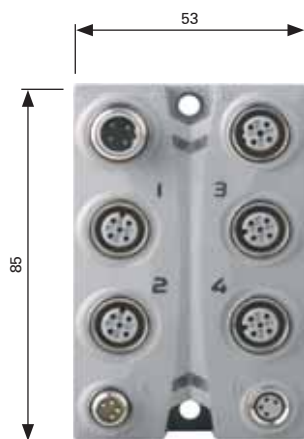
Model number	X67ACTQ08	X67ACTQ12
Short description	X67 torque wrench, 0,4 nm for X67 plugs (M8), for hex-head plugs	X67 torque wrench, 0,6 nm for X67 plugs (M12), for hex-head plugs

Mechanical and electrical configuration

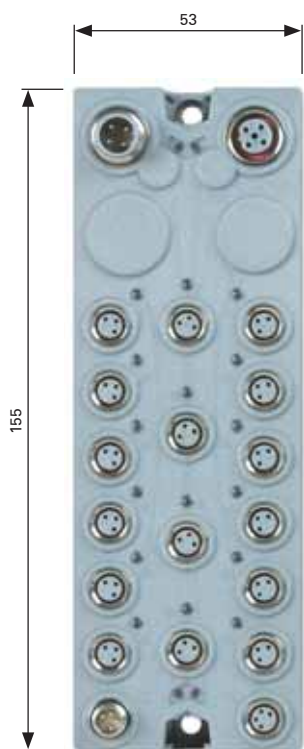
Dimensions

The dimensions are in 2D with the ECAD macros for CAD support. STEP data is provided for 3D representation.

The STEP data can be downloaded from the B&R website (www.br-automation.com) under Services.



X67 modules



X67 high density modules



Threaded caps

To guarantee IP67 protection, connectors that are not being used must be closed with X67AC0M08 or X67AC0M12 caps!

Installation

Several types of installation are possible for the X67 modules:

- On an aluminum frame
- On a mounting rail
- On a mounting plate or directly on the machine

On an aluminum frame

Mounting on an aluminum frame is done using two wedge nuts and M4 screws.



Mechanical and electrical configuration

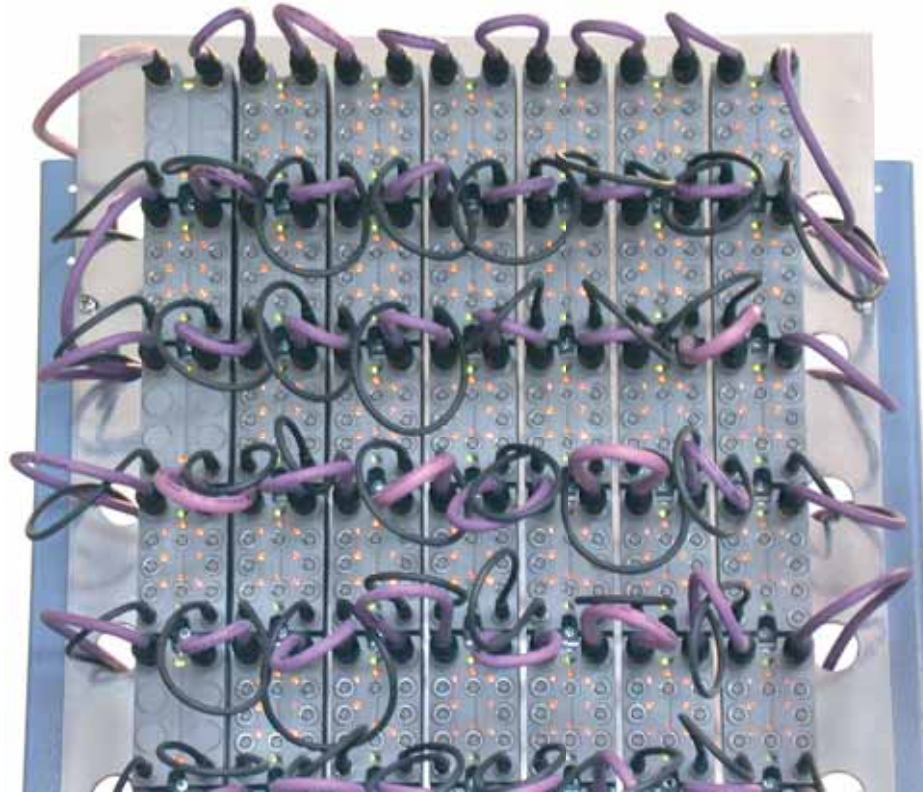
DIN rail installation

An X67 module can be installed on a DIN rail using the X67ACTS35 mounting plate for DIN rails.



On a mounting plate or directly on the machine

X67 modules can also be mounted on a mounting plate or directly on the machine.



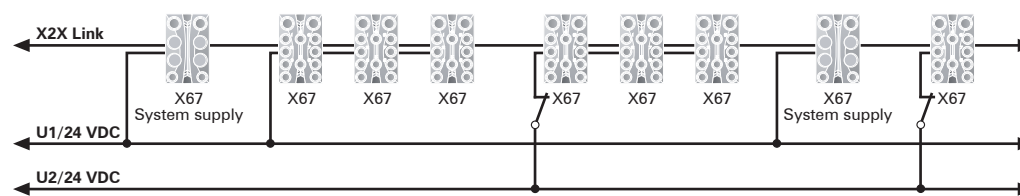
Mechanical and electrical configuration

The power supply design

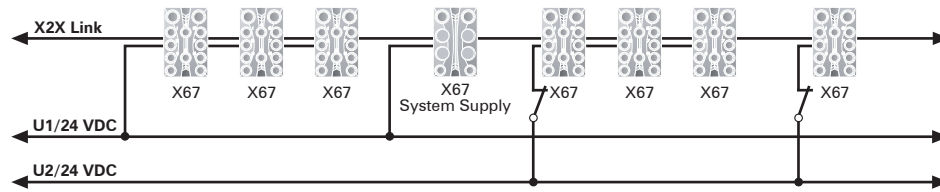
Decentralized structure allows modules to be placed in different supply voltage groups as needed. This allows various modules to be connected to different overcurrent protection circuits, as well as the implementation of different E-stop groups.

The entire X2X Link is operated completely independent of the I/O supply. In addition to the communication lines, the connection cable contains two wires used to supply the X2X Link electronics for each module. Electrically, this is totally isolated from the I/O section. For this reason, loss of voltage on the I/O side (e.g. due to short circuits, cable breaks, or E-stop) only knocks out the I/O section. The bus section continues to function with the corresponding status messages being sent to the CPU. This feature is essential in allowing errors to be analyzed quickly and corrected.

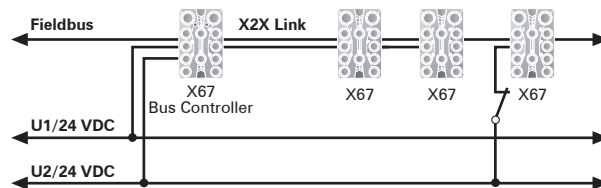
The X2X Link voltage supply is guaranteed by system supply modules.



X67 I/O modules are power consumers on the X2X Link. System supply modules feed in the power. System supply modules should be planned according to the power output table. Since they flow in both directions, they can be arranged either at the beginning or between the consumers. Redundant configurations are also possible by adding more system supply modules.



The bus controllers can supply several modules on the X2X Link without an additional system supply.



Mechanical and electrical configuration

Power output table

Two module overviews are provided for improved orientation:

- Bus controller
- System supply and I/O modules

The power provided by the bus controllers and power supply modules is shown with a "+" sign. The power required by modules is shown with a "-" sign.

To calculate the power balance, the positive and negative power values should be added together. The sum is not permitted to be less than zero.

Bus controller

Key terms regarding bus controllers are "power input" and "power output".

There are three types of power input:

- Fieldbus
- I/O internal
- X2X Link supply

Name	Model number	Power consumption [W]			Power provided for X2X Link [W] ¹⁾
		Fieldbus	I/O internal	X2X Link supply ²⁾	
BC4321	X67BC4321	-2.1	-2.0	-4.1	+3.0
BC5321	X67BC5321	-2.7	-2.0	-3.9	+3.0
BC6321	X67BC6321	-3.8	-2.0	-3.7	+3.0
BC6321.L08	X67BC6321.L08	-3.25	-2.04	-23.63	+15.0
BC6321.L12	X67BC6321.L12	-3.25	-2.04	-23.63	+15.0
BC7321-1	X67BC7321-1	-2.1	-2.0	-4.1	+3.0
BC8321-1	X67BC8321-1	-3.5	-2.5	-4.2	+3.0

1) X2X Link supply for I/O modules

2) At maximum X2X Link power output for connected I/O modules.

Note: The sensor / actuator supply is not taken into consideration in the table. It must be calculated in the power output table according to the required power.

System supply and I/O modules

The column marked "Power" contains values for the power provided or the power required by the module. This allows a power output table to be calculated quickly and easily for a particular hardware configuration.

The values in the "X2X Link Power" column refer to the power table for the X2X Link. The values in the "Internal I/O Power" column refer to the internal power requirements of the modules using the module supply.

Name	Model number	X2X Link power [W]	Internal I/O power [W]
AI1223	X67AI1223	-1.0	-3.0
AI1323	X67AI1323	-1.0	-3.0
AI2744	X67AI2744	-0.75	-1.6
AI4850	X67AI4850	-0.75	-1.6
AM1223	X67AM1223	-1.0	-3.0
AM1323	X67AM1323	-1.0	-3.0
AO1223	X67AO1223	-1.0	-4.0
AO1323	X67AO1323	-1.0	-4.5
AT1322	X67AT1322	-1.0	-1.5
AT1402	X67AT1402	-1.0	-2.6
DC1198	X67DC1198	-0.75	-2.8
DC2322	X67DC2322	-0.75	-2.0
DI1371	X67DI1371	-1.0	-1.0
DI1371.L08	X67DI1371.L08	-0.75	-0.5
DI1371.L12	X67DI1371.L12	-0.75	-0.5
DM1321	X67DM1321	-1.0	-2.5
DM1321.L08	X67DM1321.L08	-0.75	-3.0
DM1321.L12	X67DM1321.L12	-0.75	-3.0
DM9321	X67DM9321	-1.0	-2.5
DM9331.L12	X67DM9331.L12	-0.75	-1.7
DO1332	X67DO1332	-1.0	-2.0
DO9332.L12	X67DO9332.L12	-0.75	-1.7
DV1311.L08	X67DV1311.L08	-0.75	-1.3
DV1311.L12	X67DV1311.L12	-0.75	-1.3
IF1121	X67IF1121	-0.75	-2.4
MM2436	X67MM2436	-0.75	-1.0
PS1300	X67PS1300	+15.0	-3.0
SM2436	X67SM2436	-0.75	-2.0
SM4320	X67SM4320	-0.75	-2.0
UM1352	X67UM1352	-0.75	-0.9

Note: The sensor / actuator supply is not taken into consideration in the table. It must be calculated in the power output table according to the required power.

Mechanical and electrical configuration

Example 1

Calculation of the X2X Link power required and the module power required internally on the basis of the given hardware configuration. The X2X Link power output table is balanced. No PS1300 is required. The internal module power consumption and the sensor supply must come from the external power supply.



Module	X2X Link power [W]	Internal module power [W]
BC7321-1	+3.0	8.2
DM1321	-1.0	2.5
DM1321	-1.0	2.5
DI1371	-1.0	1.0
Sum	0	14.2

Example 2

Calculation of the X2X Link power required and the module power required internally on the basis of the given hardware configuration. The X2X Link power output table results in a surplus of +10.0 W. A PS1300 is therefore sufficient. The internal module power consumption and the sensor supply must come from the external power supply.



Module	X2X Link power [W]	Internal module power [W]
AM1223	-1.0	3.0
AM1223	-1.0	3.0
PS1300	+15.0	3.0 + 15.0
DM1321	-1.0	2.5
DO1332	-1.0	2.0
AT1322	-1.0	1.5
Sum	+10.0	30.0



Integrated safety technology Functional safety - Decentralized and intelligent

Safety shut-offs do not always have to involve a full machine shutdown. Smart, safe reactions to various situations provide safety without always stopping the production process. Intelligent, decentralized and integrated safety technology that is simple to operate and that reaches extremely high reaction times opens up an entirely new range of machine safety concepts.

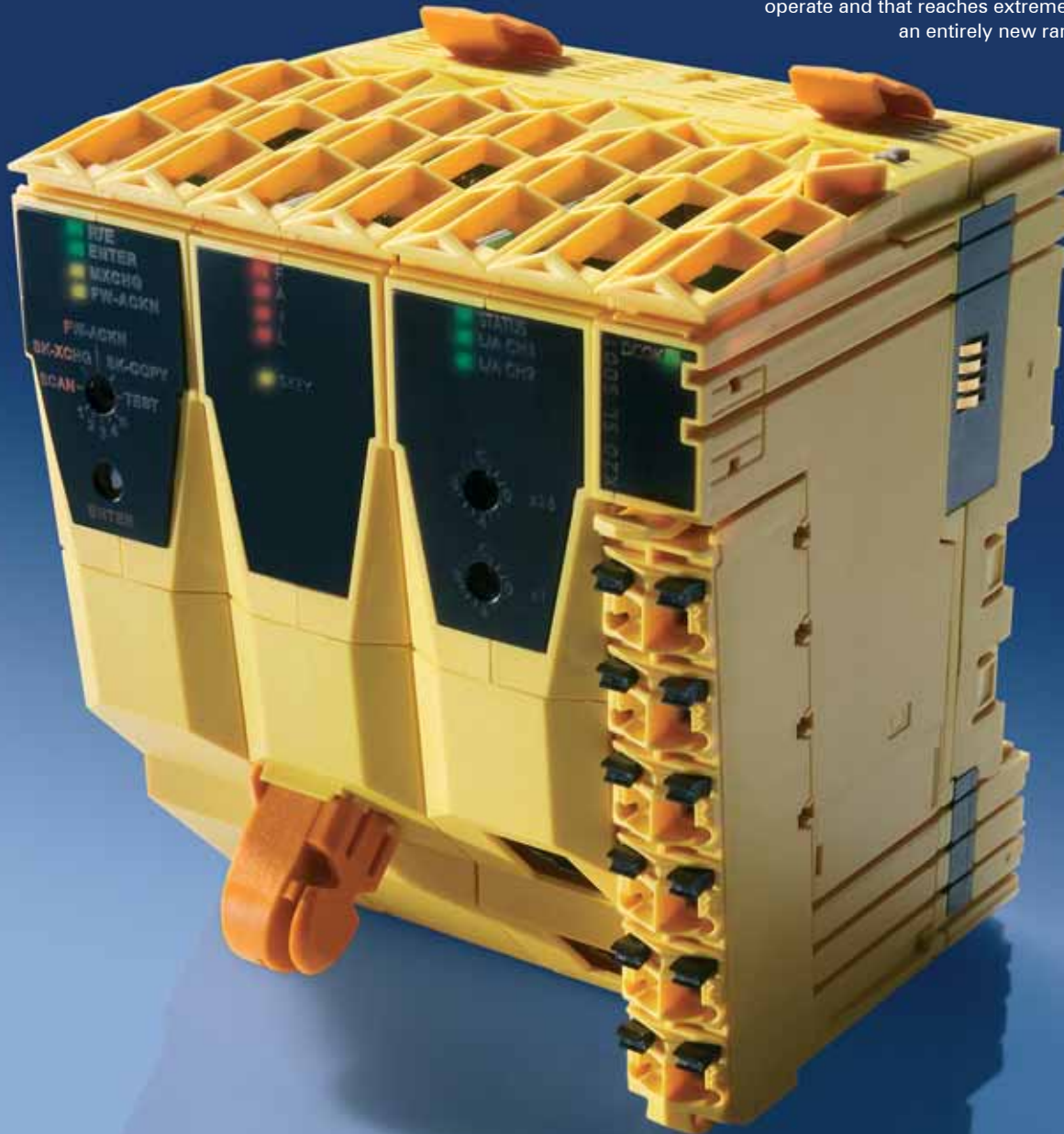


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Mechanical and electrical configuration	566

System characteristics



Integrated safety technology

Today, safety on machines is limited to E-stop buttons that are wired directly to safety relays in the switching cabinet. The only possible safety reaction is switching off the machine. The future looks different: Fixed wiring is replaced by safe data transfer via the existing machine bus system. Flexibly configured or programmed safety behavior adapts optimally to various E-stop situations. Complete diagnostics of safety components via the machine bus system provide detailed data about the status of the machine.

Current technological situation

Insufficient manipulation safety and the inadequacy of current safety solutions allow dangerous behavior when operating the machine. 25% of all accidents in the workplace result from this situation. New possibilities in safety technology provide considerable potential for improvement here. While working to improve the safety of machines, safety technology guidelines are continually updated according to the current technological situation. Consequently, improvements become mandatory.

Smart-safe reactions

Safety shut-offs do not always have to involve a full machine shutdown. When opening a protective cover, it is often sufficient to reduce the speed. Smart, safe reactions to various situations provide safety without stopping the production process. The machine does not need to be emptied and set up again, and manipulation is not necessary. This results in real advantages for the user that can be implemented with programmable safety behavior.

Fast and safe

- IEC 61508, SIL 3
- EN954, CAT 4
- IEC 62061, SIL 3
- ISO 13849, PL e

Integrated safety highlights

- Open standard
- Smart-safe reactions
- No additional wiring
- Safe reactions as fast as hard-wired reactions
- Decentralized safety technology
- Fully integrated in existing topologies
- Scalable solution for simple and complex machines

Flexibility reduces costs

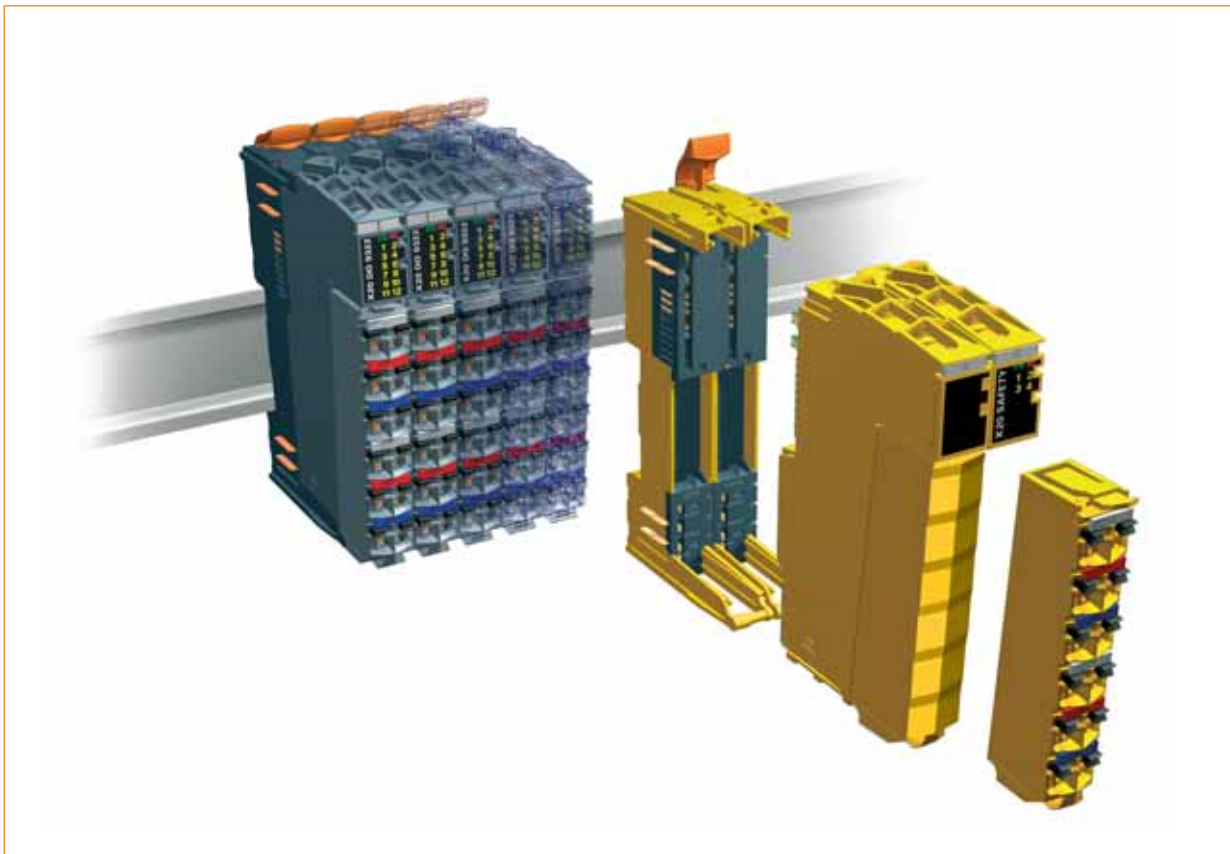
Distributed I/O increases flexibility. This applies to both standard I/O and safe I/O. Integrated Safety Technology modules simply have additional I/O nodes attached; everything else remains the same. Modular machine manufacturing is supported optimally in this way. This flexibility is also possible in the safety controller. Different models can be handled by programming the application as needed. Expensive adaptations are not needed and costs are reduced.

Open

Like all POWERLINK technologies, POWERLINK Safety is a completely open standard. Various manufacturers from different fields of automation technology have specified the concepts and requirements. The result is POWERLINK Safety, the first real-time Ethernet-based safety bus. The function blocks specified in PLCopen are the basis for safety programming.

Fast

A cycle time of 200 μ s for SIL 3 is a new dimension in safety communication. Reaction times decrease by a factor of 10, and the advantages of hard-wired solutions are combined with the possibilities of modern, integrated and intelligent safety bus technology. POWERLINK and POWERLINK Safety accomplish this all using standard Ethernet mechanisms. This allows these protocols to be combined with all conventional and, more importantly, newer Ethernet profiles. Powerlink Safety is the fastest and most flexible real-time safety bus system on the market.



System characteristics

Innovative

The reduction to one cable allows for transfer of safe data using the existing infrastructure. Additional cabling of a safe line is not necessary. Transparent and non-reactive access to safe data is an integral part of non-safe machine control. Complicated communication mechanisms between safe and non-safe areas are things of the past. Having smart-safe reactions instead of hard machine stops provides advantages for processes, avoids manipulations and increases the value of machines.

Uncomplicated

Simple exchange of devices, simple but safe update mechanisms or remote diagnostics for all errors - uncomplicated handling during service is the basic requirement for practical use. For this, all procedures must be protected from accidental errors and intentional manipulation. Protective measures include separate clock outputs for each safety input, protection against mixing up safety circuits, as well as software protection using a SafeKEY.

Programming safe applications is reduced to virtually wiring certified function blocks. Implementation, testing, and commissioning – themselves complex safety procedures – are extremely simplified through this.

Integrated and innovative

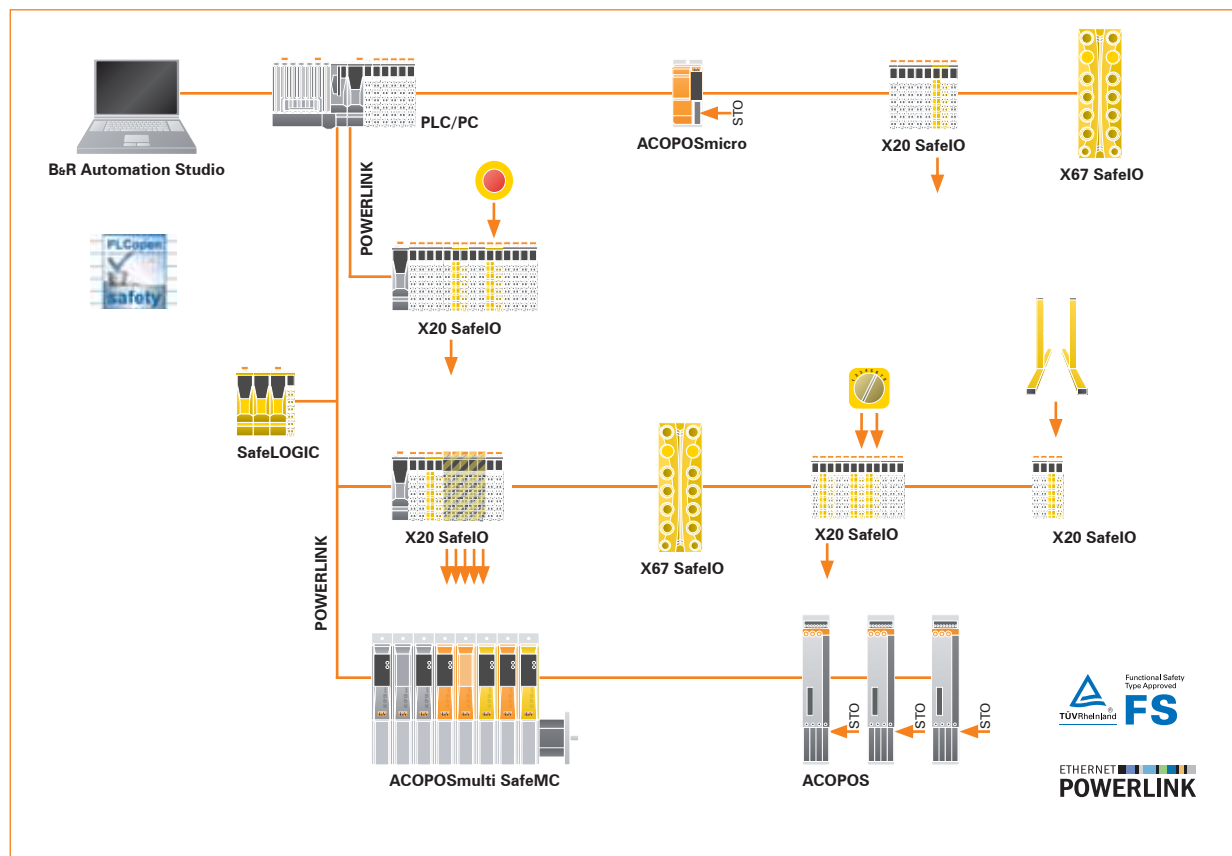
- Safe and standard data transfer via the same cable
- Programming safety and standard applications with Automation Studio
- Servo drive with integrated safety functions
- Transparent data exchange



Products

Emphasis is clearly placed on the products when it comes to integrated safety technology. Indeed, the X20 SafeIO modules, the integral SafeMC (safe motion control) capabilities of ACOPOS and ACOPOSmulti platforms, the SafeLOGIC controller and the SafeDESIGNER toolset in Automation Studio really catch the eye. Integrated Safety Technology means more than that, however: It is a synonym for the way in which the safety-related components work with one another and with standard automation technology.

All products in the "Integrated Safety Technology" program are optimally adjusted to each other and, more importantly, to existing automation products. Compatible applications can therefore be created very easily. Elegant application solutions with integral smart-safe reactions and maximum cost reductions are the result.



Product overview

Bus modules



Model number	Short description	
X20BM33	X20 bus module, safety coded, internal I/O supply is interconnected	 546



Terminal blocks



Model number	Short description	
X20TB52	X20 terminal block, 12-pin, safety coded	 547

CPUs



Model number	Short description	
X20SL8000	X20 SafeLOGIC, Safety CPU standard, exchangeable User RAM: memory key, 1 POWERLINK V2 interface, Controlled Node, integrated 2x hub, incl. supply module, terminal block X20TB52, X20 locking plate (right), order memory key separately.	 548
X20SL8001	X20 SafeLOGIC, Safety CPU plus, exchangeable User RAM: memory key, 1 POWERLINK V2 interface, Controlled Node, integrated 2x hub, incl. supply module, terminal block X20TB52, X20 locking plate (right), order memory key separately.	 550

Digital input



Model number	Short description	
X20SI2100	X20 safe digital input module, 2 failsafe inputs, 2 pulse outputs, 24 VDC, configurable input filters	552
X20SI4100	X20 safe digital input module, 4 failsafe inputs, 4 pulse outputs, 24 VDC, configurable input filters	554

Digital output



Model number	Short description	
X20SO2110	X20 safe digital output module, 2 failsafe semiconductor outputs with current monitoring, 24 VDC, 0.5 A	556
X20SO2120	X20 safe digital output module, 2 failsafe semiconductor outputs with current monitoring, 24 VDC, 2 A	558
X20SO4110	X20 safe digital output module, 4 failsafe semiconductor outputs with current monitoring, 24 VDC, 0.5 A	560
X20SO4120	X20 safe digital output module, 4 failsafe semiconductor outputs with current monitoring, 24 VDC, 2 A	562

Accessories



Model number	Short description	
X20MK0201	X20 memory key, 2 MB	564
X20MK0203	X20 memory key, 8 MB	564

Bus module BM33

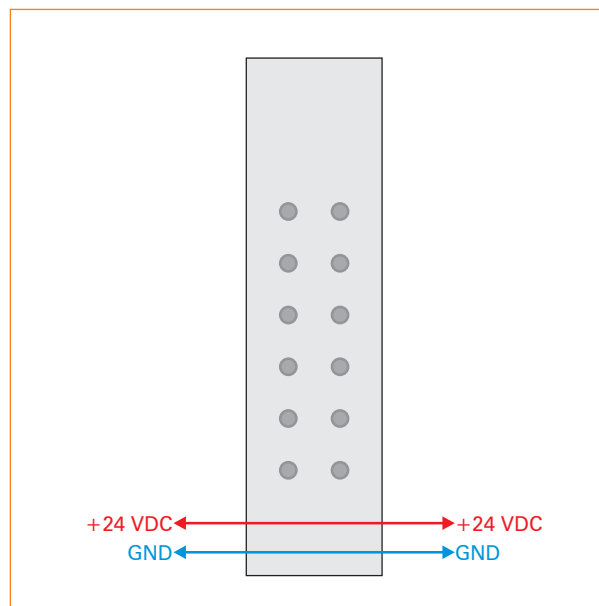


The BM33 bus module is the base for all X20 SafeIO modules.

- Standard bus module
- The internal I/O supply is interconnected

Short description	X20BM33
Bus module	Standard bus module, safety coded, the internal I/O supply is interconnected
General information	X20BM33
Power consumption	
Bus	0.13 W
I/O internal	-
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20BM33
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20BM33
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20BM33
Spacing	25 ^{+0.2} mm

Potential control



12-pin terminal block

TB52



The X20 SafeIO modules are wired using TB52 terminal blocks.

- Tool-free wiring with push-in technology
- Simple wire release using lever
- Ability to label each terminal
- Plain text labeling also possible
- Test access for standard probes
- Potential for customer coding

Short description	X20TB52
Terminal block	12-pin, safety coded
Terminal block	X20TB52
Type of terminal	Push-in terminal
Distance between contacts	
Left - right	4.2 mm
Above - below	10.96 mm
Contact resistance	≤5 mΩ
Rated voltage	230 VAC
Rated Current ¹⁾	10 A / contact
Connection cross section	
Solid wire line	0.08 mm ² - 25 mm ² / AWG 28 - 14
Fine wire line	0.25 mm ² - 25 mm ² / AWG 24 - 14
With wire tip sleeves	0.25 mm ² - 1.5 mm ² / AWG 24 - 16
	Up to 2x 0.75 mm ² for double wire tip sleeves
Cable type	Copper wires only (no aluminum wires!)

1) The limit data for each SafeIO module must be taken into consideration.

SafeLOGIC SL8000



SafeLOGIC controllers handle all central tasks within a safety-related application. Three different functional areas exist here. The configuration management system monitors the entire safety-related configuration of the application. When replacements are needed, the parameter management system makes sure that newly installed modules are assigned correct parameters that apply to the application. Lastly, SafeLOGIC handles the actual safety-related execution of the application program.

Configuration management:

- Ensures a consistent, safety-related machine configuration.
- Mechanisms are specified in POWERLINK Safety and therefore span across manufacturers
- Checks the module type as well as hardware and firmware versions against application specifications.
- Checks the configuration at startup and periodically during operation.

Parameter management

- Ensures consistent parameters in the devices.
- Mechanisms are specified in POWERLINK Safety and therefore span across manufacturers
- Checks the parameters against application specifications.
- Independently performs complete parameter downloads

Application processing

- Cycle time 1 ms and up
- Max. 20 safety nodes

Integrated but separated:

Integrated because of

- Transparent data exchange between the standard CPU and the SafeLOGIC controller
- Transparent data exchange between the SafeIO and the standard CPU
- Transparent data exchange between the standard I/O and the SafeLOGIC controller
- SafeDESIGNER integrated in Automation Studio

Separated because of

- Free choice of standard CPU platform (SoftPLC, X20, ACOPOS, Power Panel) without restrictions by SafeLOGIC
- Scalability of the standard CPU without affecting the SafeLOGIC controller
- Separate management of access rights in Automation Studio

SafeKEY

- Storage medium for the application, configuration, and device parameters.
- Removable so that data can be handled very easily on an initialized SafeLOGIC controller



Short description	SL8000	
System module	CPU	
Processor	Intel XSCALE 266 MHz	
Interfaces	POWERLINK V2	
Controller	SL8000	
Fastest task class cycle time	1 ms	
SafeKEY slot	1x	
Real-time clock	Nonvolatile memory, resolution 1 second	
Modular interface slots	None	
Fieldbus	SL8000	
Type	POWERLINK V2 100 Base-T (ANSI/IEE 802.3)	
Design	Internal 2x hub, 2x shielded RJ45 port	
Cable length	Max. 100 m between two stations (segment length)	
Transfer rate	100 MBit/s	
CPU supply	SL8000	
Reverse polarity protection	Yes	
Fuse	Yes, not exchangeable	
General information	SL8000	
Status indicators	CPU function, overtemperature, Ethernet POWERLINK, SafeKEY	
Diagnostics		
CPU function	Yes, with status LED	
Over-temperature	Yes, with status LED	
Ethernet POWERLINK	Yes, with status LED	
SafeKEY	Yes, with status LED	
Cooling	Fan-free	
Power consumption	6.12 W	
Certification	CE, C-UL-US, GOST-R, IEC 61508, IEC 62061, ISO 13849	
Functionality	SL8000	
Number of supported safety nodes	max. 20	
Communication with each other	Communication only possible with a SafeLOGIC SL8001	
Supports machine options	No	
Operational conditions	SL8000	
Operating temperature		
Horizontal installation	0°C to +55°C	
Vertical installation	0°C to +50°C	
Relative humidity	5 to 95%, non-condensing	
Mounting orientation	Horizontal or vertical	
Installation at altitudes above sea level		
0-2000 m	No derating	
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m	
Protection type	IP20	
Storage and transport conditions	SL8000	
Temperature	- 25°C to + 70°C	
Relative humidity	5 to 95%, non-condensing	
Mechanical characteristics	SL8000	
Dimensions (W x H x D)	87.5 x 99 x 75 mm	
Comment	Order application memory (SafeKEY) separately X20 locking plate included in delivery X20 terminal block, 12-pin, safety coded, included in delivery SafeKEY cover is included in delivery	
Required accessories	SL8000	
X20MK0201	X20 memory key, 2 MB (SafeKEY)	564
X20MK0203	X20 memory key, 8 MB (SafeKEY)	564

SafeLOGIC SL8001



SafeLOGIC controllers handle all central tasks within a safety-related application. Three different functional areas exist here. The configuration management system monitors the entire safety-related configuration of the application. When replacements are needed, the parameter management system makes sure that newly installed modules are assigned correct parameters that apply to the application. Lastly, SafeLOGIC handles the actual safety-related execution of the application program.

Configuration management:

- Ensures a consistent, safety-related machine configuration.
- Mechanisms are specified in POWERLINK Safety and therefore span across manufacturers
- Checks the module type as well as hardware and firmware versions against application specifications.
- Checks the configuration at startup and periodically during operation.

Parameter management

- Ensures consistent parameters in the devices.
- Mechanisms are specified in POWERLINK Safety and therefore span across manufacturers
- Checks the parameters against application specifications.
- Independently performs complete parameter downloads

Application processing

- Cycle time 1 ms and up
- Max. 100 safety nodes
- Free communication with any other SafeLOGICs possible
- Supports machine options

Integrated but separated:

Integrated because of

- Transparent data exchange between the standard CPU and the SafeLOGIC controller
- Transparent data exchange between the SafeIO and the standard CPU
- Transparent data exchange between the standard I/O and the SafeLOGIC controller
- SafeDESIGNER integrated in Automation Studio

Separated because of

- Free choice of standard CPU platform (SoftPLC, X20, ACOPOS, Power Panel) without restrictions by SafeLOGIC
- Scalability of the standard CPU without affecting the SafeLOGIC controller
- Separate management of access rights in Automation Studio

SafeKEY

- Storage medium for the application, configuration, and device parameters.
- Removable so that data can be handled very easily on an initialized SafeLOGIC controller



Short description	SL8001	
System module	CPU	
Processor	Intel XSCALE 266 MHz	
Interfaces	POWERLINK V2	
Controller	SL8001	
Fastest task class cycle time	1 ms	
SafeKEY slot	1x	
Real-time clock	Nonvolatile memory, resolution 1 second	
Modular interface slots	None	
Fieldbus	SL8001	
Type	POWERLINK V2 100 Base-T (ANSI/IEE 802.3)	
Design	Internal 2x hub, 2x shielded RJ45 port	
Cable length	Max. 100 m between two stations (segment length)	
Transfer rate	100 MBit/s	
CPU supply	SL8001	
Reverse polarity protection	Yes	
Fuse	Yes, not exchangeable	
General information	SL8001	
Status indicators	CPU function, overtemperature, Ethernet POWERLINK, SafeKEY	
Diagnostics		
CPU function	Yes, with status LED	
Over-temperature	Yes, with status LED	
Ethernet POWERLINK	Yes, with status LED	
SafeKEY	Yes, with status LED	
Cooling	Fan-free	
Power consumption	6.12 W	
Certification	CE, C-UL-US, GOST-R, IEC 61508, IEC 62061, ISO 13849	
Functionality	SL8001	
Number of supported safety nodes	max. 100	
Communication with each other	Free communication with any other SafeLOGICs	
Supports machine options	Yes	
Operational conditions	SL8001	
Operating temperature		
Horizontal installation	0°C to +55°C	
Vertical installation	0°C to +50°C	
Relative humidity	5 to 95%, non-condensing	
Mounting orientation	Horizontal or vertical	
Installation at altitudes above sea level		
0-2000 m	No derating	
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m	
Protection type	IP20	
Storage and transport conditions	SL8001	
Temperature	- 25°C to + 70°C	
Relative humidity	5 to 95%, non-condensing	
Mechanical characteristics	SL8001	
Dimensions (W x H x D)	87.5 x 99 x 75 mm	
Comment	Order application memory (SafeKEY) separately X20 locking plate included in delivery X20 terminal block, 12-pin, safety coded, included in delivery SafeKEY cover is included in delivery	
Required accessories	SL8001	
X20MK0201	X20 memory key, 2 MB (SafeKEY)	564
X20MK0203	X20 memory key, 8 MB (SafeKEY)	564

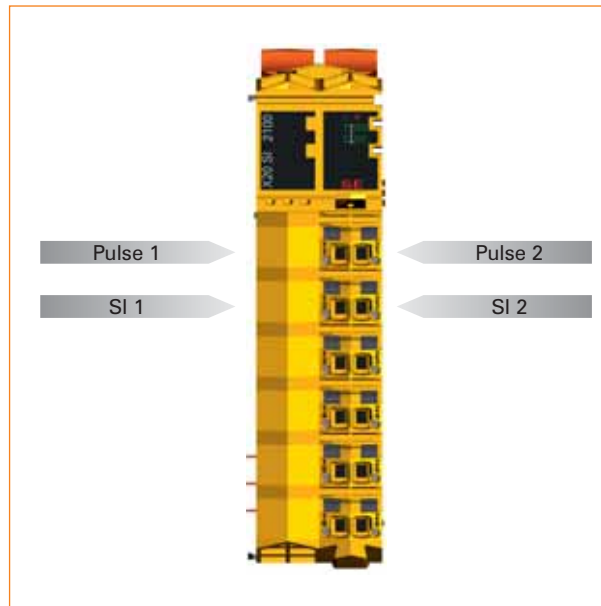
Secure digital input module SI2100



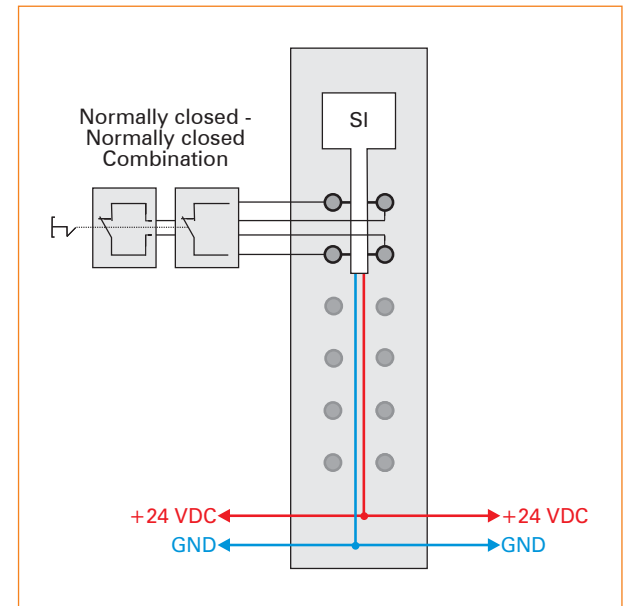
- 2 failsafe digital inputs
- 2 pulse outputs
- Software input filter can be configured for entire module

Short description	X20SI2100
I/O module	2 failsafe digital inputs, 2 pulse outputs, 24 VDC
Digital inputs	X20SI2100
Rated voltage	24 VDC
Input filter	
Hardware	≤150 μs
Software	Configurable between 0 and 100 ms
Input circuit	Sink
Digital clock outputs	X20SI2100
Design	Push-Pull
Switching voltage	24 VDC (-15% / +20%)
General information	X20SI2100
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.25 W
I/O internal	1.00 W
Certification	CE, C-UL-US, GOST-R, IEC 61508, IEC 62061, ISO 13849
Operational conditions	X20SI2100
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20SI2100
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20SI2100
Spacing	25 ^{+0.2} mm
Comment	Order safety coded terminal block 1x X20TB52 separately Order safety coded bus module 1x X20BM33 separately

Pin assignments



Connection example



Required accessories

X20TB52	X20 terminal block, 12-pin, safety coded	547
X20BM33	X20 bus module, safety coded, internal I/O supply is interconnected	546

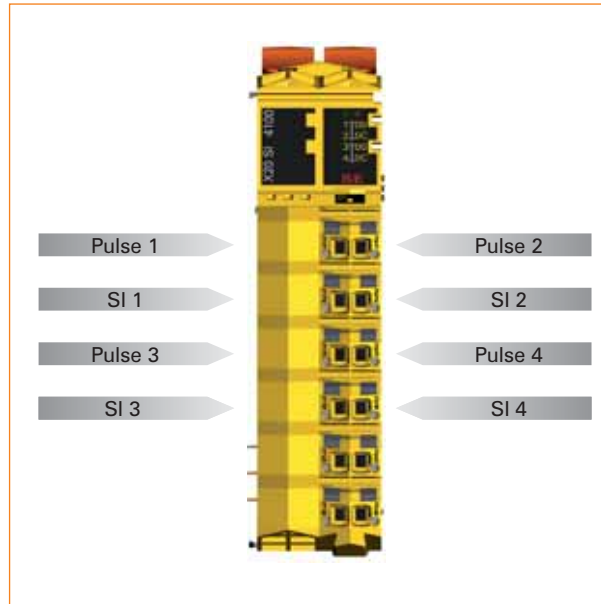
Secure digital input module SI4100



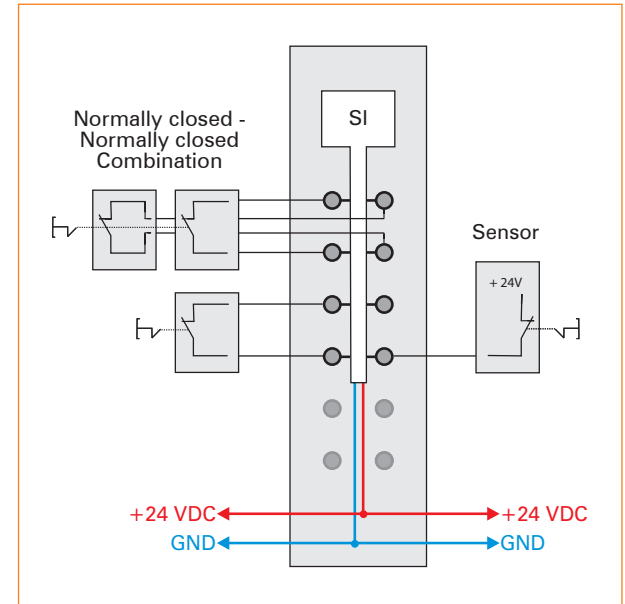
- 4 failsafe digital inputs
- 4 pulse outputs
- Software input filter can be configured for entire module

Short description	X20SI4100
I/O module	4 failsafe digital inputs, 4 pulse outputs, 24 VDC
Digital inputs	X20SI4100
Rated voltage	24 VDC
Input filter	
Hardware	≤ 150 μs
Software	Configurable between 0 and 100 ms
Input circuit	Sink
Digital clock outputs	X20SI4100
Design	Push-Pull
Switching voltage	24 VDC (-15% / +20%)
General information	X20SI4100
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.32 W
I/O internal	1.25 W
Certification	CE, C-UL-US, GOST-R, IEC 61508, IEC 62061, ISO 13849
Operational conditions	X20SI4100
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20SI4100
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20SI4100
Spacing	25 ^{+0.2} mm
Comment	Order safety coded terminal block 1x X20TB52 separately Order safety coded bus module 1x X20BM33 separately

Pin assignments



Connection example



Required accessories

X20TB52	X20 terminal block, 12-pin, safety coded	547
X20BM33	X20 bus module, safety coded, internal I/O supply is interconnected	546

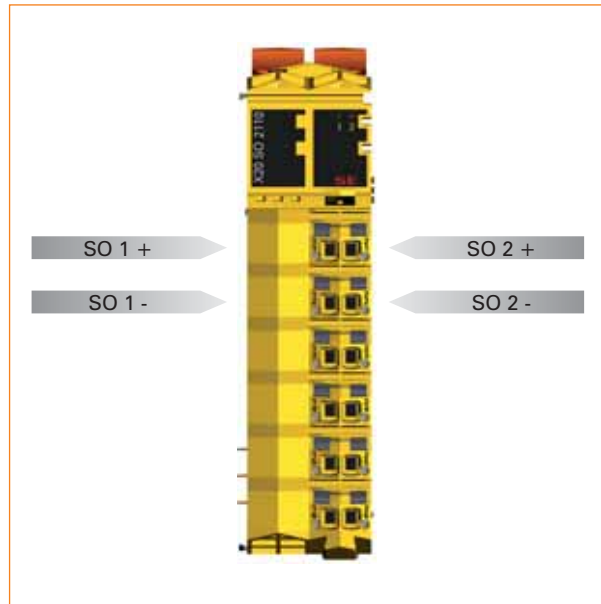
Safe digital output module SO2110



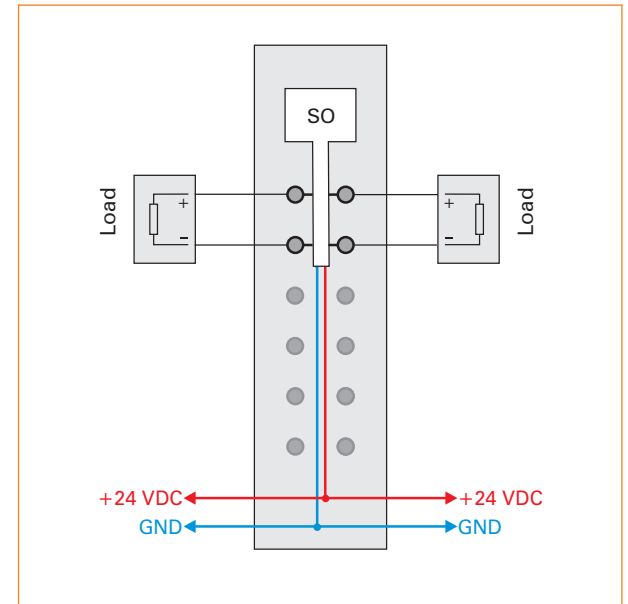
- 2 failsafe digital semiconductor outputs with current monitoring
- Open circuit recognition
- Integrated output protection

Short description	X20SO2110
I/O module	2 failsafe digital semiconductor outputs, 24 VDC, 0.5 A
Digital outputs	X20SO2110
Rated voltage	24 VDC
Rated output current	0.5 A
Total current	1.0 A
Output protection	Thermal cutoff for overcurrent or short circuit, Integrated protection for switching inductances, Reverse polarity protection
General information	X20SO2110
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Outputs	Yes, with status LED and software status (output error status)
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.25 W
I/O internal	0.5 W
Certification	CE, C-UL-US, GOST-R, IEC 61508, IEC 62061, ISO 13849
Operational conditions	X20SO2110
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20SO2110
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20SO2110
Spacing	25 ^{+0.2} mm
Comment	Order safety coded terminal block 1x X20TB52 separately Order safety coded bus module 1x X20BM33 separately

Pin assignments



Connection example



Required accessories

X20TB52	X20 terminal block, 12-pin, safety coded	547
X20BM33	X20 bus module, safety coded, internal I/O supply is interconnected	546

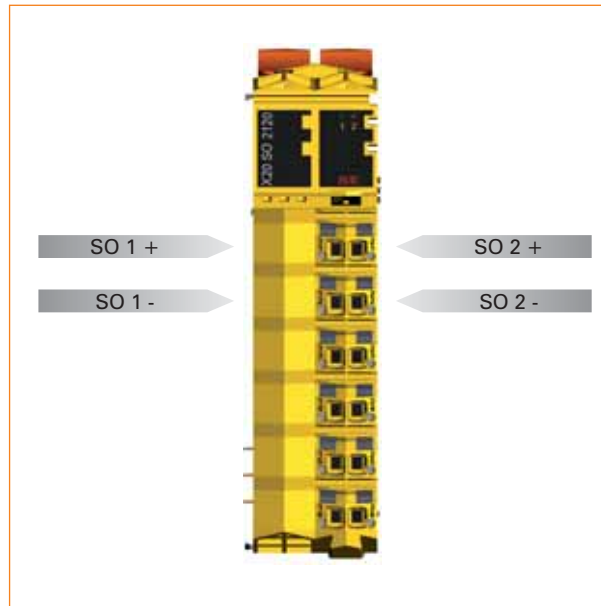
Safe digital output module SO2120



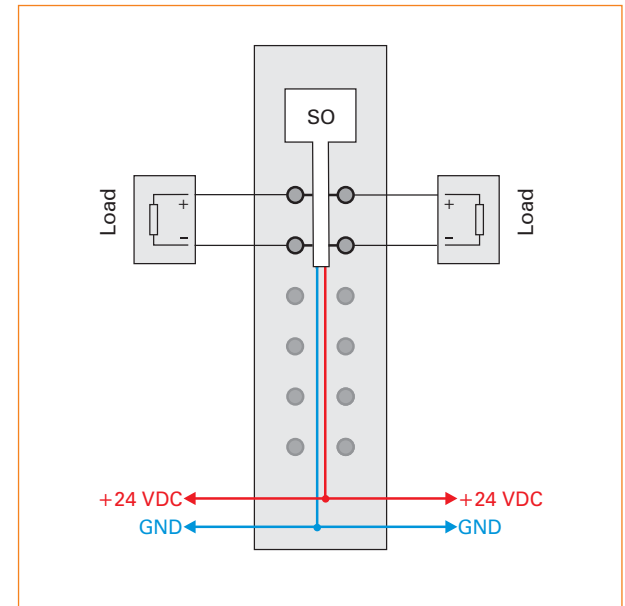
- 2 failsafe digital semiconductor outputs with current monitoring
- Open circuit recognition
- Integrated output protection

Short description	X20SO2120
I/O module	2 failsafe digital semiconductor outputs, 24 VDC, 2.0 A
Digital outputs	X20SO2120
Rated voltage	24 VDC
Rated output current	2.0 A
Total current	4.0 A
Output protection	Thermal cutoff for overcurrent or short circuit, Integrated protection for switching inductances, Reverse polarity protection
General information	X20SO2120
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Outputs	Yes, with status LED and software status (output error status)
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.25 W
I/O internal	0.5 W
Certification	CE, C-UL-US, GOST-R, IEC 61508, IEC 62061, ISO 13849
Operational conditions	X20SO2120
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20SO2120
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20SO2120
Spacing	25 ^{+0.2} mm
Comment	Order safety coded terminal block 1x X20TB52 separately Order safety coded bus module 1x X20BM33 separately

Pin assignments



Connection example



Required accessories

X20TB52	X20 terminal block, 12-pin, safety coded	547
X20BM33	X20 bus module, safety coded, internal I/O supply is interconnected	546

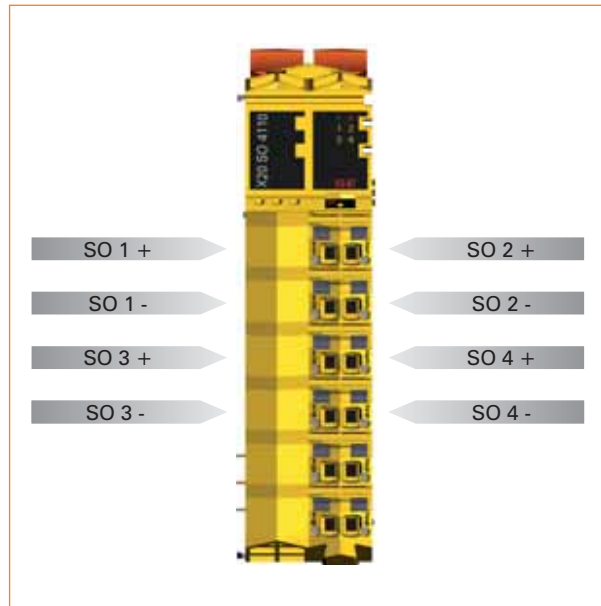
Safe digital output module SO4110



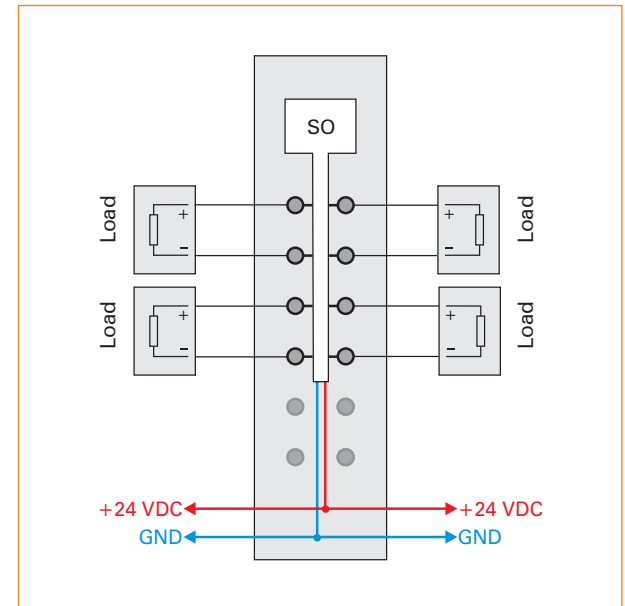
- 4 failsafe digital semiconductor outputs with current monitoring
- Open circuit recognition
- Integrated output protection

Short description	X20SO4110
I/O module	4 failsafe digital semiconductor outputs, 24 VDC, 0.5 A
Digital outputs	X20SO4110
Rated voltage	24 VDC
Rated output current	0.5 A
Total current	2.0 A
Output protection	Thermal cutoff for overcurrent or short circuit, Integrated protection for switching inductances, Reverse polarity protection
General information	X20SO4110
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Outputs	Yes, with status LED and software status (output error status)
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.25 W
I/O internal	0.5 W
Certification	CE, C-UL-US, GOST-R, IEC 61508, IEC 62061, ISO 13849
Operational conditions	X20SO4110
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20SO4110
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20SO4110
Spacing	25 ^{+0.2} mm
Comment	Order safety coded terminal block 1x X20TB52 separately Order safety coded bus module 1x X20BM33 separately

Pin assignments



Connection example



Required accessories

X20TB52	X20 terminal block, 12-pin, safety coded	547
X20BM33	X20 bus module, safety coded, internal I/O supply is interconnected	546

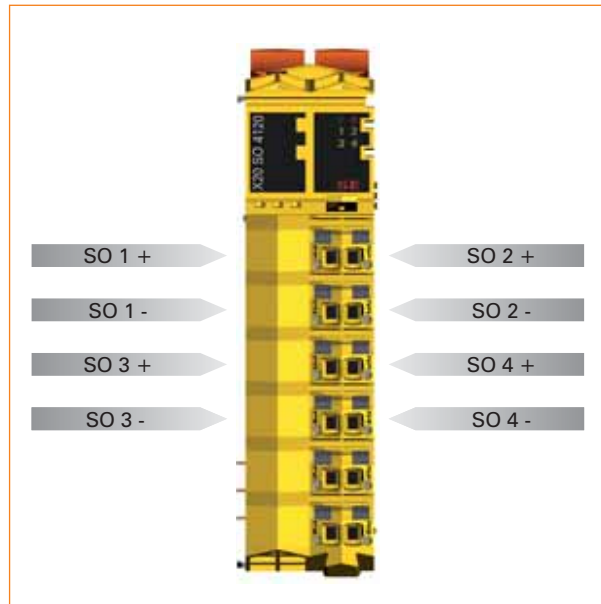
Safe digital output module SO4120



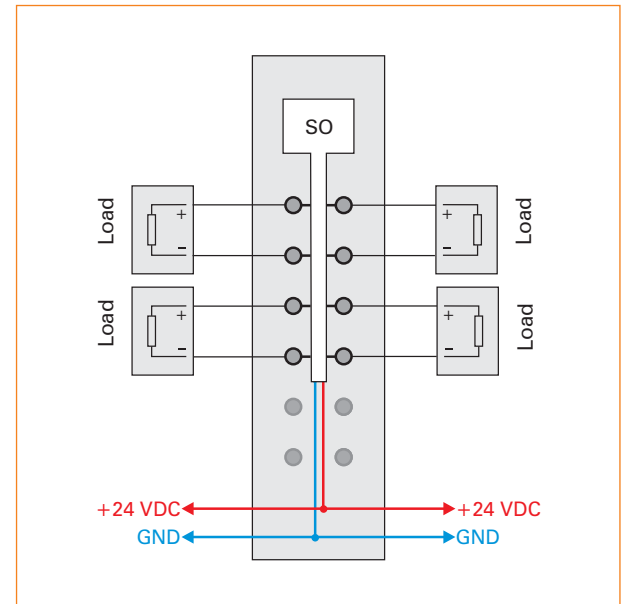
- 4 failsafe digital semiconductor outputs with current monitoring
- Open circuit recognition
- Integrated output protection

Short description	X20SO4120
I/O module	4 failsafe digital semiconductor outputs, 24 VDC, 2.0 A
Digital outputs	X20SO4120
Rated voltage	24 VDC
Rated output current	2.0 A
Total current	5.0 A
Output protection	Thermal cutoff for overcurrent or short circuit, Integrated protection for switching inductances, Reverse polarity protection
General information	X20SO4120
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Outputs	Yes, with status LED and software status (output error status)
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.25 W
I/O internal	0.5 W
Certification	CE, C-UL-US, GOST-R, IEC 61508, IEC 62061, ISO 13849
Operational conditions	X20SO4120
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20SO4120
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20SO4120
Spacing	25 ^{+0.2} mm
Comment	Order safety coded terminal block 1x X20TB52 separately Order safety coded bus module 1x X20BM33 separately

Pin assignments



Connection example



Required accessories

X20TB52	X20 terminal block, 12-pin, safety coded	547
X20BM33	X20 bus module, safety coded, internal I/O supply is interconnected	546

Accessories

Storage medium



Model number	Short description
X20MK0201	X20 memory key, 2 MB
X20MK0203	X20 memory key, 8 MB

Since all of the Integrated Safety Technology products are seamlessly integrated in the X20 System, all X20 accessories are of course also available for the X20 safety modules.

X20 System - Accessories, see page 388.



Mechanical and electrical configuration

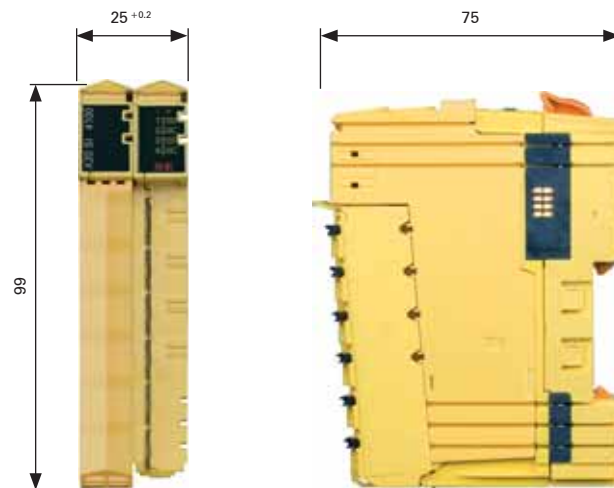
Dimensions

The dimensions are in 2D with the ECAD macros for CAD support . STEP data is provided for 3D representation.

The STEP data can be downloaded from the B&R website (www.br-automation.com) under Services.



SafeLOGIC standard / plus



SafeIO modules

All specified mounting guidelines for electrical configuration of the X20 System also apply to the Integrated Safety Technology products.

Mechanical and electrical configuration of the X20 System, see page 392.

Valve connections Economical usage of peripheral space

The direct connection of pneumatic valves from different manufacturers offers the possibility of custom components for all types of applications.



Table of contents

System characteristics	572
Typical topologies	573
Product overview	575
Product data sheets	576

System characteristics



Direct fieldbus connection on the valve

XV valve connections allow the integration of pneumatic valves from most well-known manufacturers directly in the automation system. Up to 24 digital outputs – for up to 24 valves – are located in a compact housing.

For all pneumatic valves

These valves use the 25-pin multi-pin socket used by all leading manufacturers. Valve manifolds from Bürkert, Festo, Rexroth, Norgren, SMC, and many other manufacturers can be added to an already networked environment without any problems and with minimal effort needed for configuration.

High integration

The compact solution results in considerable savings possibilities for the user. The reduced amount of wiring needed for a large number of valves cuts back on the amount of effort needed for project setup and maintenance. The different number of channels on the valve manifold connections permits cost-effective, tailored adaptation of all valve variations.

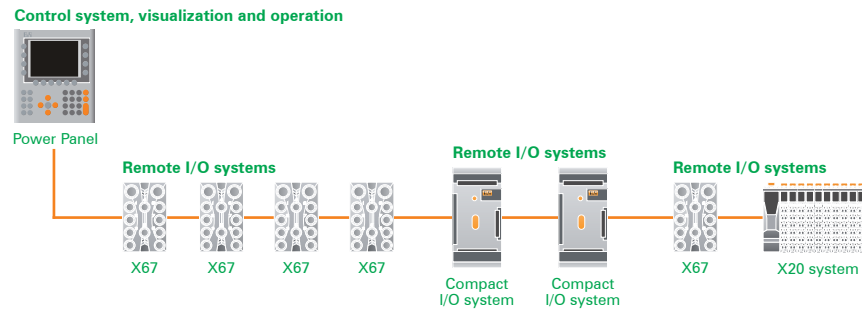
Valve connection selection table	7XV108.50-11	7XV108.50-12	7XV116.50-11	7XV116.50-12	7XV124.50-11	7XV124.50-12	
Number of valves	8	8	16	16	24	24	
GND pin	22,23,24,25	13,22,23,24,25	22,23,24,25	13,22,23,24,25	25	13	
Protection type	IP20	IP20	IP20	IP20	IP20	IP20	
Bus connection	11-pin	11-pin	11-pin	11-pin	11-pin	11-pin	
Power supply	Bus connection	Bus connection	Bus connection	Bus connection	Bus connection	Bus connection	
Page	576	576	577	577	578	578	

Valve connection selection table	7XV108.50-51	7XV108.50-62	7XV116.50-51	7XV116.50-62	7XV124.50-51	7XV124.50-61	7XV124.50-62
Number of valves	8	8	16	16	24	24	24
GND pin	22,23,24,25	13,22,23,24,25	22,23,24,25	13,22,23,24,25	25	25	13
Protection type	IP67	IP67	IP67	IP67	IP67	IP67	IP67
Bus connection	M12	M12	M12	M12	M12	M12	M12
Power supply	M8	M8	M8	M8	M8	M8	M8
Page	576	576	577	577	578	578	578

Typical topologies

Compact automation with distributed I/O

The compact I/O system can be connected directly to a B&R control system via CAN I/O or X2X Link. In this way, compact I/O modules can be combined with I/O modules from other B&R system families as desired. This allows a customized automation solution to be created for each application.



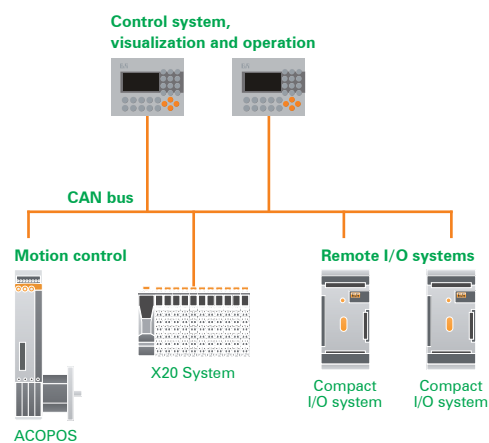
Components and technologies

Control system	Power Panel: Integrated control, operation, and visualization	786
Visualization and operation	Power Panel: Integrated control, operation, and visualization	786
Remote I/O systems	X67 System: Remote I/O with IP67 protection	36
	Compact I/O system: Economical usage of peripheral space	418
	Compact controllers: Remote I/O	581

Typical topologies

Flexible compact control systems

Cost-effective, flexible compact control systems can be created using control components, drive systems and operating interfaces networked via the CAN bus. B&R system components together with the compact I/O system are easy to expand and upgrade to the middle performance class, providing fast solutions for many tasks.



Control system	Power Panel: Integrated control, operation, and visualization	786
Visualization and operation	Power Panel: Integrated control, operation, and visualization	786
Motion control	ACOPOS: Intelligent servo drives	1250
	ACOPOSMulti: Modular drive system	1320
Distributed I/O systems	Compact I/O system: Economical usage of peripheral space	36
	Compact controllers: Remote I/O	581

Product overview

Valve connections



Model number	Short description	
7XV108.50-11	Remote valve manifold connection 8x for 25-pin DSUB multi-pin connection, X2X Link, electrically isolated	576
7XV108.50-12	Remote valve manifold connection 8x for 25-pin DSUB multi-pin connection, X2X Link, electrically isolated	576
7XV108.50-51	Remote valve manifold connection 8x for 25-pin DSUB multi-pin connection, X2X Link, electrically isolated, IP67 protection	576
7XV108.50-62	Remote valve manifold connection 8x for 25-pin DSUB multi-pin connection, X2X Link, electrically isolated, IP67 protection	576
7XV116.50-11	Remote valve manifold connection 16x for 25-pin DSUB multi-pin connection, X2X Link, electrically isolated	577
7XV116.50-12	Remote valve manifold connection 16x for 25-pin DSUB multi-pin connection, X2X Link, electrically isolated	577
7XV116.50-21	Remote valve manifold connection 16x for 25-pin DSUB multi-pin connection, X2X Link, electrically isolated	577
7XV116.50-51	Remote valve manifold connection 16x for 25-pin DSUB multi-pin connection, X2X Link, electrically isolated, IP67 protection	577
7XV116.50-62	Remote valve manifold connection 16x for 25-pin DSUB multi-pin connection, X2X Link, electrically isolated, IP67 protection	578
7XV124.50-11	Remote valve manifold connection 24x for 25-pin DSUB multi-pin connection, X2X Link, electrically isolated	578
7XV124.50-12	Remote valve manifold connection 24x for 25-pin DSUB multi-pin connection, X2X Link, electrically isolated	578
7XV124.50-51	Remote valve manifold connection 24x for 25-pin DSUB multi-pin connection, X2X Link, electrically isolated, IP67 protection	578
7XV124.50-61	Remote valve manifold connection 24x for 25-pin DSUB multi-pin connection, X2X Link, electrically isolated, IP67 protection	578
7XV124.50-62	Remote valve manifold connection 24x for 25-pin DSUB multi-pin connection, X2X Link, electrically isolated, IP67 protection	578

Valve connection XV108



7XV108.50-11/12



7XV108.50-51



7XV108.50-62

Short description	7XV108.50-11	7XV108.50-12	7XV108.50-51	7XV108.50-62
Remote valve manifold connection for 25-pin DSUB multi-pin connection, X2X Link, electrically isolated, 8xDO 0.1 A, 24 VDC, GND pins 22,23,24,25, separate 24 VDC supply.	8 valves	8 valves	8 valves	8 valves
Outputs	7XV108.50-11	7XV108.50-12	7XV108.50-51	7XV108.50-62
Rated voltage	24 VDC	24 VDC	24 VDC	24 VDC
Max. output current	0.1 A	0.1 A	0.1 A	0.1 A
Output circuit	Source	Source	Source	Source
Max. switching frequency	100 Hz	100 Hz	100 Hz	100 Hz
Max. switching frequency	200 μ s	200 μ s	200 μ s	200 μ s
Max. switching frequency	250 μ s	250 μ s	250 μ s	250 μ s
Output protection	Protected against short circuit, overload and overtemperature	Protected against short circuit, overload and overtemperature	Protected against short circuit, overload and overtemperature	Protected against short circuit, overload and overtemperature
General information	7XV108.50-11	7XV108.50-12	7XV108.50-51	7XV108.50-62
Status indicators	Operating status and supply	Operating status and supply	Operating status and supply	Operating status and supply
Electrical isolation				
X2X Link - Digital outputs	Yes	Yes	Yes	Yes
X2X Link - 24 VDC X2X, OUT supply	Yes	Yes	Yes	Yes
Digital outputs - 24 VDC X2X, OUT supply	No	No	No	No
Power consumption	Max. 1.5 W	Max. 1.5 W	Max. 1.5 W	Max. 1.5 W
Certification	CE, C-UL-US	CE, C-UL-US	CE, C-UL-US	CE, C-UL-US
Ex zone 2			II 3G EEx nA II T5, IP67, Ta = 0 - 50°C	II 3G EEx nA II T5, IP67, Ta = 0 - 50°C
Wiring	7XV108.50-11	7XV108.50-12	7XV108.50-51	7XV108.50-62
GND pin	22,23,24,25	13,22,23,24,25	22,23,24,25	13,22,23,24,25
Bus connection	11-pin	11-pin	M12	M12
Power supply	Bus connection	Bus connection	M8	M8
Mechanical characteristics	7XV108.50-11	7XV108.50-12	7XV108.50-51	7XV108.50-62
Protection type	IP20	IP20	IP67	IP67
Operating temperature	0°C to 55°C	0°C to 55°C	0°C to 55°C (in non-Ex environments)	0°C to 55°C (in non-Ex environments)
Relative humidity	5 to 95%, non-condensing	5 to 95%, non-condensing	5 to 95%, non-condensing	5 to 95%, non-condensing
Module dimensions including mounting plates	63 x 59 x 20 mm (H x W x D)	63 x 59 x 20 mm (H x W x D)	62 x 70 x 30 mm (H x W x D)	67 x 66 x 30 mm (H x W x D)

Required accessories

0TB1111.8110	Accessory terminal block (3.5), 11-pin, cage clamps, 1.5 mm ² , protected against vibration by the screw flange	686
0TB1111.8010	Accessory terminal block (3.5), 11-pin, cage clamps, 1.5 mm ² , protected against vibration by the screw flange	686

Valve connection XV116



Short description	7XV116.50-11	7XV116.50-12	7XV116.50-21	7XV116.50-51	7XV116.50-62
Remote valve manifold connection for 25-pin DSUB multi-pin connection, X2X Link, electrically isolated, 16xDO 0.1 A, 24 VDC, separate 24 VDC supply.	16 valves	16 valves	16 valves	16 valves	16 valves
Outputs	7XV116.50-11	7XV116.50-12	7XV116.50-21	7XV116.50-51	7XV116.50-62
Rated voltage	24 VDC	24 VDC	24 VDC	24 VDC	24 VDC
Max. output current	0.1 A	0.1 A	0.1 A	0.1 A	0.1 A
Output circuit	Source	Source	Source	Source	Source
Max. switching frequency	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz
Max. switching frequency	200 μ s	200 μ s	200 μ s	200 μ s	200 μ s
Max. switching frequency	250 μ s	250 μ s	250 μ s	250 μ s	250 μ s
Output protection	Protected against short circuit, overload and overtemperature	Protected against short circuit, overload and overtemperature	Protected against short circuit, overload and overtemperature	Protected against short circuit, overload and overtemperature	Protected against short circuit, overload and overtemperature
General information	7XV116.50-11	7XV116.50-12	7XV116.50-21	7XV116.50-51	7XV116.50-62
Status indicators	Operating status and supply	Operating status and supply	Operating status and supply	Operating status and supply	Operating status and supply
Electrical isolation					
X2X Link - Digital outputs	Yes	Yes	Yes	Yes	Yes
X2X Link - 24 VDC X2X, OUT supply	Yes	Yes	Yes	Yes	Yes
Digital outputs - 24 VDC X2X, OUT supply	No	No	No	No	No
Power consumption	Max. 1.5 W	Max. 1.5 W	Max. 1.5 W	Max. 1.5 W	Max. 1.5 W
Certification	CE, C-UL-US	CE, C-UL-US	CE, C-UL-US	CE, C-UL-US	CE, C-UL-US
Ex zone 2				II 3G EEx nA II T5, IP67, Ta = 0 - 50°C	II 3G EEx nA II T5, IP67, Ta = 0 - 50°C
Wiring	7XV116.50-11	7XV116.50-12	7XV116.50-21	7XV116.50-51	7XV116.50-62
GND pin	22,23,24,25	13,22,23,24,25	22,23,24,25	22,23,24,25	13,22,23,24,25
Bus connection	11-pin	11-pin	11-pin	M12	M12
Power supply	Bus connection	Bus connection	Bus connection	M8	M8
Mechanical characteristics	7XV116.50-11	7XV116.50-12	7XV116.50-21	7XV116.50-51	7XV116.50-62
Protection type	IP20	IP20	IP20	IP67	IP67
Operating temperature	0°C to 55°C	0°C to 55°C	0°C to 55°C	0°C to 55°C (in non-Ex environments)	0°C to 55°C (in non-Ex environments)
Relative humidity	5 to 95% non-condensing	5 to 95% non-condensing	5 to 95% non-condensing	5 to 95% non-condensing	5 to 95% non-condensing
Module dimensions including mounting plates	63 x 59 x 20 mm (H x W x D)	63 x 59 x 20 mm (H x W x D)	63 x 59 x 20 mm (H x W x D)	62 x 70 x 30 mm (H x W x D)	67 x 66 x 30 mm (H x W x D)

Required accessories

0TB1111.8110	Accessory terminal block (3.5), 11-pin, cage clamps, 1.5 mm ² , protected against vibration by the screw flange	686
0TB1111.8010	Accessory terminal block (3.5), 11-pin, cage clamps, 1.5 mm ² , protected against vibration by the screw flange	686

Valve connection XV124



7XV124.50-11/12



7XV108.50-51



7XV124.50-61/62

Short description	7XV124.50-11	7XV124.50-12	7XV124.50-51	7XV124.50-61	7XV124.50-62
Remote valve manifold connection for 25-pin DSUB multi-pin connection, X2X Link, electrically isolated, 24xDO 0.1 A, 24 VDC, separate 24 VDC supply	24 valves	24 valves	24 valves	24 valves	24 valves
Outputs	7XV124.50-11	7XV124.50-12	7XV124.50-51	7XV124.50-61	7XV124.50-62
Rated voltage	24 VDC	24 VDC	24 VDC	24 VDC	24 VDC
Max. output current	0.1 A	0.1 A	0.1 A	0.1 A	0.1 A
Output circuit	Source	Source	Source	Source	Source
Max. switching frequency	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz
Max. switching frequency	200 μ s	200 μ s	200 μ s	200 μ s	200 μ s
Max. switching frequency	250 μ s	250 μ s	250 μ s	250 μ s	250 μ s
Output protection	Protected against short circuit, overload and overtemperature	Protected against short circuit, overload and overtemperature	Protected against short circuit, overload and overtemperature	Protected against short circuit, overload and overtemperature	Protected against short circuit, overload and overtemperature
General information	7XV124.50-11	7XV124.50-12	7XV124.50-51	7XV124.50-61	7XV124.50-62
Status indicators	Operating status and supply	Operating status and supply	Operating status and supply	Operating status and supply	Operating status and supply
Electrical isolation					
X2X Link - Digital outputs	Yes	Yes	Yes	Yes	Yes
X2X Link - 24 VDC X2X, OUT supply	Yes	Yes	Yes	Yes	Yes
Digital outputs - 24 VDC X2X, OUT supply	No	No	No	No	No
Power consumption	Max. 1.5 W	Max. 1.5 W	Max. 1.5 W	Max. 1.5 W	Max. 1.5 W
Certification	CE, C-UL-US	CE, C-UL-US	CE, C-UL-US	CE, C-UL-US	CE, C-UL-US
Ex zone 2			II 3G EEx nA II T5, IP67, Ta = 0 - 50°C	II 3G EEx nA II T5, IP67, a = 0 - 50°C	II 3G EEx nA II T5, IP67, a = 0 - 50°C
Wiring	7XV124.50-11	7XV124.50-12	7XV124.50-51	7XV124.50-61	7XV124.50-62
GND pin	25	13	25	25	13
Bus connection	11-pin	11-pin	M12	M12	M12
Power supply	Bus connection	Bus connection	M8	M8	M8
Mechanical characteristics	7XV124.50-11	7XV124.50-12	7XV124.50-51	7XV124.50-61	7XV124.50-62
Protection type	IP20	IP20	IP67	IP67	IP67
Operating temperature	0°C to 55°C	0°C to 55°C	0°C to 55°C (in non-Ex environments)	0°C to 55°C (in non-Ex environments)	0°C to 55°C (in non-Ex environments)
Relative humidity	5 to 95%, non-condensing	5 to 95%, non-condensing	5 to 95%, non-condensing	5 to 95%, non-condensing	5 to 95%, non-condensing
Module dimensions including mounting plates	63 x 59 x 20 mm (H x W x D)	63 x 59 x 20 mm (H x W x D)	62 x 70 x 30 mm (H x W x D)	67 x 66 x 30 mm (H x W x D)	67 x 66 x 30 mm (H x W x D)

Required accessories

0TB1111.8110	Accessory terminal block (3.5), 11-pin, cage clamps, 1.5 mm ² , protected against vibration by the screw flange	686
0TB1111.8010	Accessory terminal block (3.5), 11-pin, cage clamps, 1.5 mm ² , protected against vibration by the screw flange	686



Compact I/O system Economical usage of peripheral space

Space-saving design and flexible networking for I/O connections in the switching cabinet. Signals ranging from simple digital inputs to complex SSI encoders can be handled for any application using custom components.



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System characteristics



Remote connection of peripherals

Space-saving Compact I/O system modules reduce wiring of sensors and actuators. Discrete I/O signals are bundled on the modules and transferred to the controller over a fieldbus connection. The system is ideally suited for use in standard IP20 operating environments.

Flexibility for sensors and actuators

Compact I/O system modules already include signal adaptation for various purposes. In addition to classic digital signals, there are modules that can handle rotational encoder evaluation, gate measurement, event counters or pulse width signals. Analog modules are also supplemented with temperature inputs, strain gauge evaluation or resistance measurement. The Compact I/O system always provides the right I/O combination for each application.

Communication

Compact I/O system modules are equipped with CAN I/O or X2X Link interfaces. All I/O signals are bundled and sent to the higher-level controller using this channel. This expands the I/O backplane in the field. The Compact I/O system can be combined with all B&R controller families and other components as desired. This allows a customized and cost-effective automation architecture to be created for each application.

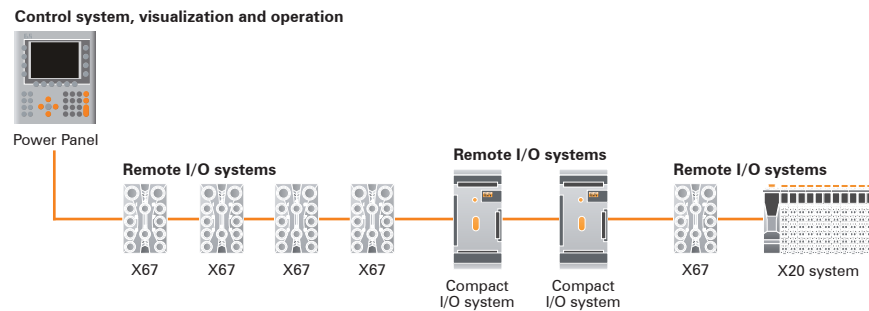
	7CX408.50-1	7CX436.50-1	7XX408.50-1	7XX410.50-1	7XX412.50-1	7XX415.50-K02	7XX426.50-1	7XX436.50-1
Communication interface	CAN	CAN	X2X	X2X	X2X	X2X	X2X	X2X
Digital inputs, 24 VDC	(16)	(8)	(16)	3	-	(16)	(8)	(8)
Digital outputs, 24 VDC	(16)	(8)	(16)	-	16	8	8	8
Analog inputs	-	(4)	-	-	(2)	-	1	(4)
Analog outputs	-	4	-	3	-	-	3	4
Displacement gauge / Potentiometer	-	-	-	-	-	-	4	-
Full-bridge strain gauge	-	-	-	-	-	2	-	-
SSI absolute encoder 5V and incremental encoder 5 V	-	-	-	3	-	-	-	-
Temperature measurement	-	(2)	-	-	(8)	-	-	(2)
Event counter	(2)	(2)	(2)	-	-	(3)	(2)	(2)
Incremental encoder	(1)	(1)	(1)	-	-	(1)	(1)	(1)
Gate measurement	(1)	(1)	(1)	-	-	(1)	(1)	(1)
Period and frequency measurement	(1)	(1)	(1)	-	-	(1)	(1)	(1)
PWM output	(2)	(2)	(2)	-	-	-	-	-
Comparator function	-	-	-	-	-	-	√	√
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Numbers in parentheses represent multiple assignment. Check the specifications in the data sheet for the configuration.

Typical topologies

Compact automation with distributed I/O

The Compact I/O system can be directly connected to a B&R control system via CAN I/O or X2X Link. In this way, Compact I/O modules can be combined with I/O modules from other B&R system families as desired. This allows a customized automation solution to be created for each application.



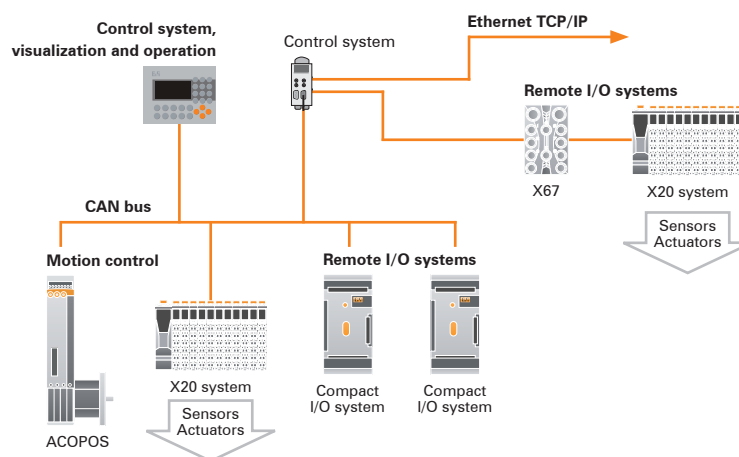
Components and technologies

Control system	Power Panel: Integrated control, operation, and visualization	786
Visualization and operation	Power Panel: Integrated control, operation, and visualization	786
Remote I/O systems	X20 System: Slice-based I/O and control system	36
	X67 System: Remote I/O with IP67 protection	418
	Compact I/O system: Economical usage of peripheral space	581

Typical topologies

Flexible compact control systems

Cost-effective, flexible compact control systems can be created using control components, drive systems and operating interfaces networked via the CAN bus. B&R system components together with the Compact I/O system are easy to expand and upgrade to the middle performance class providing fast solutions for many tasks.



Control system	Power Panel: Integrated control, operation, and visualization	786
Visualization and operation	Power Panel: Integrated control, operation, and visualization	786
Motion control	ACOPOS: Intelligent servo drives	1250
	ACOPOSmulti: modular drive system	1320
Distributed I/O systems	X20 System: Slice-based I/O and control system	36
	X67 System: Remote I/O with IP67 protection	418
	Compact I/O system: Economical usage of peripheral space	581

Product overview

Remote I/O with CAN interface



Model number	Short description	
7CX408.50-1	Remote I/O with CAN interface, 24 VDC; 1 CAN interface, electrically isolated, network-capable; 16xDI, 24 VDC, sink; 2 event counters or 1 incremental encoder or 1 gate/period measurement; 12xDO 0.4 A, 4xDO 2 A, 24 VDC, 2 DO with PWM functionality.	588
7CX436.50-1	Remote I/O with CAN interface, 24 VDC, 1 CAN interface, electrically isolated, network-capable, 8xDI, 24 VDC, sink, 2 event counters or 1 incremental encoder or 1 gate/period measurement, 4xDO 0,4 A, 4xDO 2 A, 24 VDC, 2 DO with PWM functionality, 4 AI, +/-10 V, 12-bit + sign, two of the analog inputs can be used as KTY10 or PT1000 input, 4 AO, +/-10 V, 12-bit.	590

Remote I/O with X2X Link



Model number	Short description	
7XX410.50-1	Remote I/O with X2X Link, 24 VDC; 3x absolute encoder or incremental encoder inputs; 3x AO +/-10 VDC, 12-bit; 3 x DI, 24 VDC, sink.	592
7XX412.50-1	Remote I/O with X2X Link, 24 VDC; 8 thermocouple inputs (two of which can be separately configured using software as an analog input +/-10V 12-bit or for resistance measurement 0 to 4 kOhm); 12xDO 2 A 50%, 4xDO 2 A 100%, 24 VDC.	594
7XX415.50-K02	Remote I/O with X2X Link, 24 VDC; 2 full-bridge strain gauge inputs; 4xDO 0.5 A, 4xDO 2 A; 24 VDC; 16xDI, 24 VDC, sink or source, 3 event counters or 1 incremental encoder or 1 gate/period measurement and 1 event counter.	596
7XX426.50-1	Remote I/O with X2X Link, 24 VDC; 8xDI, 24 VDC, sink or source, 2 event counters, or 1 incremental encoder, or 1 gate/period measurement; 4xDO 2 A, 50%, 4xDO 2 A, 24 VDC; 4 pots AI, 4.5 V, 14 bit; 1 AI 0-10 V 12-bit; 3 AO, +/-10 V, 12-bit.	598
7XX436.50-1	Remote I/O with X2X Link, 24 VDC; 8xDI, 24 VDC, sink/source; 2 event counters, or 1 incremental encoder, or 1 gate/period measurement, 4xDO 0.5 A, 4xDO 2 A, 24 VDC; 4 AI, +/-10 V, 12-bit, two of the analog inputs can be used as KTY10 or PT1000 input, 4 AO, +/-10 V, 12-bit.	600
7XX408.50-1	Remote I/O with X2X Link, 24 VDC; 16xDI, 24 VDC, sink/source; 2 event counters, or 1 incremental encoder, or 1 gate/period measurement; 12xDO 0.5 A, 4xDO 2 A, 24 VDC; 2 outputs (2A) with PWM functionality.	602

Embedded controllers



Model number	Short description	
7EC020.60-2	Embedded controller, x86 100 MHz Intel-compatible, 32 MB DRAM, 32 kB SRAM, CompactFlash, CAN, X2X Link, Ethernet, RS232	604
7EC020.61-2	Embedded controller, x86 100 MHz Intel-compatible, 32 MB DRAM, 32 kB SRAM, CompactFlash, CAN, X2X Link, Ethernet, RS232, ARNC0	604
7EC021.60-1	Embedded controller, x86 100 MHz Intel-compatible, 16MB DRAM, 32 kB SRAM, CompactFlash, CAN, Profibus DP, X2X Link, Ethernet, RS232	606
7EC021.61-2	Embedded controller, x86 100 MHz Intel-compatible, 32MB DRAM, 32 kB SRAM, CompactFlash, CAN, Profibus DP, X2X Link, Ethernet, RS232, ARNC0	606
0AC021.9	Mountain rail fastening set for EC020 and EC021	608

Remote I/O with CAN bus interface CX408



- 16 digital inputs with special functions (event counter, incremental encoder operation, gate, frequency and period measurement)
- 16 digital outputs (2 outputs with pulse width modulation)

CAN

Short description	7CX408.50-1
Digital channels	16 inputs, 16 outputs
Interfaces	1 x CAN I/O slave
Electrical isolation	
Input - Output	No
CAN - Input/Output	Yes
Supply voltage	24 VDC
Power consumption	1.6 W
Digital inputs	7CX408.50-1
Rated voltage	24 VDC
Input filter	
Hardware	≤2 ms
Software	-
Input circuit	Sink
Additional functions	Event counting, incremental encoder operation, gate, frequency and period measurement
Digital outputs	7CX408.50-1
Rated voltage	24 VDC
Rated output current	
Outputs 1 - 12	0.4 A
Outputs 13 - 16	2.0 A
Total current	10.0 A
Output circuit	Source
Output protection	Thermal cutoff for overcurrent or short circuit, integrated protection for switching inductances
Additional functions	Pulse width modulation
Sensor supply	External
Interfaces	7CX408.50-1
Application interface	
Fieldbus	CAN I/O slave
Design	12-pin multipoint connector
Maximum baud rate	500 kBit/s
General information	7CX408.50-1
Certification	CE, C-UL-US, GOST-R
Status indicators	I/O function for each channel, status
Diagnostics	
I/O function	Yes, with LEDs
CAN interface	Yes, with status LED
Mechanical characteristics	7CX408.50-1
Dimensions (W x H x D [mm])	170 x 80 x 30
Weight	365 g
Protection type	IP20
Installation	On EN50022-compliant mounting rails or screw mounting
Operating / Storage temperature	0 to 55°C / 25 to +70°C
Relative humidity	5 - 95%, non-condensing
Comment	Order 1 x TB712 terminal block separately Order 2 x TB718 terminal block separately



Remote I/O with CAN bus interface CX436



- 8 digital inputs with special functions (event counting, incremental encoder operation, gate, frequency and period measurement)
- 8 digital outputs (2 outputs with pulse width modulation)
- 4 analog inputs (2 inputs can be used for temperature measurement with KTY10 or PT1000)
- 4 analog outputs

CAN

Short description	7CX436.50-1
Digital channels	8 inputs, 8 outputs
Analog channels	4 inputs (2 of these can be configured for temperature and resistance measurement), 4 outputs
Interfaces	1 x CAN I/O slave
Electrical isolation	
Digital - Analog	Yes
Digital - Digital	No
Analog - Analog	No
CAN - Digital/Analog	Yes
Supply voltage	24 VDC
Power consumption	5 W
Digital inputs	7CX436.50-1
Rated voltage	24 VDC
Input filter	
Hardware	≤2 ms
Software	-
Input circuit	Sink
Additional functions	Event counting, incremental encoder operation, gate, frequency and period measurement
Digital outputs	7CX436.50-1
Rated voltage	24 VDC
Rated output current	
Outputs 1 - 4	0.4 A
Outputs 5 - 8	2.0 A
Total current	9.6 A
Output circuit	Source
Output protection	Thermal cutoff for overcurrent or short circuit, integrated protection for switching inductances
Additional functions	Pulse width modulation
Sensor supply	External
Analog inputs	7CX436.50-1
Input	±10 V
Digital converter resolution	12-bit + sign
Conversion time	≤5 ms for all channels
Output format	INT
Input impedance in signal range	20 MΩ
Basic accuracy	±0.071% at 25°C, based on the current measurement value
Input protection	Protection against wiring with supply voltage
Temperature measurement	7CX436.50-1
Measuring procedure	Resistance measurement with constant current feed for 2-lines
Digital converter resolution	12-bit
Conversion time	≤5 ms for all channels
Output format	INT
Basic accuracy	±0.35% at 25°C, based on the current measurement value
Sensor	Can be configured for each channel using software
KTY10-6	-50 to +125°C
PT1000	-200 to +850°C
Resistance measurement range	0 to 4000 Ω
Input protection	Protection against wiring with supply voltage

Resistance measurement	7CX436.50-1
Measuring procedure	Resistance measurement with constant current feed for 2-lines
Input	0 - 4000 Ω
Digital converter resolution	12-bit
Conversion time	≤ 5 ms for all channels
Output format	INT
Basic accuracy	$\pm 0.35\%$ at 25°C, based on the current measurement value
Input protection	Protection against wiring with supply voltage
Analog outputs	7CX436.50-1
Output	± 10 V
Digital converter resolution	12-bit
Conversion time	≤ 5 ms for all channels
Power on/off behavior	Internal enable relay for boot procedure and error
Basic accuracy	$\pm 0.088\%$ at 25°C, based on the current output value
Output protection	Protection against wiring with supply voltage, short circuit protection
Interfaces	7CX436.50-1
Application interface	
Fieldbus	CAN I/O slave
Design	12-pin multipoint connector
Maximum baud rate	500 kBit/s
General information	7CX436.50-1
Certification	CE, C-UL-US, GOST-R
Status indicators	I/O function for each channel, status
Diagnostics	
I/O function	Yes, with LEDs
CAN interface	Yes, with status LED
Mechanical characteristics	7CX436.50-1
Dimensions (W x H x D [mm])	170 x 80 x 30
Weight	410 g
Protection type	IP20
Installation	On EN50022-compliant mounting rails or screw mounting
Operating / Storage temperature	0 to 55°C / 25 to +70°C
Relative humidity	5 - 95%, non-condensing
Comment	Order 1 x TB712 terminal block separately Order 2 x TB718 terminal block separately

Remote I/O with X2X Link XX410



- 3 inputs for absolute and incremental encoders
- 3 analog outputs
- 3 digital inputs

Short description	7XX410.50-1
Digital channels	3 inputs
Analog channels	3 outputs
Encoder inputs	3 inputs for SSI or incremental encoder (can be configured using software)
Interfaces	1 x X2X Link slave
Electrical isolation	
Encoder - Encoder/Analog	No
Encoder - 24 VDC/Digital	Yes
X2X - Encoder	Yes
X2X - Analog/Digital	Yes
Supply voltage	24 VDC
Power consumption	
Without encoder supply	3.0 W
With 5V encoder supply (600 mA)	7.5 W
Digital inputs	7XX410.50-1
Rated voltage	24 VDC
Input filter	
Hardware	≤100 μs
Software	≤16 μs
Input circuit	Sink
Additional functions	-
Encoder inputs	7XX410.50-1
5V SSI encoder inputs	
Counter size	Max. 31 bit
Maximum baud rate	400 kBit/s
5V incremental encoder inputs	
Counter size	32-bit
Input frequency	Max. 400 kHz
Evaluation	4-fold
Encoder inputs	Symmetric
Design	18-pin multipoint connector
External encoder supply	+24 VDC
Per channel	Max. 300 mA
Internal encoder supply	+5 VDC
Per channel	Max. 300 mA
For all channels	Max. 600 mA

Analog outputs	7XX410.50-1
Output	± 10 V
Digital converter resolution	12-bit
Data format	INT
Conversion time	≤ 300 μs for all channels
Power on/off behavior	Internal enable relay for boot procedure and error
Output protection	Protection against wiring with supply voltage, short circuit protection
Interfaces	7XX410.50-1
Application interface	
Type	X2X Link slave
Design	12-pin multipoint connector
General information	7XX410.50-1
Certification	CE, C-UL-US, GOST-R
Status indicators	I/O function, status
Diagnostics	
I/O function	Yes, with LEDs
Power supply	Yes, with software status
Status, X2X	Yes, with status LED
Mechanical characteristics	7XX410.50-1
Dimensions (W x H x D [mm])	170 x 80 x 30
Weight	400 g
Protection type	IP20
Installation	On EN50022-compliant mounting rails or screw mounting
Operating / Storage temperature	0 to 55°C / 25 to +70°C
Relative humidity	5 - 95%, non-condensing
Comment	Order 1 x TB712 terminal block separately Order 2 x TB718 terminal block separately

Remote I/O with X2X Link XX412



- 8 thermocouple inputs (2 of these can be used as analog inputs or for resistance measurement)
- 16 digital outputs

Short description	7XX412.50-1
Digital channels	16 outputs
Analog channels	8 thermocouple inputs (using software, 2 of these can be configured as analog inputs or for resistance measurement)
Interfaces	1 x X2X Link slave
Electrical isolation	
24 VDC - Digital	No
Analog - Digital	Yes
X2X - Digital/Analog	Yes
Supply voltage	24 VDC
Power consumption	4.0 W
Digital outputs	7XX412.50-1
Rated voltage	24 VDC
Rated output current	
Outputs 1 - 12	2.0 A, 50%
Outputs 13 - 16	2.0 A, 100%
Total current	20.0 A
Outputs 1 - 12	12.0 A
Outputs 13 - 16	8.0 A
Output circuit	Source
Output protection	Thermal cutoff for overcurrent or short circuit, integrated protection for switching inductances, reverse polarity protection for output supply
Additional functions	-
Sensor supply	External
Thermocouple inputs	7XX412.50-1
Digital converter resolution	16-bit
Output format	INT
Measurement area	
Type J	-180 to +1190°C
Type K	-200 to +1380°C
Type S	-27 to +1815°C
Terminal temperature compensation	Yes
Input protection	Protection against wiring with supply voltage
Analog inputs	7XX412.50-1
Number of channels	Using software, up to 2 of the thermocouple inputs can be configured as differential inputs
Input	
Voltage	±10 V
Resistance	0 - 4000 Ω
Digital converter resolution	
Voltage input	12-bit
Resistance input	11-bit
Conversion time	≤300 μs for all channels
Output format	INT
Input impedance in signal range	20 MΩ
Input protection	Protection against wiring with supply voltage

Temperature measurement		7XX412.50-1
Number of channels	Using software, up to 2 of the thermocouple inputs can be configured for temperature measurement	
Input type	Resistance measurement with constant current feed for 2-lines	
Conversion time	≤300 μs for all channels	
Output format	INT	
Sensor	Can be configured for each channel using software	
KTY10-6	-50 to +125°C	
PT1000	-200 to +850°C	
Resistance measurement range	0 to 4000 Ω	
Input protection	Protection against wiring with supply voltage	
Interfaces		7XX412.50-1
Application interface		
Type	X2X Link slave	
Design	12-pin multipoint connector	
General information		7XX412.50-1
Certification	CE, C-UL-US, GOST-R	
Status indicators	I/O function for each digital output, status	
Diagnostics		
I/O function	Yes, with LEDs	
X2X Interface	Yes, with status LED	
Mechanical characteristics		7XX412.50-1
Dimensions (W x H x D [mm])	170 x 80 x 30	
Weight	410 g	
Protection type	IP20	
Installation	On EN50022-compliant mounting rails or screw mounting	
Operating / Storage temperature	0 to 55°C / 25 to +70°C	
Relative humidity	5 - 95%, non-condensing	
Comment	Order 1 x TB712 terminal block separately Order 2 x TB718 terminal block separately	

Remote I/O with X2X Link XX415



- 2 full-bridge strain gauge inputs
- 8 digital outputs
- 16 digital inputs with special functions (event counting, incremental encoder operation, gate, frequency and period measurement)

Short description	7XX415.50-K02	
Digital channels	16 inputs, 8 outputs	
Analog channels	2 full-bridge strain gauge inputs	
Interfaces	1 x X2X Link slave	
Electrical isolation		
24 VDC - Dig. output	No	
24 VDC - Dig. input	Yes	
24 VDC - Analog	Yes	
Dig. input - Dig. output	Yes	
Analog - Digital	Yes	
X2X - All channels	Yes	
X2X - 24 VDC	Yes	
Supply voltage	24 VDC	
Power consumption	4.0 W	
Digital inputs	7XX415.50-K02	
Channels	1 - 3	4 - 16
Rated voltage	24 VDC	24 VDC
Input filter		
Hardware	≤4 μs	≤200 μs
Software	-	-
Input circuit	Sink	Sink or source
Additional functions	Event counting, incremental encoder operation, gate, frequency and period measurement	-
Digital outputs	7XX415.50-K02	
Rated voltage	24 VDC	
Rated output current		
Outputs 1 - 4	0.5 A	
Outputs 5 - 8	2.0 A	
Total current	10.0 A	
Output circuit	Source	
Output protection	Thermal cutoff for overcurrent or short circuit, integrated protection for switching inductances, reverse polarity protection for output supply	
Additional functions	-	
Sensor supply	External	
Analog inputs	7XX415.50-K02	
Full-bridge strain gauge inputs	2	
Type	Differential	
Conversion method	Sigma delta	
Digital converter resolution	24-bit	
Effective resolution	15 to 18-bit (depending on the data output rate and measurement range)	
Operating range / Measurement sensor	75 to 5,000 Ω	
Bridge voltage	4.5 VDC / max. 60 mA	
Wiring	4-wire	
Measurement area	Approximately ±8 to ±65 mV, can be configured using software	
Input current	<140 nA	
Conversion time	Configurable between 3 and 20 ms	
Output format	DINT	
Input protection	Protection against wiring with supply voltage	

Interfaces	7XX415.50-K02
Application interface	
Type	X2X Link slave
Design	12-pin multipoint connector
General information	7XX415.50-K02
Certification	CE, C-UL-US, GOST-R
Status indicators	I/O function for each digital output, status
Diagnostics	
I/O function	Yes, with software status
Power supply	Yes, with software status
X2X	Yes, with status LED
Mechanical characteristics	7XX415.50-K02
Dimensions (W x H x D [mm])	170 x 80 x 30
Weight	405 g
Protection type	IP20
Installation	On EN50022-compliant mounting rails or screw mounting
Operating / Storage temperature	0 to 55°C / 25 to +70°C
Relative humidity	5 - 95%, non-condensing
Comment	Order 1 x TB712 terminal block separately Order 2 x TB718 terminal block separately

Remote I/O with X2X Link XX426



- 8 digital inputs with special functions (event counting, incremental encoder operation, gate and period measurement)
- 8 digital outputs
- 4 analog inputs for potentiometer or displacement gauge
- 1 analog input for voltage measurement
- 3 analog outputs

Short description	7XX426.50-1	
Digital channels	8 inputs, 8 outputs	
Analog channels	5 inputs (4x potentiometer, 1x differential input, comparator), 3 outputs	
Interfaces	1 x X2X Link slave	
Electrical isolation		
24 VDC - Dig. input	Yes	
24 VDC - Dig. output	No	
24 VDC - Analog	Yes	
Analog - Digital	Yes	
Analog - Analog	No	
X2X - Digital/Analog	Yes	
X2X - 24 VDC	Yes	
Supply voltage	24 VDC	
Power consumption	5.0 W	
Digital inputs	7XX426.50-1	
Channels	1 - 3	4 - 8
Rated voltage	24 VDC	
Input filter		
Hardware	≤4 μs	≤200 μs
Software	-	-
Input circuit	Sink or source	Sink or source
Additional functions	Event counting, incremental encoder operation, gate and period measurement	-
Digital outputs	7XX426.50-1	
Rated voltage	24 VDC	
Rated output current		
Outputs 1 - 4	2.0 A, 50%	
Outputs 5 - 8	2.0 A, 100%	
Total current	10.0 A	
Output circuit	Source	
Output protection	Thermal cutoff for overcurrent or short circuit, integrated protection for switching inductances, reverse polarity protection for output supply	
Additional functions	-	
Sensor supply	External	
Potentiometer, displacement gauge	7XX426.50-1	
Input type	Single ended input in the range from 0 to U _{pot}	
Digital converter resolution	14-bit	
Potentiometer supply voltage U _{pot}	4.5 V / max. 9 mA	
Measurement sensor	1 kΩ to 10 kΩ, potentiometer	
Conversion time	≤300 μs for all channels	
Output format	INT	
Input protection	Protection against wiring with supply voltage	

Differential input	7XX426.50-1
Input type	Voltage input
Input	0 to +10 V
Digital converter resolution	12-bit
Conversion time	≤300 μs
Output format	INT
Input impedance in signal range	20 MΩ
Input protection	Protection against wiring with supply voltage
Comparator	7XX426.50-1
Number of channels	1, can be configured using software
Trigger threshold	Can be used on an analog input (potentiometer/displacement gauge 4 or differential output)
Triggering	Takes place either on digital output 1 or on analog output 3 using predefinable values
Timestamp for trigger	Yes
Trigger threshold for triggering	Yes
Reaction time	≤200 μs
Analog outputs	7XX426.50-1
Output	±10 V
Digital converter resolution	12-bit
Data format	INT
Conversion time	≤300 μs for all channels
Maximum load per output	±10 mA (load <1 kΩ)
Power on/off behavior	Internal enable relay for boot procedure and error
Output protection	Protection against wiring with supply voltage, short circuit protection
Interfaces	7XX426.50-1
Application interface	
Type	X2X Link slave
Design	12-pin multipoint connector
General information	7XX426.50-1
Certification	CE, C-UL-US, GOST-R
Status indicators	I/O function for each digital input/output, status
Diagnostics	
I/O function	Yes, with LEDs
X2X Interface	Yes, with status LED and software status
Mechanical characteristics	7XX426.50-1
Dimensions (W x H x D [mm])	170 x 80 x 30
Weight	410 g
Protection type	IP20
Installation	On EN50022-compliant mounting rails or screw mounting
Operating / Storage temperature	0 to 55°C / 25 to +70°C
Relative humidity	5 - 95%, non-condensing
Comment	Order 1 x TB712 terminal block separately Order 2 x TB718 terminal block separately

Remote I/O with X2X Link XX436



- 8 digital inputs with special functions (event counting, incremental encoder operation, frequency and period measurement)
- 8 digital outputs
- 4 analog inputs (2 inputs can be used for temperature measurement with KTY10 or PT1000)
- 4 analog outputs

Short description	7XX436.50-1	
Digital channels	8 inputs, 8 outputs	
Analog channels	4 inputs (differential inputs, two of which can be used as temperature inputs, comparator can be configured using software), 4 outputs	
Interfaces	1 x X2X Link slave	
Electrical isolation		
24 VDC - Dig. input	Yes	
24 VDC - Dig. output	No	
24 VDC - Analog	Yes	
Analog - Digital	Yes	
Analog - Analog	No	
X2X - Digital/Analog	Yes	
X2X - 24 VDC	Yes	
Supply voltage	24 VDC	
Power consumption	5.0 W	
Digital inputs	7XX436.50-1	
Channels	1 - 3	4 - 8
Rated voltage	24 VDC	24 VDC
Input filter		
Hardware	≤4 μs	≤200 μs
Software	-	-
Input circuit	Sink or source	
Additional functions	Event counting, incremental encoder operation, gate, frequency or period measurement	
Digital outputs	7XX436.50-1	
Rated voltage	24 VDC	
Rated output current		
Outputs 1 - 4	0.5 A	
Outputs 5 - 8	2.0 A	
Total current	10.0 A	
Output circuit	Source	
Output protection	Thermal cutoff for overcurrent and short circuit, integrated protection for switching inductances, reverse polarity protection of output supply	
Additional functions	-	
Sensor supply	External	
Analog inputs	7XX436.50-1	
Input type	Differential input (2 channels can be configured as temperature inputs)	
Input	±10 V	
Digital converter resolution	12-bit	
Conversion time	≤300 μs for all channels	
Output format	INT	
Input impedance in signal range	20 MΩ	
Input protection	Protection against wiring with supply voltage	
Comparator	7XX436.50-1	
Number of channels	1, can be configured using software	
Trigger threshold	Can be used on an analog input	
Triggering	Takes place either on digital output 1 or on analog output 1 using predefinable values	
Timestamp for trigger	Yes	
Trigger threshold for triggering	Yes	
Reaction time	≤200 μs	

Temperature measurement	7XX436.50-1
Number of channels	Up to 2 (depending on the configuration)
Temperature measurement	Resistance measurement with constant current feed for 2-lines
Conversion time	≤300 μs for all channels
Output format	INT
Sensor	Can be configured for each channel using software
KTY10-6	-50 to +125°C
PT1000	-200 to +850°C
Resistance measurement range	0 to 4000 Ω
Analog outputs	7XX436.50-1
Output	±10 V
Digital converter resolution	12-bit
Data format	INT
Conversion time	≤300 μs for all channels
Power on/off behavior	Internal enable relay for boot procedure and error
Output protection	Protection against wiring with supply voltage, short circuit protection
Interfaces	7XX436.50-1
Application interface	
Type	X2X Link slave
Design	12-pin multipoint connector
General information	7XX436.50-1
Certification	CE, C-UL-US, GOST-R
Status indicators	I/O function for each digital input/output, status
Diagnostics	
I/O function	Yes, with LEDs
Power supply	Yes, with software status
Status	Yes, with status LED and software status
Mechanical characteristics	7XX436.50-1
Dimensions (W x H x D [mm])	170 x 80 x 30
Weight	410 g
Protection type	IP20
Installation	On EN50022-compliant mounting rails or screw mounting
Operating / Storage temperature	0 to 55°C / 25 to +70°C
Relative humidity	5 - 95%, non-condensing
Comment	Order 1 x TB712 terminal block separately Order 2 x TB718 terminal block separately

Remote I/O with X2X Link XX408



- 16 digital inputs with special functions (event counting, incremental encoder operation, gate, frequency and period measurement)
- 16 digital outputs (2 outputs with pulse width modulation)

Short description	7XX408.50-1	
Digital channels	16 inputs, 16 outputs	
Interfaces	1 x X2X Link slave	
Electrical isolation		
24 VDC - Input	Yes	
24 VDC - Output	No	
Input - Output	Yes	
X2X - Input/Output	Yes	
Supply voltage	24 VDC	
Power consumption	2.0 W	
Digital inputs	7XX408.50-1	
Channels	1 - 3	4 - 16
Rated voltage	24 VDC	24 VDC
Input filter		
Hardware	≤4 μs	≤200 μs
Software	-	-
Input circuit	Sink or source	Sink or source
Additional functions	Event counting, incremental encoder operation, gate, frequency and period measurement	-
Digital outputs	7XX408.50-1	
Rated voltage	24 VDC	
Rated output current		
Outputs 1 - 4	0.5 A	
Outputs 5 - 8	2.0 A	
Total current	10.0 A	
Output circuit	Source	
Output protection	Thermal cutoff for overcurrent or short circuit, integrated protection for switching inductances	
Additional functions	Pulse width modulation	
Sensor supply	External	
Interfaces	7XX408.50-1	
Application interface		
Type	X2X Link slave	
Design	12-pin multipoint connector	
General information	7XX408.50-1	
Certification	CE, C-UL-US, GOST-R	
Status indicators	I/O function for each channel, status	
Diagnostics		
I/O function	Yes, with LEDs	
X2X Interface	Yes, with status LED	
Mechanical characteristics	7XX408.50-1	
Dimensions (W x H x D [mm])	170 x 80 x 30	
Weight	355 g	
Protection type	IP20	
Installation	On EN50022-compliant mounting rails or screw mounting	
Operating / Storage temperature	0 to 55°C / 25 to +70°C	
Relative humidity	5 - 95%, non-condensing	
Comment	Order 1 x TB712 terminal block separately Order 2 x TB718 terminal block separately	

Accessories for the Compact I/O system

Required accessories		
7TB712.9	Accessory terminal block, 12-pin, screw clamp, 1.5 mm ²	687
7TB712.91	Accessory terminal block, 12-pin, cage clamp, 1.5 mm ²	687
7TB718.9	Accessory terminal block, 18-pin, screw clamp, 1.5 mm ²	688
7TB718.91	Accessory terminal block, 18-pin, cage clamp, 1.5 mm ²	688

Optional accessories		
7TB722.9	2003 terminal block, 22-pin, screw clamps	
7TB722.91	2003 terminal block, 22-pin, cage clamps	
7TB733.9	2003 terminal block, 33-pin, screw clamps	
7TB733.91	2003 terminal block, 33-pin, cage clamps	
7TB736.9	2003 terminal block, 36-pin, screw clamps	
7TB736.91	2003 terminal block, 36-pin, cage clamps	
7TB772.91	2003 terminal block, 72-pin, cage clamps	
0AC301.9	Accessory, 8x shielding clamp	695

Embedded controller EC20



The EC20 embedded controller is a stand-alone CPU for switching cabinet installation.

The EC20 module offers removable application memory in the form of a CompactFlash card as well as a separate backup battery for the module. Additional features:

- RS232 interface (IF1) for programming and configuring using B&R Automation Studio
- CAN interface (IF2) for connecting to a CAN network
- X2X Link interface (IF4)
- Ethernet interface (IF6) for connecting to an Ethernet network
- ARNC0 (only on 7EC020.61-2).

In addition, a maximum of three digital inputs / outputs are provided. The digital inputs and outputs can be configured individually as input or output. Additional functions such as a counter function with direction switching (step per motor) or period and gate measurement are integrated.

General information	7EC020.60-2, 7EC020.61-2
Certification	CE, C-UL-US, GOST-R
Module type	Embedded controller
Power consumption	< 6 W
CPU	7EC020.60-2, 7EC020.61-2
Processor clock	100 MHz
SRAM	32 kB
DRAM	32 MB
Operating system	AC140 (version E2.82 or higher)
Application interface IF1	7EC020.60-2, 7EC020.61-2
Interface type	RS232
Design	9-pin DSUB plug
Maximum transfer rate	115.2 kBit/s to 19200 kBit/s at 15 m
Display	232 LED
Application interface IF2	7EC020.60-2, 7EC020.61-2
Interface type	CAN electrically isolated
Design	9-pin DSUB plug
Maximum transfer rate	50 kBit/s at 1000 m to 500 kBit/s at 60m
Display	CAN LED
Network-capable	Yes
Bus termination resistor	Externally wired
Application interface IF4 ¹⁾	7EC020.60-2, 7EC020.61-2
Interface type	X2X Link master electrically isolated
Design	4-pin connector
Max. distance	100 m
Display	X2X LED
Network-capable	Yes, network topology: Line
<small>1) Application memory must be ordered separately.</small>	
Application interface IF6	7EC020.60-2, 7EC020.61-2
Interface type	IEEE 802.3 Ethernet
Design	RJ45 socket
Max. distance	100 m
Transfer rate	10/100 MBit/s
Display	ACT LED
Inputs / outputs	7EC020.60-2, 7EC020.61-2
Connection, module-side	8-pin connector
Configuration of the digital inputs/outputs	Can be configured individually as input or output
Digital inputs ²⁾	7EC020.60-2, 7EC020.61-2
Number of inputs	Max. 3
Wiring	Sink
Electrical isolation	Input - PLC
Input voltage	24 VDC
Input delay	< 5 μ s

2) Shielded cables must be used for inputs 1 - 3.

Event counter	7EC020.60-2, 7EC020.61-2
Signal form	Square wave pulse
Input frequency	Max. 100 kHz
Pulse length	Min. 5 μ s
Counter size	32-bit
Inputs	Counter on input 1
Incremental counter	7EC020.60-2, 7EC020.61-2
Signal form	Square wave pulse
Evaluation	4-fold
Input frequency	Max. 20 kHz
Counter size	16-bit
Inputs	A/B on input 1/2 reference pulse on input 3
Gate measurement	7EC020.60-2, 7EC020.61-2
Signal form	Square wave pulse
Input frequency	Max. 100 kHz
Count frequency	31.25 kHz/4 MHz internal, max. 100 kHz external
Period measurement	7EC020.60-2, 7EC020.61-2
Signal form	Square wave pulse
Input frequency	Max. 100 kHz
Count frequency	31.25 kHz/4 MHz internal, max. 100 kHz external
Digital outputs	7EC020.60-2, 7EC020.61-2
Interface type	Max. 3
Design	High-side transistor outputs, readable
Electrical isolation	Input - PLC
Rated voltage	24 VDC
Rated current	500 mA
Switching delay	Typ. 250 μ s
Switching frequency (resistive load)	Max. 100 Hz
Output protection	Cutoff for overcurrent or short circuit
Mechanical characteristics	7EC020.60-2, 7EC020.61-2
Dimensions in mm (W x H x D)	43 x 122 x 110
Protection	IP20
Operating temperature	0 to +45°C
Storage temperature	-25°C to +55°C
Relative humidity	5 to 95%, non-condensing
Comment	Backup battery included in delivery

Required accessories		
0TB708.91	Accessory terminal block, 8-pin, cage clamps, 1.5 mm ²	682
0TB708:91-02	Accessory terminal block, 20 pcs. 8-pin cage clamps, 1.5 mm ²	
0TB704.9	Accessory, terminal block, 4-pin, screw clamps, 1.5 mm ²	680
0TB704.91	Accessory, terminal block, 4-pin, cage clamps, 2.5 mm ²	680
0G0001.00-090	Cable PC <-> PLC/PW, RS232, online cable	674
7AC911.9	Bus connector, CAN	690
0AC912.9	Bus adapter, CAN, 1 CAN interface	692
0AC913.92	Bus adapter, CAN, 2 CAN interfaces, including 30 cm connection cable	692
5CFCRD.0064-03	CompactFlash 64 MB ATA/IDE SiliconSystems	672
5CFCRD.0128-03	CompactFlash 128 MB ATA/IDE SiliconSystems	672
5CFCRD.0256-03	CompactFlash 256 MB ATA/IDE SiliconSystems	672
5CFCRD.0512-03	CompactFlash 512 MB ATA/IDE SiliconSystems	672
5CFCRD.1024-03	CompactFlash 1024 MB ATA/IDE SiliconSystems	672
5CFCRD.2048-03	CompactFlash 2048 MB ATA/IDE SiliconSystems	672
5CFCRD.4096-03	CompactFlash 4096 MB ATA/IDE SiliconSystems	672
5CFCRD.8192-03	CompactFlash 8192 MB ATA/IDE SiliconSystems	672

Embedded controller EC21



The EC21 embedded controller is a stand-alone CPU for switching cabinet installation.

The EC21 module offers removable application memory in the form of a CompactFlash card as well as a separate backup battery for the module. Additional features:

- RS232 interface (IF1) for programming and configuring using B&R Automation Studio
- CAN interface (IF2) for connecting to a CAN network
- Profibus DP interface (IF3) for connecting to a Profibus network
- X2X Link interface (IF4)
- Ethernet interface (IF6) for connecting to an Ethernet network.
- ARNC0 (only 7EC021.61-2)

In addition, a maximum of three digital inputs / outputs are provided. The digital inputs and outputs can be configured individually as input or output. Additional functions such as a counter function with direction switching (stepper motor) or period and gate measurement are integrated.

General information	7EC021.60-1, 7EC021.61-2	
Certification	CE, C-UL-US, GOST-R	
Module type	Embedded controller	
Power consumption	< 6 W	
CPU	7EC021.60-1	7EC021.61-2
Processor clock	100 MHz	100 MHz
SRAM	32 kB	32 kB
DRAM	16 MB	32 MB
Operating system	AC140 (version E2.82 or higher)	AC140 (version E2.82 or higher)
Application interface IF1	7EC021.60-1, 7EC021.61-2	
Interface type	RS232	
Design	9-pin DSUB plug	
Maximum transfer rate	115.2 kBit/s to 19200 kBit/s at 15 m	
Display	232 LED	
Application interface IF2	7EC021.60-1, 7EC021.61-2	
Interface type	CAN electrically isolated	
Design	9-pin DSUB plug	
Maximum transfer rate	50 kBit/s at 1000 m to 500 kBit/s at 60m	
Display	CAN LED	
Network-capable	Yes	
Bus termination resistor	Externally wired	
Application interface IF3	7EC021.60-1, 7EC021.61-2	
Interface type	RS485 electrically isolated	
Transfer protocol	Profibus DP	
Design	9-pin DSUB socket	
Maximum transfer rate	187.5 kBit/s at 1000 m to 12 MBit/s at 100 m	
Indicators	PB LED	
Network-capable	Yes	
Bus termination resistor	External T-connector	
Application interface IF4 ¹⁾	7EC021.60-1, 7EC021.61-2	
Interface type	X2X Link master electrically isolated	
Design	4-pin connector	
Max. distance	100 m	
Display	X2X LED	
Network-capable	Yes, network topology: Line	
1) Application memory must be ordered separately.		
Application interface IF6	7EC021.60-1, 7EC021.61-2	
Interface type	IEEE 802.3 Ethernet	
Design	RJ45 socket	
Max. distance	100 m	
Transfer rate	10/100 MBit/s	
Display	ACT LED	
Inputs / outputs	7EC021.60-1, 7EC021.61-2	
Connection, module-side	8-pin connector	
Configuration of the digital inputs/outputs	Can be configured individually as input or output	
Digital inputs ²⁾	7EC021.60-1, 7EC021.61-2	
Number of inputs	Max. 3	
Wiring	Sink	
Electrical isolation	Input - PLC	
Input voltage	24 VDC	
Input delay	< 5 μ s	

2) Shielded cables must be used for inputs 1 - 3.

Event counter	7EC021.60-1
Signal form	Square wave pulse
Input frequency	Max. 100 kHz
Pulse length	Min. 5 μ s
Counter size	32-bit
Inputs	Counter on input 1
Incremental counter	7EC021.60-1
Signal form	Square wave pulse
Evaluation	4-fold
Input frequency	Max. 20 kHz
Counter size	16-bit
Inputs	A/B on input 1/2 reference pulse on input 3
Gate measurement	7EC021.60-1
Signal form	Square wave pulse
Input frequency	Max. 100 kHz
Count frequency	31.25 kHz/4 MHz internal, max. 100 kHz external
Period measurement	7EC021.60-1
Signal form	Square wave pulse
Input frequency	Max. 100 kHz
Count frequency	31.25 kHz/4 MHz internal, max. 100 kHz external
Digital outputs	7EC021.60-1
Interface type	Max. 3
Design	High-side transistor outputs, readable
Electrical isolation	Input - PLC
Rated voltage	24 VDC
Rated current	500 mA
Switching delay	Typ. 250 μ s
Switching frequency (resistive load)	Max. 100 Hz
Output protection	Cutoff for overcurrent or short circuit
Mechanical characteristics	7EC021.60-1
Dimensions in mm (W x H x D)	43 x 122 x 110
Protection	IP20
Operating temperature	0 to +45°C
Storage temperature	-25°C to +55°C
Relative humidity	5 to 95%, non-condensing
Comment	Backup battery included in delivery

Required accessories		
0TB708.91	Accessory terminal block, 8-pin, cage clamps, 1.5 mm ²	682
0TB708:91-02	Accessory terminal block, 20 pcs. 8-pin cage clamps, 1.5 mm ²	
0TB704.9	Accessory, terminal block, 4-pin, screw clamps, 1.5 mm ²	680
0TB704.91	Accessory, terminal block, 4-pin, cage clamps, 2.5 mm ²	680
0G0001.00-090	Cable PC <-> PLC/PW, RS232, online cable	674
7AC911.9	Bus connector, CAN	690
0AC912.9	Bus adapter, CAN, 1 CAN interface	692
0AC913.92	Bus adapter, CAN, 2 CAN interfaces, including 30 cm connection cable	692
5FCFRD.0064-03	CompactFlash 64 MB ATA/IDE SiliconSystems	672
5FCFRD.0128-03	CompactFlash 128 MB ATA/IDE SiliconSystems	672
5FCFRD.0256-03	CompactFlash 256 MB ATA/IDE SiliconSystems	672
5FCFRD.0512-03	CompactFlash 512 MB ATA/IDE SiliconSystems	672
5FCFRD.1024-03	CompactFlash 1024 MB ATA/IDE SiliconSystems	672
5FCFRD.2048-03	CompactFlash 2048 MB ATA/IDE SiliconSystems	672
5FCFRD.4096-03	CompactFlash 4096 MB ATA/IDE SiliconSystems	672
5FCFRD.8192-03	CompactFlash 8192 MB ATA/IDE SiliconSystems	672

Mounting rail installation



The mounting rail fastening set allows quick and easy installation of an EC020 or EC021 on a mounting rail. The required mounting materials are included in delivery.

Short description

Installation

OAC021.9

Easy snap-on mounting onto the DIN rail





Network and fieldbus modules

Flexible communication

Fieldbus and IT networks are standards in automation today. B&R systems support the most common fieldbus systems and networks.

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System characteristics

Unlimited communication

Today, extensive communication possibilities are a basic requirement for any automation solution. Ethernet is easily experiencing the strongest growth in this sector. CAN bus systems are also experiencing significant gains.

Flexible communication and networking are a fundamental part of B&R products. Most CPUs are already equipped with an integrated 10/100 MBit/s Ethernet interface.

Communication must adapt to meet the requirements of the application. That is why there is a wide product range of interface modules. They can be used with all x86-based CPUs from the 2003 and 2005 systems as well as with the Power Panel 400 series. The modules are based on the B&R aPCI standard. Plug-in cards are available in the PCI format for B&R Industrial PCs.

aPCI modules (advanced PCI) are based on the PCI bus standard. The form factor and boot behavior have been optimized for usage in automation devices.

Networks for automation

For the most part, higher demands are placed on communication in the field than those in office communication. Real-time capability and deterministic behavior are of utmost importance in this respect. Jitter behavior in the microsecond range and extremely high resistance to disturbance are important factors.

True real-time for standard Ethernet

POWERLINK provides a standard protocol for Fast Ethernet, which has proven its tough real-time characteristics in thousands of applications. The Ethernet POWERLINK Standardization Group (EPSG) ensures openness and continuous advancement. POWERLINK as Standard Ethernet based system represents the second generation of fieldbus. This makes it possible to apply the full power of IT technologies to the automation field for the first time. POWERLINK is comparably suited for drives, I/O, visualization and data exchange between PLC systems.

CAN bus in automation

The CAN bus has had much success, particularly in machine manufacturing, and is steadily gaining importance. High resistance to disturbance, high-speed data transfer, ease of use and deterministic real-time behavior are among the reasons for this success. CAN is the ideal fieldbus for applications with a manageable number of remote I/O nodes and few axes.

As a fieldbus, CAN bus reaches its limits when dealing with larger and more complex machines. For these applications, however, POWERLINK is the ideal expansion in the higher performance range.

Remote backplane

Decentralization is the dominating trend in automation technology. This has come about as a result of economic considerations and the total cost reduction of machines by those who see the clear advantages of a decentralized structure for multiple applications. These demands brought about the idea of running the conventional backplane for the I/O modules in a PLC system or a bus controller in one cable. The result is the extremely high-speed I/O connection, X2X Link.

Serial communication

Interfaces such as RS232, RS422 and RS485 still play an important role in the automation world. Robust, simple and nevertheless efficient, these interfaces still find wide usage. The classic RS232 interface is fully capable of meeting the demands for system programming and maintenance.

Ethernet POWERLINK: Real-time industrial Ethernet is reality

Why Ethernet?

To simplify development, maintenance, and stock keeping, there is a strong demand from the automation industry to unify all possible levels of data communication and network technology. With the Internet revolution, widely adopted networking and protocol standards from the IT world have reached pricing and robustness levels which make them attractive for communication networks in the automation industry.

- **The future of Ethernet is guaranteed**

The basic technology has been available for more than 30 years and is being continually advanced. The long life-cycles specific to the automation market demand a lasting base.

- **Ethernet technology is well-known**

Ethernet and its accompanying protocols are considered common knowledge nowadays. The large number of available tools, programs, and components continues to reduce costs.

- **Ethernet provides transparency**

The Ethernet standards bring together the IP-based data transfer protocols for diverse purposes. The integration of IT and automation by using Ethernet gives you real interoperability with Internet flexibility.

- **Ethernet is real-time capable**

With POWERLINK, Ethernet also includes sensor and actuator levels, with cycle times down to 200 μ s and ultra precise timing precision better than one microsecond.

Ethernet POWERLINK - The technology

Regular Ethernet is not capable of handling data transfer in real time. Additional measures like fully switched Ethernet and frame prioritization are not suitable either. First, it does not fit the flexibility needs of automation network topologies. Second, deterministic data transfer and timing precision still cannot be guaranteed. And third, it is quite complex to configure network utilization by selecting appropriate node and frame priorities.

Multiple industry groups have therefore introduced various new mechanisms to achieve real-time capability using Ethernet. These include non-standard access mechanisms on the physical medium using Ethernet frames that have to be decoded cyclically using special components as well as non-standard shortening of the Ethernet frames to lower transfer times even further.

POWERLINK was developed from the very beginning with the intent of providing standard conformity. As an open industrial standard, Ethernet requires non-proprietary real-time enhancements. POWERLINK enhances Ethernet according to the IEEE 802.3 standard with a mixed polling and time slicing mechanism.

This results in:

- Guaranteed transfer of time-critical data within very short and precise isochronous cycles with configurable timing.
- Synchronization of all network nodes with high precision in the sub-microsecond range.
- Transmitting less time-critical data in a reserved asynchronous channel.

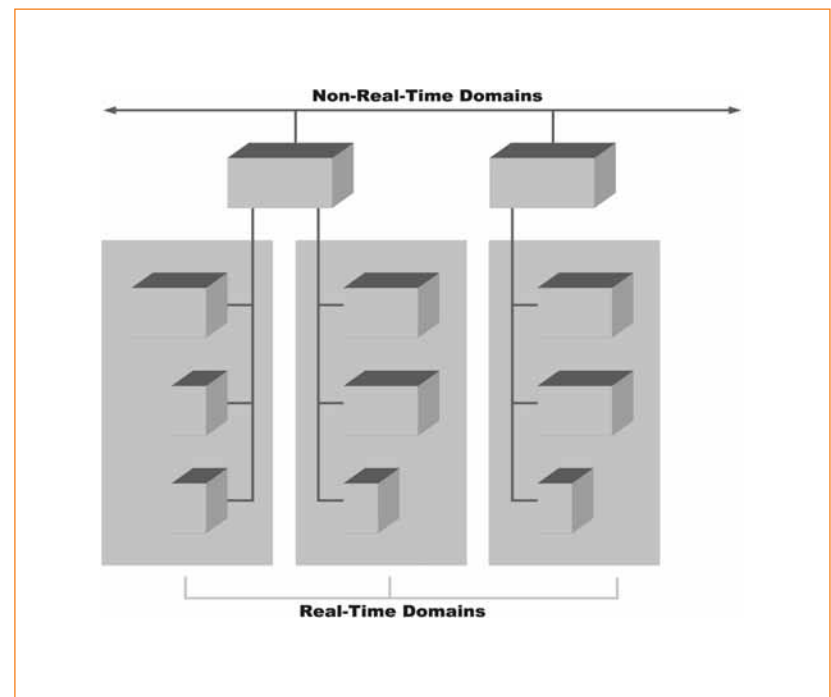
Current POWERLINK implementations have reached 200 μ s cycle time with a timing deviation (jitter) below 1 μ s.

Due to its standard compliancy it is possible to leverage and continue using any standard Ethernet silicon, infrastructure component or test and measurement equipment with POWERLINK. All IP-based protocols on higher layers, like TCP, UDP and above, can be further used without modifications. In particular, POWERLINK conforms to the following international standards:

- IEEE 802.3 Fast Ethernet
- IEC 61748-2
- IEC 61158
- IP-based protocols (UDP, TCP, etc.)
- Standard device profiles according to CANopen EN50325-4
- Standard Ethernet chips, no ASICs necessary
- IEEE 1588 for real-time domain synchronization (future versions)

Network structure

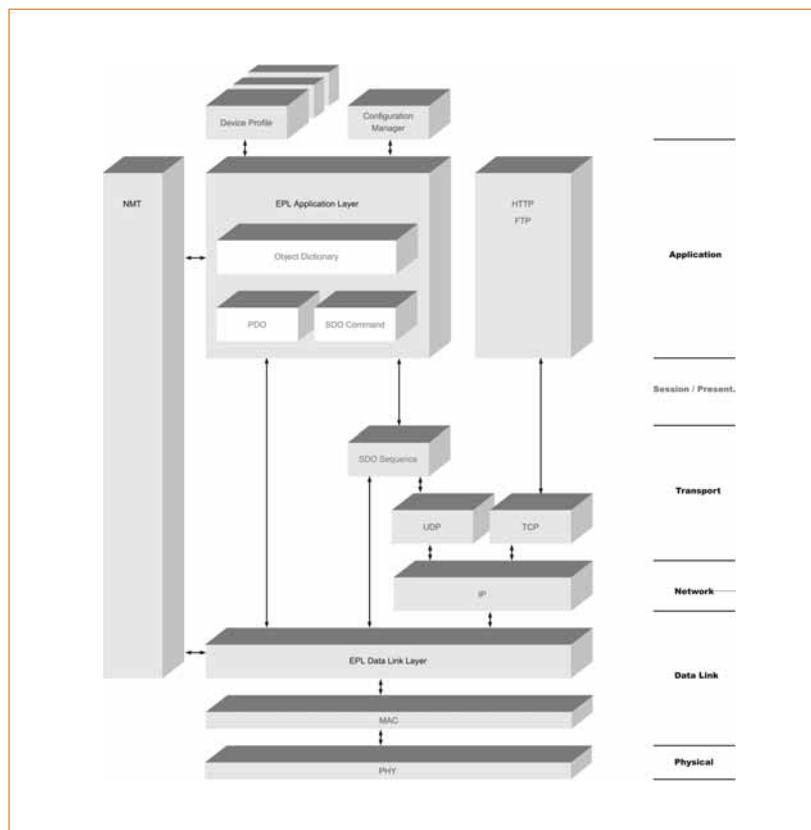
POWERLINK distinguishes between real-time domains and non real-time domains. This separation matches typical machine and plant concepts. It also satisfies the increasing security demands to prevent hacker attacks at the machine level or harm through erroneous data communication on higher network hierarchies. True real-time requirements are met within the real-time domain. Less time critical data is routed transparently between the real-time domain and non-real-time domain using standard IP frames. A clear boundary between a machine and factory network prevents potential security flaws from the very beginning while keeping full data transparency.



System characteristics

Reference model

POWERLINK is based on the ISO/OSI layer model and supports client/server and producer/consumer communication relationships. The protocol is based on the standard IEEE 802.3 layers. The current physical layer is 100BASE-X. In the future, however, it could also be based on faster Ethernet variants such as GBit Ethernet. To minimize path delay and frame jitter, it is recommended to use repeating hubs instead of switching hubs within the real-time domain. POWERLINK references the IAONA Industrial Ethernet Planning and Installation Guide available for download from www.iaona-eu.org for proper wiring of industrial networks. Both RJ45 and M12 industrial Ethernet connectors are specified.



Data link layer

Deterministic timing is achieved by applying a cyclic timing schedule for all connected nodes to access the physical layer. The schedule is divided into an isochronous phase and an asynchronous phase. During the isochronous phase, time-critical data is transferred, the asynchronous phase reserves bandwidth for non time-critical data. The MN frees access to the physical medium via explicit messages. As a result, just one single node has access to the network at all times, thereby preventing collisions. The CSMA/CD mechanism, which causes non-deterministic Ethernet behavior, has no effect when POWERLINK operates free of disturbances.

POWERLINK uses MAC addressing in concordance with IEEE 802.3. Each device has a unique MAC address. In addition, nodes in the real-time domain are assigned an EPL node ID. The respective node ID of a device can be selected by a node switch on the front side of the device.

Ethernet POWERLINK also offers standard IP addressing when needed. This means that real-time devices can be accessed from anywhere in the world via the Internet. Local IP addresses are assigned to devices in a real-time domain. The local IP address for a particular device is derived from the respective node ID. The transition to the Internet is made via Network Address Translation (NAT), as when connecting to an Internet service provider.

Application layer

POWERLINK has been integrated with the well-known and widely deployed CANopen family of communication and device profiles. CANopen's DS301 and DS302 communication profiles have been adapted to POWERLINK in a joint technical working group of both the EPSG and the CiA (CAN in Automation) group. Users and vendors of CANopen-enabled devices are now able to easily migrate their applications from the well-established CAN bus to an Ethernet environment which is a hundredfold faster. CAN bus and Ethernet networks can transparently be combined wherever needed.

Device operating modes

A POWERLINK capable device can handle the following operating states.

Basic Ethernet mode: The device is operated directly in the existing Ethernet networks, when real-time data transfer is not necessary. This is the default operating mode after switching on the device.

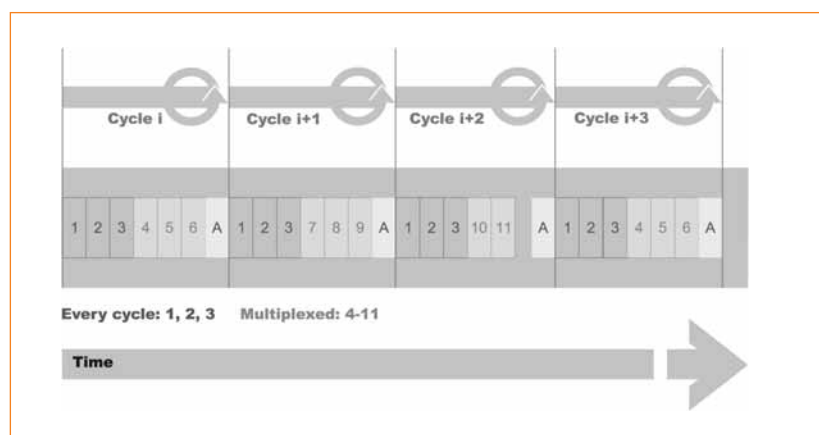
Ethernet POWERLINK mode: After completing the boot procedure, the device enters real-time operation. The managing node checks the timing. The cycle time depends on the amount of isochronous and asynchronous data, as well as the number of nodes. The basic cycle consists of the following phases:

- Start phase: All networked nodes synchronize themselves to the managing node's clock.
- Isochronous phase: The managing node assigns a fixed time window to each node to transfer time-critical data. All other nodes can always listen to all data during this phase (publish/subscribe).
- Asynchronous phase: The managing node grants the right to send ad-hoc data e.g. parameters and diagnostics data. Standard IP-based protocols and addressing are used during this phase.

The quality of the real-time behavior depends on the precision of the overall basic cycle time. The length of individual phases can vary as long as the total of all phases remain within the basic cycle time boundaries. Adherence to the basic cycle time is monitored by the MN. The duration of the isochronous and the asynchronous phase can be configured.

Optimal use of bandwidth

In addition to transferring isochronous data during each basic cycle, multiple nodes are able to share common time slots for better bandwidth utilization. For that reason, the isochronous phase can distinguish between time slots dedicated to particular nodes which have to send their data every single basic cycle, and time-slots reserved for multiple slots to transfer their data one after the other.



Less important, yet still time-critical, data can therefore be transferred during longer cycles than the basic cycle. Assigning the time slots during each cycle is at the discretion of the managing node.

IP address assignment

Today, a DHCP server usually handles IP address assignment in an office. This server manages a pool of available addresses and assigns them automatically to devices upon request. However, this also means that devices on an office network never have permanent IP addresses. Instead, a device receives a new address from the pool each time it logs on to the network. If individual devices are contacted using an IP address at the machine level, it's important that any replacement device will have the same IP address again. In this case, the DHCP mechanism is not the right choice since a replaced device will no longer be accessible via the same address.

With POWERLINK, the device address is linked with the node selection switch on the front side of the device. This method is used to calculate the IP address itself, but it can still be overwritten by a network manager if needed. This guarantees that devices that are exchanged retain their previously selected IP addresses without them having to be entered manually.

Since the number of IP addresses available worldwide is limited, it's usually a company's IT department that is in charge of allocating them. An engineer using Ethernet for networking will probably need several IP addresses so that devices and modules in his machine can be reached by higher-level management. Series production can result in addresses being used even more quickly. Moreover, many IT departments underestimate the requirements for these types of services.

POWERLINK assigns local IP addresses at the machine level according to international standards, regardless if the machine is connected in the vendor's production network or at the final customer site. The same local IP addresses are always used on the machine. NAT (Network Address Translation) is used to assign global addresses to local internal addresses in the network where the machine is running. This method has already established itself in the Internet environment. With POWERLINK, it is used to cleanly separate manufacturer and end-user addresses without a lengthy reconfiguration process after delivery.

Safety

One of the main reasons for using industrial Ethernet is the transparency achieved when transferring data to standard applications such as databases, process control systems, ERP systems, etc. System accessibility over the Internet also offers new possibilities for maintenance and service. However, this transparency also offers potential drawbacks.

For this reason, POWERLINK provides clear dividing lines and access controls at the machine level from the very beginning. While it is important to guarantee external access to the machine network for authorized persons, the timing of the real-time domain must not be influenced by malicious attacks on the higher-level network. Separation between real-time and non-real-time domains in POWERLINK ensures security in all aspects.

Flexible topologies

Ethernet networks installed in office buildings rely mostly on a star topology. This is not suitable for most machine networks. Fieldbuses helped to reduce the wiring effort required while being able to adapt the network topology to the needs of the application. To help industrial Ethernet succeed at the lowest level, it must be possible to implement it with any network topology.

That's why individual POWERLINK devices are equipped with several Ethernet ports which can handle lines and branches. Therefore, any topology such as line, tree, star or mixed structures can be realized. Inside the device, a repeating hub ensures that the data stream continues on to its intended destination. In addition to greater flexibility when networking, this reduces the need for external infrastructure components such as switching or repeating hubs.

With POWERLINK, the physical and the logical topologies of the network are separated. It is possible to connect a device to any port on the network without having to reconfigure it. This achieves a higher degree of freedom when designing and upgrading modular machine systems and prevents errors that may occur when the wrong cable is inserted.

Future outlook

Further deployment of IT technologies like Ethernet and its IP-based protocols cannot be stopped in automation anymore. Major advantages like increased bandwidth, data transparency, seamless integration and leveraging standard software and tools will lead to the substitution of classical fieldbus systems.

Besides its outstanding real-time capabilities, POWERLINK offers ease-of-use in networking as demanded in the industry. This is one of the reasons for the protocol's success in more than 40,000 nodes in serial applications. Furthermore, the foundation has already been secured towards future applications through current works on machine safety, availability, reliability and engineering environments.

www.ethernet-powerlink.org

System characteristics

CAN (Controller Area Network)

The CAN protocol describes an asynchronous, serial bus system developed in the automotive industry to manage the cabling of the individual systems, sensors and actuators in a more efficient and cost-effective manner. The following section will provide a brief introduction to the most important of these performance features in the CAN protocol.

A CAN network is based on data exchange according to the **Producer-Consumer principle**. This means that a message transmitted by a producer node can be received by all other consumer nodes. Data that must be sent is addressed using a unique "**message identifier**".

The "**Broadcast**" mechanism makes it possible to send messages to all nodes connected to the bus system.

Direct communication between all nodes is possible based on the fact that every node can initiate its own message transfer (**multi-master functionality**). Unlike cyclic data transfers, data is only sent when necessary. This **event-oriented message transfer** puts much less load on the bus, thereby lowering the required data transfer rate.

A **lossless, bit-wise bus arbitration** prevents multiple nodes from sending data simultaneously, which can result in collisions. The arbitration phase is used to determine which message has the highest priority and can be sent. The message with the lowest message identifier has the highest priority.

The maximum **message length** of a CAN message is 8 bytes. More comprehensive data blocks are separated and then transferred one after the other. An average data size of 4 bytes enables approximately 10,000 messages per second at a bit rate of 1 MBit/s. If the average data size doubles to 8 bytes, then the rate becomes approximately 7,200 messages per second.

Compared to other protocols, the CAN protocol distinguishes itself through extensive **error detection**. This means that the sender of a message can monitor the bus level to detect global errors. Furthermore, received messages are checked for error-free transfer based on specific format elements, whereby local errors can also be filtered out. To make sure that defective network nodes do not prevent continuous message transfer, the CAN protocol provides mechanisms for detecting and then disabling the defective network nodes.

Due to the data transfer described, the CAN protocol is assigned the two lowest layers in the ISO/OSI model (layer 1/2 protocol). This is standardized in **ISO 11898**. Based on standardized, higher protocols and the profiles CANopen and DeviceNet, systems can also be implemented for distributed applications.

CANopen

CANopen is a communication protocol for layer 7 (user layer in the ISO/OSI model), which features a high degree of flexibility in the configuration and uses CAN as layer 2 transport medium. Originally developed for motion applications, it is now an established protocol in a wide range of application areas, such as medical engineering, naval navigation, railroading and even building automation. CANopen has been overseen by the organization **CAN in Automation (CiA)** since 1995 and is standardized as European Norm **EN 50325-4**.

CANopen is not a classical master-slave system, but rather runs with **Client-Server services** and follows the **Producer-Consumer principle**.

It provides standardized communication objects: **Service Data Objects (SDO)** for configuring object directory entries, **Process Data Objects (PDO)** for transporting real-time data, **Network Management objects (NMT)** to the controller and monitoring the nodes as well as other objects such as Synchronization Object, Time Stamp and **Emergency Telegrams**.

All communication and user objects are grouped in the **object directory (object dictionary)**. Each entry represents an object and is labeled using a 16-bit index that can also contain up to 256 sub-indexes. A unique, 32-bit long **COB-ID (Communication Object Identifier)** exists for every communication object in the network.

Service data objects provide a service for accessing the object directory. The SDO objects are lower priority than the PDOs because they use relatively high COB-IDs. These only contain reference data (8 byte), whose content is determined by **PDO Mapping entries** in the object directory. PDOs can also be used to transfer values from multiple objects. The recipients of the PDOs can only use parts of this data according to their PDO Mapping entries. When a PDO is received, the data is written to respectively different objects in the object directory according to the mapping entries (e.g. in a digital output object). The PDOs can be transferred cyclically, event-oriented, polled or synchronized.

Network management objects are used for managing the network. This can include messages that initiate a state change in a device or disperse global error messages, among other things.

The assignment of communication and device profile objects to their respective index is defined in **profiles**, whereby the object directory acts as a unique interface between the application and the CANopen device. The flexibility and openness of CANopen means that additional manufacturer-specific functionalities are able to be implemented.

Electronic data sheets, also known as **EDS files**, use a standardized text format to describe the object directory of a device as well as physical parameters such as supported baud rates. Configuration tools can scan EDS files from different manufacturers, which make it possible to configure devices and establish communication.

DeviceNet

DeviceNet is an open fieldbus standard, also based on the CAN protocol and standardized in **IEC 62026** as well as **EN 50325**. Protocol specifications and the maintenance of the DeviceNet standard are overseen by the independent and open user organization **ODVA (Open DeviceNet Vendor Association)**.

DeviceNet uses the CAN specification on the lower layers of the ISO/OSI model (layers 1 - 4) with just a few limitations. On the upper layers (5 - 7), DeviceNet uses the **Common Industrial Protocol (CIP)** defined by the ODVA.

DeviceNet is a **multi-master system**. Communication between the nodes can be divided into the following categories:

- **Polled I/O message connection** - Cyclic query of the slave data from the master
- **Explicit message connection** - Acyclic communication between master and slave
- **Bit strobe I/O message connection** - Simultaneous transmission of a message from the master to all slaves
- **Change of state / Cyclic message connection** - A change on the input of the slave automatically initiates the transmission of the current data to the master

In order for two DeviceNet devices to exchange reference data between one another, a CIP connection must first be established between them. The connection is established either via the **Unconnected Message Manager (UCMM)** or the Group 2 Unconnected Port. CAN identifiers are used to establish the connection. A connection that has been established can be used either for the transfer of **Explicit Messages** or to create additional I/O connections (**Implicit Messages**).

DeviceNet devices can either be **Client, Server** or both. In return, clients and servers can be **Producer, Consumer** or both. The connection of a typical client sends requests (Produce) and receives responses (Consume). DeviceNet allows multiple variations of this principle. Network nodes that only send messages serve as data source for cyclic messages or change-of-state messages, which considerably reduces the amount of data. Bus cycle times depend on the number of nodes, the respective amount of data on the individual slaves, the selected type of communication and the transfer speed.

In a DeviceNet network, up to **64 bus stations** (incl. master) can communicate with each other at **transfer rates** of 125, 250 or 500 kBit/s.

In addition to the two signals for data transfer CAN-Low and CAN-High, the DeviceNet cable also provides two lines for supplying the DeviceNet bus stations with 24 volts of operating voltage. The nodes connected to the bus can be supplied with power from the bus or from an external source.

Every DeviceNet device has an electronic **device data sheet (EDS file)**. The linear EDS file contains all communication parameters of the entire device (nodes) and the available objects. On the other hand, modularly designed devices use one EDS file per component (module), which provides advantages in the configuration. A DeviceNet configuration tool is used to input the EDS files and then to configure the device.

Profibus (Process Field Bus)

Started in 1987 as a publicly promoted project in Germany, Profibus has become one of the most important fieldbuses worldwide. The "Profibus Nutzerorganisation e.V." (User Organization, abbrev: PNO) established in 1989 and the national branch are now united in the umbrella group "Profibus & PROFINET International" (PI).

IEC 61158 Part 3 specifies three types:

- Profibus FMS (Fieldbus Message Specification; replaced by DP in 1993)
- Profibus DP (decentralized peripherals)
- Profibus PA (process automation)

With a share of more than 90% of all Profibus fieldbus devices, Profibus DP constitutes a central focus; it is a high-speed (up to 12 MBit/s) and simple protocol for classic automation tasks in the area of production engineering. Profibus PA distinguishes itself through the possibility of intrinsically safe operation and the supply for the field devices via the bus for process engineering, but offers comparatively slow data transfer.

Three different procedures are determined for the Profibus **physical layer**, whereby the first two are used for Profibus DP.

- **Electrical transfer** according to EIA-485 involves using twisted pair wires in a line topology. Depending on the bit rate being used (9600 Bit/s to 12 MBit/s), the cable length is limited to 100 m to 1200 m per segment (between two repeaters). Both ends of a segment must be terminated with a terminating resistor to prevent reflections. Passive bus coupling of the nodes makes it possible to connect and to disconnect devices during operation.
- **Optical transfer** via fiber optics involves the use of star, bus, and ring topologies, which allows redundant cabling. The distance between repeaters can be up to 15 km. Due to active bus coupling, network operation is disrupted when connecting and disconnecting nodes.
- **Profibus PA** involves the use of MBP (Manchester Bus Powered) transfer technology, whereby data and power supply for the field devices are both transferred via the same cable. The bit rate is specified at 31.25 kBit/s and allows line topologies up to 1900 m and branches to the field devices with a maximum of 60 m. Performance can be limited in such a manner so that usage in explosive environments is also possible.

With the different characteristics of the physical layer (layer 1 in the ISO-/OSI model) Profibus offers a uniform **data link layer** called (Fieldbus Data Link, layer 2). This works with a hybrid access procedure, which combines the **token passing procedure** with a **master slave procedure**. In a Profibus DP network, the controller corresponds to the master while the sensors and actuators (also called I/Os) correspond to the slaves. If there is more than one master in the network (multi-master system), control priority is handled by passing on a token. Only the master that currently holds the token can send queries to the slaves. Layers 3 to 6 are not used by Profibus.

The **user layer** (layer 7) of Profibus DP establishes the connection between the application process and layer 2.

The **General Station Description (GSD file)**, also known as device master data description, is included in the transfer to each field device and defines the device's technical details (e.g. length of the data to be exchanged). All of the configuration possibilities for modular devices such as the X20 System are contained in the GSD file.

Product overview

Selecting interfaces

aPCI communication modules	RS232	RS485/RS422	Profibus DP Master	Profibus DP Slave	CAN bus	X2X	Ethernet	Ethernet POWERLINK	
3IF722.9	-	2 ¹⁾	-	-	1	-	-	-	622
3IF761.9	1	-	-	1	-	-	-	-	623
3IF762.9	-	1	-	1	-	-	-	-	624
3IF766.9	1	-	1	-	-	-	-	-	625
3IF771.9	-	-	-	-	1	-	-	-	626
3IF772.9	1	-	-	-	2	-	-	-	627
3IF779.9	-	1	-	-	1	1	-	-	628
3IF781.9	-	-	-	-	-	-	1	-	629
3IF782.9-1	-	1 ²⁾	-	-	-	-	-	1	630
3IF786.9-1	1	-	-	-	-	-	-	1	631
3IF787.9-1	-	-	-	-	1	-	-	1	632
3IF789.9-1	-	-	-	-	-	1	-	1	633
3IF791.9	-	-	-	-	-	1	-	-	634
3IF792.9	1	-	-	-	-	2	-	-	635
3IF797.9-1	1	-	-	-	1	1	-	-	636

PCI communication modules	RS232	RS485/RS422	Profibus DP Master	Profibus DP Slave	CAN bus	X2X	Ethernet	Ethernet POWERLINK	
5LS166.6	1	-	1	-	-	-	-	-	637
5LS172.6	-	-	-	-	2	-	-	-	638
5LS182.6-1	-	-	-	-	-	-	-	1	639
5LS187.6-1	-	-	-	-	1	-	-	1	640
5LS189.6-1	-	-	-	-	-	1	-	1	641
5LS197.6	-	-	-	-	1	1	-	-	642

1) 1 x RS485/RS422, 1 x RS485 to 4-pin terminal block

2) RS485 to 4-pin terminal block

aPCI communication modules

Model number	Short description	
3IF722.9	aPCI interface module, 1 CAN interface, max. 500 kBit/s, object buffers in both send and receive directions, network-capable, electrically isolated, 1 RS485/RS422 interface, 1 RS485 interface to terminal block	622
3IF761.9	aPCI interface module, 1 Profibus DP interface, electrically isolated and network-capable, 1 RS232 interface	623
3IF762.9	aPCI interface module, 1 Profibus DP interface, electrically isolated and network-capable, 1 RS485/422 interface, electrically isolated and network-capable	624
3IF766.9	aPCI interface module, 1 Profibus DP master interface, electrically isolated and network-capable, max. 12 MBit/s, max. 3.5 KB input data and max. 3.5 KB output data, RS232 configuration interface	625
3IF771.9	aPCI interface module, 1 CAN interface, max. 500 kBit/s, CAN bus: electrically isolated, network-capable, object buffer in send and receive directions	626
3IF772.9	aPCI interface module, 1 RS232 interface, 2 CAN interface, max. 500 kBit/s, CAN bus: electrically isolated, network-capable, object buffers in send and receive directions	627
3IF779.9	aPCI interface module, 1 X2X Link master interface, electrically isolated, 1 CAN interface, max. 500 kBit/s, object buffers in both send and receive directions, network-capable, electrically isolated, 1 RS485/RS422 interface	628
3IF781.9	aPCI interface module, 1 Ethernet interface 10/100 Base-T	629
3IF782.9-1	aPCI interface module, 1 POWERLINK V1/V2 interface, managing or controlled node, 1 RS485 interface to terminal block	630
3IF786.9-1	aPCI interface module, 1 POWERLINK V1/V2 interface, managing or controlled node, 1 RS232 interface	631
3IF787.9-1	aPCI interface module, 1 POWERLINK V1/V2 interface, managing or controlled node, 1 CAN interface, max. 500 kBit/s, object buffers in send and receive directions, network-capable, electrically isolated	632
3IF789.9-1	aPCI interface module 1 POWERLINK V1/V2 interface, managing or controlled node 1 X2X Link master interface, electrically isolated	633
3IF791.9	aPCI interface module, 1 X2X Link master interface, electrically isolated	634
3IF792.9	aPCI interface module, 2 X2X Link master interfaces, electrically isolated, 1 RS232 interface	635
3IF797.9-1	aPCI interface module, 1 X2X Link master interface, electrically isolated, 1 CAN interface, max. 500 kBit/s, object buffers in both send and receive directions, network-capable, electrically isolated, 1 RS232 interface	636

PCI communication modules

Model number	Short description	
5LS166.6	Logic scanner Profibus DP, PCI half-size module, 1 Profibus DP master interface, electrically isolated and network-capable, max. 12 MBit/s, max. 3.5 KB input data and max. 3.5 KB output data, RS232 configuration interface	637
5LS172.6	Logic scanner 2 x CAN bus, PCI half-size module, max. 500 kBit/s, object buffer in both send and receive directions, 256 KB SRAM (Automation Runtime), CAN bus: electrically isolated	638
5LS182.6-1	Logic scanner POWERLINK V1/V2, PCI half-size module, 1 POWERLINK V1/V2 interface, managing or controlled node, integrated 2x hub, 1 MB SRAM (Automation Runtime), order 1 x TB704 terminal block separately.	639
5LS187.6-1	Logic scanner POWERLINK V1/V2, PCI half-size module, 1 POWERLINK V1/V2 interface, managing or controlled node, 1 CAN interface module, max. 500 kBit/s, object buffers in send and receive directions, network-capable, electrically isolated, 1 MB SRAM (Automation Runtime)	640
5LS189.6-1	Logic scanner POWERLINK V1/V2, PCI half-size module, 1 POWERLINK V1/V2 interface, managing or controlled node, 1 X2X Link master interface, electrically isolated, 1 MB SRAM (Automation Runtime)	641
5LS197.6	Logic scanner X2X Link, PCI half-size module, 1 X2X Link master interface, electrically isolated, 1 CAN interface, max. 500 kBit/s, object buffers in send and receive directions, network-capable, electrically isolated, 1 MB SRAM (Automation Runtime)	642

Infrastructure components

Short description	
Hub, interface converter, bus adapter	672

aPCI interface module IF722



- CAN bus connection
- RS485/RS422 on DSUB
- RS485 on multipoint connector

CAN

Short description	3IF722.9
Communication module	1 x RS485/RS422, 1 x CAN bus, 1 x RS485
Interfaces	3IF722.9
Interface IF1	
Type	RS485/RS422
Design	9-pin DSUB socket
Maximum transfer rate	115.2 kBit/s
Interface IF2	
Type	CAN bus
Design	4-pin multipoint connector
Maximum transfer rate	500 kBit/s
Interface IF3	
Type	RS485
Design	4-pin multipoint connector
Maximum transfer rate	115.2 kBit/s
General information	3IF722.9
Status indicators	2 LEDs for sending/receiving data for IF1 1 LED each for sending data for IF2 and IF3
Diagnostics	
Data transfer	Yes, with status LEDs
Electrical isolation	
PLC - IFx	Yes
IFx - IFx	Yes
Power consumption	
3.3 V	0.74 W
5 V	1.0 W
Total	1.74 W
Certification	CE, C-UL-US, GOST-R
Mechanical characteristics	3IF722.9
Slot	Insert e.g. in CP360
Protection type	IP20
Operating / Storage temperature	0°C to +60°C / -25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Comment	Order 2 x 0TB704.9 terminal block separately

Required accessories		
0TB704.9	Accessory terminal block, 4-pin, screw clamp, 1.5 mm ²	680
Optional accessories		
0AC913.93	Bus adapter, CAN, 2 CAN interfaces, including 30 cm attachment cable (TB704)	692

aPCI interface module IF761



- Profibus DP slave connection
- RS232 can be configured as an online interface



Short description	3IF761.9	
Communication module	1 x RS232, 1 x Profibus DP slave	
Interfaces	3IF761.9	
Interface IF1		
Type	RS232	
Design	9-pin DSUB plug	
Maximum transfer rate	115.2 kBit/s	
Interface IF2		
Fieldbus	Profibus DP slave	
Type	RS485	
Design	9-pin DSUB socket	
Maximum transfer rate	12 MBit/s	
General information	3IF761.9	
Status indicators	Send/receive data via interface	
Diagnostics		
Data transfer	Yes, with status LEDs	
Electrical isolation		
PLC - IF1	No	
PLC - IF2	Yes	
IF1 - IF2	Yes	
Power consumption		
3.3 V	0.15 W	
5 V	1.2 W	
Total	1.35 W	
Certification	CE, C-UL-US, GOST-R	
Mechanical characteristics	3IF761.9	
Slot	Insert e.g. in CP360	
Protection type	IP20	
Operating / Storage temperature	0°C to +60°C / -25°C to +70°C	
Relative humidity	5 to 95%, non-condensing	

Optional accessories		
0G0001.00-090	Cable PC <-> PLC/PW, RS232, online cable	
0G1000.00-090	Bus connector, RS485, for Profibus networks	690

aPCI interface module IF762



- Profibus DP slave connection
- RS485/RS422 user-specific
- configuration possible



Short description	3IF762.9
Communication module	1 x RS485/RS422, 1 x Profibus DP slave
Interfaces	3IF762.9
Interface IF1	
Type	RS485/RS422
Design	9-pin DSUB socket
Maximum transfer rate	115.2 kBit/s
Interface IF2	
Fieldbus	Profibus DP slave
Type	RS485
Design	9-pin DSUB socket
Maximum transfer rate	12 MBit/s
General information	3IF762.9
Status indicators	Send/receive data via interface
Diagnostics	
Data transfer	Yes, with status LEDs
Electrical isolation	
PLC - IFx	Yes
IF1 - IF2	Yes
Power consumption	
3.3 V	0.15 W
5 V	1.29 W
Total	1.44 W
Certification	CE, C-UL-US, GOST-R
Mechanical characteristics	3IF762.9
Slot	Insert e.g. in CP360
Protection type	IP20
Operating / Storage temperature	0°C to +60°C / -25°C to +70°C
Relative humidity	5 to 95%, non-condensing

Optional accessories	
OG1000.00-090	Bus connector, RS485, for Profibus networks

690

aPCI interface module IF766



- Profibus DP master connection
- RS232 can be used as an online interface



Short description		3IF766.9
Communication module		1 x RS232, 1 x Profibus DP master
Interfaces		3IF766.9
Interface IF1		
Type	RS232	
Design	9-pin DSUB plug	
Maximum transfer rate	115.2 kBit/s	
Interface IF2		
Fieldbus	Profibus DP master	
Number of slaves	125	
Type	RS485	
Design	9-pin DSUB socket	
Maximum transfer rate	12 MBit/s	
General information		3IF766.9
Status indicators	2 LEDs for sending/receiving data for IF1 4 LEDs for IF2 bus function	
Diagnostics		
RS232 data transfer	Yes, with status LEDs	
Profibus DP bus function	Yes, with status LEDs	
Electrical isolation		
PLC - IF1	No	
PLC - IF2	Yes	
IF1 - IF2	Yes	
Power consumption		
3.3 V	0.8 W	
5 V	0.5 W	
Total	1.3 W	
Certification	CE, C-UL-US (in development), GOST-R	
Mechanical characteristics		3IF766.9
Slot	Insert e.g. in CP360	
Protection type	IP20	
Operating / Storage temperature	0°C to +60°C / -25°C to +70°C	
Relative humidity	5 to 95%, non-condensing	
Comment	Order Fieldbus Configurator separately	

Required accessories		
1A0550.03	B&R Fieldbus Configurator for Automation Studio versions ≥ V 2.5.2	
Optional accessories		
0G0001.00-090	Cable PC <-> PLC/PW, RS232, online cable	
0G1000.00-090	Bus connector, RS485, for Profibus networks	

690

aPCI interface module IF771



- CAN bus connection as a single interface

CAN

Short description	3IF771.9
Communication module	1 x CAN bus
Interfaces	3IF771.9
Interface IF1	
Type	CAN bus
Design	4-pin multipoint connector
Maximum transfer rate	500 kBit/s
General information	3IF771.9
Status indicators	Send/receive data for IF1
Diagnostics	
Data transfer	Yes, with status LEDs
Electrical isolation	
PLC - IF1	Yes
Power consumption	
3.3 V	0.64 W
5 V	0.66 W
Total	1.3 W
Certification	CE, C-UL-US, GOST-R
Mechanical characteristics	3IF771.9
Slot	Insert e.g. in CP360
Protection type	IP20
Operating / Storage temperature	0°C to +60°C / -25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Comment	Order 1 x TB704 terminal block separately

Required accessories		
0TB704.9	Accessory terminal block, 4-pin, screw clamp, 1.5 mm ²	680
0TB704.91	Accessory terminal block, 4-pin, cage clamps, 2.5 mm ²	680
Optional accessories		
0AC913.93	Bus adapter, CAN, 2 CAN interfaces, including 30 cm attachment cable (TB704)	692

aPCI interface module IF772



- Dual CAN bus connection
- RS232 can be configured as an online interface

CAN

Short description	3IF772.9
Communication module	1 x RS232, 2 x CAN bus
Interfaces	3IF772.9
Interface IF1	
Type	RS232
Design	9-pin DSUB plug
Maximum transfer rate	115.2 kBit/s
Interfaces IF2 and IF3	
Type	CAN bus
Design	2 x 4-pin multipoint connector
Maximum transfer rate	500 kBit/s
General information	3IF772.9
Status indicators	2 LEDs for sending/receiving data for IF1 1 LED each for sending data for IF2 and IF3
Diagnostics	
Data transfer	Yes, with status LEDs
Electrical isolation	
PLC - IF1	No
PLC - IF2/IF3	Yes
IFx - IFx	Yes
Power consumption	
3.3 V	0.2 W
5 V	1.8 W
Total	2.0 W
Certification	CE, C-UL-US, GOST-R
Mechanical characteristics	3IF772.9
Slot	Insert e.g. in CP360
Protection type	IP20
Operating / Storage temperature	0°C to +60°C / -25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Comment	Order 2 x 0TB704.9 terminal block separately

Required accessories		
0TB704.9	Accessory terminal block, 4-pin, screw clamp, 1.5 mm ²	680
Optional accessories		
0G0001.00-090	Cable PC <-> PLC/PW, RS232, online cable	
0AC913.93	Bus adapter, CAN, 2 CAN interfaces, including 30 cm attachment cable (TB704)	692

aPCI interface module IF779



- Multi-interface module
- E.g. axis applications via CAN bus
- E.g. high-speed I/O via X2X Link

CAN

Short description	3IF779.9
Communication module	1 x RS485/RS422, 1 x CAN bus, 1 x X2X Link master
Interfaces	3IF779.9
Interface IF1	
Type	RS485/RS422
Design	9-pin DSUB socket
Maximum transfer rate	115.2 kBit/s
Interface IF2	
Type	CAN bus
Design	4-pin multipoint connector
Maximum transfer rate	500 kBit/s
Interface IF3	
Type	X2X Link master
Design	4-pin multipoint connector
General information	3IF779.9
Status indicators	
	2 LEDs for sending/receiving data for IF1
	1 LED each for sending/receiving data for IF2 and IF3
Diagnostics	
Data transfer	Yes, with status LEDs
Electrical isolation	
PLC - IFx	Yes
IFx - IFx	Yes
Power consumption	
3.3 V	0.77 W
5 V	1.74 W
Total	2.51 W
Certification	CE, C-UL-US, GOST-R
Mechanical characteristics	3IF779.9
Slot	Insert e.g. in CP360
Protection type	IP20
Operating / Storage temperature	0°C to +60°C / -25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Comment	Order 2 x 0TB704.9 terminal block separately

Required accessories		
0TB704.9	Accessory terminal block, 4-pin, screw clamp, 1.5 mm ²	680
Optional accessories		
0AC913.93	Bus adapter, CAN, 2 CAN interfaces, including 30 cm attachment cable (TB704)	692

aPCI interface module IF781



- Ethernet 10/100 MBit/s as a single interface

Short description	3IF781.9	
Communication module	1 x Ethernet	
Interfaces	3IF781.9	
Interface IF1		
Type	Ethernet	
Design	Shielded RJ45 port	
Transfer rate	10/100 MBit/s	
Cable length	Max. 100 m between two stations (segment length)	
General information	3IF781.9	
Status indicators	Transfer rate, send/receive data	
Diagnostics		
Transfer rate	Yes, with status LED	
Data transfer	Yes, with status LED	
Electrical isolation		
PLC - IF1	Yes	
Power consumption		
3.3 V	0.66 W	
5 V	-	
Total	0.66 W	
Certification	CE, C-UL-US, GOST-R	
Mechanical characteristics	3IF781.9	
Slot	Insert e.g. in CP360	
Protection type	IP20	
Operating / Storage temperature	0°C to +60°C / -25°C to +70°C	
Relative humidity	5 to 95%, non-condensing	

aPCI interface module IF782



- POWERLINK V1/V2 for real-time Ethernet communication
- RS485 on multipoint connector

ETHERNET 
POWERLINK

Short description		3IF782.9-1
Communication module		1 x RS485, 1 x POWERLINK V1/V2 managing or controlled node
Interfaces		3IF782.9-1
Interface IF1		
Type	RS485	
Design	4-pin multipoint connector	
Maximum transfer rate	115.2 kBit/s	
Interface IF2		
Fieldbus	POWERLINK V1/V2	
Type	100 Base-T (ANSI/IEEE 802.3)	
Design	Shielded RJ45 port	
Transfer rate	100 MBit/s	
Cable length	Max. 100 m between two stations (segment length)	
General information		3IF782.9-1
Status indicators		Send/receive data for IF1 Status of Ethernet POWERLINK station, network activity, link/collision for IF2
Diagnostics		
Data transfer (IF1)	Yes, with status LEDs	
Station status (IF2)	Yes, with status LED and software status	
Bus function (IF2)	Yes, with status LED and software status	
Electrical isolation		
PLC - IFx	Yes	
IF1 - IF2	Yes	
Power consumption		
3.3 V	2.5 W	
5 V	0.3 W	
Total	2.8 W	
Certification	CE, C-UL-US, GOST-R	
Mechanical characteristics		3IF782.9-1
Slot	Insert e.g. in CP360	
Protection type		
Operating / Storage temperature	0°C to +60°C / -25°C to +70°C	
Relative humidity	5 to 95%, non-condensing	
Comment	Order 1 x TB704 terminal block separately	

Required accessories		
0TB704.9	Accessory terminal block, 4-pin, screw clamp, 1.5 mm ²	680
0TB704.91	Accessory terminal block, 4-pin, cage clamps, 2.5 mm ²	680

aPCI interface module IF786



- Multi-interface module
- POWERLINK V1/V2 for real-time Ethernet communication
- RS232 can be configured as an online interface

ETHERNET 
POWERLINK

Short description		3IF786.9-1
Communication module	1 x RS232, 1 x POWERLINK V1/V2 managing or controlled node	
Interfaces		3IF786.9-1
Interface IF1		
Type	RS232	
Design	9-pin DSUB plug	
Maximum transfer rate	115.2 kBit/s	
Interface IF2		
Fieldbus	POWERLINK V1/V2	
Type	100 Base-T (ANSI/IEEE 802.3)	
Design	Shielded RJ45 port	
Transfer rate	100 MBit/s	
Cable length	Max. 100 m between two stations (segment length)	
General information		3IF786.9-1
Status indicators	Send/receive data for IF1 Status of Ethernet POWERLINK station, network activity, link/collision for IF2	
Diagnostics		
Data transfer (IF1)	Yes, with status LEDs	
Station status (IF2)	Yes, with status LED and software status	
Bus function (IF2)	Yes, with status LED and software status	
Electrical isolation		
PLC - IF1	No	
PLC - IF2	Yes	
IF1 - IF2	Yes	
Power consumption		
3.3 V	2.0 W	
5 V	0.5 W	
Total	2.5 W	
Certification	CE, C-UL-US, GOST-R	
Mechanical characteristics		3IF786.9-1
Slot	Insert e.g. in CP360	
Protection type	IP20	
Operating / Storage temperature	0°C to +60°C / -25°C to +70°C	
Relative humidity	5 to 95%, non-condensing	

Optional accessories

OG0001.00-090	Cable PC <-> PLC/PW, RS232, online cable
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aPCI interface module IF787



- Interface module with CAN bus and POWERLINK V1/V2

ETHERNET 
POWERLINK
CAN

Short description		3IF787.9-1
Communication module		1 x CAN-bus, 1 x POWERLINK V1/V2 managing or controlled node
Interfaces		3IF787.9-1
Interface IF1		
Type	CAN bus	
Design	4-pin multipoint connector	
Maximum transfer rate	500 kBit/s	
Interface IF2		
Fieldbus	POWERLINK V1/V2	
Type	100 Base-T (ANSI/IEEE 802.3)	
Design	Shielded RJ45 port	
Transfer rate	100 MBit/s	
Cable length	Max. 100 m between two stations (segment length)	
General information		3IF787.9-1
Status indicators		Send/receive data for IF1 Status of Ethernet POWERLINK station, network activity, link/collision for IF2
Diagnostics		
Data transfer (IF1)	Yes, with status LED and software status	
Station status (IF2)	Yes, with status LED and software status	
Bus function (IF2)	Yes, with status LED and software status	
Electrical isolation		
PLC - IFx	Yes	
IF1 - IF2	Yes	
Power consumption		
3.3 V	2.5 W	
5 V	0.5 W	
Total	3.0 W	
Certification	CE, C-UL-US, GOST-R	
Mechanical characteristics		3IF787.9-1
Slot	Insert e.g. in CP360	
Protection type	IP20	
Operating / Storage temperature	0°C to +60°C / -25°C to +70°C	
Relative humidity	5 to 95%, non-condensing	
Comment	Order 1 x TB704 terminal block separately	

Required accessories		
0TB704.9	Accessory terminal block, 4-pin, screw clamp, 1.5 mm ²	 680
0TB704.91	Accessory terminal block, 4-pin, cage clamps, 2.5 mm ²	 680
Optional accessories		
0AC913.93	Bus adapter, CAN, 2 CAN interfaces, including 30 cm attachment cable (TB704)	 692

aPCI interface module IF789



- POWERLINK V1/V2
- Direct connection for high-speed I/O

ETHERNET 
POWERLINK

Short description		3IF789.9-1
Communication module	1 x X2X Link master, 1 x POWERLINK V1/V2 managing or controlled node	
Interfaces		3IF789.9-1
Interface IF1		
Type	X2X Link master	
Design	4-pin multipoint connector	
Interface IF2		
Fieldbus	POWERLINK V1/V2	
Type	100 Base-T (ANSI/IEEE 802.3)	
Design	Shielded RJ45 port	
Transfer rate	100 MBit/s	
Cable length	Max. 100 m between two stations (segment length)	
General information		3IF789.9-1
Status indicators		
	Send/receive data for IF1	
	Status of Ethernet POWERLINK station, network activity, link/collision for IF2	
Diagnostics		
Data transfer (IF1)	Yes, with status LED and software status	
Station status (IF2)	Yes, with status LED and software status	
Bus function (IF2)	Yes, with status LED and software status	
Electrical isolation		
PLC - IFx	Yes	
IF1 - IF2	Yes	
Power consumption		
3.3 V	2.3 W	
5 V	0.5 W	
Total	2.8 W	
Certification	CE, C-UL-US, GOST-R	
Mechanical characteristics		3IF789.9-1
Slot	Insert e.g. in CP360	
Protection type	IP20	
Operating / Storage temperature	0°C to +60°C / -25°C to +70°C	
Relative humidity	5 to 95%, non-condensing	
Comment	Order 1 x TB704 terminal block separately	

Required accessories		
0TB704.9	Accessory terminal block, 4-pin, screw clamp, 1.5 mm ²	680
0TB704.91	Accessory terminal block, 4-pin, cage clamps, 2.5 mm ²	680

aPCI interface module IF791



- X2X Link connection

Short description	3IF791.9	
Communication module	1 x X2X Link master	
Interfaces	3IF791.9	
Interface IF1		
Type	X2X Link master	
Design	4-pin multipoint connector	
General information	3IF791.9	
Status indicators	Data transmission and status of IF1	
Diagnostics		
Data transfer	Yes, with status LED	
Electrical isolation		
PLC - IF1	Yes	
Power consumption		
3.3 V	0.43 W	
5 V	0.76 W	
Total	1.19 W	
Certification	CE, C-UL-US, GOST-R	
Mechanical characteristics	3IF791.9	
Slot	Insert e.g. in CP360	
Protection type	IP20	
Operating / Storage temperature	0°C to +60°C / -25°C to +70°C	
Relative humidity	5 to 95%, non-condensing	
Comment	Order 1 x TB704 terminal block separately	

Required accessories		
0TB704.9	Accessory terminal block, 4-pin, screw clamp, 1.5 mm ²	680
0TB704.91	Accessory terminal block, 4-pin, cage clamps, 2.5 mm ²	680

aPCI interface module IF792



- Dual X2X Link connection
- RS232 can be configured as an online interface

Short description	3IF792.9
Communication module	1 x RS232, 2 x X2X Link master
Interfaces	3IF792.9
Interface IF1	
Type	RS232
Design	9-pin DSUB plug
Maximum transfer rate	115.2 kBit/s
IF2/IF3 Interface	
Type	X2X Link master
Design	4-pin multipoint connector
General information	3IF792.9
Status indicators	2 LEDs for sending/receiving data for IF1 1 LED each for sending/receiving data for IF2 and IF3
Diagnostics	
Data transfer	Yes, with status LEDs
Electrical isolation	
PLC - IF1	No
PLC - IF2/IF3	Yes
IFx - IFx	Yes
Power consumption	
3.3 V	0.5 W
5 V	1.35 W
Total	1.85 W
Certification	CE, C-UL-US, GOST-R
Mechanical characteristics	3IF792.9
Slot	Insert e.g. in CP360
Protection type	IP20
Operating / Storage temperature	0°C to +60°C / -25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Comment	Order 2 x 0TB704.9 terminal block separately

Required accessories		
0TB704.9	Accessory terminal block, 4-pin, screw clamp, 1.5 mm ²	680
Optional accessories		
0G0001.00-090	Cable PC <-> PLC/PW, RS232, online cable	

aPCI interface module IF797



- X2X connection
- CAN bus interface
- RS232 can be configured as an online interface

CAN

Short description		3IF797.9-1
Communication module		1 x RS232, 1 x CAN bus, 1 x X2X Link master
Interfaces		3IF797.9-1
Interface IF1		
Type		RS232
Design		9-pin DSUB plug
Maximum transfer rate		115.2 kBit/s
Interface IF2		
Type		CAN bus
Design		4-pin multipoint connector
Maximum transfer rate		500 kBit/s
Interface IF3		
Type		X2X Link master
Design		4-pin multipoint connector
General information		3IF797.9-1
Status indicators		2 LEDs for sending/receiving data for IF1 1 LED each for sending/receiving data for IF2 and IF3
Diagnostics		
Data transfer		Yes, with status LEDs
Electrical isolation		
PLC - IF1		No
PLC - IF2/IF3		Yes
IFx - IFx		Yes
Power consumption		
3.3 V		0.68 W
5 V		1.28 W
Total		1.96 W
Certification		CE, C-UL-US, GOST-R
Mechanical characteristics		3IF797.9-1
Slot		Insert e.g. in CP360
Protection type		IP20
Operating / Storage temperature		0°C to +60°C / -25°C to +70°C
Relative humidity		5 to 95%, non-condensing
Comment		Order 2 x 0TB704.9 terminal block separately Replaces interface module 3IF797.9 starting with AS 2.4

Required accessories		
0TB704.9	Accessory terminal block, 4-pin, screw clamp, 1.5 mm ²	680
Optional accessories		
0G0001.00-090	Cable PC <-> PLC/PW, RS232, online cable	
0AC913.93	Bus adapter, CAN, 2 CAN interfaces, including 30 cm attachment cable (TB704)	692

Logic scanner LS166



- Profibus DP master connection
- RS232 interface



Short description		5LS166.6
Communication module	1 x RS232, 1 x Profibus DP master	
Interfaces		5LS166.6
Interface IF1		
Type	RS232	
Design	9-pin DSUB plug	
Maximum transfer rate	115.2 kBit/s	
Interface IF2		
Fieldbus	Profibus DP master	
Number of slaves	125	
Type	RS485	
Design	9-pin DSUB socket	
Maximum transfer rate	12 MBit/s	
General information		5LS166.6
Status indicators	2 LEDs for sending/receiving data for IF1 4 LEDs for IF2 bus function	
Diagnostics		
RS232 data transfer	Yes, with status LEDs and software status	
Profibus DP bus function	Yes, with status LEDs and software status	
SRAM	1 MB, battery-backup	
Ready relay	No	
Electrical isolation		
PC - IF1	No	
PC - IF2	Yes	
IF1 - IF2	Yes	
Power consumption	1.5 W	
Certification	CE, C-UL-US (in development), GOST-R	
Mechanical characteristics		5LS166.6
Slot	Standard PCI half-size module, ISA Plug & Play	
Installation in		
B&R Automation PC APC620/810	Yes	
B&R Panel PC PPC700	Yes	
Desktop PC	Yes	
Protection type	IP20 when installed	
Operating / Storage temperature	0°C to +55°C / -25°C to +70°C	
Relative humidity	0 to 95%, non-condensing	
Comment	Order Fieldbus Configurator separately Lithium battery included in delivery	

Required accessories	
1A0550.03	B&R Fieldbus Configurator for Automation Studio versions ≥ V 2.5.2
Optional accessories	
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell
0AC201.9	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell
0G0001.00-090	Cable PC <-> PLC/PW, RS232, online cable
0G1000.00-090	Bus connector, RS485, for Profibus networks, remote I/O

690

Logic scanner LS172



- Dual CAN bus connection

CAN

Short description	5LS172.6
Communication module	2 x CAN bus
Interfaces	5LS172.6
Interface IF1/IF2	
Type	CAN bus
Design	2 x 4-pin multipoint connector
Maximum transfer rate	500 kBit/s
General information	5LS172.6
Status indicators	-
Diagnostics	
Data transfer	Yes, with software status
SRAM	256 KB, battery-backup
Ready relay	N.O. and N.C., max. 30 VDC, max. 6 A
Electrical isolation	
PC - IF1/IF2	Yes
IF1 - IF2	Yes
Power consumption	2.4 W
Certification	CE, C-UL-US, GOST-R
Mechanical characteristics	5LS172.6
Slot	Standard PCI half-size module, ISA Plug & Play
Installation in	
B&R Automation PC APC620/810	Yes
B&R Panel PC PPC700	Yes
Desktop PC	Yes
Protection type	IP20 when installed
Operating / Storage temperature	0°C to +55°C / -25°C to +70°C
Relative humidity	0 to 95%, non-condensing
Comment	3 x 0TB704.9 terminal blocks included in delivery Lithium battery included in delivery

Optional accessories		
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell	
0AC201.9	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	
0TB704.9	Accessory terminal block, 4-pin, screw clamp, 1.5 mm ²	680
0TB704.91	Accessory terminal block, 4-pin, cage clamps, 2.5 mm ²	680
0AC913.93	Bus adapter, CAN, 2 CAN interfaces, including 30 cm attachment cable (TB704)	692

Logic scanner LS182



- POWERLINK V1/V2 for real-time Ethernet communication
- Integrated hub for efficient cabling
- Configurable ring redundancy

ETHERNET 
POWERLINK

Short description	5LS182.6-1
Communication module	1 x POWERLINK V1/V2 managing or controlled node
Interfaces	5LS182.6-1
Interface IF1	
Fieldbus	POWERLINK V1/V2
Type	100 Base-T (ANSI/IEEE 802.3)
Design	Internal 2x hub, 2 x shielded RJ45 port
Transfer rate	100 MBit/s
Cable length	Max. 100 m between two stations (segment length)
General information	5LS182.6-1
Status indicators	Status of Ethernet POWERLINK station, network activity, link
Diagnostics	
Station status	Yes, with status LED and software status
Bus function	Yes, with status LED and software status
SRAM	1 MB, battery-backup
Ready relay	N.O. and N.C., max. 30 VDC, max. 6 A
Electrical isolation	
PC - IF1	Yes
Power consumption	2 W
Certification	CE, C-UL-US (in development), GOST-R (in development)
Mechanical characteristics	5LS182.6-1
Slot	Standard PCI half-size module, ISA Plug & Play
Installation in	
B&R Automation PC APC620/810	Yes
B&R Panel PC PPC700	Yes
Desktop PC	Yes
Protection type	IP20 when installed
Operating / Storage temperature	0°C to +55°C / -25°C to +70°C
Relative humidity	0 to 95%, non-condensing
Comment	Order 1 x TB704 terminal block separately Lithium battery included in delivery

Required accessories		
0TB704.9	Accessory terminal block, 4-pin, screw clamp, 1.5 mm ²	 680
0TB704.91	Accessory terminal block, 4-pin, cage clamps, 2.5 mm ²	 680

Optional accessories		
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell	
0AC201.9	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	

Logic scanner LS187



- Interface module with CAN bus and POWERLINK V1/V2

ETHERNET 
POWERLINK
CAN

Short description		5LS187.6-1
Communication module	1 x CAN-bus, 1 x POWERLINK V1/V2 managing or controlled node	
Interfaces		5LS187.6-1
Interface IF1		
Type	CAN bus	
Design	4-pin multipoint connector	
Maximum transfer rate	500 kBit/s	
Interface IF2		
Fieldbus	POWERLINK V1/V2	
Type	100 Base-T (ANSI/IEEE 802.3)	
Design	Shielded RJ45 port	
Transfer rate	100 MBit/s	
Cable length	Max. 100 m between two stations (segment length)	
General information		5LS187.6-1
Status indicators	Status of Ethernet POWERLINK station, network activity, link/collision for IF2	
Diagnostics		
Data transfer (IF1)	Yes, with software status	
Station status (IF2)	Yes, with status LED and software status	
Bus function (IF2)	Yes, with status LED and software status	
SRAM	1 MB, battery-backup	
Ready relay	N.O. and N.C., max. 30 VDC, max. 6 A	
Electrical isolation		
PC - IFx	Yes	
IF1 - IF2	Yes	
Power consumption	4.0 W	
Certification	CE, C-UL-US, GOST-R	
Mechanical characteristics		5LS187.6-1
Slot	Standard PCI half-size module, ISA Plug & Play	
Installation in		
B&R Automation PC APC620/810	Yes	
B&R Panel PC PPC700	Yes	
Desktop PC	Yes	
Protection type	IP20 when installed	
Operating / Storage temperature	0°C to +55°C / -25°C to +70°C	
Relative humidity	0 to 95%, non-condensing	
Comment	Order 2 x TB704 terminal blocks separately Lithium battery included in delivery	

Required accessories		
0TB704.9	Accessory terminal block, 4-pin, screw clamp, 1.5 mm ²	680
0TB704.91	Accessory terminal block, 4-pin, cage clamps, 2.5 mm ²	680

Optional accessories		
4A0006.00-000	Lithium batteries, 3 V / 950 mAh, button cell	
0AC201.9	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	
0AC913.93	Bus adapter, CAN, 2 CAN interfaces, including 30 cm attachment cable (TB704)	692

Logic scanner LS189



- POWERLINK V1/V2
- X2X Link connection

ETHERNET 
POWERLINK

Short description	5LS189.6-1
Communication module	1 x X2X Link master, 1 x POWERLINK V1/V2 managing or controlled node
Interfaces	5LS189.6-1
Interface IF1	
Type	X2X Link master
Design	4-pin multipoint connector
Interface IF2	
Fieldbus	POWERLINK V1/V2
Type	100 Base-T (ANSI/IEEE 802.3)
Design	Shielded RJ45 port
Transfer rate	100 MBit/s
Cable length	Max. 100 m between two stations (segment length)
General information	5LS189.6-1
Status indicators	Status of Ethernet POWERLINK station, network activity, link/collision for IF2
Diagnostics	
Data transfer (IF1)	Yes, with software status
Station status (IF2)	Yes, with status LED and software status
Bus function (IF2)	Yes, with status LED and software status
SRAM	1 MB, battery-backup
Ready relay	N.O. and N.C., max. 30 VDC, max. 6 A
Electrical isolation	
PC - IFx	Yes
IF1 - IF2	Yes
Power consumption	4.0 W
Certification	CE, C-UL-US, GOST-R
Mechanical characteristics	5LS189.6-1
Slot	Standard PCI half-size module, ISA Plug & Play
Installation in	
B&R Automation PC APC620/810	Yes
B&R Panel PC PPC700	Yes
Desktop PC	Yes
Protection type	IP20 when installed
Operating / Storage temperature	0°C to +55°C / -25°C to +70°C
Relative humidity	0 to 95%, non-condensing
Comment	Order 2 x TB704 terminal blocks separately Lithium battery included in delivery

Required accessories		
0TB704.9	Accessory terminal block, 4-pin, screw clamp, 1.5 mm ²	680
0TB704.91	Accessory terminal block, 4-pin, cage clamps, 2.5 mm ²	680

Optional accessories		
4A0006.00-000	Lithium batteries, 3 V / 950 mAh, button cell	
0AC201.9	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	

Logic scanner LS197



- X2X Link connection
- CAN bus interface

CAN

Short description		5LS197.6
Communication module		1 x CAN Bus, 1 x X2X Link master
Interfaces		5LS197.6
Interface IF1		
Type		CAN bus
Design		4-pin multipoint connector
Maximum transfer rate		500 kBit/s
Interface IF2		
Type		X2X Link master
Design		4-pin multipoint connector
General information		5LS197.6
Status indicators		1 LED per interface for sending data
Diagnostics		
Data transfer		Yes, with status LED and software status
SRAM		1 MB, battery-backup
Ready relay		N.O. and N.C., max. 30 VDC, max. 6 A
Electrical isolation		
PC - IFx		Yes
IF1 - IF2		Yes
Power consumption		2.28 W
Certification		CE, C-UL-US (in development), GOST-R
Mechanical characteristics		5LS197.6
Slot		Standard PCI half-size module, ISA Plug & Play
Installation in		
B&R Automation PC APC620/810		Yes
B&R Panel PC PPC700		Yes
Desktop PC		Yes
Protection type		IP20 when installed
Operating / Storage temperature		0°C to +60°C / -25°C to +70°C
Relative humidity		5 to 95%, non-condensing
Comment		Order 2 x 0TB704.9 terminal block separately Lithium battery included in delivery

Required accessories		
0TB704.9	Accessory terminal block, 4-pin, screw clamp, 1.5 mm ²	680

Optional accessories		
4A0006.00-000	Lithium batteries, 3 V / 950 mAh, button cell	
0AC201.9	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	
0AC913.93	Bus adapter, CAN, 2 CAN interfaces, including 30 cm attachment cable (TB704)	692





Power supplies

Switching power supplies and accessories

The supplementary power supplies offered by B&R allow us to provide complete system solutions.

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System characteristics

Power supply on the mounting rail

In order to meet demands for complete, comprehensive system solutions, power supplies for mounting rail installation are available in the B&R product line. This extensive spectrum ranges from single-phase power supplies that supply 2.1 A up to three-phase power supplies that supply 40 A. All switching power supplies can handle a wide range of AC and DC input voltages. This input voltage ranges from 100 to 240 VAC and 400 to 500 VAC as well as from 85 to 375 VDC. Devices are protected against short circuit, overload, and open circuit, which allows them to be operated without functional limitations or derating even when overloads between 15% and 25% occur.

Two mini power supplies (PS102 and PS104) in robust plastic housing are available in the lower performance range. A well-designed cooling concept allows several different mounting orientations. The functional DIN rail allows fast mounting and demounting. Wiring is essentially performed in seconds thanks to the cage clamp terminals used. The compact design, easy mounting and several different mounting orientations make the two smallest power supplies in this product line components that can be used practically anywhere.

All other power supplies (starting with PS105) feature a metal housing, which protects the internal electronics from small parts (such as screws) using a fine ventilation grid. Sophisticated mounting mechanics enable user-friendly installation on the mounting rail. Simply hang the unit, snap it in and you are finished. Even the 40 A unit sits as though it were screwed in.

Optimal layout of the connections and control elements

The connection terminals and control elements are clearly arranged on the front side and are well labeled. The terminals are easily accessible on the bottom and/or top edges of the unit's front side. The large size and stability of the terminals also allow the use of a battery-operated screw driver. Furthermore, the terminals are designed so that the cable does not require heat protection even when using larger devices.

Safety is important to us

Electronic current limiting protects against overload and short circuit. The **overvoltage protection** protects connected devices in the event that the controlled system fails. The **overtemperature protection** initiates a continuous reduction of output power when the temperature gets too high (thermal load distribution). Units with three-phase input are equipped with a **phase monitor**, which switches the unit to hiccup mode if one of the phases fails. If two phases are sufficient for supplying the load then the unit will continue to operate.

Selection guide

	OPS102.0	OPS104.0	OPS105.1	OPS105.2	OPS110.1	OPS110.2	OPS120.1	OPS305.1	OPS310.1	OPS320.1	OPS340.1
Output power	50 W	100 W	120 W	120 W	240 W	240 W	480 W	120 W	240 W	490 W	960 W
AC input voltage	85-264 V	85-132 V 184-264 V	85-132 V 176-264 V	85-132 V 176-264 V	85-132 V 176-264 V	85-132 V 176-264 V	85-132 V 184-264 V	340-576 V	340-576 V	340-576 V	340-575 V
DC input voltage	85-375 V	220-375 V	210-375 V	210-375 V	240-375 V	240-375 V	-	450-820 V	450-820 V	450-820 V	-
Output voltage	24-28 V	24-28 V	24 V	24 V	24-28 V	24 V	24-28 V	24-28 V	24-28 V	24-28 V	24-28 V
Output current at 24 V	2.1 A	4.2 A	5 A	5 A	10 A	10 A	20 A	5 A	10 A	20 A	40 A
Parallel operation	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Current balancing	No	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes	Yes
1/3 phase	1	1	1	1	1	1	1	3	3	3	3
Page	650	651	652	653	654	655	656	657	658	659	660

Reserves

The power supplies contain a certain amount of reserves so that your units do not immediately switch off when minimal overload occurs:

- **25% power reserves:** It is possible that you could briefly (<1 min.) require 25 A when operating at a rated current of e.g. 20 A. At 45°C (instead of 60°C) or with forced ventilation, you could even sustain this current permanently.
- **Overload design:** Some units provide 1.5x to 2x the rated current when overload occurs - permanently, without hiccup or switching off!
- In addition, you can also connect the same power supplies **in parallel** without any startup problems and with current distribution if necessary.

Electromagnetic compatibility (EMC)

All units meet the EN 61000-6-3 (emissions) and EN 61000-6-2 (immunity to disturbances) standards in the highest respective classes. Furthermore, noise suppression is also provided in the output so that even long, unshielded lines do not emit noise. The larger units are additionally provided with:

- An **active transient filter** to prevent the danger of voltage spikes from the mains.
- An **active turn-on delay**, which is also fully functional on warm units. As a result, even the PS340 (24 V/40 A) allows protection with standard circuit breakers, which are used in the line in any case.
- **Phase monitoring** (with three-phase input), so that the unit and the preceding supply lines are not overloaded if one phase fails.

In addition to these functions, EMC will also be included with the CE certification. Furthermore, the power supplies also meet the EN 50178, EN 60204-1 and UL508 LISTED standards in addition to the standard international certifications (IEC 60950, EN 60950, UL 60950, CUL CSA-C22.2 No 60950).

Product overview

Single-phase power supplies



Model number	Short description	
OPS102.0	24 VDC power supply, 1 phase, 50 W, input 100-240 VAC, wide range, DIN rail mounting	650
OPS104.0	24 VDC power supply, 1 phase, 100 W, input 115/230 VAC, auto select, DIN rail mounting	651
OPS105.1	24 VDC power supply, 1 phase, 5 A, input 115/230 VAC, manual select, DIN rail mounting	652
OPS110.1	24 VDC power supply, 1 phase, 10 A, input 115/230 VAC, manual select, DIN rail mounting	654
OPS120.1	24 VDC power supply, 1 phase, 20 A, input 115/230 VAC, auto select, DIN rail mounting	656

Three-phase power supplies



Model number	Short description	
OPS305.1	24 VDC power supply, 3-phase, 5 A, input 400..500 VAC (3 phases), wide range, DIN rail mounting	657
OPS310.1	24 VDC power supply, 3-phase, 10 A, input 400..500 VAC (3 phases), wide range, DIN rail mounting	658
OPS320.1	24 VDC power supply, 3-phase, 20 A, input 400..500 VAC (3 phases), wide range, DIN rail mounting	659
OPS340.1	24 VDC power supply, 3-phase, 40 A, input 400..500 VAC (3 phases), wide range, DIN rail mounting	660

Redundant single-phase power supplies



Model number	Short description	
OPS105.2	24 VDC power supply, 1 phase, 5 A, redundant through parallel operation, input 115/230 VAC, manual select, DIN rail mounting	653
OPS110.2	24 VDC power supply, 1 phase, 10 A, redundant through parallel operation, input 115/230 VAC, manual select, DIN rail mounting	655

Buffer module



Model number	Short description	
OPB020.1	24 VDC buffer module, 0-20 A, 0.2 s / 20 A to 3.6 s / 1 A, DIN rail mounting	662

Uninterruptible power supply



Model number	Short description	
9A0100.11	USV 24 V DC, 24 V DC input, 24 V DC output, serial interface	664
9A0100.12	UPS battery unit type A, 24 V, 7 Ah, incl. battery cage	666
9A0100.13	UPS battery type A (replacement part); 2 x 12 V, 7 Ah, for battery unit 9A0100.12	
9A0100.14	UPS battery unit type B, 24 V, 2.2 Ah, incl. battery cage	666
9A0100.15	UPS batteries type B (replacement part); 2 x 12 V, 2.2 Ah, for battery unit 9A0100.14	
9A0100.16	UPS battery unit type C, 24 V; 4.5 Ah; incl. battery cage	666
9A0100.17	UPS batteries type C (replacement part); 2 x 12 V, 4.5 Ah, for battery unit 9A0100.16	

PS102



- 100-240 V wide range input
- Overload design (does not switch off during overloads up to 1.5 times nominal current)
- Worldwide certification (UL, EN, CSA, CB scheme) for industry and home/office
- Compact design
- Problem-free and fast mounting and connection (no tools necessary)

Input	0PS102.0
Input voltage	AC 85-264 V (wide range), 47-63 Hz DC 85-375 V
Input current	<1.0 A (at AC 100 V, 50 W P _{out}) <0.6 A (at AC 196 V, 50 W P _{out})
External overcurrent protection	Not required, unit equipped with internal fuse
Transient immunity	Transient resistance according to VDE 0160 / W2
Output (including logic)	0PS102.0
Output power	50 W
Rated voltage	DC 24-28 V (default: 24.5 V ±0.5%)
Permitted output load	Up to 2.1 A continuously (convection cooling)
Overvoltage protection	< 40 V
Protection functions	Output protected against continuous short circuit, open circuit and overload
Power back immunity	35 V
Output noise suppression	Unit complies with EN 61000-6-3 (class B)
General information	0PS102.0
Certification	CE, C-UL-US, GOST-R
Operation indicator	Green LED (DC OK), threshold V _{out} = 20 V
"Power good" output	For controlling a 24 V relay
Terminals	Cage clamp terminals (spring clamp)
Connection cross section	Solid: 0.3 - 2.5 mm ² / 28 - 12 AWG Flexible: 0.3 - 4 mm ² / 28 - 12 AWG
Efficiency, Reliability	0PS102.0
Efficiency	Typ. 88.5% (at AC 230 V, 24 V / 2.1 A)
Loss	Typ. 6.8 W (at AC 230 V, 24 V / 2.1 A)
MTBF (reliability)	Approx. 600,000 h
Mechanical characteristics	0PS102.0
Installation	Easy snap-on mounting onto the DIN rail
Ventilation / Cooling	Normal convection, no fan required
Operating / Storage temperature	-10°C to +70°C / -25°C to +85°C
Relative humidity	Max. 95%, non-condensing
Dimensions (W x H x D [mm])	45 x 75 x 91 (+rail)
Weight	240 g



- 115/230 V auto select input with overload design (high output overload capacity)
- Selectable single/parallel operation (jumper on front)
- Worldwide certification (UL, EN, CSA, CB scheme) for industry and home/office
- Compact design
- Problem-free and fast mounting and connection (no tools necessary)

Input	0PS104.0
Input voltage	AC 85-132 / 184-264 V (auto select), 47-63 Hz DC 220-375 V
Input current	<2.1 A (at AC 100 V, 100 W P _{out}) <1 A (at AC 220 V, 100 W P _{out})
External overcurrent protection	Not required, unit equipped with internal fuse
Transient immunity	Transient resistance according to VDE 0160 / W2
Output (including logic)	0PS104.0
Output power	100 W
Rated voltage	DC 24-28 V (default: 24.5 V ±0.5%)
Permitted output load	Up to 4.2 A continuously (convection cooling)
Overvoltage protection	< 36 V
Protection functions	Unit protected against continuous short circuit, overload and open circuit
Power back immunity	35 V
Output noise suppression	Unit complies with EN 61000-6-3 (class B)
General information	0PS104.0
Certification	CE, C-UL-US, GOST-R
Operation indicator	Green LED (DC OK)
Terminals	Cage clamp terminals (spring clamp)
Connection cross section	Solid: 0.3 - 2.5 mm ² / 28 - 12 AWG Flexible: 0.3 - 4 mm ² / 28 - 12 AWG
Efficiency, Reliability	0PS104.0
Efficiency	Typ. 90% (at AC 230 V, 24.5 V / 4.2 A)
Loss	Typ. 11.4 W (at AC 230 V, 24.5 V / 4.2 A)
MTBF (reliability)	Approx. 500,000 h
Mechanical characteristics	0PS104.0
Installation	Easy snap-on mounting onto the DIN rail
Ventilation / Cooling	Normal convection, no fan required
Operating / Storage temperature	-10°C to +70°C / -25°C to +85°C
Relative humidity	Max. 95%, non-condensing
Dimensions (W x H x D [mm])	73 x 75 x 103 (+rail)
Weight	360 g

PS105.1



- Quasi wide range input:
AC 230 V / 115 V
- Power boost up to 6 A
- High overload current, no switch off
- Robust mechanics and EMC
- Closed metal housing

Input	OPS105.1
Input voltage	AC 85-132 / 176-264 V (switchable), 47-63 Hz DC 210-375 V
Input current	<2.6 A (switch in 115 V position) <1.4 A (switch in 230 V position)
External overcurrent protection	Not required, unit equipped with internal fuse Recommendation: Use circuit breaker for supply lines
Transient immunity	Transient resistance according to VDE 0160 / W2
Output (including logic)	OPS105.1
Output power	120 W
Rated voltage	24 VDC +5% -1%
Permitted output load	5 A
Overvoltage protection	Typ. 29 V
Protection functions	Output protected against short circuit, open circuit and overload
Power back immunity	26 V
Output noise suppression	Unit complies with EN 61000-6-3 (class B)
General information	OPS105.1
Certification	CE, C-UL-US, GOST-R
Operation indicator	Green LED on front panel (goes out when $V_{out} < 18$ V)
Terminals	Robust screw terminals
Connection cross section	Solid: 0.5 - 6 mm ² / 20 - 10 AWG Flexible: 0.5 - 4 mm ² / 20 - 10 AWG
Efficiency, Reliability	OPS105.1
Efficiency	Typ. 90% (230 VAC, 24 V / 5 A)
Loss	Typ. 13.3 W (230 VAC, 24 V / 5 A)
MTBF (reliability)	520,000 h
Mechanical characteristics	OPS105.1
Installation	Easy snap-on mounting onto the DIN rail
Ventilation / Cooling	Normal convection, no fan required
Operating / Storage temperature	-10°C to +70°C / -25°C to +85°C
Relative humidity	Max. 95%, non-condensing
Dimensions (W x H x D [mm])	64 x 124 x 102 (+rail)
Weight	620 g

PS105.2



- Quasi wide range input:
AC 230 V / 115 V
- Power boost up to 6 A
- High overload current, no switch off
- N+1 redundancy, RDY relay contact
- Closed metal housing

Input	0PS105.2
Input voltage	AC 85-132 / 176-264 V (switchable), 47-63 Hz DC 210-375 V
Input current	<2.6 A (switch in 115 V position) <1.4 A (switch in 230 V position)
External overcurrent protection	Not required, unit equipped with internal fuse Recommendation: Use circuit breaker for supply lines
Transient immunity	Transient resistance according to VDE 0160 / W2
Output (including logic)	0PS105.2
Output power	120 W
Rated voltage	24 VDC
Permitted output load	5 A
Overvoltage protection	Typ. 29 V
Protection functions	Output protected against short circuit, open circuit and overload
Output noise suppression	Unit complies with EN 61000-6-3 (class B)
General information	0PS105.2
Certification	CE, C-UL-US, GOST-R
Operation indicator	Green LED on front panel
RDY relay contact	Normally open
Terminals	Robust connector
Connection cross section	Solid/flexible: 0.2 - 2.5 mm ² / 22 - 12 AWG
Efficiency, Reliability	0PS105.2
Efficiency	Typ. 89% (230 VAC, 24 V / 5 A)
Loss	Typ. 14.8 W (230 VAC, 24 V / 5 A)
MTBF (reliability)	480,000 h
Mechanical characteristics	0PS105.2
Installation	Easy snap-on mounting onto the DIN rail
Ventilation / Cooling	Normal convection, no fan required
Operating / Storage temperature	-10°C to +70°C / -25°C to +85°C
Relative humidity	Max. 95%, non-condensing
Dimensions (W x H x D [mm])	64 x 124 x 102 (+rail)
Weight	620 g

PS110.1



- Input: AC 115 V / 230 V
- Power boost up to 288 W
- High overload current, no switch off
- Closed metal housing

Input	OPS110.1
Input voltage	AC 85-132 / 176-264 V (switchable), 47-63 Hz DC 240-375 V
Input current	<6 A (switch in 115 V position) <2.8 A (switch in 230 V position)
External overcurrent protection	Not required, unit equipped with internal fuse Recommendation: Use circuit breaker for supply lines
Transient immunity	Transient resistance according to VDE 0160 / W2
Output (including logic)	OPS110.1
Output power	240 W
Rated voltage	24-28 VDC (default: 24.5 V \pm 0.5%)
Permitted output load	
$T_U=0^{\circ}\text{C} - 60^{\circ}\text{C}$	10 A / 24 V or 8.6 A / 28 V (240 W)
$T_U=0^{\circ}\text{C} - 45^{\circ}\text{C}$	12 A / 24 V or 10.3 A / 28 V (288 W)
Overvoltage protection	Typ. 35 V
Protection functions	Output protected against short circuit, open circuit and overload
Power back immunity	34 V
Output noise suppression	Unit complies with EN 61000-6-3 (class B)
General information	OPS110.1
Certification	CE, C-UL-US, GOST-R
Operation indicator	Green LED on front panel
Terminals	Robust screw terminals
Connection cross section	Solid: 0.5 - 6 mm ² / 20 - 10 AWG Flexible: 0.5 - 4 mm ² / 20 - 10 AWG
Efficiency, Reliability	OPS110.1
Efficiency	Typ. 90% (230 VAC, 24 V / 10 A)
Loss	Typ. 26.7 W (230 VAC, 24 V / 10 A)
MTBF (reliability)	425,000 h
Mechanical characteristics	OPS110.1
Installation	Easy snap-on mounting onto the DIN rail
Ventilation / Cooling	Normal convection, no fan required
Operating / Storage temperature	0°C to +70°C / -25°C to +85°C
Relative humidity	Max. 95%, non-condensing
Dimensions (W x H x D [mm])	120 x 124 x 102 (+rail)
Weight	980 g

PS110.2



- Input: AC 115 V / 230 V
- High overload current, no switch off
- N+1 redundancy, RDY relay contact
- Robust mechanics and EMC
- Closed metal housing

Input	0PS110.2
Input voltage	AC 85-132 / 176-264 V (switchable), 47-63 Hz DC 240-375 V
Input current	<6 A (switch in 115 V position) <2.8 A (switch in 230 V position)
External overcurrent protection	Not required, unit equipped with internal fuse Recommendation: Use circuit breaker for supply lines
Transient immunity	Transient resistance according to VDE 0160 / W2
Output (including logic)	0PS110.2
Output power	240 W
Rated voltage	24 VDC
Permitted output load	10 A ($T_U=0^{\circ}\text{C} - 60^{\circ}\text{C}$) / 12 A ($T_U = 0^{\circ}\text{C} - 45^{\circ}\text{C}$)
Overvoltage protection	Typ. 35 V
Protection functions	Output protected against short circuit, open circuit and overload
Output noise suppression	Unit complies with EN 61000-6-3 (class B)
General information	0PS110.2
Certification	CE, C-UL-US, GOST-R
Operation indicator	Green LED on front panel
RDY relay contact	Normally open
Terminals	Robust connector
Connection cross section	Solid/flexible: 0.2 - 2.5 mm ² / 22 - 12 AWG
Efficiency, Reliability	0PS110.2
Efficiency	Typ. 89% (230 VAC, 24 V / 10 A)
Loss	Typ. 26.7 W (230 VAC, 24 V / 10 A)
MTBF (reliability)	390,000 h
Mechanical characteristics	0PS110.2
Installation	Easy snap-on mounting onto the DIN rail
Ventilation / Cooling	Normal convection, no fan required
Operating / Storage temperature	0°C to +70°C / -25°C to +85°C
Relative humidity	Max. 95%, non-condensing
Dimensions (W x H x D [mm])	120 x 124 x 102 (+rail)
Weight	980 g

PS120



- Input: AC 115/230 V auto select
- Ideal for parallel operation
- Adjustable overload behavior (continuous current / hiccup)!
- Closed metal housing

Input	OPS120.1
Input voltage	AC 85-132 / 184-264 V (auto select), 47-63 Hz, auto range
Input current	<10 A (115 V range) <5 A (230 V range)
External overcurrent protection	With standard thermomagnetic circuit breaker
Transient immunity	Transient resistance according to VDE 0160 / W2
Output (including logic)	OPS120.1
Output power	480 W
Rated voltage	24-28 VDC
Permitted output load	20 A / 24 V or 18 A / 28 V
Overvoltage protection	At 31 V \pm 3%: Switches to hiccup mode
Protection functions	Output protected against short circuit, open circuit and overload
Power back immunity	30 V
Output noise suppression	Unit complies with EN 61000-6-3 (class B)
General information	OPS120.1
Certification	CE, C-UL-US, GOST-R
Status indicators	
Operation	LED, green
Overload	LED, red
Terminals	Robust screw terminals
Connection cross section	Solid: 0.5 - 6 mm ² / 20 - 10 AWG Flexible: 0.5 - 4 mm ² / 20 - 10 AWG
Efficiency, Reliability	OPS120.1
Efficiency	Typ. 90% (230 VAC, 24 V / 20 A)
Loss	Typ. 53 W (230 VAC, 24 V / 20 A)
MTBF (reliability)	519,000 h
Mechanical characteristics	OPS120.1
Installation	Easy snap-on mounting onto the DIN rail
Ventilation / Cooling	Normal convection, no fan required
Operating / Storage temperature	0°C to +70°C / -25°C to +85°C
Relative humidity	Max. 95%, non-condensing
Dimensions (W x H x D [mm])	220 x 124 x 102 (+rail)
Weight	1800 g

PS305



- Input: 3 AC 400 - 500 V
- Power boost up to 144 W
- High overload current, no switch off
- Three-phase wide range input
- Closed metal housing

Input	0PS305.1
Input voltage	3 AC 340-576 V, 47-63 Hz DC 450-820 V
Input current	3 x 0.5 A
External overcurrent protection	With three standard thermomagnetic circuit breakers
Transient immunity	Transient resistance according to VDE 0160 / W2
Output (including logic)	0PS305.1
Output power	120 W
Rated voltage	24-28 VDC
Permitted output load	5 A at 24 V
Overvoltage protection	Typ. 33 V
Protection functions	Output protected against short circuit, open circuit and overload
Power back immunity	34 V (unsuitable for inductive loads)
Output noise suppression	Unit complies with EN 61000-6-3 (class B)
General information	0PS305.1
Certification	CE, C-UL-US, GOST-R
Operation indicator	Green LED on front panel
Terminals	Robust screw terminals
Connection cross section	Solid: 0.5 - 6 mm ² / 20 - 10 AWG Flexible: 0.5 - 4 mm ² / 20 - 10 AWG
Efficiency, Reliability	0PS305.1
Efficiency	Typ. 89% (3 AC 400 V, 24 V / 5 A)
Loss	Typ. 15 W (3 AC 400 V, 24 V / 5 A)
MTBF (reliability)	410,000 h
Mechanical characteristics	0PS305.1
Installation	Easy snap-on mounting onto the DIN rail
Ventilation / Cooling	Normal convection, no fan required
Operating / Storage temperature	-10°C to +70°C / -25°C to +85°C
Relative humidity	Max. 95%, non-condensing
Dimensions (W x H x D [mm])	73 x 124 x 117 (+rail)
Weight	730 g

PS310



- Input: 3 AC 400-500 V (2-phase and 3-phase operation)
- Power boost up to 288 W
- Separate primary fuse not required
- Switchable operating mode (single/parallel)
- Selectable overload behavior (fuse mode)

Input		OPS310.1
Input voltage	2 AC and 3 AC 340-576 V, 47-63 Hz	DC 450-820 V
Input current (at 24 V / 10 A)	3 x 0.8/0.7 A at 400/500 VAC	2 x 1.2/1 A at 400/500 VAC
External overcurrent protection	Each phase internally fused	External fuse for line protection if necessary
Transient immunity	Transient resistance according to VDE 0160 / W2	
Output (including logic)		OPS310.1
Output power	240 W	
Rated voltage	24-28 VDC (default: 24.5 V ±0.5%)	
Permitted output load	T _U =0°C - 60°C 24 V / 10 A or 28 V / 8.6 A (240 W) T _U =0°C - 45°C 24 V / 12 A or 28 V / 10.3 A (288 W)	
Overvoltage protection	Typ. 36 V, max. 39 V	
Protection functions	Output protected against short circuit, open circuit and overload	
Power back immunity	34 V	
Output noise suppression	Unit complies with EN 61000-6-3 (class B)	
General information		OPS310.1
Certification	CE, C-UL-US, GOST-R	
Status indicators	Operation LED, green Switch-off in fuse mode LED, red	
Terminals	Robust screw terminals	
Connection cross section	Solid: 0.5 - 6 mm ² / 20 - 10 AWG Flexible: 0.5 - 4 mm ² / 20 - 10 AWG	
Efficiency, Reliability		OPS310.1
Efficiency / loss	3-phase operation Typ. 91.2% / P _V = 23.6 W (400 V) Typ. 92.0% / P _V = 21.4 W (500 V) 2-phase operation Typ. 90.9% / P _V = 24.5 W (400 V)	
MTBF (reliability)	3-phase operation 543,000 h 2-phase operation 525,000 h	
Mechanical characteristics		OPS310.1
Installation	Easy snap-on mounting onto the DIN rail	
Ventilation / Cooling	Normal convection, no fan required	
Operating / Storage temperature	0°C to +70°C / -25°C to +85°C	
Relative humidity	Max. 95%, non-condensing	
Dimensions (W x H x D (mm))	89 x 124 x 117 (+rail)	
Weight	980 g	



- DC bus power supply for ACOPOS
- Input: 3 AC 400-500 V
- Power boost up to 600 W
- Separate primary fuse not required
- Switchable operating mode (single/parallel)
- Selectable overload behavior (fuse mode)

Input	0PS320.1
Input voltage	3 AC 340-576 V, 47-63 Hz DC 450-820 V
Input current	3 x 1.5 A
External overcurrent protection	Each phase internally fused External fuse for line protection if necessary
Transient immunity	Active transient filter, therefore resistant to transients acc. to VDE 0160 / W2
Output (including logic)	0PS320.1
Output power	490 W
Rated voltage	DC 24-28 V (default: 24.5 V \pm 0.5%)
Permitted output load	
$T_U=0^\circ\text{C} - 60^\circ\text{C}$	24.5 V / 20 A (490 W) or 28 V / 18 A (504 W)
$T_U=0^\circ\text{C} - 45^\circ\text{C}$	24.5 V / 25 A (612 W) or 28 V / 22 A (616 W)
Overvoltage protection	33 V \pm 10% switch to hiccup mode
Protection functions	Output protected against short circuit, open circuit and overload
Power back immunity	35 V
Output noise suppression	Unit complies with EN 61000-6-3 (class B)
General information	0PS320.1
Certification	CE, C-UL-US, GOST-R
Status indicators	
Operation	LED, green
Overload	LED, red
Switch-off in fuse mode	LED, red
Terminals	Robust screw terminals
Connection cross section	Solid: 0.5 - 6 mm ² / 20 - 10 AWG Flexible: 0.5 - 4 mm ² / 20 - 10 AWG
Efficiency, Reliability	0PS320.1
Efficiency	Typ. 92% (24.5 V / 20 A, $V_{in_{nom}}$)
Loss	Typ. 42 W (24.5 V / 20 A, $V_{in_{nom}}$)
MTBF (reliability)	504,000 h
Mechanical characteristics	0PS320.1
Installation	Easy snap-on mounting onto the DIN rail
Ventilation / Cooling	Normal convection, no fan required
Operating / Storage temperature	0°C to +70°C / -25°C to +85°C
Relative humidity	Max. 95%, non-condensing
Dimensions (W x H x D [mm])	150 x 124 x 121 (+rail)
Weight	1800 g

PS340



- Input: 3 AC 400-500 V
- Power boost up to 1080 W
- No switch-off during overload
- Ideal for parallel operation
- Simple overcurrent protection

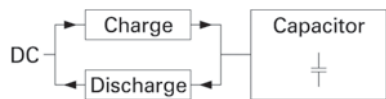
Input	OPS340.1
Input voltage	3 AC 340-575 V, 47-63 Hz
Input current	3 x 3.0 A
External overcurrent protection	With three standard thermomagnetic circuit breakers
Transient immunity	Active transient filter, therefore resistant to transients acc. to VDE 0160 / W2
Output (including logic)	OPS340.1
Output power	960 W
Rated voltage	DC 24-28 V (default: 24.5 V \pm 0.5%)
Permitted output load	
$T_U=0^{\circ}\text{C} - 60^{\circ}\text{C}$	24 V / 40 A (960 W) or 28 V / 35 A (980 W)
$T_U=0^{\circ}\text{C} - 45^{\circ}\text{C}$	24 V / 45 A (1080 W) or 28 V / 38 A (1064 W)
Overvoltage protection	32 V \pm 10%: Switches to hiccup mode
Protection functions	Output protected against short circuit, open circuit and overload
Power back immunity	35 V
Output noise suppression	Unit complies with EN 61000-6-3 (class B)
General information	OPS340.1
Certification	CE, C-UL-US, GOST-R
Status indicators	
Operation	LED, green
Overload	LED, red
Terminals	Robust screw terminals
Connection cross section	
Input	Solid: 0.5 - 6 mm ² / 20-10 AWG, flexible: 0.5 - 4 mm ² / 20-10 AWG
Output	Solid: 0.5 - 16 mm ² / 22-8 AWG, flexible: 0.5 - 10 mm ² / 22-8 AWG
Efficiency, Reliability	OPS340.1
Efficiency	Typ. 92.5% (400 VAC, 24 V / 40 A)
Loss	Typ. 78 W (400 VAC, 24 V / 40 A)
MTBF (reliability)	305,000 h
Mechanical characteristics	OPS340.1
Installation	Easy snap-on mounting onto the DIN rail
Ventilation / Cooling	Normal convection, no fan required
Operating / Storage temperature	0°C to +70°C / -25°C to +85°C
Relative humidity	Max. 95%, non-condensing
Dimensions (W x H x D [mm])	275 x 124 x 117 (+rail)
Weight	3300 g





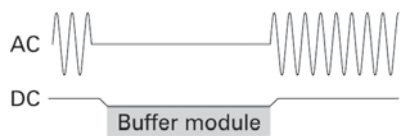
- Buffering for 24 V power consumers
- Output current up to 20 A
- Can be switched in parallel for larger buffer currents and times
- Easy to switch in parallel to the power supply or load in the 24 VDC circuit
- Simple and problem-free retrofitting of existing systems
- Suitable for industry due to energy storage in electrolytic capacitors (no rechargeable batteries)

Load operation (input)		0PB020.1
Rated voltage	DC 24 V	
Charging current	<600 mA	
Load time	18-27 s (first charge)	
Internal fuse	Not provided	
Closed-circuit consumption	Typ. 80 mA	
Power consumption	Typ. 1.9 W	
Buffer operation (output)		0PB020.1
Buffer voltage	Can be selected using jumpers: "V _{in} -1V": Variable response threshold (1 V under V _{in}) 23-27.8 V "22.5V fixed": fixed response threshold 22.5 V	
Buffer current	0-20 A	
Current limitation	>20 A	
Hold-up time		
Guaranteed	0.2 s at 22.5 V/20 A, 28 s at 22.5 V/100 mA	
Typical	0.31 s at 22.5 V/20 A, 43 s at 22.5 V/100 mA	
Power back immunity	35 V	
General information		0PB020.1
Certification	CE, C-UL-US, GOST-R	
Status indicators	Green status LED (buffer charged/discharged, charging/discharging)	
Signal connections		
Outputs	2 (buffer operation, ready for operation)	
Inputs	1 (discharge capacitor)	
Terminals	Protection against direct contact screw clamps	
Connection cross section	Solid: 0.5 - 6 mm ² , 20 - 10 AWG Flexible: 0.5 - 4 mm ² , 20 - 10 AWG	
Efficiency, Reliability		0PB020.1
MTBF (reliability)	Approx. 480,000 hours (readiness for operation, T _U = +40°C)	
Lifespan	>42,000 hours calculated life expectancy (T _U = +40°C)	
Mechanical characteristics		0PB020.1
Installation	Easy snap-on mounting onto the DIN rail	
Ventilation / Cooling	Normal convection, no fan required	
Operating / Storage temperature	-10°C to +70°C / -25°C to +85°C	
Relative humidity	5 - 95%, non-condensing	
Dimensions (W x H x D [mm])	64 x 124 x 102 (+rail)	
Weight	740 g	



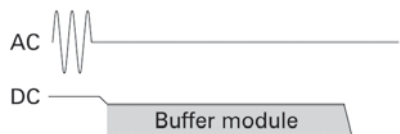
Function principle and application

The buffer module is an accessory for regulated 24 VDC power supplies. The energy from the DC circuit is stored in electrolytic capacitors and then used in the event of a power failure or when needed to cover overloads. Machines and systems can be easily equipped with the buffer module for use worldwide in unstable power circuits. Hold-up times less than 4 seconds make it the ideal alternative to a DC UPS (cost effective, requires less space, maintenance-free). When short-term currents peaks occur, it provides the required energy and therefore prevents the otherwise common task of over-dimensioning the power supply.

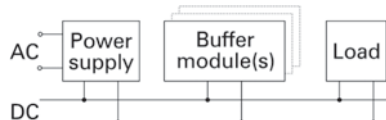


Protection during power supply failures

Statistics show that 80% of all power failures are shorter than 0.2 s. These power failures are completely bypassed and do not affect the DC voltage. This increases the reliability and availability of the entire system.



After a power failure or a shutdown, the buffer module delivers the load current for a specified amount of time and reports the loss via signal terminals. Process data can be saved and processes can be terminated, before the DC voltage is switched off. Controlled restarts are then possible.



Easy-to-operate, expandable, maintenance-free

The buffer module does not require any control lines. It can be connected in parallel at any location in the load current circuit. Any number of buffer modules can be connected in parallel to increase performance or extend the hold-up time. The double terminals allow easy wiring. A housing connection is also available.

24 VDC UPS module



The UPS module is used to supply power for systems which cannot be connected directly to the +24 VDC power mains for safety reasons because a power failure could cause data to be lost. The UPS module allows the load system (e.g. industrial PC) to be shut down securely without losing data if a power failure occurs.

Properties:

- 24 VDC input voltage
- 24 VDC output voltage
- Industrial standard installation
- Communication via serial interface
- Status display
- Deep discharge protection
- Short circuit protection
- Maintenance-free battery units

General information	9A0100.11
Input during mains operation	Regulated DC voltage
Rated voltage value	24 VDC
Voltage range	20 - 30 VDC
Battery switching threshold	18 V
Power failure bypass	Max. 20 min with 150 W load
Output during mains operation	
Rated voltage value	24 VDC
Voltage range	19 - 30 VDC
Max. output current	8 A
Output during battery operation	
Rated voltage value	24 VDC
Voltage range	21 - 26.8 VDC
Max. output current	10 A
Battery charging rating	
Charging clearing voltage	27.6 VDC
Charging current	From 0.88 A to 2.88 A depending on battery
Software support	Microsoft Windows NT 4.0 Workstation/embedded, Windows 2000, Windows XP Professional/embedded
Standards	UL
Protection and monitoring	9A0100.11
Deep discharge protection	Yes, cutoff threshold 21 VDC
Short circuit protection	Yes
Fuses	Yes, for mains supply, battery, battery charger
Reverse polarity protection	Yes, for mains supply and battery
Status indicators	9A0100.11
Operating mode	Green LED (mains operation, battery operation, etc.)
Status	Yellow LED (overload, temperature alarm, etc.)
Battery charging current	Yellow LED
Battery status	Yellow LED (battery change, age, etc.)
Battery reverse polarity	Red LED (battery reverse polarity, not connected)
Fuses	Red LED (mains supply, battery, battery charger)
Interface	9A0100.11
Type	Serial, RS232

Environmental conditions	9A0100.11
Environmental temperature	
Operation	0°C to +55°C
Storage / Transport	-20°C to +60°C
Relative humidity	5 - 95% (non-condensing)
Mechanical characteristics	9A0100.11
Outer dimensions (W x H x D (mm))	185 x 115 x 69
Weight	Approx. 1.1 kg

Required accessories		
9A0100.12	UPS battery unit type A, 24 V, 7 Ah, incl. battery cage	666
9A0100.14	UPS battery unit type B, 24 V, 2.2 Ah, incl. battery cage	666
9A0100.16	UPS battery unit type C, 24 V; 4.5 Ah; incl. battery cage	666
9A0017.01	Null modem cable RS232, 0.6 m, to connect UPS and IPC (9-pin DSUB socket - 9-pin DSUB socket)	
9A0017.02	Null modem cable RS232, 1.8 m, to connect UPS and IPC (9-pin DSUB socket - 9-pin DSUB socket)	

UPS battery unit



General information	9A0100.12	9A0100.14	9A0100.16
Capacity	7.2 Ah	2.2 Ah	4.5 Ah
Type	Lead acid battery, maintenance-free	Lead acid battery, maintenance-free	Lead acid battery, maintenance-free
Contents of delivery	Rechargeable battery, battery cage, temperature sensor, connection cable for charger, 3 m, 2.5 mm ²	Rechargeable battery, battery cage, temperature sensor, connection cable for charger, 3 m, 2.5 mm ²	Rechargeable battery, battery cage, temperature sensor, connection cable for charger, 3 m, 0.75 mm ²
Lifespan	Up to 10 years	Up to 10 years	Up to 15 years
Environmental conditions	9A0100.12	9A0100.14	9A0100.16
Environmental temperature			
Operation	0°C to +40°C	0°C to +40°C	-40°C to +80°C
Storage / Transport	-15°C to +40°C	-15°C to +40°C	-65°C to +80°C
Relative humidity	25 - 85% (non-condensing)	25 - 85% (non-condensing)	5 - 95% (non-condensing)
Mechanical characteristics	9A0100.12	9A0100.14	9A0100.16
Outer dimensions (W x H x D [mm])	200 x 155 x 125	180 x 120 x 80	223.2 x 145 x 78.2
Weight	Approx. 6.1 kg	Approx. 2.3 kg	Approx. 5 kg

Accessories

9A0100.13	UPS batteries type A (replacement part); 2 x 12 V, 7 Ah, for battery unit 9A0100.12
9A0100.15	UPS batteries type B (replacement part); 2 x 12 V, 2.2 Ah, for battery unit 9A0100.14
9A0100.17	UPS batteries type C (replacement part); 2 x 12 V, 4.5 Ah, for battery unit 9A0100.16





Accessories

Terminals, infrastructure components,
memory, batteries, cables, etc.

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Product overview

Terminal blocks



Model number	Short description	
0TB3102-7011	Accessory terminal block, 2-pin, A coded, screw clamp, 6 mm ²	676
0TB3102-7012	Accessory terminal block, 2-pin, B coded, screw clamp, 6 mm ²	676
0TB103.8	Connector, 24 VDC, 3-pin male, screw clamp, 3.31 mm ² , protected against vibration by the screw flange	677
0TB103.9	Connector, 24 VDC, 3-pin female, screw clamp, 3.31 mm ² , protected against vibration by the screw flange	677
0TB103.91	Connector, 24 VDC, 3-pin female, cage clamp, 3.31 mm ² , protected against vibration by the screw flange	677
0TB3103-7020	Accessory terminal block, 3-pin, screw clamp 6 mm ²	678
0TB3104-7011	Accessory terminal block, 4-pin, A coded, screw clamp, 6 mm ²	679
0TB3104-7012	Accessory terminal block, 4-pin, B coded, screw clamp, 6 mm ²	679
0TB704.9	Accessory terminal block, 4-pin, screw clamp, 1.5 mm ²	680
0TB704.91	Accessory terminal block, 4-pin, cage clamp, 2.5 mm ²	680
0TB2105.9010	Accessory terminal block, 5-pin, screw clamp, 1.5 mm ²	681
0TB2105.9110	Accessory terminal block, 5-pin, cage clamp, 2.5 mm ²	681
0TB708.91	Accessory terminal block, 8-pin, cage clamp, 1.5 mm ²	682
0TB1108.8110	Accessory terminal block, 8-pin, cage clamp, 1.5 mm ² , protected against vibration by the screw flange	682
0TB710.91	Accessory terminal block, 10-pin, cage clamp, 1.5 mm ²	683
0TB1111.8010	Accessory terminal block, 10-pin, screw clamp, 1.5 mm ² , protected against vibration by the screw flange	684
0TB1111.8110	Accessory terminal block, 10-pin, cage clamp, 1.5 mm ² , protected against vibration by the screw flange	684
7TB710.9	Accessory terminal block, 10-pin, screw clamp, 1.5 mm ²	685
7TB710.91	Accessory terminal block, 10-pin, cage clamp, 2.5 mm ²	685
0TB1111.8010	Accessory terminal block, 11-pin, screw clamp, 1.5 mm ² , protected against vibration by the screw flange	686
0TB1111.8110	Accessory terminal block, 11-pin, cage clamp, 1.5 mm ² , protected against vibration by the screw flange	686
7TB712.9	Accessory terminal block, 12-pin, screw clamp, 1.5 mm ²	687
7TB712.91	Accessory terminal block, 12-pin, cage clamp, 1.5 mm ²	687
7TB718.9	Accessory terminal block, 18-pin, screw clamp, 1.5 mm ²	688
7TB718.91	Accessory terminal block, 18-pin, cage clamp, 1.5 mm ²	688

Infrastructure components



Model number	Short description	
0AC401.9	Encoder 5 V - 24 V, converter for 5 V encoders (abs. or incr.)	690
0AC808.9	8x industrial hub (Layer 2), 24 VDC, 10/100 MBit/s with auto-sensing, MDIX switch for channel 1	689
0AC912.9	Bus adapter, CAN, 1 CAN interface	692
0AC913.92	Bus adapter, CAN, 2 CAN interfaces, including 30 cm attachment cable (DSUB connector)	692
0AC913.93	Bus adapter, CAN, 2 CAN interfaces, including 30 cm attachment cable (TB704)	692
0G1000.00-090	Bus connector, RS485, for Profibus networks	690
7AC911.9	Bus connector, CAN bus	690
ECINT1-1	RS232/RS485 interface converter, electrically isolated, for coupling RS232 interface modules to an RS485 twisted pair bus, without lightning protection	691
ECINT1-11	RS232/RS485 interface converter, electrically isolated, for coupling RS232 interface modules to an RS485 twisted pair bus, with lightning protection	691

CompactFlash



Model number	Short description
5CFCRD.0064-03	CompactFlash 64 MB ATA/IDE SiliconSystems
5CFCRD.0128-03	CompactFlash 128 MB ATA/IDE SiliconSystems
5CFCRD.0256-03	CompactFlash 256 MB ATA/IDE SiliconSystems
5CFCRD.0512-03	CompactFlash 512 MB ATA/IDE SiliconSystems
5CFCRD.1024-03	CompactFlash 1024 MB ATA/IDE SiliconSystems
5CFCRD.2048-03	CompactFlash 2048 MB ATA/IDE SiliconSystems
5CFCRD.4096-03	CompactFlash 4096 MB ATA/IDE SiliconSystems
5CFCRD.8192-03	CompactFlash 8192 MB ATA/IDE SiliconSystems

PC cards



Model number	Short description
0MC111.9-1	PC card, 2 MB FlashPROM
0MC112.9-1	PC card, 4 MB FlashPROM
0MC211.9	PC card, 2 MB SRAM
9A0015.99	CompactFlash adapter; for operating CompactFlash in a PC card slot

USB accessories



Model number	Short description
5MD900.USB2-01	USB 2.0 drive combination; consists of DVD-RW/CD-RW, FDD, CompactFlash slot (type II), USB connection (type A front, type B back); 24 VDC; (screw clamp 0TB103.9 or 693 cage clamp 0TB103.91)
5A5003.03	Front cover for USB drive combination 5MD900.USB2-01
5CAUSB.0018-00	USB 2.0 cable type A-B, 1.8 m
5CAUSB.0050-00	USB 2.0 cable type A-B, 5 m
5MMUSB.2048-00	USB 2.0 flash drive, 2048 MB

PCI cards



Model number	Short description
5ACPCI.ETH1-01	PCI Ethernet card with 1x 10/100 MBit/s RJ45 network connection
5ACPCI.ETH3-01	PCI Ethernet card with 3x 10/100 MBit/s RJ45 network connections

Product overview

Cables

Model number	Short description	
0G0001.00-090	Cable PC <-> PLC/PW, RS232, online cable	
9A0017.01	Null modem cable RS232, 0.6 m, for connecting UPS and IPC	
9A0017.02	Null modem cable RS232, 1.8 m, for connecting UPS and IPC	
X20CA0E61.0002	EPL connection cable RJ45 to RJ45, 0.2 m	694
X20CA0E61.0010	EPL connection cable RJ45 to RJ45, 1.0 m	694
X20CA0E61.0020	EPL connection cable RJ45 to RJ45, 2.0 m	694
X20CA0E61.0050	EPL connection cable RJ45 to RJ45, 5.0 m	694
X20CA0E61.0100	EPL connection cable RJ45 to RJ45, 10.0 m	694
X20CA0E61.0150	EPL connection cable RJ45 to RJ45, 15.0 m	694
X20CA0E61.0500	EPL connection cable RJ45 to RJ45, 50.0 m	694
X67CA0E41.0050	EPL attachment cable RJ45 to M12, 5.0 m	694
X67CA0E41.0150	EPL attachment cable RJ45 to M12, 15.0 m	694
X67CA0E41.0500	EPL attachment cable RJ45 to M12, 50.0 m	694
X67CA0X99.1000	Cable for custom prefabrication, 100.0 m	

19" AT keyboard



Model number	Short description	
5E9600.01-010	AT keyboard, 19 inch, front mount installation, IP65 from front, German keyboard layout	696
5E9600.01-020	AT keyboard, 19 inch, front mount installation, IP65 from front, US keyboard layout	696

Batteries

Model number	Short description	
0AC200.9	Lithium batteries, 5 pcs., 3 V / 950 mAh, cylindrical battery	
0AC201.9	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell	

Miscellaneous

Model number	Short description	
0AC171.9	Glass tube fuses 5 x 20 mm, 20 pcs., 3.15 A T / 250 V	
0AC301.9	Accessory, 8x shielding clamp	695
5AC900.1100-00	Touch screen pen (5x)	
9A0013.01	Pen for resistive touch screen	

Data sheets for product-specific accessories can be found in the sections for the respective product families.



Terminal blocks

The single row 2-pin terminal block 0TB3102 is used for making connections on an X20 energy measurement module.



Brief overview	0TB3102-7011	0TB3102-7012
Number of pins	2	2
Coding	A	B
Type of terminal	Screw clamps	Screw clamps
Distance between contacts	7.62 mm	7.62 mm
Contact resistance	≤4.5 mΩ	≤4.5 mΩ
Rated voltage	600 V	600 V
Rated current ¹⁾	31 A	31 A
Connection cross section		
AWG wire	22 - 10 AWG	22 - 10 AWG
Solid wire line	0.20 - 6.00 mm ²	0.20 - 6.00 mm ²
Fine wire line without wire tip sleeves	0.20 - 6.00 mm ²	0.20 - 6.00 mm ²
Fine wire line with wire tip sleeves	0.25 - 6.00 mm ²	0.25 - 6.00 mm ²
Wire tip sleeves with plastic covering	0.25 - 4.00 mm ²	0.25 - 4.00 mm ²
Cable type	Only copper wires (no aluminum wires!)	Only copper wires (no aluminum wires!)
Comment	Multi-function flange for secure, high-speed and tool-free locking Rated values according to UL	Multi-function flange for secure, high-speed and tool-free locking Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration!

The single row 3-pin terminal block TB103 is used to connect the supply voltage.



Brief overview	0TB103.8	0TB103.9	0TB103.91
Number of pins	3 (male)	3 (female)	3 (female)
Type of terminal	Screw clamps	Screw clamps	Cage clamps
Distance between contacts	5.08 mm	5.08 mm	5.08 mm
Contact resistance	≤5 mΩ	≤5 mΩ	≤5 mΩ
Rated voltage	300 V	300 V	300 V
Rated current ¹⁾	10 A / contact	10 A / contact	10 A / contact
Connection cross section			
AWG wire	22 - 12 AWG	26 - 12 AWG	26 - 12 AWG
Solid wire line	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²	0.20 - 2.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Protected against vibration by the screw flange Rated values according to UL	Protected against vibration by the screw flange Rated values according to UL	Protected against vibration by the screw flange Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

Terminal blocks

The single row, 3-pin terminal block 0TB3103 is used for making the connection to the X20 motor module MM4456 and other devices.



Brief overview	0TB3103-7020
Number of pins	3
Type of terminal	Screw clamps
Distance between contacts	7.62 mm
Contact resistance	$\leq 4.5 \text{ m}\Omega$
Rated voltage	600 V
Rated current ¹⁾	31 A
Connection cross section	
AWG wire	22 - 10 AWG
Solid wire line	0.20 - 6.00 mm ²
Fine wire line without wire tip sleeves	0.20 - 6.00 mm ²
Fine wire line with wire tip sleeves	0.25 - 6.00 mm ²
Wire tip sleeves with plastic covering	0.25 - 4.00 mm ²
Cable type	Only copper wires (no aluminum wires!)
Comment	Multi-function flange for secure, high-speed and tool-free locking Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration!

The single row 4-pin terminal block OTB3104 is used for making connections on an X20 energy measurement module.



Brief overview	OTB3104-7011	OTB3104-7012
Number of pins	4	4
Coding	A	B
Type of terminal	Screw clamps	Screw clamps
Distance between contacts	7.62 mm	7.62 mm
Contact resistance	$\leq 4.5 \text{ m}\Omega$	$\leq 4.5 \text{ m}\Omega$
Rated voltage	600 V	600 V
Rated current ¹⁾	31 A	31 A
Connection cross section		
AWG wire	22 - 10 AWG	22 - 10 AWG
Solid wire line	0.20 - 6.00 mm ²	0.20 - 6.00 mm ²
Fine wire line without wire tip sleeves	0.20 - 6.00 mm ²	0.20 - 6.00 mm ²
Fine wire line with wire tip sleeves	0.25 - 6.00 mm ²	0.25 - 6.00 mm ²
Wire tip sleeves with plastic covering	0.25 - 4.00 mm ²	0.25 - 4.00 mm ²
Cable type	Only copper wires (no aluminum wires!)	Only copper wires (no aluminum wires!)
Comment	Multi-function flange for secure, high-speed and tool-free locking Rated values according to UL	Multi-function flange for secure, high-speed and tool-free locking Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration!

Terminal blocks

The single-row 4-pin terminal block TB704 is used as the supply voltage terminal block and the connection terminal for fieldbuses.



Brief overview	0TB704.9	0TB704.91 ¹⁾
Number of pins	4	4
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	5.08 mm	5.08 mm
Contact resistance	≤5 mΩ	≤5 mΩ
Rated voltage	300 V	300 V
Rated current ²⁾	10 A / contact	10 A / contact
Connection cross section		
AWG wire	26 - 12 AWG	26 - 12 AWG
Solid wire line	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 2.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Rated values according to UL	Rated values according to UL

1) The cage clamp terminal blocks cannot be used side-by-side.

2) The respective limit data for the I/O modules must be taken into consideration.

The single row 5-pin terminal block TB2105 is also used as a connection terminal for fieldbuses.



Brief overview	0TB2105.9010	0TB2105.9110 ¹⁾
Number of pins	5	5
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	5.08 mm	5.08 mm
Contact resistance	≤5 mΩ	≤5 mΩ
Rated voltage	300 V	300 V
Rated current ²⁾	10 A / contact	10 A / contact
Connection cross section		
AWG wire	26 - 12 AWG	26 - 12 AWG
Solid wire line	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 2.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Rated values according to UL	Rated values according to UL

1) The cage clamp terminal blocks cannot be used side-by-side.

2) The respective limit data for the I/O modules must be taken into consideration.

Terminal blocks

The single-row 8-pin terminal block TB708 is used for making connections on various B&R modules.



Brief overview	0TB708.91	0TB1108.8110
Number of pins	8	8
Type of terminal	Cage clamps	Cage clamps
Distance between contacts	3.5 mm	3.5 mm
Contact resistance	≤4.2 mΩ	≤4.2 mΩ
Rated voltage	300 V	300 V
Rated current ¹⁾	10 A / contact	10 A / contact
Connection cross section		
AWG wire	26 - 14 AWG	26 - 14 AWG
Solid wire line	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.00 mm ²	0.20 - 1.00 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Mechanical removal aid, Rated values according to UL	Protected against vibration by the screw flange Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

The single row 10-pin terminal block OTB710 is used for making connections on an XV module.



Brief overview	OTB710.91
Number of pins	10
Type of terminal	Cage clamps
Distance between contacts	3.5 mm
Contact resistance	$\leq 4.2 \text{ m}\Omega$
Rated voltage	300 V
Rated current ¹⁾	10 A / contact
Connection cross section	
AWG wire	26 - 14 AWG
Solid wire line	0.20 - 1.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.00 mm ²
Cable type	Copper wires only (no aluminum wires!)
Comment	Mechanical removal aid, Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

Terminal blocks

The single row 10-pin terminal block TB1110 is used for making connections on various B&R I/O modules.



Brief overview	0TB1110.8010	0TB1110.8110
Number of pins	10	10
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	3.5 mm	3.5 mm
Contact resistance	≤4.2 mΩ	≤4.2 mΩ
Rated voltage	300 V	300 V
Rated current ¹⁾	10 A / contact	10 A / contact
Connection cross section		
AWG wire	28 - 14 AWG	26 - 14 AWG
Solid wire line	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.50 mm ²	0.20 - 1.00 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Protected against vibration by the screw flange Rated values according to UL	Protected against vibration by the screw flange Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

The single row 10-pin terminal block TB710 is used for making connections on various B&R I/O modules.



Brief overview	7TB710.9	7TB710.91
Number of pins	10	10
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	5.08 mm	5.08 mm
Contact resistance	$\leq 2 \text{ m}\Omega$	$\leq 5 \text{ m}\Omega$
Rated voltage	300 V	300 V
Rated current ¹⁾	10 A / contact	10 A / contact
Connection cross section		
AWG wire	24 - 12 AWG	26 - 12 AWG
Solid wire line	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line with wire tip sleeves	0.25 - 2.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.25 - 2.50 mm ²	0.20 - 1.50 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Rated values according to UL	Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

Terminal blocks

The single-row 11-pin terminal block TB1111 is used for making connections on various B&R modules.



Brief overview	0TB1111.8010	0TB1111.8110
Number of pins	11	11
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	3.5 mm	3.5 mm
Contact resistance	≤4.2 mΩ	≤4.2 mΩ
Rated voltage	300 V	300 V
Rated current ¹⁾	10 A / contact	10 A / contact
Connection cross section		
AWG wire	28 - 14 AWG	26 - 14 AWG
Solid wire line	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.50 mm ²	0.20 - 1.00 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Protected against vibration by the screw flange Rated values according to UL	Protected against vibration by the screw flange Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

The single row 12-pin terminal block TB712 is used for making connections on various B&R I/O modules. Removal is simplified by two ejection levers on the terminal block.



Brief overview	7TB712.9	7TB712.91
Number of pins	12	12
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	3.5 mm	3.5 mm
Contact resistance	≤4.2 mΩ	≤4.2 mΩ
Rated voltage	300 V	300 V
Rated current ¹⁾	10 A / contact	10 A / contact
Connection cross section		
AWG wire	28 - 14 AWG	26 - 14 AWG
Solid wire line	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.50 mm ²	0.20 - 1.00 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Mechanical removal aid Rated values according to UL	Mechanical removal aid Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

Terminal blocks

The single row 18-pin terminal block TB718 is used for making connections on various B&R I/O modules. Removal is simplified by two ejection levers on the terminal block.



Brief overview	7TB718.9	7TB718.91
Number of pins	18	18
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	3.5 mm	3.5 mm
Contact resistance	≤4.2 mΩ	≤4.2 mΩ
Rated voltage	300 V	300 V
Rated current ¹⁾	10 A / contact	10 A / contact
Connection cross section		
AWG wire	28 - 14 AWG	26 - 14 AWG
Solid wire line	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.50 mm ²	0.20 - 1.00 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Mechanical removal aid Rated values according to UL	Mechanical removal aid Rated values according to UL

¹⁾ The respective limit data for the I/O modules must be taken into consideration.

Ethernet hub AC808



The AC808 Ethernet hub is a standalone device that can be used universally as a Level 2 hub in standard Ethernet or POWERLINK networks. It is suitable for both 100 MBit/s (Fast Ethernet) and 10 MBit/s networks. The hub automatically recognizes the transfer speed for the channels. ¹⁾

The Ethernet connections are made using RJ45 connectors. The pin assignments can be crossed for the first channel using switches.

The hub can be installed horizontally or vertically on the mounting rail. It also has fastening possibilities on the sides for direct mounting.

Brief overview		0AC808.9
Type		8x industrial hub (Layer 2)
Interface		Ethernet 10/100 Base-T (ANSI/IEEE 802.3)
Cable length		Max. 100 m between two stations (segment length)
Transfer rate		10 or 100 MBit/s; 100 MBit/s used for devices with 10/100 MBit/s auto-negotiation ¹⁾
Port design		Shielded RJ45 ports
Power supply		24 VDC, max. 5.2 W, protection against reverse polarity
<small>1) Note: If devices that use 10 MBit/s as well as 100 MBit/s are connected, then there is no communication between these devices. Devices with 10/100 MBit/s autonegotiation are always operated with 100 MBit/s on the hub.</small>		
General information		0AC808.9
Status indicators		Network activity for each channel, Link/Collision for each channel, Supply voltage
Diagnostics		
Bus function		Yes, with status LED
Hub supply		Yes, with status LED
Certification		CE, C-UL-US, GOST-R
Mechanical characteristics		0AC808.9
Dimensions (W x H x D)		115 x 43 (51 with mounting rail) x 86 mm
Protection type		IP20
Installation		Mounting rail installation and mounting rail adapter included in delivery
Mounting orientation		Vertical or horizontal
Operating temperature		
Horizontal installation		0°C to +60°C
Vertical installation		0°C to +50°C
Storage temperature		-25°C to +70°C
Relative humidity		5 to 95%, non-condensing
Comment		Order 1 x TB704 terminal block separately

Required accessories		
0TB704.9	Accessory terminal block, 4-pin, screw clamp, 1.5 mm ²	680
0TB704.91	Accessory terminal block, 4-pin, cage clamps, 2.5 mm ²	680

Level converter Bus connectors

The adapter is used as a converter for 5 V encoders. The 5 V differential signals delivered by the encoder are converted to 24 V signals. Absolute and incremental encoders can be used.

Brief overview	0AC401.9
Power supply	24 VDC
Overvoltage protection	External fuse specified at 10 AT
Input frequency	100 kHz
Power consumption	Typ. 6.0 W @ 24 V, the encoder supply (+5 V) is loaded with 500 mA
General information	0AC401.9
Certification	CE, C-UL-US, GOST-R
Mechanical characteristics	0AC401.9
Dimensions (W x H x D)	77 x 112.5 x 58 mm
Protection type	IP20
Installation	DIN rail installation
Mounting orientation	Horizontal or vertical
Operating temperature	0°C to +55°C
Storage temperature	-20°C to +70°C
Relative humidity	0 - 95%, non-condensing

The RS485 bus connector is used to connect a controller to a Profibus network or an RS485 network. The terminating resistor is integrated in the bus connector. The terminating resistor can be turned on or off.



The AC911 bus connector is used to connect a controller to a CAN network. The terminating resistor is integrated in the bus connector. The terminating resistor can be turned on or off.

Brief overview	0G1000.00-090	7AC911.9
Interface	Profibus DP, RS485 network	-
Fieldbus Type	RS485	CAN
Design	9-pin DSUB plug	9-pin DSUB socket
Connection	For two bus lines using screw clamps	For two bus lines using screw clamps
Terminating resistor	Can be switched on	Can be switched on
Stress relief	Integrated	Integrated
Certification	CE, GOST-R	CE, GOST-R

Interface converters

ECINT1



The INT1 interface converter is used to convert RS232 interface signals to an RS485 signal level. It is used if:

- Data transfer over a long distance is required which cannot be bridged by an RS232 interface. The distance between two stations can be max. 5,000 m when using shielded RS485 cables.
- Electrical isolation is required for the interface.
- A PLC is to be connected to a network using an RS232 interface.

The INT1-11 interface converter is equipped with lightning protection.

Brief overview	ECINT1-1	ECINT1-11
Power supply	24 VDC, maximum 4.3 W, protection against reverse polarity	24 VDC, maximum 4.3 W, protection against reverse polarity
Overvoltage protection	Yes	Yes
Maximum transfer rate	115.2 kBit/s	115.2 kBit/s
Cable length		
RS232	Max. 10 m	Max. 10 m
RS485	Max. 5,000 m	Max. 5,000 m
Operating modes	Point-to-point RS422 network RS485 network	Point-to-point RS422 network RS485 network
Terminating resistor	Can be switched on	Can be switched on
Lightning protection	-	Yes
General information	ECINT1-1	ECINT1-11
Status indicators	RS232 signal lines, RS485 active, supply voltage	RS232 signal lines, RS485 active, supply voltage
Diagnostics		
Interface function	Yes, with status LED	Yes, with status LED
Power supply	Yes, with status LED	Yes, with status LED
Certification	CE, GOST-R	CE, GOST-R
Mechanical characteristics	ECINT1-1	ECINT1-11
Dimensions (W x H x D)	100 x 73 x 114 mm	100 x 73 x 114 mm
Protection type	IP20	IP20
Installation	Mounting rail or back wall installation using M5 screws	Mounting rail or back wall installation using M5 screws
Mounting orientation	Any	Any
Operating temperature	0°C to +60°C	0°C to +60°C
Storage temperature	-20°C to +70°C	-20°C to +70°C
Relative humidity	0 - 95%, non-condensing	0 - 95%, non-condensing

Bus adapter CAN 1x, CAN 2x



Brief overview	0AC912.9	0AC913.92	0AC913.93
Bus adapter	CAN 1x	CAN 2x	CAN 2x
Connection to controller	Using 9-pin DSUB socket, connection made by customer	Using 30 cm cable with 9-pin DSUB housing	Using 30 cm cable with 4-pin plug
Networking	Using 9-pin terminal block	Using the 9-pin DSUB plug (C1) and the 9-pin DSUB socket (C2)	Using the 9-pin DSUB plug (C1) and the 9-pin DSUB socket (C2)
Terminating resistor	Can be switched on	Can be switched on	Can be switched on
Installation	DIN rail installation	DIN rail installation	DIN rail installation
Mounting orientation	Horizontal or vertical	Horizontal or vertical	Horizontal or vertical
Certification	CE, GOST-R	CE, GOST-R	CE, GOST-R

USB drive combination



General information		SMD900.USB2-01	
Transfer rate	Low speed (1.5 MBit/s), full speed (12 MBit/s), to high speed (480 MBit/s)		
Maximum cable length	5 m (without hub)		
CD/DVD formats	Read CD-ROM CD-RW CD-R CD-DA Photo CD (single/multi-session) Enhanced CD DVD-ROM DVD-R, +R DVD-RW, +RW DVD video DVD RAM (4.7 GB, 2.6 GB)	Write CD-R/RW DVD-R/RW DVD-RAM DVD+R/RW DVD+R (double layer)	
CD/DVD speed	CD: 24 x / DVD: 8 x	CD: 24 x / DVD: 8 x	
Floppy disk drive	1.44 MByte		
CompactFlash slot	Type II		
Interfaces	USB 2.0: front (type A), back (type B)		
Power supply	24 VDC ± 25%		
Environmental conditions		SMD900.USB2-01	
Ambient temperature			
Operation	+5°C to +45°C		
Storage	-20°C to +60°C		
Transport	-40°C to +65°C		
Relative humidity			
Operation	8 - 80%, non-condensing		
Storage	5 - 95%, non-condensing		
Transport	5 - 95%, non-condensing		
Mechanical characteristics		SMD900.USB2-01	
Protection type	IP65 front side (only with optional front cover), IP20 back side		
Dimensions (W x H x D)	156 x 52 x 140 mm		
Required accessories			
0TB103.9	Connector, 24 VDC, 3-pin female, screw clamps, 3.31 mm ² , protected against vibration by the screw flange		677
0TB103.91	Connector, 24 VDC, 3-pin female, cage clamps, 3.31 mm ² , protected against vibration by the screw flange		677
5A5003.03	Controller R-IDE front cover		
5CAUSB.0018-00	USB 2.0 cable type A-B, 1.8 m		
5CAUSB.0050-00	USB 2.0 cable type A-B, 5 m		
5SWUTI.0000-00	Nero CD-RW OEM software. Only available with a CD-RW drive.		

Ethernet POWERLINK cable

Ethernet POWERLINK cable
RJ45 to RJ45



Length	Connection cable Model number	Short description
0.2 m	X20CA0E61.0002	POWERLINK connection cable RJ45 to RJ45, 0.2 m
1.0 m	X20CA0E61.0010	POWERLINK connection cable RJ45 to RJ45, 1.0 m
2.0 m	X20CA0E61.0020	POWERLINK connection cable RJ45 to RJ45, 2.0 m
5.0 m	X20CA0E61.0050	POWERLINK connection cable RJ45 to RJ45, 5.0 m
10.0 m	X20CA0E61.0100	POWERLINK connection cable RJ45 to RJ45, 10.0 m
15.0 m	X20CA0E61.0150	POWERLINK connection cable RJ45 to RJ45, 15.0 m
50.0 m	X20CA0E61.0500	POWERLINK connection cable RJ45 to RJ45, 50.0 m

Ethernet POWERLINK cable
RJ45 to M12



Length	Attachment cable Model number	Short description
5 m	X67CA0E41.0050	POWERLINK attachment cable RJ45 to M12, 5.0 m
15 m	X67CA0E41.0150	POWERLINK attachment cable RJ45 to M12, 15.0 m
50 m	X67CA0E41.0500	POWERLINK attachment cable RJ45 to M12, 50.0 m

For detailed information and support: www.br-automation.com

8x shield terminal AC301



The AC301 8x connection shielding clamp is used for optimal cable shielding for analog signal lines, as well as for encoder and counter signals. The cable shields are screwed directly on the shield bracket. The required mounting materials are included in delivery.

Short description	0AC301.9
Number of cable shield clamps	8
Type of terminal	4 x screw clamps (sets of two)
Dimensions including shield clamps (W x H x D)	76 x 25 x 22 mm

19" AT keyboard



General information	5E9600.01-010	5E9600.01-020
Keyboard format	German	English
Installation	Front mount installation, 19" rack	Front mount installation, 19" rack
Connection	PS/2 plug	PS/2 plug
Environmental conditions	5E9600.01-010	5E9600.01-020
Ambient temperature		
Operation	0°C to +55°C	0°C to +55°C
Storage / Transport	-20°C to +60°C	-20°C to +60°C
Relative humidity	5 - 95%, non-condensing	5 - 95%, non-condensing
Mechanical characteristics	5E9600.01-010	5E9600.01-020
EN 60529 protection	IP65 (front side)	IP65 (front side)
Dimensions (W x H x D)	482.6 x 177 x 35 mm	482.6 x 177 x 35 mm





R

Rated current
The rated current is the effective value for the phase current at the rated speed. This is possible only if the motor is operated under the rated conditions.

Rated power
The rated power is output by the motor when $n = n_N$. This is possible only if the motor is operated under the rated conditions.

Rated torque
The nominal torque is output by the motor ($n = n_N$) when the nominal speed is reached for any length of time if the environmental conditions are correct.

Real-time
A system is operating in real-time or has real-time capability, if the input signals are received and processed in a defined time period, and the results are made available in the system environment. See also 'Real-time Demands' and 'Real-time System'.



Release delay

Delay time required until the holding torque of the holding brake is reduced to the operating voltage has been returned to the holding torque.

Reliability

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Contact Information

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






























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4

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 0737-1184 - Operator Panels and Industrial PCs

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 1769-2024 - Automation Software and Service

4PP420.1505-K14	1034
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5AC800.FLG1-00	1063
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5ACPCI.ETH1-01	673
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5ACPCI.RAIC-03	923
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5AP920.1043-01	1090
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5AP920.1505-01	1094
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5AP920.1505-K34	1045
5AP920.1505-K54	1046
5AP920.1505-K74	1048
5AP920.1706-01	1096
5AP920.1906-01	1097
5AP920.1906-K03	1049

5AP980.1043-01	1090
5AP980.1214-K04	1050
5AP980.1505-01	1094
5AP981.1043-01	1091
5AP981.1505-01	1095
5AP982.1043-01	1092
5CADVI.0018-00	1098
5CADVI.0050-00	1098
5CADVI.0100-00	1098
5CAMPB.0100-10	906
5CAMPB.0020-10	905
5CAMPB.0020-11	905
5CAMPB.0018-10	904
5CAMPB.0018-30	904
5CAMPB.0050-10	904
5CAMPB.0050-30	904
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5CAMPB.0100-30	904
5CAMPB.0150-10	904
5CAMPB.0150-30	904
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5CAMPB.0200-30	904
5CAPWR.0018-20	1068
5CAPWR.0050-20	1068
5CAPWR.0100-20	1068
5CAPWR.0150-20	1068
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5CAPWR.0250-20	1068
5CAPWR.0300-20	1069
5CAPWR.0400-20	1069
5CASDL.0018-00	1101
5CASDL.0018-01	1099
5CASDL.0018-03	1100
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5CASDL.0300-00	1101
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5CASDL.0300-30	1067
5CASDL.0400-13	1102
5CASDL.0400-30	1067
5CASDL.0430-13	1102
5CAUPS.0005-00	924
5CAUPS.0030-00	924
5CAUSB.0018-00	673
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5CAUSB.0050-00	673
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5CAX2X.0018-20	1070
5CAX2X.0050-20	1070
5CAX2X.0100-20	1070
5CAX2X.0150-20	1070
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5CAX2X.0250-20	1070
5CAX2X.0300-20	1070
5CAX2X.0400-20	1070
5CFCRD.0064-03	672
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5CFCRD.4096-03	672
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5CFCRD.8192-03	672
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5DLSDL.1000-00	1086
5DLSDL.1000-01	1086
5E9000.18	1027
5E9000.29	1053
5E9600.01-010	696
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5E9600.01-020	696
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5LS166.6	637
5LS172.6	638
5LS182.6-1	639
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5LS189.6-1	641
5LS197.6	642

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5MMDDR.1024-00	931
5MMDDR.1024-01	961
5MMDDR.2048-01	961
5MMUSB.2048-00	673
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5MP040.0381-01	890
5MP040.0381-02	892
5MP050.0653-01	894
5MP050.0653-02	896
5MP050.0653-03	898
5MP050.0653-04	900
5MP181.0843-07	889
5PC310.L800-00	982
5PC310.L800-01	982
5PC600.FA01-00	923
5PC600.FA02-00	923
5PC600.FA03-00	923
5PC600.FA05-00	923
5PC600.SE00-00	926
5PC600.SE00-01	926
5PC600.SE00-02	926
5PC600.SF03-00	928
5PC600.SX01-00	927
5PC600.SX02-00	927
5PC600.SX02-01	927
5PC600.SX05-00	928
5PC600.SX05-01	928
5PC600.X855-00	930
5PC600.X855-01	930
5PC600.X855-02	930
5PC600.X855-03	931
5PC600.X855-04	931
5PC600.X855-05	931
5PC700.FA00-01	994
5PC700.FA02-00	994
5PC720.1043-00	996
5PC720.1043-01	996
5PC720.1214-00	998
5PC720.1214-01	998
5PC720.1505-00	999
5PC720.1505-01	999
5PC720.1505-02	1000
5PC720.1706-00	1001
5PC720.1906-00	1001
5PC781.1043-00	997
5PC781.1505-00	1000
5PC782.1043-00	997
5PC800.B945-00	960
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5PC800.B945-02	960
5PC800.B945-03	961
5PC800.B945-04	961
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5PC810.BX05-00	957
5PC810.BX05-01	957
5PC810.FA01-00	957
5PC810.FA02-00	957
5PC810.FA05-00	957
5PC810.SX01-00	959
5PC810.SX02-00	959
5PC810.SX05-00	959
5PP320.0571-39	828
5PP320.0571-K14	1037
5PP320.0573-39	830
5PP320.0573-3B	830
5PP320.0653-K02	1036
5PP320.1043-39	831
5PP320.1043-K04	1038
5PP320.1043-K14	1039
5PP320.1214-39	832
5PP320.1505-39	833
5PP320.1505-K04	1040
5PP320.1505-K14	1041
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5SWFON.0000-10	1121
5SWFON.0000-20	1121
5SWFON.0001-00	1121
5SWFON.0001-10	1121
5SWFON.0001-20	1121
5SWHMI.0000-00	1120
5SWUTI.0000-00	1121
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5SWWCE.0516-ENG	1117
5SWWCE.0519-ENG	1117
5SWWCE.0521-ENG	1117
5SWWCE.0523-ENG	1117
5SWWCE.0524-ENG	1117
5SWWCE.0525-ENG	1117
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5SWWCE.0724-ENG	1117
5SWWCE.0725-ENG	1117
5SWWCE.0821-ENG	1117
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5SWWXR0600-ENG	1115
5SWWXR0600-GER	1115
5SWWXR0600-MUL	1115
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7CX436.50-1	590
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7EC021.61-2	606
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7XV108.50-11	576
7XV108.50-12	576
7XV108.50-51	576
7XV108.50-62	576
7XV116.50-11	577
7XV116.50-12	577
7XV116.50-51	577
7XV116.50-62	577
7XV124.50-11	578
7XV124.50-12	578
7XV124.50-51	578
7XV124.50-61	578
7XV124.50-62	578
7XX408.50-1	602
7XX410.50-1	592
7XX412.50-1	594

7XX415.50-K02	596
7XX426.50-1	598
7XX436.50-1	600

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80MPD1.300S000-01	1450
80MPD3.300S000-01	1451
80MPD5.300S000-01	1452
80MPH1.300S000-01	1453
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80MPH4.300S000-01	1455
80MPH4.500S000-01	1456
80MPH6.300S000-01	1457
80PS080X3.10-01	1242
80SD100XD.C044-01	1238
80SD100XD.C0XX-01	1234
80SD100XS.C04X-01	1240
80SD100XS.C0XX-01	1236
8AC110.60-2	1290
8AC114.60-2	1291
8AC120.60-1	1292
8AC121.60-1	1294
8AC122.60-3	1296
8AC123.60-1	1298
8AC130.60-1	1300
8AC131.60-1	1303
8AC140.60-2	1306
8AC140.60-3	1306
8AC140.61-3	1306
8AC141.60-3	1310
8AC141.61-3	1310
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8B0C0160HC00.001-1	1376
8B0C0160HC00.A01-1	1380
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8B0C0160HW00.001-1	1376
8B0C0160HW00.A01-1	1380
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8B0C0320HC00.002-1	1380
8B0C0320HW00.000-1	1380
8B0C0320HW00.002-1	1380
8B0K1650HC00.000-1	1409
8B0K1650HW00.000-1	1409

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8B0M0220HC00.000-1	1366
8B0M0220HW00.000-1	1366

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8B0M0270HC00.000-1	1366
8B0M0270HW00.000-1	1366
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8BAC0120.001-1	1412
8BAC0121.000-1	1413
8BAC0122.000-1	1414
8BAC0123.000-1	1416
8BAC0123.001-1	1418
8BAC0123.002-1	1420
8BAC0124.000-1	1422
8BAC0132.000-1	1424
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8BCA0003.1311A-0	1432
8BCA0003.1511A-0	1433
8BCA0005.1111A-0	1431
8BCA0005.1311A-0	1432
8BCA0005.1511A-0	1433
8BCA01X5.1111A-0	1431
8BCA01X5.1311A-0	1432
8BCA01X5.1511A-0	1433
8BCE0005.1111A-0	1428
8BCE0007.1111A-0	1428
8BCE0010.1111A-0	1428
8BCE0015.1111A-0	1428
8BCE0020.1111A-0	1428
8BCE0025.1111A-0	1428
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8BCM0015.1111A-0	1425
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8BCM0020.1111A-0	1425
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8BCM0025.1111A-0	1425
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8BCM0025.1523A-0	1427
8BCR0005.1111A-0	1429
8BCR0007.1111A-0	1429
8BCR0010.1111A-0	1429
8BCR0015.1111A-0	1429
8BCR0020.1111A-0	1429
8BCR0025.1111A-0	1429
8BCS0005.1111A-0	1430
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8BCS0020.1111A-0	1430
8BCS0025.1111A-0	1430
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8BPM0003.0000-00	1582
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8BPR0001.0000-00	1583
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8BVE0500HC00.000-1	1404
8BVE0500HW00.000-1	1404
8BVF0220H000.000-1	1362
8BVF0440H000.001-2	1362
8BVF0880H000.000-1	1362
8BVI0014HCD0.000-1	1389
8BVI0014HCS0.000-1	1384
8BVI0014HWD0.000-1	1389

8BVI0014HWS0.000-1	1384
8BVI0028HCD0.000-1	1389
8BVI0028HCS0.000-1	1384
8BVI0028HWD0.000-1	1389
8BVI0028HWS0.000-1	1384
8BVI0055HCD0.000-1	1389
8BVI0055HCS0.000-1	1384
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8BVI0220HWS0.000-1	1394
8BVI0440HCS0.000-1	1394
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8BVI0880HCS0.000-1	1399
8BVI0880HWS0.000-1	1399
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8BVP0440HW00.000-1	1370
8BVP0880HC00.000-1	1370
8BVP0880HW00.000-1	1370
8BVR0220H000.100-1	1364
8BVR0440H000.100-1	1364
8BVR0880H000.100-1	1364
8BXF001.0000-00	1441
8BXF002.0000-00	1441
8CE005.12-1	1318
8CE007.12-1	1318
8CE010.12-1	1318
8CE015.12-1	1318
8CE020.12-1	1318
8CE025.12-1	1318
8CM005.12-1	1314
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8CM005.12-8	1317
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8CM007.12-8	1317
8CM010.12-1	1314

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8CM025.12-1	1314
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8CM025.12-8	1317
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8CR015.12-1	1319
8CR020.12-1	1319
8CR025.12-1	1319
8JSA2	1604
8JSA3	1610
8JSA4	1616
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8JSA6	1628
8JSA7	1636
8LSA2	1486
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8LSA7	1526
8LSA8	1532
8LSC4	1546
8LSC5	1554
8LSC5A	1562
8LSC5B	1562
8LSC5C	1562
8LSC6	1568
8LSC7	1576
8LTA9	1662
8LTJ9	1670

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8SCS003.0000-00	1440
8SCS004.0000-00	1440
8SCS005.0000-00	1440
8SCS007.0000-00	1441
8SCS008.0000-00	1441
8TB2104.2010-00	1434
8TB2104.203F-00	1434
8TB2104.203L-00	1434
8TB2104.204A-00	1435
8TB2106.2010-00	1435
8TB2108.2010-00	1435
8TB2112.2010-00	1436
8TB3102.201C-10	1436
8TB3104.201H-10	1436
8TB3104.201M-10	1437
8TB3104.204G-00	1437
8TB3104.204K-00	1437
8TB4103.203C-10	1438
8TB4104.202L-10	1438
8TB4104.202N-10	1438
8TB4104.204G-00	1439
8TB4104.204G-10	1439
8TB4104.206D-10	1439
8V1010.001-2	1274
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8V1010.501-2	1270
8V1010.50-2	1270
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8V128M.001-2	1286

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9A0014.10	1104
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9A0017.01	674
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9A0017.02	674
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9A0100.11	664
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9A0100.14	666
9A0100.15	649
9A0100.16	666
9A0100.17	649
9S0001.11-090	1114
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9S0001.36-020	1114

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	1959
ECINT1-11	691
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MA4SERV-0	1934
MA4SERV-E	1934
MAACP2-0	1935
MAACP2-E	1935
MAACPM-ENG	1935
MAACPM-GER	1935
MAAP800-ENG	1935
MAAP800-GER	1935
MAAP900-ENG	1935
MAAP900-GER	1935
MAAPC620-ENG	1935
MAAPC620-GER	1935
MAAPC680-ENG	1935
MAAPC680-GER	1935
MAAPC800-ENG	1935
MAAPC800-GER	1935
MACIO-ENG	1934
MACIO-GER	1934
MACIS-ENG	1934
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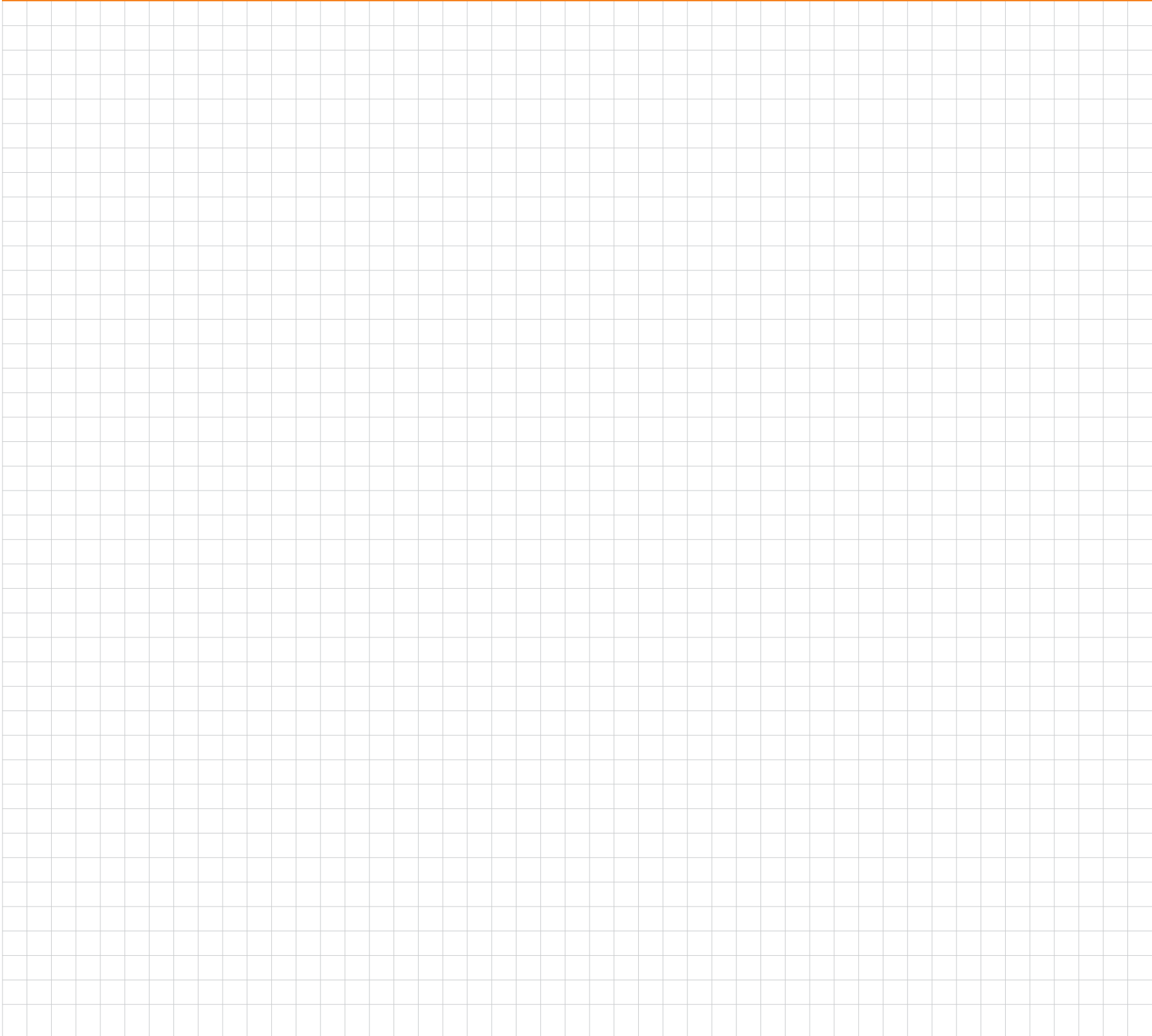
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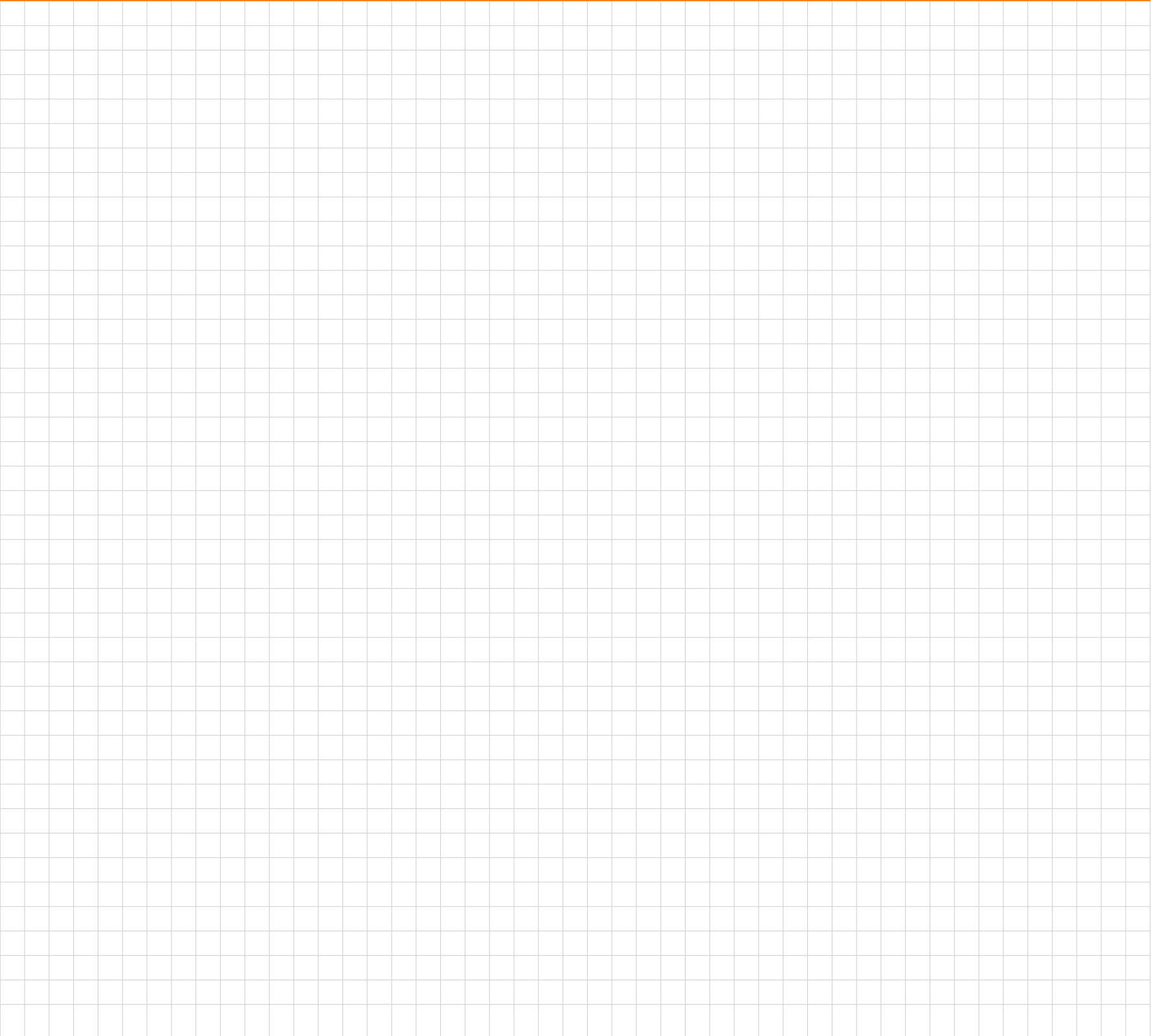
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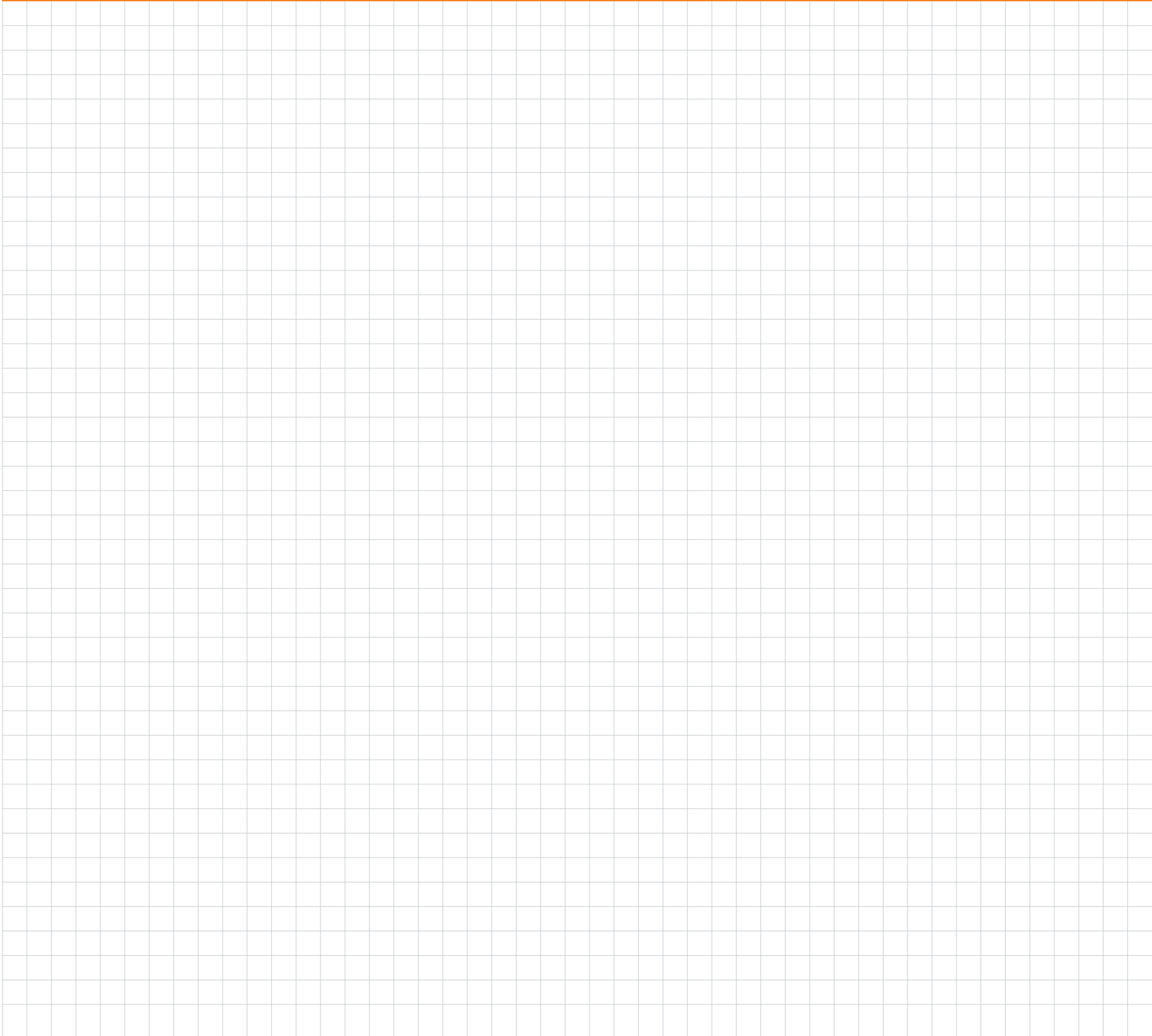
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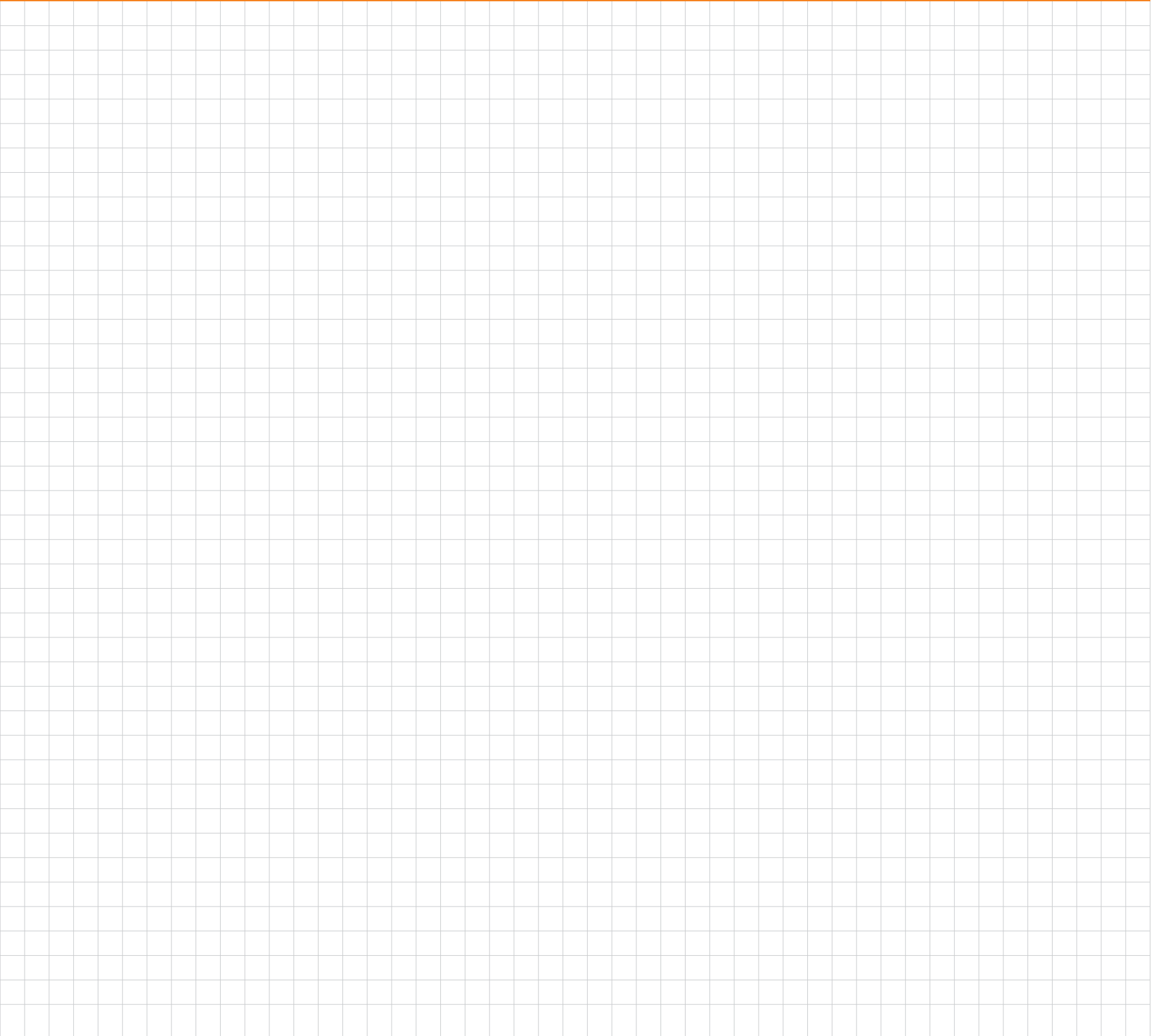
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B&R was founded in 1979 by Erwin Bernecker and Josef Rainer. Since then it has become one of the largest privately owned automation companies in the world, employing more than 1700 people. A network of subsidiaries and international sales and support offices in more than 60 countries around the world guarantees global know-how at a local level. B&R customers are leaders in their respective industrial sectors. Flexible solutions and systems for individual automation projects greatly contribute to their companies' success. Continual innovation guarantees B&R customers the competitive edge. Since the company's founding, all innovations and investments have concentrated on one core area: solutions for industrial automation. As a privately owned company, all financial decisions are made independently of external investors or shareholders. This autonomy is the cornerstone for flexibility and dynamics – constant product innovations are the result.

Custom-made

Using standard components is not always the best approach. A demand for specialized solutions also exists. Willingness and ability to perform customer-oriented research and development has established B&R's position in the market. The developers at B&R work together with the customer in project teams to create custom-made solutions. This flexible and innovative approach for creating uncommon solutions is the foundation for expanding our customers' market lead. In addition to functional aspects, aesthetic design is becoming a decisive factor in all product segments as well. On request, we can manage the layout and design of operating and visualization units based on the customer's corporate design.

Support for series production

Not every machine manufacturing company has the possibility to program and extensively test all controllers for a complete production series. It isn't even necessary to assign personnel and important resources for this purpose. B&R provides just-in-time delivery of automation solutions that are completely programmed and tested, configured according to customer specifications for series production. This is done by excellently trained personnel using the most modern programming and testing systems. The customer just has to install the preconfigured components in the machine and test the entire system. This allows the customer to concentrate on the core area of expertise in machine manufacturing and achieve increased efficiency and freedom for innovation."

Solutions for all industries

Companies specializing in packaging, plastics, printing and paper, textiles, automobile, food and beverages, semiconductors, wood, metal and mining, pharmaceuticals, chemicals and building automation rely on B&R know-how. Our complete solutions help customers from all industries achieve a decisive competitive edge. Orientation towards applications in all areas of machine automation and process control technology builds the foundation that makes us a strong partner. We offer our customers a complete automation solution from one source: No unnecessary interfaces, maximum flexibility and the highest level of profitability.





Individual solutions for all industries

Outstanding solutions with distinctive technology and designs are becoming increasingly important in today's capital goods industry. In these cases, specially developed technical solutions for the application are required. A uniform appearance is also essential in representing the corporate identity. In the eyes of the user, this begins with the human-machine interface. In addition to an extensive range of standard products, B&R always offers the right automation solutions, ranging from freely configurable, customized user interfaces to specially developed electronic components and software.

Application programming

The programming required for machine controllers is constantly becoming more extensive. Machine manufacturing companies seldom have the resources needed to program and maintain software. Economics and the need to focus on the main area of expertise often make it impossible to establish these resources. B&R application experts and service partners can help. Together with the customer, specifications are made, the ideal system architecture is developed, the software is programmed and the system is tested. The customer can concentrate on making sure the application functions as desired. The well trained B&R specialists implement the application requirements and provide service for machine and system manufacturing companies all over the world throughout the entire product lifespan.

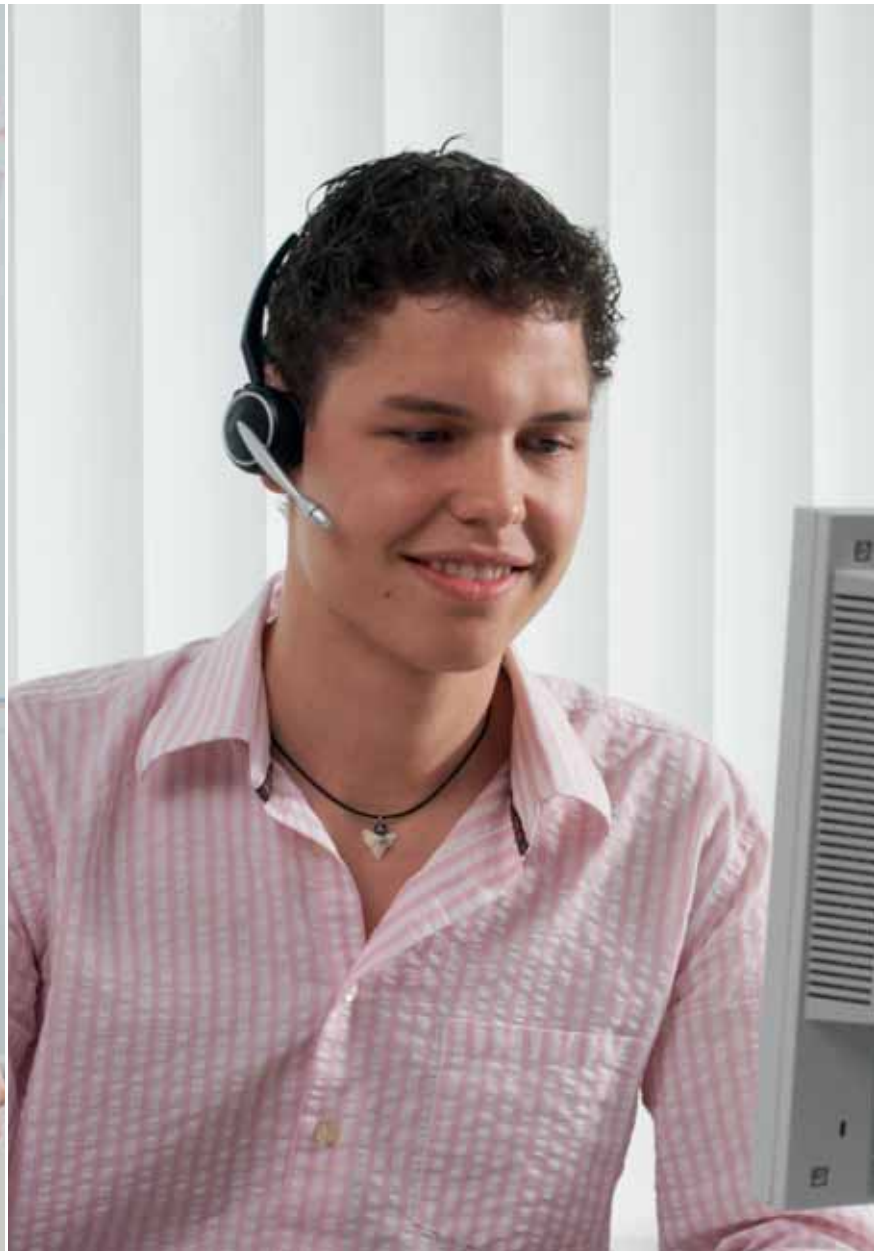
Seminars and training

Skilled employees are the foundation of a company's success. Continued training provides a competitive advantage. B&R offers an extensive seminar and training program at all locations and on-site at the customer's location. The B&R training calendar contains customized, compact training solutions ranging from introduction courses to special automation technology courses. Individual problems can be examined in clearly defined groups. Experienced trainers provide theoretical and practical information. Realistic exercises allow automation solutions to be created on modern systems. In addition to the standard program, company-specific trainings are also offered that match the tasks the participants will be carrying out in the future.

Hotline support

Quality not only refers to the product; it also refers to the support provided when implementing a product so that a task can be completed in the most ideal way possible. Question must be answered quickly, and any unclear situations must be cleared up fast to reach goals and meet deadlines. B&R customers receive hotline support for all products via email and telephone. Personal contact allows knowledgeable answers to be given and solutions to be worked out quickly. Skilled and experienced technicians work on the problem until a solution is found. They work closely with development and production to continually improve our products based on customer inquiries and prevent unclear situations in the future.





Understanding and supporting the customer

Every application is a challenge. Solving problems means being able to listen. Once contact has been made, qualified and comprehensively trained staff put themselves in the customer's frame of mind. Engagement with our customers doesn't end when the sale is finalized. To us, this period is just the start of a commitment that will last over the entire working relationship. Customer specialists for technical support, application engineering and training are available at all locations worldwide. The most modern software and infrastructure guarantee fast response times and access to information from the entire company. Easy availability, clearly assigned roles, keeping promises and personal commitment all guarantee the highest level of service quality worldwide.



Perfection in Automation

Innovative software
Sleek hardware
Real-time Ethernet



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Topologies	 757

Product overview

Control systems

Scalable from space-saving, cost-effective machine controllers to large systems with distributed intelligence. A wide range of I/O components and attachment modules always allow for the right connections.

X20 System - Slice-based I/O and control system	37
Power Panel - Integrated control, operation and visualization	787
Mobile Panel - More than just mobile operation and monitoring	873

Industrial PCs

Fully scalable industrial PC solutions for high-performance applications. Computing power, displays, operational elements, operating systems and interfaces can be optimized for the individual requirements.

Automation PC APC620 - Modular, fan-free industrial PCs	911
Automation PC APC810 - Highest-level performance with Intel® Core™ 2 Duo processors	945
Panel PC - Integrated operation and PC	985
PC Software - Operating system and software components	1109
Panel PC 300 - Makes any Automation Panel 900 into an embedded PC.	973

Visualization and operation

From two-line displays to high-resolution graphics with touch screen. The right HMI for every application.

Power Panel - Integrated control, operation and visualization	787
Mobile Panel - More than just mobile operation and monitoring	873
Automation PC APC620 - Modular, fan-free industrial PCs	911
Automation PC APC810 - Highest-level performance with Intel® Core™ 2 Duo processors	945
Panel PC - Integrated operation and PC	985
Customized HMI systems	1013
Automation Panel - A new dimension in machine visualization	1055/1077
PANELWARE - Compact operator panels	773
Panel PC 300 - Makes any Automation Panel 900 into an embedded PC.	973

Motion control

Speed and precision to meet the highest demands with built-in technology functions for flexible operation. Safety functions and "Plug & Play" in the power transmission system allow for solutions that will set you in motion.

ACOPOSmicro - Compact drive system	1221
ACOPOS - Intelligent servo drives	1251
ACOPOSmulti - Modular drive system	1321
Synchronous motors (8LS)	1459
8JS synchronous motors	1585
8LT synchronous motors	1645
Stepper motors	1443
ARNCO - Integrated CNC	1681

Remote I/O systems

Switching cabinets are becoming obsolete – flexible and configurable distributed I/O systems reduce wiring, increase stability and can be adapted to any environment.

X20 System - Slice-based I/O and control system	37
X67 System - Remote I/O with IP67 protection	419
Compact I/O System - Save space when connecting peripheral devices	581
XV valve connections - Economical usage of peripheral space	569

Integrated safety technology

Safety shut-offs do not always have to involve a full machine shutdown. Smart, safe reactions to various situations provide safety without always stopping the production process. Intelligent, decentralized and integrated safety technology that is simple to operate and that reaches extremely high reaction times opens up an entirely new range of machine safety concepts.

X20 System - Slice-based I/O and control system	37
Integrated Safety Technology - Decentralized and intelligent functional safety	537
SafeDESIGNER	1877

Programming and training

Automation Studio provides scalability, multi-platform capability, and the flexibility to meet all programming requirements. From the simplest machine to the most complex process, this single configuration and programming tool covers all tasks and system platforms. B&R also provides a modular training program that can be tailored to your needs.

Automation Studio	1805
SafeDESIGNER	1877
FieldbusDESIGNER	1887
Automation training	1893

Communication

Fieldbus and IT networks are standard components of automation solutions. With POWERLINK, a system-wide real-time network is available.

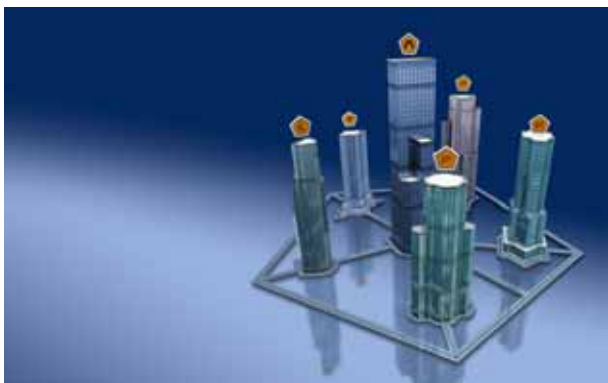
Flexible communication	611
Real-time industrial Ethernet	611
FieldbusDESIGNER	1887

Accessories, documentation

As system supplier for automation solutions, we cover the entire product spectrum - everything from configuration tool to terminal blocks.

Terminal blocks, cables, memory cards, etc.	1123
Switching Power Supplies and Accessories for Mounting Rail Installation	645
Manuals and brochures	1929

News



Integrated automation for increased profitability

Complete machine automation using one intelligent tool to implement the entire automation system – this has long been the philosophy of the Austrian automation specialists at B&R. B&R recognized early that the market is not only searching for components such as controllers, visualization devices, industrial PCs and drive systems, an integral software tool is desired that covers all automation tasks. Total solutions provide enormous savings potential, which is recognized by many machine manufacturers as an important competitive edge.

Not only that, software needs to be flexible when it comes to machine configurations and options. Connecting ERP systems, E-CAD tools and automation tools enables the creation of individual machine software based on automated processes. With Automation Studio, B&R provides a single development environment for control, visualization, motion control, and communication tasks – in short, everything that has to do with automation.

In times when cost pressures continue to mount, it's extremely important for machine and systems manufacturers to concentrate on their main areas of expertise. By using a single comprehensive tool, machine manufacturers no longer have to spend vast amounts of money to implement interfaces between the controllers, drives, and visualization application.

All standardized IEC editors, a completely integrated ANSI C compiler and debugger, graphic configuration for I/O points and axes, and integrated configuration of machine visualization systems accompany the customer from the programming and commissioning phases all the way to production and service. Many advanced functions for temperature control, drive technology and fieldbus communication are already included in the standard Automation Studio package. Automation Studio users can now develop their automation projects faster and the open software design provides a system that can be integrated seamlessly into existing processes.

A network-wide real-time communication system is needed in addition to a software tool. With POWER-LINK, B&R has offered Ethernet-based real-time communication for the last five years. This technology has now established itself on the market. In the meantime, more than 40,000 series production machines have been set up and are being used in various industries. In addition to B&R, many leading automation manufacturers are relying on this open and pioneering technology.

Remaining true to the guiding principle "Perfection in Automation," B&R offers technologically advanced total solutions for hardware and software as well as knowledgeable customer-oriented support in all areas of automation. Total solutions offered by a single source provide considerable savings potential for customers throughout the entire lifespan of the machines and systems.



Positioning precision taken to new dimensions

For drives, efficient machine design and compact size are the basic principles for providing maximum flexibility.

The new 8LT series three-phase synchronous motors from B&R provide machine and system manufacturers with a compact solution for the most demanding applications. Excellent dynamic properties and positioning precision help users easily master even the most difficult tasks.

The permanently excited high-torque motors are available with self-cooled or externally-cooled options. The short, compact design of the motors can eliminate the need for angular gears in many cases. Thanks to the special design of the motor components, all motors are maintenance-free.

The supply voltage of the high-torque motors ranges from 400 to 480 VAC. With a rated power of 1.51 to 32.4 kW, the motors can be easily integrated in a wide range of applications. The motors have an especially high power rating with a stall torque of 50 to 408 Nm.

Embedded parameter chip for reliable identification

All torque motors are equipped with an embedded parameter chip, which guarantees seamless identification of all device data. Using the integrated chip, important information such as serial number, type, manufacturer data, etc. can be read and registered electronically. As a result, it isn't necessary to remove components for identification.



UL certification for ACOPOSmulti

The energy efficient B&R drive system ACOPOSmulti was awarded a UL certificate from the Underwriters Laboratories. In addition to meeting all criteria for a UL compliant construction, the drive distinguishes itself through an innovative energy concept and a high level of dependability. A fundamental entry requirement for the North American automation market, the UL certification serves as an important step for the international sales of B&R innovative technology.

A high level of efficiency and dependability allow ACOPOSmulti to meet the special demands of modern Motion Control products. Active power supply modules with Power Factor Correction and the ability for power regeneration ensure the most efficient energy usage while simultaneously protecting valuable resources.

News



Small, flexible, unique - ACOPOSmicro is setting the pace

Complex CNC applications are increasingly implementing stepper motor technology. In addition, more and more pneumatic systems are being replaced by electrical drives. ACOPOSmicro – an extremely compact drive for operating stepper and servo motors in the lower performance range – provides an innovative and impressive solution. ACOPOSmicro is an addition to the successful ACOPOS and ACOPOSmulti product range.

At only 63 mm wide, it saves space in the switching cabinet. An 80 VDC version is available in order to achieve higher torque at high speeds. The performance ranges between 50 W and 1 kW. POWERLINK and the X2X remote backplane are onboard as fieldbus interfaces.

A clever cooling design, like the one already used for ACOPOSmulti, provides advantages for the environment. Side and back wall mounting are possible. Cold plate mounting with oil or water cooling is available in addition to wall and feed-through mounting. This cooling design reduces costs by eliminating the need to carry out additional work for climate-control and the related service tasks.

Using standardized PLCopen motion control function blocks and CNC robotics libraries, all motor types supported by ACOPOSmicro can be controlled via B&R Automation Studio without problems.

ACOPOSmicro is often implemented in the semiconductor, packaging, textile and printing industries.



Unlimited flexibility for machine manufacturing

A new member has been introduced to the industrial PC generation from B&R. The product range has been expanded with the APC620 embedded. Windows XP embedded with real-time extension is the system platform used. Windows XP embedded offers advantages for applications with a minimal operating system size.

Intel processors from Celeron M to Pentium M 1.4 GHz provide requirement-oriented, scalable computing power. POWERLINK and CAN as well as the X2X remote backplane are onboard as fieldbus interfaces. The CPU has 256 KB of battery-buffered SRAM memory.

Like its big brothers, the APC620 has an integrated Smart Display Link that can be used to operate a remote line with four displays at distances up to 160 m.

The APC family is the most innovative industrial PC generation on the market. Fan-free, compact, scalable and economical – these are the key features that provide machine manufacturers the highest level of flexibility.



TÜV Certificate for B&R Integrated Safety Technology

The safety-related products from B&R have been certified by TÜV Rheinland for use in safety-oriented applications. In addition to meeting all specified safety criteria, B&R safety technology also has the major advantage of seamless integration in existing automation infrastructure. Flexible adjustment of the safety behavior to the requirements of the machine ensures optimum safety reactions. Safety technology integration

B&R safety products enable simple integration of safety technology in the functional application. Fixed wiring is replaced by safe data transfer via the existing machine bus system. Flexibly configured or programmed safety behavior adapts optimally to various situations. Complete diagnostics of safety components via the machine bus system provide detailed data about the status of the machine.

Safety cut-offs do not always have to involve shutting down the machine. When opening a protective cover, for example, it is often sufficient to reduce the speed. Smart, safe reactions to various situations provide safety without stopping the production process. This means that the machine does not have to be run without load or set up again, and manipulation is no longer necessary. This results in real advantages for the user that can be easily implemented with programmable safety behavior.

Rapid advancements in technology make it necessary to continually update the safety regulations. Adapting safety products to the current regulations in the area of safety technology has the highest priority at B&R. The safety-related products SafeDESIGNER, SafeLOGIC, X20 SafeIO and POWERLINK Safety fulfill ISO 13849 (PL e) IEC 62061 (SIL 3) and IEC 61508 (SIL 3) standards.

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Distributed I/O on open fieldbuses	770
Complete networking with industrial Ethernet	771

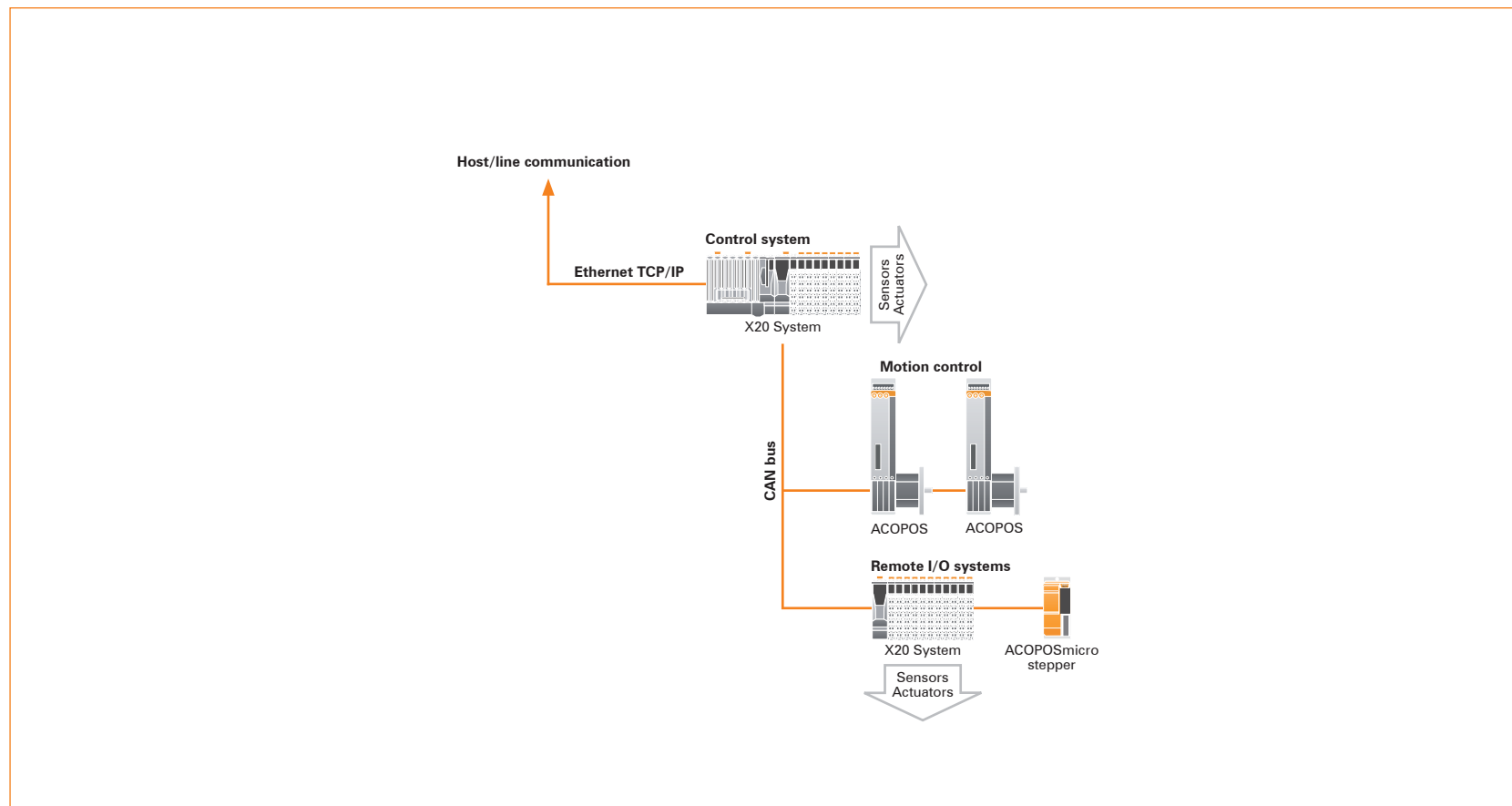
Compact automation in a line system

Short description

The machine should be able to communicate with the outside world. The compact controller is connected with the higher-level plant network via Ethernet TCP/IP. Data can be read from the machine controller and commands can be given over the plant network. Internal machine communication to drives and remote I/O systems takes place via CAN bus.

Properties

- Connection to the line system and plant network
- Compact
- Economical
- Scalable for average demands



Components and technologies

Control system	X20 System: Slice-based I/O and control system	37
Motion control	ACOPOSmicro: Compact drive system	1221
	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
	Stepper motors	1443
Remote I/O systems	X20 System: Slice-based I/O and control system	37
Networks and fieldbuses	CAN bus	611
	Ethernet TCP/IP	611

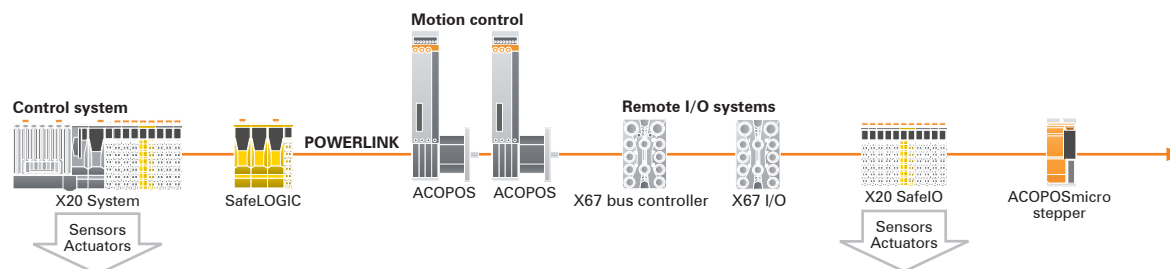
High-performance compact automation

Short description

Space in the switching cabinet is highly valuable. Reducing PLC dimensions should not reduce automation performance. The CPU with local I/O is connected with various distributed components via a high-performance network. This results in a high-performance system that allows optimal solutions to be implemented for more complex tasks in spite of the compact dimensions.

Properties

- Scalable performance
- Highly economical
- Compact dimensions
- Sufficient network reserves for expansions
- Customized solutions for complex tasks



Components and technologies

Control system	X20 System: Slice-based I/O and control system	37
Motion control	ACOPOSmicro: Compact drive system	1221
	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
	Stepper motors	1443
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419
Safety technology	Integrated safety technology	537
Networks and fieldbuses	POWERLINK	611

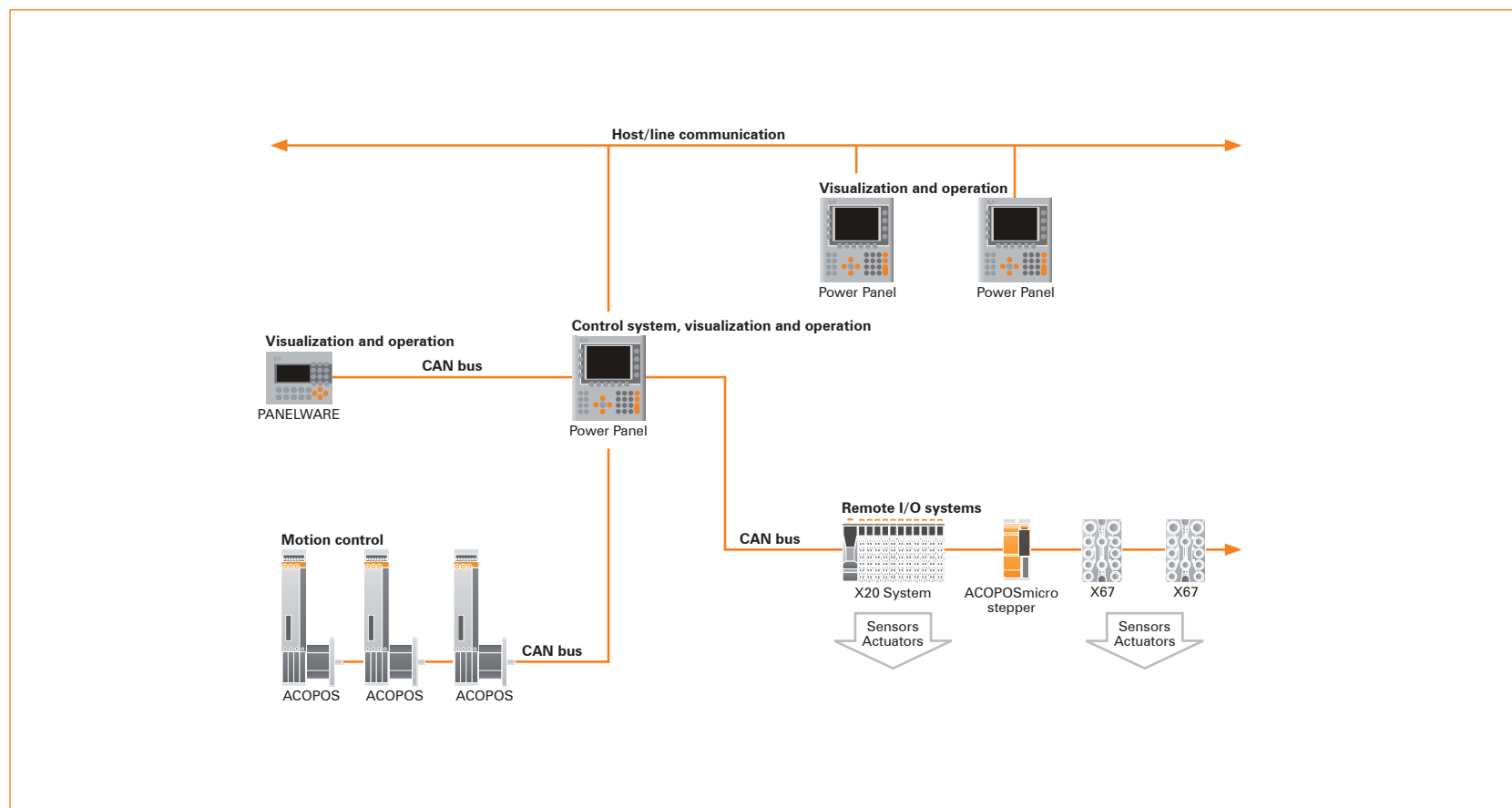
Panel-based automation

Short description

Operation, visualization and control are integrated. Host/line connections can be used for additional operator stations. The drives are networked with each other so that multi-axis movements can be synchronized. I/O signals are connected in the machine room or in the switching cabinet.

Properties

- Compact dimensions
- Flexible operating concepts
- Clear networking
- Modularly expandable



Components and technologies

Control system	Power Panel: Integrated control, operation, and visualization	787
Visualization and operation	Power Panel: Integrated control, operation, and visualization PANELWARE: Compact Operator Panel	787 773
Motion control	ACOPOSmicro: Compact drive system ACOPOS: Intelligent servo drives ACOPOSmulti: Modular drive system Synchronous Motors: Dynamic precision drives Stepper motors	1221 1251 1321 1459/1585/1645 1443
Remote I/O systems	X20 System: Slice-based I/O and control system X67 System: Remote I/O with IP67 protection	37 419
Networks and fieldbuses	Inside the machine: CAN bus Host/line communication: Ethernet TCP/IP	611 611

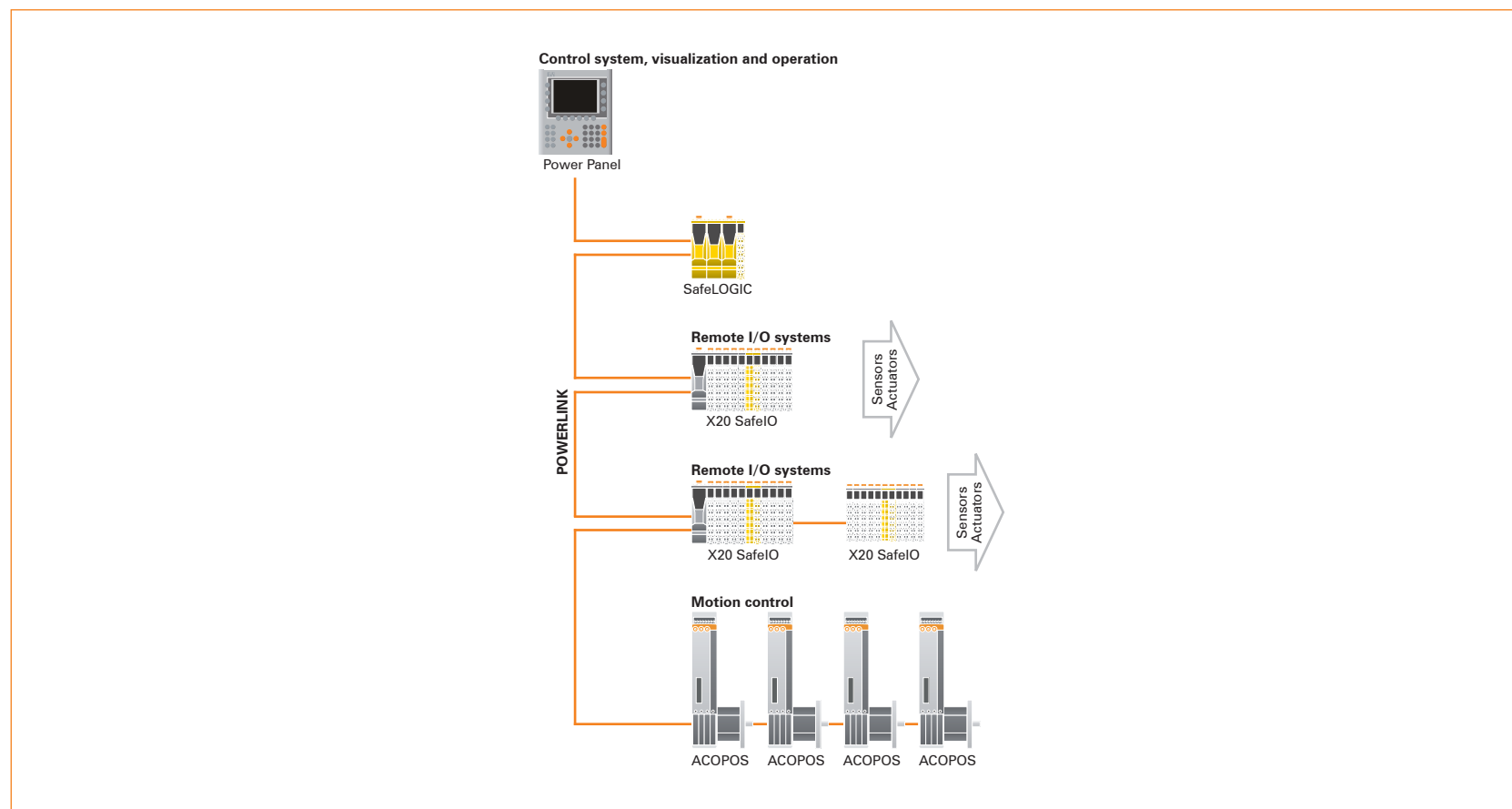
Panel-based automation with a uniform high-performance network

Short description

The operator panel is the central controller. All components, such as I/O systems, safety technology and drives, are connected via a high-performance network. With POWERLINK, the system is set up to handle the highest real-time demands.

Properties

- Modular and scalable machine modules
- Highest performance class for real-time applications
- Precise synchronization of multi-axis movements and I/O signals
- Exceptionally large rated torque



Components and technologies

Control system	Power Panel: Integrated control, operation, and visualization	787
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
Motion control	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
	X20 System: Slice-based I/O and control system	37
Remote I/O systems	X20 System: Slice-based I/O and control system	37
Safety technology	Integrated safety technology	537
Networks and fieldbuses	POWERLINK	611

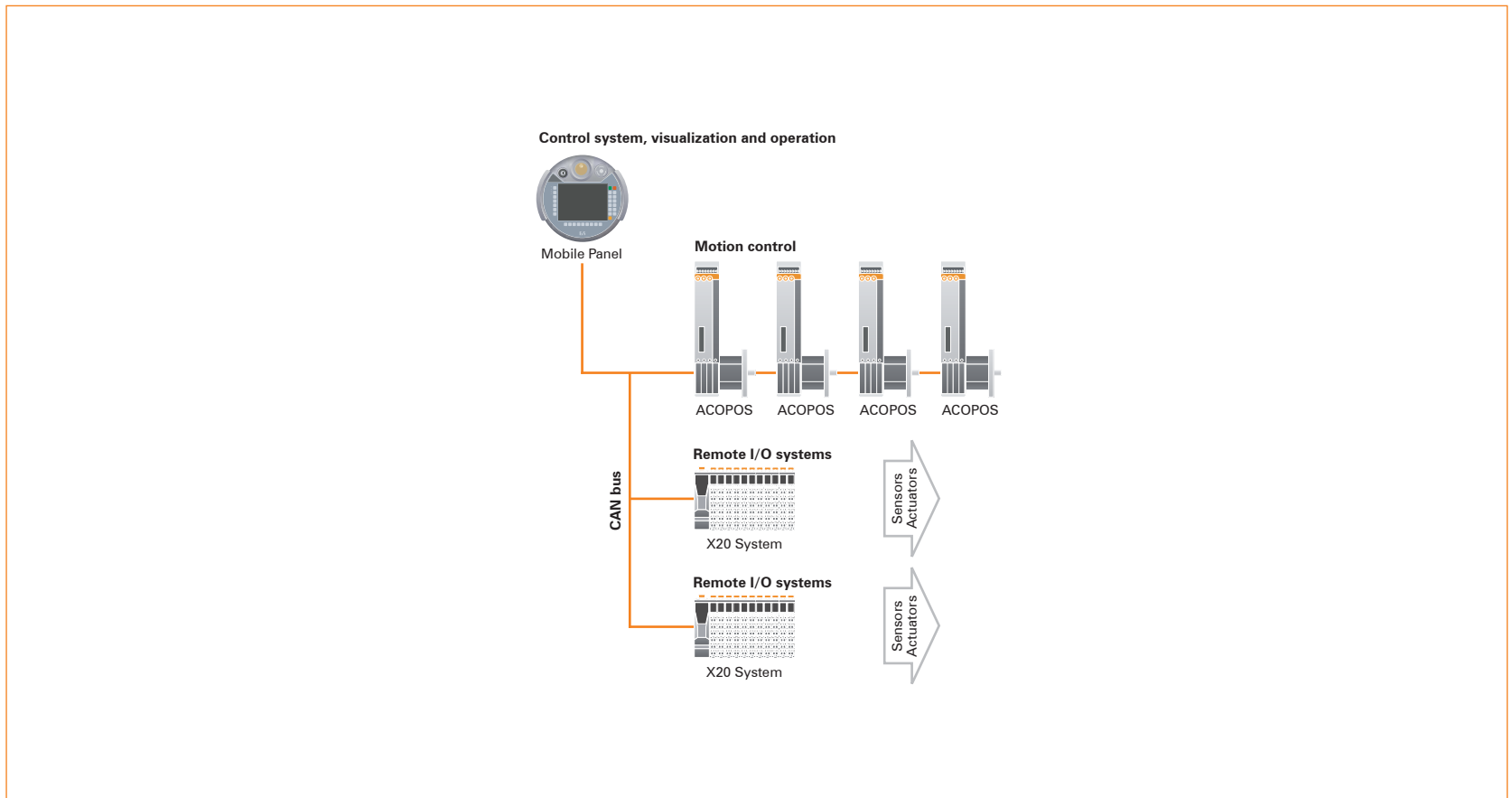
Mobile automation

Short description

The challenge is to provide automation with an optimal price/performance ratio, compact size and mobile operation. The controller is integrated in the mobile operating device. Remote I/O systems and drives are connected efficiently via CAN bus. The result is a flexible, economical system for average performance demands.

Properties

- Mobile operation with integrated control
- Compact
- Economical
- Scalable for average demands



Components and technologies

Control system	Mobile Panel - More than just mobile operation and monitoring	873
Visualization and operation	Mobile Panel - More than just mobile operation and monitoring	873
Motion control	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
Remote I/O systems	X20 System: Slice-based I/O and control system	37
Networks and fieldbuses	CAN bus	611

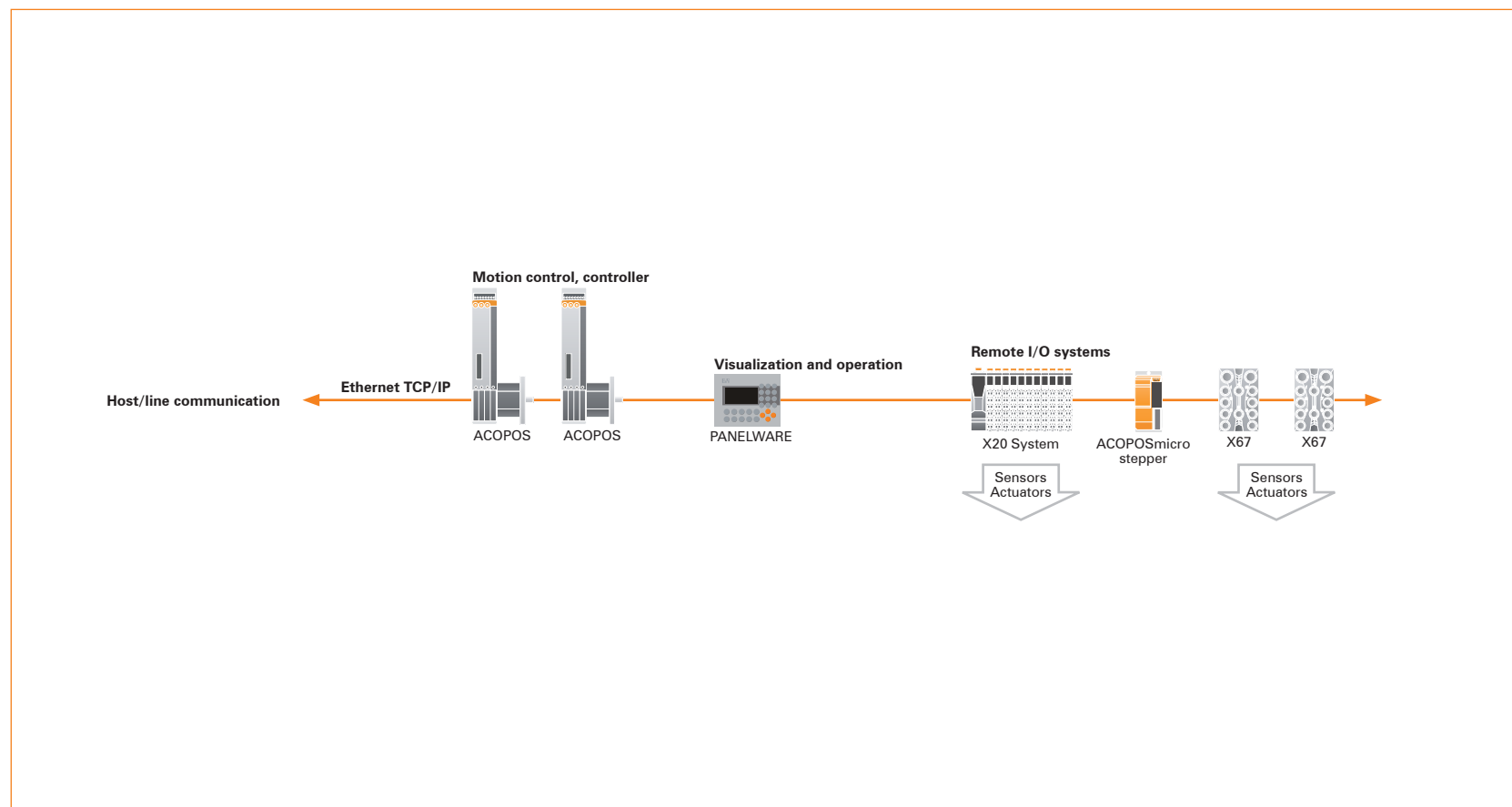
Drive-based automation

Short description

The drive is the controller. The controller is centrally located in one drive or distributed over several drives. The drives are connected with each other so that multi-axis movements can be synchronized. Operation is handled in a simple manner. Returned messages are shown on simple text or graphic displays. I/O signals are connected in the switching cabinet or directly in the machine room.

Properties

- Compact dimensions
- Moderate space requirements in the switching cabinet
- Simple operating concepts
- Minimal wiring
- Modular and scalable



Components and technologies

Control system	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	PANELWARE: Compact Operator Panel	773
Visualization and operation		
Motion control	ACOPOSmicro: Compact drive system	1221
	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
	Stepper motors	1443
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419
Networks and fieldbuses	Inside the machine: CAN bus	611
	Host/line communication: Ethernet TCP/IP	611

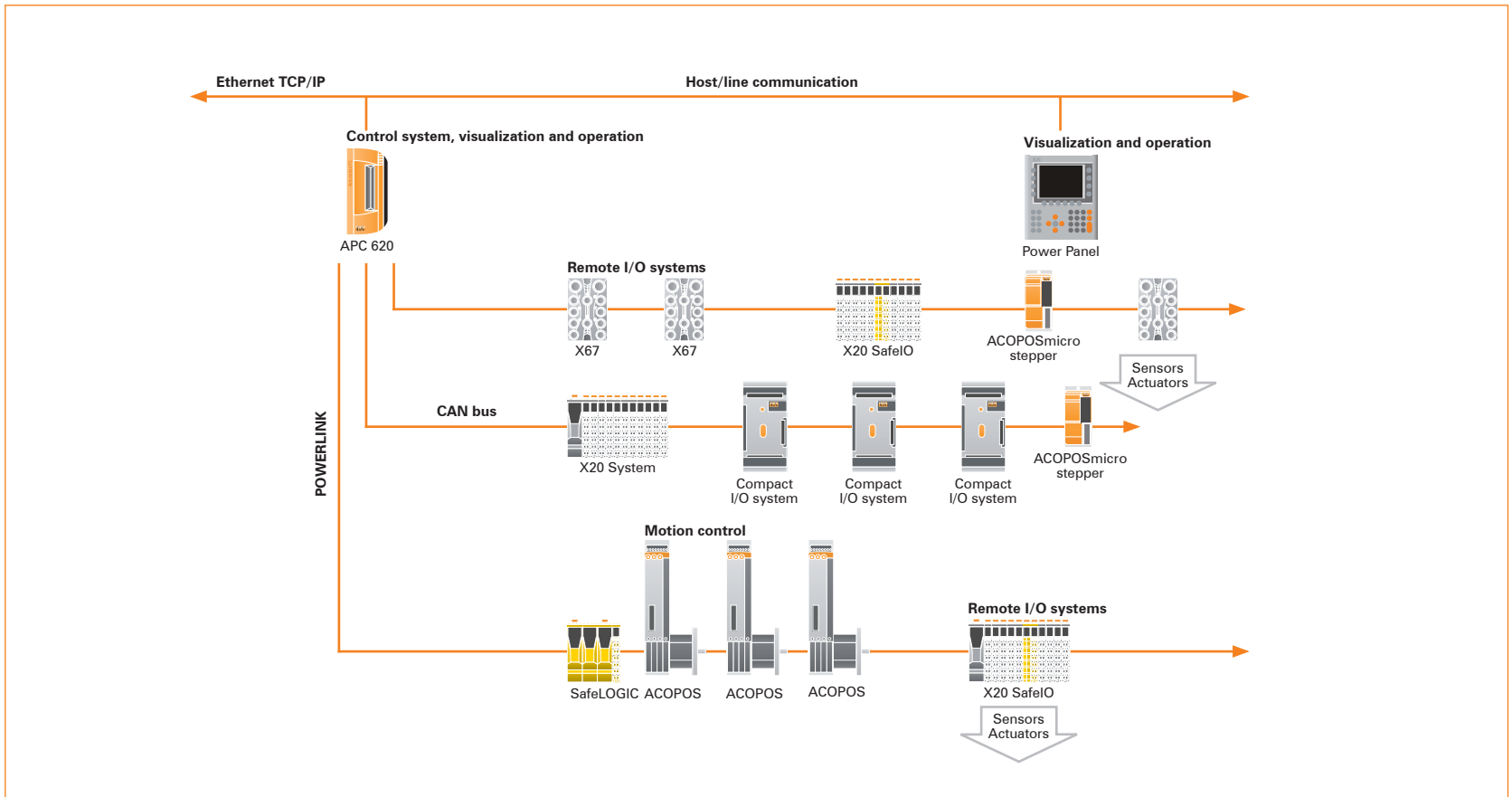
Open PC-based automation

Short description

Automation with standard PC architecture. The industrial PC handles all automation tasks centrally. I/O peripherals, safety technology and drives are connected via fieldbuses and networks. Operation and visualization takes place using a local or remote display unit. Additionally, host/line connections can be used for additional operator stations.

Properties

- Central control concept
- Clear networking
- Scalable performance
- High-performance operating concepts
- Standard PC software can be used



Components and technologies

Control system	APC 620 / APC 810: Automation PC	911/945
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
Motion control	ACOPOSmicro: Compact drive system	1221
	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
	Stepper motors	1443
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419
	Compact I/O System: Economical usage of peripheral space	581
Safety technology	Integrated safety technology	537
Networks and fieldbuses	POWERLINK	611
	Ethernet TCP/IP	611
	CAN bus	611

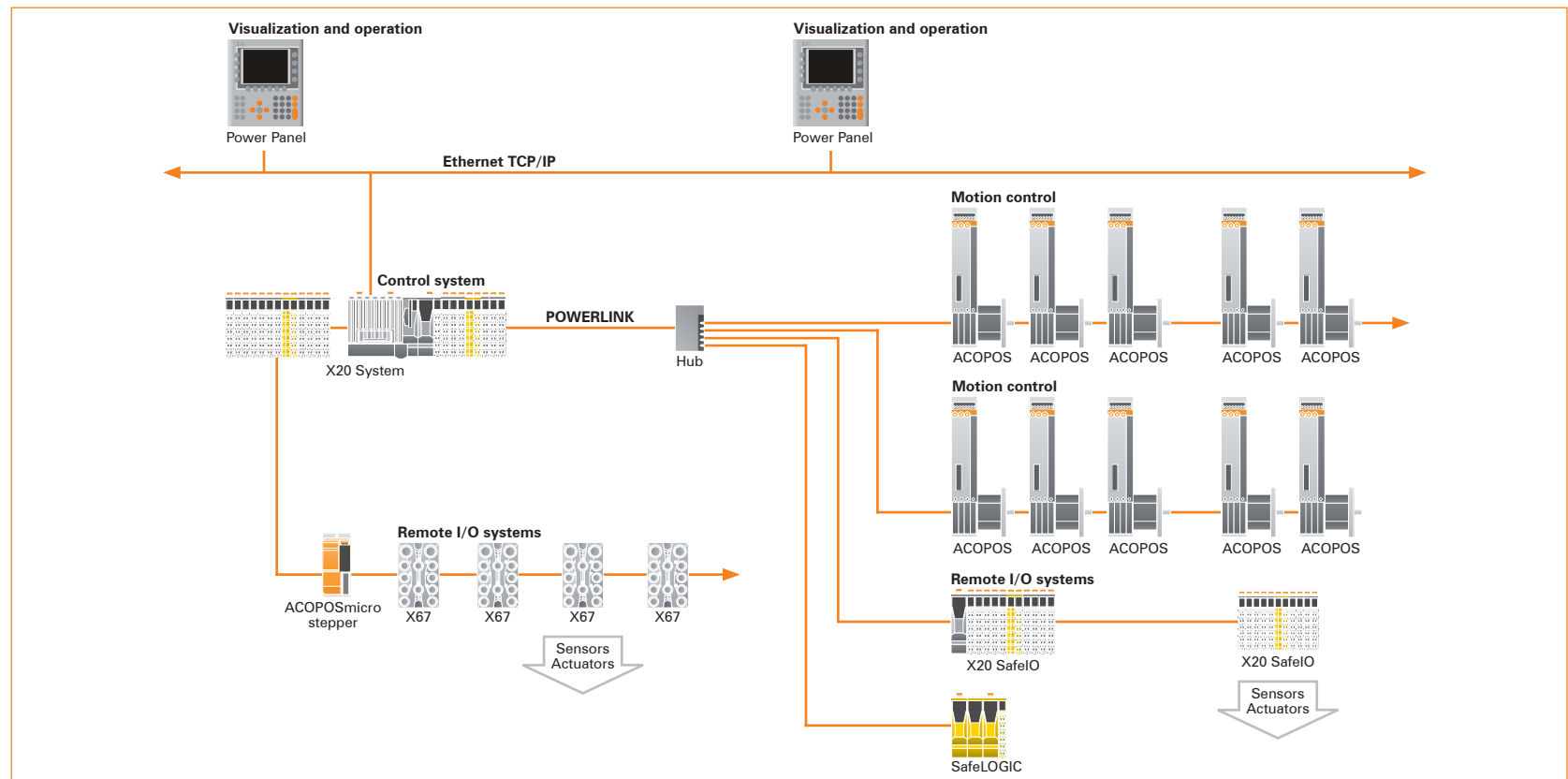
Embedded PC-based automation for high-performance machines

Short description

Large machines and systems place high demands on the functionality and performance of automation components. Flexibility, expandability and scalable performance classes allow the most modern machine concepts to be realized. High-performance PLC with PC architecture as the controller, central and distributed expansions for I/O channels, open network standards and operator panels using the newest ergonomic designs. The example from the packaging industry combines decentralized operation, 50 drives, and 50 remote I/O systems as well as more than 60 I/O modules with IP20 and IP67 protection distributed throughout the machine room.

Properties

- Scalable performance and I/O capacity
- Mixture of central and distributed architecture
- Clear concept and servicing
- Greatly reduced wiring
- Integrated safety technology



Components and technologies

Control system	X20 System: Slice-based I/O and control system	37
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
Motion control	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
	Stepper motors	1443
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419
Safety technology	Integrated safety technology	537
Networks and fieldbuses	POWERLINK	611
	Ethernet TCP/IP	611

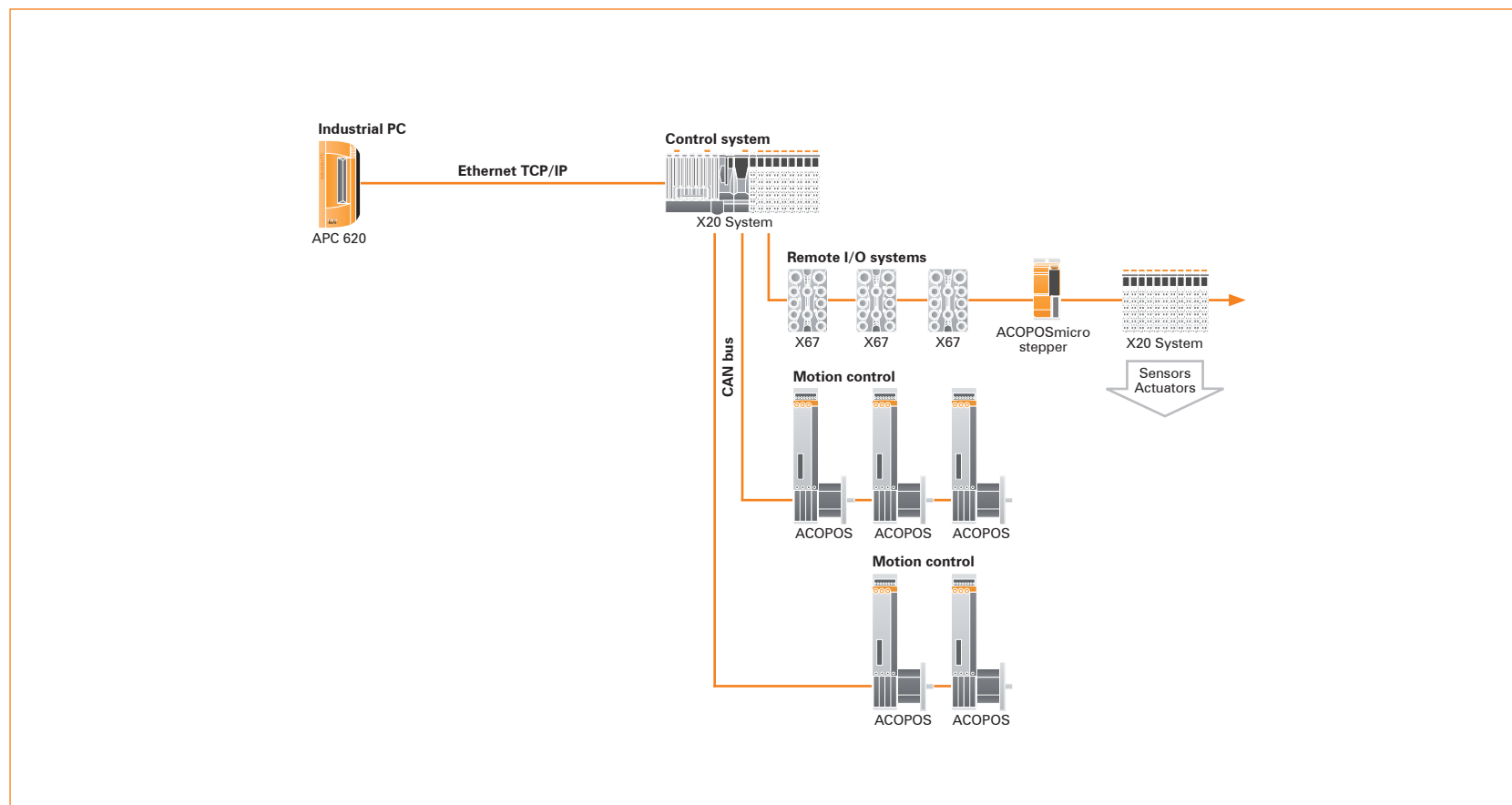
Open and embedded PC-based automation

Short description

The Windows-based visualization and data management are handled by an industrial PC. The machine is controlled centrally by the PLC. Several fieldbus lines connect drives and I/O systems to the PLC. In addition to the local PLC I/O systems, there are also distributed I/O modules with IP67 protection outside the switching cabinet in the machine room.

Properties

- Customized use of central and distributed components
- High-performance, open operating and management concepts



Components and technologies

Control system	X20 System: Slice-based I/O and control system	37
Industrial PC	APC 620 / APC 810: Automation PC	911/945
Motion control	ACOPOSmicro: Compact drive system	1221
	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
	Stepper motors	1443
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419
Networks and fieldbuses	Ethernet TCP/IP	611
	CAN bus	611

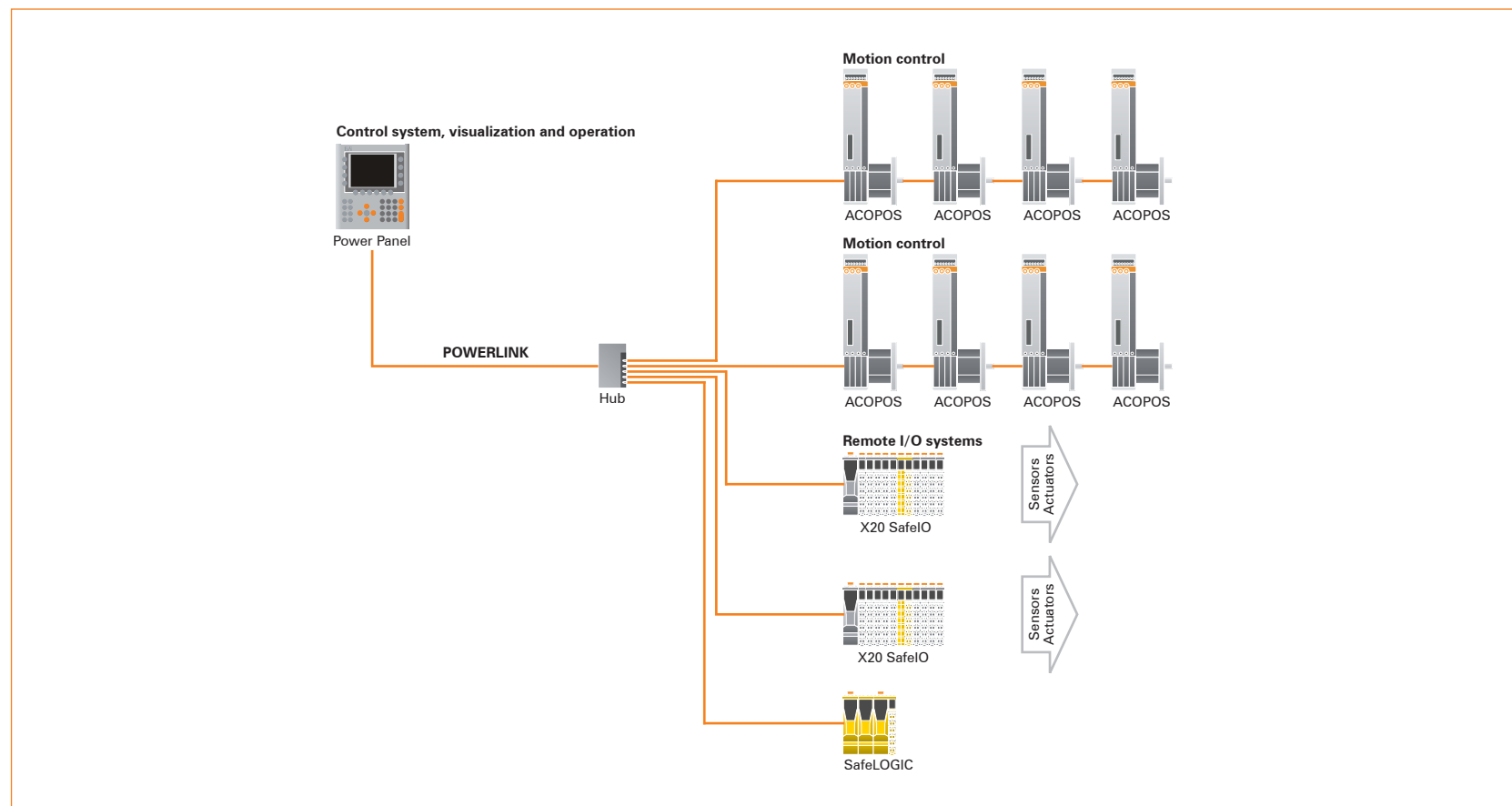
Central automation of modular machines

Short description

For modular machine concepts with many similar elements, a central controller is often more economical than a distributed solution. Compact controllers with integrated visualization also meet high demands. Connecting intelligent drives and I/O systems using a powerful POWERLINK network sets no limits for expandability, precision and performance.

Properties

- Compact central operating and control unit
- Precise synchronization of highly dynamic multi-axis systems
- High degree of flexibility for (future) expansions
- Configurable safety-related machine options



Components and technologies

Control system	Power Panel: Integrated control, operation, and visualization	787
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
Motion control	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
Remote I/O systems	X20 System: Slice-based I/O and control system	37
Safety technology	Integrated safety technology	537
Networks and fieldbuses	POWERLINK	611

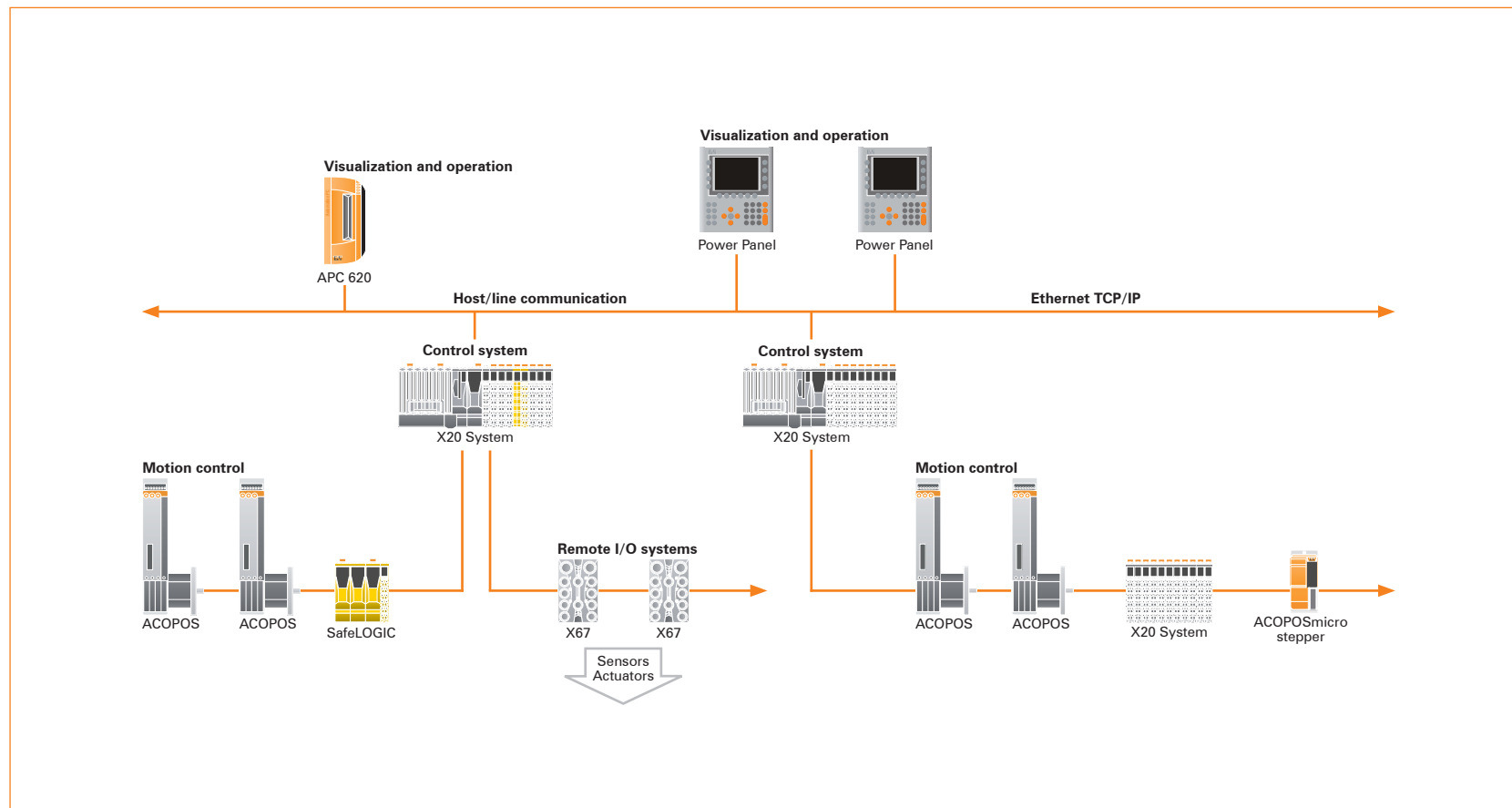
SCADA systems and PC visualization

Short description

This represents the classic approach of using programmable logic controllers for I/O systems and drives and higher-level industrial PCs for management, data handling and visualization. Normally, a SCADA application runs on the industrial PC. Expansion options are possible for several clients that are connected via Ethernet and exchange data using OPC mechanisms.

Properties

- Centrally monitored production and manufacturing processes
- Embedded in plant networks
- High-performance operating and control concepts



Components and technologies

Control system	X20 System: Slice-based I/O and control system	37
Industrial PC	APC 620 / APC 810: Automation PC	911/945
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
Motion control	ACOPOSmicro: Compact drive system	1221
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	X67 System: Remote I/O with IP67 protection	419
Safety technology	Integrated safety technology	537
Networks and fieldbuses	POWERLINK	611
	Ethernet TCP/IP	611
	CAN bus	611

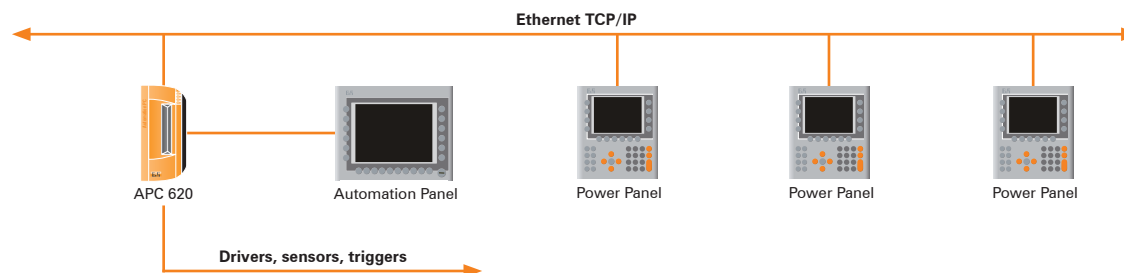
Distributed machine operation with thin clients

Short description

Machine operation should alternate between several different locations. Application and control programs run centrally on an industrial PC. Several cost-effective operator stations (thin clients) are connected via Ethernet. All operator stations offer uniform operational elements and interfaces e.g. for the use of transportable memory media.

Properties

- High-performance and economical operating concepts
- Distribution of machine operation as desired
- Flexible expansions
- Local use of transportable memory media (USB, Disk-on-Key)



Components and technologies

Industrial PC	APC 620 / APC 810: Automation PC	911/945
Visualization and operation	Power Panel: Integrated control, operation, and visualization Automation Panel	787 1055/1077
Networks and fieldbuses	Ethernet TCP/IP	611

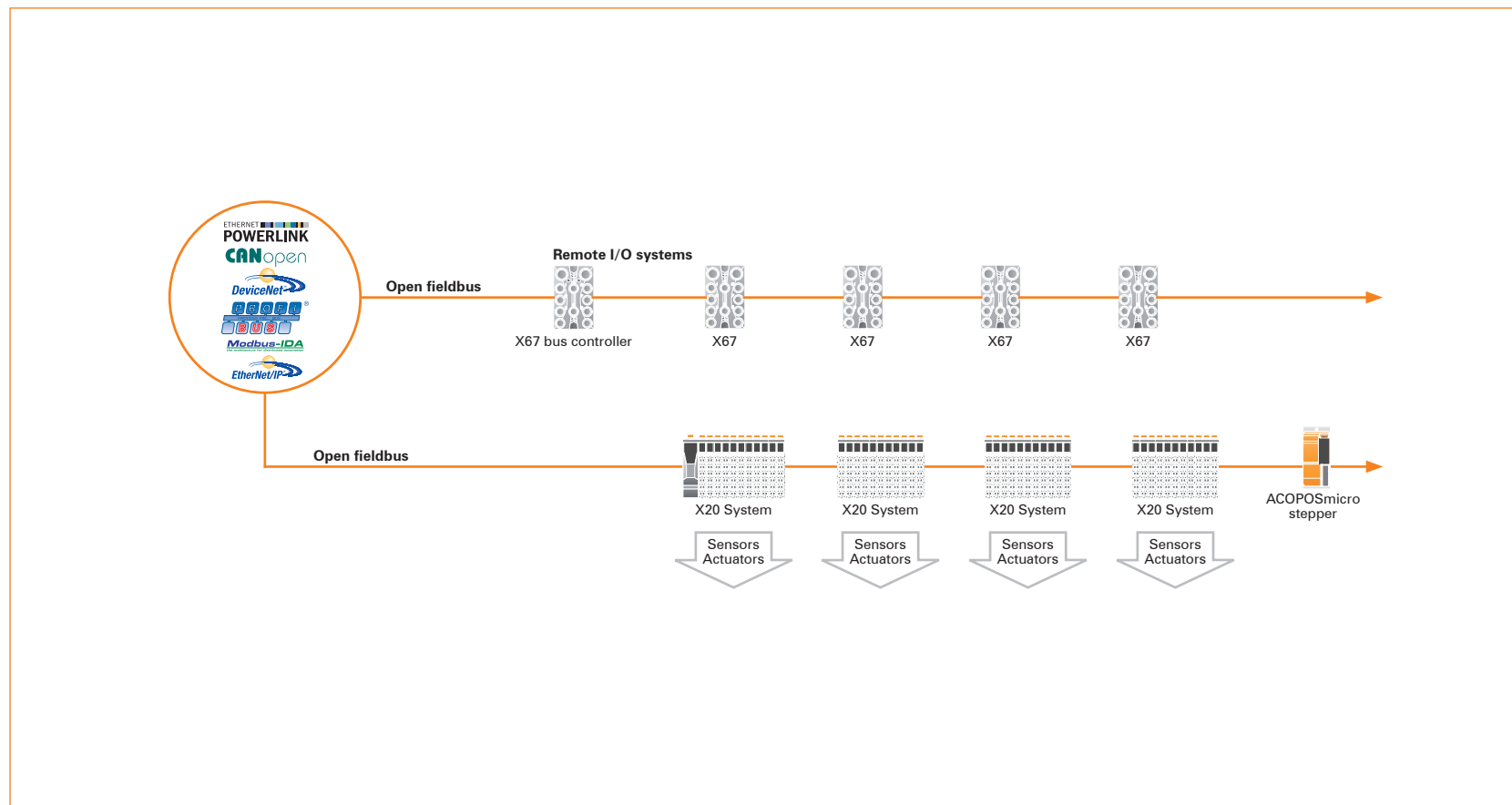
Distributed I/O on open fieldbuses

Short description

Distributed connections of sensors and actuators to the controller should be made directly in the machine room. The components require a certain specified class of protection against dirt, dust and moisture. Open fieldbuses such as CANopen, DeviceNet, Profibus DP and POWERLINK have established themselves for distributed automation.

Properties

- Open for connection to standardized fieldbuses
- Flexible handling of I/O directly in the machine room
- High transfer rates and built-in technology functions
- Robust and resistant to disturbances
- Simple wiring, no cable trees



Components and technologies

Motion control	ACOPOSmicro: Compact drive system	1221
	Stepper motors	1443
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419
Networks and fieldbuses	POWERLINK	611
	CAN bus and CANopen	611
	DeviceNet	611
	Profibus DP	611

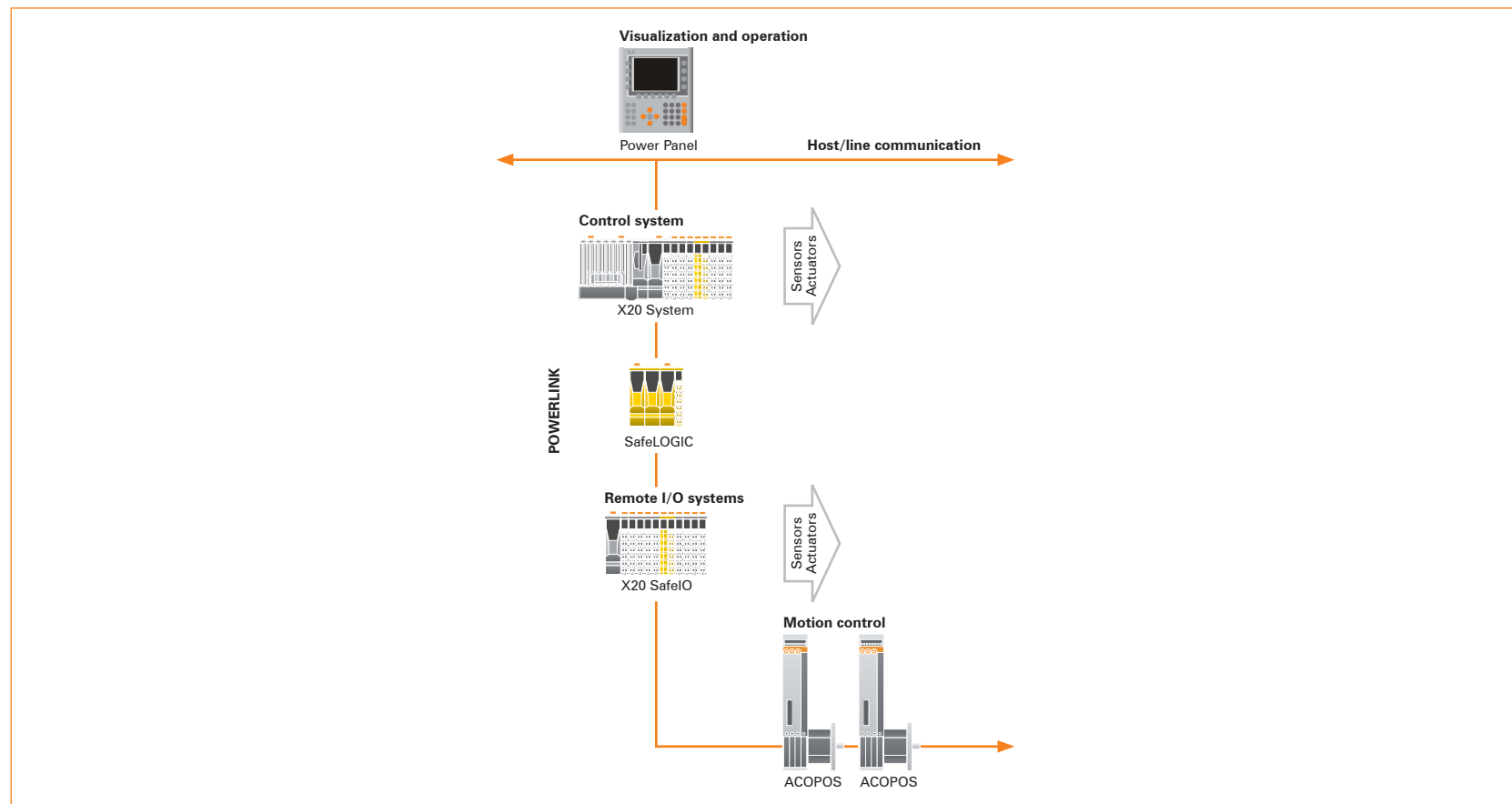
Complete networking with industrial Ethernet

Short description

Ethernet is the worldwide IT standard for networks. Complete connection of the production line to the plant network promises transparency and cost reductions for maintenance and operation. Ethernet is becoming more important as a fieldbus replacement for the automation of machines and systems. The connection of visualization systems and networking for time-critical data communication to I/O systems, safety technology and drives takes place using Ethernet TCP/IP protocols, POWERLINK and POWERLINK Safety.

Properties

- Open network standard
- Transparent communication for management, process and field levels
- Seamless integration in line networks and the IT infrastructure
- Highest level of safety (SIL 3 according to IEC 61508)



Components and technologies

Control system	X20 System: Slice-based I/O and control system	37
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
Motion control	ACOPOS: Intelligent servo drives	1251
	ACOPOSMulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
Remote I/O systems	X20 System: Slice-based I/O and control system	37
Safety technology	Integrated safety technology	537
Networks and fieldbuses	POWERLINK	611
	Ethernet TCP/IP	611

PANELWARE – Compact operator panels

PANELWARE compact terminals in combination with B&R control systems are the ideal solution for space-saving machine visualization applications.



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System characteristics

Remote visualization

PANELWARE operator panels can be placed right where status messages and operating data are displayed and where they are easily accessible for setting up the machine.

Compact operator panels

Compact panels are devices with minimum space requirements. These panels are equipped with keys and an alphanumeric LCD. They are controlled by the PLC using escape sequences.

Panel – Controller variations

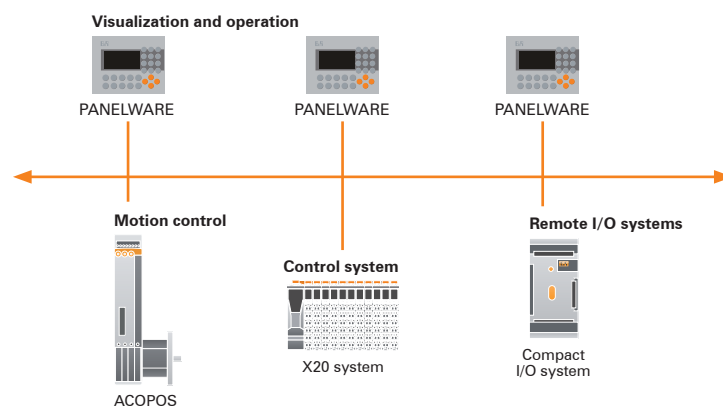
PANELWARE controllers are standalone modules. The range of different graphics panels makes it possible to put together the perfect configuration for any particular application's demands.



Typical topologies

Compact visualization and operation

PANELWARE operator panels are used in combination with a control system to automate small machines. The product series ranges from 4x20 character LCD devices up to graphics terminals with 128x240 pixels (16x40 characters). The terminal is programmed via the PLC.



Control system	X20 System: Slice-based I/O and control system	37
Visualization and operation	PANELWARE: Compact operator panels	773
Motion control	ACOPOS: Intelligent servo drives	1251
Remote I/O systems	Compact I/O system: Economical usage of peripheral space	581

Product overview

Controller module



Model number	Short description	
4C1300.01-510	PANELWARE panel controller C130, color: black, VT100 terminal emulation, 24 VDC supply, 1 electrically isolated CAN interface	780

Compact HMI



Model number	Short description	
4B1260.00-490	PANELWARE Compact HMI, white, terminal HMI (escape sequences), LCD, 4 x 20 characters, background lighting, 12 number keys + 12 function keys, 1 RS232 interface, IP65 protection (front side)	781
4B1270.00-490	PANELWARE Compact HMI, white, terminal HMI (escape sequences), LCD, 4 x 20 characters, background lighting, 12 number keys + 12 function keys, CAN interface, 24 VDC supply, IP65 protection (front side)	782
4B1260.00-390	PANELWARE Compact HMI, white, terminal HMI (escape sequences), LCD, 4 x 20 characters, background lighting, 14 function keys, 6 system keys, 1 RS232 interface, IP65 protection (front side)	781
4B1270.00-390	PANELWARE Compact HMI, white, terminal HMI (escape sequences), LCD, 4 x 20 characters, background lighting, 14 function keys, 6 system keys, CAN interface, 24 VDC supply, IP65 protection (front side)	782
4PW035.E300-01	PANELWARE Compact HMI, terminal HMI (escape sequences), LCD, 160 x 80 characters, background lighting, 26 keys, CAN interface, 24 VDC supply, IP65 protection (front side)	783
4PW035.E300-02	PANELWARE Compact HMI, terminal HMI, LCD, 160 x 80 characters, background lighting, 26 keys, X2X interface, 24 VDC supply, IP65 protection (front side)	783

Display panels



Model number	Short description	
4D1165.00-490	PANELWARE graphics display panel, white, LCD, graphics-capable, 16 x 40 characters or 128 x 240 pixels, character height: 4.0 mm, black on white, background lighting, IP65 aluminum front, horizontal, 47 keys, 30 of which have LEDs	784
4D1166.00-490	PANELWARE graphics display panel, white, LCD, graphics-capable, 16 x 40 characters or 128 x 240 pixels, character height: 4.0 mm, black on white, background lighting, IP65 aluminum front, vertical, 47 keys, 30 of which have LEDs	784
4D1167.00-490	PANELWARE graphic display panel, with matrix touch, LCD, graphics-capable, 16 x 40 characters or 128 x 240 pixels, character height: 4.0 mm, black on white, background lighting, integrated matrix touch with 4 x 8 fields, IP65 aluminum front, 24 keys, 8 of which have LEDs	784

Accessories



Model number	Short description	
4A0027.00-000	Power supply for Compact HMI P120/P121/P125/P126, 24 VDC, 7.5 W	785

Controller module C130



Controller	4C1300.01-510
Short description	C130
Control	Escape sequences B&R Visual Components
Possible connections	
Display modules	1
Keypad modules	1-7
Interfaces	4C1300.01-510
Interface	CAN bus
Design	9-pin DSUB plug
Electrical isolation	Yes
Maximum distance	1000 m
Maximum baud rate	500 kBit/s
Network-capable	Yes
24 VDC supply	4C1300.01-510
Input voltage (min./nom./max.)	18 / 24 / 30 VDC
Current requirements	95 mA at 24 VDC
Environmental conditions	4C1300.01-510
Ambient temperature	
Operation	0 to +50°C
Storage	-20 to +60°C
Relative humidity in operation and storage	10 to 95% (non-condensing)
Mechanics	4C1300.01-510
Protection type	IP20
Outer dimensions (W x H x D [mm])	182 x 86 x 30
Weight	Approx. 500 g

Optional accessories		C130
7AC911.9	Bus connector, CAN bus	• 1144
0AC912.9	Bus adapter, CAN bus, 1 CAN interface	• 1146
0AC913.92	Bus adapter, CAN bus, 2 CAN interfaces, including 30 cm attachment cable	• 1146

All parts required for installation of the controller module and key legend sheets for keypad modules are included in the delivery of the controller module.

Compact HMI P126



General information	4B1260.00-490	4B1260.00-390
Display	4 x 20 LCD, LED background lighting	4 x 20 LCD, LED background lighting
Keyboard	Mylar keypad with 24 keys: 12 function keys with LED (labeled with legend sheets) 12 number keys	Mylar keypad with 20 keys: 14 function keys with LED (labeled with legend sheets) 6 system keys
Control	Escape sequences	Escape sequences
Interfaces	4B1260.00-490	4B1260.00-390
Type	RS232	RS232
Design	9-pin DSUB plug	9-pin DSUB plug
Electrical isolation	No	No
Maximum distance	15 m / 9,600 Bit/s with external 24 VDC supply	15 m / 9,600 Bit/s with external 24 VDC supply
Maximum bit rate	9,600 Bit/s	9,600 Bit/s
Network-capable	No	No
24 VDC supply	4B1260.00-490	4B1260.00-390
Input voltage (min./nom./max.)	5 / 5.2 / 5.5 VDC	5 / 5.2 / 5.5 VDC
Power consumption (typ./max.)	1.8 / 2.5 W	2.0 / 2.5 W
Environmental conditions	4B1260.00-490	4B1260.00-390
Ambient temperature		
Operation	0 to +50°C	0 to +50°C
Storage	-20 to +60°C	-20 to +60°C
Relative humidity in operation and storage	10 to 90% (non-condensing)	10 to 90% (non-condensing)
Mechanics	4B1260.00-490	4B1260.00-390
Front	Multi-layered cover with insertion slots for key labels and company logo or machine description	Multi-layered cover with insertion slots for Key labels
EN 60529 protection	IP65 (front side)	IP65 (front side)
Weight	Approx. 500 g	Approx. 500 g
Outer dimensions (W x H x D [mm])	145 x 180 x 30	153 x 120 x 43

Optional accessories		-490	-390
BRKACOMP1-0	Data cable, length: 1.5 m, from compact PLC (IF1/RS232) to Compact HMI P120/P121	•	•
4A0026.00-000	PANELWARE set with legend sheets for P125/P126/P127 Compact HMI, 10 sheets	•	•
4A0027.00-000	Power supply for Compact HMI P120/P121/P125/P126, 24 VDC, 7.5 W	•	•
4A0046.00-000	PANELWARE set with legend sheets for P126/P127 Compact HMI		•

Compact HMI P127



General information	4B1270.00-490	4B1270.00-390
Display	4 x 20 LCD, LED background lighting	4 x 20 LCD, LED background lighting
Keyboard	Mylar keypad with 24 keys: 12 function keys with LED (labeled with legend sheets) 12 number keys	Mylar keypad with 20 keys: 14 function keys with LED (labeled with legend sheets) 6 system keys
Control	Escape sequences, B&R Visual Components	Escape sequences, B&R Visual Components
Interfaces	4B1270.00-490	4B1270.00-390
Type	CAN	CAN
Design	9-pin DSUB plug	9-pin DSUB plug
Electrical isolation	Yes	Yes
Maximum distance	1000 m	1000 m
Maximum bit rate	500 kBit/s	500 kBit/s
Network-capable	Yes	Yes
24 VDC supply	4B1270.00-490	4B1270.00-390
Input voltage (min./nom./max.)	18 / 24 / 30 VDC	18 / 24 / 30 VDC
Power consumption (typ./max.)	2.8 / 3.3 W	2.2 / 2.5 W
Environmental conditions	4B1270.00-490	4B1270.00-390
Ambient temperature		
Operation	0 to +50°C	0 to +50°C
Storage	-20 to +60°C	-20 to +60°C
Relative humidity in operation and storage	10 to 90% (non-condensing)	10 to 90% (non-condensing)
Mechanics	4B1270.00-490	4B1270.00-390
Front	Multi-layered cover with insertion slots for key labels and company logo or machine description	Multi-layered cover with insertion slots for Key labels
EN 60529 protection	IP65 (front side)	IP65 (front side)
Weight	Approx. 500 g	Approx. 500 g
Outer dimensions (W x H x D [mm])	145 x 180 x 30	153 x 120 x 43

Optional accessories		-490	-390	
4A0026.00-000	PANELWARE set with legend sheets for P125/P126/P127 Compact HMI, 10 sheets	•		
4A0046.00-000	PANELWARE set with legend sheets , for P126/P127 Compact HMI		•	
7AC911.9	Bus connector, CAN	•	•	1144
0AC912.9	Bus adapter, CAN, 1 CAN interface	•	•	1146
0AC913.92	Bus adapter, CAN, 2 CAN interfaces, includes 30 cm attachment cable (DSUB)	•	•	1146

Compact HMI PW35



General information	4PW035.E300-01	4PW035.E300-02	
Keyboard			
Total keys	26 keys (10 with LED)	26 keys (10 with LED)	
System keys	Number block, control keys	Number block, control keys	
Label	10 keys with legend strips	10 keys with legend strips	
Control	Escape sequences, B&R Visual Components	B&R Visual Components	
Display	4PW035.E300-01	4PW035.E300-02	
Type	LCD b/w	LCD b/w	
Resolution	160 x 80 pixels	160 x 80 pixels	
Background lighting	LED	LED	
Character set	European / Cyrillic	European / Cyrillic	
Interfaces	4PW035.E300-01	4PW035.E300-02	
Type	CAN	X2X	
Electrical isolation	Yes	Yes	
Design	9-pin DSUB plug	8-pin multipoint connector	
Distance	Max. 1000 m bus length	100 m	
Max. baud rate	500 kBit/s		
24 VDC supply	4PW035.E300-01	4PW035.E300-02	
Rated voltage	24 VDC ± 25%	24 VDC ± 25%	
Power consumption	Max. 6 W	Max. 6 W	
Environmental conditions	4PW035.E300-01	4PW035.E300-02	
Ambient temperature			
Operation	0 to +50°C	0 to +50°C	
Storage	-20 to +60°C	-20 to +60°C	
Relative humidity			
Operation / Storage	5 to 95% (non-condensing)	5 to 95% (non-condensing)	
Mechanical characteristics	4PW035.E300-01	4PW035.E300-02	
Protection type	IP65 (front side)	IP65 (front side)	
Outer dimensions (W x H x D [mm])	153 x 120 x 46.1	153 x 120 x 46.1	
Weight	0.5 kg	0.5 kg	
Required accessories			
0TB1108.8110	Accessory 8-pin cage clamps (3.5)	-01 •	1136
Optional accessories			
4A0044.00-000	Set of printable legend strips for the PP15 and PP35	•	•
7AC911.9	Bus connector, CAN	•	1144
0AC912.9	Bus adapter, CAN, 1 CAN interface	•	1146
0AC913.92	Bus adapter, CAN, 2 CAN interfaces, including 30 cm connection cable (DSUB connector)	•	1146

Graphic LC Display Panels



General information	4D1165.00-490	4D1166.00-490	4D1167.00-490
Resolution	128 x 240 pixels	128 x 240 pixels	128 x 240 pixels
Number of lines	16	16	16
Number of characters/line	40	40	40
Character height	4 mm	4 mm	4 mm
Font sizes	Single, double and quadruple	Single, double and quadruple	Single, double and quadruple
Background lighting	CFL (miniature florescent tube)	CFL (miniature florescent tube)	CFL (miniature florescent tube)
Color	Black on white	Black on white	Black on white
Keys	47	47	24
Key LEDs	31	31	8
Key labels	Yes	Yes	Yes
Grid - Touch	-	-	Integrated, 4 x 8 fields
Supply via controller	4D1165.00-490	4D1166.00-490	4D1167.00-490
Maximum current consumption	300 mA	300 mA	300 mA
Environmental conditions	4D1165.00-490	4D1166.00-490	4D1167.00-490
Ambient temperature			
Operation	0 to +50°C	0 to +50°C	0 to +50°C
Storage	-20 to +60°C	-20 to +60°C	-20 to +60°C
Relative humidity			
Operation (non-condensing)	20 to 85%	20 to 85%	20 to 85%
Storage (non-condensing)	20 to 90%	20 to 90%	20 to 90%
Mechanics	4D1165.00-490	4D1166.00-490	4D1167.00-490
Format	Horizontal	Vertical	Vertical
Outer dimensions (W x H x D [mm])	350 x 220 x 38.6	214 x 326 x 38.6	214 x 286 x 38.6

Optional accessories

4A0029.00-000	PANELWARE set with legend sheets for graphic display panel 4D1167, with Corel Draw template (for 10 devices)
4A0030.00-000	PANELWARE set with legend sheets for graphic display panel 4D1165, for 10 devices
4A0031.00-000	PANELWARE set with legend sheets for graphic display panel 4D1166, for 10 devices

Power supplies for P12x



Interfaces	4A0027.00-000
RS232 interface	
Design	9-pin DSUB plug
Electrical isolation	No
Interface to Panel	
Design	10-pin connector
Connection	Cable to panel is contained in the delivery
Electrical isolation	No
24 VDC supply	4A0027.00-000
Input voltage (min./nom./max.)	18 / 24 / 30 VDC
Power consumption	Max. 7.5 W
Connection	3-pin female multipoint connector
Environmental conditions	4A0027.00-000
Ambient temperature	
Operation	0 to +50°C
Storage	-20 to +60°C
Relative humidity in operation and storage	5 to 95% (non-condensing)
Mechanics	4A0027.00-000
Outer dimensions (W x H x D [mm])	114 x 85.5 x 31
Weight	N/A



Power Panel Integrated control, operation and visualization

The compact and intelligent PP15, PP21, and PP41 Power Panel devices are the first choice for automating small to mid-sized machines and systems with maximum component density.



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System characteristics

Redefining performance

The compact and intelligent Power Panels PP15, PP21, PP35 and PP41 are the first choice for automation on small to mid-size machines and systems with maximum component density. These products integrate the visualization, a complete PLC, and digital inputs and outputs. In addition, these devices can be modularly expanded and are available in variations with text display and graphics with up to QVGA resolution.

Even higher demands are met by the Power Panel 45, Power Panel 300 and Power Panel 400 product lines. Their area of use may range from simple operator terminals and visualizations with a standard operating system to complete automation systems with integrated control and drive technology. Whether stand-alone or networked, the possibilities are endless.

Power Panel 300 embedded devices can be used as a terminal in one system or distributed over several operator stations.

Power Panel 400 devices additionally offer all of the functions of a controller, including modular fieldbus interfaces and input systems that range from analog resistive touch screens to various keyboard devices.

Power Panel overview

	PP15	PP35	PP21	PP41	PP45	PP300	PP400
Display	LCD 4 x 20 characters	LCD 160 x 80 pixels	LCD 4 x 20 characters	LCD QVGA	LCD QVGA	LCD/TFT QVGA VGA SVGA XGA	LCD/TFT QVGA VGA XGA
Covered keys	Yes	Yes	Yes	Yes	Yes	No	Yes
Touch screen	-	-	-	-	Yes	Yes	Yes
Memory	300 KB SRAM 1024 KB/1984 KB User PROM	300 KB SRAM 1024 KB/1984 KB User PROM	700 KB SRAM 1.4 MB User PROM	700 KB SRAM 1.4 MB User PROM	64 MB DRAM 32 KB SRAM	128 MB SDRAM ¹⁾ 256/512 MB SDRAM ²⁾	128 MB SDRAM 512 KB SRAM
Inputs/outputs onboard	Yes	Yes	Yes	Yes	No	No	No
Interfaces Onboard	CAN bus RS232	CAN bus RS232	CAN bus RS232	CAN bus RS232	X2X	RS232	RS232
Ethernet TCP/IP onboard/modular	- / -	- / -	- / -	- / Yes	Yes / -	Yes / -	Yes / -
Expansion modules	-	-	Max. 6 B&R 2003 screw-in modules	Max. 6 B&R 2003 screw-in modules 1 B&R 2005 communication module	Max. 1 PP45 compact IF slot	-	Max. 2 aPCI modules
Instruction cycle time	0.8 μ s	0.8 μ s	0.5 μ s	0.5 μ s	TBD	- ³⁾	0.038 μ s ¹⁾

1) Embedded variations

2) BIOS variations

3) No controller functionality

16 digital outputs

16 digital inputs



RS232

CAN bus

**Power Panel
PP15 / PP35
Digital types**

PP15 / PP21 / PP35 / PP41

Compact control and visualization devices

The devices in the Power Panel model range from PP15 to PP41 integrate controller, onboard I/O and visualization. This product family is especially noteworthy for its compact design and extensive range of functions. An integrated CAN bus interface is available for connecting additional input/output channels or drives. Programming applications and the visualization project can be done using Automation Studio, the programming and diagnostics tool from B&R.

The same aspect ratio for graphics or text

PP15 and PP35 devices offer a choice between a 4 x 20 character or 160 x 80 pixel graphic display with the same outer dimensions.

Modularly expandable

In addition to the integrated inputs/outputs, the PP21 and PP41 are also equipped with six expansion slots. This enables expansion with up to 60 digital or 24 analog inputs/outputs. Three slots can be used for modules with TPU functionality. As a result, functions such as event counting, trigger function, stepper motor control and frequency measurement are possible. As an additional option, the PP41 offers an expansion slot for System 2005 communication modules. This makes it possible to connect Ethernet TCP/IP in addition to fieldbus systems. Character sets and language modules for the visualization unit are stored on a CompactFlash card that can be exchanged from the outside.

4 analog outputs
8 digital outputs

4 analog inputs
8 digital inputs



RS232

CAN bus

**Power Panel
PP15 / PP35
Analog types**

10 digital inputs

8 digital outputs



Optional slot
for communication
modules (only PP41)

RS232
CAN bus

Slots for
expansion
modules

**Power Panel
PP21 / PP41**

System characteristics



Model number	Type	Display	Resolution	Digital inputs/outputs	Analog inputs/outputs	CAN bus	Ethernet	
4PP015.0420-01	PP15	LCD	4x20 characters	16 / 16	- / -	✓	-	804
4PP015.0420-36	PP15	LCD	4x20 characters	8 / 8	4 / 4	✓	-	804
4PP015.C420-01	PP15	LCD	4x20 characters	16 / 16	- / -	✓	-	804
4PP015.C420-36	PP15	LCD	4x20 characters	8 / 8	4 / 4	✓	-	804
4PP015.E420-01	PP15	LCD	4x20 characters	16 / 16	- / -	✓	-	804
4PP015.E420-101	PP15	LCD	4x20 characters	16 / 16	- / -	✓	-	807
4PP015.E420-36	PP15	LCD	4x20 characters	8 / 8	4 / 4	✓	-	804
4P0420.00-490	PP21	LCD	4x20 characters	10 / 8	- / -	✓	-	804
4PP035.0300-01	PP35	LCD	160x80 pixels	16 / 16	- / -	✓	-	809
4PP035.0300-36	PP35	LCD	160x80 pixels	8 / 8	4 / 4	✓	-	809
4PP035.E300-01	PP35	LCD	160x80 pixels	16 / 16	- / -	✓	-	809
4PP035.E300-36	PP35	LCD	160x80 pixels	8 / 8	4 / 4	✓	-	809
4PP035.E300-136	PP35	LCD	160x80 pixels	8 / 8	4 / 4	✓	-	812
4P3040.01-490	PP41	LCD	QVGA	10 / 8	- / -	✓	✓	816

Power Panel 45



Model number	Diagonal [in]	Display	Resolution	Touch screen	DRAM [MB]	SRAM [KB]	aPCI slots	Ethernet	
4PP045.0571-042	5.7	LCD m	QVGA	✓	64	32	0	✓	821
4PP045.0571-062	5.7	LCD color	QVGA	✓	64	32	0	✓	822
4PP045.0571-L42	5.7	LCD m	QVGA	-	64	32	0	✓	823

Power Panel 300 BIOS

Universal application

Power Panel 300 devices with BIOS are set up for use with Windows® CE .net or Windows® XP embedded. This allows these devices to be used universally with standard SCADA packages as web terminals or thin clients.



Model number	Type	Diagonal [in]	Display	Resolution	Touch screen	DRAM [MB]	SRAM [KB]	aPCI slots	Ethernet	
5PP320.0571-39	BIOS	5.7	TFT color	QVGA	✓	256	-	0	✓	828
5PP320.0573-39	BIOS	5.7	TFT color	VGA	✓	256	-	0	✓	830
5PP320.0573-3B	BIOS	5.7	TFT color	VGA	✓	512	-	0	✓	830
5PP320.1043-39	BIOS	10.4	TFT color	VGA	✓	256	-	0	✓	831
5PP320.1214-39	BIOS	12.1	TFT color	SVGA	✓	256	-	0	✓	832
5PP320.1505-39	BIOS	15	TFT color	XGA	✓	256	-	0	✓	833

Power Panel 300 embedded

More than visualization

Devices in the Power Panel 300 embedded product line are visualization terminals that can be connected to additional Power Panel terminals, industrial PCs, controllers, or any other high-level computer system. However, the Power Panel 300 is more than just a simple display unit. In addition to handling its visualization tasks, the Power Panel 300 can also execute any software component that can run on a controller. Power Panel 100 devices can be programmed with Automation Studio, our extensive configuration and programming tool.

Distributed or central data storage

The data points are stored either on a central controller (terminal mode) or directly on the Power Panel CompactFlash.

Open communication

The RS232 and Ethernet interfaces on the Power Panel 300/400 can be programmed as needed. This makes it possible to couple various peripherals or to connect with higher level systems.

Power Panel 400 embedded

Integrating control and motion technology

Power Panel 400 devices integrate both control and drive technology. The devices are equipped with up to two slots for interface modules. CAN bus, X2X Link or POWERLINK connections are supported.

Programming with Automation Studio

Automation Studio handles uniform configuration and programming of the controller and visualization. Combining a Power Panel 300 and 400 in terminal mode achieves an even higher level of freedom. For example, a Power Panel 400 located on one side of the machine can handle all the control and visualization tasks, while a Power Panel 300 on the other side of the machine can manage a second visualization application.

Power Panel 300/400



Model number	Type	Diagonal [in]	Display	Resolution	Touch screen	DRAM [MB]	SRAM [KB]	aPCI slots	Ethernet	
4PP320.0571-01	Embedded	5.7	LCD m	QVGA	✓	128	-	0	✓	834
4PP320.0571-35	Embedded	5.7	TFT color	QVGA	✓	128	-	0	✓	835
4PP420.0571-45	Embedded	5.7	LCD m	QVGA	✓	128	512	1	✓	842
4PP420.0571-75	Embedded	5.7	TFT color	QVGA	✓	128	512	1	✓	844
4PP420.0571-85	Embedded	5.7	LCD m	QVGA	✓	128	512	2	✓	842
4PP420.0571-B5	Embedded	5.7	TFT color	QVGA	✓	128	512	2	✓	844
4PP420.0573-75	Embedded	5.7	TFT color	VGA	✓	128	512	1	✓	845



4PP351.0571-01	Embedded	5.7	LCD m	QVGA	✓	128	-	0	✓	838
4PP351.0571-31	Embedded	5.7	TFT color	QVGA	✓	128	-	0	✓	839
4PP451.0571-45	Embedded	5.7	LCD m	QVGA	✓	128	512	1	✓	848
4PP451.0571-75	Embedded	5.7	TFT color	QVGA	-	128	512	1	✓	849
4PP451.0571-85	Embedded	5.7	LCD m	QVGA	✓	128	512	2	✓	848
4PP451.0571-B5	Embedded	5.7	TFT color	QVGA	✓	128	512	2	✓	849



4PP352.0571-35	Embedded	5.7	TFT color	QVGA	-	128	-	0	✓	840
4PP452.0571-45	Embedded	5.7	LCD m	QVGA	-	128	512	1	✓	850
4PP452.0571-75	Embedded	5.7	TFT color	QVGA	-	128	512	1	✓	851
4PP452.0571-B5	Embedded	5.7	TFT color	TFT color	-	128	512	2	✓	851



4PP320.1043-31	Embedded	10.4	TFT color	VGA	✓	128	-	0	✓	836
4PP420.1043-75	Embedded	10.4	TFT color	VGA	✓	128	512	1	✓	846
4PP420.1043-B5	Embedded	10.4	TFT color	VGA	✓	128	512	2	✓	846

System characteristics

Power Panel 300 / 400 (continued)



Model number	Type	Diagonal [in]	Display	Resolution	Touch screen	DRAM [MB]	SRAM [KB]	aPCI slots	Ethernet	
4PP480.1043-75	Embedded	10.4	TFT color	VGA	✓	128	512	1	✓	852



4PP381.1043-31	Embedded	10.4	TFT color	VGA	✓	128	-	0	✓	841
4PP451.1043-75	Embedded	10.4	TFT color	VGA	-	128	512	1	✓	854
4PP451.1043-B5	Embedded	10.4	TFT color	VGA	-	128	512	1	✓	854
4PP481.1043-75	Embedded	10.4	TFT color	VGA	✓	128	512	1	✓	855
4PP481.1043-B5	Embedded	10.4	TFT color	VGA	✓	128	512	2	✓	855



4PP452.1043-75	Embedded	10.4	TFT color	VGA	✓	128	512	1	✓	857
4PP482.1043-75	Embedded	10.4	TFT color	VGA	✓	128	512	1	✓	858



4PP320.1505-31	Embedded	15	TFT color	XGA	✓	128	-	0	✓	837
4PP420.1505-75	Embedded	15	TFT color	XGA	✓	128	512	1	✓	847
4PP420.1505-B5	Embedded	15	TFT color	XGA	✓	128	512	2	✓	847



4PP480.1505-75	Embedded	15	TFT color	XGA	✓	128	512	1	✓	853
4PP480.1505-B5	Embedded	15	TFT color	XGA	✓	128	512	1	✓	853

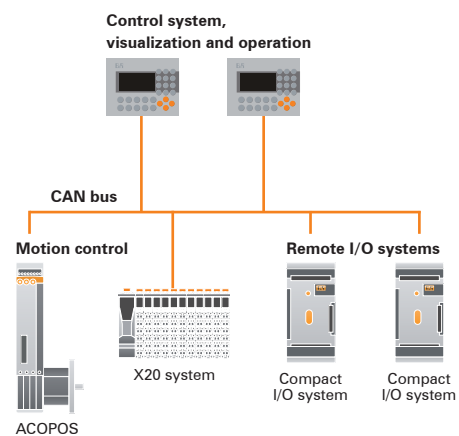


4PP481.1505-75	Embedded	15	TFT color	XGA	✓	128	512	1	✓	856
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Typical topologies

Distributed systems

In a distributed system, two or more Power Panel devices are connected to each other over a CAN bus. Control programs run on each Power Panel. The sensors and actuators are connected to the integrated inputs and outputs as well as the remote CAN bus stations.



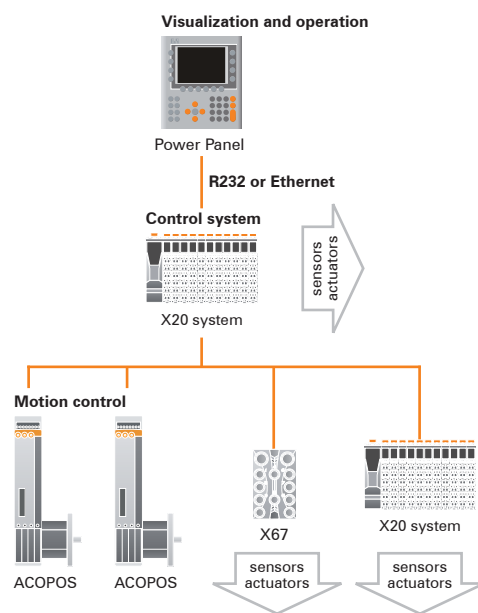
Components and technologies

Control system	Power Panel: Integrated control, operation, and visualization	787
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
Motion control	ACOPOS: Intelligent servo drives	1251
	ACOPOSMulti: Modular drive system	1321
Remote I/O systems	Compact I/O System: Space-saving peripheral connections	581
	X20 System: Slice-based I/O and control system	37

Typical topologies

Power Panel as an intelligent visualization device

The visualization project runs on the Power Panel. Serial RS232 or Ethernet TCP/IP provides the communication to the control. Flexible programming with frame drivers or Ethernet socket services allows a connection to be made to any control system. I/O peripherals and drives are connected to the controller.

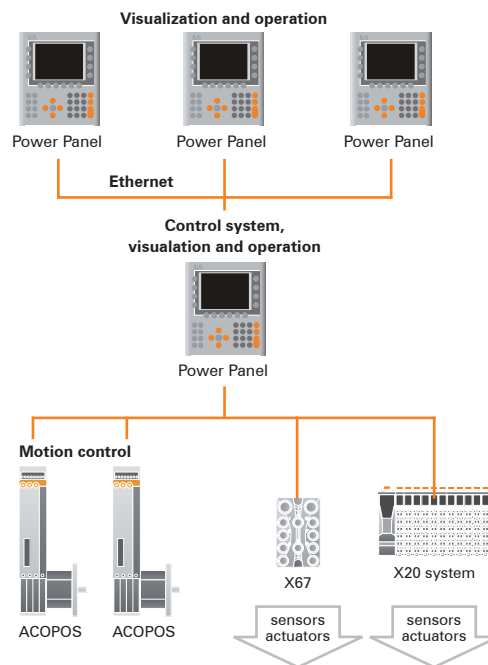


Components and technologies

Control system	X20 System: Slice-based I/O and control system	37
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
Motion control	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419

Power Panel 400 with Power Panel 300 terminals

The control program and visualization run on the Power Panel 400. I/O peripherals and drives are connected via a CAN bus, POWERLINK, or another network type. Other Power Panel 300 units are connected as terminals over Ethernet TCP/IP.



Components and technologies

Control system	Power Panel: Integrated control, operation, and visualization	787
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
Motion control	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419

Product overview

Power Panel PP15 / PP35



Model number	Short description	
4PP015.0420-01	Power Panel PP15, LCD, 4x20 characters, 16 keys (10 with legend strips), 300 KB SRAM, 1024 KB FlashPROM, RS232, CAN bus, 16 digital inputs 24 VDC, 16 digital outputs 24 VDC, 0.5 A, IP65 protection (front side). 24 VDC.	804
4PP015.0420-36	Power Panel PP15, LCD, 4x20 characters, 16 keys (10 with legend strips), 300 KB SRAM, 1024 KB FlashPROM, RS232, CAN bus, 8 digital inputs 24 VDC, 8 digital outputs 24 VDC, 0.5 A, 4 analog inputs, 4 analog outputs. IP65 protection (front side). 24 VDC.	804
4PP015.C420-01	Power Panel PP15, LCD, 4x20 characters, 26 keys (10 with legend strips), 300 KB SRAM, 1024 KB FlashPROM, RS232, CAN bus, 16 digital inputs 24 VDC, 16 digital outputs 24 VDC, 0.5 A, IP65 protection (front side). 24 VDC.	804
4PP015.C420-36	Power Panel PP15, LCD, 4x20 characters, 26 keys (10 with legend strips), 300 KB SRAM, 1024 KB FlashPROM, RS232, CAN bus, 8 digital inputs 24 VDC, 8 digital outputs 24 VDC, 0.5 A, 4 analog inputs, 4 analog outputs. IP65 protection (front side). 24 VDC.	804
4PP015.E420-01	Power Panel PP15, LCD, 4x20 characters, 26 keys (10 with legend strips), 300 KB SRAM, 1024 KB FlashPROM, RS232, CAN bus, 16 digital inputs 24 VDC, 16 digital outputs 24 VDC, 0.5 A, IP65 protection (front side). 24 VDC.	804
4PP015.E420-101	Power Panel PP15, LCD, 4x20 characters, 26 keys (10 with legend strips), 300 KB SRAM, 1984 KB FlashPROM, RS232, CAN bus, 16 digital inputs 24 VDC, 16 digital outputs 24 VDC, 0.5 A, IP65 protection (front side). 24 VDC.	807
4PP015.E420-36	Power Panel PP15, LCD, 4x20 characters, 26 keys (10 with legend strips), 300 KB SRAM, 1024 KB FlashPROM, RS232, CAN bus, 8 digital inputs 24 VDC, 8 digital outputs 24 VDC, 0.5 A, 4 analog inputs, 4 analog outputs. IP65 protection (front side). 24 VDC.	804
4PP035.0300-01	Power Panel PP35, LCD, 160x80 pixels, 16 keys (10 with legend strips), 300 KB SRAM, 1024 KB FlashPROM, RS232, CAN bus, 16 digital inputs 24 VDC, 16 digital outputs 24 VDC, 0.5 A, IP65 protection (front side). 24 VDC.	809
4PP035.0300-36	Power Panel PP35, LCD, 160x80 pixels, 16 keys (10 with legend strips), 300 KB SRAM, 1024 KB FlashPROM, RS232, CAN bus, 8 digital inputs 24 VDC, 8 digital outputs 24 VDC, 0.5 A, 4 analog inputs, 4 analog outputs. IP65 protection (front side). 24 VDC.	809
4PP035.E300-01	Power Panel PP35, LCD, 160x80 pixels, 26 keys (10 with legend strips), 300 KB SRAM, 1024 KB FlashPROM, RS232, CAN bus, 16 digital inputs 24 VDC, 16 digital outputs 24 VDC, 0.5 A, IP65 protection (front side). 24 VDC.	809
4PP035.E300-36	Power Panel PP35, LCD, 160x80 pixels, 26 keys (10 with legend strips), 300 KB SRAM, 1024 KB FlashPROM, RS232, CAN bus, 8 digital inputs 24 VDC, 8 digital outputs 24 VDC, 0.5 A, 4 analog inputs, 4 analog outputs. IP65 protection (front side). 24 VDC.	809
4PP035.E300-136	Power Panel PP35, LCD, 160x80 pixels, 26 keys (10 with legend strips), 300 KB SRAM, 1984 KB FlashPROM, RS232, CAN bus, 8 digital inputs 24 VDC, 8 digital outputs 24 VDC, 0.5 A, 4 analog inputs, 4 analog outputs. IP65 protection (front side). 24 VDC.	812

Power Panel PP21/PP41



Model number	Short description	
4P0420.00-490	Power Panel PP21, LCD, 4x20 characters, background lighting, 34 function keys, system compatible 2003 CPU, 700 KB SRAM, 1.4 MB FlashPROM, 1 PC card slot, 1 RS232 interface, 1 CAN bus interface (electrically isolated, network-capable), 6 slots for screw-in modules, 10 digital inputs 24 VDC, 8 digital outputs 24 VDC, 0.4 A, IP65 protection (front side), 155 x 190 mm (W x H), 24 VDC.	816
4P3040.01-490	Power Panel PP41, 5.7" QVGA b/w LC display, 8 soft keys and 32 function keys, compatible with 2003 CPU, 700 KB SRAM, 1.4 MB FlashPROM, 1 PC card slot, 1 RS232 interface, 1 CAN bus interface (electrically isolated, network-capable), 6 slots for screw-in modules, 10 digital inputs 24 VDC, 8 digital outputs 24 VDC, 0.4 A, IP65 protection (front side), 205 x 220 mm (W x H), 24 VDC.	818

Power Panel PP45



Model number	Short description	
4PP045.0571-042	Power Panel PP45, 5.7" QVGA m LCD with touch screen (resistive), 64 MB DRAM, CompactFlash slot (type I), ETH 10/100, 2x USB, X2X Link master interface, battery, IP65 protection (front side), 24 VDC.	821
4PP045.0571-062	Power Panel PP45, 5.7" QVGA color LC display with touch screen (resistive), 64 MB DRAM, CompactFlash slot (type I), ETH 10/100, 2x USB, X2X Link master interface, battery, IP65 protection (front side); 24 VDC.	822
4PP045.0571-L42	Power Panel PP45, 5.7" QVGA m LC display with 24 keys (6 with legend strips), 64 MB DRAM, CompactFlash slot (type I), ETH 10/100, X2X Link master interface, battery, IP65 protection (front side); 24 VDC.	823
4PP045.IF10-1	PP45 interface module, 1x RS232	824
4PP045.IF23-1	PP45 interface module, 1x RS232/422/485, RS422/485 electrically isolated and network-capable, 1x CAN, electrically isolated and network-capable	825
4PP045.IF24-1	PP45 interface module, 1x RS232/422/485, RS422/485 electrically isolated and network-capable, 1x Profibus DP slave, electrically isolated and network-capable	826
4PP045.IF33-1	PP45 interface module, 2x CAN, electrically isolated and network capable	827

Product overview

Power Panel 300 BIOS



Model number	Short description	
5PP320.0571-39	Power Panel PP320 BIOS 5.7" QVGA color TFT display with touch screen (resistive); 256 MB SDRAM; Compact Flash slot (type I); ETH 10/100; RS 232, 2x USB; battery; metal housing, IP65 protection (front side); 24 VDC.	828
5PP320.0573-39	Power Panel PP320 BIOS 5.7" VGA color TFT display with touch screen (resistive); 256 MB SDRAM; Compact Flash slot (type I); ETH 10/100; RS 232, 2x USB; battery; metal housing, IP65 protection (front side); 24 VDC.	830
5PP320.0573-3B	Power Panel PP320 BIOS; 5.7" VGA color TFT display with touch screen (resistive); 512 MB SDRAM; CompactFlash slot (type I), ETH 10/100, RS 232, 2x USB; battery; metal housing, IP 65 protection (front side); 24 VDC.	830
5PP320.1043-39	Power Panel PP320 BIOS 10.4" VGA color TFT display with touch screen (resistive); 256 MB SDRAM; CompactFlash slot (type I); ETH 10/100; RS 232, 2x USB; battery; metal housing, IP65 protection (front side); 24 VDC	831
5PP320.1214-39	Power Panel PP320 BIOS 12.1" SVGA color TFT display with touch screen (resistive); 256 MB SDRAM; Compact Flash slot (type I); ETH 10/100; RS 232, 2x USB; battery; metal housing, IP65 protection (front side); 24 VDC.	832
5PP320.1505-39	Power Panel PP320 BIOS 15" XGA color TFT display with touch screen (resistive); 256 MB SDRAM; Compact Flash slot (type I); ETH 10/100; RS 232, 2x USB; battery; metal housing, IP65 protection (front side); 24 VDC	833

Power Panel 300 embedded



Model number	Short description	
4PP320.0571-01	Power Panel PP320, 5.7" QVGA monochrome LC display with touch screen (resistive), 128 MB SDRAM; CompactFlash slot (type I), ETH 10/100, RS232, 2x USB, metal housing, IP65 protection (front side), 24 VDC.	834
4PP320.0571-35	Power Panel PP320, 5.7" QVGA TFT color display with touch screen (resistive), 128 MB SDRAM; CompactFlash slot (type I), ETH 10/100, RS232, 2x USB, metal housing, IP65 protection (front side), 24 VDC.	835
4PP320.1043-31	Power Panel PP320, 10.4" VGA color TFT display with touch screen (resistive), 128 MB SDRAM; CompactFlash slot (type I), ETH 10/100, RS232, 2x USB, metal housing, IP65 protection (front side), 24 VDC.	836
4PP320.1505-31	Power Panel PP320, 15" XGA color TFT display with touch screen (resistive), 128 MB SDRAM; CompactFlash slot (type I), ETH 10/100, RS232, 2x USB, metal housing, IP65 protection (front side), 24 VDC.	837
4PP351.0571-01	Power Panel PP351, 5.7" QVGA monochrome LC display; 6 soft keys; 16 function keys and 20 system keys; 128 MB SDRAM; CompactFlash slot (type I); ETH 10/100; RS 232; 2x USB; metal housing, IP65 protection (front side); 24 VDC.	838
4PP351.0571-35	Power Panel PP351, 5.7" QVGA color TFT display; 6 soft keys; 16 function keys and 20 system keys; 128 MB SDRAM; CompactFlash slot (type I); ETH 10/100; RS 232; 2x USB; metal housing, IP65 protection (front side); 24 VDC.	839
4PP352.0571-35	Power Panel PP352, 5.7" QVGA color TFT display; 20 function keys and 20 system keys; 128 MB SDRAM; CompactFlash slot (type I); ETH 10/100; RS 232; 2x USB; metal housing, IP65 protection (front side); 24 VDC.	840
4PP381.1043-31	Power Panel PP381; 10.4" VGA color TFT display with touch screen (resistive); 10 soft keys; 28 function keys and 20 system keys; 128 MB SDRAM; CompactFlash slot (type I); ETH 10/100; RS 232; 2x USB; metal housing, IP65 protection (front side); 24 VDC.	841



Product overview

Power Panel 400 embedded



Model number	Short description	
4PP420.0571-45	Power Panel PP420, 5.7" QVGA m LC display with touch screen (resistive); 1 aPCI slot; 128 MB SDRAM; 512 KB SRAM; CompactFlash slot (type I), ETH 10/100, RS232, 2x USB; battery; metal housing, IP65 protection (front side); 24 VDC.	842
4PP420.0571-75	Power Panel PP420, 5.7" QVGA color TFT display with touch screen (resistive); 1 aPCI slot; 128 MB SDRAM; 512 KB SRAM; CompactFlash slot (type I), ETH 10/100, RS232, 2x USB; battery; metal housing, IP65 protection (front side); 24 VDC.	844
4PP420.0571-85	Power Panel PP420, 5.7" QVGA monochrome LC display with touch screen (resistive); 2 aPCI slots; 128 MB SDRAM; 512 KB SRAM; CompactFlash slot (type I), ETH 10/100, RS232, 2x USB; battery; metal housing, IP65 protection (front side); 24 VDC.	842
4PP420.0571-B5	Power Panel PP420, 5.7" QVGA color TFT display with touch screen (resistive); 2 aPCI slot; 128 MB SDRAM; 512 KB SRAM; CompactFlash slot (type I), ETH 10/100, RS232, 2x USB; battery; metal housing, IP65 protection (front side); 24 VDC.	844
4PP420.0573-75	Power Panel PP420, 5.7" VGA color TFT display with touch screen (resistive); 1 aPCI slot; 128 MB SDRAM; 512 KB SRAM; CompactFlash slot (type I), ETH 10/100, RS232, 2x USB; battery; metal housing, IP65 protection (front side); 24 VDC.	845
4PP420.1043-75	Power Panel PP420, 10.4" VGA color TFT display with touch screen (resistive); 1 aPCI slot; 128 MB SDRAM; 512 KB SRAM; CompactFlash slot (type I), ETH 10/100, RS232, 2x USB; battery; metal housing, IP65 protection (front side); 24 VDC.	846
4PP420.1043-B5	Power Panel PP420, 10.4" VGA color TFT display with touch screen (resistive); 2 aPCI slots; 128 MB SDRAM; 512 KB SRAM; CompactFlash slot (type I), ETH 10/100, RS232, 2x USB; battery; metal housing, IP65 protection (front side); 24 VDC.	846
4PP420.1505-75	Power Panel PP420, 15" XGA color TFT display with touch screen (resistive); 1 aPCI slot; 128 MB SDRAM; 512 KB SRAM; CompactFlash slot (type I), ETH 10/100, RS232, 2x USB; battery; metal housing, IP65 protection (front side); 24 VDC.	847
4PP420.1505-B5	Power Panel PP420, 15" XGA color TFT display with touch screen (resistive); 2 aPCI slots; 128 MB SDRAM; 512 KB SRAM; CompactFlash slot (type I), ETH 10/100, RS232, 2x USB; battery; metal housing, IP65 protection (front side); 24 VDC.	847
4PP451.0571-45	Power Panel PP451, 5.7" QVGA monochrome LC display; 6 soft keys; 16 function keys and 20 system keys; 1 aPCI slot, 128 MB SDRAM; 512 KB SRAM; CompactFlash slot (type I), ETH 10/100, RS232, 2x USB; battery; metal housing, IP65 protection (front side); 24 VDC.	848
4PP451.0571-75	Power Panel PP451, 5.7" QVGA color TFT display; 6 soft keys; 16 function keys and 20 system keys; 1 aPCI slot, 128 MB SDRAM; 512 KB SRAM; CompactFlash slot (type I), ETH 10/100, RS232, 2x USB; battery; metal housing, IP65 protection (front side); 24 VDC.	849
4PP451.0571-85	Power Panel PP451, 5.7" QVGA monochrome LC display; 6 soft keys; 16 function keys and 20 system keys; 2 aPCI slot, 128 MB SDRAM; 512 KB SRAM; CompactFlash slot (type I), ETH 10/100, RS232, 2x USB; battery; metal housing, IP65 protection (front side); 24 VDC. 4PP451.0571-B5	848
4PP451.0571-B5	Power Panel PP451, 5.7" QVGA color TFT display; 6 soft keys; 16 function keys and 20 system keys; 2 aPCI slot, 128 MB SDRAM; 512 KB SRAM; CompactFlash slot (type I), ETH 10/100, RS232, 2x USB; battery; metal housing, IP65 protection (front side); 24 VDC.	849
4PP451.1043-75	Power Panel PP451, 10.4" VGA color TFT display; 10 soft keys; 28 function keys and 20 system keys; 1 aPCI slot, 128 MB SDRAM; 512 KB SRAM; CompactFlash slot (type I), ETH 10/100, RS232, 2x USB; battery; metal housing, IP65 protection (front side); 24 VDC.	854
4PP451.1043-B5	Power Panel PP451, 10.4" VGA color TFT display; 10 soft keys; 28 function keys and 20 system keys; 2 aPCI slot, 128 MB SDRAM; 512 KB SRAM; CompactFlash slot (type I), ETH 10/100, RS232, 2x USB; battery; metal housing, IP65 protection (front side); 24 VDC.	854
4PP452.0571-45	Power Panel PP452, 5.7" QVGA monochrome LC display; 20 function keys and 20 system keys; 1 aPCI slot, 128 MB SDRAM; 512 KB SRAM; CompactFlash slot (type I), ETH 10/100, RS232, 2x USB; battery; metal housing, IP65 protection (front side); 24 VDC.	850
4PP452.0571-75	Power Panel PP452, 5.7" QVGA color TFT display; 20 function keys and 20 system keys; 1 aPCI slot, 128 MB SDRAM; 512 KB SRAM; CompactFlash slot (type I), ETH 10/100, RS232, 2x USB; battery; metal housing, IP65 protection (front side); 24 VDC.	851
4PP452.0571-B5	Power Panel PP452, 5.7" QVGA color TFT display; 20 function keys and 20 system keys; 2 aPCI slot, 128 MB SDRAM; 512 KB SRAM; CompactFlash slot (type I), ETH 10/100, RS232, 2x USB; battery; metal housing, IP65 protection (front side); 24 VDC.	851
4PP452.1043-75	Power Panel PP452, 10.4" VGA color TFT display; 44 function keys and 20 system keys; 1 aPCI slot, 128 MB SDRAM; 512 KB SRAM; CompactFlash slot (type I), ETH 10/100, RS232, 2x USB; battery; metal housing, IP65 protection (front side); 24 VDC.	857

Model number	Short description	
4PP480.1043-75	Power Panel PP480, 10.4" VGA color TFT display with touch screen (resistive); 10 soft keys and 12 function keys; 1 aPCI slot; 128 MB SDRAM, 512 KB SRAM; CompactFlash slot (type I), ETH 10/100, RS232, 2x USB; battery; metal housing, IP65 protection (front side); 24 VDC.	852
4PP480.1505-75	Power Panel PP480, 15" XGA color TFT display with touch screen (resistive); 12 soft keys and 20 function keys; 1 aPCI slot; 128 MB SDRAM, 512 KB SRAM; CompactFlash slot (type I), ETH 10/100, RS232, 2x USB; battery; metal housing, IP65 protection (front side); 24 VDC.	853
4PP480.1505-B5	Power Panel PP480, 15" XGA color TFT display; 12 soft keys and 20 function keys; 2 aPCI slot; 128 MB SDRAM, 512 KB SRAM; CompactFlash slot (type I), ETH 10/100, RS232, 2x USB; battery; metal housing, IP65 protection (front side); 24 VDC.	853
4PP481.1043-75	Power Panel PP481, 10.4" VGA color TFT color display with touch screen (resistive); 10 soft keys; 28 function and 20 system keys; 1 aPCI slot; 128 MB SDRAM; 512 KB SRAM; CompactFlash slot (type I), ETH 10/100, RS232, 2x USB; battery; metal housing, IP65 protection (front side); 24 VDC.	855
4PP481.1043-B5	Power Panel PP481, 10.4" VGA color TFT color display with touch screen (resistive); 10 soft keys; 28 function and 20 system keys; 2 aPCI slots; 128 MB SDRAM; 512 KB SRAM; CompactFlash slot (type I), ETH 10/100, RS232, 2x USB; battery; metal housing, IP65 protection (front side); 24 VDC.	855
4PP481.1505-75	Power Panel PP481, 15" XGA color TFT color display with touch screen (resistive); 12 soft keys; 20 function and 92 system keys; 1 aPCI slot; 128 MB SDRAM; 512 KB SRAM; CompactFlash slot (type I), ETH 10/100, RS232, 2x USB; battery; metal housing, IP65 protection (front side); 24 VDC.	856
4PP482.1043-75	Power Panel PP482, 10.4" VGA color TFT display with touch screen (resistive); 44 function keys and 20 system keys; 1 aPCI slot; 128 MB SDRAM; 512 KB SRAM; CompactFlash slot (type I), ETH 10/100, RS232, 2x USB; battery; metal housing, IP65 protection (front side); 24 VDC.	857

Power Panel PP15



4PP015.0420-01/36



4PP015.C420-01/36
4PP015.E420-01/36

General information		4PP015.0420-01, 4PP015.C420-01, 4PP015.E420-01		4PP015.0420-36, 4PP015.C420-36, 4PP015.E420-36	
Certification		CE, C-UL-US, GHOST-R		CE, C-UL-US, GHOST-R	
Status indicators		I/O function for each channel, status		I/O function for each channel, status	
Diagnostics					
Status		Yes, with status LED		Yes, with status LED	
I/O function		Yes, with LEDs		Yes, with LEDs	
Interface		Yes, with LEDs		Yes, with LEDs	
Display		4PP015.0420-01, 4PP015.C420-01, 4PP015.E420-01		4PP015.0420-36, 4PP015.C420-36, 4PP015.E420-36	
Type		LCD b/w		LCD b/w	
Resolution		4 x 20 characters		4 x 20 characters	
Background lighting		LED		LED	
Display character set		English / Katakana 4PP015.0420-01 English / Cyrillic 4PP015.C420-01 English / European 4PP015.E420-01		English / Katakana 4PP015.0420-36 English / Cyrillic 4PP015.C420-36 English / European 4PP015.E420-36	
Keys		4PP015.0420-01, 4PP015.C420-01, 4PP015.E420-01		4PP015.0420-36, 4PP015.C420-36, 4PP015.E420-36	
Total keys		16 (12 with LEDs) 4PP015.0420-01 26 (10 with LEDs) 4PP015.C420-01, 4PP015.E420-01		16 (12 with LEDs) 4PP015.0420-36 26 (10 with LEDs) 4PP015.C420-36, 4PP015.E420-36	
System keys					
		Number block		Number block	
		Control keys		Control keys	
Label		10 keys with legend strips		10 keys with legend strips	
Processor		4PP015.0420-01, 4PP015.C420-01, 4PP015.E420-01		4PP015.0420-36, 4PP015.C420-36, 4PP015.E420-36	
Typical instruction cycle time (average value at 70% bit and 30% analog processing)		0.8 μ s		0.8 μ s	
Standard memory					
User RAM		300 KB SRAM		300 KB SRAM	
System PROM		448 KB FlashPROM		448 KB FlashPROM	
User PROM		1024 KB FlashPROM		1024 KB FlashPROM	
Data buffering with backup battery		Lithium battery 3 V / 950 mAh		Lithium battery 3 V / 950 mAh	
Hardware watchdog		Yes		Yes	
Voltage monitoring		An NMI is triggered at a supply voltage < 15 VDC.		An NMI is triggered at a supply voltage < 15 VDC.	
Real-time clock		1 s resolution, nonvolatile		1 s resolution, nonvolatile	
System bus for expansions		No		No	
Interfaces		4PP015.0420-01, 4PP015.C420-01, 4PP015.E420-01		4PP015.0420-36, 4PP015.C420-36, 4PP015.E420-36	
IF1 application interface					
Type		RS232		RS232	
Design		9-pin DSUB plug		9-pin DSUB plug	
Electrical isolation		No		No	
Max. baud rate		115.2 kBits/s		115.2 kBits/s	
IF2 application interface					
Type		CAN bus		CAN bus	
Design		9-pin DSUB plug		9-pin DSUB plug	
Electrical isolation		Yes		Yes	
Digital inputs		4PP015.0420-01, 4PP015.C420-01, 4PP015.E420-01		4PP015.0420-36, 4PP015.C420-36, 4PP015.E420-36	
Channels		1-3	4-16	1-3	4-8
Additional functions for inputs		Counter	-	Counter	-
Input circuit		Sink or source	Sink or source	Sink or source	Sink or source
Rated voltage		24 VDC	24 VDC	24 VDC	24 VDC
Input current at rated voltage		Approx. 10 mA	Approx. 5 mA	Approx. 10 mA	Approx. 5 mA
Input filter		<10 μ s	<1 ms	<10 μ s	<1 ms
Electrical isolation					
Channel - Bus		Yes	Yes	Yes	Yes
Channel - Channel		No	No	No	No
Group isolation		No	No	No	No

Analog inputs	4PP015.0420-01, 4PP015.C420-01, 4PP015.E420-01	4PP015.0420-36, 4PP015.C420-36, 4PP015.E420-36
Number of channels	-	4 differential inputs; 2 of which can be configured individually as temperature inputs
Input	-	±10 V
Digital converter resolution	-	12-bit
Conversion time	-	150 µs for all channels
Input filter		
Hardware	-	Cut-off frequency 10 kHz / attenuation 60 dB
Software	-	-
Output format	-	UINT
Input impedance in signal range	-	20 MΩ
Input circuit	-	IEC 61131-2
Electrical isolation		
Channel - Bus	-	Yes
Channel - Channel	-	No
Group isolation	-	No
Temperature measurement	4PP015.0420-01, 4PP015.C420-01, 4PP015.E420-01	4PP015.0420-36, 4PP015.C420-36, 4PP015.E420-36
Number of channels	-	Up to 2 (depending on the configuration)
Input	-	Resistance measurement using 2-line procedure with constant current feed
Digital converter resolution	-	12-bit
Conversion time	-	150 µs for all channels
Input filter		
Hardware	-	Cut-off frequency 10 kHz / attenuation 60 dB
Software	-	-
Output format	-	UINT
Sensor		Can be set per channel
KTY10-6	-	-50°C to +125°C
PT1000	-	-200°C to +850°C
Resistance measurement range	-	0-4000 Ω
Input circuit	-	IEC 61131-2
Electrical isolation		
Channel - Bus	-	Yes
Channel - Channel	-	No
Group isolation	-	No
Digital outputs	4PP015.0420-01, 4PP015.C420-01, 4PP015.E420-01	4PP015.0420-36, 4PP015.C420-36, 4PP015.E420-36
Amount	16	8
Rated voltage	24 VDC	24 VDC
Rated output current	0.5 A	0.5 A
Total current	8 A	4 A
Output circuit	Source	Source
Output protection	Overload protection, short circuit protection	Overload protection, short circuit protection
Internal protective circuit	VDR	VDR
Electrical isolation		
Channel - Bus	No	No
Channel - Channel	No	No
Group isolation	No	No

Power Panel PP15

Analog outputs		4PP015.0420-01, 4PP015.C420-01, 4PP015.E420-01	4PP015.0420-36, 4PP015.C420-36, 4PP015.E420-36
Number of channels	-	-	4
Output	-	-	±10 V
Digital converter resolution	-	-	12-bit
Conversion time	-	-	150 µs for all channels
Power on/off behavior	-	-	Internal enable relay for boot procedure and errors
Basic accuracy	-	-	±0.088% at 25°C based on the current output value
Output protection	-	-	Continuous short circuit protection
Electrical isolation			
Channel - Bus	-	-	Yes
Channel - Channel	-	-	No
Group isolation	-	-	No
Power supply		4PP015.0420-01, 4PP015.C420-01, 4PP015.E420-01	4PP015.0420-36, 4PP015.C420-36, 4PP015.E420-36
Rated voltage	24 VDC	24 VDC	24 VDC
Power consumption	Max. 6 W	Max. 6 W	Max. 6 W
Environmental conditions		4PP015.0420-01, 4PP015.C420-01, 4PP015.E420-01	4PP015.0420-36, 4PP015.C420-36, 4PP015.E420-36
Temperature			
Operation	0 to +50°C	0 to +50°C	0 to +50°C
Storage	-20 to +60°C	-20 to +60°C	-20 to +60°C
Relative humidity			
Operation	10 to 90% (non-condensing)	10 to 90% (non-condensing)	10 to 90% (non-condensing)
Storage	5 to 95% (non-condensing)	5 to 95% (non-condensing)	5 to 95% (non-condensing)
Mechanics		4PP015.0420-01, 4PP015.C420-01, 4PP015.E420-01	4PP015.0420-36, 4PP015.C420-36, 4PP015.E420-36
Protection type	IP65 (front side)	IP65 (front side)	IP65 (front side)
Outer dimensions (W x H x D [mm])	153 x 120 x 46.1	153 x 120 x 46.1	153 x 120 x 46.1
Weight	0.5 kg	0.5 kg	0.5 kg

Required accessories			
0TB103.9	24 VDC screw clamps		1131
0TB103.91	24 VDC cage clamps		1131
7TB718.9	Accessory, terminal block, 18-pin, screw clamps, 1.5 mm ²		1141
7TB718.91	Accessory, terminal block, 18-pin, cage clamps, 1.5 mm ²		1141
Optional accessories			
0AC201.9 ¹⁾	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell		1128
4A0006.00-000 ¹⁾	Lithium battery, 3 V / 950 mAh, button cell		1128
4A0044.00-000	Set of printable legend strips for the PP15 and PP35		---
7AC911.9	CAN bus connector		1143

1) Replacement part



4PP015.E420-101

General information		4PP015.E420-101	
Certification	CE, C-UL-US, GHOST-R		
Status indicators	I/O function for each channel, status		
Diagnostics			
Status	Yes, with status LED		
I/O function	Yes, with LEDs		
Interface	Yes, with LEDs		
Display		4PP015.E420-101	
Type	LCD b/w		
Resolution	4 x 20 characters		
Background lighting	LED		
Display character set	English / European		
Keys		4PP015.E420-101	
Total keys	26 (10 with LEDs)		
System keys	Number block Control keys		
Label	10 keys with legend strips		
Processor		4PP015.E420-101	
Typical instruction cycle time (average value at 70% bit and 30% analog processing)	0.8 μ s		
Standard memory			
User RAM	300 KB SRAM		
System PROM	448 KB FlashPROM		
User PROM	1984 KB FlashPROM		
Data buffering with backup battery	Lithium battery 3 V / 950 mAh		
Hardware watchdog	Yes		
Voltage monitoring	An NMI is triggered at a supply voltage < 15 VDC.		
Real-time clock	1 s resolution, nonvolatile		
System bus for expansions	No		
Interfaces		4PP015.E420-101	
IF1 application interface			
Type	RS232		
Design	9-pin DSUB plug		
Electrical isolation	No		
Max. baud rate	115.2 kBits/s		
IF2 application interface			
Type	CAN bus		
Design	9-pin DSUB plug		
Electrical isolation	Yes		
Digital inputs		4PP015.E420-101	
Channels	1-3	4-16	
Additional functions for inputs	Counter	-	
Input circuit	Sink or source	Sink or source	
Rated voltage	24 VDC	24 VDC	
Input current at rated voltage	Approx. 10 mA	Approx. 5 mA	
Input filter	<10 μ s	<1 ms	
Electrical isolation			
Channel - Bus	Yes	Yes	
Channel - Channel	No	No	
Group isolation	No	No	

Power Panel PP15

Digital outputs	4PP015.E420-101
Amount	16
Rated voltage	24 VDC
Rated output current	0.5 A
Total current	8 A
Output circuit	Source
Output protection	Overload protection, short circuit protection
Internal protective circuit	VDR
Electrical isolation	
Channel - Bus	No
Channel - Channel	No
Group isolation	No
Power supply	4PP015.E420-101
Rated voltage	24 VDC
Power consumption	Max. 6 W
Environmental conditions	4PP015.E420-101
Temperature	
Operation	0 to +50°C
Storage	-20 to +60°C
Relative humidity	
Operation	10 to 90% (non-condensing)
Storage	5 to 95% (non-condensing)
Mechanics	4PP015.E420-101
Protection type	IP65 (front side)
Outer dimensions (W x H x D [mm])	153 x 120 x 46.1
Weight	0.5 kg

Required accessories		
0TB103.9	24 VDC screw clamps	1131
0TB103.91	24 VDC cage clamps	1131
7TB718.9	Accessory, terminal block, 18-pin, screw clamps, 1.5 mm ²	1141
7TB718.91	Accessory, terminal block, 18-pin, cage clamps, 1.5 mm ²	1141
Optional accessories		
0AC201.9 ¹⁾	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	1128
4A0006.00-000 ¹⁾	Lithium battery, 3 V / 950 mAh, button cell	1128
4A0044.00-000	Set of printable legend strips for the PP15 and PP35	---
7AC911.9	CAN bus connector	1143

1) Replacement part

Power Panel PP35



4PP035.0300-01/36



4PP035.E300-01/36

General information	4PP035.0300-01, 4PP035.E300-01	4PP035.0300-36, 4PP035.E300-36		
Certification	CE, C-UL-US, GHOST-R	CE, C-UL-US, GHOST-R		
Status indicators	I/O function for each channel, status	I/O function for each channel, status		
Diagnostics				
Status	Yes, with status LED	Yes, with status LED		
I/O function	Yes, with LEDs	Yes, with LEDs		
Interface	Yes, with LEDs	Yes, with LEDs		
Display	4PP035.0300-01, 4PP035.E300-01	4PP035.0300-36, 4PP035.E300-36		
Type	LCD b/w	LCD b/w		
Resolution	160 x 80 pixels	160 x 80 pixels		
Background lighting	LED	LED		
Display character set	European / Cyrillic	European / Cyrillic		
Keys	4PP035.0300-01, 4PP035.E300-01	4PP035.0300-36, 4PP035.E300-36		
Total keys	16 (12 with LEDs) 4PP035.0300-01 26 (10 with LEDs) 4PP035.E300-01	16 (12 with LEDs) 4PP035.0300-36 26 (10 with LEDs) 4PP035.E300-36		
System keys	Number block Control keys	Number block Control keys		
Label	10 keys with legend strips	10 keys with legend strips		
Processor	4PP035.0300-01, 4PP035.E300-01	4PP035.0300-36, 4PP035.E300-36		
Typical instruction cycle time (average value at 70% bit and 30% analog processing)	0.8 μ s	0.8 μ s		
Standard memory				
User RAM	300 KB SRAM	300 KB SRAM		
System PROM	448 KB FlashPROM	448 KB FlashPROM		
User PROM	1024 KB FlashPROM	1024 KB FlashPROM		
Data buffering with backup battery	Lithium battery 3 V / 950 mAh	Lithium battery 3 V / 950 mAh		
Hardware watchdog	Yes	Yes		
Voltage monitoring	An NMI is triggered at a supply voltage < 15 VDC.	An NMI is triggered at a supply voltage < 15 VDC.		
Real-time clock	1 s resolution, nonvolatile	1 s resolution, nonvolatile		
System bus for expansions	No	No		
Interfaces	4PP035.0300-01, 4PP035.E300-01	4PP035.0300-36, 4PP035.E300-36		
IF1 application interface				
Type	RS232	RS232		
Design	9-pin DSUB plug	9-pin DSUB plug		
Electrical isolation	No	No		
Max. baud rate	115.2 kBits/s	115.2 kBits/s		
IF2 application interface				
Type	CAN bus	CAN bus		
Design	9-pin DSUB plug	9-pin DSUB plug		
Electrical isolation	Yes	Yes		
Max. baud rate	500 kBits/s	500 kBits/s		
Digital inputs	4PP035.0300-01, 4PP035.E300-01	4PP035.0300-36, 4PP035.E300-36		
Channels	1-3	4-16	1-3	4-8
Additional functionalities for inputs	Counter	-	Counter	-
Input circuit	Sink or source	Sink or source	Sink or source	Sink or source
Rated voltage	24 VDC	24 VDC	24 VDC	24 VDC
Input current at rated voltage	Approx. 10 mA	Approx. 5 mA	Approx. 10 mA	Approx. 5 mA
Input filter	<10 μ s	<1 ms	<10 μ s	<1 ms
Electrical isolation				
Channel - Bus	Yes	Yes	Yes	Yes
Channel - Channel	No	No	No	No
Group isolation	No	No	No	No

Power Panel PP35

Analog inputs	4PP035.0300-01, 4PP035.E300-01	4PP035.0300-36, 4PP035.E300-36
Number of channels	-	4 differential inputs, 2 of which can be configured individually as temperature inputs
Input	-	±10 V
Digital converter resolution	-	12-bit
Conversion time	-	150 µs for all channels
Input filter		
Hardware	-	Cut-off frequency 10 kHz / attenuation 60 dB
Software	-	-
Output format	-	UINT
Input impedance in signal range	-	20 MΩ
Input circuit	-	IEC 61131-2
Electrical isolation		
Channel - Bus	-	Yes
Channel - Channel	-	No
Group isolation	-	No
Temperature measurement	4PP035.0300-01, 4PP035.E300-01	4PP035.0300-36, 4PP035.E300-36
Number of channels	-	Up to 2 (depending on the configuration)
Input	-	Resistance measurement using 2-line procedure with constant current feed
Digital converter resolution	-	12-bit
Conversion time	-	150 µs for all channels
Input filter		
Hardware	-	Cut-off frequency 10 kHz / attenuation 60 dB
Software	-	-
Output format	-	UINT
Sensor		Can be set per channel
KTY10-6	-	-50°C to +125°C
PT1000	-	-200°C to +850°C
Resistance measurement range	-	0-4000 Ω
Input circuit	-	IEC 61131-2
Electrical isolation		
Channel - Bus	-	Yes
Channel - Channel	-	No
Group isolation	-	No
Digital outputs	4PP035.0300-01, 4PP035.E300-01	4PP035.0300-36, 4PP035.E300-36
Amount	16	8
Rated voltage	24 VDC	24 VDC
Rated output current	0.5 A	0.5 A
Total current	8 A	4 A
Output circuit	Source	Source
Output protection	Overload protection, short circuit protection	Overload protection, short circuit protection
Internal protective circuit	VDR	VDR
Electrical isolation		
Channel - Bus	No	No
Channel - Channel	No	No
Group isolation	No	No

Analog outputs	4PP035.0300-01, 4PP035.E300-01	4PP035.0300-36, 4PP035.E300-36
Number of channels	-	4
Output	-	± 10 V
Digital converter resolution	-	12-bit
Conversion time	-	150 µs for all channels
Power on/off behavior	-	Internal enable relay for boot procedure and errors
Basic accuracy	-	±0.088% at 25°C based on the current output value
Output protection	-	Continuous short circuit protection
Electrical isolation		
Channel - Bus	-	Yes
Channel - Channel	-	No
Group isolation	-	No
Power supply	4PP035.0300-01, 4PP035.E300-01	4PP035.0300-36, 4PP035.E300-36
Rated voltage	24 VDC	24 VDC
Power consumption	Max. 6 W	Max. 6 W
Environmental conditions	4PP035.0300-01, 4PP035.E300-01	4PP035.0300-36, 4PP035.E300-36
Temperature		
Operation	0 to +50°C	0 to +50°C
Storage	-20 to +60°C	-20 to +60°C
Relative humidity		
Operation	10 to 90% (non-condensing)	10 to 90% (non-condensing)
Storage	5 to 95% (non-condensing)	5 to 95% (non-condensing)
Mechanics	4PP035.0300-01, 4PP035.E300-01	4PP035.0300-36, 4PP035.E300-36
Protection type	IP65 (front side)	IP65 (front side)
Outer dimensions (W x H x D [mm])	153 x 120 x 46.1	153 x 120 x 46.1
Weight	0.5 kg	0.5 kg

Required accessories		
0TB103.9	24 VDC screw clamps	1131
0TB103.91	24 VDC cage clamps	1131
7TB718.9	Accessory, terminal block, 18-pin, screw clamps, 1.5 mm ²	1141
7TB718.91	Accessory, terminal block, 18-pin, cage clamps, 1.5 mm ²	1141
Optional accessories		
0AC201.9 ¹⁾	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	1128
4A0006.00-000 ¹⁾	Lithium battery, 3 V / 950 mAh, button cell	1128
4A0044.00-000	Set of printable legend strips for the PP15 and PP35	---
7AC911.9	CAN bus connector	1143

1) Replacement parts

Power Panel PP35



4PP035.E300-136

General information		4PP035.E300-136	
Certification	CE, C-UL-US, GHOST-R		
Status indicators	I/O function for each channel, status		
Diagnostics			
Status	Yes, with status LED		
I/O function	Yes, with LEDs		
Interface	Yes, with LEDs		
Display		4PP035.E300-136	
Type	LCD b/w		
Resolution	160 x 80 pixels		
Background lighting	LED		
Display character set	European / Cyrillic		
Keys		4PP035.E300-136	
Total keys	26 (10 with LEDs)		
System keys	Number block Control keys		
Label	10 keys with legend strips		
Processor		4PP035.E300-136	
Typical instruction cycle time (average value at 70% bit and 30% analog processing)	0.8 μ s		
Standard memory			
User RAM	300 KB SRAM		
System PROM	448 KB FlashPROM		
User PROM	1984 KB FlashPROM		
Data buffering with backup battery	Lithium battery 3 V / 950 mAh		
Hardware watchdog	Yes		
Voltage monitoring	An NMI is triggered at a supply voltage < 15 VDC.		
Real-time clock	1 s resolution, nonvolatile		
System bus for expansions	No		
Interfaces		4PP035.E300-136	
IF1 application interface			
Type	RS232		
Design	9-pin DSUB plug		
Electrical isolation	No		
Max. baud rate	115.2 kBits/s		
IF2 application interface			
Type	CAN bus		
Design	9-pin DSUB plug		
Electrical isolation	Yes		
Max. baud rate	500 kBits/s		
Digital inputs		4PP035.E300-136	
Channels	1-3	4-8	
Additional functionalities for inputs	Counter	-	
Input circuit	Sink or source	Sink or source	
Rated voltage	24 VDC	24 VDC	
Input current at rated voltage	Approx. 10 mA	Approx. 5 mA	
Input filter	<10 μ s	<1 ms	
Electrical isolation			
Channel - Bus	Yes	Yes	
Channel - Channel	No	No	
Group isolation	No	No	

Analog inputs		4PP035.E300-136
Number of channels	4 differential inputs, 2 of which can be configured individually as temperature inputs	
Input	±10 V	
Digital converter resolution	12-bit	
Conversion time	150 μs for all channels	
Input filter		
Hardware	Cut-off frequency 10 kHz / attenuation 60 dB	
Software	-	
Output format	UINT	
Input impedance in signal range	20 MΩ	
Input circuit	IEC 61131-2	
Electrical isolation		
Channel - Bus	Yes	
Channel - Channel	No	
Group isolation	No	
Temperature measurement		4PP035.E300-136
Number of channels	Up to 2 (depending on the configuration)	
Input	Resistance measurement using 2-line procedure with constant current feed	
Digital converter resolution	12-bit	
Conversion time	150 μs for all channels	
Input filter		
Hardware	Cut-off frequency 10 kHz / attenuation 60 dB	
Software	-	
Output format	UINT	
Sensor	Can be set per channel	
KTY10-6	-50°C to +125°C	
PT1000	-200°C to +850°C	
Resistance measurement range	0-4000 Ω	
Input circuit	IEC 61131-2	
Electrical isolation		
Channel - Bus	Yes	
Channel - Channel	No	
Group isolation	No	
Digital outputs		4PP035.E300-136
Amount	8	
Rated voltage	24 VDC	
Rated output current	0.5 A	
Total current	4 A	
Output circuit	Source	
Output protection	Overload protection, short circuit protection	
Internal protective circuit	VDR	
Electrical isolation		
Channel - Bus	No	
Channel - Channel	No	
Group isolation	No	

Power Panel PP35

Analog outputs		4PP035.E300-136
Number of channels		4
Output		± 10 V
Digital converter resolution		12-bit
Conversion time		150 µs for all channels
Power on/off behavior		Internal enable relay for boot procedure and errors
Basic accuracy		±0.088% at 25°C based on the current output value
Output protection		Continuous short circuit protection
Electrical isolation		
Channel - Bus		Yes
Channel - Channel		No
Group isolation		No
Power supply		4PP035.E300-136
Rated voltage		24 VDC
Power consumption		Max. 6 W
Environmental conditions		4PP035.E300-136
Temperature		
Operation		0 to +50°C
Storage		-20 to +60°C
Relative humidity		
Operation		10 to 90% (non-condensing)
Storage		5 to 95% (non-condensing)
Mechanics		4PP035.E300-136
Protection type		IP65 (front side)
Outer dimensions (W x H x D [mm])		153 x 120 x 46.1
Weight		0.5 kg

Required accessories		
0TB103.9	24 VDC screw clamps	1131
0TB103.91	24 VDC cage clamps	1131
7TB718.9	Accessory, terminal block, 18-pin, screw clamps, 1.5 mm ²	1141
7TB718.91	Accessory, terminal block, 18-pin, cage clamps, 1.5 mm ²	1141
Optional accessories		
0AC201.9 ¹⁾	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	1128
4A0006.00-000 ¹⁾	Lithium battery, 3 V / 950 mAh, button cell	1128
4A0044.00-000	Set of printable legend strips for the PP15 and PP35	
7AC911.9	CAN bus connector	1143

1) Replacement parts



Power Panel PP21



Display	4P0420.00-490
Type	LCD
Resolution	4x20 characters
Background lighting	LED
Keys	4P0420.00-490
Function keys	17, with LED
System keys	Number block Control keys
Processor	4P0420.00-490
Additional I/O processor	Handles I/O data points
Typical instruction cycle time	0.5 μ s (average value at 70% bit and 30% analog processing)
Standard memory	
User RAM	700 KB SRAM
System PROM	600 kB FlashPROM
User PROM	1.4 MB FlashPROM
Data buffering with backup battery	Lithium battery 3 V / 950 mAh
Hardware watchdog	Yes
Voltage monitoring	Internal supply monitored for overvoltage and undervoltage
Peripherals	4P0420.00-490
Real-time clock	1 s resolution, nonvolatile
Status indicators	LEDs
System bus for expansions	No
Slots for B&R 2003 screw-in modules	6
For serial asynchronous communication	3
For TPU	3
For CAN bus communication	1
PC card slot	1
Memory size	
SRAM	Max. 4 MB
FlashPROM	Max. 4 MB
Standard communication interfaces	4P0420.00-490
IF1 application interface	
Type	RS232
Design	9-pin DSUB plug
Electrical isolation	No
Max. baud rate	115.2 kBits/s
IF2 application interface	
Type	CAN bus
Design	9-pin DSUB plug
Electrical isolation	Yes
Max. baud rate	500 kBits/s

Digital inputs	4P0420.00-490
Number of channels	10
Additional functionalities for inputs	4x TPU
Input circuit	Sink
Rated voltage	24 VDC
Input current at rated voltage	Approx. 4 mA
Input filter	<1 ms
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Group isolation	Input group - Output group
Digital outputs	4P0420.00-490
Amount	8 + 1 floating relay contact
Rated voltage	24 VDC
Rated output current	0.4 A
Total current	3.2 A
Output circuit	Source
Output protection	Overload protection
Internal protective circuit	Yes
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Group isolation	Input group - Output group
Power supply	4P0420.00-490
Rated voltage	24 VDC
Power consumption	Max. 20 W
Output power for screw-in modules and PC card interface	10 W
Environmental conditions	4P0420.00-490
Temperature	
Operation	0 to +50°C
Storage	-20 to +60°C
Relative humidity	
Operation	10 to 90% (non-condensing)
Storage	5 to 95% (non-condensing)
Mechanics	4P0420.00-490
Protection type	IP65 (front side)
Outer dimensions (W x H x D [mm])	155 x 190 x 84.4
Weight	1.25 kg

Power Panel PP41



Display	4P3040.01-490
Type	LCD b/w
Diagonal	5.7"
Resolution	QVGA, 320 x 240 pixels
Brightness	150 cd/m ²
Half-brightness time	50,000 h
Keys	4P3040.01-490
Function keys	16, with LED
System keys	Number block Cursor keys Control keys
Processor	4P3040.01-490
Additional I/O processor	Handles I/O data points
Typical instruction cycle time	0.5 μ s (average value at 70% bit and 30% analog processing)
Standard memory	
User RAM	700 KB SRAM
System PROM	600 kB FlashPROM
User PROM	1.4 MB FlashPROM
Data buffering with backup battery	Lithium battery 3 V / 950 mAh
Hardware watchdog	Yes
Voltage monitoring	Internal supply monitored for overvoltage and undervoltage
Peripherals	4P3040.01-490
Real-time clock	1 s resolution, nonvolatile
Status indicators	LEDs
System bus for expansions	Expansion module EX101 1 insert slot For B&R SYSTEM 2005 interface modules
Slots for B&R 2003 screw-in modules	6
For serial asynchronous communication	3
For TPU	3
For CAN bus communication	1
PC card slot	1
Memory size	
SRAM	Max. 4 MB
FlashPROM	Max. 4 MB
Standard communication interfaces	4P3040.01-490
IF1 application interface	
Type	RS232
Design	9-pin DSUB plug
Electrical isolation	No
Max. baud rate	115.2 kBits/s
IF2 application interface	
Type	CAN bus
Design	9-pin DSUB plug
Electrical isolation	Yes
Max. baud rate	500 kBits/s

Digital inputs	4P3040.01-490
Number of channels	10
Additional functionalities for inputs	4x TPU
Input circuit	Sink
Rated voltage	24 VDC
Input current at rated voltage	Approx. 4 mA
Input filter	<1 ms
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Group isolation	Input group - Output group
Digital outputs	4P3040.01-490
Amount	8 + 1 floating relay contact
Rated voltage	24 VDC
Rated output current	0.4 A
Total current	3.2 A
Output circuit	Source
Output protection	Overload protection
Internal protective circuit	Yes
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Group isolation	Input group - Output group
Power supply	4P3040.01-490
Rated voltage	24 VDC
Power consumption	Max. 20 W
Output power for screw-in modules and PC card interface	11 W
Environmental conditions	4P3040.01-490
Temperature	
Operation	0 to +50°C
Storage	-20 to +60°C
Relative humidity	
Operation	10 to 90% (non-condensing)
Storage	5 to 95% (non-condensing)
Mechanics	4P3040.01-490
Protection type	IP65 (front side)
Outer dimensions (W x H x D [mm])	205 x 220 x 110.4
Weight	1.95 kg

PP21 / PP41 accessories

Required accessories		
7TB712.9	Accessory, terminal block, 12-pin, screw clamps, 1.5 mm ²	1141
7TB712.91	Accessory, terminal block, 12-pin, cage clamps, 1.5 mm ²	1141
0AC201.9 ¹⁾	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	1128
4A0006.00-000 ¹⁾	Lithium battery, 3 V / 950 mAh, button cell	1128
Optional accessories		
0MC111.9-1	PCMCIA accessory, 2 MB FLASH	1127
0MC112.9-1	PCMCIA accessory, 4 MB FLASH	1127
0MC211.9	PCMCIA accessory, 2 MB SRAM	1127
4A0034.00-000	A4 legend strip template, for PP41 (4P3040.01-490) 5 sheets, for 10 devices, with CorelDraw template	
4A0035.00-000	A4 legend strip template, for PP21 (4P0420.00-490) 2 sheets, for 10 devices, with CorelDraw template	
4IF370.7	Power Panel interface module, 1 CAN interface, electrically isolated, network capable, screw-in module	
7AI261.7	2003 analog input module, 1 input for evaluation of a full-bridge strain gauge, 24 bit, screw-in module	
7AI294.7	2003 analog input module, 4 inputs, potentiometer evaluation, 13-bit, screw-in module	
7AI351.70	2003 analog input module, 1 input, ±10 V or 0-20 mA, 12-bit + sign, screw-in module, order 1x TB712 terminal block separately	
7AI354.70	2003 analog input module, 4 inputs, ±10 V, 12-bit + sign, screw-in module, order 1x TB712 terminal block separately	
7AI774.70	2003 analog input module, 4 inputs, 0 to 20 mA, 12-bit, screw-in module, order 1x TB712 terminal block separately	
7AM351.70	2003 analog mixed module, 1 input, ±10 V, 16-bit, 1 output, ±10 V, 16-bit, screw-in module, order 1x TB712 terminal block separately	
7AO352.70	2003 analog output module, 2 outputs, ±10 V or 0 - 20 mA, 12-bit, screw-in module, order 1x TB712 terminal block separately	
7AT324.70	2003 analog input module, 4 temperature inputs (2-line connection), KTY10 to +150°C, KTY84 to +300°C, PT100 to +850°C, PT1000 to +850°C, screw-in module, order 1x TB712 terminal block separately	
7AT352.70	2003 analog input module, 2 inputs, PT100 (3-line connection), up to +850°C, screw-in module, order 1x TB712 terminal block separately	
7AT664.70	2003 analog input module, 4 inputs, thermocouple, up to +1768°C, screw-in module, order 1x TB712 terminal block separately	
7DI135.70	2003 digital input module, 4 inputs 24 VDC, sink, incremental encoder operation: 50 kHz, event counter operation: 100 kHz, 1 comparator output 24 VDC, screw-in module, order 1x TB712 terminal block separately	
7DI138.70	2003 digital input module, 10 inputs 24 VDC, sink, 2 inputs for event counter operation, input frequency 20 kHz, screw-in module, order 1x TB712 terminal block separately	
7DI140.70	2003 digital input module, 10 inputs 24 VDC, sink, 2 inputs for event counter operation or direction-dependent position determination, input frequency 50 kHz, 4 inputs can be used as high-speed inputs (e.g. gate, frequency measurement), screw-in module, order 1x TB712 terminal block separately	
7DO135.70	2003 digital output module, 4 FET outputs 12 to 24 VDC, 0.1 A, screw-in module, order 1x TB712 terminal block separately	
7DO138.70	2003 digital output module, 8 outputs 24 VDC, 0.5 A, short circuit protection, thermal overload protection, screw-in module, order 1x TB712 terminal block separately	
7IF311.7	2003 interface module, 1 RS232 interface, screw-in module	
7IF321.7	2003 interface module, 1 RS485/RS422 interface, electrically isolated, network-capable, screw-in module	
7IF361.70-1	2003 interface module, 1 RS485 interface, electrically isolated and network-capable, transfer protocol: PROFIBUS-DP, screw-in module	
7NC161.7	2003 encoder module, input frequency 100 kHz, incremental or absolute, 32-bit, encoder supply 5 VDC or 24 VDC, screw-in module	

1) Replacement part

Power Panel PP45 5.7" LCD touch screen



Controller	4PP045.0571-042	
Processor	ELAN SC520 100 MHz, Intel compatible	
Main memory	64 MB DRAM	
SRAM	32 KB, battery-buffered	
CompactFlash slot	1 slot for Type I CompactFlash card	
PP45 compact IF slot	1	
Watchdog	Internal system management controller	
Power failure logic	System management controller, 10 ms buffer time	
Battery	Lithium, 950 mAh, exchanged from the outside	
Real-time clock	Battery-buffered	
Mode/node switches	2, 16 digits each	
Display	4PP045.0571-042	
Type	LCD m	
Colors	8 shades of gray	
Resolution	QVGA, 320 x 240 pixels	
Diagonal	5.7"	
Brightness	140 cd/m ²	
Half-brightness time	55,000 h	
Touch screen	Analog resistive	
Keys	4PP045.0571-042	
Touch keys	10	
Interfaces	4PP045.0571-042	
USB	2x USB 2.0, connection type A	
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	
X2X	X2X Link master	
24 VDC supply	4PP045.0571-042	
Input voltage	24 VDC ± 25%	
Environmental conditions	4PP045.0571-042	
Temperature		
Operation	0 to +50°C	
Storage	-20°C to +70°C	
Relative humidity		
Operation	10% to 90%, non-condensing	
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing	
Mechanics	4PP045.0571-042	
Protection type	IP65 (front side) / IP20 (back side)	
Outer dimensions (W x H x D [mm])	203 x 145 x 55	
Weight	0.5 kg	

Required accessories		
0AC201.9 ¹⁾	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	1128
4A0006.00-000 ¹⁾	Lithium battery, 3 V / 950 mAh, button cell	1128
0TB103.9	Plug 24 VDC screw clamp	1131
0TB103.91	Plug 24 VDC cage clamp	1131
	CompactFlash cards	1126

1) Replacement part

Power Panel

PP45 5.7" LCD color touch screen



Controller		4PP045.0571-062
Processor	ELAN SC520 100 MHz, Intel compatible	
Main memory	64 MB DRAM	
SRAM	32 KB, battery-buffered	
CompactFlash slot	1 slot for Type I CompactFlash card	
PP45 compact IF slot	1	
Watchdog	Internal system management controller	
Power failure logic	System management controller, 10 ms buffer time	
Battery	Lithium, 950 mAh, exchanged from the outside	
Real-time clock	Battery-buffered	
Mode/node switches	2, 16 digits each	
Display		4PP045.0571-062
Type	LCD color	
Colors	256 colors	
Resolution	QVGA, 320 x 240 pixels	
Diagonal	5.7"	
Brightness	140 cd/m ²	
Half-brightness time	55,000 h	
Touch screen	Analog resistive	
Keys		4PP045.0571-062
Touch keys	10	
Interfaces		4PP045.0571-062
USB	2x USB 2.0, connection type A	
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	
X2X	X2X Link master	
24 VDC supply		4PP045.0571-062
Input voltage	24 VDC ± 25%	
Environmental conditions		4PP045.0571-062
Temperature		
Operation	0 to +50°C	
Storage	-20°C to +70°C	
Relative humidity		
Operation	10% to 90%, non-condensing	
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing	
Mechanics		4PP045.0571-062
Protection type	IP65 (front side) / IP20 (back side)	
Outer dimensions (W x H x D [mm])	203 x 145 x 55	
Weight	0.5 kg	

Required accessories		
0AC201.9 ¹⁾	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	1128
4A0006.00-000 ¹⁾	Lithium battery, 3 V / 950 mAh, button cell	1128
0TB103.9	Plug 24 VDC screw clamp	1131
0TB103.91	Plug 24 VDC cage clamp	1131
	CompactFlash cards	1126

1) Replacement part

Power Panel PP45 5.7" LCD



Controller	4PP045.0571-L42
Processor	ELAN SC520 100 MHz, Intel compatible
Main memory	64 MB DRAM
SRAM	32 KB, battery-buffered
CompactFlash slot	1 slot for Type I CompactFlash card
PP45 compact IF slot	1
Watchdog	Internal system management controller
Power failure logic	System management controller, 10 ms buffer time
Battery	Lithium, 950 mAh, exchanged from the outside
Real-time clock	Battery-buffered
Mode/node switches	2, 16 digits each
Display	4PP045.0571-L42
Type	LCD b/w
Colors	8 shades of gray
Resolution	QVGA, 320 x 240 pixels
Diagonal	5.7"
Brightness	140 cd/m ²
Half-brightness time	55,000 h
Keys	4PP045.0571-L42
Function keys	24 (6 with legend strips)
Interfaces	4PP045.0571-L42
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)
X2X	X2X Link master
24 VDC supply	4PP045.0571-L42
Input voltage	24 VDC ± 25%
Environmental conditions	4PP045.0571-L42
Temperature	
Operation	0 to +50°C
Storage	-20°C to +70°C
Relative humidity	
Operation	10% to 90%, non-condensing
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing
Mechanics	4PP045.0571-L42
Protection type	IP65 (front side) / IP20 (back side)
Outer dimensions (W x H x D [mm])	203 x 145 x 55
Weight	0.5 kg

Required accessories		
0AC201.9 ¹⁾	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	1128
4A0006.00-000 ¹⁾	Lithium battery, 3 V / 950 mAh, button cell	1128
0TB103.9	Plug 24 VDC screw clamp	1131
0TB103.91	Plug 24 VDC cage clamp	1131
	CompactFlash cards	1126

1) Replacement part

PP45 interface module IF10



Short description	4PP045.IF10-1
Communication module	1x RS232
Interfaces	4PP045.IF10-1
Interface	
Type	RS232
Design	9-pin DSUB plug
Maximum transfer rate	115.2 kBit/s
General information	4PP045.IF10-1
Status indicators	Sending and receiving data
Diagnostics	
Data transfer	Yes, with status LEDs
Electrical isolation	
PLC - IF1	No
Power consumption	
3.3 V	0.15 W
5 V	1.2 W
Total	1.35 W
Certification	CE, C-UL-US, GOST-R
Mechanical characteristics	4PP045.IF10-1
Slot	PP45 insert
Protection type	IP20
Operating / Storage temperature	0°C to + 50°C / - 25°C to + 70°C
Relative humidity	10 to 90%, non-condensing

Optional accessories	
0G001.00-090	Cable PC <-> PLC/PW, RS232, online cable

PP45 interface module IF23



Short description		4PP045.IF23-1
Communication module	1x RS232/RS422/RS485, 1x CAN	
Interfaces		4PP045.IF23-1
Interface IF1		
Type	RS232	
Design	9-pin DSUB plug (shared with IF2)	
Maximum transfer rate	115.2 kBit/s	
Interface IF2		
Type	RS485/RS422	
Design	9-pin DSUB plug (shared with IF1)	
Maximum transfer rate	115.2 kBit/s	
Interface IF3		
Type	CAN	
Design	4-pin multipoint connector	
Maximum transfer rate	1000 kBit/s	
General information		4PP045.IF23-1
Status indicators	Send/receive data via interface	
Diagnostics		
Data transfer	Yes, with status LED	
Electrical isolation		
PLC - IF1	No	
PLC - IF2/IF3	Yes	
IF1 - IF2/IF3	Yes	
IF2 - IF3	Yes	
Power consumption		
5 V	2.0 W	
24 V	-	
Total	2.0 W	
Certification	CE, C-UL-US, GOST-R	
Mechanical characteristics		4PP045.IF23-1
Slot	PP45 insert	
Protection type	IP20	
Operating / Storage temperature	0°C to + 50°C / - 25°C to + 70°C	
Relative humidity	10 to 90%, non-condensing	

Optional accessories		
0AC913.93	Bus adapter, CAN, 2 CAN interfaces, including 30 cm attachment cable (TB704)	1141
0G0001.00-090	Cable PC <-> PLC/PW, RS232, online cable	
0G1000.00-090	Bus connector, RS485, for Profibus networks	1141

PP45 interface module IF24



Short description		4PP045.IF24-1
Communication module		1x RS232/RS422/RS485, 1x Profibus DP slave
Interfaces		4PP045.IF24-1
Interface IF1		
Type	RS232	
Design	9-pin DSUB plug (shared with IF2)	
Maximum transfer rate	115.2 kBit/s	
Interface IF2		
Type	RS485/RS422	
Design	9-pin DSUB socket (shared with IF1)	
Maximum transfer rate	115.2 kBit/s	
Interface IF3		
Fieldbus	Profibus DP slave	
Type	RS485	
Design	9-pin DSUB socket	
Maximum transfer rate	12 MBit/s	
General information		4PP045.IF24-1
Status indicators	Send/receive data via interface	
Diagnostics		
Data transfer	Yes, with status LED	
Electrical isolation		
PLC - IF1	No	
PLC - IF2	Yes	
PLC - IF3	Yes	
Power consumption		
3.3 V	0.15 W	
5 V	1.2 W	
Total	1.35 W	
Certification	CE, C-UL-US, GOST-R	
Mechanical characteristics		4PP045.IF24-1
Slot	PP45 insert	
Protection type	IP20	
Operating / Storage temperature	0°C to + 50°C / - 25°C to + 70°C	
Relative humidity	10 to 90%, non-condensing	

Optional accessories		
0G0001.00-090	Cable PC <-> PLC/PW, RS232, online cable	
0G1000.00-090	Bus connector, RS485, for Profibus networks	1141

PP45 interface module IF33



Short description	4PP045.IF33-1	
Communication module	2x CAN bus	
Interfaces	4PP045.IF33-1	
Interfaces IF1 and IF2		
Type	CAN bus	
Design	2x 4-pin multipoint connector	
Maximum transfer rate	1000 kBit/s	
General information	4PP045.IF33-1	
Status indicators	2 LEDs each for sending/receiving data for IF1 and IF2	
Diagnostics		
Data transfer	Yes, with status LEDs	
Electrical isolation		
PLC - IF1/IF2	Yes	
IF1 - IF2	Yes	
Power consumption		
3.3 V	0.2 W	
5 V	1.8 W	
Total	2.0 W	
Certification	CE, C-UL-US, GOST-R	
Mechanical characteristics	4PP045.IF33-1	
Slot	PP45 insert	
Protection type	IP20	
Operating / Storage temperature	0°C to + 50°C / - 25°C to + 70°C	
Relative humidity	10 to 90%, non-condensing	

Required accessories		
OTB704.9	Accessory terminal block, 4-pin, screw clamp, 1.5 mm ²	1134
Optional accessories		
OAC913.93	Bus adapter, CAN, 2 CAN interfaces, including 30 cm attachment cable (TB704)	1141

Power Panel

PP320 Bios 5.7" TFT color touch screen



Controller		5PP320.0571-39
Processor	Geode LX800 500 MHz, MMX compatible	
Main memory	256 MB DRAM	
Graphics memory	8 MB shared memory (allocated from main memory)	
CompactFlash slot	1 slot for Type I CompactFlash card	
Battery	Lithium, 950 mAh, exchanged from the outside	
Real-time clock	Battery-buffered	
Mode/node switches	2, 16 digits each	
Display		5PP320.0571-39
Type	TFT color	
Colors	262.144 ¹⁾	
Resolution	QVGA, 320 x 240 pixels	
Diagonal	5.7"	
Brightness	500 cd/m ²	
Half-brightness time	50,000 h	
Touch screen	Analog resistive	
1) The actual number of colors depends on the graphics memory, the graphics mode configured, and the graphics driver being used.		
Interfaces		5PP320.0571-39
Serial		
Type	RS232	
Design	9-pin DSUB plug	
Electrical isolation	No	
Max. baud rate	115 kBits/s	
USB	2x USB 1.1, 2.0, connection type A ¹⁾	
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	
1) Windows CE limitation - USB 1.1		
24 VDC supply		5PP320.0571-39
Input voltage	24 VDC ±25%, electrically isolated	
Environmental conditions		5PP320.0571-39
Temperature		
Operation	0 to +50°C	
Storage	-20°C to +60°C	
Relative humidity		
Operation	5% to 85%, non-condensing	
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing	
Mechanics		5PP320.0571-39
Protection type	IP65 (front side) / IP20 (back side)	
Outer dimensions (W x H x D (mm))	212 x 156 x 55.5	
Weight	1.4 kg	

Required accessories		
0AC201.9 ¹⁾	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	1128
4A0006.00-000 ¹⁾	Lithium battery, 3 V / 950 mAh, button cell	1128
0TB103.9	Plug 24 VDC screw clamp	1131
0TB103.91	Plug 24 VDC cage clamp	1131
	Operating system	1114
	CompactFlash cards	1126

1) Replacement part



Power Panel

PP320 Bios 5.7" TFT color touch screen



	5PP320.0573-39	5PP320.0573-3B
Controller	5PP320.0573-39	5PP320.0573-3B
Processor	Geode LX800 500 MHz, MMX compatible	Geode LX800 500 MHz, MMX compatible
Main memory	256 MB DRAM	512 MB DRAM
Graphics memory	8 MB shared memory (allocated from main memory)	8 MB shared memory (allocated from main memory)
CompactFlash slot	1 slot for Type I CompactFlash card	1 slot for Type I CompactFlash card
Battery	Lithium, 950 mAh, exchanged from the outside	Lithium, 950 mAh, exchanged from the outside
Real-time clock	Battery-buffered	Battery-buffered
Mode/node switches	2, 16 digits each	2, 16 digits each
Display	5PP320.0573-39	5PP320.0573-3B
Type	TFT color	TFT color
Colors	262,144 ¹⁾	262,144 ¹⁾
Resolution	VGA, 640 x 480 pixels	VGA, 640 x 480 pixels
Diagonal	5.7"	5.7"
Brightness	350 cd/m ²	350 cd/m ²
Half-brightness time	75,000 h	75,000 h
Touch screen	Analog resistive	Analog resistive
1) The actual number of colors depends on the graphics memory, the graphics mode configured, and the graphics driver being used.		
Interfaces	5PP320.0573-39	5PP320.0573-3B
Serial		
Type	RS232	RS232
Design	9-pin DSUB plug	9-pin DSUB plug
Electrical isolation	No	No
Max. baud rate	115 kBits/s	115 kBits/s
USB		
	2x USB 1.1, 2.0, connection type A ¹⁾	2x USB 1.1, 2.0, connection type A ¹⁾
Ethernet		
	RJ45 twisted pair (10 BaseT / 100 BaseT)	RJ45 twisted pair (10 BaseT / 100 BaseT)
1) Windows CE limitation - USB 1.1		
24 VDC supply	5PP320.0573-39	5PP320.0573-3B
Input voltage	24 VDC ±25%, electrically isolated	24 VDC ±25%, electrically isolated
Environmental conditions	5PP320.0573-39	5PP320.0573-3B
Temperature		
Operation	0 to +50°C	0 to +50°C
Storage	-20°C to +60°C	-20°C to +60°C
Relative humidity		
Operation	5% to 85%, non-condensing	5% to 85%, non-condensing
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing
Mechanics	5PP320.0573-39	5PP320.0573-3B
Protection type	IP65 (front side) / IP20 (back side)	IP65 (front side) / IP20 (back side)
Outer dimensions (W x H x D [mm])	212 x 156 x 55.5	212 x 156 x 55.5
Weight	1.4 kg	1.4 kg

Required accessories		
0AC201.9 ¹⁾	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	1128
4A0006.00-000 ¹⁾	Lithium battery, 3 V / 950 mAh, button cell	1128
0TB103.9	Plug 24 VDC screw clamp	1131
0TB103.91	Plug 24 VDC cage clamp	1131
	Operating system	1114
	CompactFlash cards	1126

1) Replacement part

Power Panel

PP320 Bios 10.4" TFT color touch screen



Controller		5PP320.1043-39
Processor	Geode LX800 500 MHz, MMX compatible	
Main memory	256 MB DRAM	
Graphics memory	8 MB shared memory (allocated from main memory)	
CompactFlash slot	1 slot for Type I CompactFlash card	
Battery	Lithium, 950 mAh, exchanged from the outside	
Real-time clock	Battery-buffered	
Mode/node switches	2, 16 digits each	
Display		5PP320.1043-39
Type	TFT color	
Colors	262.144 ¹⁾	
Resolution	VGA, 640 x 480 pixels	
Diagonal	10.4"	
Brightness	450 cd/m ²	
Half-brightness time	55,000 h	
Touch screen	Analog resistive	
1) The actual number of colors depends on the graphics memory, the graphics mode configured, and the graphics driver being used.		
Interfaces		5PP320.1043-39
Serial		
Type	RS232	
Design	9-pin DSUB plug	
Electrical isolation	No	
Max. baud rate	115 kBits/s	
USB	2x USB 1.1, 2.0, connection type A ¹⁾	
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	
1) Windows CE limitation - USB 1.1		
24 VDC supply		5PP320.1043-39
Input voltage	24 VDC ±25%, electrically isolated	
Environmental conditions		5PP320.1043-39
Temperature		
Operation	0 to +50°C	
Storage	-20°C to +70°C	
Relative humidity		
Operation	5% to 85%, non-condensing	
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing	
Mechanics		5PP320.1043-39
Protection type	IP65 (front side) / IP20 (back side)	
Outer dimensions (W x H x D [mm])	323 x 260 x 65.5	
Weight	3.7 kg	

Required accessories			
0AC201.9 ¹⁾	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell		1128
4A0006.00-000 ¹⁾	Lithium battery, 3 V / 950 mAh, button cell		1128
0TB103.9	Plug 24 VDC screw clamp		1131
0TB103.91	Plug 24 VDC cage clamp		1131
	Operating system		1114
	CompactFlash cards		1126

1) Replacement part

Power Panel

PP320 Bios 12.1" TFT color touch screen



Controller		5PP320.1214-39
Processor	Geode LX800 500 MHz, MMX compatible	
Main memory	256 MB DRAM	
Graphics memory	8 MB shared memory (allocated from main memory)	
CompactFlash slot	1 slot for Type I CompactFlash card	
Battery	Lithium, 950 mAh, exchanged from the outside	
Real-time clock	Battery-buffered	
Mode/node switches	2, 16 digits each	
Display		5PP320.1214-39
Type	TFT color	
Colors	262.144 ¹⁾	
Resolution	SVGA, 800 x 600 pixels	
Diagonal	12.1"	
Brightness	350 cd/m ²	
Half-brightness time	50,000 h	
Touch screen	Analog resistive	
1) The actual number of colors depends on the graphics memory, the graphics mode configured, and the graphics driver being used.		
Interfaces		5PP320.1214-39
Serial		
Type	RS232	
Design	9-pin DSUB plug	
Electrical isolation	No	
Max. baud rate	115 kBits/s	
USB	2x USB 1.1, 2.0, connection type A ¹⁾	
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	
1) Windows CE limitation - USB 1.1		
24 VDC supply		5PP320.1214-39
Input voltage	24 VDC ±25%, electrically isolated	
Environmental conditions		5PP320.1214-39
Temperature		
Operation	0 to +45°C	
Storage	-20°C to +60°C	
Relative humidity		
Operation	5% to 85%, non-condensing	
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing	
Mechanics		5PP320.1214-39
Protection type	IP65 (front side) / IP20 (back side)	
Outer dimensions (W x H x D (mm))	362 x 284 x 65.5	
Weight	4.1 kg	

Required accessories		
0AC201.9 ¹⁾	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	1128
4A0006.00-000 ¹⁾	Lithium battery, 3 V / 950 mAh, button cell	1128
0TB103.9	Plug 24 VDC screw clamp	1131
0TB103.91	Plug 24 VDC cage clamp	1131
	Operating system	1114
	CompactFlash cards	1126

1) Replacement part

Power Panel

PP320 Bios 15" TFT color touch screen



Controller		5PP320.1505-39
Processor	Geode LX800 500 MHz, MMX compatible	
Main memory	256 MB DRAM	
Graphics memory	8 MB shared memory (allocated from main memory)	
CompactFlash slot	1 slot for Type I CompactFlash card	
Battery	Lithium, 950 mAh, exchanged from the outside	
Real-time clock	Battery-buffered	
Mode/node switches	2, 16 digits each	
Display		5PP320.1505-39
Type	TFT color	
Colors	262.144 ¹⁾	
Resolution	XGA, 1024 x 768 pixels	
Diagonal	15"	
Brightness	250 cd/m ²	
Half-brightness time	50,000 h	
Touch screen	Analog resistive	
¹⁾ The actual number of colors depends on the graphics memory, the graphics mode configured, and the graphics driver being used.		
Interfaces		5PP320.1505-39
Serial		
Type	RS232	
Design	9-pin DSUB plug	
Electrical isolation	No	
Max. baud rate	115 kBits/s	
USB	2x USB 1.1, 2.0, connection type A ¹⁾	
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	
¹⁾ Windows CE limitation - USB 1.1		
24 VDC supply		5PP320.1505-39
Input voltage	24 VDC ±25%, electrically isolated	
Environmental conditions		5PP320.1505-39
Temperature		
Operation	0°C to +50°C	
Storage	-20°C to +60°C	
Relative humidity		
Operation	5% to 85%, non-condensing	
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing	
Mechanics		5PP320.1505-39
Protection type	IP65 (front side) / IP20 (back side)	
Outer dimensions (W x H x D [mm])	435 x 330 x 71.5	
Weight	6.3 kg	

Required accessories			
0AC201.9 ¹⁾	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell		1128
4A0006.00-000 ¹⁾	Lithium battery, 3 V / 950 mAh, button cell		1128
0TB103.9	Plug 24 VDC screw clamp		1131
0TB103.91	Plug 24 VDC cage clamp		1131
	Operating system		1114
	CompactFlash cards		1126

¹⁾ Replacement part

Power Panel

PP320 embedded 5.7" LCD monochrome touch screen



Controller		4PP320.0571-01
Processor	Geode LX800 500 MHz, MMX compatible	
Main memory	128 MB DRAM	
Graphics memory	8 MB shared memory (allocated from main memory)	
CompactFlash slot	1 slot for Type I CompactFlash card	
Mode/node switches	2, 16 digits each	
Display		4PP320.0571-01
Type	LCD monochrome	
Colors	8 shades of grey ¹⁾	
Resolution	QVGA, 320 x 240 pixels	
Diagonal	5.7"	
Brightness	220 cd/m ²	
Half-brightness time	50,000 h	
Touch screen	Analog resistive	
1) Automation Runtime limitation - max. 256 shades of grey, USB 1.1		
Interfaces		4PP320.0571-01
Serial		
Type	RS232	
Design	9-pin DSUB plug	
Electrical isolation	No	
Max. baud rate	115 kBits/s	
USB	2x USB 2.0, connection type A ¹⁾	
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	
1) Automation Runtime limitation - max. 256 shades of grey, USB 1.1		
24 VDC supply		4PP320.0571-01
Input voltage	24 VDC ±25%, electrically isolated	
Environmental conditions		4PP320.0571-01
Ambient temperature		
Operation	0 to 50°C	
Storage	-20 to +60°C	
Relative humidity		
Operation	5 - 85%, non-condensing	
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing	
Mechanics		4PP320.0571-01
Protection type	IP65 (front side) / IP20 (back side)	
Outer dimensions (W x H x D [mm])	212 x 156 x 55.5	
Weight	1.4 kg	

Required accessories		
0TB103.9	Plug 24 VDC screw clamp	1131
0TB103.91	Plug 24 VDC cage clamp	1131
	CompactFlash cards	1126

Power Panel PP320 embedded 5.7" TFT touch screen



Controller		4PP320.0571-35
Processor	Geode LX800 500 MHz, MMX compatible	
Main memory	128 MB DRAM	
Graphics memory	8 MB shared memory (allocated from main memory)	
CompactFlash slot	1 slot for Type I CompactFlash card	
Mode/node switches	2, 16 digits each	
Display		4PP320.0571-35
Type	TFT color	
Colors	262.144 ¹⁾	
Resolution	QVGA, 320 x 240 pixels	
Diagonal	5.7"	
Brightness	500 cd/m ²	
Half-brightness time	50,000 h	
Touch screen	Analog resistive	
1) Automation Runtime limitation - max. 256 colors, USB 1.1		
Interfaces		4PP320.0571-35
Serial		
Type	RS232	
Design	9-pin DSUB plug	
Electrical isolation	No	
Max. baud rate	115 kBits/s	
USB	2x USB 2.0, connection type A ¹⁾	
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	
1) Automation Runtime limitation - max. 256 colors, USB 1.1		
24 VDC supply		4PP320.0571-35
Input voltage	24 VDC ±25%, electrically isolated	
Environmental conditions		4PP320.0571-35
Ambient temperature		
Operation	0 to 50°C	
Storage	-20 to +60°C	
Relative humidity		
Operation	5 - 85%, non-condensing	
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing	
Mechanics		4PP320.0571-35
Protection type	IP65 (front side) / IP20 (back side)	
Outer dimensions (W x H x D [mm])	212 x 156 x 55.5	
Weight	1.4 kg	

Required accessories		
0TB103.9	Plug 24 VDC screw clamp	1131
0TB103.91	Plug 24 VDC cage clamp	1131
	CompactFlash cards	1126

Power Panel

PP320 embedded 10.4" TFT color touch screen



Controller		4PP320.1043-31
Processor	Geode LX800 500 MHz, MMX compatible	
Main memory	128 MB DRAM	
Graphics memory	8 MB shared memory (allocated from main memory)	
CompactFlash slot	1 slot for Type I CompactFlash card	
Mode/node switches	2, 16 digits each	
Display		4PP320.1043-31
Type	TFT color	
Colors	262.144 ¹⁾	
Resolution	VGA, 640 x 480 pixels	
Diagonal	10.4"	
Brightness	450 cd/m ²	
Half-brightness time	55,000 h	
Touch screen	Analog resistive	
1) Automation Runtime limitation - max. 256 colors, USB 1.1		
Interfaces		4PP320.1043-31
Serial		
Type	RS232	
Design	9-pin DSUB plug	
Electrical isolation	No	
Max. baud rate	115 kBits/s	
USB	2x USB 2.0, connection type A ¹⁾	
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	
1) Automation Runtime limitation - max. 256 colors, USB 1.1		
24 VDC supply		4PP320.1043-31
Input voltage	24 VDC ±25%, electrically isolated	
Environmental conditions		4PP320.1043-31
Temperature		
Operation	0 to 50°C	
Storage	-20 to +70°C	
Relative humidity		
Operation	5 - 85%, non-condensing	
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing	
Mechanics		4PP320.1043-31
Protection type	IP65 (front side) / IP20 (back side)	
Outer dimensions (W x H x D [mm])	323 x 260 x 65.5	
Weight	3.7 kg	

Required accessories		
0TB103.9	Plug 24 VDC screw clamp	1131
0TB103.91	Plug 24 VDC cage clamp	1131
	CompactFlash cards	1126

Power Panel

PP320 embedded 15" TFT color touch screen



Controller		4PP320.1505-31
Processor	Geode LX800 500 MHz, MMX compatible	
Main memory	128 MB DRAM	
Graphics memory	8 MB shared memory (allocated from main memory)	
CompactFlash slot	1 slot for Type I CompactFlash card	
Mode/node switches	2, 16 digits each	
Display		4PP320.1505-31
Type	TFT color	
Colors	262.144 ¹⁾	
Resolution	XGA, 1024 x 768 pixels	
Diagonal	15"	
Brightness	250 cd/m ²	
Half-brightness time	50,000 h	
Touch screen	Analog resistive	
1) Automation Runtime limitation - max. 256 colors, USB 1.1		
Interfaces		4PP320.1505-31
Serial		
Type	RS232	
Design	9-pin DSUB plug	
Electrical isolation	No	
Max. baud rate	115 kBits/s	
USB	2x USB 2.0, connection type A ¹⁾	
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	
1) Automation Runtime limitation - max. 256 colors, USB 1.1		
24 VDC supply		4PP320.1505-31
Input voltage	24 VDC ±25%, electrically isolated	
Environmental conditions		4PP320.1505-31
Temperature		
Operation	0°C to +50°C	
Storage	-20 to +60°C	
Relative humidity		
Operation	5 - 85%, non-condensing	
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing	
Mechanics		4PP320.1505-31
Protection type	IP65 (front side) / IP20 (back side)	
Outer dimensions (W x H x D [mm])	435 x 330 x 71.5	
Weight	6.3 kg	

Required accessories		
0TB103.9	Plug 24 VDC screw clamp	1131
0TB103.91	Plug 24 VDC cage clamp	1131
	CompactFlash cards	1126

Power Panel PP351 embedded 5.7" LCD monochrome



Controller		4PP351.0571-01
Processor	Geode LX800 500 MHz, MMX compatible	
Main memory	128 MB DRAM	
Graphics memory	8 MB shared memory (allocated from main memory)	
CompactFlash slot	1 slot for Type I CompactFlash card	
Mode/node switches	2, 16 digits each	
Display		4PP351.0571-01
Type	LCD monochrome	
Colors	8 shades of grey ¹⁾	
Resolution	QVGA, 320 x 240 pixels	
Diagonal	5.7"	
Brightness	220 cd/m ²	
Half-brightness time	50,000 h	
Touch screen	-	
Keys		4PP351.0571-01
Function keys	16, with LED	
Soft keys	6, with LED	
System keys	Number block Cursor keys	
Interfaces		4PP351.0571-01
Serial		
Type	RS232	
Design	9-pin DSUB plug	
Electrical isolation	No	
Max. baud rate	115 kBits/s	
USB	2x USB 2.0, connection type A ¹⁾	
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	
24 VDC supply		4PP351.0571-01
Input voltage	24 VDC ±25%, electrically isolated	
Environmental conditions		4PP351.0571-01
Temperature		
Operation	0 to +50°C	
Storage	-20°C to +60°C	
Relative humidity		
Operation	5% to 85%, non-condensing	
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing	
Mechanics		4PP351.0571-01
Protection type	IP65 (front side) / IP20 (back side)	
Outer dimensions (W x H x D [mm])	212 x 245 x 55.5	
Weight	1.4 kg	

1) Automation Runtime limitation - max. 256 shades of grey, USB 1.1

Required accessories		
	Plug 24 VDC	1131
5AC900.057X-00	Legend strips for 5.7" panel, 1 sheet for labeling 3 panels. For Power Panel 4PPx51.0571-xx.	868
	CompactFlash cards	1126

1) Replacement part

Power Panel

PP351 embedded 5.7" TFT color



Controller	4PP351.0571-35	
Processor	Geode LX800 500 MHz, MMX compatible	
Main memory	128 MB DRAM	
Graphics memory	8 MB shared memory (allocated from main memory)	
CompactFlash slot	1 slot for Type I CompactFlash card	
Mode/node switches	2, 16 digits each	
Display	4PP351.0571-35	
Type	TFT color	
Colors	262.144 ¹⁾	
Resolution	QVGA, 320 x 240 pixels	
Diagonal	5.7"	
Brightness	500 cd/m ²	
Half-brightness time	50,000 h	
Touch screen	-	
Keys	4PP351.0571-35	
Function keys	16, with LED	
Soft keys	6, with LED	
System keys	Number block Cursor keys	
Interfaces	4PP351.0571-35	
Serial		
Type	RS232	
Design	9-pin DSUB plug	
Electrical isolation	No	
Max. baud rate	115 kBits/s	
USB	2x USB 2.0, connection type A ¹⁾	
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	
24 VDC supply	4PP351.0571-35	
Input voltage	24 VDC ±25%, electrically isolated	
Environmental conditions	4PP351.0571-35	
Temperature		
Operation	0 to +50°C	
Storage	-20°C to +60°C	
Relative humidity		
Operation	5% to 85%, non-condensing	
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing	
Mechanics	4PP351.0571-35	
Protection type	IP65 (front side) / IP20 (back side)	
Outer dimensions (W x H x D [mm])	212 x 245 x 55.5	
Weight	1.4 kg	

1) Automation Runtime limitation - max. 256 colors, USB 1.1

Required accessories		
	Plug 24 VDC	1131
5AC900.057X-00	Legend strips for 5.7" panel, 1 sheet for labeling 3 panels. For Power Panel 4PPx51.0571-xx.	868
	CompactFlash cards	1126

1) Replacement part

Power Panel PP352 embedded 5.7" LCD color



Controller		4PP352.0571-35
Processor	Geode LX800 500 MHz, MMX compatible	
Main memory	128 MB DRAM	
Graphics memory	8 MB shared memory (allocated from main memory)	
CompactFlash slot	1 slot for Type I CompactFlash card	
Mode/node switches	2, 16 digits each	
Display		4PP352.0571-35
Type	TFT color	
Colors	262.144 ¹⁾	
Resolution	QVGA, 320 x 240 pixels	
Diagonal	5.7"	
Brightness	500 cd/m ²	
Half-brightness time	50,000 h	
Touch screen	-	
Keys		4PP352.0571-35
Function keys	16, with LED	
Soft keys	6, with LED	
System keys	Number block Cursor keys	
Interfaces		4PP352.0571-35
Serial		
Type	RS232	
Design	9-pin DSUB plug	
Electrical isolation	No	
Max. baud rate	115 kBits/s	
USB	2x USB 2.0, connection type A ¹⁾	
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	
24 VDC supply		4PP352.0571-35
Input voltage	24 VDC ±25%, electrically isolated	
Environmental conditions		4PP352.0571-35
Temperature		
Operation	0 to +50°C	
Storage	-20°C to +60°C	
Relative humidity		
Operation	5% to 85%, non-condensing	
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing	
Mechanics		4PP352.0571-35
Protection type	IP65 (front side) / IP20 (back side)	
Outer dimensions (W x H x D [mm])	212 x 245 x 55.5	
Weight	1.4 kg	

1) Automation Runtime limitation - max. 256 colors, USB 1.1

Required accessories		
	Plug 24 VDC	1131
5AC900.057X-00	Legend strips for 5.7" panel, 1 sheet for labeling 3 panels. For Power Panel 4PPx51.0571-xx.	868
	CompactFlash cards	1126

1) Replacement part

Power Panel PP381 embedded 10.4" TFT color touch screen



Controller	4PP381.1043-31	
Processor	Geode LX800 500 MHz, MMX compatible	
Main memory	128 MB DRAM	
Graphics memory	8 MB shared memory (allocated from main memory)	
CompactFlash slot	1 slot for Type I CompactFlash card	
Mode/node switches	2, 16 digits each	
Display	4PP381.1043-31	
Type	TFT color	
Colors	262.144 ¹⁾	
Resolution	VGA, 640 x 480 pixels	
Diagonal	10.4"	
Brightness	450 cd/m ²	
Half-brightness time	55,000 h	
Touch screen	Analog resistive	
Keys	4PP381.1043-31	
Function keys	28, with LED	
Soft keys	10, with LED	
System keys	Number block, cursor keys	
Interfaces	4PP381.1043-31	
Serial		
Type	RS232	
Design	9-pin DSUB plug	
Electrical isolation	No	
Max. baud rate	115 kBits/s	
USB	2x USB 2.0, connection type A ¹⁾	
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	
24 VDC supply	4PP381.1043-31	
Input voltage	24 VDC ±25%, electrically isolated	
Environmental conditions	4PP381.1043-31	
Temperature		
Operation	0 to +50°C	
Storage	-20°C to +70°C	
Relative humidity		
Operation	5% to 85%, non-condensing	
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing	
Mechanics	4PP381.1043-31	
Protection type	IP65 (front side) / IP20 (back side)	
Outer dimensions (W x H x D [mm])	323 x 358 x 65.5	
Weight	4.6 kg	

1) Automation Runtime limitation - max. 256 colors, USB 1.1

Required accessories		
	Plug 24 VDC	1131
5AC900.104X-00	Legend strips for 10.4" panel, 1 sheet for labeling 1 panel. For Power Panel 4PPx51.1043-xx and 4PPx81.1043-xx devices.	868
	CompactFlash cards	1126

1) Replacement part

Power Panel PP420 embedded 5.7" LCD monochrome touch screen



Controller	4PP420.0571-45	4PP420.0571-85
Processor	Geode LX800 500 MHz, MMX compatible	Geode LX800 500 MHz, MMX compatible
Main memory	128 MB DRAM	128 MB DRAM
Graphics memory	8 MB shared memory (allocated from main memory)	8 MB shared memory (allocated from main memory)
SRAM	512 KB, battery-buffered	512 KB, battery-buffered
CompactFlash slot	1 slot for Type I CompactFlash card	1 slot for Type I CompactFlash card
aPCI slots	1	2
Watchdog	MTCX	MTCX
Power failure logic	MTCX 10 ms buffer time	MTCX 10 ms buffer time
Battery	Lithium, 950 mAh, exchanged from the outside	Lithium, 950 mAh, exchanged from the outside
Real-time clock	Battery-buffered	Battery-buffered
Mode/node switches	2, 16 digits each	2, 16 digits each
Display	4PP420.0571-45	4PP420.0571-85
Type	LCD monochrome	LCD monochrome
Colors	8 shades of grey ¹⁾	8 shades of grey ¹⁾
Resolution	QVGA, 320 x 240 pixels	QVGA, 320 x 240 pixels
Diagonal	5.7"	5.7"
Brightness	220 cd/m ²	220 cd/m ²
Half-brightness time	50,000 h	50,000 h
Touch screen	Analog resistive	Analog resistive
<small>1) Automation Runtime limitation - max. 256 shades of grey, USB 1.1</small>		
Interfaces	4PP420.0571-45	4PP420.0571-85
Serial		
Type	RS232	RS232
Design	9-pin DSUB plug	9-pin DSUB plug
Electrical isolation	No	No
Max. baud rate	115 kBits/s	115 kBits/s
USB	2x USB 2.0, connection type A ¹⁾	2x USB 2.0, connection type A ¹⁾
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	RJ45 twisted pair (10 BaseT / 100 BaseT)
<small>1) Automation Runtime limitation - max. 256 shades of grey, USB 1.1</small>		
24 VDC supply	4PP420.0571-45	4PP420.0571-85
Input voltage	24 VDC ±25%, electrically isolated	24 VDC ±25%, electrically isolated
Environmental conditions	4PP420.0571-45	4PP420.0571-85
Temperature		
Operation	0 to +50°C	0 to +50°C
Storage	-20°C to +60°C	-20°C to +60°C
Relative humidity		
Operation	5% to 85%, non-condensing	5% to 85%, non-condensing
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing
Mechanics	4PP420.0571-45	4PP420.0571-85
Protection type	IP65 (front side) / IP20 (back side)	IP65 (front side) / IP20 (back side)
Outer dimensions (W x H x D [mm])	212 x 156 x 76	212 x 156 x 76
Weight	1.7 kg (without aPCI module)	1.7 kg (without aPCI module)

Required accessories		
	Network and fieldbus modules	611
	Lithium battery, 3 V / 950 mAh, button cell ¹⁾	1128
OTB103.9	Plug 24 VDC screw clamp	1131
OTB103.91	Plug 24 VDC cage clamp	1131
	CompactFlash cards	1126

1) Replacement part



Power Panel

PP420 embedded 5.7" TFT color touch screen



Controller	4PP420.0571-75	4PP420.0571-B5
Processor	Geode LX800 500 MHz, MMX compatible	Geode LX800 500 MHz, MMX compatible
Main memory	128 MB DRAM	128 MB DRAM
Graphics memory	8 MB shared memory (allocated from main memory)	8 MB shared memory (allocated from main memory)
SRAM	512 KB, battery-buffered	256 KB, battery-buffered
CompactFlash slot	1 slot for Type I CompactFlash card	1 slot for Type I CompactFlash card
aPCI slots	1	2
Watchdog	MTCX	MTCX
Power failure logic	MTCX 10 ms buffer time	MTCX 10 ms buffer time
Battery	Lithium, 950 mAh, exchanged from the outside	Lithium, 950 mAh, exchanged from the outside
Real-time clock	Battery-buffered	Battery-buffered
Mode/node switches	2, 16 digits each	2, 16 digits each
Display	4PP420.0571-75	4PP420.0571-B5
Type	TFT color	TFT color
Colors	262.144 ¹⁾	262.144 ¹⁾
Resolution	QVGA, 320 x 240 pixels	QVGA, 320 x 240 pixels
Diagonal	5.7"	5.7"
Brightness	500 cd/m ²	500 cd/m ²
Half-brightness time	50,000 h	50,000 h
Touch screen	Analog resistive	Analog resistive
1) Automation Runtime limitation - max. 256 colors, USB 1.1		
Interfaces	4PP420.0571-75	4PP420.0571-B5
Serial		
Type	RS232	RS232
Design	9-pin DSUB plug	9-pin DSUB plug
Electrical isolation	No	No
Max. baud rate	115 kBits/s	115 kBits/s
USB	2x USB 2.0, connection type A ¹⁾	2x USB 2.0, connection type A ¹⁾
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	RJ45 twisted pair (10 BaseT / 100 BaseT)
1) Automation Runtime limitation - max. 256 colors, USB 1.1		
24 VDC supply	4PP420.0571-75	4PP420.0571-B5
Input voltage	24 VDC ±25%, electrically isolated	24 VDC ±25%, electrically isolated
Environmental conditions	4PP420.0571-75	4PP420.0571-B5
Temperature		
Operation	0 to +50°C	0 to +50°C
Storage	-20°C to +60°C	-20°C to +60°C
Relative humidity		
Operation	5% to 85%, non-condensing	5% to 85%, non-condensing
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing
Mechanics	4PP420.0571-75	4PP420.0571-B5
Protection type	IP65 (front side) / IP20 (back side)	IP65 (front side) / IP20 (back side)
Outer dimensions (W x H x D [mm])	212 x 156 x 76	212 x 156 x 98
Weight	1.7 kg (without aPCI module)	2.0 kg (without aPCI module)

Required accessories		
	Network and fieldbus modules	611
	Lithium battery, 3 V / 950 mAh, button cell ¹⁾	1128
0TB103.9	Plug 24 VDC screw clamp	1131
0TB103.91	Plug 24 VDC cage clamp	1131
	CompactFlash cards	1126

1) Replacement part



Controller		4PP420.0573-75
Processor	Geode LX800 500 MHz, MMX compatible	
Main memory	128 MB DRAM	
Graphics memory	8 MB shared memory (allocated from main memory)	
SRAM	512 KB, battery-buffered	
CompactFlash slot	1 slot for Type I CompactFlash card	
aPCI slots	1	
Watchdog	MTCX	
Power failure logic	MTCX 10 ms buffer time	
Battery	Lithium, 950 mAh, exchanged from the outside	
Real-time clock	Battery-buffered	
Mode/node switches	2, 16 digits each	
Display		4PP420.0573-75
Type	TFT color	
Colors	262,144 ¹⁾	
Resolution	VGA, 640 x 480 pixels	
Diagonal	5.7"	
Brightness	350 cd/m ²	
Half-brightness time	75,000 h	
Touch screen	Analog resistive	
1) Automation Runtime limitation - max. 256 colors, USB 1.1		
Interfaces		4PP420.0573-75
Serial		
Type	RS232	
Design	9-pin DSUB plug	
Electrical isolation	No	
Max. baud rate	115 kBits/s	
USB	2x USB 2.0, connection type A ¹⁾	
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	
1) Automation Runtime limitation - max. 256 colors, USB 1.1		
24 VDC supply		4PP420.0573-75
Input voltage	24 VDC ±25%, electrically isolated	
Environmental conditions		4PP420.0573-75
Temperature		
Operation	0 to +50°C	
Storage	-20°C to +60°C	
Relative humidity		
Operation	5% to 85%, non-condensing	
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing	
Mechanics		4PP420.0573-75
Protection type	IP65 (front side) / IP20 (back side)	
Outer dimensions (W x H x D [mm])	212 x 156 x 76	
Weight	1.7 kg (without aPCI module)	

Required accessories		
	Network and fieldbus modules	611
	Lithium battery, 3 V / 950 mAh, button cell ¹⁾	1128
0TB103.9	Plug 24 VDC screw clamp	1131
0TB103.91	Plug 24 VDC cage clamp	1131
	CompactFlash cards	1126

1) Replacement part

Power Panel

PP420 embedded 10.4" TFT color touch screen



Controller	4PP420.1043-75	4PP420.1043-B5
Processor	Geode LX800 500 MHz, MMX compatible	Geode LX800 500 MHz, MMX compatible
Main memory	128 MB DRAM	128 MB DRAM
Graphics memory	8 MB shared memory (allocated from main memory)	8 MB shared memory (allocated from main memory)
SRAM	512 KB, battery-buffered	512 KB, battery-buffered
CompactFlash slot	1 slot for Type I CompactFlash card	1 slot for Type I CompactFlash card
aPCI slots	1	2
Watchdog	MTCX	MTCX
Power failure logic	MTCX 10 ms buffer time	MTCX 10 ms buffer time
Battery	Lithium, 950 mAh, exchanged from the outside	Lithium, 950 mAh, exchanged from the outside
Real-time clock	Battery-buffered	Battery-buffered
Mode/node switches	2, 16 digits each	2, 16 digits each
Display	4PP420.1043-75	4PP420.1043-B5
Type	TFT color	TFT color
Colors	262.144 ¹⁾	262.144 ¹⁾
Resolution	VGA, 640 x 480 pixels	VGA, 640 x 480 pixels
Diagonal	10.4"	10.4"
Brightness	450 cd/m ²	450 cd/m ²
Half-brightness time	55,000 h	55,000 h
Touch screen	Analog resistive	Analog resistive
1) Automation Runtime limitation - max. 256 colors, USB 1.1		
Interfaces	4PP420.1043-75	4PP420.1043-B5
Serial		
Type	RS232	RS232
Design	9-pin DSUB plug	9-pin DSUB plug
Electrical isolation	No	No
Max. baud rate	115 kBits/s	115 kBits/s
USB	2x USB 2.0, connection type A ¹⁾	2x USB 2.0, connection type A ¹⁾
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	RJ45 twisted pair (10 BaseT / 100 BaseT)
1) Automation Runtime limitation - max. 256 colors, USB 1.1		
24 VDC supply	4PP420.1043-75	4PP420.1043-B5
Input voltage	24 VDC ±25%, electrically isolated	24 VDC ±25%, electrically isolated
Environmental conditions	4PP220.1043-75	4PP420.1043-B5
Temperature		
Operation	0 to +50°C	0 to +50°C
Storage	-20°C to +70°C	-20°C to +70°C
Relative humidity		
Operation	5% to 85%, non-condensing	5% to 85%, non-condensing
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing
Mechanics	4PP220.1043-75	4PP420.1043-B5
Protection type	IP65 (front side) / IP20 (back side)	IP65 (front side) / IP20 (back side)
Outer dimensions (W x H x D [mm])	323 x 260 x 86	323 x 260 x 108
Weight	3.9 kg (without aPCI module)	4.2 kg (without aPCI module)

Required accessories		
	Network and fieldbus modules	611
	Lithium battery, 3 V / 950 mAh, button cell ¹⁾	1128
OTB103.9	Plug 24 VDC screw clamp	1131
OTB103.91	Plug 24 VDC cage clamp	1131
	CompactFlash cards	1126

1) Replacement part

Power Panel

PP420 embedded 15" TFT color touch screen



Controller	4PP420.1505-75	4PP420.1505-B5
Processor	Geode LX800 500 MHz, MMX compatible	Geode LX800 500 MHz, MMX compatible
Main memory	128 MB DRAM	128 MB DRAM
Graphics memory	8 MB shared memory (allocated from main memory)	8 MB shared memory (allocated from main memory)
SRAM	512 KB, battery-buffered	512 KB, battery-buffered
CompactFlash slot	1 slot for Type I CompactFlash card	1 slot for Type I CompactFlash card
aPCI slots	1	2
Watchdog	MTCX	MTCX
Power failure logic	MTCX 10 ms buffer time	MTCX 10 ms buffer time
Battery	Lithium, 950 mAh, exchanged from the outside	Lithium, 950 mAh, exchanged from the outside
Real-time clock	Battery-buffered	Battery-buffered
Mode/node switches	2, 16 digits each	2, 16 digits each
Display	4PP420.1505-75	4PP420.1505-B5
Type	TFT color	TFT color
Colors	262,144 ¹⁾	262,144 ¹⁾
Resolution	XGA, 1024 x 768 pixels	XGA, 1024 x 768 pixels
Diagonal	15"	15"
Brightness	250 cd/m ²	250 cd/m ²
Half-brightness time	50,000 h	50,000 h
Touch screen	Analog resistive	Analog resistive
1) Automation Runtime limitation - max. 256 colors, USB 1.1		
Interfaces	4PP420.1505-75	4PP420.1505-B5
Serial		
Type	RS232	RS232
Design	9-pin DSUB plug	9-pin DSUB plug
Electrical isolation	No	No
Max. baud rate	115 kBits/s	115 kBits/s
USB	2x USB 2.0, connection type A ¹⁾	2x USB 2.0, connection type A ¹⁾
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	RJ45 twisted pair (10 BaseT / 100 BaseT)
1) Automation Runtime limitation - max. 256 colors, USB 1.1		
24 VDC supply	4PP420.1505-75	4PP420.1505-B5
Input voltage	24 VDC ±25%, electrically isolated	24 VDC ±25%, electrically isolated
Environmental conditions	4PP420.1505-75	4PP420.1505-B5
Temperature		
Operation	0°C to +50°C	0°C to +50°C
Storage	-20°C to +60°C	-20°C to +60°C
Relative humidity		
Operation	5% to 85%, non-condensing	5% to 85%, non-condensing
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing
Mechanics	4PP420.1505-75	4PP420.1505-B5
Protection type	IP65 (front side) / IP20 (back side)	IP65 (front side) / IP20 (back side)
Outer dimensions (W x H x D [mm])	435 x 330 x 87	435 x 330 x 109
Weight	6.5 kg	6.8 kg

Required accessories		
	Network and fieldbus modules	611
	Lithium battery, 3 V / 950 mAh, button cell ¹⁾	1128
0TB103.9	Plug 24 V screw clamp	1131
0TB103.91	Plug 24 VDC cage clamp	1131
	CompactFlash cards	1126

1) Replacement part

Power Panel PP451 embedded 5.7" LCD monochrome



Controller	4PP451.0571-45	4PP451.0571-85
Processor	Geode LX800 500 MHz, MMX compatible	Geode LX800 500 MHz, MMX compatible
Main memory	128 MB DRAM	128 MB DRAM
Graphics memory	8 MB shared memory (allocated from main memory)	8 MB shared memory (allocated from main memory)
SRAM	512 KB, battery-buffered	512 KB, battery-buffered
CompactFlash slot	1 slot for Type I CompactFlash card	1 slot for Type I CompactFlash card
aPCI slots	1	2
Watchdog	MTCX	MTCX
Power failure logic	MTCX 10 ms buffer time	MTCX 10 ms buffer time
Battery	Lithium, 950 mAh, exchanged from the outside	Lithium, 950 mAh, exchanged from the outside
Real-time clock	Battery-buffered	Battery-buffered
Mode/node switches	2, 16 digits each	2, 16 digits each
Display	4PP451.0571-45	4PP451.0571-85
Type	LCD monochrome	LCD monochrome
Colors	8 shades of grey ¹⁾	8 shades of grey ¹⁾
Resolution	QVGA, 320 x 240 pixels	QVGA, 320 x 240 pixels
Diagonal	5.7"	5.7"
Brightness	220 cd/m ²	220 cd/m ²
Half-brightness time	50,000 h	50,000 h
Touch screen	-	-
Keys	4PP451.0571-45	4PP451.0571-85
Function keys	16, with LED	16, with LED
Soft keys	6, with LED	6, with LED
System keys	Number block Cursor keys	Number block Cursor keys
Interfaces	4PP451.0571-45	4PP451.0571-85
Serial		
Type	RS232	RS232
Design	9-pin DSUB plug	9-pin DSUB plug
Electrical isolation	No	No
Max. baud rate	115 kBits/s	115 kBits/s
USB	2x USB 2.0, connection type A ¹⁾	2x USB 2.0, connection type A ¹⁾
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	RJ45 twisted pair (10 BaseT / 100 BaseT)
24 VDC supply	4PP451.0571-45	4PP451.0571-85
Input voltage	24 VDC ±25%, electrically isolated	24 VDC ±25%, electrically isolated
Environmental conditions	4PP451.0571-45	4PP451.0571-85
Temperature		
Operation	0 to +50°C	0 to +50°C
Storage	-20°C to +60°C	-20°C to +60°C
Relative humidity		
Operation	5% to 85%, non-condensing	5% to 85%, non-condensing
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing
Mechanics	4PP451.0571-75	4PP451.0571-B5
Protection type	IP65 (front side) / IP20 (back side)	IP65 (front side) / IP20 (back side)
Outer dimensions (W x H x D [mm])	212 x 245 x 76.5	212 x 245 x 98.5
Weight	2.4 kg	2.7 kg
<small>1) Automation Runtime limitation - max. 256 shades of grey, USB 1.1</small>		
Required accessories		
Network and fieldbus modules		611
Lithium battery, 3 V / 950 mAh, button cell ¹⁾		1128
Plug 24 VDC		1131
5AC900.057X-00	Legend strips for 5.7" panel, 1 sheet for labeling 3 panels. For Power Panel 4PPx51.0571-xx.	868
CompactFlash cards		1126

1) Replacement part

Power Panel PP451 embedded 5.7" TFT color



	4PP451.0571-75	4PP451.0571-B5
Controller	4PP451.0571-75	4PP451.0571-B5
Processor	Geode LX800 500 MHz, MMX compatible	Geode LX800 500 MHz, MMX compatible
Main memory	128 MB DRAM	128 MB DRAM
Graphics memory	8 MB shared memory (allocated from main memory)	8 MB shared memory (allocated from main memory)
SRAM	512 KB, battery-buffered	512 KB, battery-buffered
CompactFlash slot	1 slot for Type I CompactFlash card	1 slot for Type I CompactFlash card
aPCI slots	1	2
Watchdog	MTCX	MTCX
Power failure logic	MTCX 10 ms buffer time	MTCX 10 ms buffer time
Battery	Lithium, 950 mAh, exchanged from the outside	Lithium, 950 mAh, exchanged from the outside
Real-time clock	Battery-buffered	Battery-buffered
Mode/node switches	2, 16 digits each	2, 16 digits each
Display	4PP451.0571-75	4PP451.0571-B5
Type	TFT color	TFT color
Colors	262.144 ¹⁾	262.144 ¹⁾
Resolution	QVGA, 320 x 240 pixels	QVGA, 320 x 240 pixels
Diagonal	5.7"	5.7"
Brightness	500 cd/m ²	500 cd/m ²
Half-brightness time	50,000 h	50,000 h
Touch screen	-	-
Keys	4PP451.0571-75	4PP451.0571-B5
Function keys	16, with LED	16, with LED
Soft keys	6, with LED	6, with LED
System keys	Number block Cursor keys	Number block Cursor keys
Interfaces	4PP451.0571-75	4PP451.0571-B5
Serial		
Type	RS232	RS232
Design	9-pin DSUB plug	9-pin DSUB plug
Electrical isolation	No	No
Max. baud rate	115 kBits/s	115 kBits/s
USB	2x USB 2.0, connection type A ¹⁾	2x USB 2.0, connection type A ¹⁾
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	RJ45 twisted pair (10 BaseT / 100 BaseT)
24 VDC supply	4PP451.0571-75	4PP451.0571-B5
Input voltage	24 VDC ±25%, electrically isolated	24 VDC ±25%, electrically isolated
Environmental conditions	4PP451.0571-75	4PP451.0571-B5
Temperature		
Operation	0 to +50°C	0 to +50°C
Storage	-20°C to +60°C	-20°C to +60°C
Relative humidity		
Operation	5% to 85%, non-condensing	5% to 85%, non-condensing
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing
Mechanics	4PP451.0571-75	4PP451.0571-B5
Protection type	IP65 (front side) / IP20 (back side)	IP65 (front side) / IP20 (back side)
Outer dimensions (W x H x D [mm])	212 x 245 x 76.5	212 x 245 x 98.5
Weight	2.4 kg	2.7 kg
1) Automation Runtime limitation - max. 256 colors, USB 1.1		
Required accessories		
	Network and fieldbus modules	611
	Lithium battery, 3 V / 950 mAh, button cell ¹⁾	1128
	Plug 24 VDC	1131
5AC900.057X-00	Legend strips for 5.7" panel, 1 sheet for labeling 3 panels. For Power Panel 4PPx51.0571-xx.	868
	CompactFlash cards	1126

1) Replacement part

Power Panel PP452 embedded 5.7" LCD monochrome



Controller		4PP452.0571-45
Processor	Geode LX800 500 MHz, MMX compatible	
Main memory	128 MB DRAM	
Graphics memory	8 MB shared memory (allocated from main memory)	
SRAM	512 KB, battery-buffered	
CompactFlash slot	1 slot for Type I CompactFlash card	
aPCI slots	1	
Watchdog	MTCX	
Power failure logic	MTCX 10 ms buffer time	
Battery	Lithium, 950 mAh, exchanged from the outside	
Real-time clock	Battery-buffered	
Mode/node switches	2, 16 digits each	
Display		4PP452.0571-45
Type	LCD monochrome	
Colors	8 shades of grey ¹⁾	
Resolution	QVGA, 320 x 240 pixels	
Diagonal	5.7"	
Brightness	220 cd/m ²	
Half-brightness time	50,000 h	
Touch screen	-	
Keys		4PP452.0571-45
Function keys	16, with LED	
Soft keys	6, with LED	
System keys	Number block Cursor keys	
Interfaces		4PP452.0571-45
Serial		
Type	RS232	
Design	9-pin DSUB plug	
Electrical isolation	No	
Max. baud rate	115 kBits/s	
USB	2x USB 2.0, connection type A ¹⁾	
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	
24 VDC supply		4PP452.0571-45
Input voltage	24 VDC ±25%, electrically isolated	
Environmental conditions		4PP452.0571-45
Temperature		
Operation	0 to +50°C	
Storage	-20°C to +60°C	
Relative humidity		
Operation	5% to 85%, non-condensing	
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing	
Mechanics		4PP452.0571-45
Protection type	IP65 (front side) / IP20 (back side)	
Outer dimensions (W x H x D [mm])	302 x 187 x 76	
Weight	2.4 kg	
1) Automation Runtime limitation - max. 256 shades of grey, USB 1.1		
Required accessories		
	Network and fieldbus modules	611
	Lithium battery, 3 V / 950 mAh, button cell ¹⁾	1128
	Plug 24 VDC	1131
5AC900.057X-00	Legend strips for 5.7" panel, 1 sheet for labeling 3 panels. For Power Panel 4PPx51.0571-xx.	868
	CompactFlash cards	1126

1) Replacement part

Power Panel PP452 embedded 5.7" TFT color



Controller	4PP452.0571-75	4PP452.0571-B5
Processor	Geode LX800 500 MHz, MMX compatible	Geode LX800 500 MHz, MMX compatible
Main memory	128 MB DRAM	128 MB DRAM
Graphics memory	8 MB shared memory (allocated from main memory)	8 MB shared memory (allocated from main memory)
SRAM	512 KB, battery-buffered	512 KB, battery-buffered
CompactFlash slot	1 slot for Type I CompactFlash card	1 slot for Type I CompactFlash card
aPCI slots	1	2
Watchdog	MTCX	MTCX
Power failure logic	MTCX 10 ms buffer time	MTCX 10 ms buffer time
Battery	Lithium, 950 mAh, exchanged from the outside	Lithium, 950 mAh, exchanged from the outside
Real-time clock	Battery-buffered	Battery-buffered
Mode/node switches	2, 16 digits each	2, 16 digits each
Display	4PP452.0571-75	4PP452.0571-B5
Type	TFT color	TFT color
Colors	262.144 ¹⁾	262.144 ¹⁾
Resolution	QVGA, 320 x 240 pixels	QVGA, 320 x 240 pixels
Diagonal	5.7"	5.7"
Brightness	500 cd/m ²	500 cd/m ²
Half-brightness time	50,000 h	50,000 h
Touch screen	-	-
Keys	4PP452.0571-75	4PP452.0571-B5
Function keys	16, with LED	16, with LED
Soft keys	6, with LED	6, with LED
System keys	Number block Cursor keys	Number block Cursor keys
Interfaces	4PP452.0571-75	4PP452.0571-B5
Serial		
Type	RS232	RS232
Design	9-pin DSUB plug	9-pin DSUB plug
Electrical isolation	No	No
Max. baud rate	115 kBits/s	115 kBits/s
USB	2x USB 2.0, connection type A ¹⁾	2x USB 2.0, connection type A ¹⁾
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	RJ45 twisted pair (10 BaseT / 100 BaseT)
24 VDC supply	4PP452.0571-75	4PP452.0571-B5
Input voltage	24 VDC ±25%, electrically isolated	24 VDC ±25%, electrically isolated
Environmental conditions	4PP452.0571-75	4PP452.0571-B5
Temperature		
Operation	0 to +50°C	0 to +50°C
Storage	-20°C to +60°C	-20°C to +60°C
Relative humidity		
Operation	5% to 85%, non-condensing	5% to 85%, non-condensing
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing
Mechanics	4PP452.0571-75	4PP452.0571-B5
Protection type	IP65 (front side) / IP20 (back side)	IP65 (front side) / IP20 (back side)
Outer dimensions (W x H x D [mm])	302 x 187 x 76	302 x 187 x 98
Weight	2.4 kg	2.7 kg

1) Automation Runtime limitation - max. 256 colors, USB 1.1

Required accessories		
	Network and fieldbus modules	611
	Lithium battery, 3 V / 950 mAh, button cell ¹⁾	1128
	Plug 24 VDC	1131
5AC900.057X-00	Legend strips for 5.7" panel, 1 sheet for labeling 3 panels. For Power Panel 4PPx51.0571-xx.	868
	CompactFlash cards	1126

1) Replacement part

Power Panel PP480 embedded 10.4" TFT color touch screen



Controller		4PP480.1043-75
Processor	Geode LX800 500 MHz, MMX compatible	
Main memory	128 MB DRAM	
Graphics memory	8 MB shared memory (allocated from main memory)	
SRAM	512 KB, battery-buffered	
CompactFlash slot	1 slot for Type I CompactFlash card	
aPCI slots	1	
Watchdog	MTCX	
Power failure logic	MTCX 10 ms buffer time	
Battery	Lithium, 950 mAh, exchanged from the outside	
Real-time clock	Battery-buffered	
Mode/node switches	2, 16 digits each	
Display		4PP480.1043-75
Type	TFT color	
Colors	262.144 ¹⁾	
Resolution	VGA, 640 x 480 pixels	
Diagonal	10.4"	
Brightness	450 cd/m ²	
Half-brightness time	55,000 h	
Touch screen	Analog resistive	
Keys		4PP480.1043-75
Function keys	12, with LED	
Soft keys	10, with LED	
Interfaces		4PP480.1043-75
Serial		
Type	RS232	
Design	9-pin DSUB plug	
Electrical isolation	No	
Max. baud rate	115 kBits/s	
USB	2x USB 2.0, connection type A ¹⁾	
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	
24 VDC supply		4PP480.1043-75
Input voltage	24 VDC ±25%, electrically isolated	
Environmental conditions		4PP480.1043-75
Temperature		
Operation	0 to +50°C	
Storage	-20°C to +70°C	
Relative humidity		
Operation	5% to 85%, non-condensing	
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing	
Mechanics		4PP480.1043-75
Protection type	IP65 (front side) / IP20 (back side)	
Outer dimensions (W x H x D [mm])	323 x 260 x 86	
Weight	3.9 kg	

1) Automation Runtime limitation - max. 256 colors, USB 1.1

Required accessories		
	Network and fieldbus modules	611
	Lithium battery, 3 V / 950 mAh, button cell ¹⁾	1128
	Plug 24 VDC	1131
5AC900.104X-02	Legend strips for 10.4" panel, 1 sheet for labeling 3 panels. For Power Panel 4PPx80.1043-xx.	868
	CompactFlash cards	1126

1) Replacement part

Power Panel PP480 embedded 15" TFT color touch screen



	4PP480.1505-75	4PP480.1505-B5
Controller	4PP480.1505-75	4PP480.1505-B5
Processor	Geode LX800 500 MHz, MMX compatible	Geode LX800 500 MHz, MMX compatible
Main memory	128 MB DRAM	128 MB DRAM
Graphics memory	8 MB shared memory (allocated from main memory)	8 MB shared memory (allocated from main memory)
SRAM	512 KB, battery-buffered	512 KB, battery-buffered
CompactFlash slot	1 slot for Type I CompactFlash card	1 slot for Type I CompactFlash card
aPCI slots	1	2
Watchdog	MTCX	MTCX
Power failure logic	MTCX 10 ms buffer time	MTCX 10 ms buffer time
Battery	Lithium, 950 mAh, exchanged from the outside	Lithium, 950 mAh, exchanged from the outside
Real-time clock	Battery-buffered	Battery-buffered
Mode/node switches	2, 16 digits each	2, 16 digits each
Display	4PP480.1505-75	4PP480.1505-B5
Type	TFT color	TFT color
Colors	262.144 ¹⁾	262.144 ¹⁾
Resolution	XGA, 1024 x 768 pixels	XGA, 1024 x 768 pixels
Diagonal	15"	15"
Brightness	250 cd/m ²	250 cd/m ²
Half-brightness time	50,000 h	50,000 h
Touch screen	Analog resistive	Analog resistive
Keys	4PP480.1505-75	4PP480.1505-B5
Function keys	20, with LED	20, with LED
Soft keys	12, with LED	12, with LED
Interfaces	4PP480.1505-75	4PP480.1505-B5
Serial		
Type	RS232	RS232
Design	9-pin DSUB plug	9-pin DSUB plug
Electrical isolation	No	No
Max. baud rate	115 kBits/s	115 kBits/s
USB	2x USB 2.0, connection type A ¹⁾	2x USB 2.0, connection type A ¹⁾
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	RJ45 twisted pair (10 BaseT / 100 BaseT)
24 VDC supply	4PP480.1505-75	4PP480.1505-B5
Input voltage	24 VDC ±25%, electrically isolated	24 VDC ±25%, electrically isolated
Environmental conditions	4PP480.1505-75	4PP480.1505-B5
Temperature		
Operation	0°C to +50°C	0°C to +50°C
Storage	-20°C to +60°C	-20°C to +60°C
Relative humidity		
Operation	5% to 85%, non-condensing	5% to 85%, non-condensing
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing
Mechanics	4PP480.1505-75	4PP480.1505-B5
Protection type	IP65 (front side) / IP20 (back side)	IP65 (front side) / IP20 (back side)
Outer dimensions (W x H x D [mm])	435 x 330 x 87	435 x 330 x 87
Weight	6.5 kg	6.8 kg

1) Automation Runtime limitation - max. 256 colors, USB 1.1

Required accessories		
	Network and fieldbus modules	611
	Lithium battery, 3 V / 950 mAh, button cell ¹⁾	1128
0TB103.9	Plug 24 VDC	1131
5AC900.150X-00	Legend strips for 15" panel, 1 sheet for labeling 4 panels. for Power Panel 4PPx80.1505-xx and 4PPx81.1505-xx devices	868
	CompactFlash cards	1126

1) Replacement part

Power Panel PP451 embedded 10.4" TFT color



Controller	4PP451.1043-75	4PP451.1043-B5
Processor	Geode LX800 500 MHz, MMX compatible	Geode LX800 500 MHz, MMX compatible
Main memory	128 MB DRAM	128 MB DRAM
Graphics memory	8 MB shared memory (allocated from main memory)	8 MB shared memory (allocated from main memory)
SRAM	512 KB, battery-buffered	512 KB, battery-buffered
CompactFlash slot	1 slot for Type I CompactFlash card	1 slot for Type I CompactFlash card
aPCI slots	1	2
Watchdog	MTCX	MTCX
Power failure logic	MTCX 10 ms buffer time	MTCX 10 ms buffer time
Battery	Lithium, 950 mAh, exchanged from the outside	Lithium, 950 mAh, exchanged from the outside
Real-time clock	Battery-buffered	Battery-buffered
Mode/node switches	2, 16 digits each	2, 16 digits each
Display	4PP451.1043-75	4PP451.1043-B5
Type	TFT color	TFT color
Colors	262.144 ¹⁾	262.144 ¹⁾
Resolution	VGA, 640 x 480 pixels	VGA, 640 x 480 pixels
Diagonal	10.4"	10.4"
Brightness	450 cd/m ²	450 cd/m ²
Half-brightness time	55,000 h	55,000 h
Touch screen	-	-
Keys	4PP451.1043-75	4PP451.1043-B5
Function keys	28, with LED	28, with LED
Soft keys	10, with LED	10, with LED
System keys	Number block, cursor keys	Number block, cursor keys
Interfaces	4PP451.1043-75	4PP451.1043-B5
Serial		
Type	RS232	RS232
Design	9-pin DSUB plug	9-pin DSUB plug
Electrical isolation	No	No
Max. baud rate	115 kBits/s	115 kBits/s
USB	2x USB 2.0, connection type A ¹⁾	2x USB 2.0, connection type A ¹⁾
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	RJ45 twisted pair (10 BaseT / 100 BaseT)
24 VDC supply	4PP451.1043-75	4PP451.1043-B5
Input voltage	24 VDC ±25%, electrically isolated	24 VDC ±25%, electrically isolated
Environmental conditions	4PP451.1043-75	4PP451.1043-B5
Temperature		
Operation	0 to +50°C	0 to +50°C
Storage	-20°C to +70°C	-20°C to +70°C
Relative humidity		
Operation	5% to 85%, non-condensing	5% to 85%, non-condensing
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing
Mechanics	4PP451.1043-75	4PP451.1043-B5
Protection type	IP65 (front side) / IP20 (back side)	IP65 (front side) / IP20 (back side)
Outer dimensions (W x H x D [mm])	323 x 358 x 86	323 x 358 x 108
Weight	5.0 kg	5.3 kg
<small>1) Automation Runtime limitation - max. 256 colors, USB 1.1</small>		
Required accessories		
	Network and fieldbus modules	611
	Lithium battery, 3 V / 950 mAh, button cell ¹⁾	1128
	Plug 24 VDC	1131
5AC900.104X-00	Legend strips for 10.4" panel, 1 sheet for labeling 1 panel. For Power Panel 4PPx51.1043-xx and 4PPx81.1043-xx devices.	868
	CompactFlash cards	1126

1) Replacement part

Power Panel PP481 embedded 10.4" TFT color touch screen



Controller	4PP481.1043-75	4PP481.1043-B5
Processor	Geode LX800 500 MHz, MMX compatible	Geode LX800 500 MHz, MMX compatible
Main memory	128 MB DRAM	128 MB DRAM
Graphics memory	8 MB shared memory (allocated from main memory)	8 MB shared memory (allocated from main memory)
SRAM	512 KB, battery-buffered	512 KB, battery-buffered
CompactFlash slot	1 slot for Type I CompactFlash card	1 slot for Type I CompactFlash card
aPCI slots	1	2
Watchdog	MTCX	MTCX
Power failure logic	MTCX 10 ms buffer time	MTCX 10 ms buffer time
Battery	Lithium, 950 mAh, exchanged from the outside	Lithium, 950 mAh, exchanged from the outside
Real-time clock	Battery-buffered	Battery-buffered
Mode/node switches	2, 16 digits each	2, 16 digits each
Display	4PP481.1043-75	4PP481.1043-B5
Type	TFT color	TFT color
Colors	262.144 ¹⁾	262.144 ¹⁾
Resolution	VGA, 640 x 480 pixels	VGA, 640 x 480 pixels
Diagonal	10.4"	10.4"
Brightness	450 cd/m ²	450 cd/m ²
Half-brightness time	55,000 h	55,000 h
Touch screen	Analog resistive	Analog resistive
Keys	4PP481.1043-75	4PP481.1043-B5
Function keys	28, with LED	28, with LED
Soft keys	10, with LED	10, with LED
System keys	Number block, cursor keys	Number block, cursor keys
Interfaces	4PP481.1043-75	4PP481.1043-B5
Serial		
Type	RS232	RS232
Design	9-pin DSUB plug	9-pin DSUB plug
Electrical isolation	No	No
Max. baud rate	115 kBits/s	115 kBits/s
USB	2x USB 2.0, connection type A ¹⁾	2x USB 2.0, connection type A ¹⁾
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	RJ45 twisted pair (10 BaseT / 100 BaseT)
24 VDC supply	4PP481.1043-75	4PP481.1043-B5
Input voltage	24 VDC ±25%, electrically isolated	24 VDC ±25%, electrically isolated
Environmental conditions	4PP481.1043-75	4PP481.1043-B5
Temperature		
Operation	0 to +50°C	0 to +50°C
Storage	-20°C to +70°C	-20°C to +70°C
Relative humidity		
Operation	5% to 85%, non-condensing	5% to 85%, non-condensing
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing
Mechanics	4PP481.1043-75	4PP481.1043-B5
Protection type	IP65 (front side) / IP20 (back side)	IP65 (front side) / IP20 (back side)
Outer dimensions (W x H x D [mm])	323 x 358 x 86	323 x 358 x 108
Weight	5.0 kg	5.3 kg
1) Automation Runtime limitation - max. 256 colors, USB 1.1		
Required accessories		
	Network and fieldbus modules	611
	Lithium battery, 3 V / 950 mAh, button cell ¹⁾	1128
	Plug 24 VDC	1131
5AC900.104X-00	Legend strips for 10.4" panel, 1 sheet for labeling 1 panel. For Power Panel 4PPx51.1043-xx and 4PPx81.1043-xx devices.	868
	CompactFlash cards	1126

1) Replacement part

Power Panel PP481 embedded 15.0" TFT color touch screen



Controller		4PP481.1505-75
Processor	Geode LX800 500 MHz, MMX compatible	
Main memory	128 MB DRAM	
Graphics memory	8 MB shared memory (allocated from main memory)	
SRAM	512 KB, battery-buffered	
CompactFlash slot	1 slot for Type I CompactFlash card	
aPCI slots	1	
Watchdog	MTCX	
Power failure logic	MTCX 10 ms buffer time	
Battery	Lithium, 950 mAh, exchanged from the outside	
Real-time clock	Battery-buffered	
Mode/node switches	2, 16 digits each	
Display		4PP481.1505-75
Type	TFT color	
Colors	262.144 ¹⁾	
Resolution	XGA, 1024 x 768 pixels	
Diagonal	15.0"	
Brightness	450 cd/m ²	
Half-brightness time	50,000 h	
Touch screen	Analog resistive	
Keys		4PP481.1505-75
Function keys	20, with LED	
Soft keys	12, with LED	
System keys	Alphanumeric keys Number block, cursor keys	
Interfaces		4PP481.1505-75
Serial		
Type	RS232	
Design	9-pin DSUB plug	
Electrical isolation	No	
Max. baud rate	115 kBits/s	
USB	2x USB 2.0, connection type A ¹⁾	
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	
24 VDC supply		4PP481.1505-75
Input voltage	24 VDC ±25%, electrically isolated	
Environmental conditions		4PP481.1505-75
Temperature		
Operation	0 to +50°C	
Storage	-20°C to +60°C	
Relative humidity		
Operation	5% to 85%, non-condensing	
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing	
Mechanics		4PP481.1505-75
Protection type	IP65 (front side) / IP20 (back side)	
Outer dimensions (W x H x D [mm])	435 x 430 x 87	
Weight	8.0 kg	
1) Automation Runtime limitation - max. 256 colors, USB 1.1		
Required accessories		
	Network and fieldbus modules	611
	Lithium battery, 3 V / 950 mAh, button cell ¹⁾	1128
	Plug 24 VDC	1131
5AC900.150X-00	Legend strips for 15" panel, 1 sheet for labeling 4 panels. for Power Panel 4PPx80.1505-xx and 4PPx81.1505-xx devices	868
	CompactFlash cards	1126

1) Replacement part

Power Panel PP452 embedded 10.4" TFT color



Controller	4PP452.1043-75	
Processor	Geode LX800 500 MHz, MMX compatible	
Main memory	128 MB DRAM	
Graphics memory	8 MB shared memory (allocated from main memory)	
SRAM	512 KB, battery-buffered	
CompactFlash slot	1 slot for Type I CompactFlash card	
aPCI slots	1	
Watchdog	MTCX	
Power failure logic	MTCX 10 ms buffer time	
Battery	Lithium, 950 mAh, exchanged from the outside	
Real-time clock	Battery-buffered	
Mode/node switches	2, 16 digits each	
Display	4PP452.1043-75	
Type	TFT color	
Colors	262,144 ¹⁾	
Resolution	VGA, 640 x 480 pixels	
Diagonal	10.4"	
Brightness	450 cd/m ²	
Half-brightness time	55,000 h	
Touch screen	-	
Keys	4PP452.1043-75	
Function keys	44	
System keys	Number block Cursor keys	
Interfaces	4PP452.1043-75	
Serial		
Type	RS232	
Design	9-pin DSUB plug	
Electrical isolation	No	
Max. baud rate	115 kBits/s	
USB	2x USB 2.0, connection type A ¹⁾	
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	
24 VDC supply	4PP452.1043-75	
Input voltage	24 VDC ±25%, electrically isolated	
Environmental conditions	4PP452.1043-75	
Temperature		
Operation	0 to +50°C	
Storage	-20°C to +70°C	
Relative humidity		
Operation	5% to 85%, non-condensing	
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing	
Mechanics	4PP452.1043-75	
Protection type	IP65 (front side) / IP20 (back side)	
Outer dimensions (W x H x D [mm])	423 x 288 x 86	
Weight	5.2 kg	
1) Automation Runtime limitation - max. 256 colors, USB 1.1		
Required accessories		
	Network and fieldbus modules	611
	Lithium battery, 3 V / 950 mAh, button cell ¹⁾	1128
	Plug 24 VDC	1131
5AC900.104X-01	Legend strips for 10.4" panel, 1 sheet for labeling 1 panels. for Power Panel 4PPx52.1043-xx and 4PPx82.1043-xx devices	868
	CompactFlash cards	1126
1) Replacement part		

Power Panel

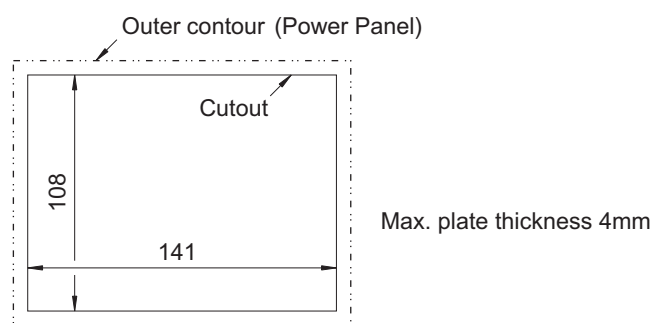
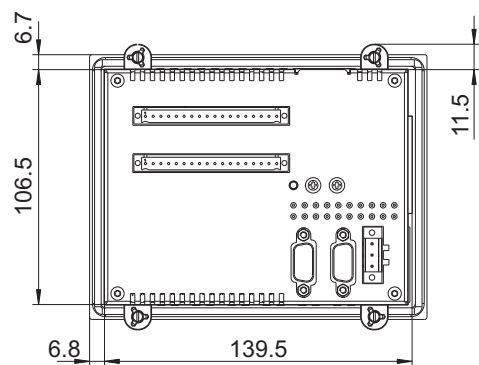
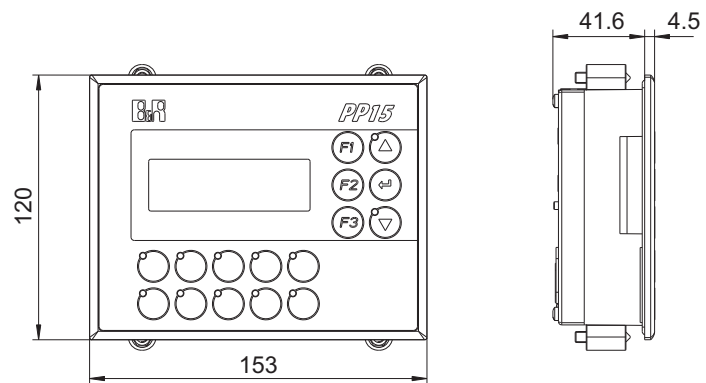
PP482 embedded 10.4" TFT color touch screen



Controller	4PP482.1043-75	
Processor	Geode LX800 500 MHz, MMX compatible	
Main memory	128 MB DRAM	
Graphics memory	8 MB shared memory (allocated from main memory)	
SRAM	512 KB, battery-buffered	
CompactFlash slot	1 slot for Type I CompactFlash card	
aPCI slots	1	
Watchdog	MTCX	
Power failure logic	MTCX 10 ms buffer time	
Battery	Lithium, 950 mAh, exchanged from the outside	
Real-time clock	Battery-buffered	
Mode/node switches	2, 16 digits each	
Display	4PP482.1043-75	
Type	TFT color	
Colors	262.144 ¹⁾	
Resolution	VGA, 640 x 480 pixels	
Diagonal	10.4"	
Brightness	450 cd/m ²	
Half-brightness time	55,000 h	
Touch screen	Analog resistive	
Keys	4PP482.1043-75	
Function keys	44	
System keys	Number block Cursor keys	
Interfaces	4PP482.1043-75	
Serial		
Type	RS232	
Design	9-pin DSUB plug	
Electrical isolation	No	
Max. baud rate	115 kBits/s	
USB	2x USB 2.0, connection type A ¹⁾	
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	
24 VDC supply	4PP482.1043-75	
Input voltage	24 VDC ±25%, electrically isolated	
Environmental conditions	4PP482.1043-75	
Temperature		
Operation	0 to +50°C	
Storage	-20°C to +70°C	
Relative humidity		
Operation	5% to 85%, non-condensing	
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing	
Mechanics	4PP482.1043-75	
Protection type	IP65 (front side) / IP20 (back side)	
Outer dimensions (W x H x D [mm])	423 x 288 x 86	
Weight	5.2 kg	
1) Automation Runtime limitation - max. 256 colors, USB 1.1		
Required accessories		
	Network and fieldbus modules	611
	Lithium battery, 3 V / 950 mAh, button cell ¹⁾	1128
	Plug 24 VDC	1131
5AC900.104X-01	Legend strips for 10.4" panel, 1 sheet for labeling 1 panels. for Power Panel 4PPx52.1043-xx and 4PPx82.1043-xx devices	868
	CompactFlash cards	1126
1) Replacement part		

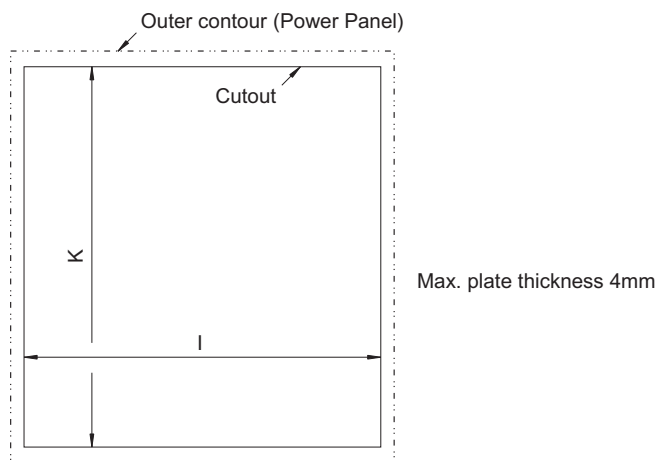
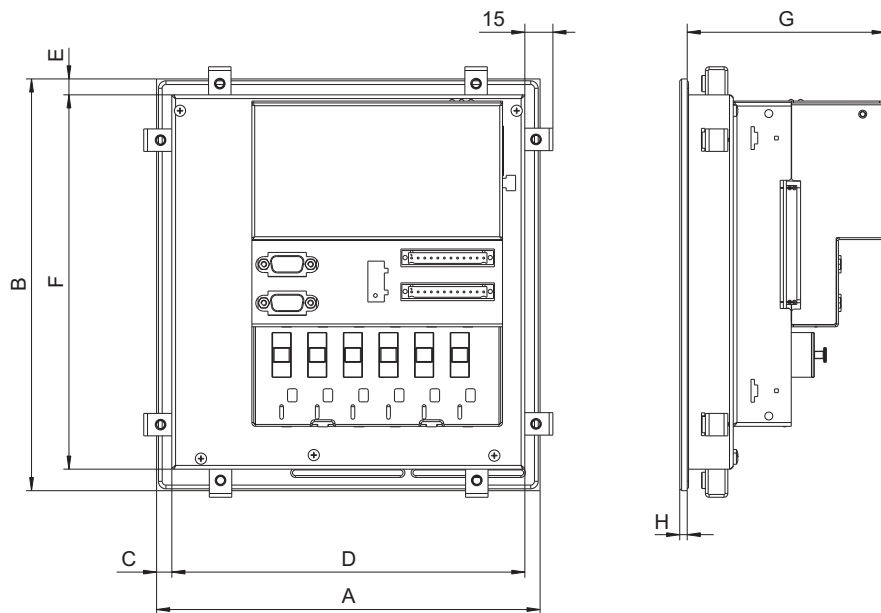


Dimensions



PP 15/35 dimensions

All dimensions in mm

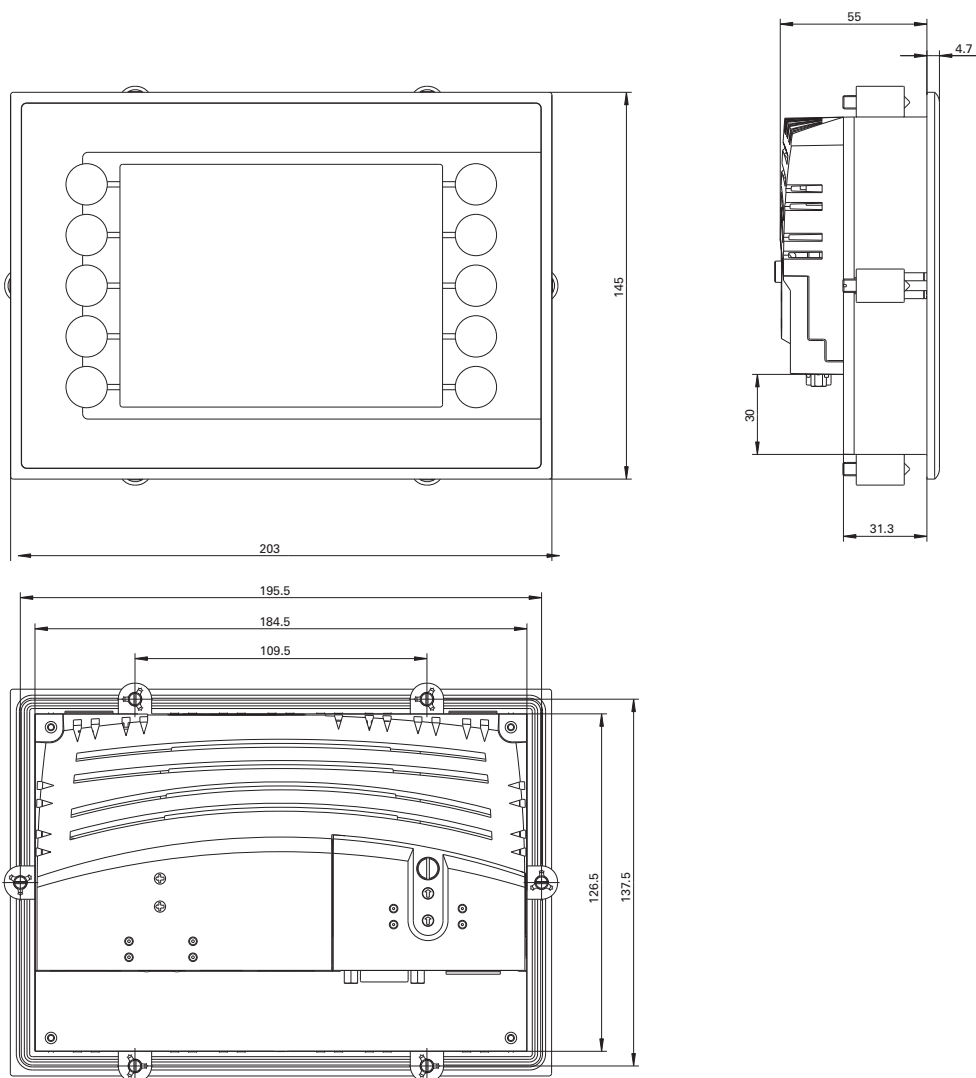


PP 21/41 dimensions

Model number	A	B	C	D	E	F	G	H	I	K
4P0420.00-490	155	190	10	134	8.1	173.8	81.2	4	138	179
4P3040.01-490	205	220	8	188.7	10	200	105.8	4	192	205

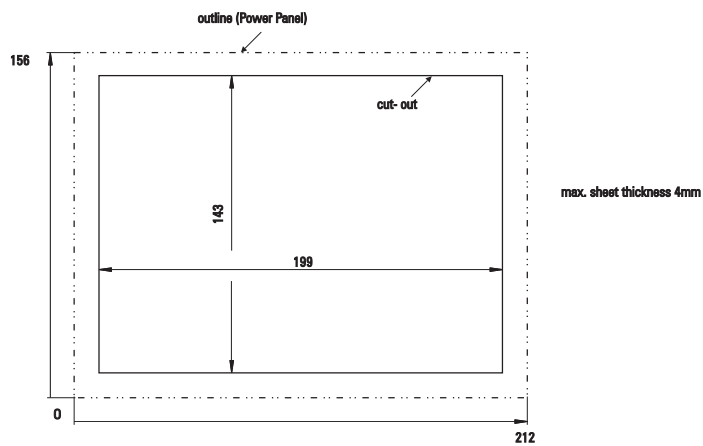
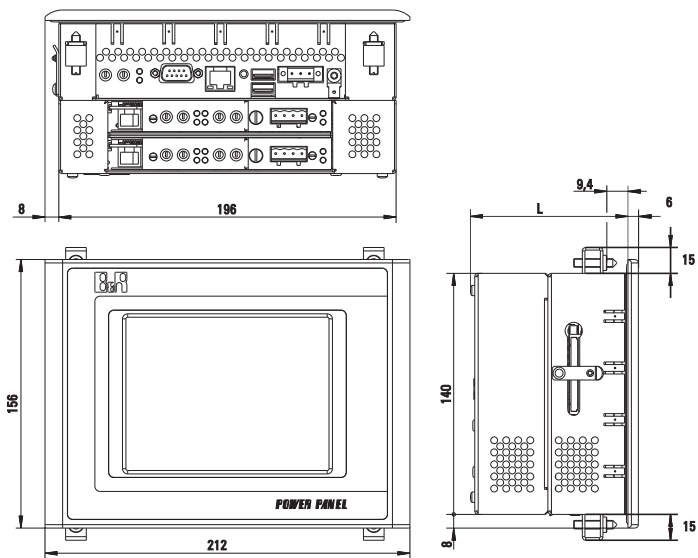
All dimensions in mm

Dimensions



PP45 dimensions

All dimensions in mm

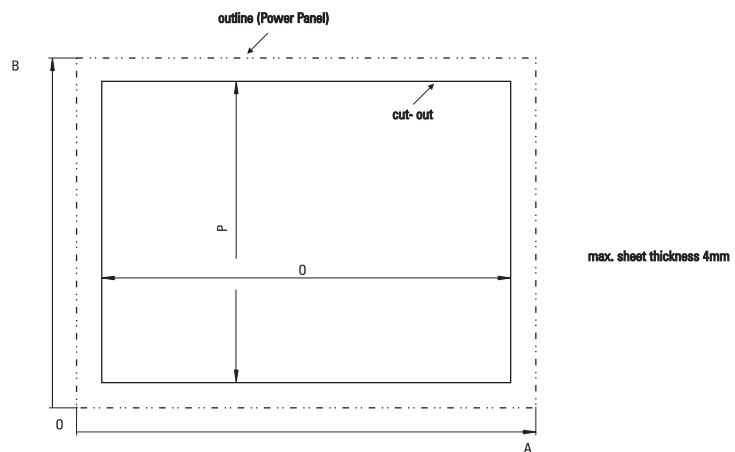
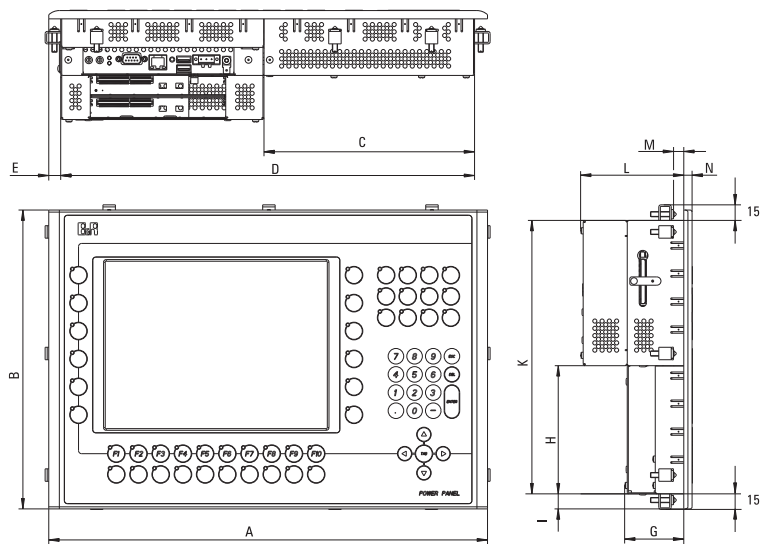


Power Panel dimensions

Model number	aPCI slots	L
4PP320.0571-01	0	49.5
4PP320.0571-35	0	49.5
4PP420.0571-45	1	70
4PP420.0571-75	1	70
4PP420.0571-85	2	92
4PP420.0571-B5	2	92
4PP420.0573-75	1	70
5PP320.0571-39	0	49.5
5PP320.0573-39	0	49.5
5PP320.0573-3B	0	49.5

All dimensions in mm

Dimensions



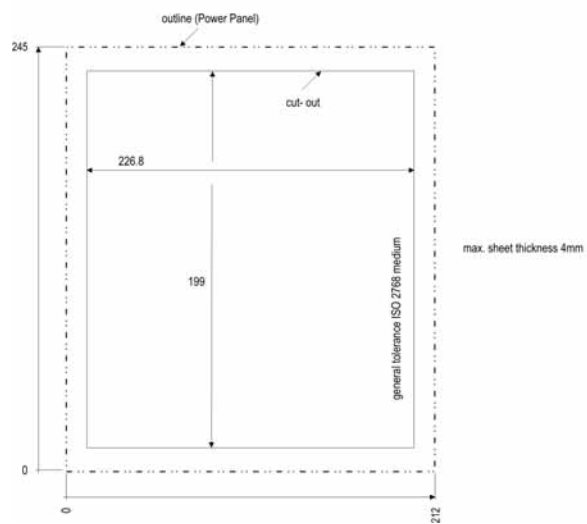
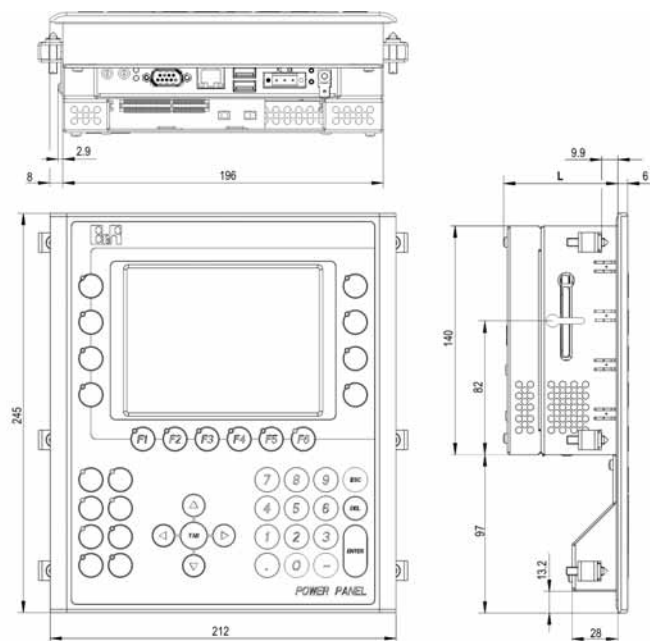
Power Panel dimensions

All dimensions in mm

Model number	A	B	C	D	E	G	H	I	K	L	M	N	O	P
4PP320.1043-31	323	260	104	300	11.5	57.5	100	10	240	57.5	9.9	8	303	243
4PP320.1505-31	435	330	216	412	11.6	63.5	169	10.5	309	63.5	9.9	8	414.8	312
4PP352.0571-35	302	187	-	286	8	50	-	8	171	50	11.9	6	289	174
4PP381.1043-31	323	358	-	300	11.5	57.5	-	15	333	57.5	9.9	8	303	336
4PP420.1043-75	323	260	104	300	11.5	57.5	100	10	240	78	9.9	8	303	243
4PP420.1043-B5	323	260	104	300	11.5	57.5	100	10	240	100	9.9	8	303	243
4PP420.1505-75	435	330	216	412	11.6	58.5	169	10.5	309	79	9.9	8	414.8	312
4PP420.1505-B5	435	330	216	412	11.6	58.5	169	10.5	309	101	9.9	8	414.8	312
4PP451.1043-75	323	358	104	300	11.5	57.5	193	15	333	78	9.9	8	303	336
4PP451.1043-B5	323	358	104	300	11.5	57.5	193	15	333	100	9.9	8	303	336
4PP452.0571-45	302	187	90	286	8	50	31	8	171	70	11.9	6	289	174
4PP452.0571-75	302	187	90	286	8	50	31	8	171	70	11.9	6	289	174
4PP452.0571-B5	302	187	90	286	8	50	31	8	171	92	11.9	6	289	174
4PP452.1043-75	423	288	203	399	11.5	57.5	123.5	14.5	263.5	78	9.9	8	402	266.5
4PP480.1043-75	323	260	104	300	11.5	57.5	100	10	240	78	9.9	8	303	243
4PP480.1505-75	435	330	216	412	11.6	58.5	169	10.5	309	79	9.9	8	414.8	312
4PP480.1505-B5	435	330	216	412	11.6	58.5	169	10.5	309	79	9.9	8	414.8	312
4PP481.1043-75	323	358	104	300	11.5	57.5	193	15	333	78	9.9	8	303	336
4PP481.1043-B5	323	358	104	300	11.5	57.5	193	15	333	100	9.9	8	303	336
4PP481.1505-75	435	430	216	412	11.6	58.5	269.5	10	409.5	79	9.9	8	414.8	412
4PP482.1043-75	423	288	203	399	11.5	57.5	123.5	14.5	263.5	78	9.9	8	402	266.5
5PP320.1043-39	323	260	104	300	11.5	57.5	100	10	240	57.5	9.9	8	303	243
5PP320.1214-39	362	284	146	342	10	57.5	123.9	10	264	57.5	9.9	8	345	267
5PP320.1505-39	435	330	216	412	11.6	55.5	169	10.5	309	63.5	9.9	8	414.8	312

All dimensions in mm

Dimensions



Power Panel dimensions

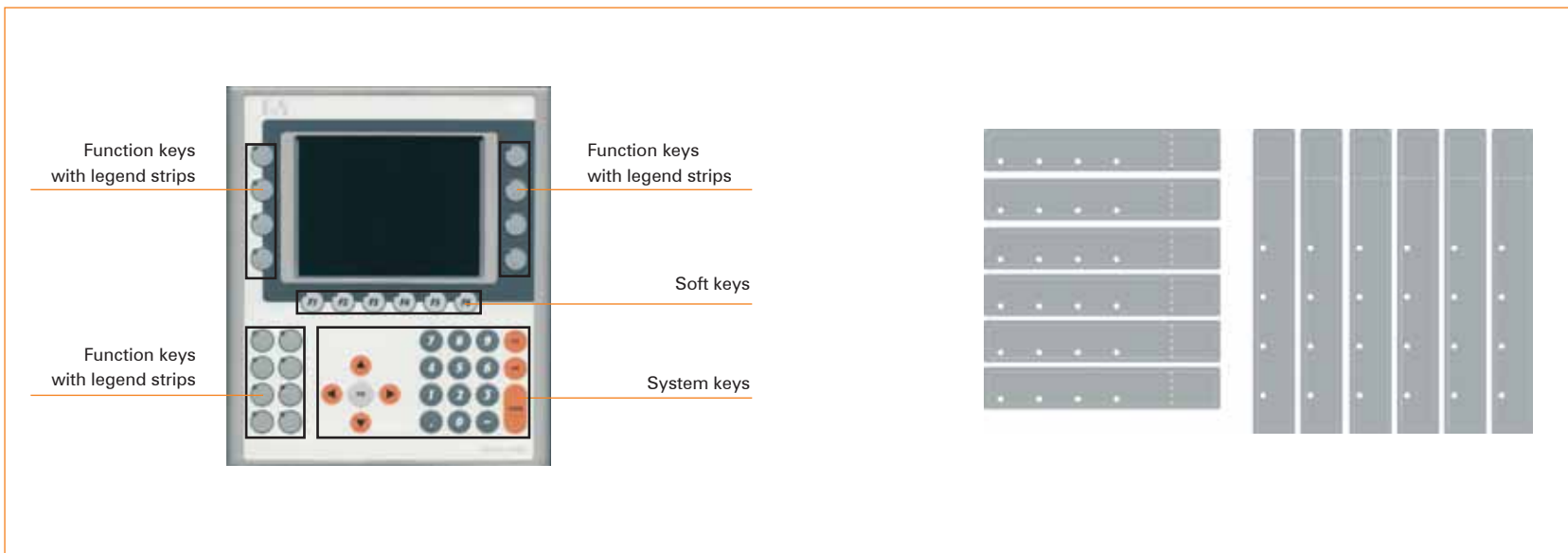
Model number	aPCI slots	L
4PP351.0571-01	0	49.5
4PP351.0571-35	0	49.5
4PP451.0571-45	1	70
4PP451.0571-75	1	70
4PP451.0571-85	1	92
4PP451.0571-B5	1	92

All dimensions in mm

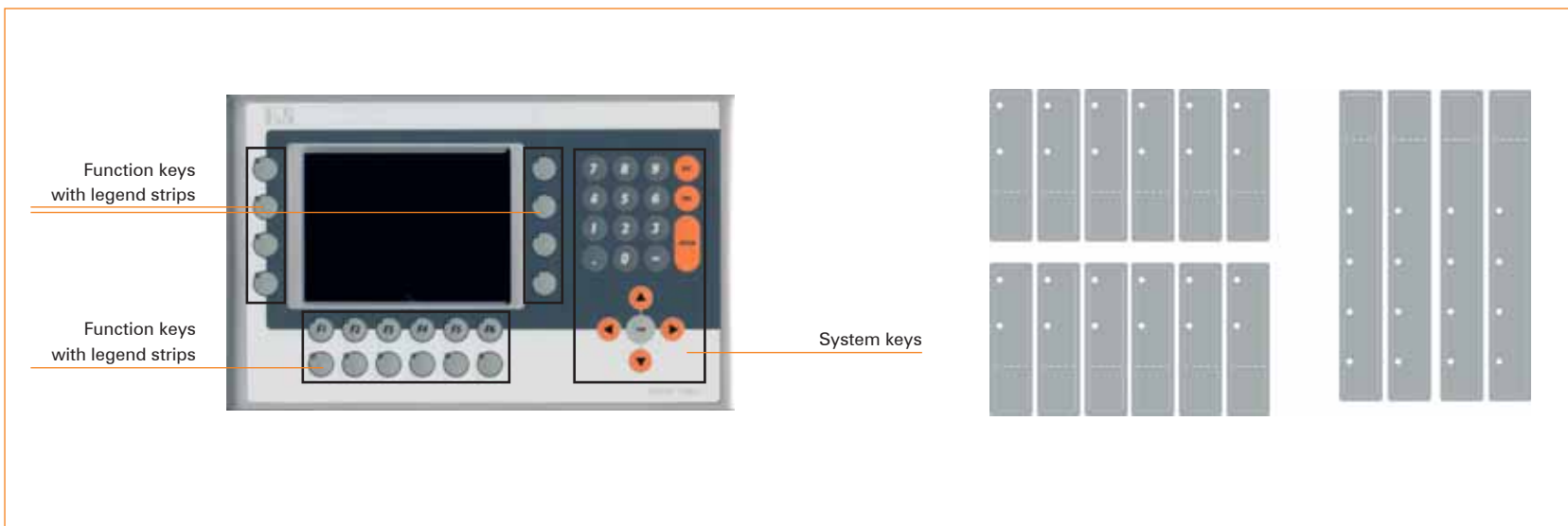


Legend strips

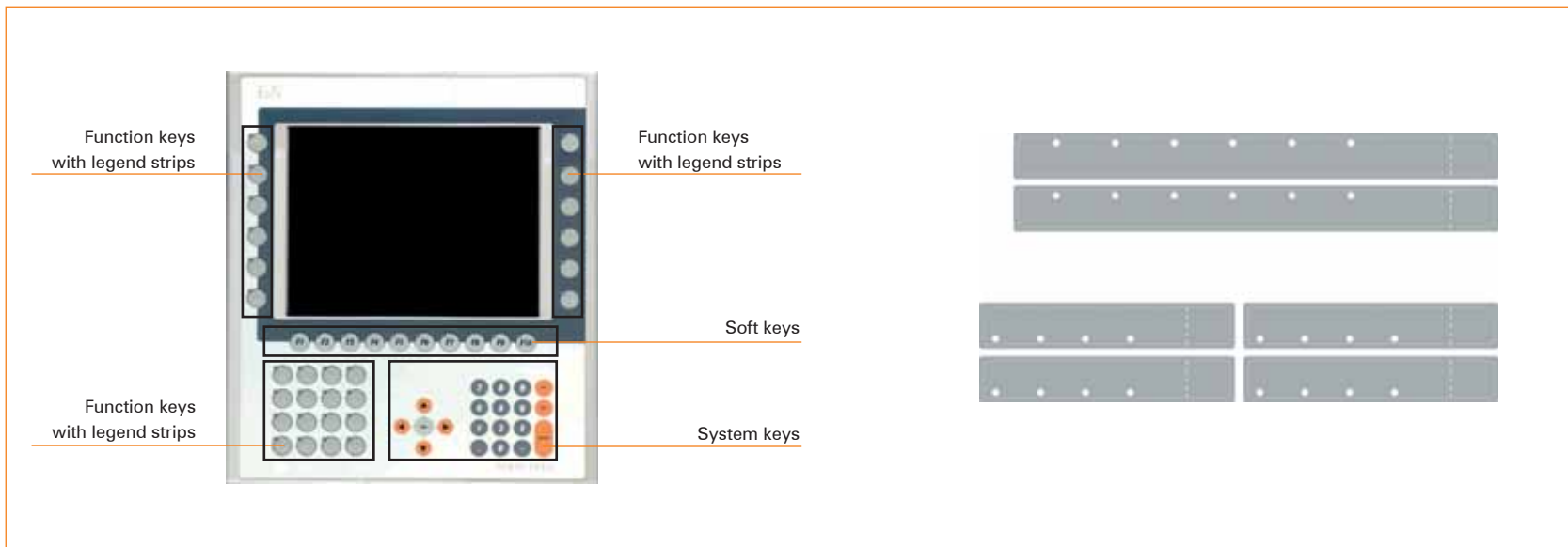
Model number	Short description
5AC900.057X-00	5.7" legend strip template for Power Panel 4PP351.0571-01, 4PP351.0571-35, 4PP451.0571-45, 4PP451.0571-85, 4PP451.0571-75, 4PP451.0571-B5. For 3 devices.



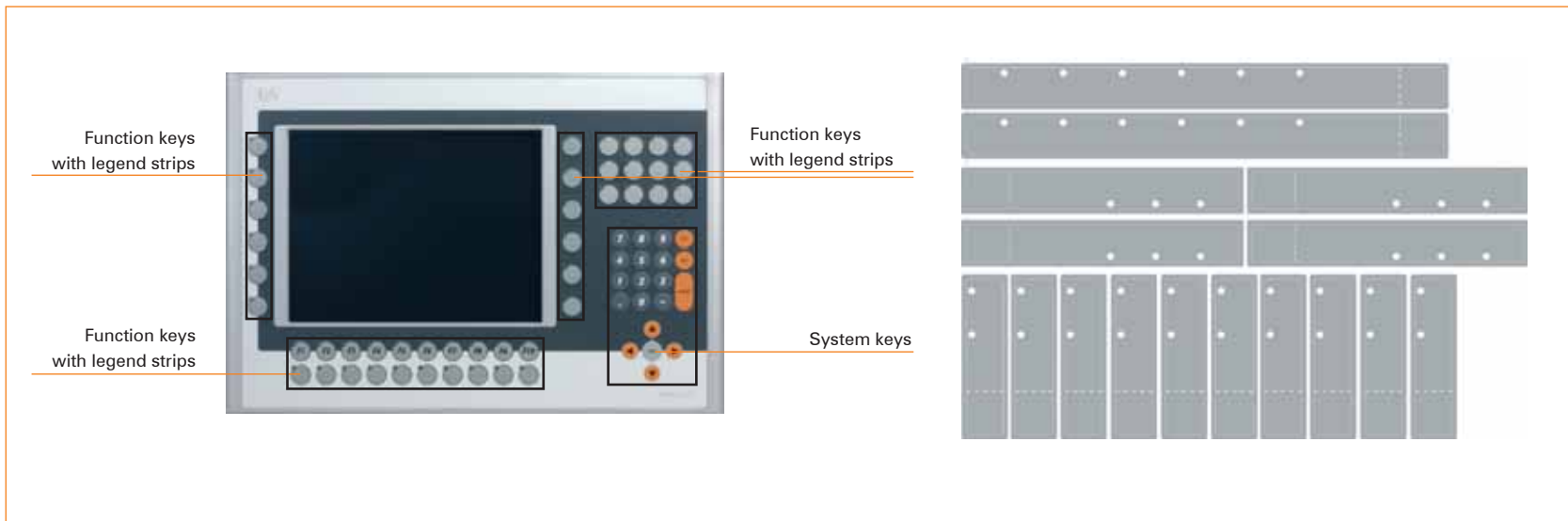
Model number	Short description
5AC900.057X-01	5.7" legend strip template for Power Panel 4PP352.0571-35, 4PP452.0571-45, 4PP452.0571-75, 4PP452.0571-B5. For 3 devices.



Model number	Short description
5AC900.104X-00	10.4" legend strip template for Power Panel 4PP381.1043-31, 4PP451.1043-75, 4PP451.1043-B5, 4PP481.1043-75, 4PP481.1043-B5. For Panel PC 5PC781.1043-00. For 1 device.

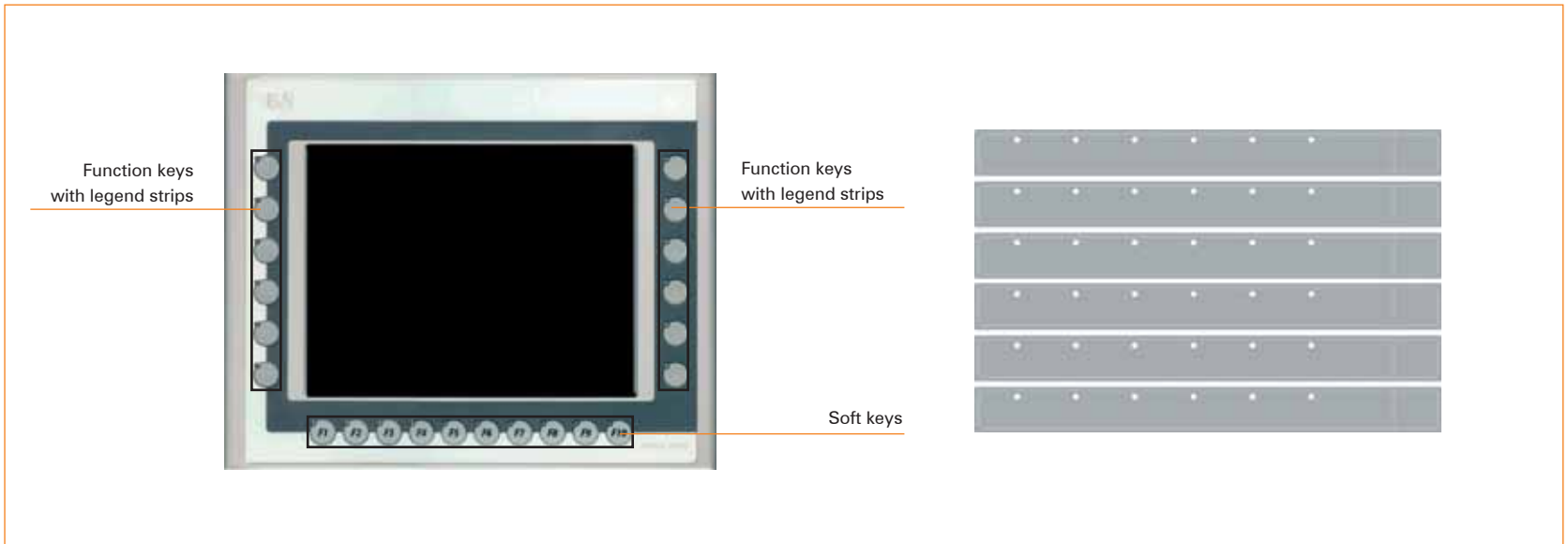


Model number	Short description
5AC900.104X-01	10.4" legend strip template for Power Panel 4PP452.1043-75, 4PP482.1043-B5, 4PP482.1043-75. For Panel PC 5PC782.1043-00. For 1 device.

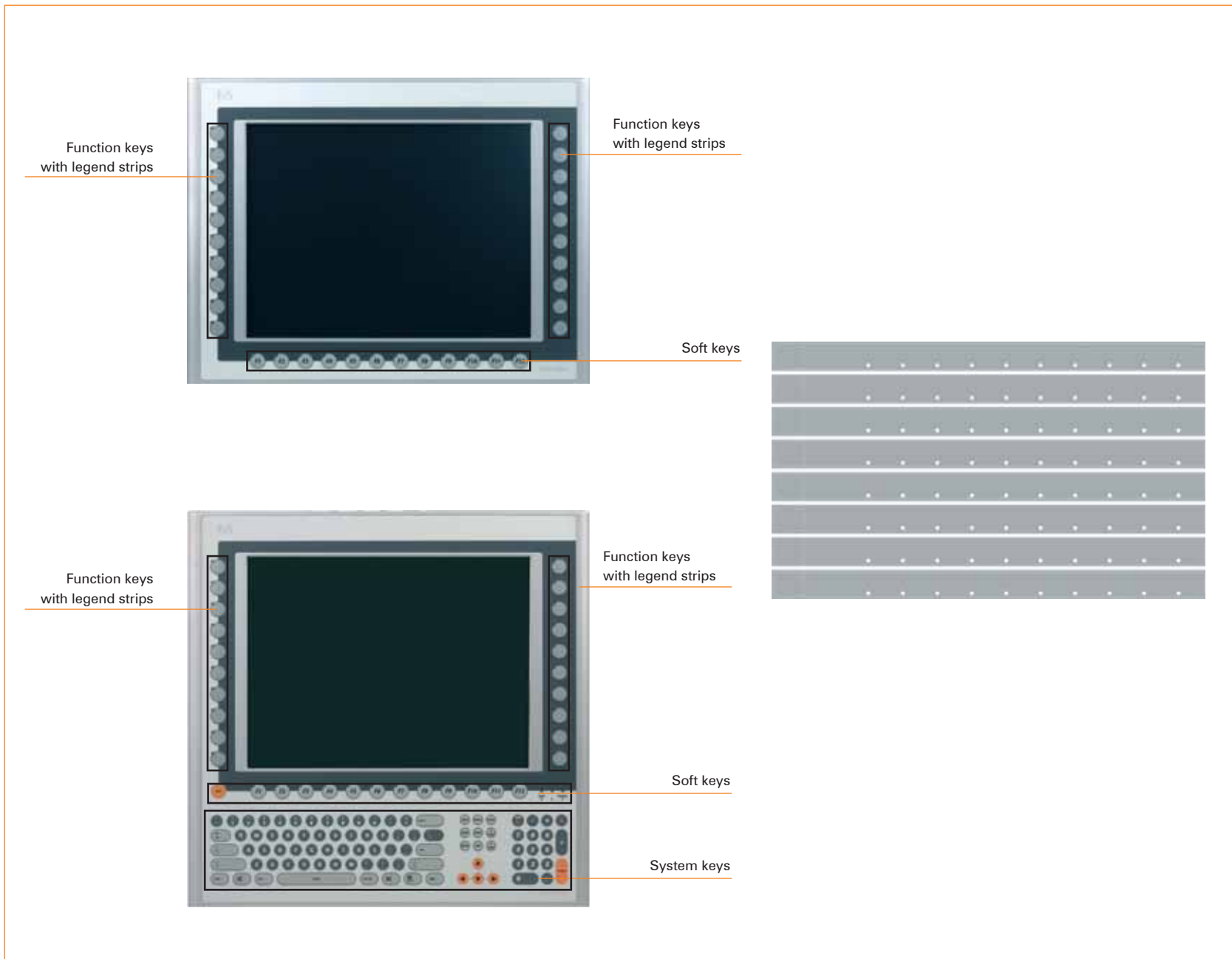


Legend strips

Model number	Short description
5AC900.104X-02	10.4" legend strip template for Power Panel 4PP480.1043-75. For 3 devices.



Model number	Short description
5AC900.150X-00	15" legend strip template for Power Panel 4PP480.1505-75, 4PP480.1505-B5, 4PP481.1505-75. For 4 devices.





Mobile Panel

More than just mobile operation and monitoring

Mobile operator panels are used everywhere where machine operation and monitoring require the maximum amount of flexibility. B&R has created a leading-edge product line which integrates control as well as operation and monitoring.



Table of contents

System characteristics	876
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Product data sheets	886
Dimensions	908

System characteristics



Robust design for use in rough industrial environments

A hand-held unit like the Mobile Panel has to meet higher demands than a mounted device. For this reason, the Mobile Panel has a particularly robust design. The double-walled housing absorbs hard impacts. Control elements such as key switches and E-stop are flush-mounted. The rounded housing form dampens external impacts.

In addition, the electronics are positioned to absorb external shocks and jolts as effectively as possible. The housing, cables, and connectors are all protected against dust and sprayed water.

Operating and monitoring

On the Mobile Panel, the limited space available for display and keys is used optimally. B&R decided on a combination of function keys, numeric keys and touch screen. Frequently used functions can be assigned to pre-programmed keys, and functions that depend on the state of the machine are assigned to touch buttons. A digital pen for touch operation can be found on the back of the device.



Wide variety with MP40/50

Ergonomic, light and extremely impact-resistant. These qualities of the six new handheld operating devices in the MP40 and MP50 lines enable safe and simple on-site operation and monitoring with a maximum range of functions.

The main differences within the various series include display size and the types of operating elements. Depending on the application, operating elements might include a joystick, handwheel, override potentiometer, key switch, or illuminated button. The MP40 and MP50 Mobile Panel devices are available with a 3.8" QVGA LCD monochromedisplay and a 6.5" VGA TFT color display.

For safety, an E-stop button is integrated via an additional connection box, which enables connecting and disconnecting during operation without loss of the safety function. Two integrated three-step enable switches, ergonomically optimal for left or right-handed operators, provide the highest degree of safety even during setup.



Performance principle

The processors are based on an Intel PXA 270 CPU with 128 MB flash memory and 256 MB DRAM. The Windows CE operating system offers a flexible foundation for a wide range of applications types, such as mobile thin clients, direct connections to the controller and open SCADA systems. The double-walled panels with IP65 protection have integrated interfaces such as USB and Ethernet 10/100.

The new series fits seamlessly into the B&R system environment. The panels are configured easily using Visual Components. The X20 CPU provides a compact and scalable control platform that unites all functions.



A firm grasp on operation with MP100/200

For a Mobile Panel, operating comfort is mainly defined through ergonomics. Many well thought out details guarantee that the Mobile Panel is easy to handle. Having the cable connected in the middle keeps the Mobile Panel balanced and prevents one side from being dragged down. The handle can also be adjusted without tools, allowing the Mobile Panel to be used optimally by both right- and left-handed operators.

The Mobile Panel surface is also important for operating comfort. The device has a soft-touch coating, which results in optimal haptic qualities. The soft-touch coating is also extremely resistant to impacts, acids, alcohol and cleaning agents. The handle was designed so that the Mobile Panel can stand steadily on a table and be operated securely.

Communication

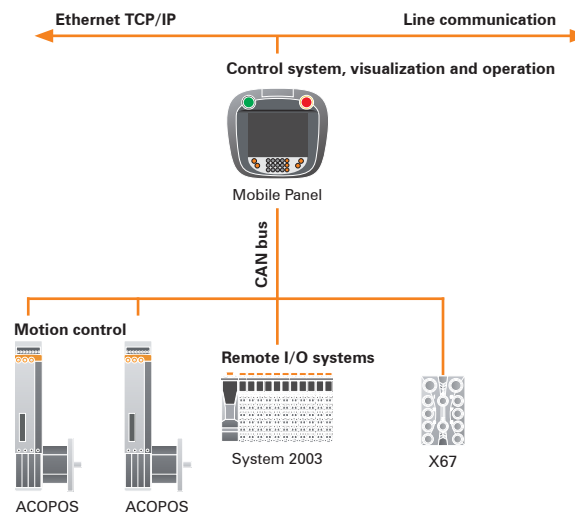
The Mobile Panel can be seamlessly integrated in the automation solution. An Ethernet connection is available for this purpose. For devices with an integrated controller, networking takes place via CAN bus. Thought was also given to loading programs. A separate serial connection is available so that program changes can be downloaded without opening the housing. All communication channels are transferred to the switching cabinet using a hybrid cable.

All software is stored on a CompactFlash card which is found behind a cover on the back of the Mobile Panel. In addition to the CompactFlash slot, a USB interface can be used to transfer data using a USB flash drive.

Typical topologies

Mobile control and visualization

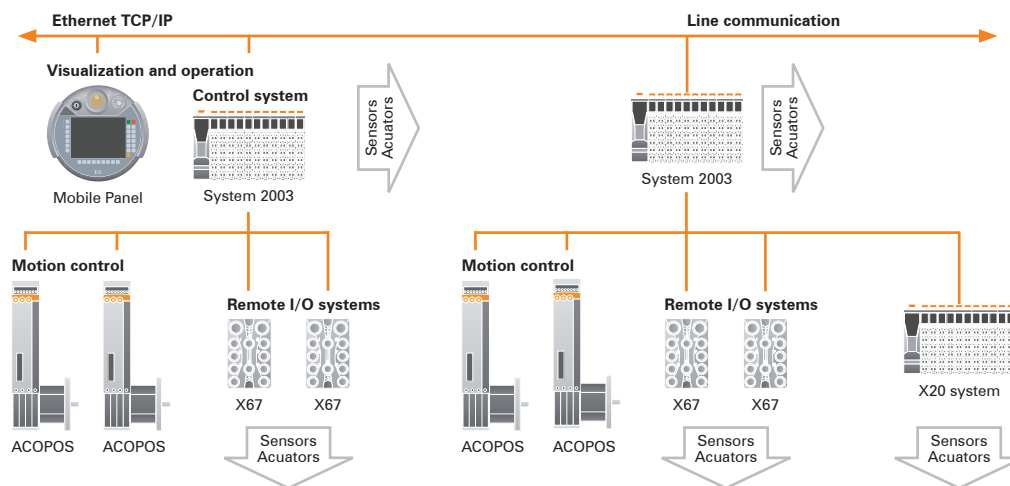
The control program and the visualization run on the Mobile Panel 200. I/O peripherals and drives are connected via CAN bus. Communication with higher-level systems is handled by Ethernet.



Control system	Mobile Panel: More than just mobile operation and monitoring	873
Motion control	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419

Mobile operation and monitoring

The control programs are distributed over several PLC stations. Fieldbus systems are used to connect I/O systems and drives to the PLCs. Machine operation and visualization take place on a central MobilePanel, which uses Ethernet to communicate with the controllers.

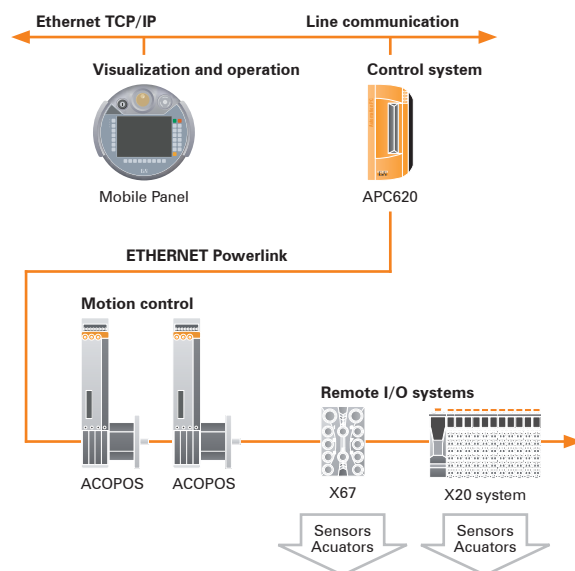


Control system	X20 System: Slice-based I/O and control system	37
Visualization and operation	Mobile Panel: More than just operation and monitoring	873
Motion control	ACOPOS: Intelligent servo drives	1251
	ACOPOSMulti: Modular drive system	1321
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419

Typical topologies

The mobile thin client

The Mobile Panel with the Windows CE operating system is connected as a thin client to an APC620 or APC810 with Windows XP Professional/Embedded. The control program runs on the industrial PC, and I/O peripherals and drives are connected to the industrial PC via a fieldbus.



Visualization and operation	Mobile Panel: More than just operation and monitoring	873
Motion control	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419
Industrial PC	Automation PC APC620: The modular, fan-free industrial PC	911
	Automation PC APC810: Highest-level performance with Intel® Core™ 2 Duo processors	945
	Panel PC: Operation and PC integrated	985



Product overview

MP100/200 device configuration

	Model number	Name	Number / Combinations	
Operating unit	4MP181.0843-03	Mobile Panel MP181; 8.4" VGA color	Select 1	886
	4MP251.0571-12	Mobile Panel MP251; 5.7" QVGA color		887
	4MP281.0571-12	Mobile Panel MP281; 5.7" QVGA color		887
	4MP281.0843-13	Mobile Panel MP281; 8.4" VGA color		888
	5MP181.0843-07	Mobile Panel MP181 BIOS; 8.4" VGA color		889
Handle	4MPHDL.0000-00	Mobile Panel handle	Select 1	884
Cables	5CAMPH.0018-10	MP100/200 attachment cable PP 1.8 m	Select 1	904
	5CAMPH.0050-10	MP100/200 attachment cable PP 5 m		904
	5CAMPH.0100-10	MP100/200 attachment cable PP 10 m		904
	5CAMPH.0150-10	MP100/200 attachment cable PP 15 m		904
	5CAMPH.0200-10	MP100/200 attachment cable PP 20 m		904
Switching cabinet cable	5CAMP.0020-10	MP switching cabinet cable CO PP 2 m (Ethernet crossover)	Select 1	905
	5CAMP.0020-11	MP switching cabinet cable ST PP 2 m (Ethernet straight)		905
Wall mount	4MPBRA.0000-00	Mobile Panel wall mount 100/200	Option	903
Connection box	4MPCBX.0000-00	MP connection box	Option	902
	4MPCBX.0001-00	MP connection box, small	Option	902
Box cable	5CAMPB.0100-10	MP box cable PP 10 m (Ethernet crossover)	Option	906

MP40/50 device configuration

	Model number	Name	Number / Combinations	
Operating unit	5MP040.0381-01	MP40 LCD M QVGA 3.8" F SB	Select 1	890
	5MP040.0381-02	MP40 LCD M QVGA 3.8" F SB KS HW		892
	5MP050.0653-01	MP50 TFT C VGA 6.5" FT SB PB HW		894
	5MP050.0653-02	MP50 TFT C VGA 6.5" FT SB KS JS		896
	5MP050.0653-03	MP50 TFT C VGA 6.5" FT SB OP HW		898
	5MP050.0653-04	MP50 TFT C VGA 6.5" FT SB KS HW		900
Cables	5CAMPH.0018-30	MP40/50 attachment cable PP 1.8 m	Select 1	904
	5CAMPH.0050-30	MP40/50 attachment cable PP 5 m		904
	5CAMPH.0100-30	MP40/50 attachment cable PP 10 m		904
	5CAMPH.0150-30	MP40/50 attachment cable PP 15 m		904
	5CAMPH.0200-30	MP40/50 attachment cable PP 20 m		904
Switching cabinet cable	5CAMP.0020-10	MP switching cabinet cable CO PP 2 m (Ethernet crossover)	Select 1	905
	5CAMP.0020-11	MP switching cabinet cable ST PP 2 m (Ethernet straight)		905
Wall mount	4MPBRA.0000-01	Mobile Panel wall mount 40/50	Option	903
Connection box	4MPCBX.0000-00	MP connection box	Option	902
	4MPCBX.0001-00	MP connection box, small	Option	902
Box cable	5CAMPB.0100-10	MP box cable PP 10 m (Ethernet crossover)	Option	906

Operating units



Model number	Short description	
4MP181.0843-03	Mobile Panel MP181 embedded operating unit 8.4" VGA color TFT display with touch screen (resistive); 19 system keys; key switch and E-stop. 64 MB SDRAM; Compact Flash slot (type I); ETH 10/100; USB 1.1; 24 VDC.	886
4MP251.0571-12	Mobile Panel MP251 embedded operating unit 5.7" QVGA color LCD; 14 soft keys and 19 system keys; key switch and E-stop. 64 MB SDRAM; 256 kB SRAM; CompactFlash slot (type I); ETH 10/100; CAN; USB 1.1; battery; 24 VDC.	887
4MP281.0571-12	Mobile Panel MP281 embedded operating unit 5.7" QVGA color LCD with touch screen (resistive); 14 soft keys and 19 system keys; key switch and E-stop. 64 MB SDRAM; 256 kB SRAM; CompactFlash slot (type I); ETH 10/100; CAN; USB 1.1; battery; 24 VDC.	887
4MP281.0843-13	Mobile Panel MP281 embedded operating unit 8.4" VGA color TFT display with touch screen (resistive); 19 system keys; key switch and E-stop. 64 MB SDRAM; 256 kB SRAM; CompactFlash slot (type I); ETH 10/100; CAN; USB 1.1; battery; 24 VDC.	888
5MP181.0843-07	Mobile Panel MP181 BIOS operating unit 8.4" VGA color TFT display with touch screen (resistive); 19 system keys; key switch and E-stop. 128 MB SDRAM; Compact Flash slot (type I); ETH 10/100; USB 1.1; battery; 24 VDC.	889
5MP040.0381-01	Mobile Panel MP40, 3.8" QVGA LCD monochrome display, Intel PXA 270 processor, 256 MB DRAM, 128 MB flash; ETH 10/100, USB 1.1; 51 system keys, stop button, 2 integrated 3-step enable switches, handle.	890
5MP040.0381-02	Mobile Panel MP40, 3.8" QVGA LCD monochrome display, Intel PXA 270 processor, 256 MB DRAM, 128 MB flash; ETH 10/100, USB 1.1; 51 system keys, stop button, handwheel, key switch; 2 integrated 3-step enable switches, handle.	892
5MP050.0653-01	Mobile Panel MP50, 6.5" VGA TFT color display with touch screen (analog resistive), Intel PXA 270 processor, 256 MB DRAM, 128 MB flash; ETH 10/100, USB 1.1; 31 system keys, stop button, handwheel, push button; 2 integrated 3-step enable switches, handle.	894
5MP050.0653-02	Mobile Panel MP50, 6.5" VGA TFT color display with touch screen (analog resistive), Intel PXA 270 processor, 256 MB DRAM, 128 MB flash; ETH 10/100, USB 1.1; 31 system keys, stop button, joystick, key switch; 2 integrated 3-step enable switches, handle.	896
5MP050.0653-03	Mobile Panel MP50, 6.5" VGA TFT color display with touch screen (analog resistive), Intel PXA 270 processor, 256 MB DRAM, 128 MB flash; ETH 10/100, USB 1.1; 31 system keys, stop button, handwheel, override potentiometer; 2 integrated 3-step enable switches, handle.	898
5MP050.0653-04	Mobile Panel MP50, 6.5" VGA TFT color display with touch screen (analog resistive), Intel PXA 270 processor, 256 MB DRAM, 128 MB flash; ETH 10/100, USB 1.1; 31 system keys, stop button, handwheel, key switch; 2 integrated 3-step enable switches, handle.	900

Product overview

Handle



Model number	Short description	
4MPHDL.0000-00	Mobile Panel 100/200 handle With integrated 3-step enable switch	903

Cables



Model number	Short description	
5CAMPH.0018-10	MP100/200 attachment cable PP 1.8 m	904
5CAMPH.0050-10	MP100/200 attachment cable PP 5 m	904
5CAMPH.0100-10	MP100/200 attachment cable PP 10 m	904
5CAMPH.0150-10	MP100/200 attachment cable PP 15 m	904
5CAMPH.0200-10	MP100/200 attachment cable PP 20 m	904
5CAMP.0020-10	MP switching cabinet cable CO PP 2 m (Ethernet crossover)	905
5CAMP.0020-11	MP switching cabinet cable ST PP 2 m (Ethernet straight)	905
5CAMPH.0018-30	MP40/50 attachment cable PP 1.8 m	904
5CAMPH.0050-30	MP40/50 attachment cable PP 5 m	904
5CAMPH.0100-30	MP40/50 attachment cable PP 10 m	904
5CAMPH.0150-30	MP40/50 attachment cable PP 15 m	904
5CAMPH.0200-30	MP40/50 attachment cable PP 20 m	904

Wall mount



Model number	Short description	
4MPBRA.0000-00	Mobile Panel wall mount MP100/200	903
4MPBRA.0000-01	Mobile Panel wall mount MP40/50	903

Connection box



Model number	Short description	
4MPCBX.0000-00	Mobile Panel connection box	902
4MPCBX.0001-00	Mobile Panel connection box, small	902

Box cable



Model number	Short description	
5CAMPB.0100-10	Mobile Panel box cable PP 10 m (Ethernet crossover)	906

Mobile Panel

MP181 embedded 8.4" TFT color Touch



Controller	4MP181.0843-03
Processor	Geode SC2200 266 MHz, MMX compatible
Main memory	64 MB DRAM
Graphics memory	4 MB shared memory (reserved from the main memory)
SRAM	-
CompactFlash slot	1 slot for Type I CompactFlash cards (behind the cover)
Battery	-
Mode/Node switches ¹⁾	2, 16 positions each (back side)
1) Accessible by removing the handle	
Display	4MP181.0843-03
Type	TFT color
Colors	256
Resolution	VGA, 640 x 480 pixels
Diagonal	8.4"
Brightness	120 cd/m ²
Half-brightness time	50,000 h
Touch screen	Analog resistive
Keys	4MP181.0843-03
System keys	Number block 4 system keys
E-stop ¹⁾	Yes (2 N.C., right position)
Key switch ¹⁾	Yes (1 normally open, momentary, left position)
1) Connection via Mobile Panel cable	
Interfaces	4MP181.0843-03
Serial	RS232 (Rx/D and Tx/D, not modem-capable)
USB	1x USB 1.1, connection type A (behind the cover)
Ethernet ¹⁾	RJ45 twisted pair (10 BaseT / 100 BaseT)
1) Connection via Mobile Panel cable	
24 VDC supply	4MP181.0843-03
Input voltage ¹⁾	24 VDC ±25%, electrically isolated
1) Connection via Mobile Panel cable	
Environmental conditions	4MP181.0843-03
Temperature	
Operation	0°C to +45°C
Storage	-20°C to +60°C
Relative humidity	
Operation	45 - 85%, non-condensing
Storage	8 - 85%, non-condensing
Mechanics	4MP181.0843-03
Protection type	IP54 (with cable and handle)
Outer dimensions (W x H x D [mm])	
Without handle	306.6 x 76 x 270.6
With handle	306.6 x 175.2 x 270.6
Weight	Approx. 1.9 kg
Drop height	1 m to industrial floor

Required accessories		
5CAMPH.0018-10	MP100/200 attachment cable PP 1.8 m	904
5CAMPH.0050-10	MP100/200 attachment cable PP 5 m	904
5CAMPH.0100-10	MP100/200 attachment cable PP 10 m	904
5CAMPH.0150-10	MP100/200 attachment cable PP 15 m	904
5CAMPH.0200-10	MP100/200 attachment cable PP 20 m	904
5CAMPC.0020-10	MP switching cabinet cable CO PP 2 m (Ethernet crossover)	905
5CAMPC.0020-11	MP switching cabinet cable ST PP 2 m (Ethernet straight)	905
	CompactFlash cards	1126

Mobile Panel MP251/281 embedded 5.7" LCD color (touch screen)



Controller	4MP251.0571-12	4MP281.0571-12
Processor	Geode SC2200 266 MHz, MMX compatible	Geode SC2200 266 MHz, MMX compatible
Main memory	64 MB DRAM	64 MB DRAM
Graphics memory	4 MB shared memory (reserved from the main memory)	4 MB shared memory (reserved from the main memory)
SRAM	256 KB onboard, battery-buffered	256 KB onboard, battery-buffered
CompactFlash slot	1 slot for Type I CompactFlash cards (behind the cover)	1 slot for Type I CompactFlash cards (behind the cover)
Battery	Lithium, 950 mAh	Lithium, 950 mAh
Mode/Node switches ¹⁾	2, 16 positions each (back side)	2, 16 positions each (back side)
1) Accessible by removing the handle		
Display	4MP251.0571-12	4MP281.0571-12
Type	LCD color	LCD color
Colors	256	256
Resolution	QVGA, 320 x 240 pixels	QVGA, 320 x 240 pixels
Diagonal	5.7"	5.7"
Brightness	150 cd/m ²	150 cd/m ²
Half-brightness time	50,000 h	50,000 h
Touch screen	-	Analog resistive
Keys	4MP251.0571-12	4MP281.0571-12
Soft keys	14 (6 with LED)	14 (6 with LED)
System keys	Number block 4 system keys	Number block 4 system keys
E-stop	Yes (2 N.C., right position)	Yes (2 N.C., right position)
Key switch ¹⁾	Yes (1 normally open, momentary, left position)	Yes (1 normally open, momentary, left position)
1) Connection via Mobile Panel cable		
Interfaces	4MP251.0571-12	4MP281.0571-12
Serial	RS232 (RxD and TxD, not modem-capable)	RS232 (RxD and TxD, not modem-capable)
USB	1x USB 1.1, connection type A (behind the cover)	1x USB 1.1, connection type A (behind the cover)
Ethernet ¹⁾	RJ45 twisted pair (10 BaseT / 100 BaseT)	RJ45 twisted pair (10 BaseT / 100 BaseT)
CAN ¹⁾	Yes, electrically isolated	Yes, electrically isolated
1) Connection via Mobile Panel cable		
24 VDC supply	4MP251.0571-12	4MP281.0571-12
Input voltage ¹⁾	24 VDC ±25%, electrically isolated	24 VDC ±25%, electrically isolated
1) Connection via Mobile Panel cable		
Environmental conditions	4MP251.0571-12	4MP281.0571-12
Operational temperature	0°C to +45°C	0°C to +45°C
Storage temperature	-20°C to +60°C	-20°C to +60°C
Relative humidity - operation	45 - 85%, non-condensing	45 - 85%, non-condensing
Relative humidity - storage	8 - 85%, non-condensing	8 - 85%, non-condensing
Mechanics	4MP251.0571-12	4MP281.0571-12
Protection type	IP54 (with cable and handle)	IP54 (with cable and handle)
Outer dimensions (W x H x D [mm])		
Without handle	306.6 x 76 x 270.6	306.6 x 76 x 270.6
With handle	306.6 x 175.2 x 270.6	306.6 x 175.2 x 270.6
Weight	Approx. 1.65 kg	Approx. 1.65 kg
Drop height	1 m to industrial floor	1 m to industrial floor
Required accessories		
5CAMPH.0018-10	MP100/200 attachment cable PP 1.8 m	904
5CAMPH.0050-10	MP100/200 attachment cable PP 5 m	904
5CAMPH.0100-10	MP100/200 attachment cable PP 10 m	904
5CAMPH.0150-10	MP100/200 attachment cable PP 15 m	904
5CAMPH.0200-10	MP100/200 attachment cable PP 20 m	904
5CAMPC.0020-10	MP switching cabinet cable CO PP 2 m (Ethernet crossover)	905
5CAMPC.0020-11	MP switching cabinet cable ST PP 2 m (Ethernet straight)	905
	CompactFlash cards	1126

Mobile Panel

MP281 embedded 8.4" TFT color Touch



Controller	4MP281.0843-13	
Processor	Geode SC2200 266 MHz, MMX compatible	
Main memory	64 MB DRAM	
Graphics memory	4 MB shared memory (reserved from the main memory)	
SRAM	256 KB onboard, battery-buffered	
CompactFlash slot	1 slot for Type I CompactFlash cards (behind the cover)	
Battery ¹⁾	Lithium, 950 mAh	
Mode/Node switch ¹⁾	2, 16 positions each (back side)	
1) Accessible by removing the handle		
Display	4MP281.0843-13	
Type	TFT color	
Colors	256	
Resolution	VGA, 640 x 480 pixels	
Diagonal	8.4"	
Brightness	120 cd/m ²	
Half-brightness time	50,000 h	
Touch screen	Analog resistive	
Keys	4MP281.0843-13	
System keys	Number block 4 system keys	
E-stop ¹⁾	Yes (2 N.C., right position)	
Key switch ¹⁾	Yes (1 normally open, momentary, left position)	
1) Connection via Mobile Panel cable		
Interfaces	4MP281.0843-13	
Serial	RS232 (Rx/D and Tx/D, not modem-capable)	
USB	1x USB 1.1, connection type A (behind the cover)	
Ethernet ¹⁾	RJ45 twisted pair (10 BaseT / 100 BaseT)	
CAN bus ¹⁾	Electrically isolated	
1) Connection via Mobile Panel cable		
24 VDC supply	4MP281.0843-13	
Input voltage ¹⁾	24 VDC ±25%, electrically isolated	
1) Connection via Mobile Panel cable		
Environmental conditions	4MP281.0843-13	
Temperature		
Operation	0°C to +45°C	
Storage	-20°C to +60°C	
Relative humidity		
Operation	45 - 85%, non-condensing	
Storage	8 - 85%, non-condensing	
Mechanics	4MP281.0843-13	
Protection type	IP54 (with cable and handle)	
Outer dimensions (W x H x D (mm))		
Without handle	306.6 x 76 x 270.6	
With handle	306.6 x 175.2 x 270.6	
Weight	Approx. 1.9 kg	
Drop height	1 m to industrial floor	
Required accessories		
5CAMPH.0018-10	MP100/200 attachment cable PP 1.8 m	904
5CAMPH.0050-10	MP100/200 attachment cable PP 5 m	904
5CAMPH.0100-10	MP100/200 attachment cable PP 10 m	904
5CAMPH.0150-10	MP100/200 attachment cable PP 15 m	904
5CAMPH.0200-10	MP100/200 attachment cable PP 20 m	904
5CAMPC.0020-10	MP switching cabinet cable CO PP 2 m (Ethernet crossover)	905
5CAMPC.0020-11	MP switching cabinet cable ST PP 2 m (Ethernet straight)	905
	CompactFlash cards	1126

Mobile Panel

MP181 BIOS 8.4" TFT color touch



Controller		5MP181.0843-07
Processor	Geode SC2200 266 MHz, MMX compatible	
Main memory	128MB DRAM	
Graphics memory	4 MB shared memory (reserved from the main memory)	
SRAM		
CompactFlash slot	1 slot for Type I CompactFlash cards (behind the cover)	
Battery ¹⁾	Lithium, 950 mAh	
Mode/Node switch ¹⁾	2, 16 positions each (back side)	
1) Accessible by removing the handle		
Display		5MP181.0843-07
Type	TFT color	
Colors	262.144 ¹⁾	
Resolution	VGA, 640 x 480 pixels	
Diagonal	8.4"	
Brightness	120 cd/m ²	
Half-brightness time	50,000 h	
Touch screen	Analog resistive	
1) The actual number of colors depends on the graphics memory, the graphics mode configured, and the graphics driver being used.		
Keys		5MP181.0843-07
System keys	Number block 4 system keys	
E-stop ¹⁾	Yes (2 N.C., right position)	
Key switch ¹⁾	Yes (1 normally open, momentary, left position)	
1) Connection via Mobile Panel cable		
Interfaces		5MP181.0843-07
Serial	RS232 (Rx/D and Tx/D, not modem-capable)	
USB	1x USB 1.1, connection type A (behind the cover)	
Ethernet ¹⁾	RJ45 twisted pair (10 BaseT / 100 BaseT)	
1) Connection via Mobile Panel cable		
24 VDC supply		5MP181.0843-07
Input voltage ¹⁾	24 VDC ±25%, electrically isolated	
1) Connection via Mobile Panel cable		
Environmental conditions		5MP181.0843-07
Temperature		
Operation	0°C to +45°C	
Storage	-20°C to +60°C	
Relative humidity		
Operation	45 - 85%, non-condensing	
Storage	8 - 85%, non-condensing	
Mechanics		5MP181.0843-07
Protection type	IP54 (with cable and handle)	
Outer dimensions (W x H x D [mm])		
With handle	306.6 x 175.2 x 270.6	
Weight	Approx. 1.9 kg	
Drop height	1 m to industrial floor	

Required accessories		
5CAMPH.0018-10	MP100/200 attachment cable PP 1.8 m	904
5CAMPH.0050-10	MP100/200 attachment cable PP 5 m	904
5CAMPH.0100-10	MP100/200 attachment cable PP 10 m	904
5CAMPH.0150-10	MP100/200 attachment cable PP 15 m	904
5CAMPH.0200-10	MP100/200 attachment cable PP 20 m	904
5CAMPC.0020-10	MP switching cabinet cable CO PP 2 m (Ethernet crossover)	905
5CAMPC.0020-11	MP switching cabinet cable ST PP 2 m (Ethernet straight)	905
	CompactFlash cards	1126

Mobile Panel MP40 BIOS 3.8" LCD monochrome



Controller	5MP040.0381-01
Processor	Intel PXA 270/416 MHz
Main memory	256 MB
Graphics memory	Reserved in main memory
SRAM	-
CompactFlash slot	-
Battery	-
Mode/node switches	-
Display	5MP040.0381-01
Type	LCD monochrome
Colors	16 shades of gray ¹⁾
Resolution	QVGA 320 x 240 pixels
Diagonal	3.8"
Brightness	110 cd/m ²
Half-brightness time	50,000 h
1) The actual number of colors depends on the graphics memory, the graphics mode configured, and the graphics driver being used.	
Operation	5MP040.0381-01
Touch screen	-
Keys	
Soft keys	6
System keys	51
LEDs	7
Stop button	Yes (2 N.C., right position)
Enable switch	Yes (two 3-step switches), left and right position
Mounted in the middle	
Electronic handwheel	-
3 axes joystick	-
Mounted on the left	
Illuminated button	-
Key switch	-
Override potentiometer	-
Interfaces	5MP040.0381-01
USB	1x USB 1.1, connection type A (behind the cover)
Ethernet ¹⁾	RJ45 twisted pair (10 BaseT / 100 BaseT)
1) Connection via Mobile Panel cable	
24 VDC supply	5MP040.0381-01
Input voltage ¹⁾	24 VDC ± 25%
1) Connection via Mobile Panel cable	

Environmental conditions		5MP040.0381-01
Temperature		
Operation		0°C to +50°C
Storage		-20°C to +70°C
Relative humidity		5% - 95% (non-condensing)
Mechanics		5MP040.0381-01
Protection type		IP65
Outer dimensions (W x H x D [mm])		
With handle		250 x 250 x 114
Weight		Approx. 1.1 kg
Drop height		1.5 m to industrial floor

Required accessories		
5CAMPH.0018-30	MP40/50 attachment cable PP 1.8 m	904
5CAMPH.0050-30	MP40/50 attachment cable PP 5 m	904
5CAMPH.0100-30	MP40/50 attachment cable PP 10 m	904
5CAMPH.0150-30	MP40/50 attachment cable PP 15 m	904
5CAMPH.0200-30	MP40/50 attachment cable PP 20 m	904
5CAMPC.0020-10	MP switching cabinet cable CO PP 2 m (Ethernet crossover)	905
5CAMPC.0020-11	MP switching cabinet cable ST PP 2 m (Ethernet straight)	905
5SWWCE.0524-ENG	OEM Microsoft Windows CE 5.0 Pro for MP40 PXA270	1117
5SWWCE.0624-ENG	OEM Microsoft Windows CE 5.0 ProPlus for MP40 PXA270	1117
5SWWCE.0724-ENG	OEM Microsoft Windows CE 5.0 ProTCAR (Terminal Client AR) for MP40 PXA270	1117

Mobile Panel MP40 BIOS 3.8" LCD monochrome



Controller		5MP040.0381-02
Processor		Intel PXA 270/416 MHz
Main memory		256 MB
Graphics memory		Reserved in main memory
SRAM		-
CompactFlash slot		-
Battery		-
Mode/node switches		-
Display		5MP040.0381-02
Type		LCD monochrome
Colors		16 shades of gray ¹⁾
Resolution		QVGA 320 x 240 pixels
Diagonal		3.8"
Brightness		110 cd/m ²
Half-brightness time		50,000 h
1) The actual number of colors depends on the graphics memory, the graphics mode configured, and the graphics driver being used.		
Operation		5MP040.0381-02
Touch screen		-
Keys		
Soft keys		6
System keys		51
LEDs		7
Stop button		Yes (2 N.C., right position)
Enable switch		Yes (two 3-step switches), left and right position
Mounted in the middle		
Electronic handwheel		Yes
3 axes joystick		-
Mounted on the left		
Illuminated button		-
Key switch		Yes
Override potentiometer		-
Interfaces		5MP040.0381-02
USB		1x USB 1.1, connection type A (behind the cover)
Ethernet ¹⁾		RJ45 twisted pair (10 BaseT / 100 BaseT)
1) Connection via Mobile Panel cable		
24 VDC supply		5MP040.0381-02
Input voltage ¹⁾		24 VDC ± 25%
1) Connection via Mobile Panel cable		

Environmental conditions		5MP040.0381-02
Temperature		
Operation		0°C to +50°C
Storage		-20°C to +70°C
Relative humidity		5% - 95% (non-condensing)
Mechanics		5MP040.0381-02
Protection type		IP65
Outer dimensions (W x H x D [mm])		
With handle		250 x 250 x 114
Weight		Approx. 1.1 kg
Drop height		1.5 m to industrial floor

Required accessories		
5CAMPH.0018-30	MP40/50 attachment cable PP 1.8 m	904
5CAMPH.0050-30	MP40/50 attachment cable PP 5 m	904
5CAMPH.0100-30	MP40/50 attachment cable PP 10 m	904
5CAMPH.0150-30	MP40/50 attachment cable PP 15 m	904
5CAMPH.0200-30	MP40/50 attachment cable PP 20 m	904
5CAMPC.0020-10	MP switching cabinet cable CO PP 2 m (Ethernet crossover)	905
5CAMPC.0020-11	MP switching cabinet cable ST PP 2 m (Ethernet straight)	905
5SWWCE.0524-ENG	OEM Microsoft Windows CE 5.0 Pro for MP40 PXA270	1117
5SWWCE.0624-ENG	OEM Microsoft Windows CE 5.0 ProPlus for MP40 PXA270	1117
5SWWCE.0724-ENG	OEM Microsoft Windows CE 5.0 ProTCAR (Terminal Client AR) for MP40 PXA270	1117

Mobile Panel

MP50 BIOS 6.5" color TFT with touch screen



Controller		5MP050.0653-01
Processor		Intel PXA 270/416 MHz
Main memory		256 MB
Graphics memory		Reserved in main memory
SRAM		-
CompactFlash slot		-
Battery		-
Mode/node switches		-
Display		5MP050.0653-01
Type		TFT color
Colors		65535 ¹⁾
Resolution		VGA 640x480 pixels
Diagonal		6.5"
Brightness		400 cd/m ²
Half-brightness time		50,000 h
1) The actual number of colors depends on the graphics memory, the graphics mode configured, and the graphics driver being used.		
Operation		5MP050.0653-01
Touch screen		Yes
Keys		
Soft keys		-
System keys		31
LEDs		4
Stop button		Yes (2 N.C., right position)
Enable switch		Yes (two 3-step switches), left and right position
Mounted in the middle		
Electronic handwheel		Yes
3 axes joystick		-
Mounted on the left		
Illuminated button		Yes
Key switch		-
Override potentiometer		-
Interfaces		5MP050.0653-01
USB		1x USB 1.1, connection type A (behind the cover)
Ethernet ¹⁾		RJ45 twisted pair (10 BaseT / 100 BaseT)
1) Connection via Mobile Panel cable		
24 VDC supply		5MP050.0653-01
Input voltage ¹⁾		24 VDC ± 25%
1) Connection via Mobile Panel cable		

Environmental conditions		5MP050.0653-01
Temperature		
Operation		0°C to +50°C
Storage		-20°C to +70°C
Relative humidity		5% - 95% (non-condensing)
Mechanics		5MP050.0653-01
Protection type		IP65
Outer dimensions (W x H x D [mm])		
With handle		250 x 250 x 114
Weight		Approx. 1.1 kg
Drop height		1.5 m to industrial floor

Required accessories		
5CAMPH.0018-30	MP40/50 attachment cable PP 1.8 m	904
5CAMPH.0050-30	MP40/50 attachment cable PP 5 m	904
5CAMPH.0100-30	MP40/50 attachment cable PP 10 m	904
5CAMPH.0150-30	MP40/50 attachment cable PP 15 m	904
5CAMPH.0200-30	MP40/50 attachment cable PP 20 m	904
5CAMPC.0020-10	MP switching cabinet cable CO PP 2 m (Ethernet crossover)	905
5CAMPC.0020-11	MP switching cabinet cable ST PP 2 m (Ethernet straight)	905
5SWWCE.0525-ENG	OEM Microsoft Windows CE 5.0 Pro for MP50 PXA270	1117
5SWWCE.0625-ENG	OEM Microsoft Windows CE 5.0 ProPlus for MP50 PXA270	1117
5SWWCE.0725-ENG	OEM Microsoft Windows CE 5.0 ProTCAR (Terminal Client AR) for MP50 PXA270	1117

Mobile Panel

MP50 BIOS 6.5" color TFT with touch screen



Controller		5MP050.0653-02
Processor	Intel PXA 270/416 MHz	
Main memory	256 MB	
Graphics memory	Reserved in main memory	
SRAM	-	
CompactFlash slot	-	
Battery	-	
Mode/node switches	-	
Display		5MP050.0653-02
Type	TFT color	
Colors	65535 ¹⁾	
Resolution	VGA 640x480 pixels	
Diagonal	6.5"	
Brightness	400 cd/m ²	
Half-brightness time	50,000 h	
1) The actual number of colors depends on the graphics memory, the graphics mode configured, and the graphics driver being used.		
Operation		5MP050.0653-02
Touch screen	Yes	
Keys		
Soft keys	-	
System keys	31	
LEDs	4	
Stop button	Yes (2 N.C., right position)	
Enable switch	Yes (two 3-step switches), left and right position	
Mounted in the middle		
Electronic handwheel	-	
3 axes joystick	Yes	
Mounted on the left		
Illuminated button	-	
Key switch	Yes	
Override potentiometer	-	
Interfaces		5MP050.0653-02
USB	1x USB 1.1, connection type A (behind the cover)	
Ethernet ¹⁾	RJ45 twisted pair (10 BaseT / 100 BaseT)	
1) Connection via Mobile Panel cable		
24 VDC supply		5MP050.0653-02
Input voltage ¹⁾	24 VDC ± 25%	
1) Connection via Mobile Panel cable		

Environmental conditions	5MP050.0653-02
Temperature	
Operation	0°C to +50°C
Storage	-20°C to +70°C
Relative humidity	5% - 95% (non-condensing)
Mechanics	5MP050.0653-02
Protection type	IP65
Outer dimensions (W x H x D [mm])	
With handle	250 x 250 x 114
Weight	Approx. 1.1 kg
Drop height	1.5 m to industrial floor

Required accessories		
5CAMPH.0018-30	MP40/50 attachment cable PP 1.8 m	904
5CAMPH.0050-30	MP40/50 attachment cable PP 5 m	904
5CAMPH.0100-30	MP40/50 attachment cable PP 10 m	904
5CAMPH.0150-30	MP40/50 attachment cable PP 15 m	904
5CAMPH.0200-30	MP40/50 attachment cable PP 20 m	904
5CAMPC.0020-10	MP switching cabinet cable CO PP 2 m (Ethernet crossover)	905
5CAMPC.0020-11	MP switching cabinet cable ST PP 2 m (Ethernet straight)	905
5SWWCE.0525-ENG	OEM Microsoft Windows CE 5.0 Pro for MP50 PXA270	1117
5SWWCE.0625-ENG	OEM Microsoft Windows CE 5.0 ProPlus for MP50 PXA270	1117
5SWWCE.0725-ENG	OEM Microsoft Windows CE 5.0 ProTCAR (Terminal Client AR) for MP50 PXA270	1117

Mobile Panel

MP50 BIOS 6.5" color TFT with touch screen



Controller		5MP050.0653-03
Processor	Intel PXA 270/416 MHz	
Main memory	256 MB	
Graphics memory	Reserved in main memory	
SRAM	-	
CompactFlash slot	-	
Battery	-	
Mode/node switches	-	
Display		5MP050.0653-03
Type	TFT color	
Colors	65535 ¹⁾	
Resolution	VGA 640x480 pixels	
Diagonal	6.5"	
Brightness	400 cd/m ²	
Half-brightness time	50,000 h	
1) The actual number of colors depends on the graphics memory, the graphics mode configured, and the graphics driver being used.		
Operation		5MP050.0653-03
Touch screen	Yes	
Keys		
Soft keys	-	
System keys	31	
LEDs	4	
Stop button	Yes (2 N.C., right position)	
Enable switch	Yes (two 3-step switches), left and right position	
Mounted in the middle		
Electronic handwheel	Yes	
3 axes joystick	-	
Mounted on the left		
Illuminated button	-	
Key switch	-	
Override potentiometer	Yes	
Interfaces		5MP050.0653-03
USB	1x USB 1.1, connection type A (behind the cover)	
Ethernet ¹⁾	RJ45 twisted pair (10 BaseT / 100 BaseT)	
1) Connection via Mobile Panel cable		
24 VDC supply		5MP050.0653-03
Input voltage ¹⁾	24 VDC ± 25%	
1) Connection via Mobile Panel cable		

Environmental conditions		5MP050.0653-03
Temperature		
Operation		0°C to +50°C
Storage		-20°C to +70°C
Relative humidity		5% - 95% (non-condensing)
Mechanics		5MP050.0653-03
Protection type		IP65
Outer dimensions (W x H x D [mm])		
With handle		250 x 250 x 114
Weight		Approx. 1.1 kg
Drop height		1.5 m to industrial floor

Required accessories		
5CAMPH.0018-30	MP40/50 attachment cable PP 1.8 m	904
5CAMPH.0050-30	MP40/50 attachment cable PP 5 m	904
5CAMPH.0100-30	MP40/50 attachment cable PP 10 m	904
5CAMPH.0150-30	MP40/50 attachment cable PP 15 m	904
5CAMPH.0200-30	MP40/50 attachment cable PP 20 m	904
5CAMPC.0020-10	MP switching cabinet cable CO PP 2 m (Ethernet crossover)	905
5CAMPC.0020-11	MP switching cabinet cable ST PP 2 m (Ethernet straight)	905
5SWWCE.0525-ENG	OEM Microsoft Windows CE 5.0 Pro for MP50 PXA270	1117
5SWWCE.0625-ENG	OEM Microsoft Windows CE 5.0 ProPlus for MP50 PXA270	1117
5SWWCE.0725-ENG	OEM Microsoft Windows CE 5.0 ProTCAR (Terminal Client AR) for MP50 PXA270	1117

Mobile Panel

MP50 BIOS 6.5" color TFT with touch screen



Controller	5MP050.0653-04
Processor	Intel PXA 270/416 MHz
Main memory	256 MB
Graphics memory	Reserved in main memory
SRAM	-
CompactFlash slot	-
Battery	-
Mode/node switches	-
Display	5MP050.0653-04
Type	TFT color
Colors	65535 ¹⁾
Resolution	VGA 640x480 pixels
Diagonal	6.5"
Brightness	400 cd/m ²
Half-brightness time	50,000 h
<small>1) The actual number of colors depends on the graphics memory, the graphics mode configured, and the graphics driver being used.</small>	
Operation	5MP050.0653-04
Touch screen	Yes
Keys	
Soft keys	-
System keys	31
LEDs	4
Stop button	Yes (2 N.C., right position)
Enable switch	Yes (two 3-step switches), left and right position
Mounted in the middle	
Electronic handwheel	Yes
3 axes joystick	-
Mounted on the left	
Illuminated button	-
Key switch	Yes
Override potentiometer	-
Interfaces	5MP050.0653-04
USB	1x USB 1.1, connection type A (behind the cover)
Ethernet ¹⁾	RJ45 twisted pair (10 BaseT / 100 BaseT)
<small>1) Connection via Mobile Panel cable</small>	
24 VDC supply	5MP050.0653-04
Input voltage ¹⁾	24 VDC ± 25%
<small>1) Connection via Mobile Panel cable</small>	

Environmental conditions		5MP050.0653-04
Temperature		
Operation		0°C to +50°C
Storage		-20°C to +70°C
Relative humidity		5% - 95% (non-condensing)
Mechanics		5MP050.0653-04
Protection type		IP65
Outer dimensions (W x H x D [mm])		
With handle		250 x 250 x 114
Weight		Approx. 1.1 kg
Drop height		1.5 m to industrial floor

Required accessories		
5CAMPH.0018-30	MP40/50 attachment cable PP 1.8 m	904
5CAMPH.0050-30	MP40/50 attachment cable PP 5 m	904
5CAMPH.0100-30	MP40/50 attachment cable PP 10 m	904
5CAMPH.0150-30	MP40/50 attachment cable PP 15 m	904
5CAMPH.0200-30	MP40/50 attachment cable PP 20 m	904
5CAMPC.0020-10	MP switching cabinet cable CO PP 2 m (Ethernet crossover)	905
5CAMPC.0020-11	MP switching cabinet cable ST PP 2 m (Ethernet straight)	905
5SWWCE.0525-ENG	OEM Microsoft Windows CE 5.0 Pro for MP50 PXA270	1117
5SWWCE.0625-ENG	OEM Microsoft Windows CE 5.0 ProPlus for MP50 PXA270	1117
5SWWCE.0725-ENG	OEM Microsoft Windows CE 5.0 ProTCAR (Terminal Client AR) for MP50 PXA270	1117

Connection box



Mechanics	4MPCBX.0000-00	4MPCBX.0001-00
Material		
Cover	GK-AISi9Mg (chill casting)	GK-AISi9Mg (chill casting)
Housing	GK-AISi11Mg (chill casting)	GK-AISi11Mg (chill casting)
Paint, color	Powdered RAL7012 fine structure	Powdered RAL7012 fine structure
Dimensions	172 x 158 x 74	157 x 90 x 74
Weight (without attachment cable)	Approx. 1 kg	Approx. 0.5 kg
E-stop	Yes	-
Hot plug button	Yes	-
Electrical characteristics	4MPCBX.0000-00	4MPCBX.0001-00
Power supply		
Rated voltage	18 - 30 VDC	-
Current requirements	Typically 150 mA	-
Power consumption	Approx. 2 W	-
Environmental characteristics	4MPCBX.0000-00	4MPCBX.0001-00
Protection type	IP65 (only with screw-on caps and caps installed)	IP65 (only with cap)

Required accessories		
5CAMPB.0100-10	MP box cable PP 10 m (Ethernet crossover)	906

Handle

MP100/200 handle



Brief overview	4MPHDL.0000-00
Outer dimensions (W x H x D [mm])	190 x 79.5 x 183
Weight	540 g
Enable switch	3-step (null, enable, panic position)

MP100/200 wall mount



Brief overview	4MPBRA.0000-00
Outer dimensions (W x H x D [mm])	140 x 305 x 109
Weight	680 g
Material	St37, powder-coated RAL 7016

MP40/50 wall mount



Brief overview	4MPBRA.0000-01
Outer dimensions (W x H x D [mm])	201.4 x 392.9 x 118

Mobile Panel cable

MP100/200 attachment cable



Brief overview	5CAMPH.0018-10	5CAMPH.0050-10	5CAMPH.0100-10	5CAMPH.0150-10	5CAMPH.0200-10
Type	Attachment cable	Attachment cable	Attachment cable	Attachment cable	Attachment cable
Length	1.8 m ± 100 mm	5 m ± 100 mm	10 m ± 100 mm	15 m ± 150 mm	20 m ± 200 mm
Total diameter	10 mm	10 mm	10 mm	10 mm	10 mm
Material	Silicon and halogen-free, flame-retardant PUR outer sheathing				
Minimum flex radius	60 mm	60 mm	60 mm	60 mm	60 mm
Maximum tension stress	140 N	140 N	140 N	140 N	140 N
Standards	Flame retardant in accordance with IEC 60332-1 and VW1 / FT1 in accordance with C-UL, shield damping in accordance with IEC 60096-1 Amendment 2. Mechanical characteristics according to DIN VDE 0472 part 603 test type H (100,000 cycles), oil resistant, hydrolysis resistant according to DIN VDE 0282 part 10				
Permissible operating temperature	-20°C to +80°C	-20°C to +80°C	-20°C to +80°C	-20°C to +80°C	-20°C to +80°C
Non-moving state	-5°C to +60°C	-5°C to +60°C	-5°C to +60°C	-5°C to +60°C	-5°C to +60°C
In motion					
Cable elements	Twisted pair cable (10/100 MBit/s); 4 wires				
Ethernet	6 wires				
Enable switch	5 wires				
CAN bus	6 wires				
Entry devices	24 VDC and ground, 3 wires				
Power supply	Rx, Tx, 3 wires				
Serial					

MP40/50 attachment cable



Brief overview	5CAMPH.0018-30	5CAMPH.0050-30	5CAMPH.0100-30	5CAMPH.0150-30	5CAMPH.0200-30
Type	Attachment cable	Attachment cable	Attachment cable	Attachment cable	Attachment cable
Length	1.8 m ± 100 mm	5 m ± 100 mm	10 m ± 100 mm	15 m ± 150 mm	20 m ± 150 mm
Total diameter	10 mm	10 mm	10 mm	10 mm	10 mm
Material	Silicon and halogen-free, flame-retardant PUR outer sheathing				
Minimum flex radius	60 mm	60 mm	60 mm	60 mm	60 mm
Maximum tension stress	140 N	140 N	140 N	140 N	140 N
Standards	Flame retardant in accordance with IEC 60332-1 and VW1 / FT1 in accordance with C-UL, shield damping in accordance with IEC 60096-1 Amendment 2. Mechanical characteristics according to DIN VDE 0472 part 603 test type H (100,000 cycles), oil resistant, hydrolysis resistant according to DIN VDE 0282 part 10				
Permissible operating temperature	-20°C to +80°C	-20°C to +80°C	-20°C to +80°C	-20°C to +80°C	-20°C to +80°C
Non-moving state	-5°C to +60°C	-5°C to +60°C	-5°C to +60°C	-5°C to +60°C	-5°C to +60°C
In motion					
Cable elements	Twisted pair cable (10/100 MBit/s); 4 wires				
Ethernet	4 wires				
Enable switch	24 VDC and ground, 2 wires				
Power supply	Rx, Tx, 4 wires				
Stop button					

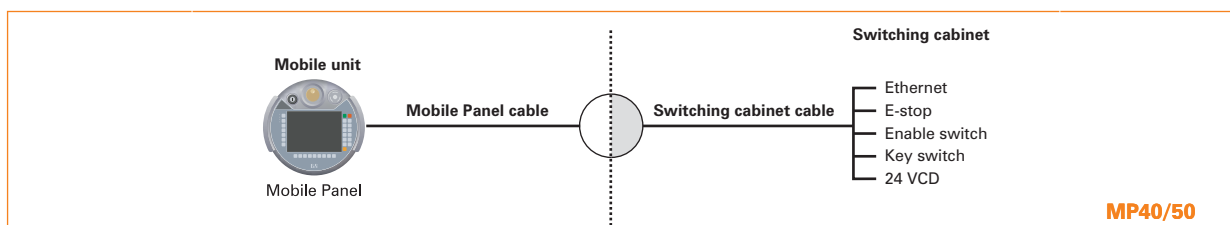
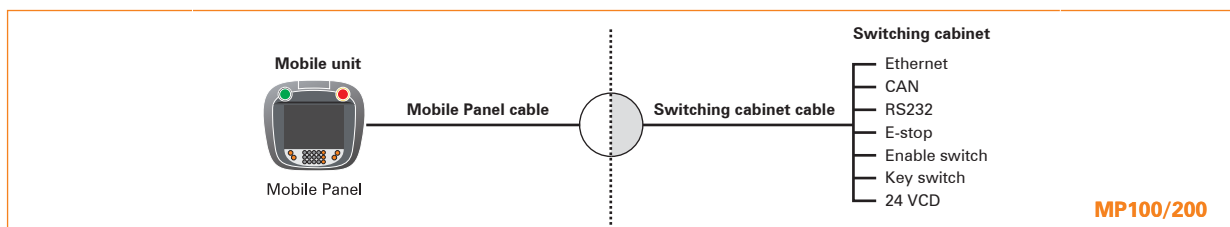
Switching cabinet cable for MP100/200 or MP40/50



Brief overview	5CAMPC.0020-10	5CAMPC.0020-11
Type	Switching cabinet cable Ethernet crossover	Switching cabinet cable Ethernet straight through
Length	2 m ± 50 mm	2 m ± 50 mm
Total diameter	10 mm	10 mm
Material	Silicon and halogen-free, flame-retardant PUR outer sheathing	
Minimum flex radius	60 mm	60 mm
Maximum tension stress	140 N	140 N
Standards	Flame retardant in accordance with IEC 60332-1 and VW1 / FT1 in accordance with C-UL, shield damping in accordance with IEC 60096-1 Amendment 2. Mechanical characteristics according to DIN VDE 0472 part 603 test type H (100,000 cycles), oil resistant, hydrolysis resistant according to DIN VDE 0282 part 10	
Permissible operating temperature	-20°C to +80°C	-20°C to +80°C
Non-moving state	-5°C to +60°C	-5°C to +60°C
In motion		
Cable elements		
Ethernet	Twisted pair cable (10/100 MBit/s); 4 wires	
Enable switch	4 wires	
CAN bus	5 wires	
Entry devices	6 wires	
Power supply	24 VDC and ground, 3 wires	
Serial	Rx/D, Tx/D, 3 wires	

Cabling

The Mobile Panel is connected using a single cable that includes all supply, communication, and control lines. The cable can be plugged into the switching cabinet. The other end in the switching cabinet is a 2 m cable with open ends (Ethernet with RJ45 plug) for simple wiring.



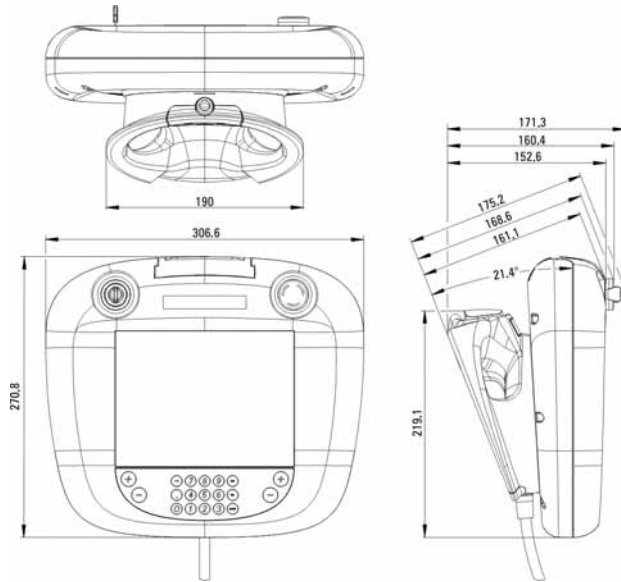
Box cable



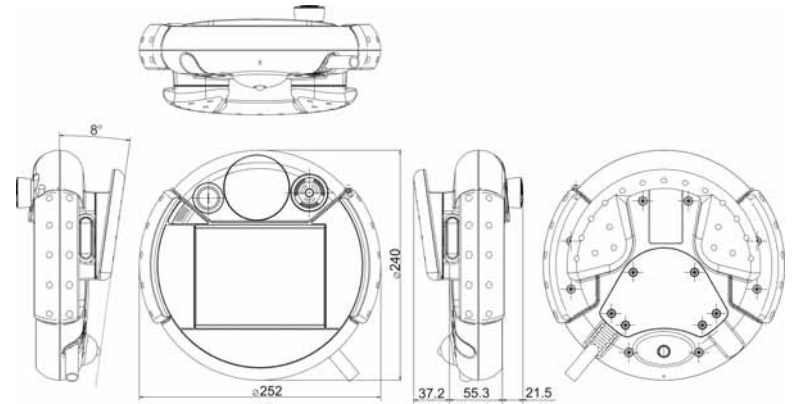
Brief overview		5CAMPB.0100-10
Type	Box cable Ethernet crossover	
Length	10 m ± 100 mm	
Total diameter	10 mm	
Material	Silicon and halogen free, flame retardant PUR outer sheathing	
Minimum flex radius	60 mm	
Maximum tension stress	140 N	
Standards	Flame retardant according to IEC 60332-1 and VW1 / FT1 according to C-UL Shield damping according to IEC 60096-1, amendment 2 Mechanical characteristics according to DIN VDE 0472 section 603 test type H (100000 cycles) Oil resistant, hydrolysis resistant according to DIN VDE 0282 section 10	
Permissible operating temperature		
Non-moving state	-20°C to +80°C	
In motion	-5°C to +60°C	
Cable elements		
Network	Twisted pair cable (10/100 MBit/s); 4 wires	
Enable switch	6 wires	
2 x CAN bus	5 wires	
Entry devices	6 wires	
Power supply	24 VDC and ground, 3 wires	
Serial connection (Rx/D / Tx/D)	Rx/D, Tx/D, 3 wires	



Dimensions

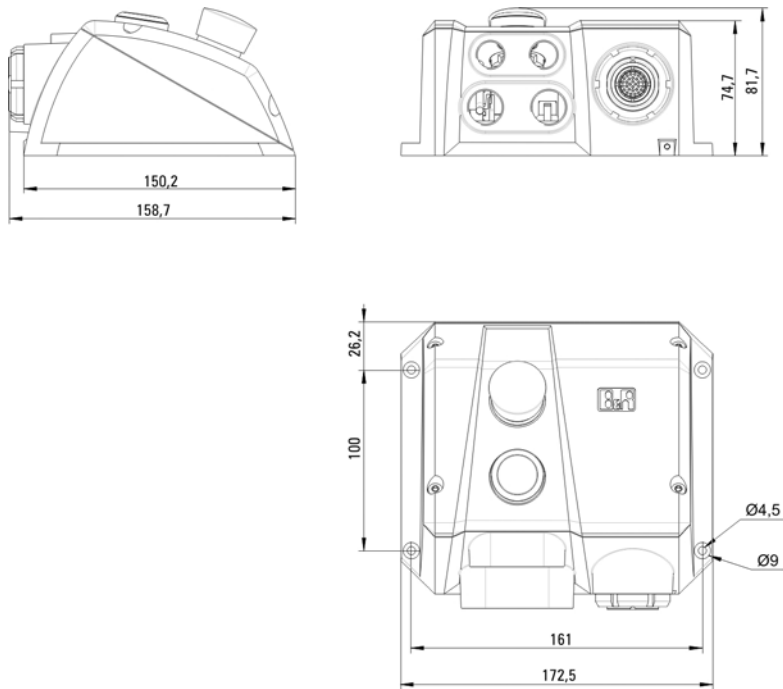


Mobile Panel 100/200 dimensions

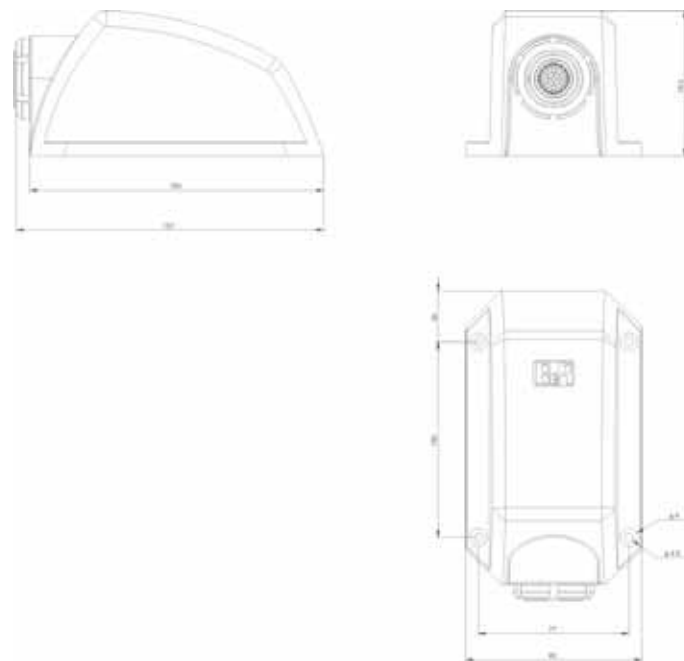


Mobile Panel 40/50 dimensions

All dimensions in mm



Connection box dimensions



Small connection box dimensions

All dimensions in mm

Automation PC 620

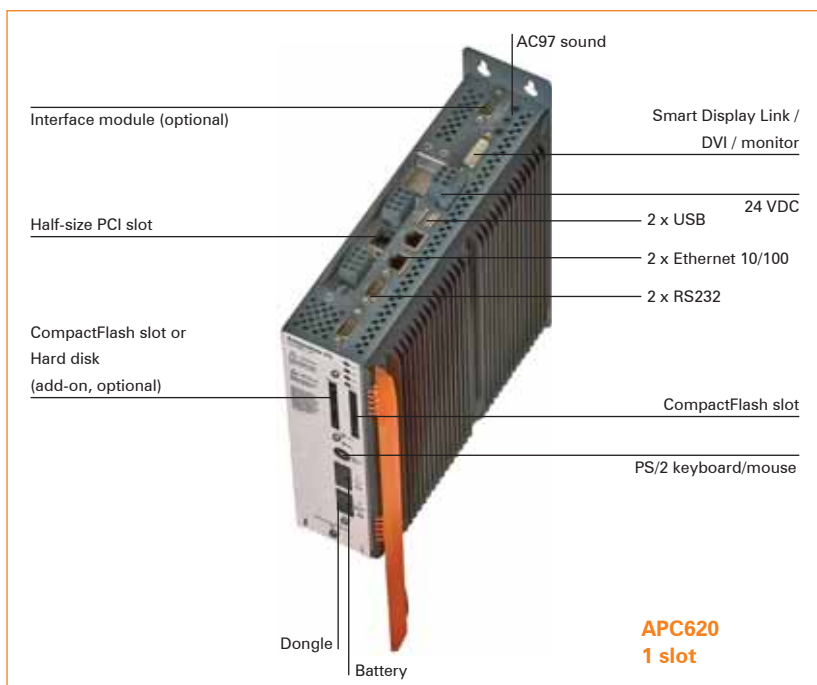
The modular, fan-free industrial PC



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System characteristics



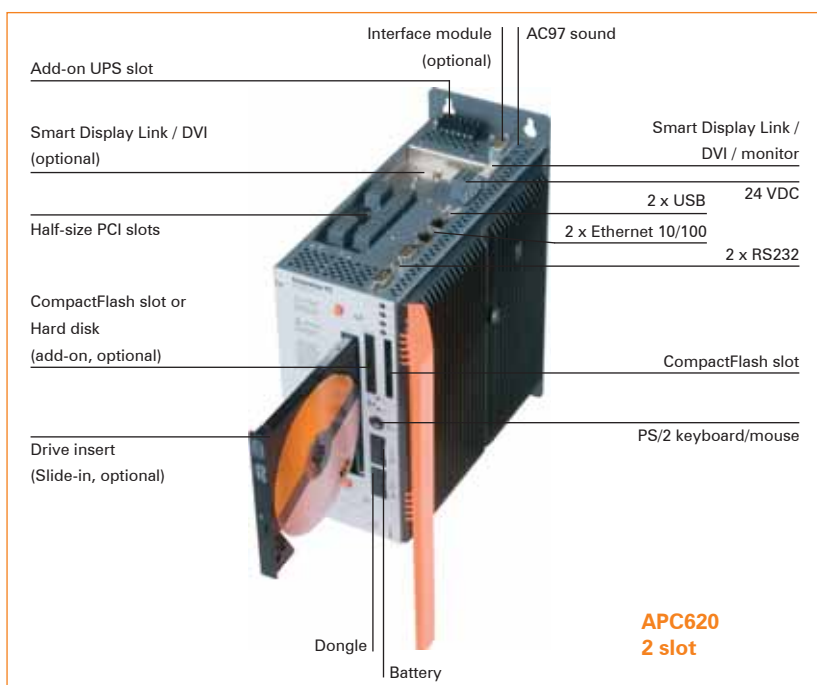
The innovative industrial PC

The new APC620 relies on experience collected over many years of industrial PC development and many applications. The result: the APC620 – providing optimal adaptability and ergonomics. The mechanical design is based on the results of extensive shock and vibration tests that place the highest demands on the materials. The APC620's main advantages are its modular design, the flexibility of the slots and the well thought out arrangement of interfaces and drives.

The display units have also been updated with new technology. Modular interfaces allow adjustments to be made to meet various requirements.

Reliability over many years

The B&R development engineers considered the importance of long-term availability when choosing which components to use. After all, the product lifespan of a B&R industrial PC series is ten years or more. Furthermore, the use of B&R industrial PCs in tough production environments places special demands on reliability and longevity. The elimination of internal cable connections for PC components, firm fitting circuit boards and the optional use of mass memory without rotating parts (CompactFlash) together with a very robust mechanical construction affords a high level of protection against breakdowns.

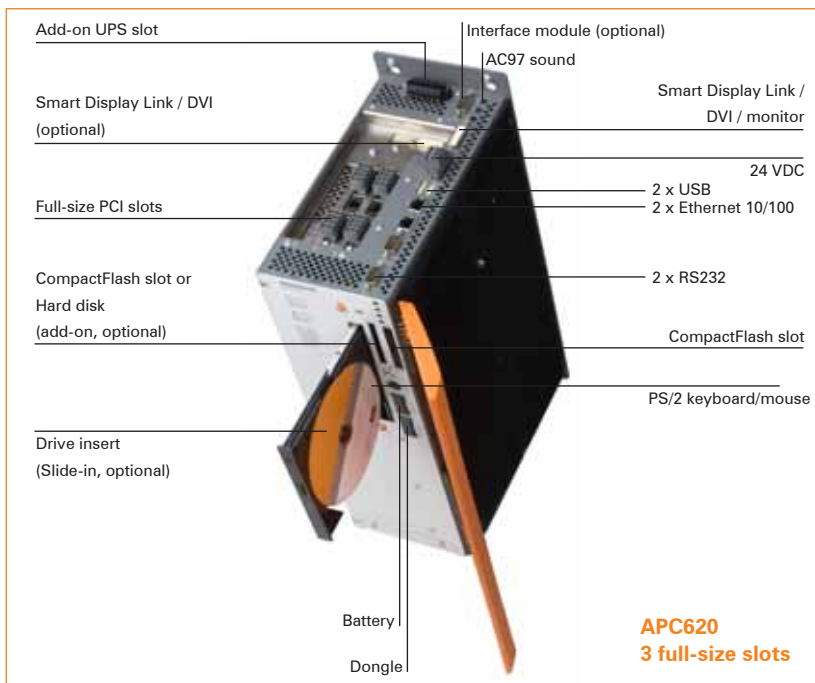


Compact construction

The APC620 saves space in the switching cabinet. Drive inserts (HDD, CD-ROM, DVD, etc.) and up to two CompactFlash slots are hidden behind a cover on the front of the device. All connections and interfaces are located on the top side of the housing. The installation depth is not increased by protruding connectors.

Fan-free

The APC620 is fan-free. All components that require cooling are placed on the board so that the heat is distributed directly to the large outer heat sink. The advantages of a fan-free system are obvious: When using CompactFlash cards, there are no rotating parts. This also eliminates maintenance work such as regularly exchanging fan filters. Maintenance costs and worn out parts are greatly reduced.



Options

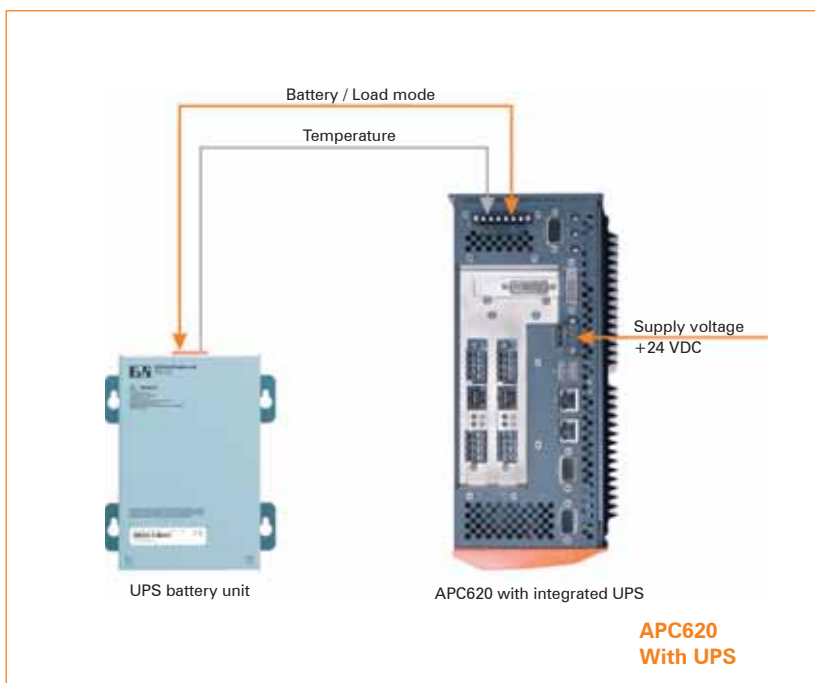
Housing is available with one, two, or five half-size PCI slots. The other components have an extremely modular design. A Compact Flash slot is provided on the base system and can be supplemented with a second Compact Flash or a hard disk. There are up to two slots provided for other drives as well. CD-ROM, DVD-RW/CD-RW, floppy disk, hard disk or CompactFlash can be used. The modular plug-in technology makes it easy for the user to switch drives.

Full-size PCI slots

The APC620 with 3 long PCI slots is a new addition to B&R's Automation PC product line. Based on innovative Pentium M technology, this variant also offers several different processor and drive options.

APC620 embedded

The APC620 embedded integrates the powerful Pentium® M technology with up to 1400 MHz with the fieldbus interfaces Ethernet POWERLINK, CAN, and X2X in an extremely compact housing. The APC620 embedded is perfectly suited for complex automation tasks. All the advantages of an open system are still available when fully integrated in an automation system.



Highest performance

For applications with the highest processor performance requirements, the APC620 is available with Intel® Pentium® M and Celeron® M processors. These processors, developed specially for mobile computing, offer many advantages for industrial applications as well. They combine high computing capacity with low power consumption. The clock rates range from 600 MHz to 1.8 GHz. The Intel® 855GME chipset contains two integrated graphic engines that provide optimal use of memory for the system and graphics.

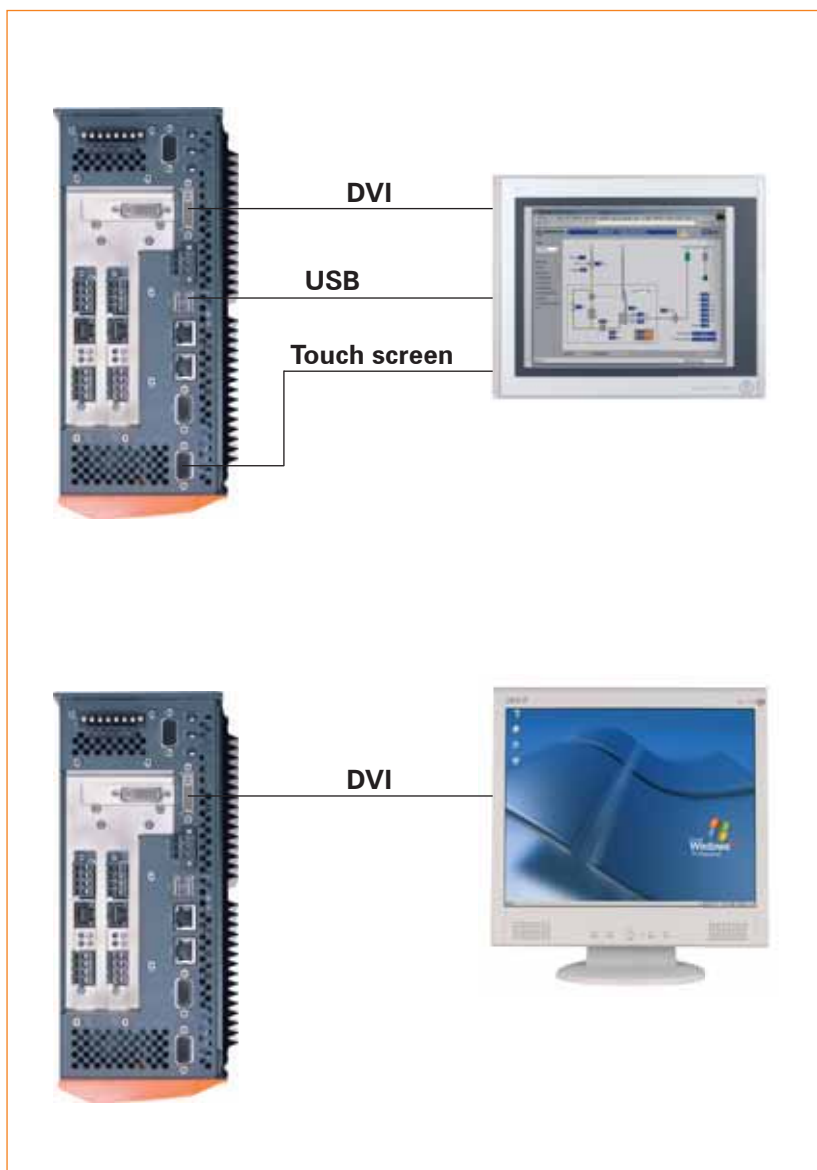
SRAM module for Automation PC 620 and Panel PC 700

The 512 KB SRAM modules expand the range of the APC620 and Panel PC 700. This allows applications that do not require a fieldbus card with integrated SRAM to store nonvolatile data in the optional SRAM module. Due to the power supply buffering integrated in the APC620 and Panel PC, Automation Runtime applications support the backup of data in the SRAM module when a power failure occurs. This module uses the buffer battery from the PC system. It is inserted directly on the PC board and doesn't require a PCI slot.

APC620 with uninterruptible power supply

With the optionally integrated UPS, the APC620 makes sure that the PC system completes all write operations even if a power failure occurs. This means that all running programs will be ended properly by the UPS software. This prevents inconsistent data. The UPS charging circuit takes up very little space in the APC620. The rechargeable batteries are mounted next to the PC and are easy to replace.

System characteristics



Display connection

The APC620 from B&R has an integrated interface for connecting an Automation Panel or a monitor. This industrial version also allows additional Automation Panels to be connected by inserting an optional link module. This modularity is also available on the panel. B&R offers the following possibilities in order to meet the various requirements for Panel operation:

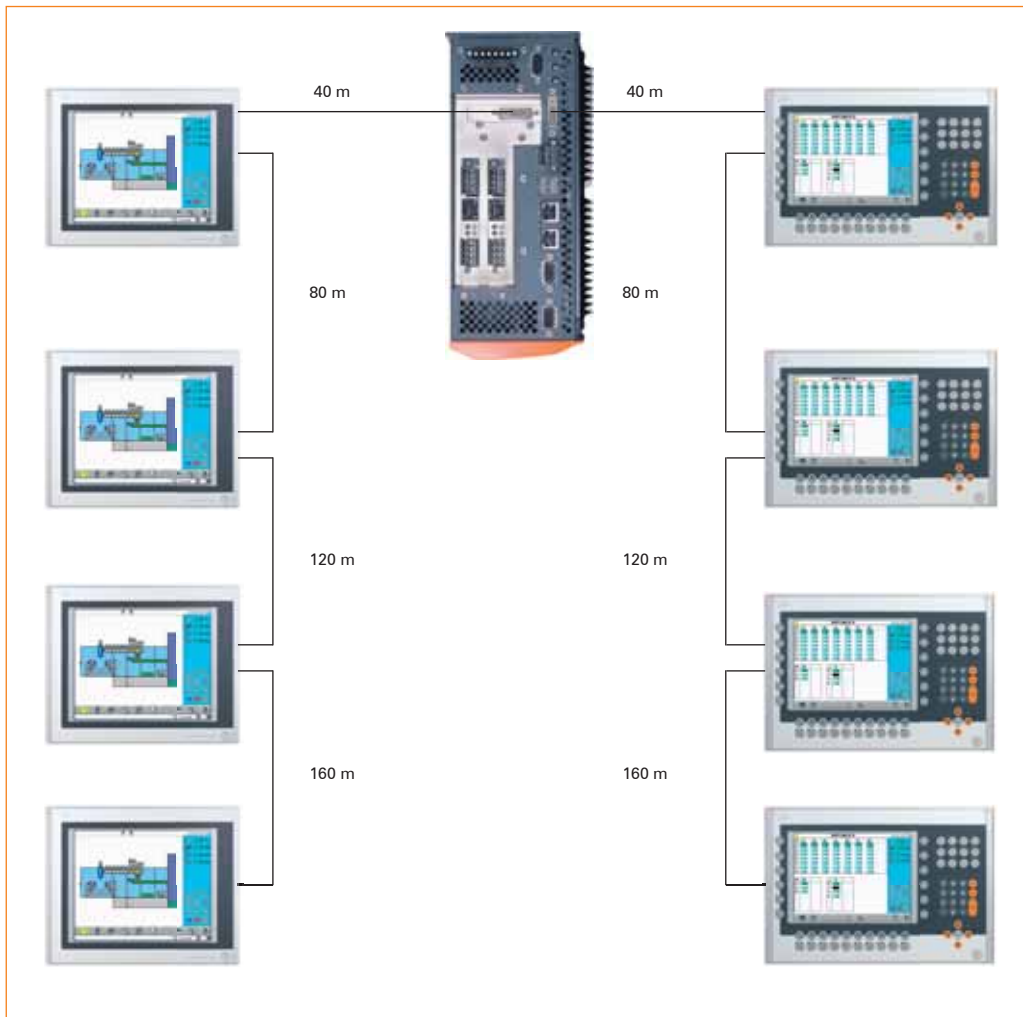
DVI (Digital Visual Interface)

SDL (Smart Display Link)

DVI - The open standard

The DVI (Digital Visual Interface) link is based on the DVI standard defined by the Digital Display Working Group, which is also being used more frequently in today's offices. The integrated panel interface is designed so that display units and office monitors with a DVI interface can also be connected. Connections to a touch screen or remote USB interfaces require separate cables.

It is also possible to connect monitors with analog RGB interfaces.



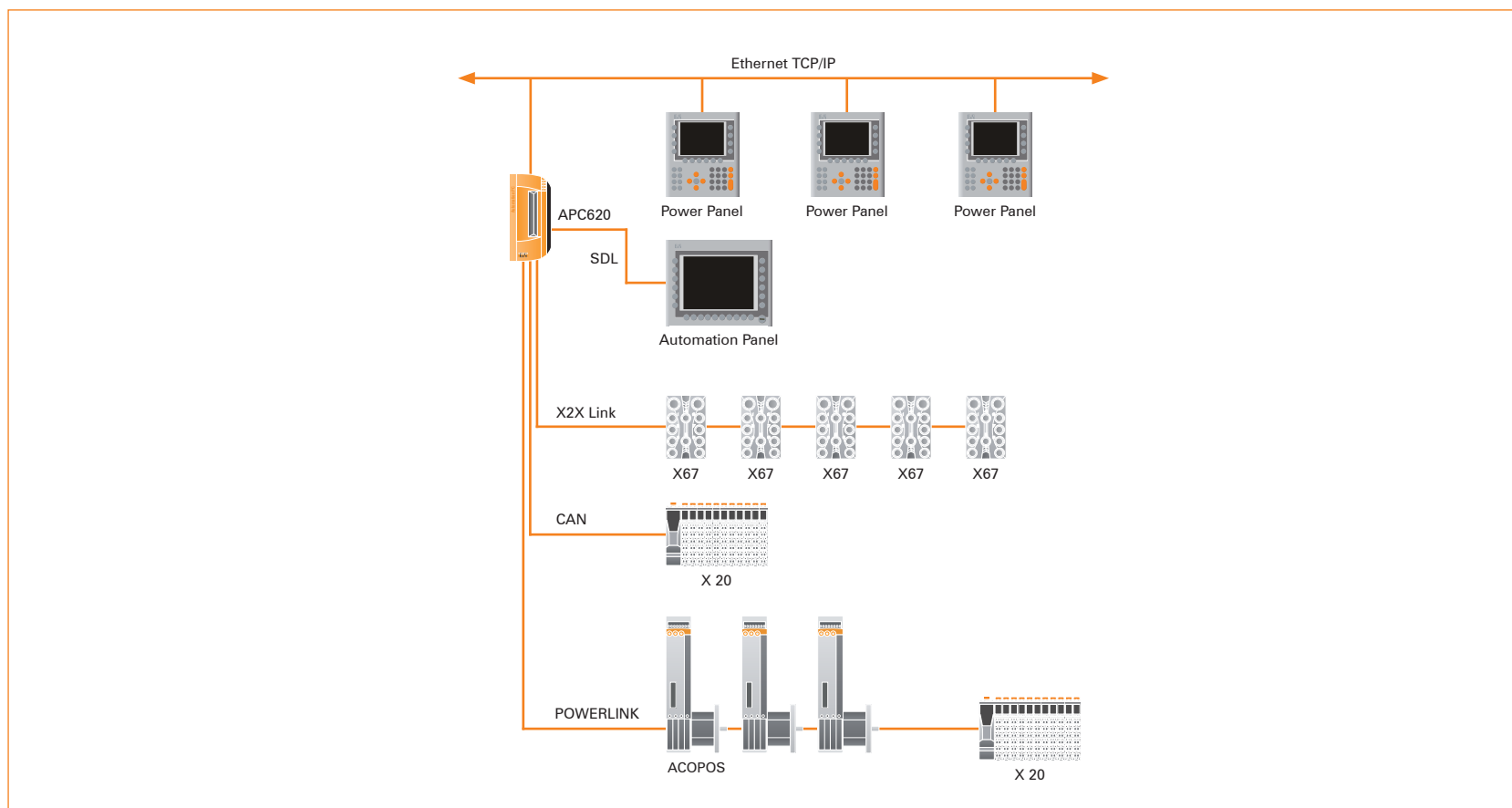
Smart Display Link

SDL (Smart Display Link) is already integrated on the APC620. It combines the digital display interface and touch transfer for the display unit into one interface. Matrix keys, service data (temperature, operating hours) and USB signals are also transferred. SDL also allows the display unit to be equipped with PC resources such as USB drives and keyboard. Four Automation Panels can be connected via SDL to the integrated or optional SDL interfaces. The Automation Panel 900 can be combined with the Automation Panel 800, and the AP800 is always last on the line. The two lines display different content (dual independent display). Alternatively, the same display content can also be shown on all displays (display clone). Touch and key entries on the Automation Panel can be locked with software to prevent operating errors. USB is supported up to a maximum segment length of 30 m on the first two displays. Starting at a segment length of 30 m and higher, USB is only available up to a maximum of 40 m for the first respective display. USB devices can only be connected directly to the Automation Panel (without a hub).

Typical topologies

APC620 embedded for central control and visualization

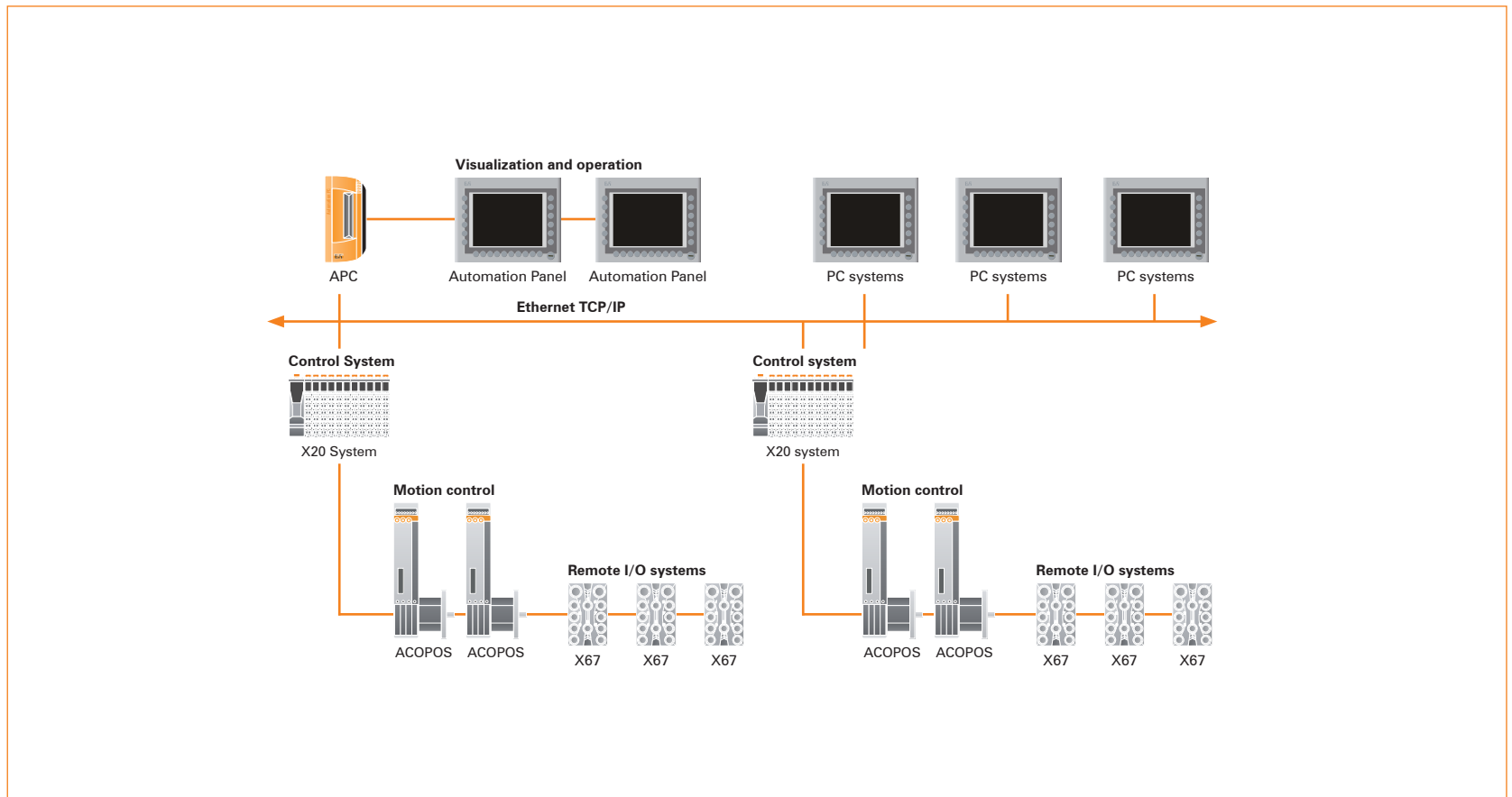
The control program runs on the APC620 embedded. The visualization project is integrated with Visual Components. A display unit is connected to the PC. The PC is networked over Ethernet TCP/IP; additional Power Panel-based operator terminals can also be connected via Ethernet. Communication to I/O systems with axes is handled via fieldbus systems (CAN, Ethernet POWERLINK).



Control system	APC620: Automation PC	911
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
	Automation Panel 800: Modular operation and visualization	1055
	Automation Panel 900: Compact operation and visualization	1077
Motion control	ACOPOS: Intelligent servo drives	1251
Remote I/O systems	X67 System: Remote I/O with IP67 protection	419
	X20 System: Slice-based I/O and control system	37

APC620 as visualization device

The visualization runs as a SCADA application on the APC620. Two display units are connected to the PC either locally or remotely. The control tasks interact with one or more underlying PLC stations where I/O systems and drives are connected locally or remotely over fieldbus systems. Additional SCADA stations can be networked via Ethernet TCP/IP.



Control system	X20 System: Slice-based I/O and control system	37
	APC620: Automation PC	911
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
	Automation Panel 800: Modular operation and visualization	1055
	Automation Panel 900: Compact operation and visualization	1077
Motion control	ACOPOS: Intelligent servo drives	1251
Remote I/O systems	X67 System: Remote I/O with IP67 protection	419
	X20 System: Slice-based I/O and control system	37

Configuration

System unit (housing with main board)

Select a system unit

5PC600.SE00-00	APC620 embedded system unit, 512 kb SRAM, 1 Automation Panel Link slot (SDL)	926
5PC600.SE00-01	APC620 embedded system unit, 512 kb SRAM, 1 Automation Panel Link slot (CRT)	926
5PC600.SE00-02	APC620 embedded system unit, 1024 kb SRAM, 1 Automation Panel Link slot (SDL)	926
5PC600.SX01-00	APC620 system unit, 1 PCI slot	927
5PC600.SX02-00	APC620 system unit, 2 PCI slots, 1 drive slot, 1 Automation Panel Link slot	927
5PC600.SX02-01	APC620 system unit, 2 PCI slots, 1 drive slot	927
5PC600.SF03-00	APC620 system unit, 3 full-size PCI slots, 1 drive slot, 1 Automation Panel Link slot	928
5PC600.SX05-00	APC620 system unit, 5 PCI slots, 2 drive slots, 1 Automation Panel Link slot	928
5PC600.SX05-01	APC620 system unit, 5 PCI slots, 2 drive slots	928

CPU boards with 855 GME chipset

Select a CPU board (APC620 embedded: only 600 MHz, 1000 MHz, 1100 MHz and 1400 MHz)

5PC600.X855-00	CPU board, Intel® Pentium® M, 1100 MHz	930
5PC600.X855-01	CPU board, Intel® Pentium® M, 1600 MHz	930
5PC600.X855-02	CPU board, Intel® Pentium® M, 1400 MHz	930
5PC600.X855-03	CPU board, Intel® Pentium® M, 1800 MHz	931
5PC600.X855-04	CPU board, Intel® Celeron® M, 600 MHz	931
5PC600.X855-05	CPU board, Intel® Celeron® M, 1000 MHz	931

Memory for CPU boards with 855 GME chipset

Select a memory module

5MMDDR.0256-00	SO-DIMM DDR SDRAM, 256 MB	931
5MMDDR.0512-00	SO-DIMM DDR SDRAM, 512 MB	931
5MMDDR.1024-00	SO-DIMM DDR SDRAM, 1024 MB	931

Heat sinks for CPU boards with 855GME chipset

Select a heat sink

5AC600.HS01-01	Heat sink for half-size PCI system units with Celeron® M 600 MHz, 1000 and Pentium® M 1100 MHz, 1400 MHz.	931
5AC600.HS01-02	Heat sink for half-size PCI system units with Pentium® M 1600 MHz, 1800 MHz.	931
5AC600.HS02-01	Heat sink for full-size PCI system units with Celeron® M 600 MHz, 1000 and Pentium® M 1100 MHz, 1400 MHz.	931
5AC600.HS02-02	Heat sink for full-size PCI system units with Pentium® M 1600 MHz, 1800 MHz.	931
5AC600.HS03-01	Heat sink for APC620 embedded system units with Celeron® M 600 MHz, Celeron® M 1000 MHz, Pentium® M 1100 MHz and Pentium® M 1400 MHz	931





Automation Panel link transmitter

Select an Automation Panel Link transmitter (for 5PC600.SX02-00, 5PC600.SX05-00 and 5PC600.SF03-00 only)

5AC600.SDL0-00	Automation Panel SDL link transmitter	📄 924
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Components

Select an add-on drive (not for APC620 embedded)

5AC600.HDDI-05	40 GB add-on hard disk, 24/7 operation and expanded temperature range	📄 923
5AC600.HDDI-06	80 GB add-on hard disk, 24/7 operation and expanded temperature range	📄 923
5AC600.CFSI-00	Add-on CompactFlash slot	📄 923

Select a slide-in drive (not for APC620 embedded)

5PC600.SF03-00, 5PC600.SX02-00, 5PC600.SX02-01: One drive

5PC600.SX05-00, 5PC600.SX05-01: Two drives

5AC600.HDDS-02	40 GB slide-in hard disk, 24/7 operation and expanded temperature range	📄 923
5AC600.CFSS-00	Slide-in CompactFlash adapter for 2 CF	📄 923
5AC600.DVDS-00	Slide-in DVD-ROM/CD-RW	📄 923
5AC600.DVRS-00	Slide-in DVD-R/RW, DVD+R/RW	📄 923
5AC600.CDXS-00	Slide-in CD-ROM	📄 923
5AC600.FDDS-00	Slide-in USB FDD	📄 923

Select max. one Raid system

5ACPCI.RAIC-03	PCI RAID system SATA 2x160 GB (controller and 2x hard disk)	📄 923
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Select UPS

(Select combination of UPS, battery unit and cable)

5AC600.UPSI-00	Uninterruptible power supply for APC620	📄 924
5AC600.UPSB-00	Select battery unit	📄 924
5CAUPS.0005-00	0.5 mm APC620 UPS cable	📄 924
5CAUPS.0030-00	3 m APC620 UPS cable	📄 924

Select max. one SRAM module (not for APC620 embedded)

5AC600.SRAM-00	512 KB SRAM module for APC620 and PPC700	📄 924
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Fan kits

Select a fan kit (if required)¹

5PC600.FA01-00	Fan kit for system unit 1 PCI	📄 924
5PC600.FA02-00	Fan kit for system unit 2 PCI	📄 924
5PC600.FA03-00	Fan kit for system unit 3 PCI	📄 924
5PC600.FA05-00	Fan kit for system unit 5 PCI	📄 924

¹ A fan kit may be necessary for certain system configurations.

Supply voltage connectors

Select a supply voltage connector

0TB103.9	Accessory terminal block 3-pin, screw clamps 3.31 mm ²	📄 1131
0TB103.91	Accessory terminal block 3-pin, cage clamps 3.31 mm ²	📄 1131

Product overview

APC620 system units



Model number	Short description	
5PC600.SE00-00	APC620 embedded system unit, 512 kB SRAM, connections for Ethernet POWERLINK, CAN, X2X, 2x RS232, 2x USB 2.0, Smart Display Link/ DVI/ Monitor, ETH 10/100; 24 VDC	926
5PC600.SE00-01	APC620 embedded system unit, 512 kB SRAM, connections for Ethernet POWERLINK, CAN, X2X, 2x RS232, 2x USB 2.0, monitor, ETH 10/100; 24 VDC	926
5PC600.SE00-02	APC620 embedded system unit, 1024 kB SRAM, connections for Ethernet POWERLINK, CAN, X2X, 2x RS232, 2x USB 2.0, Smart Display Link/ DVI/ Monitor, ETH 10/100; 24 VDC	926
5PC600.SX01-00	APC620 system unit 1 PCI slot, connections for 2 x RS232, 2 x USB 2.0, Smart Display Link / DVI / monitor, 2 x ETH 10/100, AC97 sound, PS/2 keyboard/mouse, 24 VDC.	927
5PC600.SX02-00	APC620 system unit, 2 PCI slots, 1 slot for Automation Panel link transmitter, 1 drive slot, Smart Display Link / DVI / monitor, connections for 2 x RS232, 2 x USB 2.0, 2 x ETH 10/100, AC97 sound, PS/2 keyboard/mouse, 24 VDC.	927
5PC600.SX02-01	APC620 system unit 2 PCI slots, 1 drive slot, connections for 2 x RS232, 2 x USB 2.0, Smart Display Link / DVI / monitor, 2 x ETH 10/100, AC97 sound, PS/2 keyboard/mouse, 24 VDC.	927
5PC600.SF03-00	APC620 system unit, 3 full-size PCI slots, 1 slot for Automation Panel Link transmitter, 1 drive slot; Smart Display Link/ DVI/ monitor, connections for 2 x RS232, 2 x USB 2.0, 2 x ETH 10/100, AC97 sound, PS/2 keyboard/mouse; 24 VDC.	928
5PC600.SX05-00	APC620 system unit, 5 PCI slots, 1 slot for Automation Panel link transmitter, 2 drive slots, Smart Display Link / DVI / monitor, connections for 2 x RS232, 2 x USB 2.0, 2 x ETH 10/100, AC97 sound, PS/2 keyboard/mouse, 24 VDC.	928
5PC600.SX05-01	APC620 system unit 5 PCI slots, 2 drive slots, connections for 2 x RS232, 2 x USB 2.0, Smart Display Link / DVI / monitor, 2 x ETH 10/100, AC97 sound, PS/2 keyboard/mouse, 24 VDC.	928

CPU boards, memory and heat sinks



Intel® Pentium® M / Celeron® M

Model number	Short description	
5PC600.X855-00	CPU board Intel® Pentium® M, 1100 MHz, 400 MHz PSB, 1 MB L2 cache, 855GME chipset, 1 socket for SO-DIMM DDR module.	930
5PC600.X855-01	CPU board Intel® Pentium® M, 1600 MHz, 400 MHz PSB, 1 MB L2 cache, 855GME chipset, 1 socket for SO-DIMM DDR module.	930
5PC600.X855-02	CPU board Intel® Pentium® M, 1400 MHz, 400 MHz PSB, 2 MB L2 cache, 855GME chipset, 1 socket for SO-DIMM DDR module.	930
5PC600.X855-03	CPU board Intel® Pentium® M, 1800 MHz, 400 MHz PSB, 2 MB L2 cache, 855GME chipset, 1 socket for SO-DIMM DDR module.	931
5PC600.X855-04	CPU board Intel® Celeron® M, 600 MHz, 400 MHz PSB, 512 kB L2 cache, 855GME chipset, 1 socket for SO-DIMM DDR module.	931
5PC600.X855-05	CPU board Intel® Celeron® M, 1000 MHz, 400 MHz PSB, 512 kB L2 cache, 855GME chipset, 1 socket for SO-DIMM DDR module.	931
5MMDDR.0256-00	SO-DIMM DDR SDRAM, 256 MB PC2700	931
5MMDDR.0512-00	SO-DIMM DDR SDRAM, 512 MB PC2700	931

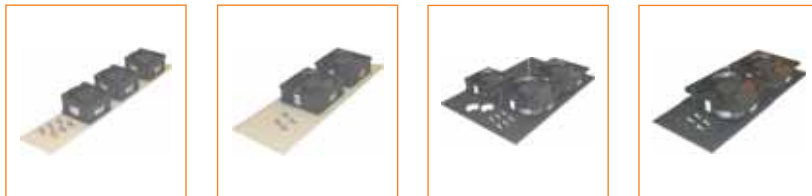
Model number	Short description	
5MMDDR.1024-00	SO-DIMM DDR SDRAM, 1024 MB PC2700	931
5AC600.HS01-01	APC620 heat sink for CPU boards with Celeron® M 600 MHz, Celeron® M 1000 MHz, Pentium® M 1100 MHz, Pentium® M 1400 MHz	931
5AC600.HS01-02	APC620 heat sink for CPU boards with Pentium® M 1600 MHz, Pentium® M 1800 MHz	931
5AC600.HS02-01	APC620 heat sink for CPU boards with Celeron® M 600 MHz, Celeron® M 1000 MHz, Pentium® M 1100 MHz, Pentium® M 1400 MHz, for system unit 5PC600.SF03-00	931
5AC600.HS02-02	APC620 heat sink for CPU boards with Pentium® M 1600 MHz, Pentium® M 1800 MHz, for system unit 5PC600.SF03-00	931
5AC600.HS03-01	APC620 embedded heat sink for CPU boards with Celeron® M 600 MHz, Celeron® M 1000 MHz, Pentium® M 1100 MHz, Pentium® M 1400 MHz.	931

Drives



Model number	Short description
5AC600.HDDI-05	40 GB hard disk (add-on), 24/7 operation, with expanded temperature range
5AC600.HDDI-06	80 GB hard disk (add-on), 24/7 operation, with expanded temperature range
5AC600.CFSI-00	CompactFlash slot (add-on)
5AC600.CFSS-00	Dual CompactFlash slot (slide-in) (1 x IDE, 1 x USB 2.0)
5AC600.HDDS-02	40 GB hard disk (slide-in), 24/7 operation, with expanded temperature range
5AC600.DVRS-00	DVD-R/RW DVD+R/RW drive (slide-in)
5AC600.DVDS-00	DVD-ROM/CD-RW drive (slide-in)
5AC600.CDXS-00	CD-ROM drive (slide-in)
5AC600.FDDS-00	FDD drive (slide-in)
5ACPCI.RAIC-03	PCI RAID system SATA 2x160 GB (controller and 2x hard disk)
5ACPCI.RAIC-04	Replacement SATA-HDD 160 GB

Fan kits



Model number	Short description
5PC600.FA01-00	APC620 fan kit for system units with 1 PCI slot
5PC600.FA02-00	APC620 fan kit for system units with 2 PCI slots
5PC600.FA03-00	APC620 fan kit for system units with 3 PCI slots
5PC600.FA05-00	APC620 fan kit for system units with 5 PCI slots

Product overview

Automation Panel link transmitter



Model number	Short description
5AC600.SDL0-00	APC620 Smart Display Link transmitter For connecting Automation Panels to an APC620 via SDL (not for APC620 embedded).

Accessories



Model number	Short description
5AC900.1000-00	Adapter DVI (plug) to CRT (socket), for connecting a standard monitor to a DVI-I interface.
5AC600.ICOV-00	Interface covers for APC620 or Panel PC; 5 pcs.
5AC600.CANI-00	CAN interface, for installation in an APC620 or Panel PC. (not for APC620 embedded)
5AC600.485I-00	RS232/422/485 interface, for installation in an APC620 or Panel PC.
5AC600.UPSI-00	Uninterruptible Power Supply for APC620
5AC600.UPSB-00	Battery unit
5CAUPS.0005-00	0.5 m APC620 UPS cable
5CAUPS.0030-00	3 m APC620 UPS cable
5AC600.SRAM-00	512 KB SRAM module for APC620 and PPC700 (not for APC620 embedded)
5AC600.FA01-00	APC620 replacement fan filter, for 1 PCI system units. 5 pieces.
5AC600.FA02-00	APC620 replacement fan filter, for 2 PCI system units. 5 pieces.
5AC600.FA03-00	APC620 replacement fan filter, for 3 PCI system units. 5 pieces.
5AC600.FA05-00	APC620 replacement fan filter, for 5 PCI system units. 5 pieces.



System units



	5PC600.SE00-00	5PC600.SE00-01	5PC600.SE00-02
COM1 / COM2	RS232	RS232	RS232
Design	9-pin DSUB plug	9-pin DSUB plug	9-pin DSUB plug
Max. baud rate	115 kBit/s	115 kBit/s	115 kBit/s
USB	4 x USB 2.0 connection type A	4 x USB 2.0 connection type A	4 x USB 2.0 connection type A
Panel/Monitor interface	SDL/DVI/monitor	Monitor	SDL/ DVI/ Monitor
Design	DVI-I socket	DVI-I socket	DVI-I socket
Keyboard/Mouse	USB	USB	USB
AC97 sound	-	-	-
CompactFlash slot 1	Integrated (type I)	Integrated (type I)	Integrated (type I)
CompactFlash slot 2 ¹	Integrated (type I)	Integrated (type I)	Integrated (type I)
Hard disk ¹	-	-	-
Ethernet	1 x 10/100 MBit/s	1 x 10/100 MBit/s	1 x 10/100 MBit/s
PCI slots (half-size)	0	0	0
PCI slots (full-size)	0	0	0
SRAM	512 KB onboard	512 KB onboard	1024 KB onboard
X2X Link master	1	1	1
Ethernet POWERLINK	1	1	1
CAN	1	1	1
Automation Panel link slot	-	-	-
Battery	Lithium, 950 mAh	Lithium, 950 mAh	Lithium, 950 mAh
Real-time clock	√	√	√
Dongle port	√	√	√
Reset button	√	√	√
Power button	√	√	√
Housing fan inserts	-	-	-
Slot for optional drives	-	-	-
APC620 UPS module	Optional	Optional	Optional
Power supply	24 VDC +/- 25%	24 VDC +/- 25%	24 VDC +/- 25%
Power supply buffering	10 ms	10 ms	10 ms

1) Either a 2nd CompactFlash slot or a hard disk can be installed at the factory (not for APC620 embedded).

Accessories

Model number	Short description	
0TB103.9	Plug, terminal block 3-pin, screw clamps 3.31 mm ²	1131
0TB103.91	Plug, terminal block 3-pin, cage clamps 3.31 mm ²	1131
	3V lithium batteries	1128
	CompactFlash cards	1126
	Accessories	1123
5SWUTI.0000-00	Nero CD-RW OEM software. Only available with a CD-RW drive.	1121



	5PC600.SX01-00	5PC600.SX02-00	5PC600.SX02-01
COM1 / COM2	RS232	RS232	RS232
Design	9-pin DSUB plug	9-pin DSUB plug	9-pin DSUB plug
Max. baud rate	115 kBit/s	115 kBit/s	115 kBit/s
USB	2 x USB 2.0 connection type A	2 x USB 2.0 connection type A	2 x USB 2.0 connection type A
Panel/Monitor interface	SDL/DVI/monitor	SDL/DVI/monitor	SDL/DVI/monitor
Design	DVI-I socket	DVI-I socket	DVI-I socket
Keyboard/Mouse	PS/2 (combined)	PS/2 (combined)	PS/2 (combined)
AC97 sound	Mic., line in, line out	Mic., line in, line out	Mic., line in, line out
CompactFlash slot 1	Integrated (type I)	Integrated (type I)	Integrated (type I)
CompactFlash slot 2 ¹	Optional (type I)	Optional (type I)	Optional (type I)
Hard disk ¹	Optional	Optional	Optional
Ethernet	2 x 10/100 Mbit/s	2 x 10/100 Mbit/s	2 x 10/100 Mbit/s
PCI slots (half-size)	1	2	2
PCI slots (full-size)	0	0	0
SRAM	512 KB optional	512 KB optional	512 KB optional
X2X Link master	-	-	-
Ethernet POWERLINK	-	-	-
CAN	Optional	Optional	Optional
Automation Panel link slot	-	√	-
Battery	Lithium, 950 mAh	Lithium, 950 mAh	Lithium, 950 mAh
Real-time clock	√	√	√
Dongle port	√	√	√
Reset button	√	√	√
Power button	√	√	√
Housing fan inserts	√	√	√
Slot for optional drives	-	1	1
APC620 UPS module	Optional	Optional	Optional
Power supply	24 VDC +/- 25%	24 VDC +/- 25%	24 VDC +/- 25%
Power supply buffering	10 ms	10 ms	10 ms

1) Either a 2nd CompactFlash slot or a hard disk can be installed at the factory.

Accessories

Model number	Short description	
0TB103.9	Plug, terminal block 3-pin, screw clamps 3.31 mm ²	1131
0TB103.91	Plug, terminal block 3-pin, cage clamps 3.31 mm ²	1131
	3V lithium batteries	1128
	CompactFlash cards	1126
	Accessories	1123
5SWUTI.0000-00	Nero CD-RW OEM software. Only available with a CD-RW drive.	1121

System units



	5PC600.SF03-00	5PC600.SX05-00	5PC600.SX05-01
COM1 / COM2	RS232	RS232	RS232
Design	9-pin DSUB plug	9-pin DSUB plug	9-pin DSUB plug
Max. baud rate	115 kBit/s	115 kBit/s	115 kBit/s
USB	2 x USB 2.0 connection type A	2 x USB 2.0 connection type A	2 x USB 2.0 connection type A
Panel/Monitor interface	SDL/DVI/monitor	SDL/DVI/monitor	SDL/DVI/monitor
Design	DVI-I socket	DVI-I socket	DVI-I socket
Keyboard/Mouse	PS/2 (combined)	PS/2 (combined)	PS/2 (combined)
AC97 sound	Mic., line in, line out	Mic., line in, line out	Mic., line in, line out
CompactFlash slot 1	Integrated (type I)	Integrated (type I)	Integrated (type I)
CompactFlash slot 2 ¹	Optional (type I)	Optional (type I)	Optional (type I)
Hard disk ¹	Optional	Optional	Optional
Ethernet	2 x 10/100 Mbit/s	2 x 10/100 Mbit/s	2 x 10/100 Mbit/s
PCI slots (half-size)	0	5	5
PCI slots (full-size)	3	0	0
SRAM	512 KB optional	512 KB optional	512 KB optional
X2X Link master	-	-	-
Ethernet POWERLINK	-	-	-
CAN	Optional	Optional	Optional
Automation Panel link slot	√	√	-
Battery	Lithium, 950 mAh	Lithium, 950 mAh	Lithium, 950 mAh
Real-time clock	√	√	√
Dongle port	√	√	√
Reset button	√	√	√
Power button	√	√	√
Housing fan inserts	√	√	√
Slot for optional drives	1	2	2
APC620 UPS module	Optional	Optional	Optional
Power supply	24 VDC +/- 25%	24 VDC +/- 25%	24 VDC +/- 25%
Power supply buffering	10 ms	10 ms	10 ms

1) Either a 2nd CompactFlash slot or a hard disk can be installed at the factory.

Accessories

Model number	Short description	
0TB103.9	Plug, terminal block 3-pin, screw clamps 3.31 mm ²	1131
0TB103.91	Plug, terminal block 3-pin, cage clamps 3.31 mm ²	1131
	3V lithium batteries	1128
	CompactFlash cards	1126
	Accessories	1123
5SWUTI.0000-00	Nero CD-RW OEM software. Only available with a CD-RW drive.	1121



CPU boards

CPU boards Intel® Pentium® M / Celeron® M Intel® 855 GME chipset



Model number	5PC600.X855-00	5PC600.X855-01	5PC600.X855-02
Processor	Intel® Pentium® M 1100 MHz	Intel® Pentium® M 1600 MHz	Intel® Pentium® M 1400 MHz
L2 cache	1 MB	1 MB	2 MB
External bus	400 MHz	400 MHz	400 MHz
Memory socket	1 x SO-DIMM DDR 333 MHz	1 x SO-DIMM DDR 333 MHz	1 x SO-DIMM DDR 333 MHz
BIOS	AMI	AMI	AMI
Chipset	Intel® 855GME	Intel® 855GME	Intel® 855GME
Graphics	Chipset graphics	Chipset graphics	Chipset graphics
Memory	Max. 64 MB video RAM ¹⁾	Max. 64 MB video RAM ¹⁾	Max. 64 MB video RAM ¹⁾
Resolution	Max. UXGA	Max. UXGA	Max. UXGA

¹⁾ Allocated in main memory

CPU boards Intel® Pentium® M / Celeron® M Intel® 855 GME chipset



Model number	5PC600.X855-03	5PC600.X855-04	5PC600.X855-05
Processor	Intel® Pentium® M 1800 MHz	Intel® Celeron® M 600 MHz	Intel® Celeron® M 1000 MHz
L2 cache	2 MB	512 kB	512 kB
External bus	400 MHz	400 MHz	400 MHz
Memory socket	1 x SO-DIMM DDR 333 MHz	1 x SO-DIMM DDR 333 MHz	1 x SO-DIMM DDR 333 MHz
BIOS	AMI	AMI	AMI
Chipset	Intel® 855GME	Intel® 855GME	Intel® 855GME
Graphics	Chipset graphics	Chipset graphics	Chipset graphics
Memory	Max. 64 MB video RAM ¹	Max. 64 MB video RAM ¹	Max. 64 MB video RAM ¹
Resolution	Max. UXGA	Max. UXGA	Max. UXGA

1) Allocated in main memory.

Accessories



Model number	Short description
5AC600.HS01-01	APC620 heat sink for CPU boards with Celeron® M 600 MHz, Celeron® M 1000, Pentium® M 1100 MHz, Pentium® M 1400 MHz
5AC600.HS01-02	APC620 heat sink for CPU boards with Pentium® M 1600 MHz, Pentium® M 1800 MHz
5AC600.HS02-01	APC620 heat sink for CPU boards with Celeron® M 600 MHz, Celeron® M 1000 MHz, Pentium® M 1100 MHz, Pentium® M 1400 MHz, for system unit 5PC600.SF03-00
5AC600.HS02-02	APC620 heat sink for CPU boards with Pentium® M 1600 MHz, Pentium® M 1800 MHz, for system unit 5PC600.SF03-00
5AC600.HS03-01	APC620 embedded heat sink for CPU boards with Celeron® M 600 MHz, Celeron® M 1000 MHz, Pentium® M 1100 MHz, Pentium® M 1400 MHz.
5MMDDR.0256-00	SO-DIMM DDR SDRAM, 256 MB PC2700
5MMDDR.0512-00	SO-DIMM DDR SDRAM, 512 MB PC2700
5MMDDR.1024-00	SO-DIMM DDR SDRAM, 1024 MB PC2700

1) Allocated in main memory.

Display links

Monitor via DVI/ CRT adapter

A monitor (via adapter) or a DVI monitor with max. SXGA resolution is connected to the integrated DVI interface.



Possible combinations

	5PC600.X855-00	5PC600.X855-01	5PC600.X855-02	5PC600.X855-03	5PC600.X855-04	5PC600.X855-05
5PC600.SE00-02	✓	-	✓	-	✓	✓
5PC600.SE00-01	✓	-	✓	-	✓	✓
5PC600.SE00-00	✓	-	✓	-	✓	✓
5PC600.SX01-00	✓	✓	✓	✓	✓	✓
5PC600.SX02-00	✓	✓	✓	✓	✓	✓
5PC600.SX02-01	✓	✓	✓	✓	✓	✓
5PC600.SF03-00	✓	✓	✓	✓	✓	✓
5PC600.SX05-00	✓	✓	✓	✓	✓	✓
5PC600.SX05-01	✓	✓	✓	✓	✓	✓

Component overview

System units

	Slot for link modules	PCI slots
5PC600.SE00-00	-	0
5PC600.SE00-02	-	0
5PC600.SX01-00	-	1
5PC600.SX02-01	-	2
5PC600.SX02-00	✓	2
5PC600.SF03-00	✓	3
5PC600.SX05-01	-	5
5PC600.SX05-00	✓	5

CPU boards

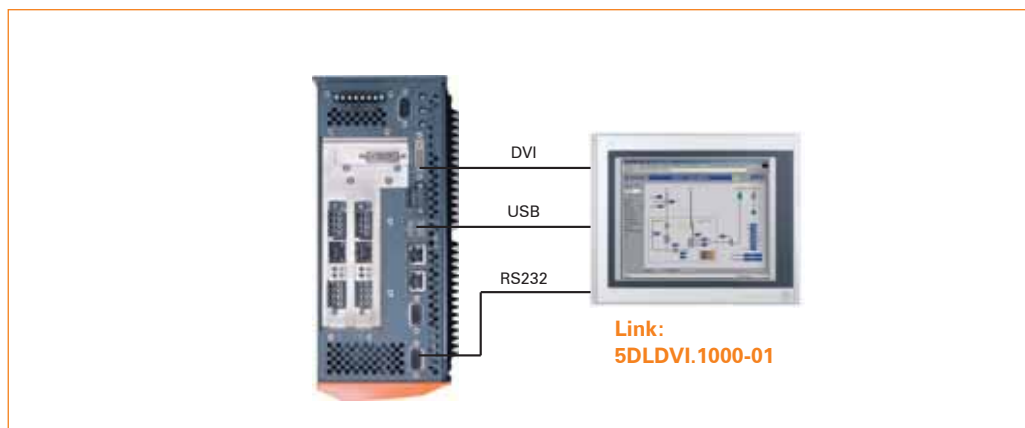
	Chipset	Processor	Resolution
5PC600.X855-00	Intel® 855GME	Pentium® M 1100 MHz	Max. UXGA
5PC600.X855-01	Intel® 855GME	Pentium® M 1600 MHz	Max. UXGA
5PC600.X855-02	Intel® 855GME	Pentium® M 1400 MHz	Max. UXGA
5PC600.X855-03	Intel® 855GME	Pentium® M 1800 MHz	Max. UXGA
5PC600.X855-04	Intel® 855GME	Celeron® M 600 MHz	Max. UXGA
5PC600.X855-05	Intel® 855GME	Celeron® M 1000 MHz	Max. UXGA

Accessories

	Type
5AC900.1000-00	DVI - CRT adapter

Automation Panel via DVI

An Automation Panel with max. SXGA resolution is connected to the integrated DVI interface. As an alternative, an office TFT with a DVI interface can also be operated. A separate cable is used for the touch screen and USB.



Possible combinations

	5PC600.X855-00	5PC600.X855-01	5PC600.X855-02	5PC600.X855-03	5PC600.X855-04	5PC600.X855-05
5PC600.SE00-02	√	-	√	-	√	√
5PC600.SE00-01	-	-	-	-	-	-
5PC600.SE00-00	√	-	√	-	√	√
5PC600.SX01-00	√	√	√	√	√	√
5PC600.SX02-00	√	√	√	√	√	√
5PC600.SX02-01	√	√	√	√	√	√
5PC600.SF03-00	√	√	√	√	√	√
5PC600.SX05-00	√	√	√	√	√	√
5PC600.SX05-01	√	√	√	√	√	√

Component overview

System units

	Slot for link modules	PCI slots
5PC600.SE00-00	-	0
5PC600.SE00-02	-	0
5PC600.SX01-00	-	1
5PC600.SX02-01	-	2
5PC600.SX02-00	√	2
5PC600.SF03-00	√	3
5PC600.SX05-01	-	5
5PC600.SX05-00	√	5

CPU boards

	Chipset	Processor	Resolution
5PC600.X855-00	Intel® 855GME	Pentium® M 1100 MHz	Max. UXGA
5PC600.X855-01	Intel® 855GME	Pentium® M 1600 MHz	Max. UXGA
5PC600.X855-02	Intel® 855GME	Pentium® M 1400 MHz	Max. UXGA
5PC600.X855-03	Intel® 855GME	Pentium® M 1800 MHz	Max. UXGA
5PC600.X855-04	Intel® 855GME	Celeron® M 600 MHz	Max. UXGA
5PC600.X855-05	Intel® 855GME	Celeron® M 1000 MHz	Max. UXGA

Cables

	Type	Length
5CADVI.0018-00	DVI	1.8 m
5CADVI.0050-00	DVI	5 m
5CADVI.0100-00	DVI	10 m ¹
9A0014.02	Touch screen	1.8 m
9A0014.05	Touch screen	5 m
9A0014.10	Touch screen	10 m ¹
5CAUSB.0018-00	USB	1.8 m
5CAUSB.0050-00	USB	5 m

Automation Panel link module

Type	
5DL DVI.1000-01	DVI receiver

Automation Panel 900

	Diagonal	Max. resolution	Touch screen	USB	Max. segment length
5AP920.1214-01	12.1"	SVGA	√	√	5 m / 10 m ¹
5AP920.1043-01	10.4"	VGA	√	√	5 m / 10 m ¹
5AP920.1505-01	15.0"	XGA	√	√	5 m / 10 m ¹
5AP920.1706-01	17.0"	SXGA	√	√	5 m / 10 m ¹
5AP920.1906-01	19.0"	SXGA	√	√	5 m / 10 m ¹

¹⁾ USB is limited to 5 m

Display links

Up to four Automation Panels via SDL on one line

An Automation Panel is connected to the integrated SDL interface via an SDL cable. Up to three other Automation Panels of the same type are connected to this Automation Panel and operated via SDL. All four displays show the same content.



Possible combinations

	5PC600.X855-00	5PC600.X855-01	5PC600.X855-02	5PC600.X855-03	5PC600.X855-04	5PC600.X855-05
5PC600.SE00-02	✓	-	✓	-	✓	✓
5PC600.SE00-01	-	-	-	-	-	-
5PC600.SE00-00	✓	-	✓	-	✓	✓
5PC600.SX01-00	✓	✓	✓	✓	✓	✓
5PC600.SX02-00	✓	✓	✓	✓	✓	✓
5PC600.SX02-01	✓	✓	✓	✓	✓	✓
5PC600.SF03-00	✓	✓	✓	✓	✓	✓
5PC600.SX05-00	✓	✓	✓	✓	✓	✓
5PC600.SX05-01	✓	✓	✓	✓	✓	✓

Component overview

System units

	Slot for link modules	PCI slots
5PC600.SE00-00	-	0
5PC600.SE00-02	-	0
5PC600.SX01-00	-	1
5PC600.SX02-01	-	2
5PC600.SX02-00	✓	2
5PC600.SF03-00	✓	3
5PC600.SX05-01	-	5
5PC600.SX05-00	✓	5

CPU boards

	Chipset	Processor	Resolution
5PC600.X855-00	Intel® 855GME	Pentium® M 1100 MHz	Max. UXGA
5PC600.X855-01	Intel® 855GME	Pentium® M 1600 MHz	Max. UXGA
5PC600.X855-02	Intel® 855GME	Pentium® M 1400 MHz	Max. UXGA
5PC600.X855-03	Intel® 855GME	Pentium® M 1800 MHz	Max. UXGA
5PC600.X855-04	Intel® 855GME	Celeron® M 600 MHz	Max. UXGA
5PC600.X855-05	Intel® 855GME	Celeron® M 1000 MHz	Max. UXGA

SDL cables

See AP900 SDL cable section	1087
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Automation Panel link module

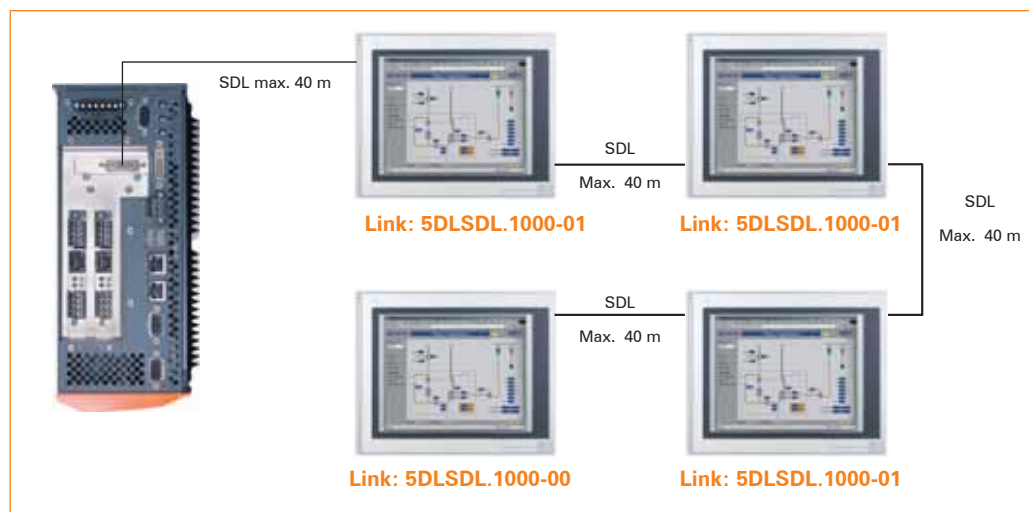
	Type
5DLSDL.1000-00	SDL receiver
5DLSDL.1000-01	SDL transceiver

Automation Panel 900

Display	Diagonal	Resolution	Touch screen	Keys	Max. SDL segment length w/o extender	Max. SDL segment length w/ extender
5AP920.1043-01	10.4"	VGA	✓	-	30	40
5AP980.1043-01	10.4"	VGA	✓	✓	30	40
5AP981.1043-01	10.4"	VGA	✓	✓	30	40
5AP982.1043-01	10.4"	VGA	✓	✓	30	40
5AP920.1214-01	12.1"	SVGA	✓	-	30	40
5AP920.1505-01	15.0"	XGA	✓	-	25	40
5AP980.1505-01	15.0"	XGA	✓	✓	25	40
5AP981.1505-01	15.0"	XGA	✓	✓	25	40
5AP920.1706-01	17.0"	SXGA	✓	-	20	40
5AP920.1906-01	19.0"	SXGA	✓	-	20	40

Up to four Automation Panels via SDL (optional) on one line

An Automation Panel is connected to the optional SDL transmitter via an SDL cable. Three other Automation Panels of the same type are connected to this Automation Panel and operated via SDL. All displays show the same content.



Possible combinations

	5PC600.X855-00	5PC600.X855-01	5PC600.X855-02	5PC600.X855-03	5PC600.X855-04	5PC600.X855-05
5PC600.SE00-01	-	-	-	-	-	-
5PC600.SE00-00	-	-	-	-	-	-
5PC600.SX01-00	-	-	-	-	-	-
5PC600.SX02-00	√	√	√	√	√	√
5PC600.SX02-01	-	-	-	-	-	-
5PC600.SF03-00	√	√	√	√	√	√
5PC600.SX05-00	√	√	√	√	√	√
5PC600.SX05-01	-	-	-	-	-	-

Component overview

System units

	Slot for Link modules	PCI slots
5PC600.SX02-00	√	2
5PC600.SF03-00	√	3
5PC600.SX05-00	√	5

CPU boards

	Chipset	Processor	Resolution
5PC600.X855-00	Intel® 855GME	Pentium® M 1100 MHz	Max. UXGA
5PC600.X855-01	Intel® 855GME	Pentium® M 1600 MHz	Max. UXGA
5PC600.X855-02	Intel® 855GME	Pentium® M 1400 MHz	Max. UXGA
5PC600.X855-03	Intel® 855GME	Pentium® M 1800 MHz	Max. UXGA
5PC600.X855-04	Intel® 855GME	Celeron® M 600 MHz	Max. UXGA
5PC600.X855-05	Intel® 855GME	Celeron® M 1000 MHz	Max. UXGA

SDL cables

See AP900 SDL cable section	1087
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Automation Panel link module

	Type
5DLSDL.1000-00	SDL receiver
5DLSDL.1000-01	SDL transceiver

Link module APC620

	Type
5AC600.SDL0-00	SDL transmitter

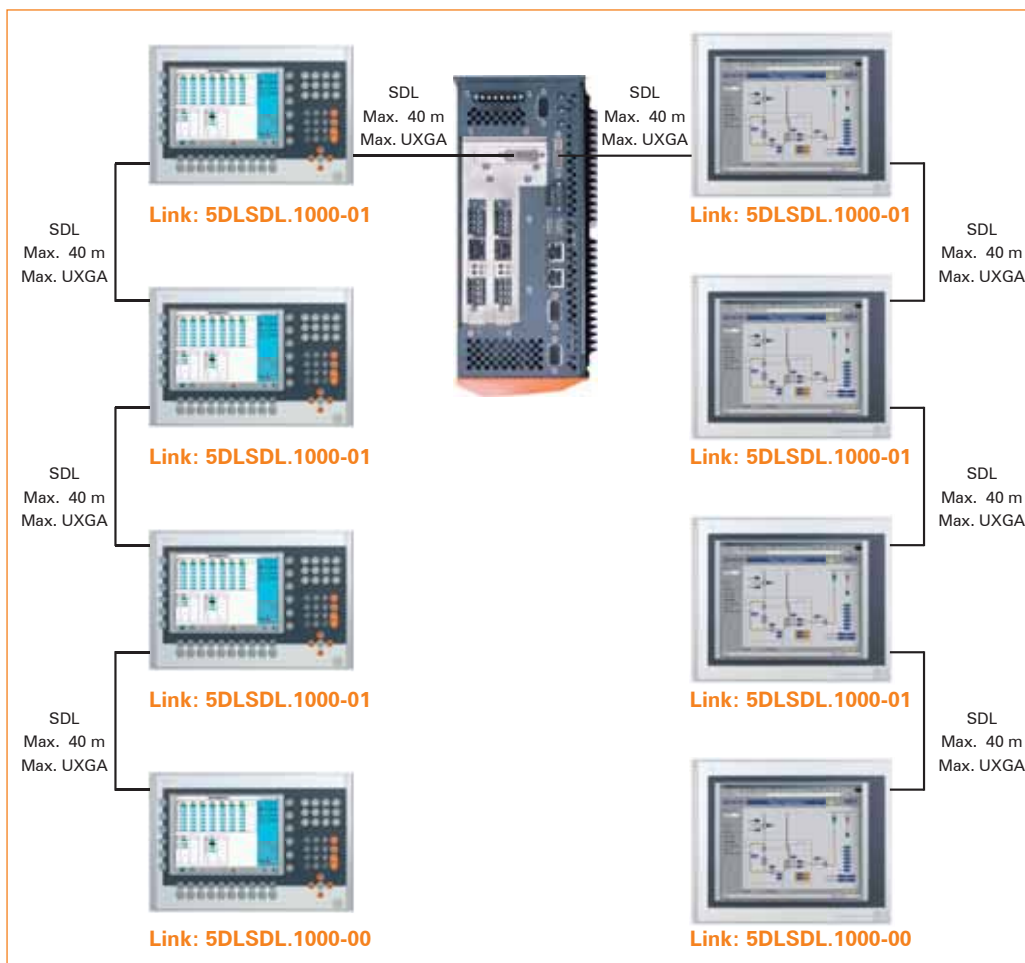
Automation Panel 900

Display	Diagonal	Resolution	Touch screen	Keys	Max. segment length SDL w/o extender	Max. segment length SDL w/ extender
5AP920.1043-01	10.4"	VGA	√	-	30	40
5AP980.1043-01	10.4"	VGA	√	√	30	40
5AP981.1043-01	10.4"	VGA	√	√	30	40
5AP982.1043-01	10.4"	VGA	√	√	30	40
5AP920.1214-01	12.1"	SVGA	√	-	30	40
5AP920.1505-01	15.0"	XGA	√	-	25	40
5AP980.1505-01	15.0"	XGA	√	√	25	40
5AP981.1505-01	15.0"	XGA	√	√	25	40
5AP920.1706-01	17.0"	SXGA	√	-	20	40
5AP920.1906-01	19.0"	SXGA	√	-	20	40

Display links

Up to eight Automation Panels via SDL and SDL (optional)

Up to four Automation Panels (max. UXGA) are connected to the integrated SDL interface via an SDL cable. Four additional Automation Panels (max. UXGA) are connected to the optional SDL transmitter. The Automation Panels in each line must be the same type. The two lines display different content, but displays in the same line show the same content.



Possible combinations

	5PC600.X855-00	5PC600.X855-01	5PC600.X855-02	5PC600.X855-03	5PC600.X855-04	5PC600.X855-05
5PC600.SE00-01	-	-	-	-	-	-
5PC600.SE00-00	-	-	-	-	-	-
5PC600.SX01-00	-	-	-	-	-	-
5PC600.SX02-00	✓	✓	✓	✓	✓	✓
5PC600.SX02-01	-	-	-	-	-	-
5PC600.SF03-00	✓	✓	✓	✓	✓	✓
5PC600.SX05-00	✓	✓	✓	✓	✓	✓
5PC600.SX05-01	-	-	-	-	-	-

Component overview

System units

	Slot for link modules	PCI slots
5PC600.SX02-00	√	2
5PC600.SF03-00	√	3
5PC600.SX05-00	√	5

SDL cables

See AP900 SDL cable section [1087](#)

CPU boards

	Chipset	Processor	Resolution
5PC600.X855-00	Intel® 855GME	Pentium® M 1100 MHz	Max. UXGA
5PC600.X855-01	Intel® 855GME	Pentium® M 1600 MHz	Max. UXGA
5PC600.X855-02	Intel® 855GME	Pentium® M 1400 MHz	Max. UXGA
5PC600.X855-03	Intel® 855GME	Pentium® M 1800 MHz	Max. UXGA
5PC600.X855-04	Intel® 855GME	Celeron® M 600 MHz	Max. UXGA
5PC600.X855-05	Intel® 855GME	Celeron® M 1000 MHz	Max. UXGA

Automation Panel link module

	Type
5DLSDL.1000-00	SDL receiver
5DLSDL.1000-01	SDL transceiver

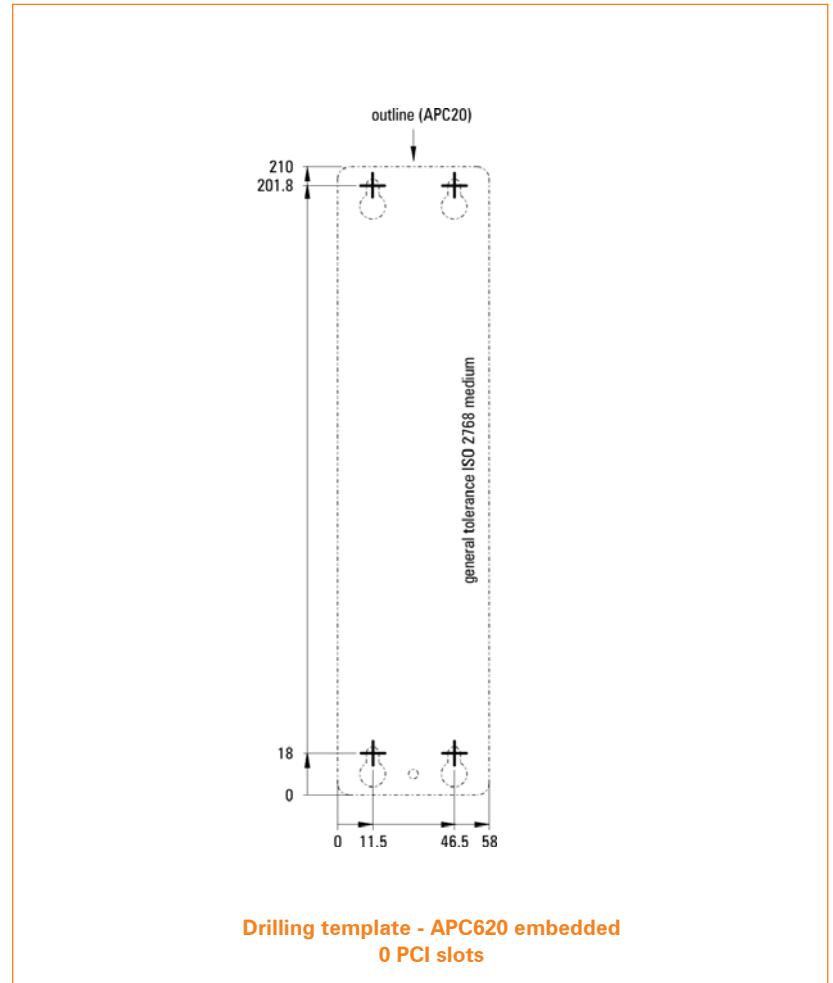
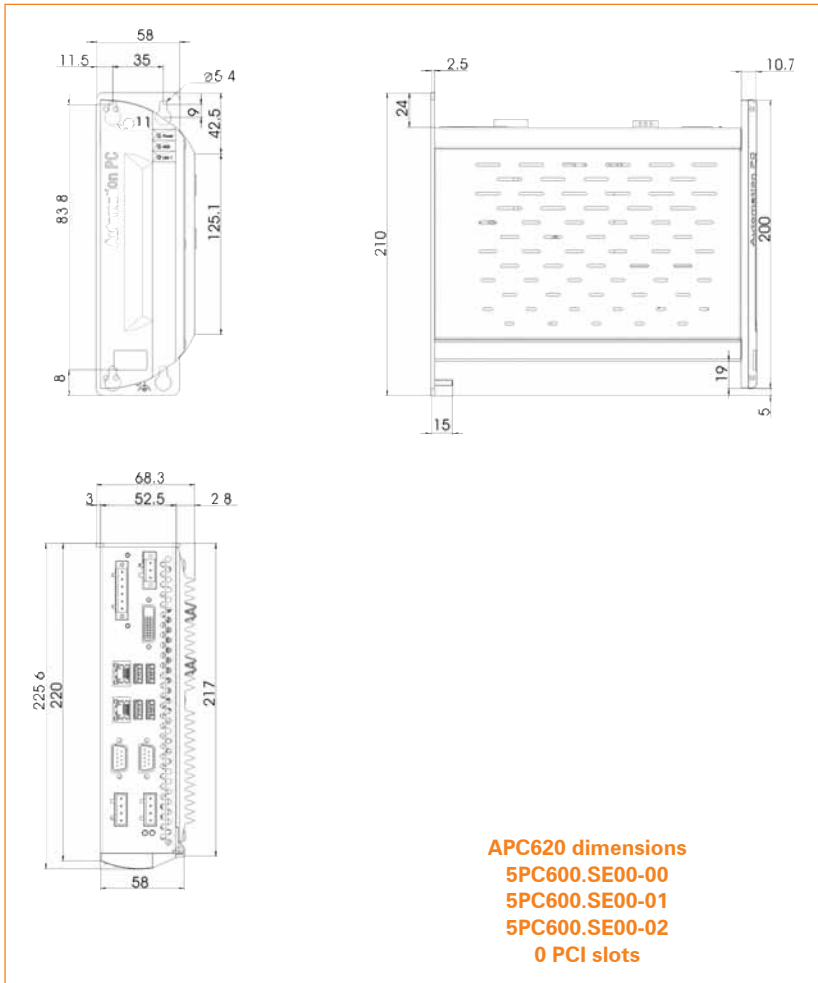
Link module APC620

	Type
5AC600.SDL0-00	SDL transmitter

Automation Panel 900

Display	Diagonal	Resolution	Touch screen	Keys	Max. SDL segment length w/o extender	Max. SDL segment length w/ extender
5AP920.1043-01	10.4"	VGA	√	-	30	40
5AP980.1043-01	10.4"	VGA	√	√	30	40
5AP981.1043-01	10.4"	VGA	√	√	30	40
5AP982.1043-01	10.4"	VGA	√	√	30	40
5AP920.1214-01	12.1"	SVGA	√	-	30	40
5AP920.1505-01	15.0"	XGA	√	-	25	40
5AP980.1505-01	15.0"	XGA	√	√	25	40
5AP981.1505-01	15.0"	XGA	√	√	25	40
5AP920.1706-01	17.0"	SXGA	√	-	20	40
5AP920.1906-01	19.0"	SXGA	√	-	20	40

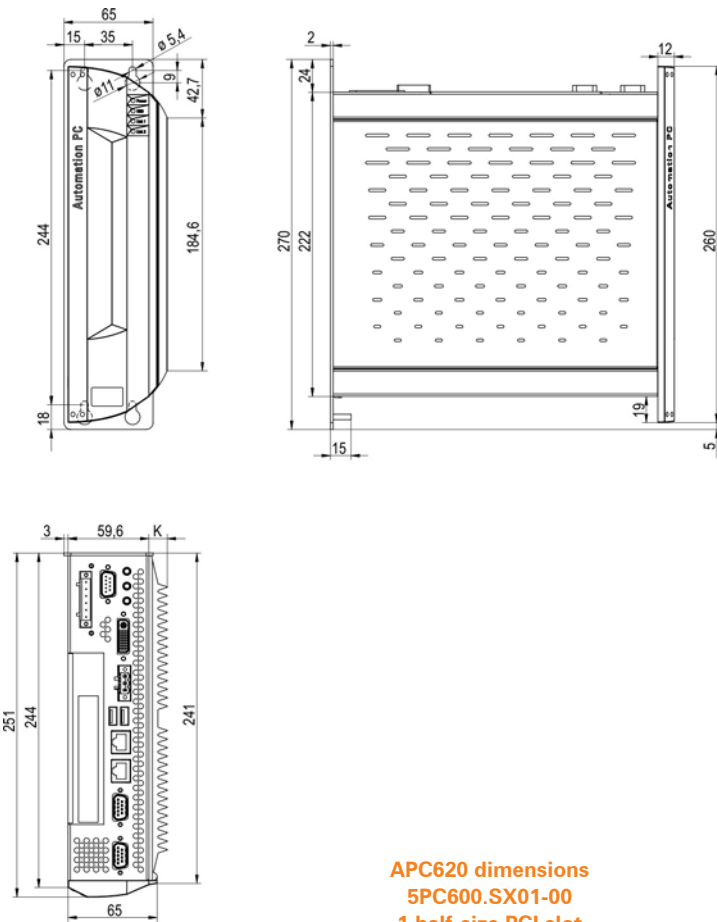
Dimensions



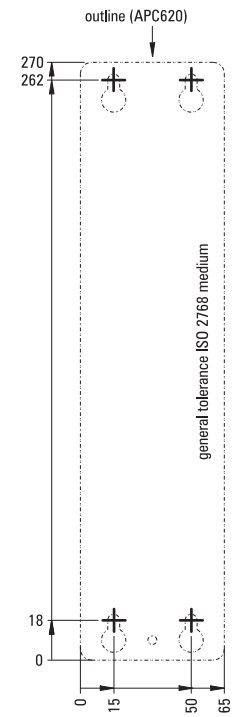
Heat sink dimensions

Heat sink	Short description	K
5AC600.HS03-01	APC620 embedded heat sink for CPU boards with Celeron® M 600 MHz, Celeron® M 1000 MHz, Pentium® M 1100 MHz, Pentium® M 1400 MHz.	12.8 mm

All dimensions in mm



APC620 dimensions
5PC600.SX01-00
1 half-size PCI slot



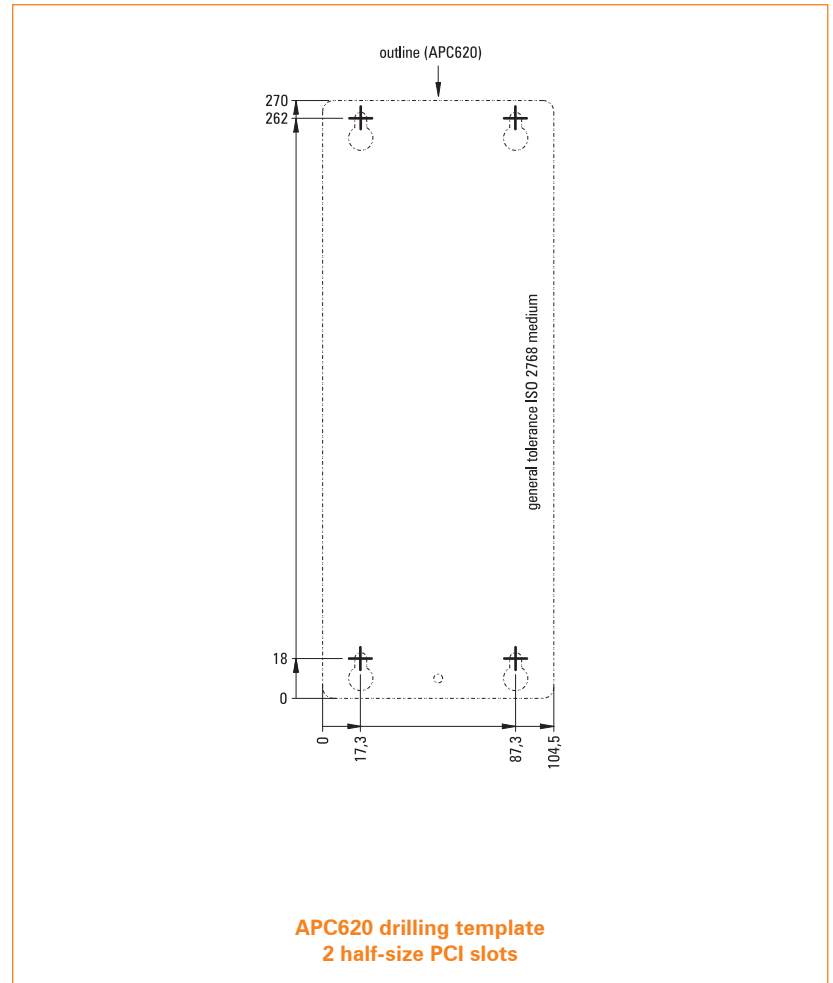
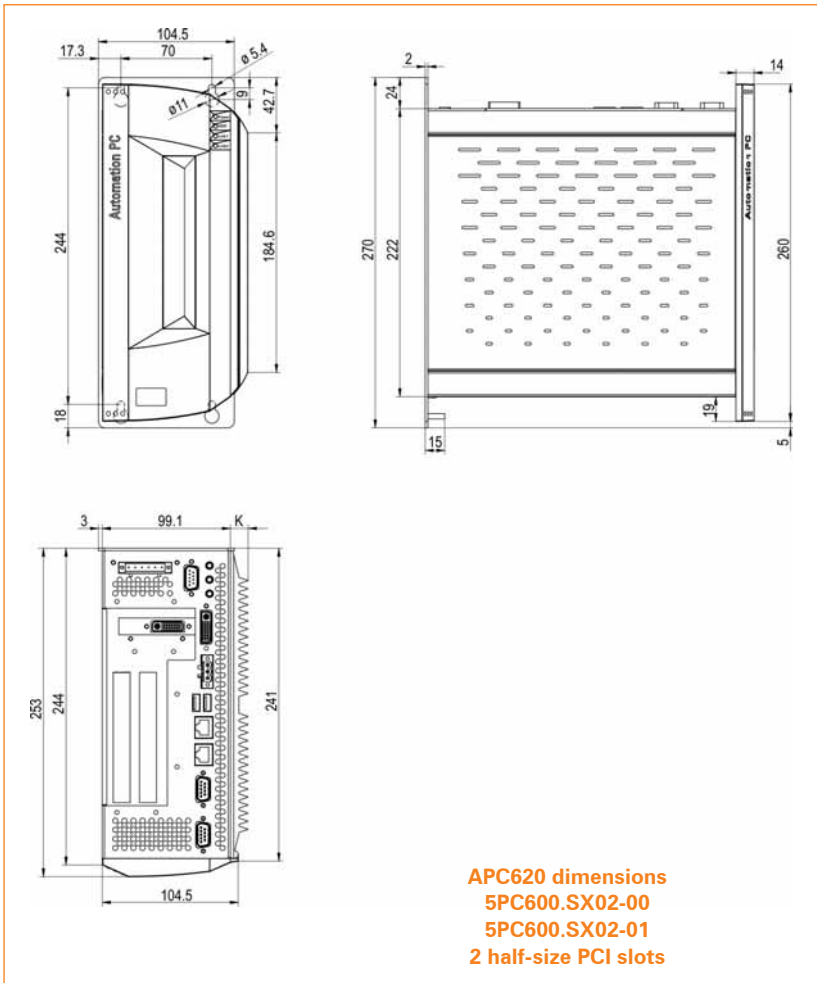
APC620 drilling template
1 half-size PCI slot

Heat sink dimensions

Heat sink	Short description	K
5AC600.HS01-01	APC620 heat sink for CPU boards with Celeron® M 600 MHz, 1000 MHz, Pentium® M 1100 MHz, 1400 MHz.	12.8 mm
5AC600.HS01-02	APC620 heat sink for CPU boards with Pentium® M 1600 MHz, 1800 MHz.	28 mm

All dimensions in mm

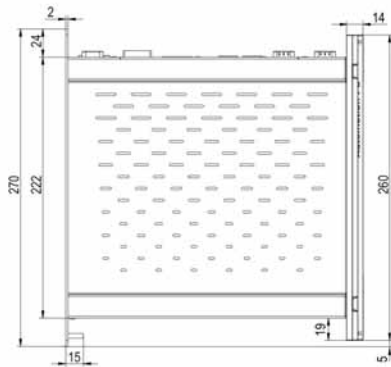
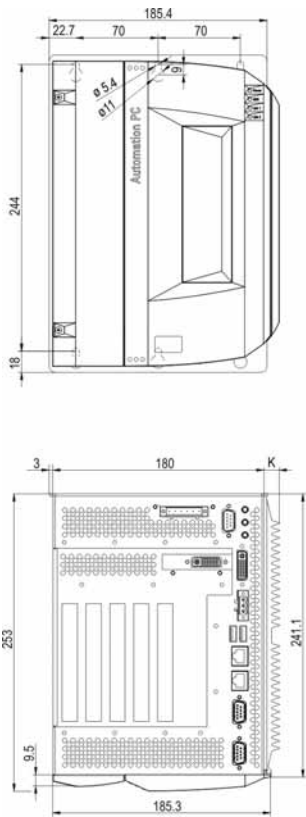
Dimensions



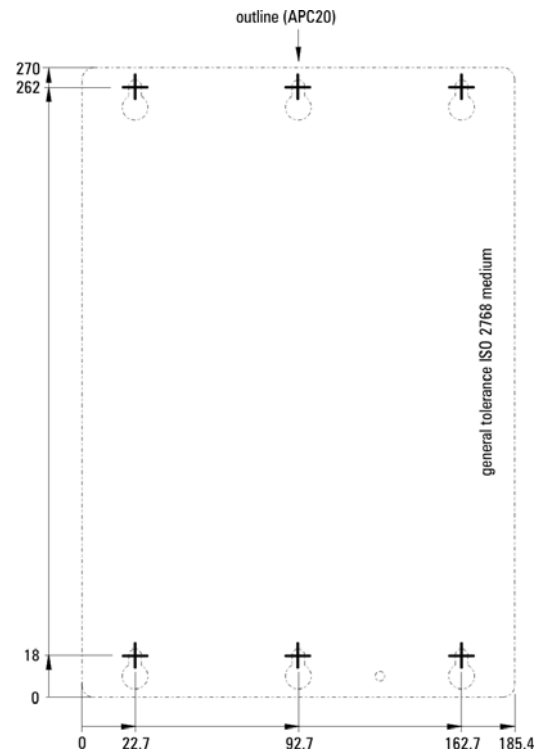
Heat sink dimensions

Heat sink	Short description	K
5AC600.HS01-01	APC620 heat sink for CPU boards with Celeron® M 600 MHz, 1000 MHz, Pentium® M 1100 MHz, 1400 MHz.	12.8 mm
5AC600.HS01-02	APC620 heat sink for CPU boards with Pentium® M 1600 MHz, 1800 MHz.	28 mm

All dimensions in mm



APC620 dimensions
5PC600.SX05-00
5PC600.SX05-01
5 half-size PCI slots



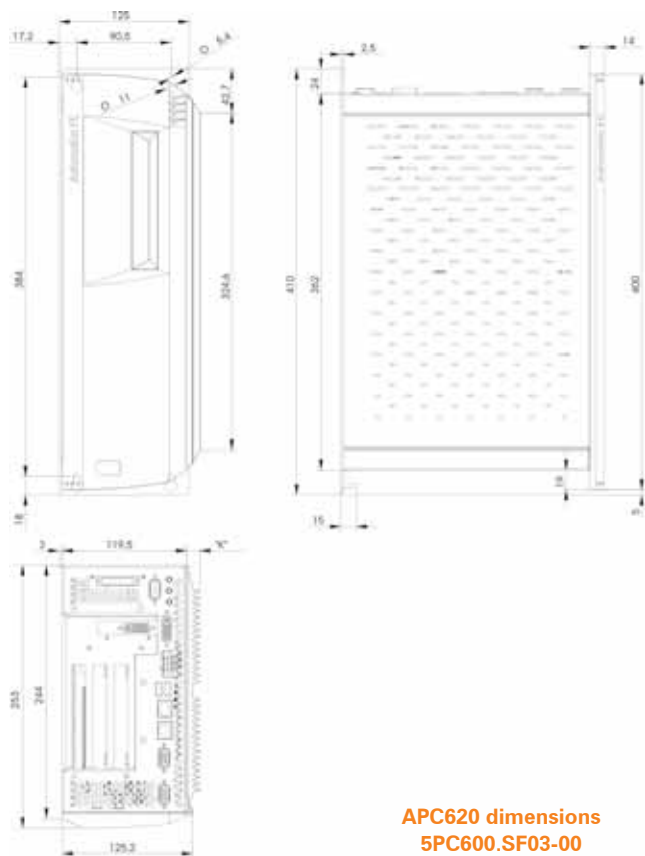
APC620 drilling template
5 half-size PCI slots

Heat sink dimensions

Heat sink	Short description	K
5AC600.HS01-01	APC620 heat sink for CPU boards with Celeron® M 600 MHz, 1000 MHz, Pentium® M 1100 MHz, 1400 MHz.	12.8 mm
5AC600.HS01-02	APC620 heat sink for CPU boards with Pentium® M 1600 MHz, 1800 MHz.	28 mm

All dimensions in mm

Dimensions



APC620 dimensions
5PC600.SF03-00
3 full-size PCI slots

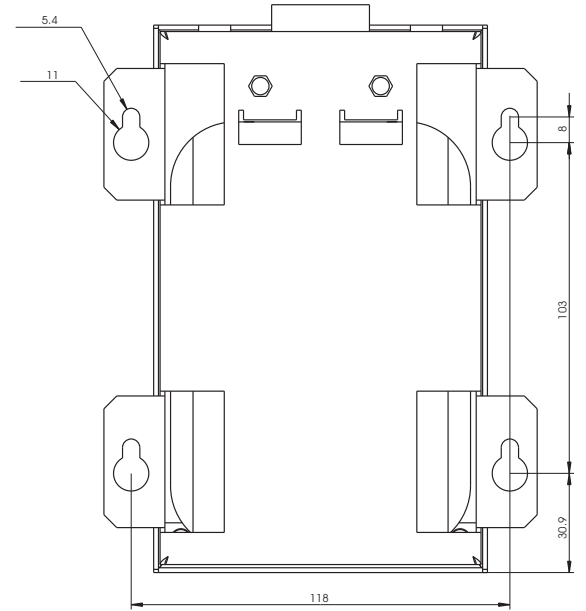
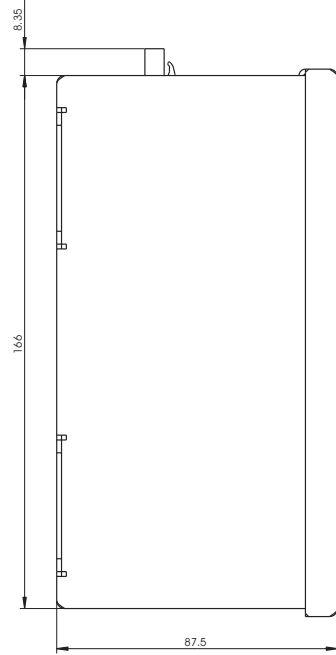
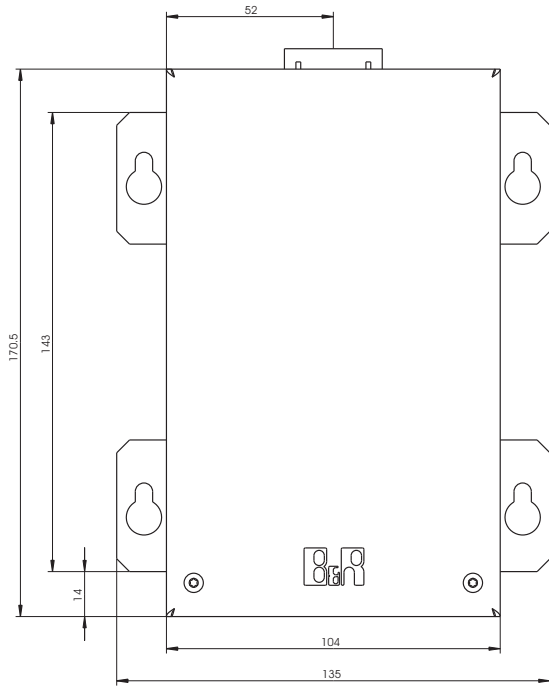


APC620 drilling template
3 full-size PCI slots

Heat sink dimensions

Heat sink	Short description	K
5AC600.HS02-01	APC620 heat sink for CPU boards with Celeron® M 600 MHz, Celeron® M 1000 MHz, Pentium® M 1100 MHz, Pentium® M 1400 MHz, for system unit 5PC600.SF03-00	12.8 mm
5AC600.HS02-02	APC620 heat sink for CPU boards with Pentium® M 1600 MHz, Pentium® M 1800 MHz, for system unit 5PC600.SF03-00	28 mm

All dimensions in mm



**Dimensions
UPS battery unit**

Model number	Short description
5AC600.UPSB-00	Battery unit

All dimensions in mm

Automation PC 810

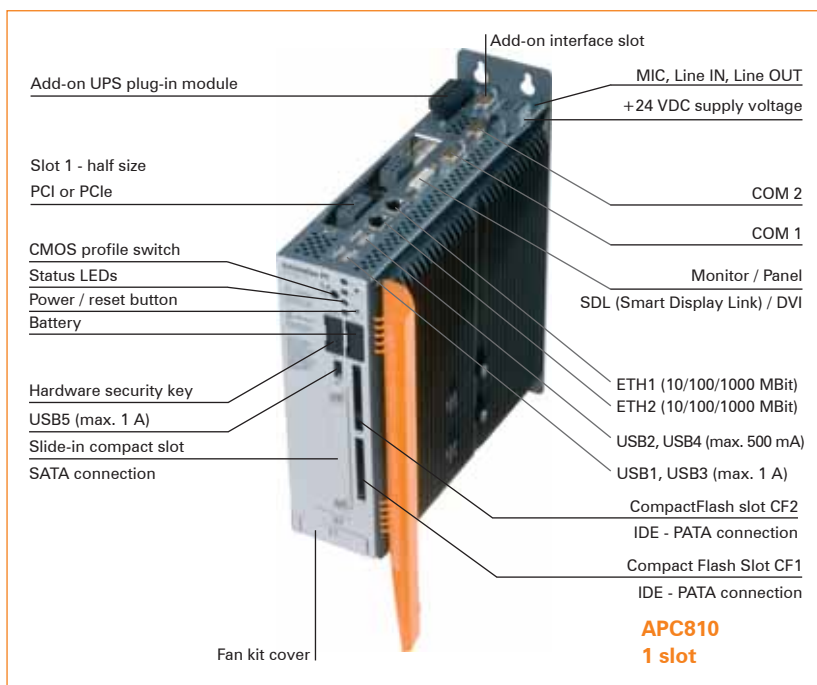
Highest performance with
Intel® Core™ 2 Duo processors



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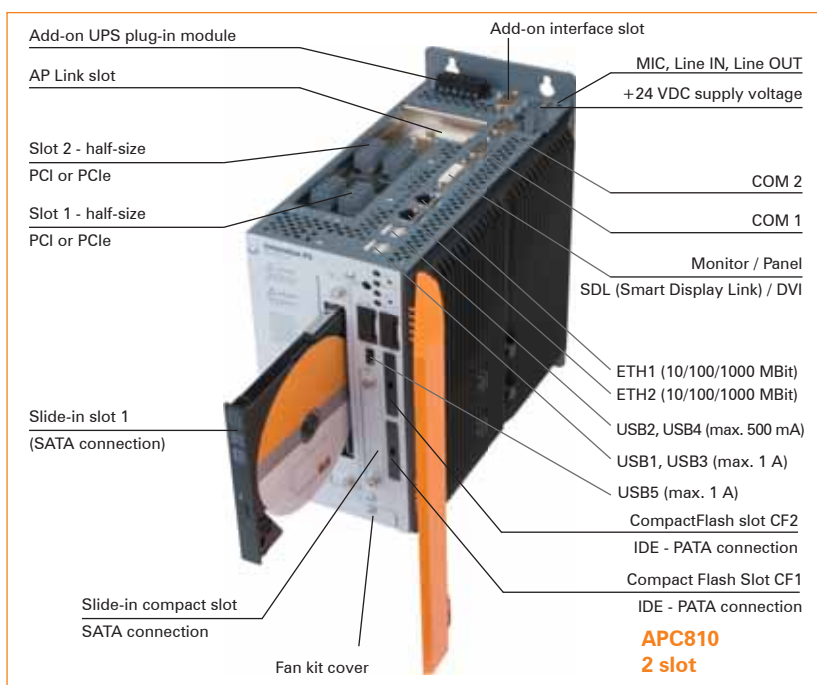
System characteristics	📄	948
Typical topologies	📄	952
Product overview	📄	956
Product data sheets	📄	959
Display links	📄	962
Dimensions	📄	968

System characteristics



Reliability for many years

The APC810 is the sophisticated upgrade to the proven APC620 product series. Based on the latest Intel® Core™2 Duo technology, the APC810 offers the highest level of performance for all applications that require maximum computing power. The highly successful and award-winning APC620 was further developed and given detailed additions and updates to offer innovative solutions for even greater customer satisfaction and easier maintenance. As with all PC series, B&R development engineers took long-term availability of the components into consideration. After all, the product lifespan of a B&R industrial PC generation is ten years or more.

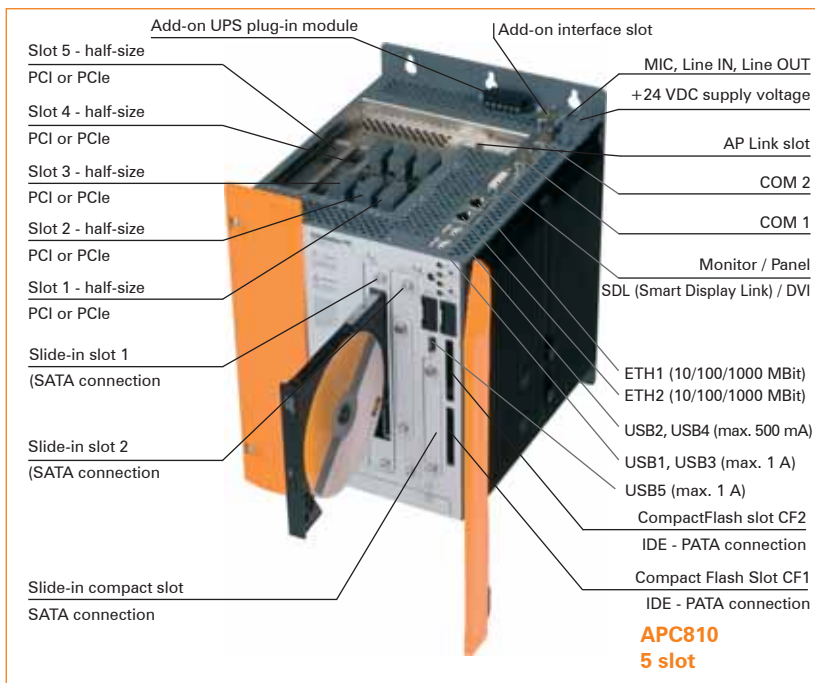


Compact construction

The APC810 saves space in the switching cabinet. Drive inserts (DVD, HDD) and two CompactFlash slots are protected behind a cover on the front of the device. The modular plug-in technology makes it easy for the user to switch drives. All connections and interfaces are located on the top side of the housing. The installation depth is not increased by protruding connectors.

Fan-free

The APC810 can be operated in many variations without using fans. All components that require cooling are arranged on the board so that the heat is distributed directly to the heat sink. The advantages are obvious: When using CompactFlash cards, there are no rotating parts. This makes the APC810 extremely robust against mechanical loads, which reduces maintenance.



Wide variety for all applications

The different APC810 sizes with one, two and five PCI/PCI Express slots provide the optimum design for every installation situation - a perfect fit without wasting valuable space in the switching cabinet.

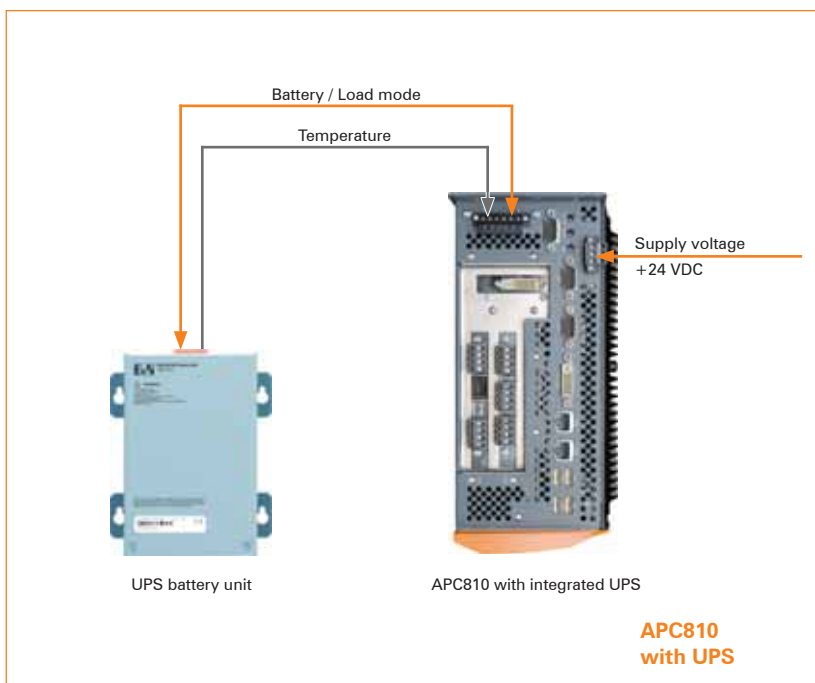
All types have SRAM onboard. In this way, the application can save data using the nonvolatile SRAM memory. Due to the power supply buffering integrated in the APC810, Automation Runtime applications support backing up data in the SRAM module when a power failure occurs. This module uses the buffer battery from the PC system.

Highest performance

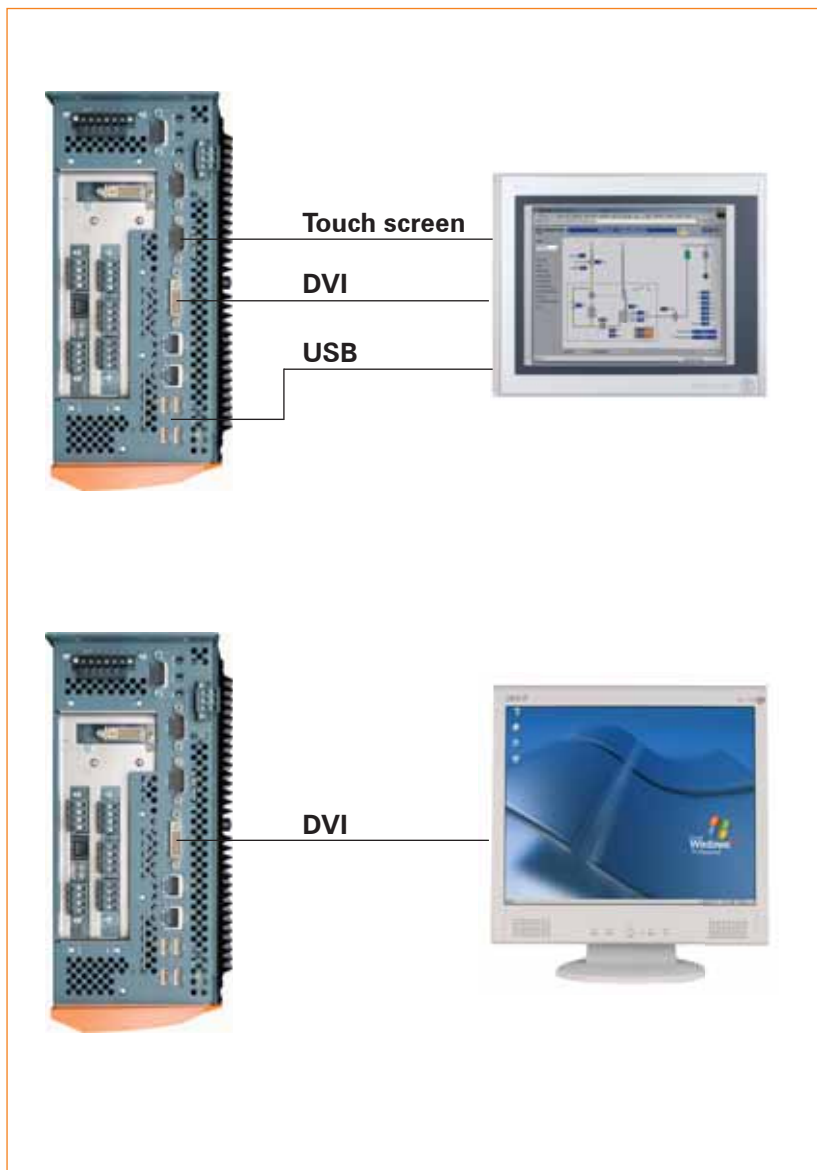
In the APC810, the latest PC architecture and the high-performance Core™2 Duo processors ensure that automation and visualization systems with the highest demands run optimally. The Intel 945 GM chipset contains the Graphics Media Accelerator GMA 950, which supports a number of 2D and 3D graphics options. The two DDR2 RAM chips are designed with Dual Channel technology and are connected to the CPU via a high-speed 667 MHz front-side bus. The maximum memory size is 3 GB. Thanks to PCI and PCI Express slots, the APC810 is well-equipped for all current and future demands.

APC810 with uninterruptible power supply

With an optionally integrated UPS, the Automation PC makes sure that the PC system completes write operations even after a power failure occurs. When the UPS detects a power failure, it switches to battery operation immediately without interruption. This means that all running programs will be ended properly by the UPS software. This prevents inconsistent data. By integrating the charging circuit in the Automation PC housing, the installation has been reduced to merely attaching the connection cable to the battery unit mounted next to the PC. Special emphasis was placed on ease of maintenance when the battery unit was designed. The batteries are easily accessible from the front and can be switched in just a few moments when servicing.



System characteristics



Display connection

The APC810 from B&R has an integrated interface for connecting an Automation Panel or a monitor. This industrial version also allows additional Automation Panels to be connected by inserting an optional link module. This modularity is also available on the panel. B&R offers the following possibilities in order to meet the various requirements for Panel operation:

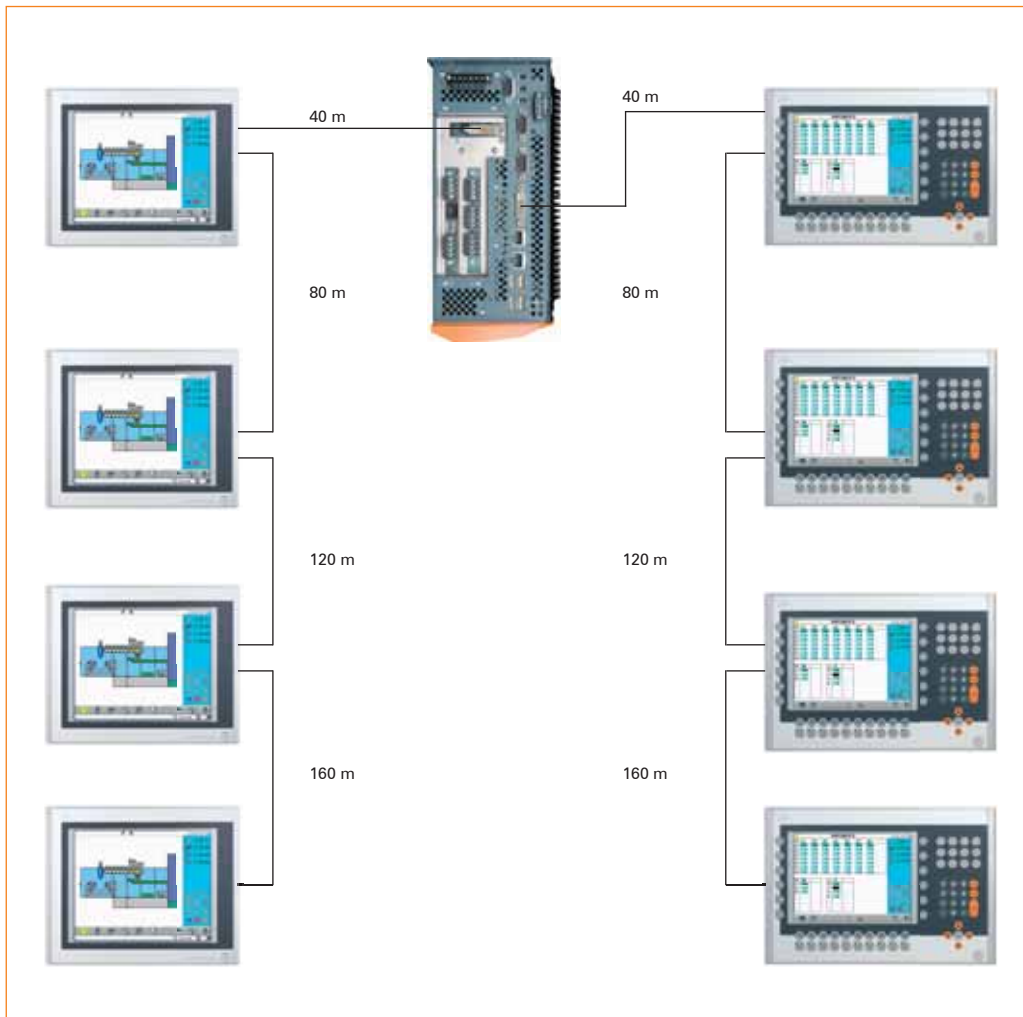
DVI (Digital Visual Interface)

SDL (Smart Display Link)

DVI - The open standard

The DVI (Digital Visual Interface) link is based on the DVI standard defined by the Digital Display Working Group, which is also being used more frequently in today's offices. The integrated panel interface is designed so that display units and office monitors with a DVI interface can also be connected. The connection of a touch screen as well as the connection of remote USB interfaces is made using separate cables.

It is also possible to connect monitors with analog RGB interfaces.



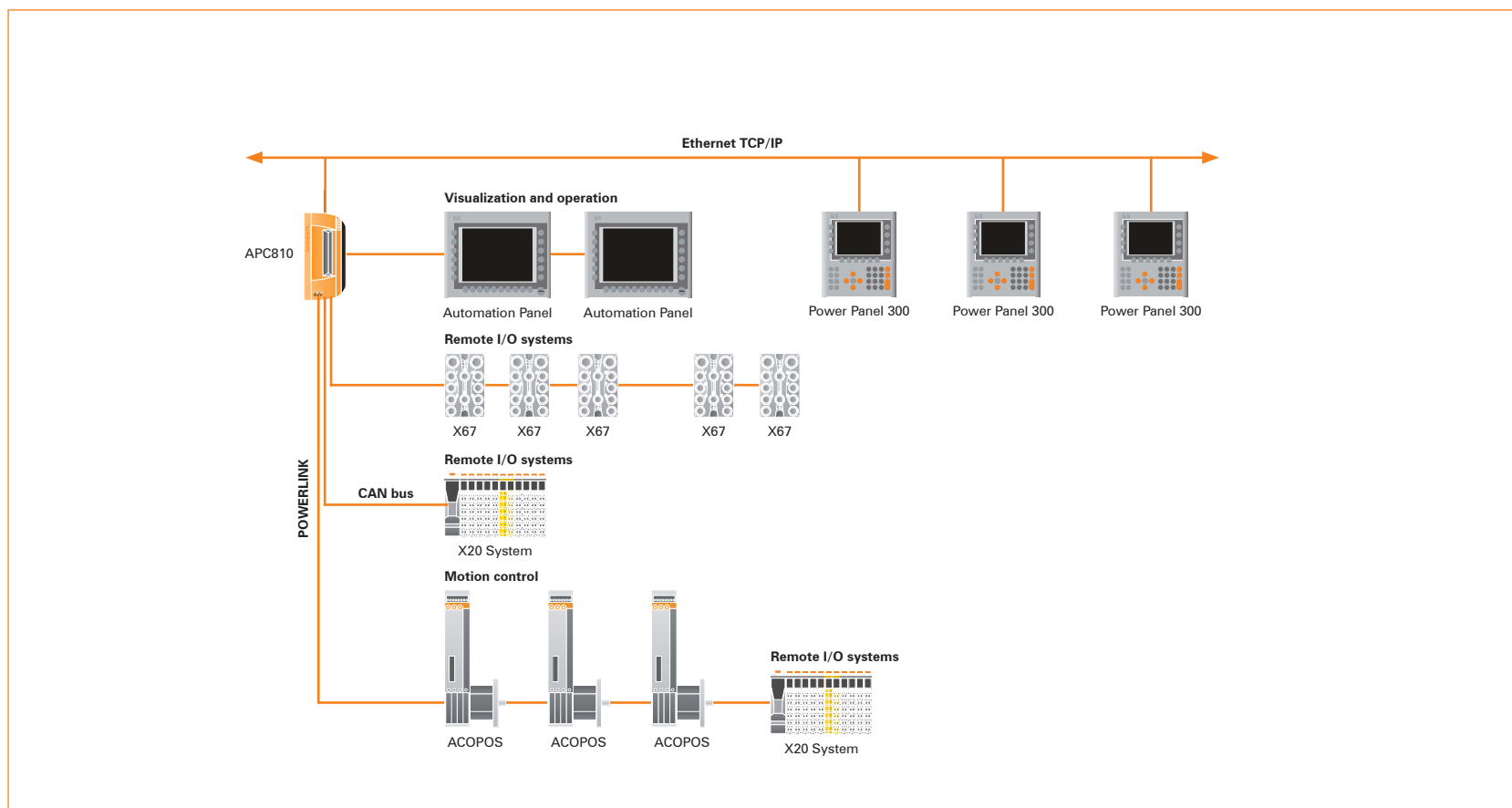
Smart Display Link

SDL (Smart Display Link) is already integrated on the APC810. It combines the digital display and touch screen connections for the display unit in one interface. Matrix keys, service data (temperature, operating hours) and USB signals are also transferred. SDL also allows the display unit to be equipped with PC resources such as USB drives and a keyboard. Four Automation Panels can be connected via SDL to the integrated or optional SDL interfaces. The Automation Panel 900 can be combined with the Automation Panel 800, and the AP800 is always last on the line. The two lines display different content (dual independent display). Alternatively, the same display content can also be shown on all displays (display clone). Touch screen and key entries on the Automation Panel can be locked with software to prevent operating errors. USB is supported up to a maximum segment length of 30 m on the first two displays. Starting at a segment length of 30 m and higher, USB is only available up to a maximum of 40 m for the first display. USB devices can only be connected directly to the Automation Panel (without a hub).

Typical topologies

APC810 for central control and visualization

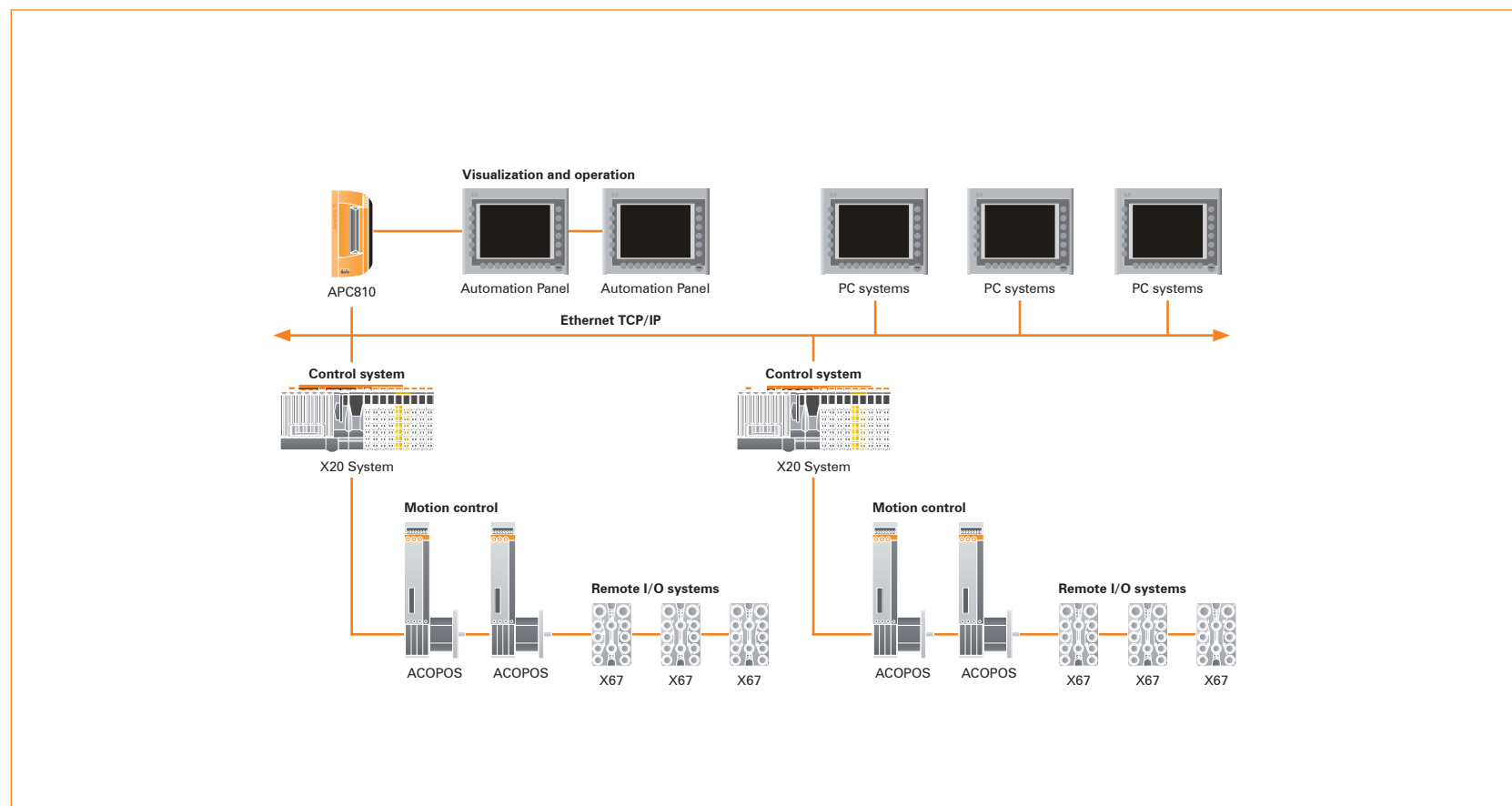
The control program runs on the APC810 parallel to Windows. The visualization project is integrated with Visual Components. Up to four display units are connected to the PC either locally or remotely. The PC is networked via Ethernet TCP/IP; additional Power Panel-based operator terminals can also be connected via Ethernet. Fieldbus systems (CAN bus, POWERLINK) are used to handle communication to I/O systems with axis control.



Control system	APC 810: Automation PC	945
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
	Automation Panel 800: Modular operation and visualization	1055
	Automation Panel 900: Compact operation and visualization	1077
Motion control	ACOPOS: Intelligent servo drives	1251
Remote I/O systems	X67 System: Remote I/O with IP67 protection	419
	X20 System: Slice-based I/O and control system	37

APC810 as a visualization device

The visualization runs as a SCADA application on the APC810. Up to four display units are connected to the PC either locally or remotely. The control tasks interact with one or more underlying PLC stations that have I/O systems and drives connected locally or remotely via fieldbus systems. Additional SCADA stations can be networked via Ethernet TCP/IP.



Control system	X20 System: Slice-based I/O and control system	37
	APC810: Automation PC	945
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
	Automation Panel 800: Modular operation and visualization	1055
	Automation Panel 900: Compact operation and visualization	1077
Motion control	ACOPOS: Intelligent servo drives	1251
Remote I/O systems	X67 System: Remote I/O with IP67 protection	419
	X20 System: Slice-based I/O and control system	37

Configuration

System unit (select a max. of 1 system unit + 1 bus unit)

1 slot system unit

5PC810.SX01-00 System unit APC810, 1 card slot (PCI, PCI Express, depending on bus) [959](#)

1 slot bus unit (select a max. of 1)

5PC810.BX01-00 APC810 bus unit with a PCI slot. [957](#)

5PC810.BX01-01 APC810 bus unit with a PCIe slot. [957](#)

2 slot system unit

5PC810.SX02-00 System unit APC810, 2 slots (PCI, PCI Express, depending on bus)
1 slot for Automation Panel Link transmitter [959](#)

2 slot bus unit (select a max. of 1)

5PC810.BX02-00 APC810 bus unit with 2 PCI slots. [957](#)

5PC810.BX02-01 APC810 bus unit with one PCI and one PCIe slot. [957](#)

5 slot system unit

5PC810.SX05-00 System unit APC810, 5 slots (PCI, PCI Express, depending on bus)
1 slot for Automation Panel Link transmitter [959](#)

5 slot bus unit (select a max. of 1)

5PC810.BX05-00 APC810 bus unit with 4 PCI slots and one PCIe slot. [957](#)

5PC810.BX05-01 APC810 bus unit with 2 PCI slots and 3 PCIe slots. [957](#)

CPU boards with 945 GME chipset

Select a CPU board

5PC800.B945-00 CPU board Intel® Core™ Duo L2400, 1.66 GHz [960](#)

5PC800.B945-01 CPU board Intel® Core™2 Duo L7400, 1.5 GHz [960](#)

5PC800.B945-02 CPU board Intel® Core™2 Duo U7500, 1.06 GHz [960](#)

5PC800.B945-03 CPU board Intel® Celeron® M 423, 1.06 GHz [961](#)

5PC800.B945-04 CPU board Intel® Core™2 Duo T7400, 2.16 GHz [961](#)

Memory for CPU boards with 945 GME chipset

Select memory module (one or two, maximum 3 GB)

5MMDDR.0512-01 SO-DIMM DDR2 512 MB PC2-5300 [961](#)

5MMDDR.1024-01 SO-DIMM DDR2 1024 MB PC2-5300 [961](#)

5MMDDR.2048-01 SO-DIMM DDR2 2048 MB PC2-5300 [961](#)

Heat sink

Select heat sink depending on the CPU board

5AC801.HS00-00 Heat sink APC810 for CPU boards with Dual Core
processors L2400, L7400, U7500 and Celeron® M 423 [961](#)

5AC801.HS00-01 Heat sink APC810 for CPU board with Dual Core
processor T7400 [961](#)





Automation Panel Link insert cards

Select a max. of one card (only for system units 5PC810.SX02-00 and 5PC810.SX05-00)

5AC801.SDL0-00	Automation Panel SDL link transmitter	958
5AC801.RDYR-00	APC810 ready relay	958

Components

Select max. one slide-in compact drive

5AC801.HDDI-00	Slide-in compact HDD 40 GB	957
5AC801.HDDI-02	Slide-in compact HDD 160 GB 24x7 ET	957

Select slide-in drive (only for system units 5PC810.SX02-00 and 5PC810.SX05-00)

5AC801.HDDS-00	Slide-in HDD 40 GB	957
5AC801.DVDS-00	Slide-in DVD-ROM	957
5AC801.DVRS-00	Slide-in DVD-R/RW	957
5AC801.ADAS-00	Slide-In compact adapter for operating a slide-in compact HDD in a slide-in slot (see image on page 948)	957

Select max. one Raid system

5ACPCI.RAIC-03	PCI RAID system SATA 2x160 GB (controller and 2x hard disk)	957
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Select combination of UPS, battery unit and cable

5AC600.UPSI-00	Uninterruptible power supply for APC620, APC810	958
5AC600.UPSB-00	Select battery unit	958
5CAUPS.0005-00	APC620, APC810 UPS cable, 0.5 m	958
5CAUPS.0030-00	APC620, APC810 UPS cable, 3 m	958

Fan kits

Select a fan kit (if required)¹

5PC810.FA01-00	APC810 fan kit for system unit with 1CS, made up of 3 fans (40x40x10)	957
5PC810.FA02-00	APC810 fan kit for system unit with CS, made up of 2 fans (70x70x15)	957
5PC810.FA05-00	APC810 fan kit for system unit with 5CS, made up of 3 fans (70x70x15)	957

1 A fan kit may be necessary for certain system configurations.

Supply voltage connectors

Select a supply voltage connector

0TB103.9	Accessory terminal block 3-pin, screw clamps 3.31 mm ²	1131
0TB103.91	Accessory terminal block 3-pin, cage clamps 3.31 mm ²	1131

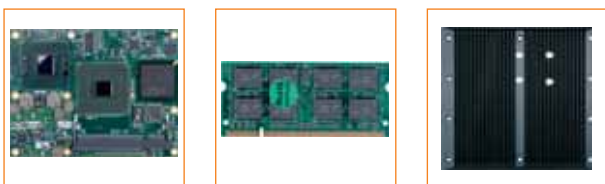
Product overview

APC810 system units



Model number	Short description	
5PC810.SX01-00	APC810 system unit with 1 card slot (PCI Express, PCI, depending on bus) 1 slide-in compact slot; Smart Display Link/DVI/Monitor, 2x RS232, 5x USB 2.0, 2x ETH 10/100/1000, AC97 Sound, 24 VDC	959
5PC810.SX02-00	APC810 system unit with 2 card slots (PCI Express, PCI, depending on bus), 1 slot for Automation Panel Link transmitter; 1 slide-in compact and 1 slide-in slot; Smart Display Link/DVI/Monitor, 2x RS232, 5x USB 2.0, 2x ETH 10/100/1000, AC97 sound, 24 VDC	959
5PC810.SX05-00	APC810 system unit with 5 card slots (PCI Express, PCI, depending on bus) 1 slot for Automation Panel Link transmitter; 1 slide-in compact and 2 slide-in slots; Smart Display Link/DVI/Monitor, 2x RS232, 5x USB 2.0, 2x ETH 10/100/1000, AC97 sound, 24 VDC	959

CPU boards, memory and heat sinks



Intel® Pentium® M / Celeron® M

Model number	Short description	
5PC800.B945-00	CPU board Intel Core Duo L2400 1.66 GHz, 667 MHz FSB, 2 MB L2 cache; 945GME chipset; 2 sockets for SO-DIMM DDR2 modules (max. expansion is a total of 3 GB)	960
5PC800.B945-01	CPU board Intel Core2 Duo L7400 1.5 GHz, 667 MHz FSB, 4 MB L2 cache; 945GME chipset; 2 sockets for SO-DIMM DDR2 modules (max. expansion is a total of 3 GB)	960
5PC800.B945-02	CPU board Intel Core2 Duo U7500, 1.06 GHz, 533 MHz FSB, 2 MB L2 cache; 945GME chipset; 2 sockets for SO-DIMM DDR2 modules (max. expansion is a total of 3 GB)	960
5PC800.B945-03	CPU board Intel Celeron M 423 1.06 GHz, 533 MHz FSB, 1 MB L2 cache; 945GME chipset; 2 sockets for SO-DIMM DDR2 modules (max. expansion is a total of 3 GB)	961
5PC800.B945-04	CPU board Intel Core2 Duo T7400 2.16 GHz, 667 MHz FSB, 4 MB L2 cache; 945GME chipset; 2 sockets for SO-DIMM DDR2 modules (max. expansion is a total of 3 GB)	961
5MMDDR.0512-01	SO-DIMM DDR2 512 MB PC2-5300	961
5MMDDR.1024-01	SO-DIMM DDR2 1024 MB PC2-5300	961
5MMDDR.2048-01	SO-DIMM DDR2 2048 MB PC2-5300	961
5AC801.HS00-00	Heat sink APC810 for CPU boards with Dual Core processors L2400, L7400, U7500 and Celeron® M 423	961
5AC801.HS00-01	Heat sink APC810 for CPU board with Dual Core processor T7400	961

Backplane



Model number	Short description
5PC810.BX01-00	APC810 bus with one PCI slot
5PC810.BX01-01	APC810 bus with one PCI Express (x4) slot
5PC810.BX02-00	APC810 bus with two PCI slots
5PC810.BX02-01	APC810 bus with one PCI and one PCI Express (x4) slot
5PC810.BX05-00	APC810 bus with 4 PCI slots and one PCI Express (x1) slot
5PC810.BX05-01	APC810 bus with 2 PCI slots and 3 PCI Express (x1) slots

Drives



Model number	Short description
5AC801.ADAS-00	Slide-in compact SATA hard disk adapter
5AC801.HDDI-00	40 GB hard disk (slide-in compact), 24/7 operation, with extended temperature range
5AC801.HDDI-02	160 GB hard disk (slide-in compact), 24/7 operation, with extended temperature range
5AC801.HDDS-00	40 GB hard disk (slide-in), 24/7 operation, with extended temperature range
5AC801.DVDS-00	DVD-ROM SATA drive (slide-in)
5AC801.DVRS-00	DVD-R/RW DVD+R/RW SATA drive (slide-in)
5ACPCI.RAIC-03	PCI RAID system SATA 2x160 GB (controller and 2x hard disk)
5ACPCI.RAIC-04	Replacement SATA-HDD 160 GB

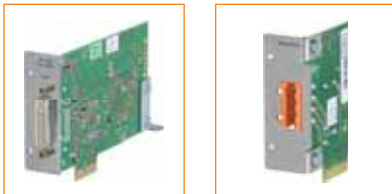
Fan kits



Model number	Short description
5PC810.FA01-00	APC810 fan kit for system unit with CS, made up of 3 fans (40x40x10)
5PC810.FA02-00	APC810 fan kit for system unit with CS, made up of 2 fans (70x70x15)
5PC810.FA05-00	APC810 fan kit for system unit with 5CS, made up of 3 fans (70x70x15)

Product overview

Automation Panel Link insert cards



Model number	Short description
5AC801.SDL0-00	Smart Display Link/DVI-D transmitter For connecting Automation Panels to an APC810 via SDL
5AC801.RDYR-00	APC810 ready relay

Accessories



Model number	Short description
5AC900.1000-00	Adapter DVI (plug) to CRT (socket), for connecting a standard monitor to a DVI-I interface.
5AC600.CANI-00	CAN interface, for installation in an APC620, PanelPC 700 or APC810.
5AC600.485I-00	RS232/422/485 interface, for installation in an APC620, PanelPC 700 or APC810.
5AC600.UPSI-00	Uninterruptible power supply for APC620 or APC810.
5AC600.UPSB-00	Battery unit
5CAUPS.0005-00	APC620, APC810 UPS cable, 0.5 m
5CAUPS.0030-00	APC620, APC810 UPS cable, 3 m
5AC801.FA01-00	APC810 replacement fan filter 1CS 5 pcs.
5AC801.FA02-00	APC810 replacement fan filter 2CS 5 pcs.
5AC801.FA05-00	APC810 replacement fan filter 5CS 5 pcs.

System units



	5PC810.SX01-00	5PC810.SX02-00	5PC810.SX05-00
COM1 / COM2	RS232	RS232	RS232
Design	9-pin DSUB plug	9-pin DSUB plug	9-pin DSUB plug
Max. baud rate	115 kBit/s	115 kBit/s	115 kBit/s
USB	5x USB 2.0 connection type A	5x USB 2.0 connection type A	5x USB 2.0 connection type A
Panel/Monitor interface	SDL/DVI/monitor	SDL/DVI/monitor	SDL/DVI/monitor
Design	DVI-I socket	DVI-I socket	DVI-I socket
AC97 sound	Mic., line in, line out	Mic., line in, line out	Mic., line in, line out
CompactFlash Slot 1 (IDE-PATA)	Integrated (type I)	Integrated (type I)	Integrated (type I)
CompactFlash Slot 2 (IDE-PATA)	Integrated (type I)	Integrated (type I)	Integrated (type I)
Ethernet	2x 10/100/1000 Mbit/s	2x 10/100/1000 Mbit/s	2x 10/100/1000 Mbit/s
Slots (PCI/PCI Express, half size)	1x PCI 1x PCI Express	2x PCI 1x PCI, 1x PCI Express	4x PCI, 1x PCI Express 2x PCI, 3x PCI Express
SRAM	512 kByte	512 kByte	512 kByte
Automation Panel link slot	-	√	√
Battery	Lithium, 950 mAh	Lithium, 950 mAh	Lithium, 950 mAh
Real-time clock	√	√	√
Dongle port	√	√	√
Reset button	√	√	√
Power button	√	√	√
Housing fan inserts	√	√	√
Insert for slide-in compact drive (SATA)	1	1	1
Insert for slide-in drive (SATA)	-	1	2
UPS module	Optional	Optional	Optional
Power supply	24 VDC +/- 25%	24 VDC +/- 25%	24 VDC +/- 25%
Power supply buffering	10 ms	10 ms	10 ms

Accessories

Model number	Short description	
0TB103.9	Terminal block plug 3-pin, screw clamps 3.31 mm ²	1131
0TB103.91	Terminal block plug 3-pin, cage clamps 3.31 mm ²	1131
	3 V lithium batteries	1128
	CompactFlash cards	1126
	USB accessories	1127
5SWUTI.0000-00	OEM Nero CD-RW software. Only available with a CD-RW drive.	1121

CPU boards

CPU boards Intel® / Celeron® M / Core™ Duo / Core™ 2 Duo Intel® 945 GME chipset



Model number	5PC800.B945-00	5PC800.B945-01	5PC600.X855-02
Processor	Intel® Core™ Duo L2400	Intel® Core™ 2 Duo L7500	Intel® Core™ 2 Duo U7500
Clock frequency	1.66 GHz	1.5 GHz	1.06 GHz
L2 cache	2 MB	4 MB	2 MB
External bus	667 MHz	667 MHz	533 MHz
Memory socket (dual channel memory)	2x SO-DIMM	2x SO-DIMM	2x SO-DIMM
BIOS	American Megatrends	American Megatrends	American Megatrends
Chipset	Intel® 945GME	Intel® 945GME	Intel® 945GME
Graphics	Chipset graphics	Chipset graphics	Chipset graphics
Graphics memory	Max. 224 MB RAM ¹⁾	Max. 224 MB RAM ¹⁾	Max. 224 MB RAM ¹⁾

¹⁾ Allocated in the main memory.

CPU boards Intel® / Celeron® M / Core™ Duo / Core™ 2 Duo Intel® 945 GME chipset



Model number	SPC800.B945-03	SPC800.B945-04
Processor	Intel® Celeron® M 423	Intel® Core™2 Duo T7400
Clock frequency	1.06 GHz	2.16 GHz
L2 cache	1 MB	4 MB
External bus	533 MHz	667 MHz
Memory socket (dual channel memory)	2x SO-DIMM	2x SO-DIMM
BIOS	American Megatrends	American Megatrends
Chipset	Intel® 945GME	Intel® 945GME
Graphics	Chipset graphics	Chipset graphics
Graphics memory	Max. 224 MB RAM ¹	Max. 224 MB RAM ¹

Accessories

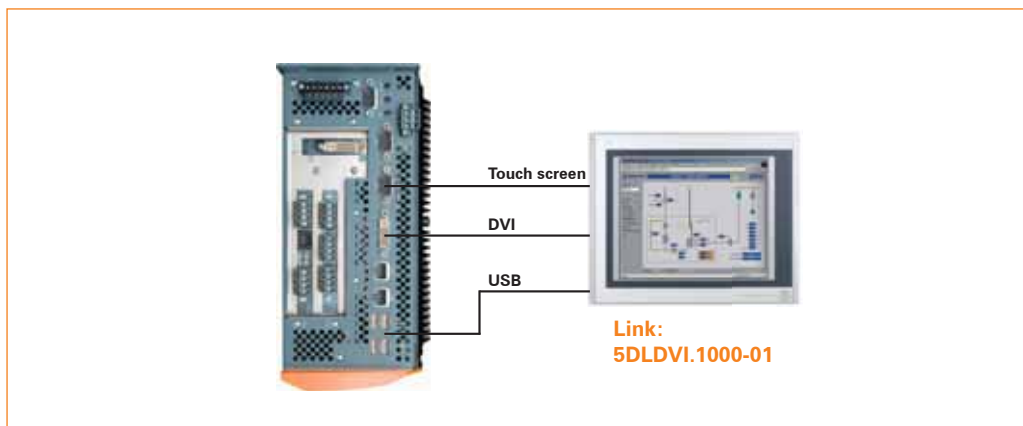


Model number	Short description
5MMDDR.0512-01	SO-DIMM DDR2 512 MB PC2-5300
5MMDDR.1024-01	SO-DIMM DDR2 1024 MB PC2-5300
5MMDDR.2048-01	SO-DIMM DDR2 2048 MB PC2-5300
5AC801.HS00-00	Heat sink APC810 for CPU boards with Dual Core processors L2400, L7400, U7500 and Celeron® M 423
5AC801.HS00-01	Heat sink APC810 for CPU board with Dual Core processor T7400

Display links

Automation Panel via DVI

An Automation Panel with max. SXGA resolution is connected to the integrated DVI interface. As an alternative, an office TFT monitor with DVI interface or an analog monitor (using an adapter) can also be operated. A separate cable is used for touch screen and USB.



Possible combinations

	5PC800.B945-00	5PC800.B945-01	5PC800.B945-02	5PC800.B945-03	5PC800.B945-04
5PC810.SX01-00	✓	✓	✓	✓	✓
5PC810.SX02-00	✓	✓	✓	✓	✓
5PC810.SX05-00	✓	✓	✓	✓	✓

Component overview

System units

	Slot for link modules	PCI/PCIe Bus
5PC810.SX01-00	✓	1
5PC810.SX02-00	✓	2
5PC810.SX05-00	✓	5

CPU boards

	Chipset	Processor	Resolution
5PC800.B945-00	Intel® 945GME	Core Duo L2400 1.66 GHz	Max. SXGA
5PC800.B945-01	Intel® 945GME	Core2 Duo L7400 1.5 GHz	Max. SXGA
5PC800.B945-02	Intel® 945GME	Core2 Duo U7500, 1.06 GHz	Max. SXGA
5PC800.B945-03	Intel® 945GME	Celeron M 423 1.06 GHz	Max. SXGA
5PC800.B945-04	Intel® 945GME	Core2 Duo T7400 2.16 GHz	Max. SXGA

Cables

	Type	Length
5CADVI.0018-00	DVI	1.8 m
5CADVI.0050-00	DVI	5 m
5CADVI.0100-00	DVI	10 m ¹
9A0014.02	Touch screen	1.8 m
9A0014.05	Touch screen	5 m
9A0014.10	Touch screen	10 m ¹
5CAUSB.0018-00	USB	1.8 m
5CAUSB.0050-00	USB	5 m

Automation Panel link module

	Type
5DL DVI.1000-01	DVI receiver

Automation Panel 900

	Diagonal	Max. resolution	Touch screen	USB	Max. segment length
5AP920.1043-01	10.4"	VGA	✓	✓	5 m / 10 m ¹
5AP920.1214-01	12.1"	SVGA	✓	✓	5 m / 10 m ¹
5AP920.1505-01	15.0"	XGA	✓	✓	5 m / 10 m ¹
5AP920.1706-01	17.0"	SXGA	✓	✓	5 m / 10 m ¹
5AP920.1906-01	19.0"	SXGA	✓	✓	5 m / 10 m ¹

¹) USB is limited to 5m

Up to four Automation Panels via SDL on one line

An Automation Panel is connected to the integrated SDL interface via an SDL cable. Up to three other Automation Panels of the same type are connected to this Automation Panel and operated via SDL. All four displays show the same content.



Possible combinations

	5PC800.B945-00	5PC800.B945-01	5PC800.B945-02	5PC800.B945-03	5PC800.B945-04
5PC810.SX01-00	✓	✓	✓	✓	✓
5PC810.SX02-00	✓	✓	✓	✓	✓
5PC810.SX05-00	✓	✓	✓	✓	✓

Component overview

System units

	Slot for link modules	PCI/PCIe Bus
5PC810.SX01-00	✓	1
5PC810.SX02-00	✓	2
5PC810.SX05-00	✓	5

CPU boards

	Chipset	Processor	Resolution
5PC800.B945-00	Intel® 945GME	Core Duo L2400 1.66 GHz	Max. UXGA
5PC800.B945-01	Intel® 945GME	Core2 Duo L7400 1.5 GHz	Max. UXGA
5PC800.B945-02	Intel® 945GME	Core2 Duo U7500, 1.06 GHz	Max. UXGA
5PC800.B945-03	Intel® 945GME	Celeron M 423 1.06 GHz	Max. UXGA
5PC800.B945-04	Intel® 945GME	Core2 Duo T7400 2.16 GHz	Max. UXGA

SDL cables

See AP900 SDL cable section	1087
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Automation Panel link module

	Type
5DLSDL.1000-00	SDL receiver
5DLSDL.1000-01	SDL transceiver

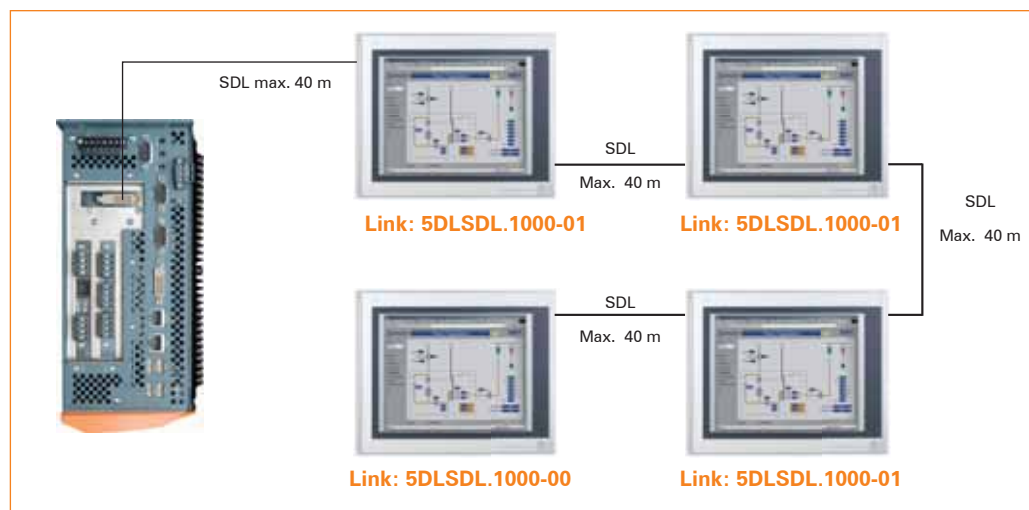
Automation Panel 900

Display	Diagonal	Resolution	Touch screen	Keys	Max. SDL segment length w/o extender	Max. SDL segment length w/ extender
5AP920.1043-01	10.4"	VGA	✓	-	30	40
5AP980.1043-01	10.4"	VGA	✓	✓	30	40
5AP981.1043-01	10.4"	VGA	✓	✓	30	40
5AP982.1043-01	10.4"	VGA	✓	✓	30	40
5AP920.1214-01	12.1"	SVGA	✓	-	30	40
5AP920.1505-01	15.0"	XGA	✓	-	25	40
5AP980.1505-01	15.0"	XGA	✓	✓	25	40
5AP981.1505-01	15.0"	XGA	✓	✓	25	40
5AP920.1706-01	17.0"	SXGA	✓	-	20	40
5AP920.1906-01	19.0"	SXGA	✓	-	20	40

Display links

Up to four Automation Panels via SDL (optional) on one line

An Automation Panel (max. UXGA) is connected to the optional SDL transmitter via an SDL cable. Three other Automation Panels of the same type are connected to this Automation Panel and operated via SDL. All displays show the same content.



Possible combinations

	5PC800.B945-00	5PC800.B945-01	5PC800.B945-02	5PC800.B945-03	5PC800.B945-04
5PC810.SX01-00	✓	✓	✓	✓	✓
5PC810.SX02-00	✓	✓	✓	✓	✓
5PC810.SX05-00	✓	✓	✓	✓	✓

Component overview

System units

	Slot for Link modules	PCI/PCIe Bus
5PC810.SX01-00	✓	1
5PC810.SX02-00	✓	2
5PC810.SX05-00	✓	5

CPU boards

	Chipset	Processor	Resolution
5PC800.B945-00	Intel® 945GME	Core Duo L2400 1.66 GHz	Max. UXGA
5PC800.B945-01	Intel® 945GME	Core2 Duo L7400 1.5 GHz	Max. UXGA
5PC800.B945-02	Intel® 945GME	Core2 Duo U7500, 1.06 GHz	Max. UXGA
5PC800.B945-03	Intel® 945GME	Celeron M 423 1.06 GHz	Max. UXGA
5PC800.B945-04	Intel® 945GME	Core2 Duo T7400 2.16 GHz	Max. UXGA

SDL cables

See AP900 SDL cable section	1087
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Automation Panel link module

	Type
5DLSDL.1000-00	SDL receiver
5DLSDL.1000-01	SDL transceiver

Link module APC810

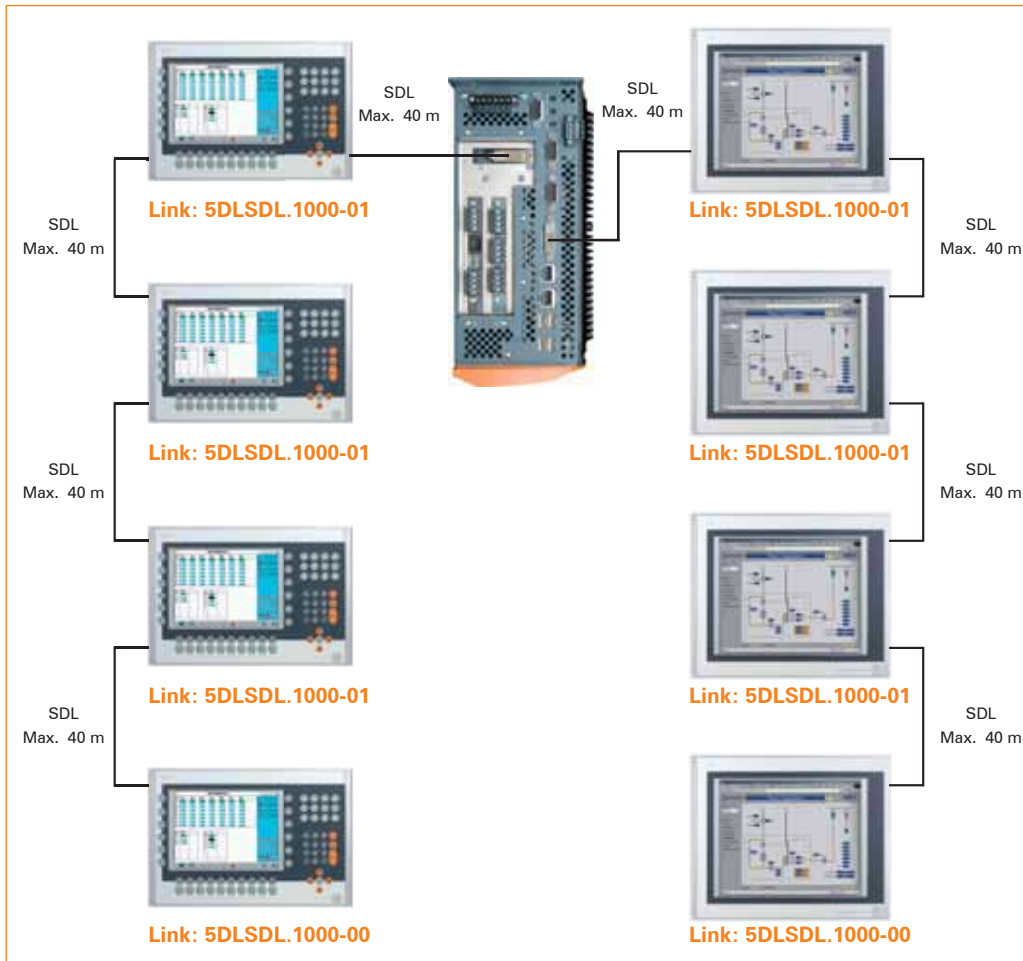
	Type
5AC801.SDL0-00	SDL transmitter

Automation Panel 900

Display	Diagonal	Resolution	Touch screen	Keys	Max. segment length SDL w/o extender	Max. segment length SDL w/ extender
5AP920.1043-01	10.4"	VGA	✓	-	30	40
5AP980.1043-01	10.4"	VGA	✓	✓	30	40
5AP981.1043-01	10.4"	VGA	✓	✓	30	40
5AP982.1043-01	10.4"	VGA	✓	✓	30	40
5AP920.1214-01	12.1"	SVGA	✓	-	30	40
5AP920.1505-01	15.0"	XGA	✓	-	25	40
5AP980.1505-01	15.0"	XGA	✓	✓	25	40
5AP981.1505-01	15.0"	XGA	✓	✓	25	40
5AP920.1706-01	17.0"	SXGA	✓	-	20	40
5AP920.1906-01	19.0"	SXGA	✓	-	20	40

Up to eight Automation Panels via SDL and SDL (optional)

Up to four Automation Panels (max. UXGA) are connected to the integrated SDL interface via an SDL cable. Four additional Automation Panels (max. UXGA) are connected to the optional SDL transmitter. The Automation Panels in each line must be the same type. The two lines display different content, but displays in the same line show the same content.



Possible combinations

	5PC800.B945-00	5PC800.B945-01	5PC800.B945-02	5PC800.B945-03	5PC800.B945-04
5PC810.SX01-00	✓	✓	✓	✓	✓
5PC810.SX02-00	✓	✓	✓	✓	✓
5PC810.SX05-00	✓	✓	✓	✓	✓

Display links

Component overview

System units

	Slot for link modules	PCI/ PCIe bus
5PC810.SX01-00	√	1
5PC810.SX02-00	√	2
5PC810.SX05-00	√	5

SDL cables

See AP900 SDL cable section [1087](#)

CPU boards

	Chipset	Processor	Resolution
5PC800.B945-00	Intel® 945GME	Core Duo L2400 1.66 GH	Max. UXGA
5PC800.B945-01	Intel® 945GME	Core2 Duo L7400 1.5 GHz	Max. UXGA
5PC800.B945-02	Intel® 945GME	Core2 Duo U7500, 1.06 GHz	Max. UXGA
5PC800.B945-03	Intel® 945GME	Celeron M 423 1.06 GHz	Max. UXGA
5PC800.B945-04	Intel® 945GME	Core2 Duo T7400 2.16 GHz	Max. UXGA

Automation Panel link module

	Type
5DLSDL.1000-00	SDL receiver
5DLSDL.1000-01	SDL transceiver

Link module APC810

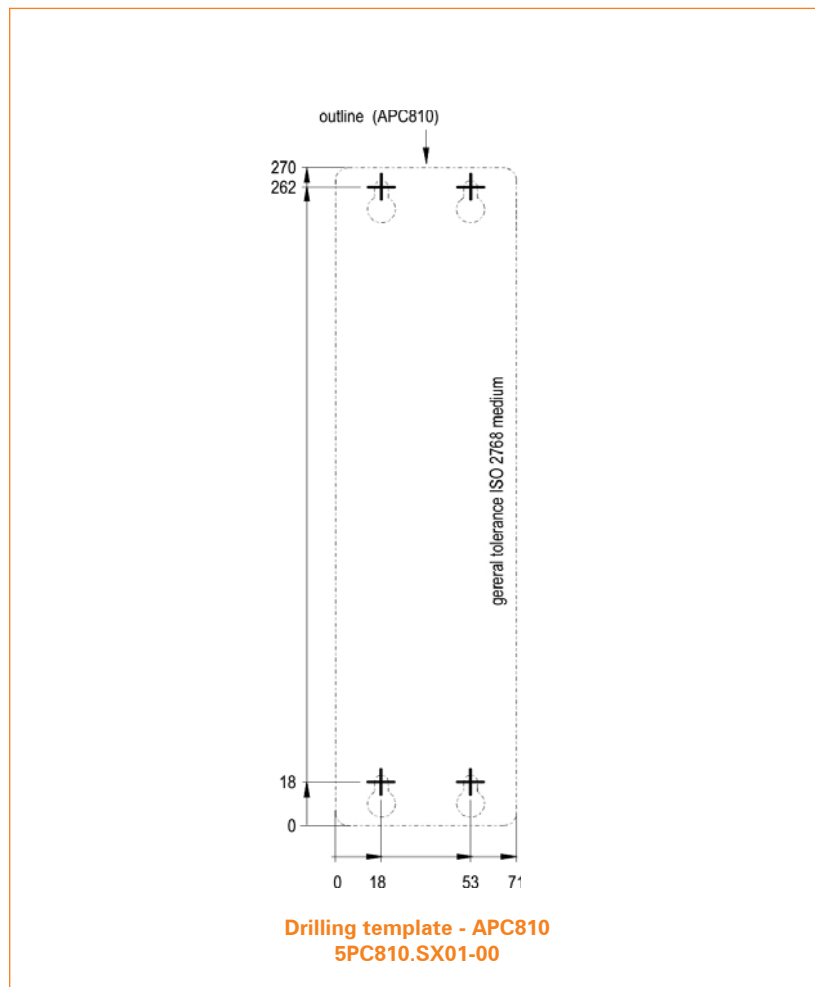
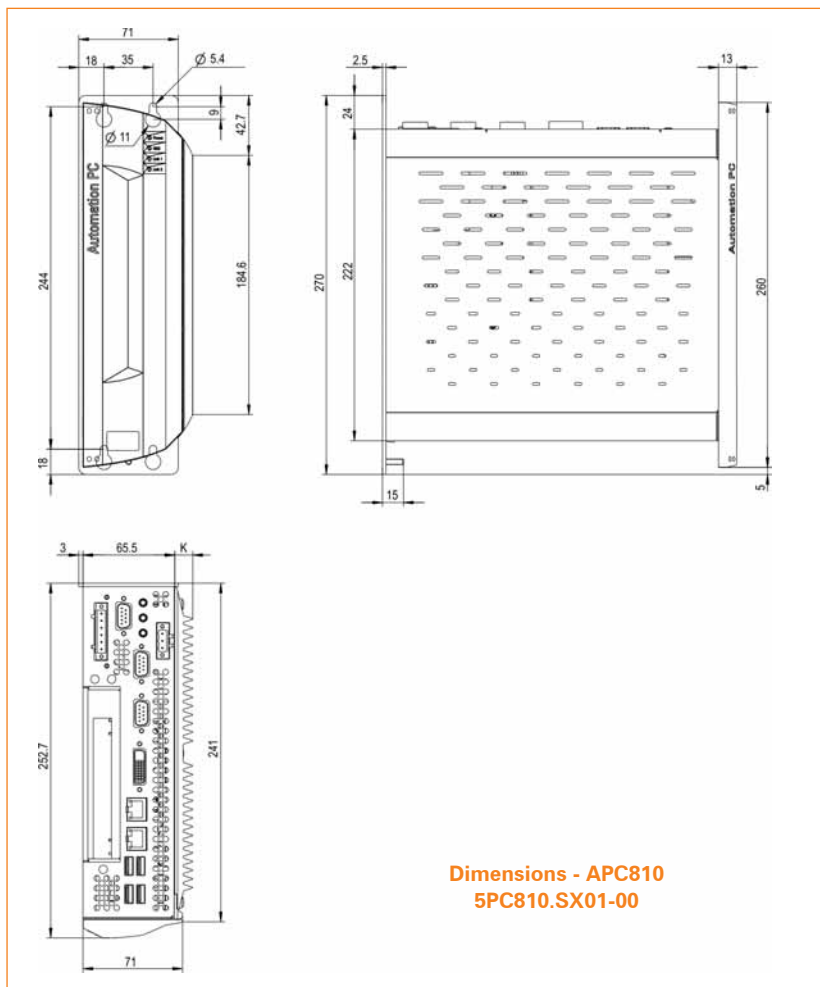
	Type
5AC801.SDL0-00	SDL transmitter

Automation Panel 900

Display	Diagonal	Resolution	Touch screen	Keys	Max. SDL segment length w/o extender	Max. SDL segment length w/ extender
5AP920.1043-01	10.4"	VGA	√	-	30	40
5AP980.1043-01	10.4"	VGA	√	√	30	40
5AP981.1043-01	10.4"	VGA	√	√	30	40
5AP982.1043-01	10.4"	VGA	√	√	30	40
5AP920.1214-01	12.1"	SVGA	√	-	30	40
5AP920.1505-01	15.0"	XGA	√	-	25	40
5AP980.1505-01	15.0"	XGA	√	√	25	40
5AP981.1505-01	15.0"	XGA	√	√	25	40
5AP920.1706-01	17.0"	SXGA	√	-	20	40
5AP920.1906-01	19.0"	SXGA	√	-	20	40



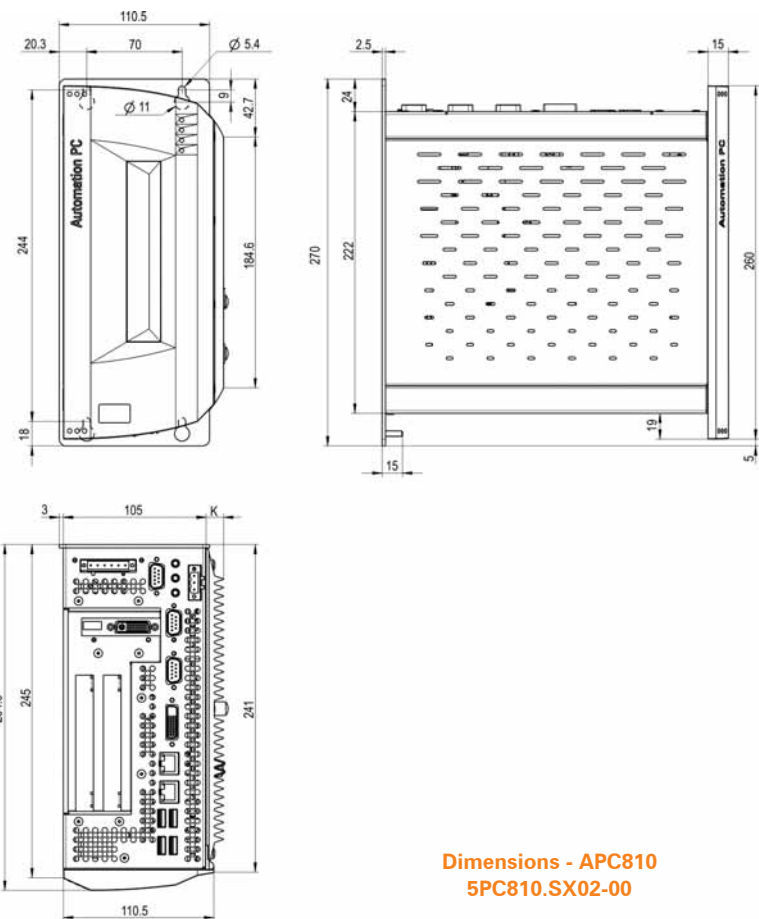
Dimensions



Heat sink dimensions

Heat sink	Short description	K
5AC801.HS00-00	Heat sink APC810 for CPU boards with Dual Core processors L2400, L7400, U7500 and Celeron® M 423	12.8 mm
5AC801.HS00-01	Heat sink APC810 for CPU board with Dual Core processor T7400	28 mm

All dimensions in mm



Dimensions - APC810
5PC810.SX02-00



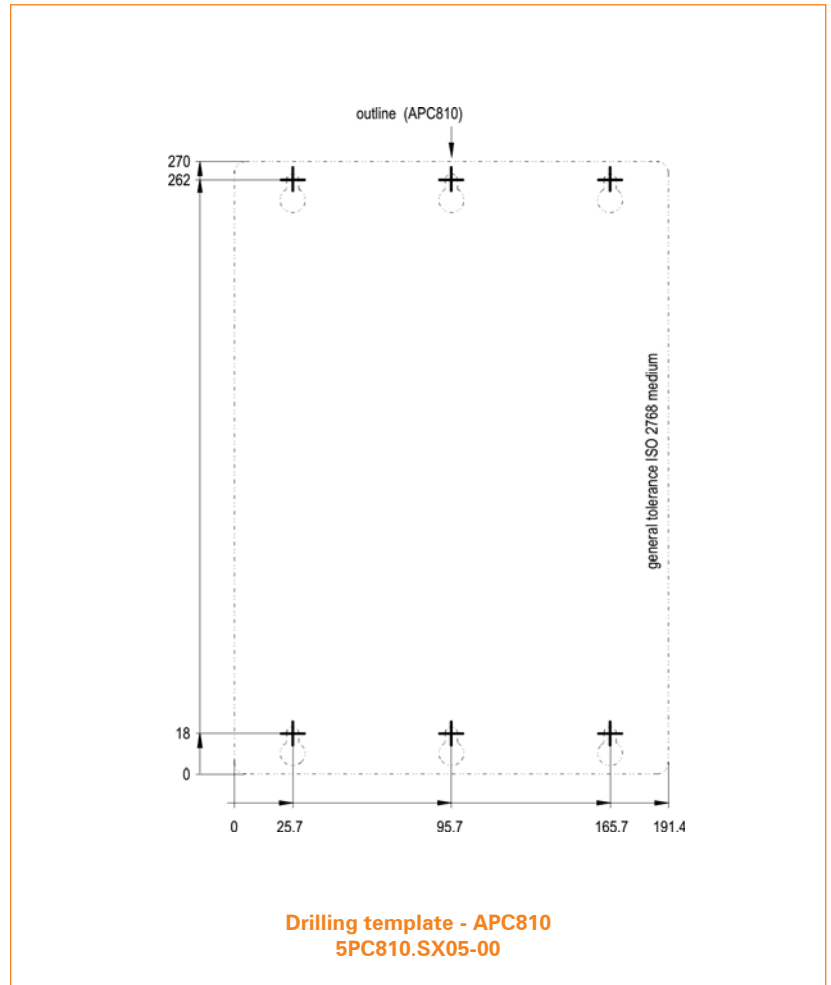
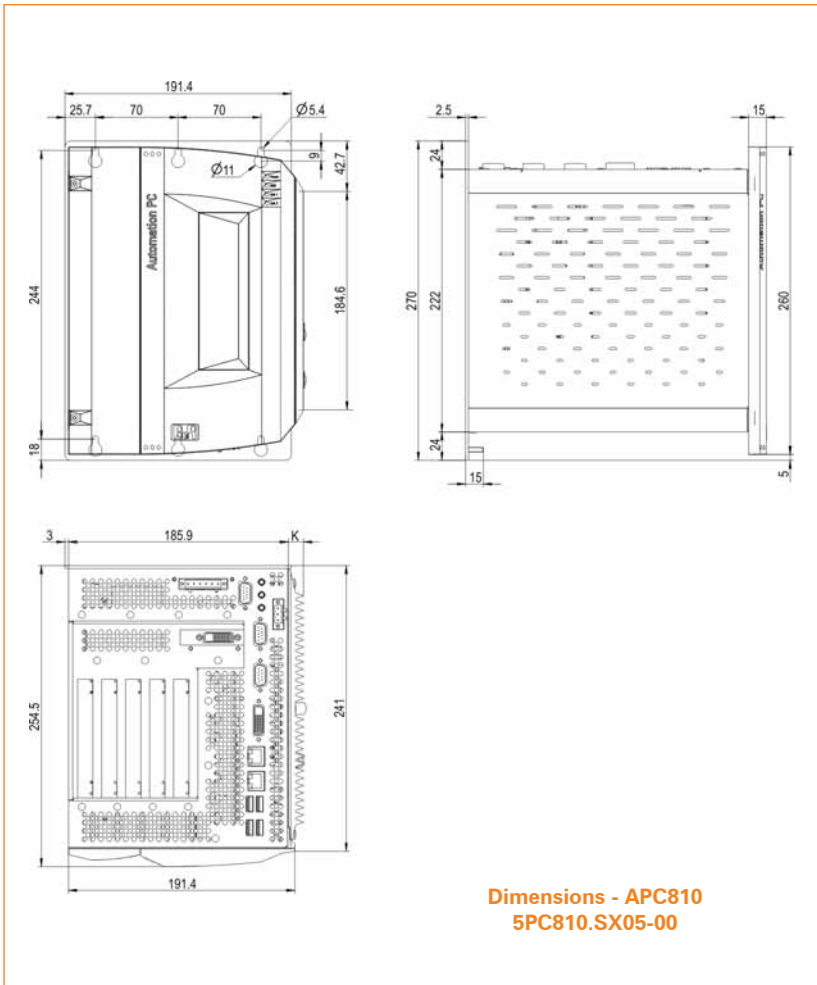
Drilling template - APC810
5PC810.SX02-00

Heat sink dimensions

Heat sink	Short description	K
5AC801.HS00-00	Heat sink APC810 for CPU boards with Dual Core processors L2400, L7400, U7500 and Celeron® M 423	12.8 mm
5AC801.HS00-01	Heat sink APC810 for CPU board with Dual Core processor T7400	28 mm

All dimensions in mm

Dimensions



Heat sink dimensions

Heat sink	Short description	K
5AC801.HS00-00	Heat sink APC810 for CPU boards with Dual Core processors L2400, L7400, U7500 and Celeron® M 423	12.8 mm
5AC801.HS00-01	Heat sink APC810 for CPU board with Dual Core processor T7400	28 mm

All dimensions in mm





Panel PC 300

The Panel PC 300 expands the Automation Panel 900 to include embedded PCs. The Panel PC insert contains a complete PC design, based on a 500 MHz processor.



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System characteristics



Panel PC 300

The Panel PC 300 expands the Automation Panel 900 to include embedded PCs. The Panel PC insert contains a complete PC design, based on a 500 MHz processor.

Complete product range

With 256 MB or 512 MB SDRAM, Ethernet 10/100 and a serial interface, the Panel PC 300 is perfectly suited for applications in Windows® CE and Windows® XP embedded. The Automation Panel's onboard USB 2.0 interfaces are also supported by the Panel PC 300 insert.

The Panel PC 300 makes it possible for the user to also use the Automation Panel 900 for applications that do not require the computing power of an APC620 or APC810. Of course, custom Automation Panels can also be equipped with the Panel PC 300 insert.

Fan-free

The Panel PC 300 insert was designed for operation without a fan. Together with the CompactFlash card, it functions without any rotating parts, which plays a deciding role in minimizing maintenance cycles.



Product overview

Panel PC 300



Model number	Short description	
5PC310.L800-00	Panel PC 300 insert for Automation Panel 900; 256 MB SDRAM; CompactFlash slot (Type I); ETH 10/100; RS 232; USB 2.0 (USB 2.0 interfaces integrated on Automation Panel); battery; 24 VDC.	982
5PC310.L800-01	Panel PC 300 insert for Automation Panel 900; 512 MB SDRAM; CompactFlash slot (Typ I); ETH 10/100; RS 232; USB 2.0 (USB 2.0 interfaces integrated on Automation Panel); battery; 24 VDC.	982

Accessories

Model number	Short description	
0TB103.0	Terminal block, 3-pin, screw clamp, 3.31 mm ²	1131
0TB103.91	Terminal block, 3-pin, cage clamps, 3.31 mm ²	1131
	CompactFlash	1126



Product overview

Automation Panel 10.4" VGA



Model number	Short description	
5AP920.1043-01	Automation Panel AP920, 10.4" VGA color TFT display with touch screen (resistive); 2 USB 2.0 interfaces; insert for Automation Panel link; IP 65 protection (front). 24 VDC.	1090
5AP980.1043-01	Automation Panel AP980, 10.4" VGA color TFT display with touch screen (resistive); 10 soft keys and 12 function keys; 2 USB 2.0 interfaces; insert for Automation Panel link; IP 65 protection (front side). 24 VDC.	1090
5AP981.1043-01	Automation Panel AP981, 10.4" VGA color TFT display with touch screen (resistive); 10 soft keys; 28 function keys and 20 system keys; 2 USB 2.0 interfaces; insert for Automation Panel link; IP 65 protection (front side). 24 VDC.	1091
5AP982.1043-01	Automation Panel AP982, 10.4" VGA color TFT display with touch screen (resistive); 44 function keys and 20 system keys; 2 USB 2.0 interfaces; insert for Automation Panel link; IP 65 protection (front side). 24 VDC.	1092

Automation Panel 12.1" SVGA



Model number	Short description	
5AP920.1214-01	Automation Panel AP920, 12.1" SVGA color TFT display with touch screen (resistive); 3 USB 2.0 interfaces; insert for Automation Panel link; IP 65 protection (front). 24 VDC.	1093

Automation Panel 15" XGA



Model number	Short description	
5AP920.1505-01	Automation Panel AP920, 15" XGA color TFT display with touch screen (resistive); 3 USB 2.0 interfaces; insert for Automation Panel link; IP 65 protection (front). 24 VDC.	1094
5AP980.1505-01	Automation Panel AP981, 15" XGA color TFT display with touch screen (resistive); 12 soft keys and 20 function keys; 3 USB 2.0 interfaces; insert for Automation Panel link; IP 65 protection (front side). 24 VDC.	1094
5AP981.1505-01	Automation Panel AP981, 15" XGA color TFT display with touch screen (resistive); 12 soft keys; 20 function keys and 92 system keys; 3 USB 2.0 interfaces; insert for Automation Panel link; IP 65 protection (front side). 24 VDC.	1095

Automation Panel 17" SXGA



Model number	Short description	1096
5AP920.1706-01	Automation Panel AP920, 17" SXGA color TFT display with touch screen (resistive); 3 USB 2.0 interfaces; insert for Automation Panel link; IP 65 protection (front). 24 VDC.	1096

Automation Panel 19" SXGA



Model number	Short description	1097
5AP920.1906-01	Automation Panel AP920, 19" SXGA color TFT display with touch screen (resistive); 3 USB 2.0 interfaces; insert for Automation Panel link; IP 65 protection (front). 24 VDC.	1097

Panel PC 300



Name	5PC310.L800-00	5PC310.L800-01
CPU	AMD LX800/500 MHz	AMD LX800/500 MHz
Memory	256 MB RAM L2 cache 128 KB External bus 400 MHz	512 MB RAM L2 cache 128 KB External bus 400 MHz
COM	RS232	RS232
Design	9-pin DSUB connector	9-pin DSUB connector
Max. baud rate	115 kBit/s	115 kBit/s
Ethernet	2x 10/100 Mbit/s	2x 10/100 Mbit/s
USB	Up to 3x USB 2.0 (Automation Panel onboard interfaces)	Up to 3x USB 2.0 (Automation Panel onboard interfaces)
Reset Taster	√	√
Power Taster	√	√
Slots	CompactFlash slot 1x Type I	CompactFlash slot 1x Type I
Supported displays	10.4" VGA TFT color 12.1" SVGA TFT color 15" XGA TFT color 17" SXGA TFT color 19" SXGA TFT color	10.4" VGA TFT color 12.1" SVGA TFT color 15" XGA TFT color 17" SXGA TFT color 19" SXGA TFT color
Miscellaneous	Fan-free Supply voltage 24 VDC +/- 25%	Fan-free Supply voltage 24 VDC +/- 25%

Optional accessories		
CompactFlash	Reference to Accessories section	1126
0TB103.9	connector 24 VDC screw clamp	1131
0TB103.91	connector 24 VDC cage clamp	1131



Panel PC 700

A combination of an industrial PC and display in one housing. A Panel PC is the first choice anywhere a PC and display must be installed in a limited space.



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Product overview	📄 992
Product data sheets	📄 996
Display links	📄 1002
Dimensions	📄 1006
Legend strips	📄 1010

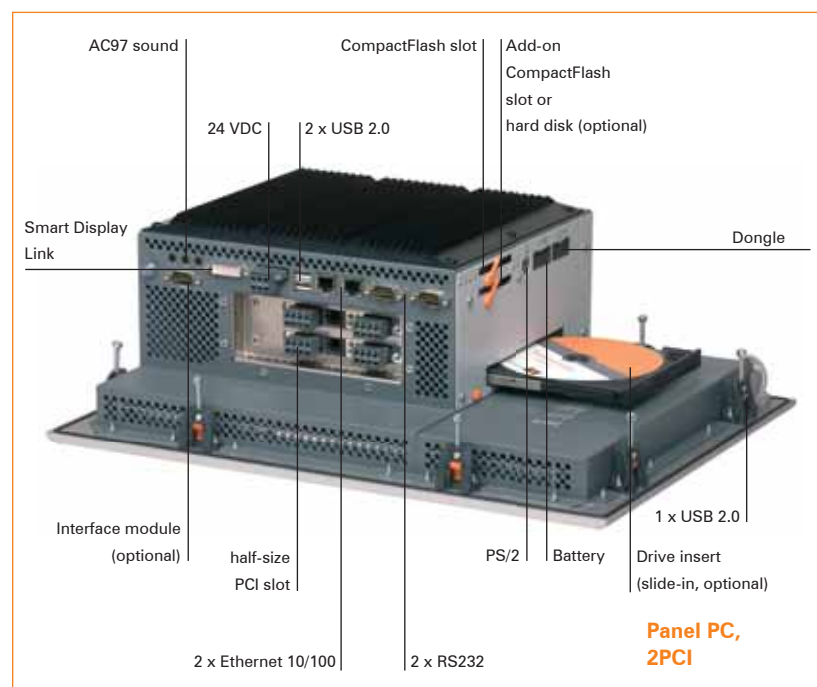
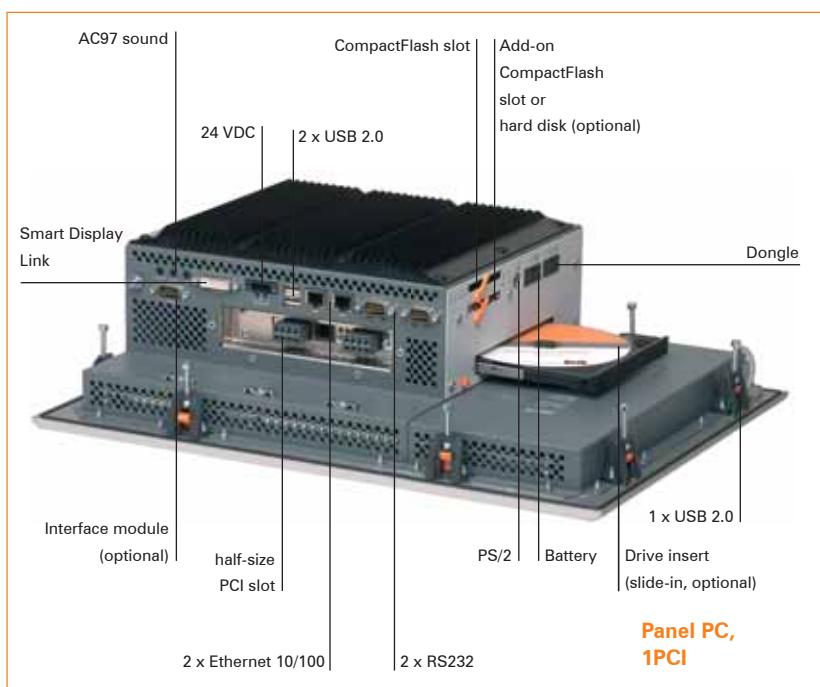
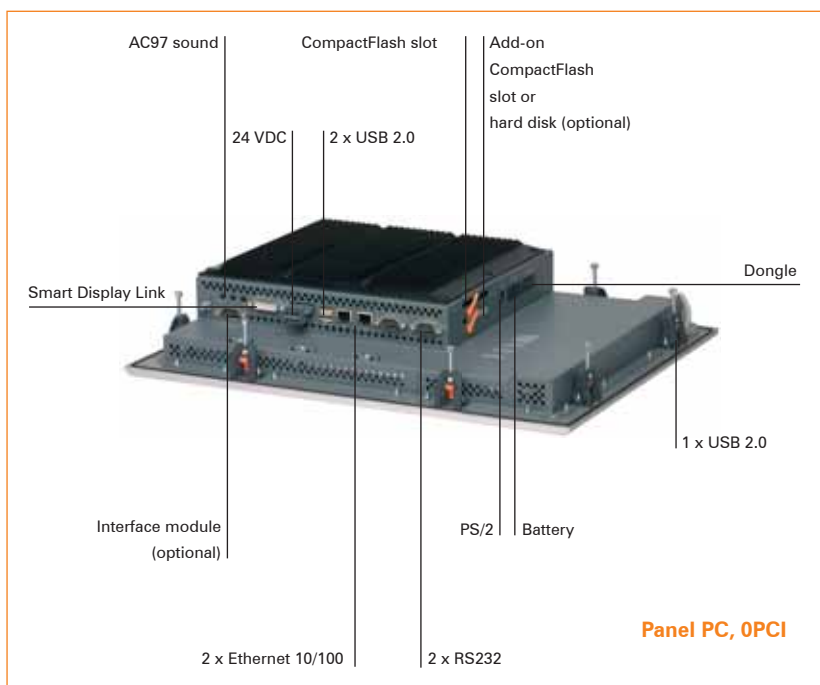
System characteristics

Panel PCs - compact and high performance

The Panel PC combines an industrial PC and display in one housing. This variant is the first choice anywhere a PC and display must be installed in a limited space. During construction of the Panel PC 700, special attention was given to ensuring mechanical robustness.

The Panel PC and APC620 are based on the same platform, which means that the Panel PC also offers the full bandwidth of processors ranging from Celeron® 600 MHz to Pentium® M 1.8 GHz. Panel PCs are available as touch devices with 10.4" VGA, 12.1" SVGA, 15" XGA and 19" SXGA TFT displays. The housing is also a defining factor: From very flat devices without PCI slots to expandable devices with two PCI slots, the Panel PC can be optimized to meet the requirements of the application. Four additional Automation Panels can be connected to the Panel PC 700 (dual independent display).

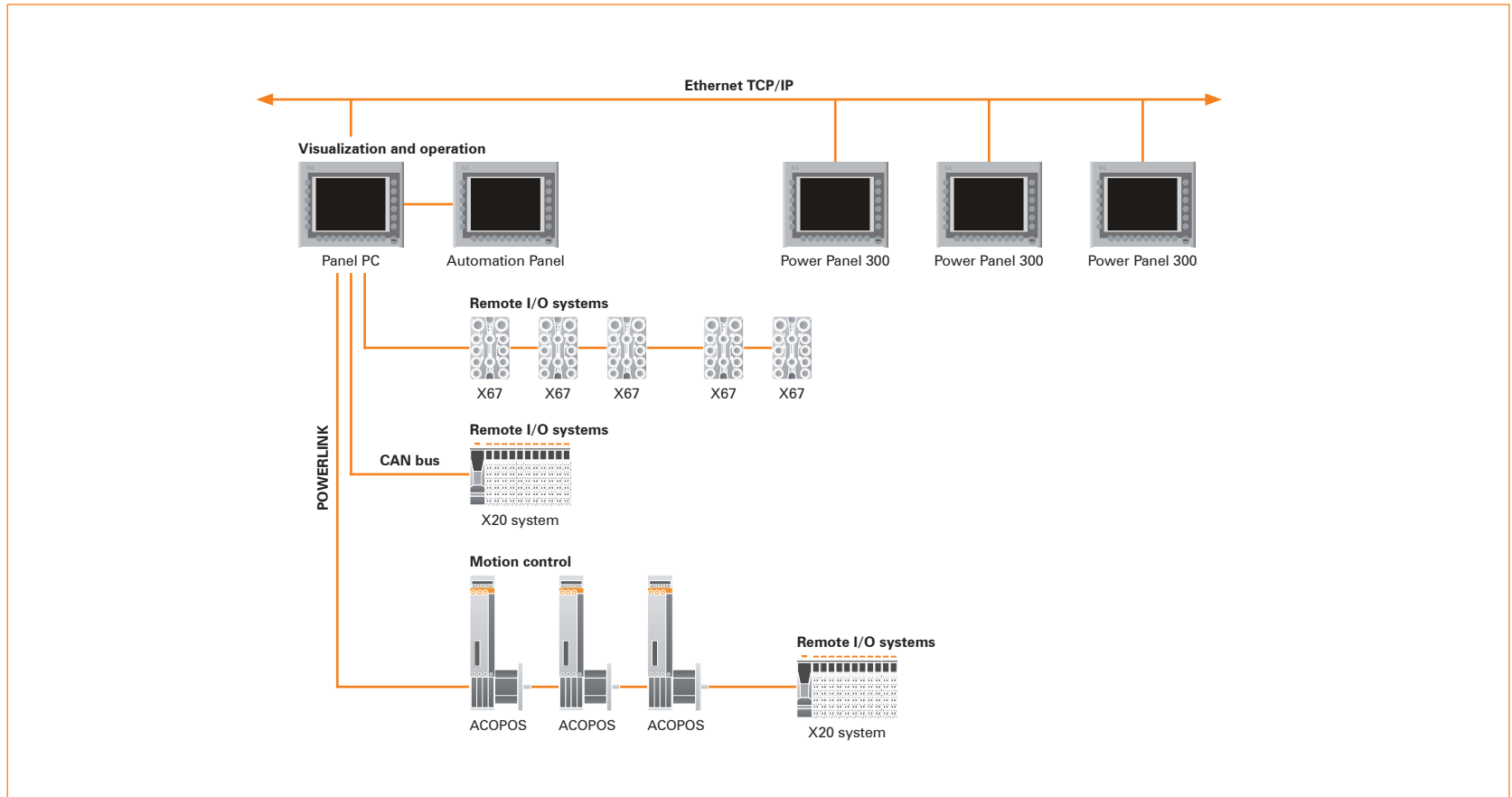
The Panel PC has an integrated CompactFlash slot, which can be expanded with a second CompactFlash slot or a hard disk. Additionally, the Panel PC with one or two PCI slots can be optionally equipped with a slide-in drive (CD-ROM, DVD-RW/CD-RW, hard disk, floppy disk drive or CompactFlash). Models with one or more PCI slots additionally offer a slot option for the SRAM module.



Typical topologies

Panel PC for central control and visualization

The control program runs on the Panel PC. The visualization project is integrated with Visual Components. The PC is networked over Ethernet TCP/IP; additional Power Panel-based operator terminals can also be connected via Ethernet. Communication to I/O systems with axes is handled via fieldbus systems (CAN, Ethernet POWERLINK).



Control system	Panel PC: Integrated control, operation, and visualization	985
Visualization and operation	Power Panel: Integrated control, operation, and visualization	987
	Automation Panel 800: Modular operation and visualization	1055
	Automation Panel 900: Compact operation and visualization	1077
Motion control	ACOPOS: Integrated servo drives	1251
	ACOPOSmulti: Modular drive system	1321
Remote I/O systems	X67 System: Remote I/O	419
	X20 System: Slice-based I/O and control system	37

Configuration

Panel PCs (housing with main board, display)

Select a Panel PC

5PC720.1043-00	Panel PC 720 10.4" VGA TFT, touch screen, 0 PCI slots	996
5PC720.1043-01	Panel PC 720 10.4" VGA TFT, touch screen, 2 PCI slots, 1 drive slot	996
5PC720.1214-00	Panel PC 720 12.1" SVGA TFT, touch screen, 0 PCI slots	998
5PC720.1214-01	Panel PC 720 12.1" SVGA TFT, touch screen, 2 PCI slots, 1 drive slot	998
5PC720.1505-00	Panel PC 720 15" XGA TFT, touch screen, 0 PCI slots	999
5PC720.1505-01	Panel PC 720 15" XGA TFT, touch screen, 2 PCI slots, 1 drive slot	999
5PC720.1505-02	Panel PC 720 15" XGA TFT, touch screen, 1 PCI slots, 1 drive slot	1000
5PC720.1706-00	Panel PC720 17" SXGA TFT, touch screen, 0 PCI slots	1001
5PC720.1906-00	Panel PC 720 19" SXGA TFT, touch screen, 0 PCI slots	1001
5PC781.1043-00	Panel PC 781 10.4" VGA TFT, touch screen, keys, 0 PCI slots	997
5PC781.1505-00	Panel PC 781 15" XGA TFT, touch screen, keys, 0 PCI slots	1000
5PC782.1043-00	Panel PC 782 10.4" VGA TFT, touch screen, keys, 0 PCI slots	997

CPU boards with 855 GME chipset

Select a CPU board

5PC600.X855-00	CPU board, Intel® Pentium® M, 1100 MHz	930
5PC600.X855-01	CPU board, Intel® Pentium® M, 1600 MHz	930
5PC600.X855-02	CPU board, Intel® Pentium® M, 1400 MHz	930
5PC600.X855-03	CPU board, Intel® Pentium® M, 1800 MHz	931
5PC600.X855-04	CPU board, Intel® Celeron® M, 600 MHz	931
5PC600.X855-05	CPU board, Intel® Celeron® M, 1000 MHz	931

Memory for CPU boards with 855 GME chipset

Select a memory module

5MMDDR.0256-00	SO-DIMM DDR SDRAM, 256 MB	931
5MMDDR.0512-00	SO-DIMM DDR SDRAM, 512 MB	931
5MMDDR.1024-00	SO-DIMM DDR SDRAM, 1024 MB	931

Heat sinks for CPU boards with 855GME chipset

Select a heat sink

5AC700.HS01-01	Panel PC heat sink for CPU board with Celeron® M 600 MHz, 1000 MHz, Pentium® M 1100 MHz, 1400 MHz.	993
5AC700.HS01-02	Panel PC heat sink for CPU boards with Pentium® M 1600 MHz, 1800 MHz.	993



Drives		
Select max. one add-on drive		
5AC600.HDDI-05	40 GB add-on hard disk, 24/7 operation and expanded temperature range	994
5AC600.HDDI-06	80 GB add-on hard disk, 24/7 operation and expanded temperature range	994
5AC600.CFSI-00	Add-on CompactFlash slot	994
Select max. one slide-in drive (only for 5PC720.1043-01, 5PC720.1214-01, 5PC720.1505-01 and 5PC720.1505-02)		
5AC600.HDDS-02	40 GB slide-in hard disk, 24/7 operation and expanded temperature range	
5AC600.CFSS-00	Slide-in CompactFlash adapter for 2 CF	994
5AC600.DVDS-00	Slide-in DVD-ROM/CD-RW	994
5AC600.DVRS-00	Slide-in DVD-R/RW, DVD+R/RW	994
5AC600.CDXS-00	Slide-in CD-ROM	994
5AC600.FDDS-00	Slide-in USB FDD	994
5AC600.HCFS-00	40 GB slide-in hard disk, 24/7 operation and expanded temperature range with CompactFlash adapter	994
Select max. one Raid system (only for 5PC720.1043-01, 5PC720.1214-01, 5PC720.1505-01 and 5PC720.1505-02)		
5ACPCI.RAIC-03	PCI RAID system SATA 2 x 160 GB (controller and 2x hard disk)	994
Select max. one SRAM module (only for 5PC720.1043-01, 5PC720.1214-01, 5PC720.1505-01 and 5PC720.1505-02)		
5AC600.SRAM-00	512 KB SRAM module for APC620 and PPC700	995

Fan kits		
Select a fan kit (if required)¹⁾		
5PC700.FA00-01	Fan kit for 0 PCI Panel PC 10.4", 12.1", 15", 17" and 19"	994
5PC700.FA02-00	Fan kit for 2 PCI Panel PC 10.4"	994
5PC700.FA02-01	Fan kit for 1 or 2 PCI Panel PC 12.1" and 15"	994

1) A fan kit may be necessary for certain system configurations.

Supply voltage connectors		
Select a supply voltage connector		
0TB103.9	Accessory terminal block 3-pin, screw clamps 3.31 mm ²	1131
0TB103.91	Accessory terminal block 3-pin, cage clamps 3.31 mm ²	1131

Product overview

Panel PC system units



Model number	Short description	
5PC720.1043-00	Panel PC 720 10.4" VGA, 0 PCI slots, 10.4" VGA color TFT display with touch screen (resistive); connections for 2 x RS232, 3 x USB 2.0, monitor, 2 x Ethernet 10/100, AC97 sound, PS/2 keyboard/mouse; IP65 protection (front side); 24 VDC.	996
5PC720.1043-01	Panel PC 720 10.4" VGA, 2 PCI slots, 10.4" VGA color TFT display with touch screen (resistive); 1 drive slot; connections for 2 x RS232, 3 x USB 2.0, monitor, 2 x Ethernet 10/100, AC97 sound, PS/2 keyboard/mouse; IP65 protection (front side); 24 VDC.	996
5PC720.1214-00	Panel PC 720 12.1" SVGA, 0 PCI slots, 12.1" SVGA color TFT display with touch screen (resistive); connections for 2 x RS232, 3 x USB 2.0, monitor, 2 x Ethernet 10/100, AC97 sound, PS/2 keyboard/mouse; IP65 protection (front side); 24 VDC.	998
5PC720.1214-01	Panel PC 720 12.1" SVGA, 2 PCI slots, 12.1" SVGA color TFT display with touch screen (resistive); 1 drive slot; connections for 2 x RS232, 3 x USB 2.0, monitor, 2 x Ethernet 10/100, AC97 sound, PS/2 keyboard/mouse; IP65 protection (front side); 24 VDC.	998
5PC720.1505-00	Panel PC 720 15" XGA, 0 PCI slots, 15" XGA color TFT display with touch screen (resistive); connections for 2 x RS232, 3 x USB 2.0, monitor, 2 x Ethernet 10/100, AC97 sound, PS/2 keyboard/mouse; IP65 protection (front side); 24 VDC.	999
5PC720.1505-01	Panel PC 720 15" XGA, 2 PCI slots, 15" XGA color TFT display with touch screen (resistive); 1 drive slot; connections for 2 x RS232, 3 x USB 2.0, monitor, 2 x Ethernet 10/100, AC97 sound, PS/2 keyboard/mouse; IP65 protection (front side); 24 VDC.	999
5PC720.1505-02	Panel PC 720 15" XGA, 1 PCI slots, 15" XGA color TFT display with touch screen (resistive); 1 drive slot; connections for 2 x RS232, 3 x USB 2.0, monitor, 2 x Ethernet 10/100, AC97 sound, PS/2 keyboard/mouse; IP65 protection (front side); 24 VDC.	1000
5PC720.1706-00	Panel PC 720 17" SXGA, 0 PCI slots, 17" SXGA color TFT display with touch screen (resistive); connections for 2x RS232, 3x USB 2.0, monitor, 2x Ethernet 10/100, AC97 sound, PS/2 keyboard/mouse; IP65 protection (front side); 24 VDC.	1001
5PC720.1906-00	Panel PC 720 19" SXGA, 0 PCI slots, 19" SVGA color TFT display with touch screen (resistive); connections for 2 x RS232, 3 x USB 2.0, monitor, 2 x Ethernet 10/100, AC97 sound, PS/2 keyboard/mouse; IP65 protection (front side); 24 VDC.	1001
5PC781.1043-00	Panel PC 781 10.4" VGA, 0 PCI slots, 10.4" VGA TFT color display with touch screen (resistive); 10 soft keys; 28 function keys and 20 system keys; connections for 2 x RS232, 3 x USB 2.0, monitor, 2 x Ethernet 10/100, AC97 sound, PS/2 keyboard/mouse; IP65 protection (front side); 24 VDC.	997
5PC781.1505-00	Panel PC 781 15" XGA, 0 PCI slots, 15" XGA TFT color display with touch screen (resistive); 12 soft keys; 20 function keys and 92 system keys; connections for 2 x RS232, 3 x USB 2.0, monitor, 2 x Ethernet 10/100, AC97 sound, PS/2 keyboard/mouse; IP65 protection (front side); 24 VDC.	1000
5PC782.1043-00	Panel PC 782 10.4" VGA, 0 PCI slots, 10.4" VGA color TFT display with touch screen (resistive); 44 function keys and 20 system keys; connections for 2 x RS232, 3 x USB 2.0, monitor, 2 x Ethernet 10/100, AC97 sound, PS/2 keyboard/mouse; IP65 protection (front side); 24 VDC.	997

CPU boards, memory and heat sinks



Intel® Pentium® M / Celeron® M

Model number	Short description	
5PC600.X855-00	CPU board Intel® Pentium® M, 1100 MHz, 400 MHz FSB, 1 MB L2 cache; 855GME chipset; 1 socket for SO-DIMM DDR module	930
5PC600.X855-01	CPU board Intel® Pentium® M, 1600 MHz, 400 MHz FSB, 1 MB L2 Cache; 855GME chipset; 1 socket for SO-DIMM DDR module	930
5PC600.X855-02	CPU board Intel® Pentium® M, 1400 MHz, 400 MHz FSB, 2 MB L2 Cache; 855GME chipset; 1 socket for SO-DIMM DDR module	930
5PC600.X855-03	CPU board Intel® Pentium® M, 1800 MHz, 400 MHz FSB, 2 MB L2 cache; 855GME chipset, 1 socket for SO-DIMM DDR module	931
5PC600.X855-04	CPU board Intel® Celeron® M, 600 MHz, 400 MHz FSB, 512 kB L2 cache; 855GME chipset, 1 socket for SO-DIMM DDR module	931
5PC600.X855-05	CPU board Intel® Celeron® M, 1000 MHz, 400 MHz FSB, 512 kB L2 cache; 855GME chipset, 1 socket for SO-DIMM DDR module	931
5MMDDR.0256-00	SO-DIMM DDR SDRAM, 256 MB PC2700	931
5MMDDR.0512-00	SO-DIMM DDR SDRAM, 512 MB PC2700	931
5MMDDR.1024-00	SO-DIMM DDR SDRAM, 1024 MB PC2700	931
5AC700.HS01-01	Panel PC heat sink for CPU boards with Celeron® M 600 MHz, Celeron® M 1000 MHz, Pentium® M 1100 MHz, Pentium® M 1400 MHz	---
5AC700.HS01-02	Panel PC heat sink for CPU boards with Pentium® M 1600 MHz, Pentium® M 1800 MHz	---

Product overview

Drives



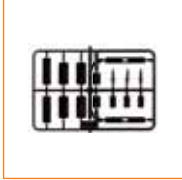
Model number	Short description
5AC600.HDDI-05	40 GB hard disk (add-on), 24/7 operation, with expanded temperature range
5AC600.HDDI-06	80 GB hard disk (add-on), 24/7 operation, with expanded temperature range
5AC600.CFSI-00	CompactFlash slot (add-on)
5AC600.CFSS-00	Dual CompactFlash slot (slide-in) (1 x IDE, 1 x USB 2.0)
5AC600.HDDS-02	40 GB hard disk (slide-in), 24/7 operation, with expanded temperature range
5AC600.DVRS-00	DVD-R/RW DVD+R/RW drive (slide-in)
5AC600.DVDS-00	DVD-ROM/CD-RW drive (slide-in)
5AC600.CDXS-00	CD-ROM drive (slide-in)
5AC600.FDDS-00	FDD drive (slide-in)
5AC600.HCFS-00	40 GB slide-in hard disk, 24/7 operation and expanded temperature range with CompactFlash adapter
5ACPCI.RAIC-03	PCI RAID system SATA 2x160 GB (controller and 2x hard disk)
5ACPCI.RAIC-04	Replacement SATA-HDD 160 GB

Fan kits



Model number	Short description
5PC700.FA00-01	Panel PC fan kit, for Panel PC 10.4", 12.1", 15", 17" and 19" with 0 PCI slots.
5PC700.FA02-00	Panel PC fan kit, for Panel PC 10.4" with 2 PCI slots.
5PC700.FA02-01	Panel PC fan kit, for Panel PC 12.1" and 15" with 1 or 2 PCI slots.

Accessories



Model number	Short description
5AC900.1000-00	Adapter DVI (plug) to CRT (socket), for connecting a standard monitor to a DVI-I interface.
5AC600.ICOV-00	Interface covers for APC620 or Panel PC; 5 pcs.
5AC600.CANI-00	CAN interface, for installation in an APC620 or Panel PC.
5AC600.485I-00	RS232/422/485 interface, for installation in an APC620 or Panel PC.
5AC700.FA00-00	Panel PC replacement fan filter, for 0 PCI system units. 5 pieces.
5AC700.FA02-00	Panel PC replacement fan filter, for 1 or 2 PCI system units. 5 pieces.
5AC600.SRAM-00	512 KB SRAM module for APC620 and PPC700

Panel PC 10.4"



	5PC720.1043-00	5PC720.1043-01
Type	TFT color	TFT color
Colors	262,144	262,144
Resolution	VGA, 640 x 480 pixels	VGA, 640 x 480 pixels
Diagonal	10.4"	10.4"
Brightness	350 cd/m ²	350 cd/m ²
Half-brightness time	50,000 hours	50,000 hours
Touch screen	Analog resistive	Analog resistive
Keys		
Function keys	-	-
Soft keys	-	-
System keys	-	-
COM1 / COM2	RS232	RS232
Design	9-pin DSUB plug	9-pin DSUB plug
Max. baud rate	115 kBit/s	115 kBit/s
USB	Connection type A 2 x USB 2.0 (back side) 1 x USB 2.0 (front side), behind IP65 cover	Connection type A 2 x USB 2.0 (back side) 1 x USB 2.0 (front side), behind IP65 cover
Panel/Monitor interface	SDL/DVI/monitor	SDL/DVI/monitor
Design	DVI-I socket	DVI-I socket
Keyboard/Mouse	PS/2 (combined)	PS/2 (combined)
AC97 sound	Mic., line in, line out	Mic., line in, line out
CompactFlash slot 1	Integrated (type I)	Integrated (type I)
CompactFlash slot 2 ¹	Optional (type I)	Optional (type I)
Hard disk ¹	Optional	Optional
Ethernet	2 x 10/100 Mbit/s	2 x 10/100 Mbit/s
PCI slots (half-size)	-	2
SRAM	512 KB optional	512 KB optional
Automation Panel link slot	-	-
Reset button	√	√
Power button	√	√
Housing fan inserts	√	√
Slot for optional drives	--	1
Power supply	24 VDC +/- 25 %	24 VDC +/- 25 %
Power supply buffering	10 ms	10 ms
Protection type	IP65 front side, IP20 back side	IP65 front side, IP20 back side
Outer dimensions (WxHxD [mm])	323 x 260 x 101.5	323 x 260 x 166.5

1) Either a 2nd CompactFlash slot or a hard disk can be installed at the factory.



	5PC781.1043-00	5PC782.1043-00
Type	TFT color	TFT color
Colors	262,144	262,144
Resolution	VGA, 640 x 480 pixels	VGA, 640 x 480 pixels
Diagonal	10.4"	10.4"
Brightness	350 cd/m ²	350 cd/m ²
Half-brightness time	50,000 hours	50,000 hours
Touch screen	Analog resistive	Analog resistive
Keys		
Function keys	28	44
Soft keys	10	10
System keys	20	20
COM1 / COM2	RS232	RS232
Design	9-pin DSUB plug	9-pin DSUB plug
Max. baud rate	115 kBit/s	115 kBit/s
USB	Connection type A 2 x USB 2.0 (back side)1 x USB 2.0 (front side), behind IP65 cover	Connection type A 2 x USB 2.0 (back side)1 x USB 2.0 (front side), behind IP65 cover
Panel/Monitor interface	SDL/DVI/monitor	SDL/DVI/monitor
Design	DVI-I socket	DVI-I socket
Keyboard/Mouse	PS/2 (combined)	PS/2 (combined)
AC97 sound	Mic., line in, line out	Mic., line in, line out
CompactFlash slot 1	Integrated (type I)	Integrated (type I)
CompactFlash slot 2 ¹	Optional (type I)	Optional (type I)
Hard disk ¹	Optional	Optional
Ethernet	2 x 10/100 Mbit/s	2 x 10/100 Mbit/s
PCI slots (half-size)	-	-
SRAM	512 KB optional	512 KB optional
Automation Panel link slot	-	-
Reset button	√	√
Power button	√	√
Housing fan inserts	√	√
Slot for optional drives	-	-
Power supply	24 VDC +/- 25 %	24 VDC +/- 25 %
Power supply buffering	10 ms	10 ms
Protection type	IP65 front side, IP20 back side	IP65 front side, IP20 back side
Outer dimensions (WxHxD [mm])	323x358x101.5	423x288x101.5

1) Either a 2nd CompactFlash slot or a hard disk can be installed at the factory.

Panel PC 12.1"



	5PC720.1214-00	5PC720.1214-01
Type	TFT color	TFT color
Colors	262,144	262,144
Resolution	SVGA, 800 x 600 pixels	SVGA, 800 x 600 pixels
Diagonal	12.1"	12.1"
Brightness	350 cd/m ²	350 cd/m ²
Half-brightness time	50,000 hours	50,000 hours
Touch screen	Analog resistive	Analog resistive
Keys		
Function keys	-	-
Soft keys	-	-
System keys	-	-
COM1 / COM2	RS232	RS232
Design	9-pin DSUB plug	9-pin DSUB plug
Max. baud rate	115 kBit/s	115 kBit/s
USB	Connection type A 2 x USB 2.0 (back side) 1 x USB 2.0 (front side), behind IP65 cover	Connection type A 2 x USB 2.0 (back side) 1 x USB 2.0 (front side), behind IP65 cover
Panel/Monitor interface	SDL/DVI/monitor	SDL/DVI/monitor
Design	DVI-I socket	DVI-I socket
Keyboard/Mouse	PS/2 (combined)	PS/2 (combined)
AC97 sound	Mic., line in, line out	Mic., line in, line out
CompactFlash slot 1	Integrated (type I)	Integrated (type I)
CompactFlash slot 2 ¹	Optional (type I)	Optional (type I)
Hard disk ¹	Optional	Optional
Ethernet	2 x 10/100 Mbit/s	2 x 10/100 Mbit/s
PCI slots (half-size)	-	2
SRAM	512 KB optional	512 KB optional
Automation Panel link slot	-	-
Reset button	√	√
Power button	√	√
Housing fan inserts	√	√
Slot for optional drives	-	1
Power supply	24 VDC +/- 25 %	24 VDC +/- 25 %
Power supply buffering	10 ms	10 ms
Protection type	IP65 front side, IP20 back side	IP65 front side, IP20 back side
Outer dimensions (WxHxD [mm])	362 x 284 x 101.5	362 x 284 x 166.5

1) Either a 2nd CompactFlash slot or a hard disk can be installed at the factory.

Panel PC 15"



	5PC720.1505-00	5PC720.1505-01
Type	TFT color	TFT color
Colors	16 million	16 million
Resolution	XGA, 1024 x 768 pixels	XGA, 1024 x 768 pixels
Diagonal	15"	15"
Brightness	250 cd/m ²	250 cd/m ²
Half-brightness time	50,000 hours	50,000 hours
Touch screen	Analog resistive	Analog resistive
Keys		
Function keys	-	-
Soft keys	-	-
System keys	-	-
COM1 / COM2	RS232	RS232
Design	9-pin DSUB plug	9-pin DSUB plug
Max. baud rate	115 kBit/s	115 kBit/s
USB	Connection type A 2 x USB 2.0 (back side)1 x USB 2.0 (front side), behind IP65 cover	Connection type A 2 x USB 2.0 (back side)1 x USB 2.0 (front side), behind IP65 cover
Panel/Monitor interface	SDL/DVI/monitor	SDL/DVI/monitor
Design	DVI-I socket	DVI-I socket
Keyboard/Mouse	PS/2 (combined)	PS/2 (combined)
AC97 sound	Mic., line in, line out	Mic., line in, line out
CompactFlash slot 1	Integrated (type I)	Integrated (type I)
CompactFlash slot 2 ¹	Optional (type I)	Optional (type I)
Hard disk ¹	Optional	Optional
Ethernet	2 x 10/100 Mbit/s	2 x 10/100 Mbit/s
PCI slots (half-size)	-	2
SRAM	512 KB optional	512 KB optional
Automation Panel link slot	-	-
Reset button	√	√
Power button	√	√
Housing fan inserts	√	√
Slot for optional drives	-	1
Power supply	24 VDC +/- 25 %	24 VDC +/- 25 %
Power supply buffering	10 ms	10 ms
Protection type	IP65 front side, IP20 back side	IP65 front side, IP20 back side
Outer dimensions (WxHxD [mm])	435x330x101.5	435x330x166.5

1) Either a 2nd CompactFlash slot or a hard disk can be installed at the factory.

Panel PC 15"



	SPC720.1505-02	SPC781.1505-00
Type	TFT color	TFT color
Colors	16 million	16 million
Resolution	XGA, 1024 x 768 pixels	XGA, 1024 x 768 pixels
Diagonal	15"	15"
Brightness	250 cd/m ²	250 cd/m ²
Half-brightness time	50,000 hours	50,000 hours
Touch screen	Analog resistive	Analog resistive
Keys		
Function keys	-	20
Soft keys	-	12
System keys	-	92
COM1 / COM2	RS232	RS232
Design	9-pin DSUB plug	9-pin DSUB plug
Max. baud rate	115 kBit/s	115 kBit/s
USB	Connection type A 2 x USB 2.0 (back side) 1 x USB 2.0 (front side), behind IP65 cover	Connection type A 2 x USB 2.0 (back side) 1 x USB 2.0 (front side), behind IP65 cover
Panel/Monitor interface	SDL/DVI/monitor	SDL/DVI/monitor
Design	DVI-I socket	DVI-I socket
Keyboard/Mouse	PS/2 (combined)	PS/2 (combined)
AC97 sound	Mic., line in, line out	Mic., line in, line out
CompactFlash slot 1	Integrated (type I)	Integrated (type I)
CompactFlash slot 2 ¹	Optional (type I)	Optional (type I)
Hard disk ¹	Optional	Optional
Ethernet	2 x 10/100 Mbit/s	2 x 10/100 Mbit/s
PCI slots (half-size)	1	-
SRAM	512 KB optional	512 KB optional
Automation Panel link slot	-	-
Reset button	√	√
Power button	√	√
Housing fan inserts	√	√
Slot for optional drives	1	-
Power supply	24 VDC +/- 25 %	24 VDC +/- 25 %
Power supply buffering	10 ms	10 ms
Protection type	IP65 front side, IP20 back side	IP65 front side, IP20 back side
Outer dimensions (WxHxD [mm])	435 x 330 x 146.2	435 x 430 x 101.5

1) Either a 2nd CompactFlash slot or a hard disk can be installed at the factory.

Panel PC 17" / 19"



	5PC720.1706-00	5PC720.1906-00
Type	TFT color	TFT color
Colors	16 million	16 million
Resolution	SXGA, 1280 x 1024 pixels	SXGA, 1280 x 1024 pixels
Diagonal	17"	19"
Brightness	250 cd/m ²	300 cd/m ²
Half-brightness time	50,000 hours	50,000 hours
Touch screen	Analog resistive	Analog resistive
Keys		
Function keys	-	-
Soft keys	-	-
System keys	-	-
COM1 / COM2	RS232	RS232
Design	9-pin DSUB plug	9-pin DSUB plug
Max. baud rate	115 kBit/s	115 kBit/s
USB	Connection type A 2 x USB 2.0 (back side) 1 x USB 2.0 (front side), behind IP65 cover	Connection type A 2 x USB 2.0 (back side) 1 x USB 2.0 (front side), behind IP65 cover
Panel/Monitor interface	SDL/DVI/monitor	SDL/DVI/monitor
Design	DVI-I socket	DVI-I socket
Keyboard/Mouse	PS/2 (combined)	PS/2 (combined)
AC97 sound	Mic., line in, line out	Mic., line in, line out
CompactFlash slot 1	Integrated (type I)	Integrated (type I)
CompactFlash slot 2 ¹⁾	Optional (type I)	Optional (type I)
Hard disk ¹⁾	Optional	Optional
Ethernet	2 x 10/100 Mbit/s	2 x 10/100 MBit/s
PCI slots (half-size)	-	-
SRAM	512 KB optional	512 KB optional
Automation Panel link slot	-	-
Reset button	√	√
Power button	√	√
Housing fan inserts	√	√
Slot for optional drives	-	-
Power supply	24 VDC +/- 25 %	24 VDC +/- 25 %
Power supply buffering	10 ms	10 ms
Protection type	IP65 front side, IP20 back side	IP65 front side, IP20 back side
Outer dimensions (WxHxD [mm])	477 x 390 x 106	527 x 421 x 106

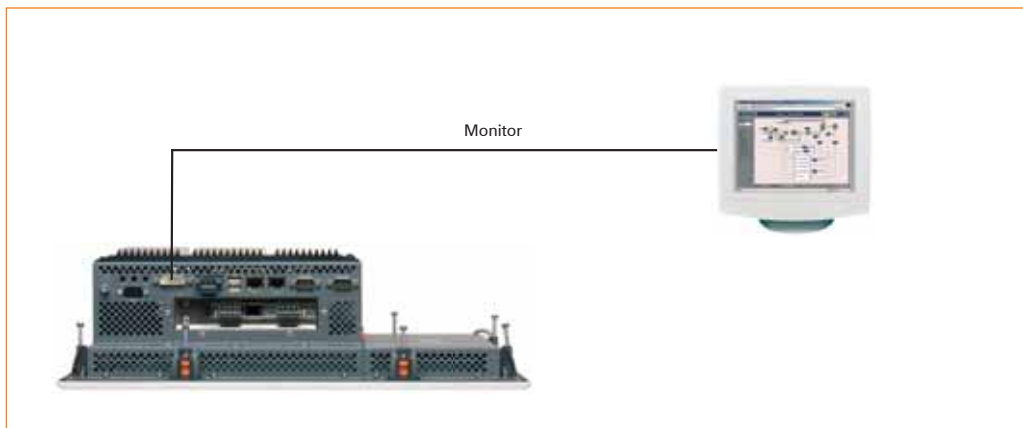
1) Either a 2nd CompactFlash slot or a hard disk can be installed at the factory.

Display links

Panel PC as a standalone device / with monitor

The Panel PC is operated as a standalone device.

An analog monitor can be connected (using an adapter) as an additional visualization unit.



Possible combinations

	5PC600.X855-00	5PC600.X855-01	5PC600.X855-02	5PC600.X855-03	5PC600.X855-04	5PC600.X855-05
5PC720.1043-00	✓	✓	✓	✓	✓	✓
5PC720.1043-01	✓	✓	✓	✓	✓	✓
5PC720.1214-00	✓	✓	✓	✓	✓	✓
5PC720.1214-01	✓	✓	✓	✓	✓	✓
5PC720.1505-00	✓	✓	✓	✓	✓	✓
5PC720.1505-01	✓	✓	✓	✓	✓	✓
5PC720.1505-02	✓	✓	✓	✓	✓	✓
5PC720.1706-00	✓	✓	✓	✓	✓	✓
5PC720.1906-00	✓	✓	✓	✓	✓	✓
5PC781.1043-00	✓	✓	✓	✓	✓	✓
5PC781.1505-00	✓	✓	✓	✓	✓	✓
5PC782.1043-00	✓	✓	✓	✓	✓	✓

Component overview

System units

	PCI slots
5PC720.1043-00	0
5PC720.1043-01	2
5PC720.1214-00	0
5PC720.1214-01	2
5PC720.1505-00	0
5PC720.1505-01	2
5PC720.1505-02	1
5PC720.1706-00	0
5PC720.1906-00	0
5PC781.1043-00	0
5PC781.1505-00	0
5PC782.1043-00	0

CPU boards

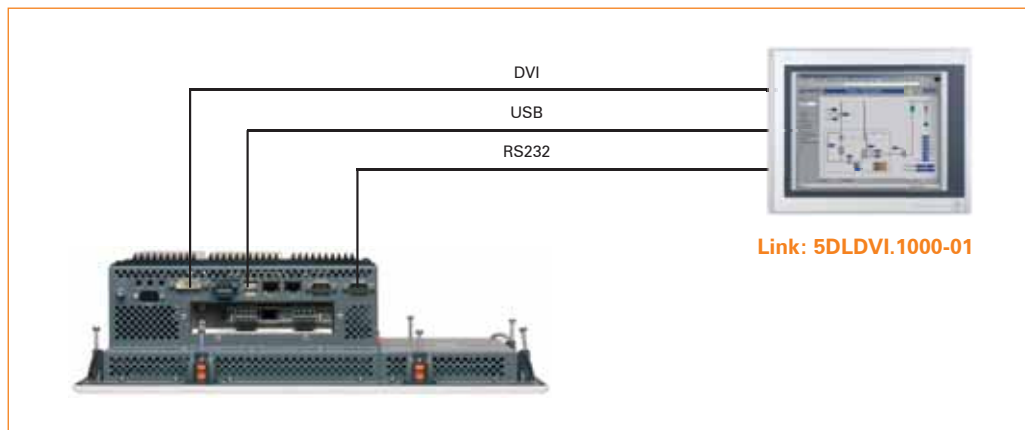
	Chipset	Processor	Resolution
5PC600.X855-00	Intel® 855GME	Pentium® M 1100 MHz	Max. UXGA
5PC600.X855-01	Intel® 855GME	Pentium® M 1600 MHz	Max. UXGA
5PC600.X855-02	Intel® 855GME	Pentium® M 1400 MHz	Max. UXGA
5PC600.X855-03	Intel® 855GME	Pentium® M 1800 MHz	Max. UXGA
5PC600.X855-04	Intel® 855GME	Celeron® M 600 MHz	Max. UXGA
5PC600.X855-05	Intel® 855GME	Celeron® M 1000 MHz	Max. UXGA

Accessories

	Type
5AC900.1000-00	DVI - CRT adapter

Automation Panel via DVI

An Automation Panel with max. SXGA resolution is connected to the integrated DVI interface. As an alternative, an office TFT with a DVI interface can also be operated. A separate cable is used for the touch screen and USB.



Possible combinations

	5PC600.X855-00	5PC600.X855-01	5PC600.X855-02	5PC600.X855-03	5PC600.X855-04	5PC600.X855-05
5PC720.1043-00	√	√	√	√	√	√
5PC720.1043-01	√	√	√	√	√	√
5PC720.1214-00	√	√	√	√	√	√
5PC720.1214-01	√	√	√	√	√	√
5PC720.1505-00	√	√	√	√	√	√
5PC720.1505-01	√	√	√	√	√	√
5PC720.1505-02	√	√	√	√	√	√
5PC720.1706-00	√	√	√	√	√	√
5PC720.1906-00	√	√	√	√	√	√
5PC781.1043-00	√	√	√	√	√	√
5PC781.1505-00	√	√	√	√	√	√
5PC782.1043-00	√	√	√	√	√	√

Component overview

System units

	PCI slots
5PC720.1043-00	0
5PC720.1043-01	2
5PC720.1214-00	0
5PC720.1214-01	2
5PC720.1505-00	0
5PC720.1505-01	2
5PC720.1505-02	1
5PC720.1706-00	0
5PC720.1906-00	0
5PC781.1043-00	0
5PC781.1505-00	0
5PC782.1043-00	0

CPU boards

	Chipset	Processor	Resolution
5PC600.X855-00	Intel® 855GME	Pentium® M 1100 MHz	Max. UXGA
5PC600.X855-01	Intel® 855GME	Pentium® M 1600 MHz	Max. UXGA
5PC600.X855-02	Intel® 855GME	Pentium® M 1400 MHz	Max. UXGA
5PC600.X855-03	Intel® 855GME	Pentium® M 1800 MHz	Max. UXGA
5PC600.X855-04	Intel® 855GME	Celeron® M 600 MHz	Max. UXGA
5PC600.X855-05	Intel® 855GME	Celeron® M 1000 MHz	Max. UXGA

Cables

	Type	Length
5CADVI.0018-00	DVI	1.8 m
5CADVI.0050-00	DVI	5 m
5CADVI.0100-00	DVI	10 m ¹⁾
9A0014.02	Touch screen	1.8 m
9A0014.05	Touch screen	5 m
9A0014.10	Touch screen	10 m ¹⁾
5CAUSB.0018-00	USB	1.8 m
5CAUSB.0050-00	USB	5 m

1) USB limited to 5 m

Automation Panel link module

	Type
5DLVDI.1000-01	DVI receiver

Automation Panel 900

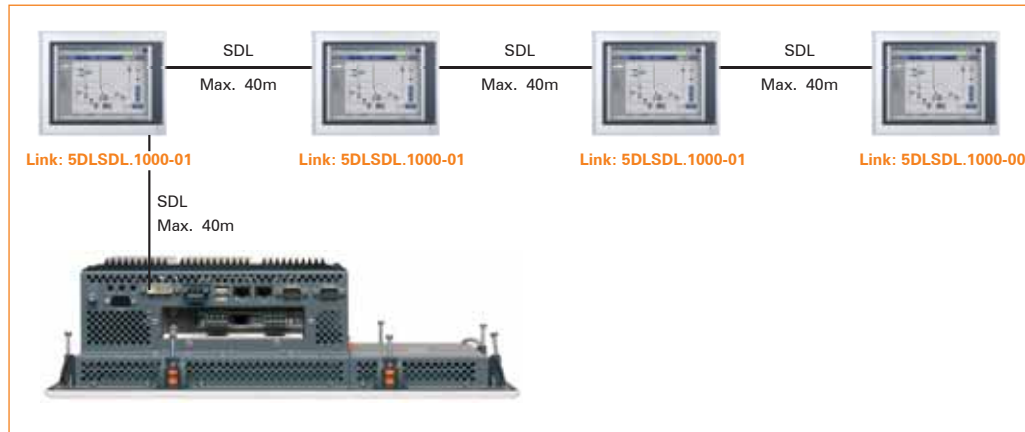
Display	Diagonal	Resolution	Touch screen	USB	Max. segment length
5AP920.1043-01	10.4"	VGA	√	√	5 m / 10 m ¹⁾
5AP920.1214-01	12.1"	SVGA	√	√	5 m / 10 m ¹⁾
5AP920.1505-01	15.0"	XGA	√	√	5 m / 10 m ¹⁾
5AP920.1706-01	17.0"	SXGA	√	√	5 m / 10 m ¹⁾
5AP920.1906-01	19.0"	SXGA	√	√	5 m / 10 m ¹⁾

1) USB limited to 5 m

Display links

Up to four Automation Panels via SDL on one line

An Automation Panel is connected to the integrated SDL interface via an SDL cable. Up to three other Automation Panels of the same type are connected to this Automation Panel and operated via SDL. All four displays show the same screen content, but this can be different from what is shown on the Panel PC.



Possible combinations

	5PC600.X855-00	5PC600.X855-01	5PC600.X855-02	5PC600.X855-03	5PC600.X855-04	5PC600.X855-05
5PC720.1043-00	✓	✓	✓	✓	✓	✓
5PC720.1043-01	✓	✓	✓	✓	✓	✓
5PC720.1214-00	✓	✓	✓	✓	✓	✓
5PC720.1214-01	✓	✓	✓	✓	✓	✓
5PC720.1505-00	✓	✓	✓	✓	✓	✓
5PC720.1505-01	✓	✓	✓	✓	✓	✓
5PC720.1505-02	✓	✓	✓	✓	✓	✓
5PC720.1706-00	✓	✓	✓	✓	✓	✓
5PC720.1906-00	✓	✓	✓	✓	✓	✓
5PC781.1043-00	✓	✓	✓	✓	✓	✓
5PC781.1505-00	✓	✓	✓	✓	✓	✓
5PC782.1043-00	✓	✓	✓	✓	✓	✓

Component overview

System units

	PCI slots
5PC720.1043-00	0
5PC720.1043-01	2
5PC720.1214-00	0
5PC720.1214-01	2
5PC720.1505-00	0
5PC720.1505-01	2
5PC720.1505-02	1
5PC720.1706-00	0
5PC720.1906-00	0
5PC781.1043-00	0
5PC781.1505-01	0
5PC782.1043-00	0

CPU boards

	Chipset	Processor	Resolution
5PC600.X855-00	Intel® 855GME	Pentium® M 1100 MHz	Max. UXGA
5PC600.X855-01	Intel® 855GME	Pentium® M 1600 MHz	Max. UXGA
5PC600.X855-02	Intel® 855GME	Pentium® M 1400 MHz	Max. UXGA
5PC600.X855-03	Intel® 855GME	Pentium® M 1800 MHz	Max. UXGA
5PC600.X855-04	Intel® 855GME	Celeron® M 600 MHz	Max. UXGA
5PC600.X855-05	Intel® 855GME	Celeron® M 1000 MHz	Max. UXGA

SDL cables

See AP900 SDL cable section	1087
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Automation Panel link module

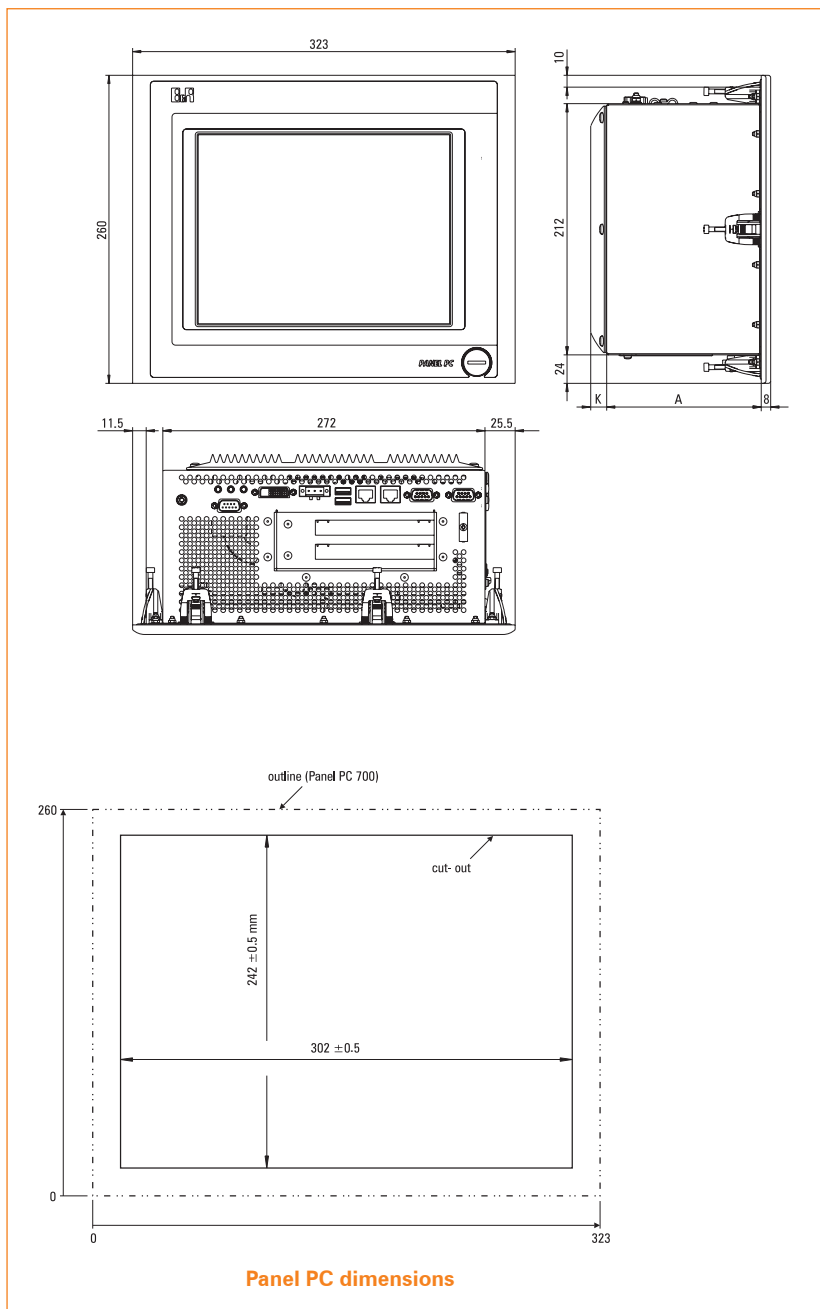
	Type
5DLSDDL.1000-00	SDL receiver
5DLSDDL.1000-01	SDL transceiver

Automation Panel 900

Display	Diagonal	Resolution	Touch screen	Keys	Max. segment length SDL w/o extender	Max. segment length SDL w/ extender
5AP920.1043-01	10.4"	VGA	✓	-	30	40
5AP980.1043-01	10.4"	VGA	✓	✓	30	40
5AP981.1043-01	10.4"	VGA	✓	✓	30	40
5AP982.1043-01	10.4"	VGA	✓	✓	30	40
5AP920.1214-01	12.1"	SVGA	✓	-	30	40
5AP920.1505-01	15.0"	XGA	✓	-	25	40
5AP980.1505-01	15.0"	XGA	✓	✓	25	40
5AP981.1505-01	15.0"	XGA	✓	✓	25	40
5AP920.1706-01	17.0"	SXGA	✓	-	20	40
5AP920.1906-01	19.0"	SXGA	✓	-	20	40



Dimensions

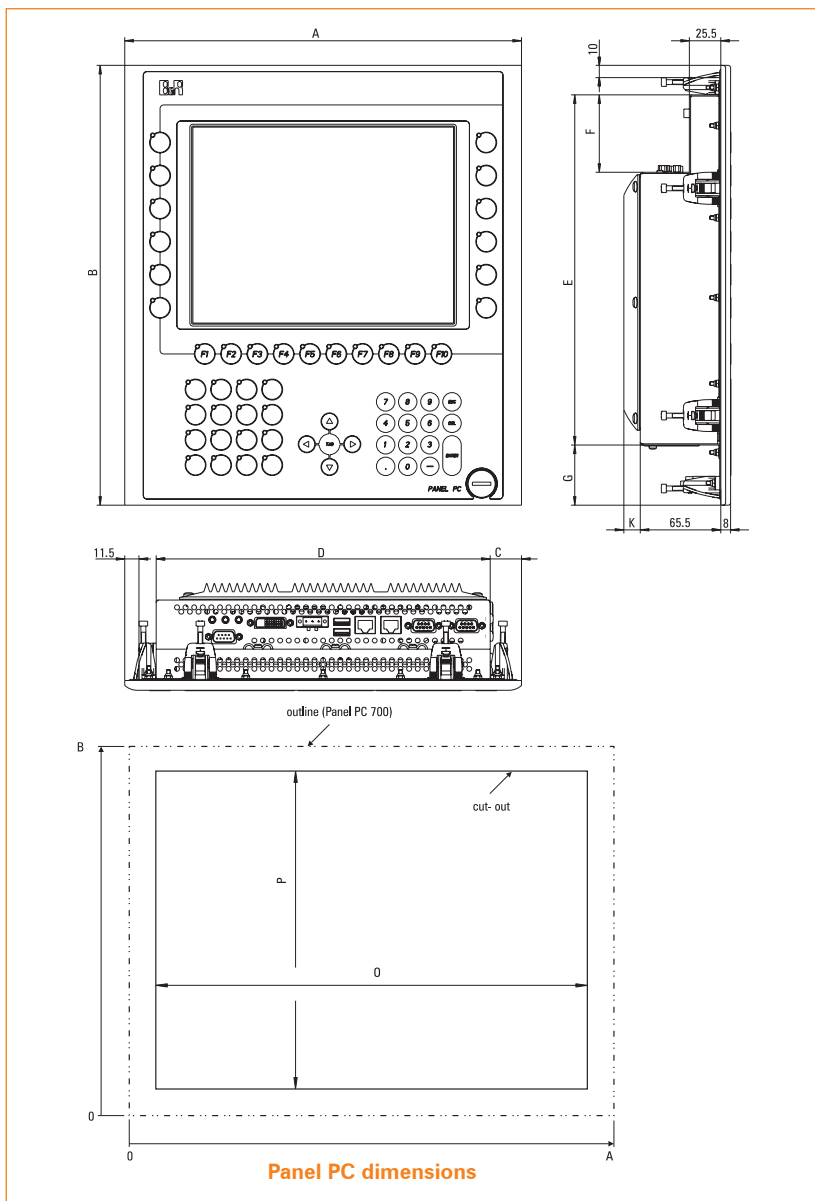


System unit	PCI slots	A
5PC720.1043-00	0	65.5 mm
5PC720.1043-01	2	130.5 mm

Heat sink dimensions (dimension K)

Heat sink	Short description	K
5AC700.HS01-01	Heat sink for Panel PC with CPU boards Pentium® M1100 MHz, 1400 MHz and Celeron® M 600 MHz, 1000 MHz.	12.8 mm
5AC700.HS01-02	Heat sink for Panel PC with CPU board Pentium® M 1600 MHz and 1800 MHz.	28 mm

All dimensions in mm



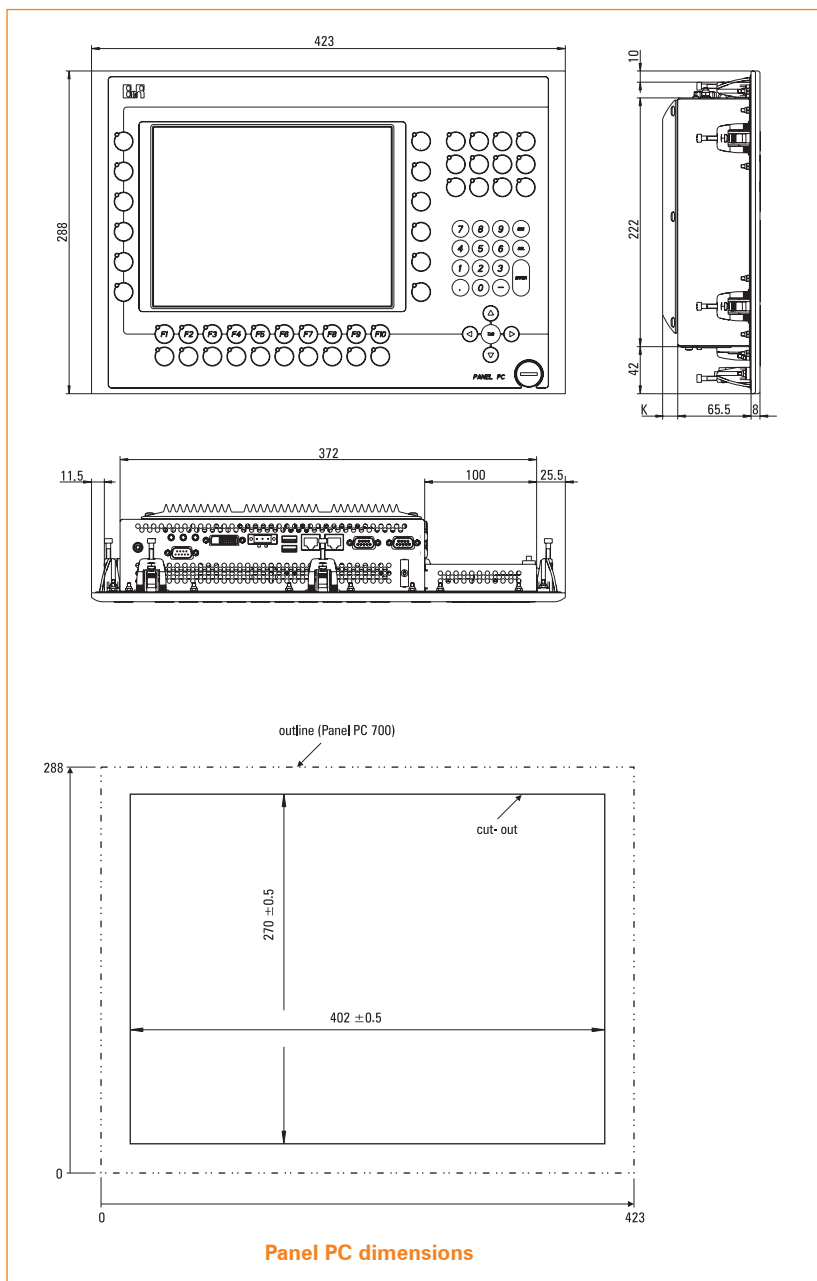
System unit	PCI slots	A	B	C	D	E	F	G	O	P	Q
5PC720.1214-00	0	362 mm	284 mm	26 mm	310 mm	236 mm	14 mm	24 mm	341 ± 0.5 mm	266 ± 0.5 mm	65.5 ± 0.5 mm
5PC781.1043-00	0	323 mm	358 mm	25.5 mm	272 mm	285 mm	63 mm	49 mm	302 ± 0.5 mm	340 ± 0.5 mm	65.5 ± 0.5 mm
5PC720.1214-01	2	362 mm	284 mm	26 mm	310 mm	236 mm	14 mm	24 mm	341 ± 0.5 mm	266 ± 0.5 mm	130.5 ± 0.5 mm

Heat sink dimensions (dimension K)

Heat sink	Short description	K
5AC700.HS01-01	Heat sink for Panel PC with CPU boards Pentium® M1100 MHz, 1400 MHz and Celeron® M 600 MHz, 1000 MHz.	12.8 mm
5AC700.HS01-02	Heat sink for Panel PC with CPU board Pentium® M 1600 MHz and 1800 MHz.	28 mm

All dimensions in mm

Dimensions

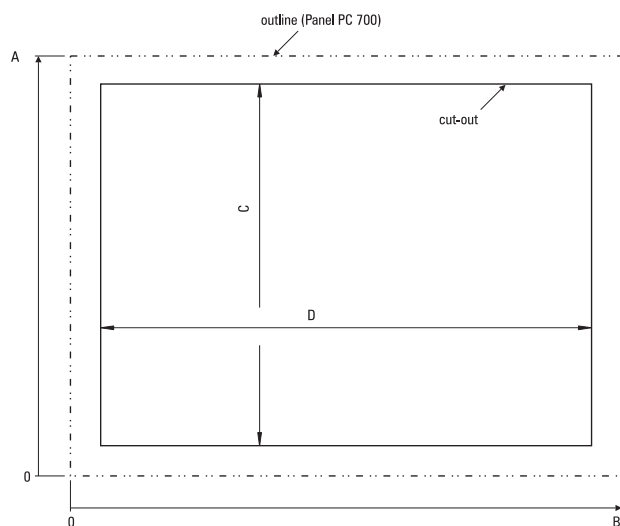
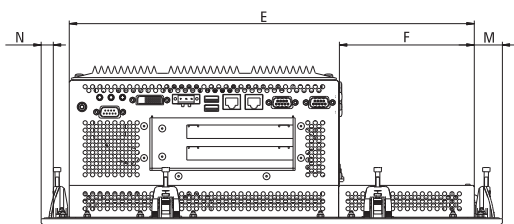
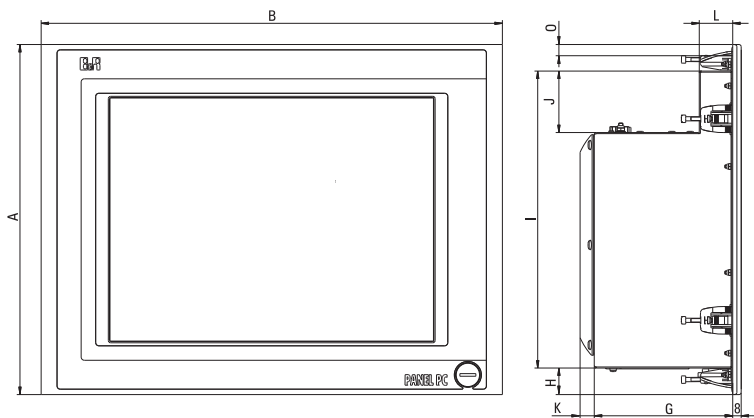


System unit	PCI slots
5PC782.1043-00	0

Heat sink dimensions (dimension K)

Heat sink	Short description	K
5AC700.HS01-01	Heat sink for Panel PC with CPU boards Pentium® M1100 MHz, 1400 MHz and Celeron® M 600 MHz, 1000 MHz.	12.8 mm
5AC700.HS01-02	Heat sink for Panel PC with CPU board Pentium® M 1600 MHz and 1800 MHz.	28 mm

All dimensions in mm



Panel PC dimensions

Heat sink dimensions (dimension K)

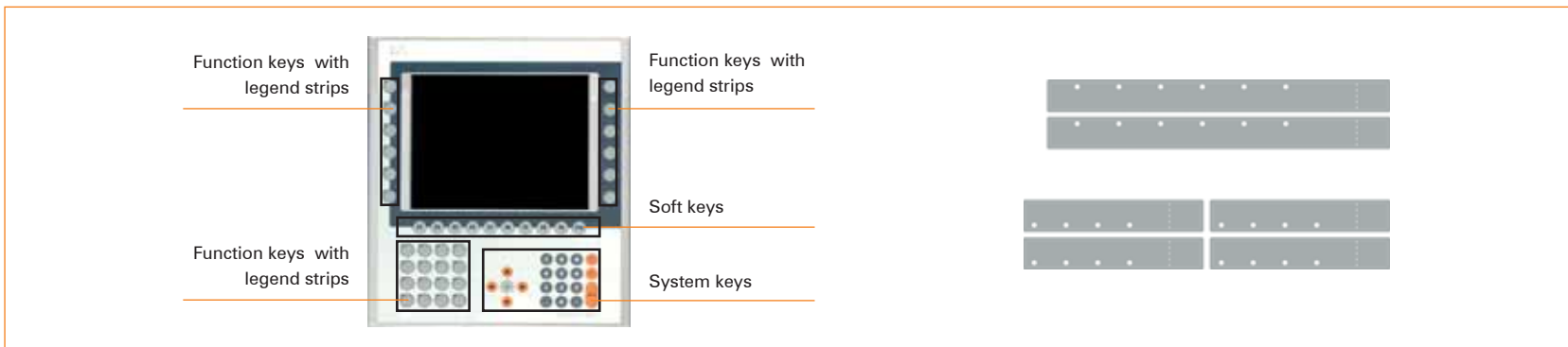
Heat sink	Short description	K
5AC700.HS01-01	Heat sink for Panel PC with CPU boards Pentium® M1100 MHz, 1400 MHz and Celeron® M 600 MHz, 1000 MHz.	12.8 mm
5AC700.HS01-02	Heat sink for Panel PC with CPU board Pentium® M 1600 MHz and 1800 MHz.	28 mm

System unit	PCI slots	A	B	C	D	E	F	G	H	I	J	L	M	N	O
5PC720.1505-00	0	330 mm	435 mm	311 mm	415 mm	382 mm	127.2 mm	65.5 mm	25 mm	280 mm	58 mm	31.5 mm	26.5 mm	11.5 mm	10.5 mm
5PC720.1505-01	2	330 mm	435 mm	311 mm	415 mm	382 mm	127.2 mm	130.5 mm	25 mm	280 mm	58 mm	31.5 mm	26.5 mm	11.5 mm	10.5 mm
5PC720.1505-02	1	330 mm	435 mm	311 mm	415 mm	382 mm	127.2 mm	110.2 mm	25 mm	280 mm	58 mm	31.5 mm	26.5 mm	11.5 mm	10.5 mm
5PC781.1505-00	0	430 mm	435 mm	411 mm	415 mm	382 mm	127.2 mm	65.5 mm	37 mm	368 mm	146 mm	31.5 mm	26.5 mm	11.5 mm	10.5 mm
5PC720.1706-00	0	390.3 mm	476.9 mm	372 mm	459 mm	420.5 mm	166.5 mm	70 mm	31 mm	328.5 mm	106.5 mm	36 mm	28.2 mm	10 mm	10 mm
5PC720.1906-00	0	421 mm	527 mm	403 mm	509 mm	472.5 mm	218.5 mm	70 mm	29.5 mm	360.5 mm	138.5 mm	36 mm	27.2 mm	10 mm	10 mm

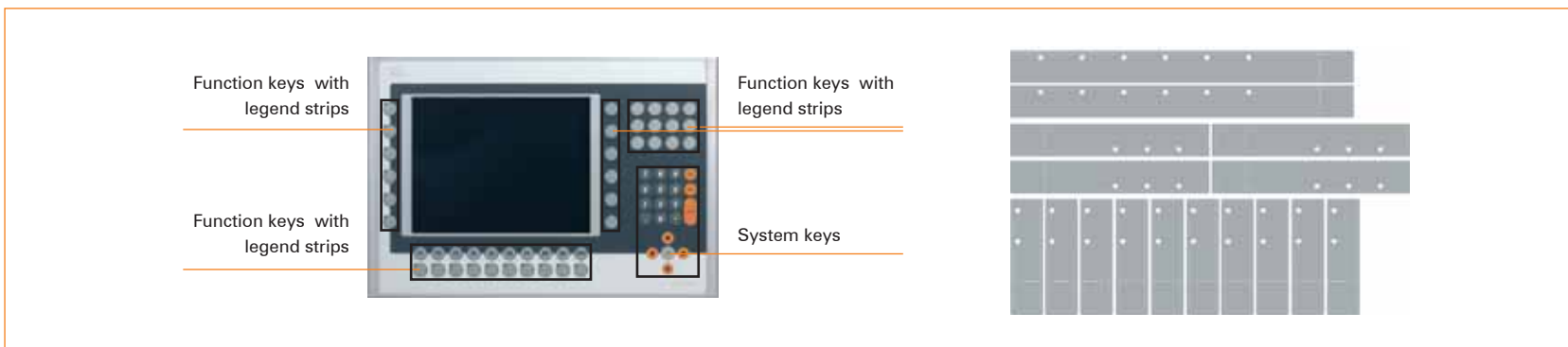
All dimensions in mm

Legend strips

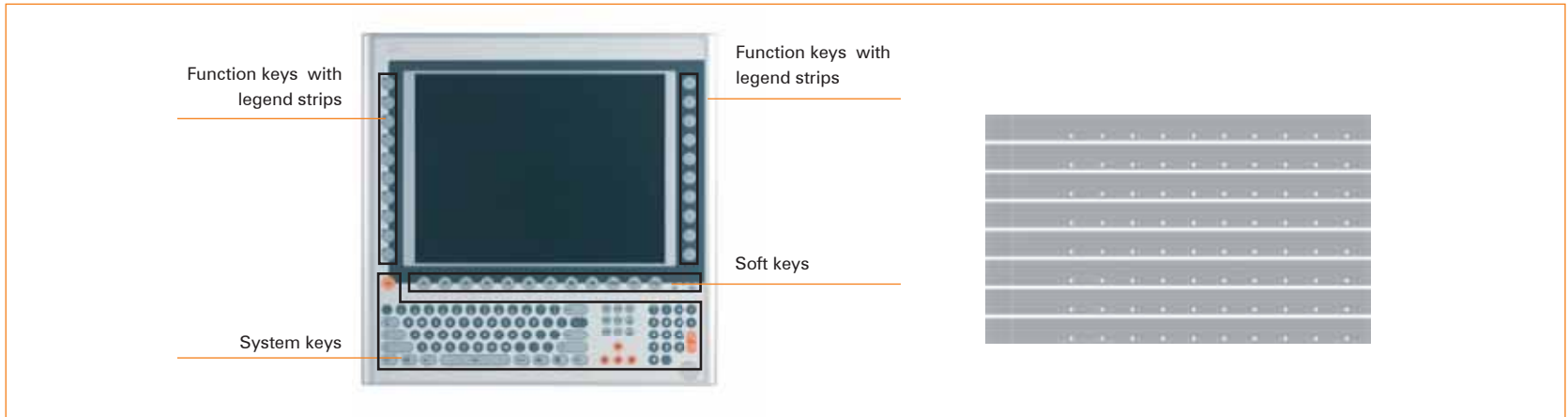
Model number	Short description
5AC900.104X-00	Legend strip template 10.4" Power Panel 4PP381.1043-31, 4PP451.1043-75, 4PP451.1043-B5, 4PP481.1043-75, 4PP481.1043-B5. For Panel PC 5PC781.1043-00. For 1 device.



Model number	Short description
5AC900.104X-01	10.4" legend strip template for Power Panel 4PP452.1043-75, 4PP482.1043-B5, 4PP482.1043-75. For Panel PC 5PC782.1043-00. For 1 device.



Model number	Short description
5AC900.150X-01	15" legend strip template for Power Panel 4PP480.1505-75, 4PP480.1505-B5, 4PP481.1505-75. For 4 devices.



Customized HMI systems

Branch-specific and customized operator panels are used where the device must be optimally matched to an application and its specific requirements.



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Customized HMI systems



Corporate design

Corporate identity is becoming increasingly important in the production industry. A uniform appearance is essential in representing the corporate identity. In the eyes of the user, this begins with their own custom HMI display unit.

With low minimum order amounts, B&R offers the development of customized display fronts in four categories.

Category A

Design modifications of existing standard B&R display units with integration of your logos, custom design of key labels, symbols and legend strips, as well as complete labeling according to your color specifications. Decisive advantages of Category A include full compatibility with B&R series devices and fast availability since only the foil needs to be produced.

Category B

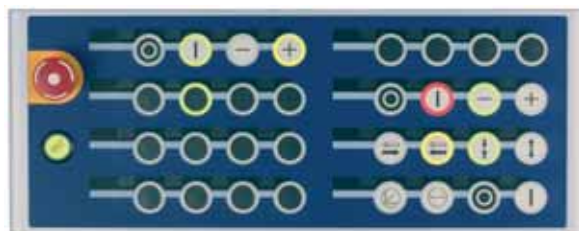
Based on standard B&R display units with the same modification options as Category A. In addition, the number of keys and their layout can be changed.

Category C

Category C display units represent new designs. Dimensions of the front of the unit can be customized, and touch and display technology can be selected from the standard product spectrum. Additional components such as an emergency stop can also be integrated.

Category D

Completely new development with all the modification possibilities of Categories A through C, as well as the integration of special technologies that are not included in the B&R standard product spectrum.





Technical options

Displays:

- Character-based and graphics-capable LC displays
- Character and graphics-capable VF displays
- High-resolution color TFT LC displays

Touch screen systems:

- Resistive matrix touch screen
- Analog resistive touch screen
- Resistive touch screens that are resistant to contamination and can be seamlessly integrated in the décor foil. These displays are ideally suited for use in the foodstuffs and pharmaceutical industries.
- Piezzo touch screens for the toughest operating conditions with a virtually indestructible laminated glass plate with a depth of between 11 to 35 mm.
- Infrared touch screen with very high transparency and durability because of glass surface, "glove operation".
- Surface wave touch screen with very high resolution, transparency, and durability because of the glass surface.

Key technologies:

- Short stroke keys
- Covered keys with integrated metallic contact elements
- B&R illuminated ring keys
- Electromechanical keys
- Emergency stop button
- Rotational encoder
- Key switch

Indications:

- Integrated LEDs with various functions
- Luminous fields

Drives:

- Integrated FDD and CD drive, IP65 protection

Hygienic construction

Protection types > IP65 possible

Transponder read/write unit

Complete systems:

- Panel and entry systems, keyboards, transponders, etc. integrated in a housing, also for swing support mounting

Design:

- Photo-like print on the front foil



Product overview

Keyboard modules



Model number	Short description	
4XP0000.00-K20	X2X keyboard module, 4 B&R illuminated ring keys, 3 colors (red, green, yellow), X2X interface, 24 VDC supply, IP65 protection (from front), order 1x 0TB1108.8110 terminal block separately.	1024
4XP0000.00-K21	X2X keyboard module, 6 B&R illuminated ring keys, 3 colors (red, green, yellow), X2X interface, E-stop button, 24 VDC supply, IP65 protection (from front), order terminal block 1x 0TB1108.8110 and 1x 0TB1104.8100 separately.	1024
4XP0000.00-K40	X2X keyboard module, 4 B&R illuminated ring keys (square), 3 colors (red, green, yellow), X2X interface, 24 VDC supply, IP65 protection (from front), order 1x 0TB1108.8110 terminal block separately.	1025
4XP0000.00-K41	X2X keyboard module, 6 B&R illuminated ring keys (square), 3 colors (red, green, yellow), X2X interface, E-stop button, 24 VDC supply, IP65 protection (from front), order terminal block 1x 0TB1108.8110 and 1x 0TB1104.8100 separately.	1025
4XP0000.00-K33	X2X keyboard module, 16 function keys, X2X interface, 24 VDC supply, IP65 protection (from front). Order 1x 0TB1108.8110 terminal block separately.	1026
5E9000.18	cHMI extension 30 keys CAN	1027

PP21/41



Model number	Short description	
4P0420.00-K04	Power Panel PP21, LCD 4x20 characters Cyrillic, background lighting, 34 function keys, system-compatible 2003 CPU, 700 KB SRAM, 1.4 MB FlashPROM, 1 PCMCIA slot, 1 RS232 interface, 1 CAN interface: electrically isolated, network capable, 6 slots for screw-in modules, 10 digital inputs 24 VDC, 8 digital outputs 24 VDC, 0.4 A, IP65 protection (from front), 155 x 190 mm (WxH), 24 VDC. Order TB712 terminal blocks separately!	1028
4P3040.00-K19	Power Panel PP41 touch screen, 5.7 inch QVGA b/w LCD, matrix touch with 5 x 8 fields, 8 softkeys and 32 function keys, system-compatible 2003 CPU, 700 KB SRAM, 1.4 MB FlashPROM, 1 PCMCIA slot, 1 RS232 interface, 1 CAN interface: electrically isolated, network capable, 6 slots for screw-in modules, 10 digital inputs 24 VDC, 8 digital outputs 24 VDC, 0.4 A, IP65 protection (from front), 205 x 220 mm (WxH), 24 VDC. Order TB712 terminal blocks separately!	1030

PP300/400



Model number	Short description	
4PP420.0571-K04	Power Panel PP420 5.7" QVGA color TFT display, fully integrated touch screen, without dirt-collecting edges (resistive); front made of stainless steel. 1 aPCI slot; 128 MB SDRAM; 512 KB SRAM; CompactFlash slot (type I); ETH 10/100; RS232; 2x USB; battery; metal housing, IP66 protection (from front); 24 VDC. Plug for supply voltage included in delivery (screw clamps).	1032
4PP420.0571-K34	Power Panel PP420 5.7" QVGA color TFT display, fully integrated touch screen, without dirt-collecting edges (resistive); front made of stainless steel. 2 aPCI slots; 128 MB SDRAM; 512 KB SRAM; CompactFlash slot (type I); ETH 10/100; RS232; 2x USB; battery; metal housing, IP66 protection (from front); 24 VDC. Plug for supply voltage included in delivery (screw clamps).	1032
4PP420.1043-K14	Power Panel PP420 10.4" VGA color TFT display, fully integrated touch screen, without dirt-collecting edges (resistive); front made of stainless steel. 1 aPCI slot; 128 MB SDRAM; 256 KB SRAM; CompactFlash slot (type I); ETH 10/100; RS232; 2x USB; battery; metal housing, IP66 protection (from front); 24 VDC. Plug for supply voltage included in delivery (screw clamps).	1033
4PP420.1043-K24	Power Panel PP420 10.4" VGA color TFT display, fully integrated touch screen, without dirt-collecting edges (resistive); front made of stainless steel. 2 aPCI slots; 128 MB SDRAM; 256 KB SRAM; CompactFlash slot (type I); ETH 10/100; RS232; 2x USB; battery; metal housing, IP66 protection (from front); 24 VDC. Plug for supply voltage included in delivery (screw clamps).	1033
4PP420.1505-K04	Power Panel PP420 15" XGA color TFT display, fully integrated touch screen, without dirt-collecting edges (resistive); front made of stainless steel. 1 aPCI slot; 128 MB SDRAM; 512 KB SRAM; CompactFlash slot (type I); ETH 10/100; RS232; 2x USB; battery; metal housing, IP66 protection (from front); 24 VDC. Plug for supply voltage included in delivery (screw clamps).	1034
4PP420.1505-K14	Power Panel PP420 15" XGA color TFT display, fully integrated touch screen, without dirt-collecting edges (resistive); front made of stainless steel. 2 aPCI slots; 128 MB SDRAM; 512 KB SRAM; CompactFlash slot (type I); ETH 10/100; RS232; 2x USB; battery; metal housing, IP66 protection (from front); 24 VDC. Plug for supply voltage included in delivery (screw clamps).	1034
4PP450.1043-K01	Power Panel PP450, 10.4" VGA color TFT display; 86 keys; 1 aPCI slot; 64 MB SDRAM; 512 KB SRAM; CompactFlash slot (type I); ETH 10/100; RS 232; 2x USB; battery; metal housing, IP 65 protection (from front); 24 V DC. Plug for supply voltage included in delivery (screw clamps).	1035
5PP320.0653-K02	Power Panel PP320 BIOS, 6.5" VGA color TFT display with touch screen (resistive); 256 MB SDRAM; CompactFlash slot (type I); ETH 10/100; RS 232; 2x USB; battery; metal housing, IP 65 protection (from front); 24 VDC. Plug for supply voltage included in delivery (screw clamps).	1036
5PP320.0571-K14	Power Panel PP320 BIOS, 5.7" QVGA color TFT display, fully integrated touch screen, without dirt-collecting edges (resistive); front made of stainless steel. 256 MB SDRAM; CompactFlash slot (type I); ETH 10/100; RS232; 2x USB; battery; metal housing, IP66 protection (from front); 24 VDC. Plug for supply voltage included in delivery (screw clamps).	1037
5PP320.1043-K04	Power Panel PP320 BIOS, 10.4" VGA color TFT display, fully integrated touch screen, without dirt-collecting edges (resistive); front made of stainless steel. 256 MB SDRAM; CompactFlash slot (type I); ETH 10/100; RS232; 2x USB; battery; metal housing, IP66 protection (from front); 24 VDC. Plug for supply voltage included in delivery (screw clamps).	1038
5PP320.1043-K14	Power Panel PP320 BIOS IP65 10.4" VGA color TFT display with fully integrated touch screen, without dirt-collecting edges (resistive); front / housing made from stainless steel; 256 MB SDRAM; CompactFlash slot (type I), ETH 10/100, RS232, 1x USB; battery; IP65 protection; prepared for connection to the stainless steel Rittal CP-S support arm system; 24 VDC. Plug for power supply must be ordered separately (screw clamp: 0TB103.9; cage clamps: 0TB103.91).	1039

Product overview

5PP320.1505-K04	Power Panel PP320 BIOS IP65 15" XGA color TFT display with fully integrated touch screen, without dirt-collecting edges (resistive); front / housing made from stainless steel; 256 MB SDRAM; CompactFlash slot (type I), ETH 10/100, RS232, 1x USB; battery; IP65 protection; prepared for connection to the stainless steel Rittal CP-S support arm system; 24 VDC. Plug for power supply must be ordered separately (screw clamp: 0TB103.9; cage clamps: 0TB103.91).	1040
5PP320.1505-K14	Power Panel PP320 BIOS, 15" XGA color TFT display, fully integrated touch screen, without dirt-collecting edges (resistive); front made of stainless steel. 256 MB SDRAM; CompactFlash slot (type I); ETH 10/100; RS232; 2x USB; battery; metal housing, IP66 protection (from front); 24 VDC. Plug for supply voltage included in delivery (screw clamps).	1041

AP900



Model number	Short description	
5AP920.1043-K04	Automation Panel AP920, 10.4" VGA color TFT display, fully integrated touch screen, without dirt-collecting edges (resistive); front made of stainless steel; 1 USB 2.0 interface; insert for Automation Panel Link; IP 66 protection (from front). 24 VDC.	1042
5AP920.1505-K04	Automation Panel IP65 AP920 15" XGA color TFT display with fully integrated touch screen, without dirt-collecting edges (resistive); front / housing made from stainless steel; 1 USB 2.0 interface; insert for Automation Panel Link; prepared for connection to the stainless steel Rittal CP-S support arm system; IP65 protection. 24 VDC.	1043
5AP920.1505-K14	Automation Panel IP65 AP920 15" XGA color TFT display, touch screen (resistive); front / housing made from stainless steel; 1 USB 2.0 interface; insert for Automation Panel Link; prepared for connection to a support arm system, (5A5007.01); IP65 protection. 24 VDC.	1044
5AP920.1505-K24	Automation Panel IP65 AP920 15" XGA color TFT display, touch screen (resistive); front / housing made from stainless steel; 1 USB 2.0 interface; insert for Automation Panel Link; prepared for connection to the stainless steel Rittal CP-S support arm system; IP65 protection. 24 VDC.	1044
5AP920.1505-K34	Automation Panel IP65 AP920; 15" XGA color TFT display with fully integrated touch screen, without dirt-collecting edges (resistive); front / housing made from stainless steel; 1 USB 2.0 interface; insert for Automation Panel Link; prepared for connection to the stainless steel Rose GTH 48 support arm system; IP65 protection. 24 VDC. Hygiene tested according to DIN EN 1672-2	1045
5AP920.1505-K54	Automation Panel AP920, 15" XGA color TFT display, fully integrated touch screen, without dirt-collecting edges (resistive); front made of stainless steel; 2 USB 2.0 interfaces; insert for Automation Panel Link; IP 66 protection (from front); 24 VDC.	1046
5AP920.1505-K26	Automation Panel AP920, 15" XGA color TFT display with touch screen (resistive); 3 USB 2.0 interfaces; insert for Automation Panel Link; IP 65 protection (from front). 24 VDC.	1047
5AP920.1505-K74	Automation Panel AP920, 15" XGA color TFT display, fully integrated touch screen, without dirt-collecting edges (resistive); front made of stainless steel; 2 USB 2.0 interfaces; insert for Automation Panel Link; read/write unit for 125 kHz transponder; IP 66 protection (from front); 24 VDC.	1048
5AP920.1906-K03	Automation Panel AP920, 19" SXGA color TFT display with touch screen (resistive); 3 USB 2.0 interfaces; insert for Automation Panel Link; prepared for installation on a VESA 100-compatible mount; IP 20 protection, 24 VDC.	1049
5AP980.1214-K04	cHMI Automation Panel AP980, 12.1" SVGA color TFT display with touch screen (resistive); 46 function keys and 26 system keys; 3 USB 2.0 interfaces; insert for Automation Panel Link; IP 65 protection (front side). 24 VDC.	1050

Mobile terminal



Model number	Short description	
4B1270.00-K15	cHMI Handheld / CAN, terminal HMI (escape sequences), LCD, 4 x 20 characters, background lighting, 12 number keys + 12 function keys, CAN interface, 24 VDC supply, IP65 protection	1052

Transponder read/write unit



Model number	Short description	
5E9000.29	Transponder 125 kHz, read/write unit, mounting diameter 22.5 mm, USB connection cable length 800 mm, IP 65 protection (from front).	1053

Customized HMI systems

Branch-specific devices

In addition to the standard operating units, B&R also offers devices that meet the specific requirements unique to certain branches.

Especially in the beverage, foodstuffs, pharmaceutical, and packaging industries, equipment must meet demanding levels of hygiene, robustness and reliability. The special construction of B&R's products ensures that this happens.



Operating unit with 5.7" display

The B&R stainless steel program

B&R has developed a device series which is perfectly suited for use in the foodstuffs, pharmaceutical and packaging industries. This series of devices features a hygienic construction and uses especially resistant materials such as smoothed stainless steel, high-grade polyester foil and special sealing materials.

From simple visualization terminals to operating units with integrated control and drive technology, from 5.7" displays to 15" TFT displays, and even customized adjustments – the right configuration for the job is often very simply assembled.



Operating unit with 10.4" display

Properties:

- Stainless steel (1.4301) front plate with smoothed surface
- Completely integrated touch screen minimizes dirt-collecting edges and simplifies cleaning
- Foodstuff-qualified seals
- Mounting compatible with standard devices with same display diagonal
- Shatter protection
- IP66 protection (front-side)
- Designed according to DIN EN 1672-2 (hygienic requirements for foodstuff machines)



Operating unit with 15" display



IP65 protected operating unit with
10.4" display



IP65 protected operating unit with
15" display

Operator panels from one source

HMI devices are frequently enclosed in a housing, which is then mounted either directly on the machine or on a support arm system. Operating units with all-around IP65 protection can be installed without this housing.

The special construction with the completely integrated touch screen and the elimination of the transition to the housing help to minimize grooves and edges. This makes the devices ideal for operation in branches where easy cleaning, space efficiency, robustness, and intuitive operation with a touch screen are especially important.

The sleek design makes these devices not only optically pleasing, but also allows them to be installed on a support arm system precisely where they are needed to operate the machine.

Properties:

- Stainless steel (1.4301) housing with smoothed surface
- Completely integrated touch screen minimizes dirt-collecting edges and simplifies cleaning
- Foodstuff-qualified seals
- Sleek and optically pleasing design, intended for installation on support arm system
- All-around IP65 protection
- Shatter protection
- USB interface

Keyboard module



- X2X keyboard
- 4 B&R illuminated ring keys
- White aluminum front foil



- X2X keyboard
- 6 B&R illuminated ring keys
- E-stop
- White aluminum front foil

Features	4XP0000.00-K20	4XP0000.00-K21
LEDs	1x Run (green), 1x Error (red)	1x Run (green), 1x Error (red)
X2X interface		
Type	X2X slave	X2X slave
Design	8-pin multipoint connector	8-pin multipoint connector
Electrical isolation	Yes	Yes
Internal bus supply	Yes	Yes
Keys	4XP0000.00-K20	4XP0000.00-K21
Function keys	4	6
Type	B&R illuminated ring keys	B&R illuminated ring keys
Illuminated ring colors	red, yellow, green	red, yellow, green
Mechanical switching elements	4XP0000.00-K20	4XP0000.00-K21
E-stop	-	2 normally closed contacts
24 VDC supply	4XP0000.00-K20	4XP0000.00-K21
Input voltage	24 VDC ±25%, electrically isolated	24 VDC ±25%, electrically isolated
Environmental conditions	4XP0000.00-K20	4XP0000.00-K21
Temperature		
Operation	0 to +50°C	0 to +50°C
Storage	-20°C to +60°C	-20°C to +60°C
Relative humidity		
Operation, storage, transport	5% to 90%, non-condensing	5% to 90%, non-condensing
Mechanics	4XP0000.00-K20	4XP0000.00-K21
Protection type	IP65 (front side) / IP20 (back side)	IP65 (front side) / IP20 (back side)
Outer dimensions (W x H x D [mm])	90 x 80 x 37	170 x 80 x 32
Weight	Approx. 0.25 kg	Approx. 0.43 kg

Required accessories		-K20	-K21	
0TB103.9	24 VDC plug, screw clamps	•	•	1131
0TB103.91	24 VDC plug, cage clamps	•	•	1131
0TB1108.8110	8-pin plug, cage clamps	•	•	1138
0TB1104.8100	4-pin plug, cage clamps		•	

Keyboard module



- X2X keyboard
- 4 B&R illuminated ring keys (square)



- X2X keyboard
- 6 B&R illuminated ring keys (square)
- E-stop

Features	4XP0000.00-K40	4XP0000.00-K41
LEDs	1x Run (green), 1x Error (red)	1x Run (green), 1x Error (red)
X2X interface		
Type	X2X slave	X2X slave
Design	8-pin multipoint connector	8-pin multipoint connector
Electrical isolation	Yes	Yes
Internal bus supply	Yes	Yes
Keys	4XP0000.00-K40	4XP0000.00-K41
Function keys	4	6
Type	B&R illuminated ring keys (square)	B&R illuminated ring keys (square)
Illuminated ring colors	red, yellow, green	red, yellow, green
Mechanical switching elements	4XP0000.00-K40	4XP0000.00-K41
E-stop	-	2 normally closed contacts
24 VDC supply	4XP0000.00-K40	4XP0000.00-K41
Input voltage	24 VDC ±25%, electrically isolated	24 VDC ±25%, electrically isolated
Environmental conditions	4XP0000.00-K40	4XP0000.00-K41
Temperature		
Operation	0 to +50°C	0 to +50°C
Storage	-20°C to +60°C	-20°C to +60°C
Relative humidity		
Operation, storage, transport	5% to 90%, non-condensing	5% to 90%, non-condensing
Mechanics	4XP0000.00-K40	4XP0000.00-K41
Protection type	IP65 (front side) / IP20 (back side)	IP65 (front side) / IP20 (back side)
Outer dimensions (W x H x D [mm])	90 x 80 x 37	170 x 80 x 32
Weight	Approx. 0.25 kg	Approx. 0.43 kg

Required accessories		-K40	-K41	
OTB103.9	24 VDC plug, screw clamps	•	•	1131
OTB103.91	24 VDC plug, cage clamps	•	•	1131
OTB1108.8110	8-pin plug, cage clamps	•	•	1138
OTB1104.8100	4-pin plug, cage clamps		•	

Keyboard module



- X2X keyboard
- 16 covered keys

Features	4XP0000.00-K33	
LEDs	1x Run (green), 1x Error (red)	
X2X interface		
Type	X2X slave	
Design	8-pin multipoint connector	
Electrical isolation	Yes	
Internal bus supply	Yes	
Keys	4XP0000.00-K33	
Function keys	16	
Type	Covered keys	
LED color	Yellow	
24 VDC supply	4XP0000.00-K33	
Input voltage	24 VDC \pm 25%, electrically isolated	
Environmental conditions	4XP0000.00-K33	
Temperature		
Operation	0 to +50°C	
Storage	-20°C to +60°C	
Relative humidity		
Operation, storage, transport	5% .. 90%, non-condensing	
Mechanics	4XP0000.00-K33	
Protection type	IP65 (front side) / IP20 (back side)	
Outer dimensions (W x H x D [mm])	90 x 80 x 37	
Weight	Approx. 0.2 kg	

Required accessories		
0TB103.9	24 VDC plug, screw clamps	1131
0TB103.91	24 VDC plug, cage clamps	1131
0TB1108.8110	8-pin plug, cage clamps	1138

Keyboard module



- CAN keyboard
- 30 covered keys

Features	5E9000.18
LEDs	2x CAN bus status (yellow), 1x DCOK (green)
CAN interface	
Type	CAN slave
Design	9-pin DSUB plug
Electrical isolation	Yes
Keys	5E9000.18
Function keys	30
Type	Covered keys
LED color	Yellow
24 VDC supply	5E9000.18
Input voltage	24 VDC \pm 25%, electrically isolated
Environmental conditions	5E9000.18
Temperature	
Operation	0 to +50°C
Storage	-20°C to +60°C
Relative humidity	
Operation, storage, transport	5% .. 90%, non-condensing
Mechanics	5E9000.18
Protection type	IP65 (front side) / IP20 (back side)
Outer dimensions (W x H x D [mm])	310 x 120 x 26
Weight	Approx. 0.9 kg

Required accessories		
0TB103.9	24 VDC plug, screw clamps	1131
0TB103.91	24 VDC plug, cage clamps	1131
0TB1108.8110	8-pin plug, cage clamps	1138
7AC911.9	Bus connector, CAN	1144
0AC912.9	Bus adapter, CAN, 1 CAN interface	1146
0AC913.92	Bus adapter, CAN, 2 CAN interfaces, including 30 cm connection cable (DSUB connector)	1146

Power Panel PP21



- Power Panel PP21
- Display character set Cyrillic

Display	4P0420.00-K04
Type	LCD
Resolution	4 x 20 characters
Background lighting	LED
Display character set	Cyrillic
Keys	4P0420.00-K04
Function keys	17, with LED
System keys	Number block, control keys
Processor	4P0420.00-K04
Additional I/O processor	Handles I/O data points
Typical instruction cycle time	0.5 μ s (average value at 70% bit and 30% analog processing)
Standard memory	
User RAM	700 KB SRAM
System PROM	600 KB FlashPROM
User PROM	1.4 MB FlashPROM
Data buffering with backup battery	Lithium battery 3 V / 950 mAh
Hardware watchdog	Yes
Voltage monitoring	Internal supply monitored for overvoltage and undervoltage
Peripherals	4P0420.00-K04
Real-time clock	1 s resolution, nonvolatile
Status indicators	LEDs
System bus for expansions	No
Slots for B&R 2003 screw-in modules	6
For serial asynchronous communication	3
For TPU	3
For CAN bus communication	1
PC card slot	1
Memory size	
SRAM	Max. 4 MB
FlashPROM	Max. 4 MB
Standard communication interfaces	4P0420.00-K04
IF1 application interface	
Type	RS232
Design	9-pin DSUB connector
Electrical isolation	No
Max. baud rate	115.2 kBit/s
IF2 application interface	
Type	CAN bus
Design	9-pin DSUB connector
Electrical isolation	Yes
Max. baud rate	500 kBit/s

Digital inputs	4P0420.00-K04
Number of channels	10
Additional functionalities for inputs	4x TPU
Input circuit	Sink
Rated voltage	24 VDC
Input current at rated voltage	Approx. 4 mA
Input filter	<1 ms
Electrical isolation	
Channel – Bus	Yes
Channel – Channel	No
Group isolation	Input group - Output group
Digital outputs	4P0420.00-K04
Amount	8 + 1 floating relay contact
Rated voltage	24 VDC
Rated output current	0.4 A
Total current	3.2 A
Output circuit	Source
Output protection	Overload protection
Internal protective circuit	Yes
Electrical isolation	
Channel – Bus	Yes
Channel – Channel	No
Group isolation	Input group - Output group
Power supply	4P0420.00-K04
Rated voltage	24 VDC
Power consumption	Max. 20 W
Output power for screw-in modules and PC card interface	10 W
Environmental conditions	4P0420.00-K04
Temperature	
Operation	0°C to +50°C
Storage	-20°C to +60°C
Relative humidity	
Operation	10 to 90% (non-condensing)
Storage	5 to 95% (non-condensing)
Mechanics	4P0420.00-K04
Protection type	IP65 (front side)
Outer dimensions (W x H x D [mm])	155 x 190 x 84.4
Weight	1.25 kg

Required accessories	
See PP21/41 accessories	820
Optional accessories	
See PP21/41 accessories	820

Power Panel PP41 5.7" LCD touch screen



- Power Panel PP41
- 5.7" monochrome LCD
- Matrix touch

Display	4P3040.00-K19
Type	LCD b/w
Diagonal	5.7"
Resolution	QVGA, 320 x 240 pixels
Brightness	150 cd/m ²
Half-brightness time	50,000 h
Keys	4P3040.00-K19
Function keys	16, with LED
System keys	Number block, cursor block, control keys
Touch screen	4P3040.00-K19
Technology	Resistive matrix touch
Resolution	5 x 8 fields
Processor	4P3040.00-K19
Additional I/O processor	Handles I/O data points
Typical instruction cycle time	0.5 μ s (average value at 70% bit and 30% analog processing)
Standard memory	
User RAM	700 KB SRAM
System PROM	600 KB FlashPROM
User PROM	1.4 MB FlashPROM
Data buffering with backup battery	Lithium battery 3 V / 950 mAh
Hardware watchdog	Yes
Voltage monitoring	Internal supply monitored for overvoltage and undervoltage
Peripherals	4P3040.00-K19
Real-time clock	1 s resolution, nonvolatile
Status indicators	LEDs
System bus for expansions	Expansion module EX101 1 insert slot For B&R SYSTEM 2005 interface modules
Slots for B&R 2003 screw-in modules	6
For serial asynchronous communication	3
For TPU	3
For CAN bus communication	1
PC card slot	1
Memory size	
SRAM	Max. 4 MB
FlashPROM	Max. 4 MB
Standard communication interfaces	4P3040.00-K19
IF1 application interface	
Type	RS232
Design	9-pin DSUB connector
Electrical isolation	No
Max. baud rate	115.2 kBit/s
IF2 application interface	
Type	CAN bus
Design	9-pin DSUB connector
Electrical isolation	Yes
Max. baud rate	500 kBit/s

Digital inputs	4P3040.00-K19
Number of channels	10
Additional functionalities for inputs	4x TPU
Input circuit	Sink
Rated voltage	24 VDC
Input current at rated voltage	Approx. 4 mA
Input filter	<1 ms
Electrical isolation	
Channel – Bus	Yes
Channel – Channel	No
Group isolation	Input group - Output group
Digital outputs	4P3040.00-K19
Amount	8 + 1 floating relay contact
Rated voltage	24 VDC
Rated output current	0.4 A
Total current	3.2 A
Output circuit	Source
Output protection	Overload protection
Internal protective circuit	Yes
Electrical isolation	
Channel – Bus	Yes
Channel – Channel	No
Group isolation	Input group - Output group
Power supply	4P3040.00-K19
Rated voltage	24 VDC
Power consumption	Max. 20 W
Output power for screw-in modules and PC card interface	11 W
Environmental conditions	4P3040.00-K19
Temperature	
Operation	0°C to +50°C
Storage	-20°C to +60°C
Relative humidity	
Operation	10 to 90% (non-condensing)
Storage	5 to 95% (non-condensing)
Mechanics	4P3040.00-K19
Protection type	IP65 (front side)
Outer dimensions (W x H x D [mm])	205 x 220 x 110.4
Weight	1.95 kg

Required accessories	
See PP21/41 accessories	820
Optional accessories	
See PP21/41 accessories	820

Power Panel PP420 embedded 5.7" TFT color touch screen



- PP420 embedded
- 5.7" TFT color display
- Analog, resistive touch screen (without dirt-collecting edges)
- Hygienically-compatible design
- Stainless steel front

Controller	4PP420.0571-K04	4PP420.0571-K34
Processor	Geode LX800 500 MHz, MMX compatible	Geode LX800 500 MHz, MMX compatible
Main memory	128 MB SDRAM	128 MB SDRAM
Graphics memory	8 MB shared memory (allocated from main memory)	8 MB shared memory (allocated from main memory)
CompactFlash slot	1 slot for Type I CompactFlash card	1 slot for Type I CompactFlash card
aPCI slots	1	2
Battery	Lithium, 950 mAh, exchanged from the outside	Lithium, 950 mAh, exchanged from the outside
Real-time clock	Battery-buffered	Battery-buffered
Mode/node switches	2, 16 digits each	2, 16 digits each
Display	4PP420.0571-K04	4PP420.0571-K34
Type	TFT color	TFT color
Colors	262.144 ¹⁾	262.144 ¹⁾
Resolution	QVGA, 320 x 240 pixels	QVGA, 320 x 240 pixels
Diagonal	5.7"	5.7"
Brightness	500 cd/m ²	500 cd/m ²
Half-brightness time	50,000 h	50,000 h
Touch screen	Analog, resistive (without dirt-collecting edges)	Analog, resistive (without dirt-collecting edges)
1) Automation Runtime limitation - max. 256 colors, USB 1.1		
Interfaces	4PP420.0571-K04	4PP420.0571-K34
Serial		
Type	RS232	RS232
Design	9-pin DSUB connector	9-pin DSUB connector
Electrical isolation	No	No
Max. baud rate	115 kBit/s	115 kBit/s
USB	2x USB 2.0, connection type A ¹⁾	2x USB 2.0, connection type A ¹⁾
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	RJ45 twisted pair (10 BaseT / 100 BaseT)
1) Automation Runtime limitation - max. 256 colors, USB 1.1		
Power supply	4PP420.0571-K04	4PP420.0571-K34
Input voltage	24 VDC ±25%, electrically isolated	24 VDC ±25%, electrically isolated
Environmental conditions	4PP420.0571-K04	4PP420.0571-K34
Temperature		
Operation	0 to +50°C	0 to +50°C
Storage	-20°C to +60°C	-20°C to +60°C
Relative humidity		
Operation, storage, transport	T ≤ 40°C 5% to 90%, non-condensing T > 40°C 5% to 75%, non-condensing	T ≤ 40°C 5% to 90%, non-condensing T > 40°C 5% to 75%, non-condensing
Mechanics	4PP420.0571-K04	4PP420.0571-K34
Protection type	IP66 (front side) / IP20 (back side)	IP66 (front side) / IP20 (back side)
Outer dimensions (W x H x D [mm])	219 x 163 x 71	219 x 163 x 87
Weight	Approx. 1.4 kg (without aPCI interface module)	Approx. 1.58 kg (without aPCI interface module)

Required accessories		
	Network and fieldbus modules	611
	Lithium battery, 3 V / 950 mAh, button cell ¹⁾	1128
0TB103.9	24 VDC plug, screw clamps	1131
0TB103.91	24 VDC plug, cage clamps	1131
	CompactFlash cards	1126

1) Replacement part

Power Panel

PP420 embedded 10.4" TFT color touch screen



- PP420 embedded
- 10.4" TFT color display
- Analog, resistive touch screen (without dirt-collecting edges)
- Hygienically-compatible design
- Stainless steel front

Controller	4PP420.1043-K14	4PP420.1043-K24
Processor	Geode LX800 500 MHz, MMX compatible	Geode LX800 500 MHz, MMX compatible
Main memory	128 MB DRAM	128 MB DRAM
Graphics memory	8 MB shared memory (allocated from main memory)	8 MB shared memory (allocated from main memory)
CompactFlash slot	1 slot for Type I CompactFlash card	1 slot for Type I CompactFlash card
aPCI slots	1	2
Battery	Lithium, 950 mAh, exchanged from the outside	Lithium, 950 mAh, exchanged from the outside
Real-time clock	Battery-buffered	Battery-buffered
Mode/node switches	2, 16 digits each	2, 16 digits each
Display	4PP420.1043-K14	4PP420.1043-K24
Type	TFT color	TFT color
Colors	262.144 ¹⁾	262.144 ¹⁾
Resolution	VGA, 640 x 480 pixels	VGA, 640 x 480 pixels
Diagonal	10.4"	10.4"
Brightness	450 cd/m ²	450 cd/m ²
Half-brightness time	55,000 h	55,000 h
Touch screen	Analog, resistive (without dirt-collecting edges)	Analog, resistive (without dirt-collecting edges)
1) Automation Runtime limitation - max. 256 colors, USB 1.1		
Interfaces	4PP420.1043-K14	4PP420.1043-K24
Serial		
Type	RS232	RS232
Design	9-pin DSUB connector	9-pin DSUB connector
Electrical isolation	No	No
Max. baud rate	115 kBit/s	115 kBit/s
USB	2x USB 2.0, connection type A ¹⁾	2x USB 2.0, connection type A ¹⁾
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	RJ45 twisted pair (10 BaseT / 100 BaseT)
1) Automation Runtime limitation - max. 256 colors, USB 1.1		
24 VDC supply	4PP420.1043-K14	4PP420.1043-K24
Input voltage	24 VDC ±25%, electrically isolated	24 VDC ±25%, electrically isolated
Environmental conditions	4PP420.1043-K14	4PP420.1043-K24
Temperature		
Operation	0 to +50°C	0 to +50°C
Storage	-20°C to +70°C	-20°C to +70°C
Relative humidity		
Operation, storage, transport	T ≤ 40°C 5% to 90%, non-condensing T > 40°C 5% to 75%, non-condensing	T ≤ 40°C 5% to 90%, non-condensing T > 40°C 5% to 75%, non-condensing
Mechanics	4PP420.1043-K14	4PP420.1043-K24
Protection type	IP66 (front side) / IP20 (back side)	IP66 (front side) / IP20 (back side)
Outer dimensions (W x H x D [mm])	330 x 267 x 90	330 x 267 x 104
Weight	Approx. 5.3 kg (without aPCI interface module)	Approx. 5.7 kg (without aPCI interface module)

Required accessories		
	Network and fieldbus modules	611
	Lithium battery, 3 V / 950 mAh, button cell ¹⁾	1128
0TB103.9	24 VDC plug, screw clamps	1131
0TB103.91	24 VDC plug, cage clamps	1131
	CompactFlash cards	1126

1) Replacement part

Power Panel PP420 embedded 15" TFT color touch screen



- PP420 embedded
- 15" TFT color display
- Analog, resistive touch screen (without dirt-collecting edges)
- Hygienically-compatible design
- Stainless steel front

Controller	4PP420.1505-K04	4PP420.1505-K14
Processor	Geode LX800 500 MHz, MMX compatible	Geode LX800 500 MHz, MMX compatible
Main memory	128 MB DRAM	128 MB DRAM
Graphics memory	8 MB shared memory (allocated from main memory)	8 MB shared memory (allocated from main memory)
CompactFlash slot	1 slot for Type I CompactFlash card	1 slot for Type I CompactFlash card
aPCI slots	1	2
Battery	Lithium, 950 mAh, exchanged from the outside	Lithium, 950 mAh, exchanged from the outside
Real-time clock	Battery-buffered	Battery-buffered
Mode/node switches	2, 16 digits each	2, 16 digits each
Display	4PP420.1505-K04	4PP420.1505-K14
Type	TFT color	TFT color
Colors	262.144 ¹⁾	262.144 ¹⁾
Resolution	XGA, 1024 x 768 pixels	XGA, 1024 x 768 pixels
Diagonal	15"	15"
Brightness	250 cd/m ²	250 cd/m ²
Half-brightness time	50,000 h	50,000 h
Touch screen	Analog, resistive (without dirt-collecting edges)	Analog, resistive (without dirt-collecting edges)
1) Automation Runtime limitation - max. 256 colors, USB 1.1		
Interfaces	4PP420.1505-K04	4PP420.1505-K14
Serial		
Type	RS232	RS232
Design	9-pin DSUB connector	9-pin DSUB connector
Electrical isolation	No	No
Max. baud rate	115 kBit/s	115 kBit/s
USB	2x USB 1.1, 2.0, connection type A ¹⁾	2x USB 1.1, 2.0, connection type A ¹⁾
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	RJ45 twisted pair (10 BaseT / 100 BaseT)
1) Automation Runtime limitation - max. 256 colors, USB 1.1		
24 VDC supply	4PP420.1505-K04	4PP420.1505-K14
Input voltage	24 VDC ±25%, electrically isolated	24 VDC ±25%, electrically isolated
Environmental conditions	4PP420.1505-K04	4PP420.1505-K14
Temperature		
Operation	0 to +50°C	0 to +50°C
Storage	-20°C to +60°C	-20°C to +60°C
Relative humidity		
Operation, storage, transport	T ≤ 40°C 5% to 90%, non-condensing T > 40°C 5% to 75%, non-condensing	T ≤ 40°C 5% to 90%, non-condensing T > 40°C 5% to 75%, non-condensing
Mechanics	4PP420.1505-K04	4PP420.1505-K14
Protection type	IP66 (front side) / IP20 (back side)	IP66 (front side) / IP20 (back side)
Outer dimensions (W x H x D (mm))	435 x 330 x 86	435 x 330 x 105
Weight	Approx. 6.7 kg (without aPCI interface module)	Approx. 6.9 kg (without aPCI interface module)

Required accessories		
	Network and fieldbus modules	611
	Lithium battery, 3 V / 950 mAh, button cell ¹⁾	1128
0TB103.9	24 VDC plug, screw clamps	1131
0TB103.91	24 VDC plug, cage clamps	1131
	CompactFlash cards	1126

1) Replacement part

Power Panel PP450 embedded 10.4" TFT color



- PP450 embedded
- 10.4" TFT color display
- Expanded keyboard

Controller	4PP450.1043-K01
Processor	Geode LX800 500 MHz, MMX compatible
Main memory	128 MB DRAM
Graphics memory	8 MB shared memory (allocated from main memory)
CompactFlash slot	1 slot for Type I CompactFlash card
aPCI slots	1
Battery	Lithium, 950 mAh, exchanged from the outside
Real-time clock	Battery-buffered
Mode/node switches	2, 16 digits each
Display	4PP450.1043-K01
Type	TFT color
Colors	262,144 ¹⁾
Resolution	VGA, 640 x 480 pixels
Diagonal	10.4"
Brightness	450 cd/m ²
Half-brightness time	55,000 h
Touch screen	-
1) Automation Runtime limitation - max. 256 colors, USB 1.1	
Keys	4PP450.1043-K01
Function keys	58, with LED
Soft keys	8
System keys	Number block, cursor keys
Interfaces	4PP450.1043-K01
Serial	
Type	RS232
Design	9-pin DSUB connector
Electrical isolation	No
Max. baud rate	115 kBit/s
USB	2x USB, 2.0, connection type A ¹⁾
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)
1) Automation Runtime limitation - max. 256 colors, USB 1.1	
24 VDC supply	4PP450.1043-K01
Input voltage	24 VDC ±25%, electrically isolated
Environmental conditions	4PP450.1043-K01
Temperature	
Operation	0 to +50°C
Storage	-20°C to +70°C
Relative humidity	
Operation, storage, transport	5% to 90%, non-condensing
Mechanics	4PP450.1043-K01
Protection type	IP65 (front side) / IP20 (back side)
Outer dimensions (W x H x D [mm])	310 x 474 x 85
Weight	Approx. 4.65 kg (without aPCI interface module)

Required accessories		
	Network and fieldbus modules	
	Lithium battery, 3 V / 950 mAh, button cell ¹⁾	611
0TB103.9	24 VDC plug, screw clamps	1128
0TB103.91	24 VDC plug, cage clamps	1131
	CompactFlash cards	1131
5A9001.17	cHMI legend strips for 4PPx50.1043-K01	1126

1) Replacement part

Power Panel PP320 BIOS 6.5" TFT color touch screen



- PP320 BIOS
- 6.5" TFT color display
- Analog, resistive touch screen

Controller		5PP320.0653-K02
Processor	Geode LX800 500 MHz, MMX compatible	
Main memory	256 MB DRAM	
Graphics memory	8 MB shared memory (allocated from main memory)	
CompactFlash slot	1 slot for Type I CompactFlash card	
Battery	Lithium, 950 mAh, exchanged from the outside	
Real-time clock	Battery-buffered	
Mode/node switches	2, 16 digits each	
Display		5PP320.0653-K02
Type	TFT color	
Colors	262.144 ¹⁾	
Resolution	VGA, 640 x 480 pixels	
Diagonal	6.5"	
Brightness	300 cd/m ²	
Half-brightness time	50,000 h	
Touch screen	Analog resistive	
1) The actual number of colors depends on the graphics memory, the graphics mode configured, and the graphics driver being used.		
Interfaces		5PP320.0653-K02
Serial		
Type	RS232	
Design	9-pin DSUB connector	
Electrical isolation	No	
Max. baud rate	115 kBit/s	
USB	2x USB 1.1, 2.0, connection type A ¹⁾	
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	
1) Windows CE limitation - USB 1.1		
24 VDC supply		5PP320.0653-K02
Input voltage	24 VDC ±25%, electrically isolated	
Environmental conditions		5PP320.0653-K02
Temperature		
Operation	0 to +50°C	
Storage	-20°C to +70°C	
Relative humidity		
Operation, storage, transport	T ≤ 40°C 5% to 90%, non-condensing	
	T > 40°C 5% to 75%, non-condensing	
Mechanics		5PP320.0653-K02
Protection type	IP65 (front side) / IP20 (back side)	
Outer dimensions (W x H x D [mm])	230 x 175 x 57	
Weight	Approx. 1.8 kg	

Required accessories		
0AC201.9 ¹⁾	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	1128
4A0006.00-000 ¹⁾	Lithium battery, 3 V / 950 mAh, button cell	1128
0TB103.9	24 VDC plug, screw clamps	1131
0TB103.91	24 VDC plug, cage clamps	1131
	Operating system	1114
	CompactFlash cards	1126

1) Replacement part

Power Panel

PP320 BIOS 5.7" TFT color touch screen



- PP320 BIOS
- 5.7" TFT color display
- Analog, resistive touch screen (without dirt-collecting edges)
- Hygienically-compatible design
- Stainless steel front

Controller		5PP320.0571-K14
Processor	Geode LX800 500 MHz, MMX compatible	
Main memory	256 MB DRAM	
Graphics memory	8 MB shared memory (allocated from main memory)	
CompactFlash slot	1 slot for Type I CompactFlash card	
Battery	Lithium, 950 mAh, exchanged from the outside	
Real-time clock	Battery-buffered	
Mode/node switches	2, 16 digits each	
Display		5PP320.0571-K14
Type	TFT color	
Colors	262.144 ¹⁾	
Resolution	QVGA, 320 x 240 pixels	
Diagonal	5.7"	
Brightness	500 cd/m ²	
Half-brightness time	50,000 h	
Touch screen	Analog, resistive (without dirt-collecting edges)	
1) The actual number of colors depends on the graphics memory, the graphics mode configured, and the graphics driver being used.		
Interfaces		5PP320.0571-K14
Serial		
Type	RS232	
Design	9-pin DSUB connector	
Electrical isolation	No	
Max. baud rate	115 kBit/s	
USB	2x USB 1.1, 2.0, connection type A ¹⁾	
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	
1) Windows CE limitation - USB 1.1		
24 VDC supply		5PP320.0571-K14
Input voltage	24 VDC ±25%, electrically isolated	
Environmental conditions		5PP320.0571-K14
Temperature		
Operation	0 to +50°C	
Storage	-20°C to +60°C	
Relative humidity		
Operation, storage, transport	T ≤ 40°C 5% to 90%, non-condensing T > 40°C 5% to 75%, non-condensing	
Mechanics		5PP320.0571-K14
Protection type	IP66 (front side) / IP20 (back side)	
Outer dimensions (W x H x D [mm])	219 x 163 x 50.5	
Weight	Approx. 1.55 kg	

Required accessories			
0AC201.9 ¹⁾	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell		1128
4A0006.00-000 ¹⁾	Lithium battery, 3 V / 950 mAh, button cell		1128
0TB103.9	24 VDC plug, screw clamps		1131
0TB103.91	24 VDC plug, cage clamps		1131
	Operating system		1114
	CompactFlash cards		1126

1) Replacement part

Power Panel

PP320 BIOS 10.4" TFT color touch screen



- PP320 BIOS
- 10.4" TFT color display
- Analog, resistive touch screen (without dirt-collecting edges)
- Hygienically-compatible design
- Stainless steel front

Controller		5PP320.1043-K04
Processor	Geode LX800 500 MHz, MMX compatible	
Main memory	256 MB DRAM	
Graphics memory	8 MB shared memory (allocated from main memory)	
CompactFlash slot	1 slot for Type I CompactFlash card	
Battery	Lithium, 950 mAh, exchanged from the outside	
Real-time clock	Battery-buffered	
Mode/node switches	2, 16 digits each	
Display		5PP320.1043-K04
Type	TFT color	
Colors	262.144 ¹⁾	
Resolution	VGA, 640 x 480 pixels	
Diagonal	10.4"	
Brightness	450 cd/m ²	
Half-brightness time	55,000 h	
Touch screen	Analog, resistive (without dirt-collecting edges)	
1) The actual number of colors depends on the graphics memory, the graphics mode configured, and the graphics driver being used.		
Interfaces		5PP320.1043-K04
Serial		
Type	RS232	
Design	9-pin DSUB connector	
Electrical isolation	No	
Max. baud rate	115 kBit/s	
USB	2x USB 1.1, 2.0, connection type A ¹⁾	
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	
1) Windows CE limitation - USB 1.1		
24 VDC supply		5PP320.1043-K04
Input voltage	24 VDC ±25%, electrically isolated	
Environmental conditions		5PP320.1043-K04
Temperature		
Operation	0 to +50°C	
Storage	-20°C to +70°C	
Relative humidity		
Operation, storage, transport	T ≤ 40°C 5% to 90%, non-condensing	
	T > 40°C 5% to 75%, non-condensing	
Mechanics		5PP320.1043-K04
Protection type	IP66 (front side) / IP20 (back side)	
Outer dimensions (W x H x D [mm])	330 x 267 x 69.5	
Weight	Approx. 5.75 kg	

Required accessories		
0AC201.9 ¹⁾	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	1128
4A0006.00-000 ¹⁾	Lithium battery, 3 V / 950 mAh, button cell	1128
0TB103.9	24 VDC plug, screw clamps	1131
0TB103.91	24 VDC plug, cage clamps	1131
	Operating system	1114
	CompactFlash cards	1126

1) Replacement part

Power Panel

PP320 BIOS 10.4" TFT color touch screen



- PP320 BIOS
- 10.4" TFT color display
- Analog, resistive touch screen (without dirt-collecting edges)
- For Rittal CP-S support arm system
- IP65 stainless steel housing
- Hygienically-compatible front design

Controller	5PP320.1043-K14
Processor	Geode LX800 500 MHz, MMX compatible
Main memory	256 MB DRAM
Graphics memory	8 MB shared memory (allocated from main memory)
CompactFlash slot	1 slot for Type I CompactFlash card
Battery	Lithium, 950 mAh, exchanged from the outside
Real-time clock	Battery-buffered
Mode/node switches	2, 16 digits each
Display	5PP320.1043-K14
Type	TFT color
Colors	262.144 ¹⁾
Resolution	VGA, 640 x 480 pixels
Diagonal	10.4"
Brightness	450 cd/m ²
Half-brightness time	55,000 h
Touch screen	Analog, resistive (without dirt-collecting edges)
1) The actual number of colors depends on the graphics memory, the graphics mode configured, and the graphics driver being used.	
Interfaces	5PP320.1043-K14
Serial	
Type	RS232
Design	9-pin DSUB connector
Electrical isolation	No
Max. baud rate	115 kBit/s
USB	2x USB 1.1, 2.0, connection type A ¹⁾
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)
1) Windows CE limitation - USB 1.1	
24 VDC supply	5PP320.1043-K14
Input voltage	24 VDC ±25%, electrically isolated
Environmental conditions	5PP320.1043-K14
Temperature	
Operation	0 to +45°C
Storage	-20°C to +70°C
Relative humidity	
Operation, storage, transport	T ≤ 40°C 5% to 90%, non-condensing T > 40°C 5% to 75%, non-condensing
Mechanics	5PP320.1043-K14
Protection type	IP65 (entire device)
Outer dimensions (W x H x D [mm])	313.5 x 260.5 x 124.5
Weight	Approx. 3.8 kg

Required accessories			
0AC201.9 ¹⁾	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell		1128
4A0006.00-000 ¹⁾	Lithium battery, 3 V / 950 mAh, button cell		1128
0TB103.9	24 VDC plug, screw clamps		1131
0TB103.91	24 VDC plug, cage clamps		1131
	Operating system		1114
	CompactFlash cards		1126

1) Replacement part

Power Panel PP320 BIOS 15" TFT color touch screen



- PP320 BIOS
- 15" TFT color display
- Analog, resistive touch screen (without dirt-collecting edges)
- For Rittal CP-S support arm system
- IP65 stainless steel housing
- Hygienically-compatible front design

Controller		5PP320.1505-K04
Processor	Geode LX800 500 MHz, MMX compatible	
Main memory	256 MB DRAM	
Graphics memory	8 MB shared memory (allocated from main memory)	
CompactFlash slot	1 slot for Type I CompactFlash card	
Battery	Lithium, 950 mAh, exchanged from the outside	
Real-time clock	Battery-buffered	
Mode/node switches	2, 16 digits each	
Display		5PP320.1505-K04
Type	TFT color	
Colors	262.144 ¹⁾	
Resolution	XGA, 1024 x 768 pixels	
Diagonal	15"	
Brightness	250 cd/m ²	
Half-brightness time	50,000 h	
Touch screen	Analog, resistive (without dirt-collecting edges)	
1) The actual number of colors depends on the graphics memory, the graphics mode configured, and the graphics driver being used.		
Interfaces		5PP320.1505-K04
Serial		
Type	RS232	
Design	9-pin DSUB connector	
Electrical isolation	No	
Max. baud rate	Max. 115 kBaud	
USB		
	3x USB 1.1, 2.0, connection type A ¹⁾	
Ethernet		
	RJ45 twisted pair (10 BaseT / 100 BaseT)	
1) Windows CE limitation - USB 1.1		
24 VDC supply		5PP320.1505-K04
Input voltage	24 VDC ±25%, electrically isolated	
Environmental conditions		5PP320.1505-K04
Temperature		
Operation	0 to +40°C	
Storage	-20°C to +60°C	
Relative humidity		
Operation, storage, transport	T ≤ 40°C 5% to 90%, non-condensing	
	T > 40°C 5% to 75%, non-condensing	
Mechanics		5PP320.1505-K04
Protection type	IP65 (entire device)	
Outer dimensions (W x H x D [mm])	420 x 344 x 71.5	
Weight	Approx. 6.3 kg	

Required accessories		
0AC201.9 ¹⁾	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	1128
4A0006.00-000 ¹⁾	Lithium battery, 3 V / 950 mAh, button cell	1128
0TB103.9	24 VDC plug, screw clamps	1131
0TB103.91	24 VDC plug, cage clamps	1131
	Operating system	1114
	CompactFlash cards	1126

1) Replacement part

Power Panel

PP320 BIOS 15" TFT color touch screen



- PP320 BIOS
- 15" TFT color display
- Analog, resistive touch screen (without dirt-collecting edges)
- Hygienically-compatible design
- Stainless steel front

Controller		5PP320.1505-K14
Processor	Geode LX800 500 MHz, MMX compatible	
Main memory	256 MB DRAM	
Graphics memory	8 MB shared memory (allocated from main memory)	
CompactFlash slot	1 slot for Type I CompactFlash card	
Battery	Lithium, 950 mAh, exchanged from the outside	
Real-time clock	Battery-buffered	
Mode/node switches	2, 16 digits each	
Display		5PP320.1505-K14
Type	TFT color	
Colors	262.144 ¹⁾	
Resolution	XGA, 1024 x 768 pixels	
Diagonal	15"	
Brightness	250 cd/m ²	
Half-brightness time	50,000 h	
Touch screen	Analog, resistive (without dirt-collecting edges)	
1) The actual number of colors depends on the graphics memory, the graphics mode configured, and the graphics driver being used.		
Interfaces		5PP320.1505-K14
Serial		
Type	RS232	
Design	9-pin DSUB connector	
Electrical isolation	No	
Max. baud rate	Max. 115 kBaud	
USB		
	2x USB 1.1, 2.0, connection type A ¹⁾	
Ethernet		
	RJ45 twisted pair (10 BaseT / 100 BaseT)	
1) Windows CE limitation - USB 1.1		
24 VDC supply		5PP320.1505-K14
Input voltage	24 VDC ±25%, electrically isolated	
Environmental conditions		5PP320.1505-K14
Temperature		
Operation	0 to +50°C	
Storage	-20°C to +60°C	
Relative humidity		
Operation, storage, transport	T ≤ 40°C 5% to 90%, non-condensing	
	T > 40°C 5% to 75%, non-condensing	
Mechanics		5PP320.1505-K14
Protection type	IP66 (front side) / IP20 (back side)	
Outer dimensions (W x H x D [mm])	435 x 330 x 56	
Weight	Approx. 6 kg	

Required accessories		
0AC201.9 ¹⁾	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	1128
4A0006.00-000 ¹⁾	Lithium battery, 3 V / 950 mAh, button cell	1128
0TB103.9	24 VDC plug, screw clamps	1131
0TB103.91	24 VDC plug, cage clamps	1131
	Operating system	1114
	CompactFlash cards	1126

1) Replacement part

Automation Panel AP920 10.4" TFT color touch screen



- AP920
- 10.4" TFT color display
- Analog, resistive touch screen (without dirt-collecting edges)
- Hygienically-compatible design
- Stainless steel front

Display	5AP920.1043-K04
Type	TFT color
Colors	262.144
Resolution	VGA, 640 x 480 pixels
Diagonal	10.4"
Brightness	350 cd/m ²
Half-brightness time	50,000 h
Touch screen	Analog, resistive (without dirt-collecting edges)
Keys	5AP920.1043-K04
Function keys	-
Soft keys	-
System keys	-
Interfaces	5AP920.1043-K04
Display link slot	1 (back side)
USB	1x USB 2.0 (back side)
Power supply	5AP920.1043-K04
Input voltage	24 VDC ± 25% (via Automation Panel Link insert card)
Environmental conditions	5AP920.1043-K04
Temperature	
Operation	0 to +50°C
Storage	-20°C to +60°C
Relative humidity	
Operation, storage, transport	T ≤ 40°C 5% to 90%, non-condensing T > 40°C 5% to 75%, non-condensing
Mechanics	5AP920.1043-K04
Protection type	IP66 (front side) / IP20 (back side)
Outer dimensions (W x H x D [mm])	330 x 267 x 58.7
Weight	Approx. 5.7 kg

Required accessories		
0TB103.9	24 VDC plug, screw clamps	1131
0TB103.91	24 VDC plug, cage clamps	1131
	USB accessories	1127
	Display links	1086
	Cables	1086

Automation Panel

AP920 15" TFT color touch screen



- AP920
- 15" TFT color display
- Analog, resistive touch screen (without dirt-collecting edges)
- For Rittal CP-S support arm system
- IP65 stainless steel housing
- Hygienically-compatible front design

Display	5AP920.1505-K04	
Type	TFT color	
Colors	16.8 million	
Resolution	XGA, 1024 x 768 pixels	
Diagonal	15"	
Brightness	250 cd/m ²	
Half-brightness time	50,000 h	
Touch screen	Analog, resistive (without dirt-collecting edges)	
Keys	5AP920.1505-K04	
Function keys	-	
Soft keys	-	
System keys	-	
Interfaces	5AP920.1505-K04	
Display link slot	1 (in panel)	
USB	2x USB 2.0 (in panel) / 1x USB 2.0 (back side)	
Power supply	5AP920.1505-K04	
Input voltage	24 VDC ± 25% (via Automation Panel Link insert card)	
Environmental conditions	5AP920.1505-K04	
Temperature		
Operation	0 to +45°C	
Storage	-20°C to +60°C	
Relative humidity		
Operation, storage, transport	T <= 40°C 5% to 90%, non-condensing T > 40°C 5% to 75%, non-condensing	
Mechanics	5AP920.1505-K04	
Protection type	IP65 (entire device)	
Outer dimensions (W x H x D [mm])	420 x 344 x 71.5	
Weight	Approx. 6 kg	

Required accessories		
0TB103.9	24 VDC plug, screw clamps	1131
0TB103.91	24 VDC plug, cage clamps	1131
	USB accessories	1127
	Display links	1086
	Cables	1086

Automation Panel AP920 15" TFT color touch screen



- AP920
- 15" TFT color display
- Analog, resistive touch screen
- For connection flange 5A5007.01
- IP65 stainless steel housing



- AP920
- 15" TFT color display
- Analog, resistive touch screen
- For RITTAL CP-S support arm system
- IP65 stainless steel housing

Display	5AP920.1505-K14	5AP920.1505-K24
Type	TFT color	TFT color
Colors	16.8 million	16.8 million
Resolution	XGA, 1024 x 768 pixels	XGA, 1024 x 768 pixels
Diagonal	15"	15"
Brightness	250 cd/m ²	250 cd/m ²
Half-brightness time	50,000 h	50,000 h
Touch screen	Analog resistive	Analog resistive
Keys	5AP920.1505-K14	5AP920.1505-K24
Function keys	-	-
Soft keys	-	-
System keys	-	-
Interfaces	5AP920.1505-K14	5AP920.1505-K24
Display link slot	1 (in panel)	1 (in panel)
USB	2x USB 2.0 (in panel) / 1x USB 2.0 (back side)	2x USB 2.0 (in panel) / 1x USB 2.0 (back side)
Power supply	5AP920.1505-K14	5AP920.1505-K24
Input voltage	24 VDC ± 25% (via Automation Panel Link insert card)	24 VDC ± 25% (via Automation Panel Link insert card)
Environmental conditions	5AP920.1505-K14	5AP920.1505-K24
Temperature		
Operation	0 to +45°C	0 to +45°C
Storage	-20°C to +60°C	-20°C to +60°C
Relative humidity		
Operation, storage, transport	T ≤ 40°C 5% to 90%, non-condensing T > 40°C 5% to 75%, non-condensing	T ≤ 40°C 5% to 90%, non-condensing T > 40°C 5% to 75%, non-condensing
Mechanics	5AP920.1505-K14	5AP920.1505-K24
Protection type	IP65 (entire device)	IP65 (entire device)
Outer dimensions (W x H x D [mm])	420 x 344 x 71.5	420 x 344 x 71.5
Weight	Approx. 6 kg	Approx. 6 kg

Required accessories		
0TB103.9	24 VDC plug, screw clamps	1131
0TB103.91	24 VDC plug, cage clamps	1131
	USB accessories	1127
	Display links	1086
	Cables	1086

Automation Panel

AP920 15" TFT color touch screen



- AP920
- 15" TFT color display
- Analog, resistive touch screen
- For Rose GTH 48 support arm system
- Hygienically tested according to DIN EN 1672-2
- IP65 stainless steel housing

Display	5AP920.1505-K34	
Type	TFT color	
Colors	16.8 million	
Resolution	XGA, 1024 x 768 pixels	
Diagonal	15"	
Brightness	250 cd/m ²	
Half-brightness time	50,000 h	
Touch screen	Analog, resistive (without dirt-collecting edges)	
Keys	5AP920.1505-K34	
Function keys	-	
Soft keys	-	
System keys	-	
Interfaces	5AP920.1505-K34	
Display link slot	1 (in panel)	
USB	2x USB 2.0 (in panel) / 1x USB 2.0 (back side)	
Power supply	5AP920.1505-K34	
Input voltage	24 VDC ± 25% (via Automation Panel Link insert card)	
Environmental conditions	5AP920.1505-K34	
Temperature		
Operation	0 to +45°C	
Storage	-20°C to +60°C	
Relative humidity		
Operation, storage, transport	T ≤ 40°C 5% to 90%, non-condensing T > 40°C 5% to 75%, non-condensing	
Mechanics	5AP920.1505-K34	
Protection type	IP65 (entire device)	
Outer dimensions (W x H x D [mm])	420 x 344 x 71.5	
Weight	Approx. 6 kg	

Required accessories		
0TB103.9	24 VDC plug, screw clamps	1131
0TB103.91	24 VDC plug, cage clamps	1131
	USB accessories	1127
	Display links	1086
	Cables	1086

Automation Panel AP920 15" TFT color touch screen



- AP920
- 15" TFT color display
- Analog, resistive touch screen (without dirt-collecting edges)
- Hygienically-compatible design
- Stainless steel front

Display	5AP920.1505-K54	
Type	TFT color	
Colors	16.8 million	
Resolution	XGA, 1024 x 768 pixels	
Diagonal	15"	
Brightness	250 cd/m ²	
Half-brightness time	50,000 h	
Touch screen	Analog, resistive (without dirt-collecting edges)	
Keys	5AP920.1505-K54	
Function keys	-	
Soft keys	-	
System keys	-	
Interfaces	5AP920.1505-K54	
Display link slot	1 (back side)	
USB	2x USB 2.0 (back side)	
Power supply	5AP920.1505-K54	
Input voltage	24 VDC ± 25% (via Automation Panel Link insert card)	
Environmental conditions	5AP920.1505-K54	
Temperature		
Operation	0 to +50°C	
Storage	-20°C to +60°C	
Relative humidity		
Operation, storage, transport	T ≤ 40°C 5% to 90%, non-condensing T > 40°C 5% to 75%, non-condensing	
Mechanics	5AP920.1505-K54	
Protection type	IP66 (front side) / IP20 (back side)	
Outer dimensions (W x H x D [mm])	435 x 330 x 64	
Weight	Approx. 7.6 kg	

Required accessories		
0TB103.9	24 VDC plug, screw clamps	1131
0TB103.91	24 VDC plug, cage clamps	1131
	USB accessories	1127
	Display links	1086
	Cables	1086

Automation Panel

AP920 15" TFT color touch screen



- AP920
- 15" TFT color display
- Analog, resistive touch screen
- Installation-compatible to 5D5212.02

Display	5AP920.1505-K26	
Type	TFT color	
Colors	16.8 million	
Resolution	XGA, 1024 x 768 pixels	
Diagonal	15"	
Brightness	250 cd/m ²	
Half-brightness time	50,000 h	
Touch screen	Analog resistive	
Keys	5AP920.1505-K26	
Function keys	-	
Soft keys	-	
System keys	-	
Interfaces	5AP920.1505-K26	
Display link slot	1 (back side)	
USB	1x USB 2.0 (front side) / 2x USB 2.0 (back side)	
Power supply	5AP920.1505-K26	
Input voltage	24 VDC ± 25% (via Automation Panel Link insert card)	
Environmental conditions	5AP920.1505-K26	
Temperature		
Operation	0 to +50°C	
Storage	-25°C to +60°C	
Relative humidity		
Operation, storage, transport	T <= 40°C 5% to 90%, non-condensing T > 40°C 5% to 75%, non-condensing	
Mechanics	5AP920.1505-K26	
Protection type	IP65 (front side) / IP20 (back side)	
Outer dimensions (W x H x D [mm])	435 x 330 x 45	
Weight	Approx. 4.5 kg	

Required accessories		
0TB103.9	24 VDC plug, screw clamps	1131
0TB103.91	24 VDC plug, cage clamps	1131
	USB accessories	1127
	Display links	1086
	Cables	1086

Automation Panel AP920 15" TFT color touch screen



- AP920
- 15" TFT color display
- Analog, resistive touch screen (without dirt-collecting edges)
- Built-in transponder read/write unit
- Hygienically-compatible design
- Stainless steel front

Display	5AP920.1505-K74	
Type	TFT color	
Colors	16.8 million	
Resolution	XGA, 1024 x 768 pixels	
Diagonal	15"	
Brightness	250 cd/m ²	
Half-brightness time	50,000 h	
Touch screen	Analog, resistive (without dirt-collecting edges)	
Keys	5AP920.1505-K74	
Function keys	-	
Soft keys	-	
System keys	-	
Transponder read/write unit	5AP920.1505-K74	
Transponder	For transponders 4102 and 4150 amplitude modulation, carrier frequency 125 kHz	
Read/write range in air	Min. 10 mm	
Interfaces	5AP920.1505-K74	
Display link slot	1 (back side)	
USB	2x USB 2.0 (back side)	
Power supply	5AP920.1505-K74	
Input voltage	24 VDC ± 25% (via Automation Panel Link insert card)	
Environmental conditions	5AP920.1505-K74	
Temperature		
Operation	0 to +50°C	
Storage	-25°C to +60°C	
Relative humidity		
Operation, storage, transport	T ≤ 40°C 5% to 90%, non-condensing	
	T > 40°C 5% to 75%, non-condensing	
Mechanics	5AP920.1505-K74	
Protection type	IP66 (front side) / IP20 (back side)	
Outer dimensions (W x H x D [mm])	445 x 330 x 54	
Weight	Approx. 7.6 kg	

Required accessories		
0TB103.9	24 VDC plug, screw clamps	1131
0TB103.91	24 VDC plug, cage clamps	1131
	USB accessories	1127
	Display links	1086
	Cables	1086

Automation Panel

AP920 19" TFT color touch screen



- AP920
- 19" TFT color display
- Analog, resistive touch screen
- With VESA 100 connection for monitor mounting

Display	5AP920.1906-K03	
Type	TFT color	
Colors	16.8 million	
Resolution	SXGA, 1280 x 1024 pixels	
Diagonal	19"	
Brightness	250 cd/m ²	
Half-brightness time	35,000 h	
Touch screen	Analog resistive	
Keys	5AP920.1906-K03	
Function keys	-	
Soft keys	-	
System keys	-	
Interfaces	5AP920.1906-K03	
Display link slot	1 (back side)	
USB	1x USB 2.0 (front side) / 2x USB 2.0 (back side)	
Power supply	5AP920.1906-K03	
Input voltage	24 VDC ± 25% (via Automation Panel Link insert card)	
Environmental conditions	5AP920.1906-K03	
Temperature		
Operation	0 to +50°C	
Storage	-20°C to +60°C	
Relative humidity		
Operation, storage, transport	T <= 40°C 5% to 90%, non-condensing T > 40°C 5% to 75%, non-condensing	
Mechanics	5AP920.1906-K03	
Protection type	IP20 (entire device)	
Outer dimensions (W x H x D [mm])	527 x 421 x 68	
Weight	Approx. 9.25 kg	

Required accessories		
0TB103.9	24 VDC plug, screw clamps	1131
0TB103.91	24 VDC plug, cage clamps	1131
	USB accessories	1127
	Display links	1086
	Cables	1086

Automation Panel AP980 12.1" TFT color touch screen



- AP920
- 12.1" TFT color display
- Analog, resistive touch screen
- 72 covered keys (47 with LED)
- For installation in a 19" rack

Display	5AP980.1214-K04
Type	TFT color
Colors	262.144
Resolution	SVGA, 800 x 600 pixels
Diagonal	12.1"
Brightness	350 cd/m ²
Half-brightness time	50,000 h
Touch screen	Analog resistive
Keys	5AP980.1214-K04
Function keys	46
Soft keys	-
System keys	17
Interfaces	5AP980.1214-K04
Display link slot	1 (back side)
USB	1x USB 2.0 (front side) / 2x USB 2.0 (back side)
Power supply	5AP980.1214-K04
Input voltage	24 VDC ± 25% (via Automation Panel Link insert card)
Environmental conditions	5AP980.1214-K04
Temperature	
Operation	0 to +50°C
Storage	-20°C to +60°C
Relative humidity	
Operation, storage, transport	T ≤ 40°C 5% to 90%, non-condensing T > 40°C 5% to 75%, non-condensing
Mechanics	5AP980.1214-K04
Protection type	IP65 (front side) / IP20 (back side)
Outer dimensions (W x H x D [mm])	482.6 x 310.4 x 50.2
Weight	Approx. 4.5 kg

Required accessories		
0TB103.9	24 VDC plug, screw clamps	1131
0TB103.91	24 VDC plug, cage clamps	1131
	USB accessories	1127
	Display links	1086
	Cables	1086



Mobile terminal

Mobile terminal P127



- Mobile terminal P127
- 4 x 20 display
- 24 keys

Display	4B1270.00-K15
Type	LCD
Resolution	4 x 20 characters
Background lighting	LED yellow / green
Display character set	English / Katakana
Keys	4B1270.00-K15
Function keys	12
System keys	12 number keys
Additional hardware keys	1. E-stop button 2. Enable button (2-step)
Interfaces	4B1270.00-K15
CAN interface	
Type	CAN slave
Design	3-pin terminal block
Electrical isolation	Yes
24 VDC supply	4B1270.00-K15
Input voltage	24 VDC \pm 25%, electrically isolated
Environmental conditions	4B1270.00-K15
Temperature	
Operation	0 to +50°C
Storage	-10°C to +60°C
Relative humidity	
Operation, storage, transport	5% to 90%, non-condensing
Mechanics	4B1270.00-K15
Protection type	IP65 (entire device)
Outer dimensions (W x H x D [mm])	116 x 226 x 50
Weight	Approx. 0.46 kg

Transponder read/write unit



- 125 kHz transponder read/write unit
- USB interface

Transponder read/write unit	5E9000.29
Transponder	For transponders 4102 and 4150 amplitude modulation, carrier frequency 125 kHz
Read/write range in air	Min. 16 mm
Interface	USB 1.1
Electrical data	5E9000.29
Supply voltage	5 VDC \pm 20% (via USB)
Power consumption	Approx. 0.15 Watt
Environmental conditions	5E9000.29
Temperature	
Operation	0 to +50°C
Storage	-20°C to +60°C
Relative humidity	
Operation, storage, transport	5% to 90%, non-condensing
Mechanics	5E9000.29
Protection type	IP65 (front side)
Outer dimensions (W x H x D [mm])	46.2 x 44.4 x 40.5
Weight	Approx. 0.05 kg

Required accessories	
5A9000.37	Transponder key, black housing, read only, 4102, 40-bit, 125 kHz
5A9000.38	Transponder key, white housing, read only, 4102, 40-bit, 125 kHz
5A9000.39	Transponder key, yellow housing, read only, 4102, 40-bit, 125 kHz
5A9000.40	Transponder key, red housing, read only, 4102, 40-bit, 125 kHz
5A9000.41	Transponder key, green housing, read only, 4102, 40-bit, 125 kHz
5A9000.42	Transponder key, blue housing, read only, 4102, 40-bit, 125 kHz
5A9000.43	Transponder key, black housing, read/write, 4150, 928-bit, 125 kHz
5A9000.44	Transponder key, white housing, read/write, 4150, 928-bit, 125 kHz
5A9000.45	Transponder key, yellow housing, read/write, 4150, 928-bit, 125 kHz
5A9000.46	Transponder key, red housing, read/write, 4150, 928-bit, 125 kHz
5A9000.47	Transponder key, green housing, read/write, 4150, 928-bit, 125 kHz
5A9000.48	Transponder key, blue housing, read/write, 4150, 928-bit, 125 kHz



Automation Panel 800

A new dimension for visualization on the machine.
Flexible display units with modular transfer technology.

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System characteristics



Automation Panel 800

The newest generation of fully closed display units, the Automation Panel 800 offers the highest degree of flexibility. Mounting on swing arm systems allows the operator panel to be placed at the most ergonomically convenient position – a decisive advantage for comfortable operation of the machine.

Optimal user guidance

All Automation Panel 800 devices are equipped with a touch screen. This allows even complex processes to be handled intuitively. The Automation Panel 800 can also be outfitted with additional function keys that allow the legend sheets to be individually labeled.

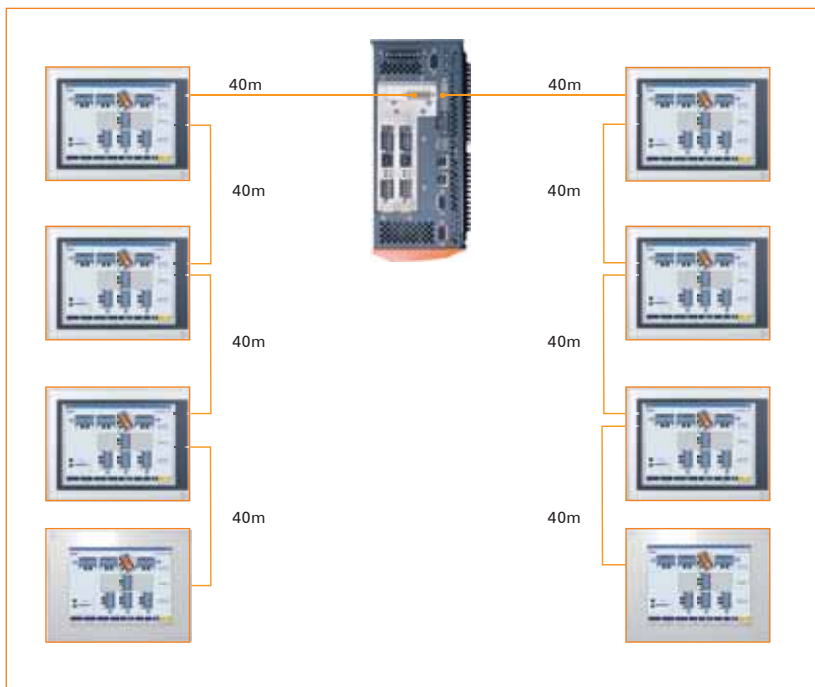


Flexible expansions

Automation Panel 800 devices allow flexible expansions. Key modules with function keys, illuminated ring keys and E-stop buttons make the Automation Panel a building block system that can be fit to any application.

Industrial design

The Automation Panel is extremely flat, allowing it to be attached anywhere on the machine. The surface of the housing is coated with a very resistant paint.

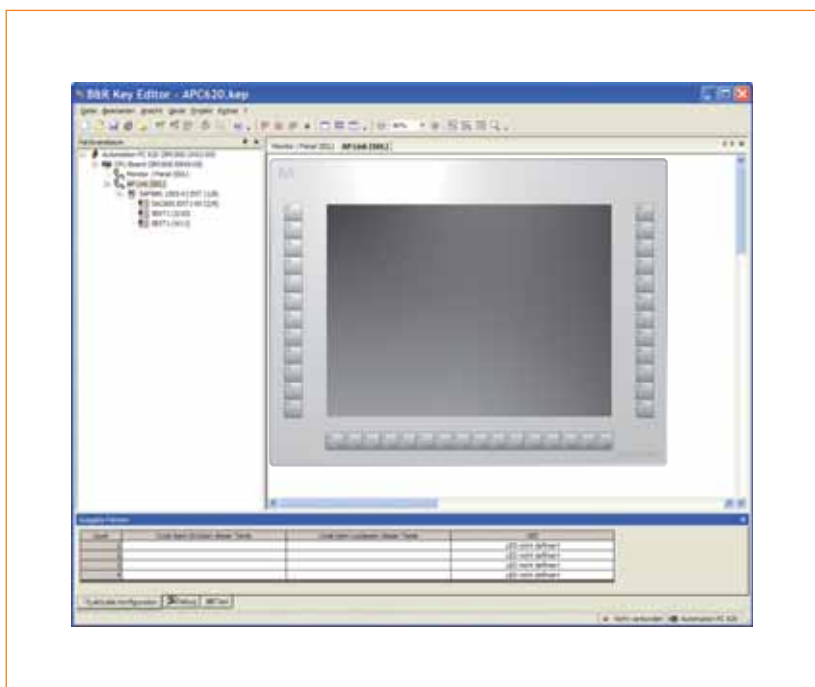


Smart Display Link

All Automation Panel devices are connected to the Automation Panel 620 or APC 810 via the Smart Display Link. The Smart Display Link transfers all communication channels via a single cable – from the display and touch screen data to function key and LED data. Even a remote USB interface is available on the keyboard.

Automation Panel 800 highlights:

- Smart Display Link
- Only one cable needed to transfer display, touch, matrix key, LED, USB, and service data
- Dual independent display
- Distances up to 40 m per segment
- Can be combined with Automation Panel 900



Key configuration, easy and fast

On display units, it is often necessary to adjust the function keys for the respective application software. On Windows®-based systems, pressing the F1 key opens the help page, which is often not what is desired for visualization systems in runtime mode. B&R Automation Panel devices have an easy-to-operate key editor program. Each key can be individually defined with up to four different functions. Multiple characters can also be sent with a single key stroke.

Product overview

Automation Panel 15" XGA



Model number	Short description	
5AP820.1505-00	Automation Panel 820, 15" XGA color TFT display with touch screen (resistive) Smart Display Link connection; IP 65 protection (with flange). 24VDC	1065
5AP880.1505-00	Automation Panel 880, 15" XGA color TFT display with touch screen (resistive); 40 function keys; Smart Display Link connection; IP 65 protection (with flange). 24VDC	1065

Keyboard attachments



Model number	Short description	
5AC800.EXT1-00	Keyboard attachment - keypad For Automation Panel 800 USB interface, IP65 protection	

Keyboard attachments



Model number	Short description
5AC800.EXT2-00	Keyboard attachment - left For Automation Panel 800 20 function keys and 20 system keys, IP65 protection
5AC800.EXT2-01	Keyboard attachment - right For Automation Panel 800 20 function keys and 20 system keys, IP65 protection

Keyboard attachments



Model number	Short description
5AC800.EXT3-00	Keyboard attachment - left For Automation Panel 800 16 function keys and 8 illuminated ring keys, IP65 protection
5AC800.EXT3-01	Keyboard attachment - right For Automation Panel 800 16 function keys and 8 illuminated ring keys, IP65 protection

Product overview

Keyboard attachments



Model number	Short description
5AC800.EXT3-02	Keyboard attachment - left For Automation Panel 800 4 function keys and 12 illuminated ring keys, E-stop, key switch, IP65 protection
5AC800.EXT3-03	Keyboard attachment - right For Automation Panel 800 4 function keys and 12 illuminated ring keys, E-stop, key switch, IP65 protection

Keyboard attachments



Model number	Short description
5AC800.EXT3-04	Keyboard attachment - left For Automation Panel 800 12 function keys and 8 illuminated ring keys, E-stop, key switch, IP65 protection
5AC800.EXT3-05	Keyboard attachment - right For Automation Panel 800 12 function keys and 8 illuminated ring keys, E-stop, key switch, IP65 protection

Flange



Model number	Short description
5AC800.FLG1-00	Flange For Automation Panel 800 and standard swing arm systems (e.g. Rittal CP-S).



Connection pieces

Model number	Short description
5AC800.CON1-00	Straight connector For connecting keyboard attachments to the Automation Panel 800
5AC800.CON2-00	Angled connector (60°) For connecting keyboard attachments to the Automation Panel 800
5AC800.COV1-00	Extension cover
5AC800.COV2-00	Extension cover USB

Product overview

Cables



Model number	Short description	
5CASDL.0018-20	SDL cable for Automation Panel 800, 1.8 m.	1066
5CASDL.0050-20	SDL cable for Automation Panel 800, 5 m.	1066
5CASDL.0100-20	SDL cable for Automation Panel 800, 10 m.	1066
5CASDL.0150-20	SDL cable for Automation Panel 800, 15 m.	1066
5CASDL.0200-20	SDL cable for Automation Panel 800, 20 m.	1066
5CASDL.0250-20	SDL cable for Automation Panel 800, 25 m.	1066
5CASDL.0300-30	SDL cable for Automation Panel 800, 30 m with extender.	1067
5CASDL.0400-30	SDL cable for Automation Panel 800, 40 m with extender.	1067
5CAPWR.0018-20	Voltage supply cable for Automation Panel 800, 1.8 m.	1068
5CAPWR.0050-20	Voltage supply cable for Automation Panel 800, 5 m.	1068
5CAPWR.0100-20	Voltage supply cable for Automation Panel 800, 10 m.	1068
5CAPWR.0150-20	Voltage supply cable for Automation Panel 800, 15 m.	1068
5CAPWR.0200-20	Voltage supply cable for Automation Panel 800, 20 m.	1068
5CAPWR.0250-20	Voltage supply cable for Automation Panel 800, 25 m.	1068
5CAPWR.0300-20	Voltage supply cable for Automation Panel 800, 30 m.	1068
5CAPWR.0400-20	Voltage supply cable for Automation Panel 800, 40 m.	1068
5CAX2X.0018-20	X2X cable for Automation Panel 800, 1.8 m.	1070
5CAX2X.0050-20	X2X cable for Automation Panel 800, 5 m.	1070
5CAX2X.0100-20	X2X cable for Automation Panel 800, 10 m.	1070
5CAX2X.0150-20	X2X cable for Automation Panel 800, 15 m.	1070
5CAX2X.0200-20	X2X cable for Automation Panel 800, 20 m.	1070
5CAX2X.0250-20	X2X cable for Automation Panel 800, 25 m.	1070
5CAX2X.0300-20	X2X cable for Automation Panel 800, 30 m.	1070
5CAX2X.0400-20	X2X cable for Automation Panel 800, 40 m.	1070

Automation Panel 15"



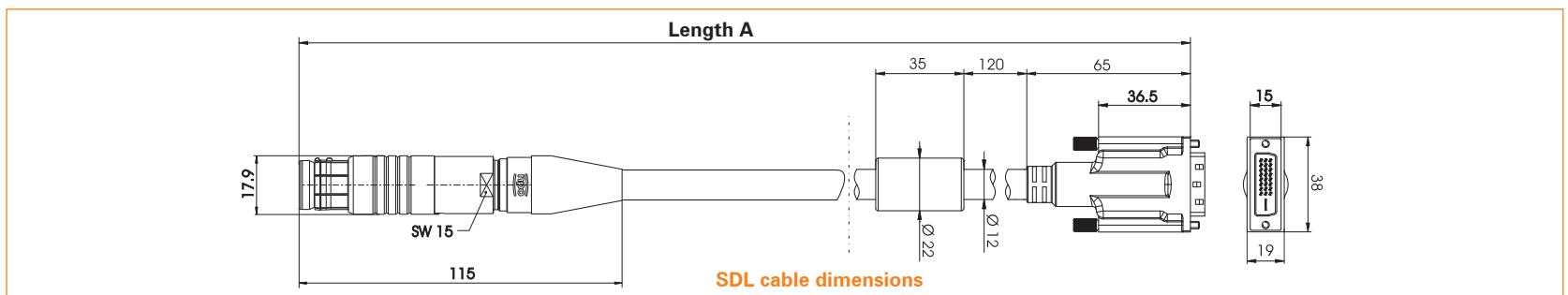
	5AP820.1505-00	5AP880.1505-00
Display type	TFT color	TFT color
Colors	16 million	16 million
Resolution	XGA, 1024 x 768 pixels	XGA, 1024 x 768 pixels
Diagonal	15"	15"
Brightness	250 cd/m ²	250 cd/m ²
Half-brightness time	50,000 hours	50,000 hours
Touch screen	Analog resistive	Analog resistive
Function keys	-	40
Display link	SDL	SDL
Protection type	IP65 (with flange)	IP65 (with flange)

SDL cable



	5CASDL.0018-20	5CASDL.0050-20	5CASDL.0100-20	5CASDL.0150-20	5CASDL.0200-20	5CASDL.0250-20
Length	1.8 m ± 20 mm	5 m ± 45 mm	10 m ± 90 mm	15 m ± 135 mm	20 m ± 180 mm	25 m ± 230 mm
Cable diameter	Max. 12 mm	Max. 12 mm	Max. 12 mm	Max. 12 mm	Max. 12 mm	Max. 12 mm
Shielding	Individual cable pairs, and entire cable	Individual cable pairs, and entire cable	Individual cable pairs, and entire cable	Individual cable pairs, and entire cable	Individual cable pairs, and entire cable	Individual cable pairs, and entire cable
Connector type	1x DVI-D (24+1), male 1x ODU Mini Snap plug, 24-pin	1x DVI-D (24+1), male 1x ODU Mini Snap plug, 24-pin	1x DVI-D (24+1), male 1x ODU Mini Snap plug, 24-pin	1x DVI-D (24+1), male 1x ODU Mini Snap plug, 24-pin	1x DVI-D (24+1), male 1x ODU Mini Snap plug, 24-pin	1x DVI-D (24+1), male 1x ODU Mini Snap plug, 24-pin
Wire cross section	AWG 24	AWG 24	AWG 24	AWG 24	AWG 24	AWG 24
Wave impedance	Max. 145 Ω/km	Max. 145 Ω/km	Max. 95 Ω/km	Max. 95 Ω/km	Max. 95 Ω/km	Max. 95 Ω/km
Line resistance	> 10 MΩ/km	> 10 MΩ/km	> 10 MΩ/km	> 10 MΩ/km	> 10 MΩ/km	> 10 MΩ/km
Flexibility ¹⁾	flexible ¹⁾	flexible ¹⁾	flexible ¹⁾	flexible ¹⁾	flexible ¹⁾	flexible ¹⁾
Flex radius						
Single	>= 10 x Cable diameter	>= 10 x Cable diameter	>= 10 x Cable diameter	>= 10 x Cable diameter	>= 10 x Cable diameter	>= 10 x Cable diameter
Moving	>= 15 x Cable diameter	>= 15 x Cable diameter	>= 15 x Cable diameter	>= 15 x Cable diameter	>= 15 x Cable diameter	>= 15 x Cable diameter
Plug connection cycles	100	100	100	100	100	100
Weight	ca. 300 g	ca. 590 g	ca. 2100 g	ca. 3000 g	ca. 4100 g	ca. 5100 g

¹⁾ limited use in cable drag chains



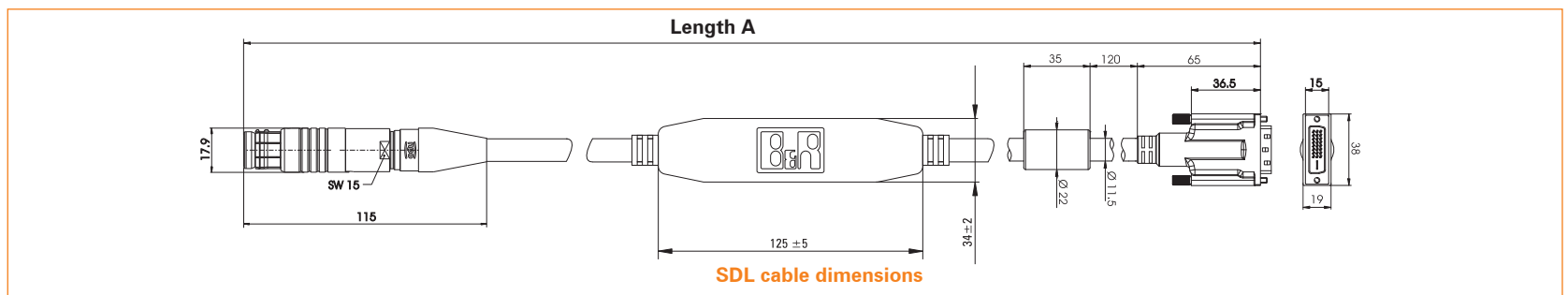
Model number	Length A
5CASDL.0018-20	1800 mm ± 20 mm
5CASDL.0050-20	5000 mm ± 45 mm
5CASDL.0100-20	10000 mm ± 90 mm
5CASDL.0150-20	15000 mm ± 135 mm
5CASDL.0200-20	20000 mm ± 180 mm
5CASDL.0250-20	25000 mm ± 230 mm

All dimensions in mm



	5CASDL.0300-30	5CASDL.0400-30
Length	30 m ± 280 mm	40 m ± 380 mm
Dimensions of extender box	Height 20 mm, width 34 mm, length 125 mm	Height 20 mm, width 34 mm, length 125 mm
Cable diameter	Max. 11.5 mm	Max. 11.5 mm
Shielding	Individual cable pairs and entire cable	Individual cable pairs and entire cable
Connector type	1x DVI-D (24+1), male 1x ODU Mini Snap plug 24-pin	1x DVI-D (24+1), male 1x ODU Mini Snap plug 24-pin
Wire cross section	AWG 24	AWG 24
Line resistance	Max. 95 Ω/km	Max. 95 Ω/km
Insulation resistance	> 10 M Ω/km	> 10 M Ω/km
Flexibility	flexible ¹⁾	flexible ¹⁾
Flex radius		
Single	>= 10 x Cable diameter	>= 10 x Cable diameter
Moving	>= 15 x Cable diameter	>= 15 x Cable diameter
Plug connection cycles	100	100
Weight	Approx. 6250 g	Approx. 8250 g

¹⁾ limited use in cable drag chains



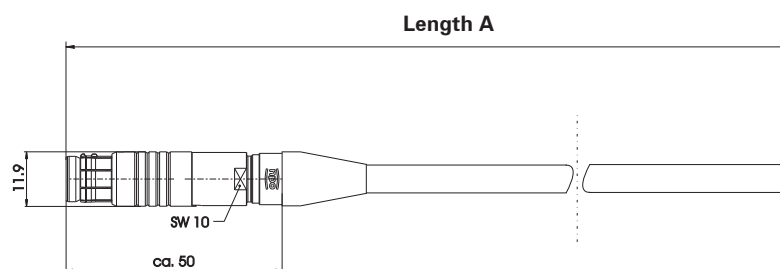
Model number	Length A
5CASDL.0300-30	3000 mm ± 280 mm
5CASDL.0400-30	4000 mm ± 380 mm

All dimensions in mm

Power cable



	5CAPWR.0018-20	5CAPWR.0050-20	5CAPWR.0100-20	5CAPWR.0150-20	5CAPWR.0200-20	5CAPWR.0250-20
Length	1.8 m ± 20 mm	5 m ± 45 mm	10 m ± 90 mm	15 m ± 135 mm	20 m ± 180 mm	25 m ± 230 mm
Cable diameter	6.6 mm	6.6 mm	6.6 mm	6.6 mm	6.6 mm	6.6 mm
Connector type	ODU Mini snap	ODU Mini snap	ODU Mini snap	ODU Mini snap	ODU Mini snap	ODU Mini snap
Wire cross section	1 mm ² / AWG17	1 mm ² / AWG17	1 mm ² / AWG17	1 mm ² / AWG17	1 mm ² / AWG17	1 mm ² / AWG17
Line resistance	Max. 19.5 Ohm/km	Max. 19.5 Ohm/km	Max. 19.5 Ohm/km	Max. 19.5 Ohm/km	Max. 19.5 Ohm/km	Max. 19.5 Ohm/km
Insulation resistance	Min. 200 MOhm/km at +20°C	Min. 200 MOhm/km at +20°C	Min. 200 MOhm/km at +20°C	Min. 200 MOhm/km at +20°C	Min. 200 MOhm/km at +20°C	Min. 200 MOhm/km at +20°C
Flexibility	Flexible (cannot be used in cable drag chains)	Flexible (cannot be used in cable drag chains)	Flexible (cannot be used in cable drag chains)	Flexible (cannot be used in cable drag chains)	Flexible (cannot be used in cable drag chains)	Flexible (cannot be used in cable drag chains)
Flex radius	15 x outer diameter	15 x outer diameter	15 x outer diameter	15 x outer diameter	15 x outer diameter	15 x outer diameter
Shielding	Aluminum foil clad + tinned copper mesh	Aluminum foil clad + tinned copper mesh	Aluminum foil clad + tinned copper mesh	Aluminum foil clad + tinned copper mesh	Aluminum foil clad + tinned copper mesh	Aluminum foil clad + tinned copper mesh
Current load	16.0 A at 25°C	16.0 A at 25°C	16.0 A at 25°C	16.0 A at 25°C	16.0 A at 25°C	16.0 A at 25°C

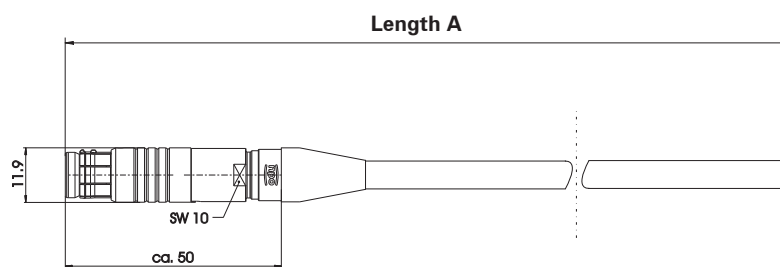


power cable dimensions

Model number	Length A
5CAPWR.0018-20	1800 mm ± 20 mm
5CAPWR.0050-20	1800 mm ± 45 mm
5CAPWR.0100-20	10000 mm ± 90 mm
5CAPWR.0150-20	15000 mm ± 135 mm
5CAPWR.0200-20	20000 mm ± 180 mm
5CAPWR.0250-20	25000 mm ± 230 mm

All dimensions in mm

	5CAPWR.0300-20	5CAPWR.0400-20				
Length	30m ± 330mm	40m ± 380mm				
Cable diameter	6.6mm	6.6mm				
Connector type	ODU Mini snap	ODU Mini snap				
Wire cross section	1mm ² / AWG17	1mm ² / AWG17				
Line resistance	Max. 19.5 Ohm/km	Max. 19.5 Ohm/km				
Insulation resistance	Min. 200 MOhm/km at +20°C	Min. 200 MOhm/km at +20°C				
Flexibility	Flexible (cannot be used in cable drag chains)	Flexible (cannot be used in cable drag chains)				
Flex radius	15 x outer diameter	15 x outer diameter				
Shielding	Aluminum foil clad + tinned copper mesh	Aluminum foil clad + tinned copper mesh				
Current load	16.0 A at 25°C	16.0 A at 25°C				



power cable dimensions

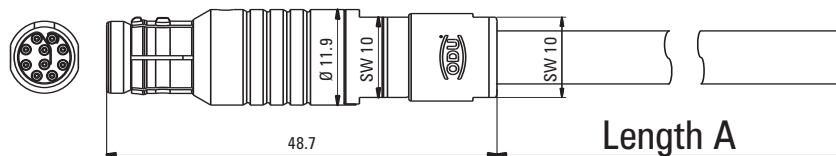
Model number	Length A
5CAPWR.0300-20	30000 mm ± 330 mm
5CAPWR.0400-20	40000 mm ± 380 mm

All dimensions in mm

X2X cable



	5CAX2X.0018-20	5CAX2X.0050-20	5CAX2X.0100-20	5CAX2X.0150-20	5CAX2X.0200-20	5CAX2X.0250-20	5CAX2X.0300-20	5CAX2X.0400-20
Connector type	1.8 m ± 20 mm	5 m ± 45 mm	10 m ± 90 mm	15 m ± 135 mm	20 m ± 180 mm	25 m ± 230 mm	30 m ± 280 mm	40 m ± 380 mm
Weight	ODU Mini snap	ODU Mini snap	ODU Mini snap	ODU Mini snap	ODU Mini snap	ODU Mini snap	ODU Mini snap	ODU Mini snap
Cable diameter	60 kg/km	60 kg/km	60 kg/km	60 kg/km	60 kg/km	60 kg/km	60 kg/km	60 kg/km
Flexibility	6.8 mm	6.8 mm	6.8 mm	6.8 mm	6.8 mm	6.8 mm	6.8 mm	6.8 mm
Flex radius	Semi-flexible	Semi-flexible	Semi-flexible	Semi-flexible	Semi-flexible	Semi-flexible	Semi-flexible	Semi-flexible
Single	10x outer diameter	10x outer diameter	10x outer diameter	10x outer diameter	10x outer diameter	10x outer diameter	10x outer diameter	10x outer diameter
Moving	15x outer diameter	15x outer diameter	15x outer diameter	15x outer diameter	15x outer diameter	15x outer diameter	15x outer diameter	15x outer diameter
Materials	Aluminum foil clad + tinned copper mesh							
Total shield color	Violet (RAL 4001)							
Wire cross section								
Data pair	-	-	-	-	-	-	-	-
Device Net	AWG 24	AWG 24	AWG 24	AWG 24	AWG 24	AWG 24	AWG 24	AWG 24
6 wires	AWG 28	AWG 28	AWG 28	AWG 28	AWG 28	AWG 28	AWG 28	AWG 28
Line resistance								
AWG 24	Max. 89 Ω/km	Max. 89 Ω/km	Max. 89 Ω/km	Max. 89 Ω/km	Max. 89 Ω/km	Max. 89 Ω/km	Max. 89 Ω/km	Max. 89 Ω/km
AWG 28	Max. 220 Ω/km	Max. 220 Ω/km	Max. 220 Ω/km	Max. 220 Ω/km	Max. 220 Ω/km	Max. 220 Ω/km	Max. 220 Ω/km	Max. 220 Ω/km
Insulation resistance	Min. 200 M Ω/km	Min. 200 M Ω/km	Min. 200 M Ω/km	Min. 200 M Ω/km	Min. 200 M Ω/km	Min. 200 M Ω/km	Min. 200 M Ω/km	Min. 200 M Ω/km
Test voltage	1000 V	1000 V	1000 V	1000 V	1000 V	1000 V	1000 V	1000 V
Operating voltage	Max. 30 V	Max. 30 V	Max. 30 V	Max. 30 V	Max. 30 V	Max. 30 V	Max. 30 V	Max. 30 V

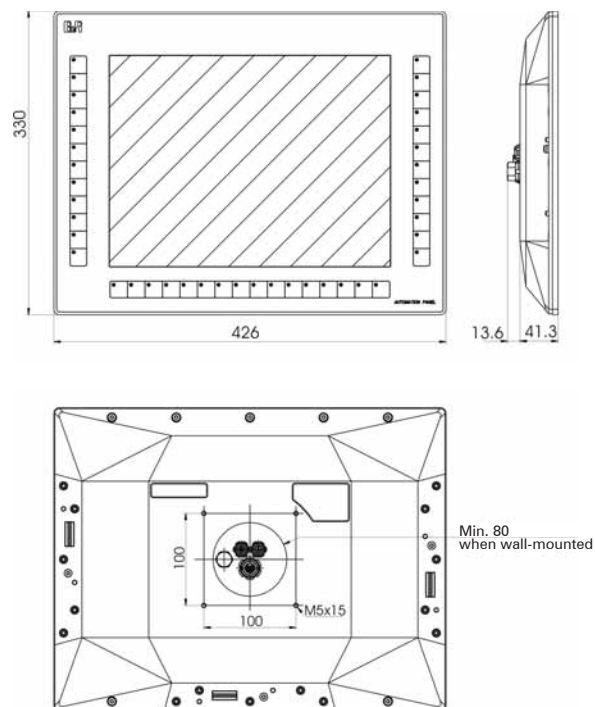


X2X cable dimensions

Model number	Length A
5CAX2X.0018-20	1800 mm ± 20 mm
5CAX2X.0050-20	5000 mm ± 45 mm
5CAX2X.0100-20	10000 mm ± 90 mm
5CAX2X.0150-20	15000 mm ± 135 mm
5CAX2X.0200-20	20000 mm ± 180 mm
5CAX2X.0250-20	25000 mm ± 230 mm
5CAX2X.0300-20	30000 mm ± 280 mm
5CAX2X.0400-20	40000 mm ± 380 mm

All dimensions in mm

Dimensions - Automation Panel

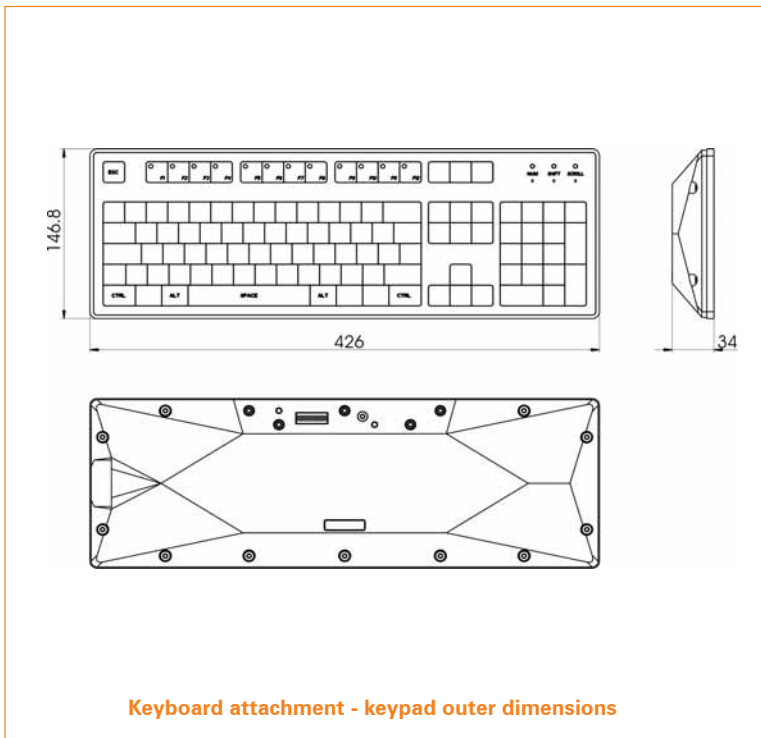


Automation Panel 800 outer dimensions

Model number	Short description	
5AP820.1505-00	Automation Panel 820, 15" XGA color TFT display with touch screen (resistive) Smart Display Link connection; IP 65 protection (with flange). 24VDC	1065
5AP880.1505-00	Automation Panel 880, 15" XGA color TFT display with touch screen (resistive); 40 function keys; Smart Display Link connection; IP 65 protection (with flange). 24 VDC	1065

All dimensions in mm

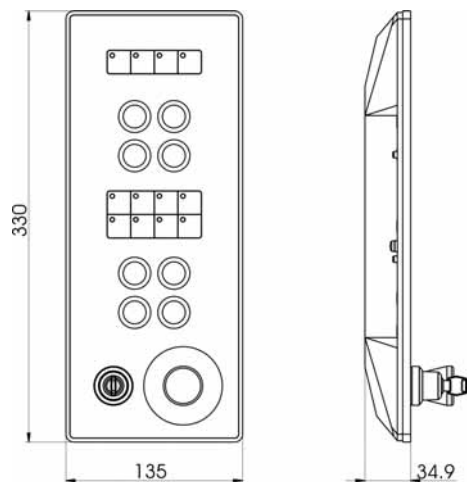
Keyboard attachment dimensions



Model number	Short description
5AC800.EXT1-00	Keyboard attachment - keypad For Automation Panel 800 USB interface, IP65 protection

1060

All dimensions in mm



Keyboard attachment - left / right attachment dimensions

Model number	Short description	
5AC800.EXT2-00	Keyboard attachment - left For Automation Panel 800 20 function keys and 20 system keys, IP65 protection	1061
5AC800.EXT2-01	Keyboard attachment - right For Automation Panel 800 20 function keys and 20 system keys, IP65 protection	1061
5AC800.EXT3-00	Keyboard attachment - left For Automation Panel 800 16 function keys and 8 illuminated ring keys, IP65 protection	1061
5AC800.EXT3-01	Keyboard attachment - right For Automation Panel 800 16 function keys and 8 illuminated ring keys, IP65 protection	1061
5AC800.EXT3-02	Keyboard attachment - left For Automation Panel 800 4 function keys and 12 illuminated ring keys, E-stop, key switch, IP65 protection	1062
5AC800.EXT3-03	Keyboard attachment - right For Automation Panel 800 4 function keys and 12 illuminated ring keys, E-stop, key switch, IP65 protection	1062
5AC800.EXT3-04	Keyboard attachment - left For Automation Panel 800 12 function keys and 8 illuminated ring keys, E-stop, key switch, IP65 protection	1062
5AC800.EXT-05	Keyboard attachment - right For Automation Panel 800 12 function keys and 8 illuminated ring keys, E-stop, key switch, IP65 protection	1062

All dimensions in mm

Legend strips

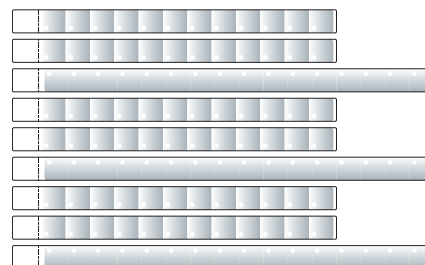
Model number	Short description
5AC800.150X-00	Legend strip template 15.0". For Automation Panel 800 5AP880.1505-00. For 3 devices.

Function keys
with legend strips



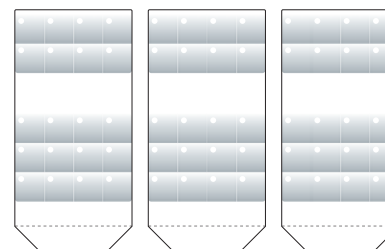
Function keys
with legend strips

Function keys
with legend strips

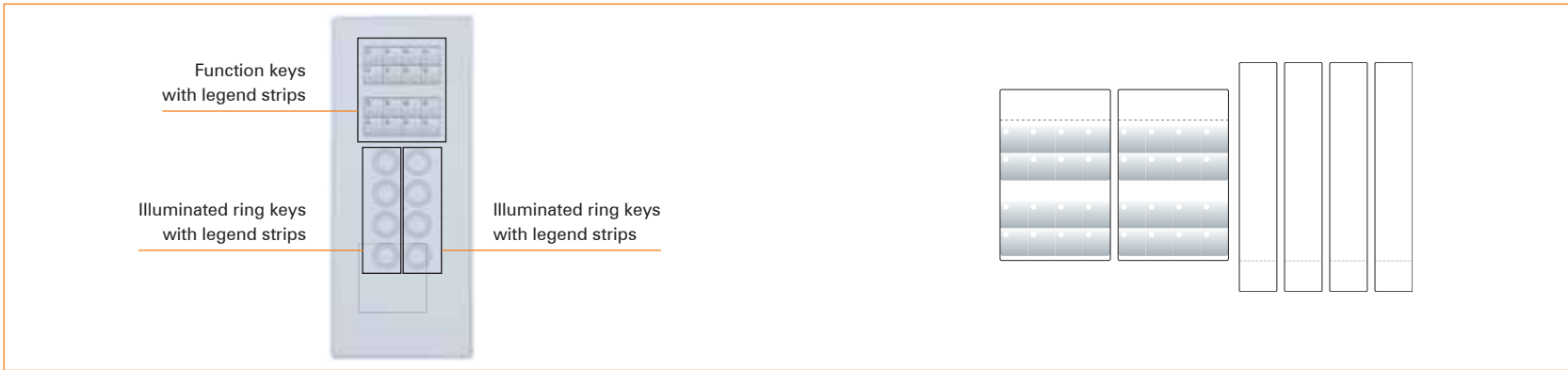


Model number	Short description
5AC800.EXTX-00	Legend strip template 15.0". For Automation Panel 800 attachments 5AC800.EXT2-00, 5AC800.EXT2-01. For 3 devices.

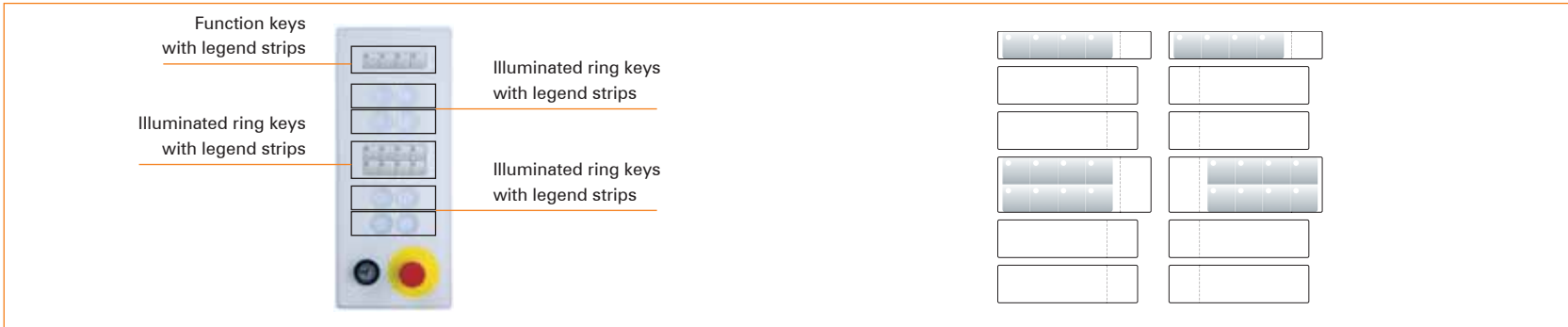
Function keys
with legend strips



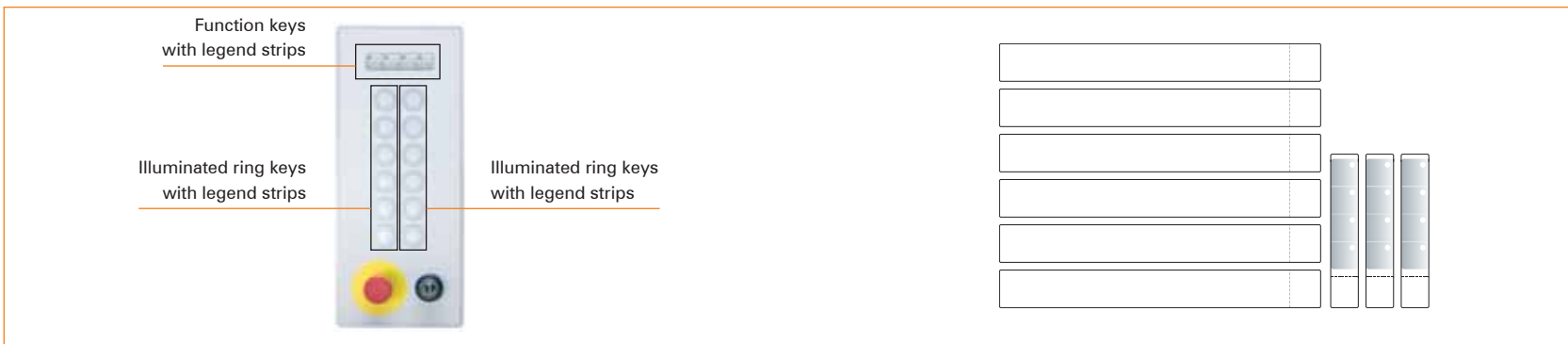
Model number	Short description
5AC800.EXTX-01	Legend strip template 15.0". For Automation Panel 800 attachments 5AC800.EXT3-00, 5AC800.EXT3-01. For 2 devices.

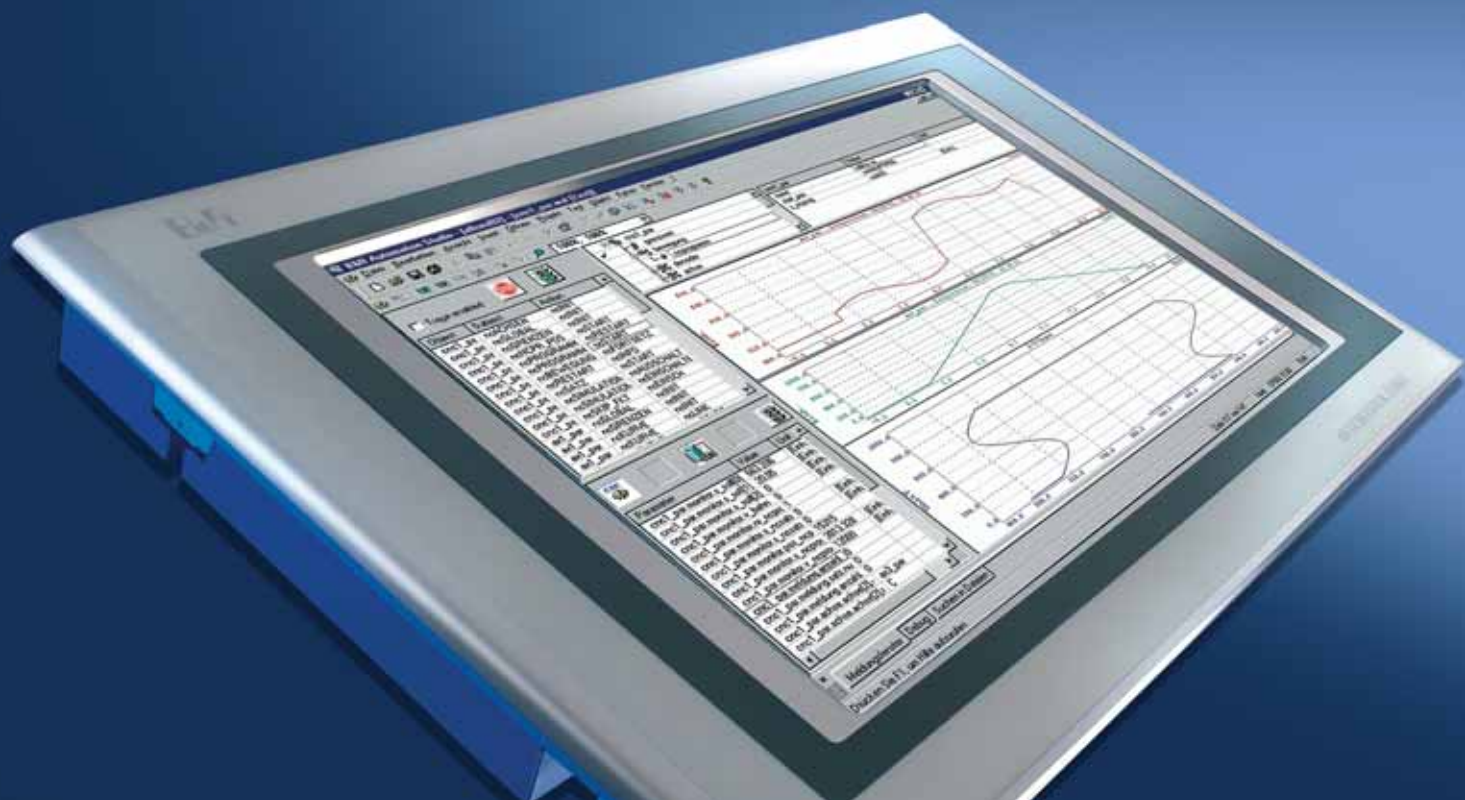


Model number	Short description
5AC800.EXTX-02	Legend strip template 15.0". For Automation Panel 800 attachments 5AC800.EXT3-04, 5AC800.EXT3-05. For 2 devices.



Model number	Short description
5AC800.EXTX-03	Legend strip template 15.0". For Automation Panel 800 attachments 5AC800.EXT3-02, 5AC800.EXT3-03. For 3 devices.





Automation Panel 900

A new dimension for visualization on the machine.
Flexible display units with modular transfer technology.



Table of contents

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System characteristics



Automation Panel

Many variations

The Automation Panel was developed for industrial use. It is available in different designs, from 10.4" VGA TFT, 12.1" SVGA TFT, 15" XGA TFT, 17" SXGA TFT, up to 19" SXGA TFT with keys, touch screen, and USB.

For harsh operating conditions

The front is made of milled aluminum. This provides the robustness expected of operating panels in tough industrial environments. Automation Panels also have IP65 protection against sprayed water.

Maximum flexibility

All Automation Panels are equipped with an insert on the back that allows modular display interfaces to be connected. The optimal transfer technology can be selected for any machine topology.

Simple handling of complex procedures

Whether operating using the touch screen, the permanent function keys, or a combination of both, the Automation Panel offers all input variations.



5DL DVI.1000-01

DVI

DVI stands for Digital Video Interface. DVI link is the first choice wherever compatibility with a standard is important. With a DVI connection, the Automation Panel can also be used universally with systems from other manufacturers. With this type of transfer, display data, USB 2.0 data, and touch screen data are sent separately over their own cable.



5DLSDL.1000-00

SDL receiver

SDL stands for Smart Display Link. With SDL, all communication between the Automation Panel and APC620 / PPC700 / APC810 takes place using a single cable. In addition to transferring display data, it also handles touch screen, matrix key, LED, and service data. The Automation Panel can be mounted up to 43 m from the system unit. USB 1.1 is fully integrated in the SDL and transferred over this distance as well. External modules are not needed for this purpose. A panel can be operated on one line with an SDL receiver.



5DLSDL.1000-01

SDL transceiver

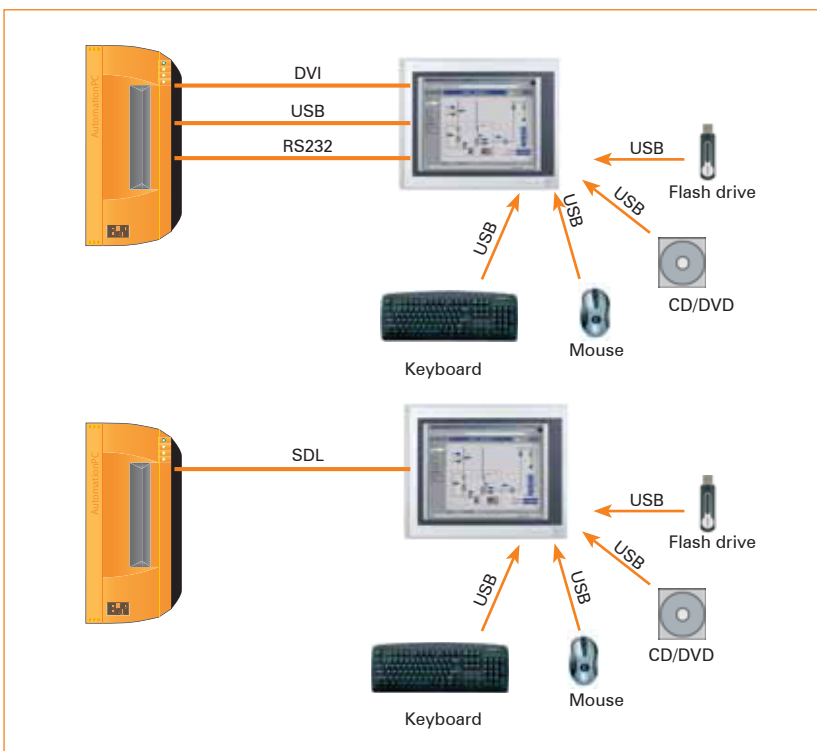
The SDL transceiver makes it possible to connect another Automation Panel to the first Automation Panel. In the second segment, a maximum distance of 43 m can be bridged (the maximum distance is limited by the resolution). To achieve the maximum segment length, cables can be used together with an extender, which acts like an amplifier and is integrated in the cable. Additional hardware is not required.

System characteristics



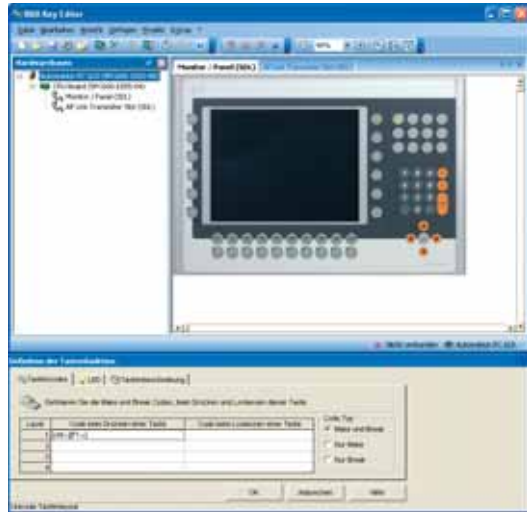
Simple installation

All Automation Panels are equipped with fastening elements for fast mounting. The Automation Panel is simply slid into the corresponding cutout in the switching cabinet from the front. The clamps ensure that it is held in place and does not fall out. Then the screws on the back must be tightened to press the integrated clamping lever against the wall of the switching cabinet. The construction of the fastening element is set up so that all parts are completely integrated. Loose accessory parts such as nuts or screws are a thing of the past.



On-site peripheral devices

All Automation Panels support USB. Whereas USB signals are transferred via a separate cable with the DVI link (USB is not part of the DVI standard), USB is fully integrated in the SDL. All Automation Panels are equipped with a USB hub that provides up to three USB interfaces. USB peripheral devices such as CD-ROM drives, USB flash drives, or keyboards can easily be connected to the operating unit. Access to the switching cabinet is not necessary. The APC620/ PPC700/ APC810 can also be booted via USB. USB is supported on the first two displays up to a segment length of 30 m. If the segment length is more than 30 m, then USB is only supported on one display. The maximum segment length is 40 m in this case. USB devices can only be connected directly to the Automation Panel (without a hub).



Key configuration - Easy and fast

All Automation Panels have an easy-to-operate key editor. The functionality of each key can be configured separately. Each key can have up to four functions. Multiple characters can also be sent with a single key stroke. The Key Editor can be downloaded from the B&R homepage. To optimally set up the keys for the application, each Automation Panel can be ordered with function key legend strip templates. Each legend sheet has a CorelDRAW template with predefined key positions.

Product overview

Automation Panel 10.4" VGA



Model number	Short description	
5AP920.1043-01	Automation Panel AP920, 10.4" VGA color TFT display with touch screen (resistive); 2 USB 2.0 interfaces; insert for Automation Panel link; IP 65 protection (front). 24 VDC.	1090
5AP980.1043-01	Automation Panel AP980, 10.4" VGA color TFT display with touch screen (resistive); 10 soft keys and 12 function keys; 2 USB 2.0 interfaces; insert for Automation Panel link; IP 65 protection (front side). 24 VDC.	1090
5AP981.1043-01	Automation Panel AP981, 10.4" VGA color TFT display with touch screen (resistive); 10 soft keys; 28 function keys and 20 system keys; 2 USB 2.0 interfaces; insert for Automation Panel link; IP 65 protection (front side). 24 VDC.	1091
5AP982.1043-01	Automation Panel AP982, 10.4" VGA color TFT display with touch screen (resistive); 44 function keys and 20 system keys; 2 USB 2.0 interfaces; insert for Automation Panel link; IP 65 protection (front side). 24 VDC.	1092

Automation Panel 12.1" SVGA



Model number	Short description	
5AP920.1214-01	Automation Panel AP920, 12.1" SVGA color TFT display with touch screen (resistive); 3 USB 2.0 interfaces; insert for Automation Panel link; IP 65 protection (front). 24 VDC.	1093

Automation Panel 15" XGA



Model number	Short description	
5AP920.1505-01	Automation Panel AP920, 15" XGA color TFT display with touch screen (resistive); 3 USB 2.0 interfaces; insert for Automation Panel link; IP 65 protection (front). 24 VDC.	1094
5AP980.1505-01	Automation Panel AP981, 15" XGA color TFT display with touch screen (resistive); 12 soft keys and 20 function keys; 3 USB 2.0 interfaces; insert for Automation Panel link; IP 65 protection (front side). 24 VDC.	1094
5AP981.1505-01	Automation Panel AP981, 15" XGA color TFT display with touch screen (resistive); 12 soft keys; 20 function keys and 92 system keys; 3 USB 2.0 interfaces; insert for Automation Panel link; IP 65 protection (front side). 24 VDC.	1095

Automation Panel 17" SXGA



Model number	Short description
5AP920.1706-01	Automation Panel AP920, 17" SXGA color TFT display with touch screen (resistive); 3 USB 2.0 interfaces; insert for Automation Panel link; IP 65 protection (front), 24 VDC. 1096

Automation Panel 19" SXGA



Model number	Short description
5AP920.1906-01	Automation Panel AP920, 19" SXGA color TFT display with touch screen (resistive); 3 USB 2.0 interfaces; insert for Automation Panel link; IP 65 protection (front), 24 VDC. 1097

Product overview

Display links



Model number	Short description
5DL DVI.1000-01	Automation Panel link, DVI receiver, connections for DVI-D, RS232 and USB 2.0 (Type B); 24VDC.
5DLS DL.1000-00	Automation Panel Link, SDL receiver, connection for SDL In; transfer of display, touch screen, USB 1.1, matrix key, and service data; 24VDC.
5DLS DL.1000-01	Automation Panel Link, SDL transceiver, connections for SDL In and SDL Out; transfer of display, touch screen, USB 1.1, matrix key, and service data; 24VDC.

Cables



Model number	Short description
5CADVI.0018-00	DVI-D cable 1.8 m / single 1098
5CADVI.0050-00	DVI-D cable 5 m / single 1098
5CADVI.0100-00	DVI-D cable 10 m / single 1098



Model number	Short description
5CAUSB.0018-00	USB 2.0 connection cable type A - type B; 1.8 m 1103
5CAUSB.0050-00	USB 2.0 connection cable type A - type B; 5 m 1103



Model number	Short description	
9A0014.02	RS232 extension cable for remote operation of a display unit with touch screen, length 1.8 m.	1104
9A0014.05	RS232 extension cable for remote operation of a display unit with touch screen, length 5 m.	1104
9A0014.10	RS232 extension cable for remote operation of a display unit with touch screen, length 10 m.	1104



Model number	Short description	
5CASDL.0018-00	SDL cable 1.8 m (for a fixed type of layout)	1099
5CASDL.0018-01	SDL cable 1.8 m; 45° connector (for a fixed type of layout)	1100
5CASDL.0018-03	SDL cable 1.8 m (for fixed and flexible type of layout)	1101
5CASDL.0050-00	SDL cable 5 m (for a fixed type of layout)	1099
5CASDL.0050-01	SDL cable 5 m; 45° connector (for a fixed type of layout)	1100
5CASDL.0050-03	SDL cable 5 m (for fixed and flexible type of layout)	1101
5CASDL.0100-00	SDL cable 10 m (for a fixed type of layout)	1099
5CASDL.0100-01	SDL cable 10 m; 45° connector (for a fixed type of layout)	1100
5CASDL.0100-03	SDL cable 10 m (for fixed and flexible type of layout)	1101
5CASDL.0150-00	SDL cable 15 m (for a fixed type of layout)	1099
5CASDL.0150-01	SDL cable 15 m; 45° connector (for a fixed type of layout)	1100
5CASDL.0150-03	SDL cable 15 m (for fixed and flexible type of layout)	1101
5CASDL.0200-00	SDL cable 20 m (for a fixed type of layout)	1099
5CASDL.0200-03	SDL cable 20 m (for fixed and flexible type of layout)	1100
5CASDL.0250-00	SDL cable 25 m (for a fixed type of layout)	1101
5CASDL.0250-03	SDL cable 25 m (for fixed and flexible type of layout)	1099
5CASDL.0300-00	SDL cable 30 m (for a fixed type of layout)	1100
5CASDL.0300-03	SDL cable 30 m (for fixed and flexible type of layout)	1101
5CASDL.0300-13	SDL cable 30 m with extender (for fixed and flexible type of layout)	1102
5CASDL.0400-13	SDL cable 40 m with extender (for fixed and flexible type of layout)	1102
5CASDL.0430-13	SDL cable 43 m with extender (for fixed and flexible type of layout)	1102

Product overview

Accessories



Model number	Short description
5AC900.1200-00	USB interface cover (permanently attached) for Automation Panel and Panel PC



Automation Panel 10.4"



	5AP920.1043-01	5AP980.1043-01
Display type	TFT color	TFT color
Colors	262,144	262,144
Resolution	VGA, 640 x 480 pixels	VGA, 640 x 480 pixels
Diagonal	10.4"	10.4"
Brightness	350 cd/m ²	350 cd/m ²
Half-brightness time	50,000 hours	50,000 hours
Touch screen	Analog resistive	Analog resistive
Keys		
Function keys	-	12, with LED
Soft keys	-	10, with LED
System keys	-	-
Display link slot	1 on back	1 on back
USB	1 x USB 2.0 (back side) 1 x USB 2.0 (front side), behind IP65 cover, connection type A	1 x USB 2.0 (back side) 1 x USB 2.0 (front side), behind IP65 cover, connection type A
Protection type	IP65 (front side) IP20 back side	IP65 (front side) IP20 back side
Outer dimensions (WxHxD [mm])	323 x 260 x 55	323 x 260 x 55

Required accessories

Model number	Short description	
0TB103.9	Plug 24 VDC screw clamp	1131
0TB103.91	Plug 24 VDC cage clamp	1131
	USB accessories	1127
	Display links	1086
	Cables	1086



5AP981.1043-01	
Display type	TFT color
Colors	262,144
Resolution	VGA, 640 x 480 pixels
Diagonal	10.4"
Brightness	350 cd/m ²
Half-brightness time	50,000 hours
Touch screen	Analog resistive
Keys	
Function keys	28, with LED
Soft keys	10, with LED
System keys	20
Display link slot	1 on back
USB	1 x USB 2.0 (back side) 1 x USB 2.0 (front side), behind IP65 cover, connection type A
Protection type	IP65 (front side) IP20 back side
Outer dimensions (WxHxD [mm])	323x358x55

Required accessories

Model number	Short description	
0TB103.9	Plug 24 VDC screw clamp	1131
0TB103.91	Plug 24 VDC cage clamp	1131
	USB accessories	1127
	Display links	1086
	Cables	1086

Automation Panel 10.4"



5AP982.1043-01	
Display type	TFT color
Colors	262,144
Resolution	VGA, 640 x 480 pixels
Diagonal	10.4"
Brightness	350 cd/m ²
Half-brightness time	50,000 hours
Touch screen	Analog resistive
Keys	
Function keys	44, with LED
Soft keys	-
System keys	20
Display link slot	1 on back
USB	1 x USB 2.0 (back side) 1 x USB 2.0 (front side), behind IP65 cover, connection type A
Protection type	IP65 (front side) IP20 back side
Outer dimensions (WxHxD [mm])	423 x 288 x 55

Required accessories

Model number	Short description	
0TB103.9	Plug 24 VDC screw clamp	1131
0TB103.91	Plug 24 VDC cage clamp	1131
	USB accessories	1127
	Display links	1086
	Cables	1086

Automation Panel 12.1"

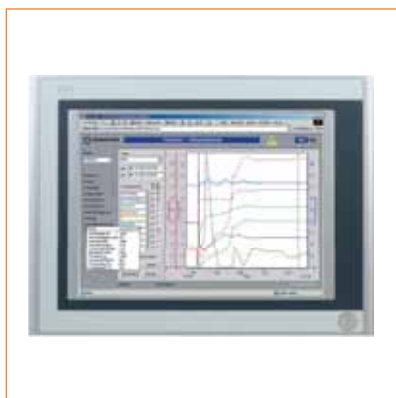


5AP920.1214-01	
Display type	TFT color
Colors	262,144
Resolution	SVGA, 800 x 600 pixels
Diagonal	12.1"
Brightness	350 cd/m ²
Half-brightness time	50,000 hours
Touch screen	Analog resistive
Keys	-
Function keys	-
Soft keys	-
System keys	-
Display link slot	1 on back
USB	2 x USB 2.0 (back side) 1 x USB 2.0 (front side), behind IP65 cover, connection type A
Protection type	IP65 (front side) IP20 back side
Outer dimensions (WxHxD [mm])	362 x 284 x 55

Required accessories

Model number	Short description	
OTB103.9	Plug 24 VDC screw clamp	1131
OTB103.91	Plug 24 VDC cage clamp	1131
	USB accessories	1127
	Display links	1086
	Cables	1086

Automation Panel 15"



	5AP920.1505-01	5AP980.1505-01
Display type	TFT color	TFT color
Colors	16.8 million	16.8 million
Resolution	XGA, 1024 x 768 pixels	XGA, 1024 x 768 pixels
Diagonal	15"	15"
Brightness	250 cd/m ²	250 cd/m ²
Half-brightness time	50,000 hours	50,000 hours
Touch screen	Analog resistive	Analog resistive
Keys		
Function keys	-	20, with LED
Soft keys	-	12, with LED
System keys	-	-
Display link slot	1 on back	1 on back
USB	2 x USB 2.0 (back side) 1 x USB 2.0 (front side), behind IP65 cover, connection type A	2 x USB 2.0 (back side) 1 x USB 2.0 (front side), behind IP65 cover, connection type A
Protection type	IP65 (front side) IP20 back side	IP65 (front side) IP20 back side
Outer dimensions (WxHxD [mm])	435 x 330 x 54	435 x 330 x 54

Required accessories

Model number	Short description	
0TB103.9	Plug 24 VDC screw clamp	1131
0TB103.91	Plug 24 VDC cage clamp	1131
	USB accessories	1127
	Display links	1086
	Cables	1086

Automation Panel 15"



5AP981.1505-01	
Display type	TFT color
Colors	16.8 million
Resolution	XGA, 1024 x 768 pixels
Diagonal	15"
Brightness	250 cd/m ²
Half-brightness time	50,000 hours
Touch screen	Analog resistive
Keys	
Function keys	20, with LED
Soft keys	12, with LED
System keys	92
Display link slot	1 on back
USB	2 x USB 2.0 (back side) 1 x USB 2.0 (front side), behind IP65 cover, connection type A
Protection type	IP65 (front side) IP20 back side
Outer dimensions (WxHxD [mm])	435 x 430 x 54

Required accessories

Model number	Short description	
0TB103.9	Plug 24 VDC screw clamp	1131
0TB103.91	Plug 24 VDC cage clamp	1131
	USB accessories	1127
	Display links	1086
	Cables	1086

Automation Panel 17"



	5AP920.1706-01
Display type	TFT color
Colors	16.8 million
Resolution	SXGA, 1280 x 1024 pixels
Diagonal	17"
Brightness	250 cd/m ²
Half-brightness time	50,000 hours
Touch screen	Analog resistive
Keys	
Function keys	-
Soft keys	-
System keys	-
Display link slot	1 on back
USB	2 x USB 2.0 (back side) 1 x USB 2.0 (front side), behind IP65 cover, connection type A
Protection type	IP65 (front side) IP20 back side
Outer dimensions (WxHxD [mm])	477 x 390 x 59

Required accessories

Model number	Short description	
0TB103.9	Plug 24 VDC screw clamp	1131
0TB103.91	Plug 24 VDC cage clamp	1131
	USB accessories	1127
	Display links	1086
	Cables	1086

Automation Panel 19"



5AP920.1906-01	
Display type	TFT color
Colors	16.8 million
Resolution	SXGA, 1280 x 1024 pixels
Diagonal	19"
Brightness	250 cd/m ²
Half-brightness time	35,000 hours
Touch screen	Analog resistive
Keys	
Function keys	-
Soft keys	-
System keys	-
Display link slot	1 on back
USB	2 x USB 2.0 (back side) 1 x USB 2.0 (front side), behind IP65 cover, connection type A
Protection type	IP65 (front side) IP20 back side
Outer dimensions (WxHxD [mm])	527 x 421 x 62

Required accessories

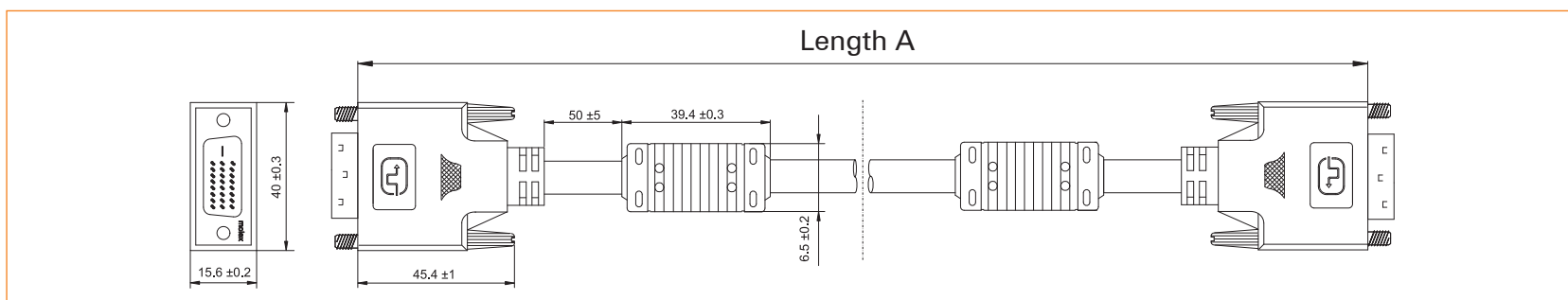
Model number	Short description	
0TB103.9	Plug 24 VDC screw clamp	1131
0TB103.91	Plug 24 VDC cage clamp	1131
	USB accessories	1127
	Display links	1086
	Cables	1086

DVI cable



	5CADVI.0018-00	5CADVI.0050-00	5CADVI.0100-00
Length	1.8 m ± 30 mm	5 m ± 50 mm	10 m ± 100 mm
Outer diameter	Max. 8.5 mm	Max. 8.5 mm	Max. 8.5 mm
Shielding	Individual cable pairs, and entire cable	Individual cable pairs, and entire cable	Individual cable pairs, and entire cable
Connector type	2x DVI-D (18+1), male	2x DVI-D (18+1), male	2x DVI-D (18+1), male
Wire cross section	AWG 28	AWG 28	AWG 28
Wave impedance	Max. 237 Ω/km	Max. 237 Ω/km	Max. 237 Ω/km
Insulation resistance	Min. 100 MΩ/km	Min. 100 MΩ/km	Min. 100 MΩ/km
Flexibility ¹⁾	Flexible	Flexible	Flexible
Flex radius	Greater than or equal to 5 x cable diameter	Greater than or equal to 5 x cable diameter	Greater than or equal to 5 x cable diameter

¹⁾ Not for use in drag chain installations



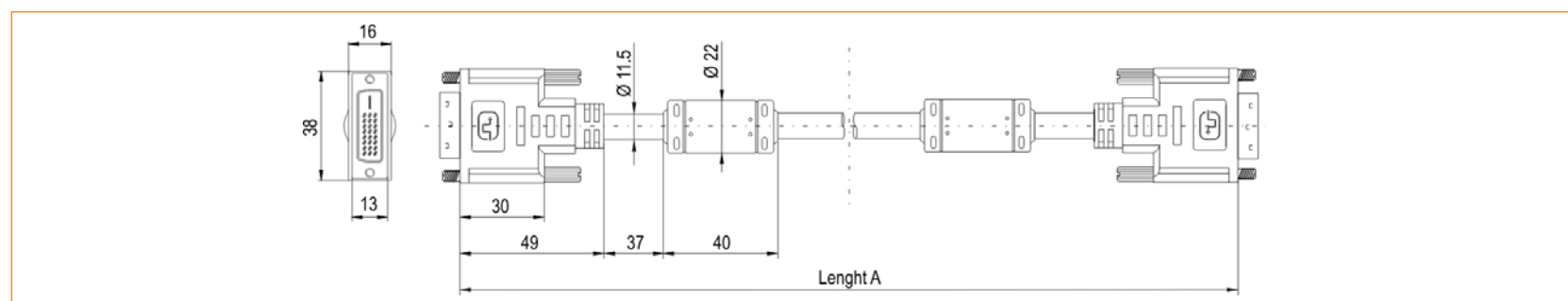
Model number	Length A
5CADVI.0018-00	1,800 ± 30 mm
5CADVI.0050-00	5,000 ± 50 mm
5CADVI.0100-00	10,000 ± 100 mm

All dimensions in mm

SDL cable - fixed



	5CASDL.0018-00	5CASDL.0050-00	5CASDL.0100-00	5CASDL.0150-00	5CASDL.0200-00	5CASDL.0250-00	5CASDL.0300-00
Length	1.8 m ± 50 mm	5 m ± 80 mm	10 m ± 100 mm	15 m ± 120 mm	20 m ± 150 mm	25 m ± 200 mm	30 m ± 200 mm
Outer diameter	Max. 9 mm	Max. 9 mm	Max. 12 mm	Max. 12 mm	Max. 12 mm	Max. 12 mm	Max. 12 mm
Shielding	Individual cable pairs, and entire cable	Individual cable pairs, and entire cable	Individual cable pairs, and entire cable	Individual cable pairs, and entire cable	Individual cable pairs, and entire cable	Individual cable pairs, and entire cable	Individual cable pairs, and entire cable
Connector type	2x DVI-D (24+1), male	2x DVI-D (24+1), male	2x DVI-D (24+1), male	2x DVI-D (24+1), male	2x DVI-D (24+1), male	2x DVI-D (24+1), male	2x DVI-D (24+1), male
Wire cross section	28 AWG	28 AWG	24 AWG	24 AWG	24 AWG	24 AWG	24 AWG
Wave impedance	Max. 237 Ω/km	Max. 237 Ω/km	Max. 93 Ω/km	Max. 93 Ω/km	Max. 93 Ω/km	Max. 93 Ω/km	Max. 93 Ω/km
Insulation resistance	Min. 10 MΩ/km	Min. 10 MΩ/km	Min. 10 MΩ/km	Min. 10 MΩ/km	Min. 10 MΩ/km	Min. 10 MΩ/km	Min. 10 MΩ/km
Flexibility	Fixed layout	Fixed layout	Fixed layout	Fixed layout	Fixed layout	Fixed layout	Fixed layout
Flex radius	Greater than or equal to 5 x cable diameter	Greater than or equal to 5 x cable diameter	Greater than or equal to 5 x cable diameter	Greater than or equal to 5 x cable diameter	Greater than or equal to 5 x cable diameter	Greater than or equal to 5 x cable diameter	Greater than or equal to 5 x cable diameter



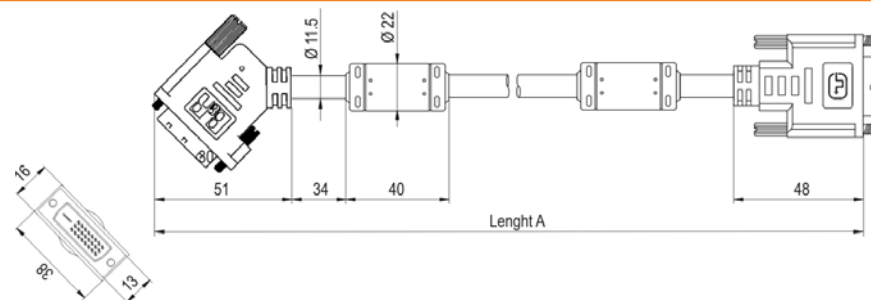
Model number	Length A
5CASDL.0018-00	1,800 ± 50 mm
5CASDL.0050-00	5,000 ± 80 mm
5CASDL.0100-00	10,000 ± 100 mm
5CASDL.0150-00	15,000 ± 120 mm
5CASDL.0200-00	20,000 ± 150 mm
5CASDL.0250-00	25,000 ± 200 mm
5CASDL.0300-00	30,000 ± 200 mm

All dimensions in mm

SDL cable - fixed and angled



	5CASDL.0018-01	5CASDL.0050-01	5CASDL.0100-01	5CASDL.0150-01
Length	1.8 m ± 50 mm	5 m ± 80 mm	10 m ± 100 mm	15 m ± 120 mm
Outer diameter	Max. 9 mm	Max. 9 mm	Max. 12 mm	Max. 12 mm
Shielding	Individual cable pairs, and entire cable	Individual cable pairs, and entire cable	Individual cable pairs, and entire cable	Individual cable pairs, and entire cable
Connector type	2x DVI-D (24+1), male	2x DVI-D (24+1), male	2x DVI-D (24+1), male	2x DVI-D (24+1), male
Wire cross section	28 AWG	28 AWG	24 AWG	24 AWG
Wave impedance	Max. 237 Ω/km	Max. 237 Ω/km	Max. 93 Ω/km	Max. 93 Ω/km
Insulation resistance	Min. 10 MΩ/km	Min. 10 MΩ/km	Min. 10 MΩ/km	Min. 10 MΩ/km
Flexibility	Fixed layout	Fixed layout	Fixed layout	Fixed layout
Flex radius	Min. 45 mm	Greater than or equal to 5 x cable diameter	Greater than or equal to 5 x cable diameter	Greater than or equal to 5 x cable diameter



Model number	Length A
5CASDL.0018-01	1,800 ± 20 mm
5CASDL.0050-01	5,000 ± 45 mm
5CASDL.0100-01	10,000 ± 90 mm
5CASDL.0150-01	15,000 ± 135 mm

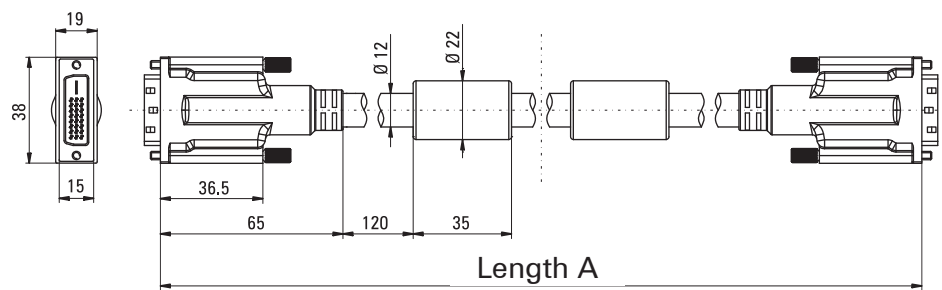
All dimensions in mm

SDL cable - flexible



	5CASDL.0018-03	5CASDL.0050-03	5CASDL.0100-03	5CASDL.0150-03	5CASDL.0200-03	5CASDL.0250-03	5CASDL.0300-03
Length	1.8 m ± 20 mm	5 m ± 45 mm	10 m ± 90 mm	15 m ± 135 mm	20 m ± 180 mm	25 m ± 230 mm	30 m ± 280 mm
Outer diameter	Max. 12 mm	Max. 12 mm	Max. 12 mm	Max. 12 mm	Max. 12 mm	Max. 12 mm	Max. 12 mm
Shielding	Individual cable pairs, and entire cable	Individual cable pairs, and entire cable	Individual cable pairs, and entire cable	Individual cable pairs, and entire cable	Individual cable pairs, and entire cable	Individual cable pairs, and entire cable	Individual cable pairs, and entire cable
Connector type	2x DVI-D (24+1), male	2x DVI-D (24+1), male	2x DVI-D (24+1), male	2x DVI-D (24+1), male	2x DVI-D (24+1), male	2x DVI-D (24+1), male	2x DVI-D (24+1), male
Wire cross section	24 AWG	24 AWG	24 AWG	24 AWG	24 AWG	24 AWG	24 AWG
Wave impedance	Max. 110 Ω/km	Max. 110 Ω/km	Max. 110 Ω/km	Max. 110 Ω/km	Max. 110 Ω/km	Max. 110 Ω/km	Max. 110 Ω/km
Insulation resistance	Min. 10 MΩ/km	Min. 10 MΩ/km	Min. 10 MΩ/km	Min. 10 MΩ/km	Min. 10 MΩ/km	Min. 10 MΩ/km	Min. 10 MΩ/km
Flexibility	Flexible ¹⁾	Flexible ¹⁾	Flexible ¹⁾	Flexible ¹⁾	Flexible ¹⁾	Flexible ¹⁾	Flexible ¹⁾
Flex radius	Greater than or equal to 15 x cable diameter	Greater than or equal to 15 x cable diameter	Greater than or equal to 15 x cable diameter	Greater than or equal to 15 x cable diameter	Greater than or equal to 15 x cable diameter	Greater than or equal to 15 x cable diameter	Greater than or equal to 15 x cable diameter

¹⁾ Conditional use in drag chain installations



Model number	Length A
5CASDL.0018-03	1,800 ± 20 mm
5CASDL.0050-03	5,000 ± 45 mm
5CASDL.0100-03	10,000 ± 90 mm
5CASDL.0150-03	15,000 ± 135 mm
5CASDL.0200-03	20,000 ± 180 mm
5CASDL.0250-03	25,000 ± 230 mm
5CASDL.0300-03	30,000 ± 280 mm

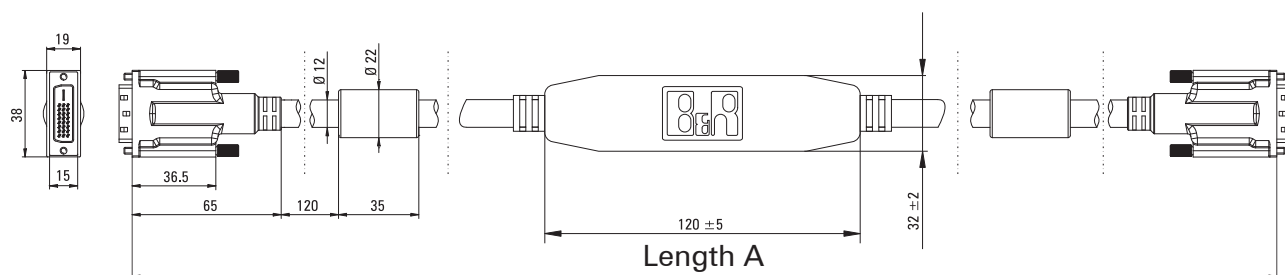
All dimensions in mm

SDL flex cable with extender



	5CASDL.0300-13	5CASDL.0400-13	5CASDL.0430-13
Length	30m ± 280 mm	40 m ± 380 mm	43 m ± 380 mm
Outer diameter	Max. 12 mm ± 0.5 mm	Max. 12 mm ± 0.5 mm	Max. 12 mm ± 0.5 mm
Shielding	Individual cable pairs, and entire cable	Individual cable pairs, and entire cable	Individual cable pairs, and entire cable
Connector type	2x DVI-D (24+1), male	2x DVI-D (24+1), male	2x DVI-D (24+1), male
Wire cross section	24 AWG	24 AWG	24 AWG
Wave impedance	Max. 110 Ω/km	Max. 110 Ω/km	Max. 110 Ω/km
Insulation resistance	Min. 200 MΩ/km	Min. 200 MΩ/km	Min. 200 MΩ/km
Flexibility	Flexible ¹⁾	Flexible ¹⁾	Flexible ¹⁾
Flex radius	Greater than or equal to 15 x cable diameter	Greater than or equal to 15 x cable diameter	Greater than or equal to 15 x cable diameter

¹⁾ Conditional use in drag chain installations



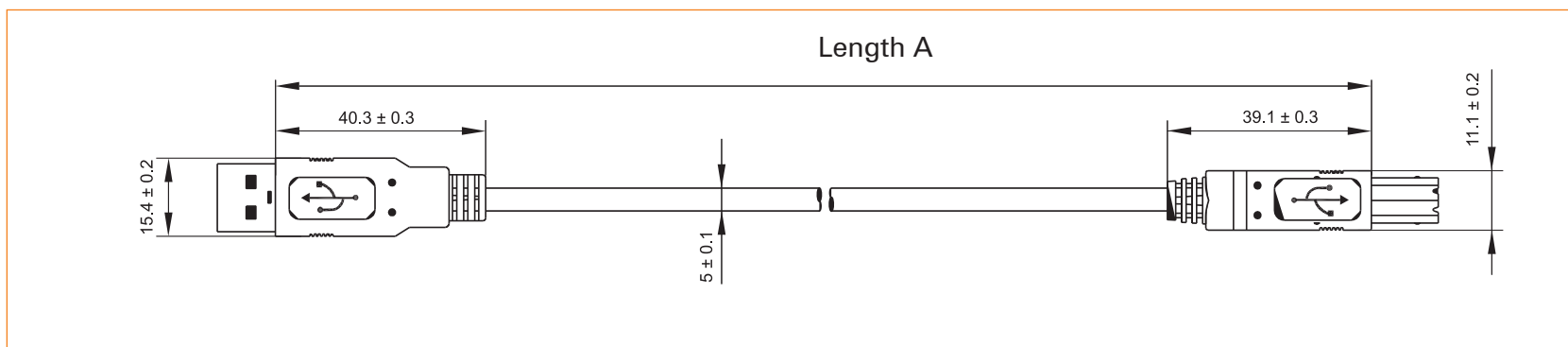
Model number	Length A
5CASDL.0300-13	30,000 ± 280 mm
5CASDL.0400-13	40,000 ± 380 mm
5CASDL.0430-13	43,000 ± 380 mm

All dimensions in mm

USB cable



	5CAUSB.0018-00	5CAUSB.0050-00
Length	1.8 m ± 30 mm	5 m ± 50 mm
Outer diameter	Max. 5 mm	Max. 5 mm
Shielding	Entire cable	Entire cable
Connector type	USB type A, male, and USB type B, male	USB type A, male, and USB type B, male
Wire cross section	AWG 24, 28	AWG 24, 28
Flexibility	Flexible	Flexible
Flex radius	Min. 100 mm	Min. 100 mm



Model number	Length A
5CAUSB.0018-00	1,800 ± 30 mm
5CAUSB.0050-00	5,000 ± 50 mm

All dimensions in mm

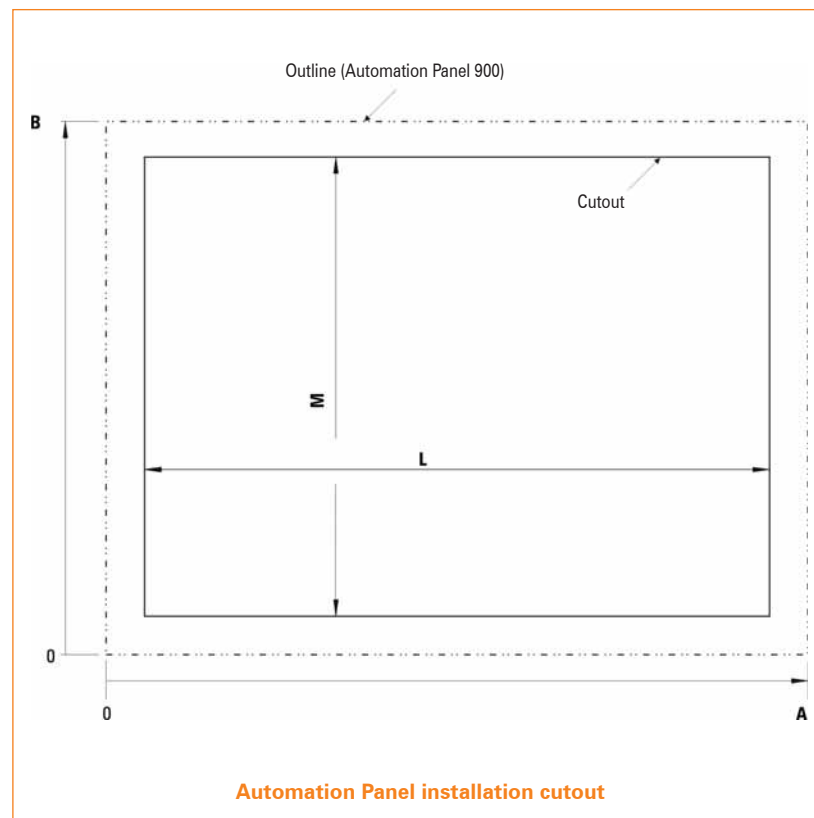
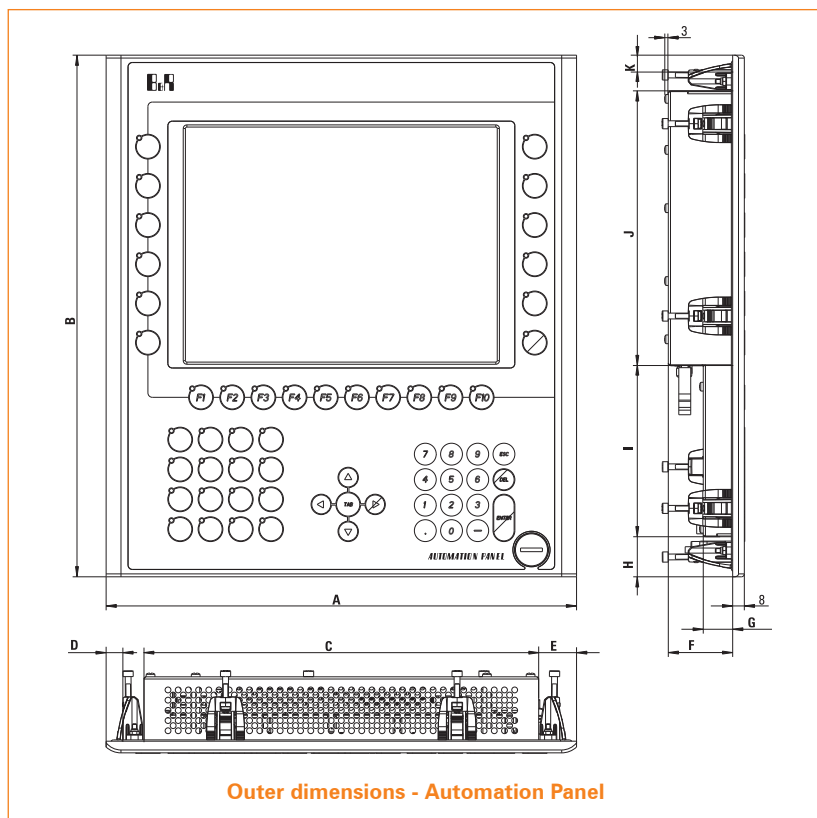
RS232 cable



	9A0014.02	9A0014.05	9A0014.10
Length	1.8 m ± 50 mm	5 m ± 80 mm	10 m ± 100 mm
Outer diameter	Max. 5 mm	Max. 5 mm	Max. 5 mm
Shielding	Entire cable	Entire cable	Entire cable
Connector type	9-pin DSUB, male / female	9-pin DSUB, male / female	9-pin DSUB, male / female
Wire cross section	AWG 26	AWG 26	AWG 26
Flexibility	Flexible	Flexible	Flexible
Flex radius	Min. 70 mm	Min. 70 mm	Min. 70 mm

All dimensions in mm

Dimensions - Automation Panel

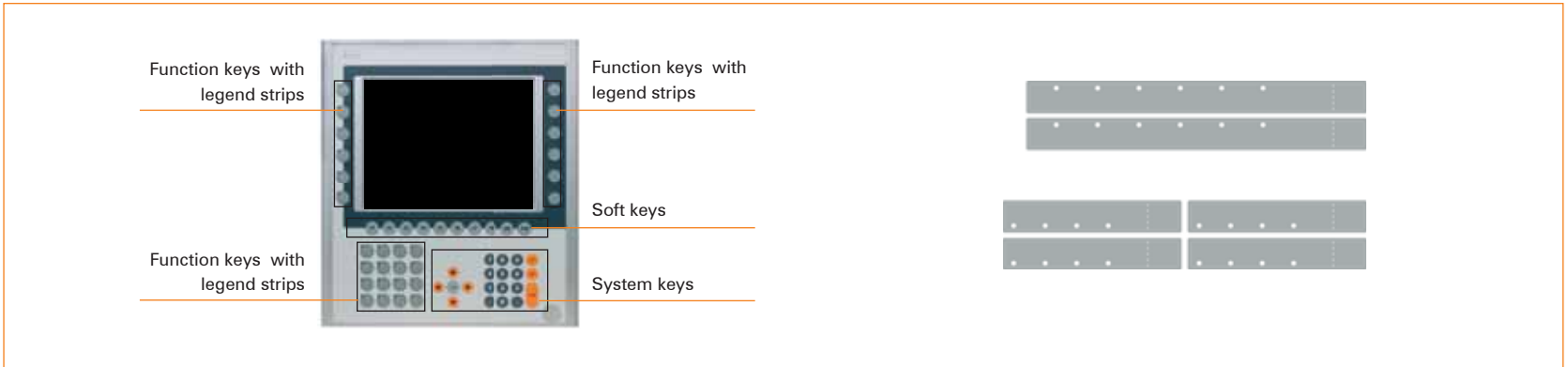


	Diagonal	A	B	C	D	E	F	G	H	I	J	K	L	M
5AP920.1043-01	10.4"	323	260	271	11.5	25.9	44.2	20.2	27.5	19.5	188.5	10	302	242
5AP980.1043-01	10.4"	323	260	271	11.5	25.9	44.2	20.2	27.5	19.5	188.5	10	302	242
5AP981.1043-01	10.4"	323	358	271	11.5	25.9	44.2	20.2	27.5	117.5	188.5	10	302	340
5AP982.1043-01	10.4"	423	288	371	11.5	25.9	44.2	20.2	27.5	47.5	188.5	10	402	270
5AP920.1214-01	12.1"	362	284	310	11.5	25.9	42.2	18.2	27.5	38	195	10	341	266
5AP920.1505-01	15"	435	330	382	11.5	26.5	42.7	18.7	25	78.5	201.5	10.5	414	311
5AP980.1505-01	15"	435	330	382	11.5	26.5	42.7	18.7	25	78.5	201.5	10.5	414	311
5AP981.1505-01	15"	435	430	382	11.5	26.5	42.2	18.2	25	178.5	201.5	10.5	414	411
5AP920.1706-01	17"	477	390	420.5	10	28	47.2	23.2	31	103.5	225	10	459	372
5AP920.1906-01	19"	527	421	472.5	10	27.5	50.7	26.7	29.5	109.5	251	10	509	403

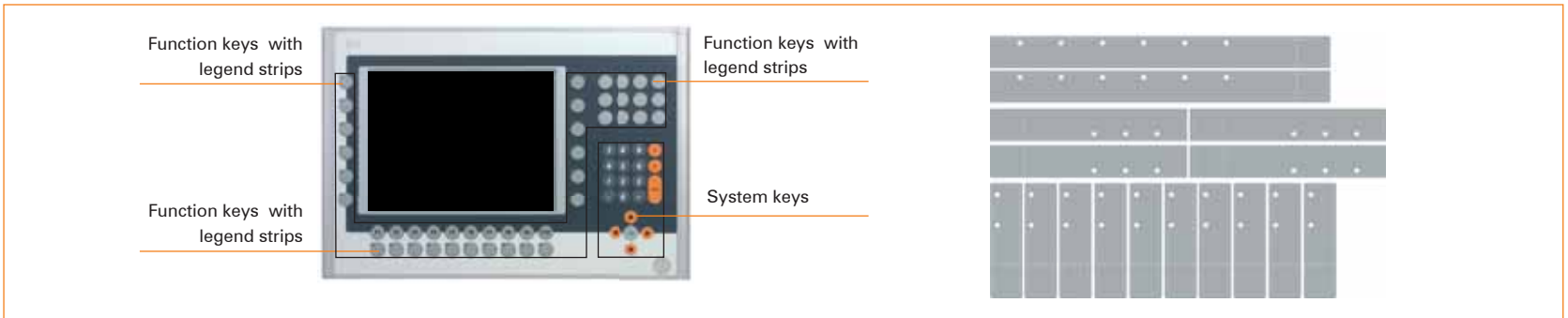
All dimensions in mm

Legend strips

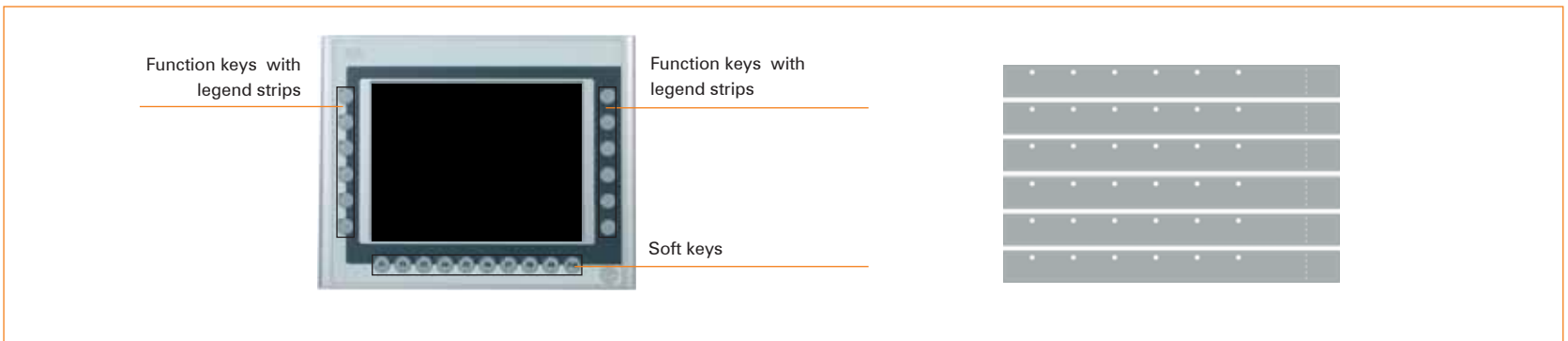
Model number	Short description
5AC900.104X-03	Legend strip template 10.4". For Automation Panel 5AP981.1043-01. For 1 device.



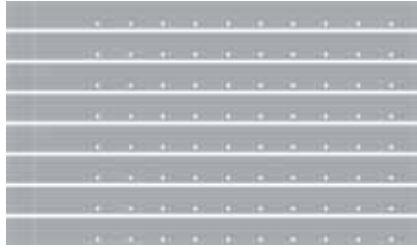
Model number	Short description
5AC900.104X-04	Legend strip template 10.4". For Automation Panel 5AP982.1043-01. For 1 device.



Model number	Short description
5AC900.104X-05	Legend strip template 10.4". For Automation Panel 5AP980.1043-01. For 3 devices.



Model number	Short description
5AC900.150X-01	Legend strip template 15.0". For Automation Panels 5AP951.1505-01 and 5AP981.1505-01. For Panel PC 5PC781.1505-00. For 4 devices.





PC software

In addition to an extensive array of industrial PCs and Power Panels, B&R also offers Windows operating systems and standard software such as OPC Server.



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Machine controllers are becoming more and more common with higher-level ERP systems, control systems, PC visualizations and office applications. To meet the respective industrial demands for quality, availability, and safety, B&R offers complete integrated solutions:

- Seamless integration of industrial PCs in controller networks
- Office operating systems on industrial PCs and Power Panel devices
- Transparent controller integration using Automation Objects for:
 - Remote maintenance and diagnostics
 - Connections to SCADA systems, OPC support (OLE for Process Control)
 - Integration in process control systems and simulations
 - PC-based visualization applications created with Visual Basic, C/C++, and more programming languages
- Use of existing infrastructure such as Ethernet and USB
- Remote desktop software for client/server configurations

PVI - Process Visualization Interface

PVI is used for transparent networking of controllers with different applications within a company. Process data is accessed uniformly using familiar technologies such as C++, VB or the programming languages from Visual Studio.NET, regardless of network protocols and media. This makes it easy to integrate most applications implemented on the Windows® operating system with the B&R controllers.

- Transparent Communication
- Modern visualization possibilities
- Communication interface based on C++, VB or .NET
- Independent of the transport medium

Model number ¹⁾	Description	
5S0500.02	PVI dongle for 3rd-party PC ²⁾ / parallel port	Cross-reference to Chapter 37 - page 1851
5S0500.02U	PVI dongle for 3rd-party PC ²⁾ / USB	
5S0500.99	PVI unlimited developer's license ³⁾	

1) PVI is part of Automation Studio™. Unlimited use without a license key is only possible with a B&R IPC/APC.

2) Licenses for PVI are included in B&R PCs (IPC/APC).

3) Customer licenses do not require hardware license (dongle).

OPC, OLE for Process Control, Automation Runtime for PCs



OPC, OLE for Process Control

OPC (www.opcfoundation.org) is an industry standard created by automation manufacturers in cooperation with Microsoft. This standard defines a common interface used by devices for communication in process control. The goal is to be able to use software for control and monitoring purposes, regardless of the hardware manufacturer. OPC is based on the OLE/COM/DCOM technologies from Microsoft. Two integral components of Automation Studio software include an OPC server and a configuration tool. Examples which allow OPC to be used quickly are also included.

- Cross reference to Chapter 37 - Page 1852 (Automation Studio and OPC)

Automation Runtime for PCs

B&R Automation Runtime for PCs and industrial PCs makes it possible to seamlessly scale applications to the highest performance classes.

Model number	B&R product group	Example configuration	Name Automation Runtime	PLC	Soft PLC	Simulation	Visualization	Web Server	CNC
1A4601.06	APC, x86 CPU	APC620 ...	AR 106	x			x	x	
1A4601.06-2	APC, x86 CPU	APC620 ...	AR 106 ARNC0	x			x	x	x
1A4600.10	APC/IPC, x86 CPU	PPC700, XP/E ...	AR 010 ¹⁾		x		x	x	
1A4600.20	Desktop PC, x86 CPU	PC, XP Professional ...	AR 010 ¹⁾ Desktop		x		x	x	
1A4600.20-2	Desktop PC, x86 CPU	PC, XP Professional ...	AR 010 ¹⁾ ARNC0/Desktop		x		x	x	x

1) AR 010 requires Windows XP Embedded or Professional.

Windows® operating systems

Windows® operating systems

With Windows® operating systems, B&R offers the standard of the PC world for controllers and visualization applications as well. These include Windows® XP Professional as well as the modular variants for embedded use, Windows® XP Embedded and Windows® CE .NET.

Model number	Short description
5SWWWXP0600-ENG	WinXP Professional SP3 CD, English
5SWWWXP0600-GER	WinXP Professional SP3 CD, German
5SWWWXP0600-MUL	WinXP Professional SP3 CD, Multi-language
9S0001.11-090	OEM MS Windows XP Embedded license, only supplied together with a B&R device.
5SWWWXP0413-ENG	OEM Microsoft Windows XP embedded FP2007 for APC620 X855GME, English.
5SWWWXP0416-ENG	OEM Microsoft Windows XP embedded FP2007 for PPC700 X855GME, English.
5SWWWXP0419-ENG	OEM Microsoft Windows XP embedded FP2007 for MP100 SCx200, English.
5SWWWXP0421-ENG	OEM Microsoft Windows XP embedded FP2007 for PP300 LX800, English.
5SWWWXP0423-ENG	OEM Microsoft Windows XP embedded FP2007 for PPC300 LX800, English.
5SWWWXP0426-ENG	OEM Microsoft Windows XP embedded FP2007 for APC810 B945GME
9S0001.29-020	OEM Microsoft Windows CE 5.0 Pro license, only supplied together with a device.
9S0001.36-020	OEM Microsoft Windows CE 5.0 ProPlus license, only supplied together with a device.
5SWWWCE.0513-ENG	OEM Microsoft Windows CE 5.0 Pro for APC620 X855GME.
5SWWWCE.0516-ENG	OEM Microsoft Windows CE 5.0 Pro for PPC700 X855GME
5SWWWCE.0519-ENG	OEM Microsoft Windows CE 5.0 Pro for MP100 SCx200.
5SWWWCE.0521-ENG	OEM Microsoft Windows CE 5.0 Pro for PP300 LX800.
5SWWWCE.0523-ENG	OEM Microsoft Windows CE 5.0 Pro for PPC300 LX800.
5SWWWCE.0524-ENG	OEM Microsoft Windows CE 5.0 Pro for MP40 PXA270.
5SWWWCE.0525-ENG	OEM Microsoft Windows CE 5.0 Pro for MP50 PXA270.
5SWWWCE.0613-ENG	OEM Microsoft Windows CE 5.0 ProPlus for APC620 X855GME.
5SWWWCE.0616-ENG	OEM Microsoft Windows CE 5.0 ProPlus for PPC700 X855GME.
5SWWWCE.0619-ENG	OEM Microsoft Windows CE 5.0 ProPlus for MP100 SCx200.
5SWWWCE.0621-ENG	OEM Microsoft Windows CE 5.0 ProPlus for PP300 LX800.
5SWWWCE.0623-ENG	OEM Microsoft Windows CE 5.0 ProPlus for PPC300 LX800.
5SWWWCE.0624-ENG	OEM Microsoft Windows CE 5.0 ProPlus for MP40 PXA270.
5SWWWCE.0625-ENG	OEM Microsoft Windows CE 5.0 ProPlus for MP50 PXA270.
5SWWWCE.0724-ENG	OEM Microsoft Windows CE 5.0 ProTCAR (Terminal Client AR) for MP40 PXA270.
5SWWWCE.0725-ENG	OEM Microsoft Windows CE 5.0 ProTCAR (Terminal Client AR) for MP50 PXA270.
5SWWWCE.0821-ENG	OEM Microsoft Windows CE 6.0 Pro for PP300 LX800



Windows® XP Embedded

Windows® XP Embedded is the modular variant of Windows® XP Professional. It's used if XP applications require a smaller operating system size to run. Together with CompactFlash memory, Windows® XP Embedded makes it possible to use the Microsoft desktop operating system in rough environmental conditions. In addition to the familiar features included in Windows® XP Professional, Windows® XP Embedded has been improved with regard to dependability by adding a write filter for individual memory partitions. By protecting individual partitions such as the boot partition, the PC system can be started without any problems, even after an unexpected power failure. Preinstalled Compact Flash cards offered by B&R for industrial PCs and Power Panel devices make the transition to Windows® XP Embedded as easy as possible. In addition to Windows® XP Embedded, the standard Windows® XP Professional operating system is also available in both English and German. Unlike Windows® XP Embedded, however, this version must be activated by Microsoft.

Windows® XP Professional

Windows® XP Professional, the operating system used most in the office world, is also available for the field of automation. With the AR010 Soft PLC, controller tasks and Windows® applications can be linked together.

Windows XP embedded/ professional configuration

Model number ²⁾	Type	Target system	Preinstalled	Memory required on CF/ HD ¹⁾	Minimum amount of RAM
5SWWXP0413-ENG	Windows XP embedded FP2007	APC620 with CPU boards 5PC600.X855-00 5PC600.X855-01 5PC600.X855-02 5PC600.X855-03 5PC600.X855-04	Yes	250 MB	128 MB
5SWWXP0416-ENG	Windows XP embedded FP2007	PPC700 with CPU boards 5PC600.X855-00 5PC600.X855-01 5PC600.X855-02 5PC600.X855-03 5PC600.X855-04	Yes	250 MB	128 MB
5SWWXP0419-ENG	Windows XP embedded FP2007	MP100 SCx200	Yes	210 MB	128 MB
5SWWXP0421-ENG	Windows XP embedded FP2007	PP300 LX800	Yes	220 MB	128 MB
5SWWXP0423-ENG	Windows XP embedded FP2007	PPC300 LX800	Yes	220 MB	128 MB
5SWWXP0426-ENG	Windows XP embedded FP2007	APC810 with CPU boards 5PC800.B945-00 5PC800.B945-01 5PC800.B945-02 5PC800.B945-03 5PC800.B945-04	Yes	250 MB	128 MB
5SWWXP0600-ENG	WinXP Professional SP3 CD, English	APC620 PPC700 APC810	If desired	≤2.1 G	128 MB
5SWWXP0600-GER	WinXP Professional SP3 CD, German	APC620 PPC700 APC810	If desired	≤2.1 G	128 MB
5SWWXP0600-MUL	WinXP Professional SP3 CD, Multi-language	APC620 PPC700 APC810	If desired	≤2.1 G	128 MB

1) Data medium sold separately. The minimum size of the system partition is 488 MB.

2) Can only be ordered together with a corresponding B&R device.

Windows® operating systems

When it comes to low memory requirements and high performance in open systems, Windows® CE 5.0 and CE 6.0 is the right choice. B&R provides a standard image for Power Panel and Mobile Panel which provides numerous software tools and services while taking up just approx. 30 MB.

Windows® CE 5.0

- Internet Explorer 6.0 for Windows® CE - standard components
- Fonts for attractive text display
- TCP/IP for network and Internet communication
- Remote Desktop Protocol (RDP) for thin clients
- ActiveSync for synchronization with the PC
- Windows® Media Player application
- Compact Framework
- Network utilities
- VBScript
- JScript
- Viewers for Excel, Word, images, PDFs, PowerPoint (only in Windows CE 5.0 ProPlus)



Windows® CE 6.0

If you need more than the 32 processes (now 32000) or the maximum 32 MB (now 2 GB) memory per process that are possible in Windows CE 5.0, then Windows® CE 6.0 is just the right thing. B&R provides a standard image for Power Panel 300/400 which provides numerous software tools and services while taking up only approximately 30 MB.

- Internet Explorer 6.0 for Windows® CE - standard components
- Fonts for attractive text display
- TCP/IP for network and Internet communication
- Remote Desktop Protocol (RDP) for thin clients
- ActiveSync for synchronization with the PC
- Windows® Media Player application
- Compact Framework
- Network utilities
- VBScript
- JScript

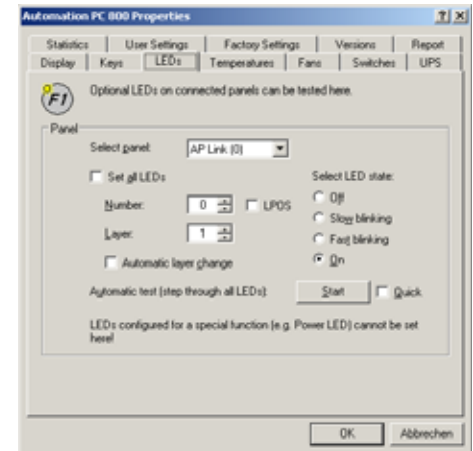
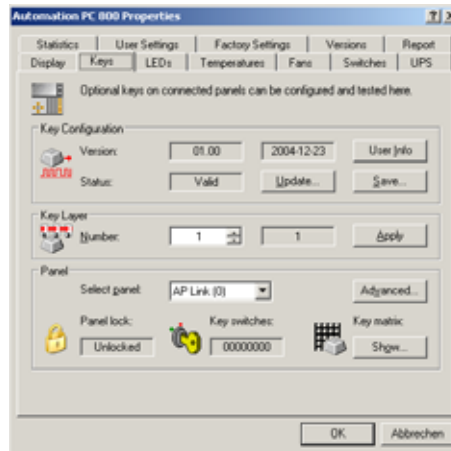
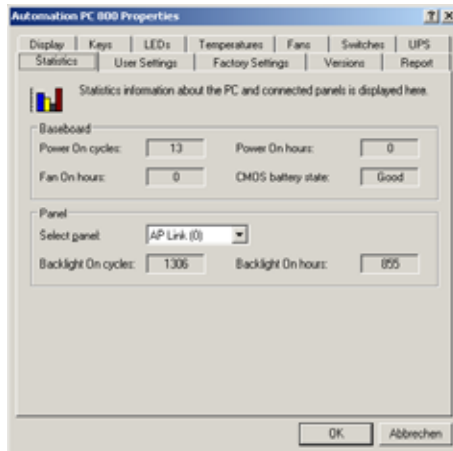
Windows CE configuration

Model number ²⁾	Type	Target system	Preinstalled	Memory required on CF/ HD ¹⁾	Minimum amount of RAM
5SWWCE.0513-ENG	Windows CE 5.0 Pro	APC620 with CPU boards 5PC600.X855-00 5PC600.X855-01 5PC600.X855-02 5PC600.X855-03 5PC600.X855-04	Yes	31 MB	128 MB
5SWWCE.0516-ENG	Windows CE 5.0 Pro	PPC700 with CPU boards 5PC600.X855-00 5PC600.X855-01 5PC600.X855-02 5PC600.X855-03 5PC600.X855-04	Yes	31 MB	128 MB
5SWWCE.0519-ENG	Windows CE 5.0 Pro	MP100 SCx200	Yes	26 MB	128 MB
5SWWCE.0521-ENG	Windows CE 5.0 Pro	PP300 LX800	Yes	26 MB	128 MB
5SWWCE.0523-ENG	Windows CE 5.0 Pro	PPC300 LX800	Yes	31 MB	128 MB
5SWWCE.0524-ENG	Windows CE 5.0 Pro	MP40 PXA270	Yes	26 MB	128 MB
5SWWCE.0525-ENG	Windows CE 5.0 Pro	MP50 PXA270	Yes	26 MB	128 MB
5SWWCE.0613-ENG	Windows CE 5.0 ProPlus	APC620 with CPU boards 5PC600.X855-00 5PC600.X855-01 5PC600.X855-02 5PC600.X855-03 5PC600.X855-04	Yes	33 MB	128 MB
5SWWCE.0616-ENG	Windows CE 5.0 ProPlus	PPC700 with CPU boards 5PC600.X855-00 5PC600.X855-01 5PC600.X855-02 5PC600.X855-03 5PC600.X855-04	Yes	33 MB	128 MB
5SWWCE.0619-ENG	Windows CE 5.0 ProPlus	MP100 SCx200	Yes	27 MB	128 MB
5SWWCE.0621-ENG	Windows CE 5.0 ProPlus	PP300 LX800	Yes	27 MB	128 MB
5SWWCE.0623-ENG	Windows CE 5.0 ProPlus	PPC300 LX800	Yes	33 MB	128 MB
5SWWCE.0624-ENG	Windows CE 5.0 ProPlus	MP40 PXA270	Yes	27 MB	128 MB
5SWWCE.0625-ENG	Windows CE 5.0 ProPlus	MP50 PXA270	Yes	27 MB	128 MB
5SWWCE.0724-ENG	Windows CE 5.0 ProTCAR (Terminal Client AR)	MP40 PXA270	Yes	27 MB	128 MB
5SWWCE.0725-ENG	Windows CE 5.0 ProTCAR (Terminal Client AR)	MP50 PXA270	Yes	27 MB	128 MB
5SWWCE.0821-ENG	Windows CE 6.0 Pro	PP300 LX800	Yes	26 MB	128 MB

1) Data medium sold separately. (Not for MP40/50 target systems.)

2) Can only be ordered together with a corresponding B&R device.

Windows® operating systems



ADI - Automation Device Interface

With ADI (Automation Device Interface), B&R provides a software component for all B&R-specific system interfaces. It is included in installed operating systems and can be downloaded for Windows XP from the homepage. All specific device data can be read and modified, for example:

- Reading the key matrix
- Changing the display brightness
- Switching LEDs on/off
- Reading temperature values
- Reading device data

This software component is available for the following devices:

- Automation PC 620
- Automation PC 810
- Panel PC 300
- Panel PC 700
- Power Panel 100
- Power Panel 300
- Mobile Panel 100, 200
- Mobile Panel 40/50
- APC add-on UPS built-in to APC620 and APC810
- Automation Panel 800 and 900 connected to an APC620, APC810 or Panel PC

ADI .NET SDK can be used to create applications with Microsoft Visual Studio 2005 that access ADI functions via a .NET Class Library. The programming languages Visual Basic .NET, Visual C++, Visual C# and Visual J# are supported. The ADI Development Kit can be used to create applications with Microsoft Visual C++ 6.0, Microsoft Visual Basic 6.0 and Microsoft eMbedded Visual C++ 4.0. Both development packages can be downloaded from the homepage.

To provide fast access for the user, the B&R Control Center can be activated on the PC. It displays a clearly designed window on the screen showing all information.

Thin client software



Operation and observation on distributed stations

Thin clients are the perfect solution when you want to alternate between using different operating units. B&R Power Panel 300 devices equipped with Windows CE® operating systems are the best suited platform for handling this type of work. The Thin Clients act as pure input/output units. The applications are executed on the server. The clients themselves are networked with Ethernet TCP/IP in a cost-effective manner.

Power Panel 300 as Thin Client

The Power Panel 300 is perfect for use as a thin client due to its nearly maintenance-free construction with no rotating parts, its CompactFlash memory, and the many different display types (up to 15" XGA TFT). While other systems require an expensive operating system on the server for similar solutions, the Windows® XP Professional operating system is quite sufficient for this B&R solution.

Remote Desktop Protocol

The convenient B&R configuration package is able to generate industrially useful solutions for both clients and servers from the "Remote Desktop Protocol" standard service. Entering passwords on the clients is not necessary. This is because the preferred client automatically connects to the server upon system startup. The inactive clients display a simple login screen. The application can then be pulled up on the screen using the mouse or keyboard.

USB drives on the thin client

If a drive is connected to the client (e.g. a USB flash drive), it is made available to the entire network over Ethernet. The server can also access this remote drive, making it much easier to change or replace machine parameters.

Model number ¹⁾	Description
5SWOSU.0000-EN	Thin client – client software, for Windows CE 4.1/ 4.2 and 6.0, English.
5SWOSU.0001-EN	Thin client – client software, for Windows XP Pro / Embedded, English.

1) Only the license sticker is included in delivery. Software is installed together with the necessary operating system when the device is assembled.

Drivers and Utilities DVD



Drivers and Utilities DVD

The Drivers and Utilities DVD contains all of the necessary drivers and documentation for the following:

- Power Panel
- Provit industrial PCs
- Automation PC
- Display units
- UPS
- Embedded operating systems
- Mobile Panel
- Panel PC

The following are also included on the DVD:

- Updates and drivers for industrial PCs
- BIOS updates
- Graphics drivers
- Network driver
- Touch screen drivers
- ADI development kit
- CF life span calculator – (Silicon System)
- Manuals
- Legend strip templates
- MCAD templates

MTC libraries:

- Operating keypads and LEDs on display units
- System monitoring (temperatures, alarms)
- Event counters (power-on cycles, operating times, overtemperature hours)

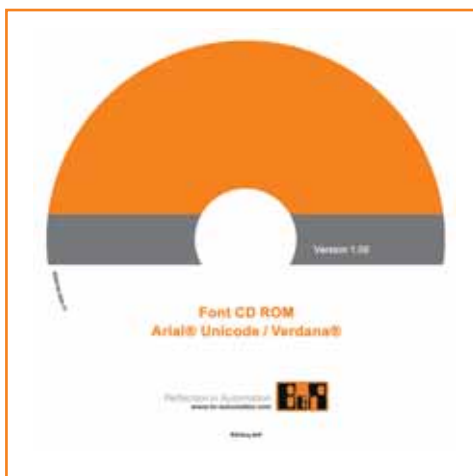
MKEY utilities:

- Easy key configuration on display units
- Configuration of specific functions such as changing brightness settings
- Key and project wizards

Support files for embedded operating systems:

- Windows® CE utilities
- Software development kit (SDK) for developing applications for Windows® CE
- Target Designer export files for Windows® XP Embedded
- Thin client software

Model number	Name
5SWHMI.0000-00	Drivers and Utilities DVD



Model number	Short description
5SWUTI.0000-00	OEM Nero CD-RW software. Only available with a CD-RW drive.
5SWFON.0000-00	B&R Unicode font CD Andale/ Thorndale
5SWFON.0001-00	B&R Unicode font Andale/ Thorndale license. Only available with a new PC or Power Panel.
5SWFON.0000-10	B&R Unicode font CD Arial/ Verdana
5SWFON.0001-10	B&R Unicode font Arial / Verdana license. Only available with a new PC or Power Panel.
5SWFON.0000-20	B&R Unicode Font CD Arial WGL
5SWFON.0001-20	B&R Unicode Font Arial WGL license. Only available with a new PC or Power Panel.



Accessories

Terminals, infrastructure components,
memory, batteries, cables, etc.

Table of contents

Product overview	 1126
Product data sheets	 1130

Product overview

Terminal blocks



Model number	Short description	
0TB3102-7011	Accessory terminal block, 2-pin, A coded, screw clamp, 6 mm ²	1130
0TB3102-7012	Accessory terminal block, 2-pin, B coded, screw clamp, 6 mm ²	1130
0TB103.8	Connector, 24 VDC, 3-pin male, screw clamp, 3.31 mm ² , protected against vibration by the screw flange	1131
0TB103.9	Connector, 24 VDC, 3-pin female, screw clamp, 3.31 mm ² , protected against vibration by the screw flange	1131
0TB103.91	Connector, 24 VDC, 3-pin female, cage clamp, 3.31 mm ² , protected against vibration by the screw flange	1131
0TB3103-7020	Accessory terminal block, 3-pin, screw clamp 6 mm ²	1132
0TB3104-7011	Accessory terminal block, 4-pin, A coded, screw clamp, 6 mm ²	1133
0TB3104-7012	Accessory terminal block, 4-pin, B coded, screw clamp, 6 mm ²	1133
0TB704.9	Accessory terminal block, 4-pin, screw clamp, 1.5 mm ²	1134
0TB704.91	Accessory terminal block, 4-pin, cage clamp, 2.5 mm ²	1134
0TB2105.9010	Accessory terminal block, 5-pin, screw clamp, 1.5 mm ²	1135
0TB2105.9110	Accessory terminal block, 5-pin, cage clamp, 2.5 mm ²	1135
0TB708.91	Accessory terminal block, 8-pin, cage clamp, 1.5 mm ²	1136
0TB1108.8110	Accessory terminal block, 8-pin, cage clamp, 1.5 mm ² , protected against vibration by the screw flange	1136
0TB710.91	Accessory terminal block, 10-pin, cage clamp, 1.5 mm ²	1137
0TB1111.8010	Accessory terminal block, 10-pin, screw clamp, 1.5 mm ² , protected against vibration by the screw flange	1138
0TB1111.8110	Accessory terminal block, 10-pin, cage clamp, 1.5 mm ² , protected against vibration by the screw flange	1138
7TB710.9	Accessory terminal block, 10-pin, screw clamp, 1.5 mm ²	1139
7TB710.91	Accessory terminal block, 10-pin, cage clamp, 2.5 mm ²	1139
0TB1111.8010	Accessory terminal block, 11-pin, screw clamp, 1.5 mm ² , protected against vibration by the screw flange	1140
0TB1111.8110	Accessory terminal block, 11-pin, cage clamp, 1.5 mm ² , protected against vibration by the screw flange	1140
7TB712.9	Accessory terminal block, 12-pin, screw clamp, 1.5 mm ²	1141
7TB712.91	Accessory terminal block, 12-pin, cage clamp, 1.5 mm ²	1141
7TB718.9	Accessory terminal block, 18-pin, screw clamp, 1.5 mm ²	1142
7TB718.91	Accessory terminal block, 18-pin, cage clamp, 1.5 mm ²	1142

Infrastructure components



Model number	Short description	
0AC401.9	Encoder 5 V - 24 V, converter for 5 V encoders (abs. or incr.)	1144
0AC808.9	8x industrial hub (Layer 2), 24 VDC, 10/100 MBit/s with auto-sensing, MDIX switch for channel 1	1143
0AC912.9	Bus adapter, CAN, 1 CAN interface	1146
0AC913.92	Bus adapter, CAN, 2 CAN interfaces, including 30 cm attachment cable (DSUB connector)	1146
0AC913.93	Bus adapter, CAN, 2 CAN interfaces, including 30 cm attachment cable (TB704)	1146
0G1000.00-090	Bus connector, RS485, for Profibus networks	1144
7AC911.9	Bus connector, CAN bus	1144
ECINT1-1	RS232/RS485 interface converter, electrically isolated, for coupling RS232 interface modules to an RS485 twisted pair bus, without lightning protection	1145
ECINT1-11	RS232/RS485 interface converter, electrically isolated, for coupling RS232 interface modules to an RS485 twisted pair bus, with lightning protection	1145

CompactFlash



Model number	Short description
5CFCRD.0064-03	CompactFlash 64 MB ATA/IDE SiliconSystems
5CFCRD.0128-03	CompactFlash 128 MB ATA/IDE SiliconSystems
5CFCRD.0256-03	CompactFlash 256 MB ATA/IDE SiliconSystems
5CFCRD.0512-03	CompactFlash 512 MB ATA/IDE SiliconSystems
5CFCRD.1024-03	CompactFlash 1024 MB ATA/IDE SiliconSystems
5CFCRD.2048-03	CompactFlash 2048 MB ATA/IDE SiliconSystems
5CFCRD.4096-03	CompactFlash 4096 MB ATA/IDE SiliconSystems
5CFCRD.8192-03	CompactFlash 8192 MB ATA/IDE SiliconSystems

PC cards



Model number	Short description
0MC111.9-1	PC card, 2 MB FlashPROM
0MC112.9-1	PC card, 4 MB FlashPROM
0MC211.9	PC card, 2 MB SRAM
9A0015.99	CompactFlash adapter; for operating CompactFlash in a PC card slot

USB accessories



Model number	Short description	
5MD900.USB2-01	USB 2.0 drive combination; consists of DVD-RW/CD-RW, FDD, CompactFlash slot (type II), USB connection (type A front, type B back); 24 VDC; (screw clamp 0TB103.9 or cage clamp 0TB103.91)	1147
5A5003.03	Front cover for USB drive combination 5MD900.USB2-01	
5CAUSB.0018-00	USB 2.0 cable type A-B, 1.8 m	
5CAUSB.0050-00	USB 2.0 cable type A-B, 5 m	
5MMUSB.2048-00	USB 2.0 flash drive, 2048 MB	

PCI cards



Model number	Short description
5ACPCI.ETH1-01	PCI Ethernet card with 1x 10/100 MBit/s RJ45 network connection
5ACPCI.ETH3-01	PCI Ethernet card with 3x 10/100 MBit/s RJ45 network connections

Product overview

Cables

Model number	Short description	
0G0001.00-090	Cable PC <-> PLC/PW, RS232, online cable	
9A0017.01	Null modem cable RS232, 0.6 m, for connecting UPS and IPC	
9A0017.02	Null modem cable RS232, 1.8 m, for connecting UPS and IPC	
X20CA0E61.0002	EPL connection cable RJ45 to RJ45, 0.2 m	1148
X20CA0E61.0010	EPL connection cable RJ45 to RJ45, 1.0 m	1148
X20CA0E61.0020	EPL connection cable RJ45 to RJ45, 2.0 m	1148
X20CA0E61.0050	EPL connection cable RJ45 to RJ45, 5.0 m	1148
X20CA0E61.0100	EPL connection cable RJ45 to RJ45, 10.0 m	1148
X20CA0E61.0150	EPL connection cable RJ45 to RJ45, 15.0 m	1148
X20CA0E61.0500	EPL connection cable RJ45 to RJ45, 50.0 m	1148
X67CA0E41.0050	EPL attachment cable RJ45 to M12, 5.0 m	1148
X67CA0E41.0150	EPL attachment cable RJ45 to M12, 15.0 m	1148
X67CA0E41.0500	EPL attachment cable RJ45 to M12, 50.0 m	1148
X67CA0X99.1000	Cable for custom prefabrication, 100.0 m	

19" AT keyboard



Model number	Short description	
5E9600.01-010	AT keyboard, 19 inch, front mount installation, IP65 from front, German keyboard layout	1150
5E9600.01-020	AT keyboard, 19 inch, front mount installation, IP65 from front, US keyboard layout	1150

Batteries

Model number	Short description	
0AC200.9	Lithium batteries, 5 pcs., 3 V / 950 mAh, cylindrical battery	
0AC201.9	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell	

Miscellaneous

Model number	Short description	
0AC171.9	Glass tube fuses 5 x 20 mm, 20 pcs., 3.15 A T / 250 V	
0AC301.9	Accessory, 8x shielding clamp	1149
5AC900.1100-00	Touch screen pen (5x)	
9A0013.01	Pen for resistive touch screen	

Data sheets for product-specific accessories can be found in the sections for the respective product families.



Terminal blocks

The single row 2-pin terminal block 0TB3102 is used for making connections on an X20 energy measurement module.



Brief overview	0TB3102-7011	0TB3102-7012
Number of pins	2	2
Coding	A	B
Type of terminal	Screw clamps	Screw clamps
Distance between contacts	7.62 mm	7.62 mm
Contact resistance	≤4.5 mΩ	≤4.5 mΩ
Rated voltage	600 V	600 V
Rated current ¹⁾	31 A	31 A
Connection cross section		
AWG wire	22 - 10 AWG	22 - 10 AWG
Solid wire line	0.20 - 6.00 mm ²	0.20 - 6.00 mm ²
Fine wire line without wire tip sleeves	0.20 - 6.00 mm ²	0.20 - 6.00 mm ²
Fine wire line with wire tip sleeves	0.25 - 6.00 mm ²	0.25 - 6.00 mm ²
Wire tip sleeves with plastic covering	0.25 - 4.00 mm ²	0.25 - 4.00 mm ²
Cable type	Only copper wires (no aluminum wires!)	Only copper wires (no aluminum wires!)
Comment	Multi-function flange for secure, high-speed and tool-free locking Rated values according to UL	Multi-function flange for secure, high-speed and tool-free locking Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration!

The single row 3-pin terminal block TB103 is used to connect the supply voltage.



Brief overview	0TB103.8	0TB103.9	0TB103.91
Number of pins	3 (male)	3 (female)	3 (female)
Type of terminal	Screw clamps	Screw clamps	Cage clamps
Distance between contacts	5.08 mm	5.08 mm	5.08 mm
Contact resistance	≤5 mΩ	≤5 mΩ	≤5 mΩ
Rated voltage	300 V	300 V	300 V
Rated current ¹⁾	10 A / contact	10 A / contact	10 A / contact
Connection cross section			
AWG wire	22 - 12 AWG	26 - 12 AWG	26 - 12 AWG
Solid wire line	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²	0.20 - 2.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Protected against vibration by the screw flange Rated values according to UL	Protected against vibration by the screw flange Rated values according to UL	Protected against vibration by the screw flange Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

Terminal blocks

The single row, 3-pin terminal block 0TB3103 is used for making the connection to the X20 motor module MM4456 and other devices.



Brief overview	0TB3103-7020
Number of pins	3
Type of terminal	Screw clamps
Distance between contacts	7.62 mm
Contact resistance	$\leq 4.5 \text{ m}\Omega$
Rated voltage	600 V
Rated current ¹⁾	31 A
Connection cross section	
AWG wire	22 - 10 AWG
Solid wire line	0.20 - 6.00 mm ²
Fine wire line without wire tip sleeves	0.20 - 6.00 mm ²
Fine wire line with wire tip sleeves	0.25 - 6.00 mm ²
Wire tip sleeves with plastic covering	0.25 - 4.00 mm ²
Cable type	Only copper wires (no aluminum wires!)
Comment	Multi-function flange for secure, high-speed and tool-free locking Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration!

The single row 4-pin terminal block OTB3104 is used for making connections on an X20 energy measurement module.



Brief overview	OTB3104-7011	OTB3104-7012
Number of pins	4	4
Coding	A	B
Type of terminal	Screw clamps	Screw clamps
Distance between contacts	7.62 mm	7.62 mm
Contact resistance	$\leq 4.5 \text{ m}\Omega$	$\leq 4.5 \text{ m}\Omega$
Rated voltage	600 V	600 V
Rated current ¹⁾	31 A	31 A
Connection cross section		
AWG wire	22 - 10 AWG	22 - 10 AWG
Solid wire line	0.20 - 6.00 mm ²	0.20 - 6.00 mm ²
Fine wire line without wire tip sleeves	0.20 - 6.00 mm ²	0.20 - 6.00 mm ²
Fine wire line with wire tip sleeves	0.25 - 6.00 mm ²	0.25 - 6.00 mm ²
Wire tip sleeves with plastic covering	0.25 - 4.00 mm ²	0.25 - 4.00 mm ²
Cable type	Only copper wires (no aluminum wires!)	Only copper wires (no aluminum wires!)
Comment	Multi-function flange for secure, high-speed and tool-free locking Rated values according to UL	Multi-function flange for secure, high-speed and tool-free locking Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration!

Terminal blocks

The single-row 4-pin terminal block TB704 is used as the supply voltage terminal block and the connection terminal for fieldbuses.



Brief overview	0TB704.9	0TB704.91 ¹⁾
Number of pins	4	4
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	5.08 mm	5.08 mm
Contact resistance	≤5 mΩ	≤5 mΩ
Rated voltage	300 V	300 V
Rated current ²⁾	10 A / contact	10 A / contact
Connection cross section		
AWG wire	26 - 12 AWG	26 - 12 AWG
Solid wire line	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 2.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Rated values according to UL	Rated values according to UL

1) The cage clamp terminal blocks cannot be used side-by-side.

2) The respective limit data for the I/O modules must be taken into consideration.

The single row 5-pin terminal block TB2105 is also used as a connection terminal for fieldbuses.



Brief overview	0TB2105.9010	0TB2105.9110 ¹⁾
Number of pins	5	5
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	5.08 mm	5.08 mm
Contact resistance	≤5 mΩ	≤5 mΩ
Rated voltage	300 V	300 V
Rated current ²⁾	10 A / contact	10 A / contact
Connection cross section		
AWG wire	26 - 12 AWG	26 - 12 AWG
Solid wire line	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 2.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Rated values according to UL	Rated values according to UL

1) The cage clamp terminal blocks cannot be used side-by-side.

2) The respective limit data for the I/O modules must be taken into consideration.

Terminal blocks

The single-row 8-pin terminal block TB708 is used for making connections on various B&R modules.



Brief overview	0TB708.91	0TB1108.8110
Number of pins	8	8
Type of terminal	Cage clamps	Cage clamps
Distance between contacts	3.5 mm	3.5 mm
Contact resistance	≤4.2 mΩ	≤4.2 mΩ
Rated voltage	300 V	300 V
Rated current ¹⁾	10 A / contact	10 A / contact
Connection cross section		
AWG wire	26 - 14 AWG	26 - 14 AWG
Solid wire line	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.00 mm ²	0.20 - 1.00 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Mechanical removal aid, Rated values according to UL	Protected against vibration by the screw flange Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

The single row 10-pin terminal block OTB710 is used for making connections on an XV module.



Brief overview	OTB710.91
Number of pins	10
Type of terminal	Cage clamps
Distance between contacts	3.5 mm
Contact resistance	$\leq 4.2 \text{ m}\Omega$
Rated voltage	300 V
Rated current ¹⁾	10 A / contact
Connection cross section	
AWG wire	26 - 14 AWG
Solid wire line	0.20 - 1.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.00 mm ²
Cable type	Copper wires only (no aluminum wires!)
Comment	Mechanical removal aid, Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

Terminal blocks

The single row 10-pin terminal block TB1110 is used for making connections on various B&R I/O modules.



Brief overview	0TB1110.8010	0TB1110.8110
Number of pins	10	10
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	3.5 mm	3.5 mm
Contact resistance	≤4.2 mΩ	≤4.2 mΩ
Rated voltage	300 V	300 V
Rated current ¹⁾	10 A / contact	10 A / contact
Connection cross section		
AWG wire	28 - 14 AWG	26 - 14 AWG
Solid wire line	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.50 mm ²	0.20 - 1.00 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Protected against vibration by the screw flange Rated values according to UL	Protected against vibration by the screw flange Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

The single row 10-pin terminal block TB710 is used for making connections on various B&R I/O modules.



Brief overview	7TB710.9	7TB710.91
Number of pins	10	10
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	5.08 mm	5.08 mm
Contact resistance	$\leq 2 \text{ m}\Omega$	$\leq 5 \text{ m}\Omega$
Rated voltage	300 V	300 V
Rated current ¹⁾	10 A / contact	10 A / contact
Connection cross section		
AWG wire	24 - 12 AWG	26 - 12 AWG
Solid wire line	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line with wire tip sleeves	0.25 - 2.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.25 - 2.50 mm ²	0.20 - 1.50 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Rated values according to UL	Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

Terminal blocks

The single-row 11-pin terminal block TB1111 is used for making connections on various B&R modules.



Brief overview	0TB1111.8010	0TB1111.8110
Number of pins	11	11
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	3.5 mm	3.5 mm
Contact resistance	≤4.2 mΩ	≤4.2 mΩ
Rated voltage	300 V	300 V
Rated current ¹⁾	10 A / contact	10 A / contact
Connection cross section		
AWG wire	28 - 14 AWG	26 - 14 AWG
Solid wire line	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.50 mm ²	0.20 - 1.00 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Protected against vibration by the screw flange Rated values according to UL	Protected against vibration by the screw flange Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

The single row 12-pin terminal block TB712 is used for making connections on various B&R I/O modules. Removal is simplified by two ejection levers on the terminal block.



Brief overview	7TB712.9	7TB712.91
Number of pins	12	12
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	3.5 mm	3.5 mm
Contact resistance	≤4.2 mΩ	≤4.2 mΩ
Rated voltage	300 V	300 V
Rated current ¹⁾	10 A / contact	10 A / contact
Connection cross section		
AWG wire	28 - 14 AWG	26 - 14 AWG
Solid wire line	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.50 mm ²	0.20 - 1.00 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Mechanical removal aid Rated values according to UL	Mechanical removal aid Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

Terminal blocks

The single row 18-pin terminal block TB718 is used for making connections on various B&R I/O modules. Removal is simplified by two ejection levers on the terminal block.



Brief overview	7TB718.9	7TB718.91
Number of pins	18	18
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	3.5 mm	3.5 mm
Contact resistance	≤4.2 mΩ	≤4.2 mΩ
Rated voltage	300 V	300 V
Rated current ¹⁾	10 A / contact	10 A / contact
Connection cross section		
AWG wire	28 - 14 AWG	26 - 14 AWG
Solid wire line	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.50 mm ²	0.20 - 1.00 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Mechanical removal aid Rated values according to UL	Mechanical removal aid Rated values according to UL

¹⁾ The respective limit data for the I/O modules must be taken into consideration.

Ethernet hub AC808



The AC808 Ethernet hub is a standalone device that can be used universally as a Level 2 hub in standard Ethernet or POWERLINK networks. It is suitable for both 100 MBit/s (Fast Ethernet) and 10 MBit/s networks. The hub automatically recognizes the transfer speed for the channels. ¹⁾

The Ethernet connections are made using RJ45 connectors. The pin assignments can be crossed for the first channel using switches.

The hub can be installed horizontally or vertically on the mounting rail. It also has fastening possibilities on the sides for direct mounting.

Brief overview	0AC808.9
Type	8x industrial hub (Layer 2)
Interface	Ethernet 10/100 Base-T (ANSI/IEEE 802.3)
Cable length	Max. 100 m between two stations (segment length)
Transfer rate	10 or 100 MBit/s; 100 MBit/s used for devices with 10/100 MBit/s auto-negotiation ¹⁾
Port design	Shielded RJ45 ports
Power supply	24 VDC, max. 5.2 W, protection against reverse polarity
1) Note: If devices that use 10 MBit/s as well as 100 MBit/s are connected, then there is no communication between these devices. Devices with 10/100 MBit/s autonegotiation are always operated with 100 MBit/s on the hub.	
General information	0AC808.9
Status indicators	Network activity for each channel, Link/Collision for each channel, Supply voltage
Diagnostics	
Bus function	Yes, with status LED
Hub supply	Yes, with status LED
Certification	CE, C-UL-US, GOST-R
Mechanical characteristics	0AC808.9
Dimensions (W x H x D)	115 x 43 (51 with mounting rail) x 86 mm
Protection type	IP20
Installation	Mounting rail installation and mounting rail adapter included in delivery
Mounting orientation	Vertical or horizontal
Operating temperature	
Horizontal installation	0°C to +60°C
Vertical installation	0°C to +50°C
Storage temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Comment	Order 1 x TB704 terminal block separately

Required accessories		
0TB704.9	Accessory terminal block, 4-pin, screw clamp, 1.5 mm ²	1134
0TB704.91	Accessory terminal block, 4-pin, cage clamps, 2.5 mm ²	1134

Level converter Bus connectors

The adapter is used as a converter for 5 V encoders. The 5 V differential signals delivered by the encoder are converted to 24 V signals. Absolute and incremental encoders can be used.

Brief overview	0AC401.9
Power supply	24 VDC
Overvoltage protection	External fuse specified at 10 AT
Input frequency	100 kHz
Power consumption	Typ. 6.0 W @ 24 V, the encoder supply (+5 V) is loaded with 500 mA
General information	0AC401.9
Certification	CE, C-UL-US, GOST-R
Mechanical characteristics	0AC401.9
Dimensions (W x H x D)	77 x 112.5 x 58 mm
Protection type	IP20
Installation	DIN rail installation
Mounting orientation	Horizontal or vertical
Operating temperature	0°C to +55°C
Storage temperature	-20°C to +70°C
Relative humidity	0 - 95%, non-condensing

The RS485 bus connector is used to connect a controller to a Profibus network or an RS485 network. The terminating resistor is integrated in the bus connector. The terminating resistor can be turned on or off.



The AC911 bus connector is used to connect a controller to a CAN network. The terminating resistor is integrated in the bus connector. The terminating resistor can be turned on or off.

Brief overview	0G1000.00-090	7AC911.9
Interface	Profibus DP, RS485 network	-
Fieldbus Type	RS485	CAN
Design	9-pin DSUB plug	9-pin DSUB socket
Connection	For two bus lines using screw clamps	For two bus lines using screw clamps
Terminating resistor	Can be switched on	Can be switched on
Stress relief	Integrated	Integrated
Certification	CE, GOST-R	CE, GOST-R

Interface converters

ECINT1



The INT1 interface converter is used to convert RS232 interface signals to an RS485 signal level. It is used if:

- Data transfer over a long distance is required which cannot be bridged by an RS232 interface. The distance between two stations can be max. 5,000 m when using shielded RS485 cables.
- Electrical isolation is required for the interface.
- A PLC is to be connected to a network using an RS232 interface.

The INT1-11 interface converter is equipped with lightning protection.

Brief overview	ECINT1-1	ECINT1-11
Power supply	24 VDC, maximum 4.3 W, protection against reverse polarity	24 VDC, maximum 4.3 W, protection against reverse polarity
Overvoltage protection	Yes	Yes
Maximum transfer rate	115.2 kBit/s	115.2 kBit/s
Cable length		
RS232	Max. 10 m	Max. 10 m
RS485	Max. 5,000 m	Max. 5,000 m
Operating modes	Point-to-point RS422 network RS485 network	Point-to-point RS422 network RS485 network
Terminating resistor	Can be switched on	Can be switched on
Lightning protection	-	Yes
General information	ECINT1-1	ECINT1-11
Status indicators	RS232 signal lines, RS485 active, supply voltage	RS232 signal lines, RS485 active, supply voltage
Diagnostics		
Interface function	Yes, with status LED	Yes, with status LED
Power supply	Yes, with status LED	Yes, with status LED
Certification	CE, GOST-R	CE, GOST-R
Mechanical characteristics	ECINT1-1	ECINT1-11
Dimensions (W x H x D)	100 x 73 x 114 mm	100 x 73 x 114 mm
Protection type	IP20	IP20
Installation	Mounting rail or back wall installation using M5 screws	Mounting rail or back wall installation using M5 screws
Mounting orientation	Any	Any
Operating temperature	0°C to +60°C	0°C to +60°C
Storage temperature	-20°C to +70°C	-20°C to +70°C
Relative humidity	0 - 95%, non-condensing	0 - 95%, non-condensing

Bus adapter CAN 1x, CAN 2x



Brief overview	0AC912.9	0AC913.92	0AC913.93
Bus adapter	CAN 1x	CAN 2x	CAN 2x
Connection to controller	Using 9-pin DSUB socket, connection made by customer	Using 30 cm cable with 9-pin DSUB housing	Using 30 cm cable with 4-pin plug
Networking	Using 9-pin terminal block	Using the 9-pin DSUB plug (C1) and the 9-pin DSUB socket (C2)	Using the 9-pin DSUB plug (C1) and the 9-pin DSUB socket (C2)
Terminating resistor	Can be switched on	Can be switched on	Can be switched on
Installation	DIN rail installation	DIN rail installation	DIN rail installation
Mounting orientation	Horizontal or vertical	Horizontal or vertical	Horizontal or vertical
Certification	CE, GOST-R	CE, GOST-R	CE, GOST-R

USB drive combination



General information		SMD900.USB2-01	
Transfer rate	Low speed (1.5 MBit/s), full speed (12 MBit/s), to high speed (480 MBit/s)		
Maximum cable length	5 m (without hub)		
CD/DVD formats	Read	Write	
	CD-ROM	CD-R/RW	
	CD-RW	DVD-R/RW	
	CD-R	DVD-RAM	
	CD-DA	DVD+R/RW	
	Photo CD (single/multi-session)	DVD+R (double layer)	
	Enhanced CD		
	DVD-ROM		
	DVD-R, +R		
	DVD-RW, +RW		
	DVD video		
	DVD RAM (4.7 GB, 2.6 GB)		
CD/DVD speed	CD: 24 x / DVD: 8 x	CD: 24 x / DVD: 8 x	
Floppy disk drive	1.44 MByte		
CompactFlash slot	Type II		
Interfaces	USB 2.0: front (type A), back (type B)		
Power supply	24 VDC ± 25%		
Environmental conditions		SMD900.USB2-01	
Ambient temperature			
Operation	+5°C to +45°C		
Storage	-20°C to +60°C		
Transport	-40°C to +65°C		
Relative humidity			
Operation	8 - 80%, non-condensing		
Storage	5 - 95%, non-condensing		
Transport	5 - 95%, non-condensing		
Mechanical characteristics		SMD900.USB2-01	
Protection type	IP65 front side (only with optional front cover), IP20 back side		
Dimensions (W x H x D)	156 x 52 x 140 mm		

Required accessories			
0TB103.9	Connector, 24 VDC, 3-pin female, screw clamps, 3.31 mm ² , protected against vibration by the screw flange		1131
0TB103.91	Connector, 24 VDC, 3-pin female, cage clamps, 3.31 mm ² , protected against vibration by the screw flange		1131
5A5003.03	Controller R-IDE front cover		
5CAUSB.0018-00	USB 2.0 cable type A-B, 1.8 m		
5CAUSB.0050-00	USB 2.0 cable type A-B, 5 m		
5SWUTI.0000-00	Nero CD-RW OEM software. Only available with a CD-RW drive.		

Ethernet POWERLINK cable

Ethernet POWERLINK cable
RJ45 to RJ45



Length	Connection cable Model number	Short description
0.2 m	X20CA0E61.0002	POWERLINK connection cable RJ45 to RJ45, 0.2 m
1.0 m	X20CA0E61.0010	POWERLINK connection cable RJ45 to RJ45, 1.0 m
2.0 m	X20CA0E61.0020	POWERLINK connection cable RJ45 to RJ45, 2.0 m
5.0 m	X20CA0E61.0050	POWERLINK connection cable RJ45 to RJ45, 5.0 m
10.0 m	X20CA0E61.0100	POWERLINK connection cable RJ45 to RJ45, 10.0 m
15.0 m	X20CA0E61.0150	POWERLINK connection cable RJ45 to RJ45, 15.0 m
50.0 m	X20CA0E61.0500	POWERLINK connection cable RJ45 to RJ45, 50.0 m

Ethernet POWERLINK cable
RJ45 to M12



Length	Attachment cable Model number	Short description
5 m	X67CA0E41.0050	POWERLINK attachment cable RJ45 to M12, 5.0 m
15 m	X67CA0E41.0150	POWERLINK attachment cable RJ45 to M12, 15.0 m
50 m	X67CA0E41.0500	POWERLINK attachment cable RJ45 to M12, 50.0 m

For detailed information and support: www.br-automation.com

8x shield terminal AC301



The AC301 8x connection shielding clamp is used for optimal cable shielding for analog signal lines, as well as for encoder and counter signals. The cable shields are screwed directly on the shield bracket. The required mounting materials are included in delivery.

Short description	0AC301.9
Number of cable shield clamps	8
Type of terminal	4 x screw clamps (sets of two)
Dimensions including shield clamps (W x H x D)	76 x 25 x 22 mm

19" AT keyboard



General information	5E9600.01-010	5E9600.01-020
Keyboard format	German	English
Installation	Front mount installation, 19" rack	Front mount installation, 19" rack
Connection	PS/2 plug	PS/2 plug
Environmental conditions	5E9600.01-010	5E9600.01-020
Ambient temperature		
Operation	0°C to +55°C	0°C to +55°C
Storage / Transport	-20°C to +60°C	-20°C to +60°C
Relative humidity	5 - 95%, non-condensing	5 - 95%, non-condensing
Mechanical characteristics	5E9600.01-010	5E9600.01-020
EN 60529 protection	IP65 (front side)	IP65 (front side)
Dimensions (W x H x D)	482.6 x 177 x 35 mm	482.6 x 177 x 35 mm





R

Rated current
The rated current is the effective value for the phase
the rated torque at the rated speed. This is possible
correct.

Rated power
The rated power is output by the motor when $n = nN$. This is
conditions are correct.

Rated torque
The nominal torque is output by the motor ($n = nN$) when the nominal
for any length of time if the environmental conditions are correct.

Real-time
A system is operating in real-time or has real-time capability, if the input signals
and processed in a defined time period, and the results are made available in
the system environment. See also 'Real-time Demands' and 'Real-time System'



Release delay

Delay time required until the holding torque of the holding brake is reduced to the operating voltage has been returned to the holding torque.

Reliability

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3IF792.9	635
3IF797.9-1	636

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4C1300.01-510	780
4D1165.00-490	784
4D1166.00-490	784
4D1167.00-490	784
4MP181.0843-03	886
4MP251.0571-12	887
4MP281.0571-12	887
4MP281.0843-13	888
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4MPCBX.0000-00	902
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4PP381.1043-31	841
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4PP452.0571-75	850
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4PP482.1043-75	857
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4PW035.E300-02	783
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4XP0000.00-K41	1025

5

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5AC600.HDDI-05	923
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5AC600.HS01-01	931
5AC600.HS01-02	931
5AC600.HS02-01	931
5AC600.HS02-02	931
5AC600.HS03-01	931
5AC600.ICOV-00	924
5AC600.SDL0-00	924
5AC600.SRAM-00	924
5AC600.UPSB-00	924
5AC600.UPSI-00	924
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5AC700.HS01-02	993
5AC800.150X-00	1074
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5AC800.CON2-00	1063
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5AC800.COV2-00	1063
5AC800.EXT1-00	1060
5AC800.EXT2-00	1061
5AC800.EXT2-01	1061
5AC800.EXT3-00	1061
5AC800.EXT3-01	1061
5AC800.EXT3-02	1062
5AC800.EXT3-03	1062
5AC800.EXT3-04	1062
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5AC801.ADAS-00	957
5AC801.DVDS-00	957
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5AC801.FA01-00	957
5AC801.FA02-00	957
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5AC801.HDDS-00	957
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5AC900.057X-00	868
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5AC900.1000-00	958
5AC900.104X-00	869
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5AC900.104X-02	870
5AC900.104X-03	1106
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5AC900.1100-00	674
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5ACPCI.ETH1-01	673
	1127
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5ACPCI.RAIC-03	923
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5AP820.1505-00	1065
5AP880.1505-00	1065
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5AP920.1043-K04	1042
5AP920.1214-01	1093
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5AP920.1505-K54	1046
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5AP920.1706-01	1096
5AP920.1906-01	1097
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5AP980.1214-K04	1050
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5AP981.1043-01	1091
5AP981.1505-01	1095
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5CADVI.0018-00	1098
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5CADVI.0100-00	1098
5CAMPB.0100-10	906
5CAMPB.0020-10	905
5CAMPB.0020-11	905
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5CAMPB.0018-30	904
5CAMPB.0050-10	904
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5CAMPH.0150-30	904
5CAMPH.0200-10	904
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5CAPWR.0018-20	1068
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5CASDL.0018-00	1101
5CASDL.0018-01	1099
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5CASDL.0250-00	1101
5CASDL.0250-03	1100
5CASDL.0250-20	1066
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5CASDL.0300-13	1102
5CASDL.0300-30	1067
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5CASDL.0400-30	1067
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5CAUPS.0030-00	924

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	1127
	1707
	1941
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	1103
	1127
	1707
	1941
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5CAX2X.0100-20	1070
5CAX2X.0150-20	1070
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5CAX2X.0300-20	1070
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5CFCRD.4096-03	672
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5CFCRD.8192-03	672
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5DLSDL.1000-00	1086
5DLSDL.1000-01	1086
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5E9000.29	1053
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5E9600.01-020	696
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5LS166.6	637
5LS172.6	638
5LS182.6-1	639
5LS187.6-1	640
5LS189.6-1	641
5LS197.6	642
5MD900.USB2-01	693
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5MMDDR.0512-01	961
5MMDDR.1024-00	931
5MMDDR.1024-01	961
5MMDDR.2048-01	961
5MMUSB.2048-00	673
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5MP040.0381-01	890
5MP040.0381-02	892
5MP050.0653-01	894
5MP050.0653-02	896
5MP050.0653-03	898
5MP050.0653-04	900
5MP181.0843-07	889
5PC310.L800-00	982
5PC310.L800-01	982

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5PC600.FA02-00	923
5PC600.FA03-00	923
5PC600.FA05-00	923
5PC600.SE00-00	926
5PC600.SE00-01	926
5PC600.SE00-02	926
5PC600.SF03-00	928
5PC600.SX01-00	927
5PC600.SX02-00	927
5PC600.SX02-01	927
5PC600.SX05-00	928
5PC600.SX05-01	928
5PC600.X855-00	930
5PC600.X855-01	930
5PC600.X855-02	930
5PC600.X855-03	931
5PC600.X855-04	931
5PC600.X855-05	931
5PC700.FA00-01	994
5PC700.FA02-00	994
5PC700.FA02-01	994
5PC720.1043-00	996
5PC720.1043-01	996
5PC720.1214-00	998
5PC720.1214-01	998
5PC720.1505-00	999
5PC720.1505-01	999
5PC720.1505-02	1000
5PC720.1706-00	1001
5PC720.1906-00	1001
5PC781.1043-00	997
5PC781.1505-00	1000
5PC782.1043-00	997
5PC800.B945-00	960
5PC800.B945-01	960
5PC800.B945-02	960
5PC800.B945-03	961
5PC800.B945-04	961
5PC810.BX01-00	957
5PC810.BX01-01	957
5PC810.BX02-00	957
5PC810.BX02-01	957
5PC810.BX05-00	957
5PC810.BX05-01	957

5PC810.FA01-00	957
5PC810.FA02-00	957
5PC810.FA05-00	957
5PC810.SX01-00	959
5PC810.SX02-00	959
5PC810.SX05-00	959
5PP320.0571-39	828
5PP320.0571-K14	1037
5PP320.0573-39	830
5PP320.0573-3B	830
5PP320.0653-K02	1036
5PP320.1043-39	831
5PP320.1043-K04	1038
5PP320.1043-K14	1039
5PP320.1214-39	832
5PP320.1505-39	833
5PP320.1505-K04	1040
5PP320.1505-K14	1041
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5SWFON.0000-20	1121
5SWFON.0001-00	1121
5SWFON.0001-10	1121
5SWFON.0001-20	1121
5SWHMI.0000-00	1120
5SWUTI.0000-00	1121
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5SWWCE.0516-ENG	1117
5SWWCE.0519-ENG	1117
5SWWCE.0521-ENG	1117
5SWWCE.0523-ENG	1117
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5SWWCE.0613-ENG	1117
5SWWCE.0616-ENG	1117
5SWWCE.0619-ENG	1117
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5SWWCE.0725-ENG	1117
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5SWWWXP0423-ENG	1115
5SWWWXP0426-ENG	1115
5SWWWXP0600-ENG	1115
5SWWWXP0600-GER	1115
5SWWWXP0600-MUL	1115

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7EC021.60-1	606
7EC021.61-2	606
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7XV108.50-51	576
7XV108.50-62	576
7XV116.50-11	577
7XV116.50-12	577
7XV116.50-51	577
7XV116.50-62	577
7XV124.50-11	578
7XV124.50-12	578
7XV124.50-51	578
7XV124.50-61	578
7XV124.50-62	578
7XX408.50-1	602
7XX410.50-1	592
7XX412.50-1	594
7XX415.50-K02	596
7XX426.50-1	598
7XX436.50-1	600

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80MPD1.300S000-01	1450
80MPD3.300S000-01	1451
80MPD5.300S000-01	1452
80MPH1.300S000-01	1453
80MPH3.300S000-01	1454
80MPH4.300S000-01	1455
80MPH4.500S000-01	1456
80MPH6.300S000-01	1457
80PS080X3.10-01	1242
80SD100XD.C044-01	1238
80SD100XD.C0XX-01	1234
80SD100XS.C04X-01	1240
80SD100XS.C0XX-01	1236
8AC110.60-2	1290
8AC114.60-2	1291
8AC120.60-1	1292
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8AC122.60-3	1296
8AC123.60-1	1298
8AC130.60-1	1300
8AC131.60-1	1303
8AC140.60-2	1306
8AC140.60-3	1306
8AC140.61-3	1306
8AC141.60-3	1310
8AC141.61-3	1310

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8B0C0160HC00.001-1	1376
8B0C0160HC00.A01-1	1380
8B0C0160HW00.000-1	1376
8B0C0160HW00.001-1	1376
8B0C0160HW00.A01-1	1380
8B0C0320HC00.000-1	1380
8B0C0320HC00.002-1	1380
8B0C0320HW00.000-1	1380
8B0C0320HW00.002-1	1380
8B0K1650HC00.000-1	1409
8B0K1650HW00.000-1	1409
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8B0M0040HF00.000-1	1366
8B0M0040HFF0.000-1	1366
8B0M0040HW00.000-1	1366
8B0M0050HC00.000-1	1366
8B0M0050HW00.000-1	1366
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8BAC0121.000-1	1413
8BAC0122.000-1	1414
8BAC0123.000-1	1416
8BAC0123.001-1	1418
8BAC0123.002-1	1420
8BAC0124.000-1	1422
8BAC0132.000-1	1424
8BCA0003.1111A-0	1431
8BCA0003.1311A-0	1432
8BCA0003.1511A-0	1433
8BCA0005.1111A-0	1431
8BCA0005.1311A-0	1432
8BCA0005.1511A-0	1433
8BCA01X5.1111A-0	1431
8BCA01X5.1311A-0	1432
8BCA01X5.1511A-0	1433
8BCE0005.1111A-0	1428
8BCE0007.1111A-0	1428
8BCE0010.1111A-0	1428
8BCE0015.1111A-0	1428
8BCE0020.1111A-0	1428
8BCE0025.1111A-0	1428
8BCM0005.1111A-0	1425

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8BCM0005.1312A-0	1426	8BVF0220H000.000-1	1362	8CM007.12-3	1315
8BCM0005.1523A-0	1427	8BVF0440H000.001-2	1362	8CM007.12-5	1316
8BCM0007.1111A-0	1425	8BVF0880H000.000-1	1362	8CM007.12-8	1317
8BCM0007.1312A-0	1426	8BVI0014HCD0.000-1	1389	8CM010.12-1	1314
8BCM0007.1523A-0	1427	8BVI0014HCS0.000-1	1384	8CM010.12-3	1315
8BCM0010.1111A-0	1425	8BVI0014HWD0.000-1	1389	8CM010.12-5	1316
8BCM0010.1312A-0	1426	8BVI0014HWS0.000-1	1384	8CM010.12-8	1317
8BCM0010.1523A-0	1427	8BVI0028HCD0.000-1	1389	8CM015.12-1	1314
8BCM0015.1111A-0	1425	8BVI0028HCS0.000-1	1384	8CM015.12-3	1315
8BCM0015.1312A-0	1426	8BVI0028HWD0.000-1	1389	8CM015.12-5	1316
8BCM0015.1523A-0	1427	8BVI0028HWS0.000-1	1384	8CM015.12-8	1317
8BCM0020.1111A-0	1425	8BVI0055HCD0.000-1	1389	8CM020.12-1	1314
8BCM0020.1312A-0	1426	8BVI0055HCS0.000-1	1384	8CM020.12-3	1315
8BCM0020.1523A-0	1427	8BVI0055HWD0.000-1	1389	8CM020.12-5	1316
8BCM0025.1111A-0	1425	8BVI0055HWS0.000-1	1384	8CM020.12-8	1317
8BCM0025.1312A-0	1426	8BVI0110HCS0.000-1	1384	8CM025.12-1	1314
8BCM0025.1523A-0	1427	8BVI0110HWS0.000-1	1384	8CM025.12-3	1315
8BCR0005.1111A-0	1429	8BVI0220HCS0.000-1	1394	8CM025.12-5	1316
8BCR0007.1111A-0	1429	8BVI0220HWS0.000-1	1394	8CM025.12-8	1317
8BCR0010.1111A-0	1429	8BVI0440HCS0.000-1	1394	8CR005.12-1	1319
8BCR0015.1111A-0	1429	8BVI0440HWS0.000-1	1394	8CR007.12-1	1319
8BCR0020.1111A-0	1429	8BVI0880HCS0.000-1	1399	8CR010.12-1	1319
8BCR0025.1111A-0	1429	8BVI0880HWS0.000-1	1399	8CR015.12-1	1319
8BCS0005.1111A-0	1430	8BVP0220HC00.000-1	1370	8CR020.12-1	1319
8BCS0007.1111A-0	1430	8BVP0220HW00.000-1	1370	8CR025.12-1	1319
8BCS0010.1111A-0	1430	8BVP0440HC00.000-1	1370	8JSA2	1604
8BCS0015.1111A-0	1430	8BVP0440HW00.000-1	1370	8JSA3	1610
8BCS0020.1111A-0	1430	8BVP0880HC00.000-1	1370	8JSA4	1616
8BCS0025.1111A-0	1430	8BVP0880HW00.000-1	1370	8JSA5	1622
8BPE0001.0000-00	1583	8BVR0220H000.100-1	1364	8JSA6	1628
	1643	8BVR0440H000.100-1	1364	8JSA7	1636
	1679	8BVR0880H000.100-1	1364	8LSA2	1486
8BPM0001.0000-00	1582	8BXF001.0000-00	1441	8LSA3	1494
	1642	8BXF002.0000-00	1441	8LSA4	1502
	1678	8CE005.12-1	1318	8LSA5	1510
8BPM0002.0000-00	1582	8CE007.12-1	1318	8LSA6	1518
	1642	8CE010.12-1	1318	8LSA7	1526
	1678	8CE015.12-1	1318	8LSA8	1532
8BPM0003.0000-00	1582	8CE020.12-1	1318	8LSC4	1546
	1642	8CE025.12-1	1318	8LSC5	1554
	1678	8CM005.12-1	1314	8LSC5A	1562
8BPR0001.0000-00	1583	8CM005.12-3	1315	8LSC5B	1562
	1643	8CM005.12-5	1316	8LSC5C	1562
8BVE0500HC00.000-1	1404	8CM005.12-8	1317	8LSC6	1568
8BVE0500HW00.000-1	1404	8CM007.12-1	1314	8LSC7	1576

8LTA9	1662
8LTJ9	1670
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8SCS001.0000-00	1440
8SCS002.0000-00	1440
8SCS003.0000-00	1440
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8SCS005.0000-00	1440
8SCS007.0000-00	1441
8SCS008.0000-00	1441
8TB2104.2010-00	1434
8TB2104.203F-00	1434
8TB2104.203L-00	1434
8TB2104.204A-00	1435
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8TB2108.2010-00	1435
8TB2112.2010-00	1436
8TB3102.201C-10	1436
8TB3104.201H-10	1436
8TB3104.201M-10	1437
8TB3104.204G-00	1437
8TB3104.204K-00	1437
8TB4103.203C-10	1438
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8TB4104.202N-10	1438
8TB4104.204G-00	1439
8TB4104.204G-10	1439
8TB4104.206D-10	1439
8V1010.001-2	1274
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8V1640.00-2	1286

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9A0014.02	1104
9A0014.05	1104
9A0014.10	1104
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9A0017.01	674
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9A0017.02	674
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9A0100.11	664
9A0100.12	666
9A0100.13	649
9A0100.14	666
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9A0100.16	666
9A0100.17	649
9S0001.11-090	1114
9S0001.29-020	1114
9S0001.36-020	1114

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ECINT1-11	691
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MA4SERV-0	1934
MA4SERV-E	1934
MAACP2-0	1935
MAACP2-E	1935
MAACPM-ENG	1935
MAACPM-GER	1935
MAAP800-ENG	1935
MAAP800-GER	1935
MAAP900-ENG	1935
MAAP900-GER	1935
MAAPC620-ENG	1935
MAAPC620-GER	1935
MAAPC680-ENG	1935
MAAPC680-GER	1935
MAAPC800-ENG	1935
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MACIO-ENG	1934
MACIO-GER	1934
MACIS-ENG	1934
MACIS-GER	1934
MACOGETST-ENG	1934
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MADNGETST-ENG	1934
MADNGETST-GER	1934
MAEI-ENG	1934
MAEI-GER	1934
MAEIGETST-ENG	1934
MAEIGETST-GER	1934
MAMB-ENG	1934
MAMB-GER	1934
MAMKEY-ENG	1935
MAMKEY-GER	1935
MAMOT1-0	1935
MAMOT1-E	1935

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MAMOT2-ENG	1935
MAMOT2-GER	1935
MAMP100.200-ENG	1935
MAMP100.200-GER	1935
MAMP40.50-ENG	1935
MAMP40.50-GER	1935
MAMPCBX-ENG	1935
MAMPCBX-GER	1935
MAPBGETST-ENG	1934
MAPBGETST-GER	1934
MAPLINK-0	1934
MAPLINK-E	1934
MAPP01-0	1934
MAPP01-E	1934
MAPP100.200-ENG	1935
MAPP100.200-GER	1935
MAPP300.400-ENG	1935
MAPP300.400-GER	1935
MAPP45-ENG	1934
MAPP45-GER	1934
MAPPC300-ENG	1935
MAPPC300-GER	1935
MAPPC700-ENG	1935
MAPPC700-GER	1935
MAPRV2000-ENG	1935
MAPRV2000-GER	1935
MAPRV5000-ENG	1935
MAPRV5000-GER	1935
MAPWC130-0E	1934
MAPWHW-0	1934
MAPWHW-E	1934
MAPWP127-0E	1934
MASAFETY1-ENG	1934
MASAFETY1-GER	1934
MASAFETY2-ENG	1934
MASAFETY2-GER	1934
MASAFETY-ENG	1934
MASAFETY-GER	1934
MASAFETYGUIDE-X	1935
MASYS22003-0	1934
MASYS22003-E	1934
MASYS22005-0	1934
MASYS22005-E	1934
MAUPS24VDC-ENG	1935
MAUPS24VDC-GER	1935

MAX20-ENG	1934
MAX20-GER	1934
MAX67-ENG	1934
MAX67-GER	1934
MM-D00516.267	1933
MM-D00523.276	1933
MM-D00525.278	1933
MM-D00525.279	1933
MM-D00536.309	1933
MM-D00537.314	1933
MM-D00537.315	1933
MM-D00540.318	1933
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MM-D00605.356	1933
MM-D00615.380	1933
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MM-D00740.580	1933
MM-E00443.232	1933
MM-E00516.268	1933
MM-E00523.277	1933
MM-E00530.291	1933
MM-E00530.292	1933
MM-E00536.310	1933
MM-E00536.311	1933
MM-E00537.315	1933
MM-E00540.319	1933
MM-E00540.325	1933
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MM-E00605.357	1933
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MM-E00735.558	1933
MM-E00740.581	1933

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TM140TRE.30-ENG	1927
TM140TRE.30-GER	1927
TM210TRE.30-ENG	1900
TM210TRE.30-GER	1900
TM211TRE.30-ENG	1900

TM211TRE.30-GER	1900
TM213TRE.00-ENG	1901
TM213TRE.00-GER	1901
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B&R was founded in 1979 by Erwin Bernecker and Josef Rainer. Since then it has become one of the largest privately owned automation companies in the world, employing more than 1700 people. A network of subsidiaries and international sales and support offices in more than 60 countries around the world guarantees global know-how at a local level. B&R customers are leaders in their respective industrial sectors. Flexible solutions and systems for individual automation projects greatly contribute to their companies' success. Continual innovation guarantees B&R customers the competitive edge. Since the company's founding, all innovations and investments have concentrated on one core area: solutions for industrial automation. As a privately owned company, all financial decisions are made independently of external investors or shareholders. This autonomy is the cornerstone for flexibility and dynamics – constant product innovations are the result.

Custom-made

Using standard components is not always the best approach. A demand for specialized solutions also exists. Willingness and ability to perform customer-oriented research and development has established B&R's position in the market. The developers at B&R work together with the customer in project teams to create custom-made solutions. This flexible and innovative approach for creating uncommon solutions is the foundation for expanding our customers' market lead. In addition to functional aspects, aesthetic design is becoming a decisive factor in all product segments as well. On request, we can manage the layout and design of operating and visualization units based on the customer's corporate design.

Support for series production

Not every machine manufacturing company has the possibility to program and extensively test all controllers for a complete production series. It isn't even necessary to assign personnel and important resources for this purpose. B&R provides just-in-time delivery of automation solutions that are completely programmed and tested, configured according to customer specifications for series production. This is done by excellently trained personnel using the most modern programming and testing systems. The customer just has to install the preconfigured components in the machine and test the entire system. This allows the customer to concentrate on the core area of expertise in machine manufacturing and achieve increased efficiency and freedom for innovation."

Solutions for all industries

Companies specializing in packaging, plastics, printing and paper, textiles, automobile, food and beverages, semiconductors, wood, metal and mining, pharmaceuticals, chemicals and building automation rely on B&R know-how. Our complete solutions help customers from all industries achieve a decisive competitive edge. Orientation towards applications in all areas of machine automation and process control technology builds the foundation that makes us a strong partner. We offer our customers a complete automation solution from one source: No unnecessary interfaces, maximum flexibility and the highest level of profitability.





Individual solutions for all industries

Outstanding solutions with distinctive technology and designs are becoming increasingly important in today's capital goods industry. In these cases, specially developed technical solutions for the application are required. A uniform appearance is also essential in representing the corporate identity. In the eyes of the user, this begins with the human-machine interface. In addition to an extensive range of standard products, B&R always offers the right automation solutions, ranging from freely configurable, customized user interfaces to specially developed electronic components and software.

Application programming

The programming required for machine controllers is constantly becoming more extensive. Machine manufacturing companies seldom have the resources needed to program and maintain software. Economics and the need to focus on the main area of expertise often make it impossible to establish these resources. B&R application experts and service partners can help. Together with the customer, specifications are made, the ideal system architecture is developed, the software is programmed and the system is tested. The customer can concentrate on making sure the application functions as desired. The well trained B&R specialists implement the application requirements and provide service for machine and system manufacturing companies all over the world throughout the entire product lifespan.

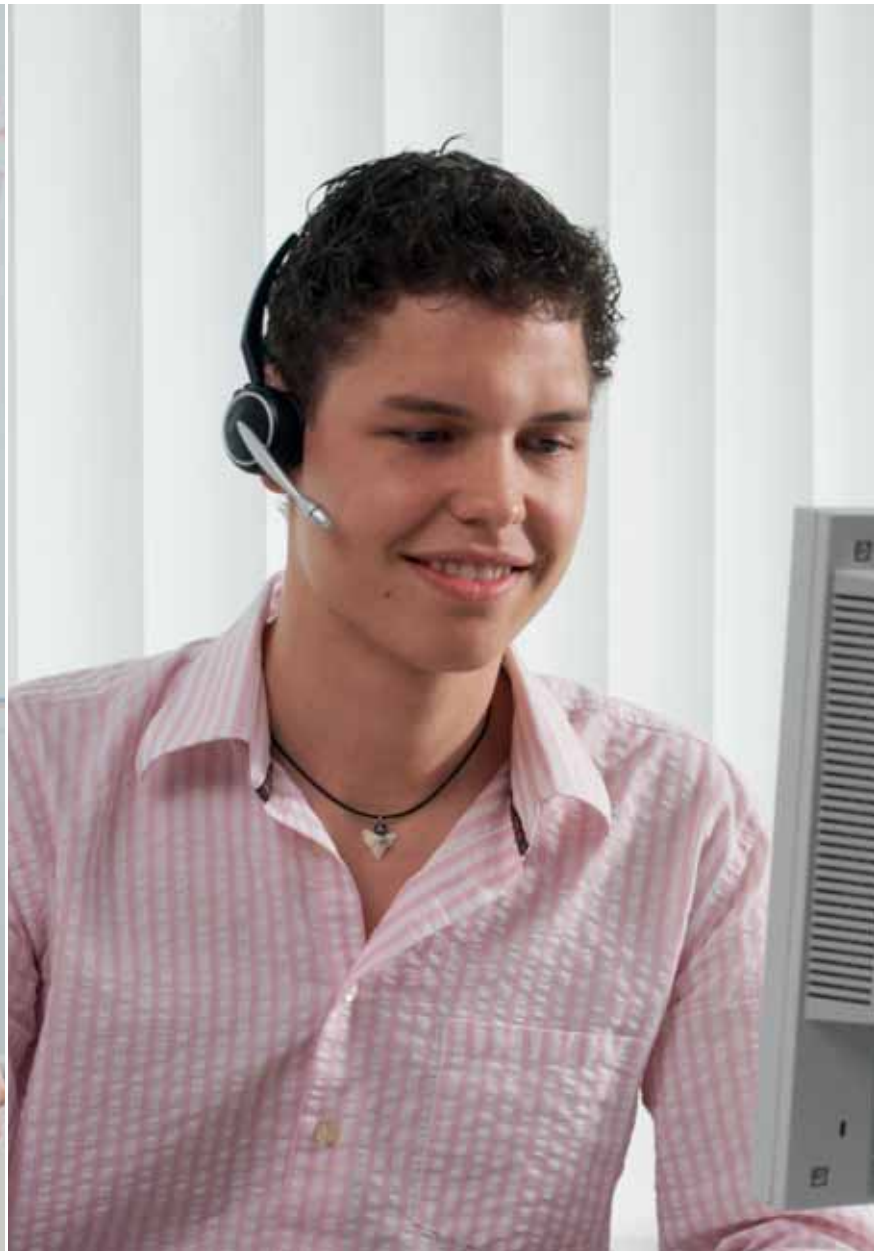
Seminars and training

Skilled employees are the foundation of a company's success. Continued training provides a competitive advantage. B&R offers an extensive seminar and training program at all locations and on-site at the customer's location. The B&R training calendar contains customized, compact training solutions ranging from introduction courses to special automation technology courses. Individual problems can be examined in clearly defined groups. Experienced trainers provide theoretical and practical information. Realistic exercises allow automation solutions to be created on modern systems. In addition to the standard program, company-specific trainings are also offered that match the tasks the participants will be carrying out in the future.

Hotline support

Quality not only refers to the product; it also refers to the support provided when implementing a product so that a task can be completed in the most ideal way possible. Question must be answered quickly, and any unclear situations must be cleared up fast to reach goals and meet deadlines. B&R customers receive hotline support for all products via email and telephone. Personal contact allows knowledgeable answers to be given and solutions to be worked out quickly. Skilled and experienced technicians work on the problem until a solution is found. They work closely with development and production to continually improve our products based on customer inquiries and prevent unclear situations in the future.





Understanding and supporting the customer

Every application is a challenge. Solving problems means being able to listen. Once contact has been made, qualified and comprehensively trained staff put themselves in the customer's frame of mind. Engagement with our customers doesn't end when the sale is finalized. To us, this period is just the start of a commitment that will last over the entire working relationship. Customer specialists for technical support, application engineering and training are available at all locations worldwide. The most modern software and infrastructure guarantee fast response times and access to information from the entire company. Easy availability, clearly assigned roles, keeping promises and personal commitment all guarantee the highest level of service quality worldwide.



Perfection in Automation

Innovative software
Sleek hardware
Real-time Ethernet



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Product overview

Control systems

Scalable from space-saving, cost-effective machine controllers to large systems with distributed intelligence. A wide range of I/O components and attachment modules always allow for the right connections.

X20 System - Slice-based I/O and control system	37
Power Panel - Integrated control, operation and visualization	787
Mobile Panel - More than just mobile operation and monitoring	873

Industrial PCs

Fully scalable industrial PC solutions for high-performance applications. Computing power, displays, operational elements, operating systems and interfaces can be optimized for the individual requirements.

Automation PC APC620 - Modular, fan-free industrial PCs	911
Automation PC APC810 - Highest-level performance with Intel® Core™ 2 Duo processors	945
Panel PC - Integrated operation and PC	985
PC Software - Operating system and software components	1109
Panel PC 300 - Makes any Automation Panel 900 into an embedded PC.	973

Visualization and operation

From two-line displays to high-resolution graphics with touch screen. The right HMI for every application.

Power Panel - Integrated control, operation and visualization	787
Mobile Panel - More than just mobile operation and monitoring	873
Automation PC APC620 - Modular, fan-free industrial PCs	911
Automation PC APC810 - Highest-level performance with Intel® Core™ 2 Duo processors	945
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Customized HMI systems	1013
Automation Panel - A new dimension in machine visualization	1055/1077
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Panel PC 300 - Makes any Automation Panel 900 into an embedded PC.	973

Motion control

Speed and precision to meet the highest demands with built-in technology functions for flexible operation. Safety functions and "Plug & Play" in the power transmission system allow for solutions that will set you in motion.

ACOPOSmicro - Compact drive system	1221
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ARNCO - Integrated CNC	1681

Remote I/O systems

Switching cabinets are becoming obsolete – flexible and configurable distributed I/O systems reduce wiring, increase stability and can be adapted to any environment.

X20 System - Slice-based I/O and control system	37
X67 System - Remote I/O with IP67 protection	419
Compact I/O System - Save space when connecting peripheral devices	581
XV valve connections - Economical usage of peripheral space	569

Integrated safety technology

Safety shut-offs do not always have to involve a full machine shutdown. Smart, safe reactions to various situations provide safety without always stopping the production process. Intelligent, decentralized and integrated safety technology that is simple to operate and that reaches extremely high reaction times opens up an entirely new range of machine safety concepts.

X20 System - Slice-based I/O and control system	37
Integrated Safety Technology - Decentralized and intelligent functional safety	537
SafeDESIGNER	1877

Programming and training

Automation Studio provides scalability, multi-platform capability, and the flexibility to meet all programming requirements. From the simplest machine to the most complex process, this single configuration and programming tool covers all tasks and system platforms. B&R also provides a modular training program that can be tailored to your needs.

Automation Studio	1805
SafeDESIGNER	1877
FieldbusDESIGNER	1887
Automation training	1893

Communication

Fieldbus and IT networks are standard components of automation solutions. With POWERLINK, a system-wide real-time network is available.

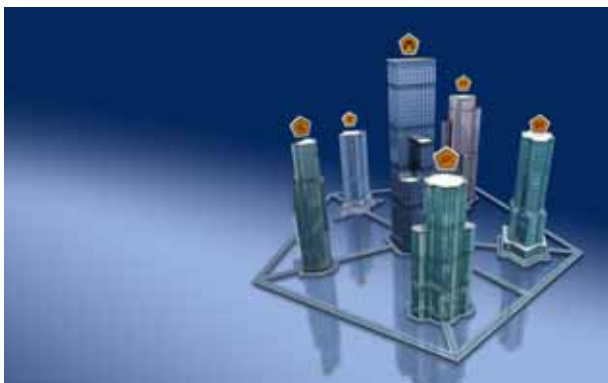
Flexible communication	611
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FieldbusDESIGNER	1887

Accessories, documentation

As system supplier for automation solutions, we cover the entire product spectrum - everything from configuration tool to terminal blocks.

Terminal blocks, cables, memory cards, etc.	1703
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News



Integrated automation for increased profitability

Complete machine automation using one intelligent tool to implement the entire automation system – this has long been the philosophy of the Austrian automation specialists at B&R. B&R recognized early that the market is not only searching for components such as controllers, visualization devices, industrial PCs and drive systems, an integral software tool is desired that covers all automation tasks. Total solutions provide enormous savings potential, which is recognized by many machine manufacturers as an important competitive edge.

Not only that, software needs to be flexible when it comes to machine configurations and options. Connecting ERP systems, E-CAD tools and automation tools enables the creation of individual machine software based on automated processes. With Automation Studio, B&R provides a single development environment for control, visualization, motion control, and communication tasks – in short, everything that has to do with automation.

In times when cost pressures continue to mount, it's extremely important for machine and systems manufacturers to concentrate on their main areas of expertise. By using a single comprehensive tool, machine manufacturers no longer have to spend vast amounts of money to implement interfaces between the controllers, drives, and visualization application.

All standardized IEC editors, a completely integrated ANSI C compiler and debugger, graphic configuration for I/O points and axes, and integrated configuration of machine visualization systems accompany the customer from the programming and commissioning phases all the way to production and service. Many advanced functions for temperature control, drive technology and fieldbus communication are already included in the standard Automation Studio package. Automation Studio users can now develop their automation projects faster and the open software design provides a system that can be integrated seamlessly into existing processes.

A network-wide real-time communication system is needed in addition to a software tool. With POWER-LINK, B&R has offered Ethernet-based real-time communication for the last five years. This technology has now established itself on the market. In the meantime, more than 40,000 series production machines have been set up and are being used in various industries. In addition to B&R, many leading automation manufacturers are relying on this open and pioneering technology.

Remaining true to the guiding principle "Perfection in Automation," B&R offers technologically advanced total solutions for hardware and software as well as knowledgeable customer-oriented support in all areas of automation. Total solutions offered by a single source provide considerable savings potential for customers throughout the entire lifespan of the machines and systems.



Positioning precision taken to new dimensions

For drives, efficient machine design and compact size are the basic principles for providing maximum flexibility.

The new 8LT series three-phase synchronous motors from B&R provide machine and system manufacturers with a compact solution for the most demanding applications. Excellent dynamic properties and positioning precision help users easily master even the most difficult tasks.

The permanently excited high-torque motors are available with self-cooled or externally-cooled options. The short, compact design of the motors can eliminate the need for angular gears in many cases. Thanks to the special design of the motor components, all motors are maintenance-free.

The supply voltage of the high-torque motors ranges from 400 to 480 VAC. With a rated power of 1.51 to 32.4 kW, the motors can be easily integrated in a wide range of applications. The motors have an especially high power rating with a stall torque of 50 to 408 Nm.

Embedded parameter chip for reliable identification

All torque motors are equipped with an embedded parameter chip, which guarantees seamless identification of all device data. Using the integrated chip, important information such as serial number, type, manufacturer data, etc. can be read and registered electronically. As a result, it isn't necessary to remove components for identification.



UL certification for ACOPOSmulti

The energy efficient B&R drive system ACOPOSmulti was awarded a UL certificate from the Underwriters Laboratories. In addition to meeting all criteria for a UL compliant construction, the drive distinguishes itself through an innovative energy concept and a high level of dependability. A fundamental entry requirement for the North American automation market, the UL certification serves as an important step for the international sales of B&R innovative technology.

A high level of efficiency and dependability allow ACOPOSmulti to meet the special demands of modern Motion Control products. Active power supply modules with Power Factor Correction and the ability for power regeneration ensure the most efficient energy usage while simultaneously protecting valuable resources.

News



Small, flexible, unique - ACOPOSmicro is setting the pace

Complex CNC applications are increasingly implementing stepper motor technology. In addition, more and more pneumatic systems are being replaced by electrical drives. ACOPOSmicro – an extremely compact drive for operating stepper and servo motors in the lower performance range – provides an innovative and impressive solution. ACOPOSmicro is an addition to the successful ACOPOS and ACOPOSmulti product range.

At only 63 mm wide, it saves space in the switching cabinet. An 80 VDC version is available in order to achieve higher torque at high speeds. The performance ranges between 50 W and 1 kW. POWERLINK and the X2X remote backplane are onboard as fieldbus interfaces.

A clever cooling design, like the one already used for ACOPOSmulti, provides advantages for the environment. Side and back wall mounting are possible. Cold plate mounting with oil or water cooling is available in addition to wall and feed-through mounting. This cooling design reduces costs by eliminating the need to carry out additional work for climate-control and the related service tasks.

Using standardized PLCopen motion control function blocks and CNC robotics libraries, all motor types supported by ACOPOSmicro can be controlled via B&R Automation Studio without problems.

ACOPOSmicro is often implemented in the semiconductor, packaging, textile and printing industries.



Unlimited flexibility for machine manufacturing

A new member has been introduced to the industrial PC generation from B&R. The product range has been expanded with the APC620 embedded. Windows XP embedded with real-time extension is the system platform used. Windows XP embedded offers advantages for applications with a minimal operating system size.

Intel processors from Celeron M to Pentium M 1.4 GHz provide requirement-oriented, scalable computing power. POWERLINK and CAN as well as the X2X remote backplane are onboard as fieldbus interfaces. The CPU has 256 KB of battery-buffered SRAM memory.

Like its big brothers, the APC620 has an integrated Smart Display Link that can be used to operate a remote line with four displays at distances up to 160 m.

The APC family is the most innovative industrial PC generation on the market. Fan-free, compact, scalable and economical – these are the key features that provide machine manufacturers the highest level of flexibility.



TÜV Certificate for B&R Integrated Safety Technology

The safety-related products from B&R have been certified by TÜV Rheinland for use in safety-oriented applications. In addition to meeting all specified safety criteria, B&R safety technology also has the major advantage of seamless integration in existing automation infrastructure. Flexible adjustment of the safety behavior to the requirements of the machine ensures optimum safety reactions. Safety technology integration

B&R safety products enable simple integration of safety technology in the functional application. Fixed wiring is replaced by safe data transfer via the existing machine bus system. Flexibly configured or programmed safety behavior adapts optimally to various situations. Complete diagnostics of safety components via the machine bus system provide detailed data about the status of the machine.

Safety cut-offs do not always have to involve shutting down the machine. When opening a protective cover, for example, it is often sufficient to reduce the speed. Smart, safe reactions to various situations provide safety without stopping the production process. This means that the machine does not have to be run without load or set up again, and manipulation is no longer necessary. This results in real advantages for the user that can be easily implemented with programmable safety behavior.

Rapid advancements in technology make it necessary to continually update the safety regulations. Adapting safety products to the current regulations in the area of safety technology has the highest priority at B&R. The safety-related products SafeDESIGNER, SafeLOGIC, X20 SafeIO and POWERLINK Safety fulfill ISO 13849 (PL e) IEC 62061 (SIL 3) and IEC 61508 (SIL 3) standards.

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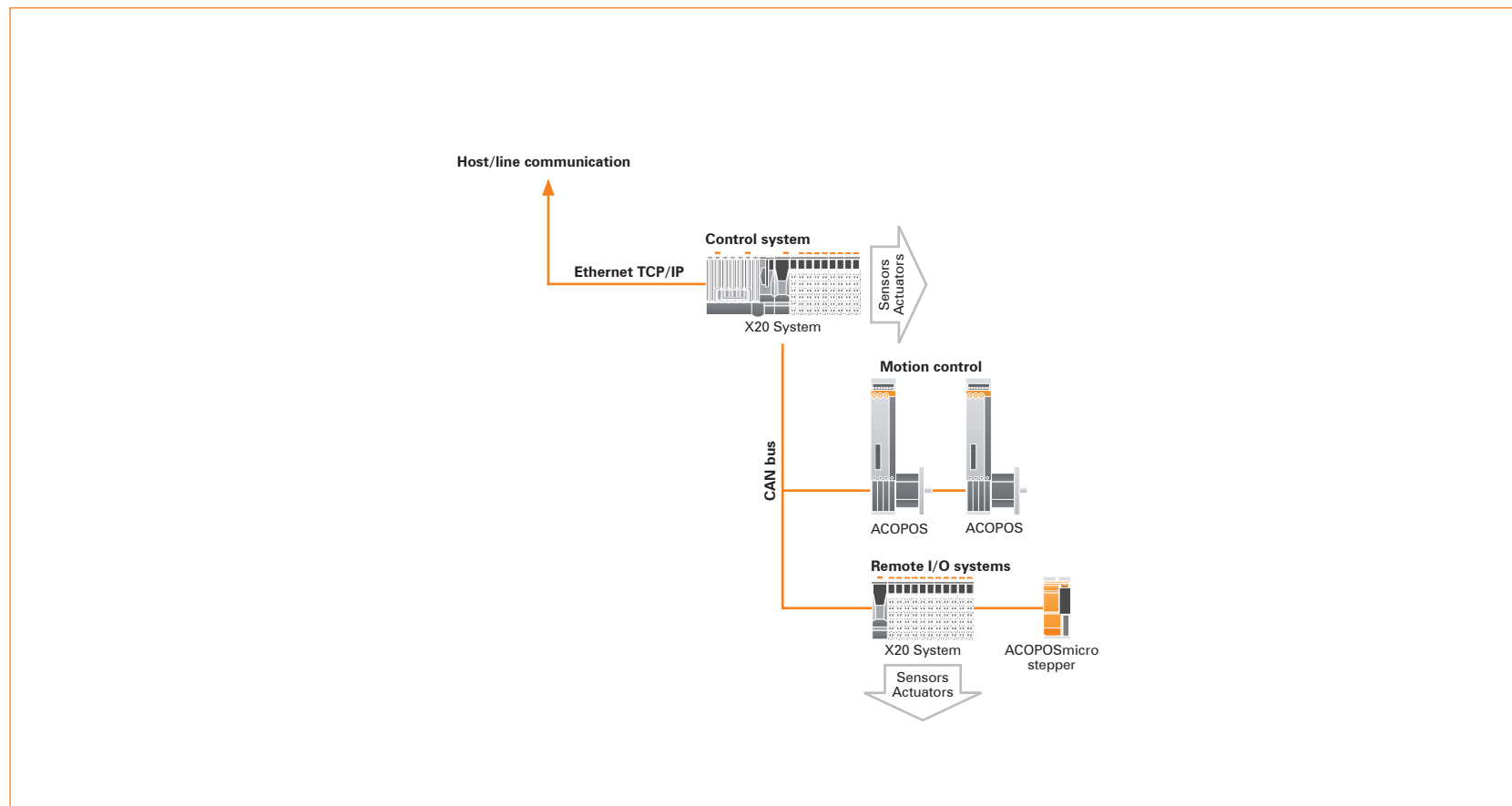
Compact automation in a line system

Short description

The machine should be able to communicate with the outside world. The compact controller is connected with the higher-level plant network via Ethernet TCP/IP. Data can be read from the machine controller and commands can be given over the plant network. Internal machine communication to drives and remote I/O systems takes place via CAN bus.

Properties

- Connection to the line system and plant network
- Compact
- Economical
- Scalable for average demands



Components and technologies

Control system	X20 System: Slice-based I/O and control system	37
Motion control	ACOPOSmicro: Compact drive system	1221
	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
	Stepper motors	1443
Remote I/O systems	X20 System: Slice-based I/O and control system	37
Networks and fieldbuses	CAN bus	611
	Ethernet TCP/IP	611

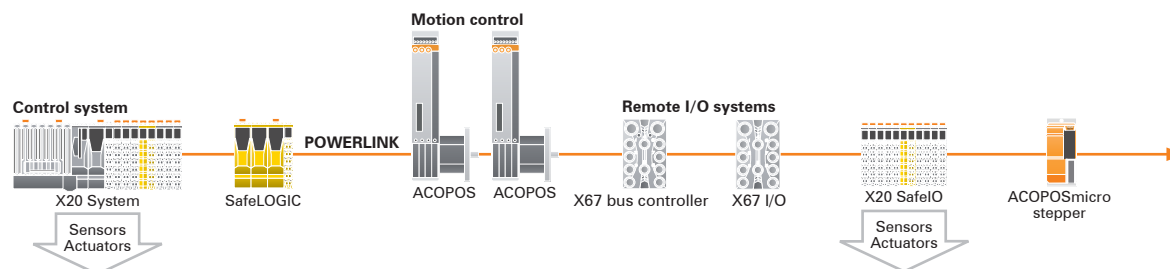
High-performance compact automation

Short description

Space in the switching cabinet is highly valuable. Reducing PLC dimensions should not reduce automation performance. The CPU with local I/O is connected with various distributed components via a high-performance network. This results in a high-performance system that allows optimal solutions to be implemented for more complex tasks in spite of the compact dimensions.

Properties

- Scalable performance
- Highly economical
- Compact dimensions
- Sufficient network reserves for expansions
- Customized solutions for complex tasks



Components and technologies

Control system	X20 System: Slice-based I/O and control system	37
Motion control	ACOPOSmicro: Compact drive system	1221
	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
	Stepper motors	1443
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419
Safety technology	Integrated safety technology	537
Networks and fieldbuses	POWERLINK	611

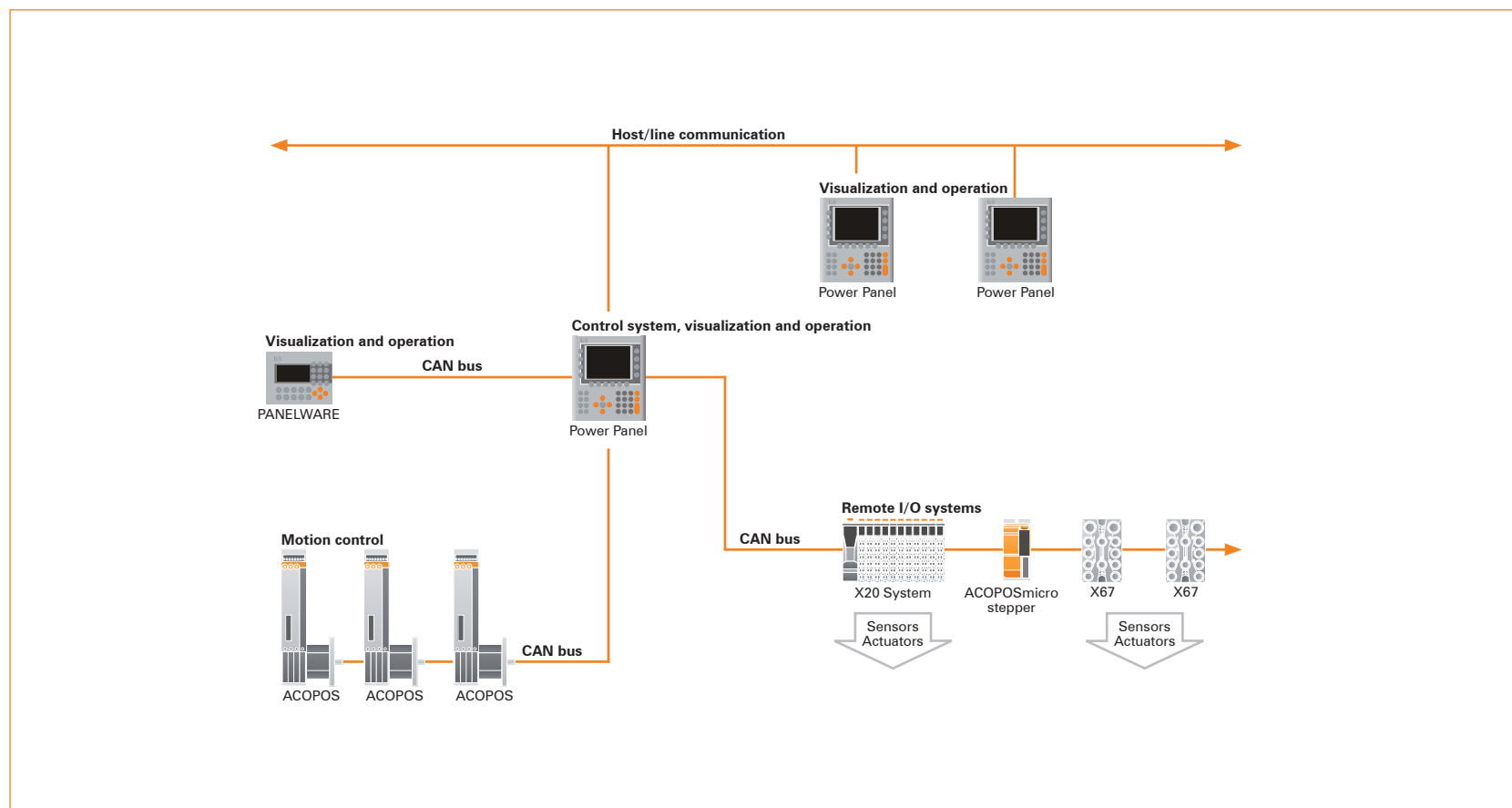
Panel-based automation

Short description

Operation, visualization and control are integrated. Host/line connections can be used for additional operator stations. The drives are networked with each other so that multi-axis movements can be synchronized. I/O signals are connected in the machine room or in the switching cabinet.

Properties

- Compact dimensions
- Flexible operating concepts
- Clear networking
- Modularly expandable



Components and technologies

Control system	Power Panel: Integrated control, operation, and visualization	787
Visualization and operation	Power Panel: Integrated control, operation, and visualization PANELWARE: Compact Operator Panel	787 773
Motion control	ACOPOSmicro: Compact drive system ACOPOS: Intelligent servo drives ACOPOSmulti: Modular drive system Synchronous Motors: Dynamic precision drives Stepper motors	1221 1251 1321 1459/1585/1645 1443
Remote I/O systems	X20 System: Slice-based I/O and control system X67 System: Remote I/O with IP67 protection	37 419
Networks and fieldbuses	Inside the machine: CAN bus Host/line communication: Ethernet TCP/IP	611 611

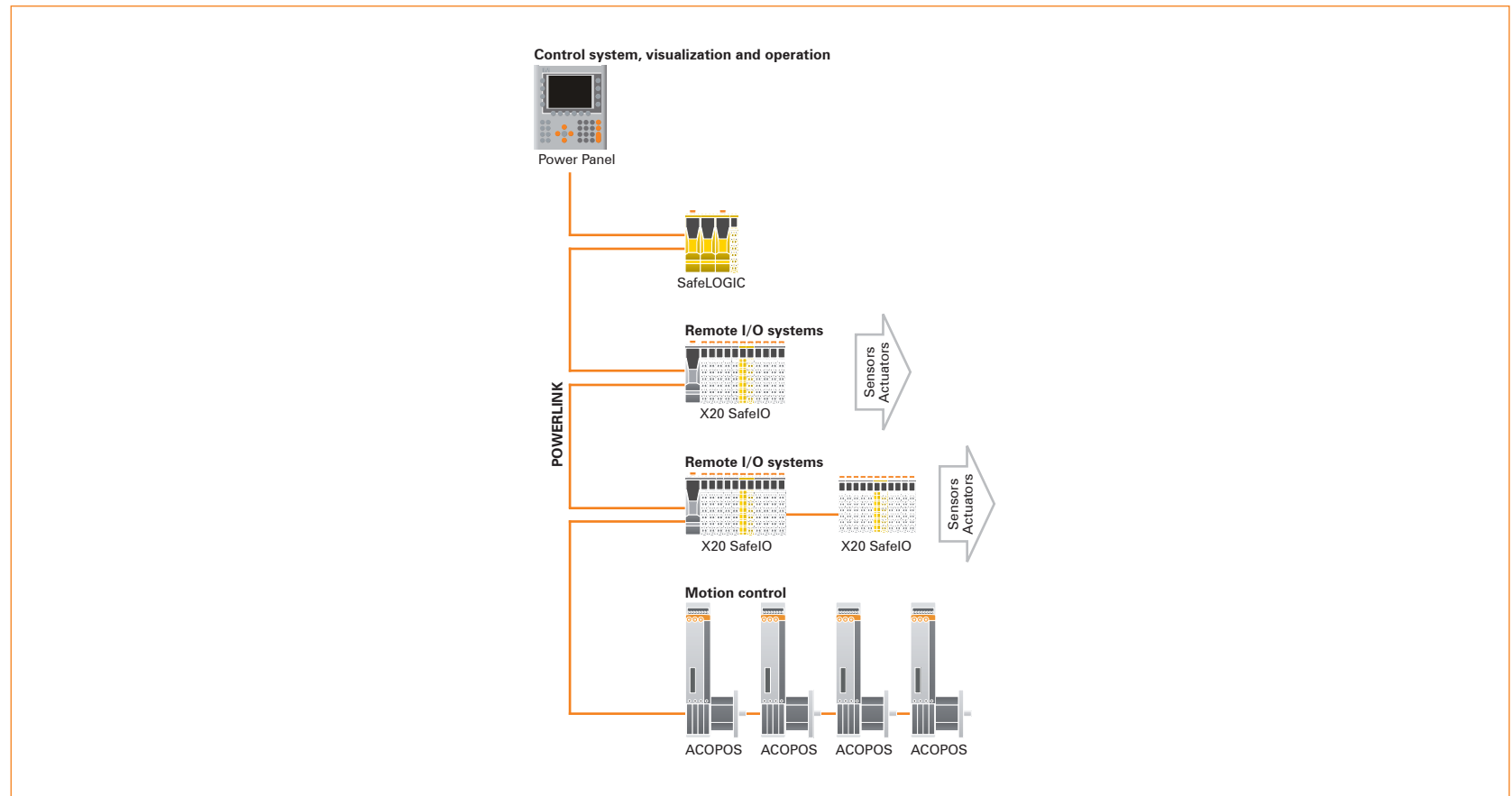
Panel-based automation with a uniform high-performance network

Short description

The operator panel is the central controller. All components, such as I/O systems, safety technology and drives, are connected via a high-performance network. With POWERLINK, the system is set up to handle the highest real-time demands.

Properties

- Modular and scalable machine modules
- Highest performance class for real-time applications
- Precise synchronization of multi-axis movements and I/O signals
- Exceptionally large rated torque



Components and technologies

Control system	Power Panel: Integrated control, operation, and visualization	787
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
Motion control	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
	X20 System: Slice-based I/O and control system	37
Remote I/O systems	X20 System: Slice-based I/O and control system	37
Safety technology	Integrated safety technology	537
Networks and fieldbuses	POWERLINK	611

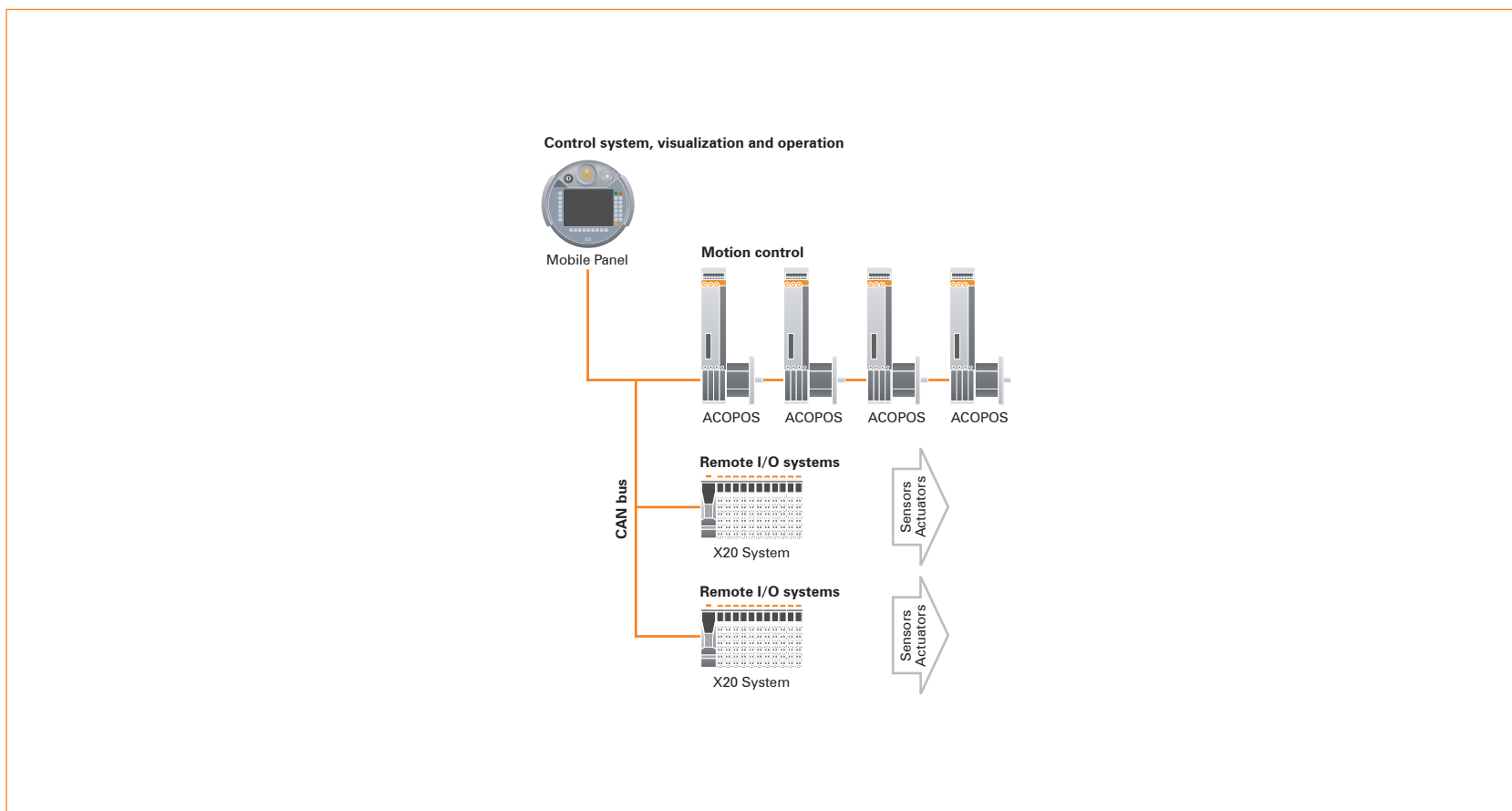
Mobile automation

Short description

The challenge is to provide automation with an optimal price/performance ratio, compact size and mobile operation. The controller is integrated in the mobile operating device. Remote I/O systems and drives are connected efficiently via CAN bus. The result is a flexible, economical system for average performance demands.

Properties

- Mobile operation with integrated control
- Compact
- Economical
- Scalable for average demands



Components and technologies

Control system	Mobile Panel - More than just mobile operation and monitoring	873
Visualization and operation	Mobile Panel - More than just mobile operation and monitoring	873
Motion control	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
Remote I/O systems	X20 System: Slice-based I/O and control system	37
Networks and fieldbuses	CAN bus	611

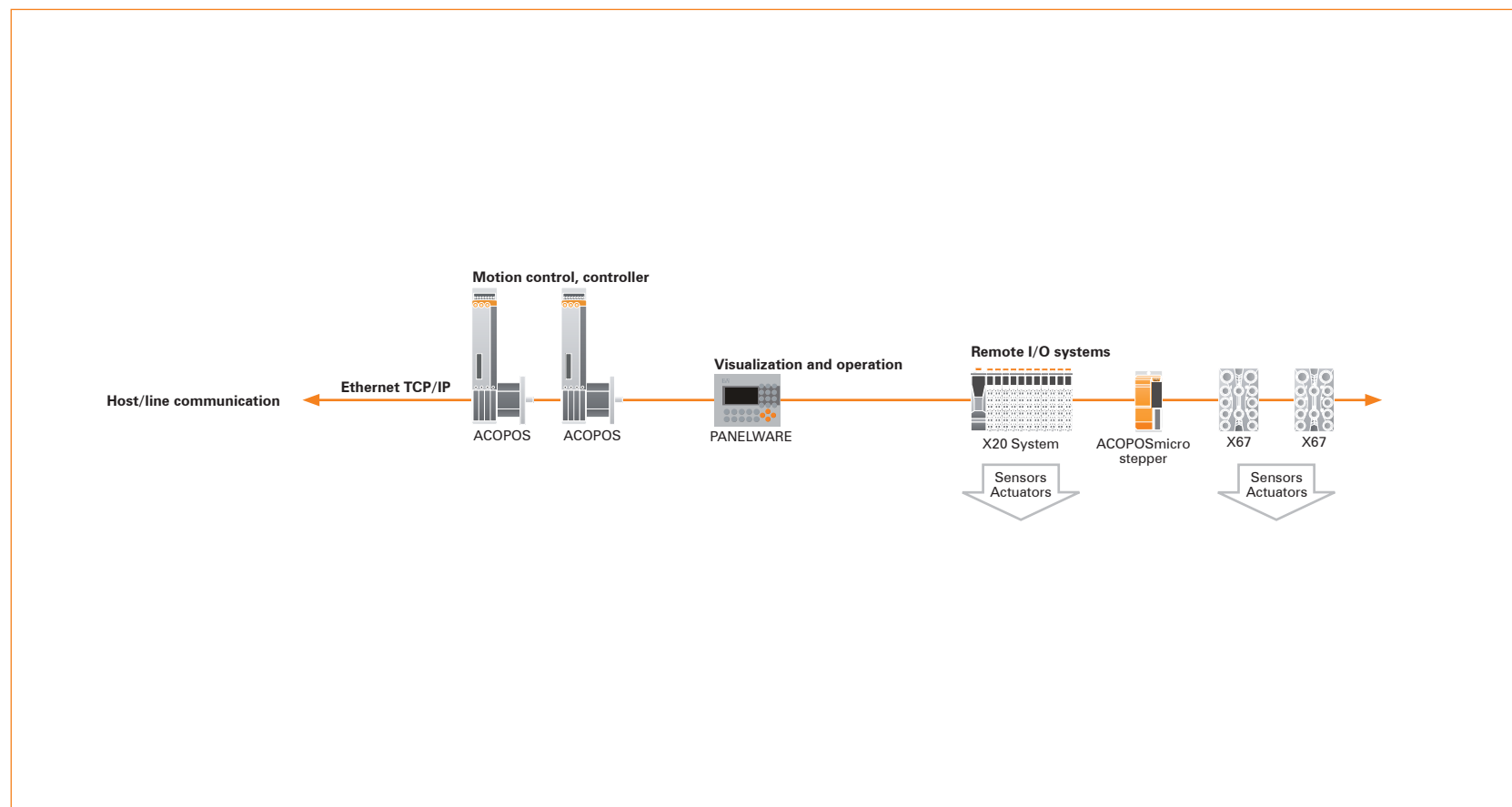
Drive-based automation

Short description

The drive is the controller. The controller is centrally located in one drive or distributed over several drives. The drives are connected with each other so that multi-axis movements can be synchronized. Operation is handled in a simple manner. Returned messages are shown on simple text or graphic displays. I/O signals are connected in the switching cabinet or directly in the machine room.

Properties

- Compact dimensions
- Moderate space requirements in the switching cabinet
- Simple operating concepts
- Minimal wiring
- Modular and scalable



Components and technologies

Control system	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	PANELWARE: Compact Operator Panel	773
Visualization and operation		
Motion control	ACOPOSmicro: Compact drive system	1221
	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
	Stepper motors	1443
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419
Networks and fieldbuses	Inside the machine: CAN bus	611
	Host/line communication: Ethernet TCP/IP	611

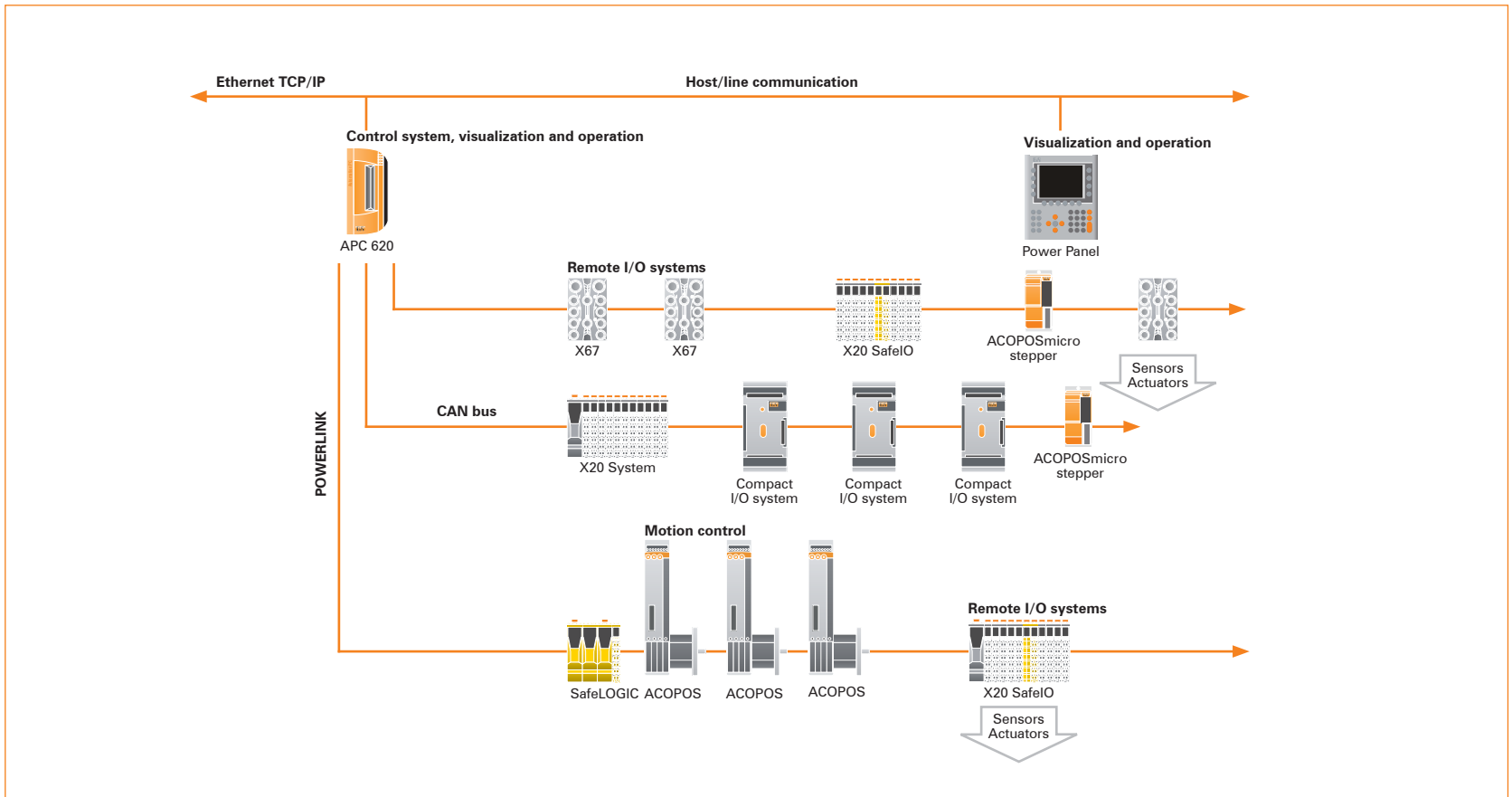
Open PC-based automation

Short description

Automation with standard PC architecture. The industrial PC handles all automation tasks centrally. I/O peripherals, safety technology and drives are connected via fieldbuses and networks. Operation and visualization takes place using a local or remote display unit. Additionally, host/line connections can be used for additional operator stations.

Properties

- Central control concept
- Clear networking
- Scalable performance
- High-performance operating concepts
- Standard PC software can be used



Components and technologies

Control system	APC 620 / APC 810: Automation PC	911/945
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
Motion control	ACOPOSmicro: Compact drive system	1221
	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
	Stepper motors	1443
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419
	Compact I/O System: Economical usage of peripheral space	581
Safety technology	Integrated safety technology	537
Networks and fieldbuses	POWERLINK	611
	Ethernet TCP/IP	611
	CAN bus	611

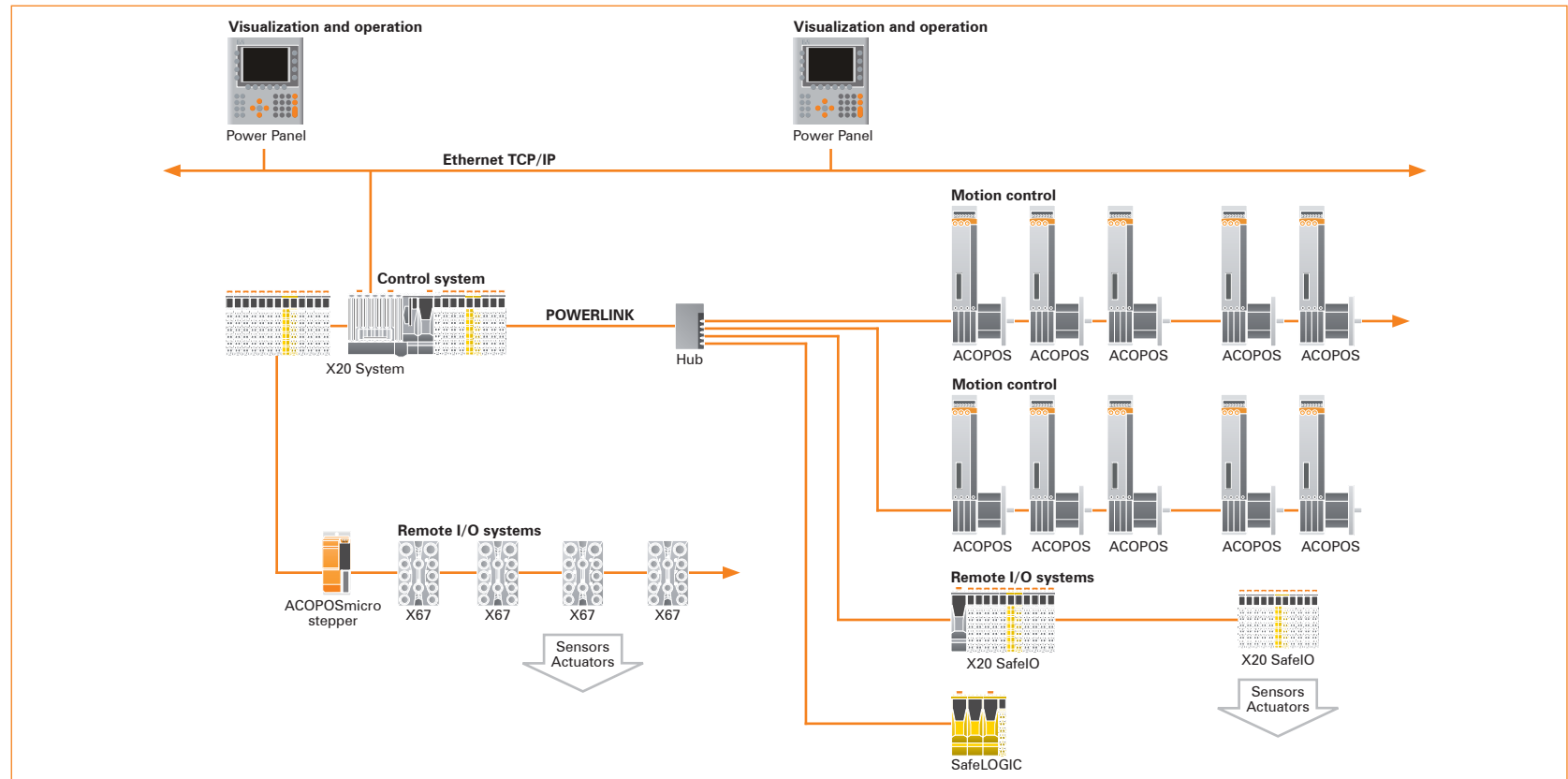
Embedded PC-based automation for high-performance machines

Short description

Large machines and systems place high demands on the functionality and performance of automation components. Flexibility, expandability and scalable performance classes allow the most modern machine concepts to be realized. High-performance PLC with PC architecture as the controller, central and distributed expansions for I/O channels, open network standards and operator panels using the newest ergonomic designs. The example from the packaging industry combines decentralized operation, 50 drives, and 50 remote I/O systems as well as more than 60 I/O modules with IP20 and IP67 protection distributed throughout the machine room.

Properties

- Scalable performance and I/O capacity
- Mixture of central and distributed architecture
- Clear concept and servicing
- Greatly reduced wiring
- Integrated safety technology



Components and technologies

Control system	X20 System: Slice-based I/O and control system	37
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
Motion control	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
	Stepper motors	1443
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419
Safety technology	Integrated safety technology	537
Networks and fieldbuses	POWERLINK	611
	Ethernet TCP/IP	611

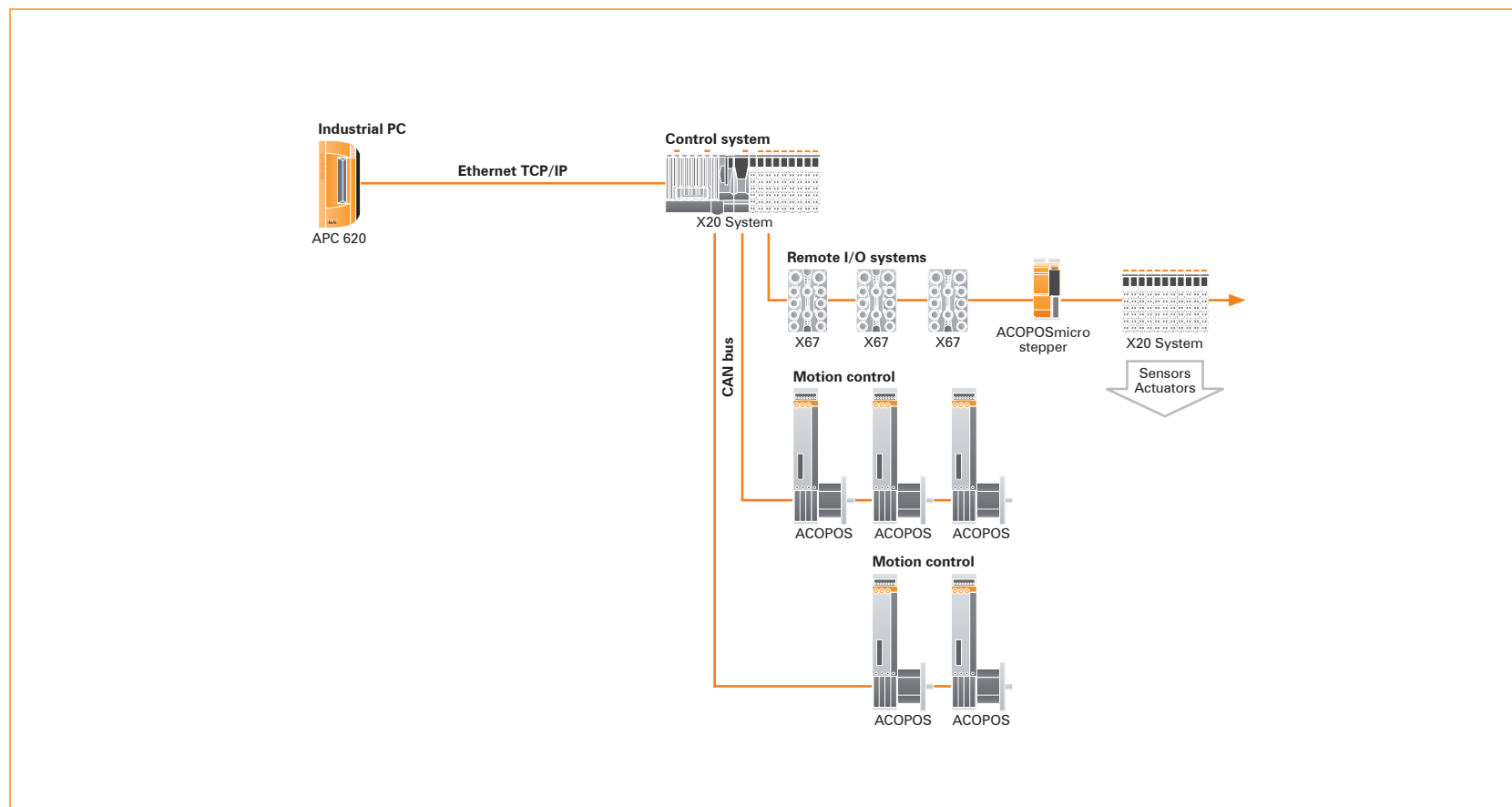
Open and embedded PC-based automation

Short description

The Windows-based visualization and data management are handled by an industrial PC. The machine is controlled centrally by the PLC. Several fieldbus lines connect drives and I/O systems to the PLC. In addition to the local PLC I/O systems, there are also distributed I/O modules with IP67 protection outside the switching cabinet in the machine room.

Properties

- Customized use of central and distributed components
- High-performance, open operating and management concepts



Components and technologies

Control system	X20 System: Slice-based I/O and control system	37
Industrial PC	APC 620 / APC 810: Automation PC	911/945
Motion control	ACOPOSmicro: Compact drive system	1221
	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
	Stepper motors	1443
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419
Networks and fieldbuses	Ethernet TCP/IP	611
	CAN bus	611

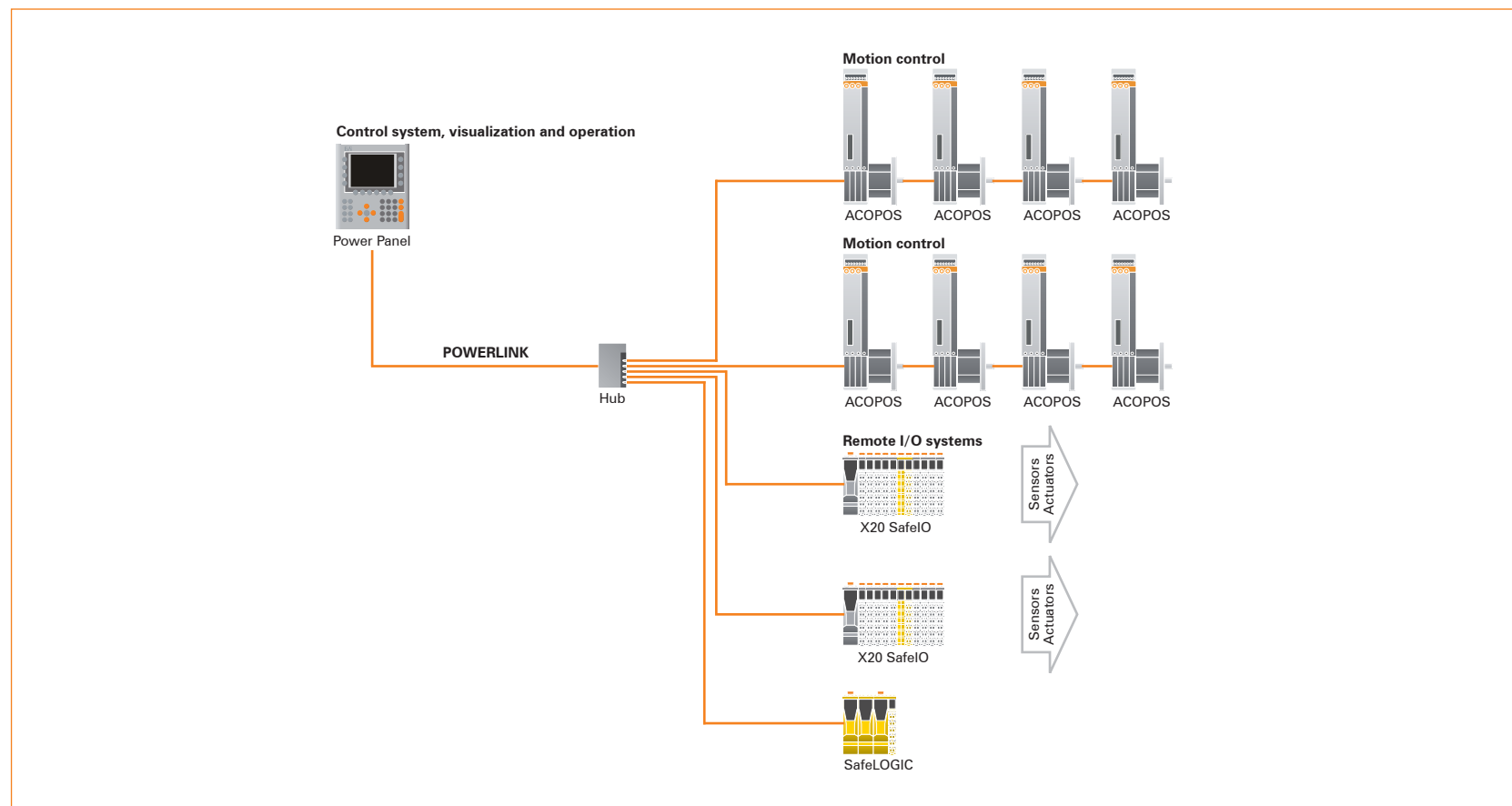
Central automation of modular machines

Short description

For modular machine concepts with many similar elements, a central controller is often more economical than a distributed solution. Compact controllers with integrated visualization also meet high demands. Connecting intelligent drives and I/O systems using a powerful POWERLINK network sets no limits for expandability, precision and performance.

Properties

- Compact central operating and control unit
- Precise synchronization of highly dynamic multi-axis systems
- High degree of flexibility for (future) expansions
- Configurable safety-related machine options



Components and technologies

Control system	Power Panel: Integrated control, operation, and visualization	787
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
Motion control	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
Remote I/O systems	X20 System: Slice-based I/O and control system	37
Safety technology	Integrated safety technology	537
Networks and fieldbuses	POWERLINK	611

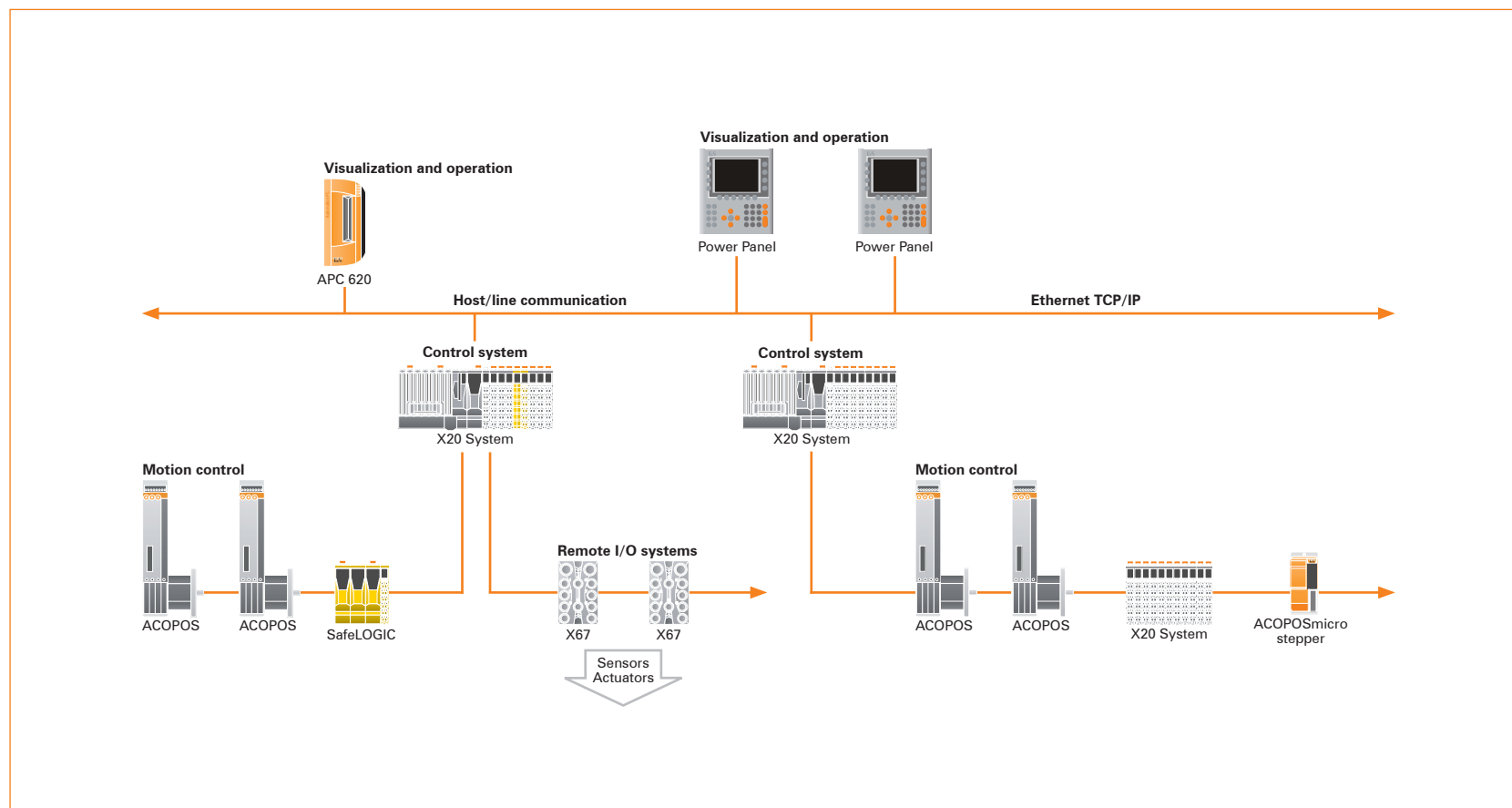
SCADA systems and PC visualization

Short description

This represents the classic approach of using programmable logic controllers for I/O systems and drives and higher-level industrial PCs for management, data handling and visualization. Normally, a SCADA application runs on the industrial PC. Expansion options are possible for several clients that are connected via Ethernet and exchange data using OPC mechanisms.

Properties

- Centrally monitored production and manufacturing processes
- Embedded in plant networks
- High-performance operating and control concepts



Components and technologies

Control system	X20 System: Slice-based I/O and control system	37
Industrial PC	APC 620 / APC 810: Automation PC	911/945
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
Motion control	ACOPOSmicro: Compact drive system	1221
	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
	Stepper motors	1443
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419
Safety technology	Integrated safety technology	537
Networks and fieldbuses	POWERLINK	611
	Ethernet TCP/IP	611
	CAN bus	611

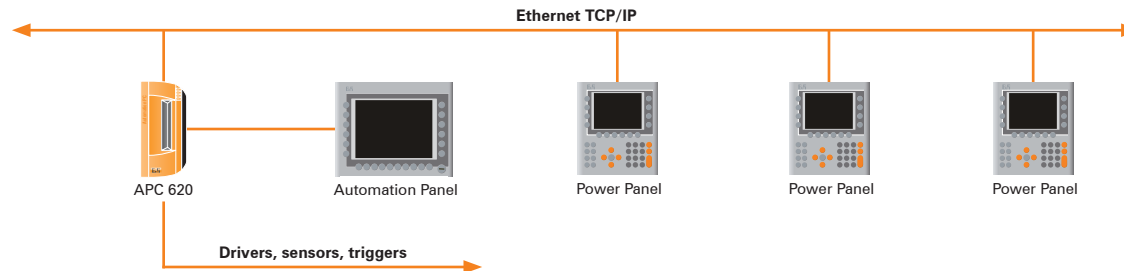
Distributed machine operation with thin clients

Short description

Machine operation should alternate between several different locations. Application and control programs run centrally on an industrial PC. Several cost-effective operator stations (thin clients) are connected via Ethernet. All operator stations offer uniform operational elements and interfaces e.g. for the use of transportable memory media.

Properties

- High-performance and economical operating concepts
- Distribution of machine operation as desired
- Flexible expansions
- Local use of transportable memory media (USB, Disk-on-Key)



Components and technologies

Industrial PC	APC 620 / APC 810: Automation PC	911/945
Visualization and operation	Power Panel: Integrated control, operation, and visualization Automation Panel	787 1055/1077
Networks and fieldbuses	Ethernet TCP/IP	611

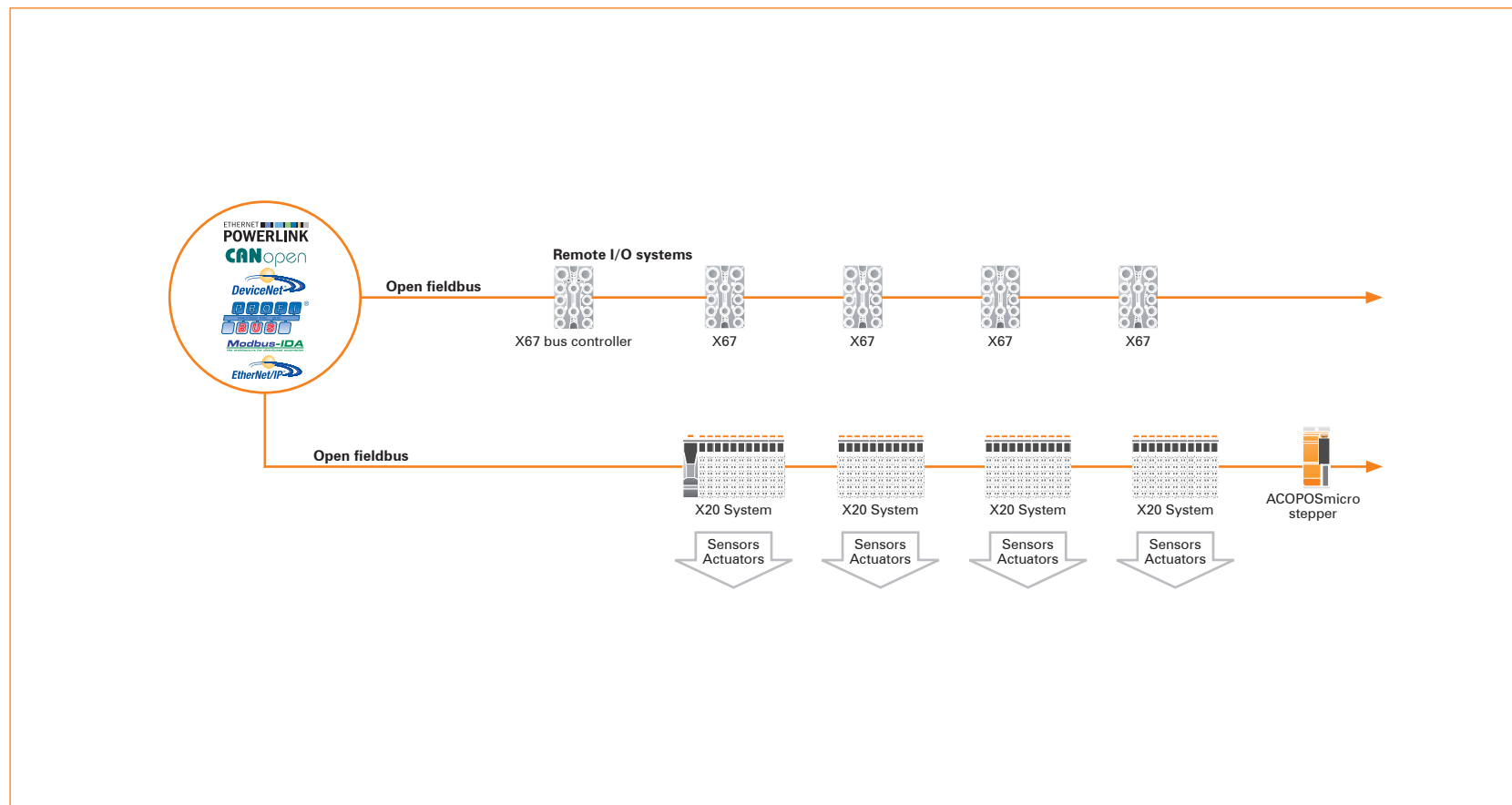
Distributed I/O on open fieldbuses

Short description

Distributed connections of sensors and actuators to the controller should be made directly in the machine room. The components require a certain specified class of protection against dirt, dust and moisture. Open fieldbuses such as CANopen, DeviceNet, Profibus DP and POWERLINK have established themselves for distributed automation.

Properties

- Open for connection to standardized fieldbuses
- Flexible handling of I/O directly in the machine room
- High transfer rates and built-in technology functions
- Robust and resistant to disturbances
- Simple wiring, no cable trees



Components and technologies

Motion control	ACOPOSmicro: Compact drive system	1221
	Stepper motors	1443
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419
Networks and fieldbuses	POWERLINK	611
	CAN bus and CANopen	611
	DeviceNet	611
	Profibus DP	611

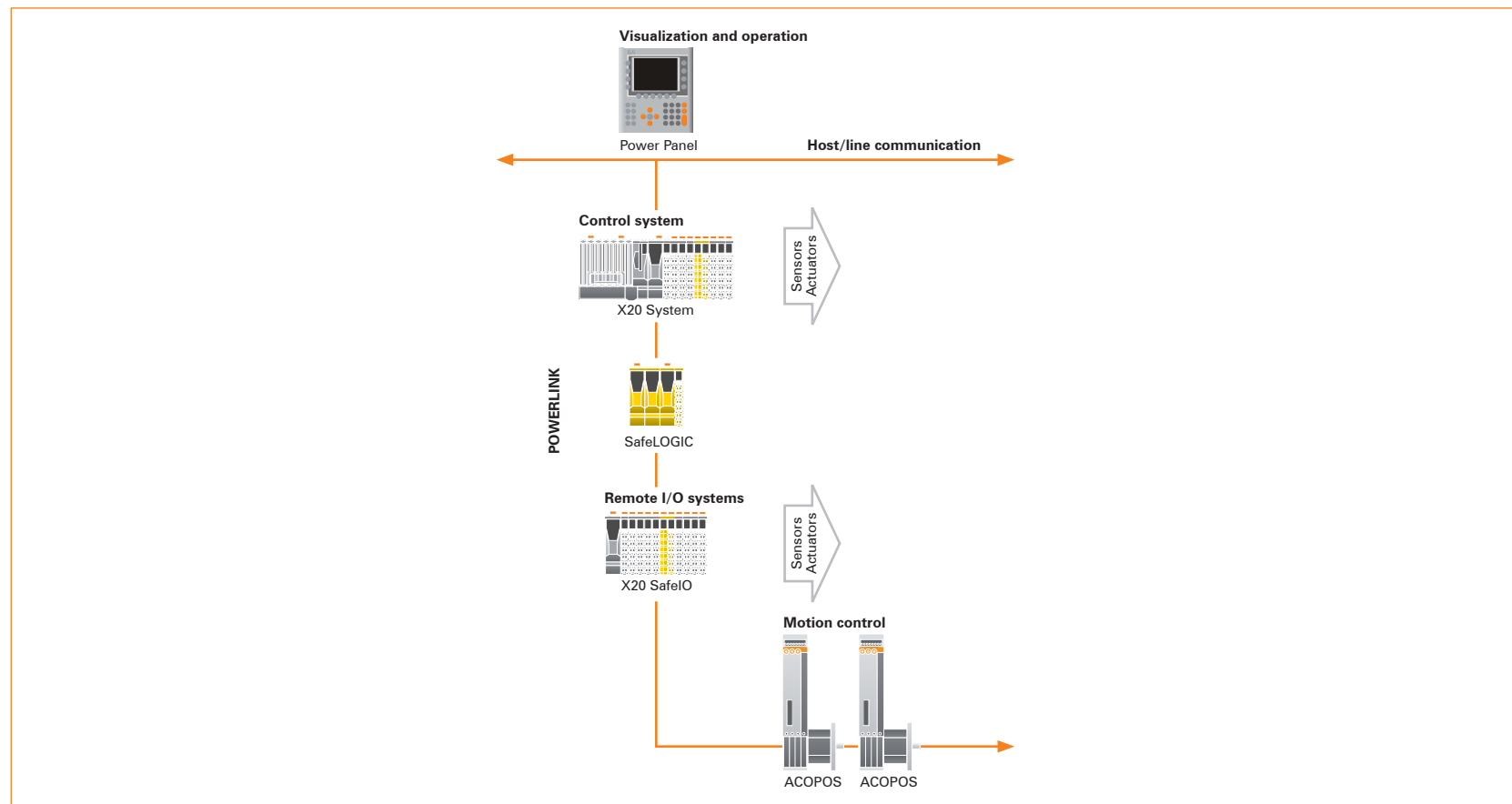
Complete networking with industrial Ethernet

Short description

Ethernet is the worldwide IT standard for networks. Complete connection of the production line to the plant network promises transparency and cost reductions for maintenance and operation. Ethernet is becoming more important as a fieldbus replacement for the automation of machines and systems. The connection of visualization systems and networking for time-critical data communication to I/O systems, safety technology and drives takes place using Ethernet TCP/IP protocols, POWERLINK and POWERLINK Safety.

Properties

- Open network standard
- Transparent communication for management, process and field levels
- Seamless integration in line networks and the IT infrastructure
- Highest level of safety (SIL 3 according to IEC 61508)



Components and technologies

Control system	X20 System: Slice-based I/O and control system	37
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
Motion control	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
Remote I/O systems	X20 System: Slice-based I/O and control system	37
Safety technology	Integrated safety technology	537
Networks and fieldbuses	POWERLINK	611
	Ethernet TCP/IP	611

ACOPOSmicro Drive system

This series provides the user with solutions for the low and the lowest power range.



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Accessories		1244

System characteristics

The ACOPOSmicro drive system

Flexibility

Ever-changing fields of application and the necessity to integrate different types of drives in one machine often creates accordingly large challenges for the developers of the application. Creating projects with B&R Automation Studio makes it possible to operate a wide range of drive designs using the same tools. That means that flexible drive architectures can be implemented linked together or even independent of one another.

It is also possible to include various machine versions in the configuration phase and to account for different models with alternating drive types. A combination of stepper motors and servos is easy to implement. This gives the machine manufacturer new levels of freedom in regard to flexibility.

Smallest dimensions

The compactness of the module is clearly evident in the two-channel version. The ACOPOSmicro requires a base surface of less than 50 cm² per axis.

This not only saves space in the switching cabinet for applications with multiple axes, but also provides advantages in wiring because the bus and supply voltage connection is only needed for every second motor.

A continuous current of 10 A and a 15 A peak current are possible for each stepper motor. This power rating is sufficient to run even the largest stepper motors. The module is protected against over-current, over-temperature and other prohibited operating conditions. The respective warnings and error messages can be output via the fieldbus.

Variable rated voltage ranges

To achieve higher torque values at high speeds, the first voltage variation was designed for a rated voltage of 80 VDC. A withstand capability is provided up to 100 VDC. However, the drive can also be utilized in the low voltage range with nearly no limitations. This means that the ACOPOSmicro product line can be operated down to a voltage of 18 VDC. A 1-phase AC version is also in preparation, which is suitable for both the U.S. (110 VAC) as well as the European voltage range (230 VAC).

Integrated I/O

In addition to trigger inputs, a 24 VDC output is also provided. This can be used, among other things, to control external brakes and is available for other tasks. If required, additional options can be added via an optional module at a minimum cost and without taking up extra space.

This makes it possible to implement even extraordinary customer-specific requirements. The optional support of many different encoder systems, even on the stepper motor variation, illustrates this product line's high degree of flexibility.

Highlights of the ACOPOSmicro drive system

- Innovative drive concept
- Wide range of use
- Compact construction
- Flexible functionality
- Optional expansions



ACOPOSmicro with encoder interface



ACOPOSmicro with heat spreader and mounting plate

Areas of application for stepper motor control

Whereas earlier stepper motors were mainly reserved for simpler tasks, today they are used to meet even complex CNC demands. The particular advantage offered by these motors is their high level of torque in the low to middle speed range that can be implemented starting with very small motor designs. The use of this technology is an economical solution within the torque limits.

Highest resolution

Depending on the stepper motor being used, the ACOPOSmicro can handle a resolution in up to 102,400 partial steps. This is possible due to the 256 micro-steps supported by the system. The basis stepping angle is automatically divided into the maximum possible micro-steps according to the speed. In addition to the possibility for increased positioning accuracy, this also enables much smoother operation. The common problem of accumulating resonance frequencies is significantly minimized by the fine grading of current changes. The current controller's high frequency also plays a role in this. Optional encoder feedback can help stepper motors achieve highly accurate positioning under a wide range of load torques.

Ease of handling

Of course no switches are needed for selecting the motor current on the device. All module settings are software-based. The default values of all existing parameters are quickly and easily adapted to the project and overwritten at runtime. Resolution of the current settings to approximately one percent the rated current meets all needs in regard to selecting a current value. The module's main feature is that rated current, boost current and holding current can each be defined separately. This keeps thermal loss in the stepper motor to a minimum and the maximum torque is available exactly when it is needed. All of this leads to noticeable savings in energy and reduces power loss in the motor, which further results in a longer life for all components.

Coding and identification

The possibility of using coded connection terminals is useful, especially on the two-channel version. In particular, this eliminates fatal errors that can occur by connecting the wrong drive axis during commissioning. The possibility to easily label the ACOPOSmicro also helps to avoid errors.

Modular cooling design



Wall mounting

Conventional mounting method. The heat is dissipated directly through the air in the switching cabinet. Suitable for a small number of axes with low power ratings. Larger amounts of power dissipation can also be brought under control by using additional switching cabinet fans and climate control units.



Feed-through mounting

Based on a feed-through heat sink, the excessive heat is output directly to the ambient air outside of the switching cabinet. Suitable for a large number of axes with any range of power rating.

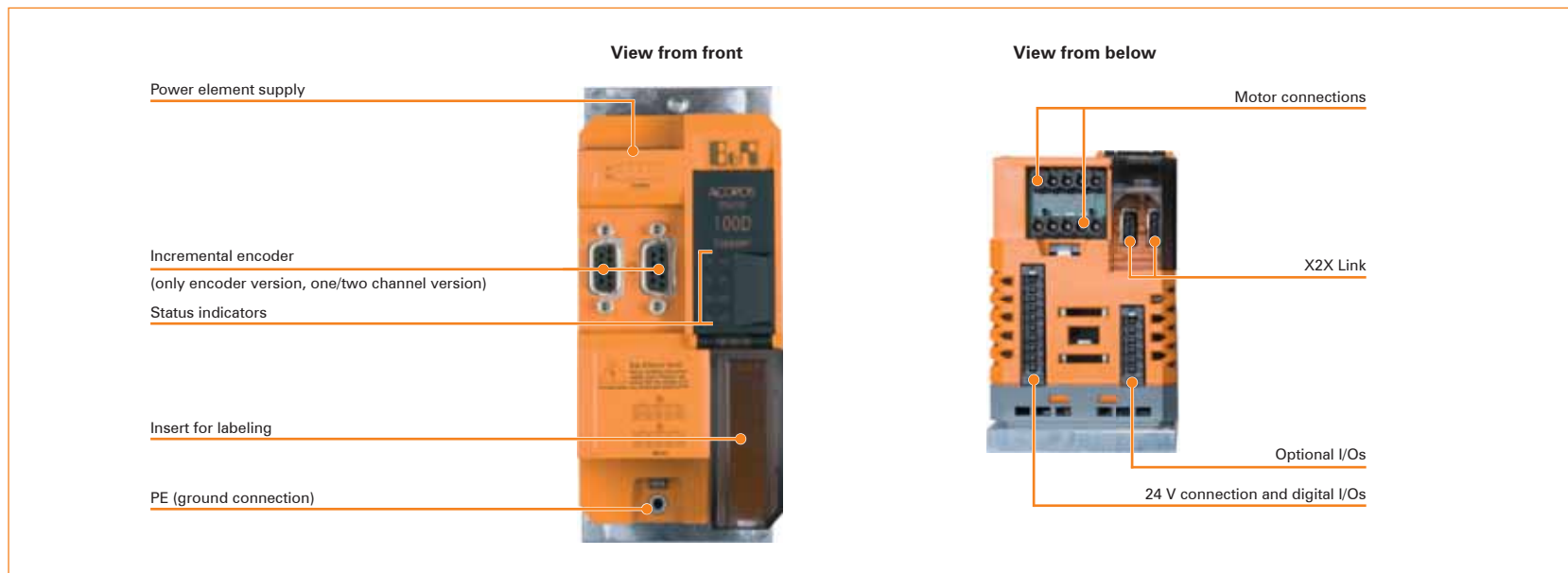


ColdPlate

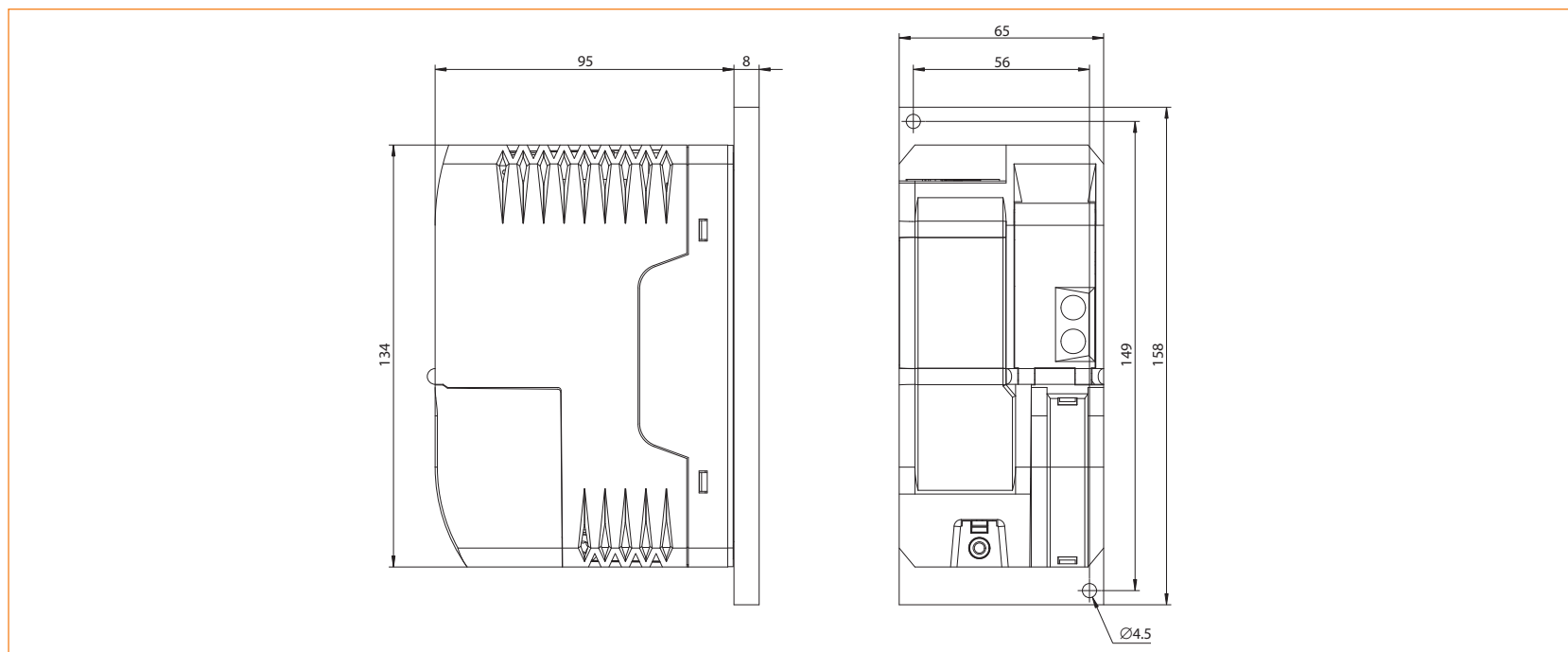
The excessive heat that is generated by the devices is output directly to the cooling medium via a plate cooled with oil or water. Suitable for a large number of axes with any range of power rating and uses a machine's own cooling circulation system.

System characteristics

Operating and connection elements



Dimensions



Software operation

Standardized programming

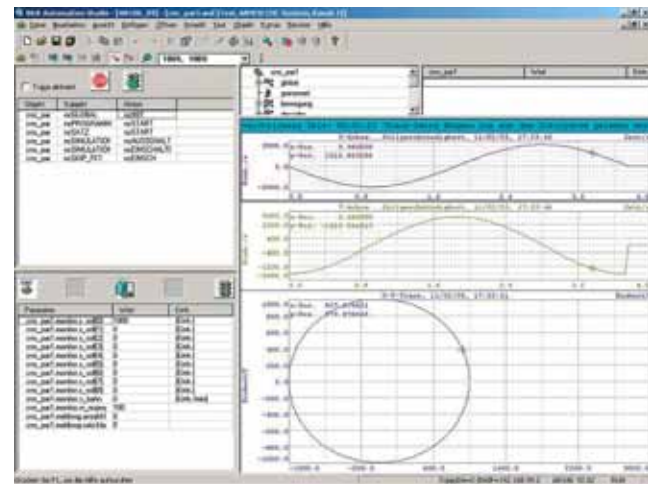
The creation of PLCopen motion control function blocks ensures the support of a standard that can handle positioning tasks quickly, easily, and efficiently. They can be programmed in the proven IEC 61131 standard programming languages Structured Text, Instruction List, Ladder Diagram, or Sequential Function Chart. In addition to these languages, B&R also supports programming in B&R Automation Basic and C. All motor types supported by the ACOPOSmicro drive system can be controlled with these PLCopen function blocks.



The universal availability of PLCopen function blocks for all B&R products makes it possible to optimize the component selection to match the performance demands of every application. The PLCopen library is included in the Automation Studio package. Selecting this library in the project automatically imports it and makes the function blocks available for programming.

Full integration in the CNC system

With B&R Automation Studio, commissioning is easy as pie. Stepper motors can be operated in single-axis mode, with an axis group, or connected to other axes. The B&R Soft CNC is able to handle up to 100 axes per interface. The interfaces within a CNC channel can be mixed as needed.

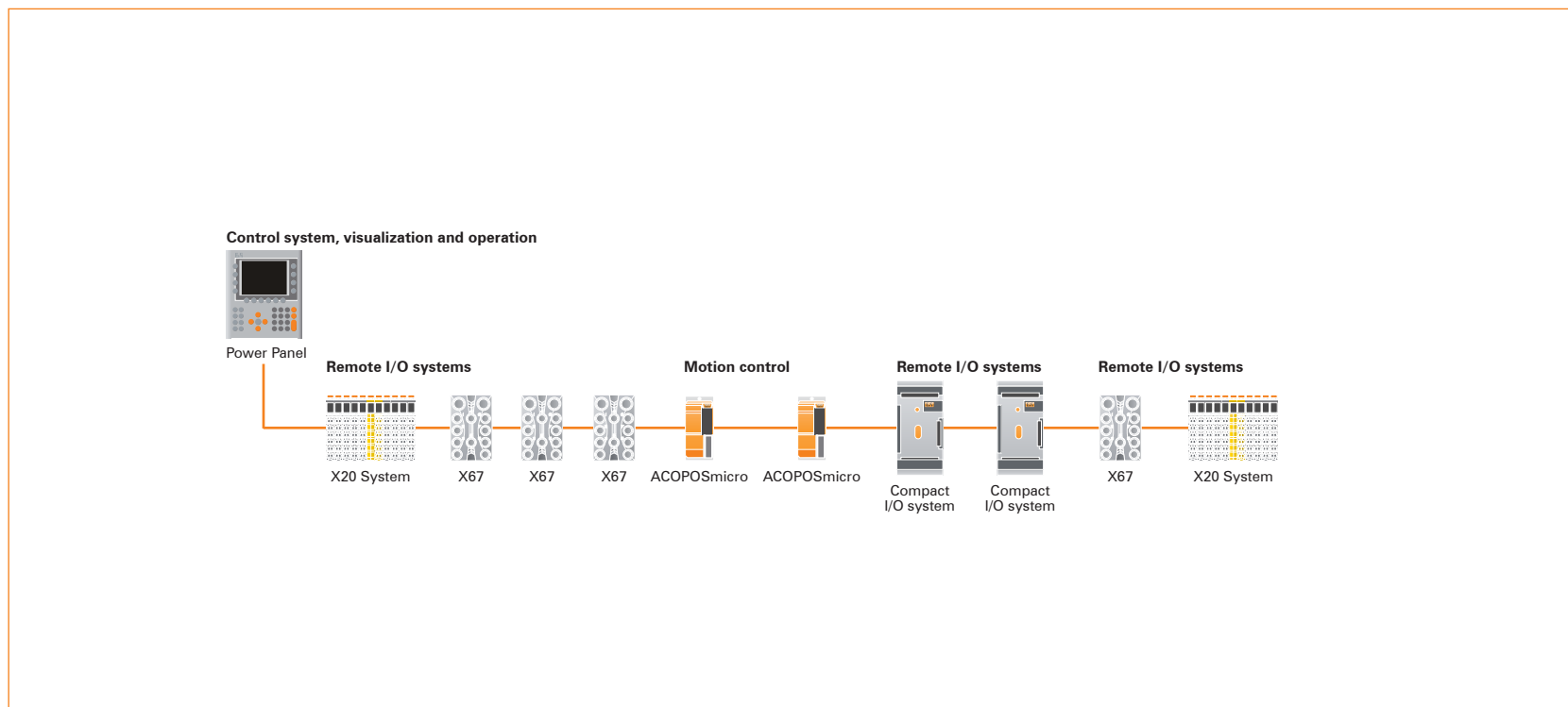


Complete integration in Automation Studio

Typical topologies

Compact solution for small and mid-sized machines

The ACOPOSmicro is connected directly to a B&R controller system. This is the most compact solution for remote distributed I/O systems. The ACOPOSmicro, X67 system, Compact I/O system, X20 system and simple operating panels can be operated on the same line.

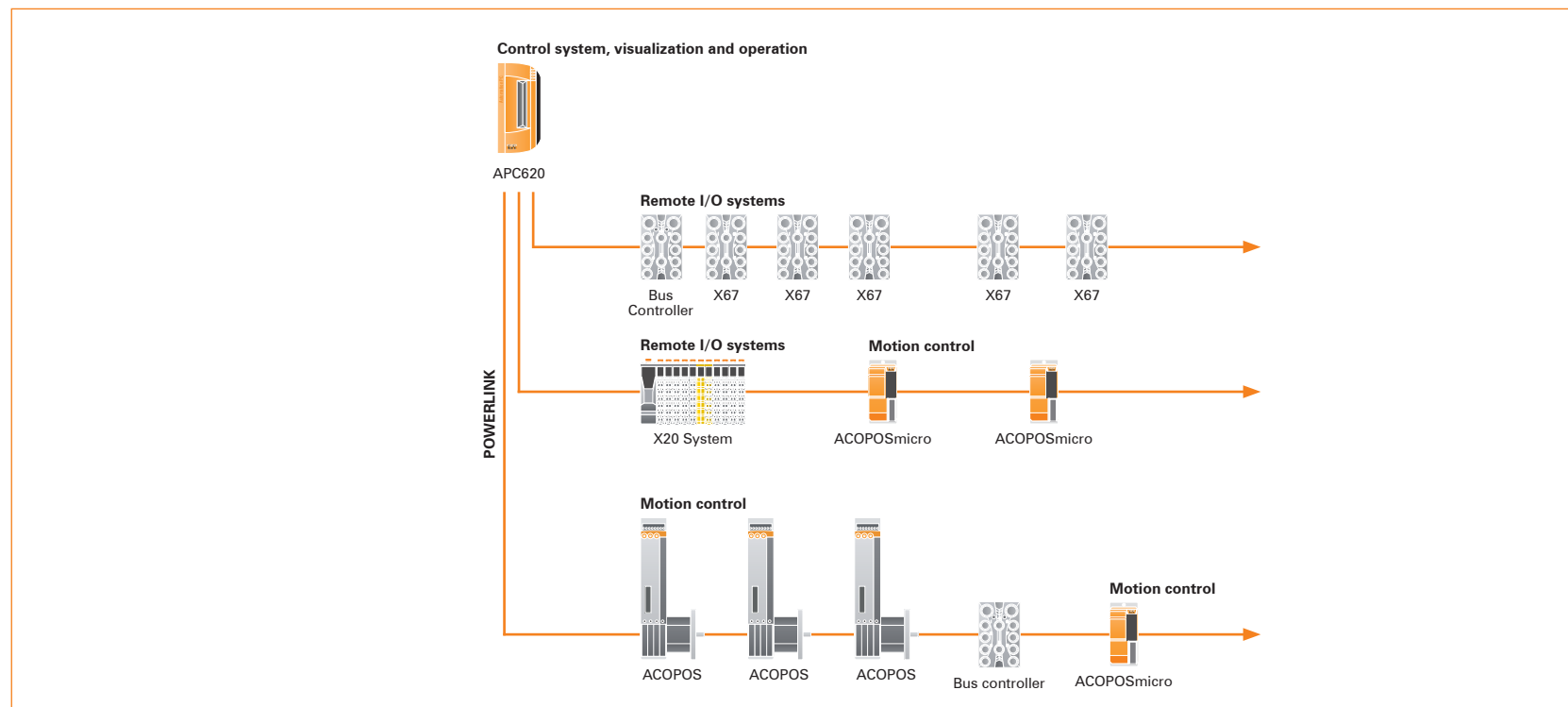


Components and technologies

Control system	Power Panel: Integrated control, operation, and visualization	787
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
Motion control	ACOPOSmicro: Stepper motor drive system	1221
	Stepper motors	1443
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419
	Compact I/O system and valve connections: Economical usage of peripheral space	581

Custom-fit system combinations

Optimized machine designs require customized implementation of fieldbus systems. With the flexibility of the X67 system and the openness of B&R's system components, the automation can adapt ideally to the cost and performance demands of the application.



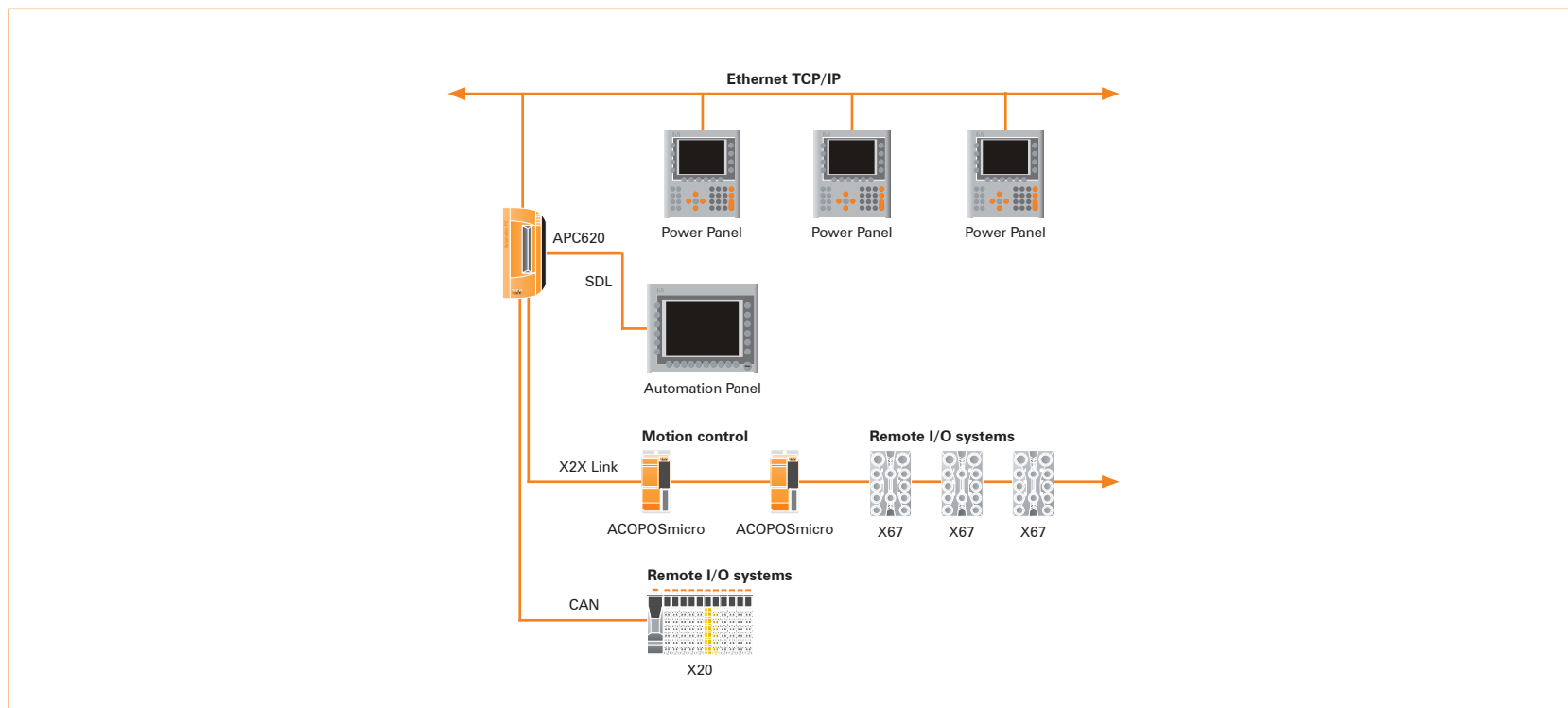
Components and technologies

Control system	Automation PC APC620: The new industrial PC generation	911
	Panel PC: Operation and PC integrated	973/985
Visualization and operation	Panel PC: Operation and PC integrated	973/985
	Automation Panel: A new dimension in machine visualization	1055/1077
Motion control	ACOPOSmicro: Stepper motor drive system	1221
	Stepper motors	1443
	ACOPOS: Intelligent servo drives	1251
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419
	Compact I/O system and valve connections: Economical usage of peripheral space	581
Network and fieldbus modules	Various fieldbus modules	611

Typical topologies

APC620 embedded for central control, visualization and operation of the drive technology

The control program runs on the APC620 embedded. The visualization project is integrated with Visual Components. A display unit is connected to the PC. The PC is networked via Ethernet TCP/IP; additional Power Panel-based operator terminals can also be connected via Ethernet. Fieldbus systems (CAN bus, X2X Link) are used to handle communication to I/O systems with axis control.



Components and technologies

Control system	APC620: Automation PC	911
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
	Automation Panel 800: Modular operation and visualization	1055
	Automation Panel 900: Compact operation and visualization	1077
Motion control	ACOPOSmicro: Stepper motor drive system	1221
	Stepper motors	1443
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419



Product overview

ACOPOSmicro stepper motor control



Model number	Short description	
80SD100XD.C0XX-01	ACOPOSmicro stepper motor module, X2X Link connection, 24-64 VDC \pm 25% supply, 2 motor connections, 10 A, 2 digital inputs 24 VDC sink (can be used as trigger inputs), 1 digital output 24 VDC, 0.5 A, LEDs for status display	1234
80SD100XS.C0XX-01	ACOPOSmicro stepper motor module, X2X Link connection, 24-64 VDC \pm 25% supply, 1 motor connection, 10 A, 2 digital inputs 24 VDC sink (can be used as trigger inputs), 1 digital output 24 VDC, 0.5 A, LEDs for status display	1236
80SD100XD.C044-01	ACOPOSmicro stepper motor module, X2X Link connection, 24-64 VDC \pm 25% supply, 2 motor connections, 10 A, 2 x 24 V incremental encoder, 2 digital inputs 24 VDC sink (can be used as trigger inputs), 1 digital output 24 VDC, 0.5 A, LEDs for status display	1238
80SD100XS.C04X-01	ACOPOSmicro stepper motor module, X2X Link connection, 24-64 VDC \pm 25% supply, 1 motor connection, 10 A, 1 x 24 V incremental encoder, 2 digital inputs 24 VDC sink (can be used as trigger inputs), 1 digital output 24 VDC, 0.5 A, LEDs for status display	1240

ACOPOSmicro power supply module



Model number	Short description	
80PS080X3.10-01	Power supply, X2X, 24 VDC, 36 - 80 VDC, 1 kW	1242

Accessories

Short description	
Terminal blocks	1244
Prefabricated cables	1248

Stepper motor modules in other product families

X20 System



Model number	Short description	
X20SM1426	X20 stepper motor module, 24 VDC supply, 1 x motor connection, 1 A, 1.2 A max., 4 x digital input 24 VDC, sink, can be used as incremental encoders	324
X20SM1436	X20 stepper motor module, 24 - 39 VDC \pm 25% supply, 1 x motor connection, 3 A, 3.5 A max., 4 x digital input 24 VDC, sink, can be used as incremental encoders	326

X67 System



Model number	Short description	
X67SM2436	X67 stepper motor module, 18 - 48 VDC supply, 8 A max., 2 motor connections, 3 A, 5 A max., 2 x 3 digital inputs 24 VDC, sink, can be used as 2 incremental encoders	492
X67SM4320	X20 stepper motor module, 24 - 39 VDC \pm 25% supply, 1 x motor connection, 3 A, 3.5 A max., 4 x digital input 24 VDC, sink, can be used as incremental encoders	494

Stepper motor module

X2X Link, 2 channels



- Control for 2 stepper motors (2-phase bipolar, full bridge)
- 256 microsteps per step
- 2 trigger inputs
- Motor holding brake connection
- Enable input
- Automatic motor detection
- Holding, boost and continuous current can be defined independent of one another

Short description	80SD100XD.C0XX-01
Stepper motor module	Connection for two stepper motors (each 2-phase bipolar, full bridge)
Motor connector	80SD100XD.C0XX-01
Amount	2
Rated voltage	24 - 64 VDC \pm 25%
Rated current	10 A
Maximum current / motor	15 A
Maximum current / module	30 A
Controller frequency	38.5 kHz
Step resolution	256 microsteps per step
Motor brake connection	80SD100XD.C0XX-01
Continuous current	0.5 A
Rated voltage	24 VDC
Protective measures	Overload / short-circuit protection
Maximum switching frequency	100 Hz
Trigger inputs	80SD100XD.C0XX-01
Amount	2
Rated voltage	24 VDC
Input filter	
Hardware	<10 μ s
Input circuit	Sink
Enable input	80SD100XD.C0XX-01
Amount	1
Rated voltage	24 VDC
Input circuit	Sink
X2X Link interface	80SD100XD.C0XX-01
Design	4-pin plug
Minimum cycle time on the X2X bus	250 μ s
Power element supply	80SD100XD.C0XX-01
Input voltage	24 - 64 VDC (\pm 25%)
Undervoltage cut-off	<18 VDC
Overvoltage cut-off	>95 VDC
Voltage measurement	Yes
Line protection	Must be implemented externally
24 VDC supply	80SD100XD.C0XX-01
Input voltage	24 VDC (\pm 25%)
Power consumption	
CPU	6.0 W
X2X Link supply	0.0 W (generated internally from the CPU supply)
Voltage monitoring	Yes

General information		80SD100XD.C0XX-01
Status indicators	X2X bus function, operating status, module status, module information	
Diagnostics		
Module run/error	Yes, with status LED and software status	
X2X Link	Yes, with status LED	
Motor status	Yes, with status LED and software status	
Module / cooling unit temperature	Yes, with software status	
Electrical isolation from the CPU		
X2X Link	Yes	
Trigger inputs	Yes	
Enable input	Yes	
Motor holding brake	No	
Power element (supply, motor connection)	Yes	
Certification	CE, C-UL-US (in development), GOST-R	
Operational conditions		80SD100XD.C0XX-01
Operating temperature	0°C to 45°C	
Relative humidity	5 to 85%, non-condensing	
Degree of pollution according to EN 60664-1	2 (non-conductive material)	
Protection type	IP20	
Storage and transport conditions		80SD100XD.C0XX-01
Temperature	-25°C to +55°C	
Relative humidity	5 to 95%, non-condensing	
Mechanical characteristics		80SD100XD.C0XX-01
Dimensions (W x H x D)	65 x 134 x 95 mm (without mounting plate or ColdPlate)	
Mounting / cooling	Screw mounting with heat spreader on mounting plate or ColdPlate	
Comment	Please order terminal blocks separately!	

Required accessories			
0TB1110.8010	Accessory terminal block (3.5), 10-pin screw clamp, 1.5 mm ² , protected against vibration by the screw flange		1718
0TB1110.8110	Accessory terminal block (3.5), 10-pin cage clamp, 1.5 mm ² , protected against vibration by the screw flange		1718
0TB1310.3100	Accessory terminal block (3.5), 3 x 10-pin cage clamp, 1.5 mm ² , protected against vibration by the screw flange		1246
0TB2105.4021	Accessory terminal block (5.08), 5-pin, AX1-coded, SL screw clamp 2.5 mm ²		1244
0TB2105.4022	Accessory terminal block (5.08), 5-pin, AX2-coded, SL screw clamp 2.5 mm ²		1244
0TB2105.4121	Accessory terminal block (5.08), 5-pin, AX1-coded, SL cage clamp 2.5 mm ²		1244
0TB2105.4122	Accessory terminal block (5.08), 5-pin, AX2-coded, SL cage clamp 2.5 mm ²		1244
0TB2105.9021	Accessory terminal block (5.08), 5-pin, DC-coded, BL screw clamp 2.5 mm ²		1245
0TB2105.9121	Accessory terminal block (5.08), 5-pin, DC-coded, BL cage clamp 2.5 mm ²		1245
X20CA0X48.0010	X2X Link device attachment cable, 1.0 m		1248
X20CA0X48.0020	X2X Link device attachment cable, 2.0 m		1248
X20CA0X68.0003	X2X Link device connection cable, 0.3 m		1248
X20CA0X68.0010	X2X Link device connection cable, 1.0 m		1248

Key: BL ... Female multipoint connector; SL ... Multipoint connector

Stepper motor module X2X Link, 1 channel



- Control for 1 stepper motor (2-phase bipolar, full bridge)
- 256 microsteps per step
- 2 trigger inputs
- Motor holding brake connection
- Enable input
- Automatic motor detection
- Holding, boost and continuous current can be defined independent of one another

Short description	80SD100XS.C0XX-01
Stepper motor module	Connection for one stepper motor (2-phase bipolar, full bridge)
Motor connector	80SD100XS.C0XX-01
Amount	1
Rated voltage	24 - 64 VDC \pm 25%
Rated current	10 A
Maximum current / motor	15 A
Controller frequency	38.5 kHz
Step resolution	256 microsteps per step
Motor brake connection	80SD100XS.C0XX-01
Continuous current	0.5 A
Rated voltage	24 VDC
Protective measures	Overload / short-circuit protection
Maximum switching frequency	100 Hz
Trigger inputs	80SD100XS.C0XX-01
Amount	2
Rated voltage	24 VDC
Input filter	
Hardware	< 10 μ s
Input circuit	Sink
Enable input	80SD100XS.C0XX-01
Amount	1
Rated voltage	24 VDC
Input circuit	Sink
X2X Link interface	80SD100XS.C0XX-01
Design	4-pin plug
Minimum cycle time on the X2X bus	250 μ s
Power element supply	80SD100XS.C0XX-01
Input voltage	24 - 64 VDC (\pm 25%)
Undervoltage cut-off	< 18 VDC
Overvoltage cut-off	> 95 VDC
Voltage measurement	Yes
Line protection	Must be implemented externally
24 VDC supply	80SD100XS.C0XX-01
Input voltage	24 VDC (\pm 25%)
Power consumption	
CPU	6.0 W
X2X Link supply	0.0 W (generated internally from the CPU supply)
Voltage monitoring	Yes

General information	80SD100XS.C0XX-01
Status indicators	X2X bus function, operating status, module status, module information
Diagnostics	
Module run/error	Yes, with status LED and software status
X2X Link	Yes, with status LED
Motor status	Yes, with status LED and software status
Module / cooling unit temperature	Yes, with software status
Electrical isolation from the CPU	
X2X Link	Yes
Trigger inputs	Yes
Enable input	Yes
Motor holding brake	No
Power element (supply, motor connection)	Yes
Certification	CE, C-UL-US (in development), GOST-R
Operational conditions	80SD100XS.C0XX-01
Operating temperature	0°C to 45°C
Relative humidity	5 to 85%, non-condensing
Degree of pollution according to EN 60664-1	2 (non-conductive material)
Protection type	IP20
Storage and transport conditions	80SD100XS.C0XX-01
Temperature	-25°C to +55°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	80SD100XS.C0XX-01
Dimensions (W x H x D)	65 x 134 x 95 mm (without mounting plate or ColdPlate)
Mounting / cooling	Screw mounting with heat spreader on mounting plate or ColdPlate
Comment	Please order terminal blocks separately!

Required accessories			
0TB1110.8010	Accessory terminal block (3.5), 10-pin screw clamp, 1.5 mm ² , protected against vibration by the screw flange		1718
0TB1110.8110	Accessory terminal block (3.5), 10-pin cage clamp, 1.5 mm ² , protected against vibration by the screw flange		1718
0TB1310.3100	Accessory terminal block (3.5), 3 x 10-pin cage clamp, 1.5 mm ² , protected against vibration by the screw flange		1246
0TB2105.4021	Accessory terminal block (5.08), 5-pin, AX1-coded, SL screw clamp 2.5 mm ²		1244
0TB2105.4121	Accessory terminal block (5.08), 5-pin, AX1-coded, SL cage clamp 2.5 mm ²		1244
0TB2105.9021	Accessory terminal block (5.08), 5-pin, DC-coded, BL screw clamp 2.5 mm ²		1245
0TB2105.9121	Accessory terminal block (5.08), 5-pin, DC-coded, BL cage clamp 2.5 mm ²		1245
X20CA0X48.0010	X2X Link device attachment cable, 1.0 m		1248
X20CA0X48.0020	X2X Link device attachment cable, 2.0 m		1248
X20CA0X68.0003	X2X Link device connection cable, 0.3 m		1248
X20CA0X68.0010	X2X Link device connection cable, 1.0 m		1248

Key: BL ... Female multipoint connector; SL ... Multipoint connector

Stepper motor module

X2X Link, 2 channels, 2 incremental encoder inputs



- Control for 2 stepper motors (2-phase bipolar, full bridge)
- 256 microsteps per step
- 2 incremental encoder inputs
- 2 trigger inputs
- Motor holding brake connection
- Enable input
- Automatic motor detection
- Holding, boost and continuous current can be defined independent of one another

Short description	80SD100XD.C044-01
Stepper motor module	Connection for two stepper motors (each 2-phase bipolar, full bridge)
Motor connector	80SD100XD.C044-01
Amount	2
Rated voltage	24 - 64 VDC \pm 25%
Rated current	10 A
Maximum current / motor	15 A
Maximum current / module	30 A
Controller frequency	38.5 kHz
Step resolution	256 microsteps per step
Motor brake connection	80SD100XD.C044-01
Continuous current	0.5 A
Rated voltage	24 VDC
Protective measures	Overload / short-circuit protection
Maximum switching frequency	100 Hz
Incremental encoder	80SD100XD.C044-01
Amount	2
Encoder inputs	24 V, asymmetrical
Counter size	16-bit
Input frequency	Max. 100 kHz
Evaluation	4x
Encoder supply	Module-internal, max. 2 x 40 mA
Trigger inputs	80SD100XD.C044-01
Amount	2
Rated voltage	24 VDC
Input filter	
Hardware	<10 μ s
Input circuit	Sink
Enable input	80SD100XD.C044-01
Amount	1
Rated voltage	24 VDC
Input circuit	Sink
X2X Link interface	80SD100XD.C044-01
Design	4-pin plug
Minimum cycle time on the X2X bus	250 μ s
Power element supply	80SD100XD.C044-01
Input voltage	24 - 64 VDC (\pm 25%)
Undervoltage cut-off	<18 VDC
Overvoltage cut-off	>95 VDC
Voltage measurement	Yes
Line protection	Must be implemented externally
24 VDC supply	80SD100XD.C044-01
Input voltage	24 VDC (\pm 25%)
Power consumption	
CPU	8.0 W
X2X Link supply	0.0 W (generated internally from the CPU supply)
Voltage monitoring	Yes

General information		80SD100XD.C044-01
Status indicators		X2X bus function, operating status, module status, module information
Diagnostics		
Module run/error		Yes, with status LED and software status
X2X Link		Yes, with status LED
Motor status		Yes, with status LED and software status
Module / cooling unit temperature		Yes, with software status
Electrical isolation from the CPU		
X2X Link		Yes
Trigger inputs		Yes
Enable input		Yes
Motor holding brake		No
Power element (supply, motor connection)		Yes
Incremental encoder		No
Certification		CE, C-UL-US (in development), GOST-R
Operational conditions		80SD100XD.C044-01
Operating temperature		0°C to 45°C
Relative humidity		5 to 85%, non-condensing
Degree of pollution according to EN 60664-1		2 (non-conductive material)
Protection type		IP20
Storage and transport conditions		80SD100XD.C044-01
Temperature		-25°C to +55°C
Relative humidity		5 to 95%, non-condensing
Mechanical characteristics		80SD100XD.C044-01
Dimensions (W x H x D)		65 x 134 x 95 mm (without mounting plate or ColdPlate)
Mounting / cooling		Screw mounting with heat spreader on mounting plate or ColdPlate
Comment		Please order terminal blocks separately!

Required accessories			
0TB1110.8010	Accessory terminal block (3.5), 10-pin screw clamp, 1.5 mm ² , protected against vibration by the screw flange		1718
0TB1110.8110	Accessory terminal block (3.5), 10-pin cage clamp, 1.5 mm ² , protected against vibration by the screw flange		1718
0TB1310.3100	Accessory terminal block (3.5), 3 x 10-pin cage clamp, 1.5 mm ² , protected against vibration by the screw flange		1246
0TB2105.4021	Accessory terminal block (5.08), 5-pin, AX1-coded, SL screw clamp 2.5 mm ²		1244
0TB2105.4022	Accessory terminal block (5.08), 5-pin, AX2-coded, SL screw clamp 2.5 mm ²		1244
0TB2105.4121	Accessory terminal block (5.08), 5-pin, AX1-coded, SL cage clamp 2.5 mm ²		1244
0TB2105.4122	Accessory terminal block (5.08), 5-pin, AX2-coded, SL cage clamp 2.5 mm ²		1244
0TB2105.9021	Accessory terminal block (5.08), 5-pin, DC-coded, BL screw clamp 2.5 mm ²		1245
0TB2105.9121	Accessory terminal block (5.08), 5-pin, DC-coded, BL cage clamp 2.5 mm ²		1245
X20CA0X48.0010	X2X Link device attachment cable, 1.0 m		1248
X20CA0X48.0020	X2X Link device attachment cable, 2.0 m		1248
X20CA0X68.0003	X2X Link device connection cable, 0.3 m		1248
X20CA0X68.0010	X2X Link device connection cable, 1.0 m		1248

Key: BL ... Female multipoint connector; SL ... Multipoint connector

Stepper motor module

X2X Link, 1 channel, 1 incremental encoder input



- Control for 1 stepper motor (2-phase bipolar, full bridge)
- 256 microsteps per step
- 1 incremental encoder input
- 2 trigger inputs
- Motor holding brake connection
- Enable input
- Automatic motor detection
- Holding, boost and continuous current can be defined independent of one another

Short description	80SD100XS.C04X-01
Stepper motor module	Connection for one stepper motor (each 2-phase bipolar, full bridge)
Motor connector	80SD100XS.C04X-01
Amount	1
Rated voltage	24 - 64 VDC \pm 25%
Rated current	10 A
Maximum current / motor	15 A
Controller frequency	38.5 kHz
Step resolution	256 microsteps per step
Motor brake connection	80SD100XS.C04X-01
Continuous current	0.5 A
Rated voltage	24 VDC
Protective measures	Overload / short-circuit protection
Maximum switching frequency	100 Hz
Incremental encoder	80SD100XS.C04X-01
Amount	1
Encoder inputs	24 V, asymmetrical
Counter size	16-bit
Input frequency	Max. 100 kHz
Evaluation	4x
Encoder supply	Module-internal, max. 40 mA
Trigger inputs	80SD100XS.C04X-01
Amount	2
Rated voltage	24 VDC
Input filter	
Hardware	<10 μ s
Input circuit	Sink
Enable input	80SD100XS.C04X-01
Amount	1
Rated voltage	24 VDC
Input circuit	Sink
X2X Link interface	80SD100XS.C04X-01
Design	4-pin plug
Minimum cycle time on the X2X bus	250 μ s
Power element supply	80SD100XS.C04X-01
Input voltage	24 - 64 VDC (\pm 25%)
Undervoltage cut-off	<18 VDC
Overvoltage cut-off	>95 VDC
Voltage measurement	Yes
Line protection	Must be implemented externally
24 VDC supply	80SD100XS.C04X-01
Input voltage	24 VDC (\pm 25%)
Power consumption	
CPU	7.0 W
X2X Link supply	0.0 W (generated internally from the CPU supply)
Voltage monitoring	Yes

General information		80SD100XS.C04X-01
Status indicators		X2X bus function, operating status, module status, module information
Diagnostics		
Module run/error		Yes, with status LED and software status
X2X Link		Yes, with status LED
Motor status		Yes, with status LED and software status
Module / cooling unit temperature		Yes, with software status
Electrical isolation from the CPU		
X2X Link		Yes
Trigger inputs		Yes
Enable input		Yes
Motor holding brake		No
Power element (supply, motor connection)		Yes
Incremental encoder		No
Certification		CE, C-UL-US (in development), GOST-R
Operational conditions		80SD100XS.C04X-01
Operating temperature		0°C to 45°C
Relative humidity		5 to 85%, non-condensing
Degree of pollution according to EN 60664-1		2 (non-conductive material)
Protection type		IP20
Storage and transport conditions		80SD100XS.C04X-01
Temperature		-25°C to +55°C
Relative humidity		5 to 95%, non-condensing
Mechanical characteristics		80SD100XS.C04X-01
Dimensions (W x H x D)		65 x 134 x 95 mm (without mounting plate or ColdPlate)
Mounting / cooling		Screw mounting with heat spreader on mounting plate or ColdPlate
Comment		Please order terminal blocks separately!

Required accessories			
0TB1110.8010	Accessory terminal block (3.5), 10-pin screw clamp, 1.5 mm ² , protected against vibration by the screw flange		1718
0TB1110.8110	Accessory terminal block (3.5), 10-pin cage clamp, 1.5 mm ² , protected against vibration by the screw flange		1718
0TB1310.3100	Accessory terminal block (3.5), 3 x 10-pin cage clamp, 1.5 mm ² , protected against vibration by the screw flange		1246
0TB2105.4021	Accessory terminal block (5.08), 5-pin, AX1-coded, SL screw clamp 2.5 mm ²		1244
0TB2105.4022	Accessory terminal block (5.08), 5-pin, AX2-coded, SL screw clamp 2.5 mm ²		1244
0TB2105.9021	Accessory terminal block (5.08), 5-pin, DC-coded, BL screw clamp 2.5 mm ²		1245
0TB2105.9121	Accessory terminal block (5.08), 5-pin, DC-coded, BL cage clamp 2.5 mm ²		1245
X20CA0X48.0010	X2X Link device attachment cable, 1.0 m		1248
X20CA0X48.0020	X2X Link device attachment cable, 2.0 m		1248
X20CA0X68.0003	X2X Link device connection cable, 0.3 m		1248
X20CA0X68.0010	X2X Link device connection cable, 1.0 m		1248

Key: BL ... Female multipoint connector; SL ... Multipoint connector

Power supply unit



- Input: 3 x 400 - 480 VAC
- Output voltage can be adjusted via X2X Link
- Status information can be read via X2X Link
- Chopper output for connecting an external braking resistor
- Three-phase wide range input
- Closed metal housing

DC power supply input unit	80PS080X3.10-01
Input voltage range	3 x 400 - 480 VAC $\pm 15\%$
Frequency range of mains voltage	50 - 60 Hz $\pm 5\%$
DC power supply output unit	80PS080X3.10-01
Output voltage (can be adjusted via X2X communication)	Rated current
36 - 60 VDC	16.5 A
61 - 80 VDC	13.5 A
Output power	Max. 1000 W continuous power
Output protection	Short-circuit, overload and open circuit protection
Power back immunity	Yes, <100 VDC
Additional 24VDC output	80PS080X3.10-01
Voltage range	24 VDC $\pm 10\%$ / 2 A
Output protection	Short-circuit, overload and open circuit protection
Electrical isolation	
from primary output 36 - 80 VDC	Yes
from communication interface	No
Communication interface	80PS080X3.10-01
Application interface	X2X Link
Minimum cycle time on the X2X bus	400 μ s
Design	X2X Link plug
Electrical isolation	Yes
Chopper output	80PS080X3.10-01
Response threshold for chopper activation	
Can be configured via X2X Link	48 - 95 VDC
Output current / Output power	
Continuous current / Continuous power	TBD
Maximum current / Maximum power	TBD
Over-temperature protection (chopper-internal)	Yes
General	80PS080X3.10-01
Status LEDs	Yes
Housing	Stable metal housing
Protection type	IP20
Operational conditions	80PS080X3.10-01
Operating temperature	TBD
Relative humidity	5 to 95%, non-condensing
Storage and transport conditions	80PS080X3.10-01
Temperature	-25°C to +85°C
Relative humidity	Max. 95%, non-condensing



Terminal blocks

This single-row 5-pin terminal block TB2105 is used for the motor connection to the ACOPOSmicro.



Brief overview	0TB2105.4021	0TB2105.4121
Number of pins	5	5
Coding	AX1	AX1
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	5.08 mm	5.08 mm
Contact resistance	≤2 mΩ	≤5 mΩ
Rated voltage	300 V	300 V
Rated current ¹⁾	15 A / contact	15 A / contact
Connection cross section		
AWG wire	24 - 12 AWG	26 - 12 AWG
Solid wire line	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line with wire tip sleeves	0.25 - 2.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.25 - 2.50 mm ²	0.20 - 1.50 mm ²
Cable type	Only copper wires (no aluminum wires!)	Only copper wires (no aluminum wires!)
Comment	Rated values according to UL	Rated values according to UL
Brief overview	0TB2105.4022	0TB2105.4122
Number of pins	5	5
Coding	AX2	AX2
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	5.08 mm	5.08 mm
Contact resistance	≤2 mΩ	≤5 mΩ
Rated voltage	300 V	300 V
Rated current ¹⁾	15 A / contact	15 A / contact
Connection cross section		
AWG wire	24 - 12 AWG	26 - 12 AWG
Solid wire line	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line with wire tip sleeves	0.25 - 2.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.25 - 2.50 mm ²	0.20 - 1.50 mm ²
Cable type	Only copper wires (no aluminum wires!)	Only copper wires (no aluminum wires!)
Comment	Rated values according to UL	Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

This single row 5-pin terminal block TB2105 is used to connect the power supply to the ACOPOSmicro.



Brief overview	0TB2105.9021	0TB2105.9121
Number of pins	5	5
Coding	DC	DC
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	5.08 mm	5.08 mm
Contact resistance	$\leq 2 \text{ m}\Omega$	$\leq 5 \text{ m}\Omega$
Rated voltage	300 V	300 V
Rated current ¹⁾	15 A / contact	15 A / contact
Connection cross section		
AWG wire	24 - 12 AWG	26 - 12 AWG
Solid wire line	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line with wire tip sleeves	0.25 - 2.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.25 - 2.50 mm ²	0.20 - 1.50 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Rated values according to UL	Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

Terminal blocks

The three-row 30-pin terminal block TB1310 is used to connect the I/Os and the CPU supply to the ACOPOSmicro.



Brief overview	0TB1310.3100
Number of pins	30
Type of terminal	Cage clamps
Distance between contacts	3.5 mm
Contact resistance	$\leq 4.2 \text{ m}\Omega$
Rated voltage	300 V
Rated current ¹⁾	10 A / contact
Connection cross section	
AWG wire	26 - 14 AWG
Solid wire line	0.20 - 1.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.50 mm ²
Cable type	Only copper wires (no aluminum wires!)
Comment	Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.



Prefabricated cables

ACOPOSmicro connection cable X2X to X2X



Length	Connection cable Model number	Short description
0.3 m	X20CA0X68.0003	X2X Link device connection cable, 0.3 m
1.0 m	X20CA0X68.0010	X2X Link device connection cable, 1.0 m

ACOPOSmicro attachment cable X2X - open



Length	Attachment cable Model number	Short description
1.0 m	X20CA0X48.0010	X2X Link device attachment cable, 1.0 m
2.0 m	X20CA0X48.0020	X2X Link device attachment cable, 2.0 m





ACOPOS Intelligent servo drives

Increased production volume, reduced production cycles, and improved quality with greater precision become a reality with ACOPOS servo drives.

Table of contents

System characteristics		1254
Typical topologies		1261
Product overview		1266
Product data sheets		1270
Accessories		1314

System characteristics

High-performance servo drive concept

The ACOPOS servo drive family is an important component of the complete automation solutions provided by B&R. Industry-specific functions and intuitive tools form the basis for short development times.

An important criteria for the performance of an automation solution is a fast and precise reaction to events dependent on the application or sudden changes in the production process. Therefore, ACOPOS servo drives work with very short scan times and communication cycles of 400 μ s, which only amount to 50 μ s in the control loop.

More room for innovation

The successful application of ACOPOS servo drives in the following industries demonstrates the impressive innovative power of their pioneering design: performance and function coupled with user-friendliness.

- Packaging industry
- Handling technology
- Plastics processing
- Paper and printing
- Textile industry
- Wood industry
- Metal working industry
- Semiconductor industry



Outstanding quality, robust and secure

The ACOPOS servo family was tested thoroughly during the development phase. Under difficult conditions, such as heavy vibrations or increased temperatures, the devices were subject to loads that greatly exceed the values that occur in normal everyday operation.

EMC was given special attention to facilitate use in a rough industrial environment. Field tests have been carried out under difficult conditions in addition to the tests defined in the standard. The results confirm the excellent values measured by the testing laboratory and during operation. The necessary filters, which meet CE guidelines, are also integrated in the device. Using computer-aided models, the thermal behavior of the entire system is pre-calculated based on measured currents and temperatures. This results in maximum performance by taking advantage of the system's full capabilities. ACOPOS servo drives use the information on the motor's embedded parameter chip, which contains all relevant mechanical and electronic data. The work-intensive and error-prone task of manually setting parameters is no longer necessary and start-up times are substantially reduced. During service, relevant data can be requested and the cause of problems that may exist can be determined.

The ACOPOS servo family is also available with partially-coated circuit boards. These versions are - with identical specifications - more robust in regard to environmental influences such as dust, aggressive vapors or moisture.



ACOPOS plug-in modules

Modular and precise with communication options

The I/O points needed to operate a servo axis are part of the standard equipment for ACOPOS servo drives. The user is provided two trigger inputs for tasks requiring precise measurements or print mark control.

Further configuration of the ACOPOS servo drive to meet the respective application-specific demands takes place using plug-in modules. Plug-in modules are available to make network connections with other drives, controllers and visualization devices as well as for the connection of encoders, sensors and actuators. Additionally, CPU modules for controller and drive integration are also available for drive-based automation.

Parameter	Default Name	ID	Value	Unit
Encoder1 interface Type	ENCOD1_TYPE	97	9	
Encoder1 scaling: increments per 1SCALE_ENCDD_MOTOR	SCALE_ENCDD_MCR1	108	16388	
Encoder1 Poles per encoder revolution	ENCOD1_POLEPAIRS	203		
SSI absolute Encoder Slot 3				
Encoder2 interface Type	ENCOD2_TYPE	98	6	
Encoder2 scaling: increments per encoder revolution	SCALE_ENCDD2_MCR1	209	0	
SSI encoder2 Number of leading zeros	ENCOD2_SSI_LEADING_BITS	241	0	
SSI encoder2 Number of data bits	ENCOD2_SSI_DATA_BITS	242	0	
SSI encoder2 Data code (noDRIVE/NOSENSOR)	ENCOD2_SSI_CODE	243	0	
SSI encoder2 Parity check (noDRIVE/NOSENSOR)	ENCOD2_SSI_PARITY_CHK	244	0	
BMS43L ED 30 - New 03				
General parameters:				
Motor Type	MOTOR_TYPE	30	04P02	
Motor Software Compatibility	MOTOR_COMPATIBILITY	31	040201	
Motor winding connection	MOTOR_WIND_CONNECT	46	1	
Motor Number of poles	MOTOR_POLEPAIRS	47	3	
Scale parameters:				
Motor holding brake Rated current	MOTOR_BRAKE_CURR_RATED	42	0	A
Motor holding brake Rated torque	MOTOR_BRAKE_TORQ_RATED	43	0	Nm
Motor holding brake Engaging Delay	MOTOR_BRAKE_ON_TIME	44	0	s
Motor holding brake Release Delay	MOTOR_BRAKE_OFF_TIME	45	0	s
Thermocou sensor parameters:				
Motor temperature sensor Parameter1	MOTOR_TEMPSENS_PWM1	64	833	
Motor temperature sensor Parameter2	MOTOR_TEMPSENS_PWM2	65	2225	
Motor temperature sensor Parameter3	MOTOR_TEMPSENS_PWM3	66	30	

Configuring instead of programming

ACOPOS servo drives can be configured for demanding positioning tasks such as electronic gears or cam profiles. Based on long-term cooperation with customers from all over the world, B&R shares its know-how in the form of compact function blocks for many applications. Industry-specific functionality can be quickly and easily implemented in an application program.

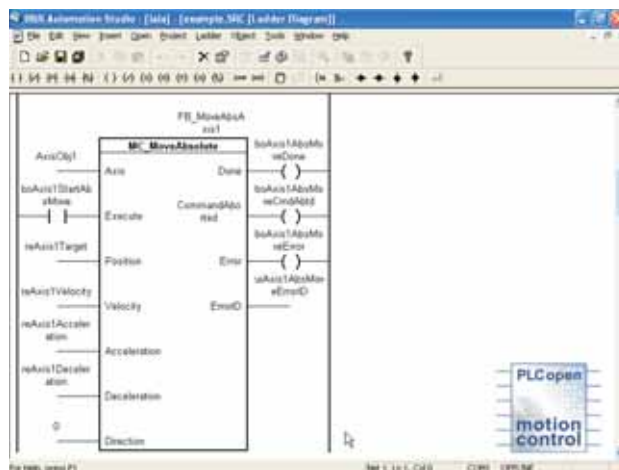
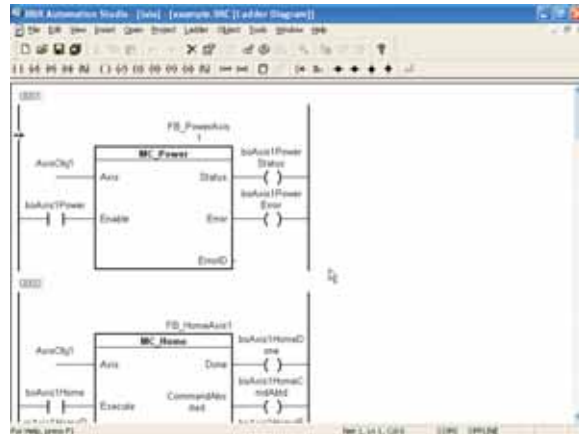
System characteristics

PLCopen motion control function blocks

Motion control is one of the central themes in automation technology. This is partly due to its high portion of the entire automation expenses and the resulting savings potential.

The PLCopen motion control function blocks (conforming to IEC 61131-3) support the user when implementing these possibilities by providing vendor-independence and reducing development times. The user can choose between the programming languages Ladder Diagram (LD), Structured Text (ST) and the high-level language "C".

The function range of the function blocks is divided into the areas of single and multi-axis movements. In addition to the usual relative and absolute movements, the first of the two areas also includes the possibility of overlapping movements. In the area of multi-axis movements, functions such as gears, cam profile functions, up/down synchronization and differential gear (changing phase angles) are supported.





Higher productivity with smart process technology

Smart process technology meets the customer's need for cost-effective solutions and high production speeds. This freely configurable technology library is seamlessly integrated into the existing motion control product.

Using indirect process parameters makes it possible to eliminate sensors, which are often not fast enough to keep up with high production speeds. Synchronous processing and short response times make it possible to achieve excellent productivity and precision. For example, highly efficient and intelligent decentralized units allow seamless quality control. In the field, this significantly reduces cycle times while improving component quality.

This meets the requirements of modern motion control products such as high product quality, machine productivity along with short maintenance and down times and, to a greater extent, seamless quality control during production.



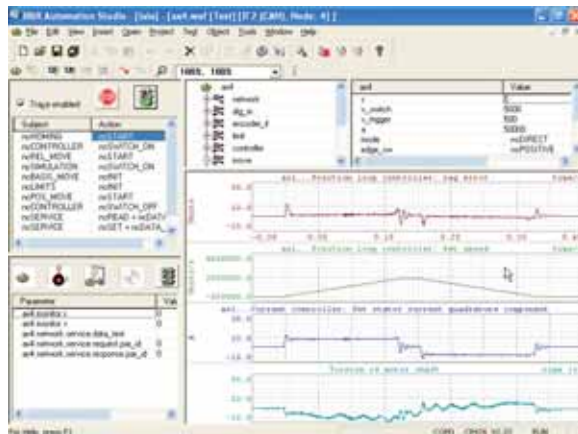
ACOPOS also perfectly suited for CNC applications

The integrated "Soft" CNC system from B&R unites all of the software components necessary for machine automation on a 64-bit processor platform. It provides sufficient computing power for complex processing machines. The integrated system architecture, together with ACOPOS servo drives, provides many opportunities regarding reaction speed, data throughput and precision, and also allows cost savings to be made.

- Uniformly integrated ACOPOS servo drive technology
- Powerful and fast-reacting
- Unlimited flexibility of PLC and CNC systems provides room for automation ideas
- 8 independent CNC channels
- Up to a total of 100 axes for positioning, CNC, electronic gears
- Individual graphic interface
- Nearly unlimited system memory for programs, diagnostics and process data
- Internet or intranet connection for inspection or remote maintenance

Leading manufacturers of water jet, laser and torch cutting production technologies are already utilizing these technological advantages.

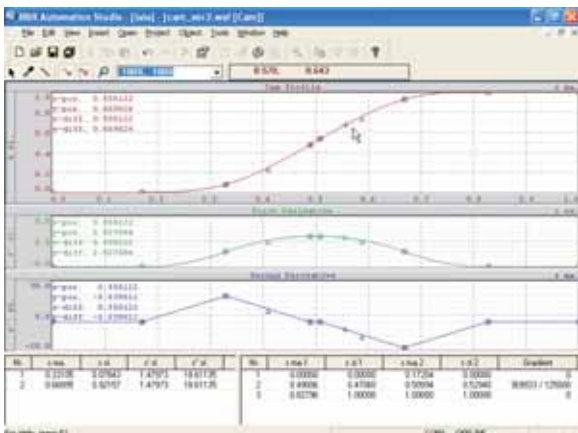
System characteristics



Quick and easy commissioning

All B&R products are programmed in a uniform manner using B&R Automation Studio with the Windows look and feel. Complex drive solutions can be created after a short orientation period. Adding hardware components and program sections, as well as their configuration, is done in dialog boxes; this reduces project development times considerably.

Axis movements can be checked without programming using NC Test. All types of movements, ranging from point-to-point to gear functions, can be carried out interactively. The reaction of the axis can be seen online in the monitor window. The trace function records relevant drive data for clear evaluation.



Tools for straightforward and efficient diagnostics

The drive is monitored in real-time using the oscilloscope function. Many trigger possibilities generate informative data for analyzing the movement during operation. The graphic display allows the user to make fine adjustments and optimizations of the movement in the microsecond range. The integration of powerful tools, such as the cam editor, reduces programming for complex coupled movements to simple drag-and-drop procedures. The results and effects on speed, acceleration and jolt can be immediately analyzed graphically.

ACOPOS servo drives

Controlling your power transmission system with ACOPOS™ servo drives from B&R allows you to fully use the advantages of an optimized system architecture. Applications that require additional positioning tasks such as torque limitation or torque control can be created quickly and elegantly. The flexible system concept for B&R servo drives is achieved using matched hardware and software components. You can select the optimal system configuration for your application and increase your competitiveness.

- Perfect integration in all B&R product families
- Object-oriented axis programming minimizes development time and increases reusability
- Integrated technology functions for industry-specific tasks
- Operation of synchronous and induction motors possible
- Current controller scan time up to 50µs
- Reduced commissioning and service times using "embedded motor parameter chip"
- CAN bus and POWERLINK network connection
- Input voltage range from 400 - 480 VAC (±10 %) for many areas of use
- Connection possibilities for all standard encoder systems
- Up to two free slots for optional technology modules
- Electronic secure restart inhibit integrated
- Optionally available as version with partially-coated circuit boards - more robust in regard to environmental influences

Overview

The ACOPOS servo drive series covers a current range from 1.0 to 128 A and a power range from 0.5 to 64 kW with 11 devices in 4 groups. They offer connection possibilities for all standard encoder systems and modular fieldbus interfaces. ACOPOS servo drives are suitable for both synchronous and induction servo motors and have built-in line filters to meet the limit values for CISPR11, Group 2, Class A.

	8V1010.50-2, 8V1010.501-2 8V1016.50-2, 8V1016.501-2 8V1010.00-2, 8V1010.001-2 8V1016.00-2, 8V1016.001-2	8V1022.00-2, 8V1022.001-2 8V1045.00-2, 8V1045.001-2 8V1090.00-2, 8V1090.001-2	8V1180.00-2, 8V1180.001-2 8V1320.00-2, 8V1320.001-2	8V1640.00-2, 8V1640.001-2 8V128M.00-2, 8V128M.001-2
Power connections	Plug connection	Plug connection	Plug connection	Fixed
Integrated line filter	Yes	Yes	Yes	Yes
Mains failure monitoring	Yes	Yes	Yes	Yes
DC bus connection	Yes	Yes	Yes	Yes
24 VDC supply	External ¹⁾	External ¹⁾	External or internal via DC bus	External or internal via DC bus
24 VDC output	No	No	24 V / 0.5 A	24 V / 0.5 A
Integrated brake chopper	Yes	Yes	Yes	Yes
Internal braking resistor	Yes	Yes	Yes	Yes ²⁾
Connection of External Braking Resistor Possible	No	No	Yes	Yes
Monitored output for motor holding brake	Yes	Yes	Yes	Yes
Monitored input for motor temperature sensor	Yes	Yes	Yes	Yes
Max. number of plug-in modules	3	4	4	4

¹⁾ External DC bus power supply OPS320.1 (24V / 20A) can be used.

²⁾ The braking resistor integrated in the ACOPOS servo drives 1640 and 128M is dimensioned so that it is possible to brake to a stop (in a typical drive situation).

24 VDC supply during power failures

In order to be able to provide the stop function for category 1 according to IEC 60204-1 during a power failure, the 24 VDC supply voltage for the servo drives as well as encoders, sensors and the safety circuit must remain active during the entire stopping procedure. The ACOPOS servo drives recognize a power failure and can immediately initiate active braking of the motor. The brake energy that occurs when braking is returned to the DC bus and the DC bus power supply can use it to create the 24 VDC supply voltage. An external DC bus power supply must be used for ACOPOS servo drives 8V1010 to 8V1090. A DC bus power supply is integrated in ACOPOS servo drives 8V1180 to 8V128M. The ACOPOS servo drives with an integrated DC bus power supply provide the 24 VDC supply for the servo drive and also a 24 VDC output to supply encoders, sensors and the safety circuit. In many cases, it is not necessary to use an uninterruptible power supply (UPS) which is otherwise needed.

Typical topologies

ACOPOS configurations

ACOPOS servo drives include multiple technology-specific functions with performance, flexibility and capability in the field which has been remarkably proven in countless applications. The ACOPOS functions listed below are basic functions which the user can switch between as needed within 400 μ s. Furthermore, manipulations such as changes in product length, print mark control, overlying torque control, brief process adaptations and quality checks can be carried out at any time.

- Point-to-point
- Electronic gears
- Electronic compensation gears
- Cross cutters
- Electronic cam profiles
- Flying saws
- Line shaft
- CNC

ACOPOS servo drives can be used in various configurations depending on the network type and the requirements of the application. The functions listed above are available to the user in each of the topology examples shown.

Reaction speeds are not influenced by the network and control system being used if technology functions are processed directly on the ACOPOS servo drive. Additional sensors and actuators must be integrated in the control and adaptation for more complex processes. In these cases, the level of performance depends mostly on the type of network and control system being used.

The topology examples shown on the following pages provide an overview of the bandwidths which are possible with B&R automation components.

ACOPOS in the POWERLINK network

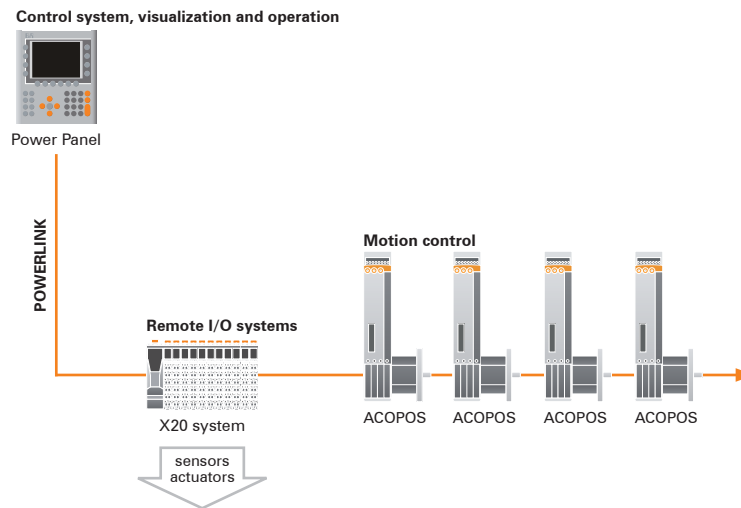
High-performance machine architectures require flexible networks and fieldbuses. With POWERLINK, a network is available to the user that fully meets the high demands of dynamic motion systems. POWERLINK adapts to the requirements of the machine and the system. The rigid coupling of many axes with controllers, industrial PCs, I/O systems and operator panels allows machines and systems to be created with the highest level of precision. Compatibility to standard Ethernet also reduces the number of networks and fieldbuses on the machine level.

Successful areas of use for these topologies:

- Packaging industry
- Handling technology
- Plastics processing
- Paper and printing
- Textile industry
- Wood industry
- Metal working industry
- Semiconductor industry

Compact, modular motion control applications

- Modular machine architecture, up to 100 m distance between the individual axes
- Minimal wiring required due to line structure (no ring)
- No additional infrastructure components needed
- Drive control loop synchronized to the PLC program



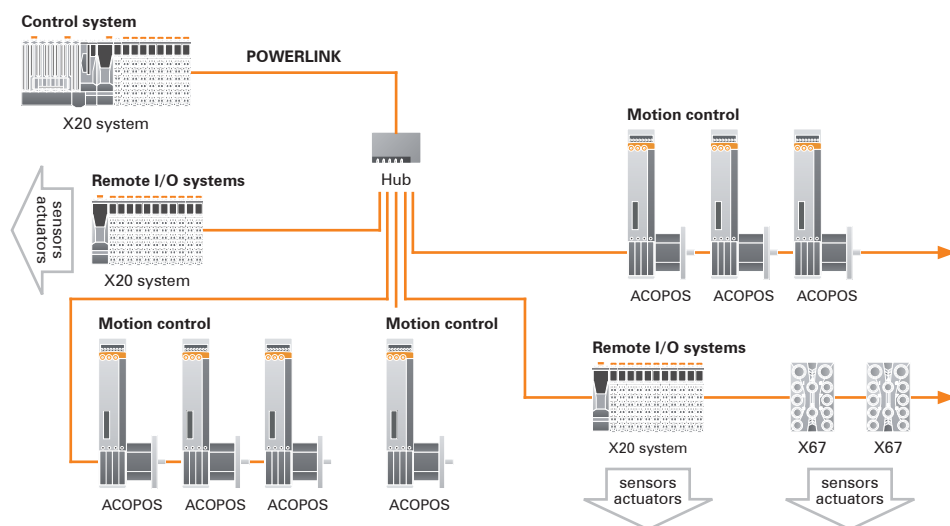
Components and technologies

Control system	Power Panel: Integrated control, operation, and visualization	787
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
Motion control	ACOPOS: Intelligent servo drives	1251
	Synchronous motors: Dynamic precision drives	1459/1585/1645
Remote I/O systems	X20 System: Slice-based I/O and control system	37
Network and fieldbuses	POWERLINK	611

Typical topologies

Extensive, modular motion control applications with up to 253 axes

- Modular machine architecture, up to 100 m distance between the individual axes
- Optimized wiring, due to mixed star-line structure
- Nodes with fast and slow scan rates can be operated within one network. This eliminates the need to divide the network into fast and slow segments.
- Drive control loop synchronized to the PLC program

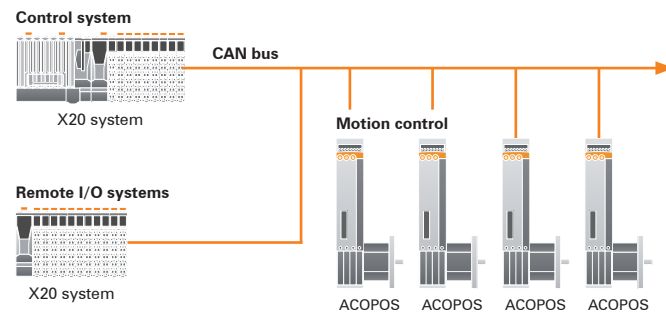


Components and technologies

Control system	X20 System: Slice-based I/O and control system	37	
Motion control	ACOPOS: Intelligent servo drives	1251	
	Synchronous motors: Dynamic precision drives	1459/1585/1645	
Remote I/O systems	X20 System: Slice-based I/O and control system	37	
	X67 System: Remote I/O with IP67 protection	419	
Network and fieldbuses	Inside the machine	POWERLINK	611
	Host/line communication	Ethernet TCP/IP	

ACOPOS in a CAN bus network

The dynamic requirements for small and mid-sized machines with several axes can be handled efficiently using a CAN bus. The CAN bus is a cost-effective fieldbus for networking ACOPOS servo drives with controllers, industrial PCs, I/O systems and operator panels.



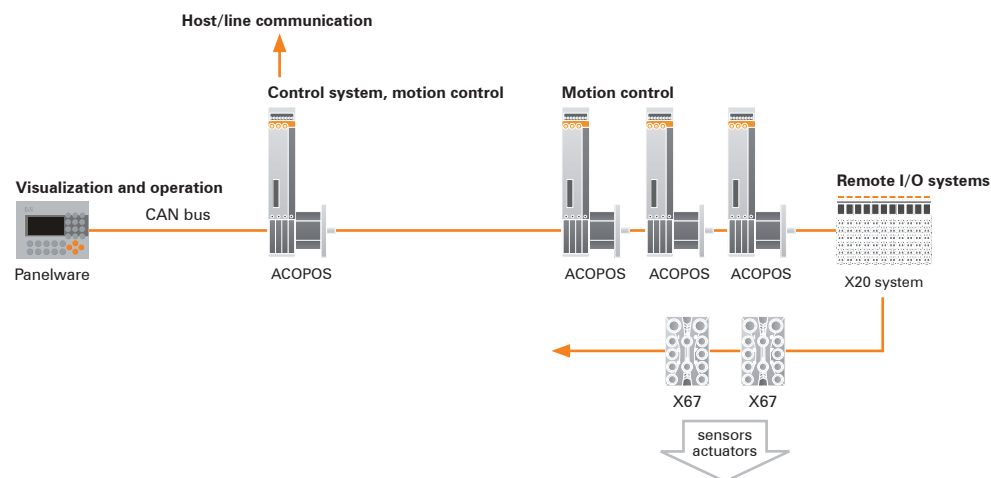
Components and technologies

Control system	X20 System: Slice-based I/O and control system	37
Motion control	ACOPOS: Intelligent servo drives	1251
	Synchronous motors: Dynamic precision drives	1459/1585/1645
Remote I/O systems	X20 System: Slice-based I/O and control system	37
Network and fieldbuses	CAN bus	611

Typical topologies

Drive-based control

The controller is located centrally on an ACOPOS servo drive. The drives are networked and synchronized with each other via the CAN bus. As a result, electronic gear and cam profile applications as well as CNC applications are possible in addition to simple point-to-point movements. Control of the simple operation/visualization is handled by the controller on the ACOPOS servo drive. I/O signals are connected in the switching cabinet or directly in the machine room. By eliminating the need for an external controller, even very limited space can be used optimally.



Components and technologies

Control system	ACOPOS: Intelligent servo drives		1251
Visualization and operation	Panelware: Compact operator panels		773
Motion control	ACOPOS: Intelligent servo drives		1251
	Synchronous motors: Dynamic precision drives		1459/1585/1645
Remote I/O systems	X20 System: Slice-based I/O and control system		37
	X67 System: Remote I/O with IP67 protection		419
Network and fieldbuses	Inside the machine	CAN bus	611
	Host/line communication	Ethernet TCP/IP	



Product overview

ACOPOS servo drives



Model number	Short description	
8V1010.50-2	Servo drive 3x 110-230V / 1x110-230V, 2.0A, 0.45kW, line filter, braking resistor and electronic secure restart inhibit integrated	1270
8V1010.501-2	Servo drive 3x 110-230V / 1x110-230V, 2.0A, 0.45kW, line filter, braking resistor and electronic secure restart inhibit integrated, coated	1270
8V1016.50-2	Servo drive 3x 110-230V / 1x110-230V, 3.2A, 0.7kW, line filter, braking resistor and electronic secure restart inhibit integrated	1270
8V1016.501-2	Servo drive 3x 110-230V / 1x110-230V, 3.2A, 0.7kW, line filter, braking resistor and electronic secure restart inhibit integrated, coated	1270
8V1010.00-2	Servo drive 3x 400-480V 1.0A 0.45kW, line filter, braking resistor and electronic secure restart inhibit integrated	1274
8V1010.001-2	Servo drive 3x 400-480V, 1.0A, 0.45kW, line filter, braking resistor and electronic secure restart inhibit integrated, coated	1274
8V1016.00-2	Servo drive 3x 400-480V, 1.6A, 0.7kW, line filter, braking resistor and electronic secure restart inhibit integrated	1274
8V1016.001-2	Servo drive 3x 400-480V, 1.6A, 0.7kW, line filter, braking resistor and electronic secure restart inhibit integrated, coated	1274



Model number	Short description	
8V1022.00-2	Servo drive 3x 400-480V, 2.2A, 1kW, line filter, braking resistor and electronic secure restart inhibit integrated	1278
8V1022.001-2	Servo drive 3x 400-480V, 2.2A, 1kW, line filter, braking resistor and electronic secure restart inhibit integrated, coated	1278
8V1045.00-2	Servo drive 3x 400-480V, 4.4A, 2kW, line filter, braking resistor and electronic secure restart inhibit integrated	1278
8V1045.001-2	Servo drive 3x 400-480V, 4.4A, 2kW, line filter, braking resistor and electronic secure restart inhibit integrated, coated	1278
8V1090.00-2	Servo drive 3x 400-480V, 8.8A, 4kW, line filter, braking resistor and electronic secure restart inhibit integrated	1278
8V1090.001-2	Servo drive 3x 400-480V, 8.8A, 4kW, line filter, braking resistor and electronic secure restart inhibit integrated, coated	1278



Model number	Short description	
8V1180.00-2	Servo drive 3x 400-480V, 19A, 9kW, line filter, braking resistor, DC bus power supply and electronic secure restart inhibit integrated	1282
8V1180.001-2	Servo drive 3x 400-480V, 34A, 16kW, line filter, braking resistor, DC bus power supply and electronic secure restart inhibit integrated, coated	1282
8V1320.00-2	Servo drive 3x 400-480V, 34A, 16kW, line filter, braking resistor, DC bus power supply and electronic secure restart inhibit integrated	1282
8V1320.001-2	Servo drive 3x 400-480V, 34A, 16kW, line filter, braking resistor, DC bus power supply and electronic secure restart inhibit integrated, coated	1282



Model number	Short description	
8V1640.00-2	Servo drive 3x 400-480V, 64A, 32kW, line filter, braking resistor, DC bus power supply and electronic secure restart inhibit integrated	1286
8V1640.001-2	Servo drive 3x 400-480V, 64A, 32kW, line filter, braking resistor, DC bus power supply and electronic secure restart inhibit integrated, coated	1286
8V128M.00-2	Servo drive 3x 400-480V, 128A, 64kW, line filter, braking resistor, DC bus power supply and electronic secure restart inhibit integrated	1286
8V128M.001-2	Servo drive 3x 400-480V, 128A, 64kW, line filter, braking resistor, DC bus power supply and electronic secure restart inhibit integrated, coated	1286

ACOPOS plug-in modules

Network modules



Model number	Short description	
8AC110.60-2	ACOPOS plug-in module, CAN interface	1290
8AC114.60-2	ACOPOS plug-in module, POWERLINK V2 interface	1291

Encoder modules



Model number	Short description	
8AC120.60-1	ACOPOS insert module, EnDat encoder and sine incremental encoder interface	1292
8AC121.60-1	ACOPOS plug-in module, HIPERFACE interface	1294
8AC122.60-3	ACOPOS plug-in module, resolver interface	1296
8AC123.60-1	ACOPOS plug-in module, incremental encoder and SSI absolute encoder interface	1298

I/O modules



Model number	Short description	
8AC130.60-1	ACOPOS plug-in module, 8 digital I/O configurable in pairs as 24V input or as output 400/100 mA, 2 digital outputs 2A, order TB712 terminal block separately.	1300
8AC131.60-1	ACOPOS plug-in module, 2 analog inputs $\pm 10V$, 2 digital I/O points which can be configured as a 24V input or 45 mA output, order TB712 terminal block separately.	1303

CPU modules



Model number	Short description	
8AC140.60-2	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input $\pm 10V$, order program memory and 0TB708 terminal block separately.	1306
8AC140.60-3	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 32MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input $\pm 10V$, order program memory and 0TB708 terminal block separately.	1306
8AC140.61-3	ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input $\pm 10V$, order program memory and 0TB708 terminal block separately.	1306
8AC141.60-2	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link Master interface, 3 digital I/O can be configured as 24 VDC input or output 500 mA, 1 analog input $\pm 10V$, order program memory and 0TB704 and 0TB708 terminal blocks separately.	1310
8AC141.61-3	ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link Master interface, 3 digital I/O can be configured as 24 VDC input or output 500 mA, 1 analog input $\pm 10V$, order program memory and 0TB704 and 0TB708 terminal blocks separately.	1310

Product overview

Accessories

Motor cables 1.5 mm²



Model number	Short description	
8CM005.12-1	Motor cable, length 5 m, 4 x 1.5 mm ² + 2 x 2 x 0.75 mm ² , motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1314
8CM007.12-1	Motor cable, length 7 m, 4 x 1.5 mm ² + 2 x 2 x 0.75 mm ² , motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1314
8CM010.12-1	Motor cable, length 10 m, 4 x 1.5 mm ² + 2 x 2 x 0.75 mm ² , motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1314
8CM015.12-1	Motor cable, length 15 m, 4 x 1.5 mm ² + 2 x 2 x 0.75 mm ² , motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1314
8CM020.12-1	Motor cable, length 20 m, 4 x 1.5 mm ² + 2 x 2 x 0.75 mm ² , motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1314
8CM025.12-1	Motor cable, length 25 m, 4 x 1.5 mm ² + 2 x 2 x 0.75 mm ² , motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1314

Motor cables 4 mm²



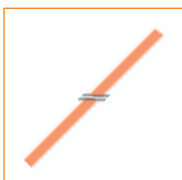
Model number	Short description	
8CM005.12-3	Motor cable, length 5 m, 4 x 4 mm ² + 2 x 2 x 1 mm ² , motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1315
8CM007.12-3	Motor cable, length 7 m, 4 x 4 mm ² + 2 x 2 x 1 mm ² , motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1315
8CM010.12-3	Motor cable, length 10 m, 4 x 4 mm ² + 2 x 2 x 1 mm ² , motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1315
8CM015.12-3	Motor cable, length 15 m, 4 x 4 mm ² + 2 x 2 x 1 mm ² , motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1315
8CM020.12-3	Motor cable, length 20 m, 4 x 4 mm ² + 2 x 2 x 1 mm ² , motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1315
8CM025.12-3	Motor cable, length 25 m, 4 x 4 mm ² + 2 x 2 x 1 mm ² , motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1315

Motor cables 10 mm²



Model number	Short description	
8CM005.12-5	Motor cable, length 5 m, 4 x 10 mm ² + 2 x 2 x 1.5 mm ² , motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1316
8CM007.12-5	Motor cable, length 7 m, 4 x 10 mm ² + 2 x 2 x 1.5 mm ² , motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1316
8CM010.12-5	Motor cable, length 10 m, 4 x 10 mm ² + 2 x 2 x 1.5 mm ² , motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1316
8CM015.12-5	Motor cable, length 15 m, 4 x 10 mm ² + 2 x 2 x 1.5 mm ² , motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1316
8CM020.12-5	Motor cable, length 20 m, 4 x 10 mm ² + 2 x 2 x 1.5 mm ² , motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1316
8CM025.12-5	Motor cable, length 25 m, 4 x 10 mm ² + 2 x 2 x 1.5 mm ² , motor plug 8-pin Intercontec socket, can be used in drag chains, UL/CSA listed	1316

Motor cables 35 mm²



Model number	Short description	
8CM005.12-8	Motor cable, length 5 m, 4 x 35 mm ² + 2 x 2 x 1.5 mm ² , can be used in drag chains, UL/CSA listed	1317
8CM007.12-8	Motor cable, length 7 m, 4 x 35 mm ² + 2 x 2 x 1.5 mm ² , can be used in drag chains, UL/CSA listed	1317
8CM010.12-8	Motor cable, length 10 m, 4 x 35 mm ² + 2 x 2 x 1.5 mm ² , can be used in drag chains, UL/CSA listed	1317
8CM015.12-8	Motor cable, length 15 m, 4 x 35 mm ² + 2 x 2 x 1.5 mm ² , can be used in drag chains, UL/CSA listed	1317
8CM020.12-8	Motor cable, length 20 m, 4 x 35 mm ² + 2 x 2 x 1.5 mm ² , can be used in drag chains, UL/CSA listed	1317
8CM025.12-8	Motor cable, length 25 m, 4 x 35 mm ² + 2 x 2 x 1.5 mm ² , can be used in drag chains, UL/CSA listed	1317

EnDat cables



Model number	Short description	
8CE005.12-1	EnDat cable, length 5 m, 10 x 0.14 mm ² + 2 x 0.5 mm ² , EnDat plug 17-pin Intercontec socket, servo connector 15-pin DSUB plug, can be used in cable drag claims, UL/CSA certified	1318
8CE007.12-1	EnDat cable, length 7 m, 10 x 0.14 mm ² + 2 x 0.5 mm ² , EnDat plug 17-pin Intercontec socket, servo connector 15-pin DSUB plug, can be used in cable drag claims, UL/CSA certified	1318
8CE010.12-1	EnDat cable, length 10 m, 10 x 0.14 mm ² + 2 x 0.5 mm ² , EnDat plug 17-pin Intercontec socket, servo connector 15-pin DSUB plug, can be used in cable drag claims, UL/CSA certified	1318
8CE015.12-1	EnDat cable, length 15 m, 10 x 0.14 mm ² + 2 x 0.5 mm ² , EnDat plug 17-pin Intercontec socket, servo connector 15-pin DSUB plug, can be used in cable drag claims, UL/CSA certified	1318
8CE020.12-1	EnDat cable, length 20 m, 10 x 0.14 mm ² + 2 x 0.5 mm ² , EnDat plug 17-pin Intercontec socket, servo connector 15-pin DSUB plug, can be used in cable drag claims, UL/CSA certified	1318
8CE025.12-1	EnDat cable, length 25 m, 10 x 0.14 mm ² + 2 x 0.5 mm ² , EnDat plug 17-pin Intercontec socket, servo connector 15-pin DSUB plug, can be used in cable drag claims, UL/CSA certified	1318

Resolver cables



Model number	Short description	
8CR005.12-1	Resolver cable, length 5 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA certified	1319
8CR007.12-1	Resolver cable, length 7 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA certified	1319
8CR010.12-1	Resolver cable, length 10 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA certified	1319
8CR015.12-1	Resolver cable, length 15 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA certified	1319
8CR020.12-1	Resolver cable, length 20 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA certified	1319
8CR025.12-1	Resolver cable, length 25 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA certified	1319

Single-phase servo drives

8V1010, 8V1016



8V1010.5xx-2



8V1016.5xx-2

- Designed for operation on a single-phase or three-phase power mains
- Modular mechanical structure plug-in modules
- Integrated power filter
- Integrated braking resistor
- Integrated electronic restart inhibit

General information	8V1010.50-2, 8V1010.501-2	8V1016.50-2, 8V1016.501-2
C-UL-US listed	Yes	Yes
Power mains connection	8V1010.50-2, 8V1010.501-2	8V1016.50-2, 8V1016.501-2
Mains input voltage	3x 110 VAC to 230 VAC ± 10% or 1x 110 VAC to 230 VAC ± 10%, power filter according to EN 61800-3-A11 second environment (limits from CISPR11, group 2, class A)	3x 110 VAC to 230 VAC ± 10% or 1x 110 VAC to 230 VAC ± 10% power filter according to EN 61800-3-A11 second environment (limits from CISPR11, group 2, class A)
Frequency	50 / 60 Hz ± 4%	50 / 60 Hz ± 4%
Installed load	Max. 1.35 kVA	Max. 2.1 kVA
Starting current	5 A (at 230 VAC)	5 A (at 230 VAC)
Switch-on interval	> 10 sec	> 10 sec
Power loss at max. device power without braking resistor	80 W	110 W
24 VDC supply	8V1010.50-2, 8V1010.501-2	8V1016.50-2, 8V1016.501-2
Input voltage ¹⁾	24 VDC +25% / -20%	24 VDC +25% / -20%
Input capacitance	5600 µF	5600 µF
Current consumption ²⁾	Max. 1.47 A + current for motor holding brake	Max. 1.47 A + current for motor holding brake
1) When using motor holding brakes, the valid input voltage range is reduced. The input voltage range should be selected so that the proper supply voltage for the motor holding brake can be maintained.		
2) The current requirements depend on the configuration of the ACOPOS servo drive.		
DC bus	8V1010.50-2, 8V1010.501-2	8V1016.50-2, 8V1016.501-2
DC bus capacitance	2040 µF	2040 µF
Motor connector	8V1010.50-2, 8V1010.501-2	8V1016.50-2, 8V1016.501-2
Continuous current ¹⁾	2.3 A _{eff}	3.6 A _{eff}
Reduction of continuous current depending on ambient temperature ²⁾		
Mains input voltage: 400 VAC		
Switching frequency 20 kHz	No reduction	No reduction
Switching frequency 10 kHz	No reduction	No reduction
Switching frequency 5 kHz	No reduction	No reduction
Mains input voltage: 480 VAC		
Switching frequency 20 kHz	No reduction	No reduction
Switching frequency 10 kHz	No reduction	No reduction
Switching frequency 5 kHz	No reduction	No reduction
Reduction of continuous current depending on altitude		
starting at 500 m above sea level	0.23 A _{eff} per 1000 m	0.36 A _{eff} per 1000 m
Maximum current	7.8 A _{eff}	12 A _{eff}
Rated switching frequency	10 kHz	10 kHz
Maximum motor line length	15 m	15 m
Protective measures	Short circuit & overload protection	Short circuit & overload protection
1) Valid in the following conditions: Mains input voltage 230 VAC, nominal switching frequency, 40° C ambient temperature, installation altitudes < 500 m above sea level. 2) The nominal switching frequency values for the respective ACOPOS servo drive are marked in bold.		
Motor holding brake connection	8V1010.50-2, 8V1010.501-2	8V1016.50-2, 8V1016.501-2
Maximum output current	1.3 A	1.3 A
Max. number of switching cycles	Unlimited since done electronically	Unlimited since done electronically
Braking resistor	8V1010.50-2, 8V1010.501-2	8V1016.50-2, 8V1016.501-2
Peak power output	1.9 kW	1.9 kW
Continuous power	130 W	130 W

Trigger inputs	8V1010.50-2, 8V1010.501-2	8V1016.50-2, 8V1016.501-2
Number of inputs	2	2
Wiring	Sink	Sink
Electrical isolation		
Input – ACOPOS	Yes	Yes
Input – Input	No	No
Input voltage		
Rated	24 VDC	24 VDC
Maximum	30 VDC	30 VDC
Switching threshold		
LOW	< 5 V	< 5 V
HIGH	> 15 V	> 15 V
Input current at rated voltage	Approx. 10 mA	Approx. 10 mA
Switching delay		
Positive edge	52 μ s \pm 0.5 μ s (digitally filtered)	52 μ s \pm 0.5 μ s (digitally filtered)
Negative edge	53 μ s \pm 0.5 μ s (digitally filtered)	53 μ s \pm 0.5 μ s (digitally filtered)
Modulation compared to ground potential	Max. \pm 38 V	Max. \pm 38 V
Limit switch and reference inputs	8V1010.50-2, 8V1010.501-2	8V1016.50-2, 8V1016.501-2
Number of inputs	3	3
Wiring	Sink	Sink
Electrical isolation		
Input - ACOPOS	Yes	Yes
Input - Input	No	No
Input voltage		
Rated	24 VDC	24 VDC
Maximum	30 VDC	30 VDC
Switching threshold		
LOW	< 5 V	< 5 V
HIGH	> 15 V	> 15 V
Input current at rated voltage	Approx. 4 mA	Approx. 4 mA
Switching delay	Max. 2.0 ms	Max. 2.0 ms
Modulation compared to ground potential	Max. \pm 38 V	Max. \pm 38 V
Enable input	8V1010.50-2, 8V1010.501-2	8V1016.50-2, 8V1016.501-2
Number of inputs	1	1
Wiring	Sink	Sink
Electrical isolation		
Input - ACOPOS	Yes	Yes
Input voltage		
Rated	24 VDC	24 VDC
Maximum	30 VDC	30 VDC
Switching threshold		
LOW	< 5 V	< 5 V
HIGH	> 15 V	> 15 V
Input current at rated voltage	Approx. 30 mA	Approx. 30 mA
Switching delay		
Enable 1 -> 0, PWM off	Max. 2.0 ms	Max. 2.0 ms
Enable 0 -> 1, ready for PWM	Max. 100 μ s	Max. 100 μ s
Modulation compared to ground potential	Max. \pm 38 V	Max. \pm 38 V

Single-phase servo drives

8V1010, 8V1016

Operational conditions	8V1010.50-2, 8V1010.501-2	8V1016.50-2, 8V1016.501-2
Ambient temperature during operation	5 to 40°C	5 to 40°C
Max. ambient temperature ¹⁾	+55°C	+55°C
Relative humidity during operation	5 to 85%, non-condensing	5 to 85%, non-condensing
Installation at altitudes above sea level	0 to 500 m	0 to 500 m
Maximum installation altitude ²⁾	2000 m	2000 m
Degree of pollution according to EN 60664-1	2 (non-conductive material)	2 (non-conductive material)
Overvoltage cat. according to IEC 60364-4-443:1999	II	II
EN 60529 protection	IP20	IP20

1) Continuous operation of ACOPOS servo drives at an ambient temperature ranging from 40°C to 55°C is possible (taking the continuous current reductions listed into consideration), but results in a shorter lifespan.

2) Continuous operation of ACOPOS servo drives at altitudes ranging from 500 m to 2000 m above sea level is possible (taking the continuous current reductions listed into consideration). Additional requirements are to be arranged with B&R.

Storage and transport conditions	8V1010.50-2, 8V1010.501-2	8V1016.50-2, 8V1016.501-2
Storage temperature	-25 to +55°C	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing	5 to 95%, non-condensing
Transport temperature	-25 to +70°C	-25 to +70°C
Relative humidity during transport	95% at +40°C	95% at +40°C
Mechanical characteristics	8V1010.50-2, 8V1010.501-2	8V1016.50-2, 8V1016.501-2
Dimensions		
Width	58.5 mm	58.5 mm
Height	257 mm	257 mm
Depth	220 mm	220 mm
Weight	2.5 kg	2.5 kg

Optional accessories		
8AC110.60-2	ACOPOS plug-in module, CAN interface	1290
8AC114.60-2	ACOPOS plug-in module, POWERLINK V2 interface	1291
8AC120.60-1	ACOPOS insert module, EnDat encoder and sine incremental encoder interface	1292
8AC121.60-1	ACOPOS plug-in module, HIPERFACE interface	1294
8AC122.60-3	ACOPOS plug-in module, resolver interface	1296
8AC123.60-1	ACOPOS plug-in module, incremental encoder and SSI absolute encoder interface	1298
8AC130.60-1	ACOPOS insert module, 8 digital I/O configurable in pairs as 24V input or as 400/100 mA output, 2 digital outputs 2A, order TB712 terminal blocks separately.	1300
8AC131.60-1	ACOPOS plug-in module, 2 analog inputs $\pm 10V$, 2 digital I/O points which can be configured as a 24V input or as 45 mA output, order TB712 terminal blocks separately.	1303
8AC140.60-2	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input $\pm 10V$, order program memory and 0TB708 terminal block separately.	1306
8AC140.60-3	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 32MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input $\pm 10V$, order program memory and 0TB708 terminal block separately.	1306
8AC140.61-3	ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input $\pm 10V$, order program memory and 0TB708 terminal block separately.	1306
8AC141.60-2	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link Master interface, 3 digital I/O can be configured as 24 VDC input or output 500 mA, 1 analog input $\pm 10V$, order program memory and 0TB704 and 0TB708 terminal blocks separately.	1310
8AC141.61-3	ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link Master interface, 3 digital I/O can be configured as 24 VDC input or output 500 mA, 1 analog input $\pm 10V$, order program memory and 0TB704 and 0TB708 terminal blocks separately.	1310
0PS320.1	24 VDC power supply, 3-phase, 20 A, input 400..500 VAC (3 phases), wide range, DIN rail mounting	659
8CM005.12-1	Motor cable, length 5 m, 4 x 1.5 mm ² + 2 x 2 x 0.75 mm ² , motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified	1314
8CM007.12-1	Motor cable, length 7 m, 4 x 1.5 mm ² + 2 x 2 x 0.75 mm ² , motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified	1314
8CM010.12-1	Motor cable, length 10 m, 4 x 1.5 mm ² + 2 x 2 x 0.75 mm ² , motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified	1314
8CM015.12-1	Motor cable, length 15 m, 4 x 1.5 mm ² + 2 x 2 x 0.75 mm ² , motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified	1314

Servo drives 8V1010, 8V1016



8V1010.0xx-2



8V1016.0xx-2

- Modular mechanical structure using insert modules
- Integrated power filter
- Integrated braking resistor
- Integrated electronic restart inhibit

General information	8V1010.00-2, 8V1010.001-2	8V1016.00-2, 8V1016.001-2
C-UL-US listed	Yes	Yes
Power mains connection	8V1010.00-2, 8V1010.001-2	8V1016.00-2, 8V1016.001-2
Mains input voltage	3x 400 VAC to 480 VAC ± 10%, power filter according to EN 61800-3-A11 second environment (limits from CISPR11, group 2, class A)	3x 400 VAC to 480 VAC ± 10%, power filter according to EN 61800-3-A11 second environment (limits from CISPR11, group 2, class A)
Frequency	50 / 60 Hz ± 4%	50 / 60 Hz ± 4%
Installed load	Max. 1.35 kVA	Max. 2.1 kVA
Starting current	2 A (at 400 VAC)	2 A (at 400 VAC)
Switch-on interval	> 10 sec	> 10 sec
Power loss at max. device power without braking resistor	80 W	110 W
24 VDC supply	8V1010.00-2, 8V1010.001-2	8V1016.00-2, 8V1016.001-2
Input voltage ¹⁾	24 VDC +25% / -20%	24 VDC +25% / -20%
Input capacitance	5600 µF	5600 µF
Current consumption ²⁾	Max. 1.47 A + current for motor holding brake	Max. 1.47 A + current for motor holding brake
1) When using motor holding brakes, the valid input voltage range is reduced. The input voltage range should be selected so that the proper supply voltage for the motor holding brake can be maintained.		
2) The current requirements depend on the configuration of the ACOPOS servo drive.		
DC bus	8V1010.00-2, 8V1010.001-2	8V1016.00-2, 8V1016.001-2
DC bus capacitance	165 µF	165 µF
Motor connector	8V1010.00-2, 8V1010.001-2	8V1016.00-2, 8V1016.001-2
Continuous current ¹⁾	1 A _{eff}	1.6 A _{eff}
Reduction of continuous current depending on the ambient temperature ²⁾		
Mains input voltage: 400 VAC		
Switching frequency 20 kHz	No reduction	No reduction
Switching frequency 10 kHz	No reduction	No reduction
Switching frequency 5 kHz	No reduction	No reduction
Mains input voltage: 480 VAC		
Switching frequency 20 kHz	0.13 A _{eff} per °C (starting at 45° C)	0.13 A _{eff} per °C (starting from 40°C)
Switching frequency 10 kHz	No reduction	No reduction
Switching frequency 5 kHz	No reduction	No reduction
Reduction of continuous current depending on installation altitude greater than 500 m above sea level		
level	0.1 A _{eff} per 1000 m	0.16 A _{eff} per 1000 m
Maximum current	2.8 A _{eff}	5 A _{eff}
Rated switching frequency	10 kHz	10 kHz
Maximum motor line length	15 m	15 m
Protective measures	Short circuit and overload protection	Short circuit and overload protection
1) Valid in the following conditions: Mains input voltage 400 VAC, nominal switching frequency, 40°C ambient temperature, installation altitudes < 500 m above sea level.		
2) The nominal switching frequency values for the respective ACOPOS servo drive are marked in bold.		
Motor holding brake connection	8V1010.00-2, 8V1010.001-2	8V1016.00-2, 8V1016.001-2
Maximum output current	1.3 A	1.3 A
Max. number of switching cycles	Unlimited since done electronically	Unlimited since done electronically
Braking resistor	8V1010.00-2, 8V1010.001-2	8V1016.00-2, 8V1016.001-2
Peak power output	2 kW	2 kW
Continuous power	130 W	130 W

Trigger inputs	8V1010.00-2, 8V1010.001-2	8V1016.00-2, 8V1016.001-2
Number of inputs	2	2
Wiring	Sink	Sink
Electrical isolation		
Input - ACOPOS	Yes	Yes
Input - Input	No	No
Input voltage		
Rated	24 VDC	24 VDC
Maximum	30 VDC	30 VDC
Switching threshold		
LOW	< 5 V	< 5 V
HIGH	> 15 V	> 15 V
Input current at rated voltage	Approx. 10 mA	Approx. 10 mA
Switching delay		
Positive edge	52 μ s \pm 0.5 μ s (digitally filtered)	52 μ s \pm 0.5 μ s (digitally filtered)
Negative edge	53 μ s \pm 0.5 μ s (digitally filtered)	53 μ s \pm 0.5 μ s (digitally filtered)
Modulation compared to ground potential	Max. \pm 38 V	Max. \pm 38 V
Limit switch and reference inputs	8V1010.00-2, 8V1010.001-2	8V1016.00-2, 8V1016.001-2
Number of inputs	3	3
Wiring	Sink	Sink
Electrical isolation		
Input - ACOPOS	Yes	Yes
Input - Input	No	No
Input voltage		
Rated	24 VDC	24 VDC
Maximum	30 VDC	30 VDC
Switching threshold		
LOW	< 5 V	< 5 V
HIGH	> 15 V	> 15 V
Input current at rated voltage	Approx. 4 mA	Approx. 4 mA
Switching delay	Max. 2.0 ms	Max. 2.0 ms
Modulation compared to ground potential	Max. \pm 38 V	Max. \pm 38 V
Enable input	8V1010.00-2, 8V1010.001-2	8V1016.00-2, 8V1016.001-2
Number of inputs	1	1
Wiring	Sink	Sink
Electrical isolation		
Input - ACOPOS	Yes	Yes
Input voltage		
Rated	24 VDC	24 VDC
Maximum	30 VDC	30 VDC
Switching threshold		
LOW	< 5 V	< 5 V
HIGH	> 15 V	> 15 V
Input current at rated voltage	Approx. 30 mA	Approx. 30 mA
Switching delay		
Enable 1 -> 0, PWM off	Max. 2.0 ms	Max. 2.0 ms
Enable 0 -> 1, ready for PWM	Max. 100 μ s	Max. 100 μ s
Modulation compared to ground potential	Max. \pm 38 V	Max. \pm 38 V

Servo drives 8V1010, 8V1016

Operational conditions	8V1010.00-2, 8V1010.001-2	8V1016.00-2, 8V1016.001-2
Ambient temperature during operation	5 to 40°C	5 to 40°C
Max. ambient temperature ¹⁾	+55°C	+55°C
Relative humidity during operation	5 to 85%, non-condensing	5 to 85%, non-condensing
Installation at altitudes above sea level	0 to 500 m	0 to 500 m
Maximum installation altitude ²⁾	2000 m	2000 m
Degree of pollution according to EN 60664-1	2 (non-conductive material)	2 (non-conductive material)
Overvoltage cat. according to IEC 60364-4-443:1999	II	II
EN 60529 protection	IP20	IP20

1) Continuous operation of ACOPOS servo drives at an ambient temperature ranging from 40°C to 55°C is possible (taking the continuous current reductions listed into consideration), but results in a shorter lifespan.

2) Continuous operation of ACOPOS servo drives at altitudes ranging from 500 m to 2000 m above sea level is possible (taking the continuous current reductions listed into consideration). Additional requirements are to be arranged with B&R.

Storage and transport conditions	8V1010.00-2, 8V1010.001-2	8V1016.00-2, 8V1016.001-2
Storage temperature	-25 to +55°C	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing	5 to 95%, non-condensing
Transport temperature	-25 to +70°C	-25 to +70°C
Relative humidity during transport	95% at +40°C	95% at +40°C
Mechanical characteristics	8V1010.00-2, 8V1010.001-2	8V1016.00-2, 8V1016.001-2
Dimensions		
Width	58.5 mm	58.5 mm
Height	257 mm	257 mm
Depth	220 mm	220 mm
Weight	2.5 kg	2.5 kg

Optional accessories		
8AC110.60-2	ACOPOS plug-in module, CAN interface	1290
8AC114.60-2	ACOPOS plug-in module, POWERLINK V2 interface	1291
8AC120.60-1	ACOPOS insert module, EnDat encoder and sine incremental encoder interface	1292
8AC121.60-1	ACOPOS plug-in module, HIPERFACE interface	1294
8AC122.60-3	ACOPOS plug-in module, resolver interface	1296
8AC123.60-1	ACOPOS plug-in module, incremental encoder and SSI absolute encoder interface	1298
8AC130.60-1	ACOPOS insert module, 8 digital I/O configurable in pairs as 24V input or as 400/100 mA output, 2 digital outputs 2A, order TB712 terminal blocks separately	1300
8AC131.60-1	ACOPOS plug-in module, 2 analog inputs $\pm 10V$, 2 digital I/O points which can be configured as a 24V input or as 45 mA output, order TB712 terminal blocks separately	1303
8AC140.60-2	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Profibus-DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input $\pm 10V$, order program memory and 0TB708 terminal block separately	1306
8AC140.60-3	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 32MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input $\pm 10V$, order program memory and 0TB708 terminal block separately.	1306
8AC140.61-3	ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input $\pm 10V$, order program memory and 0TB708 terminal block separately	1306
8AC141.60-2	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link master interface, 3 digital I/O points can be configured as a 24 VDC input or 500 mA output, 1 analog input $\pm 10V$, order program memory and 0TB704 and 0TB708 terminal blocks separately	1310
8AC141.61-3	ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link Master interface, 3 digital I/O can be configured as 24 VDC input or output 500 mA, 1 analog input $\pm 10V$, order program memory and 0TB704 and 0TB708 terminal blocks separately.	1310
0PS320.1	24 VDC power supply, 3-phase, 20 A, input 400..500 VAC (3 phases), wide range, DIN rail mounting	659
8CM005.12-1	Motor cable, length 5 m, 4 x 1.5 mm ² + 2 x 2 x 0.75 mm ² , motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified	1314
8CM007.12-1	Motor cable, length 7 m, 4 x 1.5 mm ² + 2 x 2 x 0.75 mm ² , motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified	1314
8CM010.12-1	Motor cable, length 10 m, 4 x 1.5 mm ² + 2 x 2 x 0.75 mm ² , motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified	1314
8CM015.12-1	Motor cable, length 15 m, 4 x 1.5 mm ² + 2 x 2 x 0.75 mm ² , motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified	1314

Servo drives 8V1022, 8V1045, 8V1090



8V1022.0xx-2



8V1045.0xx-2



8V1090.0xx-2

- Modular mechanical structure using insert modules
- Integrated power filter
- Integrated braking resistor
- All connections made using plug-in connectors
- Integrated electronic restart inhibit

General information	8V1022.00-2, 8V1022.001-2	8V1045.00-2, 8V1045.001-2	8V1090.00-2, 8V1090.001-2
C-UL-US listed	Yes	Yes	Yes
Power mains connection	8V1022.00-2, 8V1022.001-2	8V1045.00-2, 8V1045.001-2	8V1090.00-2, 8V1090.001-2
Mains input voltage	3x 400 VAC to 480 VAC ± 10% power filter according to EN 61800-3-A11 second environment (limits from CISPR11, group 2, class A)	3x 400 VAC to 480 VAC ± 10% power filter according to EN 61800-3-A11 second environment (limits from CISPR11, group 2, class A)	3x 400 VAC to 480 VAC ± 10% power filter according to EN 61800-3-A11 second environment (limits from CISPR11, group 2, class A)
Frequency	50 / 60 Hz ± 4%	50 / 60 Hz ± 4%	50 / 60 Hz ± 4%
Installed load	Max. 3 kVA	Max. 5 kVA	Max. 10 kVA
Starting current at 400 VAC	4 A	7 A	7 A
Switch-on interval	> 10 sec	> 10 sec	> 10 sec
Power loss at max. device power without braking resistor	Approx. 120 W	Approx. 180 W	Approx. 200 W
24 VDC supply	8V1022.00-2, 8V1022.001-2	8V1045.00-2, 8V1045.001-2	8V1090.00-2, 8V1090.001-2
Input voltage ¹⁾	24 VDC +25% / -25%	24 VDC +25% / -25%	24 VDC +25% / -25%
Input capacitance	8200 µF	8200 µF	8200 µF
Current consumption ²⁾	Max. 2.5 A + current for motor holding brake	Max. 2.5 A + current for motor holding brake	Max. 2.5 A + current for motor holding brake
1) When using motor holding brakes, the valid input voltage range is reduced. The input voltage range should be selected so that the proper supply voltage for the motor holding brake can be maintained.			
2) The current requirements depend on the configuration of the ACOPOS servo drive.			
DC bus	8V1022.00-2, 8V1022.001-2	8V1045.00-2, 8V1045.001-2	8V1090.00-2, 8V1090.001-2
DC bus capacitance	235 µF	235 µF	470 µF
Motor connector	8V1022.00-2, 8V1022.001-2	8V1045.00-2, 8V1045.001-2	8V1090.00-2, 8V1090.001-2
Continuous current ¹⁾	2.2 A _{eff}	4.4 A _{eff}	8.8 A _{eff}
Reduction of continuous current depending on the ambient temperature ²⁾			
Mains input voltage: 400 VAC			
Switching frequency 20 kHz	No reduction	0.13 A_{eff} per °C (from 45°C)	0.18 A _{eff} per °C (from 30°C)
Switching frequency 10 kHz	No reduction	No reduction	0.18 A_{eff} per °C (from 54°C)
Switching frequency 5 kHz	No reduction	No reduction	No reduction
Mains input voltage: 480 VAC			
Switching frequency 20 kHz	0.13 A_{eff} per °C (from 51°C)	0.13 A_{eff} per °C (from 35°C)	0.18 A _{eff} per °C (from 18°C)
Switching frequency 10 kHz	No reduction	No reduction	0.18 A_{eff} per °C (from 48°C)
Switching frequency 5 kHz	No reduction	No reduction	No reduction
Reduction of continuous current depending on altitude			
Starting at 500 m above sea level	0.22 A _{eff} per 1000 m	0.44 A _{eff} per 1000 m	0.88 A _{eff} per 1000 m
Maximum current	14 A _{eff}	24 A _{eff}	24 A _{eff}
Rated switching frequency	20 kHz	20 kHz	10 kHz
Maximum motor line length	25 m	25 m	25 m
Protective measures	Short circuit & overload protection	Short circuit & overload protection	Short circuit & overload protection
1) Valid in the following conditions: Mains input voltage 400 VAC, nominal switching frequency, 40° C ambient temperature, installation altitudes < 500 m above sea level. 2) The nominal switching frequency values for the respective ACOPOS servo drive are marked in bold.			
Motor holding brake connection	8V1022.00-2, 8V1022.001-2	8V1045.00-2, 8V1045.001-2	8V1090.00-2, 8V1090.001-2
Maximum output current	1 A	1 A	1 A
Max. number of switching cycles	Approx. 240,000	Approx. 240,000	Approx. 240,000
Braking resistor	8V1022.00-2, 8V1022.001-2	8V1045.00-2, 8V1045.001-2	8V1090.00-2, 8V1090.001-2
Peak power output	3.5 kW	7 kW	7 kW
Continuous power	130 W	200 W	200 W

Trigger inputs	8V1022.00-2, 8V1022.001-2	8V1045.00-2, 8V1045.001-2	8V1090.00-2, 8V1090.001-2
Number of inputs	2	2	2
Wiring	Sink	Sink	Sink
Electrical isolation			
Input - ACOPOS	Yes	Yes	Yes
Input - Input	No	No	No
Input voltage			
Rated	24 VDC	24 VDC	24 VDC
Maximum	30 VDC	30 VDC	30 VDC
Switching threshold			
LOW	< 5 V	< 5 V	< 5 V
HIGH	> 15 V	> 15 V	> 15 V
Input current at rated voltage	Approx. 10 mA	Approx. 10 mA	Approx. 10 mA
Switching delay			
Positive edge	52 μ s \pm 0.5 μ s (digitally filtered)	52 μ s \pm 0.5 μ s (digitally filtered)	52 μ s \pm 0.5 μ s (digitally filtered)
Negative edge	53 μ s \pm 0.5 μ s (digitally filtered)	53 μ s \pm 0.5 μ s (digitally filtered)	53 μ s \pm 0.5 μ s (digitally filtered)
Modulation compared to ground potential	Max. \pm 38 V	Max. \pm 38 V	Max. \pm 38 V
Limit switch and reference inputs	8V1022.00-2, 8V1022.001-2	8V1045.00-2, 8V1045.001-2	8V1090.00-2, 8V1090.001-2
Number of inputs	3	3	3
Wiring	Sink	Sink	Sink
Electrical isolation			
Input - ACOPOS	Yes	Yes	Yes
Input - Input	No	No	No
Input voltage			
Rated	24 VDC	24 VDC	24 VDC
Maximum	30 VDC	30 VDC	30 VDC
Switching threshold			
LOW	< 5 V	< 5 V	< 5 V
HIGH	> 15 V	> 15 V	> 15 V
Input current at rated voltage	Approx. 4 mA	Approx. 4 mA	Approx. 4 mA
Switching delay	Max. 2.0 ms	Max. 2.0 ms	Max. 2.0 ms
Modulation compared to ground potential	Max. \pm 38 V	Max. \pm 38 V	Max. \pm 38 V
Enable input	8V1022.00-2, 8V1022.001-2	8V1045.00-2, 8V1045.001-2	8V1090.00-2, 8V1090.001-2
Number of inputs	1	1	1
Wiring	Sink	Sink	Sink
Electrical isolation			
Input - ACOPOS	Yes	Yes	Yes
Input voltage			
Rated	24 VDC	24 VDC	24 VDC
Maximum	30 VDC	30 VDC	30 VDC
Switching threshold			
LOW	< 5 V	< 5 V	< 5 V
HIGH	> 15 V	> 15 V	> 15 V
Input current at rated voltage	Approx. 30 mA	Approx. 30 mA	Approx. 30 mA
Switching delay			
Enable 1 -> 0, PWM off	Max. 2.0 ms	Max. 2.0 ms	Max. 2.0 ms
Enable 0 -> 1, ready for PWM	Max. 100 μ s	Max. 100 μ s	Max. 100 μ s
Modulation compared to ground potential	Max. \pm 38 V	Max. \pm 38 V	Max. \pm 38 V

Servo drives

8V1022, 8V1045, 8V1090

Operational conditions	8V1022.00-2, 8V1022.001-2	8V1045.00-2, 8V1045.001-2	8V1090.00-2, 8V1090.001-2
Ambient temperature during operation	5 to 40°C	5 to 40°C	5 to 40°C
Max. ambient temperature ¹⁾	+55°C	+55°C	+55°C
Relative humidity during operation	5 to 85%, non-condensing	5 to 85%, non-condensing	5 to 85%, non-condensing
Installation at altitudes above sea level	0 to 500 m	0 to 500 m	0 to 500 m
Maximum installation altitude ²⁾	2000 m	2000 m	2000 m
Degree of pollution according to EN 60664-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Overvoltage cat. according to IEC 60364-4-443:1999	II	II	II
EN 60529 protection	IP20	IP20	IP20
<p>1) Continuous operation of ACOPOS servo drives at an ambient temperature ranging from 40°C to 55°C is possible (taking the continuous current reductions listed into consideration), but results in a shorter lifespan.</p> <p>2) Continuous operation of ACOPOS servo drives at altitudes ranging from 500 m to 2000 m above sea level is possible (taking the continuous current reductions listed into consideration). Additional requirements are to be arranged with B&R.</p>			
Storage and transport conditions	8V1022.00-2, 8V1022.001-2	8V1045.00-2, 8V1045.001-2	8V1090.00-2, 8V1090.001-2
Storage temperature	-25 to +55°C	-25 to +55°C	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing	5 to 95%, non-condensing	5 to 95%, non-condensing
Transport temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Relative humidity during transport	95% at +40°C	95% at +40°C	95% at +40°C
Mechanical characteristics	8V1022.00-2, 8V1022.001-2	8V1045.00-2, 8V1045.001-2	8V1090.00-2, 8V1090.001-2
Dimensions			
Width	70.5 mm	70.5 mm	70.5 mm
Height	375 mm	375 mm	375 mm
Depth	235.5 mm	235.5 mm	235.5 mm
Weight	4.0 kg	4.1 kg	4.4 kg

Optional accessories		
8AC110.60-2	ACOPOS plug-in module, CAN interface	1290
8AC114.60-2	ACOPOS plug-in module, POWERLINK V2 interface	1291
8AC120.60-1	ACOPOS insert module, EnDat encoder and sine incremental encoder interface	1292
8AC121.60-1	ACOPOS plug-in module, HIPERFACE interface	1294
8AC122.60-3	ACOPOS plug-in module, resolver interface	1296
8AC123.60-1	ACOPOS plug-in module, incremental encoder and SSI absolute encoder interface	1298
8AC130.60-1	ACOPOS insert module, 8 digital I/O configurable in pairs as 24V input or as 400/100 mA output, 2 digital outputs 2A, order TB712 terminal blocks separately	1300
8AC131.60-1	ACOPOS plug-in module, 2 analog inputs $\pm 10V$, 2 digital I/O points which can be configured as a 24V input or as 45 mA output, order TB712 terminal blocks separately	1303
8AC140.60-2	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input $\pm 10V$, order program memory and 0TB708 terminal block separately.	1306
8AC140.60-3	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 32MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input $\pm 10V$, order program memory and 0TB708 terminal block separately.	1306
8AC140.61-3	ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input $\pm 10V$, order program memory and 0TB708 terminal block separately	1306
8AC141.60-2	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link Master interface, 3 digital I/O can be configured as 24 VDC input or output 500 mA, 1 analog input $\pm 10V$, order program memory and 0TB704 and 0TB708 terminal blocks separately.	1310
8AC141.61-3	ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link Master interface, 3 digital I/O can be configured as 24 VDC input or output 500 mA, 1 analog input $\pm 10V$, order program memory and 0TB704 and 0TB708 terminal blocks separately.	1310
0PS320.1	24 VDC power supply, 3-phase, 20 A, input 400..500 VAC (3 phases), wide range, DIN rail mounting	659
8CM005.12-1	Motor cable, length 5 m, 4 x 1.5 mm ² + 2 x 2 x 0.75 mm ² , motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed	1314
8CM007.12-1	Motor cable, length 7 m, 4 x 1.5 mm ² + 2 x 2 x 0.75 mm ² , motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed	1314
8CM010.12-1	Motor cable, length 10 m, 4 x 1.5 mm ² + 2 x 2 x 0.75 mm ² , motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed	1314
8CM015.12-1	Motor cable, length 15 m, 4 x 1.5 mm ² + 2 x 2 x 0.75 mm ² , motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed	1314
8CM020.12-1	Motor cable, length 20 m, 4 x 1.5 mm ² + 2 x 2 x 0.75 mm ² , motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed	1314
8CM025.12-1	Motor cable, length 25 m, 4 x 1.5 mm ² + 2 x 2 x 0.75 mm ² , motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed	1314

Servo drives 8V1180, 8V1320



- Modular mechanical structure using insert modules
- Integrated power filter
- Integrated or External braking resistor
- All connections made using plug-in connectors
- Integrated electronic restart inhibit

General information	8V1180.00-2, 8V1180.001-2	8V1320.00-2, 8V1320.001-2
C-UL-US listed	Yes	Yes
Power mains connection	8V1180.00-2, 8V1180.001-2	8V1320.00-2, 8V1320.001-2
Mains input voltage	3x 400 VAC to 480 VAC ±10% Power filter according to EN 61800-3-A11 second environment (Limits from CISPR11, Group 2, Class A)	3x 400 VAC to 480 VAC ±10% Power filter according to EN filter 61800-3-A11 second environment (Limits from CISPR11, Group 2, Class A)
Frequency	50 / 60 Hz ± 4%	50 / 60 Hz ± 4%
Installed load	Max. 17 kVA	Max. 30 kVA
Starting current at 400 VAC	13 A	13 A
Switch-on interval	> 10 sec	> 10 sec
Power loss at max. device power without	Approx. 500 W	Approx. 800 W
Braking resistor		
24 VDC supply	8V1180.00-2, 8V1180.001-2	8V1320.00-2, 8V1320.001-2
Input voltage	24 VDC +25% / -20%	24 VDC +25% / -20%
Input capacitance	40,000 µF	40,000 µF
Current requirements at 24 VDC ¹⁾		
Mains input voltage applied	... ²⁾	... ²⁾
Mains input voltage not applied	Max. 2.8 A + current for motor holding brake + current on the 24 VDC output	Max. 2.8 A + current for motor holding brake + current on the 24 VDC output
DC bus power supply		
Switch-on voltage	455 VDC	455 VDC
1) The current requirements depend on the configuration of the ACOPOS servo drive. 2) If the mains input voltage (3x 400 VAC to 480 VAC ±10%) is applied, the 24 VDC supply voltage for the ACOPOS servo drive is created by the internal DC bus power supply, which reduces the 24 VDC current requirements (I _{24VDC}) to 0.		
24 VDC output	8V1180.00-2, 8V1180.001-2	8V1320.00-2, 8V1320.001-2
Output voltage		
Mains input voltage applied	22 to 24 VDC	22 to 24 VDC
Mains input voltage not applied	16.7 to 30 VDC ¹⁾	16.7 to 30 VDC ¹⁾
Output current	Max. 0.5 A	Max. 0.5 A
1) If the mains input voltage (3x 400 VAC to 480 VAC ±10%) is not applied, the voltage is created at the 24 VDC output from the ACOPOS servo drive's 24 VDC supply voltage; in this case it is between the maximum allowable and the minimum allowable (reduced by max. 2.5 V) 24 VDC supply voltage of the ACOPOS servo drive.		
DC bus	8V1180.00-2, 8V1180.001-2	8V1320.00-2, 8V1320.001-2
DC bus capacitance	940 µF	1645 µF
Motor connector	8V1180.00-2, 8V1180.001-2	8V1320.00-2, 8V1320.001-2
Continuous current ¹⁾	19 A _{eff}	34 A _{eff}
Reduction of continuous current depending on ambient temperature ²⁾		
Mains input voltage: 400 VAC		
Switching frequency 20 kHz	No reduction	0.61 A _{eff} per °C (from 40°C)
Switching frequency 10 kHz	No reduction	No reduction
Switching frequency 5 kHz	No reduction	No reduction
Mains input voltage: 480 VAC		
Switching frequency 20 kHz	No reduction	0.61 A _{eff} per °C (from 25°C)
Switching frequency 10 kHz	No reduction	No reduction
Switching frequency 5 kHz	No reduction	No reduction
Reduction of continuous current depending on installation altitude		
Starting at 500 m above sea level	1.9 A _{eff} per 1000 m	3.4 A _{eff} per 1000 m
Maximum current	50 A _{eff}	80 A _{eff}
Rated switching frequency	10 kHz	10 kHz
Maximum motor line length	25 m	25 m
Protective measures	Short circuit & overload protection	Short circuit & overload protection

1) Valid in the following conditions: Mains input voltage 400 VAC, nominal switching frequency, 40°C ambient temperature, installation altitudes < 500 m above sea level.

2) The nominal switching frequency values for the respective ACOPOS servo drive are marked in bold.

Motor holding brake connection	8V1180.00-2, 8V1180.001-2	8V1320.00-2, 8V1320.001-2
Maximum output current	1.5 A	1.5 A
Max. number of switching cycles	Unlimited since done electronically	Unlimited since done electronically
Braking resistor	8V1180.00-2, 8V1180.001-2	8V1320.00-2, 8V1320.001-2
Peak power int. / ext.	14 / 40 kW	14 / 40 kW
Continuous power int. / ext.	0.4 / 8 kW ¹⁾	0.4 / 8 kW ¹⁾
Minimum braking resistance (ext.)	15 Ω	15 Ω
Rated current of the built-in fuse	10 A (fast-acting)	10 A (fast-acting)
1) Continuous power refers to the maximum breaking power the ACOPOS servo driver can yield continuously. Depending on the application, the actual continuous power provided by the external braking resistor is limited by the rated current of fuse I _B (integrated in the ACOPOS servo driver), and the value of the external braking resistance R _{BR} .		
Trigger inputs	8V1180.00-2, 8V1180.001-2	8V1320.00-2, 8V1320.001-2
Number of inputs	2	2
Wiring	Sink	Sink
Electrical isolation		
Input - ACOPOS	Yes	Yes
Input - Input	No	No
Input voltage		
Rated	24 VDC	24 VDC
Maximum	30 VDC	30 VDC
Switching threshold		
LOW	< 5 V	< 5 V
HIGH	> 15 V	> 15 V
Input current at rated voltage	Approx. 10 mA	Approx. 10 mA
Switching delay		
Positive edge	52 μs ± 0.5 μs (digitally filtered)	52 μs ± 0.5 μs (digitally filtered)
Negative edge	53 μs ± 0.5 μs (digitally filtered)	53 μs ± 0.5 μs (digitally filtered)
Modulation compared to ground potential	Max. ±38 V	Max. ±38 V
Limit switch and reference inputs	8V1180.00-2, 8V1180.001-2	8V1320.00-2, 8V1320.001-2
Number of inputs	3	3
Wiring	Sink	Sink
Electrical isolation		
Input - ACOPOS	Yes	Yes
Input - Input	No	No
Input voltage		
Rated	24 VDC	24 VDC
Maximum	30 VDC	30 VDC
Switching threshold		
LOW	< 5 V	< 5 V
HIGH	> 15 V	> 15 V
Input current at rated voltage	Approx. 4 mA	Approx. 4 mA
Switching delay	Max. 2.0 ms	Max. 2.0 ms
Modulation compared to ground potential	Max. ±38 V	Max. ±38 V

Servo drives

8V1180, 8V1320

Enable input	8V1180.00-2, 8V1180.001-2	8V1320.00-2, 8V1320.001-2
Number of inputs	1	1
Wiring	Sink	Sink
Electrical isolation		
Input - ACOPOS	Yes	Yes
Input voltage		
Rated	24 VDC	24 VDC
Maximum	30 VDC	30 VDC
Switching threshold		
LOW	< 5 V	< 5 V
HIGH	> 15 V	> 15 V
Input current at rated voltage	Approx. 30 mA	Approx. 30 mA
Switching delay		
Enable 1 -> 0, PWM off	Max. 2.0 ms	Max. 2.0 ms
Enable 0 -> 1, ready for PWM	Max. 100 μ s	Max. 100 μ s
Modulation compared to ground potential	Max. \pm 38 V	Max. \pm 38 V
Operational conditions	8V1180.00-2, 8V1180.001-2	8V1320.00-2, 8V1320.001-2
Environment temperature during operation ¹⁾	5 to 40°C	5 to 40°C
Max. ambient temperature	+55°C	+55°C
Relative humidity during operation	5 to 85%, non-condensing	5 to 85%, non-condensing
Installation at altitudes above sea level	0 to 500 m	0 to 500 m
Maximum installation altitude ²⁾	2000 m	2000 m
Degree of pollution according to EN 60664-1	2 (non-conductive material)	2 (non-conductive material)
Overvoltage cat. according to IEC 60364-4-443:1999	II	II
EN 60529 protection	IP20	IP20
<p>1) Continuous operation of ACOPOS servo drives at an ambient temperature ranging from 40°C to 55°C is possible (taking the continuous current reductions listed into consideration), but results in a shorter lifespan.</p> <p>2) Continuous operation of ACOPOS servo drives at altitudes ranging from 500 m to 2000 m above sea level is possible (taking the continuous current reductions listed into consideration). Additional requirements are to be arranged with B&R.</p>		
Storage and transport conditions	8V1180.00-2, 8V1180.001-2	8V1320.00-2, 8V1320.001-2
Storage temperature	-25 to +55°C	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing	5 to 95%, non-condensing
Transport temperature	-25 to +70°C	-25 to +70°C
Relative humidity during transport	95% at +40°C	95% at +40°C
Mechanical characteristics	8V1180.00-2, 8V1180.001-2	8V1320.00-2, 8V1320.001-2
Dimensions		
Width	200 mm	200 mm
Height	375 mm	375 mm
Depth	234 mm	234 mm
Weight	10.1 kg	10.6 kg

Optional accessories		
8AC110.60-2	ACOPOS plug-in module, CAN interface	1290
8AC114.60-2	ACOPOS plug-in module, POWERLINK V2 interface	1291
8AC120.60-1	ACOPOS insert module, EnDat encoder and sine incremental encoder interface	1292
8AC121.60-1	ACOPOS plug-in module, HIPERFACE interface	1294
8AC122.60-3	ACOPOS plug-in module, resolver interface	1296
8AC123.60-1	ACOPOS plug-in module, incremental encoder and SSI absolute encoder interface	1298
8AC130.60-1	ACOPOS insert module, 8 digital I/O configurable in pairs as 24V input or as 400/100 mA output, 2 digital outputs 2A, order TB712 terminal blocks separately	1300
8AC131.60-1	ACOPOS plug-in module, 2 analog inputs $\pm 10V$, 2 digital I/O points which can be configured as a 24V input or as 45 mA output, order TB712 terminal blocks separately	1303
8AC140.60-2	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Profibus-DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input $\pm 10V$, order program memory and OTB708 terminal block separately	1306
8AC140.60-3	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 32MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input $\pm 10V$, order program memory and OTB708 terminal block separately.	1306
8AC140.61-3	ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input $\pm 10V$, order program memory and OTB708 terminal block separately	1306
8AC141.60-2	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link Master interface, 3 digital I/O can be configured as 24 VDC input or output 500 mA, 1 analog input $\pm 10V$, order program memory and OTB704 and OTB708 terminal blocks separately.	1310
8AC141.61-3	ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link Master interface, 3 digital I/O can be configured as 24 VDC input or output 500 mA, 1 analog input $\pm 10V$, order program memory and OTB704 and OTB708 terminal blocks separately.	1310
0PS320.1	24 VDC power supply, 3-phase, 20 A, input 400..500 VAC (3 phases), wide range, DIN rail mounting	659
8CM005.12-3	Motor cable, length 5 m, 4 x 4 mm ² + 2 x 2 x 1 mm ² , motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed	1315
8CM007.12-3	Motor cable, length 7 m, 4 x 4 mm ² + 2 x 2 x 1 mm ² , motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed	1315
8CM010.12-3	Motor cable, length 10 m, 4 x 4 mm ² + 2 x 2 x 1 mm ² , motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed	1315
8CM015.12-3	Motor cable, length 15 m, 4 x 4 mm ² + 2 x 2 x 1 mm ² , motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed	1315
8CM020.12-3	Motor cable, length 20 m, 4 x 4 mm ² + 2 x 2 x 1 mm ² , motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed	1315
8CM025.12-3	Motor cable, length 25 m, 4 x 4 mm ² + 2 x 2 x 1 mm ² , motor plug 8-pin Intercontec socket, can be used in cable drag chains, UL/CSA listed	1315

Servo drives 8V1640, 8V128M



- Modular mechanical structure using insert modules
- Integrated power filter
- Integrated or optional external braking resistor
- Integrated electronic restart inhibit

General information	8V1640.00-2, 8V1640.001-2	8V128M.00-2, 8V128M.001-2
C-UL-US listed	Yes	Yes
Power mains connection	8V1640.00-2, 8V1640.001-2	8V128M.00-2, 8V128M.001-2
Mains input voltage	3x 400 VAC to 480 VAC $\pm 10\%$ Power filter according to IEC 61800-3-A11 second environment (Limits from CISPR11, Group 2, Class A)	3x 400 VAC to 480 VAC $\pm 10\%$ Power filter according to IEC 61800-3-A11 second environment (Limits from CISPR11, Group 2, Class A)
Frequency	50 / 60 Hz $\pm 4\%$	50 / 60 Hz $\pm 4\%$
Installed load	Max. 54 kVA	Max. 98 kVA
Starting current at 400 VAC	26 A	26 A
Switch-on interval	> 10 sec	> 10 sec
Power loss at max. device power without braking resistor	Approx. 1600 W	Approx. 3200 W
24 VDC supply	8V1640.00-2, 8V1640.001-2	8V128M.00-2, 8V128M.001-2
Input voltage	24 VDC $+25\% / -20\%$	24 VDC $+25\% / -20\%$
Input capacitance	32800 μ F	32800 μ F
Current requirements at 24 VDC ¹⁾		
Mains input voltage applied	... ²⁾	... ²⁾
Mains input voltage not applied	Max. 4.6 A + 1.4 * (current for motor holding brake + current on the 24 VDC output)	Max. 5.7 A + 1.4 * (current for the motor holding brake + current on the 24 VDC output)
DC bus power supply		
Switch-on voltage	455 VDC	455 VDC
1) The current requirements depend on the configuration of the ACOPOS servo drive.		
2) If the mains input voltage (3x 400 VAC to 480 VAC $\pm 10\%$) is applied, the 24 VDC supply voltage for the ACOPOS servo drive is created by the internal DC bus power supply, which reduces the 24 VDC current requirements (I_{24VDC}) to 0.		
24 VDC output	8V1640.00-2, 8V1640.001-2	8V128M.00-2, 8V128M.001-2
Output voltage		
Mains input voltage applied	22 to 24 VDC	22 to 24 VDC
Mains input voltage not applied	16.7 to 30 VDC ¹⁾	16.7 to 30 VDC ¹⁾
Output current	Max. 0.5 A	Max. 0.5 A
1) If the mains input voltage (3x 400 VAC to 480 VAC $\pm 10\%$) is not applied, the voltage is created at the 24 VDC output from the ACOPOS servo drive's 24 VDC supply voltage; in this case it is between the maximum allowable and the minimum allowable (reduced by max. 2.5 V) 24 VDC supply voltage of the ACOPOS servo drive.		
DC bus	8V1640.00-2, 8V1640.001-2	8V128M.00-2, 8V128M.001-2
DC bus capacitance	3300 μ F	6600 μ F
Motor connector	8V1640.00-2, 8V1640.001-2	8V128M.00-2, 8V128M.001-2
Continuous current ¹⁾	64 A _{eff}	128 A _{eff}
Reduction of continuous current depending on the ambient temperature ²⁾		
Mains input voltage: 400 VAC		
Switching frequency 20 kHz	0.96 A _{eff} per °C (from 25°C)	1.65 A _{eff} per °C (from 12°C)
Switching frequency 10 kHz	No reduction	1.65 A _{eff} per °C (from 52°C)
Switching frequency 5 kHz	No reduction	No reduction
Mains input voltage: 480 VAC		
Switching frequency 20 kHz	0.96 A _{eff} per °C (from 10°C)	1.65 A _{eff} per °C (from 10°C) ³⁾
Switching frequency 10 kHz	0.96 A_{eff} per °C (from 50°C)	1.65 A _{eff} per °C (from 36°C)
Switching frequency 5 kHz	No reduction	No reduction
Reduction of continuous current depending on installation altitude		
Starting at 500 m above sea level	6.4 A _{eff} per 1000 m	12.8 A _{eff} per 1000 m
Maximum current	200 A _{eff}	300 A _{eff}
Rated switching frequency	10 kHz	5 kHz
Maximum motor line length	25 m	25 m
Protective measures	Short circuit and overload protection	Short circuit and overload protection

1) Valid in the following conditions: Mains input voltage 400 VAC, nominal switching frequency, 40°C ambient temperature, installation altitudes < 500 m above sea level.

2) The nominal switching frequency values for the respective ACOPOS servo drive are marked in bold.

3) For a mains input voltage of 480 VAC and a switching frequency of 20 kHz, a maximum continuous current of 95 A_{eff} is permitted.

At ambient temperatures > 10°C, a reduction of the continuous current of 1.65 A_{eff} per °C must be taken into consideration.

Motor holding brake connection	8V1640.00-2, 8V1640.001-2	8V128M.00-2, 8V128M.001-2
Maximum output current	3 A	3 A
Max. number of switching cycles	Approx. 80,000	Approx. 80,000
Braking resistor	8V1640.00-2, 8V1640.001-2	8V128M.00-2, 8V128M.001-2
Peak power int. / ext.	7 / 250 kW	8.5 / 250 kW
Continuous power int. / ext.	0.2 / 24 kW ¹⁾	0.24 / 24 kW ¹⁾
Minimum braking resistance (ext.)	2.5 Ω	2.5 Ω
Rated current of the built-in fuse	30 A (fast-acting)	30 A (fast-acting)
1) Continuous power refers to the maximum breaking power the ACOPOS servo driver can yield continuously. Depending on the application, the actual continuous power provided by the external braking resistor is limited by the rated current of fuse I _B (integrated in the ACOPOS servo driver), and the value of the external braking resistance R _{BR} .		
Trigger inputs	8V1640.00-2, 8V1640.001-2	8V128M.00-2, 8V128M.001-2
Number of inputs	2	2
Wiring	Sink	Sink
Electrical isolation		
Input - ACOPOS	Yes	Yes
Input - Input	No	No
Input voltage		
Rated	24 VDC	24 VDC
Maximum	30 VDC	30 VDC
Switching threshold		
LOW	< 5 V	< 5 V
HIGH	> 15 V	> 15 V
Input current at rated voltage	Approx. 10 mA	Approx. 10 mA
Switching delay		
Positive edge	52 μs ± 0.5 μs (digitally filtered)	52 μs ± 0.5 μs (digitally filtered)
Negative edge	53 μs ± 0.5 μs (digitally filtered)	53 μs ± 0.5 μs (digitally filtered)
Modulation compared to ground potential	Max. ±38 V	Max. ±38 V
Limit switch and reference inputs	8V1640.00-2, 8V1640.001-2	8V128M.00-2, 8V128M.001-2
Number of inputs	3	3
Wiring	Sink	Sink
Electrical isolation		
Input - ACOPOS	Yes	Yes
Input - Input	No	No
Input voltage		
Rated	24 VDC	24 VDC
Maximum	30 VDC	30 VDC
Switching threshold		
LOW	< 5 V	< 5 V
HIGH	> 15 V	> 15 V
Input current at rated voltage	Approx. 4 mA	Approx. 4 mA
Switching delay	Max. 2.0 ms	Max. 2.0 ms
Modulation compared to ground potential	Max. ±38 V	Max. ±38 V

Servo drives

8V1640, 8V128M

Enable input	8V1640.00-2, 8V1640.001-2	8V128M.00-2, 8V128M.001-2
Number of inputs	1	1
Wiring	Sink	Sink
Electrical isolation		
Input - ACOPOS	Yes	Yes
Input voltage		
Rated	24 VDC	24 VDC
Maximum	30 VDC	30 VDC
Switching threshold		
LOW	< 5 V	< 5 V
HIGH	> 15 V	> 15 V
Input current at rated voltage	Approx. 30 mA	Approx. 30 mA
Switching delay		
Enable 1 -> 0, PWM off	Max. 2.0 ms	Max. 2.0 ms
Enable 0 -> 1, ready for PWM	Max. 100 μ s	Max. 100 μ s
Modulation compared to ground potential	Max. \pm 38 V	Max. \pm 38 V
Operational conditions	8V1640.00-2, 8V1640.001-2	8V128M.00-2, 8V128M.001-2
Ambient temperature during operation	5 to 40°C	5 to 40°C
Max. ambient temperature ¹⁾	+55°C	+55°C
Relative humidity during operation	5 to 85%, non-condensing	5 to 85%, non-condensing
Installation at altitudes above sea level	0 to 500 m	0 to 500 m
Maximum installation altitude ²⁾	2000 m	2000 m
Degree of pollution according to EN 60664-1	2 (non-conductive material)	2 (non-conductive material)
Overvoltage cat. according to IEC 60364-4-443:1999	II	II
EN 60529 protection	IP20	IP20
<p>1) Continuous operation of ACOPOS servo drives at an ambient temperature ranging from 40°C to 55°C is possible (taking the continuous current reductions listed into consideration), but results in a shorter lifespan.</p> <p>2) Continuous operation of ACOPOS servo drives at altitudes ranging from 500 m to 2000 m above sea level is possible (taking the continuous current reductions listed into consideration). Additional requirements are to be arranged with B&R.</p>		
Storage and transport conditions	8V1640.00-2, 8V1640.001-2	8V128M.00-2, 8V128M.001-2
Storage temperature	-25 to +55°C	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing	5 to 95%, non-condensing
Transport temperature	-25 to +70°C	-25 to +70°C
Relative humidity during transport	95% at +40°C	95% at +40°C
Mechanical characteristics	8V1640.00-2, 8V1640.001-2	8V128M.00-2, 8V128M.001-2
Dimensions		
Width	276 mm	402 mm
Height	460 mm	460 mm
Depth	295 mm	295 mm
Weight	24.1 kg	33.8 kg

Optional accessories		
8AC110.60-2	ACOPOS plug-in module, CAN interface	1290
8AC114.60-2	ACOPOS plug-in module, POWERLINK V2 interface	1291
8AC120.60-1	ACOPOS insert module, EnDat encoder and sine incremental encoder interface	1292
8AC121.60-1	ACOPOS plug-in module, HIPERFACE interface	1294
8AC122.60-3	ACOPOS plug-in module, resolver interface	1296
8AC123.60-1	ACOPOS plug-in module, incremental encoder and SSI absolute encoder interface	1298
8AC130.60-1	ACOPOS insert module, 8 digital I/O configurable in pairs as 24V input or as 400/100 mA output, 2 digital outputs 2A, order TB712 terminal blocks separately.	1300
8AC131.60-1	ACOPOS plug-in module, 2 analog inputs $\pm 10V$, 2 digital I/O points which can be configured as a 24V input or as 45 mA output, order TB712 terminal blocks separately	1303
8AC140.60-2	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Profibus-DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input $\pm 10V$, order program memory and 0TB708 terminal block separately	1306
8AC140.60-3	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 32MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input $\pm 10V$, order program memory and 0TB708 terminal block separately.	1306
8AC140.61-3	ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 1 CAN interface, 1 Ethernet interface 100 Base-T, 1 Profibus DP slave interface, 1 RS232 interface, 3 digital I/O can be configured as 24 VDC input or 500 mA output, 1 analog input $\pm 10V$, order program memory and 0TB708 terminal block separately	1306
8AC141.60-2	ACOPOS plug-in module, CPU, x86 100 MHz Intel compatible, 16 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link Master interface, 3 digital I/O can be configured as 24 VDC input or output 500 mA, 1 analog input $\pm 10V$, order program memory and 0TB704 and 0TB708 terminal blocks separately.	1310
8AC141.61-3	ACOPOS plug-in module, CPU, ARNC0, x86 100 MHz Intel compatible, 32 MB DRAM, 32 kB SRAM, removable application memory: CompactFlash, 2 CAN interfaces, 1 Ethernet interface 100 Base-T, 1 RS232 interface, 1 X2X Link Master interface, 3 digital I/O can be configured as 24 VDC input or output 500 mA, 1 analog input $\pm 10V$, order program memory and 0TB704 and 0TB708 terminal blocks separately.	1310
0PS320.1	24 VDC power supply, 3-phase, 20 A, input 400..500 VAC (3 phases), wide range, DIN rail mounting	659
8CM005.12-5	Motor cable, length 5 m, 4 x 10 mm ² + 2 x 2 x 1.5 mm ² , motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified	1316
8CM007.12-5	Motor cable, length 7 m, 4 x 10 mm ² + 2 x 2 x 1.5 mm ² , motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified	1316
8CM010.12-5	Motor cable, length 10 m, 4 x 10 mm ² + 2 x 2 x 1.5 mm ² , motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified	1316
8CM015.12-5	Motor cable, length 15 m, 4 x 10 mm ² + 2 x 2 x 1.5 mm ² , motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified	1316
8CM020.12-5	Motor cable, length 20 m, 4 x 10 mm ² + 2 x 2 x 1.5 mm ² , motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified	1316
8CM025.12-5	Motor cable, length 25 m, 4 x 10 mm ² + 2 x 2 x 1.5 mm ² , motor plug 8-pin Intercontec socket, can be used in cable drag claims, UL/CSA certified	1316

CAN bus interface 8AC110



- CAN interface for installation in ACOPOS servo drives
- For communication and configuration of the ACOPOS servo drives for standard applications
- Node number can be set using switch

General information	8AC110.60-2
C-UL-US listed	Yes
Module type	ACOPOS plug-in module
Slot	Slot 1
Power consumption	Max. 0.7 W
CAN bus interface	8AC110.60-2
Connection, module-side	9-pin DSUB plug
Indicators	RXD/TXD LEDs
Electrical isolation	
CAN bus - ACOPOS	Yes
Maximum distance	60 m
Baud rate	500 kBit/s
Network-capable	Yes
Bus termination resistor	Externally wired
Operational conditions	8AC110.60-2
Ambient temperature during operation	--- ¹⁾
Relative humidity during operation	--- ¹⁾
1) ACOPOS plug-in modules can be used in an ACOPOS servo drive; the corresponding values can be found in the technical data of the respective ACOPOS servo drive.	
Storage and transport conditions	8AC110.60-2
Storage temperature	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing
Transport temperature	-25 to +70°C
Relative humidity during transport	95% at +40°C

CAN

Optional accessories			
7AC911.9	Bus connector, CAN		1724
0AC912.9	Bus adapter, CAN, 1 CAN bus interface		1726
0AC913.92	Bus adapter, CAN, 2 CAN bus interfaces, including 30 cm connection cable (DSUB connector)		1726


POWERLINK V2 interface 8AC114



- POWERLINK V2 interface for installation in ACOPOS servo drives
- Integrated 2x hub for easy wiring
- For communication and configuration of ACOPOS servo drives for complex and time-critical applications
- Node number can be set using switch

ETHERNET 
POWERLINK

General information		8AC114.60-2
C-UL-US listed		In preparation
Module type		ACOPOS plug-in module
Slot		Slot 1
Power consumption		Max. 3 W
POWERLINK interface		8AC114.60-2
Connection, module-side		2x RJ45 socket
Indicators		Status LED + 2x Link LED
Electrical isolation		
ETHERNET - ACOPOS		Yes
Maximum distance per segment		100 m ¹⁾
Baud rate		100 Mbit/s
Network-capable		Yes
Hub, 2x		Yes
Maximum number of hub levels		10
Cabling topology		Star or tree with level 2 hubs
Possible station operating modes		Synchronous to POWERLINK cycle
Watchdog function		
Hardware		Yes (via ACOPOS servo drive)
Software		Yes (via ACOPOS servo drive)
1) With a cycle time of 400 µs and 10 ACOPOS servo drives, the maximum total cable length is 200 m.		
Operational conditions		8AC114.60-2
Ambient temperature during operation		... ¹⁾
Relative humidity during operation		... ¹⁾
1) ACOPOS plug-in modules can be used in an ACOPOS servo drive; the corresponding values can be found in the technical data of the respective ACOPOS servo drive.		
Storage and transport conditions		8AC114.60-2
Storage temperature		-25 to +55°C
Relative humidity during storage		5 to 95%, non-condensing
Transport temperature		-25 to +70°C
Relative humidity during transport		95% at +40°C

Optional accessories	Amount		
X20CA0E61.xxxx	max. 2	EPL connection cable RJ45 to RJ45, xxxx m	 1728

EnDat encoder and sine incremental encoder interface 8AC120



- EnDat encoder interface for installation in ACOPOS servo drives
- Encoder monitoring
- Also suitable for evaluating simple incremental encoders with sinusoidal input signal

General information		8AC120.60-1
C-UL-US listed		Yes
Module type		ACOPOS plug-in module
Slot ¹⁾		Slots 2, 3 and 4
Power consumption		Depends on the encoder connected
E0 ... EnDat single-turn, 512 lines		Max. 2.3 W
E1 ... EnDat multi-turn, 512 lines		Max. 3.1 W
E2 ... EnDat single-turn, 32 lines (inductive)		Max. 3.1 W
E3 ... EnDat multi-turn, 32 lines (inductive)		Max. 3.1 W
E4 ... EnDat single-turn, 512 lines		Max. 2.4 W
E5 ... EnDat multi-turn, 512 lines		Max. 2.7 W
¹⁾ The AC120 is an encoder module. Several encoder modules can also be inserted. In this case, the encoder module in the slot with the lowest number is automatically used for motor feedback.		
Encoder input ¹⁾		8AC120.60-1
Connection, module-side		15-pin DSUB socket
Indicators		UP/DN LEDs
Electrical isolation		
Encoder - ACOPOS		No
Encoder monitoring		Yes
Encoder supply		
Output voltage		Typ. 5 V
Ability to work under pressure		250 mA ²⁾
Sense lines		2, compensation of max. 2x 0.7 V
Sine-cosine inputs		
Signal transfer		Differential signals, symmetric
Differential voltage		0.5 to 1.25 V _{ss}
Common mode voltage		Max. ±7 V
Terminating resistor		120 Ω
Signal frequency (-5 dB)		DC up to 400 kHz
Signal frequency (-3 dB)		DC up to 300 kHz
Resolution ³⁾		16384 * number of encoder lines
Precision ⁴⁾		---
Reference input		
Signal transfer		Differential signal, symmetric
Differential voltage for high		≥ +0.2 V
Differential voltage for low		≤ -0.2 V
Common mode voltage		Max. ±7 V
Terminating resistor		120 Ω
Serial interface		Synchronous
Signal transfer		RS485
Baud rate		625 kBaud

¹⁾ The EnDat encoder must be wired using a cable with a single shield.

²⁾ This value only applies to the encoder. The actual load capacity of the encoder supply is approx. 300 mA. The difference of approx. 50 mA is covers the consumption of the terminating resistors that are always present. For longer encoder cables, it is important to note that the maximum voltage drop permitted on the supply wires (there and back) is 1.45 V. This can reduce the permissible load current.

³⁾ Depending on the resolution of the connected encoder, in practical applications only a part of this resolution can be used. The usable resolution can be further reduced by signal interferences from the connected encoder.

⁴⁾ In the field, the precision is limited by the encoder.

Operational conditions		8AC120.60-1
Ambient temperature during operation	---	1)
Relative humidity during operation	---	1)

1) ACOPOS plug-in modules can be used in an ACOPOS servo drive; the corresponding values can be found in the technical data of the respective ACOPOS servo drive.

Storage and transport conditions		8AC120.60-1
Storage temperature	-25 to +55°C	
Relative humidity during storage	5 to 95%, non-condensing	
Transport temperature	-25 to +70°C	
Relative humidity during transport	95% at +40°C	

Optional accessories		
8CE005.12-1	EnDat cable, length 5 m, 10 x 0.14 mm ² + 2 x 0.5 mm ² , EnDat plug 17-pin Intercontec socket, 15-pin servo connector DSUB plug, can be used in cable drag chains, UL/CSA listed	1318
8CE007.12-1	EnDat cable, length 7 m, 10 x 0.14 mm ² + 2 x 0.5 mm ² , EnDat plug 17-pin Intercontec socket, 15-pin servo connector DSUB plug, can be used in cable drag chains, UL/CSA listed	1318
8CE010.12-1	EnDat cable, length 10 m, 10 x 0.14 mm ² + 2 x 0.5 mm ² , EnDat plug 17-pin Intercontec socket, 15-pin servo connector DSUB plug, can be used in cable drag chains, UL/CSA listed	1318
8CE015.12-1	EnDat cable, length 15 m, 10 x 0.14 mm ² + 2 x 0.5 mm ² , EnDat plug 17-pin Intercontec socket, 15-pin servo connector DSUB plug, can be used in cable drag chains, UL/CSA listed	1318
8CE020.12-1	EnDat cable, length 20 m, 10 x 0.14 mm ² + 2 x 0.5 mm ² , EnDat plug 17-pin Intercontec socket, 15-pin servo connector DSUB plug, can be used in cable drag chains, UL/CSA listed	1318
8CE025.12-1	EnDat cable, length 25 m, 10 x 0.14 mm ² + 2 x 0.5 mm ² , EnDat plug 17-pin Intercontec socket, 15-pin servo connector DSUB plug, can be used in cable drag chains, UL/CSA listed	1318

HIPERFACE interface 8AC121



- HIPERFACE interface for installation in ACOPOS servo drives
- Encoder monitoring

General information		8AC121.60-1
C-UL-US listed		Yes
Module type		ACOPOS plug-in module
Slot ¹⁾		Slots 2, 3 and 4
Power consumption		
With encoder current requirement of 0 mA		0.35 W
With encoder current requirement of 100 mA		1.4 W
With encoder current requirement of 170 mA		2.1 W

1) The AC121 is an encoder module. Several encoder modules can also be inserted. In this case, the module in the slot with the lowest number is automatically used for motor feedback.

Encoder input ¹⁾		8AC121.60-1
Connection, module-side		15-pin DSUB socket, 2 pins closed
Indicators		UP/DN LEDs
Electrical isolation		
Encoder - ACOPOS		No
Encoder monitoring		Yes
Encoder supply		
Output voltage		8 - 9 V
Ability to work under pressure		170 mA
Sense lines		--- ²⁾
Sine-cosine inputs		
Signal transfer		Differential signal, asymmetric
Differential voltage		0.5 ... 1.25 V _{ss}
Common mode voltage		Max. ±7 V
Terminating resistor		120 Ω
Signal frequency		DC ... 200 kHz
Resolution ³⁾		16384 * number of encoder lines
Precision ⁴⁾		---
Serial interface		
Signal transfer		RS485
Baud rate		9600 baud

1) The HIPERFACE encoder must be wired using a cable with a single shield.

2) No sense lines are present because the supply voltage for the HIPERFACE encoder is permitted to lie between 7 and 12 V.

3) Noise on the encoder signal reduces the practical resolution by approx. 5 bits (a factor of 32).

4) In the field, the precision is limited by the encoder.

Operational conditions		8AC121.60-1
Ambient temperature during operation		0 to +50°C
Relative humidity during operation		5 to 95%, non-condensing
Storage and transport conditions		8AC121.60-1
Storage temperature		-25 to +55°C
Relative humidity during storage		5 to 95%, non-condensing
Transport temperature		-25 to +70°C
Relative humidity during transport		95% at +40°C



Resolver interface 8AC122



- Resolver interface for installation in ACOPOS servo drives
- Monitoring the encoder input signals
- Resolver type BRX

General information		8AC122.60-3
C-UL-US listed		Yes
Module type		ACOPOS plug-in module
Slot ¹⁾		Slots 2, 3 and 4
Power consumption		Max. 2.5 W
1) The AC122 is an encoder module. Several encoder modules can also be inserted. In this case, the encoder module in the slot with the lowest number is automatically used for motor feedback.		
Resolver input ¹⁾		8AC122.60-3
Resolver type		BRX ²⁾
Number of poles		2-pin
Rated voltage ratio		0.5 ± 10%
Input frequency		10 kHz
Input voltage		3 to 7 V _{rms}
Max. phase shift		± 45°
Max. elec. angular error		± 10 angular minutes
Connection, module-side		9-pin DSUB socket
Indicators		UP/DN LEDs
Electrical isolation		
Resolver - ACOPOS		No
Encoder monitoring		Yes
Resolution		14 bits/rev ⁴⁾
Bandwidth		2.5 kHz
Accuracy		± 8 angular minutes
Reference output		
Signal transfer		Differential signals
Differential voltage		Typically 3.4 V _{eff}
Output current		Max. 50 mA _{eff}
Frequency		10 kHz
Sine-cosine inputs		
Signal transfer		Differential signals
Input impedance at 10 kHz (per pin)		10.4 kΩ - j 11.1 kΩ
Electrical isolation encoder-ACOPOS		No, common-mode voltage on the sine cosine inputs max ± 20 V

1) The resolver must be wired using a cable with a single shield and twisted pair signal lines.

2) BRX resolvers are fed with a sine signal (reference signal) from the module and return two sine signals with a 90° phase shift as a result. The amplitudes of these signals change with the angular position of the resolver. Unlike BRX resolvers, BRT resolvers can be fed with two sine signals which are offset by 90°. A single sine signal with constant amplitude is returned. The phase position of this signal changes with the angular position of the resolver.

Starting with firmware V2.040, BRT resolvers can be basically evaluated with 8AC122.60-3. However, resolution and precision are limited because the resolver is run in inverse mode. Additionally, the rated voltage ratio is different to 0.5 (default value) and has to be set appropriately.

3) Starting with firmware V2.040, the rated voltage ratio can be set in a range of 0.3 ... 0.5 (default value).

4) 12 bits/rev is set as default, but this can be changed to 14 bits/rev.

Operational conditions		8AC122.60-3
Ambient temperature during operation	---	1)
Relative humidity during operation	---	1)

1) ACOPOS plug-in modules can be used in an ACOPOS servo drive; the corresponding values can be found in the technical data of the respective ACOPOS servo drives.

Storage and transport conditions		8AC122.60-3
Storage temperature	-25 to +55°C	
Relative humidity during storage	5 to 95%, non-condensing	
Transport temperature	-25 to +70°C	
Relative humidity during transport	95% at +40°C	

Optional accessories		
8CR005.12-1	Resolver cable, length 5 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1319
8CR007.12-1	Resolver cable, length 7 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1319
8CR010.12-1	Resolver cable, length 10 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1319
8CR015.12-1	Resolver cable, length 15 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1319
8CR020.12-1	Resolver cable, length 20 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1319
8CR025.12-1	Resolver cable, length 25 m, 3 x 2 x 24 AWG/19, resolver plug 12-pin Intercontec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1319

Incremental encoder and SSI absolute value encoder interface 8AC123



- Incremental encoder and SSI absolute encoder interface for installing ACOPOS servo drives
- Monitoring the encoder input signals
- Encoder supply voltage of 5V or 15V
- Compensation for a voltage drop at 5 V encoder supply voltage

General information	8AC123.60-1
C-UL-US listed	Yes
Module type	ACOPOS plug-in module
Slot ¹⁾	Slots 2, 3 and 4
Power consumption	Max. 7.5 W Depends on the current requirements for the encoder connected ²⁾

1) The AC123 is an encoder module. Several encoder modules can also be inserted. In this case, the encoder module in the slot with the lowest number is automatically used for motor feedback.

2) The power consumption of the plug-in module can be approximated using the following formula:

$$P_{\text{Module}} [\text{W}] = P_{\text{Encoder}} [\text{W}] \cdot k + 0.6 \text{ W}$$

The power consumed by the encoder P_{Encoder} is calculated from the selected encoder supply voltage (5 V / 15 V) and the current required:

$$P_{\text{Encoder}} [\text{W}] = U_{\text{Encoder}} [\text{V}] \cdot I_{\text{Encoder}} [\text{A}]$$

The following values must be used for k:

$$k = 1.2 \text{ (for 15 V encoder supply)}$$

$$k = 1.75 \text{ (for 5 V encoder supply)}$$

Encoder input ¹⁾	8AC123.60-1
Connection, module-side	15-pin DSUB socket
Indicators	UP/DN LEDs
Electrical isolation	
Encoder - ACOPOS	Yes
Encoder monitoring	Yes
Signal transfer	Differential signal transfer
Cable length ²⁾	Max. 50 m

1) The encoder must be wired using a cable with a single shield and twisted pair signal lines (e.g. $4 \times 2 \times 0.14 \text{ mm}^2 + 2 \times 0.5 \text{ mm}^2$).

2) A cable with at least $4 \times 2 \times 0.14 \text{ mm}^2 + 2 \times 0.5 \text{ mm}^2$ is required for the maximum cable length. The sense lines must be used.

Encoder supply	8AC123.60-1
Supply voltages	Internal, select between 5 V/15 V
Sense lines	
For 5 V	Yes, 2, compensation of max. 2 V
For 15 V	No
Ability to work under pressure	
5 V	350 mA
15 V	350 mA
Short circuit protection, overload protection	Yes

Incremental encoder	8AC123.60-1
Signal form	Square wave pulse
Evaluation	4x
Input frequency	Max. 200 kHz
Counter frequency	Max. 800 kHz
Reference frequency	Max. 200 kHz
Distance between edges	Min. $0.6 \mu\text{s}$
Counter size	32-bit
Inputs	A, A\, B, B\, R, R\
Differential voltage inputs A, B, R	
Minimum	2.5 V
Maximum	6 V

SSI absolute encoder	8AC123.60-1
Coding	Gray, binary
Baud rate	200 kBit/s
Word size	Max. 31-bit
Differential voltage clock output - 120 Ω	
Minimum	2.5 V
Maximum	5 V
Differential voltage data input	
Minimum	2.5 V
Maximum	6 V
Operational conditions	8AC123.60-1
Ambient temperature during operation	... 1)
Relative humidity during operation	... 1)
1) ACOPOS plug-in modules can be used in an ACOPOS servo drive; the corresponding values can be found in the technical data of the respective ACOPOS servo drive.	
Storage and transport conditions	8AC123.60-1
Storage temperature	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing
Transport temperature	-25 to +70°C
Relative humidity during transport	95% at +40°C

Digital mixed module 8AC130



- Digital mixed module for installation in ACOPOS servo drives
- Maximum of 8 digital inputs or 10 digital outputs
- The I/O points can be configured in pairs as inputs or outputs
- Incremental encoder functionality (A, B, R)
- Incremental encoder emulation

General information		8AC130.60-1
C-UL-US listed		Yes
Module type		ACOPOS plug-in module
Slot ¹⁾		Slots 2, 3 and 4
Power consumption		Max. 0.8 W
1) The AC130 can also be used as an encoder module. Several encoder modules can also be inserted. In this case, the encoder module in the slot with the lowest number is automatically used for motor feedback.		
Inputs/outputs		8AC130.60-1
Connection, module-side		12-pin connector
Configuration of the inputs/outputs		Configured in pairs as input or output
Display		24 V LED
Supply voltage		8AC130.60-1
Supply voltage		
Minimum		18 VDC
Rated		24 VDC
Maximum		30 VDC
Reverse polarity protection		Yes
Voltage monitoring (24 V - LED)		Yes, supply voltage > 18 V
Digital inputs ¹⁾		8AC130.60-1
Number of inputs		Max. 8
Wiring		Sink
Electrical isolation		
Input - ACOPOS		Yes
Input - Input		No
Input voltage		
Rated		24 VDC
Maximum		30 VDC
Switching threshold		
LOW		< 5 V
HIGH		> 15 V
Input current at rated voltage		
Inputs 1 - 4		Approx. 10 mA
Inputs 5 - 8		Approx. 5.5 mA
Switching delay		
Inputs 1 - 4		Max. 5 μ s
Inputs 5 - 8		Max. 35 μ s
Modulation compared to ground potential		---
1) Shielded cables must be used for inputs 1 - 4.		
Event counter		8AC130.60-1
Signal form		Square wave pulse
Input frequency		Max. 100 kHz
Counter size		16-bit
Inputs		
Input 1		Counter 1
Input 2		Counter 2

Incremental encoder		8AC130.60-1
Signal form		Square wave pulse
Evaluation		4x
Encoder monitoring		No
Input frequency		Max. 62.5 kHz
Counter frequency		Max. 250 kHz
Reference frequency		Max. 62.5 kHz
Distance between edges		Min. 2.5 μ s
Counter size		16-bit
Inputs		
Input 1		Channel A
Input 2		Channel B
Input 3		Reference pulse R
Outputs		8AC130.60-1
Number of outputs		Max. 10
Type		Transistor outputs
Outputs 1 - 4		Push-pull
Outputs 5 - 10		High-side
Electrical isolation		
Output - ACOPOS		Yes
Output - Output		No
Switching voltage		
Minimum		18 VDC
Rated		24 VDC
Maximum		30 VDC
Continuous current		
Outputs 1 - 4		Max. 100 mA
Outputs 5 - 8		Max. 400 mA
Outputs 9 - 10		Max. 2 A
Switching delay 0 -> 1 and 1 -> 0		
Outputs 1 - 4		Max. 5 μ s
Outputs 5 - 8		Max. 50 μ s
Outputs 9 - 10		Max. 500 μ s
Switching frequency (resistive load)		
Outputs 1 - 2		Max. 10 kHz
Outputs 3 - 4		Max. 10 kHz
Outputs 5 - 8		Max. 5 kHz
Outputs 9 - 10		Max. 100 Hz
Protection		
Short circuit protection		Yes
Overload protection		Yes
Short circuit current at 24 V (until cut-off)		
Outputs 1 - 4		Approx. 1 A
Outputs 5 - 8		Approx. 1.2 A
Outputs 9 - 10		Approx. 24 A
Readable outputs		Yes

Digital mixed module 8AC130

Operational conditions	8AC130.60-1
Ambient temperature during operation	--- 1)
Relative humidity during operation	--- 1)

1) ACOPOS plug-in modules can be used in an ACOPOS servo drive; the corresponding values can be found in the technical data of the respective ACOPOS servo drive.

Storage and transport conditions	8AC130.60-1
Storage temperature	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing
Transport temperature	-25 to +70°C
Relative humidity during transport	95% at +40°C

Required accessories		
7TB712.9	Terminal block, 12-pin, screw clamps	1721
7TB712.91	Terminal block, 12-pin, cage clamps	1721

Mixed module 8AC131



- Mixed module for installation in ACOPOS servo drives
- 2 analog inputs with 12-bit resolution and up to 2 digital inputs/outputs
- Digital inputs/outputs can be switched individually
- Counter function
- All digital outputs can be read

General information		8AC131.60-1
C-UL-US listed		Yes
Module type		ACOPOS plug-in module
Slot		Slots 2, 3 and 4
Power consumption		Max. 1 W
Inputs/outputs		8AC131.60-1
Connection, module-side		12-pin connector
Configuration of the digital inputs/outputs		Can be configured individually as digital input or output
Display		24 V LED
Supply voltage		8AC131.60-1
Supply voltage		
Minimum		18 VDC
Rated		24 VDC
Maximum		30 VDC
Reverse polarity protection		Yes
Voltage monitoring (24 V - LED)		Yes, supply voltage > 18 V
Digital inputs		8AC131.60-1
Number of inputs		Max. 2
Wiring		Sink
Electrical isolation		
Input - ACOPOS		Yes
Input - Input		No
Input voltage		
Rated		24 VDC
Maximum		30 VDC
Switching threshold		
LOW		< 5 V
HIGH		> 15 V
Input current at rated voltage		Approx. 8 mA
Switching delay		
Counter		Max. 5 μ s
Digital input		Max. 55 μ s (digitally filtered)
Modulation compared to ground potential		Max. \pm 50 V
Event counter		8AC131.60-1
Signal form		Square wave pulse
Input frequency		Max. 100 kHz
Counter size		16-bit
Inputs		
Input 1		Counter 1
Input 2		Counter 2

Mixed module 8AC131

Digital outputs		8AC131.60-1
Number of outputs		Max. 2
Type		Transistor outputs push-pull
Electrical isolation		
Output - ACOPOS		Yes
Output - Output		No
Switching voltage		
Minimum		18 VDC
Rated		24 VDC
Maximum		30 VDC
Continuous current		Max. 45 mA
Switching delay 0 -> 1 and 1 -> 0		Max. 5 μ s
Switching frequency (resistive load)		Max. 100 kHz
Protection		
Short circuit protection		Yes
Overload protection		Yes
Short circuit current at 24 V (until cut-off)		Approx. 0.3 A
Readable outputs		Yes
Analog inputs		8AC131.60-1
Number of inputs		Max. 2
Design		Differential input or single ended input
Electrical isolation		
Input - ACOPOS		Yes
Input - Input		No
Input signal		
Rated		-10 V to +10 V
Maximum		-15 V to +15 V
Operating mode		Cyclic measurement synchronous to 50 μ s ACOPOS clock
Digital converter resolution		12-bit
Non-linearity		± 1 LSB
Output format		INT16 \$8000 - \$7FF0 LSB = \$0010 = 4.883 mV
Conversion procedure		Successive approximation
Conversion time for both inputs		<50 μ s
Differential input impedance		> 10 M Ω
Input filter		Analog low pass 3rd order / cut-off frequency: 10 kHz
Basic Accuracy at 25°C		Refers to the measurement range limit. $\pm 0.05\%$ ¹⁾
Offset drift		Max. $\pm 0.0005\%$ / °C ¹⁾
Gain drift		Max. $\pm 0.006\%$ / °C ¹⁾
Cross-talk between the analog inputs		Min. -90 dB at 1kHz
Common-mode rejection		
DC		Min. -73 dB
50 Hz		Min. -73 dB
Modulation compared to ground potential		Max. ± 50 V
Modulation between the analog input channels		Max. ± 5 V

1) Refers to the measurement range limit.

Operational conditions		8AC131.60-1
Ambient temperature during operation		... 1)
Relative humidity during operation		... 1)

1) ACOPOS plug-in modules can be used in an ACOPOS servo drive; the corresponding values can be found in the technical data of the respective ACOPOS servo drive.

Storage and transport conditions		8AC131.60-1
Storage temperature		-25 to +55°C
Relative humidity during storage		5 to 95%, non-condensing
Transport temperature		-25 to +70°C
Relative humidity during transport		95% at +40°C

Required accessories		
7TB712.9	Terminal block, 12-pin, screw clamps	1721
7TB712.91	Terminal block, 12-pin, cage clamps	1721

CPU module 8AC140



- Complete PLC for installation in ACOPOS servo drives
- Removable application memory (CompactFlash) ¹⁾
- Interfaces for connecting to CAN bus, Profibus or Ethernet networks ²⁾
- Integrated analog input and up to three digital inputs/outputs (can be configured individually as input/output)
- Can be delivered with built-in CNC function (ARNCO, only on 8AC140.61-3)

1) Application memory must be ordered separately.

2) Ethernet interface only on 8AC140.60-3 and 8AC140.61-3.

General information	8AC140.60-2	8AC140.60-3	8AC140.61-3
C-UL-US listed	Yes	Yes	Yes
Module type	ACOPOS plug-in module double-width	ACOPOS plug-in module double-width	ACOPOS plug-in module double-width
Slot ¹⁾	Slots 1 + 2	Slots 1 + 2	Slots 1 + 2
Power consumption	Max. 4.5 W	Max. 4.5 W	Max. 4.5 W
Visual Components capability	Yes	Yes	Yes
ACOPOS capability	Yes	Yes	Yes

1) The AC140 is a module with double-width and occupies slots 1 and 2.

CPU	8AC140.60-2	8AC140.60-3	8AC140.61-3
Processor clock	100 MHz	100 MHz	100 MHz
SRAM	32 kB	32 kB	32 kB
DRAM	16 MB	32 MB	32 MB
Operating system	AC140 (version V2.67 and higher)	AC140 (version V2.67 and higher)	AC140 (version V2.67 and higher)

IF1 application interface	8AC140.60-2	8AC140.60-3	8AC140.61-3
Interface type	RS232	RS232	RS232
Electrical isolation	No	No	No
Design	9-pin DSUB plug	9-pin DSUB plug	9-pin DSUB plug
Max. distance	15 m / 19,200 baud	15 m / 19,200 baud	15 m / 19,200 baud
Max. baud rate	115.2 kBaud	115.2 kBaud	115.2 kBaud
Display	X1 LED	X1 LED	X1 LED

IF2 application interface	8AC140.60-2	8AC140.60-3	8AC140.61-3
Interface type	CAN bus	CAN bus	CAN bus
Electrical isolation	Yes	Yes	Yes
Design	9-pin DSUB plug	9-pin DSUB plug	9-pin DSUB plug
Max. distance	1000 m	1000 m	1000 m
Max. baud rate			
Bus lengths up to 60 m	500 kBit/s	500 kBit/s	500 kBit/s
Bus lengths up to 200 m	250 kBit/s	250 kBit/s	250 kBit/s
Bus lengths up to 1,000 m	50 kBit/s	50 kBit/s	50 kBit/s
Indicators	RX / TX LEDs	RX / TX LEDs	RX / TX LEDs
Network-capable	Yes	Yes	Yes
Bus termination resistor	Externally wired	Externally wired	Externally wired

IF3 application interface	8AC140.60-2	8AC140.60-3	8AC140.61-3
Interface type	RS485	RS485	RS485
Transfer protocol	Profibus DP	Profibus DP	Profibus DP
Electrical isolation	Yes	Yes	Yes
Design	9-pin DSUB socket	9-pin DSUB socket	9-pin DSUB socket
Controller	ASIC SPC3	ASIC SPC3	ASIC SPC3
RAM	1.5 kByte	1.5 kByte	1.5 kByte
Max. distance	1000 m	1000 m	1000 m
Max. baud rate			
Bus lengths up to 100 m	12 MBit/s	12 MBit/s	12 MBit/s
Bus lengths up to 200 m	1.5 MBit/s	1.5 MBit/s	1.5 MBit/s
Bus lengths up to 400 m	500 kBit/s	500 kBit/s	500 kBit/s
Bus lengths up to 1,000 m	187.5 kBit/s	187.5 kBit/s	187.5 kBit/s
Indicators	RX / TX LEDs	PB LED	PB LED
Network-capable	Yes	Yes	Yes
Bus termination resistor	External T-connector	External T-connector	External T-connector

Application interface IF5	8AC140.60-2	8AC140.60-3	8AC140.61-3
Interface type	---	Ethernet	Ethernet
Electrical isolation	---	Yes	Yes
Design	---	RJ45 socket	RJ45 socket
Max. distance	---	100 m	100 m
Baud rate	---	10/100 MBit/s	10/100 MBit/s
Display	---	ACT LED	ACT LED
Network-capable	---	Yes	Yes
Inputs/outputs	8AC140.60-2	8AC140.60-3	8AC140.61-3
Connection, module-side	8-pin connector	8-pin connector	8-pin connector
Configuration of the digital inputs/outputs	Can be configured individually as input or output	Can be configured individually as input or output	Can be configured individually as input or output
Digital inputs ¹⁾	8AC140.60-2	8AC140.60-3	8AC140.61-3
Number of inputs	Max. 3	Max. 3	Max. 3
Wiring	Sink	Sink	Sink
Electrical isolation			
Input - ACOPOS	Yes	Yes	Yes
Input - Input	No	No	No
Input voltage			
Rated	24 VDC	24 VDC	24 VDC
Maximum	30 VDC	30 VDC	30 VDC
Switching threshold			
LOW	< 5 V	< 5 V	< 5 V
HIGH	> 15 V	> 15 V	> 15 V
Input current at rated voltage	Approx. 4.2 mA	Approx. 4.2 mA	Approx. 4.2 mA
Input delay	< 5 μ s	< 5 μ s	< 5 μ s
Modulation compared to ground potential	Max. \pm 30 V	Max. \pm 30 V	Max. \pm 30 V
1) Shielded cables must be used for inputs 1 - 3.			
Event counter	8AC140.60-2	8AC140.60-3	8AC140.61-3
Signal form	Square wave pulse	Square wave pulse	Square wave pulse
Input frequency	Max. 100 kHz	Max. 100 kHz	Max. 100 kHz
Pulse length	Min. 5 μ s	Min. 5 μ s	Min. 5 μ s
Counter size	32-bit	32-bit	32-bit
Inputs			
Input 1	Counter 1	Counter 1	Counter 1
Input 2	---	---	---
Input 3	---	---	---
Incremental counter	8AC140.60-2	8AC140.60-3	8AC140.61-3
Signal form	Square wave pulse	Square wave pulse	Square wave pulse
Evaluation	4x	4x	4x
Encoder monitoring	No	No	No
Input frequency	Max. 20 kHz	Max. 20 kHz	Max. 20 kHz
Counter frequency	Max. 80 kHz	Max. 80 kHz	Max. 80 kHz
Reference frequency	Max. 20 kHz	Max. 20 kHz	Max. 20 kHz
Distance between edges	Min. 5 μ s	Min. 5 μ s	Min. 5 μ s
Counter size	16-bit	16-bit	16-bit
Inputs			
Input 1	Channel A	Channel A	Channel A
Input 2	Channel B	Channel B	Channel B
Input 3	Reference pulse R	Reference pulse R	Reference pulse R

CPU module 8AC140

Gate measurement	8AC140.60-2	8AC140.60-3	8AC140.61-3
Signal form	Square wave pulse	Square wave pulse	Square wave pulse
Gate frequency	Max. 100 kHz	Max. 100 kHz	Max. 100 kHz
Pulse length	Min. 5 μ s	Min. 5 μ s	Min. 5 μ s
Counter frequency			
Internal	31.25 kHz or 4 MHz	31.25 kHz or 4 MHz	31.25 kHz or 4 MHz
External	Max. 100 kHz	Max. 100 kHz	Max. 100 kHz
Period measurement	8AC140.60-2	8AC140.60-3	8AC140.61-3
Signal form	Square wave pulse	Square wave pulse	Square wave pulse
Input frequency	Max. 100 kHz	Max. 100 kHz	Max. 100 kHz
Pulse length	Min. 5 μ s	Min. 5 μ s	Min. 5 μ s
Counter frequency			
Internal	31.25 kHz or 4 MHz	31.25 kHz or 4 MHz	31.25 kHz or 4 MHz
External	Max. 100 kHz	Max. 100 kHz	Max. 100 kHz
Digital outputs	8AC140.60-2	8AC140.60-3	8AC140.61-3
Number of outputs	Max. 3	Max. 3	Max. 3
Type	High-side transistor outputs	High-side transistor outputs	High-side transistor outputs
Electrical isolation			
Output - ACOPOS	Yes	Yes	Yes
Output - Output	No	No	No
Switching voltage			
Minimum	18 VDC	18 VDC	18 VDC
Rated	24 VDC	24 VDC	24 VDC
Maximum	30 VDC	30 VDC	30 VDC
Continuous current	Max. 500 mA	Max. 500 mA	Max. 500 mA
Switching delay 0 -> 1 and 1 -> 0	Max. 500 μ s (typ. 250 μ s)	Max. 500 μ s (typ. 250 μ s)	Max. 500 μ s (typ. 250 μ s)
Switching frequency (resistive load)	Max. 100 Hz	Max. 100 Hz	Max. 100 Hz
Protection			
Short circuit protection	Yes	Yes	Yes
Overload protection	Yes	Yes	Yes
Continuous short circuit current at 24 V	Typ. 4 A	Typ. 4 A	Typ. 4 A
Readable outputs	Yes	Yes	Yes
Analog input	8AC140.60-2	8AC140.60-3	8AC140.61-3
Design	Differential input	Differential input	Differential input
Electrical isolation			
Input - ACOPOS ¹⁾	No, max. modulation: ± 13 V	No, max. modulation: ± 13 V	No, max. modulation: ± 13 V
Input signal			
Rated	-10 V to +10 V	-10 V to +10 V	-10 V to +10 V
Maximum	-13 V to +13 V	-13 V to +13 V	-13 V to +13 V
Operating mode	Cyclic measurement non-synchronous to 50 μ s ACOPOS clock	Cyclic measurement non-synchronous to 50 μ s ACOPOS clock	Cyclic measurement non-synchronous to 50 μ s ACOPOS clock
Digital converter resolution	12-bit	12-bit	12-bit
Non-linearity	± 2 LSB	± 2 LSB	± 2 LSB
Output format	INT 16 \$8001 - \$7FFF LSB = \$0010 = 4.88 mV	INT 16 \$8001 - \$7FFF LSB = \$0010 = 4.88 mV	INT 16 \$8001 - \$7FFF LSB = \$0010 = 4.88 mV
Conversion procedure	Successive approximation	Successive approximation	Successive approximation
Conversion time	<50 μ s	<50 μ s	<50 μ s
Differential input impedance	20 M Ω	20 M Ω	20 M Ω
Input filter	Analog low pass 3rd-order cut-off frequency: 10 kHz	Analog low pass 3rd-order cut-off frequency: 10 kHz	Analog low pass 3rd-order cut-off frequency: 10 kHz
Common-mode rejection			
DC	Min. 73 dB	Min. 73 dB	Min. 73 dB
50 Hz	Min. 73 dB	Min. 73 dB	Min. 73 dB

1) External electrical isolation for the connected sensors is recommended because the analog input is not electrically isolated.

Operational conditions	8AC140.60-2	8AC140.60-3	8AC140.61-3
Ambient temperature during operation	--- ¹⁾	--- ¹⁾	--- ¹⁾
Relative humidity during operation	--- ¹⁾	--- ¹⁾	--- ¹⁾

1) ACOPOS plug-in modules can be used in an ACOPOS servo drive; the corresponding values can be found in the technical data of the respective for a list of exclusive actions.

Storage and transport conditions	8AC140.60-2	8AC140.60-3	8AC140.61-3
Storage temperature	-25 to +55°C	-25 to +55°C	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing	5 to 95%, non-condensing	5 to 95%, non-condensing
Transport temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Relative humidity during transport	95% at +40°C	95% at +40°C	95% at +40°C

Required accessories		
5CFCRD.0064-03	CompactFlash 64 MB ATA/IDE SiliconSystems	1706
5CFCRD.0128-03	CompactFlash 128 MB ATA/IDE SiliconSystems	1706
5CFCRD.0256-03	CompactFlash 256 MB ATA/IDE SiliconSystems	1706
5CFCRD.0512-03	CompactFlash 512 MB ATA/IDE SiliconSystems	1706
5CFCRD.1024-03	CompactFlash 1024 MB ATA/IDE SiliconSystems	1706
5CFCRD.2048-03	CompactFlash 2048 MB ATA/IDE SiliconSystems	1706
5CFCRD.4096-03	CompactFlash 4096 MB ATA/IDE SiliconSystems	1706
5CFCRD.8092-03	CompactFlash 8092 MB ATA/IDE SiliconSystems	1706
0TB708.91	Accessory terminal block, 8-pin, cage clamps 1.5 mm ²	1716

Optional accessories		
0G0001.00-090	Cable PC <-> PLC/PW, RS232, online cable	1708
7AC911.9	Bus connector, CAN	1724
0AC912.9	Bus connector, CAN, 1 CAN interface	1726
0AC913.92	Bus connector, CAN, 2 CAN interfaces, including 30 cm connection cable (DSUB connector)	1726

CPU module 8AC141



- Complete PLC for installation in ACOPOS servo drives
- Removable application memory (CompactFlash) ¹⁾
- Interfaces for connecting to CAN bus or Ethernet networks
- X2X Link interface
- Up to three digital inputs/outputs (can be configured individually as input / output)
- With built-in CNC function (ARNCO, only on 8AC141.61-3)

¹⁾ Application memory must be ordered separately.

General information	8AC141.60-2	8AC141.61-3
C-UL-US listed	Yes	Yes
Module type	ACOPOS plug-in module double-width	ACOPOS plug-in module double-width
Slot ¹⁾	Slots 1 + 2	Slots 1 + 2
Power consumption	Max. 4.5 W	Max. 4.5 W
Visual Components capability	Yes	Yes
ACOPOS capability	Yes	Yes
¹⁾ The AC141 is a module with double-width and occupies slots 1 and 2.		
CPU	8AC141.60-2	8AC141.61-3
Processor clock	100 MHz	100 MHz
SRAM	32 kB	32 kB
DRAM	16 MB	32 MB
Operating system	AC140 (version V2.80 and higher)	AC140 (version V2.80 and higher)
IF1 application interface	8AC141.60-2	8AC141.61-3
Interface type	RS232	RS232
Electrical isolation	No	No
Design	9-pin DSUB plug	9-pin DSUB plug
Max. distance	15 m / 19,200 baud	15 m / 19,200 baud
Max. baud rate	115.2 kBaud	115.2 kBaud
Display	232 LED	232 LED
Application interfaces IF2, IF3	8AC141.60-2	8AC141.61-3
Interface type	CAN bus	CAN bus
Electrical isolation	Yes	Yes
Design	9-pin DSUB plug	9-pin DSUB plug
Max. distance	1000 m	1000 m
Max. baud rate		
Bus lengths up to 60 m	500 kBit/s	500 kBit/s
Bus lengths up to 200 m	250 kBit/s	250 kBit/s
Bus lengths up to 1,000 m	50 kBit/s	50 kBit/s
Indicators		
IF2	CAN1 LED	CAN1 LED
IF3	CAN2 LED	CAN2 LED
Network-capable	Yes	Yes
Bus termination resistor	Externally wired	Externally wired
IF4 application interface	8AC141.60-2	8AC141.61-3
Interface type	X2X	X2X
Electrical isolation	Yes	Yes
Design	4-pin connector	4-pin connector
Max. distance	100 m	100 m
Indicators	X2X LED	X2X LED
Application interface IF6	8AC141.60-2	8AC141.61-3
Interface type	Ethernet	Ethernet
Electrical isolation	Yes	Yes
Design	RJ45 socket	RJ45 socket
Max. distance	100 m	100 m
Baud rate	10/100 MBit/s	10/100 MBit/s
Display	ACT LED	ACT LED
Network-capable	Yes	Yes

Inputs/outputs	8AC141.60-2	8AC141.61-3
Connection, module-side	8-pin connector	8-pin connector
Configuration of the digital inputs/outputs	Can be configured individually as input or output	Can be configured individually as input or output
Digital inputs ¹⁾	8AC141.60-2	8AC141.61-3
Number of inputs	Max. 3	Max. 3
Wiring	Sink	Sink
Electrical isolation		
Input - ACOPOS	Yes	Yes
Input - Input	No	No
Input voltage		
Rated	24 VDC	24 VDC
Maximum	30 VDC	30 VDC
Switching threshold		
LOW	< 5 V	< 5 V
HIGH	>15 V	>15 V
Input current at rated voltage	Approx. 4.2 mA	Approx. 4.2 mA
Input delay	<5 μ s	<5 μ s
Modulation compared to ground potential	Max. \pm 30 V	Max. \pm 30 V
1) Shielded cables must be used for inputs 1 - 3.		
Event counter	8AC141.60-2	8AC141.61-3
Signal form	Square wave pulse	Square wave pulse
Input frequency	Max. 100 kHz	Max. 100 kHz
Pulse length	Min. 5 μ s	Min. 5 μ s
Counter size	32-bit	32-bit
Inputs		
Input 1	Counter 1	Counter 1
Input 2	Count direction (only in stepper motor mode)	Count direction (only in stepper motor mode)
Input 3	---	---
Incremental counter	8AC141.60-2	8AC141.61-3
Signal form	Square wave pulse	Square wave pulse
Evaluation	4x	4x
Encoder monitoring	No	No
Input frequency	Max. 20 kHz	Max. 20 kHz
Counter frequency	Max. 80 kHz	Max. 80 kHz
Reference frequency	Max. 20 kHz	Max. 20 kHz
Distance between edges	Min. 5 μ s	Min. 5 μ s
Counter size	16-bit	16-bit
Inputs		
Input 1	Channel A	Channel A
Input 2	Channel B	Channel B
Input 3	Reference pulse R	Reference pulse R
Gate measurement	8AC141.60-2	8AC141.61-3
Signal form	Square wave pulse	Square wave pulse
Gate frequency	Max. 100 kHz	Max. 100 kHz
Pulse length	Min. 5 μ s	Min. 5 μ s
Counter frequency		
Internal	31.25 kHz or 4 MHz	31.25 kHz or 4 MHz
External	Max. 100 kHz	Max. 100 kHz
Period measurement	8AC141.60-2	8AC141.61-3
Signal form	Square wave pulse	Square wave pulse
Input frequency	Max. 100 kHz	Max. 100 kHz
Pulse length	Min. 5 μ s	Min. 5 μ s
Counter frequency		
Internal	31.25 kHz or 4 MHz	31.25 kHz or 4 MHz
External	Max. 100 kHz	Max. 100 kHz

CPU module 8AC141

Digital outputs	8AC141.60-2	8AC141.61-3
Number of outputs	Max. 3	Max. 3
Type	High-side transistor outputs	High-side transistor outputs
Electrical isolation		
Output - ACOPOS	Yes	Yes
Output - Output	No	No
Switching voltage		
Minimum	18 VDC	18 VDC
Rated	24 VDC	24 VDC
Maximum	30 VDC	30 VDC
Continuous current	Max. 500 mA	Max. 500 mA
Switching delay 0 -> 1 and 1 -> 0	Max. 500 μ s (typ. 250 μ s)	Max. 500 μ s (typ. 250 μ s)
Switching frequency (resistive load)	Max. 100 Hz	Max. 100 Hz
Protection		
Short circuit protection	Yes	Yes
Overload protection	Yes	Yes
Continuous short circuit current at 24 V	Typ. 4 A	Typ. 4 A
Readable outputs	Yes	Yes
Analog input	8AC141.60-2	8AC141.61-3
Design	Differential input	Differential input
Electrical isolation		
Input - ACOPOS ¹⁾	No, max. modulation: ± 13 V	No, max. modulation: ± 13 V
Input signal		
Rated	-10 V to +10 V	-10 V to +10 V
Maximum	-13 V to +13 V	-13 V to +13 V
Operating mode	Cyclic measurement, non-synchronous to 50 μ s ACOPOS clock	Cyclic measurement, non-synchronous to 50 μ s ACOPOS clock
Digital converter resolution	12-bit	12-bit
Non-linearity	± 2 LSB	± 2 LSB
Output format	INT 16 \$8001 - \$7FFF LSB = \$0010 = 4.88 mV	INT 16 \$8001 - \$7FFF LSB = \$0010 = 4.88 mV
Conversion procedure	Successive approximation	Successive approximation
Conversion time	<50 μ s	<50 μ s
Differential input impedance	20 M Ω	20 M Ω
Input filter	Analog low pass 3rd-order cut-off frequency: 10 kHz	Analog low pass 3rd-order cut-off frequency: 10 kHz
Common-mode rejection		
DC	Min. 73 dB	Min. 73 dB
50 Hz	Min. 73 dB	Min. 73 dB
1) External electrical isolation for the connected sensors is recommended because the analog input is not electrically isolated.		
Operational conditions	8AC141.60-2	8AC141.61-3
Ambient temperature during operation	--- ¹⁾	--- ¹⁾
Relative humidity during operation	--- ¹⁾	--- ¹⁾
1) ACOPOS plug-in modules can be used in an ACOPOS servo drive; the corresponding values can be found in the technical data of the respective for a list of exclusive actions.		
Storage and transport conditions	8AC141.60-2	8AC141.61-3
Storage temperature	-25 to +55°C	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing	5 to 95%, non-condensing
Transport temperature	-25 to +70°C	-25 to +70°C
Relative humidity during transport	95% at +40°C	95% at +40°C

Required accessories		
5CFCRD.0064-03	CompactFlash 64 MB ATA/IDE SiliconSystems	1706
5CFCRD.0128-03	CompactFlash 128 MB ATA/IDE SiliconSystems	1706
5CFCRD.0256-03	CompactFlash 256 MB ATA/IDE SiliconSystems	1706
5CFCRD.0512-03	CompactFlash 512 MB ATA/IDE SiliconSystems	1706
5CFCRD.1024-03	CompactFlash 1024 MB ATA/IDE SiliconSystems	1706
5CFCRD.2048-03	CompactFlash 2048 MB ATA/IDE SiliconSystems	1706
5CFCRD.4096-03	CompactFlash 4096 MB ATA/IDE SiliconSystems	1706
5CFCRD.8092-03	CompactFlash 8092 MB ATA/IDE SiliconSystems	1706
0TB708.91	Accessory terminal block, 8-pin, cage clamps 1.5 mm ²	1716
0TB704.9	Accessory terminal block, 4-pin, screw clamp 1.5 mm ²	1714
0TB704.91	Accessory terminal block, 4-pin, cage clamps 2.5 mm ²	1714
Optional accessories		
0G0001.00-090	Cable PC <-> PLC/PW, RS232, online cable	1708
7AC911.9	Bus connector, CAN	1724
0AC912.9	Bus connector, CAN, 1 CAN interface	1726
0AC913.92	Bus connector, CAN, 2 CAN interfaces, including 30 cm connection cable	1726

Motor cables 1.5 mm² 8CM



- UL/CSA listed
- Can be used in cable drag chains
- Optimally produced for use with ACOPOS servo drives 1010/1016/1022/1045/1090 and B&R servo motors with size 1 motor plugs

Available from production in six different lengths: ¹⁾

Cable length	Model number
5 m	8CM005.12-1
7 m	8CM007.12-1
10 m	8CM010.12-1
15 m	8CM015.12-1
20 m	8CM020.12-1
25 m	8CM025.12-1

¹⁾ Custom fabrications are available upon request.

General information	8CMxxx.12-1
Cable cross section	4 x 1.5 mm ² + 2 x 2 x 0.75 mm ²
Durability	Oil resistant according to VDE 0472 part 803, as well as standard hydraulic oil
Certification	UL AWM Style 20234, 80°C, 1000 V, E63216 and CSA AWM I/II A/B, 90°C, 1000 V, FT2 LL46064
Lines	8CMxxx.12-1
Power lines	1.5 mm ² , tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	Black, brown, blue, yellow/green
Signal lines	0.75 mm ² , tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	White, white/red, white/blue, white/green
Cable structure	8CMxxx.12-1
Power lines	
Stranding	No
Shield	No
Signal lines	
Stranding	White with white/red and white/blue with white/green
Shield	Separate shielding for pairs, tinned Cu mesh, optical coverage 85% > and foil banding
Cable stranding	With filler elements and foil banding
Cable shielding	Tinned Cu mesh, optical coverage 85% and wrapped in isolating fabric
Outer sheathing	
Material	PUR
Color	Orange, similar to RAL 2003 flat
Labeling	BERNECKER & RAINER 4x1.5+2x2x0.75 FLEX
Electrical characteristics	8CMxxx.12-1
Conductor resistance	
Power lines	≤ 14 Ω/km
Signal lines	≤ 19 Ω/km
Insulation resistance	> 200 Ω/km
Test voltage	
Wire/wire	3 kV
Wire/shield	3 kV
Operating voltage	Max. 1000 V
Mechanical characteristics	8CMxxx.12-1
Temperature range	
Moving	-10°C to +70°C
Static	-20°C to +90°C
Outer diameter	12.8 mm ± 0.4 mm
Flex radius	>96 mm
Speed	≤ 4 m/s
Acceleration	< 60 m/s ²
Flex cycles	≥ 3,000,000
Weight	0.26 kg/m

Motor cables 4 mm² 8CM



- UL/CSA certified
- Can be used in cable drag chains
- Produced for optimal use with ACOPOS servo drives 1180/1320 and B&R servo motors with size 1 motor plugs

Available from production in six different lengths: ¹⁾

Cable length	Model number
5 m	8CM005.12-3
7 m	8CM007.12-3
10 m	8CM010.12-3
15 m	8CM015.12-3
20 m	8CM020.12-3
25 m	8CM025.12-3

¹⁾ Custom fabrications are available upon request.

General information	8CMxxx.12-3
Cable cross section	4 x 4 mm ² + 2 x 2 x 1 mm ²
Durability	Oil resistant according to VDE 0472 part 803, as well as standard hydraulic oil
Certification	UL AWM Style 20234, 80°C, 1000 V, E63216 and CSA AWM I/II A/B, 90°C, 1000 V, FT2 LL46064
Lines	8CMxxx.12-3
Power lines	4 mm ² , tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	Black, brown, blue, yellow/green
Signal lines	1 mm ² , tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	White, white/red, white/blue, white/green
Cable structure	8CMxxx.12-3
Power lines	
Stranding	No
Shield	No
Signal lines	
Stranding	White with white/red and white/blue with white/green
Shield	Separate shielding for pairs, tinned Cu mesh, optical coverage 85% > and foil banding
Cable stranding	With filler elements and foil banding
Cable shielding	Tinned Cu mesh, optical coverage 85% and wrapped in isolating fabric
Outer sheathing	
Material	PUR
Color	Orange, similar to RAL 2003 flat
Labeling	BERNECKER & RAINER 4x4.0+2x2x1.0 FLEX
Electrical characteristics	8CMxxx.12-3
Conductor resistance	
Power lines	≤ 5.2 Ω/km
Signal lines	≤ 19 Ω/km
Insulation resistance	> 200 MΩ/km
Test voltage	
Wire/wire	3 kV
Wire/shield	3 kV
Operating voltage	Max. 1000 V
Mechanical characteristics	8CMxxx.12-3
Temperature range	
Moving	-10°C to +70°C
Static	-20°C to +90°C
Outer diameter	15.8 mm ± 0.5 mm
Flex radius	> 118.5 mm
Speed	≤ 4 m/s
Acceleration	< 60 m/s ²
Flex cycles	≥ 3,000,000
Weight	0.45 kg/m

Motor cables 10 mm² 8CM



- UL/CSA certified
- Can be used in cable drag chains
- Optimally produced for use with ACOPOS servo drives 1640/128M and B&R servo motors with size 1.5 motor plugs

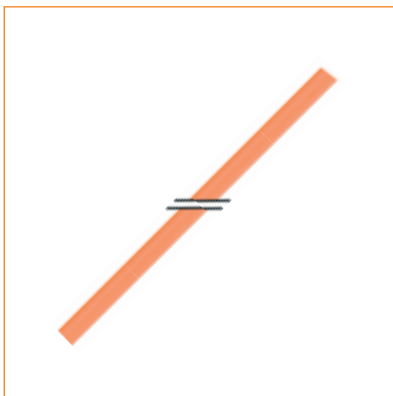
Available from production in six different lengths: ¹⁾

Cable length	Model number
5 m	8CM005.12-5
7 m	8CM007.12-5
10 m	8CM010.12-5
15 m	8CM015.12-5
20 m	8CM020.12-5
25 m	8CM025.12-5

¹⁾ Custom fabrications are available upon request.

General information	8CMxxx.12-5
Cable cross section	4 x 10 mm ² + 2 x 2 x 1.5 mm ²
Durability	Oil resistant according to VDE 0472 part 803, as well as standard hydraulic oil
Certification	UL AWM Style 20234, 80°C, 1000 V, E63216 and CSA AWM I/II A/B, 90°C, 1000 V, FT2 LL46064
Lines	8CMxxx.12-5
Power lines	10 mm ² , tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	Black, brown, blue, yellow/green
Signal lines	1.5 mm ² , tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	White, white/red, white/blue, white/green
Cable structure	8CMxxx.12-5
Power lines	
Stranding	No
Shield	No
Signal lines	
Stranding	White with white/red and white/blue with white/green
Shield	Separate shielding for pairs, tinned Cu mesh, optical coverage 85% > and foil banding
Cable stranding	With filler elements and foil banding
Cable shielding	Tinned Cu mesh, optical coverage 85% and wrapped in isolating fabric
Outer sheathing	
Material	PUR
Color	Orange, similar to RAL 2003 flat
Labeling	BERNECKER & RAINER 4x10.0+2x2x1.5 FLEX
Electrical characteristics	8CMxxx.12-5
Conductor resistance	
Power lines	≤ 2.1 Ω/km
Signal lines	≤ 14 Ω/km
Insulation resistance	> 200 MΩ/km
Test voltage	
Wire/wire	3 kV
Wire/shield	3 kV
Operating voltage	Max. 1000 V
Mechanical characteristics	8CMxxx.12-5
Temperature range	
Moving	-10°C to +70°C
Static	-20°C to +90°C
Outer diameter	20.1 mm ± 0.7 mm
Flex radius	> 150.8 mm
Speed	≤ 4 m/s
Acceleration	< 60 m/s ²
Flex cycles	≥ 3,000,000
Weight	0.77 kg/m

Motor cables 35 mm² 8CM



- UL/CSA certified
- Can be used in cable drag chains

Available from production in six different lengths: ¹⁾

Cable length	Model number
5 m	8CM005.12-8
7 m	8CM007.12-8
10 m	8CM010.12-8
15 m	8CM015.12-8
20 m	8CM020.12-8
25 m	8CM025.12-8

¹⁾ Custom fabrications are available upon request.

General information	8CMxxx.12-8
Cable cross section	4 x 35 mm ² + 2 x 2 x 1.5 mm ²
Durability	Oil resistant according to VDE 0472 part 803, as well as standard hydraulic oil
Certification	UL AWM Style 20669, 90°C, 600 V, E63216 and CSA AWM I/II A/B, 90°C, 600 V, FT1 LL46064
Lines	8CMxxx.12-8
Power lines	35 mm ² , tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	Black, brown, blue, yellow/green
Signal lines	1.5 mm ² , tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	White, white/red, white/blue, white/green
Cable structure	8CMxxx.12-8
Power lines	
Stranding	No
Shield	No
Signal lines	
Stranding	White with white/red and white/blue with white/green
Shield	Separate shielding for pairs, tinned Cu mesh, optical coverage 85% > and foil banding
Cable stranding	With filler elements and foil banding
Cable shielding	Tinned Cu mesh, optical coverage 85% and wrapped in isolating fabric
Outer sheathing	
Material	PUR
Color	Orange, similar to RAL 2003 flat
Labeling	BERNECKER & RAINER 4x35.0+2x2x1.5 FLEX
Electrical characteristics	8CMxxx.12-8
Conductor resistance	
Power lines	≤ 0.6 Ω/km
Signal lines	≤ 14 Ω/km
Insulation resistance	> 200 MΩ/km
Test voltage	
Wire/wire	3 kV
Wire/shield	1 kV
Operating voltage	Max. 600 V
Mechanical characteristics	8CMxxx.12-8
Temperature range	
Moving	-10°C to +70°C
Static	-20°C to +90°C
Outer diameter	32.5 mm ± 1 mm
Flex radius	>243.8 mm
Speed	≤ 4 m/s
Acceleration	< 60 m/s ²
Flex cycles	≥ 3,000,000
Weight	2.2 kg/m

EnDat cables 8CE



- UL/CSA certified
- Can be used in cable drag chains
- Produced for optimal use with ACOPOS servo drives and B&R servo motors

Available from production in six different lengths: ¹⁾

Cable length	Model number
5 m	8CE005.12-1
7 m	8CE007.12-1
10 m	8CE010.12-1
15 m	8CE015.12-1
20 m	8CE020.12-1
25 m	8CE025.12-1

¹⁾ Custom fabrications are available upon request.

General information	8CExxx.12-1
Cable cross section	10 x 0.14 mm ² + 2 x 0.50 mm ²
Durability	Oil resistant according to VDE 0472 part 803, as well as standard hydraulic oil
Certification	UL AWM Style 20963, 80°C, 30 V, E63216 and CSA AWM I/II A/B, 90°C, 30 V, FT1 LL46064
Lines	8CExxx.12-1
Signal lines	0.14 mm ² , tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	Blue, brown, yellow, gray, green, pink, red, black, violet, white
Supply lines	0.5 mm ² , tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	White/green, white/red
Cable structure	8CExxx.12-1
Signal lines	
Stranding	Green with brown, gray with yellow, white with violet, black with red, pink with blue
Shield	No
Supply lines	
Stranding	White/red with white/green and filler elements
Shield	No
Cable stranding	With foil banding
Cable shielding	Cu mesh, optical coverage 85% and wrapped in isolating fabric
Outer sheathing	
Material	PUR
Color	RAL 6018
Labeling	BERNECKER & RAINER 10x0.14+2x0.50 FLEX
Electrical characteristics	8CExxx.12-1
Conductor resistance	
Signal lines	≤ 140 Ω/km
Supply lines	≤ 40 Ω/km
Insulation resistance	> 200 MΩ/km
Test voltage	
Wire/wire	1.5 kV
Wire/shield	0.8 kV
Operating voltage	Max. 30 V
Mechanical characteristics	8CExxx.12-1
Temperature range	
Moving	-10°C to +70°C
Static	-20°C to +90°C
Outer diameter	7.3 mm ± 0.25 mm
Flex radius	> 55 mm
Speed	≤ 4 m/s
Acceleration	< 60 m/s ²
Flex cycles	≥ 3,000,000
Weight	0.08 kg/m

Resolver cables 8CR



- UL/CSA certified
- Can be used in cable drag chains
- Optimally produced for use with ACOPOS servo drives and B&R servo motors

Available from production in six different lengths: ¹⁾

Cable length	Model number
5 m	8CR005.12-1
7 m	8CR007.12-1
10 m	8CR010.12-1
15 m	8CR015.12-1
20 m	8CR020.12-1
25 m	8CR025.12-1

¹⁾ Custom fabrications are available upon request.

General information	8CRxxx.12-1
Cable cross section	3 x 2 x 24 AWG/19
Durability	Oil resistant according to VDE 0472 part 803, as well as standard hydraulic oil
Certification	UL AWM Style 20671, 90°C, 30 V, E63216 and CSA AWM, 90°C, 30 V, I/II A/B FT1 LL46064
Lines	8CRxxx.12-1
Signal lines	24 AWG/19, tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	White, brown, green, yellow, gray, pink
Cable structure	8CRxxx.12-1
Signal lines	
Stranding	White with brown, green with yellow, gray with pink
Shield	No
Cable stranding	The 3 pairs together covered by foil banding
Cable shielding	Cu mesh, optical coverage $\geq 90\%$ and wrapped in isolating fabric
Outer sheathing	
Material	PUR
Color	RAL 6018
Labeling	BERNECKER & RAINER 3x2x24 AWG FLEX
Electrical characteristics	8CRxxx.12-1
Conductor resistance 24 AWG	$\leq 86 \Omega/\text{km}$
Insulation resistance	$> 200 \text{ M}\Omega/\text{km}$
Test voltage	
Wire/wire	1.5 kV
Wire/shield	0.8 kV
Operating voltage	Max. 30 V
Mechanical characteristics	8CRxxx.12-1
Temperature range	
Moving	-10°C to +80°C
Static	-40°C to +90°C
Outer diameter	6.5 mm \pm 0.2 mm
Flex radius	≥ 50 mm
Speed	≤ 4 m/s
Acceleration	$< 60 \text{ m/s}^2$
Flex cycles	$\geq 3,000,000$
Weight	0.07 kg/m

ACOPOSmulti Modular drive system

The new drive generation from B&R provides a universal solution for any automation task in machine manufacturing. A new milestone on the path to "Perfection in Automation".



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System characteristics



The drive system for maximum customer benefits

In today's market, customers demand more than simply meeting technical requirements. Above all, customers require cost-effective solutions, investment security and a high degree of availability.

ACOPOSmulti, the new drive generation from B&R, possesses these characteristics. It is the universal solution for all automation tasks in machine manufacturing. A new milestone on the path to "Perfection in Automation". The ACOPOSmulti generation offers the highest degree of efficiency for multi-axis machines that are commonly used in the plastics, packaging, print, and textile industries.

Modular cooling design

The use of fans and climate control units in the switching cabinet means considerably higher costs as well as additional maintenance expenses.

ACOPOSmulti gives the designer the free space for conventional heat dissipation in the switching cabinet, a feed-through cooler with IP65 protection for releasing heat outside the switching cabinet and a cold plate variant for connecting to a cooling circulation system (water, oil).



Wall mounting



Feed-through mounting



Installing the cold plate



Trend-setting power supply

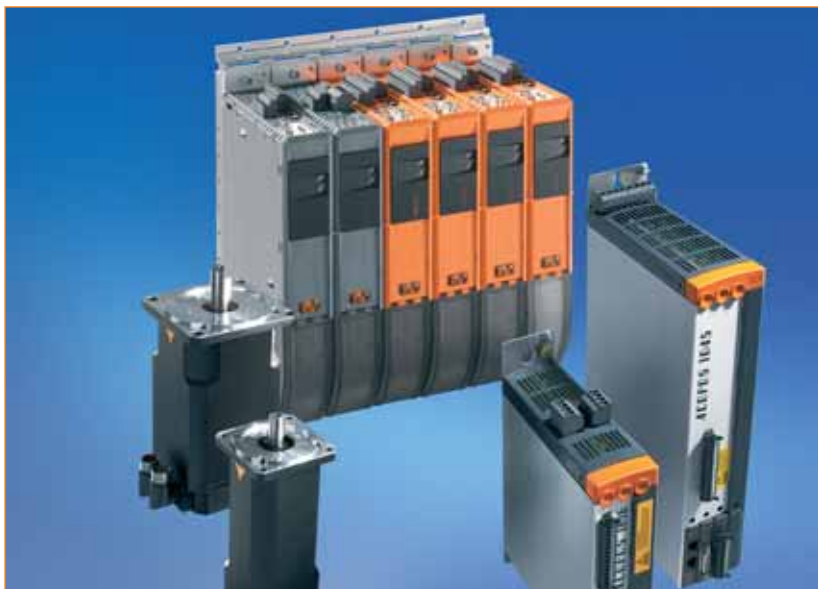
Conventional drive systems convert only half of the applied power from the mains into actual mechanical power. The ACOPOSmulti drive system treads a new path:

- **Power factor correction**
This means that only effective power is taken from the power supply. This reduces the connected load and current consumption of the machine by approximately a factor of 2. This results in smaller fuses and wire cross-sections.
- **Stable voltage conditions**
The DC bus voltage remains constant regardless of the mains supply voltage, which means maximum utilization by the inverter modules and motors no matter what country they are operating in.
- **Integrated power regeneration unit**
All of the power supply modules are able to regenerate power. Instead of being converted to heat as is usually the case, kinetic energy generated during braking is converted to electrical energy that is regenerated into the power supply system.
- **Sophisticated diagnostics**
The intelligent power supply modules with network connection via POWERLINK offer completely new options for machine and system diagnostics.

Handling power failures safely

Modern production machines rely on flexibility. Mechanical cams are replaced by electronic cam profiles. The well-known advantages of flexibility and wear-free electronics also have a disadvantage: Loss of the cam profile link when a power failure occurs. This is not the case with the ACOPOSmulti drive system - the integrated 24V auxiliary supply module makes it possible to maintain a coordinated movement until the system reaches a standstill.

System characteristics



Outstanding usability

The ACOPOSmulti drive system is designed to provide the highest degree of usability throughout its entire life cycle.

- **Designed for simple management of machine variations**
An ACOPOSmulti mounting plate is the basis for different variations of the machine. The design of the machine determines which devices are used. The software recognizes the design automatically and provides the necessary functions.
- **Ideally suited for industrial switching cabinet construction**
The ACOPOSmulti is designed with connection technology that allows prewiring of complete switching cabinets - ideal for manufacturing series machines.
- **Easy maintenance**
ACOPSMulti allows you to exchange drive components quickly - this considerably reduces downtimes for production machines.

Compact, scalable performance

Compact, high-performance drive technology is the latest trend. The main reason for this is to achieve the best possible use of production halls, which requires small machine dimensions. Based on this principle, ACOPOSmulti offers maximum performance with minimum space requirements. The range of applications includes sensor-free induction motors, permanent magnet servo motors in standard torque or linear motor versions, and ultra-dynamic ironless linear motors.

Investment security

Special attention was given to the topic of investment security during development of the ACOPOSmulti drive system. As a result, it is just as easy to add the ACOPOSmulti drive system to an existing system as it is to use it in new machines. Thanks to software compatibility with the ACOPOS drive generation already established on the market, efforts can be concentrated on the most important factor - the application. That's all there is to it.

Safety as an integral system component

Trend-setting safety technology communicates via one network, POWERLINK Safety. By integrating this open standard, the ACOPOSmulti drive system, together with the B&R safety-related components, has raised the bar in the area of secure automation solutions.

Integrated technology

Modern marketing demands individualization of the end product. Flexibility of the machine is therefore one of the decisive factors to rise above the competition. Modern machine concepts replace mechanical process technologies with sophisticated mechatronic concepts. As a result, the role of software in the process is constantly increasing in importance. B&R offers a multitude of industry-specific technology functions to make automation easy, even for complex applications. These intuitively built and easy-to-operate software components guarantee a cost-effective solution.

Easy wiring

Industrial switching cabinet construction streamlines production cycles. Prefabricated cable trees used directly on the machine or system make assembly easier and faster. The ACOPOSmulti drive system supports prewiring of the entire switching cabinet using its sophisticated wiring and mounting technology. Therefore, the ACOPOSmulti drive components are mounted in the switching cabinet and connected to the prewired cable trees. ACOPOSmulti drastically reduces the amount of manual wiring.

The ideal cooling method for each machine

The use of fans and climate control units in the switching cabinet means additional maintenance expenses and considerably higher costs. The ideal solution would be a drive design that does not allow any power loss in the switching cabinet. ACOPOS-multi gives the designer the free space required for conventional heat dissipation in the switching cabinet, a feed-through cooler with IP65 protection for releasing heat outside the switching cabinet and a cold plate variant for connecting to a cooling circulation system (water, oil).

Modular cooling design

The devices are connected consecutively without splicing and all have the same height. Only the width differs and depends on the continuous power of the respective module. The ACOPOSmulti drive system is designed so that you can easily implement the ideal cooling concept for your machine.



Conventional mounting method. The heat is dissipated directly through the air in the switching cabinet. Suitable for a small number of axes with low power ratings. This limitation can be circumvented by using additional fans or climate control units in the switching cabinet.



Based on a feed-through heat sink, the excessive heat is output directly to the ambient air outside of the switching cabinet. Suitable for a large number of axes with any range of power rating.



The excessive heat that is generated by the devices is output directly to the cooling medium via a plate cooled with oil or water. Suitable for a large number of axes with any range of power rating and a machine's own cooling circulation system.

System characteristics



Wiring made easy

The wiring of electrical switching devices in the switching cabinet has been made considerably easier in previous years with plug-in rail-mount systems from various manufacturers. With its trend-setting connection design, ACOPOSmulti breaks new ground on this path adapted for drive systems.

Simply attach to the mounting plate and fasten the device - this establishes the connections with the power supply module. In addition to the connection of the DC bus and the 24V auxiliary supply, the ground connection is established via the rail system. Additional grounding measures from module to module are not necessary.

The rails integrated in the mounting plate are amply dimensioned. This makes it possible to freely arrange the sequence of modules without limitations.



The rail system integrated in the backplane module is designed to be protected from accidentally being touched. The 24V auxiliary supply voltage and the DC voltage from the DC bus are distributed.

The rail contacts are used for the power supply modules and the auxiliary supply modules to feed power in to the rail system and to supply inverter modules with power. A protective ground conductor is integrated in the the rail system. Therefore, external wiring is not needed for the modules.



The motor and encoder lines are connected in the easiest way imaginable using plugs and prefabricated cables. The network connection is also made the same way. For large power ratings (i.e. 64kW and up), threaded bolts and sufficient free space make it much easier to connect to the power supply module and inverter module.

The ACOPOSmulti motor and encoder cables are produced with SpeedTEC® connectors from Intercontec - providing easy-to-use connectors for our customers. SpeedTEC® connectors are designed so that the system can only be closed if it is connected correctly. Because of the ratchet effect, the user is sure that the connector is closed correctly and that it cannot be opened again by vibrations.



All insertable connections (signal, motor connection) can be wired using screw terminals or cage clamps, according to the user's needs. The principle - simply attach and tighten the screws - was also skillfully applied to the shield connections.

ACOPOSmulti motor cables are equipped with a shield plate that only needs to be connected to the ACOPOSmulti inverter module and fastened. Optimum shielding effect and quick, easy installation does not have to be a contradiction.



Intelligent power supply modules

Constant DC bus voltage regardless of the mains supply – that means maximum utilization by the inverter modules and motors no matter what country they are operating in. Identical machine behavior worldwide, without additional upstream transformers. When using modern systems, valuable resources are lost because they have to be dimensioned according to the smallest mains voltage. Furthermore, it is also possible to operate ACOPOSmulti drive systems without upstream transformers on 3x220V voltage networks. However, this requires utilization of to the next larger power supply module.

Integrated power regeneration unit

Power supply modules are able to regenerate power. Instead of being converted to heat as is usually the case, kinetic energy generated during braking is converted to electrical energy that is regenerated into the power supply system. The advantage: This prevents additional heat from being generated by the braking resistors used inside switching cabinets for conventional devices. The integrated power regeneration system provides an efficient and environmentally-friendly solution for avoiding heat build-up in the switching cabinet which is otherwise generated by braking energy. This is especially important when arranging several small axes in a tight space.

Power factor correction

Another advantage: Only effective power is taken from the power mains. The power factor correction (PFC) mechanism considerably reduces the connected load and current consumption of the machine (by approximately a factor of 2). This results in smaller fuses and connection cross-sections.

In general, the power supply module is designed so that all of the challenges for machine designers arising from the world's different power supply networks can be met optimally. ACOPOSmulti drives are already prepared for future standards.

Prepared for "intelligent maintenance"

Like all other modules in the ACOPOSmulti series, the power supply modules also have a network connection. This allows all data about current consumption, machine efficiency, etc. to be recorded and analyzed. Together with the information from the single axes, this represents a big step in the direction of "intelligent maintenance".



Integrated 24V auxiliary supply modules

The ACOPOSmulti drive system integrates the 24V supply for drives as well as for the PLC, PC, or peripherals (optional). This doesn't just minimize space requirements; it also ensures predictable machine behavior when power is lost.

Supply for the PLC, drives and peripherals

Why was an effort made to include peripheral devices as well as drives in the 24V supply design of the ACOPOSmulti drive units? The answer comes easy when taking a closer look at modern production machines, particularly the behavior when power failures or power dips occur. While earlier production machines were positively driven with the help of mechanical cams, modern systems are equipped with electronic cam profiles. The well-known advantages of flexibility and wear-free electronics also have a disadvantage: Loss of the cam profile link when a power failure occurs.

Power failures are not a problem

ACOPOSmulti addresses this issue with its integrated 24V auxiliary supply module. The kinetic energy created in the motors when braking is returned to the DC bus where it is available as electrical energy. This electrical energy is distributed to the drives and even the PLC, PC, or peripherals if necessary. To ideally distribute this limited energy during a power failure, the auxiliary supply modules have a fixed output as well as a 24V output that can be switched off in order to cut off the supply for non-essential peripheral components. Devices can be connected directly to the common DC bus on the drive and have open-circuit, short-circuit, and overload protection. This is the ideal solution for electronically linked systems to utilize the advantage of mechanical cams - the defined reference for the angle of the axes is maintained during a loss of or dip in the power supply.

System characteristics



Scalable inverter modules

Space inside the switching cabinet is highly valuable. Minimum volume is a decisive factor between survival and failure on the market. Based on this principle, the ACOPOSmulti drive system offers maximum performance with minimum space requirements. To further optimize the compact design, inverter modules up to 11A are also available as double-axis modules. Depending on the application, this enables you to establish the best possible individual configuration of inverter modules consisting of single and double-axis modules. Above 11A, all devices are single-axis modules, which means the customer does not have to sacrifice compactness.

Scalable dynamic features

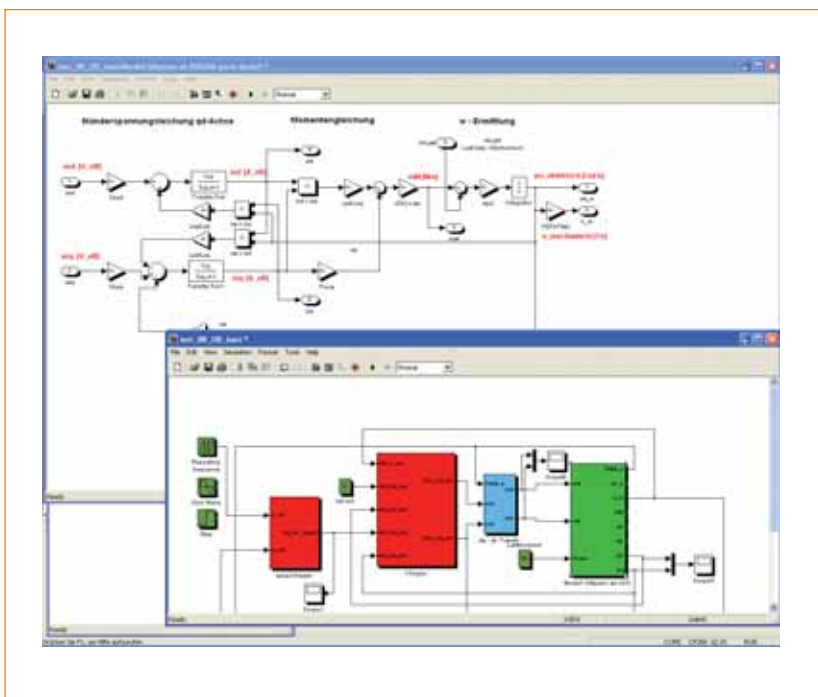
The paradigm shift for the designers of production machines is in full swing. As a result, the number of hybrid drive systems is increasing. ACOPOSmulti is the perfect solution for this mix of conventional motor-gear combinations and direct drive technology. The scalability of drive computing power allows the best possible utilization of devices in the vast field of motion technology. The range of applications includes sensor-free induction motors, permanent magnet servo motors in standard torque or linear motor versions, and ultra-dynamic ironless linear motors. Of course, all inverter modules are equipped with protection against short-circuit and ground faults.

Safely taking it to the physical limits

IGBTs (Insulated Gate Bipolar Transistor) are one of the key components in the inverter. They are responsible for the power output of the respective inverter module. Pulse width modulated signals are used to generate an output voltage with a controlled amplitude, frequency and phase. The temperature and the increase in temperature in the actual component represents one of the most important factors affecting the lifespan of the IGBTs. Strict adherence to limits is a measure of quality for an inverter, even under the toughest conditions. B&R guarantees adherence to the limits at maximum output power by using a sophisticated mathematical model from the IGBT structure.

Finding a solution to this apparent contradiction provides a number of benefits for the user:

- Safe inverter operation independent of the operating mode and the environmental conditions.
- The connected motor does not spin out when the temperature limit is exceeded. Instead, the brakes are applied until reaching standstill, without overloading the IGBTs.
- Internal computer-aided models (IGBTs, motor) make it possible to predict the load on a power transmission system after all of its components have completely warmed up (after one cycle). This function considerably reduces the typically long settling times during thermal processes and allows the machine operator to optimize the production process extremely efficiently.





Accurate encoder plug-in modules

The highly accurate encoder interfaces for resolvers, EnDat 2.1 and 2.2 and encoders with sinusoidal output signals play a significant role in the excellent results of the entire control network.

The parameter memory in the EnDat encoders is used by B&R to store motor data (among other things). In this way, the ACOPOSmulti inverters are always automatically provided with the correct motor parameters and limit values. This is referred to as the "embedded parameter chip".

Nonvolatile application memory, which is also integrated in the embedded parameter chip, allows the machine manufacturer to store initialization and calibration parameters such as zero points and torque linearization. Furthermore, modules or additional units which have been finished, tested, and aligned can then be integrated into the production process or installed at the end customer's facilities without extensive calibration testing.



EnDat 2.1 from Heidenhain

EnDat is a standard developed by Johannes Heidenhain GmbH (www.heidenhain.de), incorporating the advantages of absolute and incremental position measurement and also offers a read/write parameter memory in the encoder.

The incremental process allows the short delay times necessary for position measurement on drives with exceptional dynamic properties. With the sinusoidal incremental signal and the fine resolution in the EnDat encoder plug-in module, a very high positioning resolution is achieved in spite of the moderate signal frequencies used.

During start-up, the module is automatically identified, configured and its parameters set by the ACOPOSmulti inverter's operating system.

With absolute position measurement, a homing procedure is not required. A motor with a multi-turn encoder (4096 revolutions) might also have to be installed depending on the movement range.

System characteristics



EnDat 2.2 from Heidenhain

This compatible enhancement of the EnDat 2.1 interface brings new advantages. With just four signal lines, additional information and also position values can be transferred. Optimized signal creation and an expanded supply voltage range increase the system performance.

EnDat 2.2 - The bidirectional interface

The EnDat interface from HEIDENHAIN is a digital, bidirectional interface for measurement devices. It is able to output position values from incremental and absolute measurement devices and can read, update or store new information saved in the measurement device. Only 4 signal lines are needed because serial data transfer is used. The data is transferred synchronous to the clock signal defined by the subsequent electronics. The transfer method (position values, parameters, diagnostics, etc.) is selected using mode commands sent to the measurement device by the subsequent electronics.



Incremental encoder with sinusoidal output signal

Incremental encoders with sinusoidal output signals are mostly used in linear motors and systems with high-resolution optical or magnetic position measurement systems.

This encoder plug-in module has inputs for two differential sinusoidal incremental signals with a 90° phase shift and a reference mark signal. The permissible signal amplitudes are dimensioned with a high tolerance and ideally matched to the subsequent evaluation electronics to achieve the best possible resolution.



HIPERFACE

HIPERFACE is a standard developed by Max Stegmann GmbH (www.stegmann.de), similar to EnDat, incorporating the advantages of absolute and incremental position measurement and also offers a read/write parameter memory in the encoder. With absolute position measurement (absolute position is read in serially), the homing procedure is usually not required. When necessary, a multi-turn encoder (4096 revolutions) should be installed. To save costs, a single-turn encoder and a reference switch can also be used. In this case, a homing procedure must be carried out.

The incremental process allows the short delay times necessary for position measurement on drives with exceptional dynamic properties. With the sinusoidal incremental signal and the fine resolution in the HIPERFACE module, a very high positioning resolution is achieved in spite of the moderate signal frequencies used.

This module can be used to evaluate encoders which are built into OEM motors and also encoders for external axes (encoders that evaluate any machine movement). The input signals are monitored. In this way, broken connections, shorted lines and encoder supply failure can be recognized.



Resolvers

The resolver is a measuring principle optimally suited for tough environmental conditions. Its transformer functions do not require any electronic components in the motor. Resolution and accuracy are limited compared to inductive or optical position measurement systems. All of the information contained in the resolver signals is used by the ACOPOSmulti encoder plug-in modules to evaluate the signal, allowing extraordinarily good results. This makes it possible to detect broken connections, shorted lines and encoder supply failure (reference signal), in addition to position information.

Universal temperature sensor connection

Depending on the motor structure, the temperature sensor is connected either via the power connection or via the plug for the position encoder. EnDat 2.2 offers another possibility. This encoder transfers the temperature information digitally; additional lines are not required for this procedure.

The ACOPOSmulti drive system can work with all of the versions described above. The connections are designed to be universal.

System characteristics



Embedded parameter chip

Each module in the ACOPOSmulti drive system can be uniquely identified using an embedded parameter chip. This makes it possible to identify each module on the network. This paves the way for an automatic system configuration using the application program, which is of particular interest for many different machine types.

Consequently, not only ACOPOSmulti modules use this method of identification. B&R motors are also equipped with an embedded parameter chip. It contains all of the mechanical and electronic data relevant to the motor. This makes it possible for the application program to identify the entire power transmission system. The work-intensive and error-prone task of manually setting parameters is no longer necessary and start-up times are substantially reduced.

A simple comparison of the machine configuration when servicing the system helps to quickly diagnose faulty arrangements and minimizes costly downtimes.

The valuable information provided also allows you to draw conclusions about usage and possible errors.

Future compatibility ensured with embedded parameter chip

The unique identification of the ACOPOSmulti modules via embedded parameter chip meets the necessary demands when using systems in validated environments. It must be possible to identify each time a module is exchanged. Applications with these demands (e.g. FDA, GAMP, 21CFR11) are becoming more and more common.

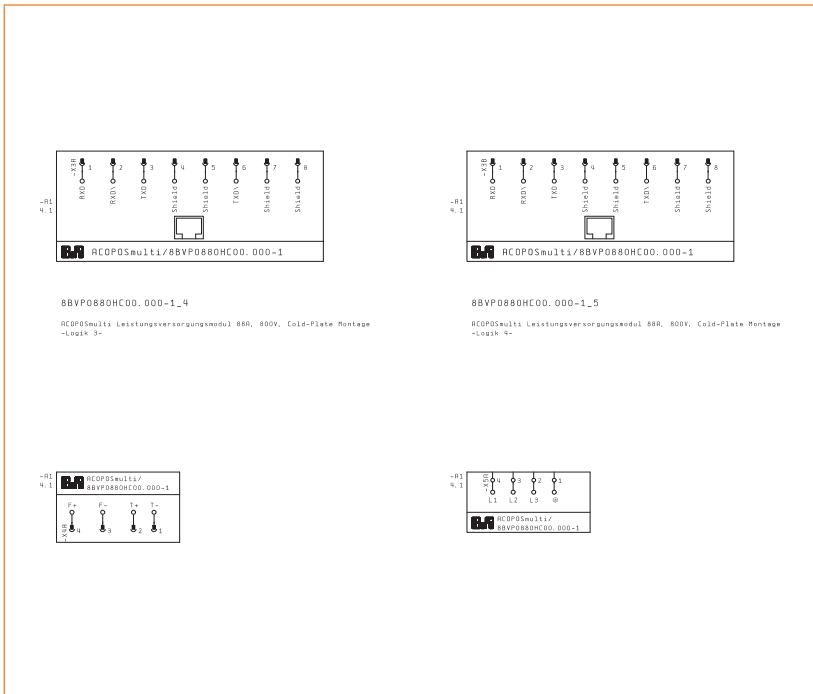


Quality made by B&R

The name B&R stands for many years of experience in developing and manufacturing industrial electronics. In addition to electronics, mechanics are increasingly becoming a key element for the best possible operation. Several man-years have been invested in the development of the ACOPOSmulti drive system's mechanical design to achieve the highest degree of component density, outstanding performance and simple handling.

High-quality components and excellent EMC properties guarantee high availability of modern production systems. A requirement for usage in rough industrial environments is to meet all of the main EMC standards.

The ACOPOSmulti drive system was developed exclusively by B&R and is produced in-house. The shortest path between development and production has proven to be the best solution over the years and make up one of the pillars of our outstanding quality. There is just one company behind the entire palette of hardware and software, who carries sole responsibility - B&R.



Construction support

Macros for ECAD systems

The electronics in a machine must be designed in a manner which optimally utilizes the materials and space available. Graphic ECAD systems have established themselves as the right tool for the job.

Every module in the ACOPSMulti drive system comes with pre-designed electronic descriptions of the mechanical dimensions and the electrical signals. These macros are loaded directly to well-established ECAD systems.

Design and changes are immediately reflected at all levels of development. This saves time for the more important tasks and prevents errors right from the start.

3D CAD documents

The goal is always to get the most out of a switching cabinet, however it is becoming more and more common for electronic components to be placed wherever the machine construction allows. These machine-specific switching cabinets can be designed optimally. 3D CAD data in STEP format is used to design the switching cabinets when using various modules in the ACOPSMulti drive system.

The accelerated development, programming, maintenance and documentation involved with the ACOPSMulti drive system mean lower costs, enhanced quality and increased sales by entering the market earlier.

System characteristics



Integrated technology

The individualization of end products places consistently higher demands on machine flexibility. More and more mechanical process technology is designed with sophisticated mechatronic concepts using software. To keep process precision from falling behind, especially at high production speeds, B&R offers a multitude of industry-specific technology functions.

Taking it to the physical limits

Both trigger inputs or touch probe inputs on the ACOPOSmulti process their signals in the sub-microsecond range, which enables them to meet the toughest demands for precision. The area of application for these inputs ranges from detecting index marks for packaging, printing or print post-processing to measurement tasks in the metal processing sector.

The ACOPOSmulti inverter is optionally available with up to two 14-bit analog inputs. These analog inputs can be directly integrated in the control process. These inputs are read and further processed every $50\mu\text{s}$. The resulting fast reaction times in the process are practically predestined for applications which change between different motion states such as position and torque control.

This quick and exact detection of process parameters, such as pressure sensors, makes it possible to accurately control processes that are extremely sensitive despite their dynamic properties.

Smart Process Technology

Smart Process Technology (the freely configurable technology library in the drive), which has already produced amazing results in numerous series production machines with ACOPOS servo drives by cutting production times in half through its options and reaction times in the sub-millisecond range, is also available for the ACOPOSmulti drive generation.

Here are a few applications that come up time and time again, which already rely on Smart Process Technology:

- **Positioning paired with smart torque control**

In many applications, mechanically forced processes are replaced with fine, adaptive electronic processes. This can be illustrated with the processes used when closing drink bottles or welding small parts. All of these procedures have something in common; optimal control and coordination of position and torque is crucial for reproducibility and therefore the quality of the product.

- **Smart drum sequencer**

In addition to its qualities as all-around talent, this drum sequencer also runs in the sub-millisecond range, thereby allowing exceptional process speeds with the same high quality.





PLCopen motion control

Standardized programming

The creation of PLCopen motion control function blocks fulfills a long-awaited demand for a standard that can handle positioning tasks quickly, easily, and efficiently.

They can be programmed in the proven IEC 61131 standard programming languages Structured Text, Instruction List, Ladder Diagram, or Sequential Function Chart. In addition to these languages, B&R also supports programming in B&R Automation Basic and C.

All motor types supported by the ACOPOSmulti drive system such as synchronous motors, asynchronous motors, linear motors, torque motors, and direct drives can be controlled with these PLCopen function blocks.

The universal availability of PLCopen function blocks for all B&R products makes it possible to optimize the component selection to match the performance demands of every application.

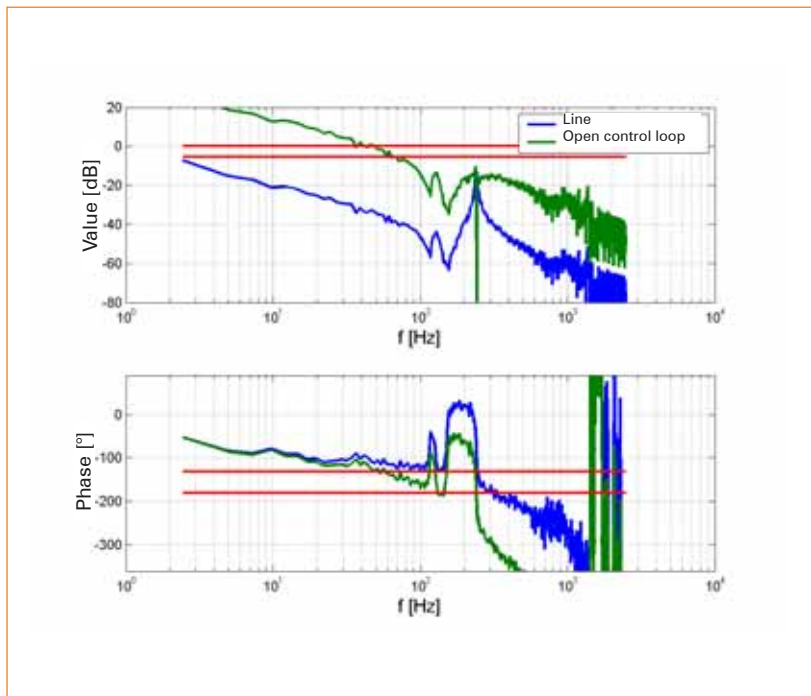
Like the drive firmware, the PLCopen library is included in the Automation Studio package. Selecting this library in the project automatically imports it and makes the function blocks available for programming.

The PLCopen function blocks are divided into administrative motion control function blocks and function blocks for single and multiple axis functionality.

Effective and transparent task execution

Technology function blocks are available as a supplement to standard applications. These are based on PLCopen function blocks, used according to their functionality, and can be found in "open source."

System characteristics



Auto-tuning - fully automatic controller configuration

With the help of the auto-tuning function for drive axes, it is possible to automatically and optimally configure the drive controller for the ACOPOSmulti drive system (this includes the position controller and the underlying speed controller). The control parameters are detected while the machine is practically at a standstill. Parameters to compensate for the effects of inertia and friction are also determined.

Procedure

Before the actual auto-tuning process, a safe operation area is specified where the drive can move during automatic controller configuration. Then the fully automatic controller configuration is started with a mouse click. Within a short time, the auto-tuning function determines the optimal controller configuration for the mechanical system that is connected. The parameters for reference variable implementation are then calculated using a defined drive movement. This includes, for example, inertia as well as speed-proportional and static friction.

Quick and easy commissioning

The biggest advantages of the auto-tuning function are that Automation Studio beginners are provided support when commissioning axes and people without a lot of technical knowledge concerning drives can quickly achieve good results because of the simple operation. Advanced users can work in expert mode, which allows custom tuning of individual control loops.

In this way, it is possible for beginners and experts to achieve more dynamic operation of a drive. Extensive testing in the field has shown that this procedure is very robust when using different mechanics and encoder systems and provides very good lag error characteristics. In most cases, manually adjusting the control parameters afterwards is not necessary.

A variety of application possibilities

The advantage of being independent of the encoder system results in a wide spectrum of application possibilities. Typical areas of use include highly dynamic direct drive torque motors or geared power transmission systems, drives with synchronous or induction motors and linear drives. The auto-tuning function can also be used on machines with a limited range of movement or with limitations regarding movement direction after it has been configured accordingly. Additionally, decreased dynamics caused by mechanical resonances on two-mass systems can be reduced using passive damping.



100% software compatibility with the well-established ACOPOS drive generation

Investment security is an important factor at B&R. This is evident by the software compatibility of the ACOPOSmulti system with the ACOPOS drive generation, which is already established on the market.

In this case, compatibility does not mean remaining stagnant. It means that the ACOPOSmulti drive generation inherited all of the functions from the ACOPOS generation and further advanced both generations.

The user can build upon this and implement the additional functions that can be used to improve performance and take advantage of intelligent maintenance.

System characteristics



Open standard

EPLsafety, like all POWERLINK components, is an open standard. Various manufacturers from all fields of automation technology work together to specify the concepts and requirements. The balance of different demands means that useful solutions which are then certified and implemented can be found for all areas of use.

The result is EPLsafety; the first fully independent real-time Ethernet based safety bus that meets the safety category IEC 61508 SIL 3 even with short 100 μ s cycle times.

EPG Working Group Safety

POWERLINK is supported by EPAG (POWERLINK Standardization Group), an open association of leading end users, manufacturers and research institutes for automation technology. The group's goal is to provide an open standard for Industrial Ethernet with precise real-time behavior in the microsecond range.

Safety as an integral system component

Safety technology today is a rigid technology separate from the flexible machine controller. Next to the sleek automation of production machines designed with well-established fieldbus systems, the implementation of safety technology seems archaic by comparison. In many cases, the lack of flexibility makes it necessary to work restrictively with protective measures. This in turn hinders the productivity of a system due to time-consuming and complicated procedures.

EPLsafety sets a technical standard

There are a number of new approaches to safe field bus systems that are heavily influenced by proprietary standards and long response times. The ACOPOSmulti drive system is different. This system is based on POWERLINK Safety. The activation of functions such as safely limited speed is done directly over the network. Wiring these safety-related signals to the drive is now a thing of the past. The information is collected from its source via secure digital inputs and outputs, then distributed to the affected sensors and actuators, in this case the drive, via a secure central unit, the Safe Logic.

POWERLINK provides the best possible communication connection between the Safe Logic and the non-secure controller.

Secure drive functions

Safety in the ACOPOSmulti drive system comprises the following functions according to Cat. 3, EN 954-1:

- Uncontrolled and controlled stops
- Safe stop and safe operation halt
- Safe limited step measurement and safe limited absolute position
- Safe Limited Speed
- Safe rotational direction

The functions described above are offered as options with the understanding that they are not a part of all the drives in a production machine.

Basic functions like uncontrolled stop and secure stop or secure output for the motor holding brake (both according to Cat. 3, EN 954-1) are provided as standard. Therefore, the safety-related functions can be implemented in simple applications via conventional wiring.

Secure configuration and programming

All secure connections run in the Safe Logic. This is where the logical relationships between the individual safe devices are defined. Function block based programming is also possible, in addition to pure configuration. The programmer is supported by a number of pre-defined safety function blocks. Routing can be set up to the Safe Logic via the normal CPU and POWERLINK for programming.



System characteristics

Configuration of an ACOPOSmulti drive system

An ACOPOSmulti drive system consists of a regeneration choke, line filter and three device groups - supply voltage modules, auxiliary voltage modules and inverter modules. Configuration significantly depends on the following factors: Cooling methods, medium and maximum total power of the drives and the peripheral supply (e.g. PLC, actuators, motor with brake, sensors) as well as the power and current of the individual drive units.

1) Cooling method	2) Supply voltage range	3) Axis modules	4) Plug-in modules	5) Options and reserved slots
Standard cooling (wall mounting)	Determine the supply voltage range	Single-axis modules	8BAC0120.000-1	Determine the number of optional and reserve slots
		8BVI0014HWS0.000-1	8BAC0120.001-1	
		8BVI0028HWS0.000-1	8BAC0121.000-1	
		8BVI0055HWS0.000-1	8BAC0122.000-1	
		8BVI0110HWS0.000-1	8BAC0123.000-1	
		8BVI0220HWS0.000-1	8BAC0123.001-1	
		8BVI0440HWS0.000-1	8BAC0123.002-1	
		8BVI0880HWS0.000-1	8BAC0124.000-1	
			8BAC0132.000-1	
		Two-axis modules		
		8BVI0014HWD0.000-1		
		8BVI0028HWD0.000-1		
		8BVI0055HWD0.000-1		
Feed-through cooling (feed-through mounting)	Determine the supply voltage range	Single-axis modules	8BAC0120.000-1	Determine the number of optional and reserve slots
		8BVI0014HCS0.000-1	8BAC0120.001-1	
		8BVI0028HCS0.000-1	8BAC0121.000-1	
		8BVI0055HCS0.000-1	8BAC0122.000-1	
		8BVI0110HCS0.000-1	8BAC0123.000-1	
		8BVI0220HCS0.000-1	8BAC0123.001-1	
		8BVI0440HCS0.000-1	8BAC0123.002-1	
		8BVI0880HCS0.000-1	8BAC0124.000-1	
			8BAC0132.000-1	
		Two-axis modules		
		8BVI0014HCD0.000-1		
		8BVI0028HCD0.000-1		
		8BVI0055HCD0.000-1		
Oil / water cooling (cold plate mounting)	Determine the supply voltage range	Single-axis modules	8BAC0120.000-1	Determine the number of optional and reserve slots
		8BVI0014HCS0.000-1	8BAC0120.001-1	
		8BVI0028HCS0.000-1	8BAC0121.000-1	
		8BVI0055HCS0.000-1	8BAC0122.000-1	
		8BVI0110HCS0.000-1	8BAC0123.000-1	
		8BVI0220HCS0.000-1	8BAC0123.001-1	
		8BVI0440HCS0.000-1	8BAC0123.002-1	
		8BVI0880HCS0.000-1	8BAC0124.000-1	
			8BAC0132.000-1	
		Two-axis modules		
		8BVI0014HCD0.000-1		
		8BVI0028HCD0.000-1		
		8BVI0055HCD0.000-1		

The configuration of an ACOPOSmulti drive system is done in 9 steps:

- 1) Determine the cooling method
- 2) Determine the supply voltage range
- 3) Select the inverter modules
- 4) Select corresponding plug-in modules
- 5) If the drive system should be expandable:
Determine the number of additional slots for other modules
- 6) Select the power supply module based on the power required for the inverter modules (with a mains supply voltage of 3 x 220 VAC, select the next larger power supply module)
- 7) Select the auxiliary supply module based on the power required for the inverter modules as well as the requirements of the application
- 8) The number of width units results from the number of modules plus the specified number of optional slots
- 9) Select the mounting plate for the number of width units determined

6) Power supply module with filter components	7) Auxiliary supply design	8) Width units	9) Mounting plate
Power supply modules 8BVP0220HW0.000-1 8BVP0440HW0.000-1 8BVP0880HW0.000-1	Internal 24 V 8B0C0160HW0.000-1 8B0C0320HW0.000-1	Determine width units	8B0MnnnnHW0.000-1
Line filter 8BVF0220H000.000-1 8BVF0440H000.001-2 8BVF0880H000.000-1	External 42 V 8B0C0160HW0.A01-1		
Regeneration chokes 8BVR0220H000.100-1 8BVR0440H000.100-1 8BVR0880H000.100-1	Internal and external 24 V 8B0C0160HW0.001-1 8B0C0320HW0.002-1		
Power supply modules 8BVP0220HC00.000-1 8BVP0440HC00.000-1 8BVP0880HC00.000-1	Internal 24 V 8B0C0160HC00.000-1 8B0C0320HC00.000-1	Determine width units	8B0MnnnnHF00.000-1
Line filter 8BVF0220H000.000-1 8BVF0440H000.001-2 8BVF0880H000.000-1	External 42 V 8B0C0160HC00.A01-1		
Regeneration chokes 8BVR0220H000.100-1 8BVR0440H000.100-1 8BVR0880H000.100-1	Internal and external 24 V 8B0C0160HC00.001-1 8B0C0320HC00.002-1		
Power supply modules 8BVP0220HC00.000-1 8BVP0440HC00.000-1 8BVP0880HC00.000-1	Internal 24 V 8B0C0160HC00.000-1 8B0C0320HC00.000-1	Determine width units	8B0MnnnnHC00.000-1
Line filter 8BVF0220H000.000-1 8BVF0440H000.001-2 8BVF0880H000.000-1	External 42 V 8B0C0160HC00.A01-1		
Regeneration chokes 8BVR0220H000.100-1 8BVR0440H000.100-1 8BVR0880H000.100-1	Internal and external 24 V 8B0C0160HC00.001-1 8B0C0320HC00.002-1		

Typical topologies

ACOPOSmulti configurations

ACOPOSmulti drive systems include multiple technology-specific functions. The ACOPOSmulti functions listed below are basic functions which the user can switch between as needed within 400 μ s. Furthermore, manipulations such as changes in product length, print mark control, overlying torque control, brief process adaptations and quality checks can be carried out at any time.

- Point-to-point
- Electronic gears
- Electronic differential gears
- Cutting unit
- Electronic cam profiles
- Flying saws
- Line shaft
- CNC

ACOPOSmulti servo drives can be used in various configurations depending on the requirements of the application. The functions listed above are available to the user in each of the topology examples shown.

Reaction speeds are not influenced by the network and control system being used if technology functions are processed directly on the ACOPOSmulti drive system. Additional sensors and actuators must be integrated in the control and adaptation for more complex processes. In these cases, the level of performance depends mostly on the control system being used.

The topology examples shown on the following pages provide an overview of the bandwidths which are possible with B&R automation components.

ACOPOSmulti drive systems in an Ethernet POWERLINK network

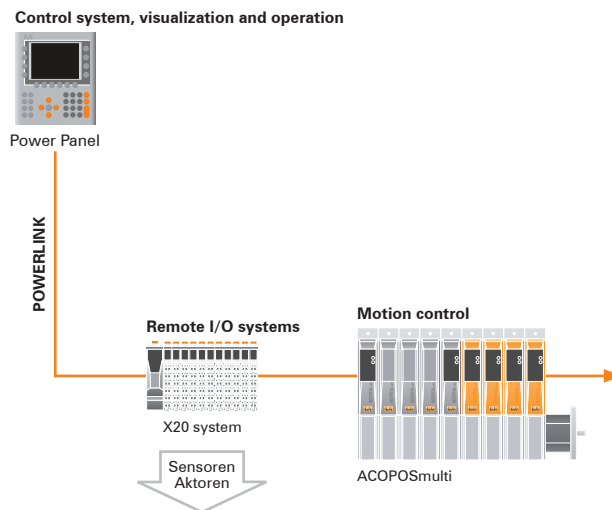
High-performance machine architectures require flexible networks and fieldbuses. With POWERLINK, a network is available to the user that fully meets the high demands of dynamic motion systems. POWERLINK adapts to the requirements of the machine and the system. The rigid coupling of many axes with controllers, industrial PCs, I/O systems and operator panels allows machines and systems to be created with the highest level of precision. Compatibility to standard Ethernet also reduces the number of networks and fieldbuses on the machine level.

Successful areas of use for these topologies:

- Packaging industry
- Handling technology
- Plastics processing
- Paper and printing
- Textile industry
- Wood industry
- Metalworking industry
- Semiconductor industry

Compact, modular motion control applications

- Modular machine architecture, up to 100 m distance between the individual axes
- Minimal wiring required due to line structure (no ring)
- No additional infrastructure components are needed
- Drive control loop synchronized to the PLC program



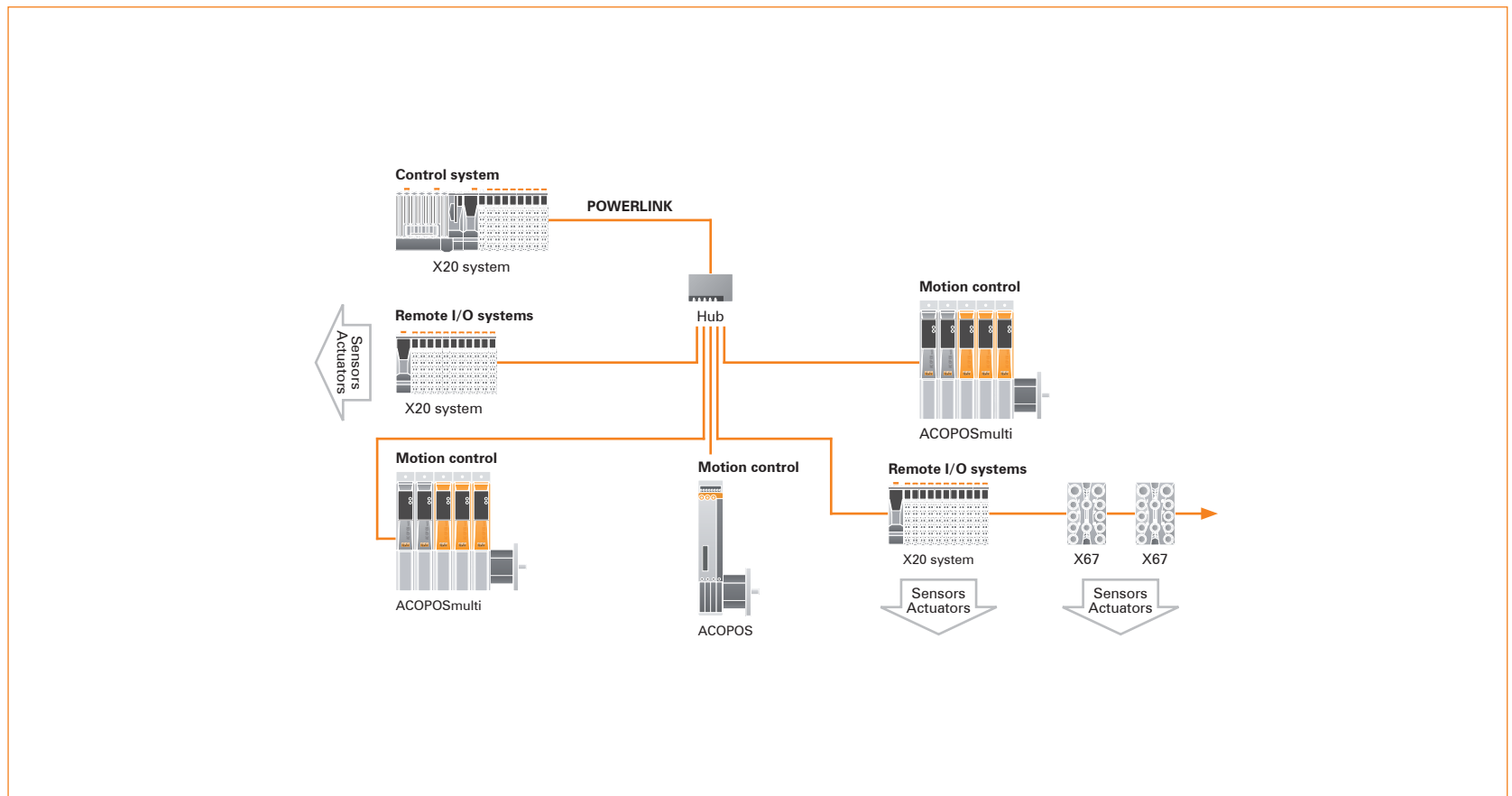
Components and technologies

Control system	Power Panel: Integrated control, operation, and visualization	787
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
Motion control	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
Remote I/O systems	X20 System	37
Network and fieldbuses	POWERLINK	611

Typical topologies

Extensive, modular motion control applications with up to 253 axes

- Modular machine architecture, up to 100 m distance between the individual axes
- Optimized wiring, due to mixed star-line structure (not a ring)
- Nodes with fast and slow scan rates can be operated within one network, eliminating the need to divide the network into fast and slow segments
- Drive control loop synchronized to the PLC program

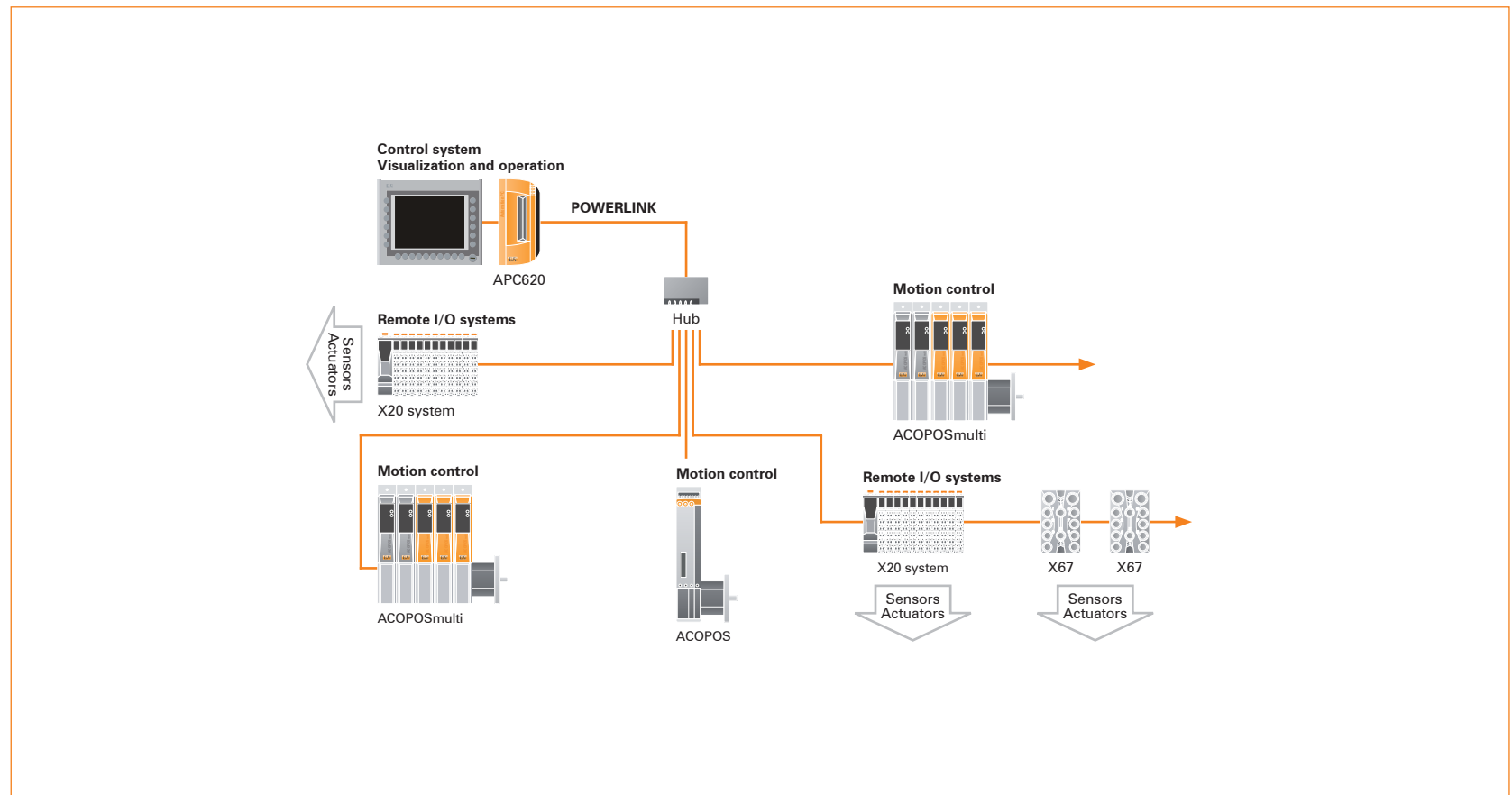


Components and technologies

Control system	X20 System: Slice-based I/O system	37
Motion control	ACOPOSMulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
Remote I/O systems	X20 System: Slice-based I/O system	37
	X67 System: Remote I/O with IP67 protection	419
Network and fieldbuses	Ethernet POWERLINK	611

Modular motion control applications with up to 253 axes and a visualization system

- Modular machine architecture, up to 100 m distance between the individual axes
- Optimized wiring, due to mixed star-line structure (not a ring)
- Nodes with fast and slow scan rates can be operated within one network, eliminating the need to divide the network into fast and slow segments
- Drive control loop synchronized to the PLC program
- Control and visualization using a powerful IPC system



Components and technologies

Control system	Automation PC APC620: The new industrial PC generation	911
Motion control	ACOPOSMulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
Remote I/O systems	X20 System: Slice-based I/O system	37
	X67 System: Remote I/O with IP67 protection	419
Network and fieldbuses	Ethernet POWERLINK	611

Product overview

Line filter



Model number	Short description	
8BVF0220H000.000-1	ACOPOSmulti line filter 22.5A, 480V	1362
8BVF0440H000.001-2	ACOPOSmulti line filter 45A, 480V, increased peak current load capacity	1362
8BVF0880H000.000-1	ACOPOSmulti line filter 90A, 480V	1362

Regeneration chokes



Model number	Short description	
8BVR0220H000.100-1	ACOPOSmulti regeneration choke 22.5A, 480V, terminals	1364
8BVR0440H000.100-1	ACOPOSmulti regeneration choke 45A, 480V, terminals	1364
8BVR0880H000.100-1	ACOPOSmulti regeneration choke 90A, 480V, terminals	1364

Mounting plates

Wall mounting






Model number	Short description	
8B0M0040HW00.000-1	ACOPOSmulti mounting plate with backplane 4 slots, HV, wall mounting, 75 mm ² and 22 mm ² , complete	1366
8B0M0050HW00.000-1	ACOPOSmulti mounting plate with backplane 5 slots, HV, wall mounting, 75 mm ² and 22 mm ² , complete	1366
8B0M0060HW00.000-1	ACOPOSmulti mounting plate with backplane 6 slots, HV, wall mounting, 75 mm ² and 22 mm ² , complete	1366
8B0M0070HW00.000-1	ACOPOSmulti mounting plate with backplane 7 slots, HV, wall mounting, 75 mm ² and 22 mm ² , complete	1366
8B0M0080HW00.000-1	ACOPOSmulti mounting plate with backplane 8 slots, HV, wall mounting, 75 mm ² and 22 mm ² , complete	1366
8B0M0090HW00.000-1	ACOPOSmulti mounting plate with backplane 9 slots, HV, wall mounting, 75 mm ² and 22 mm ² , complete	1366
8B0M0100HW00.000-1	ACOPOSmulti mounting plate with backplane 10 slots, HV, wall mounting, 75 mm ² and 22 mm ² , complete	1366
8B0M0110HW00.000-1	ACOPOSmulti mounting plate with backplane 11 slots, HV, wall mounting, 75 mm ² and 22 mm ² , complete	1366
8B0M0120HW00.000-1	ACOPOSmulti mounting plate with backplane 12 slots, HV, wall mounting, 75 mm ² and 22 mm ² , complete	1366
8B0M0130HW00.000-1	ACOPOSmulti mounting plate with backplane 13 slots, HV, wall mounting, 75 mm ² and 22 mm ² , complete	1366
8B0M0140HW00.000-1	ACOPOSmulti mounting plate with backplane 14 slots, HV, wall mounting, 75 mm ² and 22 mm ² , complete	1366
8B0M0150HW00.000-1	ACOPOSmulti mounting plate with backplane 15 slots, HV, wall mounting, 75 mm ² and 22 mm ² , complete	1366
8B0M0160HW00.000-1	ACOPOSmulti mounting plate with backplane 16 slots, HV, wall mounting, 75 mm ² and 22 mm ² , complete	1366
8B0M0170HW00.000-1	ACOPOSmulti mounting plate with backplane 17 slots, HV, wall mounting, 75 mm ² and 22 mm ² , complete	1366
8B0M0180HW00.000-1	ACOPOSmulti mounting plate with backplane 18 slots, HV, wall mounting, 75 mm ² and 22 mm ² , complete	1366
8B0M0190HW00.000-1	ACOPOSmulti mounting plate with backplane 19 slots, HV, wall mounting, 75 mm ² and 22 mm ² , complete	1366
8B0M0200HW00.000-1	ACOPOSmulti mounting plate with backplane 20 slots, HV, wall mounting, 75 mm ² and 22 mm ² , complete	1366
8B0M0210HW00.000-1	ACOPOSmulti mounting plate with backplane 21 slots, HV, wall mounting, 75 mm ² and 22 mm ² , complete	1366
8B0M0220HW00.000-1	ACOPOSmulti mounting plate with backplane 22 slots, HV, wall mounting, 75 mm ² and 22 mm ² , complete	1366
8B0M0230HW00.000-1	ACOPOSmulti mounting plate with backplane 23 slots, HV, wall mounting, 75 mm ² and 22 mm ² , complete	1366
8B0M0240HW00.000-1	ACOPOSmulti mounting plate with backplane 24 slots, HV, wall mounting, 75 mm ² and 22 mm ² , complete	1366
8B0M0250HW00.000-1	ACOPOSmulti mounting plate with backplane 25 slots, HV, wall mounting, 75 mm ² and 22 mm ² , complete	1366
8B0M0260HW00.000-1	ACOPOSmulti mounting plate with backplane 26 slots, HV, wall mounting, 75 mm ² and 22 mm ² , complete	1366
8B0M0270HW00.000-1	ACOPOSmulti mounting plate with backplane 27 slots, HV, wall mounting, 75 mm ² and 22 mm ² , complete	1366

Product overview

Power supply modules




Wall mounting



Model number	Short description	
8BVP0220HW00.000-1	ACOPOSmulti power supply module 22A, HV, wall mounting	 1370
8BVP0440HW00.000-1	ACOPOSmulti power supply module 44A, HV, wall mounting	 1370
8BVP0880HW00.000-1	ACOPOSmulti power supply module 88 A, HV, wall mounting	 1370

Cold plate or feed-through mounting



Model number	Short description	
8BVP0220HC00.000-1	ACOPOSmulti power supply module 22A, HV, cold plate or feed-through mounting	 1370
8BVP0440HC00.000-1	ACOPOSmulti power supply module 44A, HV, cold plate or feed-through mounting	 1370
8BVP0880HC00.000-1	ACOPOSmulti power supply module 88A, HV, cold plate or feed-through mounting	 1370

Auxiliary supply modules 400W

Wall mounting



Model number	Short description	
8B0C0160HW00.000-1	ACOPOSmulti auxiliary supply module 16A, HV, wall mounting	1376
8B0C0160HW00.001-1	ACOPOSmulti auxiliary supply module 16A, HV, wall mounting, 24VOut 1x16A, 1x5A	1376

Cold plate or feed-through mounting



Model number	Short description	
8B0C0160HC00.000-1	ACOPOSmulti auxiliary supply module 16A, HV, cold plate or feed-through mounting	1376
8B0C0160HC00.001-1	ACOPOSmulti auxiliary supply module 16A, HV, cold plate or feed-through mounting, 24VOut 1x16A, 1x5A	1376

Auxiliary supply modules 800W

Wall mounting



Model number	Short description	
8B0C0320HW00.000-1	ACOPOSmulti auxiliary supply module 32A, HV, wall mounting	1380
8B0C0320HW00.002-1	ACOPOSmulti auxiliary supply module 32A, HV, wall mounting, 24 VOut 1x32A, 1x5A	1380
8B0C0160HW00.A01-1	ACOPOSmulti auxiliary supply module 16A, HV, wall mounting, 42 VOut 1x16A, 1x3A	1380

Cold plate or feed-through mounting



Model number	Short description	
8B0C0320HC00.000-1	ACOPOSmulti auxiliary supply module 32A, HV, cold plate or feed-through mounting	1380
8B0C0320HC00.002-1	ACOPOSmulti auxiliary supply module 32A, HV, cold plate or feed-through mounting, 24 VOut 1x32A, 1x5A	1380
8B0C0160HC00.A01-1	ACOPOSmulti auxiliary supply module 16A, HV, cold plate or feed-through mounting, 42 VOut 1x16A, 1x3A	1380

Product overview

Inverter modules 1.4kW ... 11kW (single-axis modules)

Wall mounting



Model number	Short description	
8BVI0014HWS0.000-1	ACOPOSmulti inverter module 1.9A, HV, wall-mounting	1384
8BVI0028HWS0.000-1	ACOPOSmulti inverter module 3.8A, HV, wall-mounting	1384
8BVI0055HWS0.000-1	ACOPOSmulti inverter module 7.6A, HV, wall-mounting	1384
8BVI0110HWS0.000-1	ACOPOSmulti inverter module 15.1A, HV, wall-mounting	1384

Cold plate or feed-through mounting



Model number	Short description	
8BVI0014HCS0.000-1	ACOPOSmulti inverter module 1.9A, HV, cold plate or feed-through mounting	1384
8BVI0028HCS0.000-1	ACOPOSmulti inverter module 3.8A, HV, cold plate or feed-through mounting	1384
8BVI0055HCS0.000-1	ACOPOSmulti inverter module 7.6A, HV, cold plate or feed-through mounting	1384
8BVI0110HCS0.000-1	ACOPOSmulti inverter module 15.1A, HV, cold plate or feed-through mounting	1384

Inverter modules 1.4 kW ... 5.5kW (two-axis modules)

Wall mounting



Model number	Short description	
8BVI0014HWD0.000-1	ACOPOSmulti inverter module 1.9A, HV, wall mounting, 2 axes	1389
8BVI0028HWD0.000-1	ACOPOSmulti inverter module 3.8A, HV, wall mounting, 2 axes	1389
8BVI0055HWD0.000-1	ACOPOSmulti inverter module 7.6A, HV, wall mounting, 2 axes	1389

Cold plate or feed-through mounting



Model number	Short description	
8BVI0014HCD0.000-1	ACOPOSmulti inverter module 1.9A, HV, cold plate or feed-through mounting, 2 axes	1389
8BVI0028HCD0.000-1	ACOPOSmulti inverter module 3.8A, HV, cold plate or feed-through mounting, 2 axes	1389
8BVI0055HCD0.000-1	ACOPOSmulti inverter module 7.6A, HV, cold plate or feed-through mounting, 2 axes	1389

Inverter modules 16kW ... 32kW (single-axis modules)



Wall mounting



Model number	Short description	
8BVI0220HWS0.000-1	ACOPOSmulti inverter module 22A, HV, wall-mounting	 1394
8BVI0440HWS0.000-1	ACOPOSmulti inverter module 44A, HV, wall-mounting	 1394

Cold plate or feed-through mounting



Model number	Short description	
8BVI0220HCS0.000-1	ACOPOSmulti inverter module 22A, HV, cold plate or feed-through mounting	 1394
8BVI0440HCS0.000-1	ACOPOSmulti inverter module 44A, HV, cold plate or feed-through mounting	 1394

Inverter modules 64kW (single-axis modules)


Wall mounting



Model number	Short description	
8BVI880HWS0.000-1	ACOPOSmulti inverter module 88A, HV, wall-mounting	 1399

Cold plate or feed-through mounting



Model number	Short description	
8BVI0880HCS0.000-1	ACOPOSmulti inverter module 88A, HV, cold plate or feed-through mounting	 1399

Product overview

Expansion modules

Wall mounting



Model number	Short description	
8BVE500HW00.000-1	ACOPSMulti expansion module 50A, HV, wall-mounting	1404

Cold plate or feed-through mounting



Model number	Short description	
8BVE0500HC00.000-1	ACOPSMulti expansion module 50A, HV, cold plate or feed-through mounting	1404

Capacitor modules

Wall mounting



Model number	Short description	
8B0K1650HW00.000-1	ACOPSMulti capacitor module 1650uF, HV, wall-mounting	1409

Cold plate or feed-through mounting



Model number	Short description	
8B0K1650HC00.000-1	ACOPSMulti capacitor module 1650uF, HV, cold plate or feed-through mounting	1409

ACOPOSmulti plug-in modules

Encoder modules



Model number	Short description	
8BAC0120.000-1	ACOPOSmulti plug-in module, EnDat 2.1 interface	1410
8BAC0120.001-1	ACOPOSmulti plug-in module, EnDat 2.2 interface	1412



Model number	Short description	
8BAC0121.000-1	ACOPOSmulti plug-in module, HIPERFACE interface	1413



Model number	Short description	
8BAC0122.000-1	ACOPOSmulti plug-in module, resolver interface	1414



Model number	Short description	
8BAC0123.000-1	ACOPOSmulti plug-in module, incremental encoder and SSI absolute encoder interface for RS422 signals	1416
8BAC0123.001-1	ACOPOSmulti plug-in module, incremental encoder interface for 5V single-ended and 5V differential signals	1418
8BAC0123.002-1	ACOPOSmulti plug-in module, incremental encoder interface for 24V single-ended and 24V differential signals	1420



Model number	Short description	
8BAC0124.000-1	ACOPOSmulti plug-in module, SinCos interface	1422

Product overview

I/O modules



Model number	Short description	
8BAC0132.000-1	ACOPOS multi input module, 4 analog inputs $\pm 10V$	1424

Accessories

Motor cables 1.5 mm²



Model number	Short description	
8BCM0005.1111A-0	ACP multi motor cable, length 5m, 4 x 1.5 mm ² + 2 x 2 x 0.75 mm ² , 8-pin SpeedTec motor connector, can be used in drag chains, UL/CSA certified	1425
8BCM0007.1111A-0	ACP multi motor cable, length 7m, 4 x 1.5 mm ² + 2 x 2 x 0.75 mm ² , 8-pin SpeedTec motor connector, can be used in drag chains, UL/CSA certified	1425
8BCM0010.1111A-0	ACP multi motor cable, length 10m, 4 x 1.5 mm ² + 2 x 2 x 0.75 mm ² , 8-pin SpeedTec motor connector, can be used in drag chains, UL/CSA certified	1425
8BCM0015.1111A-0	ACP multi motor cable, length 15m, 4 x 1.5 mm ² + 2 x 2 x 0.75 mm ² , 8-pin SpeedTec motor connector, can be used in drag chains, UL/CSA certified	1425
8BCM0020.1111A-0	ACP multi motor cable, length 20m, 4 x 1.5 mm ² + 2 x 2 x 0.75 mm ² , 8-pin SpeedTec motor connector, can be used in drag chains, UL/CSA certified	1425
8BCM0025.1111A-0	ACP multi motor cable, length 25m, 4 x 1.5 mm ² + 2 x 2 x 0.75 mm ² , 8-pin SpeedTec motor connector, can be used in drag chains, UL/CSA certified	1425

Motor cables 4 mm²



Model number	Short description	
8BCM0005.1312A-0	ACP multi motor cable, length 5 m, 4 x 4mm ² + 2 x 2 x 1mm ² , 8-pin SpeedTec motor connector, can be used in drag chains, UL/CSA certified	1426
8BCM0007.1312A-0	ACP multi motor cable, length 7m, 4 x 4mm ² + 2 x 2 x 1mm ² , 8-pin SpeedTec motor connector, can be used in drag chains, UL/CSA certified	1426
8BCM0010.1312A-0	ACP multi motor cable, length 10m, 4 x 4mm ² + 2 x 2 x 1mm ² , 8-pin SpeedTec motor connector, can be used in drag chains, UL/CSA certified	1426
8BCM0015.1312A-0	ACP multi motor cable, length 15m, 4 x 4mm ² + 2 x 2 x 1mm ² , 8-pin SpeedTec motor connector, can be used in drag chains, UL/CSA certified	1426
8BCM0020.1312A-0	ACP multi motor cable, length 20m, 4 x 4mm ² + 2 x 2 x 1mm ² , 8-pin SpeedTec motor connector, can be used in drag chains, UL/CSA certified	1426
8BCM0025.1312A-0	ACP multi motor cable, length 25m, 4 x 4mm ² + 2 x 2 x 1mm ² , 8-pin SpeedTec motor connector, can be used in drag chains, UL/CSA certified	1426

Motor cables 10 mm²



Model number	Short description	
8BCM0005.1523A-0	ACPmulti motor cable, length 5m, 4 x 10 mm ² + 2 x 2 x 1.5 mm ² , 8-pin SpeedTec motor connector, can be used in drag chains, UL/CSA certified	1427
8BCM0007.1523A-0	ACPmulti motor cable, length 7m, 4 x 10 mm ² + 2 x 2 x 1.5 mm ² , 8-pin SpeedTec motor connector, can be used in drag chains, UL/CSA certified	1427
8BCM0010.1523A-0	ACPmulti motor cable, length 10m, 4 x 10 mm ² + 2 x 2 x 1.5 mm ² , 8-pin SpeedTec motor connector, can be used in drag chains, UL/CSA certified	1427
8BCM0015.1523A-0	ACPmulti motor cable, length 15m, 4 x 10 mm ² + 2 x 2 x 1.5 mm ² , 8-pin SpeedTec motor connector, can be used in drag chains, UL/CSA certified	1427
8BCM0020.1523A-0	ACPmulti motor cable, length 20m, 4 x 10 mm ² + 2 x 2 x 1.5 mm ² , 8-pin SpeedTec motor connector, can be used in drag chains, UL/CSA certified	1427
8BCM0025.1523A-0	ACPmulti motor cable, length 25m, 4 x 10 mm ² + 2 x 2 x 1.5 mm ² , 8-pin SpeedTec motor connector, can be used in drag chains, UL/CSA certified	1427

EnDat cables



Model number	Short description	
8BCE0005.1111A-0	ACPmulti EnDat cable, length 5m, 10 x 0.14mm ² + 2 x 0.5mm ² , EnDat plug 17-pin SpeedTec socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1428
8BCE0007.1111A-0	ACPmulti EnDat cable, length 7m, 10 x 0.14mm ² + 2 x 0.5mm ² , EnDat plug 17-pin SpeedTec socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1428
8BCE0010.1111A-0	ACPmulti EnDat cable, length 10m, 10 x 0.14mm ² + 2 x 0.5mm ² , EnDat plug 17-pin SpeedTec socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1428
8BCE0015.1111A-0	ACPmulti EnDat cable, length 15m, 10 x 0.14mm ² + 2 x 0.5mm ² , EnDat plug 17-pin SpeedTec socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1428
8BCE0020.1111A-0	ACPmulti EnDat cable, length 20m, 10 x 0.14mm ² + 2 x 0.5mm ² , EnDat plug 17-pin SpeedTec socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1428
8BCE0025.1111A-0	ACPmulti EnDat cable, length 25m, 10 x 0.14mm ² + 2 x 0.5mm ² , EnDat plug 17-pin SpeedTec socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1428

Resolver cables



Model number	Short description	
8BCR0005.1111A-0	ACPmulti resolver cable, length 5m, 3 x 2 x 24AWG (19x0, 127), resolver plug 12-pin SpeedTec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1429
8BCR0007.1111A-0	ACPmulti resolver cable, length 7m, 3 x 2 x 24AWG (19x0, 127), resolver plug 12-pin SpeedTec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1429
8BCR0010.1111A-0	ACPmulti resolver cable, length 10m, 3 x 2 x 24AWG (19x0, 127), resolver plug 12-pin SpeedTec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1429
8BCR0015.1111A-0	ACPmulti resolver cable, length 15m, 3 x 2 x 24AWG (19x0, 127), resolver plug 12-pin SpeedTec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1429
8BCR0020.1111A-0	ACPmulti resolver cable, length 20m, 3 x 2 x 24AWG (19x0, 127), resolver plug 12-pin SpeedTec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1429
8BCR0025.1111A-0	ACPmulti resolver cable, length 25m, 3 x 2 x 24AWG (19x0, 127), resolver plug 12-pin SpeedTec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1429

Product overview

SinCos cables



Model number	Short description	
8BCS0005.1111A-0	ACPMulti SinCos cable, length 5m, 10 x 0.14mm ² + 2 x 0.5mm ² , SinCos plug 12-pin SpeedTec socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1430
8BCS0007.1111A-0	ACPMulti SinCos cable, length 7m, 10 x 0.14mm ² + 2 x 0.5mm ² , SinCos plug 12-pin SpeedTec socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1430
8BCS0010.1111A-0	ACPMulti SinCos cable, length 10m, 10 x 0.14mm ² + 2 x 0.5mm ² , SinCos plug 12-pin SpeedTec socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1430
8BCS0015.1111A-0	ACPMulti SinCos cable, length 15m, 10 x 0.14mm ² + 2 x 0.5mm ² , SinCos plug 12-pin SpeedTec socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1430
8BCS0020.1111A-0	ACPMulti SinCos cable, length 20m, 10 x 0.14mm ² + 2 x 0.5mm ² , SinCos plug 12-pin SpeedTec socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1430
8BCS0025.1111A-0	ACPMulti SinCos cable, length 25m, 10 x 0.14 mm ² + 2 x 0.5 mm ² , SinCos plug 12-pin 15-pin SpeedTec socket, servo plug DSUB plug, can be used in cable drag chains, UL/CSA listed	1430

Expansion cables



Model number	Short description	
8BCA01X5.1111A-0	ACPMulti expansion cable, length 1.5 m, 3 x 1.5 mm ² , UL/CSA listed	1431
8BCA0003.1111A-0	ACPMulti expansion cable, length 3 m, 3 x 1.5 mm ² , UL/CSA listed	1431
8BCA0005.1111A-0	ACPMulti expansion cable, length 5 m, 3 x 1.5 mm ² , UL/CSA listed	1431
8BCA01X5.1312A-0	ACPMulti expansion cable, length 1.5 m, 3 x 4 mm ² , UL/CSA listed	1432
8BCA0003.1312A-0	ACPMulti expansion cable, length 3 m, 3 x 4 mm ² , UL/CSA listed	1432
8BCA0005.1312A-0	ACPMulti expansion cable, length 5 m, 3 x 4 mm ² , UL/CSA listed	1432
8BCA01X5.1513A-0	ACPMulti expansion cable, length 1.5 m, 3 x 10 mm ² , UL/CSA listed	1433
8BCA0003.1513A-0	ACPMulti expansion cable, length 3 m, 3 x 10 mm ² , UL/CSA listed	1433
8BCA0005.1513A-0	ACPMulti expansion cable, length 5 m, 3 x 10 mm ² , UL/CSA listed	1433

Terminals



Model number	Short description	
8TB2104.2010-00	Screw terminal 4-pin, 1 row RM5.08 label 1: numbered serially	1434
8TB2104.203F-00	Screw terminal 4-pin, 3 row RM5.08 label 1: T- T+ B- B+, F coding: 0101	1434
8TB2104.203L-00	Screw terminal 4-pin, 3 row RM5.08 label 1: T- T+ B- B+, L coding: 1010	1434
8TB2104.204A-00	Screw terminal 4-pin, 4 row RM5.08 label 1: T- T+ F- F+, A coding: 0000	1435
8TB2106.2010-00	Screw terminal 6-pin, 1 row RM5.08 label 1: numbered serially	1435
8TB2108.2010-00	Screw terminal 8-pin, 1 row RM5.08 label 1: numbered serially	1435
8TB2112.2010-00	Screw terminal 12-pin, 1 row RM5.08 label 1: numbered serially	1436
8TB3102.201C-10	Screw terminal 2-pin, 1 row RM7.62 label 1: numbered serially, C coding: 10	1436
8TB3104.201H-10	Screw terminal 4-pin, 1 row RM7.62 label 1: numbered serially, H coding: 0111	1436
8TB3104.201M-10	Screw terminal 4-pin, 1 row RM7.62 label 1: numbered serially, M coding: 1011	1437
8TB3104.204G-00	Screw terminal 4-pin, 4 row RM7.62 label 1: PE W V U, G coding: 0110	1437
8TB3104.204K-00	Screw terminal 4-pin, 4 row RM7.62 label 1: PE W V U, K coding: 1001	1437
8TB4103.203C-10	Screw terminal 3-pin, 1 row RM10.16, label 3: +DC -DC PE, C coding: 010	1438
8TB4104.202N-10	Screw terminal 4-pin, 1 row RM10.16, label 2: L1 L2 L3 PE, N coding: 1100	1438
8TB4104.202L-10	Screw terminal 4-pin, 1 row RM10.16, label 2: L1 L2 L3 PE, L coding: 1010	1438
8TB4104.206D-10	Screw terminal 4-pin, 1 row RM10.16, label 2: L1' L2' L3' PE, D coding: 0011	1439
8TB4104.204G-00	Screw terminal 4-pin, 1 row RM10.16, label 4: PE W V U, G coding: 0110	1439
8TB4104.204G-10	Screw terminal 4-pin, 1 row RM10.16, label 4: PE W V U, G coding: 0110	1439

Shield component sets



Model number	Short description	
8SCS000.0000-00	Shield component set consisting of: 1 shield plate 1x type 0, 1 hose clamp, B 9 mm, D 12-22 mm	1440
8SCS001.0000-00	Shield component set consisting of: 1 shield plate 4x type 1, 1 hose clamp, B 9mm, D 12-22 mm	1440
8SCS002.0000-00	Shield component set consisting of: 1 clamping plate, 2 clamps D 4-13.5 mm, 2 screws	1440
8SCS003.0000-00	Shield component set consisting of: 1 shield mounting plate 4x 45°, 8 screws	1440
8SCS004.0000-00	Shield component set consisting of: 1 shield plate 4x type 0, 2 hose clamps, B 9 mm, D 32-50 mm	1440
8SCS005.0000-00	Shield component set consisting of: 1 slot cover shield sheet	1440
8SCS007.0000-00	Shield component set consisting of: 1 shield mounting plate 2x 45°, 4 screws	1441
8SCS008.0000-00	Shield component set consisting of: 1 shield plate 2x type 0, 1 hose clamp, B 9 mm, D 23-35 mm	1441

Fan modules



Model number	Short description	
8BXF001.0000-00	Replacement fan for ACOPOSmulti modules (8BVP/8B0C/8BVI/8BVE/8B0K)	1441
8BXF002.0000-00	ACOPOSmulti fan module, replacement fan for mounting plate with backplane module, wall mounting (8B0MxxxxHWxx.xxx-x)	1441

Line filter 8BVF



8BVF0440H000.001-2

- Wider power input voltage range
- Optimally suited for ACOPOSmulti power supply modules
- Adherence to the limits according to CISPR11, Group 2, Class A




General information	8BVF0220H000.000-1	8BVF0440H000.001-2	8BVF0880H000.000-1
C-UL-US listed	Yes	Yes	Yes
Cooling and mounting methods	Wall mounting	Wall mounting	Wall mounting
Power mains connection	8BVF0220H000.000-1	8BVF0440H000.001-2	8BVF0880H000.000-1
Mains input voltage	3x220 to 3x480VAC ±10%	3x220 to 3x480VAC ±10%	3x220 to 3x480VAC ±10%
Frequency	50 / 60 Hz ± 4%	50 / 60 Hz ± 4%	50 / 60 Hz ± 4%
Allocation to the power supply module	15 kW	32 kW	60 kW
Continuous current ¹⁾	22.5 A _{eff}	45 A _{eff}	90 A _{eff}
Peak current < 10 s	56 A _{eff}	180 A _{eff}	180 A _{eff}
Reduction of continuous current depending on the ambient temperature starting at 40°C.	In preparation	0.4 A _{eff} per °C starting at 40°C	1 A _{eff} per °C starting at 40°C
Power loss at rated current	In preparation	250W	470W
Line filter according to EN61800-3-A11 second environment (limits from CISPR11, Group 2, Class A) ²⁾	Yes	Yes	Yes
Design			
L1, L2, L3, PE and L1', L2', L3', PE	Connectors	Connectors	Feed-through terminals
PU	Threaded bolt M5	Threaded bolt M5	No
Shield connection			
on the mains	No	No	No
on the device	Yes ³⁾	Yes ³⁾	Yes ³⁾
Terminal connection cross section			
Flexible and fine wire lines with wire tip sleeves	0.5 - 16 mm ²	0.5 - 16 mm ²	10 - 50 mm ²
UL/cULus	20 - 6	20 - 6	6 - 1/0
CSA	20 - 6	20 - 6	6 - 1/0
Terminal outer cross-section of the shield connection	23 - 35 mm	23 - 35 mm	32 - 50 mm
<p>1) Valid in the following conditions: 40°C ambient temperature, installation altitude < 500 m above sea level.</p> <p>2) To avoid exceeding the EMC limit values, the total length of all motor cables for each mounting plate (and therefore each line filter) should be limited to a maximum of 900 m. The cable length between the line filter and the power supply module is limited to a maximum of 5 m. The maximum motor cable length per motor connection is also limited (see inverter modules).</p> <p>3) The cable does not require shielding up to a total cable length between the line filter, regeneration choke and power supply module of 3 m.</p> <p>Please contact B&R when using cable lengths > 3 m.</p>			
Temperature sensor	8BVF0220H000.000-1	8BVF0440H000.001-2	8BVF0880H000.000-1
Temperature sensor type	EPCOS B59100M1155A070	EPCOS B59100M1155A070	EPCOS B59100M1155A070
Design			
T+, T-	Connectors	Connectors	Connectors
Terminal connection cross section			
Flexible and fine wire lines with wire tip sleeves	0.25 - 2.5 mm ²	0.25 - 2.5 mm ²	0.25 - 2.5 mm ²
UL/cULus	30 - 12	30 - 12	30 - 12
CSA	28 - 12	28 - 12	28 - 12
Fan connection	8BVF0220H000.000-1	8BVF0440H000.001-2	8BVF0880H000.000-1
Max. power consumption (P _{Fan8BVF...})	8.25 W		
Design			
F+, F-	Connectors	Connectors	Connectors
Terminal connection cross section			
Flexible and fine wire lines with wire tip sleeves	0.25 - 2.5 mm ²	0.25 - 2.5 mm ²	0.25 - 2.5 mm ²
UL/cULus	30 - 12	30 - 12	30 - 12
CSA	28 - 12	28 - 12	28 - 12

Operational conditions	8BVF0220H000.000-1	8BVF0440H000.001-2	8BVF0880H000.000-1
Ambient temperature during operation	5 to 40°C	5 to 40°C	5 to 40°C
Max. ambient temperature ¹⁾	+55°C	+55°C	+55°C
Relative humidity during operation	5 to 85%, non-condensing	5 to 85%, non-condensing	5 to 85%, non-condensing
Installation at altitudes above sea level	0 to 500 m	0 to 500 m	0 to 500 m
Maximum installation attitude ²⁾	4000 m	4000 m	4000 m
Degree of pollution according to EN 60664-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Overvoltage cat. according to IEC 60364-4-443:1999	III	III	III
EN 60529 protection	IP20	IP20	IP20

1) Continuous operation of the ACOPOSmulti power filter at ambient temperatures ranging from 40°C to max. 55°C is possible (taking the continuous current reductions listed into consideration), but results in a shorter lifespan.

2) Continuous operation of ACOPOSmulti line filters at altitudes ranging from 500 m to 4000 m above sea level is possible (taking the continuous current reductions listed into consideration). Additional requirements are to be arranged with B&R.

Mechanical characteristics	8BVF0220H000.000-1	8BVF0440H000.001-2	8BVF0880H000.000-1
Dimensions			
Width	135 mm	135 mm	175 mm
Height	378 mm	378 mm	436 mm
Depth	212 mm	212 mm	212 mm
Weight	In preparation	15 kg	23.5 kg

Required accessories				
8TB4104.202N-10 ¹⁾	1	Screw terminal 4-pin, 1 row RM10.16 Label 2: L1 L2 L3 PE, N coding: 1100	Plug for X1 connection	 1438
8TB4104.206D-10 ¹⁾	1	Screw terminal 4-pin, 1 row RM10.16 Label 2: L1' L2' L3' PE, D coding: 0011	Plug for X2 connection	 1439
8TB2104.204A-00	1	Screw terminal 4-pin, 1 row RM5.08 Label 4: T- T+ F- F+, A coding: 0000	Plug for X3 connection	 1435

1) Only for 8BVF0220H000.000-1 and 8BVF0440H000.001-2.

Regeneration chokes 8BVR



8BVR0440H000.100-1

- Connection for temperature sensor
- Optimally suited for ACOPOSmulti power supply modules

General information	8BVR0220H000.100-1	8BVR0440H000.100-1	8BVR0880H000.100-1
C-UL-US listed	Yes	Yes	Yes ¹⁾
Cooling and mounting methods	Wall mounting	Wall mounting	Wall mounting

1) The C-UL-US listing is now valid for horizontal mounting orientation if the specified reduction of the continuous current is taken into consideration! C-UL-US conformity can also be achieved for vertical mounting orientation: The cabling of the regeneration choke must have lines with a temperature rating of at least 105°. In addition, the switching cabinet must be tested and approved by UL. The specified reduction of the continuous current must be adhered to!

Power mains connection	8BVR0220H000.100-1	8BVR0440H000.100-1	8BVR0880H000.100-1
Mains input voltage	3x220 to 3x480VAC ± 10%	3x220 to 3x480VAC ± 10%	3x220 to 3x480VAC ± 10%
Frequency	50 / 60 Hz ± 4%	50 / 60 Hz ± 4%	50 / 60 Hz ± 4%
Allocation to the power supply module	15 kW	32 kW	60 kW
Continuous current ¹⁾	22.5 A _{eff}	45 A _{eff}	90 A _{eff}
Peak current < 10 s	In preparation	90 A _{eff}	180 A _{eff}
Reduction of continuous current depending on the ambient temperature			
Horizontal mounting orientation	---	---	0.6 A _{eff} per °C starting at 10°C
Vertical mounting orientation	In preparation	0.4 A _{eff} per °C starting at 40°C	1 A _{eff} per °C starting at 40°C
Power loss at rated current	In preparation	330 W	470 W
Design			
U1, V1, W1	Terminals	Terminals	Terminals
U2, V2, W2	Terminals	Terminals	Terminals
Shielding connection ²⁾			
on the mains	No	No	No
on the device	No	No	No
Terminal connection cross section			
Flexible and fine wire lines with wire tip sleeves	1.5 - 16 mm ²	1.5 - 16 mm ²	2.5 - 35 mm ²
UL/cULus	18 - 6	18 - 4	12 - 1
CSA	14 - 6	14 - 6	12 - 2
Terminal outer cross-section of the shield connection	---	---	---

1) Valid in the following conditions: 40°C ambient temperature, installation altitude < 500 m above sea level.

2) The cable does not require shielding up to a total cable length between the line filter, regeneration choke and power supply module of 3 m. Please contact B&R when using cable lengths > 3 m.

Temperature sensor	8BVR0220H000.100-1	8BVR0440H000.100-1	8BVR0880H000.100-1
Temperature sensor type	EPCOS B59100M1155A070	EPCOS B59100M1155A070	EPCOS B59100M1155A070
Design			
T+, T-	Terminals	Terminals	Terminals
Terminal connection cross section			
Flexible and fine wire lines with wire tip sleeves	0.5 - 2.5 mm ²	0.5 - 2.5 mm ²	0.5 - 2.5 mm ²
UL/cULus	30 - 12	30 - 12	30 - 12
CSA	26 - 12	26 - 12	26 - 12

Operational conditions	8BVR0220H000.100-1	8BVR0440H000.100-1	8BVR0880H000.100-1
Mounting orientation			
Horizontal	No	No	Yes
Vertical	Yes	Yes	Yes ¹⁾
Ambient temperature during operation	5 to 40°C	5 to 40°C	5 to 40°C
Max. ambient temperature ²⁾	+55°C	+55°C	+55°C
Relative humidity during operation	5 to 85%, non-condensing	5 to 85%, non-condensing	5 to 85%, non-condensing
Installation at altitudes above sea level	0 to 500 m	0 to 500 m	0 to 500 m
Maximum installation attitude ³⁾	4000 m	4000 m	4000 m
Degree of pollution according to EN 60664-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Overvoltage cat. according to IEC 60364-4-443:1999	III	III	III
EN 60529 protection	IP00	IP00	IP00
<p>1) The C-UL-US listing is now valid for horizontal mounting orientation if the specified reduction of the continuous current is taken into consideration! C-UL-US conformity can also be achieved for vertical mounting orientation: The cabling of the regeneration choke must have lines with a temperature rating of at least 105°C. In addition, the switching cabinet must be tested and approved by UL. The specified reduction of the continuous current must be adhered to!</p> <p>2) Continuous operation of ACOPOSmulti regeneration chokes at ambient temperatures ranging from 40°C to max. 55°C is possible (taking the continuous current reductions listed into consideration), but results in a shorter lifespan.</p> <p>3) Continuous operation of ACOPOSmulti regeneration chokes at altitudes ranging from 500 m to 4000 m above sea level is possible (taking the continuous current reductions listed into consideration). Additional requirements are to be arranged with B&R.</p>			
Storage and transport conditions	8BVR0220H000.100-1	8BVR0440H000.100-1	8BVR0880H000.100-1
Storage temperature	-25 to +55°C	-25 to +55°C	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing	5 to 95%, non-condensing	5 to 95%, non-condensing
Transport temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Relative humidity during transport	95% at +40°C	95% at +40°C	95% at +40°C
Mechanical characteristics	8BVR0220H000.100-1	8BVR0440H000.100-1	8BVR0880H000.100-1
Dimensions			
Width	In preparation	240 mm	290 mm
Height	In preparation	280 mm	406 mm
Depth	In preparation	125 mm	135 mm
Weight	In preparation	23.9 kg	40.2 kg

Mounting plates 8B0M



8B0M0060HW00.000-1



8B0M0060HC00.000-1



8B0M0060HF00.000-1

- Groundbreaking power distribution system
- Integrated distribution of the power and auxiliary supply voltage
- Prevention from accidentally touching the unit
- Optional slots possible

General information	8B0MnnnnHW00.000-1	8B0MnnnnHC00.000-1	8B0MnnnnHF00.000-1
C-UL-US listed	In preparation	In preparation	In preparation
Cooling and mounting methods	Wall mounting	Installing the cold plate	Feed-through mounting
Number of slots nnnn			
Min.	4	4	4 ¹⁾
Max.	27	27	20

1) The number of slots must be a multiple of 4.

DC bus	8B0MnnnnHW00.000-1	8B0MnnnnHC00.000-1	8B0MnnnnHF00.000-1
Voltage	800 VDC	800 VDC	800 VDC
Max.	900 VDC	900 VDC	900 VDC
Continuous power ¹⁾	200 kW	200 kW	200 kW
Reduction of continuous current depending on the ambient temperature starting at 40°C.	In preparation	In preparation	In preparation
Reduction of continuous power depending on the installation altitude starting at 500m above sea level	20 kW per 1000 m	20 kW per 1000 m	20 kW per 1000 m
Cross section			
DC+, DC-	72 mm ²	72 mm ²	72 mm ²
PU	72 mm	72 mm	72 mm

1) Valid in the following conditions: 40°C ambient temperature, installation altitude < 500 m above sea level.

24 VDC auxiliary supply	8B0MnnnnHW00.000-1	8B0MnnnnHC00.000-1	8B0MnnnnHF00.000-1
Voltage	25 VDC ± 1.6%	25 VDC ± 1.6%	25 VDC ± 1.6%
Continuous power ¹⁾	1500 W	1500 W	1500 W
Max. power consumption per slot (P _{Fan8B0M...})	8.25 W ²⁾	-	8.25 W ³⁾
Reduction of continuous current depending on the ambient temperature starting at 40°C.	In preparation	In preparation	In preparation
Reduction of continuous power depending on the installation altitude starting at 500m above sea level	150 W per 1000 m	150 W per 1000 m	150 W per 1000 m
Cross section			
24 VDC, COM	21.3 mm ²	21.3 mm ²	21.3 mm ²

1) Valid in the following conditions: 40°C ambient temperature, installation altitude < 500 m above sea level.

2) Corresponds to the attributable power consumption of the fan modules on the mounting plate.

3) Corresponds to the attributable power consumption of the fan module 8B0M0040HFF0.000-1.

Operational conditions	8B0MnnnnHW00.000-1	8B0MnnnnHC00.000-1	8B0MnnnnHF00.000-1
Ambient temperature during operation	5 to 40°C	5 to 40°C	5 to 40°C
Max. ambient temperature ¹⁾	+55°C	+55°C	+55°C
Relative humidity during operation	5 to 85%, non-condensing	5 to 85%, non-condensing	5 to 85%, non-condensing
Installation at altitudes above sea level	0 to 500 m	0 to 500 m	0 to 500 m
Maximum installation attitude ²⁾	4000 m	4000 m	4000 m
Degree of pollution according to EN 60664-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Overvoltage cat. according to IEC 60364-4-443:1999	III	III	III
EN 60529 protection	IP20	IP20	IP64 Fan module IP54 (8B0M0040HFF0.000-1)
Flow volume			
Minimum	-	3 l/min	-
Maximum	-	6 l/min	-
Pressure drop depending on the flow volume			
3 l/min	-	typically 0.3 bar ³⁾	-
6 l/min	-	typically 0.7 bar ³⁾	-
Test pressure	-	10 bar for 1 minute, air inside, water outside	-
Maximum continual pressure ⁴⁾	-	4 bar	-

- 1) Continuous operation of ACOPOSmulti mounting plates at an ambient temperature ranging from 40°C to max. 55°C is possible (taking the continuous power reductions listed into consideration).
- 2) Continuous operation of ACOPOSmulti mounting plates at altitudes ranging from 500 m to 4000 m above sea level is possible (taking the continuous power reductions listed into consideration).
Additional requirements are to be arranged with B&R.
- 3) Valid in the following conditions: Mounting plate with max. 27 slots, cooling medium tap water. Values vary depending on the cooling medium and/or connection fitting being used!
- 4) The requirements for the entire system (tubing, heat exchangers, re-coiling systems, etc.) and possible application-specific requirements must be met.

Storage and transport conditions	8B0MnnnnHW00.000-1	8B0MnnnnHC00.000-1	8B0MnnnnHF00.000-1
Storage temperature	-25 to +55°C	-25 to +55°C	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing	5 to 95%, non-condensing	5 to 95%, non-condensing
Transport temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Relative humidity during transport	95% at +40°C	95% at +40°C	95% at +40°C
Mechanical characteristics	8B0MnnnnHW00.000-1	8B0MnnnnHC00.000-1	8B0MnnnnHF00.000-1
Dimensions ¹⁾			
Width	(n * 53.5) mm	(94 + (n - 1) * 53.5)	(64 + n * 53.5) mm
Height	385 mm	378 mm	378 mm
Depth	13.5 mm	17 mm	14 mm
Weight	(0.53 * number of slots) kg	(0.94 * number of slots) kg	(1.6 * number of slots) kg




- 1) The dimensions define the size of the mounting plate. Make sure to leave additional space above and below the backplanes for mounting, connections and air circulation.

Mounting plates 8B0M

Modul number overview ¹⁾

Number of slots	Wall mounting	Cold plate mounting	Feed-through mounting
4	8B0M0040HW00.000-1	8B0M0040HC00.000-1	8B0M0040HF00.000-1
5	8B0M0050HW00.000-1	8B0M0050HC00.000-1	-
6	8B0M0060HW00.000-1	8B0M0060HC00.000-1	-
7	8B0M0070HW00.000-1	8B0M0070HC00.000-1	-
8	8B0M0080HW00.000-1	8B0M0080HC00.000-1	8B0M0080HF00.000-1
9	8B0M0090HW00.000-1	8B0M0090HC00.000-1	-
10	8B0M0100HW00.000-1	8B0M0100HC00.000-1	-
11	8B0M0110HW00.000-1	8B0M0110HC00.000-1	-
12	8B0M0120HW00.000-1	8B0M0120HC00.000-1	8B0M0120HF00.000-1
13	8B0M0130HW00.000-1	8B0M0130HC00.000-1	-
14	8B0M0140HW00.000-1	8B0M0140HC00.000-1	-
15	8B0M0150HW00.000-1	8B0M0150HC00.000-1	-
16	8B0M0160HW00.000-1	8B0M0160HC00.000-1	8B0M0160HF00.000-1
17	8B0M0170HW00.000-1	8B0M0170HC00.000-1	-
18	8B0M0180HW00.000-1	8B0M0180HC00.000-1	-
19	8B0M0190HW00.000-1	8B0M0190HC00.000-1	-
20	8B0M0200HW00.000-1	8B0M0200HC00.000-1	8B0M0200HF00.000-1
21	8B0M0210HW00.000-1	8B0M0210HC00.000-1	-
22	8B0M0220HW00.000-1	8B0M0220HC00.000-1	-
23	8B0M0230HW00.000-1	8B0M0230HC00.000-1	-
24	8B0M0240HW00.000-1	8B0M0240HC00.000-1	-
25	8B0M0250HW00.000-1	8B0M0250HC00.000-1	-
26	8B0M0260HW00.000-1	8B0M0260HC00.000-1	-
27	8B0M0270HW00.000-1	8B0M0270HC00.000-1	-

1) Model numbers shown with bold font indicate preferred types. Preferred types are available immediately when ordered for the first time and for service orders.

Optional accessories			
8B0M0040HFF0.000-1 ¹⁾	Up to 5	ACOPOSMulti fan module for mounting plate 4 slots, HV, feed-through mounting	One fan module is required for every 4 slots
8BXF002.0000-00 ²⁾	---	ACOPOSMulti fan module, replacement fan for mounting plate with backplane module, wall mounting (8B0MnnnnHWxx.xxx-x)	Replacement fan for ACOPOSMulti mounting plates 8B0MnnnnHWxx.xxx-x  1441
X67CA0P20.xxxx ^{1) 3)}	1	Power connection cable, xxxx m	24 VDC connection cable for ACOPOSMulti fan modules 8B0M0040HFF0.000-1  516
X67CA0P00.0002 ¹⁾	Up to 4	Power connection cable, 0.2 m	24 VDC connection cable between two ACOPOSMulti fan modules 8B0M0040HFF0.000-1  516

1) Only for 8B0MnnnnHF00.000-1.

2) Only for 8B0MnnnnHW00.xxx-1.

3) The cable length is specified in decimeters by xxxx (0010 equals a cable length of 1 m).



Power supply modules 8BVP



8BVP0880HC00.000-1

- Wide input voltage range
- Capable of regeneration
- Integrated connection for temperature sensors
- 2 slots for ACOPOSmulti plug-in modules

ETHERNET 
POWERLINK

Wall mounting	8BVP0220HW00.000-1	8BVP0440HW00.000-1	8BVP0880HW00.000-1
Cold plate or feed-through mounting	8BVP0220HC00.000-1	8BVP0440HC00.000-1	8BVP0880HC00.000-1
General information			
C-UL-US listed	Yes	Yes	Yes
Available cooling and mounting methods			
Wall mounting	Yes	Yes	Yes
Cold plate or feed-through mounting	Yes	Yes	Yes
Module width	1	2	4
Power mains connection			
Mains input voltage	3x220 to 3x480VAC ±10%	3x220 to 3x480VAC ±10%	3x220 to 3x480VAC ±10%
System configuration	TT, TN-S, TN-C-S	TT, TN-S, TN-C-S	TT, TN-S, TN-C-S
Frequency	50 / 60 Hz ± 4%	50 / 60 Hz ± 4%	50 / 60 Hz ± 4%
Installed load	In preparation	In preparation	In preparation
Power loss at max. device power	In preparation	In preparation	In preparation
Starting current at 400 VAC	In preparation	In preparation	In preparation
Switch-on interval	> 10 sec	> 10 sec	> 10 sec
Max. chargeable DC bus capacitance	4 mF	4 mF	8 mF
Rated switching frequency	5 kHz	5 kHz	5 kHz
Integrated line filter according to EN61800-3-A11 second environment (limits from CISPR11, group 2, class A)	No	No	No
Integrated regeneration choke	No	No	No
Capable of regeneration	Yes	Yes	Yes
Power Factor Control (PFC)	Yes	Yes	Yes
Design			
L1, L2, L3, PE	Connectors	Connectors	Threaded bolt M8
PU	Threaded bolt M5	Threaded bolt M5	No
Shield connection	Yes ¹⁾	Yes ¹⁾	Yes ¹⁾
Terminal connection cross sections			
Flexible and fine wire lines			
with wire tip sleeves	0.5 - 16 mm ²	0.5 - 16 mm ²	6 - 50 mm ² ²⁾
Approval data			
UL/C-UL-US	20 - 6	20 - 6	In preparation
CSA	20 - 6	20 - 6	In preparation
Terminal cross sections (cable diameter) for the shield connection	12 - 22 mm	23 - 35 mm	32 - 50 mm

1) The cable does not require shielding up to a total cable length between the line filter, regeneration choke and power supply module of 3 m.
Please contact B&R when using cable lengths > 3 m.

2) The connection is made with cable lugs using an M8 threaded bolt.

Wall mounting	8BVP0220HW00.000-1	8BVP0440HW00.000-1	8BVP0880HW00.000-1
Cold plate or feed-through mounting	8BVP0220HC00.000-1	8BVP0440HC00.000-1	8BVP0880HC00.000-1
DC bus connection			
Voltage	800 VDC	800 VDC	800 VDC
Max.	900 VDC	900 VDC	900 VDC
Continuous power (supply and regeneration) ¹⁾	15 kW	30 kW	60 kW
Reduction of continuous power depending on mains input voltage			
Mains input voltage < 3x400 VAC	37.5 W * (400 - mains input voltage)	75 W * (400 - mains input voltage)	150 W * (400 - mains input voltage)
Reduction of continuous power depending on the ambient temperature starting at 40°C.	In preparation	In preparation	In preparation
Reduction of continuous power depending on installation altitude			
Starting at 500 m above sea level	1.5 kW per 1000 m	3 kW per 1000 m	6 kW per 1000 m
Reduction of continuous power depending on the cooling type			
Wall mounting	In preparation	In preparation	In preparation
Cold plate or feed-through mounting	In preparation	In preparation	In preparation
Peak power (supply and regeneration)	37.5 kW	60 kW	120 kW
Power loss at max. device power	In preparation	In preparation	In preparation
DC bus capacitance	In preparation	825 µF	1650 µF
Protective measures			
Overload protection	Yes	Yes	Yes
Short circuit and ground fault	No	No	No
Design	ACOPOSmulti backplane	ACOPOSmulti backplane	ACOPOSmulti backplane
1) Valid in the following conditions: 40°C ambient temperature, installation altitude < 500 m above sea level.			
24 VDC supply ¹⁾			
Input voltage	25 VDC ± 1.6%	25 VDC ± 1.6%	25 VDC ± 1.6%
Input capacitance	In preparation	4.7 µF	4.7 µF
Max. power consumption	$P_{24\text{ V Out}} \{0 \dots 10\text{ W}\}^2 + P_{\text{Fan8BVF...}}^3 + 2 * P_{\text{Fan8B0M...}}^4$	$P_{24\text{ V Out}} \{0 \dots 10\text{ W}\}^2 + P_{\text{Fan8BVF...}}^3 + 4 * P_{\text{Fan8B0M...}}^4$	$P_{24\text{ V Out}} \{0 \dots 10\text{ W}\}^2 + P_{\text{Fan8BVF...}}^3 + 4 * P_{\text{Fan8B0M...}}^4$
Design	ACOPOSmulti backplane	ACOPOSmulti backplane	ACOPOSmulti backplane
1) In the power supply modules a DC bus power supply is integrated for the electronic supply. The 24 VDC supply from the ACOPOSmulti backplane only feeds the +24 VDC of the trigger inputs and the encoder power supplies on the encoder modules.			
2) The power consumption P _{24 V Out} corresponds to the power that is output on the module's X2 / +24 V Out 1 and X2 / +24 V Out 2 connections (max. 10 W).			
3) The power consumption P _{Fan8BVF...} corresponds to the portion of the power that is output on the X4A / F- and X4A / F+ connectors on the module and can be found in the technical data for the respective line filter 8BVF... (fan connection).			
4) The power consumption P _{Fan8B0M...} corresponds to the portion of the power that is used by the fan modules in the mounting plate / by the 8B0M0040HFF0.000-1 fan module and can be found in the technical data for the respective 8B0M... mounting plate.			
Filter fan connection			
Output voltage	24V +5.8 / -0.1%	24V +5.8 / -0.1%	24V +5.8 / -0.1%
Continuous current	4.2 A	4.2 A	4.2 A
Protective measures			
Overload protection	No	No	No
Short circuit protection	Yes	Yes	Yes
Cable breakage monitoring	No	No	No
Undervoltage monitoring	No	No	No
Max. over-current limitation	10 A	10 A	10 A

Power supply modules

8BVP

Wall mounting	8BVP0220HW00.000-1	8BVP0440HW00.000-1	8BVP0880HW00.000-1
Cold plate or feed-through mounting	8BVP0220HC00.000-1	8BVP0440HC00.000-1	8BVP0880HC00.000-1
Trigger inputs			
Number of inputs	2	2	2
Wiring	Sink	Sink	Sink
Electrical isolation			
Input - Power supply module	Yes	Yes	Yes
Input - Input	Yes	Yes	Yes
Input voltage			
Rated	24 VDC	24 VDC	24 VDC
Maximum	30 VDC	30 VDC	30 VDC
Switching threshold			
LOW	< 5 V	< 5 V	< 5 V
HIGH	>15 V	>15 V	>15 V
Input current at rated voltage	Approx. 10 mA	Approx. 10 mA	Approx. 10 mA
Switching delay			
Positive edge	52 μ s \pm 0.5 μ s (digitally filtered)	52 μ s \pm 0.5 μ s (digitally filtered)	52 μ s \pm 0.5 μ s (digitally filtered)
Negative edge	53 μ s \pm 0.5 μ s (digitally filtered)	53 μ s \pm 0.5 μ s (digitally filtered)	53 μ s \pm 0.5 μ s (digitally filtered)
Modulation compared to ground potential	Max. \pm 38 V	Max. \pm 38 V	Max. \pm 38 V
24 V Out			
Amount	2	2	2
Output voltage			
DC bus voltage (U _{DC}): 260 ... 315 VDC	25 VDC * (U _{DC} / 315)	25 VDC * (U _{DC} / 315)	25 VDC * (U _{DC} / 315)
DC bus voltage (U _{DC}): 315 ... 900 VDC	24 VDC \pm 6%	24 VDC \pm 6%	24 VDC \pm 6%
Fuse protection	500 mA (slow-blow) electronic, automatic reset	500 mA (slow-blow) electronic, automatic reset	500 mA (slow-blow) electronic, automatic reset
Operational conditions			
Ambient temperature during operation			
Max. ambient temperature ¹⁾	+55°C	+55°C	+55°C
Relative humidity during operation			
Installation at altitudes above sea level	0 to 500 m	0 to 500 m	0 to 500 m
Maximum installation attitude ²⁾	4000 m	4000 m	4000 m
Degree of pollution according to EN 60664-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Overvoltage cat. according to IEC 60364-4-443:1999			
EN 60529 protection	IP20	IP20	IP20
<p>1) Continuous operation of ACOPOSMulti power supply modules at ambient temperatures ranging from 40°C to max. 55°C is possible (taking the continuous current reductions listed into consideration), but results in a shorter lifespan.</p> <p>2) Continuous operation of ACOPOSMulti power supply modules at altitudes ranging from 500 m to 4000 m above sea level is possible (taking the continuous current reductions listed into consideration). Additional requirements are to be arranged with B&R.</p>			
Storage and transport conditions			
Storage temperature	-25 to +55°C	-25 to +55°C	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing	5 to 95%, non-condensing	5 to 95%, non-condensing
Transport temperature	25 to +70°C	25 to +70°C	25 to +70°C
Relative humidity during transport	95% at +40°C	95% at +40°C	95% at +40°C

Wall mounting	8BVP0220HW00.000-1	8BVP0440HW00.000-1	8BVP0880HW00.000-1
Cold plate or feed-through mounting	8BVP0220HC00.000-1	8BVP0440HC00.000-1	8BVP0880HC00.000-1
Mechanical characteristics			
Dimensions ¹⁾			
Width	106.5 mm	106.5 mm	213.5 mm
Height	317 mm	317 mm	317 mm
Depth			
Wall mounting	263 mm	263 mm	263 mm
Cold-plate	212 mm	212 mm	212 mm
Feed-through mounting	209 mm	209 mm	209 mm
Weight			
Wall mounting	In preparation	Approx. 5.5 kg	Approx. 10.2 kg
Cold-plate	In preparation	Approx. 4.5 kg	Approx. 7.9 kg
Feed-through mounting	In preparation	Approx. 4.5 kg	Approx. 7.9 kg

1) The dimensions define the true device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

Required accessories					
8TB2106.2010-00	1	Screw terminal 6-pin, 1 row RM5.08 Label 1: numbered serially	Plug for X1 connection		1435
8TB2108.2010-00	1	Screw terminal 8-pin, 1 row RM5.08 Label 1: numbered serially	Plug for X2 connection		1435
8TB2104.204A-00	1	Screw terminal 4-pin, 1 row RM5.08 Label 4: T- T+ F- F+, A coding: 0000	Plug for X4A connection		1435
8TB4104.202L-10 ¹⁾	1	Screw terminal 4-pin, 1 row RM10.16 Label 2: L1 L2 L3 PE, N coding: 1100	Plug for X5A connection		1438

1) Only for 8BVP0220Hx00.000-1 und 8BVP0440Hx00.000-1.

Power supply modules

8BVP

Optional accessories				
8BAC0120.000-1	max. 2	ACOPOSmulti plug-in module, EnDat 2.1 interface	---	1410
8BAC0120.001-1	max. 2	ACOPOSmulti plug-in module, EnDat 2.2 interface	---	1412
8BAC0121.000-1	max. 2	ACOPOSmulti plug-in module, HIPERFACE interface	---	1413
8BAC0122.000-1	max. 2	ACOPOSmulti plug-in module, resolver interface	---	1414
8BAC0123.000-1	max. 2	ACOPOSmulti plug-in module, incremental encoder and SSI absolute encoder interface for RS422 signals	---	1416
8BAC0123.001-1	max. 2	ACOPOSmulti plug-in module, incremental encoder interface for 5V single-ended and 5V differential signals	---	1418
8BAC0123.002-1	max. 2	ACOPOSmulti plug-in module, incremental encoder interface for 24V single-ended and 24V differential signals	---	1420
8BAC0124.000-1	max. 2	ACOPOSmulti plug-in module, SinCos interface	---	1422
8BAC0132.000-1	max. 2	ACOPOSmulti input module, 4 analog inputs $\pm 10V$	---	1424
8SCS005.0000-00	Up to 2	Shield component set consisting of: 1 slot cover shield sheet	Shield sheet for covering free plug-in module slots	1440
8SCS002.0000-00	1	Shield component set consisting of: 1 clamping plate 2 clamps D 4-13.5 mm 2 screws	Shield component set for I/O cables with a cable cross section of 4 - 13.5 mm	1440
8SCS000.0000-00 ¹⁾	1	Shield component set consisting of: 1 shield plate 1x type 0 1 hose clamp, W 9 mm, D 12-22 mm	Shield component set for mains cables with a cable cross section of 12 - 22 mm	1440
8SCS008.0000-00 ²⁾	1	Shield component set consisting of: 1 shield plate, 2x, type 0 1 hose clamp, W 9 mm, D 23-35 mm	Shield component set for mains cables with a cross section of 23 - 35 mm	1441
8SCS003.0000-00 ³⁾	1	Shield component set consisting of: 1 shield mounting plate, 4x, 45° 8 screws	Base plate for mounting shield component set 8SCS001.0000-00 or 8SCS004.0000-00	1440
8SCS004.0000-00 ³⁾	1	Shield component set consisting of: 1 shield plate, 4x, type 0 2 hose clamps, W 9 mm, D 32-50 mm	Shield component set for mains cables with a cable cross section of 32 - 50 mm	1440
8SCS001.0000-00 ³⁾	3	Shield component set consisting of: 1 shield plate, 4x, type 1 1 hose clamp, W 9mm, D 12-22 mm	Shield component set for single lines with a cross section of 12 - 22 mm	1441
8SCS007.0000-00 ²⁾	1	Shield component set consisting of: 1 shield mounting plate, 2x, 45° 4 screws	Base plate for mounting shield component set 8SCS008.0000-00	1441
8BXF001.0000-00	---	ACOPOSmulti fan module, replacement fan for ACOPOSmulti Modules (8BVP/8B0C/8BVI/8BVE/8B0K)	Replacement fan for ACOPOSmulti modules (8BVP/8B0C/8BVI/8BVE/8B0K)	1441

1) Only for 8BVP0220Hx00.000-1. 2) Only for 8BVP0440Hx00.000-1. 3) Only for 8BVP0880Hx00.000-1.



Auxiliary supply modules 400W

8B0C0160



8B0C0160HC00.001-1

- Possibilities for supplying external 24V devices
- Extensive protective measures

Wall mounting	8B0C0160HW00.000-1	8B0C0160HW00.001-1
Cold plate or feed-through mounting	8B0C0160HC00.000-1	8B0C0160HC00.001-1
General information		
C-UL-US listed	Yes	Yes
Available cooling and mounting methods		
Wall mounting	Yes	Yes
Cold plate or feed-through mounting	Yes	Yes
Module width	1	1
DC bus connection		
Voltage	800 VDC	800 VDC
Operating range in continuous operation	260 - 900 VDC	260 - 900 VDC
Full continuous power	315 - 900 VDC	315 - 900 VDC
Continuous power consumption	Max. 470 W	Max. 470 W
Power loss at max. device power	In preparation	In preparation
DC bus capacitance	In preparation	In preparation
Design	ACOPOSmulti backplane	ACOPOSmulti backplane
24 VDC output		
Continuous power ¹⁾	400 W	400 W
Output voltage		
DC bus voltage (U_{DC}): 260 ... 315 VDC	25 VDC * ($U_{DC} / 315$)	25 VDC * ($U_{DC} / 315$)
DC bus voltage (U_{DC}): 315 ... 900 VDC	24 VDC \pm 6%	24 VDC \pm 6%
Continuous current	16 ADC	16 ADC
Reduction of continuous power depending on the ambient temperature starting at 40°C.	No reduction	No reduction
Reduction of continuous power depending on installation altitude		
Starting at 500 m above sea level	40 W per 1000 m	40 W per 1000 m
Reduction of continuous power depending on the cooling type		
Wall mounting	In preparation	In preparation
Cold plate or feed-through mounting	In preparation	In preparation
Startup delay	Max. 1 sec.	Max. 1 sec.
Startup time	Approx. 5 - 20 ms	Approx. 5 - 20 ms
Residual ripple	Typ. 50 mV _{SS}	Typ. 50 mV _{SS}

1) Valid in the following conditions: 55°C ambient temperature, installation altitude < 500 m above sea level.

Wall mounting	8B0C0160HW00.000-1	8B0C0160HW00.001-1
Cold plate or feed-through mounting	8B0C0160HC00.000-1	8B0C0160HC00.001-1
24 VDC internal system supply voltage		
Output voltage	25 VDC ± 1.6%	25 VDC ± 1.6%
Peak current (< 4 s)		
DC bus voltage (UDC): 350 ... 900 VDC	21 ADC	21 ADC
Protective measures		
Open circuit protection	Yes	Yes
Overload protection	Yes	Yes
Short circuit protection	Yes	Yes
Feedback protection	Max. 26 VDC (also when switched off)	Max. 26 VDC (also when switched off)
Over-temperature protection	Yes	Yes
Dielectric strength to ground	±50 VDC	±50 VDC
Output / input isolation	SELV / PELV requirements	SELV / PELV requirements
Design	ACOPOSmulti backplane	ACOPOSmulti backplane
24 VDC Out		
Output voltage		
DC bus voltage (U _{DC}): 260 ... 315 VDC	---	25 VDC * (U _{DC} / 315)
DC bus voltage (U _{DC}): 315 ... 900 VDC	---	24 VDC ± 6%
Peak current (< 4 s) over the total operating range of the DC bus voltage.	---	---
Protection of 24 VDC Out 1 output	---	16 A (slow-blow) electronic, automatic reset
Protection of 24 VDC Out 2 output	---	5 A (slow-blow) electronic, automatic reset
Protective measures		
Open circuit protection	---	Yes
Overload protection	---	Yes
Short circuit protection	---	Yes
Feedback protection	---	Max. 35 VDC (also when switched off)
Over-temperature protection	---	Yes
Dielectric strength to ground	---	±50 VDC
Output / input isolation	---	SELV / PELV requirements
Design	---	---
24 VDC, COM	---	Connectors
Terminal connection cross sections for output 24 VDC Out 1		
Flexible and fine wire lines with wire tip sleeves	---	0.5 – 6 mm ²
Approbation data		
UL/C-UL-US	---	22 - 10
CSA	---	22 - 10
Terminal connection cross sections for output 24 VDC Out 2		
Flexible and fine wire lines with wire tip sleeves	---	0.2 - 2.5 mm ²
Approbation data		
UL/C-UL-US	---	22 - 12
CSA	---	22 - 12

Auxiliary supply modules 400W

8B0C0160

Wall mounting	8B0C0160HW00.000-1	8B0C0160HW00.001-1
Cold plate or feed-through mounting	8B0C0160HC00.000-1	8B0C0160HC00.001-1
24 VDC Out 1 controller input		
Wiring	---	Sink
Electrical isolation	---	
Input - 24 VDC		Yes
Modulation compared to ground potential	---	Max. ± 50 V
Input voltage		
Rated	---	24 VDC
Maximum	---	30 VDC
Switching threshold		
LOW (24 VDC Out 1 is switched on)	---	< 5 V
HIGH (24 VDC Out 1 is switched off)	---	> 15 V
Input current at rated voltage	---	Approx. 10 mA
Switching delay		
ON (24 VDC Out 1 is switched on)	---	Max. 25 ms
OFF (24 VDC Out 1 is switched off) ¹⁾	---	Max. 0.25 ms
Design	---	Connectors
Terminal connection cross sections of the 24 VDC Out 1 control input		
Flexible and fine wire lines		
with wire tip sleeves	---	0.2 - 2.5 mm ²
Approbation data		
UL/C-UL-US	---	30 - 12
CSA	---	22 - 12
1) The output and any connected loads are not actively discharged when switching off.		
Operational conditions		
Ambient temperature during operation	5 to 40°C	5 to 40°C
Max. ambient temperature	+55°C	+55°C
Relative humidity during operation	5 to 85%, non-condensing	5 to 85%, non-condensing
Installation at altitudes above sea level	0 to 500 m	0 to 500 m
Maximum installation attitude ¹⁾	4000 m	4000 m
Degree of pollution according to EN 60664-1	2 (non-conductive material)	2 (non-conductive material)
Overvoltage cat. according to IEC 60364-4-443:1999	III	III
EN 60529 protection	IP20	IP20
1) Continuous operation of ACOPOSmulti control supply units at altitudes ranging from 500 m to 4000 m above sea level is possible (taking the continuous power reductions listed into consideration). Additional requirements are to be arranged with B&R.		
Storage and transport conditions		
Storage temperature	-25 to +55°C	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing	5 to 95%, non-condensing
Transport temperature	-25 to +70°C	-25 to +70°C
Relative humidity during transport	95% at +40°C	95% at +40°C

Wall mounting	8B0C0160HW00.000-1	8B0C0160HW00.001-1
Cold plate or feed-through mounting	8B0C0160HC00.000-1	8B0C0160HC00.001-1
Mechanical characteristics		
Dimensions ¹⁾		
Width	53 mm	53 mm
Height	317 mm	317 mm
Depth		
Wall mounting	263 mm	263 mm
Cold-plate	212 mm	212 mm
Feed-through mounting	209 mm	209 mm
Weight		
Wall mounting	In preparation	In preparation
Cold-plate	Approx. 2.6 kg	Approx. 2.6 kg
Feed-through mounting	Approx. 2.6 kg	Approx. 2.6 kg

1) The dimensions define the true device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

Required accessories				
8TB2106.2010-00	1	Screw terminal 6-pin, 1 row RM5.08 Label 1: numbered serially	Plug for X1 connection	1435
8TB2104.2010-00 ¹⁾	1	Screw terminal 4-pin, 1 row RM5.08 Label 1: numbered serially	Plug for X2 connection	1434
8TB3104.201M-10 ¹⁾	1	Screw terminal 4-pin, 1 row RM7.62 Label 1: numbered serially Coding M: 1011	Plug for X3 connection	1437

1) Only for 8B0C0160Hx00.001-1.

Optional accessories				
8BXF001.0000-00	---	ACOPOSmulti fan module, replacement fan for ACOPOSmulti Modules (8BVP/8B0C/8BVI/8BVE/8B0K)	Replacement fan for ACOPOSmulti modules (8BVP/8B0C/8BVI/8BVE/8B0K)	1441

Auxiliary supply modules 800W

8B0C0160, 8B0C0320



8B0C0320HC00.002-1

- Possibilities for supplying external 24V devices
- Extensive protective measures

Wall mounting	8B0C0320HW00.000-1	8B0C0320HW00.002-1	8B0C0160HW00.A01-1
Cold plate or feed-through mounting	8B0C0320HC00.000-1	8B0C0320HC00.002-1	8B0C0160HC00.A01-1
General information			
C-UL-US listed	Yes	Yes	Yes
Available cooling and mounting methods			
Wall mounting	Yes	Yes	Yes
Cold plate or feed-through mounting	Yes	Yes	Yes
Module width	1	1	1
DC bus connection			
Voltage	800 VDC	800 VDC	800 VDC
Operating range in continuous operation	260 - 900 VDC	260 - 900 VDC	260 - 900 VDC
Full continuous power	315 - 900 VDC	315 - 900 VDC	315 - 900 VDC
Continuous power consumption	Max. 940 W	Max. 940 W	Max. 940 W
Power loss at max. device power	80 W	80 W	80 W
DC bus capacitance	220 nF	220 nF	220 nF
Design	ACOPOSmulti backplane	ACOPOSmulti backplane	ACOPOSmulti backplane
24 VDC or 42 VDC output			
Continuous power ¹⁾	800 W	800 W	800 W
Output voltage			
DC bus voltage (U_{DC}): 260 ... 315 VDC	25 VDC * ($U_{DC} / 315$)	25 VDC * ($U_{DC} / 315$)	0 V
DC bus voltage (U_{DC}): 315 ... 900 VDC	24 VDC \pm 6%	24 VDC \pm 6%	42 VDC
Continuous current	32 ADC	32 ADC	16 ADC
Reduction of continuous power depending on the ambient temperature starting at 40°C.	No reduction	No reduction	No reduction
Reduction of continuous power depending on installation altitude			
Starting at 500 m above sea level	80 W per 1000 m	80 W per 1000 m	80 W per 1000 m
Reduction of continuous power depending on the cooling type			
Wall mounting	In preparation	In preparation	In preparation
Cold plate or feed-through mounting	In preparation	In preparation	In preparation
Startup delay	Max. 1 sec.	Max. 1 sec.	Max. 1 sec.
Startup time	Approx. 5 - 20 ms	Approx. 5 - 20 ms	Approx. 5 - 20 ms
Residual ripple	Typ. 50 mV _{SS}	Typ. 50 mV _{SS}	Typ. 50 mV _{SS}

1) Valid in the following conditions: 55°C ambient temperature, installation altitude < 500 m above sea level.

Wall mounting	8B0C0320HW00.000-1	8B0C0320HW00.002-1	8B0C0160HW00.A01-1
Cold plate or feed-through mounting	8B0C0320HC00.000-1	8B0C0320HC00.002-1	8B0C0160HC00.A01-1
24 VDC internal system supply voltage			
Output voltage	25 VDC ± 1.6%	25 VDC ± 1.6%	---
Peak current (< 4 s)			
DC bus voltage (U _{DC}): 350 ... 900 VDC	42 ADC	42 ADC	---
Protective measures			
Open circuit protection	Yes	Yes	---
Overload protection	Yes	Yes	---
Short circuit protection	Yes	Yes	---
Feedback protection	Max. 26 VDC (also when switched off)	Max. 26 VDC (also when switched off)	---
Over-temperature protection	Yes	Yes	---
Dielectric strength to ground	±50 VDC	±50 VDC	---
Output / input isolation	SELV / PELV requirements	SELV / PELV requirements	---
Design	ACOPOSmulti backplane	ACOPOSmulti backplane	ACOPOSmulti backplane
24 VDC or 42 VDC Out			
Output voltage			
DC bus voltage (U _{DC}): 260 ... 315 VDC	---	25 VDC * (U _{DC} / 315)	0 V
DC bus voltage (U _{DC}): 315 ... 900 VDC	---	24 VDC ± 6%	42 VDC ± 6%
Peak current (< 4 s) over the total operating range of the DC bus voltage.	---	---	21 ADC
Protection of 24 VDC Out 1 output	---	32 A (slow-blow) electronic, automatic reset	---
Protection of 24 VDC Out 2 output	---	5 A (slow-blow) electronic, automatic reset	---
Protection of 42 VDC Out 1 output	---	---	16 A (slow-blow) electronic, automatic reset
Protection of 42 VDC Out 2 output	---	---	3 A (slow-blow) electronic, automatic reset
Protective measures			
Open circuit protection	---	Yes	Yes
Overload protection	---	Yes	Yes
Short circuit protection	---	Yes	Yes
Feedback protection	---	Max. 35 VDC (also when switched off)	Max. 60 VDC (also when switched off)
Over-temperature protection	---	Yes	Yes
Dielectric strength to ground	---	±50 VDC	±96 VDC
Output / input isolation	---	SELV / PELV requirements	SELV / PELV requirements
Design	---	Connectors	Connectors
24 VDC or 42 VDC, COM			
Terminal connection cross sections of the output 24 VDC or 42 VDC Out 1			
Flexible and fine wire lines with wire tip sleeves	---	0.5 - 6 mm ²	0.5 - 6 mm ²
Approbation data			
UL/C-UL-US	---	22 - 10	22 - 10
CSA	---	22 - 10	22 - 10
Terminal connection cross sections of the output 24 VDC or 42 VDC Out 2			
Flexible and fine wire lines with wire tip sleeves	---	0.2 - 2.5 mm ²	0.2 - 2.5 mm ²
Approbation data			
UL/C-UL-US	---	22 - 12	22 - 12
CSA	---	22 - 12	22 - 12

Auxiliary supply modules 800W

8B0C0160, 8B0C0320

Wall mounting	8B0C0320HW00.000-1	8B0C0320HW00.002-1	8B0C0160HW00.A01-1
Cold plate or feed-through mounting	8B0C0320HC00.000-1	8B0C0320HC00.002-1	8B0C0160HC00.A01-1
24 VDC or 42 VDC Out 1 control input			
Wiring	---	Sink	Sink
Electrical isolation	---		
Input - 24 VDC or 42 VDC		Yes	Yes
Modulation compared to ground potential	---	Max. ±50 V	Max. ±50 V
Input voltage			
Rated	---	24 VDC	24 VDC
Maximum	---	30 VDC	30 VDC
Switching threshold			
LOW (24 VDC or 42 VDC Out 1 is switched on)	---	< 5 V	< 5 V
HIGH (24 VDC or 42 VDC Out 1 is switched off)	---	> 15 V	> 15 V
Input current at rated voltage	---	Approx. 10 mA	Approx. 10 mA
Switching delay			
ON (24 VDC or 42 VDC Out 1 is switched on)	---	Max. 25 ms	Max. 25 ms
OFF (24 VDC or 42 VDC Out 1 is switched off) ¹⁾	---	Max. 0.25 ms	Max. 0.25 ms
Design	---	Connectors	Connectors
Terminal connection cross sections			
of the 24 VDC or 42 VDC Out 1 control input			
Flexible and fine wire lines	---	0.2 - 2.5 mm ²	0.2 - 2.5 mm ²
with wire tip sleeves			
Approbation data			
UL/C-UL-US	---	30 - 12	30 - 12
CSA	---	22 - 12	22 - 12

1) The output and any connected loads are not actively discharged when switching off.

Operational conditions			
Ambient temperature during operation	5 to 40°C	5 to 40°C	5 to 40°C
Max. ambient temperature	+55°C	+55°C	+55°C
Relative humidity during operation	5 to 85%, non-condensing	5 to 85%, non-condensing	5 to 85%, non-condensing
Installation at altitudes above sea level	0 to 500 m	0 to 500 m	0 to 500 m
Maximum installation attitude ¹⁾	4000 m	4000 m	4000 m
Degree of pollution according to EN 60664-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Overvoltage cat. according to IEC 60364-4-443:1999	III	III	III
EN 60529 protection	IP20	IP20	IP20

1) Continuous operation of ACOPOSMulti control supply units at altitudes ranging from 500 m to 4000 m above sea level is possible (taking the continuous power reductions listed into consideration). Additional requirements are to be arranged with B&R.

Wall mounting	8B0C0320HW00.000-1	8B0C0320HW00.002-1	8B0C0160HW00.A01-1
Cold plate or feed-through mounting	8B0C0320HC00.000-1	8B0C0320HC00.002-1	8B0C0160HC00.A01-1
Storage and transport conditions			
Storage temperature	-25 to +55°C	-25 to +55°C	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing	5 to 95%, non-condensing	5 to 95%, non-condensing
Transport temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Relative humidity during transport	95% at +40°C	95% at +40°C	95% at +40°C
Mechanical characteristics			
Dimensions ¹⁾			
Width	53 mm	53 mm	53 mm
Height	317 mm	317 mm	317 mm
Depth			
Wall mounting	263 mm	263 mm	263 mm
Cold-plate	212 mm	212 mm	212 mm
Feed-through mounting	209 mm	209 mm	209 mm
Weight			
Wall mounting	In preparation	In preparation	In preparation
Cold-plate	Approx. 2.6 kg	Approx. 2.6 kg	Approx. 2.6 kg
Feed-through mounting	Approx. 2.6 kg	Approx. 2.6 kg	Approx. 2.6 kg

1) The dimensions define the true device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

Required accessories					
8TB2106.2010-00	1	Screw terminal 6-pin, 1 row RM5.08 Label 1: numbered serially	Plug for X1 connection		1435
8TB2104.2010-00 ¹⁾	1	Screw terminal 4-pin, 1 row RM5.08 Label 1: numbered serially	Plug for X2 connection		1434
8TB3104.201M-10 ²⁾	1	Screw terminal 4-pin, 1 row RM7.62 Label 1: numbered serially, M coding: 1011	Plug for X3 connection		1437
8TB3104.201H-10 ³⁾		Screw terminal 4-pin, 1 row RM7.62 Label 1: numbered serially, H coding: 0111	Plug for X3 connection		1436

1) Only for 8B0C0320Hx00.002-1 and 8B0C0160Hx00.A01-1.

2) Only for 8B0C0320Hx00.002-1.

3) Only for 8B0C0160Hx00.A01-1.

Optional accessories					
8BXF001.0000-00	---	ACOPOSmulti fan module, replacement fan for ACOPOSmulti Modules (8BVP/8B0C/8BVI/8BVE/8B0K)	Replacement fan for ACOPOSmulti modules (8BVP/8B0C/8BVI/8BVE/8B0K)		1441

Inverter modules 1.4kW ... 11kW (single-axis modules)

8BVI0014, 8BVI0028, 8BVI0055, 8BVI0110



- Uncontrolled stops and secure halt integrated
- Integrated connection for motor holding brake and temperature sensor
- 2 slots for ACOPOSmulti plug-in modules

ETHERNET 
POWERLINK

Wall mounting	8BVI0014HWS0.000-1	8BVI0028HWS0.000-1	8BVI0055HWS0.000-1	8BVI0110HWS0.000-1
Cold plate or feed-through mounting	8BVI0014HCS0.000-1	8BVI0028HCS0.000-1	8BVI0055HCS0.000-1	8BVI0110HCS0.000-1
General information				
C-UL-US listed	Yes	Yes	Yes	Yes
Available cooling and mounting methods				
Wall mounting	Yes	Yes	Yes	Yes
Cold plate or feed-through mounting	Yes	Yes	Yes	Yes
Module width	1	1	1	1
DC bus				
Voltage	800 VDC	800 VDC	800 VDC	800 VDC
Max.	900 VDC	900 VDC	900 VDC	900 VDC
Continuous power consumption	In preparation	In preparation	In preparation	In preparation
Power loss at max. device power	In preparation	In preparation	In preparation	In preparation
DC bus capacitance	165 μ F	165 μ F	165 μ F	330 μ F
Design	ACOPOSmulti backplane	ACOPOSmulti backplane	ACOPOSmulti backplane	ACOPOSmulti backplane
24 VDC supply				
Input voltage	25 VDC \pm 1.6%	25 VDC \pm 1.6%	25 VDC \pm 1.6%	25 VDC \pm 1.6%
Input capacitance	In preparation	In preparation	In preparation	In preparation
Max. power consumption	12 W + P _{24 V Out} {0 ... 10 W} ¹⁾ + P _{HoldingBrake} + P _{Fan8B0M...} ²⁾	12 W + P _{24 V Out} {0 ... 10 W} ¹⁾ + P _{HoldingBrake} + P _{Fan8B0M...} ²⁾	12 W + P _{24 V Out} {0 ... 10 W} ¹⁾ + P _{HoldingBrake} + P _{Fan8B0M...} ²⁾	12 W + P _{24 V Out} {0 ... 10 W} ¹⁾ + P _{HoldingBrake} + P _{Fan8B0M...} ²⁾
Design	ACOPOSmulti backplane	ACOPOSmulti backplane	ACOPOSmulti backplane	ACOPOSmulti backplane

1) The power consumption P_{24 V Out} corresponds to the power that is output on the module's X2 / +24 V Out 1 and X2 / +24 V Out 2 connections (max. 10 W).

2) The power consumption P_{Fan8B0M...} corresponds to the portion of the power that is used by the fan modules in the mounting plate / by the 8B0M0040HFF0.000-1 fan module and can be found in the technical data for the respective 8B0M... mounting plate.

Wall mounting	8BVI0014HWS0.000-1	8BVI0028HWS0.000-1	8BVI0055HWS0.000-1	8BVI0110HWS0.000-1
Cold plate or feed-through mounting	8BVI0014HCS0.000-1	8BVI0028HCS0.000-1	8BVI0055HCS0.000-1	8BVI0110HCS0.000-1
Motor connector				
Continuous power ¹⁾	1.4 kW	2.8 kW	5.5 kW	11 kW
Continuous current	1.93 A _{eff}	3.86 A _{eff}	7.6 A _{eff}	15.1 A _{eff}
Reduction of continuous current depending on the ambient temperature starting at 40°C.	In preparation	In preparation	In preparation	In preparation
Reduction of continuous current depending on switching frequency				
Switching frequency 20 kHz	In preparation	In preparation	In preparation	In preparation
Switching frequency 10 kHz	In preparation	In preparation	In preparation	In preparation
Switching frequency 5 kHz	No reduction	No reduction	No reduction	No reduction
Reduction of continuous current depending on installation altitude				
Starting at 500 m above sea level	0.19 A _{eff} per 1,000 m	0.38 A _{eff} per 1,000 m	0.76 A _{eff} per 1,000 m	1.51 A _{eff} per 1,000 m
Reduction of continuous current depending on cooling type				
Wall mounting	In preparation	In preparation	In preparation	In preparation
Cold plate or feed-through mounting	In preparation	In preparation	In preparation	In preparation
Maximum current	4.7 A _{eff}	9.5 A _{eff}	18.9 A _{eff}	37.7 A _{eff}
Rated switching frequency	5 kHz	5 kHz	5 kHz	5 kHz
Possible switching frequencies	5/10/20 kHz	5/10/20 kHz	5/10/20 kHz	5/10/20 kHz
Protective measures				
Overload protection	Yes	Yes	Yes	Yes
Short circuit and ground fault	Yes	Yes	Yes	Yes
Maximum motor line length depending on the switching frequency ²⁾				
Switching frequency 5 kHz	25 m	25 m	25 m	25 m
Switching frequency 10 kHz	25 m	25 m	25 m	25 m
Switching frequency 20 kHz	10 m	10 m	10 m	10 m
Design				
U, V, W, PE	Connectors	Connectors	Connectors	Connectors
Shield connection	Yes	Yes	Yes	Yes
Terminal connection cross sections				
Flexible and fine wire lines with wire tip sleeves	0.25 - 4 mm ²	0.25 - 4 mm ²	0.25 - 4 mm ²	0.25 - 4 mm ²
Approval data				
UL/C-UL-US	30 - 10	30 - 10	30 - 10	30 - 10
CSA	28 - 10	28 - 10	28 - 10	28 - 10
Terminal cross sections (cable diameter) for the shield connection	12 - 22 mm	12 - 22 mm	12 - 22 mm	12 - 22 mm

1) The continuous power and continuous current are valid for the following boundary conditions: Nominal DC bus voltage 800 VDC, nominal switching frequency 5 kHz, 40°C ambient temperature, installation altitude < 500 m above sea level

2) Information: When using two motor cables that are connected in parallel, the maximum permissible motor cable lengths are reduced by half.
The total length of all motor cables per backplane module is limited.

Inverter modules 1.4kW ... 11kW (single-axis modules)

8BVI0014, 8BVI0028, 8BVI0055, 8BVI0110

Wall mounting	8BVI0014HWS0.000-1	8BVI0028HWS0.000-1	8BVI0055HWS0.000-1	8BVI0110HWS0.000-1
Cold plate or feed-through mounting	8BVI0014HCS0.000-1	8BVI0028HCS0.000-1	8BVI0055HCS0.000-1	8BVI0110HCS0.000-1
Motor holding brake connection				
Output voltage	24 VDC +5.8% / +0.2%	24 VDC +5.8% / +0.2%	24 VDC +5.8% / +0.2%	24 VDC +5.8% / +0.1%
Continuous current	1.1 A	1.1 A	1.1 A	2.1 A
Max. internal resistance	0.5 Ω	0.5 Ω	0.5 Ω	0.3 Ω
Extinction potential	Approx. 30 V	Approx. 30 V	Approx. 30 V	Approx. 30 V
Max. extinction energy per connection	1.5 Ws	1.5 Ws	1.5 Ws	3 Ws
Max. switching frequency	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz
Protective measures				
Overload and short-circuit protection	Yes	Yes	Yes	Yes
Cable breakage monitoring	Yes	Yes	Yes	Yes
Undervoltage monitoring	Yes	Yes	Yes	Yes
Max. over-current limitation	8 A	8 A	8 A	10 A
Response threshold for cable breakage monitoring	Approx. 0.25 A	Approx. 0.25 A	Approx. 0.25 A	Approx. 0.5 A
Response threshold for undervoltage monitoring	24 VDC +0% / -5%	24 VDC +0% / -5%	24 VDC +0% / -5%	24 VDC +0% / -5%
Trigger inputs				
Number of inputs	2	2	2	2
Wiring	Sink	Sink	Sink	Sink
Electrical isolation				
Input - inverter module	Yes	Yes	Yes	Yes
Input - Input	Yes	Yes	Yes	Yes
Input voltage				
Rated	24 VDC	24 VDC	24 VDC	24 VDC
Maximum	30 VDC	30 VDC	30 VDC	30 VDC
Switching threshold				
LOW	< 5 V	< 5 V	< 5 V	< 5 V
HIGH	> 15 V	> 15 V	> 15 V	> 15 V
Input current at rated voltage	Approx. 10 mA	Approx. 10 mA	Approx. 10 mA	Approx. 10 mA
Switching delay				
Positive edge	52μs ± 0.5μs (digitally filtered)	52μs ± 0.5μs (digitally filtered)	52μs ± 0.5μs (digitally filtered)	52μs ± 0.5μs (digitally filtered)
Negative edge	53μs ± 0.5μs (digitally filtered)	53μs ± 0.5μs (digitally filtered)	53μs ± 0.5μs (digitally filtered)	53μs ± 0.5μs (digitally filtered)
Modulation compared to ground potential	Max. ±38 V	Max. ±38 V	Max. ±38 V	Max. ±38 V
24 V Out				
Amount	2	2	2	2
Output voltage				
DC bus voltage (U _{DC}): 260 ... 315 VDC	25 VDC * (U _{DC} / 315)	25 VDC * (U _{DC} / 315)	25 VDC * (U _{DC} / 315)	25 VDC * (U _{DC} / 315)
DC bus voltage (U _{DC}): 315 ... 900 VDC	24 VDC ± 6%	24 VDC ± 6%	24 VDC ± 6%	24 VDC ± 6%
Fuse protection				
	500 mA (slow-blow) electronic, automatic reset	500 mA (slow-blow) electronic, automatic reset	500 mA (slow-blow) electronic, automatic reset	500 mA (slow-blow) electronic, automatic reset

Wall mounting	8BVI0014HWS0.000-1	8BVI0028HWS0.000-1	8BVI0055HWS0.000-1	8BVI0110HWS0.000-1
Cold plate or feed-through mounting	8BVI0014HCS0.000-1	8BVI0028HCS0.000-1	8BVI0055HCS0.000-1	8BVI0110HCS0.000-1
Enable inputs				
Number of inputs	2	2	2	2
Wiring	Sink	Sink	Sink	Sink
Electrical isolation				
Input - inverter module	Yes	Yes	Yes	Yes
Input - Input	Yes	Yes	Yes	Yes
Input voltage				
Rated	24 VDC	24 VDC	24 VDC	24 VDC
Maximum	30 VDC	30 VDC	30 VDC	30 VDC
Switching threshold				
LOW	< 5 V	< 5 V	< 5 V	< 5 V
HIGH	>15 V	>15 V	>15 V	>15 V
Input current at rated voltage	Approx. 30 mA	Approx. 30 mA	Approx. 30 mA	Approx. 30 mA
Switching delay				
Enable 1 -> 0, PWM off	Max. 2.0 ms	Max. 2.0 ms	Max. 2.0 ms	Max. 2.0 ms
Enable 0 -> 1, ready for PWM	Max. 100 μ s	Max. 100 μ s	Max. 100 μ s	Max. 100 μ s
Modulation compared to ground potential	Max. \pm 38 V	Max. \pm 38 V	Max. \pm 38 V	Max. \pm 38 V
Operational conditions				
Ambient temperature during operation	5 to 40°C	5 to 40°C	5 to 40°C	5 to 40°C
Max. ambient temperature ¹⁾	+55°C	+55°C	+55°C	+55°C
Relative humidity during operation	5 to 85%	5 to 85%	5 to 85%	5 to 85%
	non-condensing	non-condensing	non-condensing	non-condensing
Installation at altitudes above sea level	0 to 500 m	0 to 500 m	0 to 500 m	0 to 500 m
Maximum installation attitude ²⁾	4000 m	4000 m	4000 m	4000 m
Degree of pollution according to EN 60664-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Overvoltage cat. according to IEC 60364-4-443:1999	III	III	III	III
EN 60529 protection	IP20	IP20	IP20	IP20
<p>1) Continuous operation of ACOPOSmulti inverter modules at ambient temperatures ranging from 40°C to max. 55°C is possible (taking the continuous current reductions listed into consideration), but results in a shorter lifespan.</p> <p>2) Continuous operation of ACOPOSmulti inverter modules at altitudes ranging from 500 m to 4000 m above sea level is possible (taking the continuous current reductions listed into consideration). Additional requirements are to be arranged with B&R.</p>				
Storage and transport conditions				
Storage temperature	-25 to +55°C	-25 to +55°C	-25 to +55°C	-25 to +55°C
Relative humidity during storage	5 to 95%	5 to 95%	5 to 95%	5 to 95%
	non-condensing	non-condensing	non-condensing	non-condensing
Transport temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C	-25 to +70°C
Relative humidity during transport	95% at +40°C	95% at +40°C	95% at +40°C	95% at +40°C
Mechanical characteristics				
Dimensions ¹⁾				
Width	53 mm	53 mm	53 mm	53 mm
Height	317 mm	317 mm	317 mm	317 mm
Depth				
Wall mounting	263 mm	263 mm	263 mm	263 mm
Cold-plate	212 mm	212 mm	212 mm	212 mm
Feed-through mounting	209 mm	209 mm	209 mm	209 mm
Weight				
Wall mounting	Approx. 2.6 kg	Approx. 2.6 kg	Approx. 2.7 kg	Approx. 2.9 kg
Cold-plate	Approx. 2.1 kg	Approx. 2.1 kg	Approx. 2.2 kg	Approx. 2.4 kg
Feed-through mounting	Approx. 2.1 kg	Approx. 2.1 kg	Approx. 2.2 kg	Approx. 2.4 kg

1) The dimensions define the true device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

Inverter modules 1.4kW ... 11kW (single-axis modules)

8BVI0014, 8BVI0028, 8BVI0055, 8BVI0110

Required accessories				
8TB2106.2010-00	1	Screw terminal 6-pin, 1 row RM5.08 Label 1: numbered serially	Plug for X1 connection	1435
8TB2108.2010-00	1	Screw terminal 8-pin, 1 row RM5.08 Label 1: numbered serially	Plug for X2 connection	1435
8TB2104.203L-00	1	Screw terminal 4-pin, 1 row RM5.08 Label 3: T- T+ B- B+ Coding L: 1010	Plug for X4A connection	1434
8TB3104.204G-00	1	Screw terminal 4-pin, 1 row RM7.62 Label 4: PE W V U Coding G: 0110	Plug for X5A connection	1437

Optional accessories				
8BAC0120.000-1	max. 2	ACOPOSmulti plug-in module, EnDat 2.1 interface	---	1410
8BAC0120.001-1	max. 2	ACOPOSmulti plug-in module, EnDat 2.2 interface	---	1412
8BAC0121.000-1	max. 2	ACOPOSmulti plug-in module, HIPERFACE interface	---	1413
8BAC0122.000-1	max. 2	ACOPOSmulti plug-in module, resolver interface	---	1414
8BAC0123.000-1	max. 2	ACOPOSmulti plug-in module, incremental encoder and SSI absolute encoder interface for RS422 signals	---	1416
8BAC0123.001-1	max. 2	ACOPOSmulti plug-in module, incremental encoder interface for 5V single-ended and 5V differential signals	---	1418
8BAC0123.002-1	max. 2	ACOPOSmulti plug-in module, incremental encoder interface for 24V single-ended and 24V differential signals	---	1420
8BAC0124.000-1	max. 2	ACOPOSmulti plug-in module, SinCos interface	---	1422
8BAC0132.000-1	max. 2	ACOPOSmulti input module, 4 analog inputs $\pm 10V$	---	1424
8SCS005.0000-00	Up to 2	Shield component set consisting of: 1 slot cover shield sheet	Shield sheet for covering free plug-in module slots	1440
8SCS002.0000-00	1	Shield component set consisting of: 1 clamping plate 2 clamps D 4-13.5 mm 2 screws	Shield component set for I/O cables with a cable cross section of 4 - 13.5 mm	1440
8SCS000.0000-00	1	Shield component set consisting of: 1 shield plate 1x type 0 1 hose clamp, W 9 mm, D 12-22 mm	Shield component set for motor cables with a cable cross section of 12-22 mm	1440
8BXF001.0000-00	---	ACOPOSmulti fan module, replacement fan for ACOPOSmulti Modules (8BVP/8B0C/8BVI/8BVE/8B0K)	Replacement fan for ACOPOSmulti modules (8BVP/8B0C/8BVI/8BVE/8B0K)	1441

Inverter modules 1.4kW ... 5.5kW (two-axis modules)

8BVI0014, 8BVI0028, 8BVI0055



8BVI0055.HCD0.000-1

- Uncontrolled stops and secure halt integrated
- Integrated connection for motor holding brake and temperature sensor
- 2 slots for ACOPOSmulti plug-in modules
- Two-axis modules contain two complete standalone inverters in an inverter module

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Wall mounting	8BVI0014HWD0.000-1	8BVI0028HWD0.000-1	8BVI0055HWD0.000-1
Cold plate or feed-through mounting	8BVI0014HCD0.000-1	8BVI0028HCD0.000-1	8BVI0055HCD0.000-1
General information			
C-UL-US listed	Yes	Yes	Yes
Available cooling and mounting methods			
Wall mounting	Yes	Yes	Yes
Cold plate or feed-through mounting	Yes	Yes	Yes
Module width	1	1	1
DC bus			
Voltage	800 VDC	800 VDC	800 VDC
Max.	900 VDC	900 VDC	900 VDC
Continuous power consumption	In preparation	In preparation	In preparation
Power loss at max. device power	In preparation	In preparation	In preparation
DC bus capacitance	165 μ F	165 μ F	330 μ F
Design	ACOPOSmulti backplane	ACOPOSmulti backplane	ACOPOSmulti backplane
24 VDC supply			
Input voltage	25 VDC \pm 1.6%	25 VDC \pm 1.6%	25 VDC \pm 1.6%
Input capacitance	In preparation	In preparation	In preparation
Max. power consumption	16 W + $P_{24V Out}$ {0 ... 10 W} ¹⁾ + $P_{HoldingBrake} + P_{Fan8B0M...}$ ²⁾	16 W + $P_{24V Out}$ {0 ... 10 W} ¹⁾ + $P_{HoldingBrake} + P_{Fan8B0M...}$ ²⁾	16 W + $P_{24V Out}$ {0 ... 10 W} ¹⁾ + $P_{HoldingBrake} + P_{Fan8B0M...}$ ²⁾
Design	ACOPOSmulti backplane	ACOPOSmulti backplane	ACOPOSmulti backplane

1) The power consumption $P_{24V Out}$ corresponds to the power that is output on the module's X2 / +24 V Out 1 and X2 / +24 V Out 2 connections (max. 10 W).

2) The power consumption $P_{Fan8B0M...}$ corresponds to the portion of the power that is used by the fan modules in the mounting plate / by the 8B0M0040HFF0.000-1 fan module and can be found in the technical data for the respective 8B0M... mounting plate.

Inverter modules 1.4kW ... 5.5kW (two-axis modules)

8BVI0014, 8BVI0028, 8BVI0055

Wall mounting	8BVI0014HWD0.000-1	8BVI0028HWD0.000-1	8BVI0055HWD0.000-1
Cold plate or feed-through mounting	8BVI0014HCD0.000-1	8BVI0028HCD0.000-1	8BVI0055HCD0.000-1
Motor connector			
Continuous power ¹⁾	1.4 kW	2.8 kW	5.5 kW
Continuous current	1.93 A _{eff}	3.86 A _{eff}	7.6 A _{eff}
Reduction of continuous current depending on the ambient temperature starting at 40°C.	In preparation	In preparation	In preparation
Reduction of continuous current depending on switching frequency			
Switching frequency 20 kHz	In preparation	In preparation	In preparation
Switching frequency 10 kHz	In preparation	In preparation	In preparation
Switching frequency 5 kHz	No reduction	No reduction	No reduction
Reduction of continuous current depending on installation altitude			
Starting at 500 m above sea level	0.19 A _{eff} per 1,000 m	0.38 A _{eff} per 1,000 m	0.76 A _{eff} per 1,000 m
Reduction of continuous current depending on cooling type			
Wall mounting	In preparation	In preparation	In preparation
Cold plate or feed-through mounting	In preparation	In preparation	In preparation
Maximum current	4.4 A _{eff}	9.5 A _{eff}	18.9 A _{eff}
Rated switching frequency	5 kHz	5 kHz	5 kHz
Possible switching frequencies	5/10/20 kHz	5/10/20 kHz	5/10/20 kHz
Protective measures			
Overload protection	Yes	Yes	Yes
Short circuit and ground fault	Yes	Yes	Yes
Maximum motor line length depending on the switching frequency ²⁾			
Switching frequency 5 kHz	25 m	25 m	25 m
Switching frequency 10 kHz	25 m	25 m	25 m
Switching frequency 20 kHz	10 m	10 m	10 m
Design			
U, V, W, PE	Connectors	Connectors	Connectors
Shield connection	Yes	Yes	Yes
Terminal connection cross sections			
Flexible and fine wire lines with wire tip sleeves	0.25 - 4 mm ²	0.25 - 4 mm ²	0.25 - 4 mm ²
Approbation data			
UL/C-UL-US	30 - 10	30 - 10	30 - 10
CSA	28 - 10	28 - 10	28 - 10
Terminal cross sections (cable diameter) for the shield connection	12 - 22 mm	12 - 22 mm	12 - 22 mm

1) The continuous power and continuous current are valid for the following boundary conditions: Nominal DC bus voltage 800 VDC, nominal switching frequency 5 kHz, 40°C ambient temperature, installation altitude < 500 m above sea level

2) Information: When using two motor cables that are connected in parallel, the maximum permissible motor cable lengths are reduced by half. The total length of all motor cables per backplane module is limited.

Wall mounting	8BVI0014HWD0.000-1	8BVI0028HWD0.000-1	8BVI0055HWD0.000-1
Cold plate or feed-through mounting	8BVI0014HCD0.000-1	8BVI0028HCD0.000-1	8BVI0055HCD0.000-1
Motor holding brake connection			
Output voltage	24 VDC +5.8% / +0.2%	24 VDC +5.8% / +0.2%	24 VDC +5.8% / +0.2%
Continuous current	1.1 A	1.1 A	1.1 A
Max. internal resistance	0.5 Ω	0.5 Ω	0.5 Ω
Extinction potential	Approx. 30 V	Approx. 30 V	Approx. 30 V
Max. extinction energy per connection	1.5 Ws	1.5 Ws	1.5 Ws
Max. switching frequency	0.5 Hz	0.5 Hz	0.5 Hz
Protective measures			
Overload and short-circuit protection	Yes	Yes	Yes
Cable breakage monitoring	Yes	Yes	Yes
Undervoltage monitoring	Yes	Yes	Yes
Max. over-current limitation	8 A	8 A	8 A
Response threshold for cable breakage monitoring	Approx. 0.25 A	Approx. 0.25 A	Approx. 0.25 A
Response threshold for undervoltage monitoring	24 VDC +0% / -5%	24 VDC +0% / -5%	24 VDC +0% / -5%
Trigger inputs			
Number of inputs	2	2	2
Wiring	Sink	Sink	Sink
Electrical isolation			
Input - inverter module	Yes	Yes	Yes
Input - Input	No	No	No
Input voltage			
Rated	24 VDC	24 VDC	24 VDC
Maximum	30 VDC	30 VDC	30 VDC
Switching threshold			
LOW	< 5 V	< 5 V	< 5 V
HIGH	> 15 V	> 15 V	> 15 V
Input current at rated voltage	Approx. 10 mA	Approx. 10 mA	Approx. 10 mA
Switching delay			
Positive edge	52 μs ± 0.5 μs (digitally filtered)	52 μs ± 0.5 μs (digitally filtered)	52 μs ± 0.5 μs (digitally filtered)
Negative edge	53 μs ± 0.5 μs (digitally filtered)	53 μs ± 0.5 μs (digitally filtered)	53 μs ± 0.5 μs (digitally filtered)
Modulation compared to ground potential	Max. ±38 V	Max. ±38 V	Max. ±38 V
24 V Out			
Amount	2	2	2
Output voltage			
DC bus voltage (U _{DC}): 260 ... 315 VDC	25 VDC * (U _{DC} / 315)	25 VDC * (U _{DC} / 315)	25 VDC * (U _{DC} / 315)
DC bus voltage (U _{DC}): 315 ... 900 VDC	24 VDC ± 6%	24 VDC ± 6%	24 VDC ± 6%
Fuse protection	500 mA (slow-blow) electronic, automatic reset	500 mA (slow-blow) electronic, automatic reset	500 mA (slow-blow) electronic, automatic reset
Enable inputs			
Number of inputs	2	2	2
Wiring	Sink	Sink	Sink
Electrical isolation			
Input - inverter module	Yes	Yes	Yes
Input - Input	Yes	Yes	Yes
Input voltage			
Rated	24 VDC	24 VDC	24 VDC
Maximum	30 VDC	30 VDC	30 VDC
Switching threshold			
LOW	< 5 V	< 5 V	< 5 V
HIGH	> 15 V	> 15 V	> 15 V
Input current at rated voltage	Approx. 30 mA	Approx. 30 mA	Approx. 30 mA
Switching delay			
Enable 1 -> 0, PWM off	Max. 2.0 ms	Max. 2.0 ms	Max. 2.0 ms
Enable 0 -> 1, ready for PWM	Max. 100 μs	Max. 100 μs	Max. 100 μs
Modulation compared to ground potential	Max. ±38 V	Max. ±38 V	Max. ±38 V

Inverter modules 1.4kW ... 5.5kW (two-axis modules)

8BVI0014, 8BVI0028, 8BVI0055

Wall mounting	8BVI0014HWD0.000-1	8BVI0028HWD0.000-1	8BVI0055HWD0.000-1
Cold plate or feed-through mounting	8BVI0014HCD0.000-1	8BVI0028HCD0.000-1	8BVI0055HCD0.000-1
Operational conditions			
Ambient temperature during operation	5 to 40°C	5 to 40°C	5 to 40°C
Max. ambient temperature ¹⁾	+55°C	+55°C	+55°C
Relative humidity during operation	5 to 85%	5 to 85%	5 to 85%
	non-condensing	non-condensing	non-condensing
Installation at altitudes above sea level	0 to 500 m	0 to 500 m	0 to 500 m
Maximum installation attitude ²⁾	4000 m	4000 m	4000 m
Degree of pollution according to EN 60664-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Overvoltage cat. according to IEC 60364-4-443:1999	III	III	III
EN 60529 protection	IP20	IP20	IP20
1) Continuous operation of ACOPOSmulti inverter modules at ambient temperatures ranging from 40°C to max. 55°C is possible (taking the continuous current reductions listed into consideration), but results in a shorter lifespan.			
2) Continuous operation of ACOPOSmulti inverter modules at altitudes ranging from 500 m to 4000 m above sea level is possible (taking the continuous current reductions listed into consideration). Additional requirements are to be arranged with B&R.			
Storage and transport conditions			
Storage temperature	-25 to +55°C	-25 to +55°C	-25 to +55°C
Relative humidity during storage	5 to 95%	5 to 95%	5 to 95%
	non-condensing	non-condensing	non-condensing
Transport temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Relative humidity during transport	95% at +40°C	95% at +40°C	95% at +40°C
Mechanical characteristics			
Dimensions ¹⁾			
Width	53 mm	53 mm	53 mm
Height	317 mm	317 mm	317 mm
Depth			
Wall mounting	263 mm	263 mm	263 mm
Cold-plate	212 mm	212 mm	212 mm
Feed-through mounting	209 mm	209 mm	209 mm
Weight			
Wall mounting	Approx. 2.8 kg	Approx. 2.8 kg	Approx. 2.9 kg
Cold-plate	Approx. 2.3 kg	Approx. 2.3 kg	Approx. 2.3 kg
Feed-through mounting	Approx. 2.3 kg	Approx. 2.3 kg	Approx. 2.3 kg

1) The dimensions define the true device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

Required accessories				
8TB2112.2010-00	1	Screw terminal 12-pin, 1 row RM5.08 Label 1: numbered serially	Plug for X1 connection	1436
8TB2108.2010-00	1	Screw terminal 8-pin, 1 row RM5.08 Label 1: numbered serially	Plug for X2 connection	1435
8TB2104.203L-00	1	Screw terminal 4-pin, 1 row RM5.08 Label 3: T- T+ B- B+ Coding L: 1010	Plug for X4A connection	1434
8TB2104.203F-00	1	Screw terminal 4-pin, 1 row RM5.08 Label 3: T- T+ B- B+ Coding F: 0101	Plug for X4B connection	1434
8TB3104.204G-00	1	Screw terminal 4-pin, 1 row RM7.62 Label 4: PE W V U Coding G: 0110	Plug for X5A connection	1437
8TB3104.204K-00	1	Screw terminal 4-pin, 1 row RM7.62 Label 4: PE W V U Coding K: 1001	Plug for X5B connection	1437

Optional accessories				
8BAC0120.000-1	max. 2	ACOPOSmulti plug-in module, EnDat 2.1 interface	---	1410
8BAC0120.001-1	max. 2	ACOPOSmulti plug-in module, EnDat 2.2 interface	---	1412
8BAC0121.000-1	max. 2	ACOPOSmulti plug-in module, HIPERFACE interface	---	1413
8BAC0122.000-1	max. 2	ACOPOSmulti plug-in module, resolver interface	---	1414
8BAC0123.000-1	max. 2	ACOPOSmulti plug-in module, incremental encoder and SSI absolute encoder interface for RS422 signals	---	1416
8BAC0123.001-1	max. 2	ACOPOSmulti plug-in module, incremental encoder interface for 5V single-ended and 5V differential signals	---	1418
8BAC0123.002-1	max. 2	ACOPOSmulti plug-in module, incremental encoder Interface for 24V single-ended and 24V differential signals	---	1420
8BAC0124.000-1	max. 2	ACOPOSmulti plug-in module, SinCos interface	---	1422
8BAC0132.000-1	max. 2	ACOPOSmulti input module, 4 analog inputs $\pm 10V$	---	1424
8SCS005.0000-00	Up to 2	Shield component set consisting of: 1 slot cover shield sheet	Shield sheet for covering free plug-in module slots	1440
8SCS002.0000-00	1	Shield component set consisting of: 1 clamping plate 2 clamps D 4-13.5 mm 2 screws	Shield component set for I/O cables with a cable cross section of 4 - 13.5 mm	1440
8SCS000.0000-00	Up to 2	Shield component set consisting of: 1 shield plate 1x type 0 1 hose clamp, W 9mm, D 12-22 mm	Shield component set for motor cables with a cable cross section of 12-22 mm	1440
8BXF001.0000-00	---	ACOPOSmulti fan module, replacement fan for ACOPOSmulti Modules (8BVP/8B0C/8BVI/8BVE/8B0K)	Replacement fan for ACOPOSmulti modules (8BVP/8B0C/8BVI/8BVE/8B0K)	1441

Inverter modules 16kW ... 32kW (single-axis modules) 8BVI0220, 8BVI0440



- Uncontrolled stops and secure halt integrated
- Integrated connection for motor holding brake and temperature sensor
- 2 slots for ACOPOSmulti plug-in modules

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Wall mounting	8BVI0220HWS0.000-1	8BVI0440HWS0.000-1
Cold plate or feed-through mounting	8BVI0220HCS0.000-1	8BVI0440HCS0.000-1
General information		
C-UL-US listed	Yes	Yes
Available cooling and mounting methods		
Wall mounting	Yes	Yes
Cold plate or feed-through mounting	Yes	Yes
Module width	2	2
DC bus		
Voltage	800 VDC	800 VDC
Max.	900 VDC	900 VDC
Continuous power consumption	In preparation	In preparation
Power loss at max. device power	In preparation	In preparation
DC bus capacitance	495 μ F	925 μ F
Design	ACOPOSmulti backplane	ACOPOSmulti backplane
24 VDC supply		
Input voltage	25 VDC \pm 1.6%	25 VDC \pm 1.6%
Input capacitance	In preparation	In preparation
Max. power consumption	20 W + $P_{24\text{ V Out}}$ {0 ... 10 W} ¹⁾ + $P_{\text{HoldingBrake}} + 2 * P_{\text{Fan8B0M...}}^{2)}$	20 W + $P_{24\text{ V Out}}$ {0 ... 10 W} ¹⁾ + $P_{\text{HoldingBrake}} + 2 * P_{\text{Fan8B0M...}}^{2)}$
Design	ACOPOSmulti backplane	ACOPOSmulti backplane

1) The power consumption $P_{24\text{ V Out}}$ corresponds to the power that is output on the module's X2 / +24 V Out 1 and X2 / +24 V Out 2 connections (max. 10 W).

2) The power consumption $P_{\text{Fan8B0M...}}$ corresponds to the portion of the power that is used by the fan modules in the mounting plate / by the 8B0M0040HFF0.000-1 fan module and can be found in the technical data for the respective 8B0M... mounting plate.

Wall mounting	8BVI0220HWS0.000-1	8BVI0440HWS0.000-1
Cold plate or feed-through mounting	8BVI0220HCS0.000-1	8BVI0440HCS0.000-1
Motor connector		
Continuous power ¹⁾	16 kW	32 kW
Continuous current	22 A _{eff}	44 A _{eff}
Reduction of continuous current depending on the ambient temperature starting at 40°C.	In preparation	In preparation
Reduction of continuous current depending on switching frequency		
Switching frequency 20 kHz	In preparation	In preparation
Switching frequency 10 kHz	In preparation	In preparation
Switching frequency 5 kHz	No reduction	No reduction
Reduction of continuous current depending on installation altitude		
Starting at 500 m above sea level	2.2 A _{eff} per 1,000 m	4.4 A _{eff} per 1,000 m
Reduction of continuous current depending on cooling type		
Wall mounting	In preparation	In preparation
Cold plate or feed-through mounting	In preparation	In preparation
Maximum current	55 A _{eff}	88 A _{eff}
Rated switching frequency	5 kHz	5 kHz
Possible switching frequencies	5/10/20 kHz	5/10/20 kHz
Protective measures		
Overload protection	Yes	Yes
Short circuit and ground fault	Yes	Yes
Maximum motor line length depending on the switching frequency ¹⁾		
Switching frequency 5 kHz	25 m	25 m
Switching frequency 10 kHz	25 m	25 m
Switching frequency 20 kHz	25 m	25 m
Design		
U, V, W, PE	Connectors	Connectors
Shield connection	Yes	Yes
Terminal connection cross sections		
Flexible and fine wire lines with wire tip sleeves	0.5 - 6 mm ²	0.5 - 16 mm ²
Approval data		
UL/C-UL-US	20 - 8	20 - 6
CSA	20 - 8	20 - 6
Terminal cross sections (cable diameter) for the shield connection	12 - 22 mm	23 - 35 mm

1) The continuous power and continuous current are valid for the following boundary conditions: Nominal DC bus voltage 800 VDC, nominal switching frequency 5 kHz, 40°C ambient temperature, installation altitude < 500 m above sea level

2) Information: When using two motor cables that are connected in parallel, the maximum permissible motor cable lengths are reduced by half.
The total length of all motor cables per backplane module is limited.

Inverter modules 16kW ... 32kW (single-axis modules) 8BVI0220, 8BVI0440

Wall mounting	8BVI0220HWS0.000-1	8BVI0440HWS0.000-1
Cold plate or feed-through mounting	8BVI0220HCS0.000-1	8BVI0440HCS0.000-1
Motor holding brake connection		
Output voltage	24 VDC +5.8% / +0.1%	24 VDC +5.8% / +0.1%
Continuous current	4.2 A	4.2 A
Max. internal resistance	0.15 Ω	0.15 Ω
Extinction potential	Approx. 30 V	Approx. 30 V
Max. extinction energy per connection	3 Ws	3 Ws
Max. switching frequency	0.5 Hz	0.5 Hz
Protective measures		
Overload and short-circuit protection	Yes	Yes
Cable breakage monitoring	Yes	Yes
Undervoltage monitoring	Yes	Yes
Max. over-current limitation	10 A	10 A
Response threshold for cable breakage monitoring	Approx. 0.5 A	Approx. 0.5 A
Response threshold for undervoltage monitoring	24 VDC +0% / -5%	24 VDC +0% / -5%
Trigger inputs		
Number of inputs	2	2
Wiring	Sink	Sink
Electrical isolation		
Input - inverter module	Yes	Yes
Input - Input	No	No
Input voltage		
Rated	24 VDC	24 VDC
Maximum	30 VDC	30 VDC
Switching threshold		
LOW	< 5 V	< 5 V
HIGH	> 15 V	> 15 V
Input current at rated voltage	Approx. 10 mA	Approx. 10 mA
Switching delay		
Positive edge	52 μs ± 0.5 μs (digitally filtered)	52 μs ± 0.5 μs (digitally filtered)
Negative edge	53 μs ± 0.5 μs (digitally filtered)	53 μs ± 0.5 μs (digitally filtered)
Modulation compared to ground potential	Max. ±38 V	Max. ±38 V
24 V Out		
Amount	2	2
Output voltage		
DC bus voltage (U _{DC}): 260 ... 315 VDC	25 VDC * (U _{DC} / 315)	25 VDC * (U _{DC} / 315)
DC bus voltage (U _{DC}): 315 ... 900 VDC	24 VDC ± 6%	24 VDC ± 6%
Fuse protection	500 mA (slow-blow) electronic, automatic reset	500 mA (slow-blow) electronic, automatic reset

Wall mounting	8BVI0220HWS0.000-1	8BVI0440HWS0.000-1
Cold plate or feed-through mounting	8BVI0220HCS0.000-1	8BVI0440HCS0.000-1
Enable inputs		
Number of inputs	2	2
Wiring	Sink	Sink
Electrical isolation		
Input - inverter module	Yes	Yes
Input - Input	Yes	Yes
Input voltage		
Rated	24 VDC	24 VDC
Maximum	30 VDC	30 VDC
Switching threshold		
LOW	< 5 V	< 5 V
HIGH	> 15 V	> 15 V
Input current at rated voltage	Approx. 30 mA	Approx. 30 mA
Switching delay		
Enable 1 -> 0, PWM off	Max. 2.0 ms	Max. 2.0 ms
Enable 0 -> 1, ready for PWM	Max. 100 μ s	Max. 100 μ s
Modulation compared to ground potential	Max. \pm 38 V	Max. \pm 38 V
Operational conditions		
Ambient temperature during operation	5 to 40°C	5 to 40°C
Max. ambient temperature ¹⁾	+55°C	+55°C
Relative humidity during operation	5 to 85%, non-condensing	5 to 85%, non-condensing
Installation at altitudes above sea level	0 to 500 m	0 to 500 m
Maximum installation attitude ²⁾	4000 m	4000 m
Degree of pollution according to EN 60664-1	2 (non-conductive material)	2 (non-conductive material)
Overvoltage cat. according to IEC 60364-4-443:1999	III	III
EN 60529 protection	IP20	IP20
<p>1) Continuous operation of ACOPOSmulti inverter modules at ambient temperatures ranging from 40°C to max. 55°C is possible (taking the continuous current reductions listed into consideration), but results in a shorter lifespan.</p> <p>2) Continuous operation of ACOPOSmulti inverter modules at altitudes ranging from 500 m to 4000 m above sea level is possible (taking the continuous current reductions listed into consideration). Additional requirements are to be arranged with B&R.</p>		
Storage and transport conditions		
Storage temperature	-25 to +55°C	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing	5 to 95%, non-condensing
Transport temperature	-25 to +70°C	-25 to +70°C
Relative humidity during transport	95% at +40°C	95% at +40°C
Mechanical characteristics		
Dimensions ¹⁾		
Width	106.5 mm	106.5 mm
Height	317 mm	317 mm
Depth		
Wall mounting	263 mm	263 mm
Cold-plate	212 mm	212 mm
Feed-through mounting	209 mm	209 mm
Weight		
Wall mounting	Approx. 5.2 kg	Approx. 5.2 kg
Cold-plate	Approx. 3.9 kg	Approx. 4.2 kg
Feed-through mounting	Approx. 3.9 kg	Approx. 4.2 kg

1) The dimensions define the true device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

Inverter modules 16kW ... 32kW (single-axis modules)

8BVI0220, 8BVI0440

Required accessories				
8TB2106.2010-00	1	Screw terminal 6-pin, 1 row RM5.08 Label 1: numbered serially	Plug for X1 connection	1435
8TB2108.2010-00	1	Screw terminal 8-pin, 1 row RM5.08 Label 1: numbered serially	Plug for X2 connection	1435
8TB2104.203L-00	1	Screw terminal 4-pin, 1 row RM5.08 Label 3: T- T+ B- B+ Coding L: 1010	Plug for X4A connection	1434
8TB4104.204G-00 ¹⁾	1	Screw terminal 4-pin, 1 row RM10.16 Label 4: PE W V U Coding G: 0110	Plug for X5A connection	1439
8TB4104.204G-10 ²⁾	1	Screw terminal 4-pin, 1 row RM10.16 Label 4: PE W V U Coding G: 0110	Plug for X5A connection	1439

1) Only for 8BVI0220HxS0.000-1.

2) Only for 8BVI0440HxS0.000-1.

Optional accessories				
8BAC0120.000-1	max. 2	ACOPOSmulti plug-in module, EnDat 2.1 interface	---	1410
8BAC0120.001-1	max. 2	ACOPOSmulti plug-in module, EnDat 2.2 interface	---	1412
8BAC0121.000-1	max. 2	ACOPOSmulti plug-in module, HIPERFACE interface	---	1413
8BAC0122.000-1	max. 2	ACOPOSmulti plug-in module, resolver interface	---	1414
8BAC0123.000-1	max. 2	ACOPOSmulti plug-in module, incremental encoder and SSI absolute encoder interface for RS422 signals	---	1416
8BAC0123.001-1	max. 2	ACOPOSmulti plug-in module, incremental encoder interface for 5V single-ended and 5V differential signals	---	1418
8BAC0123.002-1	max. 2	ACOPOSmulti plug-in module, incremental encoder interface for 24V single-ended and 24V differential signals	---	1420
8BAC0124.000-1	max. 2	ACOPOSmulti plug-in module, SinCos interface	---	1422
8BAC0132.000-1	max. 2	ACOPOSmulti input module, 4 analog inputs $\pm 10V$	---	1424
8SCS000.0000-00	1	Shield component set consisting of: 1 shield plate 1x type 01 1 hose clamp, B 9 mm, D 12-22 mm	Shield component set for motor cables with a cable diameter of 12 - 22 mm	1440
8SCS005.0000-00	Up to 2	Shield component set consisting of: 1 slot cover shield sheet	Shield sheet for covering free plug-in module slots	1440
8SCS002.0000-00	1	Shield component set consisting of: 1 clamping plate 2 clamps D 4-13.5 mm 2 screws	Shield component set for I/O cables with a cable cross section of 4 - 13.5 mm	1440
8SCS008.0000-00	1	Shield component set consisting of: 1 shield plate, 2x, type 0 1 hose clamp, W 9 mm, D 23-35 mm	Shield component set for motor cables with a cable cross section of 23-35 mm	1441
8SCS007.0000-00	1	Shield component set consisting of: 1 shield mounting plate, 2x, 45° 4 screws	Base plate for mounting shield component set 8SCS008.0000-00	1441
8BXF001.0000-00	---	ACOPOSmulti fan module, replacement fan for ACOPOSmulti modules (8BVP/8B0C/8BVI/8BVE/8B0K)	Replacement fan for ACOPOSmulti modules (8BVP/8B0C/8BVI/8BVE/8B0K)	1441

Inverter modules 64kW (single-axis modules) 8BVI0880



- Uncontrolled stops and secure halt integrated
- Integrated connection for motor motor holding brake and temperature sensor
- 2 slots for ACOPOSmulti plug-in modules

ETHERNET 
POWERLINK

Wall mounting	8BVI0880HWS0.000-1
Cold plate or feed-through mounting	8BVI0880HCS0.000-1
General information	
C-UL-US listed	Yes
Available cooling and mounting methods	
Wall mounting	Yes
Cold plate or feed-through mounting	Yes
Module width	4
DC bus	
Voltage	800 VDC
Max.	900 VDC
Continuous power consumption	In preparation
Power loss at max. device power	In preparation
DC bus capacitance	1980 μ F
Design	ACOPOSmulti backplane
24 VDC supply	
Input voltage	25 VDC \pm 1.6%
Input capacitance	In preparation
Max. power consumption	27 W + $P_{24\text{ V Out}}$ {0 ... 10 W} ¹⁾ + $P_{\text{HoldingBrake}}$ + 4 * $P_{\text{Fan8B0M...}}$ ²⁾
Design	ACOPOSmulti backplane

1) The power consumption $P_{24\text{ V Out}}$ corresponds to the power that is output on the module's X2 / +24 V Out 1 and X2 / +24 V Out 2 connections (max. 10 W).

2) The power consumption $P_{\text{Fan8B0M...}}$ corresponds to the portion of the power that is used by the fan modules in the mounting plate / by the 8B0M0040HFF0.000-1 fan module and can be found in the technical data for the respective 8B0M... mounting plate.

Inverter modules 64kW (single-axis modules) 8BVI0880

Wall mounting	8BVI0880HWS0.000-1
Cold plate or feed-through mounting	8BVI0880HCS0.000-1
Motor connector	
Continuous power ¹⁾	64 kW
Continuous current	88 A _{eff}
Reduction of continuous current depending on the ambient temperature starting at 40°C.	In preparation
Reduction of continuous current depending on switching frequency	
Switching frequency 20 kHz	In preparation
Switching frequency 10 kHz	In preparation
Switching frequency 5 kHz	No reduction
Reduction of continuous current depending on installation altitude	
Starting at 500 m above sea level	8.8 A _{eff} per 1,000 m
Reduction of continuous current depending on cooling type	
Wall mounting	In preparation
Cold plate or feed-through mounting	In preparation
Maximum current	176 A _{eff}
Rated switching frequency	5 kHz
Possible switching frequencies	5/10/20 kHz
Protective measures	
Overload protection	Yes
Short circuit and ground fault	Yes
Maximum motor line length depending on the switching frequency ²⁾	
Switching frequency 5 kHz	25 m
Switching frequency 10 kHz	25 m
Switching frequency 20 kHz	25 m
Design	
U, V, W, PE	Threaded bolt M8
Shield connection	Yes
Terminal connection cross sections	
Flexible and fine wire lines with wire tip sleeves	6 - 50 mm ² ³⁾
Approbation data	
UL/C-UL-US	In preparation
CSA	In preparation
Terminal cross sections (cable diameter) of the shielding connection ⁴⁾	12 - 50 mm

1) The continuous power and continuous current are valid for the following boundary conditions: Nominal DC bus voltage 800 VDC, nominal switching frequency 5 kHz, 40°C ambient temperature, installation altitudes < 500 m above sea level.

2) Information: When using two motor cables that are connected in parallel, the maximum permissible motor cable lengths are reduced by half. The total length of all motor cables per backplane module is limited.

3) The connection is made with cable lugs using an M8 threaded bolt.

4) The terminal cable outer diameter depends on the shield component set.

Wall mounting	8BVI0880HWS0.000-1
Cold plate or feed-through mounting	8BVI0880HCS0.000-1
Motor holding brake connection	
Output voltage	24 VDC +5.8% / -0.1%
Continuous current	4.2 A
Max. internal resistance	0.15 Ω
Extinction potential	Approx. 30 V
Max. extinction energy per connection	3 Ws
Max. switching frequency	0.5 Hz
Protective measures	
Overload and short-circuit protection	Yes
Cable breakage monitoring	Yes
Undervoltage monitoring	Yes
Max. over-current limitation	10 A
Response threshold for cable breakage monitoring	Approx. 0.5 A
Response threshold for undervoltage monitoring	24 VDC +0% / -5%
Trigger inputs	
Number of inputs	2
Wiring	Sink
Electrical isolation	
Input - inverter module	Yes
Input - Input	Yes
Input voltage	
Rated	24 VDC
Maximum	30 VDC
Switching threshold	
LOW	< 5 V
HIGH	>15 V
Input current at rated voltage	Approx. 10 mA
Switching delay	
Positive edge	52 μ s \pm 0.5 μ s (digitally filtered)
Negative edge	53 μ s \pm 0.5 μ s (digitally filtered)
Modulation compared to ground potential	Max. \pm 38 V
24 V Out	
Amount	2
Output voltage	
DC bus voltage (U_{DC}): 260 ... 315 VDC	25 VDC * (U_{DC} / 315)
DC bus voltage (U_{DC}): 315 ... 900 VDC	24 VDC \pm 6%
Fuse protection	500 mA (slow-blow) electronic, automatic reset
Enable inputs	
Amount of energy	2
Wiring	Sink
Electrical isolation	
Input - inverter module	Yes
Input - Input	Yes
Input voltage	
Rated	24 VDC
Maximum	30 VDC
Switching threshold	
LOW	< 5 V
HIGH	>15 V
Input current at rated voltage	Approx. 30 mA
Switching delay	
Enable 1 -> 0, PWM off	Max. 2.0 ms
Enable 0 -> 1, ready for PWM	Max. 100 μ s
Modulation compared to ground potential	Max. \pm 38 V

Inverter modules 64kW (single-axis modules) 8BVI0880

Wall mounting	8BVI0880HWS0.000-1
Cold plate or feed-through mounting	8BVI0880HCS0.000-1
Operational conditions	
Ambient temperature during operation	5 to 40°C
Max. ambient temperature ¹⁾	+55°C
Relative humidity during operation	5 to 85%, non-condensing
Installation at altitudes above sea level	0 to 500 m
Maximum installation attitude ²⁾	4000 m
Degree of pollution according to EN 60664-1	2 (non-conductive material)
Overvoltage cat. according to IEC 60364-4-443:1999	III
EN 60529 protection	IP20
<p>1) Continuous operation of ACOPOSmulti inverter modules at ambient temperatures ranging from 40°C to max. 55°C is possible (taking the continuous current reductions listed into consideration), but results in a shorter lifespan.</p> <p>2) Continuous operation of ACOPOSmulti inverter modules at altitudes ranging from 500 m to 4000 m above sea level is possible (taking the continuous current reductions listed into consideration). Additional requirements are to be arranged with B&R.</p>	
Storage and transport conditions	
Storage temperature	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing
Transport temperature	-25 to +70°C
Relative humidity during transport	95% at +40°C
Mechanical characteristics	
Dimensions ¹⁾	
Width	213,5 mm
Height	317 mm
Depth	
Wall mounting	263 mm
Cold-plate	212 mm
Feed-through mounting	209 mm
Weight	
Wall mounting	Approx. 9.6 kg
Cold-plate	Approx. 7.1 kg
Feed-through mounting	Approx. 7.1 kg

1) The dimensions define the true device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

Required accessories					
8TB2106.2010-00	1	Screw terminal 6-pin, 1 row RM5.08 Label 1: numbered serially		Plug for X1 connection	1435
8TB2108.2010-00	1	Screw terminal 8-pin, 1 row RM5.08 Label 1: numbered serially		Plug for X2 connection	1435
8TB2104.203L-00	1	Screw terminal 4-pin, 1 row RM5.08 Label 3: T- T+ B- B+ Coding L: 1010		Plug for X4A connection	1434

Optional accessories					
8BAC0120.000-1	max. 2	ACOPOSmulti plug-in module, EnDat 2.1 interface		---	1410
8BAC0120.001-1	max. 2	ACOPOSmulti plug-in module, EnDat 2.2 interface		---	1412
8BAC0121.000-1	max. 2	ACOPOSmulti plug-in module, HIPERFACE interface		---	1413
8BAC0122.000-1	max. 2	ACOPOSmulti plug-in module, resolver interface		---	1414
8BAC0123.000-1	max. 2	ACOPOSmulti plug-in module, incremental encoder and SSI absolute encoder interface for RS422 signals		---	1416
8BAC0123.001-1	max. 2	ACOPOSmulti plug-in module, incremental encoder interface for 5V single-ended and 5V differential signals		---	1418
8BAC0123.002-1	max. 2	ACOPOSmulti plug-in module, incremental encoder interface for 24V single-ended and 24V differential signals		---	1420
8BAC0124.000-1	max. 2	ACOPOSmulti plug-in module, SinCos interface		---	1422
8BAC0132.000-1	max. 2	ACOPOSmulti input module, 4 analog inputs $\pm 10V$		---	1424
8SCS005.0000-00	Up to 2	Shield component set consisting of: 1 slot cover shield sheet		Shield sheet for covering free plug-in module slots	1440
8SCS002.0000-00	1	Shield component set consisting of: 1 clamping plate 2 clamps D 4-13.5 mm 2 screws		Shield component set for I/O cables with a cable cross section of 4 - 13.5 mm	1440
8SCS003.0000-00	1	Shield component set consisting of: 1 shield mounting plate, 4x, 45° 8 screws		Base plate for mounting shield component set 8SCS001.0000-00 or 8SCS004.0000-00	1440
8SCS004.0000-00	1	Shield component set consisting of: 1 shield plate, 4x, type 0 2 hose clamp, W 9 mm, D 32-50 mm		Shield component set for motor cables with a cable cross section of 32 - 50 mm	1440
8SCS001.0000-00	3	Shield component set consisting of: 1 shield plate, 4x, type 1 1 hose clamp, W 9 mm, D 12-22 mm		Shield component set for single lines with a cross section of 12-22 mm	1440
8BXF001.0000-00	---	ACOPOSmulti fan module, replacement fan for ACOPOSmulti modules (8BVP/8B0C/8BVI/8BVE/8B0K)		Replacement fan for ACOPOSmulti modules (8BVP/8B0C/8BVI/8BVE/8B0K)	1441

Expansion modules 8BVE



8BVE0500HC00.000-1

- For distributing the DC power supply and the 24 VDC auxiliary supply on multiple mounting plates
- For creating decentralized units in the ACOPOSmulti drive system
- Output for overload protection

Wall mounting	8BVE0500HW00.000-1
Cold plate or feed-through mounting	8BVE0500HC00.000-1
General information	
C-UL-US listed	In preparation
Available cooling and mounting methods	
Wall mounting	Yes
Cold plate or feed-through mounting	Yes
Module width	1
DC bus connection	
Voltage	800 VDC
Max.	900 VDC
Continuous power depending on the fuse ¹⁾	
10 A	In preparation
20 A	In preparation
50 A	32 kW
Continuous power depending on the fuse ¹⁾	
10 A	In preparation
20 A	In preparation
50 A	40 A _{eff}
Reduction of continuous power depending on the ambient temperature starting at 40°C.	
	In preparation
Reduction of continuous power depending on installation altitude	
Starting at 500 m above sea level	10% per 1000 m
Reduction of continuous power depending on cooling method	
Wall mounting	In preparation
Cold plate or feed-through mounting	
Continuous current depending on the fuse	
10 A	In preparation
20 A	In preparation
50 A	In preparation
Power loss at max. device power	
	In preparation
DC bus capacitance	

Design	
	ACOPOSmulti backplane

1) The continuous power and continuous current are valid for the following boundary conditions: Nominal DC bus voltage 800 VDC, 40°C ambient temperature, installation altitudes < 500 m above sea level.

DC bus cable outlet	
Number of cable outlets	2
Fuse protection: DC+ and DC-	
Type ¹⁾	2 x blow-out fuse Ø 14 x 51 mm
Tripping characteristics	ultra fast-acting
Rated current ²⁾	10 / 20 / 50 A
Protective measures	
Overload protection depending on the fuse	
10 A	No (overload indicated via LED, has potential-free alarm contacts)
20 A	No (overload indicated via LED, has potential-free alarm contacts)
50 A	No (overload indicated via LED, has potential-free alarm contacts)
Short circuit and ground fault	Yes
Maximum line length between two expansion modules	5 m
Design	
DC+, DC-, PE	Connectors
Shield connection	Yes
Terminal connection cross sections	
Flexible and fine wire lines	
with wire tip sleeves	0.5 – 16 mm ²
Approbation data	
UL/C-UL-US	20 - 6
CSA	20 - 6
Terminal cross sections (cable diameter) for the shield connection	12 - 22 mm

1) For example, a type 5020106.xx fuse from Siba (www.sibafuses.com) may be used (xx is the rated current for the fuse; only fuses with a rated current of 50 A or less may be used.).

2) For a 10 A rated current, fuses of type 5011806.10 from Siba (www.sibafuses.com) must be used.

For a 20 A rated current, fuses of type 5011806.20 from Siba (www.sibafuses.com) must be used.

For a 50 A rated current, fuses of type 5020106.50 from Siba (www.sibafuses.com) must be used.

Expansion modules 8BVE

Wall mounting	8BVE0500HW00.000-1
Cold plate or feed-through mounting	8BVE0500HC00.000-1
24 VDC auxiliary supply cable outlet	
Number of cable outlets	2
Output voltage	
DC bus voltage 260 ... 315 VDC	25 VDC * (DC bus voltage / 315)
DC bus voltage 315 ... 900 VDC	24 VDC ± 6%
24 VDC fuse protection	
Type ¹⁾	Burn-out fuse Ø 10 x 38 mm
Tripping characteristics	fast-acting
Rated current	12 / 30 A
Protective measures	
Overload protection	Yes
Short circuit protection	Yes
Maximum line length between two expansion modules	5 m
Design	
24 VDC, COM	Connectors
Shield connection	No
Terminal connection cross sections	
Flexible and fine wire lines	
with wire tip sleeves	0.5 – 6 mm ²
Approbation data	
UL/C-UL-US	22 -10
CSA	22 -10
Terminal cable outer-cross-section dimension of the shield connection	---

1) For example, a type KLKD0xx fuse from Littelfuse (www.littelfuse.com) may be used (xx is the rated current for the fuse; only fuses with a rated current of 30 A or less may be used.)

Alarm contacts ¹⁾	
Amount	2
Type	
Alarm contact 1	Normally closed
Alarm contact 2	Normally open
Electrical isolation	
Alarm contact - Alarm contact	Yes
Alarm contact - ACOPOSmulti module	Yes
Rated voltage	30 VDC
Maximum current	1 A
Switching delay 1 -> 0 and 0 -> 1	3 ms
Max. number of switching cycles	100,000
Protection	
Short circuit protection	No
Overload protection	No

1) The alarm contacts are activated if

- the load on the damping resistors is >100% (OLD LED lit)
- the expansion module's 24 VDC outlet is overloaded (OL24 LED lit)
- the expansion module's DC bus outlet is overloaded (OLDC LED lit).

When the load on the damping resistors is > 100%, or when the 24 VDC outlet or DC bus outlet is overloaded, internal components of the device are overloaded.

The alarm contacts must therefore be monitored externally. When activating the alarm contacts, the ACOPOSmulti drive system should be switched off in order to prevent damage to the expansion module.

Wall mounting	8BVE0500HW00.000-1
Cold plate or feed-through mounting	8BVE0500HC00.000-1
Operational conditions	
Ambient temperature during operation	5 to 40°C
Max. ambient temperature ¹⁾	+55°C
Relative humidity during operation	5 to 85%, non-condensing
Installation at altitudes above sea level	0 to 500 m
Maximum installation attitude ²⁾	4000 m
Degree of pollution according to EN 60664-1	2 (non-conductive material)
Overvoltage cat. according to IEC 60364-4-443:1999	III
EN 60529 protection	IP20
1) Continuous operation of ACOPOSMulti expansion modules at ambient temperatures ranging from 40°C to max. 55°C is possible (taking the continuous current reductions listed into consideration), but results in a shorter lifespan.	
2) Continuous operation of ACOPOSMulti expansion modules at altitudes ranging from 500 m to 4000 m above sea level is possible (taking the continuous current reductions listed into consideration). Additional requirements are to be arranged with B&R.	
Storage and transport conditions	
Storage temperature	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing
Transport temperature	-25 to +70°C
Relative humidity during transport	95% at +40°C
Mechanical characteristics	
Dimensions ¹⁾	
Width	53 mm
Height	317 mm
Depth	
Wall mounting	263 mm
Cold-plate	212 mm
Feed-through mounting	209 mm
Weight	
Wall mounting	Approx. 3.1 kg
Cold-plate	Approx. 2.6 kg
Feed-through mounting	Approx. 2.6 kg

1) The dimensions define the true device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

Expansion modules 8BVE

Required accessories				
8TB2104.2010-00	1	Screw terminal 4-pin, 1 row RM5.08 Label 1: numbered serially	Plug for X2 connection	1435
8TB3102.201C-10	1 ¹⁾	Screw terminal 2-pin, 1 row RM7.62 Label 1: numbered serially, C coding: 10	Plug for X3A, X3B connection	1436
8TB4103.203C-10	1 ¹⁾	Screw terminal 3-pin, 1 row RM10.16 Label 3: +DC -DC PE, C coding: 010	Plug for X4A, X4B connection	1438
8BXS000.0000-00	1 ²⁾	Fuse set consists of: 2x 14 x 51 mm fuses, 50 A, ultra fast-acting	Fuses for cable outlet DC bus (DC+, DC-)	
8BXS001.0000-00	1 ²⁾	Fuse set consists of: 2x 14 x 51 mm fuses, 20 A, ultra fast-acting	Fuses for cable outlet DC bus (DC+, DC-)	
8BXS002.0000-00	1 ²⁾	Fuse set consists of: 2x 14 x 51 mm fuses, 10 A, ultra fast-acting	Fuses for cable outlet DC bus (DC+, DC-)	
8BXS003.0000-00	1 ³⁾	Fuse set consists of: 1x 10 x 38 mm fuse, 30 A, ultra fast-acting	Fuse for cable outlet 24 VDC auxiliary supply	
8BXS004.0000-00	1 ³⁾	Fuse set consists of: 1x 14 x 51 mm fuse, 12 A, ultra fast-acting	Fuse for cable outlet 24 VDC auxiliary supply	

1) One screw terminal is required for each expansion module.

If more than two expansion modules are used, then (n - 2) **additional** screw terminals are required for wiring the modules (n = number of expansion modules).

2) Only **one** fuse set can be used per expansion module for the DC bus cable outlet.

3) Only **one** fuse set can be used per expansion module for the 24 VDC auxiliary supply cable outlet.

Optional accessories				
8BCA01X5.1111A-0		ACPmulti expansion cable, length 1.5 m, 3 x 1.5 mm ² , UL/CSA listed		1431
8BCA0003.1111A-0		ACPmulti expansion cable, length 3 m, 3 x 1.5 mm ² , UL/CSA listed		1431
8BCA0005.1111A-0		ACPmulti expansion cable, length 5 m, 3 x 1.5 mm ² , UL/CSA listed		1431
8BCA01X5.1312A-0		ACPmulti expansion cable, length 1.5 m, 3 x 4 mm ² , UL/CSA listed		1432
8BCA0003.1312A-0		ACPmulti expansion cable, length 3 m, 3 x 4 mm ² , UL/CSA listed		1432
8BCA0005.1312A-0		ACPmulti expansion cable, length 5 m, 3 x 4 mm ² , UL/CSA listed		1432
8BCA01X5.1513A-0		ACPmulti expansion cable, length 1.5 m, 3 x 10 mm ² , UL/CSA listed		1433
8BCA0003.1513A-0		ACPmulti expansion cable, length 3 m, 3 x 10 mm ² , UL/CSA listed		1433
8BCA0005.1513A-0		ACPmulti expansion cable, length 5 m, 3 x 10 mm ² , UL/CSA listed		1433
8SCS000.0000-00	1	Shield component set consisting of: 1 shield plate 1x type 0 1 hose clamp, W 9mm, D 12-22 mm	Shield component set for expansion cables with a cable diameter of 12 - 22 mm	1440
8BXF001.0000-00	---	ACOPOSmulti fan module, replacement fan for ACOPOSmulti modules (8BVP/8B0C/8BVI/8BVE/8B0K)	Replacement fan for ACOPOSmulti modules (8BVP/8B0C/8BVI/8BVE/8B0K)	1441

Capacitor modules 8B0K



8B0K1650HC00.000-1

- used for buffering the DC bus
- seamless integration in the ACOPOS-multi drive system

Wall mounting	8B0K1650HW00.000-1			
Cold plate or feed-through mounting	8B0K1650HC00.000-1			
General information				
C-UL-US listed	In preparation			
Available cooling and mounting methods				
Wall mounting	Yes			
Cold plate or feed-through mounting	Yes			
Module width	1			
DC bus connection				
Voltage	800 VDC			
Max.	900 VDC			
Power loss at max. device power	In preparation			
DC bus capacitance	1650 μ F			
Design	ACOPOSmulti backplane			
24 VDC supply				
Input voltage	25 VDC + 1.6% / -20%			
Max. power consumption	3 W			
Design	ACOPOSmulti backplane			
Operational conditions				
Ambient temperature during operation	5 to 40°C			
Max. ambient temperature ¹⁾	+55°C			
Relative humidity during operation	5 to 85%, non-condensing			
Installation at altitudes above sea level	0 to 500 m			
Maximum installation attitude ²⁾	4000 m			
Degree of pollution according to EN 60664-1	2 (non-conductive material)			
Overvoltage cat. according to IEC 60364-4-443:1999	III			
EN 60529 protection	IP20			
1) Continuous operation of ACOPOSmulti expansion modules at ambient temperatures ranging from 40°C to max. 55°C is possible (taking the continuous current reductions listed into consideration), but results in a shorter lifespan.				
2) Continuous operation of ACOPOSmulti expansion modules at altitudes ranging from 500 m to 4000 m above sea level is possible (taking the continuous current reductions listed into consideration). Additional requirements are to be arranged with B&R.				
Storage and transport conditions				
Storage temperature	-25 to +55°C			
Relative humidity during storage	5 to 95%, non-condensing			
Transport temperature	-25 to +70°C			
Relative humidity during transport	95% at +40°C			
Mechanical characteristics				
Dimensions ¹⁾				
Width	53 mm			
Height	317 mm			
Depth				
Wall mounting	263 mm			
Cold-plate	212 mm			
Feed-through mounting	209 mm			
Weight				
Wall mounting	Approx. 3.2 kg			
Cold-plate	Approx. 2.7 kg			
Feed-through mounting	Approx. 2.7 kg			
1) The dimensions define the true device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.				
Optional accessories				
8BXF001.0000-00	---	ACOPOSmulti fan module, replacement fan for ACOPOSmulti modules (8BVP/8B0C/8BVI/8BVE/8B0K)	Replacement fan for ACOPOSmulti modules (8BVP/8B0C/8BVI/8BVE/8B0K)	1441

EnDat 2.1 interface 8BAC0120



- Encoder monitoring
- EnDat 2.1 protocol
- High precision analog signal processing
- Embedded parameter chip with B&R motors

General information		8BAC0120.000-1
C-UL-US listed		Yes
Module type		ACOPOSmulti plug-in module
Slot ¹⁾		Slots 1 and 2
Max. power consumption		
E0 ... EnDat single-turn, 512 lines		4 W
E1 ... EnDat multi-turn, 512 lines		4 W
E2 ... EnDat single-turn, 32 lines (inductive)		4 W
E3 ... EnDat multi-turn, 32 lines (inductive)		4 W
E4 ... EnDat single-turn, 512 lines		4 W
E5 ... EnDat multi-turn, 512 lines		4 W
<p>1) The 8BAC0120.000-1 is an encoder module. Up to two encoder modules can be connected. In this case, the encoder module in the first slot automatically serves as motor feedback for the first axis and the encoder module in the second slot serves as motor feedback for the second axis. The second slot can be used for other purposes when in single-axis operation.</p>		
Encoder input ¹⁾		8BAC0120.000-1
Connection, module-side		15-pin DSUB socket
Indicators		UP/DN LEDs
Electrical isolation		
Encoder - ACOPOSmulti		No
Encoder monitoring		Yes
Maximum encoder cable length		75 m
<p>1) The EnDat encoder must be wired using a cable with a single shield.</p>		
Encoder supply		8BAC0120.000-1
Output voltage		5 V ± 5%
Ability to work under pressure		250 mA ¹⁾
Sense lines		2, compensation of max. 2 x 0.7 V
<p>1) An additional reserve of 57 mA is available for terminating resistors.</p>		
Sine-cosine inputs		8BAC0120.000-1
Signal transfer		Differential signals, symmetric
Differential voltage		0.5 to 1.25 V _{SS}
Common mode voltage		Max. ±7 V
Terminating resistor		120 Ω
Signal frequency (-5 dB)		DC up to 400 kHz
Signal frequency (-3 dB)		DC up to 300 kHz
ADC resolution		12-bit
Synchronous serial interface		8BAC0120.000-1
Signal transfer		RS485
Data transfer rate		781.25 kBit/s
Position		8BAC0120.000-1
Resolution @ 1 V _{SS} ¹⁾		Number of encoder lines * 5700
Precision ²⁾		-
Noise ²⁾		-
<p>1) This value does not correspond to the encoder resolution that must be configured in Automation Studio (16384 * number of encoder lines).</p> <p>2) In the field, this is limited by the encoder.</p>		
Operational conditions		8BAC0120.000-1
Ambient temperature during operation		... ¹⁾
Relative humidity during operation		... ¹⁾
<p>1) ACOPOSmulti plug-in modules can be used in an ACOPOSmulti inverter or power supply module; the corresponding values can be found in the technical data of the respective ACOPOSmulti inverter or power supply module.</p>		
Storage and transport conditions		8BAC0120.000-1
Storage temperature		-25 to +55°C
Relative humidity during storage		5 to 95%, non-condensing
Transport temperature		-25 to +70°C
Relative humidity during transport		95% at +40°C

Optional accessories		
8BCE0005.1111A-0	ACPMulti EnDat cable, length 5m, 10 x 0.14mm ² + 2 x 0.5mm ² , EnDat plug 17-pin SpeedTec socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1428
8BCE0007.1111A-0	ACPMulti EnDat cable, length 7m, 10 x 0.14mm ² + 2 x 0.5mm ² , EnDat plug 17-pin SpeedTec socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1428
8BCE0010.1111A-0	ACPMulti EnDat cable, length 10m, 10 x 0.14mm ² + 2 x 0.5mm ² , EnDat plug 17-pin SpeedTec socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1428
8BCE0015.1111A-0	ACPMulti EnDat cable, length 15m, 10 x 0.14mm ² + 2 x 0.5mm ² , EnDat plug 17-pin SpeedTec socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1428
8BCE0020.1111A-0	ACPMulti EnDat cable, length 20m, 10 x 0.14mm ² + 2 x 0.5mm ² , EnDat plug 17-pin SpeedTec socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1428
8BCE0025.1111A-0	ACPMulti EnDat cable, length 25m, 10 x 0.14mm ² + 2 x 0.5mm ² , EnDat plug 17-pin SpeedTec socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1428

EnDat 2.2 interface 8BAC0120



- Encoder monitoring
- EnDat 2.2 protocol
- High precision analog signal processing
- Embedded parameter chip with B&R motors

General information	8BAC0120.001-1
C-UL-US listed	Yes
Module type	ACOPOSmulti plug-in module
Slot ¹⁾	Slots 1 and 2
Max. power consumption	In preparation
1) The 8BAC0120.001-1 is an encoder module. Two encoder modules can also be inserted. In this case, the encoder module in the first slot automatically serves as motor feedback for the first axis and the encoder module in the second slot serves as motor feedback for the second axis. The second slot can be used for other purposes when in single-axis operation.	
Encoder connection ¹⁾	8BAC0120.001-1
Connection, module-side	9-pin DSUB socket
Indicators	UP/DN LEDs
Electrical isolation	
Encoder - ACOPOSmulti	No
Encoder monitoring	Yes
Maximum encoder cable length	100 m
	Depending on the cross section of the supply wires on the encoder cable ²⁾
1) The EnDat encoder must be wired using a cable with a single shield and twisted pair signal lines.	
2) The maximum encoder cable length l_{max} can be calculated as follows (the maximum permissible encoder length of 100 m must not be exceeded): $l_{max} = \frac{Z_{\theta}}{I_{\theta}} \cdot A \cdot \frac{1}{2 \cdot \rho}$	
	I_{θ} ... Maximum current consumption of the encoder [A]
	A ... Wire cross section of the supply wire [mm ²]
	ρ ... Specific resistance [Ω mm ² /m] (e.g. for copper: $\rho = 0.0178$)
Approved EnDat 2.2 cables can be obtained from DR. JOHANNES HEIDENHAIN GmbH (www.heidenhain.de).	
If EnDat 2.2 cables from other manufacturers are used, they must be approved by B&R.	
Encoder supply	8BAC0120.001-1
Output voltage	Typ. 12.5 V
Ability to work under pressure	350 mA
Protective measures	
Overload protection	Yes
Short circuit protection	Yes
Synchronous serial interface	8BAC0120.001-1
Signal transfer	RS485
Baud rate	6.25 Mbit/s
Operational conditions	8BAC0120.001-1
Ambient temperature during operation	... ¹⁾
Relative humidity during operation	... ¹⁾
1) ACOPOSmulti plug-in modules can be used in an ACOPOSmulti inverter or power supply module; the corresponding values can be found in the technical data of the respective ACOPOSmulti inverter or power supply module.	
Storage and transport conditions	8BAC0120.001-1
Storage temperature	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing
Transport temperature	-25 to +70°C
Relative humidity during transport	95% at +40°C

HIPERFACE interface 8BAC0121



- Encoder monitoring
- High resolution

General information	8BAC0121.000-1
C-UL-US listed	Yes
Module type	ACOPOSMulti plug-in module
Slot ¹⁾	Slots 1 and 2
Max. power consumption	$P_{\text{Module}} [\text{mW}] = 25 \text{ V} * I_{25\text{VDC}} [\text{mA}]$ $I_{25\text{VDC}} [\text{mA}] = I_{\text{Encoder}} [\text{mA}] * 0,48 + 50 \text{ mA}$
1) The 8BAC0121.000-1 is an encoder module. Up to two encoder modules can be connected. In this case, the encoder module in the first slot automatically serves as motor feedback for the first axis and the encoder module in the second slot serves as motor feedback for the second axis. The second slot can be used for other purposes when in single-axis operation.	
Encoder connection ¹⁾	8BAC0121.000-1
Connection, module-side	15-pin DSUB socket
Indicators	UP/DN LEDs
Electrical isolation	
Encoder - ACOPOSMulti	No
Encoder monitoring	Yes
Maximum encoder cable length	75 m
1) The HIPERFACE encoder must be wired using a cable with a single shield.	
Encoder supply	8BAC0121.000-1
Output voltage	Typ. 10 V
Ability to work under pressure	130 mA ¹⁾
Sense lines	--- ²⁾
Protective measures	
Overload protection	Yes
Short circuit protection	Yes
1) An additional reserve of 40 mA is available for terminating resistors.	
2) No sense lines are present because the supply voltage for the HIPERFACE encoder is permitted to lie between 7 and 12 V.	
Sine-cosine inputs	8BAC0121.000-1
Signal transfer	Differential signal, asymmetric
Differential voltage	0.5 to 1.25 V _{ss}
Common mode voltage	Max. ±7 V
Terminating resistor	120 Ω
Signal frequency	DC up to 200 kHz
ADC resolution	12-bit
Asynchronous serial interface	8BAC0121.000-1
Signal transfer	RS485
Data transfer rate	9600 bit/s
Position	8BAC0121.000-1
Resolution @ 1 V _{ss} ¹⁾	Number of encoder lines * 5700
Precision ²⁾	---
Noise ²⁾	---
1) This value does not correspond to the encoder resolution that must be configured in Automation Studio (16384 * number of encoder lines)	
2) In the field, this is limited by the encoder.	
Operational conditions	8BAC0121.000-1
Ambient temperature during operation	--- ¹⁾
Relative humidity during operation	--- ¹⁾
1) ACOPOSMulti plug-in modules can be used in an ACOPOSMulti inverter or power supply module; the corresponding values can be found in the technical data of the respective ACOPOSMulti inverter or power supply module.	
Storage and transport conditions	8BAC0121.000-1
Storage temperature	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing
Transport temperature	-25 to +70°C
Relative humidity during transport	95% at +40°C

Resolver interface 8BAC0122



- Encoder monitoring
- High resolution

General information	8BAC0122.000-1
C-UL-US listed	Yes
Module type	ACOPOSmulti plug-in module
Slot ¹⁾	Slots 1 and 2
Max. power consumption	1 W
1) The 8BAC0122.000-1 is an encoder module. Two encoder modules can also be inserted. In this case, the encoder module in the first slot automatically serves as motor feedback for the first axis and the encoder module in the second slot serves as motor feedback for the second axis. The second slot can be used for other purposes when in single-axis operation.	
Encoder connection ¹⁾	8BAC0122.000-1
Connection, module-side	9-pin DSUB socket
Indicators	UP/DN LEDs
Electrical isolation	
Encoder - ACOPOSmulti	No
Encoder monitoring	Yes
Maximum encoder cable length	100 m
1) The resolver must be wired using a cable with a single shield and twisted pair signal lines.	
Encoder supply	8BAC0122.000-1
Signal transfer	Differential signals
Frequency	10 kHz
Output voltage	Typ. 3 V _{eff}
Output current	Max. 50 mA _{eff}
Protective measures	
Overload protection	Yes
Short circuit protection	Yes
Analog inputs	8BAC0122.000-1
Signal transfer	Differential signals
Input voltage	Resolver transfer: 0.5 ±10%
Input Impedance	10.4 kΩ - j 11.1 kΩ
Common mode voltage	Max. ±20 V
ADC resolution	14-bit
Position	8BAC0122.000-1
Resolution @ $\ddot{u} = 0.5$	Number of pole pairs * 22600
Bandwidth	In preparation
Accuracy	In preparation
Noise	In preparation
Operational conditions	8BAC0122.000-1
Ambient temperature during operation	... ¹⁾
Relative humidity during operation	... ¹⁾
1) ACOPOSmulti plug-in modules can be used in an ACOPOSmulti inverter or power supply module; the corresponding values can be found in the technical data of the respective ACOPOSmulti inverter or power supply module.	
Storage and transport conditions	8BAC0122.000-1
Storage temperature	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing
Transport temperature	-25 to +70°C
Relative humidity during transport	95% at +40°C

Optional accessories		
8BCR0005.1111A-0	ACPMulti resolver cable, length 5m, 3 x 2 x 24AWG (19x0, 127), resolver plug 12-pin SpeedTec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1429
8BCR0007.1111A-0	ACPMulti resolver cable, length 7m, 3 x 2 x 24AWG (19x0, 127), resolver plug 12-pin SpeedTec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1429
8BCR0010.1111A-0	ACPMulti resolver cable, length 10m, 3 x 2 x 24AWG (19x0, 127), resolver plug 12-pin SpeedTec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1429
8BCR0015.1111A-0	ACPMulti resolver cable, length 15m, 3 x 2 x 24AWG (19x0, 127), resolver plug 12-pin SpeedTec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1429
8BCR0020.1111A-0	ACPMulti resolver cable, length 20m, 3 x 2 x 24AWG (19x0, 127), resolver plug 12-pin SpeedTec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1429
8BCR0025.1111A-0	ACPMulti resolver cable, length 25m, 3 x 2 x 24AWG (19x0, 127), resolver plug 12-pin SpeedTec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed	1429

Incremental / SSI encoder interface 8BAC0123.000-1



- Evaluation of incremental/SSI encoders with output signals in accordance to RS422
- Encoder monitoring
- Encoder supply +5V and +24V
- Connection for temperature sensor
- Evaluation of tracer pins possible

General information	8BAC0123.000-1
C-UL-US listed	In preparation
Module type	ACOPOSmulti plug-in module
Slot ¹⁾	Slots 1 and 2
Max. power consumption ²⁾	$P_{\text{Module}} [\text{mW}] = 25 \text{ V} * I_{\text{25VDC}} [\text{mA}]$
Encoder supply 5V	$I_{\text{25VDC}} [\text{mA}] = I_{\text{Encoder}} [\text{mA}] * 0.42 + 45 \text{ mA}$
Encoder supply 24V	$I_{\text{25VDC}} [\text{mA}] = I_{\text{Encoder}} [\text{mA}] + 45 \text{ mA}$
Encoder connection ³⁾	8BAC0123.000-1
Connection, module-side	15-pin DSUB socket
Indicators	UP/DN LEDs
Electrical isolation	
Encoder - ACOPOSmulti	Yes
Maximum encoder cable length	100 m
Encoder supply 5V	8BAC0123.000-1
Output voltage	5 V ± 5%
Ability to work under pressure	350 mA ⁴⁾
Sense lines	--- ²⁾
Sense lines	
Amount	2
Max. compensation	2 x 1.5 V
Protective measures	
Overload protection	Yes
Short circuit protection	Yes
Encoder supply 24V	8BAC0123.000-1
Output voltage	24 V ± 10%
Ability to work under pressure	300 mA ⁵⁾
Sense lines	No
Protective measures	
Overload protection	Yes
Short circuit protection	Yes
Inputs A, B, R	8BAC0123.000-1
Signal transfer	RS422
Differential voltage	±0.5 V to ±7 V ⁶⁾
Common mode voltage	-10 V to +13 V
Terminating resistor	120 Ω (difference)
Max. input frequency ⁷⁾	50 / 100 / 200 / 400 kHz
Min. edge interval ⁸⁾	1.3 / 0.7 / 0.4 / 0.2 μs

Clock output	8BAC0123.000-1
Signal transfer	RS422
Baud rate	390 kBaud
Operational conditions	8BAC0123.000-1
Ambient temperature during operation	... ⁹⁾
Relative humidity during operation	... ⁹⁾
Operational conditions	8BAC0123.000-1
Storage temperature	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing
Transport temperature	-25 to +70°C
Relative humidity during transport	95% at +40°C

- 1) The 8BAC0123.000-1 is an encoder module. Two encoder modules can also be inserted. In this case, the encoder module in the first slot automatically serves as motor feedback for the first axis and the encoder module in the second slot serves as motor feedback for the second axis. The second slot can be used for other purposes when in single-axis operation.
- 2) $I_{Encoder}$... Current requirements for the incremental encoder. The current requirements for the terminating resistors is already included in the formula. A voltage drop on the encoder cable of max. $2 \times 1.5 \text{ V}$ is also included (only for 5V encoder supply).
- 3) The encoder must be wired using a cable with a single shield.
- 4) An additional reserve of 60 mA is available for terminating resistors.
- 5) An additional reserve of 25 mA is available for terminating resistors.
- 6) With wire break monitoring deactivated, +/- 0.2 V is sufficient
- 7) Input filter can be configured using software.
- 8) Automatic adjustment to the selected input filter.
- 9) ACOPOSmulti plug-in modules can be used in an ACOPOSmulti inverter or power supply module; the corresponding values can be found in the technical data of the respective ACOPOSmulti inverter or power supply module.

+5V incremental encoder interface 8BAC0123.001-1



- Evaluation of incremental encoders with push, pull or push-pull outputs with no complementary signal
- Evaluation of incremental encoders with symmetrical push-pull outputs that cannot handle such high loads
- Encoder supply +5V
- Connection for temperature sensor

General information	8BAC0123.001-1
C-UL-US listed	In preparation
Module type	ACOPOSmulti plug-in module
Slot ¹⁾	Slots 1 and 2
Max. power consumption ²⁾	$P_{\text{Module}} [\text{mW}] = 25 \text{ V} * I_{\text{25VDC}} [\text{mA}]$ $I_{\text{25VDC}} [\text{mA}] = I_{\text{Encoder}} [\text{mA}] * 0.42 + 48 \text{ mA}$
Encoder connection ³⁾	8BAC0123.001-1
Connection, module-side	15-pin DSUB socket
Indicators	UP/DN LEDs
Electrical isolation	
Encoder - ACOPOSmulti	Yes
Max. encoder cable length	
Incremental encoder	25 m
SSI encoder	---
Encoder supply 5V	8BAC0123.001-1
Output voltage	5 V ± 5%
Ability to work under pressure	350 mA ⁴⁾
Sense lines	
Amount	2
Max. compensation	2 x 1.5 V
Protective measures	
Overload protection	Yes
Short circuit protection	Yes
Inputs A, B, R	8BAC0123.001-1
Single-ended signals	
Input voltage for HIGH	> 2.4 V (to COM)
Input voltage for LOW	> 1.0 V (to COM)
Maximum input voltage	-10 V / +13V (to COM)
Differential signals	
Differential voltage	±0.8 V to ±23 V ⁵⁾
Maximum input voltage	-10 V / +13 V (to COM)
Input resistance	See block diagram
Max. input frequency ⁶⁾	25 / 50 / 100 / 200 kHz
Min. edge interval ⁷⁾	2.6 / 1.3 / 0.7 / 0.4 μs

Clock output	8BAC0123.001-1
Signal transfer	RS422
Baud rate	390 kBaud
Operational conditions	8BAC0123.001-1
Ambient temperature during operation	... ⁸⁾
Relative humidity during operation	... ⁸⁾
Storage and transport conditions	8BAC0123.001-1
Storage temperature	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing
Transport temperature	-25 to +70°C
Relative humidity during transport	95% at +40°C

- 1) The 8BAC0123.001-1 is an encoder module. Two encoder modules can also be inserted. In this case, the encoder module in the first slot automatically serves as motor feedback for the first axis and the encoder module in the second slot serves as motor feedback for the second axis. The second slot can be used for other purposes when in single-axis operation.
- 2) $I_{Encoder}$... Current requirements for the incremental encoder. The current requirements for the terminating resistors is already included in the formula. A voltage drop on the encoder cable of max $2 \times 1.5 \text{ V}$ is also included.
- 3) The encoder must be wired using a cable with a single shield.
- 4) An additional reserve of 60 mA is available for terminating resistors.
- 5) With wire break monitoring deactivated, +/- 0.5 V is sufficient
- 6) Input filter can be configured using software.
- 7) Automatic adjustment to the selected input filter.
- 8) ACOPOSmulti plug-in modules can be used in an ACOPOSmulti inverter or power supply module; the corresponding values can be found in the technical data of the respective ACOPOSmulti inverter or power supply module.

+24V incremental encoder interface 8BAC0123.002-1



- Evaluation of incremental encoders with push, pull or push-pull outputs with no complementary signal
- Evaluation of incremental encoders with symmetrical push-pull outputs
- Evaluation of tracer pins or other similar rapid sensors with digital output
- Encoder supply +24V
- Connection for temperature sensor

General information	8BAC0123.002-1
C-UL-US listed	In preparation
Module type	ACOPOSmulti plug-in module
Slot ¹⁾	Slots 1 and 2
Max. power consumption ²⁾	$P_{\text{Module}} [\text{mW}] = 25 \text{ V} * I_{25\text{VDC}} [\text{mA}]$ $I_{25\text{VDC}} [\text{mA}] = I_{\text{Encoder}} [\text{mA}] * 60 \text{ mA}$
Encoder connection ³⁾	8BAC0123.002-1
Connection, module-side	15-pin DSUB socket
Indicators	UP/DN LEDs
Electrical isolation	
Encoder - ACOPOSmulti	Yes
Max. encoder cable length	25 m
Encoder supply 24V	8BAC0123.002-1
Output voltage	24 V \pm 10%
Ability to work under pressure	300 mA ⁴⁾
Sense lines	---
Protective measures	
Overload protection	Yes
Short circuit protection	Yes
Inputs A, B, R	8BAC0123.002-1
Single-ended signals	
Input voltage for HIGH	> 14 V (to COM)
Input voltage for LOW	> 5.5 V (to COM)
Maximum input voltage	-15 V / +30 V (to COM)
Differential signals	
Differential voltage	$\pm 4 \text{ V}$ to $\pm 30 \text{ V}$ (5)
Maximum input voltage	-15 V / +30 V (to COM)
Input resistance	See block diagram
Max. input frequency ⁶⁾	25 / 50 / 100 / 200 kHz
Min. edge interval ⁷⁾	2.6 / 1.3 / 0.7 / 0.4 μs
Clock output	8BAC0123.002-1
Signal transfer	---
Operational conditions	8BAC0123.002-1
Ambient temperature during operation	--- ⁸⁾
Relative humidity during operation	--- ⁸⁾
Storage and transport conditions	8BAC0123.002-1
Storage temperature	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing
Transport temperature	-25 to +70°C
Relative humidity during transport	95% at +40°C

1) The 8BAC0123.002-1 is an encoder module. Two encoder modules can also be inserted. In this case, the encoder module in the first slot automatically serves as motor feedback for the first axis and the encoder module in the second slot serves as motor feedback for the second axis. The second slot can be used for other purposes when in single-axis operation.

2) I_{Encoder} ... Current requirements for the incremental encoder. The current requirements for the terminating resistors is already included in the formula.

3) The encoder must be wired using a cable with a single shield.

4) An additional reserve of 25 mA is available for terminating resistors.

5) With wire break monitoring deactivated, +/- 2.5 V is sufficient

6) Input filter can be configured using software.

7) Automatic adjustment to the selected input filter.

8) ACOPOSmulti plug-in modules can be used in an ACOPOSmulti inverter or power supply module; the corresponding values can be found in the technical data of the respective ACOPOSmulti inverter or power supply module.



SinCos encoder interface

8BAC0124



- Evaluation of incremental encoders with sinusoidal output signal
- Encoder monitoring
- Limit switch inputs

General information	8BAC0124.000-1
C-UL-US listed	Yes
Module type	ACOPOSmulti plug-in module
Slot ¹⁾	Slots 1 and 2
Max. power consumption	$P_{\text{Module}} [\text{mW}] = 25 \text{ V} * I_{25\text{VDC}} [\text{mA}]$ $I_{25\text{VDC}} [\text{mA}] = I_{\text{Encoder}} [\text{mA}] * 0.37 + 32 \text{ mA}$
1) The 8BAC0124.000-1 is an encoder module. Up to two encoder modules can be connected. In this case, the encoder module in the first slot automatically serves as motor feedback for the first axis and the encoder module in the second slot serves as motor feedback for the second axis. The second slot can be used for other purposes when in single-axis operation.	
Encoder connection ¹⁾	8BAC0124.000-1
Connection, module-side	15-pin DSUB socket
Indicators	UP/DN LEDs
Electrical isolation	
Encoder - ACOPOSmulti	No
Encoder monitoring	Yes
Max. encoder cable length	75 m
1) The encoder must be wired using a cable with a single shield and twisted pair signal lines.	
Encoder supply	8BAC0124.000-1
Output voltage	5 V ± 5%
Ability to work under pressure	300 mA ¹⁾
Sense lines	2, compensation of max. 2 x 0.7 V
Protective measures	
Overload protection	Yes
Short circuit protection	Yes
1) An additional reserve of 12 mA is available for terminating resistors and limit switch inputs.	
Sine-cosine inputs	8BAC0124.000-1
Signal transfer	Differential signals, symmetric
Differential voltage	0.5 to 1.25 V _{ss}
Common mode voltage	Max. ±7 V
Terminating resistor	120 Ω
Signal frequency (-5 dB)	DC up to 400 kHz
Signal frequency (-3 dB)	DC up to 300 kHz
ADC resolution	12-bit
Reference input	8BAC0124.000-1
Signal transfer	Differential signal, symmetric
Differential voltage for high	≥ +0.2 V
Differential voltage for low	≤ -0.2 V
Common mode voltage	Max. ±7 V
Terminating resistor	120 Ω
Position	8BAC0124.000-1
Resolution @ 1 V _{ss} ¹⁾	Number of encoder lines * 5700
Precision ²⁾	---
Noise ²⁾	---
1) This value does not correspond to the encoder resolution that must be configured in Automation Studio (16384 * number of encoder lines).	
2) In the field, this is limited by the encoder.	

Limit switch inputs ¹⁾		8BAC0124.000-1
Number of inputs		2
Wiring		Source
Input resistance		1470 Ω
Electrical isolation		
Input - ACOPOSmulti		No
Input - Input		No
Input voltage		
Minimum		-12 V
Rated		+5 V
Maximum		+20 V
Switching threshold		
LOW		< 0.8 V
HIGH		>2 V
Switching delay		Max. 100μs

1) The measurement system offered by Heidenhain with limit switch outputs LIDA 47x, LIDA 48x and LIF4x1 was tested for compatibility.

In the field, the cable length is limited by the encoder.

Operational conditions		8BAC0124.000-1
Ambient temperature during operation		... ¹⁾
Relative humidity during operation		... ¹⁾

1) ACOPOSmulti plug-in modules can be used in an ACOPOSmulti inverter or power supply module; the corresponding values can be found in the technical data of the respective ACOPOSmulti inverter or power supply module.

Storage and transport conditions		8BAC0124.000-1
Storage temperature		-25 to +55°C
Relative humidity during storage		5 to 95%, non-condensing
Transport temperature		-25 to +70°C
Relative humidity during transport		95% at +40°C

Optional accessories			
8BCS0005.1111A-0	ACPMulti SinCos cable, length 5m, 10 x 0.14mm ² + 2 x 0.5mm ² , SinCos plug 12-pin SpeedTec socket, servo plug 15-pin. DSUB plug, can be used in cable drag chains, UL/CSA listed		1430
8BCS0007.1111A-0	ACPMulti SinCos cable, length 7m, 10 x 0.14mm ² + 2 x 0.5mm ² , SinCos plug 12-pin SpeedTec socket, servo plug 15-pin. DSUB plug, can be used in cable drag chains, UL/CSA listed		1430
8BCS0010.1111A-0	ACPMulti SinCos cable, length 10m, 10 x 0.14mm ² + 2 x 0.5mm ² , SinCos plug 12-pin SpeedTec socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed		1430
8BCS0015.1111A-0	ACPMulti SinCos cable, length 15m, 10 x 0.14mm ² + 2 x 0.5mm ² , SinCos plug 12-pin SpeedTec socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed		1430
8BCS0020.1111A-0	ACPMulti SinCos cable, length 20m, 10 x 0.14mm ² + 2 x 0.5mm ² , SinCos plug 12-pin SpeedTec socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed		1430
8BCS0025.1111A-0	ACPMulti SinCos cable, length 25m, 10 x 0.14mm ² + 2 x 0.5mm ² , SinCos plug 12-pin SpeedTec socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed		1430

Analog In interface 8BAC0132



- 4 high-speed analog inputs ± 10 V

General information	8BAC0132.000-1
C-UL-US listed	In preparation
Module type	ACOPOSmulti plug-in module
Slot	Slots 1 and 2
Max. power consumption	In preparation
Module connection	8BAC0132.000-1
Connection, module-side	10-pin connector
Indicators	UP-LED (module OK) and DN-LED (module NOT_OK)
Analog inputs	8BAC0132.000-1
Number of inputs	4
Design	Differential input
Electrical isolation	
Input - ACOPOSmulti	Yes
Input - Input	No
Input signal	
Rated	-10 V to +10 V
Maximum	-15 V to +15 V
Operating mode	Cyclic measurement synchronous to 50 μ s
Digital converter resolution	14 BIT
Non-linearity	± 1 LSB
Conversion procedure	Successive approximation
Input conversion times	In preparation
Differential input impedance	> 10 MOhm
Input filter	Analog low pass 3rd order / cut-off frequency: 30 kHz
Common-mode rejection	
DC	In preparation
50 Hz	In preparation
Operational conditions	8BAC0132.000-1
Ambient temperature during operation	... ¹⁾
Relative humidity during operation	... ¹⁾
1) ACOPOSmulti plug-in modules can be used in an ACOPOSmulti inverter or power supply module; the corresponding values can be found in the technical data of the respective ACOPOSmulti inverter or power supply module.	
Storage and transport conditions	8BAC0132.000-1
Storage temperature	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing
Transport temperature	-25 to +70°C
Relative humidity during transport	95% at +40°C

Required accessories		
0TB1110.8010	Accessory terminal block(3.5), 10 pins screw clamp 1,5 sq. mm, protected against vibration by the screw flange	1718
0TB1110.8110	Accessory terminal block(3.5), 10 pins cage clamp 1,5 sq. mm, protected against vibration by the screw flange	1718

Motor cable 1.5 mm² 8BCM



- UL/CSA listed
- Can be used in cable drag chains
- Optimally produced for use with ACOPOSmulti drive systems and B&R servo motors with motor plug size 1
- SpeedTEC® - innovative connector system for secure connections
- Shield plate integrated

Available from production in six different lengths: ¹⁾

Cable length	Model number
5 m	8BCM0005.1111A-0
7 m	8BCM0007.1111A-0
10 m	8BCM0010.1111A-0
15 m	8BCM0015.1111A-0
20 m	8BCM0020.1111A-0
25 m	8BCM0025.1111A-0

¹⁾ Custom fabrications are available upon request.

General information	8BCMxxxx.1111A-0
Cable cross section	4 x 1.5 mm ² + 2 x 2 x 0.75 mm ²
Durability	Oil resistant according to VDE 0472 part 803, as well as standard hydraulic oil
Certification	UL AWM Style 20234, 80°C, 1000 V, E63216 and CSA AWM I/II A/B, 90°C, 1000 V, FT2 LL46064
Lines	8BCMxxxx.1111A-0
Power lines	1.5 mm ² , tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	Black, brown, blue, yellow/green
Signal lines	0.75 mm ² , tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	White, white/red, white/blue, white/green
Cable structure	8BCMxxxx.1111A-0
Power lines	
Stranding	No
Shield	No
Signal lines	
Stranding	White with white/red and white/blue with white/green
Shield	Separate shielding for pairs, tinned Cu mesh, optical coverage 85% > and foil banding
Cable stranding	With filler elements and foil banding
Cable shielding	Tinned Cu mesh, optical coverage 85% and wrapped in isolating fabric
Outer sheathing	
Material	PUR
Color	Orange, similar to RAL 2003 flat
Labeling	BERNECKER + RAINER 4x1.5+2x2x0.75 FLEX
Electrical characteristics	8BCMxxxx.1111A-0
Conductor resistance	
Power lines	≤ 14 Ω/km
Signal lines	≤ 19 Ω/km
Insulation resistance	> 200 Ω/km
Test voltage	
Wire/wire	3 kV
Wire/shield	3 kV
Operating voltage	Max. 1000 V
Mechanical characteristics	8BCMxxxx.1111A-0
Temperature range	
Moving	-10°C to +70°C
Static	-20°C to +90°C
Outer diameter	12.8 mm ± 0.4 mm
Flex radius	>96 mm
Speed	≤ 4 m/s
Acceleration	< 60 m/s ²
Flex cycles	≥ 3,000,000
Weight	0.26 kg/m

Motor cable 4 mm² 8BCM



- UL/CSA certified
- Can be used in cable drag chains
- Produced for optimal Use with ACOPOSmulti drive systems and B&R servo motors with motor plug size 1
- SpeedTEC® - innovative connector system for secure connections
- Shield plate integrated

Available from production in six different lengths: ¹⁾

Cable length	Model number
5 m	8BCM0005.1312A-0
7 m	8BCM0007.1312A-0
10 m	8BCM0010.1312A-0
15 m	8BCM0015.1312A-0
20 m	8BCM0020.1312A-0
25 m	8BCM0025.1312A-0

¹⁾ Custom fabrications are available upon request.

General information	8BCMxxxx.1312A-0
Cable cross section	4 x 4 mm ² + 2 x 2 x 1 mm ²
Durability	Oil resistant according to VDE 0472 part 803, as well as standard hydraulic oil
Certification	UL AWM Style 20234, 80°C, 1000 V, E63216 and CSA AWM I/II A/B, 90°C, 1000 V, FT2 LL46064
Lines	8BCMxxxx.1312A-0
Power lines	4 mm ² , tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	Black, brown, blue, yellow/green
Signal lines	1 mm ² , tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	White, white/red, white/blue, white/green
Cable structure	8BCMxxxx.1312A-0
Power lines	
Stranding	No
Shield	No
Signal lines	
Stranding	White with white/red and white/blue with white/green
Shield	Separate shielding for pairs, tinned Cu mesh, optical coverage 85% > and foil banding
Cable stranding	With filler elements and foil banding
Cable shielding	Tinned Cu mesh, optical coverage 85% and wrapped in isolating fabric
Outer sheathing	
Material	PUR
Color	Orange, similar to RAL 2003 flat
Labeling	BERNECKER + RAINER 4x4.0+2x2x1.0 FLEX
Electrical characteristics	8BCMxxxx.1312A-0
Conductor resistance	
Power lines	≤ 5.2 Ω/km
Signal lines	≤ 19 Ω/km
Insulation resistance	> 200 MΩ/km
Test voltage	
Wire/wire	3 kV
Wire/shield	3 kV
Operating voltage	Max. 1000 V
Mechanical characteristics	8BCMxxxx.1312A-0
Temperature range	
Moving	-10°C to +70°C
Static	-20°C to +90°C
Outer diameter	15.8 mm ± 0.5 mm
Flex radius	> 118.5 mm
Speed	≤ 4 m/s
Acceleration	< 60 m/s ²
Flex cycles	≥ 3,000,000
Weight	0.45 kg/m

Motor cable 10 mm² 8BCM



- UL/CSA certified
- Can be used in cable drag chains
- Produced for optimal Use with ACOPOSmulti drive systems and B&R servo motors with motor plug size 1.5
- SpeedTEC® - innovative connector system for secure connections
- Shield plate integrated

Available from production in six different lengths: ¹⁾

Cable length	Model number
5 m	8BCM0005.1523A-0
7 m	8BCM0007.1523A-0
10 m	8BCM0010.1523A-0
15 m	8BCM0015.1523A-0
20 m	8BCM0020.1523A-0
25 m	8BCM0025.1523A-0

¹⁾ Custom fabrications are available upon request.

General information	8BCMxxxx.1523A-0
Cable cross section	4 x 10 mm ² + 2 x 2 x 1.5 mm ²
Durability	Oil resistant according to VDE 0472 part 803, as well as standard hydraulic oil
Certification	UL AWM Style 20234, 80°C, 1000 V, E63216 and CSA AWM I/II A/B, 90°C, 1000 V, FT2 LL46064
Lines	8BCMxxxx.1523A-0
Power lines	10 mm ² , tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	Black, brown, blue, yellow/green
Signal lines	1.5 mm ² , tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	White, white/red, white/blue, white/green
Cable structure	8BCMxxxx.1523A-0
Power lines	
Stranding	No
Shield	No
Signal lines	
Stranding	White with white/red and white/blue with white/green
Shield	Separate shielding for pairs, tinned Cu mesh, optical coverage 85% > and foil banding
Cable stranding	With filler elements and foil banding
Cable shielding	Tinned Cu mesh, optical coverage 85% and wrapped in isolating fabric
Outer sheathing	
Material	PUR
Color	Orange, similar to RAL 2003 flat
Labeling	BERNECKER + RAINER 4x10.0+2x2x1.5 FLEX
Electrical characteristics	8BCMxxxx.1523A-0
Conductor resistance	
Power lines	≤ 2.1 Ω/km
Signal lines	≤ 19 Ω/km
Insulation resistance	> 200 MΩ/km
Test voltage	
Wire/wire	3 kV
Wire/shield	3 kV
Operating voltage	Max. 1000 V
Mechanical characteristics	8BCMxxxx.1523A-0
Temperature range	
Moving	-10°C to +70°C
Static	-20°C to +90°C
Outer diameter	20.1 mm ± 0.7 mm
Flex radius	>150.8 mm
Speed	≤ 4 m/s
Acceleration	< 60 m/s ²
Flex cycles	≥ 3,000,000
Weight	0.77 kg/m

EnDat cables 8BCE



- UL/CSA certified
- can be used in cable drag chains
- Optimally produced for use with ACOPOSmulti drive systems and B&R servo motors
- SpeedTEC® - innovative plug system for sure connections

Available from production in six different lengths: ¹⁾

Cable length	Model number
5 m	8BCE0005.1111A-0
7 m	8BCE0007.1111A-0
10 m	8BCE0010.1111A-0
15 m	8BCE0015.1111A-0
20 m	8BCE0020.1111A-0
25 m	8BCE0025.1111A-0

¹⁾ Custom fabrications are available upon request.

General information	8BCExxxx.1111A-0
Cable cross section	10 x 0.14 mm ² + 2 x 0.50 mm ²
Durability	Oil resistant according to VDE 0472 part 803, as well as standard hydraulic oil
Certification	UL AWM Style 20963, 80°C, 30 V, E63216 and CSA AWM I/II A/B, 90°C, 30 V, FT1 LL46064
Lines	8BCExxxx.1111A-0
Signal lines	0.14 mm ² , tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	Blue, brown, yellow, gray, green, pink, red, black, violet, white
Supply lines	0.5 mm ² , tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	White/green, white/red
Cable structure	8BCExxxx.1111A-0
Signal lines	
Stranding	Green with brown, gray with yellow, white with violet, black with red, pink with blue
Shield	No
Supply lines	
Stranding	White/red with white/green and filler elements
Shield	No
Cable stranding	With foil banding
Cable shielding	Cu mesh, optical coverage 85% and wrapped in isolating fabric
Outer sheathing	
Material	PUR
Color	RAL 6018
Labeling	BERNECKER + RAINER 10x0.14+2x0.50 FLEX
Electrical characteristics	8BCExxxx.1111A-0
Conductor resistance	
Signal lines	≤ 140 Ω/km
Supply lines	≤ 40 Ω/km
Insulation resistance	> 200 MΩ/km
Test voltage	
Wire/wire	1.5 kV
Wire/shield	0.8 kV
Operating voltage	Max. 30 V
Mechanical characteristics	8BCExxxx.1111A-0
Temperature range	
Moving	-10°C to +70°C
Static	-20°C to +90°C
Outer diameter	7.3 mm ± 0.25 mm
Flex radius	> 55 mm
Speed	≤ 4 m/s
Acceleration	< 60 m/s ²
Flex cycles	≥ 3,000,000
Weight	0.08 kg/m

Resolver cables 8BCR



- UL/CSA certified
- can be used in cable drag chains
- Optimally produced for Use with ACOPOSmulti drive systems and B&R servo motors
- SpeedTEC® - innovative connector system for secure connections

Available from production in six different lengths: ¹⁾

Cable length	Model number
5 m	8BCR0005.1111A-0
7 m	8BCR0007.1111A-0
10 m	8BCR0010.1111A-0
15 m	8BCR0015.1111A-0
20 m	8BCR0020.1111A-0
25 m	8BCR0025.1111A-0

¹⁾ Custom fabrications are available upon request.

General information	8BCRxxxx.1111A-0
Cable cross section	3 x 2 x 24 AWG/19
Durability	Oil resistant according to VDE 0472 part 803, as well as standard hydraulic oil
Certification	UL AWM Style 20671, 90°C, 30 V, E63216 and CSA AWM, 90°C, 30 V, I/II A/B FT1 LL46064
Lines	8BCRxxxx.1311A-0
Signal lines	24 AWG/19, tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	White, brown, green, yellow, gray, pink
Cable structure	8BCRxxxx.1111A-0
Signal lines	
Stranding	White with brown, green with yellow, gray with pink
Shield	No
Cable stranding	The 3 pairs together covered by foil banding
Cable shielding	Cu mesh, optical coverage $\geq 90\%$ and wrapped in isolating fabric
Outer sheathing	
Material	PUR
Color	RAL 6018
Labeling	BERNECKER + RAINER 3x2x24 AWG FLEX
Electrical characteristics	8BCRxxxx.1111A-0
Conductor resistance 24 AWG	$\leq 86 \Omega/\text{km}$
Insulation resistance	$> 200 \text{ M}\Omega/\text{km}$
Test voltage	
Wire/wire	1.5 kV
Wire/shield	0.8 kV
Operating voltage	Max. 30 V
Mechanical characteristics	8BCRxxxx.1111A-0
Temperature range	
Moving	-10°C to +80°C
Static	-40°C to +90°C
Outer diameter	6.5 mm \pm 0.2 mm
Flex radius	≥ 50 mm
Speed	≤ 4 m/s
Acceleration	< 60 m/s ²
Flex cycles	$\geq 3,000,000$
Weight	0.07 kg/m

SinCos cable 8BCS



- UL/CSA certified
- can be used in cable drag chains
- Optimally produced for Use with ACOPOSmulti drive systems and B&R servo motors
- SpeedTEC® - innovative connector system for secure connections

Available from production in six different lengths: ¹⁾

Cable length	Model number
5 m	8BCS0005.1111A-0
7 m	8BCS0007.1111A-0
10 m	8BCS0010.1111A-0
15 m	8BCS0015.1111A-0
20 m	8BCS0020.1111A-0
25 m	8BCS0025.1111A-0

¹⁾ Custom fabrications are available upon request.

General information	8BCSxxxx.1111A-0
Cable cross section	10 x 0.14 mm ² + 2 x 0.50 mm ²
Durability	Oil resistant according to VDE 0472 part 803, as well as standard hydraulic oil
Certification	UL AWM Style 20963, 80°C, 30 V, E63216 and CSA AWM I/II A/B, 90°C, 30 V, FT1 LL46064
Lines	8BCSxxxx.1111A-0
Signal lines	0.14 mm ² , tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	Blue, brown, yellow, gray, green, pink, red, black, violet, white
Supply lines	0.5 mm ² , tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	White/green, white/red
Cable structure	8BCSxxxx.1111A-0
Signal lines	
Stranding	Green with brown, gray with yellow, white with violet, black with red, pink with blue
Shield	No
Supply lines	
Stranding	White/red with white/green and filler elements
Shield	No
Cable stranding	With foil banding
Cable shielding	Cu mesh, optical coverage 85% and wrapped in isolating fabric
Outer sheathing	
Material	PUR
Color	RAL 6018
Labeling	BERNECKER + RAINER 10x0.14+2x0.50 FLEX
Electrical characteristics	8BCSxxxx.1111A-0
Conductor resistance	
Signal lines	≤ 140 Ω/km
Supply lines	≤ 40 Ω/km
Insulation resistance	> 200 MΩ/km
Test voltage	
Wire/wire	1.5 kV
Wire/shield	0.8 kV
Operating voltage	Max. 30 V
Mechanical characteristics	8BCSxxxx.1111A-0
Temperature range	
Moving	-10°C to +70°C
Static	-20°C to +90°C
Outer diameter	7.3 mm ± 0.25 mm
Flex radius	> 55 mm
Speed	≤ 4 m/s
Acceleration	< 60 m/s ²
Flex cycles	≥ 3,000,000
Weight	0.08 kg/m

Expansion cable 1.5 mm² 8BCA



- UL/CSA listed
- Can be used in drag chains
- Shield plates integrated

Available from production in three different lengths: ¹⁾

Cable length	Model number
1.5 m	8BCA01X5.1111A-0
3 m	8BCA0003.1111A-0
5 m	8BCM0005.1111A-0

¹⁾ Custom fabrications are available upon request.

General information	8BCAxxxx.1111A-0
Cable cross section	3 x 1.5 mm ²
Durability	Oil resistant according to VDE 0472 part 803, as well as standard hydraulic oil
Certification	UL AWM Style 20234, 80°C, 1000 V, E63216 and CSA AWM I/II A/B, 90°C, 1000 V, FT2 LL46064
Lines	8BCAxxxx.1111A-0
Power lines	1.5 mm ² , tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	Black, brown, yellow/green
Cable structure	8BCAxxxx.1111A-0
Power lines	
Stranding	No
Shield	No
Cable stranding	With filler elements and foil banding
Cable shielding	Tinned Cu mesh, optical coverage 85% and wrapped in isolating fabric
Outer sheathing	
Material	PUR
Color	Orange, similar to RAL 2003 flat
Labeling	BERNECKER + RAINER 4x1.5+2x2x0.75 FLEX
Electrical characteristics	8BCAxxxx.1111A-0
Conductor resistance	≤ 14 Ω/km
Insulation resistance	> 200 Ω/km
Test voltage	
Wire/wire	3 kV
Wire/shield	3 kV
Operating voltage	Max. 1000 V
Mechanical characteristics	8BCAxxxx.1111A-0
Temperature range	
Moving	-10°C to +70°C
Static	-20°C to +90°C
Outer diameter	12.8 mm ± 0.4 mm
Flex radius	>96 mm
Speed	≤ 4 m/s
Acceleration	< 60 m/s ²
Flex cycles	≥ 3,000,000
Weight	0.26 kg/m

Expansion cable 4 mm² 8BCA



- UL/CSA certified
- Can be used in cable drag chains
- Shield plates integrated

Available from production in three different lengths: ¹⁾

Cable length	Model number
1.5 m	8BCA01X5.1312A-0
3 m	8BCA0003.1312A-0
5 m	8BCA0005.1312A-0

¹⁾ Custom fabrications are available upon request.

General information	8BCMxxxx.1312A-0
Cable cross section	3 x 4 mm ²
Durability	Oil resistant according to VDE 0472 part 803, as well as standard hydraulic oil
Certification	UL AWM Style 20234, 80°C, 1000 V, E63216 and CSA AWM I/II A/B, 90°C, 1000 V, FT2 LL46064
Lines	8BCMxxxx.1312A-0
Power lines	4 mm ² , tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	Black, brown, yellow/green
Cable structure	8BCMxxxx.1312A-0
Power lines	
Stranding	No
Shield	No
Cable stranding	With filler elements and foil banding
Cable shielding	Tinned Cu mesh, optical coverage 85% and wrapped in isolating fabric
Outer sheathing	
Material	PUR
Color	Orange, similar to RAL 2003 flat
Labeling	BERNECKER + RAINER 4x4.0+2x2x1.0 FLEX
Electrical characteristics	8BCMxxxx.1312A-0
Conductor resistance	≤ 5.2 Ω/km
Insulation resistance	> 200 MΩ/km
Test voltage	
Wire/wire	3 kV
Wire/shield	3 kV
Operating voltage	Max. 1000 V
Mechanical characteristics	8BCMxxxx.1312A-0
Temperature range	
Moving	-10°C to +70°C
Static	-20°C to +90°C
Outer diameter	15.8 mm ± 0.5 mm
Flex radius	> 118.5 mm
Speed	≤ 4 m/s
Acceleration	< 60 m/s ²
Flex cycles	≥ 3,000,000
Weight	0.45 kg/m

Expansion cable 10 mm² 8BCA



- UL/CSA certified
- Can be used in cable drag chains
- Shield plates integrated

Available from production in three different lengths: ¹⁾

Cable length	Model number
1.5 m	8BCA01X5.1513A-0
3 m	8BCA0003.1513A-0
5 m	8BCM0005.1513A-0

¹⁾ Custom fabrications are available upon request.

General information	8BCAxxxx.1513A-0
Cable cross section	3 x 10 mm ² + 2 x 2 x 1 mm ²
Durability	Oil resistant according to VDE 0472 part 803, as well as standard hydraulic oil
Certification	UL AWM Style 20234, 80°C, 1000 V, E63216 and CSA AWM I/II A/B, 90°C, 1000 V, FT2 LL46064
Lines	8BCAxxxx.1513A-0
Power lines	10 mm ² , tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	Black, brown, yellow/green
Cable structure	8BCAxxxx.1513A-0
Power lines	
Stranding	No
Shield	No
Cable stranding	With filler elements and foil banding
Cable shielding	Tinned Cu mesh, optical coverage 85% and wrapped in isolating fabric
Outer sheathing	
Material	PUR
Color	Orange, similar to RAL 2003 flat
Labeling	BERNECKER + RAINER 4x10.0+2x2x1.5 FLEX
Electrical characteristics	8BCAxxxx.1513A-0
Conductor resistance	≤ 2.1 Ω/km
Insulation resistance	> 200 MΩ/km
Test voltage	
Wire/wire	3 kV
Wire/shield	3 kV
Operating voltage	Max. 1000 V
Mechanical characteristics	8BCAxxxx.1513A-0
Temperature range	
Moving	-10°C to +70°C
Static	-20°C to +90°C
Outer diameter	20.1 mm ± 0.7 mm
Flex radius	> 150.8 mm
Speed	≤ 4 m/s
Acceleration	< 60 m/s ²
Flex cycles	≥ 3,000,000
Weight	0.77 kg/m

Terminals 8TB



Brief overview	8TB2104.2010-00	8TB2104.203F-00	8TB2104.203L-00
Number of pins	4	4	4
Coding	0	F	L
Type of terminal	Screw clamps	Screw clamps	Screw clamps
Distance between contacts	5.08 mm	5.08 mm	5.08 mm
Rated voltage	300 V	300 V	300 V
Rated current	10 A	10 A	10 A
Connection cross section			
AWG wire	24 - 12 AWG	24 - 12 AWG	24 - 12 AWG
Solid wire line	0.2 - 2.5 mm ²	0.2 - 2.5 mm ²	0.2 - 2.5 mm ²
Fine wire line without wire tip sleeves	0.2 - 2.5 mm ²	0.2 - 2.5 mm ²	0.2 - 2.5 mm ²
Fine wire line with wire tip sleeves	0.25 - 2.5 mm ²	0.25 - 2.5 mm ²	0.25 - 2.5 mm ²
Wire tip sleeves with plastic covering	0.25 - 2.5 mm ²	0.25 - 2.5 mm ²	0.25 - 2.5 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Label 1: numbered serially 0 coding: None Rated values according to UL	Label 3: T- T+ B- B+ F coding: 0101 Rated values according to UL	Label 3: T- T+ B- B+ L coding: 1010 Rated values according to UL



Brief overview	8TB2104.204A-00	8TB2106.2010-00	8TB2108.2010-00
Number of pins	4	6	8
Coding	A	0	0
Type of terminal	Screw clamps	Screw clamps	Screw clamps
Distance between contacts	5.08 mm	5.08 mm	5.08 mm
Rated voltage	300 V	300 V	300 V
Rated current	10 A	10 A	10 A
Connection cross section			
AWG wire	24 - 12 AWG	24 - 12 AWG	24 - 12 AWG
Solid wire line	0.2 - 2.5 mm ²	0.2 - 2.5 mm ²	0.2 - 2.5 mm ²
Fine wire line without wire tip sleeves	0.2 - 2.5 mm ²	0.2 - 2.5 mm ²	0.2 - 2.5 mm ²
Fine wire line with wire tip sleeves	0.25 - 2.5 mm ²	0.25 - 2.5 mm ²	0.25 - 2.5 mm ²
Wire tip sleeves with plastic covering	0.25 - 2.5 mm ²	0.25 - 2.5 mm ²	0.25 - 2.5 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Label 4: T- T+ F- F+ A coding: 0000 Rated values according to UL	Label 1: numbered serially 0 coding: None Rated values according to UL	Label 1: numbered serially 0 coding: None Rated values according to UL

Terminals 8TB



Brief overview	8TB2112.2010-00	8TB3102.201C-10	8TB3104.201H-10
Number of pins	12	2	4
Coding	0	C	H
Type of terminal	Screw clamps	Screw clamps	Screw clamps
Distance between contacts	5.08 mm	7.62 mm	7.62 mm
Rated voltage	300 V	600 V	600 V
Rated current	10 A	30 A	30 A
Connection cross section			
AWG wire	24 - 12 AWG	24 - 10 AWG	24 - 10 AWG
Solid wire line	0.2 - 2.5 mm ²	0.2 - 10 mm ²	0.2 - 10 mm ²
Fine wire line without wire tip sleeves	0.2 - 2.5 mm ²	0.2 - 6 mm ²	0.2 - 6 mm ²
Fine wire line with wire tip sleeves	0.25 - 2.5 mm ²	0.25 - 6 mm ²	0.25 - 6 mm ²
Wire tip sleeves with plastic covering	0.25 - 2.5 mm ²	0.25 - 4 mm ²	0.25 - 4 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Label 1: numbered serially 0 coding: None Rated values according to UL	Label 1: numbered serially C coding: 10 Rated values according to UL	Label 1: numbered serially H coding: 0111 Rated values according to UL



Brief overview	8TB3104.201M-10	8TB3104.204G-00	8TB3104.204K-00
Number of pins	4	4	4
Coding	M	G	K
Type of terminal	Screw clamps	Screw clamps	Screw clamps
Distance between contacts	7.62 mm	7.62 mm	7.62 mm
Rated voltage	600 V	600 V	600 V
Rated current	30 A	20 A	20 A
Connection cross section			
AWG wire	24 - 10 AWG	24 - 10 AWG	24 - 10 AWG
Solid wire line	0.2 - 10 mm ²	0.2 - 4 mm ²	0.2 - 4 mm ²
Fine wire line without wire tip sleeves	0.2 - 6 mm ²	0.2 - 4 mm ²	0.2 - 4 mm ²
Fine wire line with wire tip sleeves	0.25 - 6 mm ²	0.25 - 4 mm ²	0.25 - 4 mm ²
Wire tip sleeves with plastic covering	0.25 - 4 mm ²	0.25 - 4 mm ²	0.25 - 4 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Label 1: numbered serially M coding: 1011 Rated values according to UL	Label 4: PE W V U G coding: 0110 Rated values according to UL	Label 4: PE W V U K coding: 1001 Rated values according to UL

Terminals 8TB



Brief overview	8TB4103.203C-10	8TB4104.202N-10	8TB4104.202L-10
Number of pins	3	4	4
Coding	C	N	L
Type of terminal	Screw clamps	Screw clamps	Screw clamps
Distance between contacts	10.16 mm	10.16 mm	10.16 mm
Rated voltage	600 V	600 V	600 V
Rated current	55 A	55 A	55 A
Connection cross section			
AWG wire	18 - 6 AWG	18 - 6 AWG	18 - 6 AWG
Solid wire line	0.75 - 16 mm ²	0.75 - 16 mm ²	0.75 - 16 mm ²
Fine wire line without wire tip sleeves	0.75 - 16 mm ²	0.75 - 16 mm ²	0.75 - 16 mm ²
Fine wire line with wire tip sleeves	0.5 - 16 mm ²	0.5 - 16 mm ²	0.5 - 16 mm ²
Wire tip sleeves with plastic covering	0.5 - 16 mm ²	0.5 - 16 mm	0.5 - 16 mm
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Label 3: +DC -DC PE C coding: 010 Rated values according to UL	Label 2: L1 L2 L3 PE N coding: 1100 Rated values according to UL	Label 2: L1 L2 L3 PE L coding: 1010 Rated values according to UL



Brief overview	8TB4104.206D-10	8TB4104.204G-00	8TB4104.204G-10
Number of pins	4	4	4
Coding	D	G	G
Type of terminal	Screw clamps	Screw clamps	Screw clamps
Distance between contacts	10.16 mm	10.16 mm	10.16 mm
Rated voltage	600 V	600 V	600 V
Rated current	55 A	50 A	55 A
Connection cross section			
AWG wire	18 - 6 AWG	18 - 8 AWG	18 - 6 AWG
Solid wire line	0.75 - 16 mm ²	0.75 - 10 mm ²	0.75 - 16 mm ²
Fine wire line without wire tip sleeves	0.75 - 16 mm ²	0.75 - 6 mm ²	0.75 - 16 mm ²
Fine wire line with wire tip sleeves	0.5 - 16 mm ²	0.5 - 6 mm ²	0.5 - 16 mm ²
Wire tip sleeves with plastic covering	0.5 - 16 mm ²	0.5 - 6 mm	0.5 - 16 mm
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Label 2: L1' L2' L3' PE D coding: 0011 Rated values according to UL	Label 4: PE W V U G coding: 0110 Rated values according to UL	Label 4: PE W V U G coding: 0110 Rated values according to UL

Shield component sets 8SCS



Brief overview

Contents of delivery

8SCS000.0000-00

1 shield plate 1x type 0
1 hose clamp, W 9 mm, D 12-22 mm

8SCS001.0000-00

1 shield plate, 4x, type 1
1 hose clamp, W 9 mm, D 12-22 mm

8SCS002.0000-00

1 clamping plate
2 clamps D 4-13.5 mm
2 screws



Brief overview

Contents of delivery

8SCS003.0000-00

1 shield mounting plate, 4x, 45°
8 screws

8SCS004.0000-00

1 shield plate, 4x, type 0
2 hose clamps, W 9 mm, D 32-50 mm

8SCS005.0000-00

1 slot cover shield sheet

Shield component sets / fan modules 8SCS / 8BXF



Brief overview

Contents of delivery

8SCS007.0000-00

1 shield mounting plate, 2x, 45°
4 screws

8SCS008.0000-00

1 shield plate, 2x, type 0
1 hose clamp, W 9 mm, D 23-35 mm



Brief overview

Comment

8BXF001.0000-00

Replacement fan for ACOPOSmulti modules
(8BVP/8B0C/8BVI/8BVE/8B0K)

8BXF002.0000-00

Replacement fan for mounting plates
8B0MxxxxHWxx.xxx-x



Stepper motors

The market demands cost-effective solutions.
To answer this demand, B&R offers their stepper motors as a cost-effective and powerful addition to the existing product portfolio.

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System characteristics

Areas of use

Over 500 million stepper motors are assembled worldwide each year. Although most of these motors are used in very simple applications, the trend is also continuing to grow in applications that were handled strictly by DC and BLDC motors in the past. High grade controllers continue to enable more complex tasks to be solved. Many applications that were solved using smaller servo motors in the past can now be handled by a stepper motor with the corresponding electronics.

Not only the controller possibilities have advanced over the last few years, but the motors themselves are running considerably smoother and with stronger torque values thanks to improved technologies. New, robust and even affordable position feedback possibilities are also playing their part in opening up new areas of application for stepper motors.

Of course stepper motor solutions also have their limitations. Particularly high speeds, easily achieved by servos, often mean the end of implementation possibilities for a stepper motor. However, dealing with gearing solutions can create many chances to succeed with a small conversion or even without any gears at all. The reason for this is the high torque that can be achieved with stepper motors in the low to middle speed range.

Choosing the right motor

Choosing a motor can introduce many hurdles for the user. Motors from different manufacturers or even motor generations can have considerable differences. The standard specifications in the data sheets often do not provide enough information to make this decision. Only detailed information can reliably indicate the possible areas of use. Parameters such as concentricity, counter EMF, efficiency, resonance frequencies, etc., become more important the more complex the application is.

With careful decision making, stepper motors can be used for many more applications than is the case today. Special attention must be given to the properties that are particularly important for the respective applications. These properties often cannot be reached until used in combination with the drive.

Concentricity and angular precision

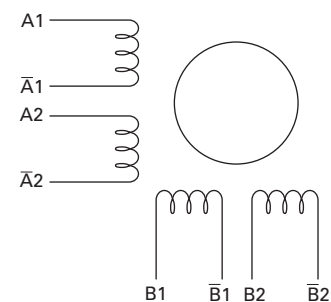
A majority of the 2-phase hybrid stepper motors have a stepping angle of 1.8 degrees. In addition to this however, are the versions with 0.9 degrees and the even less common with 0.45 degrees. The smaller stepping angle often results in a worse torque curve. Only stepper motor drivers that support micro-steps can then be used to achieve higher positioning accuracy. Moreover, a high step resolution produces excellent concentricity properties and reduces potential problems resulting from resonance effects.

Positioning accuracy

The degree of precision achieved by the set position depends on the applied load torque as well as the manufacturing accuracy of the stepper motor. The amount of positioning accuracy within one step is always dependent on the load and the resulting angular slip. However, this can never be higher than one full step because otherwise the motor gets out of sync and steps are lost. The best way to compensate for this load angle is via position feedback. This is why all B&R stepper motors are also available in affordable encoder variations, which achieve a resolution of up to 12 bits. Therefore, positioning precision is possible with an angular deviation of less than 0.1 degrees, even under considerable load torque.

Highlights of the B&R stepper motors

- High torque
- High overload capability
- Cost-effective encoder option
- Able to be operated in parallel and serially



Schematic diagram of a stepper motor in 8-line design



Product overview

Stepper motors



Model number	Short description	
80MPD1.300S000-01	Stepper motor, 2-pin, 56 mm flange, length 45 mm, 3 A serial / 6 A parallel	1450
80MPD3.300S000-01	Stepper motor, 2-pin, 56 mm flange, length 57.5 mm, 3 A serial / 6 A parallel	1451
80MPD5.300S000-01	Stepper motor, 2-pin, 56 mm flange, length 80.5 mm, 3 A serial / 6 A parallel	1452
80MPH1.300S000-01	Stepper motor, 2-pin, 86 mm flange, length 66 mm, 3 A serial / 6 A parallel	1453
80MPH3.300S000-01	Stepper motor, 2-pin, 86 mm flange, length 98 mm, 3 A serial / 6 A parallel	1454
80MPH4.300S000-01	Stepper motor, 2-pin, 86 mm flange, length 98 mm, 3 A serial / 6 A parallel	1455
80MPH4.500S000-01	Stepper motor, 2-pin, 86 mm flange, length 98 mm, 5 A serial / 10 A parallel	1456
80MPH6.300S000-01	Stepper motor, 2-pin, 86 mm flange, length 130 mm, 3 A serial / 6 A parallel	1457

Overview

Flange size 56 mm



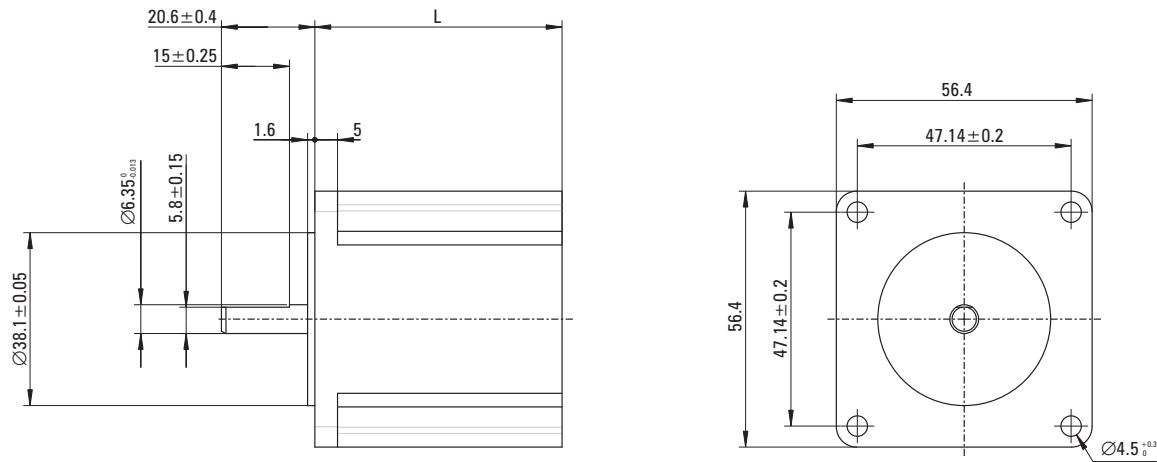
Motor	80MPD1.300S000-01		80MPD3.300S000-01		80MPD5.300S000-01	
Length [mm]	45		57.5		80.5	
Wiring	Serial	Parallel	Serial	Parallel	Serial	Parallel
Current [A]	3	6	3	6	3	6
Resistance / phase [Ω]	1.2	0.3	1.6	0.4	2.4	0.6
Inductance / phase [mH]	2.7	0.9	5.2	1.3	8.8	2.2
Stall torque [Nm]	0.8		1.25		2.2	
Holding torque [Nm]	1.1		1.8		3.0	
Detent torque [mNm]	<30		<50		<90	
Stepping angle [$^\circ$]	1.8		1.8		1.8	
	1450		1451		1452	

Flange size 86 mm

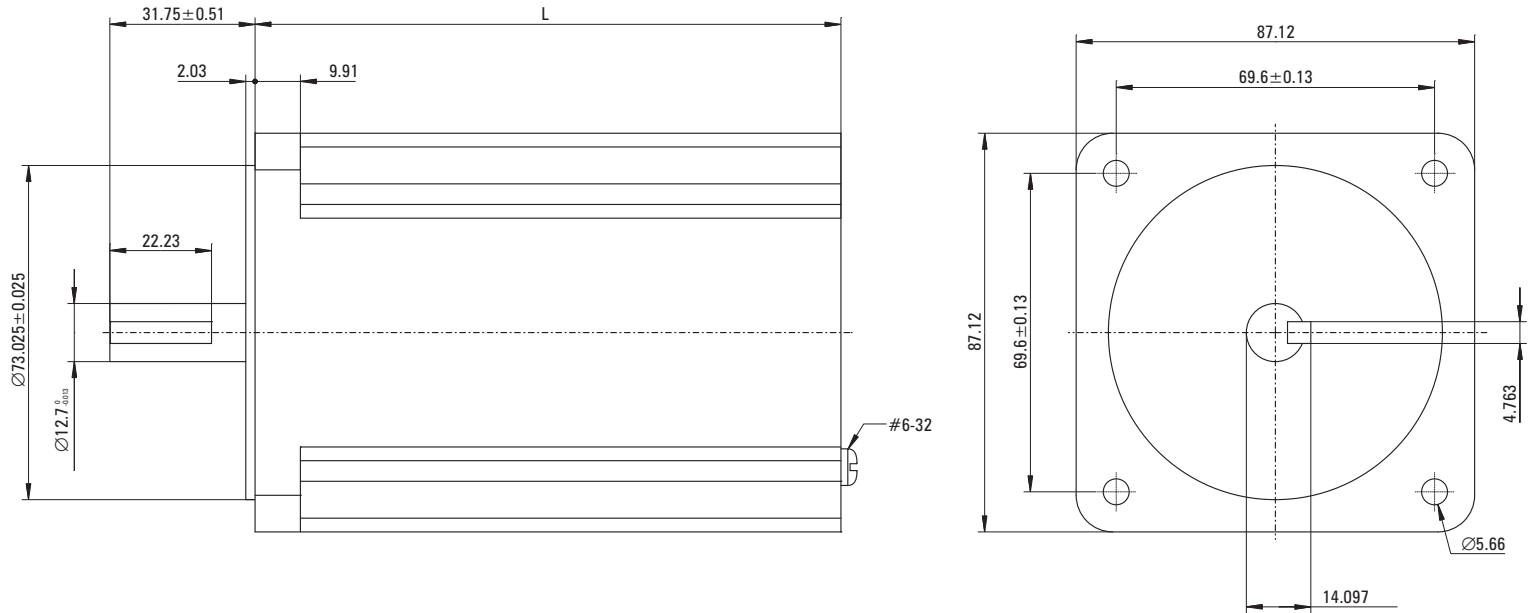


Motor	80MPH1.300S000-01		80MPH3.300S000-01		80MPH4.300S000-01		80MPH4.500S000-01		80MPH6.300S000-01	
Length [mm]	66		98		98		98		130	
Wiring	Serial	Parallel	Serial	Parallel	Serial	Parallel	Serial	Parallel	Serial	Parallel
Current [A]	3	6	3	6	3	6	5	10	3	6
Resistance / phase [Ω]	1.7	0.4	2.2	0.6	2.2	0.6	0.9	0.2	2.7	0.7
Inductance / phase [mH]	12.9	3.2	17.3	4.3	17.3	4.3	5.6	1.4	20.0	5.0
Stall torque [Nm]	2.9		5.5		6.3		6.3		9.3	
Holding torque [Nm]	4.2		8.0		9.5		9.5		13.6	
Detent torque [mNm]	<160		<210		<320		<320		<420	
Stepping angle [$^\circ$]	1.8		1.8		1.8		1.8		1.8	
	1453		1454		1455		1456		1457	

Dimensions



Dimensions of stepper motors with flange size 56 mm (all measurements in mm)

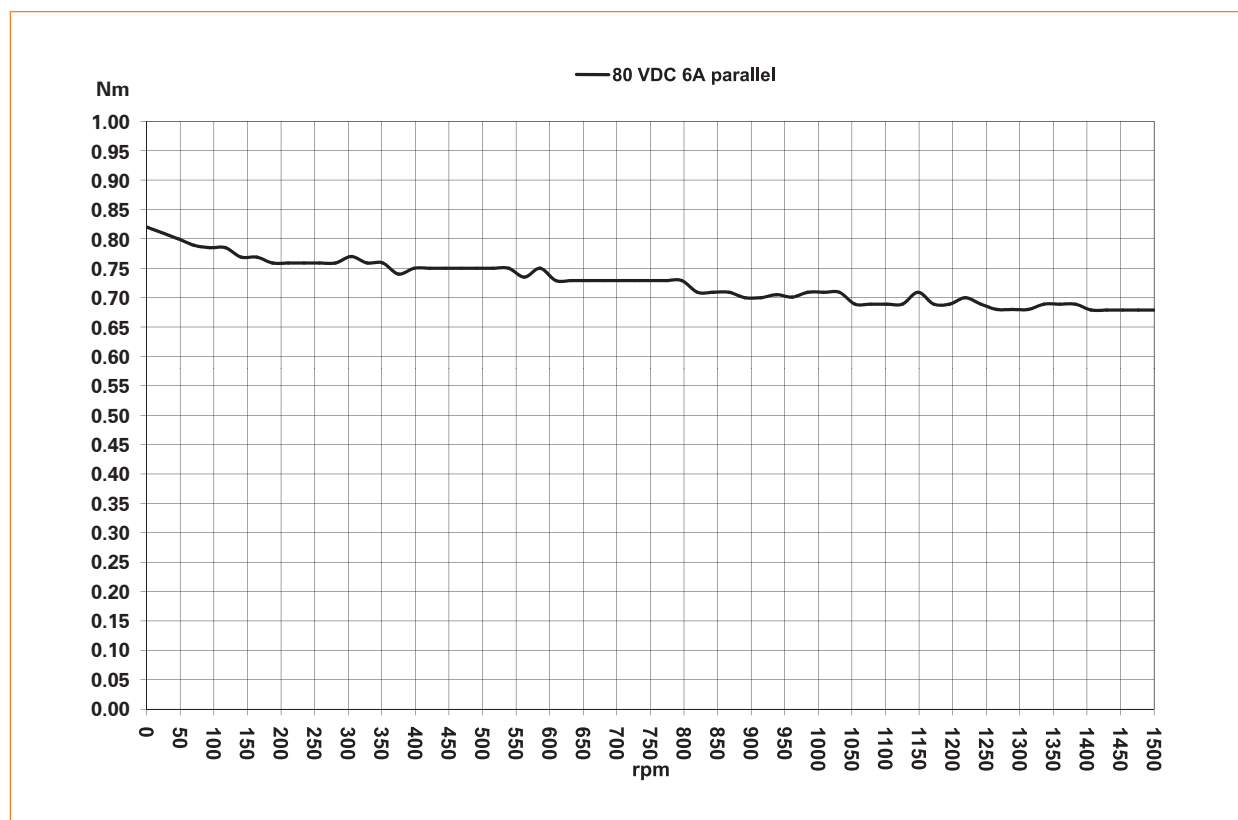


Dimensions of stepper motors with flange size 86 mm (all measurements in mm)

Stepper motors 80MPD1, 3 A



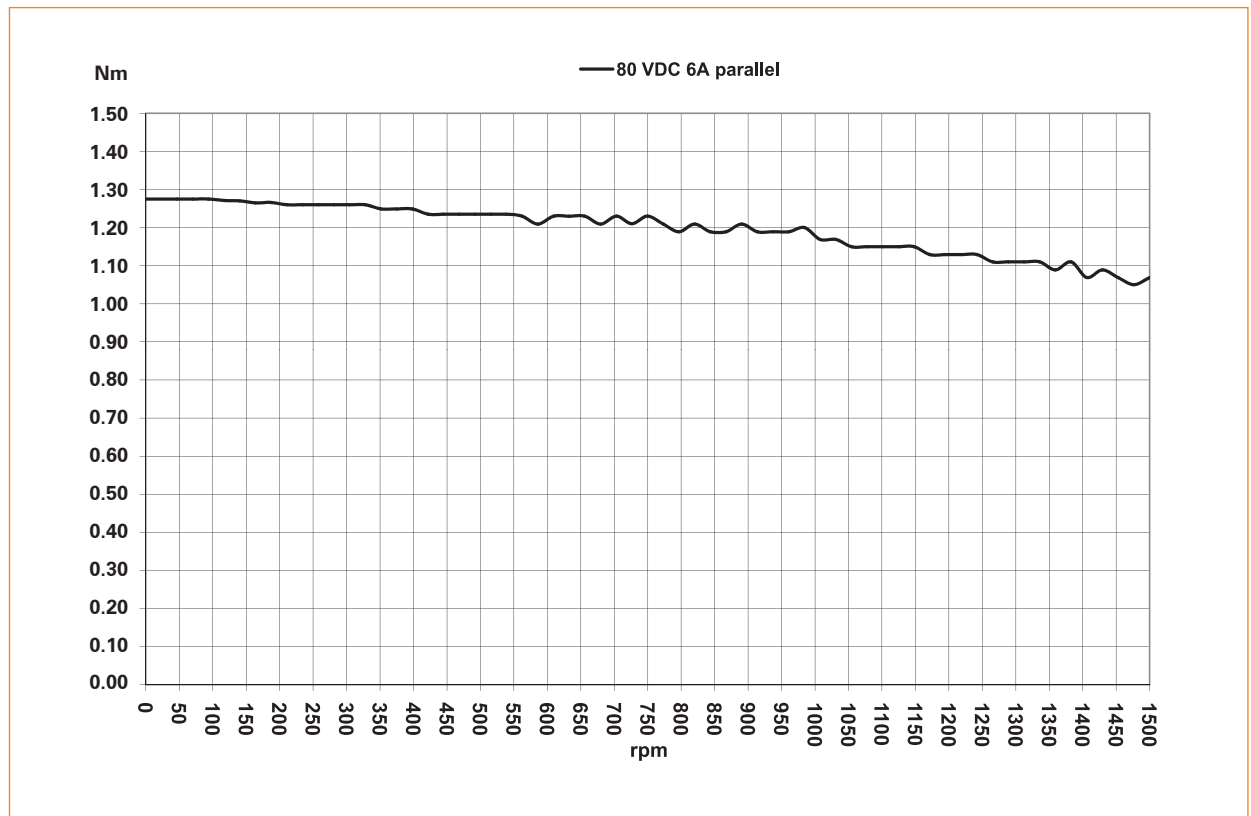
Short description	80MPD1.300S000-01	
Stepper motor	Stepper motor flange size 56 mm, length 45 mm	
Technical data	80MPD1.300S000-01	
Length	45 mm	
Wiring	Serial	Parallel
Current	3 A	6 A
Resistance / phase	1.2 Ω	0.3 Ω
Inductance / phase	2.7 mH	0.9 mH
Stall torque	0.8 Nm	
Holding torque	1.1 Nm	
Detent torque	<30 mNm	
Stepping angle	1.8°	



Stepper motors 80MPD3, 3 A



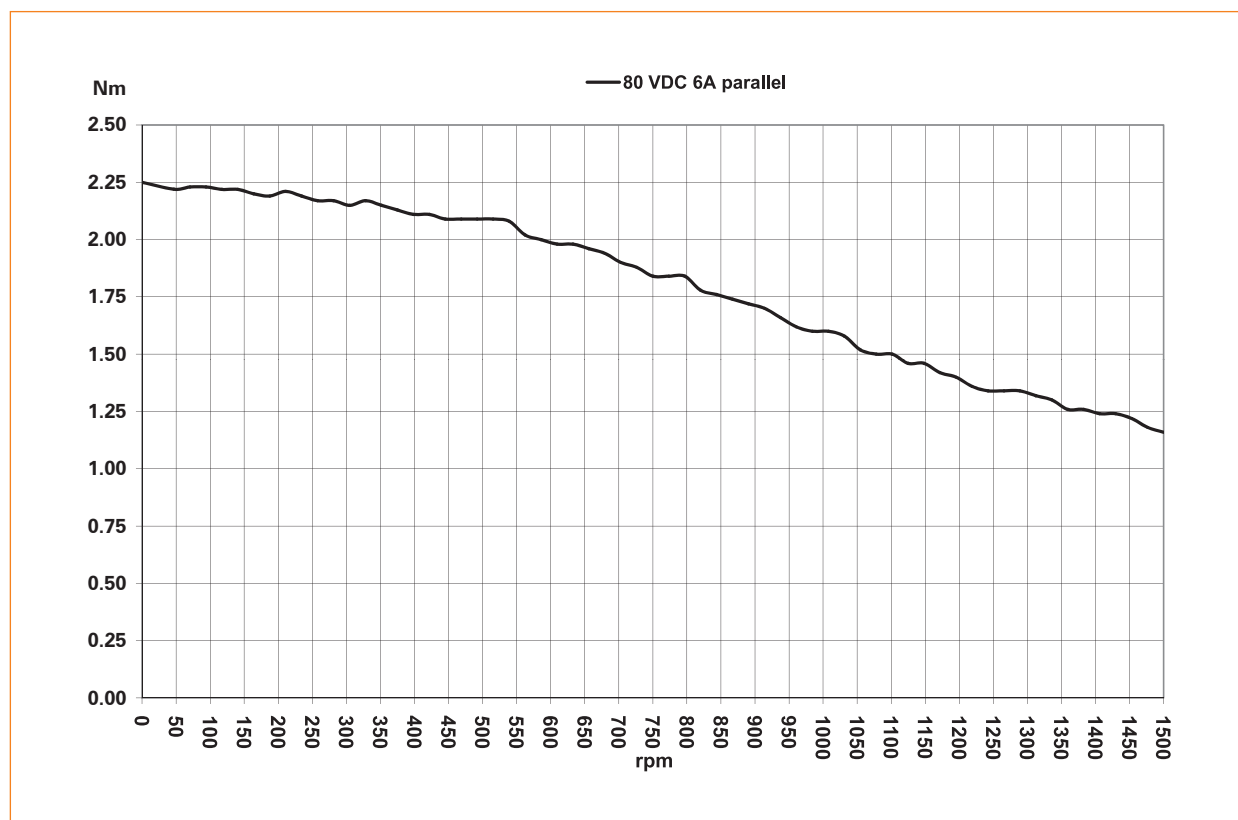
Short description	80MPD3.300S000-01	
Stepper motor	Stepper motor flange size 56 mm, length 57.5 mm	
Technical data	80MPD3.300S000-01	
Length	57.5 mm	
Wiring	Serial	Parallel
Current	3 A	6 A
Resistance / phase	1.6 Ω	0.4 Ω
Inductance / phase	5.2 mH	1.3 mH
Stall torque	1.25 Nm	
Holding torque	1.8 Nm	
Detent torque	<50 mNm	
Stepping angle	1.8°	



Stepper motors 80MPD5, 3 A



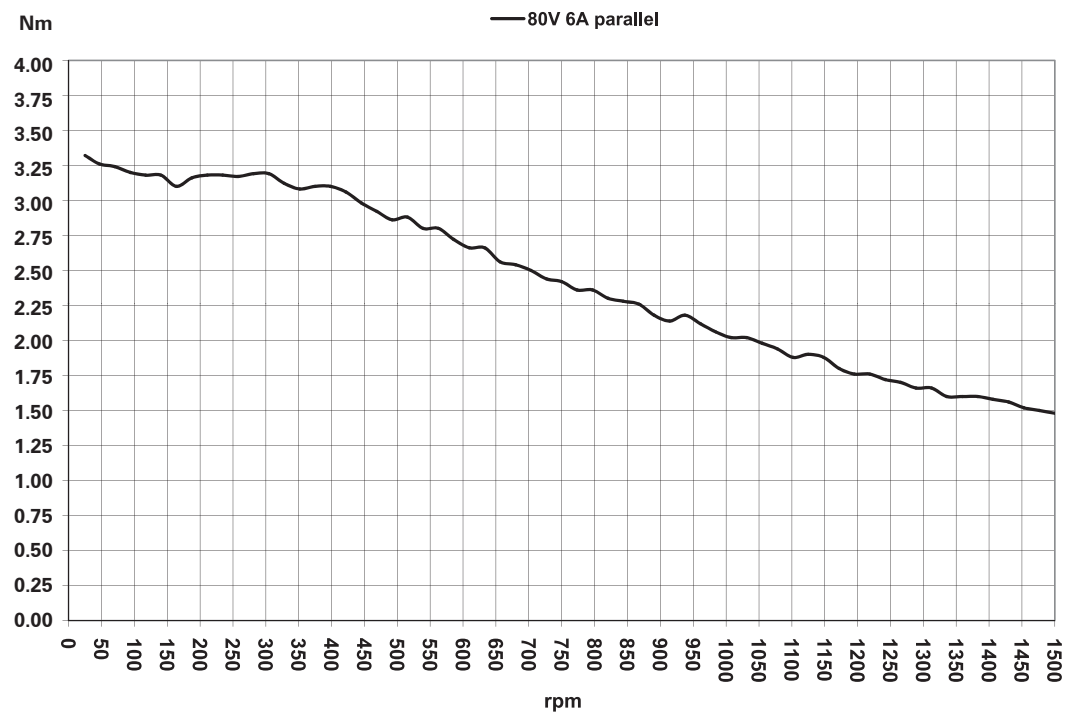
Short description	80MPD5.300S000-01	
Stepper motor	Stepper motor flange size 56 mm, length 80.5 mm	
Technical data	80MPD5.300S000-01	
Length	80.5 mm	
Wiring	Serial	Parallel
Current	3 A	6 A
Resistance / phase	2.4 Ω	0.6 Ω
Inductance / phase	8.8 mH	2.2 mH
Stall torque	2.2 Nm	
Holding torque	3.0 Nm	
Detent torque	<90 mNm	
Stepping angle	1.8°	



Stepper motors 80MPH1, 3 A



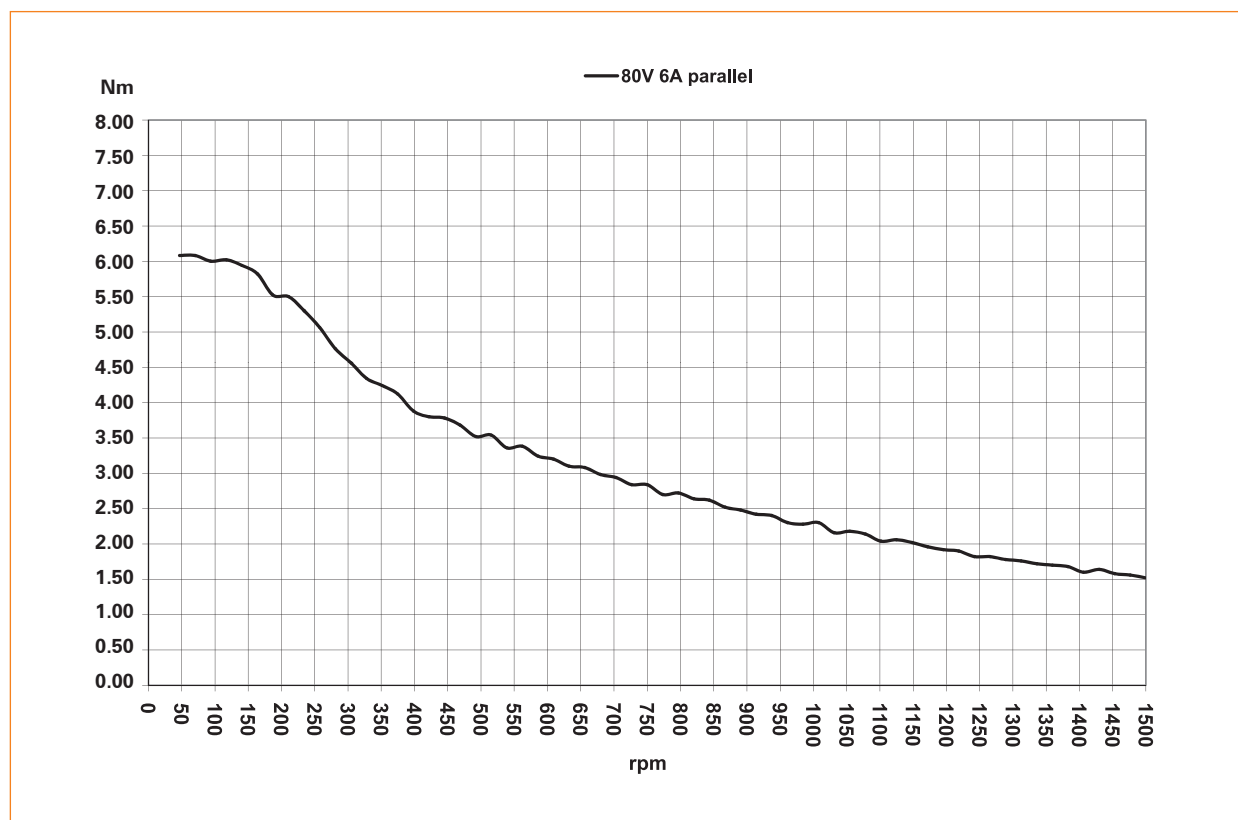
Short description	80MPH1.300S000-01	
Stepper motor	Stepper motor flange size 86 mm, length 66 mm	
Technical data	80MPH1.300S000-01	
Length	66 mm	
Wiring	Serial	Parallel
Current	3 A	6 A
Resistance / phase	1.7 Ω	0.4 Ω
Inductance / phase	12.9 mH	3.2 mH
Stall torque	2.9 Nm	
Holding torque	4.2 Nm	
Detent torque	<160 mNm	
Stepping angle	1.8°	



Stepper motors 80MPH3, 3 A



Short description	80MPH3.300S000-01	
Stepper motor	Stepper motor flange size 86 mm, length 98 mm	
Technical data	80MPH3.300S000-01	
Length	98 mm	
Wiring	Serial	Parallel
Current	3 A	6 A
Resistance / phase	2.2 Ω	0.6 Ω
Inductance / phase	17.3 mH	4.3 mH
Stall torque	5.5 Nm	
Holding torque	8.0 Nm	
Detent torque	<210 mNm	
Stepping angle	1.8°	



Stepper motors 80MPH4, 3 A



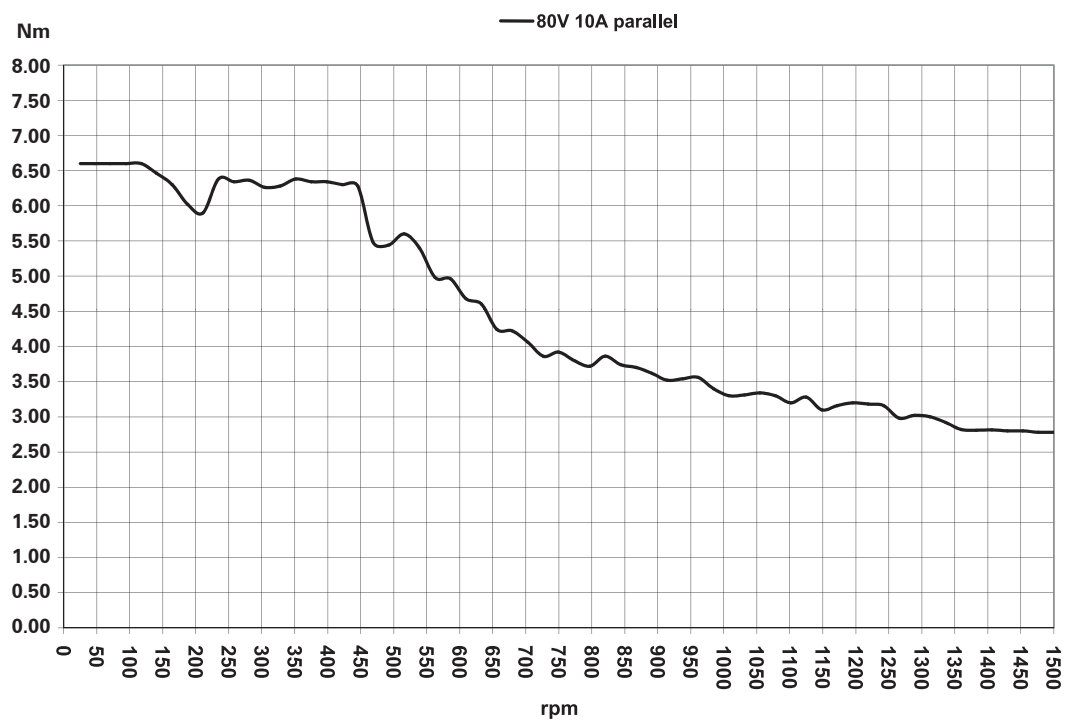
Short description	80MPH4.300S000-01	
Stepper motor	Stepper motor flange size 86 mm, length 98 mm	
Technical data	80MPH4.300S000-01	
Length	98 mm	
Wiring	Serial	Parallel
Current	3 A	6 A
Resistance / phase	2.2 Ω	0.6 Ω
Inductance / phase	17.3 mH	4.3 mH
Stall torque	6.3 Nm	
Holding torque	9.5 Nm	
Detent torque	<320 mNm	
Stepping angle	1.8°	



Stepper motors 80MPH4, 5 A



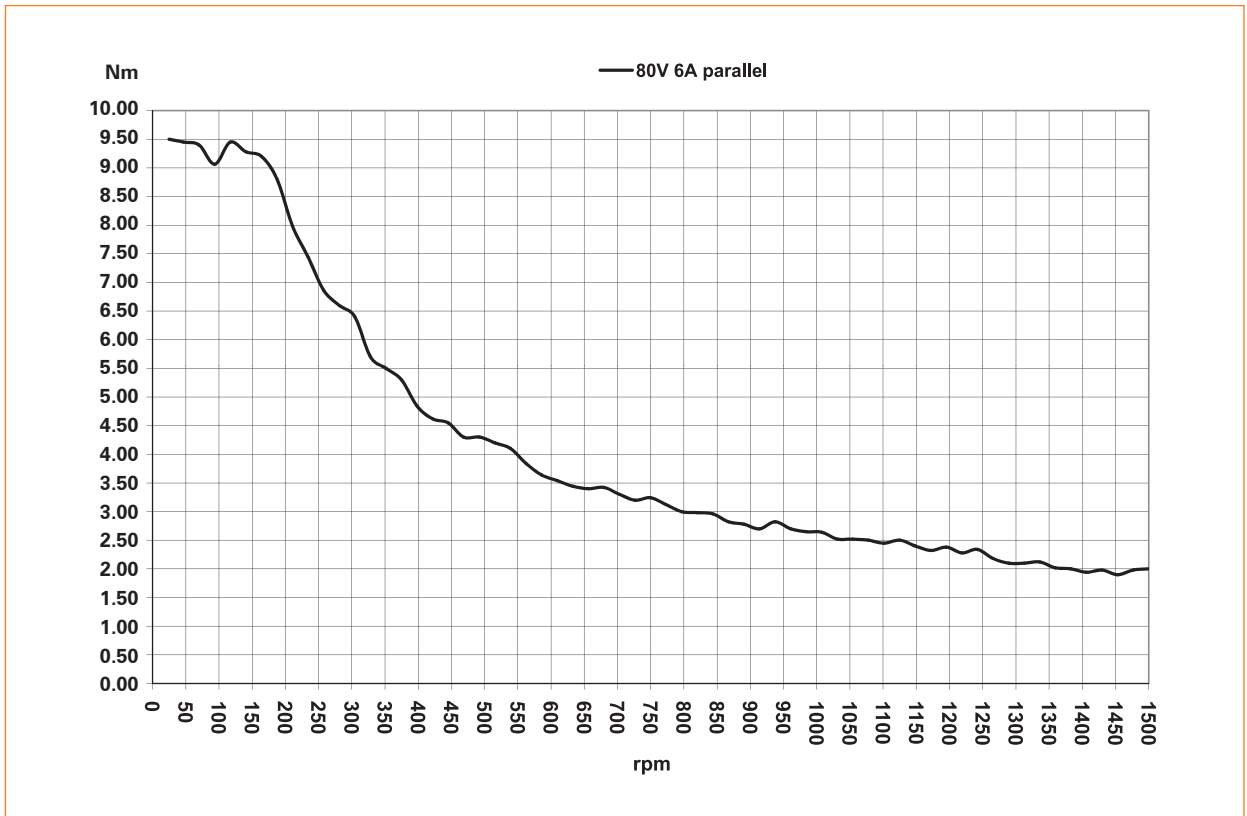
Short description	80MPH4.500S000-01	
Stepper motor	Stepper motor flange size 86 mm, length 98 mm	
Technical data	80MPH4.500S000-01	
Length	98 mm	
Wiring	Serial	Parallel
Current	5 A	10 A
Resistance / phase	0.9 Ω	0.2 Ω
Inductance / phase	5.6 mH	1.4 mH
Stall torque	6.3	
Holding torque	9.5	
Detent torque	<320 mNm	
Stepping angle	1.8°	

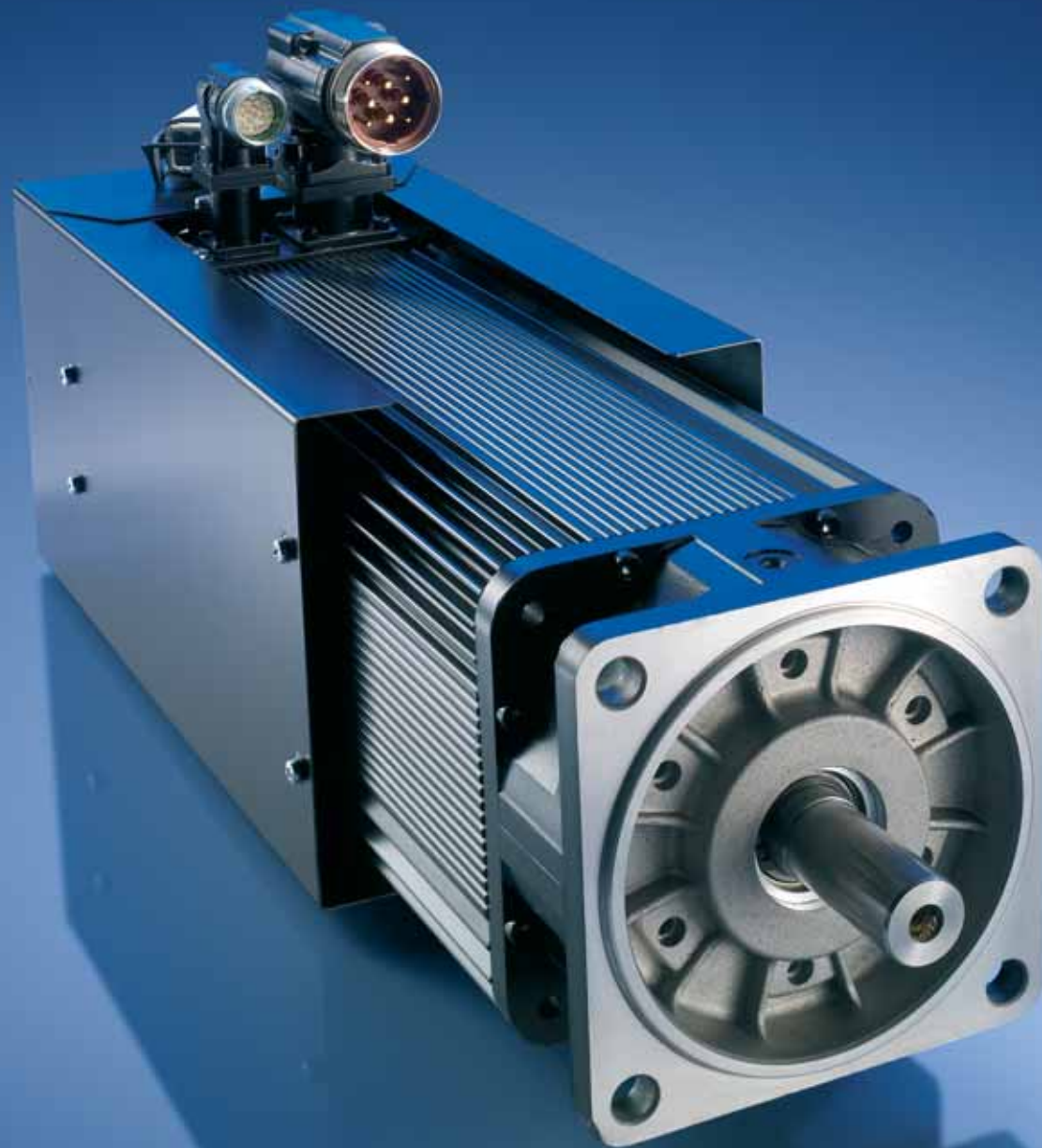


Stepper motors 80MPH6, 3 A



Short description	80MPH6.300S000-01	
Stepper motor	Stepper motor flange size 86 mm, length 130 mm	
Technical data	80MPH6.300S000-01	
Length	130 mm	
Wiring	Serial	Parallel
Current	3 A	6 A
Resistance / phase	2.7 Ω	0.7 Ω
Inductance / phase	20.0 mH	5.0 mH
Stall torque	9.3 Nm	
Holding torque	13.6 Nm	
Detent torque	<420 mNm	
Stepping angle	1.8°	











8LS three-phase synchronous motors

Dynamic precision drives

Modern machine concepts require mechatronic solutions. The AC servo motor series from B&R provides ways for the machine manufacturer to further optimize service and production processes.

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System characteristics



8LS three-phase synchronous motors

B&R 8LS three-phase synchronous motors have been specially developed for use in high-performance applications. They are now being used to produce consumer goods and products in the plastic, packaging, metal, food and beverage industries and then palletize them with material handling systems. Complete solutions from one source: this requires the right components as well as the right configuration for the application environment. The large selection of available 8LS three-phase synchronous motors makes it possible to easily meet conditions such as reducing the variety of parts, guaranteeing ease of service and maintaining minimum requirements on space.

An optimally configured drive rounds off a successful design. To meet this goal, specialists are available at B&R subsidiaries all over the world who are eager to share their know-how in the area of mechatronics. B&R automation components: the economical combination of mechanics, electronics, technology and innovation.

Feedback systems specified to meet your needs

8LS three-phase synchronous motors are available with different encoder systems. As standard, they are equipped with Heidenhain EnDat encoders. Depending on the application, the customer can select between normal and high-resolution encoders. Both types are also available as multi-turn encoders. They allow operation without requiring homing procedures or additional measurement systems on the workpiece. The absolute encoder functions without a battery and is therefore absolutely maintenance free. The 8LS three-phase synchronous motors are also available with resolvers for machines with lower precision and speed requirements.

Smooth surface

The special surface construction of the 8MS three-phase synchronous motors allow them to be used in applications for the food and beverage industry. Depressions where liquids could collect were deliberately avoided.

Connection type

The uniform connection technology, the prefabricated cables and the embedded parameter chip described above allow plug and play operation of the power transmission system. The angled connectors can be swiveled, which provides the maximum amount of flexibility during cabling.

Custom configurations

B&R has successfully implemented many projects where the drive was specially adapted to the requirements of the application. One example is direct attachment of a pulley to a motor shaft. The use of bearings that withstand the high radial forces required by the construction allows the motor and belt drive to be easily installed. High-alloy steel is used to keep the shaft diameter small for trouble-free mounting of small belt disks (in spite of heavy loads).

Advantages of B&R drives for your application:

- *Easy to install*
- *Small installation dimensions*
- *Extremely easy to service*
- *Low costs*

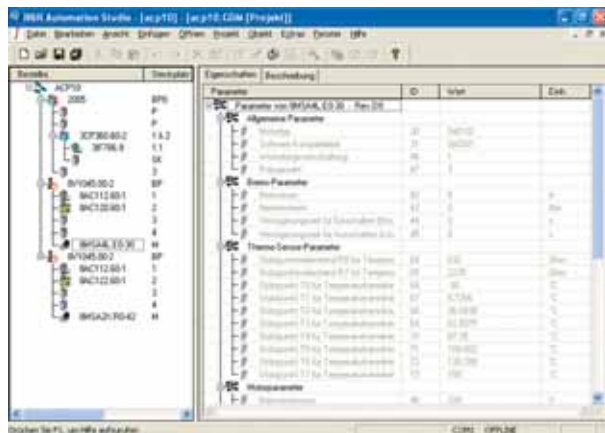




Powerful and dynamic

Production machines with high clock rates demand dynamic motors. Systems with large moving masses require not only a high rated speed, but also an extremely low moment of inertia.

With their long and sleek form, 8LSC motors are ideally suited for this type of application. In addition, conventional air cooling ensures uncomplicated integration into any system.



Embedded parameter chip

All relevant mechanical and electrical information and data is stored in the encoder used for the 8LS three-phase synchronous motors. This means that the user doesn't have to make settings on the servo drive in the field. As soon as the encoder is connected to the servo drive and the power is applied to the electronics, the motor is automatically identified. The motor sends its rated parameters and limit parameters to the servo drive. The drive then automatically determines the current limits and current control parameters required for optimal control of the motor. The user only has to optimize the speed and position controller. The integrated start-up environment in B&R Automation Studio™ provides assistance.

In addition to start-up assistance, routine service work is also made easier and motors can be exchanged without having to take extra time to set parameters.

System characteristics

8LS three-phase synchronous motors

Three-phase synchronous motors from the 8LS series are permanently excited, electronically commutated synchronous motors for applications that require excellent dynamic characteristics and positioning precision as well as compact size and reduced weight.

- NdFeB permanent magnets
- Sinusoidal commutation with EnDat encoder or resolver as feedback unit
- Three-phase winding with star connection
- Compact sizes result in low weight
- Minimum moment of inertia because of favorable rotor construction results in very good dynamic properties
- High overload capability/peak torque
- Low torque ripple
- High dynamic torque at high speeds
- Long life-span, all motor parts except for bearings are free of wear
- Power dissipation generated in the stator diverted directly to the flange via the housing
- Preloaded, grooved ball bearings which are sealed on both sides and greased
- Complete motor system with stall torque ranging from 0.2 Nm to 115 Nm
- Connection using two circular plugs
- Controlled by ACOPOS servo drives (📄 1251) or ACOPOSmulti drive systems (📄 1321)

8LS three-phase synchronous motors are not allowed to be connected directly to the power mains; they are only allowed to be operated in combination with ACOPOS servo drives (📄 1251) or ACOPOSmulti drive systems (📄 1321)!

Cooling types

Cooling type A

8LS three-phase synchronous motors with cooling type A are self-cooling and have a long, slim design. The motors must be installed on the cooling surface (flange).

Cooling type C

8LS three-phase synchronous motors with cooling type C are based on motors with cooling type A. They are separately cooled and the only difference is a fan module mounted in the area of the B-side bearing. The motors must be installed on the cooling surface (flange). The built-in fan module increases the rated torque (M_N), rated current (I_N), stall torque (M_0) and stall current (I_0) by 30% as compared to the respective motors with cooling type A.

Sizes

8LS three-phase synchronous motors are available in seven different sizes (2 through 8). They have different dimensions (especially flange dimensions) and power ratings. The various sizes can be differentiated by a number (c) in the model number. The larger the number, the larger the flange dimensions and power rating for the respective motor. (see also order key [1472](#))

Overview

Cooling type	Available sizes						
	2	3	4	5	6	7	8
A	Yes	Yes	Yes	Yes	Yes	Yes	Yes
C	---	---	Yes	Yes	Yes	Yes	---

Lengths

8LS three-phase synchronous motors are available in up to eight different lengths. They have different power ratings with identical flange dimensions. The various lengths can be differentiated by a number (d) in the model number. (see also order key [1472](#))


Overview

Length	Available for size						
	2	3	4	5	6	7	8
3	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6	Yes	Yes	Yes	Yes	Yes	---	Yes
7	---	---	---	Yes	---	---	---
A	---	---	---	Yes	---	---	---
B	---	---	---	Yes	---	---	---
C	---	---	---	Yes	---	---	---

System characteristics

Motor encoder system

The 8LS three-phase synchronous motors are available with EnDat encoders and also with resolvers. The encoder system is listed as part of the model number in the form of a 2-digit code (ee).

(see also order key  1472)

EnDat encoders

General information

EnDat is a standard developed by Johannes Heidenhain GmbH (www.heidenhain.de) that incorporates the advantages of absolute and incremental position measurement and also offers a read/write parameter memory in the encoder. With absolute position measurement (absolute position is read in serially), the homing procedure is usually not required. When necessary, a multi-turn encoder (4096 revolutions) should be installed. To save costs, a single-turn encoder and a reference switch can also be used. In this case, a homing procedure must be carried out. The incremental process allows the short delay times necessary for position measurement on drives with exceptional dynamic properties. With the sinusoidal incremental signal and the fine resolution in the EnDat module, a very high positioning resolution is achieved in spite of the moderate signal frequencies used.

Technical data

Different types of EnDat encoders can be used depending on the requirements:

Name	Order code (ee)					
	E0 ¹⁾	E1 ¹⁾	E2 ²⁾	E3 ²⁾	E4 ³⁾	E5 ³⁾
Encoder type	EnDat single-turn	EnDat multi-turn	EnDat single-turn	EnDat multi-turn	EnDat single-turn	EnDat multi-turn
Resolution	512-line		32-line		512-line	
Recognizable revolutions	---	4096	---	4096	---	4096
Accuracy	±60"		±280"		±60"	
Limit frequency	≥ 100 kHz (-3 dB)		≥ 6 kHz (-3 dB)		≥ 200 kHz (-3 dB)	
Vibration during operation 55 < f ≤ 2000 Hz	≤ 100 m/s ²	≤ 100 m/s ²	≤ 100 m/s ²	≤ 100 m/s ²	≤ 100 m/s ²	≤ 100 m/s ²
Shock during operation Length 6 ms	≤ 1000 m/s ²	≤ 1000 m/s ²	≤ 1000 m/s ²	≤ 1000 m/s ²	≤ 1000 m/s ²	≤ 1000 m/s ²
Manufacturer	Dr. Johannes Heidenhain GmbH	Dr. Johannes Heidenhain GmbH	Dr. Johannes Heidenhain GmbH	Dr. Johannes Heidenhain GmbH	Dr. Johannes Heidenhain GmbH	Dr. Johannes Heidenhain GmbH
Internet address	www.heidenhain.de	www.heidenhain.de	www.heidenhain.de	www.heidenhain.de	www.heidenhain.de	www.heidenhain.de
Manufacturer's product ID	ECN1313	EQN1325	ECI1317	EQI1329	ECN1113	EQN1125

1) Only available for size 3 to 8 motors.

2) Only available for size 3 to 7 motors Not available for 8LSx5A/B/C motors.

3) Only available for size 2 motors

Resolvers

General information

BRX type resolvers are used in the servo motors. These resolvers are fed with a single sinusoidal signal (reference signal) and return two sinusoidal signals as the result. The amplitude of these signals change with the angular position (sine or cosine form).

Technical data

Name	Order code (ee) R0
Accuracy	± 10 angular minutes
Non-linearity	± 1 angular minute
Vibration during operation	
$10 < f \leq 500$ Hz	≤ 100 m/s ²
Shock during operation	
Length 11 ms	≤ 400 m/s ²

Motor options

Depending on the cooling type, size and length, the 8LS three-phase synchronous motors can be delivered

- With various rated speeds
- With or without oil seal
- With or without holding brake
- With a smooth shaft or a keyed shaft
- With two different connection directions.

The rated speed is listed as part of the model number in the form of a 3-digit code (nnn). The code is equal to the rated speed divided by 100. The respective combination of the other motor options is listed in the form of a 2-digit code (ff) as part of the model number (see section "Determining the order code for motor options (ff)", 1470).

(see also order key 1472)

Rated speed

The 8LS three-phase synchronous motors can be delivered with up to five different rated speeds depending on the size and length. ¹⁾

Size	Available rated speed n_N [min ⁻¹]																																									
	1500							2000							3000							4500							6000													
2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	Yes	Yes	Yes	Yes	---	---	---	---	---	---	---	---	---	---	Yes	Yes	Yes	Yes	---	---	---	---	---	---	---	---	
4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	Yes	Yes	Yes	Yes	---	---	---	---	---	---	---	---	---	---	Yes	Yes	Yes	Yes	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8	---	---	Yes	Yes	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Length	3	4	5	6	7	A	B	C	3	4	5	6	7	A	B	C	3	4	5	6	7	A	B	C	3	4	5	6	7	A	B	C	3	4	5	6	7	A	B	C		

1) Only cooling type C.

Oil seal

All 8LS three-phase synchronous motors are available with an optional form A oil seal according to DIN 3760. When equipped with an oil seal, the motors have IP65 protection according to IEC 60034-5.

Proper lubrication of the oil seal must be guaranteed throughout the entire lifespan of the motor.

System characteristics

Holding brake

All 8LS three-phase synchronous motors can be delivered with a holding brake. It is installed directly behind the A flange on the motor and is used to hold the motor shaft when no power is applied to the servo motor.

Functionality

The holding brake is controlled by the ACOPOS servo drive or an ACOPOSmulti inverter module. It uses permanent magnets that are demagnetized when 24 VDC is applied to a magnet winding. This releases the brake.

The brake is designed as a holding brake. It is not permitted to be used to for operational braking! If these conditions are met, the brake has a lifespan of approximately 5,000,000 cycles (opening and closing the brake again is one cycle).

Loaded braking during an emergency stop is permitted - but reduces the lifespan.

The required brake holding torque is determined based on the occurring load torque. If the load torque is not sufficiently known, it is recommended to assume a safety factor of 2.

Technical data for the standard holding brake

Name	Size of motor						
	2	3	4	5	6	7	8
Holding torque M_{Br} [Nm]	2.2	4	8	15	32	32	130
Installed load P_{on} [W]	8	12	18	24	26	26	50
Maximum speed n_{max} [min ⁻¹]	12000	10000	10000	10000	10000	8000	8000
Installed current I_{on} [A]	0.33	0.5	0.75	1	1.08	1.08	2.08
Installed voltage U_{on} [V]	24 VDC +6% / -10%	24 VDC +6% / -10%	24 VDC +6% / -10%	24 VDC +6% / -10%	24 VDC +6% / -10%	24 VDC +6% / -10%	24 VDC +6% / -10%
Activation delay t_{on} [ms]	28	29	40	50	90	90	190
Release delay t_{off} [ms]	14	19	7	10	22	22	65
Moment of inertia J_{Br} [kgcm ²]	0.12	0.38	0.54	1.66	5.85	5.85	53
Weight m_{Br} [kg]	0.16	0.29	0.46	0.9	1.6	1.6	5.35

Design of the shaft end

All 8LS three-phase synchronous motor shafts comply to DIN 748. They can be delivered with a smooth shaft or a keyed shaft.

Smooth shaft

A smooth shaft end is used for a force-fit shaft-hub connection that guarantees a zero-play connection between shaft and hub as well as smooth operation. The end of the shaft has a threaded center hole which can be used to remove drive elements.

Keyed shaft

The keyed shaft can be used for a form-fit torque transfer with low demands on the shaft-hub connection and for handling torques with a constant direction.

The keyways for the 8LS three-phase synchronous motors conform to keyway form N1 according to DIN 6885-1. Form A shaft keys that conform to DIN 6885-1 are used. Balancing motors with keyways is done using the half-key convention according to DIN ISO 8821.

The end of the shaft has a threaded center hole which can be used to mount drive elements with shaft end disks.

Load capacity of the shaft end and bearing

8LS three-phase synchronous motors are equipped with grooved ball bearings which are sealed on both sides and greased. The radial and axial forces (F_r , F_a) that occur on the shaft end during operation and installation must be within the specifications listed below. The bearing elements are not permitted to be subject to shocks or impacts! Incorrect handling will cause the lifespan of the bearings to be reduced or the bearing to be damaged.

Installation

The axial forces F_a permitted during the installation of gearboxes, pinion gears, couplings, etc. depend on the motor size and can be found in the following table:

Size of motor	Permitted axial force F_a [N]	
	Standard bearing	Special motor option "Reinforced A side bearing"
2	850	---
3	1400	---
4	2300	5050
5	2500	9500
6	2500	9500
7	5500	---
8	9500	18700

Operation

Radial force

The radial force F_r on the shaft end is made up of the installation forces (e.g. belt tension on pulleys) and operational forces (e.g. load torque on the pinion). The maximum radial force F_r depends on the shaft end type, bearing type, average speed, position where the radial force is applied and the desired lifespan of the bearings.

Axial force, shift in shaft position caused by axial force

The axial force F_a on the shaft end is made up of the installation forces (e.g. stress caused by installation) and operational forces (e.g. thrust caused by slanted tooth pinions). The maximum axial force F_a depends on the bearing type and the desired lifespan of the bearings. The fixed bearing is secured on the A flange with a retaining ring. The floating bearing is preloaded on the B flange with a spring in the direction of the A flange. Axial forces in the direction of the B flange can cause the spring bias to be overcome and the shaft is shifted by the amount of axial play in the bearing (approx. 0.1 - 0.2 mm). This shift can cause problems on motors with holding brakes or motors with EnDat encoders (E2 and E3). Therefore, **no** axial force is permitted in the direction of the B flange when using these motors.

The shaft ends of motors with holding brakes are not permitted to have axial loads applied. Especially axial forces in the direction of the B flange should be prevented because these forces can cause the brake to fail!

System characteristics

Determining permissible values for F_r and F_a

Information to determine permissible values of F_r and F_a can be taken from the motor data for the respective three-phase synchronous motors (see section "8LSA2", 1486 to section "8LSC7", 1576). Permissible values are based on a bearing lifespan of 20,000 h (bearing lifespan calculation based on DIN ISO 281).

Simultaneously loading the shaft end with the maximum values of F_r and F_a is not permitted! Contact B&R if this occurs.

Connection directions

8LS three-phase synchronous motors can be delivered with "top" connection direction and also with axial swivel connectors.

Determining the order code for motor options (ff)

The respective code (ff) for the order key can be found in the following table:

Motor options				Code for order key (ff)
Connection direction	Oil seal	Holding brake	Shaft end	
Straight (top connector)	No	No	Smooth	C0
		Normal	Keyed	C1
			Smooth	C2
	Yes	No	Keyed	C3
			Smooth	C6
			Keyed	C7
		Normal	Smooth	C8
			Keyed	C9
Angled (swivel connector)	No	No	Smooth	D0
		Normal	Keyed	D1
			Smooth	D2
	Yes	No	Keyed	D3
			Smooth	D6
			Keyed	D7
		Normal	Smooth	D8
			Keyed	D9

Special motor options



8LS three-phase synchronous motors can be delivered with the following special motor options depending on the cooling type, size and length: ¹⁾

- "Reinforced A side bearing"
- "24 VDC fan"
- "24 VDC fan + reinforced A side bearing"

The respective special motor option is listed as part of the model number in the form of a 2-digit code (gg). If no special motor options are required, enter 00 for gg (for cooling type A) or 05 for gg (for cooling type C).

(see also order key  1472)

"Reinforced A side bearing"

8MS three-phase synchronous motors with cooling type A and special motor option "reinforced A side bearing" can handle increased radial and axial forces (F_r , F_a) on the end of the shaft. Information to determine permissible values of F_r and F_a can be taken from the motor data for the respective 8LS three-phase synchronous motors (see section "8LSA2",  1486 to section "8LSC7",  1576).


The following motor sizes are available with special motor option "reinforced A side bearing":

Special motor option	Code (gg)	Available for motor size							
		2	3	4	5	6	7	8	
"Reinforced A side bearing"	04	---	---	Yes	Yes	Yes	---	Yes	

Motors with special motor option "reinforced A side bearing" have increased values (in relation to motors with standard bearings) for the dimensions of the motor shaft, including the total length.

The exact dimensions can be found in the motor data for the respective 8LS three-phase synchronous motors.

"24 VDC fan", "24 VDC fan + reinforced A side bearing"

All 8LS three-phase synchronous motors with cooling type C are delivered as standard with fans that have an operating voltage of 24 VDC. The technical data for the 24 VDC fans can be found in section "Fan Modules" ( 1475). A combination of special motor options "24 VDC fan" and "reinforced A side bearing" is also possible.

1) Other special motor options must be arranged with B&R.

System characteristics

Order key

8LS	b	c	d	.	ee	nnn	ff	gg	-	h
-----	---	---	---	---	----	-----	----	----	---	---

Cooling type (see section "Cooling types", 1464)

A ... self-cooling (no separate surface cooling)

C ... separately cooled (surface cooling with independent fan module attached)

Size (see section "Sizes", 1465)

Valid values: **2, 3, 4, 5, 6, 7, 8**

Length (see section "Lengths", 1465)

Valid values: **3, 4, 5, 6, 7, A, B, C**

Encoder system (see section "Motor encoder systems", 1466)

E0 ... EnDat single-turn, 512-lines (ECN1313)¹⁾

E1 ... EnDat multi-turn, 512-lines (EQN1325), 4.096 revolutions¹⁾

E2 ... EnDat single-turn, 32-lines, inductive (ECI1317)²⁾

E3 ... EnDat multi-turn, 32-lines, inductive (EQI1329), 4.096 revolutions²⁾

E4 ... EnDat single-turn, 512-lines (ECN1113)³⁾

E5 ... EnDat multi-turn, 512-lines (EQN1125), 4.096 revolutions³⁾

R0 ... Resolver

1) Only available for size 3 to 8 motors

2) Only available for size 3 to 7 motors Not available for 8LSx5A/B/C motors.

3) Only available for size 2 motors.

Motor options (see section "Motor options", 1467, and section "Determining the order code for motor options (ff)", 1470)

nnn .. Rated rotational speed/100; e.g.: 030 corresponds to a rated speed of 3000 min⁻¹

Motor options (see section "Motor options", 1467)

Special motor options (see section "Special motor options", 1471)¹⁾

Cooling type A:

00 ... No special motor options

04 ... Reinforced A side bearing

Cooling type C:

05 ... No special motor options

11 ... Reinforced A side bearing²⁾

1) Special options must be arranged with B&R. If no special motor options are required, enter 00 for gg (for cooling type A) or 05 for gg (for cooling type C).

2) Special motor option only available for motor sizes 4, 5 and 6.

Motor version

Valid values: **0.1**

Example order 1

A three-phase synchronous motor (type **8LSA45**) with a rated speed of 3000 min^{-1} was selected for an application. Because of the construction, the cables can only be connected on the top of the motor ("top" connection direction). The motor should also be equipped with a holding brake, a keyed shaft and a 512-line EnDat single-turn encoder.

The code (ee) for the encoder system is **E0** (see "EnDat encoder", 1466).

The code (nnn) for a rated speed of 3000 min^{-1} is **030**.

The code (ff) for the other options (oil seal, holding brake, keyed shaft and connection direction) is **C3** (see "Motor option key codes (ff)", 1470).

The model number for the required motor is **8LSA45.E030C300-0**

Example order 2

A three-phase synchronous motor (type **8LSA56**) with a rated speed of 4500 min^{-1} was selected for an application. Because of the construction, the cables can only be connected on the back of the motor (swivel connectors). The motor should also be equipped with a holding brake, a smooth shaft, an oil seal and a 512-line EnDat multi-turn encoder.

The code (ee) for the encoder system is **E1** (see "Technical data for the EnDat encoder", 1466).

The code (nnn) for a rated speed of 4500 min^{-1} is **045**.

The code (ff) for the other options (oil seal, holding brake, keyed shaft and connection direction) is **D8** (see "Motor option key codes (ff)", 1470).

Therefore the model number for the motor required is: **8LSA56.E1045D800-1**

System characteristics

General motor data

General information	Cooling type A	Cooling type C
C-UR-US listed	Yes	Yes
Electrical characteristics	Cooling type A	Cooling type C
Mains input voltage on servo drive	3x 400 VAC ... 3x 480 VAC ± 10%	3x 400 VAC ... 3x 480 VAC ± 10%
Connection type	Circular connector from Intercontec	Circular connector from Intercontec
Motor connector	Size 1 (8LSA8: Size 1.5)	Size 1
Encoder connection	Size 1	Size 1
Efficiency	Typ. >90%	Typ. >90%
Thermal characteristics	Cooling type A	Cooling type C
Insulation class according to IEC 60034-1	F	F
Methods of cooling according to IEC 60034-6 (IC code)	Self-cooling No separate surface cooling (IC4A0A0)	Separately cooled Surface cooling with independent cooling module attached (IC4A0A6)
Thermal motor protection according to IEC 60034-11	Maximum winding temperature is 115°C (the thermal motor protection in ACOPOS servo drives or in the ACOPOSmulti drive system limits it to 110°C)	Maximum winding temperature is 115°C (the thermal motor protection in ACOPOS servo drives or in the ACOPOSmulti drive system limits it to 110°C)
Mechanical characteristics	Cooling type A	Cooling type C
Vibration severity according to IEC 60034-14	Vibration severity grade R ¹⁾	Vibration severity grade R ¹⁾
Roller bearing, dynamic load ratings and rated lifespan	Based on DIN ISO 281	Based on DIN ISO 281
Eye bolt according to DIN 580	For size 8	For size 8
Shaft end according to DIN 748 ²⁾	Form E	Form E
Oil seal according to DIN 3760	Form A	Form A
Key and keyway according to DIN 6885-1	Keyway form N1; key form A	Keyway form N1; key form A
Balancing the shaft according to DIN ISO 8821	Half-key arrangement	Half-key arrangement
Mounting flange according to DIN 42948	Form A	Form A
Shaft end concentricity, coaxial properties and mounting flange plane according to DIN 42955	Tolerance R	Tolerance R
Paint	Water-based paint	Water-based paint
Name	98160 *IDROLIN/E SM SEMIOPACO NERO RAL 9005-C.452	98160 *IDROLIN/E SM SEMIOPACO NERO RAL 9005-C.452
Color	RAL 9005 flat; shaft end and flange front metallic glossy	RAL 9005 flat; shaft end and flange front metallic glossy
Operational conditions	Cooling type A	Cooling type C
Rating class, operation mode acc. to IEC 60034-1	S1 - continuous operation	S1 - continuous operation
Ambient temperature during operation	-15°C to +40°C	-15°C to +40°C
Relative humidity during operation	5 to 95%, non-condensing	5 to 95%, non-condensing
Reduction of the rated current and stall current at temperatures above 40°C	10% per 10°C	10% per 10°C
Maximum ambient temperature during operation	+55°C ³⁾	+55°C ³⁾
Reduction of the rated current and stall current at installation altitudes	10% per 1000 m	10% per 1000 m
Starting at 1000 m above sea level		
Maximum installation altitude	2000 m ⁴⁾	2000 m ⁴⁾
Maximum flange temperature	65°C	65°C
Protection Standards according to IEC 60034-5 (IP code)	IP64	IP64 (IP20 fan module)
With optional oil seal	IP65	IP65 (IP20 fan module)
Construction and mounting arrangement type according to EN60034-7 (IM code)	Horizontal (IM3001) Vertical, motor hangs on the machine (IM3011) Vertical, motor stands on the machine (IM3031)	Horizontal (IM3001) Vertical, motor hangs on the machine (IM3011) Vertical, motor stands on the machine (IM3031)
Storage and transport conditions	Cooling type A	Cooling type C
Storage temperature	-20 to +60°C	-20 to +60°C
Relative humidity during storage	Max. 90%, non-condensing	Max. 90%, non-condensing
Transport temperature	-20 to +60°C	-20 to +60°C
Relative humidity during transport	Max. 90%, non-condensing	Max. 90%, non-condensing

1) Valid for all motors with a shaft height of more than 56 mm

2) Except motor sizes 2 and 7

3) Continuous operation of the servo motors at ambient temperatures from +40°C to max. +55°C is possible, but results in a shorter lifespan.

4) Additional requirements are to be arranged with B&R.

Fan modules

Overview

The fan modules used are size-dependent.

Fans	For motor 8LSC4	8LSC5	8LSC6	8LSC7
Manufacturer	ebm-papst	ebm-papst	ebm-papst	ebm-papst
Internet address	www.ebmpapst.com	www.ebmpapst.com	www.ebmpapst.com	www.ebmpapst.com
Manufacturer's product ID				
24 VDC operating voltage ¹⁾	4184 NXH	7114 N	7114 N	W1G180-AA01-13

1) Fans with 24 VDC operating voltage are special motor options.

Technical data

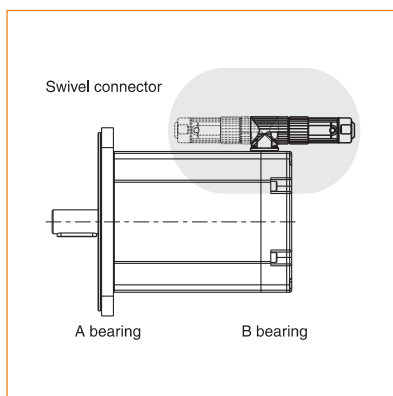
General information	24 VDC fan			
Manufacturer's product ID	4184 NXH	7114 N	7114 N	W1G180-AA01-13
C-UR-US listed	Yes	Yes	Yes	Yes
Fan type	DC fan with electronically commutated external rotor motor	DC fan with electronically commutated external rotor motor	DC fan with electronically commutated external rotor motor	DC fan with electronically commutated external rotor motor
Rotor bearings	Ball bearings	Ball bearings	Ball bearings	Ball bearings
Protection type	IP20	IP20	IP20	IP20
Power mains connection	24 VDC fan			
Rated voltage	24 VDC +5% / -50%	24 VDC +25% / -50%	24 VDC +25% / -50%	24 VDC +15% / -50%
Power consumption	11 W	12 W	12 W	36 W
Overload protection	Protected against blocking and overloading by PTC resistor; partially impedance protected	Protected against blocking and overloading by PTC resistor; partially impedance protected	Protected against blocking and overloading by PTC resistor; partially impedance protected	Protected against blocking and overloading by PTC resistor; partially impedance protected
Mechanical characteristics	24 VDC fan			
Temperature range	-30 ... +55°C	-25 ... +72°C	-25 ... +72°C	-20 ... +72°C
Operating noise	57 dB(A)	55 dB(A)	55 dB(A)	59 dB(A)
Lifespan				
At 40°C	70000 h	80000 h	80000 h	40000 h
At maximum temperature	50000 h	37500 h	37500 h	37500 h

System characteristics

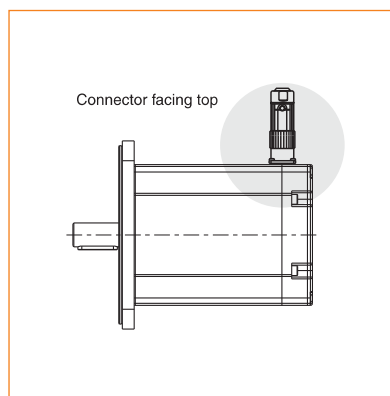
Terminology and formula symbols

Connection direction terminology, bearings

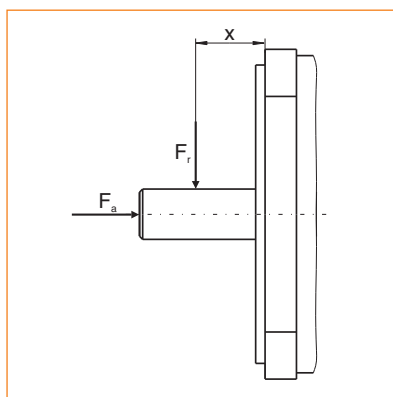
Angled (swivel connector)



Straight (top connector)



Definitions for maximum shaft load diagrams



F_r Radial force

F_a Axial force

x Between motor flange and the point the radial force F_r is applied

Formula symbols

Term	Character	Device	Description
Rated speed	n_N	min^{-1}	Rated motor speed.
Rated torque	M_N	Nm	The rated torque is output by the motor ($n = n_N$) when the rated current is being drawn. This is possible for any length of time if the environmental conditions are correct.
Rated power	P_N	kW	The rated power is output by the motor when $n = n_N$. This is possible for any length of time if the environmental conditions are correct.
Rated current	I_N	A	The rated current is the effective value for the phase current (current in the motor supply line) when generating the rated torque at the rated speed. This is possible for any length of time if the environmental conditions are correct.
Stall torque	M_0	Nm	The "stall torque" is output by the motor at the speed n_0 and when the "stall current" is being drawn. This is possible for any length of time if the environmental conditions are correct. The speed n_0 must be high enough so that the winding temperature in all windings is uniform and stationary ($n_0 = 50 \text{ min}^{-1}$ for B&R motors). The continuous torque is reduced while stationary.
Stall current	I_0	A	The "stall current" is the effective value of the phase current (current in the motor supply line) for the generation of the "stall torque" at the speed n_0 . This is possible for any length of time if the environmental conditions are correct. The speed n_0 must be high enough so that the winding temperature in all windings is uniform and stationary ($n_0 = 50 \text{ min}^{-1}$ for B&R motors). The continuous current is reduced while stationary.
Peak torque	M_{max}	Nm	The peak torque is briefly output by the motor when the peak current is being drawn.
Maximum current	I_{max}	A	The peak current is the effective value of the phase current (current in the motor supply line) for the generation of the peak torque. Only possible for a short time. The peak current is determined by the magnetic circuit. Exceeding this value for a short time can cause irreversible damage (demagnetize the magnet material).
Maximum angular acceleration without brake	a	rad/s^2	Maximum acceleration of the motor without load and without brake. Value for the dynamics of the motor (corresponds to M_{max} / J).
Maximum speed	n_{max}	min^{-1}	Maximum motor speed. This is a mechanical condition (centrifugal force, bearing wear).
Average speed	n_{aver}	min^{-1}	Average speed for one cycle
Torque constant	K_T	Nm/A	The torque constant determines the torque created by the motor with 1 A_{rms} phase current. This value applies at a motor temperature of 20°C. When the temperature increases, the torque constant is reduced (generally to 10%). When the current increases, the torque constant is reduced (generally starting at twice the value of the rated current).
Voltage constant	K_E	V/1000 min^{-1}	The voltage constant determines the effective value (phase-phase) of the reverse voltage (EMF) induced by the motor with a speed of 1000 min^{-1} . This value applies at a motor temperature of 20°C. When the temperature increases, the voltage constant is reduced (generally to 5%). When the current increases, the voltage constant is reduced (generally starting at twice the value of the rated current).
Stator resistance	$R_{2\text{ph}}$	Ω	Resistance measured in ohms between two motor leads (phase-phase) at 20°C winding temperature. On B&R motors, the windings use a star connection.
Stator inductance	$L_{2\text{ph}}$	mH	Winding inductance measured between two motor leads. Stator inductance depends on the rotor position.
Electrical time constant	t_{el}	ms	Corresponds to 1/5 of the time needed for the stator current to stabilize with constant operating conditions.
Thermal time constant	t_{therm}	min	Corresponds to 1/5 of the time needed for the motor temperature to stabilize with constant operating conditions.
Moment of inertia without brake	J	kgcm^2	Moment of inertia for the motor without holding brake.
Weight without brake	m	kg	Weight of the motor without holding brake.
Moment of inertia of brake	J_{Br}	kgcm^2	Moment of inertia for the built-in holding brake.
Weight of brake	m_{Br}	kg	Weight of the built-in holding brake.
Brake holding torque	M_{Br}	Nm	Minimum torque required to hold the rotor when the brake is activated.
Installed load	P_{in}	W	Installed load for the built-in holding brake.
Installed current	I_{in}	A	Installed current for the built-in holding brake.
Installed voltage	U_{in}	V	Operating voltage for the built-in holding brake.
Activation delay	t_{on}	ms	Delay time required for the holding torque of the brake to be established after the operating voltage has been removed from the holding brake.
Release delay	t_{off}	ms	Delay time required until the holding torque of the holding brake is reduced by 90% (the brake is released) after the operating voltage has been returned to the holding brake.

Overview of preferred types

Preferred types have increased availability for first orders and convenience when service is needed.

Options	8LSA25.R0060D000-0	8LSA25.R0060D200-0	8LSA35.E2030D000-0	8LSA35.E2060D000-0	8LSA35.E3030D000-0	8LSA35.E3060D000-0	8LSA35.E2030D200-0	8LSA35.E2060D200-0	8LSA35.E3030D200-0	8LSA35.E3060D200-0
Rated speed n_N [min ⁻¹]	6000	6000	3000	6000	3000	6000	3000	6000	3000	6000
Holding brake	No	Yes	No	No	No	No	Yes	Yes	Yes	Yes
Encoder	Resolvers	Resolvers	EnDat 32-line Single-turn	EnDat 32-line Single-turn	EnDat 32-line Multi-turn	EnDat 32-line Multi-turn	EnDat 32-line Single-turn	EnDat 32-line Single-turn	EnDat 32-line Multi-turn	EnDat 32-line Multi-turn
Shaft end	Smooth	Smooth	Smooth	Smooth	Smooth	Smooth	Smooth	Smooth	Smooth	Smooth
Connection direction	Angled (swivel)	Angled (swivel)	Angled (swivel)	Angled (swivel)	Angled (swivel)	Angled (swivel)	Angled (swivel)	Angled (swivel)	Angled (swivel)	Angled (swivel)
Technical data										
Rated speed n_N [min ⁻¹]	6000	6000	3000	6000	3000	6000	3000	6000	3000	6000
Number of poles	4	4	4	4	4	4	4	4	4	4
Rated torque M_N [Nm]	0.52	0.52	2.1	1.6	2.1	1.6	2.1	1.6	2.1	1.6
Rated power P_N [kW]	0.33	0.33	0.66	1.01	0.66	1.01	0.66	1.01	0.66	1.01
Rated current I_N [A]	0.71	0.71	1.44	2.2	1.44	2.2	1.44	2.2	1.44	2.2
Stall torque M_0 [Nm]	0.6	0.6	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Stalled current I_0 [A]	0.82	0.82	1.58	3.16	1.58	3.16	1.58	3.16	1.58	3.16
Peak torque M_{max} [Nm]	2.4	2.4	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2
Peak current I_{max} [A]	3.7	3.7	6.8	13.6	6.8	13.6	6.8	13.6	6.8	13.6
Maximum angular acceleration without brake a [rad/s ²]	150000	150000	102222	102222	102222	102222	102222	102222	102222	102222
Maximum speed n_{max} [min ⁻¹]	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000
Torque constant K_T [Nm/A]	0.73	0.73	1.46	0.73	1.46	0.73	1.46	0.73	1.46	0.73
Voltage constant K_E [V/1000 min ⁻¹]	43.98	43.98	87.96	43.98	87.96	43.98	87.96	43.98	87.96	43.98
Stator resistance R_{2ph} [Ω]	31	31	18.5	4.6	18.5	4.6	18.5	4.6	18.5	4.6
Stator inductance L_{2ph} [mH]	49.7	49.7	49.16	12.29	49.16	12.29	49.16	12.29	49.16	12.29
Electrical time constant t_{el} [ms]	1.6	1.6	2.66	2.67	2.66	2.67	2.66	2.67	2.66	2.67
Thermal time constant t_{therm} [min]	25	25	38	38	38	38	38	38	38	38
Moment of inertia without brake J [kgcm ²]	0.16	0.16	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Weight without brake m [kg]	1.6	1.6	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66
Holding brake										
Moment of inertia for brake J_{Br} [kgcm ²]	---	0.12	---	---	---	---	0.38	0.38	0.38	0.38
Weight of brake m_{Br} [kg]	---	0.16	---	---	---	---	0.29	0.29	0.29	0.29
Holding torque of the brake M_{Br} [Nm]	---	2.2	---	---	---	---	4	4	4	4
Recommendations										
Cable cross section for B&R motor cables [mm ²] ¹⁾	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
ACOPOS	▣ 1314	▣ 1314	▣ 1314	▣ 1314	▣ 1314	▣ 1314	▣ 1314	▣ 1314	▣ 1314	▣ 1314
ACOPOSmulti	▣ 1425	▣ 1425	▣ 1425	▣ 1425	▣ 1425	▣ 1425	▣ 1425	▣ 1425	▣ 1425	▣ 1425
ACOPOS servo drive 8Vxxxx.00-x ²⁾	1010	1010	1022	1045	1022	1045	1022	1045	1022	1045
ACOPOSmulti inverter module 8BVI... ³⁾	0014	0014	0014	0028	0014	0028	0014	0028	0014	0028
Data sheet	▣ 1486	▣ 1486	▣ 1494	▣ 1494	▣ 1494	▣ 1494	▣ 1494	▣ 1494	▣ 1494	▣ 1494

1) The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSmulti inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request.

2) The recommended servo drive is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

3) The recommended inverter module is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

Options	8LSA44.E2030D000-0	8LSA44.E2060D000-0	8LSA44.E3030D000-0	8LSA44.E3060D000-0	8LSA44.E2030D200-0	8LSA44.E2060D200-0	8LSA44.E3030D200-0	8LSA44.E3060D200-0	8LSA55.E2030D000-1	8LSA55.E3030D000-1	8LSA55.E2030D200-1	8LSA55.E3030D200-1
Rated speed n_N [min ⁻¹]	3000	6000	3000	6000	3000	6000	3000	6000	3000	3000	3000	3000
Holding brake	No	No	No	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Encoder	EnDat 32-line Single-turn	EnDat 32-line Single-turn	EnDat 32-line Multi-turn	EnDat 32-line Multi-turn	EnDat 32-line Single-turn	EnDat 32-line Single-turn	EnDat 32-line Multi-turn	EnDat 32-line Multi-turn	EnDat 32-line Single-turn	EnDat 32-line Multi-turn	EnDat 32-line Single-turn	EnDat 32-line Multi-turn
Shaft end	Smooth	Smooth	Smooth	Smooth	Smooth	Smooth	Smooth	Smooth	Smooth	Smooth	Smooth	Smooth
Connection direction	Angled (swivel)	Angled (swivel)	Angled (swivel)	Angled (swivel)	Angled (swivel)	Angled (swivel)	Angled (swivel)	Angled (swivel)	Angled (swivel)	Angled (swivel)	Angled (swivel)	Angled (swivel)
Technical data												
Rated speed n_N [min ⁻¹]	3000	6000	3000	6000	3000	6000	3000	6000	3000	3000	3000	3000
Number of poles	10	10	10	10	10	10	10	10	8	8	8	8
Rated torque M_N [Nm]	4.62	3	4.62	3	4.62	3	4.62	3	11.6	11.6	11.6	11.6
Rated power P_N [kW]	1.45	1.88	1.45	1.88	1.45	1.88	1.45	1.88	3.64	3.64	3.64	3.64
Rated current I_N [A]	2.84	3.69	2.84	3.69	2.84	3.69	2.84	3.69	6.9	6.9	6.9	6.9
Stall torque M_0 [Nm]	6	6	6	6	6	6	6	6	12.5	12.5	12.5	12.5
Stall current I_0 [A]	3.69	7.37	3.69	7.37	3.69	7.37	3.69	7.37	8.07	8.07	8.07	8.07
Peak torque M_{max} [Nm]	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	41.4	41.4	41.4	41.4
Peak current I_{max} [A]	21.88	43.76	21.88	43.76	21.88	43.76	21.88	43.76	32.96	32.96	32.96	32.96
Maximum angular acceleration without brake a [rad/s ²]	83562	83562	83562	83562	83562	83562	83562	83562	50526	50526	50526	50526
Maximum speed n_{max} [min ⁻¹]	12000	12000	12000	12000	12000	12000	12000	12000	9000	9000	9000	9000
Torque constant K_T [Nm/A]	1.63	0.81	1.63	0.81	1.63	0.81	1.63	0.81	1.63	1.63	1.63	1.63
Voltage constant K_E [V/1000 min ⁻¹]	98.43	49.22	98.43	49.22	98.43	49.22	98.43	49.22	98.43	98.43	98.43	98.43
Stator resistance R_{2ph} [Ω]	3.6	0.86	3.6	0.86	3.6	0.86	3.6	0.86	1.13	1.13	1.13	1.13
Stator inductance L_{2ph} [mH]	24	6.2	24	6.2	24	6.2	24	6.2	12.5	12.5	12.5	12.5
Electrical time constant t_{el} [ms]	6.67	7.19	6.67	7.19	6.67	7.19	6.67	7.19	11.09	11.09	11.09	11.09
Thermal time constant t_{therm} [min]	30	30	30	30	30	30	30	30	40	40	40	40
Moment of inertia without brake J [kgcm ²]	2.73	2.73	2.73	2.73	2.73	2.73	2.73	2.73	8.19	8.19	8.19	8.19
Weight without brake m [kg]	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	13.29	13.29	13.29	13.29
Holding brake												
Moment of inertia for brake J_B [kgcm ²]	---	---	---	---	0.54	0.54	0.54	0.54	---	---	1.66	1.66
Weight of brake m_B [kg]	---	---	---	---	0.46	0.46	0.46	0.46	---	---	0.9	0.9
Holding torque of the brake M_B [Nm]	---	---	---	---	8	8	8	8	---	---	15	15
Recommendations												
Cable cross section for B&R motor cables [mm ²] ¹⁾	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
ACOPOS	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314
ACOPOSMulti	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425
ACOPOS servo drive 8Vxxx.00-x ²⁾	1045	1090	1045	1090	1045	1090	1045	1090	1180	1180	1180	1180
ACOPOSMulti inverter module 8BVI... ³⁾	0055	0110	0055	0110	0055	0110	0055	0110	0110	0110	0110	0110
Data sheet	▮ 1502	▮ 1502	▮ 1502	▮ 1502	▮ 1502	▮ 1502	▮ 1502	▮ 1502	▮ 1510	▮ 1510	▮ 1510	▮ 1510

1) The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSMulti inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request.

2) The recommended servo drive is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

3) The recommended inverter module is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

Product overview

Self-cooling motors (cooling type A)

The technical data listed in this section (K_E , K_T , I_N , I_0 , I_{max} , R_{2ph} , L_{2ph} , t_{el} , t_{therm} , m , J) has a theoretical tolerance range of $\pm 10\%$. This is also valid for the speed - torque characteristic curves represented in the following sections.

Motor	8LSA23.ee060f9g-0	8LSA24.ee060f9g-0	8LSA25.ee045f9g-0	8LSA25.ee060f9g-0	8LSA26.ee045f9g-0	8LSA26.ee060f9g-0	8LSA33.ee030f9g-0	8LSA33.ee045f9g-0	8LSA33.ee060f9g-0	8LSA34.ee022f9g-0	8LSA34.ee030f9g-0	8LSA34.ee045f9g-0	8LSA34.ee060f9g-0
Rated speed n_N [min ⁻¹]	6000	6000	4500	6000	4500	6000	3000	4500	6000	2200	3000	4500	6000
Number of poles	4	4	4	4	4	4	4	4	4	4	4	4	4
Rated torque M_N [Nm]	0.17	0.35	0.54	0.52	0.72	0.69	0.7	0.67	0.6	1.44	1.4	1.3	1
Rated power P_N [kW]	0.11	0.22	0.25	0.33	0.34	0.43	0.22	0.32	0.38	0.33	0.44	0.61	0.63
Rated current I_N [A]	0.23	0.48	0.56	0.71	0.74	0.95	0.48	0.69	0.82	0.72	0.96	1.34	1.37
Stall torque M_0 [Nm]	0.2	0.4	0.6	0.6	0.8	0.8	0.75	0.75	0.75	1.5	1.5	1.5	1.5
Stall current I_0 [A]	0.27	0.55	0.62	0.82	0.82	1.1	0.52	0.77	1.03	0.75	1.03	1.55	2.06
Peak torque M_{max} [Nm]	0.8	1.6	3.2	2.4	3.2	3.2	3	3	3	6	6	6	6
Peak current I_{max} [A]	1.25	2.5	2.77	3.7	3.75	5	2.22	3.32	4.43	3.24	4.43	6.65	8.87
Maximum angular acceleration without brake a [rad/s ²]	114286	133333	200000	150000	160000	160000	85714	85714	85714	100000	100000	100000	100000
Maximum speed n_{max} [min ⁻¹]	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000
Torque constant K_T [Nm/A]	0.73	0.73	0.97	0.73	0.97	0.73	1.46	0.97	0.73	1.99	1.46	0.97	0.73
Voltage constant K_E [V/1000 min ⁻¹]	43.98	43.98	58.64	43.98	58.64	43.98	87.96	58.64	43.98	120.42	87.96	58.64	43.98
Stator resistance R_{2ph} [Ω]	230	70	54.7	31	36.9	20.8	100	40.46	27	5.8	32.3	15.2	8.52
Stator inductance L_{2ph} [mH]	150	75	91.8	49.7	66.9	37.5	147.48	63.08	36.87	134	73.12	32.77	18.28
Electrical time constant t_{el} [ms]	0.65	1.07	1.68	1.6	1.81	1.8	1.48	1.4	1.37	23.1	2.26	2.2	2.15
Thermal time constant t_{therm} [min]	15	20	25	25	30	30	32	32	32	35	35	35	35
Moment of inertia without brake J [kgcm ²]	0.07	0.12	0.16	0.16	0.2	0.2	0.35	0.35	0.35	0.6	0.6	0.6	0.6
Weight without brake m [kg]	1	1.3	1.6	1.6	1.9	1.9	2.13	2.13	2.13	2.89	2.89	2.89	2.89
Holding brake													
Moment of inertia for brake J_{Br} [kgcm ²]	0.12	0.12	0.12	0.12	0.12	0.12	0.38	0.38	0.38	0.38	0.38	0.38	0.38
Weight of brake m_{Br} [kg]	0.16	0.16	0.16	0.16	0.16	0.16	0.29	0.29	0.29	0.29	0.29	0.29	0.29
Holding torque of the brake M_{Br} [Nm]	2.2	2.2	2.2	2.2	2.2	2.2	4	4	4	4	4	4	4
Recommendations													
Cable cross section for B&R motor cables [mm ²] ¹⁾	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
ACOPOS	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314
ACOPOSmulti	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425
ACOPOS servo drive 8Vxxx.00-x ²⁾	1010	1010	1010	1010	1010	1016	1010	1010	1016	1010	1016	1022	1045
ACOPOSmulti inverter module 8BVI... ³⁾	0014	0014	0014	0014	0014	0014	0014	0014	0014	0014	0014	0014	0028

1) The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSmulti inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request.

2) The recommended servo drive is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

3) The recommended ACOPOSmulti inverter module is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

Motor	8LSA35.ee022f9g-0	8LSA35.ee030f9g-0	8LSA35.ee045f9g-0	8LSA35.ee060f9g-0	8LSA36.ee022f9g-0	8LSA36.ee030f9g-0	8LSA36.ee045f9g-0	8LSA36.ee060f9g-0	8LSA43.ee022f9g-0	8LSA43.ee030f9g-0	8LSA43.ee045f9g-0	8LSA43.ee060f9g-0
Rated speed n_N [min ⁻¹]	2200	3000	4500	6000	2200	3000	4500	6000	2200	3000	4500	6000
Number of poles	4	4	4	4	4	4	4	4	10	10	10	10
Rated torque M_N [Nm]	2.1	2.1	1.8	1.6	2.7	2.7	2.2	1.8	3.5	3.1	2.7	2
Rated power P_N [kW]	0.48	0.66	0.85	1.01	0.62	0.85	1.04	1.13	0.81	0.97	1.27	1.26
Rated current I_N [A]	1.05	1.44	1.86	2.2	1.36	1.86	2.27	2.47	1.58	1.9	2.49	2.46
Stall torque M_0 [Nm]	2.3	2.3	2.3	2.3	3	3	3	3	4	4	4	4
Stall current I_0 [A]	1.15	1.58	2.37	3.16	1.51	2.07	3.09	4.12	1.8	2.46	3.7	4.91
Peak torque M_{max} [Nm]	9.2	9.2	9.2	9.2	12	12	12	12	15.2	15.2	15.2	15.2
Peak current I_{max} [A]	4.97	6.8	10.2	13.6	6.48	8.9	13.3	17.73	10.71	14.59	21.94	29.17
Maximum angular acceleration without brake a [rad/s ²]	102222	102222	102222	102222	100000	100000	100000	100000	81283	81283	81283	81283
Maximum speed n_{max} [min ⁻¹]	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000
Torque constant K_T [Nm/A]	1.99	1.46	0.97	0.73	1.99	1.45	0.97	0.73	2.22	1.63	1.08	0.81
Voltage constant K_E [V/1000 min ⁻¹]	120.42	87.96	58.64	43.98	120.42	87.96	58.64	43.98	134.04	98.43	65.45	49.22
Stator resistance R_{2ph} [Ω]	32.7	18.5	8.2	4.6	21	11.6	5.16	2.9	10.7	5.43	2.42	1.36
Stator inductance L_{2ph} [mH]	91.1	49.16	21.7	12.29	67.7	36.5	16.64	9.45	69.4	36.5	16.5	9.2
Electrical time constant t_{el} [ms]	2.79	2.66	2.65	2.67	3.22	3.15	3.23	3.26	6.49	6.72	6.83	6.77
Thermal time constant t_{therm} [min]	38	38	38	38	40	40	40	40	25	25	25	25
Moment of inertia without brake J [kgcm ²]	0.9	0.9	0.9	0.9	1.2	1.2	1.2	1.2	1.87	1.87	1.87	1.87
Weight without brake m [kg]	3.66	3.66	3.66	3.66	4.43	4.43	4.43	4.43	3.9	3.9	3.9	3.9
Holding brake												
Moment of inertia for brake J_{Br} [kgcm ²]	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.54	0.54	0.54	0.54
Weight of brake m_{Br} [kg]	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.46	0.46	0.46	0.46
Holding torque of the brake M_{Br} [Nm]	4	4	4	4	4	4	4	4	8	8	8	8
Recommendations												
Cable cross section for B&R motor cables [mm ²] ¹⁾	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
ACOPOS	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314
ACOPOSmulti	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425
ACOPOS servo drive 8Vxxx.00-x ²⁾	1016	1022	1045	1045	1016	1045	1045	1090	1022	1045	1045	1090
ACOPOSmulti inverter module 8BVI... ³⁾	0014	0014	0028	0028	0014	0028	0028	0055	0028	0028	0055	0055

1) The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSmulti inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request.

2) The recommended servo drive is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

3) The recommended ACOPOSmulti inverter module is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

Product overview

Self-cooling motors (cooling type A)

Motor	8LSA44.ee022fpgg-0	8LSA44.ee030fpgg-0	8LSA44.ee045fpgg-0	8LSA44.ee060fpgg-0	8LSA45.ee022fpgg-0	8LSA45.ee030fpgg-0	8LSA45.ee045fpgg-0	8LSA45.ee060fpgg-0	8LSA46.ee022fpgg-0	8LSA46.ee030fpgg-0	8LSA46.ee045fpgg-0	8LSA46.ee060fpgg-0
Rated speed n_N [min ⁻¹]	2200	3000	4500	6000	2200	3000	4500	6000	2200	3000	4500	6000
Number of poles	10	10	10	10	10	10	10	10	10	10	10	10
Rated torque M_N [Nm]	5.2	4.62	3.6	3	7	6.16	4.8	4	8.7	7.7	6	5
Rated power P_N [kW]	1.2	1.45	1.7	1.88	1.61	1.94	2.26	2.51	2	2.42	2.83	3.14
Rated current I_N [A]	2.35	2.84	3.33	3.69	3.16	3.78	4.43	4.91	3.92	4.73	5.54	6.14
Stall torque M_0 [Nm]	6	6	6	6	8	8	8	8	10	10	10	10
Stall current I_0 [A]	2.71	3.69	5.54	7.37	3.61	4.91	7.39	9.83	4.51	6.14	9.24	12.28
Peak torque M_{max} [Nm]	22.8	22.8	22.8	22.8	30.4	30.4	30.4	30.4	38	38	38	38
Peak current I_{max} [A]	16.07	21.88	32.91	43.76	21.43	29.17	43.88	58.35	26.78	36.47	54.85	72.94
Maximum angular acceleration without brake a [rad/s ²]	83516	83562	83562	83562	84916	84810	84810	84810	86620	86620	86620	86620
Maximum speed n_{max} [min ⁻¹]	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000
Torque constant K_T [Nm/A]	2.22	1.63	1.08	0.81	2.22	1.63	1.08	0.81	2.22	1.63	1.08	0.81
Voltage constant K_E [V/1000 min ⁻¹]	134.04	98.43	65.45	49.22	134.04	98.43	65.45	49.22	134.04	98.43	65.45	49.22
Stator resistance R_{2ph} [Ω]	6.24	3.6	1.53	0.86	4.32	2.49	1.11	0.67	3.61	1.92	0.88	0.48
Stator inductance L_{2ph} [mH]	44.8	24	10.8	6.2	41	21.8	9.69	5.45	32	17.44	7.75	4.36
Electrical time constant t_{el} [ms]	7.18	6.67	7.04	7.19	9.49	8.76	8.76	8.13	8.86	9.08	8.81	9.08
Thermal time constant t_{therm} [min]	30	30	30	30	35	35	35	35	40	40	40	40
Moment of inertia without brake J [kgcm ²]	2.73	2.73	2.73	2.73	3.58	3.58	3.58	3.58	4.39	4.39	4.39	4.39
Weight without brake m [kg]	5.26	5.26	5.26	5.26	6.7	6.7	6.7	6.7	8.1	8.1	8.1	8.1
Holding brake												
Moment of inertia for brake J_{Br} [kgcm ²]	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54
Weight of brake m_{Br} [kg]	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Holding torque of the brake M_{Br} [Nm]	8	8	8	8	8	8	8	8	8	8	8	8
Recommendations												
Cable cross section for B&R motor cables [mm ²] ¹⁾	1.5	1.5	1.5	1.5	1.5	1.5	1.5	4	1.5	1.5	4	4
ACOPOS	▣ 1314	▣ 1314	▣ 1314	▣ 1314	▣ 1314	▣ 1314	▣ 1314	▣ 1315	▣ 1314	▣ 1314	▣ 1315	▣ 1315
ACOPOSmulti	▣ 1425	▣ 1425	▣ 1425	▣ 1425	▣ 1425	▣ 1425	▣ 1425	▣ 1426	▣ 1425	▣ 1425	▣ 1426	▣ 1426
ACOPOS servo drive 8Vxxxx.00-x ²⁾	1045	1045	1090	1090	1045	1090	1090	1180	1090	1090	1180	1180
ACOPOSmulti inverter module 8BVI... ³⁾	0028	0055	0055	0110	0055	0055	0110	0110	0055	0055	0110	0110

1) The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSmulti inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request.

2) The recommended servo drive is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

3) The recommended ACOPOSmulti inverter module is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

Motor	8LSA53.ee022f9g-1	8LSA53.ee030ff9g-1	8LSA53.ee045ff9g-1	8LSA54.ee022f9g-1	8LSA54.ee030ff9g-1	8LSA54.ee045ff9g-1	8LSA55.ee022f9g-1	8LSA55.ee030ff9g-1	8LSA55.ee045ff9g-1	8LSA56.ee022f9g-1	8LSA56.ee030ff9g-1	8LSA56.ee045ff9g-1	8LSA57.ee022f9g-1	8LSA57.ee030ff9g-1	8LSA57.ee045ff9g-1
Rated speed n_N [min ⁻¹]	2200	3000	4500	2200	3000	4500	2200	3000	4500	2200	3000	4500	2200	3000	4500
Number of poles	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Rated torque M_N [Nm]	4.2	4	3.9	7.8	7.7	7.3	11.8	11.6	9.5	14.4	13.9	12.7	18	17.5	15
Rated power P_N [kW]	0.97	1.26	1.84	1.8	2.42	3.44	2.72	3.64	4.48	3.32	4.37	5.98	4.15	5.5	7.07
Rated current I_N [A]	2	2.5	3.8	3.6	4.7	7.1	5.1	6.9	9	6.3	8.2	11.9	7.6	10	13.9
Stall torque M_0 [Nm]	4.5	4.5	4.5	9	9	9	12.5	12.5	12.5	16	16	16	20	20	20
Stall current I_0 [A]	2.12	2.74	4.35	3.92	5.38	8.6	5.69	8.07	11.38	7.21	9.89	15.79	8.84	12.32	19.3
Peak torque M_{max} [Nm]	13.8	13.8	13.8	27.6	27.6	27.6	41.4	41.4	41.4	55.2	55.2	55.2	69	69	69
Peak current I_{max} [A]	8	10.53	16.48	15.39	20.92	32.96	23.64	32.96	47.29	30.78	41.83	65.92	38.39	52.63	82.61
Maximum angular acceleration without brake a [rad/s ²]	38107	38107	38107	45660	45660	45660	50526	50526	50526	51777	51777	51777	52558	52558	52558
Maximum speed n_{max} [min ⁻¹]	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000
Torque constant K_T [Nm/A]	2.22	1.63	1.09	2.22	1.63	1.09	2.22	1.63	1.09	2.22	1.63	1.09	2.22	1.63	1.09
Voltage constant K_E [V/1000 min ⁻¹]	134.04	98.43	65.97	134.04	98.43	65.97	134.04	98.43	65.97	134.04	98.43	65.97	134.04	98.43	65.97
Stator resistance R_{2ph} [Ω]	9.35	5.59	2.22	3.81	2.03	0.79	2.27	1.13	0.57	1.64	0.87	0.34	1.24	0.64	0.26
Stator inductance L_{2ph} [mH]	82.1	47.39	19.33	39.75	21.52	8.67	24.29	12.5	6.07	18.73	10.14	4.08	14.87	7.91	3.21
Electrical time constant t_{el} [ms]	8.79	8.48	8.7	10.43	10.62	10.92	10.72	11.09	10.72	11.43	11.64	11.97	12.04	12.45	12.39
Thermal time constant t_{therm} [min]	33	33	33	37	37	37	40	40	40	43	43	43	46	46	46
Moment of inertia without brake J [kgcm ²]	3.62	3.62	3.62	6.04	6.04	6.04	8.19	8.19	8.19	10.66	10.66	10.66	13.13	13.13	13.13
Weight without brake m [kg]	9.93	9.93	9.93	11.46	11.46	11.46	13.29	13.29	13.29	15.31	15.31	15.31	17.24	17.24	17.24
Holding brake															
Moment of inertia for brake J_{Br} [kgcm ²]	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66
Weight of brake m_{Br} [kg]	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Holding torque of the brake M_{Br} [Nm]	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Recommendations															
Cable cross section for B&R motor cables [mm ²] ¹⁾	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	4	1.5	4	4	4	4	4
ACOPOS	⊗ 1314	⊗ 1314	⊗ 1314	⊗ 1314	⊗ 1314	⊗ 1314	⊗ 1314	⊗ 1314	⊗ 1315	⊗ 1314	⊗ 1315	⊗ 1315	⊗ 1315	⊗ 1315	⊗ 1315
ACOPOSmulti	⊗ 1425	⊗ 1425	⊗ 1425	⊗ 1425	⊗ 1425	⊗ 1425	⊗ 1425	⊗ 1425	⊗ 1426	⊗ 1425	⊗ 1426	⊗ 1426	⊗ 1426	⊗ 1426	⊗ 1426
ACOPOS servo drive 8Vxxx.00-x ²⁾	1045	1045	1045	1045	1090	1180	1090	1180	1180	1090	1180	1180	1180	1180	1320
ACOPOSmulti inverter module 8BVI... ³⁾	0028	0028	0055	0055	0055	0110	0055	0110	0110	0110	0110	0220	0110	0110	0220

1) The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSmulti inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request.

2) The recommended servo drive is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

3) The recommended ACOPOSmulti inverter module is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

Product overview

Self-cooling motors (cooling type A)

Motor	8LSA63.ee022ffgg-1	8LSA63.ee030ffgg-1	8LSA63.ee045ffgg-1	8LSA64.ee022ffgg-1	8LSA64.ee030ffgg-1	8LSA64.ee045ffgg-1	8LSA65.ee022ffgg-1	8LSA65.ee030ffgg-1	8LSA65.ee045ffgg-1	8LSA66.ee022ffgg-1	8LSA66.ee030ffgg-1	8LSA66.ee045ffgg-1
Rated speed n_N [min ⁻¹]	2200	3000	4500	2200	3000	4500	2200	3000	4500	2200	3000	4500
Number of poles	8	8	8	8	8	8	8	8	8	8	8	8
Rated torque M_N [Nm]	11.8	11.6	9.5	18	17.5	15.1	22	21	12.2	24.5	23.5	15
Rated power P_N [kW]	2.72	3.64	4.48	4.15	5.5	7.12	5.07	6.6	5.75	5.64	7.38	7.07
Rated current I_N [A]	5.1	6.9	9	7.6	10	13.9	8.8	11.7	14.2	9.9	13	15.9
Stall torque M_0 [Nm]	12.5	12.5	12.5	20	20	20	24	24	24	28	28	28
Stall current I_0 [A]	5.69	8.07	11.38	8.84	12.32	19.3	10.36	14.79	20.87	11.83	16.57	23.73
Peak torque M_{max} [Nm]	46.92	46.92	46.92	78.2	78.2	78.2	97.92	97.92	97.92	114.24	114.24	114.24
Peak current I_{max} [A]	30.48	42.48	60.96	49.48	67.84	106.48	64.31	90.95	130.49	74.41	103.49	152.61
Maximum angular acceleration without brake a [rad/s ²]	57263	57263	57263	59566	59566	59566	62787	62787	62787	63246	63246	63246
Maximum speed n_{max} [min ⁻¹]	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000
Torque constant K_T [Nm/A]	2.22	1.63	1.09	2.22	1.63	1.09	2.22	1.63	1.09	2.22	1.63	1.09
Voltage constant K_E [V/1000 min ⁻¹]	134.04	98.43	65.97	134.04	98.43	65.97	134.04	98.43	65.97	134.04	98.43	65.97
Stator resistance R_{2ph} [Ω]	2.27	1.13	0.57	1.24	0.64	0.26	0.99	0.48	0.24	0.84	0.43	0.21
Stator inductance L_{2ph} [mH]	24.29	12.5	6.07	14.87	7.91	3.21	12	6	2.91	10.4	5.37	2.47
Electrical time constant t_{el} [ms]	10.72	11.09	10.72	12.04	12.45	12.39	12.17	12.4	11.98	12.36	12.53	11.81
Thermal time constant t_{therm} [min]	42	42	42	45	45	45	48	48	48	52	52	52
Moment of inertia without brake J [kgcm ²]	8.19	8.19	8.19	13.13	13.13	13.13	15.85	15.85	15.85	18.06	18.06	18.06
Weight without brake m [kg]	13.29	13.29	13.29	17.24	17.24	17.24	19.17	19.17	19.17	21.1	21.1	21.1
Holding brake												
Moment of inertia for brake J_{Br} [kgcm ²]	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85
Weight of brake m_{Br} [kg]	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Holding torque of the brake M_{Br} [Nm]	32	32	32	32	32	32	32	32	32	32	32	32
Recommendations												
Cable cross section for B&R motor cables [mm ²] ¹⁾	1.5	1.5	4	4	4	4	4	4	4	4	4	4
ACOPOS	▮ 1314	▮ 1314	▮ 1315	▮ 1315	▮ 1315	▮ 1315	▮ 1315	▮ 1315	▮ 1315	▮ 1315	▮ 1315	▮ 1315
ACOPOSmulti	▮ 1425	▮ 1425	▮ 1426	▮ 1426	▮ 1426	▮ 1426	▮ 1426	▮ 1426	▮ 1426	▮ 1426	▮ 1426	▮ 1426
ACOPOS servo drive 8Vxxxx.00-x ²⁾	1090	1180	1180	1180	1180	1320	1180	1180	1320	1180	1180	1320
ACOPOSmulti inverter module 8BVI... ³⁾	0055	0110	0110	0110	0110	0220	0110	0220	0440	0110	0220	0440

1 The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSmulti inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request.

2 The recommended servo drive is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

3 The recommended ACOPOSmulti inverter module is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

Motor	8LSA73.ee022ffgg-0	8LSA73.ee030ffgg-0	8LSA73.ee045ffgg-0	8LSA74.ee022ffgg-0	8LSA74.ee030ffgg-0	8LSA74.ee045ffgg-0	8LSA75.ee022ffgg-0	8LSA75.ee030ffgg-0	8LSA83.ee022ffgg-0	8LSA83.ee030ffgg-0	8LSA84.ee022ffgg-0	8LSA84.ee030ffgg-0	8LSA85.ee015ffgg-0	8LSA85.ee020ffgg-0	8LSA86.ee015ffgg-0	8LSA86.ee020ffgg-0
Rated speed n_N [min ⁻¹]	2200	3000	4500	2200	3000	4500	2200	3000	2200	3000	2200	3000	1500	2000	1500	2000
Number of poles	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Rated torque M_N [Nm]	21	20	14.5	26	24	15	32	30	31	27	51.5	48.4	77	72	97	85
Rated power P_N [kW]	4.84	6.28	6.83	5.99	7.54	7.07	7.37	9.42	7.14	8.48	11.86	15.21	12.1	15.08	15.24	17.8
Rated current I_N [A]	9.47	12.27	13.18	11.73	14.72	13.64	14.43	18.4	13.98	16.56	23.23	29.69	22.25	29.39	31.09	34.69
Stall torque M_0 [Nm]	26	26	26	32	32	32	40	40	40	40	69	69	94	94	115	115
Stall current I_0 [A]	11.73	15.95	23.64	14.43	19.63	29.09	18.04	24.54	18.04	24.54	31.12	42.33	27.17	38.37	36.86	46.94
Peak torque M_{max} [Nm]	107	107	107	134	134	134	187	187	120	120	204	204	280	280	345	345
Peak current I_{max} [A]	84.3	115	171	103	140	207	130	176	72.6	102	115.5	171	113	150.6	137	182
Maximum angular acceleration without brake a [rad/s ²]	10918	10918	10918	11652	11652	11652	13357	13357	18462	18462	17895	17895	18667	18667	17969	17969
Maximum speed n_{max} [min ⁻¹]	6000	6000	6000	6000	6000	6000	4500	4500	3600	3600	3600	3600	3600	3600	3600	3600
Torque constant K_T [Nm/A]	2.22	1.63	1.1	2.22	1.63	1.1	2.22	1.63	2.22	1.63	2.22	1.63	3.46	2.45	3.12	2.45
Voltage constant K_E [V/1000 min ⁻¹]	134.04	98.43	65.97	134.04	98.43	65.97	134.04	98.43	134.04	98.43	134.04	98.43	209.43	147.65	188.49	147.65
Stator resistance R_{2ph} [Ω]	0.86	0.46	0.22	0.64	0.34	0.16	0.38	0.21	0.41	0.23	0.2	0.11	0.33	0.17	0.2	0.13
Stator inductance L_{2ph} [mH]	10.49	5.55	2.62	8.47	4.42	2.2	5.46	3.07	9.6	5.4	5.29	3.11	9.44	4.85	6.1	3.9
Electrical time constant t_{el} [ms]	12.23	12.07	11.91	13.15	13	13.75	14.52	14.62	23.42	23.48	26.45	27.52	28.78	28.87	30.05	30
Thermal time constant t_{therm} [min]	55	55	55	60	60	60	65	65	50	50	65	65	80	80	90	90
Moment of inertia without brake J [kgcm ²]	98	98	98	115	115	115	140	140	65	65	114	114	150	150	192	192
Weight without brake m [kg]	27	27	27	30	30	30	38	38	41.5	41.5	55	55	74	74	92	92
Holding brake																
Moment of inertia for brake J_{br} [kgcm ²]	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85	53	53	53	53	53	53	53	53
Weight of brake m_{br} [kg]	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35
Holding torque of the brake M_{br} [Nm]	32	32	32	32	32	32	32	32	130	130	130	130	130	130	130	130
Recommendations																
Cable cross section for B&R motor cables [mm ²] ¹⁾	4	4	4	4	4	4	4	4	4	4 ²⁾	10	10	4 ²⁾	10	10	10
ACOPOS	☞ 1315	☞ 1315	☞ 1315	☞ 1315	☞ 1315	☞ 1315	☞ 1315	☞ 1315	☞ 1315	☞ 1315		☞ 1316	☞ 1316		☞ 1316	☞ 1316
ACOPOSmulti	☞ 1426	☞ 1426	☞ 1426	☞ 1426	☞ 1426	☞ 1426	☞ 1426	☞ 1426	☞ 1426	☞ 1426		☞ 1427	☞ 1427		☞ 1427	☞ 1427
ACOPOS servo drive 8Vxxx.00-x ³⁾	1180	1180	1320	1180	1320	1320	1320	1320	1320	1320	1640	1640	1320	1640	1640	1640
ACOPOSmulti inverter module 8BVI... ³⁾	0110	0220	0440	0220	0220	0440	0220	0440	0220	0440	0440	0880	0440	0440	0440	0880

1) The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSmulti inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request.

2) Special prefabricated motor cables must be used for this motor / servo drive combination (size of the motor plug is not the standard size). They are available from B&R on request.

3) The recommended servo drive is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

4) The recommended ACOPOSmulti inverter module is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

8LSA2



Preferred types (see also 1478)¹⁾

Without holding brake:	8LSA25.R0060D000-0
With holding brake:	8LSA25.R0060D200-0

- a) Preferred types have increased availability for first orders and convenience when service is needed. They are equipped as follows:
- * Rated speed 6000 min⁻¹
 - * Resolvers
 - * Smooth Shaft
 - * Angled connection (swivel connector)

Technical data	8LSA23.ee060ffgg-0	8SA24.ee060ffgg-0	8LSA25.ee045ffgg-0	8LSA25.ee060ffgg-0	8LSA26.ee045ffgg-0	8LSA26.ee060ffgg-0
Rated speed n_N [min ⁻¹]	6000	6000	4500	6000	4500	6000
Number of poles	4	4	4	4	4	4
Rated torque M_N [Nm]	0.17	0.35	0.54	0.52	0.72	0.69
Rated power P_N [kW]	0.11	0.22	0.25	0.33	0.34	0.43
Rated current I_N [A]	0.23	0.48	0.56	0.71	0.74	0.95
Stall torque M_0 [Nm]	0.2	0.4	0.6	0.6	0.8	0.8
Stall current I_0 [A]	0.27	0.55	0.62	0.82	0.82	1.1
Peak torque M_{max} [Nm]	0.8	1.6	3.2	2.4	3.2	3.2
Peak current $I_{i,max}$ [A]	1.25	2.5	2.77	3.7	3.75	5
Maximum angular acceleration without brake a [rad/s ²]	114286	133333	200000	150000	160000	160000
Maximum speed n_{max} [min ⁻¹]	12000	12000	12000	12000	12000	12000
Torque constant K_T [Nm/A]	0.73	0.73	0.97	0.73	0.97	0.73
Voltage constant K_E [V/1000 min ⁻¹]	43.98	43.98	58.64	43.98	58.64	43.98
Stator resistance R_{2ph} [Ω]	230	70	54.7	31	36.9	20.8
Stator inductance L_{2ph} [mH]	150	75	91.8	49.7	66.9	37.5
Electrical time constant t_{el} [ms]	0.65	1.07	1.68	1.6	1.81	1.8
Thermal time constant t_{therm} [min]	15	20	25	25	30	30
Moment of inertia without brake J [kgcm ²]	0.07	0.12	0.16	0.16	0.2	0.2
Weight without brake m [kg]	1	1.3	1.6	1.6	1.9	1.9
Holding brake						
Moment of inertia for brake J_{Br} [kgcm ²]	0.12	0.12	0.12	0.12	0.12	0.12
Weight of brake m_{Br} [kg]	0.16	0.16	0.16	0.16	0.16	0.16
Holding torque of the brake M_{Br} [Nm]	2.2	2.2	2.2	2.2	2.2	2.2
Recommendations						
Cable cross section for B&R motor cables [mm ²] ¹⁾	1.5	1.5	1.5	1.5	1.5	1.5
ACOPOS	1314	1314	1314	1314	1314	1314
ACOPOSmulti	1425	1425	1425	1425	1425	1425
ACOPOS servo drive 8Vxxxx.00-x ²⁾	1010	1010	1010	1010	1010	1016
ACOPOSmulti inverter module 8BVI... ³⁾	0014	0014	0014	0014	0014	0014

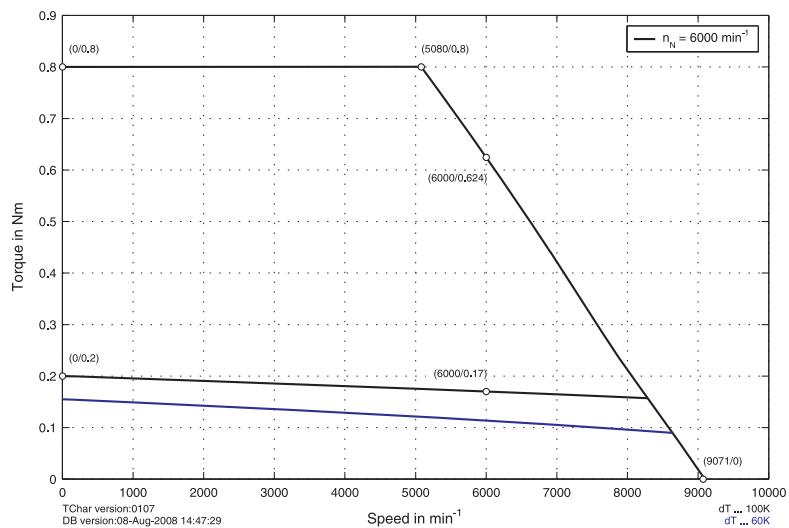
1) The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSmulti inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request.

2) The recommended servo drive is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

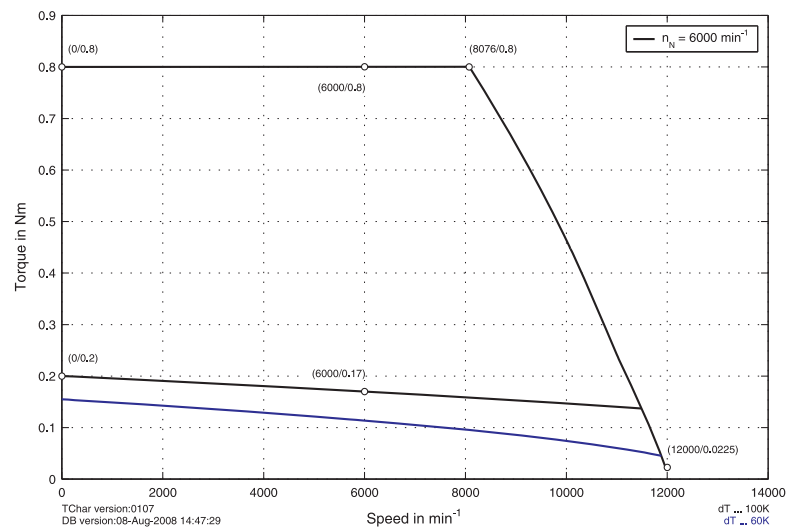
3) The recommended ACOPOSmulti inverter module is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

Speed-torque characteristic curves with 400 VAC supply voltage

ACOPOS

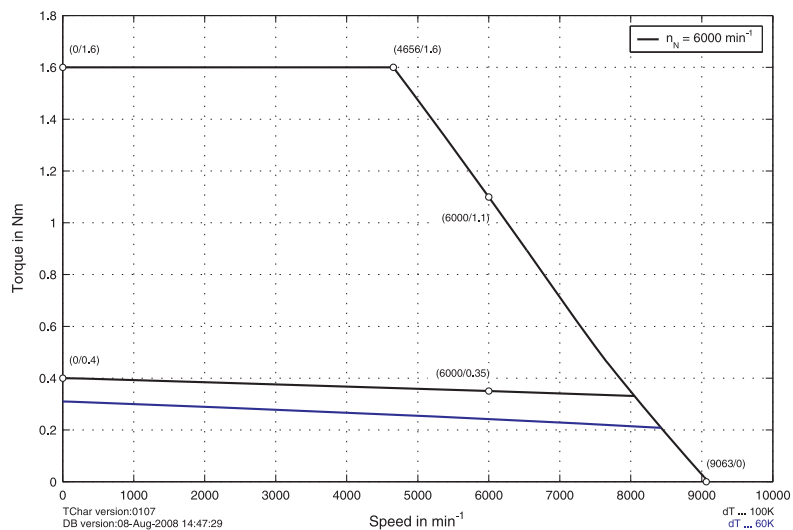


ACOPOSmulti

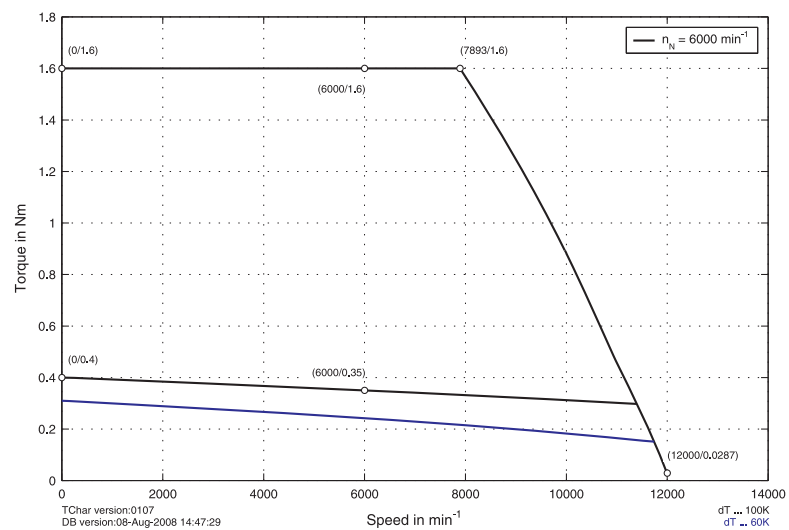


8LSA23.eennffgg-0

ACOPOS

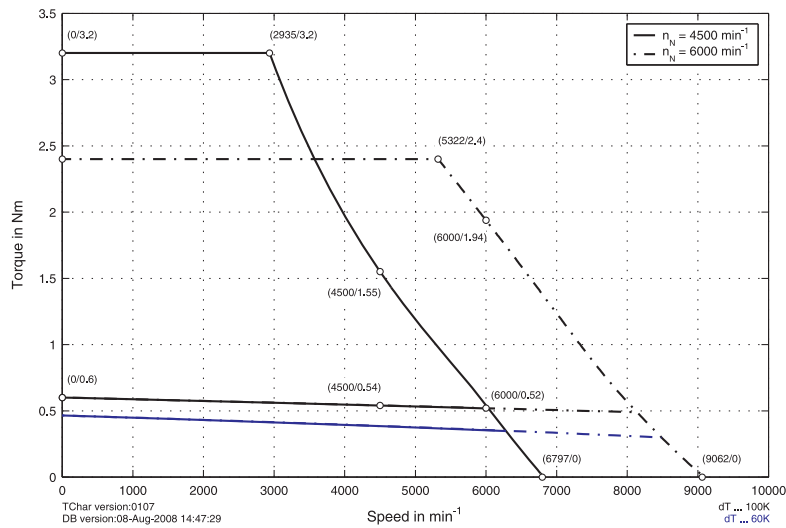


ACOPOSmulti

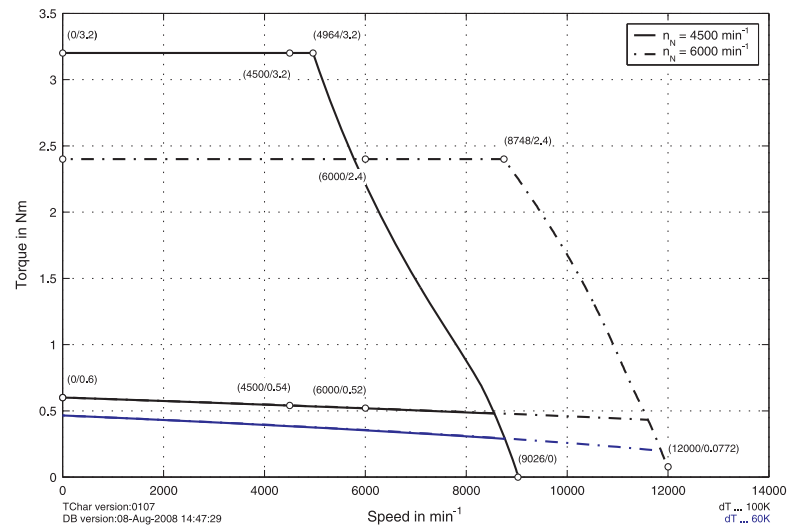


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ACOPOS

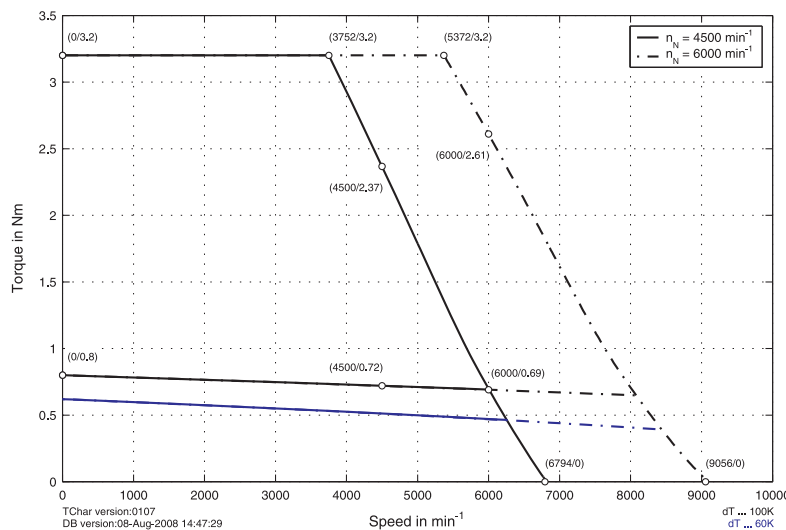


ACOPOSmulti

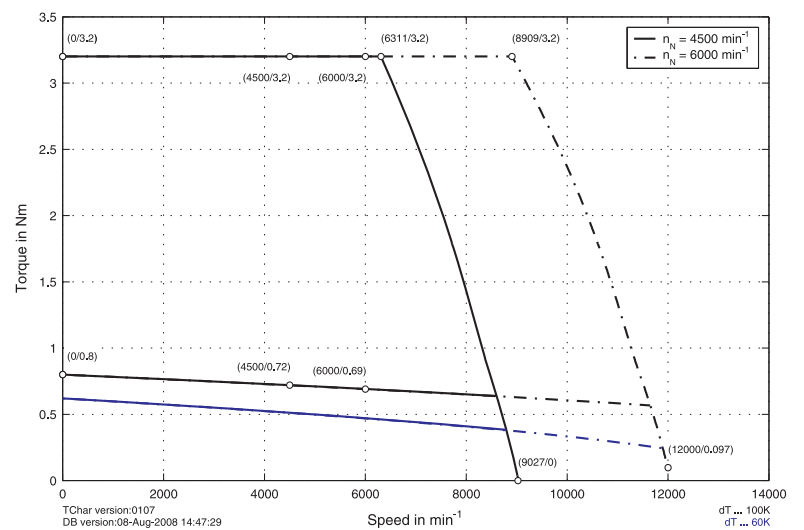


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ACOPOS



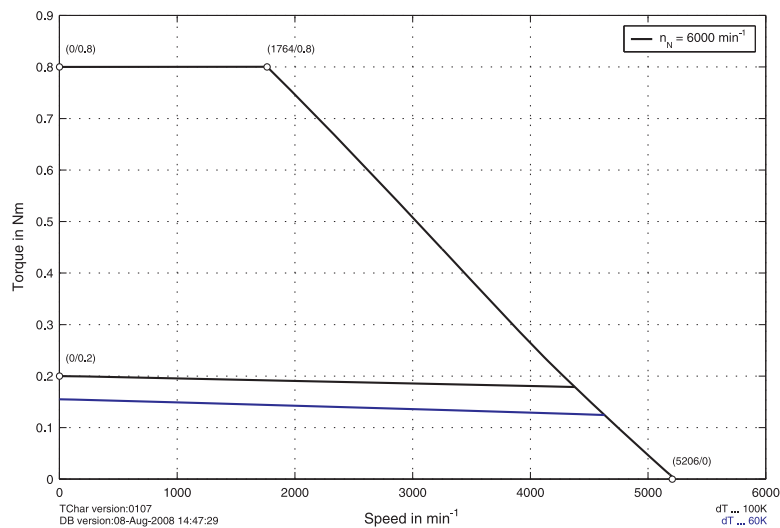
ACOPOSmulti



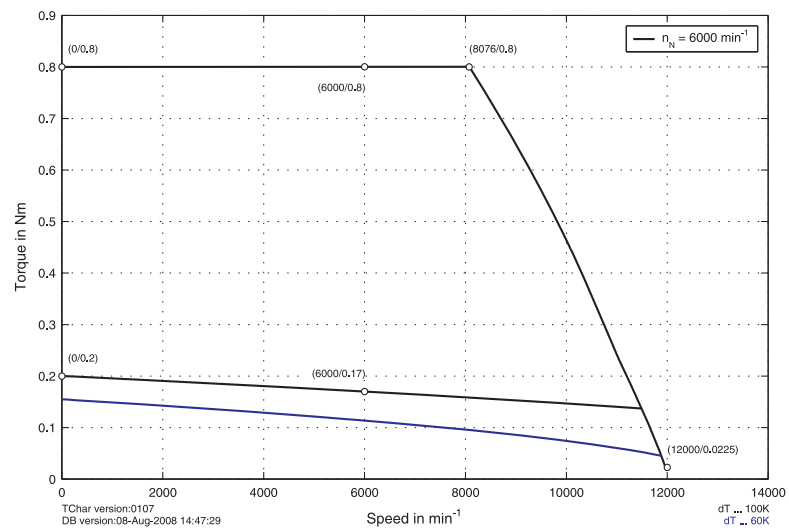
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Speed-torque characteristic curves with 230 VAC supply voltage

ACOPOS

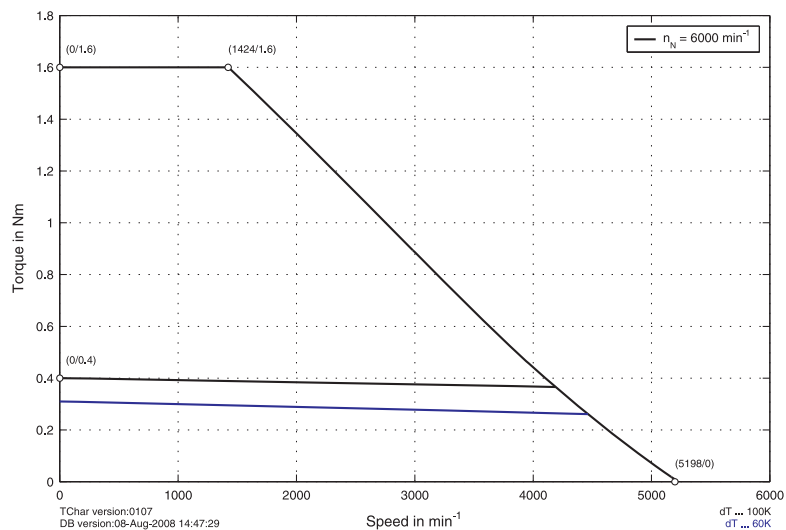


ACOPOSmulti

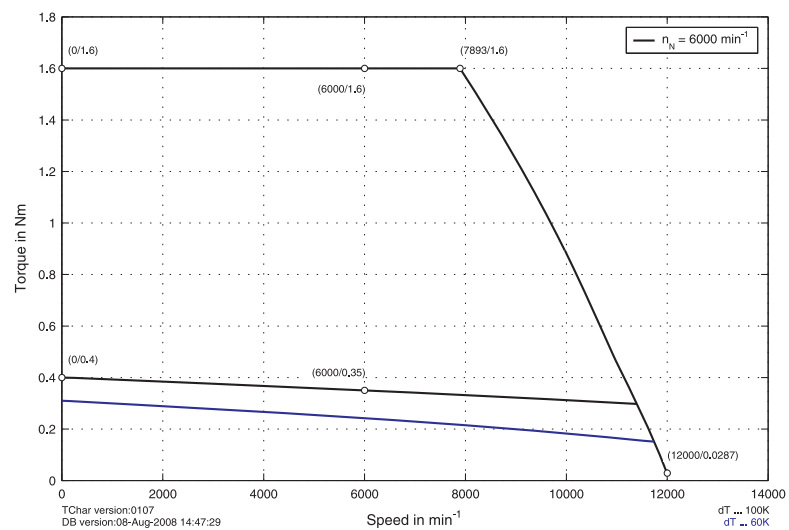


8LSA23.eennffgg-0

ACOPOS

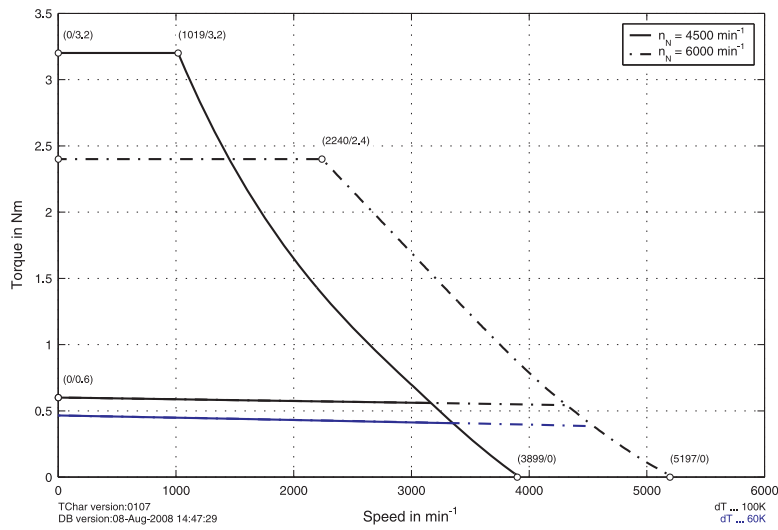


ACOPOSmulti

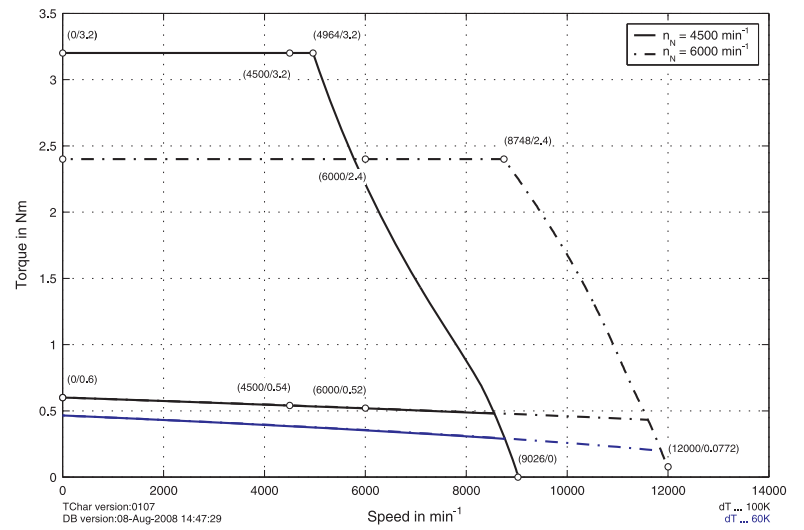


8LSA24.eennffgg-0

ACOPOS

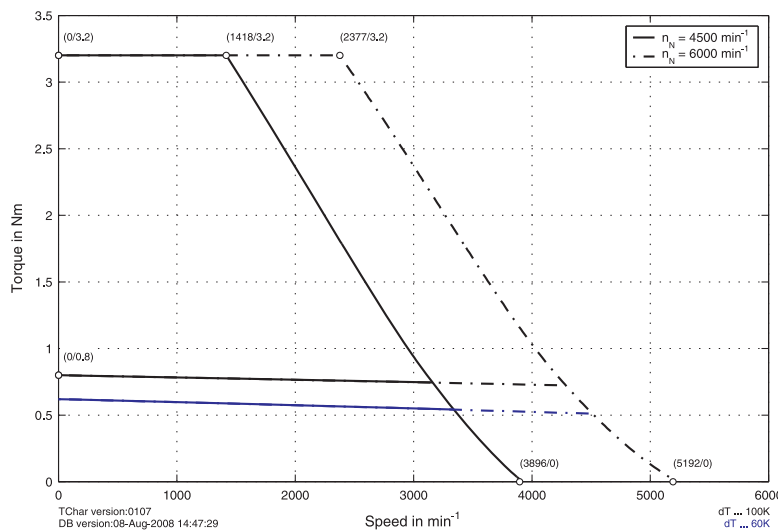


ACOPOSMulti

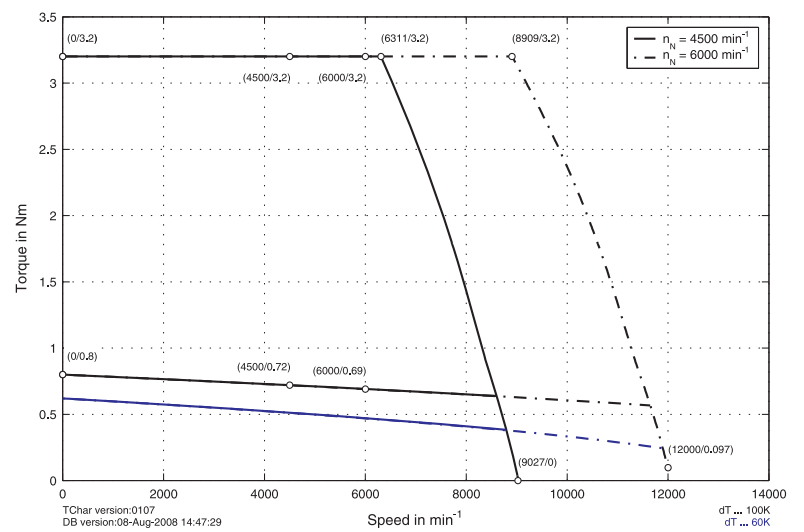


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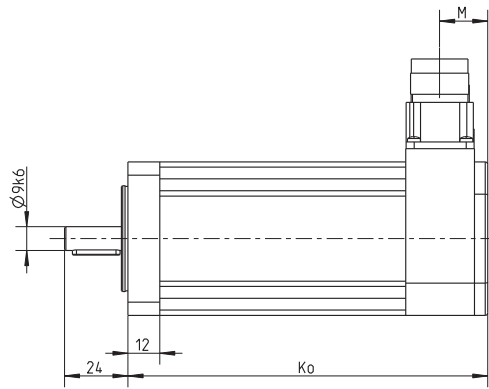
ACOPOS



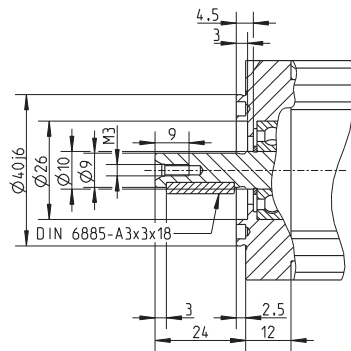
ACOPOSMulti



8LSA26.eennffgg-0



**A side flange detail
Standard bearing**



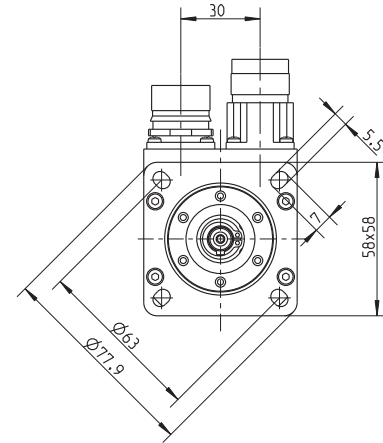
**Possible
connection directions**



Straight (top connector)



Angled (swivel connector)



Dimensions

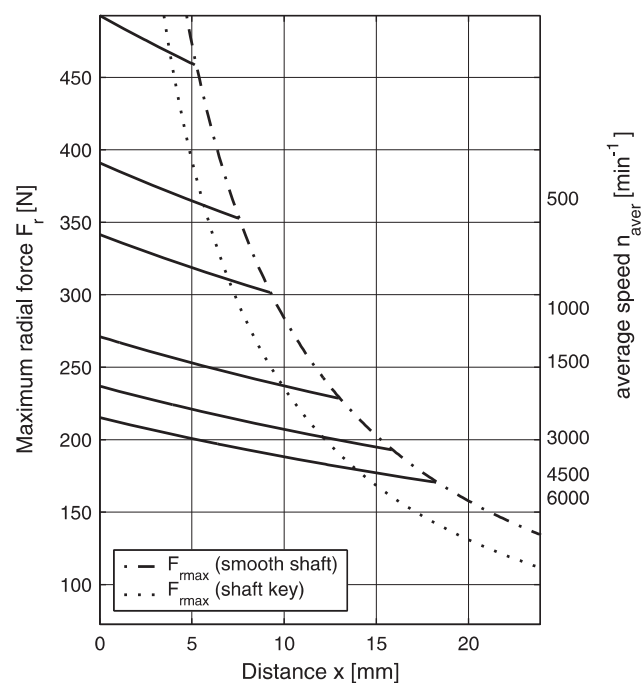
EnDat feedback		Resolver feedback		Extension of K_0 depending on the motor option [mm] ¹⁾				
Model number	K_0	M	Model number	K_0	M	Holding brake	Oil seal	Reinforced A side bearing
8LSA23.Exnnffgg-0	126	28	8LSA23.R0nnffgg-0	106	18	23.5	7	---
8LSA24.Exnnffgg-0	141	28	8LSA24.R0nnffgg-0	121	18	23.5	7	---
8LSA25.Exnnffgg-0	156	28	8LSA25.R0nnffgg-0	136	18	23.5	7	---
8LSA26.Exnnffgg-0	171	28	8LSA26.R0nnffgg-0	151	18	23.5	7	---

1) If a combination of motor options is used (e.g. holding brake and oil seal), the sum of the extensions for the individual motor options must be added to K_0 .

Maximum shaft load

The values in the diagram below are based on a mechanical lifespan of the bearings of 20,000 operating hours.

Standard bearing



maximum allowed axial force: $F_{amax} = 44$ N

Recommended B&R motor cable

The recommended B&R motor cable for a motor depends on the recommended ACOPOS servo drive or ACOPOSmulti inverter module (see "Recommended cable cross section for B&R motor cables [mm²]" in the table "Technical data") 1486

Recommended B&R encoder cables

8BCExxxx.1111A-0	ACPmulti EnDat cable, length xxxx m, 10x 0.14 mm ² + 2x 0.5 mm ² , EnDat plug 17-pin SpeedTec socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed 1428
8BCRxxxx.1111A-0	ACPmulti Resolver cable, length xxxx m, 3 x 2 x 24 AWG (19 x 0.127), resolver plug 12-pin SpeedTec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed 1429



8LSA3



Preferred types (see also 1478)^{a)}

Without holding brake:	8LSA35.E2030D000-0
	8LSA35.E2060D000-0
	8LSA35.E3030D000-0
	8LSA35.E3060D000-0
With holding brake:	8LSA35.E2030D200-0
	8LSA35.E2060D200-0
	8LSA35.E3030D200-0
	8LSA35.E3060D200-0

- a) Preferred types have increased availability for first orders and convenience when service is needed. They are equipped as follows:
- * Rated speed 3000 min⁻¹ or 6000 min⁻¹
 - * EnDat encoder - single-turn (E2) or multi-turn (E3), 32-lines, inductive
 - * Smooth Shaft
 - * Angled connection (swivel connector)

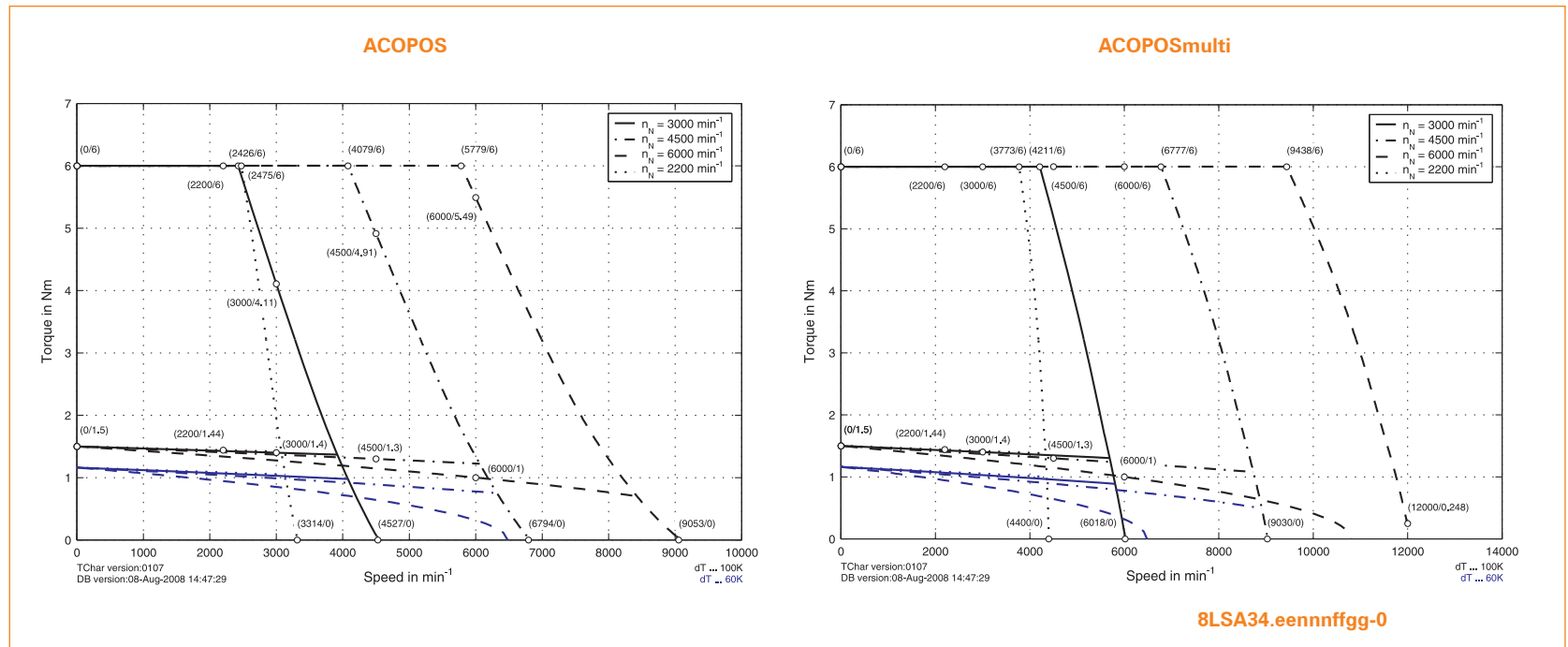
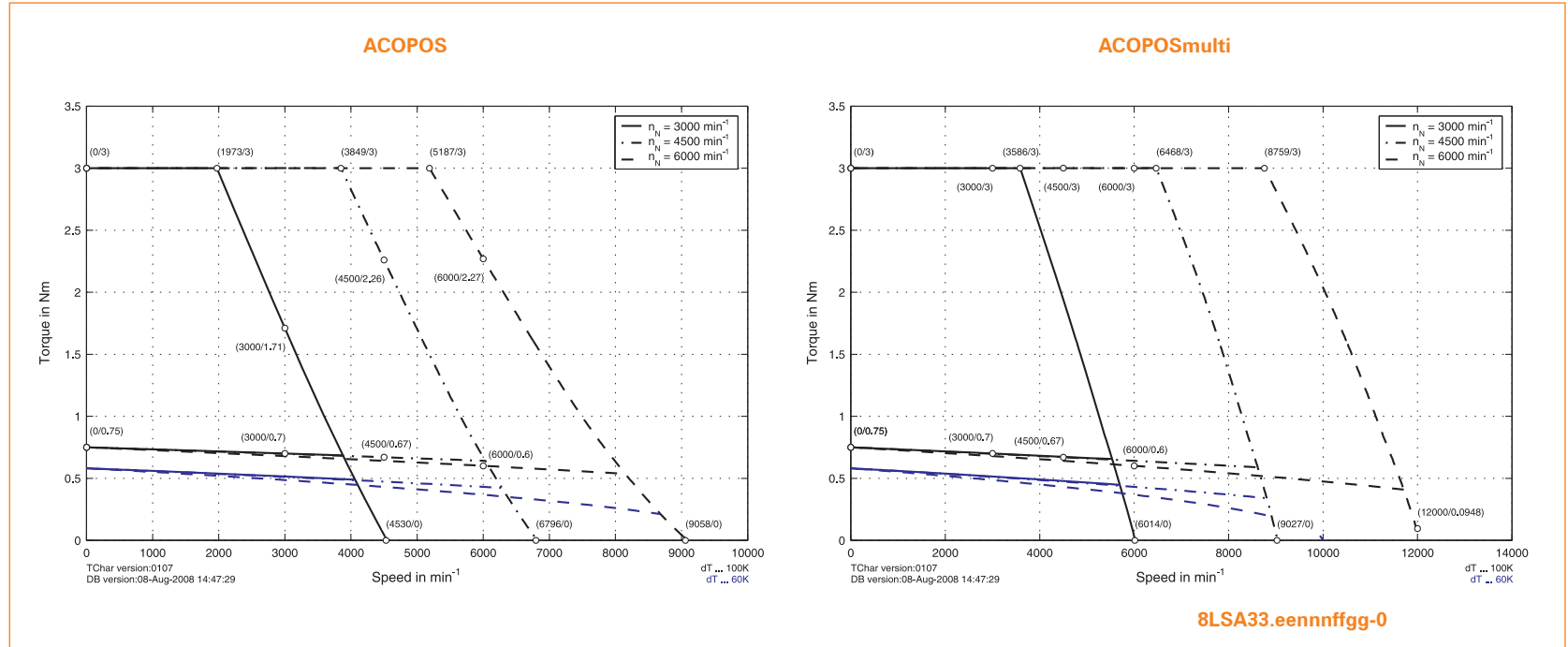
Technical data	8LSA33.ee[nnn]ffgg-0			8LSA34.ee[nnn]ffgg-0			8LSA35.ee[nnn]ffgg-0				8LSA36.ee[nnn]ffgg-0					
	[030]	[045]	[060]	[022]	[030]	[045]	[060]	[022]	[030]	[045]	[060]	[022]	[030]	[045]	[060]	
Rated speed n_N [min ⁻¹]	3000	4500	6000	2200	3000	4500	6000	2200	3000	4500	6000	2200	3000	4500	6000	
Number of poles	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
Rated torque M_N [Nm]	0.7	0.67	0.6	1.44	1.4	1.3	1	2.1	2.1	1.8	1.6	2.7	2.7	2.2	1.8	
Rated power P_N [kW]	0.22	0.32	0.38	0.33	0.44	0.61	0.63	0.48	0.66	0.85	1.01	0.62	0.85	1.04	1.13	
Rated current I_N [A]	0.48	0.69	0.82	0.72	0.96	1.34	1.37	1.05	1.44	1.86	2.2	1.36	1.86	2.27	2.47	
Stall torque M_0 [Nm]	0.75	0.75	0.75	1.5	1.5	1.5	1.5	2.3	2.3	2.3	2.3	3	3	3	3	
Stall current I_0 [A]	0.52	0.77	1.03	0.75	1.03	1.55	2.06	1.15	1.58	2.37	3.16	1.51	2.07	3.09	4.12	
Peak torque M_{max} [Nm]	3	3	3	6	6	6	6	9.2	9.2	9.2	9.2	12	12	12	12	
Peak current I_{max} [A]	2.22	3.32	4.43	3.24	4.43	6.65	8.87	4.97	6.8	10.2	13.6	6.48	8.9	13.3	17.73	
Maximum angular acceleration without brake a [rad/s ²]	85714	85714	85714	100000	100000	100000	100000	102222	102222	102222	102222	100000	100000	100000	100000	
Maximum speed n_{max} [min ⁻¹]	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	
Torque constant K_T [Nm/A]	1.46	0.97	0.73	1.99	1.46	0.97	0.73	1.99	1.46	0.97	0.73	1.99	1.45	0.97	0.73	
Voltage constant K_E [V/1000 min ⁻¹]	87.96	58.64	43.98	120.42	87.96	58.64	43.98	120.42	87.96	58.64	43.98	120.42	87.96	58.64	43.98	
Stator resistance R_{zph} [Ω]	100	40.46	27	5.8	32.3	15.2	8.52	32.7	18.5	8.2	4.6	21	11.6	5.16	2.9	
Stator inductance L_{zph} [mH]	147.48	63.08	36.87	134	73.12	32.77	18.28	91.1	49.16	21.7	12.29	67.7	36.5	16.64	9.45	
Electrical time constant t_{el} [ms]	1.48	1.4	1.37	23.1	2.26	2.2	2.15	2.79	2.66	2.65	2.67	3.22	3.15	3.23	3.26	
Thermal time constant t_{therm} [min]	32	32	32	35	35	35	35	38	38	38	38	40	40	40	40	
Moment of inertia without brake J [kgcm ²]	0.35	0.35	0.35	0.6	0.6	0.6	0.6	0.9	0.9	0.9	0.9	1.2	1.2	1.2	1.2	
Weight without brake m [kg]	2.13	2.13	2.13	2.89	2.89	2.89	2.89	3.66	3.66	3.66	3.66	4.43	4.43	4.43	4.43	
Holding brake																
Moment of inertia for brake J_{Br} [kgcm ²]	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	
Weight of brake m_{Br} [kg]	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	
Holding torque of the brake M_{Br} [Nm]	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
Recommendations																
Cable cross section for B&R motor cables [mm ²] ¹⁾	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	
ACOPOS	1314	1314	1314	1314	1314	1314	1314	1314	1314	1314	1314	1314	1314	1314	1314	
ACOPOSmulti	1425	1425	1425	1425	1425	1425	1425	1425	1425	1425	1425	1425	1425	1425	1425	
ACOPOS servo drive 8Vxxx.00-x ²⁾	1010	1010	1016	1010	1016	1022	1045	1016	1022	1045	1045	1016	1045	1090	1090	
ACOPOSmulti inverter module 8BVI... ³⁾	0014	0014	0014	0014	0014	0014	0028	0014	0014	0028	0028	0014	0028	0028	0055	

1) The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSmulti inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request.

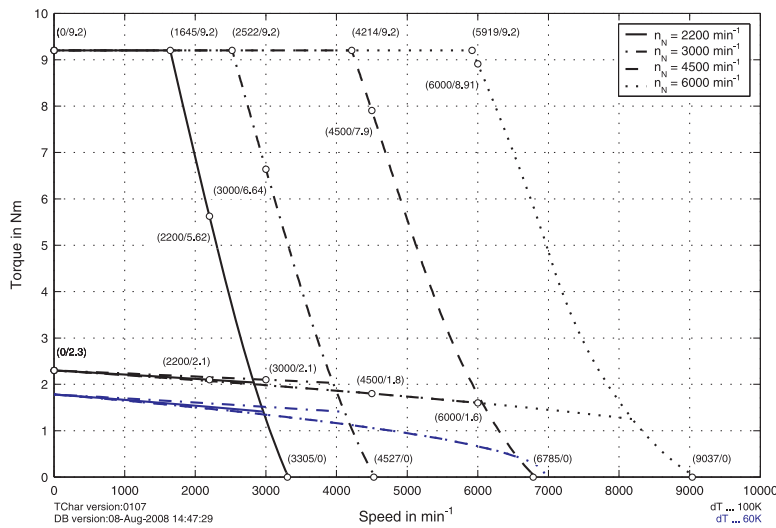
2) The recommended servo drive is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

3) The recommended ACOPOSmulti inverter module is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

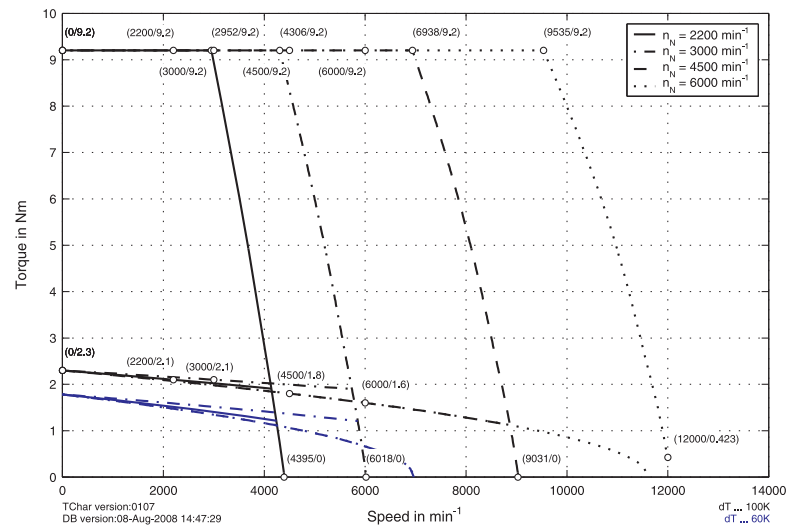
Speed-torque characteristic curves with 400 VAC supply voltage



ACOPOS

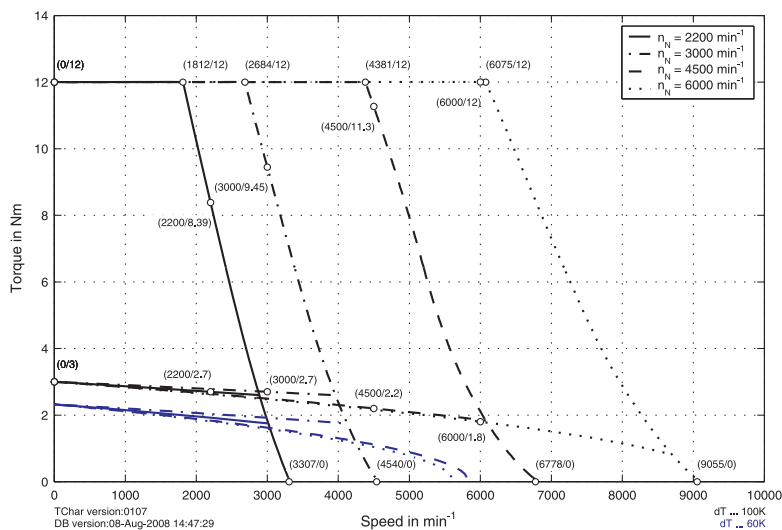


ACOPOSMulti

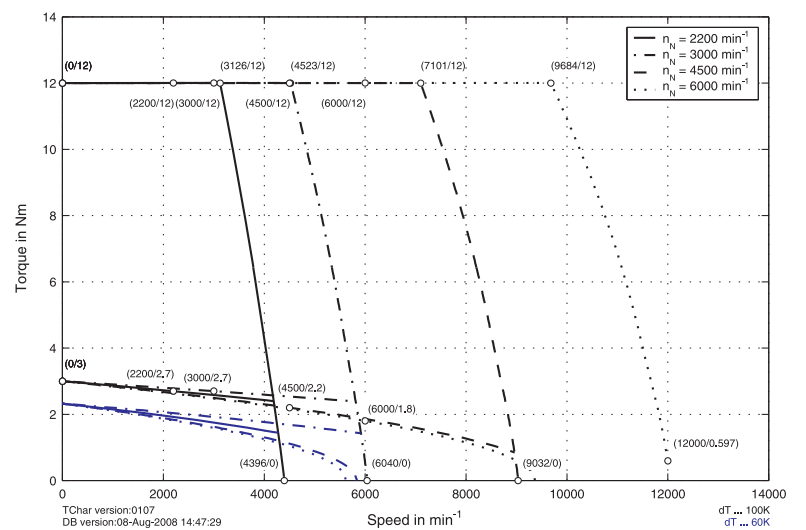


8LSA35.eennffgg-0

ACOPOS

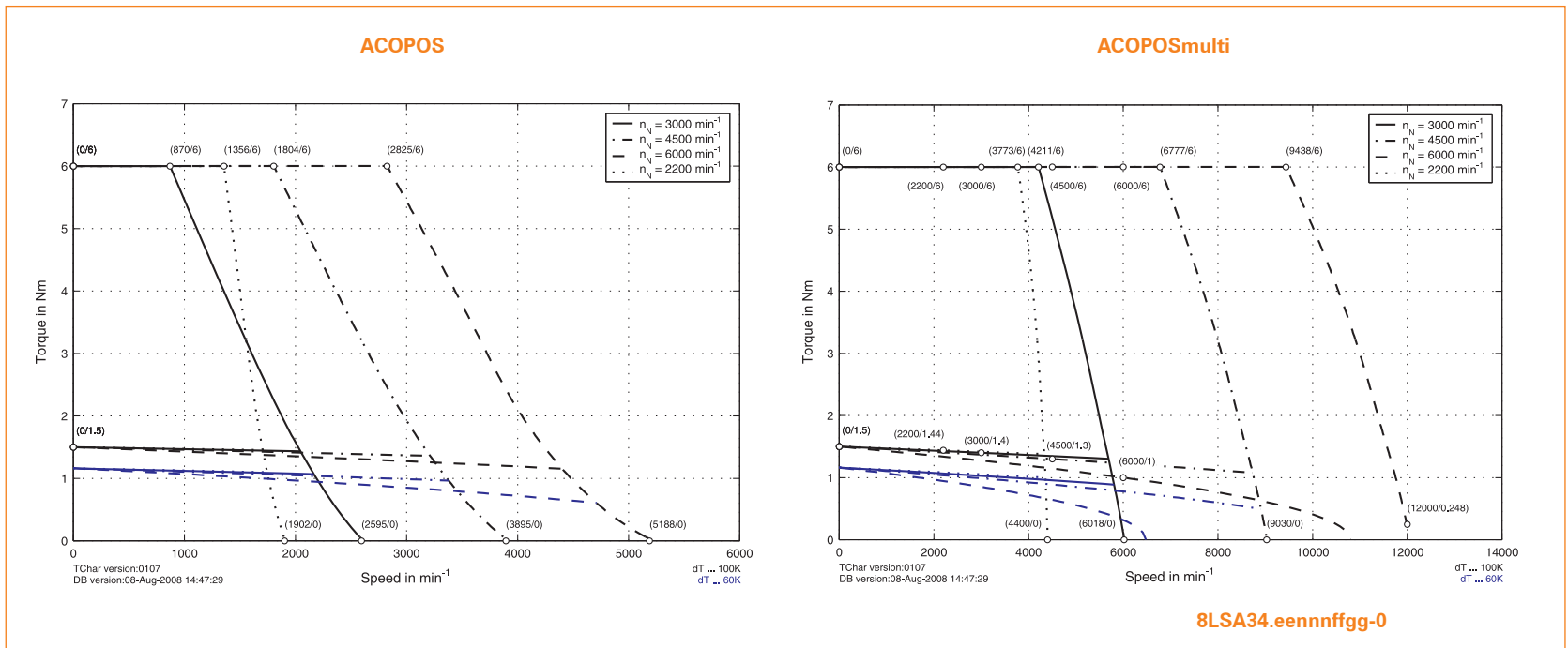
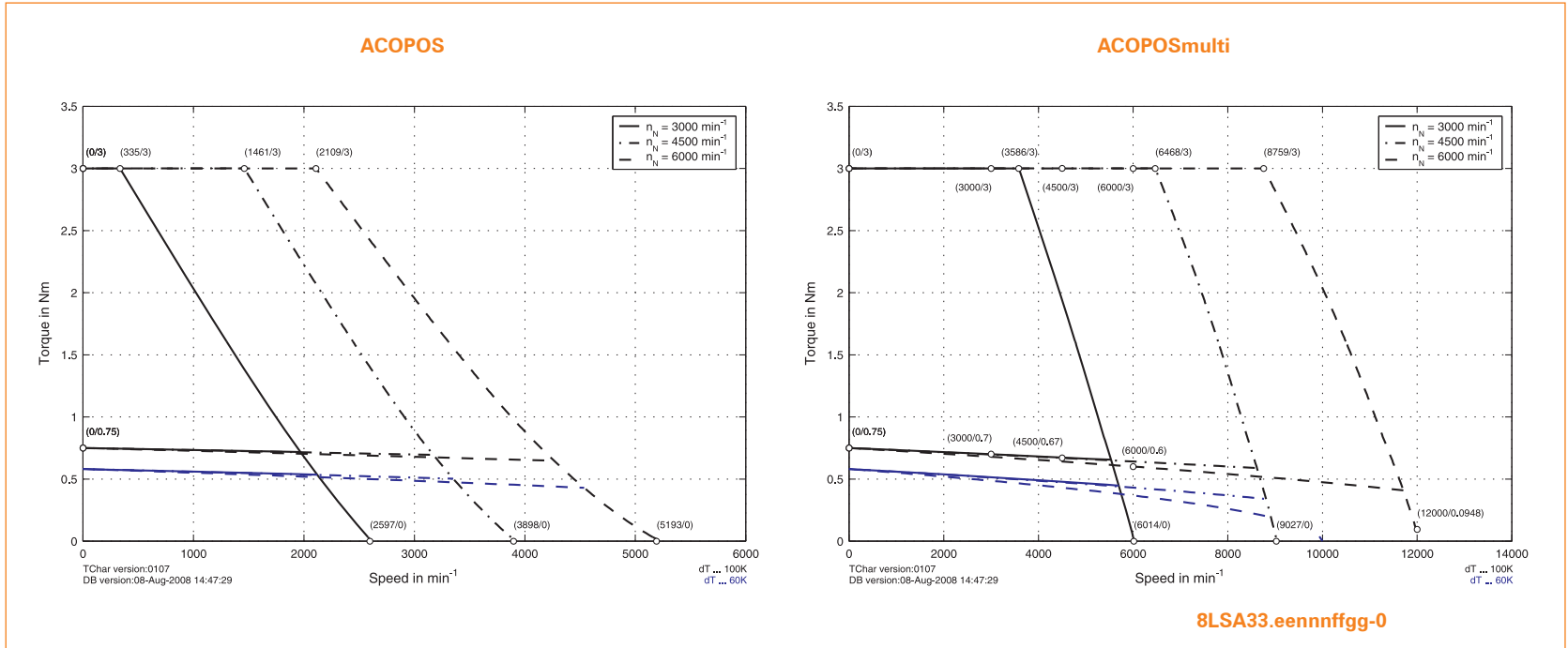


ACOPOSMulti

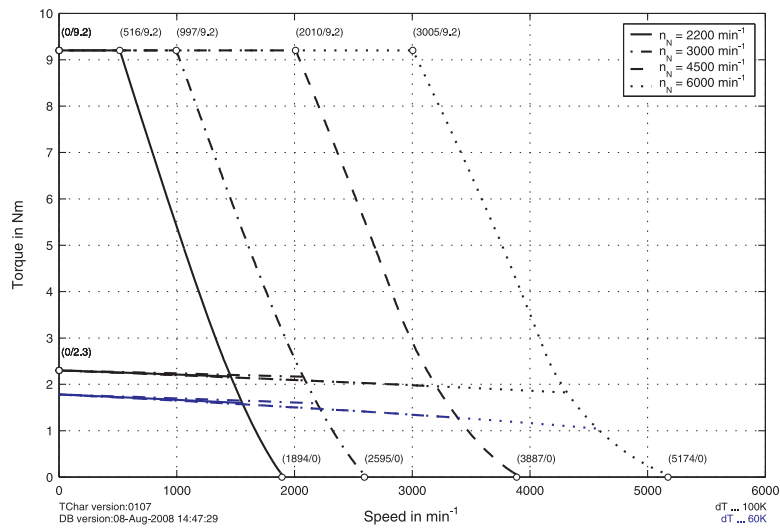


8LSA36.eennffgg-0

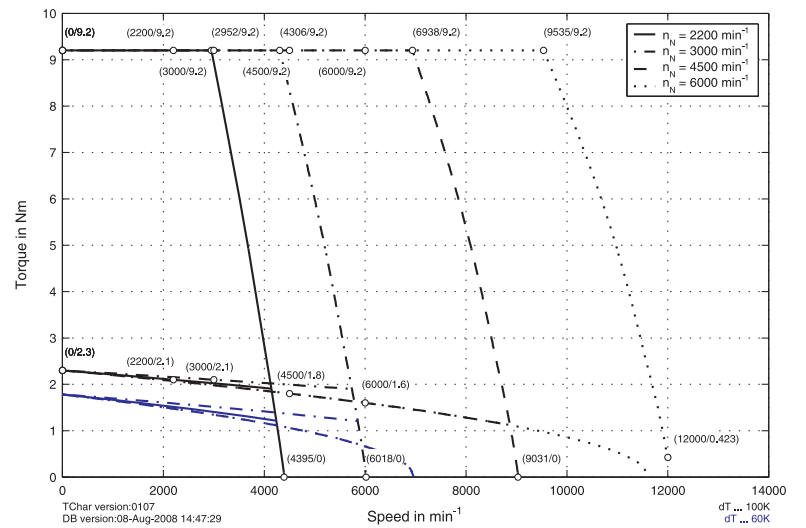
Speed-torque characteristic curves with 230 VAC supply voltage



ACOPOS

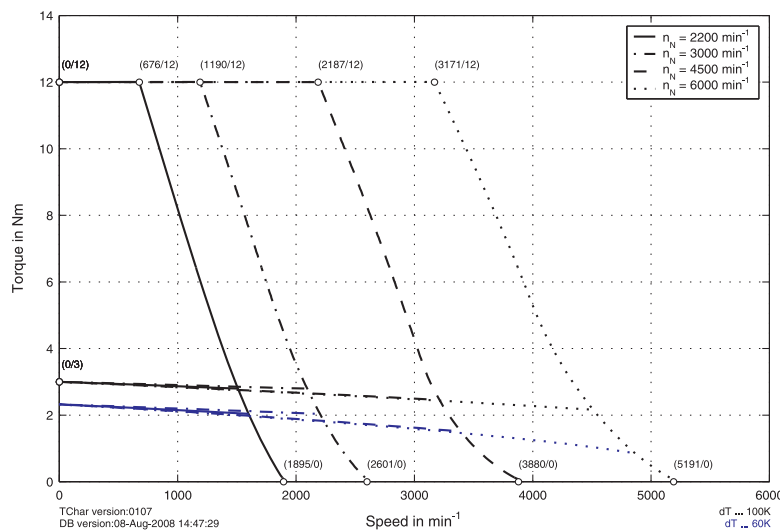


ACOPOSMulti

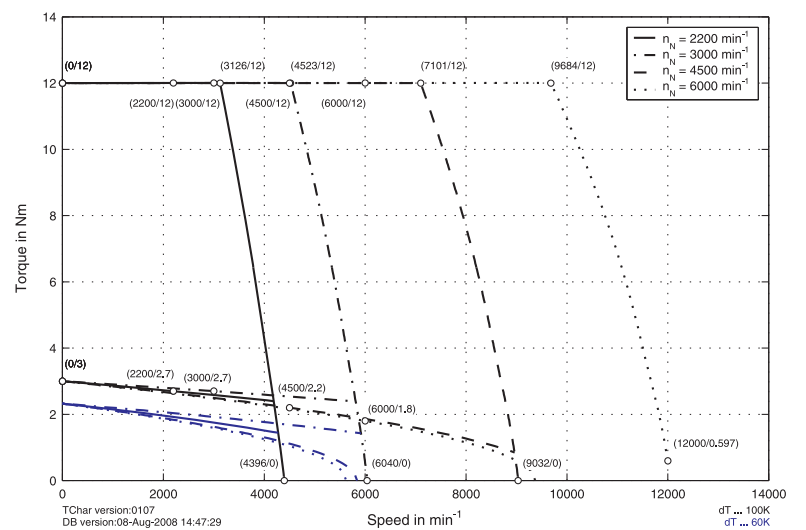


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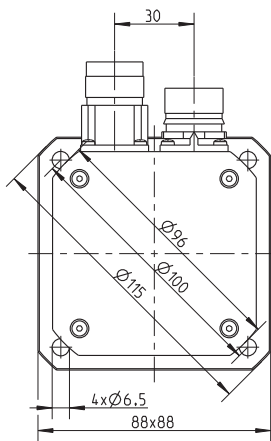
ACOPOS



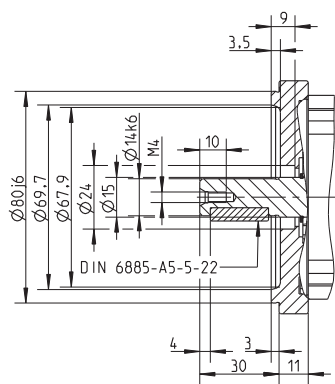
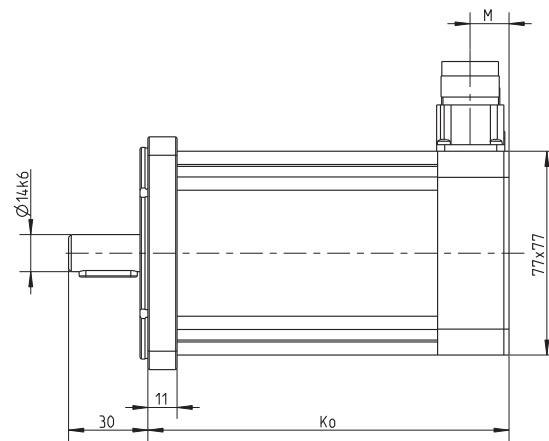
ACOPOSMulti



8LSA36.eennffgg-0



**A side flange detail
Standard bearing**



**Possible
connection directions**



Straight (top connector)



Angled (swivel connector)

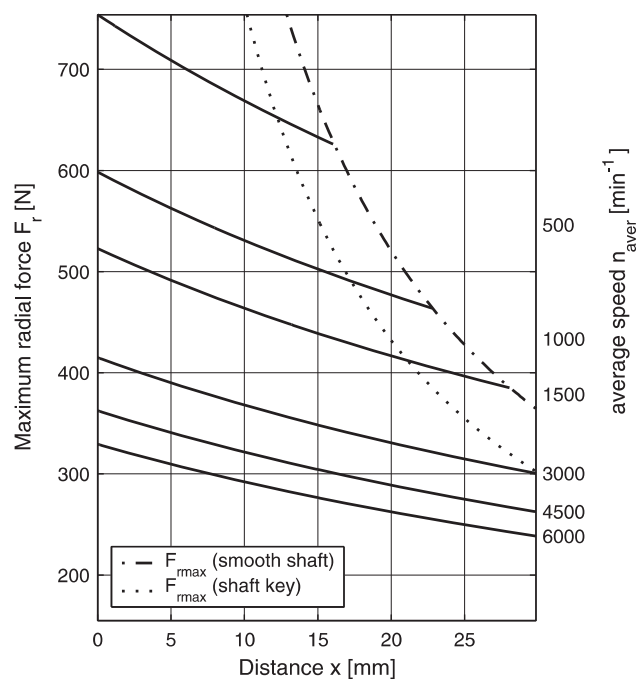
Dimensions

EnDat feedback		Resolver feedback			Extension of K_0 depending on the motor option [mm]			
Model number	K_0	M	Model number	K_0	M	Holding brake	Oil seal	Reinforced A side bearing
8LSA33.Exnnnffgg-0	161	32	8LSA33.R0nnnffgg-0	112	14.5	45	---	---
8LSA34.Exnnnffgg-0	186	32	8LSA23.R0nnnffgg-0	137	14.5	45	---	---
8LSA35.Exnnnffgg-0	211	32	8LSA35.R0nnnffgg-0	162	14.5	45	---	---
8LSA36.Exnnnffgg-0	236	32	8LSA36.R0nnnffgg-0	187	14.5	45	---	---

Maximum shaft load

The values in the diagram below are based on a mechanical lifespan of the bearings of 20,000 operating hours.

Standard bearing



maximum allowed axial force: $F_{amax} = 66$ N

Recommended B&R motor cable

The recommended B&R motor cable for a motor depends on the recommended ACOPOS servo drive or ACOPOSmulti inverter module (see "Recommended cable cross section for B&R motor cables [mm²]" in the table "Technical data")

1494

Recommended B&R encoder cables

8BCExxxx.1111A-0 ACPmulti EnDat cable, length xxxx m, 10x 0.14 mm² + 2x 0.5 mm², EnDat plug 17-pin SpeedTec socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed

1428

8BCRxxxx.1111A-0 ACPmulti Resolver cable, length xxxx m, 3 x 2 x 24 AWG (19 x 0.127), resolver plug 12-pin SpeedTec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed

1429



8LSA4



Preferred types (see also 1478)^{a)}

Without holding brake:	8LSA44.E2030D000-0
	8LSA44.E2060D000-0
	8LSA44.E3030D000-0
	8LSA44.E3060D000-0
With holding brake:	8LSA44.E2030D200-0
	8LSA44.E2060D200-0
	8LSA44.E3030D200-0
	8LSA44.E3060D200-0

a) Preferred types have increased availability for first orders and convenience when service is needed. They are equipped as follows:

- * Rated speed 3000 min⁻¹ or 6000 min⁻¹
- * EnDat encoder - single-turn (E2) or multi-turn (E3), 32-lines, inductive
- * Smooth Shaft
- * Angled connection (swivel connector)

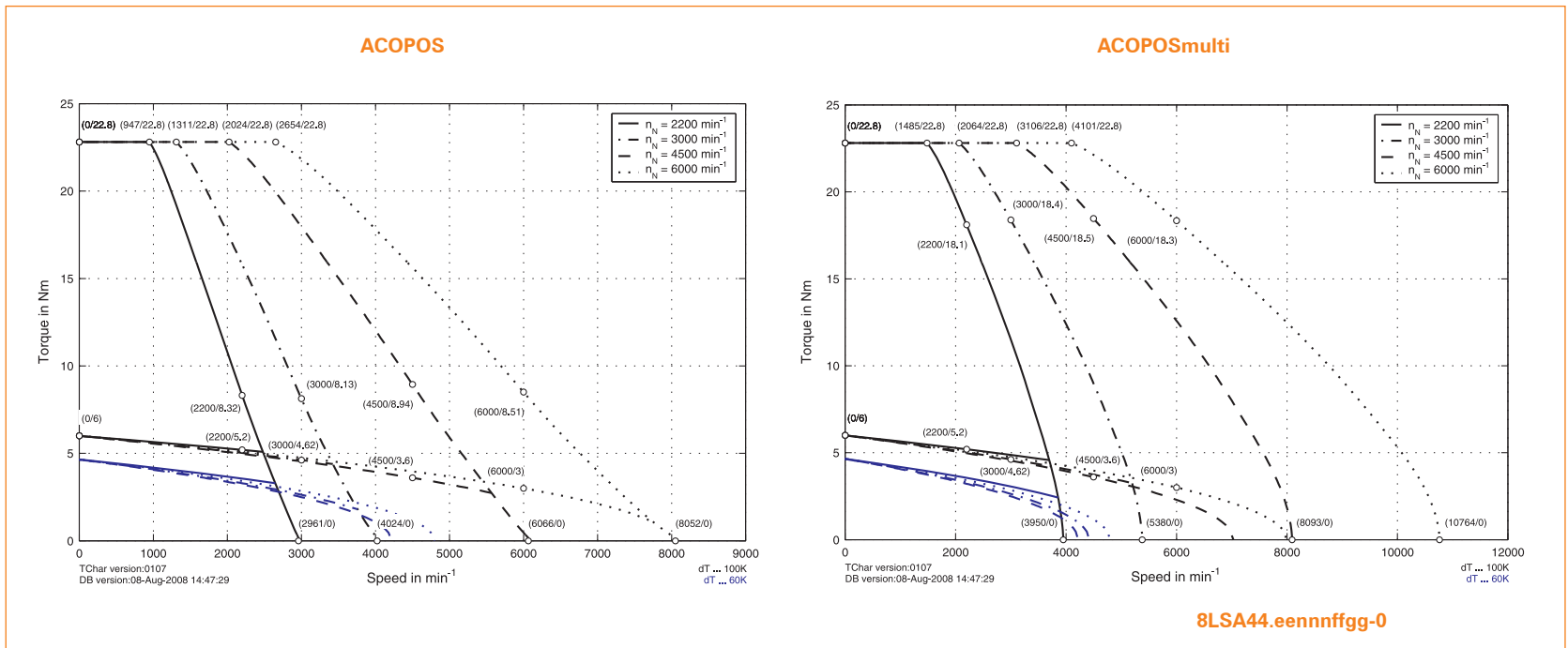
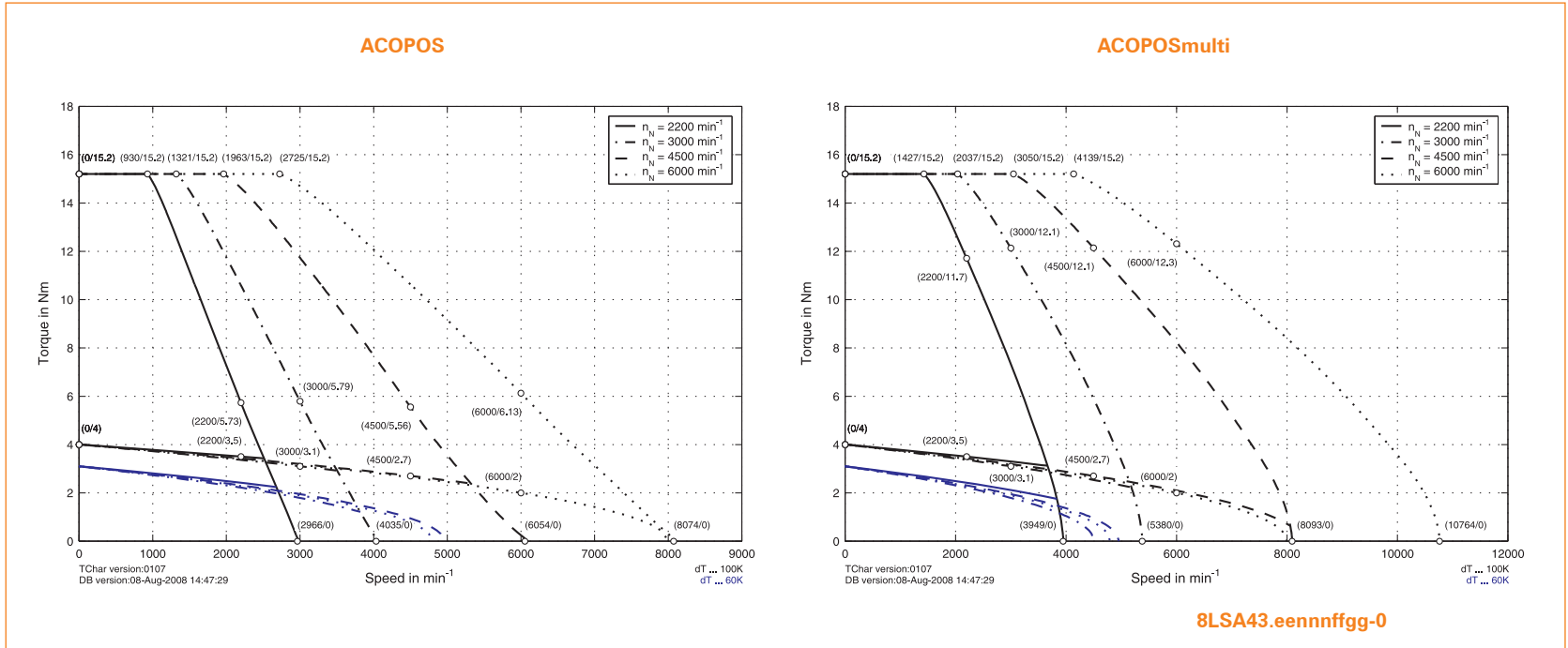
Technical data	8LSA43.ee[nnn]ffgg-0				8LSA44.ee[nnn]ffgg-0				8LSA45.ee[nnn]ffgg-0				8LSA46.ee[nnn]ffgg-0			
	[022]	[030]	[045]	[060]	[022]	[030]	[045]	[060]	[022]	[030]	[045]	[060]	[022]	[030]	[045]	[060]
Rated speed n _N [min ⁻¹]	2200	3000	4500	6000	2200	3000	4500	6000	2200	3000	4500	6000	2200	3000	4500	6000
Number of poles	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Rated torque M _N [Nm]	3.5	3.1	2.7	2	5.2	4.62	3.6	3	7	6.16	4.8	4	8.7	7.7	6	5
Rated power P _N [kW]	0.81	0.97	1.27	1.26	1.2	1.45	1.7	1.88	1.61	1.94	2.26	2.51	2	2.42	2.83	3.14
Rated current I _N [A]	1.58	1.9	2.49	2.46	2.35	2.84	3.33	3.69	3.16	3.78	4.43	4.91	3.92	4.73	5.54	6.14
Stall torque M ₀ [Nm]	4	4	4	4	6	6	6	6	8	8	8	8	10	10	10	10
Stall current I ₀ [A]	1.8	2.46	3.7	4.91	2.71	3.69	5.54	7.37	3.61	4.91	7.39	9.83	4.51	6.14	9.24	12.28
Peak torque M _{max} [Nm]	15.2	15.2	15.2	15.2	22.8	22.8	22.8	22.8	30.4	30.4	30.4	30.4	38	38	38	38
Peak current I _{max} [A]	10.71	14.59	21.94	29.17	16.07	21.88	32.91	43.76	21.43	29.17	43.88	58.35	26.78	36.47	54.85	72.94
Maximum angular acceleration without brake a [rad/s ²]	81283	81283	81283	81283	83516	83562	83562	83562	84916	84810	84810	84810	86620	86620	86620	86620
Maximum speed n _{max} [min ⁻¹]	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000
Torque constant K _T [Nm/A]	2.22	1.63	1.08	0.81	2.22	1.63	1.08	0.81	2.22	1.63	1.08	0.81	2.22	1.63	1.08	0.81
Voltage constant K _E [V/1000 min ⁻¹]	134.04	98.43	65.45	49.22	134.04	98.43	65.45	49.22	134.04	98.43	65.45	49.22	134.04	98.43	65.45	49.22
Stator resistance R _{2ph} [Ω]	10.7	5.43	2.42	1.36	6.24	3.6	1.53	0.86	4.32	2.49	1.11	0.67	3.61	1.92	0.88	0.48
Stator inductance L _{2ph} [mH]	69.4	36.5	16.5	9.2	44.8	24	10.8	6.2	41	21.8	9.69	5.45	32	17.44	7.75	4.36
Electrical time constant τ _{el} [ms]	6.49	6.72	6.83	6.77	7.18	6.67	7.04	7.19	9.49	8.76	8.76	8.13	8.86	9.08	8.81	9.08
Thermal time constant τ _{therm} [min]	25	25	25	25	30	30	30	30	35	35	35	35	40	40	40	40
Moment of inertia without brake J [kgcm ²]	1.87	1.87	1.87	1.87	2.73	2.73	2.73	2.73	3.58	3.58	3.58	3.58	4.39	4.39	4.39	4.39
Weight without brake m [kg]	3.9	3.9	3.9	3.9	5.26	5.26	5.26	5.26	6.7	6.7	6.7	6.7	8.1	8.1	8.1	8.1
Holding brake																
Moment of inertia for brake J _{Br} [kgcm ²]	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54
Weight of brake m _{Br} [kg]	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Holding torque of the brake M _{Br} [Nm]	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Recommendations																
Cable cross section for B&R motor cables [mm ²] ¹⁾	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	4	1.5	1.5	4	4
ACOPOS	1314	1314	1314	1314	1314	1314	1314	1314	1314	1314	1314	1315	1314	1314	1315	1315
ACOPOSmulti	1425	1425	1425	1425	1425	1425	1425	1425	1425	1425	1425	1426	1425	1425	1426	1426
ACOPOS servo drive 8Vxxxx.00-x ²⁾	1022	1045	1045	1090	1045	1045	1090	1090	1045	1090	1090	1180	1090	1090	1180	1180
ACOPOSmulti inverter module 8BVI... ³⁾	0028	0028	0055	0055	0028	0055	0055	0110	0055	0055	0110	0110	0055	0055	0110	0110

1) The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSmulti inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request.

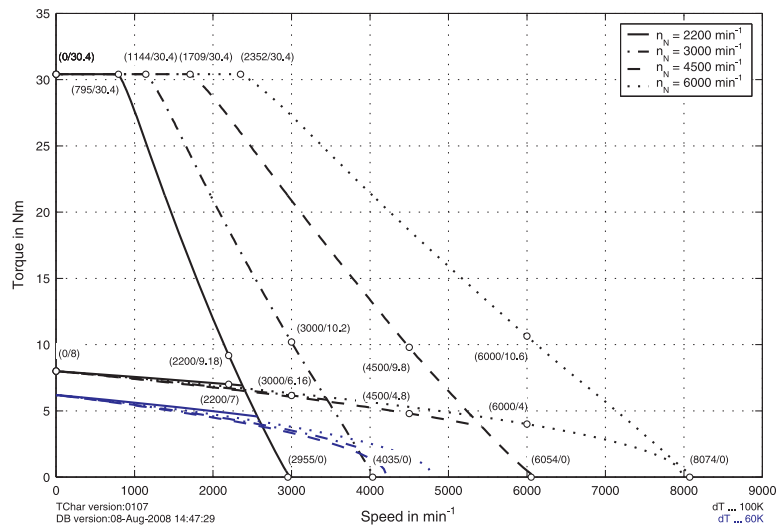
2) The recommended servo drive is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

3) The recommended ACOPOSmulti inverter module is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

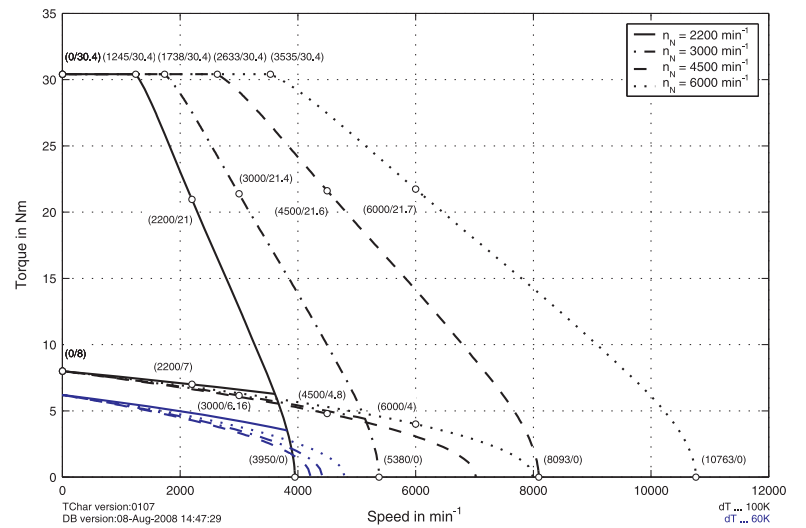
Speed-torque characteristic curves with 400 VAC supply voltage



ACOPOS

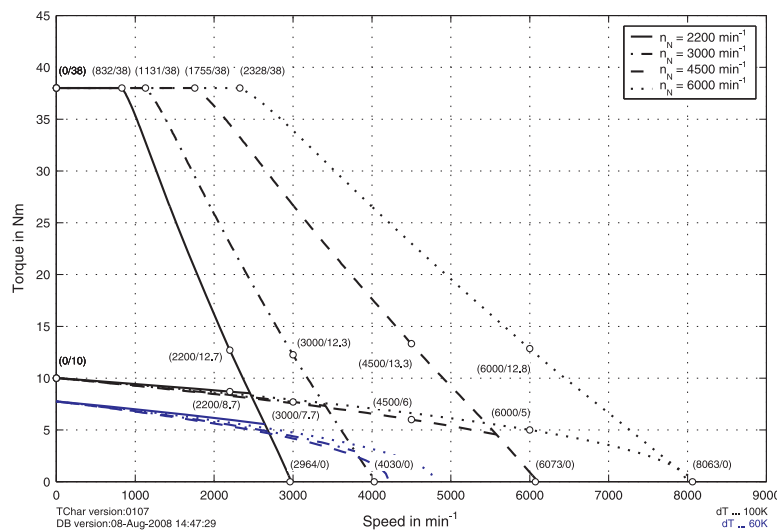


ACOPOSMulti

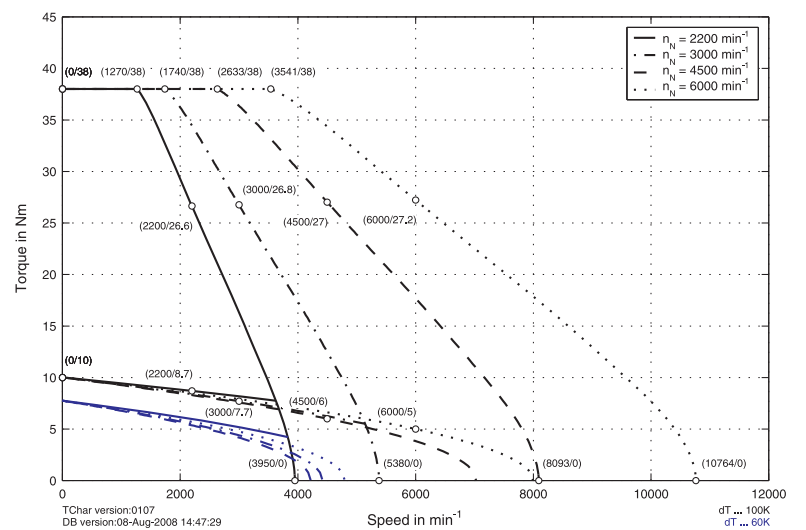


8LSA45.eennffgg-0

ACOPOS



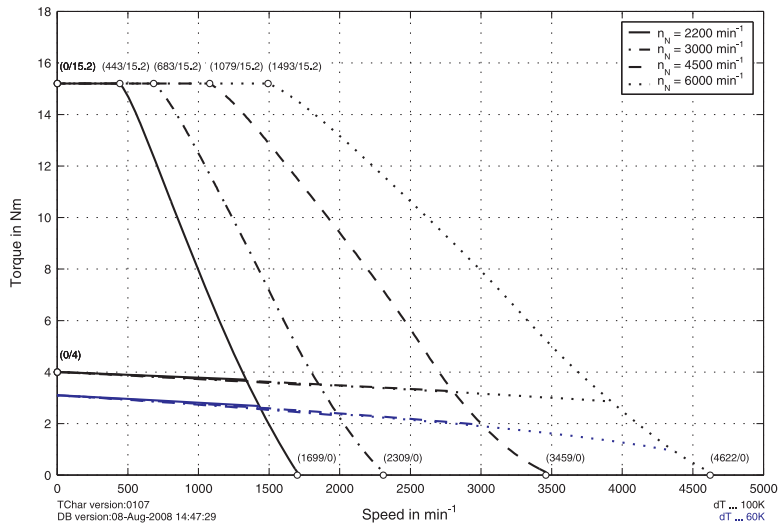
ACOPOSMulti



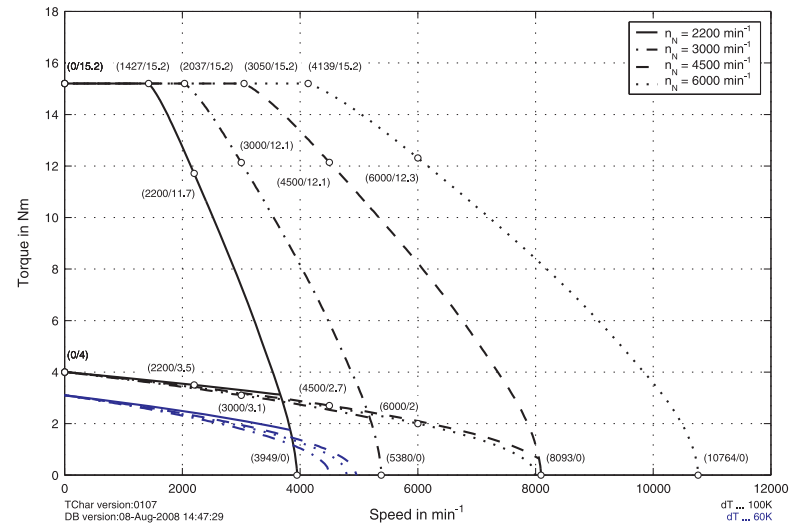
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Speed-torque characteristic curves with 230 VAC supply voltage

ACOPOS

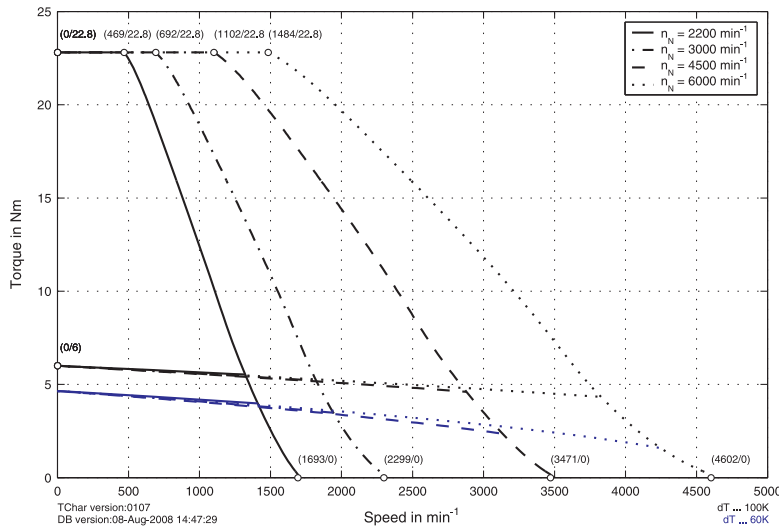


ACOPOSMulti

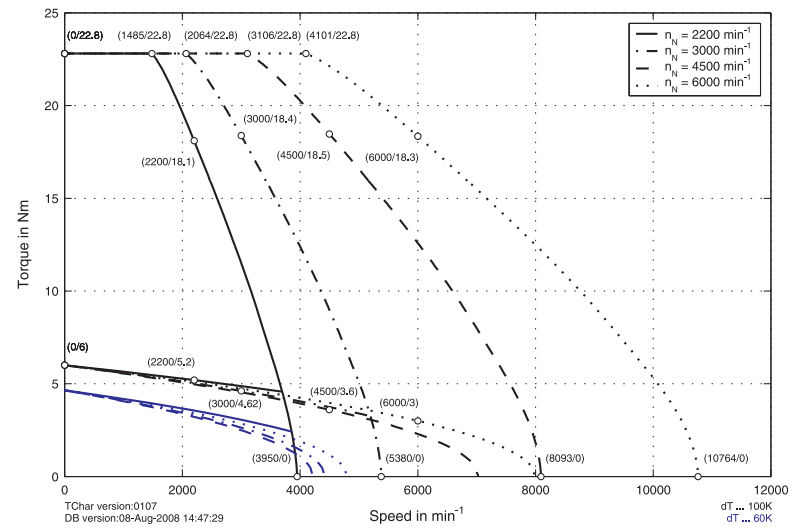


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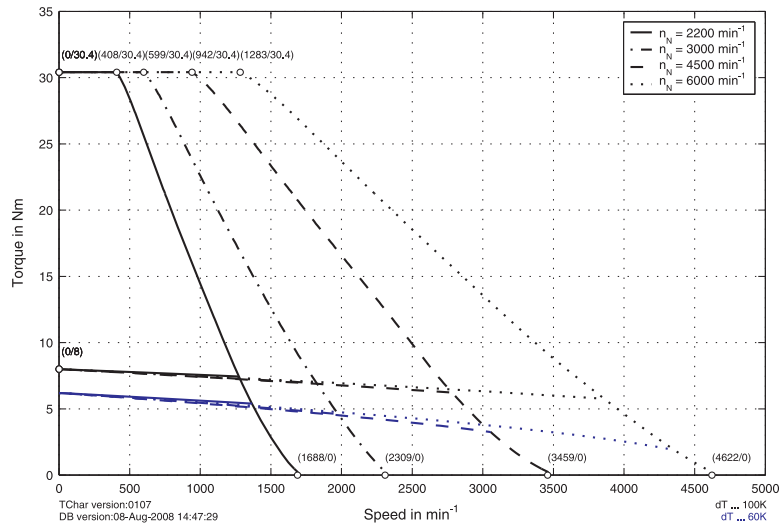


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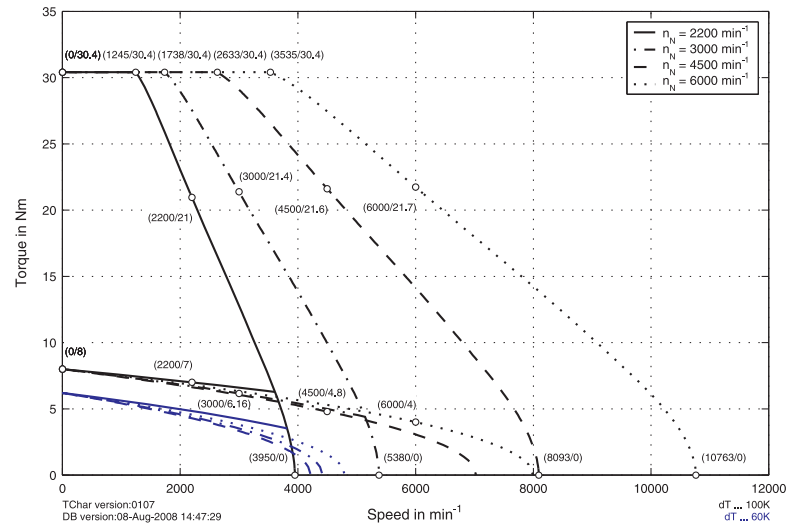


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ACOPOS

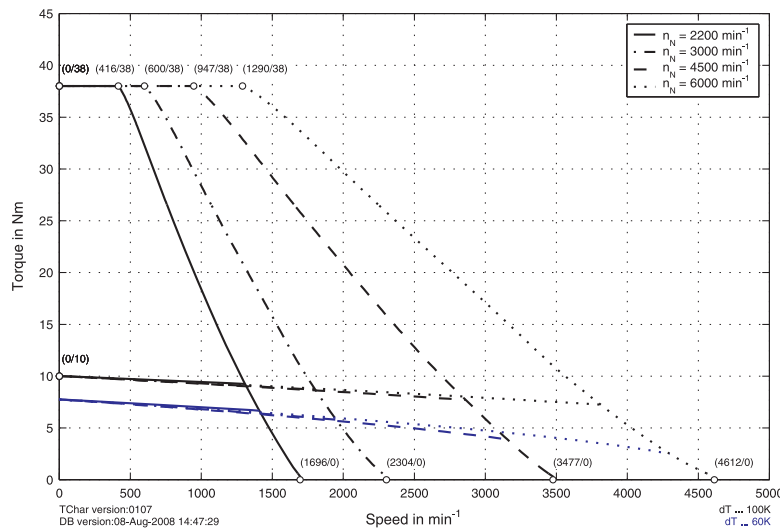


ACOPOSMulti

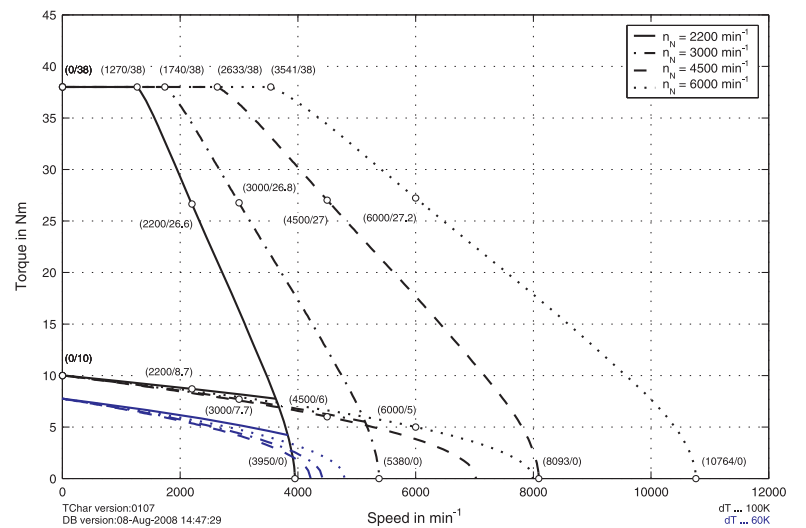


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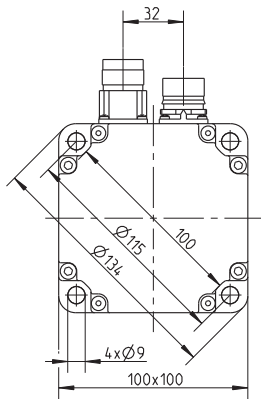
ACOPOS



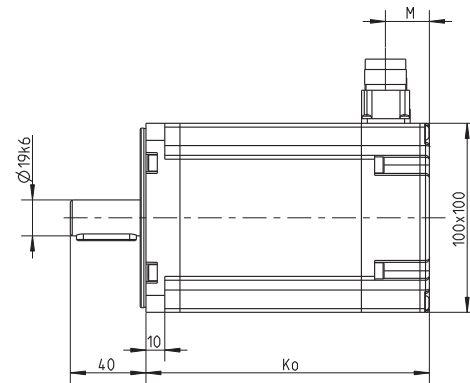
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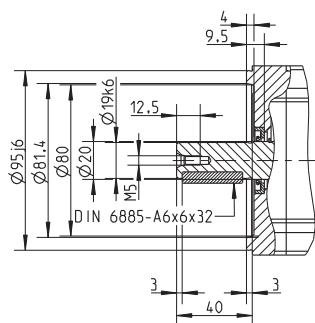
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**A side flange detail
Standard bearing**



**A side flange detail
Special motor option "Reinforced A side bearing"**



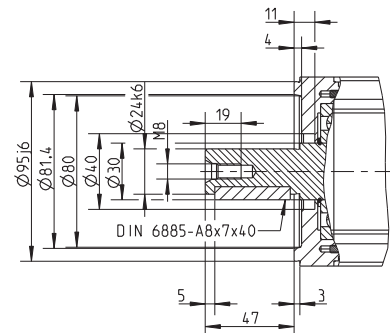
**Possible
connection directions**



Straight (top connector)



Angled (swivel connector)



Dimensions

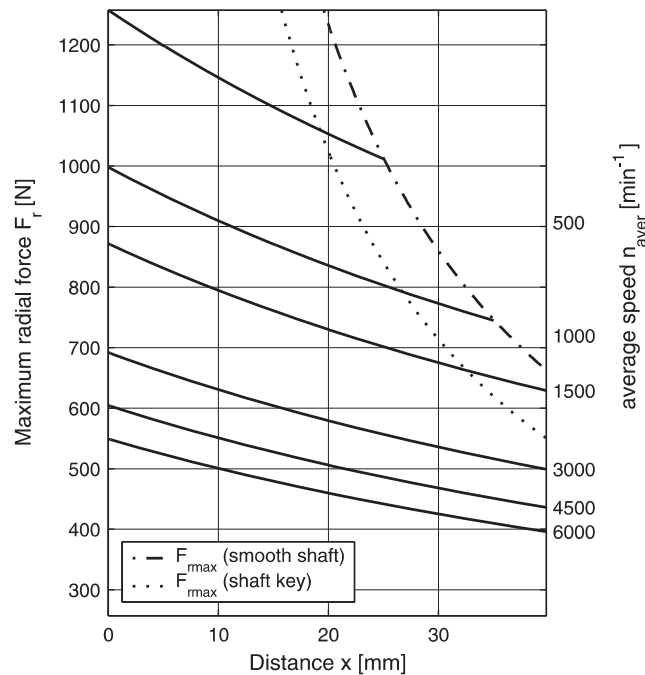
EnDat feedback Model number	K ₀	M	Resolver feedback Model number	K ₀	M	Extension of K ₀ depending on the motor option [mm]		
						Holding brake ¹⁾	Oil seal	Reinforced A side bearing
8LSA43.E0nnffgg-0, 8LSA43.E1nnffgg-0	185	58	8LSA43.R0nnffgg-0	150	23	32	---	15
8LSA44.E0nnffgg-0, 8LSA44.E1nnffgg-0	205	58	8LSA44.R0nnffgg-0	170	23	32	---	15
8LSA45.E0nnffgg-0, 8LSA45.E1nnffgg-0	229	58	8LSA45.R0nnffgg-0	194	23	32	---	15
8LSA46.E0nnffgg-0, 8LSA46.E1nnffgg-0	249	58	8LSA46.R0nnffgg-0	214	23	32	---	15
8LSA43.E2nnffgg-0, 8LSA43.E3nnffgg-0	150	23				32	---	15
8LSA44.E2nnffgg-0, 8LSA44.E3nnffgg-0	170	23				32	---	15
8LSA45.E2nnffgg-0, 8LSA45.E3nnffgg-0	194	23				32	---	15
8LSA46.E2nnffgg-0, 8LSA46.E3nnffgg-0	214	23				32	---	15

1) The motor option "holding brake" cannot be ordered in combination with special motor option "reinforced A side bearing".

Maximum shaft load

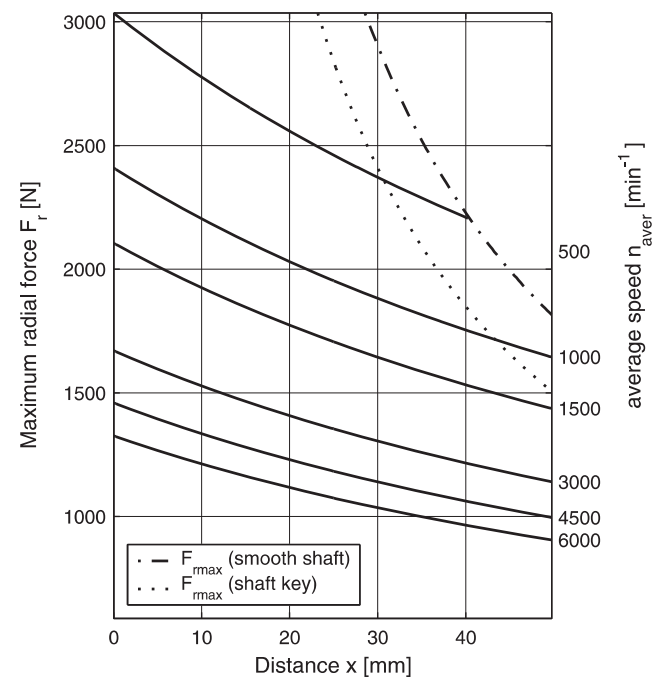
The values in the diagrams below are based on a mechanical lifespan of the bearings of 20,000 operating hours.

Standard bearing



maximum allowed axial force: $F_{amax} = 110$ N

Special motor option "Reinforced A side bearing"



maximum allowed axial force: $F_{amax} = 258$ N

Recommended B&R motor cable

The recommended B&R motor cable for a motor depends on the recommended ACOPOS servo drive or ACOPOSmulti inverter module (see "Recommended cable cross section for B&R motor cables [mm²]" in the table "Technical data")

1502

Recommended B&R encoder cables

8BCExxxx.1111A-0 ACPmulti EnDat cable, length xxxx m, 10x 0.14 mm² + 2x 0.5 mm², EnDat plug 17-pin SpeedTec socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed

1428

8BCRxxxx.1111A-0 ACPmulti Resolver cable, length xxxx m, 3 x 2 x 24 AWG (19 x 0.127), resolver plug 12-pin SpeedTec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed

1429



8LSA5



Preferred types (see also 1478)^{a)}

Without holding brake:	8LSA55.E2030D000-1 8LSA55.E3030D000-1
With holding brake:	8LSA55.E2030D200-1 8LSA55.E3030D200-1

- a) Preferred types have increased availability for first orders and convenience when service is needed. They are equipped as follows:
- * Rated speed 3000 min⁻¹
 - * EnDat encoder - single-turn (E2) or multi-turn (E3),
 - 32-lines, inductive
 - * Smooth Shaft
 - * Angled connection (swivel connector)

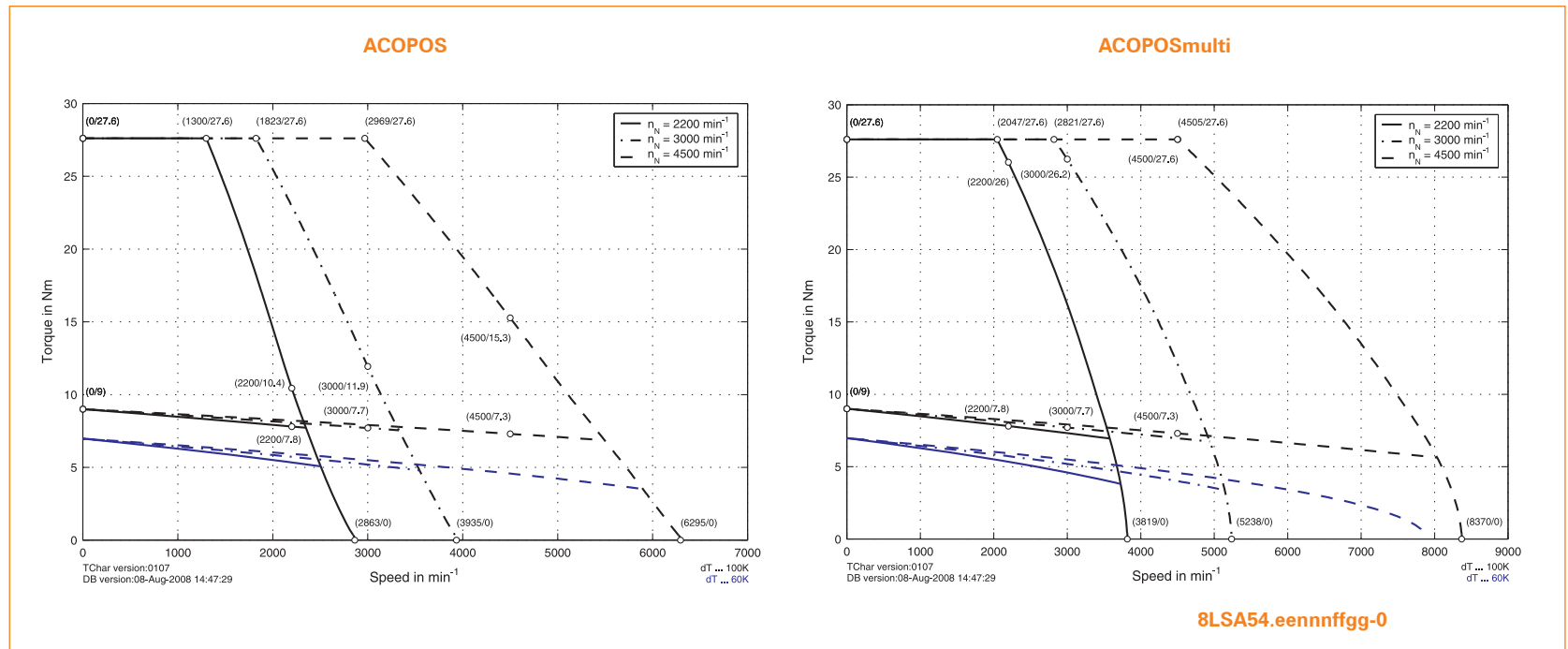
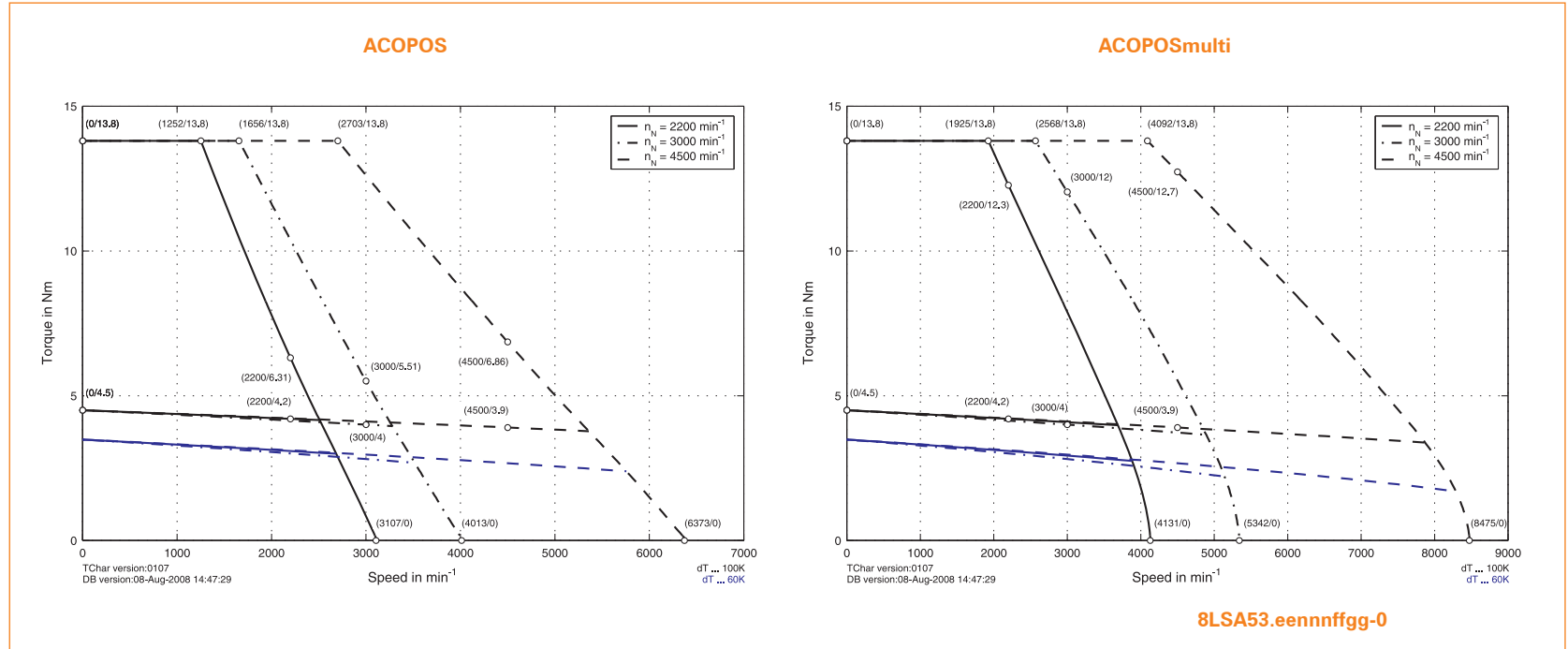
Technical data	8LSA53.ee[nnn]ffgg-1			8LSA54.ee[nnn]ffgg-1			8LSA55.ee[nnn]ffgg-1			8LSA56.ee[nnn]ffgg-1			8LSA57.ee[nnn]ffgg-1		
	[022]	[030]	[045]	[022]	[030]	[045]	[022]	[030]	[045]	[022]	[030]	[045]	[022]	[030]	[045]
Rated speed n_N [min ⁻¹]	2200	3000	4500	2200	3000	4500	2200	3000	4500	2200	3000	4500	2200	3000	4500
Number of poles	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Rated torque M_N [Nm]	4.2	4	3.9	7.8	7.7	7.3	11.8	11.6	9.5	14.4	13.9	12.7	18	17.5	15
Rated power P_N [kW]	0.97	1.26	1.84	1.8	2.42	3.44	2.72	3.64	4.48	3.32	4.37	5.98	4.15	5.5	7.07
Rated current I_N [A]	2	2.5	3.8	3.6	4.7	7.1	5.1	6.9	9	6.3	8.2	11.9	7.6	10	13.9
Stall torque M_0 [Nm]	4.5	4.5	4.5	9	9	9	12.5	12.5	12.5	16	16	16	20	20	20
Stall current I_0 [A]	2.12	2.74	4.35	3.92	5.38	8.6	5.69	8.07	11.38	7.21	9.89	15.79	8.84	12.32	19.3
Peak torque M_{max} [Nm]	13.8	13.8	13.8	27.6	27.6	27.6	41.4	41.4	41.4	55.2	55.2	55.2	69	69	69
Peak current I_{max} [A]	8	10.53	16.48	15.39	20.92	32.96	23.64	32.96	47.29	30.78	41.83	65.92	38.39	52.63	82.61
Maximum angular acceleration without brake a [rad/s ²]	38107	38107	38107	45660	45660	45660	50526	50526	50526	51777	51777	51777	52558	52558	52558
Maximum speed n_{max} [min ⁻¹]	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000
Torque constant K_T [Nm/A]	2.22	1.63	1.09	2.22	1.63	1.09	2.22	1.63	1.09	2.22	1.63	1.1	2.22	1.63	1.09
Voltage constant K_E [V/1000 min ⁻¹]	134.04	98.43	65.97	134.04	98.43	65.97	134.04	98.43	65.97	134.04	98.43	65.97	134.04	98.43	65.97
Stator resistance R_{zph} [Ω]	9.35	5.59	2.22	3.81	2.03	0.79	2.27	1.13	0.57	1.64	0.87	0.34	1.24	0.64	0.26
Stator inductance L_{zph} [mH]	82.1	47.39	19.33	39.75	21.52	8.67	24.29	12.5	6.07	18.73	10.14	4.08	14.87	7.91	3.21
Electrical time constant t_{el} [ms]	8.79	8.48	8.7	10.43	10.62	10.92	10.72	11.09	10.72	11.43	11.64	11.97	12.04	12.45	12.39
Thermal time constant t_{therm} [min]	33	33	33	37	37	37	40	40	40	43	43	43	46	46	46
Moment of inertia without brake J [kgcm ²]	3.62	3.62	3.62	6.04	6.04	6.04	8.19	8.19	8.19	10.66	10.66	10.66	13.13	13.13	13.13
Weight without brake m [kg]	9.93	9.93	9.93	11.46	11.46	11.46	13.29	13.29	13.29	15.31	15.31	15.31	17.24	17.24	17.24
Holding brake															
Moment of inertia for brake J_{Br} [kgcm ²]	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66
Weight of brake m_{Br} [kg]	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Holding torque of the brake M_{Br} [Nm]	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Recommendations															
Cable cross section for B&R motor cables [mm ²] ¹⁾	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	4	1.5	4	4	4	4	4
ACOPOS	1314	1314	1314	1314	1314	1314	1314	1314	1315	1314	1315	1315	1315	1315	1315
ACOPOSmulti	1425	1425	1425	1425	1425	1425	1425	1425	1426	1425	1426	1426	1426	1426	1426
ACOPOS servo drive 8Vxxxx.00-x ²⁾	1045	1045	1090	1045	1090	1180	1090	1180	1180	1090	1180	1180	1180	1180	1320
ACOPOSmulti inverter module 8BVI... ³⁾	0028	0028	0055	0055	0055	0110	0055	0110	0110	0110	0110	0220	0110	0110	0220

1) The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSmulti inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request.

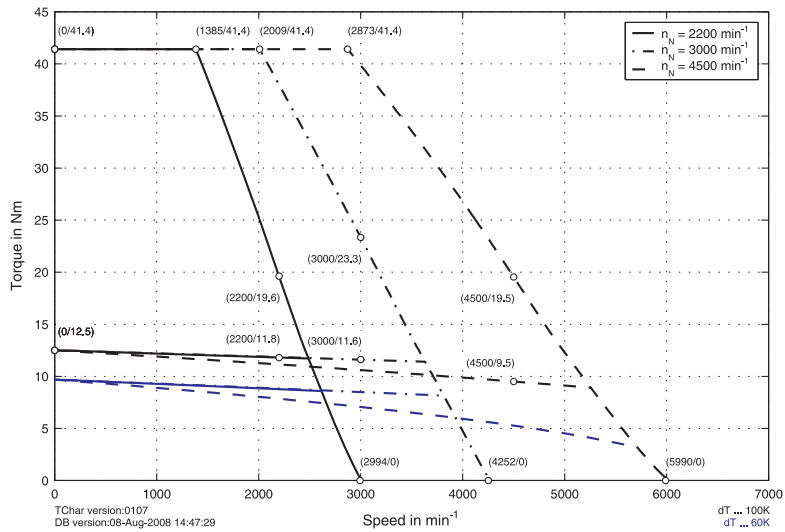
2) The recommended servo drive is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

3) The recommended ACOPOSmulti inverter module is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

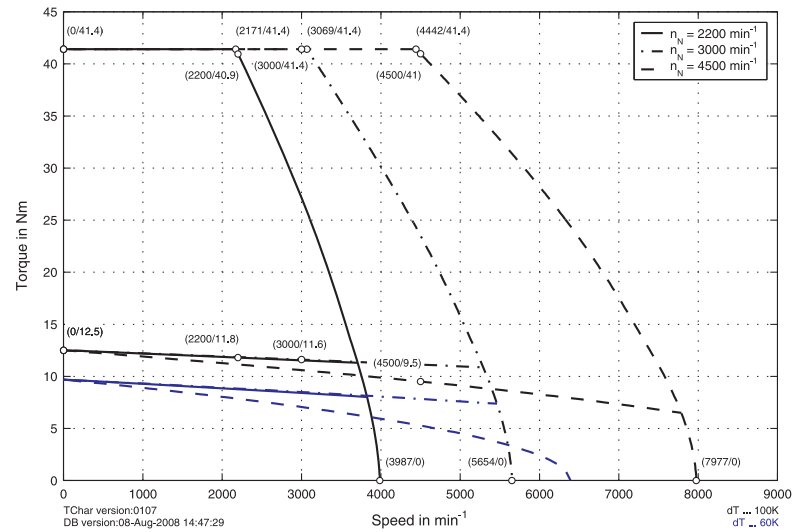
Speed-torque characteristic curves with 400 VAC supply voltage



ACOPOS

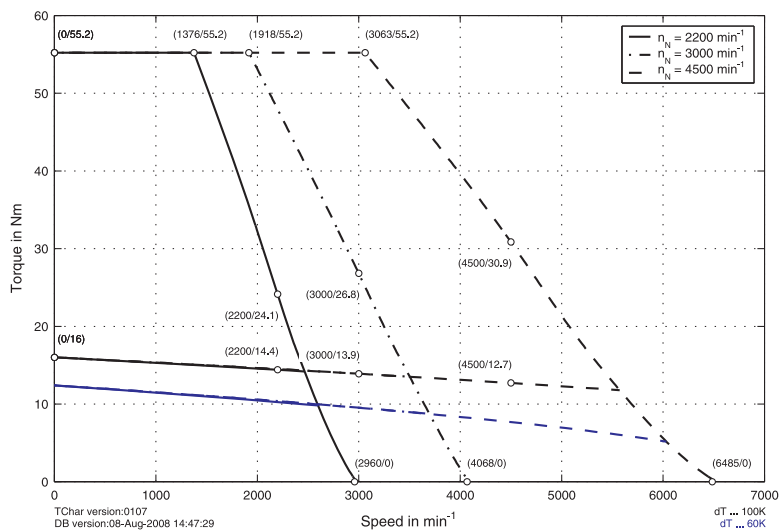


ACOPOSMulti

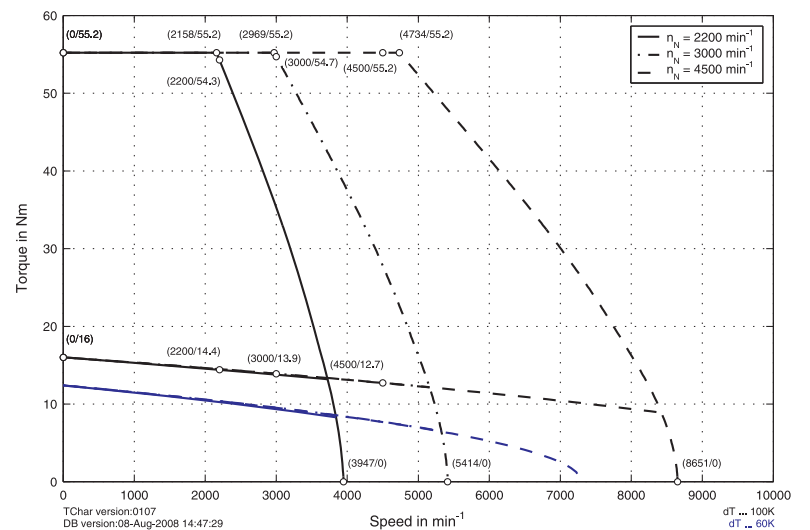


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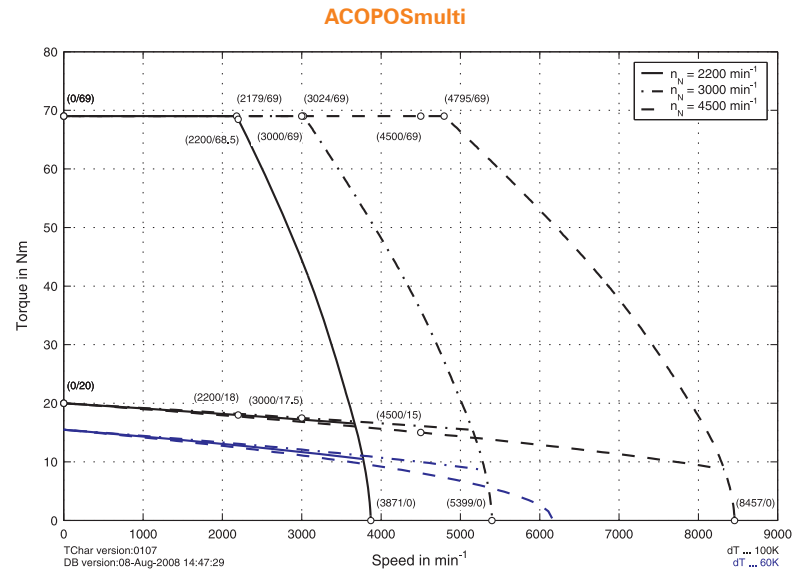
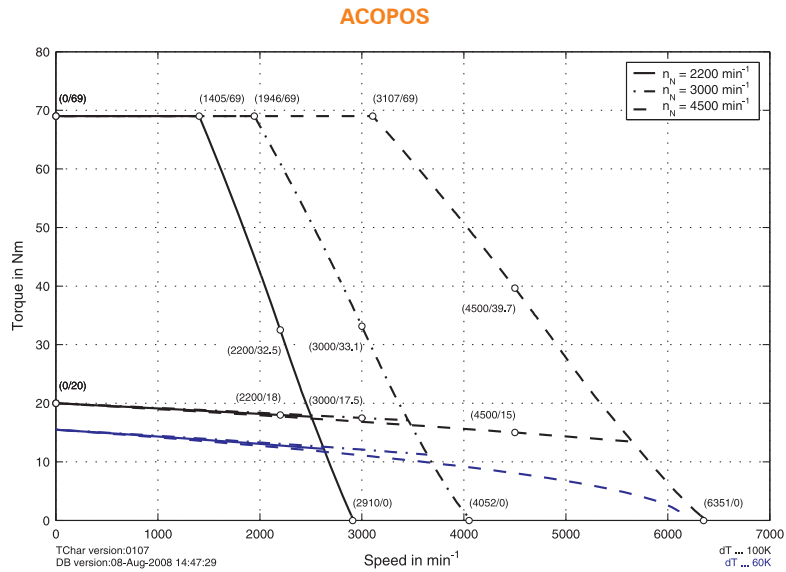
ACOPOS



ACOPOSMulti

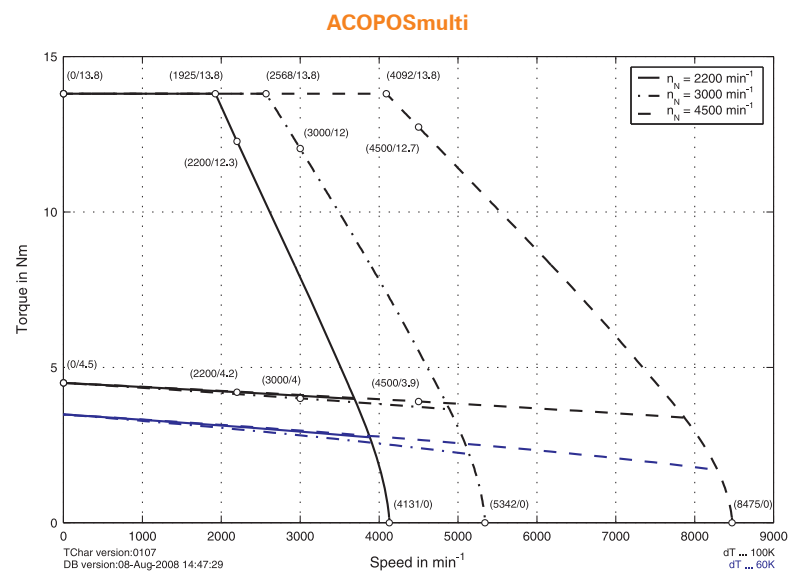
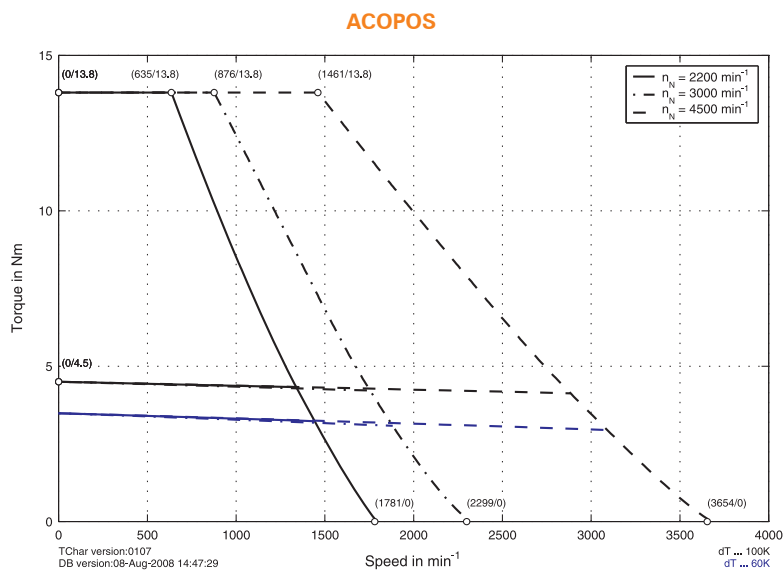


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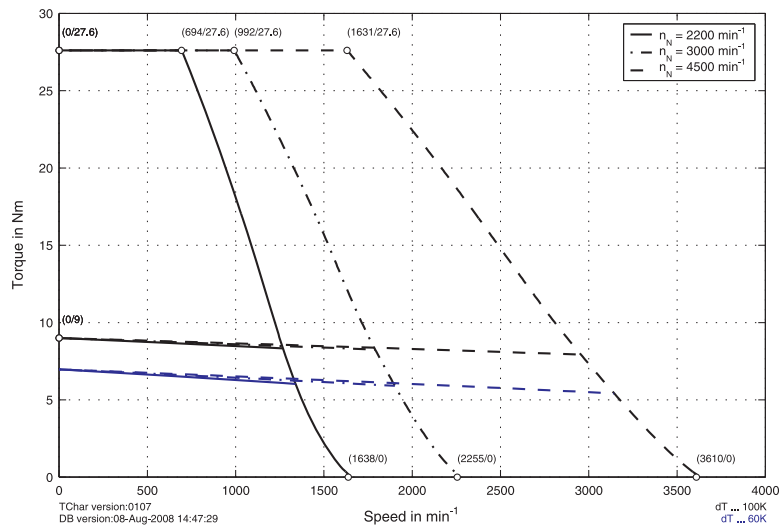
8LSA57.eennffgg-1

Speed-torque characteristic curves with 230 VAC supply voltage

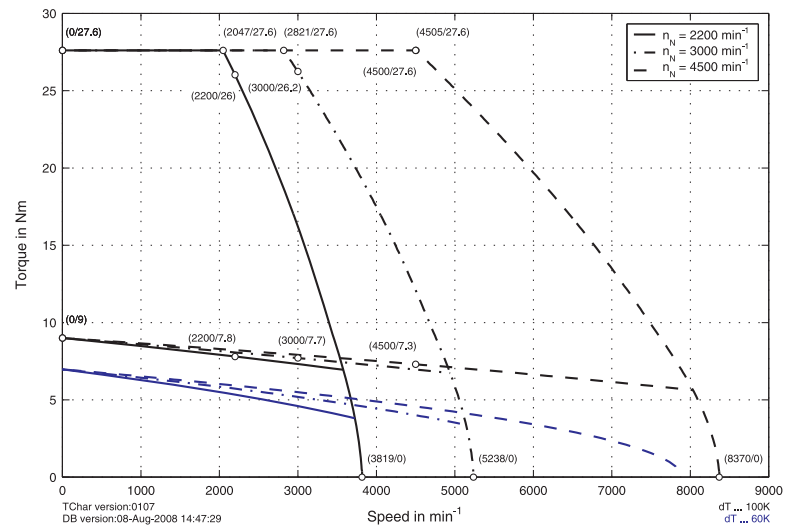


8LSA53.eennffgg-1

ACOPOS

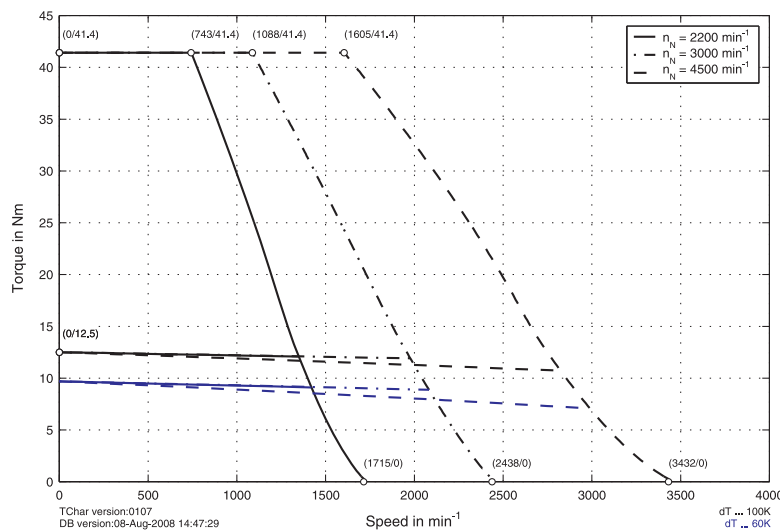


ACOPOSmulti

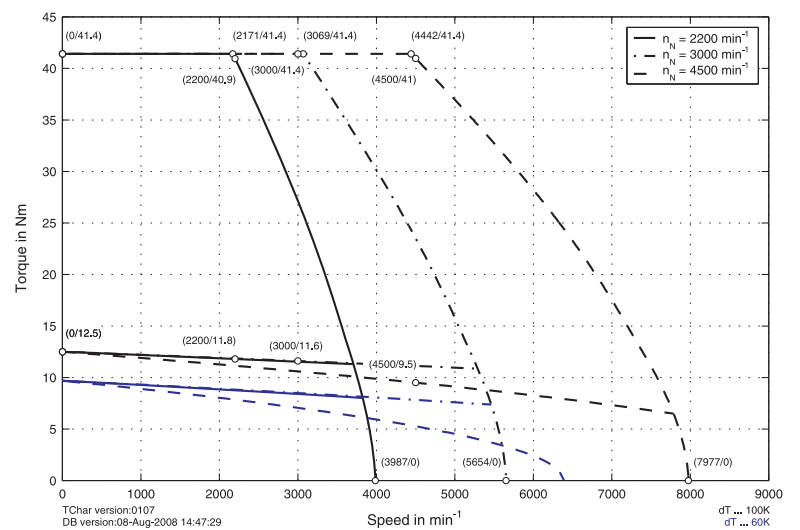


8LSA54.eennffgg-0

ACOPOS

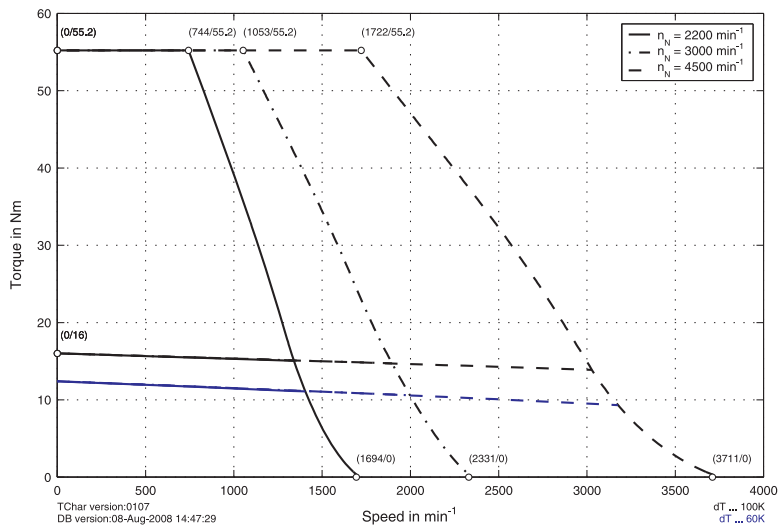


ACOPOSmulti

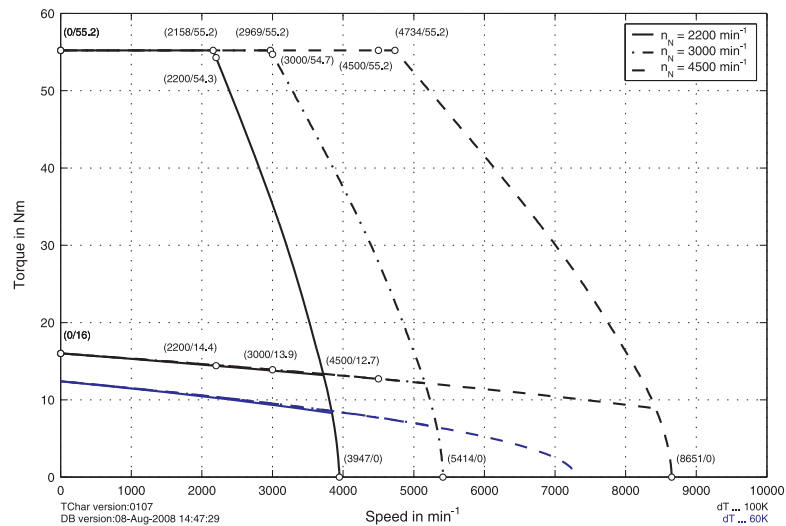


8LSA55.eennffgg-0

ACOPOS

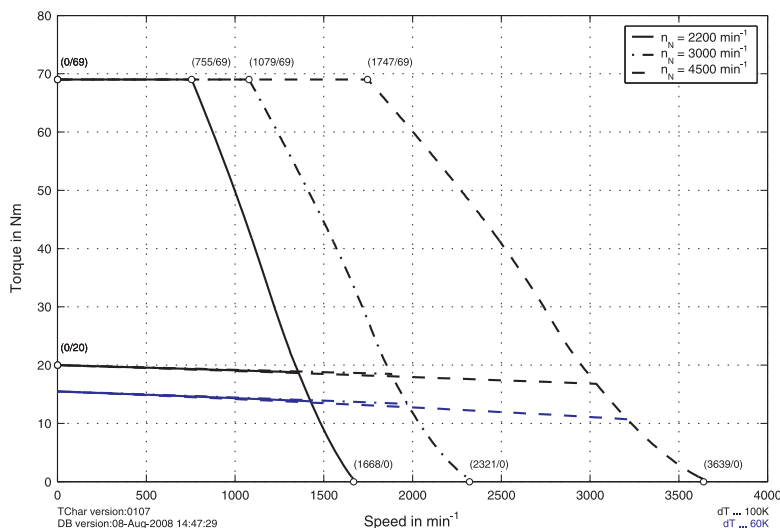


ACOPOSMulti

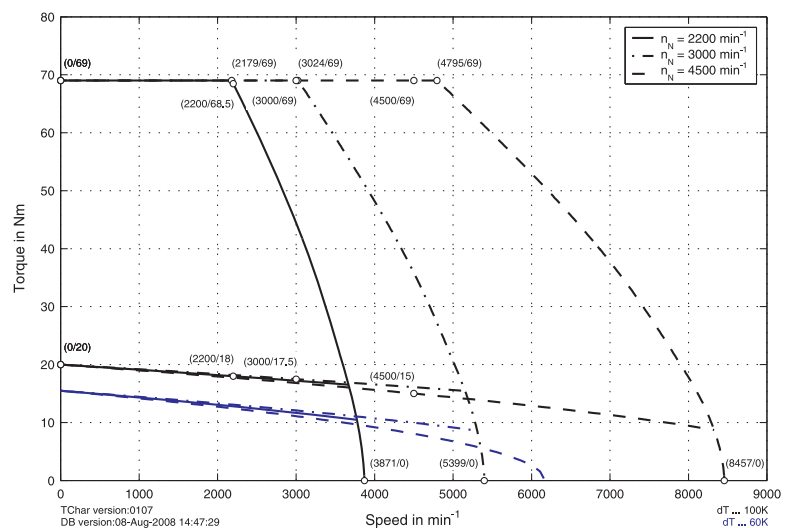


8LSA56.eennffgg-0

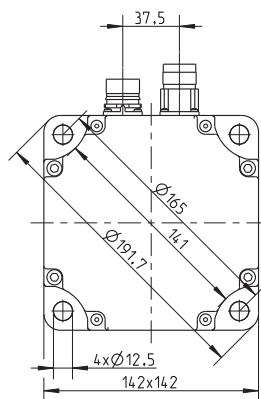
ACOPOS



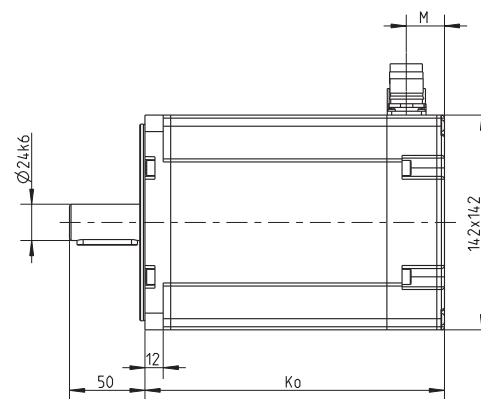
ACOPOSMulti



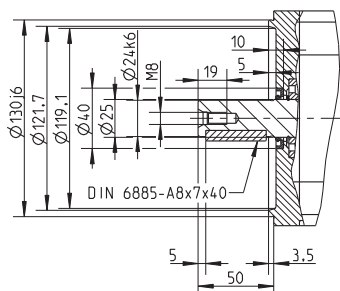
8LSA57.eennffgg-0



A side flange detail
Standard bearing



A side flange detail
Special motor option "Reinforced A side bearing"

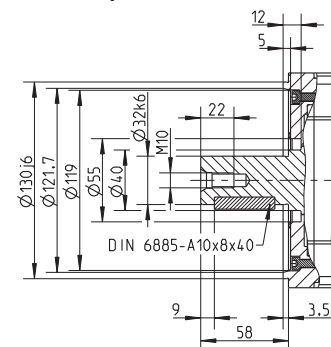


Possible connection directions

Straight (top connector)



Angled (swivel connector)



Dimensions

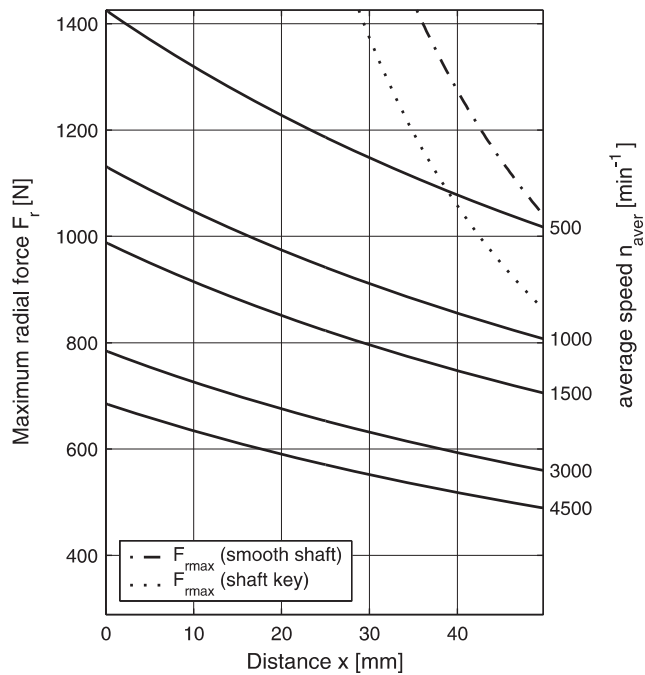
EnDat feedback Model number	K ₀	M	Resolver feedback		Extension of K ₀ depending on the motor option [mm]			
			Model number	K ₀	M	Holding brake ¹⁾	Oil seal	Reinforced A side bearing
8LSA53.E0nnnffgg-0, 8LSA53.E1nnnffgg-0	179	55	8LSA53.R0nnnffgg-0	148	25	30	---	15
8LSA54.E0nnnffgg-0, 8LSA54.E1nnnffgg-0	203	55	8LSA54.R0nnnffgg-0	173	25	30	---	15
8LSA55.E0nnnffgg-0, 8LSA55.E1nnnffgg-0	228	55	8LSA55.R0nnnffgg-0	198	25	30	---	15
8LSA56.E0nnnffgg-0, 8LSA56.E1nnnffgg-0	253	55	8LSA56.R0nnnffgg-0	223	25	30	---	15
8LSA57.E0nnnffgg-0, 8LSA57.E1nnnffgg-0	278	55	8LSA57.R0nnnffgg-0	248	25	30	---	15
8LSA53.E2nnnffgg-0, 8LSA53.E3nnnffgg-0	148	25				30	---	15
8LSA54.E2nnnffgg-0, 8LSA54.E3nnnffgg-0	173	25				30	---	15
8LSA55.E2nnnffgg-0, 8LSA55.E3nnnffgg-0	198	25				30	---	15
8LSA56.E2nnnffgg-0, 8LSA56.E3nnnffgg-0	223	25				30	---	15
8LSA57.E2nnnffgg-0, 8LSA57.E3nnnffgg-0	248	25				30	---	15

¹⁾ The motor option "holding brake" cannot be ordered in combination with special motor option "reinforced A side bearing".

Maximum shaft load

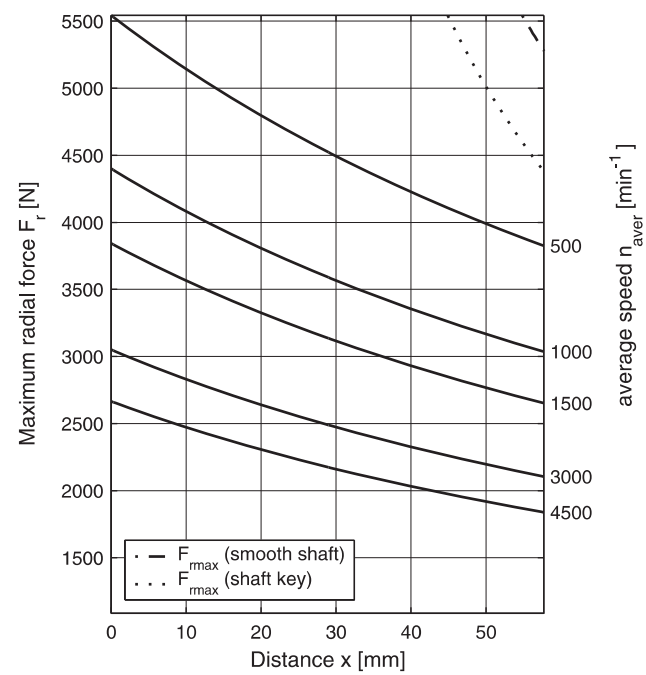
The values in the diagrams below are based on a mechanical lifespan of the bearings of 20,000 operating hours.

Standard bearing



maximum allowed axial force: $F_{amax} = 124$ N

Special motor option "Reinforced A side bearing"



maximum allowed axial force: $F_{amax} = 474$ N

Recommended B&R motor cable

The recommended B&R motor cable for a motor depends on the recommended ACOPOS servo drive or ACOPOSmulti inverter module (see "Recommended cable cross section for B&R motor cables [mm²]" in the table "Technical data") [1510](#)

Recommended B&R encoder cables

8BCExxxx.1111A-0 ACPmulti EnDat cable, length xxxx m, 10x 0.14 mm² + 2x 0.5 mm², EnDat plug 17-pin SpeedTec socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed [1428](#)

8BCRxxxx.1111A-0 ACPmulti Resolver cable, length xxxx m, 3 x 2 x 24 AWG (19 x 0.127), resolver plug 12-pin SpeedTec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed [1429](#)

8LSA6



Symbol photo

Technical data	8LSA63.ee[nnn]ffgg-1			8LSA64.ee[nnn]ffgg-1			8LSA65.ee[nnn]ffgg-1			8LSA66.ee[nnn]ffgg-1		
	[022]	[030]	[045]	[022]	[030]	[045]	[022]	[030]	[045]	[022]	[030]	[045]
Rated speed n_N [min ⁻¹]	2200	3000	4500	2200	3000	4500	2200	3000	4500	2200	3000	4500
Number of poles	8	8	8	8	8	8	8	8	8	8	8	8
Rated torque M_N [Nm]	11.8	11.6	9.5	18	17.5	15.1	22	21	12.2	24.5	23.5	15
Rated power P_N [kW]	2.72	3.64	4.48	4.15	5.5	7.12	5.07	6.6	5.75	5.64	7.38	7.07
Rated current I_N [A]	5.1	6.9	9	7.6	10	13.9	8.8	11.7	14.2	9.9	13	15.9
Stall torque M_0 [Nm]	12.5	12.5	12.5	20	20	20	24	24	24	28	28	28
Stall current I_0 [A]	5.69	8.07	11.38	8.84	12.32	19.3	10.36	14.79	20.87	11.83	16.57	23.73
Peak torque M_{max} [Nm]	46.92	46.92	46.92	78.2	78.2	78.2	97.92	97.92	97.92	114.24	114.24	114.24
Peak current I_{max} [A]	30.48	42.48	60.98	49.48	67.84	106.48	64.31	90.95	130.49	74.41	103.49	152.61
Maximum angular acceleration without brake a [rad/s ²]	57263	57263	57263	59566	59566	59566	62787	62787	62787	63246	63246	63246
Maximum speed n_{max} [min ⁻¹]	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000
Torque constant K_T [Nm/A]	2.22	1.63	1.09	2.22	1.63	1.09	2.22	1.63	1.09	2.22	1.63	1.09
Voltage constant K_E [V/1000 min ⁻¹]	134.04	98.43	65.97	134.04	98.43	65.97	134.04	98.43	65.97	134.04	98.43	65.97
Stator resistance R_{2ph} [Ω]	2.27	1.13	0.57	1.24	0.64	0.26	0.99	0.48	0.24	0.84	0.43	0.21
Stator inductance L_{2ph} [mH]	24.29	12.5	6.07	14.87	7.91	3.21	12	6	2.91	10.4	5.37	2.47
Electrical time constant t_{el} [ms]	10.72	11.09	10.72	12.04	12.45	12.39	12.17	12.4	11.98	12.36	12.53	11.81
Thermal time constant t_{therm} [min]	42	42	42	45	45	45	48	48	48	52	52	52
Moment of inertia without brake J [kgcm ²]	8.19	8.19	8.19	13.13	13.13	13.13	15.6	15.6	15.6	18.06	18.06	18.06
Weight without brake m [kg]	13.29	13.29	13.29	17.24	17.24	17.24	19.17	19.17	19.17	21.1	21.1	21.1
Holding brake												
Moment of inertia for brake J_{Br} [kgcm ²]	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85
Weight of brake m_{Br} [kg]	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Holding torque of the brake M_{Br} [Nm]	32	32	32	32	32	32	32	32	32	32	32	32
Recommendations												
Cable cross section for B&R motor cables [mm ²] ¹⁾	1.5	1.5	4	4	4	4	4	4	4	4	4	4
ACOPOS	☞ 1314	☞ 1314	☞ 1315	☞ 1315	☞ 1315	☞ 1315	☞ 1315	☞ 1315	☞ 1315	☞ 1315	☞ 1315	☞ 1315
ACOPOSmulti	☞ 1425	☞ 1425	☞ 1426	☞ 1426	☞ 1426	☞ 1426	☞ 1426	☞ 1426	☞ 1426	☞ 1426	☞ 1426	☞ 1426
ACOPOS servo drive 8Vxxxx.00-x ²⁾	1090	1180	1180	1180	1180	1320	1180	1180	1320	1180	1180	1320
ACOPOSmulti inverter module 8BVI... ³⁾	0055	0110	0110	0110	0110	0220	0110	0220	0440	0110	0220	0440

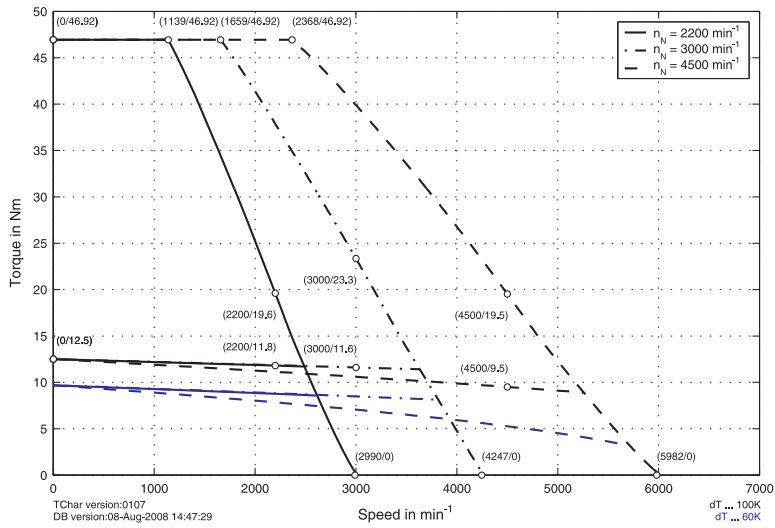
1) The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSmulti inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request.

2) The recommended servo drive is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

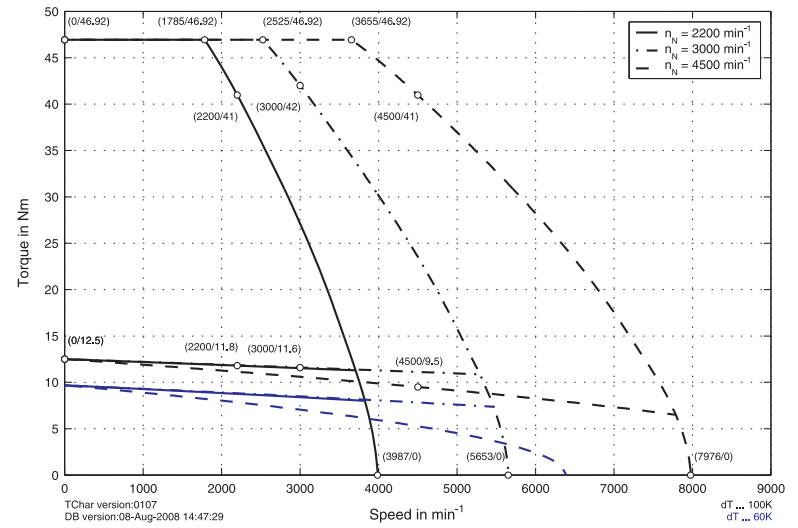
3) The recommended ACOPOSmulti inverter module is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

Speed-torque characteristic curves with 400 VAC supply voltage

ACOPOS

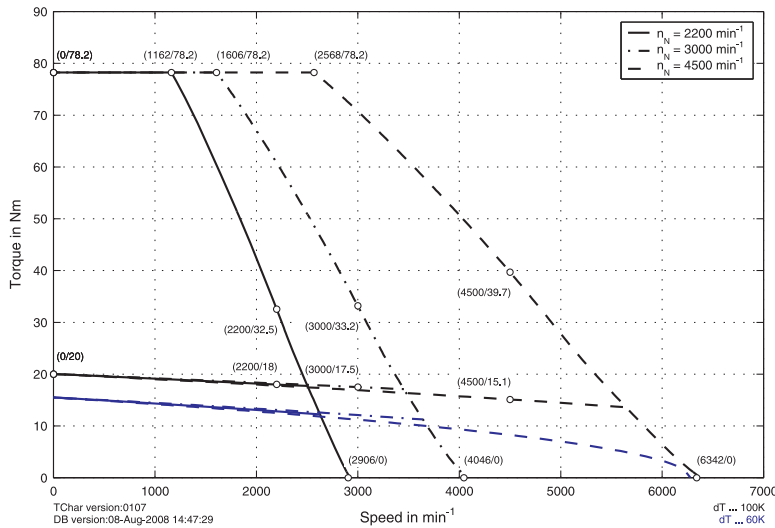


ACOPOSmulti

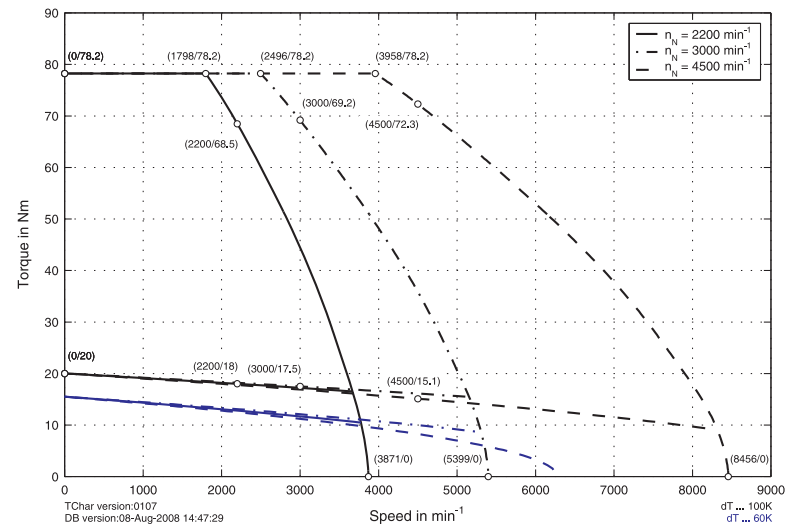


8LSA63.eennffgg-0

ACOPOS

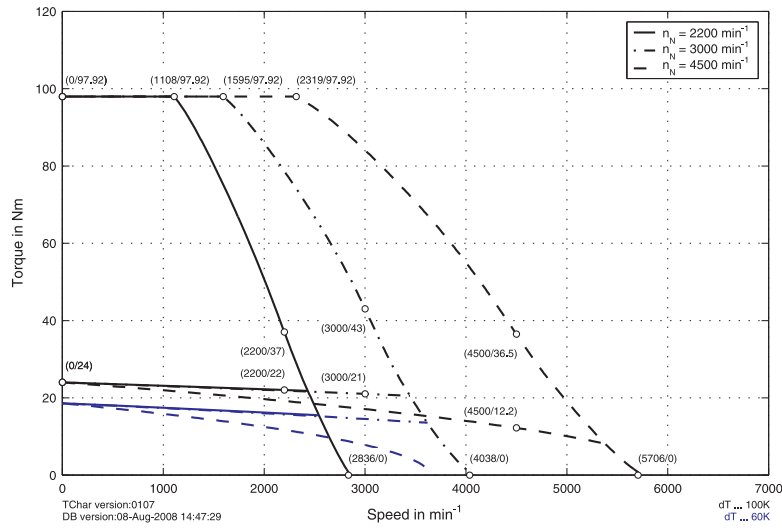


ACOPOSmulti

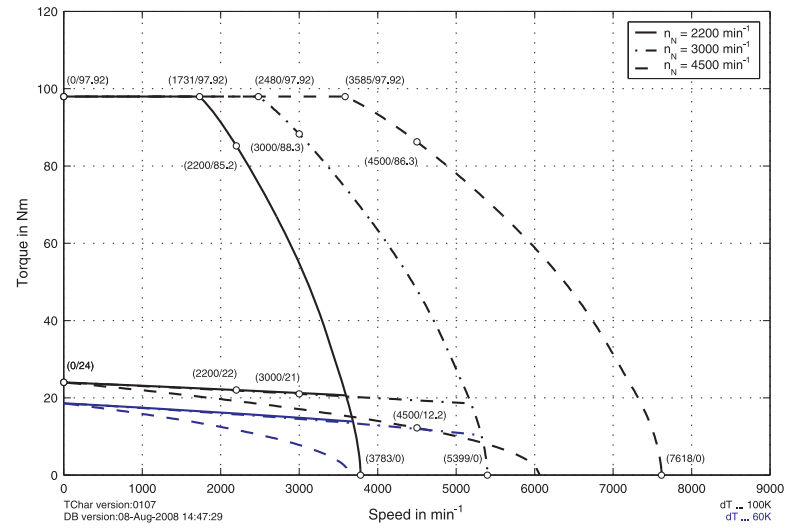


8LSA64.eennffgg-0

ACOPOS

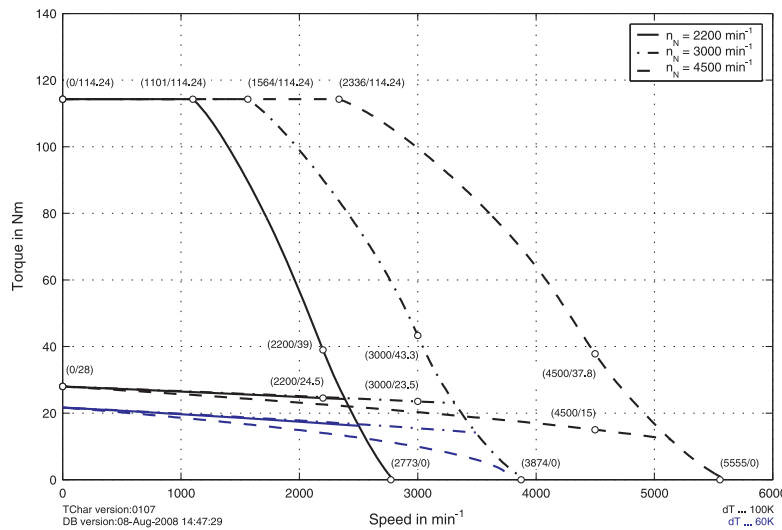


ACOPOSMulti

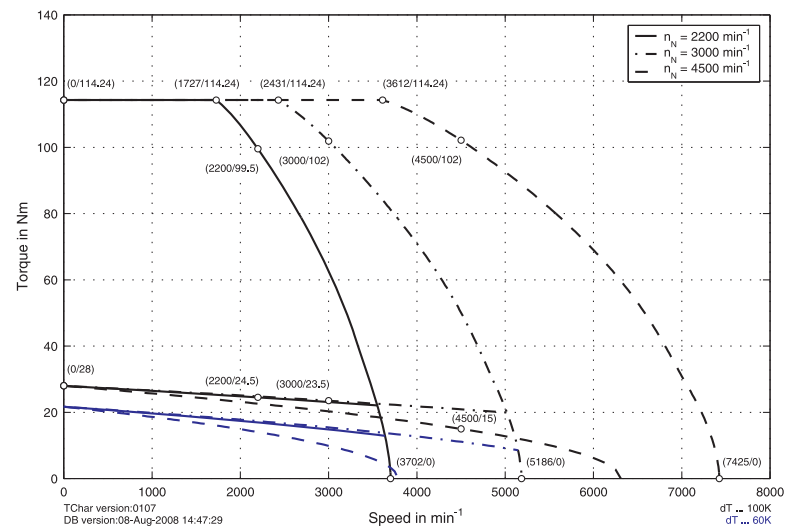


8LSA65.eennffgg-0

ACOPOS



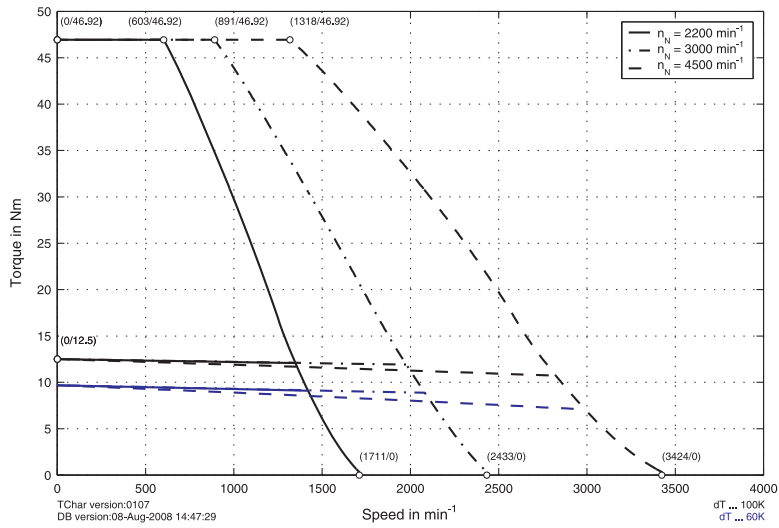
ACOPOSMulti



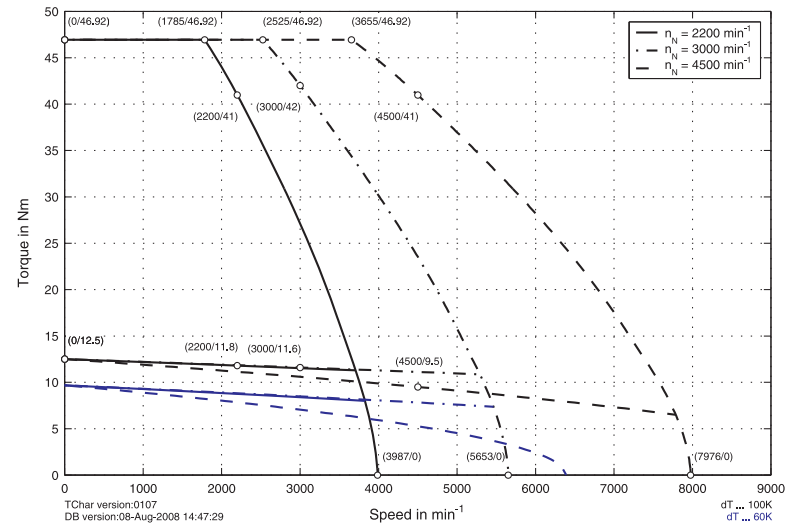
8LSA66.eennffgg-0

Speed-torque characteristic curves with 230 VAC supply voltage

ACOPOS

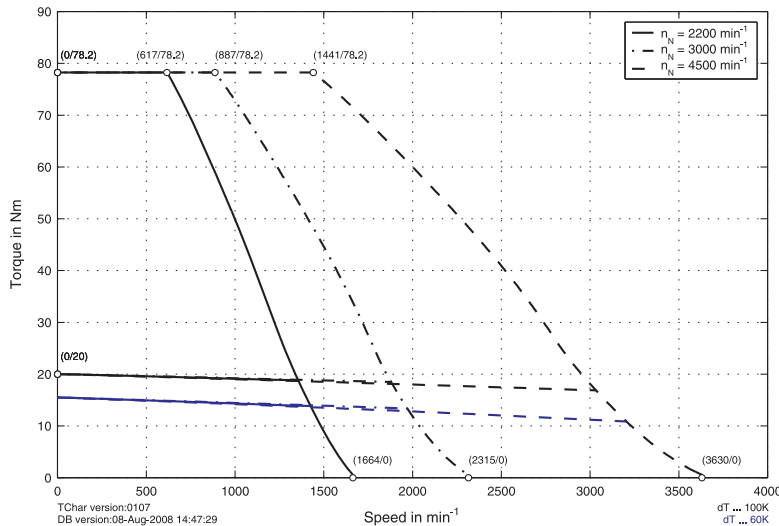


ACOPOSmulti

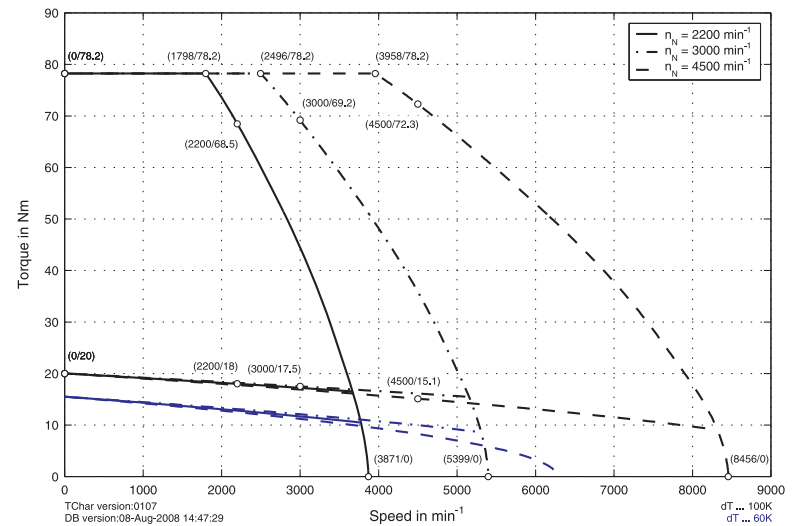


8LSA63.eennffgg-0

ACOPOS

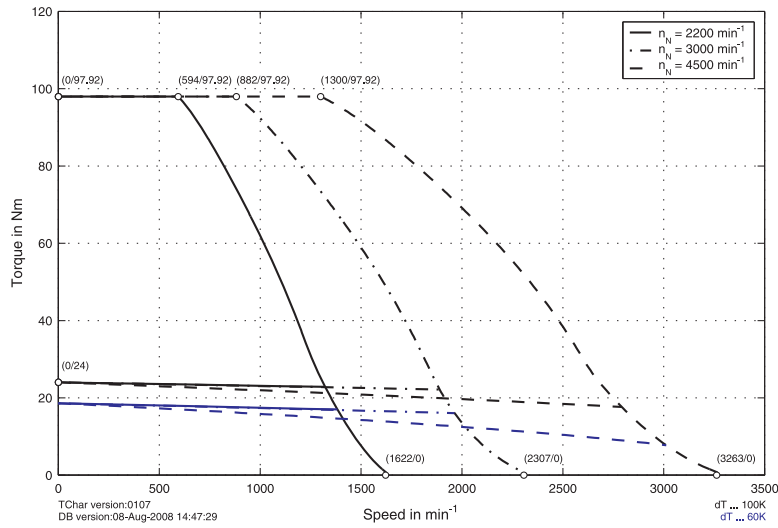


ACOPOSmulti

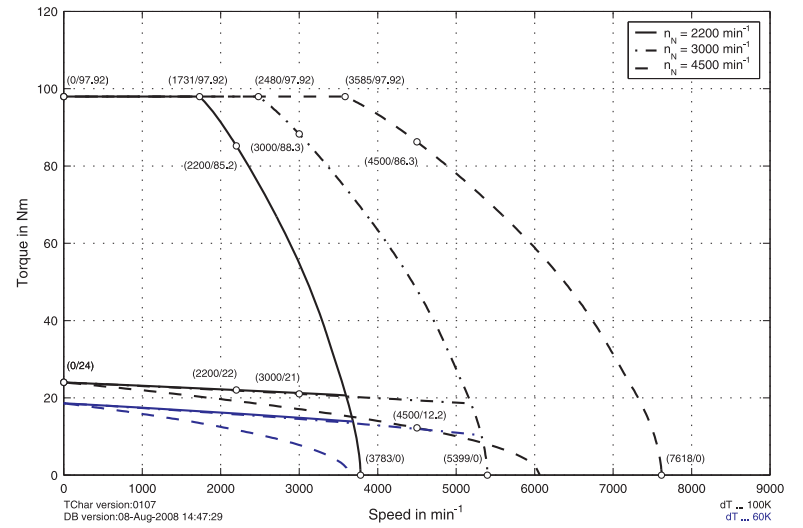


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ACOPOS

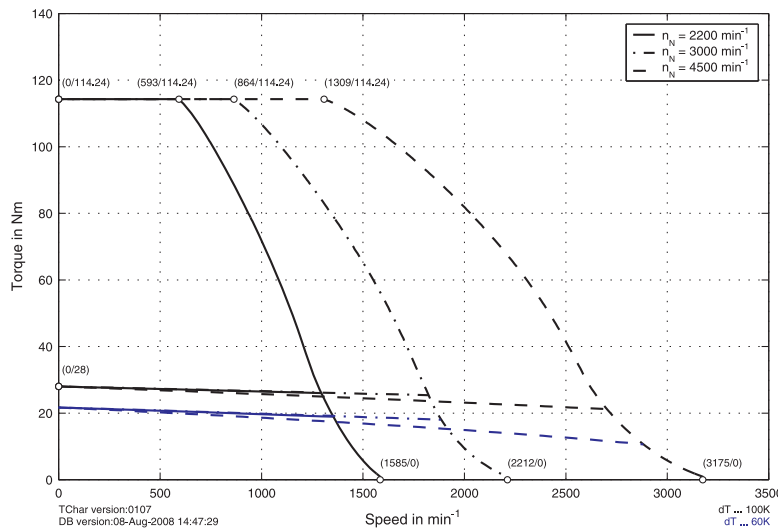


ACOPOSMulti

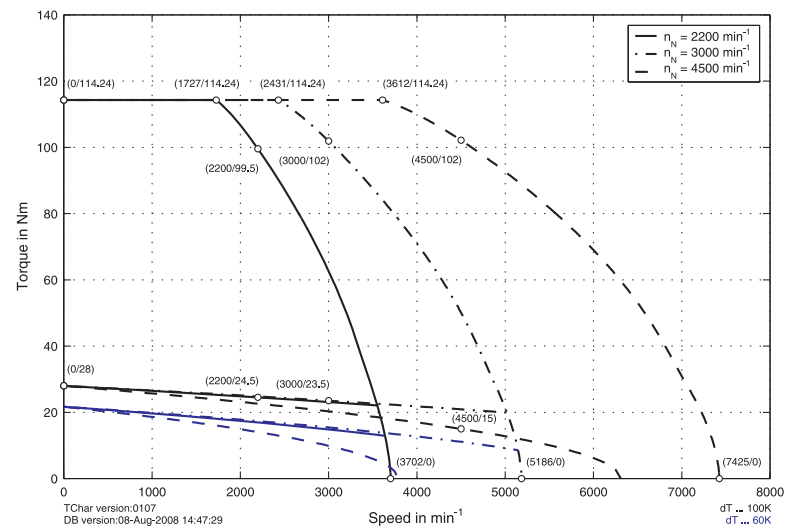


8LSA65.eennffgg-0

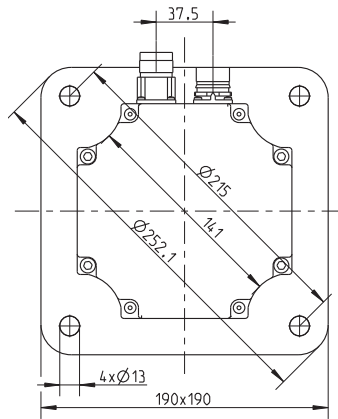
ACOPOS



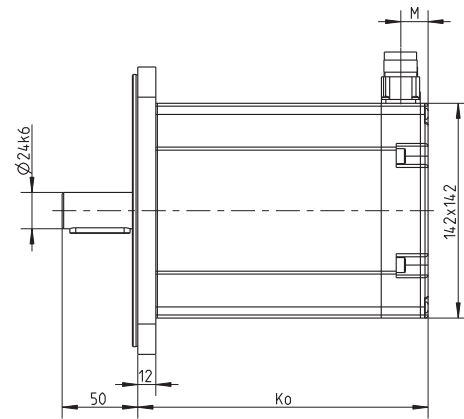
ACOPOSMulti



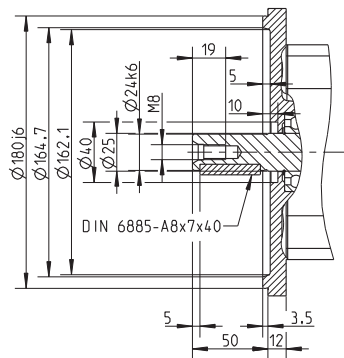
8LSA66.eennffgg-0



**A side flange detail
Standard bearing**



**A side flange detail
Special motor option "Reinforced A side bearing"**



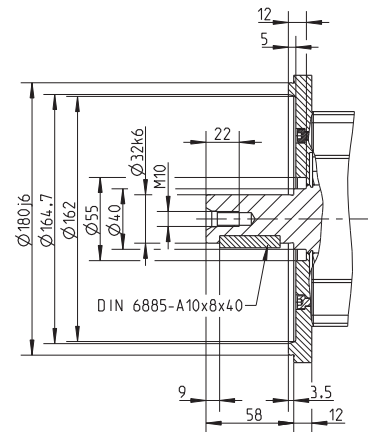
**Possible
connection directions**



Straight (top connector)



Angled (swivel connector)



Dimensions

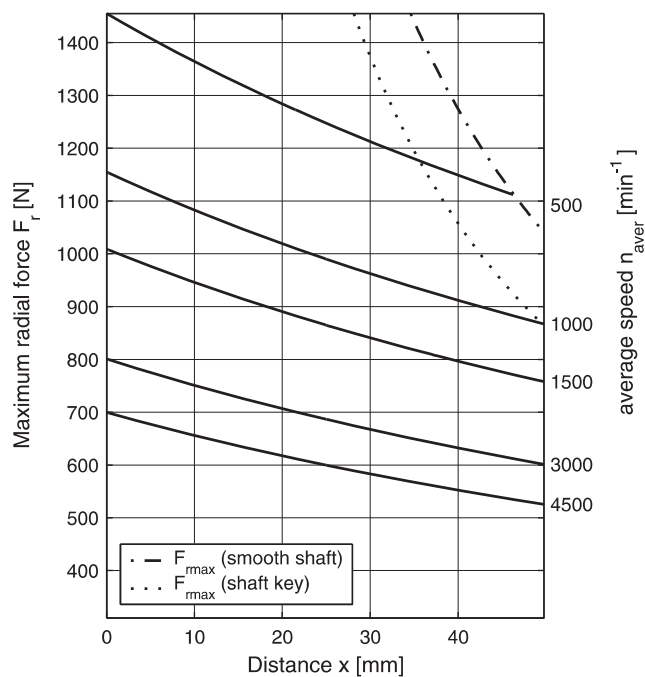
EnDat feedback			Resolver feedback			Extension of K ₀ depending on the motor option [mm]		
Model number	K ₀	M	Model number	K ₀	M	Holding brake ¹⁾	Oil seal	Reinforced A side bearing
8LSA63.E0nnnffgg-0, 8LSA63.E1nnnffgg-0	229	55	8LSA63.R0nnnffgg-1	192	18	63	---	38
8LSA64.E0nnnffgg-0, 8LSA64.E1nnnffgg-0	279	55	8LSA64.R0nnnffgg-1	242	18	63	---	38
8LSA65.E0nnnffgg-0, 8LSA65.E1nnnffgg-0	304	55	8LSA65.R0nnnffgg-1	267	18	63	---	38
8LSA66.E0nnnffgg-0, 8LSA66.E1nnnffgg-0	329	55	8LSA66.R0nnnffgg-1	292	18	63	---	38
8LSA63.E2nnnffgg-0, 8LSA63.E3nnnffgg-0	192	18				63	---	38
8LSA64.E2nnnffgg-0, 8LSA64.E3nnnffgg-0	242	18				63	---	38
8LSA65.E2nnnffgg-0, 8LSA65.E3nnnffgg-0	267	18				63	---	38
8LSA66.E2nnnffgg-0, 8LSA66.E3nnnffgg-0	292	18				63	---	38

¹⁾ The motor option "holding brake" cannot be ordered in combination with special motor option "reinforced A side bearing".

Maximum shaft load

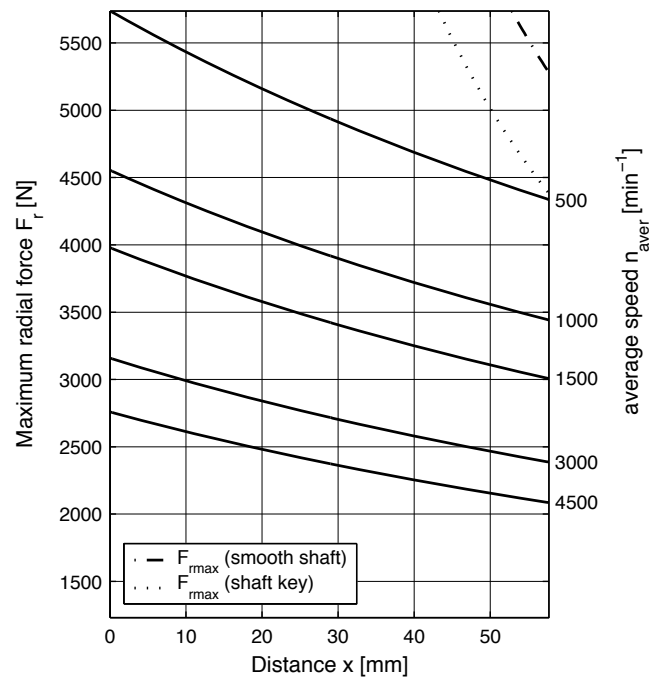
The values in the diagram below are based on a mechanical lifespan of the bearings of 20,000 operating hours.

Standard bearing



maximum allowed axial force: $F_{amax} = 131$ N

Special motor option "Reinforced A side bearing"



maximum allowed axial force: $F_{amax} = 517$ N

Recommended B&R motor cable

The recommended B&R motor cable for a motor depends on the recommended ACOPOS servo drive or ACOPOSmulti inverter module (see "Recommended cable cross section for B&R motor cables [mm²]" in the table "Technical data") 1518

Recommended B&R encoder cables

8BCExxxx.1111A-0	ACPMulti EnDat cable, length xxxx m, 10x 0.14 mm ² + 2x 0.5 mm ² , EnDat plug 17-pin SpeedTec socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed 1428
8BCRxxxx.1111A-0	ACPMulti Resolver cable, length xxxx m, 3 x 2 x 24 AWG (19 x 0.127), resolver plug 12-pin SpeedTec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed 1429



8LSA7



Symbol photo

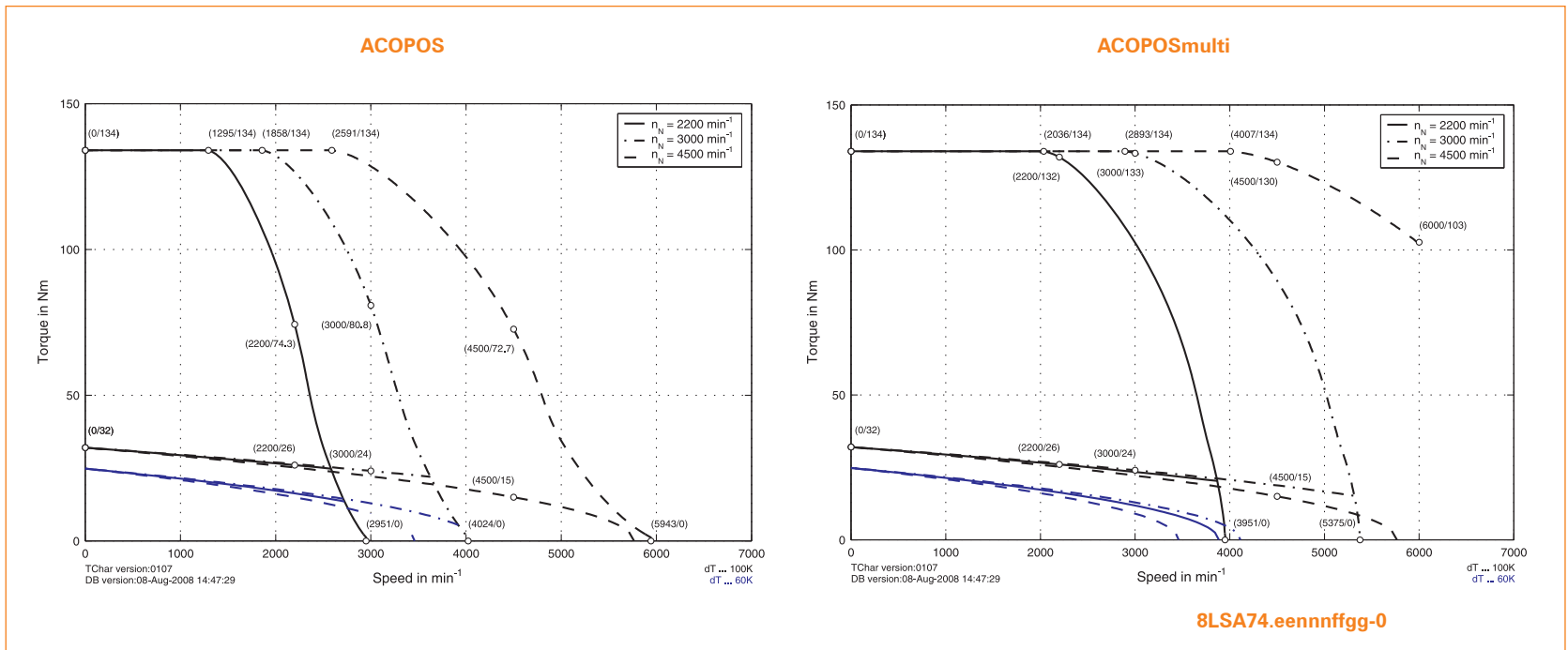
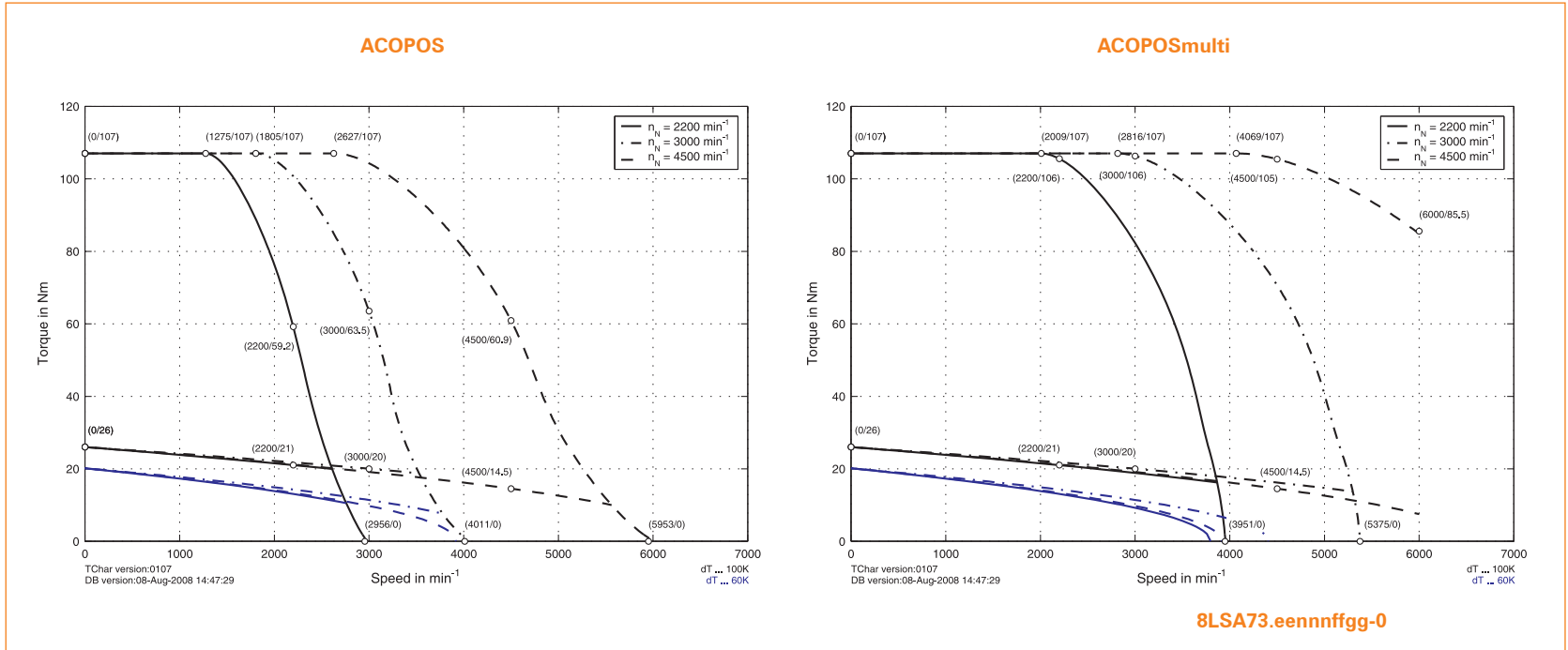
Technical data	8LSA73.ee[nnn]ffgg-0			8LSA74.ee[nnn]ffgg-0			8LSA75.ee[nnn]ffgg-0	
[nnn]	[022]	[030]	[045]	[022]	[030]	[045]	[022]	[030]
Rated speed n_N [min ⁻¹]	2200	3000	4500	2200	3000	4500	2200	3000
Number of poles	6	6	6	6	6	6	6	6
Rated torque M_N [Nm]	21	20	14.5	26	24	15	32	30
Rated power P_N [kW]	4.84	6.28	6.83	5.99	7.54	7.07	7.37	9.42
Rated current I_N [A]	9.47	12.27	13.18	11.73	14.72	13.64	14.43	18.4
Stall torque M_0 [Nm]	26	26	26	32	32	32	40	40
Stall current I_0 [A]	11.73	15.95	23.64	14.43	19.63	29.09	18.04	24.54
Peak torque M_{max} [Nm]	107	107	107	134	134	134	187	187
Peak current I_{max} [A]	84.3	115	171	103	140	207	130	176
Maximum angular acceleration without brake a [rad/s ²]	10918	10918	10918	11652	11652	11652	13357	13357
Maximum speed n_{max} [min ⁻¹]	6000	6000	6000	6000	6000	6000	4500	4500
Torque constant K_T [Nm/A]	2.22	1.63	1.1	2.22	1.63	1.1	2.22	1.63
Voltage constant K_E [V/1000 min ⁻¹]	134.04	98.43	65.97	134.04	98.43	65.97	134.04	98.43
Stator resistance R_{2ph} [Ω]	0.86	0.46	0.22	0.64	0.34	0.16	0.38	0.21
Stator inductance L_{2ph} [mH]	10.49	5.55	2.62	8.47	4.42	2.2	5.46	3.07
Electrical time constant t_{el} [ms]	12.23	12.07	11.91	13.15	13	13.75	14.52	14.62
Thermal time constant t_{therm} [min]	55	55	55	60	60	60	65	65
Moment of inertia without brake J [kgcm ²]	98	98	98	115	115	115	140	140
Weight without brake m [kg]	27	27	27	30	30	30	38	38
Holding brake								
Moment of inertia for brake J_{Br} [kgcm ²]	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85
Weight of brake m_{Br} [kg]	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Holding torque of the brake M_{Br} [Nm]	32	32	32	32	32	32	32	32
Recommendations								
Cable cross section for B&R motor cables [mm ²] ¹⁾	4	4	4	4	4	4	4	4
ACOPOS	☞ 1315	☞ 1315	☞ 1315	☞ 1315	☞ 1315	☞ 1315	☞ 1315	☞ 1315
ACOPOSmulti	☞ 1426	☞ 1426	☞ 1426	☞ 1426	☞ 1426	☞ 1426	☞ 1426	☞ 1426
ACOPOS servo drive 8Vxxxx.00-x ²⁾	1180	1180	1320	1180	1320	1320	1320	1320
ACOPOSmulti inverter module 8BVI... ³⁾	0110	0220	0440	0220	0220	0440	0220	0440

1) The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSmulti inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request.

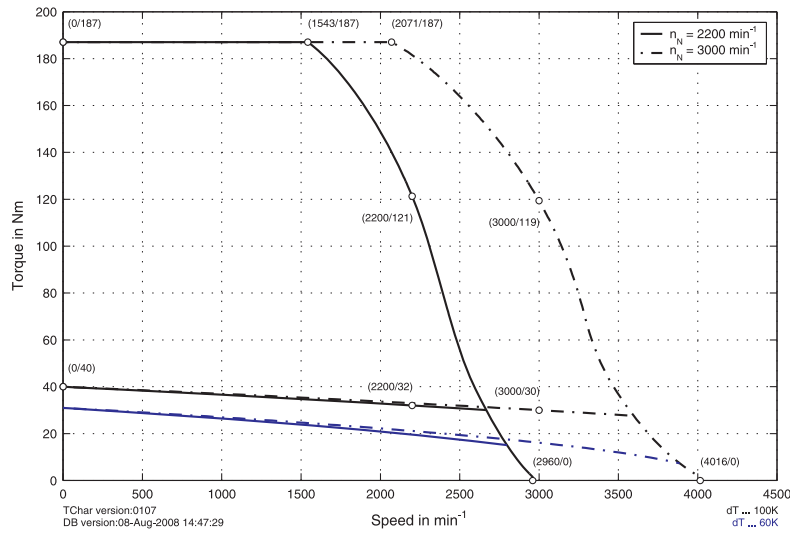
2) The recommended servo drive is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

3) The recommended ACOPOSmulti inverter module is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

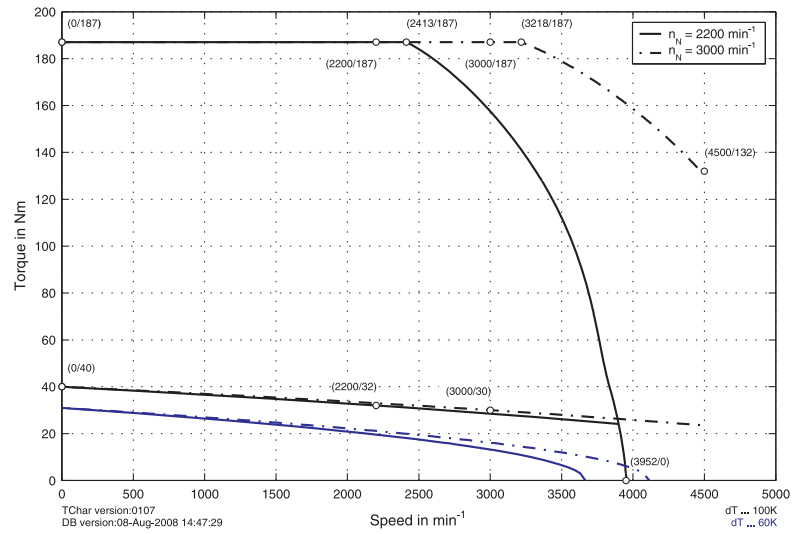
Speed-torque characteristic curves with 400 VAC supply voltage



ACOPOS



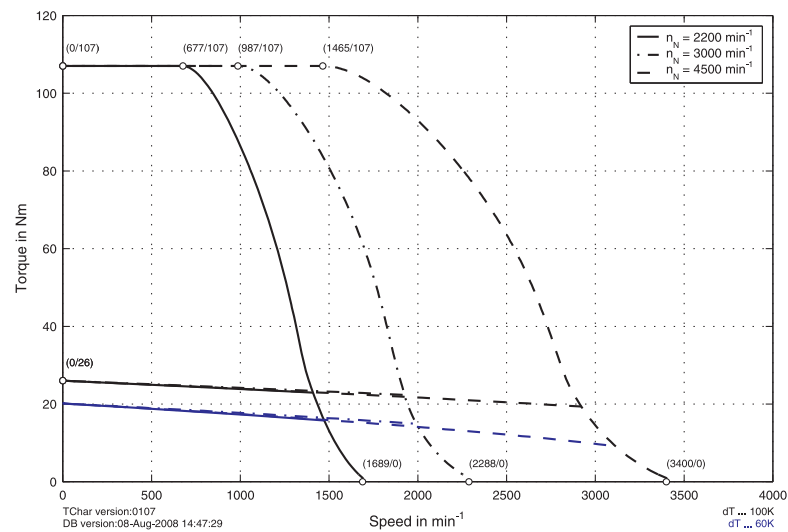
ACOPOSMulti



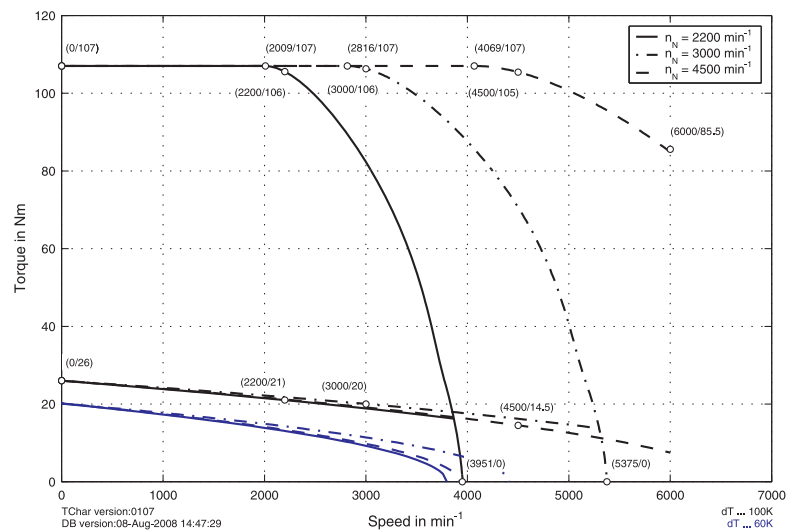
8LSA75.eennffgg-1

Speed-torque characteristic curves with 230 VAC supply voltage

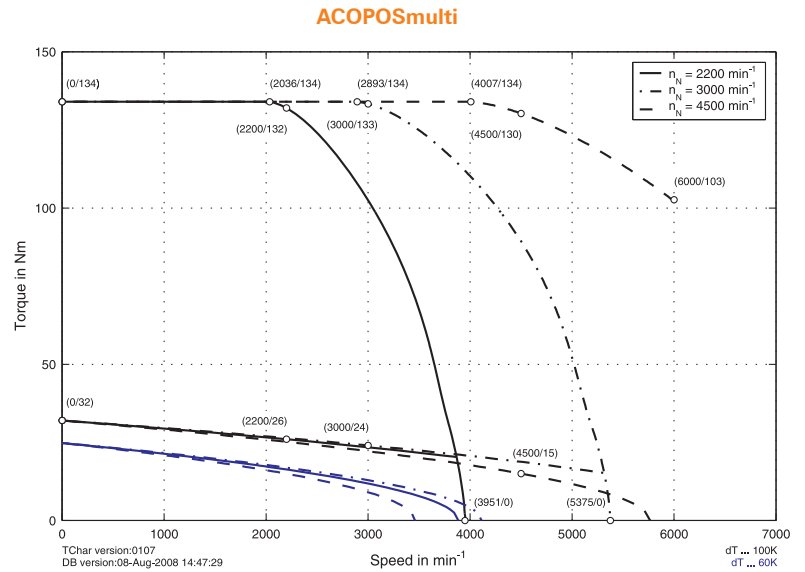
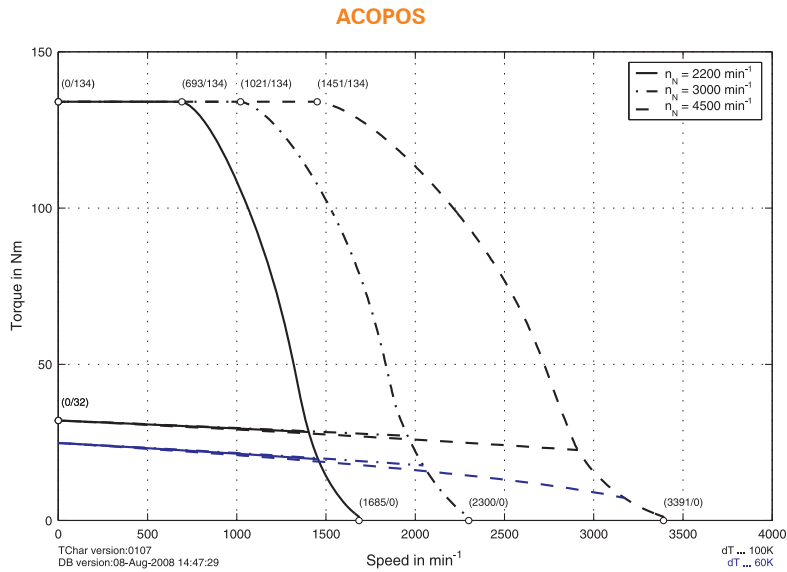
ACOPOS



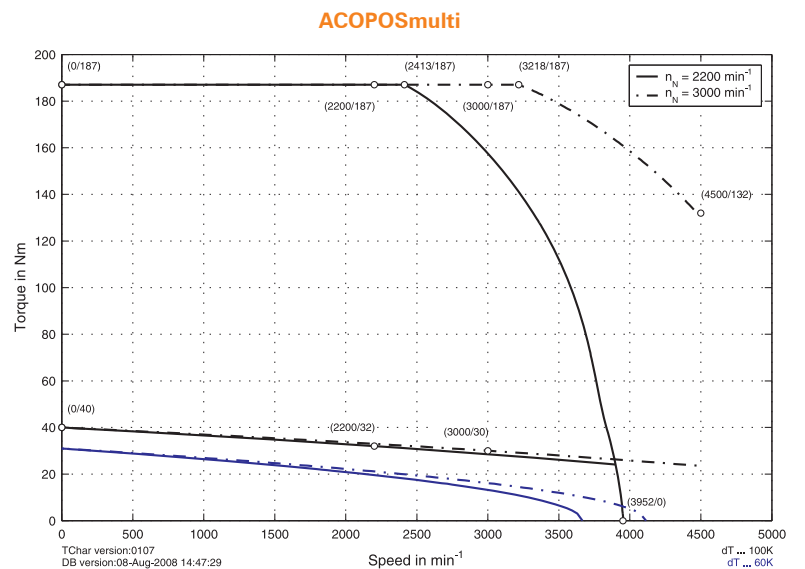
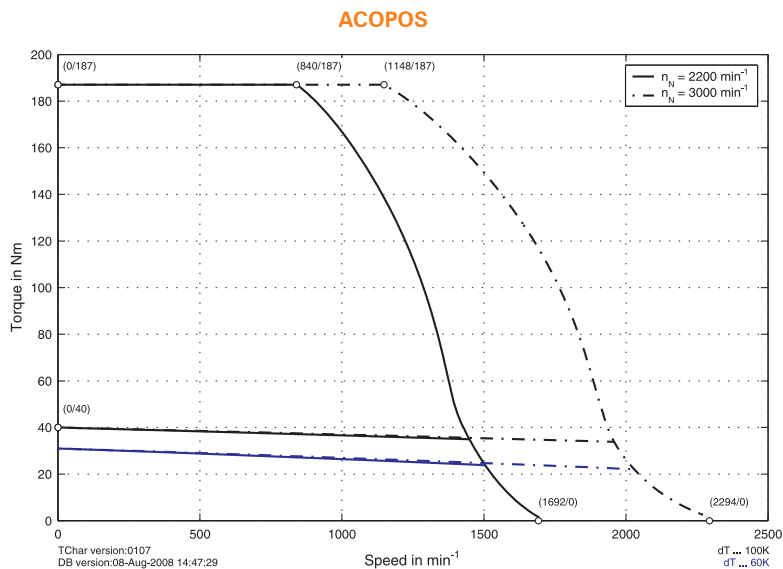
ACOPOSMulti



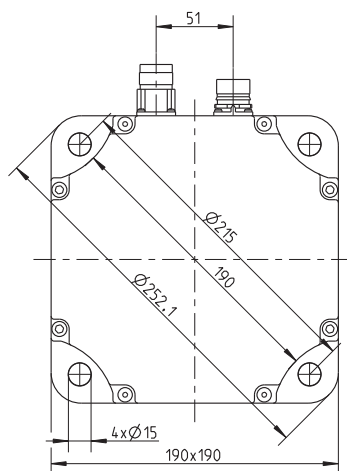
8LSA73.eennffgg-1



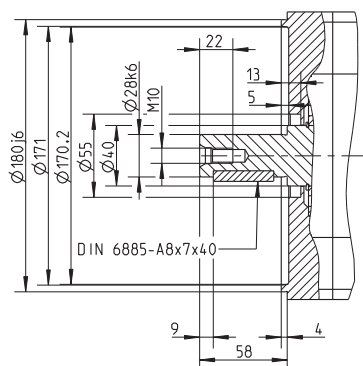
8LSA74.eennffgg-1



8LSA75.eennffgg-1



A side flange detail
Standard bearing



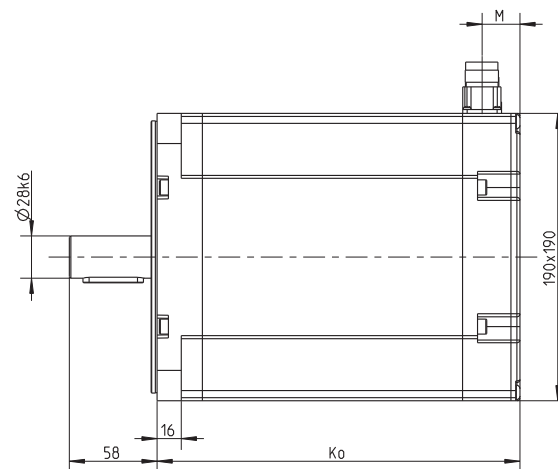
Possible connection directions



Straight (top connector)



Angled (swivel connector)



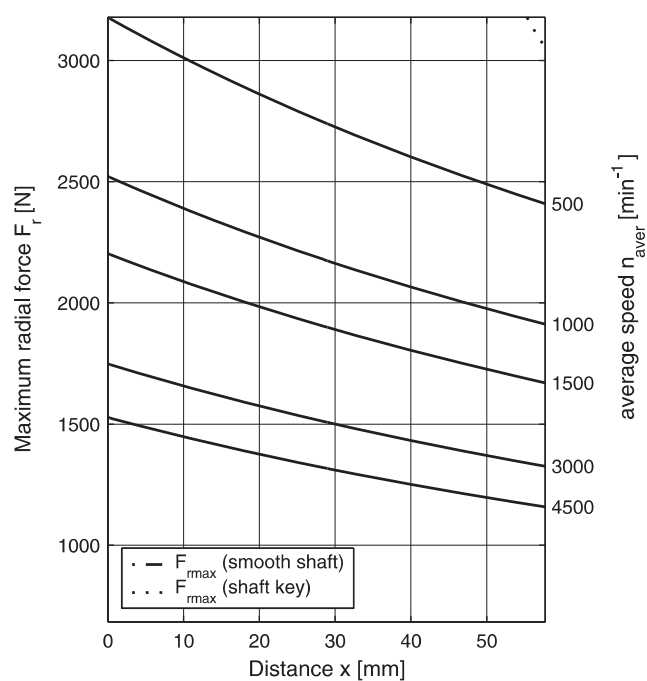
Dimensions

EnDat feedback		Resolver feedback			Extension of K_0 depending on the motor option [mm]			
Model number	K_0	M	Model number	K_0	M	Holding brake	Oil seal	Reinforced A side bearing
8LSA73.E0nnffgg-0, 8LSA73.E1nnffgg-0	268	53	8LSA73.R0nnffgg-0	240	25	40	---	---
8LSA74.E0nnffgg-0, 8LSA74.E1nnffgg-0	288	53	8LSA74.R0nnffgg-0	260	25	40	---	---
8LSA75.E0nnffgg-0, 8LSA75.E1nnffgg-0	328	53	8LSA75.R0nnffgg-0	300	25	40	---	---
8LSA73.E2nnffgg-0, 8LSA73.E3nnffgg-0	240	25				40	---	---
8LSA74.E2nnffgg-0, 8LSA74.E3nnffgg-0	260	25				40	---	---
8LSA75.E2nnffgg-0, 8LSA75.E3nnffgg-0	300	25				40	---	---

Maximum shaft load

The values in the diagram below are based on a mechanical lifespan of the bearings of 20,000 operating hours.

Standard bearing



maximum allowed axial force: $F_{amax} = 287$ N

Recommended B&R motor cable

The recommended B&R motor cable for a motor depends on the recommended ACOPOS servo drive or ACOPOSmulti inverter module (see "Recommended cable cross section for B&R motor cables [mm²]" in the table "Technical data") [1528](#)

Recommended B&R encoder cables

8BCRxxxx.1111A-0 ACPmulti EnDat cable, length xxxx m, 10x 0.14 mm² + 2x 0.5 mm², EnDat plug 17-pin SpeedTec socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed [1428](#)

8BCRxxxx.1111A-0 ACPmulti Resolver cable, length xxxx m, 3 x 2 x 24 AWG (19 x 0.127), resolver plug 12-pin SpeedTec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed [1429](#)

8LSA8



Symbol photo

Technical data	8LSA83.ee[nnn]ffgg-0		8LSA84.ee[nnn]ffgg-0		8LSA85.ee[nnn]ffgg-0		8LSA86.ee[nnn]ffgg-0	
[nnn]	[022]	[030]	[022]	[030]	[015]	[020]	[015]	[020]
Rated speed n_N [min ⁻¹]	2200	3000	2200	3000	1500	2000	1500	2000
Number of poles	6	6	6	6	6	6	6	6
Rated torque M_N [Nm]	31	27	51.5	48.4	77	72	97	85
Rated power P_N [kW]	7.14	8.48	11.86	15.21	12.1	15.08	15.24	17.8
Rated current I_N [A]	13.98	16.56	23.23	29.69	22.25	29.39	31.09	34.69
Stall torque M_0 [Nm]	40	40	69	69	94	94	115	115
Stall current I_0 [A]	18.04	24.54	31.12	42.33	27.17	38.37	36.86	46.94
Peak torque M_{max} [Nm]	120	120	204	204	280	280	345	345
Peak current I_{max} [A]	72.6	102	115.5	171	113	150.6	137	182
Maximum angular acceleration without brake a [rad/s ²]	18462	18462	17895	17895	18667	18667	17969	17969
Maximum speed n_{max} [min ⁻¹]	3600	3600	3600	3600	3600	3600	3600	3600
Torque constant K_T [Nm/A]	2.22	1.63	2.22	1.63	3.46	2.45	3.12	2.45
Voltage constant K_E [V/1000 min ⁻¹]	134.04	98.43	134.04	98.43	209.43	147.65	188.49	147.65
Stator resistance R_{2ph} [Ω]	0.41	0.23	0.2	0.11	0.33	0.17	0.2	0.13
Stator inductance L_{2ph} [mH]	9.6	5.4	5.29	3.11	9.44	4.85	6.1	3.9
Electrical time constant t_{el} [ms]	23.42	23.48	26.45	27.52	28.78	28.87	30.05	30
Thermal time constant t_{therm} [min]	50	50	65	65	80	80	90	90
Moment of inertia without brake J [kgcm ²]	65	65	114	114	150	150	192	192
Weight without brake m [kg]	41.5	41.5	55	55	74	74	92	92
Holding brake								
Moment of inertia for brake J_{Br} [kgcm ²]	53	53	53	53	53	53	53	53
Weight of brake m_{Br} [kg]	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35
Holding torque of the brake M_{Br} [Nm]	130	130	130	130	130	130	130	130
Recommendations								
Cable cross section for B&R motor cables [mm ²] ¹⁾	4 ²⁾	4 ²⁾	10	10	4 ²⁾	10	10	10
ACOPOS			≧ 1316	≧ 1316		≧ 1316	≧ 1316	≧ 1316
ACOPOSmulti			≧ 1427	≧ 1427		≧ 1427	≧ 1427	≧ 1427
ACOPOS servo drive 8Vxxxx.00-x ³⁾	1320	1320	1640	1640	1320	1640	1640	1640
ACOPOSmulti inverter module 8BVI... ⁴⁾	0220	0440	0440	0880	0440	0440	0440	0880

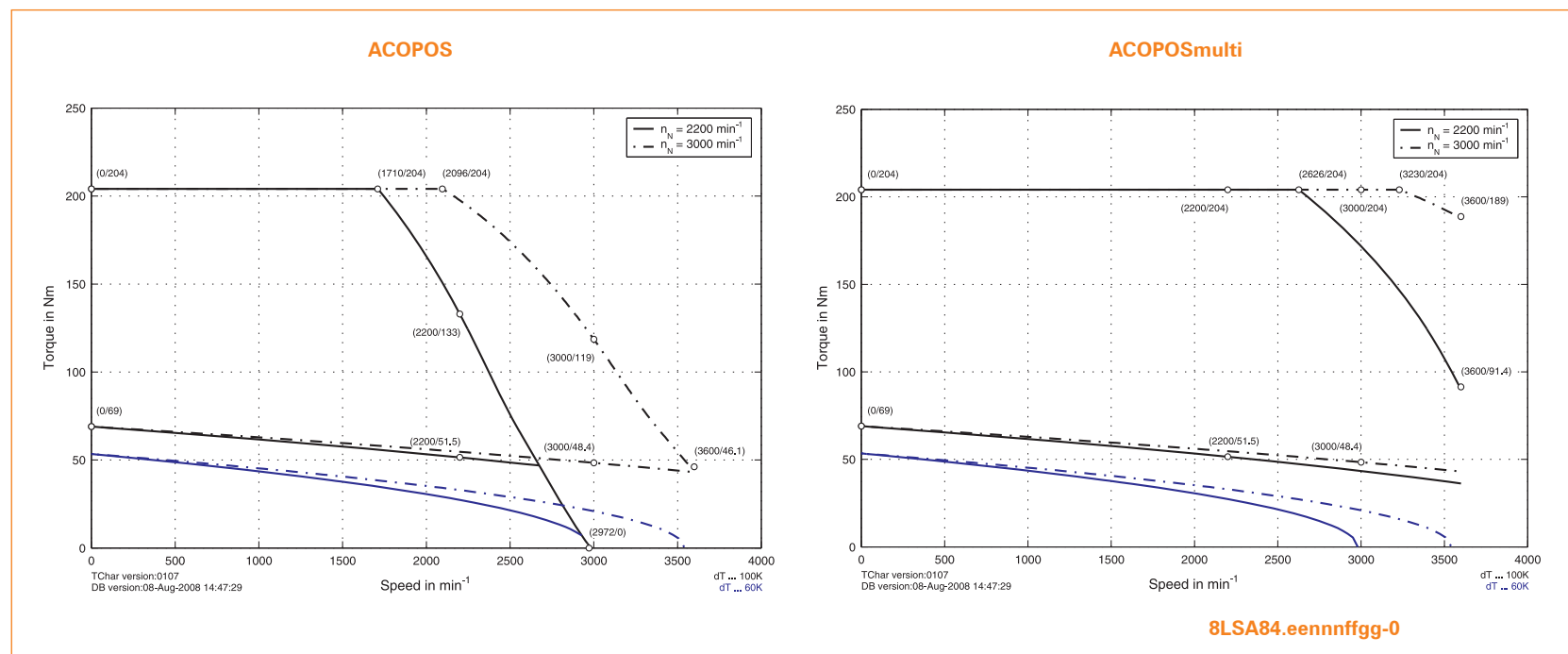
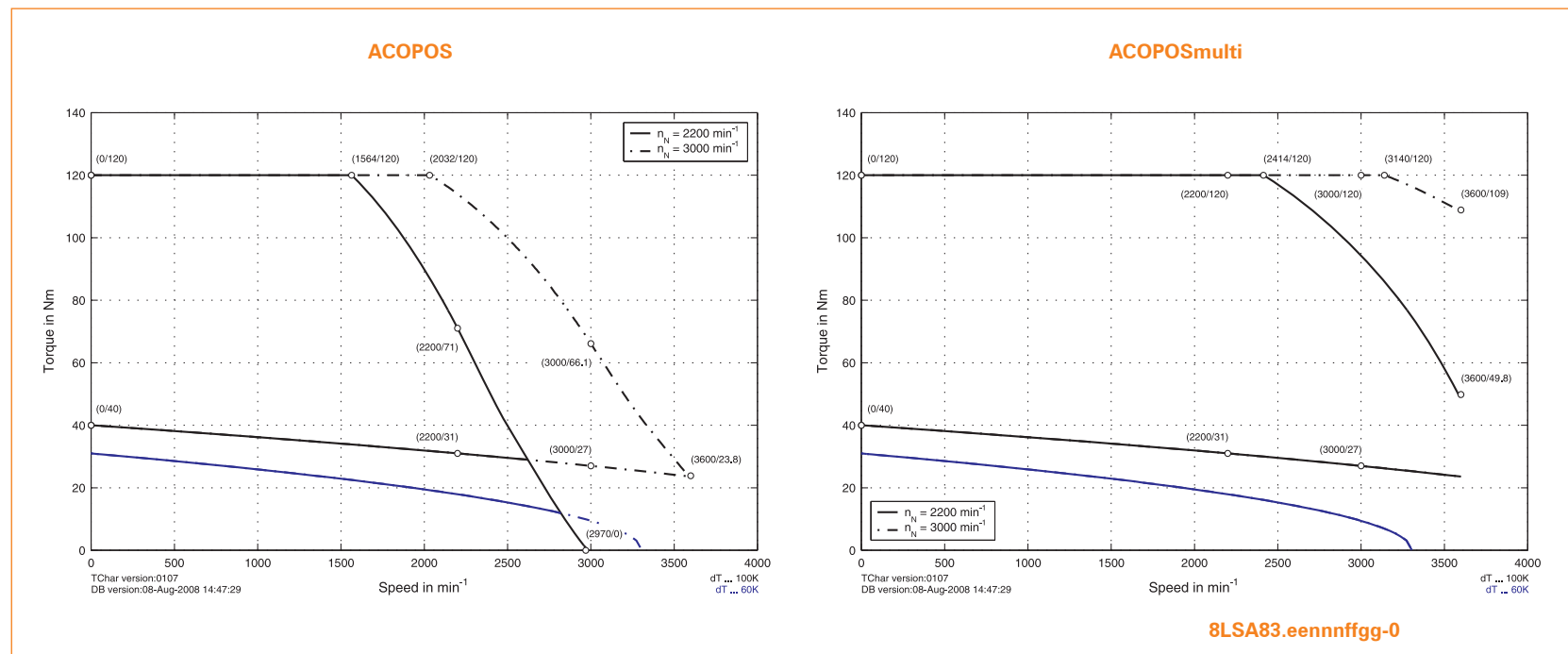
1) The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSmulti inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request.

2) Special prefabricated motor cables must be used for this motor / servo drive combination (size of the motor plug is not the standard size). They are available from B&R on request.

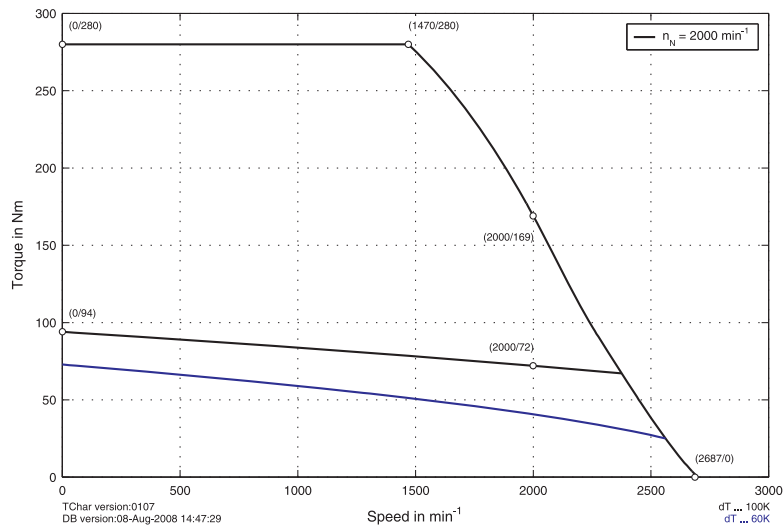
3) The recommended servo drive is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

4) The recommended ACOPOSmulti inverter module is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

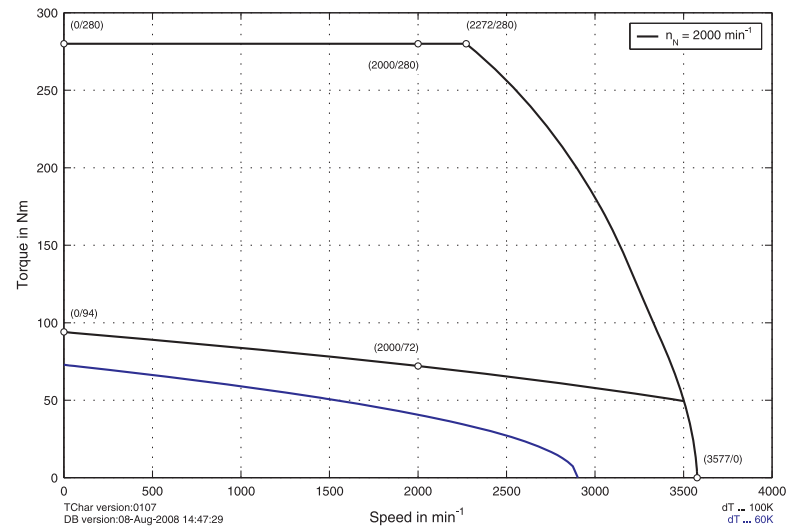
Speed-torque characteristic curves with 400 VAC supply voltage



ACOPOS

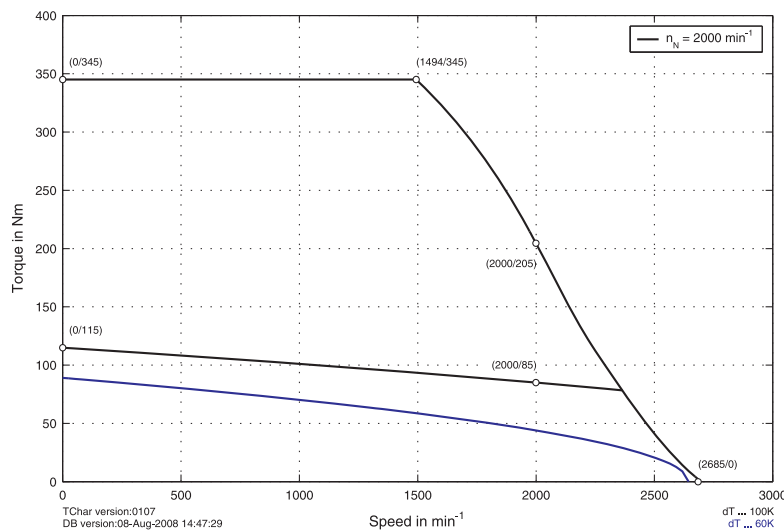


ACOPOSmulti

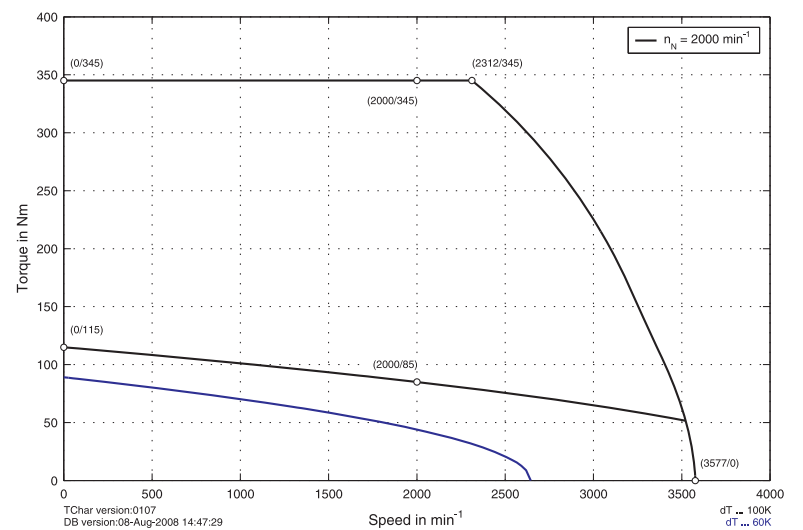


8LSA85.eennffgg-0

ACOPOS



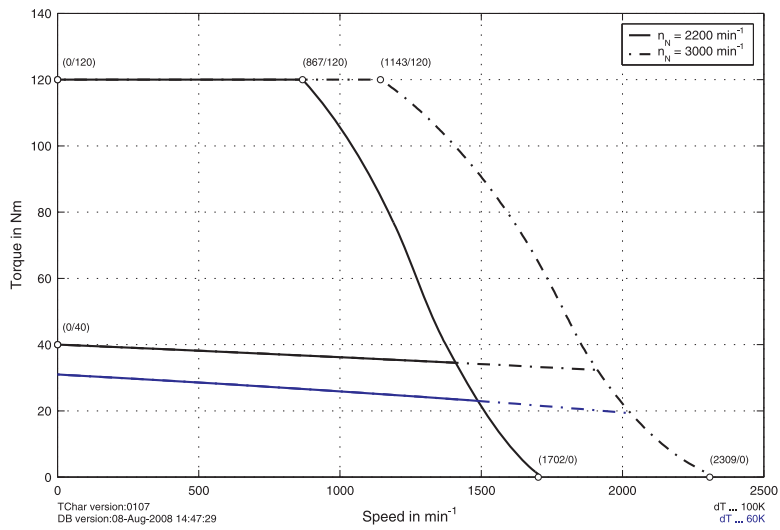
ACOPOSmulti



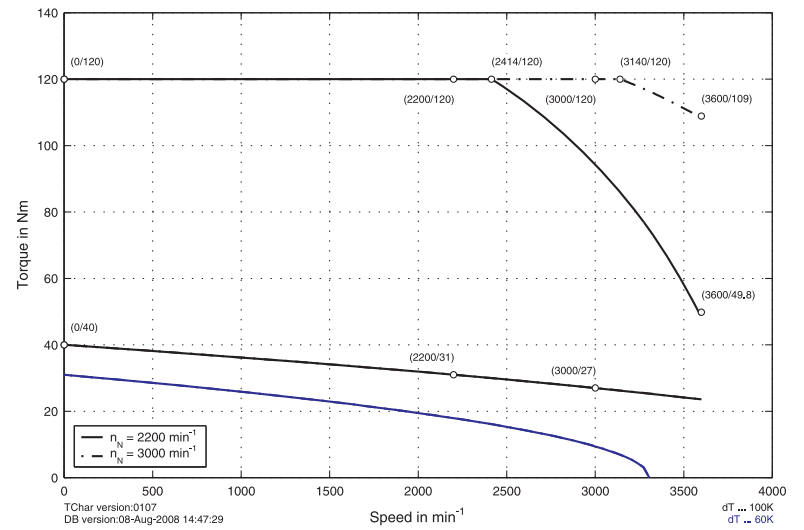
8LSA86.eennffgg-0

Speed-torque characteristic curves with 230 VAC supply voltage

ACOPOS

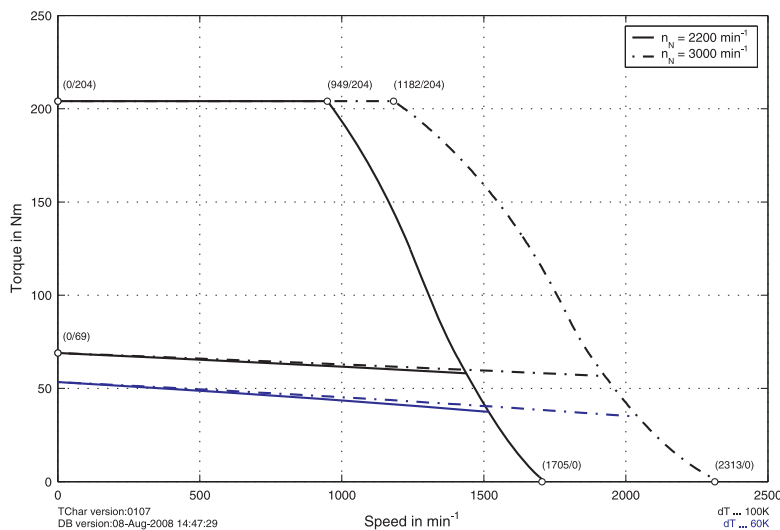


ACOPOSmulti

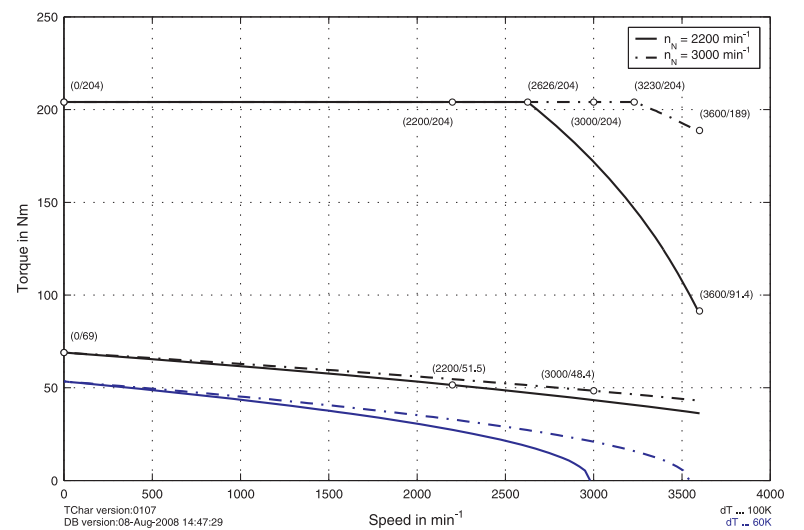


8LSA83.eennffgg-0

ACOPOS

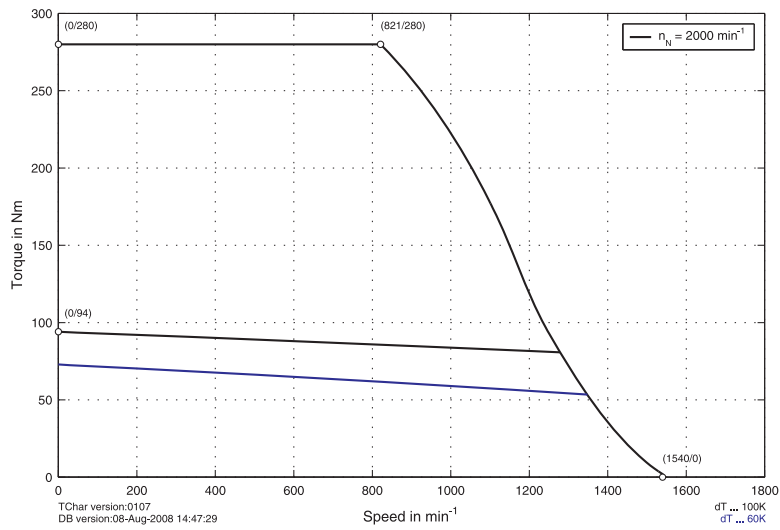


ACOPOSmulti

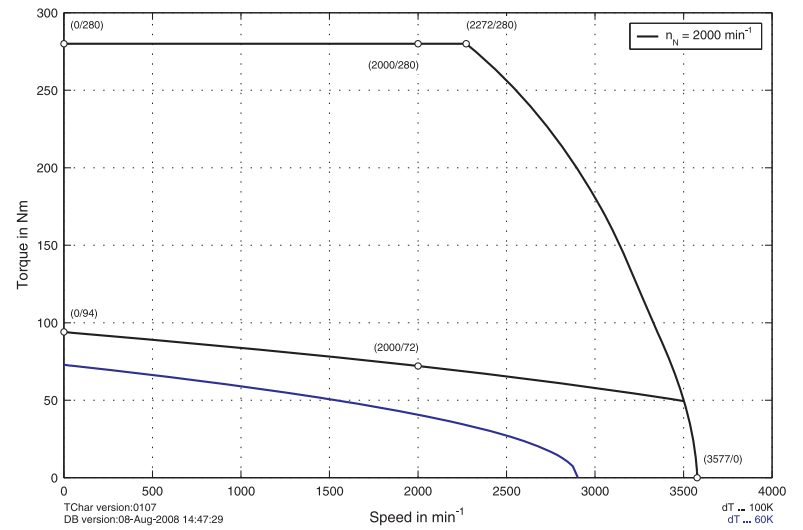


8LSA84.eennffgg-0

ACOPOS

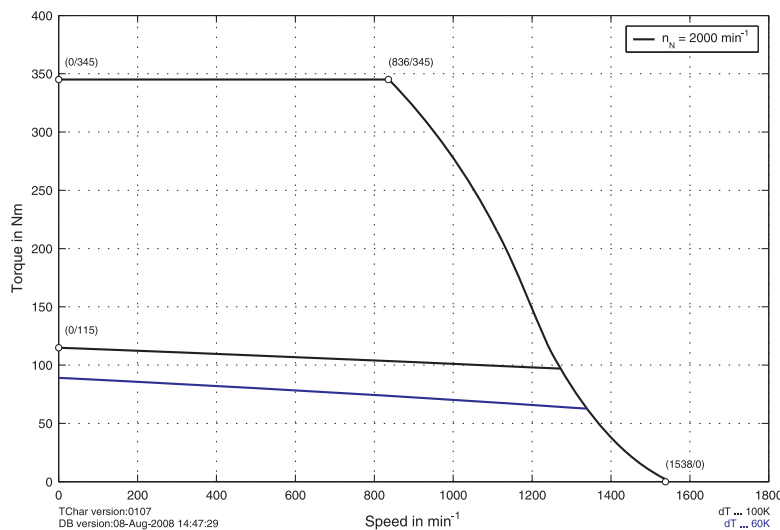


ACOPOSmulti

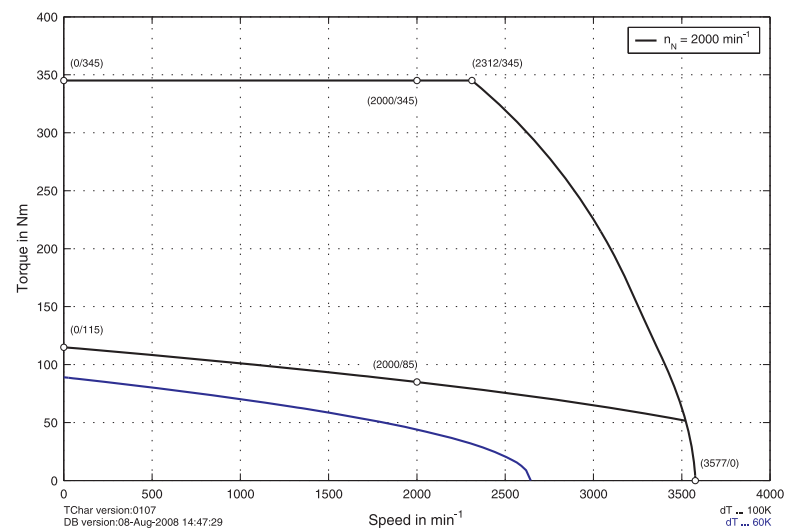


8LSA85.eennffgg-0

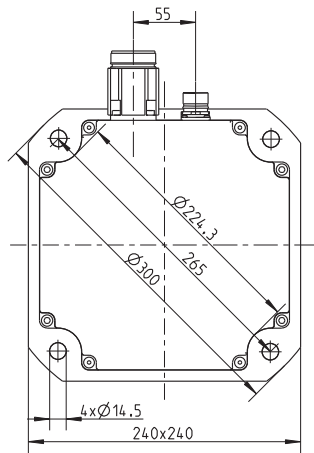
ACOPOS



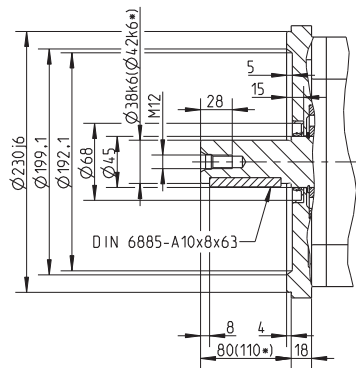
ACOPOSmulti



8LSA86.eennffgg-0



**A side flange detail
Standard bearing**



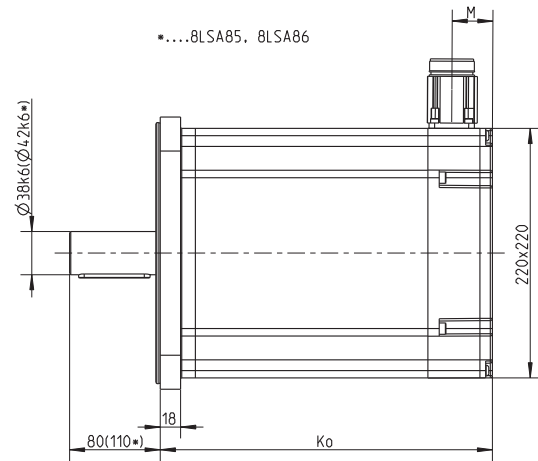
**Possible
connection directions**



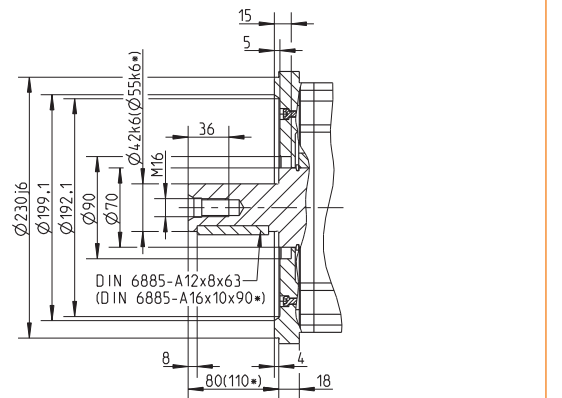
Straight (top connector)



Angled (swivel connector)



**A side flange detail
Special motor option "Reinforced A side bearing"**



Dimensions

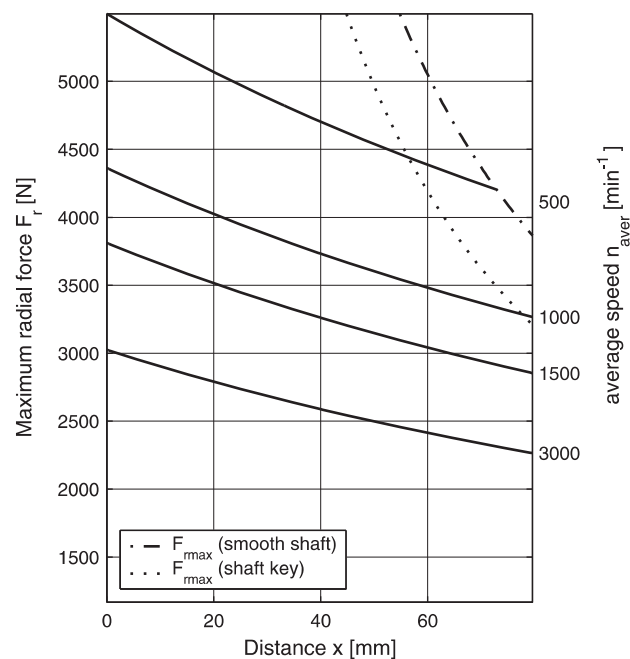
EnDat feedback			Resolver feedback			Extension of K ₀ depending on the motor option [mm]		
Model number	K ₀	M	Model number	K ₀	M	Holding brake ¹⁾	Oil seal	Reinforced A side bearing
8LSA83.E0nnffgg-0, 8LSA83.E1nnffgg-0	321	62	8LSA83.R0nnffgg-0	293	34	50	---	16.5
8LSA84.E0nnffgg-0, 8LSA84.E1nnffgg-0	401	62	8LSA84.R0nnffgg-0	373	34	50	---	16.5
8LSA85.E0nnffgg-0, 8LSA85.E1nnffgg-0	461	62	8LSA85.R0nnffgg-0	433	34	50	---	16.5
8LSA86.E0nnffgg-0, 8LSA86.E1nnffgg-0	521	62	8LSA86.R0nnffgg-0	493	34	50	---	16.5
8LSA83.E2nnffgg-0, 8LSA83.E3nnffgg-0	293	34				50	---	16.5
8LSA84.E2nnffgg-0, 8LSA84.E3nnffgg-0	373	34				50	---	16.5
8LSA85.E2nnffgg-0, 8LSA85.E3nnffgg-0	433	34				50	---	16.5
8LSA86.E2nnffgg-0, 8LSA86.E3nnffgg-0	493	34				50	---	16.5

1) The motor option "holding brake" cannot be ordered in combination with special motor option "reinforced A side bearing".

Maximum shaft load

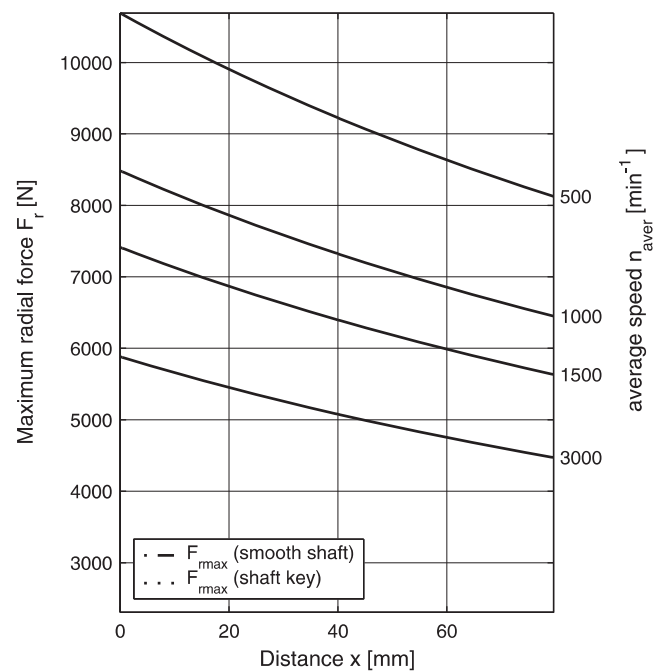
The values in the diagrams below are based on a mechanical lifespan of the bearings of 20,000 operating hours.

Standard bearing



maximum allowed axial force: $F_{amax} = 492$ N

Special motor option "Reinforced A side bearing"



maximum allowed axial force: $F_{amax} = 966$ N

Recommended B&R motor cable

The recommended B&R motor cable for a motor depends on the recommended ACOPOS servo drive or ACOPOSmulti inverter module (see "Recommended cable cross section for B&R motor cables [mm²]" in the table "Technical data") 1532

Recommended B&R encoder cables

8BCExxxx.1111A-0	ACPmulti EnDat cable, length xxxx m, 10x 0.14 mm ² + 2x 0.5 mm ² , EnDat plug 17-pin SpeedTec socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed 1428
8BCRxxxx.1111A-0	ACPmulti Resolver cable, length xxxx m, 3 x 2 x 24 AWG (19 x 0.127), resolver plug 12-pin SpeedTec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed 1429



Product overview

Separately cooled motors (cooling type C)

The technical data listed in this section (K_E , K_T , I_N , I_0 , I_{max} , R_{2ph} , L_{2ph} , t_{el} , t_{therm} , m , J) has a theoretical tolerance range of $\pm 10\%$. This is also valid for the speed - torque characteristic curves represented in the following sections.

Motor	8LSC43.ee02f1fgg-0	8LSC43.ee030f1fgg-0	8LSC43.ee045f1fgg-0	8LSC43.ee060f1fgg-0	8LSC44.ee02f1fgg-0	8LSC44.ee030f1fgg-0	8LSC44.ee045f1fgg-0	8LSC44.ee060f1fgg-0	8LSC45.ee02f1fgg-0	8LSC45.ee030f1fgg-0	8LSC45.ee045f1fgg-0	8LSC45.ee060f1fgg-0
Rated speed n_N [min ⁻¹]	2200	3000	4500	6000	2200	3000	4500	6000	2200	3000	4500	6000
Number of poles	10	10	10	10	10	10	10	10	10	10	10	10
Rated torque M_N [Nm]	4.55	4.03	3.51	2.6	6.76	6	4.68	3.9	9.1	8	6.24	5.2
Rated power P_N [kW]	1.05	1.27	1.65	1.63	1.56	1.88	2.21	2.45	2.1	2.51	2.94	3.27
Rated current I_N [A]	2.05	2.48	3.24	3.19	3.05	3.69	4.32	4.79	4.1	4.92	5.76	6.39
Stall torque M_0 [Nm]	5.2	5.2	5.2	5.2	7.8	7.8	7.8	7.8	10.4	10.4	10.4	10.4
Stall current I_0 [A]	2.35	3.19	4.8	6.39	3.52	4.79	7.21	9.58	4.69	6.39	9.61	12.78
Peak torque M_{max} [Nm]	15.2	15.2	15.2	15.2	22.8	22.8	22.8	22.8	30.4	30.4	30.4	30.4
Peak current I_{max} [A]	10.71	14.59	21.94	29.17	16.07	21.88	32.91	43.76	21.43	29.17	43.88	58.35
Maximum angular acceleration without brake a [rad/s ²]	81283	81175	81175	81175	83562	83562	83562	83562	84916	84810	84810	84810
Maximum speed n_{max} [min ⁻¹]	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000
Torque constant K_T [Nm/A]	2.22	1.63	1.08	0.81	2.22	1.63	1.08	0.81	2.22	1.63	1.08	0.81
Voltage constant K_E [V/1000 min ⁻¹]	134.04	98.43	65.45	49.22	134.04	98.43	65.45	49.22	134.04	98.43	65.45	49.22
Stator resistance R_{2ph} [Ω]	10.7	5.43	2.42	1.36	6.24	3.6	1.53	0.86	4.32	2.49	1.11	0.67
Stator inductance L_{2ph} [mH]	69.4	36.5	16.5	9.2	44.8	24	10.8	6.2	41	21.8	9.69	5.45
Electrical time constant t_{el} [ms]	6.49	6.72	6.83	6.77	7.18	6.67	7.04	7.19	9.49	8.76	8.76	8.13
Thermal time constant t_{therm} [min]	25	25	25	25	30	30	30	30	35	35	35	35
Moment of inertia without brake J [kgcm ²]	1.87	1.87	1.87	1.87	2.73	2.73	2.73	2.73	3.58	3.58	3.58	3.58
Weight without brake m [kg]	5.5	5.5	5.5	5.5	6.86	6.86	6.86	6.86	8.3	8.3	8.3	8.3
Holding brake												
Moment of inertia for brake J_{Br} [kgcm ²]	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54
Weight of brake m_{Br} [kg]	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Holding torque of the brake M_{Br} [Nm]	8	8	8	8	8	8	8	8	8	8	8	8
Recommendations												
Cable cross section for B&R motor cables [mm ²] ¹⁾	1.5	1.5	1.5	1.5	1.5	1.5	1.5	4	1.5	1.5	4	4
ACOPOS	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1315	▮ 1314	▮ 1314	▮ 1315	▮ 1315
ACOPOSMulti	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1426	▮ 1425	▮ 1425	▮ 1426	▮ 1426
ACOPOS servo drive 8Vxxxx.00-x ²⁾	1045	1045	1090	1090	1045	1090	1090	1180	1090	1090	1180	1180
ACOPOSMulti inverter module 8BVI... ³⁾	0028	0028	0055	0055	0055	0055	0110	0110	0055	0055	0110	0110

1) The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSMulti inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request.

2) The recommended servo drive is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

3) The recommended ACOPOSMulti inverter module is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

Motor	8LSC46.ee022f9g-0	8LSC46.ee030f9g-0	8LSC46.ee045f9g-0	8LSC46.ee060f9g-0	8LSC53.ee022f9g-1	8LSC53.ee030f9g-1	8LSC53.ee045f9g-1	8LSC54.ee022f9g-1	8LSC54.ee030f9g-1	8LSC54.ee045f9g-1	8LSC55.ee022f9g-1	8LSC55.ee030f9g-1
Rated speed n_N [min ⁻¹]	2200	3000	4500	6000	2200	3000	4500	2200	3000	4500	2200	3000
Number of poles	10	10	10	10	8	8	8	8	8	8	8	8
Rated torque M_N [Nm]	11.31	10.01	7.8	6.5	5.46	5.2	5.07	10.14	10.01	9.49	15.34	15.08
Rated power P_N [kW]	2.61	3.14	3.68	4.08	1.26	1.63	2.39	2.34	3.14	4.47	3.53	4.74
Rated current I_N [A]	5.1	6.15	7.21	7.98	2.6	3.25	4.94	4.68	6.11	9.23	6.63	8.97
Stall torque M_0 [Nm]	13	13	13	13	5.85	5.85	5.85	11.7	11.7	11.7	16.25	16.25
Stall current I_0 [A]	5.86	7.98	12.01	15.97	2.76	3.57	5.66	5.1	6.99	11.18	7.4	10.49
Peak torque M_{max} [Nm]	38	38	38	38	13.8	13.8	13.8	27.6	27.6	27.6	41.4	41.4
Peak current I_{max} [A]	26.78	36.47	54.85	72.94	8	10.53	16.48	15.39	20.92	32.96	23.64	32.96
Maximum angular acceleration without brake a [rad/s ²]	86620	86620	86620	86620	38107	38107	38107	45660	45660	45660	50526	50526
Maximum speed n_{max} [min ⁻¹]	12000	12000	12000	12000	9000	9000	9000	9000	9000	9000	9000	9000
Torque constant K_T [Nm/A]	2.22	1.63	1.08	0.81	2.22	1.63	1.09	2.22	1.63	1.09	2.22	1.63
Voltage constant K_E [V/1000 min ⁻¹]	134.04	98.43	65.45	49.22	134.04	98.43	65.97	134.04	98.43	65.97	134.04	98.43
Stator resistance R_{2ph} [Ω]	3.61	1.92	0.88	0.48	9.35	5.59	2.22	3.81	2.03	0.79	2.27	1.13
Stator inductance L_{2ph} [mH]	32	17.44	7.75	4.36	82.1	47.39	19.33	39.75	21.52	8.67	24.29	12.5
Electrical time constant t_{el} [ms]	8.86	9.08	8.81	9.08	8.79	8.48	8.7	10.43	10.62	10.92	10.72	11.09
Thermal time constant t_{therm} [min]	40	40	40	40	33	33	33	37	37	37	40	40
Moment of inertia without brake J [kgcm ²]	4.39	4.39	4.39	4.39	3.62	3.62	3.62	6.04	6.04	6.04	8.19	8.19
Weight without brake m [kg]	9.7	9.7	9.7	9.7	11.43	11.43	11.43	12.96	12.96	12.96	14.79	14.79
Holding brake												
Moment of inertia for brake J_{Br} [kgcm ²]	0.54	0.54	0.54	0.54	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66
Weight of brake m_{Br} [kg]	0.46	0.46	0.46	0.46	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Holding torque of the brake M_{Br} [Nm]	8	8	8	8	15	15	15	15	15	15	15	15
Recommendations												
Cable cross section for B&R motor cables [mm ²] ¹⁾	1.5	1.5	4	4	1.5	1.5	1.5	1.5	1.5	4	1.5	4
ACOPOS	▮ 1314	▮ 1314	▮ 1315	▮ 1315	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1315	▮ 1314	▮ 1315
ACOPOSmulti	▮ 1425	▮ 1425	▮ 1426	▮ 1426	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1426	▮ 1425	▮ 1426
ACOPOS servo drive 8Vxxxx.00-x ²⁾	1090	1090	1180	1180	1045	1045	1090	1090	1090	1180	1090	1180
ACOPOSmulti inverter module 8BVI... ³⁾	0055	0110	0110	0220	0028	0055	0055	0055	0110	0110	0110	0110

1) The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSmulti inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request.

2) The recommended servo drive is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

3) The recommended ACOPOSmulti inverter module is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

Product overview

Separately cooled motors (cooling type C)

Motor	8LSC55.ee045ffgg-1	8LSC56.ee022ffgg-1	8LSC56.ee030ffgg-1	8LSC56.ee045ffgg-1	8LSC57.ee022ffgg-1	8LSC57.ee030ffgg-1	8LSC57.ee045ffgg-1	8LSC5A.ee020ffgg-0	8LSC5A.ee030ffgg-0	8LSC5A.ee045ffgg-0	8LSC5B.ee020ffgg-0	8LSC5B.ee030ffgg-0
Rated speed n_N [min ⁻¹]	4500	2200	3000	4500	2200	3000	4500	2000	3000	4500	2000	3000
Number of poles	8	8	8	8	8	8	8	8	8	8	8	8
Rated torque M_N [Nm]	12.35	18.72	18.07	16.51	23.4	22.75	19.5	29.5	26.4	20	47	42
Rated power P_N [kW]	5.82	4.31	5.68	7.78	5.39	7.15	9.19	6.18	8.29	9.42	9.84	13.19
Rated current I_N [A]	11.7	8.19	10.66	15.47	9.88	13	18.07	12.08	16.21	18.93	19.3	25.8
Stall torque M_0 [Nm]	16.25	20.8	20.8	20.8	26	26	26	31	31	31	50	50
Stall current I_0 [A]	14.79	9.37	12.85	20.53	11.49	16.02	25.09	12.69	19.04	29.34	20.47	30.71
Peak torque M_{max} [Nm]	41.4	55.2	55.2	55.2	69	69	69	64	64	64	107	107
Peak current I_{max} [A]	47.29	30.78	41.83	65.92	38.39	52.63	82.61	31.47	47.21	72.75	52.62	78.93
Maximum angular acceleration without brake a [rad/s ²]	50526	51777	51777	51777	52558	52558	52558	50394	50394	50394	53234	53234
Maximum speed n_{max} [min ⁻¹]	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000
Torque constant K_T [Nm/A]	1.09	2.22	1.63	1.09	2.22	1.63	1.09	2.44	1.63	1.06	2.44	1.63
Voltage constant K_E [V/1000 min ⁻¹]	65.97	134.04	98.43	65.97	134.04	98.43	65.97	147.65	98.43	63.88	147.65	98.43
Stator resistance R_{2ph} [Ω]	0.57	1.64	0.87	0.34	1.24	0.64	0.26	1.2	0.59	0.27	0.68	0.28
Stator inductance L_{2ph} [mH]	6.07	18.73	10.14	4.08	14.87	7.91	3.21	8.5	3.91	1.61	6.03	2.44
Electrical time constant t_{el} [ms]	10.72	11.43	11.64	11.97	12.04	12.45	12.39	7.08	6.59	6.06	8.85	8.84
Thermal time constant t_{therm} [min]	40	43	43	43	46	46	46	55	55	55	60	60
Moment of inertia without brake J [kgcm ²]	8.19	10.66	10.66	10.66	13.13	13.13	13.13	12.7	12.7	12.7	20.1	20.1
Weight without brake m [kg]	14.79	16.81	16.81	16.81	18.74	18.74	18.74	17.5	17.5	17.5	26	26
Holding brake												
Moment of inertia for brake J_{Br} [kgcm ²]	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66
Weight of brake m_{Br} [kg]	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Holding torque of the brake M_{Br} [Nm]	15	15	15	15	15	15	15	15	15	15	15	15
Recommendations												
Cable cross section for B&R motor cables [mm ²] ¹⁾	4	4	4	4	4	4	4	4	4	4	4	4 ⁴⁾
ACOPOS	▣ 1315	▣ 1315	▣ 1315	▣ 1315	▣ 1315	▣ 1315	▣ 1315	▣ 1315	▣ 1315	▣ 1315	▣ 1315	▣ 1315
ACOPOSmulti	▣ 1426	▣ 1426	▣ 1426	▣ 1426	▣ 1426	▣ 1426	▣ 1426	▣ 1426	▣ 1426	▣ 1426	▣ 1426	▣ 1426
ACOPOS servo drive 8Vxxxx.00-x ²⁾	1180	1180	1180	1320	1180	1180	1320	1180	1320	1320	1320	1320
ACOPOSmulti inverter module 8BVI... ³⁾	0220	0110	0110	0440	0110	0220	0440	0110	0220	0440	0440	0440

1) The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSmulti inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request.

2) The recommended servo drive is defined for 1.1x the stall current of the motor; if more than 2x the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

3) The recommended ACOPOSmulti inverter module is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

4) Special prefabricated motor cables must be used for this motor / servo drive combination (size of the motor plug is not the standard size). They are available from B&R on request.

Motor	8LSC5B.ee045ffgg-0	8LSC5C.ee020ffgg-0	8LSC5C.ee030ffgg-0	8LSC5C.ee045ffgg-0	8LSC63.ee022ffgg-1	8LSC63.ee030ffgg-1	8LSC63.ee045ffgg-1	8LSC64.ee022ffgg-1	8LSC64.ee030ffgg-1	8LSC64.ee045ffgg-1	8LSC65.ee022ffgg-1	8LSC65.ee030ffgg-1
Rated speed n_N [min ⁻¹]	4500	2000	3000	4500	2200	3000	4500	2200	3000	4500	2200	3000
Number of poles	8	8	8	8	8	8	8	8	8	8	8	8
Rated torque M_N [Nm]	32	65	58	44	15.34	15.08	12.35	23.4	22.75	19.63	28.6	27.3
Rated power P_N [kW]	15.08	13.61	18.22	20.73	3.53	4.74	5.82	5.39	7.15	9.25	6.59	8.58
Rated current I_N [A]	30.29	26.62	35.62	41.64	6.63	8.97	11.7	9.88	13	18.07	11.44	15.21
Stall torque M_0 [Nm]	50	70	70	70	16.25	16.25	16.25	26	26	26	31.2	31.2
Stall current I_0 [A]	47.32	28.66	42.99	66.25	7.4	10.49	14.79	11.49	16.02	25.09	13.47	19.23
Peak torque M_{max} [Nm]	107	150	150	150	46.92	46.92	46.92	78.2	78.2	78.2	97.92	97.92
Peak current I_{max} [A]	121.63	73.77	110.65	170.51	30.48	42.48	60.96	49.48	67.84	106.48	64.31	90.95
Maximum angular acceleration without brake a [rad/s ²]	53234	54152	54152	54152	57263	57263	57263	59566	59566	59566	62787	62787
Maximum speed n_{max} [min ⁻¹]	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000
Torque constant K_T [Nm/A]	1.06	2.44	1.63	1.06	2.22	1.63	1.09	2.22	1.63	1.09	2.22	1.63
Voltage constant K_E [V/1000 min ⁻¹]	63.88	147.65	98.43	63.88	134.04	98.43	65.97	134.04	98.43	65.97	134.04	98.43
Stator resistance R_{2ph} [Ω]	0.11	0.46	0.2	0.09	2.27	1.13	0.57	1.24	0.64	0.26	0.99	0.48
Stator inductance L_{2ph} [mH]	1.01	4.5	1.76	0.82	24.29	12.5	6.07	14.87	7.91	3.21	12	6
Electrical time constant t_{el} [ms]	9.09	9.85	8.66	8.83	10.72	11.09	10.72	12.04	12.45	12.39	12.17	12.4
Thermal time constant t_{therm} [min]	60	65	65	65	42	42	42	45	45	45	48	48
Moment of inertia without brake J [kgcm ²]	20.1	27.7	27.7	27.7	8.19	8.19	8.19	13.13	13.13	13.13	15.6	15.6
Weight without brake m [kg]	26	34.5	34.5	34.5	14.79	14.79	14.79	18.74	18.74	18.74	20.67	20.67
Holding brake												
Moment of inertia for brake J_{br} [kgcm ²]	1.66	1.66	1.66	1.66	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85
Weight of brake m_{br} [kg]	0.9	0.9	0.9	0.9	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Holding torque of the brake M_{br} [Nm]	15	15	15	15	32	32	32	32	32	32	32	32
Recommendations												
Cable cross section for B&R motor cables [mm ²] ¹⁾	10	4	10	10	1.5	4	4	4	4	4	4	4
ACOPOS	☞ 1316	☞ 1315	☞ 1316	☞ 1316	☞ 1314	☞ 1315	☞ 1315	☞ 1315	☞ 1315	☞ 1315	☞ 1315	☞ 1315
ACOPOSmulti	☞ 1427	☞ 1426	☞ 1427	☞ 1427	☞ 1425	☞ 1426	☞ 1426	☞ 1426	☞ 1426	☞ 1426	☞ 1426	☞ 1426
ACOPOS servo drive 8Vxxxx.00-x ²⁾	1640	1320	1640	128M	1090	1180	1180	1180	1180	1320	1180	1320
ACOPOSmulti inverter module 8BVI... ³⁾	0880	0440	0880	0880	0110	0110	0220	0110	0220	0440	0110	0220

1) The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSmulti inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request.

2) The recommended servo drive is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

3) The recommended ACOPOSmulti inverter module is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

Product overview

Separately cooled motors (cooling type C)

Motor	8LSC65.ee045fpgg-1	8LSC66.ee022fpgg-1	8LSC66.ee030fpgg-1	8LSC66.ee045fpgg-1	8LSC73.ee022fpgg-0	8LSC73.ee030fpgg-0	8LSC73.ee045fpgg-0	8LSC74.ee022fpgg-0	8LSC74.ee030fpgg-0	8LSC74.ee045fpgg-0	8LSC75.ee022fpgg-0	8LSC75.ee030fpgg-0
Rated speed n_N [min ⁻¹]	4500	2200	3000	4500	2200	3000	4500	2200	3000	4500	2200	3000
Number of poles	8	8	8	8	6	6	6	6	6	6	6	6
Rated torque M_N [Nm]	15.86	31.85	30.55	19.5	27.3	26	18.85	33.8	31.2	19.5	41.6	39
Rated power P_N [kW]	7.47	7.34	9.6	9.19	6.29	8.17	8.88	7.79	9.8	9.19	9.58	12.25
Rated current I_N [A]	18.46	12.87	16.9	20.67	12.31	15.95	17.14	15.25	19.14	17.73	18.76	23.93
Stall torque M_0 [Nm]	31.2	36.4	36.4	36.4	33.8	33.8	33.8	41.6	41.6	41.6	52	52
Stall current I_0 [A]	27.12	15.38	21.54	30.84	15.25	20.74	30.73	18.76	25.52	37.82	23.45	31.9
Peak torque M_{max} [Nm]	97.92	114.24	114.24	114.24	107	107	107	134	134	134	187	187
Peak current I_{max} [A]	130.49	74.41	103.49	152.61	84.3	115	171	103	140	207	130	176
Maximum angular acceleration without brake a [rad/s ²]	62787	63246	63246	63246	10918	10918	10918	11652	11652	11652	13357	13357
Maximum speed n_{max} [min ⁻¹]	9000	9000	9000	9000	6000	6000	6000	6000	6000	6000	4500	4500
Torque constant K_T [Nm/A]	1.09	2.22	1.63	1.09	2.22	1.63	1.1	2.22	1.63	1.1	2.22	1.63
Voltage constant K_E [V/1000 min ⁻¹]	65.97	134.04	98.43	65.97	134.04	98.43	65.97	134.04	98.43	65.97	134.04	98.43
Stator resistance R_{2ph} [Ω]	0.24	0.84	0.43	0.21	0.86	0.46	0.22	0.64	0.34	0.16	0.38	0.21
Stator inductance L_{2ph} [mH]	2.91	10.4	5.37	2.47	10.49	5.55	2.62	8.47	4.42	2.2	5.46	3.07
Electrical time constant t_{el} [ms]	11.98	12.36	12.53	11.81	12.23	12.07	11.91	13.15	13	13.75	14.52	14.62
Thermal time constant t_{therm} [min]	48	52	52	52	55	55	55	60	60	60	65	65
Moment of inertia without brake J [kgcm ²]	15.6	18.06	18.06	18.06	98	98	98	115	115	115	140	140
Weight without brake m [kg]	20.67	22.6	22.6	22.6	27	27	27	30	30	30	38	38
Holding brake												
Moment of inertia for brake J_{Br} [kgcm ²]	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85
Weight of brake m_{Br} [kg]	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Holding torque of the brake M_{Br} [Nm]	32	32	32	32	32	32	32	32	32	32	32	32
Recommendations												
Cable cross section for B&R motor cables [mm ²] ¹⁾	4	4	4	10	4	4	4 ⁴⁾	4	4	10	4	10
ACOPOS	☞ 1315	☞ 1315	☞ 1315	☞ 1316	☞ 1315	☞ 1315		☞ 1315	☞ 1315	☞ 1316	☞ 1315	☞ 1316
ACOPOSmulti	☞ 1426	☞ 1426	☞ 1426	☞ 1427	☞ 1426	☞ 1426		☞ 1426	☞ 1426	☞ 1427	☞ 1426	☞ 1427
ACOPOS servo drive 8Vxxxx.00-x ²⁾	1320	1180	1320	1640	1180	1320	1320	1320	1320	1640	1320	1640
ACOPOSmulti inverter module 8BVI... ³⁾	0440	0220	0440	0440	0220	0440	0440	0220	0440	0440	0440	0440

1) The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSmulti inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request.

2) The recommended servo drive is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

3) The recommended ACOPOSmulti inverter module is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

4) Special prefabricated motor cables must be used for this motor / servo drive combination (size of the motor plug is not the standard size). They are available from B&R on request.



8LSC4



Technical data	8LSC43.ee[nnn]ffgg-0				8LSC44.ee[nnn]ffgg-0				8LSC45.ee[nnn]ffgg-0				8LSC46.ee[nnn]ffgg-0			
	[022]	[030]	[045]	[060]	[022]	[030]	[045]	[060]	[022]	[030]	[045]	[060]	[022]	[030]	[045]	[060]
Rated speed n_N [min ⁻¹]	2200	3000	4500	6000	2200	3000	4500	6000	2200	3000	4500	6000	2200	3000	4500	6000
Number of poles	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Rated torque M_N [Nm]	4.55	4.03	3.51	2.6	6.76	6	4.68	3.9	9.1	8	6.24	5.2	11.31	10.01	7.8	6.5
Rated power P_N [kW]	1.05	1.27	1.65	1.63	1.56	1.88	2.21	2.45	2.1	2.51	2.94	3.27	2.61	3.14	3.68	4.08
Rated current I_N [A]	2.05	2.48	3.24	3.19	3.05	3.69	4.32	4.79	4.1	4.92	5.76	6.39	5.1	6.15	7.21	7.98
Stall torque M_0 [Nm]	5.2	5.2	5.2	5.2	7.8	7.8	7.8	7.8	10.4	10.4	10.4	10.4	13	13	13	13
Stall current I_0 [A]	2.35	3.19	4.8	6.39	3.52	4.79	7.21	9.58	4.69	6.39	9.61	12.78	5.86	7.98	12.01	15.97
Peak torque M_{max} [Nm]	15.2	15.2	15.2	15.2	22.8	22.8	22.8	22.8	30.4	30.4	30.4	30.4	38	38	38	38
Peak current I_{max} [A]	10.71	14.59	21.94	29.17	16.07	21.88	32.91	43.76	21.43	29.17	43.88	58.35	26.78	36.47	54.85	72.94
Maximum angular acceleration without brake a [rad/s ²]	81283	81175	81175	81175	83562	83562	83562	83562	84916	84810	84810	84810	86620	86620	86620	86620
Maximum speed n_{max} [min ⁻¹]	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000
Torque constant K_T [Nm/A]	2.22	1.63	1.08	0.81	2.22	1.63	1.08	0.81	2.22	1.63	1.08	0.81	2.22	1.63	1.08	0.81
Voltage constant K_E [V/1000 min ⁻¹]	134.04	98.43	65.45	49.22	134.04	98.43	65.45	49.22	134.04	98.43	65.45	49.22	134.04	98.43	65.45	49.22
Stator resistance R_{2ph} [Ω]	10.7	5.43	2.42	1.36	6.24	3.6	1.53	0.86	4.32	2.49	1.11	0.67	3.61	1.92	0.88	0.48
Stator inductance L_{2ph} [mH]	69.4	36.5	16.5	9.2	44.8	24	10.8	6.2	41	21.8	9.69	5.45	32	17.44	7.75	4.36
Electrical time constant t_{el} [ms]	6.49	6.72	6.83	6.77	7.18	6.67	7.04	7.19	9.49	8.76	8.76	8.13	8.86	9.08	8.81	9.08
Thermal time constant t_{therm} [min]	25	25	25	25	30	30	30	30	35	35	35	35	40	40	40	40
Moment of inertia without brake J [kgcm ²]	1.87	1.87	1.87	1.87	2.73	2.73	2.73	2.73	3.58	3.58	3.58	3.58	4.39	4.39	4.39	4.39
Weight without brake m [kg]	5.5	5.5	5.5	5.5	6.86	6.86	6.86	6.86	8.3	8.3	8.3	8.3	9.7	9.7	9.7	9.7
Holding brake																
Moment of inertia for brake J_{Br} [kgcm ²]	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54
Weight of brake m_{Br} [kg]	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Holding torque of the brake M_{Br} [Nm]	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Recommendations																
Cable cross section for B&R motor cables [mm ²] ¹⁾	1.5	1.5	1.5	1.5	1.5	1.5	1.5	4	1.5	1.5	4	4	1.5	1.5	4	4
ACOPOS	⊃ 1314	⊃ 1314	⊃ 1314	⊃ 1314	⊃ 1314	⊃ 1314	⊃ 1314	⊃ 1315	⊃ 1314	⊃ 1314	⊃ 1315	⊃ 1315	⊃ 1314	⊃ 1314	⊃ 1315	⊃ 1315
ACOPOSmulti	⊃ 1425	⊃ 1425	⊃ 1425	⊃ 1425	⊃ 1425	⊃ 1425	⊃ 1425	⊃ 1426	⊃ 1425	⊃ 1425	⊃ 1426	⊃ 1426	⊃ 1425	⊃ 1425	⊃ 1426	⊃ 1426
ACOPOS servo drive 8Vxxxx.00-x ²⁾	1045	1045	1090	1090	1045	1090	1090	1180	1090	1090	1180	1180	1090	1090	1180	1180
ACOPOSmulti inverter module 8BVI... ³⁾	0028	0028	0055	0055	0055	0055	0110	0110	0055	0055	0110	0110	0055	0110	0110	0220

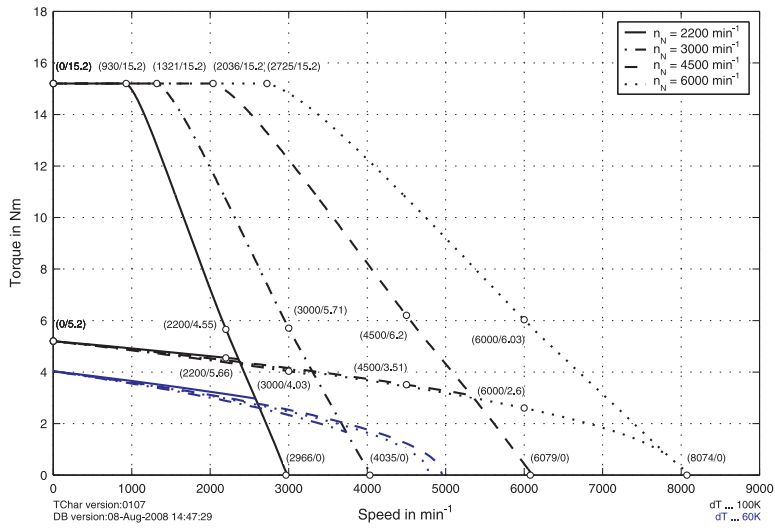
1) The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSmulti inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request.

2) The recommended servo drive is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

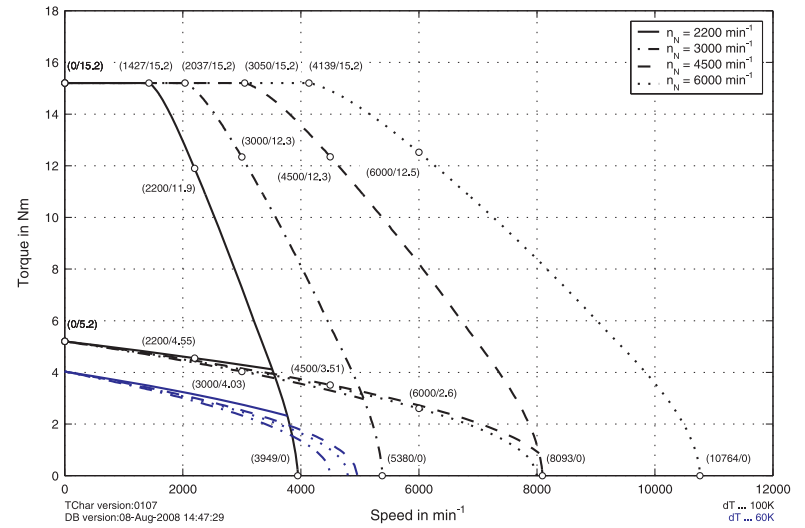
3) The recommended ACOPOSmulti inverter module is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

Speed-torque characteristic curves with 400 VAC supply voltage

ACOPOS

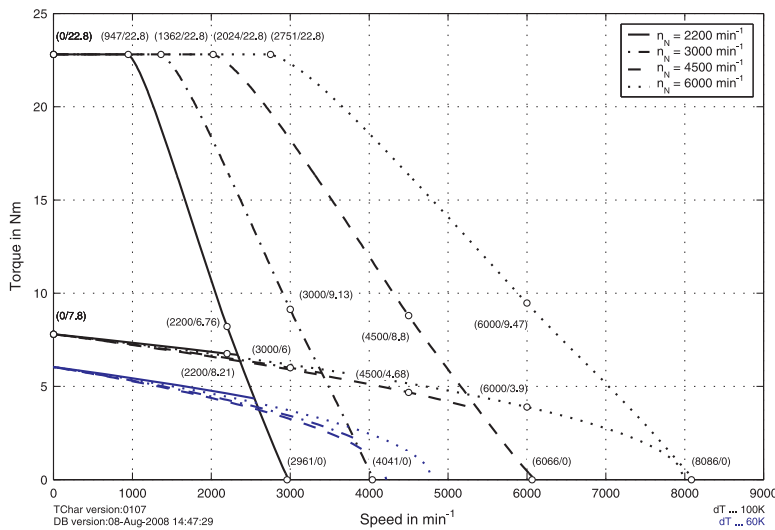


ACOPOSmulti

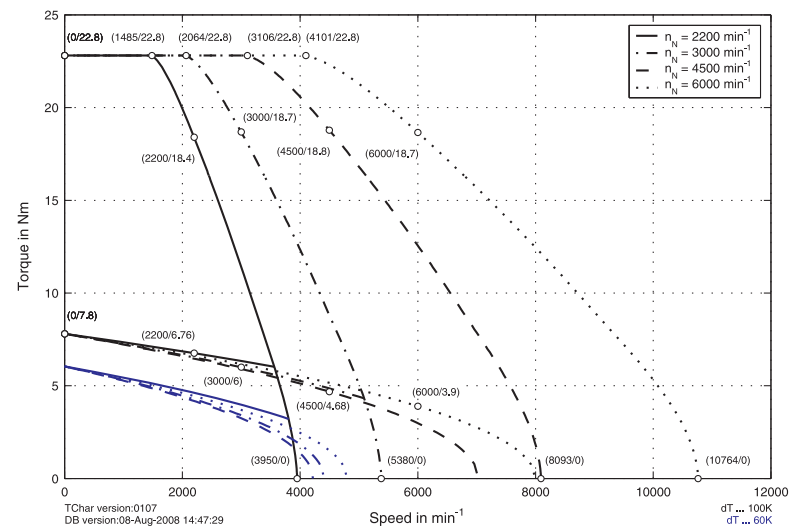


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ACOPOS

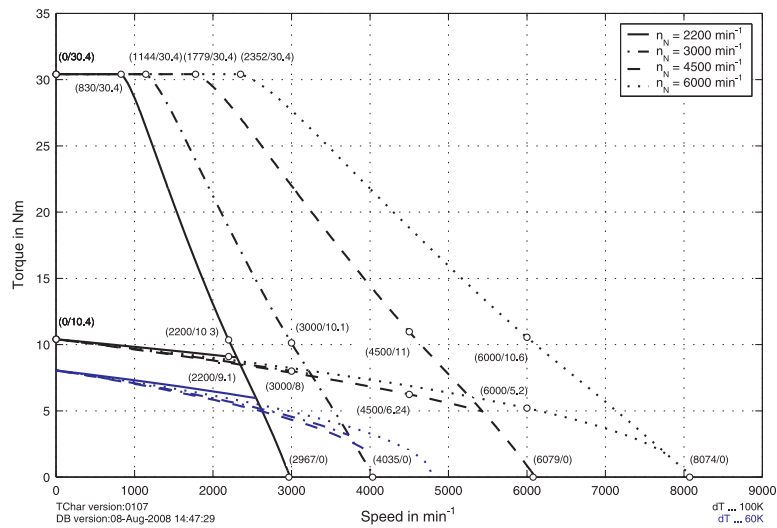


ACOPOSmulti

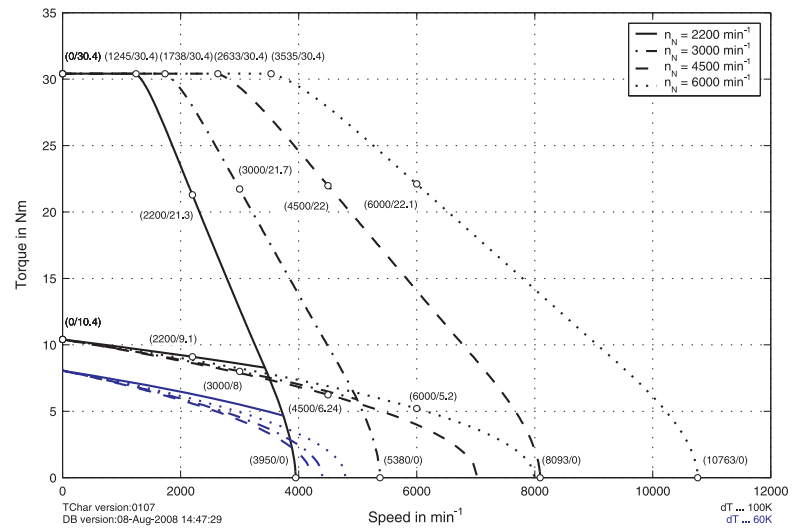


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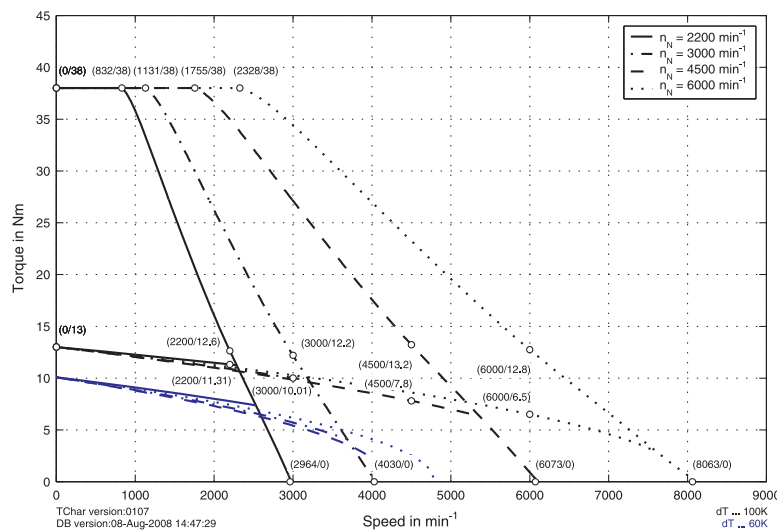


ACOPOSMulti

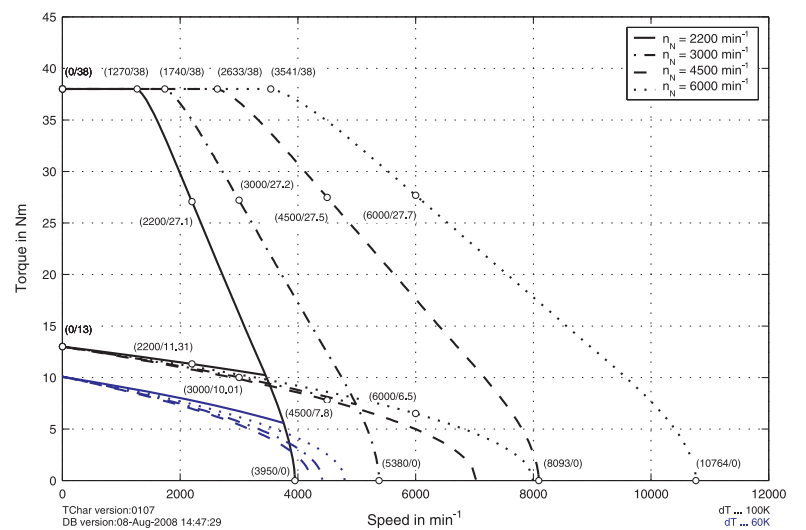


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ACOPOS



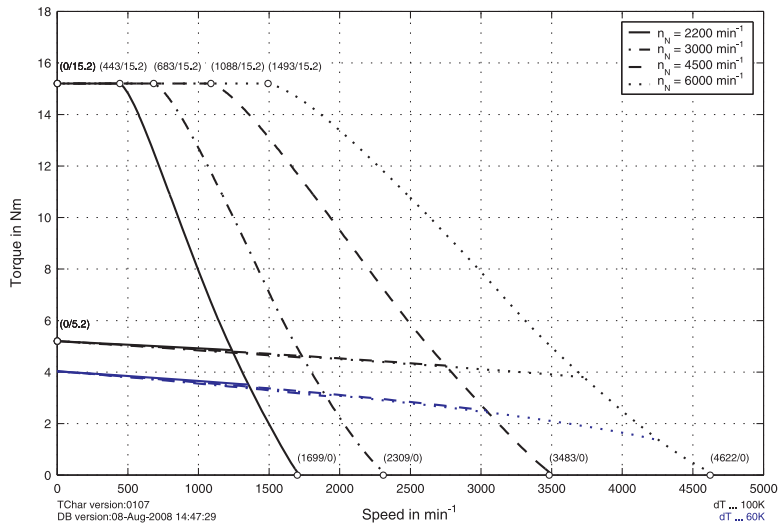
ACOPOSMulti



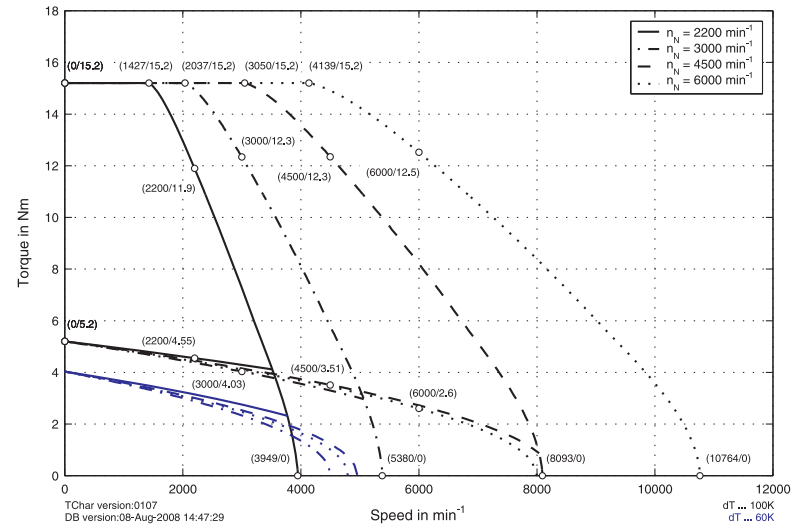
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Speed-torque characteristic curves with 230 VAC supply voltage

ACOPOS

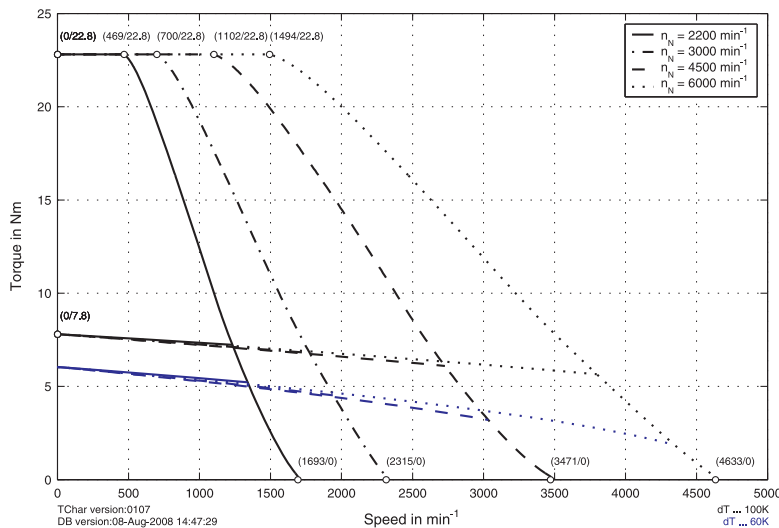


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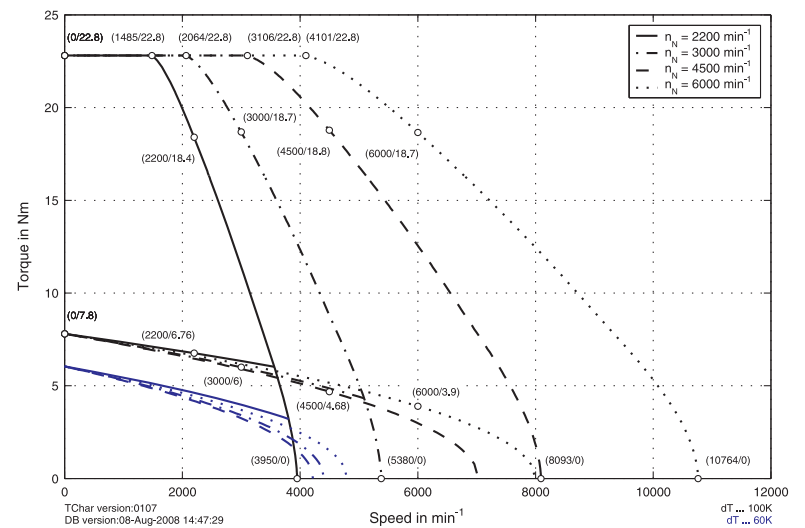


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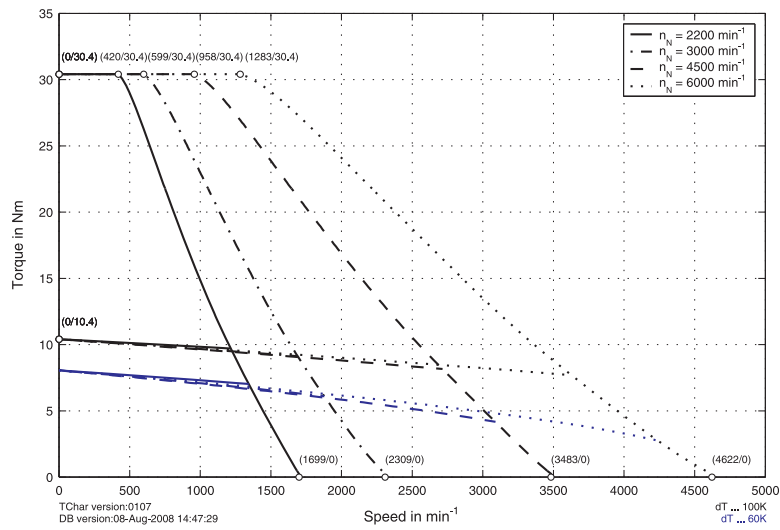


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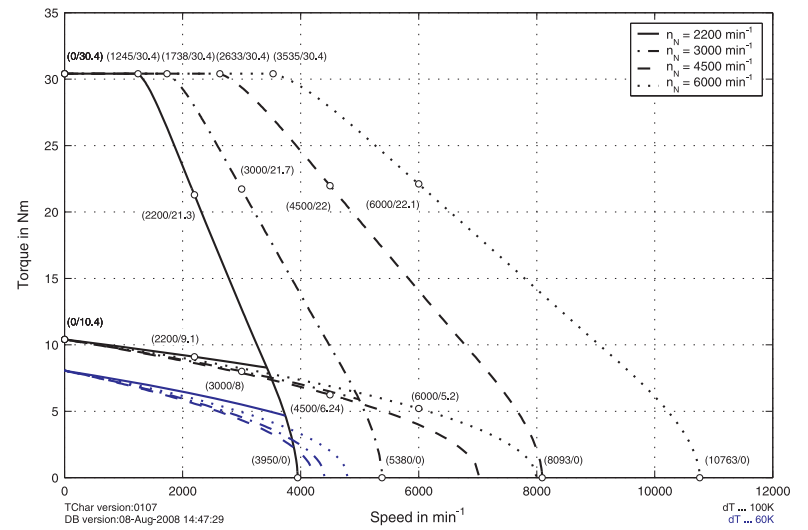


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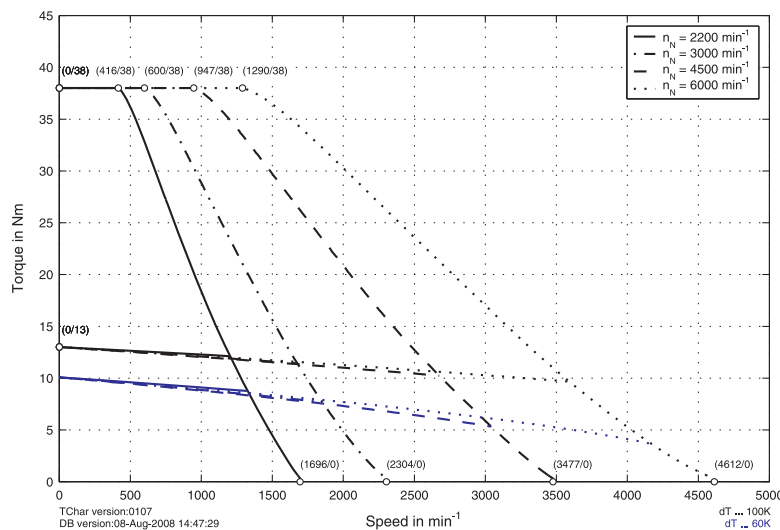


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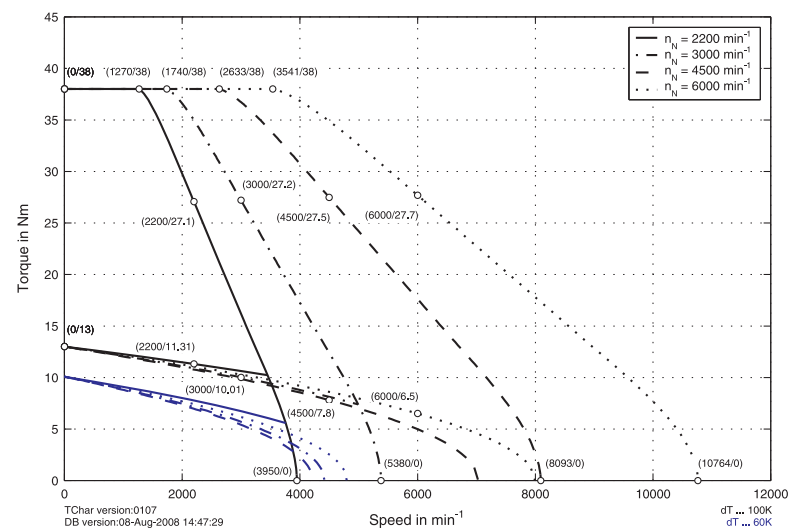


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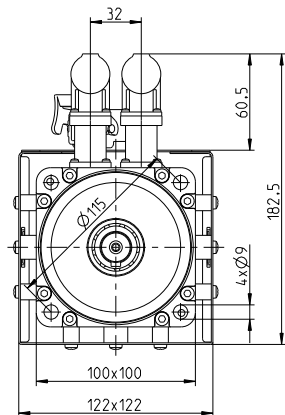
ACOPOS



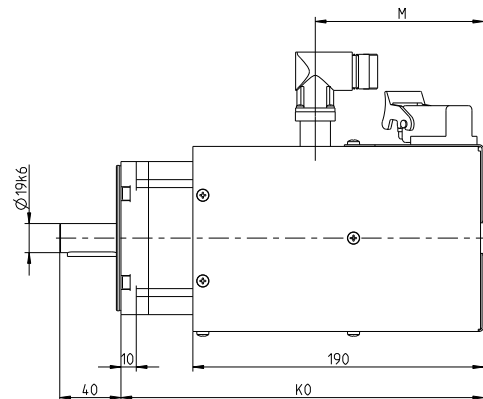
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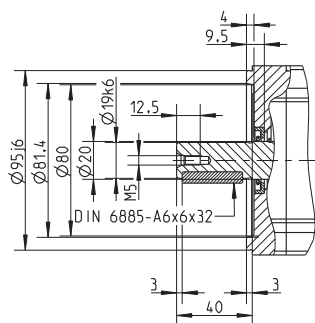
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**A side flange detail
Standard bearing**



**A side flange detail
Special motor option "Reinforced A side bearing"**



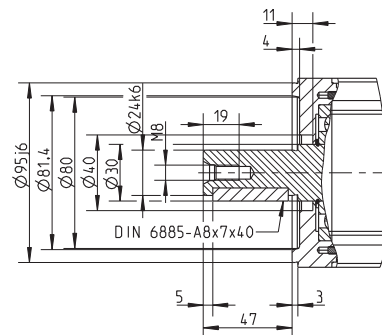
**Possible
connection directions**



Straight (top connector)



Angled (swivel connector)



Dimensions

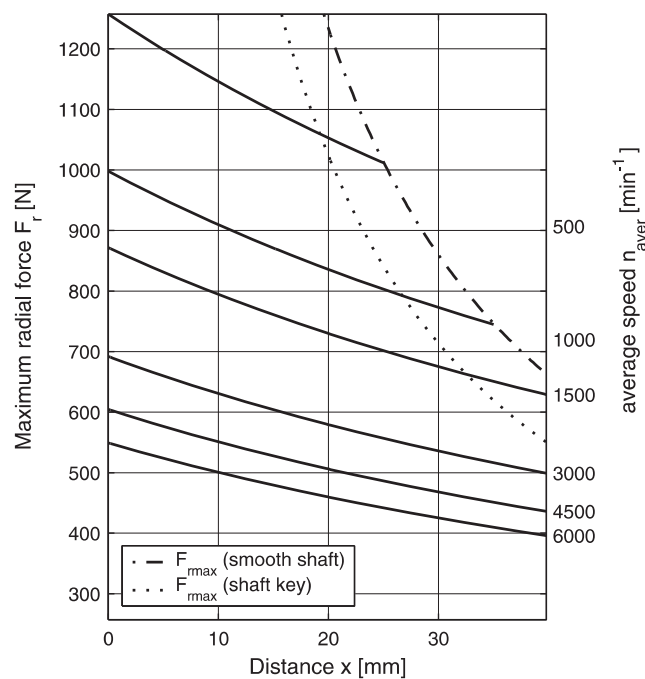
EnDat feedback Model number	K ₀	M	Resolver feedback		Extension of K ₀ depending on the motor option [mm]			
			Model number	K ₀	M	Holding brake ¹⁾	Oil seal	Reinforced A side bearing
8LSC43.Exnnnffgg-0	237	110	8LSC43.R0nnnffgg-0	202	75	32	---	15
8LSC44.Exnnnffgg-0	257	110	8LSC44.R0nnnffgg-0	222	75	32	---	15
8LSC45.Exnnnffgg-0	277	110	8LSC45.R0nnnffgg-0	242	75	32	---	15
8LSC46.Exnnnffgg-0	297	110	8LSC46.R0nnnffgg-0	262	75	32	---	15

1) The motor option "holding brake" cannot be ordered in combination with special motor option "reinforced A side bearing".

Maximum shaft load

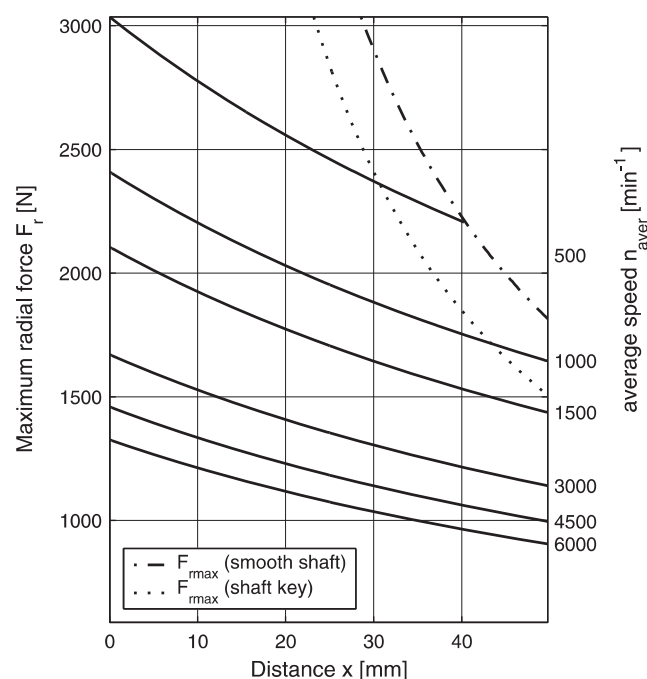
The values in the diagrams below are based on a mechanical lifespan of the bearings of 20,000 operating hours.

Standard bearing



maximum allowed axial force: $F_{amax} = 110$ N

Special motor option "Reinforced A side bearing"



maximum allowed axial force: $F_{amax} = 258$ N

Recommended B&R motor cable

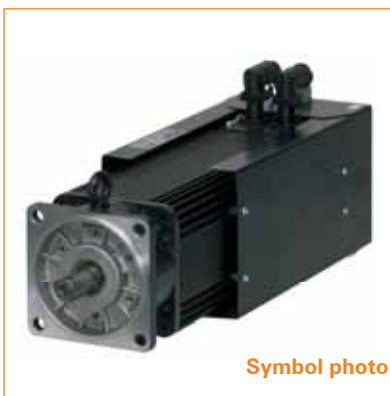
The recommended B&R motor cable for a motor depends on the recommended ACOPOS servo drive or ACOPOSmulti inverter module (see "Recommended cable cross section for B&R motor cables [mm²]" in the table "Technical data") 1546

Recommended B&R encoder cables

8BCExxxx.1111A-0	ACPmulti EnDat cable, length xxxx m, 10x 0.14 mm ² + 2x 0.5 mm ² , EnDat plug 17-pin SpeedTec socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed 1428
8BCRxxxx.1111A-0	ACPmulti Resolver cable, length xxxx m, 3 x 2 x 24 AWG (19 x 0.127), resolver plug 12-pin SpeedTec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed 1429



8LSC5



Symbol photo

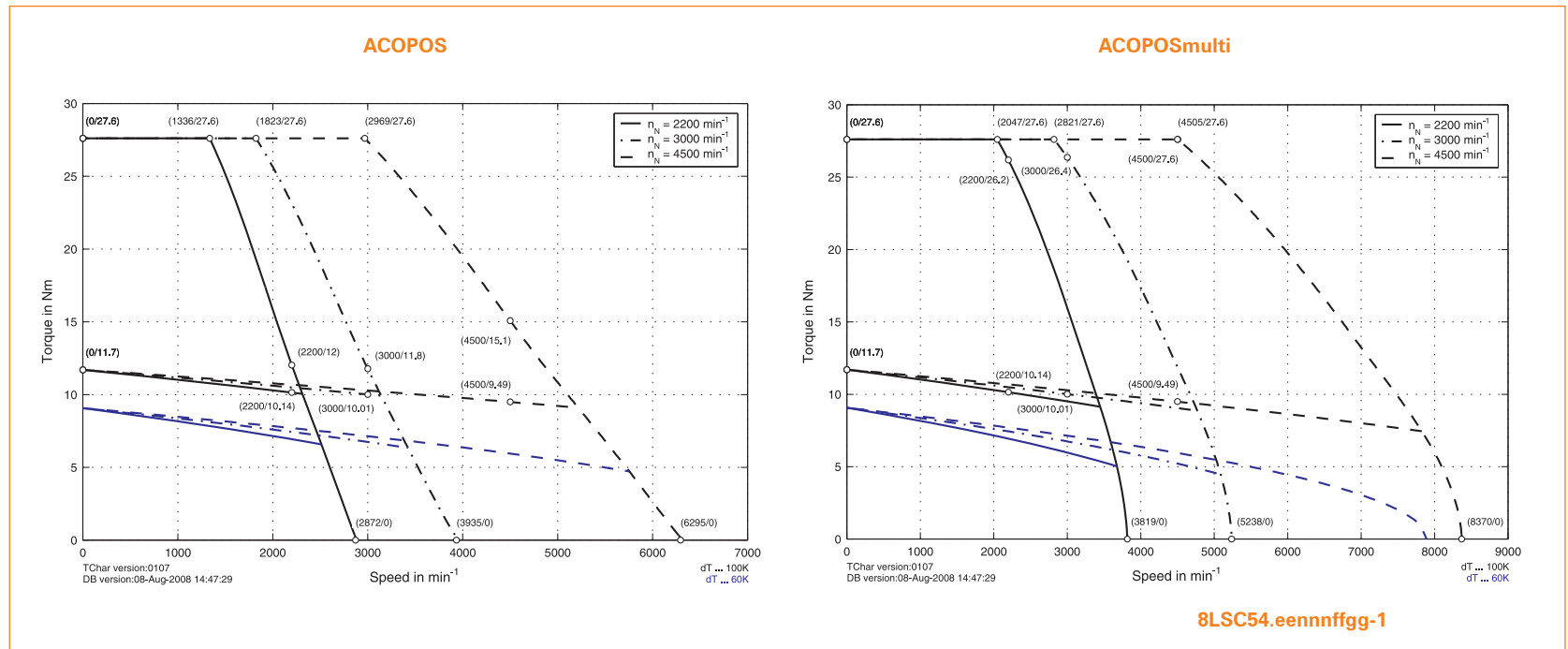
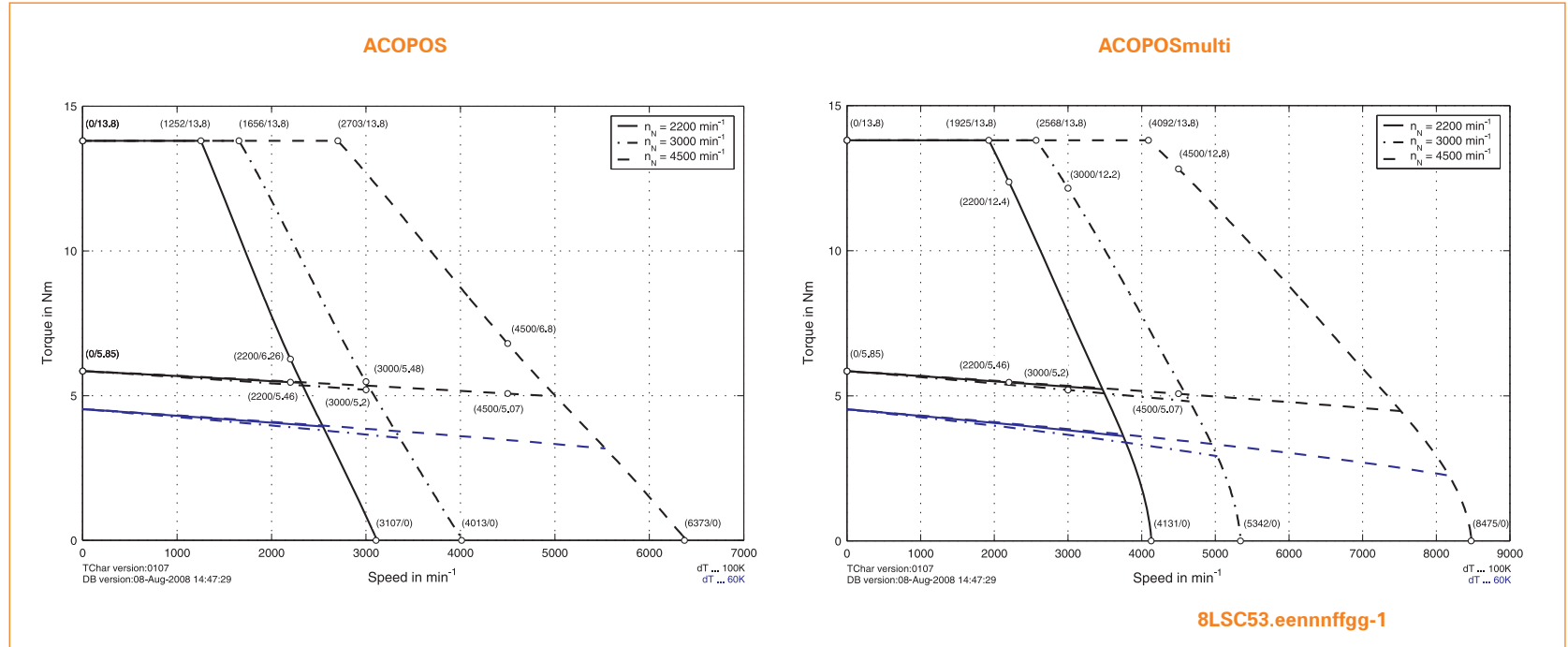
Technical data	8LSC53.ee[nnn]ffgg-1			8LSC54.ee[nnn]ffgg-1			8LSC55.ee[nnn]ffgg-1			8LSC56.ee[nnn]ffgg-1			8LSC57.ee[nnn]ffgg-1		
[nnn]	[022]	[030]	[045]	[022]	[030]	[045]	[022]	[030]	[045]	[022]	[030]	[045]	[022]	[030]	[045]
Rated speed n_N [min ⁻¹]	2200	3000	4500	2200	3000	4500	2200	3000	4500	2200	3000	4500	2200	3000	4500
Number of poles	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Rated torque M_N [Nm]	5.46	5.2	5.07	10.14	10.01	9.49	15.34	15.08	12.35	18.72	18.07	16.51	23.4	22.75	19.5
Rated power P_N [kW]	1.26	1.63	2.39	2.34	3.14	4.47	3.53	4.74	5.82	4.31	5.68	7.78	5.39	7.15	9.19
Rated current I_N [A]	2.6	3.25	4.94	4.68	6.11	9.23	6.63	8.97	11.7	8.19	10.66	15.47	9.88	13	18.07
Stall torque M_0 [Nm]	5.85	5.85	5.85	11.7	11.7	11.7	16.25	16.25	16.25	20.8	20.8	20.8	26	26	26
Stall current I_0 [A]	2.76	3.57	5.66	5.1	6.99	11.18	7.4	10.49	14.79	9.37	12.85	20.53	11.49	16.02	25.09
Peak torque M_{max} [Nm]	13.8	13.8	13.8	27.6	27.6	27.6	41.4	41.4	41.4	55.2	55.2	55.2	69	69	69
Peak current I_{max} [A]	8	10.53	16.48	15.39	20.92	32.96	23.64	32.96	47.29	30.78	41.83	65.92	38.39	52.63	82.61
Maximum angular acceleration without brake a [rad/s ²]	38107	38107	38107	45660	45660	45660	50526	50526	50526	51777	51777	51777	52558	52558	52558
Maximum speed n_{max} [min ⁻¹]	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000
Torque constant K_T [Nm/A]	2.22	1.63	1.09	2.22	1.63	1.09	2.22	1.63	1.09	2.22	1.63	1.09	2.22	1.63	1.09
Voltage constant K_E [V/1000 min ⁻¹]	134.04	98.43	65.97	134.04	98.43	65.97	134.04	98.43	65.97	134.04	98.43	65.97	134.04	98.43	65.97
Stator resistance R_{zph} [Ω]	9.35	5.59	2.22	3.81	2.03	0.79	2.27	1.13	0.57	1.64	0.87	0.34	1.24	0.64	0.26
Stator inductance L_{zph} [mH]	82.1	47.39	19.33	39.75	21.52	8.67	24.29	12.5	6.07	18.73	10.14	4.08	14.87	7.91	3.21
Electrical time constant t_{el} [ms]	8.79	8.48	8.7	10.43	10.62	10.92	10.72	11.09	10.72	11.43	11.64	11.97	12.04	12.45	12.39
Thermal time constant t_{therm} [min]	33	33	33	37	37	37	40	40	40	43	43	43	46	46	46
Moment of inertia without brake J [kgcm ²]	3.62	3.62	3.62	6.04	6.04	6.04	8.19	8.19	8.19	10.66	10.66	10.66	13.13	13.13	13.13
Weight without brake m [kg]	11.43	11.43	11.43	12.96	12.96	12.96	14.79	14.79	14.79	16.81	16.81	16.81	18.74	18.74	18.74
Holding brake															
Moment of inertia for brake J_{Br} [kgcm ²]	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66
Weight of brake m_{Br} [kg]	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Holding torque of the brake M_{Br} [Nm]	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Recommendations															
Cable cross section for B&R motor cables [mm ²] ¹⁾	1.5	1.5	1.5	1.5	1.5	4	1.5	4	4	4	4	4	4	4	4
ACOPOS	⊃ 1314	⊃ 1314	⊃ 1314	⊃ 1314	⊃ 1314	⊃ 1315	⊃ 1314	⊃ 1315	⊃ 1315	⊃ 1315	⊃ 1315	⊃ 1315	⊃ 1315	⊃ 1315	⊃ 1315
ACOPOSmulti	⊃ 1425	⊃ 1425	⊃ 1425	⊃ 1425	⊃ 1425	⊃ 1426	⊃ 1425	⊃ 1426	⊃ 1426	⊃ 1426	⊃ 1426	⊃ 1426	⊃ 1426	⊃ 1426	⊃ 1426
ACOPOS servo drive 8Vxxxx.00-x ²⁾	1045	1045	1090	1090	1090	1180	1090	1180	1180	1180	1180	1320	1180	1180	1320
ACOPOSmulti inverter module 8BVI... ³⁾	0028	0055	0055	0055	0110	0110	0110	0110	0220	0110	0110	0440	0110	0220	0440

1) The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSmulti inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request.

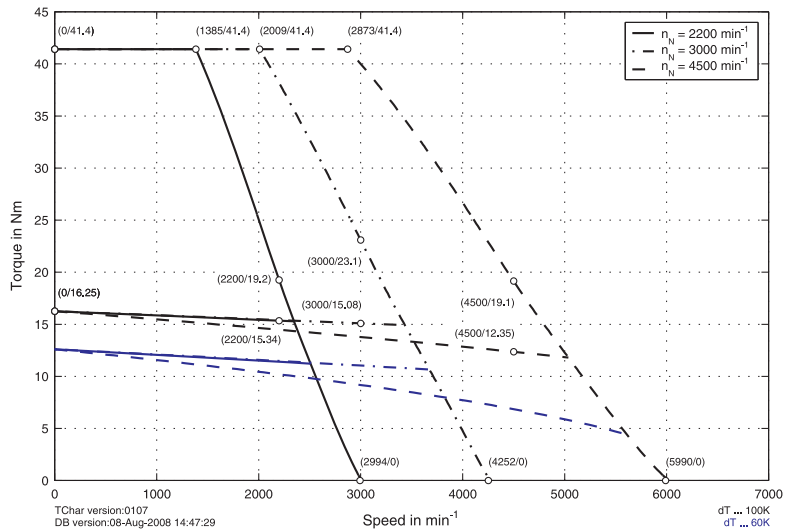
2) The recommended servo drive is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

3) The recommended ACOPOSmulti inverter module is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

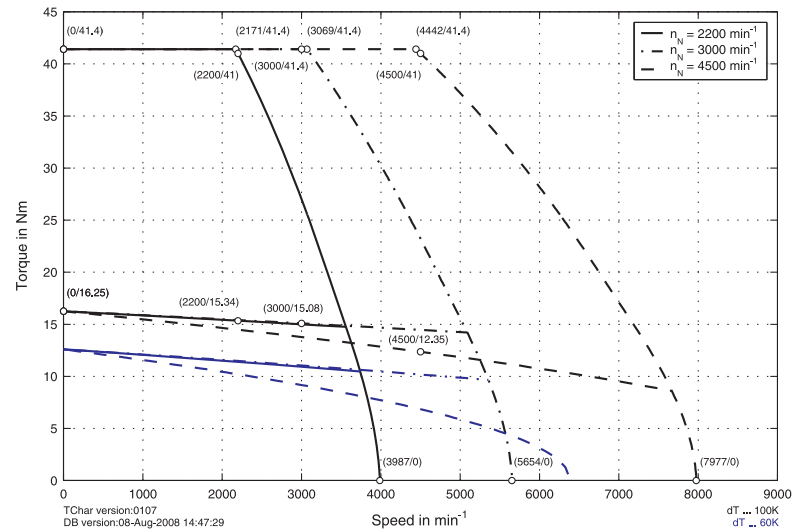
Speed-torque characteristic curves with 400 VAC supply voltage



ACOPOS

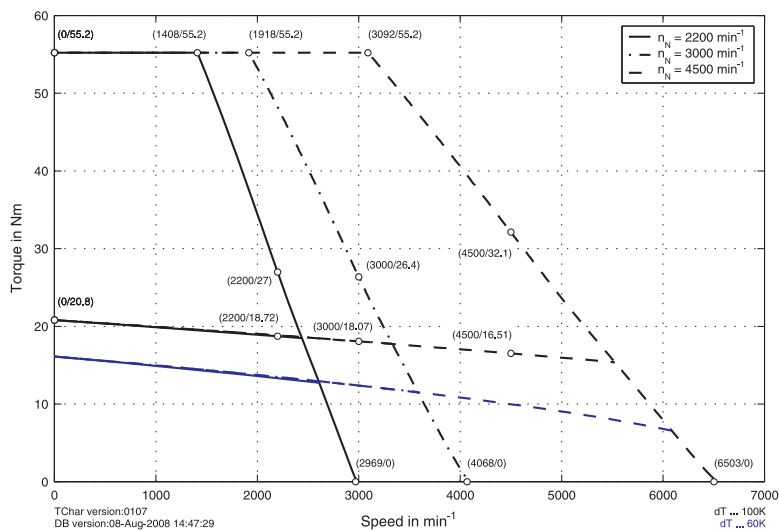


ACOPOSmulti

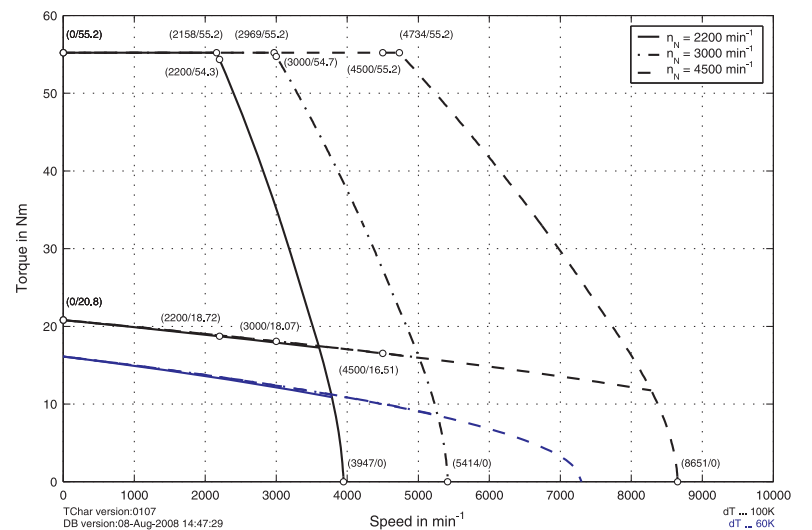


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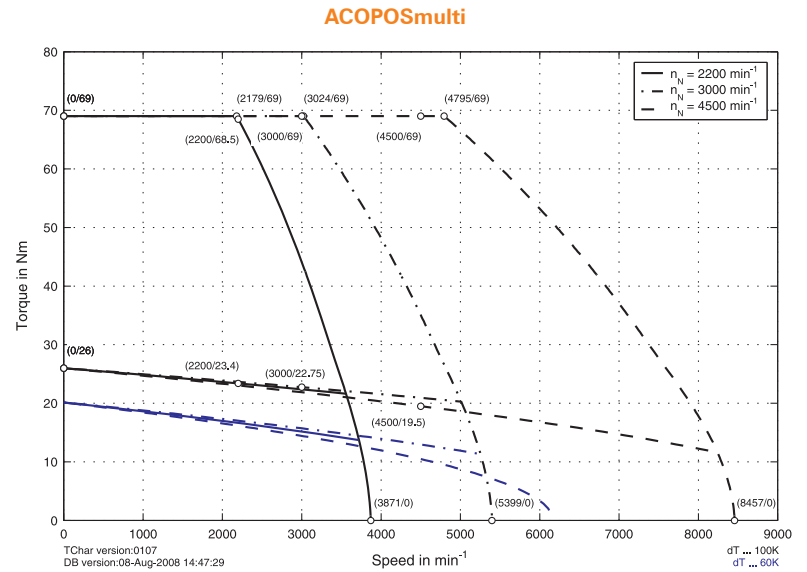
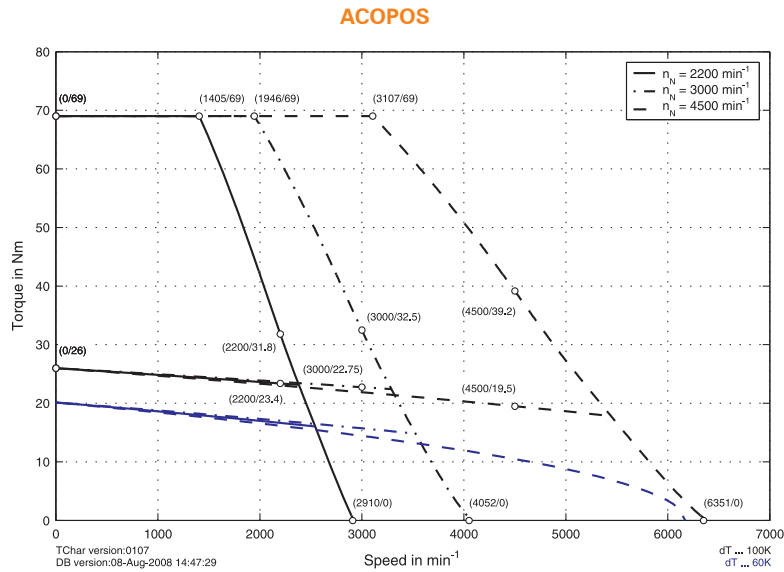
ACOPOS



ACOPOSmulti

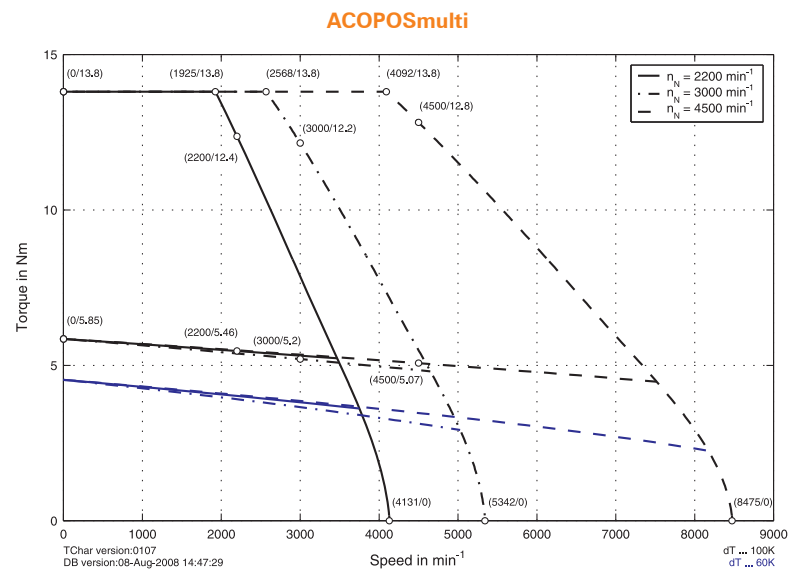
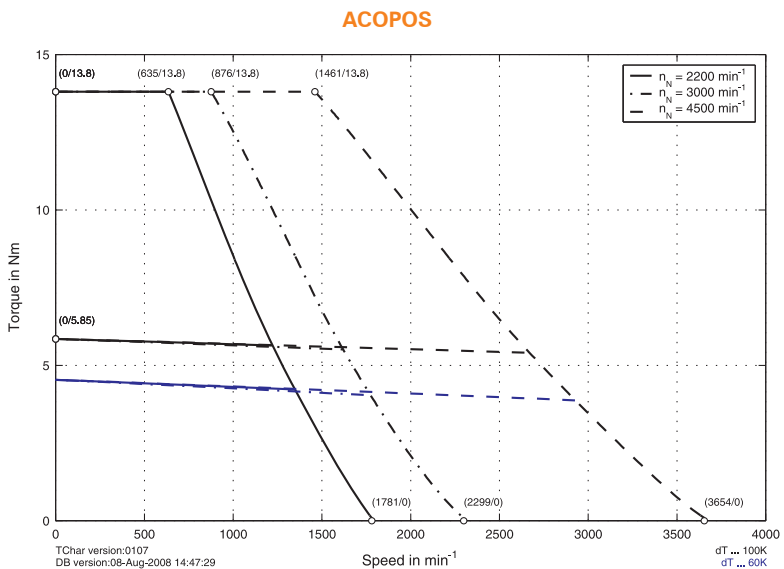


8LSC56.eennffgg-1



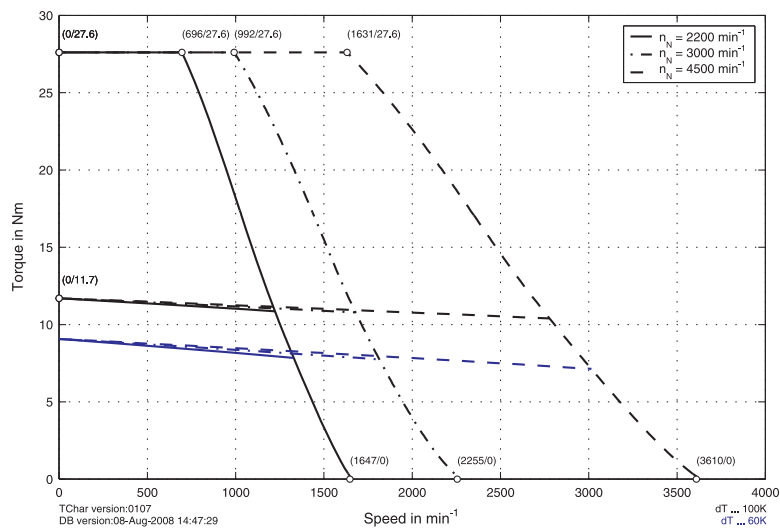
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Speed-torque characteristic curves with 230 VAC supply voltage

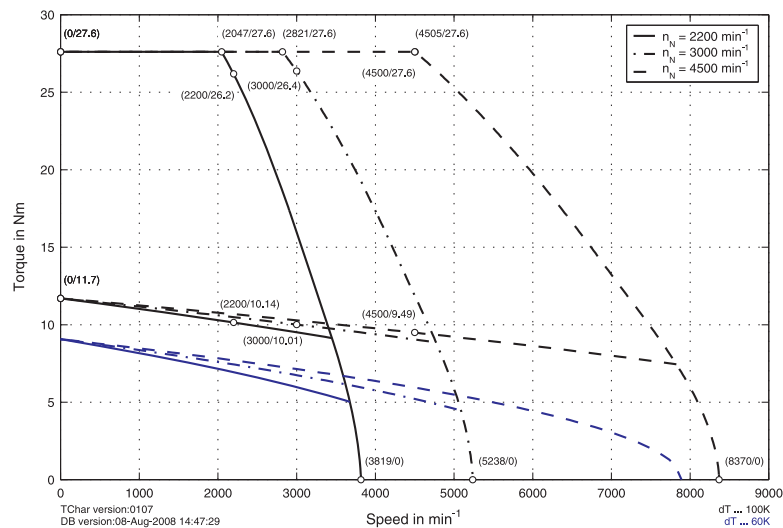


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ACOPOS

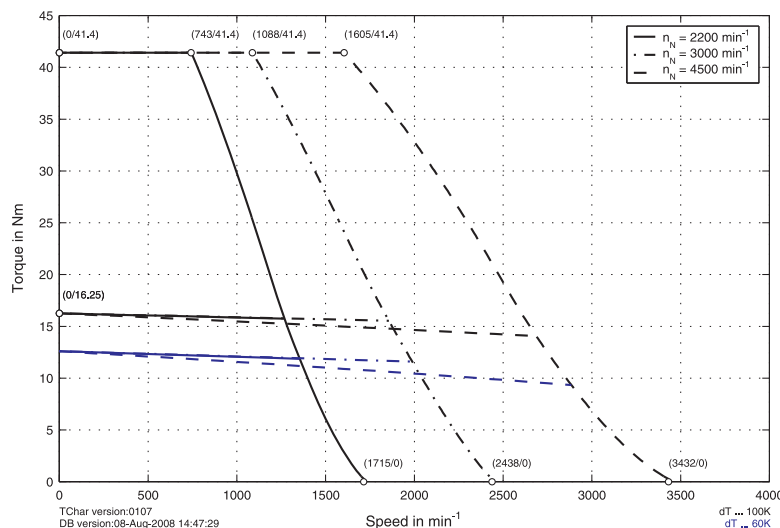


ACOPOSmulti

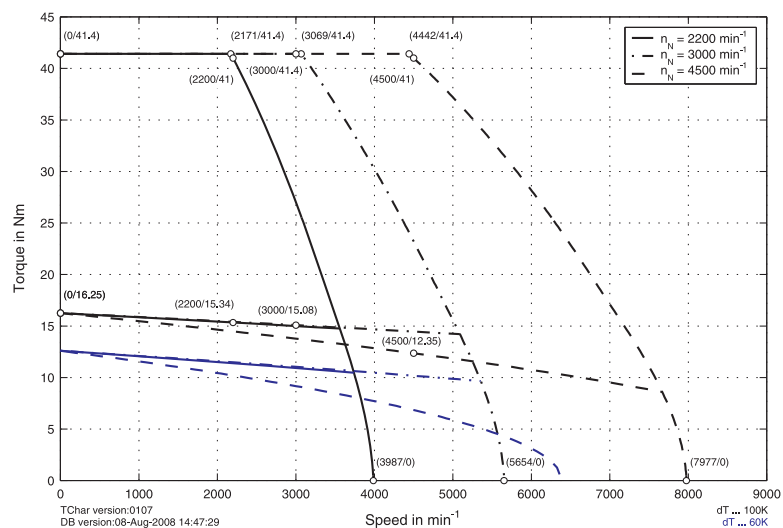


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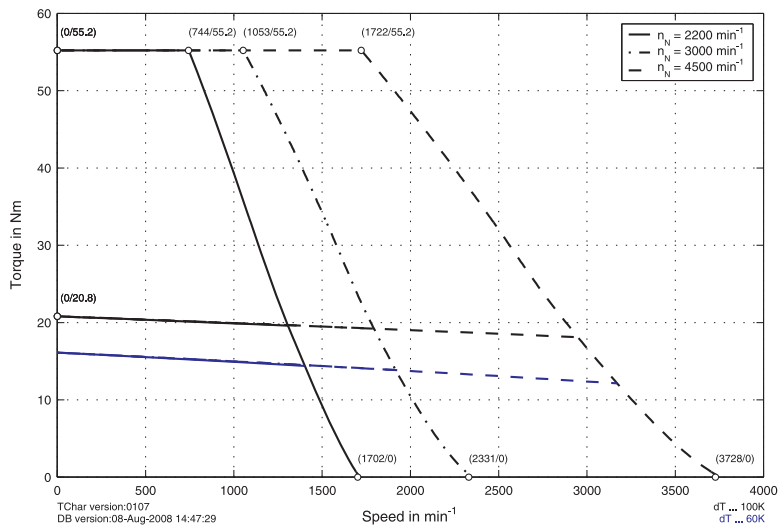


ACOPOSmulti

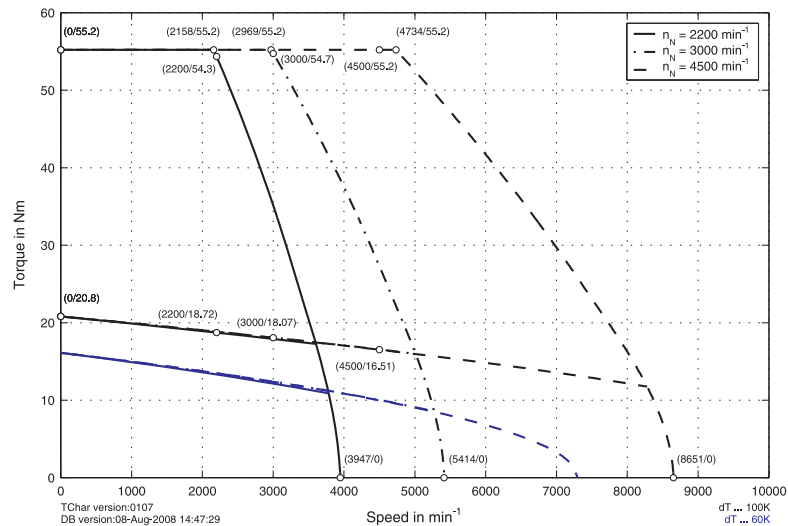


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ACOPOS

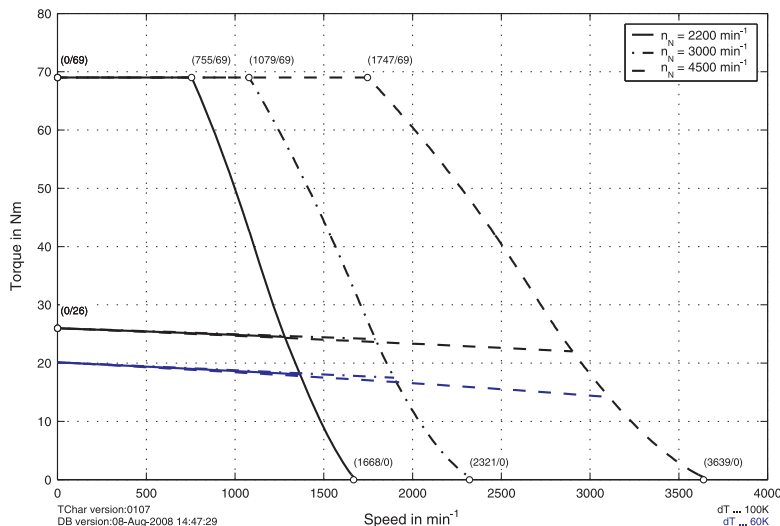


ACOPOSMulti

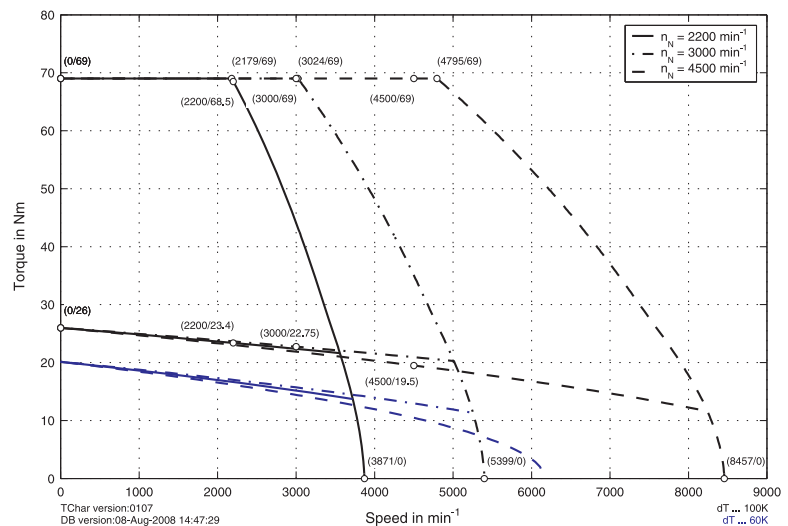


8LSC56.eennnffgg-1

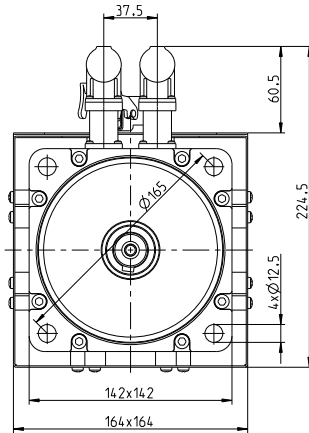
ACOPOS



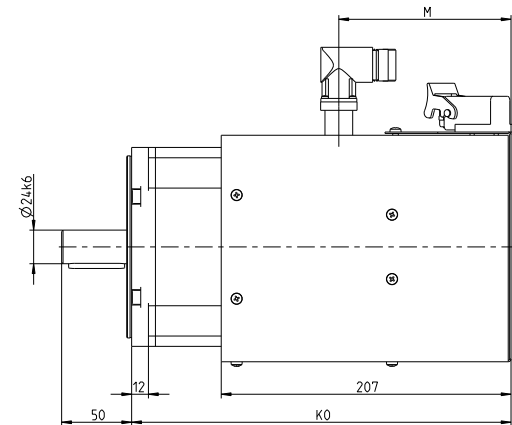
ACOPOSMulti



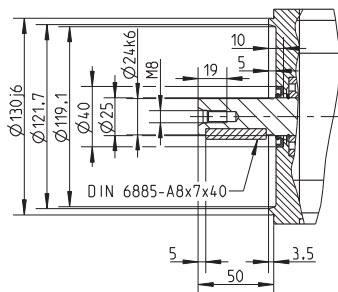
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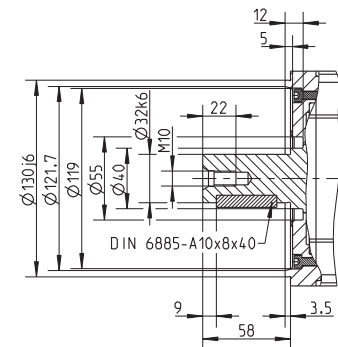
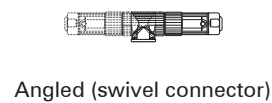
**A side flange detail
Standard bearing**



**A side flange detail
Special motor option "Reinforced A side bearing"**



**Possible
connection directions**



Dimensions

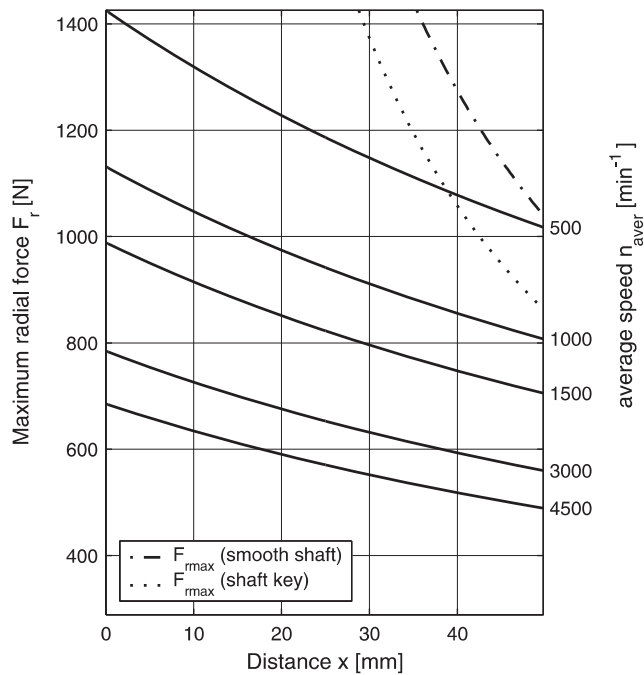
EnDat feedback		Resolver feedback		Extension of K ₀ depending on the motor option [mm]				
Model number	K ₀	M	Model number	K ₀	M	Holding brake ¹⁾	Oil seal	Reinforced A side bearing
8LSC53.Exnnffgg-1	271	123	8LSC53.R0nnffgg-1	246	93	30	---	15
8LSC54.Exnnffgg-1	296	123	8LSC54.R0nnffgg-1	266	93	30	---	15
8LSC55.Exnnffgg-1	321	123	8LSC55.R0nnffgg-1	291	93	30	---	15
8LSC56.Exnnffgg-1	346	123	8LSC56.R0nnffgg-1	316	93	30	---	15
8LSC57.Exnnffgg-1	371	123	8LSC57.R0nnffgg-1	341	93	30	---	15

1) The motor option "holding brake" cannot be ordered in combination with special motor option "reinforced A side bearing".

Maximum shaft load

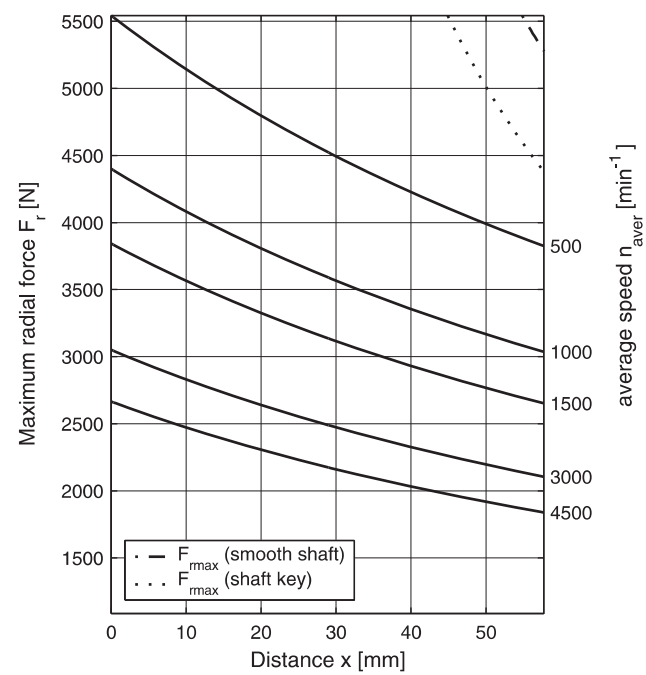
The values in the diagrams below are based on a mechanical lifespan of the bearings of 20,000 operating hours.

Standard bearing



maximum allowed axial force: $F_{amax} = 124 \text{ N}$

Special motor option "Reinforced A side bearing"



maximum allowed axial force: $F_{amax} = 474 \text{ N}$

Recommended B&R motor cable

The recommended B&R motor cable for a motor depends on the recommended ACOPOS servo drive or ACOPOSmulti inverter module (see "Recommended cable cross section for B&R motor cables [mm^2]" in the table "Technical data")

1554

Recommended B&R encoder cables

8BCExxxx.1111A-0 ACPmulti EnDat cable, length xxxx m, 10x 0.14 mm^2 + 2x 0.5 mm^2 , EnDat plug 17-pin SpeedTec socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed

1428

8BCRxxx.1111A-0 ACPmulti Resolver cable, length xxxx m, 3 x 2 x 24 AWG (19 x 0.127), resolver plug 12-pin SpeedTec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed

1429

8LSC5A/B/C



Technical data [nnn]	8LSC5A.ee[nnn]ffgg-0			8LSC5B.ee[nnn]ffgg-0			8LSC5C.ee[nnn]ffgg-0		
	[020]	[030]	[045]	[020]	[030]	[045]	[020]	[030]	[045]
Rated speed n_N [min ⁻¹]	2000	3000	4500	2000	3000	4500	2000	3000	4500
Number of poles	8	8	8	8	8	8	8	8	8
Rated torque M_N [Nm]	29.5	26.4	20	47	42	32	65	58	44
Rated power P_N [kW]	6.18	8.29	9.42	9.84	13.19	15.08	13.61	18.22	20.73
Rated current I_N [A]	12.08	16.21	18.93	19.3	25.8	30.29	26.62	35.62	41.64
Stall torque M_0 [Nm]	31	31	31	50	50	50	70	70	70
Stall current I_0 [A]	12.69	19.04	29.34	20.47	30.71	47.32	28.66	42.99	66.25
Peak torque M_{max} [Nm]	64	64	64	107	107	107	150	150	150
Peak current I_{max} [A]	31.47	47.21	72.75	52.62	78.93	121.63	73.77	110.65	170.51
Maximum angular acceleration without brake α [rad/s ²]	50394	50394	50394	53234	53234	53234	54152	54152	54152
Maximum speed n_{max} [min ⁻¹]	9000	9000	9000	9000	9000	9000	9000	9000	9000
Torque constant K_T [Nm/A]	2.44	1.63	1.06	2.44	1.63	1.06	2.44	1.63	1.06
Voltage constant K_E [V/1000 min ⁻¹]	147.65	98.43	63.88	147.65	98.43	63.88	147.65	98.43	63.88
Stator resistance R_{2ph} [Ω]	1.2	0.59	0.27	0.68	0.28	0.11	0.46	0.2	0.09
Stator inductance L_{2ph} [mH]	8.5	3.91	1.61	6.03	2.44	1.01	4.5	1.76	0.82
Electrical time constant t_{el} [ms]	7.08	6.59	6.06	8.85	8.84	9.09	9.85	8.66	8.83
Thermal time constant t_{therm} [min]	55	55	55	60	60	60	65	65	65
Moment of inertia without brake J [kgcm ²]	12.7	12.7	12.7	20.1	20.1	20.1	27.7	27.7	27.7
Weight without brake m [kg]	17.5	17.5	17.5	26	26	26	34.5	34.5	34.5
Holding brake									
Moment of inertia for brake J_{Br} [kgcm ²]	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66
Weight of brake m_{Br} [kg]	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Holding torque of the brake M_{Br} [Nm]	15	15	15	15	15	15	15	15	15
Recommendations									
Cable cross section for B&R motor cables [mm ²] ¹⁾	4	4	4	4	4 ⁴⁾	10	4	10	10
ACOPOS	☞ 1315	☞ 1315	☞ 1315	☞ 1315		☞ 1316	☞ 1315	☞ 1316	☞ 1316
ACOPOSmulti	☞ 1426	☞ 1426	☞ 1426	☞ 1426		☞ 1427	☞ 1426	☞ 1427	☞ 1427
ACOPOS servo drive 8Vxxxx.00-x ²⁾	1180	1320	1320	1320	1320	1640	1320	1640	128M
ACOPOSmulti inverter module 8BVI... ³⁾	0110	0220	0440	0440	0440	0880	0440	0880	0880

1) The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSmulti inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request.

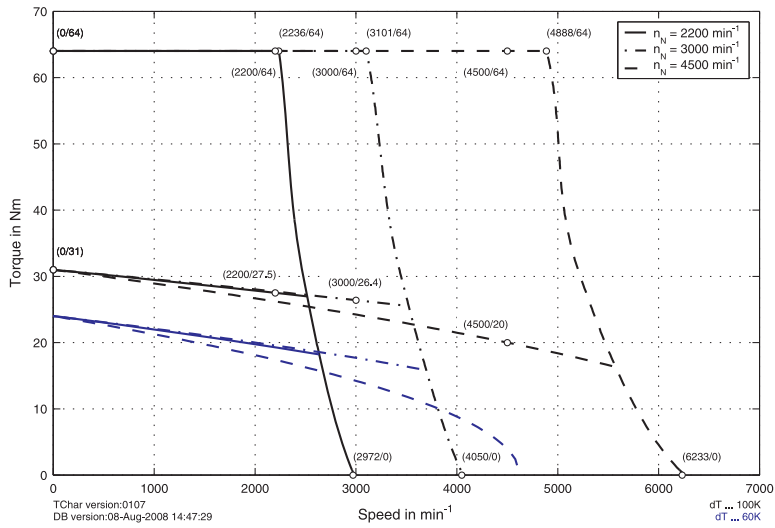
2) The recommended servo drive is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

3) The recommended ACOPOSmulti inverter module is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

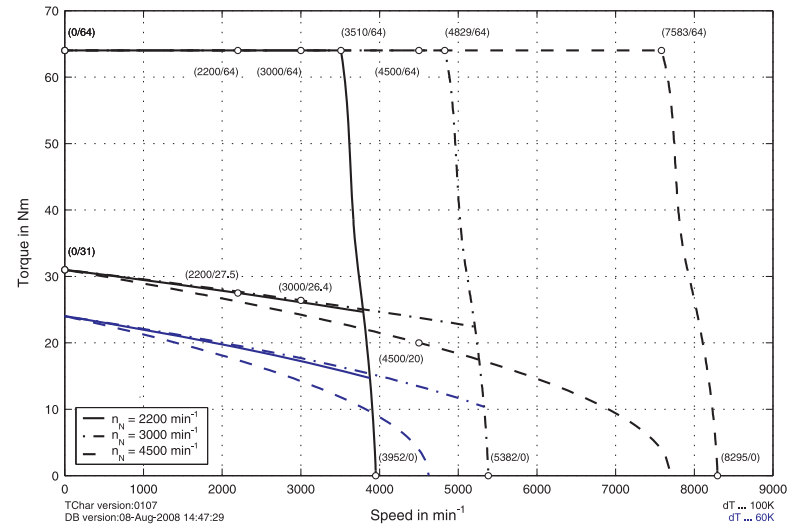
4) Special prefabricated motor cables must be used for this motor / servo drive combination (size of the motor plug is not the standard size). They are available from B&R on request.

Speed-torque characteristic curves with 400 VAC supply voltage

ACOPOS

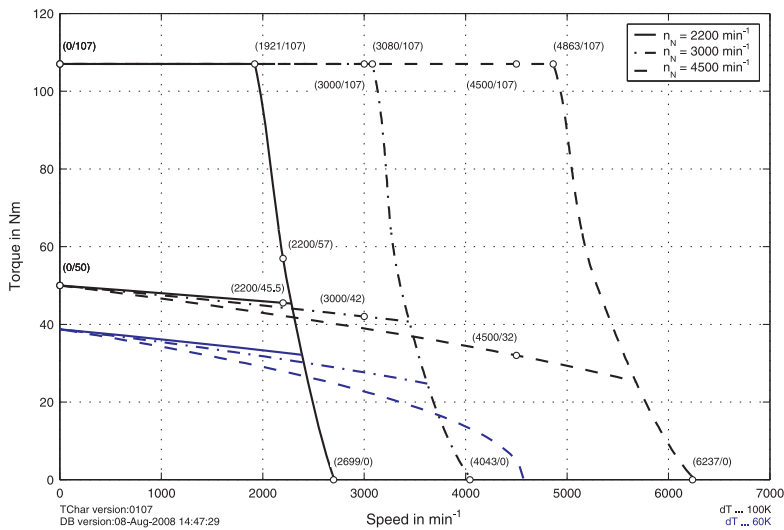


ACOPOSmulti

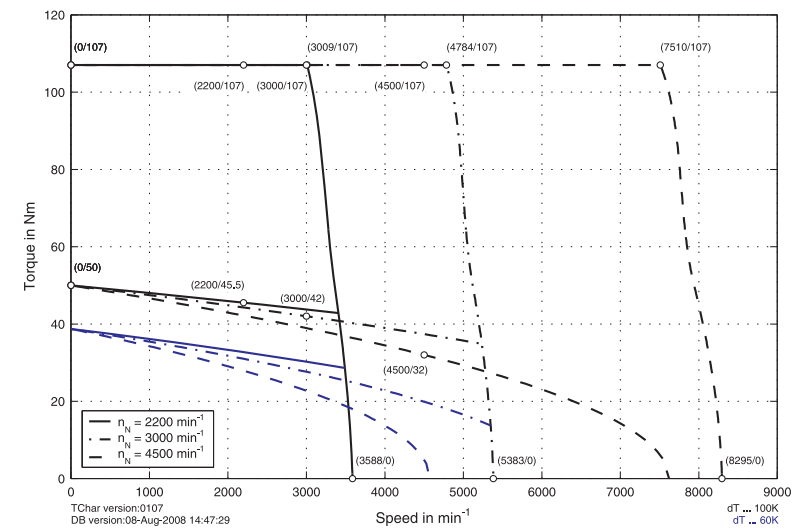


8LSC5A.eennnffgg-0

ACOPOS



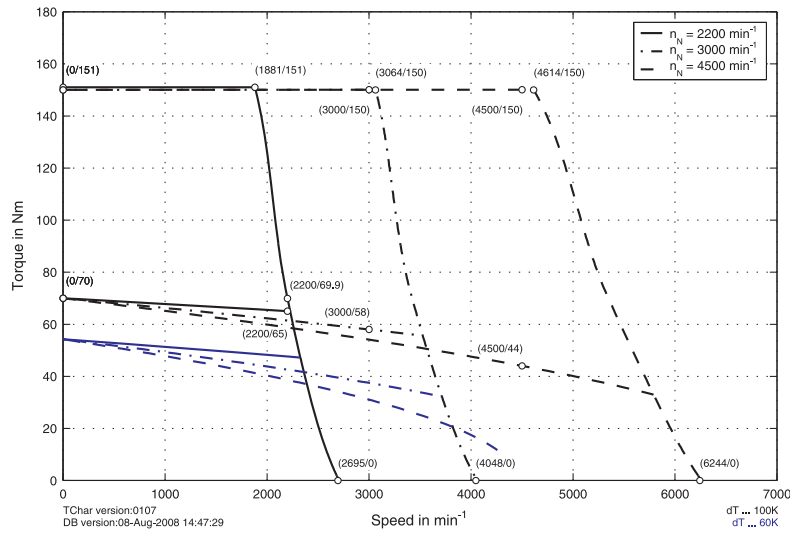
ACOPOSmulti



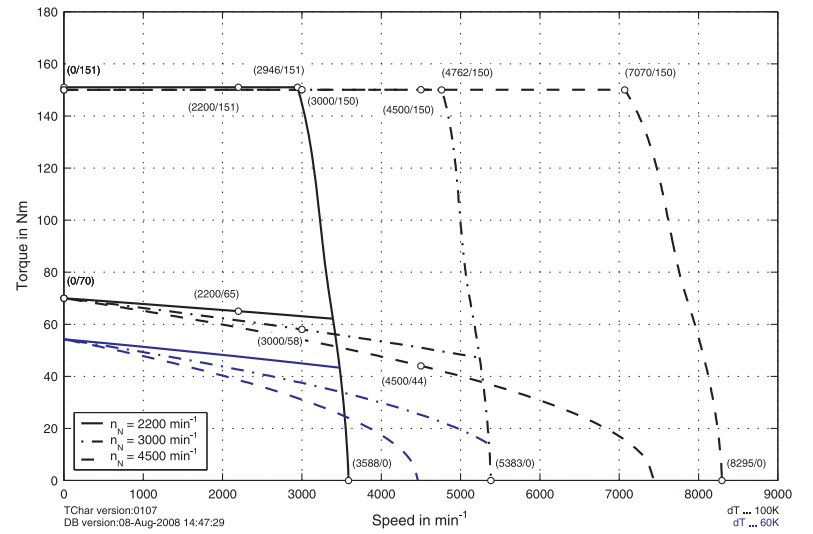
8LSC5B.eennnffgg-0

8LSC5A/B/C

ACOPOS



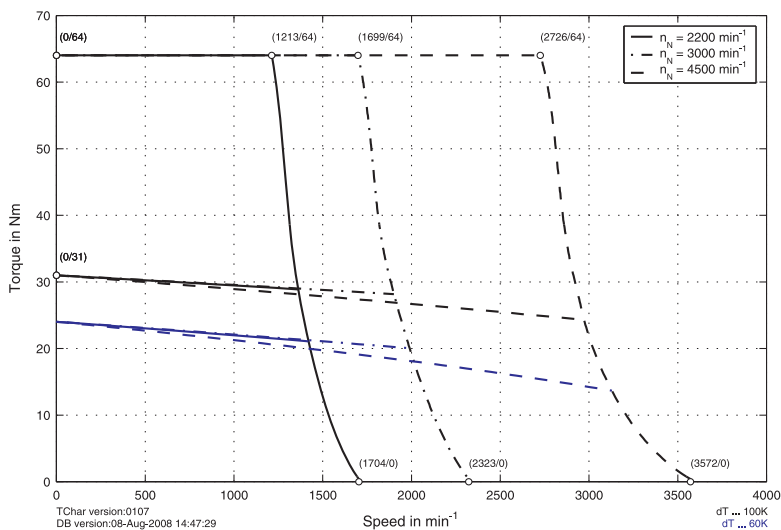
ACOPOSMulti



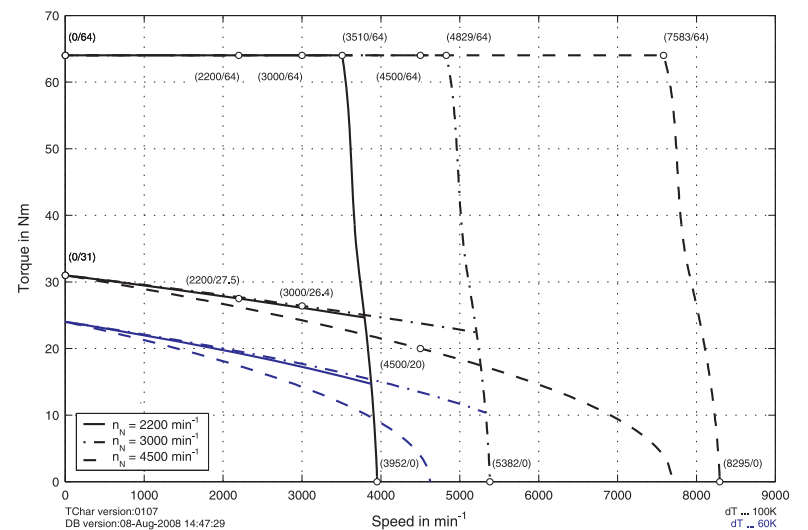
8LSC5C.eennffgg-0

Speed-torque characteristic curves with 230 VAC supply voltage

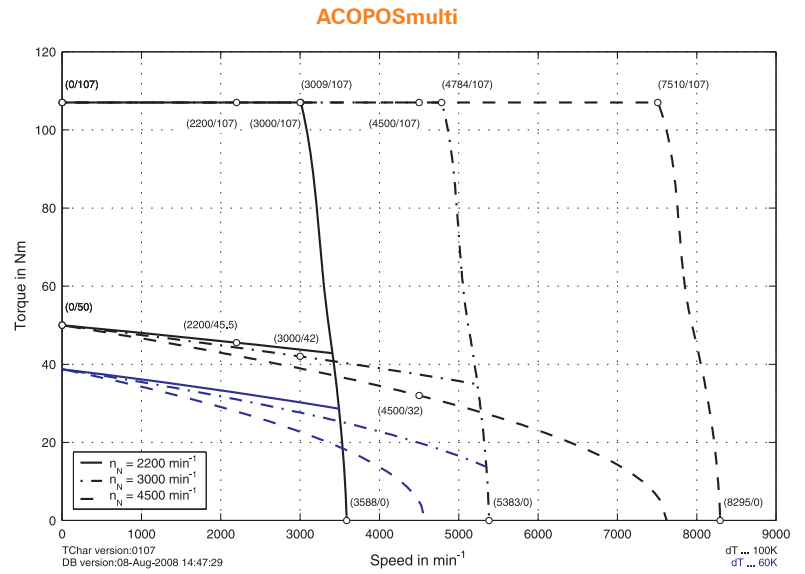
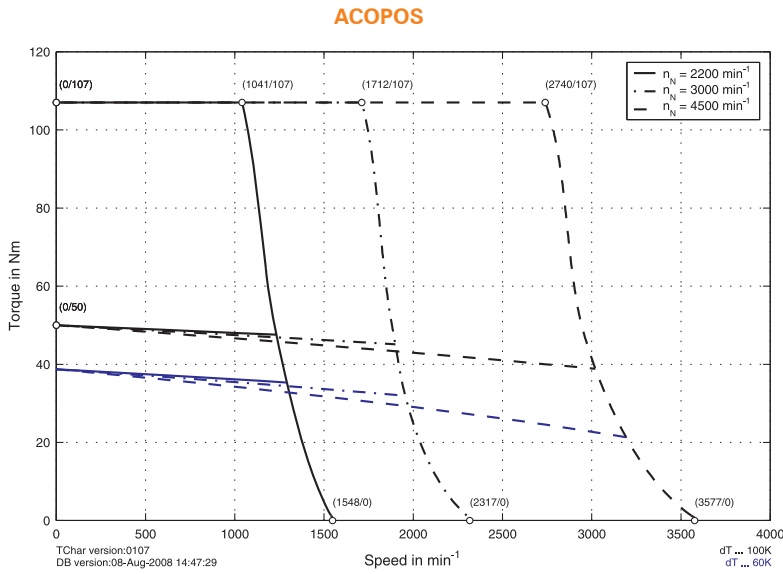
ACOPOS



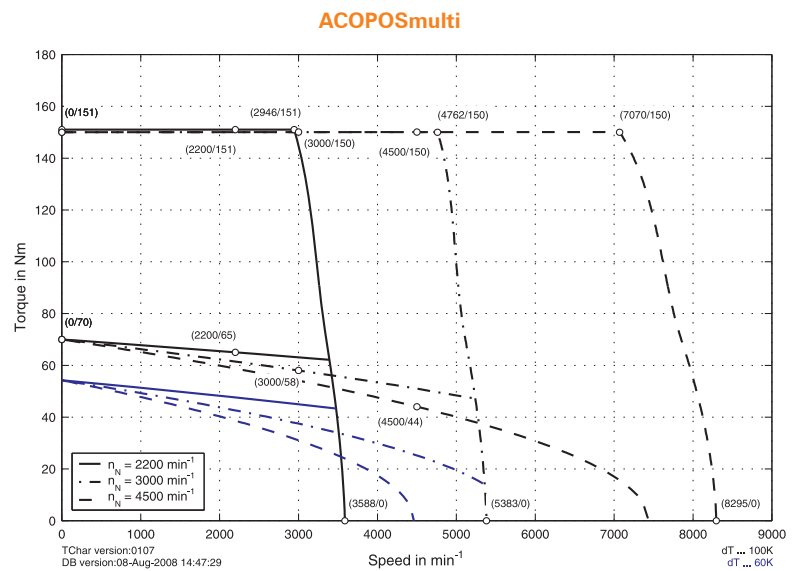
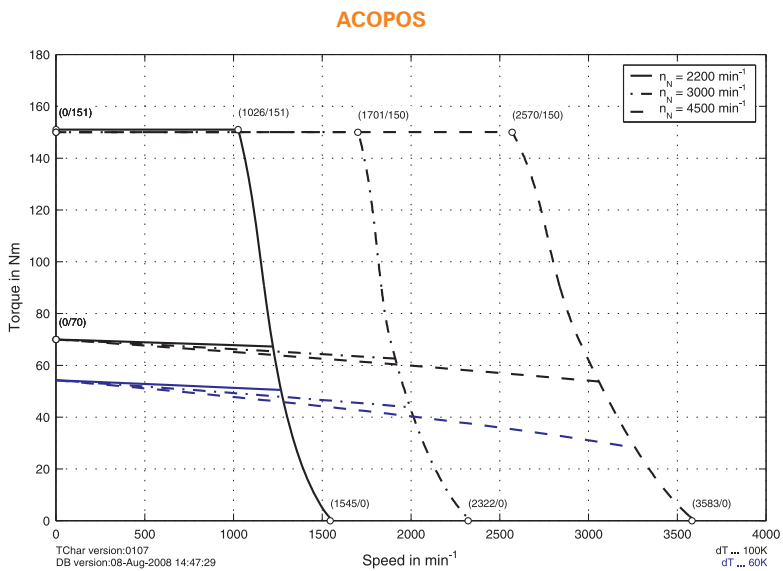
ACOPOSMulti



8LSC5A.eennffgg-0

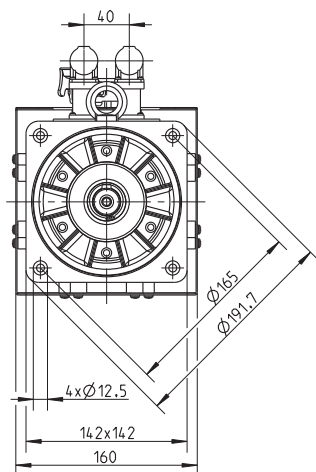


8LSC5B.eennnffg-0

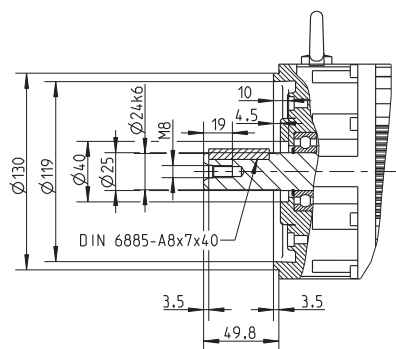


8LSC5C.eennnffg-0

8LSC5A/B/C



A side flange detail
Standard bearing



Possible connection directions

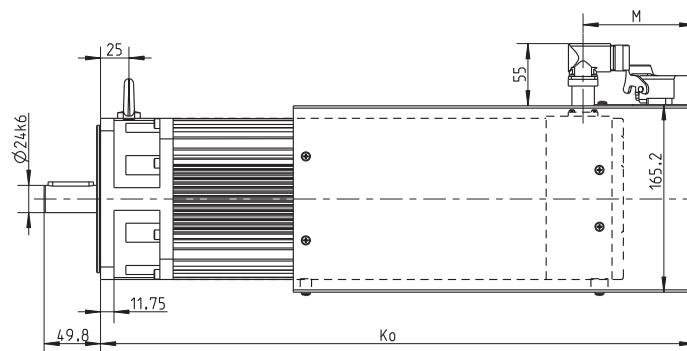


Straight (top connector)



Angled (swivel connector)

Dimensions

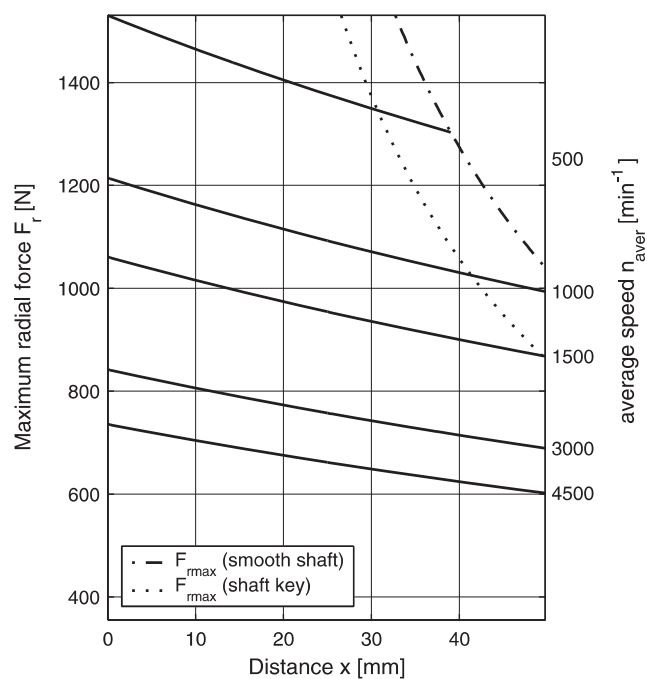


EnDat feedback		Resolver feedback		Extension of K_0 depending on the motor option [mm]				
Model number	K_0	M	Model number	K_0	M	Holding brake	Oil seal	Reinforced A side bearing
8LSC5A.Exnnffgg-0	410	123	8LSC5A.R0nnffgg-0	380	93	30	---	---
8LSC5B.Exnnffgg-0	485	123	8LSC5B.R0nnffgg-0	455	93	30	---	---
8LSC5C.Exnnffgg-0	560	123	8LSC5C.R0nnffgg-0	530	93	30	---	---

Maximum shaft load

The values in the diagram below are based on a mechanical lifespan of the bearings of 20,000 operating hours.

Standard bearing



maximum allowed axial force: $F_{amax} = 144 \text{ N}$

Recommended B&R motor cable

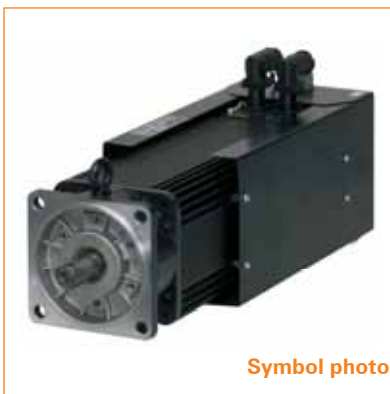
The recommended B&R motor cable for a motor depends on the recommended ACOPOS servo drive or ACOPOSmulti inverter module (see "Recommended cable cross section for B&R motor cables [mm^2]" in the table "Technical data") [1562](#)

Recommended B&R encoder cables

8BCExxxx.1111A-0 ACPmulti EnDat cable, length xxxx m, 10x 0.14 mm^2 + 2x 0.5 mm^2 , EnDat plug 17-pin SpeedTec socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed [1428](#)

8BCRxxxx.1111A-0 ACPmulti Resolver cable, length xxxx m, 3 x 2 x 24 AWG (19 x 0.127), resolver plug 12-pin SpeedTec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed [1429](#)

8LSC6



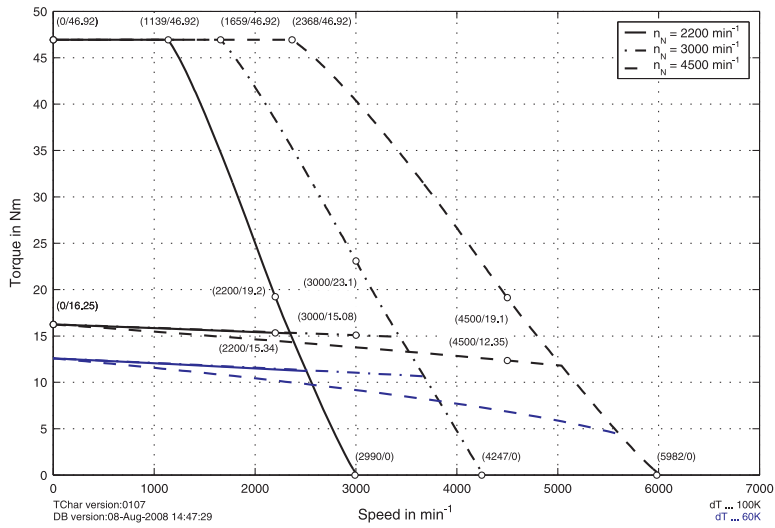
Symbol photo

Technical data	8LSC63.ee[nnn]ffgg-1			8LSC64.ee[nnn]ffgg-1			8LSC65.ee[nnn]ffgg-1			8LSC66.ee[nnn]ffgg-1		
	[022]	[030]	[045]	[022]	[030]	[045]	[022]	[030]	[045]	[022]	[030]	[045]
Rated speed n_N [min ⁻¹]	2200	3000	4500	2200	3000	4500	2200	3000	4500	2200	3000	4500
Number of poles	8	8	8	8	8	8	8	8	8	8	8	8
Rated torque M_N [Nm]	15.34	15.08	12.35	23.4	22.75	19.63	28.6	27.3	15.86	31.85	30.55	19.5
Rated power P_N [kW]	3.53	4.74	5.82	5.39	7.15	9.25	6.59	8.58	7.47	7.34	9.6	9.19
Rated current I_N [A]	6.63	8.97	11.7	9.88	13	18.07	11.44	15.21	18.46	12.87	16.9	20.67
Stall torque M_0 [Nm]	16.25	16.25	16.25	26	26	26	31.2	31.2	31.2	36.4	36.4	36.4
Stall current I_0 [A]	7.4	10.49	14.79	11.49	16.02	25.09	13.47	19.23	27.12	15.38	21.54	30.84
Peak torque M_{max} [Nm]	46.92	46.92	46.92	78.2	78.2	78.2	97.92	97.92	97.92	114.24	114.24	114.24
Peak current I_{max} [A]	30.48	42.48	60.96	49.48	67.84	106.48	64.31	90.95	130.49	74.41	103.49	152.61
Maximum angular acceleration without brake a [rad/s ²]	57263	57263	57263	59566	59566	59566	62787	62787	62787	63246	63246	63246
Maximum speed n_{max} [min ⁻¹]	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000
Torque constant K_T [Nm/A]	2.22	1.63	1.09	2.22	1.63	1.09	2.22	1.63	1.09	2.22	1.63	1.09
Voltage constant K_E [V/1000 min ⁻¹]	134.04	98.43	65.97	134.04	98.43	65.97	134.04	98.43	65.97	134.04	98.43	65.97
Stator resistance R_{2ph} [Ω]	2.27	1.13	0.57	1.24	0.64	0.26	0.99	0.48	0.24	0.84	0.43	0.21
Stator inductance L_{2ph} [mH]	24.29	12.5	6.07	14.87	7.91	3.21	12	6	2.91	10.4	5.37	2.47
Electrical time constant t_{el} [ms]	10.72	11.09	10.72	12.04	12.45	12.39	12.17	12.4	11.98	12.36	12.53	11.81
Thermal time constant t_{therm} [min]	42	42	42	45	45	45	48	48	48	52	52	52
Moment of inertia without brake J [kgcm ²]	8.19	8.19	8.19	13.13	13.13	13.13	15.6	15.6	15.6	18.06	18.06	18.06
Weight without brake m [kg]	14.79	14.79	14.79	18.74	18.74	18.74	20.67	20.67	20.67	22.6	22.6	22.6
Holding brake												
Moment of inertia for brake J_{Br} [kgcm ²]	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85
Weight of brake m_{Br} [kg]	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Holding torque of the brake M_{Br} [Nm]	32	32	32	32	32	32	32	32	32	32	32	32
Recommendations												
Cable cross section for B&R motor cables [mm ²] ¹⁾	1.5	4	4	4	4	4	4	4	4	4	4	4 ⁴⁾
ACOPOS	⊃ 1314	⊃ 1315	⊃ 1315	⊃ 1315	⊃ 1315	⊃ 1315	⊃ 1315	⊃ 1315	⊃ 1315	⊃ 1315	⊃ 1315	⊃ 1315
ACOPOSmulti	⊃ 1425	⊃ 1426	⊃ 1426	⊃ 1426	⊃ 1426	⊃ 1426	⊃ 1426	⊃ 1426	⊃ 1426	⊃ 1426	⊃ 1426	⊃ 1426
ACOPOS servo drive 8Vxxxx.00-x ²⁾	1090	1180	1180	1180	1180	1320	1180	1320	1320	1180	1320	1320
ACOPOSmulti inverter module 8BVI... ³⁾	0110	0110	0220	0110	0220	0440	0110	0220	0440	0220	0440	0440

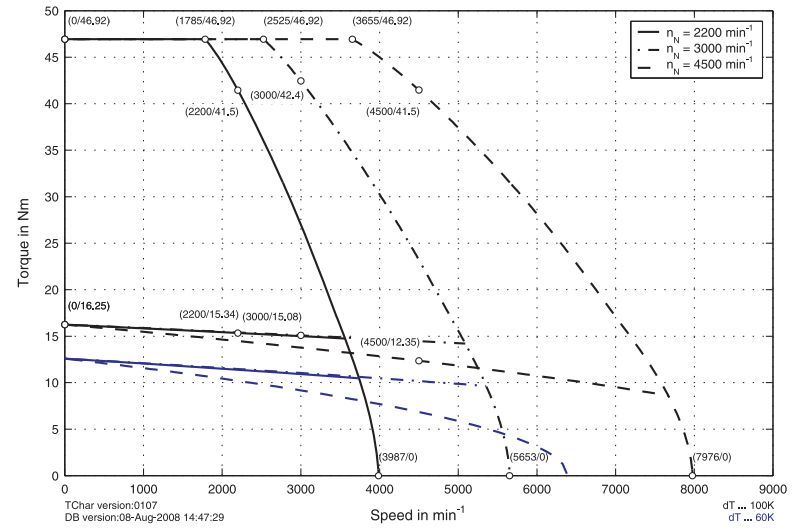
- The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSmulti inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request.
- The recommended servo drive is defined for 1.1x the stall current of the motor; if more than 2x the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).
- The recommended ACOPOSmulti inverter module is defined for 1.1x the stall current of the motor; if more than 2x the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).
- Special prefabricated motor cables must be used for this motor / servo drive combination (size of the motor plug is not the standard size). They are available from B&R on request.

Speed-torque characteristic curves with 400 VAC supply voltage

ACOPOS

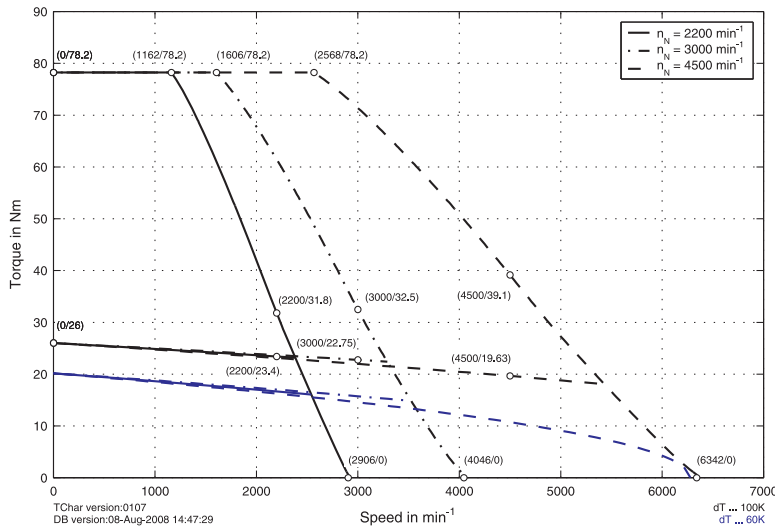


ACOPOSmulti

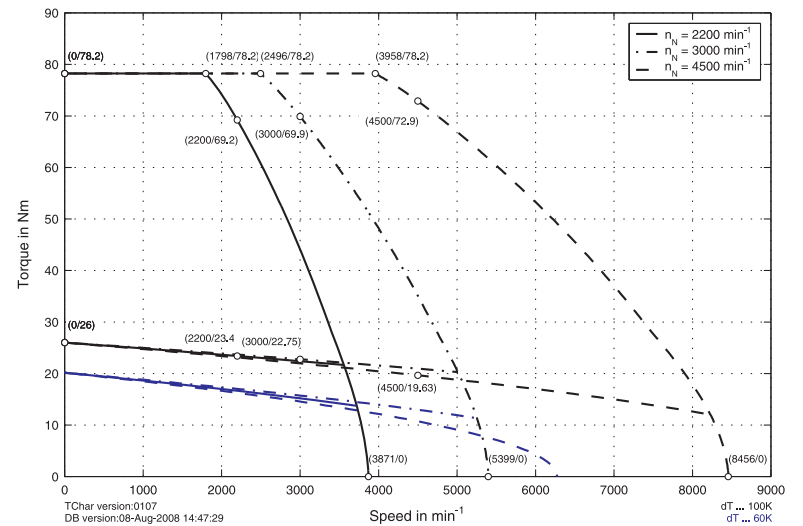


8LSC63.eennffgg-1

ACOPOS

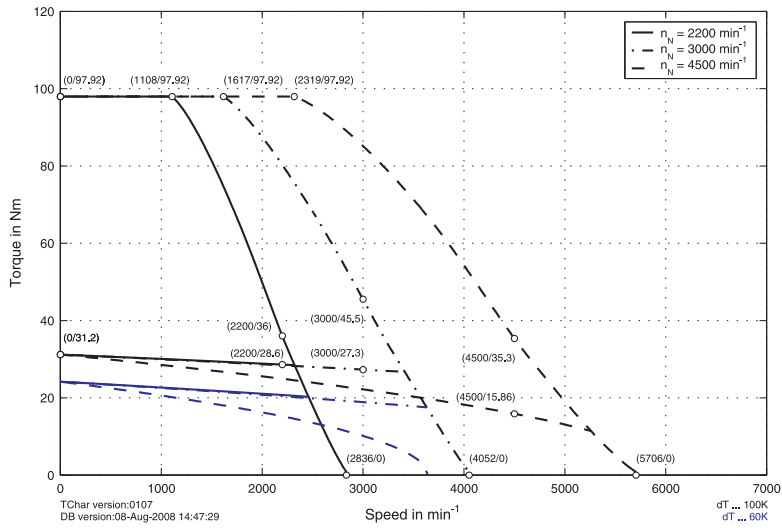


ACOPOSmulti

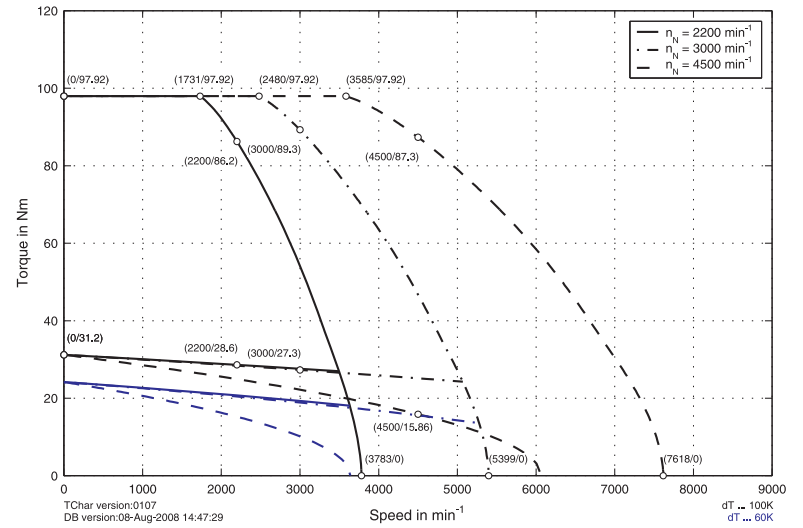


8LSC64.eennffgg-1

ACOPOS

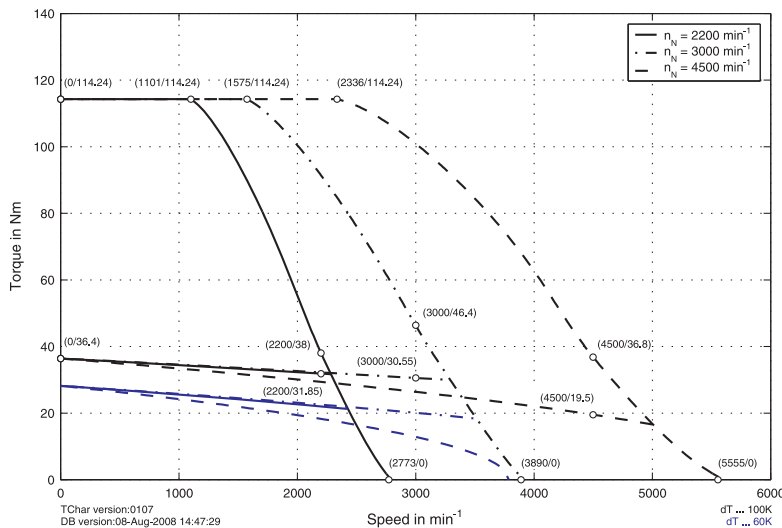


ACOPOSMulti

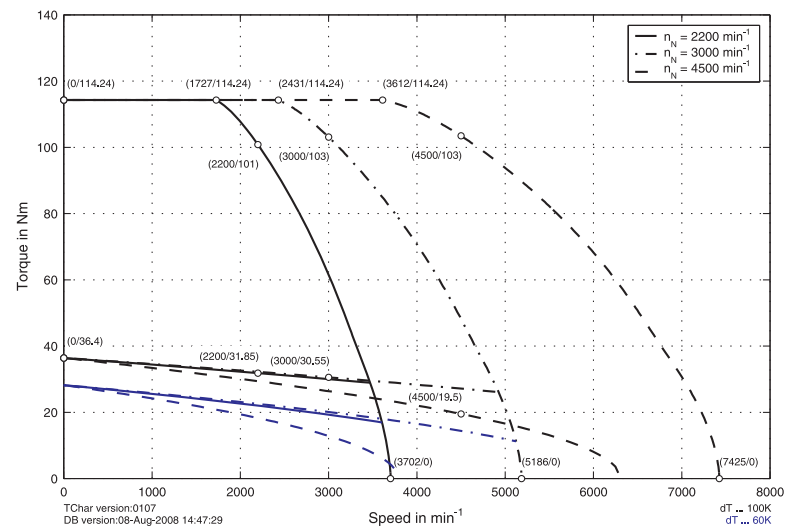


8LSC65.eennffgg-1

ACOPOS



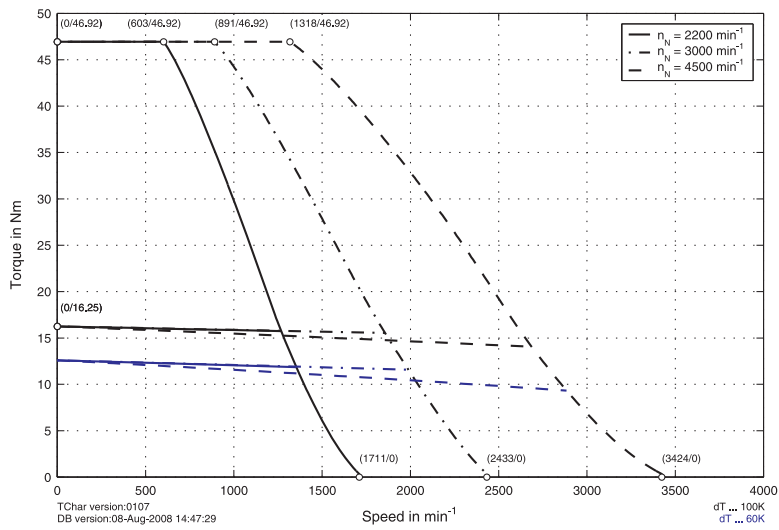
ACOPOSMulti



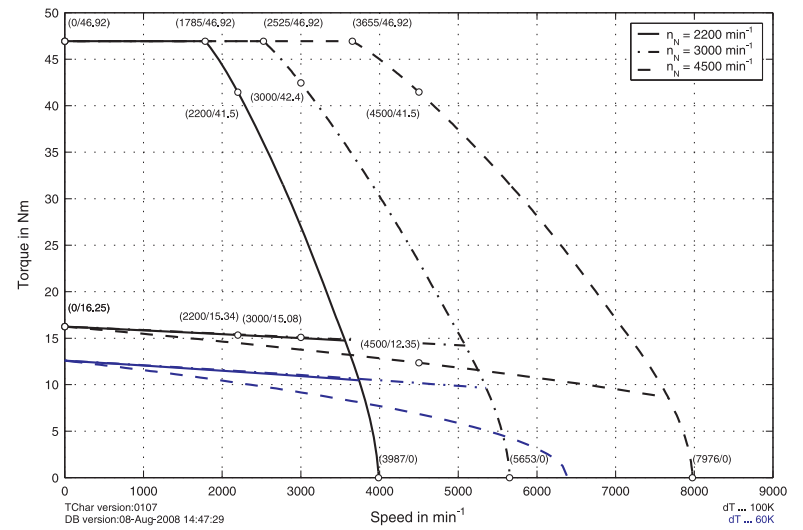
8LSC66.eennffgg-1

Speed-torque characteristic curves with 230 VAC supply voltage

ACOPOS

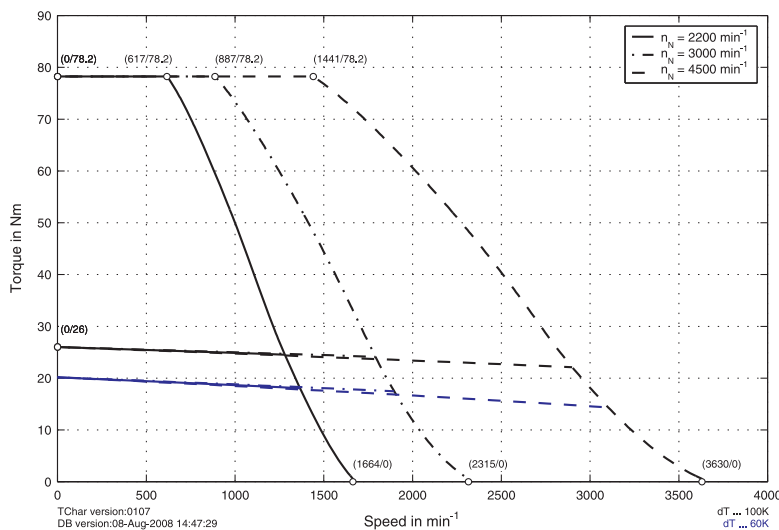


ACOPOSmulti

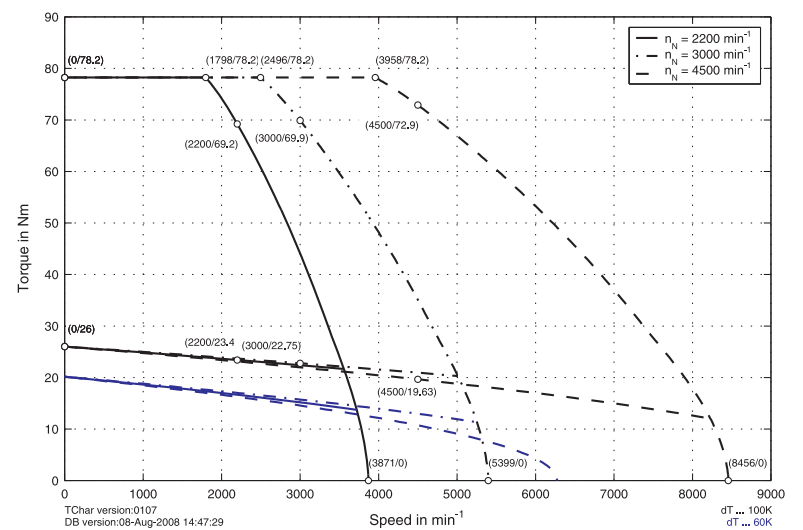


8LSC63.eennffgg-1

ACOPOS

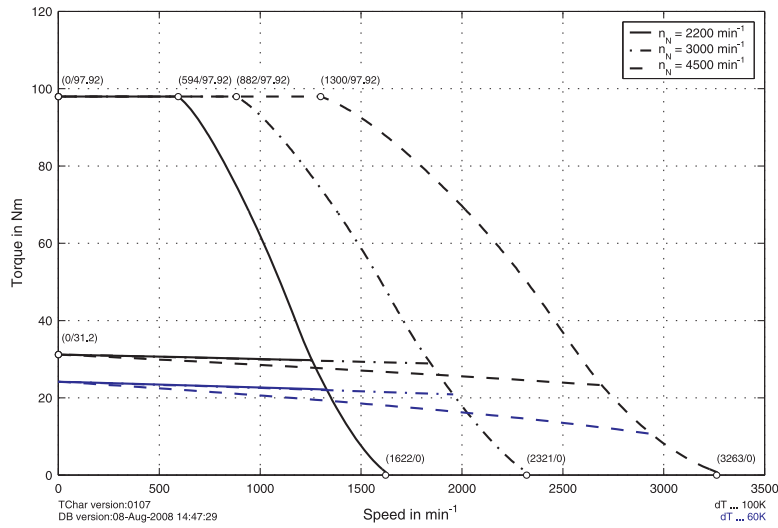


ACOPOSmulti

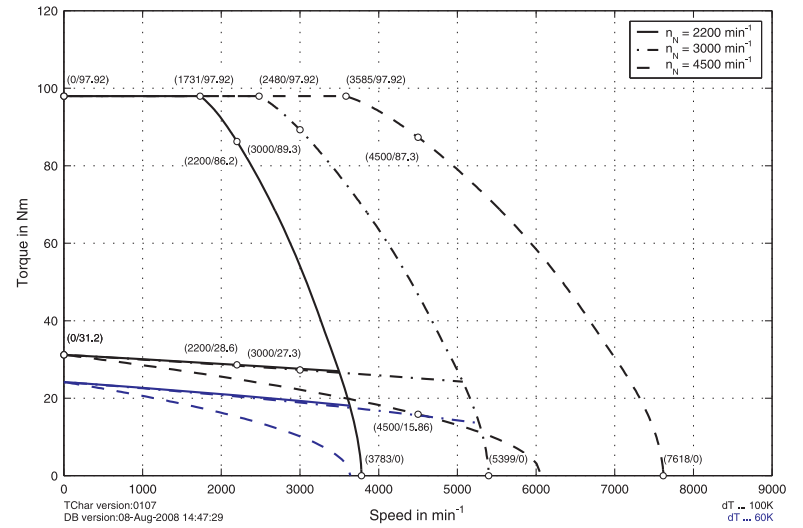


8LSC64.eennffgg-1

ACOPOS

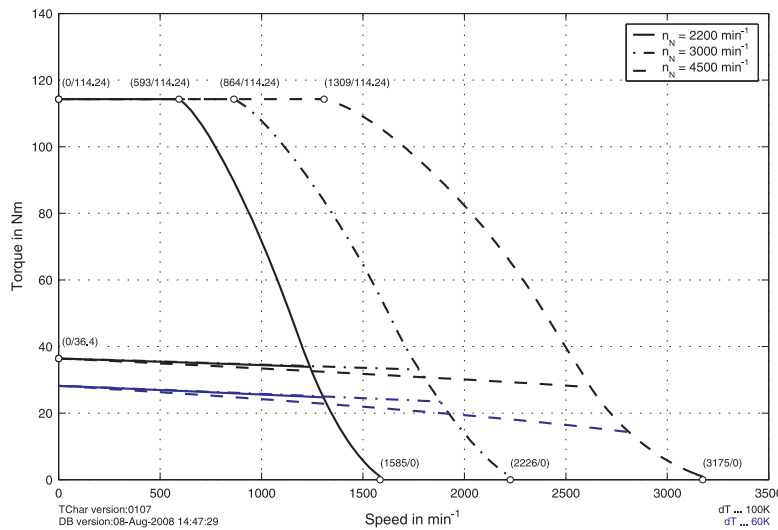


ACOPOSMulti

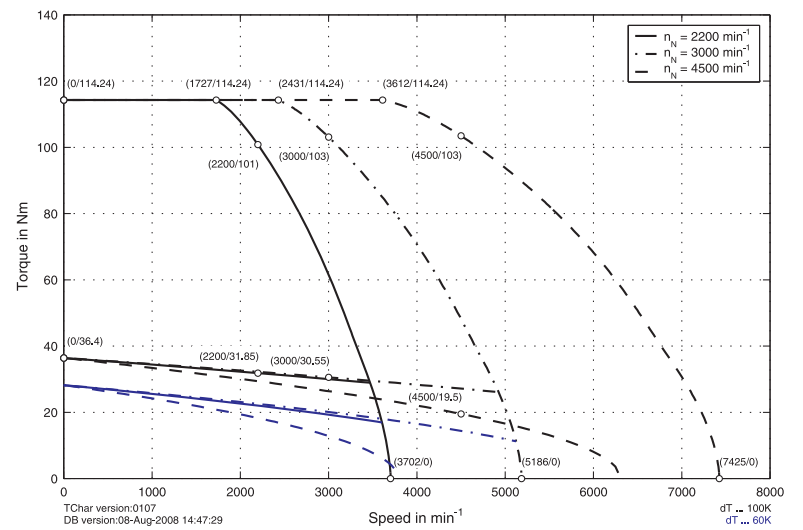


8LSC65.eennffgg-1

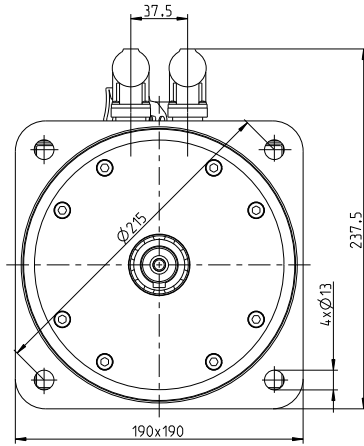
ACOPOS



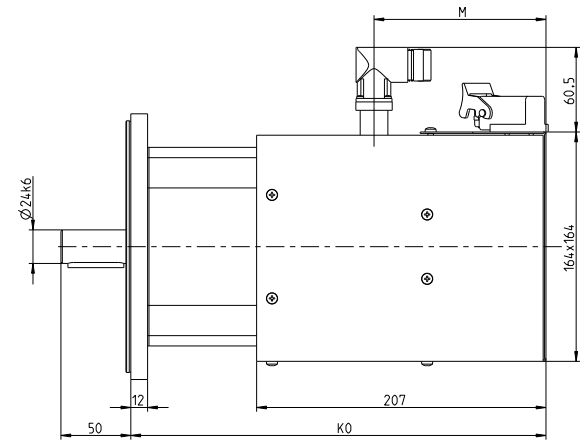
ACOPOSMulti



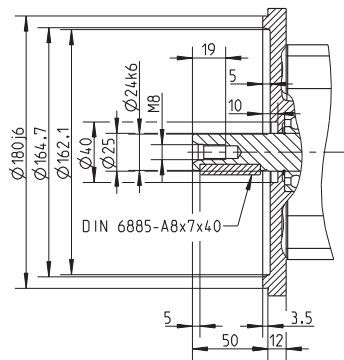
8LSC66.eennffgg-1



**A side flange detail
Standard bearing**



**A side flange detail
Special motor option "Reinforced A side bearing"**



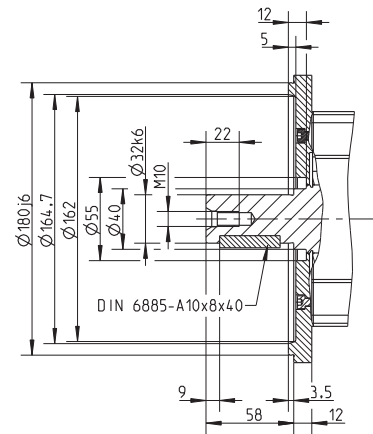
**Possible
connection directions**



Straight (top connector)



Angled (swivel connector)



Dimensions

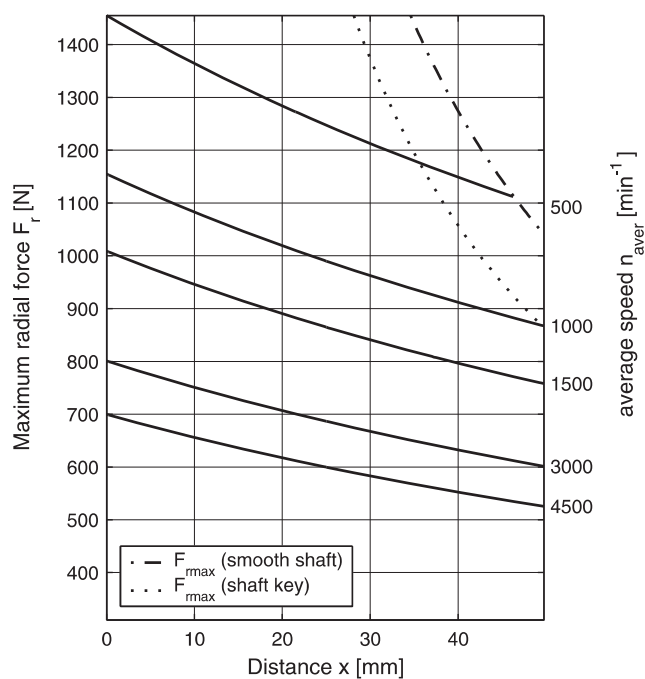
EnDat feedback		Resolver feedback		Extension of K_0 depending on the motor option [mm]				
Model number	K_0	M	Model number	K_0	M	Holding brake ¹⁾	Oil seal	Reinforced A side bearing
8LSC63.Exnnnffgg-1	297	123	8LSC63.R0nnnffgg-1	260	86	63	---	38
8LSC64.Exnnnffgg-1	347	123	8LSC64.R0nnnffgg-1	310	86	63	---	38
8LSC65.Exnnnffgg-1	372	123	8LSC65.R0nnnffgg-1	335	86	63	---	38
8LSC66.Exnnnffgg-1	397	123	8LSC66.R0nnnffgg-1	360	86	63	---	38

1) The motor option "holding brake" cannot be ordered in combination with special motor option "reinforced A side bearing".

Maximum shaft load

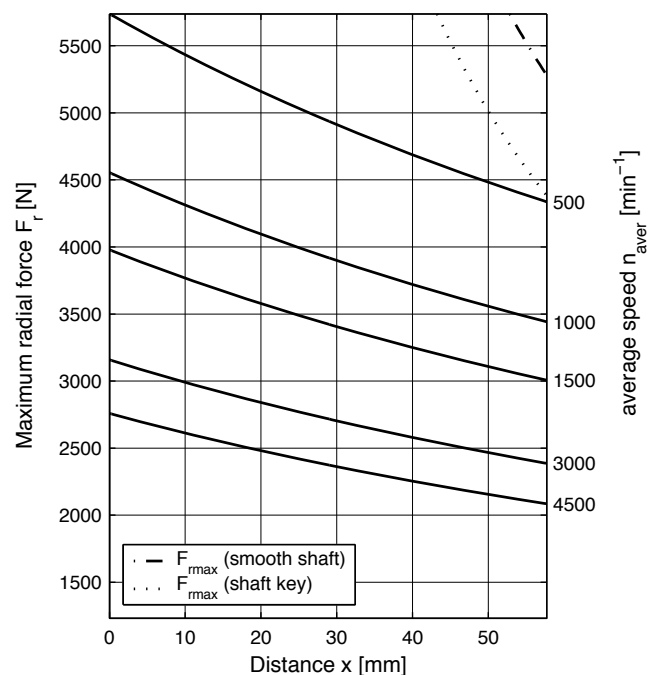
The values in the diagram below are based on a mechanical lifespan of the bearings of 20,000 operating hours.

Standard bearing



maximum allowed axial force: $F_{amax} = 131 \text{ N}$

Special motor option "Reinforced A side bearing"



maximum allowed axial force: $F_{amax} = 517 \text{ N}$

Recommended B&R motor cable

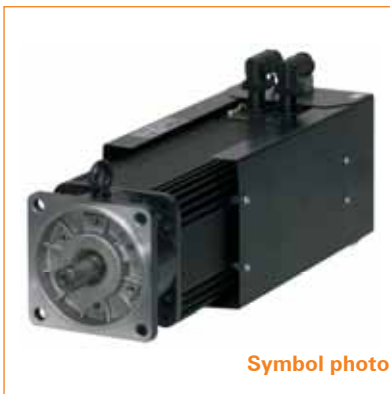
The recommended B&R motor cable for a motor depends on the recommended ACOPOS servo drive or ACOPOSmulti inverter module (see "Recommended cable cross section for B&R motor cables [mm^2]" in the table "Technical data") 1568

Recommended B&R encoder cables

8BCExxxx.1111A-0	ACPMulti EnDat cable, length xxxx m, 10x 0.14 mm^2 + 2x 0.5 mm^2 , EnDat plug 17-pin SpeedTec socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed 1428
8BCRxxxx.1111A-0	ACPMulti Resolver cable, length xxxx m, 3 x 2 x 24 AWG (19 x 0.127), resolver plug 12-pin SpeedTec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed 1429



8LSC7



Symbol photo

Technical data	8LSC73.ee[nnn]ffgg-0			8LSC74.ee[nnn]ffgg-0			8LSC75.ee[nnn]ffgg-0	
[nnn]	[022]	[030]	[045]	[022]	[030]	[045]	[022]	[030]
Rated speed n_N [min ⁻¹]	2200	3000	4500	2200	3000	4500	2200	3000
Number of poles	6	6	6	6	6	6	6	6
Rated torque M_N [Nm]	27.3	26	18.85	33.8	31.2	19.5	41.6	39
Rated power P_N [kW]	6.29	8.17	8.88	7.79	9.8	9.19	9.58	12.25
Rated current I_N [A]	12.31	15.95	17.14	15.25	19.14	17.73	18.76	23.93
Stall torque M_0 [Nm]	33.8	33.8	33.8	41.6	41.6	41.6	52	52
Stall current I_0 [A]	15.25	20.74	30.73	18.76	25.52	37.82	23.45	31.9
Peak torque M_{max} [Nm]	107	107	107	134	134	134	187	187
Peak current I_{max} [A]	84.3	115	171	103	140	207	130	176
Maximum angular acceleration without brake a [rad/s ²]	10918	10918	10918	11652	11652	11652	13357	13357
Maximum speed n_{max} [min ⁻¹]	6000	6000	6000	6000	6000	6000	4500	4500
Torque constant K_T [Nm/A]	2.22	1.63	1.1	2.22	1.63	1.1	2.22	1.63
Voltage constant K_E [V/1000 min ⁻¹]	134.04	98.43	65.97	134.04	98.43	65.97	134.04	98.43
Stator resistance R_{2ph} [Ω]	0.86	0.46	0.22	0.64	0.34	0.16	0.38	0.21
Stator inductance L_{2ph} [mH]	10.49	5.55	2.62	8.47	4.42	2.2	5.46	3.07
Electrical time constant t_{el} [ms]	12.23	12.07	11.91	13.15	13	13.75	14.52	14.62
Thermal time constant t_{therm} [min]	55	55	55	60	60	60	65	65
Moment of inertia without brake J [kgcm ²]	98	98	98	115	115	115	140	140
Weight without brake m [kg]	27	27	27	30	30	30	38	38
Holding brake								
Moment of inertia for brake J_{Br} [kgcm ²]	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85
Weight of brake m_{Br} [kg]	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Holding torque of the brake M_{Br} [Nm]	32	32	32	32	32	32	32	32
Recommendations								
Cable cross section for B&R motor cables [mm ²] ¹⁾	4	4	4 ⁴⁾	4	4	10	4	10
ACOPOS	≧ 1315	≧ 1315		≧ 1315	≧ 1315	≧ 1316	≧ 1315	≧ 1316
ACOPOSmulti	≧ 1426	≧ 1426		≧ 1426	≧ 1426	≧ 1427	≧ 1426	≧ 1427
ACOPOS servo drive 8Vxxxx.00-x ²⁾	1180	1320	1320	1320	1320	1640	1320	1640
ACOPOSmulti inverter module 8BVI... ³⁾	0220	0440	0440	0220	0440	0440	0440	0440

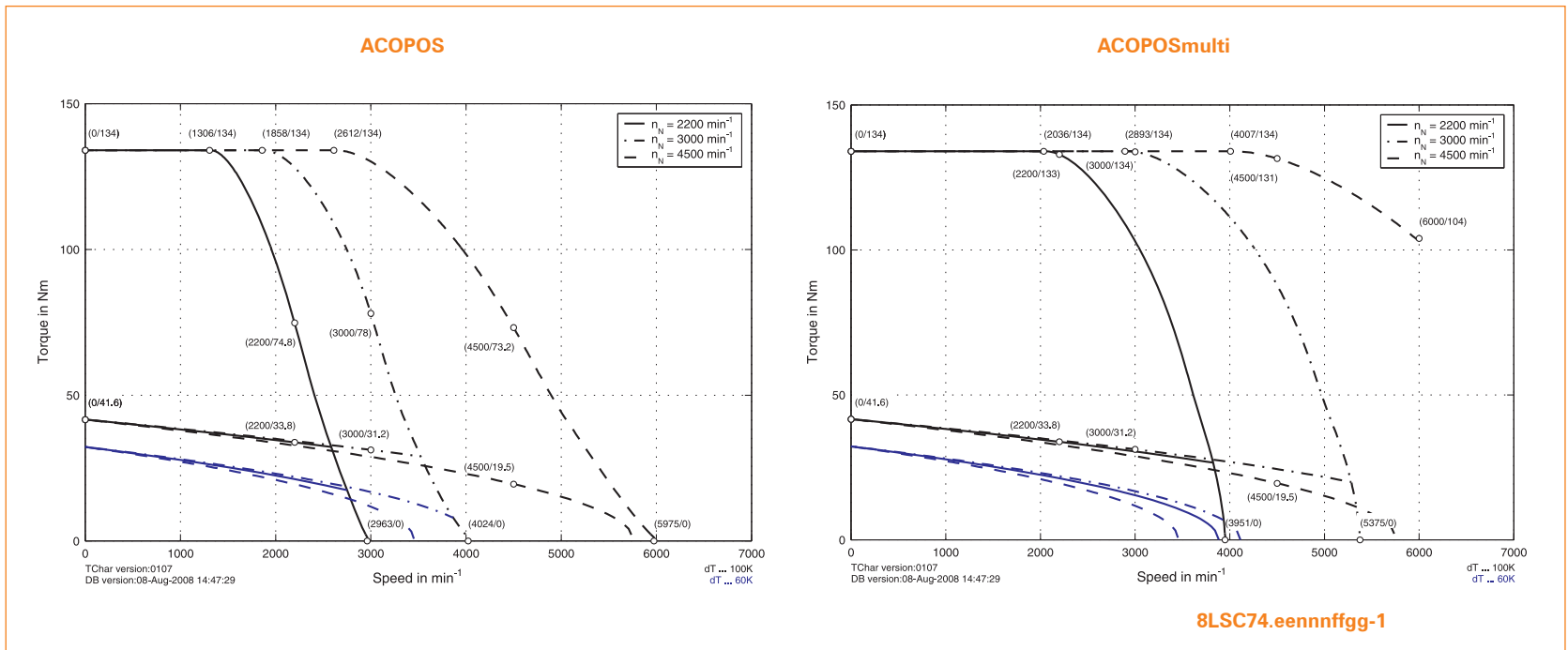
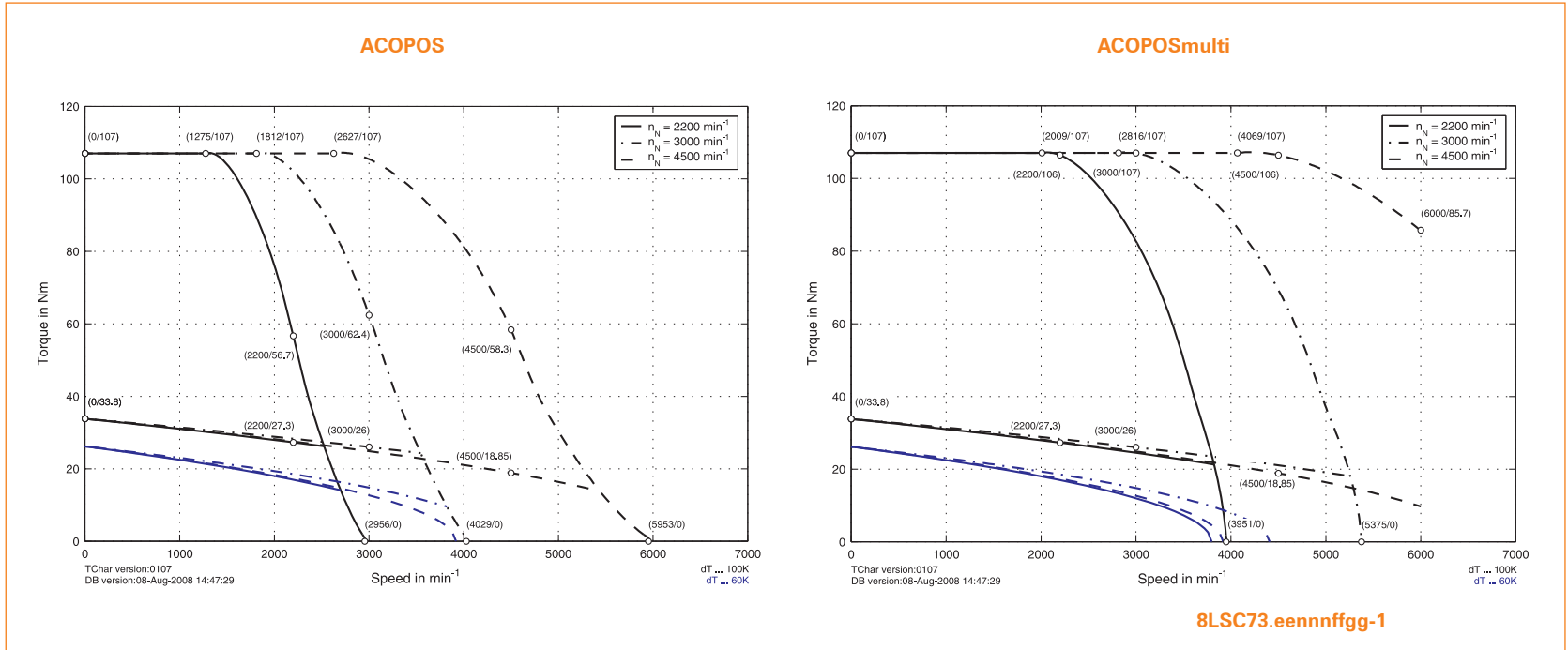
1) The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSmulti inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request.

2) The recommended servo drive is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

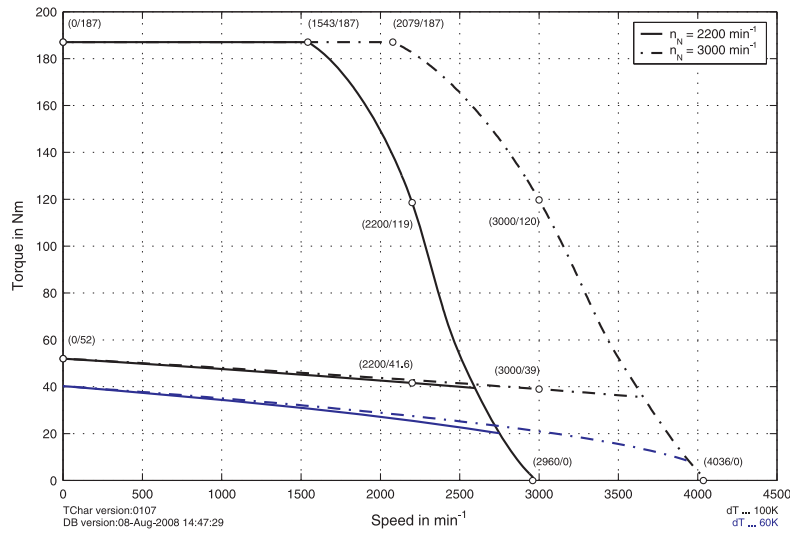
3) The recommended ACOPOSmulti inverter module is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

4) Special prefabricated motor cables must be used for this motor / servo drive combination (size of the motor plug is not the standard size). They are available from B&R on request.

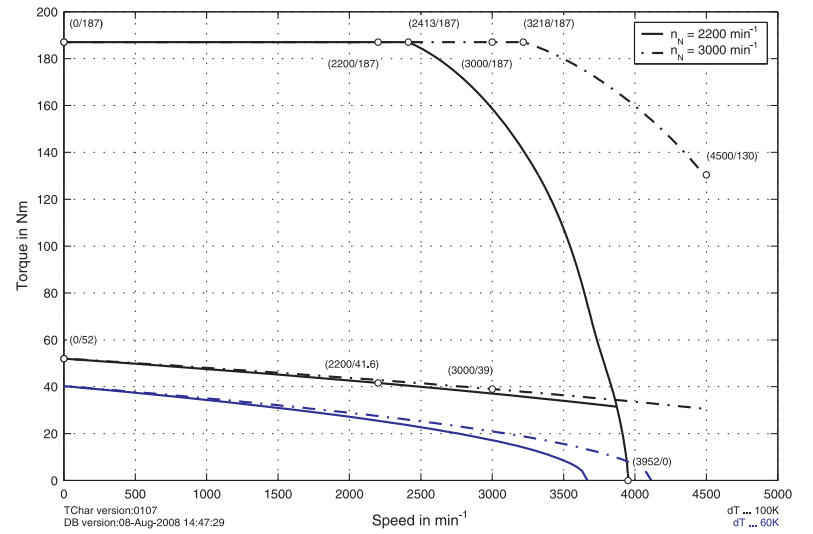
Speed-torque characteristic curves with 400 VAC supply voltage



ACOPOS



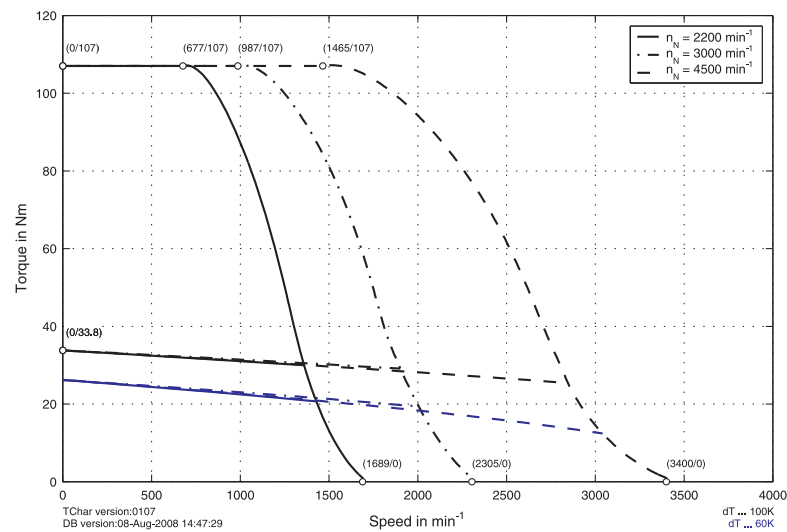
ACOPOSMulti



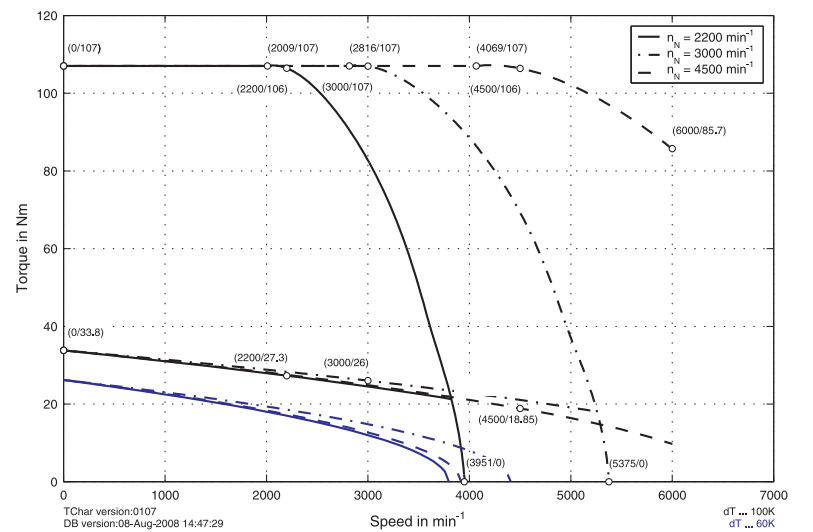
8LSC75.eennffgg-0

Speed-torque characteristic curves with 230 VAC supply voltage

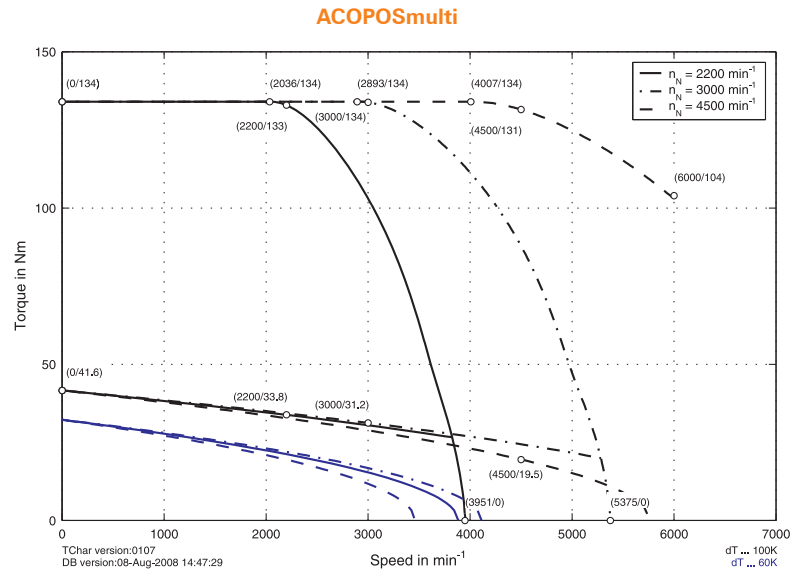
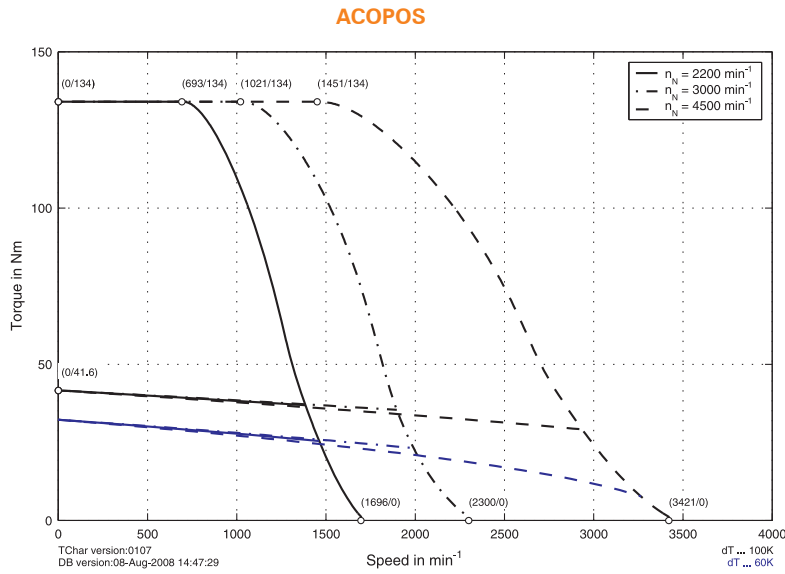
ACOPOS



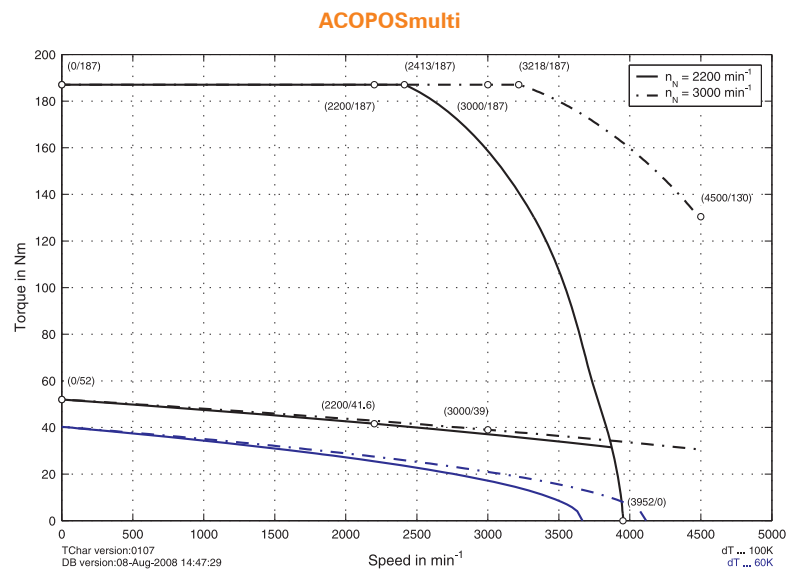
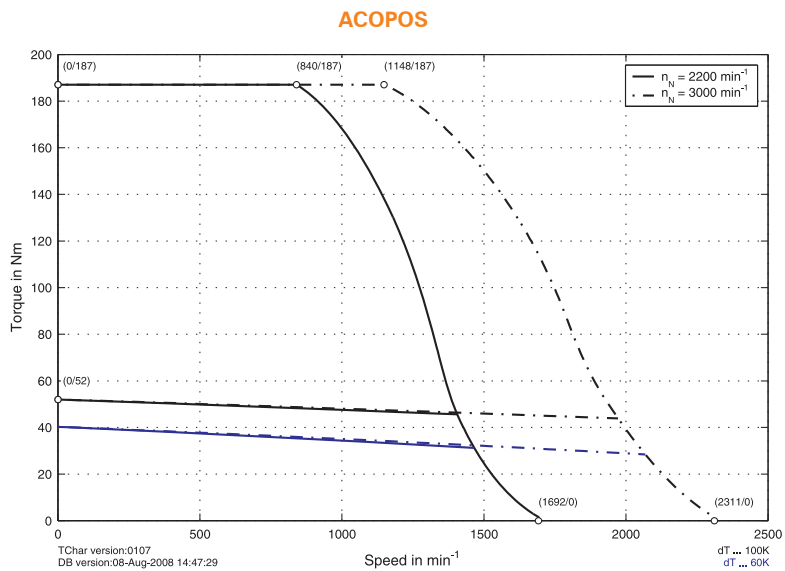
ACOPOSMulti



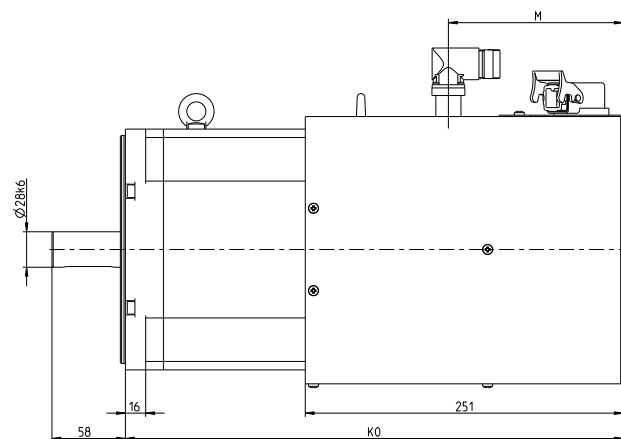
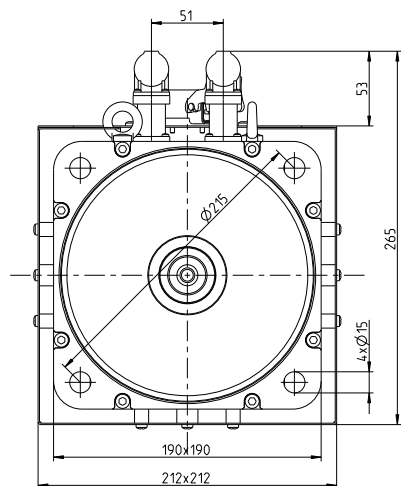
8LSC73.eennffgg-0



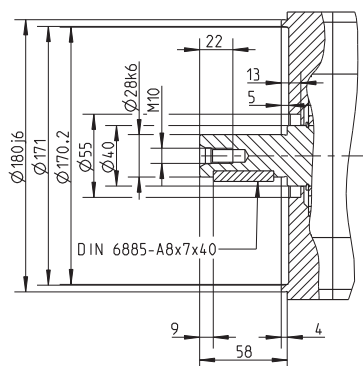
8LSC74.eennffgg-0



8LSC75.eennffgg-0



**A side flange detail
Standard bearing**



**Possible
connection directions**



Straight (top connector)



Angled (swivel connector)

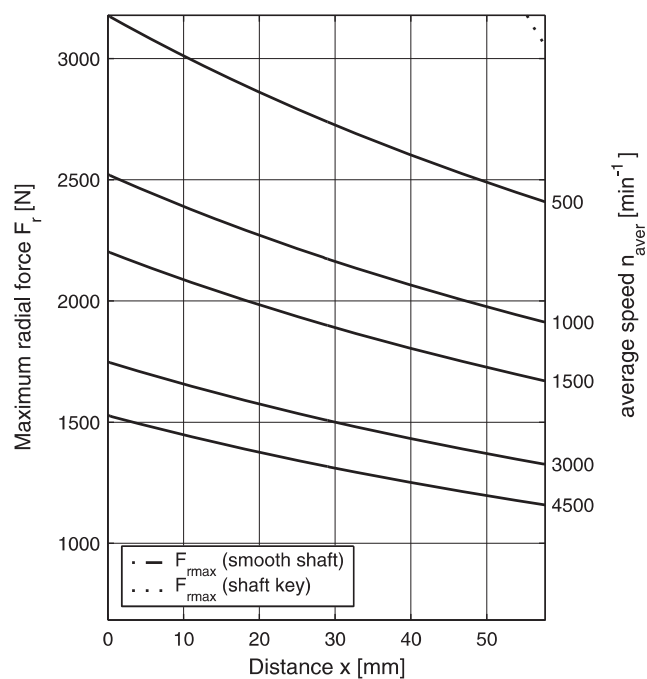
Dimensions

EnDat feedback		Resolver feedback		Extension of K_0 depending on the motor option [mm]				
Model number	K_0	M	Model number	K_0	M	Holding brake	Oil seal	Reinforced A side bearing
8LSC73.Exnnffgg-0	353	138	8LSC73.R0nnffgg-0	325	110	40	---	---
8LSC74.Exnnffgg-0	373	138	8LSC74.R0nnffgg-0	345	110	40	---	---
8LSC75.Exnnffgg-0	413	138	8LSC75.R0nnffgg-0	385	110	40	---	---

Maximum shaft load

The values in the diagram below are based on a mechanical lifespan of the bearings of 20,000 operating hours.

Standard bearing



maximum allowed axial force: $F_{amax} = 287$ N

Recommended B&R motor cable

The recommended B&R motor cable for a motor depends on the recommended ACOPOS servo drive or ACOPOSmulti inverter module (see "Recommended cable cross section for B&R motor cables [mm²]" in the table "Technical data") [1576](#)

Recommended B&R encoder cables

8BCExxxx.1111A-0 ACPmulti EnDat cable, length xxxx m, 10x 0.14 mm² + 2x 0.5 mm², EnDat plug 17-pin SpeedTec socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed [1428](#)

8BCRxxxx.1111A-0 ACPmulti Resolver cable, length xxxx m, 3 x 2 x 24 AWG (19 x 0.127), resolver plug 12-pin SpeedTec socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed [1429](#)

Motor connectors 8BPM

Features

- UL/CSA listed
- Metal housing; IP67 protection
- High-quality, gold-plated wire spring contacts
- High-level contact security even when reinserted many times
- SpeedTEC quick-release faster



General information	8BPM0001.0000-00	8BPM0002.0000-00	8BPM0003.0000-00
Connector size	Size 1	Size 1	Size 1.5
Number and type of contacts	8 (4 power and 4 signal contacts)	8 (4 power and 4 signal contacts)	8 (4 power and 4 signal contacts)
Degree of pollution	3	3	3
Installation altitude	Up to 2000 m	Up to 2000 m	Up to 2000 m
Insulator	PA, UL94/V0 listed	PA, UL94/V0 listed	PA, UL94/V0 listed
Contacts	Gold-plated brass	Gold-plated brass	Gold-plated brass
Protective ground connection on housing	According to VDE 0627	According to VDE 0627	According to VDE 0627
Protection according to DIN 40050	IP67 when connected	IP67 when connected	IP67 when connected
Certifications	UL/CSA	UL/CSA	UL/CSA
Electrical characteristics	8BPM0001.0000-00	8BPM0002.0000-00	8BPM0003.0000-00
Overvoltage category	3	3	3
Power contacts			
Rated current	30 A	30 A	75 A
Rated voltage	630 VAC / VDC	630 VAC / VDC	630 VAC / VDC
Test voltage (L-L)	6000 V	6000 V	6000 V
Contact resistance	< 3 Ω	< 3 Ω	< 1 Ω
Signal contacts			
Rated current	7 A	7 A	30 A
Rated voltage	250 VAC / VDC	250 VAC / VDC	630 VAC / VDC
Test voltage (L-L)	2500 V	2500 V	4000 V
Contact resistance	< 5 Ω	< 5 Ω	< 3 Ω
Mechanical characteristics	8BPM0001.0000-00	8BPM0002.0000-00	8BPM0003.0000-00
Temperature range	-20°C to +130°C	-20°C to +130°C	-20°C to +130°C
Housing material	Zinc casting, nickel plated	Zinc casting, nickel plated	Zinc casting, nickel plated
Gaskets	FKM	FKM	FKM
Connection cycles	> 50	> 50	> 50
Crimp range	4x 0.5 - 2.5 mm ² + 4x 0.06 - 1 mm ²	4x 2.5 - 4 mm ² + 4x 0.06 - 1 mm ²	4x 1.5 - 10 mm ² + 4x 0.5 - 2.5 mm ²
Cable ø	4.2 - 17 mm	4.2 - 17 mm	7 - 25 mm
Manufacturer information	8BPM0001.0000-00	8BPM0002.0000-00	8BPM0003.0000-00
Manufacturer	INTERCONTEC	INTERCONTEC	INTERCONTEC
Internet address	www.intercontec.biz	www.intercontec.biz	www.intercontec.biz
Manufacturer's product ID	BSTA 078 NN 00 42 0100 000	BSTA 078 NN 00 59 0100 000	CSTA 264 NN 00 45 0020 000

Encoder connectors

8BPE, 8BPR

Features

- UL/CSA listed
- Metal housing; IP67 protection
- High-quality, gold-plated wire spring contacts
- High-level contact security even when reinserted many times
- SpeedTEC quick-release faster



General information	8BPE0001.0000-00	8BPR0001.0000-00
Connector size	Size 1	Size 1
Number and type of contacts	17 signal contacts	12 signal contacts
Degree of pollution	3	3
Installation altitude	Up to 2000 m	Up to 2000 m
Insulator	PA, PBT, UL94/V0 listed	PA, PBT, UL94/V0 listed
Contacts	Gold-plated brass	Gold-plated brass
Protective ground connection on housing	According to VDE 0627	According to VDE 0627
Protection according to DIN 40050	IP67 when connected	IP67 when connected
Certifications	UL/CSA	UL/CSA
Electrical characteristics	8BPE0001.0000-00	8BPR0001.0000-00
Overvoltage category	3	3
Signal contacts		
Rated current	7 A	7 A
Rated voltage	125 V	160 V
Test voltage (L-L)	2000 V	2500 V
Contact resistance	< 5 Ω	< 5 Ω
Mechanical characteristics	8BPE0001.0000-00	8BPR0001.0000-00
Temperature range	-20°C to +130°C	-20°C to +130°C
Housing material	Zinc casting, nickel plated	Zinc casting, nickel plated
Gaskets	FKM, HBNR	FKM, HBNR
Connection cycles	> 50	> 50
Crimp range	17x 0.06 - 1 mm ²	12x 0.06 - 1 mm ²
Cable ø	3.5 - 14.7 mm	3.5 - 14.7 mm
Manufacturer information	8BPE0001.0000-00	8BPR0001.0000-00
Manufacturer	INTERCONTEC	INTERCONTEC
Internet address	www.intercontec.biz	www.intercontec.biz
Manufacturer's product ID	ASTA 035 NN 00 41 0100 000	ASTA 021 NN 00 41 0100 000

8JS three-phase synchronous motors Dynamic precision drives

Modern machine concepts demand compact and powerful motors. The compact AC servo motor series from B&R provides ways for the machine manufacturer to further optimize service and production processes.



Table of contents

System characteristics		1588
Product overview		1602
Product data sheets		1604
Accessories		1642

System characteristics



8JS three-phase synchronous motors

B&R's 8JS three-phase synchronous motors have been specially developed for use in high-performance applications. They are now being used to produce consumer goods and products in the plastic, packaging, metal, food and beverage industries and then palletize them with material handling systems. Complete solutions from one source: this requires the right components as well as the right configuration for the application environment. The large selection of available 8JS three-phase synchronous motors makes it possible to easily meet conditions such as reducing the variety of parts, guaranteeing ease of service and maintaining minimum requirements on space.

An optimally configured drive rounds off a successful design. To meet this goal, specialists are available at B&R subsidiaries all over the world who are eager to share their know-how in the area of mechatronics. B&R automation components: the economical combination of mechanics, electronics, technology and innovation.

Feedback systems specified to meet your needs

The 8JS three-phase synchronous motors are available with different encoder systems. As standard, they are equipped with Heidenhain EnDat encoders. The absolute encoder functions without a battery and is therefore absolutely maintenance free. The 8JS three-phase synchronous motors are also available with resolvers for machines with lower precision and speed requirements.

Smooth surface

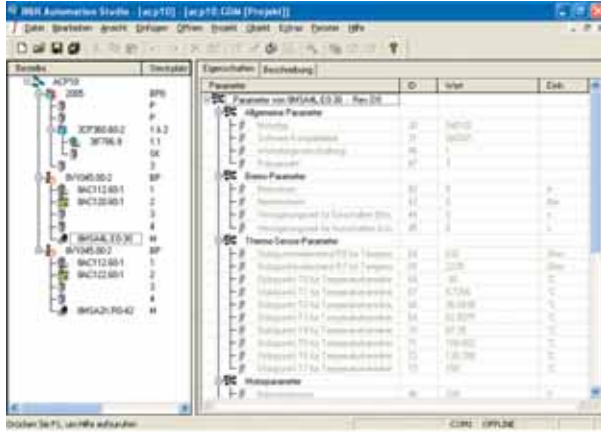
Special surface construction allows the 8JS three-phase synchronous motors to be used in applications for the food and beverage industry. Depressions where liquids could collect were deliberately avoided.

Connection type

The uniform connection technology, the prefabricated cables and the embedded parameter chip described above allow plug and play operation of the power transmission system. The angled connectors can be swiveled, which provides the maximum amount of flexibility during cabling.

Advantages of B&R drives for your application:

- *Easy to install*
- *Small installation dimensions*
- *Extremely easy to service*
- *Low costs*



Embedded parameter chip

All relevant mechanical and electrical information and data is stored in the encoder used for the 8JS three-phase synchronous motors. This means that the user doesn't have to make settings on the servo drive in the field. As soon as the encoder is connected to the servo drive and the power is applied to the electronics, the motor is automatically identified. The motor sends its rated parameters and limit parameters to the servo drive. The drive then automatically determines the current limits and current control parameters required for optimal control of the motor. The user only has to optimize the speed and position controller. The integrated start-up environment in B&R Automation Studio™ provides assistance.

In addition to start-up assistance, routine service work is also made easier and motors can be exchanged without having to take extra time to set parameters.

System characteristics

8JS three-phase synchronous motors

Three-phase synchronous motors from the 8JS series are permanently excited, electronically commutated synchronous motors for applications that require excellent dynamic characteristics and positioning precision as well as compact size and reduced weight.

- NdFeB permanent magnets
- Sinusoidal commutation with EnDat encoder or resolver as feedback unit
- Three-phase winding with star connection
- Compact sizes result in low weight
- Minimum moment of inertia because of favorable rotor construction results in very good dynamic properties
- High overload capability/peak torque
- Optimized torque ripple
- High dynamic torque at high speeds
- Long life-span, all motor parts except for bearings are free of wear
- Power dissipation generated in the stator diverted directly to the flange via the housing
- Preloaded, grooved ball bearings which are sealed on both sides and greased
- Complete motor system with stall torque ranging from 0.48 Nm to 53 Nm
- Connection using two SpeedTEC circular plugs
- Controlled by ACOPOS servo drives (📄 1251) or ACOPOSmulti drive systems (📄 1321)

8JS three-phase synchronous motors are not allowed to be connected directly to the power mains; they are only allowed to be operated in combination with ACOPOS servo drives (📄 1251) or ACOPOSmulti drive systems (📄 1321)!

Cooling types

Cooling type A

8JS three-phase synchronous motors with cooling type A are self-cooling and have a long, slim design. The motors must be installed on the cooling surface (flange).

Sizes

8JS three-phase synchronous motors are available in six different sizes (2 through 7). They have different dimensions (especially flange dimensions) and power ratings. The various sizes can be differentiated by a number (c) in the model number. The larger the number, the larger the flange dimensions and power rating for the respective motor. (see also order key [1597](#))

Overview

Cooling type	Available sizes					
	2	3	4	5	6	7
A	Yes	Yes	Yes	Yes	Yes	Yes

Lengths


The 8JS three-phase synchronous motors are available in up to five different lengths. They have different power ratings with identical flange dimensions. The various lengths can be differentiated by a number (d) in the model number. (see also order key [1597](#))

Overview

Length	Available for size					
	2	3	4	5	6	7
1	---	Yes	---	Yes	---	---
2	Yes	Yes	Yes	Yes	Yes	Yes
3	---	Yes	Yes	---	Yes	Yes
4	Yes	---	Yes	Yes	Yes	Yes
5	---	---	---	---	Yes	---

System characteristics

Motor encoder system

The 8JS three-phase synchronous motors are available with EnDat encoders and also with resolvers. The encoder system is listed as part of the model number in the form of a 2-digit code (ee).
(see also order key  1597)

EnDat encoders

General information

EnDat is a standard developed by Johannes Heidenhain GmbH (www.heidenhain.de) that incorporates the advantages of absolute and incremental position measurement and also offers a read/write parameter memory in the encoder. With absolute position measurement (absolute position is read in serially), the homing procedure is usually not required. When necessary, a multi-turn encoder (4096 revolutions) should be installed. To save costs, a single-turn encoder and a reference switch can also be used. In this case, a homing procedure must be carried out. The incremental process allows the short delay times necessary for position measurement on drives with exceptional dynamic properties. With the sinusoidal incremental signal and the fine resolution in the EnDat module, a very high positioning resolution is achieved in spite of the moderate signal frequencies used.

Technical data

Different types of EnDat encoders can be used depending on the requirements:

Name	E4 ¹⁾	E5 ¹⁾	E6 ²⁾	E7 ²⁾
Encoder type	EnDat single-turn	EnDat multi-turn	EnDat single-turn	EnDat multi-turn
Resolution	512-line	512-line	2048-line	2048-line
Recognizable Revolutions	---	4096	---	4096
Accuracy	±60"	±60"	±20"	±20"
Limit frequency	≥ 200 kHz (-3 dB)	≥ 200 kHz (-3 dB)	≥ 400 kHz (-3 dB)	≥ 400 kHz (-3 dB)
Vibration during operation 55 < f ≤ 2000 Hz	≤ 100 m/s ²	≤ 100 m/s ²	≤ 150 m/s ²	≤ 150 m/s ²
Shock during operation Length 6 ms	≤ 1000 m/s ²	≤ 1000 m/s ²	≤ 1000 m/s ²	≤ 1000 m/s ²
Manufacturer	Dr. Johannes Heidenhain GmbH	Dr. Johannes Heidenhain GmbH	Dr. Johannes Heidenhain GmbH	Dr. Johannes Heidenhain GmbH
Internet address	www.heidenhain.de	www.heidenhain.de	www.heidenhain.de	www.heidenhain.de
Manufacturer's product ID	ECN1113	EQN1125	ECN1313	EQN1325

1) Only available for size 2 and 3 motors.

2) Only available for size 4, 5, 6 and 7 motors.

Resolvers

General information

BRX type resolvers are used in the servo motors. These resolvers are fed with a single sinusoidal signal (reference signal) and return two sinusoidal signals as the result. The amplitude of these signals change with the angular position (sine or cosine form).

Technical data

Name	Order code (ee) R0
Accuracy	± 10 angular minutes
Non-linearity	± 1 angular minute
Vibration during operation	
$10 < f \leq 500$ Hz	≤ 100 m/s ²
Shock during operation	
Length 11 ms	≤ 400 m/s ²

Motor options

Depending on the size and length, the 8JS three-phase synchronous motors can be delivered

- With various rated speeds
- With or without oil seal
- With or without holding brake
- With a smooth shaft or a keyed shaft

Rated speed

The rated speed is listed as part of the model number in the form of a 3-digit code (nnn). The code is equal to the rated speed divided by 100. The respective combination of the other motor options is listed in the form of a 2-digit code (ff) as part of the model number (see section "Determining the order code for motor options (ff)", [1596](#)).
(see also order key [1597](#))

Oil seal

All 8JS three-phase synchronous motors are available with an optional form A oil seal according to DIN 3760.

When equipped with an oil seal, the motors have IP65 protection according to IEC 60034-5.

Proper lubrication of the oil seal must be guaranteed throughout the entire lifespan of the motor.

System characteristics

Holding brake

All 8JS three-phase synchronous motors can be delivered with a holding brake. It is installed directly behind the B-side bearing on the motor and is used to hold the motor shaft when no power is applied to the servo motor.

Functionality

The holding brake is a spring-loaded brake and is controlled by the ACOPOS servo drive or an ACOPOS-multi inverter module. Based on principle, this type of holding brake exhibits a minimal amount of backlash.

The brake is designed as a holding brake. It is not permitted to be used to for operational braking! If these conditions are met, the brake has a lifespan of approximately 5000000 cycles (opening and closing the brake again is one cycle).

Loaded braking during an emergency stop is permitted - but reduces the lifespan.

The required brake holding torque is determined based on the occurring load torque. If the load torque is not sufficiently known, it is recommended to assume a safety factor of 2.

Technical data for the standard holding brake

Name	Motor size					
	2	3	4	5	6	7
Holding torque M_{Br} [Nm]	1.42	2.5	5,3	14.5	25	53
Installed load P_{on} [W]	8.4 ± 7%	10.1 ± 7%	12.8 ± 7%	19.5 ± 7%	25.7 ± 7%	35.6 ± 7%
Installed current I_{on} [A]	0.35	0.42	0.53	0.82	1.07	1.48
Installed voltage U_{on} [V]	24 VDC ± 10%	24 VDC ± 10%	24 VDC ± 10%	24 VDC ± 10%	24 VDC ± 10%	24 VDC ± 10%
Activation delay t_{on} [ms]	18	10	15	15	20	35
Release delay t_{off} [ms]	20	25	35	80	105	110
Moment of inertia J_{Br} [kgcm ²]	0.011	0.011	0.068	0.173	0.61	1.64
Weight m_{Br} [kg]	0.27	0.35	0.63	1.1	2	2.9

Design of the shaft end

All 8JS three-phase synchronous motor shafts comply to DIN 748. They can be delivered with a smooth shaft or a keyed shaft.

Smooth shaft

A smooth shaft end is used for a force-fit shaft-hub connection that guarantees a zero-play connection between shaft and hub as well as smooth operation. The end of the shaft has a threaded center hole which can be used to remove drive elements.

Keyed shaft

The keyed shaft can be used for a form-fit torque transfer with low demands on the shaft-hub connection and for handling torques with a constant direction.

The keyways for the 8JS three-phase synchronous motors conform to keyway form N1 according to DIN 6885-1. Form A shaft keys that conform to DIN6885-1 are used. Balancing motors with keyways is done using the half-key convention according to ISO 1940/1, G6.3.

The end of the shaft has a threaded center hole which can be used to mount drive elements with shaft end disks.

Load capacity of the shaft end and bearing

The 8JS three-phase synchronous motors are equipped with grooved ball bearings which are sealed on both sides and greased. The radial and axial forces (F_r , F_a) that occur on the shaft end during operation and installation must be within the specifications listed below. The bearing elements are not permitted to be subject to shocks or impacts! Incorrect handling will cause the lifespan of the bearings to be reduced or the bearing to be damaged.

Installation

The axial forces F_a permitted during the installation of gearboxes, pinion gears, couplings, etc. depend on the motor size and can be found in the following table:

Motor size	Permitted axial force F_a [N]	Permitted radial force F_r [N]
2	600	150
3	600	340
4	1400	500
5	1740	830
6	2200	1940
7	3000	2300

Operation

Radial force

The radial force F_r on the shaft end is made up of the installation forces (e.g. belt tension on pulleys) and operational forces (e.g. load torque on the pinion). The maximum radial force F_r depends on the shaft end type, bearing type, average speed, position where the radial force is applied and the desired lifespan of the bearings.

Axial force, shift in shaft position caused by axial force

The axial force F_a on the shaft end is made up of the installation forces (e.g. stress caused by installation) and operational forces (e.g. thrust caused by slanted tooth pinions). The maximum axial force F_a depends on the bearing type and the desired lifespan of the bearings. The fixed bearing is secured on the A flange with a retaining ring. The floating bearing is preloaded on the B flange with a spring in the direction of the A flange. Axial forces in the direction of the B flange can cause the spring bias to be overcome and the shaft is shifted by the amount of axial play in the bearing (approx. 0.1 - 0.2 mm).

System characteristics

Determining permissible values for F_r and F_a

Information to determine permissible values of F_r and F_a can be taken from the motor data for the respective three-phase synchronous motors (see section "8JSA2", 1604 to section "8JSA7", 1636). Permissible values are based on a bearing lifespan of 20,000 h (bearing lifespan calculation based on DIN ISO 281).

Simultaneously loading the shaft end with the maximum values of F_r and F_a is not permitted! Contact B&R if this occurs.

Connection directions

8JS three-phase synchronous motors can be delivered with axial swivel connectors.

Determining the order code for motor options (ff)

The respective code (ff) for the order key can be found in the following table:

Motor options				Code for order key (ff)
Connection direction	Oil seal	Holding brake	Shaft end	
Angled (swivel connector)	No	No	Smooth	D0
		Normal	Keyed	D1
			Smooth	D2
		Keyed	D3	
	Yes	No	Smooth	D6
			Keyed	D7
		Normal	Smooth	D8
			Keyed	D9

Order key

8JS	b	c	d	.	ee	nnn	ff	gg	-	h
-----	---	---	---	---	----	-----	----	----	---	---

Cooling type(see section "Cooling types", 1590)

A ... self-cooling (no separate surface cooling)

Size (see section "Sizes", 1591)

Valid values: **2, 3, 4, 5, 6, 7**

Length (see section "Lengths", 1591)

Valid values: **1, 2, 3, 4, 5**

Encoder system (see section "Motor encoder systems", 1592)

E4 ... EnDat single-turn, 512 lines (ECN1113) ¹⁾

E5 ... EnDat multi-turn, 512 lines (EQN1125), 4,096 revolutions ¹⁾

E6 ... EnDat single-turn, 2048 lines (ECN1313) ²⁾

E7 ... EnDat multi-turn, 2048 lines (EQN1325), 4,096 revolutions ²⁾

R0 ... Resolver

1) Only available for size 2 and 3 motors.

2) Only available for size 4, 5, 6 and 7 motors.

Motor options (see section "Motor options", 1593, and section "Determining the order code for motor options (ff)", 1596)

nnn .. Rated rotational speed/100; e.g.: 030 corresponds to a rated speed of 3000 min⁻¹

Motor options (see section "Motor options", 1593)

Special motor options

00 ... No special motor options

Motor version

Valid values: **0**

System characteristics

Example order 1

A three-phase synchronous motor (type **8JSA44**) with a rated speed of 4000 min^{-1} was selected for an application. The motor should also be equipped with a holding brake, a keyed shaft and a 2048-line EnDat single-turn encoder.

The code (ee) for the encoder system is **E6** (see "EnDat encoder", 1592).

The code (nnn) for a rated speed of 4000 min^{-1} is **040**.

The code (ff) for the other options (oil seal, holding brake, keyed shaft and connection direction) is **D3** (see "Motor option key codes (ff)", 1597).

The model number for the required motor is **8JSA44.E6040D300-0**

Example order 2

A three-phase synchronous motor (type **8JSA54**) with a rated speed of 5000 min^{-1} was selected for an application. The motor should also be equipped with a holding brake, a smooth shaft, an oil seal and a 2048 line EnDat multi-turn encoder.

The code (ee) for the encoder system is **E7** (see "Technical data for the EnDat encoder", 1592).

The code (nnn) for a rated speed of 5000 min^{-1} is **050**.

The code (ff) for the other options (oil seal, holding brake, keyed shaft and connection direction) is **D8** (see "Motor option key codes (ff)", 1597).

Therefore the model number for the motor required is: **8JSA54.E7050D800-0**

General motor data

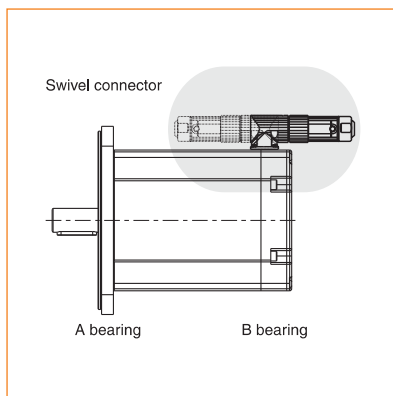
General information	Cooling type A
C-UR-US listed	YES
Electrical characteristics	Cooling type A
Mains input voltage on servo drive	3 x 400 VAC ... 3 x 480 VAC ± 10%
Connection type	SpeedTEC circular connector from Intercontec
Motor connector	Size 1
Encoder connection	Size 1
Thermal characteristics	Cooling type A
Insulation class according to IEC 60034-1	F
Methods of cooling according to IEC 60034-6 (IC code)	Self-cooling No separate surface cooling (IC4A0A0)
Thermal motor protection according to IEC 60034-11	Maximum winding temperature is 155°C (the thermal motor protection in ACOPOS servo drives or in the ACOPOSmulti drive system limits it to 110°C)
Mechanical characteristics	Cooling type A
Vibration severity according to IEC 60034-14	Vibration class A ¹⁾
Roller bearing, dynamic load ratings and rated lifespan	Based on DIN ISO 281
Shaft End according to DIN 748	Form E
Oil seal according to DIN 3760	Form A
Key and keyway according to DIN 6885-1	Keyway form N1; key form A
Shaft balancing according to ISO 1940/1, G6.3	Half-key arrangement
Mounting flange	IEC 72-1
Shaft end concentricity, coaxial properties and mounting flange plane according to DIN 42955	Tolerance-N
Paint	Polyester powder coating
Name	Mansfield 053-2006 Polyester
Color	similar to RAL 9005 flat
1) Valid for all motors with a shaft height of more than 56 mm	
Operational conditions	Cooling type A
Rating class, operation mode acc. to IEC 60034-1	S1 - continuous operation
Ambient temperature during operation	*5°C to +40°C ²⁾
Reduction of the rated current and stall current at temperatures above 40°C	10% per 10°C
Maximum ambient temperature during operation	+50°C ¹⁾
Relative humidity during operation	5 to 95%, non-condensing
Reduction of the rated current and stall current at installation altitudes	6% at 2000 m
Starting at 1000 m above sea level	17% at 3000 m 30% at 4000 m 55% at 5000 m
Maximum installation altitude	5000 m ²⁾
Maximum flange temperature	65°C
Protection Standards according to IEC 60034-5 (IP code)	IP54
With optional oil seal	IP65
Construction and mounting arrangement type according to EN60034-7 (IM code)	Horizontal (IM3001) Vertical, motor hangs on the machine (IM3031) Vertical, motor stands on the machine (IM3011)
1) Continuous operation of the servo motors at ambient temperatures from +40°C to max. +50°C is possible, but results in a shorter lifespan.	
2) Additional requirements are to be arranged with B&R.	
Storage and transport conditions	Cooling type A
Storage temperature	-20 to +60°C
Relative humidity during storage	Max. 90%, non-condensing
Transport temperature	-20 to +60°C
Relative humidity during transport	Max. 90%, non-condensing

System characteristics

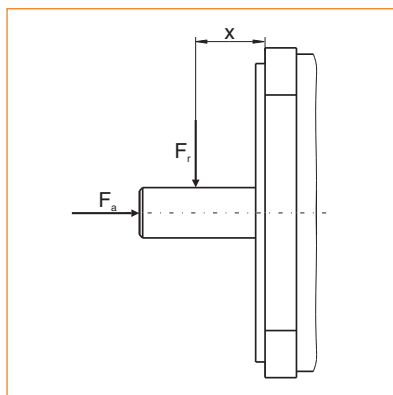
Terminology and formula symbols

Connection direction terminology, bearings

Angled (swivel connector)



Definitions for maximum shaft load diagrams



F_r Radial force

F_a Axial force

x Between motor flange and the point the radial force F_r is applied

Formula symbols

Term	Character	Device	Description
Rated speed	n_N	min^{-1}	Rated motor speed.
Rated torque	M_N	Nm	The rated torque is output by the motor ($n = n_N$) when the rated current is being drawn. This is possible for any length of time if the environmental conditions are correct.
Rated power	P_N	kW	The rated power is output by the motor when $n = n_N$. This is possible for any length of time if the environmental conditions are correct.
Rated current	I_N	A	The rated current is the effective value for the phase current (current in the motor supply line) when generating the rated torque at the rated speed. This is possible for any length of time if the environmental conditions are correct.
Stall torque	M_0	Nm	The "stall torque" is output by the motor at the speed n_0 and when the "stall current" is being drawn. This is possible for any length of time if the environmental conditions are correct. The speed n_0 must be high enough so that the winding temperature in all windings is uniform and stationary ($n_0 = 100 \text{ min}^{-1}$ for 8JS three-phase synchronous motors). The continuous torque is reduced while stationary.
Stall current	I_0	A	The "stall current" is the effective value of the phase current (current in the motor supply line) for the generation of the "stall torque" at the speed n_0 . This is possible for any length of time if the environmental conditions are correct. The speed n_0 must be high enough so that the winding temperature in all windings is uniform and stationary ($n_0 = 100 \text{ min}^{-1}$ for 8JS three-phase synchronous motors). The continuous current is reduced while stationary.
Peak torque	M_{max}	Nm	The peak torque is briefly output by the motor when the peak current is being drawn.
Maximum current	I_{max}	A	The peak current is the effective value of the phase current (current in the motor supply line) for the generation of the peak torque. Only possible for a short time. The peak current is determined by the magnetic circuit. Exceeding this value for a short time can cause irreversible damage (demagnetize the magnet material).
Maximum angular acceleration without brake	a	rad/s^2	Maximum acceleration of the motor without load and without brake. Value for the dynamics of the motor (corresponds to M_{max} / J).
Maximum speed	n_{max}	min^{-1}	Maximum motor speed. This is a mechanical condition (centrifugal force, bearing wear).
Average speed	n_{aver}	min^{-1}	Average speed for one cycle
Torque constant	K_T	Nm/A	The torque constant determines the torque created by the motor with 1 A_{rms} phase current. This value applies at a motor temperature of 20°C. When the temperature increases, the torque constant is reduced (generally to 10%). When the current increases, the torque constant is reduced (generally starting at twice the value of the rated current).
Voltage constant	K_E	V/1000 min^{-1}	The voltage constant determines the effective value (phase-phase) of the reverse voltage (EMF) induced by the motor with a speed of 1000 min^{-1} . This value applies at a motor temperature of 20°C. When the temperature increases, the voltage constant is reduced (generally to 5%). When the current increases, the voltage constant is reduced (generally starting at twice the value of the rated current).
Stator resistance	$R_{2\text{ph}}$	Ω	Resistance measured in ohms between two motor leads (phase-phase) at 20°C winding temperature. On B&R motors, the windings use a star connection.
Stator inductance	$L_{2\text{ph}}$	mH	Winding inductance measured between two motor leads. Stator inductance depends on the rotor position.
Electrical time constant	t_{el}	ms	Corresponds to 1/5 of the time needed for the stator current to stabilize with constant operating conditions.
Thermal time constant	t_{therm}	min	Corresponds to 1/5 of the time needed for the motor temperature to stabilize with constant operating conditions.
Moment of inertia without brake	J	kgcm^2	Moment of inertia for the motor without holding brake.
Weight without brake	m	kg	Weight of the motor without holding brake.
Moment of inertia of brake	J_{Br}	kgcm^2	Moment of inertia for the built-in holding brake.
Weight of brake	m_{Br}	kg	Weight of the built-in holding brake.
Brake holding torque	M_{Br}	Nm	Minimum torque required to hold the rotor when the brake is activated.
Installed load	P_{in}	W	Installed load for the built-in holding brake.
Installed current	I_{in}	A	Installed current for the built-in holding brake.
Installed voltage	U_{in}	V	Operating voltage for the built-in holding brake.
Activation delay	t_{on}	ms	Delay time required for the holding torque of the brake to be established after the operating voltage has been removed from the holding brake.
Release delay	t_{off}	ms	Delay time required until the holding torque of the holding brake is reduced by 90% (the brake is released) after the operating voltage has been returned to the holding brake.

Product overview

The technical data listed in this section (K_E , K_T , I_N , I_0 , I_{max} , R_{2ph} , L_{2ph} , t_{el} , t_{therm} , m , J) has a theoretical tolerance range of $\pm 10\%$. This is also valid for the speed - torque characteristic curves represented in the following sections.

Motor	8JSA22.ee080ffgg-0	8JSA24.ee080ffgg-0	8JSA31.ee050ffgg-0	8JSA32.ee030ffgg-0	8JSA32.ee055ffgg-0	8JSA33.ee045ffgg-0	8JSA42.ee035ffgg-0	8JSA43.ee050ffgg-0	8JSA44.ee040ffgg-0	8JSA51.ee045ffgg-0
Rated speed n_N [min ⁻¹]	8000	8000	5000	3000	5500	4500	3500	5000	4000	4500
Number of poles	6	6	8	8	8	8	10	10	10	10
Rated torque M_N [Nm]	0.7	1.1	1	1.9	1.7	2.3	2.8	3	3.8	3
Rated power P_N [kW]	0.59	0.92	0.52	0.6	0.98	1.08	1.03	1.57	1.59	1.41
Rated current I_N [A]	1.11	1.76	1.18	1.33	1.79	2.13	2.23	3.04	3.16	4.65
Stall torque M_0 [Nm] ¹⁾	0.8	1.41	1.15	2	2	2.8	3.4	4.8	5.9	4.7
Stall current I_0 [A]	1.39	2.21	1.37	1.4	2.2	2.6	2.7	4.9	5	7.5
Peak torque M_{max} [Nm]	2.73	4.76	3.88	6.92	7.05	9.96	11.3	16.1	20.2	11.9
Peak current I_{max} [A]	5.6	8.8	5.5	5.7	8.9	10.3	11	19.5	20	22.6
Maximum angular acceleration without brake a [rad/s ²]	248182	176296	117576	117288	119492	117177	75333	76667	74815	35000
Maximum speed n_{max} [min ⁻¹]	8000	8000	8000	8000	8000	8000	6000	6000	6000	6000
Torque constant K_T [Nm/A]	0.61	0.63	0.85	1.4	0.92	1.1	1.26	0.99	1.19	0.65
Voltage constant K_E [V/1000 min ⁻¹]	38.75	40.84	54.45	90.06	58.64	70.16	80.63	63.88	76.45	41.89
Stator resistance R_{2ph} [Ω]	19.4	9	21.4	23.76	10.3	9.01	7.78	2.81	2.8	1.16
Stator inductance L_{2ph} [mH]	35.5	18.7	37.5	46.5	20.1	18.5	26.8	10.8	11.5	5.2
Electrical time constant t_{el} [ms]	1.8	2.1	1.8	2	2	2.1	3.4	3.8	4.1	4.5
Thermal time constant t_{therm} [min]	9	11	14	17	17	20	17	20	24	20
Moment of inertia without brake J [kgcm ²]	0.16	0.27	0.33	0.59	0.59	0.85	1.5	2.1	2.7	3.4
Weight without brake m [kg]	1.1	1.66	1.6	2.2	2.2	2.9	3.4	4.35	5.3	4.2
Holding brake										
Moment of inertia for brake J_{Br} [kgcm ²]	0.01	0.01	0.011	0.011	0.011	0.011	0.068	0.068	0.068	0.173
Weight of brake m_{Br} [kg]	0.27	0.27	0.35	0.35	0.35	0.35	0.63	0.63	0.63	1.1
Holding torque of the brake M_{Br} [Nm]	1.42	1.42	2.5	2.5	2.5	2.5	6	6	6	14.5
Recommendations										
Cross section for B&R motor cables [mm ²] ²⁾	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
ACOPOS	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314	▮ 1314
ACOPOSmulti	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425	▮ 1425
ACOPOS servo drive 8Vxxxx.00-x ³⁾	1016	1045	1016	1016	1045	1045	1045	1090	1090	1090
ACOPOSmulti inverter module 8BVI... ⁴⁾	0014	0028	0014	0014	0028	0028	0028	0055	0055	0055

1) The values decrease depending on the motor option (see data sheet for details).

2) The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSmulti inverter module. B&R motor cables with other cable cross sections can normally be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design upon request.

3) The recommended servo drive is defined for 1.1x the stall current of the motor. If more than double the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, a detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

4) The recommended ACOPOSmulti inverter module is defined for 1.1x the stall current of the motor. If more than double the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, a detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

Motor	8JSA52.ee045ffgg-0	8JSA54.ee028ffgg-0	8JSA54.ee050ffgg-0	8JSA62.ee030ffgg-0	8JSA63.ee023ffgg-0	8JSA64.ee030ffgg-0	8JSA65.ee025ffgg-0	8JSA72.ee020ffgg-0	8JSA73.ee024ffgg-0	8JSA74.ee018ffgg-0
Rated speed n_N [min ⁻¹]	4500	2750	5000	3000	2250	3000	2500	2000	2400	1800
Number of poles	10	10	10	10	10	10	10	10	10	10
Rated torque M_N [Nm]	5.2	11.3	7.1	9.4	13.9	15.6	19.2	23.6	28.5	39.6
Rated power P_N [kW]	2.45	3.25	3.72	2.95	3.35	4.9	5.03	4.94	7.16	7.46
Rated current I_N [A]	4.4	6.01	6.24	5.84	6.42	9.4	10.38	10.13	13.38	13.94
Stall torque M_0 [Nm] ¹⁾	8.7	14.7	14.1	12.2	17.1	21	25	30	41.6	52.5
Stall current I_0 [A]	7.4	7.8	12.5	7.6	7.9	12.8	13.6	13	19.5	18.5
Peak torque M_{max} [Nm]	22	37	37.54	30	42.5	54.1	65.2	79.7	111	142
Peak current I_{max} [A]	22.1	23.3	37.5	22.7	23.6	38.4	40.9	38.9	58.6	55.5
Maximum angular acceleration without brake a [rad/s ²]	35484	30833	31283	17647	17562	16906	16300	12262	12065	11833
Maximum speed n_{max} [min ⁻¹]	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Torque constant K_T [Nm/A]	1.17	1.88	1.13	1.61	2.16	1.66	1.85	2.33	2.13	2.84
Voltage constant K_E [V/1000 min ⁻¹]	75.4	120.43	73.3	103.67	138.23	106.81	119.38	149.75	137.18	183.26
Stator resistance R_{2ph} [Ω]	1.45	1.58	0.65	1.65	1.7	0.75	0.73	0.69	0.38	0.47
Stator inductance L_{2ph} [mH]	7.8	9.6	3.5	13.4	14.6	6.2	6.1	10.8	5.9	7.7
Electrical time constant t_{el} [ms]	5.4	6.1	5.4	8.1	8.6	8.3	8.4	15.7	15.5	16.4
Thermal time constant t_{therm} [min]	24	31	31	20	25	30	35	46	53	60
Moment of inertia without brake J [kgcm ²]	6.2	12	12	17	24.2	32	40	65	92	120
Weight without brake m [kg]	5.8	9	9	8.9	11.1	13.3	15.4	19.7	26.7	33.6
Holding brake										
Moment of inertia for brake J_{Br} [kgcm ²]	0.173	0.173	0.173	0.61	0.61	0.61	0.61	1.64	1.64	1.64
Weight of brake m_{Br} [kg]	1.1	1.1	1.1	2	2	2	2	2.1	2.1	2.1
Holding torque of the brake M_{Br} [Nm]	14.5	14.5	14.5	25	25	25	25	53	53	53
Recommendations										
Cross section for B&R motor cables [mm ²] ²⁾	1.5	1.5	4	1.5	1.5	4	4	4	4	4
ACOPOS	▮ 1314	▮ 1314	▮ 1315	▮ 1314	▮ 1314	▮ 1315	▮ 1315	▮ 1315	▮ 1315	▮ 1315
ACOPOSmulti	▮ 1425	▮ 1425	▮ 1426	▮ 1425	▮ 1425	▮ 1426	▮ 1426	▮ 1426	▮ 1426	▮ 1426
ACOPOS servo drive 8Vxxx.00-x ³⁾	1090	1090	1180	1090	1090	1180	1180	1180	1320	1320
ACOPOSmulti inverter module 8BVI... ⁴⁾	0110	0110	0110	0110	0110	0110	0110	0110	0220	0220

1) The values decrease depending on the motor option (see data sheet for details).

2) The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSmulti inverter module. B&R motor cables with other cable cross sections can normally be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design upon request.

3) The recommended servo drive is defined for 1.1x the stall current of the motor. If more than double the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, a detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

4) The recommended ACOPOSmulti inverter module is defined for 1.1x the stall current of the motor. If more than double the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, a detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

8JSA2



Technical data	8JSA22.ee080ffgg-0	8JSA24.ee080ffgg-0
Rated speed n_N [min ⁻¹]	8000	8000
Number of poles	6	6
Rated torque M_N [Nm]	0.7	1.1
Rated power P_N [kW]	0.59	0.92
Rated current I_N [A]	1.11	1.76
Stall torque M_0 [Nm] ¹⁾	0.8	1.41
Stall current I_0 [A]	1.39	2.21
Peak torque M_{max} [Nm]	2.73	4.76
Peak current I_{max} [A]	5.6	8.8
Maximum angular acceleration without brake a [rad/s ²]	248182	176296
Maximum speed n_{max} [min ⁻¹]	8000	8000
Torque constant K_T [Nm/A]	0.61	0.63
Voltage constant K_E [V/1000 min ⁻¹]	38.75	40.84
Stator resistance R_{2ph} [Ω]	19.4	9
Stator inductance L_{2ph} [mH]	35.5	18.7
Electrical time constant t_{el} [ms]	1.8	2.1
Thermal time constant t_{therm} [min]	9	11
Moment of inertia without brake J [kgcm ²]	0.16	0.27
Weight without brake m [kg]	1.1	1.66
Holding brake		
Moment of inertia for brake J_{Br} [kgcm ²]	0.01	0.01
Weight of brake m_{Br} [kg]	0.27	0.27
Holding torque of the brake M_{Br} [Nm]	1.42	1.42
Recommendations		
Cross section for B&R motor cables [mm ²] ²⁾	1.5	1.5
ACOPOS ¹⁾	☰ 1314	☰ 1314
ACOPOSmulti	☰ 1425	☰ 1425
ACOPOS servo drive 8Vxxxx.00-x ³⁾	1016	1045
ACOPOSmulti inverter module 8BVI... ⁴⁾	0014	0028

1) Flange design: Aluminum, 254 mm x 254 mm x 6.35 mm. The values decrease as follows depending on the motor option (the respective rated values also decrease simultaneously):

- Holding brake: 8JSA22: 0.01 Nm / 8JSA24: 0.05 Nm

- EnDat encoder: No reduction

- Holding brake + EnDat encoder: 8JSA22: 0.02 Nm / 8JSA24: 0.12 Nm

2) The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSmulti inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request.

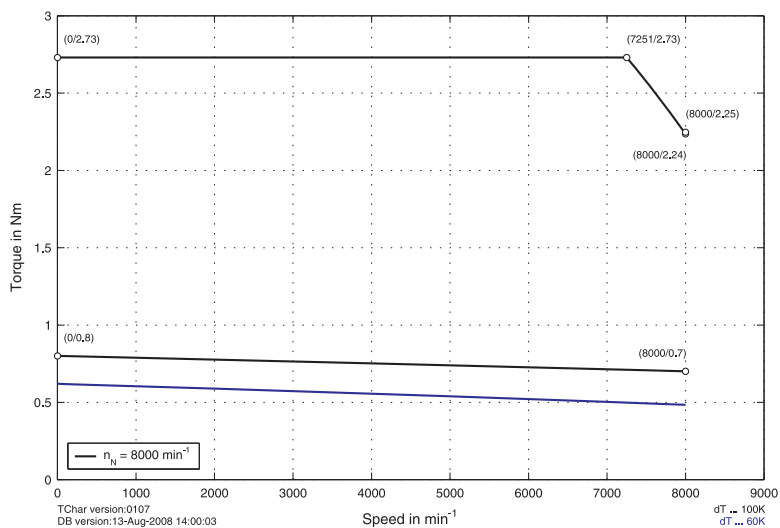
3) The recommended servo drive is defined for 1.1x the stall current of the motor; if more than 2x the stall torque is required during the acceleration phase, the next larger servo drive should be selected.

This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

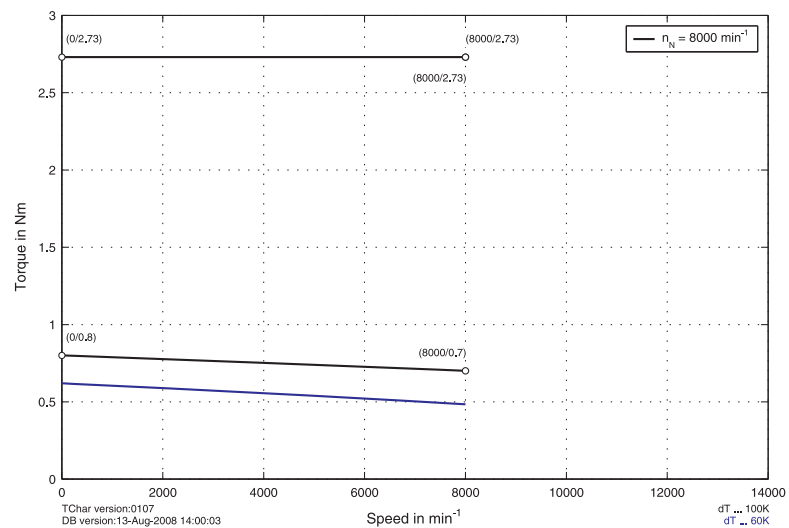
4) The recommended ACOPOSmulti inverter module is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

Speed-torque characteristic curves with 400 VAC supply voltage

ACOPOS

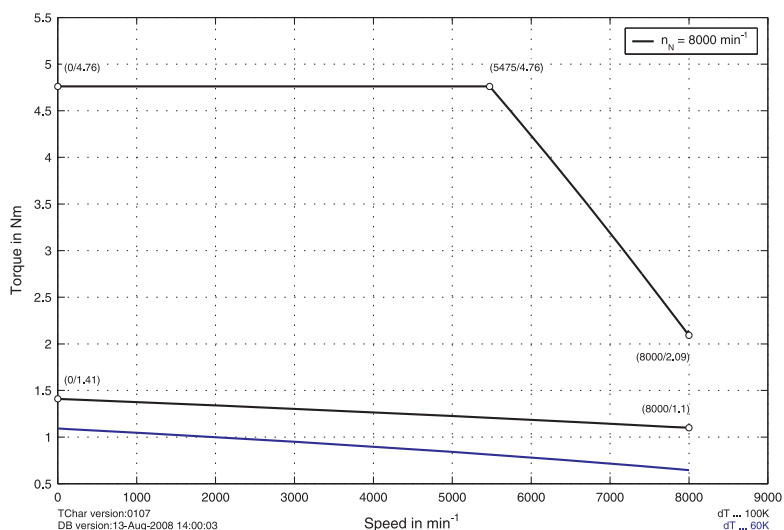


ACOPOSmulti

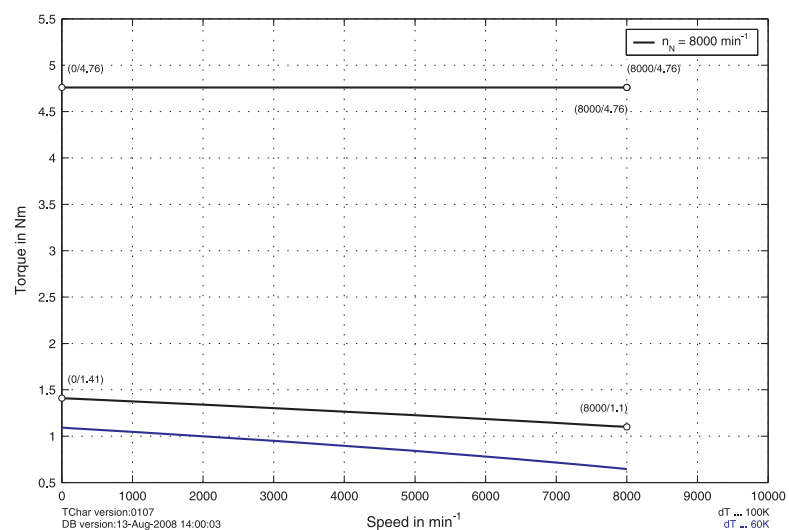


8JSA22.eennffgg-0

ACOPOS



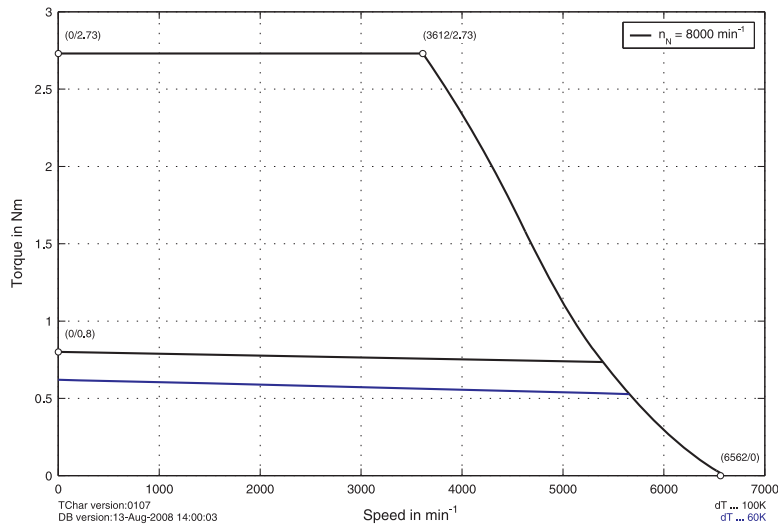
ACOPOSmulti



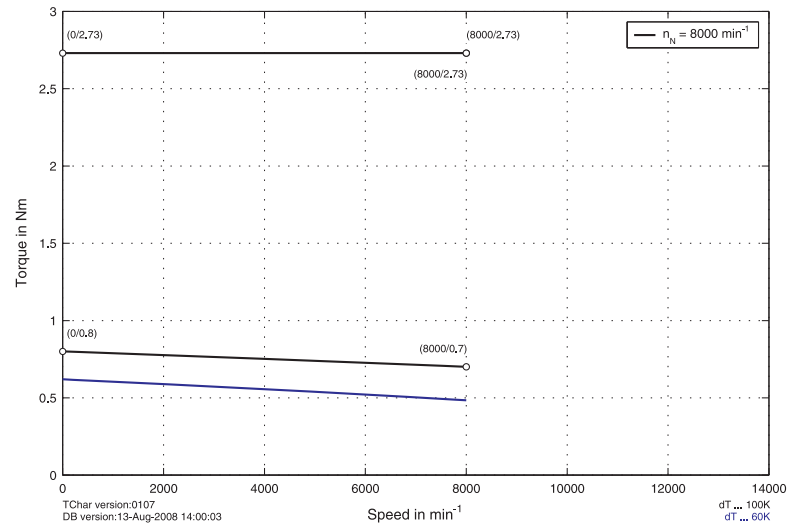
8LSA24.eennffgg-0

Speed-torque characteristic curves with 230 VAC supply voltage

ACOPOS

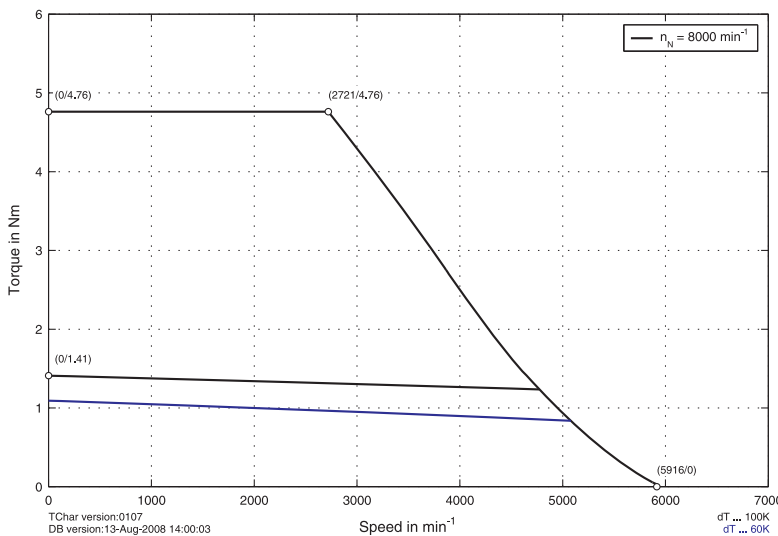


ACOPOSmulti

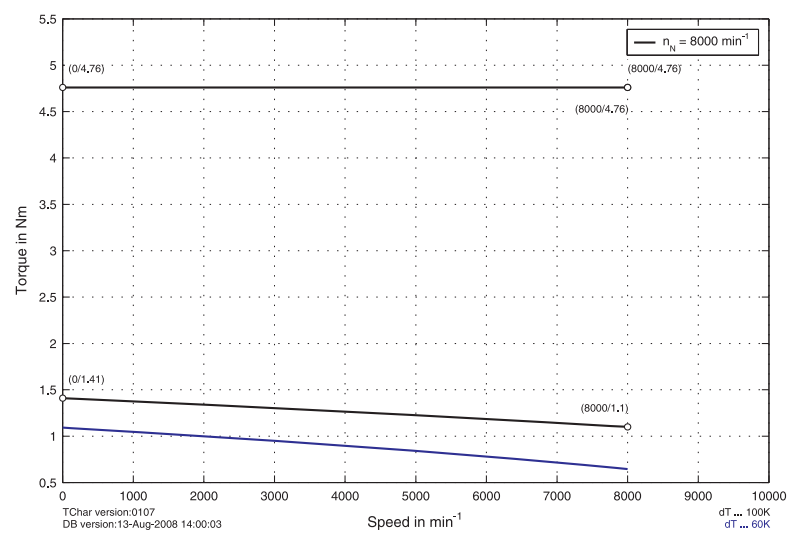


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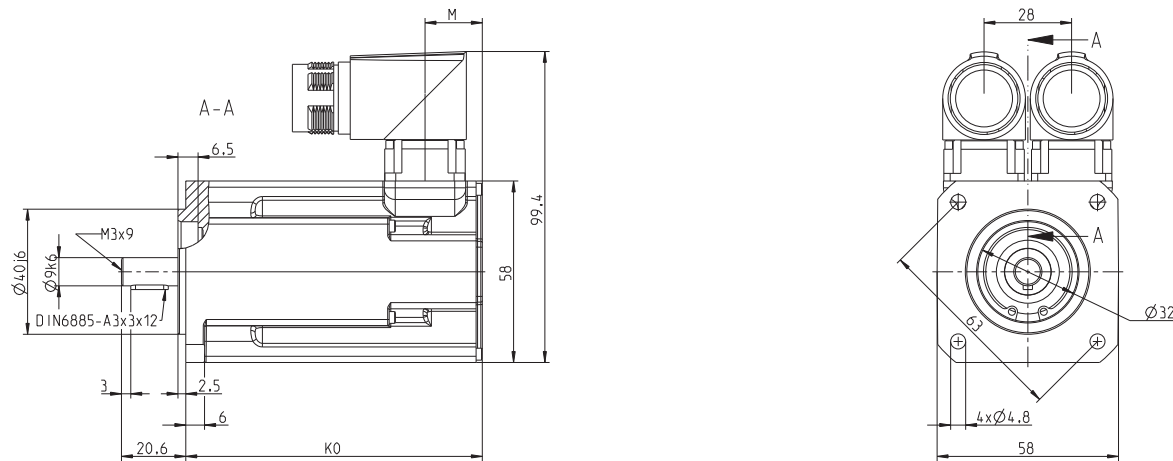
ACOPOS



ACOPOSmulti



8LSA24.eennffgg-0

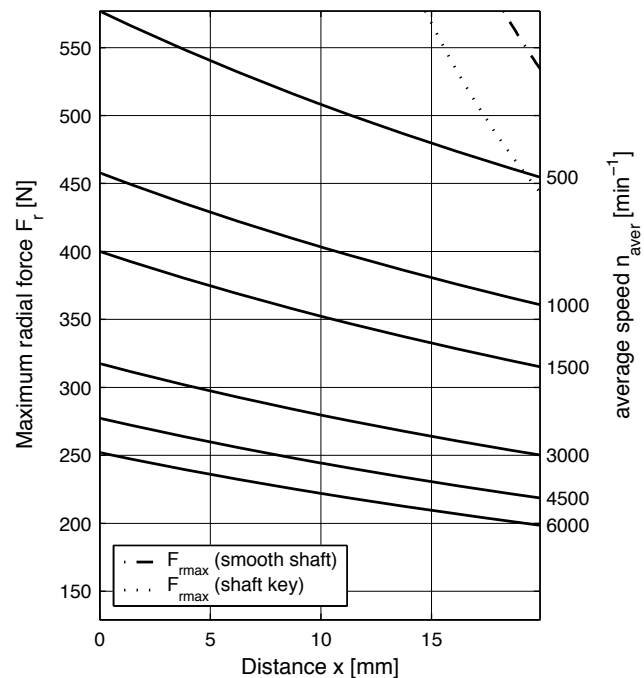


Dimensions

EnDat feedback		Resolver feedback		Extension of K_0 depending on the motor option [mm]			
Model number	K_0	M	Model number	K_0	M	Holding brake	Oil seal
8JSA22.Exnnnffgg-0	95.4	19.3	8JSA22.R0nnnffgg-0	95.4	19.3	34.1	---
8JSA24.Exnnnffgg-0	133.4	19.3	8JSA24.R0nnnffgg-0	133.4	19.3	34.1	---

Maximum shaft load

The values in the diagram below are based on a mechanical lifespan of the bearings of 20,000 operating hours.



maximum allowed axial force: $F_{amax} = 53 \text{ N}$

Recommended B&R motor cable

The recommended B&R motor cable for a motor depends on the recommended ACOPOS servo drive or ACOPOSmulti inverter module (see "Recommended cable cross section for B&R motor cables [mm^2]" in the table "Technical data") 1604

Recommended B&R encoder cable

8BCExxxx.1111A-0	ACPmulti EnDat cable, length xxxx m, $10 \times 0.14 \text{ mm}^2 + 2 \times 0.5 \text{ mm}^2$, EnDat plug 17-pin SpeedTEC socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed 1428
8BCRxxxx.1111A-0	ACPmulti Resolver cable, length xxxx m, $3 \times 2 \times 24 \text{ AWG}$ (19×0.127), resolver plug 12-pin SpeedTEC socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed 1429



8JSA3



Technical data	8JSA31.ee050ffgg-0	8JSA32.ee030ffgg-0	8JSA32.ee055ffgg-0	8JSA33.ee045ffgg-0
Rated speed n_N [min ⁻¹]	5000	3000	5500	4500
Number of poles	8	8	8	8
Rated torque M_N [Nm]	1	1.9	1.7	2.3
Rated power P_N [kW]	0.52	0.6	0.98	1.08
Rated current I_N [A]	1.18	1.33	1.79	2.13
Stall torque M_0 [Nm] ¹⁾	1.15	2	2	2.8
Stall current I_0 [A]	1.37	1.4	2.2	2.6
Peak torque M_{max} [Nm]	3.88	6.92	7.05	9.96
Peak current I_{max} [A]	5.5	5.7	8.9	10.3
Maximum angular acceleration without brake a [rad/s ²]	117576	117288	119492	117177
Maximum speed n_{max} [min ⁻¹]	8000	8000	8000	8000
Torque constant K_T [Nm/A]	0.85	1.4	0.92	1.1
Voltage constant K_E [V/1000 min ⁻¹]	54.45	90.06	58.64	70.16
Stator resistance R_{2ph} [Ω]	21.4	23.76	10.3	9.01
Stator inductance L_{2ph} [mH]	37.5	46.5	20.1	18.5
Electrical time constant t_{el} [ms]	1.8	2	2	2.1
Thermal time constant t_{therm} [min]	14	17	17	20
Moment of inertia without brake J [kgcm ²]	0.33	0.59	0.59	0.85
Weight without brake m [kg]	1.6	2.2	2.2	2.9
Holding brake				
Moment of inertia for brake J_{Br} [kgcm ²]	0.011	0.011	0.011	0.011
Weight of brake m_{Br} [kg]	0.35	0.35	0.35	0.35
Holding torque of the brake M_{Br} [Nm]	2.5	2.5	2.5	2.5
Recommendations				
Cross section for B&R motor cables [mm ²] ²⁾	1.5	1.5	1.5	1.5
ACOPOS	☞ 1314	☞ 1314	☞ 1314	☞ 1314
ACOPOSmulti	☞ 1425	☞ 1425	☞ 1425	☞ 1425
ACOPOS servo drive 8Vxxxx.00-x ³⁾	1016	1016	1045	1045
ACOPOSmulti inverter module 8BVI... ⁴⁾	0014	0014	0028	0028

1) Flange design: Aluminum, 254 mm x 254 mm x 6.35 mm. The values decrease as follows depending on the motor option (the respective rated values also decrease simultaneously):

- Holding brake: 8JSA31: 0 Nm / 8JSA32: 0.05 Nm / 8JSA24: 0.1 Nm

- EnDat encoder: No reduction

- Holding brake + EnDat encoder: 8JSA31: 0 Nm / 8JSA32: 0.1 Nm / 8JSA24: 0.2 Nm

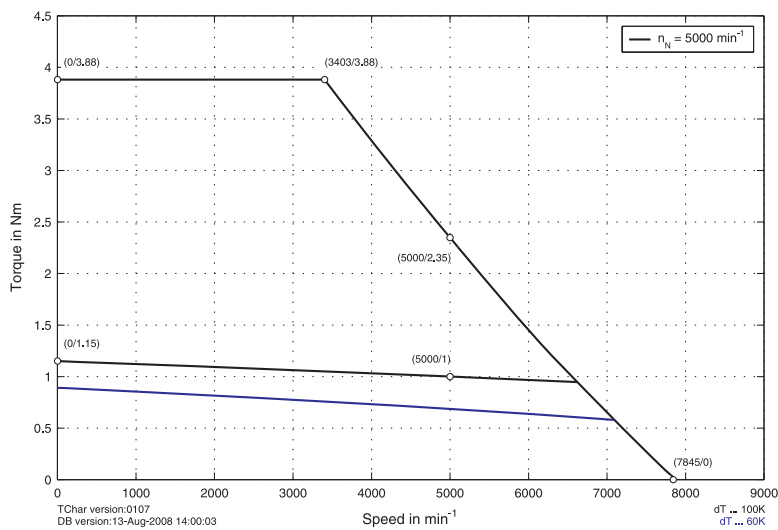
2) The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSmulti inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request.

3) The recommended servo drive is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

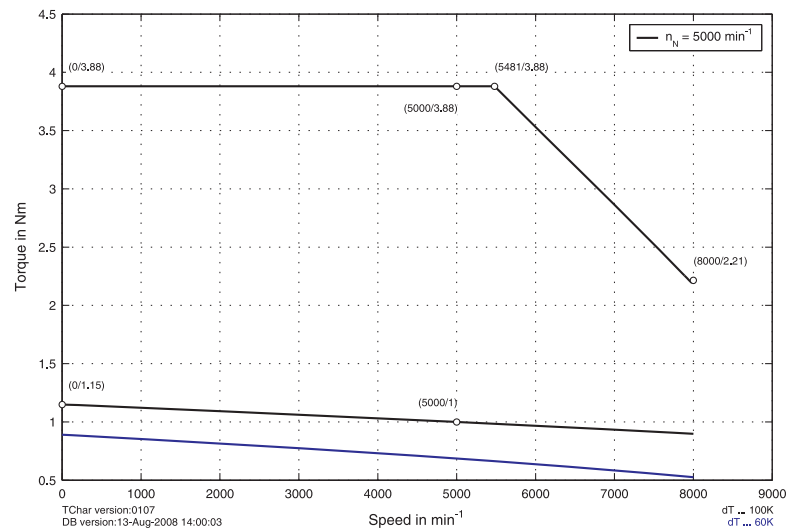
4) The recommended ACOPOSmulti inverter module is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

Speed-torque characteristic curves with 400 VAC supply voltage

ACOPOS

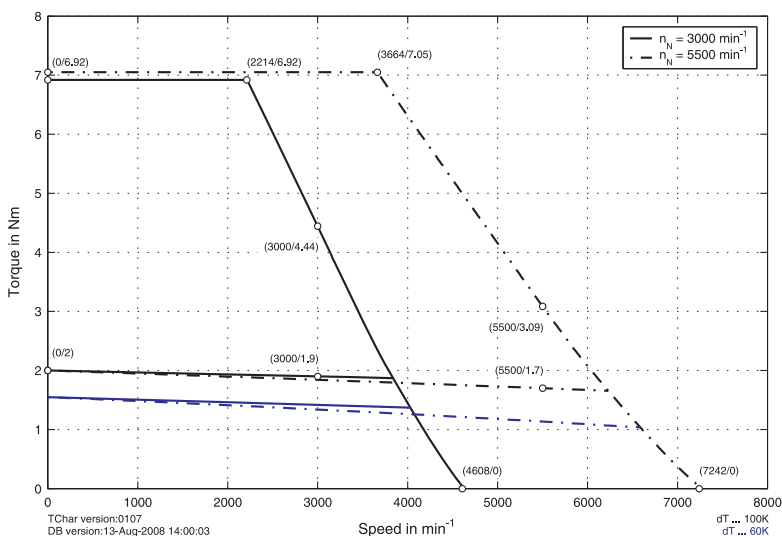


ACOPOSMulti

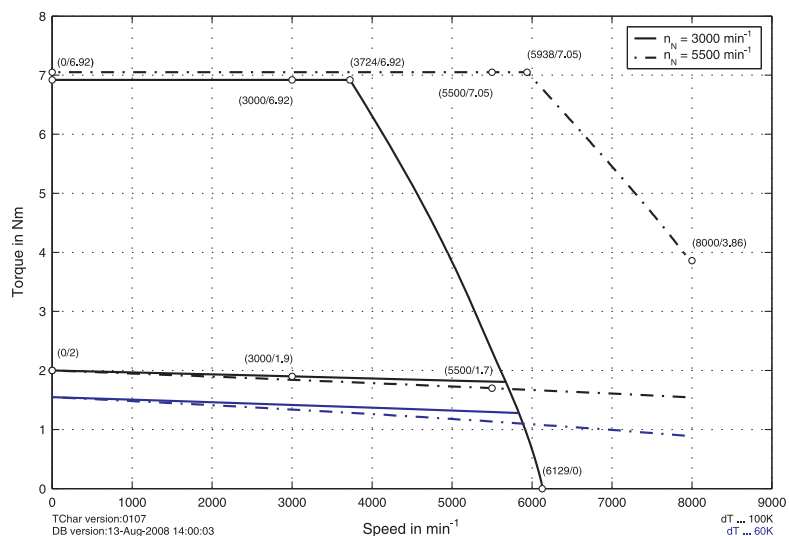


8JSA31.eennffgg-0

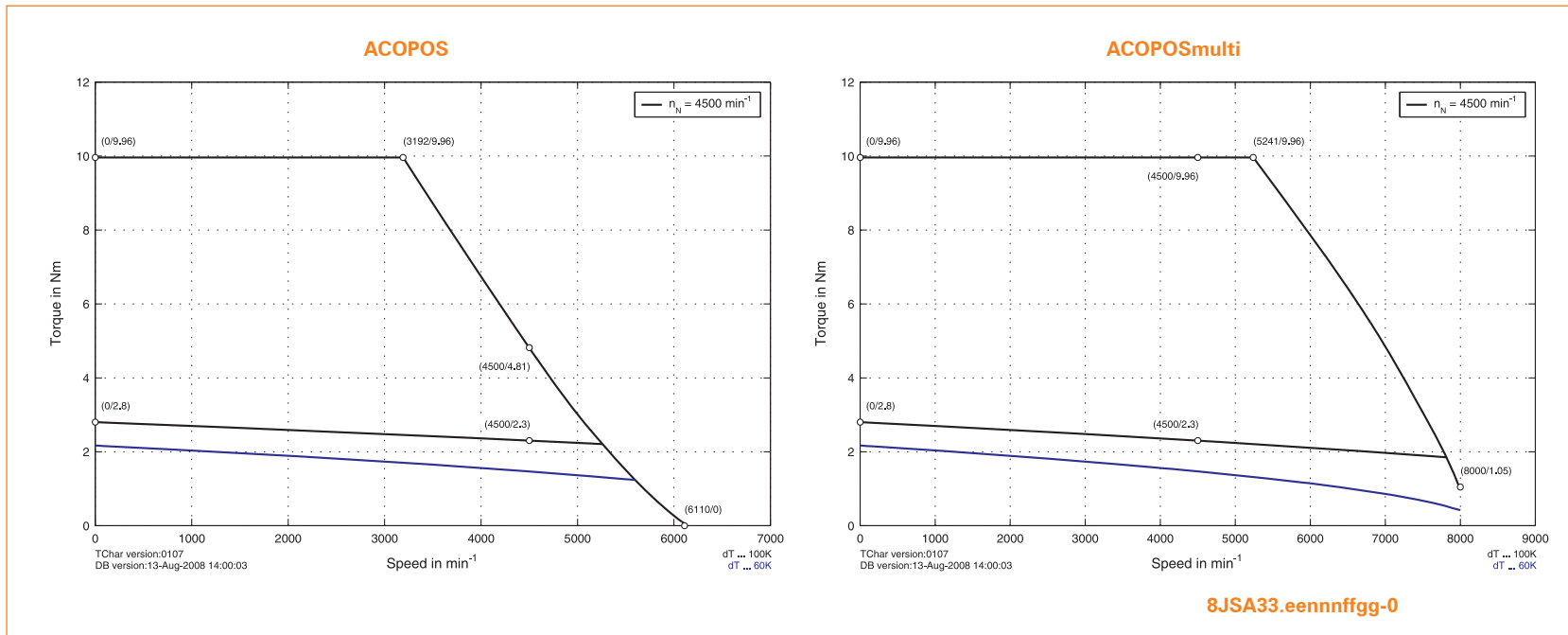
ACOPOS



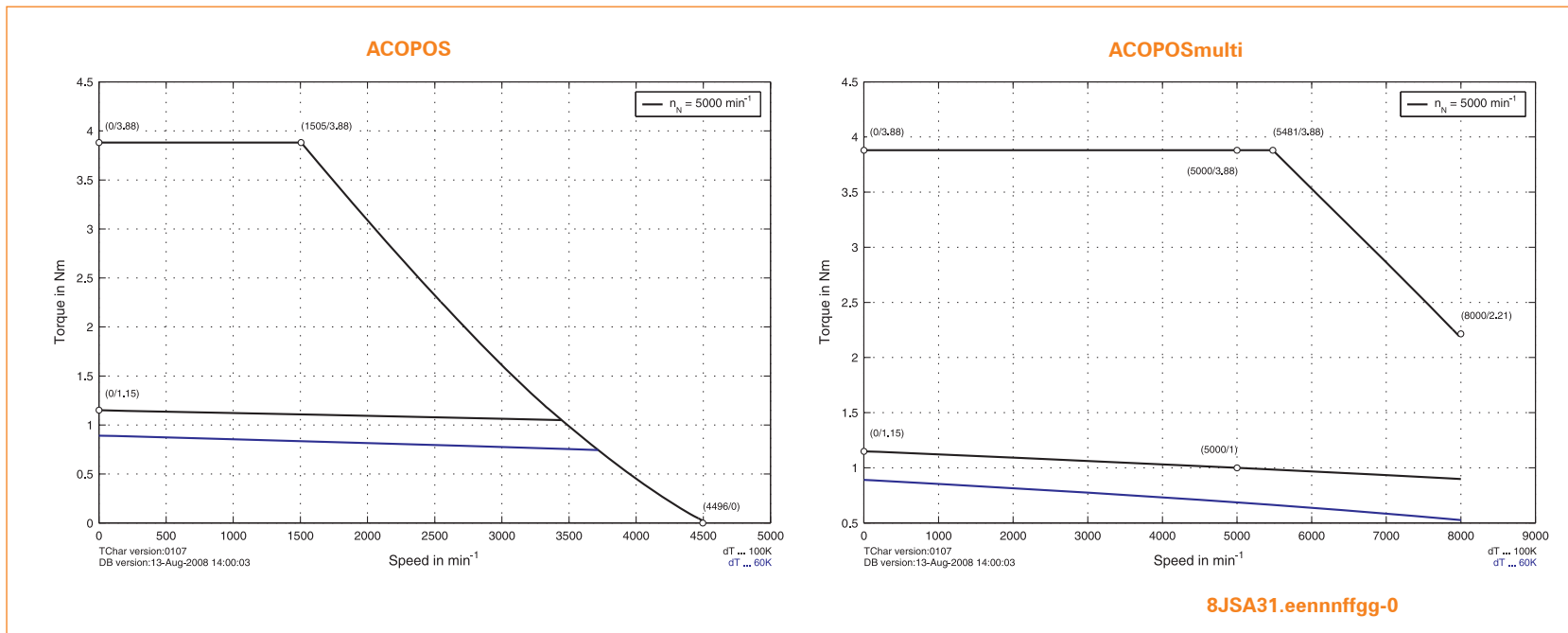
ACOPOSMulti

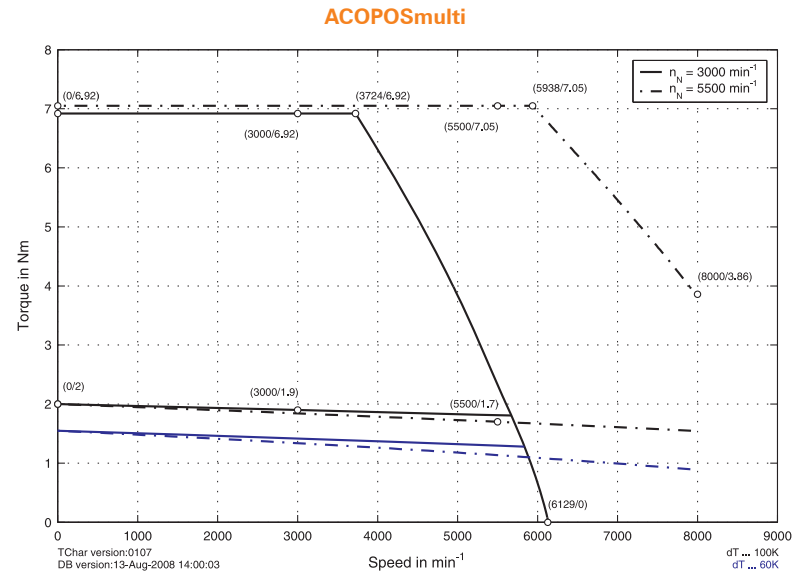
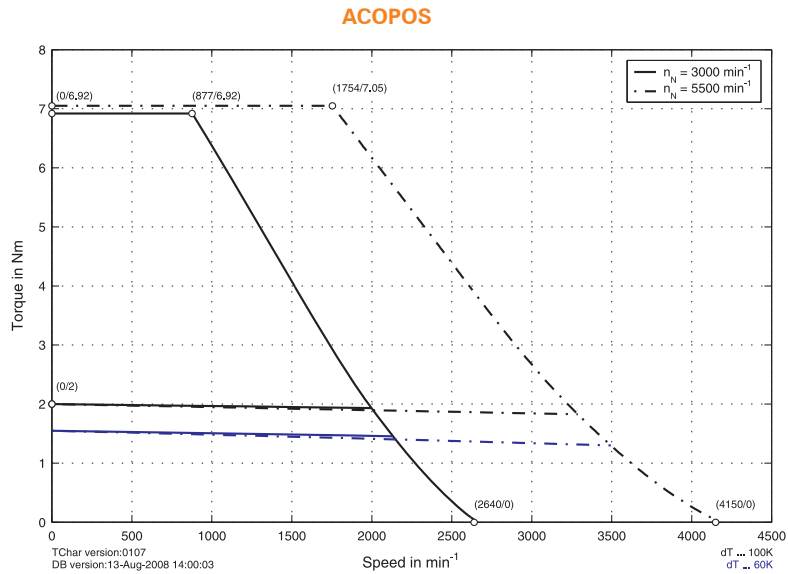


8LSA32.eennffgg-0

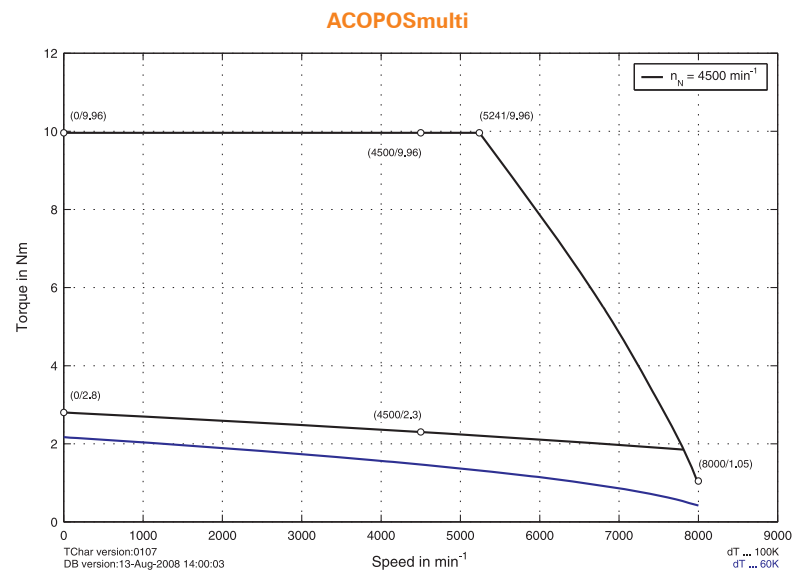
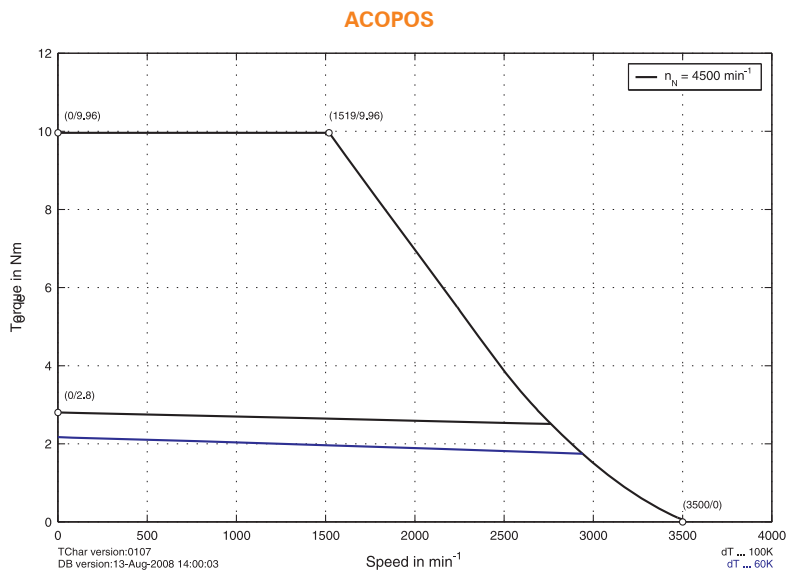


Speed-torque characteristic curves with 230 VAC supply voltage



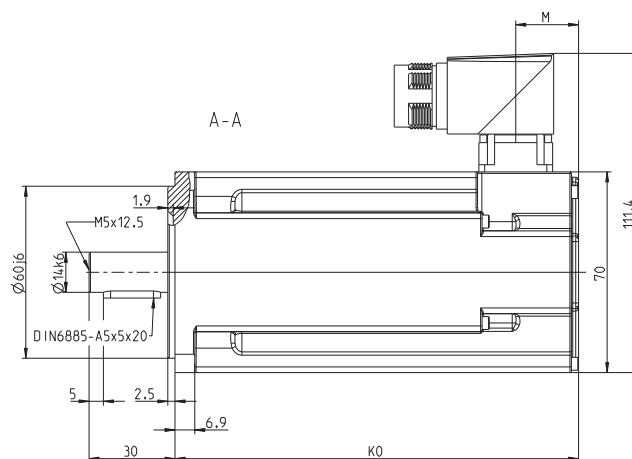
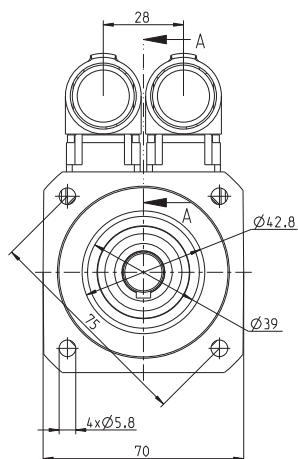


8JSA32.eennffgg-0



8JSA33.eennffgg-0

8JSA3



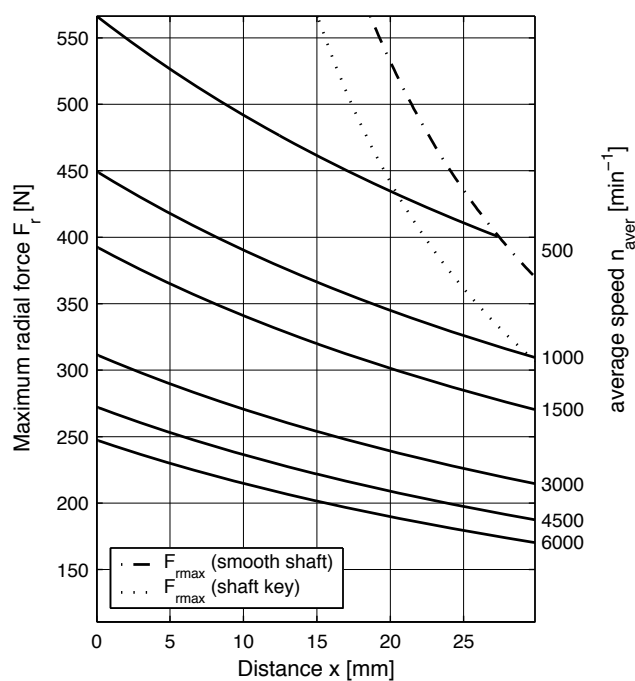
Dimensions

EnDat feedback		Resolver feedback		Extension of K_0 depending on the motor option [mm]			
Model number	K_0	M	Model number	K_0	M	Holding brake	Oil seal
8JSA31.Exnnffgg-0	109.8	21.9	8JSA31.R0nnffgg-0	109.8	21.9	32	---
8JSA32.Exnnffgg-0	140.8	21.9	8JSA32.R0nnffgg-0	140.8	21.9	32	---
8JSA33.Exnnffgg-0	171.8	21.9	8JSA33.R0nnffgg-0	171.8	21.9	32	---

Maximum shaft load

The values in the diagram below are based on a mechanical lifespan of the bearings of 20,000 operating hours.

Standard bearing



maximum allowed axial force: $F_{amax} = 48 \text{ N}$

Recommended B&R motor cable

The recommended B&R motor cable for a motor depends on the recommended ACOPOS servo drive or ACOPOSmulti inverter module (see "Recommended cable cross section for B&R motor cables [mm²]" in the table "Technical data") 1610

Recommended B&R encoder cable

8BCExxx.1111A-0	ACPmulti EnDat cable, length xxxx m, 10 x 0.14 mm ² + 2 x 0.5 mm ² , EnDat plug 17-pin SpeedTEC socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed 1428
8BCRxxx.1111A-0	ACPmulti Resolver cable, length xxxx m, 3 x 2 x 24 AWG (19 x 0.127), resolver plug 12-pin SpeedTEC socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed 1429

8JSA4



Technical data	8JSA42.ee035ffgg-0	8JSA43.ee050ffgg-0	8JSA44.ee040ffgg-0
Rated speed n_N [min^{-1}]	3500	5000	4000
Number of poles	10	10	10
Rated torque M_N [Nm]	2.8	3	3.8
Rated power P_N [kW]	1.03	1.57	1.59
Rated current I_N [A]	2.23	3.04	3.16
Stall torque M_0 [Nm] ¹⁾	3.4	4.8	5.9
Stall current I_0 [A]	2.7	4.9	5
Peak torque M_{max} [Nm]	11.3	16.1	20.2
Peak current I_{max} [A]	11	19.5	20
Maximum angular acceleration without brake a [rad/s^2]	75333	76667	74815
Maximum speed n_{max} [min^{-1}]	6000	6000	6000
Torque constant K_T [Nm/A]	1.26	0.99	1.19
Voltage constant K_E [V/1000 min^{-1}]	80.63	63.88	76.45
Stator resistance $R_{2\text{ph}}$ [Ω]	7.78	2.81	2.8
Stator inductance $L_{2\text{ph}}$ [mH]	26.8	10.8	11.5
Electrical time constant t_{el} [ms]	3.4	3.8	4.1
Thermal time constant t_{therm} [min]	17	20	24
Moment of inertia without brake J [kgcm^2]	1.5	2.1	2.7
Weight without brake m [kg]	3.4	4.35	5.3
Holding brake			
Moment of inertia for brake J_{Br} [kgcm^2]	0.068	0.068	0.068
Weight of brake m_{Br} [kg]	0.63	0.63	0.63
Holding torque of the brake M_{Br} [Nm]	6	6	6
Recommendations			
Cross section for B&R motor cables [mm^2] ²⁾	1.5	1.5	1.5
ACOPOS	≧ 1314	≧ 1314	≧ 1314
ACOPOSmulti	≧ 1425	≧ 1425	≧ 1425
ACOPOS servo drive 8Vxxxx.00-x ³⁾	1045	1090	1090
ACOPOSmulti inverter module 8BVI... ⁴⁾	0028	0055	0055

1) Flange design: Aluminum, 254 mm x 254 mm x 6.35 mm. The values decrease as follows depending on the motor option (the respective rated values also decrease simultaneously):

- Holding brake: 0.12 Nm

- EnDat encoder: 8JSA42: 0.1 Nm / 8JSA43: 0.2 Nm / 8JSA44: 0.3 Nm

- Holding brake + EnDat encoder: 8JSA42: 0.36 Nm / 8JSA43: 0.55 Nm / 8JSA44: 0.76 Nm

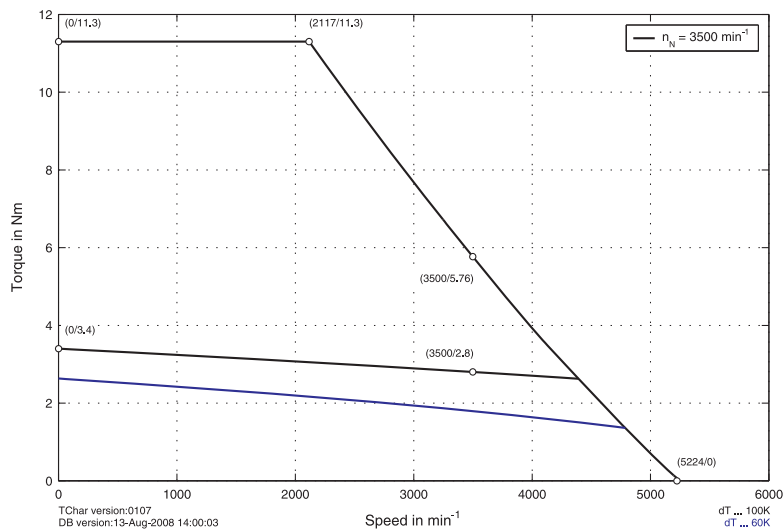
2) The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSmulti inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request.

3) The recommended servo drive is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

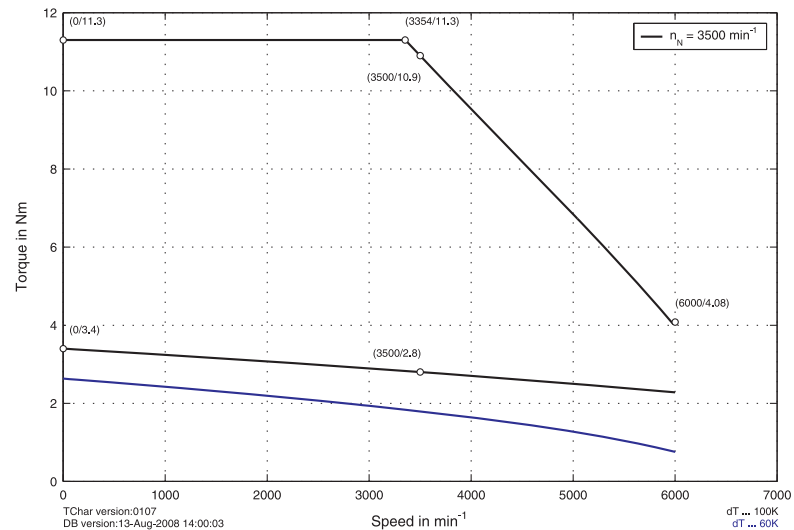
4) The recommended ACOPOSmulti inverter module is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

Speed-torque characteristic curves with 400 VAC supply voltage

ACOPOS

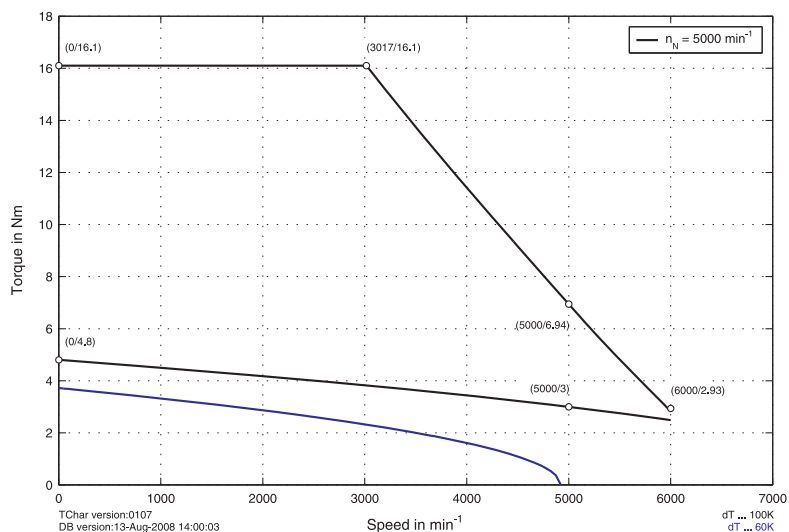


ACOPOSMulti

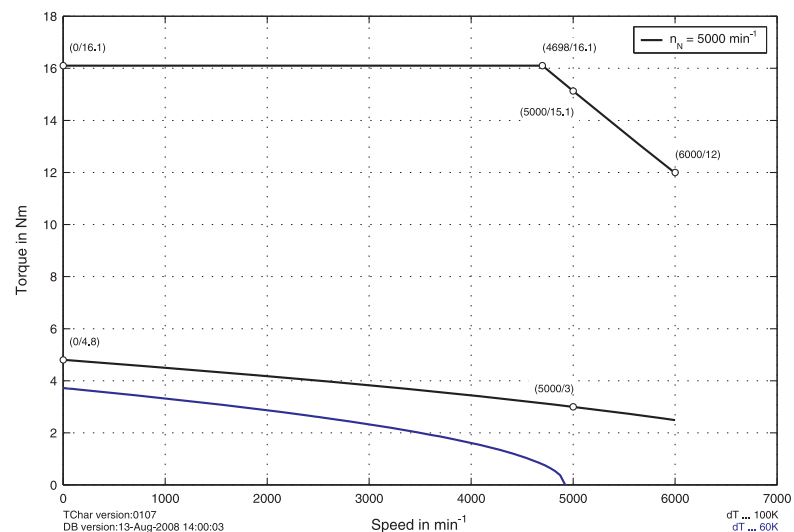


8JSA42.eennffgg-0

ACOPOS

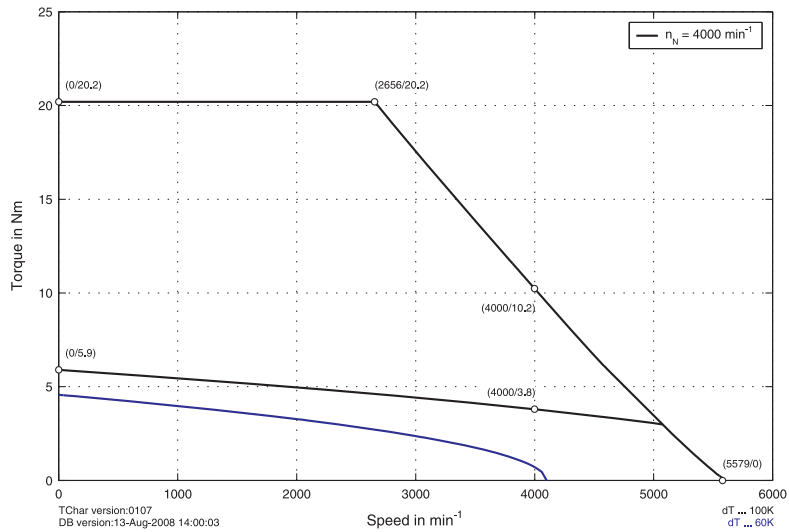


ACOPOSMulti

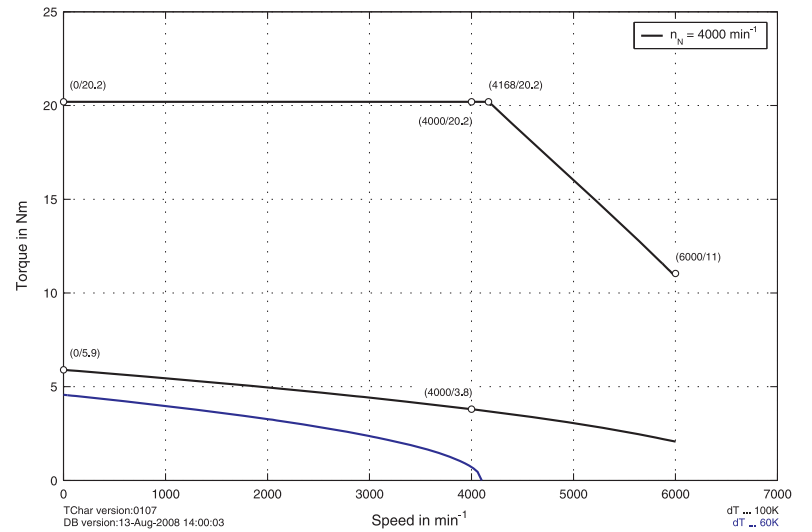


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ACOPOS



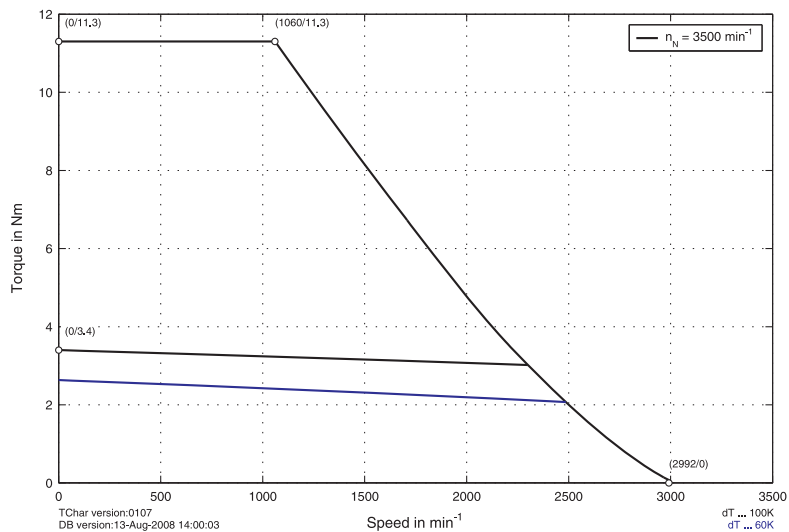
ACOPOSMulti



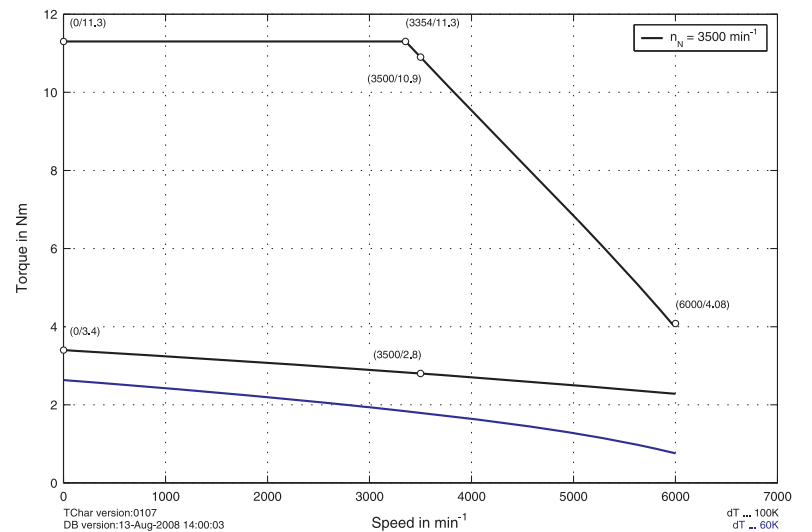
8JSA44.eennffgg-0

Speed-torque characteristic curves with 230 VAC supply voltage

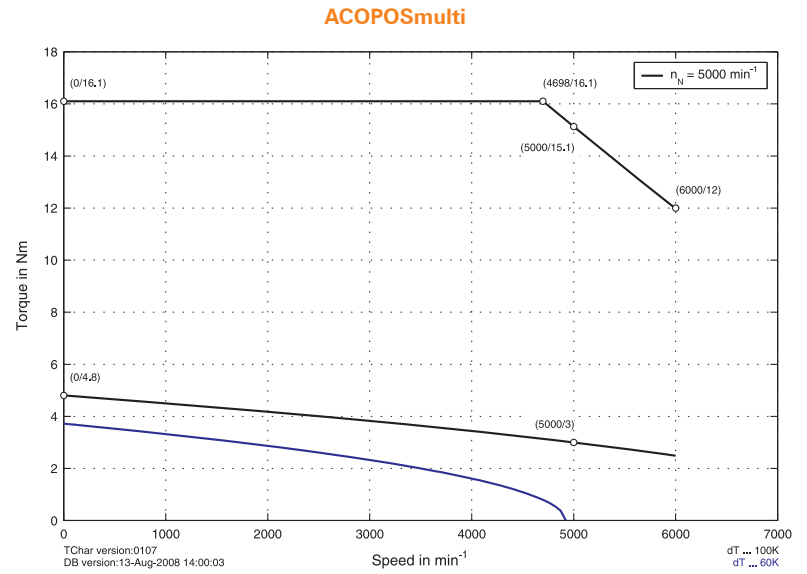
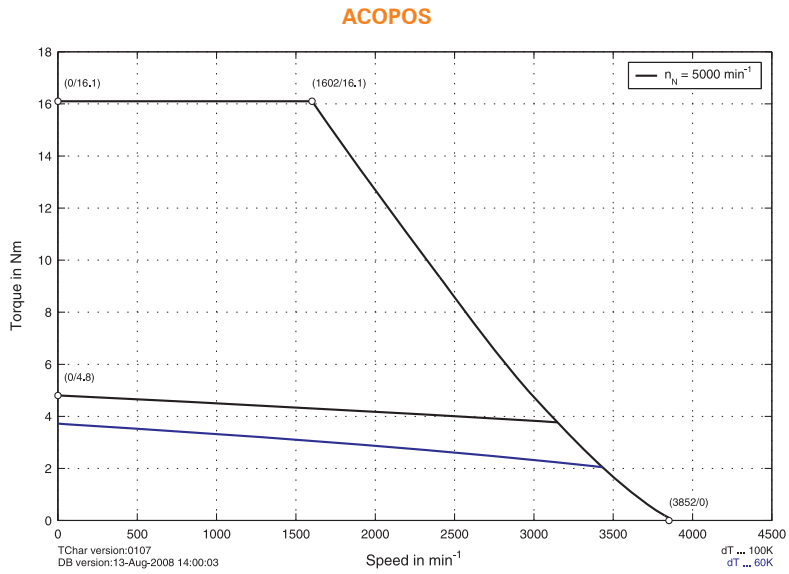
ACOPOS



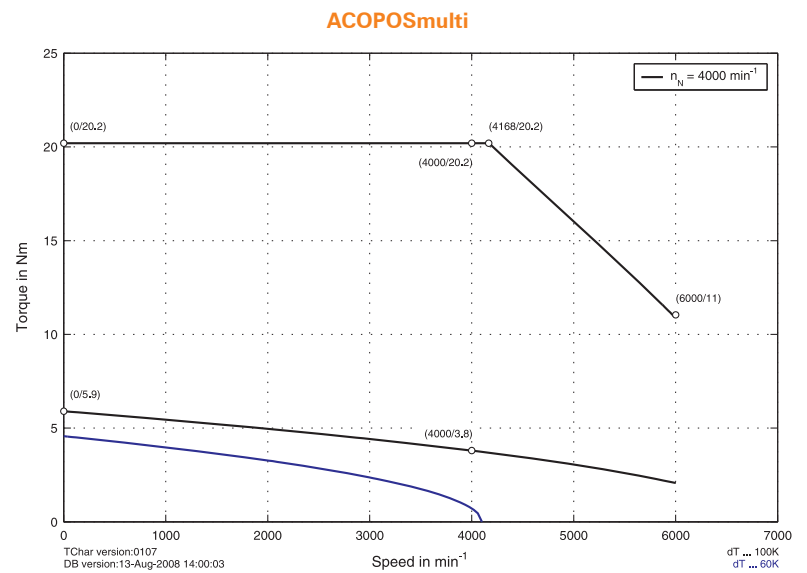
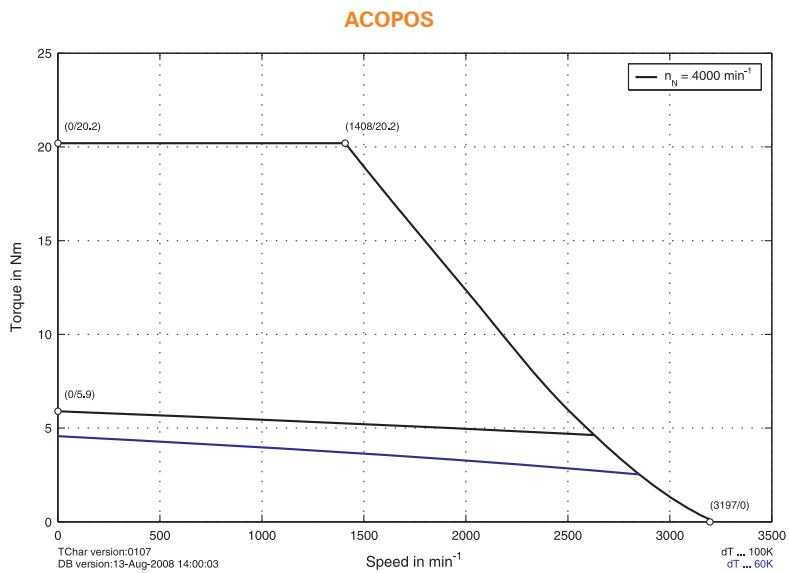
ACOPOSMulti



8JSA42.eennffgg-0

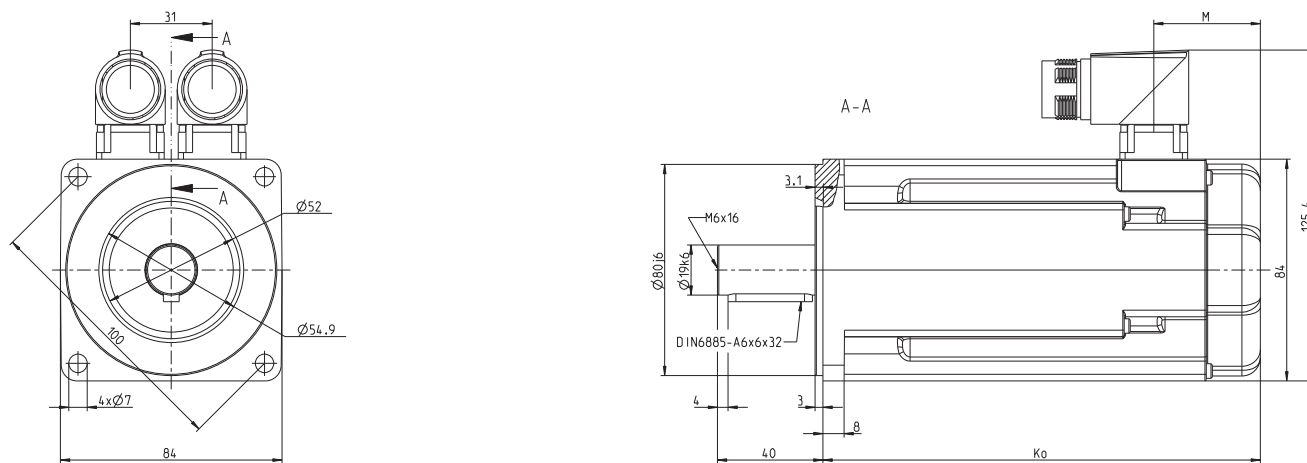


8JSA43.eennffgg-0



8JSA44.eennffgg-0

8JSA4

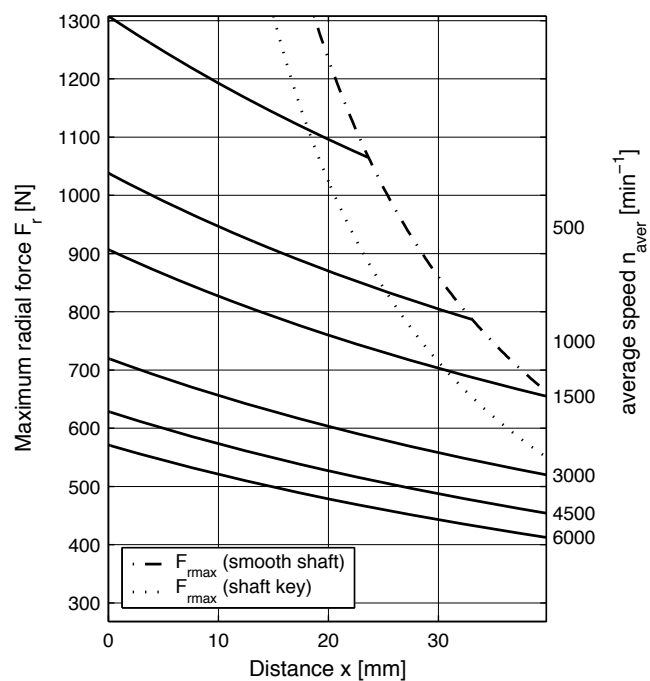


Dimensions

EnDat feedback		Resolver feedback		Extension of K_0 depending on the motor option [mm]			
Model number	K_0	M	Model number	K_0	M	Holding brake ¹⁾	Oil seal
8JSA42.Exnnnffgg-0	147.8	22.4	8JSA42.R0nnnffgg-0	147.8	22.4	33.5	---
8JSA43.Exnnnffgg-0	176.8	22.4	8JSA43.R0nnnffgg-0	176.8	22.4	33.5	---
8JSA44.Exnnnffgg-0	205.8	22.4	8JSA44.R0nnnffgg-0	205.8	22.4	33.5	---

Maximum shaft load

The values in the diagrams below are based on a mechanical lifespan of the bearings of 20,000 operating hours.



maximum allowed axial force: $F_{amax} = 115 \text{ N}$

Recommended B&R motor cable

The recommended B&R motor cable for a motor depends on the recommended ACOPOS servo drive or ACOPOSmulti inverter module (see "Recommended cable cross section for B&R motor cables [mm^2]" in the table "Technical data")

1616

Recommended B&R encoder cable

8BCExxx.1111A-0 ACPmulti EnDat cable, length xxxx m, $10 \times 0.14 \text{ mm}^2 + 2 \times 0.5 \text{ mm}^2$, EnDat plug 17-pin SpeedTEC socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed

1428

8BCRxxx.1111A-0 ACPmulti Resolver cable, length xxxx m, $3 \times 2 \times 24 \text{ AWG}$ (19×0.127), resolver plug 12-pin SpeedTEC socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed

1429

8JSA5



Technical data	8JSA51.ee045ffgg-0	8JSA52.ee045ffgg-0	8JSA54.ee028ffgg-0	8JSA54.ee050ffgg-0
Rated speed n_N [min ⁻¹]	4500	4500	2750	5000
Number of poles	10	10	10	10
Rated torque M_N [Nm]	3	5.2	11.3	7.1
Rated power P_N [kW]	1.41	2.45	3.25	3.72
Rated current I_N [A]	4.65	4.4	6.01	6.24
Stall torque M_0 [Nm] ¹⁾	4.7	8.7	14.7	14.1
Stall current I_0 [A]	7.5	7.4	7.08	12.5
Peak torque M_{max} [Nm]	11.9	22	37	37.54
Peak current I_{max} [A]	22.6	22.1	23.3	37.5
Maximum angular acceleration without brake a [rad/s ²]	35000	35484	30833	31283
Maximum speed n_{max} [min ⁻¹]	6000	6000	6000	6000
Torque constant K_T [Nm/A]	0.65	1.17	1.88	1.13
Voltage constant K_E [V/1000 min ⁻¹]	41.89	75.4	120.43	73.3
Stator resistance R_{2ph} [Ω]	1.16	1.45	1.58	0.65
Stator inductance L_{2ph} [mH]	5.2	7.8	9.6	3.5
Electrical time constant t_{el} [ms]	4.5	5.4	6.1	5.4
Thermal time constant t_{therm} [min]	20	24	31	31
Moment of inertia without brake J [kgcm ²]	3.4	6.2	12	12
Weight without brake m [kg]	4.2	5.8	9	9
Holding brake				
Moment of inertia for brake J_{Br} [kgcm ²]	0.173	0.173	0.173	0.173
Weight of brake m_{Br} [kg]	1.1	1.1	1.1	1.1
Holding torque of the brake M_{Br} [Nm]	14.5	14.5	14.5	14.5
Recommendations				
Cross section for B&R motor cables [mm ²] ²⁾	1.5	1.5	1.5	4
ACOPOS	≙ 1314	≙ 1314	≙ 1314	≙ 1315
ACOPOSmulti	≙ 1425	≙ 1425	≙ 1425	≙ 1426
ACOPOS servo drive 8Vxxxx.00-x ³⁾	1090	1090	1090	1180
ACOPOSmulti inverter module 8BVI... ⁴⁾	0055	0110	0110	0110

1) Flange design: Aluminum, 305 mm x 305 mm x 12.7 mm. The values decrease as follows depending on the motor option (the respective rated values also decrease simultaneously):

- Holding brake: 8JSA51: 0.15 Nm / 8JSA52: 0.26 Nm / 8JSA54: 0.43 Nm

- EnDat encoder: 8JSA51: 0.15 Nm / 8JSA52: 0.34 Nm / 8JSA54: 0.86 Nm

- Holding brake + EnDat encoder: 8JSA51: 0.39 Nm / 8JSA52: 0.76 Nm / 8JSA54: 1.55 Nm

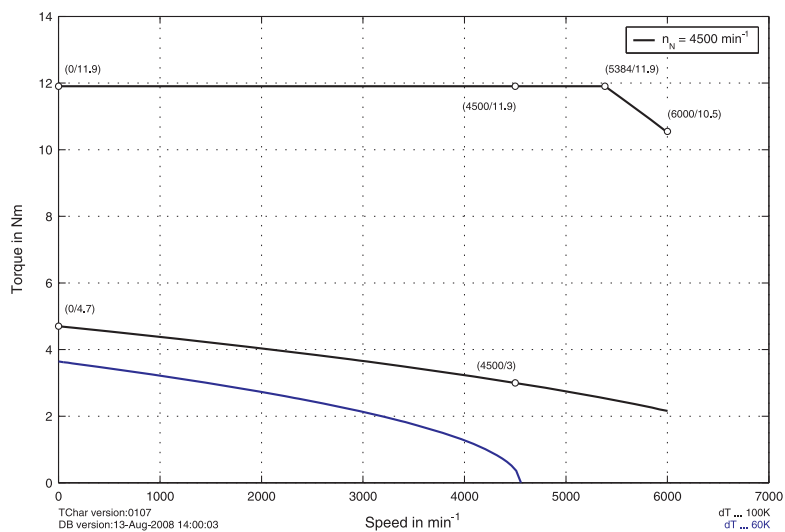
2) The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSmulti inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request.

3) The recommended servo drive is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

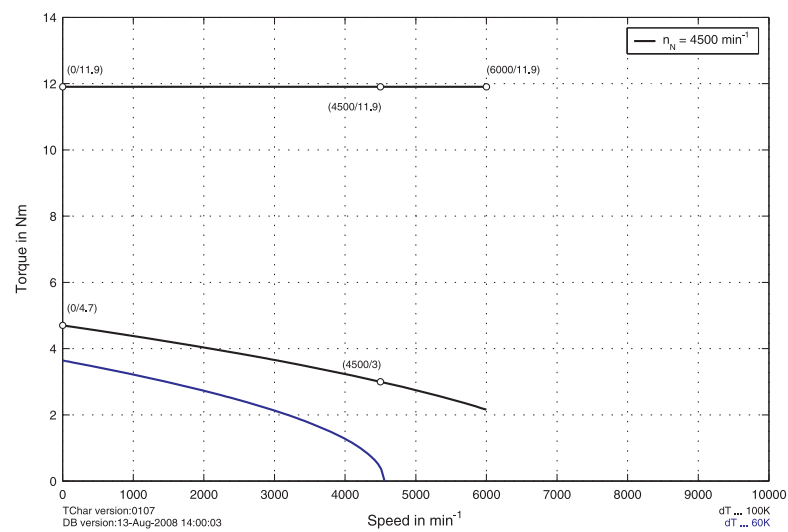
4) The recommended ACOPOSmulti inverter module is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

Speed-torque characteristic curves with 400 VAC supply voltage

ACOPOS

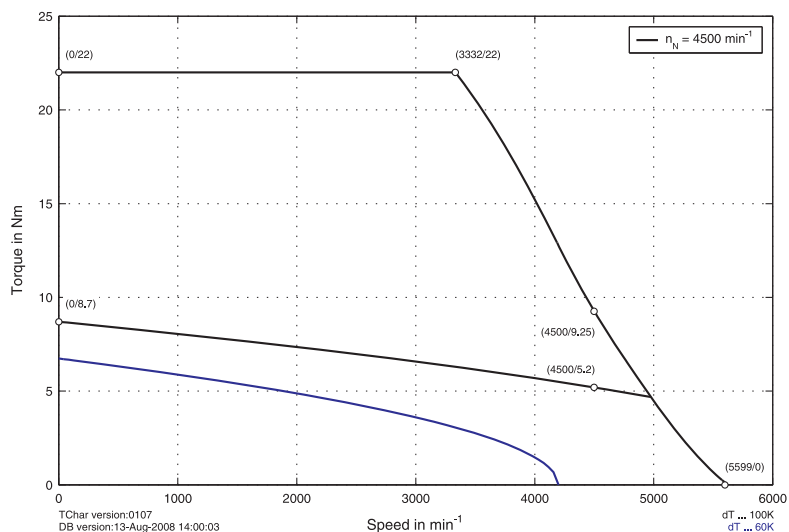


ACOPOSmulti

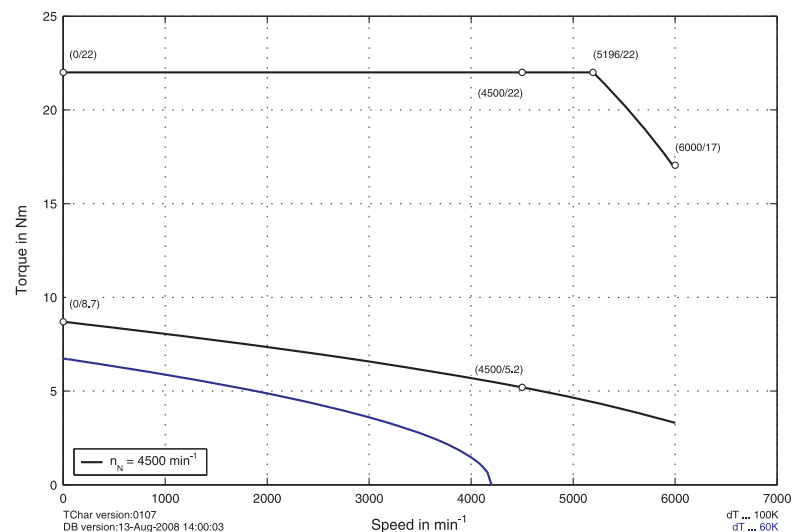


8JSA51.eennnffgg-0

ACOPOS

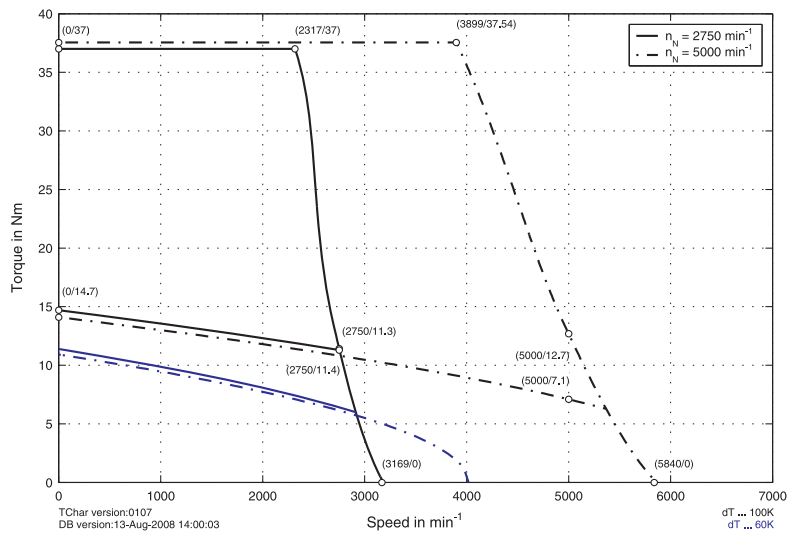


ACOPOSmulti

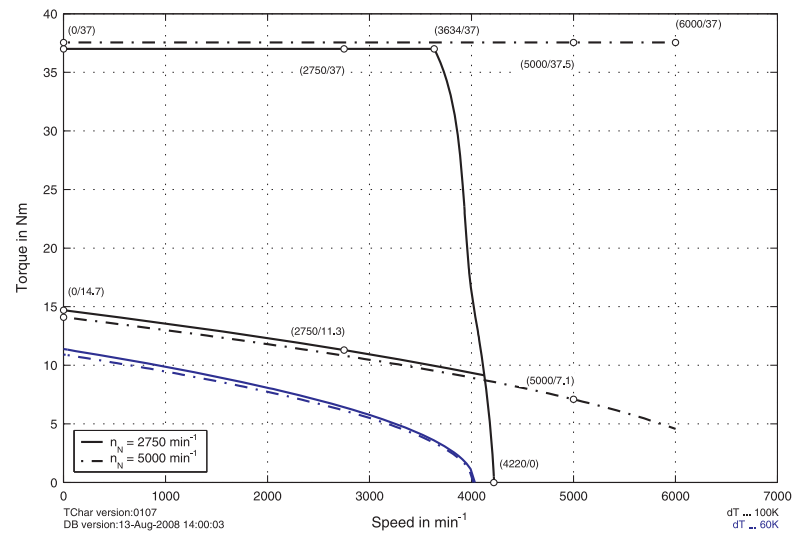


8LSA52.eennnffgg-0

ACOPOS



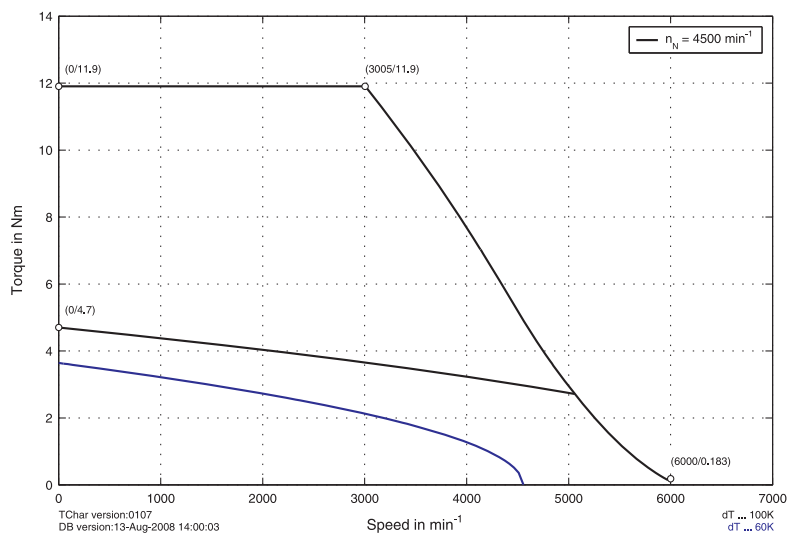
ACOPOSMulti



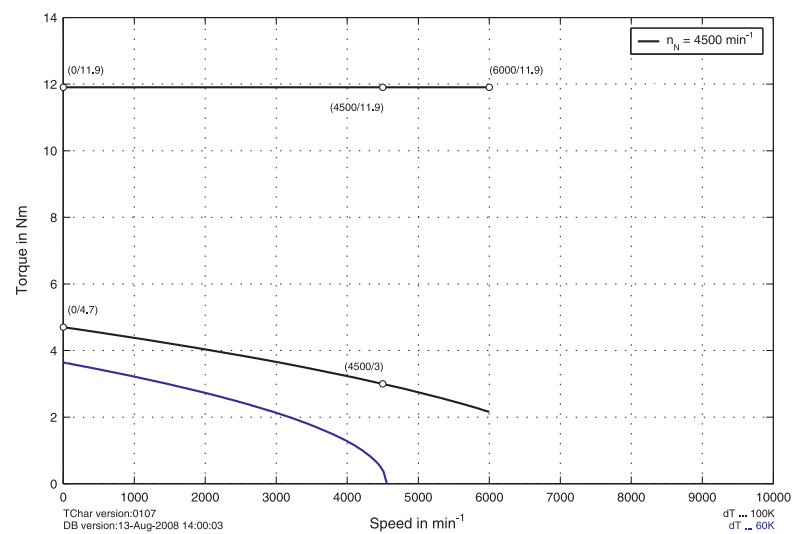
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Speed-torque characteristic curves with 230 VAC supply voltage

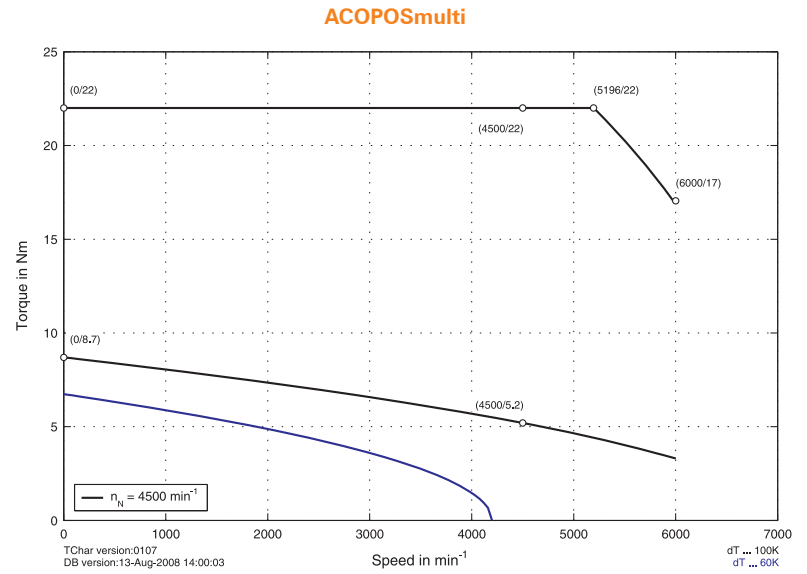
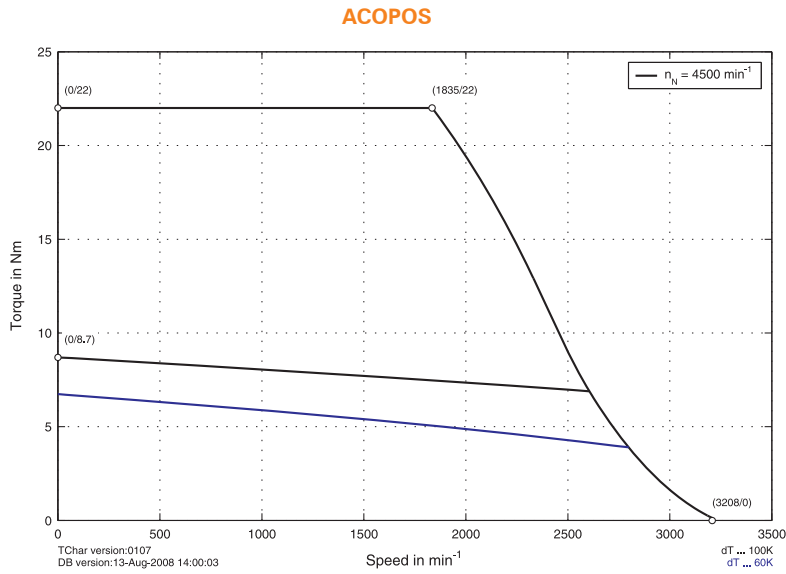
ACOPOS



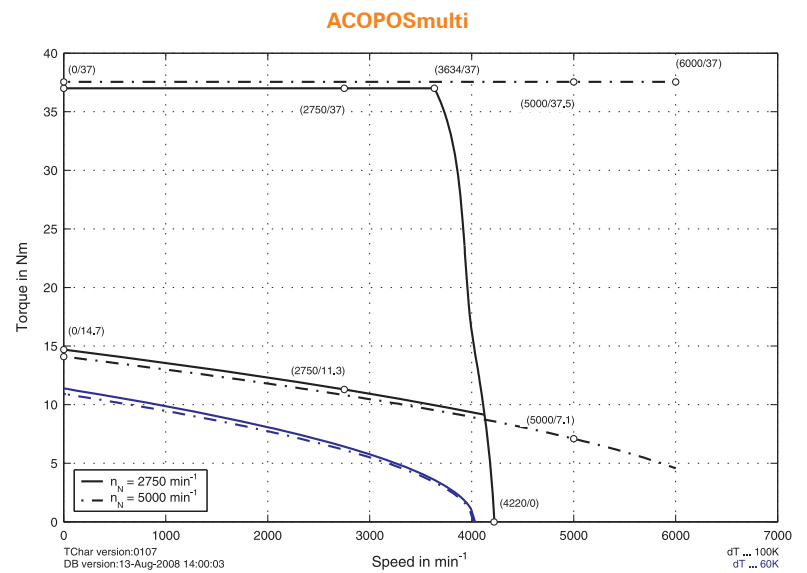
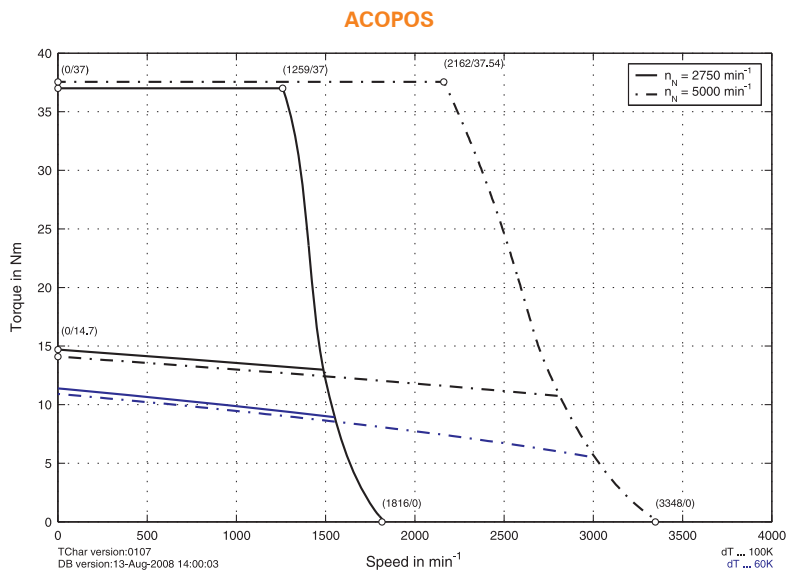
ACOPOSMulti



8JSA51.eennffgg-0

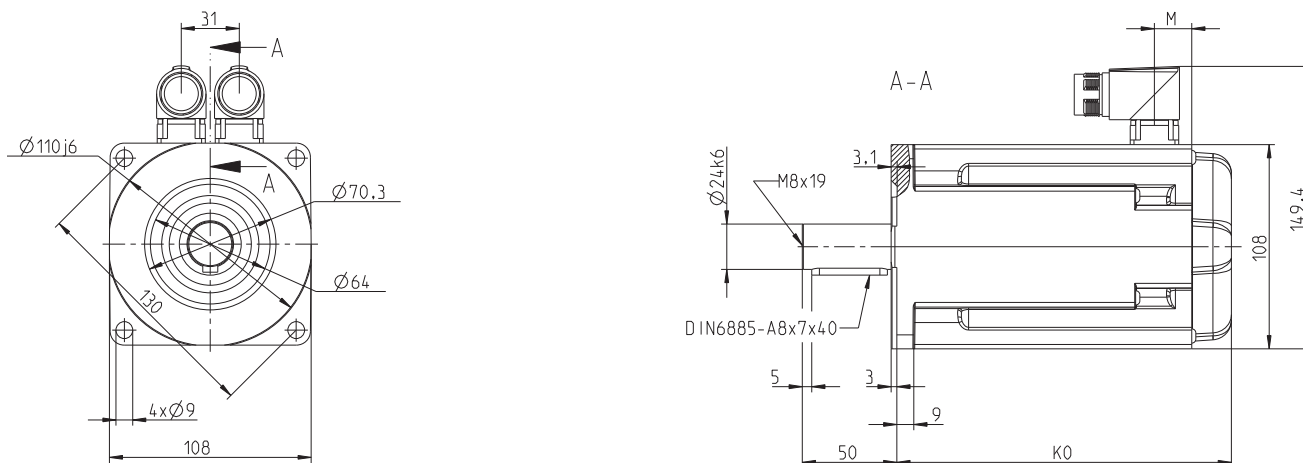


8JSA52.eennffgg-0



8JSA54.eennffgg-0

8JSA5

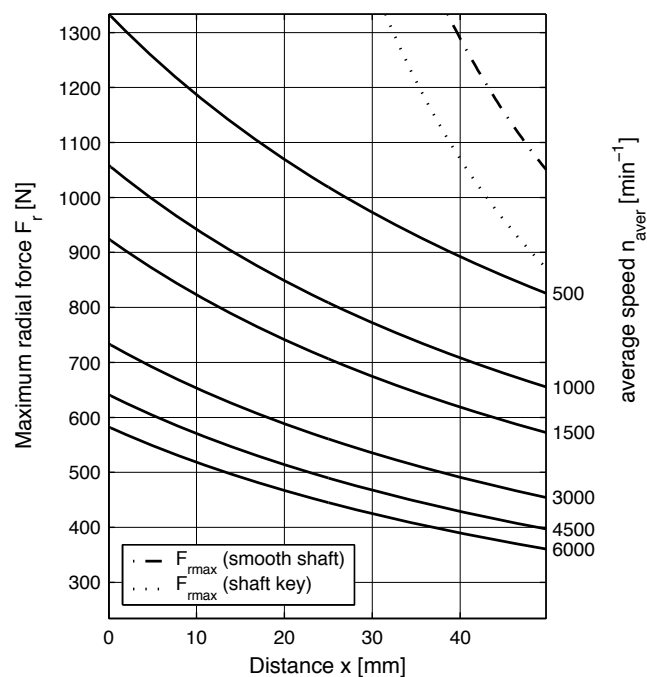


Dimensions

EnDat feedback		Resolver feedback		Extension of K_0 depending on the motor option [mm]			
Model number	K_0	M	Model number	K_0	M	Holding brake	Oil seal
8JSA51.Exnnnffgg-0	146	40.7	8JSA51.R0nnnffgg-0	127.5	22.2	45	---
8JSA52.Exnnnffgg-0	177	40.7	8JSA52.R0nnnffgg-0	158.5	22.2	45	---
8JSA54.Exnnnffgg-0	239	40.7	8JSA54.R0nnnffgg-0	220.5	22.2	45	---

Maximum shaft load

The values in the diagram below are based on a mechanical lifespan of the bearings of 20,000 operating hours.



maximum allowed axial force: $F_{amax} = 107 \text{ N}$

Recommended B&R motor cable

The recommended B&R motor cable for a motor depends on the recommended ACOPOS servo drive or ACOPOSmulti inverter module (see "Recommended cable cross section for B&R motor cables [mm^2]" in the table "Technical data") 1622

Recommended B&R encoder cable

8BCExxx.1111A-0	ACPmulti EnDat cable, length xxxx m, 10 x 0.14 mm^2 + 2 x 0.5 mm^2 , EnDat plug 17-pin SpeedTEC socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed 1428
8BCRxxx.1111A-0	ACPmulti Resolver cable, length xxxx m, 3 x 2 x 24 AWG (19 x 0.127), resolver plug 12-pin SpeedTEC socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed 1429

8JSA6



Technical data	8JSA62.ee030ffgg-0	8JSA63.ee023ffgg-0	8JSA64.ee030ffgg-0	8JSA65.ee025ffgg-0
Rated speed n_N [min ⁻¹]	3000	2250	3000	2500
Number of poles	10	10	10	10
Rated torque M_N [Nm]	9.4	13.9	15.6	19.2
Rated power P_N [kW]	2.95	3.35	4.9	5.03
Rated current I_N [A]	5.84	6.42	9.4	10.38
Stall torque M_0 [Nm] ¹⁾	12.2	17.1	21	25
Stall current I_0 [A]	7.6	7.9	12.8	13.6
Peak torque M_{max} [Nm]	30	42.5	54.1	65.2
Peak current I_{max} [A]	22.7	23.6	38.4	40.9
Maximum angular acceleration without brake a [rad/s ²]	17647	17562	16906	16300
Maximum speed n_{max} [min ⁻¹]	6000	6000	6000	6000
Torque constant K_T [Nm/A]	1.61	2.16	1.66	1.85
Voltage constant K_E [V/1000 min ⁻¹]	103.67	138.23	106.81	119.38
Stator resistance R_{2ph} [Ω]	1.65	1.7	0.75	0.73
Stator inductance L_{2ph} [mH]	13.4	14.6	6.2	6.1
Electrical time constant t_{el} [ms]	8.1	8.6	8.3	8.4
Thermal time constant t_{therm} [min]	20	25	30	35
Moment of inertia without brake J [kgcm ²]	17	24.2	32	40
Weight without brake m [kg]	8.9	11.1	13.3	15.4
Holding brake				
Moment of inertia for brake J_{Br} [kgcm ²]	0.61	0.61	0.61	0.61
Weight of brake m_{Br} [kg]	2	2	2	2
Holding torque of the brake M_{Br} [Nm]	25	25	25	25
Recommendations				
Cross section for B&R motor cables [mm ²] ²⁾	1.5	1.5	4	4
ACOPOS	≧ 1314	≧ 1314	≧ 1315	≧ 1315
ACOPOSmulti	≧ 1425	≧ 1425	≧ 1426	≧ 1426
ACOPOS servo drive 8Vxxxx.00-x ³⁾	1090	1090	1180	1180
ACOPOSmulti inverter module 8BVI... ⁴⁾	0110	0110	0110	0110

1) Flange design: Aluminum, 457 mm x 457 mm x 12.7 mm. The values decrease as follows depending on the motor option (the respective rated values also decrease simultaneously):

- Holding brake: 8JSA62: 0.5 Nm / 8JSA63: 0.9 Nm / 8JSA64: 1.3 Nm / 8JSA65: 1.7 Nm
- EnDat encoder: 8JSA62: 0.9 Nm / 8JSA63: 1.2 Nm / 8JSA64: 1.5 Nm / 8JSA65: 1.8 Nm
- Holding brake + EnDat encoder: 8JSA62: 1.6 Nm / 8JSA63: 2.4 Nm / 8JSA64: 3.1 Nm / 8JSA65: 4 Nm

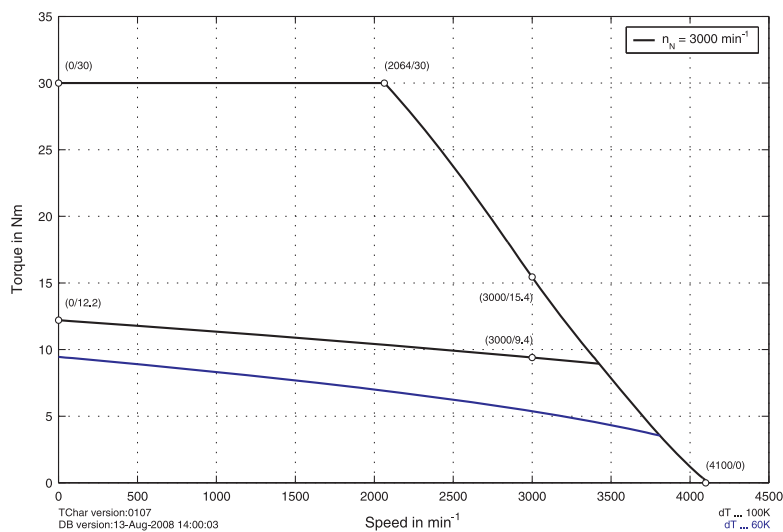
2) The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSmulti inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request.

3) The recommended servo drive is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

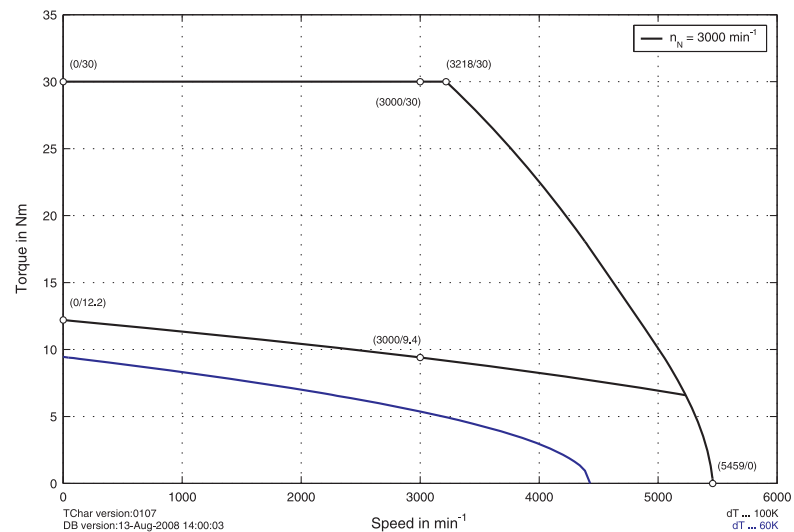
4) The recommended ACOPOSmulti inverter module is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

Speed-torque characteristic curves with 400 VAC supply voltage

ACOPOS

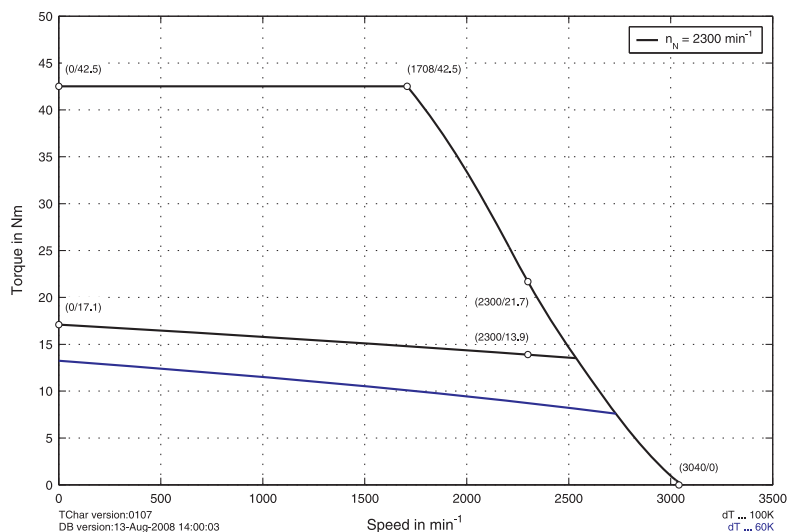


ACOPOSmulti

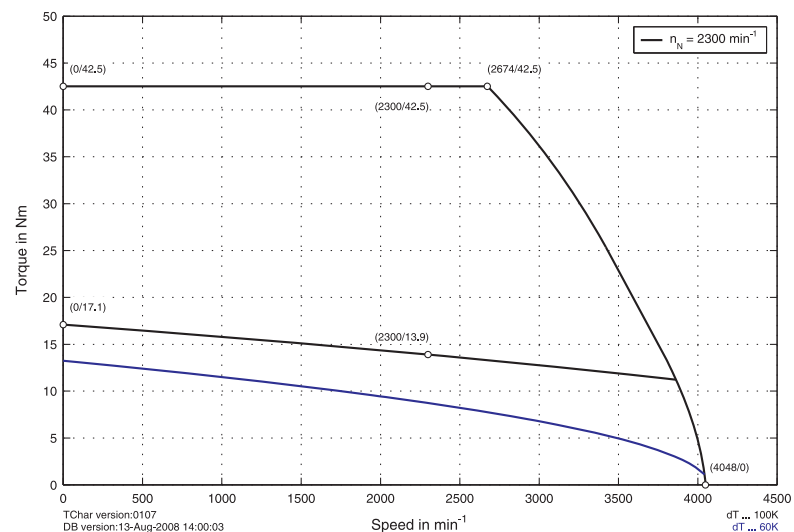


8JSA62.eennffgg-0

ACOPOS

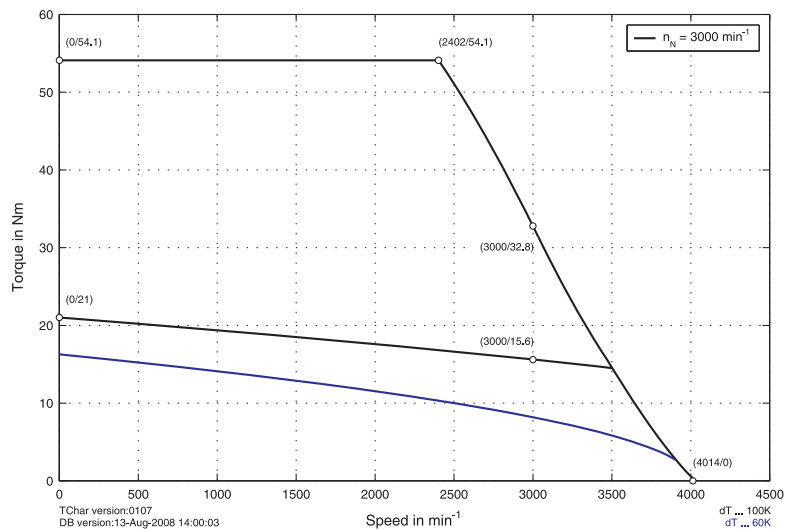


ACOPOSmulti

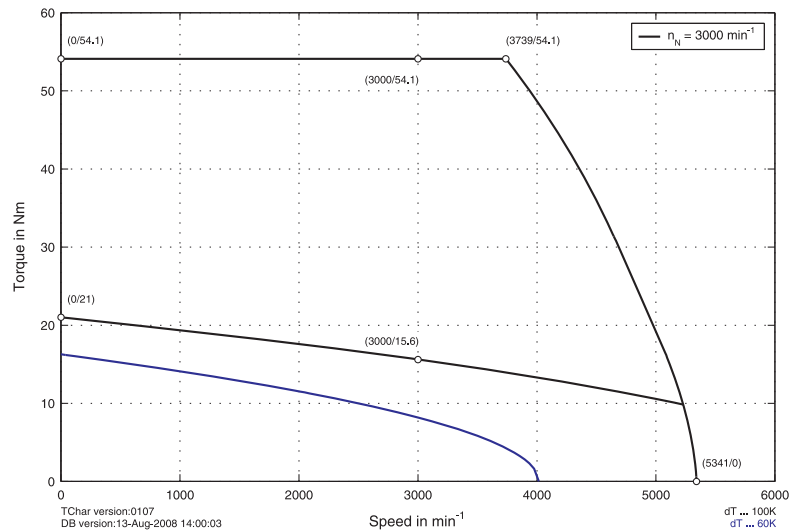


8LSA63.eennffgg-0

ACOPOS

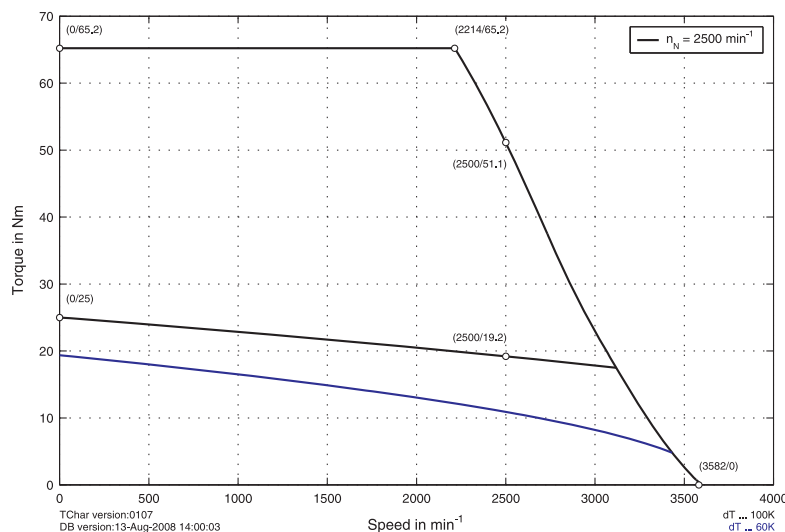


ACOPOSmulti

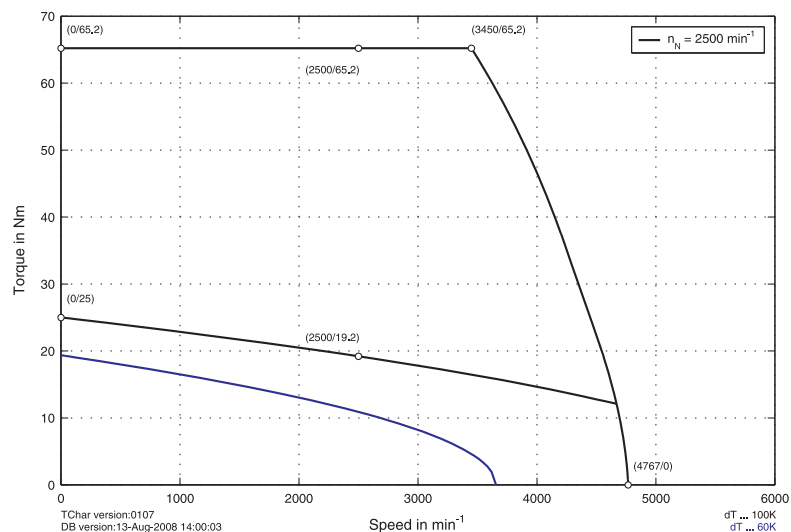


8JSA64.eennffgg-0

ACOPOS



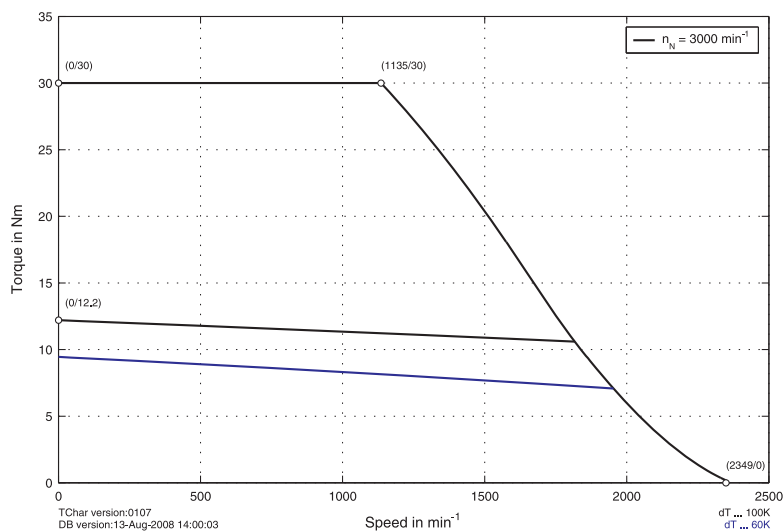
ACOPOSmulti



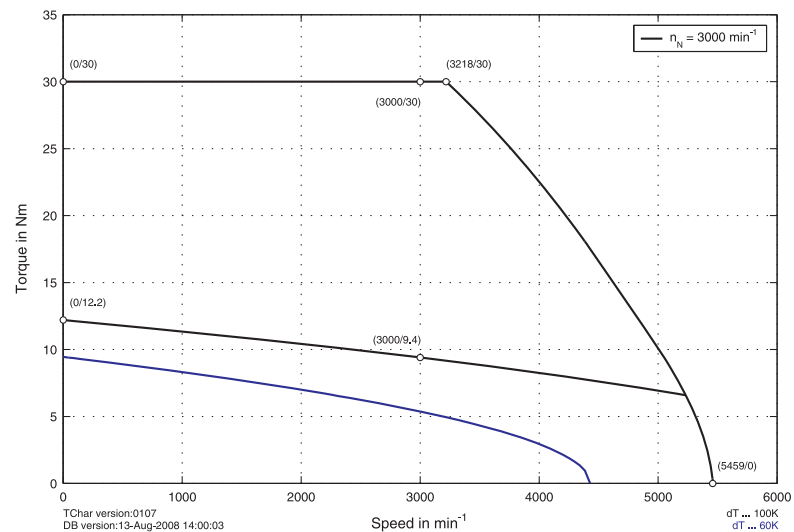
8LSA65.eennffgg-0

Speed-torque characteristic curves with 230 VAC supply voltage

ACOPOS

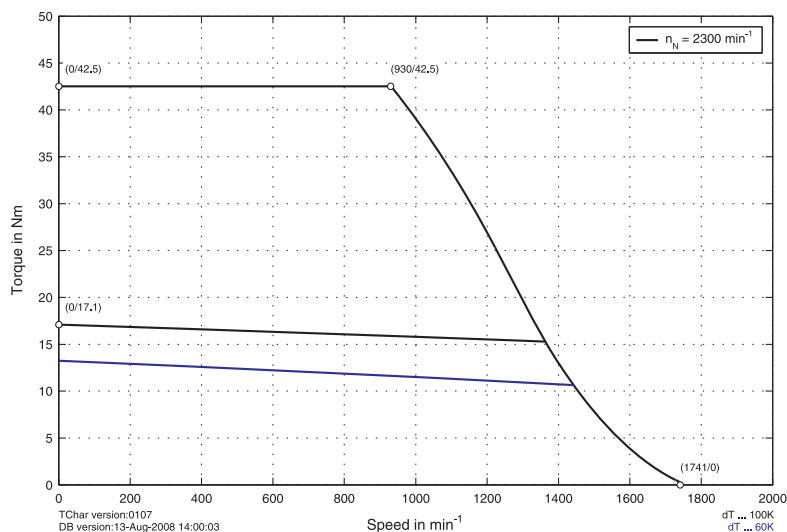


ACOPOSMulti

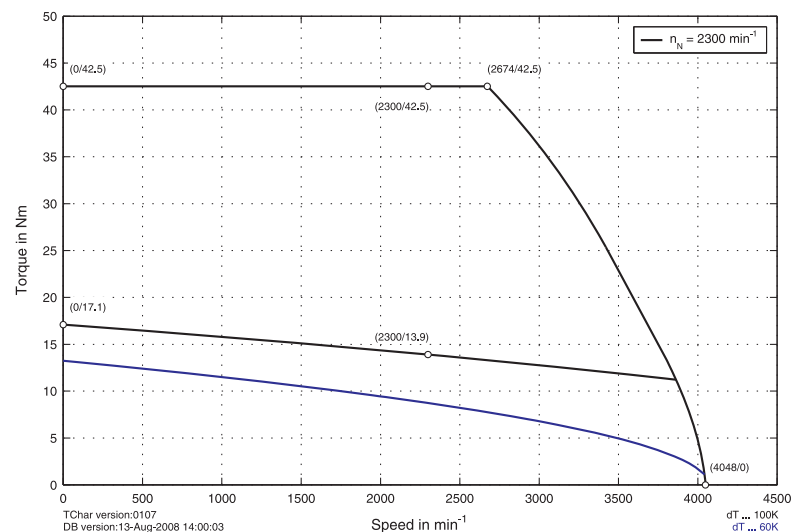


8JSA62.eennffgg-0

ACOPOS

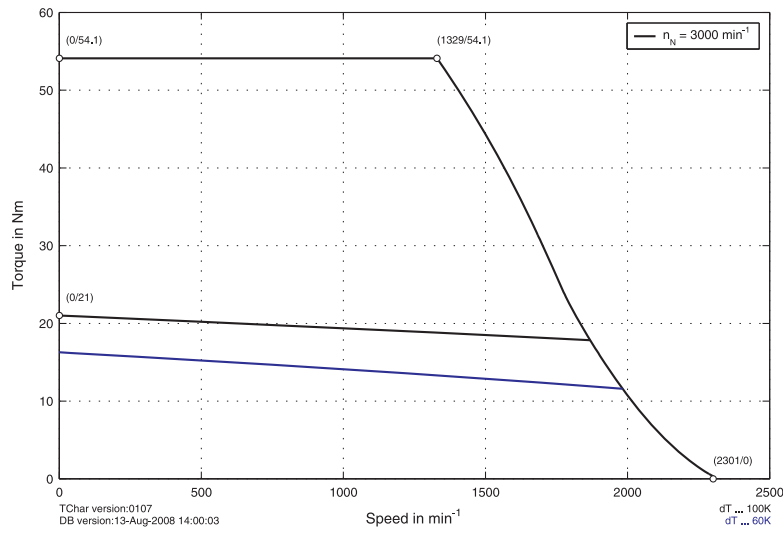


ACOPOSMulti

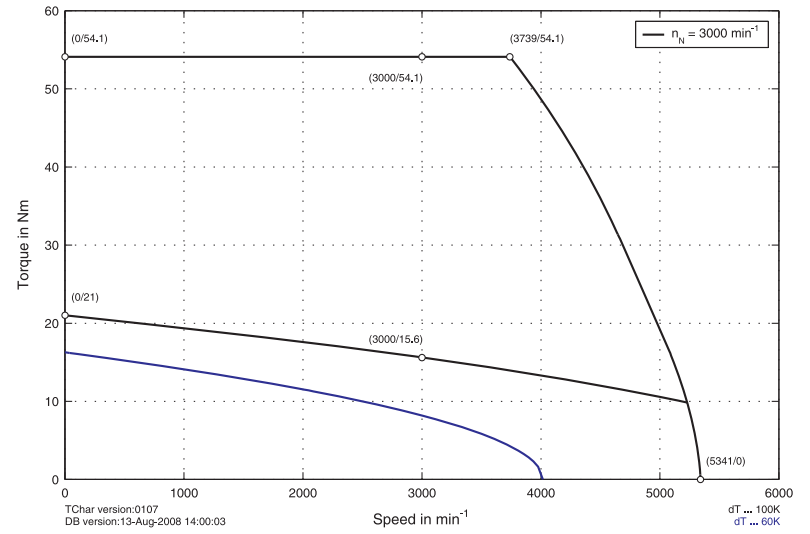


8LSA63.eennffgg-0

ACOPOS

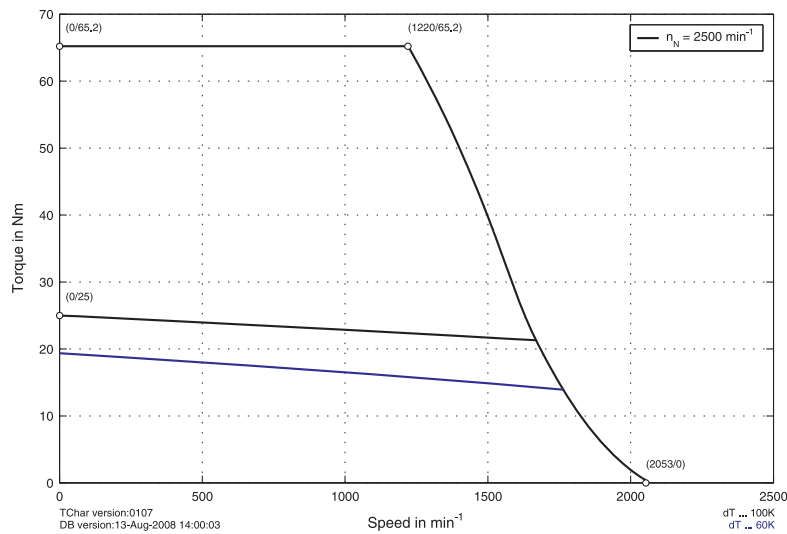


ACOPOSmulti

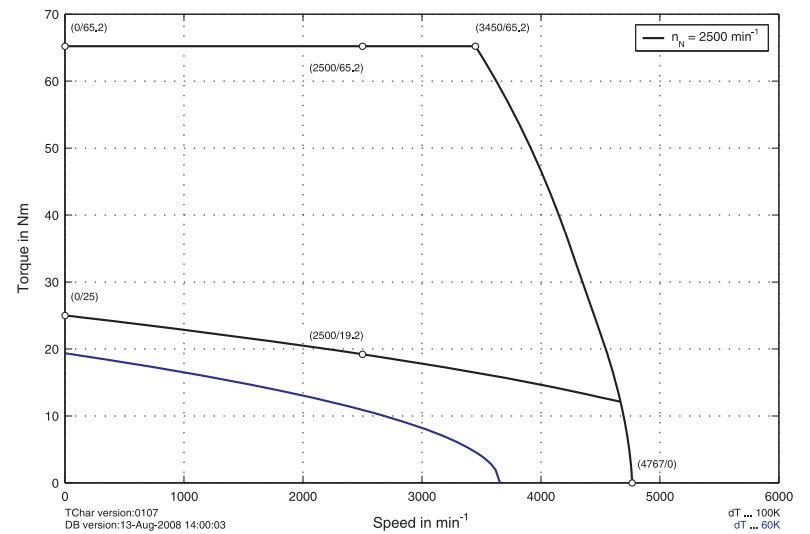


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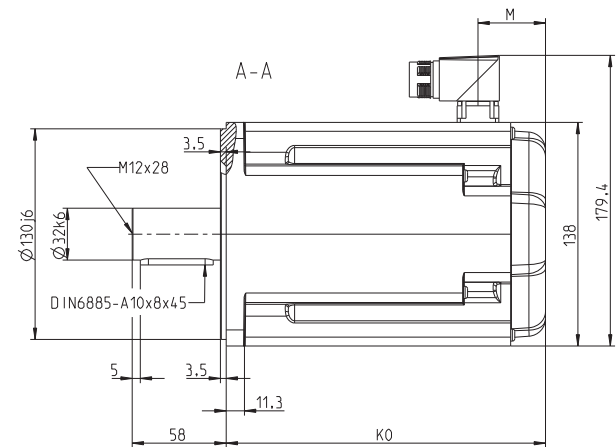
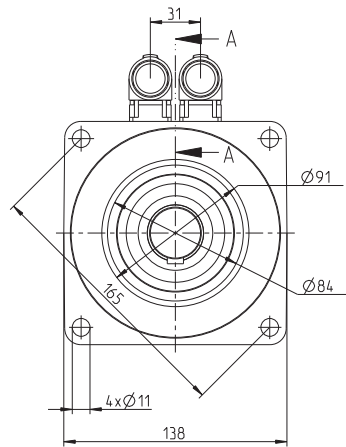
ACOPOS



ACOPOSmulti



8LSA65.eennffgg-0

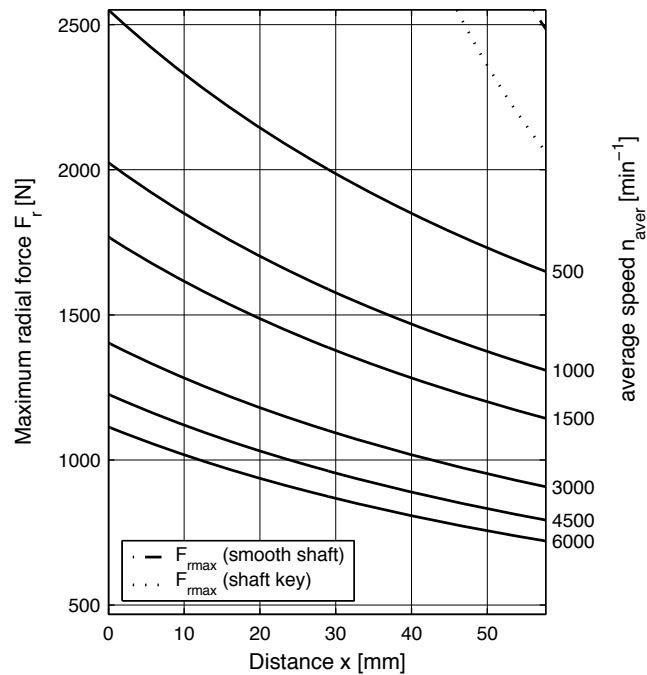


Dimensions

EnDat feedback		Resolver feedback		Extension of K_0 depending on the motor option [mm]			
Model number	K_0	M	Model number	K_0	M	Holding brake	Oil seal
8JSA62.Exnnnffgg-0	172.2	41.7	8JSA62.R0nnnffgg-0	153.7	23.2	47	---
8JSA63.Exnnnffgg-0	197.2	41.7	8JSA63.R0nnnffgg-0	178.7	23.2	47	---
8JSA64.Exnnnffgg-0	222.2	41.7	8JSA64.R0nnnffgg-0	203.7	23.2	47	---
8JSA65.Exnnnffgg-0	247.2	41.7	8JSA65.R0nnnffgg-0	228.7	23.2	47	---

Maximum shaft load

The values in the diagram below are based on a mechanical lifespan of the bearings of 20,000 operating hours.



maximum allowed axial force: $F_{amax} = 210 \text{ N}$

Recommended B&R motor cable

The recommended B&R motor cable for a motor depends on the recommended ACOPOS servo drive or ACOPOSmulti inverter module (see "Recommended cable cross section for B&R motor cables [mm^2]" in the table "Technical data") 1628

Recommended B&R encoder cable

8BCExxxx.1111A-0	ACPMulti EnDat cable, length xxxx m, $10 \times 0.14 \text{ mm}^2 + 2 \times 0.5 \text{ mm}^2$, EnDat plug 17-pin SpeedTEC socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed 1428
8BCRxxxx.1111A-0	ACPMulti Resolver cable, length xxxx m, $3 \times 2 \times 24 \text{ AWG}$ (19×0.127), resolver plug 12-pin SpeedTEC socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed 1429



8JSA7



Technical data	8JSA72.ee020ffgg-0	8JSA73.ee024ffgg-0	8JSA74.ee018ffgg-0
Rated speed n_N [min ⁻¹]	2000	2400	1800
Number of poles	10	10	10
Rated torque M_N [Nm]	23.6	28.5	39.6
Rated power P_N [kW]	4.94	7.16	7.46
Rated current I_N [A]	10.13	13.38	13.94
Stall torque M_0 [Nm] ¹⁾	30	41.6	52.5
Stall current I_0 [A]	13	19.5	18.5
Peak torque M_{max} [Nm]	79.7	111	142
Peak current I_{max} [A]	38.9	58.6	55.5
Maximum angular acceleration without brake a [rad/s ²]	12262	12065	11833
Maximum speed n_{max} [min ⁻¹]	6000	6000	6000
Torque constant K_T [Nm/A]	2.33	2.13	2.84
Voltage constant K_E [V/1000 min ⁻¹]	149.75	137.18	183.26
Stator resistance R_{2ph} [Ω]	0.69	0.38	0.47
Stator inductance L_{2ph} [mH]	10.8	5.9	7.7
Electrical time constant t_{el} [ms]	15.7	15.5	16.4
Thermal time constant t_{therm} [min]	46	53	60
Moment of inertia without brake J [kgcm ²]	65	92	120
Weight without brake m [kg]	19.7	26.7	33.6
Holding brake			
Moment of inertia for brake J_{Br} [kgcm ²]	1.64	1.64	1.64
Weight of brake m_{Br} [kg]	2.1	2.1	2.1
Holding torque of the brake M_{Br} [Nm]	53	53	53
Recommendations			
Cross section for B&R motor cables [mm ²] ²⁾	4	4	4
ACOPOS	☰ 1315	☰ 1315	☰ 1315
ACOPOSmulti	☰ 1426	☰ 1426	☰ 1426
ACOPOS servo drive 8Vxxxx.00-x ³⁾	1180	1320	1320
ACOPOSmulti inverter module 8BVI... ⁴⁾	0110	0220	0220

1) Flange design: Aluminum, 457 mm x 457 mm x 12.7 mm. The values decrease as follows depending on the motor option (the respective rated values also decrease simultaneously):

- Holding brake: 1 Nm

- EnDat encoder: 8JSA72: 2 Nm / 8JSA73: 2.7 Nm / 8JSA74: 3.4 Nm

- Holding brake + EnDat encoder: 8JSA72: 3.9 Nm / 8JSA73: 5.1 Nm / 8JSA74: 6.2 Nm

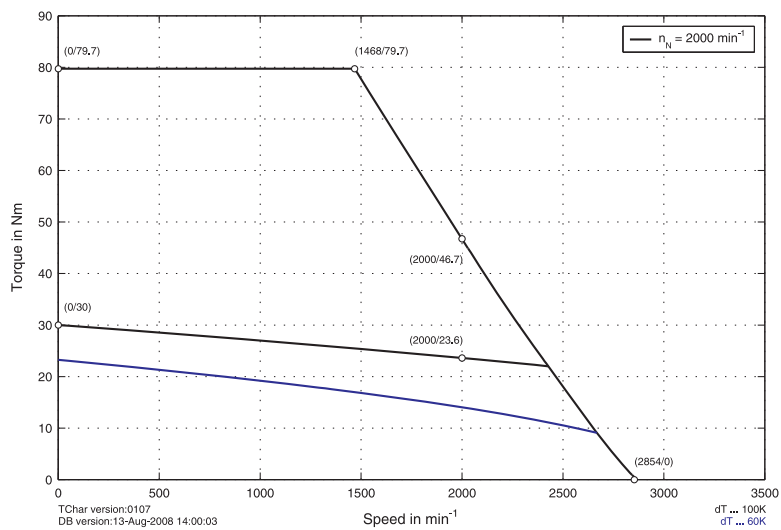
2) The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSmulti inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request.

3) The recommended servo drive is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

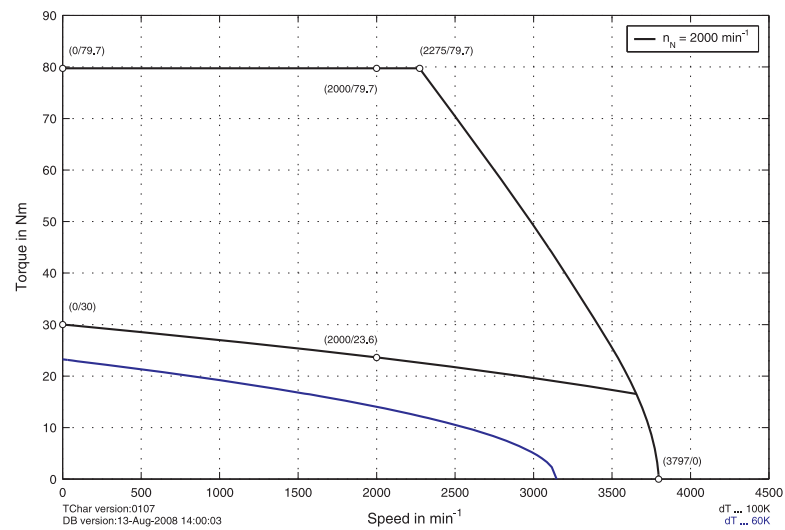
4) The recommended ACOPOSmulti inverter module is defined for 1.1x the stall current of the motor; if more than double the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

Speed-torque characteristic curves with 400 VAC supply voltage

ACOPOS

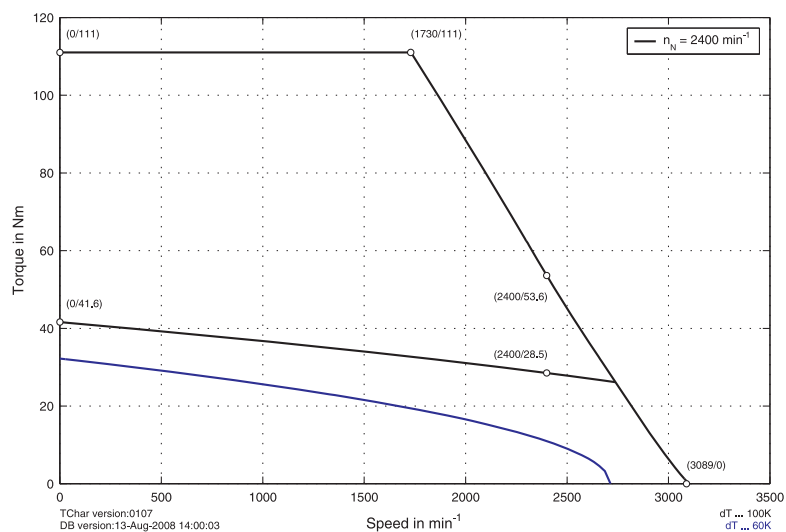


ACOPOSmulti

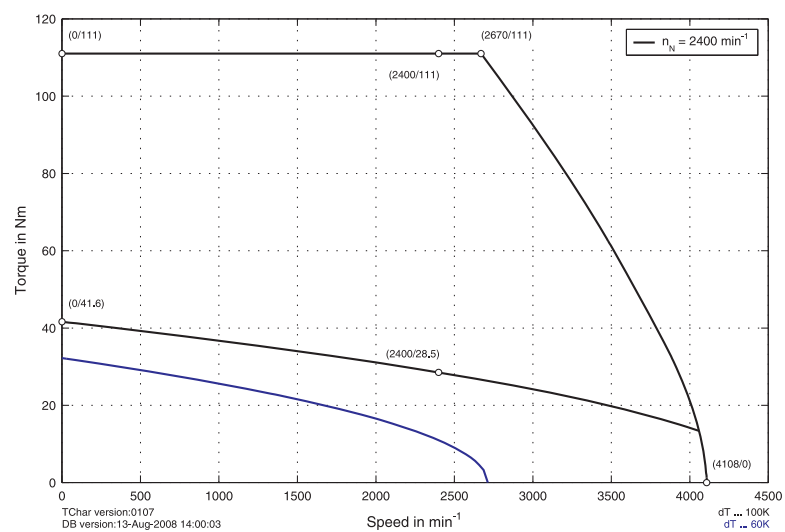


8JSA72.eennnffgg-0

ACOPOS

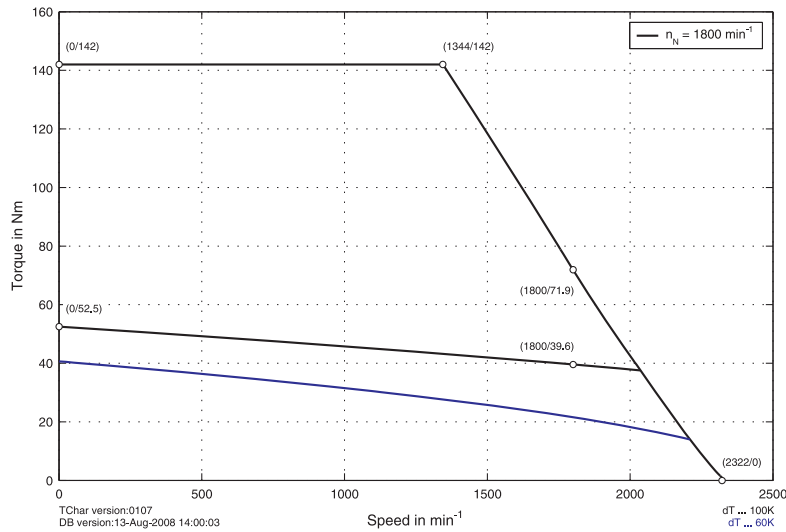


ACOPOSmulti

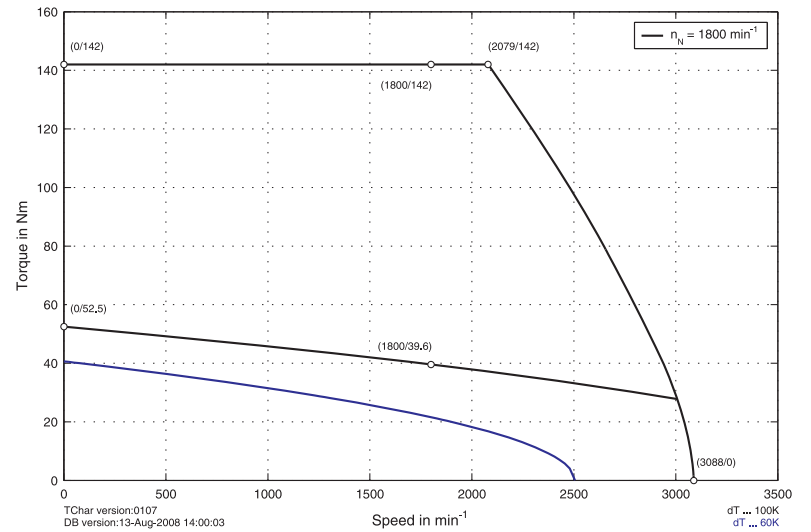


8LSA73.eennnffgg-0

ACOPOS



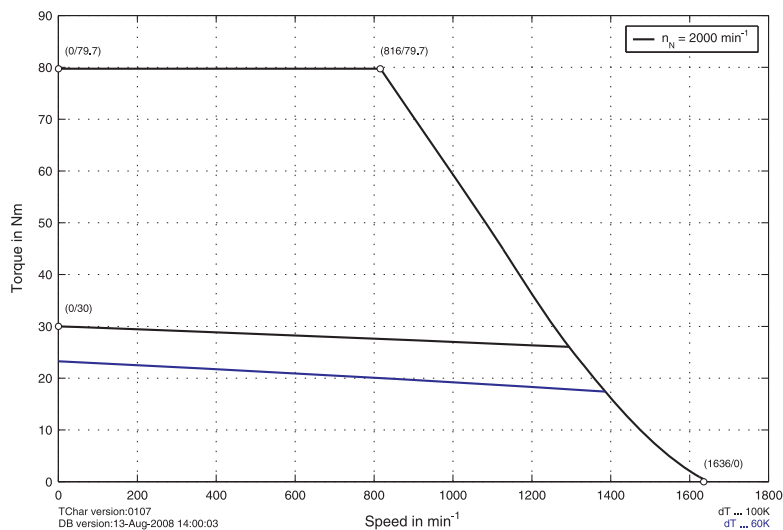
ACOPOSmulti



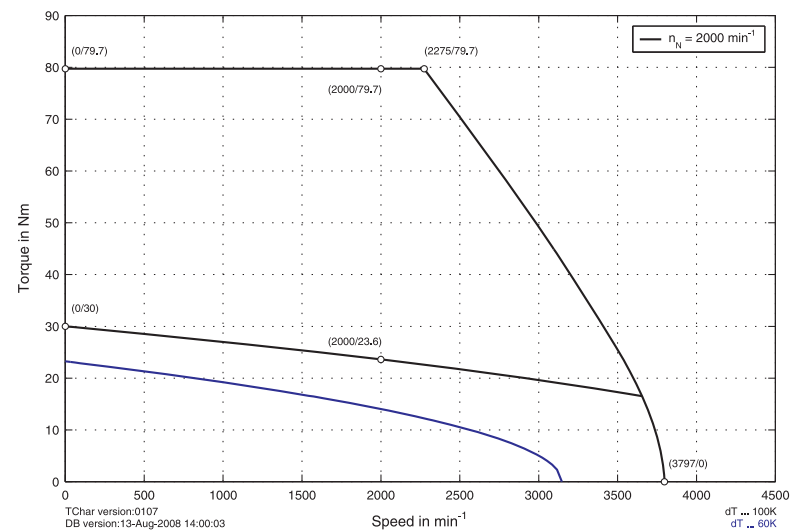
8JSA74.eennffgg-0

Speed-torque characteristic curves with 230 VAC supply voltage

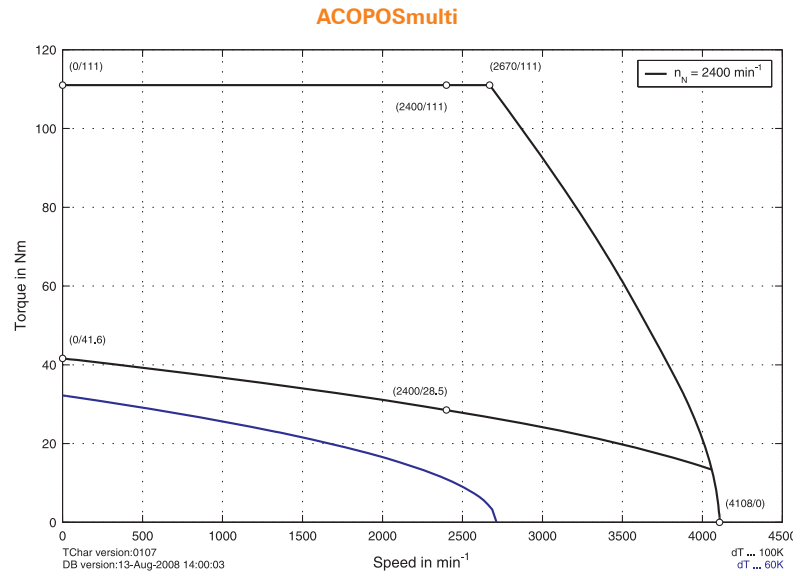
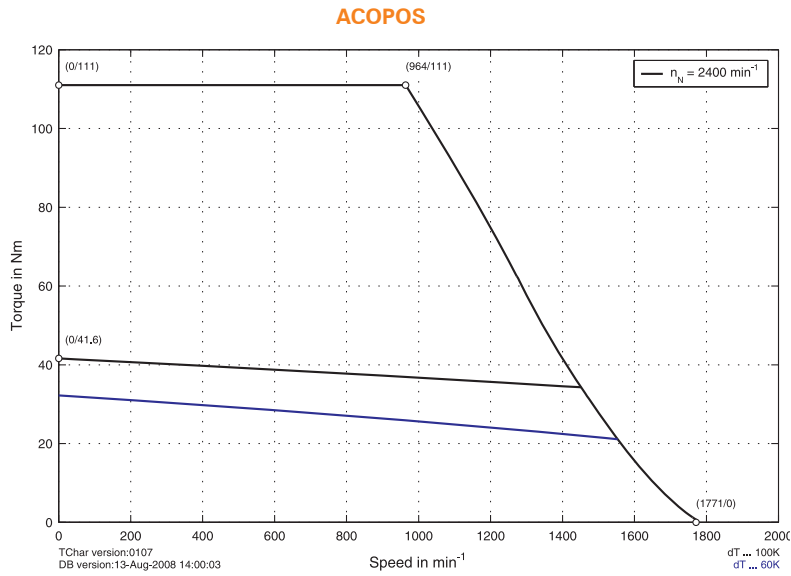
ACOPOS



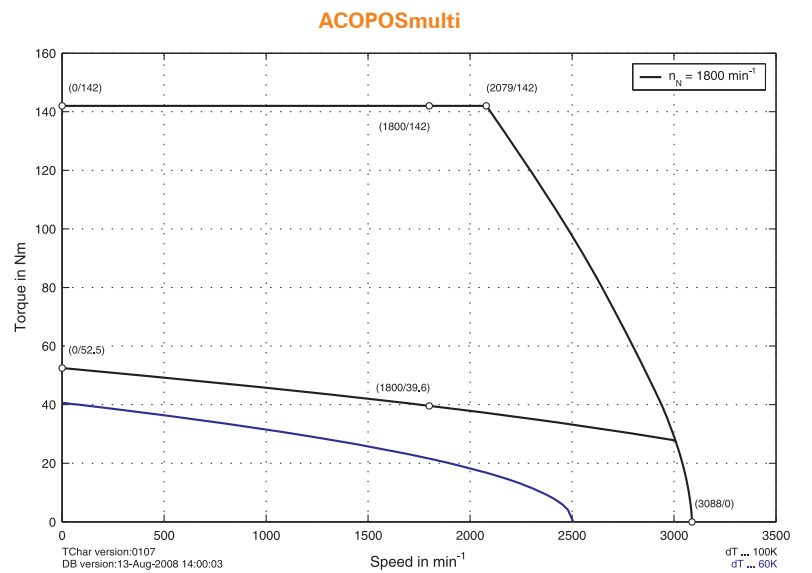
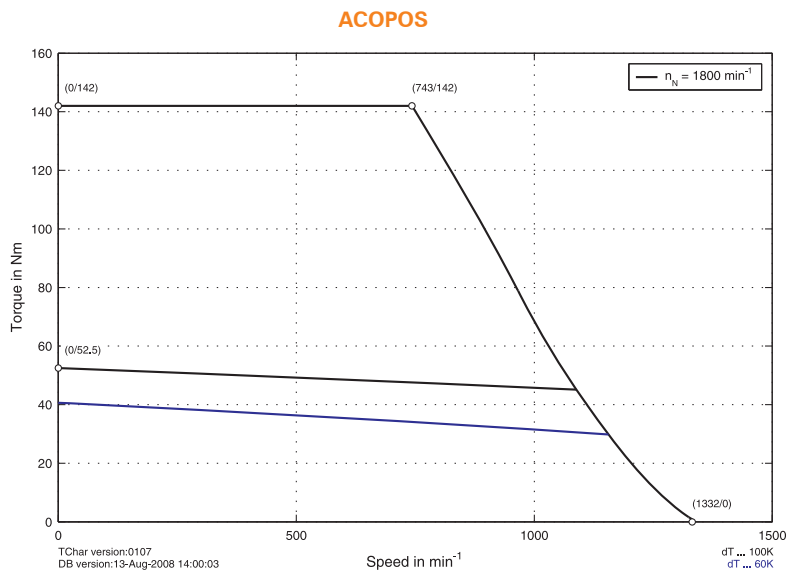
ACOPOSmulti



8JSA72.eennffgg-0

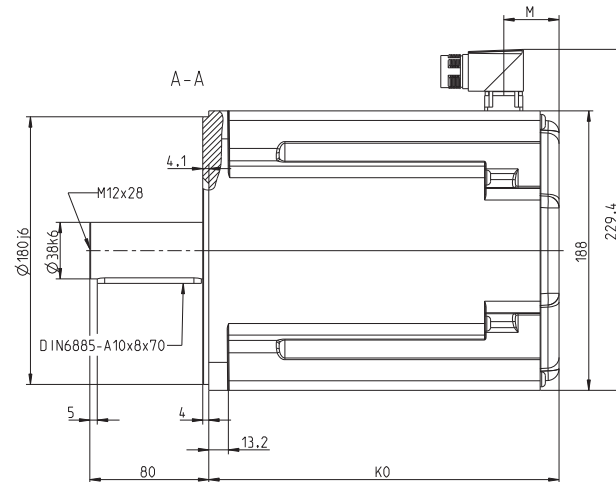
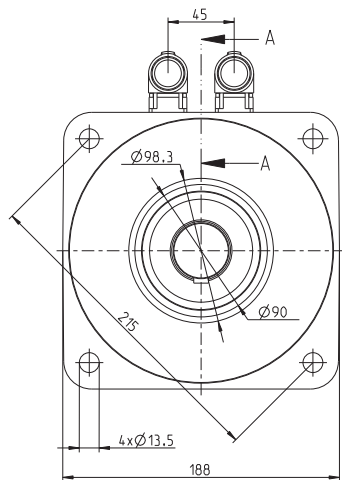


8JSA73.eennffgg-0



8JSA74.eennffgg-0

8JSA7

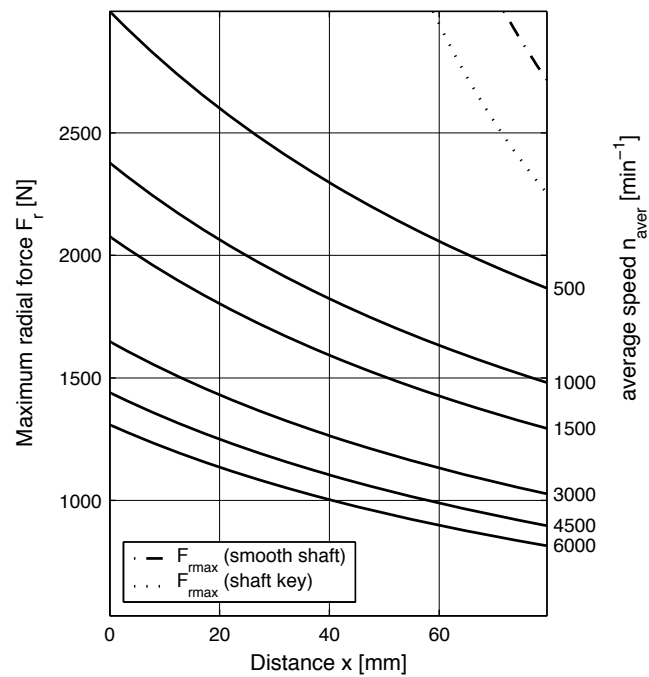


Dimensions

EnDat feedback			Resolver feedback			Extension of K_0 depending on the motor option [mm]	
Model number	K_0	M	Model number	K_0	M	Holding brake	Oil seal
8JSA72.Exnnnffgg-0	201.7	37.2	8JSA72.R0nnnffgg-0	192.5	28	42	---
8JSA73.Exnnnffgg-0	235.7	37.2	8JSA73.R0nnnffgg-0	226.5	28	42	---
8JSA74.Exnnnffgg-0	269.7	37.2	8JSA74.R0nnnffgg-0	260.5	28	42	---

Maximum shaft load

The values in the diagram below are based on a mechanical lifespan of the bearings of 20,000 operating hours.



maximum allowed axial force: $F_{amax} = 241 \text{ N}$

Recommended B&R motor cable

The recommended B&R motor cable for a motor depends on the recommended ACOPOS servo drive or ACOPOSmulti inverter module (see "Recommended cable cross section for B&R motor cables [mm^2]" in the table "Technical data") 1636

Recommended B&R encoder cable

8BCExxxx.1111A-0	ACPMulti EnDat cable, length xxxx m, $10 \times 0.14 \text{ mm}^2 + 2 \times 0.5 \text{ mm}^2$, EnDat plug 17-pin SpeedTEC socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed 1428
8BCRxxxx.1111A-0	ACPMulti Resolver cable, length xxxx m, $3 \times 2 \times 24 \text{ AWG}$ (19×0.127), resolver plug 12-pin SpeedTEC socket, servo plug 9-pin DSUB plug, can be used in cable drag chains, UL/CSA listed 1429

Motor connectors 8BPM

Features

- UL/CSA listed
- Metal housing; IP67 protection
- High-quality, gold-plated wire spring contacts
- High-level contact security even when reinserted many times
- SpeedTEC quick-release faster



General information	8BPM0001.0000-00	8BPM0002.0000-00	8BPM0003.0000-00
Connector size	Size 1	Size 1	Size 1.5
Number and type of contacts	8 (4 power and 4 signal contacts)	8 (4 power and 4 signal contacts)	8 (4 power and 4 signal contacts)
Degree of pollution	3	3	3
Installation altitude	Up to 2000 m	Up to 2000 m	Up to 2000 m
Insulator	PA, UL94/V0 listed	PA, UL94/V0 listed	PA, UL94/V0 listed
Contacts	Gold-plated brass	Gold-plated brass	Gold-plated brass
Protective ground connection on housing	According to VDE 0627	According to VDE 0627	According to VDE 0627
Protection according to DIN 40050	IP67 when connected	IP67 when connected	IP67 when connected
Certifications	UL/CSA	UL/CSA	UL/CSA
Electrical characteristics	8BPM0001.0000-00	8BPM0002.0000-00	8BPM0003.0000-00
Overvoltage category	3	3	3
Power contacts			
Rated current	30 A	30 A	75 A
Rated voltage	630 VAC / VDC	630 VAC / VDC	630 VAC / VDC
Test voltage (L-L)	6000 V	6000 V	6000 V
Contact resistance	< 3 Ω	< 3 Ω	< 1 Ω
Signal contacts			
Rated current	7 A	7 A	30 A
Rated voltage	250 VAC / VDC	250 VAC / VDC	630 VAC / VDC
Test voltage (L-L)	2500 V	2500 V	4000 V
Contact resistance	< 5 Ω	< 5 Ω	< 3 Ω
Mechanical characteristics	8BPM0001.0000-00	8BPM0002.0000-00	8BPM0003.0000-00
Temperature range	-20°C to +130°C	-20°C to +130°C	-20°C to +130°C
Housing material	Zinc casting, nickel plated	Zinc casting, nickel plated	Zinc casting, nickel plated
Gaskets	FKM	FKM	FKM
Connection cycles	> 50	> 50	> 50
Crimp range	4 x 0.5 - 2.5 mm ² + 4 x 0.06 - 1 mm ²	4 x 2.5 - 4 mm ² + 4 x 0.06 - 1 mm ²	4 x 1.5 - 10 mm ² + 4 x 0.5 - 2.5 mm ²
Cable ø	4.2 - 17 mm	4.2 - 17 mm	7 - 25 mm
Manufacturer information	8BPM0001.0000-00	8BPM0002.0000-00	8BPM0003.0000-00
Manufacturer	INTERCONTEC	INTERCONTEC	INTERCONTEC
Internet address	www.intercontec.biz	www.intercontec.biz	www.intercontec.biz
Manufacturer's product ID	BSTA 078 NN 00 42 0100 000	BSTA 078 NN 00 59 0100 000	CSTA 264 NN 00 45 0020 000

Encoder connectors 8BPE, 8BPR

Features

- UL/CSA listed
- Metal housing; IP67 protection
- High-quality, gold-plated wire spring contacts
- High-level contact security even when reinserted many times
- SpeedTEC quick-release faster







General information	8BPE0001.0000-00	8BPR0001.0000-00
Connector size	Size 1	Size 1
Number and type of contacts	17 signal contacts	12 signal contacts
Degree of pollution	3	3
Installation altitude	Up to 2000 m	Up to 2000 m
Insulator	PA, PBT, UL94/V0 listed	PA, PBT, UL94/V0 listed
Contacts	Gold-plated brass	Gold-plated brass
Protective ground connection on housing	According to VDE 0627	According to VDE 0627
Protection according to DIN 40050	IP67 when connected	IP67 when connected
Certifications	UL/CSA	UL/CSA
Electrical characteristics	8BPE0001.0000-00	8BPR0001.0000-00
Overvoltage category	3	3
Signal contacts		
Rated current	7 A	7 A
Rated voltage	125 V	160 V
Test voltage (L-L)	2000 V	2500 V
Contact resistance	< 5 Ω	< 5 Ω
Mechanical characteristics	8BPE0001.0000-00	8BPR0001.0000-00
Temperature range	-20°C to +130°C	-20°C to +130°C
Housing material	Zinc casting, nickel plated	Zinc casting, nickel plated
Gaskets	FKM, HBNR	FKM, HBNR
Connection cycles	> 50	> 50
Crimp range	17 x 0.06 - 1 mm ²	12 x 0.06 - 1 mm ²
Cable ø	3.5 - 14.7 mm	3.5 - 14.7 mm
Manufacturer information	8BPE0001.0000-00	8BPR0001.0000-00
Manufacturer	INTERCONTEC	INTERCONTEC
Internet address	www.intercontec.biz	www.intercontec.biz
Manufacturer's product ID	ASTA 035 NN 00 41 0100 000	ASTA 021 NN 00 41 0100 000



8LT three-phase synchronous motors High-torque drives

Modern machine concepts demand dynamics and precision. The high-torque servo motor series from B&R offers a high level of dynamics and positioning accuracy with compact sizes and enables the user the highest degree of flexibility for the machine design.

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Product data sheets - cooling type J		1670
Accessories		1678

System characteristics



8LT three-phase synchronous motors

Three-phase synchronous motors from the 8LT series are permanently excited torque motors for applications that require extraordinary dynamic characteristics and positioning precision as well as compact size and reduced weight. These are available in self-cooling or externally-cooled format.

The 8LT series torque motors provide the user with the highest degree of flexibility - the ideal basis for mechatronic and efficient machine design.

The short, compact design of the motors can eliminate the need for angular gears in many cases. All motor components are designed in such a way that saves maintenance.

This motor series features a relatively compact structure with a higher degree of rigidity and more dynamic properties as well as low detent torque. The externally-cooled format additionally ensures intensive surface cooling - the motor does not cause the environment around it to heat up.

The 8LT three-phase synchronous motors are designed as complete motors. Unlike built-in motors, there is no need to install bearings and encoders.

Feedback systems specified to meet your needs

8LT three-phase synchronous motors are equipped with high resolution EnDat Heidenhain encoders. A model is also available with multi-turn encoder. They allow operation without requiring homing procedures or additional measurement systems on the workpiece. The absolute encoder functions without a battery and is therefore absolutely maintenance free.

Connection type

The uniform connection technology, the prefabricated cables and the embedded parameter chip allow plug and play operation of the power transmission system. The angled connectors can be swiveled, which provides the maximum amount of flexibility during cabling.

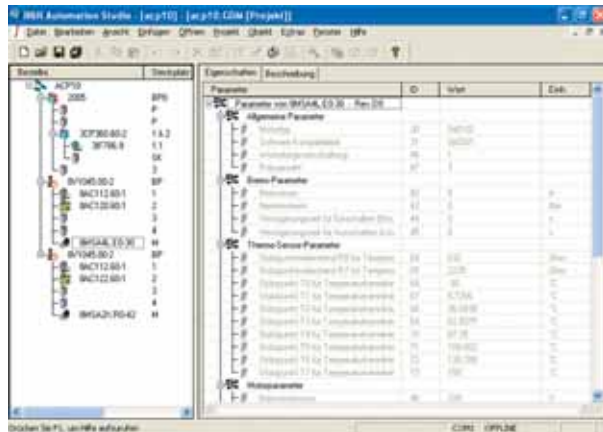
Areas of use

8LT three-phase synchronous motors are compact drive units, in which the mechanical power of the motor is directed right to the working machine without transfer elements. Typical areas of application:

- Main extruder drives
- Worm gear drives in injection molding machines
- Pull-Roll drives in foil machines
- Dynamic positioning tasks (e.g. rotary tables, clocked conveyor belts)
- Replacement for hydraulic motors
- Roller drives in paper machines
- Cross cutter drives in continuous product belts (e.g. paper, textiles, sheet metal)
- Wire-drawing machines

Advantages of B&R drives for your application:

- **Easy to install**
- **Small installation dimensions**
- **Extremely easy to service**
- **Low costs**



Embedded parameter chip

All relevant mechanical and electrical information and data is stored in the encoder used for the 8LT three-phase synchronous motors. This means that the user doesn't have to make settings on the servo drive in the field. As soon as the encoder is connected to the servo drive and the power is applied to the electronics, the motor is automatically identified. The motor sends its rated parameters and limit parameters to the servo drive. The drive then automatically determines the current limits and current control parameters required for optimal control of the motor. The user only has to optimize the speed and position controller. The integrated start-up environment in B&R Automation Studio™ provides assistance.

In addition to start-up assistance, routine service work is also made easier and motors can be exchanged without having to take extra time to set parameters.

System characteristics

8LT three-phase synchronous motors

Three-phase synchronous motors from the 8LT series are permanently excited, electronically commutated synchronous motors for applications that require excellent dynamic characteristics and positioning precision as well as compact size and reduced weight.

- NdFeB permanent magnets
- Sinusoidal commutation with high resolution EnDat encoders as the feedback unit
- Three-phase winding with star connection
- No elasticity in the power transmission system
- Minimum moment of inertia because of favorable rotor construction results in very good dynamic properties
- High overload capability/peak torque
- Low torque ripple
- No mechanical transfer elements that are subject to wear in the power transmission system, therefore high level of availability
- Long life-span, all motor parts except for bearings are free of wear
- Power dissipation generated in the stator diverted directly to the flange via the housing
- Preloaded, grooved ball bearings which are sealed on both sides and greased
- Complete motor system with stall torque ranging from 50 Nm to 408 Nm
- Connection using two SpeedTEC circular plugs
- Energy savings by reducing mechanical losses
- Controlled by ACOPOS servo drives (▣ 1251) or ACOPOSmulti drive systems (▣ 1321)

8LT three-phase synchronous motors are not allowed to be connected directly to the power mains; they are only allowed to be operated in combination with ACOPOS servo drives (▣ 1251) or ACOPOSmulti drive systems (▣ 1321)!

Cooling types


Cooling type A

8LT three-phase synchronous motors with cooling type A are self-cooling. The motors must be installed on the cooling surface (flange).

Cooling type J


8LT three-phase synchronous motors with cooling type J are based on motors with cooling type A and are liquid-cooled. The liquid-cooling increases the rated torque (M_N), rated current (I_N), stall torque (M_0) and stall current (I_0) by 70% as compared to the respective motors with cooling type A.

Sizes

8LT three-phase synchronous motors are available in size 9. (see also order key  1656)

Cooling type	Available sizes
	9
A	Yes
J	Yes

Lengths


8LT three-phase synchronous motors are available in up to five different lengths. They have different power ratings with identical flange dimensions. The various lengths can be differentiated by a number (d) in the model number (3, 4, 5, 6, 7).
(see also order key  1656)

Overview

Length	Available for size
	9
3	Yes
4	Yes
5	Yes
6	Yes
7	Yes

System characteristics

Motor encoder system

8LT three-phase synchronous motors can be delivered with high resolution EnDat Heidenhain encoders. The encoder system is listed as part of the model number in the form of a 2-digit code (ee). (see also order key  1656)

EnDat encoders

General information

EnDat is a standard developed by Johannes Heidenhain GmbH (www.heidenhain.de) that incorporates the advantages of absolute and incremental position measurement and also offers a read/write parameter memory in the encoder. With absolute position measurement (absolute position is read in serially), the homing procedure is usually not required. When necessary, a multi-turn encoder (4096 revolutions) should be installed. To save costs, a single-turn encoder and a reference switch can also be used. In this case, a homing procedure must be carried out. The incremental process allows the short delay times necessary for position measurement on drives with exceptional dynamic properties. With the sinusoidal incremental signal and the fine resolution in the EnDat module, a very high positioning resolution is achieved in spite of the moderate signal frequencies used.

Technical data

Different types of EnDat encoders can be used depending on the requirements:

Name	Order code (ee)	
	E6	E7
Encoder type	EnDat single-turn	EnDat multi-turn
Resolution	2048-line	2048-line
Recognizable	---	4096
Revolutions		
Accuracy	$\pm 20''$	$\pm 20''$
Limit frequency	≥ 400 kHz (-3 dB)	≥ 400 kHz (-3 dB)
Vibration during operation		
55 < f ≤ 2000 Hz	≤ 150 m/s ²	≤ 150 m/s ²
Shock during operation		
Length 6 ms	≤ 1000 m/s ²	≤ 1000 m/s ²
Manufacturer	Dr. Johannes Heidenhain GmbH	Dr. Johannes Heidenhain GmbH
Internet address	www.heidenhain.de	www.heidenhain.de
Manufacturer's product ID	ECN1313	EQN1325

Motor options

Depending on the cooling type and length, the 8LT three-phase synchronous motors can be delivered

- With various rated speeds
- With or without oil seal
- With two different connection directions for the motor plug.

The rated speed is listed as part of the model number in the form of a 3-digit code (nnn). The code is equal to the rated speed divided by 100. The respective combination of the other motor options is listed in the form of a 2-digit code (ff) as part of the model number (see section "Determining the order code for motor options (ff)", 1655).

(see also order key 1656)

Rated speed

8LT three-phase synchronous motors can be delivered with three different rates speeds:

Size	Available rated speed n_N [min ⁻¹]														
	300					500					1000				
9	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Length	3	4	5	6	7	3	4	5	6	7	3	4	5	6	7

Oil seal

All 8LT three-phase synchronous motors are available with an optional form A oil seal according to DIN 3760.

When equipped with an oil seal, the motors have IP65 protection according to IEC 60034-5.

Proper lubrication of the oil seal must be guaranteed throughout the entire lifespan of the motor.

System characteristics

Load capacity of the shaft end and bearing

8LT three-phase synchronous motors are equipped with grooved ball bearings which are sealed on both sides and greased. The radial and axial forces (F_r , F_a) that occur on the shaft end during operation and installation must be within the specifications listed below. The bearing elements are not permitted to be subject to shocks or impacts! Incorrect handling will cause the lifespan of the bearings to be reduced or the bearing to be damaged.

Installation

The axial forces F_a permitted during the installation of gearboxes, pinion gears, couplings, etc. depend on the motor size and can be found in the following table:

Size of motor	Permitted axial force F_a [N] Cooling type A, J
9	850

Operation

Radial force

The radial force F_r on the shaft end is made up of the installation forces (e.g. belt tension on pulleys) and operational forces (e.g. load torque on the pinion). The maximum radial force F_r depends on the shaft end type, bearing type, average speed, position where the radial force is applied and the desired lifespan of the bearings.

Axial force, shift in shaft position caused by axial force

The axial force F_a on the shaft end is made up of the installation forces (e.g. stress caused by installation) and operational forces (e.g. thrust caused by slanted tooth pinions). The maximum axial force F_a depends on the bearing type and the desired lifespan of the bearings. The fixed bearing is secured on the A flange with a retaining ring. The floating bearing is preloaded on the B flange with a spring in the direction of the A flange.

Determining permissible values for F_r and F_a

Information to determine permissible values of F_r and F_a can be taken from the motor data for the respective three-phase synchronous motors (see section "8LTA9", 1662 to section "8LTJ9", 1670). Permissible values are based on a bearing lifespan of 20,000 h (bearing lifespan calculation based on DIN ISO 281).

Simultaneously loading the shaft end with the maximum values of F_r and F_a is not permitted!
Contact B&R if this occurs.

Connection directions

8LT three-phase synchronous motors can be delivered with either straight or swivel (angled) motor plugs. The encoder plugs are always swivel (angled) design.

Determining the order code for motor options (ff)

The respective code (ff) for the order key can be found in the following table:

Motor options			
Shaft end	Connection direction	Oil seal	Code for order key (ff)
Alpha	Motor and encoder plugs - angled (swivel)	No	F0
		Yes	F3
	Motor plug - straight Encoder plug - swivel (angled)	No	F6
		Yes	F9

System characteristics

Order key

8LT	b	c	d	.	ee	nnn	ff	gg	-	h
-----	---	---	---	---	----	-----	----	----	---	---

Cooling type(see section "Cooling types", [1650](#))

A ... self-cooling (no separate surface cooling)

J ... separately cooled (surface cooling with built-in heat exchanger)

Size (see section "Sizes", [1651](#))

Valid values: **9**

Length (see section "Lengths", [1651](#))

Valid values: **3, 4, 5, 6, 7**

Encoder system (see section "Motor encoder systems", [1652](#))

E6 ... EnDat single-turn, 2048 lines (ECN1313)

E7 ... EnDat multi-turn, 2048 lines (EQN1325), 4,096 revolutions

Motor options (see section "Motor options", [1653](#), and section "Determining the order code for motor options (ff)", [1655](#))

nnn .. Rated rotational speed/100; e.g.: 030 corresponds to a rated speed of 3000 min⁻¹

Motor options (see section "Motor options", [1653](#))

Special motor options

00 ... No special motor options

Motor version

Valid values: **0**

Example order 1

A torque motor (type **8LTA93**) with a rated speed of 300 min⁻¹ was selected for an application. The motor should have a 2048-line EnDat single-turn encoder. Both the motor and the encoder plugs should be swivel plugs.

The code (ee) for the encoder system is **E6** (see "EnDat encoder", 1652).

The code (nnn) for a rated speed of 300 min⁻¹ is **003**.

The code (ff) for the other options (connection direction) is **F0** (see "Motor option key codes (ff)", 1655).

The model number for the required motor is **8LTA93.E6003F000-0**

Example order 2

A three-phase synchronous motor (type **8LTJ97**) with a rated speed of 500 min⁻¹ was selected for an application. The motor should have an oil seal and a 2048-line EnDat multi-turn encoder. The motor plug should have a straight connection. The encoder plug should have a "swivel (angled)" connection.

The code (ee) for the encoder system is **E7** (see "Technical data for the EnDat encoder", 1652).

The code (nnn) for a rated speed of 500 min⁻¹ is **005**.

The code (ff) for the other options (oil seal and connection direction) is **FA** (see "Motor option key codes (ff)", 1655).

Therefore the model number for the motor required is: **8LTJ97.E7005FA00-0**

System characteristics

General motor data

General information	Cooling type A	Cooling type J
C-UR-US listed	Yes	Yes
Electrical characteristics	Cooling type A	Cooling type J
Mains input voltage on servo drive	3 x 400 VAC ... 3 x 480 VAC ± 10%	3 x 400 VAC ... 3 x 480 VAC ± 10%
Connection type	Circular connector from Intercontec	Circular connector from Intercontec
Motor connector	Size 1, Size 1.5	Size 1, Size 1.5
Encoder connection	Size 1	Size 1
Efficiency	Typ. >90%	Typ. >90%
Thermal characteristics	Cooling type A	Cooling type J
Insulation class according to IEC 60034-1	F	F
Methods of cooling according to IEC 60034-6 (IC code)	Self-cooling No separate surface cooling (IC4A0A0)	Separately cooled Surface cooling with built-in heat exchanger (IC7A0W7, IC7A0U7)
Thermal motor protection according to IEC 60034-11	Maximum winding temperature is 145°C (the thermal motor protection in ACOPOS servo drives or in the ACOPOSmulti drive system limits it to 110°C)	Maximum winding temperature is 145°C (the thermal motor protection in ACOPOS servo drives or in the ACOPOSmulti drive system limits it to 110°C)
Mechanical characteristics	Cooling type A	Cooling type J
Vibration severity according to IEC 60034-14	Vibration severity grade R ¹⁾	Vibration severity grade R ¹⁾
Roller bearing, dynamic load ratings and rated lifespan	Based on DIN ISO 281	Based on DIN ISO 281
Eye bolt according to DIN 580	For size 9	For size 9
Oil seal according to DIN 3760	Form A	Form A
Mounting flange according to DIN 42948	Form A	Form A
Shaft end concentricity, coaxial properties and mounting flange plane according to DIN 42955	Tolerance R	Tolerance R
Paint	Water-based paint	Water-based paint
Name	98160 *IDROLIN/E SM SEMIOPACO NERO RAL 9005-C.452	98160 *IDROLIN/E SM SEMIOPACO NERO RAL 9005-C.452
Color	RAL 9005 flat; shaft end and flange front metallic glossy	RAL 9005 flat; shaft end and flange front metallic glossy
Operational conditions	Cooling type A	Cooling type J
Rating class, operation mode acc. to IEC 60034-1	S1 - continuous operation	S1 - continuous operation
Ambient temperature during operation	-15°C to +40°C	-15°C to +40°C
Relative humidity during operation	5 to 95%, non-condensing	5 to 95%, non-condensing
Reduction of the rated current and stall current at temperatures above 40°C	10% per 10°C	10% per 10°C
Maximum ambient temperature during operation	+55°C ²⁾	+55°C ²⁾
Reduction of the rated current and stall current at installation altitudes	10% per 1000 m	10% per 1000 m
Starting at 1000 m above sea level		
Maximum installation altitude	1000 m ³⁾	1000 m ³⁾
Protection Standards according to IEC 60034-5 (IP code)	IP64 (flange-side IP54)	IP64 (flange-side IP54)
With optional oil seal	IP65	IP65
Construction and mounting arrangement type according to EN60034-7 (IM code)	Horizontal (IM3001) Vertical, motor hangs on the machine (IM3011) Vertical, motor stands on the machine (IM3031)	Horizontal (IM3001) Vertical, motor hangs on the machine (IM3011) Vertical, motor stands on the machine (IM3031)
Coolant	---	Water
Coolant input temperature	---	+5°C to +25°C
Storage and transport conditions	Cooling type A	Cooling type J
Storage temperature	-20 to +60°C	-20 to +60°C
Relative humidity during storage	Max. 90%, non-condensing	Max. 90%, non-condensing
Transport temperature	-20 to +60°C	-20 to +60°C
Relative humidity during transport	Max. 90%, non-condensing	Max. 90%, non-condensing

1) Valid for all motors with a shaft height of more than 56 mm

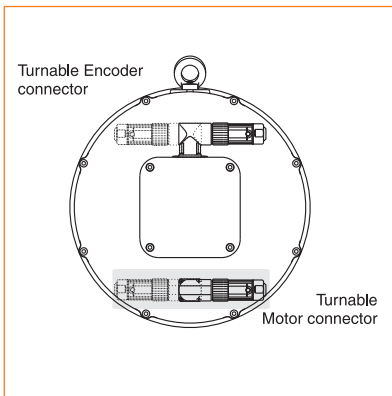
2) Continuous operation of the servo motors at ambient temperatures from +40°C to max. +55°C is possible, but results in a shorter lifespan.

3) Additional requirements are to be arranged with B&R.

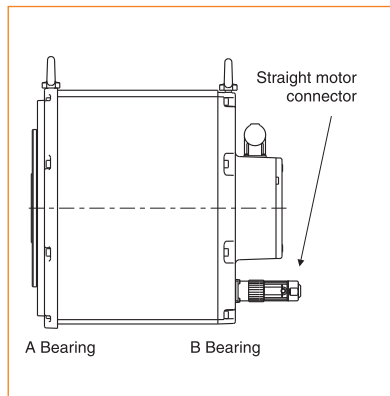
Terminology and formula symbols

Connection direction terminology, bearings

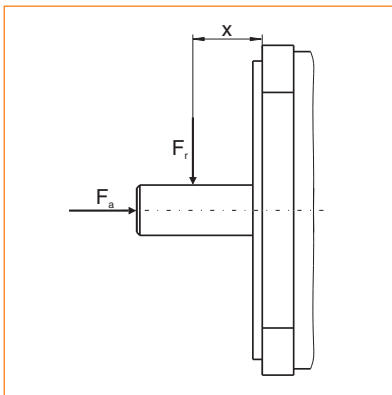
Swivel (angled)



Straight



Definitions for maximum shaft load diagrams



F_r Radial force

F_a Axial force

x Between motor flange and the point the radial force F_r is applied

System characteristics

Formula symbols

Term	Character	Device	Description
Rated speed	n_N	min^{-1}	Rated motor speed.
Rated torque	M_N	Nm	The rated torque is output by the motor ($n = n_N$) when the rated current is being drawn. This is possible for any length of time if the environmental conditions are correct.
Rated power	P_N	kW	The rated power is output by the motor when $n = n_N$. This is possible for any length of time if the environmental conditions are correct.
Rated current	I_N	A	The rated current is the effective value for the phase current (current in the motor supply line) when generating the rated torque at the rated speed. This is possible for any length of time if the environmental conditions are correct.
Stall torque	M_0	Nm	The "stall torque" is output by the motor at the speed n_0 and when the "stall current" is being drawn. This is possible for any length of time if the environmental conditions are correct. The speed n_0 must be high enough so that the winding temperature in all windings is uniform and stationary ($n_0 = 50 \text{ min}^{-1}$ for B&R motors). The continuous torque is reduced while stationary.
Stall current	I_0	A	The "stall current" is the effective value of the phase current (current in the motor supply line) for the generation of the "stall torque" at the speed n_0 . This is possible for any length of time if the environmental conditions are correct. The speed n_0 must be high enough so that the winding temperature in all windings is uniform and stationary ($n_0 = 50 \text{ min}^{-1}$ for B&R motors). The continuous current is reduced while stationary.
Peak torque	M_{max}	Nm	The peak torque is briefly output by the motor when the peak current is being drawn.
Maximum current	I_{max}	A	The peak current is the effective value of the phase current (current in the motor supply line) for the generation of the peak torque. Only possible for a short time. The peak current is determined by the magnetic circuit. Exceeding this value for a short time can cause irreversible damage (demagnetize the magnet material).
Maximum angular acceleration without brake	a	rad/s^2	Maximum acceleration of the motor without load and without brake. Value for the dynamics of the motor (corresponds to M_{max} / J).
Maximum speed	n_{max}	min^{-1}	Maximum motor speed. This is a mechanical condition (centrifugal force, bearing wear).
Average speed	n_{aver}	min^{-1}	Average speed for one cycle
Torque constant	K_T	Nm/A	The torque constant determines the torque created by the motor with 1 A_{rms} phase current. This value applies at a motor temperature of 20°C. When the temperature increases, the torque constant is reduced (generally to 10%). When the current increases, the torque constant is reduced (generally starting at twice the value of the rated current).
Voltage constant	K_E	V/1000 min^{-1}	The voltage constant determines the effective value (phase-phase) of the reverse voltage (EMF) induced by the motor with a speed of 1000 min^{-1} . This value applies at a motor temperature of 20°C. When the temperature increases, the voltage constant is reduced (generally to 5%). When the current increases, the voltage constant is reduced (generally starting at twice the value of the rated current).
Stator resistance	$R_{2\text{ph}}$	Ω	Resistance measured in ohms between two motor leads (phase-phase) at 20°C winding temperature. On B&R motors, the windings use a star connection.
Stator inductance	$L_{2\text{ph}}$	mH	Winding inductance measured between two motor leads. Stator inductance depends on the rotor position.
Electrical time constant	t_{el}	ms	Corresponds to 1/5 of the time needed for the stator current to stabilize with constant operating conditions.
Thermal time constant	t_{therm}	min	Corresponds to 1/5 of the time needed for the motor temperature to stabilize with constant operating conditions.
Moment of inertia without brake	J	kgcm^2	Moment of inertia for the motor without holding brake.
Weight without brake	m	kg	Weight of the motor without holding brake.



8LTA9



The technical data listed in this section has a theoretical tolerance range of $\pm 10\%$ ($K_E, K_T, I_N, I_0, I_{max}, t_{el}, t_{therm}, m, J$) and 15% (R_{2ph}, L_{2ph}). This is also valid for the speed - torque characteristic curves represented in this section.

Data [nnn]	8LTA93.ee[nnn]ffgg-0			8LTA94.ee[nnn]ffgg-0			8LTA95.ee[nnn]ffgg-0			8LTA96.ee[nnn]ffgg-0			8LTA97.ee[nnn]ffgg-0			
	[003]	[005]	[010]	[003]	[005]	[010]	[03]	[005]	[010]	[003]	[005]	[010]	[003]	[005]	[010]	
Rated speed n_N [min ⁻¹]	300	500	1000	300	500	1000	300	500	1000	30	500	1000	300	500	1000	
Number of poles	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	
Rated torque M_N [Nm]	48	45	39	95	90	77	142	135	116	188	180	153	225	212	182	
Rated power P_N [kW]	1.51	2.36	4.08	2.98	4.71	8.06	4.46	7.07	12.15	5.91	9.42	16.02	7.07	11.1	19.06	
Rated current I_N [A]	2.9	4.5	8.2	5.7	9.1	15.9	8.5	13.7	23.5	11.2	17.9	31	13.4	21.1	36.9	
Stall torque M_0 [Nm]	50	50	50	100	100	100	150	150	150	200	200	200	240	240	240	
Stall current I_0 [A]	3	5	10.5	6	10.1	20.6	8.9	15.2	30.4	11.9	19.9	40.5	14.3	23.9	48.6	
Peak torque M_{max} [Nm]	173	173	173	345	345	345	510	510	510	680	680	680	816	816	816	
Peak current I_{max} [A]	12	20	43	25	42	85	37	62	129	49	82	167	59	98	200	
Maximum angular acceleration without brake a [rad/s ²]	4230	4230	4230	4401	4401	4401	4400	4400	4400	4433	4433	4433	4452	4452	4452	
Maximum speed n_{max} [min ⁻¹]	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	
Torque constant K_T [Nm/A]	16.8	10.05	4.76	16.63	9.87	4.85	16.8	9.87	4.94	16.8	10.05	4.94	16.8	10.05	4.94	
Voltage constant K_E [V/1000 min ⁻¹]	1015.78	607.38	287.98	1005.31	596.9	293.22	1015.78	596.9	298.45	1015.78	607.38	298.45	1015.78	607.38	298.45	
Stator resistance R_{2ph} [Ω]	10.88	3.72	0.82	4.25	1.63	0.4	2.82	0.96	0.24	1.97	0.73	0.17	1.77	0.67	0.14	
Stator inductance L_{2ph} [mH]	82.57	29	6.6	39.9	15.1	3.42	27.5	9.41	2.42	20.86	7.4	1.76	18.09	6.63	1.52	
Electrical time constant t_{el} [ms]	7.1	7.3	7.5	9.3	9.2	8.4	9.9	9.9	10.2	10.9	10.3	10.6	10.6	10.3	11	
Thermal time constant t_{therm} [min]	50	50	50	70	70	70	90	90	90	110	110	110	130	130	130	
Moment of inertia without brake J [kgcm ²]	409	409	409	784	784	784	1159	1159	1159	1534	1534	1534	1833	1833	1833	
Weight without brake m [kg]	33	33	33	50	50	50	67	67	67	84	84	84	98	98	98	
Recommendations																
Cross section for B&R motor cables [mm ²] ¹⁾	1.5	1.5	4	1.5	4	4	4	4	4	4 ⁴⁾	4	4	10	4	4	10
ACOPOS	⊗ 1314	⊗ 1314	⊗ 1315	⊗ 1314	⊗ 1315	⊗ 1315	⊗ 1315	⊗ 1315	⊗ 1315		⊗ 1315	⊗ 1315	⊗ 1316	⊗ 1315	⊗ 1315	⊗ 1316
ACOPOSmulti	⊗ 1425	⊗ 1425	⊗ 1426	⊗ 1425	⊗ 1426	⊗ 1426	⊗ 1426	⊗ 1426	⊗ 1426		⊗ 1426	⊗ 1426	⊗ 1427	⊗ 1426	⊗ 1426	⊗ 1427
ACOPOS servo drive 8Vxxxx.00-x ²⁾	1045	1090	1180	1090	1180	1180	1180	1180	1320	1180	1320	1640	1180	1320	1640	
ACOPOSmulti inverter module 8BVI... ³⁾	0028	0055	0110	0055	0110	0220	0110	0220	0440	0110	0220	0880	0220	0440	0880	

1) The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSmulti inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request.

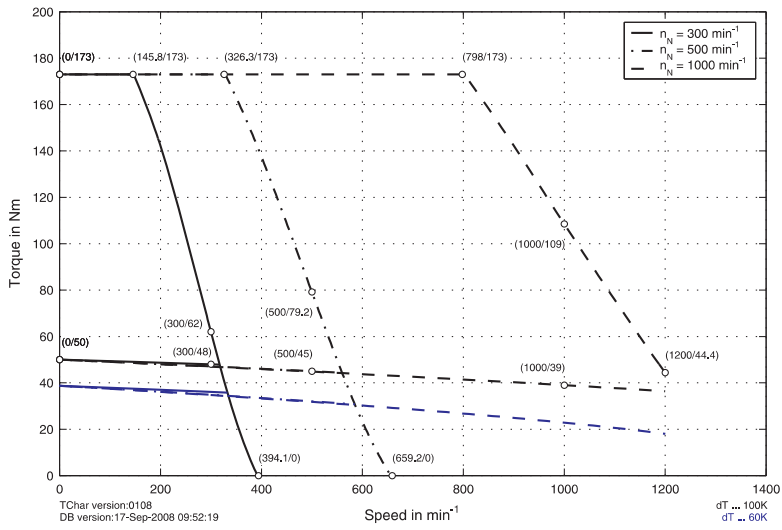
2) The recommended servo drive is defined for 1.1x the stall current of the motor; if more than 2x the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

3) The recommended ACOPOSmulti inverter module is defined for 1.1x the stall current of the motor; if more than 2x the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

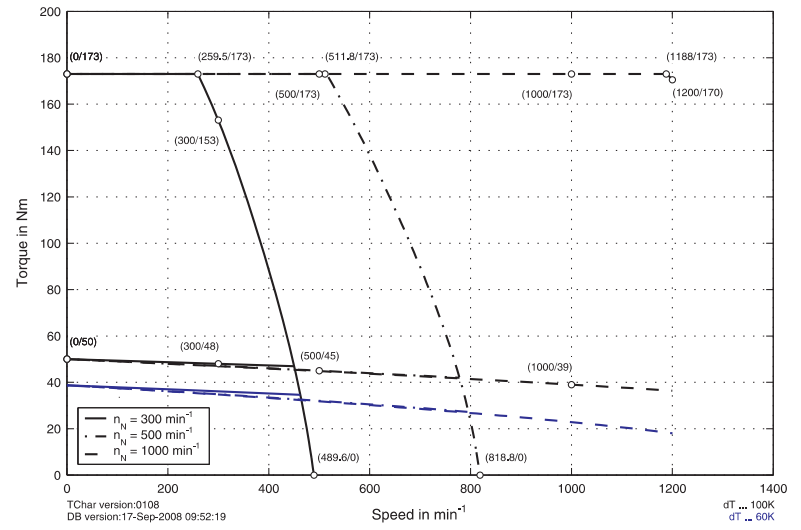
4) Special prefabricated motor cables must be used for this motor / servo drive combination (size of the motor plug is not the standard size). They are available from B&R on request.

Speed-torque characteristic curves with 400 VAC supply voltage

ACOPOS

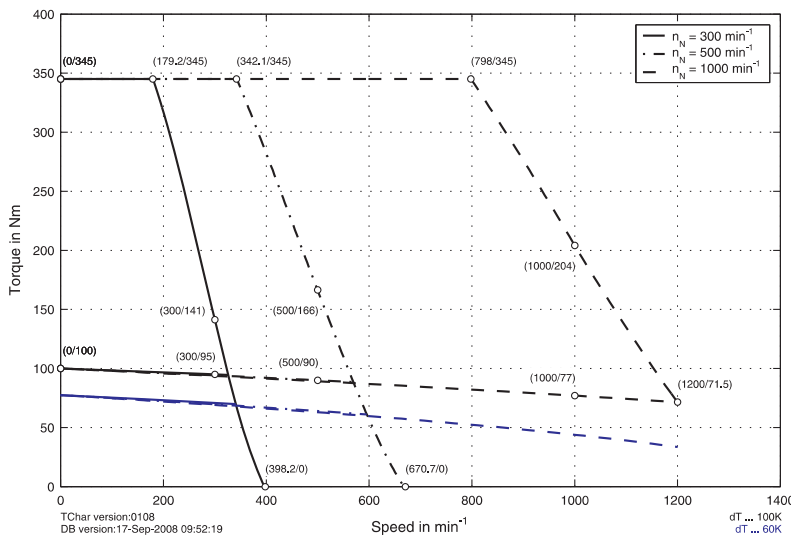


ACOPOSMulti

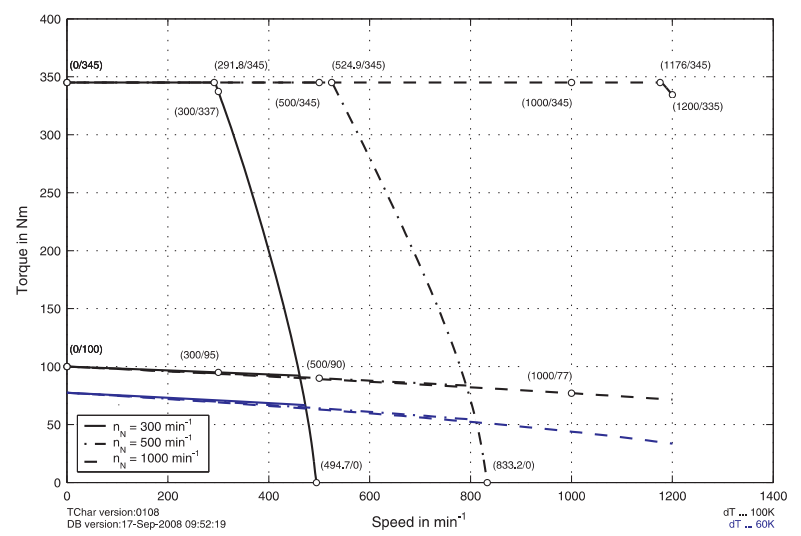


8LTA93.eennffgg-0

ACOPOS

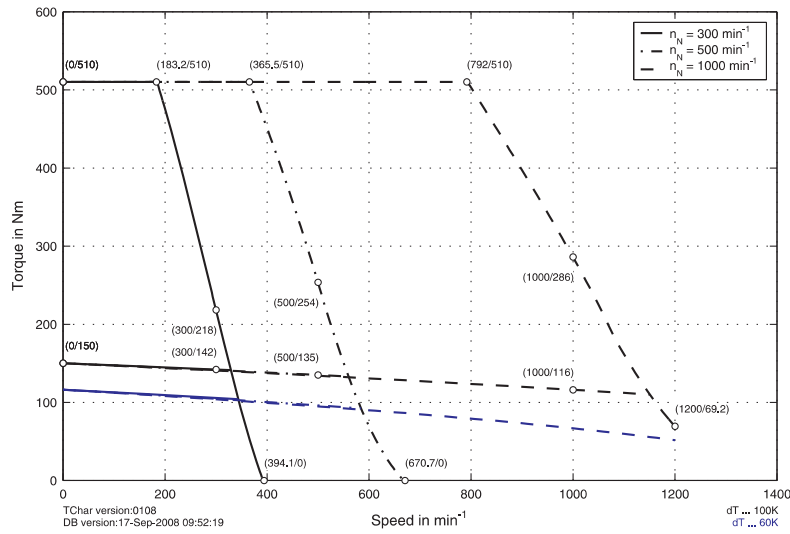


ACOPOSMulti

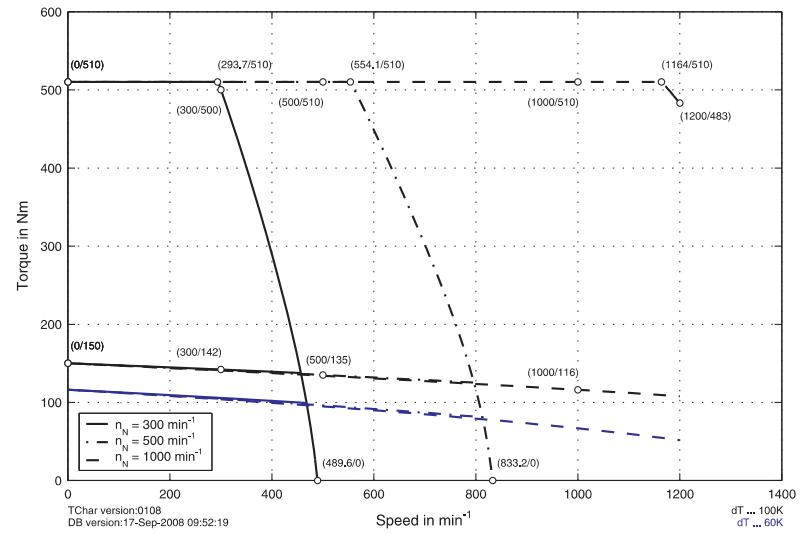


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ACOPOS

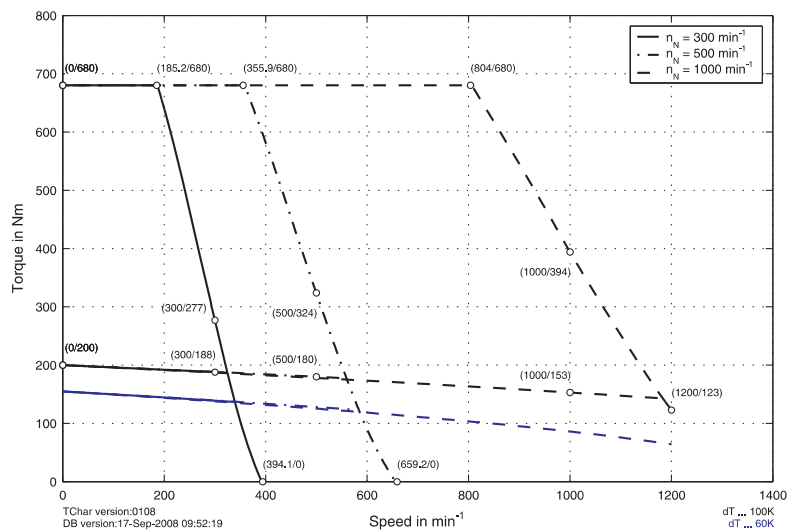


ACOPOSMulti

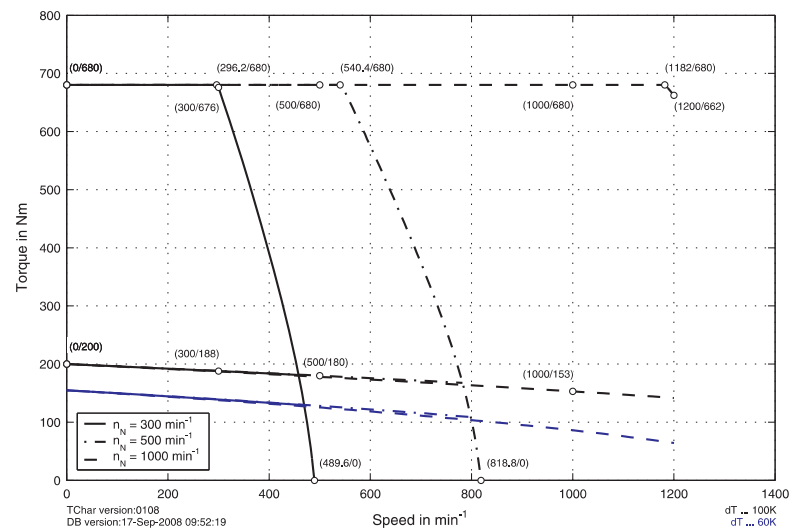


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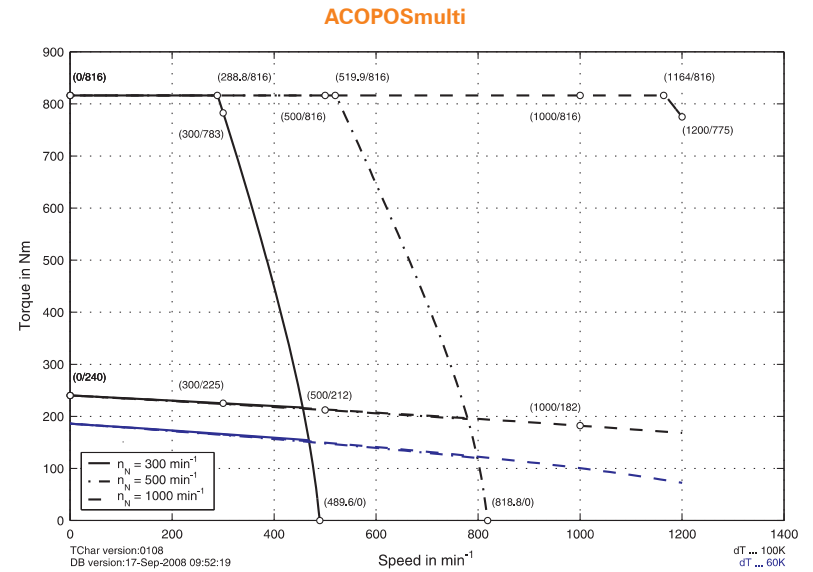
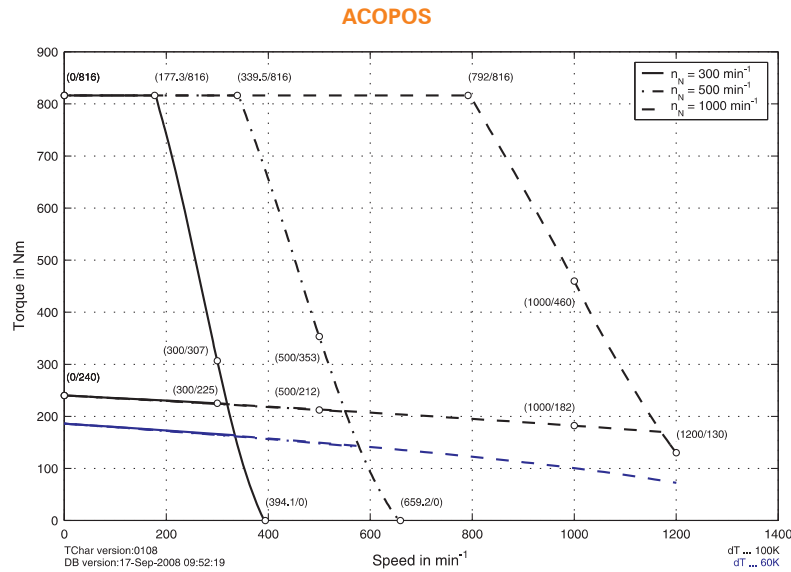
ACOPOS



ACOPOSMulti

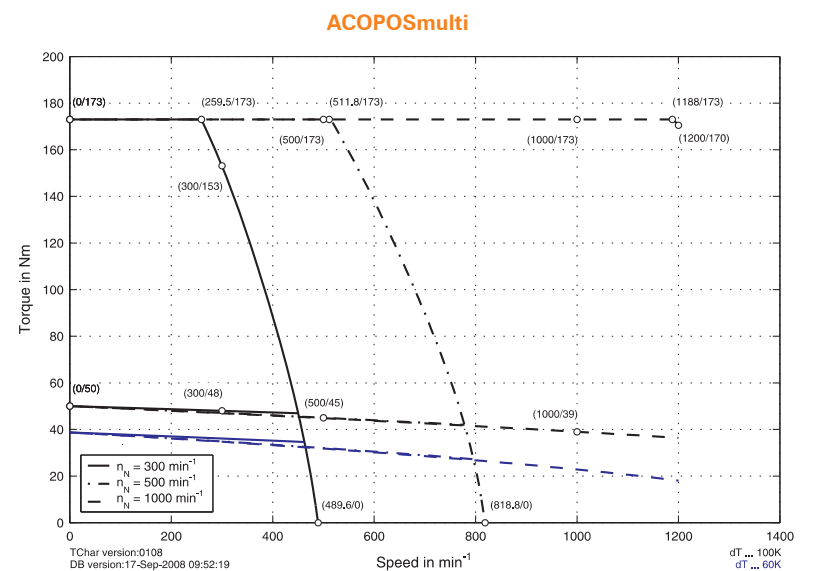
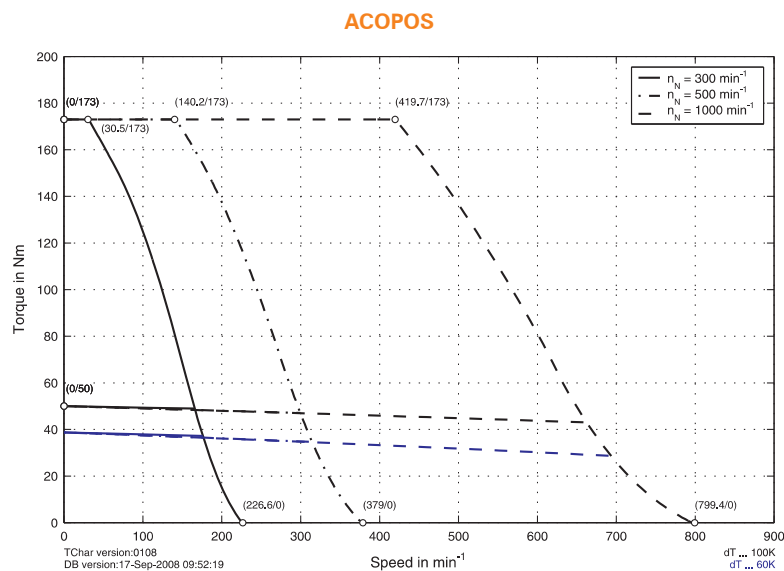


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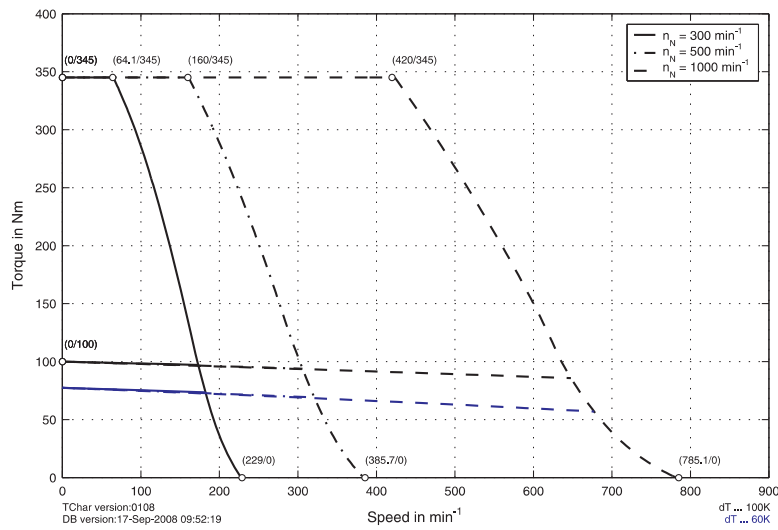
8LTA97.eennffgg-0

Speed-torque characteristic curves with 230 VAC supply voltage

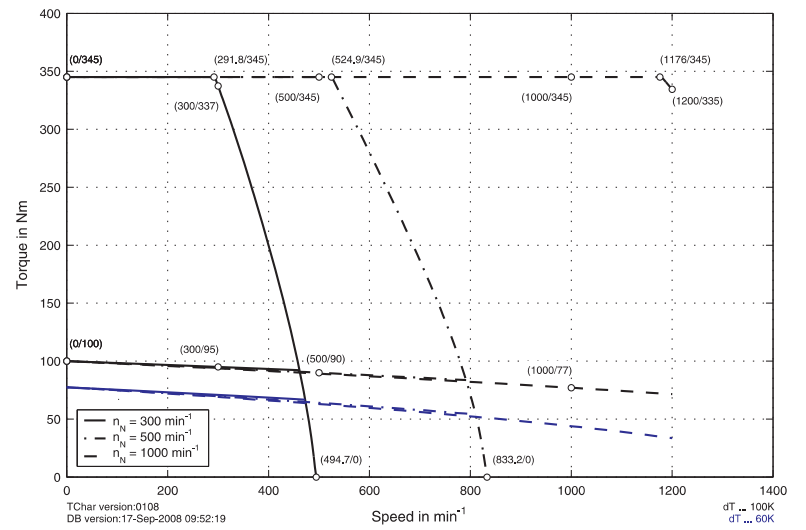


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ACOPOS

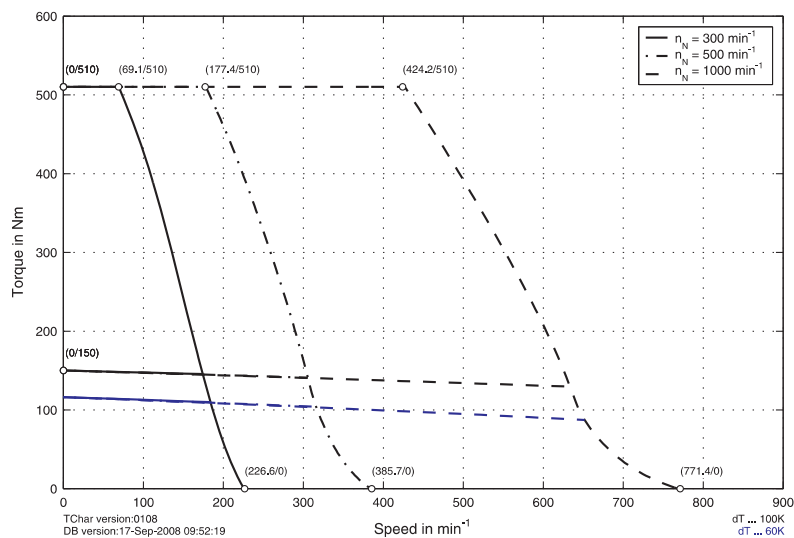


ACOPOSMulti

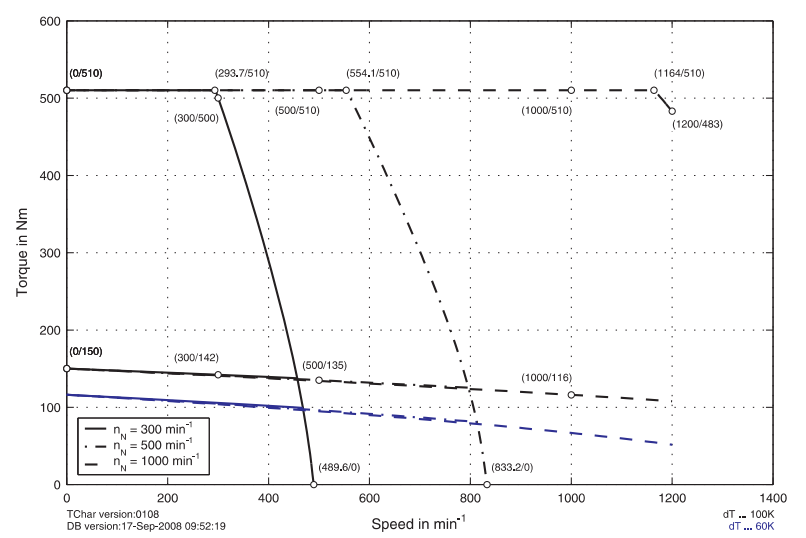


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ACOPOS

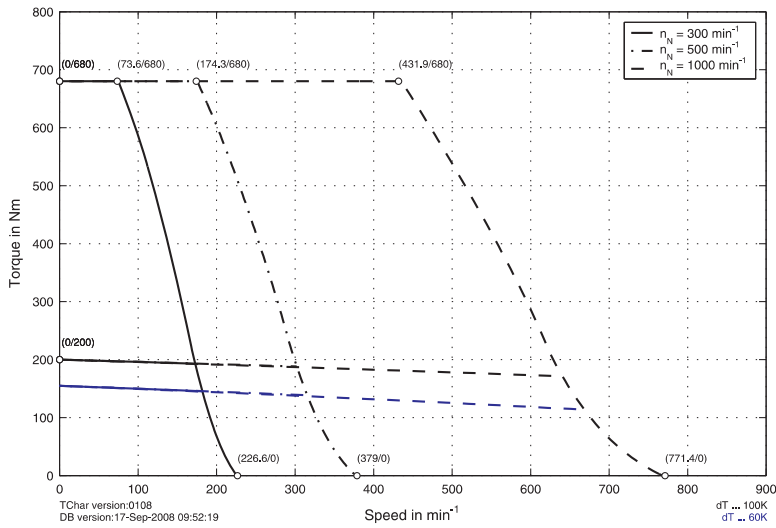


ACOPOSMulti

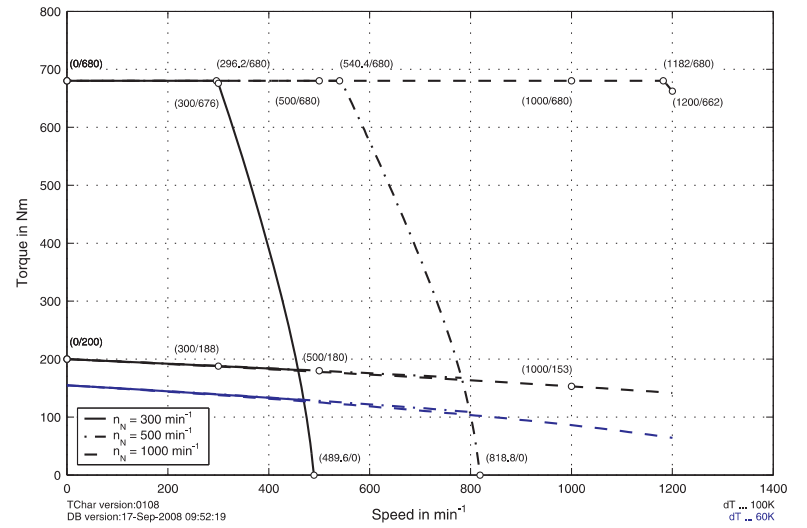


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ACOPOS

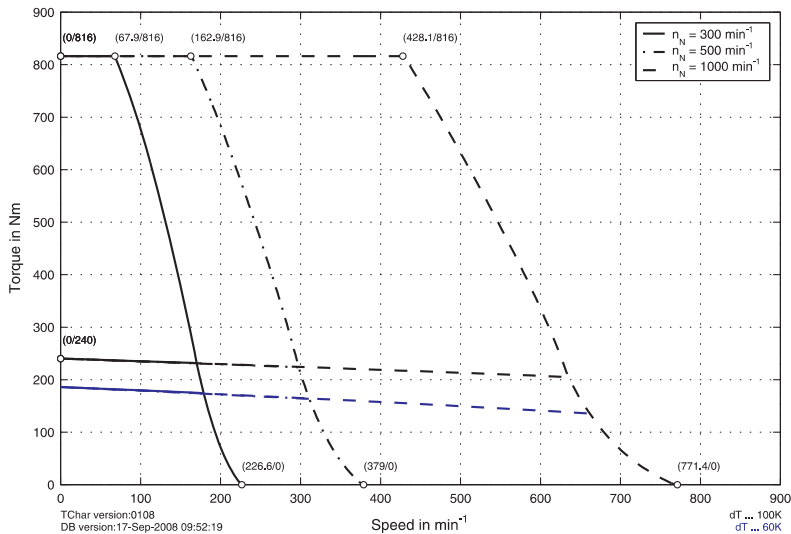


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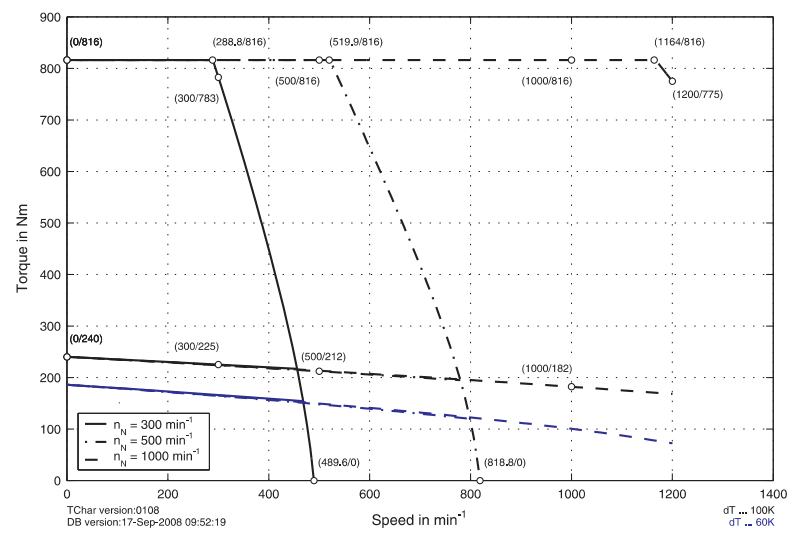


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ACOPOS

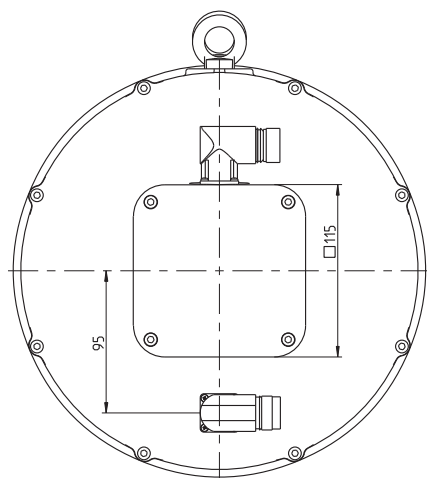


ACOPOSMulti

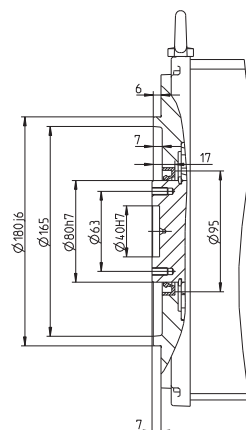
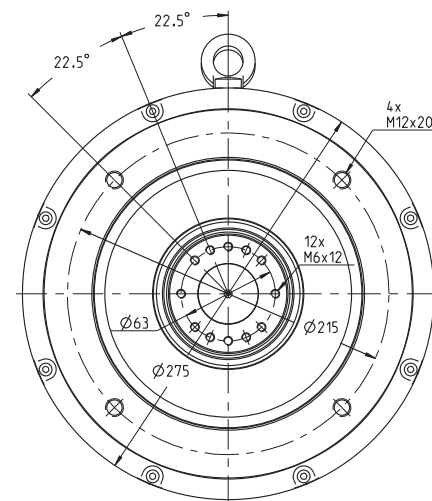
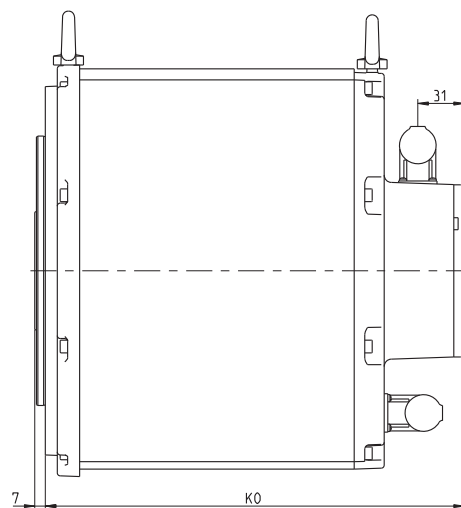


8LTA97.eennffgg-0

8LTA9



A side flange detail



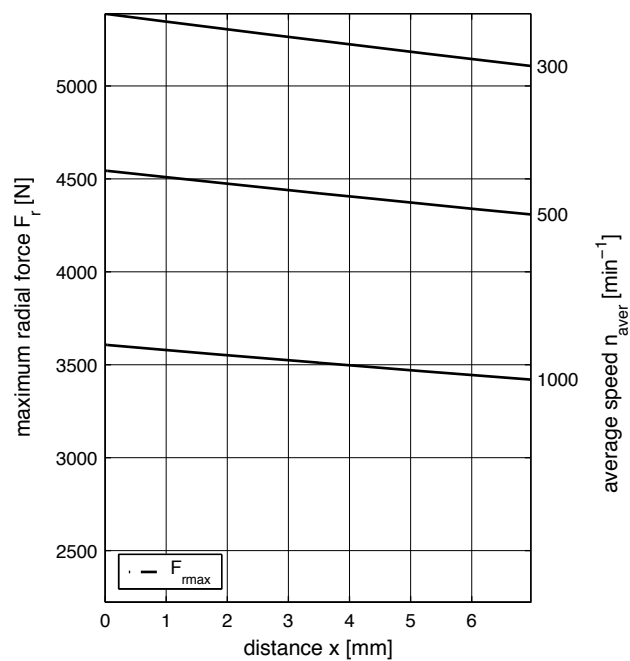
Dimensions

Model number

Model number	K_0
8LTA93.eennffgg-0	230
8LTA94.eennffgg-0	280
8LTA95.eennffgg-0	330
8LTA96.eennffgg-0	380
8LTA97.eennffgg-0	420

Maximum shaft load

The values in the diagram below are based on a mechanical lifespan of the bearings of 20,000 operating hours.



maximum allowed axial force: $F_{amax} = 840 \text{ N}$

Recommended B&R motor cable

The recommended B&R motor cable for a motor depends on the recommended ACOPOS servo drive or ACOPOSmulti inverter module (see "Recommended cable cross section for B&R motor cables [mm^2]" in the table "Technical data")

1662

Recommended B&R encoder cable

8BCExxxx.1111A-0 ACPmulti EnDat cable, length xxxx m, $10 \times 0.14 \text{ mm}^2 + 2 \times 0.5 \text{ mm}^2$, EnDat plug 17-pin SpeedTEC socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed

1428

8LTJ9



Symbol photo

The technical data listed in this section has a theoretical tolerance range of $\pm 10\%$ ($K_E, K_T, I_N, I_0, I_{max}, t_{el}, t_{therm}, m, J$) and 15% (R_{2ph}, L_{2ph}). This is also valid for the speed - torque characteristic curves represented in this section.

Data [nnn]	8LTJ93.ee[nnn]ffgg-0			8LTJ94.ee[nnn]ffgg-0			8LTJ95.ee[nnn]ffgg-0			8LTJ96.ee[nnn]ffgg-0			8LTJ97.ee[nnn]ffgg-0		
	003	[005]	[010]	[003]	[005]	[010]	[003]	[005]	[010]	[003]	[005]	[010]	[003]	[005]	[010]
Rated speed n_N [min ⁻¹]	300	500	1000	300	500	1000	300	500	1000	300	500	1000	300	500	1000
Number of poles	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
Rated torque M_N [Nm]	82	77	66	162	153	131	241	230	197	320	306	260	383	360	309
Rated power P_N [kW]	2.56	4.01	6.94	5.07	8.01	13.71	7.58	12.02	20.65	10.04	16.02	27.24	12.02	18.87	32.4
Rated current I_N [A]	4.9	7.6	13.9	9.7	15.5	27	14.4	23.2	39.9	19	30.5	52.7	22.8	35.9	62.7
Stall torque M_0 [Nm]	85	85	85	170	170	170	255	255	255	340	340	340	408	408	408
Stall current I_0 [A]	5.1	8.5	17.8	10.2	17.2	35.1	15.2	25.8	51.7	20.2	33.8	68.9	24.3	40.6	82.7
Peak torque M_{max} [Nm]	173	173	173	345	345	345	510	510	510	680.2	680	680	816	816	816
Peak current I_{max} [A]	12	20	43	25	42	85	37	62	129	49	82	167	59	98	200
Maximum angular acceleration without brake a [rad/s ²]	4230	4230	4230	4401	4401	4401	4400	4400	4400	4433	4433	4433	4452	4452	4452
Maximum speed n_{max} [min ⁻¹]	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200
Torque constant K_T [Nm/A]	16.8	10.05	4.76	16.63	9.87	4.85	16.8	9.87	4.94	16.8	10.05	4.94	16.8	10.05	4.94
Voltage constant K_E [V/1000 min ⁻¹]	1015.78	607.38	287.98	1005.31	596.9	293.22	1015.78	596.9	298.45	1015.78	607.38	298.45	1015.78	607.38	298.45
Stator resistance R_{2ph} [Ω]	10.88	3.72	0.82	4.25	1.63	0.4	2.82	0.96	0.24	1.97	0.73	0.17	1.77	0.67	0.14
Stator inductance L_{2ph} [mH]	82.57	29	6.6	39.9	15.1	3.42	27.5	9.41	2.42	20.86	7.4	1.76	18.09	6.63	1.52
Electrical time constant t_{el} [ms]	7.1	7.3	7.5	9.3	9.2	8.4	9.9	9.9	10.2	10.9	10.3	10.6	10.6	10.3	11
Thermal time constant t_{therm} [min]	50	50	50	70	70	70	90	90	90	110	110	110	130	130	130
Moment of inertia without brake J [kgcm ²]	409	409	409	784	784	784	1159	1159	1159	1534	1534	1534	1833	1833	1833
Weight without brake m [kg]	34	34	34	53	53	53	71	71	71	89	89	89	104	104	104
Recommendations															
Cross section for B&R motor cables [mm ²] ¹⁾	1.5	4	4	4	4	4 ⁴⁾	4	4	10	4	10	10	4	10	10
ACOPOS	⊗ 1314	⊗ 1315	⊗ 1315	⊗ 1315	⊗ 1315		⊗ 1315	⊗ 1315	⊗ 1316	⊗ 1315	⊗ 1316	⊗ 1316	⊗ 1315	⊗ 1316	⊗ 1316
ACOPOSmulti	⊗ 1425	⊗ 1426	⊗ 1426	⊗ 1426	⊗ 1426		⊗ 1426	⊗ 1426	⊗ 1427	⊗ 1426	⊗ 1427	⊗ 1427	⊗ 1426	⊗ 1427	⊗ 1427
ACOPOS servo drive 8Vxxxx.00-x ²⁾	1090	1180	1320	1180	1320	1640	1180	1320	1640	1320	1640	128M	1320	1640	128M
ACOPOSmulti inverter module 8BVI... ³⁾	0055	0055	0220	0110	0220	0440	0220	0440	0880	0440	0440	0880	0440	0880	0880

1) The B&R motor cables with this cable cross section are produced optimally (cables stripped to the correct length) for the recommended ACOPOS servo drive or the recommended ACOPOSmulti inverter module. B&R motor cables with other cable cross sections can also be used (within the specified terminal cross section range) and can be obtained from B&R in the desired design on request.

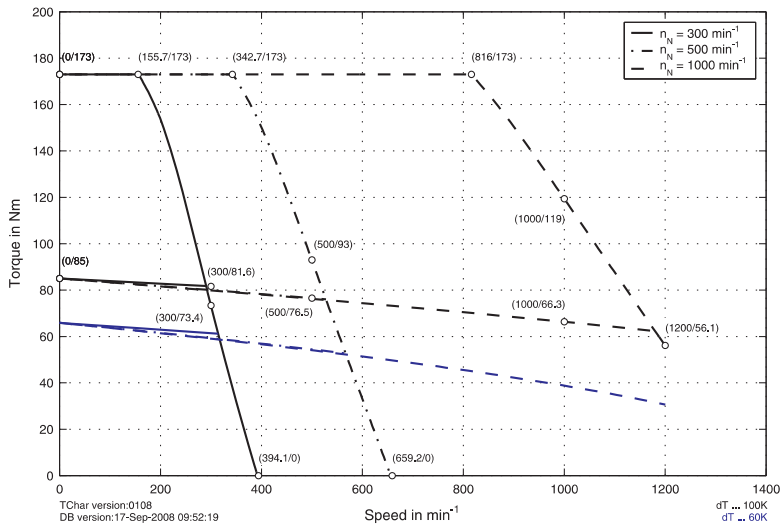
2) The recommended servo drive is defined for 1.1x the stall current of the motor; if more than 2x the stall torque is required during the acceleration phase, the next larger servo drive should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the servo drive size (one size larger or smaller).

3) The recommended ACOPOSmulti inverter module is defined for 1.1x the stall current of the motor; if more than 2x the stall torque is required during the acceleration phase, the next larger inverter module should be selected. This recommendation is only a guideline, detailed inspection of the corresponding speed - torque characteristic curve can result in deviations of the inverter module size (one size larger or smaller).

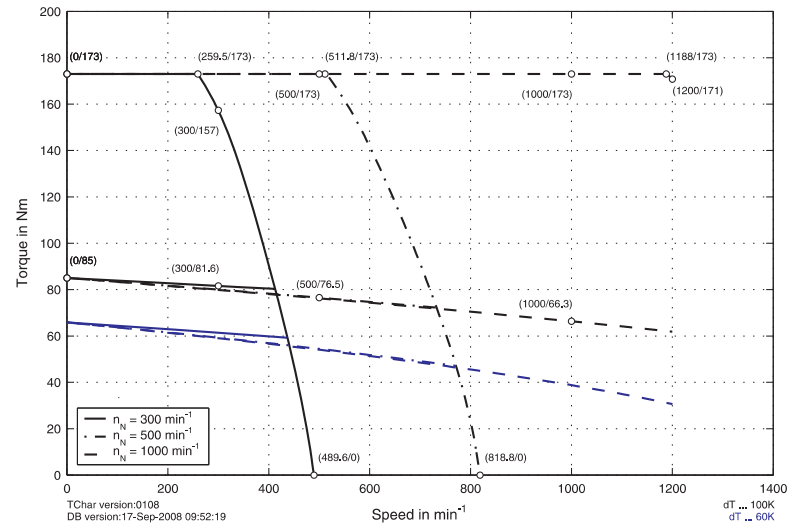
4) Special prefabricated motor cables must be used for this motor / servo drive combination (size of the motor plug is not the standard size). They are available from B&R on request.

Speed-torque characteristic curves with 400 VAC supply voltage

ACOPOS

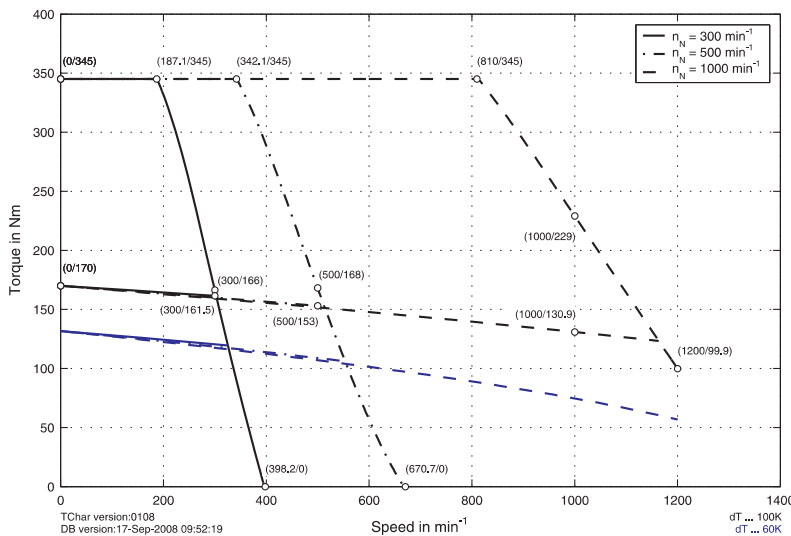


ACOPOSMulti

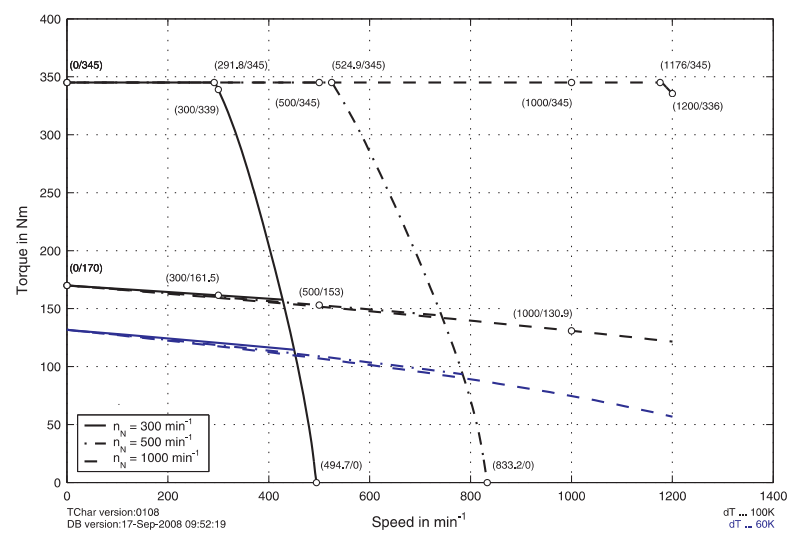


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ACOPOS

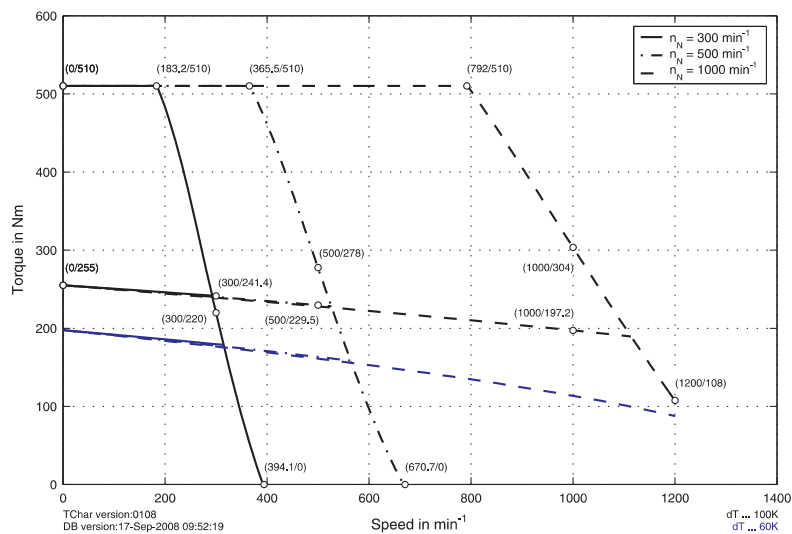


ACOPOSMulti

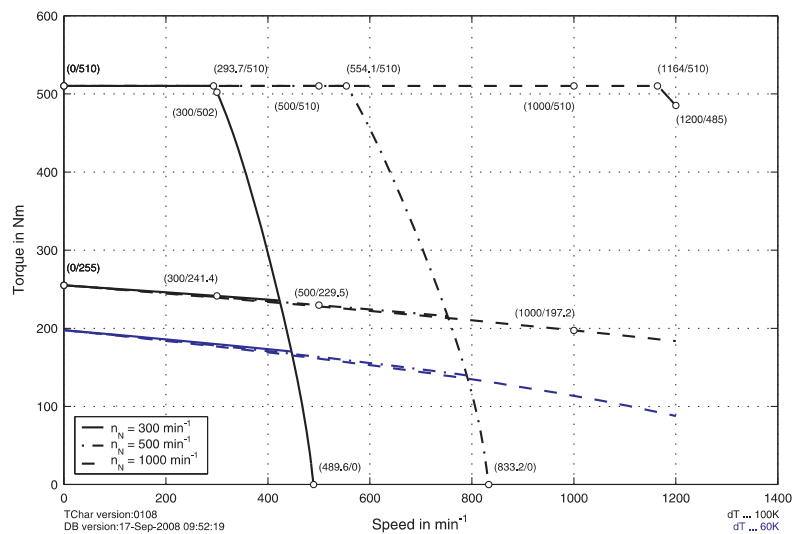


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ACOPOS

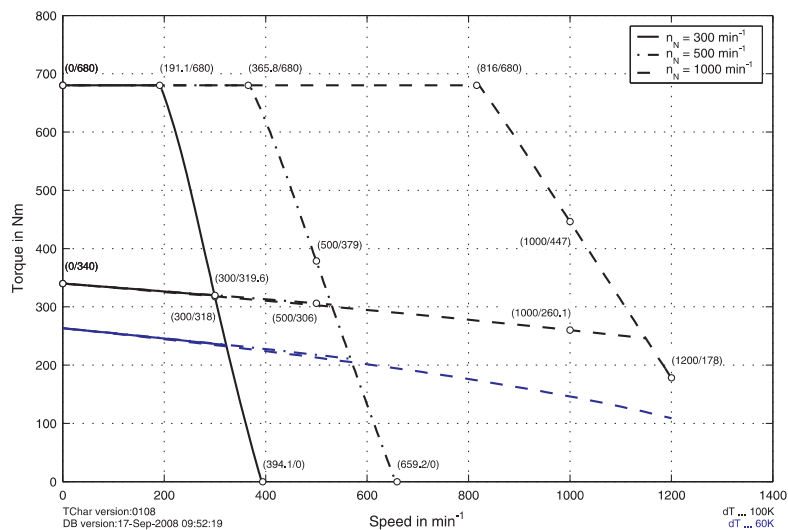


ACOPOSMulti

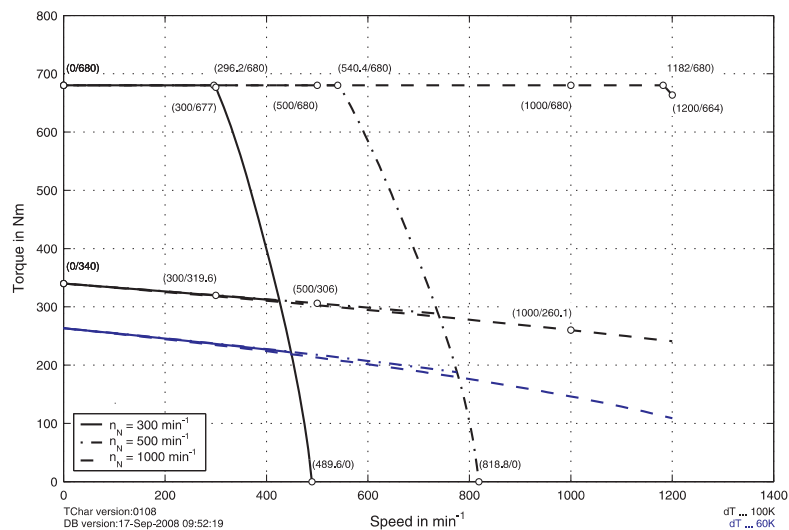


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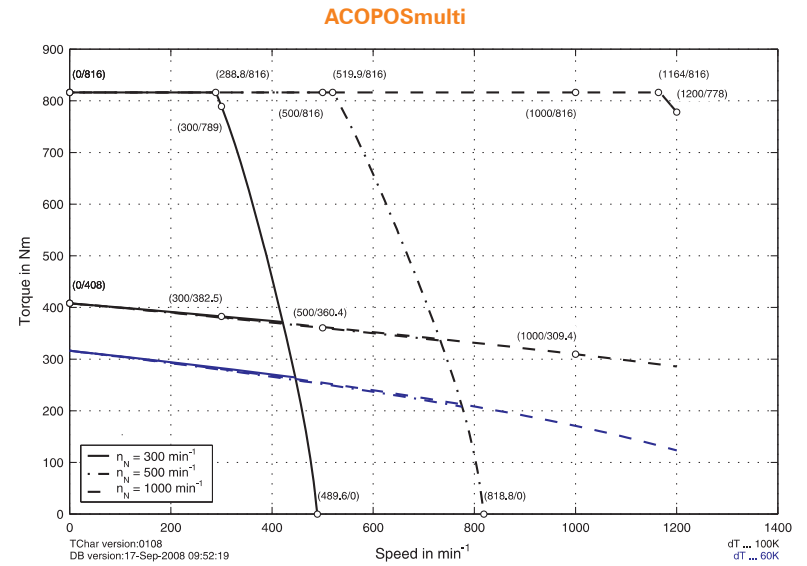
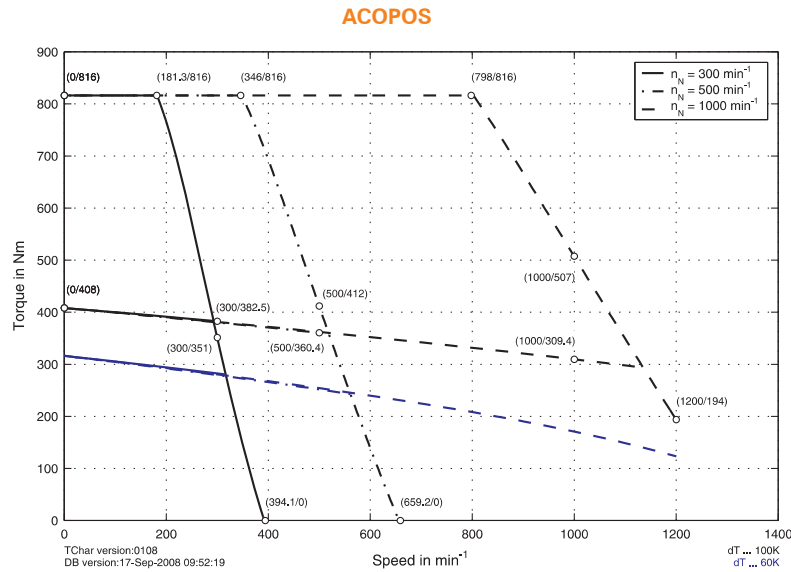
ACOPOS



ACOPOSMulti

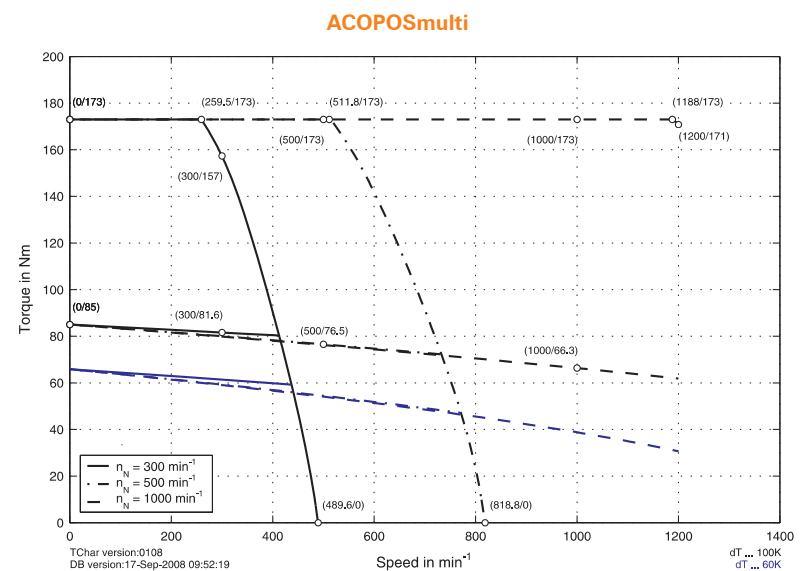
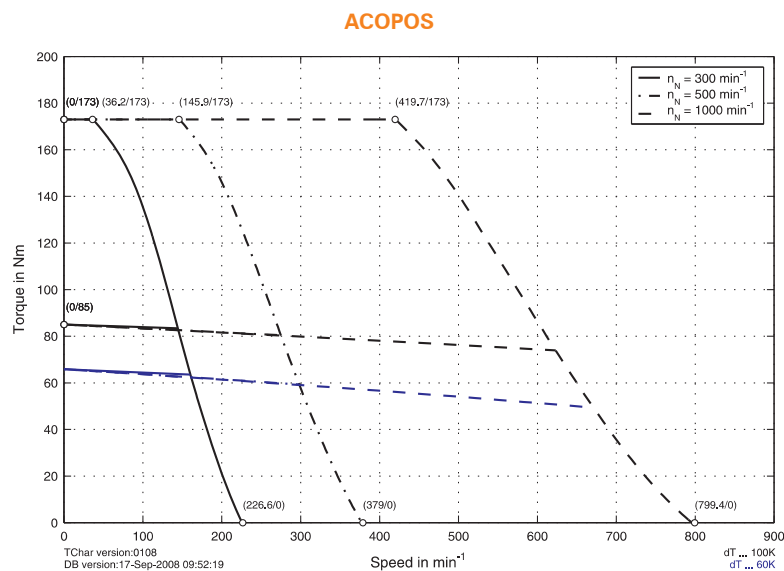


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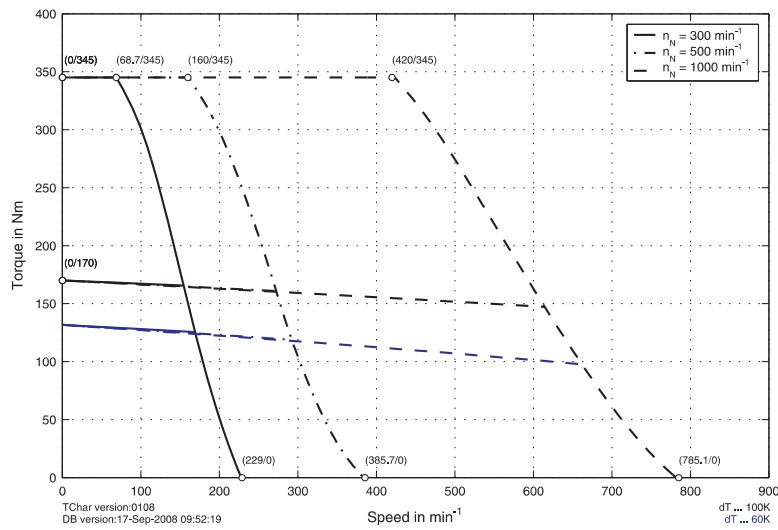
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Speed-torque characteristic curves with 230 VAC supply voltage

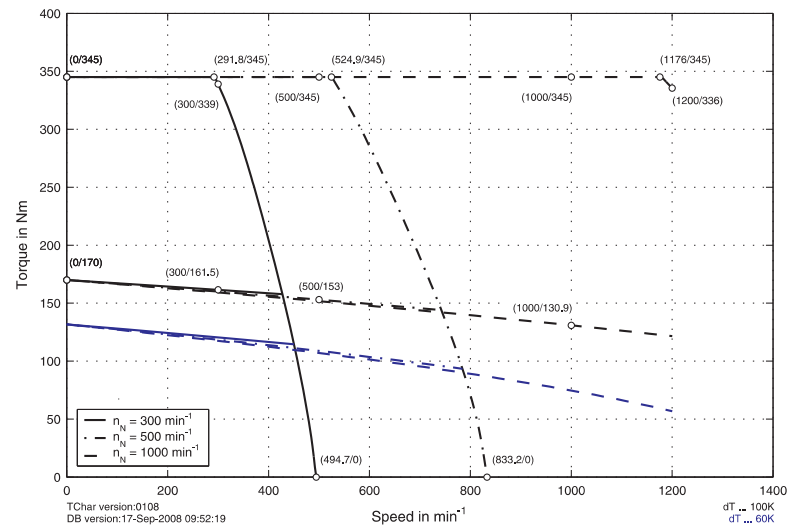


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ACOPOS

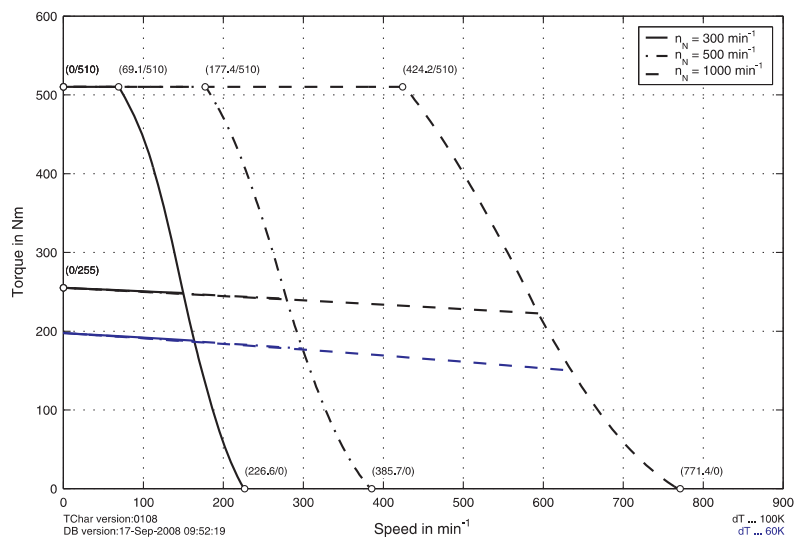


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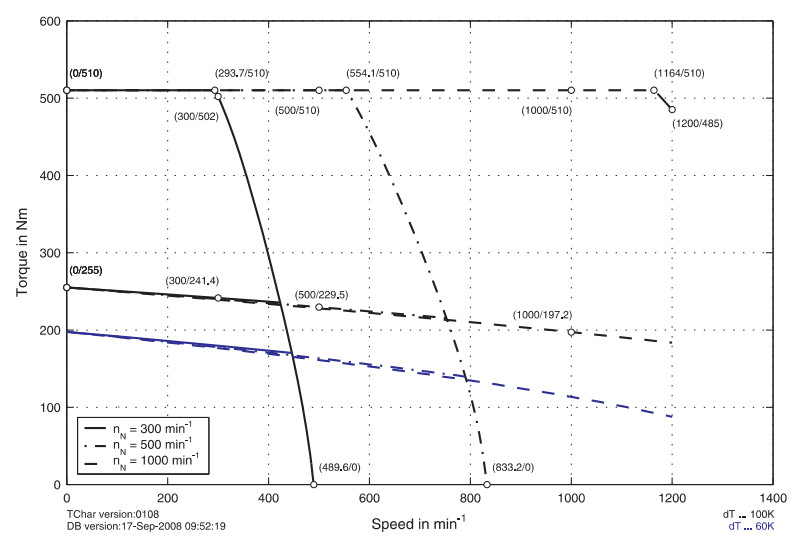


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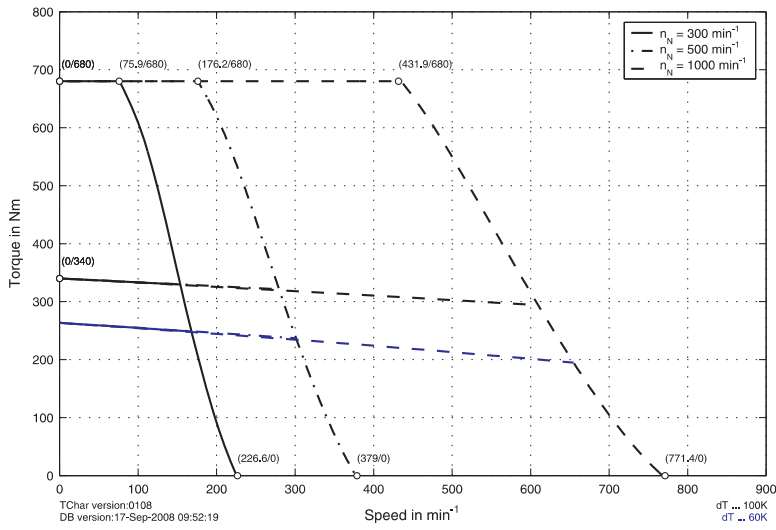


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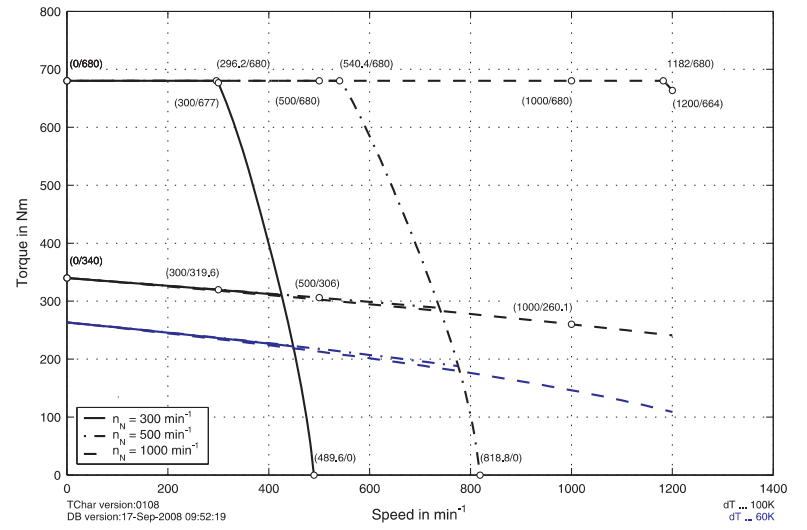


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ACOPOS

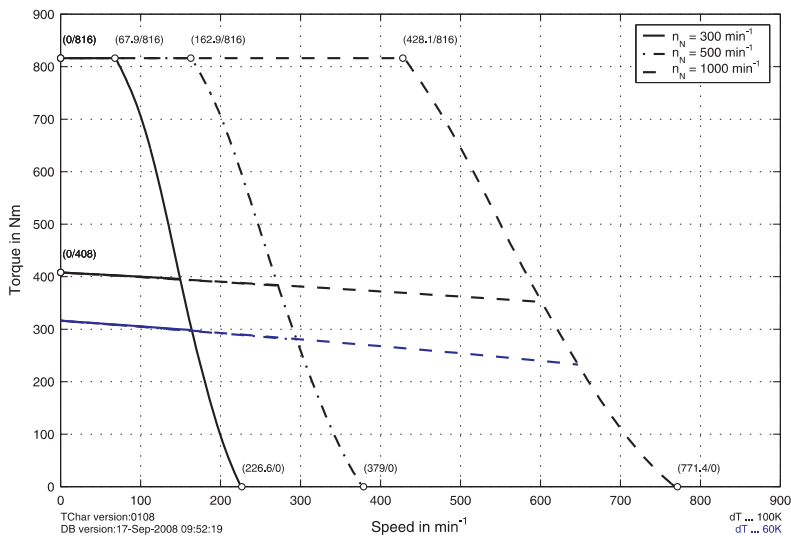


ACOPOSMulti

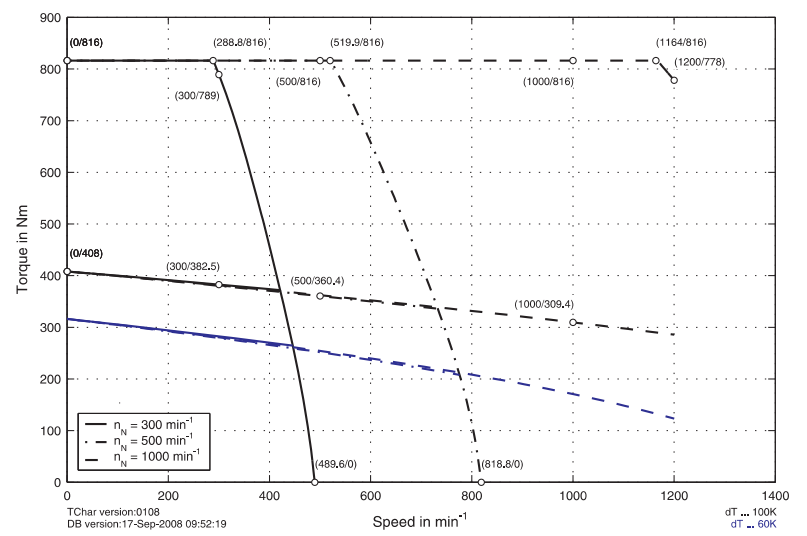


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ACOPOS

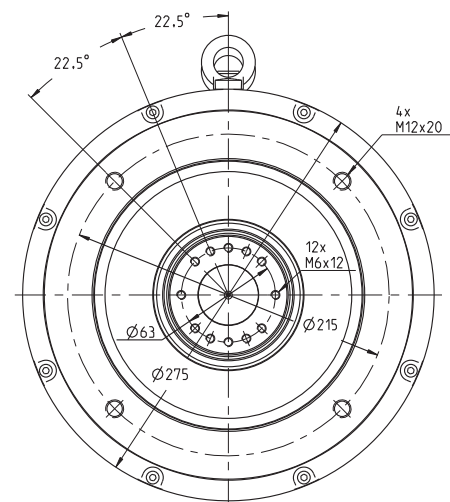
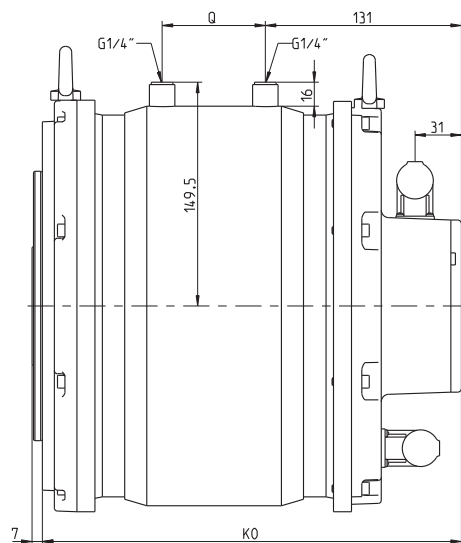
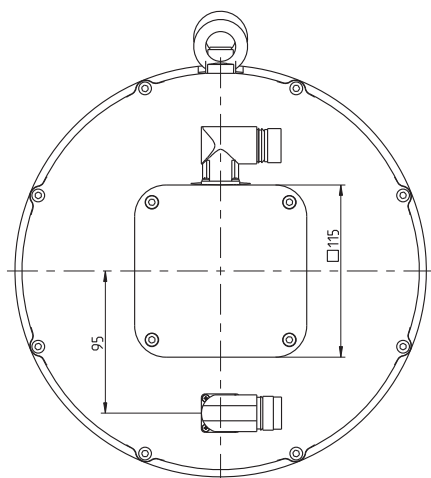


ACOPOSMulti

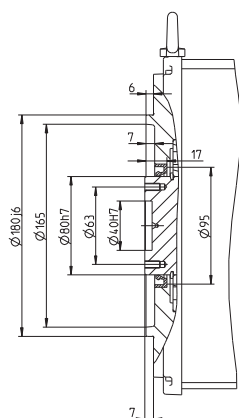


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8LTJ9



A side flange detail

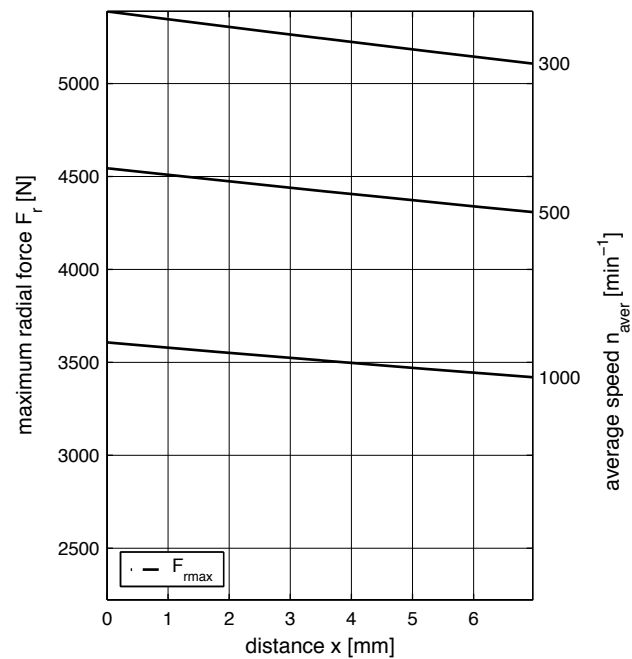


Dimensions

Model number	K_0	Q
8LTJ93.eennffgg-0	230	19
8LTJ94.eennffgg-0	280	69
8LTJ95.eennffgg-0	330	119
8LTJ96.eennffgg-0	380	169
8LTJ97.eennffgg-0	420	209

Maximum shaft load

The values in the diagram below are based on a mechanical lifespan of the bearings of 20,000 operating hours.



maximum allowed axial force: $F_{amax} = 840 \text{ N}$

Recommended B&R motor cable

The recommended B&R motor cable for a motor depends on the recommended ACOPOS servo drive or ACOPOSmulti inverter module (see "Recommended cable cross section for B&R motor cables [mm²]" in the table "Technical data")

1670

Recommended B&R encoder cable

8BCExxxx.1111A-0 ACPmulti EnDat cable, length xxxx m, 10 x 0.14 mm² + 2 x 0.5 mm², EnDat plug 17-pin SpeedTEC socket, servo plug 15-pin DSUB plug, can be used in cable drag chains, UL/CSA listed

1428

Motor connectors 8BPM

Features

- UL/CSA listed
- Metal housing; IP67 protection
- High-quality, gold-plated wire spring contacts
- High-level contact security even when reinserted many times
- SpeedTEC quick-release faster



General information	8BPM0001.0000-00	8BPM0002.0000-00	8BPM0003.0000-00
Connector size	Size 1	Size 1	Size 1.5
Number and type of contacts	8 (4 power and 4 signal contacts)	8 (4 power and 4 signal contacts)	8 (4 power and 4 signal contacts)
Degree of pollution	3	3	3
Installation altitude	Up to 2000 m	Up to 2000 m	Up to 2000 m
Insulator	PA, UL94/V0 listed	PA, UL94/V0 listed	PA, UL94/V0 listed
Contacts	Gold-plated brass	Gold-plated brass	Gold-plated brass
Protective ground connection on housing	According to VDE 0627	According to VDE 0627	According to VDE 0627
Protection according to DIN 40050	IP67 when connected	IP67 when connected	IP67 when connected
Certifications	UL/CSA	UL/CSA	UL/CSA
Electrical characteristics	8BPM0001.0000-00	8BPM0002.0000-00	8BPM0003.0000-00
Overvoltage category	3	3	3
Power contacts			
Rated current	30 A	30 A	75 A
Rated voltage	630 VAC / VDC	630 VAC / VDC	630 VAC / VDC
Test voltage (L-L)	6000 V	6000 V	6000 V
Contact resistance	< 3 Ω	< 3 Ω	< 1 Ω
Signal contacts			
Rated current	7 A	7 A	30 A
Rated voltage	250 VAC / VDC	250 VAC / VDC	630 VAC / VDC
Test voltage (L-L)	2500 V	2500 V	4000 V
Contact resistance	< 5 Ω	< 5 Ω	< 3 Ω
Mechanical characteristics	8BPM0001.0000-00	8BPM0002.0000-00	8BPM0003.0000-00
Temperature range	-20°C to +130°C	-20°C to +130°C	-20°C to +130°C
Housing material	Zinc casting, nickel plated	Zinc casting, nickel plated	Zinc casting, nickel plated
Gaskets	FKM	FKM	FKM
Connection cycles	> 50	> 50	> 50
Crimp range	4 x 0.5 - 2.5 mm ² + 4 x 0.06 - 1 mm ²	4 x 2.5 - 4 mm ² + 4 x 0.06 - 1 mm ²	4 x 1.5 - 10 mm ² + 4 x 0.5 - 2.5 mm ²
Cable ø	4.2 - 17 mm	4.2 - 17 mm	7 - 25 mm
Manufacturer information	8BPM0001.0000-00	8BPM0002.0000-00	8BPM0003.0000-00
Manufacturer	INTERCONTEC	INTERCONTEC	INTERCONTEC
Internet address	www.intercontec.biz	www.intercontec.biz	www.intercontec.biz
Manufacturer's product ID	BSTA 078 NN 00 42 0100 000	BSTA 078 NN 00 59 0100 000	CSTA 264 NN 00 45 0020 000

Encoder connectors

8BPE

Features

- UL/CSA listed
- Metal housing; IP67 protection
- High-quality, gold-plated wire spring contacts
- High-level contact security even when reinserted many times
- SpeedTEC quick-release faster



General information	8BPE0001.0000-00
Connector size	Size 1
Number and type of contacts	17 signal contacts
Degree of pollution	3
Installation altitude	Up to 2000 m
Insulator	PA, PBT, UL94/V0 listed
Contacts	Gold-plated brass
Protective ground connection on housing	According to VDE 0627
Protection according to DIN 40050	IP67 when connected
Certifications	UL/CSA
Electrical characteristics	8BPE0001.0000-00
Overvoltage category	3
Signal contacts	
Rated current	7 A
Rated voltage	125 V
Test voltage (L-L)	2000 V
Contact resistance	< 5 Ω
Mechanical characteristics	8BPE0001.0000-00
Temperature range	-20°C to +130°C
Housing material	Zinc casting, nickel plated
Gaskets	FKM, HBNR
Connection cycles	> 50
Crimp range	17 x 0.06 - 1 mm ²
Cable ø	3.5 - 14.7 mm
Manufacturer information	8BPE0001.0000-00
Manufacturer	INTERCONTEC
Internet address	www.intercontec.biz
Manufacturer's product ID	ASTA 035 NN 00 41 0100 000

ARNCO Integrated CNC

The ARNC0 integrated CNC System from B&R makes it possible to create flexible solutions in various areas of use.



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System characteristics



Integrated CNC

B&R's own Soft CNC system for PC-based target platforms, "ARNC0", has been a part of the company's comprehensive range of software products since 2001. Yet even before that, B&R had been gaining years of experience with integrated CNC solutions. This experience was used to develop an open and flexible integrated Soft CNC that fits perfectly into the B&R control architecture.

This is not just a controller, but a complete platform that automates machines. This includes digital and analog inputs and outputs, drives, CNC, visualization, and networking.

Added value

Machines with CNC control generally fall into one of two function categories: the basic functions for motion control and processing work pieces, and the various help functions.

The basic functions handle the interpretation of services according to DIN 66025, which include functions necessary for the coordinated movements of multiple CNC axes.

The help functions run on a PLC, which executes commands from the CNC interpreter - preparing everything necessary for processing work pieces.

Customization for various requirements

With standard CNC systems, the basic functions can be custom configured and a PLC program can be created. The PLC program would seem to give the CNC flexibility for adaptation to a specific machine. A closer look, however, proves that this is not true. The bottleneck in this case is the narrow interface between the basic functions and the PLC program. The so-called M functions and a set of additional parameters form the foundation of this interface. More flexibility and functionality are only possible through very expensive CNC solutions, which again only provide a limited number of basic functions and an integrated PLC interface.

Integrated CNC automation from B&R

The CNC solution from B&R - ARNC0 - differs from conventional systems in several ways. At first glance, it offers all the standard functions of a conventional CNC: the basic functions and the help functions. But this is where the similarities end: Machine-specific functions are not added to the standard functions after the fact. Instead, individually pre-designed modules are integrated into the project to achieve maximum flexibility. This means quick and easy creation and integration of any required modules (e.g. cam profiles as slaves of CNC axes, connection of I/O points via various bus systems, use of additional terminals, etc.).





Automatic movement mode



Program manager



Program editor



Test run visualization



Laser control interface



Application example: Laser cutting machine

The original solution for this machine included three separate control systems:

- A CNC system with drives for the table's X and Y axes.
- A controller for the Z axis, which controls the movement of the cutting head in two modes of operation: conventional positioning mode and tracing mode. In tracing mode, the distance to the surface of the material is recorded by a special sensor and traced by the controller.
- A PLC controller for the laser.

Software

A Power Panel 200 meets all requirements to control the entire machine using an integrated algorithm.

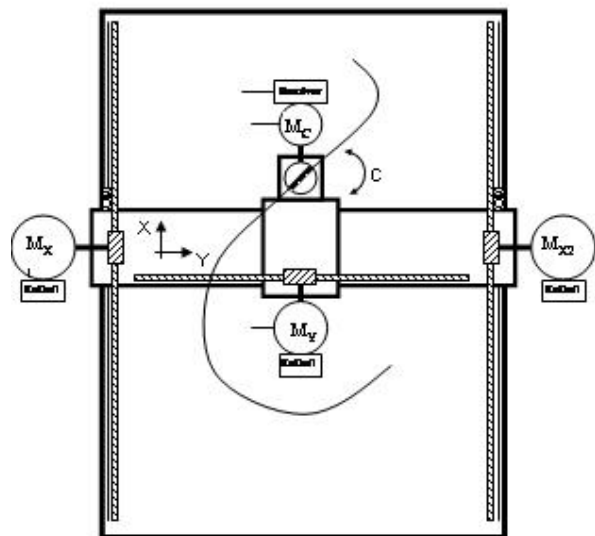
The clear advantage:

Any changes to the cutting parameters immediately takes effect in the laser subsystem, and vice versa. Better yet, by creating a small cutting parameter database or a recipe system, the machine operator can coordinate all three parts of the machine in one step, by simply selecting the parameters of the material to be processed.

An outstanding solution

The unified concept from B&R combines PLC, CNC, single axis and laser control functions into a single device, the Power Panel 200. This gives the operator an intuitive and easy-to-operate interface that can be quickly customized to the customer's needs.

System characteristics



Arrangement of axes for glass cutting

Application example: Glass processing

"Broken glass brings good luck" is a saying which definitely does not apply to glass processing. Glass processing requires that the component be precisely manipulated to prevent it from being shattered. Glass cutting cannot be compared with conventional cutting processes on other materials. Glass is scored first, and then broken. In order to result in a good cut, the glass must be scored very quickly.

Precision requirements when cutting glass for buildings fall within the range of one to two tenths of a millimeter. Automotive glass requires precision of five hundredths of a millimeter. This degree of precision and the previously mentioned need for high scoring speeds of 80 to 150 m/min place the highest demands on the drive systems and their coordination with the CNC system. Furthermore, the hard-metal cutting wheel used for scoring must always be aligned tangentially to the path.

In the addressed machine, two drives are used to move a bar in the X direction when cutting glass. This tandem or gantry axis is coupled directly in the CNC system.

In one machine variant, the cutting unit is additionally equipped with a grinding disk. The unique challenge here is in the different dynamic behavior of the cutting and grinding tools. In order to keep the processing cycles as short as possible, the CNC system must be able to switch between various limit values while the program is running.

In order to meet the specifications for precision and to reach the desired cutting speed, a great deal of focus is placed on the CNC's path generation and the quality of drive control.

The CP360 CPU from B&R's 2005 series serves as the automation platform. Data exchange between the control and the ACOPOS drives occurs via POWERLINK with 100 Mbit/s and 800 μ s cycle time. The necessary connection of the machine to a company network occurs via the integrated Ethernet interface directly on the CP360.



Selective soldering machine

Application example: Soldering machines

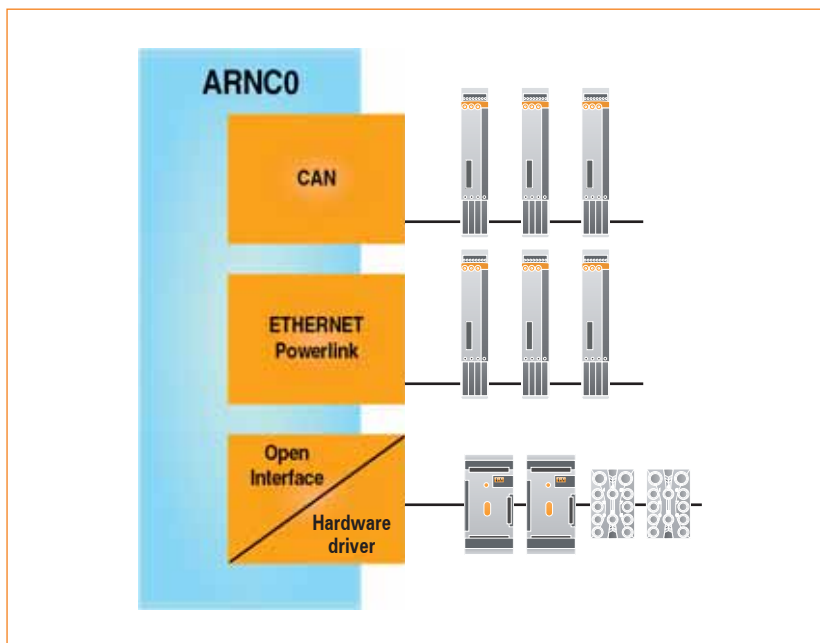
Selective soldering refers to a process that targets only specific points that are to be soldered. This has proven to be a very efficient production method, as it avoids completely immersing the product in a soldering bath. This prevents unintentional warming of sensitive components. The pins of the components which are to be soldered are directly targeted by passing the circuit boards over a stationary mini-wave solder machine. To accomplish this, 3D path control is necessary. For example, the machine must approach a set of pins at a prescribed angle and then follow a specific path on 2-3 levels, soldering the required components, and finally leave the last soldering point at a predefined peel-off angle.

After extensive evaluation, an automation solution from B&R was selected. One advantage offered by B&R's solution is the option of running the visualization, the PLC functions and the motion control component of the servo drives all on one CPU. The line movements are automatically calculated using a Soft CNC. All the soldering machine operator has to do is enter the coordinates on the touch screen. To enable the user to program the entire soldering path on the touch screen without extensive CNC programming knowledge, the end customer developed an intuitive operator interface. The entered points (that are taught) are sent to the B&R Soft CNC as DIN commands (G-codes).

A high-precision portal axis system constitutes the heart of the selective soldering machine. The X and Y axis pairs with servo drives ensure reliable unit positioning, with a repeat precision of ± 0.1 mm. The gripper is mounted on the Z axis, which has a pneumatic rotate function and can be tilted to achieve the ideal soldering angle. This not only guarantees high quality soldering, but also makes it possible to reach and solder hard-to-reach joints.

This machine uses three linear axes, which form a Cartesian robot. The three servo drives for the X, Y, and Z axes, as well as the X20 I/O systems, are networked via POWERLINK. The advantage of the single CPU solution with a real-time multitasking operating system is obvious: All information from the machine's sensors and actuators are processed jitter-free by the CPU synchronously with the bus clock of the POWERLINK network. The CNC is an integral component that results in minimal reaction times between the PLC and the CNC program. An XY fluxer can additionally be controlled via a second CNC channel that runs on the same POWERLINK line. This is a unit with two servo axes that uses the same principle as mini-wave selective soldering to spray selected points of the solder path with flux.

System characteristics



Drive interfaces

ARNC0 also offers excellent flexibility when it comes to connecting drives. First of all, ACOPOS drive technology is completely integrated. This means that the complete range of functions can also be used by ARNC0. Depending on the requirements, the connection can be made using CAN bus or POWERLINK. Secondly, ARNC0 has an open interface. Here, any number of drives can be controlled using the appropriate drivers. Drivers are already available for drives with analog interfaces (control via XX410 (📄 592)), and for stepper motors (control via X67SM2436 (📄 492) or X67SM4320 (📄 494)).

Customized solutions

For specific customized solutions, the open drive interface offers the option of connecting drives using special interfaces. The transfer of data to the target hardware takes place in the application layer. The function range of this layer can thus extend from simple data transfer all the way up to complex control engineering algorithms.

Continuous improvement

Of course, ARNC0 is not a finished software package, but is undergoing continuous improvements and refinements. In this process, special attention is given to requests and suggestions from our customers. This allows ARNC0 to be prepared to meet future demands with optimal solutions. At this point, technology-specific functions can also be integrated in the core software.

Reliable quality

An important criteria for the implementation of software in industrial machines is the reliability of the software. During the development of ARNC0, special attention was given to ensuring the functionality and stability of the software.

Especially with the continued expansion of the function range, it is essential that the availability of all existing functions continues without change. In ARNC0, this is accomplished using an automated testing environment. Here, countless application scenarios are simulated and logged. This helps ensure that new versions function identically to previous versions.

Performance features

The foundation for programming using ARNC0 is the DIN 66025 standard. ARNC0 also offers a range of additional functions that make the software much easier to implement in many different machine solutions.

Extended CNC programming technique

CNC programs are the central aspect of ARNC0 programming, and can be divided into main programs and sub-programs. The program itself can be provided as an object in RAM (BR module), as a file, or via a DNC interface.

Coordinate entry

As is prescribed in the standard, axes are addressed using axis letters X, Y, Z, A, B, C, U, V and W, and the function of each axis can be configured. Each axis can function in one of three ways:

- Max. three Cartesian axes (CNC axes)
- One tangential axis (automatic tracing is possible)
- Up to nine linear auxiliary axes

Control blocks

In the CNC program itself, elements of high level languages can also be used, such as:

- Conditions,
- IF statements,
- ELSEIF chains,
- SWITCH statements,
- FOR statements,
- WHILE statements,
- DO statements.

Mathematic operations

Mathematic operations for linking parameters are also possible.

Basic operations

- Addition (+)
- Subtraction (-)
- Multiplication (*)
- Division (/)
- Power (x to the y power)
- Modulo function (MOD)

Counting functions

- Absolute value
- Squared value
- Square root value
- Exponential function to base e
- Logarithm to base e
- Exponential function to base 10
- Base 10 logarithm

ABS[]
SQR[]
SQRT[]
EXP[]
LN[]
DEXP[]
LOG[]

Angle functions

- Sine of a value
- Cosine of a value
- Tangent of a value
- Arcsine of a value
- Arccosine of a value
- Arctangent of a value

SIN[]
COS[]
TAN[]
ASIN[]
ACOS[]
ATAN[]

Conversion Functions

- Whole number part of a value
- Part of a value after the decimal point
- Rounded value (whole number)

INT[]
FRACT[]
ROUND[]

System characteristics



Parameters

Communication between a PLC application and the CNC core occurs via a broad parameter interface. There are various parameters available:

- R Parameters Direct parameters
- P parameters Indirect parameter for indirect addressing of the R parameters
- EX parameters External parameters in a common memory area of PLC and ARNC0.
- M parameters M parameters in a common memory area of PLC and ARNC0.

R, P and EX parameters are processed synchronously with the decoder, and M parameters are processed synchronously with the path. This makes real-time control of the CNC program processing possible.

M functions

M functions handle the communication between the CNC system and the PLC. Up to 1024 M functions are possible in the CNC system, and they can be divided into two areas:

- Synchronized M functions
- Non-synchronized M functions

If the CNC system encounters a synchronized M function, a flag is set and the CNC program is stopped until this flag is acknowledged by the M function. With a non-synchronized M function a flag is also set, but the NC program is not interrupted.

Constant path speed

When processing work pieces, maintaining a constant path speed is absolutely imperative. The dynamics of the machine or the structure of the CNC program sometimes make this impossible. ARNC0 provides options for generating an optimal path for the machine's requirements. Special attention is paid to path section transitions.

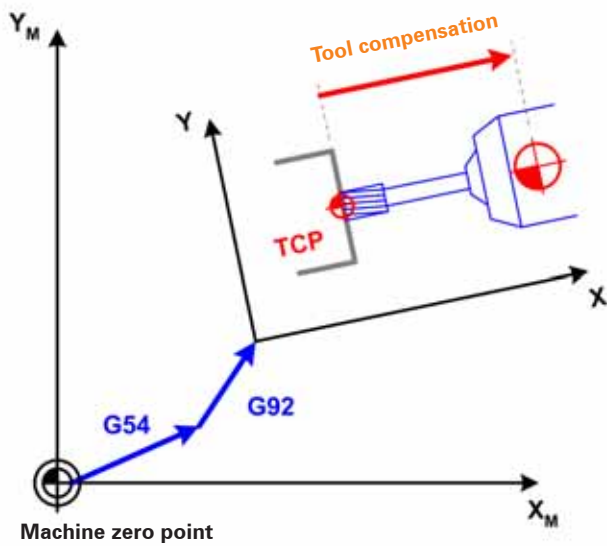
The dynamic profile can be adjusted to the requirements with a range of setting options:

- Acceleration / delay on the path
- Maximum angle for tangential path transitions
- Permissible (axis) speed for non-tangential path transitions
- Behavior of the automatic tangential axis
- Operating mode at the path transitions
- Optional halt at transition

The effective path speed can still be manipulated when the program is running using the override functions:

- Override (movement override)..... affects the actual path speed.
- Feed override affects the programmed feed "F".
- Rapid motion override affects rapid motion path sections (G0).

One special feature of ARNC0 is the option of moving backwards on the CNC path.

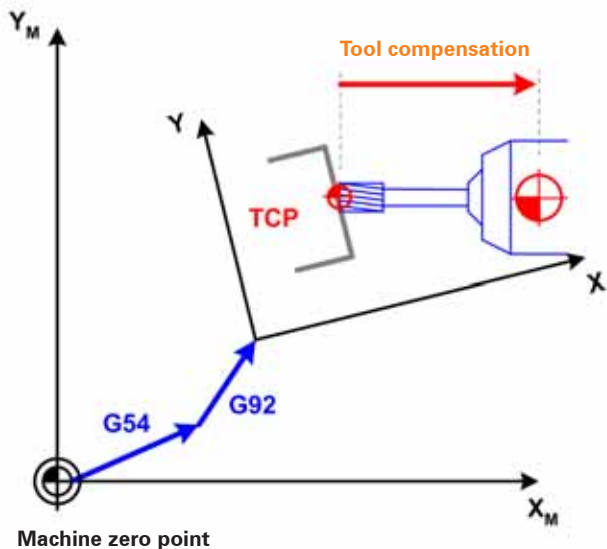


Tool compensation in the machine coordinate system

Tool data correction

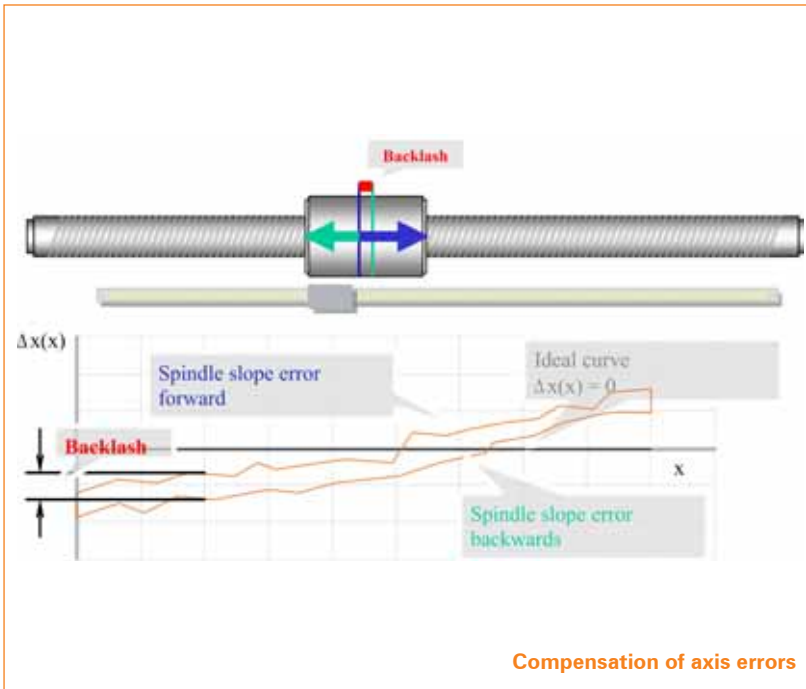
The availability of a wide range of tools is especially important for processing machines. ARNC0 offers comprehensive functions for the use of various tools (excerpt):

- Up to 500 tool place numbers (T function)
- Up to 500 tool data numbers (D function)
- Availability of tool data tables
- Changing the tool radius while program is running (e.g. wear)
- Direction of tool correction
- Path speed of programmed / corrected contour
- Path speed for arc transitions
- Different activation modes (direct, indirect, automatic transition block)
- Special function for screen changes
- Active manipulation of programmed contour
 - Programmed arc diameter smaller than tool diameter
 - Faulty arc programming
 - Automatic intersection path calculation



Tool compensation in the programmed coordinate system

System characteristics



Compensation of axis errors

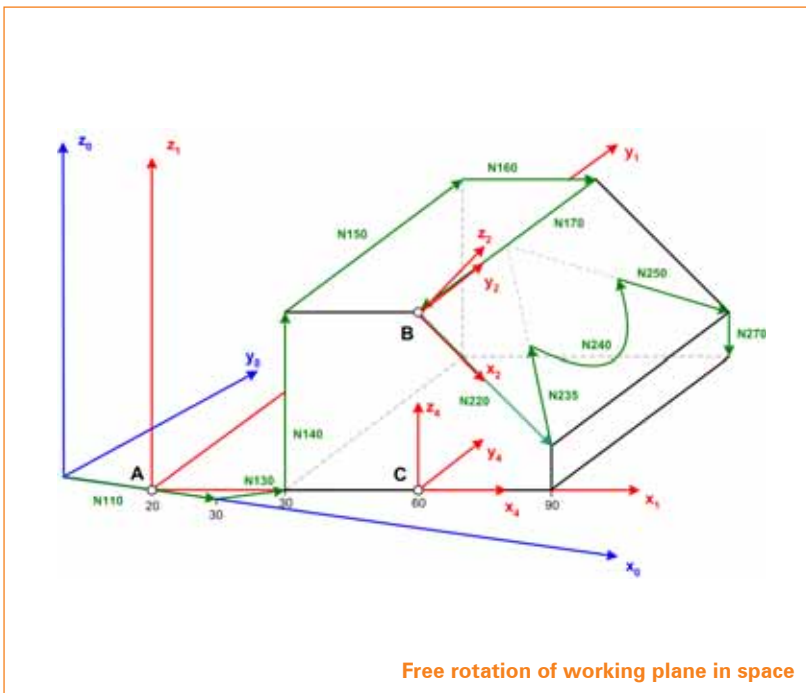
To achieve the highest precision for the movement, ARNC0 can directly compensate for axis errors such as spindle pitch error and loose spindle.

Single axis functions

Feed or auxiliary axes can be directly programmed in ARNC0 without having to use a CNC channel.

Many functions are available for programming single axes (excerpt):

- Homing
- Basic movements, also allowing for triggers
- Cam profile coupling
- Cam profile automat
- Stop / E-stop of movements



Extended functions

To make programming as easy as possible for the user, ARNC0 comes with additional function elements (excerpt):

- Free rotation of the work plane in space (monitored 3D rotation)
- Setting position correction (monitored 3D rotation)
- Skew correction
- Path plotting
- Cam wrapping
- Free layer definition with rotary axes

Performance data

Basic computer system

Microcontroller / processor type	Intel-compatible
Minimum RAM	16 MB
Minimum hard drive space	16 MB
Operating system real-time system	Automation Runtime
Operating system user interface	Automation Runtime or Windows XP

CNC controller properties

Maximum number of CNC channels	8
Maximum number axes in CNC controller	72
Simultaneously interpolating, per channel	9
Maximum number axes (CNC + auxiliary axes)	100
Number of interfaces (any configuration)	10
Virtual axes	Yes
Interpolation options	Linear, Circular, Spline
Number of blocks processed per second	≥ 2500
Size of application memory for CNC	Platform dependent
Axis speed at the finest measurement resolution	10 m/s
Finest measurement resolution	0.1 μm
Max. number of parameters that can be processed	1000
Analog set value output	Yes +/-10 V
Digital set value output	Yes - CAN, Ethernet POWERLINK
Max. number of manageable tools	500

Special properties of the CNC controller

Predictive speed control	Yes
Jolt limitation	Yes
Speed and acceleration input control	Yes
Compensation for mechanical errors	Yes
Axis transformations	SCARA, 2-axis rod kinematics 6-axis articulated arm
Optimize controller parameters during processing	Yes
Integration of customer-specific special functions	Yes - according to IEC61131, C

System characteristics

Overview of G functions

G function	Description
G00	Rapid Interpolation
G01	Linear Interpolation
G02	Circular Interpolation - clockwise
G03	Circular Interpolation - counter clockwise
G04	Dwell time in seconds
G05	Direct programming of the polar axes in clockwise direction
G06	Direct programming of the polar axes in counter-clockwise direction
G10	Programmed path speed on the tool center
G11	Programmed path speed on the workpiece contour
G12	Path speed at arc transitions
G16	Orientation of the tool axis
G17	XY plane selection
G18	ZX plane selection
G19	YZ plane selection
G17Q	Outer surface programming XY --> XV
G18Q	Outer surface programming ZX --> ZV
G19Q	Outer surface programming YZ --> YV
G20	Deactivate mirroring
G21	Mirroring over the Y axis
G22	Mirroring over the X axis
G23	Mirroring over the X axis and Y axis
G25	Tangential transition arcs
G36	CDC: Replace arc with straight line: DEACTIVATE
G37	CDC: Replace arc with straight line - ACTIVATE
G38	CDC: Allow contour violations at small path sections - DEACTIVATE
G39	CDC: Allow contour violations at small path sections - ACTIVATE
G40	Deactivate the CDC
G41	CDC left
G42	CDC right
G53	Deactivate the zero point offset
G54	Zero point offset 1
G55	Zero point offset 2
G56	Zero point offset 3
G57	Zero point offset 4
G58	Zero point offset 5
G59	Zero point offset 6
G60	Accuracy hold
G70	Units switch (programming in inches)
G71	Units switch (programming in mm)
G90	Absolute position coordinates
G91	Relative position coordinates
G92	Programmed zero point offset with coordinate system rotation
G93	Feed rate definition (inverse time feed rate definition)
G94	Feed rate definition (feed per minute)
G102	Circular interpolation in general orientation
G103	CDC: Radius dependent feed adjustment at convex path sections
G104	CDC: Radius dependent feed adjustment at concave path sections
G105	Setting the "v_jump" parameter
G106	Setting the "a_jump" parameter
G107	Axis limit switch
G108	Set path acceleration

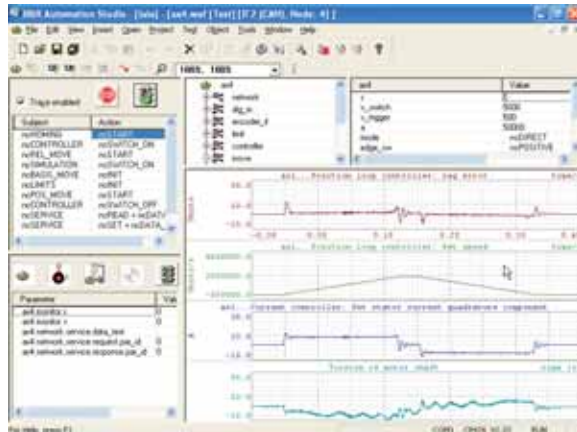
G function	Description
G109	Set path deceleration
G110	Set path acceleration and path deceleration
G111	Block transition with speed dip
G112	Block transition without speed dip
G113	Reduction of path speed at tangential path section transitions
G114	Circle dynamics: Optimized
G115	Circle dynamics: Standard
G126	Rounding edges
G130	Compensation in the direction of the machine coordinate system
G131	Compensation in the direction of the programmed system
G132	CDC with linear transitions
G133	CDC with arc transitions
G134	DEACTIVATE intersection path calculation
G135	ACTIVATE intersection path calculation
G137	Activate/deactivate CDC indirectly with transition block
G138	Activate/deactivate CDC directly
G139	Activate/deactivate CDC indirectly
G140	Deactivate tangential axis automatically
G141	Activate tangential axis automatically
G144	Continuous alignment of automatic tangential axes
G145	Standard alignment of automatic tangential axes
G153	Position coordinates in the machine coordinate system
G159=0-199	Expanded zero point offset
G161	Absolute coordinates for center of circle
G162	Relative coordinates for center of circle
G170	Decoder synchronization
G171	Immediate processing of NC blocks
G180=0-199	Connecting path elements
G192	Clamping correction
G193	Enable "Linear feed characteristic" mode
G194	Disable "Linear feed characteristic" mode
G200	Position latch
G201	Position latch with following halt
G217	Axis definition with scaling for active working plane XY
G218	Axis definition with scaling for active working plane ZX
G219	Axis definition with scaling for active working plane YZ
G220	Output signal before the end of the path section
G221	Activate prediction for G220
G222	Signal function with specification of the remaining path distance
G234	Cutter diameter compensation: Standard selection change
G235	Cutter diameter compensation: Selection change with linear transitions
G240	Non-periodic tangential axis
G241	Periodic tangential axis
G300	Chord error monitoring

System characteristics

Quick and easy commissioning

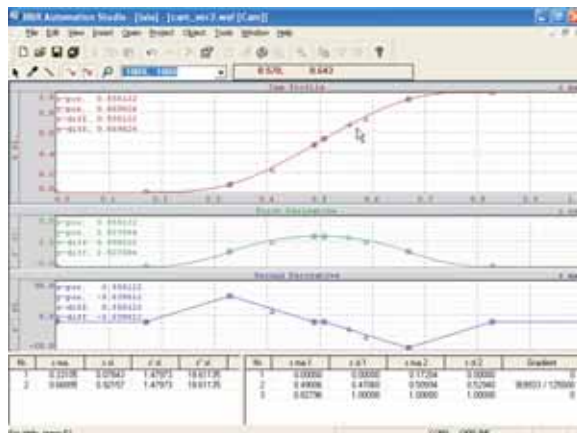
ARNCO is programmed in a uniform manner using B&R Automation Studio with Windows look and feel. Complex tasks can be put into action after a minimum of orientation. Adding hardware components and program sections, as well as their configuration, is done in dialog boxes; this reduces project development times considerably.

CNC and axis movements can be checked without programming using an NC Test. All types of movements, ranging from point-to-point to gear functions, can be carried out interactively. The reaction of the axis can be seen online in the monitor window. The trace function records relevant drive data for clear evaluation.



Tools for straightforward and efficient diagnostics

The CNC system is monitored in real-time using the oscilloscope function. Many trigger possibilities generate informative data for analyzing the movement during operation. The graphic display allows the user to make fine adjustments and optimizations of the movement in the microsecond range. The integration of powerful tools, such as the cam editor, reduces programming for complex coupled movements to simple drag-and-drop procedures. The results and effects on speed, acceleration and jolt can be immediately analyzed graphically.



Open system architecture

Its wide range of implementation makes it clear how flexible the CNC system is:

- Handling technology
- Plastics processing
- Wood industry
- Metal working industry
- Semiconductor industry
- Glass processing
- Soldering
- Optics industry

ARNCO target platforms

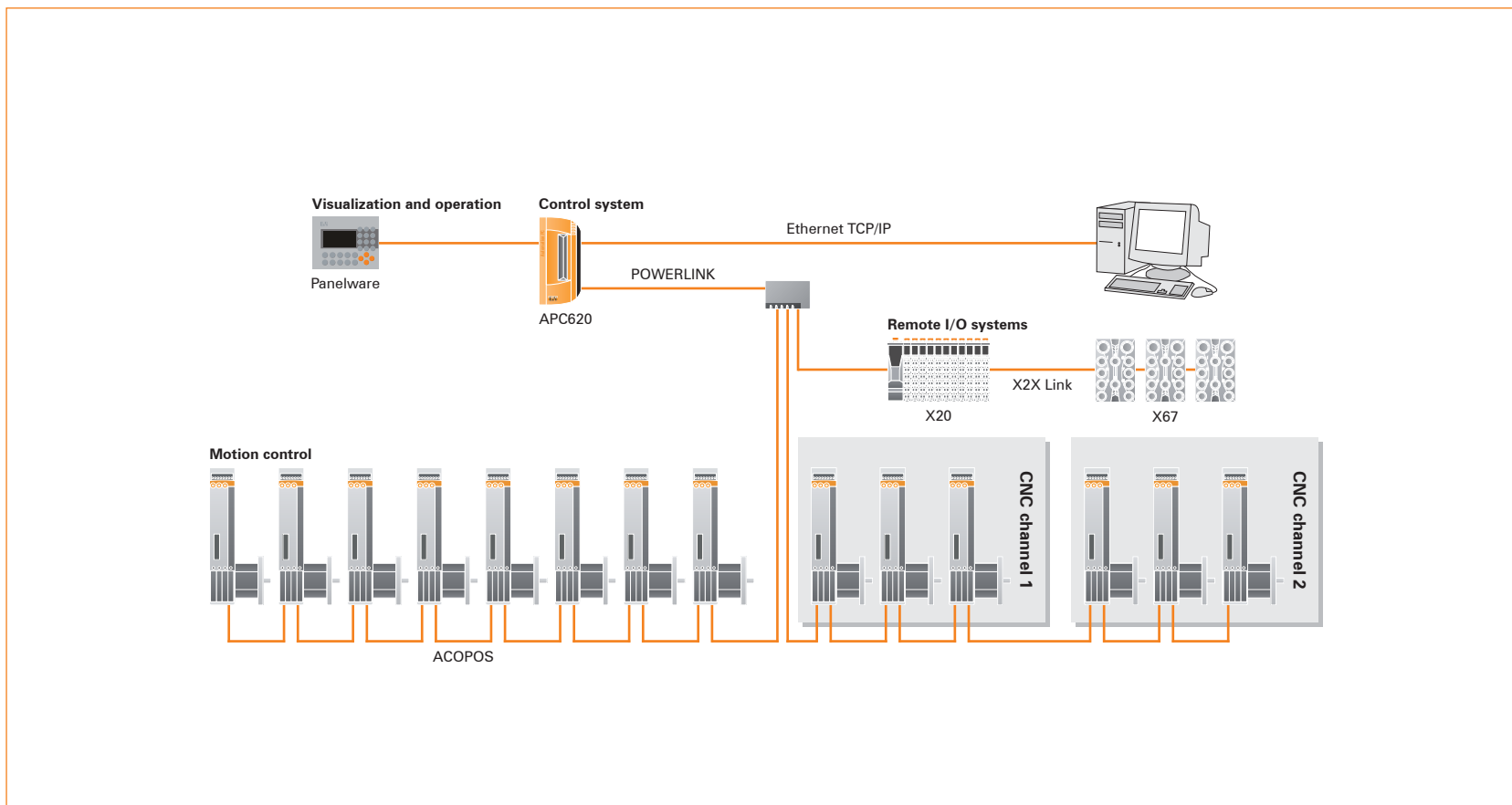
System requirements - hardware:

- At least 16MB RAM
- Drive interface, e.g.CAN with timer (e.g. LS172) for ACOPOS
Ethernet POWERLINK (e.g. LS187) for ACOPOS
X2X for XX410 and X67SM2436 via the open drive interface

Target platforms		
1A4601.02-2 (AR102)	Automation Studio (Automation Runtime)	1805
1A4601.05-2 (AR105)		
1A4601.06-2 (AR106)		
1A4600.10-2 (AR010)		
IPC5000C	Provit 5000/5600: Compact industrial PCs	
IPC5600C		
APC680	Automation PC: ACP680	
5PC600	APC620: Automation PC	911
5PC720	Panel PC: Operation and PC integrated	985
5PC781		985
5PC782		985
7CP570.60-1	System 2003: Compact controllers, remote I/O	
3CP340.60-2	System 2005: Embedded PC-based automation	
3CP360.60-1		
3CP380.60-1		
3CP382.60-1		
4PP220	Power Panel: Integrated control, operation, and visualization	787
4PP25x		787
4PP28x		787
4PP4xx		787
4MP181.0843-03	Mobile Panel: More than just mobile operation and monitoring	873
4MP181.0843-07		873
4MP251.0571-12		873
4MP281.0571-12		873
4MP281.0843-13		873
8AC140.61-3	ACOPOS: Integrated servo drives	1251
8AC141.61-3		1251
CP3484	X20 System: Slice-based I/O system	37
CP3485		37
CP3486		37
CP1484		37
CP1485		37
CP1486		37
EC141	Compact I/O system: Economical usage of peripheral space	581

Typical topologies

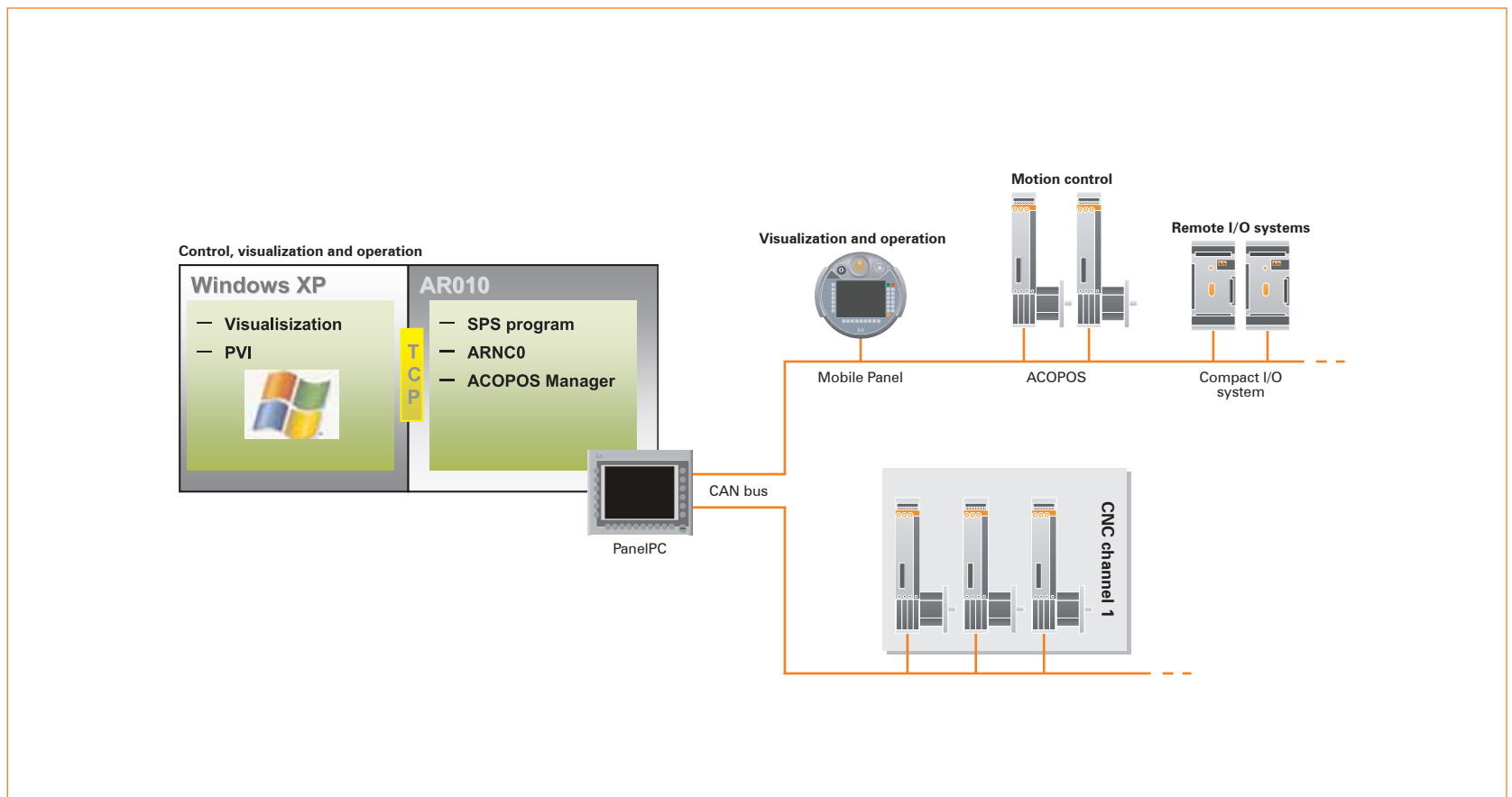
ARNCO in an Ethernet POWERLINK network



Components and technologies

Control system	APC620: Automation PC	911
Visualization and operation	Panelware: Compact operator panels	773
Motion control	ACOPOS: Intelligent servo drives	1251
	Synchronous motors: Dynamic precision drives	1459/1585/1645
Remote I/O systems	X20 System: Slice-based I/O system	37
	X67 System: Remote I/O with IP67 protection	419
Network and fieldbuses	Inside the machine:	
	POWERLINK	611
	X2X Link	611
Host/line communication	Ethernet TCP/IP	611

ARNCO in a CAN network

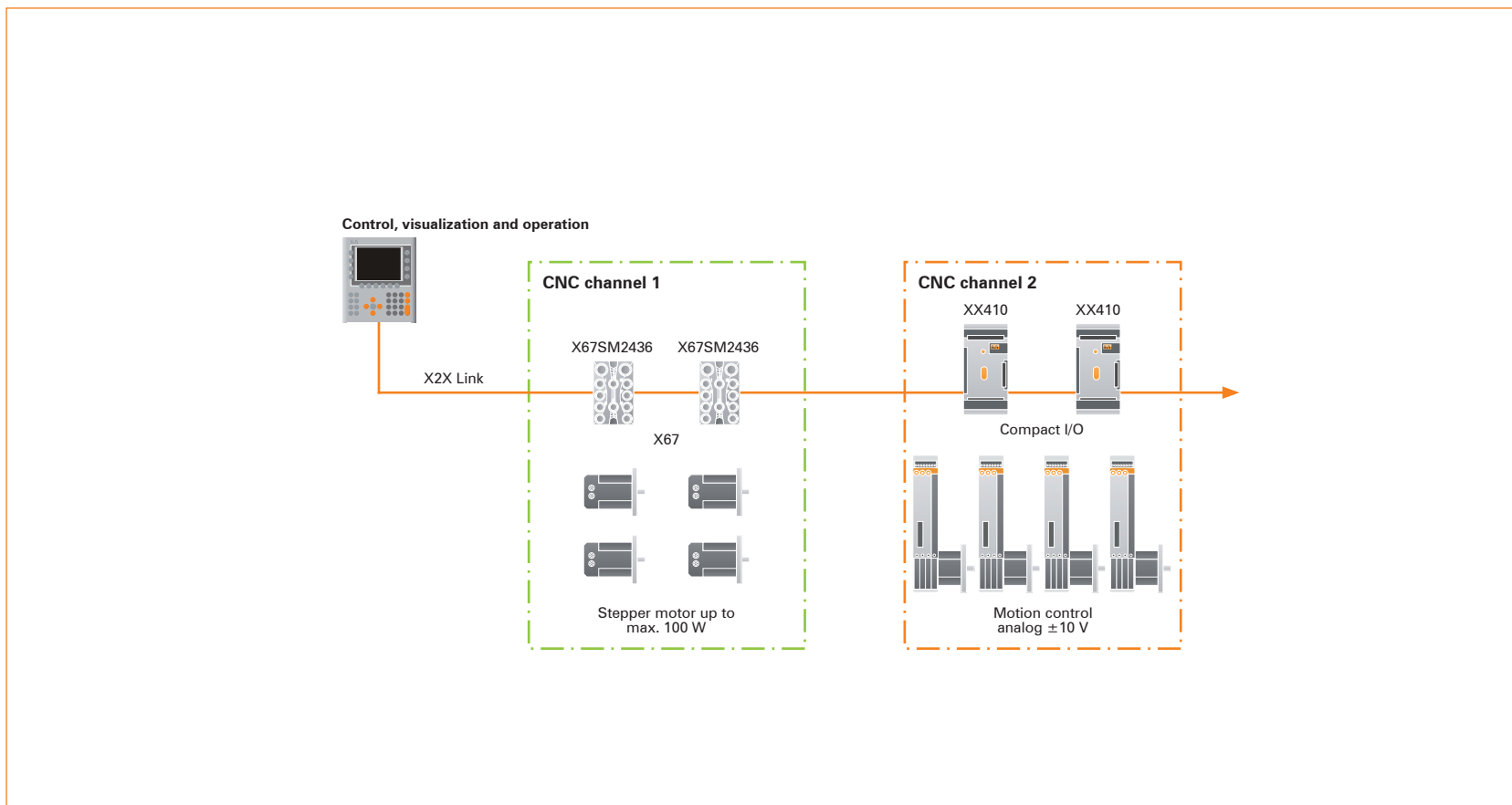


Components and technologies

Control system	Panel PC: Operation and PC integrated	985
Visualization and operation	Panel PC: Operation and PC integrated	985
	Mobile Panel: More than just mobile operation and monitoring	873
Motion control	ACOPOS: Intelligent servo drives	1251
	Synchronous motors: Dynamic precision drives	1459/1585/1645
Remote I/O systems	Compact I/O system: Economical usage of peripheral space	581
Network and fieldbuses	Within the machine: CAN bus	611

Typical topologies

ARNCO with X2X Link (open interface)



Components and technologies

Control system	Power Panel: Integrated control, operation, and visualization	787
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
Motion control	ACOPOS: Intelligent servo drives	1251
	Synchronous motors: Dynamic precision drives	1459/1585/1645
Remote I/O systems	Compact I/O system: Economical usage of peripheral space	581
	X67 System: Remote I/O with IP67 protection	419
Network and fieldbuses	Inside the machine	
	X2X Link	611





Accessories

Terminals, infrastructure components,
memory, batteries, cables, etc.

Table of contents

Product overview		1706
Product data sheets		1710

Product overview

Terminal blocks



Model number	Short description	
0TB3102-7011	Accessory terminal block, 2-pin, A coded, screw clamp, 6 mm ²	1710
0TB3102-7012	Accessory terminal block, 2-pin, B coded, screw clamp, 6 mm ²	1710
0TB103.8	Connector, 24 VDC, 3-pin male, screw clamp, 3.31 mm ² , protected against vibration by the screw flange	1711
0TB103.9	Connector, 24 VDC, 3-pin female, screw clamp, 3.31 mm ² , protected against vibration by the screw flange	1711
0TB103.91	Connector, 24 VDC, 3-pin female, cage clamp, 3.31 mm ² , protected against vibration by the screw flange	1711
0TB3103-7020	Accessory terminal block, 3-pin, screw clamp 6 mm ²	1712
0TB3104-7011	Accessory terminal block, 4-pin, A coded, screw clamp, 6 mm ²	1713
0TB3104-7012	Accessory terminal block, 4-pin, B coded, screw clamp, 6 mm ²	1713
0TB704.9	Accessory terminal block, 4-pin, screw clamp, 1.5 mm ²	1714
0TB704.91	Accessory terminal block, 4-pin, cage clamp, 2.5 mm ²	1714
0TB2105.9010	Accessory terminal block, 5-pin, screw clamp, 1.5 mm ²	1715
0TB2105.9110	Accessory terminal block, 5-pin, cage clamp, 2.5 mm ²	1715
0TB708.91	Accessory terminal block, 8-pin, cage clamp, 1.5 mm ²	1716
0TB1108.8110	Accessory terminal block, 8-pin, cage clamp, 1.5 mm ² , protected against vibration by the screw flange	1716
0TB710.91	Accessory terminal block, 10-pin, cage clamp, 1.5 mm ²	1717
0TB1111.8010	Accessory terminal block, 10-pin, screw clamp, 1.5 mm ² , protected against vibration by the screw flange	1718
0TB1111.8110	Accessory terminal block, 10-pin, cage clamp, 1.5 mm ² , protected against vibration by the screw flange	1718
7TB710.9	Accessory terminal block, 10-pin, screw clamp, 1.5 mm ²	1719
7TB710.91	Accessory terminal block, 10-pin, cage clamp, 2.5 mm ²	1719
0TB1111.8010	Accessory terminal block, 11-pin, screw clamp, 1.5 mm ² , protected against vibration by the screw flange	1720
0TB1111.8110	Accessory terminal block, 11-pin, cage clamp, 1.5 mm ² , protected against vibration by the screw flange	1720
7TB712.9	Accessory terminal block, 12-pin, screw clamp, 1.5 mm ²	1721
7TB712.91	Accessory terminal block, 12-pin, cage clamp, 1.5 mm ²	1721
7TB718.9	Accessory terminal block, 18-pin, screw clamp, 1.5 mm ²	1722
7TB718.91	Accessory terminal block, 18-pin, cage clamp, 1.5 mm ²	1722

Infrastructure components



Model number	Short description	
0AC401.9	Encoder 5 V - 24 V, converter for 5 V encoders (abs. or incr.)	1724
0AC808.9	8x industrial hub (Layer 2), 24 VDC, 10/100 MBit/s with auto-sensing, MDIX switch for channel 1	1723
0AC912.9	Bus adapter, CAN, 1 CAN interface	1726
0AC913.92	Bus adapter, CAN, 2 CAN interfaces, including 30 cm attachment cable (DSUB connector)	1726
0AC913.93	Bus adapter, CAN, 2 CAN interfaces, including 30 cm attachment cable (TB704)	1726
0G1000.00-090	Bus connector, RS485, for Profibus networks	1724
7AC911.9	Bus connector, CAN bus	1724
ECINT1-1	RS232/RS485 interface converter, electrically isolated, for coupling RS232 interface modules to an RS485 twisted pair bus, without lightning protection	1725
ECINT1-11	RS232/RS485 interface converter, electrically isolated, for coupling RS232 interface modules to an RS485 twisted pair bus, with lightning protection	1725

CompactFlash



Model number	Short description
5CFCRD.0064-03	CompactFlash 64 MB ATA/IDE SiliconSystems
5CFCRD.0128-03	CompactFlash 128 MB ATA/IDE SiliconSystems
5CFCRD.0256-03	CompactFlash 256 MB ATA/IDE SiliconSystems
5CFCRD.0512-03	CompactFlash 512 MB ATA/IDE SiliconSystems
5CFCRD.1024-03	CompactFlash 1024 MB ATA/IDE SiliconSystems
5CFCRD.2048-03	CompactFlash 2048 MB ATA/IDE SiliconSystems
5CFCRD.4096-03	CompactFlash 4096 MB ATA/IDE SiliconSystems
5CFCRD.8192-03	CompactFlash 8192 MB ATA/IDE SiliconSystems

PC cards



Model number	Short description
0MC111.9-1	PC card, 2 MB FlashPROM
0MC112.9-1	PC card, 4 MB FlashPROM
0MC211.9	PC card, 2 MB SRAM
9A0015.99	CompactFlash adapter; for operating CompactFlash in a PC card slot

USB accessories



Model number	Short description
5MD900.USB2-01	USB 2.0 drive combination; consists of DVD-RW/CD-RW, FDD, CompactFlash slot (type II), USB connection (type A front, type B back); 24 VDC; (screw clamp 0TB103.9 or 1727 cage clamp 0TB103.91)
5A5003.03	Front cover for USB drive combination 5MD900.USB2-01
5CAUSB.0018-00	USB 2.0 cable type A-B, 1.8 m
5CAUSB.0050-00	USB 2.0 cable type A-B, 5 m
5MMUSB.2048-00	USB 2.0 flash drive, 2048 MB

PCI cards



Model number	Short description
5ACPCI.ETH1-01	PCI Ethernet card with 1x 10/100 MBit/s RJ45 network connection
5ACPCI.ETH3-01	PCI Ethernet card with 3x 10/100 MBit/s RJ45 network connections

Product overview

Cables

Model number	Short description	
0G0001.00-090	Cable PC <-> PLC/PW, RS232, online cable	
9A0017.01	Null modem cable RS232, 0.6 m, for connecting UPS and IPC	
9A0017.02	Null modem cable RS232, 1.8 m, for connecting UPS and IPC	
X20CA0E61.0002	EPL connection cable RJ45 to RJ45, 0.2 m	1728
X20CA0E61.0010	EPL connection cable RJ45 to RJ45, 1.0 m	1728
X20CA0E61.0020	EPL connection cable RJ45 to RJ45, 2.0 m	1728
X20CA0E61.0050	EPL connection cable RJ45 to RJ45, 5.0 m	1728
X20CA0E61.0100	EPL connection cable RJ45 to RJ45, 10.0 m	1728
X20CA0E61.0150	EPL connection cable RJ45 to RJ45, 15.0 m	1728
X20CA0E61.0500	EPL connection cable RJ45 to RJ45, 50.0 m	1728
X67CA0E41.0050	EPL attachment cable RJ45 to M12, 5.0 m	1728
X67CA0E41.0150	EPL attachment cable RJ45 to M12, 15.0 m	1728
X67CA0E41.0500	EPL attachment cable RJ45 to M12, 50.0 m	1728
X67CA0X99.1000	Cable for custom prefabrication, 100.0 m	

19" AT keyboard



Model number	Short description	
5E9600.01-010	AT keyboard, 19 inch, front mount installation, IP65 from front, German keyboard layout	1730
5E9600.01-020	AT keyboard, 19 inch, front mount installation, IP65 from front, US keyboard layout	1730

Batteries

Model number	Short description	
0AC200.9	Lithium batteries, 5 pcs., 3 V / 950 mAh, cylindrical battery	
0AC201.9	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell	

Miscellaneous

Model number	Short description	
0AC171.9	Glass tube fuses 5 x 20 mm, 20 pcs., 3.15 A T / 250 V	
0AC301.9	Accessory, 8x shielding clamp	1729
5AC900.1100-00	Touch screen pen (5x)	
9A0013.01	Pen for resistive touch screen	

Data sheets for product-specific accessories can be found in the sections for the respective product families.



Terminal blocks

The single row 2-pin terminal block 0TB3102 is used for making connections on an X20 energy measurement module.



Brief overview	0TB3102-7011	0TB3102-7012
Number of pins	2	2
Coding	A	B
Type of terminal	Screw clamps	Screw clamps
Distance between contacts	7.62 mm	7.62 mm
Contact resistance	≤4.5 mΩ	≤4.5 mΩ
Rated voltage	600 V	600 V
Rated current ¹⁾	31 A	31 A
Connection cross section		
AWG wire	22 - 10 AWG	22 - 10 AWG
Solid wire line	0.20 - 6.00 mm ²	0.20 - 6.00 mm ²
Fine wire line without wire tip sleeves	0.20 - 6.00 mm ²	0.20 - 6.00 mm ²
Fine wire line with wire tip sleeves	0.25 - 6.00 mm ²	0.25 - 6.00 mm ²
Wire tip sleeves with plastic covering	0.25 - 4.00 mm ²	0.25 - 4.00 mm ²
Cable type	Only copper wires (no aluminum wires!)	Only copper wires (no aluminum wires!)
Comment	Multi-function flange for secure, high-speed and tool-free locking Rated values according to UL	Multi-function flange for secure, high-speed and tool-free locking Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration!

The single row 3-pin terminal block TB103 is used to connect the supply voltage.



Brief overview	0TB103.8	0TB103.9	0TB103.91
Number of pins	3 (male)	3 (female)	3 (female)
Type of terminal	Screw clamps	Screw clamps	Cage clamps
Distance between contacts	5.08 mm	5.08 mm	5.08 mm
Contact resistance	≤5 mΩ	≤5 mΩ	≤5 mΩ
Rated voltage	300 V	300 V	300 V
Rated current ¹⁾	10 A / contact	10 A / contact	10 A / contact
Connection cross section			
AWG wire	22 - 12 AWG	26 - 12 AWG	26 - 12 AWG
Solid wire line	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²	0.20 - 2.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Protected against vibration by the screw flange Rated values according to UL	Protected against vibration by the screw flange Rated values according to UL	Protected against vibration by the screw flange Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

Terminal blocks

The single row, 3-pin terminal block 0TB3103 is used for making the connection to the X20 motor module MM4456 and other devices.



Brief overview	0TB3103-7020
Number of pins	3
Type of terminal	Screw clamps
Distance between contacts	7.62 mm
Contact resistance	$\leq 4.5 \text{ m}\Omega$
Rated voltage	600 V
Rated current ¹⁾	31 A
Connection cross section	
AWG wire	22 - 10 AWG
Solid wire line	0.20 - 6.00 mm ²
Fine wire line without wire tip sleeves	0.20 - 6.00 mm ²
Fine wire line with wire tip sleeves	0.25 - 6.00 mm ²
Wire tip sleeves with plastic covering	0.25 - 4.00 mm ²
Cable type	Only copper wires (no aluminum wires!)
Comment	Multi-function flange for secure, high-speed and tool-free locking Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration!

The single row 4-pin terminal block OTB3104 is used for making connections on an X20 energy measurement module.



Brief overview	OTB3104-7011	OTB3104-7012
Number of pins	4	4
Coding	A	B
Type of terminal	Screw clamps	Screw clamps
Distance between contacts	7.62 mm	7.62 mm
Contact resistance	≤4.5 mΩ	≤4.5 mΩ
Rated voltage	600 V	600 V
Rated current ¹⁾	31 A	31 A
Connection cross section		
AWG wire	22 - 10 AWG	22 - 10 AWG
Solid wire line	0.20 - 6.00 mm ²	0.20 - 6.00 mm ²
Fine wire line without wire tip sleeves	0.20 - 6.00 mm ²	0.20 - 6.00 mm ²
Fine wire line with wire tip sleeves	0.25 - 6.00 mm ²	0.25 - 6.00 mm ²
Wire tip sleeves with plastic covering	0.25 - 4.00 mm ²	0.25 - 4.00 mm ²
Cable type	Only copper wires (no aluminum wires!)	Only copper wires (no aluminum wires!)
Comment	Multi-function flange for secure, high-speed and tool-free locking Rated values according to UL	Multi-function flange for secure, high-speed and tool-free locking Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration!

Terminal blocks

The single-row 4-pin terminal block TB704 is used as the supply voltage terminal block and the connection terminal for fieldbuses.



Brief overview	0TB704.9	0TB704.91 ¹⁾
Number of pins	4	4
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	5.08 mm	5.08 mm
Contact resistance	≤5 mΩ	≤5 mΩ
Rated voltage	300 V	300 V
Rated current ²⁾	10 A / contact	10 A / contact
Connection cross section		
AWG wire	26 - 12 AWG	26 - 12 AWG
Solid wire line	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 2.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Rated values according to UL	Rated values according to UL

1) The cage clamp terminal blocks cannot be used side-by-side.

2) The respective limit data for the I/O modules must be taken into consideration.

The single row 5-pin terminal block TB2105 is also used as a connection terminal for fieldbuses.



Brief overview	0TB2105.9010	0TB2105.9110 ¹⁾
Number of pins	5	5
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	5.08 mm	5.08 mm
Contact resistance	≤5 mΩ	≤5 mΩ
Rated voltage	300 V	300 V
Rated current ²⁾	10 A / contact	10 A / contact
Connection cross section		
AWG wire	26 - 12 AWG	26 - 12 AWG
Solid wire line	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 2.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Rated values according to UL	Rated values according to UL

1) The cage clamp terminal blocks cannot be used side-by-side.

2) The respective limit data for the I/O modules must be taken into consideration.

Terminal blocks

The single-row 8-pin terminal block TB708 is used for making connections on various B&R modules.



Brief overview	0TB708.91	0TB1108.8110
Number of pins	8	8
Type of terminal	Cage clamps	Cage clamps
Distance between contacts	3.5 mm	3.5 mm
Contact resistance	≤4.2 mΩ	≤4.2 mΩ
Rated voltage	300 V	300 V
Rated current ¹⁾	10 A / contact	10 A / contact
Connection cross section		
AWG wire	26 - 14 AWG	26 - 14 AWG
Solid wire line	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.00 mm ²	0.20 - 1.00 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Mechanical removal aid, Rated values according to UL	Protected against vibration by the screw flange Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

The single row 10-pin terminal block OTB710 is used for making connections on an XV module.



Brief overview	OTB710.91
Number of pins	10
Type of terminal	Cage clamps
Distance between contacts	3.5 mm
Contact resistance	$\leq 4.2 \text{ m}\Omega$
Rated voltage	300 V
Rated current ¹⁾	10 A / contact
Connection cross section	
AWG wire	26 - 14 AWG
Solid wire line	0.20 - 1.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.00 mm ²
Cable type	Copper wires only (no aluminum wires!)
Comment	Mechanical removal aid, Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

Terminal blocks

The single row 10-pin terminal block TB1110 is used for making connections on various B&R I/O modules.



Brief overview	0TB1110.8010	0TB1110.8110
Number of pins	10	10
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	3.5 mm	3.5 mm
Contact resistance	≤4.2 mΩ	≤4.2 mΩ
Rated voltage	300 V	300 V
Rated current ¹⁾	10 A / contact	10 A / contact
Connection cross section		
AWG wire	28 - 14 AWG	26 - 14 AWG
Solid wire line	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.50 mm ²	0.20 - 1.00 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Protected against vibration by the screw flange Rated values according to UL	Protected against vibration by the screw flange Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

The single row 10-pin terminal block TB710 is used for making connections on various B&R I/O modules.



Brief overview	7TB710.9	7TB710.91
Number of pins	10	10
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	5.08 mm	5.08 mm
Contact resistance	$\leq 2 \text{ m}\Omega$	$\leq 5 \text{ m}\Omega$
Rated voltage	300 V	300 V
Rated current ¹⁾	10 A / contact	10 A / contact
Connection cross section		
AWG wire	24 - 12 AWG	26 - 12 AWG
Solid wire line	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line with wire tip sleeves	0.25 - 2.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.25 - 2.50 mm ²	0.20 - 1.50 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Rated values according to UL	Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

Terminal blocks

The single-row 11-pin terminal block TB1111 is used for making connections on various B&R modules.



Brief overview	0TB1111.8010	0TB1111.8110
Number of pins	11	11
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	3.5 mm	3.5 mm
Contact resistance	≤4.2 mΩ	≤4.2 mΩ
Rated voltage	300 V	300 V
Rated current ¹⁾	10 A / contact	10 A / contact
Connection cross section		
AWG wire	28 - 14 AWG	26 - 14 AWG
Solid wire line	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.50 mm ²	0.20 - 1.00 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Protected against vibration by the screw flange Rated values according to UL	Protected against vibration by the screw flange Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

The single row 12-pin terminal block TB712 is used for making connections on various B&R I/O modules. Removal is simplified by two ejection levers on the terminal block.



Brief overview	7TB712.9	7TB712.91
Number of pins	12	12
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	3.5 mm	3.5 mm
Contact resistance	≤4.2 mΩ	≤4.2 mΩ
Rated voltage	300 V	300 V
Rated current ¹⁾	10 A / contact	10 A / contact
Connection cross section		
AWG wire	28 - 14 AWG	26 - 14 AWG
Solid wire line	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.50 mm ²	0.20 - 1.00 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Mechanical removal aid Rated values according to UL	Mechanical removal aid Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

Terminal blocks

The single row 18-pin terminal block TB718 is used for making connections on various B&R I/O modules. Removal is simplified by two ejection levers on the terminal block.



Brief overview	7TB718.9	7TB718.91
Number of pins	18	18
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	3.5 mm	3.5 mm
Contact resistance	≤4.2 mΩ	≤4.2 mΩ
Rated voltage	300 V	300 V
Rated current ¹⁾	10 A / contact	10 A / contact
Connection cross section		
AWG wire	28 - 14 AWG	26 - 14 AWG
Solid wire line	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.50 mm ²	0.20 - 1.00 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Mechanical removal aid Rated values according to UL	Mechanical removal aid Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

Ethernet hub AC808



The AC808 Ethernet hub is a standalone device that can be used universally as a Level 2 hub in standard Ethernet or POWERLINK networks. It is suitable for both 100 MBit/s (Fast Ethernet) and 10 MBit/s networks. The hub automatically recognizes the transfer speed for the channels. ¹⁾

The Ethernet connections are made using RJ45 connectors. The pin assignments can be crossed for the first channel using switches.

The hub can be installed horizontally or vertically on the mounting rail. It also has fastening possibilities on the sides for direct mounting.

Brief overview	0AC808.9
Type	8x industrial hub (Layer 2)
Interface	Ethernet 10/100 Base-T (ANSI/IEEE 802.3)
Cable length	Max. 100 m between two stations (segment length)
Transfer rate	10 or 100 MBit/s; 100 MBit/s used for devices with 10/100 MBit/s auto-negotiation ¹⁾
Port design	Shielded RJ45 ports
Power supply	24 VDC, max. 5.2 W, protection against reverse polarity
<small>1) Note: If devices that use 10 MBit/s as well as 100 MBit/s are connected, then there is no communication between these devices. Devices with 10/100 MBit/s autonegotiation are always operated with 100 MBit/s on the hub.</small>	
General information	0AC808.9
Status indicators	Network activity for each channel, Link/Collision for each channel, Supply voltage
Diagnostics	
Bus function	Yes, with status LED
Hub supply	Yes, with status LED
Certification	CE, C-UL-US, GOST-R
Mechanical characteristics	0AC808.9
Dimensions (W x H x D)	115 x 43 (51 with mounting rail) x 86 mm
Protection type	IP20
Installation	Mounting rail installation and mounting rail adapter included in delivery
Mounting orientation	Vertical or horizontal
Operating temperature	
Horizontal installation	0°C to +60°C
Vertical installation	0°C to +50°C
Storage temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Comment	Order 1 x TB704 terminal block separately

Required accessories		
0TB704.9	Accessory terminal block, 4-pin, screw clamp, 1.5 mm ²	1714
0TB704.91	Accessory terminal block, 4-pin, cage clamps, 2.5 mm ²	1714

Level converter Bus connectors

The adapter is used as a converter for 5 V encoders. The 5 V differential signals delivered by the encoder are converted to 24 V signals. Absolute and incremental encoders can be used.

Brief overview	0AC401.9
Power supply	24 VDC
Overvoltage protection	External fuse specified at 10 AT
Input frequency	100 kHz
Power consumption	Typ. 6.0 W @ 24 V, the encoder supply (+5 V) is loaded with 500 mA
General information	0AC401.9
Certification	CE, C-UL-US, GOST-R
Mechanical characteristics	0AC401.9
Dimensions (W x H x D)	77 x 112.5 x 58 mm
Protection type	IP20
Installation	DIN rail installation
Mounting orientation	Horizontal or vertical
Operating temperature	0°C to +55°C
Storage temperature	-20°C to +70°C
Relative humidity	0 - 95%, non-condensing

The RS485 bus connector is used to connect a controller to a Profibus network or an RS485 network. The terminating resistor is integrated in the bus connector. The terminating resistor can be turned on or off.



The AC911 bus connector is used to connect a controller to a CAN network. The terminating resistor is integrated in the bus connector. The terminating resistor can be turned on or off.

Brief overview	0G1000.00-090	7AC911.9
Interface	Profibus DP, RS485 network	-
Fieldbus Type	RS485	CAN
Design	9-pin DSUB plug	9-pin DSUB socket
Connection	For two bus lines using screw clamps	For two bus lines using screw clamps
Terminating resistor	Can be switched on	Can be switched on
Stress relief	Integrated	Integrated
Certification	CE, GOST-R	CE, GOST-R

Interface converters

ECINT1



The INT1 interface converter is used to convert RS232 interface signals to an RS485 signal level. It is used if:

- Data transfer over a long distance is required which cannot be bridged by an RS232 interface. The distance between two stations can be max. 5,000 m when using shielded RS485 cables.
- Electrical isolation is required for the interface.
- A PLC is to be connected to a network using an RS232 interface.

The INT1-11 interface converter is equipped with lightning protection.

Brief overview	ECINT1-1	ECINT1-11
Power supply	24 VDC, maximum 4.3 W, protection against reverse polarity	24 VDC, maximum 4.3 W, protection against reverse polarity
Overvoltage protection	Yes	Yes
Maximum transfer rate	115.2 kBit/s	115.2 kBit/s
Cable length		
RS232	Max. 10 m	Max. 10 m
RS485	Max. 5,000 m	Max. 5,000 m
Operating modes	Point-to-point RS422 network RS485 network	Point-to-point RS422 network RS485 network
Terminating resistor	Can be switched on	Can be switched on
Lightning protection	-	Yes
General information	ECINT1-1	ECINT1-11
Status indicators	RS232 signal lines, RS485 active, supply voltage	RS232 signal lines, RS485 active, supply voltage
Diagnostics		
Interface function	Yes, with status LED	Yes, with status LED
Power supply	Yes, with status LED	Yes, with status LED
Certification	CE, GOST-R	CE, GOST-R
Mechanical characteristics	ECINT1-1	ECINT1-11
Dimensions (W x H x D)	100 x 73 x 114 mm	100 x 73 x 114 mm
Protection type	IP20	IP20
Installation	Mounting rail or back wall installation using M5 screws	Mounting rail or back wall installation using M5 screws
Mounting orientation	Any	Any
Operating temperature	0°C to +60°C	0°C to +60°C
Storage temperature	-20°C to +70°C	-20°C to +70°C
Relative humidity	0 - 95%, non-condensing	0 - 95%, non-condensing

Bus adapter CAN 1x, CAN 2x



Brief overview	0AC912.9	0AC913.92	0AC913.93
Bus adapter	CAN 1x	CAN 2x	CAN 2x
Connection to controller	Using 9-pin DSUB socket, connection made by customer	Using 30 cm cable with 9-pin DSUB housing	Using 30 cm cable with 4-pin plug
Networking	Using 9-pin terminal block	Using the 9-pin DSUB plug (C1) and the 9-pin DSUB socket (C2)	Using the 9-pin DSUB plug (C1) and the 9-pin DSUB socket (C2)
Terminating resistor	Can be switched on	Can be switched on	Can be switched on
Installation	DIN rail installation	DIN rail installation	DIN rail installation
Mounting orientation	Horizontal or vertical	Horizontal or vertical	Horizontal or vertical
Certification	CE, GOST-R	CE, GOST-R	CE, GOST-R

USB drive combination



General information		SMD900.USB2-01	
Transfer rate	Low speed (1.5 MBit/s), full speed (12 MBit/s), to high speed (480 MBit/s)		
Maximum cable length	5 m (without hub)		
CD/DVD formats	Read CD-ROM CD-RW CD-R CD-DA Photo CD (single/multi-session) Enhanced CD DVD-ROM DVD-R, +R DVD-RW, +RW DVD video DVD RAM (4.7 GB, 2.6 GB)	Write CD-R/RW DVD-R/RW DVD-RAM DVD+R/RW DVD+R (double layer)	
CD/DVD speed	CD: 24 x / DVD: 8 x	CD: 24 x / DVD: 8 x	
Floppy disk drive	1.44 MByte		
CompactFlash slot	Type II		
Interfaces	USB 2.0: front (type A), back (type B)		
Power supply	24 VDC ± 25%		
Environmental conditions		SMD900.USB2-01	
Ambient temperature			
Operation	+5°C to +45°C		
Storage	-20°C to +60°C		
Transport	-40°C to +65°C		
Relative humidity			
Operation	8 - 80%, non-condensing		
Storage	5 - 95%, non-condensing		
Transport	5 - 95%, non-condensing		
Mechanical characteristics		SMD900.USB2-01	
Protection type	IP65 front side (only with optional front cover), IP20 back side		
Dimensions (W x H x D)	156 x 52 x 140 mm		

Required accessories			
0TB103.9	Connector, 24 VDC, 3-pin female, screw clamps, 3.31 mm ² , protected against vibration by the screw flange		1711
0TB103.91	Connector, 24 VDC, 3-pin female, cage clamps, 3.31 mm ² , protected against vibration by the screw flange		1711
5A5003.03	Controller R-IDE front cover		
5CAUSB.0018-00	USB 2.0 cable type A-B, 1.8 m		
5CAUSB.0050-00	USB 2.0 cable type A-B, 5 m		
5SWUTI.0000-00	Nero CD-RW OEM software. Only available with a CD-RW drive.		

Ethernet POWERLINK cable

Ethernet POWERLINK cable
RJ45 to RJ45



Length	Connection cable Model number	Short description
0.2 m	X20CA0E61.0002	POWERLINK connection cable RJ45 to RJ45, 0.2 m
1.0 m	X20CA0E61.0010	POWERLINK connection cable RJ45 to RJ45, 1.0 m
2.0 m	X20CA0E61.0020	POWERLINK connection cable RJ45 to RJ45, 2.0 m
5.0 m	X20CA0E61.0050	POWERLINK connection cable RJ45 to RJ45, 5.0 m
10.0 m	X20CA0E61.0100	POWERLINK connection cable RJ45 to RJ45, 10.0 m
15.0 m	X20CA0E61.0150	POWERLINK connection cable RJ45 to RJ45, 15.0 m
50.0 m	X20CA0E61.0500	POWERLINK connection cable RJ45 to RJ45, 50.0 m

Ethernet POWERLINK cable
RJ45 to M12



Length	Attachment cable Model number	Short description
5 m	X67CA0E41.0050	POWERLINK attachment cable RJ45 to M12, 5.0 m
15 m	X67CA0E41.0150	POWERLINK attachment cable RJ45 to M12, 15.0 m
50 m	X67CA0E41.0500	POWERLINK attachment cable RJ45 to M12, 50.0 m

For detailed information and support: www.br-automation.com

8x shield terminal AC301



The AC301 8x connection shielding clamp is used for optimal cable shielding for analog signal lines, as well as for encoder and counter signals. The cable shields are screwed directly on the shield bracket. The required mounting materials are included in delivery.

Short description	0AC301.9
Number of cable shield clamps	8
Type of terminal	4 x screw clamps (sets of two)
Dimensions including shield clamps (W x H x D)	76 x 25 x 22 mm

19" AT keyboard



General information	5E9600.01-010	5E9600.01-020
Keyboard format	German	English
Installation	Front mount installation, 19" rack	Front mount installation, 19" rack
Connection	PS/2 plug	PS/2 plug
Environmental conditions	5E9600.01-010	5E9600.01-020
Ambient temperature		
Operation	0°C to +55°C	0°C to +55°C
Storage / Transport	-20°C to +60°C	-20°C to +60°C
Relative humidity	5 - 95%, non-condensing	5 - 95%, non-condensing
Mechanical characteristics	5E9600.01-010	5E9600.01-020
EN 60529 protection	IP65 (front side)	IP65 (front side)
Dimensions (W x H x D)	482.6 x 177 x 35 mm	482.6 x 177 x 35 mm





R

Rated current
The rated current is the effective value for the phase current at the rated speed. This is possible only if the motor is cooled correctly.

Rated power
The rated power is output by the motor when $n = n_N$. This is possible only if the conditions are correct.

Rated torque
The nominal torque is output by the motor ($n = n_N$) when the nominal speed is reached for any length of time if the environmental conditions are correct.

Real-time
A system is operating in real-time or has real-time capability, if the input signals are received and processed in a defined time period, and the results are made available in the system environment. See also 'Real-time Demands' and 'Real-time System'.



Release delay

Delay time required until the holding torque of the holding brake is reduced to the operating voltage has been returned to the holding torque.

Reliability

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	1128	1724	1138
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4PP420.1505-75	846
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0001-0736 - I/Os, Fieldbuses and Controllers
 0737-1184 - Operator Panels and Industrial PCs

1185-1768 - Motion Technology
 1769-2024 - Automation Software and Service

4PP420.1505-K14	1034
4PP450.1043-K01	1035
4PP451.0571-45	847
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4XP0000.00-K20	1024
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5AC600.485I-00	924
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5AC600.CFSS-00	923
5AC600.DVDS-00	923
5AC600.DVRS-00	923
5AC600.FDDS-00	923
5AC600.HDDI-05	923
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5AC600.HDDS-02	923

5AC600.HS01-01	931
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5AC900.104X-02	870
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5AC900.104X-05	1106
5AC900.1100-00	674
	1128
	1708
	1942
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5AC900.150X-00	871
5AC900.150X-01	1011
5ACPCI.ETH1-01	673
	1127
	1707
	1941
5ACPCI.ETH3-01	673
	1127
	1707
	1941
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5CASDL.0018-00	1101
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5CASDL.0018-03	1100
5CASDL.0018-20	1066
5CASDL.0050-00	1101
5CASDL.0050-01	1099
5CASDL.0050-03	1100
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5CASDL.0300-03	1100
5CASDL.0300-13	1102
5CASDL.0300-30	1067
5CASDL.0400-13	1102
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5CAUPS.0005-00	924
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5CAUSB.0018-00	673
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	1707
	1941
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	1103
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	1707
	1941
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	1706
	1940
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	1706
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	1706
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5DLDVI.1000-01	1086
5DLSDL.1000-00	1086
5DLSDL.1000-01	1086
5E9000.18	1027
5E9000.29	1053
5E9600.01-010	696
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5MMDDR.2048-01	961
5MMUSB.2048-00	673
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5MP040.0381-01	890
5MP040.0381-02	892
5MP050.0653-01	894
5MP050.0653-02	896
5MP050.0653-03	898
5MP050.0653-04	900
5MP181.0843-07	889
5PC310.L800-00	982
5PC310.L800-01	982
5PC600.FA01-00	923
5PC600.FA02-00	923
5PC600.FA03-00	923
5PC600.FA05-00	923
5PC600.SE00-00	926
5PC600.SE00-01	926
5PC600.SE00-02	926
5PC600.SF03-00	928
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5PC600.X855-04	931
5PC600.X855-05	931
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5PC700.FA02-00	994
5PC700.FA02-01	994
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5PC800.B945-04	961
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5PC810.FA01-00	957
5PC810.FA02-00	957
5PC810.FA05-00	957
5PC810.SX01-00	959
5PC810.SX02-00	959
5PC810.SX05-00	959
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5PP320.0573-39	830
5PP320.0573-3B	830
5PP320.0653-K02	1036
5PP320.1043-39	831
5PP320.1043-K04	1038
5PP320.1043-K14	1039
5PP320.1214-39	832
5PP320.1505-39	833
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7EC021.61-2	606
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7XV116.50-11	577
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7XV116.50-62	577
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7XV124.50-61	578
7XV124.50-62	578
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7XX412.50-1	594

7XX415.50-K02	596
7XX426.50-1	598
7XX436.50-1	600

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80MPH4.500S000-01	1456
80MPH6.300S000-01	1457
80PS080X3.10-01	1242
80SD100XD.C044-01	1238
80SD100XD.C0XX-01	1234
80SD100XS.C04X-01	1240
80SD100XS.C0XX-01	1236
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8B0C0160HC00.001-1	1376
8B0C0160HC00.A01-1	1380
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8B0C0320HC00.002-1	1380
8B0C0320HW00.000-1	1380
8B0C0320HW00.002-1	1380
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8B0M0220HC00.000-1	1366
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8B0M0230HC00.000-1	1366	8BCM0015.1111A-0	1425	8BVI0014HWS0.000-1	1384
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8B0M0240HC00.000-1	1366	8BCM0015.1523A-0	1427	8BVI0028HCS0.000-1	1384
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8B0M0260HW00.000-1	1366	8BCM0025.1312A-0	1426	8BVI0055HWD0.000-1	1389
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8BAC0120.001-1	1412	8BCR0010.1111A-0	1429	8BVI0220HCS0.000-1	1394
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8BCA0005.1511A-0	1433	8BPM0001.0000-00	1582	8BVR0440H000.100-1	1364
8BCA01X5.1111A-0	1431		1642	8BVR0880H000.100-1	1364
8BCA01X5.1311A-0	1432		1678	8BXF001.0000-00	1441
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8BCE0005.1111A-0	1428		1642	8CE005.12-1	1318
8BCE0007.1111A-0	1428		1678	8CE007.12-1	1318
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8BCE0015.1111A-0	1428		1642	8CE015.12-1	1318
8BCE0020.1111A-0	1428		1678	8CE020.12-1	1318
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8BCM0005.1523A-0	1427	8BVE0500HW00.000-1	1404	8CM005.12-5	1316
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8CR015.12-1	1319
8CR020.12-1	1319
8CR025.12-1	1319
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8LSC6	1568
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9A0100.11	664
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9A0100.16	666
9A0100.17	649
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9S0001.29-020	1114
9S0001.36-020	1114

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MA4SERV-E	1934
MAACP2-0	1935
MAACP2-E	1935
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MAACPM-GER	1935
MAAP800-ENG	1935
MAAP800-GER	1935
MAAP900-ENG	1935
MAAP900-GER	1935
MAAPC620-ENG	1935
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MACIO-GER	1934
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MACOGETST-GER	1934
MADNGETST-ENG	1934
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MAEIGETST-GER	1934
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MAMP100.200-ENG	1935
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MAMP40.50-GER	1935
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MAPLINK-E	1934
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MAPP01-E	1934
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MAUPS24VDC-GER	1935
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MM-E00740.581	1933

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TM211TRE.30-ENG	1900
TM211TRE.30-GER	1900
TM213TRE.00-ENG	1901
TM213TRE.00-GER	1901
TM220TRE.00-ENG	1901
TM220TRE.00-GER	1901
TM223TRE.25-ENG	1902
TM223TRE.25-GER	1902
TM230TRE.30-ENG	1902
TM230TRE.30-GER	1902
TM240TRE.00-ENG	1903
TM240TRE.00-GER	1903
TM241TRE.30-ENG	1903
TM241TRE.30-GER	1903
TM246TRE.00-ENG	1904
TM246TRE.00-GER	1904
TM247TRE.00-ENG	1904
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TM248TRE.25-ENG	1905
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TM250TRE.00-ENG	1905
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TM260TRE.25-ENG	1906
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TM261TRE.00-ENG	1907
TM261TRE.00-GER	1907
TM400TRE.00-ENG	1908
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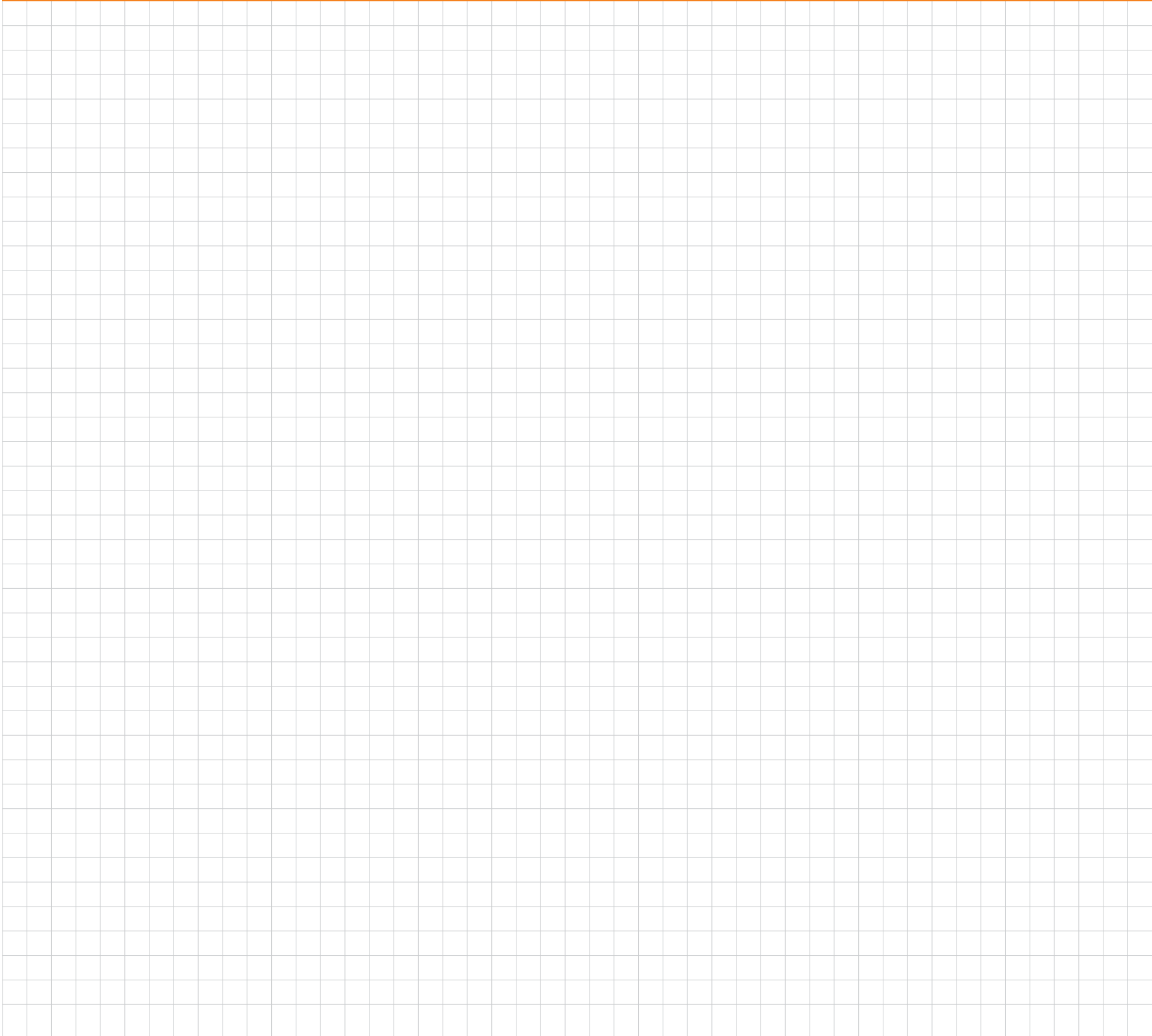
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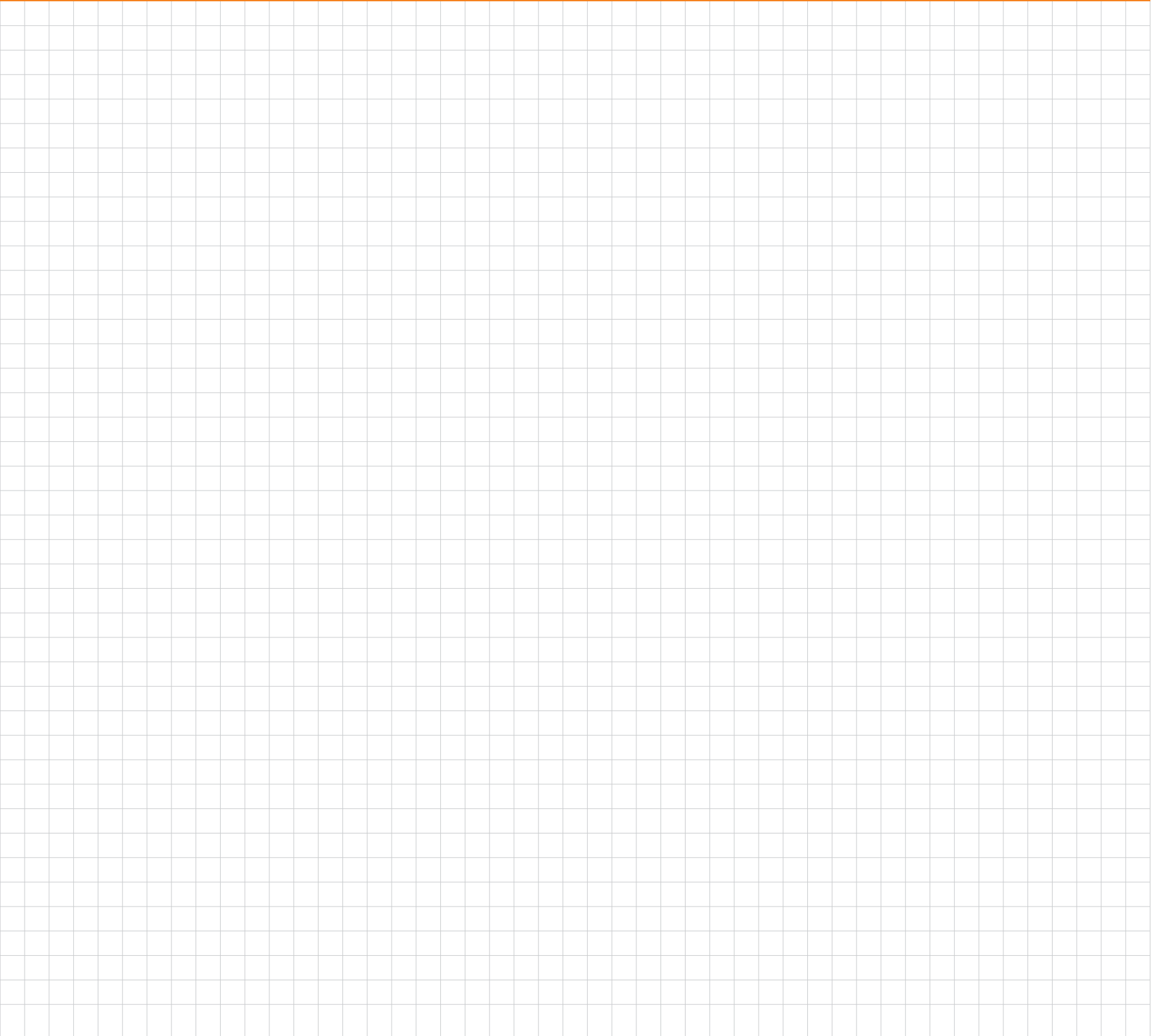
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B&R was founded in 1979 by Erwin Bernecker and Josef Rainer. Since then it has become one of the largest privately owned automation companies in the world, employing more than 1700 people. A network of subsidiaries and international sales and support offices in more than 60 countries around the world guarantees global know-how at a local level. B&R customers are leaders in their respective industrial sectors. Flexible solutions and systems for individual automation projects greatly contribute to their companies' success. Continual innovation guarantees B&R customers the competitive edge. Since the company's founding, all innovations and investments have concentrated on one core area: solutions for industrial automation. As a privately owned company, all financial decisions are made independently of external investors or shareholders. This autonomy is the cornerstone for flexibility and dynamics – constant product innovations are the result.

Custom-made

Using standard components is not always the best approach. A demand for specialized solutions also exists. Willingness and ability to perform customer-oriented research and development has established B&R's position in the market. The developers at B&R work together with the customer in project teams to create custom-made solutions. This flexible and innovative approach for creating uncommon solutions is the foundation for expanding our customers' market lead. In addition to functional aspects, aesthetic design is becoming a decisive factor in all product segments as well. On request, we can manage the layout and design of operating and visualization units based on the customer's corporate design.

Support for series production

Not every machine manufacturing company has the possibility to program and extensively test all controllers for a complete production series. It isn't even necessary to assign personnel and important resources for this purpose. B&R provides just-in-time delivery of automation solutions that are completely programmed and tested, configured according to customer specifications for series production. This is done by excellently trained personnel using the most modern programming and testing systems. The customer just has to install the preconfigured components in the machine and test the entire system. This allows the customer to concentrate on the core area of expertise in machine manufacturing and achieve increased efficiency and freedom for innovation."

Solutions for all industries

Companies specializing in packaging, plastics, printing and paper, textiles, automobile, food and beverages, semiconductors, wood, metal and mining, pharmaceuticals, chemicals and building automation rely on B&R know-how. Our complete solutions help customers from all industries achieve a decisive competitive edge. Orientation towards applications in all areas of machine automation and process control technology builds the foundation that makes us a strong partner. We offer our customers a complete automation solution from one source: No unnecessary interfaces, maximum flexibility and the highest level of profitability.





Individual solutions for all industries

Outstanding solutions with distinctive technology and designs are becoming increasingly important in today's capital goods industry. In these cases, specially developed technical solutions for the application are required. A uniform appearance is also essential in representing the corporate identity. In the eyes of the user, this begins with the human-machine interface. In addition to an extensive range of standard products, B&R always offers the right automation solutions, ranging from freely configurable, customized user interfaces to specially developed electronic components and software.

Application programming

The programming required for machine controllers is constantly becoming more extensive. Machine manufacturing companies seldom have the resources needed to program and maintain software. Economics and the need to focus on the main area of expertise often make it impossible to establish these resources. B&R application experts and service partners can help. Together with the customer, specifications are made, the ideal system architecture is developed, the software is programmed and the system is tested. The customer can concentrate on making sure the application functions as desired. The well trained B&R specialists implement the application requirements and provide service for machine and system manufacturing companies all over the world throughout the entire product lifespan.

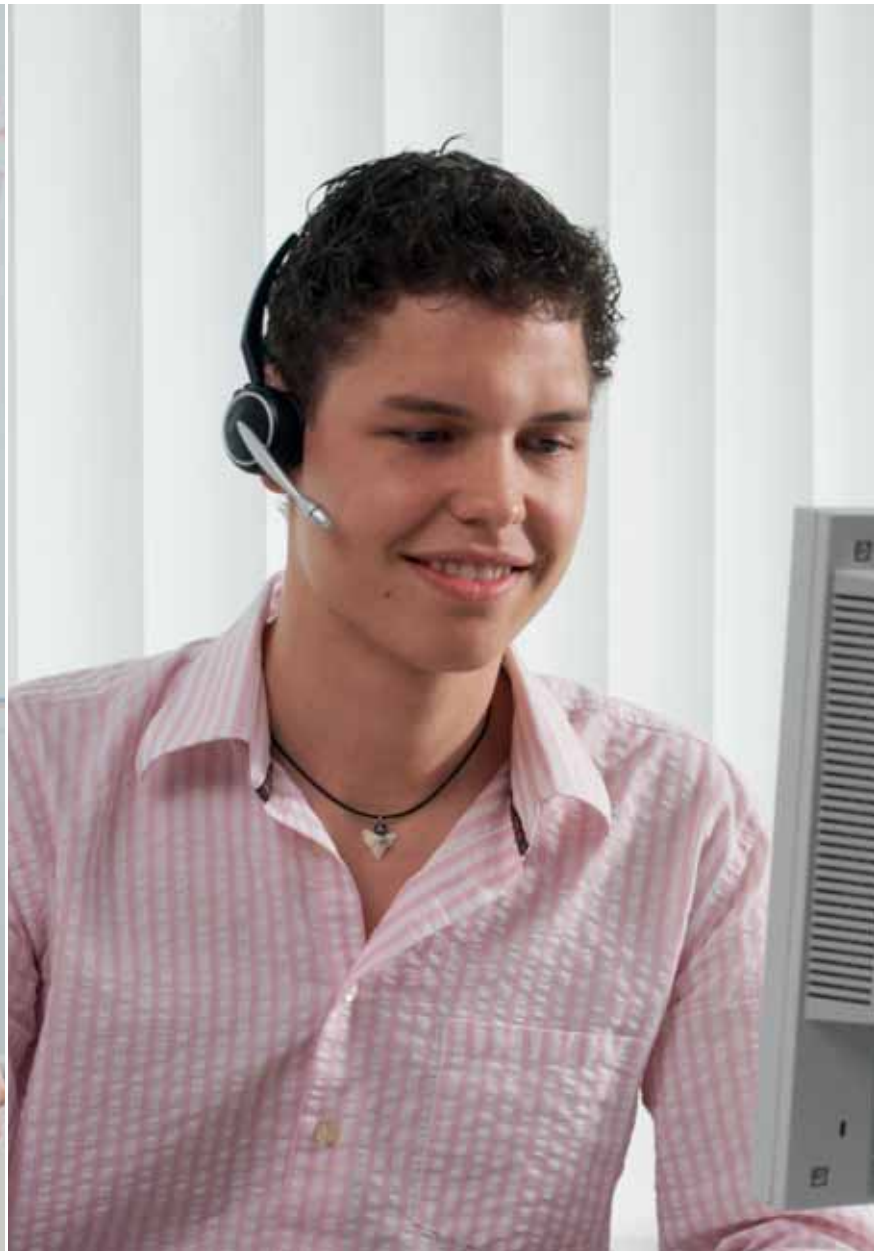
Seminars and training

Skilled employees are the foundation of a company's success. Continued training provides a competitive advantage. B&R offers an extensive seminar and training program at all locations and on-site at the customer's location. The B&R training calendar contains customized, compact training solutions ranging from introduction courses to special automation technology courses. Individual problems can be examined in clearly defined groups. Experienced trainers provide theoretical and practical information. Realistic exercises allow automation solutions to be created on modern systems. In addition to the standard program, company-specific trainings are also offered that match the tasks the participants will be carrying out in the future.

Hotline support

Quality not only refers to the product; it also refers to the support provided when implementing a product so that a task can be completed in the most ideal way possible. Question must be answered quickly, and any unclear situations must be cleared up fast to reach goals and meet deadlines. B&R customers receive hotline support for all products via email and telephone. Personal contact allows knowledgeable answers to be given and solutions to be worked out quickly. Skilled and experienced technicians work on the problem until a solution is found. They work closely with development and production to continually improve our products based on customer inquiries and prevent unclear situations in the future.





Understanding and supporting the customer

Every application is a challenge. Solving problems means being able to listen. Once contact has been made, qualified and comprehensively trained staff put themselves in the customer's frame of mind. Engagement with our customers doesn't end when the sale is finalized. To us, this period is just the start of a commitment that will last over the entire working relationship. Customer specialists for technical support, application engineering and training are available at all locations worldwide. The most modern software and infrastructure guarantee fast response times and access to information from the entire company. Easy availability, clearly assigned roles, keeping promises and personal commitment all guarantee the highest level of service quality worldwide.



Perfection in Automation

Innovative software
Sleek hardware
Real-time Ethernet



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Product overview

Control systems

Scalable from space-saving, cost-effective machine controllers to large systems with distributed intelligence. A wide range of I/O components and attachment modules always allow for the right connections.

X20 System - Slice-based I/O and control system	37
Power Panel - Integrated control, operation and visualization	787
Mobile Panel - More than just mobile operation and monitoring	873

Industrial PCs

Fully scalable industrial PC solutions for high-performance applications. Computing power, displays, operational elements, operating systems and interfaces can be optimized for the individual requirements.

Automation PC APC620 - Modular, fan-free industrial PCs	911
Automation PC APC810 - Highest-level performance with Intel® Core™ 2 Duo processors	945
Panel PC - Integrated operation and PC	985
PC Software - Operating system and software components	1109
Panel PC 300 - Makes any Automation Panel 900 into an embedded PC.	973

Visualization and operation

From two-line displays to high-resolution graphics with touch screen. The right HMI for every application.

Power Panel - Integrated control, operation and visualization	787
Mobile Panel - More than just mobile operation and monitoring	873
Automation PC APC620 - Modular, fan-free industrial PCs	911
Automation PC APC810 - Highest-level performance with Intel® Core™ 2 Duo processors	945
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Customized HMI systems	1013
Automation Panel - A new dimension in machine visualization	1055/1077
PANELWARE - Compact operator panels	773
Panel PC 300 - Makes any Automation Panel 900 into an embedded PC.	973

Motion control

Speed and precision to meet the highest demands with built-in technology functions for flexible operation. Safety functions and "Plug & Play" in the power transmission system allow for solutions that will set you in motion.

ACOPOSmicro - Compact drive system	1221
ACOPOS - Intelligent servo drives	1251
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Synchronous motors (8LS)	1459
8JS synchronous motors	1585
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Stepper motors	1443
ARNCO - Integrated CNC	1681

Remote I/O systems

Switching cabinets are becoming obsolete – flexible and configurable distributed I/O systems reduce wiring, increase stability and can be adapted to any environment.

X20 System - Slice-based I/O and control system	37
X67 System - Remote I/O with IP67 protection	419
Compact I/O System - Save space when connecting peripheral devices	581
XV valve connections - Economical usage of peripheral space	569

Integrated safety technology

Safety shut-offs do not always have to involve a full machine shutdown. Smart, safe reactions to various situations provide safety without always stopping the production process. Intelligent, decentralized and integrated safety technology that is simple to operate and that reaches extremely high reaction times opens up an entirely new range of machine safety concepts.

X20 System - Slice-based I/O and control system	37
Integrated Safety Technology - Decentralized and intelligent functional safety	537
SafeDESIGNER	1877

Programming and training

Automation Studio provides scalability, multi-platform capability, and the flexibility to meet all programming requirements. From the simplest machine to the most complex process, this single configuration and programming tool covers all tasks and system platforms. B&R also provides a modular training program that can be tailored to your needs.

Automation Studio	1805
SafeDESIGNER	1877
FieldbusDESIGNER	1887
Automation training	1893

Communication

Fieldbus and IT networks are standard components of automation solutions. With POWERLINK, a system-wide real-time network is available.

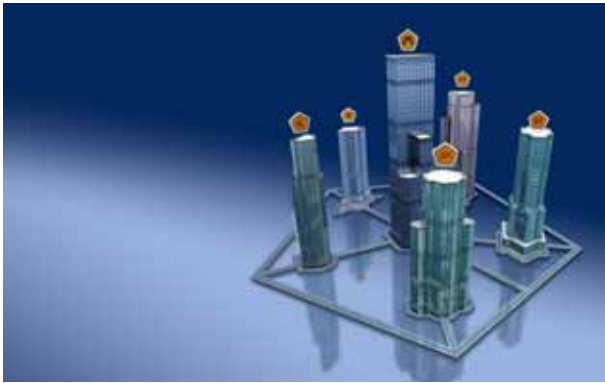
Flexible communication	611
Real-time industrial Ethernet	611
FieldbusDESIGNER	1887

Accessories, documentation

As system supplier for automation solutions, we cover the entire product spectrum - everything from configuration tool to terminal blocks.

Terminal blocks, cables, memory cards, etc.	1973
Switching Power Supplies and Accessories for Mounting Rail Installation	645
Manuals and brochures	1929

News



Integrated automation for increased profitability

Complete machine automation using one intelligent tool to implement the entire automation system – this has long been the philosophy of the Austrian automation specialists at B&R. B&R recognized early that the market is not only searching for components such as controllers, visualization devices, industrial PCs and drive systems, an integral software tool is desired that covers all automation tasks. Total solutions provide enormous savings potential, which is recognized by many machine manufacturers as an important competitive edge.

Not only that, software needs to be flexible when it comes to machine configurations and options. Connecting ERP systems, E-CAD tools and automation tools enables the creation of individual machine software based on automated processes. With Automation Studio, B&R provides a single development environment for control, visualization, motion control, and communication tasks – in short, everything that has to do with automation.

In times when cost pressures continue to mount, it's extremely important for machine and systems manufacturers to concentrate on their main areas of expertise. By using a single comprehensive tool, machine manufacturers no longer have to spend vast amounts of money to implement interfaces between the controllers, drives, and visualization application.

All standardized IEC editors, a completely integrated ANSI C compiler and debugger, graphic configuration for I/O points and axes, and integrated configuration of machine visualization systems accompany the customer from the programming and commissioning phases all the way to production and service. Many advanced functions for temperature control, drive technology and fieldbus communication are already included in the standard Automation Studio package. Automation Studio users can now develop their automation projects faster and the open software design provides a system that can be integrated seamlessly into existing processes.

A network-wide real-time communication system is needed in addition to a software tool. With POWER-LINK, B&R has offered Ethernet-based real-time communication for the last five years. This technology has now established itself on the market. In the meantime, more than 40,000 series production machines have been set up and are being used in various industries. In addition to B&R, many leading automation manufacturers are relying on this open and pioneering technology.

Remaining true to the guiding principle "Perfection in Automation," B&R offers technologically advanced total solutions for hardware and software as well as knowledgeable customer-oriented support in all areas of automation. Total solutions offered by a single source provide considerable savings potential for customers throughout the entire lifespan of the machines and systems.



Positioning precision taken to new dimensions

For drives, efficient machine design and compact size are the basic principles for providing maximum flexibility.

The new 8LT series three-phase synchronous motors from B&R provide machine and system manufacturers with a compact solution for the most demanding applications. Excellent dynamic properties and positioning precision help users easily master even the most difficult tasks.

The permanently excited high-torque motors are available with self-cooled or externally-cooled options. The short, compact design of the motors can eliminate the need for angular gears in many cases. Thanks to the special design of the motor components, all motors are maintenance-free.

The supply voltage of the high-torque motors ranges from 400 to 480 VAC. With a rated power of 1.51 to 32.4 kW, the motors can be easily integrated in a wide range of applications. The motors have an especially high power rating with a stall torque of 50 to 408 Nm.

Embedded parameter chip for reliable identification

All torque motors are equipped with an embedded parameter chip, which guarantees seamless identification of all device data. Using the integrated chip, important information such as serial number, type, manufacturer data, etc. can be read and registered electronically. As a result, it isn't necessary to remove components for identification.



UL certification for ACOPOSmulti

The energy efficient B&R drive system ACOPOSmulti was awarded a UL certificate from the Underwriters Laboratories. In addition to meeting all criteria for a UL compliant construction, the drive distinguishes itself through an innovative energy concept and a high level of dependability. A fundamental entry requirement for the North American automation market, the UL certification serves as an important step for the international sales of B&R innovative technology.

A high level of efficiency and dependability allow ACOPOSmulti to meet the special demands of modern Motion Control products. Active power supply modules with Power Factor Correction and the ability for power regeneration ensure the most efficient energy usage while simultaneously protecting valuable resources.

News



Small, flexible, unique - ACOPOSmicro is setting the pace

Complex CNC applications are increasingly implementing stepper motor technology. In addition, more and more pneumatic systems are being replaced by electrical drives. ACOPOSmicro – an extremely compact drive for operating stepper and servo motors in the lower performance range – provides an innovative and impressive solution. ACOPOSmicro is an addition to the successful ACOPOS and ACOPOSmulti product range.

At only 63 mm wide, it saves space in the switching cabinet. An 80 VDC version is available in order to achieve higher torque at high speeds. The performance ranges between 50 W and 1 kW. POWERLINK and the X2X remote backplane are onboard as fieldbus interfaces.

A clever cooling design, like the one already used for ACOPOSmulti, provides advantages for the environment. Side and back wall mounting are possible. Cold plate mounting with oil or water cooling is available in addition to wall and feed-through mounting. This cooling design reduces costs by eliminating the need to carry out additional work for climate-control and the related service tasks.

Using standardized PLCopen motion control function blocks and CNC robotics libraries, all motor types supported by ACOPOSmicro can be controlled via B&R Automation Studio without problems.

ACOPOSmicro is often implemented in the semiconductor, packaging, textile and printing industries.



Unlimited flexibility for machine manufacturing

A new member has been introduced to the industrial PC generation from B&R. The product range has been expanded with the APC620 embedded. Windows XP embedded with real-time extension is the system platform used. Windows XP embedded offers advantages for applications with a minimal operating system size.

Intel processors from Celeron M to Pentium M 1.4 GHz provide requirement-oriented, scalable computing power. POWERLINK and CAN as well as the X2X remote backplane are onboard as fieldbus interfaces. The CPU has 256 KB of battery-buffered SRAM memory.

Like its big brothers, the APC620 has an integrated Smart Display Link that can be used to operate a remote line with four displays at distances up to 160 m.

The APC family is the most innovative industrial PC generation on the market. Fan-free, compact, scalable and economical – these are the key features that provide machine manufacturers the highest level of flexibility.



TÜV Certificate for B&R Integrated Safety Technology

The safety-related products from B&R have been certified by TÜV Rheinland for use in safety-oriented applications. In addition to meeting all specified safety criteria, B&R safety technology also has the major advantage of seamless integration in existing automation infrastructure. Flexible adjustment of the safety behavior to the requirements of the machine ensures optimum safety reactions. Safety technology integration

B&R safety products enable simple integration of safety technology in the functional application. Fixed wiring is replaced by safe data transfer via the existing machine bus system. Flexibly configured or programmed safety behavior adapts optimally to various situations. Complete diagnostics of safety components via the machine bus system provide detailed data about the status of the machine.

Safety cut-offs do not always have to involve shutting down the machine. When opening a protective cover, for example, it is often sufficient to reduce the speed. Smart, safe reactions to various situations provide safety without stopping the production process. This means that the machine does not have to be run without load or set up again, and manipulation is no longer necessary. This results in real advantages for the user that can be easily implemented with programmable safety behavior.

Rapid advancements in technology make it necessary to continually update the safety regulations. Adapting safety products to the current regulations in the area of safety technology has the highest priority at B&R. The safety-related products SafeDESIGNER, SafeLOGIC, X20 SafeIO and POWERLINK Safety fulfill ISO 13849 (PL e) IEC 62061 (SIL 3) and IEC 61508 (SIL 3) standards.

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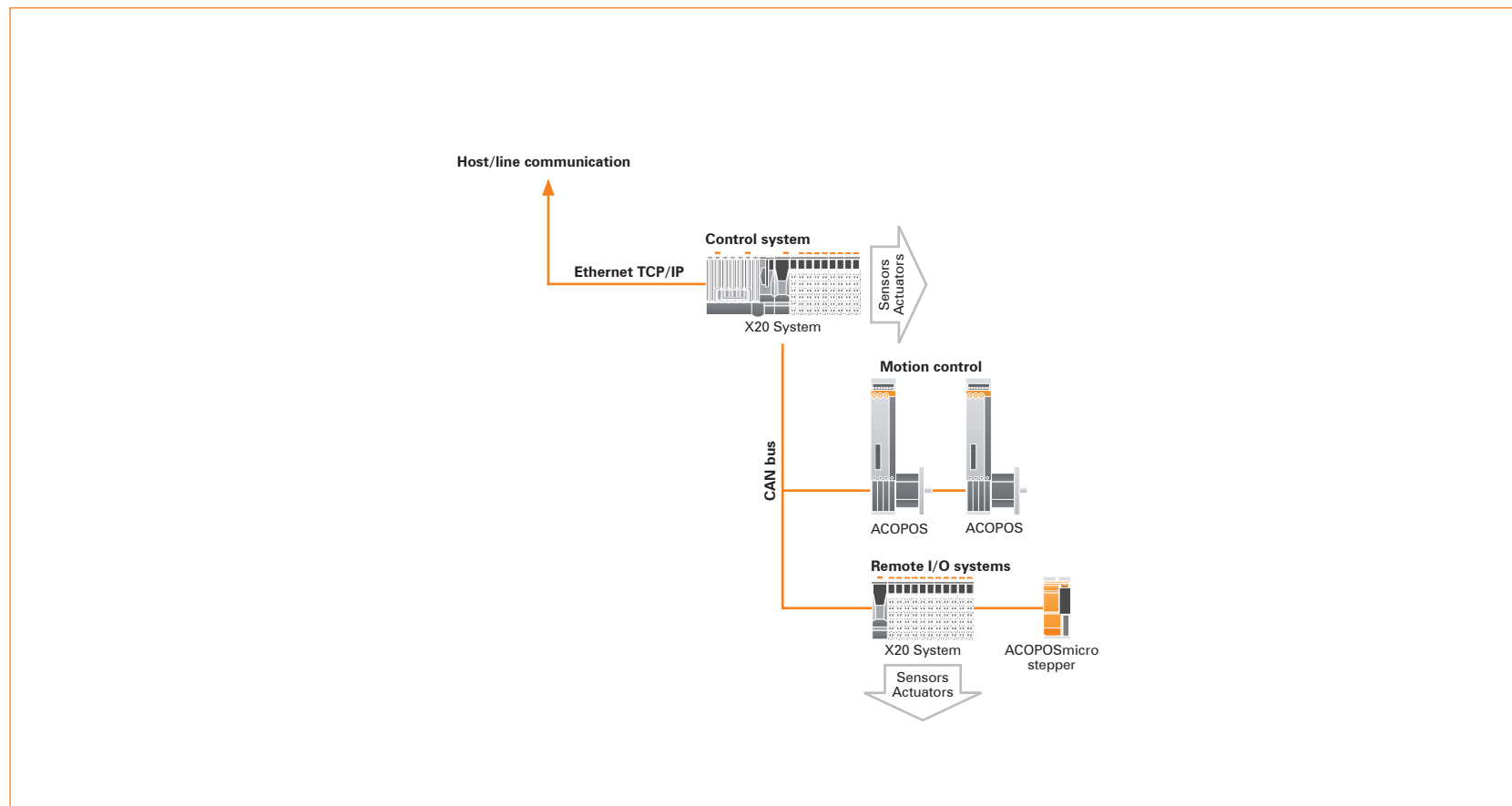
Compact automation in a line system

Short description

The machine should be able to communicate with the outside world. The compact controller is connected with the higher-level plant network via Ethernet TCP/IP. Data can be read from the machine controller and commands can be given over the plant network. Internal machine communication to drives and remote I/O systems takes place via CAN bus.

Properties

- Connection to the line system and plant network
- Compact
- Economical
- Scalable for average demands



Components and technologies

Control system	X20 System: Slice-based I/O and control system	37
Motion control	ACOPOSmicro: Compact drive system	1221
	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
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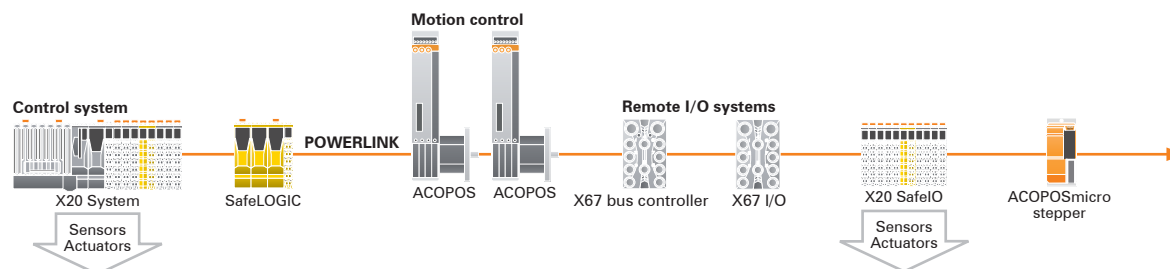
High-performance compact automation

Short description

Space in the switching cabinet is highly valuable. Reducing PLC dimensions should not reduce automation performance. The CPU with local I/O is connected with various distributed components via a high-performance network. This results in a high-performance system that allows optimal solutions to be implemented for more complex tasks in spite of the compact dimensions.

Properties

- Scalable performance
- Highly economical
- Compact dimensions
- Sufficient network reserves for expansions
- Customized solutions for complex tasks



Components and technologies

Control system	X20 System: Slice-based I/O and control system	37
Motion control	ACOPOSmicro: Compact drive system	1221
	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
	Stepper motors	1443
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419
Safety technology	Integrated safety technology	537
Networks and fieldbuses	POWERLINK	611

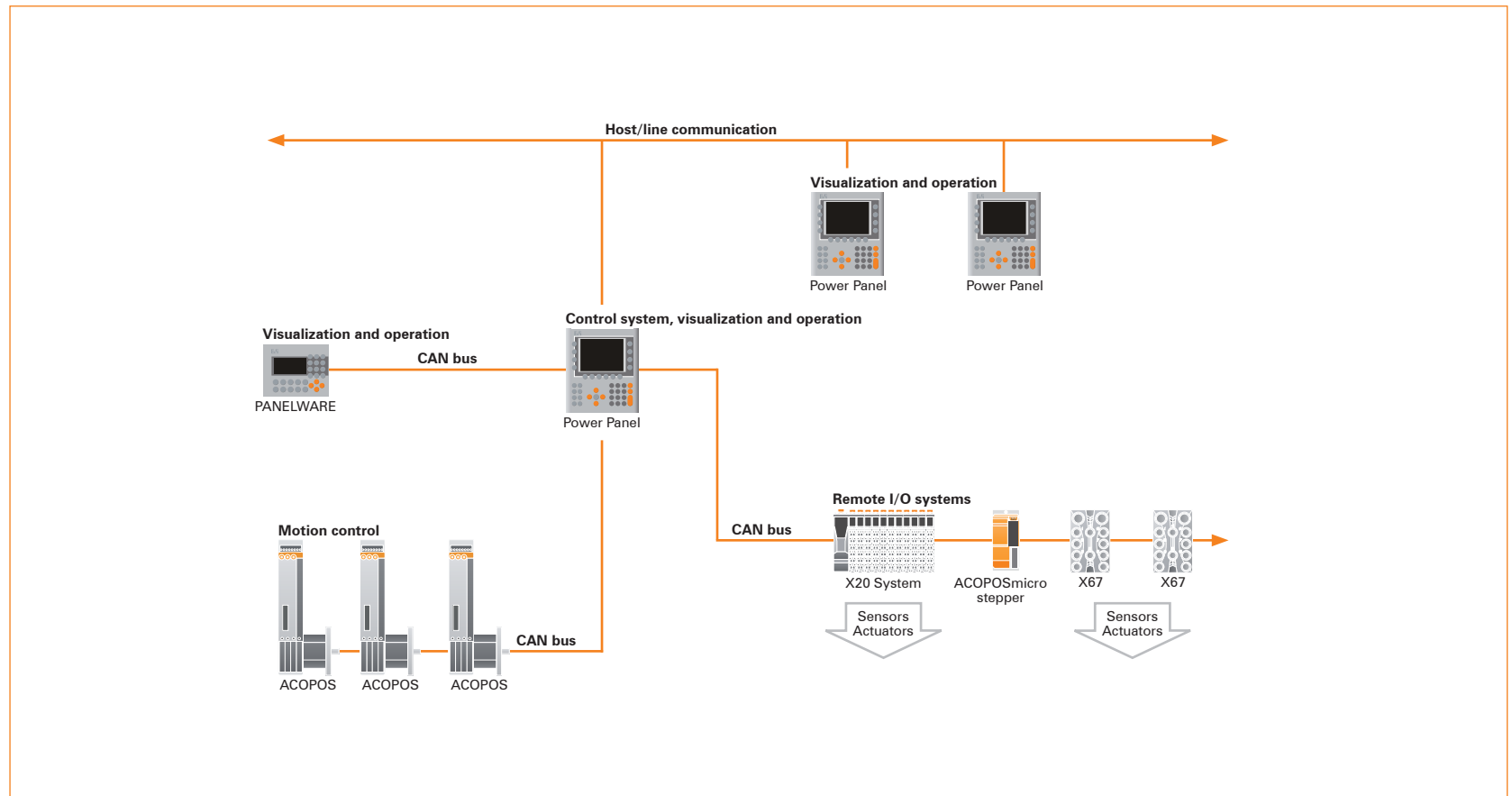
Panel-based automation

Short description

Operation, visualization and control are integrated. Host/line connections can be used for additional operator stations. The drives are networked with each other so that multi-axis movements can be synchronized. I/O signals are connected in the machine room or in the switching cabinet.

Properties

- Compact dimensions
- Flexible operating concepts
- Clear networking
- Modularly expandable



Components and technologies

Control system	Power Panel: Integrated control, operation, and visualization	787
Visualization and operation	Power Panel: Integrated control, operation, and visualization PANELWARE: Compact Operator Panel	787 773
Motion control	ACOPOSmicro: Compact drive system ACOPOS: Intelligent servo drives ACOPOSmulti: Modular drive system Synchronous Motors: Dynamic precision drives Stepper motors	1221 1251 1321 1459/1585/1645 1443
Remote I/O systems	X20 System: Slice-based I/O and control system X67 System: Remote I/O with IP67 protection	37 419
Networks and fieldbuses	Inside the machine: CAN bus Host/line communication: Ethernet TCP/IP	611 611

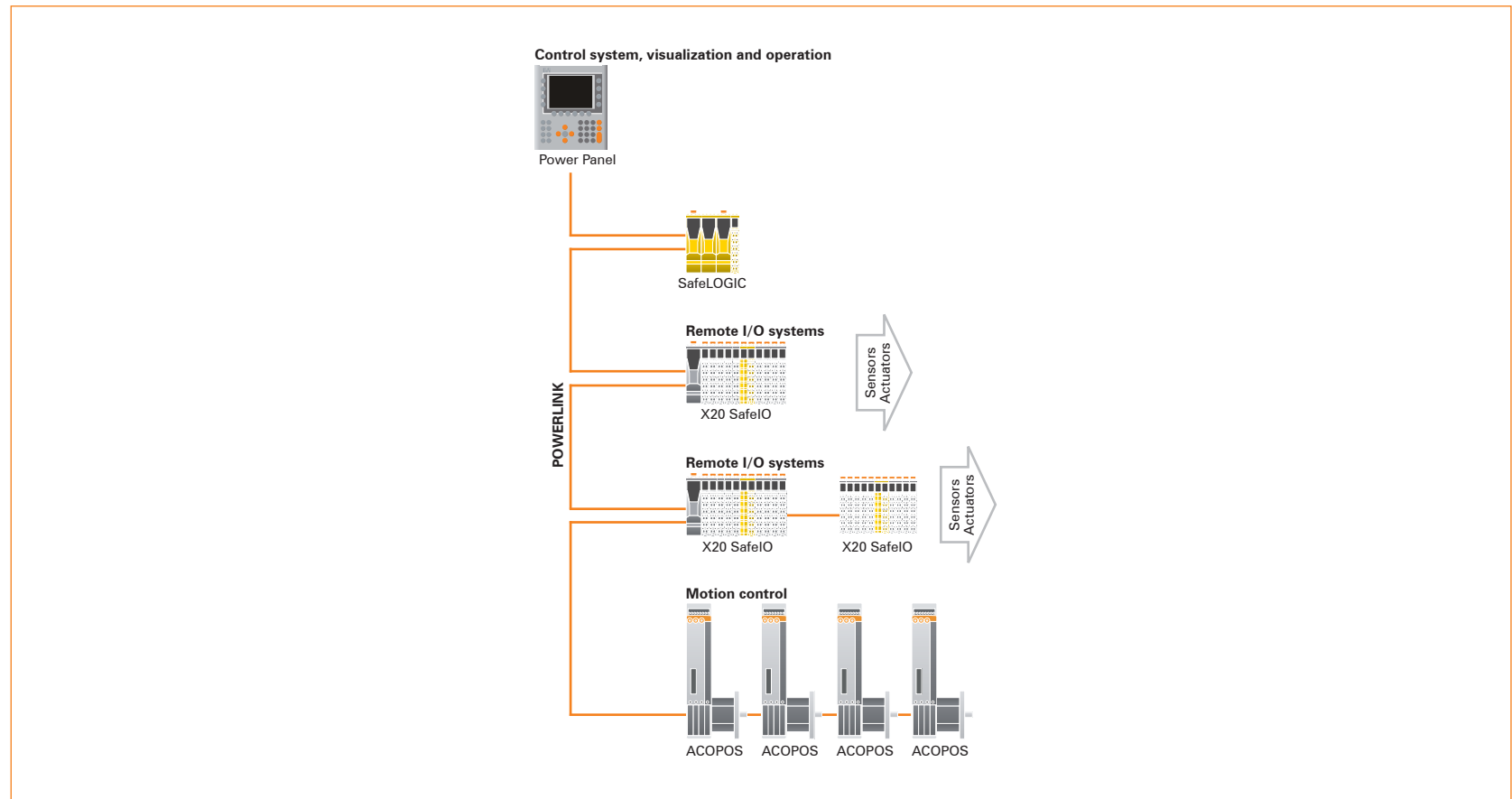
Panel-based automation with a uniform high-performance network

Short description

The operator panel is the central controller. All components, such as I/O systems, safety technology and drives, are connected via a high-performance network. With POWERLINK, the system is set up to handle the highest real-time demands.

Properties

- Modular and scalable machine modules
- Highest performance class for real-time applications
- Precise synchronization of multi-axis movements and I/O signals
- Exceptionally large rated torque



Components and technologies

Control system	Power Panel: Integrated control, operation, and visualization	787
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
Motion control	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
	X20 System: Slice-based I/O and control system	37
Remote I/O systems	X20 System: Slice-based I/O and control system	37
Safety technology	Integrated safety technology	537
Networks and fieldbuses	POWERLINK	611

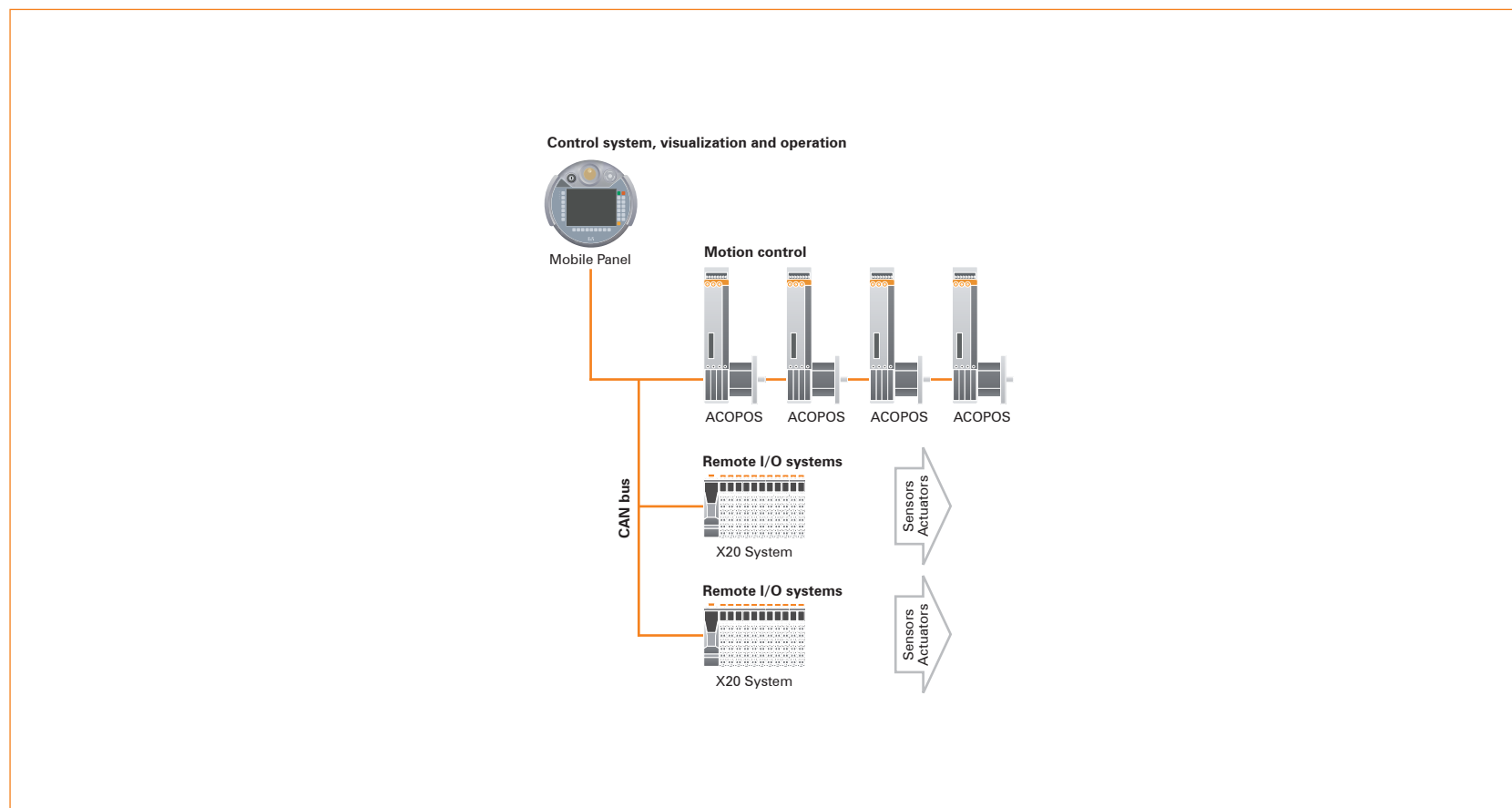
Mobile automation

Short description

The challenge is to provide automation with an optimal price/performance ratio, compact size and mobile operation. The controller is integrated in the mobile operating device. Remote I/O systems and drives are connected efficiently via CAN bus. The result is a flexible, economical system for average performance demands.

Properties

- Mobile operation with integrated control
- Compact
- Economical
- Scalable for average demands



Components and technologies

Control system	Mobile Panel - More than just mobile operation and monitoring	873
Visualization and operation	Mobile Panel - More than just mobile operation and monitoring	873
Motion control	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
Remote I/O systems	X20 System: Slice-based I/O and control system	37
Networks and fieldbuses	CAN bus	611

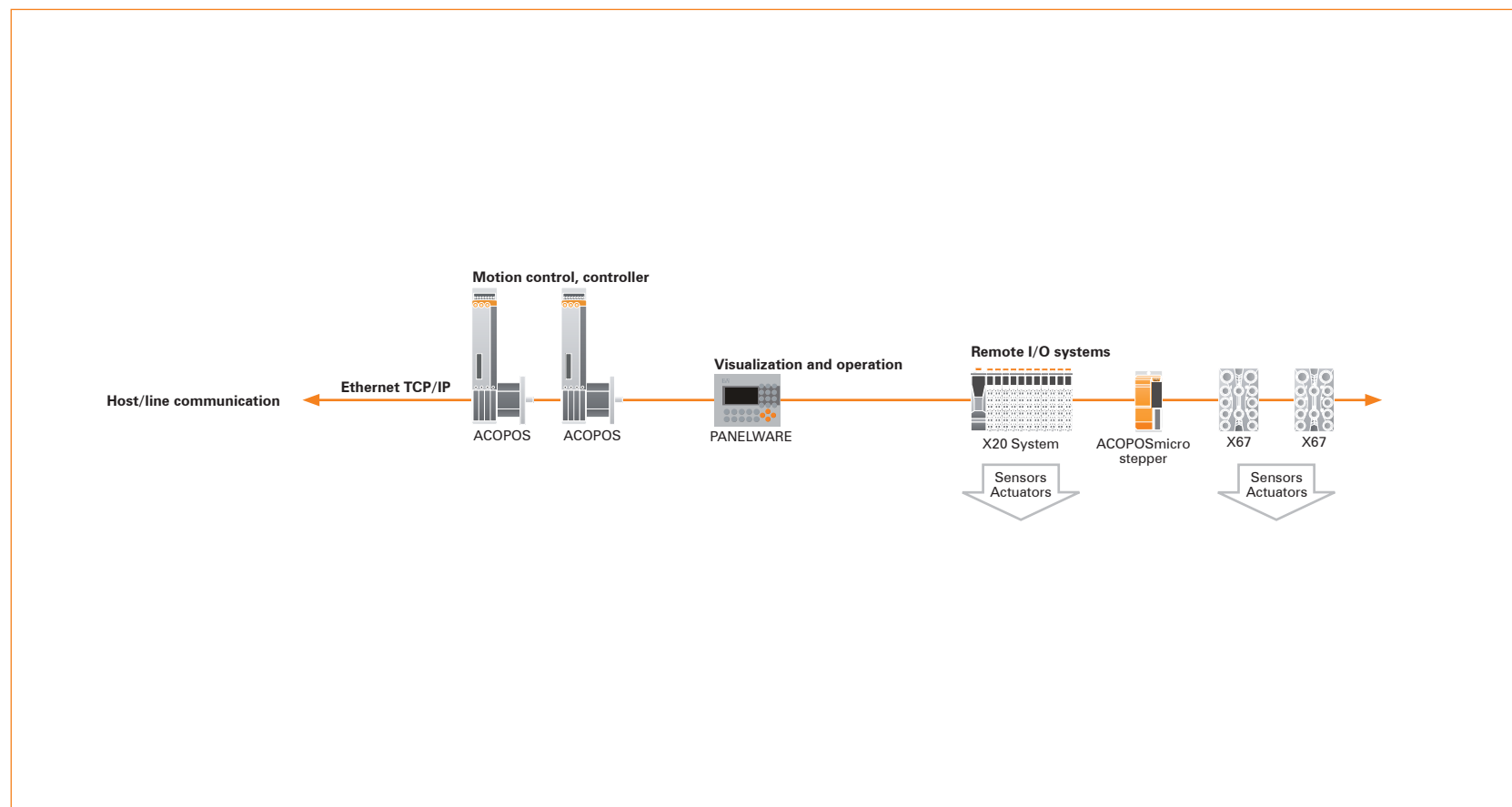
Drive-based automation

Short description

The drive is the controller. The controller is centrally located in one drive or distributed over several drives. The drives are connected with each other so that multi-axis movements can be synchronized. Operation is handled in a simple manner. Returned messages are shown on simple text or graphic displays. I/O signals are connected in the switching cabinet or directly in the machine room.

Properties

- Compact dimensions
- Moderate space requirements in the switching cabinet
- Simple operating concepts
- Minimal wiring
- Modular and scalable



Components and technologies

Control system	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	PANELWARE: Compact Operator Panel	773
Visualization and operation		
Motion control	ACOPOSmicro: Compact drive system	1221
	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
	Stepper motors	1443
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419
Networks and fieldbuses	Inside the machine: CAN bus	611
	Host/line communication: Ethernet TCP/IP	611

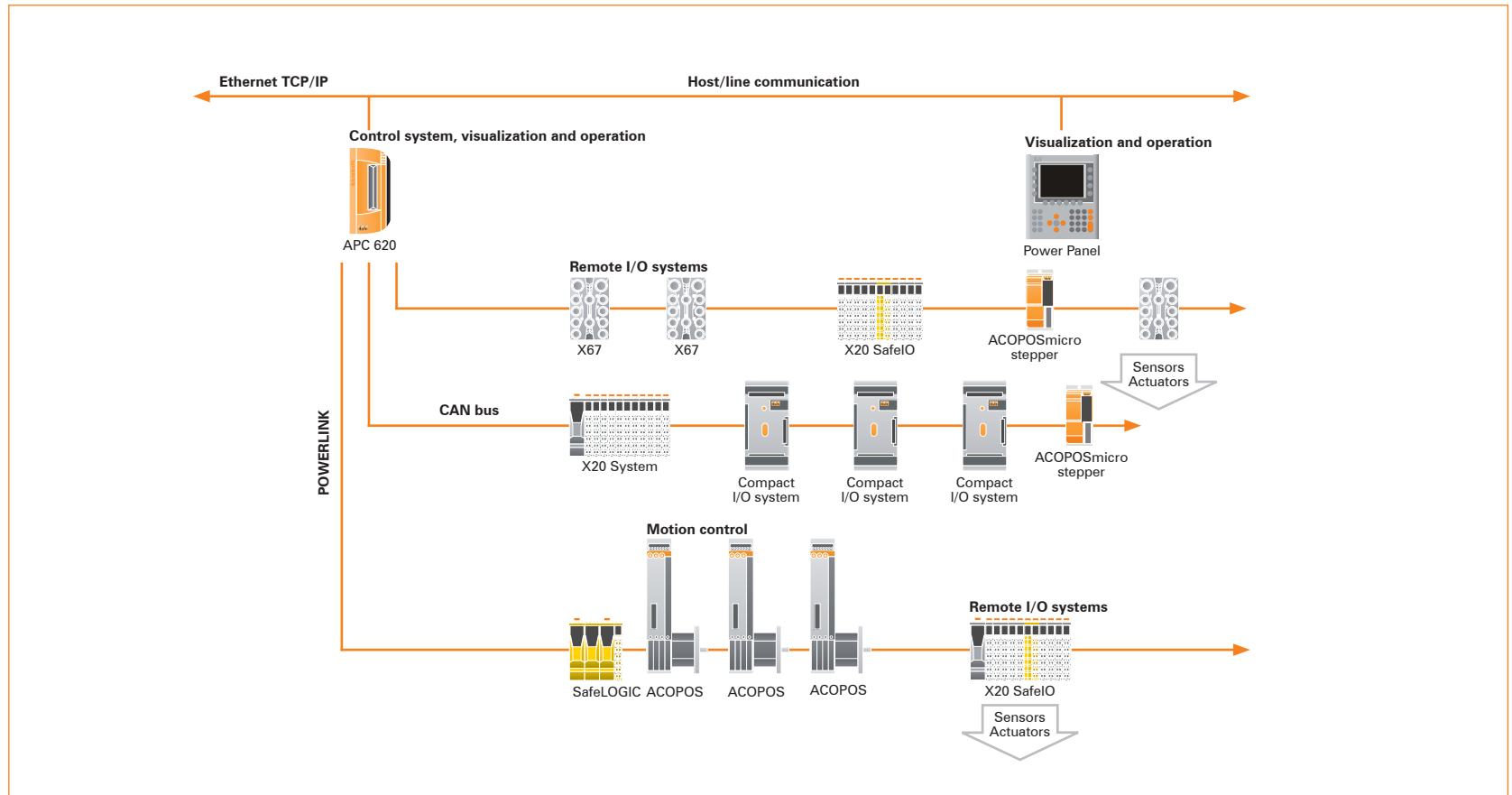
Open PC-based automation

Short description

Automation with standard PC architecture. The industrial PC handles all automation tasks centrally. I/O peripherals, safety technology and drives are connected via fieldbuses and networks. Operation and visualization takes place using a local or remote display unit. Additionally, host/line connections can be used for additional operator stations.

Properties

- Central control concept
- Clear networking
- Scalable performance
- High-performance operating concepts
- Standard PC software can be used



Components and technologies

Control system	APC 620 / APC 810: Automation PC	911/945
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
Motion control	ACOPOSmicro: Compact drive system	1221
	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
	Stepper motors	1443
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419
	Compact I/O System: Economical usage of peripheral space	581
Safety technology	Integrated safety technology	537
Networks and fieldbuses	POWERLINK	611
	Ethernet TCP/IP	611
	CAN bus	611

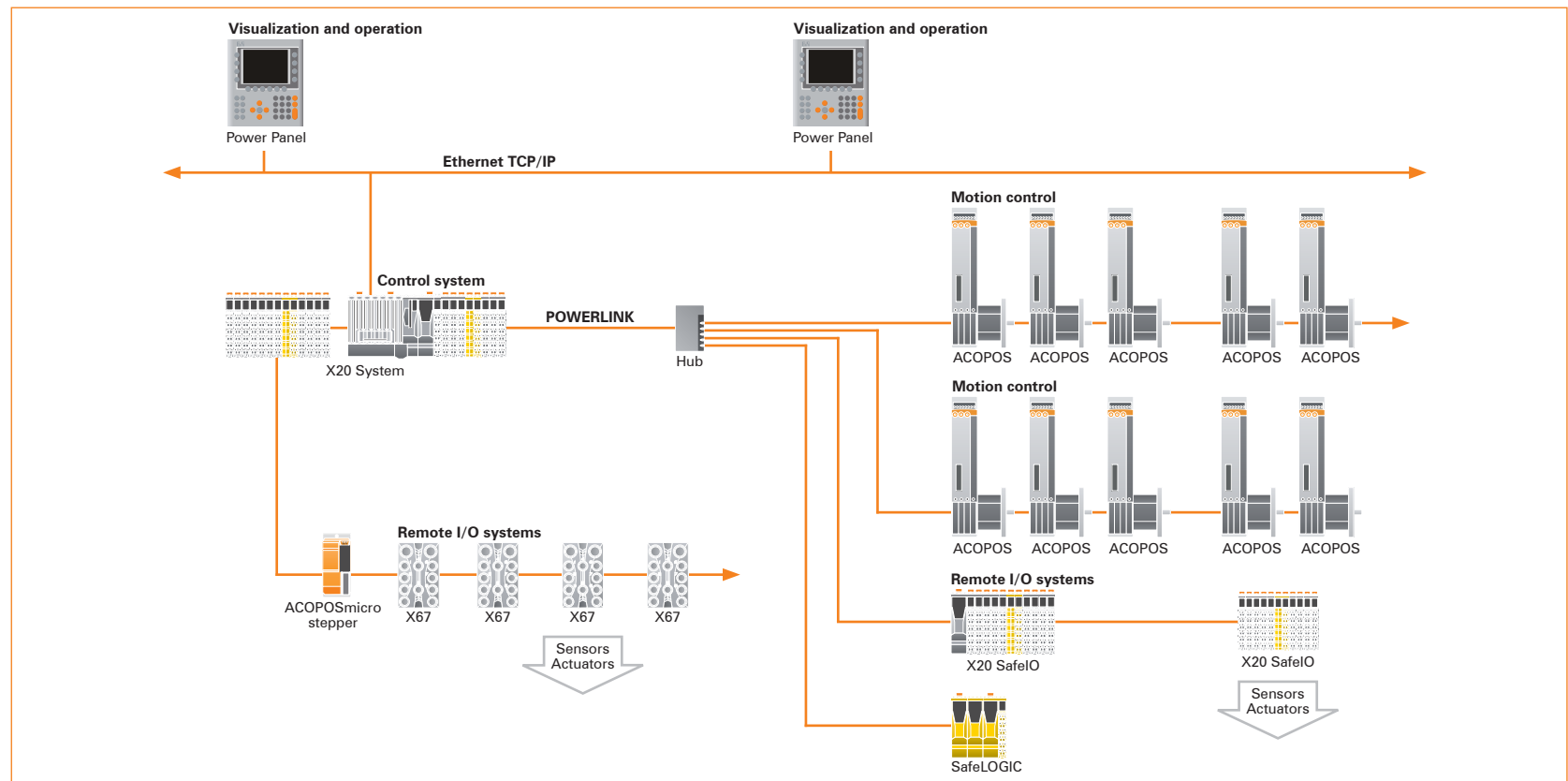
Embedded PC-based automation for high-performance machines

Short description

Large machines and systems place high demands on the functionality and performance of automation components. Flexibility, expandability and scalable performance classes allow the most modern machine concepts to be realized. High-performance PLC with PC architecture as the controller, central and distributed expansions for I/O channels, open network standards and operator panels using the newest ergonomic designs. The example from the packaging industry combines decentralized operation, 50 drives, and 50 remote I/O systems as well as more than 60 I/O modules with IP20 and IP67 protection distributed throughout the machine room.

Properties

- Scalable performance and I/O capacity
- Mixture of central and distributed architecture
- Clear concept and servicing
- Greatly reduced wiring
- Integrated safety technology



Components and technologies

Control system	X20 System: Slice-based I/O and control system	37
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
Motion control	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
	Stepper motors	1443
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419
Safety technology	Integrated safety technology	537
Networks and fieldbuses	POWERLINK	611
	Ethernet TCP/IP	611

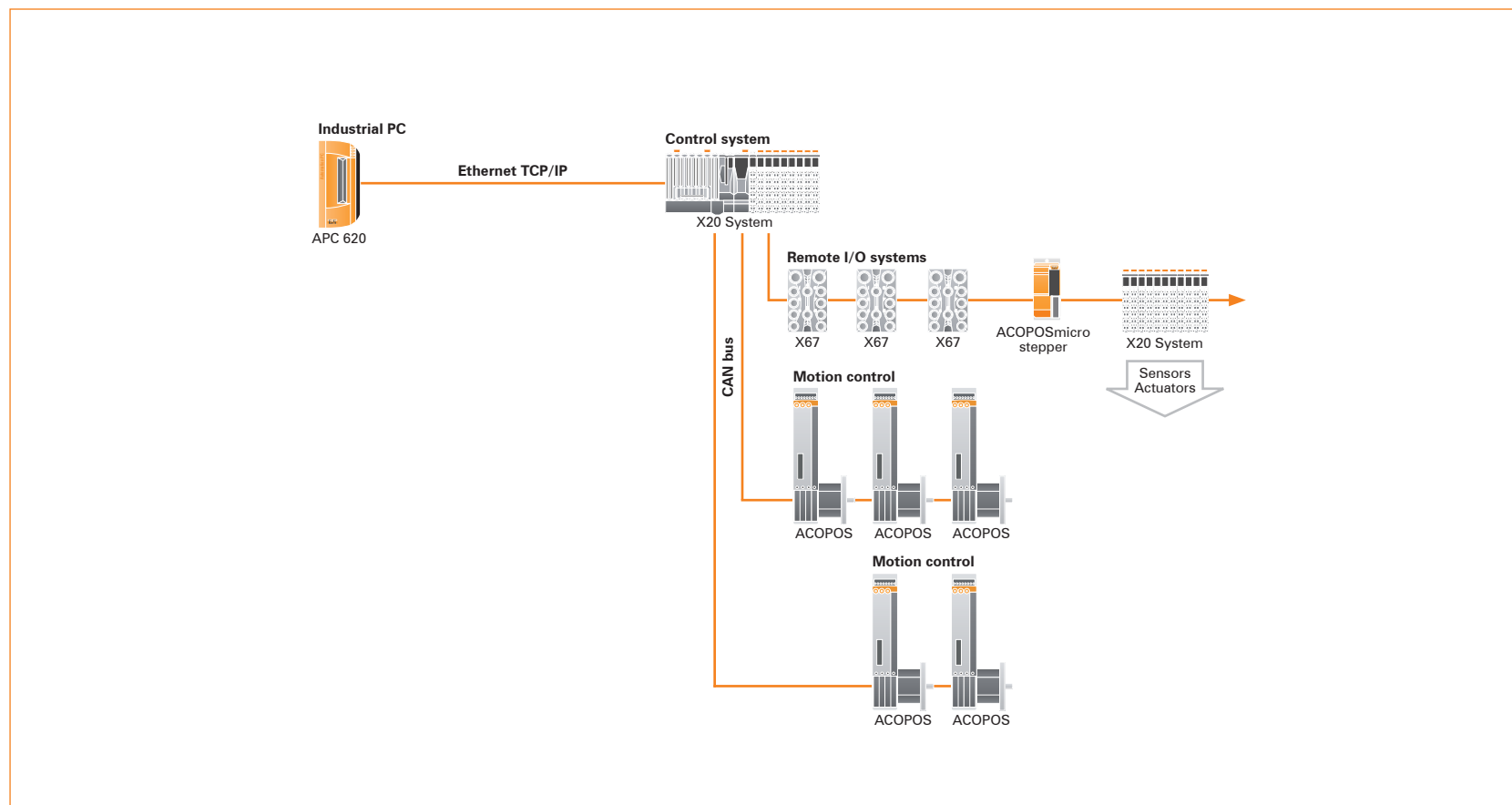
Open and embedded PC-based automation

Short description

The Windows-based visualization and data management are handled by an industrial PC. The machine is controlled centrally by the PLC. Several fieldbus lines connect drives and I/O systems to the PLC. In addition to the local PLC I/O systems, there are also distributed I/O modules with IP67 protection outside the switching cabinet in the machine room.

Properties

- Customized use of central and distributed components
- High-performance, open operating and management concepts



Components and technologies

Control system	X20 System: Slice-based I/O and control system	37
Industrial PC	APC 620 / APC 810: Automation PC	911/945
Motion control	ACOPOSmicro: Compact drive system	1221
	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
	Stepper motors	1443
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419
Networks and fieldbuses	Ethernet TCP/IP	611
	CAN bus	611

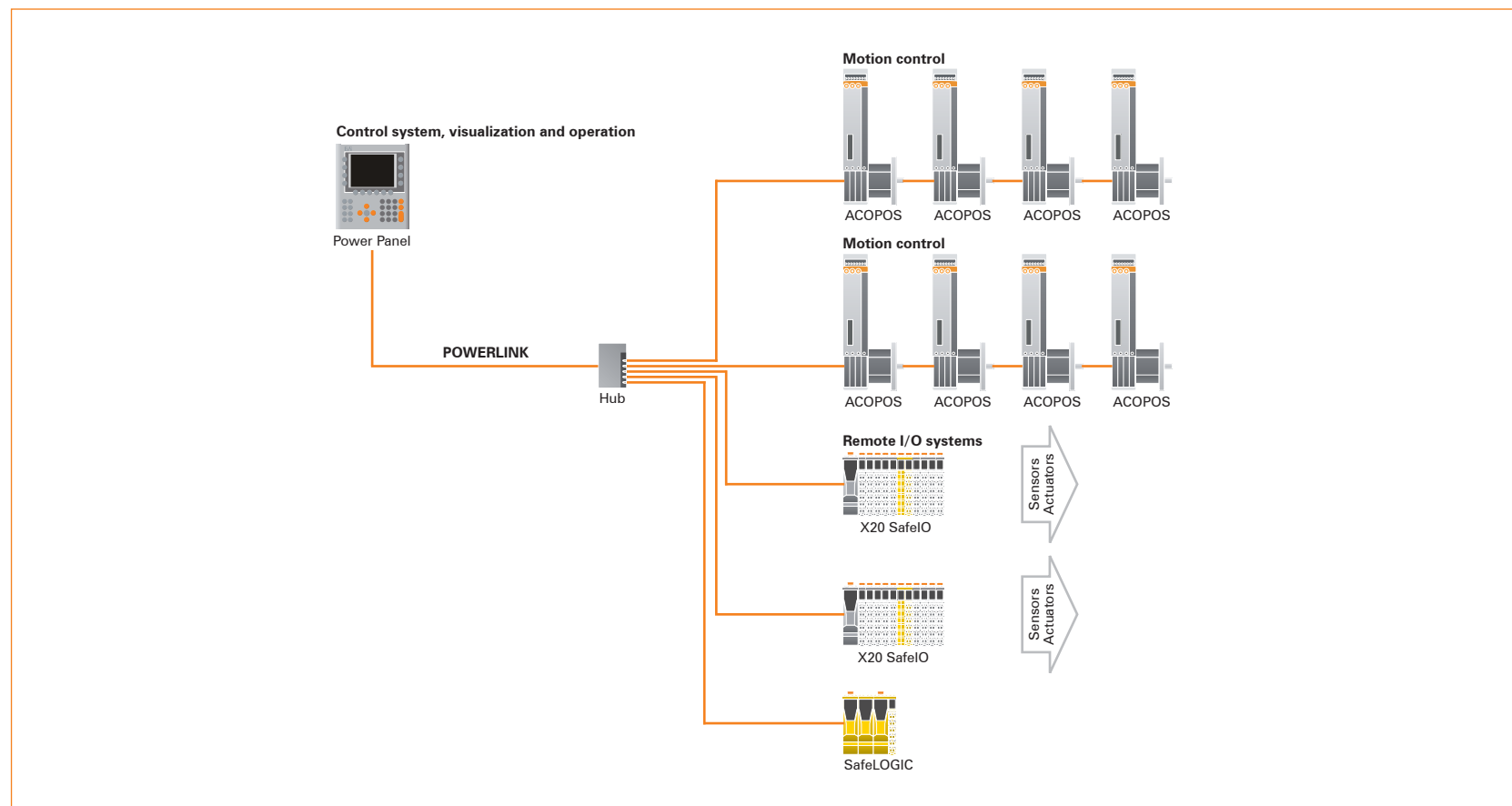
Central automation of modular machines

Short description

For modular machine concepts with many similar elements, a central controller is often more economical than a distributed solution. Compact controllers with integrated visualization also meet high demands. Connecting intelligent drives and I/O systems using a powerful POWERLINK network sets no limits for expandability, precision and performance.

Properties

- Compact central operating and control unit
- Precise synchronization of highly dynamic multi-axis systems
- High degree of flexibility for (future) expansions
- Configurable safety-related machine options



Components and technologies

Control system	Power Panel: Integrated control, operation, and visualization	787
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
Motion control	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
Remote I/O systems	X20 System: Slice-based I/O and control system	37
Safety technology	Integrated safety technology	537
Networks and fieldbuses	POWERLINK	611

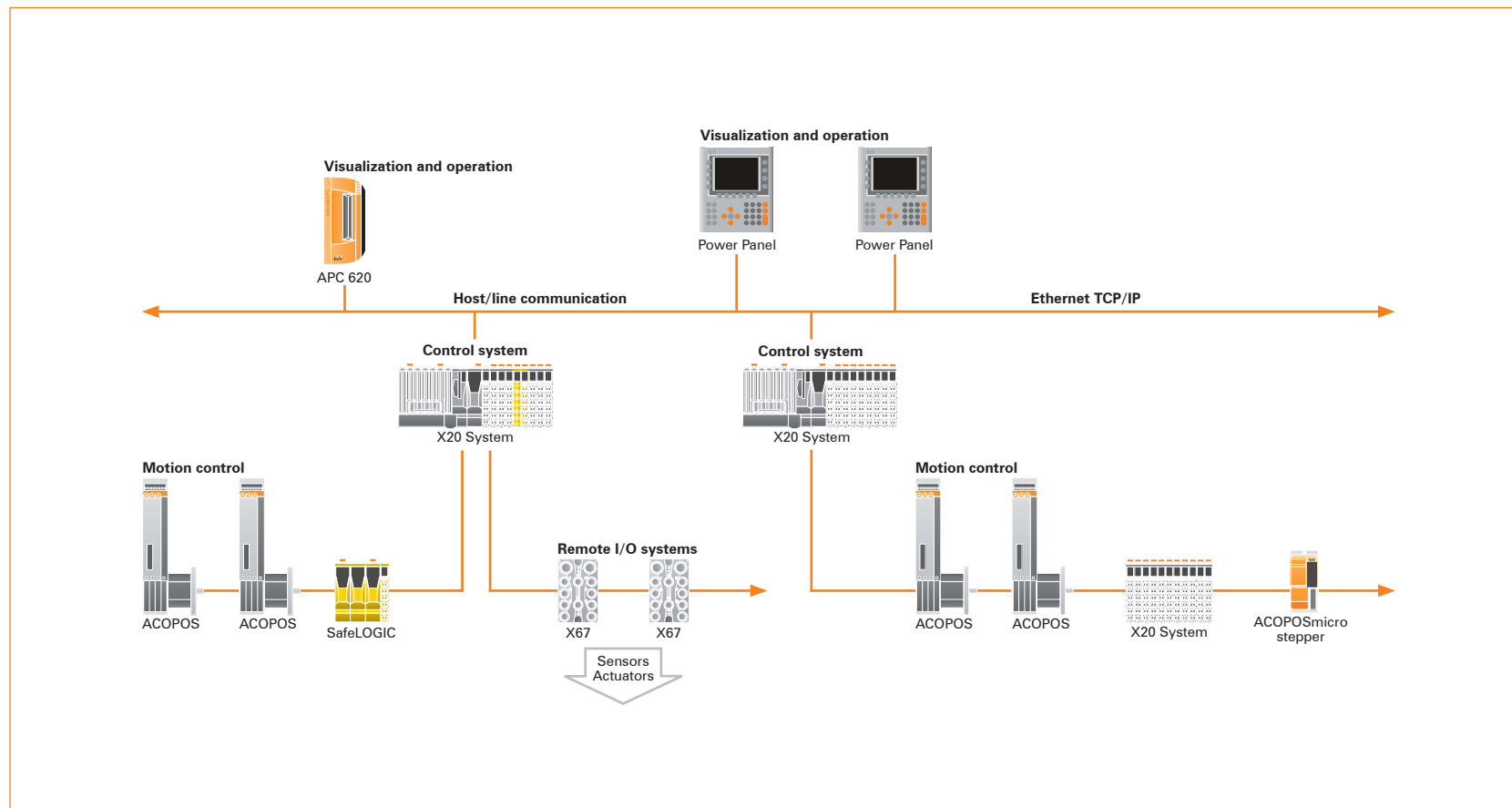
SCADA systems and PC visualization

Short description

This represents the classic approach of using programmable logic controllers for I/O systems and drives and higher-level industrial PCs for management, data handling and visualization. Normally, a SCADA application runs on the industrial PC. Expansion options are possible for several clients that are connected via Ethernet and exchange data using OPC mechanisms.

Properties

- Centrally monitored production and manufacturing processes
- Embedded in plant networks
- High-performance operating and control concepts



Components and technologies

Control system	X20 System: Slice-based I/O and control system	37
Industrial PC	APC 620 / APC 810: Automation PC	911/945
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
Motion control	ACOPOSmicro: Compact drive system	1221
	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
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Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419
Safety technology	Integrated safety technology	537
Networks and fieldbuses	POWERLINK	611
	Ethernet TCP/IP	611
	CAN bus	611

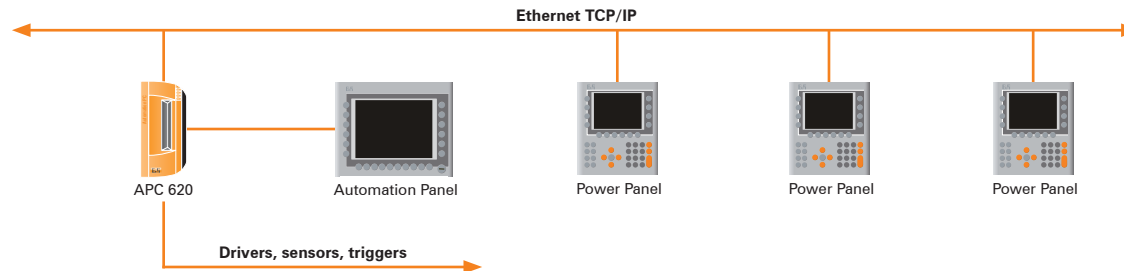
Distributed machine operation with thin clients

Short description

Machine operation should alternate between several different locations. Application and control programs run centrally on an industrial PC. Several cost-effective operator stations (thin clients) are connected via Ethernet. All operator stations offer uniform operational elements and interfaces e.g. for the use of transportable memory media.

Properties

- High-performance and economical operating concepts
- Distribution of machine operation as desired
- Flexible expansions
- Local use of transportable memory media (USB, Disk-on-Key)



Components and technologies

Industrial PC	APC 620 / APC 810: Automation PC	911/945
Visualization and operation	Power Panel: Integrated control, operation, and visualization Automation Panel	787 1055/1077
Networks and fieldbuses	Ethernet TCP/IP	611

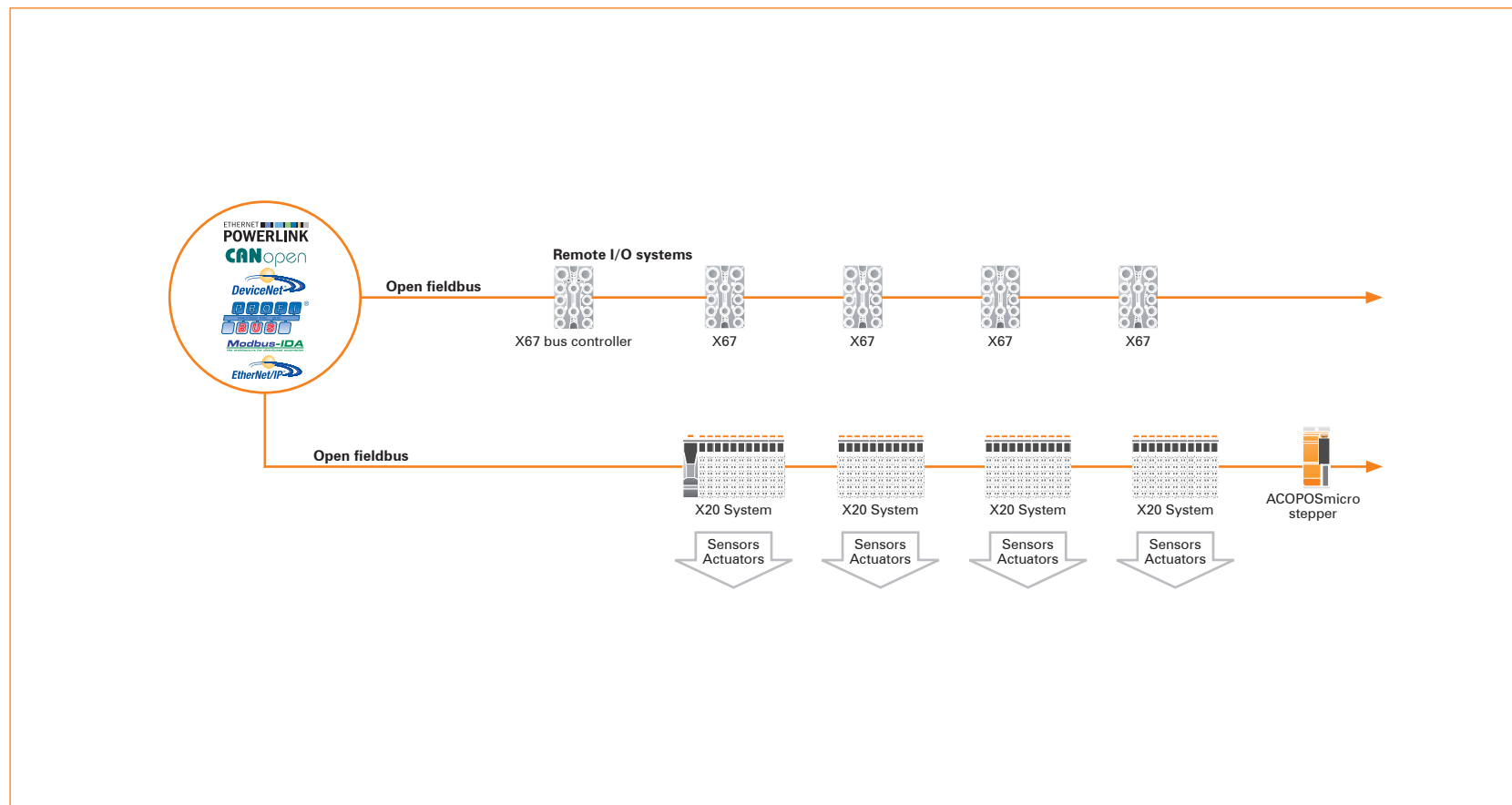
Distributed I/O on open fieldbuses

Short description

Distributed connections of sensors and actuators to the controller should be made directly in the machine room. The components require a certain specified class of protection against dirt, dust and moisture. Open fieldbuses such as CANopen, DeviceNet, Profibus DP and POWERLINK have established themselves for distributed automation.

Properties

- Open for connection to standardized fieldbuses
- Flexible handling of I/O directly in the machine room
- High transfer rates and built-in technology functions
- Robust and resistant to disturbances
- Simple wiring, no cable trees



Components and technologies

Motion control	ACOPOSmicro: Compact drive system	1221
	Stepper motors	1443
Remote I/O systems	X20 System: Slice-based I/O and control system	37
	X67 System: Remote I/O with IP67 protection	419
Networks and fieldbuses	POWERLINK	611
	CAN bus and CANopen	611
	DeviceNet	611
	Profibus DP	611

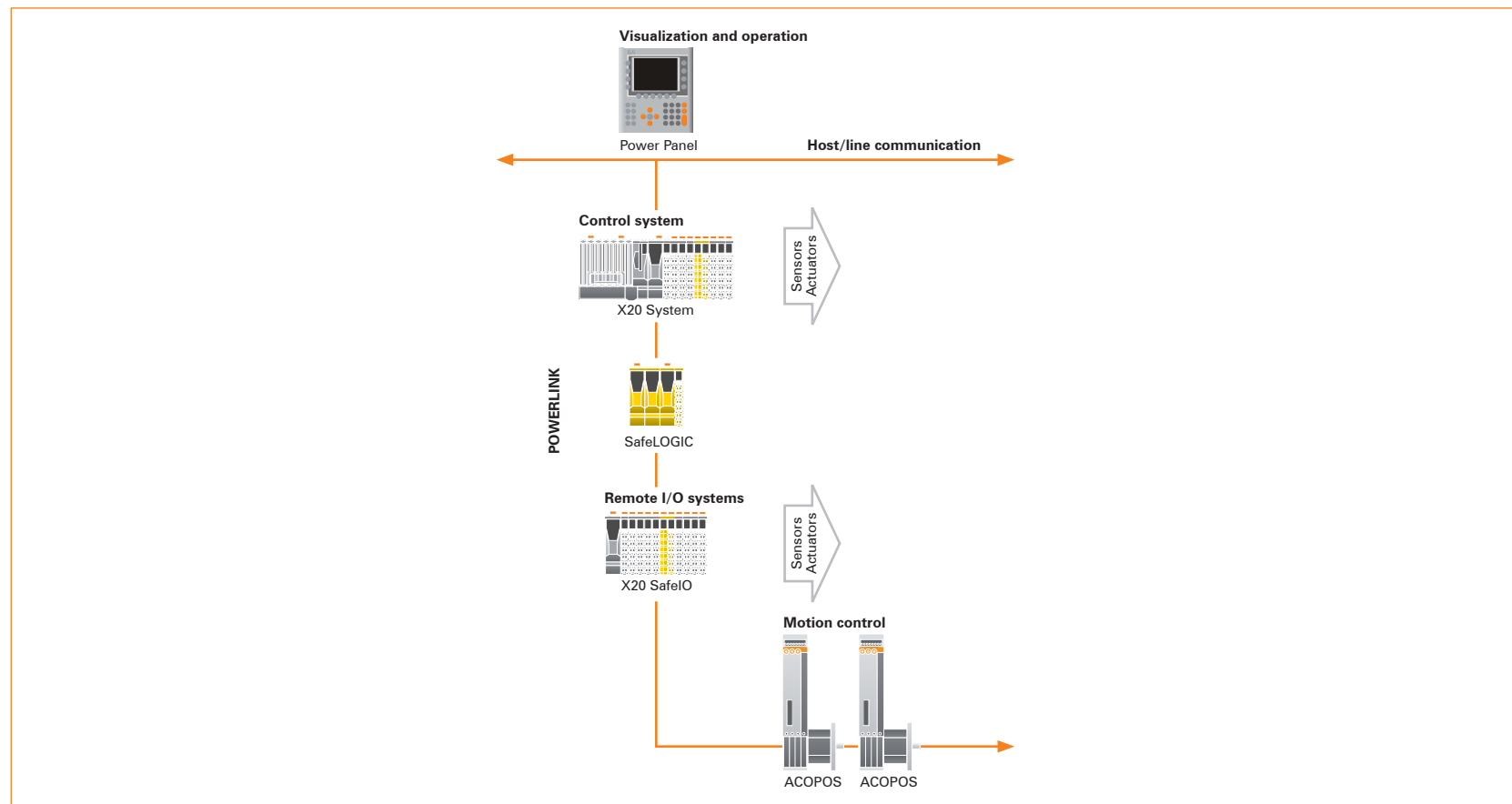
Complete networking with industrial Ethernet

Short description

Ethernet is the worldwide IT standard for networks. Complete connection of the production line to the plant network promises transparency and cost reductions for maintenance and operation. Ethernet is becoming more important as a fieldbus replacement for the automation of machines and systems. The connection of visualization systems and networking for time-critical data communication to I/O systems, safety technology and drives takes place using Ethernet TCP/IP protocols, POWERLINK and POWERLINK Safety.

Properties

- Open network standard
- Transparent communication for management, process and field levels
- Seamless integration in line networks and the IT infrastructure
- Highest level of safety (SIL 3 according to IEC 61508)



Components and technologies

Control system	X20 System: Slice-based I/O and control system	37
Visualization and operation	Power Panel: Integrated control, operation, and visualization	787
Motion control	ACOPOS: Intelligent servo drives	1251
	ACOPOSmulti: Modular drive system	1321
	Synchronous Motors: Dynamic precision drives	1459/1585/1645
Remote I/O systems	X20 System: Slice-based I/O and control system	37
Safety technology	Integrated safety technology	537
Networks and fieldbuses	POWERLINK	611
	Ethernet TCP/IP	611

Automation Studio

A single integrated software tool with an intuitive Windows user interface which can be used for every type of automation task. It provides diverse tools for project planning, configuration, programming, documentation, and diagnostics in one environment.



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Automation Studio - Overview

B&R Automation Studio is the integrated software development environment that includes tools for all parts of an automation project, making it the foundation for applications of any size and scope. Regardless of which stage a project is in – planning, implementation, testing, production, commissioning, or service – Automation Studio always serves as the interface to the machine.

One tool for every stage in the project

Complete integration of:

- Project management
- Programming
- Hardware management
- Integrated visualization
- Motion control
- Diagnostics
- Integrated Safety Technology, Page 537
- Simulation
- Help system
- Fieldbuses
- Communication
- Real-time operating system
- Remote maintenance

The controller, drive, communication, and visualization can all be configured in one environment. That reduces both integration time and maintenance costs.



Automation Studio - Overview

Model Numbers for Automation Studio

1A4300:L1	Full version for one work station
1A4300:L5	Full version for 5 work stations
1A4300:LU	Full version for unlimited number of work stations

Upgrade Service

Each Upgrade Service is valid for 12 months, and free for one year from the date of purchase.

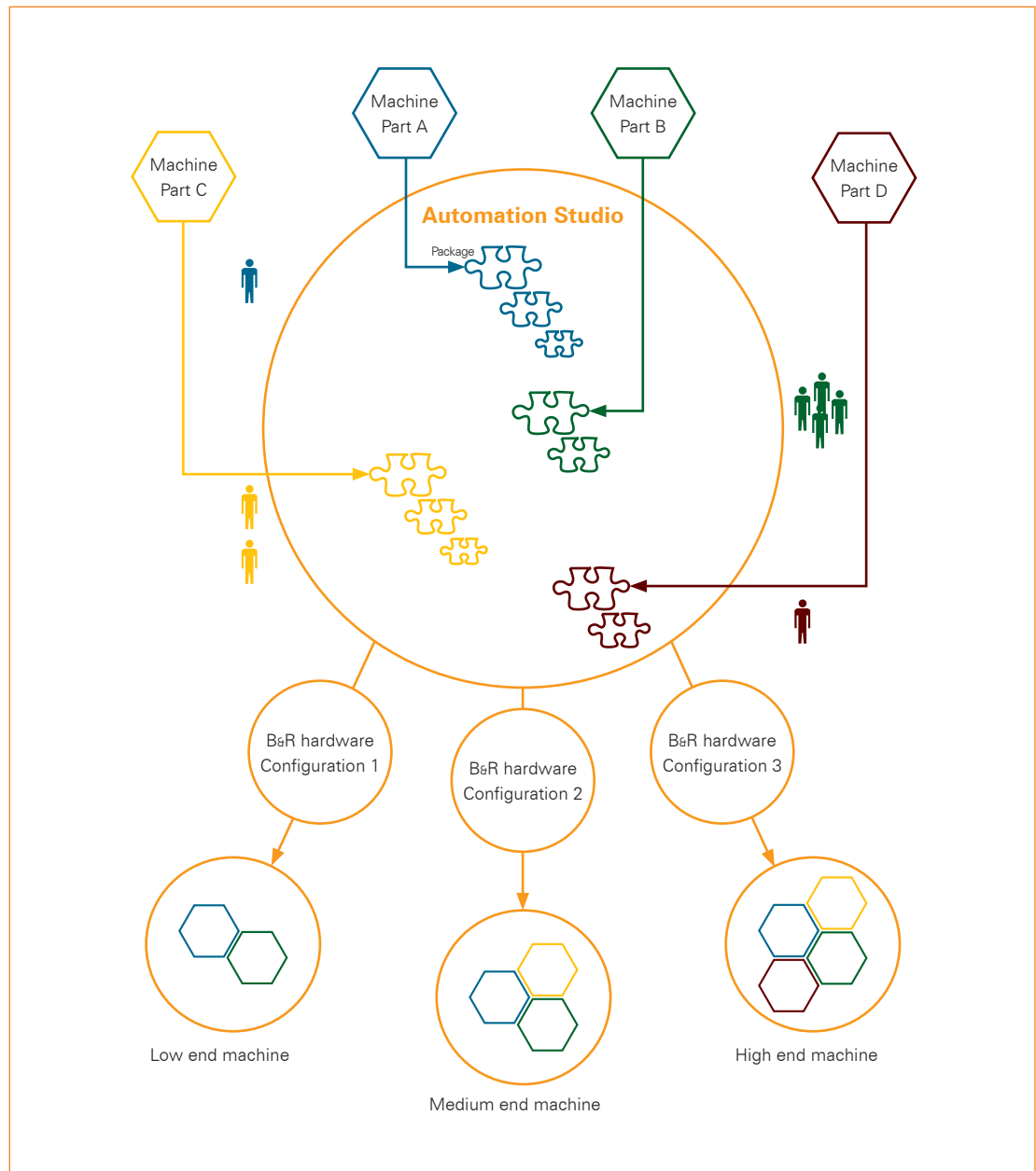
1A4300:U1	Upgrade Service for one work station
1A4300:U5	Upgrade Service for 5 work stations
1A4300:UU	Upgrade Service for unlimited number of work stations

Software on demand

Software on demand

The software in an Automation Studio project can be tailored to the machine structure. This allows the software to be organized with a clear overview, because a real reference to the programs can be seen.

- Team functions - distributed development
- Management of different hardware configurations
- Flexible I/O switching - Machine options during runtime
- Open data storage and formats in XML files
- Handling of all types of files in the project (DOC, HTML, PDF, etc.)
- Automatic creation of project components using Wizards
- Packages
- Programs
- Data objects
- Libraries
- Functions and function blocks
- Software and hardware configurations
- Separation of source data and generated data
- Version management



One development system - Many target systems

Project management

One development environment - Many target systems

The programmed and configured machine parts can be assigned different hardware configurations. This allows you to manage the delivery status and testing environment of a machine type, which can vary in the software and hardware used.

Project management

- **System-oriented view of the project**
 - Division of the project into packages
 - Data types and variables encapsulated in packages
 - Division of declarations in several files
 - Global and local libraries
 - Multiple use of source code (referencing)
 - Source code saved in XML format
- **Program blocks created in IEC 61131-3 programming languages, CFC, ANSI-C**
 - SMART Edit functions
 - Text and graphical editors
- **Complete visualization systems without programming**
 - Graphical layout of the user interface
 - Controls connected to inputs, outputs, and process variables
- **Test and optimize movement sequences**
 - Test and store parameters for servo motors in practical parameter tables
 - Design complete movements and multi-axis applications with the integrated cam profile editor
 - Design and test drum sequencers using graphical tools
 - Source code saved in XML format
- **Convenient operation with complete Windows functionality**
 - Clipboard (Copy/Paste)
 - Drag & Drop
 - Undo/Redo
 - Multiple selection, sorting
 - In-place editing
 - Find/Replace
 - Zoom
 - Restore and configure individual windows
 - Tooltips
 - Shortcut menu
 - Context-sensitive help
- **Addition of hardware/software components via the New Project Wizard**
 - Load hardware configurations directly from the target system
 - Create new projects by inserting components in logical groups
- **Generate software source files and configurations externally**
 - Macros for importing ECAD descriptions
 - XML data format for assembly variations
 - Generate configurations for modules from ERP systems externally
 - Assign data points to I/Os at time of production
 - Generate optimized customer software during production
 - Compiler and tools for generating configurations and software can be run in batch mode

Project management

An Automation Studio project is managed in various tree views.

- **Software view - Source files**

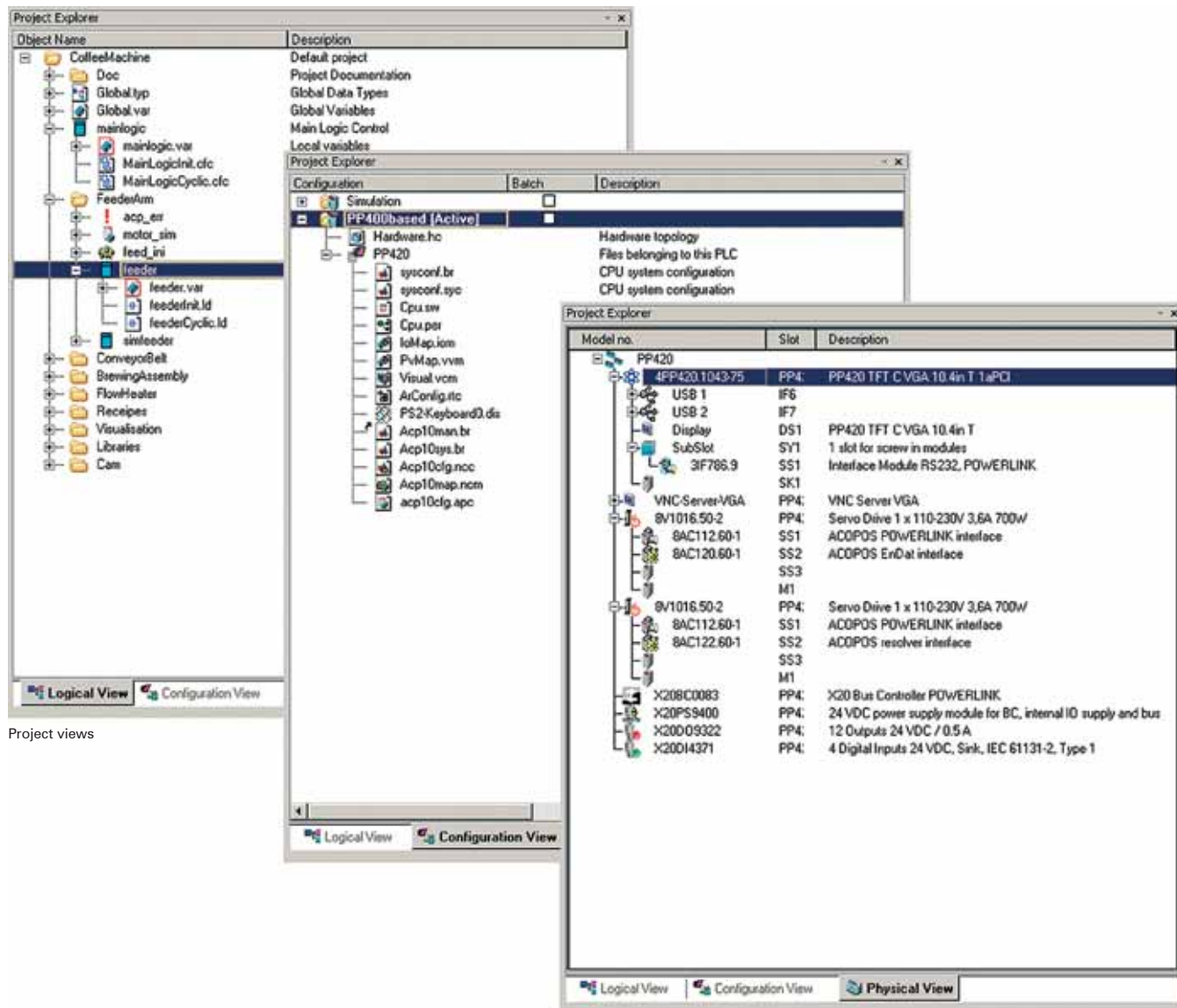
In the logical view, all software elements are showed in a tree structure. Each object can be managed as a package in a separate folder. Each package can be sorted into the software components and documentation for any component or function of a machine.

- **Configuration view**

The different hardware and software configurations are managed in this view. Each of these configurations contains hardware and software. When a configuration is activated, the selected hardware is displayed in the physical view.

- **Hardware view**

This view shows the active hardware tree for the selected configuration. Each component in this view can be configured by changing its property settings.



Project views

Project management

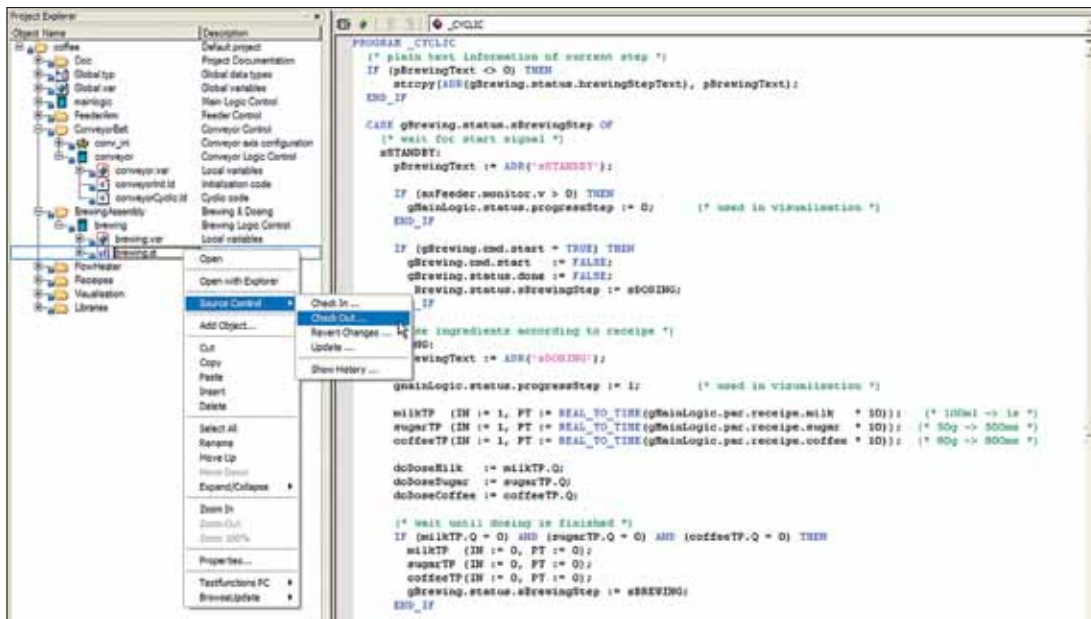
Version management

Automation Studio supports various version control systems that enable distributed development.

- Multiple developers can collaborate on a single project simultaneously
- Projects stored on a central server
- Multiple designers can have central access to the same project source files
- Development redundancies prevented by file-locking function
- Change history stored together with file
- Changes can be viewed in source code
- Project revision number increased automatically when changed
- A specific version number can be set at any time
- Projects can be reset to earlier status

Interfaces are currently installed for the following systems:

- Microsoft SourceSafe
- Subversion (SVN)

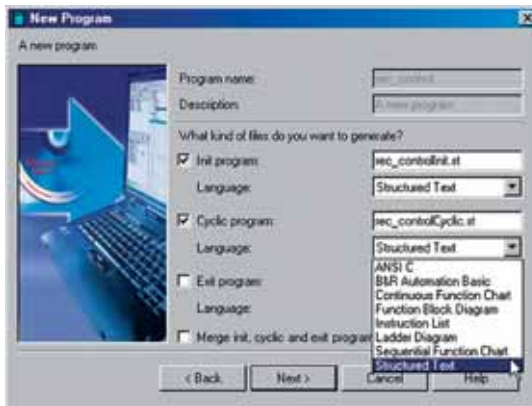


Source control in Automation Studio

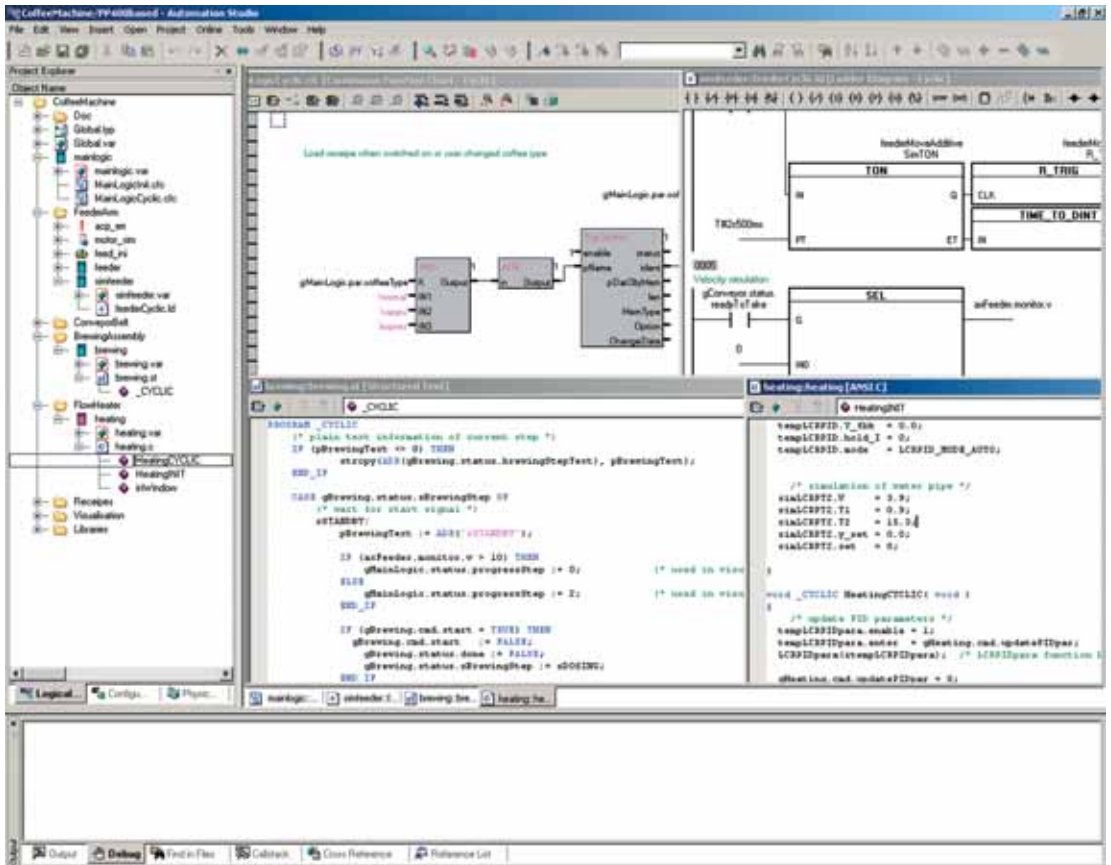
Programming languages

The right programming language for every application
In Automation Studio, programming languages can be combined in any way necessary. All languages can access the same data types and use the same libraries and global variables. In addition, Automation Studio supports simple and secure programming by providing the following capabilities:

- Modular architecture
- Division into local and global variables
- Structuring of subprograms into tasks with different priorities
- Structuring of subprograms into the initialization and cyclic routines in, each in different programming languages
- Structuring of programs using IEC actions in all IEC languages and Automation Basic
- Any combination of languages possible in the project and time classes
- Hardware and library dependencies managed by Automation Studio
- Integrated IEC 61131-3 languages and C
- Libraries can be implemented in any language



New program



Programming languages

Programming languages

- IEC 61131-3
- ANSI-C
- Automation Basic
- CFC

Programming languages

The editors in Automation Studio are optimized for each programming language and offer comprehensive functions.

- Graphic editors for
 - LD (Ladder Diagram)
 - SFC (Sequential Function Chart)
 - FBD (Function Block Diagram)
 - CFC (Continuous Function Chart)
 - Text-based editors for
 - ST Structured Text
 - IL (Instruction List)
 - C
 - B&R Automation Basic
 - Convenient operation during programming - SMART Edit
 - Automatic completion of
 - Variable names
 - Structure member
 - Function name
 - Language constructs (IF THEN, CASE, etc.)
 - Fast navigation
 - Tooltips
 - Inserting and defining process variables
 - Inserting and calling function blocks and functions
 - Context-dependent help for programming languages and function blocks
 - Repeated search and replace functions for the entire project
 - Multiple Undo/Redo
 - Comfortable navigation, selection, and copying
 - Bookmarks in files for marking functions and lines
 - Powerful online functions
- Variable monitoring for simple and complex data types
 - Invalid values displayed in monitor mode
 - Change and overwrite variables for simple and complex data types
 - Line coverage for text-based and power flow analysis for graphical languages
 - Integrated variable oscilloscope with review and trigger conditions
 - Debugging with breakpoints, single step, cycle counters, and call tree



Completion of language constructs

Automation Studio offers an easy-to-use and complete environment for programming, debugging, and testing.

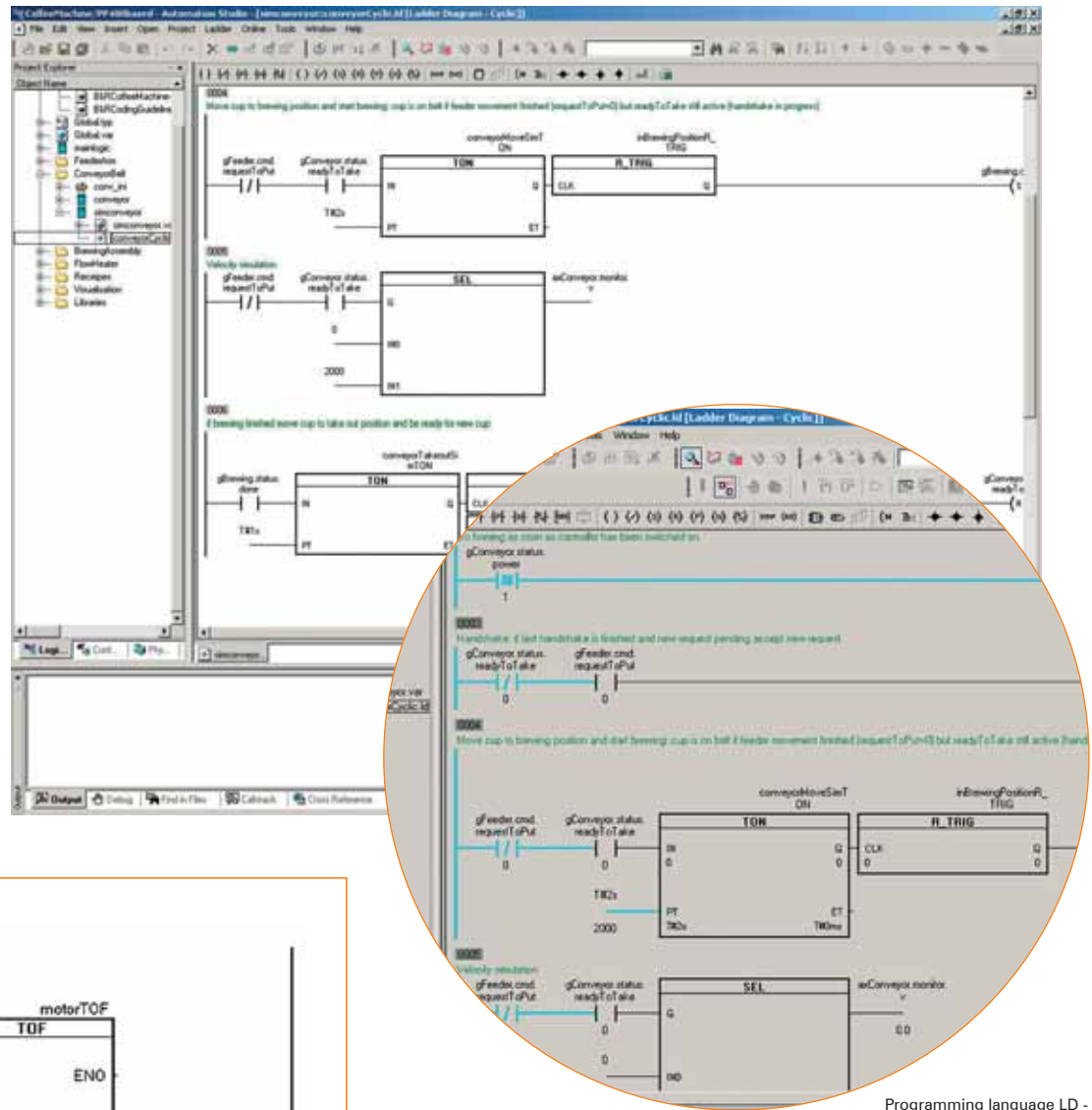
With its wide array of programming tools and languages – from IEC 61131-3 to C – Automation Studio contains everything you need for modern applications.

IEC 61131-3 - LD (Ladder Diagram)

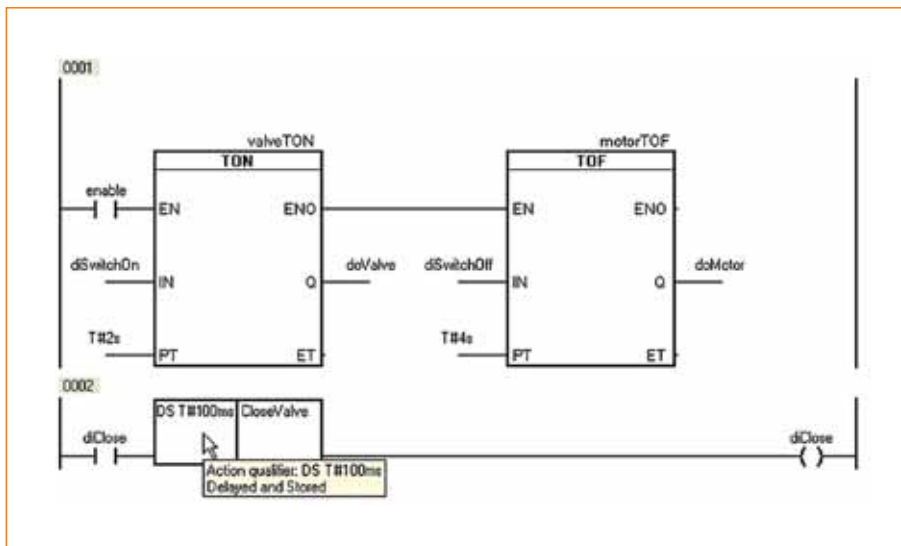
The graphical programming language Ladder Diagram LAD (according to the standard IEC DIN EN 61131-3) is based on the representation of circuit diagrams. Familiar symbols are used for programming, such as normally open and normally closed switches, coils and lamps. These are then combined in networks to form logical structures.

The Ladder Diagram enables you to integrate function blocks. In Automation Studio, it is possible to display a diagram's sequence of events as a Power Flow, which gives you a complete overview of the current state of the controller logic.

Enable inputs and outputs enable you to connect multiple blocks or functions into chains. The enable output ENO of one box is connected to the enable input of the next box. This results in the option of enabling/disabling the processing chain using an enable condition. For example, if an error occurs while a chain is being processed, the rest of the chain is disabled and is not processed.



Programming language LD - Power flow

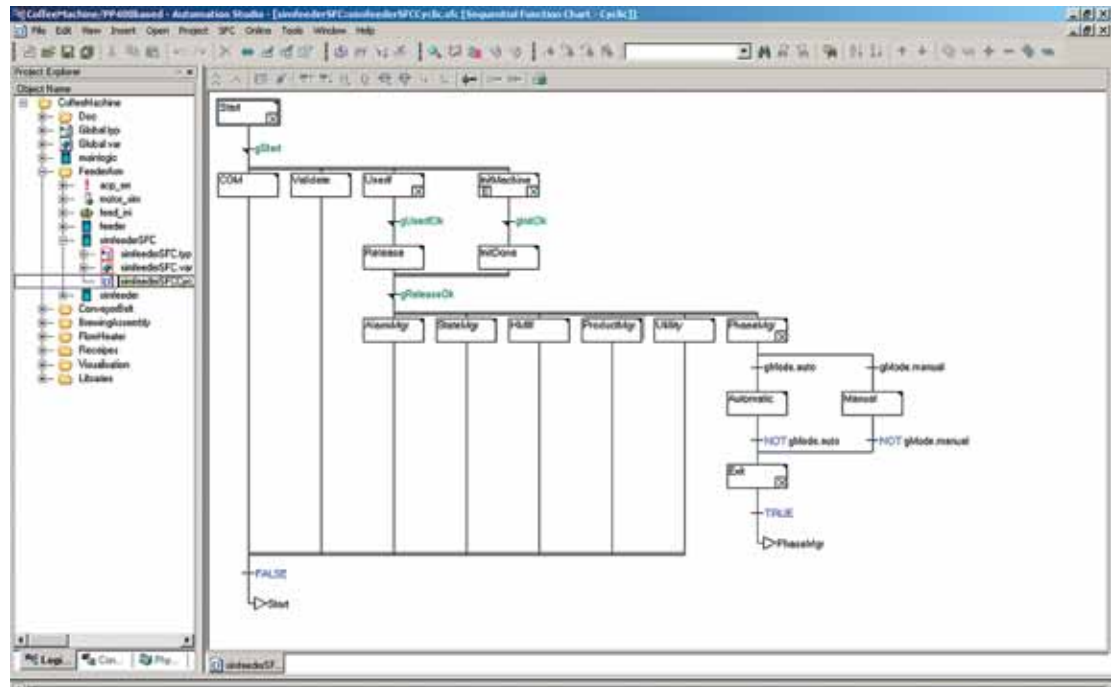


Ladder Diagram with enable inputs and outputs

Programming languages

IEC 61131-3 - SFC (Sequential Function Chart)

SFC is a graphics-based language that clearly illustrates controller sequences. It is well-suited for both time-oriented and event-oriented procedures. Sequential Function Chart consists of a chain of control steps that are linked by switching conditions.

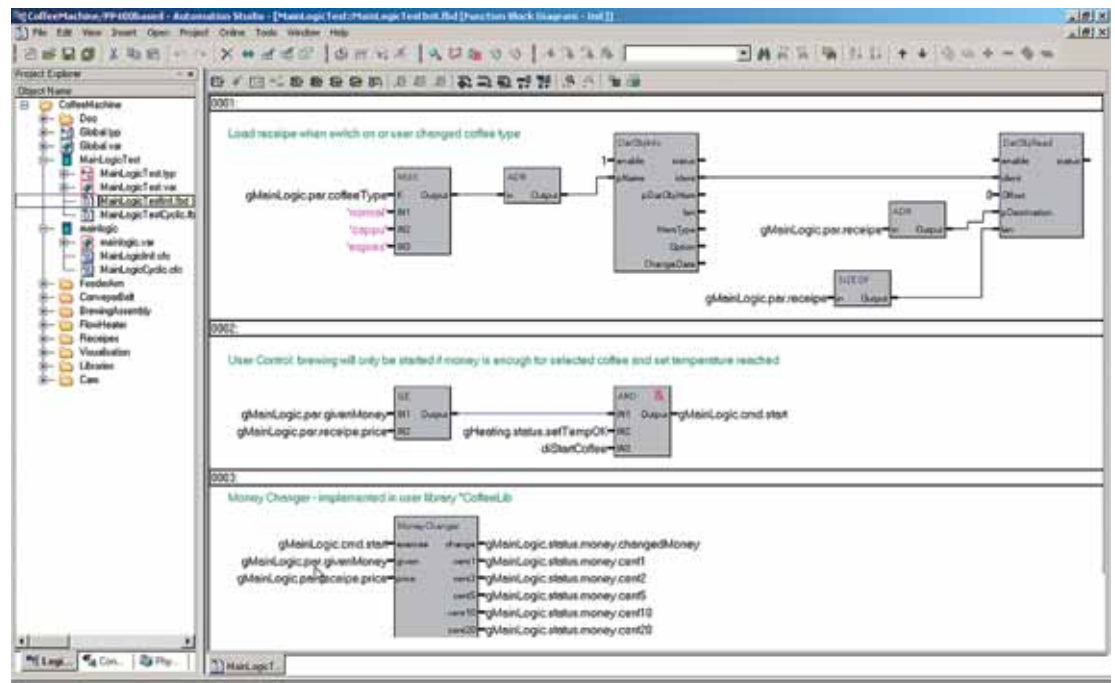


SFC programming language

IEC 61131-3 - FBD (Function Block Diagram)

This graphical programming language uses the logical symbols of boolean algebra. It is particularly suited for link controls and especially popular among beginners and less advanced programmers, since the visualization makes the programming logic easy to understand.

- Management in networks, lines and columns
- Standard function blocks (+Icon) or user FBKs
- Automatic routing
- Connection column for external variables
- Expandable inputs
- Configurable symbols
- Zooming, grid
- Monitoring, Power Flow

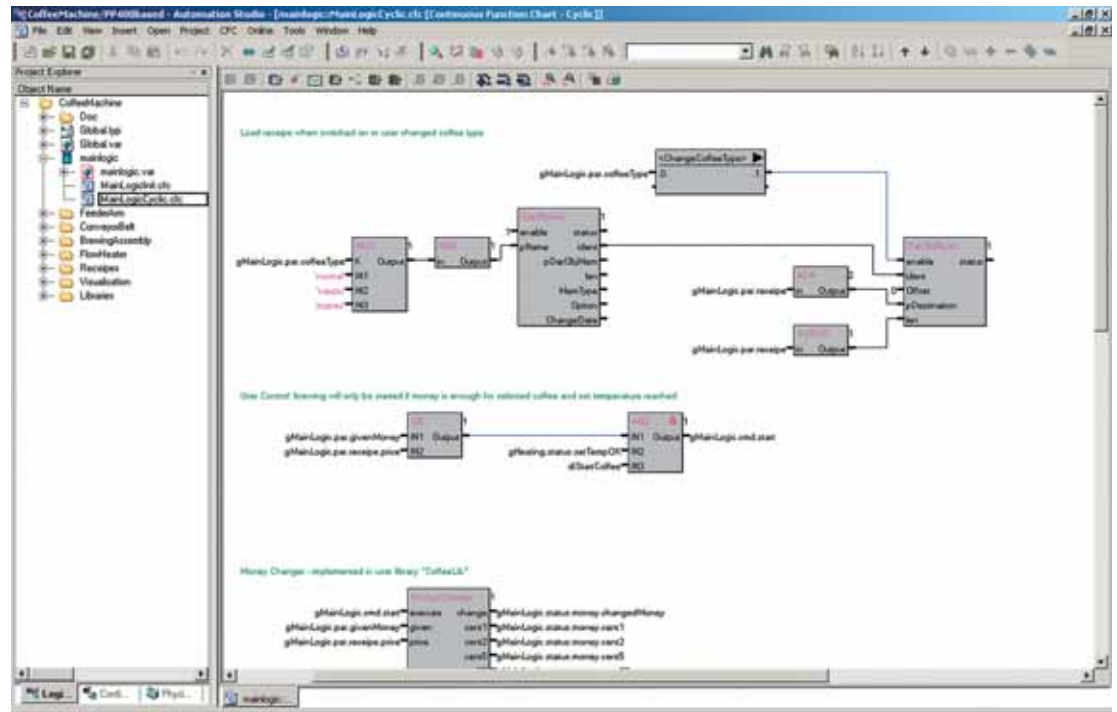


FBD programming language

IEC 61131-3 - CFC (Continuous Function Chart)

CFC (Continuous Function Chart) is a language similar to FBD (Function Block Diagram). While FBD editors are network-oriented and arrange the blocks automatically, in CFC the blocks can be placed freely on the screen. Feedback loops can be created without temporary variables. This language is especially suited for presenting an overview of an application.

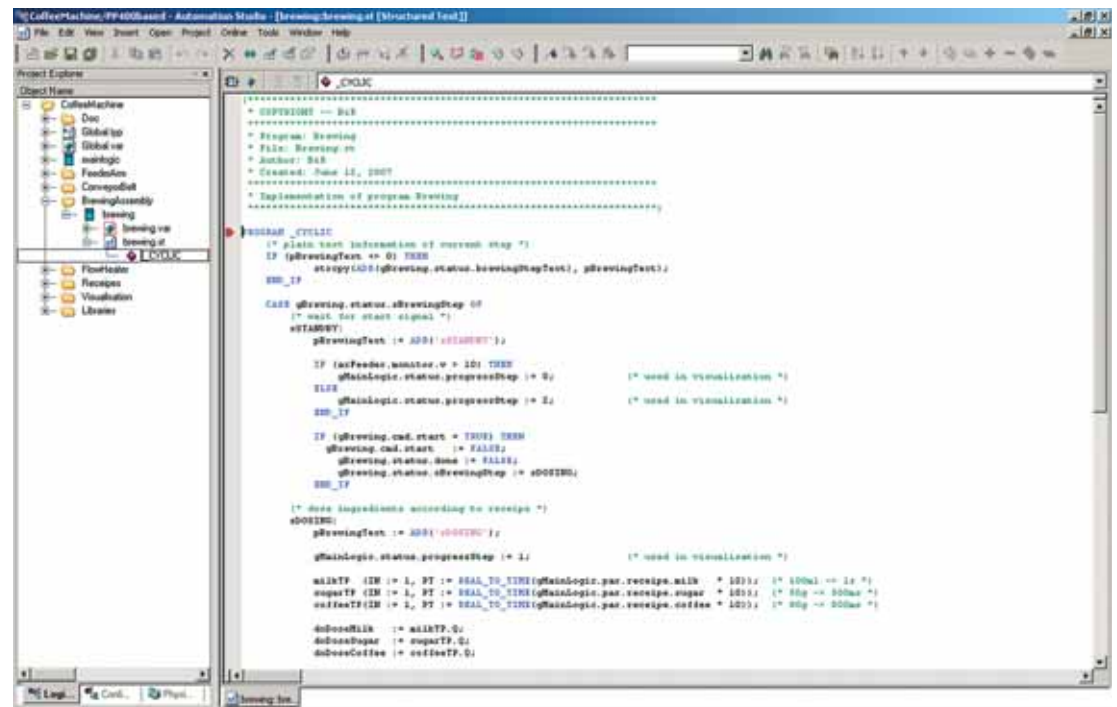
- A network with compound blocks, lines and columns
- Standard function blocks (+Icon) or user FBKs
- Automatic routing
- Connection column for external variables
- Expandable inputs
- Configurable symbols
- Zooming, grid
- Monitoring, Power Flow



CFC programming language

IEC 61131-3 - ST (Structured Text)

ST is a high-level language following the example of Pascal for structured programming. Comparable with B&R Automation Basic, this language is the most used IEC 61131-3 language.

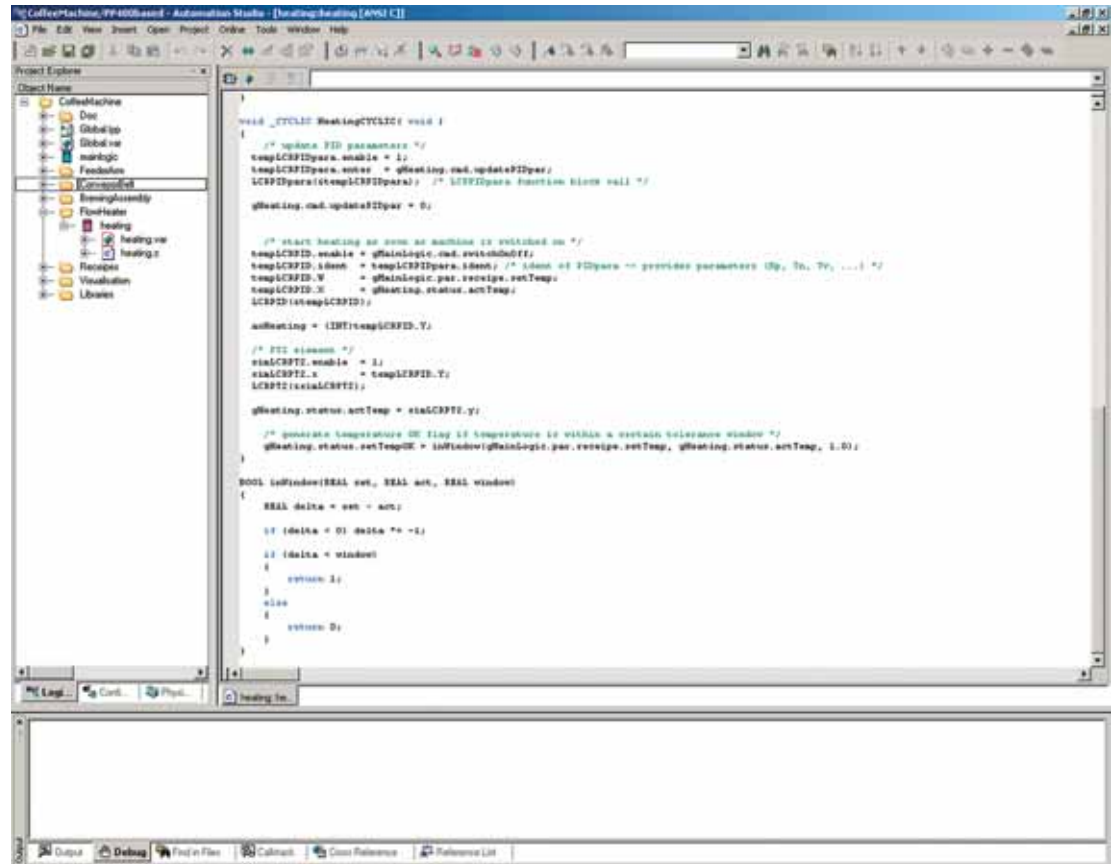


Programming languages

ANSI C

ANSI C is a powerful language for programming applications and libraries. ANSI C allows users to call function blocks and access variables from other IEC languages.

By integrating the GNU compiler, one of the most widely used C compilers has been made available. This guarantees both portability as well as a nearly unlimited number of already available algorithms and programs.



```
void _TTL1 HeatingCYLIC(void)
{
    /* update PID parameters */
    tempLCRIPpara.enable = 1;
    tempLCRIPpara.enable = gMainLogic.mdt.switchedOFF;
    LCRIPpara(tempLCRIPpara); /* LCRIPpara function block call */
    gHeating.mdt.updatePIDpar = 0;

    /* start heating as soon as machine is restarted on */
    tempLCRIP.enable = gMainLogic.mdt.switchedOFF;
    tempLCRIP.idont = tempLCRIPpara.idont; /* idont of PIDpara == provides parameters (Sp, Tn, Tv, ... ) */
    tempLCRIP.V = gMainLogic.par.recipe.setTemp;
    tempLCRIP.X = gHeating.status.actTemp;
    LCRIP(tempLCRIP);

    actheating = (IMTtempLCRIP.V);

    /* PID element */
    staLCRPT.enable = 1;
    staLCRPT.x = tempLCRIP.V;
    LCRPT(staLCRPT);

    gHeating.status.actTemp = staLCRPT.y;

    /* generate temperature DE flag if temperature is within a certain tolerance window */
    gHeating.status.setTempDE = isInRange(gMainLogic.par.recipe.setTemp, gHeating.status.actTemp, 1.0);
}

BOOL isInRange(REAL ret, REAL act, REAL window)
{
    REAL delta = act - act;

    if (delta < 0) delta *= -1;

    if (delta < window)
    {
        return 1;
    }
    else
    {
        return 0;
    }
}
```

ANSI C programming language

IEC 61131-3 Instruction List (IL)

IL is a language conforming to IEC standards which can be found on almost every controller today. This language can best be compared with programming in assembler languages.

Automation Basic

Automation Basic is a high-level language very similar to Structured Text, but whose syntax is much closer to that of Basic. This language is well-suited for all users who want to use a very easy-to-learn language, but don't want to lose out the benefits of high-level languages such as structures, addresses, and pointers.

Configuring I/O and interfaces

I/O configuration and assignments

All the interface modules needed in the hardware configuration can be conveniently inserted and configured at the appropriate interfaces or on the local I/O bus.

- Select and configure the digital and analog I/O modules on the local bus
- Select and configure a bus controller on a POWERLINK or fieldbus interface
- Select and configure digital and analog POWERLINK or fieldbus I/O modules
- Assign process variables to I/O channels

Channel Name	Data Type	Task Class	PV or Channel Name	Inverse	Source File	Description [1]
ModuleOk	BOOL			<input type="checkbox"/>		Module status (1 = module present)
DigitalOutput01	BOOL	Automatic	brewing.coffee.TP.Q	<input type="checkbox"/>	VolMap.kom	24 VDC / 0.5 A, source
DigitalOutput02	BOOL	Automatic	feeder.feederMC_Home Busy	<input type="checkbox"/>	VolMap.kom	24 VDC / 0.5 A, source
DigitalOutput03	BOOL	Automatic	feeder.feederMC_Home Comman...	<input type="checkbox"/>	VolMap.kom	24 VDC / 0.5 A, source
DigitalOutput04	BOOL			<input type="checkbox"/>		24 VDC / 0.5 A, source
DigitalOutput05	BOOL			<input type="checkbox"/>		24 VDC / 0.5 A, source
DigitalOutput06	BOOL			<input type="checkbox"/>		24 VDC / 0.5 A, source
DigitalOutput07	BOOL			<input type="checkbox"/>		24 VDC / 0.5 A, source
DigitalOutput08	BOOL			<input type="checkbox"/>		24 VDC / 0.5 A, source
DigitalOutput09	BOOL			<input type="checkbox"/>		24 VDC / 0.5 A, source
DigitalOutput10	BOOL			<input type="checkbox"/>		24 VDC / 0.5 A, source
DigitalOutput11	BOOL			<input type="checkbox"/>		24 VDC / 0.5 A, source
DigitalOutput12	BOOL			<input type="checkbox"/>		24 VDC / 0.5 A, source
StatusDigitalOutput01	BOOL			<input type="checkbox"/>		Status digital output 01 (0 = OK)
StatusDigitalOutput02	BOOL			<input type="checkbox"/>		Status digital output 02 (0 = OK)
StatusDigitalOutput03	BOOL			<input type="checkbox"/>		Status digital output 03 (0 = OK)
StatusDigitalOutput04	BOOL			<input type="checkbox"/>		Status digital output 04 (0 = OK)
StatusDigitalOutput05	BOOL			<input type="checkbox"/>		Status digital output 05 (0 = OK)
StatusDigitalOutput06	BOOL			<input type="checkbox"/>		Status digital output 06 (0 = OK)
StatusDigitalOutput07	BOOL			<input type="checkbox"/>		Status digital output 07 (0 = OK)
StatusDigitalOutput08	BOOL			<input type="checkbox"/>		Status digital output 08 (0 = OK)
StatusDigitalOutput09	BOOL			<input type="checkbox"/>		Status digital output 09 (0 = OK)
StatusDigitalOutput10	BOOL			<input type="checkbox"/>		Status digital output 10 (0 = OK)
StatusDigitalOutput11	BOOL			<input type="checkbox"/>		Status digital output 11 (0 = OK)
StatusDigitalOutput12	BOOL			<input type="checkbox"/>		Status digital output 12 (0 = OK)

Select

Variables Channels

Use Data Type Filter

Data Type: BOOL

Only Not Connected

File:

OK Cancel Help

Link a variable to a digital output

Name	Value	Description
SL1.SS1.IF2.ST1		AC0BC003
I/O parameters		
General		
Module supervised	off	Service mode if there is no hardware module
POWERLINK parameters		
Mode	controlled node	
Response timeout [ms]	25	
Multiplexed station	off	
Synchronization mode	Start of POWERL...	

Configure the POWERLINK bus controller

Select controller module

Model no.	Description
2005	System B&R 2005
2003	System B&R 2003
ACOPOS	B&R ACOPOS
ACOPOSmulti	B&R ACOPOSmulti
X20	System B&R X20
X20C0001	X20 Bus Controller POWERLINK
X20C1083	X20 Bus Controller POWERLINK, 1x I
X20C8083	X20 Bus Controller POWERLINK, HUE
X57	System B&R X57
X57BC321	Bus Controller POWERLINK
X57BC321-1	X57 Bus Controller POWERLINK
Powerlink Devices	Powerlink Devices
KEB Combivent FS	KEB Combivent FS
Lenze 8200 Vector	Lenze 8200 Vector
POWERLINK	Generic POWERLINK Station

Show customized products

Insert module Replace module

Back Next > Cancel

Insert an X20 POWERLINK bus controller

Configuring I/O and interfaces

Monitor mode

When monitor mode is turned on, the I/O modules and their channels that are configured in the project can be physically tested and the physical values of each channel can be displayed. Outputs can be set independently of the logical value assigned in the program.

Interface configuration

Each interface in the hardware configuration is configured by specifying its property settings. This makes your configurations consistent and organized.

Channel Name	Data Type	Physical Value	Force	Force Value	PV or Channel Value	Task Class	PV or Channel Name
ModuleOk	BOOL	TRUE	<input type="checkbox"/>	FALSE			
DigitalOutput01	BOOL	TRUE	<input checked="" type="checkbox"/>	TRUE	FALSE	Automatic	brewing.coffee.T.P.O
DigitalOutput02	BOOL	FALSE	<input type="checkbox"/>	FALSE	FALSE	Automatic	feeder.feederMC_Home.Busy
DigitalOutput03	BOOL	FALSE	<input type="checkbox"/>	FALSE	FALSE	Automatic	feeder.feederMC_Home.Conn...
DigitalOutput04	BOOL	FALSE	<input type="checkbox"/>	FALSE			
DigitalOutput05	BOOL	FALSE	<input type="checkbox"/>	FALSE			
DigitalOutput06	BOOL	FALSE	<input type="checkbox"/>	FALSE			
DigitalOutput07	BOOL	FALSE	<input type="checkbox"/>	FALSE			
DigitalOutput08	BOOL	FALSE	<input type="checkbox"/>	FALSE			
DigitalOutput09	BOOL	FALSE	<input type="checkbox"/>	FALSE			
DigitalOutput10	BOOL	FALSE	<input type="checkbox"/>	FALSE			
DigitalOutput11	BOOL	FALSE	<input type="checkbox"/>	FALSE			
DigitalOutput12	BOOL	FALSE	<input type="checkbox"/>	FALSE			

I/O monitor with set value

The screenshot displays the Automation Studio interface for a project named 'CoffeeMachine/PP400based - Automation Studio - [PP420.CPU.SL1.S51 [IF2 POWERLINK Configuration]]'. The Project Explorer on the left shows a tree view of hardware components, including a PP420 CPU module and various I/O modules. A context menu is open over the 'IF2 POWERLINK Configuration' component, with 'Open IF2 POWERLINK Configuration' selected. The main workspace shows the configuration parameters for the 'IF2 POWERLINK Configuration' interface, including:

- Operating mode: POWERLINK V1
- MTU size: 262
- Baud rate: 100 MBit
- POWERLINK parameters:
 - Activate POWERLINK communication: on
 - Cycle time [µs]: 2000
 - Multiplexing prescale: 8
 - Mode: managing node
- Advanced
- Ethernet parameters:
 - Activate Ethernet communication: off
 - Mode: enter IP address ...
 - Internet address
 - Subnet Mask: 255.0.0.0
- INA parameters:
 - Activate online communication: off
 - Port number: 11161
 - INA node number: 1

Interface configuration

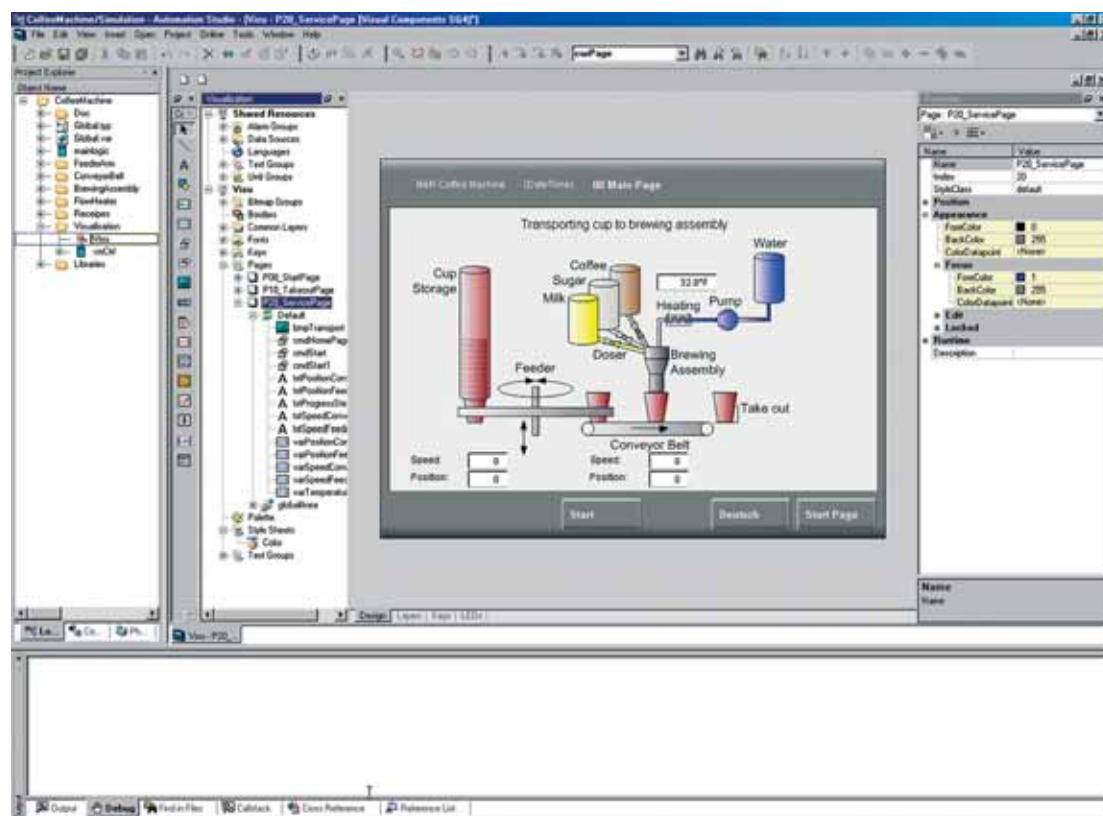
Integrated visualization

Integrated visualization

The visualization system integrated in Automation Studio is an effective tool that can be used to create line displays or control integrated or remote XGA displays with keys and touch screens. Integration of the visualization system in the control means that the communication times that are normally required for remote visualization systems are no longer an issue.

Characteristics of the visualization system

- Creating process diagrams WYSIWYG
- Displaying process diagrams on the target system
- Common management of both the visualization and controller projects
- Supporting displays from 2x20 characters to XGA resolution
- Interactions via keys and touch screen
- Flexible key assignments for hardware keys and touch buttons
- Structured arrangement of visualization components in the project
- Controls for designing process images
- Language switching with UNICODE support
- Management and display of current and past alarms
- Display of trend data
- Style sheets for managing the default properties of objects (GUI template)
- Management of and access to process data
- Unit switching
- Scaling and limiting process data
- Open user interface (API)
- Terminal mode
- VNC visualization



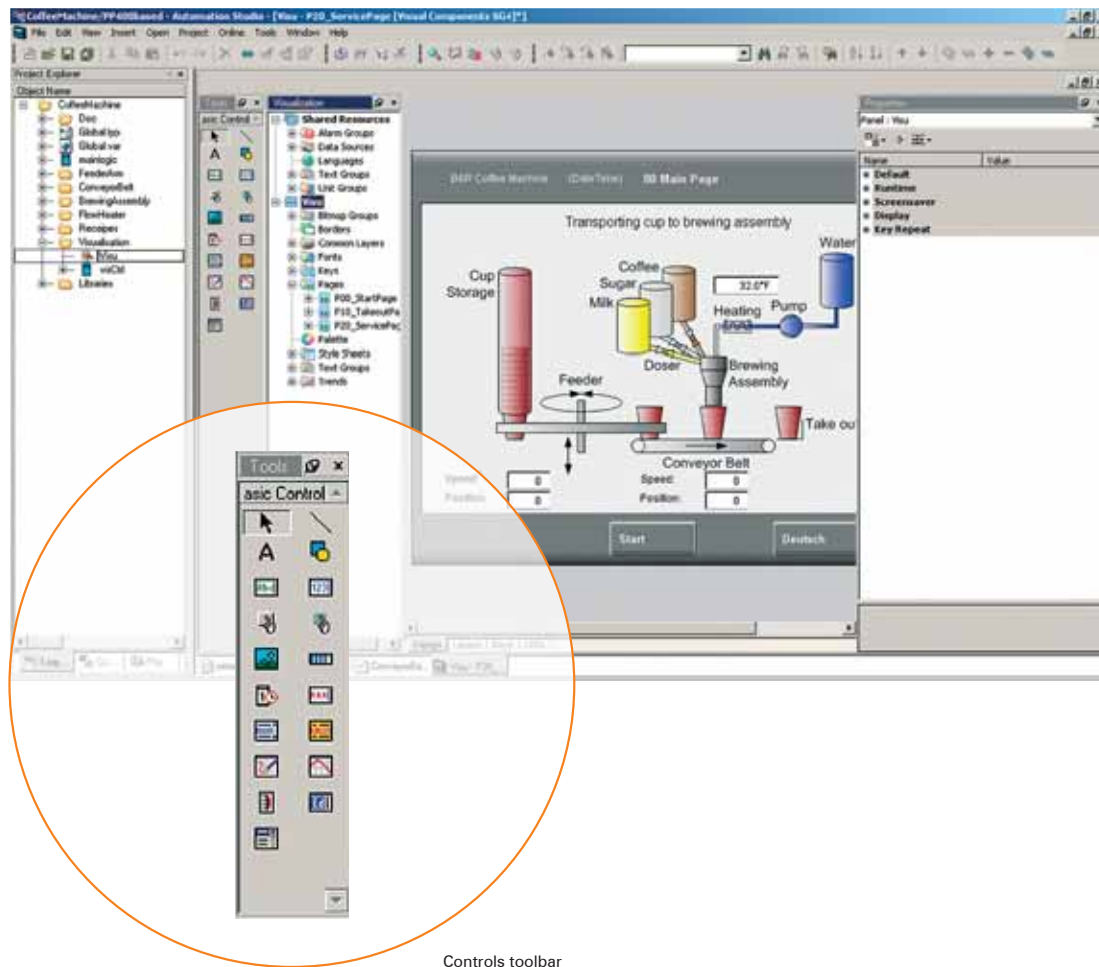
Project editor

Integrated visualization

Controls

The visualization environment contains all the controls needed to create a process image. These controls can be connected to the process variables of the control program in order to animate the process images during runtime.

- Lines and shapes
- Keys with bitmaps and text whose appearance and responses can be configured
- Hotspots for defining touch fields on touch screens
- Text input and output, Unicode-capable with language switching and format options
- Bitmaps which can be animated by overlapping and connecting with groups
- Flexible bar graphs with color switching
- Numeric input and output with touch screen support
- ListBox control for input and output
- Drop down control
- Date and time formats, display can be configured (depending on language)
- Flexible alarm control with colors and symbols to differentiate between alarms
- Flexible trend control for displaying trend curves
- Edit control
- HTML view control
- Password input
- Scale control



Controls toolbar

All controls can be managed in global and local image layers.

Tools

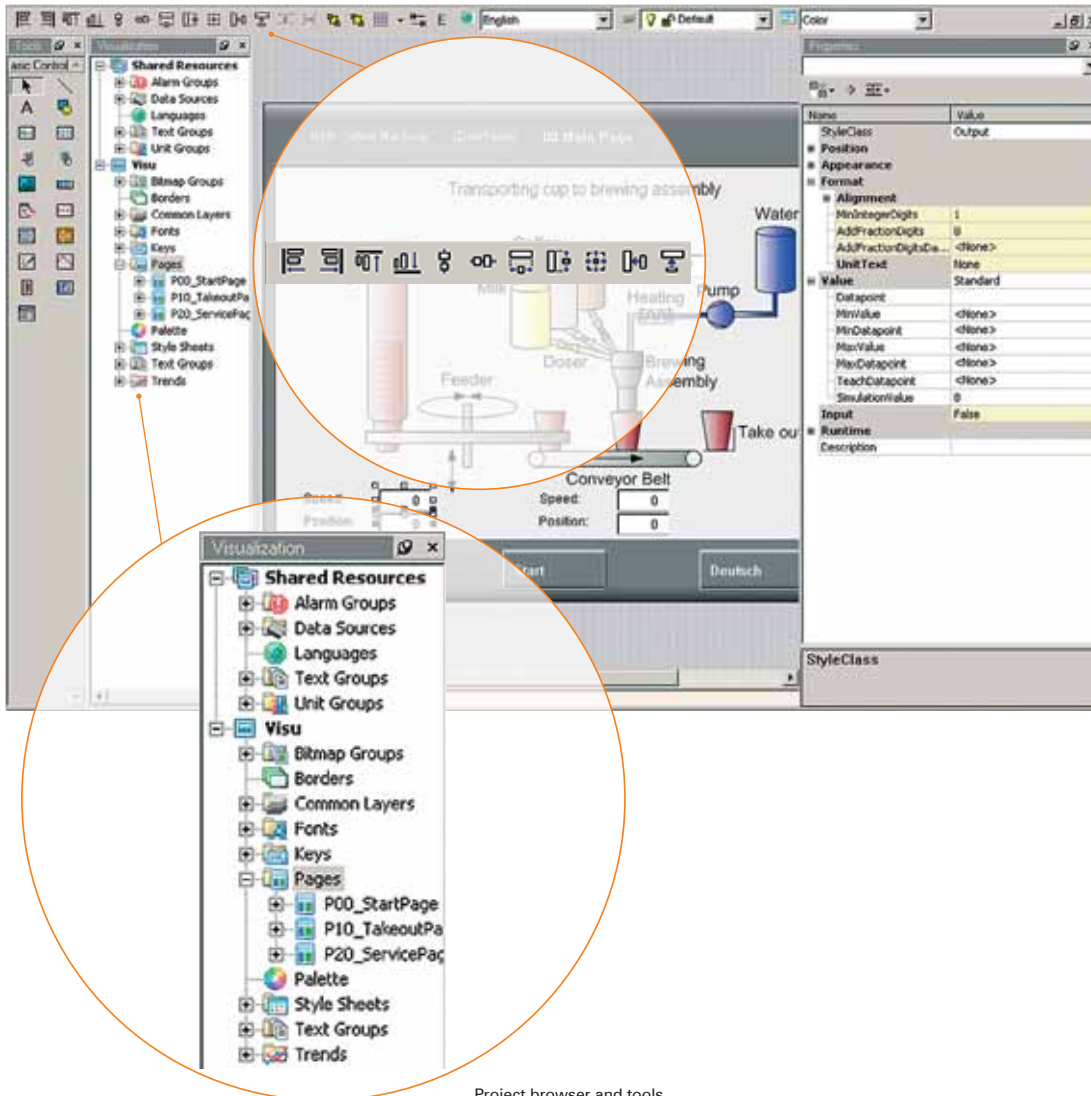
A comprehensive selection of tools is available in the context sensitive toolbar for creating process images with a visually appealing visualization design.

- Editor help
- Zoom, control order, grid, TAB order
- Tools for positioning controls
- Control size and position can be adjusted with a single mouse-click
- Managing the layers in a process image
- Managing process images
- Overview in a list or as thumbnails
- Drawing area for controls
- Key and LED assignment

Project management

The visualization components are arranged in logical folders.

- Combination of similar components into groups
- Separation of shared and local resources



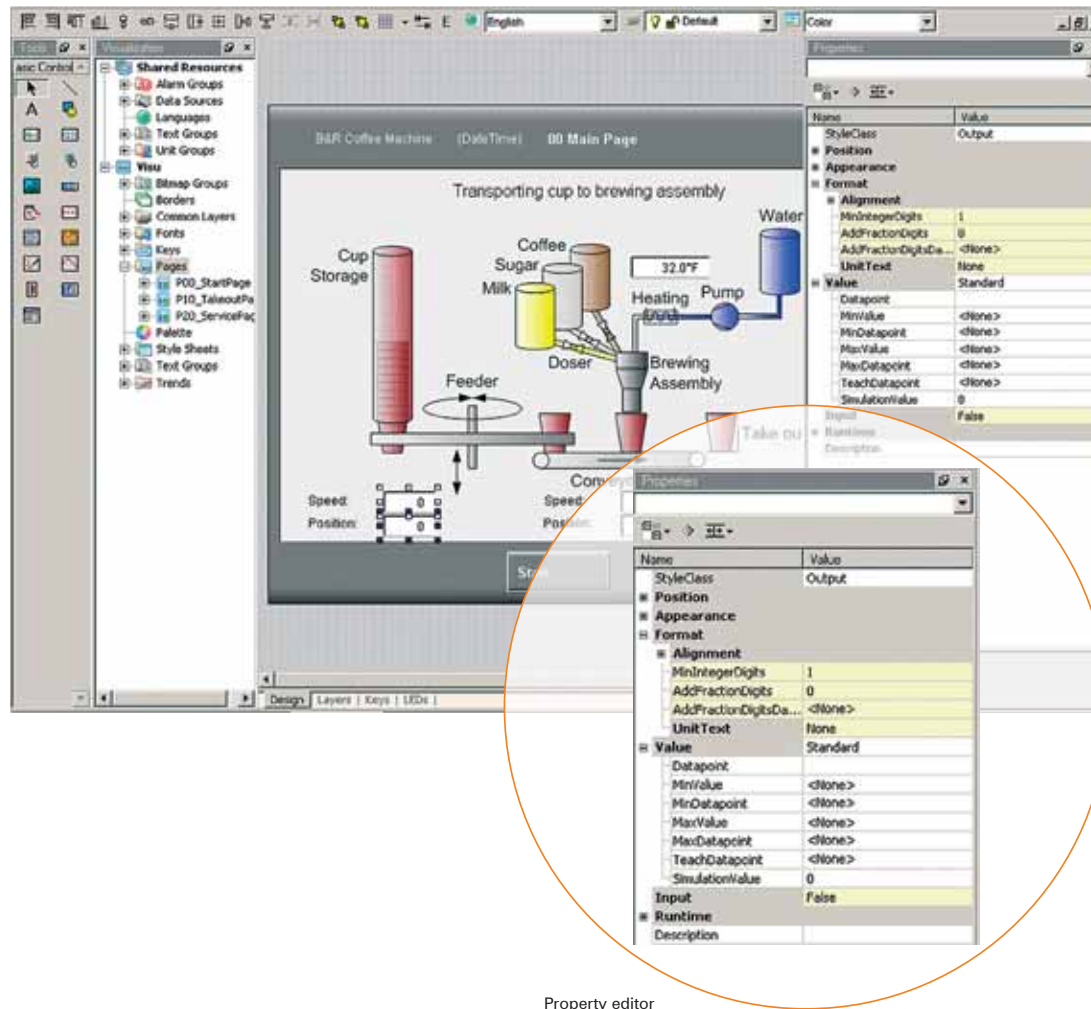
Project browser and tools

Integrated visualization

Property sheets

Every visualization component can be configured using the property sheet. This makes configuration simple and consistent.

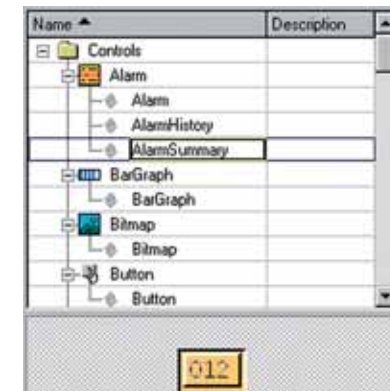
- Clear grouping of object properties
- Multiple controls can be selected
- Style classes assigned for central management properties



Property editor

Style Sheets

The appearance of visualization objects can only be configured using styles. This eliminates the tedious task of adjusting the properties of individual components. Styles can be used to adapt the GUI to the customer's needs.



Styles

Graphics

Image files can be combined and managed in logical groups.

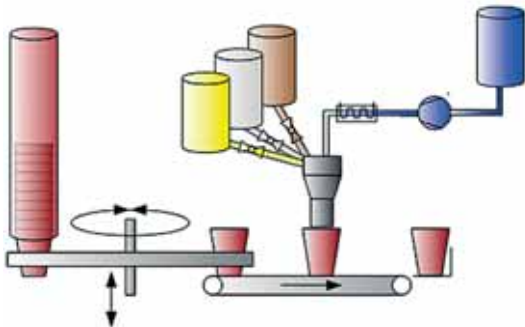
- Support of TrueColor (32-bit) graphics in the editor and during runtime
- Management of all image files used in a project
- Language-dependent configurations
- Preset images for alarm system and numeric/alpha-numeric touchpads



"Thumbnail" view of a bitmap group

Supported graphic formats

- Raw8Bit. The images have 256 colors, as previously.
- Compressed8Bit. 256 colors compressed
- Bmp32Bit. Transparency is not available here as an editor setting, instead is taken from the source file (alpha channel).
- Png32Bit. The transparency from the inserted file is also used here.



32-bit PNG file

Image layers

Every process image can be divided into several layers. These layers can be combined as needed and animated during runtime. Layers allow recurring image information to be defined centrally and adjusted with the simple addition of new elements.

- Template for common image areas
- Layering them over top of one another creates the total image
- Layers can be enabled/disabled and locked/unlocked

ColorMap table

ColorMaps constitute 8-bit color tables that allow indexing of the foreground and background colors. In this way, the color scheme can easily be changed during runtime.

Index	ForeColor	BackColor
0	0	253
1	51	126
2	177	173
3	40	217
4	0	7

ColorMap table editor

Symbol library

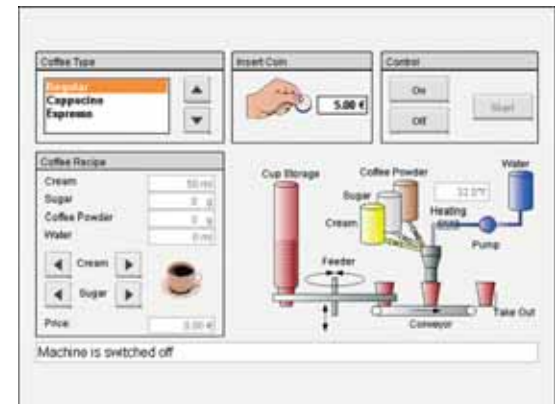
When installing Automation Studio, a symbol library is created. This library contains more than 6000 graphics and symbols in GIF, BMP or PNG format, which can be used anywhere in Visual Components. These graphics are divided into directories based on their functions.



Icon view



Global image layer



Local image layer



Entire image

Integrated visualization

Languages

To make the use of different languages more convenient, texts can be organized according to language, adapted to the project, and translated.



Add a new language/keyboard layout

- Switch texts for the desired language during run-time
- Texts in a text group
- Key assignments linked to a language or keyboard layout
- Graphics linked to a language
- Character set switching
- UNICODE fonts
- Text entry using current keyboard layout
- Any desired language displayed during project development
- No limitations to languages
- Text translation with export/import formats

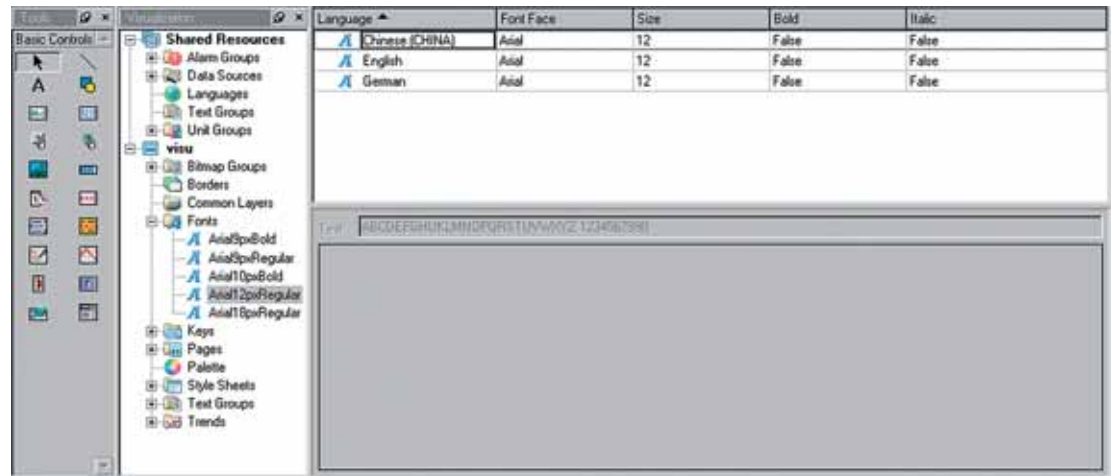
Bidirectional mode

Visual Components supports the output of text from right-to-left. Right-to-left text output is referred to as BiDi output mode, because text can flow either right-to-left or left-to-right. In other words, bidirectional text output is possible.

Character sets

In addition to multi-language support, the integration of TrueType Fonts optimizes Visual Components for international use.

- International configuration with scalable Unicode TrueType fonts
- Support for Asian fonts
- Character set switches with language
- Input help with IME (Input Method Editor)
- Arial and Arial Unicode character set included in Automation Studio



Font management

Support of BiDi output

- Output of text in right-to-left mode
- Automatic adjustment of horizontal alignment of button, list box, text, and drop-down list box controls

يعني Bidimode داشته
Alignment - Left to right
(LeftToRightLayout = False)

يعني Bidimode داشته
Alignment - Right to left
(LeftToRightLayout = False)

Keys

Any type of keyboard and key mappings can be created according to the needs of the application.

- Project development independent of hardware using virtual keys
- Keys managed using logical names
- Logical assignment takes place in key layout
- Key assignments change according to current language and layout
- Preset key layouts for touchpad entry - Numpad, Alphapad

The screenshot displays the Automation Studio interface. On the left, the 'Tools' panel shows various components like 'Basic Controls', 'Shared Resources', and 'Keys'. The 'Visualization' window shows a keyboard layout with keys labeled with logical names. The 'Properties' window for 'SWKey: SWKey_4' shows a table of virtual keys and their actions.

Name	Value
Virtual Key[0]	TP_ALPHA_1
Virtual Key[1]	TP_ALPHA_Excla...
Virtual Key[2]	TP_ALPHA_sa
Virtual Key[3]	TP_ALPHA_A
Virtual Key[4]	TP_ALPHA_sq
Virtual Key[5]	TP_ALPHA_Q

The circular inset shows a magnified view of the keyboard layout and the 'Properties' window. The keyboard layout shows keys labeled with logical names like '3', '6', '9', and 'Esc'. The 'Properties' window shows the same table of virtual keys and their actions.

Key assignments using virtual keys

Integrated visualization

Color palette

The colors of all process images are managed and set centrally using the color palette. This ensures a consistent appearance for all elements of a visualization. This makes it easy to create templates for corporate GUIs.

Index	Red	Green	Blue	Color
245	26	26	26	
246	64	64	64	
247	77	77	77	
248	153	153	153	
249	222	222	222	
250	217	217	217	
251	230	230	230	
252	242	242	242	
253	255	136	0	
254	77	77	77	
255	122	122	122	

Color management

Text groups

Texts for larger visualization applications are easier to manage and assign when they are combined in text groups.

- Manage dynamic texts of all process images to be displayed in lists
- Display dynamic texts for variable dependent text displays
- Language-dependent input
- Text snippets enable dynamic elements in text such as indices, dates, time, etc.
- Multiple use of a text when assigned to static texts

Index	Name	Description
0	AlarmState_long	
1	DateTimeFormats	
2	AcknowledgeState_lo...	
3	AcknowledgeState_s...	
4	AlarmState_short	
5	BypassState_long	
6	BypassState_short	
7	AlarmEvent_long	
8	AlarmEvent_short	
9	ProgressStrings	
10	InstantMessages	
11	TextSnippets	
12	HeaderBar	
13	PageNames	

Text group management

Index	English	German
0	%m/%d/%Y %H%M%S	%d.%m.%Y %H%M%S
1	%H%M%S	%H%M%S
2	%H%M	%H%M

Texts in the text group "DateTimeFormats"

Physical units

Physical units are sorted by group, which simplifies working with physical values of all types.

- Manage physical variables in unit groups
- Raw values are scaled to values that can be displayed
- Static and dynamic limit values can be managed for a unit
- Switching units during runtime - does not depend on the language
- Common unit groups are predefined
- 2-level scaling is possible
- Test the scaling in the development environment
- Assign a unit group to a data point
- Input and output of fractions (e.g. 1.7/8)

Name	Default Limit	Default PLC Unit	Default Display Unit
Length	None	PLCUnit	Millimeter
Mass	None	PLCUnit	Kilogramm
Memory	None	PLCUnit	Byte
Power	None	PLCUnit	Watt
Pressure	None	PLCUnit	Pascal
Temperatures	None	PLCUnit	Kelvin
Volume	None	PLCUnit	Cubicmeter

Unit groups

Index	Name	Unit Abbreviation	Unit Description	Default Precision
0	Fahrenheit	°F	fahrenheit	1
1	Celsius	°C	celsius	1

Conversion Test

Internal value :

Scaled value :

Conversion parameters

P[0] internal P[0] scaled

P[1] internal P[1] scaled

Properties

Unit : Fahrenheit

Name	Value
Name	Fahrenheit
Index	0
Type	StaticPairs
Precision	
Conversion	
Value[0]	
Internal	0
Scaled	32
Value[1]	
Internal	1000
Scaled	212
UnitText	
Abbrevia...	
Text	
English	°F
Germ...	°F
Full	
Text	
English	fahrenheit
Germ...	Fahrenheit
Description	

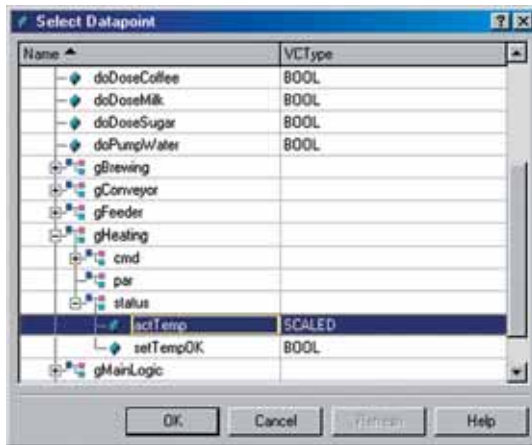
"Temperatures" unit group

Integrated visualization

Data points

To create a complete visualization project without programming, the integrated data point management system allows the process variables from the control program to be easily connected with properties of a visualization object to control the runtime behavior.

- Uniform management of all connected process variables
- Assign unit groups for scaled display of process variables
- Configure the update behavior of a process variable



Assign data points on the visualization object

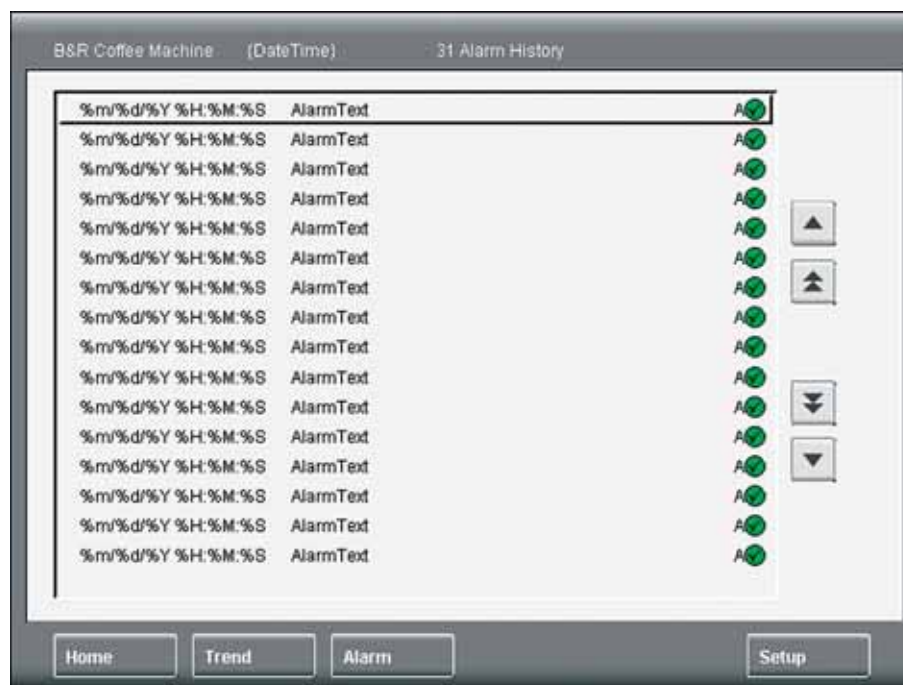
Name	PLCTy...	VCType	Unit Group / Sub...	Limit	PLCUnit	UpdateTime	UserID
aoHeating	INT	INTEG...	None	None	None	<Default>	
alWaterTemp	INT	INTEG...	None	None	None	<Default>	
axConveyor							
axFeeder							
BrewingAssembly							
diStartCoffee	BOOL	BOOL	None	None	None	<Default>	
doCupPull	BOOL	BOOL	None	None	None	<Default>	
doDoseCoffee	BOOL	BOOL	None	None	None	<Default>	
doDoseMilk	BOOL	BOOL	None	None	None	<Default>	
doDoseSugar	BOOL	BOOL	None	None	None	<Default>	
doPumpWater	BOOL	BOOL	None	None	None	<Default>	
gBrewing							
gConveyor							
gFeeder							
gHeating							
cmd							
par							
status							
actTemp	REAL	SCALED	Temperatures	None	Default	<Default>	
setTempOK	BOOL	BOOL	None	None	None	<Default>	
gMainLogic							
mainlogic							
Visualisation							

Manage data points

Alarm system

Alarms are used to record and respond to certain system states. Alarms can be displayed in messages, warnings, and alarms by dividing them in alarm groups.

- Active alarms and historical alarms displayed differently
- Manage alarm texts and their configuration in alarm groups
- Color-coded identification of alarm priorities
- Use touch screen or keys to page through alarm lists, acknowledge and bypass alarm states
- Manage all alarms in the system in the alarm overview
- Evaluate the alarm history from higher-level systems with a VISAPI user interface
- Central alarm system for displaying the alarm history on a terminal

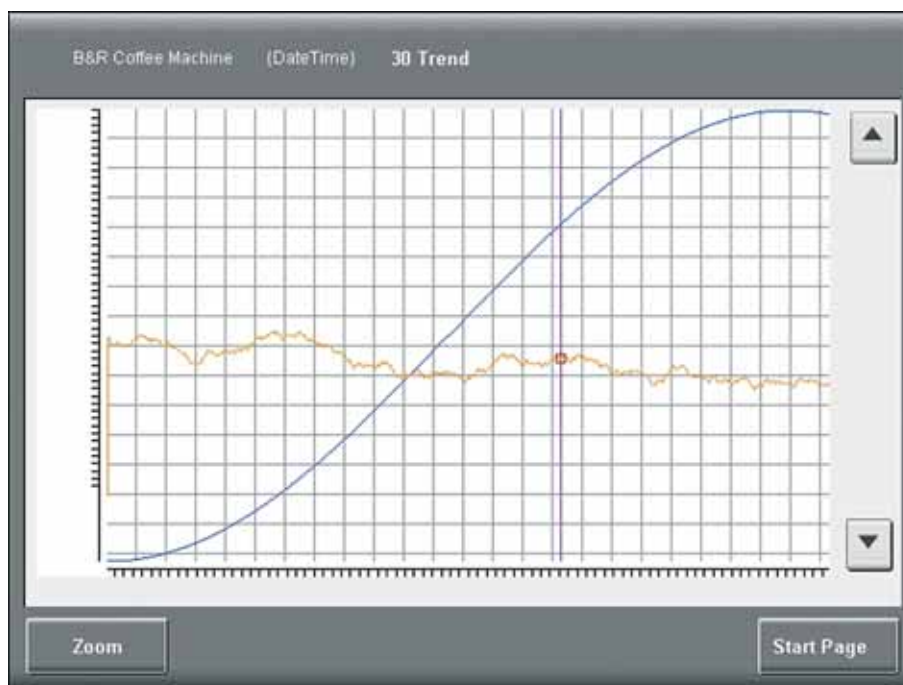


Configure the alarm history

Trend system

The trend system provides a comprehensive range of tools for configuring the display of trend data.

- Display curves
- Suited for use in terminal mode
- Display up to 16 curves with different units in one trend control
- Display multiple axes in one or more axis containers
- Display online trend and user data (recorded automatically or manually)
- Navigate using key actions and data points
- Manage trend configurations
- Link to trend control
- Combine trend components via drag & drop
- Create scaling axes using trend scale and time scale objects

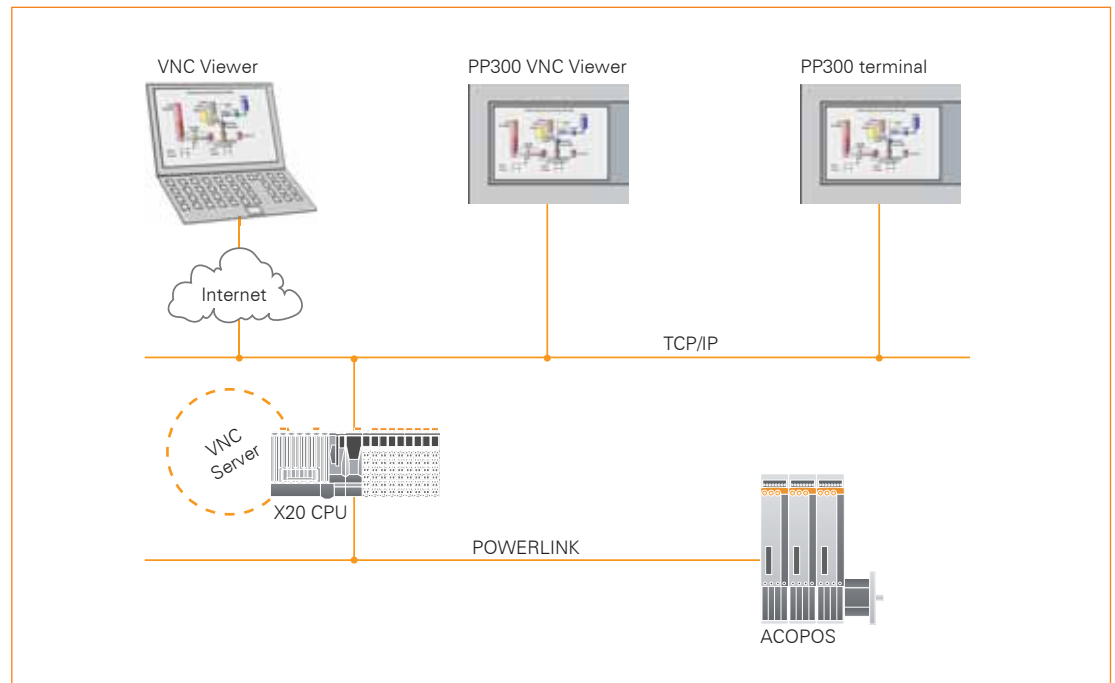


Trend control configuration

Integrated visualization

Remote visualization

Remote visualization systems make it possible to implement visualization applications from a location away from the controller. When working with on the project, it can be treated like a locally connected display.

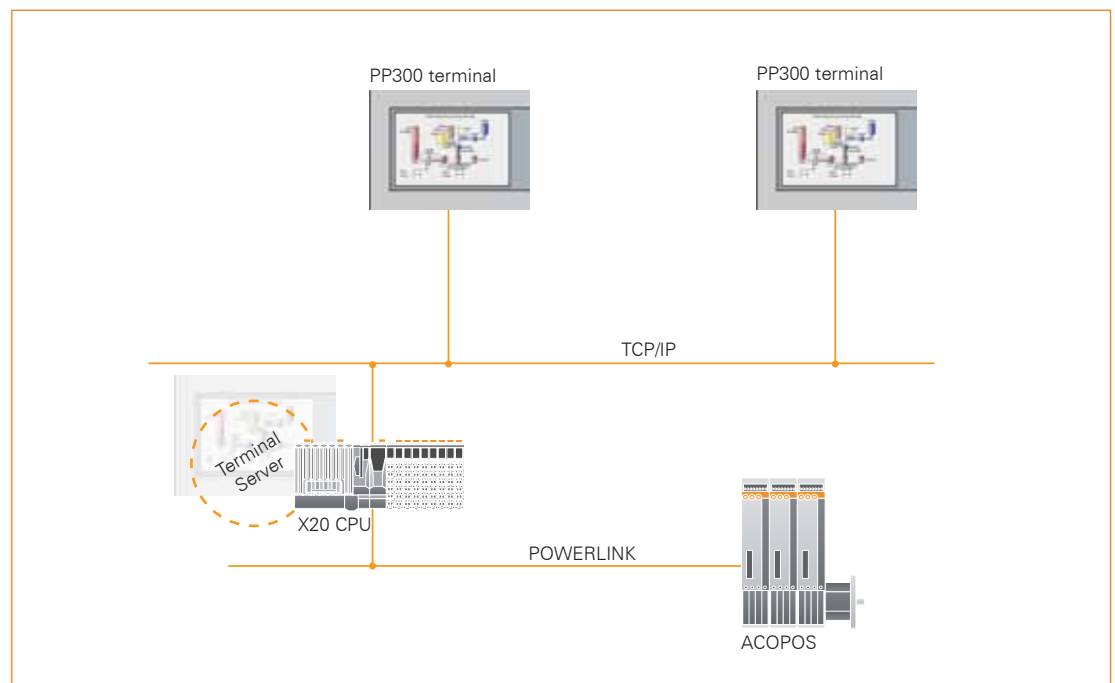


Remote visualization

Terminal mode

The visualizations configured in Automation Studio are sent from the control unit or a local visualization, and run on a Power Panel terminal connected via Ethernet. An image from the local visualization or a visualization created specifically for the terminal can be displayed.

- QVGA to XGA Power Panel support
- The visualization (Terminal Client) can be remotely operated by the controller (Terminal Server)
- The control project and visualization project are managed in a single Automation Studio project
- The variable exchange necessary between the terminal and the controller CPU takes place automatically
- Different content can be displayed on the terminal server and the terminal client

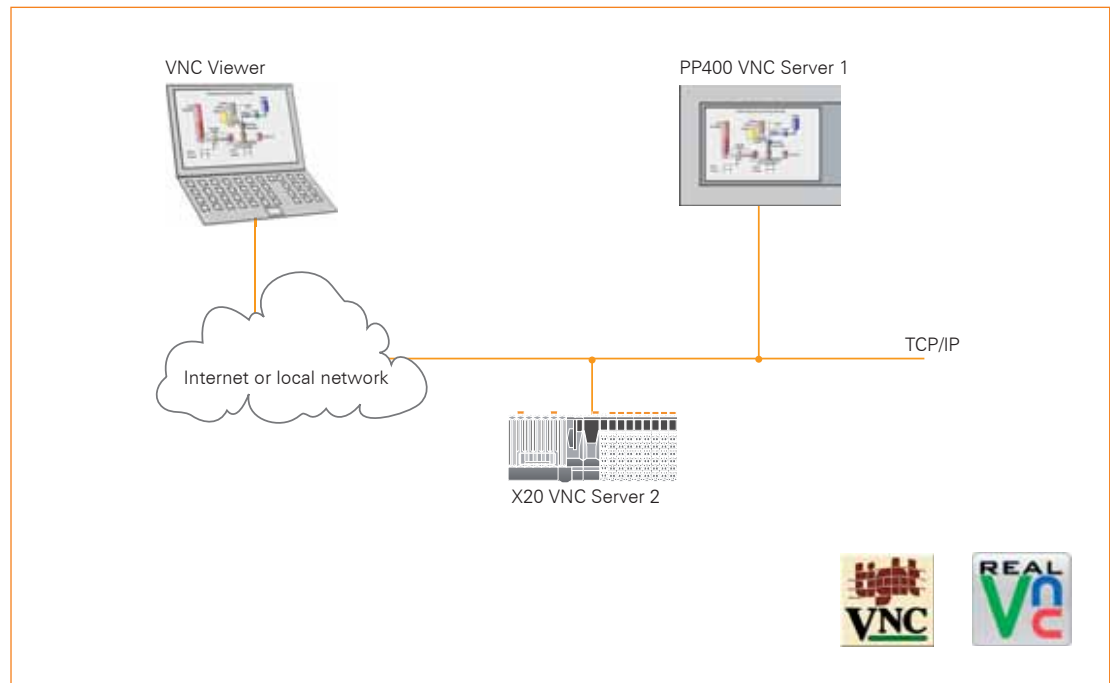


Terminal mode

VNC (Virtual Network Computing)

A VNC visualization is the fastest way to perform remote maintenance. The contents of the visualization display (VNC server) are shown on a local computer (VNC viewer). Keyboard entries and mouse movements are transferred to the VNC server.

- VNC resolutions from QVGA to XGA
- Remote visualization control - Main office function
- Support of AT keyboard for VNV Viewer PC
- Use via a modem, intranet, and Internet
- Monitoring machines and systems
- Simultaneous access to several visualization applications
- Clients available for Windows®, Linux, and other systems
- Open, documented logging system
- Freeware, so no additional costs



VNC visualization

API (Application Programming Interface)

The API enables access to the display from the application program using functions. This allows the visualization can be expanded.

VISAPI library

- Functions for outputting images and texts
- Draw bitmaps (8-bit and 32-bit)
- Calibrate the touch screen
- Set contrast, brightness, and background lighting
- Evaluate the touch position
- Evaluate keys
- Read out and configure display for higher-level systems

VCScrSht

- Save the current screen content as a bitmap. This can then be loaded to a higher-level system via FTP

VCLib

- Read out and evaluate the visualization control during runtime
- Evaluate a change in process data values
- Implement a LOG function for value changes and interactions between visualization system and operating personnel
- Evaluate additional operating devices found on MP40/50 devices (e.g. handwheel / joystick)
- Determine, limit number of connected clients, or disconnect all clients from server
- Start any process on the client

AsRxbExt

- Evaluate additional operating devices found on MP40/50 devices (e.g. handwheel / joystick)
- Determine, limit number of connected clients, or disconnect all clients from server
- Start any process on the client

The visualization functions integrated in Automation Studio let you create demanding process visualizations easily and cost-effectively.

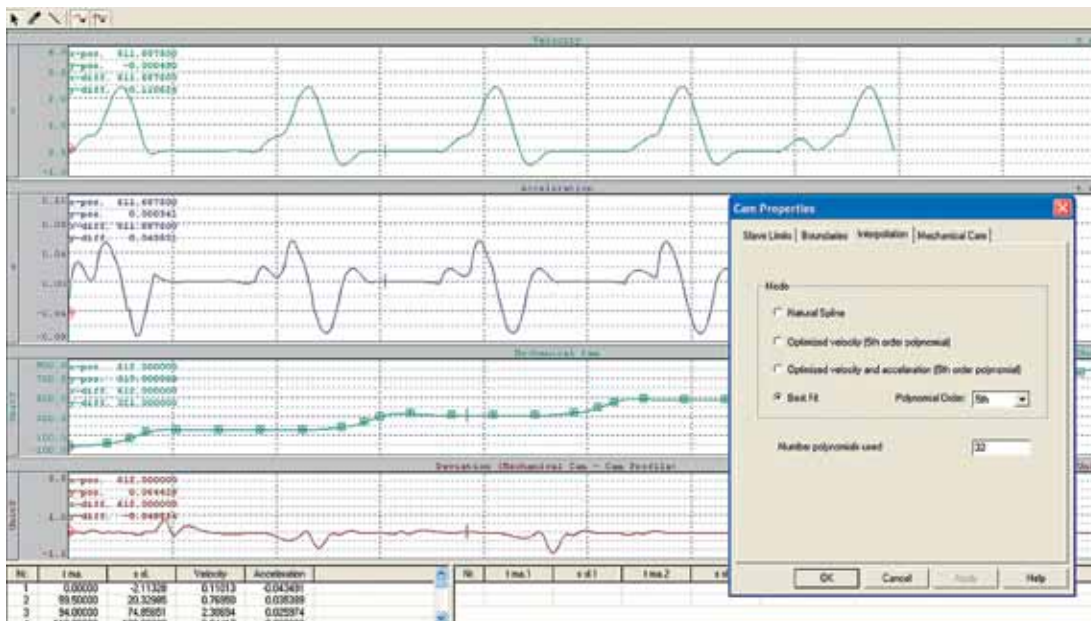
Motion control

Positioning tasks in Automation Studio

Automation Studio integrates all of the tools needed for positioning tasks. According to the motto "Configuring, not programming," even extremely complex motion applications can be realized in Automation Studio without having to resort to elaborate programming. The PLCopen motion control function blocks conform to IEC 61131-3 and are even available to the user as an option during direct programming.

Motion elements in Automation Studio support the following:

- Servo drive configurations using parameter tables
- Real-time motion analysis using the oscilloscope function
- Analyze all relevant accesses and parameters using the trace function
- Every type of movement can be checked using the integrated NC axis test and Watch functions
- Reduced development times using PLCopen Motion Control function blocks
- Smart Process Technology as a freely configurable technology library for cost-effective solutions and high production speeds
- Cam editor for easily linking complex movements
- Integrated CNC system

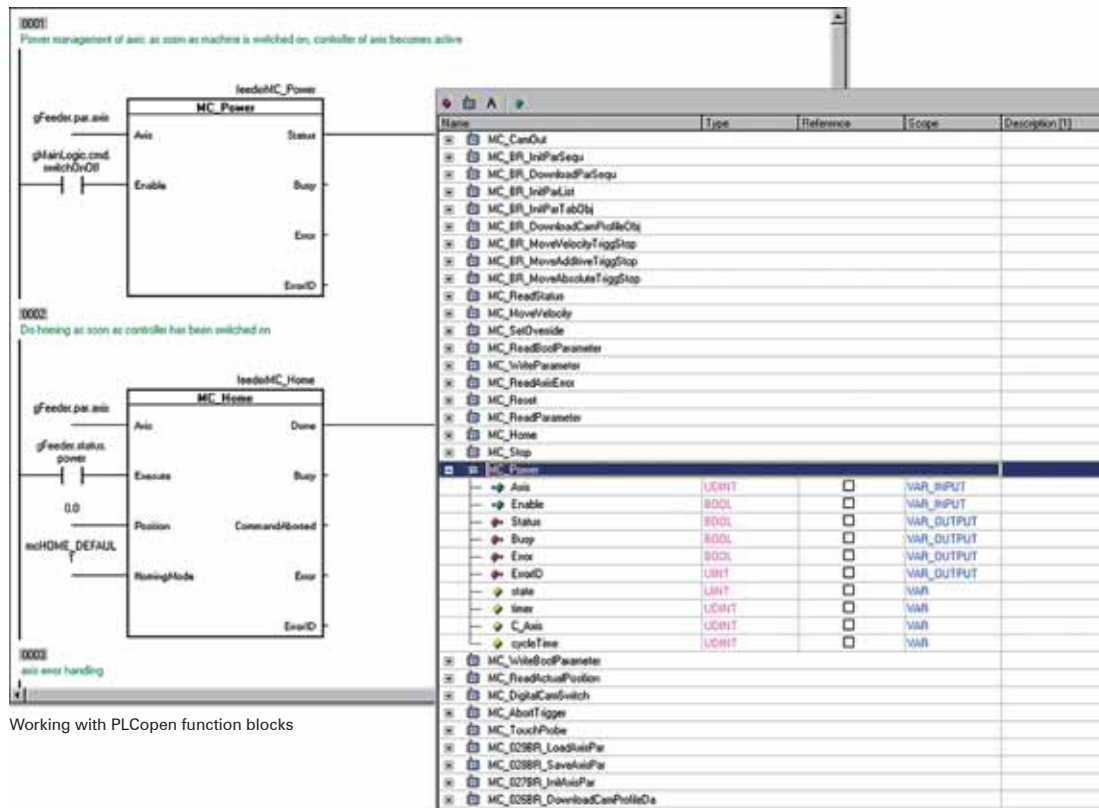


Properties - CAM profile recording

PLCopen motion control function blocks

The PLCopen standard for motion control function blocks is an important step in improving reusability and maintainability. Automation Studio has integrated PLCopen motion control function blocks. Properties of PLCopen motion control FBKs:

- Easy to use
- Efficient to reuse
- Conforms to the IEC 61131-3 standard
- Decoupling of hardware and software
- Flexibility for future expansions
- As small as possible and complete as necessary



Working with PLCopen function blocks



Motion control

CAM editor

The cam profile editor can be used to create graphical surface movement profiles according to VDI 2143.

- Clear representation
- Creation and testing in a single user interface
- Analyze the movements for acceleration, jolt
- Dynamic limit monitoring, even with accelerated master
- Motion rules and profiles according to VDI 2143
- Data format of cam profiles
 - 6th order polynomials
- Standard cam profiles
 - Entry, exit cam profiles
 - Differential gear
 - Contained in library
- Customer specific cam profiles
- Calculating inverse cam profiles
- Fixed cam profiles that define the relationship between the motor and the mechanical position for the process, so-called "inverse kinematics"
 - $s_{Process} = f(s_{Motor})$
 - $s_{Motor} = f^{-1}(s_{Process})$
- Simple calculation of the movement profile for the process
- Use the automatic differential gear function
- Import mechanical cam profiles



Cam editor

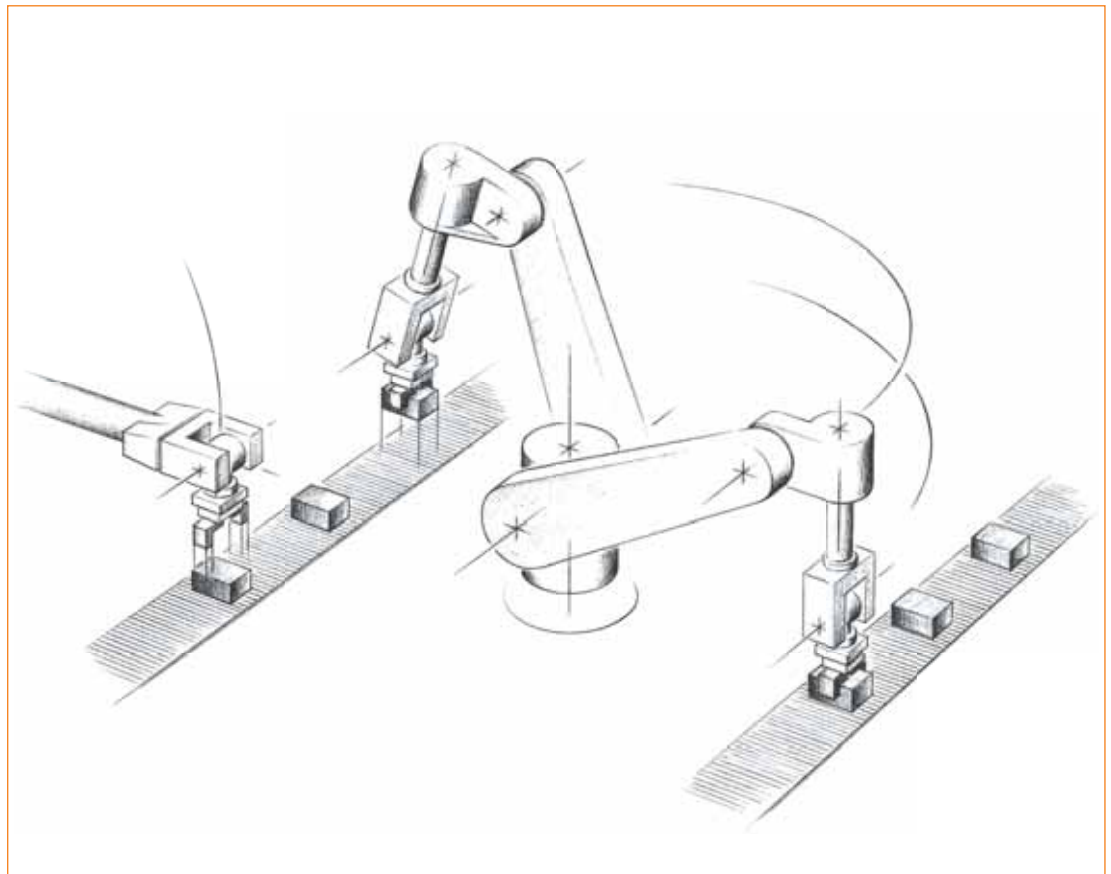


- Simple, effective optimization
- Simple handling of complex mechanics
- Direct approach of desired process position
- Simple process configuration

Creating Positioning Solutions with Soft CNC

The integrated Soft CNC system in Automation Studio unites all of the software components necessary for machine automation. The integrated system architecture, together with ACOPOS servo drives, provides many opportunities regarding reaction speed, data throughput and precision, and also allows cost savings to be made.

- Uniformly integrated ACOPOS servo drive technology
- Powerful and fast-reacting
- Unlimited flexibility of control and CNC systems provides room for automation ideas
- Eight independent CNC channels
- Up to a total of 100 axes for positioning, CNC and electronic gears
- Individual graphic interface
- Nearly unlimited system memory for programs, diagnostics, and process data
- Simulation mode for streamlined development
- Maximum comfort using more than 100 functions for all applications



Diagnostics and debugging

Diagnostic tools

Automation Studio provides a wide selection of diagnostic tools. These are divided into tools for reading control information and tools for optimizing the system.

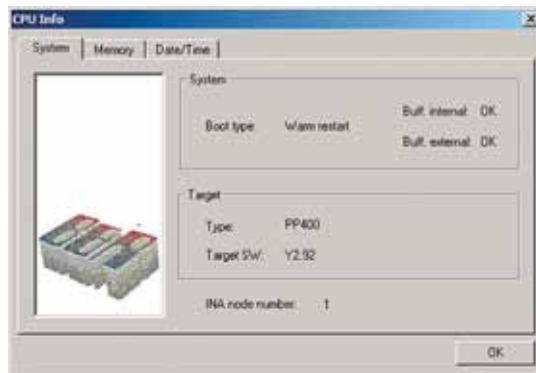
Status bar

The status bar displays the information about the run-time status of the control.

TcpIp/ANSL=1 /DAIP=10.43.19.215 PP400 Y2.92 RUN

Online information

The online information shows system information such as battery status, node number settings, available memory, and date/time settings.



System logbook

The Automation Runtime system records all error, warning, and information messages that occur during runtime in nonvolatile memory. Additionally, user information can also be entered in this system log.

This information can be read out as long as there is a connection with the system logbook, Automation Studio or another system tool.

For exceptions that are triggered by the control, the source code that triggered the error can be determined under certain circumstances. The necessary information is determined in the Backtrace window.

Object Name	Level	Time	Error Number	OS Task	Logger Module	Error Description
Online	Warning	2007-04-18 05:50:25.633000	28760	VCVisu	System	
System	Warning	2007-04-18 05:50:23.395000	10561	Acp10Nclid...	System	NC manager info (see ASCII Dat...
User	Warning	2007-04-18 05:50:21.241000	28760	VCVisu	System	
	Warning	2007-04-18 05:50:21.162000	10561	ROOT	System	NC manager info (see ASCII Dat...
	Warning	2007-04-18 05:50:11.397000	30972	ROOT	System	WARNING: PLC Reset Wam...
	Warning	2007-04-18 05:49:54.244000	7421	syssevr	System	
	Warning	2007-04-18 05:32:14.069000	10561	Acp10Nclid...	System	NC manager info (see ASCII Dat...
	Warning	2007-04-18 05:32:11.936000	10561	ROOT	System	WARNING: PLC Reset Wam...
	Warning	2007-04-18 05:31:45.094000	7421	syssevr	System	
	Warning	2007-04-18 04:09:15.411000	28760	VCVisu	System	
	Warning	2007-04-18 04:08:34.218000	28760	VCVisu	System	
	Warning	2007-04-18 04:07:26.985000	28760	VCVisu	System	
	Warning	2007-04-18 04:03:59.137000	28760	VCVisu	System	

Name	Value
Level	Warning
Date	18.04.2007
Time	05:50:21,162000
Error Number	10561
OS Task	ROOT
Logger Module	System
Object Name	Online

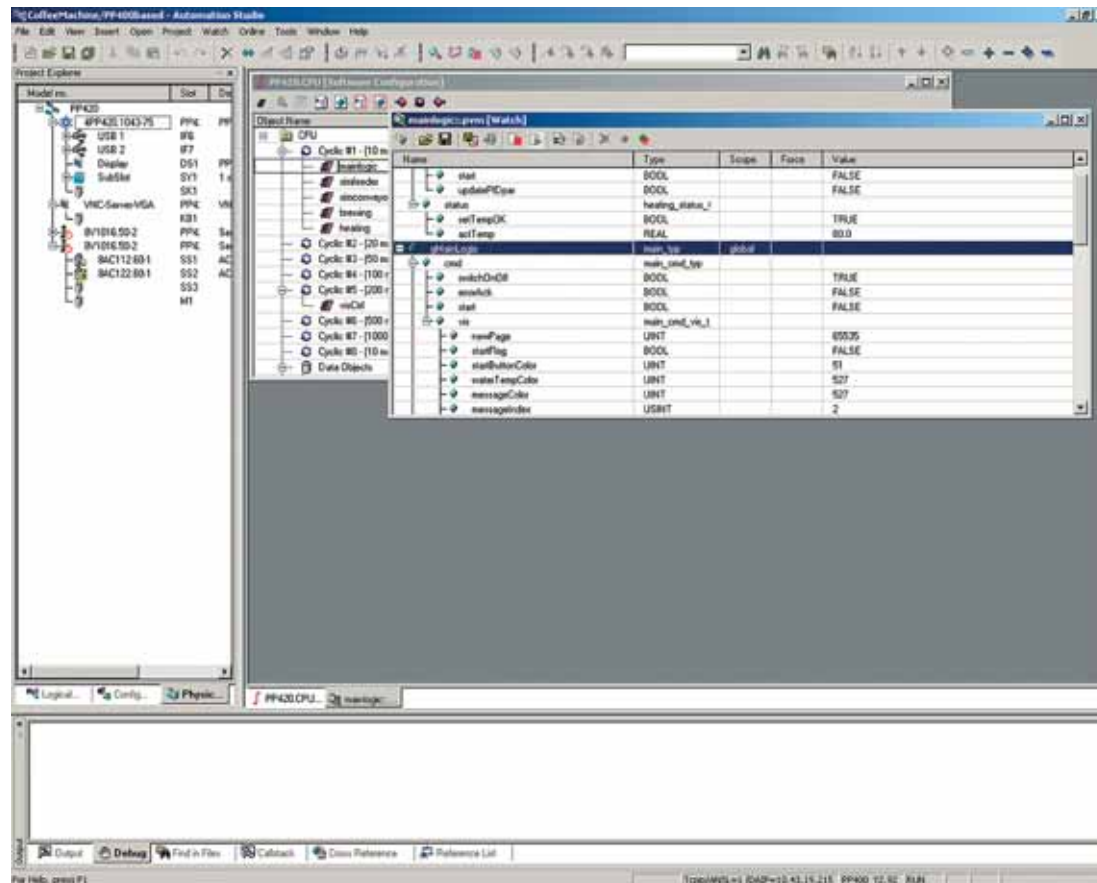
System logbook

Variable monitor

The variable monitor can be used to observe and modify the values of a task's process variables or the values of all the global variables on the target system. Values for simple or complex data types can be displayed.

The current configuration can be saved to allow multiple modifications or observations of process values.

- Displaying and modifying process values
- Information can include data type, scope, I/O data point
- Force I/O data points
- Archive and transfer process values to and from the control



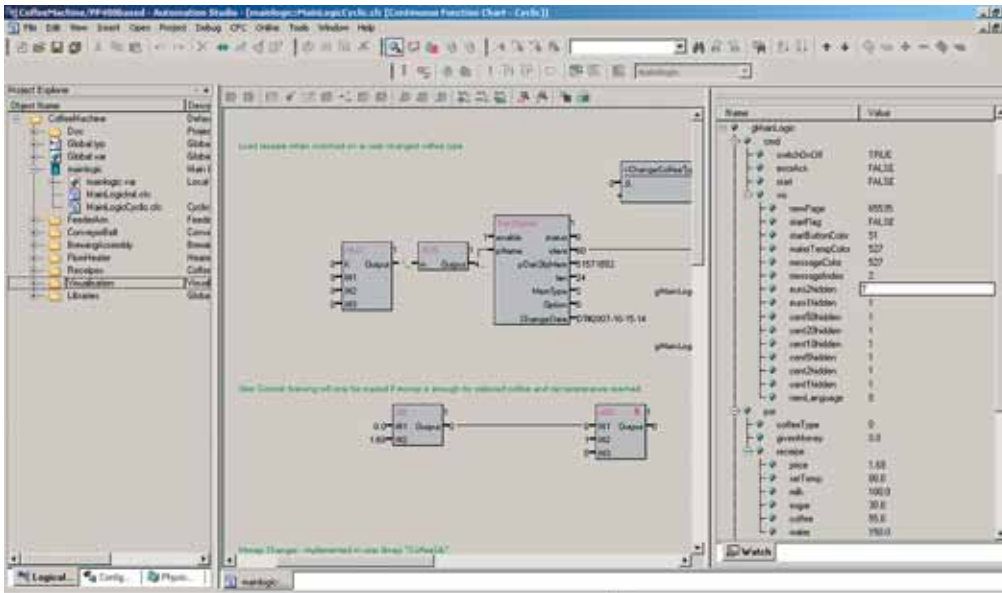
Variable monitor

Diagnostics and debugging

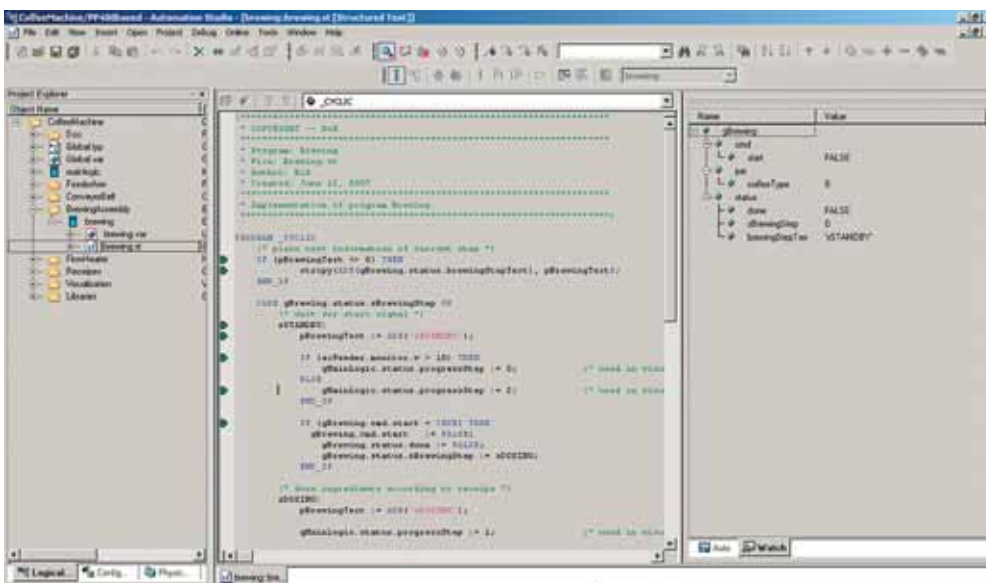
Task monitor

The task monitor is for observing the execution of an application program. Depending on the programming language being used, there are different methods for monitoring and modifying the execution of the program:

- Flow control
- Line coverage
- Variable monitor



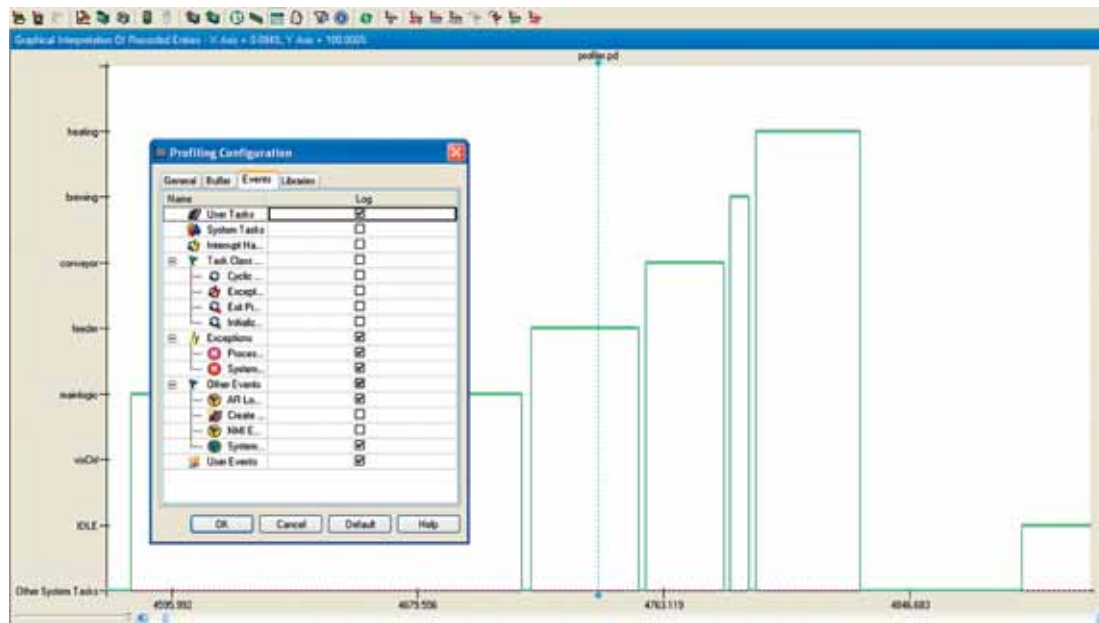
Modification of a variable while task monitor is active



Active line coverage in ST

Profiler

The profiler integrated in Automation Studio allows the runtime system to be analyzed with regard to system usage (load). The information gained from the profiler can be used to optimize the project, and in turn, the load on the runtime system.



Runtime measurement of the application task

The profiler measurement can be configured and operated via the connection to Automation Studio, or activated directly on the target system using functions from the advanced Automation Studio library.

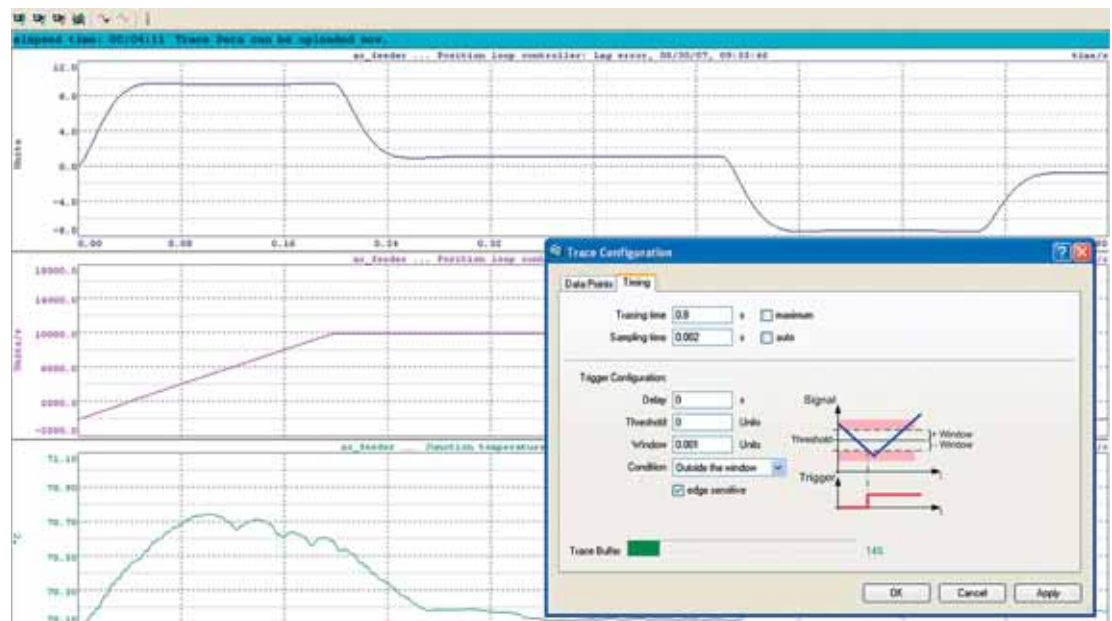
Record and analyze:

- Task runtimes
- Stack usage
- System usage

Variable oscilloscope

Using the variable oscilloscope, value changes can be recorded "offline" on the controller and displayed in a diagram.

- Record rapidly changing process variables
- Values are recorded directly on the controller
- Display value curve as a diagram
- Determine the chronological sequence of and relationships between process variables in different task classes
- Record the values at the beginning and end of a task cycle
- Maximum 8 values at a time
- Each task can be recorded
- Trace when "offline" using conditions to trigger start/stop
- Export function for external analysis of recordings



Trace configuration

Diagnostics and debugging

NC Diagnosis

If ACOPOS drives are used in the Automation Studio project, an NC diagnosis can be used to selectively record drive parameters and status information for analysis. This makes it possible to implement positioning tasks and their processes systematically.

Automation Studio includes all the tools necessary to analyze errors in motion applications.

For commissioning, tools are needed which allow defensive testing of functions:

- Integrated axis test for configuring and testing axis parameters
- Logging for communication, variables, and axes
- Extensive logbook for analysis of machine states
- Software updates via Automation Studio, Compact-Flash card, or USB flash drive
- Overwriting values to simulate different conditions

Index	Interface	Node	NC Object	Request	Time [s]	Time [s]	Response
	PLK[0]	1				2518...	
248	PLK[0]	1	ncAXIS 1	→ BASIS_MOVE_V_POS = 10000 ...	2518.544	2518...	
	PLK[0]	1				2518...	
250	PLK[0]	1	ncAXIS 1	→ BASIS_MOVE_V_NEG = 10000 ...	2518.554	2518...	
	PLK[0]	1				2518...	
252	PLK[0]	1	ncAXIS 1	→ BASIS_MOVE_A1_POS = 5000...	2518.564	2518...	
	PLK[0]	1				2518...	
254	PLK[0]	1	ncAXIS 1	→ BASIS_MOVE_A2_POS = 5000...	2518.574	2518...	
	PLK[0]	1				2518...	
256	PLK[0]	1	ncAXIS 1	→ BASIS_MOVE_A1_NEG = 5000...	2518.504	2518...	
	PLK[0]	1				2518...	
258	PLK[0]	1	ncAXIS 1	→ BASIS_MOVE_A2_NEG = 5000...	2518.594	2518...	
	PLK[0]	1				2518...	
260	PLK[0]	1	ncAXIS 1	→ CMD_CONTROLLER = ncSW_ON	2518.607	2518...	
	PLK[0]	1				2518...	
	PLK[0]	1	ncMODU...			2518...	00000000 00
263	PLK[0]	1	ncAXIS 1	→ CMD_HOMING	2520.561	2520...	
	PLK[0]	1				2520...	
				HOMING_S = 0 Units HOMING_MODE = ncDIRECT HOMING_MODE_BITS = 000... (3) ref_pulse = ncOFF (2) trigg_dr = ncPOSITIVE (1) start_dr = ncPOSITIVE (0) edge_sw = ncPOSITIVE			
	PLK[0]	1	ncMODU...			2520...	00000000 00
266	PLK[0]	1	ncAXIS 1	← HOMING_TR_S_REL	2520.598	2520...	0
	PLK[0]	1				2520...	0
268	PLK[0]	1	ncAXIS 1	← HOMING_OFFSET	2520.608	2520...	0
	PLK[0]	1				2520...	0
270	PLK[0]	1	ncAXIS 1	→ BASIS_MOVE_V_POS = 10000 ...	2524.318	2524...	
	PLK[0]	1				2524...	
272	PLK[0]	1	ncAXIS 1	→ BASIS_MOVE_V_NEG = 10000 ...	2524.335	2524...	
	PLK[0]	1				2524...	
274	PLK[0]	1	ncAXIS 1	→ BASIS_MOVE_A1_POS = 5000...	2524.345	2524...	
	PLK[0]	1				2524...	
276	PLK[0]	1	ncAXIS 1	→ BASIS_MOVE_A2_POS = 5000...	2524.355	2524...	
	PLK[0]	1				2524...	
278	PLK[0]	1	ncAXIS 1	→ BASIS_MOVE_A1_NEG = 5000...	2524.365	2524...	
	PLK[0]	1				2524...	
280	PLK[0]	1	ncAXIS 1	→ BASIS_MOVE_A2_NEG = 5000...	2524.375	2524...	
	PLK[0]	1				2524...	
282	PLK[0]	1	ncAXIS 1	→ CMD_POS_MOVE	2524.385	2524...	
	PLK[0]	1				2524...	
				BASIS_MOVE_V_POS = 1000... BASIS_MOVE_MODE = ncST...			
	PLK[0]	1	ncMODU...			2524...	00000000 00
285	PLK[0]	1	ncAXIS 1	→ CMD_BASIS_MOVE_HALT	2534.938	2534...	
	PLK[0]	1				2534...	
	PLK[0]	1	ncMODU...			2535...	00000000 00

Trace command for displaying movements

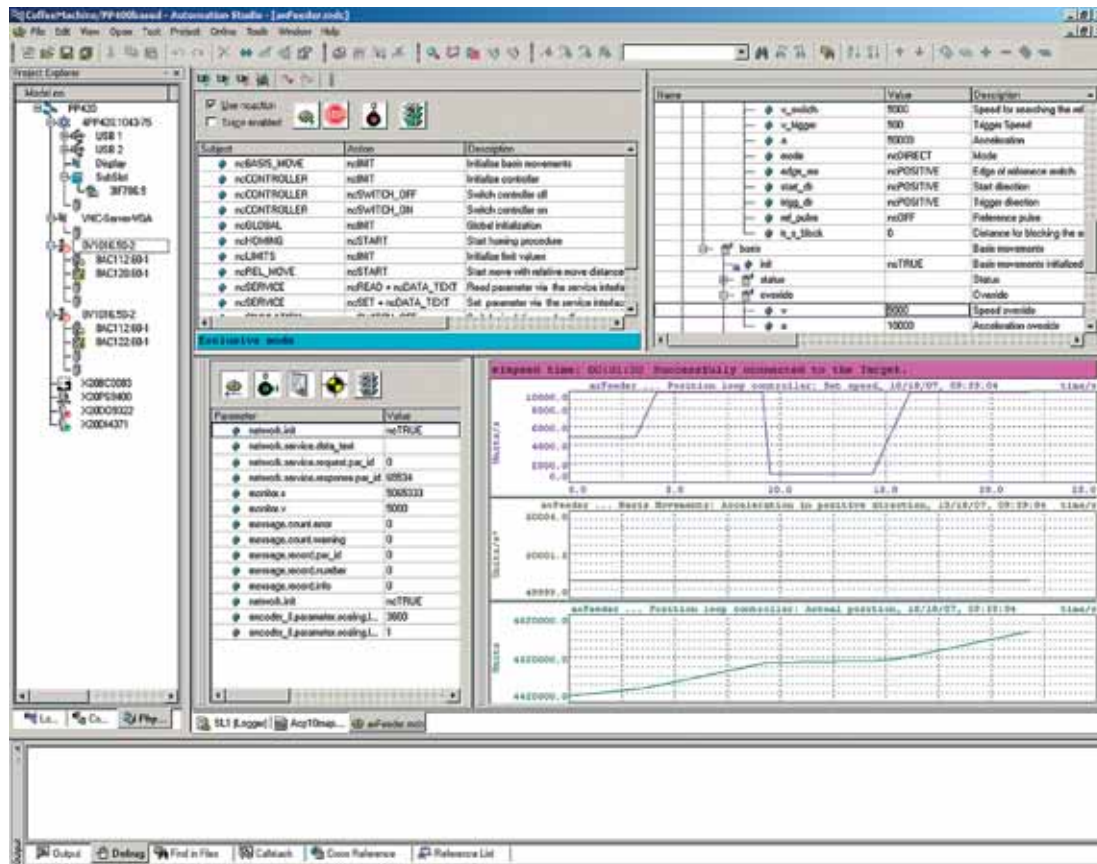
From design to maintenance, Automation Studio integrates all the tools needed to meet the demands of modern positioning tasks.

NC Test Center

The NC test center combines the individual NC testing and diagnosis tools from:

- NC variable monitor
- NC oscilloscope
- NC command interface

Depending on the current view, you can select a graphical representation of the axis parameters of the network trace command for system analysis and error analysis of data traffic between the drive and the control.

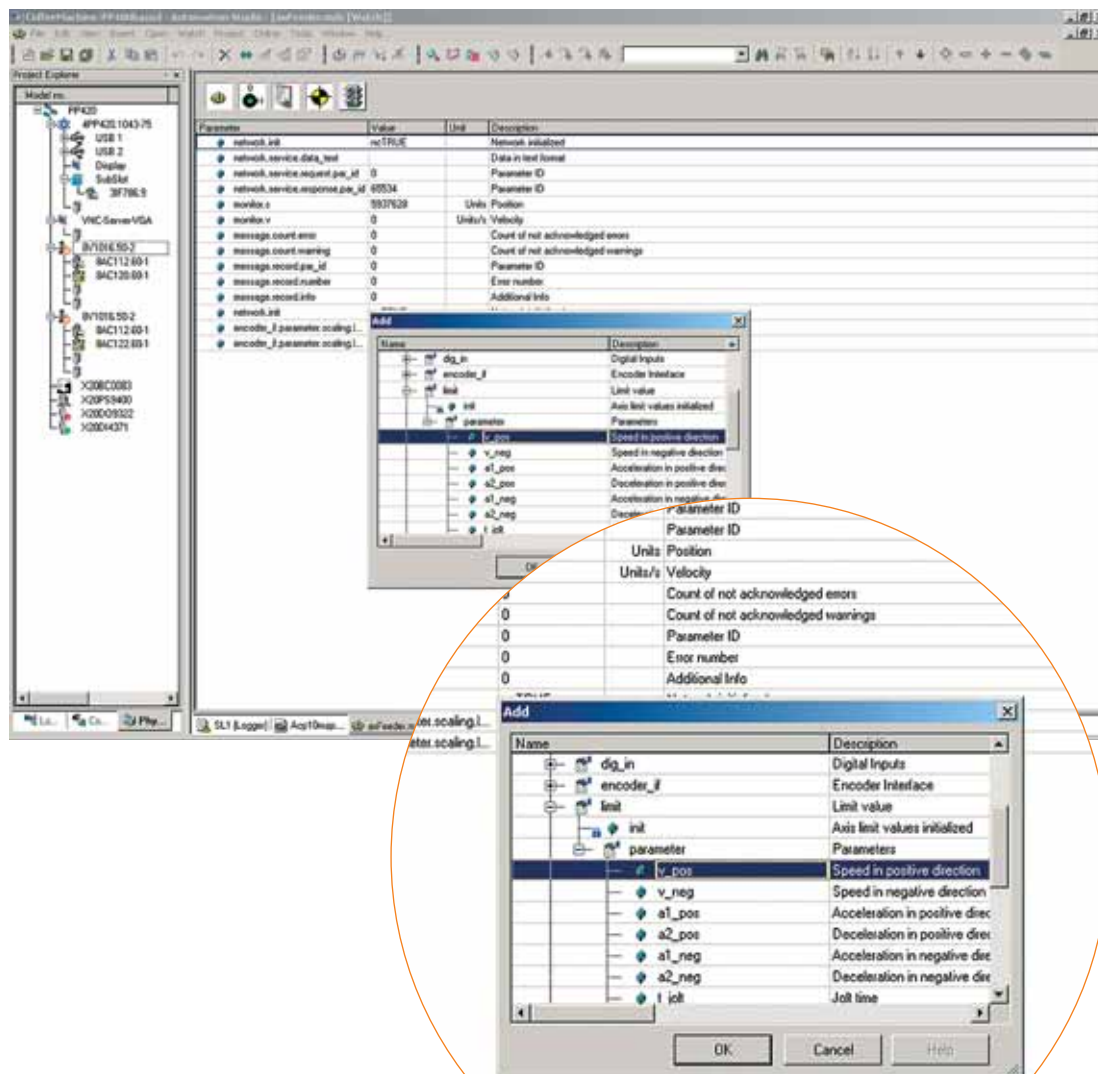


NC test window

Diagnostics and debugging

NC variable monitor

The NC variable monitor can be used to observe the values of the NC variable structure. Changing values and canceling NC commands is only possible in the NC test window.

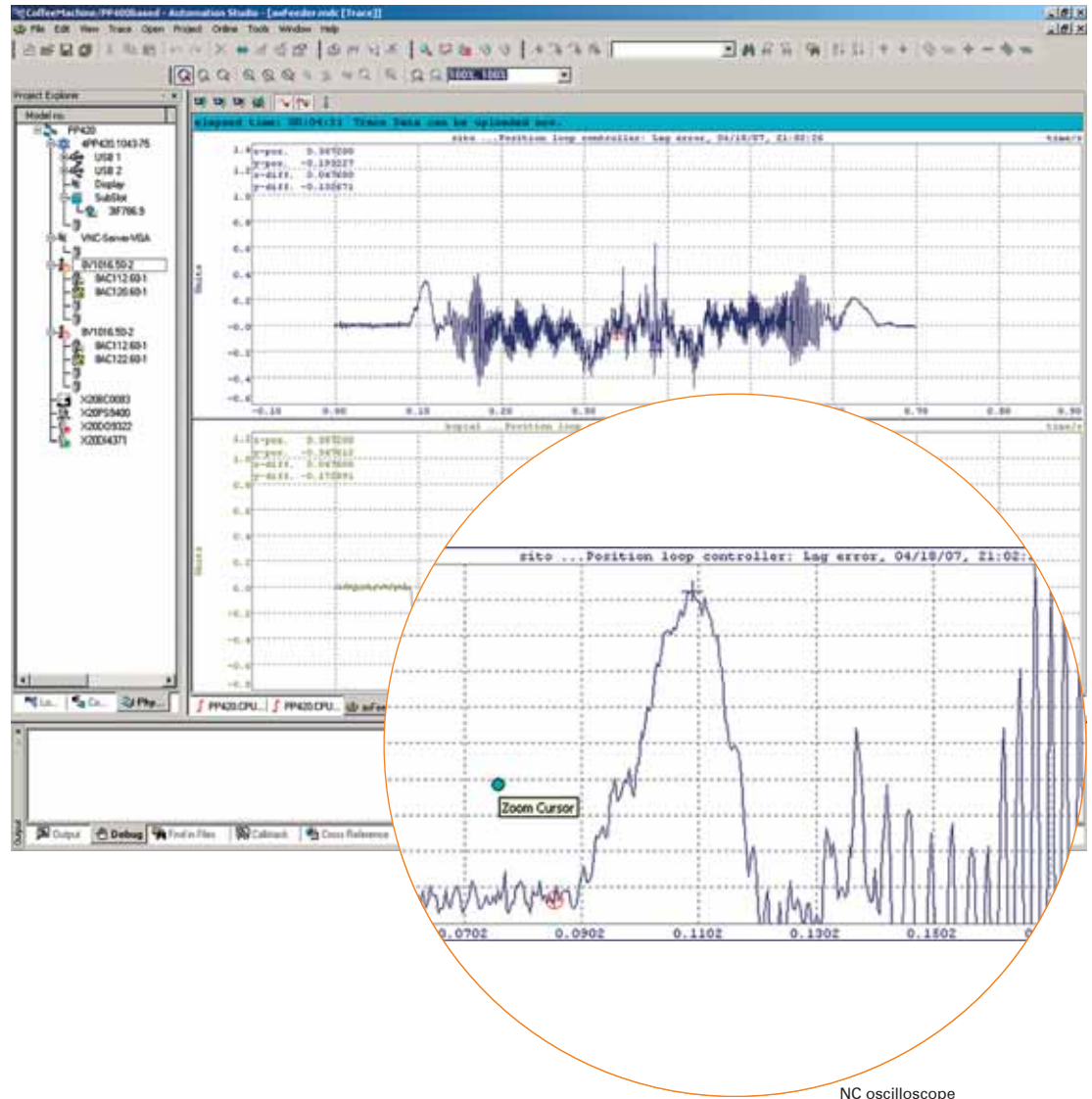


Inserting ACP10 structure variables in the NC variable monitor

NC oscilloscope

The NC oscilloscope is used for graphical analysis of all drive parameters in the system.

- Scan rate up to $50 \mu\text{s}$ (depending on drive)
- Defined trigger - pre/post
- x,y representation
- Mathematic operations
- Standard closed loop control functions
- FFT, high pass / low pass filter
- Effective value calculation
- Save and load the recording as CSV file
- Measurement cursor and zoom functions



NC oscilloscope

Help system

Online Help

The help system in Automation Studio provides the user with comprehensive hardware and software documentation.

- Context sensitive help from Automation Studio
- Full-text search
- Detailed hardware documentation including technical data
- Descriptions of software components - Reference manual
- Descriptions of standard libraries



Technical data - PP400

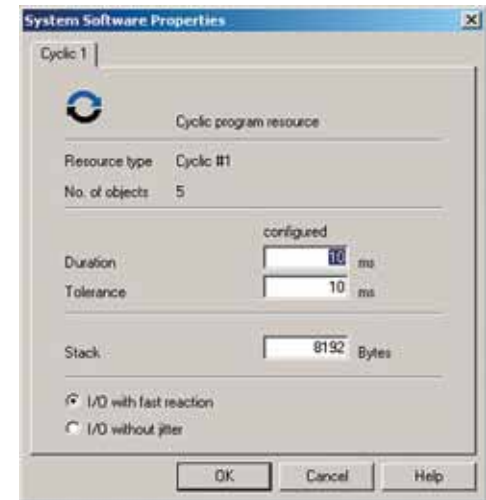
Real-time operating system

Scalability and investment security

An integral component of Automation Studio is the real-time operating system, the software kernel that allows applications to run on a target system.

This runtime environment offers numerous important advantages:

- Guaranteed highest possible performance for the hardware being used
- Runs on all B&R target systems
- Makes the application hardware-independent
- Applications can be easily ported between B&R target systems
- Cyclic runtime system guarantees deterministic behavior
- Multitasking according to deterministic runtime rules
- Configure priorities, time classes, and jitter tolerance
- Up to eight different time classes with any subprograms
- Guaranteed response to time violations and jitter tolerances
- Exception programming
- Configurable jitter tolerance in all task classes
- Supports all relevant programming languages, such as IEC 61131-3 and ANSI C
- Extensive function library conforming to IEC 61131-3 as well as the expanded B&R AutomationLibrary
- Access to all networks and bus systems via function calls or the Automation Studio configuration



Configuration of cycle time and tolerances

Object Name	Version	Transfer	Size [Byt.]	Source	Source File	Description
CPU						
Cyclic #1 - (10 ms)						
mainlogic	1.00.0	UserROM	0	mainlogic	\Cpu.svr	Main Logic Control
simfeeder	1.00.0	UserROM	0	FeederArm.simfeeder	\Cpu.svr	feeder logic control
simconveyor	1.00.0	UserROM	0	ConveyorBelt.simconveyor	\Cpu.svr	Conveyor Logic Control
brewing	1.00.0	UserROM	0	BrewingAssembly.brewing	\Cpu.svr	Brewing Logic Control
heating	1.00.0	UserROM	0	FlowFeeder.heating	\Cpu.svr	Heating PID
Cyclic #2 - (20 ms)						
Cyclic #3 - (50 ms)						
Cyclic #4 - (100 ms)						
Cyclic #5 - (200 ms)						
visCtrl	1.00.0	UserROM	0	Visualisation.visCtrl	\Cpu.svr	
Cyclic #6 - (500 ms)						
Cyclic #7 - (1000 ms)						
Cyclic #8 - (10 ms)						
Data Objects						
espres	1.00.0	UserROM	0	Recipes.espres	\Cpu.svr	Espresso
cappu	1.00.0	UserROM	0	Recipes.cappu	\Cpu.svr	Cappuccino
normal	1.00.0	UserROM	0	Recipes.normal	\Cpu.svr	Normal coffee
Acq10.sys						
No Data Objects						
conv_ini	1.00.0	UserROM	0	ConveyorBelt.conv_ini	\Cpu.svr	Conveyor axis configuration
feed_ini	1.00.0	UserROM	0	FeederArm.feed_ini	\Cpu.svr	Feeder axis configuration
acp_err	1.00.0	UserROM	0	FeederArm.acp_err	\Cpu.svr	ACP10: ErrorTest data object
motor_sim	1.00.0	UserROM	0	FeederArm.motor_sim	\Cpu.svr	Parameters for motor simulation
Visualisation						
Visu	1.00.0	UserROM	0	Visualisation.Visu	\Cpu.svr	640x480 (VGA)
Binary Objects						
Library Objects						
Configuration Objects						
actfwd	1.00.0	UserROM	1316			
actrv	1.00.0	UserROM	99624			
Acq10Cfg	2.00.1	UserROM	736		\Cpu.svr	
acconfig	1.00.0	SystemR...	1532		\Cpu.svr	
ionap	1.00.0	UserROM	1748		\Cpu.svr	
syncconf	2.92.0	SystemR...	9488		\Cpu.svr	

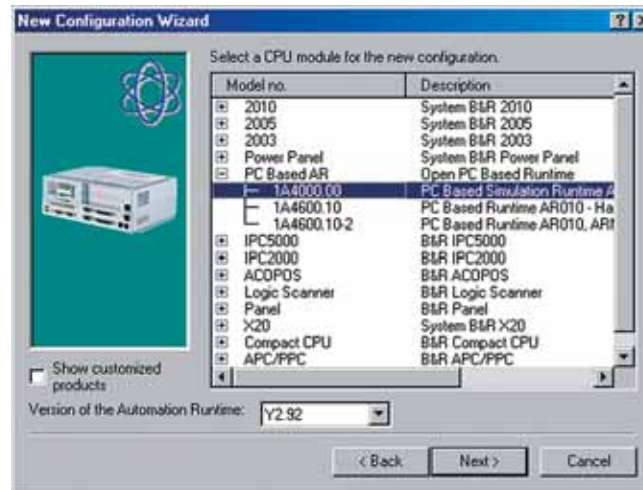
Division of software components in various task classes

Real-time operating system

One runtime environment - Many target systems

All B&R target systems support the real-time operating system. The target system is selected based on the performance and equipment requirements.

The real-time operating system guarantees the user that Automation Studio will provide a consistent environment.



Selecting the target hardware

Real-time and performance

The B&R real-time operating system meets the highest demands for determinism and speed. To take advantage of this performance advantage in the application, an abstraction layer is put over the real-time OS. This ensures the user that no adjustments will need to be made to the application if a different operating system is used.

The uniform programming interface always remains the same.

- Maximum performance by optimizing to the hardware being used
- Deterministic cycles with minimum jitter
- Task cycle synchronized with I/O cycle
- Identical behavior for the entire B&R I/O system

CONFIGURE the POWERLINK cycle time

Task cycle synchronized with I/O cycle

Application	
IEC-61131-3 / ANSI C programs	
IEC FBKs / B&R advanced automation libraries	
Cycle time insurance system	
B&R OS abstraction layer	
B&R OS abstraction layer	Device
B&R OS abstraction layer	Driver
B&R hardware: Control systems, IPC, APC	

Layer model of the runtime system

Complete scalability of controller, visualization application and drive

Scalability doesn't just make a difference with regard to speed; it's also important depending on the areas of application themselves.

- Scalable performance
- Adapts seamlessly to CPUs of different performance classes
- The runtime system enables projects to be ported simply
- Grows along with the application
- Scalable function range
- Uniform programming interface
- If a new solution or hardware is integrated, the runtime environment remains unchanged
- Grows along with the requirements
- The visualization project can be developed with the same runtime environment as the control project
- Uniform control of ACOPOS motion systems
- CNC functions can be added without leaving the runtime environment
- Services like FTP or Web servers can be easily enabled or loaded
- A secure CompactFlash file system
- PC-conforming data storage



Real-time operating system

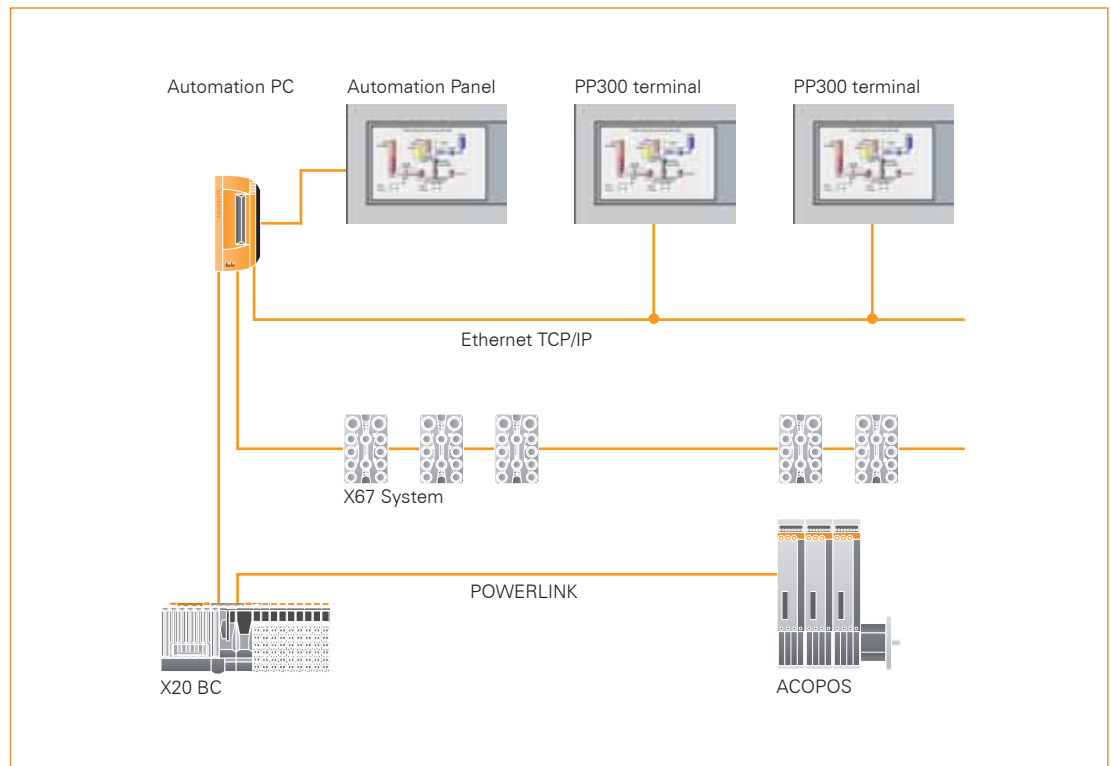
Windows XP with AR010 - Real-time and SoftCNC

The AR010 runtime environment runs in conjunction with the Windows XP Embedded or XP Professional operating system while meeting real-time, deterministic demands.

While AR010 controls real-time aspects of the application, the Windows operating system runs its standard applications at a lower level.

AR010 capabilities:

- Windows blue screen save
- AR010 continues to run normally, even if Windows crashes
- Guaranteed CPU time - Windows does not influence real-time
- Guaranteed master via real-time hardware
- With ARNC0 Soft CNC functions on B&R PCs
- B&R Automation PC provides high-performance control, motion, and visualization
- Configuration in Automation Studio provides access from AR010 to B&R fieldbus cards and APC hardware components (USB, Ethernet, etc.)
- The comfort of Windows, the performance of a real-time solution
- Coexistence of Windows XP with a proven real-time operating system
- MultiCore support (APC810) separation of Automation Runtime and Windows

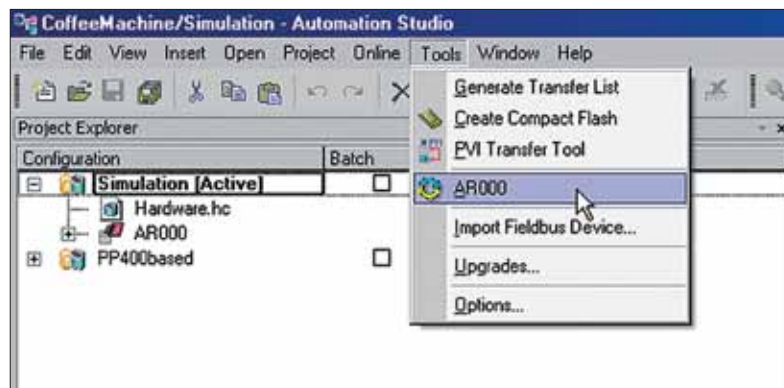


System configuration - AR010

Simulation of application using AR000

The AR000 simulation operating system, which is based on the PC operating system Windows XP, was specially developed for simulating and testing applications.

- Simulate and test the application
- Simulate I/O using the I/O simulation integrated in Automation Studio
- Present applications on your laptop using the integrated VNC server
- Virtual timer: Configurable timing for the application program (simulation of accelerated or decelerated processes)



Start the AR000 from Automation Studio

Communication and fieldbus systems

Automation Net - PVI

The PVI (Process Variable Interface) integrated in Automation Studio provides the user with all the communication services needed to transfer variables or modules between the PC and the control.

By connecting the various fieldbus systems to the B&R control system, it is possible to establish remote communication with I/O components from different manufacturers.

Communication with the PVI

The PVI offers the user a flexible and easy solution for implementing communication between control systems and between the PC and B&R control systems.

The possibilities of PVI range from simple data exchange between a visualization and a B&R controller, up to complex client / server applications that utilize the full scope of the PVI.

Automation Studio uses all of the PVI functions - from simple variable exchange (variable monitor) up to the transfer of entire projects to the B&R controller.

Open access to the PVI makes numerous interfaces available to the user for connecting Windows Client Software to the PVI. These range from programming with the help of PVI functions in the most common Windows development environments to setting parameters and configuring the PVI application.



Automation Net - PVI

PVI access

The PVI can be programmed in the following Windows 32/Windows CE programming environments. These provide the Windows application developer with the necessary tools for every programming language:

- Microsoft® Visual Studio 6.0 (Win32)
 - Visual Basic 6.0
 - Visual C++
- Microsoft® Visual Studio.NET (Win32 and WinCE)
 - C#
 - VB.NET
- Borland C Builder (Win32)
- Delphi (Win32)

Communication with the control

Communication between the Windows PVI application (e.g. Automation Studio) and the controllers takes place via the PVI line. Depending on the line ↔ communication protocol used, multi-master/multi-slave communication is possible with multiple networked PCs and controllers.

The target system's real-time operating system allows cross-system communication between separate networks or communication media.

Depending on the type of communication used, communication is possible between the PC and all B&R controller generations.

For communication with internal IPC or APC functions (component temperature queries, key queries or LED control of connected displays, etc.) there are additional

PVI lines available in order to guarantee universal axis from the Windows application.



Communication and fieldbus systems

Automation Studio and OPC

OPC (OLE for process control) is an industrial standard that was created with the participation of numerous worldwide leading automation and hardware manufacturers in cooperation with Microsoft® and managed by the OPC Foundation.

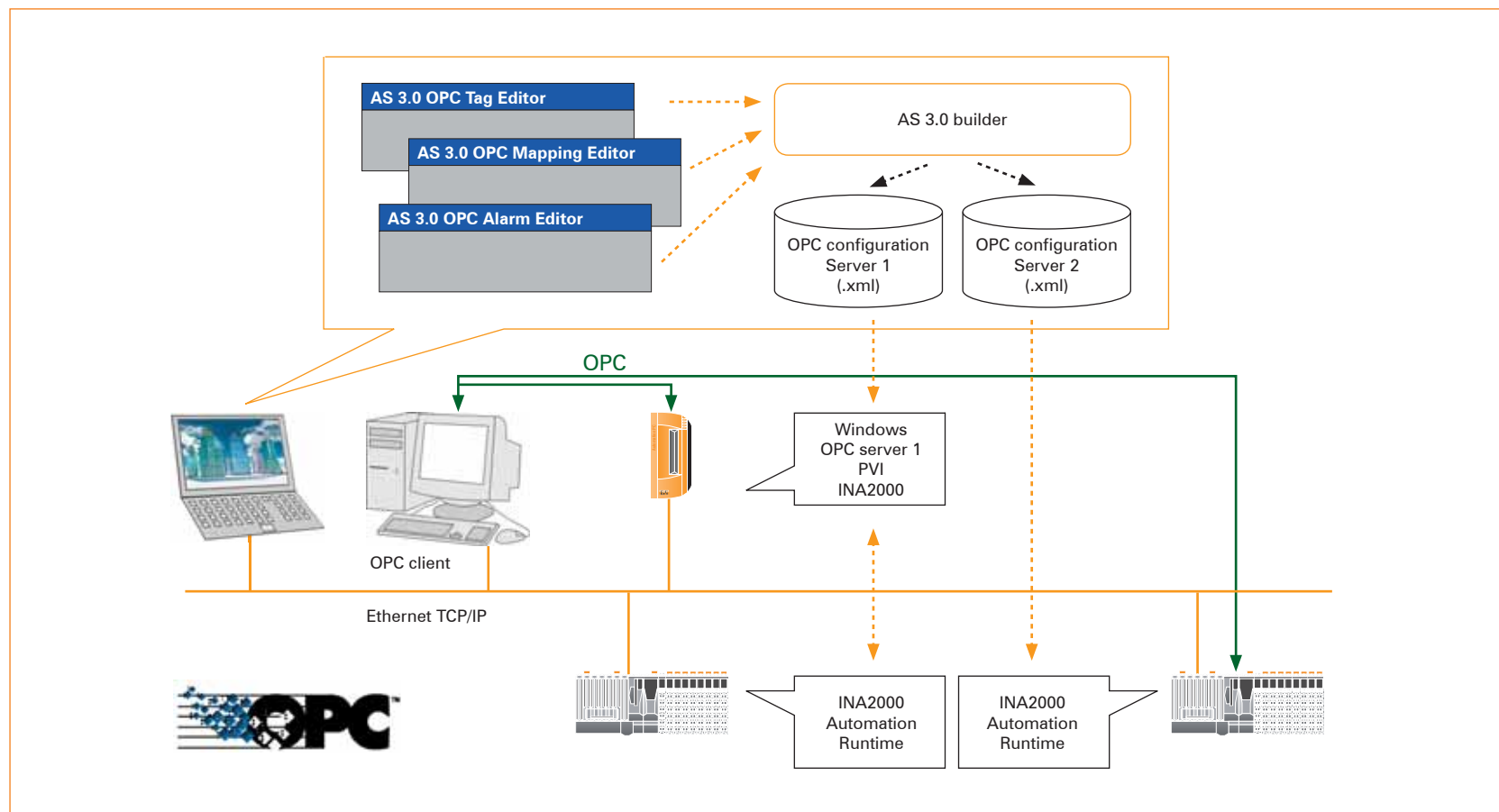
OPC is based on Microsoft's OLE (Object Linking and Embedding) and COM (Component Object Model) technology and comprises a set standard interfaces, features and methods used by automation clients for

process control and manufacturing.

Access to the OPC client can take place either on the OPC server of a Windows PC or on the OPC server integrated in Automation Runtime.

The standardized interface enables the user to select any SCADA package (Supervisory Control and Data Acquisition) that supports OPC or to create his own OPC client based on Visual Studio.NET, VC++ or VB.

When configuring the control application in Automation Studio, the user can access the process variables directly to create and manage an OPC configuration.



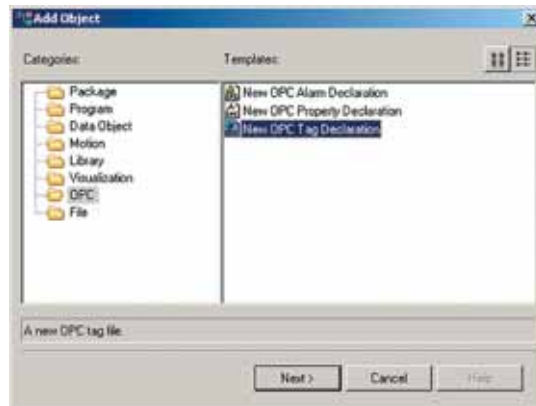
Automation Studio and OPC

OPC tags

OPC tags can be taken directly from the project's variable files via drag & drop.

The properties of an OPC tag can be edited as usual in the Automation Studio property page.

- Process variable format
- Access type, such as read or write, event variable, etc.
- Link to OPC alarm



Configure OPC tags, alarms and properties

OPC Tag N...	Data Type	Description
intVar1	INT16	
intVar1	INT16	
realVar1	FLOAT32	
uintVar1	UINT16	

Property	Value
Length	2
Format	
Is vector	false
Element count	1
Is array element	false
Index	0
Bit address	false
Bit number	0
Access	
Access type	DATA
Read access	true
Event mode	false
Write access	true
Write response	false
Fast echo	false
Refresh off	false
Refresh once	false
Refresh with time	true
Refresh time	1000
Values	
Has default	false
Default value	
Is manual	false
Manual value	
Hysteresis	
Alarm	

Settings

Create and manage OPC configuration directly in Automation Studio

Communication and fieldbus systems

OPC alarms

An OPC alarm describes the properties of an alarm definition. This configuration can be linked to one or more OPC tags.

- Alarm type for bit or value alarm
- Update rate
- Alarm limits for high and low

OPC mapping

OPC mapping assigns PVI specific properties to each OPC tag.

- Multiple tags on one process object
- PVI specific settings
- Set up special objects
- Distributed development
- Multiple mappings possible
- Systematic distribution

Property	Value
MCAlarm1	
Type	limit
Update rate	5000
Deadband	1
LowLow	
Enabled	true
Value	0
Message body	LoLo Level Alarm
Severity	850
Required acknowledge	true
Low	
Enabled	true
Value	10
Message body	Lo Level Alarm
Severity	500
Required acknowledge	true
High	
Enabled	true
Value	90
Message body	Hi Level Alarm
Severity	500
Required acknowledge	true
HighHigh	
Enabled	true
Value	100
Message body	HHi Level Alarm
Severity	850
Required acknowledge	true
Return to normal	
Enabled	false
Message	Return To Normal

OPC alarm configuration

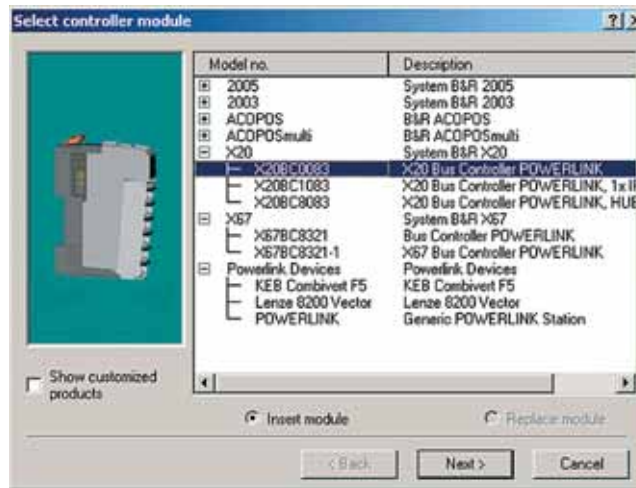
Property	Value
realVar1	
PVI path	realVar1
PVI type	Pvar
Access type	DATA
Process object specific parameters	
Variable type (VT)	I32
Values number (VN)	1
Variable length (VL)	4
Hysteresis (HV)	
Connection descriptor (CD)	realVar1
Attributes (AT)	rw
Refresh frequency (RF)	1000
Default value (DV)	
Others	
Link object specific parameters	
Casting mode (CM)	0
PG2000/AS 1.3. string	false
Decimal mode	false
Value range monitoring	false
4/5 rounding mode	false
Always terminate strings	false

Mapping of OPC tags with PVI specific properties

Fieldbus integration

Fieldbuses

In Automation Studio, a fieldbus device is added like an I/O module to the corresponding fieldbus interface. Configuration and I/O assignments take place in the project hardware tree, just like for all I/O modules. The import function provides a uniform interface for importing device descriptions from the various providers (GSD, EDS, etc.).



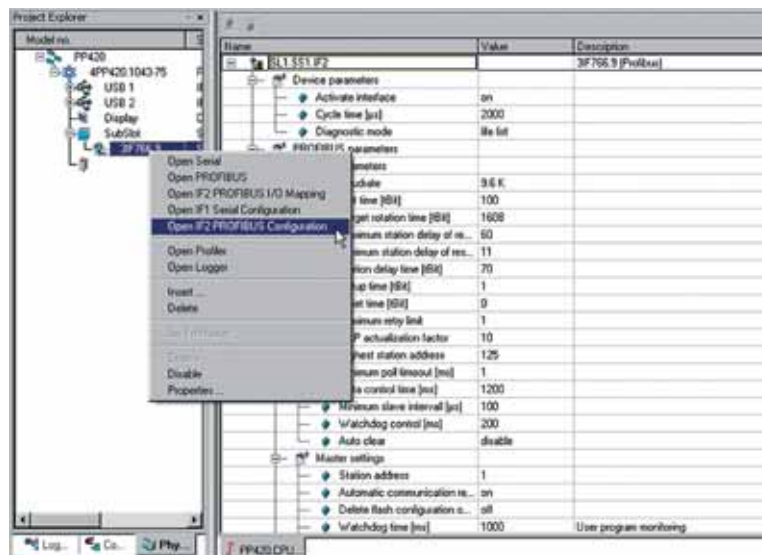
Inserting a fieldbus module

Complete integration in Automation Studio

- Import function for device descriptions (.GSD, .EDS, etc.)
- Conversion into HWC file
- Display of the fieldbus modules in the AS hardware tree

Fieldbus integration

- Available fieldbus systems
 - POWERLINK
 - CANopen
 - Profibus DP
 - ModbusTCP/IP
 - EthernetIP
 - DeviceNet
 - ModbusIDA
 - PROFINET
- Module is available in the hardware tree
- I/O configuration
- Master and slave settings
- Assign variables to I/O
- Library for special access
- Connect fieldbus IO channels
- Create the I/O layout for non-B&R devices in the I/O configuration
- Assign channels to variables in the I/O mapping
- Export function for generating device descriptions (.GSD, .EDS, etc.)



Configuration of fieldbus module in the hardware tree

Libraries

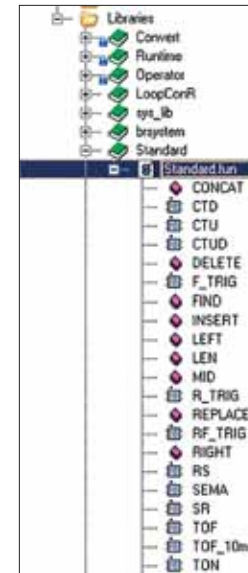
Automation Studio libraries

Automation Studio provides IEC 61131-3 libraries as well as additional functions for: runtime diagnostics and system information; communication to other controllers and I/O systems; closed loop control systems and the visualization system; and positioning tasks. This covers all the functions needed for all programming languages.

These libraries allow automation projects to be quickly and portably programmed, without having to reinvent the wheel.

- IEC 61131-3 and IEC standard functions
- Communication
- Visualization
- Motion control
- Data management and storage
- Hardware configuration and diagnosis
- Mathematical functions
- PLCopen
- Temperature and hydraulic drive control

User libraries can be created in any programming language



Libraries

IEC 61131-3 and PLCopen function blocks

The IEC 61131-3 standard defines programming languages used for automation. PLCopen is a worldwide association, independent of both manufacturers and products. Their attention is given to standardizing programming tasks in the controller world with a focus on the IEC 61131-3 standard. IEC 61131-3 and PLCopen offer the following advantages:

- Definitions of standard data types
- Advanced data types like arrays and structures
- User programs can be structured using precisely defined elements. The POU (Program Organization Unit) contains functions and function blocks (FBKs)
- All POUs can include local data
- Fully defined interfaces used to exchange data between POUs

- Functions and function blocks are purely symbolic elements independent of addresses and modules

The programming languages used in Automation Studio meet the criteria defined by the IEC 61131-3 standard. In addition, they clearly adhere to the defined syntax and semantics rules. Besides that, standard functions and function blocks are also supported. Users who have learned any one of these standard lan-

guages can put their knowledge to use, regardless of the development environment. Training costs are reduced. Both users and service personnel use a uniform programming standard understood throughout the world, allowing programs and subprograms to be expanded beyond the limits of the system.

IEC 61131-3 functions

Description	B&R IEC Library
Simple data type conversions	CONVERT
Date and time conversions	CONVERT
Network data type conversions	CONVERT
Swapping simple data types	CONVERT
Arithmetic functions	OPERATOR
Comparators	OPERATOR
Assignment and limit functions	OPERATOR
Bit-shift and logic functions	OPERATOR
Address functions and large calculations	OPERATOR
Additional functions for controlling IEC objects	RUNTIME
Counter functions	STANDARD
Timer and impulse functions	STANDARD
Edge and trigger functions	STANDARD
String handling	STANDARD
Semaphore functions	STANDARD
Motion FBKs for single and multi-axis operations	MOTION

Libraries

Expanded automation library

B&R offers an expanded function library based on Automation Runtime in addition to the IEC standard library.

Configuration, system information, runtime control, and help

Description	B&R IEC Library
Configuring the runtime environment	AsARCFg
Functions for querying control status	AsHW
Access to System 2003 Powerlink modules	AsPlkSup
Functions for manipulating character strings and memory blocks (ANSI C / UNICODE)	AsString, AsWStr
Easy access to familiar functions from the world of ANSI C	
Support for IEC date/time data types and functions (reading SNTP - Simple Network Time Protocol - status messages).	AsTime
Interface for access and controlling UPS modules	AsUPS
System functions such as runtime information and battery status	BRSystem
Access and configuration of I/O modules on the CAN bus	CANIO
Reading the IP address of the target system	AsHost
Ping an Ethernet station	Aslcmp
Control via the FlashPROM	DM_Lib
Control via the profiler, logger	AsArLog, AsArProf
Runtime control for IEC tasks	Runtime
Spooling data for intelligent peripherals	Spooler
Advanced system functions such as multi-tasking, error handling, and memory management of cyclic objects, system states, RTC and timers, generic variable access and other system functions	SYS_lib
SRAM support for IPC200x	SRAM200

Visualization

Description	B&R IEC Library
Direct access to the visualization components visualization application	Visapi
User events and recording of variable changes (report)	VCLib
Create screenshots and store as bitmap	VCsrsht
Access to keys and display on Panelware panels	C220man
Handling MP40/50 operating elements, VNC management of clients	AsRfbExt

Direct I/O access

Description	B&R IEC Library
Direct access to I/O modules	IO_Lib
Direct access to SGC I/O modules	AsSGCIO
Creating I/O shovel instructions	IOConfig
Control and configuration for 2003 I/O modules	IOCtrl
Remote I/O operations	RIO_Lib

Motion libraries

Description	B&R IEC Library
PLCopen Function Blocks	PLCopen
Support of CNC software for IPC/APC	ARNCO
PLCopen functions for single and multiple axes over POWERLINK and CAN	acp10_mc
Direct configuration of single and multi-axis projects, management of cam profiles	acp10

Communication

Description	B&R IEC Library
Exchanging process variables over any network	AsIMA
INA library expansion	Commserv
Access to Ethernet UDP and TCP/IP protocols	AsEth
Communication driver for CIP EtherNet/IP	AsEthIP AsTCP AsUDP TCPIPGR
BSD access to Ethernet sockets	EthSock
Handling POWERLINK interfaces	POWERLINK
CAN bus functions	CAN_Lib
3964R protocol support	DRV_3964
Modbus protocol support	DRV_mbus
B&R MiniNet protocol support	DRV_mnet
ABDF1 protocol support	DRVABDF1
B&R NET2000 protocol support	NET2000
ARCNET OS9 protocol support	AsArcnet
L2DP protocol support	AsL2DP
Sending emails via SMTP server	AsSmtp
Profibus DPMaster and DPSlave protocol support	DPMaster
Reading and writing process variables from/to networked controllers	INAclnt
Loading modules, access to data and time	
Frame driver for serial communication	DVFrame
Data exchange between parallel processors	PPdpr
Controlling fieldbus modules	FB_Lib
Reading and writing data from/on Profibus stations	PB_Lib
Starting and stopping SLIP devices	AsSLIP
Starting and stopping PPP devices	AsPPP
Support for L2DP slave module 7IF361.70-1	IF361
Support for L2DP slave module 3IF661.9	IF661
Control RIO stations	RIO_Lib
POWERLINK V2 function support	AsEPL

Closed loop control and mathematics

Description	B&R IEC Library
Conversion of analog values	AsCont
Mathematical functions as an expansion of the IEC 61131-3 library	AsMath
Programming control loops based on REAL values	LoopConR
Programming control loops	LoopCont
Closed loop control for hydraulics	AsHydCon

Data access and data storage

Description	B&R IEC Library
Saving and long-term storage of data	DataObj
Access to floppy drives	FDD_Lib
Direct access to files in local or network directories (CIFS - Common Internet File System)	FileO

Project installation and distribution

PVITransfer tool

Responses to different hardware configuration and expansion stages are necessary during production or servicing.

To meet these demands, you can start the PVITransfer tool inside Automation Studio to install the target hardware. Another option for installing or updating projects on the target system is USB remote installation.

Automatic creation of a project list for the active project provides the user with various tools for individual adjustment of the target configuration.

PVITransfer

- Create a bootable CompactFlash card including the operating system for the specified target hardware
- Functions for transferring project versions or project updates by generating a CD
- Manually create customer-specific project lists
- Functions for reading the log book from the target system for error analysis
- Archive variable values from target hardware
- Create update lists for project expansions

The extensive functions of the PVITransfer tool make it possible to meet the highest service and production demands time and again. All installation steps can be automated.

The option of creating a CD makes it possible to send the project via the Internet for on-site installation without Automation Studio.

Automation Studio supports flexible production and can be integrated into existing processes



Creating a CompactFlash card

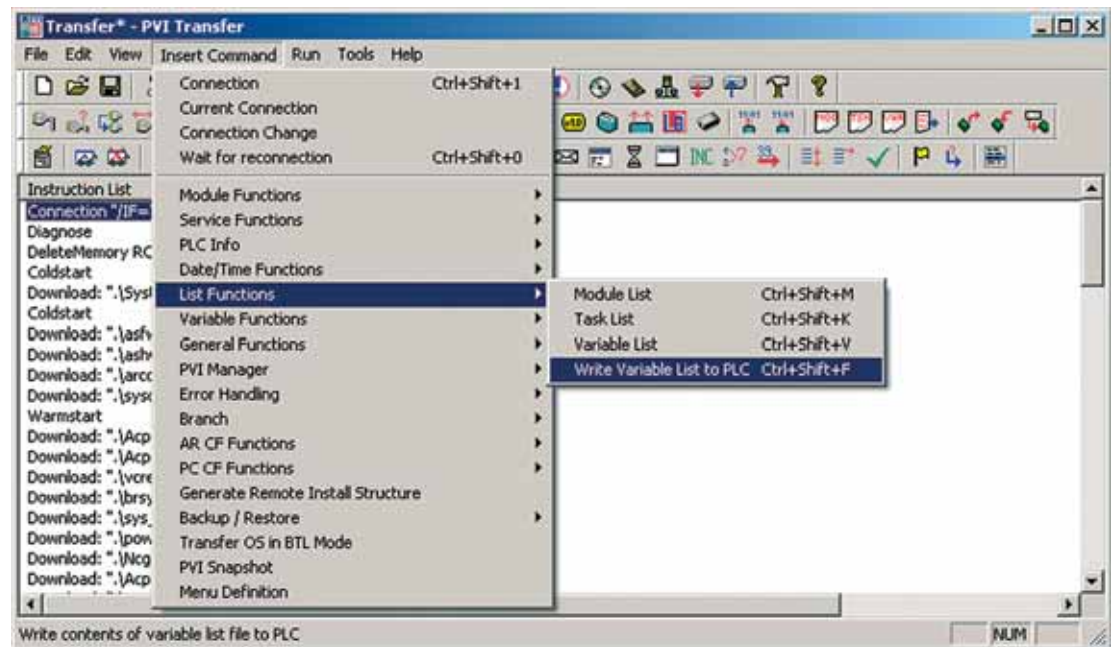
Generate CD...	F8
Generate Compact Flash...	F9
Generate Remote Install Structure...	F12
Back up files from Compact Flash...	Alt+F7
Restore files to Compact Flash...	Alt+F8
Transfer AR in Bootstraploader mode...	F10
HDD / CF Utility...	F11
View Log File	
Options	Alt+F9

USB remote installation

USB remote installation

USB remote installation offers the user the option of updating an Automation Studio project, including the operating system, using a USB mass storage device or via Ethernet.

When evaluating the configuration file, the correct project is automatically installed on the target system.



PVITransfer - Automatic loading of software and maintenance

The next time it's booted, the target system will automatically start the newly installed software.

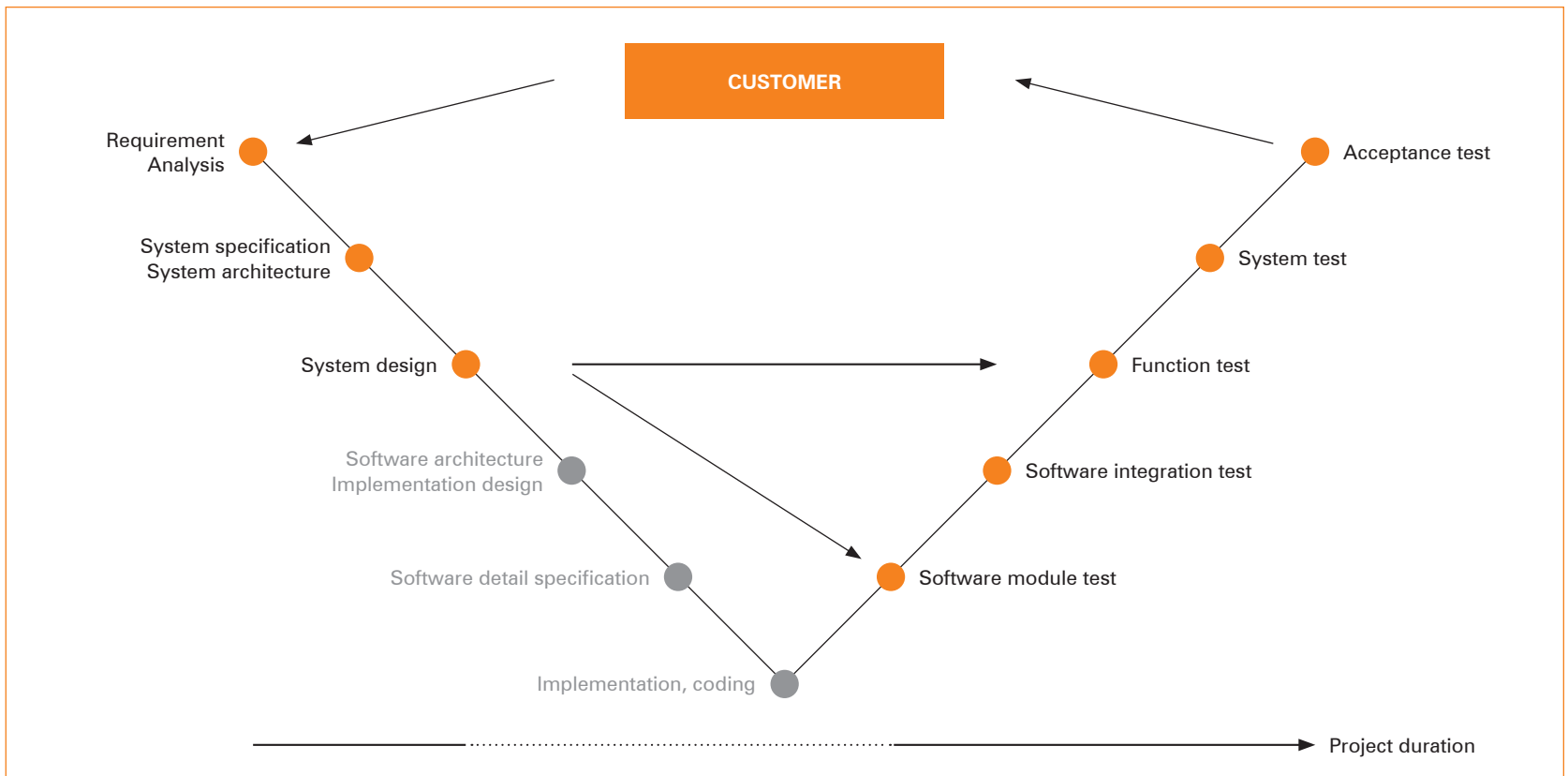
The remote installation structure is created in the PVI-Transfer tool.

Process simulation

Process simulation

As the quality requirements in the automation industry increase, the requirements for system and control technology solutions also increase. To meet these requirements, it's necessary to have meaningful and realistic simulation models, which make it possible to make assessments in advance about the system behavior of implemented automation solutions.

Preliminary verification is especially important for safety-related applications. For applications that are less critical, simulation is also an extremely helpful tool, which developers have come to rely on heavily. B&R provides an **I/O switchboard** that is integrated in Automation Studio and based on an open simulation protocol, as well as the optional **MATLAB®/Simulink®**. These are powerful tools for meeting high demands.

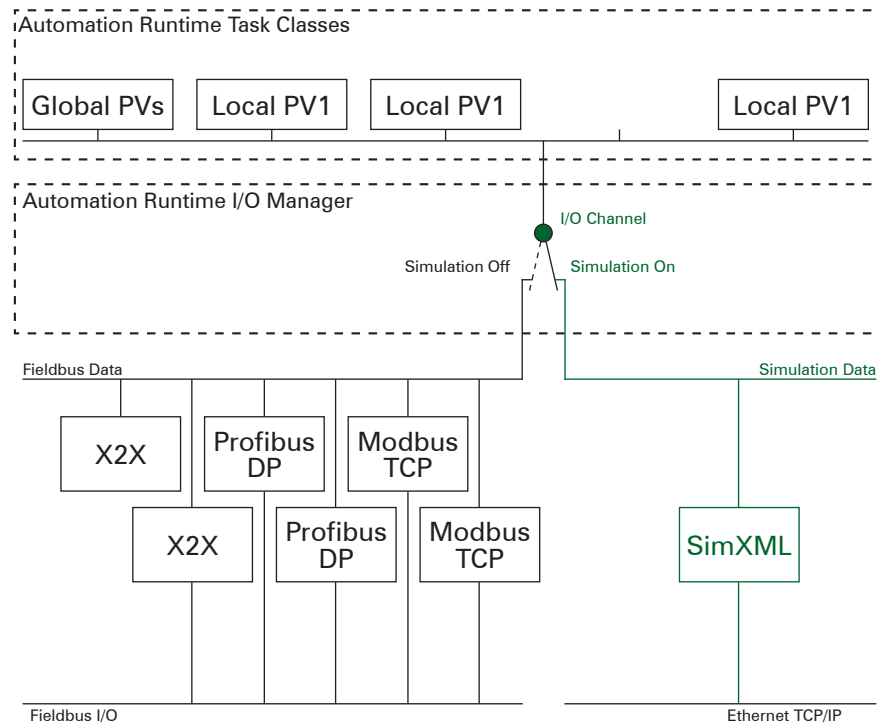


Simulation and automatic code generation - saves time and money

Process simulation

I/O simulation

Based on an open simulation protocol, I/O points on the controller can be simulated graphically in Automation Studio.
The I/O switchboard is an independent application - integrated in Automation Studio - for graphic simulation of I/O states on a controller.



Principle of the I/O simulation

I/O switchboard

- Offers a platform for testing applications without any concrete target system
- Components can be tested and evaluated separately
- Critical components can be analyzed and adapted without risking damage to the system
- Using graphic I/O modules, a simulation environment can be created that is matched to the application

- Individual channel values can be followed graphically within a specific timeframe
- The user can manually control all input channels or assign them predefined signal curves.
- Simulation of operator panels using custom parameter settings for each key

I/O switchboard components

- Boards
 - Container for system bitmaps and animated controls
- Controls
 - Digital In/Out
 - Analog In/Out
 - Counter In/Out
 - I/O container (e.g. grouped by module)
 - KeyPad (buttons with LED)
 - ACOPOS (schematic)
- Display
 - With/without graph (mini-trend)
 - With/without label
 - PV or channel name
 - Signal generator

The progression of a signal during simulation can be represented in the graphs for the respective controls.

Channel Name	Data Type	Physical Value	Force	Force Value	PV or Channel Value	Task Class	PV or Channel Name	Inverse	Simulate	Description
ModuleOk	BOOL	TRUE	<input type="checkbox"/>	FALSE					<input type="checkbox"/>	Module status (I)
DigitalOutput01	BOOL	TRUE	<input checked="" type="checkbox"/>	TRUE	TRUE	Automatic	moneyChanger.moduleInput	<input type="checkbox"/>	<input type="checkbox"/>	24VDC / 0.5A
DigitalOutput02	BOOL	FALSE	<input type="checkbox"/>	FALSE	FALSE	Automatic	moneyChanger.dcCent1Inout	<input type="checkbox"/>	<input type="checkbox"/>	24VDC / 0.5A
DigitalOutput03	BOOL	FALSE	<input type="checkbox"/>	FALSE	FALSE	Automatic	moneyChanger.dcCent1out	<input type="checkbox"/>	<input type="checkbox"/>	24VDC / 0.5A
DigitalOutput04	BOOL	TRUE	<input checked="" type="checkbox"/>	TRUE	TRUE	Automatic	moneyChanger.dcCent2Inout	<input type="checkbox"/>	<input type="checkbox"/>	24VDC / 0.5A
DigitalOutput05	BOOL	FALSE	<input type="checkbox"/>	FALSE	FALSE	Automatic	moneyChanger.dcCent2out	<input type="checkbox"/>	<input type="checkbox"/>	24VDC / 0.5A
DigitalOutput06	BOOL	FALSE	<input type="checkbox"/>	FALSE	FALSE	Automatic	moneyChanger.dcCent20out	<input type="checkbox"/>	<input type="checkbox"/>	24VDC / 0.5A
DigitalOutput07	BOOL	FALSE	<input type="checkbox"/>	FALSE	FALSE	Automatic	moneyChanger.dcCent30out	<input type="checkbox"/>	<input type="checkbox"/>	24VDC / 0.5A
DigitalOutput08	BOOL	FALSE	<input type="checkbox"/>	FALSE	FALSE	Automatic	moneyChanger.dcEuro1out	<input type="checkbox"/>	<input type="checkbox"/>	24VDC / 0.5A
DigitalOutput09	BOOL	FALSE	<input type="checkbox"/>	FALSE	FALSE	Automatic	moneyChanger.dcEuro2out	<input type="checkbox"/>	<input type="checkbox"/>	24VDC / 0.5A
DigitalOutput10	BOOL	FALSE	<input type="checkbox"/>	FALSE	FALSE	Automatic	moneyChanger.dcEuro2out	<input type="checkbox"/>	<input type="checkbox"/>	24VDC / 0.5A
DigitalOutput11	BOOL	FALSE	<input type="checkbox"/>	FALSE	FALSE	Automatic	moneyChanger.dcEuro2out	<input type="checkbox"/>	<input type="checkbox"/>	24VDC / 0.5A
DigitalOutput12	BOOL	FALSE	<input type="checkbox"/>	FALSE	FALSE	Automatic	moneyChanger.dcEuro2out	<input type="checkbox"/>	<input type="checkbox"/>	24VDC / 0.5A
StatusDigitalOutput01	BOOL	FALSE	<input type="checkbox"/>	FALSE						
StatusDigitalOutput02	BOOL	FALSE	<input type="checkbox"/>	FALSE						
StatusDigitalOutput03	BOOL	FALSE	<input type="checkbox"/>	FALSE						
StatusDigitalOutput04	BOOL	FALSE	<input type="checkbox"/>	FALSE						
StatusDigitalOutput05	BOOL	FALSE	<input type="checkbox"/>	FALSE						
StatusDigitalOutput06	BOOL	FALSE	<input type="checkbox"/>	FALSE						
StatusDigitalOutput07	BOOL	FALSE	<input type="checkbox"/>	FALSE						
StatusDigitalOutput08	BOOL	FALSE	<input type="checkbox"/>	FALSE						
StatusDigitalOutput09	BOOL	FALSE	<input type="checkbox"/>	FALSE						
StatusDigitalOutput10	BOOL	FALSE	<input type="checkbox"/>	FALSE						
StatusDigitalOutput11	BOOL	FALSE	<input type="checkbox"/>	FALSE						
StatusDigitalOutput12	BOOL	FALSE	<input type="checkbox"/>	FALSE						

I/O Mapping Simulation



Simulation process

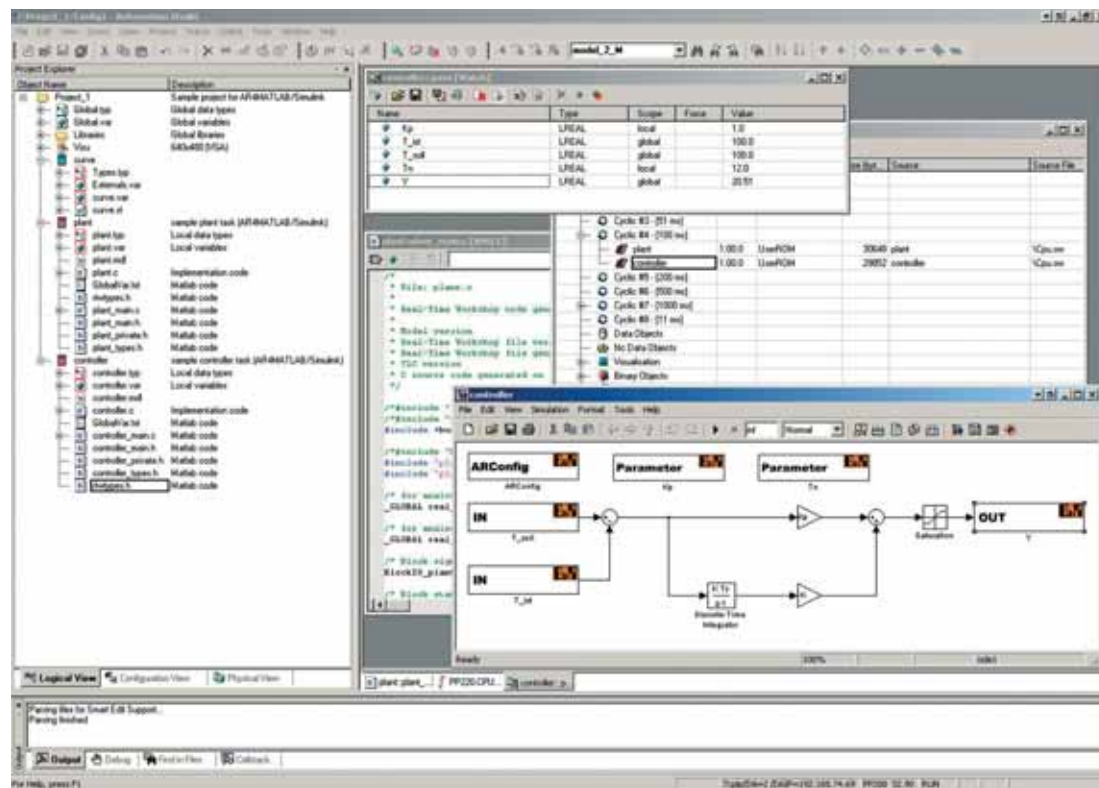
The screenshot shows the 'I/O Switchboard' software interface. The main window is titled 'Control Sheet' and contains a tree view of the I/O components. The tree view shows a hierarchy of boards and modules, including 'IP3-ST1-SL1', 'IP3-ST1-SL2', and 'IP3-ST1-SL3'. Under 'IP3-ST1-SL3', there are 16 'AnalogInput' channels and a 'ModuleOk' channel. The 'Board Browser' window at the bottom shows a list of boards and their I/O map names. The main window also displays a grid of control elements, including buttons and displays, representing the operator panel.

Assigning simulation I/O

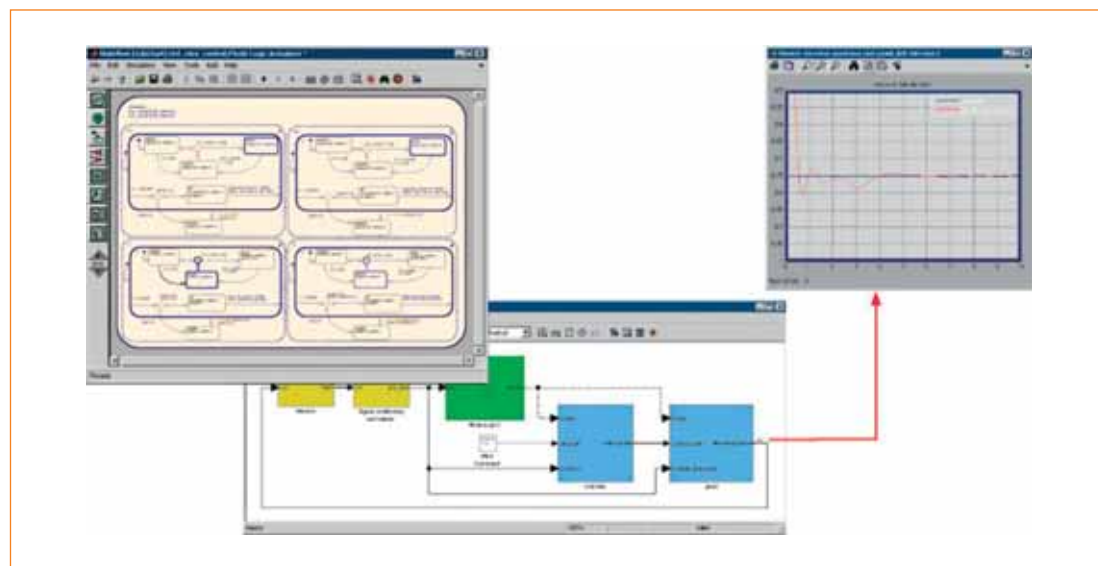
Automation Studio and MATLAB®/Simulink®

Two tools - one solution

- Fully integrated source code. The application code created fits seamlessly in the Automation Studio structure and can of course exchange data and communicate with other, manually created program sections
- Variables - interfaces between individual program sections. Interaction takes place, as usual, via global and local variables



Automation Studio and Simulink®



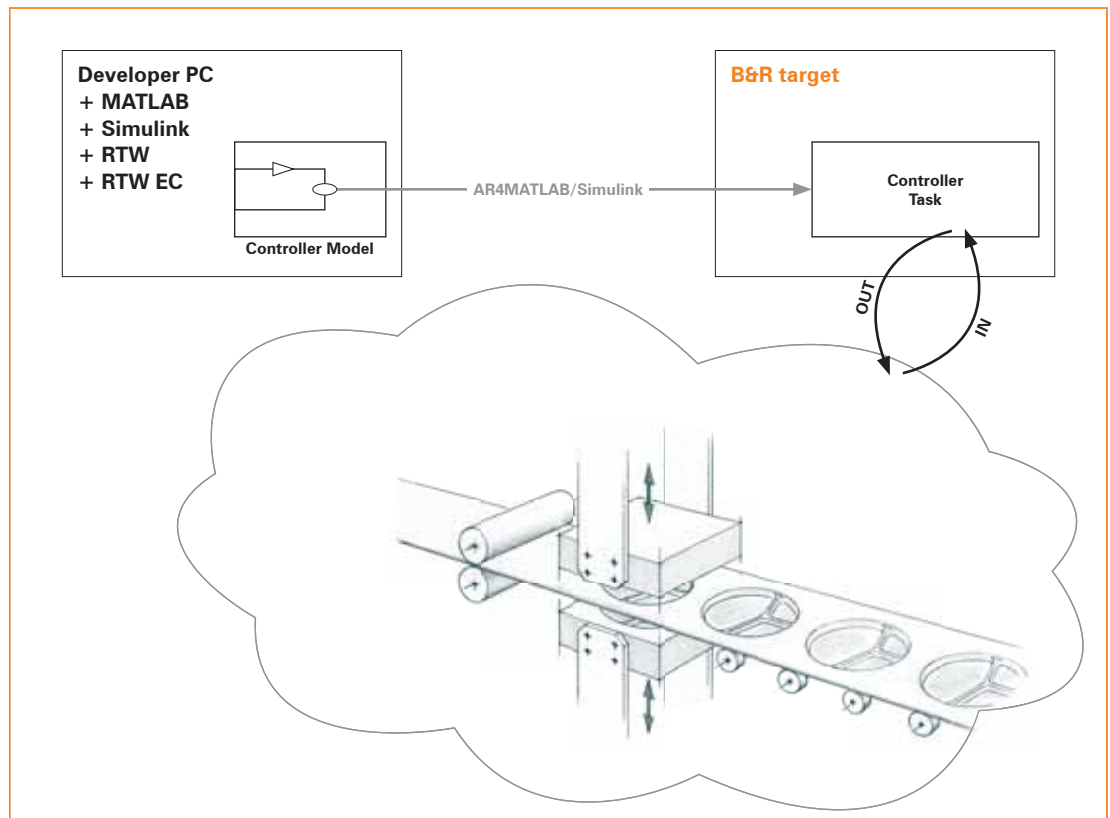
Automatic code generation with Real-time Workshop

The B&R Toolbox, combined with the flexibility of the Real-time Workshop® Embedded Coders, provides the necessary prerequisites for unlimited use of B&R target systems. The Toolbox opens completely new possibilities for designing and developing complex simulation models and control structures, which would be very difficult and time-consuming without this type of assistance.

The basic principle is simple: The Real-Time Workshop® Embedded coder automatically generates high-language code perfectly optimized for Automation Studio from a Simulink® model. Seamless and complete integration of all sources of the Simulink® models guarantees system conformity.

Rapid prototyping

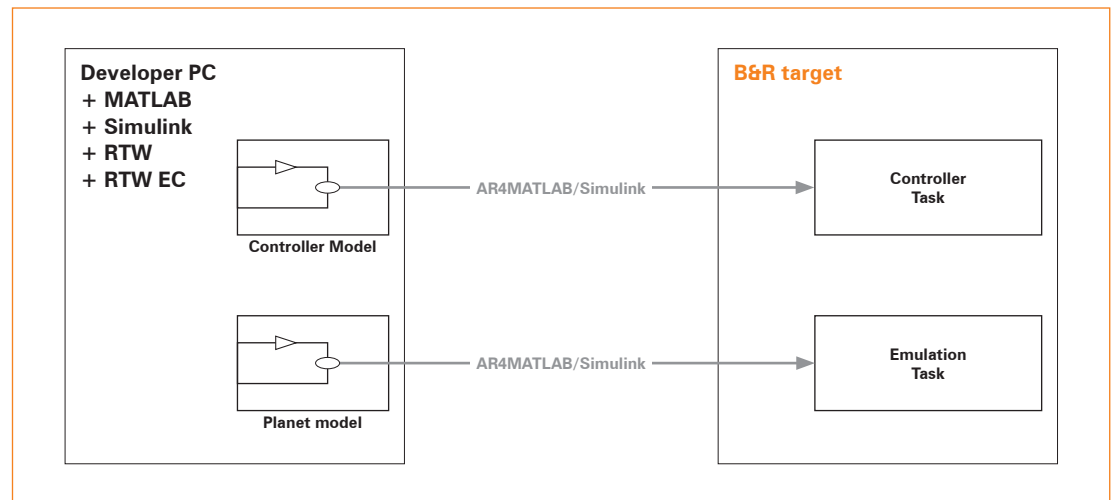
"Rapid Prototyping" offers unforeseen possibilities for quick and flexible implementation of sophisticated control and system-related solutions. Innovative ideas that have been disregarded in the past due to lack of time and resources can now be tested quickly and easily. Simulink models can easily be transferred to a B&R controller using automatic code generation and AR4MATLAB/Simulink. Tedious manual creation of source code, which always bears the risk of code error, is a thing of the past.



Automation Studio and MATLAB®/Simulink®

Hardware-in-the-Loop

In order to avoid damaging the actual system when applying newly developed algorithms, it is recommended that critical system parts are replaced in advance with an emulation system. For this purpose, an emulation task is used on the target system using "hardware-in-the-loop" that emulates the actual system in as much detail as possible. New developments are thus tested on the target system without putting the system operator at risk of experiencing damage to hardware components.

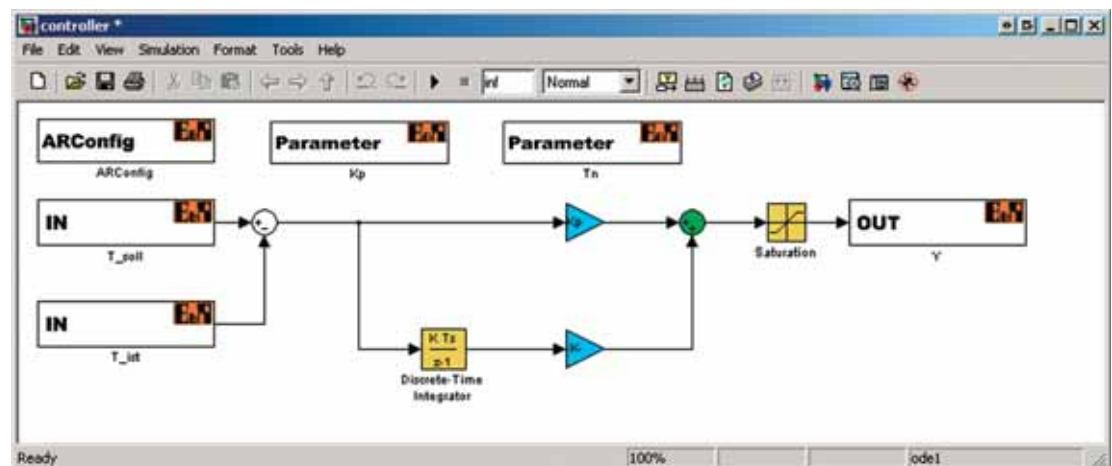


Hardware in the loop

Automation Studio and Simulink® components

There are various Simulink components available.

- Simulink Library Browser for B&R has specific functions for importing existing simulation models
- Establish a connection between runtime code and working environment
- Input and output function blocks for exchanging data between Automation Studio tasks and simulation tasks



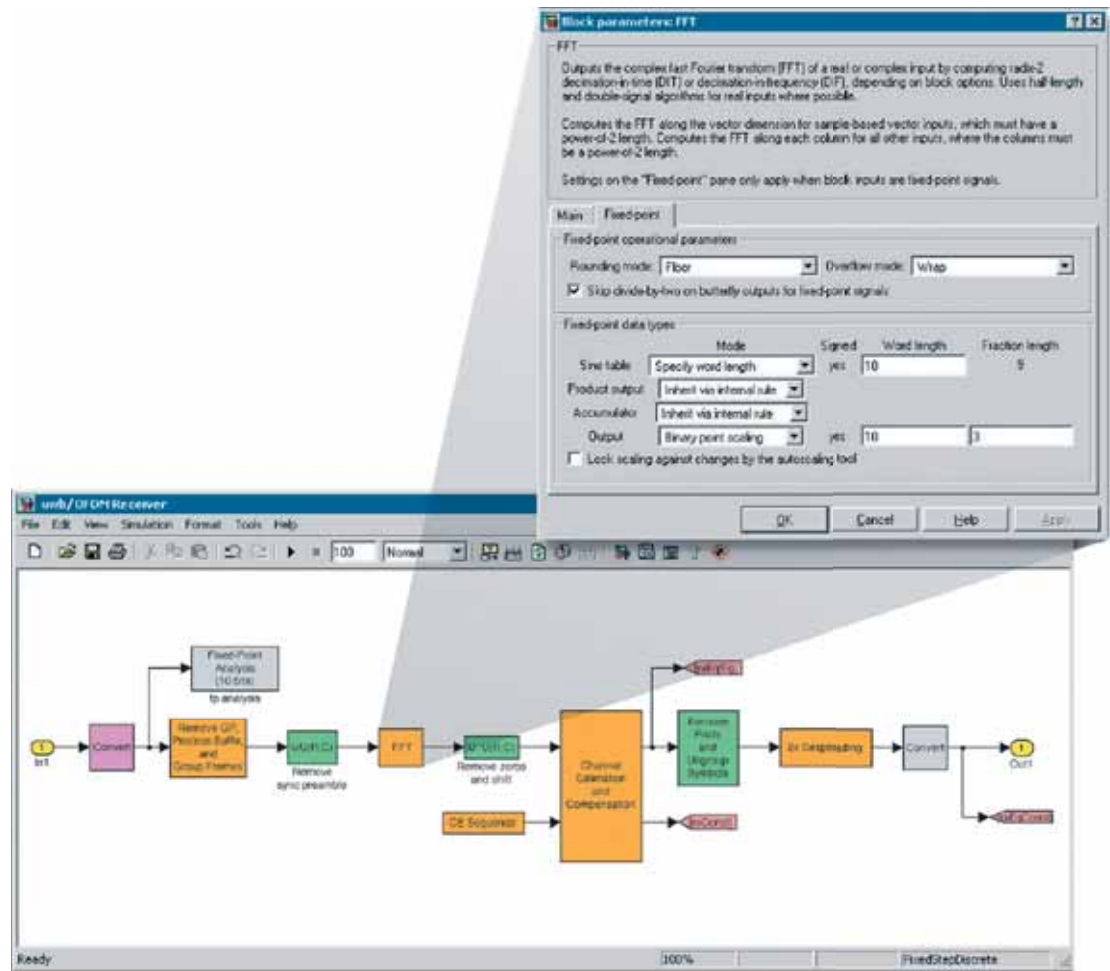
Simulation of a temperature system

Automation Studio and Stateflow

- Automate processes

Stateflow® from The MathWorks, Inc. is a comprehensive tool that can be used to implement sequential processes and branches. With the help of AR4MAT-LAB/Simulink entire sequential control can be created quickly, easily and automatically.

- Integration in Simulink Sequences formulated in Stateflow can be added as usual to an existing Simulink model. This makes it possible to add event-driven select statements or branched flow charts to the automatically generated program code.



Stateflow

Remote maintenance

Consistent from process to firmware exchange

The worldwide market opens up new opportunities, but also creates new demands. The importance of remote maintenance for modern automation is indisputable.

- Machine and system owners are placing emphasis on international locations
- Machine and system manufacturers are serving a worldwide market
- Operational availability of a production system is a decisive factor for its profitability

Error identification and correction must go quickly and reliably.

Today, it is a daily occurrence for a specialist to be called to a specific situation on a system. Great distances and the resulting travel costs make it necessary to utilize remote maintenance. In general, remote maintenance

is associated with software problems and the related hardware problems.

Any type of machine or system downtime must be able to be analyzed systematically. Active communication with the machine or system before downtime has a chance to cause damage is even better.

Just as all automation software is adjusted to the detailed requirements of the application process, the operation state "Error" should also be a part of the application's basic concept.

B&R offers the foundation for a uniform remote maintenance system for all types of applications.

Highlights

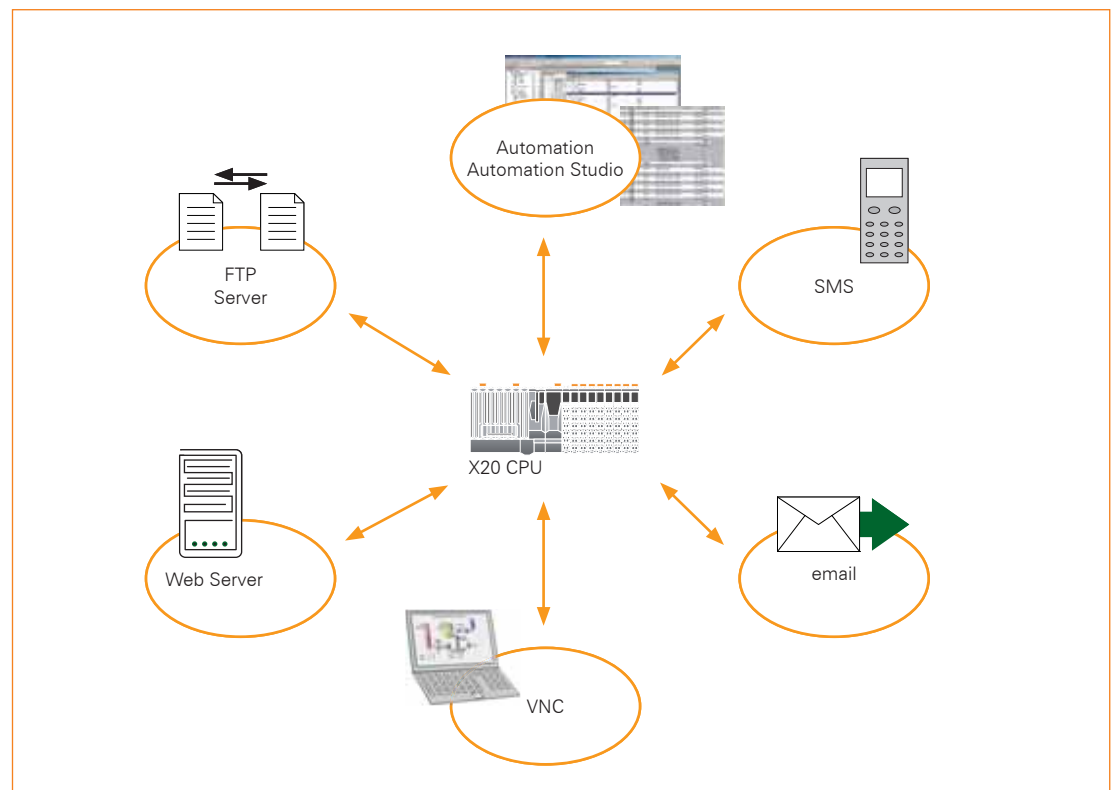
- Faster access (with broadband connections)
- Reduced costs
- High-level security based on standard components (firewalls)
- Independence from customer location
- Independence from the location of customer care representative (for some products)
- Efficient utilization of resources (software developers must not be on location)

Remote maintenance - Relief for your software headaches

Remote maintenance can also be a huge support during the standard manufacturing process. There are been situations where a machine operator accidentally modifies important machine parameters. Due to lack of training or more likely due to the rush and hectic atmosphere, the problem cannot be corrected directly. How valuable is the option to access the machine via the intranet without having to pay a process technician's time and travel costs?

- Timely and specific information directly from the process are a relief to service and maintenance
- Access to data without requiring special tools provides valuable services for providing direct help without complications in tense situations

Of course there are also situations where the most efficient solution involves using Automation Studio. B&R automation technology is designed to support the various levels of remote maintenance cost-efficiently.



Overview - Remote maintenance

State-of-the-art benefits

The communication technology that is actually available differs greatly from country to country. Company-specific safety policies often limit the use of certain types of remote maintenance. For precisely these reasons, B&R relies on general communication standards that are available worldwide. The functionality of remote maintenance must not be dependent on the communication technology. The communication technology only affects the potential transfer speed.

ISDN	Integrated Services Digital Network
SMS	Short Message System
Email	Electronic Mail
FTP	File Transfer Protocol.
Web	World Wide Web
VNC	Virtual Network Computing
GSM	Global System for Mobile Communications
GPRS	General Packet Radio Service
UMTS	Universal Mobile Telecommunications System



Standardized technologies

Standardized technologies used systematically in the automation project are what it takes to meet the demands of remote maintenance at an international level

Remote maintenance

VNC technology - Optimizes system operation

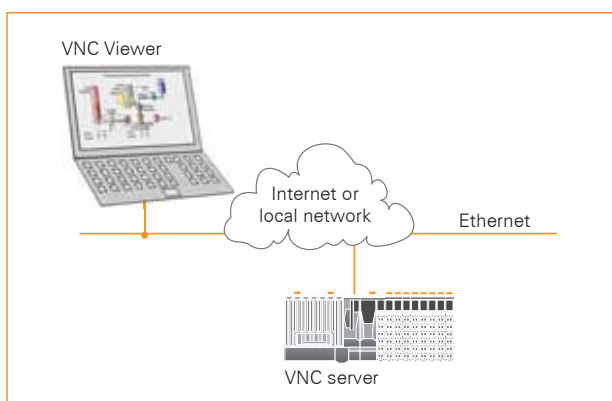
The visualization technology integrated in Automation Studio can be optionally configured for use on a VNC server. The VNC server is a component of B&R's real-time operating system. Thanks to this technology, even automation systems without display units have their own visualization. The user benefits from the high level of operating comfort with minimal costs.

The availability of VNC-based visualizations on the Intranet makes it possible to operate the machine directly or for experts to provide support to machine operating personnel for remote maintenance. VNC technology uses standard IT communication methods, which means that it implicitly uses all safety technology implemented within the company.

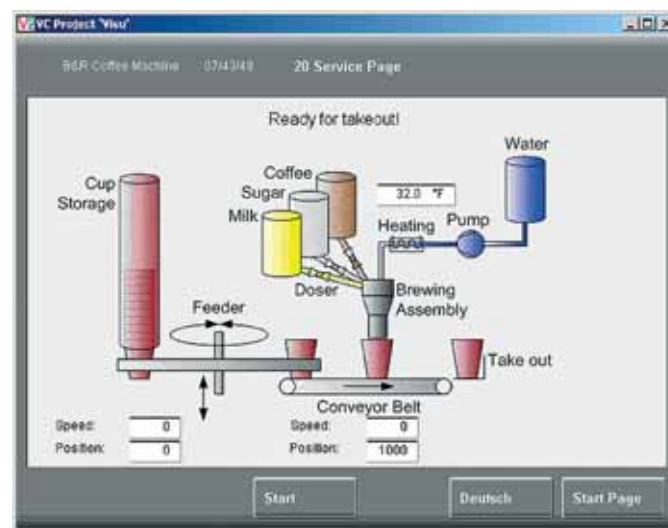
- Main office visualization without additional work
- PDA info terminals (wireless)
- Machine visualization on the Intranet
- Various user profiles, views (user levels)
- Virtual display with high resolution provides ease of operation
- Password protected access



VNC access



Remote maintenance via VNC

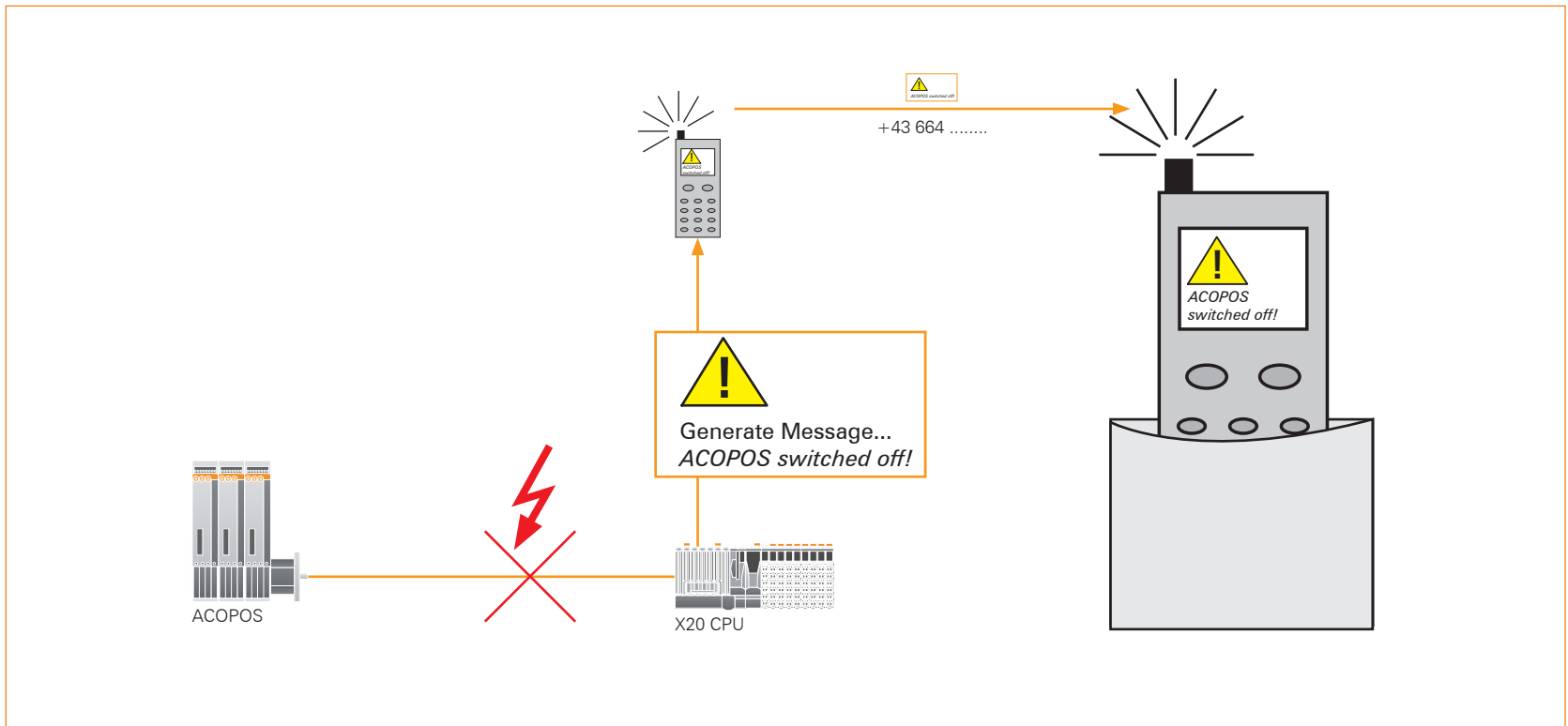


Process image display in VNC Viewer

SMS and email - Information when you need it

More and more machines and systems are able to monitor processes and identify critical situations in advance. It does not necessarily have to be preventative maintenance when an automation system reports a special situation by sending an electronic message. Regular shift logs in email form provide supervisors with useful information regarding the efficiency of the process.

Many operators also find SMS messaging technology very useful. Alarms linked to measurement values and machine states can be packaged neatly into SMS messages and sent to on-duty personnel. When coordinated appropriately, control commands can also be issued via SMS. In the case of malfunction, for example, these could maintain emergency operation until technicians arrive on site.



SMS when alarm occurs on machine

Remote maintenance

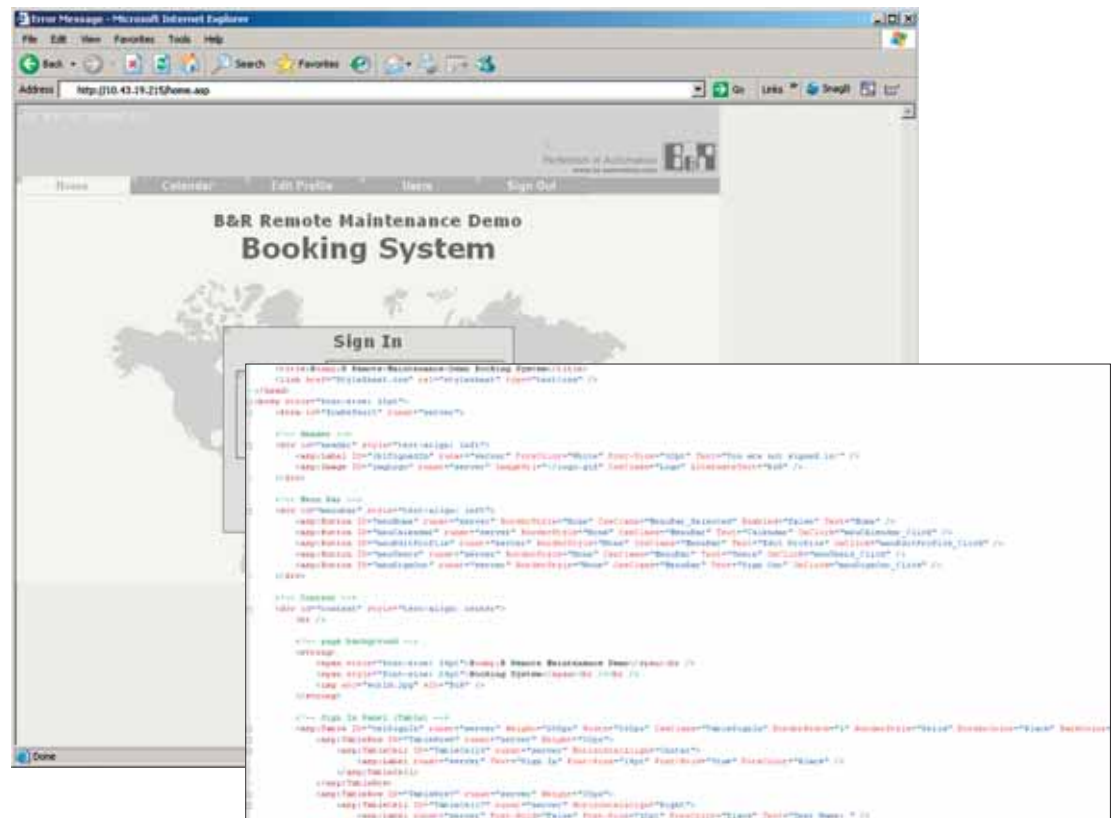
Web server - Neutral and universal

The ability to display information independent of the operating system used and with various tools (browsers) is an important characteristic of Web sites. B&R automation technology utilizes the resulting advantages with an integrated Web server.

The machine's homepage can provide the most important data to any terminal on the Intranet as needed. If desired, the automation system can expand the information to include available system data, such as exact product ID and software versions. The Web interface provides neutral, secure and universal access to the automation. Interactive Web sites also allow operation of a machine or system. Generally however, the automation technician only uses this function for navigating within the machine's homepage.

Active control usually takes place using VNC-based visualization applications. Using Web technology with an automation system enables highly secure communication.

- Integrated Web server
- System information service based on web technology
- Interactive Web sites
- Coordinated access to control data
- Password protection



Access to integrated Web server

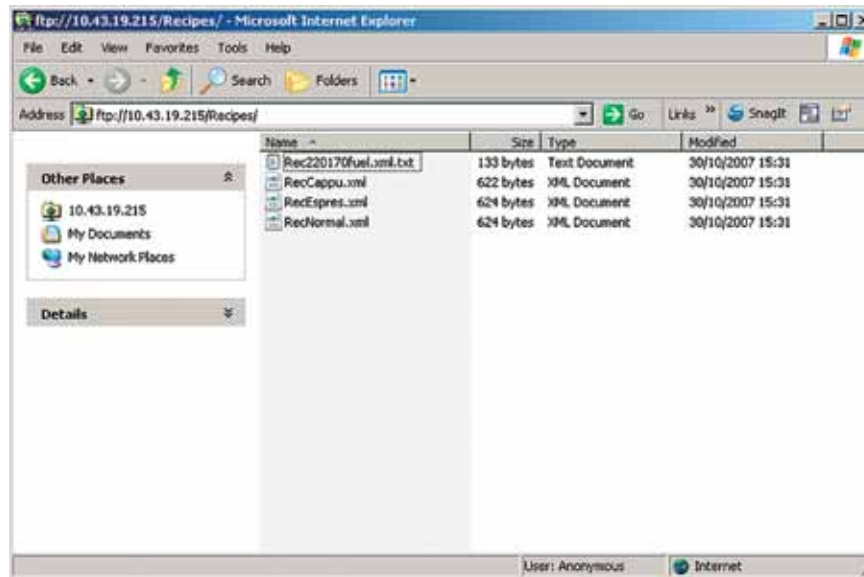
FTP server - Platform for general data exchange

Data is the basis for many decisions. In the case of a malfunction, specific data can provide valuable clues regarding the status of the system.

Logged electronic recordings on the automation system can be used to reconstruct causes and effects with respect to the current situation. Exchanging this data based on an FTP server opens up the computer system and increases flexibility.

After all, the user is not always interested in simply reading data, but in many cases in installing new settings or optimizing a specific application.

- Systematic data protection on your own drive
- Read from files
- Write to files

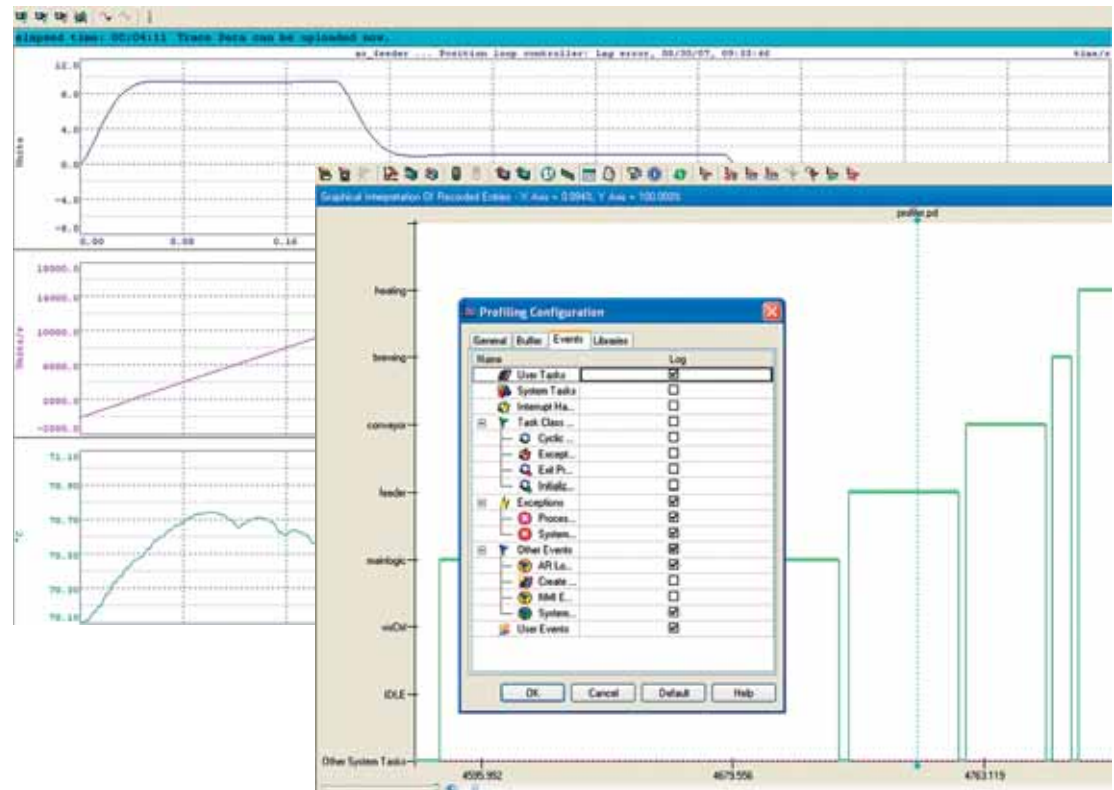


FTP access via Internet Explorer

Offline - Yet precise and always available

'Offline' is a term one would not likely associate with remote maintenance. However, many automation processes run considerably faster than can be transported precisely using standard communication. For this reason, offline processes are essential for precise data collection.

B&R's approach emphasizes chronological separation of recording and analysis of data. Consistent application of this approach makes it possible to perform remote maintenance without loss of quality.



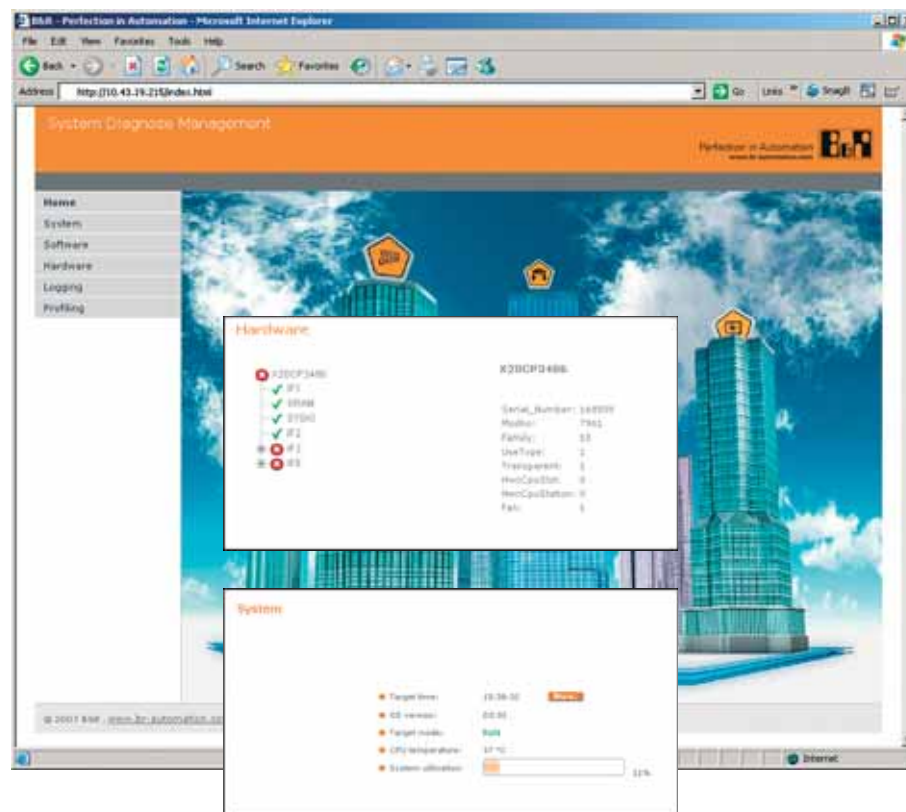
Analysis of previous recordings

Remote maintenance

System diagnostics management

When performing service, it is very important that components can be identified clearly and correctly. Clear identification of hardware is available in the automation system in the form of a material number and unique serial number. This information can be obtained at any time via the visualization application, in a Web interface, or in Automation Studio. The installed software is cataloged in the automation system using module names and version numbers. This information is also easily obtained throughout the entire system.

- Embedded parameter chip with unique serial number
- Operating status can be viewed for each individual component
- Unique version ID can be used electronically
- Complete software identification includes firmware versions



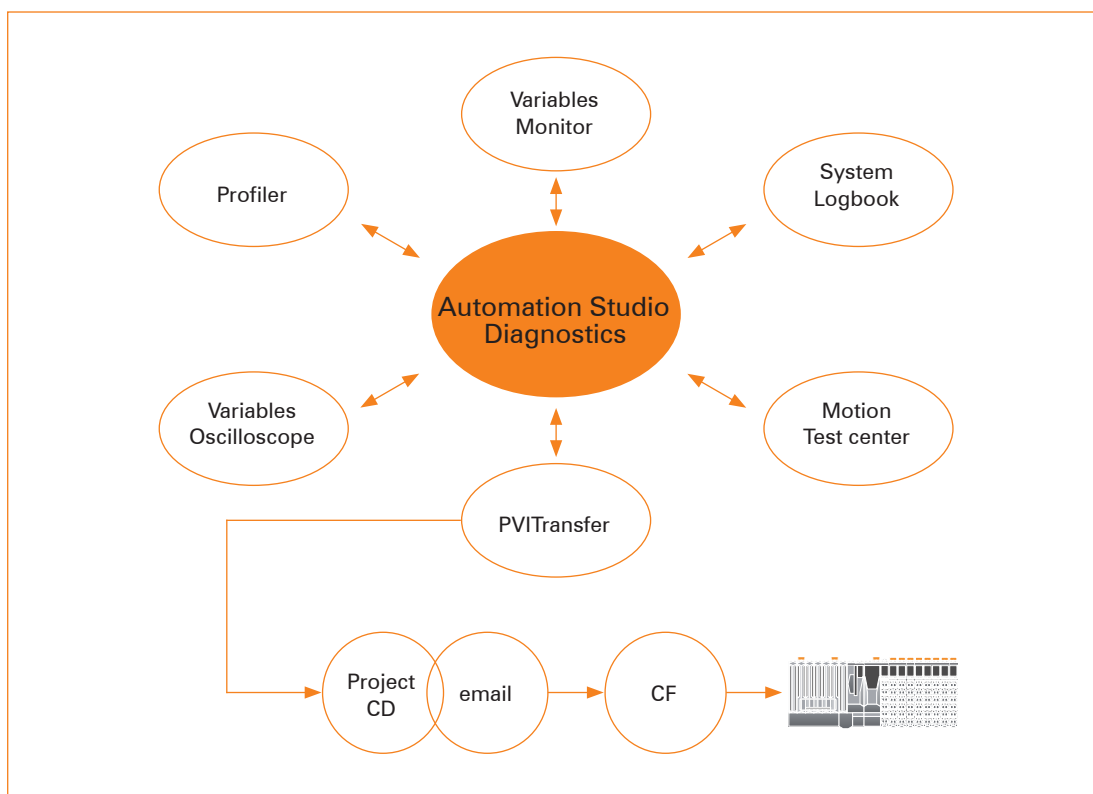
System diagnostics management

Automation Studio - Advantages at any distance

Automation Studio accompanies machines and systems throughout their entire life cycle. Accordingly, the powerful diagnostics and analysis functions for the automation system are also available for remote maintenance.

Should software need to be updated on site, Automation Studio can handle it. Whether the user decides to download it directly, or chooses to include an intermediate step for added security, Automation Studio has the appropriate infrastructure for any situation.

- System logbook
- Variable monitor
- Task monitor
- Profiler
- Variable oscilloscope
- Network diagnostics
- Motion test center
- PVITransfer



Remote maintenance in Automation Studio

			AS diagnosis and maintenance	VNC	FTP/NFS	Web Server (HTML)	SMS	e-mail	Video
Modem	Hard wired	Analog phone network	√	√ ⁽²⁾	√ ⁽²⁾	√ ⁽²⁾	√ ⁽¹⁾	√ ⁽¹⁾	
		ISDN	√	√ ⁽²⁾	√ ⁽²⁾	√ ⁽²⁾	√ ⁽¹⁾	√ ⁽¹⁾	
	Wireless connection	GSM	√	√ ⁽²⁾	√ ⁽²⁾	√ ⁽²⁾	√ ⁽¹⁾	√ ⁽¹⁾	
		UMTS	√	√ ⁽²⁾	√ ⁽²⁾	√ ⁽²⁾	√ ⁽¹⁾	√ ⁽¹⁾	
		GPRS	√	√ ⁽²⁾	√ ⁽²⁾	√ ⁽²⁾	√ ⁽¹⁾	√ ⁽¹⁾	
Internet	Hard wired	Default Ethernet	√	√	√	√	√	√	

¹ Depends on service provider

² PPP and SLIP support

SafeDESIGNER

The functions of the SafeDESIGNER package expand Automation Studio to include engineering tools for configuring safety-related applications.

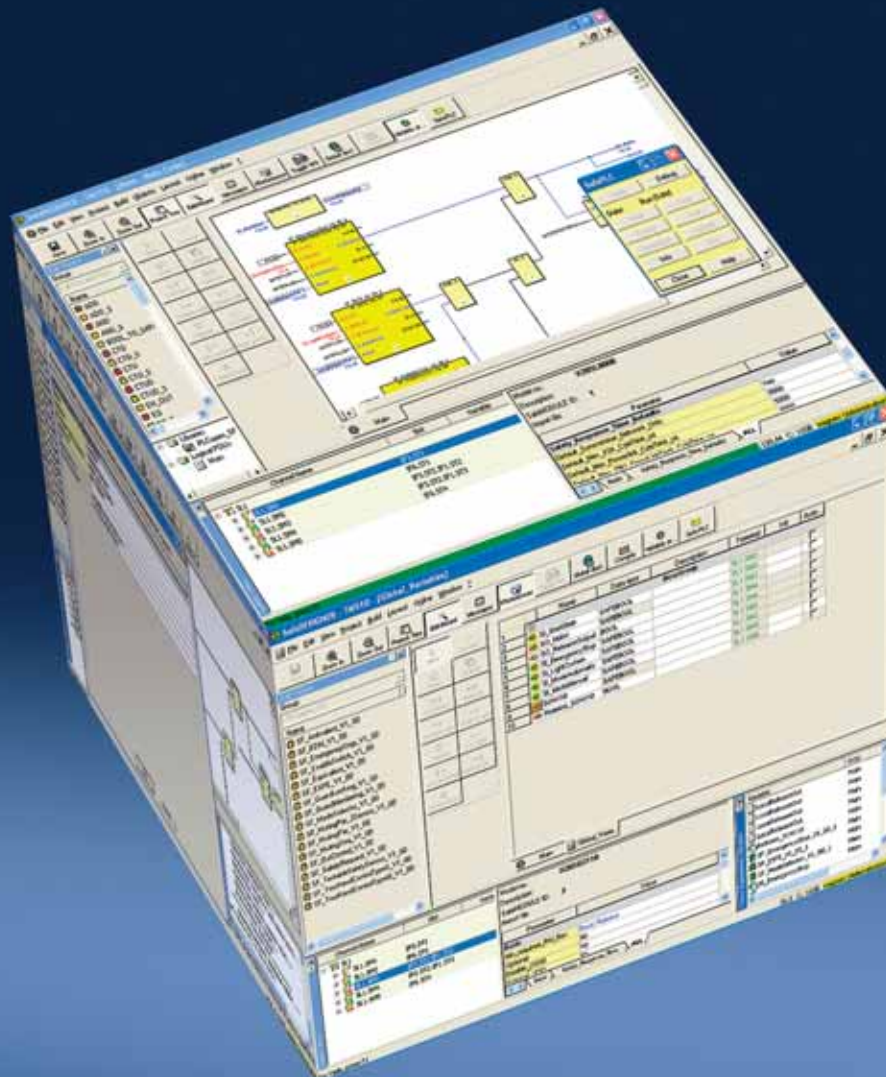


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PLCopen safety function blocks	1884

SafeDESIGNER overview

All products in the Integrated Safety Technology program integrated in Automation Studio are optimally adjusted to each other and, more importantly, to existing automation products. Compatible applications can therefore be created very easily.

Machines and systems are dangerous

When working with machines and systems, owners and operators need to feel safe. Safety technology therefore has a high level of importance in automation. Due to the complexity of safety technology and process control, the two have conventionally been kept separate. Parallel construction kept the systems isolated. This isolation, however, resulted in additional work and limitations, and ultimately reduced productivity during operation.

Integrated safety technology - Safe and transparent

The integration includes all safety relevant hardware and software components. The IEC 61508 safety standard explicitly recommends blocks for programming safety logic. The blocks in the integrated library are validated and conformant to the PLCopen Safety standards.

This flexibility enables innovative safety concepts for increased productivity. Integrating the safety technology increases machine and system availability.

Automation Studio supports open programming for safety technology - much more than conventional configuration methods typically do.

- Debugging methods for testing the software
- Testing system behavior based on specific criteria

Safety – Tested and documented

Nobody wants a safety incident. Critical situations must therefore be well considered and reliably tested. Despite a high degree of automation, human action is required here. With Automation Studio, you can document these important tasks efficiently.

Elegant application solutions with integral smart-safe reactions and maximum cost reductions



Model numbers for SafeDESIGNER

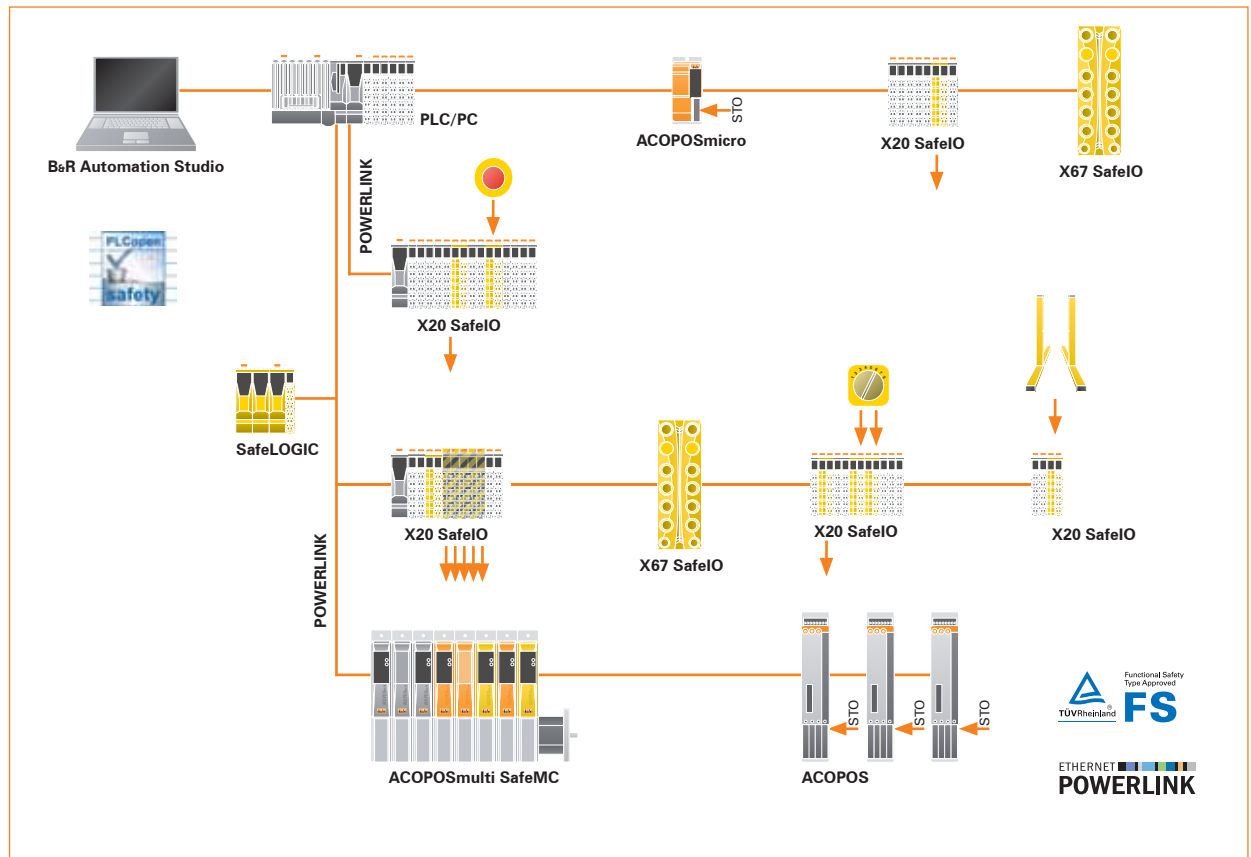
1A43S0:L1	Full version of SafeDESIGNER for one work station
1A43S0:L5	Full version SafeDESIGNER for 5 work stations
1A43S1:L1	Maintenance version of SafeDESIGNER for one work station
1A43S1:L5	Maintenance version of SafeDESIGNER for 5 work stations
1A43S1:LU	Maintenance version of SafeDESIGNER with unlimited number of work stations

Upgrade Service

Each Upgrade Service is valid for 12 months, and free for one year from the date of purchase.

1A43S0:U1	Upgrade service for full version of SafeDESIGNER for one work station
1A43S0:U5	Upgrade service for full version of SafeDESIGNER for 5 work stations
1A43S1:U1	Upgrade service for maintenance version of SafeDESIGNER for one work station
1A43S1:U5	Upgrade service for maintenance version of SafeDESIGNER for 5 work stations
1A43S1:UU	Upgrade service for maintenance version of SafeDESIGNER with unlimited work stations

All PLCopen safety function blocks are already contained in SafeDESIGNER.

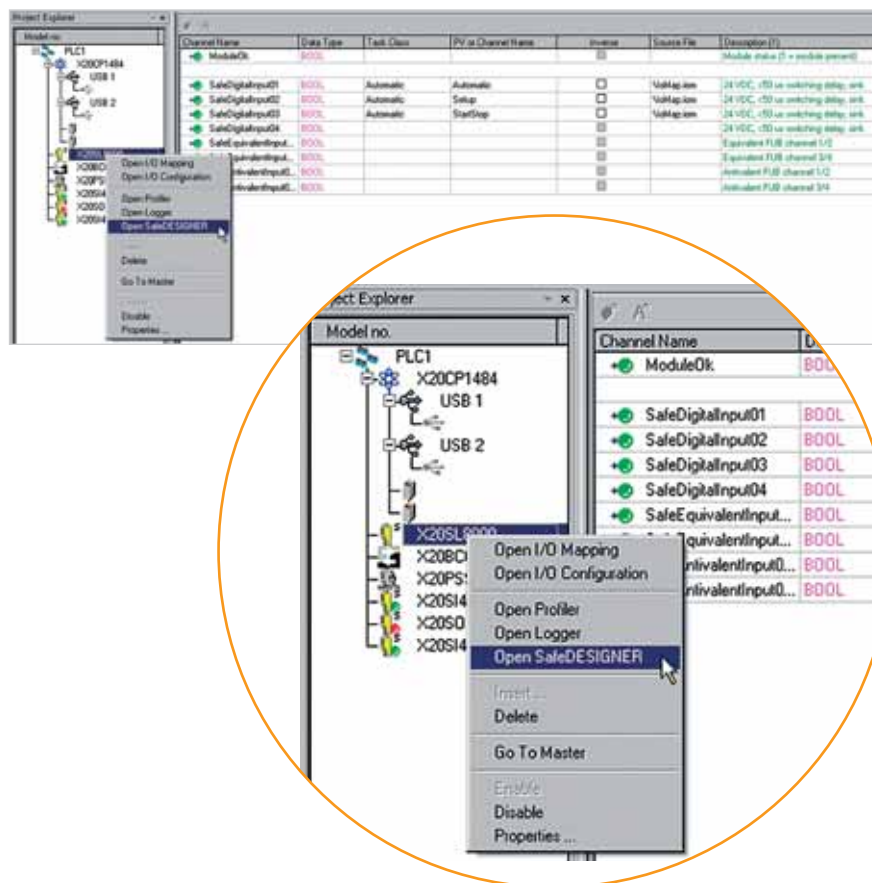


Integrated safety technology

SafeDESIGNER overview

Integrated safety technology

- Open standard
 - Use of POWERLINK safety technology as the first real-time Ethernet-based safety bus
 - Safe programming thanks to PLCopen safety function blocks
- Fast
 - A cycle time of 200 μ s for SIL3 is a new dimension for safe communication
 - Advantages of hardwired solutions are combined through the use of modern, integrated and intelligent safety bus technology
- Increased safety through reduced complexity
 - Simple and clear project design
 - Meets recommendations of IEC 61508 / IEC 62061
 - Programming with blocks
- Optimizes commissioning and maintenance times
 - Safety relevant test procedure automation support
- Integrated documentation
 - Transparent - from control to visualization
 - Complete integration without added effort
 - Parallel wiring no longer necessary



Safety integration in Automation Studio

	Name	Data type	Description	Terminal	Init	Auto
1						
New Group						
2	ESStop	SAFEBOOL		SIL3 SMC1 SafeDigitalInput04		
3	Automatic	SAFEBOOL		SIL3 SMC1 SafeDigitalInput01		
4	LG	SAFEBOOL		SIL3 SMC1 SafeEquivalentInput01/02		
5	Setup	SAFEBOOL		SIL3 SMC1 SafeDigitalInput02		
6	StartStop	SAFEBOOL		SIL3 SMC1 SafeDigitalInput03		
7	OUT	SAFEBOOL		SIL3 SMC1 SafeDigitalOutput01		

Safety variable declaration

SafeDESIGNER

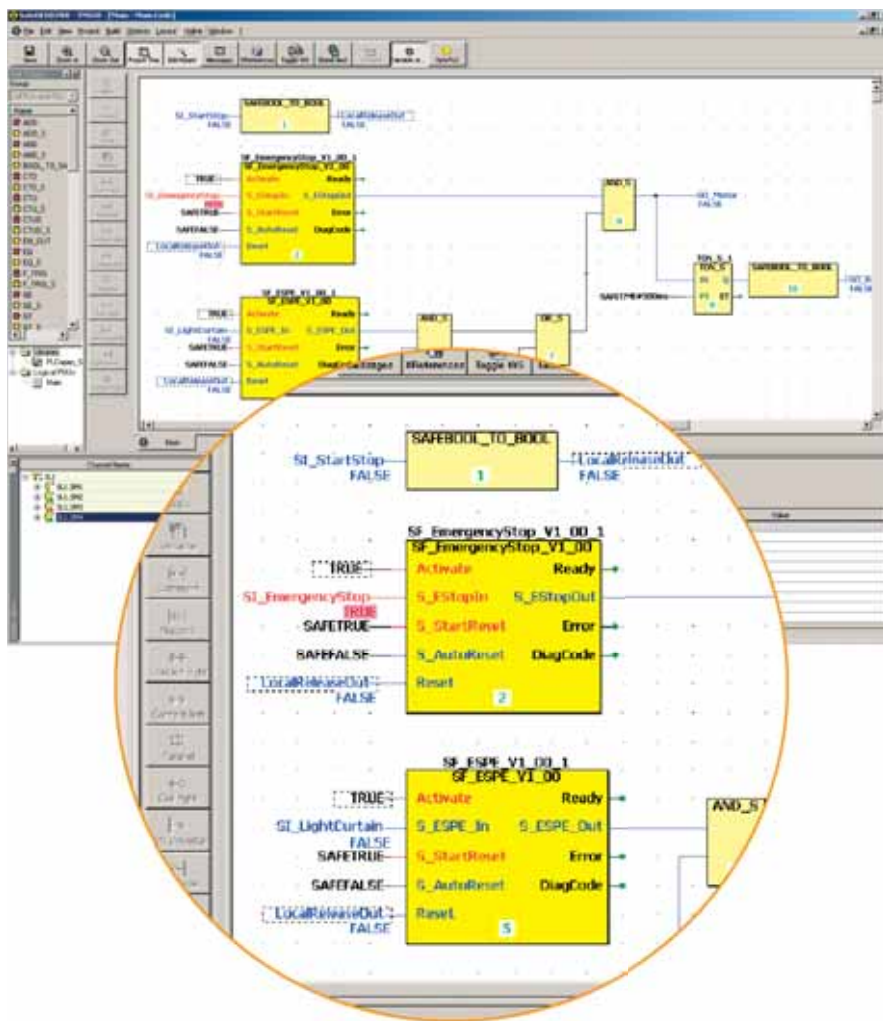
The functions of the SafeDESIGNER package expand Automation Studio to include the engineering tools needed to configure safety-related applications.

- Ladder Diagram and function block programming (LD, FBK)
- Encapsulation of safety related functions
- Independent access rights management
- Strict separation of data types for "safe" and "standard" signals
- Diverse compiler for highest safety
- Safety and plausibility monitoring during development

Safety diagnostics and validation

The various diagnostics functions in SafeDESIGNER can considerably reduce the effort involved in commissioning a safety related application. Validation and testing to ensure safe download of upload of a safety application are also integrated in SafeDESIGNER.

- Variable monitor for simple testing of sensor wiring
- Output forcing for testing actuator wiring
- Special commissioning parameters for adapting the machine to current circumstances, e.g. enabling/disabling machine options
- Safe download/upload of safety application
- CRC tests and info dialog box - the right project on the right controller



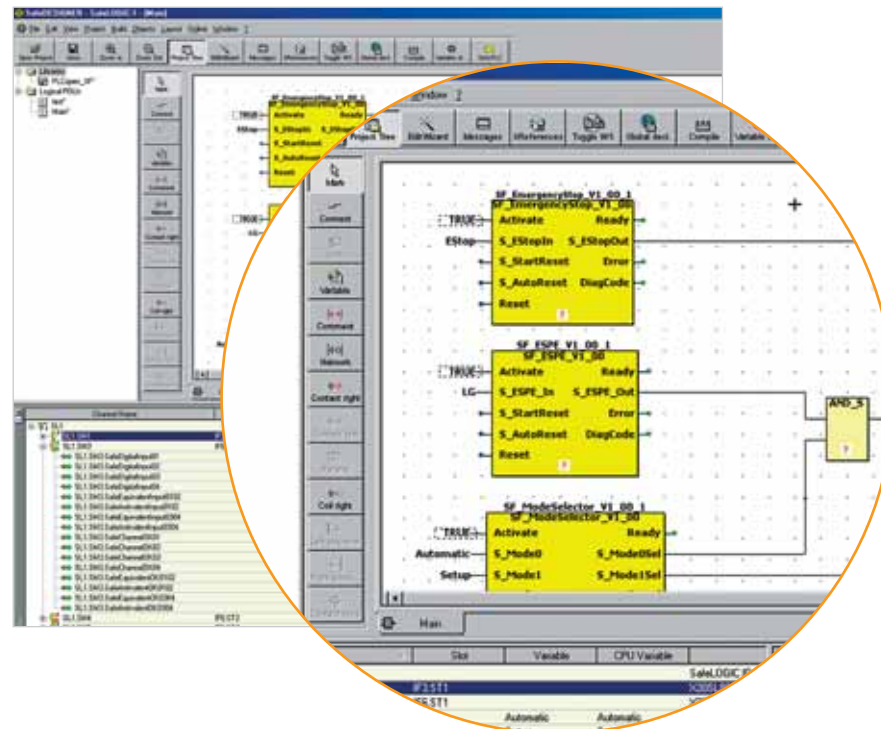
SafeDESIGNER variable monitor

PLCopen safety function blocks

PLCopen safety function blocks

The function blocks for safety-oriented applications standardized in the PLCopen package revolutionize the development of safety applications. The function blocks are certified and therefore reduce time and cost in all phases of the safety application's life cycle. From the specification and implementation to testing and checking functions, the procedure used is more similar to virtual wiring than it is to programming.

Unlike "real wiring", downloading the program to the SafeLOGIC guarantees that an identical copy will be stored. This completely eliminates wiring errors during series production. Naturally, all options for a safe programmable controller are available to handle even more complex problems that can't be solved with "real wiring".



PLCopen safety function blocks

Actuator connection

Function block	Function
OUTCONTROL	Control of an actuator with restart inhibit.
EXTERNAL DEVICE MONITORING	Control of an actuator with evaluation of the feedback signals.
SAFETY REQUEST	General safety request with status monitoring.
SAFETY GUARD INTERLOCKING WITH LOCKING	Control of a safety door with bolt.

Sensor connection

Function block	Function
EQUIVALENT	1 of 2 evaluation of two equivalent contacts (N.C. / N.C. or N.O. / N.O.) with discrepancy time monitoring.
ANTIVALENT	1 of 2 evaluation of two different contacts (N.C. / N.O.) with discrepancy time monitoring.
MODE SELECTOR	Operating mode switch (1 of max. 8 evaluation) with discrepancy time monitoring.
EMERGENCY STOP	E-stop evaluation with restart inhibit.
ELECTRO-SENSITIVE PROTECTIVE EQUIPMENT (ESPE)	Evaluation of an ESPE signal with restart inhibit.
TWO-HAND CONTROL TYPE II	Evaluation for a two-handed operator console without monitoring of the simultaneous operation.
TWO-HAND CONTROL TYPE III	Evaluation for a two-handed operator console with monitoring of the simultaneous operation.
SAFETY GUARD MONITORING	Safety door monitoring with discrepancy time monitoring and restart inhibit.
TESTABLE SAFETY SENSORS	Testing of an ESPE device with restart inhibit.
ENABLE SWITCH	Evaluation of a enable switch with restart inhibit.

Muting

Function block	Function
SEQUENTIAL MUTING	Muting with standard sensors in a sequential arrangement.
PARALLEL MUTING	Muting with standard sensors in a parallel arrangement.
PARALLEL MUTING WITH 2 SENSORS	Muting with safety sensors in a parallel arrangement.

Motion

Function block	Function
SAFESTOP1	Request and status monitoring of a safe stop 1 safety function.
SAFESTOP2	Request and status monitoring of a safe stop 2 safety function.
SAFETY LIMITED SPEED	Request and status monitoring of a safe limited speed safety function.



FieldbusDESIGNER

A stand-alone software tool, which allows simple and convenient configuration of B&R's fieldbus components.

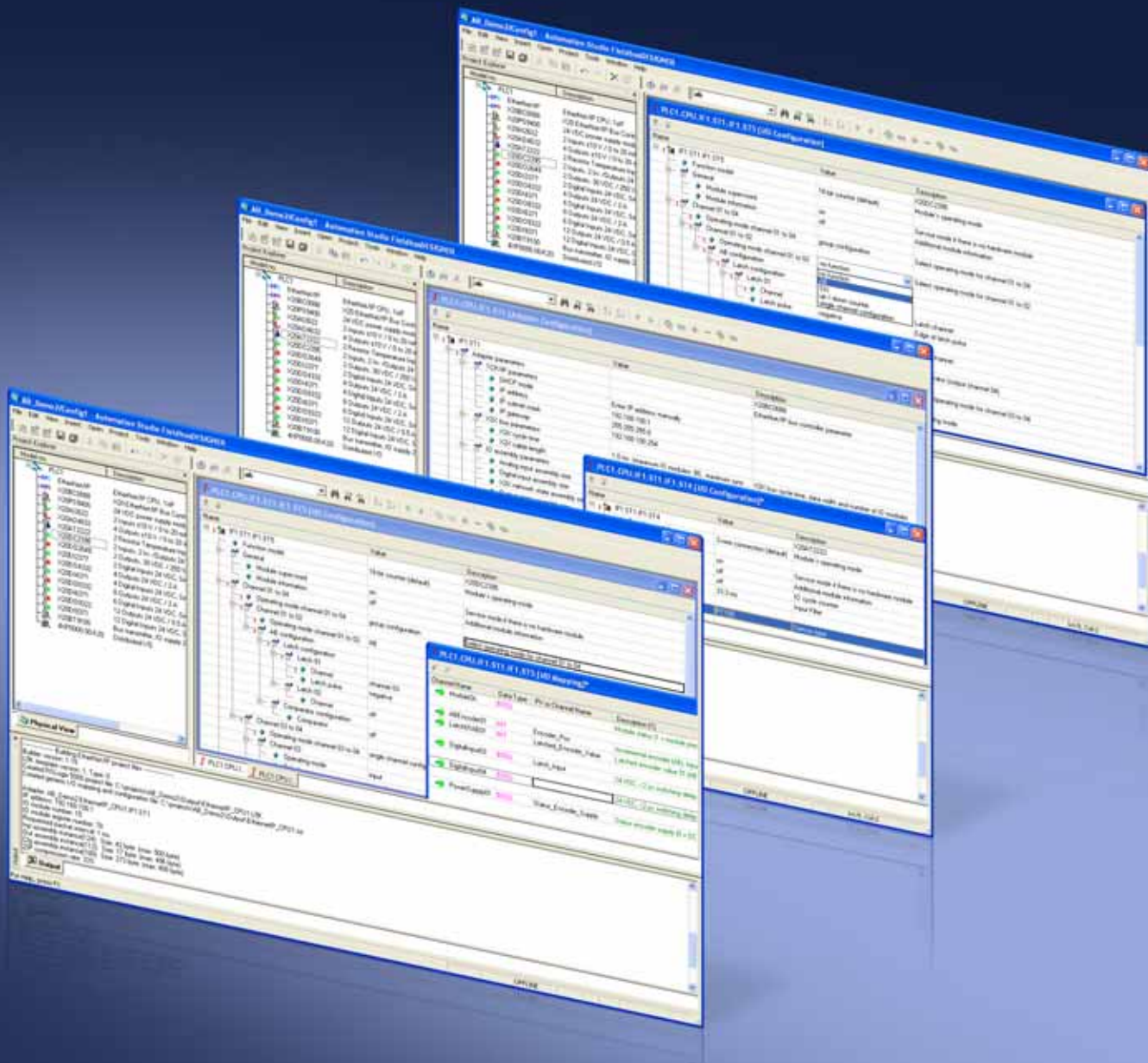


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FieldbusDESIGNER overview

The FieldbusDESIGNER is a stand-alone software tool which enables convenient configuration of the B&R fieldbus components. All I/O modules connected to the bus controller can be configured in a clear and organized manner, just as in Automation Studio.

Automation Studio Basis

As an application developed in Automation Studio, the FieldbusDESIGNER offers the following functionalities:

- Menu-guided configuration
- Wizards and selection menus
- Upgrade functionalities
- Extensive help system

Quick and easy configuration

All of the parameters on the B&R bus controller and on the I/O modules can be configured in just a few steps.

- Fieldbus selection
- Adding the bus controller to the network
- Connecting the I/O modules via the X2X Link
- Module configuration
- Assigning channel names in the I/O mapping
- Starting the builder

The screenshot displays the FieldbusDESIGNER software interface within the Automation Studio environment. The interface is divided into several panes. On the left, the 'Project Explorer' shows a tree view of the project components, including a PLC1 and various I/O modules. On the right, there are multiple configuration windows for different modules, such as 'PLC1.CPU1.R1.S11.R1.S11 [I/O Configuration]' and 'PLC1.CPU1.R1.S11.R1.S11 [IO Mapping]'. The 'IO Mapping' window shows a table with columns for Name, Value, Description, Channel Name, Data Type, and PV or Channel Name. The table lists various channels like 'ModuleOk', 'StatusInput1', 'StatusInput2', 'SupplyCurrent', and 'SupplyVoltage', each with a corresponding data type and PV/Channel Name. The interface is annotated with six numbered steps: 1. Select fieldbus (pointing to the Project Explorer), 2. Add bus controller to network (pointing to the PLC1 component), 3. Connect I/O modules via X2X (pointing to the I/O modules), 4. Configure modules (pointing to the 'IO Configuration' window), 5. Assign channel names (pointing to the 'IO Mapping' window), and 6. Start builder (pointing to the 'Start Builder' button in the top toolbar).

Quick and easy configuration in 6 steps

License for FieldbusDESIGNER

The FieldbusDESIGNER is available as free download from the B&R web portal or can be ordered as a CD version for an additional charge.

Model number for FieldbusDESIGNER as CD version

1A43FD:L1 FieldbusDESIGNER, German/English, single license, CD

Created output data

The FieldbusDESIGNER provides the following generated output data depending on the configured fieldbus:

- Complete project files for third-party systems
- I/O mapping information
- Detailed configuration data

Currently supported fieldbuses

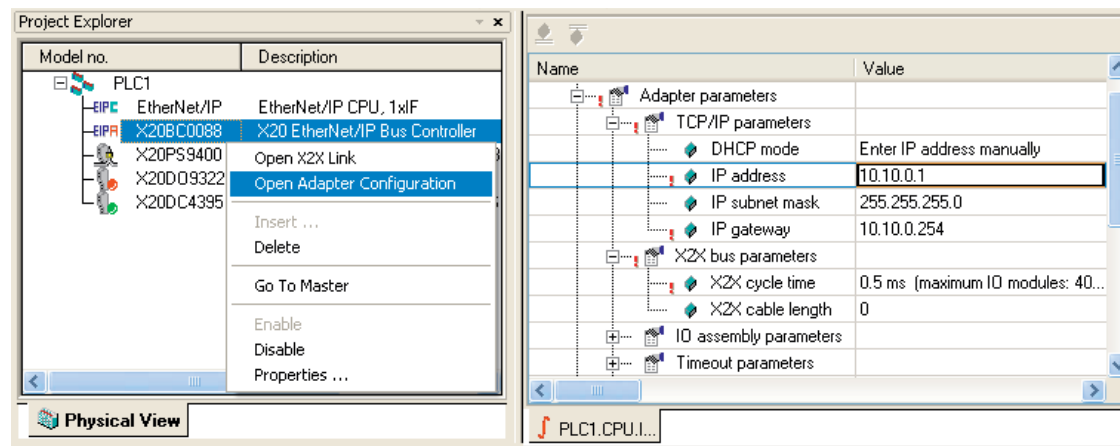
The following fieldbuses are currently supported in FieldbusDESIGNER

- EtherNet/IP
- Modbus/TCP

FieldbusDESIGNER because,

- Convenient configuration identical to Automation Studio
- No configuration on the bus controller needed when exchanging a device
- Assigning channel names instead of flat arrays with offset calculation

A B&R-recommended solution for utilizing the full functionality of the I/O modules on fieldbuses such as EtherNet/IP and Modbus/TCP.



Example: EtherNet/IP bus controller configuration



Automation training

B&R's modular training concept consists of compact training modules. This structure creates an individualized experience for every target group and helps maintain ongoing training at every location around the world.



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Tool training modules	1927

Introduction

Automation training

Our automation training program gets results quickly! A company's success is largely based on providing its employees with basic initial training and continual, specialized training. To provide support in this regard, B&R offers an extensive seminar program at all corresponding locations.

Our seminars make it possible for you to improve your automation engineering knowledge. When finished, you will be able to create efficient automation solutions yourself using B&R systems. In this way, you will secure a decisive competitive edge so that you can react faster to continually changing market demands.

Precision automation training

International standards, high quality, timeliness, and relevance are essential elements of a training program. A group's demands and previous knowledge vary from course to course. These aspects determine the goals and tempo of the training courses. A combination of course training and self-study provides a high level of flexibility.

Training modules

Our training modules are the basis for learning at seminars as well as for self-study.

The compact modules are based on a consistent didactic structure. The structured, bottom-up presentation allows complex, interrelated topics to be learned efficiently and effectively. The material has been arranged into individual modules so that training sessions can be tailored for different groups; however, the modules are also ideal for self-study.

Dates and locations

B&R offers both standard and customer-specific seminars at all of our locations worldwide. The on-site training sessions are led by our skilled and experienced trainers. Further information regarding planned dates and locations can be found on the B&R website www.br-automation.com or at the B&R subsidiary near you. (☎ 1520)

Overview of seminars

Control technology

You will become familiar with B&R's control products and the programming software Automation Studio, as well as learn how to use them.

Safety technology

These seminars provide you with a comprehensive look into the area of B&R safety technology, and into the programming of safety-oriented applications.

Visualization

These seminars provide you with a number of possibilities for easily creating your own innovative machine visualizations.

Motion control

In these seminars, you will get to know the B&R drive components and technology functions whose configuration and programming you learn step-by-step.

Process control

APROL - an Active Process Control system - allows complete automation of your systems. The seminars will introduce you to the current range of products.

Introduction

Overview of training modules

Automation Studio

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Training modules

Automation Studio

TM210 - The Basics of Automation Studio

Model number

German: TM210TRE.30-GER

English: TM210TRE.30-ENG

Objectives

- Learning how to work with Automation Studio by putting together a typical project
- Declaring data types and variables
- Programming languages in Automation Studio and their possibilities

Contents

- Installation
- Starting Automation Studio
- The first project
- The Automation Studio concept
- Variables
- Initialization
- Programming languages

Requirements

- Basic computer knowledge

TM211 - Automation Studio Online Communication

Model number

German: TM211TRE.30-GER

English: TM211TRE.30-ENG

Objectives

- Learning how to set up various online connections using different media
- Importance of the routing mechanism
- Benefits of remote maintenance

Contents

- The basics of online communication
- Online connection
- Routing
- Remote maintenance

Requirements

- TM210 - The Basics of Automation Studio

TM213 - Automation Runtime

Model number

German: TM213TRE.00-GER

English: TM213TRE.00-ENG

Objectives

- Participants will learn that there is a close relationship between accuracy, the number of machine cycles, and the quantity/quality of a product
- Automation Runtime functionality
- Automation Runtime configuration possibilities
- Automation Runtime updates

Contents

- Operating system basics
- Memory
- Operating states
- Deterministic multitasking
- Automation Runtime I/O management
- Installation and updates

Requirements

- TM210 - The Basics of Automation Studio
- TM211 - Automation Studio Online Communication

TM220 - The Service Technician on the Job

Model number

German: TM220TRE.00-GER

English: TM220TRE.00-ENG

Objectives

- Introduction to various work methods and tools
- Automation components from B&R
- Carrying out service activities

Contents

- The service technician
- Method of operation
- Controller environment
- B&R hardware
- Automation Runtime
- Practical examples

Requirements

- Basic technical training

Training modules

Automation Studio

TM223 - Automation Studio Diagnostics

Model number

German: TM223TRE.25-GER

English: TM223TRE.25-ENG

Objectives

- Using the various diagnostics tools in Automation Studio for error detection and correction

Contents

- Status bar
- Information about the target system
- Logbook
- Force
- Monitors
- Watch
- Trace
- NcDiagnose
- Profiler
- Debugger
- PVI Transfer tool

Requirements

- TM210 - The Basics of Automation Studio
- TM211 - Automation Studio Online Communication

TM230 - Structured Software Generation

Model number

German: TM230TRE.30-GER

English: TM230TRE.30-ENG

Objectives

- Basic knowledge of software development concepts, software generation and software quality issues
- Developing well-structured software concepts and implementing them using Automation Studio
- Learning Automation Studio functions that support work in project teams
- Using status diagrams and state machines to analyze, describe and discuss machine logic formally and precisely
- Producing high quality source code using B&R coding guidelines

Contents

- The software development process
- Project structuring
- Teamwork
- Status diagrams
- B&R coding guidelines

Requirements

- TM210 - The Basics of Automation Studio
- TM211 - Automation Studio Online Communication
- TM223 - Automation Studio Diagnostics
- At least one programming language

TM240 - Ladder Diagram (LAD)

Model number

German: TM240TRE.00-GER

English: TM240TRE.00-ENG

Objectives

- Overview of possibilities of Ladder Diagram programming
- Fundamental elements of Ladder Diagram and the symbols for logic programming
- Developing flexible Ladder Diagram programs using the program flow control elements

Contents

- Ladder Diagram
- Basic elements of a ladder diagram
- Ladder Diagram symbols
- Logic
- Controlling the program flow
- Using function blocks
- Current flow
- Application example

Requirements

- TM210 - The Basics of Automation Studio
- TM211 - Automation Studio Online Communication
- TM223 - Automation Studio Diagnostics

TM241 - Function Block Diagram (FBD)

Model number

German: TM241TRE.30-GER

English: TM241TRE.30-ENG

Objectives

- Overview of possibilities of Function Block Diagram programming
- Fundamental elements of the Function Block Diagram and the symbols for logic programming
- Developing flexible Function Block Diagram programs using the program flow control elements

Contents

- Function Block Diagram
- Function blocks
- Networks
- Logic
- Controlling the program flow

Requirements

- TM210 – The Basics of Automation Studio
- TM211 – Automation Studio Online Communication
- TM223 – Automation Studio Diagnostics

Training modules

Automation Studio

TM246 - Structured Text (ST)

Model number

German: TM246TRE.00-GER

English: TM246TRE.00-ENG

Objectives

- Programming language Structured Text (ST) for programming technical applications
- Command groups and their functions
- Overview of the reserved keywords in ST

Contents

- Structured Text features
- Command groups in ST
- Application example
- Keywords and functions

Requirements

- TM210 - The Basics of Automation Studio
- TM211 - Automation Studio Online Communication
- TM223 - Automation Studio Diagnostics

TM247 - Automation Basic (AB)

Model number

German: TM247TRE.00-GER

English: TM247TRE.00-ENG

Objectives

- Programming language Automation Basic (AB) for programming technical applications
- Command groups and their functions
- Overview of the reserved keywords in AB

Contents

- Automation Basic features
- Command groups in AB
- Application example
- Keywords and functions

Requirements

- TM210 - The Basics of Automation Studio
- TM211 - Automation Studio Online Communication
- TM223 - Automation Studio Diagnostics

TM248 - ANSI C

Model number

German: TM248TRE.25-GER

English: TM248TRE.25-ENG

Objectives

- The possibilities of ANSI C in Automation Studio

Contents

- The characteristics of ANSI C
- ANSI C in Automation Studio
- Variables
- Function calls
- B&R function blocks
- Compiler

Requirements

- TM210 – The Basics of Automation Studio
- TM211 – Automation Studio Online Communication
- TM223 – Automation Studio Diagnostics
- Basic knowledge of programming in C

TM250 - Memory Management and Data Storage

Model number

German: TM250TRE.00-GER

English: TM250TRE.00-ENG

Objectives

- Understanding the relationships between variables, arrays and structures and memory allocation
- Understanding the functionality of dynamic variables and dynamic memory allocation
- Overview of the options for handling data (e.g. creating data objects and files in the applications)

Contents

- Memory management
- Data storage

Requirements

- TM213 - Automation Runtime
- TM246 - Structured Text (ST)

Training modules

Automation Studio

TM260 - Automation Studio Libraries I

Model number

German: TM260TRE.25-GER

English: TM260TRE.25-ENG

Objectives

- The function principle and advantages of libraries
- Overview of the many functions in the B&R standard libraries
- Using the Automation Studio online help to configure functions and function blocks
- Working with and effectively applying the libraries and functions / function blocks
- Creating a library and the corresponding functions / function blocks

Contents

- Libraries: General information
- Standard libraries
- User libraries

Requirements

- TM213 - Automation Runtime
- TM246 - Structured Text (ST)

TM261 – Closed Loop Control with LOOPCONR

Model number

German: TM261TRE.00-GER

English: TM261TRE.00-ENG

Objectives

- Fundamental concepts such as dynamic systems, establishment of models and identification of controlled systems
- Influence of dead times, measurement errors and signal sampling of modulated actuator signals
- Advanced control structures
 - Manually configuring a PID controller
- Using the integrated auto-tuning procedure
- Pulse width modulation and control with opposing manipulated variables
- B&R simulation model with integrated temperature control system
- LoopConR library

Contents

- Simple basic concepts
 - Dynamic systems and controlled systems
- The closed control loop
- Controller and controller setting
- Application of the integrated auto-tuning procedure
- Controlling temperature systems
- Implementation of a pulse width modulation
- Procedure for solving control tasks

Requirements

- TM213 - Automation Runtime
- TM246 - Structured Text (ST)

Training modules

Automation Studio integrated motion

TM400 - The Basics of Drive Technology

Model number

German: TM400TRE.00-GER

English: TM400TRE.00-ENG

Objectives

- The components of a mechatronic drive solution
- The functionality of various technologies and their advantages / disadvantages
- The criteria for selecting a drive configuration

Contents

- The mechatronic drive solution
 - The core aspects of mechatronics
 - The basic requirements for a drive system
- Components of a drive system
 - Electrical drives
 - Position encoder
 - Power converter
- Integration in the process
 - Selecting the technology
 - Developing the control software

Requirements

- Basic knowledge of electrical engineering and mechanics

TM410 - The Basics of ASiM

Model number

German: TM410TRE.30-GER

English: TM410TRE.30-ENG

Objectives

- Learning the procedure for creating a drive configuration in Automation Studio
- Getting to know the main components of the B&R drive concept and understanding the communication relationships
- Diagnostics
- Using the "NC Test" tool to send commands to the ACOPOS and simulate specific test situations
- Using "NC Trace" to record specific values for analyzing positioning procedures

Contents

- Installation and upgrades
- NC concept
- Drive configuration
- NC software components
- NC Test
- INIT parameter settings

Requirements

- TM210 - The Basics of Automation Studio

TM440 - ASiM Basic Functions

Model number

German: TM440TRE.00-GER
English: TM440TRE.00-ENG

Objectives

- Operating the function blocks and understanding the structure of the corresponding function libraries (ACP10_MC)
- Learning how to use the basic functions for controlling and operating ACOPOS drives
- Learning how to implement specific positioning sequences in structured form using an application program

Contents

- The PLCopen programming standard
- The "ACP10_MC" function library
- Definition of a drive
- Using the functions
- Programming
 - Creating an automatic sequence
 - Error handling
- Motion control Sample Project
- Managing ACOPOS parameters

Requirements

- TM410 - The Basics of ASiM

TM441 - ASiM Multi-Axis Functions

Model number

German: TM441TRE.00-GER
English: TM441TRE.00-ENG

Objectives

- Learning the possibilities for using motion control multi-axis functions (ACP10_MC)
- Using select functions to link drives and to implement specific sequences while the drives are linked
- Creating dynamic positioning profiles (cam profiles) for linking drives

Contents

- General information about linking drives
- Electronic gears
 - Simple link
 - Drive link with position reference
 - Dynamic phase shift
- Cam profiles Introduction
 - Creating a cam profile and link functions
- Cam profile automat
 - Structure and functionality
 - Configuring and controlling the cam profile automat

Requirements

- TM440 - ASiM Basic Functions

Training modules

Automation Studio integrated motion

TM445 - ACOPOS ACP10 Software

Model number

German: TM445TRE.25-GER

English: TM445TRE.25-ENG

Objectives

- Introduction to the ACOPOS operating software ACP10
- ACP10 software in structured form for controlling ACOPOS servo drives

Contents

- Operating an axis
 - General information
 - Registering an axis
 - Executing commands
- ACP10 example task
 - Initialization steps
 - Action steps
- Special functions
 - Transferring individual ACOPOS parameters
 - Initialization of multiple parameters and message management

Requirements

- TM410 - The Basics of ASiM

TM446 - ACOPOS Smart Process Technology

Model number

German: TM446TRE.00-GER

English: TM446TRE.00-ENG

Objectives

- How and where SPT functions are used
- Configuring SPT functions in Automation Studio
- Removing fast-reacting parts of the application on the ACOPOS

Contents

- Concept
- Function overview
- Exercises

Requirements

- TM445 – ACOPOS ACP10 Software

TM450 - ACOPOS Control Concept and Settings

Model number

German: TM450TRE.25-GER

English: TM450TRE.25-ENG

Objectives

- Structure and functionality of the ACOPOS control concept
- Adjusting and optimizing the control parameters

Contents

- The essential basics of closed loop control
- Cascaded controller concept
 - Set value generator
 - Predictive position control loop
 - Speed controller
 - Current controller
- Theoretically determining the control parameters
- Procedure for setting the controller
- Saving the controller settings

Requirements

- TM410 - The Basics of ASiM

TM460 - Starting up Motors

Model number

German: TM460TRE.00-GER

English: TM460TRE.00-ENG

Objectives

- Requirements for operating a motor on a B&R servo drive
- Configuring the motor, encoder, temperature sensor and holding brake
- Starting up a motor step-by-step

Contents

- Parameter settings
- Commissioning
- Controller setting
- Checklist for startup
- Exercises

Requirements

- TM450 – ACOPOS Control Concept and Settings

Training modules

Automation Studio integrated motion

TM480 - Hydraulic Drive Control

Model number

German: TM480TRE.00-GER

English: TM480TRE.00-ENG

Objectives

- Fundamental understanding of the interrelationships in hydraulics
- Evaluating and solving hydraulic control tasks
- Linear and non-linear closed loop control methods for hydraulic drives
- Selection of suitable hardware
- Solving hydraulic tasks on your own

Contents

- Basics
- Hydraulic drive system structure
- Hydraulic drives as controlled system
- Closed loop control concept
- Axis links
- Safety

Requirements

- TM213 - Automation Runtime
- TM246 - Structured Text (ST)

Training modules

Automation Studio integrated visualization

TM500 - Basics of Integrated Safety Technology

Model number

German: TM500TRE.00-GER

English: TM500TRE.00-ENG

Objectives

- Integrated Safety Technology
- Optimally configuring components
- Commissioning and service possibilities

Contents

- Automation at B&R
- The topic of safety
- Integrated Safety Technology
- Safety components
- Commissioning and service

Requirements

- TM210 The Basics of Automation Studio

TM510 - ASiST SafeDESIGNER

Model number

German: TM510TRE.30-GER

English: TM510TRE.30-ENG

Objectives

- Procedure and aspects involved in developing a safety-oriented application
- Features available in Automation Studio and SafeDESIGNER
- Creating a safety application
- Documentation in safety applications

Contents

- Developing a safety application
- Configuration in Automation Studio
- SafeDESIGNER
- Commissioning and service
- Sample project

Requirements

- TM500 Basics of Integrated Safety Technology

Training modules

Automation Studio integrated visualization

TM600 - The Basics of Visualization

Model number

German: TM600TRE.00-GER

English: TM600TRE.00-ENG

Objectives

- Visualization design aspects
- Selecting the right visualization system for an application
- Accurately illustrating the processes in graphical or textual form using visualization standards

Contents

- Visualization – A definition
- Human machine communication
- Visualization applications in automation
 - Development
 - Demands on visualization
 - Selection criteria
 - Visualization concepts
- Visualization design aspects
- Standards and guidelines

Requirements

- Basic computer knowledge

TM630 - Visualization Programming Guide

Model number

German: TM630TRE.00-GER

English: TM630TRE.00-ENG

Objectives

- Effectively design visualization projects
- Developing a well-structured visualization

Contents

- Project procedure
- Specification
- Software design
- Integrating visualization
- Project maintenance and organization

Requirements

- TM610 - The Basics of ASiV

TM610 - The Basics of ASiV

Model number

German: TM610TRE.30-GER

English: TM610TRE.30-ENG

Objectives

- Creating a visualization system with Automation Studio
- Learning about and understand the concept and possibilities of visualization systems
- This training module also demonstrates how to get a visualization project up and running on the target system within a few minutes

Contents

- Basics
- Getting started
- Creating a new project
- Working with the Ladder Diagram editor
- Sample project

Requirements

- TM210 - The Basics of Automation Studio
- TM600 - The Basics of Visualization

TM640 - ASiV Alarm System

Model number

German: TM640TRE.30-GER

English: TM640TRE.30-ENG

Objectives

- Configuring the alarm system with Automation Studio and using it properly
- Understanding an alarm's features and gaining an overview of the different methods and possibilities for displaying alarm texts

Contents

- Automation Studio alarm system
- Configuring the alarm system
- Displaying the alarms during runtime
- Interaction with the alarm system
- Example program

Requirements

- TM610 - The Basics of ASiV

Training modules

Automation Studio integrated visualization

TM650 - ASiV Internationalization

Model number

German: TM650TRE.30-GER

English: TM650TRE.30-ENG

Objectives

- Creating a multi-language visualization system
- Appreciation for the diverse world of languages and units
- Effects of language and unit switching on the visualization application

Contents

- Language switching
- Language switching example
- Physical units
- Unit switching example

Requirements

- TM610 - The Basics of ASiV



Training modules

PVI

TM700 - Automation Net PVI

Model number

German: TM700TRE.00-GER

English: TM700TRE.00-ENG

Objectives

- Automation Net PVI introduction
- Creating simple visualization concepts
- Possibilities for programming and configuration

Contents

- B&R Automation Net
- Automation Net - PVI lines
- PVI client programming
- PVI Server

Requirements

- TM600 - The Basics of Visualization

TM710 - PVI Communication

Model number

German: TM710TRE.00-GER

English: TM710TRE.00-ENG

Objectives

- PVI communication between Windows applications and the controller
- Data acquisition, data transmission and data management processes

Contents

- PVI/Client communication
- PVI/Line communication
- PVI/PVI communication

Requirements

- TM700 - Automation Net PVI

TM711 - PVI DLL Programming

Model number

German: TM711TRE.00-GER
English: TM711TRE.00-ENG

Objectives

- Creating a PVI client application
- Using PVI functions

Contents

- PVICOM.DLL programming
- PVI client application

Requirements

- TM710 - PVI communication

TM712 - PVIServices

Model number

German: TM712TRE.00-GER
English: TM712TRE.00-ENG

Objectives

- PVIServices classes
- Creating a PVIServices application

Contents

- Basics
- Communication objects
- Example program

Requirements

- TM710 - PVI communication

Training modules

PVI

TM730 - PVI OPC

Model number

German: TM730TRE.30-GER

English: TM730TRE.30-ENG

Objectives

- OPC in AS3.x
- Creating an OPC configuration

Contents

- BR.OPC.Server
- Creating an OPC configuration in AS3.x
- Testing an OPC configuration

Requirements

- TM710 - PVI communication

Training modules

APROL process control system

TM800 - APROL System Concept

Model number

German: TM800TRE.00-GER

English: TM800TRE.00-ENG

Objectives

- Understanding control systems functionality
- Overview of the APROL control system structure and components
- Solving common automation problems using the standard system components and library function blocks

Contents

- System introduction
 - The philosophy
 - The control system components (Engineering, Runtime, Operator)
 - The bus systems
- APROL system login
 - Logging on to the engineering system
 - Window manager
 - Login mechanism
 - Licensing in APROL
 - Designer management

Requirements

- TM212 - Automation Target
- TM213 - Automation Runtime

TM810 - APROL Setup, Configuration and Recovery

Model number

German: TM810TRE.30-GER

English: TM810TRE.30-ENG

Objectives

- Installing and configuring an APROL system
- Restoring a backup

Contents

- Installing Suse Linux
- Installing APROL
- Configuring APROL
- System configuration X-Windows system Network configuration • System recovery

Requirements

- TM800 - APROL System Concept

Training modules

APROL process control system

TM811 - APROL Runtime System

Model number

German: TM811TRE.30-GER

English: TM811TRE.30-ENG

Objectives

- Operating an APROL system
- Getting to know all of the APROL analysis tools (AlarmReport, TrendReport, online trends, FC debugging, etc.)

Contents

- Runtime login - mechanisms and use
- Display Center with menu bar and toolbar, alarm list and alarm line, image tree
- Operating options, debugging, online trends, footer, etc.
- AlarmReport with filtering options, number/runtime and runtime analyses
- TrendReport with analysis options
- Help for RUNTIME and operating system

Requirements

- TM800 - APROL System Concept

TM812 - APROL Operator Management

Model number

German: TM812TRE.30-GER

English: TM812TRE.30-ENG

Objectives

- Setting up operator management for the RUNTIME and operating environment in APROL
- Presenting all options for rights assignment, profile setup, and login mechanisms
- Creating display driver function blocks with operating possibilities and corresponding rights

Contents

- Operator management (rights, profile, OperatorManager -> designer with properties)
- Adding an image function block with emphasis on operator management
- Rights management in the libraries
- OperatorManager in the engineering system and in the RUNTIME and operating environments

Requirements

- TM800 - APROL System Concept
- TM811 - APROL Runtime System

TM813 - APROL XML Queries and Audit Trail

Model number

German: TM813TRE.30-GER

English: TM813TRE.30-ENG

Objectives

- Performing Web-based queries of the control system
- Understanding the advantages of the XML concept for monitoring and logging the system
- Using Audit Trail
- Validating systems according to FDA (GAMP 4)

Contents

- The concept of data management in APROL and the corresponding XML queries
- The advantages of the mechanism and the STANDARD XML queries included in APROL
- The Audit Trail concept and recorded data (Action Logging)
- Using the Audit Trail for logging, validation and more
- Other XML queries

Requirements

- TM800 - APROL System Concept
- TM811 - APROL Runtime System

TM830 - APROL Project Engineering

Model number

German: TM830TRE.30-GER

English: TM830TRE.30-ENG

Objectives

- Creating simple projects using the standard system components and library function blocks
- Developing a complete project including hardware, software, visualization, and download

Contents

- Master data management
- Basic project settings
- Physical view
- Structuring the project
- Hardware configuration (controller, control computer, operator stations)
- Configuration of logic for the controller using a function chart
- Object-oriented programming in APROL
- Generation and distribution of the project
- Download manager
- Chart debugging and cross-references
- Creating a process control system application (creating process diagrams, animating, etc.)
- Hyper macros / typicals
- Version management

Requirements

- TM800 - APROL System Concept
- TM801 - APROL Engineering Basics

Training modules

APROL process control system

TM840 - APROL Parameter Management and Recipes

Model number

German: TM840TRE.30-GER

English: TM840TRE.30-ENG

Objectives

- Implementing parameter sets and recipes in APROL
- Working with parameter sets and recipes in the runtime and operating environments
- Adding data with MySQL

Contents

- Parameters in the engineering system (equipment -> plant parts)
- Parameters in the runtime environment (ParameterCenter)
- Parameter handling in logic sequences (automatic parameter handling)
- Database background (MySQL)

Requirements

- TM830 - APROL Project Engineering

TM850 - APROL Controller Configuration and INA

Model number

German: TM850TRE.30-GER

English: TM850TRE.30-ENG

Objectives

- Configuration of controllers in the control system.
- Configuration of communication between several controllers in the control system

Contents

- Operating system download controller (B&R controller)
- Controller (B&R controller) in Engineering (CAE Manager)
- INA - Cross communication via control computer
- INA - Direct cross communication (controller - controller)
- INA connection
- Event driver

Requirements

- TM830 - APROL Project Engineering

TM860 – APROL Library Engineering

Model number

German: TM860TRE.30-GER

English: TM860TRE.30-ENG

Objectives

- Creating libraries in APROL
- Creating "blocks" in APROL

Contents

- Library engineering basics
- Creating functions and function blocks
- Creating image macros
- Creating image function blocks
- Creating hyper macros
- UCB block engineering

Requirements

- TM830 - APROL Project Engineering

TM865 - APROL Library Guide Book

Model number

German: TM865TRE.30-GER

English: TM865TRE.30-ENG

Objectives

- Tips and guidelines for creating libraries (name assignment, standardization, colors, etc.)

Contents

- This is a supplement to library engineering
- Guidelines for assigning names to function blocks and hyper macros
- Guidelines for assigning names to function block PINs
- Guidelines for using the alarm and trend blocks
- Guidelines for using all of the hardware info

Requirements

- TM830 - APROL Project Engineering
- TM860 - APROL Library Engineering

Training modules

APROL process control system

TM870 - APROL Python Programming

Model number

German: TM870TRE.00-GER

English: TM870TRE.00-ENG

Objectives

- Introduction to Python programming
- Python for expanding the functionalities in APROL

Contents

- General information about Python
- Using Python in APROL

Requirements

- TM830 - APROL Project Engineering
- TM860 - APROL Library Engineering

TM890 - Linux Basics

Model number

German: TM890TRE.00-GER

English: TM890TRE.00-ENG

Objectives

- Make it easier to work with the powerful Linux operating system
- Commands and reference work for Linux

Contents

- General information about Linux
- Directory structure
- Basic command set
- User management and file rights
- APROL file structure

Requirements

- Basic computer knowledge

Training modules

Tools

TM140 - Automatic Code Generation with MATLAB/Simulink

Model number

German: TM140TRE.30-GER

English: TM140TRE.30-ENG

Objectives

- Automatic code generation using AR4MATLAB/Simulink
- Integrating automatically generated tasks in existing Automation Studio projects

Contents

- Application possibilities
- Knowledge of B&R Simulink blocks
- Adjusting existing Simulink models
- Options for finding errors

Requirements

- TM210 - The Basics of Automation Studio

Documentation

B&R's dedication to perfection doesn't stop with the products, it is also reflected in the documentation.

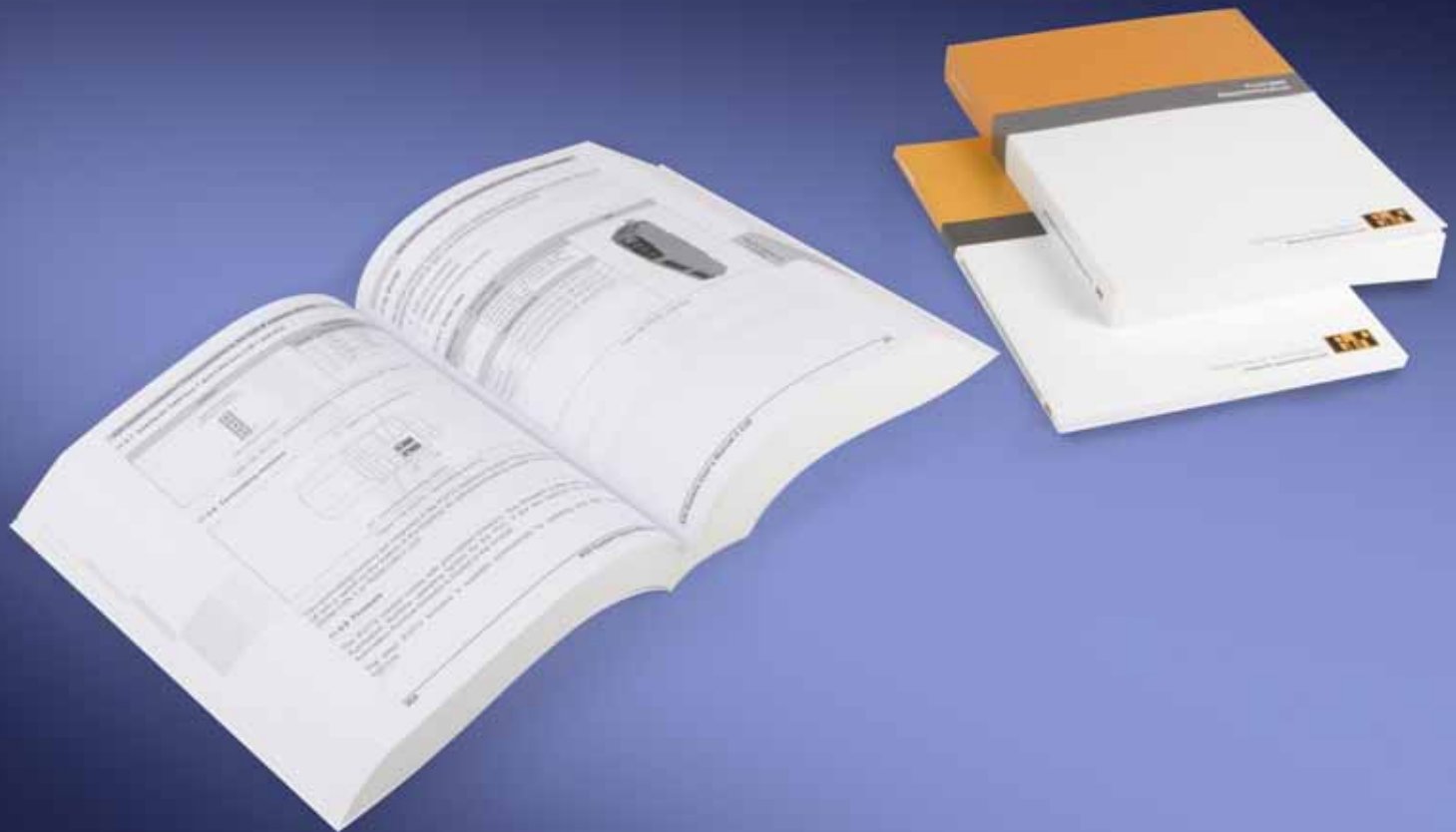


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Documentation

We pay as much attention to detail when creating our manuals and other information material as we do when developing our products. In direct cooperation with the development department, our technical writers collect all relevant information and work it into our manuals. This process results in the yearly product catalog, product brochures and manuals, which provide extremely detailed information about our products.

In addition to English and German, we also provide our documentation in French, Italian, Chinese, Czech and Polish, just to name a few.

A current and complete list of all available documentation can be found on our homepage at www.br-automation.com

General documentation

Model number	Short description
MM-D00536.309	Image brochure, German
MM-E00536.310	Image brochure, English
MM-D00516.267	Product profile, German
MM-E00516.268	Product profile, English
MM-D00537.314	High-tech manufacturing, German
MM-E00537.315	High-tech manufacturing, English

Product documents

Model number	Short description
MM-D00740.580	Innovations 2009, German
MM-E00740.581	Innovations 2009, English
MM-D00525.278	The M class, German
MM-E00530.291	The M class, English
MM-D00525.279	Multi-talented, German
MM-E00530.292	Multi-talented, English
MM-D00545.333	Integrated safety, German
MM-E00545.334	Integrated safety, English
MM-E00443.232	ETHERNET Powerlink, English
MM-D00615.380	Process control system, German
MM-E00615.381	Process control system, English
MM-D00540.318	APROL R 3.0 process control system, German
MM-E00540.319	APROL R 3.0 process control system, English

Industry-specific flyers

Model number	Short description
MM-D00540.324	Industry-specific flyer for plastics, German
MM-E00540.325	Industry-specific flyer for plastics, English
MM-D00523.276	Industry-specific flyer for packaging, German
MM-E00523.277	Industry-specific flyer for packaging, English
MM-D00605.356	Industry-specific flyer for printing, German
MM-E00605.357	Industry-specific flyer for printing, English
MM-D00537.315	Industry-specific flyer for woodworking, German
MM-E00536.311	Industry-specific flyer for woodworking, English
MM-D00735.557	Industry-specific flyer for the metal industry, German
MM-E00735.558	Industry-specific flyer for the metal industry, English
MM-D00633.434	Industry-specific flyer for the textile industry, German
MM-E00633.435	Industry-specific flyer for the textile industry, English

Manuals

Model number	Short description
MA4SERV-0	B&R System 2000 maintenance for end customers, German
MA4SERV-E	B&R System 2000 maintenance for end customers, English
MACOGETST-ENG	CANopen Getting Started user's manual, German
MACOGETST-ENG	CANopen Getting Started user's manual, English
MADNGETST-ENG	DeviceNet Getting Started user's manual, German
MADNGETST-ENG	DeviceNet Getting Started user's manual, English
MAEI-GER	EtherNet/IP user's manual, German
MAEI-ENG	EtherNet/IP user's manual, English
MAEIGETST-GER	EtherNet/IP Getting Started user's manual, German
MAEIGETST-ENG	EtherNet/IP Getting Started user's manual, English
MAMB-GER	Modbus TCP user's manual, German
MAMB-ENG	Modbus TCP user's manual, English
MAPBGST-ENG	Profibus DP Getting Started user's manual, German
MAPBGST-ENG	Profibus DP Getting Started user's manual, English
MAPLINK-E	Ethernet POWERLINK user's manual, German
MAPLINK-E	Ethernet POWERLINK user's manual, English
MASAFETY-GER	Integrated Safety Technology user's manual, German
MASAFETY-ENG	Integrated Safety Technology user's manual, English
MASAFETY1-GER	Integrated Safety Technology user's manual (without PLCopen function blocks), German
MASAFETY1-ENG	Integrated Safety Technology user's manual (without PLCopen function blocks), English
MASAFETY2-GER	Integrated Safety Technology - PLCopen function blocks user's manual, German
MASAFETY2-ENG	Integrated Safety Technology - PLCopen function blocks user's manual, English
MASYS22003-E	System 2003 user's manual, German
MASYS22003-E	System 2003 user's manual, English
MASYS22005-0	System 2005 user's manual, German
MASYS22005-E	System 2005 user's manual, English
MAX20-ENG	X20 System user's manual, German
MAX20-ENG	X20 System user's manual, English
MAX67-ENG	X67 System user's manual, German
MAX67-ENG	X67 System user's manual, English
MACIS-ENG	Compact Inverter System user's manual, German
MACIS-ENG	Compact Inverter System user's manual, English
MACIO-ENG	Compact I/O System user's manual, German
MACIO-ENG	Compact I/O System user's manual, English
MAPWHW-E	Panelware Hardware user's manual, German
MAPWHW-E	Panelware Hardware user's manual, English
MAPWP127-0E	Panelware P127 user's manual, German/English
MAPWC130-0E	Panelware C130 user's manual, German/English
MAPP01-E	Power Panel 15/21/35/41 user's manual, German
MAPP01-E	Power Panel 15/21/35/41 user's manual, English
MAPP45-ENG	PP45 user's manual, German
MAPP45-ENG	PP45 user's manual, English

Model number	Short description
MAPP100.200-GER	PP100/200 user's manual, German
MAPP100.200-ENG	PP100/200 user's manual, English
MAMP100.200-GER	MP100/200 user's manual, German
MAMP100.200-ENG	MP100/200 user's manual, English
MAAPC620-GER	APC620 user's manual, German
MAAPC620-ENG	APC620 user's manual, English
MAAPC680-GER	APC680 user's manual, German
MAAPC680-ENG	APC680 user's manual, English
MAPPC700-GER	PPC700 user's manual, German
MAPPC700-ENG	PPC700 user's manual, English
MAAP800-ENG	AP800 user's manual, German
MAAP800-ENG	AP800 user's manual, English
MAAP900-ENG	AP900 user's manual, German
MAAP900-ENG	AP900 user's manual, English
MAPRV2000-GER	Provit 2000 user's manual, German
MAPRV2000-ENG	Provit 2000 user's manual, English
MAPRV5000-ENG	Provit 5000 user's manual, German
MAPRV5000-ENG	Provit 5000 user's manual, English
MASAFETYGUIDE-X	Safety guidelines, multi-language
MAUPS24VDC-GER	UPS 24V user's manual, German
MAUPS24VDC-ENG	UPS 24V user's manual, English
MAACP2-0	ACOPOS user's manual, German
MAACP2-E	ACOPOS user's manual English
MAACPM-ENG	ACOPOSmulti user's manual, German
MAACPM-ENG	ACOPOSmulti user's manual, English
MAMOT1-E	8MS three-phase synchronous motors user's manual, German
MAMOT1-E	8MS three-phase synchronous motors user's manual, English
MAMOT2-GER	8LS three-phase synchronous motors user's manual, German
MAMOT2-ENG	8LS three-phase synchronous motors user's manual, English
MAMKEY-GER	Mkey user's manual, German
MAMKEY-ENG	Mkey user's manual, English
MAPPC300-GER	PPC300 user's manual, German
MAPPC300-ENG	PPC300 user's manual, English
MAMPCBX-ENG	MP connection box user's manual, German
MAMPCBX-ENG	MP connection box user's manual, English
MAMP40.50-GER	MP40/50 user's manual, German
MAMP40.50-ENG	MP40/50 user's manual, English
MAPP300.400-ENG	PP300/400 user's manual, German
MAPP300.400-ENG	PP300/400 user's manual, English
MAAPC800-ENG	APC800 user's manual, German
MAAPC800-ENG	APC800 user's manual, English



Accessories

Terminals, infrastructure components,
memory, batteries, cables, etc.

Table of contents

Product overview	 1940
Product data sheets	 1944

Product overview

Terminal blocks



Model number	Short description	
0TB3102-7011	Accessory terminal block, 2-pin, A coded, screw clamp, 6 mm ²	1944
0TB3102-7012	Accessory terminal block, 2-pin, B coded, screw clamp, 6 mm ²	1944
0TB103.8	Connector, 24 VDC, 3-pin male, screw clamp, 3.31 mm ² , protected against vibration by the screw flange	1945
0TB103.9	Connector, 24 VDC, 3-pin female, screw clamp, 3.31 mm ² , protected against vibration by the screw flange	1945
0TB103.91	Connector, 24 VDC, 3-pin female, cage clamp, 3.31 mm ² , protected against vibration by the screw flange	1945
0TB3103-7020	Accessory terminal block, 3-pin, screw clamp 6 mm ²	1946
0TB3104-7011	Accessory terminal block, 4-pin, A coded, screw clamp, 6 mm ²	1947
0TB3104-7012	Accessory terminal block, 4-pin, B coded, screw clamp, 6 mm ²	1947
0TB704.9	Accessory terminal block, 4-pin, screw clamp, 1.5 mm ²	1948
0TB704.91	Accessory terminal block, 4-pin, cage clamp, 2.5 mm ²	1948
0TB2105.9010	Accessory terminal block, 5-pin, screw clamp, 1.5 mm ²	1949
0TB2105.9110	Accessory terminal block, 5-pin, cage clamp, 2.5 mm ²	1949
0TB708.91	Accessory terminal block, 8-pin, cage clamp, 1.5 mm ²	1950
0TB1108.8110	Accessory terminal block, 8-pin, cage clamp, 1.5 mm ² , protected against vibration by the screw flange	1950
0TB710.91	Accessory terminal block, 10-pin, cage clamp, 1.5 mm ²	1951
0TB1111.8010	Accessory terminal block, 10-pin, screw clamp, 1.5 mm ² , protected against vibration by the screw flange	1952
0TB1111.8110	Accessory terminal block, 10-pin, cage clamp, 1.5 mm ² , protected against vibration by the screw flange	1952
7TB710.9	Accessory terminal block, 10-pin, screw clamp, 1.5 mm ²	1953
7TB710.91	Accessory terminal block, 10-pin, cage clamp, 2.5 mm ²	1953
0TB1111.8010	Accessory terminal block, 11-pin, screw clamp, 1.5 mm ² , protected against vibration by the screw flange	1954
0TB1111.8110	Accessory terminal block, 11-pin, cage clamp, 1.5 mm ² , protected against vibration by the screw flange	1954
7TB712.9	Accessory terminal block, 12-pin, screw clamp, 1.5 mm ²	1955
7TB712.91	Accessory terminal block, 12-pin, cage clamp, 1.5 mm ²	1955
7TB718.9	Accessory terminal block, 18-pin, screw clamp, 1.5 mm ²	1956
7TB718.91	Accessory terminal block, 18-pin, cage clamp, 1.5 mm ²	1956

Infrastructure components



Model number	Short description	
0AC401.9	Encoder 5 V - 24 V, converter for 5 V encoders (abs. or incr.)	1958
0AC808.9	8x industrial hub (Layer 2), 24 VDC, 10/100 MBit/s with auto-sensing, MDIX switch for channel 1	1957
0AC912.9	Bus adapter, CAN, 1 CAN interface	1960
0AC913.92	Bus adapter, CAN, 2 CAN interfaces, including 30 cm attachment cable (DSUB connector)	1960
0AC913.93	Bus adapter, CAN, 2 CAN interfaces, including 30 cm attachment cable (TB704)	1960
0G1000.00-090	Bus connector, RS485, for Profibus networks	1958
7AC911.9	Bus connector, CAN bus	1958
ECINT1-1	RS232/RS485 interface converter, electrically isolated, for coupling RS232 interface modules to an RS485 twisted pair bus, without lightning protection	1959
ECINT1-11	RS232/RS485 interface converter, electrically isolated, for coupling RS232 interface modules to an RS485 twisted pair bus, with lightning protection	1959

CompactFlash



Model number	Short description
5CFCRD.0064-03	CompactFlash 64 MB ATA/IDE SiliconSystems
5CFCRD.0128-03	CompactFlash 128 MB ATA/IDE SiliconSystems
5CFCRD.0256-03	CompactFlash 256 MB ATA/IDE SiliconSystems
5CFCRD.0512-03	CompactFlash 512 MB ATA/IDE SiliconSystems
5CFCRD.1024-03	CompactFlash 1024 MB ATA/IDE SiliconSystems
5CFCRD.2048-03	CompactFlash 2048 MB ATA/IDE SiliconSystems
5CFCRD.4096-03	CompactFlash 4096 MB ATA/IDE SiliconSystems
5CFCRD.8192-03	CompactFlash 8192 MB ATA/IDE SiliconSystems

PC cards



Model number	Short description
0MC111.9-1	PC card, 2 MB FlashPROM
0MC112.9-1	PC card, 4 MB FlashPROM
0MC211.9	PC card, 2 MB SRAM
9A0015.99	CompactFlash adapter; for operating CompactFlash in a PC card slot

USB accessories



Model number	Short description
5MD900.USB2-01	USB 2.0 drive combination; consists of DVD-RW/CD-RW, FDD, CompactFlash slot (type II), USB connection (type A front, type B back); 24 VDC; (screw clamp 0TB103.9 or 1961 cage clamp 0TB103.91)
5A5003.03	Front cover for USB drive combination 5MD900.USB2-01
5CAUSB.0018-00	USB 2.0 cable type A-B, 1.8 m
5CAUSB.0050-00	USB 2.0 cable type A-B, 5 m
5MMUSB.2048-00	USB 2.0 flash drive, 2048 MB

PCI cards



Model number	Short description
5ACPCI.ETH1-01	PCI Ethernet card with 1x 10/100 MBit/s RJ45 network connection
5ACPCI.ETH3-01	PCI Ethernet card with 3x 10/100 MBit/s RJ45 network connections

Product overview

Cables

Model number	Short description	
0G0001.00-090	Cable PC <-> PLC/PW, RS232, online cable	
9A0017.01	Null modem cable RS232, 0.6 m, for connecting UPS and IPC	
9A0017.02	Null modem cable RS232, 1.8 m, for connecting UPS and IPC	
X20CA0E61.0002	EPL connection cable RJ45 to RJ45, 0.2 m	1962
X20CA0E61.0010	EPL connection cable RJ45 to RJ45, 1.0 m	1962
X20CA0E61.0020	EPL connection cable RJ45 to RJ45, 2.0 m	1962
X20CA0E61.0050	EPL connection cable RJ45 to RJ45, 5.0 m	1962
X20CA0E61.0100	EPL connection cable RJ45 to RJ45, 10.0 m	1962
X20CA0E61.0150	EPL connection cable RJ45 to RJ45, 15.0 m	1962
X20CA0E61.0500	EPL connection cable RJ45 to RJ45, 50.0 m	1962
X67CA0E41.0050	EPL attachment cable RJ45 to M12, 5.0 m	1962
X67CA0E41.0150	EPL attachment cable RJ45 to M12, 15.0 m	1962
X67CA0E41.0500	EPL attachment cable RJ45 to M12, 50.0 m	1962
X67CA0X99.1000	Cable for custom prefabrication, 100.0 m	

19" AT keyboard



Model number	Short description	
5E9600.01-010	AT keyboard, 19 inch, front mount installation, IP65 from front, German keyboard layout	1964
5E9600.01-020	AT keyboard, 19 inch, front mount installation, IP65 from front, US keyboard layout	1964

Batteries

Model number	Short description	
0AC200.9	Lithium batteries, 5 pcs., 3 V / 950 mAh, cylindrical battery	
0AC201.9	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell	

Miscellaneous

Model number	Short description	
0AC171.9	Glass tube fuses 5 x 20 mm, 20 pcs., 3.15 A T / 250 V	
0AC301.9	Accessory, 8x shielding clamp	1963
5AC900.1100-00	Touch screen pen (5x)	
9A0013.01	Pen for resistive touch screen	

Data sheets for product-specific accessories can be found in the sections for the respective product families.



Terminal blocks

The single row 2-pin terminal block 0TB3102 is used for making connections on an X20 energy measurement module.



Brief overview	0TB3102-7011	0TB3102-7012
Number of pins	2	2
Coding	A	B
Type of terminal	Screw clamps	Screw clamps
Distance between contacts	7.62 mm	7.62 mm
Contact resistance	≤4.5 mΩ	≤4.5 mΩ
Rated voltage	600 V	600 V
Rated current ¹⁾	31 A	31 A
Connection cross section		
AWG wire	22 - 10 AWG	22 - 10 AWG
Solid wire line	0.20 - 6.00 mm ²	0.20 - 6.00 mm ²
Fine wire line without wire tip sleeves	0.20 - 6.00 mm ²	0.20 - 6.00 mm ²
Fine wire line with wire tip sleeves	0.25 - 6.00 mm ²	0.25 - 6.00 mm ²
Wire tip sleeves with plastic covering	0.25 - 4.00 mm ²	0.25 - 4.00 mm ²
Cable type	Only copper wires (no aluminum wires!)	Only copper wires (no aluminum wires!)
Comment	Multi-function flange for secure, high-speed and tool-free locking Rated values according to UL	Multi-function flange for secure, high-speed and tool-free locking Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration!

The single row 3-pin terminal block TB103 is used to connect the supply voltage.



Brief overview	0TB103.8	0TB103.9	0TB103.91
Number of pins	3 (male)	3 (female)	3 (female)
Type of terminal	Screw clamps	Screw clamps	Cage clamps
Distance between contacts	5.08 mm	5.08 mm	5.08 mm
Contact resistance	≤5 mΩ	≤5 mΩ	≤5 mΩ
Rated voltage	300 V	300 V	300 V
Rated current ¹⁾	10 A / contact	10 A / contact	10 A / contact
Connection cross section			
AWG wire	22 - 12 AWG	26 - 12 AWG	26 - 12 AWG
Solid wire line	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²	0.20 - 2.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Protected against vibration by the screw flange Rated values according to UL	Protected against vibration by the screw flange Rated values according to UL	Protected against vibration by the screw flange Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

Terminal blocks

The single row, 3-pin terminal block 0TB3103 is used for making the connection to the X20 motor module MM4456 and other devices.



Brief overview	0TB3103-7020
Number of pins	3
Type of terminal	Screw clamps
Distance between contacts	7.62 mm
Contact resistance	$\leq 4.5 \text{ m}\Omega$
Rated voltage	600 V
Rated current ¹⁾	31 A
Connection cross section	
AWG wire	22 - 10 AWG
Solid wire line	0.20 - 6.00 mm ²
Fine wire line without wire tip sleeves	0.20 - 6.00 mm ²
Fine wire line with wire tip sleeves	0.25 - 6.00 mm ²
Wire tip sleeves with plastic covering	0.25 - 4.00 mm ²
Cable type	Only copper wires (no aluminum wires!)
Comment	Multi-function flange for secure, high-speed and tool-free locking Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration!

The single row 4-pin terminal block OTB3104 is used for making connections on an X20 energy measurement module.



Brief overview	OTB3104-7011	OTB3104-7012
Number of pins	4	4
Coding	A	B
Type of terminal	Screw clamps	Screw clamps
Distance between contacts	7.62 mm	7.62 mm
Contact resistance	≤4.5 mΩ	≤4.5 mΩ
Rated voltage	600 V	600 V
Rated current ¹⁾	31 A	31 A
Connection cross section		
AWG wire	22 - 10 AWG	22 - 10 AWG
Solid wire line	0.20 - 6.00 mm ²	0.20 - 6.00 mm ²
Fine wire line without wire tip sleeves	0.20 - 6.00 mm ²	0.20 - 6.00 mm ²
Fine wire line with wire tip sleeves	0.25 - 6.00 mm ²	0.25 - 6.00 mm ²
Wire tip sleeves with plastic covering	0.25 - 4.00 mm ²	0.25 - 4.00 mm ²
Cable type	Only copper wires (no aluminum wires!)	Only copper wires (no aluminum wires!)
Comment	Multi-function flange for secure, high-speed and tool-free locking Rated values according to UL	Multi-function flange for secure, high-speed and tool-free locking Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration!

Terminal blocks

The single-row 4-pin terminal block TB704 is used as the supply voltage terminal block and the connection terminal for fieldbuses.



Brief overview	0TB704.9	0TB704.91 ¹⁾
Number of pins	4	4
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	5.08 mm	5.08 mm
Contact resistance	≤5 mΩ	≤5 mΩ
Rated voltage	300 V	300 V
Rated current ²⁾	10 A / contact	10 A / contact
Connection cross section		
AWG wire	26 - 12 AWG	26 - 12 AWG
Solid wire line	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 2.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Rated values according to UL	Rated values according to UL

1) The cage clamp terminal blocks cannot be used side-by-side.

2) The respective limit data for the I/O modules must be taken into consideration.

The single row 5-pin terminal block TB2105 is also used as a connection terminal for fieldbuses.



Brief overview	0TB2105.9010	0TB2105.9110 ¹⁾
Number of pins	5	5
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	5.08 mm	5.08 mm
Contact resistance	≤5 mΩ	≤5 mΩ
Rated voltage	300 V	300 V
Rated current ²⁾	10 A / contact	10 A / contact
Connection cross section		
AWG wire	26 - 12 AWG	26 - 12 AWG
Solid wire line	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 2.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Rated values according to UL	Rated values according to UL

1) The cage clamp terminal blocks cannot be used side-by-side.

2) The respective limit data for the I/O modules must be taken into consideration.

Terminal blocks

The single-row 8-pin terminal block TB708 is used for making connections on various B&R modules.



Brief overview	0TB708.91	0TB1108.8110
Number of pins	8	8
Type of terminal	Cage clamps	Cage clamps
Distance between contacts	3.5 mm	3.5 mm
Contact resistance	≤4.2 mΩ	≤4.2 mΩ
Rated voltage	300 V	300 V
Rated current ¹⁾	10 A / contact	10 A / contact
Connection cross section		
AWG wire	26 - 14 AWG	26 - 14 AWG
Solid wire line	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.00 mm ²	0.20 - 1.00 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Mechanical removal aid, Rated values according to UL	Protected against vibration by the screw flange Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

The single row 10-pin terminal block OTB710 is used for making connections on an XV module.



Brief overview	OTB710.91
Number of pins	10
Type of terminal	Cage clamps
Distance between contacts	3.5 mm
Contact resistance	$\leq 4.2 \text{ m}\Omega$
Rated voltage	300 V
Rated current ¹⁾	10 A / contact
Connection cross section	
AWG wire	26 - 14 AWG
Solid wire line	0.20 - 1.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.00 mm ²
Cable type	Copper wires only (no aluminum wires!)
Comment	Mechanical removal aid, Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

Terminal blocks

The single row 10-pin terminal block TB1110 is used for making connections on various B&R I/O modules.



Brief overview	0TB1110.8010	0TB1110.8110
Number of pins	10	10
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	3.5 mm	3.5 mm
Contact resistance	≤4.2 mΩ	≤4.2 mΩ
Rated voltage	300 V	300 V
Rated current ¹⁾	10 A / contact	10 A / contact
Connection cross section		
AWG wire	28 - 14 AWG	26 - 14 AWG
Solid wire line	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.50 mm ²	0.20 - 1.00 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Protected against vibration by the screw flange Rated values according to UL	Protected against vibration by the screw flange Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

The single row 10-pin terminal block TB710 is used for making connections on various B&R I/O modules.



Brief overview	7TB710.9	7TB710.91
Number of pins	10	10
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	5.08 mm	5.08 mm
Contact resistance	$\leq 2 \text{ m}\Omega$	$\leq 5 \text{ m}\Omega$
Rated voltage	300 V	300 V
Rated current ¹⁾	10 A / contact	10 A / contact
Connection cross section		
AWG wire	24 - 12 AWG	26 - 12 AWG
Solid wire line	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line with wire tip sleeves	0.25 - 2.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.25 - 2.50 mm ²	0.20 - 1.50 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Rated values according to UL	Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

Terminal blocks

The single-row 11-pin terminal block TB1111 is used for making connections on various B&R modules.



Brief overview	0TB1111.8010	0TB1111.8110
Number of pins	11	11
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	3.5 mm	3.5 mm
Contact resistance	≤4.2 mΩ	≤4.2 mΩ
Rated voltage	300 V	300 V
Rated current ¹⁾	10 A / contact	10 A / contact
Connection cross section		
AWG wire	28 - 14 AWG	26 - 14 AWG
Solid wire line	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.50 mm ²	0.20 - 1.00 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Protected against vibration by the screw flange Rated values according to UL	Protected against vibration by the screw flange Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

The single row 12-pin terminal block TB712 is used for making connections on various B&R I/O modules. Removal is simplified by two ejection levers on the terminal block.



Brief overview	7TB712.9	7TB712.91
Number of pins	12	12
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	3.5 mm	3.5 mm
Contact resistance	≤4.2 mΩ	≤4.2 mΩ
Rated voltage	300 V	300 V
Rated current ¹⁾	10 A / contact	10 A / contact
Connection cross section		
AWG wire	28 - 14 AWG	26 - 14 AWG
Solid wire line	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.50 mm ²	0.20 - 1.00 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Mechanical removal aid Rated values according to UL	Mechanical removal aid Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

Terminal blocks

The single row 18-pin terminal block TB718 is used for making connections on various B&R I/O modules. Removal is simplified by two ejection levers on the terminal block.



Brief overview	7TB718.9	7TB718.91
Number of pins	18	18
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	3.5 mm	3.5 mm
Contact resistance	≤4.2 mΩ	≤4.2 mΩ
Rated voltage	300 V	300 V
Rated current ¹⁾	10 A / contact	10 A / contact
Connection cross section		
AWG wire	28 - 14 AWG	26 - 14 AWG
Solid wire line	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.50 mm ²	0.20 - 1.00 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Mechanical removal aid Rated values according to UL	Mechanical removal aid Rated values according to UL

¹⁾ The respective limit data for the I/O modules must be taken into consideration.

Ethernet hub AC808



The AC808 Ethernet hub is a standalone device that can be used universally as a Level 2 hub in standard Ethernet or POWERLINK networks. It is suitable for both 100 MBit/s (Fast Ethernet) and 10 MBit/s networks. The hub automatically recognizes the transfer speed for the channels. ¹⁾

The Ethernet connections are made using RJ45 connectors. The pin assignments can be crossed for the first channel using switches.

The hub can be installed horizontally or vertically on the mounting rail. It also has fastening possibilities on the sides for direct mounting.

Brief overview		0AC808.9
Type		8x industrial hub (Layer 2)
Interface		Ethernet 10/100 Base-T (ANSI/IEEE 802.3)
Cable length		Max. 100 m between two stations (segment length)
Transfer rate		10 or 100 MBit/s; 100 MBit/s used for devices with 10/100 MBit/s auto-negotiation ¹⁾
Port design		Shielded RJ45 ports
Power supply		24 VDC, max. 5.2 W, protection against reverse polarity
1) Note: If devices that use 10 MBit/s as well as 100 MBit/s are connected, then there is no communication between these devices. Devices with 10/100 MBit/s autonegotiation are always operated with 100 MBit/s on the hub.		
General information		0AC808.9
Status indicators		Network activity for each channel, Link/Collision for each channel, Supply voltage
Diagnostics		
Bus function		Yes, with status LED
Hub supply		Yes, with status LED
Certification		CE, C-UL-US, GOST-R
Mechanical characteristics		0AC808.9
Dimensions (W x H x D)		115 x 43 (51 with mounting rail) x 86 mm
Protection type		IP20
Installation		Mounting rail installation and mounting rail adapter included in delivery
Mounting orientation		Vertical or horizontal
Operating temperature		
Horizontal installation		0°C to +60°C
Vertical installation		0°C to +50°C
Storage temperature		-25°C to +70°C
Relative humidity		5 to 95%, non-condensing
Comment		Order 1 x TB704 terminal block separately

Required accessories		
0TB704.9	Accessory terminal block, 4-pin, screw clamp, 1.5 mm ²	1948
0TB704.91	Accessory terminal block, 4-pin, cage clamps, 2.5 mm ²	1948

Level converter Bus connectors

The adapter is used as a converter for 5 V encoders. The 5 V differential signals delivered by the encoder are converted to 24 V signals. Absolute and incremental encoders can be used.

Brief overview	0AC401.9
Power supply	24 VDC
Overvoltage protection	External fuse specified at 10 AT
Input frequency	100 kHz
Power consumption	Typ. 6.0 W @ 24 V, the encoder supply (+5 V) is loaded with 500 mA
General information	0AC401.9
Certification	CE, C-UL-US, GOST-R
Mechanical characteristics	0AC401.9
Dimensions (W x H x D)	77 x 112.5 x 58 mm
Protection type	IP20
Installation	DIN rail installation
Mounting orientation	Horizontal or vertical
Operating temperature	0°C to +55°C
Storage temperature	-20°C to +70°C
Relative humidity	0 - 95%, non-condensing

The RS485 bus connector is used to connect a controller to a Profibus network or an RS485 network. The terminating resistor is integrated in the bus connector. The terminating resistor can be turned on or off.



The AC911 bus connector is used to connect a controller to a CAN network. The terminating resistor is integrated in the bus connector. The terminating resistor can be turned on or off.

Brief overview	0G1000.00-090	7AC911.9
Interface	Profibus DP, RS485 network	-
Fieldbus Type	RS485	CAN
Design	9-pin DSUB plug	9-pin DSUB socket
Connection	For two bus lines using screw clamps	For two bus lines using screw clamps
Terminating resistor	Can be switched on	Can be switched on
Stress relief	Integrated	Integrated
Certification	CE, GOST-R	CE, GOST-R

Interface converters

ECINT1



The INT1 interface converter is used to convert RS232 interface signals to an RS485 signal level. It is used if:

- Data transfer over a long distance is required which cannot be bridged by an RS232 interface. The distance between two stations can be max. 5,000 m when using shielded RS485 cables.
- Electrical isolation is required for the interface.
- A PLC is to be connected to a network using an RS232 interface.

The INT1-11 interface converter is equipped with lightning protection.

Brief overview	ECINT1-1	ECINT1-11
Power supply	24 VDC, maximum 4.3 W, protection against reverse polarity	24 VDC, maximum 4.3 W, protection against reverse polarity
Oversvoltage protection	Yes	Yes
Maximum transfer rate	115.2 kBit/s	115.2 kBit/s
Cable length		
RS232	Max. 10 m	Max. 10 m
RS485	Max. 5,000 m	Max. 5,000 m
Operating modes	Point-to-point RS422 network RS485 network	Point-to-point RS422 network RS485 network
Terminating resistor	Can be switched on	Can be switched on
Lightning protection	-	Yes
General information	ECINT1-1	ECINT1-11
Status indicators	RS232 signal lines, RS485 active, supply voltage	RS232 signal lines, RS485 active, supply voltage
Diagnostics		
Interface function	Yes, with status LED	Yes, with status LED
Power supply	Yes, with status LED	Yes, with status LED
Certification	CE, GOST-R	CE, GOST-R
Mechanical characteristics	ECINT1-1	ECINT1-11
Dimensions (W x H x D)	100 x 73 x 114 mm	100 x 73 x 114 mm
Protection type	IP20	IP20
Installation	Mounting rail or back wall installation using M5 screws	Mounting rail or back wall installation using M5 screws
Mounting orientation	Any	Any
Operating temperature	0°C to +60°C	0°C to +60°C
Storage temperature	-20°C to +70°C	-20°C to +70°C
Relative humidity	0 - 95%, non-condensing	0 - 95%, non-condensing

Bus adapter CAN 1x, CAN 2x



Brief overview	0AC912.9	0AC913.92	0AC913.93
Bus adapter	CAN 1x	CAN 2x	CAN 2x
Connection to controller	Using 9-pin DSUB socket, connection made by customer	Using 30 cm cable with 9-pin DSUB housing	Using 30 cm cable with 4-pin plug
Networking	Using 9-pin terminal block	Using the 9-pin DSUB plug (C1) and the 9-pin DSUB socket (C2)	Using the 9-pin DSUB plug (C1) and the 9-pin DSUB socket (C2)
Terminating resistor	Can be switched on	Can be switched on	Can be switched on
Installation	DIN rail installation	DIN rail installation	DIN rail installation
Mounting orientation	Horizontal or vertical	Horizontal or vertical	Horizontal or vertical
Certification	CE, GOST-R	CE, GOST-R	CE, GOST-R

USB drive combination



General information		SMD900.USB2-01	
Transfer rate	Low speed (1.5 MBit/s), full speed (12 MBit/s), to high speed (480 MBit/s)		
Maximum cable length	5 m (without hub)		
CD/DVD formats	Read	Write	
	CD-ROM	CD-R/RW	
	CD-RW	DVD-R/RW	
	CD-R	DVD-RAM	
	CD-DA	DVD+R/RW	
	Photo CD (single/multi-session)	DVD+R (double layer)	
	Enhanced CD		
	DVD-ROM		
	DVD-R, +R		
	DVD-RW, +RW		
	DVD video		
	DVD RAM (4.7 GB, 2.6 GB)		
CD/DVD speed	CD: 24 x / DVD: 8 x	CD: 24 x / DVD: 8 x	
Floppy disk drive	1.44 MByte		
CompactFlash slot	Type II		
Interfaces	USB 2.0: front (type A), back (type B)		
Power supply	24 VDC ± 25%		
Environmental conditions		SMD900.USB2-01	
Ambient temperature			
Operation	+5°C to +45°C		
Storage	-20°C to +60°C		
Transport	-40°C to +65°C		
Relative humidity			
Operation	8 - 80%, non-condensing		
Storage	5 - 95%, non-condensing		
Transport	5 - 95%, non-condensing		
Mechanical characteristics		SMD900.USB2-01	
Protection type	IP65 front side (only with optional front cover), IP20 back side		
Dimensions (W x H x D)	156 x 52 x 140 mm		

Required accessories			
0TB103.9	Connector, 24 VDC, 3-pin female, screw clamps, 3.31 mm ² , protected against vibration by the screw flange		1945
0TB103.91	Connector, 24 VDC, 3-pin female, cage clamps, 3.31 mm ² , protected against vibration by the screw flange		1945
5A5003.03	Controller R-IDE front cover		
5CAUSB.0018-00	USB 2.0 cable type A-B, 1.8 m		
5CAUSB.0050-00	USB 2.0 cable type A-B, 5 m		
5SWUTI.0000-00	Nero CD-RW OEM software. Only available with a CD-RW drive.		

Ethernet POWERLINK cable

Ethernet POWERLINK cable
RJ45 to RJ45



Length	Connection cable Model number	Short description
0.2 m	X20CA0E61.0002	POWERLINK connection cable RJ45 to RJ45, 0.2 m
1.0 m	X20CA0E61.0010	POWERLINK connection cable RJ45 to RJ45, 1.0 m
2.0 m	X20CA0E61.0020	POWERLINK connection cable RJ45 to RJ45, 2.0 m
5.0 m	X20CA0E61.0050	POWERLINK connection cable RJ45 to RJ45, 5.0 m
10.0 m	X20CA0E61.0100	POWERLINK connection cable RJ45 to RJ45, 10.0 m
15.0 m	X20CA0E61.0150	POWERLINK connection cable RJ45 to RJ45, 15.0 m
50.0 m	X20CA0E61.0500	POWERLINK connection cable RJ45 to RJ45, 50.0 m

Ethernet POWERLINK cable
RJ45 to M12



Length	Attachment cable Model number	Short description
5 m	X67CA0E41.0050	POWERLINK attachment cable RJ45 to M12, 5.0 m
15 m	X67CA0E41.0150	POWERLINK attachment cable RJ45 to M12, 15.0 m
50 m	X67CA0E41.0500	POWERLINK attachment cable RJ45 to M12, 50.0 m

For detailed information and support: www.br-automation.com

8x shield terminal AC301



The AC301 8x connection shielding clamp is used for optimal cable shielding for analog signal lines, as well as for encoder and counter signals. The cable shields are screwed directly on the shield bracket. The required mounting materials are included in delivery.

Short description	0AC301.9
Number of cable shield clamps	8
Type of terminal	4 x screw clamps (sets of two)
Dimensions including shield clamps (W x H x D)	76 x 25 x 22 mm

19" AT keyboard



General information	5E9600.01-010	5E9600.01-020
Keyboard format	German	English
Installation	Front mount installation, 19" rack	Front mount installation, 19" rack
Connection	PS/2 plug	PS/2 plug
Environmental conditions	5E9600.01-010	5E9600.01-020
Ambient temperature		
Operation	0°C to +55°C	0°C to +55°C
Storage / Transport	-20°C to +60°C	-20°C to +60°C
Relative humidity	5 - 95%, non-condensing	5 - 95%, non-condensing
Mechanical characteristics	5E9600.01-010	5E9600.01-020
EN 60529 protection	IP65 (front side)	IP65 (front side)
Dimensions (W x H x D)	482.6 x 177 x 35 mm	482.6 x 177 x 35 mm





Rated current

The rated current is the effective value for the phase current at the rated speed. This is possible only if the motor is operated under the rated conditions.

Rated power

The rated power is output by the motor when $n = n_N$. This is possible only if the motor is operated under the rated conditions.

Rated torque

The nominal torque is output by the motor ($n = n_N$) when the nominal speed is reached. This is possible only if the motor is operated under the rated conditions for any length of time if the environmental conditions are correct.

Real-time

A system is operating in real-time or has real-time capability, if the input signals are received, processed and the results are made available in a defined time period, and the results are made available in the system environment. See also 'Real-time Demands' and 'Real-time System'.



Release delay

Delay time required until the holding torque of the holding brake is reduced to the operating voltage has been returned to the holding torque.

Reliability

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Standards / Certificates

International certifications

B&R products and services comply with applicable standards. They are international standards from organizations such as ISO, IEC and CENELEC, as well as national standards from organizations such as UL, CSA, FCC, VDE, ÖVE, etc. We give special consideration to the reliability of our products in an industrial environment.

USA and Canada



All important B&R products are tested and listed by Underwriters Laboratories and are checked quarterly by a UL inspector. This mark is valid in the USA and Canada and makes it considerably easier to license your machines and systems in this area.

Europe



All harmonized EN standards for the valid guidelines are met.

Russian Federation



GOST-R certification is available for the export of all B&R ACOPOS servo drives to the Russian Federation.

USA and Canada



All 8MS three-phase synchronous motors are tested and listed by Underwriters Laboratories. This mark is valid for the USA and Canada and eases certification of your machines and systems in these areas.

Standards

73/23/EWG	Low-voltage guidelines
89/336/EWG	EMC – emission standard
98/37/EG	Machine guideline
CSA C22.2 / 100-95	Motors and generators
DIN 3760	Rotary oil seals
DIN 42948	Mounting flanges for electrical machines
DIN 42955	Concentricity of the shaft end, coaxial mounting flanges for rotary electrical machines; tolerances, tests
DIN 580	Lifting eye bolts
DIN 6885-1	Drive type fastenings without taper action; keys, keyways, deep pattern
DIN 748	Cylindrical shaft ends for electrical machines
DIN ISO 281	Roller bearing, dynamic load ratings and rated lifespan
DIN ISO 8821	Mechanical vibration; convention for balancing shaft/fittings and key type
EN 1037	Safety of machinery, prevention of unexpected start-up
EN 13980	Hazardous location (explosions) – use of quality management systems
EN 201	Injection molding machines, safety requirements, incl. A1
EN 418	Safety of machines, E-stop equipment
EN 50178	Electronic equipment for high voltage systems
EN 55011	Industrial, scientific and medical high-frequency devices (ISM). radio disturbances - limits and measuring procedures
EN 55022	Information technology equipment - radio disturbances - limits and measuring procedures
EN 60068-2-30	Environmental testing - Test DB and guidelines: Humid heat, cyclic (12 + 12 hour cycles)
EN 60079-15	Electronic equipment for hazardous locations (gas explosions) - ignition protection "n"
EN 60204-1	Safety of machinery - electrical equipment on machines, general requirements
EN 60715	Mounting rails for mechanical fastening of electrical devices in switching stations

Standards	
EN 61131-2	Programmable logic controllers - equipment requirements and tests
EN 61131-3	Programmable logic controllers, programming languages
EN 61800-3	Adjustable speed electric drives - EMC product standard including specific test methods
EN 954-1	Safety of machinery – safety-related controller components - Part 1: General design principles
EN/IEC 60068-2-27	Environmental testing - Test Ea and guidelines: Shocks
EN/IEC 60529	Degree of protection provided by housing
EN/IEC 60721-3-3+A2	Classification of environmental conditions, classes of environmental influence values and their limits - stationary use, weather-protected
EN/IEC 61000-6-2	EMC generic standards - immunity to disturbances in industrial areas (limit values)
EN/IEC 61000-6-4	EMC generic standards - emissions in industrial areas (limit values)
EN/IEC 62061	Machine safety - Functional safety of safety-related electrical, electronic and programmable electronic control systems
EN/ISO 13406-1	Ergonomic requirements for optical display units with a flat design - Part 1: Introduction
EN/ISO 13849	Safety of machinery - safety-related parts of control systems
FDA 21CFR Part 11	Electronic records, electronic signatures
FDA 21CFR Part 211	Current good manufacturing practice for finished pharmaceuticals
IEC 60034-1	Rotating electrical machines - part 1: Measurement and operational behavior
IEC 60034-11	Rotating electrical machines - part 11: Built-in thermal protection
IEC 60034-14	Rotating electrical machines - part 14: Mechanical vibration of certain machines with shaft heights 56 mm and higher; measurement, evaluation and limits of vibration
IEC 60034-5	Rotating electrical machines - part 5: Degrees of protection provided by the integral design of rotating electrical machines (IP code)
IEC 60034-6	Rotating electrical machines - part 6: Methods of cooling (IC code)
IEC 60034-7	Rotating electrical machines - part 7: Classification of types of construction, mounting arrangements and terminal box position (IM code)
IEC 60068-2-01	Environmental test - Tests - Test group A: Cold
IEC 60068-2-02	Environmental test - Tests - Test group B: Dry heat
IEC 60068-2-06	Environmental test - Test Fc: Oscillation, sinusoidal
IEC 60068-2-14	Environmental test - Test N: Temperature change
IEC 60068-2-32	Environmental test - Test Ed: Free fall
IEC 60079-0	Electronic equipment for hazardous locations (gas explosions) - general requirements
IEC 61131-2	Programmable Controllers, Part 2: Equipment Requirements and Tests
IEC 61131-3	Programmable Controllers, Part 3: Programming Languages
IEC 61158	IEC - Fieldbus, Parts 1 to 6
IEC 61499-1	Function blocks, architecture (for distributed systems)
IEC 61508-1	Functional safety of safety related electrical/electronic/programmable electronic systems - general requirements
IEC 61508-2	Functional safety of safety related electrical/electronic/programmable electronic systems - hardware requirements
IEC 61508-3	Functional safety of safety related electrical/electronic/programmable electronic systems - software requirements
IEC 61554	Standardized cutouts for mounting displays, panels, etc.
IEC 61784-1	Digital data communications for measurement and control: Profile sets for continuous and discrete manufacturing relative to fieldbus use in industrial control systems
IEC 61784-2	Digital data communications for measurement and control: Additional profiles for ISO/IEC 8802-3 based communication networks in real-time applications
IEC 61800-2	Adjustable speed electric drives - Part 2: General requirements; Rating specifications for low voltage adjustable frequency AC power drive systems
IEC 61800-3	Adjustable speed electric drives - Part 3: EMC product standard including specific test methods
IEC 61800-5 (draft)	Adjustable speed electric drives - Part 5: Electrical, thermal and functional safety aspects – drive systems with electrically adjustable speed (IEC 22G/CD:1998)
ISO 11898-4	Road vehicles -- Controller area network (CAN) -- Part 4: Time-triggered communication
ISO 13406-2	Ergonomic requirements for flat panel displays, pixel errors
ISO 9000	Quality management systems, basic information and terms
NFPA 79	Electrical standard for industrial machinery
UL 1004	Standard for electric motors
UL 1604	Electrical equipment for use in class I and II, division 2, and class III hazardous (classified) locations
UL 508	Industrial control equipment
UL 508C	Power conversion equipment
UL 746C	Polymeric materials, use in electrical equipment evaluations
UL 796	Printed wiring boards
UL 840	Insulation coordination including clearances and creepage distances for electrical equipment
UL 94	Tests for flammability of plastic materials
IEC/CISPR 11	Industrial, scientific and medical high-frequency device radio disturbance limits and measuring procedures

Glossary

Sections of the glossary have been taken from **A&D Dictionary 4th Edition, 2004/2005**. With the kind approval of Prof. Dr. Eng. (habil.) Ernst Habiger, Dresden University of Technology, Institute of Automation Technologies and Publish-Industry Publishers, Munich.

A

ACOPOS

Digital B&R servo motor drive

Access methods

Rules used, for example, by stations on a communication media to access a bus. Basically, a differentiation is made between collision [CSMA/CD, CSMA/CA] and collision-free [Token Bus, Token Ring, etc.] methods. A collision is the event when two or more stations coincidentally try to access the transfer media at the same time. Collision-free operation is achieved by assigning access rights [token] to the individual network stations.

Activation delay

The delay time required until the brake's holding torque is established, after the operating voltage has been removed from the holding brake.

Actuator

Actuating components for engaging a process, e.g. servo motor, switching clutch, solenoid, power switch. This involves the use of information for influencing material or energy currents in a controlled object.

Address

An address is a character string for identifying a memory location or a memory area, where data is stored and can be retrieved. It is also a symbol (e.g. with numerical controllers) for identifying a function unit for which subsequent geometrical or technological data are determined by the symbol.

Algorithms

According to DIN 19226: Algorithms are a finite series of well-defined regulations. The desired output quantities are created from permitted system input quantities. It describes how something is to be done. A procedure must at least satisfy the following requirements to be valid as an algorithm in a mathematical context.

Discreteness: An algorithm is made up of a finite series of steps.

Determinacy: Under the same start conditions, it always creates the same end result.

Clearness: The series of steps is clearly defined.

Finiteness: It ends after a finite number of steps.

From a quantity theory perspective, an algorithm is clearly defined by a set of sizes [input, intermediate and output sizes], a set of elementary operations and also by a regulation, which specifies when and in what sequence certain operations should be carried out. From a functional perspective, it transfers a set of input sizes into a set of output sizes. It can be represented in text form in a natural or artificial formal language or using graphic representations [graph, program flow chart, structured chart, Petri Nets etc.]

Analog digital converter

A functional unit that converts an analog signal into a digital signal

Analog signal

A signal, whose information parameters can accept any number of values, within specific technical limits. Theoretically, they can have an infinitely high resolution. However, in practice it is limited to a range of only 1 to 104. In addition, long-term storage and allocation causes many size problems. Therefore, digital signals are predominantly used in modern automation technology.

ANSI

American National Standards Institute > this organization promotes and manages American industrial standards.

APC

Automation PC

API

Application Program Interface > an interface, which allows applications to communicate with other applications or with the operating system.

Application layer

Application layer 7 for the OSI Reference Model. This is the layer where applications access network services. It provides services that directly support applications, e.g. software for data transfer, database access and electronic post.

Application software

Software, which is not used for operation by the computer itself, but rather when a computer is used to process a concrete application problem. It sets up the system software and uses this for fulfilling individual tasks. Application software can be accommodated in standard software used by a large number of customers in a wide range of industries. Common examples are Word, Excel, PowerPoint, Paint, Matlab etc. Industrial software tailored to the respective problems of a certain industry and individual software created for solving the particular problems of an individual user.

ASCII

American Standard Code for Information Interchange used worldwide; numbers, letters, special characters and device controller characters are represented as 7-bit binary combinations. Standard ASCII-characters cover 27 = 128 characters in total. An eighth bit is used as a so-called parity bit for error detection when transferring ASCII files. During even parity checking, this bit is set to 0, when the number of '1s' in the remaining seven bits is an even number. Otherwise, it is set to 1. The expanded ASCII character set does not use parity checking. The highest value bit is used here to switch from the standard character set to the expansion. This allows space for special regional characters e.g. umlauts in the German language.

www.asciitable.com

ASIC

Application Specific Integrated Circuit. At the start of the process, it represents a non-specific collection of logical gating circuits. Only at the end of the manufacturing process, is the chip adapted to the specific application.

Assembler

Mnemonic language [assembler language]. The machine instructions of a processor are expressed using mnemonics, i.e. using expressive abbreviation of alphanumeric characters. For example, when programming the command 'Clear register D0' in a normal processor system, the mnemonic abbreviation clr D0 is used instead of the binary command code 01000010 01000000. This type of programming is known as assembler programming. The result is an assembler program. A symbolic command corresponds exactly to a machine instruction. An assembler program is converted into bit sequences for machine codes, before the program is executed by an assembly program (also known as an assembler). It is then loaded in the program memory of the computer or controller system. In contrast to higher-level programming languages such as Pascal, C++, JAVA etc., the assembly language is processor-specific, i.e. limited to the command set of a specific processor.

Automatic mode

An operating mode, where an object [device, machine, system] operates automatically corresponding to a specified program after a start signal is issued without human contact.

Automation

According to Brockhaus: The application of technical means, using specific programs that (either partially or totally) do not require human intervention to perform operations.

Failure according to IEC 61508: A function unit loses the ability to perform a required function. In regards to safety-oriented systems, a distinction is made between dangerous and safe failures. This depends on whether the status of the system failure is considered dangerous or safe. The cause of the failure may be load related or age-related, and therefore a random failure, or related to a flaw inherent in the system. In this case, it is known as a systematic failure.

Automation Runtime
A uniform runtime system for all B&R automation components.

Automatic mode
An operating mode, where an object [device, machine, system] operates automatically corresponding to a specified program after a start signal is issued without human contact.

Automation Runtime

A uniform runtime system for all B&R automation components.

Availability

The probability that a system will be functioning at a certain point in time. Reliability parameter for repairable systems. The stationary availability is defined using the following formula: $Availability = 1 / [1 + MDT/MTBF]$. To achieve the highest possible availability values, it is necessary to perfect all quality assurance measures regarding reliability. However, this procedure has its technical and economical limits for given production conditions. When the automation plan is not sufficient to achieve the required reliability parameters, the principle of error tolerance, which is based on the shortest error detection and reconfiguration times, can allow the availability value to be increased.

Failure rate
Failure rate is a measure for the failure behavior of component units, particularly components. Reliability considerations are of primary interest here. The failure rate is represented by the fraction of failures for each time unit, based on the total number of a specified amount. For example, if an integrated switching circuit has a failure rate of 10-9 per hour, then this means that in a one hour operating period, the switching circuit fails with a probability of 10-9. To put it in another way: if there are 109 switching circuits in a function unit, then in the middle of each hour, one failure is likely. The failure rate does not remain constant within the elements' lifespan. Depending on the time, it follows the so-called "bathing-tub diagram". This means, when a component is under the influence of early failure during the beginning of its usage, it then remains constant during a specified time span. Random failures make an appearance here, and increase again under the influence of wear-out failure towards the end of the lifespan.

B

Backplane

Multilayer printed circuit boards with data, signal and supply lines and also slots for plug-in units on the back of electronic devices.

Bandwidth

General definition: The difference between the largest and smallest frequency in a uniform range. Bandwidth of a device: Width of the frequency band, within which device or transfer channel characteristics (e.g. the amplitude frequency characteristic) no longer deviates from reference values. Bandwidth of a signal: The width of the frequency band whose level does not exceed an agreed reference level for each of the spectral signal components. In the context of digital data transfer, the term bandwidth is also used as a measurement for system's performance in regards to the possible data throughput. Bandwidth here corresponds to the difference between maximum and minimum possible data rates, specified for example in bits per second.

Baud rate

Measurement unit for data transfer speed. It indicates the number of states for a transferred signal per second and is measured using the baud unit of measurement. 1 baud = 1 bit/sec or 1 bps.

Binary signal

A signal, whose information parameters can only accept two values [Low/High and 0/1].

BIOS

Basic Input/Output System. Core software for computer systems with essential routines for controlling input and output processes on hardware components, for performing tests after system start and for loading the operating system. Although BIOS is used to configure a system's performance, the user does not usually come into contact with it.

Bit

Binary digit > binary position, binary character, binary digit smallest discrete information unit. A bit can have the value 0 or 1.

Bit rate

The number of bits that can be transferred within a specified time unit. 1 bit/sec = 1 baud)

Bitmap graphic

A graphic, which is made up of single pixel information

Breakpoint

A point in a PLC program, where processing is stopped. This makes it possible to inspect variable values in certain locations of the program or to understand their incremental change. Breakpoints are available in CoDeSys.

Browser

A software tool for searching and reading websites. The most famous browsers are Microsoft Internet Explorer and Netscape Navigator

Bus, bus system

Bus line for transferring data and controller information between different components and systems, according to a defined protocol. A basic distinction can be made between parallel and serial buses.

Parallel bus systems have a large number of parallel lines, which allow data, address or controller information to be transferred using bit-parallel transfer. They are used as plug-in bus systems [backplane buses, backplanes] for connecting plug-in components [e.g. VMEbus, CompactPCI, IndustrialPCI etc.]. They are also used as peripheral buses for connecting computers with their I/O devices at close range.

Serial bus systems [cable bus systems] transfer data over long distances in a system between distributed system components using bit-serial transfer via a common medium [two/four conductor, coaxial cables, fiber optic cables or radio waves]. This allows a drastic reduction to be made in the wiring required in contrast to conventional star topology. Well-known examples are: AS-i, Arcnet, CAN, DeviceNet, Ethernet, INTERBUS, LON, PROFIBUS, SERCOS Interface etc.

In contrast to office communication, where uniform Ethernet-based systems are used worldwide, many different communication systems (often incompatible with each other) are currently used in automation technology. The choice of network type usually complies with the suppliers of the control technology used in the system, the geographical region and the special functional requirements in regards to speed and network range, as well as the availability of suitable field devices

Byte

Data format [1 byte = 8 bit] and a unit for characterizing information amounts and memory capacity. The following units are the commonly used units of progression : KB, MB, GB

C

C

A high level language developed by Bell Laboratories that allows a computer (similar to an assembly language) to control processes. It can be translated into the machine language for all well-known computers.

C++

An expanded version of the programming language C, with object-oriented programming possibilities.

Cache

Background memory, also known as non-addressable memory or fast buffer memory. It is used to relieve the fast main memory of a computer. Data, which e.g. should be output to slower components by the working memory (e.g. disk storage, printers), is stored temporarily in the cache and output from there with an appropriate speed for the target devices.

CAE

Computer Aided Engineering > computer aided planning, construction, development and project planning (computer aided engineering in the broadest sense). The data generated goes online directly into the following areas, e.g. CAM = Computer Aided Manufacturing)

CAN

Controller Area Network serial bus system, automobile manufacturing, industrial controllers, structure according to ISO 11898; Bus medium: twisted pair. Good transfer properties in short-ranges below 40 m with a 1 MBit/sec data transfer rate. Maximum number of stations: Unlimited in theory, practically up to 64 with real-time capability, i.e. defined maximum queuing time for messages with high priority. High reliability using error detection, error handling, troubleshooting. Hamming distance: 6)

www.can-cia.de

CD-ROM

Compact Disc Read-Only Memory. A removable data medium with a high capacity of ~700 MB. CD-ROMs are optically scanned.

CE Mark

A CE mark for a product. It consists of the letters 'CE' and indicates conformity to all EU guidelines for the labeled product. It indicates that the individual or corporate body, who has performed or attached the label, assures that the product conforms to all EU guidelines for the complete harmonization. It also indicates that all mandatory conformity evaluation procedures have taken place.

www.ce-richtlinien.de

CENELEC

Comité Européen de Normalisation Electrotechnique > European Committee for Electrotechnical Standardization (Headquarters: Brussels; responsible for the harmonization of electro-technical standards within the European Union and the entire European Economic Area [EEA])

www.cenelec.org

CiA

Established in 1992, CAN in Automation (CiA) is an international organization of users and manufacturers with a current membership of well over 300 members. It offers technical, product-specific and general information with the goal of spreading the knowledge about CAN and smoothing the way for future developments of CAN protocols.

www.can-cia.de

Circuit breaker

Mechanical switching device that can switch on, allow timed operation and switch off currents under certain specified operating conditions; they can also switch on allow timed operation and switch off currents under defined exception conditions e.g. short-circuit current. They are available in open and compact designs with manual, magnet, motor or pressurized air drives; in one, two, three or four pole designs; for AC, DC and three-phase current; for low voltage and high voltage applications.

Client-Server network

In contrast to a peer-to-peer network, tasks here are clearly distributed. The server offers services and the clients use these services

Closed loop control

Defined according to DIN 19226 as a procedure in which the value of a variable [control variable] is continually recorded, compared with another variable [reference variable] and changed according to the result of the comparison with the reference variable as compensation. This takes place in a closed control loop.

Code, coding

When processing information, it is often necessary to change the information from one form of representation to another. This conversion process is called coding and rules used to assign one character set to another are referred to as the code. A differentiation is made between ambiguous and unambiguous coding depending on if one set is a direct reflection of the other. Most codes use unambiguous coding with one set directly reflecting the other. A differentiation is also made between redundant and non-redundant codes. With non-redundant codes, the full range of the available character set is used, i.e. each code is defined. With redundant codes, the available character set also contains codes that are not used. This differentiation is important during data transfer when detecting and, if necessary, correcting data transfer errors.

CompactFlash®

CompactFlash memory cards [CF cards] are exchangeable nonvolatile mass memory systems with very small dimensions [43 x 36 x 3.3 mm, approximately half the size of a credit card]. In addition to the Flash memory chips, the controller is also accommodated on the cards. CF cards provide complete PC Card-ATA functionality and compatibility. A 50-pin CF card can be simply inserted in a passive 68-pin type II adapter card. It conforms to all electrical and mechanical PC Card interface specifications. CF cards were launched by SanDisk back in 1994. Currently, memory capacities reach up to 3 GB per unit. Since 1995, CompactFlash Association [CFA] has been looking after standardization and the worldwide distribution of CF technology

www.compactflashmemory.com

Compact PCI

Compact Peripheral Component Interconnect Bus - is a registered trademark of the PCI Industrial Computer Manufacturers Group)

www.picmg.org

Compiler

A program, that translates a text from a source language [normally a high level language] into the text of the target language [e.g. machine language, machine code]. That means that an executable binary file is generated from the source file on a specified processor [on a specified machine]. During this translation process, a compiler operates on several levels, in which lexical, syntactic and semantic analyses are performed. After an intermediate code is created and optimized, the machine code is finally generated. Compilers are commonly called after the source language they process and the machine, whose machine language it translates.

CPU

Central Processing Unit – the arithmetic and control unit of a computer; the unit which interprets and executes commands. Also known as the central processor or microprocessor. A CPU has the capability to load commands, to decode and to execute, as well as to transfer information to and from other resources.

Component Based Automation [CBA]

New concept for automation applications with distributed intelligence. It is based on the new PROFInet standard from the PROFIBUS users organization and supports consequent modularization using component technology for machine and system manufacturing. A new engineering tool allows distributed applications to be merged graphically throughout the entire system. Extensive programming for communication between intelligent devices is replaced by graphic configuration. Productivity of engineering and commissioning can be greatly increased in this way.

Continuous process

Considered to be physical procedures, chemical reactions or technological workflows with state values that continually change over time. That means energy and/or materials are fed, processed, transported, stored, distributed and/or used continually or for long periods of time without interruption, and especially for production processes, the end product is continually supplied. Such processes are characteristic for the creation, conversion and distribution of electrical energy as well as for the production, processing and distribution of bulk goods in various consistencies. Some typical characteristics of lines in which continuous processes are running are: installed technical equipment is connected in a consistent correlation technologically; changes to procedures for incoming and outgoing materials and processes seldom take place. Examples of this are thermal power plants, energy supply systems, refineries, continuous casting lines and rolling mills. The main tasks and control applications for guidance of continuous processes are: establishing and maintaining optimal and steady operation based on specified timing criteria, monitoring and logging the process and balancing the process activities in defined areas and times for billing purposes.

Control

Targeted interaction with values in a system that can be influenced. The system being influenced is known as the controlled system and in this case is a device, machine or system in which material and/or energy are subject to one or more possible handling forms, such as extracting, transferring, converting, saving or using as desired.

CRT

Cathode Ray Tube. An integral component of a television set or a computer monitor. A cathode ray tube consists of a vacuum tube, in which one or more electron guns are installed. Each electron gun creates a horizontal electron beam, which appears on the front of the tube (the screen). The inner surface of the screen is coated with phosphor, which is lit when hit by the electrons. Each of the electron beams move in a line from top to bottom. In order to prevent flickering, the screen content is updated at least 25 times per second. The sharpness of the picture is determined by the number of pixels on the screen.

CSMA/CD

Carrier Sense Multiple Access with Collision Detection

Bus access with stochastic access, i.e. without a defined sequence for the individual participants. Using carrier sensing, each station checks whether data is transferred via the bus. If this is not the case, then a send-capable station can begin the transfer. If two or more stations attempt to do this at the same time, a collision is caused. This is detected [collision detection] and the transfer is stopped immediately. After a randomly chosen time period has passed, each send-capable station can access the bus medium again. This allows bus access to many participants with few limitations. A central network management is not required by this process.

D

Data link layer

Link layer/data link layer. Layer 2 in the OSI reference model. The data packets to be sent are converted into frames (i.e. logical structured data packets). Confirmation is expected for sent frames after they have been received. In the LAN area, the access procedure is also accommodated in this layer [CSMA/CD, Token Passing]

Decentralized motion control

In contrast to central motion control, only the voltage supply and the necessary components for a central controller are housed in a switching cabinet with multi-motor drive systems. All other function units such as drives and controllers are accommodated directly on-site with the individual motors or directly on the motors. They are supplied by an energy bus and a controller bus. This concept is particularly useful for larger or wide-ranging distributed machines and systems. It also provides particular advantages in regards to the modular structure of machines.

Device

In common usage, the word „device“ is a synonym for an apparatus, instrument, piece of equipment, appliance,

tool or utensil. This mostly refers to fixed or mobile equipment with relatively small spatial dimensions, with a specific function or special area of use that is generally designated using a preceding word such as in the phrases sporting device, medical device, kitchen device, hearing device, measuring device, control device, automation device, peripheral device etc. Furthermore, there are fixed and mobile large devices, such as those used in the military (tanks, aircraft, ships), medical (MRI scanners), geological (earth drilling equipment, and conveyor bridges) as well as those used in research (e.g. particle accelerator). From a technical standpoint (DIN 40150), devices are made up of components, units and modules. According to regulations regarding electromagnetic compatibility of devices, a device is considered any electrical or electronic apparatus, system, construction or network, which contains electrical or electronic parts. This device definition contradicts guidelines that are well-established and also documented in DIN standards [see above] and widely accepted by engineers, and therefore causes many misunderstandings when using the regulations regarding electromagnetic compatibility of devices.

DeviceNet™

A simple CAN-based communication system for networking automation instruments [threshold encoders, photo-sensors, motor starters, frequency controlled drives, operator terminals etc.] with higher-level control devices. Two twisted pairs inside the cable are used as the transfer medium. One is used for communication [with a transfer rate of 125 kBit/sec, 250 kBit/sec or 500 kBit/sec for cable lengths of 500 m, 250 m and 100 m] and the other is used to supply current to the connected installations [maximum 8 A at 24 V DC voltage]

www.odva.org

Dial-up

Data is transferred over the telephone network using a modem or an ISDN adapter.

Digital analog converter

A functional unit that converts a digital signal into an analog signal.

Digital signal

A digital signal has several information parameters, e.g. 8, 16, 32 or 64. These are made available in chronological succession with series signals and chronologically parallel with parallel signals. With an n-parameter digital signal, $X = 2^n$ n-digit information units [words] can be represented; for example with an 8-bit-word $2^8 = 256$ different characters. The advantages of digital signals are the attainable high image precision [this is practically only a question of the number of digits], the problem-free long-term storage capability and the possibility to combine many sizes with each other, while conforming to complicated regulations. This explains the strong trend towards digital technology in all areas of automation technology.

DIMM

Double in-line memory module

A memory module, consisting of one or more RAM chips on a small circuit board, which is connected with the motherboard of a computer via a connector.

DIN

Deutsches Institut für Normung (German Institute for Standardization) Headquarters: Berlin

www.din.de

Direct drive technology

In direct drive solutions, the rotational or linear motor components [torque motors, turning moment motors, DDR motors, linear motors] are integrative components for the mechanisms and machines to be driven. As a result, there is no need for couplers, gears, rack and pinions, belt and chain drives as well as spindles. This helps to avoid all side effects caused by these components (e.g. gear backlash, frictional dead spots, elasticity effects, wear, noise emissions, additional maintenance expense and space requirements). Direct Drive Technology is therefore particularly useful, if friction and wear-free movements with high precision and dynamics using compact arrangements need to be implemented. This is particularly the case with machine tools and manufacturing installations, and also in many other application areas such as medical technology for elevator and special vehicle technology.

DMA

Direct Memory Access > Accelerated direct access to a computer's RAM through by-passing the CPU.

DNC

Direct Numerical Control. An operating mode in production systems with CNC machines. Important Features: Central storage, management and distribution of work piece processing programs to the machine through the central computer. Modern DNC systems have a large number of additional functions such as graphic simulation of the processing procedure, storage and management of tool data and correction values, palette and work piece management, specification of processing priorities with existing work piece inventory, material flow control through the system, convenient visualization, diagnostics etc.

DRAM

Dynamic RAM > dynamic RAM memory chips are used in capacitors as memory elements. They must be constantly refreshed to maintain the loading sequence [a thousand times a second for some]. They are cheaper but slower than SRAMs

DSP

Digital Signal Processor _ optimized for the fastest possible execution of special mathematical functions, particularly with complex algorithms for analog signal processing, e.g. Fast Fourier Transformation.

E

ECAD

Electrical CAD systems are configuration tools which allow the efficient creation and processing of electrical circuit diagrams and schematic diagrams as well as the automatic generation of cross-reference maps, cable and terminal diagrams, parts lists as well as order and manufacturing documents.

EDDL

Electronic Device Description Language

Electric motors

Electric motors are electromechanical energy converters that can operate machines and generators, i.e. driving and braking. Both possibilities can be used. There are a large number of different versions because there are electrical power systems for different voltages, frequencies and phase figures [DC, AC, 3-phase], and also because the mechanical energy in regards to its parameters [RPM, torque, force, speed] must be provided in many forms. Depending on the type of output motion, a basic distinction is made between motors for rotations and translation motions. A simple design is typically preferable for rotating drives. They are manufactured into corresponding types for the specified task and operating classes rather than for finished engineering and functional units. In contrast, application-specific designs are dominant with linear drives. That means they are generally developed for certain applications and designed as an engineering unit with the mechanism to be driven. Depending on the stability of the output motion, a classification between continuous and discontinuous is actively possible with both rotational and linear drives. Indexed according to motion characteristics, there are four drive motor groups available. These are namely motors for continuous rotational motion, motors for discontinuous rotational motion [stepper motors], motors for continuous longitudinal motion [linear motors] and motors for discontinuous longitudinal motion [linear stepper motors]. Motors for continuous rotational movements are the mostly common used in machines at the moment. Principal Engineering Forms: In regards to the design of stators and rotors, a choice must be made between internal rotors, external rotors, bell-shaped rotors and disk armature motors. The design of the internal rotor (stator outside, rotor inside) corresponds to standard designs. External rotor motors (stator inside, rotor outside) have a very large rotor torque and guarantee particularly low noise emission due to their very small drives. Bell-shaped rotor motors and disk armature motors have a very small rotor torque and therefore possess very good dynamic characteristics. They are preferably used as servo motors. Speed-torque behavior: Depending on the type of current that they are designed for, and the layout of stators and rotors, three natural speed-torque behavior pattern distinctions can be made with electrical motors.

These are namely: synchronous behavior (i.e. speed remains constant within the permitted load range), shunt characteristic, (i.e. speed drops slightly with increasing loads) and series characteristic (i.e. very strong drop in speed with increasing loads). The stationary torque is created time constant with electrical motors, likewise with gas, water and steam turbines. A pulsating torque, moving around a time-based mean value, is only created with some small machines (e.g. single-phase asynchronous motors). Torque overload: All electrical motors are capable of being overloaded by torque. That means, they can emit short-term torques that are larger than the motor nominal torque NM, but however do not exceed the maximum permitted torque (Nmax) for the machine in question. The following values are common. Normal Motors: $N_{max} / NM = 1.6$ to 2.5 ; servo motors: $N_{max} / NM = 5$ to 50 .

Duty Cycle Rating: Due to very strong differences with driven mechanisms and machines for time-dependent torque demand concerning the required operation mode, electrical motors are built for eight different nominal operation modes (S1 to S8, see DIN VDE 0530).Electrical safety

Protection against the dangers of electricity. Safe operation of electrical and electronic modules, components, devices, machines, equipment and systems must be guaranteed for the users and operators through applicable safety regulations and standards.

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Electrical time constant

Corresponds to 1/5 of the time needed for the stator current to stabilize with constant operating conditions.

Electromagnetic compatibility

According to EMC Law: The ability of a device or a system to function satisfactorily in its electromagnetic environment without introducing intolerable electromagnetic disturbances to anything in that environment [IEV 161-01-07])

Embedded systems

Systems with embedded computer functions. Included under this term are embedded chips, embedded microprocessors, embedded controllers and also embedded logic or embedded devices. These represent a large number of computer applications that are not classified in classical data processing and PC technology. Examples of these can be found in telecommunication systems, access control systems, intelligent sensors and actuators, bus modules as well as in many device and machine controllers and other applications. In all cases, it concerns microcontroller-based controller hardware, which is used for solving special problems. See above for an example. It provides task-specific I/O units and the software, which it operates with. It is stored as firmware in a read-only memory. The processing power is usually far weaker than a PC.

EMC

Electromagnetic compatibility

EN

European standard (see CENELEC)

Encoder

Coding measurement device, which converts a wave's angular position into coded data. A basic distinction can be made between incremental and absolute systems. Based on a photo electronic high-beam scan, incremental systems deliver increments in the form of signal pulses to an evaluation electronic system [up to 10,000 pulses per rotation]. They are very well suited for recording rotation angles and rotation speeds for motion conversion but also for recording the traverse paths and speeds for longitudinal motions. A particular advantage is their simple architecture and the resulting low price. However, a disadvantage is that it can only register the position when it is switched on. The path requests a known reference point after each power-on. Absolute systems deliver the position of the wave, using a rotation, coded absolutely on the evaluation electronic system [Single-turn encoder]. They are nonvolatile as a result. A multi-turn encoder is used for absolute angular measurement

with several rotations. They generally are made up of several coupled encoders with a precision gear or from a single-turn section that is coupled with a rotation counter.

Engineering

Engineering work in the broadest sense, i.e. using scientific and practical findings, concepts and methods for planning, designing, constructing and maintaining efficient hardware and software products, devices, machines and systems. In relation to corresponding attributes, the term 'engineering' is also used to characterize specific fields such as e.g. electrical engineering, power engineering or plant engineering.

EPROM

Erasable PROM > (complete with ultraviolet light)

EPSG

Ethernet Powerlink Standardization Group

Open association of end-users and vendor associations for the further development, standardization and distribution of ETHERNET Powerlink.

www.etherlink.org

Ergonomic

A word derived from the Greek words 'Ergon' [work] and 'nomos' [rules, law]. Part of the work sciences, ergonomics is a scientific discipline that examines the interaction between humans and their work environment. The goal is to improve the working conditions and reduce work-related stresses and strains.

ERP

Enterprise Resource Planning refers to corporate management and planning level assigned processes, i.e. the complete enterprise resource planning, optimization and management from the moment that the order is received until the goods are sent. A well-known ERP system is the software solution SAP R/3. However, there are a number of other examples of less extensive systems in regards to possible functions, where KMUs are used.

Error tolerance

A term describing the capability of a system to fulfill its specific function, even with a limited number of faulty subsystems. Error tolerant system behavior, (i.e. the preservation of the programmed functions despite the failure of system components, the occurrence of software errors or external disturbances) is achieved using redundant structures. To do this, the following redundancy principles are used. Static redundancy: function units of the redundant system are arranged in a static structure. A few examples of this include error-correction circuits, in which faulty digital signals are adjusted based on error-correction code or comparator circuits, in which the results of three parallel functional units are repeatedly compared with each other. As long as 2 out of 3 components are functioning properly, the entire system is considered to be without error, (i.e. the failure of one functional unit is tolerated). Dynamic non-operational redundancy: individual functional units are arranged in a changeable [switchable] dynamic structure. In the event of an error, the unit which had been performing the function is switched to a redundant functional unit. The latter does not have any functional task during error-free system operation (Stand-by procedure, 1 of 2 procedure). Dynamic operational redundancy: each functional unit in a system handles its own functional tasks during error-free operation. If one unit fails, the remaining functional units take over the failed unit's most important tasks by deferring some of their own tasks that are less important for the overall function of the systems (cooperative systems, self-configuring systems, self-healing systems).

ESD

Electrostatic discharge. ESD is a process for charge equalization between solid, liquid or gaseous media, which are electrically charged in a different way. It is usually accompanied by a surface, brush, spark discharge or also flashing discharge phenomenon. However, it can also take place via a contact point (excluding line-conducted), and only when the potential difference before the contact does not exceed 330 volts. Sparking can cause flammable gases and vapors or explosive compounds to ignite and through the discharge of currents and fields can damage or destroy electronic components or interfere with the functions of their electronic operating equipment. The first-named effect falls into the jurisdiction of Fire and Explosions Protection and Technical Safety.

The second-named area is the responsibility of the protection of Electrostatic Discharge Sensitive components (ESDS) and Electromagnetic Compatibility (EMC). Possible human body discharge from handling switching circuits, circuit boards, control elements, and container surfaces in transport, installation, testing, operating, repairs and service are particularly important issues for people dealing with electronic device technology. The following electrical values should be calculated: Energy content 10 to 30 mJ, electrostatic voltage 0.1 to 20 kV, strength of discharge current up to 30 A (pulse amplitude, current change speed up to 100 A/ns, electrical field strength 1 to 4 kV/m, magnetic field strength up to 15 A/m within centimeters of the discharge).

Ethernet

Baseband bus system from RANK XEROX. Originally developed for linking minicomputers in the early 1970s. Ethernet is based on the CSMA/CD access procedure. Coaxial cables and/or twisted pair cables [twisted copper wire pairs] serve as transfer medium. Transfer speeds: 10 Mbps [Ethernet], 100 Mbps [Fast Ethernet] as well as 1Gbps and 10 Gbps [Gigabit Ethernet], widely growing technology used for networking computers in a LAN, standardized since 1985 [IEEE 802.3 and ISO 8802-3]. Ethernet technology has established itself in office usage. After the enabling the possibility of extremely tough real-time demands and the adaptation of the device technology [bus cable, path fields, connection boxes] to the operational conditions of the industrial world, which are considerably tougher than those in the area of office use, Ethernet is further advancing into the area of automation technology.

ETHERNET Powerlink

An enhancement of standard Ethernet. It enables the exchange of data under strict real-time conditions with cycle times up to 200µs and jitter below 1µs. This makes it possible to apply Ethernet in automation technology at all levels of communication from the control level to the I/Os. Ethernet Powerlink was initialized by the company B&R Industrie-Elektronik and is now managed by the open end-user and vendor association, EPSG - ETHERNET Powerlink Standardization Group.

www.etherlink.org

F

Factory automation

Automation market segment, attributed to the user sectors automotive industry, electronics industry, machine and system manufacturing, assembly/robotics, transport, storage and materials handling. The main focus of this segment includes the process chain of automated manufacturing as well as the technologies required for automation, such as mounting and handling technology, robotics, image processing, ID systems, sensors and actuators, drive technology, control technology, corresponding software, hydraulics and pneumatics as well as the relevant safety systems.

Failure

Failure according to IEC 61508: A function unit loses the ability to perform a required function. In regards to safety-oriented systems, a distinction is made between dangerous and safe failures. This depends on whether the status of the system failure is considered dangerous or safe. The cause of the failure may be load related or age-related, and therefore a random failure, or related to a flaw inherent in the system. In this case, it is known as a systematic failure

Failure rate

Failure rate is a measure for the failure behavior of component units, particularly components. Reliability considerations are of primary interest here. The failure rate is represented by the fraction of failures for each time unit, based on the total number of a specified amount. For example, if an integrated switching circuit has a failure rate of 10-9 per hour, then this means that in a one hour operating period, the switching circuit fails with a probability of 10-9. To put it in another way: if there are 109 switching circuits in a function unit, then in the middle of each hour, one failure is likely. The failure rate does not remain constant within the elements' lifespan. Depending on the time, it follows the so-called "bathing-tub diagram". This means, when a component is under the influence of early failure during the beginning of its usage, it then remains constant during a specified time span. Random

Glossary

failures make an appearance here, and increase again under the influence of wear-out failure towards the end of the lifespan.

Fault

According to IEC 61508: Abnormal operation, which can reduce or prevent the capability of a functional unit to perform a required function.

FDD

Floppy Disk Drive. Reading device for removable magnetic memory from the early days of PC technology. Due to their sensitivity and moving components, FDDs have been almost completely replaced by CompactFlash memory in modern automation solutions.

Fiber optic cable

Cable made with glass or plastic fibers; immune to electromagnetic disturbances; very important as transfer media in local networks. All stations are completely isolated from each other. The fiber types are used. They differ regarding the transfer distances they can achieve. Polymer fibers are the simplest type. They can bridge distances up to 70 m between stations. HCS fibers [Hard Clad Silica] are glass fibers with a plastic coating. They can handle distances up to 400 m. Glass fiber cables are suited for distances up to 3600 m.

Fieldbus

Bus system in the area close to the process, for directly connecting sensors and actuators with own intelligence. On a fieldbus, small amounts of data are transferred between sensors, actuators and control devices in digital form. Transfer must occur as fast as possible (i.e. near real-time). Furthermore, a fixed minimum and maximum response time must be guaranteed. Serial fieldbuses are replacing conventional wiring more and more in modern automation systems. Serial networking of the components saves time during planning and installation. Additionally, the size of switching cabinets is reduced and failure and maintenance times are shortened, thereby achieving better system availability. System expansions, changes and updates are easy to implement.

File server

A computer which provides data to other users in a computer network.

Filter

In terms of suppression, filters are components used for damping conducted disturbance. Proper application of filters requires that the spectral part of the reference and disturbance variables are different enough from one another. This allows selective damping of disturbance variables without noticeable interference of the reference variables when the filter parameters have been laid out sufficiently. Therefore, the actual damping effect is achieved mostly through voltage division and the resulting filter effect is described using insertion loss. Filters can be used on a source of disturbance to prevent the emission of conducted disturbance and on a noise reduction system to increase the immunity to conducted disturbance. In addition to the most commonly used passive filters, which are made up of passive components, there are also active filters, which contain components that require a power supply. Active filters are widely used as signal filters. They are only used in power supply networks in special cases.

Firewall

A term used for an electronic, hardware and/or software-based security system between two networks, (i.e. Intranet and Internet), which protects the computer or internal company network from unauthorized access from the Internet. Only data for specific, authorized services are allowed to pass through the security barrier at a strictly defined point.

Firmware

Programs stored permanently in read-only memory. Firmware is software used to operate computer-controlled devices, which generally stays in the device throughout its lifespan or over a long period of time. Such software includes operating systems for CPUs and application programs for industrial-PCs as well as programmable logic controllers, (i.e. the software in a washing machine controller). This software is written in read-only memory (ROM, PROM, EPROM) and cannot be easily replaced.

Frequency inverter

A device based on power electronic semiconductor devices, which only functions in switching mode (i.e. only in on state or in off state). This device has the task (especially in speed-adjustable three-phase drive systems) of taking a single or three-phase AC voltage with constant frequency and amplitude, and making a normally three-phase voltage with changeable frequency and voltage amplitude to feed the three-phase motor (synchronous or asynchronous). The timing diagram of the voltage supplied by the inverter must be sinusoidal to the greatest possible extent, because voltage harmonics cause significant heating of the motor and increased noise formation. Frequency inverters are offered as ready-to-use devices in multiple variations. However, their basic structure is very similar in most cases. This means that in most cases, a frequency inverter consists of a power rectifier, which converts the single or three-phase voltage of the mains into a mostly constant DC voltage (a DC bus with a larger capacitor to smooth out the voltage) and an inverter, which converts the DC voltage of the DC bus to a variable frequency three-phase output voltage.

FTP

File Transfer Protocol. Rules for transferring data over a network from one computer to another computer. This protocol is based on TCP/IP, which has established itself as quasi standard for the transfer of data via Ethernet networks. FTP is one of the most-used protocols on the Internet. It is defined in RFC 959 in the official regulations for Internet communication.

Function Block Language

FBL. Graphical programming language according to IEC 1131-3 and DIN EN 61131-3 for creating PLC application programs.

Functional safety

Safety against the dangers resulting from device malfunction (aggregate, machine, operating equipment, system). According to IEC 61508: Part of the overall safety, based on the control object [EUC] and its control system, which depends on the proper functioning of the E/E/PE safety-related system, safety systems from other technologies and external devices for risk minimization. This is achieved while the planning, configuring, operating and maintaining the system by avoiding and/or handling potential malfunctions and by preventing dangerous system failures.

G

Gateway

Device used to connect two networks that have different protocols. For example, when using INTERBUS a gateway represents a component, which couples other transfer systems to the INTERBUS.

GB

Gigabyte. 1 GB = 1,073,741,824 bytes

GIF

Graphics Interchange Format. Graphic format with up to 256 colors in which images are compressed to a minimum size. GIF files are well-suited for images with sharp color transitions.

Ground

In the context of electro-technical theory, the term 'ground' is more or less understood as good conductive ground, which does not have any potential differences outside the area of influence or any other electrical phenomena.

GUI

Graphical User Interface. A display seen by a computer user with icons for various utilities and programs, including display and operational elements for programs or operating systems, menus and dialog boxes, which make it easier for the user to operate the computer.

H

Half duplex

Method of data transfer in which information is transferred in both directions consecutively.

Handshake

Method of synchronization for data transfer when data is sent at irregular intervals. The sender signals that data can be sent and the receiver signals when new data can be received.

HDD

Hard Disk Drive. Fixed magnetic mass memory with high capacities e.g. 120GB.

Hexadecimal system

Number system with the base $B = 16$. It has sixteen digits [0, 1, 2, 3, 4, 5, 6, 7, 8, 9, (10), (11), (12), (13), (14), (15)] which are often represented with letters for elements (10) to (15) [0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F].

The sum of the products for a hexadecimal number is calculated as follows

$$Z = z_n16^n + z_{n-1}16^{n-1} + \dots + z_i16^i + \dots + z_116^1 + z_016^0.$$

For example, value Z for the hexadecimal number 5A2FD is calculated as follows

$$Z = 5_{16}16^4 + 10_{16}16^3 + 2_{16}16^2 + 15_{16}16^1 + 13_{16}16^0$$

HMI

Human Machine Interface

Horizontal integration

Horizontal integration combines MES solutions with each other in a company pyramid. In this way, all information is available online which prevents multiple data entry and double data storage.

Host

On computer systems with multiple CPUs and bus masters, this refers to the device with the arbitration unit and host CPU or the device that has control of the entire system. With regard to the Internet, a constantly available network server is called a host.

Hot swap

Changing computer components during operation. There are three different level: basic hot swap, full hot swap and the high availability model. Basic hot swap is the simplest form in which the module to be exchanged is deactivated or the computer configuration is changed using the computer keyboard. Computer specialists are normally needed. With full hot swap, software installed on the components being exchanged handles activation and deactivation. An integrated switch on the front of the component signals the computer that removing the component will start or that inserting the new component is complete. An LED on the front side shows that the component can be removed or that the new component has been inserted. The high availability model is used in computer systems with high availability requirements. Here, the hot swap software does not control each component individually, instead it uses a separate hot swap controller [HSC]. This allows faulty boards to be automatically deactivated and prevents crashes.

HTML

Hyper Text Markup Language. Programming language with hyper text marks. Language used to write most web pages. It is based on the SGML definition. For detailed information, see www.w3.org/MarkUp

HTTP

Hyper Text Transfer Protocol. Data transfer protocol for HTML pages and all types of files coupled to them. It is the protocol that the entire WWW is based on. That means, it controls the interaction between web browser and

web server. It becomes active with each mouse-click on a hyperlink and ensures that the browser is provided the respective information.

www.w3c.org/Protocols

Hub

Central connection point in a network with star formed topology, which distributes incoming data packets to all connected end devices [similar to the way a multiple power socket distributes power].

I

IAONA

Industrial Automation Open Networking Alliance. Group of leading international automation manufacturers that distributes open IT network standards such as Ethernet as worldwide standards for industrial communication. Founded in 1999 at the SPS/IPC/DRIVES in Nuremberg.

www.iaona.org

IDE

Integrated Device Electronics. Interface for mass memory, such as HDDs, in which the controller electronics are found in the drive itself.

IEC

International Electrotechnical Commission. International standards organization that includes all national electro-technical committees. It specifies electro-technical standards worldwide; location: Geneva.

www.iec.ch

IEEE

Institute of Electrical and Electronics Engineers. American organization of electrical and electronic engineers (founded in 1884, more than 300,000 members in approximately 150 countries)

www.ieee.org

IL

Instruction List. IL is a text-based, assembly-like programming language according to IEC 1131-3 and DIN EN 61131-3 for creating PLC application programs.

Intelligent systems

Before continuing, it should be noted that it has not been possible to make a generally accepted, clear definition for intelligence, neither for psychology nor technology. However, the following is a very simplified statement concerning the many perceptions that exist, starting with a reference to the intelligence of humans: „Intelligence [mental capabilities] refers to the ability to effectively cope with tasks in life and on the job“. It is many-faceted personal trait that is mainly based on the ability to think (i.e. dealing with information rationally and emotionally). The main and partially measurable factors include: perception, processing of information, storing of information, language, mathematics, imagination, concentration and judgment. If intelligent technical systems are evaluated according to these criteria, it is clear that they surpass human abilities in certain areas, but have huge shortcomings with reference to total intelligence. That means such systems are still far from achieving the complex intelligent capabilities of humans, but support them in a significant manner, and that is the most important factor affecting the functional quality and marketability of intelligent components, modules, devices, machines and systems. Their strengths come from the use of fuzzy technologies and artificial intelligence methods for collecting information, planning actions and monitoring results, even when the conditions are not clearly defined. Areas of application include: Handwriting and voice recognition, image processing, robotics, sensor and actuator control, adaptive control and planning systems, knowledge acquisition and processing, data mining as well as assistance systems for planning, maintenance, diagnostics and project management.

Interface

From the hardware point of view, an interface is the connection point between two modules/devices/systems. The units on both sides of the interface are connected by the interface lines so that data, addresses and control signals can be exchanged. The term interface includes all functional, electrical and constructive conditions [coding, signal level, pin assignments], which characterize the connection point between the modules, devices or systems. Depending on the type of data transfer, a differentiation is made between parallel [e.g. Centronics, IEEE 488] and serial interfaces [e.g. V.24, TTY, RS232, RS422, RS485], which are set up for different transfer speeds and transfer distances. From the point of view of software, the term interface describes the transfer point between program modules using specified rules for transferring the program data.

Internet

International Network. Worldwide collection of computers and computer networks of various sizes and architectures that work with various operating systems. Information is stored remote computers [servers] that can be accessed by anyone at any time from their computers [clients]. It has developed in steps in recent decades and now is the basis for the worldwide exchange of data, for example via e-mail. It is currently the most popular network in the world with approximately 500 million users.

www.isoc.org

IP

Internet Protocol. Protocol [method, procedure] used to transfer data from one computer to another in a network, for example on the Internet or Intranet. Each computer in the network is clearly identified by its IP address. If data is sent from one computer to another, it is broken into small information packets containing the address of the sender and receiver. These packets can reach their destination over the network using different paths and in an order other than the send sequence. Once there, they are put back in the correct order by another protocol, the Transmission Control Protocol [TCP].

IP protection

It uses IEC 529, EN 60529 or DIN EN 60529 to characterize the protection of electrical devices by housings, covers or encapsulating to prevent persons from accessing dangerous parts within the cover and provide protection from contaminants and water. The protection code is specified by a 4-character code [IP code]. It consists of the letters IP and two numbers. IP stands for „International Protection“, the first number specifies protection against solid contaminants (0 to 6), the second number specifies protection against water (0 to 8). The individual degrees of protection range from simple protection against touch to full protection against dust as well as from protection against vertically dropping water to protection against being fully submerged. In industrial environments, protection levels starting with IP 65 have become standard.

IPC

Industrial PC

ISA

Industry Standard Architecture. Early bus system for expansion slots allowing installation of add-on PC cards. In modern PC architectures, it has mostly been replaced by the PCI bus.

ISO

International Organization for Standardization. Worldwide federation of national standardization institutions from over 130 countries. ISO is not an acronym for the name of the organization; it is derived from the Greek word isos, meaning „equal“.

www.iso.ch

IT system

Information Technology system. Technical system for evaluating, transferring, processing, storing and/or using information.

J

Jitter

Jitter is a term that describes time deviations of cyclic events. If, for example, an event should take place every 200_s and it actually occurs every 198 to 203_s, then the jitter is 5_s. Jitter has many causes. It originates in the components and transfer media of networks because of noise, crosstalk, electromagnetic interference and many other random occurrences. In automation technology, jitter is a measure of the quality of synchronization and timing.

JPEG

Joint Photographic Experts Group. Widely-used graphic format for compressing digital color and black/white pictures. Named after the expert group that created it.

L

LAD

Ladder Diagram. Graphical programming language according to IEC 1131-3 and DIN EN 61131-3 for creating PLC application programs.

Latency period

Synonym for delay time, reaction time and runtime. For technical purposes, the time a device requires to provide an output reaction after an input arrives or, for example, the time a data packet requires to pass from the sender to the receiver on a network or remains in a network device before being forwarded.

LCD

Liquid Crystal Display. LCDs are not lit themselves, they reflect light from their environment or allow light to pass through from behind.

LED

Light Emitting Diode. Luminescent diode.

Linear motors

All motor technologies that are used to create rotary electric motors can also be used in a linear (straight) arrangement to create linear motors. As standard synchronous motor or asynchronous motor designs, a linear motor consists of two parts; an m-strand winding packet [primary side orforcer] embedded in grooves in a metal plate or molded in plastic (iron-free) and a secondary side that either consists of a carrier rail where the permanent magnets are mounted [synchronous motor] or a squirrel cage winding placed in a magnetic frame [asynchronous motor]. Linear motors are available in flat and cylindrical designs, are air and water cooled and have different guidance systems [glide, air suspension, roller, magnet, etc.]. They are used for translatory direct drive technology. They allow immediate, low-wear, low-vibration force to be applied to machine parts that move lengthwise without having to convert a rotary movement. Together with high resolution sensor systems, powerful controllers and precision bearings, they are very well suited for linear positioning and feed movements that are highly dynamic and extremely precise. In high-end applications for measurement, optics and electronic manufacturing, they allow positioning precisions <1_m. For general use in machine manufacturing, precision requirements of 0.01mm to 0.1 mm are necessary in addition to being robust, having a long lifespan and being able to be easily integrated in the construction and control technology for machine concepts. A special linear motor application is the drive system for the Transrapid.

Low-voltage guidelines

The goal of the guideline is to guarantee the safety of the user and to minimize the incidents of accidents. This includes all electrical operating equipment for creating, conducting, distributing, saving, converting and consuming energy such as e.g. generators, cables, switches, sockets, accumulators, transformers, lights, household devices and motors for using with a nominal voltage of between 50 and 1,000 volts for AC and between 75 and 1,500 volts for DC. Exceptions are listed in Appendix II of the guidelines. According to the guidelines, such operating equipment should only be put into circulation when it has been manufactured in compliance with current EU safety engineering regulations, when it will not injure or damage humans, animals and material assets with proper installation and maintenance and usage according to regulations, when a conformity evaluation process has been undertaken by the manufacturer, when a corresponding declaration of conformity is available and finally when they are labeled with the CE marking.

LPT

Line Printer. Logical device names for printers on PC systems.

M

Machine

According to machine regulations, a machine is understood to be an entire collection of interconnected components, with at least one being movable. Along with the mechanical components, the actuator, controller and energy components are also part of a machine. See also Automation Object.

Machine guideline

Machine guideline 89/392/EWG has the task of ensuring the free movement of goods for machines in the European Union (with this machine systems and removable equipment are also meant), separately introduced safety components as well as load absorption equipment. This has led to harmonized structural demands and conformity evaluation processes, which must be fulfilled by the people responsible for this. This particularly concerns safety requirements and health protection in relation to machine construction.

www.maschinenrichtlinie.de

Manufacturing automation

Automation market segment for the industrial sectors such as circuit, component, device and aggregate manufacturing, in which primarily discrete processes (discontinuous processes) occur.

Master-Slave principle

The master-element determines that slave-elements follow the instructions of the master. With remote bus control, an automation device as master-element grants the access rights for the other components [slave-elements].

Maximum speed

Maximum motor speed. This is a mechanical condition (centrifugal force, bearing wear).

MB

Megabyte (1 MB = 1,048,576 bytes or 220)

Mechatronics

Mechatronics was coined from the terms mechanics, electronics and informatics, and is a multi-disciplinary area of engineering that integrates these three areas. Established in Japan in 1975, it is an interdisciplinary development approach for products, which provides solutions for mechanical product tasks through the dimensional, technological and functional integration of mechanical, electrical and information processing subsystems. Completely new products or products with considerably improved features have been developed as a result and this trend will continue into the future. Examples of mechatronic systems are: motor vehicles, aircrafts and

spacecrafts, ships, modern rail traffic systems, machine tools, robots, modern cameras and many other devices and systems where the close interplay of mechanics, electrics and electronics is an essential requirement for their functionality.

MES

Manufacturing Execution System. The term MES covers a series of software solutions at factory control level. Its task is to record, prepare and make appraisable, all production data for optimizing production processes. By using real-time data from production, MES systems allow monitoring, control, reaction and reporting for the respective processes as they occur. This makes it possible to react quickly to changing manufacturing conditions in relation to the reduction of non-relevant production activities, and allows a more effective management of operation and production processes. In the context of vertical integration, Manufacturing Execution Systems are the link between the Automation level and management level systems [business corporate planning, ERP].

Microprocessor

Highly integrated circuit with the functionality of a CPU, normally housed on a single chip. It comprises a control unit, arithmetic and logic unit, several registers and a link system for connecting memory and peripheral components. The main performance features are the internal and external data bus and address bus widths, the command set and the clock frequency. Additionally, a choice can be made between CISC and RISC processors. The first commercially available worldwide microprocessor was the Intel 4004. It came on the market in 1971.

MIPS

Million Instructions Per Second. A measurement unit for measuring the operating speed of a computer.

MIS

Management Information System. The goal of such systems is to provide computational and simulation technology support to management processes such as planning, monitoring, and decision making, in order to improve overall quality. This requires that all company data relevant to decision makers can be accessed and that this data can be incorporated into planning, control, and simulation processes. The performance capability of today's systems largely depends on the provision of filtered, processed, compressed information and success-critical data, within the shortest period of time. It is also very dependent on the information and organization structures within a company.

Modem

Modulator/Demodulator. An add-on card or external device, which allows information to be exchanged between computers over the telephone network using digital/analog or analog/digital signal conversion.

Motherboard

A circuit board, which houses the main components of a computer such as the CPU switching circuit, co-processors, RAM, ROM for firmware, interface circuits and expansion slots for hardware expansions.

MTBF

Mean Time Between Failures. The mean time between two failures for repairable objects and reliability parameters.

MTC

Maintenance Controller. A standalone processor system in B&R industrial PCs, which provides additional functions for system monitoring and availability.

Multiplexing

A combination of two or more information channels on a common transfer medium.

Multitasking

Multitasking is an operating mode in an operating system, which allows several computer tasks to be executed parallel and simultaneously.

N

NAMUR

NAMUR is a German standardization association for measurement and control technology in chemical industries. It was founded in 1949. The subheading "Interest Group for Process Control Technology in the Chemical and Pharmaceutical Industries" has been added to make it more relevant to today's situation. NAMUR is an association of users of process control technology. Manufacturers of control technology, hardware and software are not eligible as members. There are currently over 80 member companies from Germany and other European countries such as Spain, Austria, Hungary, Switzerland, Belgium and the Netherlands. It is concerned with planning and erection, with solutions and systems for process control and factory control levels, with measurement and positioning technology and also with the operation and technical support of process control equipment up to closure.

www.namur.de

NC

Numerical Control

.NET

DOTNET. Microsoft's new development platform provides a common runtime library and a type system for all programming languages. DOTNET is the umbrella term for the following products, strategies and technologies; .NET framework, a new software platform, Visual Studio .NET, a new development environment that supports several .NET programming languages (e.g. C# or VB.NET especially created for .NET), .NET My Services, a group of services taking over functions such as authentication, .NET Enterprise Server, which apart from the names, is independent of the other technologies and includes the products Exchange Server 2000, Application Center 2000, SQL Server 2000. .NET devices, supported by a slimmed down version of the .NET framework (.NET Compact Framework.)

Network

A connection structure of individual elements [points, nodes, components] that are connected with each other or have a defined interaction with each other [traffic systems, power supply networks, communication networks etc.]. In the context of the EMC law, for example, this is understood as a summary of several transfer lines, that are electrically or optically connected to the individual points [nodes] using an installation, a system, an apparatus or a component. Of particular importance for modern automation technology are the communication networks like the Internet, Intranet, Ethernet etc.

Network layer

Layer 3 in the OSI reference model. The data packets are addressed in this layer. Logic addresses and names are also physically converted and the transfer paths defined.

Node

Branching point in a network

Numerical controllers

NC and CNC systems are high-capacity programmable logic controllers based on the microcomputer, used for automating operating sequences, particularly with processing and converting machines, but also with polygraph machines and measurement, testing and drafting machines, as well as many other installations. In a modified form they are used to control manipulation processes for industrial robots. Corresponding to the characteristic special features of the movements in the controlled object, a distinction is made between the items controllers, linear path controllers and two or multi-dimensional continuous path controllers. They are numerical controller systems, housed on the operator panel and console for the machine to be controlled or accommodated on a separate vessel. The processing programs for individual work pieces – depending on the type and scope of the processing task, they consist of between 50 to 500 individual program sentences. Each sentence contains

the necessary geometrical and technological data for executing a technological sub-operation. They are coded alphanumerically using keyboards [work station oriented programming WOP] or memory or entered online by a higher-level control computer [DNC computer] in the internal controller work data memory. The process sizes for important control process [tool positions] are recorded with discrete measuring instruments and processed numerically together with the program information; i.e. the command information is created for main and auxiliary drives in the controlled machine.

O

Object

Something toward which thought, feeling, or action is directed. In the context of software, it is a self-contained unit that contains specific data [attributes] and functions [operations].

ODVA

Open DeviceNet Vendor Association. An independent organization that supports the further development, application and spreading of DeviceNet worldwide. Membership is made up of companies who either manufacture DeviceNet products or supply development tools for DeviceNet.

www.odva.de

OEM

Original Equipment Manufacturer. A company that integrates third-party and in-house manufactured components into their own product range and then distributes these products under its own name.

OMAC

Open Modular Architecture Controls Users Group. An association, which promotes the worldwide development and application of open modular architecture controls.

www.omac.org

OOP

Object Oriented Programming. New procedure for creating software. At the core of this procedure are objects that incorporate data and processes for manipulating this data. If the following circumstances apply then it is an example of OOP: Encapsulation: Hides the data structure of an object from the user and caller. Defines similar objects into classes. Inherits methods and capabilities of an object developed to the later model [equal treatment]. Compatible to both the original and the later model [polymorphism].

OPC

OLE for process control. A communication standard for components in the area of automation. The goal of OPC development is to provide an open interface that builds on Windows-based technologies such as OLE, COM and DCOM. It allows problem-free standardized data transfer between controllers, operating and monitoring systems, field devices and office applications of different manufacturers. This development is promoted by the OPC foundation, which is made up of over 200 companies from around the world, including Microsoft and other leading companies. Nowadays, OPC is also interpreted as a synonym for Openness, Productivity and Connectivity, symbolizing the new possibilities that this standard opens up.

OPC server

The missing link between connection modules for the InterBus and the visualization. It communicates serially with the connection modules via the ISA or PCI bus or Ethernet.

Operating system

The entire collection of programs, which together with the computer's hardware, regulate the basic operating sequence of a computer and computer-based devices.

OSI reference model

Established in 1972 by the ISO, its goal is to link the networks of different manufacturers with the different topologies. The OSI reference model [also known as a layer model] represents a standard, which classifies and defines the principles for which communication, using different protocols (rules), takes place between the components in a network. It consists of seven layers in total: Physical layer, data link layer, network layer, transport layer, session layer, presentation layer and application layer. Using the lowest layer, the physical [layer 1], the electrical and mechanical specifications for cables and network adapter cards are defined, as well as the method for sending bits over the cable. The second layer, the data link layer, integrates bits from the lowest level into groups and data packets [frames], and inserts controller information at the start of the packet [sender and receiver address, length of the packet, used protocols of higher layers]. At the next highest layer, the network layer [layer 3], information is passed on over the network used and so on.

P

Parameter data

Represents configuration values and device data, e.g. configuration values of components. The data is stored in the central controller and if necessary, can be automatically downloaded after the exchange of individual components. That means, parameter data rarely changes and is only transferred when requested. Concerning transfer speed, the data is governed by less stricter requirements in comparison to process data.

Parity checking

Parity checking is a simple process that checks for transfer errors. The parity bit is added so that each group of bits (containing the number of 1s) has either an even or odd number of bits ($HD = 2$).

PC card

Registered trademark of PCMCIA for add-on cards conforming to PCMCIA specifications.

PCI bus

Peripheral Component Interconnect Bus. Developed by INTEL as an intermediary/local bus for the latest PC generation. It is basically a synchronous bus. The main clock of the CPU is used for synchronization. The PCI bus is microprocessor independent, compatible with 32-bit and 64-bit and supports both 3.3 V and 5 V cards and devices. See also PCI SIG.

PCMCIA

Personal Computer Memory Card International Association. An international standards body made up of component manufacturers in the computer industry that support the establishment and further development of a standard for memory cards and other PC cards. The corresponding PCMCIA standard provides exact specifications for details such as size, power consumption, signal handling and programming of the cards. The cards have compact dimensions [credit card format, 3.3mm, 5mm or 10.5 mm thick], low power consumption and are configured using software. PCMCIA technology is well suited for all mobile measurement, analysis, service and testing systems equipped with mobile PCs, laptops or notebooks.

www.pcmcia.org

Physical layer

Layer 1 in the OSI reference model. It defines network cabling and transfer technology and regulates the transfer of bit streams over a physical media from one device to another.

PICMG

PCI Industrial Computers Manufacturers Group. Goal: Use of commercial PCI bus for industrial environments, especially CompactPCI bus.

www.picmg.org

PID controller

PI controller with derivative element. The derivative element additionally influences the manipulated variable to the same extent as the change speed for the control deviation.

PLC

Programmable logic controller. Computer-based control device that functions using an application program. The application program is relatively easy to create using standardized programming languages [IL, FBD, LAD, AS, ST]. Because of its serial functionality, reaction times are slower compared to connection-oriented control. Today, PLCs are available in device families with matched modular components for all levels of an automation hierarchy.

PLCopen

PLCopen is a vendor and product independent worldwide association that supports the establishment of international standards, especially IEC 61131-3, for programming industrial controllers and certifies standard-based programming systems. This includes the definition of various compliance levels, as well as the development of test procedures and provision of certificates from independent institutions.

www.plcopen.org

Polling

Method of synchronization for data transfer. When polling, one partner [master] cyclically asks other partners [slaves] if they want to send information or if they can receive information. Only the master can start communication, not the partners [slaves] being polled. They can only block communication.

Power electronics

Technology based on power semiconductors that can switch high currents and handle high voltages [e.g. IGBTs] for conversion, control and conditioning of energy. Power electronic components and devices rated up to the megawatt range can be found in the supply systems of nearly all electric/electronic equipment. According to experts, over 50% of the worldwide electric power consumption was controlled using power electronic devices and systems in year 2000.

Power Panel

Devices from this B&R product family combine visualization, control and I/O components in one compact device.

Powerlink (see ETHERNET Powerlink)

Presentation layer

Layer 6 in the OSI reference model. This layer handles text formatting and display. It is also responsible for data security. It handles data compression as well.

Process

Action, event or procedure in which continuous or discontinuous, quantitative or qualitative changes to parameters or states of a real or virtual object or media being observed take place. Every process has a defined start and a defined end. Depending on what happens during a process or which objects undergo the process, it is possible to differentiate between many types of economic and industrial processes such as value-added processes [production and manufacturing processes], service processes [logistics, maintenance and repair processes], management processes [planning and maneuvering processes], etc. For technological processes, a differentiation is often made between continuous processes, discontinuous processes and charge processes depending on the continuity of the main process activity.

Process image

Image of the signal states for digital inputs and outputs on the PLC CPU. The process image for inputs and the process image for outputs are differentiated.

Glossary

Process visualization

Display of the activities in an industrial production area, in communal areas, in traffic areas and in safety relevant or laboratory areas using modern IT equipment, i.e. suitable display systems for improved handling of the respective processes.

PROFIBUS-DP

PROFIBUS for „Decentralized Peripherals“. PROFIBUS-DP can be used to allow simply digital and analog I/O modules as well as intelligent signal and data processing units to be installed in the machine room, which among other things can significantly reduce cabling costs. Many used for time-critical factory automation applications.

Programming languages

Programming languages are artificial languages with strict syntax and semantics, clear symbols and special notation for creating algorithms in an executable computer program. Since the creation of the first functioning program-controlled computer Z3 in 1941, over a thousand programming languages have been developed for various application areas. An overview of the evolution, current state and future of programming languages can be found on the following websites.

Protocol

Information technology (IT): Specifications regarding data formats and control procedures for communication between two devices or processes. The protocol can be implemented as hardware or software and mainly includes the following aspects: the type of error detection used, the data compression method (if used) and the way the sender indicates the end of the information sent and the receiver indicates that the information has been received.

PV

Process variable. Logical storage location for values and states in a program.

R

RAM

Random Access Memory. A semiconductor memory which can be read or written to by the microprocessor or other hardware components. Memory locations can be accessed in any order. While ROM types cannot be written to, RAM memory allows both read and write access.

Rated current

The rated current is the effective value for the phase current (current in the motor supply line) when generating the rated torque at the rated speed. This is possible for any length of time if the environmental conditions are correct.

Rated power

The rated power is output by the motor when $n = n_N$. This is possible for any length of time if the environmental conditions are correct.

Rated torque

The nominal torque is output by the motor ($n = n_N$) when the nominal current is being drawn. This is possible for any length of time if the environmental conditions are correct.

Real-time

A system is operating in real-time or has real-time capability, if the input sizes [e.g. signals, data] are received and processed in a defined time period, and the results are made available in real-time for a partner system or the system environment. See also 'Real-time Demands' and 'Real-time System'

Real-time classes

The real-time demands on computer, control, controller and communication systems are defined by the physical environment that they operate in and by the partner system that they interact with. To clarify these facts about orientation in a more technically way, the IAONA real-time work group carried out a classification of networks for real-time environments. This resulted in the development of four distinct real-time classes.

Class 1 covers all installations and systems where relatively slow (not time critical) processes take place. With integrated communication systems, this means reaction times ranging between 0.1 and 10 seconds. Class 2 refers to a dynamic relatively simple usage environment, where reaction times between 1 and 500 ms are sufficient. Class 3 concerns dynamically simple devices and systems such as robots and CNC machines, which due to the communication technology demand reaction times of approximately 50µs to 20 ms.

Class 4 focuses on highly-dynamic installations and systems, whose communication network requires reaction times of well below one millisecond to ensure flawless operation.

www.iaona.org

Real-time system

A system, which responds to an outside event within a specified time period. Therefore, the main focus is not on speed. The necessary reaction speed conforms more to the environment and to the partner object, which the system cooperates with in a specific application. For example, high-speed digital controllers need real-time systems, where reaction times lie in the microsecond range. In contrast, automation solutions with programmable logic controllers can manage with reaction times in the millisecond range. For slow systems in the processing industry, e.g. temperature controllers, reaction times in the range of seconds or even minutes are sufficient. In regards to complying with the defined time limit, a distinction is made between critical and relaxed real-time demands. A critical real-time demand is when all required system responses to an outside stimulation must be made within a strictly specified time period under all possible conditions. Otherwise, considerable damage is imminent. In contrast, a relaxed real-time demand is where there is a certain degree of tolerance involved. A defined time limit can be exceeded, because there are no fatal consequences to fear. The real-time capability of a system depends on a number of variables. Particularly in Automation technology, signal running times, cycle times, latency periods, jitter, synchronicity requirements and data throughput to be managed play a significant role.

Redundancy

Technical equipment or methods exist beyond that necessary for completing a function for the purpose of increasing functional security of devices and systems.

Relay

An electric device that causes a defined change in one or more electrical output circuits when a change occurs to a value on the input circuit [current, voltage or their derivatives over time, as well as the sum, difference, product or quotient of several electrical values]. The following types are differentiated between according to DIN VDE 0435 depending on their functioning principle: Electromechanical relay, if they function according to the movement of mechanical elements resulting from the effects of an electric current on the input circuit; Electrothermal relay [thermal or bimetal relay], if they function according to the deformation of thermal elements (directly or indirectly caused by the bimetal strips being heated by the input current); Static relay, if they function according to electronic, magnetic, optical or other methods without moving mechanical elements or thermal elements. Switching relays and measurement relays are also differentiated between depending on their use. Switching relays are used as control relays, auxiliary relays, intermediate relays, timing relays, stepping relays, indicator relays and in other specifications for creating simple control applications. Measurement relays are used as protective relays, overload relays, monitoring relays, differential relays, distance relays, negative-phase-sequence relays and in other designs as monitoring, protective and diagnostics functions.

Release delay

Delay time required until the holding torque of the holding brake is reduced by 90% (the brake is released) after the operating voltage has been returned to the holding brake.

Reliability

In a technical context, reliability represents the ability to correctly operate at a continual performance level within defined probability limits and time spans. Characteristic reliability parameters are: MTBF of repairable devices,

MTTF for non-repairable systems and failure rate for modules or components, which can be used to establish availability.

Repeater

Equipment used to amplify and regenerate signals in a network. Information passed through a repeater can travel longer distances than without a repeater. Simple, cost-effective method of LAN expansion.

Residual risk

Risk that remains after applying appropriate protective measures

Resolver

Inductive devices used for determining and transferring rotation angles. Modern designs can have a precision of +/- 3 angular minutes. They are used to create highly dynamic drive solutions. They are constructed as small precision alternators with a single-strand rotor winding and a double-strand stator winding, which has strands that are offset 90 degrees in the stator. If the rotor winding has an AC voltage applied (normally 10 kHz) with constant amplitude, voltages with the same frequency are induced as in a transformer to the two stator windings, having amplitudes that are proportional to the sine and cosine of the rotor rotation angle. The rotor rotation angle can be determined using these amplitudes and an arc tangent calculation. That means the resolver works in this case as a rotation angle encoder. If the two stator windings have AC voltage applied, having amplitudes proportional to the sine and cosine of a desired angular set value, a voltage is created in the rotor that corresponds to the difference between the rotation angle set and actual values. In this case, the resolver functions as a rotation angle encoder with integrated set and actual value comparison.

Robustness

Ability of an object to continue functioning, even if specified conditions are not met. Qualitative term because exact assessment criteria do not exist.

ROM

Read Only Memory. Nonvolatile memory. Contents of the memory are stored by the chip manufacturer in final mask step [also called mask-programmed ROM]. It can only be read and constantly remains in the same form.

RS232

Recommended Standard Number 232. Oldest and most widespread interface standard, also called V.24 interface; all signals are referenced to ground making this an unbalanced interface. High level: -3 ... -30 V, Low level: +3 ... +30 V; cable lengths up to 15 m, transfer rates up to 20 kbit/s; for point-to-point connections between 2 participants.

RS422

Recommended Standard Number 422. Interface standard, balanced operation resulting in increased immunity to disturbances. High level: 2 ... -6 V, Low level: +2 ... +6 V; 4-wire connection [inverted/not inverted], cable lengths up to 1200 m, transfer rates up to 10 Mbit/s, 1 sender can carry out simplex communication with up to 10 receivers.

RS485

Recommended Standard Number 485. Interface standard upgraded from RS422; High level: 1.5 ... -6 V, Low level: +1.5 ... +6 V; 2-wire connection [half duplex operation] or 4-wire connection [full duplex operation]; cable lengths up to 1200 m, transfer rates up to 10 Mbit/s. Up to 32 participants can be connected to an RS485 bus [sender/receiver].

Runtime system

For computer technology: All routines required to execute a program written in a special programming language on a special platform [interaction with the operating system, memory management, error handling routines, etc.]. For automation technology, there are now many manufacturer-specific runtime systems for practically all controller types [PLC, CNC, PC-based system, robot controllers, etc.]. In distributed automation systems, flexibility, functionality and performance of the individual devices is often limited. It seems that using the. Net

technology from Microsoft, including the CLR (common language runtime) system, can help. For communications, a runtime system is a filter for signal correction that removes disturbances that cause sections of wireless signals for example to be distributed in different ways with different runtimes causing signal distortions for the receiver.

S

Safety

According to Brockhaus: The absence of danger or the knowledge that an individual or group is protected from potential dangers. When referring to technology, safety is the characteristic of an object [component, device, machine, system] to not present unacceptable dangers to people, equipment or the environment when operated according to specifications. Handling security issues takes place in two ways: Firstly, under the premise that the object will function as it should; secondly, under the premise that the object will not function correctly (complete failure). The first aspect mainly concerns issues of health, working conditions and fire and is regulated by many laws and guidelines. The second aspect is part of technical safety measures that are set up to minimize dangerous situations and risks associated with system failures (at least below an acceptable limiting risk level) based on the probability of a failure and the possible extent of damages. These issues are included in the topic of functional safety. For automation technology, the corresponding standards are IEC 61508 and EN 954-1. As a footnote, there is no such thing as absolute safety without any risks, neither in technology or nature.

SCADA

Supervision, Control And Data Acquisition. SCADA systems are used to control, monitor and record industrial processes. A high degree of configurability allows customization for various processes.

SDRAM

Synchronous Dynamic Random Access Memory. A form of dynamic RAM semiconductor modules that can be operated at high clock rates.

Sensor

Equipment that converts a physical value based on a physical effect into an electrical, pneumatic or hydraulic signal for further processing. Modern sensors have integrated signal preprocessing to prevent disturbances or nonlinearity. In automation technology, sensors are used to get the information required to control a process. For example, determining aggregate and machine states or to collect process data such as temperature, pressure, speed, fill level, flow, distances, angles, etc.

Sequential control

Sequential control is a control sequence where the individual steps are structured and processed sequentially in accordance to the plan/program stored in the control device. The individual steps are assigned commands, which are output to the control object by the control device as either time-dependent or process status-dependent. This is determined when both the specified timing conditions for one step are fulfilled or if stipulated events have occurred in the process range. On the basis of this fact, there is a differentiation made between time-dependent sequential control and process-dependent sequential control. Time-dependent sequential control is used where it can be safely assumed that the sequences in the controlled object are always processed according to the time function, or where important criteria for the processing sequence either cannot be recorded or only recorded with great difficulty in a metrological manner. For example, it can be found in starter automation for motors, which always start under the same stress ratios and also in automation for controlling washing machines, centrifuges, molding machines, injection molding machines and contact welding machines. They are also generally found with those devices and installations that automatically implement cleaning, heating, sintering, annealing, baking, boiling and drying processes. Due to its operating principle, process-dependent sequential control makes it possible to carry out certain program processing adjustments to accidental irregularities during process events. They are found everywhere where there are no problems caused and in the controlled object where the occurrence of certain events (e.g., "target position reached", "valve open", "operating speed reached") is recorded with suitable sensors and reported back to the control device. In everyday industrial practice, time and process dependent sequential control functions are combined in a multitude of ways.

Sequential control language

Graphical programming language according to IEC 1131-3 and DIN EN 61131-3 for structuring PLC application programs.

Servo Motors

Electric motors are used to drive mechanical components such as valves or to control or position mechanical axes for tool machines, robots and many other applications. To achieve small mechanical time constants, they have a small rotor torque and a large starting torque. They are available for all types of current (DC, AC, 3-phase), can be easily controlled and normally always function in periodic, intermittent or reversing operation.

Session layer

Layer 5 in the OSI reference model. This layer allows two applications on different devices to start use and end a session, i.e. a direct connection between the applications. It handles the dialog, regulates the length of data transfer and handles organization of which participant is sending or receiving as well as synchronization and restarting the session after an error.

SFC

Sequential Function Chart. Used for graphic representation of sequential control, graphic input language for

Signal

Physical value that changes over time, e.g. a voltage or current with a parameter [amplitude, frequency, phase position] that provides concrete information about changes to another physical value. The respective parameter is called an information parameter. For example, an electric tachometer measures the rotational speed of a mechanical shaft, i.e. it is indicated by the amplitude of the tachometer output voltage. In this case, the amplitude of the output voltage is the information parameter providing information about the rotational speed of the machine shaft over time according to the signal definition. It is possible to differentiate between different basic signal types depending on the number of values, availability over time and the number of information parameters. Analog, binary and digital signals are most important for automation technology.

Slot PLC

PC insert card that has full PLC functionality. On the PC, it is coupled via a DPR with the process using a fieldbus connection. It is programmed externally or using the host PC.

Software

All programs including the respective documentation available for the operation of data processing systems, computer systems and computer-based devices of all types. Software is implemented on hardware as the non-physical functional elements of a computer system. Using the term software when referring to computer programs was initiated in 1958 by mathematician John Tukey, Princeton University. Software can be grouped as system software and application software.

SRAM

Static Random Access Memory. A high-speed RAM semiconductor type that is mostly used in computers for cache memory. Using a backup battery, the contents of this memory can also be retained during a power failure.

SVGA

Super Video Graphics Array. Graphic standard with a resolution of at least 800x600 pixels and at least 256 colors.

Switch

Device, similar to a hub, that takes data packets received in a network and, unlike a hub, does not pass them on to all network nodes, instead only to the respective addressee. Unlike a hub, a switch provides targeted communication within a network that only takes place between sender and receiver. Other network nodes are not involved.

Symbol

From the point of view of linguistics, a symbol is a „thing“ [mark, indicator, etc.] that represents „something else“ [in the real or virtual world]. A „symbol“ has a defined relationship with the object being referenced, an „icon“ has a visual similarity with the object being referenced and an „index“ is a reference to a fact or conclusion. For technical terminology [i.e. DIN 44300], characters are symbols that represent certain information [letters, numbers, special characters, etc.].

T

Task

Program unit, which is assigned a specific priority by the real-time operating system. It contains a complete process and can consist of several modules.

TCP/IP

Transmission Control Protocol/Internet Suit of Protocols. Network protocol, generally accepted standard for data exchange in heterogeneous networks. TCP/IP is used both in local networks for communication between various computer and also for LAN to WAN access.

Terminals

Terminals are used to connect or attach electrical conductors. Terminals can be arranged in a row and usually have two separate poles (connection points). Single or multi-pole terminals (terminal blocks) can be grouped as terminal strips.

TFT display

Thin Film Transistor display. Display technology for LCD monitors in which each pixel is controlled by a thin film transistor.

Three-phase supply

Three-wire system with L1, L2, L3 or four-wire system with L1, L2, L3, N. All phases are isolated from ground and all device housings are grounded.

Time constant

Technical systems, which have input/output behavior that can be defined by a first order differential equation with the form $T(dy/dt) + y = x$, react to a jump of input value x from 0 to X or from X to 0 with reference to output value y according to the function $y = X(1 - \exp[-t/T])$ or $y = X \cdot \exp[-t/T]$. These are exponential functions in which T represents a time value. This value is referred to as a time constant and is a characteristic for the speed of a transition. After the time $t = T$ has passed; the output value y has increased to 63% of X (in the first case) or it has been reduced to 37% of X (in the second case). After $t = [3... 5]T$, the transition has been completed in both cases. Many technical procedure at least loosely follow exponential functions, therefore the term time constant is often used to characterize the timing of systems as described above.

Time to market

Time span from the development of a product until it is ready for the market. The duration of this time span is becoming more and more important for the success of a company because of shorter market, product and technology cycles.

Topology

Network architecture. Type of connection between the network components [stations, nodes]. Standard basic structures are star structure. [All stations are connected to a central node. All communication runs through this node. Direct communication between stations is not possible] Line structure [All stations are in a single common transfer path. Only one message can be transferred from one station to another at one time] Ring structure [All stations are connected in the form of a ring. There is no central node. All stations have the same rights] Mixed structure [Each station is connected to several others. Several independent transfer paths can

exist between two stations. This redundancy can be used to guarantee data transport if a transfer path is broken] Tree structure [Branched topologies are created by combining the structures mentioned]. Depending on the existing conditions, most real applications have mixed structures. For industrial automation, for example, the structure of the communication network used is heavily influenced by the special properties of the automation object [machine/system]. Applications for star network structures are mostly limited to small areas with many devices, such as individual production machines. Tree configurations, which group several star structures, are found in complex systems with many autonomous subsystems. Line structures are especially well suited for longer objects such as conveyor systems and ring structures are especially well suited for systems with stricter requirements on reliability.

Torque constant

The torque constant determines the torque created by the motor with 1 Arms phase current. This value applies at a motor temperature of 20° C. When the temperature increases, the torque constant is reduced (typically up to 10 %). When the current increases, the torque constant is reduced (generally starting at twice the value of the rated current).

Torque motors

Torque motors are rotating drive elements for direct drive technology. In modern designs, these are brushless synchronous motors with highly poled permanent magnet excitation in the internal or external rotor designs. However, they are also still available as DC motors with brushes. They are often used for the tooled machine industry as a replacement for hydraulic and standard electric drive structures made up of electric motors and a gear unit. They are set up for high torque [up to several 1,000 Newton meters, Nm] and low speeds and their mechanical concept makes them easy to integrate in the mechanisms and machines to be driven. This allows an extremely compact and efficient system construction that works with low oscillations, low play, low noise and is mostly wear and maintenance free and has improved machine dynamics, repeatability and positioning precision. The most important selection criteria for torque motors are maximum acceleration [Nm/kgm²] and the motor constant Km measured in Nm/W^{1/2}. It determines the loss at a certain torque independent of the speed. Torque motors are used, for example, in rotary table and swivel axis drives on tool machines, as drives for extruders in the plastics industry, as cylinder drives for foil machines, as robot axis drives and in many other applications.

Touch screen

Screen with touch sensors for activating an item with the finger.

Transport layer

Layer 4 in the OSI reference model. This layer is responsible for correct data representation i.e. for error detection and error correction. It converts the flow of data being sent into small data packets and converts the data packets being received back to a flow of data. Send and receive confirmation are also part of this layer. The main tasks of this layer are opening and closing node connections and guaranteeing secure data transfer.

Turning moment motors (see torque motors)

TÜV

Technical monitoring organization

www.tuevs.de

Twisted pair

Pair of copper wires twisted together. Transfer media for signals.

U

UART

Universal Asynchronous Receiver/Transmitter

UDMA

Ultra Direct Memory Access. A special IDE data transfer mode that allows high data transfer rates for disk drives. There have been many variations in the recent times. UDMA33 mode transfers 33 megabytes per second. UDMA66 mode transfers 66 megabytes per second. UDMA100 mode transfers 100 megabytes per second.

UDP

User Datagram Protocol. Network protocol.

UPS

Uninterruptible Power Supply. UPS devices and systems are made up of switches, AC and DC inverters and especially batteries that provide a continuous supply of power to the user for a relatively long period of time during a power failure and, if necessary, can improve the current quality.

USB

Universal Serial Bus. Cost-effective serial interface for PCs; IBM standard supported by Intel, Compaq and Microsoft and other well-known companies; up to 127 peripheral devices [mouse, keyboard, printer, scanner, digital cameras, modems, CDROM drives, telephones, etc.] can be connected to a single USB port. The connected devices are also supplied with power via the 4-wire bus cable. The version on the market since 2001 (Version USB 2.0) allows data transfer rates up to 480 Mbps and is therefore also useful for transferring video data and for high-speed disk drives.

www.usb.org

V

VDE

The Association for Electrical, Electronic & Information Technologies (Verband der Elektrotechnik Elektronik Informationstechnik e.V.)

www.vde.de

VGA

Video Graphics Adapter

W

Windows CE

Compact 32-bit operating system with multitasking and multithreading, that Microsoft developed especially for the OEM market. It can be ported for various processor types and has a high degree of real-time capability. The development environment uses proven, well established development tools. It is an open and scalable Windows operating system platform for many different devices. Examples of such devices are handheld PCs, digital wireless receivers, intelligent mobile phones, multimedia consoles, etc. In embedded systems, Windows CE is also an excellent choice for automation technology.

Glossary

X

XGA

eXtended Graphics Array. An extended standard for graphic controllers and displays that IBM introduced in 1990. This standard supports a 640 * 480 resolution with 65,536 colors or a 1024 * 768 resolution with 256 colors. This standard is generally used in workstation systems.

XML

eXtensible Markup Language. This new language was officially recommended in 1998 by the World Wide Web Consortium W3C as standard for web publishing and document management in client-server environments. Further development of the SGML standard. Unlike SGML documents, XML documents do not require a schema description in the form of a DTD. XML is already supported completely in the newer versions of many ERP and MES systems. XML is accepted as an industrial standard thanks to its simple notation. Information is represented using the ASCII character set. This makes XML easy to read and transparent, and for the most part, portability of the text form is superior to binary structures.

www.xml.com



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	 1942		 1952
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	 1708	 1707	 1718
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3IF789.9-1	633
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4MP281.0571-12	887
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4PP015.C420-36	804
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4PP420.0571-K34	1032
4PP420.0573-75	844
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4PP420.1043-K24	1033
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4PP451.1043-75	849
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4PP480.1505-B5	853
4PP481.1043-75	855
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4PP481.1505-75	856
4PP482.1043-75	857
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5AC600.HDDI-05	923
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5CAPWR.0250-20	1068
5CAPWR.0300-20	1069
5CAPWR.0400-20	1069
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5CASDL.0018-20	1066
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5CASDL.0150-03	1100
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5CASDL.0400-13	1102
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5CASDL.0430-13	1102
5CAUPS.0005-00	924
5CAUPS.0030-00	924
5CAUSB.0018-00	673
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5CAX2X.0018-20	1070
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5CAX2X.0400-20	1070
5CFCRD.0064-03	672
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5CFCRD.2048-03	672
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5CFCRD.8192-03	672
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5DLDVI.1000-01	1086
5DLSDL.1000-00	1086
5DLSDL.1000-01	1086
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5E9000.29	1053
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5LS166.6	637
5LS172.6	638
5LS182.6-1	639
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5MMDDR.2048-01	961
5MMUSB.2048-00	673
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5MP050.0653-01	894
5MP050.0653-02	896
5MP050.0653-03	898
5MP050.0653-04	900
5MP181.0843-07	889
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5PC600.FA02-00	923
5PC600.FA03-00	923
5PC600.FA05-00	923
5PC600.SE00-00	926
5PC600.SE00-01	926
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5PC810.SX05-00	959
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5PP320.0571-K14	1037
5PP320.0573-39	830
5PP320.0573-3B	830
5PP320.0653-K02	1036
5PP320.1043-39	831
5PP320.1043-K04	1038
5PP320.1043-K14	1039
5PP320.1214-39	832
5PP320.1505-39	833
5PP320.1505-K04	1040
5PP320.1505-K14	1041
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5SWFON.0000-20	1121
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5SWFON.0001-20	1121
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5SWUTI.0000-00	1121
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5SWWCE.0516-ENG	1117
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5SWWXR0600-MUL	1115
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7CX436.50-1	590
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7EC020.61-2	604
7EC021.60-1	606
7EC021.61-2	606
7TB710.9	685
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7TB710.91	685
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7TB718.9	688
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7XV108.50-12	576
7XV108.50-51	576
7XV108.50-62	576
7XV116.50-11	577
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7XV116.50-51	577
7XV116.50-62	577
7XV124.50-11	578
7XV124.50-12	578
7XV124.50-51	578
7XV124.50-61	578
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7XX408.50-1	602
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7XX426.50-1	598
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80MPD1.300S000-01	1450
80MPD3.300S000-01	1451
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80MPH1.300S000-01	1453
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80PS080X3.10-01	1242
80SD100XD.C044-01	1238
80SD100XD.C0XX-01	1234
80SD100XS.C04X-01	1240
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8AC140.60-2	1306
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8B0C0160HC00.001-1	1376
8B0C0160HC00.A01-1	1380
8B0C0160HW00.000-1	1376
8B0C0160HW00.001-1	1376
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8B0C0320HW00.000-1	1380
8B0C0320HW00.002-1	1380
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8B0M0220HC00.000-1	1366
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8B0M0230HC00.000-1	1366	8BCM0015.1111A-0	1425	8BVI0014HWS0.000-1	1384
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8B0M0240HC00.000-1	1366	8BCM0015.1523A-0	1427	8BVI0028HCS0.000-1	1384
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8B0M0250HW00.000-1	1366	8BCM0020.1523A-0	1427	8BVI0055HCD0.000-1	1389
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8BCM0005.1523A-0	1427	8BVE0500HW00.000-1	1404	8CM005.12-5	1316
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8CM010.12-8	1317
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8CR015.12-1	1319
8CR020.12-1	1319
8CR025.12-1	1319
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8JSA7	1636
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8LSC6	1568
8LSC7	1576
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8TB3104.201H-10	1436
8TB3104.201M-10	1437
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8TB4104.204G-10	1439
8TB4104.206D-10	1439
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9A0100.17	649
9S0001.11-090	1114
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MA4SERV-E	1934
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MAACPM-GER	1935
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X20AC0SG1.0010	389
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X20AT2222	310
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X20AT4222	312
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X20BM21	91

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X20BM33	546
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 0737-1184 - Operator Panels and Industrial PCs

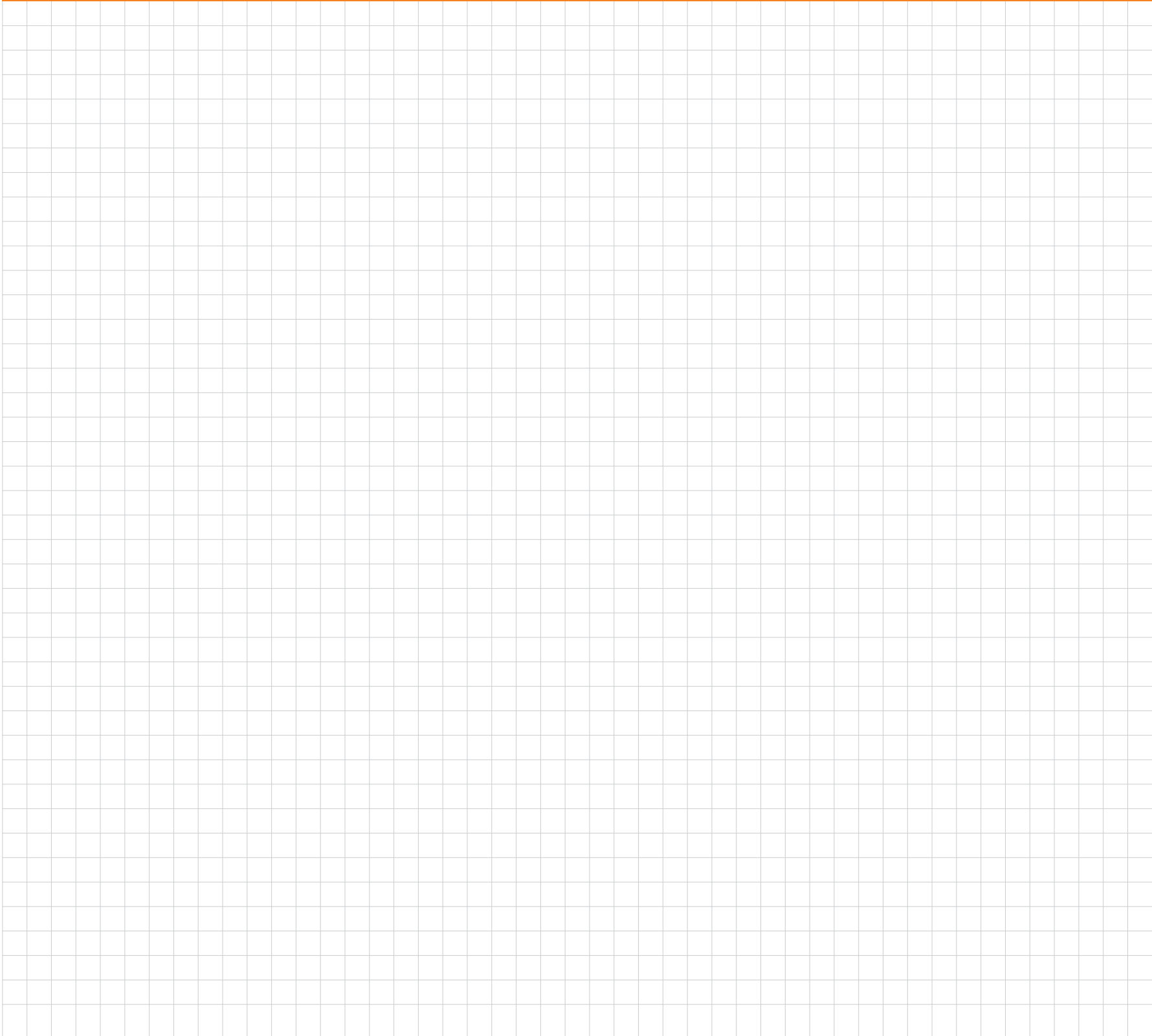
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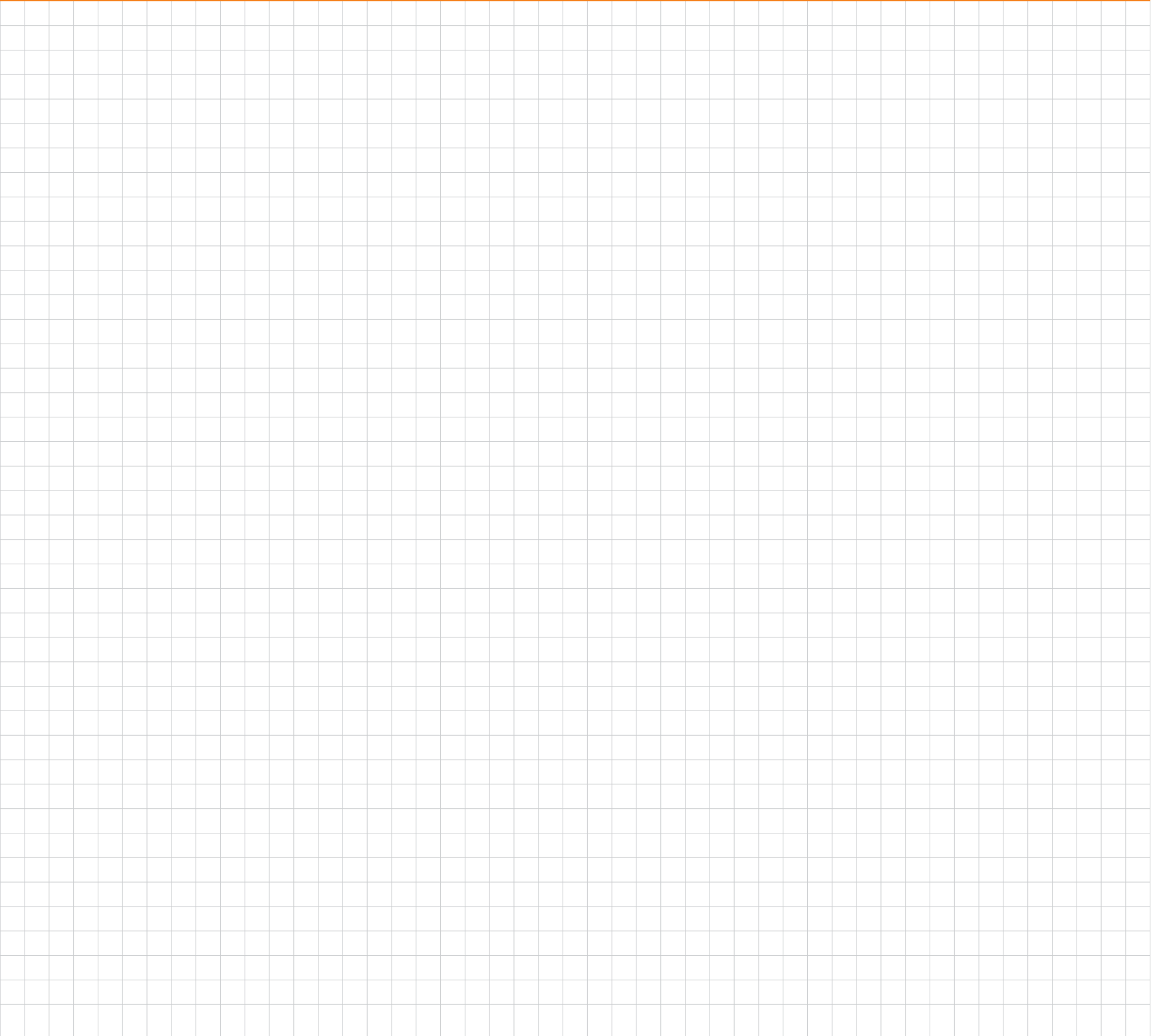
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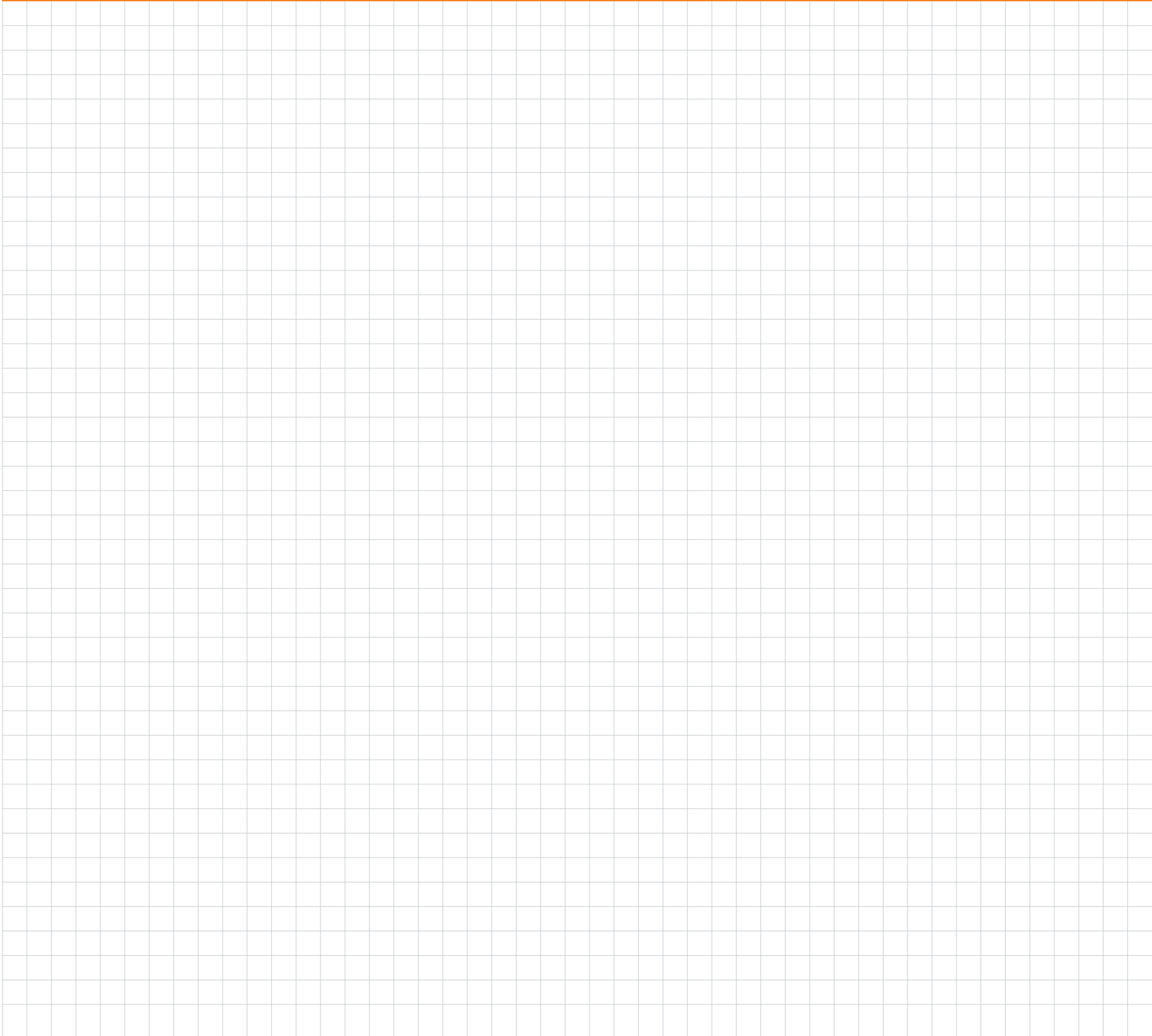
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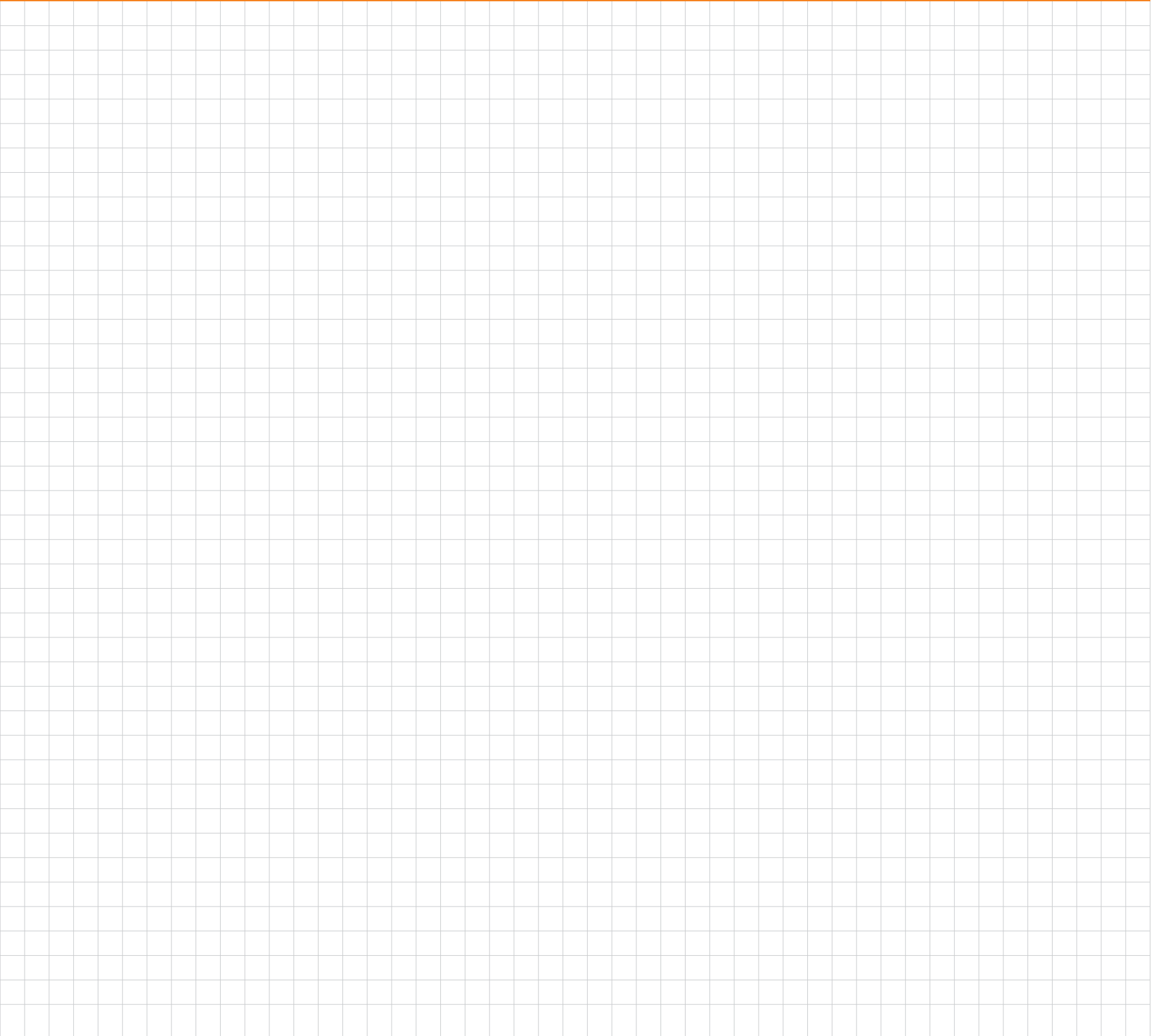
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Supplementary volume

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B&R was founded in 1979 by Erwin Bernecker and Josef Rainer. Since then it has become one of the largest privately owned automation companies in the world, employing more than 1700 people. A network of subsidiaries and international sales and support offices in more than 60 countries around the world guarantees global know-how at a local level. B&R customers are leaders in their respective industrial sectors. Flexible solutions and systems for individual automation projects greatly contribute to their companies' success. Continual innovation guarantees B&R customers the competitive edge. Since the company's founding, all innovations and investments have concentrated on one core area: solutions for industrial automation. As a privately owned company, all financial decisions are made independently of external investors or shareholders. This autonomy is the cornerstone for flexibility and dynamics – constant product innovations are the result.

Custom-made

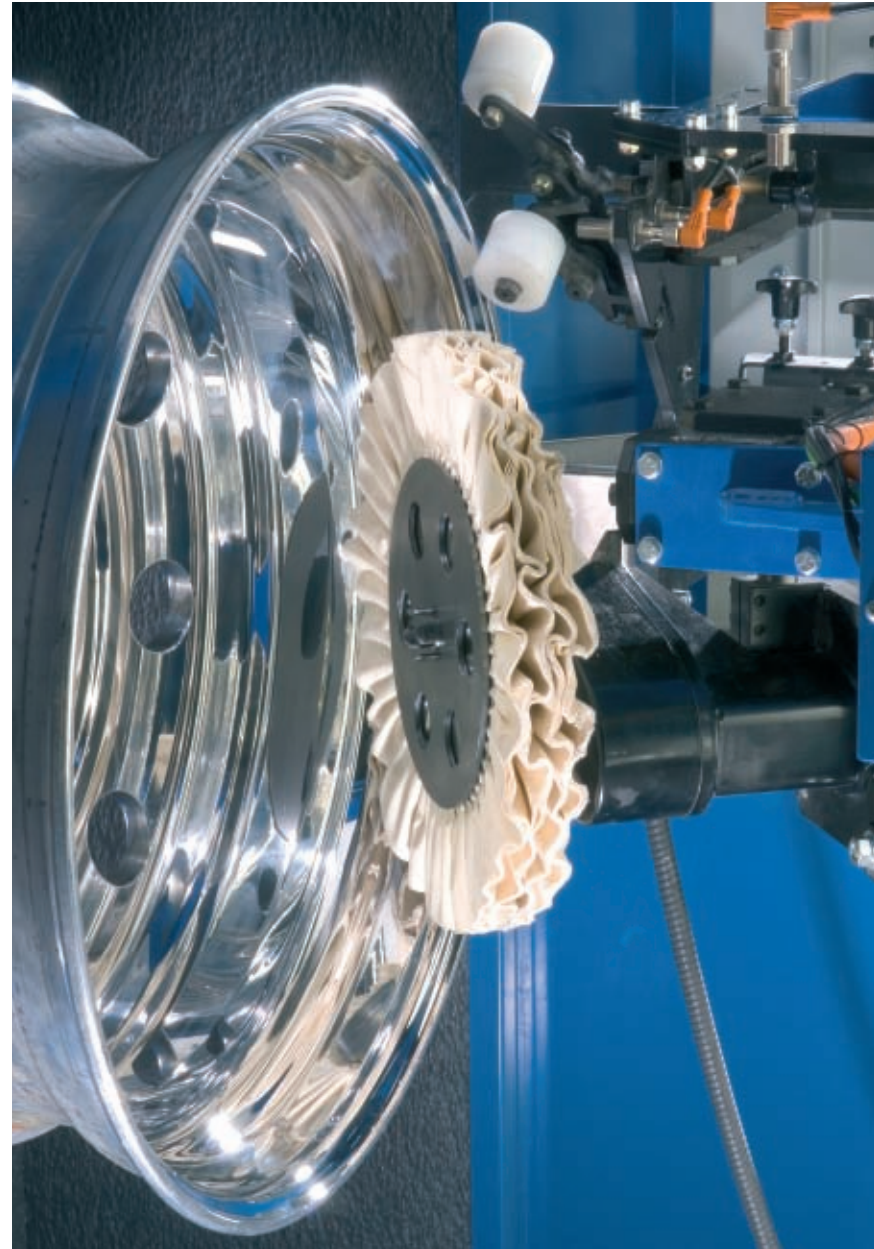
Using standard components is not always the best approach. A demand for specialized solutions also exists. Willingness and ability to perform customer-oriented research and development has established B&R's position in the market. The developers at B&R work together with the customer in project teams to create custom-made solutions. This flexible and innovative approach for creating uncommon solutions is the foundation for expanding our customers' market lead. In addition to functional aspects, aesthetic design is becoming a decisive factor in all product segments as well. On request, we can manage the layout and design of operating and visualization units based on the customer's corporate design.

Support for series production

Not every machine manufacturing company has the possibility to program and extensively test all controllers for a complete production series. It isn't even necessary to assign personnel and important resources for this purpose. B&R provides just-in-time delivery of automation solutions that are completely programmed and tested, configured according to customer specifications for series production. This is done by excellently trained personnel using the most modern programming and testing systems. The customer just has to install the preconfigured components in the machine and test the entire system. This allows the customer to concentrate on the core area of expertise in machine manufacturing and achieve increased efficiency and freedom for innovation."

Solutions for all industries

Companies specializing in packaging, plastics, printing and paper, textiles, automobile, food and beverages, semiconductors, wood, metal and mining, pharmaceuticals, chemicals and building automation rely on B&R know-how. Our complete solutions help customers from all industries achieve a decisive competitive edge. Orientation towards applications in all areas of machine automation and process control technology builds the foundation that makes us a strong partner. We offer our customers a complete automation solution from one source: No unnecessary interfaces, maximum flexibility and the highest level of profitability.





Individual solutions for all industries

Outstanding solutions with distinctive technology and designs are becoming increasingly important in today's capital goods industry. In these cases, specially developed technical solutions for the application are required. A uniform appearance is also essential in representing the corporate identity. In the eyes of the user, this begins with the human-machine interface. In addition to an extensive range of standard products, B&R always offers the right automation solutions, ranging from freely configurable, customized user interfaces to specially developed electronic components and software.

Application programming

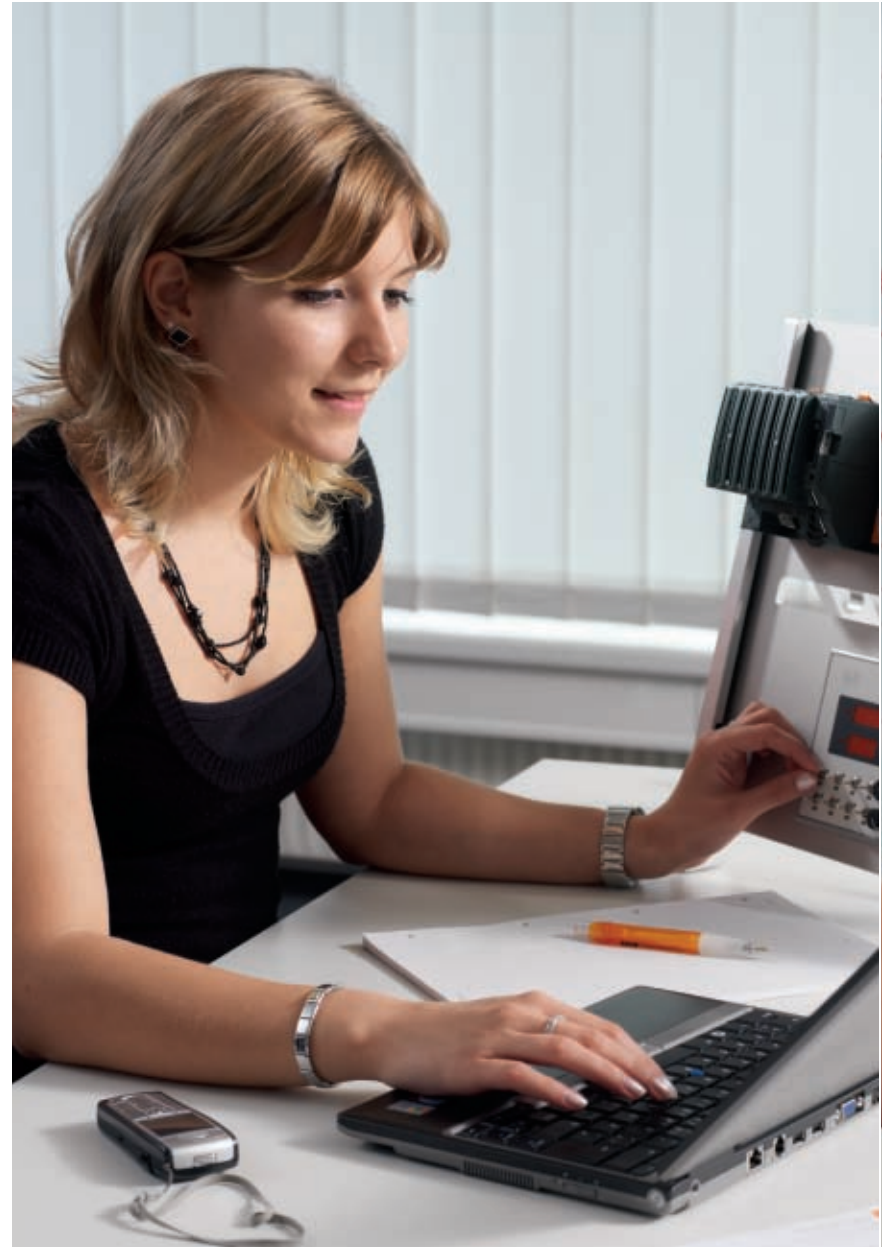
The programming required for machine controllers is constantly becoming more extensive. Machine manufacturing companies seldom have the resources needed to program and maintain software. Economics and the need to focus on the main area of expertise often make it impossible to establish these resources. B&R application experts and service partners can help. Together with the customer, specifications are made, the ideal system architecture is developed, the software is programmed and the system is tested. The customer can concentrate on making sure the application functions as desired. The well trained B&R specialists implement the application requirements and provide service for machine and system manufacturing companies all over the world throughout the entire product lifespan.

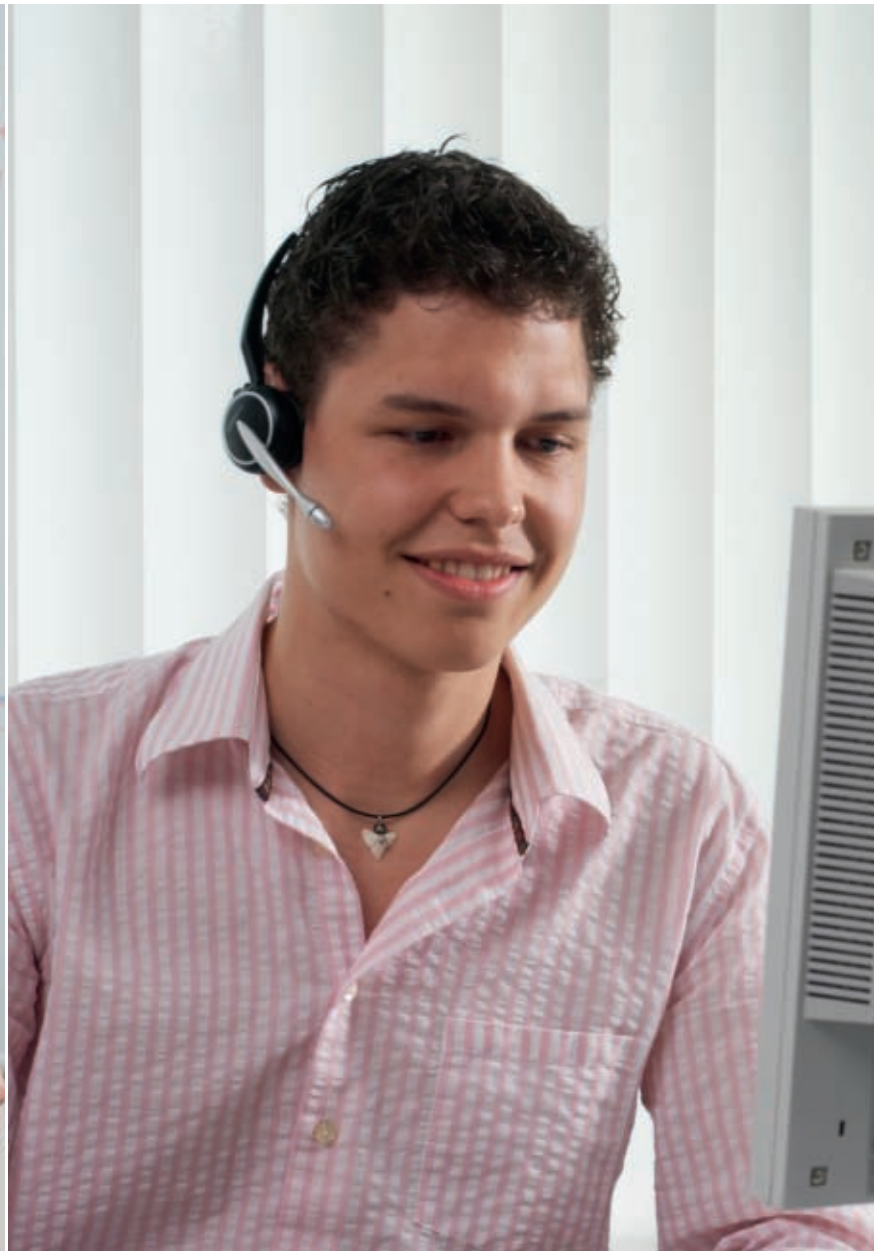
Seminars and training

Skilled employees are the foundation of a company's success. Continued training provides a competitive advantage. B&R offers an extensive seminar and training program at all locations and on-site at the customer's location. The B&R training calendar contains customized, compact training solutions ranging from introduction courses to special automation technology courses. Individual problems can be examined in clearly defined groups. Experienced trainers provide theoretical and practical information. Realistic exercises allow automation solutions to be created on modern systems. In addition to the standard program, company-specific trainings are also offered that match the tasks the participants will be carrying out in the future.

Hotline support

Quality not only refers to the product; it also refers to the support provided when implementing a product so that a task can be completed in the most ideal way possible. Question must be answered quickly, and any unclear situations must be cleared up fast to reach goals and meet deadlines. B&R customers receive hotline support for all products via email and telephone. Personal contact allows knowledgeable answers to be given and solutions to be worked out quickly. Skilled and experienced technicians work on the problem until a solution is found. They work closely with development and production to continually improve our products based on customer inquiries and prevent unclear situations in the future.





Understanding and supporting the customer

Every application is a challenge. Solving problems means being able to listen. Once contact has been made, qualified and comprehensively trained staff put themselves in the customer's frame of mind. Engagement with our customers doesn't end when the sale is finalized. To us, this period is just the start of a commitment that will last over the entire working relationship. Customer specialists for technical support, application engineering and training are available at all locations worldwide. The most modern software and infrastructure guarantee fast response times and access to information from the entire company. Easy availability, clearly assigned roles, keeping promises and personal commitment all guarantee the highest level of service quality worldwide.



X20 System Slice-based I/O and control system

There are many different slice-based I/O and control systems.
With the X20 System, B&R is setting new standards according to the motto
"Perfection in Automation".



Product overview

CPUs



Model number	Short description	
X20CP3485	X20 CPU, Celeron 400, 32 MB DRAM, 1 MB SRAM, exchangeable application memory: CompactFlash, 3 insert slots for X20IF modules, 2 USB interfaces, 1 RS232 interface, 1 Ethernet interface 10/100 Base-T, 1 POWERLINK V1/V2 interface, order program memory separately.	16
X20CP1485	X20 CPU, Celeron 400, 32 MB DRAM, 1 MB SRAM, exchangeable application memory: CompactFlash, 1 insert slot for X20IF modules, 2 USB interfaces, 1 RS232 interface, 1 Ethernet interface 10/100 Base-T, 1 POWERLINK V1/V2 interface, order program memory separately.	20
X20CP3484-1	X20 CPU, Celeron 266 compatible, 64 MB DRAM, 1 MB SRAM, exchangeable application memory: CompactFlash, 3 insert slots for X20IF modules, 2 USB interfaces, 1 RS232 interface, 1 Ethernet interface 10/100 Base-T, 1 POWERLINK V1/V2 interface, order program memory separately.	24
X20CP1484-1	X20 CPU, Celeron 266 compatible, 64 MB DRAM, 1 MB SRAM, exchangeable application memory: CompactFlash, 1 insert slot for X20IF modules, 2 USB interfaces, 1 RS232 interface, 1 Ethernet interface 10/100 Base-T, 1 POWERLINK V1/V2 interface, order program memory separately.	28
X20CP1483-1	X20 CPU, x86 100 MHz Intel compatible, 64 MB DRAM, 128 KB SRAM, exchangeable application memory: CompactFlash, 1 insert slot for X20IF modules, 2 USB interfaces, 1 RS232 interface, 1 Ethernet interface 10/100 Base-T, 1 POWERLINK V1/V2 interface, order program memory separately.	32



Communication in the X20 IF module



Model number	Short description	
X20IF1065	X20 interface module, 1 Profibus DP V1 slave interface, max.12 MBit/s, electrically isolated	36
X20IF1082-2	X20 interface module, 1 POWERLINK V1/V2 interface, managing or controlled node, integrated 2x hub, ring redundancy function, PRC function	37

System modules for the X20 hub system



Model number	Short description	
X20HB2881	X20 hub expansion module, 2x hub connection, status indicator LEDs, 2 x LWL connection	38

System modules for the X20 redundancy system



Model number	Short description	
X20HB2886	X20 hub expansion module, integrated active 2x hub, status indicator LEDs, 2 x LWL connection	39

Digital input



Model number	Short description	
X20DI4375	X20 digital input module, 4 inputs, 24 VDC, sink, configurable input filter, open circuit and short circuit detection, 3-line connections	40
X20DI6373	X20 digital input module, 6 inputs, 24 VDC, sink/source, configurable input filters	42

Digital output



Model number	Short description	
X20DO4649	X20 digital output module, 4 relays, N.O. contacts, 230 VAC / 5 A, 30 VDC / 5 A	44

Analog output



Model number	Short description	
X20AO4635	X20 analog output module, 4 outputs, ± 10 V / 0 to 20 mA, 16-bit resolution, low drift	46

Motor module



Model number	Short description	
X20MM3332	X20 digital module, 3 outputs 24 VDC full-bridge, 3 A	48
X20MM4331	X20 digital module, 4 outputs 24 VDC half-bridge, 3 A	50
X20SM3456	X20 stepper motor module, 24 - 48 VDC $\pm 25\%$ supply, 3 x motor connection, 6 A, 10 A max., 9 x digital input 24 VDC, sink, can be used as incremental encoders	52

Product overview

Other functions



Model number	Short description	
X20CM6209	X20 diode array, 1 A, 40 V reverse voltage, no module status data	54
X20DS4387	X20 digital signal module, 4 x IO Link master, can also be configured as 4 x digital input or output channels, 3-line connections	56

Counting



Model number	Short description	
X20DC1176	X20 digital counter module, 1 channel ABR, 5 V, 250 kHz input freq., 4x evaluation, encoder monitoring	58
X20DC1178	X20 digital counter module, 1 channel SSI, 5 V, 1 MBit/s, 32-bit, encoder monitoring	60
X20DC1376	X20 digital counter module, 1 channel ABR, 24 V, asymmetric, 100 kHz input freq., 4x evaluation, encoder monitoring	62
X20DC1976	X20 digital counter module, 1 channel ABR, 5 V, asymmetric, 250 kHz input freq., 4x evaluation, encoder monitoring	64

Digital signal processor



Model number	Short description	
X20DS4389	X20 digital signal module, 4 x digital inputs, 24 VDC, 4 x digital outputs, 24 VDC, 0.1 A, oversampling I/O functions, time triggered I/O functions, NetTime module	66

Integrated safety technology

The addition of the Integrated Safety Technology programs to the X20 System help it satisfy all requirements of safety-related applications.

The existing product palette of X20 safety modules is being expanded to include products with the following functionality:

- Safe CPUs
- Safe digital modules

More detailed information can be found in chapter 4, Integrated Safety Technology.

Safe CPUs



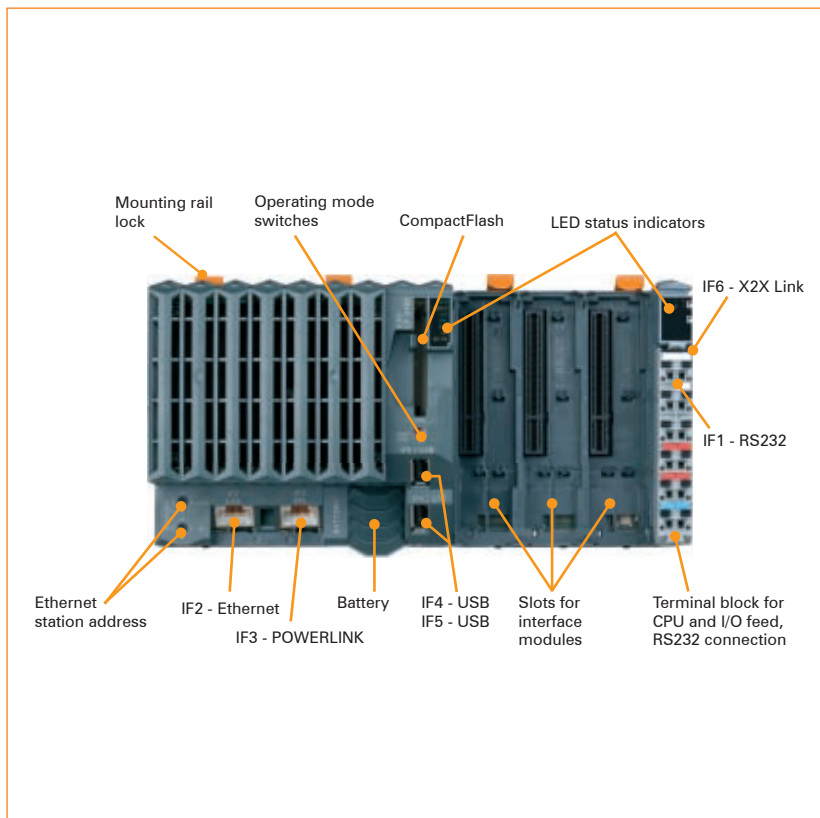
Model number	Short description	
X20SL8010	X20 SafeLOGIC, Safety CPU standard, SafeMC for up to 20 safety nodes incl. SafeMC nodes, exchangeable application memory: Memory key, 1 POWERLINK V2 interface, controlled node, integrated 2x hub, incl. supply module, terminal block TB52, X20AC0SR1 X20 locking plate (right) included, order memory key separately.	94
X20SL8011	X20 SafeLOGIC, Safety CPU plus, SafeMC for up to 100 safety nodes or SafeMC nodes, 32 machine options, POWERLINK safety gateway, exchangeable application memory: Memory key, 1 POWERLINK V2 interface, controlled node, integrated 2x hub, incl. supply module, terminal block TB52, X20AC0SR1 X20 locking plate (right) included, order memory key separately.	96

Safe digital inputs and outputs



Model number	Short description	
X20SC2432	X20 safe digital mixed module, 2 failsafe inputs, 2 pulse outputs, 24 VDC, configurable input filter, 2 relays, normally open contacts, 230 VAC / 6 A, 24 VDC / 6 A	98

CPU CP3485



The CP3485 is a powerful CPU for the X20 System. This CPU is especially useful for applications which require short cycle times, have to process very large amounts of data, or carry out floating point operations.

Ethernet and USB are onboard. In addition, the CPU has a POWERLINK V1/V2 connection for real-time communication. In addition, there are three multi-purpose slots for additional interface modules.

The two CPU models, CP3485 and CP3485-1, differ only by SDRAM size.

- Intel Celeron 400 Performance with additional I/O processor
- Ethernet, POWERLINK V1/V2 and USB onboard
- 3 slots for modular interface expansion
- Compact Flash as removable application memory
- Fan-free
- Extremely compact

ETHERNET 
POWERLINK



Short description	X20CP3485
System module	CPU
Processor	Celeron 400
Interfaces	1x RS232, 1x Ethernet, 1x POWERLINK V1/V2, 2x USB, 1x X2X Link
Controller	X20CP3485
Fastest task class cycle time	400 μ s
Typical instruction cycle time	0.015 μ s
L1 cache for data and program code	2 x 16 KB
L2 cache	256 KB
Standard memory	
Working memory (SDRAM)	32 MB
User RAM (SRAM)	1 MB
Remanent variables	256 KB
FPU	Yes
Integrated I/O processor	Processes I/O data points in the background
Data buffering	
Lithium battery	At least 3 years
Battery monitoring	Yes
CompactFlash slot	1
Real-time clock	Nonvolatile memory, resolution 1 second
Modular interface slots	3

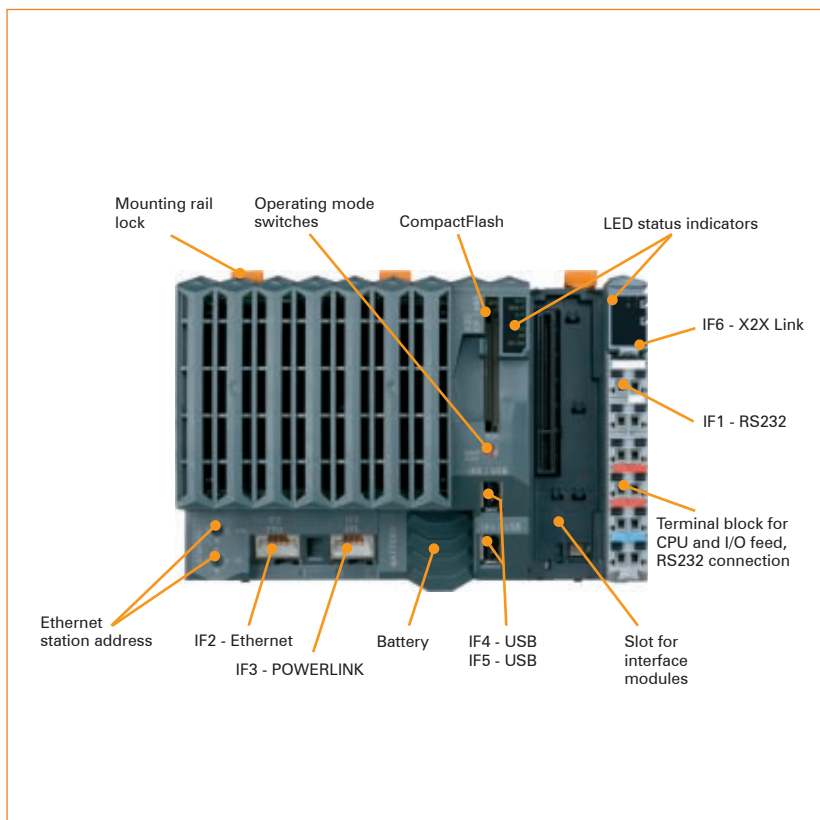
Interfaces		X20CP3485
Interface IF1		
Type		RS232
Design		Contact via 12-pin terminal block TB12
Maximum transfer rate		115.2 kBit/s
Interface IF2		
Type		Ethernet
Design		Shielded RJ45 port
Transfer rate		10/100 MBit/s
Cable length		Max. 100 m between two stations (segment length)
Interface IF3		
Fieldbus		POWERLINK V1/V2
Type		100 Base-T (ANSI/IEEE 802.3)
Design		Shielded RJ45 port
Transfer rate		100 MBit/s
Cable length		Max. 100 m between two stations (segment length)
Interfaces IF4 and IF5		
		USB Rev. 1.1
IF6 interface		
		X2X Link
CPU and X2X Link supply		X20CP3485
Input voltage		24 VDC (-15% / +20%)
Input current		Max. 2.2 A
Reverse polarity protection		Yes
Fuse		Integrated, cannot be exchanged
X2X Link supply output		X20CP3485
Rated output power		7.0 W
Parallel operation		Yes ¹⁾
Redundant operation of X2X Link supply		Yes
<small>1) In parallel operation, only 75% of the rated power can be assumed. Please ensure that all parallel operating power supplies are switched on and off simultaneously.</small>		
Input I/O supply		X20CP3485
Input voltage		24 VDC (-15% / +20%)
Fuse		Recommended pre-fusing max. 10 A slow-blow
Output I/O supply		X20CP3485
Rated output voltage		24 VDC
Permitted contact load		10.0 A
General supply		X20CP3485
Status indicators		Overload, operating status, module status, RS232 data transfer
Diagnostics		
Module run/error		Yes, with status LED and software status
Overload		Yes, with status LED and software status
RS232 data transfer		Yes, with status LED
Electrical isolation		
X2X bus supply		Yes
I/O supply		No

CPU CP3485

General information		X20CP3485
Status indicators		CPU function, overtemperature, Ethernet, POWERLINK, CompactFlash, battery
Diagnostics		
CPU function		Yes, with status LED
Over-temperature		Yes, with status LED
Ethernet		Yes, with status LED
POWERLINK		Yes, with status LED
CompactFlash		Yes, with status LED
Battery		Yes, with status LED and software status
Visual Components capability		Yes
ACOPOS capability		Yes
Cooling		Fan-free
Electrical isolation		
PLC - IF1/IF4/IF5		No
PLC - IF2/IF3/IF6		Yes
IF1/IF4/IF5 - IF2/IF3/IF6		Yes
IF1 - IF4/IF5		No
IF4 - IF5		No
Power consumption, without memory card, without interface module and USB		10.5 W
Internal power consumption of X2X Link and I/O supply ¹⁾		
Bus		1.42 W
I/O internal		0.6 W
Certification		CE, C-UL-US, GOST-R
1) The specified values are maximum values. The exact calculation is available for download as a data sheet with the other module documentation on the B&R homepage.		
Operational conditions		X20CP3485
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20CP3485
Temperature		-25°C to +70°C
Relative humidity		5 to 95%, non-condensing
Mechanical characteristics		X20CP3485
Dimensions (W x H x D)		200 x 99 x 85 mm
Comment		Order application memory (CompactFlash) separately Backup battery included in delivery X20 locking plate (right) included in delivery X20 terminal block (12-pin) included in delivery Interface module slot covers included in the delivery

Required accessories	
5CFCRD.0512-04	CompactFlash 512 MB B&R
5CFCRD.1024-04	CompactFlash 1024 MB B&R
5CFCRD.2048-04	CompactFlash 2048 MB B&R
5CFCRD.4096-04	CompactFlash 4096 MB B&R
5CFCRD.8192-04	CompactFlash 8192 MB B&R
5CFCRD.0064-03	CompactFlash 64 MB ATA/IDE SiliconSystems
5CFCRD.0128-03	CompactFlash 128 MB ATA/IDE SiliconSystems
5CFCRD.0256-03	CompactFlash 256 MB ATA/IDE SiliconSystems
5CFCRD.0512-03	CompactFlash 512 MB ATA/IDE SiliconSystems
5CFCRD.1024-03	CompactFlash 1024 MB ATA/IDE SiliconSystems
5CFCRD.2048-03	CompactFlash 2048 MB ATA/IDE SiliconSystems
5CFCRD.4096-03	CompactFlash 4096 MB ATA/IDE SiliconSystems
5CFCRD.8192-03	CompactFlash 8192 MB ATA/IDE SiliconSystems
Optional accessories	
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell
0AC201.9	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell
X20IFxxxx	Communication with POWERLINK, X2X Link, CAN bus, Profibus DP, RS232, RS422, RS485

CPU CP1485



The CP1485 is a powerful CPU for the X20 System. This CPU is especially useful for applications which require short cycle times, have to process very large amounts of data, or carry out floating point operations.

Ethernet and USB are onboard. In addition, the CPU has a POWERLINK V1/V2 connection for real-time communication. The only differences from the CP3485 are that the CP1485 only has one slot for interface modules and a smaller width.

The two CPU models, CP1485 and CP1485-1, differ only by SDRAM size.

- Intel Celeron 400 Performance with additional I/O processor
- Ethernet, POWERLINK V1/V2 and USB onboard
- 1 slot for modular interface expansion
- Compact Flash as removable application memory
- Fan-free
- Extremely compact

ETHERNET 
POWERLINK



Short description	X20CP1485
System module	CPU
Processor	Celeron 400
Interfaces	1x RS232, 1x Ethernet, 1x POWERLINK V1/V2, 2x USB, 1x X2X Link
Controller	X20CP1485
Fastest task class cycle time	400 μ s
Typical instruction cycle time	0.015 μ s
L1 cache for data and program code	2 x 16 KB
L2 cache	256 KB
Standard memory	
Working memory (SDRAM)	32 MB
User RAM (SRAM)	1 MB
Remanent variables	256 KB
FPU	Yes
Integrated I/O processor	Processes I/O data points in the background
Data buffering	
Lithium battery	At least 3 years
Battery monitoring	Yes
CompactFlash slot	1
Real-time clock	Nonvolatile memory, resolution 1 second
Modular interface slots	1

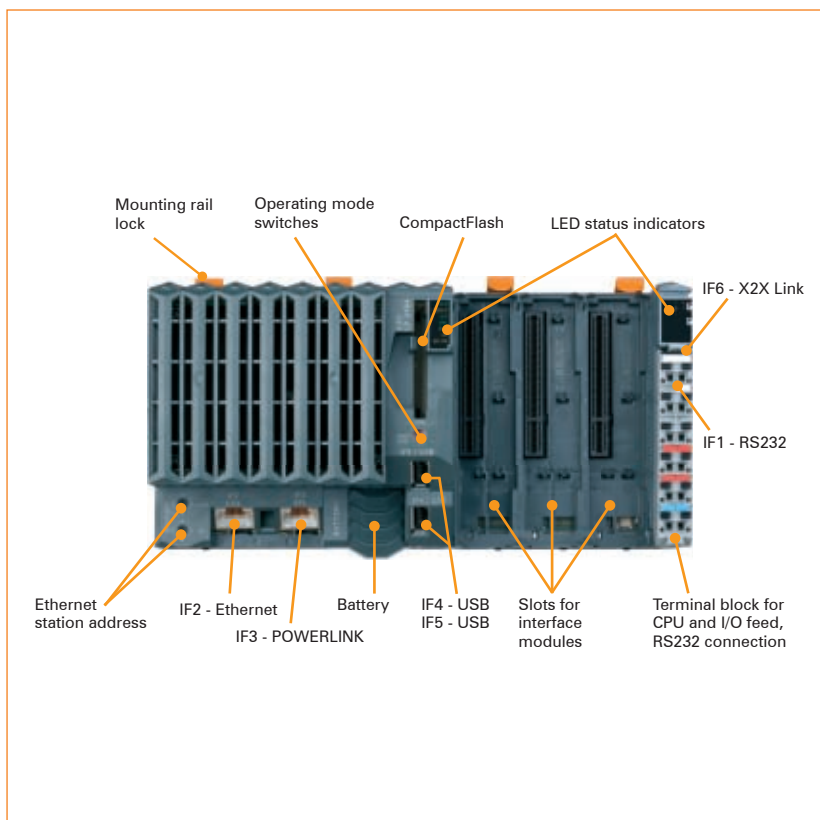
Interfaces		X20CP1485
Interface IF1		
Type		RS232
Design		Contact via 12-pin terminal block TB12
Maximum transfer rate		115.2 kBit/s
Interface IF2		
Type		Ethernet
Design		Shielded RJ45 port
Transfer rate		10/100 MBit/s
Cable length		Max. 100 m between two stations (segment length)
Interface IF3		
Fieldbus		POWERLINK V1/V2
Type		100 Base-T (ANSI/IEEE 802.3)
Design		Shielded RJ45 port
Transfer rate		100 MBit/s
Cable length		Max. 100 m between two stations (segment length)
Interfaces IF4 and IF5		USB Rev. 1.1
IF6 interface		X2X Link
CPU and X2X Link supply		X20CP1485
Input voltage		24 VDC (-15% / +20%)
Input current		Max. 2.2 A
Reverse polarity protection		Yes
Fuse		Integrated, cannot be exchanged
X2X Link supply output		X20CP1485
Rated output power		7.0 W
Parallel operation		Yes ¹⁾
Redundant operation of X2X Link supply		Yes
1) In parallel operation, only 75% of the rated power can be assumed. Please ensure that all parallel operating power supplies are switched on and off simultaneously.		
Input I/O supply		X20CP1485
Input voltage		24 VDC (-15% / +20%)
Fuse		Recommended pre-fusing max. 10 A slow-blow
Output I/O supply		X20CP1485
Rated output voltage		24 VDC
Permitted contact load		10.0 A
General supply		X20CP1485
Status indicators		Overload, operating status, module status, RS232 data transfer
Diagnostics		
Module run/error		Yes, with status LED and software status
Overload		Yes, with status LED and software status
RS232 data transfer		Yes, with status LED
Electrical isolation		
X2X bus supply		Yes
I/O supply		No

CPU CP1485

General information		X20CP1485
Status indicators		CPU function, overtemperature, Ethernet, POWERLINK, CompactFlash, battery
Diagnostics		
CPU function		Yes, with status LED
Over-temperature		Yes, with status LED
Ethernet		Yes, with status LED
POWERLINK		Yes, with status LED
CompactFlash		Yes, with status LED
Battery		Yes, with status LED and software status
Visual Components capability		Yes
ACOPOS capability		Yes
Cooling		Fan-free
Electrical isolation		
PLC - IF1/IF4/IF5		No
PLC - IF2/IF3/IF6		Yes
IF1/IF4/IF5 - IF2/IF3/IF6		Yes
IF1 - IF4/IF5		No
IF4 - IF5		No
Power consumption, without memory card, without interface module and USB		10.5 W
Internal power consumption of X2X Link and I/O supply ¹⁾		
Bus		1.42 W
I/O internal		0.6 W
Certification		CE, C-UL-US, GOST-R
1) The specified values are maximum values. The exact calculation is available for download as a data sheet with the other module documentation on the B&R homepage.		
Operational conditions		X20CP1485
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20CP1485
Temperature		-25°C to +70°C
Relative humidity		5 to 95%, non-condensing
Mechanical characteristics		X20CP1485
Dimensions (W x H x D)		150 x 99 x 85 mm
Comment		Order application memory (CompactFlash) separately Backup battery included in delivery X20 locking plate (right) included in delivery X20 terminal block (12-pin) included in delivery Interface module slot covers included in the delivery

Required accessories	
5CFCRD.0512-04	CompactFlash 512 MB B&R
5CFCRD.1024-04	CompactFlash 1024 MB B&R
5CFCRD.2048-04	CompactFlash 2048 MB B&R
5CFCRD.4096-04	CompactFlash 4096 MB B&R
5CFCRD.8192-04	CompactFlash 8192 MB B&R
5CFCRD.0064-03	CompactFlash 64 MB ATA/IDE SiliconSystems
5CFCRD.0128-03	CompactFlash 128 MB ATA/IDE SiliconSystems
5CFCRD.0256-03	CompactFlash 256 MB ATA/IDE SiliconSystems
5CFCRD.0512-03	CompactFlash 512 MB ATA/IDE SiliconSystems
5CFCRD.1024-03	CompactFlash 1024 MB ATA/IDE SiliconSystems
5CFCRD.2048-03	CompactFlash 2048 MB ATA/IDE SiliconSystems
5CFCRD.4096-03	CompactFlash 4096 MB ATA/IDE SiliconSystems
5CFCRD.8192-03	CompactFlash 8192 MB ATA/IDE SiliconSystems
Optional accessories	
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell
0AC201.9	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell
X20IFxxxx	Communication with POWERLINK, X2X Link, CAN bus, Profibus DP, RS232, RS422, RS485

CPU CP3484-1



The CP3484 is the smallest Celeron based CPU for the X20 System. However, its shortest cycle time of 800 μ s still shows its power. The basic features are the same as those of the larger types.

Ethernet and USB are onboard. In addition, the CPU has a POWERLINK V1/V2 connection for real-time communication. In addition, there are three multi-purpose slots for additional interface modules.

The two CPU models, CP3484 and CP3484-1, differ only by SDRAM size.

- Intel Celeron 266 Performance with additional I/O processor
- Ethernet, POWERLINK V1/V2 and USB onboard
- 3 slots for modular interface expansion
- Compact Flash as removable application memory
- Fan-free
- Extremely compact

ETHERNET 
POWERLINK



Short description	X20CP3484-1
System module	CPU
Processor	Celeron 266 comp.
Interfaces	1x RS232, 1x Ethernet, 1x POWERLINK V1/V2, 2x USB, 1x X2X Link
Controller	X20CP3484-1
Fastest task class cycle time	800 μ s
Typical instruction cycle time	0.022 μ s
L1 cache for data and program code	2 x 16 KB
L2 cache	-
Standard memory	
Working memory (SDRAM)	64 MB
User RAM (SRAM)	1 MB
Remanent variables	64 KB
FPU	Yes
Integrated I/O processor	Processes I/O data points in the background
Data buffering	
Lithium battery	At least 3 years
Battery monitoring	Yes
CompactFlash slot	1
Real-time clock	Nonvolatile memory, resolution 1 second
Modular interface slots	3

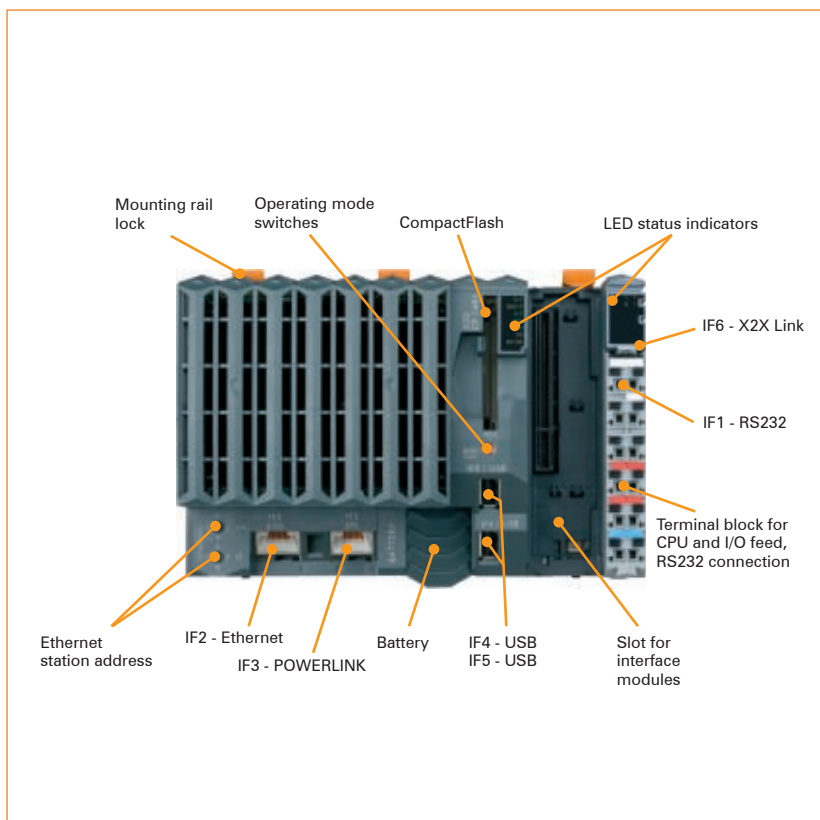
Interfaces		X20CP3484-1
Interface IF1		
Type		RS232
Design		Contact via 12-pin terminal block TB12
Maximum transfer rate		115.2 kBit/s
Interface IF2		
Type		Ethernet
Design		Shielded RJ45 port
Transfer rate		10/100 MBit/s
Cable length		Max. 100 m between two stations (segment length)
Interface IF3		
Fieldbus		POWERLINK V1/V2
Type		100 Base-T (ANSI/IEEE 802.3)
Design		Shielded RJ45 port
Transfer rate		100 MBit/s
Cable length		Max. 100 m between two stations (segment length)
Interfaces IF4 and IF5		USB Rev. 1.1
IF6 interface		X2X Link
CPU and X2X Link supply		X20CP3484-1
Input voltage		24 VDC (-15% / +20%)
Input current		Max. 2.2 A
Reverse polarity protection		Yes
Fuse		Integrated, cannot be exchanged
X2X Link supply output		X20CP3484-1
Rated output power		7.0 W
Parallel operation		Yes ¹⁾
Redundant operation of X2X Link supply		Yes
1) In parallel operation, only 75% of the rated power can be assumed. Please ensure that all parallel operating power supplies are switched on and off simultaneously.		
Input I/O supply		X20CP3484-1
Input voltage		24 VDC (-15% / +20%)
Fuse		Recommended pre-fusing max. 10 A slow-blow
Output I/O supply		X20CP3484-1
Rated output voltage		24 VDC
Permitted contact load		10.0 A
General supply		X20CP3484-1
Status indicators		Overload, operating status, module status, RS232 data transfer
Diagnostics		
Module run/error		Yes, with status LED and software status
Overload		Yes, with status LED and software status
RS232 data transfer		Yes, with status LED
Electrical isolation		
X2X bus supply		Yes
I/O supply		No

CPU CP3484-1

General information		X20CP3484-1
Status indicators		CPU function, overtemperature, Ethernet, POWERLINK, CompactFlash, battery
Diagnostics		
CPU function		Yes, with status LED
Over-temperature		Yes, with status LED
Ethernet		Yes, with status LED
POWERLINK		Yes, with status LED
CompactFlash		Yes, with status LED
Battery		Yes, with status LED and software status
Visual Components capability		Yes
ACOPOS capability		Yes
Cooling		Fan-free
Electrical isolation		
PLC - IF1/IF4/IF5		No
PLC - IF2/IF3/IF6		Yes
IF1/IF4/IF5 - IF2/IF3/IF6		Yes
IF1 - IF4/IF5		No
IF4 - IF5		No
Power consumption, without memory card, without interface module and USB		10.5 W
Internal power consumption of X2X Link and I/O supply ¹⁾		
Bus		1.42 W
I/O internal		0.6 W
Certification		CE, C-UL-US, GOST-R
1) The specified values are maximum values. The exact calculation is available for download as a data sheet with the other module documentation on the B&R homepage.		
Operational conditions		X20CP3484-1
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20CP3484-1
Temperature		-25°C to +70°C
Relative humidity		5 to 95%, non-condensing
Mechanical characteristics		X20CP3484-1
Dimensions (W x H x D)		200 x 99 x 85 mm
Comment		Order application memory (CompactFlash) separately Backup battery included in delivery X20 locking plate (right) included in delivery X20 terminal block (12-pin) included in delivery Interface module slot covers included in the delivery

Required accessories	
5CFCRD.0512-04	CompactFlash 512 MB B&R
5CFCRD.1024-04	CompactFlash 1024 MB B&R
5CFCRD.2048-04	CompactFlash 2048 MB B&R
5CFCRD.4096-04	CompactFlash 4096 MB B&R
5CFCRD.8192-04	CompactFlash 8192 MB B&R
5CFCRD.0064-03	CompactFlash 64 MB ATA/IDE SiliconSystems
5CFCRD.0128-03	CompactFlash 128 MB ATA/IDE SiliconSystems
5CFCRD.0256-03	CompactFlash 256 MB ATA/IDE SiliconSystems
5CFCRD.0512-03	CompactFlash 512 MB ATA/IDE SiliconSystems
5CFCRD.1024-03	CompactFlash 1024 MB ATA/IDE SiliconSystems
5CFCRD.2048-03	CompactFlash 2048 MB ATA/IDE SiliconSystems
5CFCRD.4096-03	CompactFlash 4096 MB ATA/IDE SiliconSystems
5CFCRD.8192-03	CompactFlash 8192 MB ATA/IDE SiliconSystems
Optional accessories	
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell
0AC201.9	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell
X20IFxxxx	Communication with POWERLINK, X2X Link, CAN bus, Profibus DP, RS232, RS422, RS485

CPU CP1484-1



The CP1484 is the smallest Celeron based CPU for the X20 System. However, its shortest cycle time of 800 μ s still shows its power. The basic features are the same as those of the larger types.

Ethernet and USB are onboard. In addition, the CPU has a POWERLINK V1/V2 connection for real-time communication. The only differences from the CP3484 are that the CP1484 only has one slot for interface modules and a smaller width.

The two CPU models, CP1484 and CP1484-1, differ only by SDRAM size.

- Intel Celeron 266 Performance with additional I/O processor
- Ethernet, POWERLINK V1/V2 and USB onboard
- 1 slot for modular interface expansion
- Compact Flash as removable application memory
- Fan-free
- Extremely compact

ETHERNET 
POWERLINK



Short description	X20CP1484-1
System module	CPU
Processor	Celeron 266 comp.
Interfaces	1x RS232, 1x Ethernet, 1x POWERLINK V1/V2, 2x USB, 1x X2X Link
Controller	X20CP1484-1
Fastest task class cycle time	800 μ s
Typical instruction cycle time	0.022 μ s
L1 cache for data and program code	2 x 16 KB
L2 cache	-
Standard memory	
Working memory (SDRAM)	64 MB
User RAM (SRAM)	1 MB
Remanent variables	64 KB
FPU	Yes
Integrated I/O processor	Processes I/O data points in the background
Data buffering	
Lithium battery	At least 3 years
Battery monitoring	Yes
CompactFlash slot	1
Real-time clock	Nonvolatile memory, resolution 1 second
Modular interface slots	1

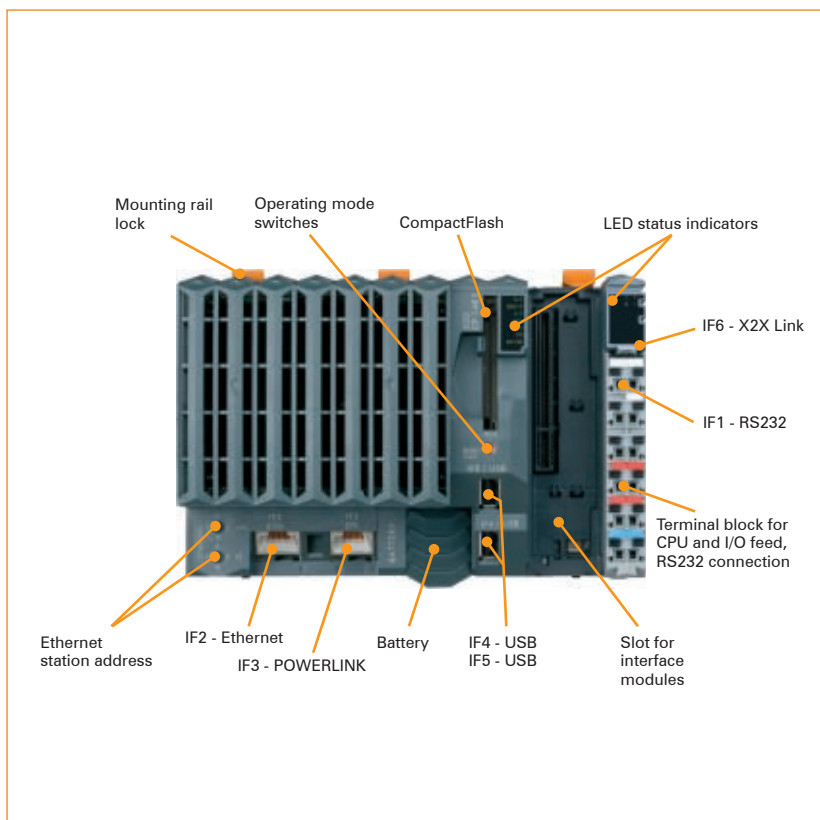
Interfaces		X20CP1484-1
Interface IF1		
Type		RS232
Design		Contact via 12-pin terminal block TB12
Maximum transfer rate		115.2 kBit/s
Interface IF2		
Type		Ethernet
Design		Shielded RJ45 port
Transfer rate		10/100 MBit/s
Cable length		Max. 100 m between two stations (segment length)
Interface IF3		
Fieldbus		POWERLINK V1/V2
Type		100 Base-T (ANSI/IEEE 802.3)
Design		Shielded RJ45 port
Transfer rate		100 MBit/s
Cable length		Max. 100 m between two stations (segment length)
Interfaces IF4 and IF5		USB Rev. 1.1
IF6 interface		X2X Link
CPU and X2X Link supply		X20CP1484-1
Input voltage		24 VDC (-15% / +20%)
Input current		Max. 2.2 A
Reverse polarity protection		Yes
Fuse		Integrated, cannot be exchanged
X2X Link supply output		X20CP1484-1
Rated output power		7.0 W
Parallel operation		Yes ¹⁾
Redundant operation of X2X Link supply		Yes
1) In parallel operation, only 75% of the rated power can be assumed. Please ensure that all parallel operating power supplies are switched on and off simultaneously.		
Input I/O supply		X20CP1484-1
Input voltage		24 VDC (-15% / +20%)
Fuse		Recommended pre-fusing max. 10 A slow-blow
Output I/O supply		X20CP1484-1
Rated output voltage		24 VDC
Permitted contact load		10.0 A
General supply		X20CP1484-1
Status indicators		Overload, operating status, module status, RS232 data transfer
Diagnostics		
Module run/error		Yes, with status LED and software status
Overload		Yes, with status LED and software status
RS232 data transfer		Yes, with status LED
Electrical isolation		
X2X bus supply		Yes
I/O supply		No

CPU CP1484-1

General information		X20CP1484-1
Status indicators		CPU function, overtemperature, Ethernet, POWERLINK, CompactFlash, battery
Diagnostics		
CPU function		Yes, with status LED
Over-temperature		Yes, with status LED
Ethernet		Yes, with status LED
POWERLINK		Yes, with status LED
CompactFlash		Yes, with status LED
Battery		Yes, with status LED and software status
Visual Components capability		Yes
ACOPOS capability		Yes
Cooling		Fan-free
Electrical isolation		
PLC - IF1/IF4/IF5		No
PLC - IF2/IF3/IF6		Yes
IF1/IF4/IF5 - IF2/IF3/IF6		Yes
IF1 - IF4/IF5		No
IF4 - IF5		No
Power consumption, without memory card, without interface module and USB		10.5 W
Internal power consumption of X2X Link and I/O supply ¹⁾		
Bus		1.42 W
I/O internal		0.6 W
Certification		CE, C-UL-US, GOST-R
1) The specified values are maximum values. The exact calculation is available for download as a data sheet with the other module documentation on the B&R homepage.		
Operational conditions		X20CP1484-1
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20CP1484-1
Temperature		-25°C to +70°C
Relative humidity		5 to 95%, non-condensing
Mechanical characteristics		X20CP1484-1
Dimensions (W x H x D)		150 x 99 x 85 mm
Comment		Order application memory (CompactFlash) separately Backup battery included in delivery X20 locking plate (right) included in delivery X20 terminal block (12-pin) included in delivery Interface module slot covers included in the delivery

Required accessories	
5CFCRD.0512-04	CompactFlash 512 MB B&R
5CFCRD.1024-04	CompactFlash 1024 MB B&R
5CFCRD.2048-04	CompactFlash 2048 MB B&R
5CFCRD.4096-04	CompactFlash 4096 MB B&R
5CFCRD.8192-04	CompactFlash 8192 MB B&R
5CFCRD.0064-03	CompactFlash 64 MB ATA/IDE SiliconSystems
5CFCRD.0128-03	CompactFlash 128 MB ATA/IDE SiliconSystems
5CFCRD.0256-03	CompactFlash 256 MB ATA/IDE SiliconSystems
5CFCRD.0512-03	CompactFlash 512 MB ATA/IDE SiliconSystems
5CFCRD.1024-03	CompactFlash 1024 MB ATA/IDE SiliconSystems
5CFCRD.2048-03	CompactFlash 2048 MB ATA/IDE SiliconSystems
5CFCRD.4096-03	CompactFlash 4096 MB ATA/IDE SiliconSystems
5CFCRD.8192-03	CompactFlash 8192 MB ATA/IDE SiliconSystems
Optional accessories	
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell
0AC201.9	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell
X20IFxxxx	Communication with POWERLINK, X2X Link, CAN bus, Profibus DP, RS232, RS422, RS485 72

CPU CP1483-1



The x86 100 MHz-compatible CP1483-1 is the entry-level X20 CPU. With an optimum price/performance ratio, it has the same basic features as all of the larger CPUs.

Ethernet and USB are onboard. In addition, the CPU has a POWERLINK V1/V2 connection for real-time communication. In addition, a multi-purpose slot is provided for an additional interface module.

The two CPU models, CP1483 and CP1483-1, differ only by SDRAM size.

- Intel x86 100 MHz-compatible with additional I/O processor
- Ethernet, POWERLINK V1/V2 and USB onboard
- 1 slot for modular interface expansion
- Compact Flash as removable application memory
- Fan-free
- Extremely compact

ETHERNET 
POWERLINK



Short description	X20CP1483-1
System module	CPU
Processor	x86 100 comp.
Interfaces	1x RS232, 1x Ethernet, 1x POWERLINK V1/V2, 2x USB, 1x X2X Link
Controller	X20CP1483-1
Fastest task class cycle time	1 ms
Typical instruction cycle time	0.076 μ s
L1 cache for data and program code	16 KB
L2 cache	-
Standard memory	
Working memory (SDRAM)	64 MB
User RAM (SRAM)	128 KB
Remanent variables	32 KB
FPU	Yes
Integrated I/O processor	Processes I/O data points in the background
Data buffering	
Lithium battery	At least 3 years
Battery monitoring	Yes
CompactFlash slot	1
Real-time clock	Nonvolatile memory, resolution 1 second
Modular interface slots	1

Interfaces		X20CP1483-1
Interface IF1		
Type		RS232
Design		Contact via 12-pin terminal block TB12
Maximum transfer rate		115.2 kBit/s
Interface IF2		
Type		Ethernet
Design		Shielded RJ45 port
Transfer rate		10/100 MBit/s
Cable length		Max. 100 m between two stations (segment length)
Interface IF3		
Fieldbus		POWERLINK V1/V2
Type		100 Base-T (ANSI/IEEE 802.3)
Design		Shielded RJ45 port
Transfer rate		100 MBit/s
Cable length		Max. 100 m between two stations (segment length)
Interfaces IF4 and IF5		USB Rev. 1.1
IF6 interface		X2X Link
CPU and X2X Link supply		X20CP1483-1
Input voltage		24 VDC (-15% / +20%)
Input current		Max. 2.2 A
Reverse polarity protection		Yes
Fuse		Integrated, cannot be exchanged
X2X Link supply output		X20CP1483-1
Rated output power		7.0 W
Parallel operation		Yes ¹⁾
Redundant operation of X2X Link supply		Yes
1) In parallel operation, only 75% of the rated power can be assumed. Please ensure that all parallel operating power supplies are switched on and off simultaneously.		
Input I/O supply		X20CP1483-1
Input voltage		24 VDC (-15% / +20%)
Fuse		Recommended pre-fusing max. 10 A slow-blow
Output I/O supply		X20CP1483-1
Rated output voltage		24 VDC
Permitted contact load		10.0 A
General supply		X20CP1483-1
Status indicators		Overload, operating status, module status, RS232 data transfer
Diagnostics		
Module run/error		Yes, with status LED and software status
Overload		Yes, with status LED and software status
RS232 data transfer		Yes, with status LED
Electrical isolation		
X2X bus supply		Yes
I/O supply		No

CPU CP1483-1

General information		X20CP1483-1
Status indicators		CPU function, overtemperature, Ethernet, POWERLINK, CompactFlash, battery
Diagnostics		
CPU function		Yes, with status LED
Over-temperature		Yes, with status LED
Ethernet		Yes, with status LED
POWERLINK		Yes, with status LED
CompactFlash		Yes, with status LED
Battery		Yes, with status LED and software status
Fan diagnostics		-
Visual Components capability		Yes
ACOPOS capability		Yes
Cooling		Fan-free
Electrical isolation		
PLC - IF1/IF4/IF5		No
PLC - IF2/IF3/IF6		Yes
IF1/IF4/IF5 - IF2/IF3/IF6		Yes
IF1 - IF4/IF5		No
IF4 - IF5		No
Power consumption, without memory card, without interface module and USB		6.0 W
Internal power consumption of X2X Link and I/O supply ¹⁾		
Bus		1.42 W
I/O internal		0.6 W
Certification		CE, C-UL-US (in development), GOST-R
1) The specified values are maximum values. The exact calculation is available for download as a data sheet with the other module documentation on the B&R homepage.		
Operational conditions		X20CP1483-1
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		0°C to +50°C
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		X20CP1483-1
Temperature		-25°C to +70°C
Relative humidity		5 to 95%, non-condensing
Mechanical characteristics		X20CP1483-1
Dimensions (W x H x D)		150 x 99 x 85 mm
Comment		Order application memory (CompactFlash) separately Backup battery included in delivery X20 locking plate (right) included in delivery X20 terminal block (12-pin) included in delivery Interface module slot covers included in the delivery

Required accessories	
5CFCRD.0512-04	CompactFlash 512 MB B&R
5CFCRD.1024-04	CompactFlash 1024 MB B&R
5CFCRD.2048-04	CompactFlash 2048 MB B&R
5CFCRD.4096-04	CompactFlash 4096 MB B&R
5CFCRD.8192-04	CompactFlash 8192 MB B&R
5CFCRD.0064-03	CompactFlash 64 MB ATA/IDE SiliconSystems
5CFCRD.0128-03	CompactFlash 128 MB ATA/IDE SiliconSystems
5CFCRD.0256-03	CompactFlash 256 MB ATA/IDE SiliconSystems
5CFCRD.0512-03	CompactFlash 512 MB ATA/IDE SiliconSystems
5CFCRD.1024-03	CompactFlash 1024 MB ATA/IDE SiliconSystems
5CFCRD.2048-03	CompactFlash 2048 MB ATA/IDE SiliconSystems
5CFCRD.4096-03	CompactFlash 4096 MB ATA/IDE SiliconSystems
5CFCRD.8192-03	CompactFlash 8192 MB ATA/IDE SiliconSystems
Optional accessories	
4A0006.00-000	Lithium battery, 3 V / 950 mAh, button cell
0AC201.9	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell
X20IFxxxx	Communication with POWERLINK, X2X Link, CAN bus, Profibus DP, RS232, RS422, RS485 72

Interface module IF1065



- Profibus DP V1 slave connection



Short description	X20IF1065
Communication module	1 x Profibus DP V1 slave
Interfaces	X20IF1065
Interface IF1	
Fieldbus	Profibus DP V1 slave
Type	RS485
Design	9-pin DSUB socket
Maximum transfer rate	12 MBit/s
General information	X20IF1065
Status indicators	Module status, bus status
Diagnostics	
Module status	Yes, with status LED and software status
Bus status	Yes, with status LED and software status
Electrical isolation	
PLC - IF1	Yes
Power consumption	1.4 W
Certification	CE, C-UL-US (in development), GOST-R
Operational conditions	X20IF1065
Operating temperature	
Horizontal installation	0 to +55°C
Vertical installation	0 to +50°C
Relative humidity	5 - 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20IF1065
Temperature	-25 to +70°C
Relative humidity	5 - 95%, non-condensing
Mechanical characteristics	X20IF1065
Slot	In X20 CPU

Optional accessories	
0G1000.00-090	Bus connector, RS485, for Profibus networks

690

Interface module F1082-2



The IF1082-2 is a high-performance POWERLINK managing node solution in accordance with the EPSG specification DS301. The integrated hub allows for the easiest possible implementation of a simple tree structure or optional ring-redundancy without extra effort. Fully automatic addressing of the connected stations is made possible by the dynamic node allocation function. With pollresponse chaining, the module also offers a solution for the highest demands in regard to response time and the shortest cycle times. When combined with the B&R control system, poll response chaining provides ideal performance, particularly for central control tasks.

- POWERLINK V1/V2 for real-time Ethernet communication
- Integrated hub for efficient cabling
- Configurable ring redundancy
- PollResponse chaining
- Dynamic Node Allocation (DNA)

ETHERNET 
POWERLINK

Short description	X20IF1082-2
Communication module	1x POWERLINK V1/V2 managing or controlled node
Interfaces	X20IF1082-2
X1/X2 interface	
Fieldbus	POWERLINK V1/V2
Transmission	100 Base-T (ANSI/IEEE 802.3)
Type	Type 4 ¹⁾
Design	Internal 2x hub, 2x shielded RJ45 port
Transfer rate	100 MBit/s
Cable length	Max. 100 m between two stations (segment length)
1) See POWERLINK Online Help under "General information, Hardware - IF/LS"	
General information	X20IF1082-2
Status indicators	Module status, bus function
Diagnostics	
Module status	Yes, with status LED and software status
Bus function	Yes, with status LED and software status
Electrical isolation	
PLC - X1/X2	Yes
Power consumption	2.0 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20IF1082-2
Operating temperature	
Horizontal installation	0 to +55°C
Vertical installation	0 to +50°C
Relative humidity	5 - 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20IF1082-2
Temperature	-25 to +70°C
Relative humidity	5 - 95%, non-condensing
Mechanical characteristics	X20IF1082-2
Slot	In X20 CPU

Optional accessories		
X20CA0E61.xxxx	POWERLINK connection cable - RJ45 to RJ45	391
X67CA0E41.xxxx	POWERLINK attachment cable - RJ45 to M12	391

Hub expansion module HB2881



The BC8083 POWERLINK bus controller and the HB8880 stand alone hub are equipped with a modular hub expansion. Depending on the bus base used, one or two additional slots are available. The HB2881 hub expansion module can be operated in these slots.

The hub expansion module HB2881 is equipped with two 100 Base-FX ports. The Ethernet connection is made using 62.5/125 μm or 50/125 μm glass fiber multimode cable with a Duplex LC connection. The module and network status is indicated using LEDs.

- Hub expansion module
- Two 100 Base-FX hub ports

Short description	X20HB2881
Hub	Two fast Ethernet fiber optic ports for hub expansion
Interface	X20HB2881
Type	Ethernet
Standard (compliance)	ANSI/IEEE 802.3
Signal	100 Base-FX
Transfer rate	100 MBit/s
Wave length	1300 nm
Port design	Duplex LC
Cable fiber type	Multimode fiber with 62.5/125 μm or 50/125 μm core diameter LC connector on both sides
Cable length	
Half duplex	Max. 400 m between two stations (segment length)
POWERLINK	Max. 2 km between two stations (segment length)
General information	X20HB2881
Status indicators	Module status, bus function
Diagnostics	
Module status	Yes, with status LED
Bus function	Yes, with status LED
Electrical isolation	
Fieldbus supply	Yes
Power consumption	2.8 W
Certification	CE, C-UL-US (in development), GOST-R
Operational conditions	X20HB2881
Operating temperature	
With 1 hub	
Horizontal installation	0 to +45°C
Vertical installation	0 to +40°C
With ≥ 2 hubs	
Horizontal installation	0 to +40°C
Vertical installation	0 to +35°C
Relative humidity	5 - 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20HB2881
Temperature	-25 to +70°C
Relative humidity	5 - 95%, non-condensing
Mechanical characteristics	X20HB2881
Slot	Hub expansion for BC8083 and HB8880

Hub expansion module HB2886



The BC8084 POWERLINK bus controller and the HB8884 stand alone hub are equipped with a modular hub expansion. Depending on the bus base used, one or two additional slots are available. The HB2886 hub expansion module can be operated in these slots.

The hub expansion module HB2886 is equipped with two 100 Base-FX ports and a redundant structure. This means that the connection between the two 100 Base-FX ports remains intact if there is a failure in the bus controller or stand-alone hub. The Ethernet connection is made using 62.5/125 μm or 50/125 μm glass fiber multimode cable with a Duplex LC connection. The module and network status is indicated using LEDs.

- Hub expansion module
- Two redundant 100 Base-FX hub ports

Short description	X20HB2886
Hub	Two redundant fast Ethernet fiber optic ports for hub expansion
Interface	X20HB2886
Type	Ethernet
Standard (compliance)	ANSI/IEEE 802.3
Signal	100 Base-FX
Transfer rate	100 MBit/s
Wave length	1300 nm
Port design	Duplex LC
Cable fiber type	Multimode fiber with 62.5/125 μm or 50/125 μm core diameter LC connector on both sides
Cable length	
Half duplex	Max. 400 m between two stations (segment length)
POWERLINK	Max. 2 km between two stations (segment length)
General information	X20HB2886
Status indicators	Module status, bus function
Diagnostics	
Module status	Yes, with status LED
Bus function	Yes, with status LED
Electrical isolation	
Fieldbus supply	Yes
Power consumption	2.8 W
Certification	CE, C-UL-US (in development), GOST-R
Operational conditions	X20HB2886
Operating temperature	
With 1 hub	
Horizontal installation	0 to +45°C
Vertical installation	0 to +40°C
With ≥ 2 hubs	
Horizontal installation	0 to +40°C
Vertical installation	0 to +35°C
Relative humidity	5 - 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
> 2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20HB2886
Temperature	-25 to +70°C
Relative humidity	5 - 95%, non-condensing
Mechanical characteristics	X20HB2886
lot	Hub expansion for BC8084 and HB8884

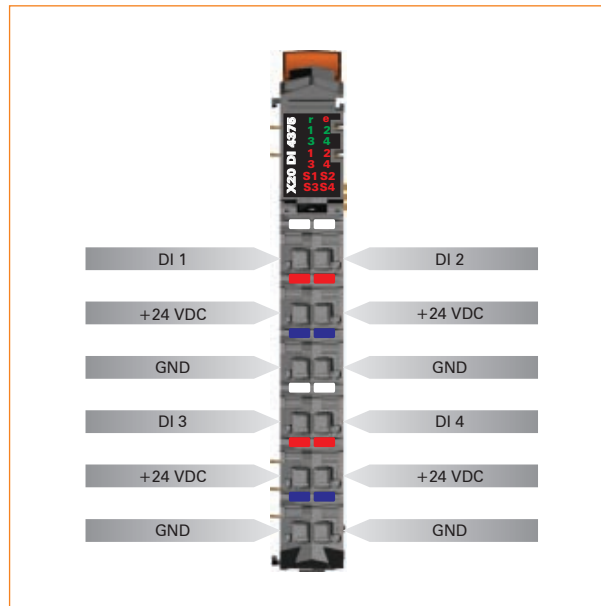
Digital input module DI4375



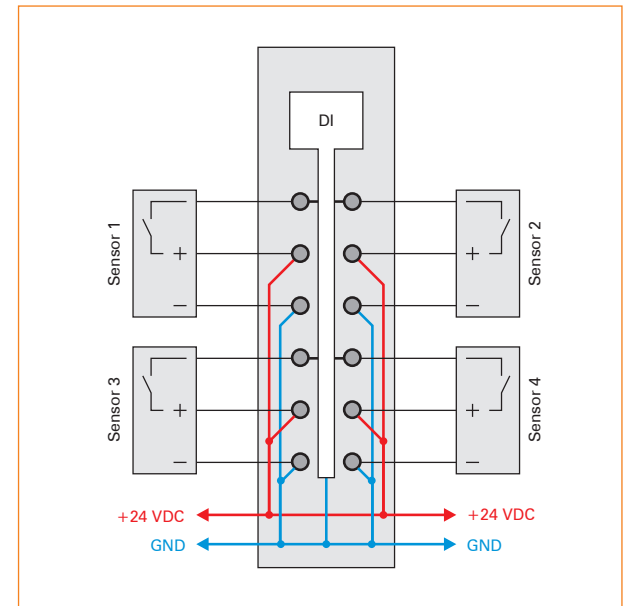
- 4 digital inputs
- Sink connection
- 3-wire connection
- 24 VDC and GND for sensor supply
- Broken wire and short circuit detection, can be switched off individually for each channel
- Software input filter can be configured for the entire module

Short description	X20DI4375
I/O module	Four 24 VDC digital inputs for 3-line connections, open circuit and short circuit detection, can be switched off individually for each channel
Digital inputs	X20DI4375
Rated voltage	24 VDC
Input filter	
Hardware	0.8 ms
Software	Default 1 ms, can be configured between 0 and 25 ms in 0.2 ms intervals
Connection type	3-line connections
Input circuit	Sink
Sensor supply	4 x 50 mA
Open circuit and short circuit detection	Yes, can be switched off individually for each channel
General information	X20DI4375
Status indicators	I/O function per channel, operating state, module status, sensor line, sensor supply
Diagnostics	
Module run/error	Yes, with status LED and software status
Sensor line short circuit	Yes, with status LED and software status
Sensor line open circuit	Yes, with status LED and software status
Sensor supply	Yes, with status LED and software status
Other channel error	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.01 W
I/O internal	1.1 W
Certification	CE, C-UL-US (in development), GOST-R
Operational conditions	X20DI4375
Operating temperature	
Horizontal installation	0 to +55°C
Vertical installation	0 to +50°C
Relative humidity	5 - 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DI4375
Temperature	-25 to +70°C
Relative humidity	5 - 95%, non-condensing
Mechanical characteristics	X20DI4375
Spacing	12.5 ^{+0.2} mm
Comment	Order 1x X20TB12 terminal block separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

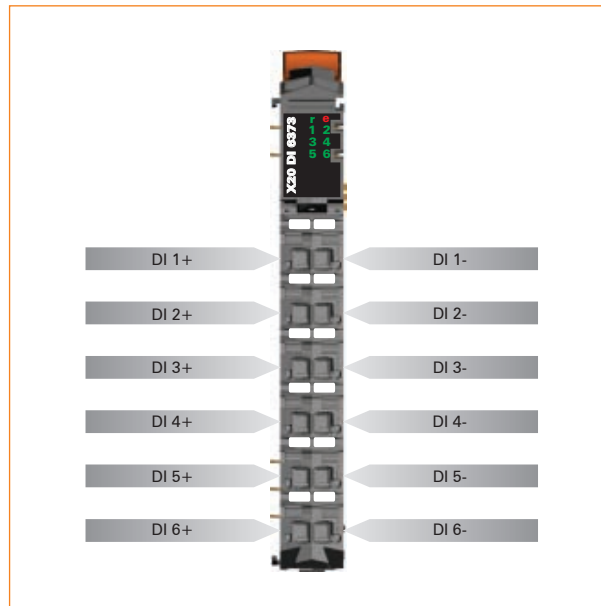
Digital input module DI6373



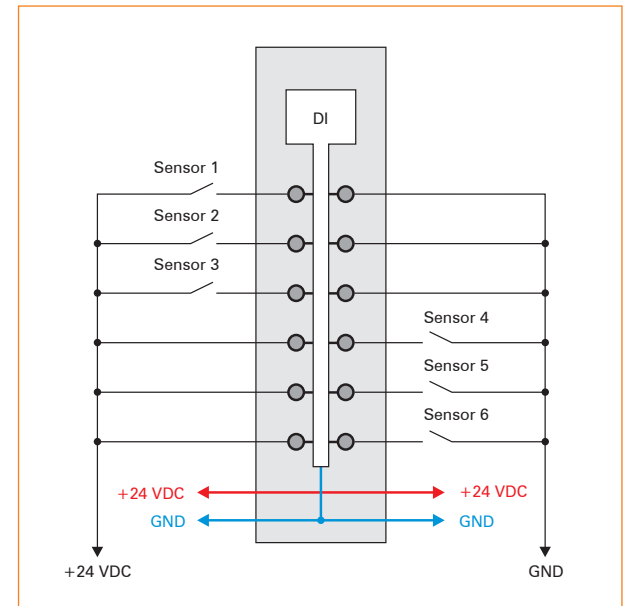
- 6 digital inputs
- Sink/Source connection
- Software input filter can be configured for the entire module

Short description	X20DI6373
I/O module	6 digital potential-free inputs - 24 VDC
Digital inputs	X20DI6373
Rated voltage	24 VDC
Input filter	
Hardware	≤ 100 μs
Software	Default 1 ms, can be configured between 0 and 25 ms in 0.2 ms intervals
Input circuit	Sink/Source
General information	X20DI6373
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.15 W
I/O internal	0.88 W
Certification	CE, C-UL-US (in development), GOST-R
Operational conditions	X20DI6373
Operating temperature	
Horizontal installation	0 to +55°C
Vertical installation	0 to +50°C
Relative humidity	5 - 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DI6373
Temperature	-25 to +70°C
Relative humidity	5 - 95%, non-condensing
Mechanical characteristics	X20DI6373
Spacing	12.5 ^{+0.2} mm
Comment	Order 1x X20TB12 terminal block separately Order bus module 1x X20BM11 separately

Pin assignments



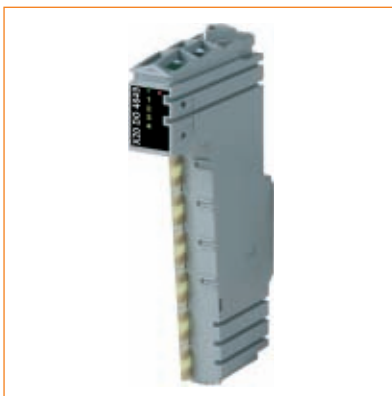
Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

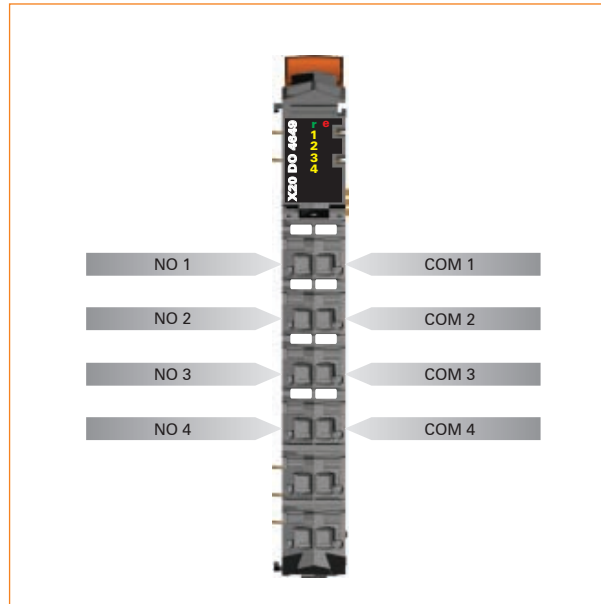
Digital output module DO4649



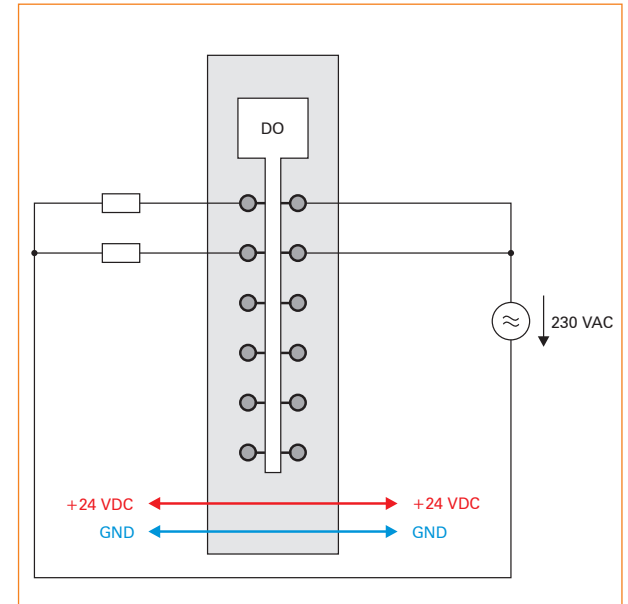
- 4 digital outputs
- Relay module for 230 VAC / 30 VDC
- 4 normally open contacts
- Outputs single-channel isolated

Short description	X20DO4649
I/O module	4 digital outputs 30 VDC / 230 VAC, outputs are single-channel isolated
Digital outputs	X20DO4649
Design	Relay / N.O. Channels are single-channel isolated
Rated voltage	30 VDC / 230 VAC
Rated frequency	DC / 45 - 63 Hz
Rated output current	5.0 A at 30 VDC / 5.0 A at 230 VAC
Total current	10.0 A at 30 VDC / 10.0 A at 230 VAC
Switching capacity	
Minimum	10 mA / 5 VDC
Maximum	150 W / 1250 VA
Actuator supply	External
General information	X20DO4649
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Outputs	Yes, with status LED
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	Yes
Power consumption	
Bus	0.8 W
I/O internal	-
Certification	CE, C-UL-US (in development), GOST-R
Operational conditions	X20DO4649
Operating temperature	
Horizontal installation	0 to +55°C
Vertical installation	0 to +50°C
Relative humidity	5 - 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DO4649
Temperature	-25 to +70°C
Relative humidity	5 - 95%, non-condensing
Mechanical characteristics	X20DO4649
Spacing	12.5 ^{+0.2} mm
Comment	Order 1x X20TB12 terminal block separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

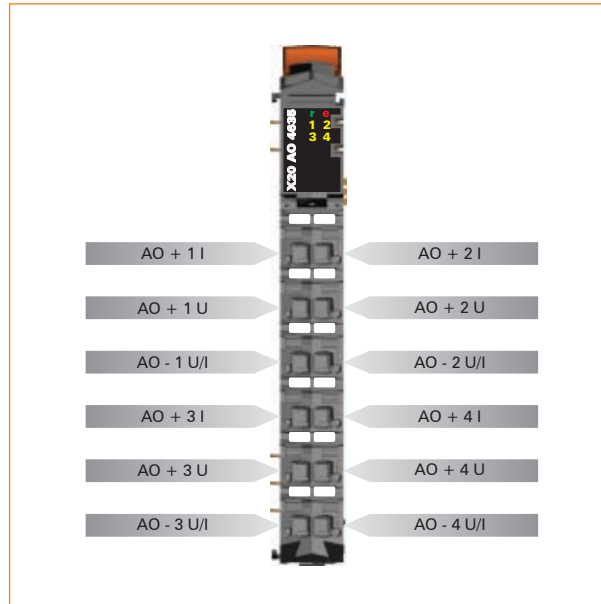
Analog output module AO4635



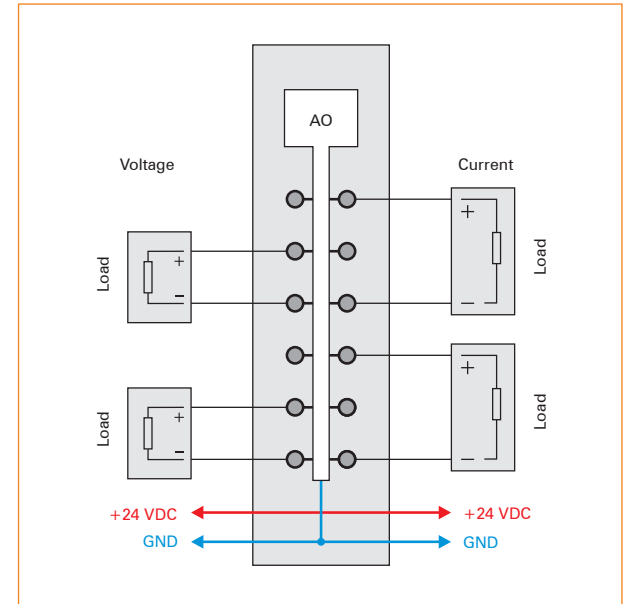
- 4 analog outputs
- Either current or voltage signal
- 16-bit digital converter resolution
- Low temperature drift

Short description	X20AO4635
I/O module	4 analog outputs, ± 10 V or 0 to 20 mA
Analog outputs	X20AO4635
Output	± 10 V or 0 to 20 mA, using different connection terminal points
Digital converter resolution	16-bit
Conversion time	50 μ s for all outputs
Power on/off behavior	Internal enable relay for boot procedure and errors
Maximum error at 25°C	
Gain	0.040%, based on the current output value
Offset	0.022%, based on the entire output range
Output protection	Short circuit protection
General information	X20AO4635
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Channel type	Yes, with software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.01 W
I/O internal	1.5 W
Certification	CE, C-UL-US, GOST-R
Operational conditions	X20AO4635
Operating temperature ¹⁾	
Horizontal installation	0 to +55°C
Vertical installation	0 to +45°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
1) See notes regarding derating and mixed operation in the module data sheet.	
Storage and transport conditions	X20AO4635
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20AO4635
Spacing	12.5 ^{+0.2} mm
Comment	Order 1x X20TB12 terminal block separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Digital motor module MM3332

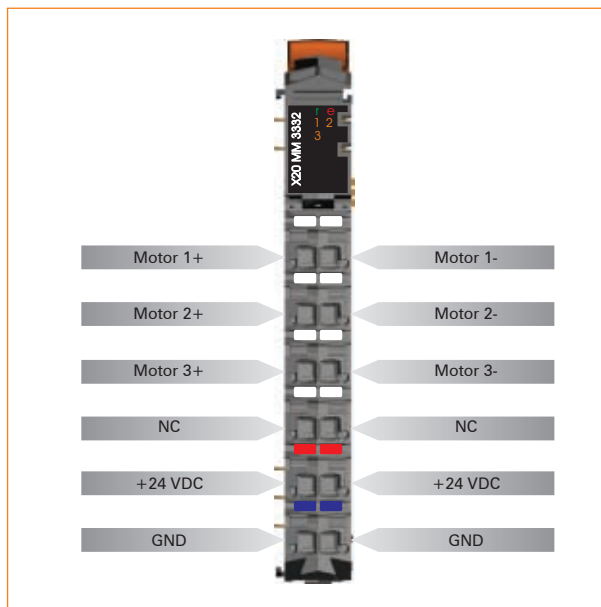


- 3 digital outputs, 24 VDC, full-bridge with 3 A

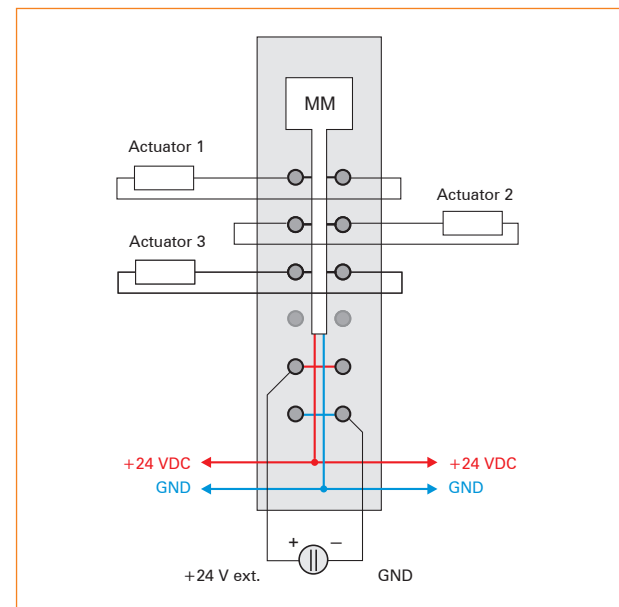
Short description	X20MM3332
I/O module	3 digital outputs, 24 VDC, full-bridge, 3 A
Digital outputs	X20MM3332
Number of channels	3
Rated voltage	24 VDC
Type	Full-bridge Highside driver (source) Lowside driver (sink)
Max. continuous current per channel	3 A
Max. module current	10 A
Current measurement in the DC bus	Yes
Resolution	100 mA
Output protection	Thermal cutoff for over-current or short circuit
General information	X20MM3332
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Output	Yes, with status LED and software status
I/O supply	Yes, with software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
External I/O supply - bus	Yes
Power consumption	
Bus	0.01 W
I/O internal	0.8 W
Certification	CE, C-UL-US (in development), GOST-R
Operational conditions	X20MM3332
Operating temperature	
Horizontal installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20

Storage and transport conditions		X20MM3332
Temperature	-25°C to +70°C	
Relative humidity	5 to 95%, non-condensing	
Mechanical characteristics		X20MM3332
Spacing	25 ^{+0.2} mm	
Comment	Order 1x X20TB12 terminal block separately Order bus module 1x X20BM11 separately	

Pin assignments



Connection example



Required accessories		
X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Digital motor module MM4331

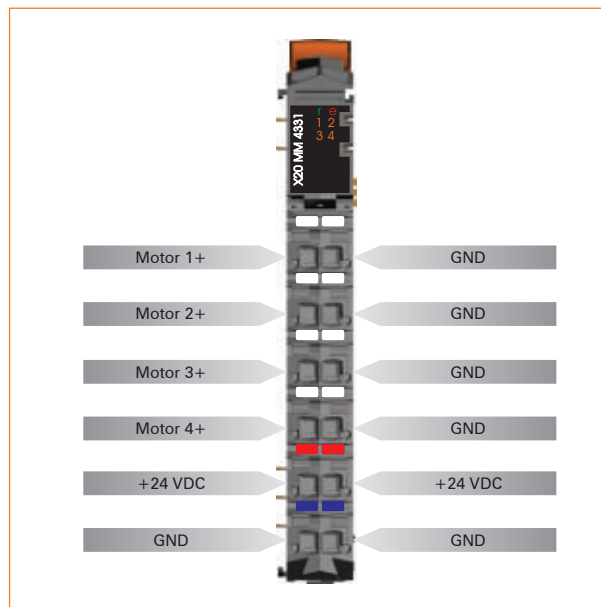


- 4 digital outputs 24 VDC half-bridge with 3 A

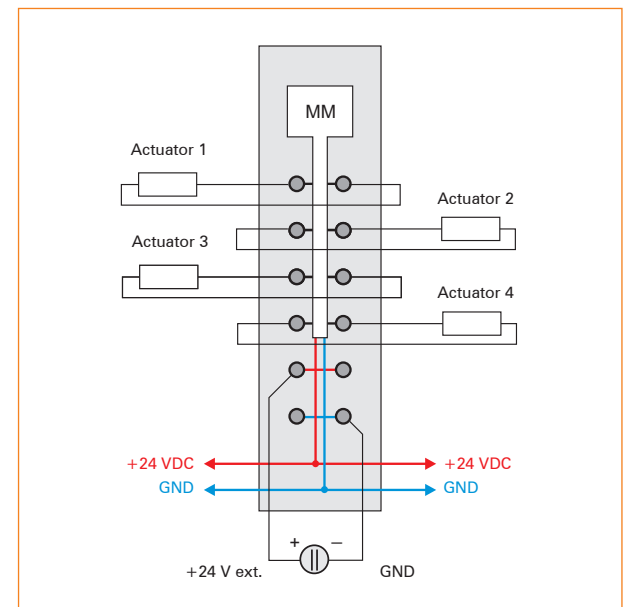
Short description	X20MM4331
I/O module	4 digital outputs 24 VDC half-bridge, 3 A
Digital outputs	X20MM4331
Number of channels	4
Rated voltage	24 VDC
Type	Half-bridge Highside driver (source) Lowside driver (sink)
Max. continuous current per channel	3 A
Max. module current	10 A
Current measurement in the DC bus	Yes
Resolution	100 mA
Output protection	Thermal cutoff for over-current or short circuit
General information	X20MM4331
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Output	Yes, with status LED and software status
I/O supply	Yes, with software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
External I/O supply - bus	Yes
Power consumption	
Bus	0.01 W
I/O internal	0.8 W
Certification	CE, C-UL-US (in development), GOST-R
Operational conditions	X20MM4331
Operating temperature	
Horizontal installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20

Storage and transport conditions	X20MM4331
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20MM4331
Spacing	25 ^{+0.2} mm
Comment	Order 1x X20TB12 terminal block separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Stepper motor module SM3456



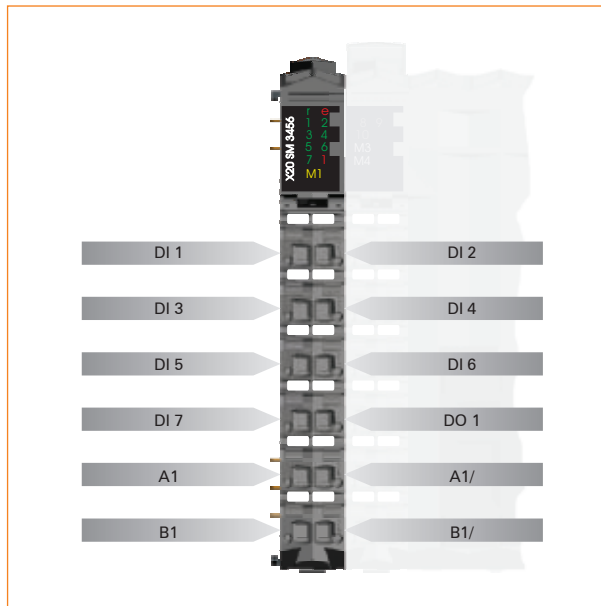
The stepper motor module SM3456 is used to control up to three stepper motors with a rated voltage from 24 VDC to 48 VDC $\pm 25\%$ at a motor rated current of 6 A (maximum current 10 A). The module supply is fed directly to the module. An additional supply module is not needed.

The module can resolve each full step into up to 256 microsteps. The module always carries out the maximum number of microsteps possible at a particular step frequency. On the one hand this increases the positioning precision, and on the other it makes operation much smoother. This considerably reduces the resonance effects common to stepper motors.

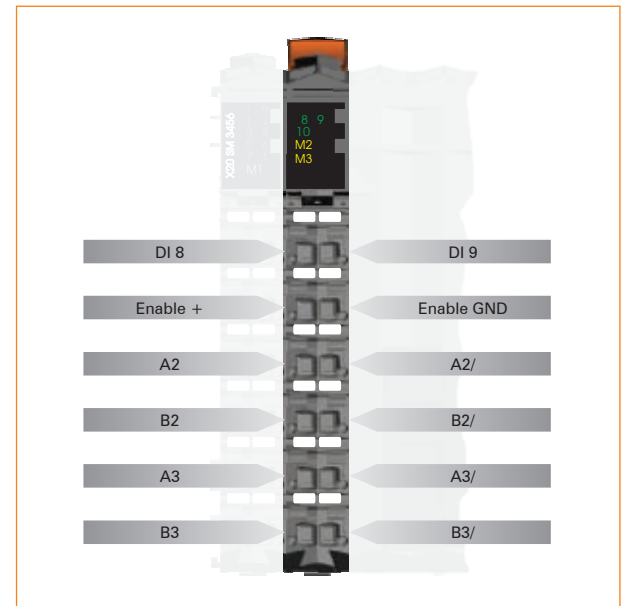
- Stepper motor control for motors with 24 VDC to 48 VDC $\pm 25\%$ and 6 A (max. 10 A)
- 256 microsteps per step
- 9 inputs for limit switches or ABR incremental encoder
- Holding, boost and continuous current can be defined independent of one another
- Automatic motor detection
- Power feed integrated in the module

Short description	X20SM3456
I/O module	1 full bridge for controlling stepper motors
Digital inputs	X20SM3456
Number of channels	9
Rated voltage	24 VDC
Input filter	
Hardware	<5 μ s
Software	
Connection type	1-line connections
Input circuit	Sink
Additional functions for inputs	Configurable as ABR incremental encoder
ABR incremental encoder	X20SM3456
Amount	3
Encoder inputs	24 V, asymmetrical
Counter size	16-bit
Input frequency (max.)	50 kHz
Evaluation	4x
Motor bridge - power element	X20SM3456
Amount	3
Rated voltage	24 VDC - 48 VDC ($\pm 25\%$)
Rated current	6.0 A
Maximum current	10 A (2 s)
Controller frequency	38.4 kHz
Step resolution	Max. 256 microsteps per step
Output protection	No reverse polarity protection for supply voltage
General information	X20SM3456
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Output	Yes, with status LED and software status
I/O supply	Yes, with software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.01 W
I/O internal	-
I/O external	
24 VDC	TBD
60 VDC	TBD
Certification	CE, C-UL-US (in development), GOST-R
Operational conditions	X20SM3456
Operating temperature	
Horizontal installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20SM3456
Temperature	-25 to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20SM3456
Spacing	87.5 ^{+0.2} mm
Comment	Order terminal block 2x X20TB12 separately Order terminal block 1x 0TB3103-7020 separately

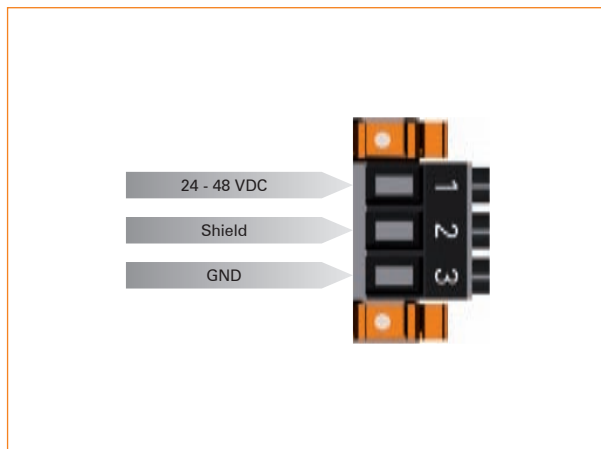
Pin assignments for DI 1-7 / DO 1 / Motor 1



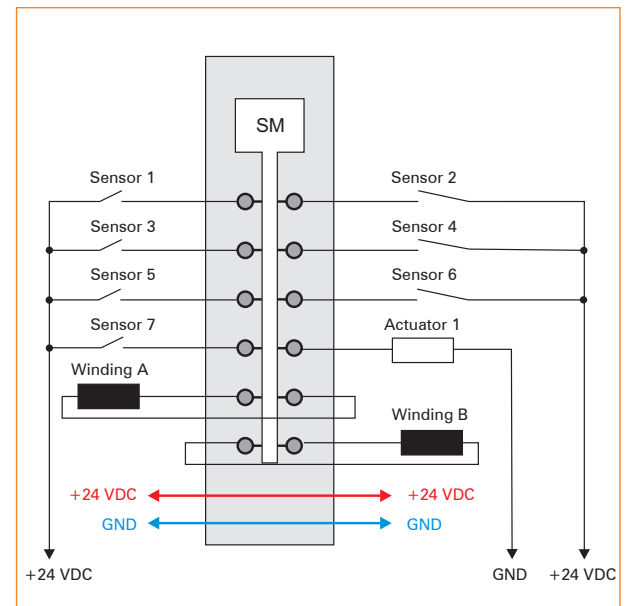
Pin assignments for DI 8-9 / Enable / Motor 2 + 3



Pin assignments for module supply



Connection example for X1 terminal block



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
0TB3103-7020	Accessory terminal block, 3-pin, screw clamp 6 mm ²	92

Diode array module CM6209



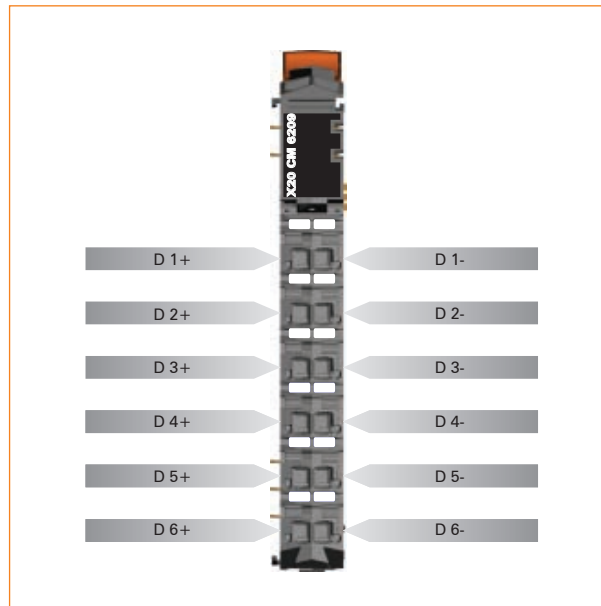
The CM6209 module is a diode array module with six diodes. It is usually used to access the status of keys. The diodes can also be operated as free-wheeling or decoupling diodes.

The diode array module has no connection to X2X Link. It behaves like a ZF0000 dummy module.

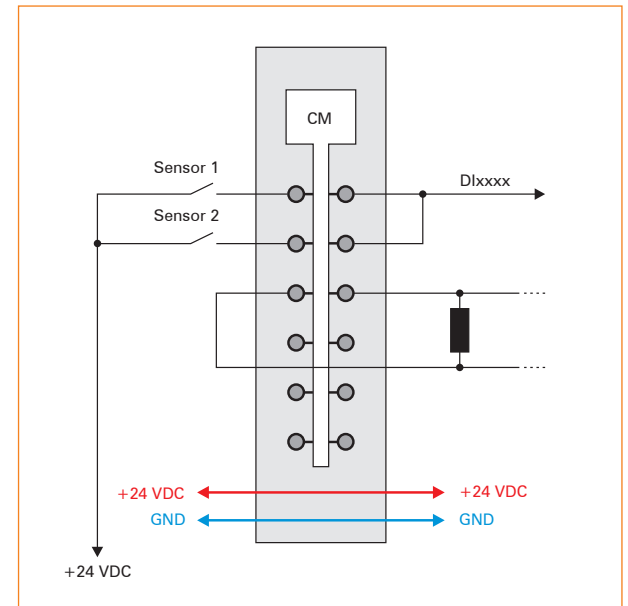
- 6 potential-free diodes
- 24 VDC
- 1 A current load for each diode

Short description	X20CM6209
I/O module	6 diodes, 24 VDC
Diode array	X20PD2113
Rated voltage	24 VDC
Rated input current	1.0 A
General information	X20CM6209
Power consumption	
Bus	-
I/O internal	-
I/O external	2.5 W
Certification	CE, C-UL-US (in development), GOST-R
Operational conditions	X20CM6209
Operating temperature	
Horizontal installation	0°C to +55°C
Vertical installation	0°C to +50°C
Relative humidity	5 to 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20CM6209
Temperature	-25°C to +70°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	X20CM6209
Spacing	12.5 ^{+0.2} mm
Comment	Order 1x X20TB12 terminal block separately Order bus module 1 x X20BM11 or supply bus module 1 x X20BM01 separately

Pin assignments



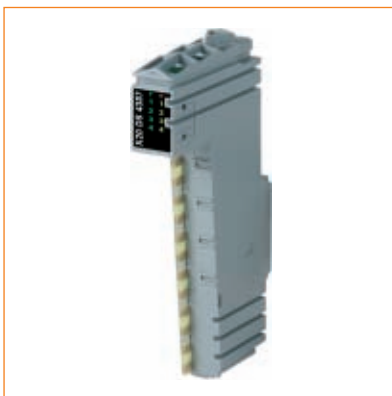
Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM01	X20 supply bus module, internal I/O supply is isolated to the left	86
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

IO-Link master module DS4387



IO-Link is a standardized communication system for connecting intelligent sensors and actuators in an automation system. The standardization includes electrical connection data as well as a digital communication protocol, which is used by the sensors and actuators in the automation system for data exchange. An IO-Link system consists of an IO-Link master and one or more IO-Link devices, i.e. sensors and actuators. The IO-Link master makes available the interface for higher level control and controls the communication with the connected IO-Link devices.

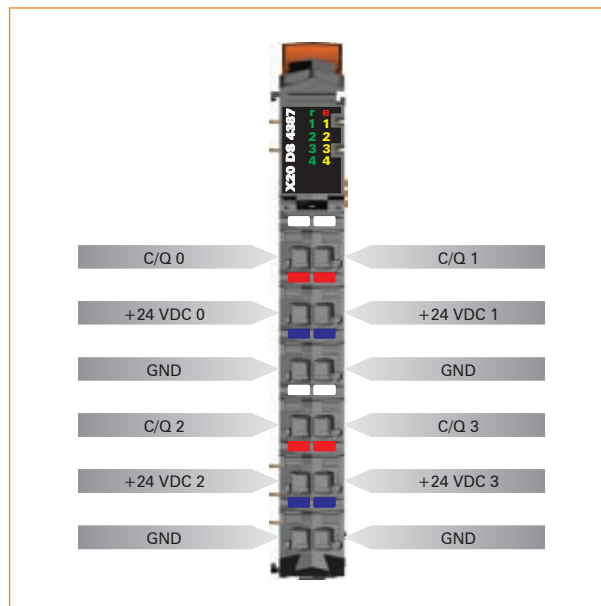
- 4 IO Link interfaces per module
- Each interface can be configured as a standard input or output
- Seamless integration in POWERLINK
- Supports all transfer rates



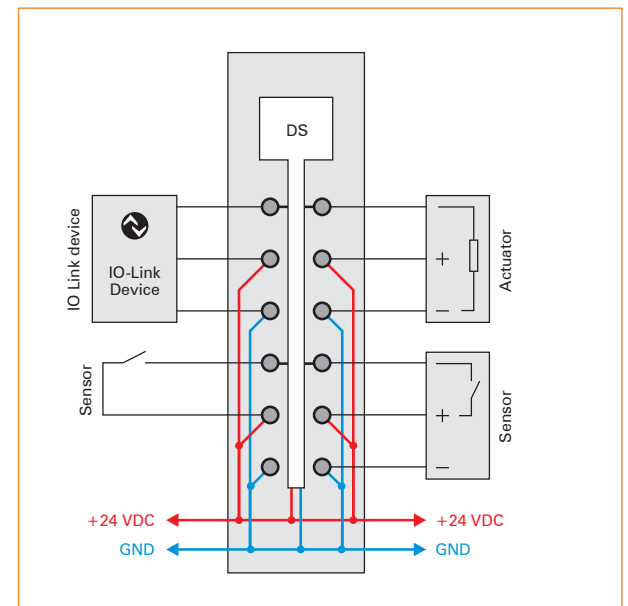
Short description	X20DS4387
I/O module	IO-Link master with 4 IO-Link interfaces
IO-Link master mode	X20DS4387
Transfer rates	
COM1	4.8 kBaud
COM2	38.4 kBaud
COM3	230.4 kBaud
Limits for COM3	
Maximum connection capacity	47 nF (cable + device)
Maximum load	100 Ω / 0.3 A
Data format	1 start bit, 8 data bits, 1 parity bit (even), 1 stop bit
Bus level	24 VDC (active), 0 VDC (idle threshold)
IO-Link device supply	24 VDC / max. 0.3 A per interface (protected)
SIO mode - digital outputs	X20DS4387
Rated voltage	24 VDC
Rated output current	0.2 A
Total current	0.4 A
Output circuit	Sink or source
Output protection	Thermal cutoff for over-current and short circuit, integrated protection for switching inductances
Actuator supply	24 VDC / max. 0.3 A per interface (protected)
SIO mode - digital inputs	X20DS4387
Rated voltage	24 VDC
Input filter	
Hardware	100 ns
Software	-
Input circuit	Sink
Sensor supply	24 VDC / max. 0.3 A per interface (protected)
General information	X20DS4387
Status indicators	IO-Link, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
IO-Link operating state	Yes, with status LED and software status
C/Q status	Yes, with status LED and software status
Cable Specification	
Cable type	3-pin standard sensor cable
Cable length	Max. 20 m
Loop resistance	Max. 6 Ω
Line capacitance	Max. 3 nF
Electrical isolation	
Bus - IO-Link	Yes
IO-Link - IO-Link	No
Power consumption	
Bus	0.01 W
I/O internal	1.6 W
Certification	CE, C-UL-US (in development), GOST-R

Operational conditions		X20DS4387
Operating temperature		
Horizontal installation		0°C to +55°C
Vertical installation		Values derated when mounted vertically
Relative humidity		
		5 to 95%, non-condensing
Mounting orientation		
		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2000 m		No derating
>2000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		
		IP20
Storage and transport conditions		X20DS4387
Temperature		
		-25°C to +70°C
Relative humidity		
		5 to 95%, non-condensing
Mechanical characteristics		X20DS4387
Spacing		
		12.5 ^{+0.2} mm
Comment		
		Order 1x X20TB12 terminal block separately
		Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

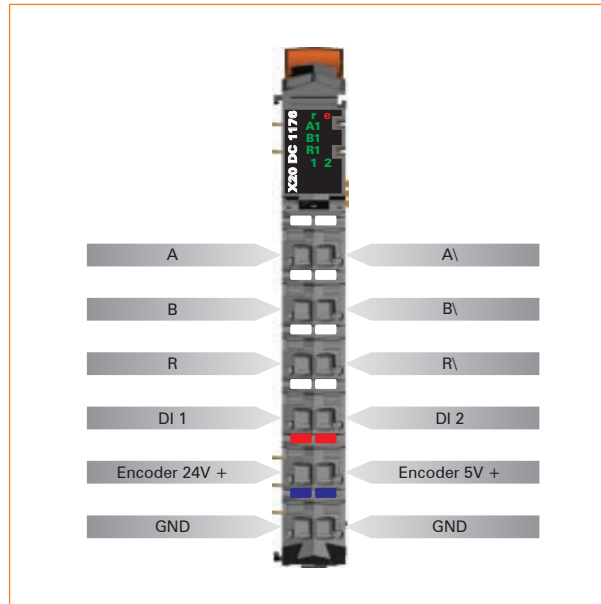
Counter module DC1176



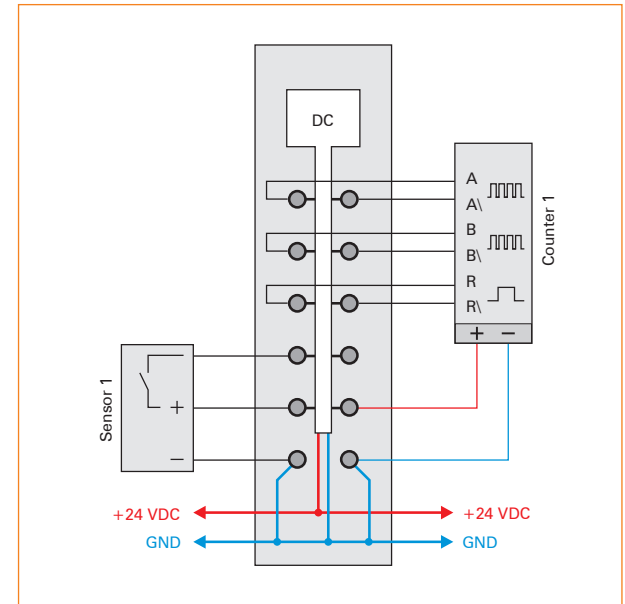
- One 5 V ABR incremental encoder
- Encoder input monitoring
- 2 additional inputs, e.g. for latch input
- 5 VDC, 24 VDC and GND for encoder supply

Short description	X20DC1176
I/O module	One 5 V ABR incremental encoder
ABR incremental encoder	X20DC1196
Encoder inputs	5 V, symmetrical
Counter size	16/32-bit
Input frequency (max.)	250 kHz
Evaluation	4x
Encoder supply	
5 V	Module-internal, max. 300 mA
24 V	Module-internal, max. 300 mA
Digital inputs	X20DC1176
Amount	2
Rated voltage	24 VDC
Input filter	
Hardware	≤2 μs
Software	–
Connection type	3-line connections
Input circuit	Sink
Additional functions	Latch input
General information	X20DC1176
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.01 W
I/O internal	1.0 W
Certification	CE, C-UL-US (in development), GOST-R
Operational conditions	X20DC1176
Operating temperature	
Horizontal installation	0 to +55°C
Vertical installation	0 to +50°C
Relative humidity	5 - 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DC1176
Temperature	-25 to +70°C
Relative humidity	5 - 95%, non-condensing
Mechanical characteristics	X20DC1176
Spacing	12.5 ^{+0.2} mm
Comment	Order 1x X20TB12 terminal block separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

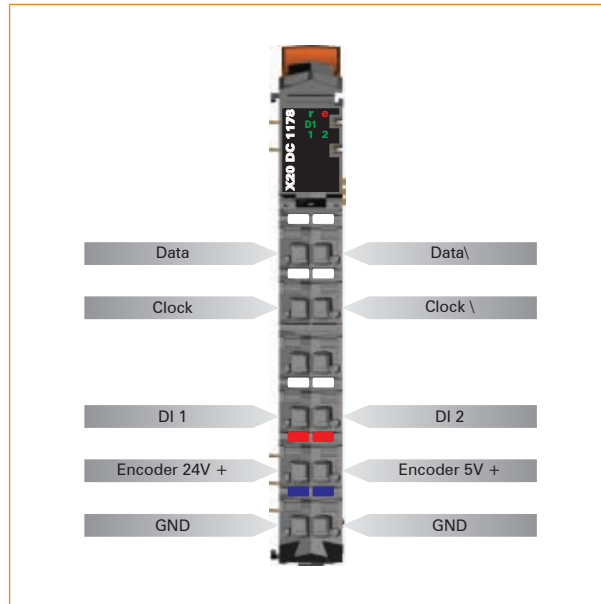
Counter module DC1178



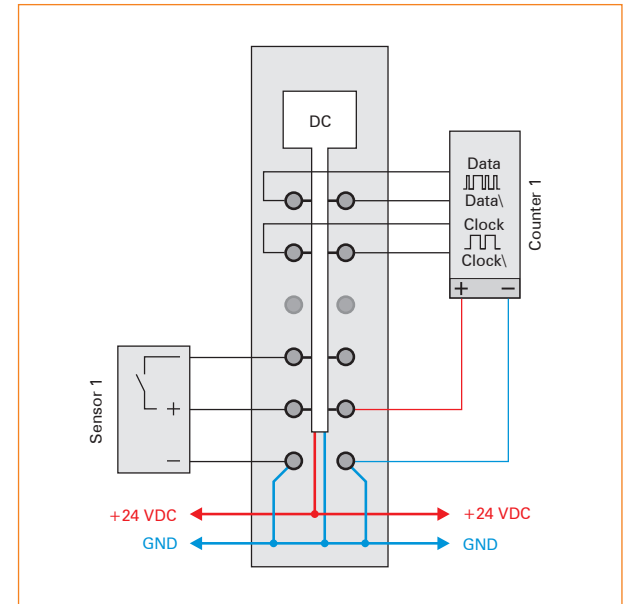
- One 5 V SSI absolute encoder
- Data signal monitoring
- 2 additional inputs
- 5 VDC, 24 VDC and GND for Encoder supply

Short description	X20DC1178
I/O module	One 5 V SSI absolute encoder
SSI absolute encoder	X20DC1178
Encoder signal	5 V, symmetrical
Counter size	Encoder-dependent up to 32 bit
Maximum transfer rate	1 MBit/s
Encoder supply	
5 V	Module-internal, max. 300 mA
24 V	Module-internal, max. 300 mA
Digital inputs	X20DC1178
Amount	2
Rated voltage	24 VDC
Input filter	
Hardware	≤2 μs
Software	-
Connection type	3-line connections
Input circuit	Sink
General information	X20DC1178
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.01 W
I/O internal	1.1 W
Certification	CE, C-UL-US (in development), GOST-R
Operational conditions	X20DC1178
Operating temperature	
Horizontal installation	0 to +55°C
Vertical installation	0 to +50°C
Relative humidity	5 - 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DC1178
Temperature	-25 to +70°C
Relative humidity	5 - 95%, non-condensing
Mechanical characteristics	X20DC1178
Spacing	12.5 ^{+0.2} mm
Comment	Order 1x X20TB12 terminal block separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

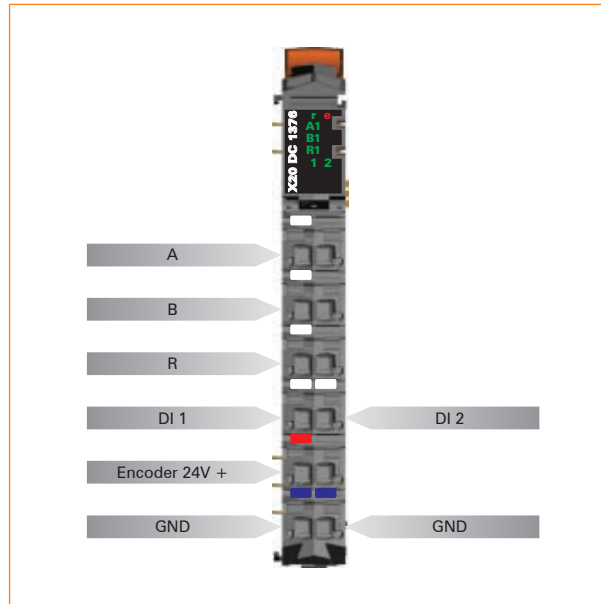
Counter module DC1376



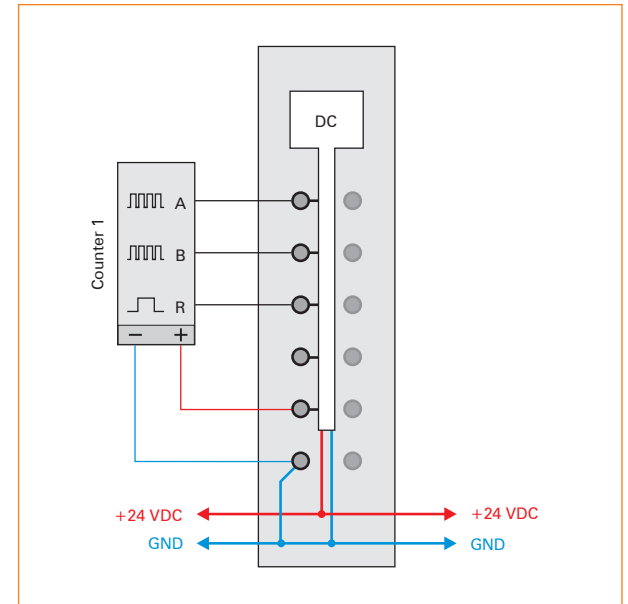
- One 24 V ABR asymmetric incremental encoder
- Encoder input monitoring
- 2 additional inputs, e.g. for latch input
- 24 VDC and GND for encoder supply

Short description	X20DC1376
I/O module	One 24 V ABR incremental encoder
ABR incremental encoder	X20DC1376
Encoder inputs	24 V, asymmetric (single ended)
Counter size	16/32-bit
Input frequency (max.)	100 kHz
Evaluation	4x
Encoder supply	Module-internal, max. 600 mA
Digital inputs	X20DC1376
Amount	2
Rated voltage	24 VDC
Input filter	
Hardware	≤2 μs
Software	-
Connection type	3-line connections
Input circuit	Sink
Additional functions	Latch input
General information	X20DC1376
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.01 W
I/O internal	1.3 W
Certification	CE, C-UL-US (in development), GOST-R
Operational conditions	X20DC1376
Operating temperature	
Horizontal installation	0 to +55°C
Vertical installation	0 to +50°C
Relative humidity	5 - 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DC1376
Temperature	-25 to +70°C
Relative humidity	5 - 95%, non-condensing
Mechanical characteristics	X20DC1376
Spacing	12.5 ^{+0.2} mm
Comment	Order 1x X20TB12 terminal block separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

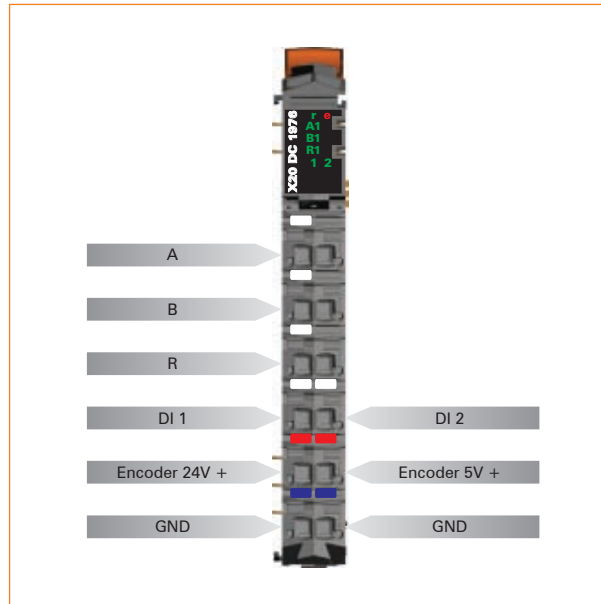
Counter module DC1976



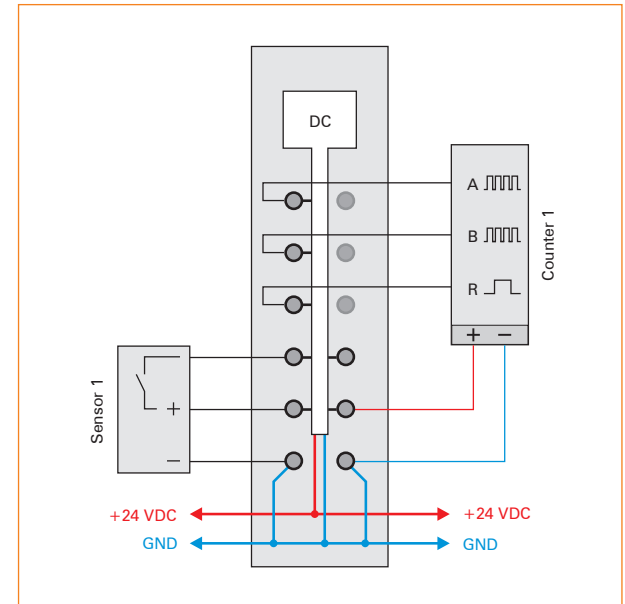
- One 5 V ABR asymmetric incremental encoder
- Encoder input monitoring
- 2 additional inputs, e.g. for latch input
- 5 VDC, 24 VDC and GND for Encoder supply

Short description	X20DC1976
I/O module	One 5 V ABR incremental encoder
ABR incremental encoder	X20DC1976
Encoder inputs	5 V, asymmetric (single ended)
Counter size	16/32-bit
Input frequency (max.)	250 kHz
Evaluation	4x
Encoder supply	
5 V	Module-internal, max. 300 mA
24 V	Module-internal, max. 300 mA
Digital inputs	X20DC1976
Amount	2
Rated voltage	24 VDC
Input filter	
Hardware	≤2 μs
Software	–
Connection type	3-line connections
Input circuit	Sink
Additional functions	Latch input
General information	X20DC1976
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.01 W
I/O internal	1.2 W
Certification	CE, C-UL-US (in development), GOST-R
Operational conditions	X20DC1976
Operating temperature	
Horizontal installation	0 to +55°C
Vertical installation	0 to +50°C
Relative humidity	5 - 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DC1976
Temperature	-25 to +70°C
Relative humidity	5 - 95%, non-condensing
Mechanical characteristics	X20DC1976
Spacing	12.5 ^{+0.2} mm
Comment	Order 1x X20TB12 terminal block separately Order bus module 1x X20BM11 separately

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88

Digital signal processor module DS4389



The DS4389 is a digital signal processor module that is used for detecting and evaluating input edges and for creating edges.

Independently of the X2X Link system cycle time, fast input edges such as print marks are detected and assigned a precise input stamp. In the other direction, the module sets outputs to exactly specified times. This is done with a resolution of up to 125 ns.

In the oversampling mode, it is possible to record very short input samples or output very short output samples with a scan rate of up to 25 μ s. If necessary, up to four events per edge detection unit are stored in a buffer (history elements).

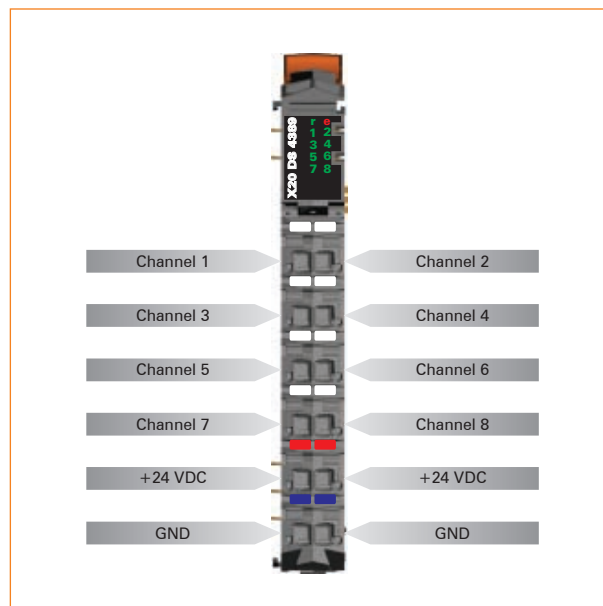
- 4 digital input channels
- 4 digital channels, can be configured as input or output
- 4 edge detection units with time stamp function (each can be used to measure pulse length or differential time, 4 history elements per unit)
- 4x edge generation with μ s precision (up to 4 edges per unit)
- 4x oversampling (input and output signal)
- 24 VDC and GND for sensor/actuator supply

Short description	X20DS4389
I/O module	4 digital input channels, 4 digital channels that can be configured as inputs or outputs, 4 edge detection units with time stamp function (each can be used to measure pulse length or differential time, 4 history elements per unit), 4x edge generation with μ s precision (up to 4 edges per unit), 4x oversampling (input and output signal)
Digital inputs	X20DS4389
Amount	4 + 4, configuration as input or output takes place using software
Rated voltage	24 VDC
Input frequency	40 kHz
Input circuit	Sink
Additional functions for inputs	4 edge detection units with time stamp function, 4x input oversampling
Digital outputs	X20DS4389
Amount	Up to 4, configuration as input or output takes place using software
Rated voltage	24 VDC
Rated output current	0.1 A
Total current	0.4 A
Output circuit	Sink and/or source
Output protection	Thermal cutoff for overcurrent or short circuit, integrated protection for switching inductances
Additional functions for outputs	4x edge generation with μ s precision, 4x output oversampling
Edge detection units	X20DS4389
Amount	4
Operating mode	4 pulse length measurements, relative or absolute time points of input edges in μ s resolution, 4 history elements per unit
Counter size	16/32-bit
Input frequency (max.)	40 kHz
Resolution	125 ns time stamp function
Signal form	Square wave pulse
Sensor supply	Module-internal, max. 600 mA
Edge generation units	X20DS4389
Amount	4
Edge generation	
Absolute	Absolute to NetTime
Relative	Relative to other edges
Offset at relative edge generation	
Value range	16 or 32 bit value
Resolution	1 μ s
Actuator supply	Module-internal, max. 600 mA
Oversampling	X20DS4389
Amount	4
Sample time	25 - 255 μ s
Data volume	Up to 64-bit per X2X Link cycle in input and output direction

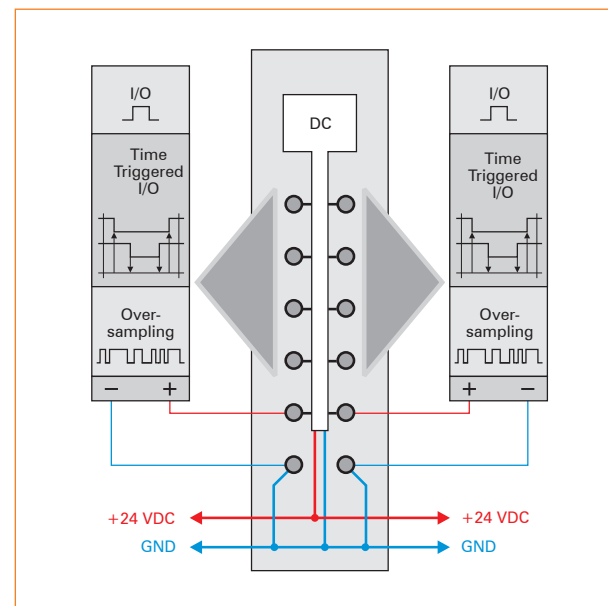
General information	X20DS4389
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Outputs	Yes, with status LED and software status (output status)
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.01 W
I/O internal	1.5 W
Certification	CE, C-UL-US (in development), GOST-R
Operational conditions	X20DS4389
Operating temperature	
Horizontal installation	0 to +55°C
Vertical installation	0 to +50°C
Relative humidity	5 - 95%, non-condensing
Mounting orientation	Horizontal or vertical
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP20
Storage and transport conditions	X20DS4389
Temperature	-25 to +70°C
Relative humidity	5 - 95%, non-condensing
Mechanical characteristics	X20DS4389
Spacing	12.5 ^{+0.2} mm
Comment	Order 1x X20TB12 terminal block separately Order bus module 1x X20BM11 separately

Digital signal processor module DS4389

Pin assignments



Connection example



Required accessories

X20TB12	X20 terminal block, 12-pin, 24 V coded	94
X20BM11	X20 bus module, 24 V coded, internal I/O supply is interconnected	88



X67 System Remote I/O with IP67 protection

Mount, connect and you're ready to go.
A new dimension for remote I/O directly mounted on the machine.
With a credit card sized design, it can be mounted in the smallest spaces.
It does not require space in the switching cabinet.
IP67 protection provides resistance in the harshest environments.
As fast as a centralized solution.
Connections are made using open fieldbus systems.



Product overview

Bus controller



Model number	Short description	
X67BC4321-1	X67 CANopen bus controller, X2X Link supply 3 W, 8 digital channels can be configured as inputs or outputs, 24 VDC, 0.5 A, configurable input filter, 2 event counters 50 kHz, I/O supply possible via CAN plug, LED status indicators	75
X67BC4321.L08	X67 CANopen bus controller, X2X Link supply 15 W, 16 digital channels can be configured as inputs or outputs, 24 VDC, 0.5 A, configurable input filter, 2 event counters 50 kHz, M8 connectors, high density module, LED status indicators	77
X67BC4321.L08-1	X67 CANopen bus controller, X2X Link supply 3 W, 16 digital channels can be configured as inputs or outputs, 24 VDC, 0.5 A, configurable input filter, 2 event counters 50 kHz, M8 connectors, I/O supply possible via CAN plug, high density module, LED status indicators	77
X67BC8321.L12	X67 POWERLINK V1/V2 bus controller, X2X Link supply 15 W, 16 digital channels can be configured as inputs or outputs, 24 VDC, 0.5 A, configurable input filter, 2 event counters 50 kHz, M12 connectors, high density module, LED status indicators	80
X67BC8331	X67 POWERLINK V1/V2 bus controller, X2X Link supply 3 W, 8 digital channels can be configured as inputs or outputs, 24 VDC, 2.0 A, configurable input filter, LED status indicators	82
X67BCD321.L12	X67 Ethernet/IP bus controller, integrated switch, X2X Link supply 15 W, 16 digital channels can be configured as inputs or outputs, 24 VDC, 0.5 A, configurable input filter, 2 event counters 50 kHz, M12 connectors, high density module, LED status indicators	84

Digital inputs and outputs



Model number	Short description	
X67DM9321.L12	X67 digital mixed module, 16 channels can be configured as inputs or outputs, 24 VDC, 0.5 A, configurable input filter, 2x 50 kHz event counters, M12 connectors, X2X Link address switch, high density module, LED status indicators	87

Communication



Model number	Short description	
X67IF1121-1	X67 interface module, 1x RS232, 1x RS485/RS422, 2 digital channels can be selected as input or output, 24 VDC, 0.5 A, configurable input filter	88

Integrated safety technology

The addition of the Integrated Safety Technology programs to the X67 System help it satisfy all requirements of safety-related applications.

The X67 safety modules include:

- Safe digital modules

More detailed information can be found in chapter 4, Integrated Safety Technology.

Safe digital inputs and outputs



Model number	Short description	
X67SC4122.L12	X67 safe digital mixed module, 8 failsafe inputs, 8 pulse outputs, 24 VDC, configurable input filter, 4 failsafe semiconductor outputs, 24 VDC, 2 A, M12 connectors, high density module, LED status indicators	100

CANopen bus controller

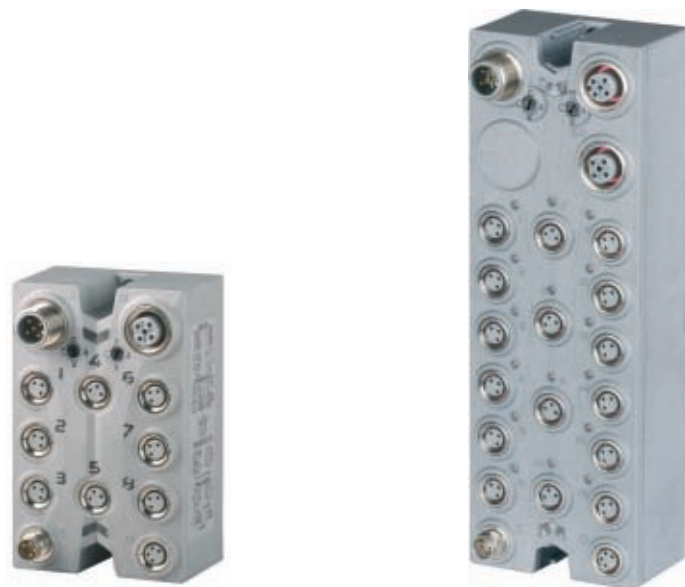
General information

CANopen

CAN (Controller Area Network) has spread considerably in automation technology. Topologically based on a line structure, CAN uses twisted pair wires for data transfer (see page 611 in the "Network and Fieldbus Modules" chapter of the 2009 product catalog). CANopen is a higher-layer protocol based on CAN. This standardized protocol offers highly flexible configuration possibilities.

X67 CANopen bus controller

The CANopen X67 bus controller meets the latest CANopen specifications DS 301 V4.02 and DS 401 V2.1. These controllers are equipped with automatic transfer rate detection and auto-mapping of the I/O modules connected via X2X Link. All CANopen operating modes such as synchronous, event, and polling modes are supported together with PDO linking, life/node guarding, emergency objects, and much more. Additional X67 or other X2X Link-based modules can be connected using the integrated X2X Link connection.



CANopen

Detailed information and support regarding selection, possible configurations, and combinations of digital and analog modules is available on the B&R homepage: www.br-automation.com

CANopen bus controller BC4321-1

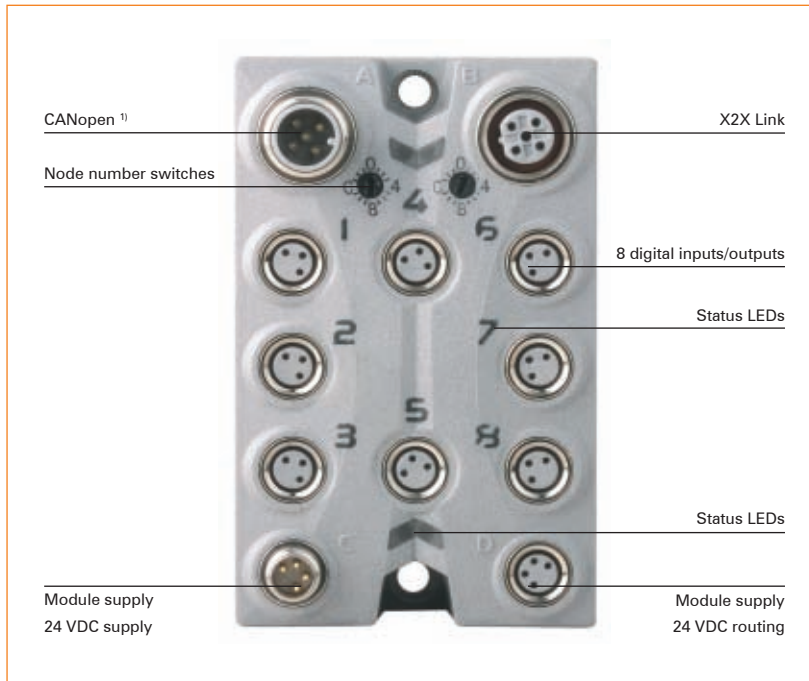


CANopen

- Fieldbus: CANopen
- I/O supply possible via CAN plug
- 8 digital channels, can be configured as input or output
- Simple I/O configuration via the fieldbus
- Integrated connection to the local expansions via X2X Link for 39 additional modules
- Cycle time for local expansion can be set: 400 μ s to 1.3 ms

Short description	X67BC4321-1
Bus controller	CANopen
Inputs/outputs	8 digital channels, configured as inputs or outputs using software, inputs with special functions
Rated voltage	24 VDC
Fieldbus	X67BC4321-1
Type	CANopen
Design	M12 circular plugs (plug on the module)
Maximum distance	1000 m
Maximum transfer rate	1 MBit/s, automatic transfer rate detection
Digital inputs	X67BC4321-1
Input filter	
Hardware	$\leq 10 \mu$ s (channels 1 - 4) / ≤ 70 ms (channels 5 - 8)
Software	Default 0 ms, can be configured between 0 and 25 ms in 0.2 ms intervals
Input circuit	Sink
Additional functions for inputs	50 kHz event counting, gate measurement
Digital outputs	X67BC4321-1
Rated output current	0.5 A
Total current	4.0 A
Output circuit	Source
Output protection	Thermal cutoff for over-current and short circuit, integrated protection for switching inductances, reverse polarity protection for output supply
General information	X67BC4321-1
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED and software status
Outputs	Yes, with status LED and software status
Electrical isolation	
Fieldbus - X2X Link	Yes
Channel - Bus	No (CAN) / Yes (X2X)
Channel - Channel	No
Sensor/actuator supply	0.5 A total current
Power consumption	
Fieldbus	3.8 W
I/O internal	-
X2X Link supply	5.5 W at maximum power output for connected I/O modules
Power output	3.0 W X2X Link supply for I/O modules
Connection type	
Fieldbus	M12, A-coded
X2X Link	M12, B-coded
Inputs/outputs	M8, 3-pin
Module supply	M8, 4-pin
Certification	CE, cRUus, GOST-R
Operational conditions	X67BC4321-1
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67BC4321-1
Temperature	-25°C to +85°C
Mechanical characteristics	X67BC4321-1
Dimensions (W x H x D)	53 x 85 x 42 mm
Weight	195 g
Torque for connections	M8: Max. 0.4 Nm / M12: Max. 0.6 Nm

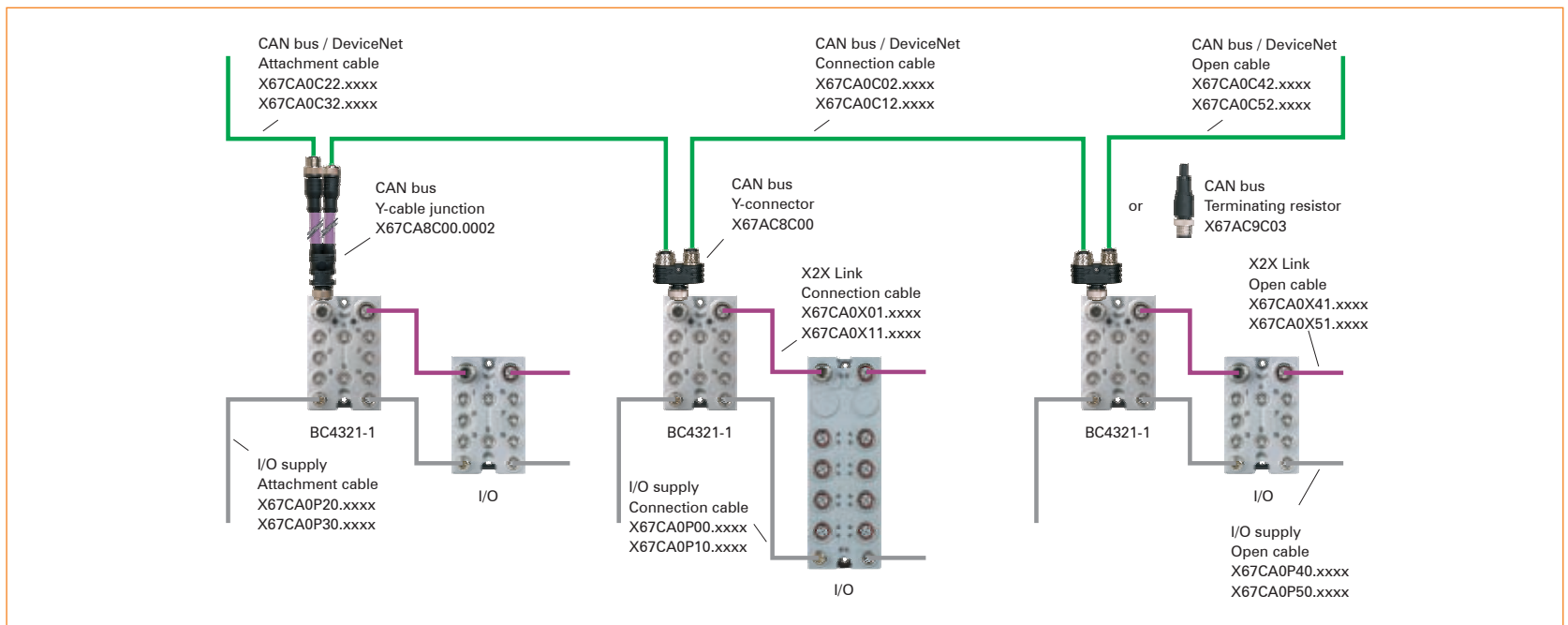
CANopen bus controller BC4321-1



Note: With multi-function modules, the bus controller only supports the default function model. The default function model is explained in the description for each multi-function module.

1) I/O supply possible via CAN plug.

Required cables and connectors



CANopen bus controller BC4321.L08, BC4321.L08-1



CANopen

BC4321.L08 and BC4321.L08-1:

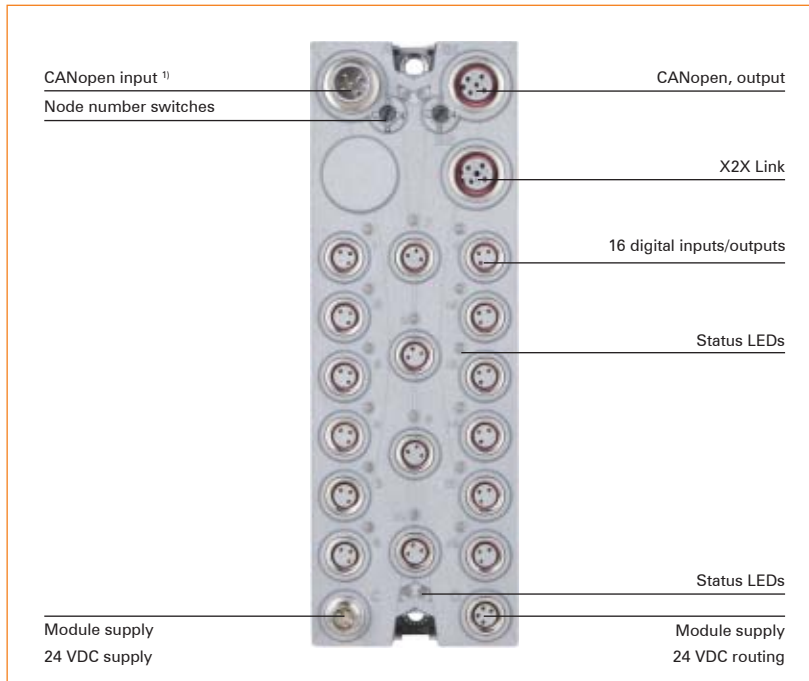
- Fieldbus: CANopen
- Integrated Y-connector for fieldbus connection
- 16 digital channels, can be configured as input or output
- Simple I/O configuration via the fieldbus
- Integrated connection to the local expansions via X2X Link for 39 additional modules
- Cycle time for local expansion can be set: 400 μ s to 1.3 ms

BC4321.L08-1:

- I/O supply possible via CAN plug

Short description	X67BC4321.L08	X67BC4321.L08-1
Bus controller	CANopen	CANopen
Inputs/outputs	16 digital channels, configured as inputs or outputs using software, inputs with special functions	
Rated voltage	24 VDC	24 VDC
Fieldbus	X67BC4321.L08	X67BC4321.L08-1
Type	CANopen	CANopen
Design	M12 circular plug (plug on module), 2x socket for the Y-connector integrated in the module	
Maximum distance	1000 m	1000 m
Maximum transfer rate	1 MBit/s, automatic transfer rate detection	
Digital inputs	X67BC4321.L08	X67BC4321.L08-1
Input filter		
Hardware	$\leq 10 \mu$ s (channels 1 - 4) / ≤ 70 ms (channels 5 - 16)	$\leq 10 \mu$ s (channels 1 - 4) / ≤ 70 ms (channels 5 - 16)
Software	Default 0 ms, can be configured betw. 0-25 ms in 0.2 ms intervals	Default 0 ms, can be configured betw. 0-25 ms in 0.2 ms intervals
Input circuit	Sink	Sink
Additional functions for inputs	50 kHz event counting, gate measurement	
Digital outputs	X67BC4321.L08	X67BC4321.L08-1
Rated output current	0.5 A	0.5 A
Total current	8.0 A	8.0 A
Output circuit	Source	Source
Output protection	Thermal cutoff for over-current and short circuit, integrated protection for switching inductances,	
General information	X67BC4321.L08	X67BC4321.L08-1
Status indicators	I/O function for each channel, supply voltage, bus function	
Diagnostics		
I/O supply	Yes, with status LED and software status	Yes, with status LED and software status
Outputs	Yes, with status LED and software status	Yes, with status LED and software status
Electrical isolation		
Fieldbus - X2X Link	Yes	Yes
Channel - Bus	Yes	No (CAN) / Yes (X2X)
Channel - Channel	No	No
Sensor/actuator supply	0.5 A total current	
Power consumption		
Fieldbus	TBD W	TBD W
I/O internal	TBD W	-
X2X Link supply	TBD W at maximum power output for connected I/O modules	TBD W at maximum power output for connected I/O modules
Power output	15.0 W X2X Link supply for I/O modules	
Connection type		
Fieldbus	M12, A-coded	M12, A-coded
X2X Link	M12, B-coded	M12, B-coded
Inputs/outputs	M8, 3-pin	M8, 3-pin
Module supply	M8, 4-pin	M8, 4-pin
Certification	CE, cRUus in preparation, GOST-R	
Operational conditions	X67BC4321.L08	X67BC4321.L08-1
Operating temperature	0°C to +60°C	
Mounting orientation	Any	
Installation at altitudes above sea level		
0 - 2000 m	No derating	No derating
> 2000 m	Reduction of ambient temperature by 0.5°C per 100 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67	
Storage and transport conditions	X67BC4321.L08	X67BC4321.L08-1
Temperature	-25°C to +85°C	
Mechanical characteristics	X67BC4321.L08	X67BC4321.L08-1
Dimensions (W x H x D)	53 x 155 x 42 mm	
Weight	320 g	
Torque for connections	M8: Max. 0.4 Nm / M12: Max. 0.6 Nm	

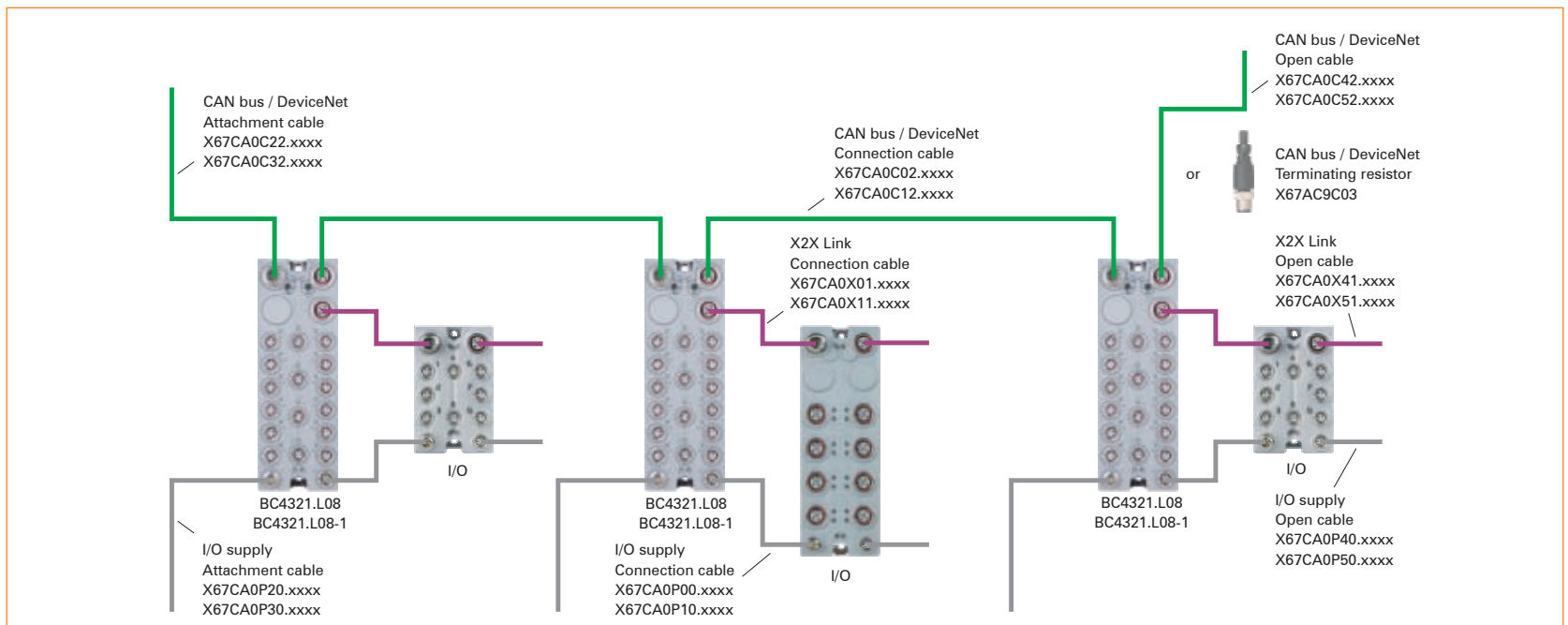
CANopen bus controller BC4321.L08, BC4321.L08-1



Note: With multi-function modules, the bus controller only supports the default function model. The default function model is explained in the description for each multi-function module.

1) BC4321.L08-1: I/O supply possible via CAN plug.

Required cables and connectors



Bus controller POWERLINK

General information

POWERLINK

POWERLINK is a standard protocol for Fast Ethernet which has proven its true real-time characteristics in thousands of applications. The Ethernet POWERLINK Standardization Group (EPSG, www.ethernet-powerlink.org) ensures that the standard remains open and is continually developed.

POWERLINK represents the second generation of the fieldbus based on standard Ethernet. This makes it possible to apply the full power of IT technologies to the automation field for the first time.

X67 bus controller POWERLINK

The POWERLINK X67 bus controllers make it possible to connect X2X Link I/O nodes to POWERLINK V1/V2. Additional X67 modules and other modules that are based on X2X Link can be attached using the integrated X2X Link connection. It is also possible to operate the X2X Link cycle synchronously 1:1 or synchronous to POWERLINK using a prescaler. Mechanically, POWERLINK is connected via the new IP67 Ethernet Standard M12 connector with D-coding.



ETHERNET 
POWERLINK

Detailed information and support regarding selection, possible configurations, and combinations of digital and analog modules is available on the B&R homepage: www.br-automation.com

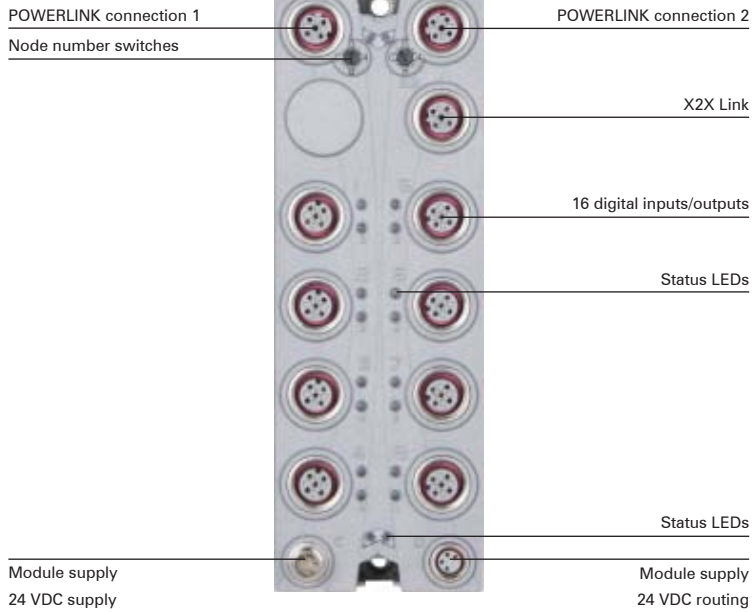
Bus controller POWERLINK BC8321.L12



ETHERNET
POWERLINK

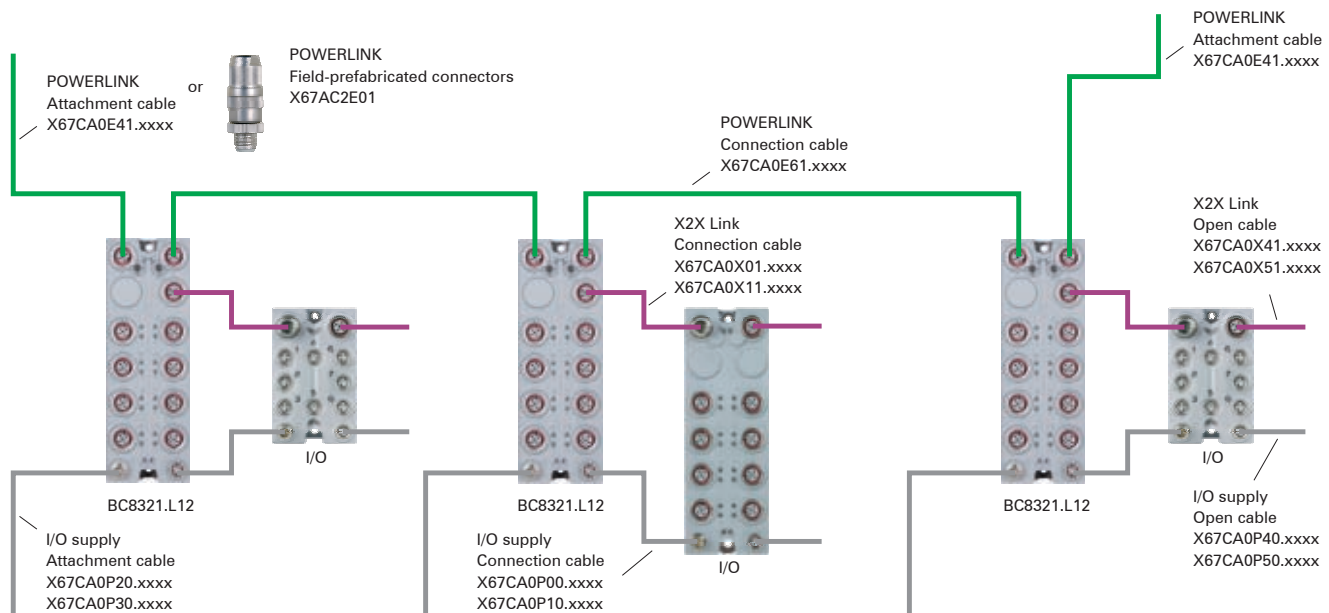
- POWERLINK V1/V2
- Integrated Y-connector for POWERLINK connection
- 16 digital channels, can be configured as input or output
- I/O configuration and firmware update via the fieldbus
- Integrated connection to the local expansion via X2X Link for up to 250 additional modules
- Cycle time for local expansion can be set: starting at 200 μ s

Short description	X67BC8321.L12
Bus controller	POWERLINK V1/V2 controlled node
Inputs/outputs	16 digital channels, configured as inputs or outputs using software, inputs with special functions
Rated voltage	24 VDC
Fieldbus	X67BC8321.L12
Type	POWERLINK V1/V2 100 Base-T (ANSI/IEE 802.3)
Design	M12 circular plug, 2x socket for the Y-connector integrated in the module
Cable length	Max. 100 m between two stations (segment length)
Transfer rate	100 MBit/s
Digital inputs	X67BC8321.L12
Input filter	
Hardware	$\leq 10 \mu$ s (channels 1 - 4) / ≤ 70 ms (channels 5 - 16)
Software	Default 0 ms, can be configured between 0 and 25 ms in 0.2 ms intervals
Input circuit	Sink
Additional functions for inputs	50 kHz event counting, gate measurement
Digital outputs	X67BC8321.L12
Rated output current	0.5 A
Total current	8.0 A
Output circuit	Source
Output protection	Thermal cutoff for over-current and short circuit, integrated protection for switching inductances, reverse polarity protection for output supply
General information	X67BC8321.L12
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED and software status
Outputs	Yes, with status LED and software status
Electrical isolation	
Fieldbus - X2X Link	No
Channel - Bus	Yes
Channel - Channel	No
Sensor/actuator supply	0.5 A total current
Power consumption	
Fieldbus	TBD W
I/O internal	TBD W
X2X Link supply	TBD W at maximum power output for connected I/O modules
Power output	15.0 W X2X Link supply for I/O modules
Connection type	
Fieldbus	M12, D-coded
X2X Link	M12, B-coded
Inputs/outputs	8x M12, A-coded
Module supply	M8, 4-pin
Certification	CE, cRUus in preparation, GOST-R
Operational conditions	X67BC8321.L12
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67BC8321.L12
Temperature	-25°C to +85°C
Mechanical characteristics	X67BC8321.L12
Dimensions (W x H x D)	53 x 155 x 42 mm
Weight	320 g
Torque for connections	M8: Max. 0.4 Nm / M12: Max. 0.6 Nm



Note: With multi-function modules, the bus controller only supports the default function model. The default function model is explained in the description for each multi-function module.

Required cables and connectors



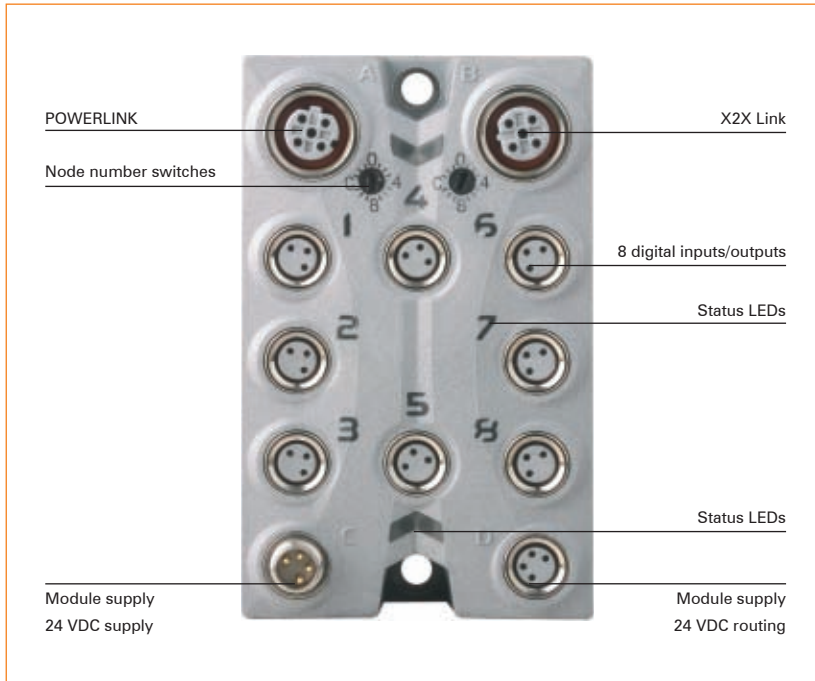
Bus controller POWERLINK BC8331



ETHERNET 
POWERLINK

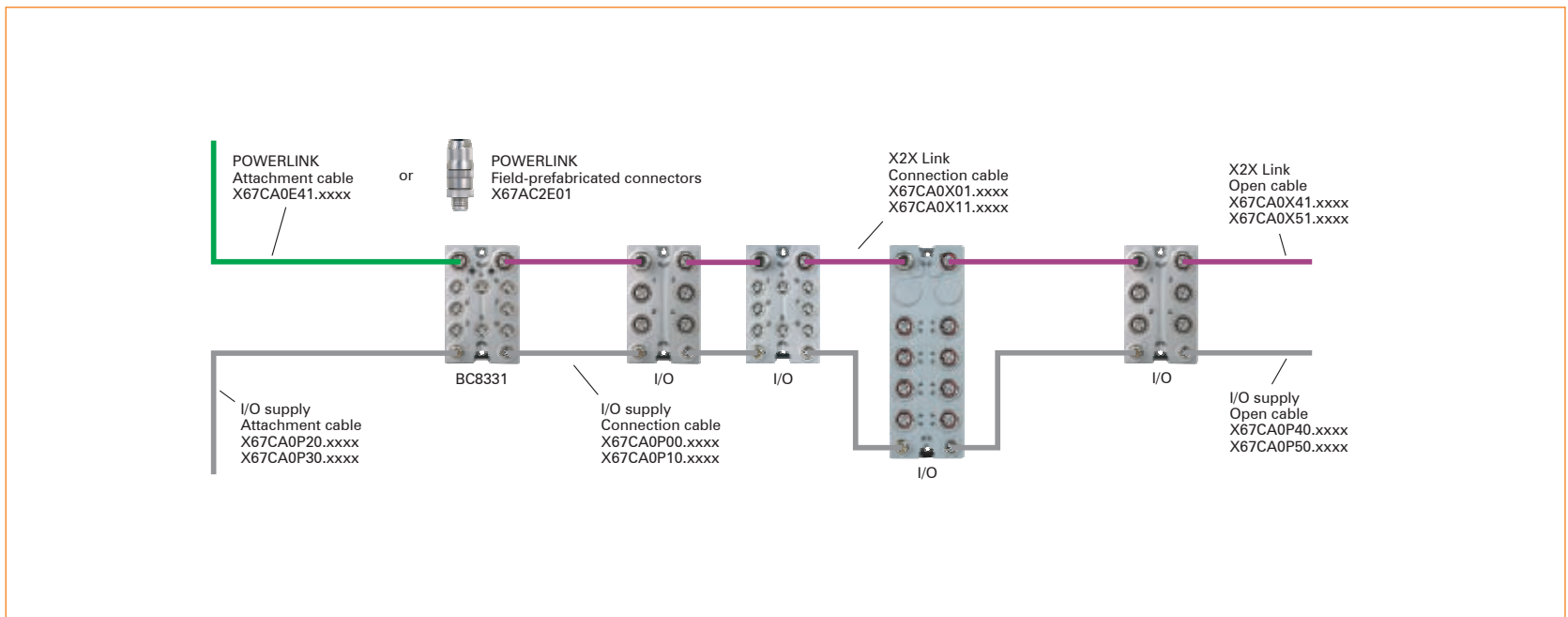
- POWERLINK V1/V2
- 8 digital channels, can be configured as input or output
- Outputs can handle up to 2 A
- I/O configuration and firmware update via the fieldbus
- Integrated connection to the local expansion via X2X Link for up to 250 additional modules
- Cycle time for local expansion can be set: starting at 200 μ s

Short description	X67BC8331
Bus controller	POWERLINK V1/V2 controlled node
Inputs/outputs	8 digital channels, configured as inputs or outputs using software
Rated voltage	24 VDC
Fieldbus	X67BC8331
Type	POWERLINK V1/V2 100 Base-T (ANSI/IEE 802.3)
Design	M12 circular plug (socket on the module)
Cable length	Max. 100 m between two stations (segment length)
Transfer rate	100 MBit/s
Digital inputs	X67BC8331
Input filter	
Hardware	$\leq 10 \mu$ s (channels 1 - 4) / ≤ 70 ms (channels 5 - 8)
Software	Default 0 ms, can be configured between 0 and 25 ms in 0.2 ms intervals
Input circuit	Sink
Digital outputs	X67BC8331
Rated output current	2.0 A
Total current	8.0 A
Output circuit	Source
Output protection	Thermal cutoff for over-current and short circuit, integrated protection for switching inductances, reverse polarity protection for output supply
General information	X67BC8331
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED and software status
Outputs	Yes, with status LED and software status
Electrical isolation	
Fieldbus - X2X Link	Yes
Channel - Bus	Yes
Channel - Channel	No
Sensor/actuator supply	0.5 A total current
Power consumption	
Fieldbus	3.5 W
I/O internal	3.8 W
X2X Link supply	4.2 W at maximum power output for connected I/O modules
Power output	3.0 W X2X Link supply for I/O modules
Connection type	
Fieldbus	M12, D-coded
X2X Link	M12, B-coded
Inputs/outputs	M8, 3-pin
Module supply	M8, 4-pin
Certification	CE, cRUus in preparation, GOST-R
Operational conditions	X67BC8331
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67BC8331
Temperature	-25°C to +85°C
Mechanical characteristics	X67BC8331
Dimensions (W x H x D)	53 x 85 x 42 mm
Weight	195 g
Torque for connections	M8: Max. 0.4 Nm / M12: Max. 0.6 Nm



Note: With multi-function modules, the bus controller only supports the default function model. The default function model is explained in the description for each multi-function module.

Required cables and connectors



Bus Controller EtherNet/IP BCD321.L12



EtherNet/IP

EtherNet/IP is a fieldbus based on Ethernet. EtherNet/IP was developed by Allen-Bradley (part of Rockwell Automation) and later transferred to the Open DeviceNet Vendor Association (ODVA) as open standard. In 1998 a ControlNet International working group designed a procedure to set the already released application protocol, Common Industrial Protocol, to Ethernet. EtherNet/IP was released in March 2000 as open industry standard based on this procedure.

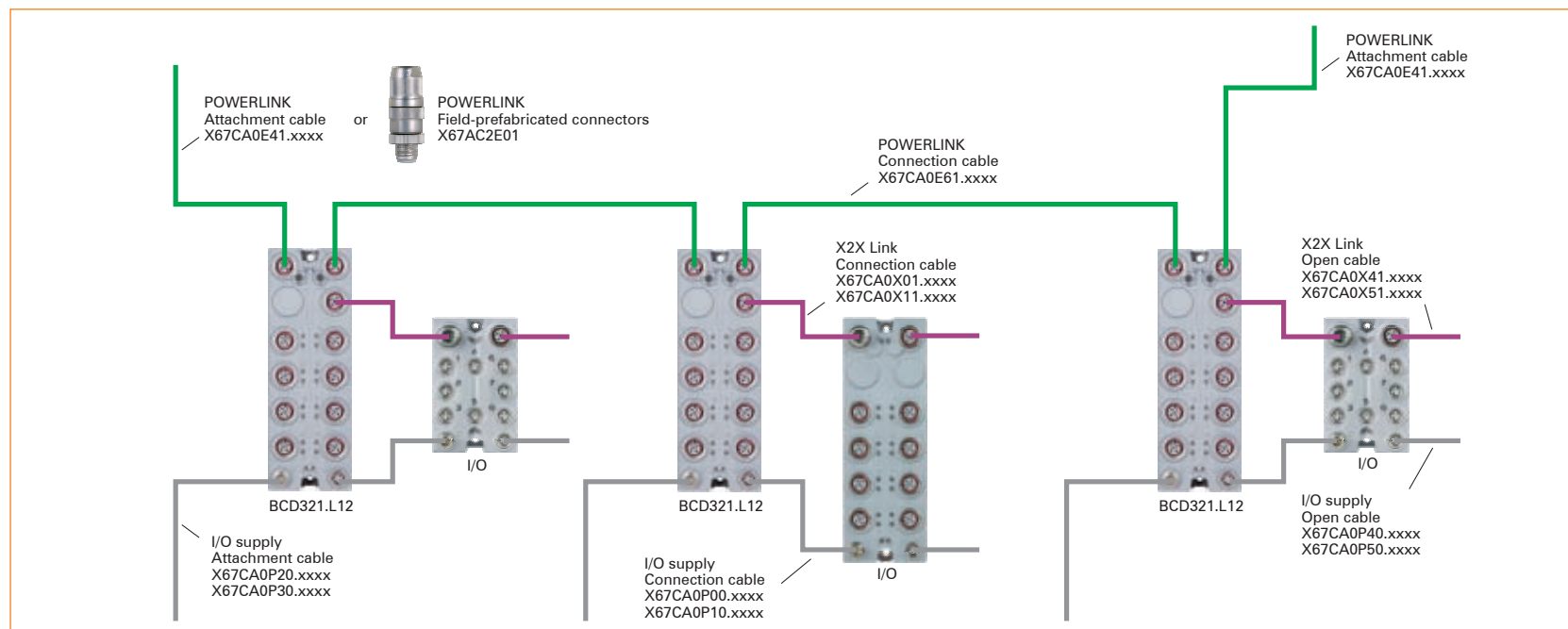
X67 Bus Controller EtherNet/IP

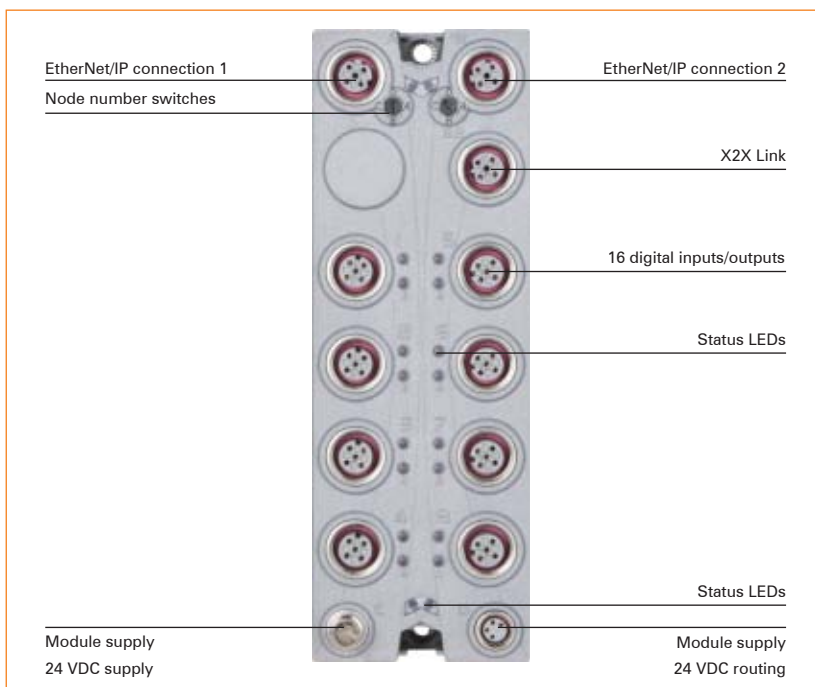
- Fieldbus: EtherNet/IP
- Integrated 3-port switch for efficient cabling
- Integrated Y-connector for fieldbus connection
- Auto configuration of the I/O modules
- Can be configured by the scanner (master) using configuration assembly
- DHCP capable
- 16 digital channels, can be configured as input or output
- Integrated connection to the local expansions via X2X Link for 252 additional modules
- Configurable I/O cycle (0.5 - 4 ms)
- Minimum fieldbus cycle time (also Request Packet Interval or RPI): 1 ms

The EtherNet/IP X67 bus controller makes it possible to connect X2X Link I/O nodes to EtherNet/IP. The bus controller is operated via a corresponding interface module or with external systems that have an EtherNet/IP scanner function. Additional X67 or other X2X Link-based modules can be connected using the integrated X2X Link connection.

Detailed information and support regarding selection, possible configurations, and combinations of digital and analog modules is available on the B&R homepage: www.br-automation.com

Required cables and connectors





Short description	X67BCD321.L12
Bus controller	EtherNet/IP
Inputs/outputs	16 digital channels, configured as inputs or outputs using software, inputs with special functions
Rated voltage	24 VDC
Fieldbus	X67BCD321.L12
Type	Ethernet
Design	Internal 3-port hardware switch, M12 circular plug, 2x socket for the Y-connector integrated in the module
Cable length	Max. 100 m between two stations (segment length)
Transfer rate	10/100 MBit/s Full-duplex / half-duplex Auto negotiation Auto-MDI/MDIX
Digital inputs	X67BCD321.L12
Input filter	
Hardware	$\leq 10 \mu\text{s}$ (channels 1 - 4) / $\leq 70 \text{ ms}$ (channels 5 - 16)
Software	Default 0 ms, can be configured between 0 - 25 ms in 0.2 ms intervals
Input circuit	Sink
Additional functions for inputs	50 kHz event counting, gate measurement
Digital outputs	X67BCD321.L12
Rated output current	0.5 A
Total current	8.0 A
Output circuit	Source
Output protection	Thermal cutoff for over-current and short circuit, integrated protection for switching inductances, reverse polarity protection for output supply
General information	X67BCD321.L12
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED and software status
Outputs	Yes, with status LED and software status
Electrical isolation	
Fieldbus - X2X Link	No
Channel - Bus	Yes
Channel - Channel	No
Sensor/actuator supply	0.5 A total current
Power consumption	
Fieldbus	TBD W
I/O internal	TBD W
X2X Link supply	TBD W at maximum power output for connected I/O modules
Power output	3.0 W X2X Link supply for I/O modules
Connection type	
Fieldbus	M12, D-coded
X2X Link	M12, B-coded
Inputs/outputs	M12, A-coded
Module supply	M8, 4-pin
Certification	CE, cRUus in preparation, GOST-R

Bus Controller EtherNet/IP BCD321.L12

Operational conditions	X67BCD321.L12
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67BCD321.L12
Temperature	-25°C to +85°C
Mechanical characteristics	X67BCD321.L12
Dimensions (W x H x D)	53 x 155 x 42 mm
Weight	320 g
Torque for connections	M8: Max. 0.4 Nm / M12: Max. 0.6 Nm

Digital mixed module DM9321.L12



A unique feature of the DM9321.L12 are the node number switches for setting the X2X Link address. Also see section "Definable X2X Link address", on page 429 in the 2009 product catalog.

- 16 digital mixed channels, can be configured as input or output
- Node number switch for setting the X2X link address
- 1:1 replacement of passive distributors
- Configurable digital input filter
- 2 additional channels with counter functions
- All outputs with single channel diagnostics
- Extensive additional status information

Short description	X67DM9321.L12
I/O module	16 digital channels, configured as inputs or outputs using software, inputs with special functions
Rated voltage	24 VDC
Digital inputs	X67DM9321.L12
Input filter	
Hardware	≤10 μs (channels 1 - 4) / ≤70 ms (channels 5 - 16)
Software	Default 0 ms, can be configured between 0 and 25 ms in 0.2 ms intervals
Input circuit	Sink
Additional functions for inputs	50 kHz event counting, gate measurement
Digital outputs	X67DM9321.L12
Rated output current	0.5 A
Total current	8.0 A
Output circuit	Source
Output protection	Thermal cutoff for over-current and short circuit, integrated protection for switching inductances, reverse polarity protection for output supply
General information	X67DM9321.L12
Status indicators	I/O function for each channel, supply voltage, bus function
Diagnostics	
I/O supply	Yes, with status LED and software status
Outputs	Yes, with status LED and software status
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Sensor/actuator supply	0.5 A total current
Power consumption	
X2X Link supply	0.75 W
Module supply	3.0 W
Connection type - Inputs / outputs	8x M12, A-coded
Certification	CE, cRUus in preparation, GOST-R
Operational conditions	X67DM9321.L12
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67DM9321.L12
Temperature	-25°C to +85°C
Mechanical characteristics	X67DM9321.L12
Dimensions (W x H x D)	53 x 155 x 42 mm
Weight	320 g
Torque for connections	M8: Max. 0.4 Nm / M12: Max. 0.6 Nm

Required accessories

See overview of pin connections

2009 Catalog 506

Interface module IF1121-1



- RS232 and RS485/RS422 can be used
- 2 digital channels, can be configured as inputs or outputs
- 2 digital inputs
- Connection of barcode scanners, ID systems and sensors on one module

Short description	X67IF1121-1
Communication module	1x RS232, 1x RS485/RS422, 2 digital inputs, 2 digital channels can be configured (using software) as inputs or outputs
Interfaces	X67IF1121-1
Interface IF1	
Type	RS232
Maximum transfer rate	115.2 kBit/s
Interface IF2	
Type	RS485/RS422
Maximum transfer rate	115.2 kBit/s
Digital inputs	X67IF1121-1
Amount	Up to 4, if the 2 digital channels are used as digital inputs
Rated voltage	24 VDC
Input filter	
Hardware	≤ 100 μs
Software	Default 0 ms, can be configured between 0 and 25 ms in 0.2 ms intervals
Input circuit	Sink
Digital outputs	X67IF1121-1
Amount	Up to 2, if the 2 digital channels are used as digital outputs
Rated voltage	24 VDC
Rated output current	0.5 A
Total current	1.0 A
Output circuit	Source
Output protection	Thermal cutoff for over-current and short circuit, integrated protection for switching inductances, reverse polarity protection for output supply
General information	X67IF1121-1
Status indicators	RS232, RS485/RS422, I/O function for each channel, supply voltage, bus function
Diagnostics	
RS232	Yes, with status LED
RS485/RS422	Yes, with status LED
I/O supply	Yes, with status LED and software status
Outputs	Yes, with status LED and software status
Electrical isolation	
IF - Bus	Yes
Channel - Bus	Yes
IF - Channel	No
Channel - Channel	No
Sensor/actuator supply	0.5 A total current
Power consumption	
X2X Link supply	0.75 W
I/O internal	2.4 W
Connection type	
X2X Link	M12, B-coded
Interfaces and inputs/outputs	M12, A-coded
Module supply	M8, 4-pin
Certification	
CE, cRUus, GOST-R	
Ex zone 2	II 3G EEx nA II T5, IP67, Ta = 0 - 60°C

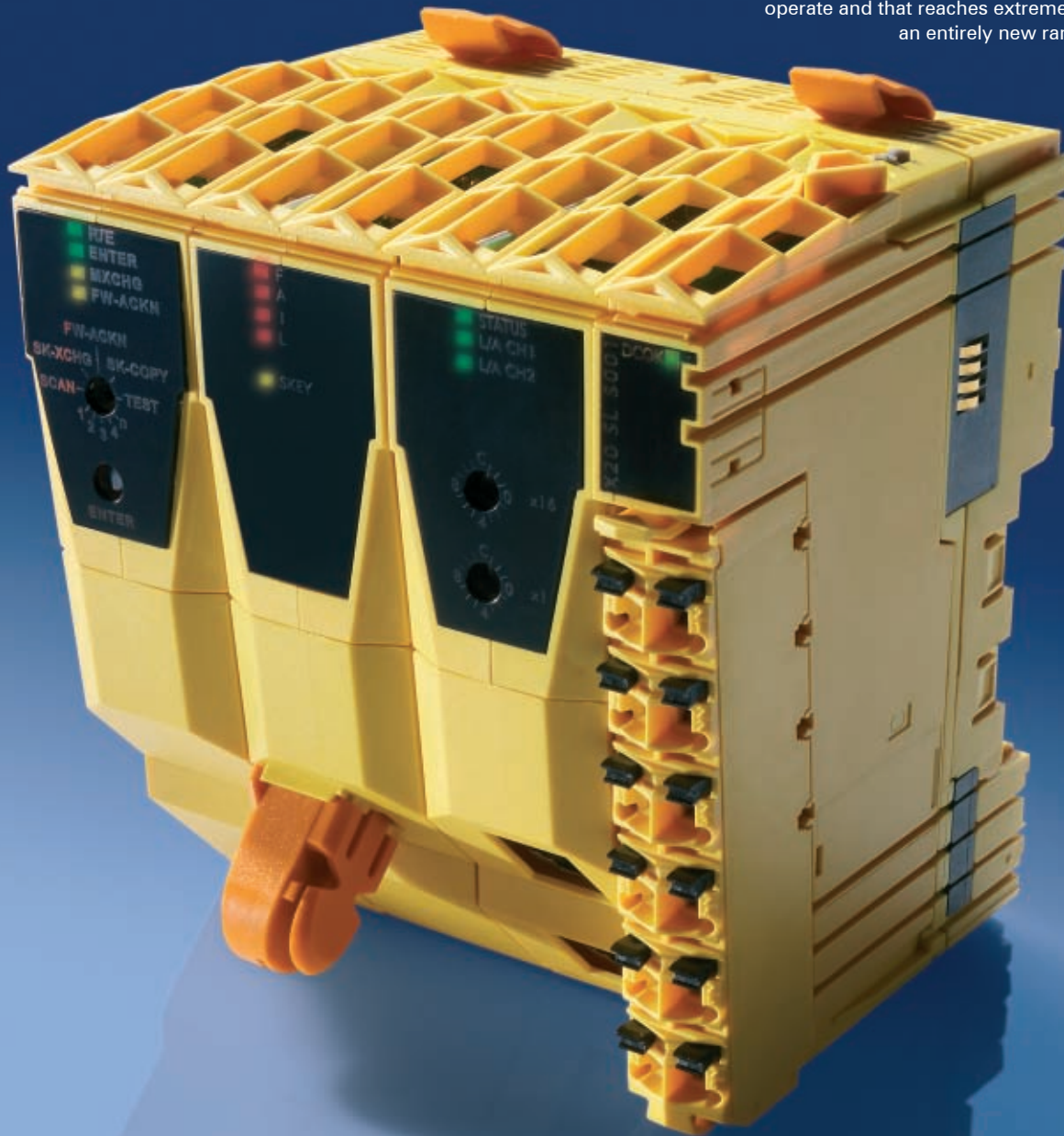
Operational conditions	X67IF1121-1
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2000 m	No derating
> 2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	X67IF1121-1
Temperature	-25°C to +85°C
Mechanical characteristics	X67IF1121-1
Dimensions (W x H x D)	53 x 85 x 42 mm
Weight	190 g
Torque for connections	M8: Max. 0.4 Nm / M12: Max. 0.6 Nm

Required accessories	
See overview of pin connections	2009 Catalog  506



Integrated safety technology Functional safety – Decentralized and intelligent

Safety shut-offs do not always have to involve a full machine shutdown. Smart, safe reactions to various situations provide safety without always stopping the production process. Intelligent, decentralized and integrated safety technology that is simple to operate and that reaches extremely high reaction times opens up an entirely new range of machine safety concepts.



Product overview

X20 System

CPUs



Model number	Short description	
X20SL8010	X20 SafeLOGIC, Safety CPU standard, SafeMC for up to 20 safety nodes incl. SafeMC nodes, exchangeable application memory: Memory key, 1 POWERLINK V2 interface, controlled node, integrated 2x hub, incl. supply module, TB52 terminal block, X20AC0SR1 X20 locking plate (right) included, order memory key separately.	94
X20SL8011	X20 SafeLOGIC, Safety CPU plus, SafeMC for up to 100 safety nodes or SafeMC nodes, 32 machine options, POWERLINK safety gateway, exchangeable application memory: Memory key, 1 POWERLINK V2 interface, controlled node, integrated 2x hub, incl. supply module, TB52 terminal block, X20AC0SR1 X20 locking plate (right) included, order memory key separately.	96

Digital inputs and outputs



Model number	Short description	
X20SC2432	X20 safe digital mixed module, 2 failsafe inputs, 2 pulse outputs, 24 VDC, configurable input filter, 2 relays, normally open contacts, 48 VDC / 6 A, 24 VDC / 6 A	98

The existing product range of X20 safety modules is being expanded to include products with increased protection (IP67).

X67 System

Digital inputs and outputs



Model number	Short description	
X67SC4122.L12	X20 safe digital mixed module, 8 failsafe inputs, 8 pulse outputs, 24 VDC, configurable input filter, 4 failsafe semiconductor outputs, 24 VDC / 2 A	100

SafeLOGIC SL8010



SafeLOGIC controllers handle all central tasks within a safety-related application. Three different functional areas exist here. The configuration management system monitors the entire safety-related configuration of the application. When replacements are needed, the parameter management system makes sure that newly installed modules are assigned correct parameters that apply to the application. Lastly, SafeLOGIC handles the actual safety-related execution of the application program.

Configuration management:

- Ensures a consistent, safety-related machine configuration
- Mechanisms are specified in POWERLINK Safety and are therefore relevant to all manufacturers
- Checks the module type as well as hardware and firmware versions against application specifications
- Checks the configuration at startup and periodically during operation

Parameter management

- Ensures consistent parameters on the devices
- Mechanisms are specified in POWERLINK Safety and are therefore relevant to all manufacturers
- Checks the parameters against application specifications
- Independently performs complete parameter downloads

Application processing

- Cycle time 1 ms and up
- Max. 20 safety nodes

Integrated but separate

Integrated because

- Transparent data exchange between the standard CPU and the SafeLOGIC controller
- Transparent data exchange between the SafeIO and the standard CPU
- Transparent data exchange between the standard I/O and the SafeLOGIC controller
- SafeDESIGNER integrated in Automation Studio

Separate because

- Free choice of standard CPU platform (SoftPLC, X20, ACOPOS, Power Panel) without restrictions by SafeLOGIC
- Scalability of the standard CPU without affecting the SafeLOGIC controller
- Separate management of access rights in Automation Studio

SafeKEY

- Storage medium for the application, configuration, and device parameters.
- Removable so that data can be handled very easily on an initialized SafeLOGIC controller



Short description	SL8010	
System module	CPU	
Processor	Intel XSCALE 266 MHz	
Interfaces	POWERLINK V2	
Controller	SL8010	
Fastest task class cycle time	1 ms	
SafeKEY slot	1 x	
Real-time clock	Nonvolatile memory, resolution 1 second	
Modular interface slots	None	
Fieldbus	SL8010	
Type	POWERLINK V2 100 Base-T (ANSI/IEE 802.3)	
Design	Internal 2x hub, 2x shielded RJ45 port	
Cable length	Max. 100 m between two stations (segment length)	
Transfer rate	100 MBit/s	
CPU supply	SL8010	
Reverse polarity protection	Yes	
Fuse	Yes, not exchangeable	
General information	SL8010	
Status indicators	CPU function, POWERLINK, SafeKEY	
Diagnostics		
CPU function	Yes, with status LED	
POWERLINK	Yes, with status LED	
SafeKEY	Yes, with status LED	
Cooling	Fan-free	
Power consumption	5.1 W	
Certification	CE, C-UL-US, GOST-R, IEC 61508, IEC 62061, ISO 13849	
Functionality	SL8010	
Support of SafeMC (Safe Motion Control)	Yes	
Number of supported safety nodes	Max. 20	
Communication with each other	Communication only possible with a SafeLOGIC SL8001 or SL8011	
Supports machine options	No	
Operational conditions	SL8010	
Operating temperature		
Horizontal installation	0°C to +55°C	
Vertical installation	0°C to +45°C	
Relative humidity	5 to 95%, non-condensing	
Mounting orientation	Horizontal or vertical	
Installation at altitudes above sea level		
0-2,000 m	No derating	
>2,000 m	Reduction of ambient temperature by 0.5°C per 100 m	
Protection type	IP20	
Storage and transport conditions	SL8010	
Temperature	- 25°C to + 70°C	
Relative humidity	5 to 95%, non-condensing	
Mechanical characteristics	SL8010	
Dimensions (W x H x D)	87.5 x 99 x 75 mm	
Comment	Order application memory (SafeKEY) separately X20 locking plate (right) included in delivery X20 terminal block, 12-pin, safety coded, included in delivery SafeKEY cover is included in delivery	
Required accessories	SL8010	
X20MK0201	X20 memory key, 2 MB (SafeKEY)	564
X20MK0203	X20 memory key, 8 MB (SafeKEY)	564

SafeLOGIC SL8011



SafeLOGIC controllers handle all central tasks within a safety-related application. Three different functional areas exist here. The configuration management system monitors the entire safety-related configuration of the application. When replacements are needed, the parameter management system makes sure that newly installed modules are assigned correct parameters that apply to the application. Lastly, SafeLOGIC handles the actual safety-related execution of the application program.

Configuration management:

- Ensures a consistent, safety-related machine configuration.
- Mechanisms are specified in POWERLINK Safety and are therefore relevant to all manufacturers
- Checks the module type as well as hardware and firmware versions against application specifications
- Checks the configuration at startup and periodically during operation

Parameter management

- Ensures consistent parameters on the devices
- Mechanisms are specified in POWERLINK Safety and are therefore relevant to all manufacturers
- Checks the parameters against application specifications
- Independently performs complete parameter downloads

Application processing

- Cycle time 1 ms and up
- Max. 100 safety nodes
- Free communication with any other SafeLOGICs possible
- Supports machine options

Integrated but separate

Integrated because

- Transparent data exchange between the standard CPU and the SafeLOGIC controller
- Transparent data exchange between the SafeIO and the standard CPU
- Transparent data exchange between the standard I/O and the SafeLOGIC controller
- SafeDESIGNER integrated in Automation Studio

Separate because

- Free choice of standard CPU platform (SoftPLC, X20, ACOPOS, Power Panel) without restrictions by SafeLOGIC
- Scalability of the standard CPU without affecting the SafeLOGIC controller
- Separate management of access rights in Automation Studio

SafeKEY

- Storage medium for the application, configuration, and device parameters.
- Removable so that data can be handled very easily on an initialized SafeLOGIC controller



Short description	SL8011	
System module	CPU	
Processor	Intel XSCALE 266 MHz	
Interfaces	POWERLINK V2	
Controller	SL8011	
Fastest task class cycle time	1 ms	
SafeKEY slot	1 x	
Real-time clock	Nonvolatile memory, resolution 1 second	
Modular interface slots	None	
Fieldbus	SL8011	
Type	POWERLINK V2 100 Base-T (ANSI/IEE 802.3)	
Design	Internal 2x hub, 2x shielded RJ45 port	
Cable length	Max. 100 m between two stations (segment length)	
Transfer rate	100 MBit/s	
CPU supply	SL8011	
Reverse polarity protection	Yes	
Fuse	Yes, not exchangeable	
General information	SL8011	
Status indicators	CPU function, POWERLINK, SafeKEY	
Diagnostics		
CPU function	Yes, with status LED	
POWERLINK	Yes, with status LED	
SafeKEY	Yes, with status LED	
Cooling	Fan-free	
Power consumption	5.1 W	
Certification	CE, C-UL-US, GOST-R, IEC 61508, IEC 62061, ISO 13849	
Functionality	SL8011	
Support of SafeMC (Safe Motion Control)	Yes	
Number of supported safety nodes	Max. 100	
Communication with each other	Free communication with any other SafeLOGICs	
Supports machine options	Yes	
Operational conditions	SL8011	
Operating temperature		
Horizontal installation	0°C to +55°C	
Vertical installation	0°C to +45°C	
Relative humidity	5 to 95%, non-condensing	
Mounting orientation	Horizontal or vertical	
Installation at altitudes above sea level		
0-2,000 m	No derating	
>2,000 m	Reduction of ambient temperature by 0.5°C per 100 m	
Protection type	IP20	
Storage and transport conditions	SL8011	
Temperature	- 25°C to + 70°C	
Relative humidity	5 to 95%, non-condensing	
Mechanical characteristics	SL8011	
Dimensions (W x H x D)	87.5 x 99 x 75 mm	
Comment	Order application memory (SafeKEY) separately X20 locking plate (right) included in delivery X20 terminal block, 12-pin, safety coded, included in delivery SafeKEY cover is included in delivery	
Required accessories	SL8011	
X20MK0201	X20 memory key, 2 MB (SafeKEY)	564
X20MK0203	X20 memory key, 8 MB (SafeKEY)	564

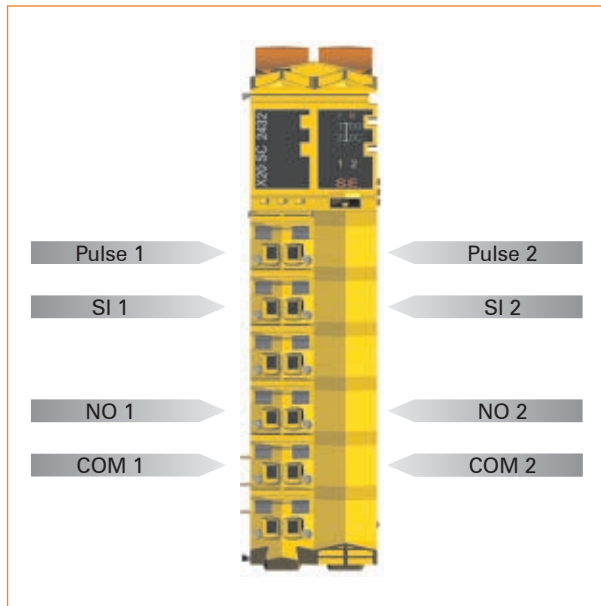
Safe digital mixed module SC2432



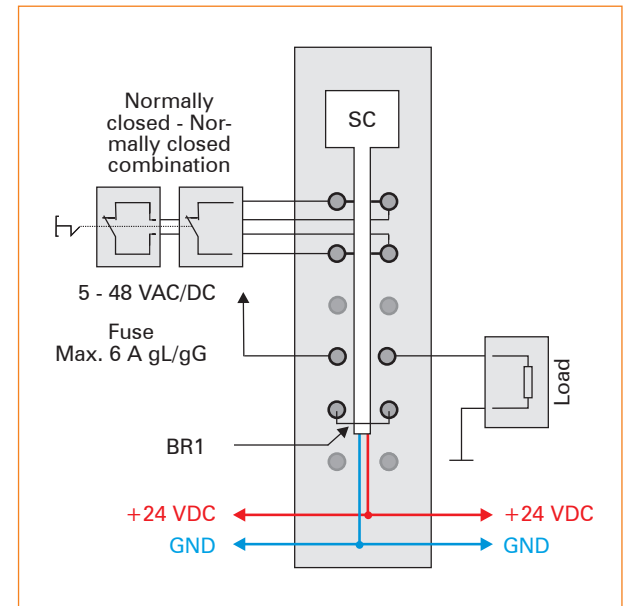
- 2 failsafe digital inputs
- 2 clock outputs
- 2 failsafe relay outputs

Short description		SC2432
I/O module		2 failsafe digital inputs, 2 clock outputs, 24 VDC, 2 failsafe relay outputs, 48 VAC / 6 A, 24 VDC / 6 A
Digital inputs		SC2432
Rated voltage		24 VDC
Input filter		
Hardware		≤150 μs
Software		Configurable between 0 and 500 ms
Input circuit		Sink
Digital clock outputs		SC2432
Design		Push-Pull
Switching voltage		24 VDC (-15% / +20%)
Rated output current		50 mA
Total current		100 mA
Output protection		Thermal cutoff of individual channels for over-current or short circuit
Relay outputs		SC2432
Switching Voltage Range		5 - 24 VDC, 5 - 48 VAC
Switching current range		5 mA - 6 A
Delay		<50 ms
General information		SC2432
Status indicators		I/O function per channel, operating state, module status
Diagnostics		
Module run/error		Yes, with status LED and software status
Inputs		Yes, with status LED
Outputs		Yes, with status LED and software status (output error status)
Electrical isolation		
Channel - Bus		Yes
Channel - Channel		No
Power consumption		
Bus		0.26 W
I/O internal		1.15 W
Certification		CE, C-UL-US, GOST-R, IEC 61508, IEC 62061, ISO 13849
Relay		EN 50155, EN 50205
Operational conditions		SC2432
Operating temperature		
Horizontal installation		0°C to +55°C, see data sheet for derating information
Vertical installation		0°C to +50°C, see data sheet for derating information
Relative humidity		5 to 95%, non-condensing
Mounting orientation		Horizontal or vertical
Installation at altitudes above sea level		
0 - 2,000 m		No derating
>2,000 m		Reduction of ambient temperature by 0.5°C per 100 m
Protection type		IP20
Storage and transport conditions		SC2432
Temperature		-25°C to +70°C
Relative humidity		5 to 95%, non-condensing
Mechanical characteristics		SC2432
Spacing		25 ^{+0.2} mm
Comment		Order safety coded terminal block 1 x X20TB52 separately Order safety coded bus module 1x X20BM33 separately

Pin assignments



Connection example



Required accessories

X20TB52	X20 terminal block, 12-pin, safety coded	547
X20BM33	X20 bus module, safety coded, internal I/O supply is interconnected	546

Safe digital mixed module SC4122.L12



- 8 failsafe digital inputs
- 8 clock outputs
- 4 failsafe digital semiconductor outputs
- Integrated output protection

Short description	SC4122.L12
I/O module	8 failsafe digital inputs, 8 clock outputs, 4 failsafe digital semiconductor outputs
Digital inputs	SC4122.L12
Rated voltage	24 VDC
Input filter	
Hardware	≤ 150 μs
Software	Configurable between 0 and 100 ms
Input circuit	Sink
Digital outputs	SC4122.L12
Rated voltage	24 VDC
Rated output current	2 A
Total current	5 A
Output protection	Thermal cutoff of individual channels for over-current or short circuit
Digital clock outputs	SC4122.L12
Design	Push-Pull
Rated voltage	24 VDC
Rated output current	50 mA
Total current	400 mA
Output protection	Thermal cutoff of individual channels for over-current or short circuit
General information	SC4122.L12
Status indicators	I/O function per channel, operating state, module status
Diagnostics	
Module run/error	Yes, with status LED and software status
Outputs	Yes, with status LED and software status
Inputs	Yes, with status LED
Electrical isolation	
Channel - Bus	Yes
Channel - Channel	No
Power consumption	
Bus	0.9 W
I/O internal	1.4 W
Connection type	
X2X Link	M12 (B-coded)
Inputs/outputs	M12 (A-coded)
Module supply	M8 (4-pin)
Certification	CE, cRUus, GOST-R IEC 61508, IEC 62061, ISO 13849 in preparation
Ex zone 2	II 3G EEx nA II T5, IP67, Ta = 0 - 60°C
Operational conditions	SC4122.L12
Operating temperature	0°C to +60°C
Mounting orientation	Any
Installation at altitudes above sea level	
0 - 2,000 m	No derating
>2,000 m	Reduction of ambient temperature by 0.5°C per 100 m
Protection type	IP67
Storage and transport conditions	SC4122.L12
Temperature	-25°C to +85°C
Mechanical characteristics	SC4122.L12
Dimensions (W x H x D)	53 x 155 x 42 mm
Weight	320 g
Torque for connections	
M8	Max. 0.4 Nm
M12	Max. 0.6 Nm

Required accessories

See overview of pin connections

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Power supplies

Switching power supplies and accessories

The supplementary power supplies offered by B&R allow us to provide complete system solutions.



System characteristics

Power supply on the mounting rail

In order to meet demands for complete, comprehensive system solutions, power supplies are available in the B&R product line for mounting rail installation. This extensive spectrum ranges from single-phase power supplies that supply 2 A up to three-phase power supplies that supply 40 A. All switching power supplies can handle a wide range of AC and DC input voltages. This input ranges from 100 to 240 VAC or 400 to 500 VAC and from 90 to 350 VDC. In addition to a wide voltage input range, the devices are also certified for a wide temperature range from -25°C to +70°C. All current supplies have short-circuit, overload, and open-circuit protection.

The lower power range up to 100 W contains four highly compact power supplies (PS1020, PS1025, PS1040 and PS1042) in robust plastic housing. The functional DIN rail allows fast mounting and removal. The functional compact design and easy mounting make the two smallest power supplies in this product line components that can be used practically anywhere.

All other power supplies (starting with PS1050) feature a metal housing that protects the internal electronics from small parts (such as screws) using a ventilation grid. Sophisticated mounting mechanics enable user-friendly installation on the mounting rail. Simply hang the unit on the rail, snap it in and you are finished. Even the 40 A unit sits as though it were screwed in.

Optimal layout of the connections and control elements

The connection terminals and control elements are clearly arranged on the front side and are clearly labeled. The terminals are easily accessible on the bottom and/or top edges on the front of the unit. The large size and stability of the terminals also allow the use of a battery-operated screw driver. Furthermore, the terminals are designed so that the cable does not require heat protection even when using larger devices. These units also have a third minus terminal for easy secondary grounding, thereby further reducing installation costs.

Safety is important to us

Electronic current limiting protects the electronic installation from overloads and short-circuits. The **over-voltage protection** protects connected devices in the event that the controlled system fails. The **over-temperature protection** initiates a continuous reduction of output power when the temperature gets too high until the temperature has returned to the permissible range (thermal load distribution).

Overload behavior

To prevent your devices from immediately shutting off when a minimal overload occurs, these power supplies operate according to a U/I characteristic curve on which the operating point moves:

- **Output characteristics:** The U/I characteristic ensures that highly capacitive loads as well as consumers with DC/DC converters in the input circuit are reliably supplied.
- **Overload design:** The output current is limited if a short-circuit or overload occurs. Instead of switching off immediately, the unit delivers a continuous output current. The secondary voltage is also lowered until the secondary short-circuit or overload has been corrected. Downstream fuses are triggered. Identical power supplies can be connected in parallel without creating any sort of startup problems.

Electromagnetic compatibility (EMC)

All units meet the EN 61000-6-3 (emissions) and EN 61000-6-2 (immunity to disturbances) standards in the highest respective classes. Furthermore, noise suppression is also provided on the output so that even long, unshielded lines do not emit noise.

Also provided:

- **Transient overload protection**, to protect the device from voltage spikes on the mains.
- **Starting current limitation**, which is also functional on warm units. As a result, even the PS3400 (24 V / 40 A) allows protection using standard circuit breakers, which are used in the feed line in any case.

In addition to these functions, EMC will also be included with the CE certification. The power supplies also meet the EN 50178, EN 60204-1 and UL508 LISTED standards in addition to the standard international certifications (IEC 60950, EN 60950, UL 60950, CUL CSA-C22.2 No 60950).

Selection guide

	0PS1020.0	0PS1040.0	0PS1025.2	0PS1042.2	0PS1050.1	0PS1100.1	0PS1200.1	0PS3050.1	0PS3100.1	0PS3200.1	0PS3400.1
Output power	48 W	96 W	60 W	100 W	120 W	240 W	480 W	120 W	240 W	480 W	960 W
AC input voltage	85-264 V	85-264 V	85-264 V	85-264 V	85-264 V	85-264 V	85-264 V	320-575 V	320-575 V	320-575 V	320-575 V
DC input voltage	90-350 V	90-350 V	95-250 V	95-250 V	-	-	-	-	-	-	-
Output voltage	22.5-28.5 V	22.5-28.5 V	22.5-29.5 V	22.5-29.5 V	22.5-29.5 V	22.5-29.5 V	22.5-29.5 V	22.5-29.5 V	22.5-29.5 V	22.5-29.5 V	22.5-29.5 V
Output current at 24 V	2 A	4 A	2.5 A	4.2 A	5 A	10 A	20 A	5 A	10 A	20 A	40 A
Parallel operation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of phases	1	1	1	1	1	1	1	2/3	2/3	3	3
Page	106	107	108	109	110	111	112	113	114	115	116

Product overview

Single-phase power supplies



Model number	Short description	
OPS1020.0	24 VDC power supply, 1-phase, 2 A, input 100 - 240 VAC, wide range, DIN rail mounting	106
OPS1040.0	24 VDC power supply, 1-phase, 4 A, input 100 - 240 VAC, wide range, DIN rail mounting	107
OPS1025.2	24 VDC power supply, 1-phase, 2.5 A, input 100 - 240 VAC, wide range, DIN rail mounting	108
OPS1042.2	24 VDC power supply, 1-phase, 4.2 A, input 100 - 240 VAC, wide range, DIN rail mounting	109
OPS1050.1	24 VDC power supply, 1-phase, 5 A, input 100 - 240 VAC, wide range, DIN rail mounting	110
OPS1100.1	24 VDC power supply, 1-phase, 10 A, input 100 - 240 VAC, wide range, DIN rail mounting	111
OPS1200.1	24 VDC power supply, 1-phase, 20 A, input 100 - 240 VAC, wide range, DIN rail mounting	112

Three-phase power supplies



Model number	Short description	
OPS3050.1	24 VDC power supply, 3-phase, 5 A, input 400 - 500 VAC, wide range, DIN rail mounting	113
OPS3100.1	24 VDC power supply, 3-phase, 10 A, input 400 - 500 VAC, wide range, DIN rail mounting	114
OPS3200.1	24 VDC power supply, 3-phase, 20 A, input 400 - 500 VAC, wide range, DIN rail mounting	115
OPS3400.1	24 VDC power supply, 3-phase, 40 A, input 400 - 500 VAC, wide range, DIN rail mounting	116

Buffer module



Model number	Short description	
OPB0200.1	24 VDC buffer module, 0 - 20 A, buffer time from 0.2 s at 20 A to 4 s at 1 A, DIN rail mounting	118

PS1020



- 100 - 240 VAC wide range input
- Power boost for reliable startup of demanding loads (up to 2.9 A)
- Can be connected in parallel for power increase and redundancy
- Active DC OK switch output
- Reliable operation due to long power failure bypass function under full load and high MTBF (>500,000 h)
- International certification package
- Wide temperature range from -25 to +70°C
- Extra slender design

Input		OPS1020.0
Input voltage	AC 85 - 264 V (wide range), 45 - 65 Hz	DC 90 - 350 V
Input current	Approx. 1.4 A (120 VAC)	Approx. 0.8 A (230 VAC)
Protective circuit	Transient over-voltage protection - Varistor	
Input fuse, integrated	2.5 A slow-blow	
Recommended pre-fusing for line protection	10 A (characteristic B)	16 A (characteristic B)
Output		OPS1020.0
Output power	48 W	
Rated voltage	24 VDC ±1%	
Setting range for output voltage	22.5 - 28.5 VDC	
Output current	2.0 A	
-25 to +60°C	Derating: 5% per °C	
>60°C		
Over-voltage protection against internal over-voltages	Yes, limited to approximately 33 VDC	
Protection functions	Output protected against continuous short circuit, open circuit and overload	
Power back immunity	Max. 30 VDC	
Output noise suppression	Unit complies with EN 55011 (class B)	
General information		OPS1020.0
Operation indicator	Green LED (DC OK), threshold $U_{out} = 21.5$ V	
Active DC OK switch output	For controlling a 24 V relay	
Type of connection	Screw clamp	
Connection cross section		
Fixed	0.2 - 2.5 mm ² / 24 - 12 AWG	
Flexibility	0.2 - 2.5 mm ² / 24 - 12 AWG	
Wire tip sleeves	Flexible cables require wire tip sleeves in order to fulfill EN 60950/UL 60950	
Certification	CE, C-UL-US, cRUus, GOST-R	
Efficiency, reliability		OPS1020.0
Efficiency	>85% (at 230 VAC and rated values)	
Power loss		
Rated load	Max. 10 W	
No-load operation	Max. 2 W	
MTBF (reliability)	>500,000 h	
Operational conditions		OPS1020.0
Operating temperature	-25 to +70°C (>60°C derating)	
Relative humidity	Max. 95%, non-condensing	
Ventilation / Cooling	Normal convection, no fan required	
Protection type	IP20	
Storage and transport conditions		OPS1020.0
Temperature	-40 to +85°C	
Relative humidity	Max. 95%, non-condensing	
Mechanical characteristics		OPS1020.0
Installation	Easy mounting on DIN rail	
Dimensions (W x H x D [mm])	45 x 99 x 114.5	
Weight	250 g	

PS1040



- 100 - 240 VAC wide range input
- Power boost for reliable startup of demanding loads (up to 5 A)
- Can be connected in parallel for power increase and redundancy
- Active DC OK switch output
- Reliable operation due to long power failure bypass function under full load and high MTBF (>500,000 h)
- International certification package
- Wide temperature range from -25 to +70°C
- Extra slender design

Input		0PS1040.0
Input voltage	AC 85 - 264 V (wide range), 45 - 65 Hz	DC 90 - 350 V
Input current	Approx. 1.3 A (120 VAC)	Approx. 0.8 A (230 VAC)
Protective circuit	Transient over-voltage protection - Varistor	
Input fuse, integrated	3.15 A slow-blow	
Recommended pre-fusing for line protection	6 A	10 A
	16 A (characteristic B)	
Output		0PS1040.0
Output power	96 W	
Rated voltage	24 VDC \pm 1%	
Setting range for output voltage	22.5 - 28.5 VDC	
Output current	4.0 A	
-25 to +60°C	Derating: 2.5% per °C	
>60°C		
Over-voltage protection against internal over-voltages	Yes, limited to approximately 35 VDC	
Protection functions	Output protected against continuous short circuit, open circuit and overload	
Power back immunity	Max. 35 VDC	
Output noise suppression	Unit complies with EN 55011 (class B)	
General information		0PS1040.0
Operation indicator	Green LED (DC OK), threshold $U_{out} = 21.5$ V	
Active DC OK switch output	For controlling a 24 V relay	
Type of connection	Screw clamp	
Connection cross section		
Fixed	0.2 - 2.5 mm ² / 24 - 12 AWG	
Flexibility	0.2 - 2.5 mm ² / 24 - 12 AWG	
Wire tip sleeves	Flexible cables require wire tip sleeves in order to fulfill EN 60950/UL 60950	
Certification	CE, C-UL-US, cRUus, GOST-R	
Efficiency, reliability		0PS1040.0
Efficiency	>88% (at 230 VAC and rated values)	
Power loss		
Rated load	Max. 12 W	
No-load operation	Max. 2.5 W	
MTBF (reliability)	>500,000 h	
Operational conditions		0PS1040.0
Operating temperature	-25 to +70°C (>60°C derating)	
Relative humidity	Max. 95%, non-condensing	
Ventilation / Cooling	Normal convection, no fan required	
Protection type	IP20	
Storage and transport conditions		0PS1040.0
Temperature	-40 to +85°C	
Relative humidity	Max. 95%, non-condensing	
Mechanical characteristics		0PS1040.0
Installation	Easy mounting on DIN rail	
Dimensions (W x H x D [mm])	67.5 x 99 x 107	
Weight	400 g	

PS1025



- 100 - 240 VAC wide range input
- Can be connected in parallel for power increase and redundancy
- Reliable operation due to long power failure bypass function under full load and high MTBF (>500,000 h)
- International certification package
- Wide temperature range from -25 to +70°C
- Extra flat design
- Easy DIN rail or wall mounting

Input		OPS1025.2
Input voltage	AC 85 - 264 V (wide range), 45 - 65 Hz	DC 95 - 250 V
Input current	Approx. 0.8 A (120 VAC)	Approx. 0.4 A (230 VAC)
Protective circuit	Transient over-voltage protection - Varistor	
Input fuse, integrated	3.15 A slow-blow	
Recommended pre-fusing for line protection	6 A (characteristic B)	10 A (characteristic B)
	16 A (characteristic B)	
Output		OPS1025.2
Output power	60 W	
Rated voltage	24 VDC ±1%	
Setting range for output voltage	22.5 - 29.5 VDC (>24 VDC power constant)	
Output current	2.5 A	
-25 to +55°C	Derating: 2.5% per °C	
>55°C		
Over-voltage protection against internal over-voltages	Yes, limited to approximately 35 VDC	
Protection functions	Output protected against continuous short circuit, open circuit and overload	
Power back immunity	Max. 35 VDC	
Output noise suppression	Unit complies with EN 55011 (class B)	
General information		OPS1025.2
Operation indicator	Green LED (DC OK), threshold $U_{out} = 21.5$ V	
Type of connection	Screw clamp	
Connection cross section		
Fixed	0.2 - 2.5 mm ² / 24 - 12 AWG	
Flexibility	0.2 - 2.5 mm ² / 24 - 12 AWG	
Wire tip sleeves	Flexible cables require wire tip sleeves in order to fulfill EN 60950/UL 60950	
Certification	CE, C-UL-US, cRUus, GOST-R	
Efficiency, reliability		OPS1025.2
Efficiency	>86% (at 230 VAC and rated values)	
Power loss		
Rated load	Max. 9.9 W	
No-load operation	Max. 0.7 W	
MTBF (reliability)	>500,000 h	
Operational conditions		OPS1025.2
Operating temperature	-25 to +70°C (>55°C derating)	
Relative humidity	Max. 95%, non-condensing	
Ventilation / Cooling	Normal convection, no fan required	
Protection type	IP20	
Storage and transport conditions		OPS1025.2
Temperature	-40 to +85°C	
Relative humidity	Max. 95%, non-condensing	
Mechanical characteristics		OPS1025.2
Installation	Easy DIN rail or wall mounting	
Dimensions (W x H x D [mm])	72 x 90 x 61	
Weight	300 g	

PS1042



- 100 - 240 VAC wide range input
- Can be connected in parallel for power increase and redundancy
- Reliable operation due to long power failure bypass function under full load and high MTBF (>500,000 h)
- International certification package
- Wide temperature range from -25 to +70°C
- Extra flat design
- Easy DIN rail or wall mounting

Input		0PS1042.2
Input voltage	AC 85 - 264 V (wide range), 45 - 65 Hz	DC 95 - 250 V
Input current	Approx. 1.3 A (120 VAC)	Approx. 0.8 A (230 VAC)
Protective circuit	Transient over-voltage protection - Varistor	
Input fuse, integrated	4 A slow-blow	
Recommended pre-fusing for line protection	6 A (characteristic B)	10 A (characteristic B)
	16 A (characteristic B)	
Output		0PS1042.2
Output power	100 W	
Rated voltage	24 VDC \pm 1%	
Setting range for output voltage	22.5 - 29.5 VDC (>24 VDC power constant)	
Output current	-25 to +55°C	4.2 A
	>55°C	Derating: 2.5% per °C
Over-voltage protection against internal over-voltages	Yes, limited to approximately 35 VDC	
Protection functions	Output protected against continuous short circuit, open circuit and overload	
Power back immunity	Max. 35 VDC	
Output noise suppression	Unit complies with EN 55011 (class B)	
General information		0PS1042.2
Operation indicator	Green LED (DC OK), threshold $U_{out} = 21.5$ V	
Type of connection	Screw clamp	
Connection cross section		
Fixed	0.2 - 2.5 mm ² / 24 - 12 AWG	
Flexibility	0.2 - 2.5 mm ² / 24 - 12 AWG	
Wire tip sleeves	Flexible cables require wire tip sleeves in order to fulfill EN 60950/UL 60950	
Certification	CE, C-UL-US, cRUus, GOST-R	
Efficiency, reliability		0PS1042.2
Efficiency	>88% (at 230 VAC and rated values)	
Power loss		
Rated load	Max. 13.2 W	
No-load operation	Max. 0.7 W	
MTBF (reliability)	>500,000 h	
Operational conditions		0PS1042.2
Operating temperature	-25 to +70°C (>55°C derating)	
Relative humidity	Max. 95%, non-condensing	
Ventilation / Cooling	Normal convection, no fan required	
Protection type	IP20	
Storage and transport conditions		0PS1042.2
Temperature	-40 to +85°C	
Relative humidity	Max. 95%, non-condensing	
Mechanical characteristics		0PS1042.2
Installation	Easy DIN rail or wall mounting	
Dimensions (W x H x D [mm])	90 x 90 x 61	
Weight	400 g	

PS1050



- 100 - 240 VAC wide range input
- High dielectric strength
- Can be connected in parallel for power increase and redundancy
- Reliable operation due to long power failure bypass function under full load and high MTBF (>500,000 h)
- International certification package
- Wide temperature range from -25 to +70°C
- Slender design
- Closed metal housing

Input	OPS1050.1
Input voltage	AC 85 - 264 V (wide range), 45 - 65 Hz
Input current	Approx. 1.65 A (120 VAC) Approx. 0.9 A (230 VAC)
Protective circuit	Transient over-voltage protection - Varistor
Input fuse, integrated	3.15 A slow-blow
Recommended pre-fusing for line protection	6 A 10 A 16 A (characteristic B)
Output	OPS1050.1
Output power	120 W
Rated voltage	24 VDC ±1%
Setting range for output voltage	22.5 - 29.5 VDC
Output current	-25 to +55°C >55°C
	5.0 A Derating: 2.5% per °C
Over-voltage protection against internal over-voltages	Yes, limited to <35 VDC
Protection functions	Output protected against continuous short circuit, open circuit and overload
Power back immunity	Max. 35 VDC
Output noise suppression	Unit complies with EN 55011 (class B)
General information	OPS1050.1
Operation indicator	Green LED (DC OK), threshold $U_{out} = 21.5$ V
Type of connection	Screw clamp
Connection cross section	
Fixed	0.2 - 2.5 mm ² / 24 - 14 AWG
Flexibility	0.2 - 2.5 mm ² / 24 - 14 AWG
Wire tip sleeves	Flexible cables require wire tip sleeves in order to fulfill EN 60950/UL 60950
Certification	CE, C-UL-US, cRUus, GOST-R
Efficiency, reliability	OPS1050.1
Efficiency	>89%
Power loss	
Rated load	Max. 18 W
No-load operation	Max. 1.1 W
MTBF (reliability)	>500,000 h
Operational conditions	OPS1050.1
Operating temperature	-25 to +70°C (>55°C derating)
Relative humidity	Max. 95%, non-condensing
Ventilation / Cooling	Normal convection, no fan required
Protection type	IP20
Storage and transport conditions	OPS1050.1
Temperature	-40 to +85°C
Relative humidity	Max. 95%, non-condensing
Mechanical characteristics	OPS1050.1
Installation	Easy mounting on DIN rail
Dimensions (W x H x D [mm])	40 x 130 x 115
Weight	600 g

PS1100



- 100 - 240 VAC wide range input
- High dielectric strength
- Can be connected in parallel for power increase and redundancy
- Reliable operation due to long power failure bypass function under full load and high MTBF (>500,000 h)
- International certification package
- Wide temperature range from -25 to +70°C
- Closed metal housing

Input	0PS1100.1
Input voltage	AC 85 - 264 V (wide range), 45 - 65 Hz
Input voltage <90 VAC	Derating of the output current: 2.5% per °C
Input current	Approx. 2.5 A (120 VAC) Approx. 1.3 A (230 VAC)
Protective circuit	Transient over-voltage protection - Varistor
Input fuse, integrated	10 A slow-blow
Recommended pre-fusing for line protection	10 A 16 A (characteristic B)
Output	0PS1100.1
Output power	240 W
Rated voltage	24 VDC ±1%
Setting range for output voltage	22.5 - 29.5 VDC
Output current	
-25 to +55°C	10.0 A
>55°C	Derating: 2.5% per °C
Over-voltage protection against internal over-voltages	Yes, limited to <35 VDC
Protection functions	Output protected against continuous short circuit, open circuit and overload
Power back immunity	Max. 35 VDC
Output noise suppression	Unit complies with EN 55011 (class B)
General information	0PS1100.1
Operation indicator	Green LED (DC OK), threshold $U_{out} = 21.5$ V
Type of connection	Screw clamp
Connection cross section	
Fixed	0.2 - 2.5 mm ² / 24 - 14 AWG
Flexibility	0.2 - 2.5 mm ² / 24 - 14 AWG
Wire tip sleeves	Flexible cables require wire tip sleeves in order to fulfill EN 60950/UL 60950
Certification	CE, C-UL-US, cRUus, GOST-R
Efficiency, reliability	0PS1100.1
Efficiency	>89%
Power loss	
Rated load	Max. 28 W
No-load operation	Max. 3.5 W
MTBF (reliability)	>500,000 h
Operational conditions	0PS1100.1
Operating temperature	-25 to +70°C (>55°C derating)
Relative humidity	Max. 95%, non-condensing
Ventilation / Cooling	Normal convection, no fan required
Protection type	IP20
Storage and transport conditions	0PS1100.1
Temperature	-40 to +85°C
Relative humidity	Max. 95%, non-condensing
Mechanical characteristics	0PS1100.1
Installation	Easy mounting on DIN rail
Dimensions (W x H x D [mm])	60 x 130 x 152.5
Weight	1100 g

PS1200



- 100 - 240 VAC wide range input
- High dielectric strength
- Can be connected in parallel for power increase and redundancy
- Reliable operation due to long power failure bypass function under full load and high MTBF (>500,000 h)
- International certification package
- Wide temperature range from -25 to +70°C
- Closed metal housing

Input	OPS1200.1
Input voltage	AC 85 - 264 V (wide range), 45 - 65 Hz
Input voltage <90 VAC	Derating of the output current: 2.5% per °C
Input current	Approx. 4.6 A (120 VAC) Approx. 2.4 A (230 VAC)
Protective circuit	Transient over-voltage protection - Varistor
Input fuse, integrated	10 A slow-blow
Recommended pre-fusing for line protection	16 A (characteristic B)
Output	OPS1200.1
Output power	480 W
Rated voltage	24 VDC ±1%
Setting range for output voltage	22.5 - 29.5 VDC
Output current	
-25 to +55°C	20.0 A
>55°C	Derating: 2.5% per °C
Over-voltage protection against internal over-voltages	Yes, limited to <35 VDC
Protection functions	Output protected against continuous short circuit, open circuit and overload
Power back immunity	Max. 35 VDC
Output noise suppression	Unit complies with EN 55011 (class B)
General information	OPS1200.1
Operation indicator	Green LED (DC OK), threshold $U_{out} = 21.5$ V
Type of connection	Screw clamp
Connection cross section - Input	
Fixed	0.2 - 2.5 mm ² / 24 - 14 AWG
Flexibility	0.2 - 2.5 mm ² / 24 - 14 AWG
Wire tip sleeves	Flexible cables require wire tip sleeves in order to fulfill EN 60950/UL 60950
Connection cross section - Output	
Fixed	0.5 - 6 mm ² / 20 - 10 AWG
Flexibility	0.5 - 4 mm ² / 20 - 10 AWG
Wire tip sleeves	Flexible cables require wire tip sleeves in order to fulfill EN 60950/UL 60950
Certification	CE, C-UL-US, cRUus, GOST-R
Efficiency, reliability	OPS1200.1
Efficiency	>91%
Power loss	
Rated load	Max. 46 W
No-load operation	Max. 4 W
MTBF (reliability)	>500,000 h
Operational conditions	OPS1200.1
Operating temperature	-25 to +70°C (>55°C derating)
Relative humidity	Max. 95%, non-condensing
Ventilation / Cooling	Normal convection, no fan required
Protection type	IP20
Storage and transport conditions	OPS1200.1
Temperature	-40 to +85°C
Relative humidity	Max. 95%, non-condensing
Mechanical characteristics	OPS1200.1
Installation	Easy mounting on DIN rail
Dimensions (W x H x D [mm])	115 x 130 x 152.5
Weight	2000 g

PS3050



- 400 - 500 VAC wide range input
- 2-phase and 3-phase operation
- Reliable supply even if one phase fails in 3-phase operation
- High dielectric strength
- Can be connected in parallel for power increase and redundancy
- Reliable operation due to long power failure bypass function under full load and high MTBF (>500,000 h)
- International certification package
- Wide temperature range from -25 to +70°C
- Closed metal housing

Input		0PS3050.1
Input voltage	3 x 320 - 575 VAC, 45 - 65 Hz 2 x 360 - 575 VAC, 45 - 65 Hz	
Input current	Approx. 3 x 0.3 A (400 VAC) Approx. 3 x 0.3 A (500 VAC) 2 x 0.65 A (400 VAC) 2 x 0.5 A (500 VAC)	
Protective circuit	Transient over-voltage protection - Varistor	
Necessary pre-fusing for devices and Line protection	2/3 x 6 A (characteristic B) 2/3 x 10 A (characteristic B) 2/3 x 16 A (characteristic B)	
Output		0PS3050.1
Output power	120 W	
Rated voltage	24 VDC ±1%	
Setting range for output voltage	22.5 - 29.5 VDC	
Output current	-25 to +55°C >55°C	5.0 A Derating: 2.5% per °C
Over-voltage protection against internal over-voltages	Yes, limited to <35 VDC	
Protection functions	Output protected against continuous short circuit, open circuit and overload	
Power back immunity	Max. 35 VDC	
Output noise suppression	Unit complies with EN 55011 (class B)	
General information		0PS3050.1
Operation indicator	Green LED (DC OK), threshold $U_{out} = 21.5$ V	
Type of connection	Screw clamp	
Connection cross section - Input		
Fixed	0.2 - 2.5 mm ² / 24 - 14 AWG	
Flexibility	0.2 - 2.5 mm ² / 24 - 14 AWG	
Wire tip sleeves	Flexible cables require wire tip sleeves in order to fulfill EN 60950/UL 60950	
Connection cross section - Output		
Fixed	0.2 - 2.5 mm ² / 16 - 12 AWG	
Flexibility	0.2 - 2.5 mm ² / 16 - 12 AWG	
Wire tip sleeves	Flexible cables require wire tip sleeves in order to fulfill EN 60950/UL 60950	
Certification	CE, C-UL-US, cRUus, GOST-R	
Efficiency, reliability		0PS3050.1
Efficiency	>89%	
Power loss		
Rated load	Max. 15 W	
No-load operation	Max. 4 W	
MTBF (reliability)	>500,000 h	
Operational conditions		0PS3050.1
Operating temperature	-25 to +70°C (>55°C derating)	
Relative humidity	Max. 95%, non-condensing	
Ventilation / Cooling	Normal convection, no fan required	
Protection type	IP20	
Storage and transport conditions		0PS3050.1
Temperature	-40 to +85°C	
Relative humidity	Max. 95%, non-condensing	
Mechanical characteristics		0PS3050.1
Installation	Easy mounting on DIN rail	
Dimensions (W x H x D [mm])	40 x 130 x 115	
Weight	600 g	

PS3100



- 400 - 500 VAC wide range input
- 2-phase and 3-phase operation
- Reliable supply even if one phase fails in 3-phase operation
- High dielectric strength
- Can be connected in parallel for power increase and redundancy
- Reliable operation due to long power failure bypass function under full load and high MTBF (>500,000 h)
- International certification package
- Wide temperature range from -25 to +70°C
- Closed metal housing

Input		OPS3100.1
Input voltage	3 x 320 - 575 VAC, 45 - 65 Hz	2 x 360 - 575 VAC, 45 - 65 Hz
Input current	3 x 0.6 A (400 VAC)	3 x 0.5 A (480 VAC)
	2 x 1.25 A (400 VAC)	2 x 1.1 A (500 VAC)
Protective circuit	Transient over-voltage protection - Varistor	
Necessary pre-fusing for device and line protection	2/3 x 6 A (characteristic B)	2/3 x 10 A (characteristic B)
	2/3 x 16 A (characteristic B)	
Output		OPS3100.1
Output power	240 W	
Rated voltage	24 VDC ±1%	
Setting range for output voltage	22.5 - 29.5 VDC	
Output current	-25 to +55°C	10.0 A
	>55°C	Derating: 2.5% per °C
Over-voltage protection against internal over-voltages	Yes, limited to <35 VDC	
Protection functions	Output protected against continuous short circuit, open circuit and overload	
Power back immunity	Max. 35 VDC	
Output noise suppression	Unit complies with EN 55011 (class B)	
General information		OPS3100.1
Operation indicator	Green LED (DC OK), threshold $U_{out} = 21.5$ V	
Type of connection	Screw clamp	
Connection cross section - Input		
Fixed	0.2 - 2.5 mm ² / 24 - 14 AWG	
Flexibility	0.2 - 2.5 mm ² / 24 - 14 AWG	
Wire tip sleeves	Flexible cables require wire tip sleeves in order to fulfill EN 60950/UL 60950	
Connection cross section - Output		
Fixed	0.2 - 2.5 mm ² / 16 - 12 AWG	
Flexibility	0.2 - 2.5 mm ² / 16 - 12 AWG	
Wire tip sleeves	Flexible cables require wire tip sleeves in order to fulfill EN 60950/UL 60950	
Certification	CE, C-UL-US, cRUus, GOST-R	
Efficiency, reliability		OPS3100.1
Efficiency	>89%	
Power loss		
Rated load	Max. 28 W	
No-load operation	Max. 6 W	
MTBF (reliability)	>500,000 h	
Operational conditions		OPS3100.1
Operating temperature	-25 to +70°C (>55°C derating)	
Relative humidity	Max. 95%, non-condensing	
Ventilation / Cooling	Normal convection, no fan required	
Protection type	IP20	
Storage and transport conditions		OPS3100.1
Temperature	-40 to +85°C	
Relative humidity	Max. 95%, non-condensing	
Mechanical characteristics		OPS3100.1
Installation	Easy mounting on DIN rail	
Dimensions (W x H x D [mm])	60 x 130 x 152.5	
Weight	1300 g	

PS3200



- 400 - 500 VAC wide range input
- Reliable supply even if one phase briefly fails in 3-phase operation
- High dielectric strength
- Can be connected in parallel for power increase and redundancy
- Reliable operation due to long power failure bypass function under full load and high MTBF (>500,000 h)
- International certification package
- Wide temperature range from -25 to +70°C
- Closed metal housing

Input	0PS3200.1
Input voltage	3 x 320 - 575 VAC, 45 - 65 Hz
Input current	3 x 1.1 A (400 VAC) 3 x 0.8 A (480 VAC)
Protective circuit	Transient over-voltage protection - Varistor
Necessary pre-fusing for devices and Line protection	3 x 6 A (characteristic B) 3 x 10 A (characteristic B) 3 x 16 A (characteristic B)
Output	0PS3200.1
Output power	480 W
Rated voltage	24 VDC ±1%
Setting range for output voltage	22.5 - 29.5 VDC
Output current	-25 to +55°C: 20.0 A >55°C: Derating: 2.5% per °C
Over-voltage protection against internal over-voltages	Yes, limited to <35 VDC
Protection functions	Output protected against continuous short circuit, open circuit and overload
Power back immunity	Max. 35 VDC
Output noise suppression	Unit complies with EN 55011 (class B)
General information	0PS3200.1
Operation indicator	Green LED (DC OK), threshold $U_{out} = 21.5$ V
Type of connection	Screw clamp
Connection cross section - Input	
Fixed	0.2 - 2.5 mm ² / 24 - 14 AWG
Flexibility	0.2 - 2.5 mm ² / 24 - 14 AWG
Wire tip sleeves	Flexible cables require wire tip sleeves in order to fulfill EN 60950/UL 60950
Connection cross section - Output	
Fixed	0.5 - 6 mm ² / 12 - 10 AWG
Flexibility	0.5 - 4 mm ² / 12 - 10 AWG
Wire tip sleeves	Flexible cables require wire tip sleeves in order to fulfill EN 60950/UL 60950
Certification	CE, C-UL-US, cRUus, GOST-R
Efficiency, reliability	0PS3200.1
Efficiency	>91%
Power loss	
Rated load	Max. 48 W
No-load operation	Max. 6 W
MTBF (reliability)	>500,000 h
Operational conditions	0PS3200.1
Operating temperature	-25 to +70°C (>55°C derating)
Relative humidity	Max. 95%, non-condensing
Ventilation / Cooling	Normal convection, no fan required
Protection type	IP20
Storage and transport conditions	0PS3200.1
Temperature	-40 to +85°C
Relative humidity	Max. 95%, non-condensing
Mechanical characteristics	0PS3200.1
Installation	Easy mounting on DIN rail
Dimensions (W x H x D [mm])	115 x 130 x 152.5
Weight	2000 g

PS3400



- 400 - 500 VAC wide range input
- Reliable supply even if one phase briefly fails in 3-phase operation
- High dielectric strength
- Can be connected in parallel for power increase and redundancy
- Reliable operation due to long power failure bypass function under full load and high MTBF (>500,000 h)
- International certification package
- Wide temperature range from -25 to +70°C
- Closed metal housing

Input	OPS3400.1
Input voltage	3 x 320 - 575 VAC, 45 - 65 Hz
Input current	3 x 2.0 A (400 VAC) 3 x 1.6 A (480 VAC)
Protective circuit	Transient over-voltage protection - Varistor
Necessary pre-fusing for device and line protection	3 x 10 A (characteristic B) 3 x 16 A (characteristic B)
Output	OPS3400.1
Output power	960 W
Rated voltage	24 VDC ±1%
Setting range for output voltage	22.5 - 29.5 VDC
Output current	
-25 to +55°C	40.0 A
>55°C	Derating: 2.5% per °C
Over-voltage protection against internal over-voltages	Yes, limited to <35 VDC
Protection functions	Output protected against continuous short circuit, open circuit and overload
Power back immunity	Max. 35 VDC
Output noise suppression	Unit complies with EN 55011 (class B)
General information	OPS3400.1
Operation indicator	Green LED (DC OK), threshold $U_{out} = 21.5$ V
Type of connection	Screw clamp
Connection cross section - Input	
Fixed	0.2 - 6 mm ² / 22 - 10 AWG
Flexibility	0.2 - 4 mm ² / 22 - 10 AWG
Wire tip sleeves	Flexible cables require wire tip sleeves in order to fulfill EN 60950/UL 60950
Connection cross section - Output	
Fixed	0.5 - 16 mm ² / 8 - 6 AWG
Flexibility	0.5 - 10 mm ² / 8 - 6 AWG
Wire tip sleeves	Flexible cables require wire tip sleeves in order to fulfill EN 60950/UL 60950
Certification	CE, C-UL-US, cRUus, GOST-R
Efficiency, reliability	OPS3400.1
Efficiency	>91.5%
Power loss	
Rated load	Max. 91 W
No-load operation	Max. 16 W
MTBF (reliability)	>500,000 h
Operational conditions	OPS3400.1
Operating temperature	-25 to +70°C (>55°C derating)
Relative humidity	Max. 95%, non-condensing
Ventilation / Cooling	Normal convection, no fan required
Protection type	IP20
Storage and transport conditions	OPS3400.1
Temperature	-40 to +85°C
Relative humidity	Max. 95%, non-condensing
Mechanical characteristics	OPS3400.1
Installation	Easy mounting on DIN rail
Dimensions (W x H x D [mm])	139 x 130 x 190
Weight	2900 g

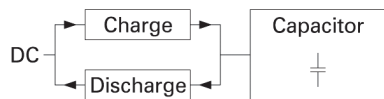


PB0200



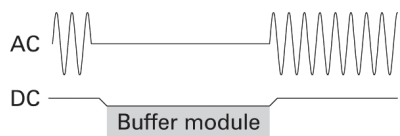
- Buffering for 24 VDC consumers
- Output current to 20 A
- Can be switched in parallel for larger buffer currents and times
- Easy to switch in parallel to the power supply or to the load in the 24 VDC circuit
- Simple and problem-free retrofitting of existing systems
- Suitable for industry because of capacitor-based energy storage (no rechargeable battery)
- High MTBF (>500,000 h)
- International certification package
- Wide temperature range from -25 to +70°C

Load operation (input)	OPB0200.1
Rated voltage	24 VDC
Input voltage range	22.5 - 30 VDC
Current requirements	
No-load operation	0.1 A
Loading procedure	0.6 A
Loading time	<27 s
Protective circuit	Transient over-voltage protection - Suppressor diode, 35 VDC
Reverse polarity protection	Yes
Input fuse, integrated	Yes
Buffer operation (output)	OPB0200.1
Buffer voltage	$U_{IN} - 0.8 \text{ V}$
Setting range for buffer voltage	22 - 28.5 VDC
Buffer current	0 - 20 A
Current limitation	27 A (buffer operation)
Buffer time	0.2 s at 20 A and 4 s at 1 A
Shutoff	>4.5 s (buffer operation)
Over-voltage protection against internal over-voltages	Yes, limited to approximately 35 VDC
Power back immunity	Max. 35 VDC (buffer operation)
Output noise suppression	Unit complies with EN 55011 (class B)
General information	OPB0200.1
Operation indicator	Green status LED (buffer charged/discharged, charging/discharging)
Active DC OK switch output	For controlling a 24 V relay (readiness for operation, buffer operation)
Type of connection	Screw clamp
Connection cross section - Input/output	
Fixed	0.5 - 16 mm ² / 20 - 6 AWG
Flexibility	0.5 - 10 mm ² / 20 - 6 AWG
Wire tip sleeves	Flexible cables require wire tip sleeves in order to fulfill EN 60950/UL 60950
Connection cross section - Switch output	
Fixed	0.2 - 2.5 mm ² / 24 - 12 AWG
Flexibility	0.2 - 2.5 mm ² / 24 - 12 AWG
Wire tip sleeves	Flexible cables require wire tip sleeves in order to fulfill EN 60950/UL 60950
Certification	CE, C-UL-US, cRUus, GOST-R
Efficiency, reliability	OPB0200.1
Efficiency	>95% (at 27 A)
Power loss	
Readiness at 27 A	Max. 2.5 W
Buffer operation at 27 A	Max. 9.8 W
MTBF (reliability)	>500,000 h
Operational conditions	OPB0200.1
Operating temperature	-25 to +70°C
Relative humidity	Max. 95%, non-condensing
Ventilation / Cooling	Normal convection, no fan required
Protection type	IP20
Storage and transport conditions	OPB0200.1
Temperature	-40 to +85°C
Relative humidity	Max. 95%, non-condensing
Mechanical characteristics	OPB0200.1
Installation	Easy mounting on DIN rail
Dimensions (W x H x D [mm])	64 x 130 x 125
Weight	1000 g



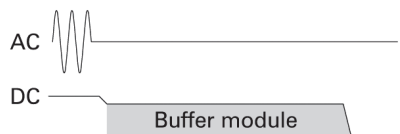
Function principle and application

The buffer module is an accessory for regulated 24 VDC power supplies. The energy from the DC circuit is stored in capacitors and then used in the event of a power failure or when needed to handle overloads. Machines and systems can be easily equipped with the buffer module for use worldwide in unstable power circuits. Buffering times less than 4 seconds make it the ideal alternative to a DC UPS (cost effective, requires less space, maintenance-free). When short-term currents peaks occur, it provides the required energy and therefore prevents the otherwise common task of over-dimensioning the power supply.

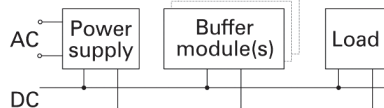


Protection during power supply failures

Statistics show that 80% of all power failures are shorter than 0.2 s. These power failures are completely bypassed and do not affect the DC voltage. This increases the reliability and availability of the entire system.



After a power failure or a shutdown, the buffer module delivers the load current for a specified amount of time and reports the loss via signal terminals. Process data can be saved and processes can be terminated, before the DC voltage is switched off. Controlled restarts are then possible.



Easy-to-operate, expandable, maintenance-free

The buffer module does not require any control lines. It can be connected in parallel at any location in the load current circuit. Five buffer modules can be connected in parallel for redundancy or to extend the buffering time. The double terminals allow easy wiring.



Power Panel Integrated control, operation and visualization

The compact and intelligent Power Panel devices are the first choice for automating small to mid- sized machines and systems with maximum component density.



Product overview

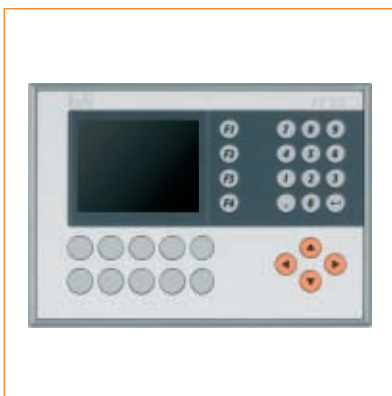
Power Panel PP65



Model number	Short description	
4PP065.0351-P74	Power Panel PP65; 3.5" QVGA color TFT display with touch screen (resistive); 1 PP65 Compact IF slot, 128 MB SDRAM; 256 kB SRAM; CompactFlash slot (Type I); ETH 10/100; POWERLINK; 2 USB; battery; IP65 protection (front side); 24 VDC.	123
4PP065.0351-X74	Power Panel PP65; 3.5" QVGA color TFT display with touch screen (resistive); 1 PP65 Compact IF slot, 128 MB SDRAM; 256 kB SRAM; CompactFlash slot (Type I); ETH 10/100; X2X Link Master interface; 2 USB; battery; IP65 protection (front side); 24 VDC.	124
4PP065.0571-P74	Power Panel PP65; 5.7" QVGA color TFT display with touch screen (resistive); 1 PP65 Compact IF slot, 128 MB SDRAM; 256 kB SRAM; CompactFlash slot (Type I); ETH 10/100; POWERLINK; 2 USB; battery; IP65 protection (front side); 24 VDC.	125
4PP065.0571-X74	Power Panel PP65; 5.7" QVGA color TFT display with touch screen (resistive); 1 PP65 Compact IF slot, 128 MB SDRAM; 256 kB SRAM; CompactFlash slot (Type I); ETH 10/100; X2X Link Master interface; 2 USB; battery; IP65 protection (front side); 24 VDC.	126

Power Panel

PP65 3.5" TFT color touch screen, POWERLINK



Controller	PP065.0351-P74	
Processor	Geode LX800 500 MHz, MMX compatible	
Main memory	128 MB DRAM	
SRAM	256 KB, battery-buffered	
CompactFlash slot	1 slot for Type I CompactFlash card	
PP65 Compact IF slot	1	
Watchdog	MTCX	
Power failure logic	MTCX 10 ms buffer time	
Battery	Lithium, 950 mAh, exchanged from the outside	
Real-time clock	Battery-buffered	
Mode/Node switch	2, 16 digits each	
Display	4PP065.0351-P74	
Type	TFT color	
Colors	262,144 ¹⁾	
Resolution	QVGA, 320 x 240 pixels	
Diagonal	3.5"	
Brightness	500 cd/m ²	
Half-brightness time	50,000 h	
Touch screen	Analog resistive	
1) Automation Runtime limitation - max. 256 colors		
Keys	4PP065.0351-P74	
Function keys	30	
Interfaces	4PP065.0351-P74	
USB	2 x USB 2.0, connection type A	
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	
POWERLINK	RJ45 twisted pair (100 Base-T)	
24 VDC supply	4PP065.0351-P74	
Input voltage	24 VDC ±25%	
Environmental conditions	4PP065.0351-P74	
Temperature		
Operation	0 to +50°C	
Storage	-20°C to +70°C	
Relative humidity		
Operation	10% to 90%, non-condensing	
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing	
Mechanics	4PP065.0351-P74	
Protection type	IP65 (front side) / IP20 (back side)	
Outer dimensions (W x H x D [mm])	203 x 145 x 55	
Weight	0.5 kg	

Required accessories		
0AC201.9 ¹⁾	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	1128
4A0006.00-000 ¹⁾	Lithium battery, 3 V / 950 mAh, button cell	1128
0TB103.9	Plug 24 VDC screw clamp	1131
0TB103.91	Plug 24 VDC cage clamp	1131
	CompactFlash cards	1126

1) Replacement part

Power Panel

PP65 3.5" TFT color touch screen, X2X



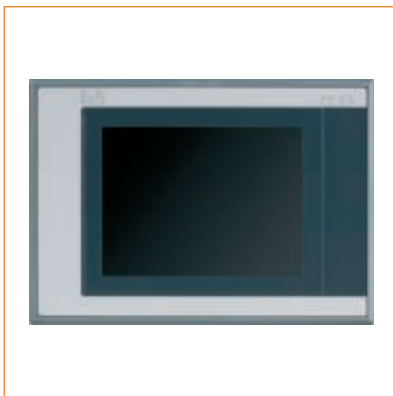
Controller	PP065.0351-X74
Processor	Geode LX800 500 MHz, MMX compatible
Main memory	128 MB DRAM
SRAM	256 KB, battery-buffered
CompactFlash slot	1 slot for Type I CompactFlash card
PP65 Compact IF slot	1
Watchdog	MTCX
Power failure logic	MTCX 10 ms buffer time
Battery	Lithium, 950 mAh, exchanged from the outside
Real-time clock	Battery-buffered
Mode/Node switch	2, 16 digits each
Display	4PP065.0351-X74
Type	TFT color
Colors	262,144 ¹⁾
Resolution	QVGA, 320 x 240 pixels
Diagonal	3.5"
Brightness	500 cd/m ²
Half-brightness time	50,000 h
Touch screen	Analog resistive
1) Automation Runtime limitation - max. 256 colors	
Keys	4PP065.0351-X74
Function keys	30
Interfaces	4PP065.0351-X74
USB	2 x USB 2.0, connection type A
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)
X2X	X2X Link master
24 VDC supply	4PP065.0351-X74
Input voltage	24 VDC ±25%
Environmental conditions	4PP065.0351-X74
Temperature	
Operation	0 to +50°C
Storage	-20°C to +70°C
Relative humidity	
Operation	10% to 90%, non-condensing
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing
Mechanics	4PP065.0351-X74
Protection type	IP65 (front side) / IP20 (back side)
Outer dimensions (W x H x D [mm])	203 x 145 x 55
Weight	0.5 kg

Required accessories		
0AC201.9 ¹⁾	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	1128
4A0006.00-000 ¹⁾	Lithium battery, 3 V / 950 mAh, button cell	1128
0TB103.9	Plug 24 VDC screw clamp	1131
0TB103.91	Plug 24 VDC cage clamp	1131
	CompactFlash cards	1126

1) Replacement part

Power Panel

PP65 5.7" TFT color touch screen, POWERLINK



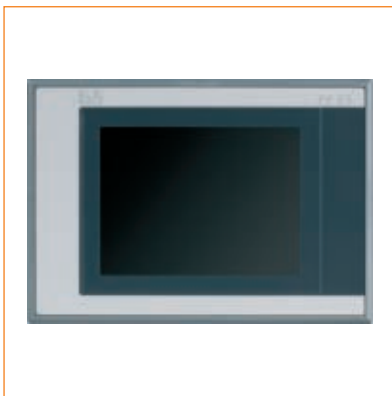
Controller	PP065.0571-P74	
Processor	Geode LX800 500 MHz, MMX compatible	
Main memory	128 MB DRAM	
SRAM	256 KB, battery-buffered	
CompactFlash slot	1 slot for Type I CompactFlash card	
PP65 Compact IF slot	1	
Watchdog	MTCX	
Power failure logic	MTCX 10 ms buffer time	
Battery	Lithium, 950 mAh, exchanged from the outside	
Real-time clock	Battery-buffered	
Mode/Node switch	2, 16 digits each	
Display	4PP065.0571-P74	
Type	TFT color	
Colors	262,144 ¹⁾	
Resolution	QVGA, 320 x 240 pixels	
Diagonal	5.7"	
Brightness	500 cd/m ²	
Half-brightness time	50,000 h	
Touch screen	Analog resistive	
1) Automation Runtime limitation - max. 256 colors		
Interfaces	4PP065.0571-P74	
USB	2 x USB 2.0, connection type A	
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)	
POWERLINK	RJ45 twisted pair (100 Base-T)	
24 VDC supply	4PP065.0571-P74	
Input voltage	24 VDC ±25%	
Environmental conditions	4PP065.0571-P74	
Temperature		
Operation	0 to +50°C	
Storage	-20°C to +70°C	
Relative humidity		
Operation	10% to 90%, non-condensing	
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing	
Mechanics	4PP065.0571-P74	
Protection type	IP65 (front side) / IP20 (back side)	
Outer dimensions (W x H x D [mm])	203 x 145 x 55	
Weight	0.5 kg	

Required accessories		
0AC201.9 ¹⁾	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	1128
4A0006.00-000 ¹⁾	Lithium battery, 3 V / 950 mAh, button cell	1128
0TB103.9	Plug 24 VDC screw clamp	1131
0TB103.91	Plug 24 VDC cage clamp	1131
	CompactFlash cards	1126

1) Replacement part

Power Panel

PP65 5.7" TFT color touch screen, X2X

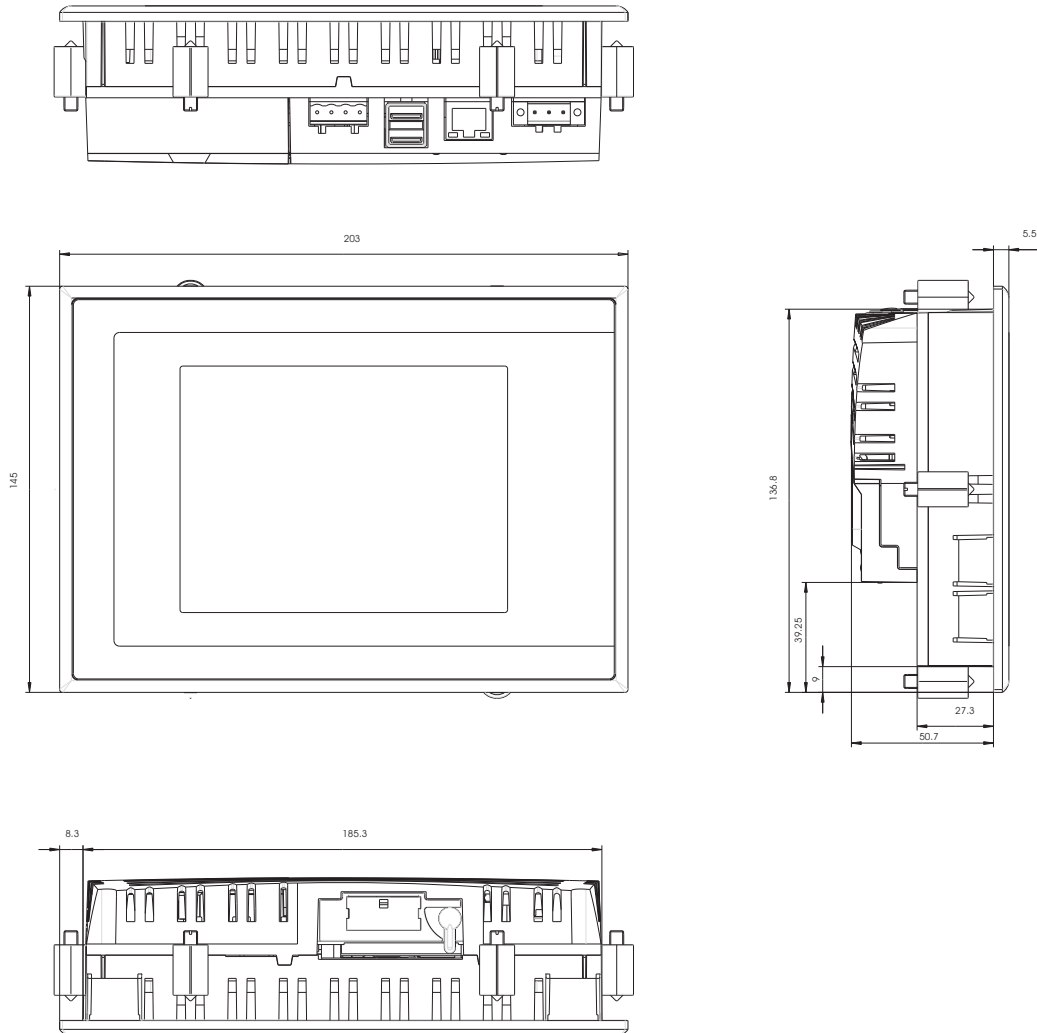


Controller	4PP065.0571-X74
Processor	Geode LX800 500 MHz, MMX compatible
Main memory	128 MB DRAM
SRAM	256 KB, battery-buffered
CompactFlash slot	1 slot for Type I CompactFlash card
PP65 Compact IF slot	1
Watchdog	MTCX
Power failure logic	MTCX 10 ms buffer time
Battery	Lithium, 950 mAh, exchanged from the outside
Real-time clock	Battery-buffered
Mode/Node switch	2, 16 digits each
Display	4PP065.0571-X74
Type	TFT color
Colors	262,144 ¹⁾
Resolution	QVGA, 320 x 240 pixels
Diagonal	5.7"
Brightness	500 cd/m ²
Half-brightness time	50,000 h
Touch screen	Analog resistive
1) Automation Runtime limitation - max. 256 colors	
Interfaces	4PP065.0571-X74
USB	2 x USB 2.0, connection type A
Ethernet	RJ45 twisted pair (10 BaseT / 100 BaseT)
X2X	X2X Link master
24 VDC supply	4PP065.0571-X74
Input voltage	24 VDC ±25%
Environmental conditions	4PP065.0571-X74
Temperature	
Operation	0 to +50°C
Storage	-20°C to +70°C
Relative humidity	
Operation	10% to 90%, non-condensing
Storage	T ≤ 40°C: 5% to 90%, non-condensing T > 40°C: < 90%, non-condensing
Mechanics	4PP065.0571-X74
Protection type	IP65 (front side) / IP20 (back side)
Outer dimensions (W x H x D [mm])	203 x 145 x 55
Weight	0.5 kg

Required accessories		
0AC201.9 ¹⁾	Lithium batteries, 5 pcs., 3 V / 950 mAh, button cell	1128
4A0006.00-000 ¹⁾	Lithium battery, 3 V / 950 mAh, button cell	1128
0TB103.9	Plug 24 VDC screw clamp	1131
0TB103.91	Plug 24 VDC cage clamp	1131
	CompactFlash cards	1126

1) Replacement part

Dimensions



PP65 dimensions

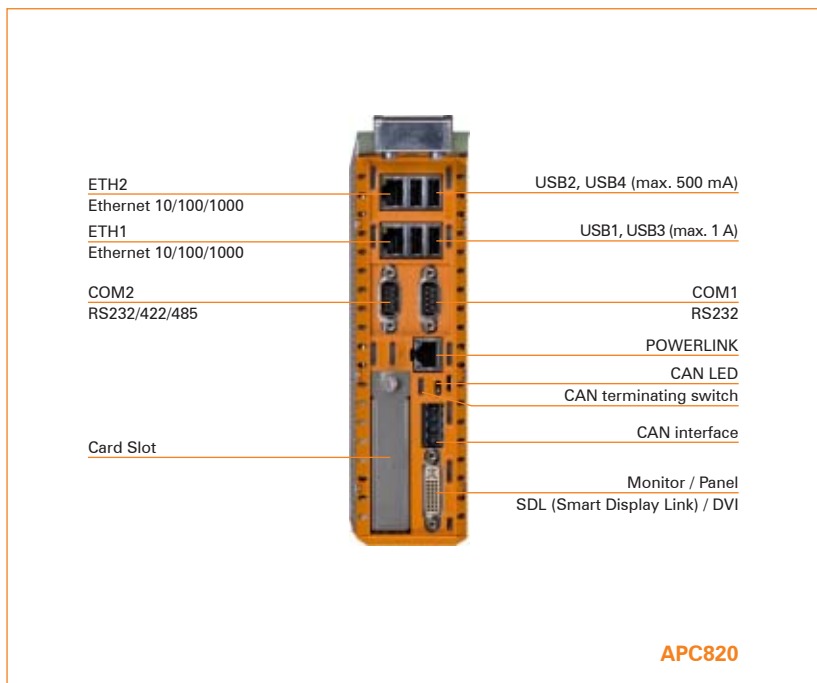
All dimensions in mm

Automation PC 820

Highest performance with
Intel® Core™ 2 Duo processors



System characteristics

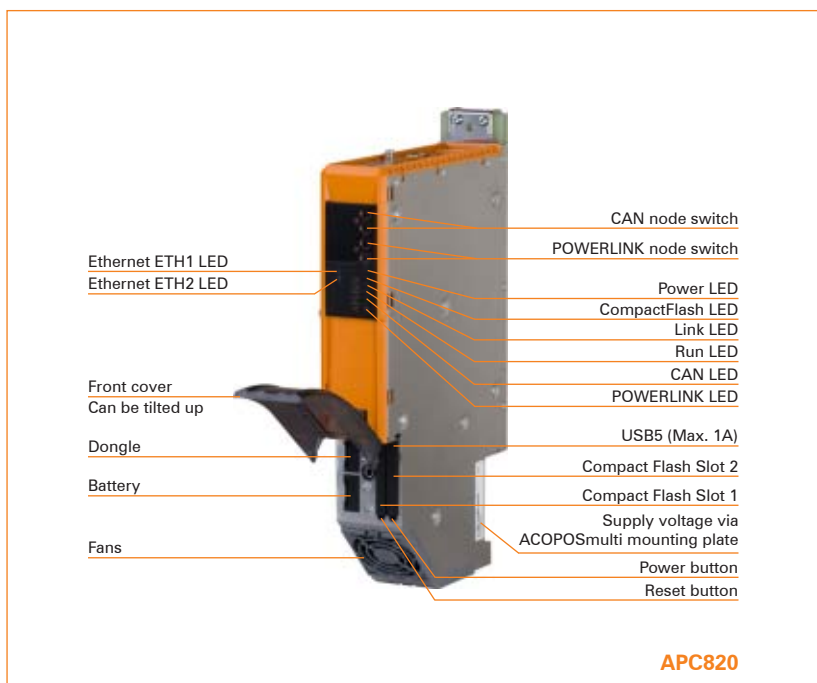


Reliability for many years

The PC market is subject to permanent change, which results in many new developments as well as discontinuations. At the same time, manufacturers of series products are looking for hardware and software revisions that are easy to follow. Guaranteed long-term availability of the components is also an important requirement. B&R has proven with its current products, that these conflicting goals can be reconciled, even for PCs. In the careful selection of components, high-quality and long-term availability are key criteria.

Communication in all directions

A wide range of onboard interfaces allows the APC820 to be optimally integrated in an automation system. Real-time communication between APC820, I/Os and drives occurs via the POWERLINK interface, which also comes standard. This helps achieve cycle times as low as 200 μ s and ultra-precise timing < 1 μ s. The two Gigabit Ethernet interfaces provide machine level communication that is completely separated from the connection to the company network. An additional CAN interface is also available for the connection of additional devices.



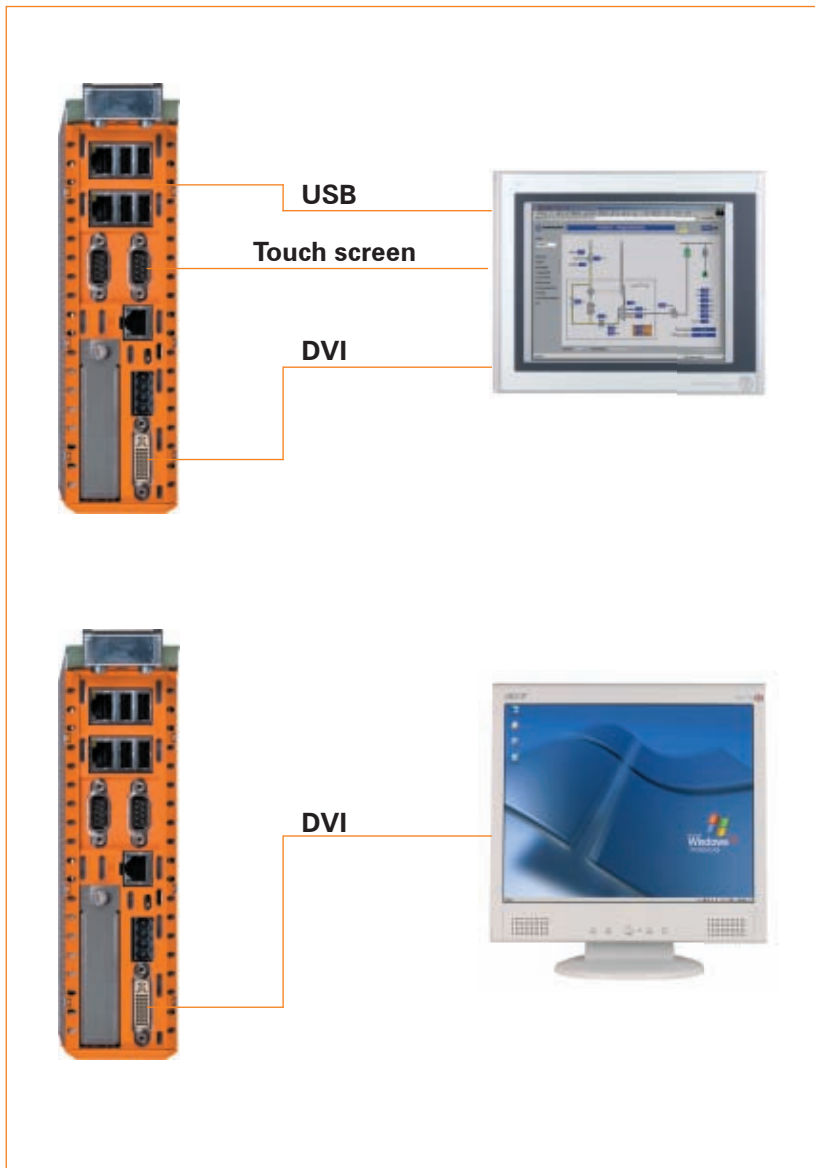
With the APC820, B&R engineers have successfully integrated the highest level of PC performance in ACOPOSmulti devices. This saves even more space in the switching cabinet by freeing up space otherwise required for the PC.

Machine manufacturers can use ACOPOSmulti units to achieve maximum performance in minimum space, which in turn results in a decisive cost advantage. The range of applications includes sensor-free induction motors, permanent magnet servo motors, and ultra-dynamic linear motors.

Robust for tough industrial use

The APC820 was designed for the toughest environments. Not a single internal cable connection was used during construction. This has made it possible to achieve maximum vibration resistance and operational safety.

Free of any rotating parts, CompactFlash cards are the optimum storage media for use in the machine.



Display connection

The APC820 from B&R has an integrated interface for connecting an Automation Panel or a monitor. B&R offers the following possibilities in order to meet the various requirements for panel operation:

DVI (Digital Visual Interface)

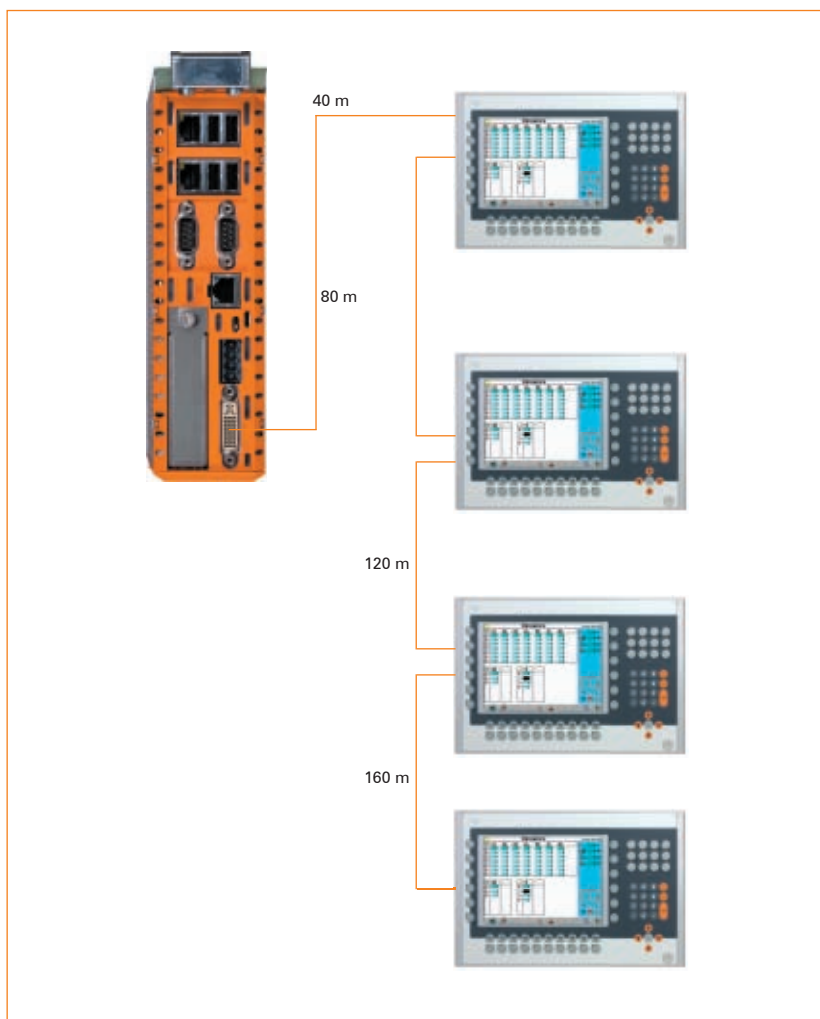
SDL (Smart Display Link)

DVI - The open standard

The DVI (Digital Visual Interface) link is based on the DVI standard defined by the Digital Display Working Group, which is also being used more frequently in today's offices. The integrated panel interface is designed so that display units and office monitors with a DVI interface can also be connected. The connection of a touch screen as well as the connection of remote USB interfaces is made using separate cables.

It is also possible to connect monitors with analog RGB interfaces.

System characteristics



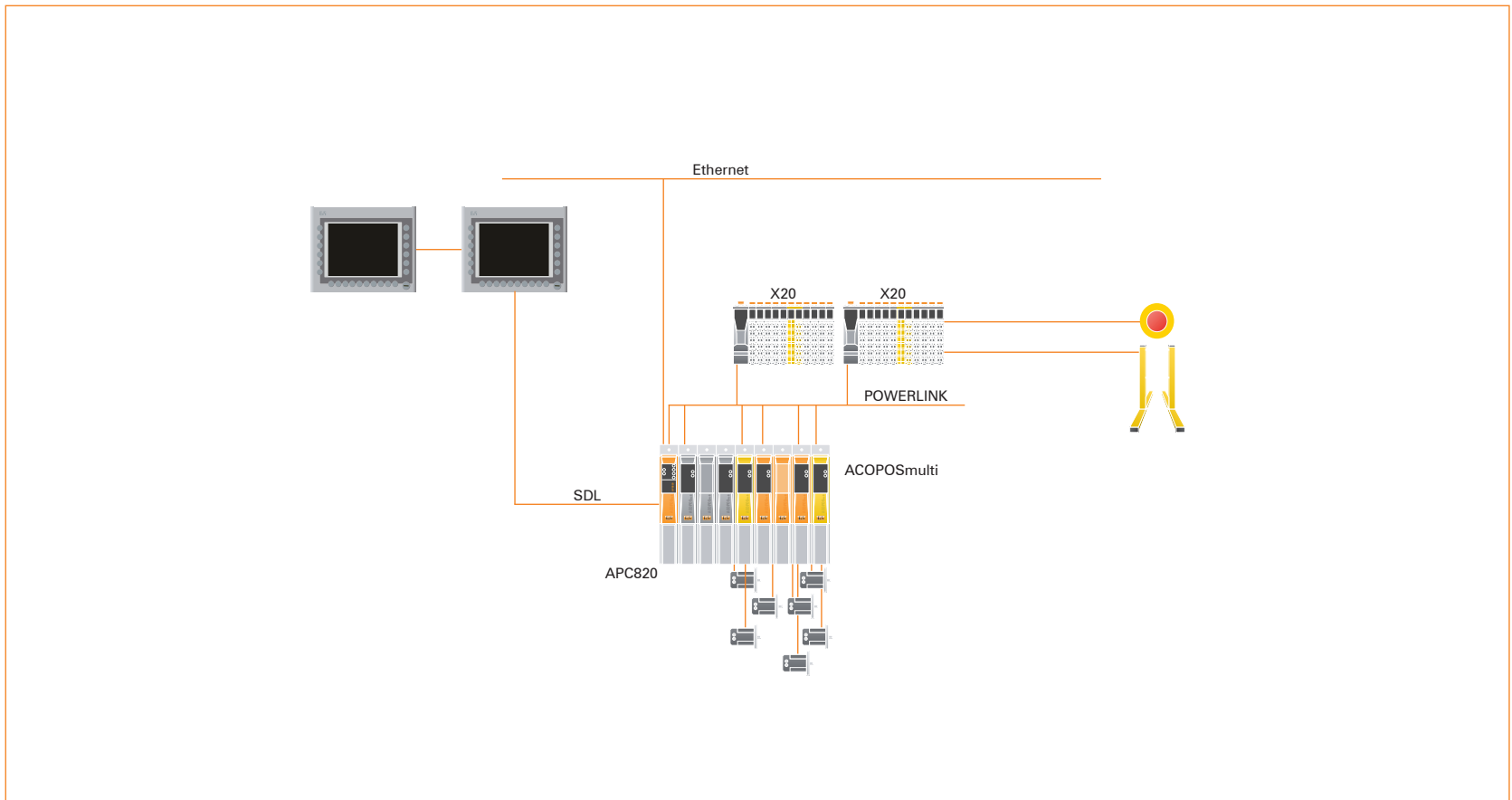
Smart Display Link

SDL (Smart Display Link) is already integrated on the APC820. It combines the digital display and touch screen connections for the display unit in one interface. Matrix keys, service data (temperature, operating hours) and USB signals are also transferred. SDL also allows the display unit to be equipped with PC resources such as USB drives and a keyboard. Four Automation Panels can be connected to the integrated SDL interface via SDL. The Automation Panel 900 can be combined with the Automation Panel 800, and the AP800 is always last on the line. Touch screen and key entries on the Automation Panel can be locked with software to prevent operating errors. USB is supported on the first two displays up to a maximum segment length of 30 m. Starting at a segment length of 30 m and higher, USB is only available for the first display up to a maximum of 40 m. USB devices can only be connected directly to the Automation Panel (without a hub).

Typical topologies

Wide range of interfaces

A wide range of onboard interfaces allows the APC820 to be optimally integrated in an automation system. Two serial RS232 interfaces, one of which is RS422/485, provide maximum flexibility for connecting peripheral devices. The two Gigabit Ethernet interfaces provide machine level communication that is completely separated from the connection to the company network. Real-time communication between the APC820, I/O and drives takes place via a POWERLINK interface, which also comes standard. This helps achieve cycle times as low as 200 μ s and ultra-precise timing better than one microsecond.



Configuration

System unit		
5PC820.SX01-00	System unit for APC820 system, 1 PCIe card slot, cold plate mounting	138
5PC820.SX01-01	System unit for APC820 system, 1 PCIe card slot, wall mounting	138

CPU boards with 945 GME chipset		
Select a CPU board		
5PC800.B945-00	CPU board Intel® Core™ Duo L2400, 1.66 GHz	139
5PC800.B945-01	CPU board Intel® Core™2 Duo L7400, 1.5 GHz	139
5PC800.B945-02	CPU board Intel® Core™2 Duo U7500, 1.06 GHz	139
5PC800.B945-03	CPU board Intel® Celeron® M 423, 1.06 GHz	140
5PC800.B945-04	CPU board Intel® Core™2 Duo T7400, 2.16 GHz	140

Memory for CPU boards with 945 GME chipset		
Select memory module (one or two, maximum 3 GB)		
5MMDDR.0512-01	SO-DIMM DDR2 512 MB PC2-5300	140
5MMDDR.1024-01	SO-DIMM DDR2 1024 MB PC2-5300	140
5MMDDR.2048-01	SO-DIMM DDR2 2048 MB PC2-5300	140

Heat sink		
Select heat sink depending on the CPU board		
5AC802.HS00-00	APC820 power supply with heat sink	140
5AC802.HS00-01	APC820 power supply with heat sink T7400	140



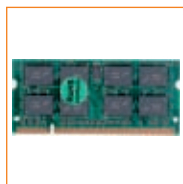
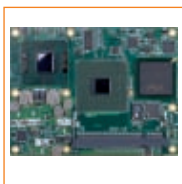
Product overview

APC820 system units



Model number	Short description	
5PC820.SX01-00	APC820 system, 1 PCIe card slot, cold plate mounting	138
5PC820.SX01-01	System unit for APC820 system, 1 PCIe card slot, wall mounting	138

CPU boards, memory and heat sinks



Intel® Core Duo™ / Core™2 Duo / Celeron® M

Model number	Short description	
5PC800.B945-00	CPU board Intel Core Duo L2400 1.66 GHz, 667 MHz FSB, 2 MB L2 cache; 945GME chipset; 2 sockets for SO-DIMM DDR2 modules (max. expansion is a total of 3 GB)	139
5PC800.B945-01	CPU board Intel Core2 Duo L7400 1.5 GHz, 667 MHz FSB, 4 MB L2 cache; 945GME chipset; 2 sockets for SO-DIMM DDR2 modules (max. expansion is a total of 3 GB)	139
5PC800.B945-02	CPU board Intel Core2 Duo U7500, 1.06 GHz, 533 MHz FSB, 2 MB L2 cache; 945GME chipset; 2 sockets for SO-DIMM DDR2 modules (max. expansion is a total of 3 GB)	139
5PC800.B945-03	CPU board Intel Celeron M 423 1.06 GHz, 533 MHz FSB, 1 MB L2 cache; 945GME chipset; 2 sockets for SO-DIMM DDR2 modules (max. expansion is a total of 3 GB)	140
5PC800.B945-04	CPU board Intel Core2 Duo T7400 2.16 GHz, 667 MHz FSB, 4 MB L2 cache; 945GME chipset; 2 sockets for SO-DIMM DDR2 modules (max. expansion is a total of 3 GB)	140
5MMDDR.0512-01	SO-DIMM DDR2 512 MB PC2-5300	140
5MMDDR.1024-01	SO-DIMM DDR2 1024 MB PC2-5300	140
5MMDDR.2048-01	SO-DIMM DDR2 2048 MB PC2-5300	140
5AC802.HS00-00	APC820 power supply with heat sink	140
5AC802.HS00-01	APC820 power supply with heat sink T7400	140

Fan kits



Model number	Short description
8BXF001.0000-00	ACPmulti fan module. Replacement filter for 5PC820.SX01-00 system unit

Accessories



Model number	Short description
5AC900.1000-00	Adapter DVI (plug) to CRT (socket), for connecting a standard monitor to a DVI-I interface.

System unit



	5PC820.SX01-00	140
COM1	RS232	RS232
Design	9-pin DSUB plug	9-pin DSUB plug
Max. baud rate	115 kBit/s	115 kBit/s
COM2	RS232/422/485	RS232/422/485
Design	9-pin DSUB plug	9-pin DSUB plug
Max. baud rate	115 kBit/s	115 kBit/s
USB	5x USB 2.0, Type A connection	5x USB 2.0, Type A connection
Panel/Monitor interface	Smart Display Link (SDL)	Smart Display Link (SDL)
Design	DVI-I	DVI-I
CompactFlash slot 1	Integrated (type I)	Integrated (type I)
CompactFlash slot 2	Integrated (type I)	Integrated (type I)
Ethernet	2x 10/100/1000 MBit/s	2x 10/100/1000 MBit/s
Design	RJ45	RJ45
POWERLINK	1x 100 MBit/s	1x 100 MBit/s
Design	RJ45, node switch	RJ45, node switch
CAN	1x	1x
Design	4-pin multipoint connector, node switch	4-pin multipoint connector, node switch
Card Slot	1 x PCIe	1 x PCIe
SRAM	1 MB, battery backed	1 MB, battery backed
Battery	Lithium, 950 mAh	Lithium, 950 mAh
Real-time clock	√	√
Dongle port	√	√
Reset button	√	√
Power button	√	√
Power supply	24 VDC, via ACOPOSmulti supply busbar	24 VDC, via ACOPOSmulti supply busbar
Power supply buffering (power fail logic with NMI)	Power Fail logic with NMI, 10 ms	Power Fail logic with NMI, 10 ms
Installation	Cold plate mounting	Wall mounting

Accessories

Model number	Short description	
	3V lithium batteries	1128
	CompactFlash cards	1126
	USB accessories	1127
5SWUT1.0000-00	OEM Nero CD-RW software. Only available with a CD-RW drive.	1121

CPU boards

CPU boards Intel® / Celeron® M / Core™ Duo / Core™ 2 Duo Intel® 945 GME chipset



Model number	5PC800.B945-00	5PC800.B945-01	5PC800.B945-02
Processor	Intel® Core™ Duo L2400	Intel® Core™ 2 Duo L7500	Intel® Core™ 2 Duo U7500
Clock frequency	1.66 GHz	1.5 GHz	1.06 GHz
L2 cache	2 MB	4 MB	2 MB
External bus	667 MHz	667 MHz	533 MHz
Memory socket (dual channel memory)	2x SO-DIMM	2x SO-DIMM	2x SO-DIMM
BIOS	American Megatrends	American Megatrends	American Megatrends
Chipset	Intel® 945GME	Intel® 945GME	Intel® 945GME
Graphics	Chipset graphics	Chipset graphics	Chipset graphics
Graphics memory	Max. 224 MB RAM ¹⁾	Max. 224 MB RAM ¹⁾	Max. 224 MB RAM ¹⁾

¹⁾ Allocated in the main memory.

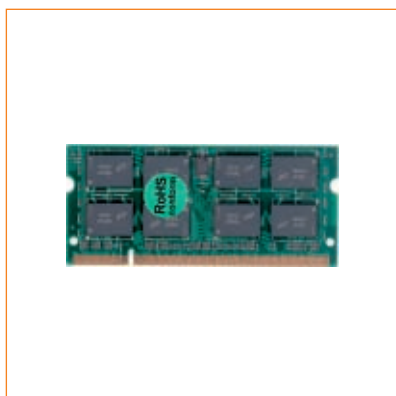
CPU boards

CPU boards Intel® / Celeron® M / Core™ Duo / Core™ 2 Duo Intel® 945 GME chipset



Model number	5PC800.B945-03	5PC800.B945-04
Processor	Intel® Celeron® M 423	Intel® Core™ 2 Duo T7400
Clock frequency	1.06 GHz	2.16 GHz
L2 cache	1 MB	4 MB
External bus	533 MHz	667 MHz
Memory socket (dual channel memory)	2x SO-DIMM	2x SO-DIMM
BIOS	American Megatrends	American Megatrends
Chipset	Intel® 945GME	Intel® 945GME
Graphics	Chipset graphics	Chipset graphics
Graphics memory	Max. 224 MB RAM ¹	Max. 224 MB RAM ¹

Accessories



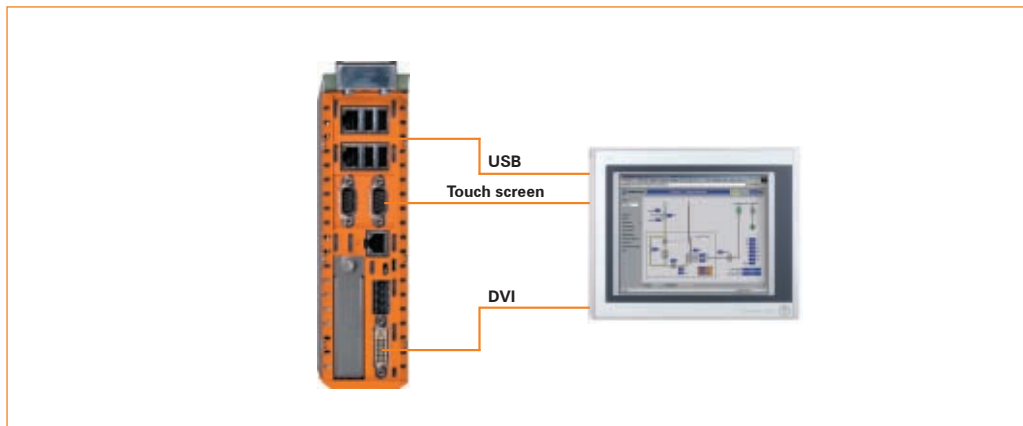
Model number	Short description
5MMDDR.0512-01	SO-DIMM DDR2 512 MB PC2-5300
5MMDDR.1024-01	SO-DIMM DDR2 1024 MB PC2-5300
5MMDDR.2048-01	SO-DIMM DDR2 2048 MB PC2-5300
5AC802.HS00-00	APC820 power supply with heat sink
5AC802.HS00-01	APC820 power supply with heat sink T7400



Display links

Automation Panel via DVI

An Automation Panel with max. SXGA resolution is connected to the integrated DVI interface. As an alternative, an office TFT monitor with DVI interface or an analog monitor (using an adapter) can also be operated. A separate cable is used for touch screen and USB.



Possible combinations

	5PC800.B945-00	5PC800.B945-01	5PC800.B945-02	5PC800.B945-03	5PC800.B945-04
5PC820.SX01-00	√	√	√	√	√

Component overview

CPU boards

	Chipset	Processor	Resolution
5PC800.B945-00	Intel® 945GME	Core Duo L2400 1.66 GHz	Max. SXGA
5PC800.B945-01	Intel® 945GME	Core2 Duo L7400 1.5 GHz	Max. SXGA
5PC800.B945-02	Intel® 945GME	Core2 Duo U7500, 1.06 GHz	Max. SXGA
5PC800.B945-03	Intel® 945GME	Celeron M 423 1.06 GHz	Max. SXGA
5PC800.B945-04	Intel® 945GME	Core2 Duo T7400 2.16 GHz	Max. SXGA

Cables

	Type	Length
5CADVI.0018-00	DVI	1.8 m
5CADVI.0050-00	DVI	5 m
5CADVI.0100-00	DVI	10 m ¹
9A0014.02	Touch screen	1.8 m
9A0014.05	Touch screen	5 m
9A0014.10	Touch screen	10 m ¹
5CAUSB.0018-00	USB	1.8 m
5CAUSB.0050-00	USB	5 m

Automation Panel 900

	Diagonal	Max. resolution	Touch screen	USB	Max. segment length
5AP920.1043-01	10.4"	VGA	√	√	5 m / 10 m ¹
5AP920.1214-01	12.1"	SVGA	√	√	5 m / 10 m ¹
5AP920.1505-01	15.0"	XGA	√	√	5 m / 10 m ¹
5AP920.1906-01	19.0"	SXGA	√	√	5 m / 10 m ¹

¹) USB is limited to 5m

Up to four Automation Panels via SDL on one line

An Automation Panel is connected to the integrated SDL interface via an SDL cable. Up to three other Automation Panels of the same type are connected to this Automation Panel and operated via SDL. All four displays show the same content.



Possible combinations

	5PC800.B945-00	5PC800.B945-01	5PC800.B945-02	5PC800.B945-03	5PC800.B945-04
5PC820.SX01-00	✓	✓	✓	✓	✓

Component overview

CPU boards

	Chipset	Processor	Resolution
5PC800.B945-00	Intel® 945GME	Core Duo L2400 1.66 GHz	Max. UXGA
5PC800.B945-01	Intel® 945GME	Core2 Duo L7400 1.5 GHz	Max. UXGA
5PC800.B945-02	Intel® 945GME	Core2 Duo U7500, 1.06 GHz	Max. UXGA
5PC800.B945-03	Intel® 945GME	Celeron M 423 1.06 GHz	Max. UXGA
5PC800.B945-04	Intel® 945GME	Core2 Duo T7400 2.16 GHz	Max. UXGA

SDL cables

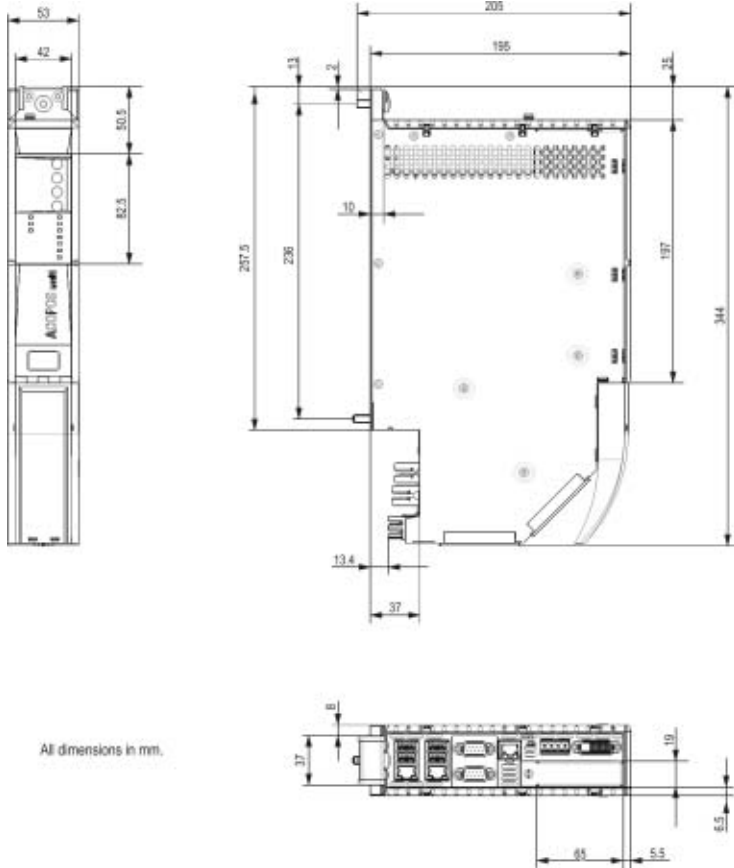
See AP900 SDL cable section

1087

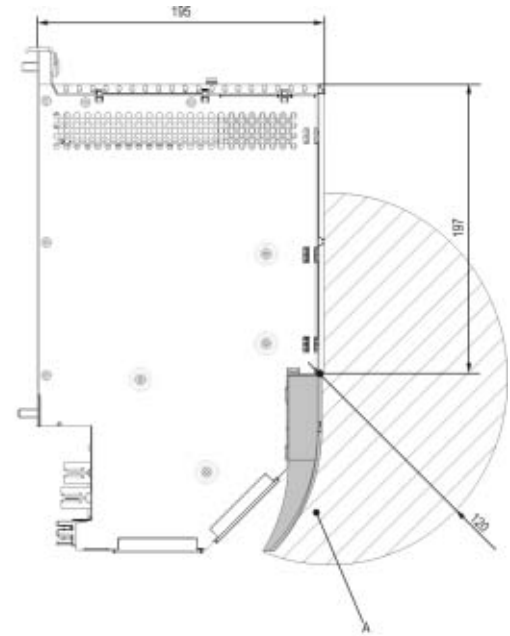
Automation Panel 900

Display	Diagonal	Resolution	Touch screen	Keys	Max. SDL segment length w/o extender	Max. SDL segment length w/ extender
5AP920.1043-01	10.4"	VGA	✓	-	30	40
5AP980.1043-01	10.4"	VGA	✓	✓	30	40
5AP981.1043-01	10.4"	VGA	✓	✓	30	40
5AP982.1043-01	10.4"	VGA	✓	✓	30	40
5AP920.1214-01	12.1"	SVGA	✓	-	30	40
5AP920.1505-01	15.0"	XGA	✓	-	25	40
5AP980.1505-01	15.0"	XGA	✓	✓	25	40
5AP981.1505-01	15.0"	XGA	✓	✓	25	40
5AP920.1906-01	19.0"	SXGA	✓	-	20	40

Dimensions



APC820 dimensions



A.....swivel range of the front cover

Swivel range of the front cover

All dimensions in mm



Industry-specific and customer-specific HMI systems

Industry-specific and customer-specific operator panels are used where the device must be optimally matched to an application and its specific requirements.



Automation Panel AP920 19" TFT color surface wave touch screen



- AP920
- 19" TFT color display
- Intelli / surface wave touch
- Glass surface

Display	5AP920.1906-K07
Type	TFT color
Colors	16.8 million
Resolution	SXGA, 1280 x 1024 pixels
Diagonal	19"
Brightness	300 cd/m ²
Half-brightness time	50,000 h
Touch screen	Surface wave touch
Keys	5AP920.1906-K07
Function keys	-
Soft keys	-
System keys	-
Interfaces	5AP920.1906-K07
Display link slot	1 (back side)
USB	1x USB 2.0 (front side) / 2x USB 2.0 (back side)
Power supply	5AP920.1906-K07
Input voltage	24 VDC ± 25% (via Automation Panel Link insert card)
Environmental conditions	5AP920.1906-K07
Temperature	
Operation	0 to +40°C
Storage	-25°C to +60°C
Relative humidity	
Operation, storage, transport	T ≤ 40°C, 5% to 90%, non-condensing T > 40°C, 5% to 75%, non-condensing
Mechanics	5AP920.1906-K07
Protection type	IP54 (front side) / IP20 (back side)
Outer dimensions (W x H x D [mm])	527 x 421 x 62
Weight	Approx. 8.25 kg

Required accessories		
0TB103.9	Plug 24 VDC screw clamp	1131
0TB103.91	Plug 24 VDC cage clamp	1131
	USB accessories	1127
	Display links	1086
	Cables	1086

Automation Panel AP920 19" TFT color touch screen



- AP920
- 19" TFT color display
- Analog, resistive touch screen, without dirt-collecting edges
- For Rittal CP-S support arm system
- IP65 stainless steel housing
- Hygienically-compatible front design

Display	5AP920.1906-K14	
Type	TFT color	
Colors	16.8 million	
Resolution	SXGA, 1280 x 1024 pixels	
Diagonal	19"	
Brightness	300 cd/m ²	
Half-brightness time	50,000 h	
Touch screen	Analog resistive	
Keys	5AP920.1906-K14	
Function keys	-	
Soft keys	-	
System keys	-	
Interfaces	5AP920.1906-K14	
Display link slot	1 (in panel)	
USB	2x USB 1 (back side)	
Power supply	5AP920.1906-K14	
Input voltage	24 VDC ± 25% (via Automation Panel Link insert card)	
Environmental conditions	5AP920.1906-K14	
Temperature		
Operation	0 to +40°C	
Storage	-25°C to +60°C	
Relative humidity		
Operation, storage, transport	T ≤ 40°C, 5% to 90%, non-condensing T > 40°C, 5% to 75%, non-condensing	
Mechanics	5AP920.1906-K14	
Protection type	IP65 (entire device)	
Outer dimensions (W x H x D [mm])	514 x 420 x 78.5	
Weight	Approx. 10.65 kg	

Required accessories		
0TB103.9	Plug 24 VDC screw clamp	1131
0TB103.91	Plug 24 VDC cage clamp	1131
	USB accessories	1127
	Display links	1086
	Cables	1086

Transponder read/write unit



- 13.56 MHz transponder read/write unit
- ISO 15693 and 14443 compatible
- USB interface

Transponder read/write unit	5E9010.29
Transponder	For transponders I-Code SLI amplitude modulation, carrier frequency 13.56 MHz
Read/write range in air	Approx. 1 to 3 cm
Interface	USB 2.0
Electrical data	5E9010.29
Supply voltage	5 VDC \pm 20% (via USB)
Power consumption	Max. 0.3 watts
Environmental conditions	5E9010.29
Temperature	
Operation	0 to +50°C
Storage	-20°C to +60°C
Relative humidity	
Operation, storage, transport	5% to 90%, non-condensing
Mechanics	5E9010.29
Protection type	IP65 (front side)
Outer dimensions (W x H x D [mm])	33 x 33 x 60
Weight	Approx. 0.05 kg

Required accessories	
5A9010.43	Transponder key, black housing, read/write, SLI, 1 kBit, 13.56 MHz
5A9010.44	Transponder key, white housing, read/write, SLI, 1 kBit, 13.56 MHz
5A9010.45	Transponder key, yellow housing, read/write, SLI, 1 kBit, 13.56 MHz
5A9010.46	Transponder key, red housing, read/write, SLI, 1 kBit, 13.56 MHz
5A9010.47	Transponder key, green housing, read/write, SLI, 1 kBit, 13.56 MHz
5A9010.48	Transponder key, blue housing, read/write, SLI, 1 kBit, 13.56 MHz
5A9010.50	Transponder credit card, white, read/write, SLI, 1 kBit, 13.56 MHz





PC software

In addition to an extensive array of industrial PCs and Power Panels, B&R also offers Windows operating systems and standard software such as OPC Server.



Windows® operating systems

Windows® XP

Windows® XP, the operating system used most in the office world, is also available for the field of automation. With the AR010 Soft PLC, controller tasks and Windows® applications can be linked together.

Windows XP embedded/ professional configuration

Model number ¹⁾	Type	Target system	Preinstalled	Memory required on CF / HD	Minimum amount of RAM
5SWWXP0428-ENG	Windows XP embedded FP2007	APC820 with CPU boards 5PC800.B945-00 5PC800.B945-01 5PC800.B945-02 5PC800.B945-03 5PC800.B945-04	Yes	250 MB	128 MB
5SWWXP0500-ENG	WinXP Professional SP2c CD, English	APC620 PPC700 APC810 APC820	If desired	≤2.1 G	128 MB
5SWWXP0500-GER	WinXP Professional SP2c CD, German	APC620 PPC700 APC810 APC820	If desired	≤2.1 G	128 MB
5SWWXP0500-MUL	WinXP Professional SP2c CD, Multilanguage	APC620 PPC700 APC810 APC820	If desired	≤2.1 G	128 MB

1) Can only be ordered together with a suitable B&R device.

Windows CE configuration

When it comes to low memory requirements and high performance in open systems, the following new Windows® CE 5.0 and CE 6.0 images, which are available in addition to the existing images, are the right choice. B&R provides a standard image that provides numerous software tools and services while taking up only approximately 30 MB.

Model number ²⁾	Type	Target system	Preinstalled	Memory required on CF ¹⁾	Minimum amount of RAM
5SWWCE.0813-ENG	Windows CE 6.0 Pro	APC620 with CPU boards 5PC600.X855-00 5PC600.X855-01 5PC600.X855-02 5PC600.X855-03 5PC600.X855-04 5PC600.X855-05	Yes	35 MB	128 MB
5SWWCE.0816-ENG	Windows CE 6.0 Pro	PPC700 with CPU boards 5PC600.X855-00 5PC600.X855-01 5PC600.X855-02 5PC600.X855-03 5PC600.X855-04 5PC600.X855-05	Yes	35 MB	128 MB
5SWWCE.0823-ENG	Windows CE 6.0 Pro	PPC300 LX800	Yes	35 MB	128 MB
5SWWCE.0826-ENG	Windows CE 6.0 Pro	APC810 with CPU boards 5PC800.B945-00 5PC800.B945-01 5PC800.B945-02 5PC800.B945-03 5PC800.B945-04	Yes	35 MB	128 MB
5SWWCE.0828-ENG	Windows CE 6.0 Pro	PPC820 with CPU boards 5PC800.B945-00 5PC800.B945-01 5PC800.B945-02 5PC800.B945-03 5PC800.B945-04	Yes	35 MB	128 MB

1) Data medium sold separately.

2) Can only be ordered together with a suitable B&R device.

ACOPOSmicro Drive system

This series provides the user with solutions for the low and the lowest power range.



Product overview

ACOPOSmicro stepper motor control



Model number	Short description	
80SD100XD.C04X-13	ACOPOSmicro stepper motor module, X2X Link connection, 24-64 VDC \pm 25% supply, 2 motor connections, 10 A, 1 x 24 V incremental encoder, 2 digital inputs 24 VDC sink (can be used as trigger inputs), 1 digital output 24 VDC, 1 A, option board 4 digital inputs 2 digital outputs, LED status indicators	160
80SD100XD.C0XX-21	ACOPOSmicro stepper motor module, X2X Link connection, 24-64 VDC \pm 25% supply, 2 motor connections, 10 A, 2 digital inputs 24 VDC sink (can be used as trigger inputs), 1 digital output 24 VDC, 1 A, option board 2 analog inputs LED status indicators	162

ACOPOSmicro servo motor control



Model number	Short description	
80VD100PS.C02X-01	ACOPOSmicro stepper motor module, POWERLINK, 24-64 VDC \pm 25% supply, 1 motor connection, 8 A, resolver interface, 2 digital inputs 24 VDC sink (can be used as trigger inputs), 1 digital output 24 VDC, 1 A, LED status indicators	164
80VD100PD.C022-01	ACOPOSmicro stepper motor module, POWERLINK, 24-64 VDC \pm 25% supply, 2 motor connections, 8 A, 2 resolver interfaces, 2 digital inputs 24 VDC sink (can be used as trigger inputs), 1 digital output 24 VDC, 1 A, LED status indicators	166
80VD100PS.C00X-01	ACOPOSmicro stepper motor module, POWERLINK, 24-64 VDC \pm 25% supply, 1 motor connection, 8 A, 1 EnDat 2.2 interface, 2 digital inputs 24 VDC sink (can be used as trigger inputs), 1 digital output 24 VDC, 1 A, LED status indicators	168
80VD100PD.C000-01	ACOPOSmicro stepper motor module, POWERLINK, 24-64 VDC \pm 25% supply, 2 motor connections, 8 A, 2 EnDat 2.2 interface, 2 digital inputs 24 VDC sink (can be used as trigger inputs), 1 digital output 24 VDC, 1 A, LED status indicators	170

Accessories

Short description	
Terminal blocks	1244
Assembled cables	1248



Stepper motor module

X2X Link, 2 channels, 1 incremental encoder input, option board



- Control for 2 stepper motors (2-phase bipolar, full bridge)
- 256 microsteps per step
- 1 incremental encoder input
- 2 trigger inputs
- Motor holding brake connection
- Enable input
- Automatic motor detection
- Holding, boost and continuous current can be defined independent of one another
- 4 digital inputs, 24 VDC, sink
- 2 digital outputs, 24 VDC, 0.5 A

Short description	80SD100XD.C04X-13
Stepper motor module	Connection for two stepper motors (each 2-phase bipolar, full bridge)
Motor connector	80SD100XD.C04X-13
Amount	2
Rated voltage	24 - 64 VDC \pm 25%
Rated current	10 A
Maximum current / motor	15 A (2 s)
Maximum current / module	30 A
Controller frequency	38.5 kHz
Step resolution	256 microsteps per step
Motor holding brake connection	80SD100XD.C04X-13
Continuous current	1 A
Rated voltage	24 VDC
Protective measures / safeguards	Overload / short-circuit protection
Maximum switching frequency	100 Hz
Incremental encoder	80SD100XD.C04X-13
Amount	1
Encoder input	24 V, asymmetrical
Counter size	16-bit
Input frequency	Max. 50 kHz
Evaluation	4x
Encoder supply	Module-internal, max. 40 mA
Trigger inputs	80SD100XD.C04X-13
Amount	2
Rated voltage	24 VDC
Input filter	
Hardware	< 10 μ s
Input circuit	Sink
Enable input	80SD100XD.C04X-13
Amount	1
Rated voltage	24 VDC
Input circuit	Sink
Digital inputs on the option board	80SD100XD.C04X-13
Amount	4
Rated voltage	24 VDC
Input filter	
Hardware	< 5 μ s
Software	-
Input circuit	Sink
Digital outputs on the option board	80SD100XD.C04X-13
Amount	2
Rated voltage	24 VDC
Rated output current	0.5 A
Total current	1 A
Connection type	1-line connections
Output circuit	Source
Output protection	Thermal cutoff for over-current or short circuit
X2X Link interface	80SD100XD.C04X-13
Design	4-pin plug
Minimum cycle time on the X2X bus	250 μ s
Power element supply	80SD100XD.C04X-13
Input voltage	24 - 64 VDC (\pm 25%)
Undervoltage cut-off	<18 VDC
Overvoltage cut-off	>95 VDC
Voltage measurement	Yes
Line protection	Must be implemented externally

24 VDC supply	80SD100XD.C04X-13
Input voltage	24 VDC (±25%)
Power consumption	
CPU (including Enable input)	7.0 W
X2X Link supply	0.0 W (generated internally from the CPU supply)
Voltage monitoring	Yes
General information	80SD100XD.C04X-13
Status indicators	X2X bus function, operating status, module status, module information
Diagnostics	
Module run/error	Yes, with status LED and software status
X2X Link	Yes, with status LED
Motor status	Yes, with status LED and software status
Module / cooling unit temperature	Yes, with software status
Electrical isolation from the CPU	
X2X Link	Yes
Trigger inputs	Yes
Enable input	Yes
Output for motor holding brake	No
Power element (supply, motor connection)	Yes
Certification	CE, C-UL-US (in development), GOST-R
Operational conditions	80SD100XD.C04X-13
Operating temperature	0°C to 45°C
Relative humidity	5 to 85%, non-condensing
Degree of pollution according to EN 60664-1	2 (non-conductive material)
Protection type	IP20
Storage and transport conditions	80SD100XD.C04X-13
Temperature	-25°C to +55°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	80SD100XD.C04X-13
Dimensions (W x H x D)	65 x 134 x 95 mm (without heat spreader)
Mounting / cooling	Screw mounting with heat spreader on mounting plate or ColdPlate
Comment	Please order terminal blocks separately!

Required accessories		
0TB1110.8010	Accessory terminal block (3.5), 10-pin screw clamp, 1.5 mm ² , protected against vibration by the screw flange	1718
0TB1110.8110	Accessory terminal block (3.5), 10-pin cage clamp, 1.5 mm ² , protected against vibration by the screw flange	1718
0TB1310.3100	Accessory terminal block (3.5), 3 x 10-pin cage clamp, 1.5 mm ² , protected against vibration by the screw flange	1246
0TB2105.4021	Accessory terminal block (5.08), 5-pin, AX1-coded, M.P. screw clamp 2.5 mm ²	1244
0TB2105.4022	Accessory terminal block (5.08), 5-pin, AX2-coded, M.P. screw clamp 2.5 mm ²	1244
0TB2105.4121	Accessory terminal block (5.08), 5-pin, AX1-coded, M.P. cage clamp 2.5 mm ²	1244
0TB2105.4122	Accessory terminal block (5.08), 5-pin, AX2-coded, M.P. cage clamp 2.5 mm ²	1244
0TB2105.9021	Accessory terminal block (5.08), 5-pin, DC-coded, M.S. screw clamp 2.5 mm ²	1245
0TB2105.9121	Accessory terminal block (5.08), 5-pin, DC-coded, M.S. cage clamp 2.5 mm ²	1245
0TB1106.8010	Accessory terminal block (3.5), 6-pin screw clamp, 1.5 mm ² , protected against vibration by the screw flange	176
0TB1106.8110	Accessory terminal block (3.5), 6-pin cage clamp, 1.5 mm ² , protected against vibration by the screw flange	176
X20CA0X48.0010	X2X Link device attachment cable, 1.0 m	1248
X20CA0X48.0020	X2X Link device attachment cable, 2.0 m	1248
X20CA0X68.0003	X2X Link device connection cable, 0.3 m	1248
X20CA0X68.0010	X2X Link device connection cable, 1.0 m	1248

Key: M.P. ... Multipoint plug; M.S. ... Multipoint socket

Stepper motor module

X2X Link, 2 channels, option board



- Control for 2 stepper motors (2-phase bipolar, full bridge)
- 256 microsteps per step
- 2 trigger inputs
- Motor holding brake connection
- Enable input
- 2 analog inputs
- Automatic motor detection
- Holding, boost and continuous current can be defined independent of one another

Short description	80SD100XD.C0XX-21
Stepper motor module	Connection for two stepper motors (2-phase bipolar, full bridge)
Motor connector	80SD100XD.C0XX-21
Amount	2
Rated voltage	24 - 64 VDC \pm 25%
Rated current	10 A
Maximum current / motor	15 A (2 s)
Maximum current / module	30 A
Controller frequency	38.5 kHz
Step resolution	256 microsteps per step
Motor holding brake connection	80SD100XD.C0XX-21
Continuous current	1 A
Rated voltage	24 VDC
Protective measures / safeguards	Overload / short-circuit protection
Maximum switching frequency	100 Hz
Trigger inputs	80SD100XD.C0XX-21
Amount	2
Rated voltage	24 VDC
Input filter	
Hardware	< 10 μ s
Input circuit	Sink
Enable input	80SD100XD.C0XX-21
Amount	1
Rated voltage	24 VDC
Input circuit	Sink
Analog inputs on the option board	80SD100XD.C0XX-21
Amount	2
Input type	Differential input
Input signal	-10V ... +10V
Digital converter resolution	13-bit
Conversion time	50 μ s for all channels
Output format	INT16
Input impedance in signal range	20M Ω
Input protection	Protection against wiring with CPU supply voltage
X2X Link interface	80SD100XD.C0XX-21
Design	4-pin plug
Minimum cycle time on the X2X bus	250 μ s
Power element supply	80SD100XD.C0XX-21
Input voltage	24 - 64 VDC (\pm 25%)
Undervoltage cut-off	<18 VDC
Overvoltage cut-off	>95 VDC
Voltage measurement	Yes
Line protection	Must be implemented externally
24 VDC supply	80SD100XD.C0XX-21
Input voltage	24 VDC (\pm 25%)
Power consumption	
CPU (including Enable input)	6.0 W
X2X Link supply	0.0 W (generated internally from the CPU supply)
Voltage monitoring	Yes

General information	80SD100XD.C0XX-21
Status indicators	X2X bus function, operating status, module status, module information
Diagnostics	
Module run/error	Yes, with status LED and software status
X2X Link	Yes, with status LED
Motor status	Yes, with status LED and software status
Module / cooling unit temperature	Yes, with software status
Electrical isolation from the CPU	
X2X Link	Yes
Trigger inputs	Yes
Enable input	Yes
Output for motor holding brake	No
Power element (supply, motor connection)	Yes
Certification	CE, C-UL-US (in development), GOST-R
Operational conditions	80SD100XD.C0XX-21
Operating temperature	0°C to 45°C
Relative humidity	5 to 85%, non-condensing
Degree of pollution according to EN 60664-1	2 (non-conductive material)
Protection type	IP20
Storage and transport conditions	80SD100XD.C0XX-21
Temperature	-25°C to +55°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	80SD100XD.C0XX-21
Dimensions (W x H x D)	65 x 134 x 95 mm (without heat spreader)
Mounting / cooling	Screw mounting with heat spreader on mounting plate or ColdPlate
Comment	Please order terminal blocks separately!

Required accessories		
0TB1110.8010	Accessory terminal block (3.5), 10-pin screw clamp, 1.5 mm ² , protected against vibration by the screw flange	1718
0TB1110.8110	Accessory terminal block (3.5), 10-pin cage clamp, 1.5 mm ² , protected against vibration by the screw flange	1718
0TB1310.3100	Accessory terminal block (3.5), 3 x 10-pin cage clamp, 1.5 mm ² , protected against vibration by the screw flange	1246
0TB2105.4021	Accessory terminal block (5.08), 5-pin, AX1-coded, M.P. screw clamp 2.5 mm ²	1244
0TB2105.4121	Accessory terminal block (5.08), 5-pin, AX1-coded, M.P. cage clamp 2.5 mm ²	1244
0TB2105.9021	Accessory terminal block (5.08), 5-pin, DC-coded, M.S. screw clamp 2.5 mm ²	1245
0TB2105.9121	Accessory terminal block (5.08), 5-pin, DC-coded, M.S. cage clamp 2.5 mm ²	1245
0TB1106.8010	Accessory terminal block (3.5), 6-pin screw clamp, 1.5 mm ² , protected against vibration by the screw flange	176
0TB1106.8110	Accessory terminal block (3.5), 6-pin cage clamp, 1.5 mm ² , protected against vibration by the screw flange	176
X20CA0X48.0010	X2X Link device attachment cable, 1.0 m	1248
X20CA0X48.0020	X2X Link device attachment cable, 2.0 m	1248
X20CA0X68.0003	X2X Link device connection cable, 0.3 m	1248
X20CA0X68.0010	X2X Link device connection cable, 1.0 m	1248

Key: M.P. ... Multipoint plug; M.S. ... Multipoint socket

Servo motor module POWERLINK, 1 channel, 1 resolver interface



- Control for 1 servo motor
- 1 resolver interface
- 2 trigger inputs
- Motor holding brake connection
- Enable input

Short description	80VD100PS.C02X-01
Servo motor module	Connection for a servo motor with resolver interface
Motor connector	80VD100PS.C02X-01
Amount	1
Rated voltage	24 - 64 VDC $\pm 25\%$
Rated current	In preparation
Maximum current / motor	In preparation
Rated switching frequency	5 kHz
Current controller frequency	20 kHz
Motor holding brake connection	80VD100PS.C02X-01
Continuous current	1 A
Rated voltage	24 VDC
Protective measures / safeguards	Overload / short-circuit protection
Maximum switching frequency	100 Hz
Encoder inputs	80VD100PS.C02X-01
Amount	1
Signal transfer	Differential signal
Input impedance	10.4 k Ω - j 11.1 k Ω
Angular position resolution	14-bit
Short circuit protection	Yes
Resolver ratio	0.5 $\pm 10\%$
Reference output	80VD100PS.C02X-01
Output voltage	3.4 V _{eff}
Max. output current	50 mA _{eff}
Trigger inputs	80VD100PS.C02X-01
Amount	2
Rated voltage	24 VDC
Input filter	
Hardware	< 10 μ s
Input circuit	Sink
Enable input	80VD100PS.C02X-01
Amount	1
Rated voltage	24 VDC
Input circuit	Sink
POWERLINK interface	80VD100PS.C02X-01
Design	RJ45 socket
Electrical isolation	Yes
Power element supply	80VD100PS.C02X-01
Input voltage	24 - 64 VDC ($\pm 25\%$)
Undervoltage cut-off	< 18 VDC
Overvoltage cut-off	> 95 VDC
Voltage measurement	Yes
Line protection	Must be implemented externally
24 VDC supply	80VD100PS.C02X-01
Input voltage	24 VDC ($\pm 25\%$)
Power consumption	
CPU	In preparation
Voltage monitoring	Yes

General information	80VD100PS.C02X-01
Status indicators	POWERLINK, operating status, module status, module information
Diagnostics	
Module run/error	Yes, with status LED and software status
POWERLINK	Yes, with status LED
Motor status	Yes, with status LED and software status
Module / cooling unit temperature	Yes, with software status
Electrical isolation from the CPU	
POWERLINK	Yes
Trigger inputs	Yes
Enable input	Yes
Output for motor holding brake	No
Power element (supply, motor connection)	Yes
Certification	CE, C-UL-US (in development), GOST-R
Operational conditions	80VD100PS.C02X-01
Operating temperature	In preparation
Relative humidity	5 to 85%, non-condensing
Degree of pollution according to EN 60664-1	2 (non-conductive material)
Protection type	IP20
Storage and transport conditions	80VD100PS.C02X-01
Temperature	-25°C to +55°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	80VD100PS.C02X-01
Dimensions (W x H x D)	65 x 134 x 95 mm (without heat spreader)
Mounting / cooling	Screw mounting with heat spreader on mounting plate or ColdPlate
Comment	Please order terminal blocks separately!

Required accessories		
OTB1110.8010	Accessory terminal block (3.5), 10-pin screw clamp, 1.5 mm ² , protected against vibration by the screw flange	1718
OTB1110.8110	Accessory terminal block (3.5), 10-pin cage clamp, 1.5 mm ² , protected against vibration by the screw flange	1718
OTB1310.3100	Accessory terminal block (3.5), 3 x 10-pin cage clamp, 1.5 mm ² , protected against vibration by the screw flange	1246
OTB2104.4021	Accessory terminal block (5.08), 4-pin, AX1-coded, M.P. screw clamp 2.5 mm ²	1244
OTB2104.4121	Accessory terminal block (5.08), 4-pin, AX1-coded, M.P. cage clamp 2.5 mm ²	1244
OTB2102.4021	Accessory terminal block (5.08), 2-pin, AX1-coded, M.P. screw clamp 2.5 mm ²	174
OTB2102.4121	Accessory terminal block (5.08), 2-pin, AX1-coded, M.P. cage clamp 2.5 mm ²	174
OTB2105.9021	Accessory terminal block (5.08), 5-pin, DC-coded, M.S. screw clamp 2.5 mm ²	175
OTB2105.9121	Accessory terminal block (5.08), 5-pin, DC-coded, M.S. cage clamp 2.5 mm ²	175

Key: M.P. ... Multipoint plug; M.S. ... Multipoint socket

Servo motor module

POWERLINK, 2 channels, 2 resolver interfaces



- Control for 2 servo motors
- 2 resolver interface
- 2 trigger inputs
- Motor holding brake connection
- Enable input

Short description	80VD100PD.C022-01
Servo motor module	Connection for two servo motors with resolver interface
Motor connector	80VD100PD.C022-01
Amount	2
Rated voltage	24 - 64 VDC $\pm 25\%$
Rated current	In preparation
Maximum current / motor	In preparation
Maximum current / module	In preparation
Rated switching frequency	5 kHz
Current controller frequency	20 kHz
Motor holding brake connection	80VD100PD.C022-01
Continuous current	1 A
Rated voltage	24 VDC
Protective measures / safeguards	Overload / short-circuit protection
Maximum switching frequency	100 Hz
Encoder inputs	80VD100PD.C022-01
Amount	2
Signal transfer	Differential signal
Input impedance	10.4 k Ω - j 11.1 k Ω
Angular position resolution	14-bit
Short circuit protection	Yes
Resolver ratio	0.5 $\pm 10\%$
Reference output	80VD100PD.C022-01
Output voltage	3.4 V _{off}
Max. output current	50 mA _{off}
Trigger inputs	80VD100PD.C022-01
Amount	2
Rated voltage	24 VDC
Input filter	
Hardware	< 10 μ s
Input circuit	Sink
Enable input	80VD100PD.C022-01
Amount	1
Rated voltage	24 VDC
Input circuit	Sink
POWERLINK interface	80VD100PD.C022-01
Design	RJ45 socket
Electrical isolation	Yes
Power element supply	80VD100PD.C022-01
Input voltage	24 - 64 VDC ($\pm 25\%$)
Undervoltage cut-off	<18 VDC
Overvoltage cut-off	>95 VDC
Voltage measurement	Yes
Line protection	Must be implemented externally
24 VDC supply	80VD100PD.C022-01
Input voltage	24 VDC ($\pm 25\%$)
Power consumption	
CPU	In preparation
Voltage monitoring	Yes

General information		80VD100PD.C022-01
Status indicators	POWERLINK, operating status, module status, module information	
Diagnostics		
Module run/error	Yes, with status LED and software status	
POWERLINK	Yes, with status LED	
Motor status	Yes, with status LED and software status	
Module / cooling unit temperature	Yes, with software status	
Electrical isolation from the CPU		
POWERLINK	Yes	
Trigger inputs	Yes	
Enable input	Yes	
Output for motor holding brake	No	
Power element (supply, motor connection)	Yes	
Certification	CE, C-UL-US (in development), GOST-R	
Operational conditions		80VD100PD.C022-01
Operating temperature	In preparation	
Relative humidity	5 to 85%, non-condensing	
Degree of pollution according to EN 60664-1	2 (non-conductive material)	
Protection type	IP20	
Storage and transport conditions		80VD100PD.C022-01
Temperature	-25°C to +55°C	
Relative humidity	5 to 95%, non-condensing	
Mechanical characteristics		80VD100PD.C022-01
Dimensions (W x H x D)	65 x 134 x 95 mm (without heat spreader)	
Mounting / cooling	Screw mounting with heat spreader on mounting plate or ColdPlate	
Comment	Please order terminal blocks separately!	

Required accessories		
0TB1110.8010	Accessory terminal block (3.5), 10-pin screw clamp, 1.5 mm ² , protected against vibration by the screw flange	1718
0TB1110.8110	Accessory terminal block (3.5), 10-pin cage clamp, 1.5 mm ² , protected against vibration by the screw flange	1718
0TB1310.3100	Accessory terminal block (3.5), 3 x 10-pin cage clamp, 1.5 mm ² , protected against vibration by the screw flange	1246
0TB2104.4021	Accessory terminal block (5.08), 4-pin, AX1-coded, M.P. screw clamp 2.5 mm ²	1244
0TB2104.4022	Accessory terminal block (5.08), 4-pin, AX2-coded, M.P. screw clamp 2.5 mm ²	1244
0TB2104.4121	Accessory terminal block (5.08), 4-pin, AX1-coded, M.P. cage clamp 2.5 mm ²	1244
0TB2104.4122	Accessory terminal block (5.08), 4-pin, AX2-coded, M.P. cage clamp 2.5 mm ²	1244
0TB2102.4021	Accessory terminal block (5.08), 2-pin, AX1-coded, M.P. screw clamp 2.5 mm ²	174
0TB2102.4022	Accessory terminal block (5.08), 2-pin, AX2-coded, M.P. screw clamp 2.5 mm ²	174
0TB2102.4121	Accessory terminal block (5.08), 2-pin, AX1-coded, M.P. cage clamp 2.5 mm ²	174
0TB2102.4122	Accessory terminal block (5.08), 2-pin, AX2-coded, M.P. cage clamp 2.5 mm ²	174
0TB2105.9021	Accessory terminal block (5.08), 5-pin, DC-coded, M.S. screw clamp 2.5 mm ²	175
0TB2105.9121	Accessory terminal block (5.08), 5-pin, DC-coded, M.S. cage clamp 2.5 mm ²	175

Key: M.P. ... Multipoint plug; M.S. ... Multipoint socket

Servo motor module

POWERLINK, 1 channel, EnDat 2.2 interface



- Control for 1 servo motor
- 1 EnDat 2.2. interface
- 2 trigger inputs
- Motor holding brake connection
- Enable input

Short description	80VD100PS.C00X-01
Servo motor module	Connection for a servo motor with EnDat 2.2 interface
Motor connector	80VD100PS.C00X-01
Amount	1
Rated voltage	24 - 64 VDC $\pm 25\%$
Rated current	In preparation
Maximum current / motor	In preparation
Rated switching frequency	5 kHz
Current controller frequency	20 kHz
Motor holding brake connection	80VD100PS.C00X-01
Continuous current	1 A
Rated voltage	24 VDC
Protective measures / safeguards	Overload / short-circuit protection
Maximum switching frequency	100 Hz
Encoder inputs	80VD100PS.C00X-01
Amount	1
Type	EnDat 2.2
Encoder - output supply voltage	typ. 24 VDC
Load capability	In preparation
Protection of the encoder supply output	Short circuit and overload protection
Signal transfer	RS485
Baud rate	6.25 Mbit/s
Trigger inputs	80VD100PS.C00X-01
Amount	2
Rated voltage	24 VDC
Input filter	
Hardware	< 10 μ s
Input circuit	Sink
Enable input	80VD100PS.C00X-01
Amount	1
Rated voltage	24 VDC
Input circuit	Sink
POWERLINK interface	80VD100PS.C00X-01
Design	RJ45 socket
Electrical isolation	Yes
Power element supply	80VD100PS.C00X-01
Input voltage	24 - 64 VDC ($\pm 25\%$)
Undervoltage cut-off	<18 VDC
Overvoltage cut-off	>95 VDC
Voltage measurement	Yes
Line protection	Must be implemented externally
24 VDC supply	80VD100PS.C00X-01
Input voltage	24 VDC ($\pm 25\%$)
Power consumption	
CPU	In preparation
Voltage monitoring	Yes

General information	80VD100PS.C00X-01
Status indicators	POWERLINK, operating status, module status, module information
Diagnostics	
Module run/error	Yes, with status LED and software status
POWERLINK	Yes, with status LED
Motor status	Yes, with status LED and software status
Module / cooling unit temperature	Yes, with software status
Electrical isolation from the CPU	
POWERLINK	Yes
Trigger inputs	Yes
Enable input	Yes
Output for motor holding brake	No
Power element (supply, motor connection)	Yes
Certification	CE, C-UL-US (in development), GOST-R
Operational conditions	80VD100PS.C00X-01
Operating temperature	In preparation
Relative humidity	5 to 85%, non-condensing
Degree of pollution according to EN 60664-1	2 (non-conductive material)
Protection type	IP20
Storage and transport conditions	80VD100PS.C00X-01
Temperature	-25°C to +55°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	80VD100PS.C00X-01
Dimensions (W x H x D)	65 x 134 x 95 mm (without heat spreader)
Mounting / cooling	Screw mounting with heat spreader on mounting plate or ColdPlate
Comment	Please order terminal blocks separately!

Required accessories		
OTB1110.8010	Accessory terminal block (3.5), 10-pin screw clamp, 1.5 mm ² , protected against vibration by the screw flange	1718
OTB1110.8110	Accessory terminal block (3.5), 10-pin cage clamp, 1.5 mm ² , protected against vibration by the screw flange	1718
OTB1310.3100	Accessory terminal block (3.5), 3 x 10-pin cage clamp, 1.5 mm ² , protected against vibration by the screw flange	1246
OTB2104.4021	Accessory terminal block (5.08), 4-pin, AX1-coded, M.P. screw clamp 2.5 mm ²	174
OTB2104.4121	Accessory terminal block (5.08), 4-pin, AX1-coded, M.P. cage clamp 2.5 mm ²	174
OTB2102.4021	Accessory terminal block (5.08), 2-pin, AX1-coded, M.P. screw clamp 2.5 mm ²	174
OTB2102.4121	Accessory terminal block (5.08), 2-pin, AX1-coded, M.P. cage clamp 2.5 mm ²	174
OTB2105.9021	Accessory terminal block (5.08), 5-pin, DC-coded, M.S. screw clamp 2.5 mm ²	175
OTB2105.9121	Accessory terminal block (5.08), 5-pin, DC-coded, M.S. cage clamp 2.5 mm ²	175

Key: M.P. ... Multipoint plug; M.S. ... Multipoint socket

Servo motor module

POWERLINK, 2 channels, 2 EnDat 2.2 interfaces



- Control for 2 servo motors
- 2 EnDat 2.2 interface
- 2 trigger inputs
- Motor holding brake connection
- Enable input

Short description	80VD100PD.C000-01
Servo motor module	Connection for two servo motors with EnDat 2.2 interface
Motor connector	80VD100PD.C000-01
Amount	2
Rated voltage	24 - 64 VDC $\pm 25\%$
Rated current	In preparation
Maximum current / motor	In preparation
Maximum current / module	In preparation
Rated switching frequency	5 kHz
Current controller frequency	20 kHz
Motor holding brake connection	80VD100PD.C000-01
Continuous current	1 A
Rated voltage	24 VDC
Protective measures / safeguards	Overload / short-circuit protection
Maximum switching frequency	100 Hz
Encoder inputs	80VD100PD.C000-01
Amount	2
Type	EnDat 2.2
Encoder - output supply voltage	typ. 24 VDC
Load capability	In preparation
Protection of the encoder supply output	Short circuit and overload protection
Signal transfer	RS485
Baud rate	6.25 Mbit/s
Trigger inputs	80VD100PD.C000-01
Amount	2
Rated voltage	24 VDC
Input filter	
Hardware	< 10 μ s
Input circuit	Sink
Enable input	80VD100PD.C000-01
Amount	1
Rated voltage	24 VDC
Input circuit	Sink
POWERLINK interface	80VD100PD.C000-01
Design	RJ45 socket
Electrical isolation	Yes
Power element supply	80VD100PD.C000-01
Input voltage	24 - 64 VDC ($\pm 25\%$)
Undervoltage cut-off	< 18 VDC
Overvoltage cut-off	> 95 VDC
Voltage measurement	Yes
Line protection	Must be implemented externally
24 VDC supply	80VD100PD.C000-01
Input voltage	24 VDC ($\pm 25\%$)
Power consumption	
CPU	In preparation
Voltage monitoring	Yes

General information	80VD100PD.C000-01
Status indicators	POWERLINK, operating status, module status, module information
Diagnostics	
Module run/error	Yes, with status LED and software status
POWERLINK	Yes, with status LED
Motor status	Yes, with status LED and software status
Module / cooling unit temperature	Yes, with software status
Electrical isolation from the CPU	
POWERLINK	Yes
Trigger inputs	Yes
Enable input	Yes
Output for motor holding brake	No
Power element (supply, motor connection)	Yes
Certification	CE, C-UL-US (in development), GOST-R
Operational conditions	80VD100PD.C000-01
Operating temperature	In preparation
Relative humidity	5 to 85%, non-condensing
Degree of pollution according to EN 60664-1	2 (non-conductive material)
Protection type	IP20
Storage and transport conditions	80VD100PD.C000-01
Temperature	-25°C to +55°C
Relative humidity	5 to 95%, non-condensing
Mechanical characteristics	80VD100PD.C000-01
Dimensions (W x H x D)	65 x 134 x 95 mm (without heat spreader)
Mounting / cooling	Screw mounting with heat spreader on mounting plate or ColdPlate
Comment	Please order terminal blocks separately!

Required accessories		
0TB1110.8010	Accessory terminal block (3.5), 10-pin screw clamp, 1.5 mm ² , protected against vibration by the screw flange	1718
0TB1110.8110	Accessory terminal block (3.5), 10-pin cage clamp, 1.5 mm ² , protected against vibration by the screw flange	1718
0TB1310.3100	Accessory terminal block (3.5), 3 x 10-pin cage clamp, 1.5 mm ² , protected against vibration by the screw flange	1246
0TB2104.4021	Accessory terminal block (5.08), 4-pin, AX1-coded, M.P. screw clamp 2.5 mm ²	1244
0TB2104.4022	Accessory terminal block (5.08), 4-pin, AX2-coded, M.P. screw clamp 2.5 mm ²	1244
0TB2104.4121	Accessory terminal block (5.08), 4-pin, AX1-coded, M.P. cage clamp 2.5 mm ²	1244
0TB2104.4122	Accessory terminal block (5.08), 4-pin, AX2-coded, M.P. cage clamp 2.5 mm ²	1244
0TB2102.4021	Accessory terminal block (5.08), 2-pin, AX1-coded, M.P. screw clamp 2.5 mm ²	174
0TB2102.4022	Accessory terminal block (5.08), 2-pin, AX2-coded, M.P. screw clamp 2.5 mm ²	174
0TB2102.4121	Accessory terminal block (5.08), 2-pin, AX1-coded, M.P. cage clamp 2.5 mm ²	174
0TB2102.4122	Accessory terminal block (5.08), 2-pin, AX2-coded, M.P. cage clamp 2.5 mm ²	174
0TB2105.9021	Accessory terminal block (5.08), 5-pin, DC-coded, M.S. screw clamp 2.5 mm ²	175
0TB2105.9121	Accessory terminal block (5.08), 5-pin, DC-coded, M.S. cage clamp 2.5 mm ²	175

Key: M.P. ... Multipoint plug; M.S. ... Multipoint socket

Terminal blocks

This single-row 5-pin terminal block TB2105 is used for the motor connection to the ACOPOSmicro stepper.



Brief overview	0TB2105.4021	0TB2105.4121
Number of pins	5	5
Coding	AX1	AX1
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	5.08 mm	5.08 mm
Contact resistance	≤2 mΩ	≤5 mΩ
Rated voltage	300 V	300 V
Rated current ¹⁾	15 A / contact	15 A / contact
Connection cross section		
AWG wire	24 - 12 AWG	26 - 12 AWG
Solid wire line	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line with wire tip sleeves	0.25 - 2.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.25 - 2.50 mm ²	0.20 - 1.50 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Rated values according to UL	Rated values according to UL
Brief overview	0TB2105.4022	0TB2105.4122
Number of pins	5	5
Coding	AX2	AX2
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	5.08 mm	5.08 mm
Contact resistance	≤2 mΩ	≤5 mΩ
Rated voltage	300 V	300 V
Rated current ¹⁾	15 A / contact	15 A / contact
Connection cross section		
AWG wire	24 - 12 AWG	26 - 12 AWG
Solid wire line	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line with wire tip sleeves	0.25 - 2.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.25 - 2.50 mm ²	0.20 - 1.50 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Rated values according to UL	Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

This single-row 4-pin terminal block TB2104 is used for the motor connection to the ACOPOSmicro servo.



Brief overview	0TB2104.4021	0TB2104.4121
Number of pins	4	4
Coding	AX1	AX1
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	5.08 mm	5.08 mm
Contact resistance	$\leq 2 \text{ m}\Omega$	$\leq 5 \text{ m}\Omega$
Rated voltage	300 V	300 V
Rated current ¹⁾	15 A / contact	15 A / contact
Connection cross section		
AWG wire	24 - 12 AWG	26 - 12 AWG
Solid wire line	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line with wire tip sleeves	0.25 - 2.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.25 - 2.50 mm ²	0.20 - 1.50 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Rated values according to UL	Rated values according to UL
Brief overview	0TB2104.4021	0TB2104.4121
Number of pins	4	4
Coding	AX2	AX2
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	5.08 mm	5.08 mm
Contact resistance	$\leq 2 \text{ m}\Omega$	$\leq 5 \text{ m}\Omega$
Rated voltage	300 V	300 V
Rated current ¹⁾	15 A / contact	15 A / contact
Connection cross section		
AWG wire	24 - 12 AWG	26 - 12 AWG
Solid wire line	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line with wire tip sleeves	0.25 - 2.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.25 - 2.50 mm ²	0.20 - 1.50 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Rated values according to UL	Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

Terminal blocks

This single-row 2-pin terminal block TB2102 is used for the connection of the motor's temperature sensor to the ACOPOSmicro servo.



Brief overview	0TB2102.4021	0TB2102.4121
Number of pins	2	2
Coding	AX1	AX1
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	5.08 mm	5.08 mm
Contact resistance	≤2 mΩ	≤5 mΩ
Rated voltage	300 V	300 V
Rated current ¹⁾	15 A / contact	15 A / contact
Connection cross section		
AWG wire	24 - 12 AWG	26 - 12 AWG
Solid wire line	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line with wire tip sleeves	0.25 - 2.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.25 - 2.50 mm ²	0.20 - 1.50 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Rated values according to UL	Rated values according to UL
Brief overview	0TB2102.4022	0TB2102.4122
Number of pins	2	2
Coding	AX2	AX2
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	5.08 mm	5.08 mm
Contact resistance	≤2 mΩ	≤5 mΩ
Rated voltage	300 V	300 V
Rated current ¹⁾	15 A / contact	15 A / contact
Connection cross section		
AWG wire	24 - 12 AWG	26 - 12 AWG
Solid wire line	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line with wire tip sleeves	0.25 - 2.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.25 - 2.50 mm ²	0.20 - 1.50 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Rated values according to UL	Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

This single-row 5-pin terminal block TB2105 is used for the connection of the power-supply to the ACOPOSmicro.



Brief overview	0TB2105.9021	0TB2105.9121
Number of pins	5	5
Coding	DC	DC
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	5.08 mm	5.08 mm
Contact resistance	$\leq 2 \text{ m}\Omega$	$\leq 5 \text{ m}\Omega$
Rated voltage	300 V	300 V
Rated current ¹⁾	15 A / contact	15 A / contact
Connection cross section		
AWG wire	24 - 12 AWG	26 - 12 AWG
Solid wire line	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 2.50 mm ²	0.20 - 2.50 mm ²
Fine wire line with wire tip sleeves	0.25 - 2.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.25 - 2.50 mm ²	0.20 - 1.50 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Rated values according to UL	Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

This single-row 6-pin terminal block TB1106 is used for the option board on the ACOPOSmicro.



Brief overview	0TB1106.8010	0TB1106.8110
Number of pins	6	6
Type of terminal	Screw clamps	Cage clamps
Distance between contacts	3.5 mm	3.5 mm
Contact resistance	$\leq 4.2 \text{ m}\Omega$	$\leq 4.2 \text{ m}\Omega$
Rated voltage	300 V	300 V
Rated current ¹⁾	10 A / contact	10 A / contact
Connection cross section		
AWG wire	28 - 14 AWG	26 - 14 AWG
Solid wire line	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line without wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Fine wire line with wire tip sleeves	0.20 - 1.50 mm ²	0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering	0.20 - 1.50 mm ²	0.20 - 1.00 mm ²
Cable type	Copper wires only (no aluminum wires!)	Copper wires only (no aluminum wires!)
Comment	Protected against vibration by the screw flange Rated values according to UL	Protected against vibration by the screw flange Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

Terminal blocks

The three-row 30-pin terminal block TB1310 is used to connect the I/Os and the CPU supply to the ACOPOSmicro.



Brief overview		0TB1310.3100
Number of pins		30
Type of terminal		Cage clamps
Distance between contacts		3.5 mm
Contact resistance		≤4.2 mΩ
Rated voltage		300 V
Rated current ¹⁾		2 A / contact
Connection cross section		
AWG wire		26 - 14 AWG
Solid wire line		0.20 - 1.50 mm ²
Fine wire line without wire tip sleeves		0.20 - 1.50 mm ²
Fine wire line with wire tip sleeves		0.20 - 1.50 mm ²
Wire tip sleeves with plastic covering		0.20 - 1.50 mm ²
Cable type		Copper wires only (no aluminum wires!)
Comment		Rated values according to UL

1) The respective limit data for the I/O modules must be taken into consideration.

Assembled cables

ACOPOSmicro stepper connection cable X2X to X2X



Length	Connection cable Model number	Short description
0.3 m	X20CA0X68.0003	X2X Link device connection cable, 0.3 m
1.0 m	X20CA0X68.0010	X2X Link device connection cable, 1.0 m
2.0 m	X20CA0X68.0020	X2X Link device connection cable, 2.0 m
5.0 m	X20CA0X68.0050	X2X Link device connection cable, 5.0 m
10.0 m	X20CA0X68.0100	X2X Link device connection cable, 10.0 m

ACOPOSmicro stepper connection cable X2X to open



Length	Attachment cable Model number	Short description
1.0 m	X20CA0X48.0010	X2X Link device attachment cable, 1.0 m
2.0 m	X20CA0X48.0020	X2X Link device attachment cable, 2.0 m
5.0 m	X20CA0X48.0050	X2X Link device attachment cable, 5.0 m
10.0 m	X20CA0X48.0100	X2X Link device attachment cable, 10.0 m
20.0 m	X20CA0X48.0200	X2X Link device attachment cable, 20.0 m





ACOPOS Intelligent servo drives

Increased production volume, reduced production cycles and improved quality with greater precision become a reality with ACOPOS servo drives.

BiSS encoder interface 8AC125



- BiSS encoder interface for installation in ACOPOS servo drives

General information		8AC125.60-1
C-UL-US listed		Yes
Module type		ACOPOS plug-in module
Slot ¹⁾		Slots 2, 3 and 4
Power consumption		In preparation
1) The AC125 is an encoder module. Several encoder modules can also be inserted. In this case, the encoder module in the slot with the lowest number is automatically used for motor feedback.		
Encoder input ¹⁾		8AC125.60-1
Connection, module-side		15-pin DSUB socket
Indicators		UP/DN LEDs
Electrical isolation		
Encoder - ACOPOS		No
Encoder monitoring		Yes
Encoder supply		
Output voltage		Typ. 5 V
Load capability		250 mA ²⁾
Sense lines		No
Sine-cosine inputs ³⁾		
Signal transfer		Differential signals, symmetric
Differential voltage		0.5 to 1.25 V _{ss}
Common mode voltage		Max. ±7 V
Terminating resistor		120 Ω
Signal frequency (-5 dB)		DC up to 400 kHz
Signal frequency (-3 dB)		DC up to 300 kHz
Resolution ⁴⁾		16384 * number of encoder lines
Precision ⁵⁾		---
Reference input		
Signal transfer		Differential signal, symmetric
Differential voltage for high		≥ +0.2 V
Differential voltage for low		≤ -0.2 V
Common mode voltage		Max. ±7 V
Terminating resistor		120 Ω
Serial interface		Synchronous
Signal transfer		RS485
Baud rate		625 kBaud

1) The BiSS encoder must be wired using a cable with a single shield.

2) This value only applies to the encoder. The actual load capacity of the encoder supply is approx. 300 mA. The difference of approx. 50 mA is covers the consumption of the terminating resistors that are always present. For longer encoder cables, it is important to note that the maximum voltage drop permitted on the supply wires (there and back) is 1.45V. This can reduce the permissible load current.

3) Currently not supported.

4) Depending on the resolution of the connected encoder, in practical applications only a part of this resolution can be used. The usable resolution can be further reduced by signal interferences from the connected encoder.

5) In the field, the precision is limited by the encoder.

Operational conditions		8AC125.60-1
Ambient temperature during operation	---	1)
Relative humidity during operation	---	1)

1) ACOPOS plug-in modules can be used in an ACOPOS servo drive; the corresponding values can be found in the technical data of the respective for a list of exclusive actions.

Storage and transport conditions		8AC125.60-1
Storage temperature	-25 to +55°C	
Relative humidity during storage	5 to 95%, non-condensing	
Transport temperature	-25 to +70°C	
Relative humidity during transport	95% at +40°C	

ACOPOSmulti Modular drive system

The new drive generation from B&R provides a universal solution for any machine manufacturing automation task. A new milestone on the path to "Perfection in Automation".



System characteristics



ACOPOSmulti inverter modules with SafeMC

The existing B&R safety system, consisting of the X20 SafeIO modules, SafeLOGIC and the SafeDESIGNER toolset in Automation Studio, is enhanced with the addition of ACOPOSmulti inverter units with integrated safety technology (SafeMC). All B&R "Integrated Safety Technology" products are optimized to work together. This results in highly effective integrated safety technology application solutions with maximum cost savings.

POWERLINK Safety sets technical standards

There are a number of new approaches to safe fieldbus systems that are heavily influenced by proprietary standards and have long response times. A difference in the B&R Safety System and therefore also in the ACOPOSmulti inverter modules with SafeMC: This system is based on POWERLINK Safety. The integrated safety functions such as "safely limited speed" can be activated directly via the network. Wiring these safety-related signals to the drive is now a thing of the past.

The information is collected from its source via safe digital inputs and outputs. The information is then distributed to respective sensors and actuators, the drive in this case, via a safe CPU, the SafeLOGIC controller with integrated safety functions. Connecting via POWERLINK results in the best possible SafeLOGIC communication connection to the standard controller for non-safety-related program creation without any additional work.

Short cycle times

Cycle times of 800 μ s are achieved on the ACOPOSmulti inverter units with SafeMC while maintaining Safety Integrity Level 3 (SIL3).

Modular, expandable system

Not all drives and axes in a production machine are safety-related. Therefore, the ACOPOSmulti inverter modules are offered both with and without integrated safety functions (SafeMC). This makes it possible to combine safe and non-safe axes in an application as needed.

Safety functions

The following safety functions are integrated in the drive in accordance with IEC 61800-5-2 thanks to ACOPOSmulti inverter modules with SafeMC and by embedding this component in the B&R Safety system. Additionally, "Safe Speed" is also provided for the SafeLOGIC. This means that safety functions can be combined as needed.

Safe state

In safety-related systems, potentially dangerous situations are not permitted, even when an error occurs. This is ensured by the two-channel hardware and firmware structure as well as by the system architecture.

Bias current fail-safe is applied in this situation. In the event of error, torque and power are always switched off on the drive.

Safe speed

If an EnDat2.2 safety encoder is installed in a system, then the SafeLOGIC can request the current speed of the motor encoder via the secure network and use that information as input signal in a safe application. With an EnDat2.2 safety encoder, the signal fulfills SIL2 in accordance with EN 61508.

Encoder

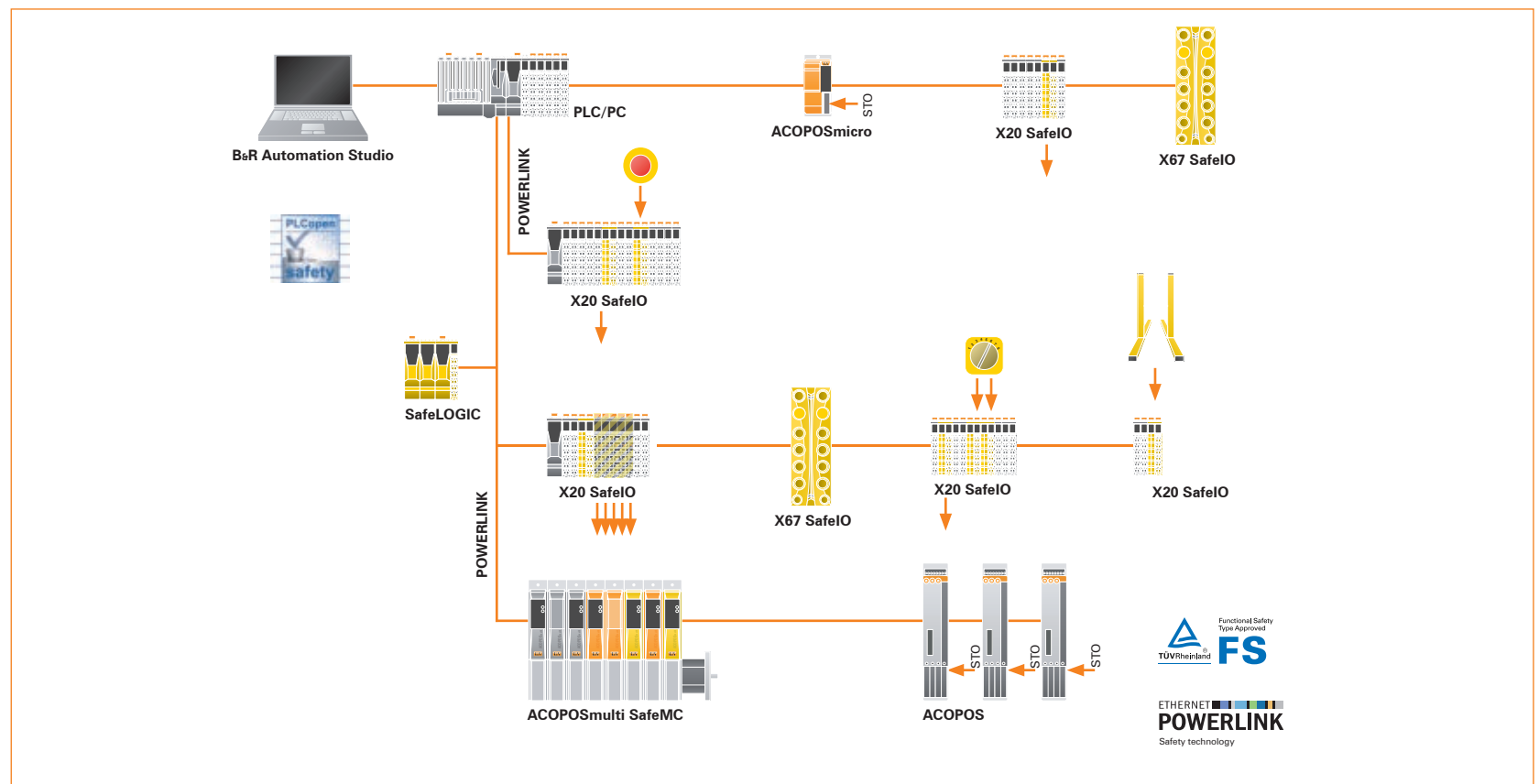
EnDat2.2 safety encoders are used to safely determine and evaluate the position and speed of the motor. They determine the position redundantly, thereby achieving SIL2.

The following safety functions are only available when using EnDat 2.2 safety encoders!

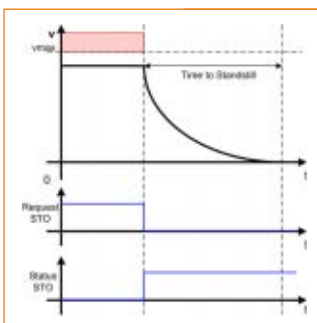
Overview of safety functions

The following safety functions are integrated in ACOPOSmulti inverter modules with SafeMC, and the following safety levels can be achieved using them:

Safety function	EN ISO 13849-1	EN 61508 / EN 62061	Safe encoder evaluation required?
Safe Torque Off (STO)	Pl e	SIL 3	No
Safe Operation Stop (SOS)	Pl d	SIL 2	Yes
Safe Stop 1 (SS1)	Pl e (time monitored) / Pl d	SIL 3 (time monitored) / SIL 2	no (time monitored) / yes
Safe Stop 2 (SS2)	Pl d	SIL 2	Yes
Safely Limited Speed (SLS)	Pl d	SIL 2	Yes
Safe Maximum Speed (SMS)	Pl d	SIL 2	Yes
Safe Direction (SDI)	Pl d	SIL 2	Yes
Safe Limited Increment (SLI)	Pl d	SIL 2	Yes
Safe Brake Control (SBC)	Pl e	SIL 3	No



System characteristics



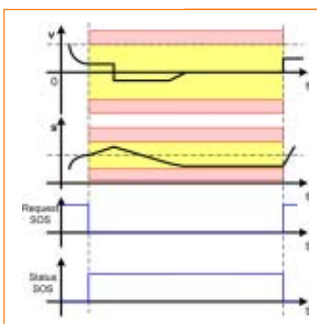
STO - Safe Torque Off

Safe Torque Off (STO) is the status when the drive motor is no longer supplied with power (i.e. free of torque and force). The power supply to the drive is safely cut off by safe activation of safe pulse disabling. The drive cannot generate any torque, and therefore any potentially dangerous movements.

STO is made available to SafeLOGIC as an integrated safety function and can therefore be requested directly via the network. This eliminates the need for external wiring.

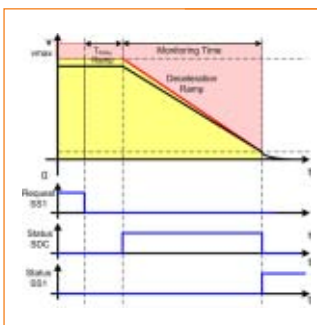
The STO safety function is the basis of all other safety functions. It is the implementation of the bias current fail-safe and is applied every time an error occurs.

The STO safety function corresponds to stop category 0 in accordance to EN 602041/11.98 and fulfills Safety Integrity Level 3 (SIL3) in accordance to EN 61508.



SOS - Safe Operating Stop

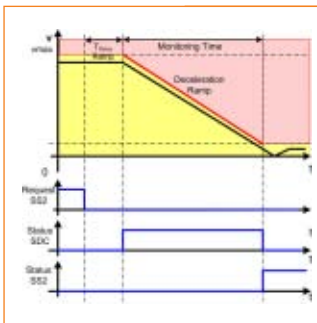
Safe Operating Stop (SOS) is the state in which the safe stopping of the drive is monitored. The drive is supplied with power and can therefore generate torque and force. All control functions between the electronic controller and the drive motor are active. The axis stop is monitored using a configurable stop tolerance window. Both the position as well as the speed are monitored. An EnDat 2.2 safety encoder is required to safely determine the speed and position. If the stop monitoring limits are violated, safe pulse disabling is activated and the drive switches to an acknowledgeable error state.



SS1 - Safe Stop 1

During Safe Stop 1 (SS1), transition of a moving motor to standstill is monitored for safety. After decelerating, safe pulse disabling is activated and switches off the torque and power to the drive. Depending on the requirements for the safety function, either only the deceleration time or also the deceleration ramp can be monitored. If the monitoring limits are violated during deceleration, safe pulse disabling is activated immediately and an acknowledgeable error state is entered. An advantage of deceleration ramp monitoring is that, when an error occurs, the assumed remaining distance to standstill is reduced.

Safe Stop 1 (SS1) corresponds to stop category 1 in accordance with EN 60204-1/11.98 and fulfills SIL3 when time-based monitoring is used and SIL2 when speed-based monitoring is used in accordance with EN 61508.

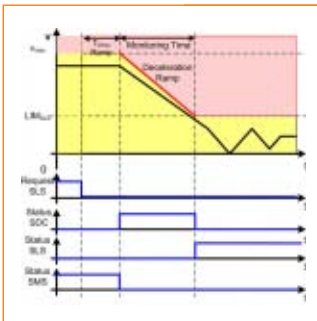


SS2 - Safe Stop 2

During Safe Stop 2 (SS2), transition of a moving motor to standstill is monitored for safety. Then the drive must be maintained at standstill by the functional application. As with SOS, this stop is monitored by the SafeMC module according to the configured tolerance window.

As with SS1, depending on the requirements for the safety function, either only the deceleration time or also the deceleration ramp can be monitored. If there are violations during ramp monitoring or subsequent stop monitoring, safe pulse disabling is activated immediately and an acknowledgeable error state is entered.

The Safe Stop 2 (SS2) corresponds to stop category 2 in accordance with EN 60204-1/11.98 and fulfills SIL2 in accordance with EN 61508.

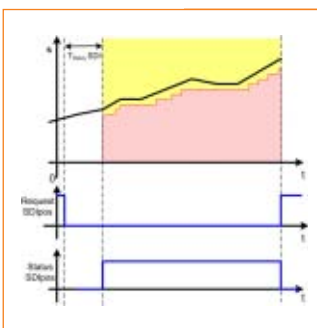


SLS - Safe Limited Speed

With the SLS safety function, the drive is monitored to make sure the configurable limits for speed are not exceeded. Depending on the application, deceleration can also be monitored until the limit is reached. Depending on the requirements, monitoring of the deceleration ramp can be set to either only monitor the deceleration time or also the deceleration ramp. If a violation is detected during monitoring of the limits for speed, safe pulse disabling is activated immediately and an acknowledgeable error state is entered. The SLS safety function fulfills SIL2 in accordance to EN 61508.

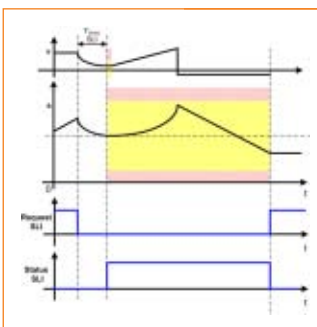
SMS - Safe Maximum Speed

The difference between SMS and SLS is that SMS cannot be actively initiated. It is either activated or deactivated by the configuration. When activated, the current speed is constantly monitored according to a defined limit. If the limit is exceeded, safe pulse disabling is activated immediately and an acknowledgeable error state is entered.



SDI – Safe Direction

The SDI safety function monitors the defined direction of movement. If the direction is violated, safe pulse disabling is activated immediately and an acknowledgeable error state is entered. Either the positive or the negative direction can be monitored. The safe direction function can be activated in parallel with other safety functions. For example, SLS can be limited to a certain direction.



SLI - Safely Limited Interval

With the SLI safety function, the movement is monitored for a defined interval. The safe axis must be stopped when the function is activated. A position window is established, which is then monitored for safety. This position window depends on the configured safe interval. If the interval is violated, safe pulse disabling is activated immediately and an acknowledgeable error state is entered.

SBC - Safe Brake Control

Safe Brake Control (SBC) sends a safe output signal to control an external brake. The SBC integrated safety function can be requested either explicitly via SafeLOGIC or when a module error occurs. Depending on the quality of the connected brake and its wiring, the function can fulfill SBC SIL3 in accordance to EN 61508.

System characteristics

Configuration of an ACOPOSmulti drive system

An ACOPOSmulti drive system consists of a regeneration choke (only for 8BVP power supply modules), line filter and three device groups - supply voltage modules, auxiliary voltage modules and inverter modules. Configuration significantly depends on the following factors: Cooling methods, medium and maximum total power of the drives and the peripheral supply (e.g. PLC, actuators, motor with brake, sensors) as well as the power and current of the individual drive units.

1) Cooling method	2) Supply voltage range	3) Axis modules	4) Plug-in modules	5) Options and reserved slots
Standard cooling (wall mounting)	Determine the supply voltage range	Single-axis modules	8BAC0120.000-1	Determine the number of optional and reserve slots
		8BVI0014HWSx.000-1	8BAC0120.001-1	
		8BVI0028HWSx.000-1	8BAC0121.000-1	
		8BVI0055HWSx.000-1	8BAC0122.000-1	
		8BVI0110HWSx.000-1	8BAC0123.000-1	
		8BVI0220HWSx.000-1	8BAC0123.001-1	
		8BVI0330HWSx.000-1	8BAC0123.002-1	
		8BVI0440HWSx.000-1	8BAC0124.000-1	
		8BVI0880HWSx.000-1	8BAC0130.000-1	
			8BAC0130.001-1	
			8BAC0132.000-1	
		Two-axis modules		
		8BVI0014HWDx.000-1		
		8BVI0028HWDx.000-1		
		8BVI0055HWDx.000-1		
		8BVI0110HWDx.000-1		
Feed-through cooling (feed-through mounting)	Determine the supply voltage range	Single-axis modules	8BAC0120.000-1	Determine the number of optional and reserve slots
		8BVI0014HCSx.000-1	8BAC0120.001-1	
		8BVI0028HCSx.000-1	8BAC0121.000-1	
		8BVI0055HCSx.000-1	8BAC0122.000-1	
		8BVI0110HCSx.000-1	8BAC0123.000-1	
		8BVI0220HCSx.000-1	8BAC0123.001-1	
		8BVI0330HCSx.000-1	8BAC0123.002-1	
		8BVI0440HCSx.000-1	8BAC0124.000-1	
		8BVI0880HCSx.000-1	8BAC0130.000-1	
			8BAC0130.001-1	
			8BAC0132.000-1	
		Two-axis modules		
		8BVI0014HCDx.000-1		
		8BVI0028HCDx.000-1		
		8BVI0055HCDx.000-1		
		8BVI0110HCDx.000-1		
Oil / water cooling (cold plate mounting)	Determine the supply voltage range	Single-axis modules	8BAC0120.000-1	Determine the number of optional and reserve slots
		8BVI0014HCSx.000-1	8BAC0120.001-1	
		8BVI0028HCSx.000-1	8BAC0121.000-1	
		8BVI0055HCSx.000-1	8BAC0122.000-1	
		8BVI0110HCSx.000-1	8BAC0123.000-1	
		8BVI0220HCSx.000-1	8BAC0123.001-1	
		8BVI0330HCSx.000-1	8BAC0123.002-1	
		8BVI0440HCSx.000-1	8BAC0124.000-1	
		8BVI0880HCSx.000-1	8BAC0130.000-1	
			8BAC0130.001-1	
			8BAC0132.000-1	
		Two-axis modules		
		8BVI0014HCDx.000-1		
		8BVI0028HCDx.000-1		
		8BVI0055HCDx.000-1		
		8BVI0110HCDx.000-1		

The configuration of an ACOPOSmulti drive system is done in 9 steps:

- 1) Determine the cooling method
- 2) Determine the supply voltage range
- 3) Select the inverter modules
- 4) Select corresponding plug-in modules
- 5) If the drive system should be expandable:
Determine the number of additional slots for other modules
- 6) Select the power supply module based on the power required for the inverter modules (with a mains supply voltage of 3 x 220 VAC, select the next larger power supply module)
- 7) Select the auxiliary supply module based on the power required for the inverter modules as well as the requirements of the application
- 8) The number of width units results from the number of modules plus the specified number of optional slots
- 9) Select the mounting plate for the number of width units determined

6a) Active power supply module with filter components	6b) Passive power supply module with filter components	7) Auxiliary supply design	8) Width units	9) Mounting plate
Active power supply modules 8BVP0220HW00.000-1 8BVP0440HW00.000-1 8BVP0880HW00.000-1	Passive power supply modules 8B0P0220HW00.000-1 8B0P0440HW00.000-1	Internal 24 V 8B0C0160HW00.000-1 8B0C0320HW00.000-1	Determine width units	8B0MnnnnHW00.000-1
Line filters 8BVF0220H000.000-1 8BVF0440H000.001-2 8BVF0880H000.000-1	Passive line filters 8B0F0300H000.000-1 8B0F0550H000.000-1	External 42 V 8B0C0160HW00.A01-1		
Regeneration chokes 8BVR0220H000.100-1 8BVR0440H000.100-1 8BVR0880H000.100-1		Internal and external 24 V 8B0C0160HW00.001-1 8B0C0320HW00.002-1 8B0C0320HW00.00A-1		
Active power supply modules 8BVP0220HC00.000-1 8BVP0440HC00.000-1 8BVP0880HC00.000-1	Passive power supply modules 8B0P0220HC00.000-1 8B0P0440HC00.000-1	Internal 24 V 8B0C0160HC00.000-1 8B0C0320HC00.000-1	Determine width units	8B0MnnnnHF00.000-1
Line filters 8BVF0220H000.000-1 8BVF0440H000.001-2 8BVF0880H000.000-1	Passive line filters 8B0F0300H000.000-1 8B0F0550H000.000-1	External 42 V 8B0C0160HC00.A01-1		
Regeneration chokes 8BVR0220H000.100-1 8BVR0440H000.100-1 8BVR0880H000.100-1		Internal and external 24 V 8B0C0160HC00.001-1 8B0C0320HC00.002-1 8B0C0320HW00.00A-1		
Active power supply modules 8BVP0220HC00.000-1 8BVP0440HC00.000-1 8BVP0880HC00.000-1	Passive power supply modules 8B0P0220HC00.000-1 8B0P0440HC00.000-1	Internal 24 V 8B0C0160HC00.000-1 8B0C0320HC00.000-1	Determine width units	8B0MnnnnHC00.000-1
Line filters 8BVF0220H000.000-1 8BVF0440H000.001-2 8BVF0880H000.000-1	Passive line filters 8B0F0300H000.000-1 8B0F0550H000.000-1	External 42 V 8B0C0160HC00.A01-1		
Regeneration chokes 8BVR0220H000.100-1 8BVR0440H000.100-1 8BVR0880H000.100-1		Internal and external 24 V 8B0C0160HC00.001-1 8B0C0320HC00.002-1 8B0C0320HW00.00A-1		

Product overview

Passive line filters



Model number	Short description	
8B0F0300H000.000-1	ACOPOSmulti passive line filter 30 A, 3x520/300 VAC, 50/60 Hz, IP20	198
8B0F0550H000.000-1	ACOPOSmulti passive line filter 55 A, 3x520/300 VAC, 50/60 Hz, IP20	198

Braking resistors



Model number	Short description	
8B0W0045H000.001-1	ACOPOSmulti braking resistor, 450 W, 50 R, IP65, terminals	199
8B0W0079H000.001-1	ACOPOSmulti braking resistor, 790 W, 33 R, IP65, terminals	199

Passive power supply modules

Wall mounting



Model number	Short description	
8B0P0220HW00.000-1	ACOPOSmulti power supply module 22 A, passive, HV, wall mounting	200
8B0P0440HW00.000-1	ACOPOSmulti power supply module 44 A, passive, HV, wall mounting	200

Cold plate or feed-through mounting



Model number	Short description	
8B0P0220HC00.000-1	ACOPOSmulti power supply module 22 A, passive, HV, cold plate or feed-through mounting	200
8B0P0440HC00.000-1	ACOPOSmulti power supply module 44 A, passive, HV, cold plate or feed-through mounting	200

Auxiliary supply modules 800 W

Wall mounting



Model number	Short description	
8B0C0320HW00.00A-1	ACOPOSMulti auxiliary supply module 32A, HV, wall mounting, 24 VIn 1x30 A, 24 VOut 1x30 A, 1x5 A	204

Cold plate or feed-through mounting



Model number	Short description	
8B0C0320HC00.00A-1	ACOPOSMulti auxiliary supply module 32 A, HV, cold plate or feed-through mounting, 24 VIn 1x30 A, 24 VOut 1x30 A, 1x5 A	204

Inverter modules 11 kW (two-axis modules)

Wall mounting



Model number	Short description	
8BVI0110HWD0.000-1	ACOPOSMulti inverter module 15.1 A, HV, wall mounting, 2 axes	208

Cold plate or feed-through mounting



Model number	Short description	
8BVI0110HCD0.000-1	ACOPOSMulti inverter module 15.1 A, HV, cold plate or feed-through mounting, 2 axes	208

Product overview

Inverter modules 24 kW (single-axis modules)

Wall mounting



Model number	Short description	
8BVI0330HWS0.000-1	ACOPOSmulti inverter module 33 A, HV, wall-mounting	213

Cold plate or feed-through mounting



Model number	Short description	
8BVI0330HCS0.000-1	ACOPOSmulti inverter module 33 A, HV, cold plate or feed-through mounting	213

Inverter modules 1.4 kW ... 11 kW, SafeMC (single-axis modules)

Wall mounting



Model number	Short description	
8BVI0014HWSS.000-1	ACOPOSmulti inverter module 1.9 A, HV, wall-mounting, SafeMC	218
8BVI0028HWSS.000-1	ACOPOSmulti inverter module 3.8 A, HV, wall-mounting, SafeMC	218
8BVI0055HWSS.000-1	ACOPOSmulti inverter module 7.6 A, HV, wall-mounting, SafeMC	218
8BVI0110HWSS.000-1	ACOPOSmulti inverter module 15.1 A, HV, wall-mounting, SafeMC	218

Cold plate or feed-through mounting



Model number	Short description	
8BVI0014HCSS.000-1	ACOPOSmulti inverter module 1.9 A, HV, cold plate or feed-through mounting, 2 axes, SafeMC	218
8BVI0028HCSS.000-1	ACOPOSmulti inverter module 3.8 A, HV, cold plate or feed-through mounting, 2 axes, SafeMC	218
8BVI0055HCSS.000-1	ACOPOSmulti inverter module 7.6 A, HV, cold plate or feed-through mounting, 2 axes, SafeMC	218
8BVI0110HCSS.000-1	ACOPOSmulti inverter module 15.1 A, HV, cold plate or feed-through mounting, 2 axes, SafeMC	218

Inverter modules 1.4 kW ... 11 kW, SafeMC (two-axis modules)

Wall mounting



Model number	Short description	
8BVI0014HWDS.000-1	ACOPOSmulti inverter module 1.9 A, HV, wall mounting, 2 axes, SafeMC	224
8BVI0028HWDS.000-1	ACOPOSmulti inverter module 3.8 A, HV, wall mounting, 2 axes, SafeMC	224
8BVI0055HWDS.000-1	ACOPOSmulti inverter module 7.6 A, HV, wall mounting, 2 axes, SafeMC	224
8BVI0110HWDS.000-1	ACOPOSmulti inverter module 15.1 A, HV, wall mounting, 2 axes, SafeMC	224

Cold plate or feed-through mounting



Model number	Short description	
8BVI0014HCDS.000-1	ACOPOSmulti inverter module 1.9 A, HV, cold plate or feed-through mounting, 2 axes, SafeMC	224
8BVI0028HCDS.000-1	ACOPOSmulti inverter module 3.8 A, HV, cold plate or feed-through mounting, 2 axes, SafeMC	224
8BVI0055HCDS.000-1	ACOPOSmulti inverter module 7.6 A, HV, cold plate or feed-through mounting, 2 axes, SafeMC	224
8BVI0110HCDS.000-1	ACOPOSmulti inverter module 15.1 A, HV, cold plate or feed-through mounting, 2 axes, SafeMC	224

Inverter modules 16 kW ... 32 kW, SafeMC (single-axis modules)

Wall mounting



Model number	Short description	
8BVI0220HWSS.000-1	ACOPOSmulti inverter module 22 A, HV, wall-mounting, SafeMC	230
8BVI0330HWSS.000-1	ACOPOSmulti inverter module 33 A, HV, wall-mounting, SafeMC	230
8BVI0440HWSS.000-1	ACOPOSmulti inverter module 44 A, HV, wall-mounting, SafeMC	230

Cold plate or feed-through mounting



Model number	Short description	
8BVI0220HCSS.000-1	ACOPOSmulti inverter module 22 A, HV, cold plate or feed-through mounting, SafeMC	230
8BVI0330HCSS.000-1	ACOPOSmulti inverter module 33 A, HV, cold plate or feed-through mounting, SafeMC	230
8BVI0440HCSS.000-1	ACOPOSmulti inverter module 44 A, HV, cold plate or feed-through mounting, SafeMC	230

Product overview

I/O modules



Model number	Short description	
8BAC0130.000-1	ACOPOSMulti plug-in module, 2 digital outputs, 50 mA, max. 62.5 kHz, 2 digital outputs, 500 mA, max. 1.25 kHz, 2 digital inputs - 24 VDC	236
8BAC0130.001-1	ACOPOSMulti plug-in module, 2 digital outputs, 50 mA, max. 62.5 kHz, 4 digital outputs, 500 mA, max. 1.25 kHz	238

Accessories

4 mm² motor cable with motor plug, size 1.5



Model number	Short description	
8BCM0005.1322A-0	ACOPOSMulti motor cable, length 5 m, 4 x 4 mm ² + 2 x 2 x 1 mm ² , 8-pin SpeedTec motor connector size 1.5, can be used in drag chains, UL/CSA certified	240
8BCM0007.1322A-0	ACOPOSMulti motor cable, length 7 m, 4 x 4 mm ² + 2 x 2 x 1 mm ² , 8-pin SpeedTec motor connector size 1.5, can be used in drag chains, UL/CSA certified	240
8BCM0010.1322A-0	ACOPOSMulti motor cable, length 10 m, 4 x 4 mm ² + 2 x 2 x 1 mm ² , 8-pin SpeedTec motor connector size 1.5, can be used in drag chains, UL/CSA certified	240
8BCM0015.1322A-0	ACOPOSMulti motor cable, length 15 m, 4 x 4 mm ² + 2 x 2 x 1 mm ² , 8-pin SpeedTec motor connector size 1.5, can be used in drag chains, UL/CSA certified	240
8BCM0020.1322A-0	ACOPOSMulti motor cable, length 20 m, 4 x 4 mm ² + 2 x 2 x 1 mm ² , 8-pin SpeedTec motor connector size 1.5, can be used in drag chains, UL/CSA certified	240
8BCM0025.1322A-0	ACOPOSMulti motor cable, length 25 m, 4 x 4 mm ² + 2 x 2 x 1 mm ² , 8-pin SpeedTec motor connector size 1.5, can be used in drag chains, UL/CSA certified	240



Passive line filter 8B0F



8B0F0330H000.000-1

- Wider power input voltage range
- Optimally suited for ACOPOSmulti power supply modules 8BOP
- Adherence to the limits according to CISPR11, Group 2, Class A

Product ID	8B0F0330H000.000-1	8B0F0550H000.000-1
General information		
C-UL-US listed	Yes	Yes
Cooling and mounting methods	Wall mounting	Wall mounting
Power mains connection		
Mains input voltage	3x520 to 3x300 VAC	3x520 to 3x300 VAC
Frequency	0 to 60 Hz	0 to 60 Hz
Allocation to the power supply module 8BOP	22 kW	44 kW
Continuous current ¹⁾	30 A _{eff}	55 A _{eff}
Peak current < 1 min	45 A _{eff}	82.5 A _{eff}
Reduction of continuous current according to the ambient temperature above 50°C	In preparation	In preparation
Power loss ²⁾	11.8 W	25.9 W
Line filter according to EN61800-3-A11 second environment (limits from CISPR11, group 2, class A) ³⁾	Yes	Yes
Design		
L1, L2, L3 and L1', L2', L3'	Terminals	Terminals
PE	M5 threaded bolt	M6 threaded bolt
Shield connection		
on the mains	No	No
on the device	No	No
Terminal connection cross section		
Flexible and fine wire lines with wire tip sleeves	Max. 10 mm ²	Max. 16 mm ²
UL/cULus	8	4
CSA	8	4
Fastening torque of the terminal screws	1.9 to 2.2 Nm	1.9 to 2.2 Nm
Operational conditions		
Ambient temperature during operation	5 to 40°C	5 to 40°C
Max. ambient temperature	+55°C	+55°C
Relative humidity during operation	5 to 85%, non-condensing	5 to 85%, non-condensing
Installation at altitudes above sea level	0 to 1000 m	0 to 1000 m
Maximum installation attitude ⁴⁾	4000 m	4000 m
Degree of pollution according to EN 60664-1	In preparation	In preparation
Overvoltage cat. according to IEC 60950	II	II
EN 60529 protection	IP20	IP20
Storage and transport conditions		
Storage temperature	-25 to +55°C	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing	5 to 95%, non-condensing
Transport temperature	-25 to +70°C	-25 to +70°C
Relative humidity during transport	95% at +40°C	95% at +40°C
Mechanical characteristics		
Dimensions		
Width	50 mm	85 mm
Height	270 mm	250 mm
Depth	85 mm	90 mm
Weight	1.2 kg	2 kg

1) Valid in the following conditions: 50°C ambient temperature, 480 VAC mains input voltage, cos phi = 0.8. The exact value depends on the respective application.

2) Valid in the following conditions: 25°C ambient temperature, frequency 50 Hz.

3) To avoid exceeding the EMC limit values, the total length of all motor cables for each mounting plate (and therefore each line filter) should be limited to a maximum of 900 m. The cable length between the line filter and the power supply module is limited to a maximum of 5 m. The maximum motor cable length per motor connection is also limited (see inverter modules).

4) Continuous operation of ACOPOSmulti line filters at altitudes ranging from 1000 m to 4000 m above sea level is possible (taking the continuous current reductions listed into consideration). Additional requirements are to be arranged with B&R.

Braking resistors 8B0W



- Compact construction
- High peak load capacity
- Intrinsically safe
- IP65 protection
- Optimally suited for ACOPOSmulti power supply modules 8BOP

General information		8B0W0045H000.001-1	8B0W0079H000.001-1
C-UL-US listed		Yes	Yes
RoHS compliant		Yes	Yes
Cooling and mounting methods		Wall mounting	Wall mounting
Resistance		8B0W0045H000.001-1	8B0W0079H000.001-1
Continuous power depending on mounting orientation			
Horizontal		360 W	632 W
Vertical		450 W	790 W
Reduction of continuous current depending on the ambient temperature starting at 40°C.			
		7.5 W/K	13.2 W/K
Ohmic resistance		50 Ω ± 10%	33 Ω ± 10%
Max. operating voltage		850 VDC	850 VDC
Isolation voltage type test		4000 VAC	4000 VAC
Intrinsically Safe		Yes ¹⁾	Yes ¹⁾
1) 8B0W external braking resistors can be considered intrinsically safe if they are connected to a 8BOP passive power supply module operated with a mains supply voltage of 3 x 380 - 500 VAC. The maximum time until the 8B0W external braking resistors are damaged is approximately 5.5 min in this case; a maximum surface temperature of approximately 479°C is achieved when this happens. A lower the mains supply voltage on the 8BOP passive power supply module allows a longer maximum time before the 8B0W external braking resistor is damaged, which also means higher occurring temperatures.			
Temperature model data		8B0W0045H000.001-1	8B0W0079H000.001-1
Maximum permissible over-temperature		682.85°C	673.08°C
Thermal resistance between braking resistor and the environment			
		1.517 K/W	0.852 K/W
Heat capacitance of the filament		16.3 J/K	22.6 J/K
Resistor connection		8B0W0045H000.001-1	8B0W0079H000.001-1
Design			
RB1, RB2		Terminals with tension spring technology	Terminals with tension spring technology
PE		M4 threaded bolt	M4 threaded bolt
Shield connection		Yes, to the terminal box via high strength cable gland	Yes, to the terminal box via high strength cable gland
Terminal connection cross section			
Flexible and fine wire lines with wire tip sleeves		1.5 - 10 mm ²	1.5 - 10 mm ²
UL/cULus		24-6	24-6
CSA		22-6	22-6
Terminal cable outer-cross-section dimension of the connection cable		9 - 16.6 mm	9 - 16.6 mm
Operational conditions		8B0W0045H000.001-1	8B0W0079H000.001-1
Mounting orientation			
Horizontal		Yes	Yes
Vertical, bottom of terminal box		Yes	Yes
Vertical, top of terminal box		No	No
Ambient temperature during operation		-40°C to +90°C	-40°C to +90°C
Relative humidity during operation		5 to 95%, non-condensing	5 to 95%, non-condensing
EN 60529 protection		IP65	IP65
Mechanical characteristics		8B0W0045H000.001-1	8B0W0079H000.001-1
Dimensions			
Width		124 mm	124 mm
Height		121 mm	121 mm
Depth		332 mm	332 mm
Weight		2.4 kg	3.9 kg

Passive power supply modules 8B0P



- Wide input voltage range
- Integrated connection for temperature sensors

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Wall mounting	8B0P0220HW00.000-1	8B0P0440HW00.000-1
Cold plate or feed-through mounting	8B0P0220HC00.000-1	8B0P0440HC00.000-1
General information		
C-UL-US listed	In preparation	In preparation
Available cooling and mounting methods		
Wall mounting	Yes	Yes
Cold plate or feed-through mounting	Yes	Yes
Module width	2	2
Power mains connection		
Mains input voltage	3x380 to 3x500 VAC ±10%	3x380 to 3x500 VAC ±10%
System configuration	TT, TN-S, TN-C-S	TT, TN-S, TN-C-S
Frequency	50 / 60 Hz ± 4%	50 / 60 Hz ± 4%
Installed load	In preparation	In preparation
Power loss at max. device power	In preparation	In preparation
Starting current at 400 VAC	In preparation	In preparation
Switch-on interval	> 60 sec	> 60 sec
Max. chargeable DC bus capacitance	4 mF	4 mF
Integrated line filter according to EN61800-3-A11 second environment (limits from		
CISPR11, group 2, class A)	No	No
Integrated regeneration choke	No	No
Capable of regeneration	No	No
Power Factor Control (PFC)	No	No
Design		
L1, L2, L3, PE	Plugs	Plugs
PE	M5 threaded bolt	M5 threaded bolt
Shield connection	Yes ¹⁾	Yes ¹⁾
Terminal connection cross sections		
Flexible and fine wire lines with wire tip sleeves	0.5 - 16 mm ²	0.5 - 16 mm ²
Approbation data		
UL/C-UL-US	20 - 6	20 - 6
CSA	20 - 6	20 - 6
Terminal cross sections (cable diameter) for the shield connection	23 - 35 mm	23 - 35 mm

¹⁾ The cable does not require shielding up to a total cable length of 3 m between the line filter and power supply module. Please contact B&R when using cable lengths > 3 m.

Wall mounting	8B0P0220HW00.000-1	8B0P0440HW00.000-1
Cold plate or feed-through mounting	8B0P0220HC00.000-1	8B0P0440HC00.000-1
DC bus connection		
Voltage	537 - 707 VDC	537 - 707 VDC
Max.	900 VDC	900 VDC
Continuous power (supply and regeneration) ¹⁾	8 kW	16 kW
Reduction of continuous power depending on mains input voltage		
Mains input voltage < 3x400 VAC	20 W * (400 - mains input voltage)	40 W * (400 - mains input voltage)
Reduction of continuous power depending on the cooling type	In preparation	In preparation
Reduction of continuous power depending on installation altitude		
Starting at 500 m above sea level	0.8 kW per 1000 m	1.6 kW per 1000 m
Peak power output (feed)	24 kW	48 kW
Power loss at max. device power	In preparation	In preparation
DC bus capacitance	660 μ F	1320 μ F
Protective measures / safeguards		
Overload protection	Yes	Yes
Short circuit and ground fault	No	No
Design	ACOPOSmulti backplane	ACOPOSmulti backplane
1) Valid in the following conditions: 40°C ambient temperature, installation altitude < 500 m above sea level.		
Braking resistor connection ¹⁾		
Peak power output (max. 1 sec)	40 kW	65 kW
Continuous power	3 kW	3 kW
Minimum permitted braking resistance	12 Ω	7.5 Ω
Rated current of the built-in, externally removable fuse in RB+ ²⁾	30 A (fast-acting)	30 A (fast-acting)
Design		
RB+, RB-, PE	Plugs	Plugs
Shield connection	Yes	Yes
Terminal connection cross sections		
Flexible and fine wire lines with wire tip sleeves	0.5 - 16 mm ²	0.5 - 16 mm ²
Approbaton data		
UL/C-UL-US	20 - 6	20 - 6
CSA	20 - 6	20 - 6
Terminal cable outer-cross-section dimension of the shield connection	23 - 35 mm	23 - 35 mm
Protective measures / safeguards		
Overload protection	Yes	Yes
Short circuit and ground fault	Yes (with RB+ through externally exchangeable blow-out fuse)	Yes (with RB+ through externally exchangeable blow-out fuse)

1) The power calculations are based on a DC bus voltage of 700 VDC.

Danger!

A component malfunction in the passive power supply module can lead to a continuous power output on the external braking resistor and cause it to overheat. This must be considered when selecting, organizing and operating the external braking resistor. In select cases, a thermal monitor and external switch off device are required.





2) A Littelfuse KLK D 030 fuse must be used.

Passive power supply modules 8B0P

Wall mounting	8B0P0220HW00.000-1	8B0P0440HW00.000-1
Cold plate or feed-through mounting	8B0P0220HC00.000-1	8B0P0440HC00.000-1
24 VDC supply ¹⁾		
Input voltage	25 VDC ±1.6%	25 VDC ±1.6%
Input capacitance	In preparation	In preparation
Max. power consumption	In preparation	In preparation
Design	ACOPOSmulti backplane	ACOPOSmulti backplane
Operational conditions		
Ambient temperature during operation	5 to 40°C	5 to 40°C
Max. ambient temperature ²⁾	+55°C	+55°C
Relative humidity during operation	TT, TN-S, TN-C-S	TT, TN-S, TN-C-S
Frequency	50 / 60 Hz ± 4%	50 / 60 Hz ± 4%
Installation at altitudes above sea level	0 to 500 m	0 to 500 m
Maximum installation attitude ³⁾	4000 m	4000 m
Degree of pollution according to EN 60664-1	2 (non-conductive material)	2 (non-conductive material)
Overvoltage cat. according to IEC 60364-4-443:1999	III	III
EN 60529 protection	IP20	IP20
Storage and transport conditions		
Storage temperature	-25 to +55°C	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing	5 to 95%, non-condensing
Transport temperature	-25 to +70°C	-25 to +70°C
Relative humidity during transport	95% at +40°C	95% at +40°C
<p>1) In the power supply modules a DC bus power supply is integrated for the electronic supply. The 24 VDC supply from the ACOPOSmulti backplane only feeds the +24 VDC of the trigger inputs and the encoder power supplies on the encoder modules.</p> <p>2) Continuous operation of ACOPOSmulti power supply modules at ambient temperatures ranging from 40°C to max. 55°C is possible (taking the continuous current reductions listed into consideration), but results in a shorter lifespan.</p> <p>3) Continuous operation of ACOPOSmulti power supply modules at altitudes ranging from 500 m to 4000 m above sea level is possible (taking the continuous current reductions listed into consideration). Additional requirements are to be arranged with B&R.</p>		
Mechanical characteristics		
Dimensions ¹⁾		
Width	106.5 mm	106.5 mm
Height	317 mm	317 mm
Depth		
Wall mounting	263 mm	263 mm
Cold-plate	212 mm	212 mm
Feed-through mounting	209 mm	209 mm
Weight		
Wall mounting	Approx. 5.85 kg	Approx. 6.1 kg
Cold-plate	Approx. 4.65 kg	Approx. 4.85 kg
Feed-through mounting	Approx. 4.65 kg	Approx. 4.85 kg

1) The dimensions define the true device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

Required accessories				
8TB2106.2010-00	1	Screw terminal 6 pins, 1 row RM5.08 Label 1: numbered serially	Plug for X1 connection	 1435
8TB4104.202L-10	1	Screw terminal 4 pins, 1 row RM10.16 Label 2: L1 L2 L3 PE Coding N: 1010	Plug for X5A connection	
8TB4103.202A-00	1	Screw terminal - 3 pins, 1 row RM10.16 Label 2: PE RB- RB+ Coding A: 000	Plug for X5B connection	

Optional accessories				
8SCS002.0000-00	1	Shield component set consisting of: 1 clamping plate 2 clamps D 4-13.5 mm 2 screws	Shield component set for I/O cables with a cable cross section of 4 - 13.5 mm	 1440
8SCS007.0000-00	1	Shield component set consisting of: 1 shield mounting plate, 2x, 45° 4 screws	Base plate for mounting shield component set 8SCS008.0000-00	 1441
8SCS008.0000-00	1	Shield component set consisting of: 1 shield plate, 2x, type 0 1 hose clamp, W 9mm, D 23-35 mm	Shield component set for mains cables with a cross section of 23 - 35 mm	 1441
8BXF001.0000-00	1	ACOPOSmulti fan module Replacement fan for ACOPOSmulti modules (8BVP/8B0C/8BVI/8BVE/8B0K)	Replacement fan for ACOPOSmulti modules (8BVP/8B0C/8BVI/8BVE/8B0K)	 1441

Auxiliary supply modules 800 W with 24Vin

8B0C0320



8B0C0320HC00.00A-1

- Input for connecting an external 24 VDC source (e.g. UPS)
- 2 outputs for supplying external 24 VDC consumers (one of which is switchable)
- Extensive protective measures

Wall mounting 8B0C0320HW00.00A-1

Cold plate or feed-through mounting 8B0C0320HC00.00A-1

General information

C-UL-US listed Yes

Available cooling and mounting methods

Wall mounting Yes

Cold plate or feed-through mounting Yes

Module width 1

DC bus connection

Voltage 750 VDC

Operating range in continuous operation 260 - 900 VDC

Full continuous power 315 - 900 VDC

Continuous power consumption Max. 940 W

Power loss at max. device power 80 W

DC bus capacitance 220 nF

Design ACOPOSmulti backplane

24 VDC output

Continuous power ¹⁾ 800 W

Output voltage

DC bus voltage 260 ... 315 VDC 25 VDC * (DC bus voltage / 315)

DC bus voltage 315 ... 900 VDC 24 VDC ±6%

Continuous current

Normal mode (via DC bus) 32 ADC

Supply mode (via +24 Vin) 30 ADC

Reduction of continuous power depending on the ambient temperature starting at 40°C. No reduction

Reduction of continuous power depending on installation altitude

Starting at 500 m above sea level

80 W per 1000 m

Reduction of continuous power depending on cooling method

Wall mounting

In preparation

Cold plate or feed-through mounting

In preparation

Startup delay

Max. 1 sec.

Startup time

Approx. 5 - 20 ms

Residual ripple

Typ. 50 mV_{SS}

1) Valid in the following conditions: 55°C ambient temperature, installation altitude < 500 m above sea level.

Wall mounting	8B0C0320HW00.00A-1
Cold plate or feed-through mounting	8B0C0320HC00.00A-1
24 VDC internal system supply voltage	
Output voltage	25 VDC ± 1.6%
Peak current (< 4 s)	
DC bus voltage (U _{DC}): 350 ... 900 VDC	42 ADC
Protective measures	
Open circuit protection	Yes
Overload protection	Yes
Short circuit protection	Yes
Feedback protection	Max. 26 VDC (also when turned off)
Over-temperature protection	Yes
Dielectric strength to ground	±50 VDC
Output / input isolation	SELV / PELV requirements
Design	ACOPOSmulti backplane
24 VDC Out	
Output voltage	
DC bus voltage 260 ... 315 VDC	25 VDC * (DC bus voltage / 315)
DC bus voltage 315 ... 900 VDC	24 VDC ± 6%
Peak current (< 4 s) over the total operating range of the DC bus voltage.	---
Protection of 24 VDC Out 1 output	30 A (slow-blow) electronic, automatic reset
Protection of 24 VDC Out 2 output	5 A (slow-blow) electronic, automatic reset (via PTC)
Protective measures	
Open circuit protection	Yes
Overload protection	Yes
Short circuit protection	Yes
Feedback protection	Max. 35 VDC (also when turned off)
Over-temperature protection	Yes
Dielectric strength to ground	±50 VDC
Output / input isolation	SELV / PELV requirements
Design	
24 VDC, COM	Plugs
Terminal connection cross sections	
for output 24 VDC Out 1	
Flexible and fine wire lines	
with wire tip sleeves	0.5 – 6 mm ²
Approbation data	
UL/C-UL-US	22 - 10
CSA	22 - 10
Terminal connection cross sections	
for output 24 VDC Out 2	
Flexible and fine wire lines	
with wire tip sleeves	0.2 - 2.5 mm ²
Approbation data	
UL/C-UL-US	22 - 12
CSA	22 - 12

Auxiliary supply modules 800 W with 24Vin

8B0C0320

Wall mounting	8B0C0320HW00.00A-1
Cold plate or feed-through mounting	8B0C0320HC00.00A-1
24 VDC Out 1 controller input	
Wiring	Sink
Electrical isolation	
Input - 24 VDC	Yes
Modulation compared to ground potential	Max. ± 50 V
Input voltage	
Rated	24 VDC
Maximum	30 VDC
Switching threshold	
LOW (24 VDC Out 1 is switched on)	<5 V
HIGH (24 VDC Out 1 is switched off)	>15 V
Input current at rated voltage	Approx. 10 mA
Switching delay	
ON (24 VDC Out 1 is switched on)	Max. 25 ms
OFF (24 VDC Out 1 is switched off) ¹⁾	Max. 0.25 ms
Design	Plugs
Terminal connection cross sections of the 24 VDC Out 1 control input	
Flexible and fine wire lines	
with wire tip sleeves	0.2 - 2.5 mm ²
Approbation data	
UL/C-UL-US	30 - 12
CSA	22 - 12
1) The output and any connected loads are not actively discharged when switching off.	
24 VDC In	
Input voltage ¹⁾	
Minimum	23 VDC
Rated	24 VDC
Maximum	26 VDC
Voltage drop between input and internal 24VDC system voltage supply	<0.5 V
Switch-on threshold	+24 VDC internal system supply voltage < 21.5 VDC
Maximum continuous current	30 A
Switching delay	
When switching to supply mode	Typ. 5 ms
When starting up via 24 Vin	Typ. 2 s
Indicators	24Vi LED ERRi LED
Under-voltage detection	YES (< 20 VDC)
Over-voltage detection	YES (> 26 VDC)
Protective measures	
Open circuit protection	Yes
Overload protection	Yes, ticker operation when overload ($T_{ON} = 1$ s, $T_{OFF} = 2.4$ s)
Short circuit protection	Yes
Over-temperature protection	Yes
Design	
24 VDC In, COM	Plugs

1) The module's +24 Vin input is resistant to damage in a voltage range from -32 VDC to +32 VDC.

Wall mounting	8B0C0320HW00.00A-1
Cold plate or feed-through mounting	8B0C0320HC00.00A-1

Terminal connection cross sections

of the 24 VDC In input

Flexible and fine wire lines
with wire tip sleeves 0.5 - 6 mm²

Approbation data

UL/C-UL-US 22 - 10
CSA 22 - 10

Operational conditions

Ambient temperature during operation	5 to 40°C
Max. ambient temperature	+55°C
Relative humidity during operation	5 to 85%, non-condensing
Installation at altitudes above sea level	0 to 500 m
Maximum installation attitude ¹⁾	4000 m
Degree of pollution according to EN 60664-1	2 (non-conductive material)
Overvoltage cat. according to IEC 60364-4-443:1999	III
EN 60529 protection	IP20

1) Continuous operation of ACOPOSmulti control supply units at altitudes ranging from 500 m to 4000 m above sea level is possible (taking the continuous power reductions listed into consideration). Additional requirements are to be arranged with B&R.

Storage and transport conditions

Storage temperature	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing
Transport temperature	-25 to +70°C
Relative humidity during transport	95% at +40°C

Mechanical characteristics

Dimensions ¹⁾

Width	53 mm
Height	317 mm
Depth	
Wall mounting	263 mm
Cold-plate	212 mm
Feed-through mounting	209 mm

Weight

Wall mounting	Approx. 3.25 kg
Cold-plate	Approx. 2.85 kg
Feed-through mounting	Approx. 2.85 kg

1) The dimensions define the true device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

Required accessories

8TB2106.2010-00	1	Screw terminal 6-pin, 1 row RM5.08 Label 1: numbered serially	Plug for X1 connection	1435
8TB2104.2010-00	1	Screw terminal 4-pin, 1 row RM5.08 Label 1: numbered serially	Plug for X2 connection	1434
8TB3104.201M-10	1	Screw terminal 4-pin, 1 row RM7.62 Label 1: numbered serially, M coding: 1011	Plug for X3 connection	1437

Optional accessories

8BXF001.0000-00	---	ACOPOSmulti fan module, replacement fan for ACOPOSmulti Modules (8BVP/8B0C/8BVI/8BVE/8B0K)	Replacement fan for ACOPOSmulti modules (8BVP/8B0C/8BVI/8BVE/8B0K)	1441
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Inverter modules 11kW (two-axis modules) 8BVI0110



- Uncontrolled stops and safe stop integrated
- Integrated connection for motor holding brake and temperature sensor
- 2 slots for ACOPOSmulti plug-in modules
- Two-axis modules contain two complete standalone inverters in an inverter module

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Wall mounting	8BVI0110HWD0.000-1
Cold plate or feed-through mounting	8BVI0110HCD0.000-1
General information	
C-UL-US listed	Yes
Available cooling and mounting methods	
Wall mounting	Yes
Cold plate or feed-through mounting	Yes
Module width	2
DC bus	
Voltage	750 VDC
Max.	900 VDC
Continuous power consumption	In preparation
Power loss at max. device power	In preparation
DC bus capacitance	660 μ F
Design	ACOPOSmulti backplane
24 VDC supply	
Input voltage	25 VDC \pm 1.6%
Input capacitance	23.5 μ F
Max. power consumption	20 W + P _{24 V Out} {0 ... 10 W} ¹⁾ + P _{HoldingBrake} + P _{Fan8B0M...} ²⁾
Design	ACOPOSmulti backplane
1) The power consumption P _{24 V Out} corresponds to the power that is output on the module's X2 / +24 V Out 1 and X2 / +24 V Out 2 connections (max. 10 W).	
2) The power consumption P _{Fan8B0M...} corresponds to the portion of the power that is used by the fan modules in the mounting plate / by the 8B0M0040HFF0.000-1 fan module and can be found in the technical data for the respective 8B0M... mounting plate.	
Motor connector	
Continuous power ¹⁾	11 kW
Continuous current ¹⁾	15.1 A _{eff}
Reduction of continuous current depending on switching frequency and cooling type ²⁾	
Switching frequency 20 kHz	
Wall mounting ³⁾	In preparation
Cold-plate mounting ⁴⁾	In preparation
Feed-through mounting	In preparation
Switching frequency 10 kHz	
Wall mounting ³⁾	In preparation
Cold-plate mounting ⁴⁾	In preparation
Feed-through mounting	In preparation
Switching frequency 5 kHz	
Wall mounting ³⁾	In preparation
Cold-plate mounting ⁴⁾	In preparation
Feed-through mounting	In preparation
Reduction of continuous current depending on installation altitude	
Starting at 500 m above sea level	1.51 A _{eff} per 1000 m
Peak current	37.7 A _{eff}
Rated switching frequency	5 kHz
Possible switching frequencies ⁵⁾	5/10/20 kHz
Max. rate of rise in voltage according to IEC EN 60034-17 ⁶⁾	10 kV/ μ s

Wall mounting	8BVI0110HWD0.000-1
Cold plate or feed-through mounting	8BVI0110HCD0.000-1
Motor connector	
Protective measures	
Overload protection	Yes
Short circuit and ground fault	Yes
Maximum motor line length depending on the switching frequency ⁷⁾	
Switching frequency 5 kHz	25 m
Switching frequency 10 kHz	25 m
Switching frequency 20 kHz	10 m
Design	
U, V, W, PE	Plugs
Shield connection	Yes
Terminal connection cross sections	
Flexible and fine wire lines with wire tip sleeves	0.25 - 4 mm ²
Approval data	
UL/C-UL-US	30 - 10
CSA	28 - 10
Terminal cross sections (cable diameter) for the shield connection	12 - 22 mm
<p>1) The continuous power and continuous current are valid for the following boundary conditions: Nominal DC bus voltage 800 VDC, nominal switching frequency 5 kHz, 40°C ambient temperature, installation altitudes < 500 m above sea level.</p> <p>2) Valid in the following conditions: Nominal DC bus voltage 800 VDC, minimum permissible coolant flow volume (3 l/min). The nominal switching frequency values for the respective ACOPOSmulti inverter module are marked in bold.</p> <p>3) The temperature specifications are based on the ambient temperature.</p> <p>4) The temperature specifications are based on the return temperature of the cold plate mounting plate.</p> <p>5) B&R recommends operating the module at nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load. When using double-axis modules, the increased CPU load causes a reduction of the functional range in the drive; if this is not taken into consideration then it can cause the computing time to be exceeded in extreme cases.</p> <p>6) The value listed is only valid for motor cables with a length > 3 m and also depends (to a small extent) on the motor used.</p> <p>7) To avoid exceeding the EMC limit values, the maximum motor cable length per motor connection is reduced at switching frequencies > 10 kHz.</p> <p>Information: When using two motor cables that are connected in parallel, the maximum permissible motor cable lengths are reduced by half.</p> <p>The total length of all motor cables per backplane module is limited.</p>	
Motor holding brake connection	
Output voltage	24 VDC +5.8% / +0.1%
Continuous current	2.1 A
Max. internal resistance	0.3 Ω
Extinction potential	Approx. 30 V
Max. extinction energy per connection	3 Ws
Max. switching frequency	0.5 Hz
Protective measures	
Overload and short-circuit protection	Yes
Cable breakage monitoring	Yes
Undervoltage monitoring	Yes
Max. over-current limitation	10 A
Response threshold for cable breakage monitoring	Approx. 0.5 A
Response threshold for undervoltage monitoring	24 VDC +0% / -5%

Inverter modules 11kW (two-axis modules) 8BVI0110

Wall mounting	8BVI0110HWD0.000-1
Cold plate or feed-through mounting	8BVI0110HCD0.000-1
Trigger inputs	
Number of inputs	2
Wiring	Sink
Electrical isolation	
Input - inverter module	Yes
Input - Input	No
Input voltage	
Rated	24 VDC
Maximum	30 VDC
Switching threshold	
LOW	<5 V
HIGH	>15 V
Input current at rated voltage	Approx. 10 mA
Switching delay	
Positive edge	52 μ s \pm 0.5 μ s (digitally filtered)
Negative edge	53 μ s \pm 0.5 μ s (digitally filtered)
Modulation compared to ground potential	Max. \pm 38 V
24 VDC Out	
Amount	2
Output voltage	
DC bus voltage 260 ... 315 VDC	25 VDC * (DC bus voltage / 315)
DC bus voltage 315 ... 900 VDC	24 VDC \pm 6%
Fuse protection	500 mA (slow-blow) electronic, automatic reset
Enable inputs	
Number of inputs	2
Wiring	Sink
Electrical isolation	
Input - inverter module	Yes
Input - Input	Yes
Input voltage	
Rated	24 VDC
Maximum	30 VDC
Switching threshold	
LOW	<5 V
HIGH	>15 V
Input current at rated voltage	Approx. 30 mA
Switching delay	
Enable 1 -> 0, PWM off	Max. 2.0 ms
Enable 0 -> 1, ready for PWM	Max. 100 μ s
Modulation compared to ground potential	Max. \pm 38 V

Wall mounting	8BVI0110HWD0.000-1
Cold plate or feed-through mounting	8BVI0110HCD0.000-1
Operational conditions	
Ambient temperature during operation	5 to 40°C
Max. ambient temperature ¹⁾	+55°C
Relative humidity during operation	5 to 85% non-condensing
Installation at altitudes above sea level	0 to 500 m
Maximum installation attitude ²⁾	4000 m
Degree of pollution according to EN 60664-1	2 (non-conductive material)
Overvoltage cat. according to IEC 60364-4-443:1999	III
EN 60529 protection	IP20
1) Continuous operation of ACOPOSmulti inverter modules at ambient temperatures ranging from 40°C to max. 55°C is possible (taking the continuous current reductions listed into consideration), but results in a shorter lifespan.	
2) Continuous operation of ACOPOSmulti inverter modules at altitudes ranging from 500 m to 4000 m above sea level is possible (taking the continuous current reductions listed into consideration). Additional requirements are to be arranged with B&R.	
Storage and transport conditions	
Storage temperature	-25 to +55°C
Relative humidity during storage	5 to 95% non-condensing
Transport temperature	-25 to +70°C
Relative humidity during transport	95% at +40°C
Mechanical characteristics	
Dimensions ¹⁾	
Width	106.5 mm
Height	317 mm
Depth	
Wall mounting	263 mm
Cold-plate	212 mm
Feed-through mounting	209 mm
Weight	
Wall mounting	Approx. 5.3 kg
Cold-plate	Approx. 4.1 kg
Feed-through mounting	Approx. 4.1 kg
1) The dimensions define the true device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.	

Inverter modules 11kW (two-axis modules) 8BVI0110

Required accessories				
8TB2112.2010-00	1	Screw terminal 12-pin, 1 row RM5.08 Label 1: numbered serially	Plug for X1 connection	1436
8TB2108.2010-00	1	Screw terminal 8-pin, 1 row RM5.08 Label 1: numbered serially	Plug for X2 connection	1435
8TB2104.203L-00	1	Screw terminal 4-pin, 1 row RM5.08 Label 3: T- T+ B- B+ Coding L: 1010	Plug for X4A connection	1434
8TB2104.203F-00	1	Screw terminal 4-pin, 1 row RM5.08 Label 3: T- T+ B- B+ Coding F: 0101	Plug for X4B connection	1434
8TB3104.204G-00	1	Screw terminal 4-pin, 1 row RM7.62 Label 4: PE W V U Coding G: 0110	Plug for X5A connection	1437
8TB3104.204K-00	1	Screw terminal 4-pin, 1 row RM7.62 Label 4: PE W V U Coding K: 1001	Plug for X5B connection	1437

Optional accessories				
8BAC0120.000-1	Max. 2	ACOPOSmulti plug-in module, EnDat 2.1 interface	---	1410
8BAC0120.001-1	Max. 2	ACOPOSmulti plug-in module, EnDat 2.2 interface	---	1412
8BAC0121.000-1	Max. 2	ACOPOSmulti plug-in module, HIPERFACE interface	---	1413
8BAC0122.000-1	Max. 2	ACOPOSmulti plug-in module, resolver interface	---	1414
8BAC0123.000-1	Max. 2	ACOPOSmulti plug-in module, incremental encoder and SSI absolute encoder interface for RS422 signals	---	1416
8BAC0123.001-1	Max. 2	ACOPOSmulti plug-in module, incremental encoder interface for 5V single-ended and 5V differential signals	---	1418
8BAC0123.002-1	Max. 2	ACOPOSmulti plug-in module, incremental encoder interface for 24V single-ended and 24V differential signals	---	1420
8BAC0124.000-1	Max. 2	ACOPOSmulti plug-in module, SinCos interface	---	1422
8BAC0130.000-1	Max. 1	ACOPOSmulti input module, 2 digital outputs, ± 50 mA, max. 62.5 kHz, 2 digital outputs, 500 mA, max. 1.25 kHz, 2 digital inputs, 24 VDC		236
8BAC0130.001-1	Max. 1	ACOPOSmulti plug-in module, 2 digital outputs, 50 mA, max. 62.5 kHz, 4 digital outputs, 500 mA, max. 1.25 kHz		238
8BAC0132.000-1	Max. 2	ACOPOSmulti input module, 4 analog inputs ± 10 V		1424
8SCS005.0000-00	Up to 2	Shield component set consisting of: 1 slot cover shield sheet	Shield sheet for covering free plug-in module slots	1440
8SCS002.0000-00	1	Shield component set consisting of: 1 clamping plate 2 clamps D 4-13.5 mm 2 screws	Shield component set for I/O cables with a cable cross section of 4 - 13.5 mm	1440
8SCS000.0000-00	Up to 2	Shield component set consisting of: 1 shield plate 1x type 0 1 hose clamp, W 9mm, D 12-22 mm	Shield component set for motor cables with a cable cross section of 12-22 mm	1440
8BXF001.0000-00	---	ACOPOSmulti fan module, replacement fan for ACOPOSmulti modules (8BVP/8B0C/8BVI/8BVE/8B0K)	Replacement fan for ACOPOSmulti modules (8BVP/8B0C/8BVI/8BVE/8B0K)	1441

Inverter modules 24kW (single-axis modules) 8BVI0330



- Uncontrolled stops and safe stop integrated
- Integrated connection for motor holding brake and temperature sensor
- 2 slots for ACOPOSmulti plug-in modules

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Wall mounting	8BVI0330HWS0.000-1
Cold plate or feed-through mounting	8BVI0330HCS0.000-1
General information	
C-UL-US listed	In preparation
Available cooling and mounting methods	
Wall mounting	Yes
Cold plate or feed-through mounting	Yes
Module width	2
DC bus	
Voltage	750 VDC
Max.	900 VDC
Continuous power consumption	In preparation
Power loss at max. device power	In preparation
DC bus capacitance	990 μ F
Design	ACOPOSmulti backplane
24 VDC supply	
Input voltage	25 VDC \pm 1.6%
Input capacitance	In preparation
Max. power consumption	$20 \text{ W} + P_{24 \text{ V Out}} \{0 \dots 10 \text{ W}\}^1 + P_{\text{HoldingBrake}} + 2 * P_{\text{Fan8B0M...}}^2$
Design	ACOPOSmulti backplane
1) The power consumption $P_{24 \text{ V Out}}$ corresponds to the power that is output on the module's X2 / +24 V Out 1 and X2 / +24 V Out 2 connections (max. 10 W).	
2) The power consumption $P_{\text{Fan8B0M...}}$ corresponds to the portion of the power that is used by the fan modules in the mounting plate / by the 8B0M0040HFF0.000-1 fan module and can be found in the technical data for the respective 8B0M... mounting plate.	
Motor connector	
Continuous power ¹⁾	24 kW
Continuous current ¹⁾	33 A _{eff}
Reduction of continuous current depending on	
Switching frequency and cooling type ²⁾	
Switching frequency 20 kHz	
Wall mounting ³⁾	In preparation
Cold-plate mounting ⁴⁾	In preparation
Feed-through mounting	In preparation
Switching frequency 10 kHz	
Wall mounting ³⁾	In preparation
Cold-plate mounting ⁴⁾	In preparation
Feed-through mounting	In preparation
Switching frequency 5 kHz	
Wall mounting ³⁾	In preparation
Cold-plate mounting ⁴⁾	In preparation
Feed-through mounting	In preparation
Reduction of continuous current depending on installation altitude	
Starting at 500 m above sea level	3.3 A _{eff} per 1000 m
Peak current	83 A _{eff}
Rated switching frequency	5 kHz
Possible switching frequencies ⁵⁾	5/10/20 kHz
Max. rate of rise in voltage according to IEC EN 60034-17 ⁶⁾	10 kV/ μ s

Inverter modules 24kW (single-axis modules)

8BVI0330

Wall mounting	8BVI0330HWS0.000-1
Cold plate or feed-through mounting	8BVI0330HCS0.000-1
Motor connector	
Protective measures	
Overload protection	Yes
Short circuit and ground fault	Yes
Maximum motor line length depending on the switching frequency ⁷⁾	
Switching frequency 5 kHz	25 m
Switching frequency 10 kHz	25 m
Switching frequency 20 kHz	25 m
Design	
U, V, W, PE	Plugs
Shield connection	Yes
Terminal connection cross sections	
Flexible and fine wire lines	
with wire tip sleeves	0.5 - 16 mm ²
Approval data	
UL/C-UL-US	20 - 6
CSA	20 - 6
Terminal cross sections (cable diameter) for the shield connection	23 - 35 mm
<p>1) The continuous power and continuous current are valid for the following boundary conditions: Nominal DC bus voltage 800 VDC, nominal switching frequency 5 kHz, 40°C ambient temperature, installation altitudes < 500 m above sea level.</p> <p>2) Valid in the following conditions: Nominal DC bus voltage 800 VDC, minimum permissible coolant flow volume (3 l/min). The nominal switching frequency values for the respective ACOPOSmulti inverter module are marked in bold.</p> <p>3) The temperature specifications are based on the ambient temperature.</p> <p>4) The temperature specifications are based on the return temperature of the cold plate mounting plate.</p> <p>5) B&R recommends operating the module at nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load. When using double-axis modules, the increased CPU load causes a reduction of the functional range in the drive; if this is not taken into consideration then it can cause the computing time to be exceeded in extreme cases.</p> <p>6) The value listed is only valid for motor cables with a length > 3 m and also depends (to a small extent) on the motor used.</p> <p>7) To avoid exceeding the EMC limit values, the maximum motor cable length per motor connection is reduced at switching frequencies > 10 kHz. Information: When using two motor cables that are connected in parallel, the maximum permissible motor cable lengths are reduced by half. The total length of all motor cables per backplane module is limited.</p>	
Motor holding brake connection	
Output voltage	24 VDC +5.8% / -0.1%
Continuous current	4.2 A
Max. internal resistance	0.15 Ω
Extinction potential	Approx. 30 V
Max. extinction energy per connection	3 Ws
Max. switching frequency	0.5 Hz
Protective measures / safeguards	
Overload and short-circuit protection	Yes
Cable breakage monitoring	Yes
Undervoltage monitoring	Yes
Max. over-current limitation	10 A
Response threshold for cable breakage monitoring	Approx. 0.5 A
Response threshold for undervoltage monitoring	24 VDC +0% / -5%

Wall mounting	8BVI0330HWS0.000-1
Cold plate or feed-through mounting	8BVI0330HCS0.000-1
Trigger inputs	
Number of inputs	2
Wiring	Sink
Electrical isolation	
Input - inverter module	Yes
Input - Input	No
Input voltage	
Rated	24 VDC
Maximum	30 VDC
Switching threshold	
LOW	<5 V
HIGH	>15 V
Input current at rated voltage	Approx. 10 mA
Switching delay	
Positive edge	52 μ s \pm 0.5 μ s (digitally filtered)
Negative edge	53 μ s \pm 0.5 μ s (digitally filtered)
Modulation compared to ground potential	Max. \pm 38 V
24 V Out	
Amount	2
Output voltage	
DC bus voltage 260 ... 315 VDC	25 VDC * (DC bus voltage / 315)
DC bus voltage 315 ... 900 VDC	24 VDC \pm 6%
Fuse protection	500 mA (slow-blow) electronic, automatic reset
Enable inputs	
Number of inputs	2
Wiring	Sink
Electrical isolation	
Input - inverter module	Yes
Input voltage	
Rated	24 VDC
Maximum	30 VDC
Switching threshold	
LOW	<5 V
HIGH	>15 V
Input current at rated voltage	Approx. 30 mA
Switching delay @ 24 VDC	
Enable 1 -> 0, PWM off	Max. 20.5 ms
Enable 0 -> 1, ready for PWM	Max. 100 μ s
Modulation compared to ground potential	Max. \pm 38 V

Inverter modules 24kW (single-axis modules) 8BVI0330

Wall mounting	8BVI0330HWS0.000-1
Cold plate or feed-through mounting	8BVI0330HCS0.000-1
Operational conditions	
Ambient temperature during operation	5 to 40°C
Max. ambient temperature ¹⁾	+55°C
Relative humidity during operation	5 to 85%, non-condensing
Installation at altitudes above sea level	0 to 500 m
Maximum installation attitude ²⁾	4000 m
Degree of pollution according to EN 60664-1	2 (non-conductive material)
Overvoltage cat. according to IEC 60364-4-443:1999	III
EN 60529 protection	IP20
<p>1) Continuous operation of ACOPOSmulti inverter modules at ambient temperatures ranging from 40°C to max. 55°C is possible (taking the continuous current reductions listed into consideration), but results in a shorter lifespan.</p> <p>2) Continuous operation of ACOPOSmulti inverter modules at altitudes ranging from 500 m to 4000 m above sea level is possible (taking the continuous current reductions listed into consideration). Additional requirements are to be arranged with B&R.</p>	
Storage and transport conditions	
Storage temperature	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing
Transport temperature	-25 to +70°C
Relative humidity during transport	95% at +40°C
Mechanical characteristics	
Dimensions ¹⁾	
Width	106,5 mm
Height	317 mm
Depth	
Wall mounting	263 mm
Cold-plate	212 mm
Feed-through mounting	209 mm
Weight	
Wall mounting	Approx. 5.2 kg
Cold-plate	Approx. 4.2 kg
Feed-through mounting	Approx. 4.2 kg

1) The dimensions define the true device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

Required accessories					
8TB2106.2010-00	1	Screw terminal 6-pin, 1 row RM5.08 Label 1: numbered serially		Plug for X1 connection	1435
8TB2108.2010-00	1	Screw terminal 8-pin, 1 row RM5.08 Label 1: numbered serially		Plug for X2 connection	1435
8TB2104.203L-00	1	Screw terminal 4-pin, 1 row RM5.08 Label 3: T- T+ B- B+ Coding L: 1010		Plug for X4A connection	1434
8TB4104.204G-10	1	Screw terminal 4-pin, 1 row RM10.16 Label 4: PE W V U Coding G: 0110		Plug for X5A connection	1439

Optional accessories					
8BAC0120.000-1	Max. 2	ACOPOSmulti plug-in module, EnDat 2.1 interface	---		1410
8BAC0120.001-1	Max. 2	ACOPOSmulti plug-in module, EnDat 2.2 interface	---		1412
8BAC0121.000-1	Max. 2	ACOPOSmulti plug-in module, HIPERFACE interface	---		1413
8BAC0122.000-1	Max. 2	ACOPOSmulti plug-in module, resolver interface	---		1414
8BAC0123.000-1	Max. 2	ACOPOSmulti plug-in module, incremental encoder and SSI absolute encoder interface for RS422 signals	---		1416
8BAC0123.001-1	Max. 2	ACOPOSmulti plug-in module, incremental encoder interface for 5 V single-ended and 5 V differential signals	---		1418
8BAC0123.002-1	Max. 2	ACOPOSmulti plug-in module, incremental encoder interface for 24 V single-ended and 24 V differential signals	---		1420
8BAC0124.000-1	Max. 2	ACOPOSmulti plug-in module, SinCos interface	---		1422
8BAC0130.000-1	Max. 2	ACOPOSmulti input module, 2 digital outputs, ± 50 mA, max. 62.5 kHz, 2 digital outputs, 500 mA, max. 1.25 kHz, 2 digital inputs - 24 VDC	---		236
8BAC0130.001-1	Max. 2	ACOPOSmulti input module, 2 digital outputs, ± 50 mA, max. 62.5 kHz, 4 digital outputs, 500 mA, max. 1.25 kHz	---		238
8BAC0132.000-1	Max. 2	ACOPOSmulti input module, 4 analog inputs ± 10 V			1424
8SCS005.0000-00	Up to 2	Shield component set consisting of: 1 slot cover shield sheet		Shield sheet for covering free plug-in module slots	1440
8SCS002.0000-00	1	Shield component set consisting of: 1 clamping plate 2 clamps D 4-13.5 mm 2 screws		Shield component set for I/O cables with a cable cross section of 4 - 13.5 mm	1440
8SCS008.0000-00	1	Shield component set consisting of: 1 shield plate, 2x, type 0 1 hose clamp, W 9 mm, D 23-35 mm		Shield component set for motor cables with a cable cross section of 23-35 mm	1441
8SCS007.0000-00	1	Shield component set consisting of: 1 shield mounting plate, 2x, 45° 4 screws		Base plate for mounting shield component set 8SCS008.0000-00	1441
8BXF001.0000-00	---	ACOPOSmulti fan module, replacement fan for ACOPOSmulti modules (8BVP/8B0C/8BVI/8BVE/8B0K)		Replacement fan for ACOPOSmulti modules (8BVP/8B0C/8BVI/8BVE/8B0K)	1441

Inverter modules 1.4kW ... 11kW, SafeMC (single-axis modules) 8BVI0014, 8BVI0028, 8BVI0055, 8BVI0110



- Clearly structured, straightforward implementation via network-based safety technology
- Modular expandability through virtual wiring
- Immediate triggering of safety function thanks to short cycle times
- Easy implementation thanks to transparent control and status information, also in the functional application
- Compact construction, complete functionality of safety functions even in two-axis modules

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Wall mounting	8BVI0014HWSS.000-1	8BVI0028HWSS.000-1	8BVI0055HWSS.000-1	8BVI0110HWSS.000-1
Cold plate or feed-through mounting	8BVI0014HCSS.000-1	8BVI0028HCSS.000-1	8BVI0055HCSS.000-1	8BVI0110HCSS.000-1
General information				
C-UL-US listed	In preparation	In preparation	In preparation	In preparation
Available cooling and mounting methods				
Wall mounting	Yes	Yes	Yes	Yes
Cold plate or feed-through mounting	Yes	Yes	Yes	Yes
Module width	1	1	1	1
DC bus				
Voltage	750 VDC	750 VDC	750 VDC	750 VDC
Max.	900 VDC	900 VDC	900 VDC	900 VDC
Continuous power consumption	In preparation	In preparation	In preparation	In preparation
Power loss at max. device power	In preparation	In preparation	In preparation	In preparation
DC bus capacitance	165 µF	165 µF	165 µF	330 µF
Design	ACOPOSmulti backplane	ACOPOSmulti backplane	ACOPOSmulti backplane	ACOPOSmulti backplane
24 VDC supply				
Input voltage	25 VDC ±1.6%	25 VDC ±1.6%	25 VDC ±1.6%	25 VDC ±1.6%
Input capacitance	23.5 µF	23.5 µF	23.5 µF	23.5 µF
Max. power consumption	12 W + P _{24 V Out} {0 ... 10 W} ¹⁾ + P _{HoldingBrake} + P _{Fan8B0M...} ²⁾	12 W + P _{24 V Out} {0 ... 10 W} ¹⁾ + P _{HoldingBrake} + P _{Fan8B0M...} ²⁾	12 W + P _{24 V Out} {0 ... 10 W} ¹⁾ + P _{HoldingBrake} + P _{Fan8B0M...} ²⁾	12 W + P _{24 V Out} {0 ... 10 W} ¹⁾ + P _{HoldingBrake} + P _{Fan8B0M...} ²⁾
Design	ACOPOSmulti backplane	ACOPOSmulti backplane	ACOPOSmulti backplane	ACOPOSmulti backplane
1) The power consumption P _{24 V Out} corresponds to the power that is output on the module's X2 / +24 V Out 1 and X2 / +24 V Out 2 connections (max. 10 W).				
2) The power consumption P _{Fan8B0M...} corresponds to the portion of the power that is used by the fan modules in the mounting plate / by the 8B0M0040HFF0.000-1 fan module and can be found in the technical data for the respective 8B0M... mounting plate.				
Motor connector				
Continuous power ¹⁾	1.4 kW	2.8 kW	5.5 kW	11 kW
Continuous current ¹⁾	1.9 A _{eff}	3.8 A _{eff}	7.6 A _{eff}	15.1 A _{eff}
Reduction of continuous current depending on switching frequency and cooling type ²⁾				
Switching frequency 20 kHz				
Wall mounting ³⁾	0.11 A/K (from 33°C)	0.12 A/K (from 33°C)	0.13 A/K (from 4°C) ⁷⁾	0.15 A/K (from -28°C) ⁷⁾
Cold-plate mounting ⁴⁾	0.13 A/K (from 46°C)	0.1 A/K (from 34°C)	0.14 A/K (from 5°C) ⁸⁾	0.18 A/K (from -13°C) ⁸⁾
Feed-through mounting	In preparation	In preparation	In preparation	In preparation
Switching frequency 10 kHz				
Wall mounting ³⁾	No reduction	No reduction	0.2 A/K (from 49°C)	0.26 A/K (from 33°C)
Cold-plate mounting ⁴⁾	No reduction	0.6 A/K (from 58°C)	0.28 A/K (from 46°C)	0.32 A/K (from 35°C)
Feed-through mounting	In preparation	In preparation	In preparation	In preparation
Switching frequency 5 kHz				
Wall mounting ³⁾	No reduction	No reduction	No reduction	No reduction
Cold-plate mounting ⁴⁾	No reduction	No reduction	0.65 A/K (from 57°C)	0.73 A/K (from 55°C)
Feed-through mounting	In preparation	In preparation	In preparation	In preparation
Reduction of continuous current depending on installation altitude				
Starting at 500 m above sea level	0.19 A _{eff} per 1000 m	0.38 A _{eff} per 1000 m	0.76 A _{eff} per 1000 m	1.51 A _{eff} per 1000 m

Wall mounting	8BVI0014HWSS.000-1	8BVI0028HWSS.000-1	8BVI0055HWSS.000-1	8BVI0110HWSS.000-1
Cold plate or feed-through mounting	8BVI0014HCSS.000-1	8BVI0028HCSS.000-1	8BVI0055HCSS.000-1	8BVI0110HCSS.000-1
Motor connector				
Peak current	4.7 A _{eff}	9.5 A _{eff}	18.9 A _{eff}	37.7 A _{eff}
Rated switching frequency	5 kHz	5 kHz	5 kHz	5 kHz
Possible switching frequencies ⁷⁾	5/10/20 kHz	5/10/20 kHz	5/10/20 kHz	5/10/20 kHz
Max. rate of rise in voltage according to IEC EN 60034-17 ⁸⁾	10 kV/μs	10 kV/μs	10 kV/μs	10 kV/μs
Protective measures				
Overload protection	Yes	Yes	Yes	Yes
Short circuit and ground fault	Yes	Yes	Yes	Yes
Maximum motor line length depending on the switching frequency ⁹⁾				
Switching frequency 5 kHz	25 m	25 m	25 m	25 m
Switching frequency 10 kHz	25 m	25 m	25 m	25 m
Switching frequency 20 kHz	10 m	10 m	10 m	10 m
Design				
U, V, W, PE	Plugs	Plugs	Plugs	Plugs
Shield connection	Yes	Yes	Yes	Yes
Terminal connection cross sections				
Flexible and fine wire lines with wire tip sleeves	0.25 - 4 mm ²	0.25 - 4 mm ²	0.25 - 4 mm ²	0.25 - 4 mm ²
Approbation data				
UL/C-UL-US	30 - 10	30 - 10	30 - 10	30 - 10
CSA	28 - 10	28 - 10	28 - 10	28 - 10
Terminal cable outer-cross-section dimension of the shield connection	12 - 22 mm	12 - 22 mm	12 - 22 mm	12 - 22 mm

1) The continuous power and continuous current are valid for the following boundary conditions: Nominal DC bus voltage 750 VDC, nominal switching frequency 5 kHz, 40°C ambient temperature, installation altitudes < 500 m above sea level.

2) Valid in the following conditions: Nominal DC bus voltage 750 VDC, minimum permissible coolant flow volume (3 l/min). The nominal switching frequency values for the respective ACOPOSmulti inverter module are marked in bold.

3) The temperature specifications are based on the ambient temperature.

4) The temperature specifications are based on the return temperature of the cold plate mounting plate.

5) The module cannot supply the full continuous current at this switching frequency. This unusual value for the ambient temperature, at which a derating of the continuous current must be accounted for, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.

6) The module cannot supply the full continuous current at this switching frequency. This unusual value for the return temperature, at which a derating of the continuous current must be accounted for, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies. Caution! Condensation can occur at low flow-temperatures and low return-temperatures.

7) B&R recommends operating the module at nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load. When using double-axis modules, the increased CPU load causes a reduction of the functional range in the drive; if this is not taken into consideration then it can cause the computing time to be exceeded in extreme cases.

8) The value listed is only valid for motor cables with a length > 3 m and also depends (to a small extend) on the motor used.

9) To avoid exceeding the EMC limit values, the maximum motor cable length per motor connection is reduced at switching frequencies > 10 kHz.

Information: When using two motor cables that are connected in parallel, the maximum permissible motor cable lengths are reduced by half. The total length of all motor cables per backplane module is limited.

Inverter modules 1.4kW ... 11kW, SafeMC (single-axis modules) 8BVI0014, 8BVI0028, 8BVI0055, 8BVI0110

Wall mounting	8BVI0014HWSS.000-1	8BVI0028HWSS.000-1	8BVI0055HWSS.000-1	8BVI0110HWSS.000-1
Cold plate or feed-through mounting	8BVI0014HCSS.000-1	8BVI0028HCSS.000-1	8BVI0055HCSS.000-1	8BVI0110HCSS.000-1
Motor holding brake connection				
Output voltage	24 VDC +5.8% / +0.2%	24 VDC +5.8% / +0.2%	24 VDC +5.8% / +0.2%	24 VDC +5.8% / +0.1%
Continuous current	1.1 A	1.1 A	1.1 A	2.1 A
Max. internal resistance	0.5 Ω	0.5 Ω	0.5 Ω	0.3 Ω
Extinction potential	Approx. 30 V	Approx. 30 V	Approx. 30 V	Approx. 30 V
Max. extinction energy per connection	1.5 Ws	1.5 Ws	1.5 Ws	3 Ws
Max. switching frequency	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz
Protective measures				
Overload and short-circuit protection	Yes	Yes	Yes	Yes
Cable breakage monitoring	Yes	Yes	Yes	Yes
Undervoltage monitoring	Yes	Yes	Yes	Yes
Max. over-current limitation	8 A	8 A	8 A	10 A
Response threshold for cable breakage monitoring	Approx. 0.25 A	Approx. 0.25 A	Approx. 0.25 A	Approx. 0.5 A
Response threshold for undervoltage monitoring	24 VDC +0% / -5%	24 VDC +0% / -5%	24 VDC +0% / -5%	24 VDC +0% / -5%
Encoder interfaces ^{1) 2)}				
Amount ³⁾	1	1	1	1
Type	EnDat 2.2	EnDat 2.2	EnDat 2.2	EnDat 2.2
Connections	9-pin DSUB socket	9-pin DSUB socket	9-pin DSUB socket	9-pin DSUB socket
Indicators	UP/DN LEDs	UP/DN LEDs	UP/DN LEDs	UP/DN LEDs
Electrical isolation				
Encoder - ACOPOSmulti	No	No	No	No
Encoder monitoring	Yes	Yes	Yes	Yes
Maximum encoder cable length	100 m Depending on the cross section of the supply wires on the encoder cable ⁴⁾	100 m Depending on the cross section of the supply wires on the encoder cable ⁴⁾	100 m Depending on the cross section of the supply wires on the encoder cable ⁴⁾	100 m Depending on the cross section of the supply wires on the encoder cable ⁴⁾
Encoder supply				
Output voltage	Typ. 12.5 V	Typ. 12.5 V	Typ. 12.5 V	Typ. 12.5 V
Load capability	350 mA	350 mA	350 mA	350 mA
Protective measures / safeguards				
Overload protection	Yes	Yes	Yes	Yes
Short circuit protection	Yes	Yes	Yes	Yes
Synchronous serial interface				
Signal transfer	RS485	RS485	RS485	RS485
Data transfer rate	6.25 Mbit/s	6.25 Mbit/s	6.25 Mbit/s	6.25 Mbit/s

1) The EnDat encoder must be wired using a cable with a single shield and twisted pair signal lines.

2) Only EnDat 2.2 safety encoders can be connected!

3) SLOT 1 of the ACOPOSmulti module is occupied by the encoder interface.

4) The maximum encoder cable length l_{max} can be calculated as follows (the maximum permissible encoder length of 100 m must not be exceeded):

$$l_{max} = \frac{7.9}{I_g} \cdot A \cdot \frac{1}{2 \cdot \rho}$$

I_g ... Max. current consumption of the encoder [A]

A ... Cross section of the supply wire [mm²]

ρ ... Specific resistance [Ωmm²/m] (e.g. for copper: $\rho = 0.0178$)

Approved EnDat 2.2 cables can be obtained from DR. JOHANNES HEIDENHAIN GmbH (www.heidenhain.de).

If EnDat 2.2 cables from other manufacturers are used, they must be approved by B&R.

Wall mounting	8BVI0014HWSS.000-1	8BVI0028HWSS.000-1	8BVI0055HWSS.000-1	8BVI0110HWSS.000-1
Cold plate or feed-through mounting	8BVI0014HCSS.000-1	8BVI0028HCSS.000-1	8BVI0055HCSS.000-1	8BVI0110HCSS.000-1
Trigger inputs				
Number of inputs	2	2	2	2
Wiring	Sink	Sink	Sink	Sink
Electrical isolation				
Input - inverter module	Yes	Yes	Yes	Yes
Input - Input	Yes	Yes	Yes	Yes
Input voltage				
Rated	24 VDC	24 VDC	24 VDC	24 VDC
Maximum	30 VDC	30 VDC	30 VDC	30 VDC
Switching threshold				
LOW	<5 V	<5 V	<5 V	<5 V
HIGH	>15 V	>15 V	>15 V	>15 V
Input current at rated voltage	Approx. 10 mA	Approx. 10 mA	Approx. 10 mA	Approx. 10 mA
Switching delay				
Positive edge	52 μ s \pm 0.5 μ s (dig. filtered)	52 μ s \pm 0.5 μ s (dig. filtered)	52 μ s \pm 0.5 μ s (dig. filtered)	52 μ s \pm 0.5 μ s (dig. filtered)
Negative edge	53 μ s \pm 0.5 μ s (dig. filtered)	53 μ s \pm 0.5 μ s (dig. filtered)	53 μ s \pm 0.5 μ s (dig. filtered)	53 μ s \pm 0.5 μ s (dig. filtered)
Modulation compared to ground potential	Max. \pm 38 V	Max. \pm 38 V	Max. \pm 38 V	Max. \pm 38 V
24 V Out				
Amount	2	2	2	2
Output voltage				
DC bus voltage 260 ... 315 VDC	25 VDC * (DC bus voltage / 315)	25 VDC * (DC bus voltage / 315)	25 VDC * (DC bus voltage / 315)	25 VDC * (DC bus voltage / 315)
DC bus voltage 315 ... 900 VDC	24 VDC \pm 6%	24 VDC \pm 6%	24 VDC \pm 6%	24 VDC \pm 6%
Fuse protection	500 mA (slow-blow) electronic, automatic reset	500 mA (slow-blow) electronic, automatic reset	500 mA (slow-blow) electronic, automatic reset	500 mA (slow-blow) electronic, automatic reset
Enable inputs				
Number of inputs	2	2	2	2
Wiring	Sink	Sink	Sink	Sink
Electrical isolation				
Input - inverter module	Yes	Yes	Yes	Yes
Input - Input	Yes	Yes	Yes	Yes
Input voltage				
Rated	24 VDC	24 VDC	24 VDC	24 VDC
Maximum	30 VDC	30 VDC	30 VDC	30 VDC
Switching threshold				
LOW	<5 V	<5 V	<5 V	<5 V
HIGH	>15 V	>15 V	>15 V	>15 V
Input current at rated voltage	Approx. 30 mA	Approx. 30 mA	Approx. 30 mA	Approx. 30 mA
Switching delay @ 24 VDC				
Enable 1 -> 0, PWM off	Max. 20.5 ms	Max. 20.5 ms	Max. 20.5 ms	Max. 20.5 ms
Enable 0 -> 1, ready for PWM	Max. 100 μ s	Max. 100 μ s	Max. 100 μ s	Max. 100 μ s
Modulation compared to ground potential	Max. \pm 38 V	Max. \pm 38 V	Max. \pm 38 V	Max. \pm 38 V

Inverter modules 1.4kW ... 11kW, SafeMC (single-axis modules) 8BVI0014, 8BVI0028, 8BVI0055, 8BVI0110

Wall mounting	8BVI0014HWSS.000-1	8BVI0028HWSS.000-1	8BVI0055HWSS.000-1	8BVI0110HWSS.000-1
Cold plate or feed-through mounting	8BVI0014HCSS.000-1	8BVI0028HCSS.000-1	8BVI0055HCSS.000-1	8BVI0110HCSS.000-1
Operational conditions				
Ambient temperature during operation	5 to 40°C	5 to 40°C	5 to 40°C	5 to 40°C
Max. ambient temperature ¹⁾	+55°C	+55°C	+55°C	+55°C
Relative humidity during operation	5 to 85%, non-condensing	5 to 85%, non-condensing	5 to 85%, non-condensing	5 to 85%, non-condensing
Installation at altitudes above sea level	0 to 500 m	0 to 500 m	0 to 500 m	0 to 500 m
Maximum installation attitude ²⁾	4000 m	4000 m	4000 m	4000 m
Degree of pollution according to EN 60664-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Overtoltage cat. according to IEC 60364-4-443:1999	III	III	III	III
EN 60529 protection	IP20	IP20	IP20	IP20
1) Continuous operation of ACOPOSmulti inverter modules at ambient temperatures ranging from 40°C to max. 55°C is possible (taking the continuous current reductions listed into consideration), but results in a shorter lifespan.				
2) Continuous operation of ACOPOSmulti inverter modules at altitudes ranging from 500 m to 4000 m above sea level is possible (taking the continuous current reductions listed into consideration). Additional requirements are to be arranged with B&R.				
Storage and transport conditions				
Storage temperature	-25 to +55°C	-25 to +55°C	-25 to +55°C	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing	5 to 95%, non-condensing	5 to 95%, non-condensing	5 to 95%, non-condensing
Transport temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C	-25 to +70°C
Relative humidity during transport	95% at +40°C	95% at +40°C	95% at +40°C	95% at +40°C
Mechanical characteristics				
Dimensions ¹⁾				
Width	53 mm	53 mm	53 mm	53 mm
Height	317 mm	317 mm	317 mm	317 mm
Depth				
Wall mounting	263 mm	263 mm	263 mm	263 mm
Cold-plate	212 mm	212 mm	212 mm	212 mm
Feed-through mounting	209 mm	209 mm	209 mm	209 mm
Weight				
Wall mounting	Approx. 2.6 kg	Approx. 2.6 kg	Approx. 2.7 kg	Approx. 2.9 kg
Cold-plate	Approx. 2.1 kg	Approx. 2.1 kg	Approx. 2.2 kg	Approx. 2.4 kg
Feed-through mounting	Approx. 2.1 kg	Approx. 2.1 kg	Approx. 2.2 kg	Approx. 2.4 kg

1) The dimensions define the true device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

Required accessories				
8TB2106.2010-00	1	Screw terminal 6-pin, 1 row RM5.08 Label 1: numbered serially	Plug for X1 connection	1435
8TB2108.2010-00	1	Screw terminal 8-pin, 1 row RM5.08 Label 1: numbered serially	Plug for X2 connection	1435
8TB2104.203L-00	1	Screw terminal 4-pin, 1 row RM5.08 Label 3: T- T+ B- B+ Coding L: 1010	Plug for X4A connection	1434
8TB3104.204G-00	1	Screw terminal 4-pin, 1 row RM7.62 Label 4: PE W V U Coding G: 0110	Plug for X5A connection	1437

Optional accessories				
8BAC0120.000-1	Max. 1	ACOPOSmulti plug-in module, EnDat 2.1 interface	---	1410
8BAC0120.001-1	Max. 1	ACOPOSmulti plug-in module, EnDat 2.2 interface	---	1412
8BAC0121.000-1	Max. 1	ACOPOSmulti plug-in module, HIPERFACE interface	---	1413
8BAC0122.000-1	Max. 1	ACOPOSmulti plug-in module, resolver interface	---	1414
8BAC0123.000-1	Max. 1	ACOPOSmulti plug-in module, incremental encoder and SSI absolute encoder interface for RS422 signals	---	1416
8BAC0123.001-1	Max. 1	ACOPOSmulti plug-in module, incremental encoder interface for 5 V single-ended and 5 V differential signals	---	1418
8BAC0123.002-1	Max. 1	ACOPOSmulti plug-in module, incremental encoder interface for 24 V single-ended and 24 V differential signals	---	1420
8BAC0124.000-1	Max. 1	ACOPOSmulti plug-in module, SinCos interface	---	1422
8BAC0130.000-1	Max. 1	ACOPOSmulti plug-in module, 2 digital outputs, 50 mA, max. 62.5 kHz, 2 digital outputs, 500mA, max. 1.25 kHz, 2 digital inputs 24 VDC	---	236
8BAC0130.001-1	Max. 1	ACOPOSmulti plug-in module, 2 digital outputs, 50 mA, max. 62.5 kHz, 4 digital outputs, 500mA, max. 1.25 kHz	---	238
8BAC0132.000-1	Max. 1	ACOPOSmulti input module, 4 analog inputs ± 10 V	---	1424
8SCS005.0000-00	Max. 1	Shield component set consisting of: 1 slot cover shield sheet	Shield sheet for covering free plug-in module slots	1440
8SCS002.0000-00	1	Shield component set consisting of: 1 clamping plate 2 clamps D 4-13.5 mm 2 screws	Shield component set for I/O cables with a cable cross section of 4 - 13.5 mm	1440
8SCS000.0000-00	1	Shield component set consisting of: 1 shield plate 1x type 0 1 hose clamp, W 9 mm, D 12-22 mm	Shield component set for motor cables with a cable cross section of 12-22 mm	1440
8BXF001.0000-00	---	ACOPOSmulti fan module, replacement fan for ACOPOSmulti modules (8BVP/8B0C/8BVI/8BVE/8B0K)	Replacement fan for ACOPOSmulti modules (8BVP/8B0C/8BVI/8BVE/8B0K)	1441

Inverter modules 1.4kW ... 11kW, SafeMC (two-axis modules) 8BVI0014, 8BVI0028, 8BVI0055, 8BVI0110



8BVI0055HCDS.000-1

- Clearly structured, straightforward implementation via network-based safety technology
- Modular expandability through virtual wiring
- Immediate triggering of safety function thanks to short cycle times
- Easy implementation thanks to transparent control and status information, also in the functional application
- Compact construction, complete functionality of safety functions even in two-axis modules

ETHERNET 
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Wall mounting	8BVI0014HWDS.000-1	8BVI0028HWDS.000-1	8BVI0055HWDS.000-1	8BVI0110HWDS.000-1
Cold plate or feed-through mounting	8BVI0014HCDS.000-1	8BVI0028HCDS.000-1	8BVI0055HCDS.000-1	8BVI0110HCDS.000-1
General information				
C-UL-US listed	In preparation	In preparation	In preparation	In preparation
Available cooling and mounting methods				
Wall mounting	Yes	Yes	Yes	Yes
Cold plate or feed-through mounting	Yes	Yes	Yes	Yes
Module width	1	1	1	2
DC bus				
Voltage	750 VDC	750 VDC	750 VDC	750 VDC
Max.	900 VDC	900 VDC	900 VDC	900 VDC
Continuous power consumption	In preparation	In preparation	In preparation	In preparation
Power loss at max. device power	In preparation	In preparation	In preparation	In preparation
DC bus capacitance	165 μF	165 μF	165 μF	330 μF
Design	ACOPOSmulti backplane	ACOPOSmulti backplane	ACOPOSmulti backplane	ACOPOSmulti backplane
24 VDC supply				
Input voltage	25 VDC ±1.6%	25 VDC ±1.6%	25 VDC ±1.6%	25 VDC ±1.6%
Input capacitance	23.5 μF	23.5 μF	23.5 μF	23.5 μF
Max. power consumption	16 W + P _{24 V Out} {0 ... 10 W} ¹⁾ + P _{HoldingBrake} + P _{Fan8B0M...} ²⁾	16 W + P _{24 V Out} {0 ... 10 W} ¹⁾ + P _{HoldingBrake} + P _{Fan8B0M...} ²⁾	16 W + P _{24 V Out} {0 ... 10 W} ¹⁾ + P _{HoldingBrake} + P _{Fan8B0M...} ²⁾	16 W + P _{24 V Out} {0 ... 10 W} ¹⁾ + P _{HoldingBrake} + P _{Fan8B0M...} ²⁾
Design	ACOPOSmulti backplane	ACOPOSmulti backplane	ACOPOSmulti backplane	ACOPOSmulti backplane
1) The power consumption P _{24 V Out} corresponds to the power that is output on the module's X2 / +24 V Out 1 and X2 / +24 V Out 2 connections (max. 10 W).				
2) The power consumption P _{Fan8B0M...} corresponds to the portion of the power that is used by the fan modules in the mounting plate / by the 8B0M0040HFF0.000-1 fan module and can be found in the technical data for the respective 8B0M... mounting plate.				
Motor connector				
Continuous power ¹⁾	1.4 kW	2.8 kW	5.5 kW	11 kW
Continuous current ¹⁾	1.9 A _{eff}	3.8 A _{eff}	7.6 A _{eff}	15.1 A _{eff}
Reduction of continuous current depending on switching frequency and cooling type ²⁾				
Switching frequency 20 kHz				
Wall mounting ³⁾	0.11 A/K (from 15°C)	0.12 A/K (from 13°C)	0.15 A/K (from -14°C) ⁷⁾	In preparation
Cold-plate mounting ⁴⁾	0.13 A/K (from 45°C)	0.12 A/K (from 34°C)	0.13 A/K (from 3°C) ⁸⁾	In preparation
Feed-through mounting	In preparation	In preparation	In preparation	In preparation
Switching frequency 10 kHz				
Wall mounting ³⁾	No reduction	No reduction	0.22 A/K (from 43°C)	In preparation
Cold-plate mounting ⁴⁾	No reduction	0.6 A/K (from 57°C)	0.28 A/K (from 43°C)	In preparation
Feed-through mounting	In preparation	In preparation	In preparation	In preparation
Switching frequency 5 kHz				
Wall mounting ³⁾	No reduction	No reduction	No reduction	In preparation
Cold-plate mounting ⁴⁾	No reduction	No reduction	0.72 A/K (from 56°C)	In preparation
Feed-through mounting	In preparation	In preparation	In preparation	In preparation
Reduction of continuous current depending on installation altitude				
Starting at 500 m above sea level	0.19 A _{eff} per 1000 m	0.38 A _{eff} per 1000 m	0.76 A _{eff} per 1000 m	1.51 A _{eff} per 1000 m

Wall mounting	8BVI0014HWDS.000-1	8BVI0028HWDS.000-1	8BVI0055HWDS.000-1	8BVI0110HWDS.000-1
Cold plate or feed-through mounting	8BVI0014HCDS.000-1	8BVI0028HCDS.000-1	8BVI0055HCDS.000-1	8BVI0110HCDS.000-1
Motor connector				
Peak current	4.7 A _{eff}	9.5 A _{eff}	18.9 A _{eff}	37.7 A _{eff}
Rated switching frequency	5 kHz	5 kHz	5 kHz	5 kHz
Possible switching frequencies ⁷⁾	5/10/20 kHz	5/10/20 kHz	5/10/20 kHz	5/10/20 kHz
Max. rate of rise in voltage according to IEC EN 60034-17 ⁸⁾	10 kV/μs	10 kV/μs	10 kV/μs	10 kV/μs
Protective measures				
Overload protection	Yes	Yes	Yes	Yes
Short circuit and ground fault	Yes	Yes	Yes	Yes
Maximum motor line length depending on the switching frequency ⁹⁾				
Switching frequency 5 kHz	25 m	25 m	25 m	25 m
Switching frequency 10 kHz	25 m	25 m	25 m	25 m
Switching frequency 20 kHz	10 m	10 m	10 m	10 m
Design				
U, V, W, PE	Plugs	Plugs	Plugs	Plugs
Shield connection	Yes	Yes	Yes	Yes
Terminal connection cross sections				
Flexible and fine wire lines with wire tip sleeves	0.25 - 4 mm ²	0.25 - 4 mm ²	0.25 - 4 mm ²	0.25 - 4 mm ²
Approbation data				
UL/C-UL-US	30 - 10	30 - 10	30 - 10	30 - 10
CSA	28 - 10	28 - 10	28 - 10	28 - 10
Terminal cable outer-cross-section dimension of the shield connection	12 - 22 mm	12 - 22 mm	12 - 22 mm	12 - 22 mm

- 1) The continuous power and continuous current are valid for the following boundary conditions: Nominal DC bus voltage 750 VDC, nominal switching frequency 5 kHz, 40°C ambient temperature, installation altitudes < 500 m above sea level.
- 2) Valid in the following conditions: Nominal DC bus voltage 750 VDC, minimum permissible coolant flow volume (3 l/min). The nominal switching frequency values for the respective ACOPOSmulti inverter module are marked in bold.
- 3) The temperature specifications are based on the ambient temperature.
- 4) The temperature specifications are based on the return temperature of the cold plate mounting plate.
- 5) The module cannot supply the full continuous current at this switching frequency. This unusual value for the ambient temperature, at which a derating of the continuous current must be accounted for, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.
- 6) The module cannot supply the full continuous current at this switching frequency. This unusual value for the return temperature, at which a derating of the continuous current must be accounted for, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies. Caution! Condensation can occur at low flow-temperatures and low return-temperatures.
- 7) B&R recommends operating the module at nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load. When using double-axis modules, the increased CPU load causes a reduction of the functional range in the drive; if this is not taken into consideration then it can cause the computing time to be exceeded in extreme cases.
- 8) The value listed is only valid for motor cables with a length > 3 m and also depends (to a small extend) on the motor used.
- 9) To avoid exceeding the EMC limit values, the maximum motor cable length per motor connection is reduced at switching frequencies > 10 kHz.
- Information: When using two motor cables that are connected in parallel, the maximum permissible motor cable lengths are reduced by half. The total length of all motor cables per backplane module is limited.

Inverter modules 1.4kW ... 11kW, SafeMC (two-axis modules) 8BVI0014, 8BVI0028, 8BVI0055, 8BVI0110

Wall mounting	8BVI0014HWDS.000-1	8BVI0028HWDS.000-1	8BVI0055HWDS.000-1	8BVI0110HWDS.000-1
Cold plate or feed-through mounting	8BVI0014HCDS.000-1	8BVI0028HCDS.000-1	8BVI0055HCDS.000-1	8BVI0110HCDS.000-1
Motor holding brake connection				
Output voltage	24 VDC +5.8% / +0.2%	24 VDC +5.8% / +0.2%	24 VDC +5.8% / +0.2%	24 VDC +5.8% / +0.1%
Continuous current	1.1 A	1.1 A	1.1 A	2.1 A
Max. internal resistance	0.5 Ω	0.5 Ω	0.5 Ω	0.3 Ω
Extinction potential	Approx. 30 V	Approx. 30 V	Approx. 30 V	Approx. 30 V
Max. extinction energy per connection	1.5 Ws	1.5 Ws	1.5 Ws	3 Ws
Max. switching frequency	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz
Protective measures				
Overload and short-circuit protection	Yes	Yes	Yes	Yes
Cable breakage monitoring	Yes	Yes	Yes	Yes
Undervoltage monitoring	Yes	Yes	Yes	Yes
Max. over-current limitation	8 A	8 A	8 A	10 A
Response threshold for cable breakage monitoring	Approx. 0.25 A	Approx. 0.25 A	Approx. 0.25 A	Approx. 0.5 A
Response threshold for undervoltage monitoring	24 VDC +0% / -5%	24 VDC +0% / -5%	24 VDC +0% / -5%	24 VDC +0% / -5%
Encoder interfaces ^{1) 2)}				
Amount ³⁾	2	2	2	2
Type	EnDat 2.2	EnDat 2.2	EnDat 2.2	EnDat 2.2
Connections	9-pin DSUB socket	9-pin DSUB socket	9-pin DSUB socket	9-pin DSUB socket
Indicators	UP/DN LEDs	UP/DN LEDs	UP/DN LEDs	UP/DN LEDs
Electrical isolation				
Encoder - ACOPOSmulti	No	No	No	No
Encoder monitoring	Yes	Yes	Yes	Yes
Maximum encoder cable length	100 m	100 m	100 m	100 m
	Depending on the cross section of the supply wires on the encoder cable ⁴⁾	Depending on the cross section of the supply wires on the encoder cable ⁴⁾	Depending on the cross section of the supply wires on the encoder cable ⁴⁾	Depending on the cross section of the supply wires on the encoder cable ⁴⁾
Encoder supply				
Output voltage	Typ. 12.5 V	Typ. 12.5 V	Typ. 12.5 V	Typ. 12.5 V
Load capability	350 mA	350 mA	350 mA	350 mA
Protective measures / safeguards				
Overload protection	Yes	Yes	Yes	Yes
Short circuit protection	Yes	Yes	Yes	Yes
Synchronous serial interface				
Signal transfer	RS485	RS485	RS485	RS485
Data transfer rate	6.25 Mbit/s	6.25 Mbit/s	6.25 Mbit/s	6.25 Mbit/s

1) The EnDat encoder must be wired using a cable with a single shield and twisted pair signal lines.

2) Only EnDat 2.2 safety encoders can be connected!

3) SLOT 1 of the ACOPOSmulti module is occupied by the encoder interface.

4) The maximum encoder cable length l_{max} can be calculated as follows (the maximum permissible encoder length of 100 m must not be exceeded):

$$l_{max} = \frac{7.9}{I_g} \cdot A \cdot \frac{1}{2 \cdot \rho}$$

I_g ... Max. current consumption of the encoder [A]

A ... Cross section of the supply wire [mm²]

ρ ... Specific resistance [Ωmm²/m] (e.g. for copper: $\rho = 0.0178$)

Approved EnDat 2.2 cables can be obtained from DR. JOHANNES HEIDENHAIN GmbH (www.heidenhain.de).










If EnDat 2.2 cables from other manufacturers are used, they must be approved by B&R.

Wall mounting	8BVI0014HWDS.000-1	8BVI0028HWDS.000-1	8BVI0055HWDS.000-1	8BVI0110HWDS.000-1
Cold plate or feed-through mounting	8BVI0014HCDS.000-1	8BVI0028HCDS.000-1	8BVI0055HCDS.000-1	8BVI0110HCDS.000-1
Trigger inputs				
Number of inputs	2	2	2	2
Wiring	Sink	Sink	Sink	Sink
Electrical isolation				
Input - inverter module	Yes	Yes	Yes	Yes
Input - Input	Yes	Yes	Yes	Yes
Input voltage				
Rated	24 VDC	24 VDC	24 VDC	24 VDC
Maximum	30 VDC	30 VDC	30 VDC	30 VDC
Switching threshold				
LOW	<5 V	<5 V	<5 V	<5 V
HIGH	>15 V	>15 V	>15 V	>15 V
Input current at rated voltage	Approx. 10 mA	Approx. 10 mA	Approx. 10 mA	Approx. 10 mA
Switching delay				
Positive edge	52 μ s \pm 0.5 μ s (dig. filtered)	52 μ s \pm 0.5 μ s (dig. filtered)	52 μ s \pm 0.5 μ s (dig. filtered)	52 μ s \pm 0.5 μ s (dig. filtered)
Negative edge	53 μ s \pm 0.5 μ s (dig. filtered)	53 μ s \pm 0.5 μ s (dig. filtered)	53 μ s \pm 0.5 μ s (dig. filtered)	53 μ s \pm 0.5 μ s (dig. filtered)
Modulation compared to ground potential	Max. \pm 38 V	Max. \pm 38 V	Max. \pm 38 V	Max. \pm 38 V
24 V Out				
Amount	2	2	2	2
Output voltage				
DC bus voltage 260 ... 315 VDC	25 VDC * (DC bus voltage / 315)	25 VDC * (DC bus voltage / 315)	25 VDC * (DC bus voltage / 315)	25 VDC * (DC bus voltage / 315)
DC bus voltage 315 ... 900 VDC	24 VDC \pm 6%	24 VDC \pm 6%	24 VDC \pm 6%	24 VDC \pm 6%
Fuse protection	500 mA (slow-blow) electronic, automatic reset	500 mA (slow-blow) electronic, automatic reset	500 mA (slow-blow) electronic, automatic reset	500 mA (slow-blow) electronic, automatic reset
Enable inputs				
Number of inputs	2	2	2	2
Wiring	Sink	Sink	Sink	Sink
Electrical isolation				
Input - inverter module	Yes	Yes	Yes	Yes
Input - Input	Yes	Yes	Yes	Yes
Input voltage				
Rated	24 VDC	24 VDC	24 VDC	24 VDC
Maximum	30 VDC	30 VDC	30 VDC	30 VDC
Switching threshold				
LOW	<5 V	<5 V	<5 V	<5 V
HIGH	>15 V	>15 V	>15 V	>15 V
Input current at rated voltage	Approx. 30 mA	Approx. 30 mA	Approx. 30 mA	Approx. 30 mA
Switching delay @ 24 VDC				
Enable 1 -> 0, PWM off	Max. 20.5 ms	Max. 20.5 ms	Max. 20.5 ms	Max. 20.5 ms
Enable 0 -> 1, ready for PWM	Max. 100 μ s	Max. 100 μ s	Max. 100 μ s	Max. 100 μ s
Modulation compared to ground potential	Max. \pm 38 V	Max. \pm 38 V	Max. \pm 38 V	Max. \pm 38 V

Inverter modules 1.4kW ... 11kW, SafeMC (two-axis modules) 8BVI0014, 8BVI0028, 8BVI0055, 8BVI0110

Wall mounting	8BVI0014HWDS.000-1	8BVI0028HWDS.000-1	8BVI0055HWDS.000-1	8BVI0110HWDS.000-1
Cold plate or feed-through mounting	8BVI0014HCDS.000-1	8BVI0028HCDS.000-1	8BVI0055HCDS.000-1	8BVI0110HCDS.000-1
Operational conditions				
Ambient temperature during operation	5 to 40°C	5 to 40°C	5 to 40°C	5 to 40°C
Max. ambient temperature ¹⁾	+55°C	+55°C	+55°C	+55°C
Relative humidity during operation	5 to 85%, non-condensing	5 to 85%, non-condensing	5 to 85%, non-condensing	5 to 85%, non-condensing
Installation at altitudes above sea level	0 to 500 m	0 to 500 m	0 to 500 m	0 to 500 m
Maximum installation attitude ²⁾	4000 m	4000 m	4000 m	4000 m
Degree of pollution according to EN 60664-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Overvoltage cat. according to IEC 60364-4-443:1999	III	III	III	III
EN 60529 protection	IP20	IP20	IP20	IP20
1) Continuous operation of ACOPOSmulti inverter modules at ambient temperatures ranging from 40°C to max. 55°C is possible (taking the continuous current reductions listed into consideration), but results in a shorter lifespan.				
2) Continuous operation of ACOPOSmulti inverter modules at altitudes ranging from 500 m to 4000 m above sea level is possible (taking the continuous current reductions listed into consideration). Additional requirements are to be arranged with B&R.				
Storage and transport conditions				
Storage temperature	-25 to +55°C	-25 to +55°C	-25 to +55°C	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing	5 to 95%, non-condensing	5 to 95%, non-condensing	5 to 95%, non-condensing
Transport temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C	-25 to +70°C
Relative humidity during transport	95% at +40°C	95% at +40°C	95% at +40°C	95% at +40°C
Mechanical characteristics				
Dimensions ¹⁾				
Width	53 mm	53 mm	53 mm	106.5 mm
Height	317 mm	317 mm	317 mm	317 mm
Depth				
Wall mounting	263 mm	263 mm	263 mm	263 mm
Cold-plate	212 mm	212 mm	212 mm	212 mm
Feed-through mounting	209 mm	209 mm	209 mm	209 mm
Weight				
Wall mounting	Approx. 2.8 kg	Approx. 2.8 kg	Approx. 2.9 kg	Approx. 5.3 kg
Cold-plate	Approx. 2.3 kg	Approx. 2.3 kg	Approx. 2.3 kg	Approx. 4.1 kg
Feed-through mounting	Approx. 2.3 kg	Approx. 2.3 kg	Approx. 2.3 kg	Approx. 4.1 kg

1) The dimensions define the true device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

Required accessories					
8TB2112.2010-00	1	Screw terminal 12-pin, 1 row RM5.08 Label 1: numbered serially	Plug for X1 connection		1436
8TB2108.2010-00	1	Screw terminal 8-pin, 1 row RM5.08 Label 1: numbered serially	Plug for X2 connection		1435
8TB2104.203L-00	1	Screw terminal 4-pin, 1 row RM5.08 Label 3: T- T+ B- B+ Coding L: 1010	Plug for X4A connection		1434
8TB2104.203F-00	1	Screw terminal 4-pin, 1 row RM5.08 Label 3: T- T+ B- B+ Coding F: 0101	Plug for X4B connection		1434
8TB3104.204G-00	1	Screw terminal 4-pin, 1 row RM7.62 Label 4: PE W V U Coding G: 0110	Plug for X5A connection		1437
8TB3104.204K-00	1	Screw terminal 4-pin, 1 row RM7.62 Label 4: PE W V U Coding K: 1001	Plug for X5B connection		1437
Optional accessories					
8SCS002.0000-00	1	Shield component set consisting of: 1 clamping plate 2 clamps D 4-13.5 mm 2 screws	Shield component set for I/O cables with a cable cross section of 4 - 13.5 mm		1440
8SCS000.0000-00	Up to 2	Shield component set consisting of: 1 shield plate 1x type 0 1 hose clamp, W 9mm, D 12-22 mm	Shield component set for motor cables with a cable cross section of 12-22 mm		1440
8BXF001.0000-00	---	ACOPOSmulti fan module, replacement fan for ACOPOSmulti modules (8BVP/8B0C/8BVI/8BVE/8B0K)	Replacement fan for ACOPOSmulti modules (8BVP/8B0C/8BVI/8BVE/8B0K)		1441

Inverter modules 16kW ... 32kW, SafeMC (single-axis modules) 8BVI0220, 8BVI0330, 8BVI0440



- Clearly structured, straightforward implementation via network-based safety technology
- Modular expandability through virtual wiring
- Immediate triggering of safety function thanks to short cycle times
- Easy implementation thanks to transparent control and status information, also in the functional application
- Compact construction, complete functionality of safety functions even in two-axis modules

ETHERNET 
POWERLINK

Wall mounting	8BVI0220HWSS.000-1	8BVI0330HWSS.000-1	8BVI0440HWSS.000-1
Cold plate or feed-through mounting	8BVI0220HCSS.000-1	8BVI0330HCSS.000-1	8BVI0440HCSS.000-1
General information			
C-UL-US listed	In preparation	In preparation	In preparation
Available cooling and mounting methods			
Wall mounting	Yes	Yes	Yes
Cold plate or feed-through mounting	Yes	Yes	Yes
Module width	2	2	2
DC bus			
Voltage	750 VDC	750 VDC	750 VDC
Max.	900 VDC	900 VDC	900 VDC
Continuous power consumption	In preparation	In preparation	In preparation
Power loss at max. device power	In preparation	In preparation	In preparation
DC bus capacitance	495 μ F	990 μ F	990 μ F
Design	ACOPOSmulti backplane	ACOPOSmulti backplane	ACOPOSmulti backplane
24 VDC supply			
Input voltage	25 VDC \pm 1.6%	25 VDC \pm 1.6%	25 VDC \pm 1.6%
Input capacitance	32.9 μ F	32.9 μ F	32.9 μ F
Max. power consumption	20 W + P _{24 V Out} {0 ... 10 W} ¹⁾ + P _{HoldingBrake} + P _{Fan8B0M...} ²⁾	20 W + P _{24 V Out} {0 ... 10 W} ¹⁾ + P _{HoldingBrake} + P _{Fan8B0M...} ²⁾	20 W + P _{24 V Out} {0 ... 10 W} ¹⁾ + P _{HoldingBrake} + P _{Fan8B0M...} ²⁾
Design	ACOPOSmulti backplane	ACOPOSmulti backplane	ACOPOSmulti backplane
1) The power consumption P _{24 V Out} corresponds to the power that is output on the module's X2 / +24 V Out 1 and X2 / +24 V Out 2 connections (max. 10 W).			
2) The power consumption P _{Fan8B0M...} corresponds to the portion of the power that is used by the fan modules in the mounting plate / by the 8B0M0040HFF0.000-1 fan module and can be found in the technical data for the respective 8B0M... mounting plate.			
Motor connector			
Continuous power ¹⁾	16 kW	24 kW	32 kW
Continuous current ¹⁾	22 A _{eff}	33 A _{eff}	44 A _{eff}
Reduction of continuous current depending on switching frequency and cooling type ²⁾			
Switching frequency 20 kHz			
Wall mounting ³⁾	0.31 A/K (from -16°C) ⁷⁾	In preparation	0.36 A/K (from -77°C) ⁷⁾
Cold-plate mounting ⁴⁾	0.36 A/K (from 5°C) ⁸⁾	In preparation	0.32 A/K (from -82°C) ⁸⁾
Feed-through mounting	In preparation	In preparation	In preparation
Switching frequency 10 kHz			
Wall mounting ³⁾	0.4 A/K (from 31°C)	In preparation	0.5 A/K (from -10°C) ⁷⁾
Cold-plate mounting ⁴⁾	0.5 A/K (from 49°C)	In preparation	0.62 A/K (from 6°C) ⁸⁾
Feed-through mounting	In preparation	In preparation	In preparation
Switching frequency 5 kHz			
Wall mounting ³⁾	No reduction	In preparation	1.57 A/K (from 40°C)
Cold-plate mounting ⁴⁾	No reduction	In preparation	0.8 A/K (from 45°C)
Feed-through mounting	In preparation	In preparation	In preparation
Reduction of continuous current depending on installation altitude			
Starting at 500 m above sea level	2.2 A _{eff} per 1000 m	3.3 A _{eff} per 1000 m	4.4 A _{eff} per 1000 m

Wall mounting	8BVI0220HWSS.000-1	8BVI0330HWSS.000-1	8BVI0440HWSS.000-1
Cold plate or feed-through mounting	8BVI0220HCSS.000-1	8BVI0330HCSS.000-1	8BVI0440HCSS.000-1
Motor connector			
Peak current	55 A _{eff}	83 A _{eff}	88 A _{eff}
Rated switching frequency	5 kHz	5 kHz	5 kHz
Possible switching frequencies ⁷⁾	5/10/20 kHz	5/10/20 kHz	5/10/20 kHz
Max. rate of rise in voltage acc. to IEC EN 60034-17 ⁸⁾	10 kV/μs	10 kV/μs	10 kV/μs
Protective measures			
Overload protection	Yes	Yes	Yes
Short circuit and ground fault	Yes	Yes	Yes
Maximum motor line length depending on the switching frequency ⁹⁾			
Switching frequency 5 kHz	25 m	25 m	25 m
Switching frequency 10 kHz	25 m	25 m	25 m
Switching frequency 20 kHz	25 m	25 m	25 m
Design			
U, V, W, PE	Plugs	Plugs	Plugs
Shield connection	Yes	Yes	Yes
Terminal connection cross sections			
Flexible and fine wire lines with wire tip sleeves	0.5 - 6 mm ²	0.5 - 16 mm ²	0.5 - 16 mm ²
Approbation data			
UL/C-UL-US	20 - 8	20 - 6	20 - 6
CSA	20 - 8	20 - 6	20 - 6
Terminal cable outer-cross-section dimension of the shield connection	12 - 22 mm	23 - 35 mm	23 - 35 mm

1) The continuous power and continuous current are valid for the following boundary conditions: Nominal DC bus voltage 750 VDC, nominal switching frequency 5 kHz, 40°C ambient temperature, installation altitudes < 500 m above sea level.

2) Valid in the following conditions: Nominal DC bus voltage 750 VDC, minimum permissible coolant flow volume (3 l/min). The nominal switching frequency values for the respective ACOPOSmulti inverter module are marked in bold.

3) The temperature specifications are based on the ambient temperature.

4) The temperature specifications are based on the return temperature of the cold plate mounting plate.

5) The module cannot supply the full continuous current at this switching frequency. This unusual value for the ambient temperature, at which a derating of the continuous current must be accounted for, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies.

6) The module cannot supply the full continuous current at this switching frequency. This unusual value for the return temperature, at which a derating of the continuous current must be accounted for, ensures that the derating of the continuous current can be determined in the same manner as at other switching frequencies. Caution! Condensation can occur at low flow-temperatures and low return-temperatures.

7) B&R recommends operating the module at nominal switching frequency. Operating the module at a higher switching frequency for application-specific reasons reduces the continuous current and increases the CPU load. When using double-axis modules, the increased CPU load causes a reduction of the functional range in the drive; if this is not taken into consideration then it can cause the computing time to be exceeded in extreme cases.

8) The value listed is only valid for motor cables with a length > 3 m and also depends (to a small extend) on the motor used.

9) Information: When using two motor cables that are connected in parallel, the maximum permissible motor cable lengths are reduced by half. The total length of all motor cables per backplane module is limited.

Inverter modules 16kW ... 32kW, SafeMC (single-axis modules)

8BVI0220, 8BVI0330, 8BVI0440

Wall mounting	8BVI0220HWSS.000-1	8BVI0330HWSS.000-1	8BVI0440HWSS.000-1
Cold plate or feed-through mounting	8BVI0220HCSS.000-1	8BVI0330HCSS.000-1	8BVI0440HCSS.000-1
Motor holding brake connection			
Output voltage	24 VDC +5.8% / -0.1%	24 VDC +5.8% / -0.1%	24 VDC +5.8% / -0.1%
Continuous current	4.2 A	4.2 A	4.2 A
Max. internal resistance	0.15 Ω	0.15 Ω	0.15 Ω
Extinction potential	Approx. 30 V	Approx. 30 V	Approx. 30 V
Max. extinction energy per connection	3 Ws	3 Ws	3 Ws
Max. switching frequency	0.5 Hz	0.5 Hz	0.5 Hz
Protective measures			
Overload and short-circuit protection	Yes	Yes	Yes
Cable breakage monitoring	Yes	Yes	Yes
Undervoltage monitoring	Yes	Yes	Yes
Max. over-current limitation	10 A	10 A	10 A
Response threshold for cable breakage monitoring	Approx. 0.5 A	Approx. 0.5 A	Approx. 0.5 A
Response threshold for undervoltage monitoring	24 VDC +0% / -5%	24 VDC +0% / -5%	24 VDC +0% / -5%
Encoder interfaces ^{1) 2)}			
Amount ³⁾	1	1	1
Type	EnDat 2.2	EnDat 2.2	EnDat 2.2
Connections	9-pin DSUB socket	9-pin DSUB socket	9-pin DSUB socket
Indicators	UP/DN LEDs	UP/DN LEDs	UP/DN LEDs
Electrical isolation			
Encoder - ACOPOSmulti	No	No	No
Encoder monitoring	Yes	Yes	Yes
Maximum encoder cable length	100 m	100 m	100 m
	Depending on the cross section of the supply wires on the encoder cable ⁴⁾	Depending on the cross section of the supply wires on the encoder cable ⁴⁾	Depending on the cross section of the supply wires on the encoder cable ⁴⁾
Encoder supply			
Output voltage	Typ. 12.5 V	Typ. 12.5 V	Typ. 12.5 V
Load capability	350 mA	350 mA	350 mA
Protective measures / safeguards			
Overload protection	Yes	Yes	Yes
Short circuit protection	Yes	Yes	Yes
Synchronous serial interface			
Signal transfer	RS485	RS485	RS485
Data transfer rate	6.25 Mbit/s	6.25 Mbit/s	6.25 Mbit/s

1) The EnDat encoder must be wired using a cable with a single shield and twisted pair signal lines.

2) Only EnDat 2.2 safety encoders can be connected!

3) SLOT 1 of the ACOPOSmulti module is occupied by the encoder interface.

4) The maximum encoder cable length l_{max} can be calculated as follows (the maximum permissible encoder length of 100 m must not be exceeded):

$$l_{max} = \frac{I_G}{I_G} \cdot A \cdot \frac{1}{2 \cdot \rho}$$

I_G ... Max. current consumption of the encoder [A]

A ... Cross section of the supply wire [mm²]

ρ ... Specific resistance [Ωmm²/m] (e.g. for copper: $\rho = 0.0178$)

Approved EnDat 2.2 cables can be obtained from DR. JOHANNES HEIDENHAIN GmbH (www.heidenhain.de).

If EnDat 2.2 cables from other manufacturers are used, they must be approved by B&R.

Wall mounting	8BVI0220HWSS.000-1	8BVI0330HWSS.000-1	8BVI0440HWSS.000-1
Cold plate or feed-through mounting	8BVI0220HCSS.000-1	8BVI0330HCSS.000-1	8BVI0440HCSS.000-1
Trigger inputs			
Number of inputs	2	2	2
Wiring	Sink	Sink	Sink
Electrical isolation			
Input - inverter module	Yes	Yes	Yes
Input - Input	No	No	No
Input voltage			
Rated	24 VDC	24 VDC	24 VDC
Maximum	30 VDC	30 VDC	30 VDC
Switching threshold			
LOW	<5 V	<5 V	<5 V
HIGH	>15 V	>15 V	>15 V
Input current at rated voltage	Approx. 10 mA	Approx. 10 mA	Approx. 10 mA
Switching delay			
Positive edge	52 μ s \pm 0.5 μ s (dig. filtered)	52 μ s \pm 0.5 μ s (dig. filtered)	52 μ s \pm 0.5 μ s (dig. filtered)
Negative edge	53 μ s \pm 0.5 μ s (dig. filtered)	53 μ s \pm 0.5 μ s (dig. filtered)	53 μ s \pm 0.5 μ s (dig. filtered)
Modulation compared to ground potential	Max. \pm 38 V	Max. \pm 38 V	Max. \pm 38 V
24 V Out			
Amount	2	2	2
Output voltage			
DC bus voltage 260 ... 315 VDC	25 VDC * (DC bus voltage / 315)	25 VDC * (DC bus voltage / 315)	25 VDC * (DC bus voltage / 315)
DC bus voltage 315 ... 900 VDC	24 VDC \pm 6%	24 VDC \pm 6%	24 VDC \pm 6%
Fuse protection			
	500 mA (slow-blow) electronic, automatic reset	500 mA (slow-blow) electronic, automatic reset	500 mA (slow-blow) electronic, automatic reset
Enable inputs			
Number of inputs	2	2	2
Wiring	Sink	Sink	Sink
Electrical isolation			
Input - inverter module	Yes	Yes	Yes
Input voltage			
Rated	24 VDC	24 VDC	24 VDC
Maximum	30 VDC	30 VDC	30 VDC
Switching threshold			
LOW	<5 V	<5 V	<5 V
HIGH	>15 V	>15 V	>15 V
Input current at rated voltage	Approx. 30 mA	Approx. 30 mA	Approx. 30 mA
Switching delay @ 24 VDC			
Enable 1 -> 0, PWM off	Max. 20.5 ms	Max. 20.5 ms	Max. 20.5 ms
Enable 0 -> 1, ready for PWM	Max. 100 μ s	Max. 100 μ s	Max. 100 μ s
Modulation compared to ground potential	Max. \pm 38 V	Max. \pm 38 V	Max. \pm 38 V

Inverter modules 16kW ... 32kW, SafeMC (single-axis modules) 8BVI0220, 8BVI0330, 8BVI0440

Wall mounting	8BVI0220HWSS.000-1	8BVI0330HWSS.000-1	8BVI0440HWSS.000-1
Cold plate or feed-through mounting	8BVI0220HCSS.000-1	8BVI0330HCSS.000-1	8BVI0440HCSS.000-1
Operational conditions			
Ambient temperature during operation	5 to 40°C	5 to 40°C	5 to 40°C
Max. ambient temperature ¹⁾	+55°C	+55°C	+55°C
Relative humidity during operation	5 to 85%, non-condensing	5 to 85%, non-condensing	5 to 85%, non-condensing
Installation at altitudes above sea level	0 to 500 m	0 to 500 m	0 to 500 m
Maximum installation attitude ²⁾	4000 m	4000 m	4000 m
Degree of pollution according to EN 60664-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Overvoltage cat. according to IEC 60364-4-443:1999	III	III	III
EN 60529 protection	IP20	IP20	IP20
1) Continuous operation of ACOPOSmulti inverter modules at ambient temperatures ranging from 40°C to max. 55°C is possible (taking the continuous current reductions listed into consideration), but results in a shorter lifespan.			
2) Continuous operation of ACOPOSmulti inverter modules at altitudes ranging from 500 m to 4000 m above sea level is possible (taking the continuous current reductions listed into consideration). Additional requirements are to be arranged with B&R.			
Storage and transport conditions			
Storage temperature	-25 to +55°C	-25 to +55°C	-25 to +55°C
Relative humidity during storage	5 to 95%, non-condensing	5 to 95%, non-condensing	5 to 95%, non-condensing
Transport temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Relative humidity during transport	95% at +40°C	95% at +40°C	95% at +40°C
Mechanical characteristics			
Dimensions ¹⁾			
Width	106.5 mm	106.5 mm	106.5 mm
Height	317 mm	317 mm	317 mm
Depth			
Wall mounting	263 mm	263 mm	263 mm
Cold-plate	212 mm	212 mm	212 mm
Feed-through mounting	209 mm	209 mm	209 mm
Weight			
Wall mounting	Approx. 5.2 kg	Approx. 5.2 kg	Approx. 5.2 kg
Cold-plate	Approx. 4.2 kg	Approx. 4.2 kg	Approx. 4.2 kg
Feed-through mounting	Approx. 4.2 kg	Approx. 4.2 kg	Approx. 4.2 kg

1) The dimensions define the true device dimensions including the respective mounting plate. Make sure to leave additional space above and below the devices for mounting, connections and air circulation.

Required accessories					
8TB2106.2010-00	1	Screw terminal 6-pin, 1 row RM5.08 Label 1: numbered serially	Plug for X1 connection		1435
8TB2108.2010-00	1	Screw terminal 8-pin, 1 row RM5.08 Label 1: numbered serially	Plug for X2 connection		1435
8TB2104.203L-00	1	Screw terminal 4-pin, 1 row RM5.08 Label 3: T- T+ B- B+ Coding L: 1010	Plug for X4A connection		1434
8TB4104.204G-00 ¹⁾	1	Screw terminal 4-pin, 1 row RM10.16 Label 4: PE W V U Coding G: 0110	Plug for X5A connection		1439
8TB4104.204G-10 ²⁾	1	Screw terminal 4-pin, 1 row RM10.16 Label 4: PE W V U Coding G: 0110	Plug for X5A connection		1439

1) Only for 8BVI0220HxSS.000-1.

2) Only for 8BVI0440HxSS.000-1.

Optional accessories					
8BAC0120.000-1	Max. 1	ACOPOSmulti plug-in module, EnDat 2.1 interface	---		1410
8BAC0120.001-1	Max. 1	ACOPOSmulti plug-in module, EnDat 2.2 interface	---		1412
8BAC0121.000-1	Max. 1	ACOPOSmulti plug-in module, HIPERFACE interface	---		1413
8BAC0122.000-1	Max. 1	ACOPOSmulti plug-in module, resolver interface	---		1414
8BAC0123.000-1	Max. 1	ACOPOSmulti plug-in module, incremental encoder and SSI absolute encoder interface for RS422 signals	---		1416
8BAC0123.001-1	Max. 1	ACOPOSmulti plug-in module, incremental encoder interface for 5 V single-ended and 5 V differential signals	---		1418
8BAC0123.002-1	Max. 1	ACOPOSmulti plug-in module, incremental encoder interface for 24 V single-ended and 24 V differential signals	---		1420
8BAC0124.000-1	Max. 1	ACOPOSmulti plug-in module, SinCos interface	---		1422
8BAC0130.000-1	Max. 1	ACOPOSmulti plug-in module, 2 digital outputs, 50 mA, max. 62.5 kHz, 2 digital outputs, 500 mA, max. 1.25 kHz, 2 digital inputs 24 VDC	---		236
8BAC0130.001-1	Max. 1	ACOPOSmulti plug-in module, 2 digital outputs, 50 mA, max. 62.5 kHz, 4 digital outputs, 500 mA, max. 1.25 kHz	---		238
8BAC0132.000-1	Max. 1	ACOPOSmulti input module, 4 analog inputs ± 10 V			1424
8SCS000.0000-00	1	Shield component set consisting of: 1 shield plate 1x type 01 1 hose clamp, B 9 mm, D 12-22 mm	Shield component set for motor cables with a cable diameter of 12 - 22 mm		1440
8SCS005.0000-00	Max. 1	Shield component set consisting of: 1 slot cover shield sheet	Shield sheet for covering free plug-in module slots		1440
8SCS002.0000-00	1	Shield component set consisting of: 1 clamping plate 2 clamps D 4-13.5 mm 2 screws	Shield component set for I/O cables with a cable cross section of 4 - 13.5 mm		1440
8SCS008.0000-00	1	Shield component set consisting of: 1 shield plate, 2x, type 0 1 hose clamp, W 9 mm, D 23-35 mm	Shield component set for motor cables with a cable cross section of 23-35 mm		1441
8SCS007.0000-00	1	Shield component set consisting of: 1 shield mounting plate, 2x, 45° 4 screws	Base plate for mounting shield component set 8SCS008.0000-00		1441
8BXF001.0000-00	---	ACOPOSmulti fan module, replacement fan for ACOPOSmulti modules (8BVP/8B0C/8BVI/8BVE/8B0K)	Replacement fan for ACOPOSmulti modules (8BVP/8B0C/8BVI/8BVE/8B0K)		1441

Digital I/O interface

BAC0130.000-1





- 2 inputs, +24 VDC
- 2 high-speed outputs, +24 VDC
- 2 standard readable outputs, +24 VDC

General information	8BAC0130.000-1
C-UL-US listed	In preparation
Module type	ACOPOSmulti plug-in module
Slot	SLOT 2
Max. power consumption	max. 800 mW
Connections	8BAC0130.000-1
Connection, module-side	10-pin connector
Indicators	UP-LED (module OK) and DN-LED (module NOT_OK)
Inputs	8BAC0130.000-1
Number of inputs	2
Wiring	Sink
Electrical isolation	
Input - ACOPOSmulti	Yes
Input - Input	No
Input voltage	
Minimum	18 VDC
Rated	24 VDC
Maximum	30 VDC
Input current at rated voltage	Approx. 11 mA
Switching delay	In preparation
Modulation compared to ground potential	Max. 30 V
High-speed outputs ¹⁾	8BAC0130.000-1
Number of outputs	2
Type	Push-pull
Electrical isolation	
Output - ACOPOSmulti	Yes
Output - Output	No
Switching voltage	
Minimum	18 VDC
Rated	24 VDC
Maximum	30 VDC
Continuous current	Max. 50 mA
Switching delay 0 -> 1 and 1 -> 0	Max. 1 μ s
Switching frequency (resistive load)	Max. 62.5 kHz
Protection	
Short circuit protection	Yes
Overload protection	Yes
Short circuit current at 24 V (until cut-off)	Approx. 0.2 A
Readable outputs	No

1) Shielded cables must be used for high-speed inputs.

Standard outputs		8BAC0130.000-1
Number of outputs		2
Type		High-side
Electrical isolation		
Output - ACOPOSmulti		Yes
Output - Output		No
Switching voltage		
Minimum		18 VDC
Rated		24 VDC
Maximum		30 VDC
Continuous current		Max. 500 mA
Switching delay 0 -> 1 and 1 -> 0		Max. 50 μ s
Switching frequency (resistive load)		Max. 1.25 kHz
Protection		
Short circuit protection		Yes
Overload protection		Yes
Short circuit current at 24 V (until cut-off)		Approx. 1.2 A
Readable outputs		Yes
Operational conditions		8BAC0130.000-1
Ambient temperature during operation		... 1)
Relative humidity during operation		... 1)
1) ACOPOSmulti plug-in modules can be used in an ACOPOSmulti inverter or power supply module; the corresponding values can be found in the technical data of the respective ACOPOSmulti inverter or power supply module.		
Storage and transport conditions		8BAC0130.000-1
Storage temperature		-25 to +55°C
Relative humidity during storage		5 to 95%, non-condensing
Transport temperature		-25 to +70°C
Relative humidity during transport		95% at +40°C

Required accessories		
8TB1110.20D-00	Accessory terminal block (3.5), 10-pin screw clamp, 1.5 qmm, protected against vibration by the screw flange, D coding: 1100110011	 1718
8TB1110.21D-00	Accessory terminal block (3.5), 10-pin cage clamp, 1.5 qmm, protected against vibration by the screw flange, D coding: 1100110011	 1718

Digital Out interface



8BAC0130.001-1



- 2 high-speed outputs, +24 VDC
- 2 standard readable outputs, +24 VDC

General information	8BAC0130.001-1
C-UL-US listed	In preparation
Module type	ACOPOSmulti plug-in module
Slot	SLOT 2
Max. power consumption	Max. 800 mW
Connections	8BAC0130.001-1
Connection, module-side	10-pin connector
Indicators	UP-LED (module OK) and DN-LED (module NOT_OK)
High-speed outputs ¹⁾	8BAC0130.001-1
Number of outputs	2
Type	Push-pull
Electrical isolation	
Output - ACOPOSmulti	Yes
Output - Output	No
Switching voltage	
Minimum	18 VDC
Rated	24 VDC
Maximum	30 VDC
Continuous current	Max. 50 mA
Switching delay 0 -> 1 and 1 -> 0	Max. 1 μ s
Switching frequency (resistive load)	Max. 62.5 kHz
Protection	
Short circuit protection	Yes
Overload protection	Yes
Short circuit current at 24 V (until cut-off)	Approx. 0.2 A
Readable outputs	No
<small>1) Shielded cables must be used for high-speed inputs.</small>	
Standard outputs	8BAC0130.001-1
Number of outputs	4
Type	High-side
Electrical isolation	
Output - ACOPOSmulti	Yes
Output - Output	No
Switching voltage	
Minimum	18 VDC
Rated	24 VDC
Maximum	30 VDC
Continuous current	Max. 500 mA
Switching delay 0 -> 1 and 1 -> 0	Max. 50 μ s
Switching frequency (resistive load)	Max. 1.25 kHz
Protection	
Short circuit protection	Yes
Overload protection	Yes
Short circuit current at 24 V (until cut-off)	Approx. 1.2 A
Readable outputs	Yes

Operational conditions		8BAC0130.001-1
Ambient temperature during operation		--- 1)
Relative humidity during operation		--- 1)
1) ACOPOSmulti plug-in modules can be used in an ACOPOSmulti inverter or power supply module; the corresponding values can be found in the technical data of the respective ACOPOSmulti inverter or power supply module.		
Storage and transport conditions		8BAC0130.001-1
Storage temperature		-25 to +55°C
Relative humidity during storage		5 to 95%, non-condensing
Transport temperature		-25 to +70°C
Relative humidity during transport		95% at +40°C

Required accessories		
8TB1110.20C-00	Accessory terminal block (3.5), 10-pin screw clamp, 1.5 qmm, protected against vibration by the screw flange, C coding: 1001111001	 1718
8TB1110.20D-00	Accessory terminal block (3.5), 10-pin cage clamp, 1.5 qmm, protected against vibration by the screw flange, D coding: 1001111001	 1718

4 mm² motor cable with motor plug, size 1.5 8BCM



- UL/CSA certified
- Can be used in cable drag chains
- Produced for optimal Use with ACOPOSmulti Drive systems and B&R servo motors with motor plug, size 1.5
- SpeedTec® - innovative plug system for safe connections
- Shield plate integrated

Available from production in six different lengths: ¹⁾

Cable length	Model number
5 m	8BCM0005.1322A-0
7 m	8BCM0007.1322A-0
10 m	8BCM0010.1322A-0
15 m	8BCM0015.1322A-0
20 m	8BCM0020.1322A-0
25 m	8BCM0025.1322A-0

¹⁾ Custom fabrications are available upon request.

General information	8BCMxxxx.1322A-0
Cable cross section	4 x 4 mm ² + 2 x 2 x 1 mm ²
Durability	Oil resistant according to VDE 0472 part 803, as well as standard hydraulic oil
Certification	UL AWM Style 20234, 80°C, 1000 V, E63216 and CSA AWM I/II A/B, 90°C, 1000 V, FT2 LL46064
Lines	8BCMxxxx.1322A-0
Power lines	4 mm ² , tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	Black, brown, blue, yellow/green
Signal lines	1 mm ² , tinned Cu wire
Wire insulation	Special thermoplastic material
Wire colors	White, white/red, white/blue, white/green
Cable structure	8BCMxxxx.1322A-0
Power lines	
Stranding	No
Shield	No
Signal lines	
Stranding	White with white/red and white/blue with white/green
Shield	Separate shielding for pairs, tinned Cu mesh, optical coverage 85% > and foil banding
Cable stranding	With filler elements and foil banding
Cable shielding	Tinned Cu mesh, optical coverage 85% and wrapped in isolating fabric
Outer sheathing	
Material	PUR
Color	Orange, similar to RAL 2003 flat
Labeling	BERNECKER + RAINER 4x4.0+2x2x1.0 FLEX
Electrical characteristics	8BCMxxxx.1322A-0
Conductor resistance	
Power lines	≤ 5.2 Ω/km
Signal lines	≤ 19 Ω/km
Insulation resistance	> 200 MΩ/km
Test voltage	
Wire/wire	3 kV
Wire/shield	3 kV
Operating voltage	Max. 1000 V
Mechanical characteristics	8BCMxxxx.1322A-0
Temperature range	
Moving	-10°C to +70°C
Static	-20°C to +90°C
Outer diameter	15.8 mm ± 0.5 mm
Flex radius	> 118.5 mm
Speed	≤ 4 m/s
Acceleration	< 60 m/s ²
Flex cycles	≥ 3,000,000
Weight	0.45 kg/m



ACOPOSInverter Variable speed drives

Combining efficiency with intelligence
Increased performance for industrial machines
Increasing competitiveness, protecting installations while reducing
energy expenditure, and decreasing maintenance costs



System characteristics

ACOPOSinverter S44

The ACOPOSinverter S44 drive is a frequency inverter for three-phase 200...240 V induction motors rated from 0.18 kW to 4 kW.

The ACOPOSinverter S44's ease of installation, based on the Plug & Play principle, its compact size and integrated functions make it particularly suitable for applications involving simple industrial machines and certain consumer machines.

Applications for simple industrial machines

- Handling (small conveyors, etc.)
- Packaging (small labelling machines, small bagging machines, etc.)
- Pumping applications (suction pumps, centrifugal pumps, circulating pumps, mono-pump and multi-pump stations, etc.)
- Machines equipped with a fan (air or smoke extraction, plastic film making machines, ovens, boilers, washing machines, etc.)

Applications for consumer machines

- Handling (access barriers, rotating advertising hoardings, etc.)
- Machines for health-related areas (medical beds, hydromassage equipment, treadmills, etc.)
- Food and beverage industry machines (mills, kneading machines, mixers, etc.)

Functions

- Switching between local control and control via the terminals
- Motor control profiles: standard, performance and pump/fan
- Frequency skip
- Present speeds
- PID controller
- S ramp, U ramp, ramp, switching
- Freewheel stop, fast stop
- Jog operation
- Configuring the logic and analog I/O
- Underload and overload detection
- Viewing the state of the logic inputs on the drive display
- Configuring how the parameters are displayed
- Error log, etc.



Power range for 50...60 Hz (kW) line supply		0.18...4
	Single-phase 100...120 V (kW)	0.18...0.75
	Single-phase 200...240 V (kW)	0.18...2.2
	Three-phase 200...240 V (kW)	0.18...4
Drive		
	Output frequency	0.5...400 Hz
	Type of control	Induction motor
		Standard (voltage/frequency), Performance (sensorless flux vector control), Pump/fan (Kn ² quadratic ratio)
	Transient overtorque	150...170% of the nominal motor torque
Functions		
	Number of functions	40
	Number of preset speeds	8
	Number of I/O	
	Analog inputs	1
	Logic inputs	4
	Analog outputs	1
	Logic outputs	1
	Relay outputs	1
Communication	Embedded	Modbus

ACOPOSinverter X64

The ACOPOSinverter X64 drive is a frequency inverter for 200...500 V three-phase induction motors from 0.18 kW to 15 kW.

The ACOPOSinverter X64 drive is robust, compact and easy to install. Its integrated functions are particularly suitable for the requirements of applications involving simple industrial machines.

Applications

The ACOPOSinverter X64 drive incorporates functions that are suitable for the most common applications, including:

- Material handling (small conveyors, hoists, etc.)
- Packing and packaging machines (small bagging machines, labelling machines, etc.)
- Special machines (mixers, kneaders, textile machines, etc.)
- Pumps, compressors, fans

Functions

- Motor and drive protection
- Linear, S, U or customized acceleration and deceleration ramps
- Local control of the speed reference using the navigation button
- +/- speed
- 16 preset speeds
- PI controller and references
- 2-wire/3-wire control
- Brake sequence
- Automatic catching of a spinning load with speed detection and automatic restart
- Fault configuration and stop type configuration
- Saving the configuration in the drive, etc.



Power range for 50...60 Hz (kW) line supply		0.18...15	
	Single-phase 200...240 V (kW)	0.18...2.2	
	Three-phase 200...240 V (kW)	0.18...15	
	Three-phase 380...500 V (kW)	0.37...15	
Drive	Output frequency	0.5...500 Hz	
	Type of control	Induction motor	
	Transient overtorque	Standard (voltage/frequency) Performance (sensorless flux vector control) 170...200% of the nominal motor torque	
Functions	Number of functions	50	
	Number of preset speeds	16	
	Number of I/O	Analog inputs	-
		Logic inputs	4 + 1 Counter input
		Analog outputs	-
		Logic outputs	1
		Relay outputs	1
Communication	Embedded	X2X Link	

System characteristics

ACOPOSinverter P84

The ACOPOSinverter P84 drive is a frequency inverter for 200...480 V three-phase induction and synchronous motors from 0.18 kW to 500 kW.

With its wide power range and numerous integrated functions, the ACOPOSinverter P84 meets the most stringent requirements for complex machines.

Applications

- Material handling (Palletizers/depalletizers, carton packers, labelling machines, conveyors, roller tables, etc.)
- Packing (Palletizers/depalletizers, carton packers, labelling machines, etc.)
- Textiles (Weaving looms, carding frames, washing machines, spinners, drawing frames, etc.)
- Wood (Automatic lathes, saws, milling)
- High inertia (Centrifuges, mixers, unbalanced machines (beam pumps, presses), etc.)
- Process machines
- Hoisting

Functions

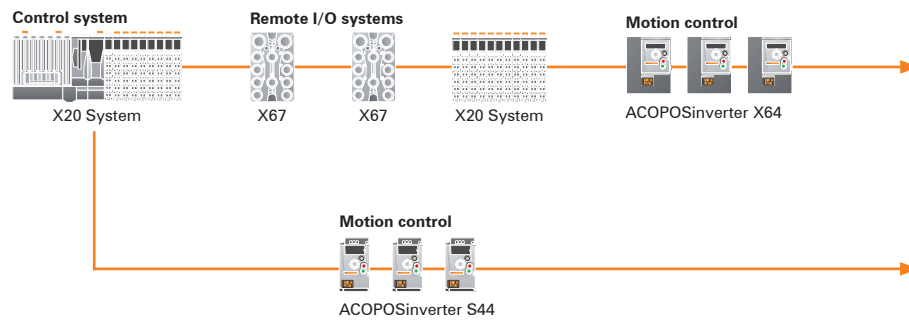
- Brake control
- Load sharing
- Limit switch management
- Current limiting
- Torque control
- Parameter set switching
- Motor switching
- PID controller
- Automatic catching of a spinning load with speed detection (catch on the fly)
- Undervoltage management
- Fastest possible stop, etc.

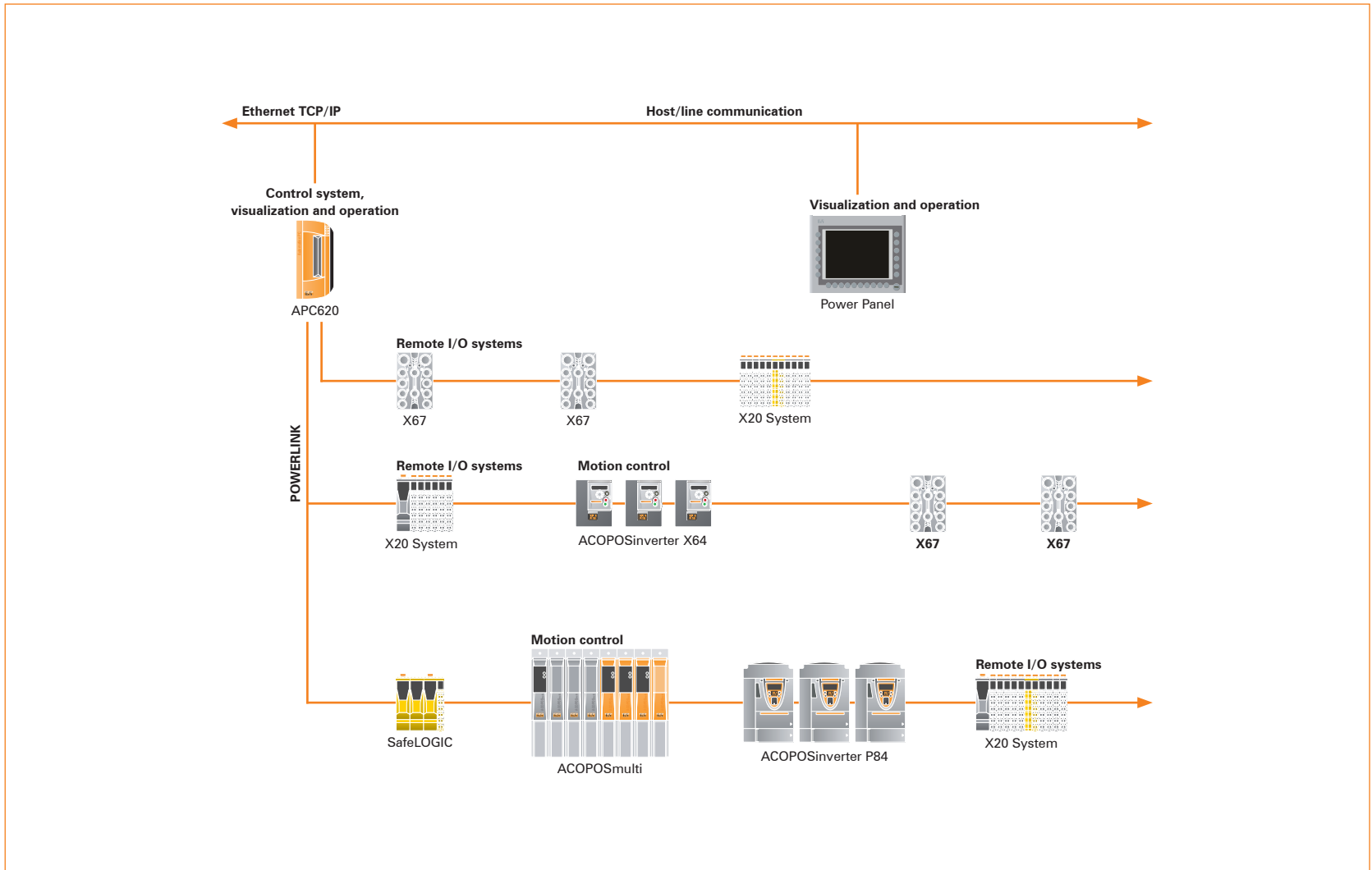


Power range for 50...60 Hz (kW) line supply		Single-phase 200...240 V (kW)	0.37...5.5	
		Three-phase 200...240 V (kW)	0.37...45	
		Three-phase 380...480 V (kW)	0.75...500	
Drive		Output frequency	1...500 Hz across the entire range 1...1600 Hz up to 37 kW at 200...240 V and 380...480 V	
		Type of control	Induction motor	Flux vector control with or without sensor, voltage/frequency ratio (2 or 5 points), ENA System
			Synchronous motor	Vector control with or without speed feedback
		Transient overtorque		220 % of the nominal motor torque for 2 seconds 170 % for 60 seconds
Functions		Number of functions	> 150	
		Number of preset speeds	16	
		Number of I/O	Analog inputs	2
			Logic inputs	5
			Analog outputs	1
			Logic outputs	-
			Relay outputs	2
Communication		Embedded	Ethernet POWERLINK	
Cards (available as an option)			Interface cards for incremental encoders	



Typical topologies





Product overview

ACOPOSinverter S44 - 1-phase 100-120V



Model number	Short description	
8I44S100018.000-1	ACOPOSinverter S44, 1x100-120V 0.18 kW, RS485 interface	258
8I44S100037.000-1	ACOPOSinverter S44, 1x100-120V 0.37 kW, RS485 interface	258
8I44S100075.000-1	ACOPOSinverter S44, 1x100-120V 0.75 kW, RS485 interface	258

ACOPOSinverter S44 - 1-phase 200-240V



Model number	Short description	
8I44S200018.000-1	ACOPOSinverter S44, 1x200-240 V 0.18 kW, integrated EMC filter, RS485 interface	262
8I44S200037.000-1	ACOPOSinverter S44, 1x200-240 V 0.37 kW, integrated EMC filter, RS485 interface	262
8I44S200055.000-1	ACOPOSinverter S44, 1x200-240 V 0.55 kW, integrated EMC filter, RS485 interface	262
8I44S200075.000-1	ACOPOSinverter S44, 1x200-240 V 0.75 kW, integrated EMC filter, RS485 interface	266
8I44S200150.000-1	ACOPOSinverter S44, 1x200-240 V 1.5 kW, integrated EMC filter, RS485 interface	266
8I44S200220.000-1	ACOPOSinverter S44, 1x200-240 V 2.2 kW, integrated EMC filter, RS485 interface	266

ACOPOSinverter S44 - 3-phase 200-240V



Model number	Short description	
8I44T200018.000-1	ACOPOSinverter S44, 3x200-240 V 0.18 kW, RS485 interface	270
8I44T200037.000-1	ACOPOSinverter S44, 3x200-240 V 0.37 kW, RS485 interface	270
8I44T200075.000-1	ACOPOSinverter S44, 3x200-240 V 0.75 kW, RS485 interface	270
8I44T200150.000-1	ACOPOSinverter S44, 3x200-240 V 1.5 kW, RS485 interface	274
8I44T200220.000-1	ACOPOSinverter S44, 3x200-240 V 2.2 kW, RS485 interface	274
8I44T200300.000-1	ACOPOSinverter S44, 3x200-240 V 3 kW, RS485 interface	278
8I44T200400.000-1	ACOPOSinverter S44, 3x200-240 V 4 kW, RS485 interface	278

ACOPOSinverter S44 - Accessories

ACOPOSinverter S44 - Additional EMC input filters

Model number	Short description	
8I0FS011.100-1	EMC filter 1-phase 11 A, mounting underneath the inverter for ACOPOSinverter S44 1x100-120 V 0.18 kW - 0.37 kW and 1x200-240 V 0.18 kW - 0.75 kW	420
8I0FS024.100-1	EMC filter 1-phase 24 A, mounting underneath the inverter for ACOPOSinverter S44 1x100-120 V 0.75 kW and 1x200-240 V 1.5 kW - 2.2 kW	420
8I0FT006.100-1	EMC filter 3-phase 6 A, mounting underneath the inverter for ACOPOSinverter S44 3x200-240 V 0.18 kW - 0.75 kW	421
8I0FT015.100-1	EMC filter 3-phase 15 A, mounting underneath the inverter for ACOPOSinverter S44 3x200-240 V 1.5 kW - 2.2 kW	421

ACOPOSinverter S44 - EMC plates

Model number	Short description	
8I0XP001.100-1	EMC plate size 1, clamps and screws included in delivery for ACOPOSinverter S44 1x100-120 V 0.18 kW - 0.37 kW and 1x200-240 V 0.18 kW - 0.75 kW and 3x200-240 V 0.18 kW - 0.75 kW	421
8I0XP002.100-1	EMC plate size 2, clamps and screws included in delivery for ACOPOSinverter S44 1x100-120 V 0.75 kW and 1x200-240 V 1.5 kW - 2.2 kW and 3x200-240 V 1.5 kW - 2.2 kW	421
8I0XP003.100-1	EMC plate size 3, clamps and screws included in delivery for ACOPOSinverter S44 3x200-240 V 3 kW - 4 kW	421

ACOPOSinverter X64 - 1-phase 200-240V



Model number	Short description	
8I64S200018.00X-1	ACOPOSinverter X64, 1x200-240 V 0.18 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, X2X Link	282
8I64S200037.00X-1	ACOPOSinverter X64, 1x200-240 V 0.37 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, X2X Link	282
8I64S200055.00X-1	ACOPOSinverter X64, 1x200-240 V 0.55 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, X2X Link	282
8I64S200075.00X-1	ACOPOSinverter X64, 1x200-240 V 0.75 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, X2X Link	286
8I64S200110.00X-1	ACOPOSinverter X64, 1x200-240 V 1.1 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, X2X Link	286
8I64S200150.00X-1	ACOPOSinverter X64, 1x200-240 V 1.5 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, X2X Link	290
8I64S200220.00X-1	ACOPOSinverter X64, 1x200-240 V 2.2 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, X2X Link	290

ACOPOSinverter X64 - 3-phase 200-240V



Model number	Short description	
8I64T200018.00X-1	ACOPOSinverter X64, 3x200-240 V 0.18 kW, integrated braking chopper, EMC plate included in delivery, X2X Link	294
8I64T200037.00X-1	ACOPOSinverter X64, 3x200-240 V 0.37 kW, integrated braking chopper, EMC plate included in delivery, X2X Link	294
8I64T200055.00X-1	ACOPOSinverter X64, 3x200-240 V 0.55 kW, integrated braking chopper, EMC plate included in delivery, X2X Link	294
8I64T200075.00X-1	ACOPOSinverter X64, 3x200-240 V 0.75 kW, integrated braking chopper, EMC plate included in delivery, X2X Link	298
8I64T200110.00X-1	ACOPOSinverter X64, 3x200-240 V 1.1 kW, integrated braking chopper, EMC plate included in delivery, X2X Link	298
8I64T200150.00X-1	ACOPOSinverter X64, 3x200-240 V 1.5 kW, integrated braking chopper, EMC plate included in delivery, X2X Link	298
8I64T200220.00X-1	ACOPOSinverter X64, 3x200-240 V 2.2 kW, integrated braking chopper, EMC plate included in delivery, X2X Link	302
8I64T200300.00X-1	ACOPOSinverter X64, 3x200-240 V 3 kW, integrated braking chopper, EMC plate included in delivery, X2X Link	302
8I64T200400.00X-1	ACOPOSinverter X64, 3x200-240 V 4 kW, integrated braking chopper, EMC plate included in delivery, X2X Link	302
8I64T200550.00X-1	ACOPOSinverter X64, 3x200-240 V 5.5 kW, integrated braking chopper, EMC plate included in delivery, X2X Link	306
8I64T200750.00X-1	ACOPOSinverter X64, 3x200-240 V 7.5 kW, integrated braking chopper, EMC plate included in delivery, X2X Link	306
8I64T201100.00X-1	ACOPOSinverter X64, 3x200-240 V 11 kW, integrated braking chopper, EMC plate included in delivery, X2X Link	310
8I64T201500.00X-1	ACOPOSinverter X64, 3x200-240 V 15 kW, integrated braking chopper, EMC plate included in delivery, X2X Link	310

ACOPOSinverter X64 - 3-phase 380-500V



Model number	Short description	
8I64T400037.00X-1	ACOPOSinverter X64, 3x380-500 V 0.37 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, X2X Link	314
8I64T400055.00X-1	ACOPOSinverter X64, 3x380-500 V 0.55 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, X2X Link	314
8I64T400075.00X-1	ACOPOSinverter X64, 3x380-500 V 0.75 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, X2X Link	314
8I64T400110.00X-1	ACOPOSinverter X64, 3x380-500 V 1.1 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, X2X Link	318
8I64T400150.00X-1	ACOPOSinverter X64, 3x380-500 V 1.5 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, X2X Link	318
8I64T400220.00X-1	ACOPOSinverter X64, 3x380-500 V 2.2 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, X2X Link	318
8I64T400300.00X-1	ACOPOSinverter X64, 3x380-500 V 3 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, X2X Link	322
8I64T400400.00X-1	ACOPOSinverter X64, 3x380-500 V 4 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, X2X Link	322
8I64T400550.00X-1	ACOPOSinverter X64, 3x380-500 V 5.5 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, X2X Link	322
8I64T400750.00X-1	ACOPOSinverter X64, 3x380-500 V 7.5 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, X2X Link	326
8I64T401100.00X-1	ACOPOSinverter X64, 3x380-500 V 11 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, X2X Link	326
8I64T401500.00X-1	ACOPOSinverter X64, 3x380-500 V 15 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, X2X Link	326

Product overview

ACOPOSinverter X64 - Accessories

ACOPOSinverter X64 - Additional EMC input filters

Model number	Short description	
8IOFS009.200-1	EMC filter 1-phase 9 A, mounting underneath or beside the inverter for ACOPOSinverter X64 1x200-240 V 0.18 kW - 0.75 kW	422
8IOFS016.200-1	EMC filter 3-phase 7 A, mounting underneath or beside the inverter for ACOPOSinverter X64 3x200-240 V 0.18 kW - 0.75 kW	423
8IOFS022.200-1	EMC filter 1-phase 16 A, mounting underneath or beside the inverter for ACOPOSinverter X64 1x200-240 V 1.1 kW - 1.5 kW	422
8IOFT007.200-1	EMC filter 1-phase 22 A, mounting underneath or beside the inverter for ACOPOSinverter X64 1x200-240 V 2.2 kW	422
8IOFT015.200-1	EMC filter 3-phase 15 A, mounting underneath or beside the inverter for ACOPOSinverter X64 3x200-240 V 1.1 kW - 2.2 kW and 3x380-500V 0.37 kW - 1.5 kW	423
8IOFT025.200-1	EMC filter 3-phase 25 A, mounting underneath or beside the inverter for ACOPOSinverter X64 3x200-240 V 3 kW - 4 kW and 3x380-500 V 2.2 kW - 4 kW	423
8IOFT047.200-1	EMC filter 3-phase 47 A, mounting underneath or beside the inverter for ACOPOSinverter X64 3x200-240 V 5.5 kW - 7.5 kW and 3x380-500 V 5.5 kW - 7.5 kW	423
8IOFT049.200-1	EMC filter 3-phase 49 A, mounting underneath or beside the inverter for ACOPOSinverter X64 3x380-500 V 11 kW - 15 kW	423
8IOFT083.200-1	EMC filter 3-phase 83 A, mounting underneath or beside the inverter for ACOPOSinverter X64 3x200-240 V 11 kW - 15 kW	423

ACOPOSinverter X64 - Line chokes

Model number	Short description	
8IOCS004.000-1	Line choke 1-phase 4 A for ACOPOSinverter X64 1x200-240 V 0.18 kW - 0.37 kW	428
8IOCS007.000-1	Line choke 1-phase 7 A for ACOPOSinverter X64 1x200-240 V 0.55 kW - 0.75 kW	428
8IOCS018.000-1	Line choke 1-phase 18 A for ACOPOSinverter X64 1x200-240 V 1.1 kW - 2.2 kW	428
8IOCT004.000-1	Line choke 3-phase 4 A for ACOPOSinverter X64 3x200-240 V 0.18 kW - 0.75 kW and 3x380-500 V 0.37 kW - 1.5 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 1.5 kW	430
8IOCT010.000-1	Line choke 3-phase 10 A for ACOPOSinverter X64 3x200-240 V 1.1 kW - 1.5 kW and 3x380-500V 2.2 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 1.5 kW - 2.2 kW and 3x380-480 V 2.2 kW - 4 kW	430
8IOCT016.000-1	Line choke 3-phase 16 A for ACOPOSinverter X64 3x200-240 V 2.2 kW - 3 kW and 3x380-500 V 5.5 kW - 7.5 kW, for ACOPOSinverter P84 3x200-240 V 3 kW and 3x380-480 V 5.5 kW - 7.5 kW	430
8IOCT030.000-1	Line choke 3-phase 30 A for ACOPOSinverter X64 3x200-240 V 4 kW - 7.5 kW and 3x380-500 V 11 kW - 15 kW, or ACOPOSinverter P84 3x200-240 V 4 kW - 5.5 kW and 3x380-480 V 11 kW - 15 kW	431
8IOCT060.000-1	Line choke 3-phase 60 A for ACOPOSinverter X64 3x200-240 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 7.5 kW - 11 kW and 3x380-480 V 18.5 kW - 22 kW	431

ACOPOSinverter X64 - Braking resistors

Model number	Short description	
8IOBR100.000-1	Braking resistor 100 Ohm, continuous braking power 0.05 kW for ACOPOSinverter X64 1x200-240 V 0.18 kW - 1.5 kW and 3x200-240 V 0.18 kW - 1.5 kW and 3x380-500 V 0.37 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 4 kW	435
8IOBR060.000-1	Braking resistor 60 Ohm, continuous braking power 0.1 kW for ACOPOSinverter X64 1x200-240 V 2.2 kW and 3x200-240 V 2.2 kW - 3 kW and 3x380-500 V 5.5 kW - 7.5 kW, for ACOPOSinverter P84 3x200-240 V 1.5 kW - 2.2 kW and 3x380-480 V 5.5 kW - 7.5 kW	435
8IOBR028.000-1	Braking resistor 28 Ohm, continuous braking power 0.2 kW for ACOPOSinverter X64 3x200-240 V 4 kW and 3x380-500 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 3 kW - 4 kW and 3x380-480 V 11 kW - 15 kW	435
8IOBR015.000-1	Braking resistor 15 Ohm, continuous braking power 1 kW for ACOPOSinverter X64 3x200-240 V 5.5 kW - 7.5 kW, for ACOPOSinverter P84 3x200-240 V 5.5 kW - 7.5 kW and 3x380-480 V 18.5 kW - 30 kW	436
8IOBR010.000-1	Braking resistor 10 Ohm, continuous braking power 1 kW for ACOPOSinverter X64 3x200-240 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 11 kW and 3x380-480 V 37 kW	436

ACOPOSinverter P84 - 3-phase 200-240V and 1-phase 200-240V



Model number	Short description	
8I84T200037.01P-1	ACOPOSinverter P84, 3x200-240 V 0.37 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, POWERLINK Interface	345
8I84T200075.01P-1	ACOPOSinverter P84, 3x200-240 V 0.75 kW and 1x200-240 V 0.37 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, POWERLINK Interface	330, 345
8I84T200150.01P-1	ACOPOSinverter P84, 3x200-240 V 1.5 kW and 1x200-240 V 0.75 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, POWERLINK Interface	330, 345
8I84T200220.01P-1	ACOPOSinverter P84, 3x200-240 V 2.2 kW and 1x200-240 V 1.5 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, POWERLINK Interface	330, 350
8I84T200300.01P-1	ACOPOSinverter P84, 3x200-240 V 3 kW and 1x200-240 V 2.2 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, POWERLINK Interface	335, 350
8I84T200400.01P-1	ACOPOSinverter P84, 3x200-240 V 4 kW and 1x200-240 V 3 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, POWERLINK Interface	335, 350
8I84T200550.01P-1	ACOPOSinverter P84, 3x200-240 V 5.5 kW and 1x200-240 V 4 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, POWERLINK Interface	340, 355
8I84T200750.01P-1	ACOPOSinverter P84, 3x200-240 V 7.5 kW and 1x200-240 V 5.5 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, POWERLINK Interface	340, 355
8I84T201100.01P-1	ACOPOSinverter P84, 3x200-240 V 11 kW, integrated braking chopper, EMC plate included in delivery, POWERLINK Interface	355
8I84T201500.01P-1	ACOPOSinverter P84, 3x200-240 V 15 kW, integrated braking chopper, EMC plate included in delivery, POWERLINK Interface	360
8I84T201850.01P-1	ACOPOSinverter P84, 3x200-240 V 18.5 kW, integrated braking chopper, EMC plate included in delivery, POWERLINK Interface	360
8I84T202200.01P-1	ACOPOSinverter P84, 3x200-240 V 22 kW, integrated braking chopper, EMC plate included in delivery, POWERLINK Interface	360
8I84T203000.01P-1	ACOPOSinverter P84, 3x200-240 V 30 kW, integrated braking chopper, EMC plate included in delivery, POWERLINK Interface	365
8I84T203700.01P-1	ACOPOSinverter P84, 3x200-240 V 37 kW, integrated braking chopper, EMC plate included in delivery, POWERLINK Interface	365
8I84T204500.01P-1	ACOPOSinverter P84, 3x200-240 V 45 kW, integrated braking chopper, EMC plate included in delivery, POWERLINK Interface	365

Product overview

ACOPOSinverter P84 - 3-phase 380-480V



Model number	Short description	
8I84T400075.01P-1	ACOPOSinverter P84, 3x380-480 V 0.75 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, POWERLINK Interface	370
8I84T400150.01P-1	ACOPOSinverter P84, 3x380-480 V 1.5 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, POWERLINK Interface	370
8I84T400220.01P-1	ACOPOSinverter P84, 3x380-480 V 2.2 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, POWERLINK Interface	370
8I84T400300.01P-1	ACOPOSinverter P84, 3x380-480 V 3 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, POWERLINK Interface	375
8I84T400400.01P-1	ACOPOSinverter P84, 3x380-480 V 4 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, POWERLINK Interface	375
8I84T400550.01P-1	ACOPOSinverter P84, 3x380-480 V 5.5 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, POWERLINK Interface	375
8I84T400750.01P-1	ACOPOSinverter P84, 3x380-480 V 7.5 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, POWERLINK Interface	380
8I84T401100.01P-1	ACOPOSinverter P84, 3x380-480 V 11 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, POWERLINK Interface	380
8I84T401500.01P-1	ACOPOSinverter P84, 3x380-480 V 15 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, POWERLINK Interface	380
8I84T401850.01P-1	ACOPOSinverter P84, 3x380-480 V 18.5 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, POWERLINK Interface	385
8I84T402200.01P-1	ACOPOSinverter P84, 3x380-480 V 22 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, POWERLINK Interface	385
8I84T403000.01P-1	ACOPOSinverter P84, 3x380-480 V 30 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, POWERLINK Interface	385
8I84T403700.01P-1	ACOPOSinverter P84, 3x380-480 V 37 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, POWERLINK Interface	390
8I84T404500.01P-1	ACOPOSinverter P84, 3x380-480 V 45 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, POWERLINK Interface	390
8I84T405500.01P-1	ACOPOSinverter P84, 3x380-480 V 55 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, POWERLINK Interface	395
8I84T407500.01P-1	ACOPOSinverter P84, 3x380-480 V 75 kW, integrated EMC filter and braking chopper, EMC plate included in delivery, POWERLINK Interface	395
8I84T409000.01P-1	ACOPOSinverter P84, 3x380-480 V 90 kW, integrated EMC filter and braking chopper, DC choke included in delivery (delivered separately), POWERLINK Interface	400
8I84T411000.01P-1	ACOPOSinverter P84, 3x380-480 V 110 kW, integrated EMC filter and braking chopper, DC choke included in delivery (delivered separately), POWERLINK Interface	400
8I84T413200.01P-1	ACOPOSinverter P84, 3x380-480 V 132 kW, integrated EMC filter and braking chopper, DC choke included in delivery (delivered separately), POWERLINK Interface	400
8I84T416000.01P-1	ACOPOSinverter P84, 3x380-480 V 160 kW, integrated EMC filter and braking chopper, DC choke included in delivery (delivered separately), POWERLINK Interface	405
8I84T420000.01P-1	ACOPOSinverter P84, 3x380-480 V 200 kW, integrated EMC filter, DC choke included in delivery (delivered separately) POWERLINK Interface	405
8I84T425000.01P-1	ACOPOSinverter P84, 3x380-480 V 250 kW, integrated EMC filter, DC choke included in delivery (delivered separately) POWERLINK Interface	405
8I84T428000.01P-1	ACOPOSinverter P84, 3x380-480 V 280 kW, integrated EMC filter, DC choke included in delivery (delivered separately) POWERLINK Interface	410
8I84T431500.01P-1	ACOPOSinverter P84, 3x380-480 V 315 kW, integrated EMC filter, DC choke included in delivery (delivered separately) POWERLINK Interface	410
8I84T440000.01P-1	ACOPOSinverter P84, 3x380-480 V 400 kW, integrated EMC filter, DC choke included in delivery (delivered separately) POWERLINK Interface	415
8I84T450000.01P-1	ACOPOSinverter P84, 3x380-480 V 500 kW, integrated EMC filter, DC choke included in delivery (delivered separately) POWERLINK Interface	415

ACOPOSinverter P84 - Accessories

ACOPOSinverter P84 - Additional EMC input filters

Model number	Short description	
810FT012.300-1	EMC filter 3-phase 12 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 0.37 kW - 1.5 kW and 3x380-480 V 0.75 kW - 2.2 kW	424
810FT026.300-1	EMC filter 3-phase 26 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 2.2 kW - 4 kW and 3x380-480 V 3 kW - 4 kW	424
810FT035.300-1	EMC filter 3-phase 35 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 5.5 kW and 3x380-480 V 5.5 kW - 7.5 kW	424
810FT046.300-1	EMC filter 3-phase 46 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 7.5 kW and 3x380-480 V 11 kW	425
810FT072.300-1	EMC filter 3-phase 72 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 11 kW - 15 kW and 3x380-480 V 15 kW - 18.5 kW	425
810FT090.300-1	EMC filter 3-phase 90 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 18.5 kW - 22 kW and 3x380-480 V 22 kW	425
810FT092.300-1	EMC filter 3-phase 92 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x380-480 V 37 kW	426
810FT180.300-1	EMC filter 3-phase 180 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 30 kW - 45 kW and 3x380-480 V 45 kW - 75 kW	426
810FT273.300-1	EMC filter 3-phase 273 A, for ACOPOSinverter P84 3x380-480 V 90 kW - 132 kW	426
810FT546.300-1	EMC filter 3-phase 546 A, for ACOPOSinverter P84 3x380-480 V 160 kW - 280 kW	427
810FT728.300-1	EMC filter 3-phase 728 A, for ACOPOSinverter P84 3x380-480 V 315 kW - 400 kW	426
810FT14M.300-1	EMC filter 3-phase 1456 A, for ACOPOSinverter P84 3x380-480 V 500 kW	427

ACOPOSinverter P84 - Line chokes

Model number	Short description	
810CS025.000-1	Line choke 1-phase 25 A, for ACOPOSinverter P84 1x200-240 V 3 kW	429
810CS045.000-1	Line choke 1-phase 45 A, for ACOPOSinverter P84 1x200-240 V 4 kW - 5.5 kW	429
810CT004.000-1	Line choke 3-phase 4 A for ACOPOSinverter X64 3x200-240 V 0.18 kW - 0.75 kW and 3x380-500 V 0.37 kW - 1.5 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 1.5 kW	430
810CT010.000-1	Line choke 3-phase 10 A for ACOPOSinverter X64 3x200-240 V 1.1 kW - 1.5 kW and 3x380-500 V 2.2 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 1.5 kW - 2.2 kW and 3x380-480 V 2.2 kW - 4 kW	430
810CT016.000-1	Line choke 3-phase 16 A for ACOPOSinverter X64 3x200-240 V 2.2 kW - 3 kW and 3x380-500 V 5.5 kW - 7.5 kW, for ACOPOSinverter P84 3x200-240 V 3 kW and 3x380-480 V 5.5 kW - 7.5 kW	430
810CT030.000-1	Line choke 3-phase 30 A for ACOPOSinverter X64 3x200-240 V 4 kW - 7.5 kW and 3x380-500 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 4 kW - 5.5 kW and 3x380-480 V 11 kW - 15 kW	431
810CT060.000-1	Line choke 3-phase 60 A for ACOPOSinverter X64 3x200-240 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 7.5 kW - 11 kW and 3x380-480 V 18.5 kW - 22 kW	431
810CT100.000-1	Line choke 3-phase 100 A for ACOPOSinverter P84 3x200-240 V 15 kW and 3x380-480 V 30 kW - 55 kW	431
810CT184.000-1	Line choke 3-phase 184 A for ACOPOSinverter P84 3x380-480 V 75 kW - 90 kW	432
810CT222.000-1	Line choke 3-phase 222 A for ACOPOSinverter P84 3x380-480 V 110 kW	432
810CT230.000-1	Line choke 3-phase 230 A for ACOPOSinverter P84 3x200-240 V 18.5 kW - 45 kW	432
810CT264.000-1	Line choke 3-phase 264 A for ACOPOSinverter P84 3x380-480 V 132 kW	433
810CT344.000-1	Line choke 3-phase 344 A for ACOPOSinverter P84 3x380-480 V 160 kW	433
810CT450.000-1	Line choke 3-phase 450 A Line choke 3-phase 450 A, for ACOPOSinverter P84 3x380-480 V 200 kW and 400 kW (2x)	433
810CT613.000-1	Line choke 3-phase 613 A for ACOPOSinverter P84 3x380-480 V 250 kW - 280 kW and 500 kW (2x)	434
810CT720.000-1	Line choke 3-phase 720 A Line choke 3-phase 720 A, for ACOPOSinverter P84 3x380-480 V 315 kW	434

Product overview

ACOPOSinverter P84 - Braking resistors

Model number	Short description	
8I0BR100.000-1	Braking resistor 100 Ohm, continuous braking power 0.05 kW for ACOPOSinverter X64 1x200-240 V 0.18 kW - 1.5 kW and 3x200-240 V 0.18 kW - 1.5 kW and 3x380-500 V 0.37 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 4 kW	435
8I0BR060.000-1	Braking resistor 60 Ohm, continuous braking power 0.1 kW for ACOPOSinverter X64 1x200-240 V 2.2 kW and 3x200-240 V 2.2 kW - 3 kW and 3x380-500 V 5.5 kW - 7.5 kW, for ACOPOSinverter P84 3x200-240 V 1.5 kW - 2.2 kW and 3x380-480 V 5.5 kW - 7.5 kW	435
8I0BR028.000-1	Braking resistor 28 Ohm, continuous braking power 0.2 kW for ACOPOSinverter X64 3x200-240 V 4 kW and 3x380-500 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 3 kW - 4 kW and 3x380-480 V 11 kW - 15 kW	435
8I0BR015.000-1	Braking resistor 15 Ohm, continuous braking power 1kW for ACOPOSinverter X64 3x200-240 V 5.5 kW - 7.5 kW, for ACOPOSinverter P84 3x200-240 V 5.5 kW - 7.5 kW and 3x380-480 V 18.5 kW - 30 kW	436
8I0BR010.000-1	Braking resistor 10 Ohm, continuous braking power 1 kW for ACOPOSinverter X64 3x200-240 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 11 kW and 3x380-480 V 37 kW	436
8I0BR008.000-1	Braking resistor 8 Ohm, continuous braking power 1 kW for ACOPOSinverter P84 3x200-240 V 15 kW	436
8I0BR005.000-1	Braking resistor 5 Ohm, continuous braking power 1.3 kW for ACOPOSinverter P84 3x200-240 V 18.5 kW - 22 kW and 3x380-480 V 45 kW - 75 kW	437
8I0BR004.000-1	Braking resistor 4 Ohm, continuous braking power 1 kW for ACOPOSinverter P84 3x200-240 V 30 kW	437
8I0BR003.000-1	Braking resistor 2.5 Ohm, continuous braking power 1 kW for ACOPOSinverter P84 3x200-240 V 37 kW - 45 kW	437
8I0BR003.001-1	Braking resistor 2.75 Ohm, continuous braking power 25 kW for ACOPOSinverter P84 3x380-480 V 90 kW	438
8I0BR002.000-1	Braking resistor 2.1 Ohm, continuous braking power 37 kW for ACOPOSinverter P84 3x380-480 V 110 kW - 132 kW	438
8I0BR002.001-1	Braking resistor 2.1 Ohm, continuous braking power 44 kW for ACOPOSinverter P84 3x380-480 V 160 kW	438
8I0BR001.001-1	Braking resistor 1.05 Ohm, continuous braking power 56 kW for ACOPOSinverter P84 3x380-480 V 200 kW	439
8I0BR001.002-1	Braking resistor 1.05 Ohm, continuous braking power 75 kW for ACOPOSinverter P84 3x380-480 V 250 kW - 280 kW	439
8I0BR001.003-1	Braking resistor 0.7 Ohm, continuous braking power 112 kW for ACOPOSinverter P84 3x380-480 V 315 kW - 400 kW	440
8I0BR001.004-1	Braking resistor 0.7 Ohm, continuous braking power 150 kW for ACOPOSinverter P84 3x380-480 V 500 kW	440

ACOPOSinverter P84 - Braking choppers

Model number	Short description	
8I0BC200.300-1	Braking chopper, continuous braking power 200 kW, for ACOPOSinverter P84 200 kW - 280 kW	444
8I0BC400.300-1	Braking chopper, continuous braking power 400 kW, for ACOPOSinverter P84 315 kW - 500 kW	444

ACOPOSinverter P84 - Feed through mounting kits

Model number	Short description	
810MF001.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 0.37 kW - 1.5 kW and 3x380-480 V 0.75 kW - 2.2 kW	445
810MF002.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 2.2 kW - 4 kW and 3x380-480 V 3 kW - 4 kW	445
810MF003.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 5.5 kW and 3x380-480 V 5.5 kW - 7.5 kW	445
810MF004.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 7.5 kW and 3x380-480 V 11 kW	445
810MF005.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 11 kW - 15 kW and 3x380-480 V 15 kW - 18.5 kW	445
810MF006.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 18.5 kW - 22 kW and 3x380-480 V 22 kW	445
810MF007.300-1	Feed through mounting kit for ACOPOSinverter P84 3x380-480 V 30 kW - 37 kW	445
810MF008.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 30 kW - 45 kW	445
810MF009.300-1	Feed through mounting kit for ACOPOSinverter P84 3x380-480 V 45 kW - 75 kW	445
810MF010.300-1	Feed through mounting kit, for ACOPOSinverter P84 3x380-480 V 90 kW	445
810MF011.300-1	Feed through mounting kit for ACOPOSinverter P84 3x380-480 V 110 kW	445
810MF012.300-1	Feed through mounting kit for ACOPOSinverter P84 3x380-480 V 132 kW	445
810MF013.300-1	Feed through mounting kit for ACOPOSinverter P84 3x380-480 V 160 kW	445
810MF014.300-1	Feed through mounting kit for ACOPOSinverter P84 3x380-480 V 200 kW - 280 kW without braking chopper	445
810MF015.300-1	Feed through mounting kit for ACOPOSinverter P84 3x380-480 V 200 kW - 280 kW with braking chopper	445

ACOPOSinverter P84 - Control card fan kits

Model number	Short description	
810XF004.300-1	Control card fan kit for ACOPOSinverter P84 3x200-240 V 18,5 kW - 22 kW and 3x380-480 V 22 kW, for operation at ambient temperature between 50 and 60°C	450
810XF005.300-1	Control card fan kit for ACOPOSinverter P84 3x380-480 V 30 kW - 37 kW, for operation at ambient temperature between 50 and 60°C	450
810XF006.300-1	Control card fan kit for ACOPOSinverter P84 3x200-240 V 30 kW - 45 kW, for operation at ambient temperature between 50 and 60°C	450
810XF007.300-1	Control card fan kit Control card fan kit, for ACOPOSinverter P84 3x380-480 V 45 kW - 75 kW, for operation at ambient temperature between 50 and 60°C	450

ACOPOSinverter P84 - Graphic display terminal

Model number	Short description	
810XD301.300-1	ACOPOSinverter P84 graphic display terminal, 8 lines, 240 x 160 pixels, background lighting, function keys, navigation button, IP54 protection	451
810XD302.300-1	Remote mounting kit for ACOPOSinverter P84 graphic display terminal, IP54 protection	451
810XD303.300-1	Front door for remote mounting kit of ACOPOSinverter P84 graphic display terminal, IP65 protection	451
810XD304.301-1	Remote cable 1 m for ACOPOSinverter P84 graphic display terminal	451
810XD304.303-1	Remote cable 3 m for ACOPOSinverter P84 graphic display terminal	451
810XD304.305-1	Remote cable 5 m for ACOPOSinverter P84 graphic display terminal	451
810XD304.310-1	Remote cable 10 m for ACOPOSinverter P84 graphic display terminal	451
810XD305.300-1	RJ45 adapter for ACOPOSinverter P84 graphic display terminal	451

ACOPOSinverter P84 - Incremental encoder interfaces

Model number	Short description	
810AC123.300-1	ACOPOSinverter P84 plug-in module, incremental encoder interface for RS422 signals, 5 V power supply	452
810AC123.301-1	ACOPOSinverter P84 plug-in module, incremental encoder interface for RS422 signals, 24 V power supply	452
810AC123.302-1	ACOPOSinverter P84 plug-in module, incremental encoder interface for open collector, 12 V power supply	452
810AC123.303-1	ACOPOSinverter P84 plug-in module, incremental encoder interface for open collector, 15 V power supply	452
810AC123.304-1	ACOPOSinverter P84 plug-in module, incremental encoder interface for push-pull, 12 V power supply	453
810AC123.305-1	ACOPOSinverter P84 plug-in module, incremental encoder interface for push-pull, 15 V power supply	453
810AC123.306-1	ACOPOSinverter P84 plug-in module, incremental encoder interface for push-pull, 24 V power supply	453

ACOPOSinverter S44

1-phase 100-120V






Motor power	8I44S100018.000-1	8I44S100037.000-1	8I44S100075.000-1
Indicated on rating plate	0.18 kW 0.25 HP	0.37 kW 0.5 HP	0.75 kW 1 HP
Power mains connection	8I44S100018.000-1	8I44S100037.000-1	8I44S100075.000-1
Mains input voltage	1x 100 VAC - 15% to 120 VAC + 10%	1x 100 VAC - 15% to 120 VAC + 10%	1x 100 VAC - 15% to 120 VAC + 10%
Frequency	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%
Apparent power (at 120 VAC)	1 kVA	1.9 kVA	3.3 kVA
Max. prospective line I _{sc} (short circuit current at the connection point)	1000 A	1000 A	1000 A
Max. line current ¹⁾			
at 100 VAC	6 A	11.4 A	18.9 A
at 120 VAC	5 A	9.3 A	15.7 A
Dissipated power at maximum output current	18 W	29 W	48 W
Integrated EMC filter	No	No	No
1) Typical value for the indicated motor power and for the maximum prospective line I _{sc} .			
Conducted and radiated EMC emissions	8I44S100018.000-1	8I44S100037.000-1	8I44S100075.000-1
With additional filter	8IOFS011.100-1	8IOFS011.100-1	8IOFS024.100-1
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	≤ 5 m ²⁾	≤ 5 m ²⁾	≤ 5 m ²⁾
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	≤ 20 m	≤ 20 m	≤ 20 m
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	≤ 20 m	≤ 20 m	≤ 20 m
1) For a shielded motor cable			
2) At a switching frequency of 2, 4, 8, 12 and 16 kHz			
Motor connector	8I44S100018.000-1	8I44S100037.000-1	8I44S100075.000-1
Maximum continuous output current (I _n) ¹⁾			
at 120 VAC	1.4 A	2.4 A	4.2 A
Reduction of continuous output current depending on the ambient temperature			
Switching frequency 4 kHz	No reduction (up to 40°C)	No reduction (up to 40°C)	No reduction (up to 50°C)
Other switching frequencies	See the derating curves in the User Manual, available on www.br-automation.com		
Reduction of continuous output current depending on altitude			
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	2.1 A	3.6 A	6.3 A
Output frequency range	0.5 to 400 Hz	0.5 to 400 Hz	0.5 to 400 Hz
Rated switching frequency	4 kHz	4 kHz	4 kHz
Minimum	2 kHz	2 kHz	2 kHz
Maximum	16 kHz	16 kHz	16 kHz
Transient overtorque	150 to 170% of the nominal motor torque depending on the drive rating and the type of motor		
Braking torque	Up to 70% of the nominal motor torque without resistor		
Motor control profiles	Standard profile (voltage/frequency ratio) Performance profile (sensorless flux vector control) Pump/fan profile (K _n ² quadratic ratio)		
Maximum motor cable length			
Shielded cable	50 m	50 m	50 m
Unshielded cable	100 m	100 m	100 m
Main drive protection features	Thermal protection against overheating Protection against short-circuits between motor phases Overcurrent protection between motor phases and earth Protection in the event of line overvoltage and undervoltage		
Motor protection	Thermal protection integrated in the drive by continuous calculation of the I ² t		

1) These values are given for a nominal switching frequency of 4 kHz, for use in continuous operation. If operation above 4 kHz needs to be continuous, the nominal drive current should be derated by 10% for 8 kHz, 20% for 12 kHz and 30% for 16 kHz. The switching frequency can be set between 2 and 16 kHz for all ratings. Above 4 kHz, the drive will reduce the switching frequency automatically in the event of an excessive temperature rise. See the derating curves in the User Manual, available on www.br-automation.com.

Available internal supplies	8I44S100018.000-1	8I44S100037.000-1	8I44S100075.000-1
Output voltage	5 VDC ± 5%	5 VDC ± 5%	5 VDC ± 5%
Max. output current	10 mA	10 mA	10 mA
Output voltage	24 VDC -15% / +20%	24 VDC -15% / +20%	24 VDC -15% / +20%
Max. output current	100 mA	100 mA	100 mA
Digital inputs	8I44S100018.000-1	8I44S100037.000-1	8I44S100075.000-1
Number of inputs	4	4	4
Input circuit	Source or Sink	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Sampling time	< 20 ms ±4 ms	< 20 ms ±4 ms	< 20 ms ±4 ms
Input impedance	3.5 kΩ	3.5 kΩ	3.5 kΩ
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
Digital outputs	8I44S100018.000-1	8I44S100037.000-1	8I44S100075.000-1
Number of outputs	1	1	1
Output circuit	Source or Sink	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Rated output current	10 mA (100 mA with external supply)	10 mA (100 mA with external supply)	10 mA (100 mA with external supply)
Update time	< 20 ms	< 20 ms	< 20 ms
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No
Relay outputs	8I44S100018.000-1	8I44S100037.000-1	8I44S100075.000-1
Number of outputs	1	1	1
Design	1 NO contact and 1 NC contact with common point	1 NO contact and 1 NC contact with common point	1 NO contact and 1 NC contact with common point
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity			
Minimum	5 mA for 24 VDC	5 mA for 24 VDC	5 mA for 24 VDC
Maximum			
on resistive load (cos φ = 1 and L/R = 0 ms)	4 A at 30 VDC / 3 A at 250 VAC	4 A at 30 VDC / 3 A at 250 VAC	4 A at 30 VDC / 3 A at 250 VAC
on inductive load (cos φ = 0.4 and L/R = 7 ms)	2 A at 30 VDC or 250 VAC	2 A at 30 VDC or 250 VAC	2 A at 30 VDC or 250 VAC
Response time (maximum)	30 ms	30 ms	30 ms
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No
Analog inputs	8I44S100018.000-1	8I44S100037.000-1	8I44S100075.000-1
Number of inputs	1	1	1
Input	0 to 5 V or 0 to 10 V or 0 to 20 mA	0 to 5 V or 0 to 10 V or 0 to 20 mA	0 to 5 V or 0 to 10 V or 0 to 20 mA
Resolution	10 bit	10 bit	10 bit
Sampling time	< 10 ms	< 10 ms	< 10 ms
Input impedance			
Voltage	30 kΩ	30 kΩ	30 kΩ
Current	250 Ω	250 Ω	250 Ω
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No

ACOPOSinverter S44

1-phase 100-120V

Analog outputs			
Number of outputs	8I44S100018.000-1	8I44S100037.000-1	8I44S100075.000-1
Output	1	1	1
Resolution	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Update time	8 bit	8 bit	8 bit
Min. load impedance	< 10 ms	< 10 ms	< 10 ms
Voltage	470 Ω	470 Ω	470 Ω
Current	800 Ω	800 Ω	800 Ω
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No
Operational conditions			
Ambient temperature	8I44S100018.000-1	8I44S100037.000-1	8I44S100075.000-1
Max. ambient temperature ¹⁾	-10 to +40°C	-10 to +40°C	-10 to +50°C
Relative humidity according to IEC 60068-2-3	Up to +60°C	Up to +60°C	Up to +60°C
Installation altitudes above sea level	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Maximum installation altitude ²⁾	0 to 1000 m	0 to 1000 m	0 to 1000 m
Operating position	Up to 2000 m	Up to 2000 m	Up to 2000 m
Maximum ambient pollution according to IEC/EN 61800-5-1			
Environmental conditions according IEC 60721-3-3	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Degree of protection	Class 3C3 and 3S2	Class 3C3 and 3S2	Class 3C3 and 3S2
1) Protective blanking cover removed and current derating of 2.2% per additional degree above ambient temperature. See the possible mounting types and derating curves in the User Manual, available on www.br-automation.com .			
2) From 1000 m to 2000 m current derating of 1% per 100 m			
Storage conditions			
Storage temperature	8I44S100018.000-1	8I44S100037.000-1	8I44S100075.000-1
	-25 to +70°C	-25 to +70°C	-25 to +70°C
Mechanical characteristics			
Dimensions	8I44S100018.000-1	8I44S100037.000-1	8I44S100075.000-1
Width	72 mm	72 mm	105 mm
Height	142 mm	130 mm	142 mm
Depth	102.2 mm	121.2 mm	156.2 mm
Weight	0.7 kg	0.8 kg	1.3 kg

Optional accessories for 8I44S100018.000-1

8I0FS011.100-1	EMC filter 1-phase 11 A, mounting underneath the inverter for ACOPOSinverter S44 1x100-120 V 0.18 kW - 0.37 kW and 1x200-240 V 0.18 kW - 0.75 kW
8I0XP001.100-1	EMC plate size 1, clamps and screws included in delivery for ACOPOSinverter S44 1x100-120 V 0.18 kW - 0.37 kW and 1x200-240 V 0.18 kW - 0.75 kW and 3x200-240 V 0.18 kW - 0.75 kW

Optional accessories for 8I44S100037.000-1

8I0FS011.100-1	EMC filter 1-phase 11 A, mounting underneath the inverter for ACOPOSinverter S44 1x100-120 V 0.18 kW - 0.37 kW and 1x200-240 V 0.18 kW - 0.75 kW
8I0XP001.100-1	EMC plate size 1, clamps and screws included in delivery for ACOPOSinverter S44 1x100-120 V 0.18 kW - 0.37 kW and 1x200-240 V 0.18 kW - 0.75 kW and 3x200-240 V 0.18 kW - 0.75 kW

Optional accessories for 8I44S100075.000-1

8I0FS024.100-1	EMC filter 1-phase 24 A, mounting underneath the inverter for ACOPOSinverter S44 1x100-120 V 0.75 kW and 1x200-240 V 1.5 kW - 2.2 kW
8I0XP002.100-1	EMC plate size 2, clamps and screws included in delivery for ACOPOSinverter S44 1x100-120 V 0.75 kW and 1x200-240 V 1.5 kW - 2.2 kW and 3x200-240 V 1.5 kW - 2.2 kW

ACOPOSinverter S44

1-phase 200-240V



Motor power	8I44S200018.000-1	8I44S200037.000-1	8I44S200055.000-1
Indicated on rating plate	0.18 kW 0.25 HP	0.37 kW 0.5 HP	0.55 kW 0.75 HP
Power mains connection	8I44S200018.000-1	8I44S200037.000-1	8I44S200055.000-1
Mains input voltage	1x 200 VAC - 15% to 240 VAC + 10%	1x 200 VAC - 15% to 240 VAC + 10%	1x 200 VAC - 15% to 240 VAC + 10%
Frequency	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%
Apparent power (at 240 VAC)	1.2 kVA	2 kVA	2.8 kVA
Max. prospective line I _{sc} (short circuit current at the connection point)	1000 A	1000 A	1000 A
Max. line current ¹⁾			
at 200 VAC	3.4 A	5.9 A	8 A
at 240 VAC	2.8 A	4.9 A	6.7 A
Dissipated power at maximum output current	18 W	27 W	34 W
Integrated EMC filter	Yes	Yes	Yes

1) Typical value for the indicated motor power and for the maximum prospective line I_{sc}.

Conducted and radiated EMC emissions	8I44S200018.000-1	8I44S200037.000-1	8I44S200055.000-1
With integrated filter			
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	≤ 5 m ²⁾	≤ 5 m ²⁾	≤ 5 m ²⁾
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	≤ 5 m ³⁾ or ≤ 10 m ⁴⁾	≤ 5 m ³⁾ or ≤ 10 m ⁴⁾	≤ 5 m ³⁾ or ≤ 10 m ⁴⁾
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	-	-	-
With additional filter			
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	≤ 20 m ²⁾	≤ 20 m ²⁾	≤ 20 m ²⁾
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	≤ 50 m	≤ 50 m	≤ 50 m
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	≤ 50 m	≤ 50 m	≤ 50 m

1) For a shielded motor cable

2) At a switching frequency of 2, 4, 8, 12 and 16 kHz

3) At a switching frequency from 2 to 12 kHz




4) At a switching frequency of 2, 4 and 16 kHz

Motor connector	8I44S200018.000-1	8I44S200037.000-1	8I44S200055.000-1
Maximum continuous output current (I _n) ¹⁾ at 240 VAC	1.4 A	2.4 A	3.5 A
Reduction of continuous output current depending on the ambient temperature			
Switching frequency 4 kHz	No reduction (up to 40°C)	No reduction (up to 40°C)	No reduction (up to 40°C)
Other switching frequencies	See the derating curves in the User Manual, available on www.br-automation.com		
Reduction of continuous output current depending on altitude			
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	2.1 A	3.6 A	5.3 A
Output frequency range	0.5 to 400 Hz	0.5 to 400 Hz	0.5 to 400 Hz
Rated switching frequency	4 kHz	4 kHz	4 kHz
Minimum	2 kHz	2 kHz	2 kHz
Maximum	16 kHz	16 kHz	16 kHz
Transient overtorque	150 to 170% of the nominal motor torque depending on the drive rating and the type of motor		
Braking torque	Up to 70% of the nominal motor torque without resistor		
Motor control profiles	Standard profile (voltage/frequency ratio) Performance profile (sensorless flux vector control) Pump/fan profile (Kn ² quadratic ratio)		
Maximum motor cable length			
Shielded cable	50 m	50 m	50 m
Unshielded cable	100 m	100 m	100 m
Main drive protection features	Thermal protection against overheating Protection against short-circuits between motor phases Overcurrent protection between motor phases and earth Protection in the event of line overvoltage and undervoltage		
Motor protection	Thermal protection integrated in the drive by continuous calculation of the I ² t		
1) These values are given for a nominal switching frequency of 4 kHz, for use in continuous operation. If operation above 4 kHz needs to be continuous, the nominal drive current should be derated by 10% for 8 kHz, 20% for 12 kHz and 30% for 16 kHz. The switching frequency can be set between 2 and 16 kHz for all ratings. Above 4 kHz, the drive will reduce the switching frequency automatically in the event of an excessive temperature rise. See the derating curves in the User Manual, available on www.br-automation.com .			
Available internal supplies	8I44S200018.000-1	8I44S200037.000-1	8I44S200055.000-1
Output voltage	5 VDC ± 5%	5 VDC ± 5%	5 VDC ± 5%
Max. output current	10 mA	10 mA	10 mA
Output voltage	24 VDC -15% / +20%	24 VDC -15% / +20%	24 VDC -15% / +20%
Max. output current	100 mA	100 mA	100 mA
Digital inputs	8I44S200018.000-1	8I44S200037.000-1	8I44S200055.000-1
Number of inputs	4	4	4
Input circuit	Source or Sink	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Sampling time	< 20 ms ± 4 ms	< 20 ms ± 4 ms	< 20 ms ± 4 ms
Input impedance	3.5 kΩ	3.5 kΩ	3.5 kΩ
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No

ACOPOSinverter S44

1-phase 200-240V

Digital outputs		8I44S200018.000-1	8I44S200037.000-1	8I44S200055.000-1
Number of outputs		1	1	1
Output circuit		Source or Sink	Source or Sink	Source or Sink
Rated voltage		24 VDC	24 VDC	24 VDC
Rated output current		10 mA (100 mA with external supply)	10 mA (100 mA with external supply)	10 mA (100 mA with external supply)
Update time		< 20 ms	< 20 ms	< 20 ms
Electrical isolation				
Output - ACOPOSinverter		Yes	Yes	Yes
Output - Output		No	No	No
Relay outputs		8I44S200018.000-1	8I44S200037.000-1	8I44S200055.000-1
Number of outputs		1	1	1
Design		1 NO contact and 1 NC contact with common point	1 NO contact and 1 NC contact with common point	1 NO contact and 1 NC contact with common point
Rated voltage		30 VDC / 250 VAC	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity				
Minimum		5 mA for 24 VDC	5 mA for 24 VDC	5 mA for 24 VDC
Maximum				
on resistive load (cos ϕ = 1 and L/R = 0 ms)		4 A at 30 VDC / 3 A at 250 VAC	4 A at 30 VDC / 3 A at 250 VAC	4 A at 30 VDC / 3 A at 250 VAC
on inductive load (cos ϕ = 0.4 and L/R = 7 ms)		2 A at 30 VDC or 250 VAC	2 A at 30 VDC or 250 VAC	2 A at 30 VDC or 250 VAC
Response time (maximum)		30 ms	30 ms	30 ms
Electrical isolation				
Output - ACOPOSinverter		Yes	Yes	Yes
Output - Output		No	No	No
Analog inputs		8I44S200018.000-1	8I44S200037.000-1	8I44S200055.000-1
Number of inputs		1	1	1
Input		0 to 5 V or 0 to 10 V or 0 to 20 mA	0 to 5 V or 0 to 10 V or 0 to 20 mA	0 to 5 V or 0 to 10 V or 0 to 20 mA
Resolution		10 bit	10 bit	10 bit
Sampling time		< 10 ms	< 10 ms	< 10 ms
Input impedance				
Voltage		30 k Ω	30 k Ω	30 k Ω
Current		250 Ω	250 Ω	250 Ω
Electrical isolation				
Input - ACOPOSinverter		Yes	Yes	Yes
Input - Input		No	No	No
Analog outputs		8I44S200018.000-1	8I44S200037.000-1	8I44S200055.000-1
Number of outputs		1	1	1
Output		0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution		8 bit	8 bit	8 bit
Update time		< 10 ms	< 10 ms	< 10 ms
Min. load impedance				
Voltage		470 Ω	470 Ω	470 Ω
Current		800 Ω	800 Ω	800 Ω
Electrical isolation				
Output - ACOPOSinverter		Yes	Yes	Yes
Output - Output		No	No	No

Operational conditions	8I44S200018.000-1	8I44S200037.000-1	8I44S200055.000-1
Ambient temperature	-10 to +40°C	-10 to +40°C	-10 to +40°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 2000 m	Up to 2000 m	Up to 2000 m
Operating position			
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C3 and 3S2	Class 3C3 and 3S2	Class 3C3 and 3S2
Degree of protection	IP20	IP20	IP20
1) Protective blanking cover removed and current derating of 2.2% per additional degree above ambient temperature. See the possible mounting types and derating curves in the User Manual, available on www.br-automation.com .			
2) From 1000 m to 2000 m current derating of 1% per 100 m			
Storage conditions	8I44S200018.000-1	8I44S200037.000-1	8I44S200055.000-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Mechanical characteristics	8I44S200018.000-1	8I44S200037.000-1	8I44S200055.000-1
Dimensions			
Width	72 mm	72 mm	72 mm
Height	142 mm	130 mm	130 mm
Depth	102.2 mm	121.2 mm	131.2 mm
Weight	0.7 kg	0.7 kg	0.8 kg

Optional accessories for 8I44S200018.000-1

8IOFS011.100-1	EMC filter 1-phase 11 A, mounting underneath the inverter for ACOPOSinverter S44 1x100-120 V 0.18 kW - 0.37 kW and 1x200-240 V 0.18 kW - 0.75 kW
8IOXP001.100-1	EMC plate size 1, clamps and screws included in delivery for ACOPOSinverter S44 1x100-120 V 0.18 kW - 0.37 kW and 1x200-240 V 0.18 kW - 0.75 kW and 3x200-240 V 0.18 kW - 0.75 kW

Optional accessories for 8I44S200037.000-1

8IOFS011.100-1	EEMC filter 1-phase 11 A, mounting underneath the inverter for ACOPOSinverter S44 1x100-120 V 0.18 kW - 0.37 kW and 1x200-240 V 0.18 kW - 0.75 kW
8IOXP001.100-1	EMC plate size 1, clamps and screws included in delivery for ACOPOSinverter S44 1x100-120 V 0.18 kW - 0.37 kW and 1x200-240 V 0.18 kW - 0.75 kW and 3x200-240 V 0.18 kW - 0.75 kW

Optional accessories for 8I44S200055.000-1

8IOFS011.100-1	EMC filter 1-phase 11 A, mounting underneath the inverter for ACOPOSinverter S44 1x100-120 V 0.18 kW - 0.37 kW and 1x200-240 V 0.18 kW - 0.75 kW
8IOXP001.100-1	EMC plate size 1, clamps and screws included in delivery for ACOPOSinverter S44 1x100-120 V 0.18 kW - 0.37 kW and 1x200-240 V 0.18 kW - 0.75 kW and 3x200-240 V 0.18 kW - 0.75 kW

ACOPOSinverter S44

1-phase 200-240V



Motor power	8I44S200075.000-1	8I44S200150.000-1	8I44S200220.000-1
Indicated on rating plate	0.75 kW 1 HP	1.5 kW 2 HP	2.2 kW 3 HP
Power mains connection	8I44S200075.000-1	8I44S200150.000-1	8I44S200220.000-1
Mains input voltage	1x 200 VAC - 15% to 240 VAC + 10%	1x 200 VAC - 15% to 240 VAC + 10%	1x 200 VAC - 15% to 240 VAC + 10%
Frequency	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%
Apparent power (at 240 VAC)	3.5 kVA	6.2 kVA	8.4 kVA
Max. prospective line I _{sc} (short circuit current at the connection point)	1000 A	1000 A	1000 A
Max. line current ¹⁾			
at 200 VAC	10.2 A	17.8 A	24 A
at 240 VAC	8.5 A	14.9 A	20.2 A
Dissipated power at maximum output current	44 W	72 W	93 W
Integrated EMC filter	Yes	Yes	Yes

1) Typical value for the indicated motor power and for the maximum prospective line I_{sc}.

Conducted and radiated EMC emissions	8I44S200075.000-1	8I44S200150.000-1	8I44S200220.000-1
With integrated filter			
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	≤ 5 m ²⁾	≤ 5 m ²⁾	≤ 5 m ²⁾
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	≤ 5 m ³⁾ or ≤ 10 m ⁴⁾	≤ 5 m ³⁾ or ≤ 10 m ⁴⁾	≤ 5 m ³⁾ or ≤ 10 m ⁴⁾
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	-	-	-
With additional filter			
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	8I0FS011.100-1 ≤ 20 m ²⁾	8I0FS024.100-1 ≤ 20 m ²⁾	8I0FS024.100-1 ≤ 20 m ²⁾
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	≤ 50 m	≤ 50 m	≤ 50 m
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	≤ 50 m	≤ 50 m	≤ 50 m

1) For a shielded motor cable

2) At a switching frequency of 2, 4, 8, 12 and 16 kHz

3) At a switching frequency from 2 to 12 kHz




4) At a switching frequency of 2, 4 and 16 kHz

Motor connector	8I44S200075.000-1	8I44S200150.000-1	8I44S200220.000-1
Maximum continuous output current (I _n) ¹⁾ at 240 VAC	4.2 A	7.5 A	10 A
Reduction of continuous output current depending on the ambient temperature			
Switching frequency 4 kHz	No reduction (up to 40°C)	No reduction (up to 50°C)	No reduction (up to 50°C)
Other switching frequencies	See the derating curves in the User Manual, available on www.br-automation.com		
Reduction of continuous output current depending on altitude			
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	6.3 A	11.2 A	15 A
Output frequency range	0.5 to 400 Hz	0.5 to 400 Hz	0.5 to 400 Hz
Rated switching frequency	4 kHz	4 kHz	4 kHz
Minimum	2 kHz	2 kHz	2 kHz
Maximum	16 kHz	16 kHz	16 kHz
Transient overtorque	150 to 170% of the nominal motor torque depending on the drive rating and the type of motor		
Braking torque	Up to 70% of the nominal motor torque without resistor		
Motor control profiles	Standard profile (voltage/frequency ratio) Performance profile (sensorless flux vector control) Pump/fan profile (K _n ² quadratic ratio)		
Maximum motor cable length			
Shielded cable	50 m	50 m	50 m
Unshielded cable	100 m	100 m	100 m
Main drive protection features	Thermal protection against overheating Protection against short-circuits between motor phases Overcurrent protection between motor phases and earth Protection in the event of line overvoltage and undervoltage		
Motor protection	Thermal protection integrated in the drive by continuous calculation of the I ² t		
1) These values are given for a nominal switching frequency of 4 kHz, for use in continuous operation. If operation above 4 kHz needs to be continuous, the nominal drive current should be derated by 10% for 8 kHz, 20% for 12 kHz and 30% for 16 kHz. The switching frequency can be set between 2 and 16 kHz for all ratings. Above 4 kHz, the drive will reduce the switching frequency automatically in the event of an excessive temperature rise. See the derating curves in the User Manual, available on www.br-automation.com .			
Available internal supplies	8I44S200075.000-1	8I44S200150.000-1	8I44S200220.000-1
Output voltage	5 VDC ± 5%	5 VDC ± 5%	5 VDC ± 5%
Max. output current	10 mA	10 mA	10 mA
Output voltage	24 VDC -15% / +20%	24 VDC -15% / +20%	24 VDC -15% / +20%
Max. output current	100 mA	100 mA	100 mA
Digital inputs	8I44S200075.000-1	8I44S200150.000-1	8I44S200220.000-1
Number of inputs	4	4	4
Input circuit	Source or Sink	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Sampling time	< 20 ms ± 4 ms	< 20 ms ± 4 ms	< 20 ms ± 4 ms
Input impedance	3.5 kΩ	3.5 kΩ	3.5 kΩ
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No

ACOPOSinverter S44

1-phase 200-240V

Digital outputs		8I44S200075.000-1	8I44S200150.000-1	8I44S200220.000-1
Number of outputs		1	1	1
Output circuit		Source or Sink	Source or Sink	Source or Sink
Rated voltage		24 VDC	24 VDC	24 VDC
Rated output current		10 mA (100 mA with external supply)	10 mA (100 mA with external supply)	10 mA (100 mA with external supply)
Update time		< 20 ms	< 20 ms	< 20 ms
Electrical isolation				
Output - ACOPOSinverter		Yes	Yes	Yes
Output - Output		No	No	No
Relay outputs		8I44S200075.000-1	8I44S200150.000-1	8I44S200220.000-1
Number of outputs		1	1	1
Design		1 NO contact and 1 NC contact with common point	1 NO contact and 1 NC contact with common point	1 NO contact and 1 NC contact with common point
Rated voltage		30 VDC / 250 VAC	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity				
Minimum		5 mA for 24 VDC	5 mA for 24 VDC	5 mA for 24 VDC
Maximum				
on resistive load ($\cos \phi = 1$ and L/R = 0 ms)		4 A at 30 VDC / 3 A at 250 VAC	4 A at 30 VDC / 3 A at 250 VAC	4 A at 30 VDC / 3 A at 250 VAC
on inductive load ($\cos \phi = 0.4$ and L/R = 7 ms)		2 A at 30 VDC or 250 VAC	2 A at 30 VDC or 250 VAC	2 A at 30 VDC or 250 VAC
Response time (maximum)		30 ms	30 ms	30 ms
Electrical isolation				
Output - ACOPOSinverter		Yes	Yes	Yes
Output - Output		No	No	No
Analog inputs		8I44S200075.000-1	8I44S200150.000-1	8I44S200220.000-1
Number of inputs		1	1	1
Input		0 to 5 V or 0 to 10 V or 0 to 20 mA	0 to 5 V or 0 to 10 V or 0 to 20 mA	0 to 5 V or 0 to 10 V or 0 to 20 mA
Resolution		10 bit	10 bit	10 bit
Sampling time		< 10 ms	< 10 ms	< 10 ms
Input impedance				
Voltage		30 k Ω	30 k Ω	30 k Ω
Current		250 Ω	250 Ω	250 Ω
Electrical isolation				
Input - ACOPOSinverter		Yes	Yes	Yes
Input - Input		No	No	No
Analog outputs		8I44S200075.000-1	8I44S200150.000-1	8I44S200220.000-1
Number of outputs		1	1	1
Output		0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution		8 bit	8 bit	8 bit
Update time		< 10 ms	< 10 ms	< 10 ms
Min. load impedance				
Voltage		470 Ω	470 Ω	470 Ω
Current		800 Ω	800 Ω	800 Ω
Electrical isolation				
Output - ACOPOSinverter		Yes	Yes	Yes
Output - Output		No	No	No

Operational conditions	8I44S200075.000-1	8I44S200150.000-1	8I44S200220.000-1
Ambient temperature	-10 to +40°C	-10 to +50°C	-10 to +50°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 2000 m	Up to 2000 m	Up to 2000 m
Operating position			
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C3 and 3S2	Class 3C3 and 3S2	Class 3C3 and 3S2
Degree of protection	IP20	IP20	IP20
1) Protective blanking cover removed and current derating of 2.2% per additional degree above ambient temperature. See the possible mounting types and derating curves in the User Manual, available on www.br-automation.com .			
2) From 1000 m to 2000 m current derating of 1% per 100 m			
Storage conditions	8I44S200075.000-1	8I44S200150.000-1	8I44S200220.000-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Mechanical characteristics	8I44S200075.000-1	8I44S200150.000-1	8I44S200220.000-1
Dimensions			
Width	72 mm	105 mm	105 mm
Height	130 mm	142 mm	142 mm
Depth	131.2 mm	156.2 mm	156.2 mm
Weight	0.8 kg	1.4 kg	1.4 kg

Optional accessories for 8I44S200075.000-1

8I0FS011.100-1	EMC filter 1-phase 11 A, mounting underneath the inverter for ACOPOSinverter S44 1x100-120 V 0.18 kW - 0.37 kW and 1x200-240 V 0.18 kW - 0.75 kW
8I0XP001.100-1	EMC plate size 1, clamps and screws included in delivery for ACOPOSinverter S44 1x100-120 V 0.18 kW - 0.37 kW and 1x200-240 V 0.18 kW - 0.75 kW and 3x200-240 V 0.18 kW - 0.75 kW

Optional accessories for 8I44S200150.000-1

8I0FS024.100-1	EMC filter 1-phase 24 A, mounting underneath the inverter for ACOPOSinverter S44 1x100-120 V 0.75 kW and 1x200-240 V 1.5 kW - 2.2 kW
8I0XP002.100-1	EMC plate size 2, clamps and screws included in delivery for ACOPOSinverter S44 1x100-120 V 0.75 kW and 1x200-240 V 1.5 kW - 2.2 kW and 3x200-240 V 1.5 kW - 2.2 kW

Optional accessories for 8I44S200220.000-1

8I0FS024.100-1	EMC filter 1-phase 24 A, mounting underneath the inverter for ACOPOSinverter S44 1x100-120 V 0.75 kW and 1x200-240 V 1.5 kW - 2.2 kW
8I0XP002.100-1	EMC plate size 2, clamps and screws included in delivery for ACOPOSinverter S44 1x100-120 V 0.75 kW and 1x200-240 V 1.5 kW - 2.2 kW and 3x200-240 V 1.5 kW - 2.2 kW

ACOPOSinverter S44

3-phase 200-240V



Motor power	8I44T200018.000-1	8I44T200037.000-1	8I44T200075.000-1
Indicated on rating plate	0.18 kW 0.25 HP	0.37 kW 0.5 HP	0.75 kW 1 HP
Power mains connection	8I44T200018.000-1	8I44T200037.000-1	8I44T200075.000-1
Mains input voltage	3x 200 VAC - 15% to 240 VAC + 10%	3x 200 VAC - 15% to 240 VAC + 10%	3x 200 VAC - 15% to 240 VAC + 10%
Frequency	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%
Apparent power (at 240 VAC)	0.7 kVA	1.2 kVA	2.2 kVA
Max. prospective line I _{sc} (short circuit current at the connection point)	5000 A	5000 A	5000 A
Max. line current ¹⁾			
at 200 VAC	2 A	3.6 A	6.3 A
at 240 VAC	1.7 A	3 A	5.3 A
Dissipated power at maximum output current	16 W	24 W	41 W
Integrated EMC filter	No	No	No

1) Typical value for the indicated motor power and for the maximum prospective line I_{sc}.

Conducted and radiated EMC emissions	8I44T200018.000-1	8I44T200037.000-1	8I44T200075.000-1
With additional filter	8IOFT006.100-1	8IOFT006.100-1	8IOFT006.100-1
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	≤ 5 m ²⁾	≤ 5 m ²⁾	≤ 5 m ²⁾
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	≤ 20 m	≤ 20 m	≤ 20 m
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	≤ 20 m	≤ 20 m	≤ 20 m

1) For a shielded motor cable




2) At a switching frequency of 2, 4, 8, 12 and 16 kHz

Motor connector	8I44T200018.000-1	8I44T200037.000-1	8I44T200075.000-1
Maximum continuous output current (In) ¹⁾ at 240 VAC	1.4 A	2.4 A	4.2 A
Reduction of continuous output current depending on the ambient temperature			
Switching frequency 4 kHz	No reduction (up to 40°C)	No reduction (up to 40°C)	No reduction (up to 40°C)
Other switching frequencies	See the derating curves in the User Manual, available on www.br-automation.com		
Reduction of continuous output current depending on altitude			
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	2.1A	3.6 A	6.3 A
Output frequency range	0.5 to 400 Hz	0.5 to 400 Hz	0.5 to 400 Hz
Rated switching frequency	4 kHz	4 kHz	4 kHz
Minimum	2 kHz	2 kHz	2 kHz
Maximum	16 kHz	16 kHz	16 kHz
Transient overtorque	150 to 170% of the nominal motor torque depending on the drive rating and the type of motor		
Braking torque	Up to 70% of the nominal motor torque without resistor		
Motor control profiles	Standard profile (voltage/frequency ratio) Performance profile (sensorless flux vector control) Pump/fan profile (Kn ² quadratic ratio)		
Maximum motor cable length			
Shielded cable	50 m	50 m	50 m
Unshielded cable	100 m	100 m	100 m
Main drive protection features	Thermal protection against overheating Protection against short-circuits between motor phases Overcurrent protection between motor phases and earth Protection in the event of line overvoltage and undervoltage Input phase loss protection, in three-phase		
Motor protection	Thermal protection integrated in the drive by continuous calculation of the I ² t		
1) These values are given for a nominal switching frequency of 4 kHz, for use in continuous operation. If operation above 4 kHz needs to be continuous, the nominal drive current should be derated by 10% for 8 kHz, 20% for 12 kHz and 30% for 16 kHz. The switching frequency can be set between 2 and 16 kHz for all ratings. Above 4 kHz, the drive will reduce the switching frequency automatically in the event of an excessive temperature rise. See the derating curves in the User Manual, available on www.br-automation.com .			
Available internal supplies	8I44T200018.000-1	8I44T200037.000-1	8I44T200075.000-1
Output voltage	5 VDC ± 5%	5 VDC ± 5%	5 VDC ± 5%
Max. output current	10 mA	10 mA	10 mA
Output voltage	24 VDC -15% / +20%	24 VDC -15% / +20%	24 VDC -15% / +20%
Max. output current	100 mA	100 mA	100 mA
Digital inputs	8I44T200018.000-1	8I44T200037.000-1	8I44T200075.000-1
Number of inputs	4	4	4
Input circuit	Source or Sink	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Sampling time	< 20 ms ±4 ms	< 20 ms ±4 ms	< 20 ms ±4 ms
Input impedance	3.5 kΩ	3.5 kΩ	3.5 kΩ
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No

ACOPOSinverter S44

3-phase 200-240V

Digital outputs	8I44T200018.000-1	8I44T200037.000-1	8I44T200075.000-1
Number of outputs	1	1	1
Output circuit	Source or Sink	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Rated output current	10 mA (100 mA with external supply)	10 mA (100 mA with external supply)	10 mA (100 mA with external supply)
Update time	< 20 ms	< 20 ms	< 20 ms
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No
Relay outputs	8I44T200018.000-1	8I44T200037.000-1	8I44T200075.000-1
Number of outputs	1	1	1
Design	1 NO contact and 1 NC contact with common point	1 NO contact and 1 NC contact with common point	1 NO contact and 1 NC contact with common point
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity			
Minimum	5 mA for 24 VDC	5 mA for 24 VDC	5 mA for 24 VDC
Maximum			
on resistive load ($\cos \phi = 1$ and $L/R = 0$ ms)	4 A at 30 VDC / 3 A at 250 VAC	4 A at 30 VDC / 3 A at 250 VAC	4 A at 30 VDC / 3 A at 250 VAC
on inductive load ($\cos \phi = 0.4$ and $L/R = 7$ ms)	2 A at 30 VDC or 250 VAC	2 A at 30 VDC or 250 VAC	2 A at 30 VDC or 250 VAC
Response time (maximum)	30 ms	30 ms	30 ms
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No
Analog inputs	8I44T200018.000-1	8I44T200037.000-1	8I44T200075.000-1
Number of inputs	1	1	1
Input	0 to 5 V or 0 to 10 V or 0 to 20 mA	0 to 5 V or 0 to 10 V or 0 to 20 mA	0 to 5 V or 0 to 10 V or 0 to 20 mA
Resolution	10 bit	10 bit	10 bit
Sampling time	< 10 ms	< 10 ms	< 10 ms
Input impedance			
Voltage	30 k Ω	30 k Ω	30 k Ω
Current	250 Ω	250 Ω	250 Ω
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
Analog outputs	8I44T200018.000-1	8I44T200037.000-1	8I44T200075.000-1
Number of outputs	1	1	1
Output	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	8 bit	8 bit	8 bit
Update time	< 10 ms	< 10 ms	< 10 ms
Min. load impedance			
Voltage	470 Ω	470 Ω	470 Ω
Current	800 Ω	800 Ω	800 Ω
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No

Operational conditions	8I44T200018.000-1	8I44T200037.000-1	8I44T200075.000-1
Ambient temperature	-10 to +40°C	-10 to +40°C	-10 to +40°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 2000 m	Up to 2000 m	Up to 2000 m
Operating position			
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C3 and 3S2	Class 3C3 and 3S2	Class 3C3 and 3S2
Degree of protection	IP20	IP20	IP20
1) Protective blanking cover removed and current derating of 2.2% per additional degree above ambient temperature. See the possible mounting types and derating curves in the User Manual, available on www.br-automation.com .			
2) From 1000 m to 2000 m current derating of 1% per 100 m			
Storage conditions	8I44T200018.000-1	8I44T200037.000-1	8I44T200075.000-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Mechanical characteristics	8I44T200018.000-1	8I44T200037.000-1	8I44T200075.000-1
Dimensions			
Width	72 mm	72 mm	72 mm
Height	142 mm	130 mm	130 mm
Depth	102.2 mm	121.2 mm	131.2 mm
Weight	0.7 kg	0.8 kg	0.8 kg

Optional accessories for 8I44T200018.000-1

8IOFT006.100-1	EMC filter 3-phase 6 A, mounting underneath the inverter for ACOPOSinverter S44 3x200-240 V 0.18 kW - 0.75 kW
8IOXP001.100-1	EMC plate size 1, clamps and screws included in delivery for ACOPOSinverter S44 1x100-120 V 0.18 kW - 0.37 kW and 1x200-240 V 0.18 kW - 0.75 kW and 3x200-240 V 0.18 kW - 0.75 kW

Optional accessories for 8I44T200037.000-1

8IOFT006.100-1	EMC filter 3-phase 6 A, mounting underneath the inverter for ACOPOSinverter S44 3x200-240 V 0.18 kW - 0.75 kW
8IOXP001.100-1	EMC plate size 1, clamps and screws included in delivery for ACOPOSinverter S44 1x100-120 V 0.18 kW - 0.37 kW and 1x200-240 V 0.18 kW - 0.75 kW and 3x200-240 V 0.18 kW - 0.75 kW

Optional accessories for 8I44T200075.000-1

8IOFT006.100-1	EMC filter 3-phase 6 A, mounting underneath the inverter for ACOPOSinverter S44 3x200-240 V 0.18 kW - 0.75 kW
8IOXP001.100-1	EMC plate size 1, clamps and screws included in delivery for ACOPOSinverter S44 1x100-120 V 0.18 kW - 0.37 kW and 1x200-240 V 0.18 kW - 0.75 kW and 3x200-240 V 0.18 kW - 0.75 kW

ACOPOSinverter S44

3-phase 200-240V



Motor power	8I44T200150.000-1	8I44T200220.000-1
Indicated on rating plate	1.5 kW 2 HP	2.2 kW 3 HP
Power mains connection	8I44T200150.000-1	8I44T200220.000-1
Mains input voltage	3x 200 VAC - 15% to 240 VAC + 10%	3x 200 VAC - 15% to 240 VAC + 10%
Frequency	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%
Apparent power (at 240 VAC)	3.9 kVA	5 kVA
Max. prospective line I _{sc} (short circuit current at the connection point)	5000 A	5000 A
Max. line current ¹⁾		
at 200 VAC	11.1 A	14.9 A
at 240 VAC	9.3 A	12.5 A
Dissipated power at maximum output current	73 W	85 W
Integrated EMC filter	No	No
1) Typical value for the indicated motor power and for the maximum prospective line I _{sc} .		
Conducted and radiated EMC emissions	8I44T200150.000-1	8I44T200220.000-1
With additional filter	8I0FT015.100-1	8I0FT015.100-1
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	≤ 5 m ²⁾	≤ 5 m ²⁾
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	≤ 20 m	≤ 20 m
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	≤ 20 m	≤ 20 m

1) For a shielded motor cable



2) At a switching frequency of 2, 4, 8, 12 and 16 kHz

Motor connector	8I44T200150.000-1	8I44T200220.000-1
Maximum continuous output current (I _n) ¹⁾ at 240 VAC	10 A	12.2 A
Reduction of continuous output current depending on the ambient temperature	No reduction (up to 50°C)	
Switching frequency 4 kHz	See the derating curves in the User Manual, available on www.br-automation.com	
Other switching frequencies		
Reduction of continuous output current depending on altitude	1% per 100 m	
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	15 A	18.3 A
Output frequency range	0.5 to 400 Hz	0.5 to 400 Hz
Rated switching frequency	4 kHz	4 kHz
Minimum	2 kHz	2 kHz
Maximum	16 kHz	16 kHz
Transient overtorque	150 to 170% of the nominal motor torque depending on the drive rating and the type of motor	
Braking torque	Up to 70% of the nominal motor torque without resistor	
Motor control profiles	Standard profile (voltage/frequency ratio) Performance profile (sensorless flux vector control) Pump/fan profile (K _n ² quadratic ratio)	
Maximum motor cable length	50 m	
Shielded cable	50 m	50 m
Unshielded cable	100 m	100 m
Main drive protection features	Thermal protection against overheating Protection against short-circuits between motor phases Overcurrent protection between motor phases and earth Protection in the event of line overvoltage and undervoltage Input phase loss protection, in three-phase	
Motor protection	Thermal protection integrated in the drive by continuous calculation of the I ² t	
1) These values are given for a nominal switching frequency of 4 kHz, for use in continuous operation. If operation above 4 kHz needs to be continuous, the nominal drive current should be derated by 10% for 8 kHz, 20% for 12 kHz and 30% for 16 kHz. The switching frequency can be set between 2 and 16 kHz for all ratings. Above 4 kHz, the drive will reduce the switching frequency automatically in the event of an excessive temperature rise. See the derating curves in the User Manual, available on www.br-automation.com .		
Available internal supplies	8I44T200150.000-1	8I44T200220.000-1
Output voltage	5 VDC ± 5%	5 VDC ± 5%
Max. output current	10 mA	10 mA
Output voltage	24 VDC -15% / +20%	24 VDC -15% / +20%
Max. output current	100 mA	100 mA
Digital inputs	8I44T200150.000-1	8I44T200220.000-1
Number of inputs	4	4
Input circuit	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC
Sampling time	< 20 ms ±4 ms	< 20 ms ±4 ms
Input impedance	3.5 kΩ	3.5 kΩ
Electrical isolation		
Input - ACOPOSinverter	Yes	Yes
Input - Input	No	No

ACOPOSinverter S44

3-phase 200-240V

Digital outputs		
	8I44T200150.000-1	8I44T200220.000-1
Number of outputs	1	1
Output circuit	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC
Rated output current	10 mA (100 mA with external supply)	10 mA (100 mA with external supply)
Update time	< 20 ms	< 20 ms
Electrical isolation		
Output - ACOPOSinverter	Yes	Yes
Output - Output	No	No
Relay outputs		
	8I44T200150.000-1	8I44T200220.000-1
Number of outputs	1	1
Design	1 NO contact and 1 NC contact with common point	1 NO contact and 1 NC contact with common point
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity		
Minimum	5 mA for 24 VDC	5 mA for 24 VDC
Maximum		
on resistive load ($\cos \phi = 1$ and $L/R = 0$ ms)	4 A at 30 VDC / 3 A at 250 VAC	4 A at 30 VDC / 3 A at 250 VAC
on inductive load ($\cos \phi = 0.4$ and $L/R = 7$ ms)	2 A at 30 VDC or 250 VAC	2 A at 30 VDC or 250 VAC
Response time (maximum)	30 ms	30 ms
Electrical isolation		
Output - ACOPOSinverter	Yes	Yes
Output - Output	No	No
Analog inputs		
	8I44T200150.000-1	8I44T200220.000-1
Number of inputs	1	1
Input	0 to 5 V or 0 to 10 V or 0 to 20 mA	0 to 5 V or 0 to 10 V or 0 to 20 mA
Resolution	10 bit	10 bit
Sampling time	< 10 ms	< 10 ms
Input impedance		
Voltage	30 k Ω	30 k Ω
Current	250 Ω	250 Ω
Electrical isolation		
Input - ACOPOSinverter	Yes	Yes
Input - Input	No	No
Analog outputs		
	8I44T200150.000-1	8I44T200220.000-1
Number of outputs	1	1
Output	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	8 bit	8 bit
Update time	< 10 ms	< 10 ms
Min. load impedance		
Voltage	470 Ω	470 Ω
Current	800 Ω	800 Ω
Electrical isolation		
Output - ACOPOSinverter	Yes	Yes
Output - Output	No	No

Operational conditions	8I44T200150.000-1	8I44T200220.000-1
Ambient temperature	-10 to +50°C	-10 to +50°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 2000 m	Up to 2000 m
Operating position		
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C3 and 3S2	Class 3C3 and 3S2
Degree of protection	IP20	IP20
1) Protective blanking cover removed and current derating of 2.2% per additional degree above ambient temperature. See the possible mounting types and derating curves in the User Manual, available on www.br-automation.com .		
2) From 1000 m to 2000 m current derating of 1% per 100 m		
Storage conditions	8I44T200150.000-1	8I44T200220.000-1
Storage temperature	-25 to +70°C	-25 to +70°C
Mechanical characteristics	8I44T200150.000-1	8I44T200220.000-1
Dimensions		
Width	105 mm	140 mm
Height	142 mm	170 mm
Depth	156.2 mm	141.2 mm
Weight	1.2 kg	1.2 kg

Optional accessories for 8I44T200150.000-1

8IOFT015.100-1	EMC filter 3-phase 15 A, mounting underneath the inverter for ACOPOSinverter S44 3x200-240 V 1.5 kW - 2.2 kW
8IOXP002.100-1	EMC plate size 2, clamps and screws included in delivery for ACOPOSinverter S44 1x100-120 V 0.75 kW and 1x200-240 V 1.5 kW - 2.2 kW and 3x200-240 V 1.5 kW - 2.2 kW

Optional accessories for 8I44T200220.000-1

8IOFT015.100-1	EMC filter 3-phase 15 A, mounting underneath the inverter for ACOPOSinverter S44 3x200-240 V 1.5 kW - 2.2 kW
8IOXP002.100-1	EMC plate size 2, clamps and screws included in delivery for ACOPOSinverter S44 1x100-120 V 0.75 kW and 1x200-240 V 1.5 kW - 2.2 kW and 3x200-240 V 1.5 kW - 2.2 kW

ACOPOSinverter S44

3-phase 200-240V



Motor power	8I44T200300.000-1	8I44T200400.000-1
Indicated on rating plate	3 kW	4 kW
	-	5 HP
Power mains connection	8I44T200300.000-1	8I44T200400.000-1
Mains input voltage	3x 200 VAC - 15% to 240 VAC + 10%	3x 200 VAC - 15% to 240 VAC + 10%
Frequency	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%
Apparent power (at 240 VAC)	6.6 kVA	8.3 kVA
Max. prospective line I _{sc} (short circuit current at the connection point)	5000 A	5000 A
Max. line current ¹⁾		
at 200 VAC	19 A	23.8 A
at 240 VAC	15.9 A	19.9 A
Dissipated power at maximum output current	94 W	128 W
Integrated EMC filter	No	No

1) Typical value for the indicated motor power and for the maximum prospective line I_{sc}.

Conducted and radiated EMC emissions	8I44T200300.000-1	8I44T200400.000-1
With additional filter	-	-
Motor cable length according to IEC/EN 61800-3	-	-
Cat. C1 ¹⁾ Environment 1 (public network)	-	-
Motor cable length according to IEC/EN 61800-3	-	-
Cat. C2 ¹⁾ Environment 1 (public network)	-	-
Motor cable length according to IEC/EN 61800-3	-	-
Cat. C3 ¹⁾ Environment 2 (industrial network)	-	-



1) For a shielded motor cable

Motor connector	8I44T200300.000-1	8I44T200400.000-1
Maximum continuous output current (I _n) ¹⁾ at 240 VAC	12.2 A	16.7 A
Reduction of continuous output current depending on the ambient temperature	No reduction (up to 50°C)	
Switching frequency 4 kHz	No reduction (up to 50°C)	
Other switching frequencies	See the derating curves in the User Manual, available on www.br-automation.com	
Reduction of continuous output current depending on altitude	1% per 100 m	
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	18.3 A	25 A
Output frequency range	0.5 to 400 Hz	0.5 to 400 Hz
Rated switching frequency	4 kHz	4 kHz
Minimum	2 kHz	2 kHz
Maximum	16 kHz	16 kHz
Transient overtorque	150 to 170% of the nominal motor torque depending on the drive rating and the type of motor	
Braking torque	Up to 70% of the nominal motor torque without resistor	
Motor control profiles	Standard profile (voltage/frequency ratio) Performance profile (sensorless flux vector control) Pump/fan profile (K _n ² quadratic ratio)	
Maximum motor cable length	50 m	
Shielded cable	50 m	50 m
Unshielded cable	100 m	100 m
Main drive protection features	Thermal protection against overheating Protection against short-circuits between motor phases Overcurrent protection between motor phases and earth Protection in the event of line overvoltage and undervoltage Input phase loss protection, in three-phase	
Motor protection	Thermal protection integrated in the drive by continuous calculation of the I ² t	
1) These values are given for a nominal switching frequency of 4 kHz, for use in continuous operation. If operation above 4 kHz needs to be continuous, the nominal drive current should be derated by 10% for 8 kHz, 20% for 12 kHz and 30% for 16 kHz. The switching frequency can be set between 2 and 16 kHz for all ratings. Above 4 kHz, the drive will reduce the switching frequency automatically in the event of an excessive temperature rise. See the derating curves in the User Manual, available on www.br-automation.com .		
Available internal supplies	8I44T200300.000-1	8I44T200400.000-1
Output voltage	5 VDC ± 5%	5 VDC ± 5%
Max. output current	10 mA	10 mA
Output voltage	24 VDC -15% / +20%	24 VDC -15% / +20%
Max. output current	100 mA	100 mA
Digital inputs	8I44T200300.000-1	8I44T200400.000-1
Number of inputs	4	4
Input circuit	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC
Sampling time	< 20 ms ±4 ms	< 20 ms ±4 ms
Input impedance	3.5 kΩ	3.5 kΩ
Electrical isolation	Yes	
Input - ACOPOSinverter	Yes	Yes
Input - Input	No	No

ACOPOSinverter S44

3-phase 200-240V

Digital outputs		
	8I44T200300.000-1	8I44T200400.000-1
Number of outputs	1	1
Output circuit	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC
Rated output current	10 mA (100 mA with external supply)	10 mA (100 mA with external supply)
Update time	< 20 ms	< 20 ms
Electrical isolation		
Output - ACOPOSinverter	Yes	Yes
Output - Output	No	No
Relay outputs		
	8I44T200300.000-1	8I44T200400.000-1
Number of outputs	1	1
Design	1 NO contact and 1 NC contact with common point	1 NO contact and 1 NC contact with common point
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity		
Minimum	5 mA for 24 VDC	5 mA for 24 VDC
Maximum		
on resistive load ($\cos \phi = 1$ and $L/R = 0$ ms)	4 A at 30 VDC / 3 A at 250 VAC	4 A at 30 VDC / 3 A at 250 VAC
on inductive load ($\cos \phi = 0.4$ and $L/R = 7$ ms)	2 A at 30 VDC or 250 VAC	2 A at 30 VDC or 250 VAC
Response time (maximum)	30 ms	30 ms
Electrical isolation		
Output - ACOPOSinverter	Yes	Yes
Output - Output	No	No
Analog inputs		
	8I44T200300.000-1	8I44T200400.000-1
Number of inputs	1	1
Input	0 to 5 V or 0 to 10 V or 0 to 20 mA	0 to 5 V or 0 to 10 V or 0 to 20 mA
Resolution	10 bit	10 bit
Sampling time	< 10 ms	< 10 ms
Input impedance		
Voltage	30 k Ω	30 k Ω
Current	250 Ω	250 Ω
Electrical isolation		
Input - ACOPOSinverter	Yes	Yes
Input - Input	No	No
Analog outputs		
	8I44T200300.000-1	8I44T200400.000-1
Number of outputs	1	1
Output	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	8 bit	8 bit
Update time	< 10 ms	< 10 ms
Min. load impedance		
Voltage	470 Ω	470 Ω
Current	800 Ω	800 Ω
Electrical isolation		
Output - ACOPOSinverter	Yes	Yes
Output - Output	No	No

Operational conditions	8I44T200300.000-1	8I44T200400.000-1
Ambient temperature	-10 to +50°C	-10 to +50°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 2000 m	Up to 2000 m
Operating position		
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C3 and 3S2	Class 3C3 and 3S2
Degree of protection	IP20	IP20
1) Protective blanking cover removed and current derating of 2.2% per additional degree above ambient temperature. See the possible mounting types and derating curves in the User Manual, available on www.br-automation.com .		
2) From 1000 m to 2000 m current derating of 1% per 100 m		
Storage conditions	8I44T200300.000-1	8I44T200400.000-1
Storage temperature	-25 to +70°C	-25 to +70°C
Mechanical characteristics	8I44T200300.000-1	8I44T200400.000-1
Dimensions		
Width	140 mm	140 mm
Height	170 mm	170 mm
Depth	141.2 mm	141.2 mm
Weight	2 kg	2 kg

Optional accessories for 8I44T200300.000-1

8I0XP003.100-1 EMC plate size 3, clamps and screws included in delivery for ACOPOSinverter S44 3x200-240 V 3 kw -4 kW

Optional accessories for 8I44T200400.000-1

8I0XP003.100-1 EMC plate size 3, clamps and screws included in delivery for ACOPOSinverter S44 3x200-240 V 3 kw -4 kW

ACOPOSinverter X64

1-phase 200-240V



Motor power	8I64S200018.00X-1	8I64S200037.00X-1	8I64S200055.00X-1
Indicated on rating plate	0.18 kW 0.25 HP	0.37 kW 0.5 HP	0.55 kW 0.75 HP
Power mains connection	8I64S200018.00X-1	8I64S200037.00X-1	8I64S200055.00X-1
Mains input voltage	1x 200 VAC - 15% to 240 VAC + 10%	1x 200 VAC - 15% to 240 VAC + 10%	1x 200 VAC - 15% to 240 VAC + 10%
Frequency	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%
Apparent power (at 240 VAC)	0.6 kVA	1 kVA	1.4 kVA
Max. prospective line I _{sc} ¹⁾ (short circuit current at the connection point)	1000 A	1000 A	1000 A
Max. line current ²⁾			
at 200 VAC	3.0 A	5.3 A	6.8 A
at 240 VAC	2.5 A	4.4 A	5.8 A
Max. line current with optional line choke			
at 200 VAC	2.1 A	3.9 A	5.2 A
at 240 VAC	1.8 A	3.3 A	4.3 A
Dissipated power at maximum output current	24 W	41 W	46 W
Integrated EMC filter	Yes	Yes	Yes

1) If line I_{sc} is greater than the values in the table, add line choke.

2) Typical value for a 4-pole motor and a maximum switching frequency of 4 kHz, with no line choke for max. prospective line I_{sc}.

Conducted and radiated EMC emissions	8I64S200018.00X-1	8I64S200037.00X-1	8I64S200055.00X-1
With integrated filter			
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	-	-	-
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	≤ 5 m	≤ 5 m	≤ 5 m
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	-	-	-
With additional filter			
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	≤ 20 m	≤ 20 m	≤ 20 m
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	≤ 50 m	≤ 50 m	≤ 50 m
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	-	-	-




1) For a shielded motor cable

Motor connector	8I64S200018.00X-1	8I64S200037.00X-1	8I64S200055.00X-1
Maximum continuous output current (I _n) ¹⁾ at 240 VAC	1.5 A	3.3 A	3.7 A
Reduction of continuous output current depending on the ambient temperature			
Switching frequency 4 kHz	No reduction (up to 50°C)	No reduction (up to 50°C)	No reduction (up to 50°C)
Other switching frequencies	See the derating curves in the Installation Manual, available on www.br-automation.com		
Reduction of continuous output current depending on altitude			
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	2.3 A	5 A	5.6 A
Output frequency range	0.5 to 500 Hz	0.5 to 500 Hz	0.5 to 500 Hz
Rated switching frequency	4 kHz	4 kHz	4 kHz
Minimum	2 kHz	2 kHz	2 kHz
Maximum	16 kHz	16 kHz	16 kHz
Transient overtorque (typical value)	170 to 200% of nominal motor torque		
Braking torque			
With braking resistor	100% of nominal motor torque continuous and up to 150% for 60 s		
Without braking resistor (typical value)	150% of nominal motor torque	100% of nominal motor torque	100% of nominal motor torque
Motor control profiles	Standard ratio (voltage/frequency) Performance ratio (sensorless flux vector control) Pump/fan ratio (Kn ² quadratic ratio) Energy saving ratio (specifically for ventilation)		
Maximum motor cable length			
Shielded cable	50 m	50 m	50 m
Unshielded cable	100 m	100 m	100 m
Main drive protection features	Thermal protection against overheating Protection against short-circuits between motor phases Input phase loss protection, for three-phase supply Protection against motor phase breaks Overcurrent protection between motor output phases and earth Line supply overvoltage and undervoltage safety features		
Motor protection	Thermal protection integrated in the drive by continuous calculation of the I ² t		
1) These values are given for a nominal switching frequency of 4 kHz, for use in continuous operation. The switching frequency is adjustable from 2 to 16 kHz. Above 4 kHz, derate the nominal drive current. The nominal motor current should not exceed this value. See the derating curves in the Installation Manual, available on www.br-automation.com .			
Braking chopper	8I64S200018.00X-1	8I64S200037.00X-1	8I64S200055.00X-1
Integrated dynamic brake transistors	Yes	Yes	Yes
Operating factor for the dynamic brake transistors	The dynamic brake transistor is sized so that it can tolerate: - The nominal motor power continuously - 150% of the nominal motor power for 60 s		
Minimum resistor value (external)	40 Ω	40 Ω	40 Ω

ACOPOSinverter X64

1-phase 200-240V

Available internal supplies	8I64S200018.00X-1	8I64S200037.00X-1	8I64S200055.00X-1
Output voltage	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)
Max. output current	100 mA	100 mA	100 mA
Digital inputs	8I64S200018.00X-1	8I64S200037.00X-1	8I64S200055.00X-1
Number of inputs	4	4	4
Input circuit	Source or Sink	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Sampling time	< 4 ms	< 4 ms	< 4 ms
Input impedance	3.5 kΩ	3.5 kΩ	3.5 kΩ
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
Counter input	8I64S200018.00X-1	8I64S200037.00X-1	8I64S200055.00X-1
Number of inputs	1	1	1
Counter frequency	In preparation	In preparation	In preparation
Counter size	In preparation	In preparation	In preparation
Digital outputs	8I64S200018.00X-1	8I64S200037.00X-1	8I64S200055.00X-1
Number of outputs	1	1	1
Output circuit	In preparation	In preparation	In preparation
Rated voltage	In preparation	In preparation	In preparation
Rated output current	In preparation	In preparation	In preparation
Relay outputs	8I64S200018.00X-1	8I64S200037.00X-1	8I64S200055.00X-1
Number of outputs	1	1	1
Design	1 N/O contact	1 N/O contact	1 N/O contact
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity			
Minimum	10 mA for 5 VDC	10 mA for 5 VDC	10 mA for 5 VDC
Maximum			
on resistive load (cos φ = 1 and L/R = 0 ms)	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC
on inductive load (cos φ = 0.4 and L/R = 7 ms)	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC
Response time (maximum)	< 8 ms	< 8 ms	< 8 ms
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No

Operational conditions	8I64S200018.00X-1	8I64S200037.00X-1	8I64S200055.00X-1
Ambient temperature	-10 to +50°C	-10 to +50°C	-10 to +50°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 2000 m	Up to 2000 m	Up to 2000 m
Operating position			
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C3 and 3S2	Class 3C3 and 3S2	Class 3C3 and 3S2
Degree of protection	IP 31 and IP 41 on upper part and IP 21 on connection terminals	IP 31 and IP 41 on upper part and IP 21 on connection terminals	IP 31 and IP 41 on upper part and IP 21 on connection terminals

1) With derating and removing the protective cover on top of the drive.
See the possible mounting types and derating curves in the Installation Manual, available on www.br-automation.com.

2) From 1000 m to 2000 m current derating of 1% per 100 m

Storage conditions	8I64S200018.00X-1	8I64S200037.00X-1	8I64S200055.00X-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C

Mechanical characteristics	8I64S200018.00X-1	8I64S200037.00X-1	8I64S200055.00X-1
Dimensions			
Width	72 mm	72 mm	72 mm
Height	145 mm	145 mm	145 mm
Depth	140 mm	140 mm	145 mm
Weight	1.5 kg	1.5 kg	1.5 kg

Optional accessories for 8I64S200018.00X-1

8I0FS009.200-1	EMC filter 1-phase 9 A, mounting underneath or beside the inverter for ACOPOSinverter X64 1x200-240 V 0.18 kW - 0.75 kW
8I0CS004.000-1	Line choke 1-phase 4 A for ACOPOSinverter X64 1x200-240 V 0.18 kW - 0.37 kW
8I0BR100.000-1	Braking resistor 100 Ohm, continuous braking power 0.05 kW for ACOPOSinverter X64 1x200-240 V 0.18 kW - 1.5 kW and 3x200-240 V 0.18 kW - 1.5 kW and 3x380-500 V 0.37 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 4 kW

Optional accessories for 8I64S200037.00X-1

8I0FS009.200-1	EMC filter 1-phase 9 A, mounting underneath or beside the inverter for ACOPOSinverter X64 1x200-240 V 0.18 kW - 0.75 kW
8I0CS004.000-1	Line choke 1-phase 4 A for ACOPOSinverter X64 1x200-240 V 0.18 kW - 0.37 kW
8I0BR100.000-1	Braking resistor 100 Ohm, continuous braking power 0.05 kW for ACOPOSinverter X64 1x200-240 V 0.18 kW - 1.5 kW and 3x200-240 V 0.18 kW - 1.5 kW and 3x380-500 V 0.37 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 4 kW

Optional accessories for 8I64S200055.00X-1

8I0FS009.200-1	EMC filter 1-phase 9 A, mounting underneath or beside the inverter for ACOPOSinverter X64 1x200-240 V 0.18 kW - 0.75 kW
8I0CS007.000-1	Line choke 1-phase 7 A for ACOPOSinverter X64 1x200-240 V 0.55 kW - 0.75 kW
8I0BR100.000-1	Braking resistor 100 Ohm, continuous braking power 0.05 kW for ACOPOSinverter X64 1x200-240 V 0.18 kW - 1.5 kW and 3x200-240 V 0.18 kW - 1.5 kW and 3x380-500 V 0.37 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 4 kW

ACOPOSinverter X64

1-phase 200-240V



Motor power	8I64S200075.00X-1	8I64S200110.00X-1
Indicated on rating plate	0.75 kW 1 HP	1.1 kW 1.5 HP
Power mains connection	8I64S200075.00X-1	8I64S200110.00X-1
Mains input voltage	1x 200 VAC - 15% to 240 VAC + 10%	1x 200 VAC - 15% to 240 VAC + 10%
Frequency	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%
Apparent power (at 240 VAC)	1.8 kVA	2.4 kVA
Max. prospective line I _{sc} ¹⁾ (short circuit current at the connection point)	1000 A	1000 A
Max. line current ²⁾		
at 200 VAC	8.9 A	12.1 A
at 240 VAC	7.5 A	10.2 A
Max. line current with optional line choke		
at 200 VAC	7.0 A	10.2 A
at 240 VAC	5.9 A	8.6 A
Dissipated power at maximum output current	60 W	74 W
Integrated EMC filter	Yes	Yes

1) If line I_{sc} is greater than the values in the table, add line choke.

2) Typical value for a 4-pole motor and a maximum switching frequency of 4 kHz, with no line choke for max. prospective line I_{sc}.

Conducted and radiated EMC emissions	8I64S200075.00X-1	8I64S200110.00X-1
With integrated filter		
Motor cable length according to IEC/EN 61800-3	-	-
Cat. C1 ¹⁾ Environment 1 (public network)		
Motor cable length according to IEC/EN 61800-3	≤ 5 m	≤ 5 m
Cat. C2 ¹⁾ Environment 1 (public network)		
Motor cable length according to IEC/EN 61800-3	-	-
Cat. C3 ¹⁾ Environment 2 (industrial network)		
With additional filter		
Motor cable length according to IEC/EN 61800-3	≤ 20 m	≤ 20 m
Cat. C1 ¹⁾ Environment 1 (public network)		
Motor cable length according to IEC/EN 61800-3	≤ 50 m	≤ 50 m
Cat. C2 ¹⁾ Environment 1 (public network)		
Motor cable length according to IEC/EN 61800-3	-	-
Cat. C3 ¹⁾ Environment 2 (industrial network)		



1) For a shielded motor cable

Motor connector	8I64S200075.00X-1	8I64S200110.00X-1
Maximum continuous output current (In) ¹⁾ at 240 VAC	4.8 A	6.9 A
Reduction of continuous output current depending on the ambient temperature		
Switching frequency 4 kHz	No reduction (up to 50°C)	No reduction (up to 50°C)
Other switching frequencies	See the derating curves in the Installation Manual, available on www.br-automation.com	
Reduction of continuous output current depending on altitude		
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	7.2 A	10.4 A
Output frequency range	0.5 to 500 Hz	0.5 to 500 Hz
Rated switching frequency	4 kHz	4 kHz
Minimum	2 kHz	2 kHz
Maximum	16 kHz	16 kHz
Transient overtorque (typical value)	170 to 200% of nominal motor torque	
Braking torque		
With braking resistor	100% of nominal motor torque continuous and up to 150% for 60 s	
Without braking resistor (typical value)	100% of nominal motor torque	50% of nominal motor torque
Motor control profiles	Standard ratio (voltage/frequency) Performance ratio (sensorless flux vector control) Pump/fan ratio (Kn ² quadratic ratio) Energy saving ratio (specifically for ventilation)	
Maximum motor cable length		
Shielded cable	50 m	50 m
Unshielded cable	100 m	100 m
Main drive protection features	Thermal protection against overheating Protection against short-circuits between motor phases Input phase loss protection, for three-phase supply Protection against motor phase breaks Overcurrent protection between motor output phases and earth Line supply overvoltage and undervoltage safety features	
Motor protection	Thermal protection integrated in the drive by continuous calculation of the I ² t	
1) These values are given for a nominal switching frequency of 4 kHz, for use in continuous operation. The switching frequency is adjustable from 2 to 16 kHz. Above 4 kHz, derate the nominal drive current. The nominal motor current should not exceed this value See the derating curves in the Installation Manual, available on www.br-automation.com .		
Braking chopper	8I64S200075.00X-1	8I64S200110.00X-1
Integrated dynamic brake transistors	Yes	Yes
Operating factor for the dynamic brake transistors	The dynamic brake transistor is sized so that it can tolerate: - The nominal motor power continuously - 150% of the nominal motor power for 60 s	
Minimum resistor value (external)	40 Ω	27 Ω

ACOPOSinverter X64

1-phase 200-240V

Available internal supplies	8I64S200075.00X-1	8I64S200110.00X-1
Output voltage	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)
Max. output current	100 mA	100 mA
Digital inputs	8I64S200075.00X-1	8I64S200110.00X-1
Number of inputs	4	4
Input circuit	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC
Sampling time	< 4 ms	< 4 ms
Input impedance	3.5 kΩ	3.5 kΩ
Electrical isolation		
Input - ACOPOSinverter	Yes	Yes
Input - Input	No	No
Counter input	8I64S200075.00X-1	8I64S200110.00X-1
Number of inputs	1	1
Counter frequency	In preparation	In preparation
Counter size	In preparation	In preparation
Digital outputs	8I64S200075.00X-1	8I64S200110.00X-1
Number of outputs	1	1
Output circuit	In preparation	In preparation
Rated voltage	In preparation	In preparation
Rated output current	In preparation	In preparation
Relay outputs	8I64S200075.00X-1	8I64S200110.00X-1
Number of outputs	1	1
Design	1 N/O contact	1 N/O contact
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity		
Minimum	10 mA for 5 VDC	10 mA for 5 VDC
Maximum		
on resistive load ($\cos \phi = 1$ and $L/R = 0$ ms)	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC
on inductive load ($\cos \phi = 0.4$ and $L/R = 7$ ms)	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC
Response time (maximum)	< 8 ms	< 8 ms
Electrical isolation		
Output - ACOPOSinverter	Yes	Yes
Output - Output	No	No

Operational conditions	8I64S200075.00X-1	8I64S200110.00X-1
Ambient temperature	-10 to +50°C	-10 to +50°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 2000 m	Up to 2000 m
Operating position		
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C3 and 3S2	Class 3C3 and 3S2
Degree of protection	IP 31 and IP 41 on upper part and IP 21 on connection terminals	IP 31 and IP 41 on upper part and IP 21 on connection terminals
<p>1) With derating and removing the protective cover on top of the drive. See the possible mounting types and derating curves in the Installation Manual, available on www.br-automation.com.</p> <p>2) From 1000 m to 2000 m current derating of 1% per 100 m</p>		
Storage conditions	8I64S200075.00X-1	8I64S200110.00X-1
Storage temperature	-25 to +70°C	-25 to +70°C
Mechanical characteristics	8I64S200075.00X-1	8I64S200110.00X-1
Dimensions		
Width	72 mm	107 mm
Height	145 mm	143 mm
Depth	145 mm	150 mm
Weight	1.5 kg	1.8 kg

Optional accessories for 8I64S200075.00X-1

8IOFS009.200-1	EMC filter 1-phase 9 A, mounting underneath or beside the inverter for ACOPOSinverter X64 1x200-240 V 0.18 kW - 0.75 kW
8IOCS007.000-1	Line choke 1-phase 7 A for ACOPOSinverter X64 1x200-240 V 0.55 kW - 0.75 kW
8IOBR100.000-1	Braking resistor 100 Ohm, continuous braking power 0.05 kW for ACOPOSinverter X64 1x200-240 V 0.18 kW - 1.5 kW and 3x200-240 V 0.18 kW - 1.5 kW and 3x380-500 V 0.37 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 4 kW

Optional accessories for 8I64S200110.00X-1

8IOFS016.200-1	EMC filter 3-phase 7 A, mounting underneath or beside the inverter for ACOPOSinverter X64 3x200-240 V 0.18 kW - 0.75 kW
8IOCS018.000-1	Line choke 1-phase 18 A for ACOPOSinverter X64 1x200-240 V 1.1 kW - 2.2 kW
8IOBR100.000-1	Braking resistor 100 Ohm, continuous braking power 0.05 kW for ACOPOSinverter X64 1x200-240 V 0.18 kW - 1.5 kW and 3x200-240 V 0.18 kW - 1.5 kW and 3x380-500 V 0.37 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 4 kW

ACOPOSinverter X64

1-phase 200-240V



Motor power	8I64S200150.00X-1	8I64S200220.00X-1
Indicated on rating plate	1.5 kW 2 HP	2.2 kW 3 HP
Power mains connection	8I64S200150.00X-1	8I64S200220.00X-1
Mains input voltage	1x 200 VAC - 15 % to 240 VAC + 10 %	1x 200 VAC - 15 % to 240 VAC + 10 %
Frequency	50 to 60 Hz ± 5 %	50 to 60 Hz ± 5 %
Apparent power (at 240 VAC)	3.2 kVA	4.4 kVA
Max. prospective line I _{sc} ¹⁾ (short circuit current at the connection point)	1000 A	1000 A
Max. line current ²⁾		
at 200 VAC	15.8 A	21.9 A
at 240 VAC	13.3 A	18.4 A
Max. line current with optional line choke		
at 200 VAC	13.4 A	19.2 A
at 240 VAC	11.4 A	16.1 A
Dissipated power at maximum output current	90 W	123 W
Integrated EMC filter	Yes	Yes

1) If line I_{sc} is greater than the values in the table, add line choke.

2) Typical value for a 4-pole motor and a maximum switching frequency of 4 kHz, with no line choke for max. prospective line I_{sc}.

Conducted and radiated EMC emissions	8I64S200150.00X-1	8I64S200220.00X-1
With integrated filter		
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	-	-
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	≤ 5 m	-
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	-	≤ 5 m
With additional filter		
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	8I0FS016.200-1 ≤ 20 m	8I0FS022.200-1 ≤ 20 m
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	≤ 50 m	≤ 50 m
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	-	-



1) For a shielded motor cable

Motor connector	8I64S200150.00X-1	8I64S200220.00X-1
Maximum continuous output current (I _n) ¹⁾ at 240 VAC	8 A	11 A
Reduction of continuous output current depending on the ambient temperature		
Switching frequency 4 kHz	No reduction (up to 50°C)	No reduction (up to 50°C)
Other switching frequencies	See the derating curves in the Installation Manual, available on www.br-automation.com	
Reduction of continuous output current depending on altitude		
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	12 A	16.5 A
Output frequency range	0.5 to 500 Hz	0.5 to 500 Hz
Rated switching frequency	4 kHz	4 kHz
Minimum	2 kHz	2 kHz
Maximum	16 kHz	16 kHz
Transient overtorque (typical value)	170 to 200% of nominal motor torque	
Braking torque		
With braking resistor	100% of nominal motor torque continuous and up to 150% for 60 s	
Without braking resistor (typical value)	50% of nominal motor torque	30% of nominal motor torque
Motor control profiles	Standard ratio (voltage/frequency) Performance ratio (sensorless flux vector control) Pump/fan ratio (K _n ² quadratic ratio) Energy saving ratio (specifically for ventilation)	
Maximum motor cable length		
Shielded cable	50 m	50 m
Unshielded cable	100 m	100 m
Main drive protection features	Thermal protection against overheating Protection against short-circuits between motor phases Input phase loss protection, for three-phase supply Protection against motor phase breaks Overcurrent protection between motor output phases and earth Line supply overvoltage and undervoltage safety features	
Motor protection	Thermal protection integrated in the drive by continuous calculation of the I ² t	
1) These values are given for a nominal switching frequency of 4 kHz, for use in continuous operation. The switching frequency is adjustable from 2 to 16 kHz. Above 4 kHz, derate the nominal drive current. The nominal motor current should not exceed this value See the derating curves in the Installation Manual, available on www.br-automation.com .		
Braking chopper	8I64S200150.00X-1	8I64S200220.00X-1
Integrated dynamic brake transistors	Yes	Yes
Operating factor for the dynamic brake transistors	The dynamic brake transistor is sized so that it can tolerate: - The nominal motor power continuously - 150% of the nominal motor power for 60 s	
Minimum resistor value (external)	27 Ω	25 Ω

ACOPOSInverter X64

1-phase 200-240V

Available internal supplies	8I64S200150.00X-1	8I64S200220.00X-1
Output voltage	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)
Max. output current	100 mA	100 mA
Digital inputs	8I64S200150.00X-1	8I64S200220.00X-1
Number of inputs	4	4
Input circuit	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC
Sampling time	< 4 ms	< 4 ms
Input impedance	3.5 k Ω	3.5 k Ω
Electrical isolation		
Input - ACOPOSInverter	Yes	Yes
Input - Input	No	No
Counter inputs	8I64S200150.00X-1	8I64S200220.00X-1
Number of inputs	1	1
Counter frequency	In preparation	In preparation
Counter size	In preparation	In preparation
Digital outputs	8I64S200150.00X-1	8I64S200220.00X-1
Number of outputs	1	1
Output circuit	In preparation	In preparation
Rated voltage	In preparation	In preparation
Rated output current	In preparation	In preparation
Relay outputs	8I64S200150.00X-1	8I64S200220.00X-1
Number of outputs	1	1
Design	1 N/O contact	1 N/O contact
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity		
Minimum	10 mA for 5 VDC	10 mA for 5 VDC
Maximum		
on resistive load ($\cos \phi = 1$ and $L/R = 0$ ms)	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC
on inductive load ($\cos \phi = 0.4$ and $L/R = 7$ ms)	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC
Response time (maximum)	< 8 ms	< 8 ms
Electrical isolation		
Output - ACOPOSInverter	Yes	Yes
Output - Output	No	No

Operational conditions	8I64S200150.00X-1	8I64S200220.00X-1
Ambient temperature	-10 to +50°C	-10 to +50°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 2000 m	Up to 2000 m
Operating position		
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C3 and 3S2	Class 3C3 and 3S2
Degree of protection	IP 31 and IP 41 on upper part and IP 21 on connection terminals	IP 31 and IP 41 on upper part and IP 21 on connection terminals

1) With derating and removing the protective cover on top of the drive.
See the possible mounting types and derating curves in the Installation Manual, available on www.br-automation.com.

2) From 1000 m to 2000 m current derating of 1% per 100 m

Storage conditions	8I64S200150.00X-1	8I64S200220.00X-1
Storage temperature	-25 to +70°C	-25 to +70°C

Mechanical characteristics	8I64S200150.00X-1	8I64S200220.00X-1
Dimensions		
Width	107 mm	142 mm
Height	143 mm	184 mm
Depth	150 mm	150 mm
Weight	1.8 kg	3.1 kg

Optional accessories for 8I64S200150.00X-1

8I0FS016.200-1	EMC filter 3-phase 7 A, mounting underneath or beside the inverter for ACOPOSinverter X64 3x200-240 V 0.18 kW - 0.75 kW
8I0CS018.000-1	Line choke 1-phase 18 A for ACOPOSinverter X64 1x200-240 V 1.1 kW - 2.2 kW
8I0BR100.000-1	Braking resistor 100 Ohm, continuous braking power 0.05 kW for ACOPOSinverter X64 1x200-240 V 0.18 kW - 1.5 kW and 3x200-240 V 0.18 kW - 1.5 kW and 3x380-500 V 0.37 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 4 kW

Optional accessories for 8I64S200220.00X-1

8I0FS022.200-1	EMC filter 1-phase 16 A, mounting underneath or beside the inverter for ACOPOSinverter X64 1x200-240 V 1.1 kW - 1.5 kW
8I0CS018.000-1	Line choke 1-phase 18 A for ACOPOSinverter X64 1x200-240 V 1.1 kW - 2.2 kW
8I0BR060.000-1	Braking resistor 60 Ohm, continuous braking power 0.1 kW for ACOPOSinverter X64 1x200-240 V 2.2 kW and 3x200-240 V 2.2 kW - 3 kW and 3x380-500 V 5.5 kW - 7.5 kW, for ACOPOSinverter P84 3x200-240 V 1.5 kW - 2.2 kW and 3x380-480 V 5.5 kW - 7.5 kW

ACOPOSinverter X64

3-phase 200-240V



Motor power	8I64T200018.00X-1	8I64T200037.00X-1	8I64T200055.00X-1
Indicated on rating plate	0.18 kW 0.25 HP	0.37 kW 0.5 HP	0.55 kW 0.75 HP
Power mains connection	8I64T200018.00X-1	8I64T200037.00X-1	8I64T200055.00X-1
Mains input voltage	3x 200 VAC - 15% to 240 VAC + 10%	3x 200 VAC - 15% to 240 VAC + 10%	3x 200 VAC - 15% to 240 VAC + 10%
Frequency	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%
Apparent power (at 240 VAC)	0.7 kVA	1.3 kVA	1.7 kVA
Max. prospective line I _{sc} ¹⁾ (short circuit current at the connection point)	5 kA	5 kA	5 kA
Max. line current ²⁾			
at 200 VAC	2.1 A	3.8 A	4.9 A
at 240 VAC	1.9 A	3.3 A	4.2 A
Max. line current with optional line choke			
at 200 VAC	1.0 A	1.9 A	2.5 A
at 240 VAC	0.9 A	1.6 A	2.2 A
Dissipated power at maximum output current	23 W	38 W	43 W
Integrated EMC filter	No	No	No

1) If line I_{sc} is greater than the values in the table, add line choke.

2) Typical value for a 4-pole motor and a maximum switching frequency of 4 kHz, with no line choke for max. prospective line I_{sc}.

Conducted and radiated EMC emissions	8I64T200018.00X-1	8I64T200037.00X-1	8I64T200055.00X-1
With additional filter	8IOFT007.200-1	8IOFT007.200-1	8IOFT007.200-1
Motor cable length according to IEC/EN 61800-3	-	-	-
Cat. C1 ¹⁾ Environment 1 (public network)			
Motor cable length according to IEC/EN 61800-3	≤ 5 m	≤ 5 m	≤ 5 m
Cat. C2 ¹⁾ Environment 1 (public network)			
Motor cable length according to IEC/EN 61800-3	-	-	-
Cat. C3 ¹⁾ Environment 2 (industrial network)			




1) For a shielded motor cable

Motor connector	8I64T200018.00X-1	8I64T200037.00X-1	8I64T200055.00X-1
Maximum continuous output current (I _n) ¹⁾ at 240 VAC	1.5 A	3.3 A	3.7 A
Reduction of continuous output current depending on the ambient temperature			
Switching frequency 4 kHz	No reduction (up to 50°C)	No reduction (up to 50°C)	No reduction (up to 50°C)
Other switching frequencies	See the derating curves in the Installation Manual, available on www.br-automation.com		
Reduction of continuous output current depending on altitude			
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	2.3 A	5 A	5.6 A
Output frequency range	0.5 to 500 Hz	0.5 to 500 Hz	0.5 to 500 Hz
Rated switching frequency	4 kHz	4 kHz	4 kHz
Minimum	2 kHz	2 kHz	2 kHz
Maximum	16 kHz	16 kHz	16 kHz
Transient overtorque (typical value)	170 to 200% of nominal motor torque		
Braking torque			
With braking resistor	100% of nominal motor torque continuous and up to 150% for 60 s		
Without braking resistor (typical value)	100% of nominal motor torque	100% of nominal motor torque	100% of nominal motor torque
Motor control profiles	Standard ratio (voltage/frequency) Performance ratio (sensorless flux vector control) Pump/fan ratio (Kn ² quadratic ratio) Energy saving ratio (specifically for ventilation)		
Maximum motor cable length			
Shielded cable	50 m	50 m	50 m
Unshielded cable	100 m	100 m	100 m
Main drive protection features	Thermal protection against overheating Protection against short-circuits between motor phases Input phase loss protection, for three-phase supply Protection against motor phase breaks Overcurrent protection between motor output phases and earth Line supply overvoltage and undervoltage safety features		
Motor protection	Thermal protection integrated in the drive by continuous calculation of the I ² t		
1) These values are given for a nominal switching frequency of 4 kHz, for use in continuous operation. The switching frequency is adjustable from 2 to 16 kHz. Above 4 kHz, derate the nominal drive current. The nominal motor current should not exceed this value See the derating curves in the Installation Manual, available on www.br-automation.com .			
Braking chopper	8I64T200018.00X-1	8I64T200037.00X-1	8I64T200055.00X-1
Integrated dynamic brake transistors	Yes	Yes	Yes
Operating factor for the dynamic brake transistors	The dynamic brake transistor is sized so that it can tolerate: - The nominal motor power continuously - 150% of the nominal motor power for 60 s		
Minimum resistor value (external)	40 Ω	40 Ω	40 Ω

ACOPOSinverter X64

3-phase 200-240V

Available internal supplies	8I64T200018.00X-1	8I64T200037.00X-1	8I64T200055.00X-1
Output voltage	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)
Max. output current	100 mA	100 mA	100 mA
Digital inputs	8I64T200018.00X-1	8I64T200037.00X-1	8I64T200055.00X-1
Number of inputs	4	4	4
Input circuit	Source or Sink	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Sampling time	< 4 ms	< 4 ms	< 4 ms
Input impedance	3.5 kΩ	3.5 kΩ	3.5 kΩ
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
Counter inputs	8I64T200018.00X-1	8I64T200037.00X-1	8I64T200055.00X-1
Number of inputs	1	1	1
Counter frequency	In preparation	In preparation	In preparation
Counter size	In preparation	In preparation	In preparation
Digital outputs	8I64T200018.00X-1	8I64T200037.00X-1	8I64T200055.00X-1
Number of outputs	1	1	1
Output circuit	In preparation	In preparation	In preparation
Rated voltage	In preparation	In preparation	In preparation
Rated output current	In preparation	In preparation	In preparation
Relay outputs	8I64T200018.00X-1	8I64T200037.00X-1	8I64T200055.00X-1
Number of outputs	1	1	1
Design	1 N/O contact	1 N/O contact	1 N/O contact
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity			
Minimum	10 mA for 5 VDC	10 mA for 5 VDC	10 mA for 5 VDC
Maximum			
on resistive load ($\cos \phi = 1$ and $L/R = 0$ ms)	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC
on inductive load ($\cos \phi = 0.4$ and $L/R = 7$ ms)	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC
Response time (maximum)	< 8 ms	< 8 ms	< 8 ms
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No

Operational conditions	8I64T200018.00X-1	8I64T200037.00X-1	8I64T200055.00X-1
Ambient temperature	-10 to +50°C	-10 to +50°C	-10 to +50°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 2000 m	Up to 2000 m	Up to 2000 m
Operating position			
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C3 and 3S2	Class 3C3 and 3S2	Class 3C3 and 3S2
Degree of protection	IP 31 and IP 41 on upper part and IP 21 on connection terminals	IP 31 and IP 41 on upper part and IP 21 on connection terminals	IP 31 and IP 41 on upper part and IP 21 on connection terminals
<p>1) With derating and removing the protective cover on top of the drive. See the possible mounting types and derating curves in the Installation Manual, available on www.br-automation.com.</p> <p>2) From 1000 m to 2000 m current derating of 1% per 100 m</p>			
Storage conditions	8I64T200018.00X-1	8I64T200037.00X-1	8I64T200055.00X-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Mechanical characteristics	8I64T200018.00X-1	8I64T200037.00X-1	8I64T200055.00X-1
Dimensions			
Width	72 mm	72 mm	72 mm
Height	145 mm	145 mm	145 mm
Depth	120 mm	120 mm	130 mm
Weight	1.3 kg	1.3 kg	1.3 kg

Optional accessories for 8I64T200018.00X-1

8IOFT007.200-1	EMC filter 1-phase 22 A, mounting underneath or beside the inverter for ACOPOSinverter X64 1x200-240 V 2.2 kW
8IOCT004.000-1	Line choke 3-phase 4 A for ACOPOSinverter X64 3x200-240 V 0.18 kW - 0.75 kW and 3x380-500 V 0.37 kW - 1.5 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 1.5 kW
8IOBR100.000-1	Braking resistor 100 Ohm, continuous braking power 0.05 kW for ACOPOSinverter X64 1x200-240 V 0.18 kW - 1.5 kW and 3x200-240 V 0.18 kW - 1.5 kW and 3x380-500 V 0.37 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 4 kW

Optional accessories for 8I64T200037.00X-1

8IOFT007.200-1	EMC filter 1-phase 22 A, mounting underneath or beside the inverter for ACOPOSinverter X64 1x200-240 V 2.2 kW
8IOCT004.000-1	Line choke 3-phase 4 A for ACOPOSinverter X64 3x200-240 V 0.18 kW - 0.75 kW and 3x380-500 V 0.37 kW - 1.5 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 1.5 kW
8IOBR100.000-1	Braking resistor 100 Ohm, continuous braking power 0.05 kW for ACOPOSinverter X64 1x200-240 V 0.18 kW - 1.5 kW and 3x200-240 V 0.18 kW - 1.5 kW and 3x380-500 V 0.37 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 4 kW

Optional accessories for 8I64T200055.00X-1

8IOFT007.200-1	EMC filter 1-phase 22 A, mounting underneath or beside the inverter for ACOPOSinverter X64 1x200-240 V 2.2 kW
8IOCT004.000-1	Line choke 3-phase 4 A for ACOPOSinverter X64 3x200-240 V 0.18 kW - 0.75 kW and 3x380-500 V 0.37 kW - 1.5 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 1.5 kW
8IOBR100.000-1	Braking resistor 100 Ohm, continuous braking power 0.05 kW for ACOPOSinverter X64 1x200-240 V 0.18 kW - 1.5 kW and 3x200-240 V 0.18 kW - 1.5 kW and 3x380-500 V 0.37 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 4 kW

ACOPOSinverter X64

3-phase 200-240V



Motor power	8I64T200075.00X-1	8I64T200110.00X-1	8I64T200150.00X-1
Indicated on rating plate	0.75 kW 1 HP	1.1 kW 1.5 HP	1.5 kW 2 HP
Power mains connection	8I64T200075.00X-1	8I64T200110.00X-1	8I64T200150.00X-1
Mains input voltage	3x 200 VAC - 15% to 240 VAC + 10%	3x 200 VAC - 15% to 240 VAC + 10%	3x 200 VAC - 15% to 240 VAC + 10%
Frequency	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%
Apparent power (at 240 VAC)	2.2 kVA	3 kVA	3.8 kVA
Max. prospective line I _{sc} ¹⁾ (short circuit current at the connection point)	5 kA	5 kA	5 kA
Max. line current ²⁾			
at 200 VAC	6.4 A	8.5 A	11.1 A
at 240 VAC	5.6 A	7.4 A	9.6 A
Max. line current with optional line choke			
at 200 VAC	3.3 A	4.8 A	6.4 A
at 240 VAC	2.9 A	4.2 A	5.6 A
Dissipated power at maximum output current	55 W	71 W	86 W
Integrated EMC filter	No	No	No

1) If line I_{sc} is greater than the values in the table, add line choke.

2) Typical value for a 4-pole motor and a maximum switching frequency of 4 kHz, with no line choke for max. prospective line I_{sc}.

Conducted and radiated EMC emissions	8I64T200075.00X-1	8I64T200110.00X-1	8I64T200150.00X-1
With additional filter	8IOFT007.200-1	8IOFT015.200-1	8IOFT015.200-1
Motor cable length according to IEC/EN 61800-3	-	-	-
Cat. C1 ¹⁾ Environment 1 (public network)			
Motor cable length according to IEC/EN 61800-3	≤ 5 m	≤ 5 m	≤ 5 m
Cat. C2 ¹⁾ Environment 1 (public network)			
Motor cable length according to IEC/EN 61800-3	-	-	-
Cat. C3 ¹⁾ Environment 2 (industrial network)			




1) For a shielded motor cable

Motor connector	8I64T200075.00X-1	8I64T200110.00X-1	8I64T200150.00X-1
Maximum continuous output current (In) ¹⁾ at 240 VAC	4.8 A	6.9 A	8 A
Reduction of continuous output current depending on the ambient temperature			
Switching frequency 4 kHz	No reduction (up to 50°C)	No reduction (up to 50°C)	No reduction (up to 50°C)
Other switching frequencies	See the derating curves in the Installation Manual, available on www.br-automation.com		
Reduction of continuous output current depending on altitude			
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	7.2 A	10.4 A	12 A
Output frequency range	0.5 to 500 Hz	0.5 to 500 Hz	0.5 to 500 Hz
Rated switching frequency	4 kHz	4 kHz	4 kHz
Minimum	2 kHz	2 kHz	2 kHz
Maximum	16 kHz	16 kHz	16 kHz
Transient overtorque (typical value)	170 to 200% of nominal motor torque		
Braking torque			
With braking resistor	100% of nominal motor torque continuous and up to 150% for 60 s		
Without braking resistor (typical value)	100% of nominal motor torque	100% of nominal motor torque	100% of nominal motor torque
Motor control profiles	Standard ratio (voltage/frequency) Performance ratio (sensorless flux vector control) Pump/fan ratio (Kn ² quadratic ratio) Energy saving ratio (specifically for ventilation)		
Maximum motor cable length			
Shielded cable	50 m	50 m	50 m
Unshielded cable	100 m	100 m	100 m
Main drive protection features	Thermal protection against overheating Protection against short-circuits between motor phases Input phase loss protection, for three-phase supply Protection against motor phase breaks Overcurrent protection between motor output phases and earth Line supply overvoltage and undervoltage safety features		
Motor protection	Thermal protection integrated in the drive by continuous calculation of the I ² t		
1) These values are given for a nominal switching frequency of 4 kHz, for use in continuous operation. The switching frequency is adjustable from 2 to 16 kHz. Above 4 kHz, derate the nominal drive current. The nominal motor current should not exceed this value See the derating curves in the Installation Manual, available on www.br-automation.com .			
Braking chopper	8I64T200075.00X-1	8I64T200110.00X-1	8I64T200150.00X-1
Integrated dynamic brake transistors	Yes	Yes	Yes
Operating factor for the dynamic brake transistors	The dynamic brake transistor is sized so that it can tolerate: - The nominal motor power continuously - 150% of the nominal motor power for 60 s		
Minimum resistor value (external)	40 Ω	27 Ω	27 Ω

ACOPOSinverter X64

3-phase 200-240V

Available internal supplies	8I64T200075.00X-1	8I64T200110.00X-1	8I64T200150.00X-1
Output voltage	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)
Max. output current	100 mA	100 mA	100 mA
Digital inputs	8I64T200075.00X-1	8I64T200110.00X-1	8I64T200150.00X-1
Number of inputs	4	4	4
Input circuit	Source or Sink	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Sampling time	< 4 ms	< 4 ms	< 4 ms
Input impedance	3.5 kΩ	3.5 kΩ	3.5 kΩ
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
Counter inputs	8I64T200075.00X-1	8I64T200110.00X-1	8I64T200150.00X-1
Number of inputs	1	1	1
Counter frequency	In preparation	In preparation	In preparation
Counter size	In preparation	In preparation	In preparation
Digital outputs	8I64T200075.00X-1	8I64T200110.00X-1	8I64T200150.00X-1
Number of outputs	1	1	1
Output circuit	In preparation	In preparation	In preparation
Rated voltage	In preparation	In preparation	In preparation
Rated output current	In preparation	In preparation	In preparation
Relay outputs	8I64T200075.00X-1	8I64T200110.00X-1	8I64T200150.00X-1
Number of outputs	1	1	1
Design	1 N/O contact	1 N/O contact	1 N/O contact
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity			
Minimum	10 mA for 5 VDC	10 mA for 5 VDC	10 mA for 5 VDC
Maximum			
on resistive load (cos φ = 1 and L/R = 0 ms)	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC
on inductive load (cos φ = 0.4 and L/R = 7 ms)	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC
Response time (maximum)	< 8 ms	< 8 ms	< 8 ms
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No

Operational conditions	8I64T200075.00X-1	8I64T200110.00X-1	8I64T200150.00X-1
Ambient temperature	-10 to +50°C	-10 to +50°C	-10 to +50°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 2000 m	Up to 2000 m	Up to 2000 m
Operating position			
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C3 and 3S2	Class 3C3 and 3S2	Class 3C3 and 3S2
Degree of protection	IP 31 and IP 41 on upper part and IP 21 on connection terminals	IP 31 and IP 41 on upper part and IP 21 on connection terminals	IP 31 and IP 41 on upper part and IP 21 on connection terminals
<p>1) With derating and removing the protective cover on top of the drive. See the possible mounting types and derating curves in the Installation Manual, available on www.br-automation.com.</p> <p>2) From 1000 m to 2000 m current derating of 1% per 100 m</p>			
Storage conditions	8I64T200075.00X-1	8I64T200110.00X-1	8I64T200150.00X-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Mechanical characteristics	8I64T200075.00X-1	8I64T200110.00X-1	8I64T200150.00X-1
Dimensions			
Width	72 mm	105 mm	105 mm
Height	145 mm	143 mm	143 mm
Depth	130 mm	130 mm	130 mm
Weight	1.3 kg	1.7 kg	1.7 kg

Optional accessories for 8I64T200075.00X-1

8IOFT007.200-1	EMC filter 1-phase 22 A, mounting underneath or beside the inverter for ACOPOSinverter X64 1x200-240 V 2.2 kW
8IOCT004.000-1	Line choke 3-phase 4 A for ACOPOSinverter X64 3x200-240 V 0.18 kW - 0.75 kW and 3x380-500 V 0.37 kW - 1.5 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 1.5 kW
8IOBR100.000-1	Braking resistor 100 Ohm, continuous braking power 0.05 kW for ACOPOSinverter X64 1x200-240 V 0.18 kW - 1.5 kW and 3x200-240 V 0.18 kW - 1.5 kW and 3x380-500 V 0.37 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 4 kW

Optional accessories for 8I64T200110.00X-1

8IOFT015.200-1	EMC filter 3-phase 15 A, mounting underneath or beside the inverter for ACOPOSinverter X64 3x200-240 V 1.1 kW - 2.2 kW and 3x380-500V 0.37kW - 1.5kW
8IOCT010.000-1	Line choke 3-phase 10 A for ACOPOSinverter X64 3x200-240 V 1.1 kW - 1.5 kW and 3x380-500V 2.2 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 1.5 kW - 2.2 kW and 3x380-480 V 2.2 kW - 4 kW
8IOBR100.000-1	Braking resistor 100 Ohm, continuous braking power 0.05 kW for ACOPOSinverter X64 1x200-240 V 0.18 kW - 1.5 kW and 3x200-240 V 0.18 kW - 1.5 kW and 3x380-500 V 0.37 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 4 kW

Optional accessories for 8I64T200150.00X-1

8IOFT015.200-1	EMC filter 3-phase 15 A, mounting underneath or beside the inverter for ACOPOSinverter X64 3x200-240 V 1.1 kW - 2.2 kW and 3x380-500V 0.37kW - 1.5kW
8IOCT010.000-1	Line choke 3-phase 10 A for ACOPOSinverter X64 3x200-240 V 1.1 kW - 1.5 kW and 3x380-500V 2.2 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 1.5 kW - 2.2 kW and 3x380-480 V 2.2 kW - 4 kW
8IOBR100.000-1	Braking resistor 100 Ohm, continuous braking power 0.05 kW for ACOPOSinverter X64 1x200-240 V 0.18 kW - 1.5 kW and 3x200-240 V 0.18 kW - 1.5 kW and 3x380-500 V 0.37 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 4 kW

ACOPOSinverter X64

3-phase 200-240V



Motor power	8I64T200220.00X-1	8I64T200300.00X-1	8I64T200400.00X-1
Indicated on rating plate	2.2 kW 3 HP	3 kW -	4 kW 5 HP
Power mains connection	8I64T200220.00X-1	8I64T200300.00X-1	8I64T200400.00X-1
Mains input voltage	3x 200 VAC - 15% to 240 VAC + 10%	3x 200 VAC - 15% to 240 VAC + 10%	3x 200 VAC - 15% to 240 VAC + 10%
Frequency	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%
Apparent power (at 240 VAC)	5.2 kVA	6.6 kVA	8.4 kVA
Max. prospective line I _{sc} ¹⁾ (short circuit current at the connection point)	5 kA	5 kA	5 kA
Max. line current ²⁾			
at 200 VAC	14.9 A	19.1 A	24.2 A
at 240 VAC	13 A	16.6 A	21.1 A
Max. line current with optional line choke			
at 200 VAC	9.2 A	12.3 A	16.1 A
at 240 VAC	8.0 A	10.7 A	14.0 A
Dissipated power at maximum output current	114 W	146 W	180 W
Integrated EMC filter	No	No	No

1) If line I_{sc} is greater than the values in the table, add line choke.

2) Typical value for a 4-pole motor and a maximum switching frequency of 4 kHz, with no line choke for max. prospective line I_{sc}.

Conducted and radiated EMC emissions	8I64T200220.00X-1	8I64T200300.00X-1	8I64T200400.00X-1
With additional filter	8I0FT015.200-1	8I0FT025.200-1	8I0FT025.200-1
Motor cable length according to IEC/EN 61800-3	-	-	-
Cat. C1 ¹⁾ Environment 1 (public network)			
Motor cable length according to IEC/EN 61800-3	≤ 5 m	≤ 5 m	≤ 5 m
Cat. C2 ¹⁾ Environment 1 (public network)			
Motor cable length according to IEC/EN 61800-3	-	-	-
Cat. C3 ¹⁾ Environment 2 (industrial network)			




1) For a shielded motor cable

Motor connector	8I64T200220.00X-1	8I64T200300.00X-1	8I64T200400.00X-1
Maximum continuous output current (I _n) ¹⁾ at 240 VAC	11 A	13.7 A	17.5 A
Reduction of continuous output current depending on the ambient temperature			
Switching frequency 4 kHz	No reduction (up to 50°C)	No reduction (up to 50°C)	No reduction (up to 50°C)
Other switching frequencies	See the derating curves in the Installation Manual, available on www.br-automation.com		
Reduction of continuous output current depending on altitude			
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	16.5 A	20.6 A	26.3 A
Output frequency range	0.5 to 500 Hz	0.5 to 500 Hz	0.5 to 500 Hz
Rated switching frequency	4 kHz	4 kHz	4 kHz
Minimum	2 kHz	2 kHz	2 kHz
Maximum	16 kHz	16 kHz	16 kHz
Transient overtorque (typical value)	170 to 200% of nominal motor torque		
Braking torque			
With braking resistor	100% of nominal motor torque continuous and up to 150% for 60 s		
Without braking resistor (typical value)	30% of nominal motor torque	30% of nominal motor torque	30% of nominal motor torque
Motor control profiles	Standard ratio (voltage/frequency) Performance ratio (sensorless flux vector control) Pump/fan ratio (Kn ² quadratic ratio) Energy saving ratio (specifically for ventilation)		
Maximum motor cable length			
Shielded cable	50 m	50 m	50 m
Unshielded cable	100 m	100 m	100 m
Main drive protection features	Thermal protection against overheating Protection against short-circuits between motor phases Input phase loss protection, for three-phase supply Protection against motor phase breaks Overcurrent protection between motor output phases and earth Line supply overvoltage and undervoltage safety features		
Motor protection	Thermal protection integrated in the drive by continuous calculation of the I ² t		
1) These values are given for a nominal switching frequency of 4 kHz, for use in continuous operation. The switching frequency is adjustable from 2 to 16 kHz. Above 4 kHz, derate the nominal drive current. The nominal motor current should not exceed this value See the derating curves in the Installation Manual, available on www.br-automation.com .			
Braking chopper	8I64T200220.00X-1	8I64T200300.00X-1	8I64T200400.00X-1
Integrated dynamic brake transistors	Yes	Yes	Yes
Operating factor for the dynamic brake transistors	The dynamic brake transistor is sized so that it can tolerate: - The nominal motor power continuously - 150% of the nominal motor power for 60 s		
Minimum resistor value (external)	25 Ω	16 Ω	16 Ω

ACOPOSinverter X64

3-phase 200-240V

Available internal supplies	8I64T200220.00X-1	8I64T200300.00X-1	8I64T200400.00X-1
Output voltage	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)
Max. output current	100 mA	100 mA	100 mA
Digital inputs	8I64T200220.00X-1	8I64T200300.00X-1	8I64T200400.00X-1
Number of inputs	4	4	4
Input circuit	Source or Sink	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Sampling time	< 4 ms	< 4 ms	< 4 ms
Input impedance	3.5 kΩ	3.5 kΩ	3.5 kΩ
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
Counter inputs	8I64T200220.00X-1	8I64T200300.00X-1	8I64T200400.00X-1
Number of inputs	1	1	1
Counter frequency	In preparation	In preparation	In preparation
Counter size	In preparation	In preparation	In preparation
Digital outputs	8I64T200220.00X-1	8I64T200300.00X-1	8I64T200400.00X-1
Number of outputs	1	1	1
Output circuit	In preparation	In preparation	In preparation
Rated voltage	In preparation	In preparation	In preparation
Rated output current	In preparation	In preparation	In preparation
Relay outputs	8I64T200220.00X-1	8I64T200300.00X-1	8I64T200400.00X-1
Number of outputs	1	1	1
Design	1 N/O contact	1 N/O contact	1 N/O contact
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity			
Minimum	10 mA for 5 VDC	10 mA for 5 VDC	10 mA for 5 VDC
Maximum			
on resistive load ($\cos \phi = 1$ and $L/R = 0$ ms)	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC
on inductive load ($\cos \phi = 0.4$ and $L/R = 7$ ms)	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC
Response time (maximum)	< 8 ms	< 8 ms	< 8 ms
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No

Operational conditions	8I64T200220.00X-1	8I64T200300.00X-1	8I64T200400.00X-1
Ambient temperature	-10 to +50°C	-10 to +50°C	-10 to +50°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 2000 m	Up to 2000 m	Up to 2000 m
Operating position			
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C3 and 3S2	Class 3C3 and 3S2	Class 3C3 and 3S2
Degree of protection	IP 31 and IP 41 on upper part and IP 21 on connection terminals	IP 31 and IP 41 on upper part and IP 21 on connection terminals	IP 31 and IP 41 on upper part and IP 21 on connection terminals

1) With derating and removing the protective cover on top of the drive.
See the possible mounting types and derating curves in the Installation Manual, available on www.br-automation.com.

2) From 1000 m to 2000 m current derating of 1% per 100 m

Storage conditions	8I64T200220.00X-1	8I64T200300.00X-1	8I64T200400.00X-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C

Mechanical characteristics	8I64T200220.00X-1	8I64T200300.00X-1	8I64T200400.00X-1
Dimensions			
Width	107 mm	142 mm	142 mm
Height	143 mm	184 mm	184 mm
Depth	130 mm	150 mm	150 mm
Weight	1.7 kg	2.9 kg	2.9 kg

Optional accessories for 8I64T200220.00X-1

8IOFT015.200-1	EMC filter 3-phase 15 A, mounting underneath or beside the inverter for ACOPOSinverter X64 3x200-240 V 1.1 kW - 2.2 kW and 3x380-500V 0.37kW - 1.5kW
8IOCT016.000-1	Line choke 3-phase 16 A for ACOPOSinverter X64 3x200-240 V 2.2 kW - 3 kW and 3x380-500 V 5.5 kW - 7.5 kW, for ACOPOSinverter P84 3x200-240 V 3 kW and 3x380-480 V 5.5 kW - 7.5 kW
8IOBR060.000-1	Braking resistor 60 Ohm, continuous braking power 0.1 kW for ACOPOSinverter X64 1x200-240 V 2.2 kW and 3x200-240 V 2.2 kW - 3 kW and 3x380-500 V 5.5 kW - 7.5 kW, for ACOPOSinverter P84 3x200-240 V 1.5 kW - 2.2 kW and 3x380-480 V 5.5 kW - 7.5 kW

Optional accessories for 8I64T200300.00X-1

8IOFT025.200-1	EMC filter 3-phase 25 A, mounting underneath or beside the inverter for ACOPOSinverter X64 3x200-240 V 3 kW - 4 kW and 3x380-500 V 2.2 kW - 4 kW
8IOCT016.000-1	Line choke 3-phase 16 A for ACOPOSinverter X64 3x200-240 V 2.2 kW - 3 kW and 3x380-500 V 5.5 kW - 7.5 kW, for ACOPOSinverter P84 3x200-240 V 3 kW and 3x380-480 V 5.5 kW - 7.5 kW
8IOBR060.000-1	Braking resistor 60 Ohm, continuous braking power 0.1 kW for ACOPOSinverter X64 1x200-240 V 2.2 kW and 3x200-240 V 2.2 kW - 3 kW and 3x380-500 V 5.5 kW - 7.5 kW, for ACOPOSinverter P84 3x200-240 V 1.5 kW - 2.2 kW and 3x380-480 V 5.5 kW - 7.5 kW

Optional accessories for 8I64T200400.00X-1

8IOFT025.200-1	EMC filter 3-phase 25 A, mounting underneath or beside the inverter for ACOPOSinverter X64 3x200-240 V 3 kW - 4 kW and 3x380-500 V 2.2 kW - 4 kW
8IOCT030.000-1	Line choke 3-phase 30 A for ACOPOSinverter X64 3x200-240 V 4 kW - 7.5 kW and 3x380-500 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 4 kW - 5.5 kW and 3x380-480 V 11 kW - 15 kW
8IOBR028.000-1	Braking resistor 28 Ohm, continuous braking power 0.2 kW for ACOPOSinverter X64 3x200-240 V 4 kW and 3x380-500 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 3 kW - 4 kW and 3x380-480 V 11 kW - 15 kW

ACOPOSinverter X64

3-phase 200-240V



Motor power	8164T200550.00X-1	8164T200750.00X-1
Indicated on rating plate	5.5 kW 7.5 HP	7.5 kW 10 HP
Power mains connection	8164T200550.00X-1	8164T200750.00X-1
Mains input voltage	3x 200 VAC - 15 % to 240 VAC + 10 %	3x 200 VAC - 15 % to 240 VAC + 10 %
Frequency	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%
Apparent power (at 240 VAC)	12.8 kVA	16.2 kVA
Max. prospective line I _{sc} ¹⁾ (short circuit current at the connection point)	22 kA	22 kA
Max. line current ²⁾		
at 200 VAC	36.8 A	46.8 A
at 240 VAC	32 A	40.9 A
Max. line current with optional line choke		
at 200 VAC	21.7 A	29.0 A
at 240 VAC	19.0 A	25.2 A
Dissipated power at maximum output current	292 W	388 W
Integrated EMC filter	No	No

1) If line I_{sc} is greater than the values in the table, add line choke.

2) Typical value for a 4-pole motor and a maximum switching frequency of 4 kHz, with no line choke for max. prospective line I_{sc}.

Conducted and radiated EMC emissions	8164T200550.00X-1	8164T200750.00X-1
With additional filter	810FT047.200-1	810FT047.200-1
Motor cable length according to IEC/EN 61800-3	-	-
Cat. C1 ¹⁾ Environment 1 (public network)		
Motor cable length according to IEC/EN 61800-3	≤ 5 m	≤ 5 m
Cat. C2 ¹⁾ Environment 1 (public network)		
Motor cable length according to IEC/EN 61800-3	-	-
Cat. C3 ¹⁾ Environment 2 (industrial network)		



1) For a shielded motor cable

Motor connector	8I64T200550.00X-1	8I64T200750.00X-1
Maximum continuous output current (In) ¹⁾ at 240 VAC	27.5 A	33 A
Reduction of continuous output current depending on the ambient temperature	No reduction (up to 50°C)	
Switching frequency 4 kHz	No reduction (up to 50°C)	No reduction (up to 50°C)
Other switching frequencies	See the derating curves in the Installation Manual, available on www.br-automation.com	
Reduction of continuous output current depending on altitude	1% per 100 m	
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	41.3 A	49.5 A
Output frequency range	0.5 to 500 Hz	0.5 to 500 Hz
Rated switching frequency	4 kHz	4 kHz
Minimum	2 kHz	2 kHz
Maximum	16 kHz	16 kHz
Transient overtorque (typical value)	170 to 200% of nominal motor torque	
Braking torque	100% of nominal motor torque continuous and up to 150% for 60 s	
With braking resistor	100% of nominal motor torque continuous and up to 150% for 60 s	30% of nominal motor torque
Without braking resistor (typical value)	30% of nominal motor torque	30% of nominal motor torque
Motor control profiles	Standard ratio (voltage/frequency) Performance ratio (sensorless flux vector control) Pump/fan ratio (Kn ² quadratic ratio) Energy saving ratio (specifically for ventilation)	
Maximum motor cable length	50 m	
Shielded cable	50 m	50 m
Unshielded cable	100 m	100 m
Main drive protection features	Thermal protection against overheating Protection against short-circuits between motor phases Input phase loss protection, for three-phase supply Protection against motor phase breaks Overcurrent protection between motor output phases and earth Line supply overvoltage and undervoltage safety features	
Motor protection	Thermal protection integrated in the drive by continuous calculation of the I ² t	
1) These values are given for a nominal switching frequency of 4 kHz, for use in continuous operation. The switching frequency is adjustable from 2 to 16 kHz. Above 4 kHz, derate the nominal drive current. The nominal motor current should not exceed this value See the derating curves in the Installation Manual, available on www.br-automation.com .		
Braking chopper	8I64T200550.00X-1	8I64T200750.00X-1
Integrated dynamic brake transistors	Yes	Yes
Operating factor for the dynamic brake transistors	The dynamic brake transistor is sized so that it can tolerate: - The nominal motor power continuously - 150% of the nominal motor power for 60 s	
Minimum resistor value (external)	8 Ω	8 Ω

ACOPOSinverter X64

3-phase 200-240V

Available internal supplies	8I64T200550.00X-1	8I64T200750.00X-1
Output voltage	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)
Max. output current	100 mA	100 mA
Digital inputs	8I64T200550.00X-1	8I64T200750.00X-1
Number of inputs	4	4
Input circuit	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC
Sampling time	< 4 ms	< 4 ms
Input impedance	3.5 kΩ	3.5 kΩ
Electrical isolation		
Input - ACOPOSinverter	Yes	Yes
Input - Input	No	No
Counter inputs	8I64T200550.00X-1	8I64T200750.00X-1
Number of inputs	1	1
Counter frequency	In preparation	In preparation
Counter size	In preparation	In preparation
Digital outputs	8I64T200550.00X-1	8I64T200750.00X-1
Number of outputs	1	1
Output circuit	In preparation	In preparation
Rated voltage	In preparation	In preparation
Rated output current	In preparation	In preparation
Relay outputs	8I64T200550.00X-1	8I64T200750.00X-1
Number of outputs	1	1
Design	1 N/O contact	1 N/O contact
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity		
Minimum	10 mA for 5 VDC	10 mA for 5 VDC
Maximum		
on resistive load ($\cos \phi = 1$ and $L/R = 0$ ms)	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC
on inductive load ($\cos \phi = 0.4$ and $L/R = 7$ ms)	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC
Response time (maximum)	< 8 ms	< 8 ms
Electrical isolation		
Output - ACOPOSinverter	Yes	Yes
Output - Output	No	No

Operational conditions	8I64T200550.00X-1	8I64T200750.00X-1
Ambient temperature	-10 to +50°C	-10 to +50°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 2000 m	Up to 2000 m
Operating position		
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C3 and 3S2	Class 3C3 and 3S2
Degree of protection	IP 31 and IP 41 on upper part and IP 21 on connection terminals	IP 31 and IP 41 on upper part and IP 21 on connection terminals
<p>1) With derating and removing the protective cover on top of the drive. See the possible mounting types and derating curves in the Installation Manual, available on www.br-automation.com.</p> <p>2) From 1000 m to 2000 m current derating of 1% per 100 m</p>		
Storage conditions	8I64T200550.00X-1	8I64T200750.00X-1
Storage temperature	-25 to +70°C	-25 to +70°C
Mechanical characteristics	8I64T200550.00X-1	8I64T200750.00X-1
Dimensions		
Width	180 mm	180 mm
Height	232 mm	232 mm
Depth	170 mm	170 mm
Weight	6.4 kg	6.4 kg

Optional accessories for 8I64T200550.00X-1

8IOFT047.200-1	EMC filter 3-phase 47 A, mounting underneath or beside the inverter for ACOPOSinverter X64 3x200-240 V 5.5 kW - 7.5 kW and 3x380-500 V 5.5 kW - 7.5 kW
8IOCT030.000-1	Line choke 3-phase 30 A for ACOPOSinverter X64 3x200-240 V 4 kW - 7.5 kW and 3x380-500 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 4 kW - 5.5 kW and 3x380-480 V 11 kW - 15 kW
8IOBR015.000-1	Braking resistor 15 Ohm, continuous braking power 1 kW for ACOPOSinverter X64 3x200-240 V 5.5 kW - 7.5 kW, for ACOPOSinverter P84 3x200-240 V 5.5 kW - 7.5 kW and 3x380-480 V 18.5 kW - 30 kW

Optional accessories for 8I64T200750.00X-1

8IOFT047.200-1	EMC filter 3-phase 47 A, mounting underneath or beside the inverter for ACOPOSinverter X64 3x200-240 V 5.5 kW - 7.5 kW and 3x380-500 V 5.5 kW - 7.5 kW
8IOCT030.000-1	Line choke 3-phase 30 A for ACOPOSinverter X64 3x200-240 V 4 kW - 7.5 kW and 3x380-500 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 4 kW - 5.5 kW and 3x380-480 V 11 kW - 15 kW
8IOBR015.000-1	Braking resistor 15 Ohm, continuous braking power 1 kW for ACOPOSinverter X64 3x200-240 V 5.5 kW - 7.5 kW, for ACOPOSinverter P84 3x200-240 V 5.5 kW - 7.5 kW and 3x380-480 V 18.5 kW - 30 kW

ACOPOSinverter X64

3-phase 200-240V



Motor power	8I64T201100.00X-1	8I64T201500.00X-1
Indicated on rating plate	11 kW 15 HP	15 kW 20 HP
Power mains connection	8I64T201100.00X-1	8I64T201500.00X-1
Mains input voltage	3x 200 VAC - 15 % to 240 VAC + 10 %	3x 200 VAC - 15 % to 240 VAC + 10 %
Frequency	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%
Apparent power (at 240 VAC)	22 kVA	28.5 kVA
Max. prospective line I _{sc} ¹⁾ (short circuit current at the connection point)	22 kA	22 kA
Max. line current ²⁾		
at 200 VAC	63.5 A	82.1 A
at 240 VAC	55.6 A	71.9 A
Max. line current with optional line choke		
at 200 VAC	41.6 A	55.7 A
at 240 VAC	36.5 A	48.6 A
Dissipated power at maximum output current	477 W	628 W
Integrated EMC filter	No	No

1) If line I_{sc} is greater than the values in the table, add line choke.

2) Typical value for a 4-pole motor and a maximum switching frequency of 4 kHz, with no line choke for max. prospective line I_{sc}.

Conducted and radiated EMC emissions	8I64T201100.00X-1	8I64T201500.00X-1
With additional filter	8I0FT083.200-1	8I0FT083.200-1
Motor cable length according to IEC/EN 61800-3	-	-
Cat. C1 ¹⁾ Environment 1 (public network)		
Motor cable length according to IEC/EN 61800-3	≤ 5 m	≤ 5 m
Cat. C2 ¹⁾ Environment 1 (public network)		
Motor cable length according to IEC/EN 61800-3	-	-
Cat. C3 ¹⁾ Environment 2 (industrial network)		



1) For a shielded motor cable

Motor connector	8I64T201100.00X-1	8I64T201500.00X-1
Maximum continuous output current (In) ¹⁾ at 240 VAC	54 A	66 A
Reduction of continuous output current depending on the ambient temperature		
Switching frequency 4 kHz	No reduction (up to 50°C)	No reduction (up to 50°C)
Other switching frequencies	See the derating curves in the Installation Manual, available on www.br-automation.com	
Reduction of continuous output current depending on altitude		
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	81 A	99 A
Output frequency range	0.5 to 500 Hz	0.5 to 500 Hz
Rated switching frequency	4 kHz	4 kHz
Minimum	2 kHz	2 kHz
Maximum	16 kHz	16 kHz
Transient overtorque (typical value)	170 to 200% of nominal motor torque	
Braking torque		
With braking resistor	100% of nominal motor torque continuous and up to 150% for 60 s	
Without braking resistor (typical value)	30% of nominal motor torque	30% of nominal motor torque
Motor control profiles	Standard ratio (voltage/frequency) Performance ratio (sensorless flux vector control) Pump/fan ratio (Kn ² quadratic ratio) Energy saving ratio (specifically for ventilation)	
Maximum motor cable length		
Shielded cable	50 m	50 m
Unshielded cable	100 m	100 m
Main drive protection features	Thermal protection against overheating Protection against short-circuits between motor phases Input phase loss protection, for three-phase supply Protection against motor phase breaks Overcurrent protection between motor output phases and earth Line supply overvoltage and undervoltage safety features	
Motor protection	Thermal protection integrated in the drive by continuous calculation of the I ² t	
1) These values are given for a nominal switching frequency of 4 kHz, for use in continuous operation. The switching frequency is adjustable from 2 to 16 kHz. Above 4 kHz, derate the nominal drive current. The nominal motor current should not exceed this value See the derating curves in the Installation Manual, available on www.br-automation.com .		
Braking chopper	8I64T201100.00X-1	8I64T201500.00X-1
Integrated dynamic brake transistors	Yes	Yes
Operating factor for the dynamic brake transistors	The dynamic brake transistor is sized so that it can tolerate: - The nominal motor power continuously - 150% of the nominal motor power for 60 s	
Minimum resistor value (external)	5 Ω	5 Ω

ACOPOSinverter X64

3-phase 200-240V

Available internal supplies		
	8I64T201100.00X-1	8I64T201500.00X-1
Output voltage	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)
Max. output current	100 mA	100 mA
Digital inputs		
	8I64T201100.00X-1	8I64T201500.00X-1
Number of inputs	4	4
Input circuit	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC
Sampling time	< 4 ms	< 4 ms
Input impedance	3.5 kΩ	3.5 kΩ
Electrical isolation		
Input - ACOPOSinverter	Yes	Yes
Input - Input	No	No
Counter inputs		
	8I64T201100.00X-1	8I64T201500.00X-1
Number of inputs	1	1
Counter frequency	In preparation	In preparation
Counter size	In preparation	In preparation
Digital outputs		
	8I64T201100.00X-1	8I64T201500.00X-1
Number of outputs	1	1
Output circuit	In preparation	In preparation
Rated voltage	In preparation	In preparation
Rated output current	In preparation	In preparation
Relay outputs		
	8I64T201100.00X-1	8I64T201500.00X-1
Number of outputs	1	1
Design	1 N/O contact	1 N/O contact
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity		
Minimum	10 mA for 5 VDC	10 mA for 5 VDC
Maximum		
on resistive load ($\cos \phi = 1$ and $L/R = 0$ ms)	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC
on inductive load ($\cos \phi = 0.4$ and $L/R = 7$ ms)	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC
Response time (maximum)	< 8 ms	< 8 ms
Electrical isolation		
Output - ACOPOSinverter	Yes	Yes
Output - Output	No	No

Operational conditions	8I64T201100.00X-1	8I64T201500.00X-1
Ambient temperature	-10 to +50°C	-10 to +50°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 2000 m	Up to 2000 m
Operating position		
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C3 and 3S2	Class 3C3 and 3S2
Degree of protection	IP 31 and IP 41 on upper part and IP 21 on connection terminals	IP 31 and IP 41 on upper part and IP 21 on connection terminals

1) With derating and removing the protective cover on top of the drive.
See the possible mounting types and derating curves in the Installation Manual, available on www.br-automation.com.

2) From 1000 m to 2000 m current derating of 1% per 100 m

Storage conditions	8I64T201100.00X-1	8I64T201500.00X-1
Storage temperature	-25 to +70°C	-25 to +70°C

Mechanical characteristics	8I64T201100.00X-1	8I64T201500.00X-1
Dimensions		
Width	245 mm	245 mm
Height	329.5 mm	329.5 mm
Depth	190 mm	190 mm
Weight	10.5 kg	10.5 kg

Optional accessories for 8I64T201100.00X-1

8IOFT083.200-1	EMC filter 3-phase 83 A, mounting underneath or beside the inverter for ACOPOSinverter X64 3x200-240 V 11 kW - 15 kW
8IOCT060.000-1	Line choke 3-phase 60 A for ACOPOSinverter X64 3x200-240 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 7.5 kW - 11 kW and 3x380-480 V 18.5 kW - 22 kW
8IOBR010.000-1	Braking resistor 10 Ohm, continuous braking power 1 kW for ACOPOSinverter X64 3x200-240 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 11 kW and 3x380-480 V 37 kW

Optional accessories for 8I64T201500.00X-1

8IOFT083.200-1	EMC filter 3-phase 83 A, mounting underneath or beside the inverter for ACOPOSinverter X64 3x200-240 V 11 kW - 15 kW
8IOCT060.000-1	Line choke 3-phase 60 A for ACOPOSinverter X64 3x200-240 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 7.5 kW - 11 kW and 3x380-480 V 18.5 kW - 22 kW
8IOBR010.000-1	Braking resistor 10 Ohm, continuous braking power 1 kW for ACOPOSinverter X64 3x200-240 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 11 kW and 3x380-480 V 37 kW

ACOPOSinverter X64

3-phase 380-500V



Motor power	8I64T400037.00X-1	8I64T400055.00X-1	8I64T400075.00X-1
Indicated on rating plate	0.37 kW 0.5 HP	0.55 kW 0.75 HP	0.75 kW 1 HP
Power mains connection	8I64T400037.00X-1	8I64T400055.00X-1	8I64T400075.00X-1
Mains input voltage	3x 380 VAC - 15% to 500 VAC + 10%	3x 380 VAC - 15% to 500 VAC + 10%	3x 380 VAC - 15% to 500 VAC + 10%
Frequency	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%
Apparent power (at 500 VAC)	1.5 kVA	1.8 kVA	2.4 kVA
Max. prospective line I _{sc} ¹⁾ (short circuit current at the connection point)	5 kA	5 kA	5 kA
Max. line current ²⁾			
at 380 VAC	2.2 A	2.8 A	3.6 A
at 500 VAC	1.7 A	2.2 A	2.7 A
Max. line current with optional line choke			
at 380 VAC	1.1 A	1.4 A	1.8 A
at 500 VAC	0.9 A	1.2 A	1.5 A
Dissipated power at maximum output current	32 W	37 W	41 W
Integrated EMC filter	Yes	Yes	Yes

1) If line I_{sc} is greater than the values in the table, add line choke.

2) Typical value for a 4-pole motor and a maximum switching frequency of 4 kHz, with no line choke for max. prospective line I_{sc}.

Conducted and radiated EMC emissions	8I64T400037.00X-1	8I64T400055.00X-1	8I64T400075.00X-1
With integrated filter			
Motor cable length according to IEC/EN 61800-3	-	-	-
Cat. C1 ¹⁾ Environment 1 (public network)			
Motor cable length according to IEC/EN 61800-3	≤ 5 m	≤ 5 m	≤ 5 m
Cat. C2 ¹⁾ Environment 1 (public network)			
Motor cable length according to IEC/EN 61800-3	-	-	-
Cat. C3 ¹⁾ Environment 2 (industrial network)			
With additional filter			
Motor cable length according to IEC/EN 61800-3	8I0FT015.200-1	8I0FT015.200-1	8I0FT015.200-1
Cat. C1 ¹⁾ Environment 1 (public network)	≤ 20 m	≤ 20 m	≤ 20 m
Motor cable length according to IEC/EN 61800-3	≤ 50 m	≤ 50 m	≤ 50 m
Cat. C2 ¹⁾ Environment 1 (public network)			
Motor cable length according to IEC/EN 61800-3	-	-	-
Cat. C3 ¹⁾ Environment 2 (industrial network)			




1) For a shielded motor cable

Motor connector	8I64T400037.00X-1	8I64T400055.00X-1	8I64T400075.00X-1
Maximum continuous output current (I _n) ¹⁾ at 500 VAC	1.5 A	1.9 A	2.3 A
Reduction of continuous output current depending on the ambient temperature			
Switching frequency 4 kHz	No reduction (up to 50°C)	No reduction (up to 50°C)	No reduction (up to 50°C)
Other switching frequencies	See the derating curves in the Installation Manual, available on www.br-automation.com		
Reduction of continuous output current depending on altitude			
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	2.3 A	2.9 A	3.5 A
Output frequency range	0.5 to 500 Hz	0.5 to 500 Hz	0.5 to 500 Hz
Rated switching frequency	4 kHz	4 kHz	4 kHz
Minimum	2 kHz	2 kHz	2 kHz
Maximum	16 kHz	16 kHz	16 kHz
Transient overtorque (typical value)	170 to 200% of nominal motor torque		
Braking torque			
With braking resistor	100% of nominal motor torque continuous and up to 150% for 60 s		
Without braking resistor (typical value)	100% of nominal motor torque	100% of nominal motor torque	100% of nominal motor torque
Motor control profiles	Standard ratio (voltage/frequency) Performance ratio (sensorless flux vector control) Pump/fan ratio (Kn ² quadratic ratio) Energy saving ratio (specifically for ventilation)		
Maximum motor cable length			
Shielded cable	50 m	50 m	50 m
Unshielded cable	100 m	100 m	100 m
Main drive protection features	Thermal protection against overheating Protection against short-circuits between motor phases Input phase loss protection, for three-phase supply Protection against motor phase breaks Overcurrent protection between motor output phases and earth Line supply overvoltage and undervoltage safety features		
Motor protection	Thermal protection integrated in the drive by continuous calculation of the I ² t		
1) These values are given for a nominal switching frequency of 4 kHz, for use in continuous operation. The switching frequency is adjustable from 2 to 16 kHz. Above 4 kHz, derate the nominal drive current. The nominal motor current should not exceed this value See the derating curves in the Installation Manual, available on www.br-automation.com .			
Braking chopper	8I64T400037.00X-1	8I64T400055.00X-1	8I64T400075.00X-1
Integrated dynamic brake transistors	Yes	Yes	Yes
Operating factor for the dynamic brake transistors	The dynamic brake transistor is sized so that it can tolerate: - The nominal motor power continuously - 150% of the nominal motor power for 60 s		
Minimum resistor value (external)	80 Ω	80 Ω	80 Ω

ACOPOSinverter X64

3-phase 380-500V

Available internal supplies	8I64T400037.00X-1	8I64T400055.00X-1	8I64T400075.00X-1
Output voltage	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)
Max. output current	100 mA	100 mA	100 mA
Digital inputs	8I64T400037.00X-1	8I64T400055.00X-1	8I64T400075.00X-1
Number of inputs	4	4	4
Input circuit	Source or Sink	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Sampling time	< 4 ms	< 4 ms	< 4 ms
Input impedance	3.5 kΩ	3.5 kΩ	3.5 kΩ
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
Counter inputs	8I64T400037.00X-1	8I64T400055.00X-1	8I64T400075.00X-1
Number of inputs	1	1	1
Counter frequency	In preparation	In preparation	In preparation
Counter size	In preparation	In preparation	In preparation
Digital outputs	8I64T400037.00X-1	8I64T400055.00X-1	8I64T400075.00X-1
Number of outputs	1	1	1
Output circuit	In preparation	In preparation	In preparation
Rated voltage	In preparation	In preparation	In preparation
Rated output current	In preparation	In preparation	In preparation
Relay outputs	8I64T400037.00X-1	8I64T400055.00X-1	8I64T400075.00X-1
Number of outputs	1	1	1
Design	1 N/O contact	1 N/O contact	1 N/O contact
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity			
Minimum	10 mA for 5 VDC	10 mA for 5 VDC	10 mA for 5 VDC
Maximum			
on resistive load (cos φ = 1 and L/R = 0 ms)	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC
on inductive load (cos φ = 0.4 and L/R = 7 ms)	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC
Response time (maximum)	< 8 ms	< 8 ms	< 8 ms
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No

Operational conditions	8I64T400037.00X-1	8I64T400055.00X-1	8I64T400075.00X-1
Ambient temperature	-10 to +50°C	-10 to +50°C	-10 to +50°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 2000 m	Up to 2000 m	Up to 2000 m
Operating position			
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C3 and 3S2	Class 3C3 and 3S2	Class 3C3 and 3S2
Degree of protection	IP 31 and IP 41 on upper part and IP 21 on connection terminals	IP 31 and IP 41 on upper part and IP 21 on connection terminals	IP 31 and IP 41 on upper part and IP 21 on connection terminals

1) With derating and removing the protective cover on top of the drive. See the possible mounting types and derating curves in the Installation Manual, available on www.br-automation.com.

2) From 1000 m to 2000 m current derating of 1% per 100 m

Storage conditions	8I64T400037.00X-1	8I64T400055.00X-1	8I64T400075.00X-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C

Mechanical characteristics	8I64T400037.00X-1	8I64T400055.00X-1	8I64T400075.00X-1
Dimensions			
Width	107 mm	107 mm	107 mm
Height	143 mm	143 mm	143 mm
Depth	150 mm	150 mm	150 mm
Weight	1.8 kg	1.8 kg	1.8 kg

Optional accessories for 8I64T400037.00X-1

8IOFT015.200-1	EMC filter 3-phase 15 A, mounting underneath or beside the inverter for ACOPOSinverter X64 3x200-240 V 1.1 kW - 2.2 kW and 3x380-500 V 0.37 kW - 1.5 kW
8IOCT004.000-1	Line choke 3-phase 4 A for ACOPOSinverter X64 3x200-240 V 0.18 kW - 0.75 kW and 3x380-500 V 0.37 kW - 1.5 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 1.5 kW
8IOBR100.000-1	Braking resistor 100 Ohm, continuous braking power 0.05 kW for ACOPOSinverter X64 1x200-240 V 0.18 kW - 1.5 kW and 3x200-240 V 0.18 kW - 1.5 kW and 3x380-500 V 0.37 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 4 kW

Optional accessories for 8I64T400055.00X-1

8IOFT015.200-1	EMC filter 3-phase 15 A, mounting underneath or beside the inverter for ACOPOSinverter X64 3x200-240 V 1.1 kW - 2.2 kW and 3x380-500 V 0.37 kW - 1.5 kW
8IOCT004.000-1	Line choke 3-phase 4 A for ACOPOSinverter X64 3x200-240 V 0.18 kW - 0.75 kW and 3x380-500 V 0.37 kW - 1.5 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 1.5 kW
8IOBR100.000-1	Braking resistor 100 Ohm, continuous braking power 0.05 kW for ACOPOSinverter X64 1x200-240 V 0.18 kW - 1.5 kW and 3x200-240 V 0.18 kW - 1.5 kW and 3x380-500 V 0.37 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 4 kW

Optional accessories for 8I64T400075.00X-1

8IOFT015.200-1	EMC filter 3-phase 15 A, mounting underneath or beside the inverter for ACOPOSinverter X64 3x200-240 V 1.1 kW - 2.2 kW and 3x380-500 V 0.37 kW - 1.5 kW
8IOCT004.000-1	Line choke 3-phase 4 A for ACOPOSinverter X64 3x200-240 V 0.18 kW - 0.75 kW and 3x380-500 V 0.37 kW - 1.5 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 1.5 kW
8IOBR100.000-1	Braking resistor 100 Ohm, continuous braking power 0.05 kW for ACOPOSinverter X64 1x200-240 V 0.18 kW - 1.5 kW and 3x200-240 V 0.18 kW - 1.5 kW and 3x380-500 V 0.37 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 4 kW

ACOPOSinverter X64

3-phase 380-500V



Motor power	8I64T400110.00X-1	8I64T400150.00X-1	8I64T400220.00X-1
Indicated on rating plate	1.1 kW 1.5 HP	1.5 kW 2 HP	2.2 kW 3 HP
Power mains connection	8I64T400110.00X-1	8I64T400150.00X-1	8I64T400220.00X-1
Mains input voltage	3x 380 VAC - 15% to 500 VAC + 10%	3x 380 VAC - 15% to 500 VAC + 10%	3x 380 VAC - 15% to 500 VAC + 10%
Frequency	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%
Apparent power (at 500 VAC)	3.2 kVA	4.2 kVA	5.9 kVA
Max. prospective line I _{sc} ¹⁾ (short circuit current at the connection point)	5 kA	5 kA	5 kA
Max. line current ²⁾			
at 380 VAC	4.9 A	6.4 A	8.9 A
at 500 VAC	3.7 A	4.8 A	6.7 A
Max. line current with optional line choke			
at 380 VAC	2.6 A	3.4 A	5.0 A
at 500 VAC	2.0 A	2.6 A	4.1 A
Dissipated power at maximum output current	48 W	61 W	79 W
Integrated EMC filter	Yes	Yes	Yes

1) If line I_{sc} is greater than the values in the table, add line choke.

2) Typical value for a 4-pole motor and a maximum switching frequency of 4 kHz, with no line choke for max. prospective line I_{sc}.

Conducted and radiated EMC emissions	8I64T400110.00X-1	8I64T400150.00X-1	8I64T400220.00X-1
With integrated filter			
Motor cable length according to IEC/EN 61800-3	-	-	-
Cat. C1 ¹⁾ Environment 1 (public network)			
Motor cable length according to IEC/EN 61800-3	≤ 5 m	≤ 5 m	≤ 5 m
Cat. C2 ¹⁾ Environment 1 (public network)			
Motor cable length according to IEC/EN 61800-3	-	-	-
Cat. C3 ¹⁾ Environment 2 (industrial network)			
With additional filter			
Filter type	8I0FT015.200-1	8I0FT015.200-1	8I0FT025.200-1
Motor cable length according to IEC/EN 61800-3	≤ 20 m	≤ 20 m	≤ 20 m
Cat. C1 ¹⁾ Environment 1 (public network)			
Motor cable length according to IEC/EN 61800-3	≤ 50 m	≤ 50 m	≤ 50 m
Cat. C2 ¹⁾ Environment 1 (public network)			
Motor cable length according to IEC/EN 61800-3	-	-	-
Cat. C3 ¹⁾ Environment 2 (industrial network)			




1) For a shielded motor cable

Motor connector	8I64T400110.00X-1	8I64T400150.00X-1	8I64T400220.00X-1
Maximum continuous output current (In) ¹⁾ at 500 VAC	3 A	4.1 A	5.5 A
Reduction of continuous output current depending on the ambient temperature			
Switching frequency 4 kHz	No reduction (up to 50°C)	No reduction (up to 50°C)	No reduction (up to 50°C)
Other switching frequencies	See the derating curves in the Installation Manual, available on www.br-automation.com		
Reduction of continuous output current depending on altitude			
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	4.5 A	6.2 A	8.3 A
Output frequency range	0.5 to 500 Hz	0.5 to 500 Hz	0.5 to 500 Hz
Rated switching frequency	4 kHz	4 kHz	4 kHz
Minimum	2 kHz	2 kHz	2 kHz
Maximum	16 kHz	16 kHz	16 kHz
Transient overtorque (typical value)	170 to 200% of nominal motor torque		
Braking torque			
With braking resistor	100% of nominal motor torque continuous and up to 150% for 60 s		
Without braking resistor (typical value)	50% of nominal motor torque	50% of nominal motor torque	30% of nominal motor torque
Motor control profiles	Standard ratio (voltage/frequency) Performance ratio (sensorless flux vector control) Pump/fan ratio (Kn ² quadratic ratio) Energy saving ratio (specifically for ventilation)		
Maximum motor cable length			
Shielded cable	50 m	50 m	50 m
Unshielded cable	100 m	100 m	100 m
Main drive protection features	Thermal protection against overheating Protection against short-circuits between motor phases Input phase loss protection, for three-phase supply Protection against motor phase breaks Overcurrent protection between motor output phases and earth Line supply overvoltage and undervoltage safety features		
Motor protection	Thermal protection integrated in the drive by continuous calculation of the I ² t		
1) These values are given for a nominal switching frequency of 4 kHz, for use in continuous operation. The switching frequency is adjustable from 2 to 16 kHz. Above 4 kHz, derate the nominal drive current. The nominal motor current should not exceed this value See the derating curves in the Installation Manual, available on www.br-automation.com .			
Braking chopper	8I64T400110.00X-1	8I64T400150.00X-1	8I64T400220.00X-1
Integrated dynamic brake transistors	Yes	Yes	Yes
Operating factor for the dynamic brake transistors	The dynamic brake transistor is sized so that it can tolerate: - The nominal motor power continuously - 150% of the nominal motor power for 60 s		
Minimum resistor value (external)	54 Ω	54 Ω	54 Ω

ACOPOSinverter X64

3-phase 380-500V

Available internal supplies	8I64T400110.00X-1	8I64T400150.00X-1	8I64T400220.00X-1
Output voltage	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)
Max. output current	100 mA	100 mA	100 mA
Digital inputs	8I64T400110.00X-1	8I64T400150.00X-1	8I64T400220.00X-1
Number of inputs	4	4	4
Input circuit	Source or Sink	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Sampling time	< 4 ms	< 4 ms	< 4 ms
Input impedance	3.5 kΩ	3.5 kΩ	3.5 kΩ
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
Counter inputs	8I64T400110.00X-1	8I64T400150.00X-1	8I64T400220.00X-1
Number of inputs	1	1	1
Counter frequency	In preparation	In preparation	In preparation
Counter size	In preparation	In preparation	In preparation
Digital outputs	8I64T400110.00X-1	8I64T400150.00X-1	8I64T400220.00X-1
Number of outputs	1	1	1
Output circuit	In preparation	In preparation	In preparation
Rated voltage	In preparation	In preparation	In preparation
Rated output current	In preparation	In preparation	In preparation
Relay outputs	8I64T400110.00X-1	8I64T400150.00X-1	8I64T400220.00X-1
Number of outputs	1	1	1
Design	1 N/O contact	1 N/O contact	1 N/O contact
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity			
Minimum	10 mA for 5 VDC	10 mA for 5 VDC	10 mA for 5 VDC
Maximum			
on resistive load (cos φ = 1 and L/R = 0 ms)	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC
on inductive load (cos φ = 0.4 and L/R = 7 ms)	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC
Response time (maximum)	< 8 ms	< 8 ms	< 8 ms
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No

Operational conditions	8I64T400110.00X-1	8I64T400150.00X-1	8I64T400220.00X-1
Ambient temperature	-10 to +50°C	-10 to +50°C	-10 to +50°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 2000 m	Up to 2000 m	Up to 2000 m
Operating position			
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C3 and 3S2	Class 3C3 and 3S2	Class 3C3 and 3S2
Degree of protection	IP 31 and IP 41 on upper part and IP 21 on connection terminals	IP 31 and IP 41 on upper part and IP 21 on connection terminals	IP 31 and IP 41 on upper part and IP 21 on connection terminals

1) With derating and removing the protective cover on top of the drive. See the possible mounting types and derating curves in the Installation Manual, available on www.br-automation.com.

2) From 1000 m to 2000 m current derating of 1% per 100 m

Storage conditions	8I64T400110.00X-1	8I64T400150.00X-1	8I64T400220.00X-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C

Mechanical characteristics	8I64T400110.00X-1	8I64T400150.00X-1	8I64T400220.00X-1
Dimensions			
Width	107 mm	107 mm	142 mm
Height	143 mm	143 mm	184 mm
Depth	150 mm	150 mm	150 mm
Weight	1.8 kg	1.8 kg	3.1 kg

Optional accessories for 8I64T400110.00X-1

8IOFT015.200-1	EMC filter 3-phase 15 A, mounting underneath or beside the inverter for ACOPOSinverter X64 3x200-240 V 1.1 kW - 2.2 kW and 3x380-500V 0.37kW - 1.5kW
8IOCT004.000-1	Line choke 3-phase 4 A for ACOPOSinverter X64 3x200-240 V 0.18 kW - 0.75 kW and 3x380-500 V 0.37 kW - 1.5 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 1.5 kW
8IOBR100.000-1	Braking resistor 100 Ohm, continuous braking power 0.05 kW for ACOPOSinverter X64 1x200-240 V 0.18 kW - 1.5 kW and 3x200-240 V 0.18 kW - 1.5 kW and 3x380-500 V 0.37 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 4 kW

Optional accessories for 8I64T400150.00X-1

8IOFT015.200-1	EMC filter 3-phase 15 A, mounting underneath or beside the inverter for ACOPOSinverter X64 3x200-240 V 1.1 kW - 2.2 kW and 3x380-500V 0.37kW - 1.5kW
8IOCT004.000-1	Line choke 3-phase 4 A for ACOPOSinverter X64 3x200-240 V 0.18 kW - 0.75 kW and 3x380-500 V 0.37 kW - 1.5 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 1.5 kW
8IOBR100.000-1	Braking resistor 100 Ohm, continuous braking power 0.05 kW for ACOPOSinverter X64 1x200-240 V 0.18 kW - 1.5 kW and 3x200-240 V 0.18 kW - 1.5 kW and 3x380-500 V 0.37 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 4 kW

Optional accessories for 8I64T400220.00X-1

8IOFT025.200-1	EMC filter 3-phase 25 A, mounting underneath or beside the inverter for ACOPOSinverter X64 3x200-240 V 3 kW - 4 kW and 3x380-500 V 2.2 kW - 4 kW
8IOCT010.000-1	Line choke 3-phase 10 A for ACOPOSinverter X64 3x200-240 V 1.1 kW - 1.5 kW and 3x380-500V 2.2 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 1.5 kW - 2.2 kW and 3x380-480 V 2.2 kW - 4 kW
8IOBR100.000-1	Braking resistor 100 Ohm, continuous braking power 0.05 kW for ACOPOSinverter X64 1x200-240 V 0.18 kW - 1.5 kW and 3x200-240 V 0.18 kW - 1.5 kW and 3x380-500 V 0.37 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 4 kW

ACOPOSinverter X64

3-phase 380-500V



Motor power	8I64T400300.00X-1	8I64T400400.00X-1	8I64T400550.00X-1
Indicated on rating plate	3 kW	4 kW	5.5 kW
	-	5 HP	7.5 HP
Power mains connection	8I64T400300.00X-1	8I64T400400.00X-1	8I64T400550.00X-1
Mains input voltage	3x 380 VAC - 15% to 500 VAC + 10%	3x 380 VAC - 15% to 500 VAC + 10%	3x 380 VAC - 15% to 500 VAC + 10%
Frequency	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%
Apparent power (at 500 VAC)	7.1 kVA	9.2 kVA	15 kVA
Max. prospective line I _{sc} ¹⁾ (short circuit current at the connection point)	5 kA	5 kA	22 kA
Max. line current ²⁾			
at 380 VAC	10.9 A	13.9 A	21.9 A
at 500 VAC	8.3 A	10.6 A	16.5 A
Max. line current with optional line choke			
at 380 VAC	6.5 A	8.5 A	11.7 A
at 500 VAC	5.2 A	6.6 A	9.3 A
Dissipated power at maximum output current	125 W	150 W	232 W
Integrated EMC filter	Yes	Yes	Yes

1) If line I_{sc} is greater than the values in the table, add line choke.

2) Typical value for a 4-pole motor and a maximum switching frequency of 4 kHz, with no line choke for max. prospective line I_{sc}.

Conducted and radiated EMC emissions	8I64T400300.00X-1	8I64T400400.00X-1	8I64T400550.00X-1
With integrated filter			
Motor cable length according to IEC/EN 61800-3	-	-	-
Cat. C1 ¹⁾ Environment 1 (public network)			
Motor cable length according to IEC/EN 61800-3	≤ 5 m	≤ 5 m	-
Cat. C2 ¹⁾ Environment 1 (public network)			
Motor cable length according to IEC/EN 61800-3	-	-	≤ 5 m
Cat. C3 ¹⁾ Environment 2 (industrial network)			
With additional filter			
Filter type	8I0FT025.200-1	8I0FT025.200-1	8I0FT047.200-1
Motor cable length according to IEC/EN 61800-3	≤ 20 m	≤ 20 m	≤ 20 m
Cat. C1 ¹⁾ Environment 1 (public network)			
Motor cable length according to IEC/EN 61800-3	≤ 50 m	≤ 50 m	≤ 50 m
Cat. C2 ¹⁾ Environment 1 (public network)			
Motor cable length according to IEC/EN 61800-3	-	-	-
Cat. C3 ¹⁾ Environment 2 (industrial network)			




1) For a shielded motor cable

Motor connector	8I64T400300.00X-1	8I64T400400.00X-1	8I64T400550.00X-1
Maximum continuous output current (I _n) ¹⁾ at 500 VAC	7.1 A	9.5 A	14.3 A
Reduction of continuous output current depending on the ambient temperature			
Switching frequency 4 kHz	No reduction (up to 50°C)	No reduction (up to 50°C)	No reduction (up to 50°C)
Other switching frequencies	See the derating curves in the Installation Manual, available on www.br-automation.com		
Reduction of continuous output current depending on altitude			
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	10.7 A	14.3 A	21.5 A
Output frequency range	0.5 to 500 Hz	0.5 to 500 Hz	0.5 to 500 Hz
Rated switching frequency	4 kHz	4 kHz	4 kHz
Minimum	2 kHz	2 kHz	2 kHz
Maximum	16 kHz	16 kHz	16 kHz
Transient overtorque (typical value)	170 to 200% of nominal motor torque		
Braking torque			
With braking resistor	100% of nominal motor torque continuous and up to 150% for 60 s		
Without braking resistor (typical value)	30% of nominal motor torque	30% of nominal motor torque	30% of nominal motor torque
Motor control profiles	Standard ratio (voltage/frequency) Performance ratio (sensorless flux vector control) Pump/fan ratio (Kn ² quadratic ratio) Energy saving ratio (specifically for ventilation)		
Maximum motor cable length			
Shielded cable	50 m	50 m	50 m
Unshielded cable	100 m	100 m	100 m
Main drive protection features	Thermal protection against overheating Protection against short-circuits between motor phases Input phase loss protection, for three-phase supply Protection against motor phase breaks Overcurrent protection between motor output phases and earth Line supply overvoltage and undervoltage safety features		
Motor protection	Thermal protection integrated in the drive by continuous calculation of the I ² t		
1) These values are given for a nominal switching frequency of 4 kHz, for use in continuous operation. The switching frequency is adjustable from 2 to 16 kHz. Above 4 kHz, derate the nominal drive current. The nominal motor current should not exceed this value See the derating curves in the Installation Manual, available on www.br-automation.com .			
Braking chopper	8I64T400300.00X-1	8I64T400400.00X-1	8I64T400550.00X-1
Integrated dynamic brake transistors	Yes	Yes	Yes
Operating factor for the dynamic brake transistors	The dynamic brake transistor is sized so that it can tolerate: - The nominal motor power continuously - 150% of the nominal motor power for 60 s		
Minimum resistor value (external)	55 Ω	36 Ω	29 Ω

ACOPOSinverter X64

3-phase 380-500V

Available internal supplies	8I64T400300.00X-1	8I64T400400.00X-1	8I64T400550.00X-1
Output voltage	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)
Max. output current	100 mA	100 mA	100 mA
Digital inputs	8I64T400300.00X-1	8I64T400400.00X-1	8I64T400550.00X-1
Number of inputs	4	4	4
Input circuit	Source or Sink	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Sampling time	< 4 ms	< 4 ms	< 4 ms
Input impedance	3.5 kΩ	3.5 kΩ	3.5 kΩ
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
Counter inputs	8I64T400300.00X-1	8I64T400400.00X-1	8I64T400550.00X-1
Number of inputs	1	1	1
Counter frequency	In preparation	In preparation	In preparation
Counter size	In preparation	In preparation	In preparation
Digital outputs	8I64T200300.00X-1	8I64T200400.00X-1	8I64T200550.00X-1
Number of outputs	1	1	1
Output circuit	In preparation	In preparation	In preparation
Rated voltage	In preparation	In preparation	In preparation
Rated output current	In preparation	In preparation	In preparation
Relay outputs	8I64T400300.00X-1	8I64T400400.00X-1	8I64T400550.00X-1
Number of outputs	1	1	1
Design	1 N/O contact	1 N/O contact	1 N/O contact
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity			
Minimum	10 mA for 5 VDC	10 mA for 5 VDC	10 mA for 5 VDC
Maximum			
on resistive load ($\cos \phi = 1$ and $L/R = 0$ ms)	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC
on inductive load ($\cos \phi = 0.4$ and $L/R = 7$ ms)	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC
Response time (maximum)	< 8 ms	< 8 ms	< 8 ms
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No

Operational conditions	8I64T400300.00X-1	8I64T400400.00X-1	8I64T400550.00X-1
Ambient temperature	-10 to +50°C	-10 to +50°C	-10 to +50°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 2000 m	Up to 2000 m	Up to 2000 m
Operating position			
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C3 and 3S2	Class 3C3 and 3S2	Class 3C3 and 3S2
Degree of protection	IP 31 and IP 41 on upper part and IP 21 on connection terminals	IP 31 and IP 41 on upper part and IP 21 on connection terminals	IP 31 and IP 41 on upper part and IP 21 on connection terminals

1) With derating and removing the protective cover on top of the drive. See the possible mounting types and derating curves in the Installation Manual, available on www.br-automation.com.

2) From 1000 m to 2000 m current derating of 1% per 100 m

Storage conditions	8I64T400300.00X-1	8I64T400400.00X-1	8I64T400550.00X-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C

Mechanical characteristics	8I64T400300.00X-1	8I64T400400.00X-1	8I64T400550.00X-1
Dimensions			
Width	142 mm	142 mm	180 mm
Height	184 mm	184 mm	232 mm
Depth	150 mm	150 mm	170 mm
Weight	3.1 kg	3.1 kg	6.5 kg

Optional accessories for 8I64T400300.00X-1

8IOFT025.200-1	EMC filter 3-phase 25 A, mounting underneath or beside the inverter for ACOPOSinverter X64 3x200-240 V 3 kW - 4 kW and 3x380-500 V 2.2 kW - 4 kW
8IOCT010.000-1	Line choke 3-phase 10 A for ACOPOSinverter X64 3x200-240 V 1.1 kW - 1.5 kW and 3x380-500V 2.2 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 1.5 kW - 2.2 kW and 3x380-480 V 2.2 kW - 4 kW
8IOBR100.000-1	Braking resistor 100 Ohm, continuous braking power 0.05 kW for ACOPOSinverter X64 1x200-240 V 0.18 kW - 1.5 kW and 3x200-240 V 0.18 kW - 1.5 kW and 3x380-500 V 0.37 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 4 kW

Optional accessories for 8I64T400400.00X-1

8IOFT025.200-1	EMC filter 3-phase 25 A, mounting underneath or beside the inverter for ACOPOSinverter X64 3x200-240 V 3 kW - 4 kW and 3x380-500 V 2.2 kW - 4 kW
8IOCT010.000-1	Line choke 3-phase 10 A for ACOPOSinverter X64 3x200-240 V 1.1 kW - 1.5 kW and 3x380-500V 2.2 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 1.5 kW - 2.2 kW and 3x380-480 V 2.2 kW - 4 kW
8IOBR100.000-1	Braking resistor 100 Ohm, continuous braking power 0.05 kW for ACOPOSinverter X64 1x200-240 V 0.18 kW - 1.5 kW and 3x200-240 V 0.18 kW - 1.5 kW and 3x380-500 V 0.37 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 4 kW

Optional accessories for 8I64T400550.00X-1

8IOFT047.200-1	EMC filter 3-phase 47 A, mounting underneath or beside the inverter for ACOPOSinverter X64 3x200-240 V 5.5 kW - 7.5 kW and 3x380-500 V 5.5 kW - 7.5 kW
8IOCT016.000-1	Line choke 3-phase 16 A for ACOPOSinverter X64 3x200-240 V 2.2 kW - 3 kW and 3x380-500 V 5.5 kW - 7.5 kW, for ACOPOSinverter P84 3x200-240 V 3 kW and 3x380-480 V 5.5 kW - 7.5 kW
8IOBR060.000-1	Braking resistor 60 Ohm, continuous braking power 0.1 kW for ACOPOSinverter X64 1x200-240 V 2.2 kW and 3x200-240 V 2.2 kW - 3 kW and 3x380-500 V 5.5 kW - 7.5 kW, for ACOPOSinverter P84 3x200-240 V 1.5 kW - 2.2 kW and 3x380-480 V 5.5 kW - 7.5 kW

ACOPOSinverter X64

3-phase 380-500V



Motor power	8I64T400750.00X-1	8I64T401100.00X-1	8I64T401500.00X-1
Indicated on rating plate	7.5 kW 10 HP	11 kW 15 HP	15 kW 20 HP
Power mains connection	8I64T400750.00X-1	8I64T401100.00X-1	8I64T401500.00X-1
Mains input voltage	3x 380 VAC - 15% to 500 VAC + 10%	3x 380 VAC - 15% to 500 VAC + 10%	3x 380 VAC - 15% to 500 VAC + 10%
Frequency	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%
Apparent power (at 500 VAC)	18 kVA	25 kVA	32 kVA
Max. prospective line I _{sc} ¹⁾ (short circuit current at the connection point)	22 kA	22 kA	22 kA
Max. line current ²⁾			
at 380 VAC	27.7 A	37.2 A	48.2 A
at 500 VAC	21 A	28.4 A	36.8 A
Max. line current with optional line choke			
at 380 VAC	15.4 A	22.5 A	29.6 A
at 500 VAC	12.1 A	18.1 A	23.3 A
Dissipated power at maximum output current	269 W	397 W	492 W
Integrated EMC filter	Yes	Yes	Yes

1) If line I_{sc} is greater than the values in the table, add line choke.

2) Typical value for a 4-pole motor and a maximum switching frequency of 4 kHz, with no line choke for max. prospective line I_{sc}.

Conducted and radiated EMC emissions	8I64T400750.00X-1	8I64T401100.00X-1	8I64T401500.00X-1
With integrated filter			
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	-	-	-
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	-	-	-
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	≤ 5 m	≤ 5 m	≤ 5 m
With additional filter			
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	≤ 20 m	≤ 20 m	≤ 20 m
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	≤ 50 m	≤ 50 m	≤ 50 m
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	-	-	-




1) For a shielded motor cable

Motor connector	8I64T400750.00X-1	8I64T401100.00X-1	8I64T401500.00X-1
Maximum continuous output current (I _n) ¹⁾ at 500 VAC	17 A	27.7 A	33 A
Reduction of continuous output current depending on the ambient temperature			
Switching frequency 4 kHz	No reduction (up to 50°C)	No reduction (up to 50°C)	No reduction (up to 50°C)
Other switching frequencies	See the derating curves in the Installation Manual, available on www.br-automation.com		
Reduction of continuous output current depending on altitude			
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	25.5 A	41.6 A	49.5 A
Output frequency range	0.5 to 500 Hz	0.5 to 500 Hz	0.5 to 500 Hz
Rated switching frequency	4 kHz	4 kHz	4 kHz
Minimum	2 kHz	2 kHz	2 kHz
Maximum	16 kHz	16 kHz	16 kHz
Transient overtorque (typical value)	170 to 200% of nominal motor torque		
Braking torque			
With braking resistor	100% of nominal motor torque continuous and up to 150% for 60 s		
Without braking resistor (typical value)	30% of nominal motor torque	30% of nominal motor torque	30% of nominal motor torque
Motor control profiles	Standard ratio (voltage/frequency) Performance ratio (sensorless flux vector control) Pump/fan ratio (Kn ² quadratic ratio) Energy saving ratio (specifically for ventilation)		
Maximum motor cable length			
Shielded cable	50 m	50 m	50 m
Unshielded cable	100 m	100 m	100 m
Main drive protection features	Thermal protection against overheating Protection against short-circuits between motor phases Input phase loss protection, for three-phase supply Protection against motor phase breaks Overcurrent protection between motor output phases and earth Line supply overvoltage and undervoltage safety features		
Motor protection	Thermal protection integrated in the drive by continuous calculation of the I ² t		
1) These values are given for a nominal switching frequency of 4 kHz, for use in continuous operation. The switching frequency is adjustable from 2 to 16 kHz. Above 4 kHz, derate the nominal drive current. The nominal motor current should not exceed this value See the derating curves in the Installation Manual, available on www.br-automation.com .			
Braking chopper	8I64T400750.00X-1	8I64T401100.00X-1	8I64T401500.00X-1
Integrated dynamic brake transistors	Yes	Yes	Yes
Operating factor for the dynamic brake transistors	The dynamic brake transistor is sized so that it can tolerate: - The nominal motor power continuously - 150% of the nominal motor power for 60 s		
Minimum resistor value (external)	19 Ω	20 Ω	20 Ω

ACOPOSinverter X64

3-phase 380-500V

Available internal supplies	8I64T400750.00X-1	8I64T401100.00X-1	8I64T401500.00X-1
Output voltage	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)
Max. output current	100 mA	100 mA	100 mA
Digital inputs	8I64T400750.00X-1	8I64T401100.00X-1	8I64T401500.00X-1
Number of inputs	4	4	4
Input circuit	Source or Sink	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Sampling time	< 4 ms	< 4 ms	< 4 ms
Input impedance	3.5 kΩ	3.5 kΩ	3.5 kΩ
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
Counter inputs	8I64T400750.00X-1	8I64T401100.00X-1	8I64T401500.00X-1
Number of inputs	1	1	1
Counter frequency	In preparation	In preparation	In preparation
Counter size	In preparation	In preparation	In preparation
Digital outputs	8I64T200750.00X-1	8I64T201100.00X-1	8I64T201500.00X-1
Number of outputs	1	1	1
Output circuit	In preparation	In preparation	In preparation
Rated voltage	In preparation	In preparation	In preparation
Rated output current	In preparation	In preparation	In preparation
Relay outputs	8I64T400750.00X-1	8I64T401100.00X-1	8I64T401500.00X-1
Number of outputs	1	1	1
Design	1 N/O contact	1 N/O contact	1 N/O contact
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity			
Minimum	10 mA for 5 VDC	10 mA for 5 VDC	10 mA for 5 VDC
Maximum			
on resistive load ($\cos \phi = 1$ and $L/R = 0$ ms)	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC
on inductive load ($\cos \phi = 0.4$ and $L/R = 7$ ms)	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC
Response time (maximum)	< 8 ms	< 8 ms	< 8 ms
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No

Operational conditions	8I64T400750.00X-1	8I64T401100.00X-1	8I64T401500.00X-1
Ambient temperature	-10 to +50°C	-10 to +50°C	-10 to +50°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 2000 m	Up to 2000 m	Up to 2000 m
Operating position			
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C3 and 3S2	Class 3C3 and 3S2	Class 3C3 and 3S2
Degree of protection	IP 31 and IP 41 on upper part and IP 21 on connection terminals	IP 31 and IP 41 on upper part and IP 21 on connection terminals	IP 31 and IP 41 on upper part and IP 21 on connection terminals

1) With derating and removing the protective cover on top of the drive. See the possible mounting types and derating curves in the Installation Manual, available on www.br-automation.com.

2) From 1000 m to 2000 m current derating of 1% per 100 m

Storage conditions	8I64T400750.00X-1	8I64T401100.00X-1	8I64T401500.00X-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C

Mechanical characteristics	8I64T400750.00X-1	8I64T401100.00X-1	8I64T401500.00X-1
Dimensions			
Width	180 mm	245 mm	245 mm
Height	232 mm	329.5 mm	329.5 mm
Depth	170 mm	190 mm	190 mm
Weight	6.5 kg	11 kg	10.5 kg

Optional accessories for 8I64T400750.00X-1

8IOFT047.200-1	EMC filter 3-phase 47 A, mounting underneath or beside the inverter for ACOPOSinverter X64 3x200-240 V 5.5 kW - 7.5 kW and 3x380-500 V 5.5 kW - 7.5 kW
8IOCT016.000-1	Line choke 3-phase 16 A for ACOPOSinverter X64 3x200-240 V 2.2 kW - 3 kW and 3x380-500 V 5.5 kW - 7.5 kW, for ACOPOSinverter P84 3x200-240 V 3 kW and 3x380-480 V 5.5 kW - 7.5 kW
8IOBR060.000-1	Braking resistor 60 Ohm, continuous braking power 0.1 kW for ACOPOSinverter X64 1x200-240 V 2.2 kW and 3x200-240 V 2.2 kW - 3 kW and 3x380-500 V 5.5 kW - 7.5 kW, for ACOPOSinverter P84 3x200-240 V 1.5 kW - 2.2 kW and 3x380-480 V 5.5 kW - 7.5 kW

Optional accessories for 8I64T401100.00X-1

8IOFT049.200-1	EMC filter 3-phase 49 A, mounting underneath or beside the inverter for ACOPOSinverter X64 3x380-500 V 11 kW - 15 kW
8IOCT030.000-1	Line choke 3-phase 30 A for ACOPOSinverter X64 3x200-240 V 4 kW - 7.5 kW and 3x380-500 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 4 kW - 5.5 kW and 3x380-480 V 11 kW - 15 kW
8IOBR028.000-1	Braking resistor 28 Ohm, continuous braking power 0.2 kW for ACOPOSinverter X64 3x200-240 V 4 kW and 3x380-500 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 3 kW - 4 kW and 3x380-480 V 11 kW - 15 kW

Optional accessories for 8I64T401500.00X-1

8IOFT049.200-1	EMC filter 3-phase 49 A, mounting underneath or beside the inverter for ACOPOSinverter X64 3x380-500 V 11 kW - 15 kW
8IOCT030.000-1	Line choke 3-phase 30 A for ACOPOSinverter X64 3x200-240 V 4 kW - 7.5 kW and 3x380-500 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 4 kW - 5.5 kW and 3x380-480 V 11 kW - 15 kW
8IOBR028.000-1	Braking resistor 28 Ohm, continuous braking power 0.2 kW for ACOPOSinverter X64 3x200-240 V 4 kW and 3x380-500 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 3 kW - 4 kW and 3x380-480 V 11 kW - 15 kW

ACOPOSinverter P84

1-phase 200-240V



Motor power	8I84T200075.01P-1	8I84T200150.01P-1	8I84T200220.01P-1
Indicated on rating plate	0.37 kW 0.5 HP	0.75 kW 1 HP	1.5 kW 2 HP
Power mains connection	8I84T200075.01P-1	8I84T200150.01P-1	8I84T200220.01P-1
Mains input voltage	1x 200 VAC - 15% to 240 VAC + 10%	1x 200 VAC - 15% to 240 VAC + 10%	1x 200 VAC - 15% to 240 VAC + 10%
Frequency	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%
Apparent power (at 240 VAC)	1.4 kVA	2.4 kVA	3.7 kVA
Max. prospective line I _{sc} (short circuit current at the connection point)	5 kA	5 kA	5 kA
Line current ¹⁾			
at 200 VAC	6.9 A	12 A	18.2 A
at 240 VAC	5.8 A	9.9 A	15.7 A
Dissipated power at nominal load and nominal switching frequency	66 W	101 W	122 W
Integrated EMC filter ²⁾	Yes	Yes	Yes

1) Typical value for the indicated motor power and for the maximum prospective line I_{sc}.

2) EMC plate delivered with the drive.

Conducted and radiated EMC emissions	8I84T200075.01P-1	8I84T200150.01P-1	8I84T200220.01P-1
With integrated filter			
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	-	-	-
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	≤ 10 m ²⁾ or ≤ 5 m ³⁾	≤ 10 m ²⁾ or ≤ 5 m ³⁾	≤ 10 m ²⁾ or ≤ 5 m ³⁾
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	-	-	-
With additional filter			
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	8I0FT012.300-1 ≤ 50 m ²⁾ or ≤ 20 m ³⁾	8I0FT012.300-1 ≤ 50 m ²⁾ or ≤ 20 m ³⁾	8I0FT026.300-1 ≤ 50 m ²⁾ or ≤ 20 m ³⁾
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	≤ 100 m ²⁾ or ≤ 50 m ³⁾	≤ 100 m ²⁾ or ≤ 50 m ³⁾	≤ 100 m ²⁾ or ≤ 50 m ³⁾
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	-	-	-

1) For a shielded motor cable

2) At a switching frequency of 4 kHz

3) At a switching frequency from 4.1 to 16 kHz

Motor connector	8I84T200075.01P-1	8I84T200150.01P-1	8I84T200220.01P-1
Maximum continuous output current (In) ¹⁾ at 230 VAC	3 A	4.8 A	8 A
Reduction of continuous output current depending on the ambient temperature	See the derating curves in the Installation Manual, available on www.br-automation.com		
At nominal switching frequency (4 kHz or 2.5 kHz for bigger drive ratings)	No reduction (up to 50°C)	No reduction (up to 50°C)	No reduction (up to 50°C)
Other switching frequencies	See the derating curves in the Installation Manual, available on www.br-automation.com		
Reduction of continuous output current depending on altitude	See the derating curves in the Installation Manual, available on www.br-automation.com		
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	4.5 A	7.2 A	12 A
Maximum transient current for 2 s	4.9 A	7.9 A	13.2 A
Output frequency range	0.5 to 1600 Hz	0.5 to 1600 Hz	0.5 to 1600 Hz
Rated switching frequency	4 kHz	4 kHz	4 kHz
Minimum	1 kHz	1 kHz	1 kHz
Maximum	16 kHz	16 kHz	16 kHz
Transient overtorque (typical value)	170% of the nominal motor torque (typical value at ± 10%) for 60 s 220% of the nominal motor torque (typical value at ± 10%) for 2 s		
Braking torque	See the derating curves in the Installation Manual, available on www.br-automation.com		
With braking resistor	Up to 150% of nominal motor torque		
Without braking resistor (typical value)	30% of nominal motor torque		
Motor control profiles	See the derating curves in the Installation Manual, available on www.br-automation.com		
Asynchronous motor	Flux Vector Control (FVC) with sensor (current vector) Sensorless Flux Vector Control (SFVC) (voltage or current vector) Voltage/frequency ratio (2 or 5 points) ENA (Energy Adaptation) System for unbalanced loads		
Synchronous motor	Vector control without speed feedback		
Maximum motor cable length ¹⁾	See the derating curves in the Installation Manual, available on www.br-automation.com		
Shielded cable	50 m	50 m	50 m
Unshielded cable	100 m	100 m	100 m
Main drive protection features	Thermal protection against overheating of the power stage Protection against: Short-circuits between motor phases, input phase breaks, overcurrents between output phases and earth, overvoltages on the DC bus, a break on the control circuit, exceeding the limit speed Safety function for: Line supply overvoltage and undervoltage, input phase loss in three-phase		
Motor protection	Thermal protection integrated in drive via continuous calculation of I ² t taking speed into account: - The motor thermal state is saved when the drive is powered down. - Function can be modified via operator dialogue terminals, depending on the type of motor (force-cooled or self-cooled). Protection against motor phase breaks Protection with PTC probes		

1) These values are given for nominal switching frequency.




Braking chopper	8I84T200075.01P-1	8I84T200150.01P-1	8I84T200220.01P-1
Integrated dynamic brake transistors	Yes	Yes	Yes
Operating factor for the dynamic brake transistors	The dynamic brake transistor is sized so that it can tolerate: - The nominal motor power continuously - 150% of the nominal motor power for 60 s		
Minimum resistor value (external) ¹⁾	44 Ω	33 Ω	22 Ω

1) The minimum ohmic value is determined at a temperature of 20°C. In an environment where the temperature is below 20°C, make sure that the minimum ohmic value recommended in the table is observed.

ACOPOSinverter P84

1-phase 200-240V

24 VDC supply	8184T200075.01P-1	8184T200150.01P-1	8184T200220.01P-1
Input voltage	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)
Power consumption	30 W	30 W	30 W
Available internal supplies	8184T200075.01P-1	8184T200150.01P-1	8184T200220.01P-1
Output voltage	10.5 VDC ($\pm 5\%$)	10.5 VDC ($\pm 5\%$)	10.5 VDC ($\pm 5\%$)
Max. output current	10 mA	10 mA	10 mA
Output voltage	24 VDC (min. 21 V, max. 27 V)	24 VDC (min. 21 V, max. 27 V)	24 VDC (min. 21 V, max. 27 V)
Max. output current	200 mA	200 mA	200 mA
Digital inputs	8184T200075.01P-1	8184T200150.01P-1	8184T200220.01P-1
Number of inputs ¹⁾	5	5	5
Input circuit	Source or Sink	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Sampling time	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms
Input impedance	3.5 k Ω	3.5 k Ω	3.5 k Ω
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
1) 1 logic input, switch-configurable as a logic input or as an input for PTC probes. Input for a maximum of 6 PTC probes mounted in series: Nominal value < 1.5 k Ω , trip resistance 3 k Ω , reset value 1.8 k Ω , short-circuit protection < 50 Ω			
Relay outputs	8184T200075.01P-1	8184T200150.01P-1	8184T200220.01P-1
Number of outputs	2	2	2
Design			
Relay 1	1 N/O contact and 1 N/C contact with common point	1 N/O contact and 1 N/C contact with common point	1 N/O contact and 1 N/C contact with common point
Relay 2	1 N/O contact	1 N/O contact	1 N/O contact
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity			
Minimum	3 mA for 24 VDC	3 mA for 24 VDC	3 mA for 24 VDC
Maximum			
on resistive load ($\cos \phi = 1$ and L/R = 0 ms)	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC
on inductive load ($\cos \phi = 0.4$ and L/R = 7 ms)	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC
Response time (maximum)	< 7 ms \pm 0.5 ms	< 7 ms \pm 0.5 ms	< 7 ms \pm 0.5 ms
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No
Analog inputs	8184T200075.01P-1	8184T200150.01P-1	8184T200220.01P-1
Number of inputs	2	2	2
Input			
Voltage	± 10 V	± 10 V	± 10 V
Voltage / Current	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	11 bit + 1 sign bit	11 bit + 1 sign bit	11 bit + 1 sign bit
Sampling time	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms
Input impedance			
Voltage	30 k Ω	30 k Ω	30 k Ω
Current	242 Ω	242 Ω	242 Ω
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No

Analog outputs	8I84T200075.01P-1	8I84T200150.01P-1	8I84T200220.01P-1
Number of outputs	1	1	1
Output ¹⁾	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	10 bit	10 bit	10 bit
Update time	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms
Min. load impedance			
Voltage	470 Ω	470 Ω	470 Ω
Current	500 Ω	500 Ω	500 Ω
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No
1) The current output can be configured as a 24 V logic output, max. 20 mA, min. load impedance 1.2 kΩ			
Safety input power removal	8I84T200075.01P-1	8I84T200150.01P-1	8I84T200220.01P-1
Number of inputs	1	1	1
Input circuit	Sink	Sink	Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Response time	≤ 100 ms	≤ 100 ms	≤ 100 ms
Switching threshold			
LOW	< 5 V	< 5 V	< 5 V
HIGH	> 15 V	> 15 V	> 15 V
Input impedance	1.5 kΩ	1.5 kΩ	1.5 kΩ
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
Operational conditions	8I84T200075.01P-1	8I84T200150.01P-1	8I84T200220.01P-1
Ambient temperature	-10 to +50°C	-10 to +50°C	-10 to +50°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 3000 m	Up to 3000 m	Up to 3000 m
Operating position			
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C1 and 3S2	Class 3C1 and 3S2	Class 3C1 and 3S2
Degree of protection	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)
1) With derating and removing the protective cover on top of the drive. See the possible mounting types and derating curves in the Installation Manual, available on www.br-automation.com .			
2) From 1000 m to 3000 m current derating of 1% per 100 m.			
Storage conditions	8I84T200075.01P-1	8I84T200150.01P-1	8I84T200220.01P-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Mechanical characteristics	8I84T200075.01P-1	8I84T200150.01P-1	8I84T200220.01P-1
Dimensions			
Width	130 mm	130 mm	155 mm
Height	230 mm	230 mm	260 mm
Depth	175 mm	175 mm	187 mm
Weight	3 kg	3 kg	4 kg

ACOPOSinverter P84

1-phase 200-240V

Optional accessories for 8I84T200075.01P-1 in 1-phase operation

8I0FT012.300-1	EMC filter 3-phase 12 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 0.37 kW - 1.5 kW and 3x380-480 V 0.75 kW - 2.2 kW
8I0BR100.000-1	Braking resistor 100 Ohm, continuous braking power 0.05 kW for ACOPOSinverter X64 1x200-240 V 0.18 kW - 1.5 kW and 3x200-240 V 0.18 kW - 1.5 kW and 3x380-500 V 0.37 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 4 kW
8I0MF001.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 0.37 kW - 1.5 kW and 3x380-480 V 0.75 kW - 2.2 kW

Optional accessories for 8I84T200150.01P-1 in 1-phase operation

8I0FT012.300-1	EMC filter 3-phase 12 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 0.37 kW - 1.5 kW and 3x380-480 V 0.75 kW - 2.2 kW
8I0BR060.000-1	Braking resistor 60 Ohm, continuous braking power 0.1 kW for ACOPOSinverter X64 1x200-240 V 2.2 kW and 3x200-240 V 2.2 kW - 3 kW and 3x380-500 V 5.5 kW - 7.5 kW, for ACOPOSinverter P84 3x200-240 V 1.5 kW - 2.2 kW and 3x380-480 V 5.5 kW - 7.5 kW
8I0MF001.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 0.37 kW - 1.5 kW and 3x380-480 V 0.75 kW - 2.2 kW

Optional accessories for 8I84T200220.01P-1 in 1-phase operation

8I0FT026.300-1	EMC filter 3-phase 26 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 2.2 kW - 4 kW and 3x380-480 V 3 kW - 4 kW
8I0BR060.000-1	Braking resistor 60 Ohm, continuous braking power 0.1 kW for ACOPOSinverter X64 1x200-240 V 2.2 kW and 3x200-240 V 2.2 kW - 3 kW and 3x380-500 V 5.5 kW - 7.5 kW, for ACOPOSinverter P84 3x200-240 V 1.5 kW - 2.2 kW and 3x380-480 V 5.5 kW - 7.5 kW
8I0MF002.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 2.2 kW - 4 kW and 3x380-480 V 3 kW - 4 kW



Motor power	8184T200300.01P-1	8184T200400.01P-1
Indicated on rating plate	2.2 kW 3 HP	3 kW -
Power mains connection	8184T200300.01P-1	8184T200400.01P-1¹⁾
Mains input voltage	1x 200 VAC - 15% to 240 VAC + 10%	1x 200 VAC - 15% to 240 VAC + 10%
Frequency	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%
Apparent power (at 240 VAC)	5.3 kVA	5.3 kVA
Max. prospective line I _{sc} (short circuit current at the connection point)	5 kA	5 kA
Line current ²⁾		
at 200 VAC	25.9 A	25.9 A ³⁾
at 240 VAC	22.1 A	22 A ³⁾
Dissipated power at nominal load and nominal switching frequency	154 W	191 W
Integrated EMC filter ⁴⁾	Yes	Yes
Conducted and radiated EMC emissions	8184T200300.01P-1	8184T200400.01P-1
With integrated filter		
Motor cable length according to IEC/EN 61800-3	-	-
Cat. C1 ¹⁾ Environment 1 (public network)	-	-
Cat. C2 ¹⁾ Environment 1 (public network)	-	-
Motor cable length according to IEC/EN 61800-3	≤ 10 m ²⁾ or ≤ 5 m ³⁾	≤ 10 m ²⁾ or ≤ 5 m ³⁾
Cat. C3 ¹⁾ Environment 2 (industrial network)		
With additional filter		
810FT026.300-1	810FT026.300-1	
Motor cable length according to IEC/EN 61800-3	≤ 50 m ²⁾ or ≤ 20 m ³⁾	≤ 50 m ²⁾ or ≤ 20 m ³⁾
Cat. C1 ¹⁾ Environment 1 (public network)		
Motor cable length according to IEC/EN 61800-3	≤ 100 m ²⁾ or ≤ 50 m ³⁾	≤ 100 m ²⁾ or ≤ 50 m ³⁾
Cat. C2 ¹⁾ Environment 1 (public network)		
Motor cable length according to IEC/EN 61800-3	-	-
Cat. C3 ¹⁾ Environment 2 (industrial network)		

1) For a shielded motor cable

2) At a switching frequency of 4 kHz

3) At a switching frequency from 4.1 to 16 kHz

ACOPOSinverter P84

1-phase 200-240V



Motor connector	8I84T200300.01P-1	8I84T200400.01P-1
Maximum continuous output current (I _n) ¹⁾ at 230 VAC	11 A	13.7 A
Reduction of continuous output current depending on the ambient temperature	No reduction (up to 50°C) At nominal switching frequency (4 kHz or 2.5 kHz for bigger drive ratings) Other switching frequencies See the derating curves in the Installation Manual, available on www.br-automation.com	
Reduction of continuous output current depending on altitude	1% per 100m Starting at 1000 m above sea level	
Maximum transient current for 60 s	16.5 A	20.6 A
Maximum transient current for 2 s	18.1 A	22.6 A
Output frequency range	0.5 to 1600 Hz	
Rated switching frequency	4 kHz	
Minimum	1 kHz	
Maximum	16 kHz	
Transient overtorque (typical value)	170% of the nominal motor torque (typical value at ± 10%) for 60 s 220% of the nominal motor torque (typical value at ± 10%) for 2 s	
Braking torque	Up to 150% of nominal motor torque 30% of nominal motor torque	
With braking resistor		
Without braking resistor (typical value)		
Motor control profiles	Flux Vector Control (FVC) with sensor (current vector) Sensorless Flux Vector Control (SFVC) (voltage or current vector) Voltage/frequency ratio (2 or 5 points) ENA (Energy Adaptation) System for unbalanced loads	
Asynchronous motor		
Synchronous motor	Vector control without speed feedback	
Maximum motor cable length ¹⁾	50 m 100 m	
Shielded cable		
Unshielded cable		
Main drive protection features	Thermal protection against overheating of the power stage Protection against: Short-circuits between motor phases, input phase breaks, overcurrents between output phases and earth, overvoltages on the DC bus, a break on the control circuit, exceeding the limit speed Safety function for: Line supply overvoltage and undervoltage, input phase loss in three-phase	
Motor protection	Thermal protection integrated in drive via continuous calculation of I ² t taking speed into account: - The motor thermal state is saved when the drive is powered down. - Function can be modified via operator dialogue terminals, depending on the type of motor (force-cooled or self-cooled). Protection against motor phase breaks Protection with PTC probes	
1) These values are given for nominal switching frequency.		
Braking chopper	8I84T200300.01P-1	8I84T200400.01P-1
Integrated dynamic brake transistors	Yes	Yes
Operating factor for the dynamic brake transistors	The dynamic brake transistor is sized so that it can tolerate: - The nominal motor power continuously - 150% of the nominal motor power for 60 s	
Minimum resistor value (external) ¹⁾	22 Ω	16 Ω

1) The minimum ohmic value is determined at a temperature of 20°C. In an environment where the temperature is below 20°C, make sure that the minimum ohmic value recommended in the table is observed.

24 VDC supply		
	8I84T200300.01P-1	8I84T200400.01P-1
Input voltage	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)
Power consumption	30 W	30 W
Available internal supplies		
	8I84T200300.01P-1	8I84T200400.01P-1
Output voltage	10.5 VDC ($\pm 5\%$)	10.5 VDC ($\pm 5\%$)
Max. output current	10 mA	10 mA
Output voltage	24 VDC (min. 21 V, max. 27 V)	24 VDC (min. 21 V, max. 27 V)
Max. output current	200 mA	200 mA
Digital inputs		
	8I84T200300.01P-1	8I84T200400.01P-1
Number of inputs ¹⁾	5	5
Input circuit	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC
Sampling time	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms
Input impedance	3.5 k Ω	3.5 k Ω
Electrical isolation		
Input - ACOPOSinverter	Yes	Yes
Input - Input	No	No
1) 1 logic input, switch-configurable as a logic input or as an input for PTC probes. Input for a maximum of 6 PTC probes mounted in series: Nominal value < 1.5 k Ω , trip resistance 3 k Ω , reset value 1.8 k Ω , short-circuit protection < 50 Ω		
Relay outputs		
	8I84T200300.01P-1	8I84T200400.01P-1
Number of outputs	2	2
Design		
Relay 1	1 N/O contact and 1 N/C contact with common point	1 N/O contact and 1 N/C contact with common point
Relay 2	1 N/O contact	1 N/O contact
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity		
Minimum	3 mA for 24 VDC	3 mA for 24 VDC
Maximum		
on resistive load ($\cos \phi = 1$ and L/R = 0 ms)	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC
on inductive load ($\cos \phi = 0.4$ and L/R = 7 ms)	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC
Response time (maximum)	< 7 ms \pm 0.5 ms	< 7 ms \pm 0.5 ms
Electrical isolation		
Output - ACOPOSinverter	Yes	Yes
Output - Output	No	No
Analog inputs		
	8I84T200300.01P-1	8I84T200400.01P-1
Number of inputs	2	2
Input		
Voltage	± 10 V	± 10 V
Voltage / Current	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	11 bit + 1 sign bit	11 bit + 1 sign bit
Sampling time	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms
Input impedance		
Voltage	30 k Ω	30 k Ω
Current	242 Ω	242 Ω
Electrical isolation		
Input - ACOPOSinverter	Yes	Yes
Input - Input	No	No

ACOPOSinverter P84

1-phase 200-240V

Analog outputs		
	8I84T200300.01P-1	8I84T200400.01P-1
Number of outputs	1	1
Output ¹⁾	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	10 bit	10 bit
Update time	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms
Min. load impedance		
Voltage	470 Ω	470 Ω
Current	500 Ω	500 Ω
Electrical isolation		
Output - ACOPOSinverter	Yes	Yes
Output - Output	No	No
1) The current output can be configured as a 24 V logic output, max. 20 mA, min. load impedance 1.2 kΩ		
Safety input power removal		
	8I84T200300.01P-1	8I84T200400.01P-1
Number of inputs	1	1
Input circuit	Sink	Sink
Rated voltage	24 VDC	24 VDC
Response time	≤ 100 ms	≤ 100 ms
Switching threshold		
LOW	< 5 V	< 5 V
HIGH	> 15 V	> 15 V
Input impedance	1.5 kΩ	1.5 kΩ
Electrical isolation		
Input - ACOPOSinverter	Yes	Yes
Input - Input	No	No
Operational conditions		
	8I84T200300.01P-1	8I84T200400.01P-1
Ambient temperature	-10 to +50°C	-10 to +50°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 3000 m	Up to 3000 m
Operating position		
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C1 and 3S2	Class 3C1 and 3S2
Degree of protection	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)
1) With derating and removing the protective cover on top of the drive. See the possible mounting types and derating curves in the Installation Manual, available on www.br-automation.com .		
2) From 1000 m to 3000 m current derating of 1% per 100 m.		
Storage conditions		
	8I84T200300.01P-1	8I84T200400.01P-1
Storage temperature	-25 to +70°C	-25 to +70°C
Mechanical characteristics		
	8I84T200300.01P-1	8I84T200400.01P-1
Dimensions		
Width	155 mm	155 mm
Height	260 mm	260 mm
Depth	187 mm	187 mm
Weight	4 kg	4 kg

Optional accessories for 8I84T200300.01P-1 in 1-phase operation

8IOFT026.300-1	EMC filter 3-phase 26 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 2.2 kW - 4 kW and 3x380-480 V 3 kW - 4 kW
8IOBR028.000-1	Braking resistor 28 Ohm, continuous braking power 0.2 kW for ACOPOSinverter X64 3x200-240 V 4 kW and 3x380-500 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 3 kW - 4 kW and 3x380-480 V 11 kW - 15 kW
8IOMF002.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 2.2 kW - 4 kW and 3x380-480 V 3 kW - 4 kW

Required accessories for 8I84T200400.01P-1 in 1-phase operation

8IOCS025.000-1	Line choke 1-phase 25 A, for ACOPOSinverter P84 1x200-240 V 3 kW
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Optional accessories for 8I84T200400.01P-1 in 1-phase operation

8IOFT026.300-1	EMC filter 3-phase 26 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 2.2 kW - 4 kW and 3x380-480 V 3 kW - 4 kW
8IOBR028.000-1	Braking resistor 28 Ohm, continuous braking power 0.2 kW for ACOPOSinverter X64 3x200-240 V 4 kW and 3x380-500 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 3 kW - 4 kW and 3x380-480 V 11 kW - 15 kW
8IOMF002.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 2.2 kW - 4 kW and 3x380-480 V 3 kW - 4 kW

ACOPOSinverter P84

1-phase 200-240V



Motor power	8184T200550.01P-1	8184T200750.01P-1
Indicated on rating plate	4 kW 5 HP	5.5 kW 7.5 HP
Power mains connection	8184T200550.01P-1 ¹⁾	8184T200750.01P-1 ¹⁾
Mains input voltage	1x 200 VAC - 15% to 240 VAC + 10%	1x 200 VAC - 15% to 240 VAC + 10%
Frequency	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%
Apparent power (at 240 VAC)	7 kVA	9.5 kVA
Max. prospective line I _{sc} (short circuit current at the connection point)	5 kA	22 kA
Line current ²⁾		
at 200 VAC	34.9 A ³⁾	47.3 A ³⁾
at 240 VAC	29.9 A ³⁾	40.1 A ³⁾
Dissipated power at nominal load and nominal switching frequency	293 W	363 W
Integrated EMC filter ⁴⁾	Yes	Yes
Conducted and radiated EMC emissions	8184T200550.01P-1	8184T200750.01P-1
With integrated filter		
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	-	-
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	-	-
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	≤ 10 m ²⁾ or ≤ 5 m ³⁾	≤ 10 m ²⁾ or ≤ 5 m ³⁾
With additional filter		
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	≤ 50 m ²⁾ or ≤ 20 m ³⁾	≤ 50 m ²⁾ or ≤ 20 m ³⁾
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	≤ 100 m ²⁾ or ≤ 50 m ³⁾	≤ 100 m ²⁾ or ≤ 50 m ³⁾
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	-	-

1) For a shielded motor cable

2) At a switching frequency of 4 kHz

3) At a switching frequency from 4.1 to 16 kHz

Motor connector	8I84T200550.01P-1	8I84T200750.01P-1
Maximum continuous output current (In) ¹⁾ at 230 VAC	17.5 A	27.5 A
Reduction of continuous output current depending on the ambient temperature		
At nominal switching frequency (4 kHz or 2.5 kHz for bigger drive ratings)	No reduction (up to 50°C)	No reduction (up to 50 °C)
Other switching frequencies	See the derating curves in the Installation Manual, available on www.br-automation.com	
Reduction of continuous output current depending on altitude		
Starting at 1000 m above sea level	1% per 100m	1% per 100m
Maximum transient current for 60 s	26.3 A	41.3 A
Maximum transient current for 2 s	28.8 A	45.3 A
Output frequency range	0.5 to 1600 Hz	0.5 to 1600 Hz
Rated switching frequency	4 kHz	4 kHz
Minimum	1 kHz	1 kHz
Maximum	16 kHz	16 kHz
Transient overtorque (typical value)	170% of the nominal motor torque (typical value at ± 10%) for 60 s 220% of the nominal motor torque (typical value at ± 10%) for 2 s	
Braking torque		
With braking resistor	Up to 150% of nominal motor torque	
Without braking resistor (typical value)	30% of nominal motor torque	
Motor control profiles		
Asynchronous motor	Flux Vector Control (FVC) with sensor (current vector) Sensorless Flux Vector Control (SFVC) (voltage or current vector) Voltage/frequency ratio (2 or 5 points) ENA (Energy Adaptation) System for unbalanced loads	
Synchronous motor	Vector control without speed feedback	
Maximum motor cable length ¹⁾		
Shielded cable	50 m	50 m
Unshielded cable	100 m	100 m
Main drive protection features	Thermal protection against overheating of the power stage Protection against: Short-circuits between motor phases, input phase breaks, overcurrents between output phases and earth, overvoltages on the DC bus, a break on the control circuit, exceeding the limit speed Safety function for: Line supply overvoltage and undervoltage, input phase loss in three-phase	
Motor protection	Thermal protection integrated in drive via continuous calculation of I ² t taking speed into account: - The motor thermal state is saved when the drive is powered down. - Function can be modified via operator dialogue terminals, depending on the type of motor (force-cooled or self-cooled). Protection against motor phase breaks Protection with PTC probes	

1) These values are given for nominal switching frequency.



Braking chopper	8I84T200550.01P-1	8I84T200750.01P-1
Integrated dynamic brake transistors	Yes	Yes
Operating factor for the dynamic brake transistors	The dynamic brake transistor is sized so that it can tolerate: - The nominal motor power continuously - 150% of the nominal motor power for 60 s	
Minimum resistor value (external) ¹⁾	11 Ω	8 Ω

1) The minimum ohmic value is determined at a temperature of 20°C. In an environment where the temperature is below 20°C, make sure that the minimum ohmic value recommended in the table is observed.

ACOPOSinverter P84

1-phase 200-240V

24 VDC supply		
Input voltage	8184T200550.01P-1 24 VDC (min. 19 V, max. 30 V)	8184T200750.01P-1 24 VDC (min. 19 V, max. 30 V)
Power consumption	30 W	30 W
Available internal supplies		
Output voltage	8184T200550.01P-1 10.5 VDC ($\pm 5\%$)	8184T200750.01P-1 10.5 VDC ($\pm 5\%$)
Max. output current	10 mA	10 mA
Output voltage	24 VDC (min. 21 V, max. 27 V)	24 VDC (min. 21 V, max. 27 V)
Max. output current	200 mA	200 mA
Digital inputs		
Number of inputs ¹⁾	5	5
Input circuit	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC
Sampling time	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms
Input impedance	3.5 k Ω	3.5 k Ω
Electrical isolation		
Input - ACOPOSinverter	Yes	Yes
Input - Input	No	No
1) 1 logic input, switch-configurable as a logic input or as an input for PTC probes. Input for a maximum of 6 PTC probes mounted in series: Nominal value < 1.5 k Ω , trip resistance 3 k Ω , reset value 1.8 k Ω , short-circuit protection < 50 Ω		
Relay outputs		
Number of outputs	2	2
Design		
Relay 1	1 N/O contact and 1 N/C contact with common point	1 N/O contact and 1 N/C contact with common point
Relay 2	1 N/O contact	1 N/O contact
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity		
Minimum	3 mA for 24 VDC	3 mA for 24 VDC
Maximum		
on resistive load ($\cos \phi = 1$ and L/R = 0 ms)	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC
on inductive load ($\cos \phi = 0.4$ and L/R = 7 ms)	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC
Response time (maximum)	< 7 ms \pm 0.5 ms	< 7 ms \pm 0.5 ms
Electrical isolation		
Output - ACOPOSinverter	Yes	Yes
Output - Output	No	No
Analog inputs		
Number of inputs	2	2
Input		
Voltage	± 10 V	± 10 V
Voltage / Current	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	11 bit + 1 sign bit	11 bit + 1 sign bit
Sampling time	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms
Input impedance		
Voltage	30 k Ω	30 k Ω
Current	242 Ω	242 Ω
Electrical isolation		
Input - ACOPOSinverter	Yes	Yes
Input - Input	No	No

Analog outputs		
	8I84T200550.01P-1	8I84T200750.01P-1
Number of outputs	1	1
Output ¹⁾	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	10 bit	10 bit
Update time	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms
Min. load impedance		
Voltage	470 Ω	470 Ω
Current	500 Ω	500 Ω
Electrical isolation		
Output - ACOPOSinverter	Yes	Yes
Output - Output	No	No
1) The current output can be configured as a 24 V logic output, max. 20 mA, min. load impedance 1.2 kΩ		
Safety input power removal		
	8I84T200550.01P-1	8I84T200750.01P-1
Number of inputs	1	1
Input circuit	Sink	Sink
Rated voltage	24 VDC	24 VDC
Response time	≤ 100 ms	≤ 100 ms
Switching threshold		
LOW	< 5 V	< 5 V
HIGH	> 15 V	> 15 V
Input impedance	1.5 kΩ	1.5 kΩ
Electrical isolation		
Input - ACOPOSinverter	Yes	Yes
Input - Input	No	No
Operational conditions		
	8I84T200550.01P-1	8I84T200750.01P-1
Ambient temperature	-10 to +50°C	-10 to +50°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 3000 m	Up to 3000 m
Operating position		
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C1 and 3S2	Class 3C1 and 3S2
Degree of protection	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)
1) With derating and removing the protective cover on top of the drive. See the possible mounting types and derating curves in the Installation Manual, available on www.br-automation.com .		
2) From 1000 m to 3000 m current derating of 1% per 100 m.		
Storage conditions		
	8I84T200550.01P-1	8I84T200750.01P-1
Storage temperature	-25 to +70°C	-25 to +70°C
Mechanical characteristics		
	8I84T200550.01P-1	8I84T200750.01P-1
Dimensions		
Width	175 mm	210 mm
Height	295 mm	295 mm
Depth	187 mm	213 mm
Weight	5.5 kg	7 kg

ACOPOSinverter P84

1-phase 200-240V

Required accessories for 8I84T200550.01P-1 in 1-phase operation

8I0CS045.000-1	Line choke 1-phase 45 A, for ACOPOSinverter P84 1x200-240 V 4 kW - 5.5 kW
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Optional accessories for 8I84T200550.01P-1 in 1-phase operation

8I0FT035.300-1	EMC filter 3-phase 35 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 5.5 kW and 3x380-480 V 5.5 kW - 7.5 kW
8I0BR015.000-1	Braking resistor 15 Ohm, continuous braking power 1kW for ACOPOSinverter X64 3x200-240 V 5.5 kW - 7.5 kW, for ACOPOSinverter P84 3x200-240 V 5.5 kW - 7.5 kW and 3x380-480 V 18.5 kW - 30 kW
8I0MF003.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 5.5 kW and 3x380-480 V 5.5 kW - 7.5 kW

Required accessories for 8I84T200750.01P-1 in 1-phase operation

8I0CS045.000-1	Line choke 1-phase 45 A, for ACOPOSinverter P84 1x200-240 V 4 kW - 5.5 kW
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Optional accessories for 8I84T200750.01P-1 in 1-phase operation

8I0FT046.300-1	EMC filter 3-phase 46 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 7.5 kW and 3x380-480 V 11 kW
8I0BR015.000-1	Braking resistor 15 Ohm, continuous braking power 1kW for ACOPOSinverter X64 3x200-240 V 5.5 kW - 7.5 kW, for ACOPOSinverter P84 3x200-240 V 5.5 kW - 7.5 kW and 3x380-480 V 18.5 kW - 30 kW
8I0MF004.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 7.5 kW and 3x380-480 V 11 kW

ACOPOSinverter P84

3-phase 200-240V



Motor power	8I84T200037.01P-1	8I84T200075.01P-1	8I84T200150.01P-1
Indicated on rating plate	0.37 kW 0.5 HP	0.75 kW 1 HP	1.5 kW 2 HP
Power mains connection	8I84T200037.01P-1	8I84T200075.01P-1	8I84T200150.01P-1
Mains input voltage	3x 200 VAC - 15% to 240 VAC + 10%	3x 200 VAC - 15% to 240 VAC + 10%	3x 200 VAC - 15% to 240 VAC + 10%
Frequency	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%
Apparent power (at 240 VAC)	1.3 kVA	2.2 kVA	4 kVA
Max. prospective line I _{sc} (short circuit current at the connection point)	5 kA	5 kA	5 kA
Line current ¹⁾			
at 200 VAC	3.5 A	6.1 A	11.3 A
at 240 VAC	3.1 A	5.3 A	9.6 A
Max. line current with optional line choke at 230 VAC	1.6 A	3.0 A	5.8 A
Dissipated power at nominal load and nominal switching frequency	46 W	66 W	101 W
Integrated EMC filter ²⁾	Yes	Yes	Yes

1) Typical value for the indicated motor power and for the maximum prospective line I_{sc}.

2) EMC plate delivered with the drive.

Conducted and radiated EMC emissions	8I84T200037.01P-1	8I84T200075.01P-1	8I84T200150.01P-1
With integrated filter			
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	-	-	-
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	≤ 10 m ²⁾ or ≤ 5 m ³⁾	≤ 10 m ²⁾ or ≤ 5 m ³⁾	≤ 10 m ²⁾ or ≤ 5 m ³⁾
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	-	-	-
With additional filter			
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	8I0FT012.300-1 ≤ 50 m ²⁾ or ≤ 20 m ³⁾	8I0FT012.300-1 ≤ 50 m ²⁾ or ≤ 20 m ³⁾	8I0FT012.300-1 ≤ 50 m ²⁾ or ≤ 20 m ³⁾
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	≤ 100 m ²⁾ or ≤ 50 m ³⁾	or ≤ 50 m ³⁾	or ≤ 50 m ³⁾
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	-	-	-

1) For a shielded motor cable

2) At a switching frequency of 4 kHz

3) At a switching frequency from 4.1 to 16 kHz

ACOPOSinverter P84

3-phase 200-240V




Motor connector	8I84T200037.01P-1	8I84T200075.01P-1	8I84T200150.01P-1
Maximum continuous output current (I _n) ¹⁾ at 230 VAC	3 A	4.8 A	8 A
Reduction of continuous output current depending on the ambient temperature			
At nominal switching frequency (4 kHz or 2.5 kHz for bigger drive ratings)	No reduction (up to 50°C)	No reduction (up to 50°C)	No reduction (up to 50°C)
Other switching frequencies	See the derating curves in the Installation Manual, available on www.br-automation.com		
Reduction of continuous output current depending on altitude			
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	4.5 A	7.2 A	12 A
Maximum transient current for 2 s	4.9 A	7.9 A	13.2 A
Output frequency range	0.5 to 1600 Hz	0.5 to 1600 Hz	0.5 to 1600 Hz
Rated switching frequency	4 kHz	4 kHz	4 kHz
Minimum	1 kHz	1 kHz	1 kHz
Maximum	16 kHz	16 kHz	16 kHz
Transient overtorque (typical value)		170% of the nominal motor torque (typical value at ± 10%) for 60 s 220% of the nominal motor torque (typical value at ± 10%) for 2 s	
Braking torque			
With braking resistor		Up to 150% of nominal motor torque	
Without braking resistor (typical value)		30% of nominal motor torque	
Motor control profiles			
Asynchronous motor		Flux Vector Control (FVC) with sensor (current vector) Sensorless Flux Vector Control (SFVC) (voltage or current vector) Voltage/frequency ratio (2 or 5 points)	
Synchronous motor		ENA (Energy Adaptation) System for unbalanced loads Vector control without speed feedback	
Maximum motor cable length ¹⁾			
Shielded cable	50 m	50 m	50 m
Unshielded cable	100 m	100 m	100 m
Main drive protection features		Thermal protection against overheating of the power stage Protection against: Short-circuits between motor phases, input phase breaks, overcurrents between output phases and earth, overvoltages on the DC bus, a break on the control circuit, exceeding the limit speed Safety function for: Line supply overvoltage and undervoltage, input phase loss in three-phase	
Motor protection		Thermal protection integrated in drive via continuous calculation of I ² t taking speed into account: - The motor thermal state is saved when the drive is powered down. - Function can be modified via operator dialogue terminals, depending on the type of motor (force-cooled or self-cooled). Protection against motor phase breaks	
1) These values are given for nominal switching frequency.			
Braking chopper	8I84T200037.01P-1	8I84T200075.01P-1	8I84T200150.01P-1
Integrated dynamic brake transistors	Yes	Yes	Yes
Operating factor for the dynamic brake transistors		The dynamic brake transistor is sized so that it can tolerate: - The nominal motor power continuously - 150% of the nominal motor power for 60 s	
Minimum resistor value (external) ¹⁾	44 Ω	44 Ω	33 Ω

1) The minimum ohmic value is determined at a temperature of 20°C. In an environment where the temperature is below 20°C, make sure that the minimum ohmic value recommended in the table is observed.

24 VDC supply	8I84T200037.01P-1	8I84T200075.01P-1	8I84T200150.01P-1
Input voltage	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)
Power consumption	30 W	30 W	30 W
Available internal supplies	8I84T200037.01P-1	8I84T200075.01P-1	8I84T200150.01P-1
Output voltage	10.5 VDC ($\pm 5\%$)	10.5 VDC ($\pm 5\%$)	10.5 VDC ($\pm 5\%$)
Max. output current	10 mA	10 mA	10 mA
Output voltage	24 VDC (min. 21 V, max. 27 V)	24 VDC (min. 21 V, max. 27 V)	24 VDC (min. 21 V, max. 27 V)
Max. output current	200 mA	200 mA	200 mA
Digital inputs	8I84T200037.01P-1	8I84T200075.01P-1	8I84T200150.01P-1
Number of inputs ¹⁾	5	5	5
Input circuit	Source or Sink	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Sampling time	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms
Input impedance	3.5 k Ω	3.5 k Ω	3.5 k Ω
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
1) 1 logic input, switch-configurable as a logic input or as an input for PTC probes. Input for a maximum of 6 PTC probes mounted in series: Nominal value < 1.5 k Ω , trip resistance 3 k Ω , reset value 1.8 k Ω , short-circuit protection < 50 Ω			
Relay outputs	8I84T200037.01P-1	8I84T200075.01P-1	8I84T200150.01P-1
Number of outputs	2	2	2
Design			
Relay 1	1 N/O contact and 1 N/C contact with common point	1 N/O contact and 1 N/C contact with common point	1 N/O contact and 1 N/C contact with common point
Relay 2	1 N/O contact	1 N/O contact	1 N/O contact
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity			
Minimum	3 mA for 24 VDC	3 mA for 24 VDC	3 mA for 24 VDC
Maximum			
on resistive load ($\cos \phi = 1$ and L/R = 0 ms)	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC
on inductive load ($\cos \phi = 0.4$ and L/R = 7 ms)	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC
Response time (maximum)	< 7 ms \pm 0.5 ms	< 7 ms \pm 0.5 ms	< 7 ms \pm 0.5 ms
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No
Analog inputs	8I84T200037.01P-1	8I84T200075.01P-1	8I84T200150.01P-1
Number of inputs	2	2	2
Input			
Voltage	± 10 V	± 10 V	± 10 V
Voltage / Current	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	11 bit + 1 sign bit	11 bit + 1 sign bit	11 bit + 1 sign bit
Sampling time	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms
Input impedance			
Voltage	30 k Ω	30 k Ω	30 k Ω
Current	242 Ω	242 Ω	242 Ω
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No

ACOPOSinverter P84

3-phase 200-240V

Analog outputs			
Number of outputs	8184T200037.01P-1	8184T200075.01P-1	8184T200150.01P-1
Number of outputs	1	1	1
Output ¹⁾	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	10 bit	10 bit	10 bit
Update time	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms
Min. load impedance			
Voltage	470 Ω	470 Ω	470 Ω
Current	500 Ω	500 Ω	500 Ω
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No
1) The current output can be configured as a 24 V logic output, max. 20 mA, min. load impedance 1.2 kΩ			
Safety input power removal			
Number of inputs	8184T200037.01P-1	8184T200075.01P-1	8184T200150.01P-1
Number of inputs	1	1	1
Input circuit	Sink	Sink	Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Response time	≤ 100 ms	≤ 100 ms	≤ 100 ms
Switching threshold			
LOW	< 5 V	< 5 V	< 5 V
HIGH	> 15 V	> 15 V	> 15 V
Input impedance	1.5 kΩ	1.5 kΩ	1.5 kΩ
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
Operational conditions			
Ambient temperature	8184T200037.01P-1	8184T200075.01P-1	8184T200150.01P-1
Ambient temperature	-10 to +50°C	-10 to +50°C	-10 to +50°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 3000 m	Up to 3000 m	Up to 3000 m
Operating position			
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C1 and 3S2	Class 3C1 and 3S2	Class 3C1 and 3S2
Degree of protection	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)
1) With derating and removing the protective cover on top of the drive. See the possible mounting types and derating curves in the Installation Manual, available on www.br-automation.com .			
2) From 1000 m to 3000 m current derating of 1% per 100 m.			
Storage conditions			
Storage temperature	8184T200037.01P-1	8184T200075.01P-1	8184T200150.01P-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Mechanical characteristics			
Dimensions	8184T200037.01P-1	8184T200075.01P-1	8184T200150.01P-1
Width	130 mm	130 mm	130 mm
Height	230 mm	230 mm	230 mm
Depth	175 mm	175 mm	175 mm
Weight	3 kg	3 kg	3 kg

Optional accessories for 8I84T200037.01P-1

8IOFT012.300-1	EMC filter 3-phase 12 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 0.37 kW - 1.5 kW and 3x380-480 V 0.75 kW - 2.2 kW
8IOCT004.000-1	Line choke 3-phase 4 A for ACOPOSinverter X64 3x200-240 V 0.18 kW - 0.75 kW and 3x380-500 V 0.37 kW - 1.5 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 1.5 kW
8IOBR100.000-1	Braking resistor 100 Ohm, continuous braking power 0.05 kW for ACOPOSinverter X64 1x200-240 V 0.18 kW 1.5 kW and 3x200-240 V 0.18 kW - 1.5 kW and 3x380-500 V 0.37 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 4 kW
8IOMF001.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 0.37 kW - 1.5 kW and 3x380-480 V 0.75 kW - 2.2 kW

Optional accessories for 8I84T200075.01P-1

8IOFT012.300-1	EMC filter 3-phase 12 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 0.37 kW - 1.5 kW and 3x380-480 V 0.75 kW - 2.2 kW
8IOCT004.000-1	Line choke 3-phase 4 A for ACOPOSinverter X64 3x200-240 V 0.18 kW - 0.75 kW and 3x380-500 V 0.37 kW - 1.5 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 1.5 kW
8IOBR100.000-1	Braking resistor 100 Ohm, continuous braking power 0.05 kW for ACOPOSinverter X64 1x200-240 V 0.18 kW 1.5 kW and 3x200-240 V 0.18 kW - 1.5 kW and 3x380-500 V 0.37 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 4 kW
8IOMF001.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 0.37 kW - 1.5 kW and 3x380-480 V 0.75 kW - 2.2 kW

Optional accessories for 8I84T200150.01P-1

8IOFT012.300-1	EMC filter 3-phase 12 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 0.37 kW - 1.5 kW and 3x380-480 V 0.75 kW - 2.2 kW
8IOCT010.000-1	Line choke 3-phase 10 A for ACOPOSinverter X64 3x200-240 V 1.1 kW - 1.5 kW and 3x380-500 V 2.2 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 1.5 kW - 2.2 kW and 3x380-480 V 2.2 kW - 4 kW
8IOBR060.000-1	Braking resistor 60 Ohm, continuous braking power 0.1 kW for ACOPOSinverter X64 1x200-240 V 2.2 kW and 3x200-240 V 2.2 kW - 3 kW and 3x380-500 V 5.5 kW - 7.5 kW, for ACOPOSinverter P84 3x200-240 V 1.5 kW - 2.2 kW and 3x380-480 V 5.5 kW - 7.5 kW
8IOMF001.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 0.37 kW - 1.5 kW and 3x380-480 V 0.75 kW - 2.2 kW

ACOPOSinverter P84

3-phase 200-240V



Motor power	8184T200220.01P-1	8184T200300.01P-1	8184T200400.01P-1
Indicated on rating plate	2.2 kW 3 HP	3 kW -	4 kW 5 HP
Power mains connection	8184T200220.01P-1	8184T200300.01P-1	8184T200400.01P-1
Mains input voltage	3x 200 VAC - 15% to 240 VAC + 10%	3x 200 VAC - 15% to 240 VAC + 10%	3x 200 VAC - 15% to 240 VAC + 10%
Frequency	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%
Apparent power (at 240 VAC)	5.3 kVA	6.8 kVA	9.5 kVA
Max. prospective line I _{sc} (short circuit current at the connection point)	5 kA	5 kA	5 kA
Line current ¹⁾			
at 200 VAC	15 A	19.3 A	25.8 A
at 240 VAC	12.8 A	16.4 A	22.9 A
Max. line current with optional line choke at 230 VAC	8.3 A	11.0 A	14.6 A
Dissipated power at nominal load and nominal switching frequency	122 W	154 W	191 W
Integrated EMC filter ²⁾	Yes	Yes	Yes

1) Typical value for the indicated motor power and for the maximum prospective line I_{sc}.

2) EMC plate delivered with the drive.

Conducted and radiated EMC emissions	8184T200220.01P-1	8184T200300.01P-1	8184T200400.01P-1
With integrated filter			
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	-	-	-
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	≤ 10 m ²⁾ or ≤ 5 m ³⁾	-	-
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	-	≤ 10 m ²⁾ or ≤ 5 m ³⁾	≤ 10 m ²⁾ or ≤ 5 m ³⁾
With additional filter			
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	810FT026.300-1 ≤ 50 m ²⁾ or ≤ 20 m ³⁾	810FT026.300-1 ≤ 50 m ²⁾ or ≤ 20 m ³⁾	810FT026.300-1 ≤ 50 m ²⁾ or ≤ 20 m ³⁾
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	≤ 100 m ²⁾ or ≤ 50 m ³⁾	≤ 100 m ²⁾ or ≤ 50 m ³⁾	≤ 100 m ²⁾ or ≤ 50 m ³⁾
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	-	-	-

1) For a shielded motor cable

2) At a switching frequency of 4 kHz

3) At a switching frequency from 4.1 to 16 kHz




Motor connector	8I84T200220.01P-1	8I84T200300.01P-1	8I84T200400.01P-1
Maximum continuous output current (I _n) ¹⁾ at 230 VAC	11 A	13.7 A	17.5 A
Reduction of continuous output current depending on the ambient temperature	See the derating curves in the Installation Manual, available on www.br-automation.com		
At nominal switching frequency (4 kHz or 2.5 kHz for bigger drive ratings)	No reduction (up to 50°C)	No reduction (up to 50°C)	No reduction (up to 50°C)
Other switching frequencies	See the derating curves in the Installation Manual, available on www.br-automation.com		
Reduction of continuous output current depending on altitude			
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	16.5 A	20.6 A	26.3 A
Maximum transient current for 2 s	18.1 A	22.6 A	28.8 A
Output frequency range	0.5 to 1600 Hz	0.5 to 1600 Hz	0.5 to 1600 Hz
Rated switching frequency	4 kHz	4 kHz	4 kHz
Minimum	1 kHz	1 kHz	1 kHz
Maximum	16 kHz	16 kHz	16 kHz
Transient overtorque (typical value)	170% of the nominal motor torque (typical value at ± 10%) for 60 s 220% of the nominal motor torque (typical value at ± 10%) for 2 s		
Braking torque			
With braking resistor	Up to 150% of nominal motor torque		
Without braking resistor (typical value)	30% of nominal motor torque		
Motor control profiles			
Asynchronous motor	Flux Vector Control (FVC) with sensor (current vector) Sensorless Flux Vector Control (SFVC) (voltage or current vector) Voltage/frequency ratio (2 or 5 points) ENA (Energy Adaptation) System for unbalanced loads		
Synchronous motor	Vector control without speed feedback		
Maximum motor cable length ¹⁾			
Shielded cable	50 m	50 m	50 m
Unshielded cable	100 m	100 m	100 m
Main drive protection features	Thermal protection against overheating of the power stage Protection against: Short-circuits between motor phases, input phase breaks, overcurrents between output phases and earth, overvoltages on the DC bus, a break on the control circuit, exceeding the limit speed Safety function for: Line supply overvoltage and undervoltage, input phase loss in three-phase		
Motor protection	Thermal protection integrated in drive via continuous calculation of I ² t taking speed into account: - The motor thermal state is saved when the drive is powered down. - Function can be modified via operator dialogue terminals, depending on the type of motor (force-cooled or self-cooled). Protection against motor phase breaks		
1) These values are given for nominal switching frequency.			
Braking chopper	8I84T200220.01P-1	8I84T200300.01P-1	8I84T200400.01P-1
Integrated dynamic brake transistors	Yes	Yes	Yes
Operating factor for the dynamic brake transistors	The dynamic brake transistor is sized so that it can tolerate: - The nominal motor power continuously - 150% of the nominal motor power for 60 s		
Minimum resistor value (external) ¹⁾	22 Ω	22 Ω	16 Ω

1) The minimum ohmic value is determined at a temperature of 20°C. In an environment where the temperature is below 20°C, make sure that the minimum ohmic value recommended in the table is observed.

ACOPOSinverter P84

3-phase 200-240V

24 VDC supply	8184T200220.01P-1	8184T200300.01P-1	8184T200400.01P-1
Input voltage	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)
Power consumption	30 W	30 W	30 W
Available internal supplies	8184T200220.01P-1	8184T200300.01P-1	8184T200400.01P-1
Output voltage	10.5 VDC ($\pm 5\%$)	10.5 VDC ($\pm 5\%$)	10.5 VDC ($\pm 5\%$)
Max. output current	10 mA	10 mA	10 mA
Output voltage	24 VDC (min. 21 V, max. 27 V)	24 VDC (min. 21 V, max. 27 V)	24 VDC (min. 21 V, max. 27 V)
Max. output current	200 mA	200 mA	200 mA
Digital inputs	8184T200220.01P-1	8184T200300.01P-1	8184T200400.01P-1
Number of inputs ¹⁾	5	5	5
Input circuit	Source or Sink	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Sampling time	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms
Input impedance	3.5 k Ω	3.5 k Ω	3.5 k Ω
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
1) 1 logic input, switch-configurable as a logic input or as an input for PTC probes. Input for a maximum of 6 PTC probes mounted in series: Nominal value < 1.5 k Ω , trip resistance 3 k Ω , reset value 1.8 k Ω , short-circuit protection < 50 Ω			
Relay outputs	8184T200220.01P-1	8184T200300.01P-1	8184T200400.01P-1
Number of outputs	2	2	2
Design			
Relay 1	1 N/O contact and 1 N/C contact with common point	1 N/O contact and 1 N/C contact with common point	1 N/O contact and 1 N/C contact with common point
Relay 2	1 N/O contact	1 N/O contact	1 N/O contact
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity			
Minimum	3 mA for 24 VDC	3 mA for 24 VDC	3 mA for 24 VDC
Maximum			
on resistive load ($\cos \phi = 1$ and L/R = 0 ms)	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC
on inductive load ($\cos \phi = 0.4$ and L/R = 7 ms)	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC
Response time (maximum)	< 7 ms \pm 0.5 ms	< 7 ms \pm 0.5 ms	< 7 ms \pm 0.5 ms
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No
Analog inputs	8184T200220.01P-1	8184T200300.01P-1	8184T200400.01P-1
Number of inputs	2	2	2
Input			
Voltage	± 10 V	± 10 V	± 10 V
Voltage / Current	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	11 bit + 1 sign bit	11 bit + 1 sign bit	11 bit + 1 sign bit
Sampling time	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms
Input impedance			
Voltage	30 k Ω	30 k Ω	30 k Ω
Current	242 Ω	242 Ω	242 Ω
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No

Analog outputs	8I84T200220.01P-1	8I84T200300.01P-1	8I84T200400.01P-1
Number of outputs	1	1	1
Output ¹⁾	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	10 bit	10 bit	10 bit
Update time	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms
Min. load impedance			
Voltage	470 Ω	470 Ω	470 Ω
Current	500 Ω	500 Ω	500 Ω
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No
1) The current output can be configured as a 24 V logic output, max. 20 mA, min. load impedance 1.2 kΩ			
Safety input power removal	8I84T200220.01P-1	8I84T200300.01P-1	8I84T200400.01P-1
Number of inputs	1	1	1
Input circuit	Sink	Sink	Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Response time	≤ 100 ms	≤ 100 ms	≤ 100 ms
Switching threshold			
LOW	< 5 V	< 5 V	< 5 V
HIGH	> 15 V	> 15 V	> 15 V
Input impedance	1.5 kΩ	1.5 kΩ	1.5 kΩ
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
Operational conditions	8I84T200220.01P-1	8I84T200300.01P-1	8I84T200400.01P-1
Ambient temperature	-10 to +50°C	-10 to +50°C	-10 to +50°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 3000 m	Up to 3000 m	Up to 3000 m
Operating position			
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C1 and 3S2	Class 3C1 and 3S2	Class 3C1 and 3S2
Degree of protection	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)
1) With derating and removing the protective cover on top of the drive. See the possible mounting types and derating curves in the Installation Manual, available on www.br-automation.com .			
2) From 1000 m to 3000 m current derating of 1% per 100 m.			
Storage conditions	8I84T200220.01P-1	8I84T200300.01P-1	8I84T200400.01P-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Mechanical characteristics	8I84T200220.01P-1	8I84T200300.01P-1	8I84T200400.01P-1
Dimensions			
Width	130 mm	155 mm	155 mm
Height	230 mm	260 mm	260 mm
Depth	175 mm	187 mm	187 mm
Weight	3 kg	4 kg	4 kg

ACOPOSinverter P84

3-phase 200-240V

Optional accessories for 8184T200220.01P-1

810FT026.300-1	EMC filter 3-phase 26 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 2.2 kW - 4 kW and 3x380-480 V 3 kW - 4 kW
810CT010.000-1	Line choke 3-phase 10 A for ACOPOSinverter X64 3x200-240 V 1.1 kW - 1.5 kW and 3x380-500 V 2.2 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 1.5 kW - 2.2 kW and 3x380-480 V 2.2 kW - 4 kW
810BR060.000-1	Braking resistor 60 Ohm, continuous braking power 0.1 kW for ACOPOSinverter X64 1x200-240 V 2.2 kW and 3x200-240 V 2.2 kW - 3 kW and 3x380-500 V 5.5 kW - 7.5 kW, for ACOPOSinverter P84 3x200-240 V 1.5 kW - 2.2 kW and 3x380-480 V 5.5 kW - 7.5 kW
810MF002.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 2.2 kW - 4 kW and 3x380-480 V 3 kW - 4 kW

Optional accessories for 8184T200300.01P-1

810FT026.300-1	EMC filter 3-phase 26 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 2.2 kW - 4 kW and 3x380-480 V 3 kW - 4 kW
810CT016.000-1	Line choke 3-phase 16 A for ACOPOSinverter X64 3x200-240 V 2.2 kW - 3 kW and 3x380-500 V 5.5 kW - 7.5 kW, for ACOPOSinverter P84 3x200-240 V 3 kW and 3x380-480 V 5.5 kW - 7.5 kW
810BR028.000-1	Braking resistor 28 Ohm, continuous braking power 0.2 kW for ACOPOSinverter X64 3x200-240 V 4 kW and 3x380-500 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 3 kW - 4 kW and 3x380-480 V 11 kW - 15 kW
810MF002.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 2.2 kW - 4 kW and 3x380-480 V 3 kW - 4 kW

Optional accessories for 8184T200400.01P-1

810FT026.300-1	EMC filter 3-phase 26 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 2.2 kW - 4 kW and 3x380-480 V 3 kW - 4 kW
810CT030.000-1	Line choke 3-phase 30 A for ACOPOSinverter X64 3x200-240 V 4 kW - 7.5 kW and 3x380-500 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 4 kW - 5.5 kW and 3x380-480 V 11 kW - 15 kW
810BR028.000-1	Braking resistor 28 Ohm, continuous braking power 0.2 kW for ACOPOSinverter X64 3x200-240 V 4 kW and 3x380-500 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 3 kW - 4 kW and 3x380-480 V 11 kW - 15 kW
810MF002.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 2.2 kW - 4 kW and 3x380-480 V 3 kW - 4 kW



Motor power	8I84T200550.01P-1	8I84T200750.01P-1	8I84T201100.01P-1
Indicated on rating plate	5.5 kW 7.5 HP	7.5 kW 10 HP	11 kW 15 HP
Power mains connection	8I84T200550.01P-1	8I84T200750.01P-1	8I84T201100.01P-1
Mains input voltage	3x 200 VAC - 15 % to 240 VAC + 10 %	3x 200 VAC - 15 % to 240 VAC + 10 %	3x 200 VAC - 15 % to 240 VAC + 10 %
Frequency	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%
Apparent power (at 240 VAC)	12.8 kVA	16.4 kVA	19 kVA
Max. prospective line I _{sc} (short circuit current at the connection point)	22 kA	22 kA	22 kA
Line current ¹⁾			
at 200 VAC	35 A	45 A	53.3 A
at 240 VAC	30.8 A	39.4 A	45.8 A
Max. line current with optional line choke at 230 VAC	19.5 A	26.5 A	37.1 A
Dissipated power at nominal load and nominal switching frequency	293 W	363 W	566 W
Integrated EMC filter ²⁾	Yes	Yes	No

1) Typical value for the indicated motor power and for the maximum prospective line I_{sc}.

2) EMC plate delivered with the drive.

Conducted and radiated EMC emissions	8I84T200550.01P-1	8I84T200750.01P-1	8I84T201100.01P-1
With integrated filter			
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	-	-	-
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	-	-	-
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	≤ 10 m ²⁾ or ≤ 5 m ³⁾	≤ 10 m ²⁾ or ≤ 5 m ³⁾	-
With additional filter			
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	≤ 50 m ²⁾ or ≤ 20 m ³⁾	≤ 50 m ²⁾ or ≤ 20 m ³⁾	≤ 50 m ⁴⁾ or ≤ 25 m ⁵⁾
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	≤ 100 m ²⁾ or ≤ 50 m ³⁾	≤ 100 m ²⁾ or ≤ 50 m ³⁾	≤ 100 m ⁴⁾ or ≤ 50 m ⁵⁾
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	-	-	-

1) For a shielded motor cable

2) At a switching frequency of 4 kHz

3) At a switching frequency from 4.1 to 16 kHz

4) At a switching frequency of 3.5 to 4 kHz

5) At a switching frequency of 4.1 to 12 kHz

ACOPOSinverter P84

3-phase 200-240V




Motor connector	8I84T200550.01P-1	8I84T200750.01P-1	8I84T201100.01P-1
Maximum continuous output current (In) ¹⁾ at 230 VAC	17.5 A	27.5 A	33 A
Reduction of continuous output current depending on the ambient temperature			
At nominal switching frequency (4 kHz or 2.5 kHz for bigger drive ratings)	No reduction (up to 50°C)	No reduction (up to 50°C)	No reduction (up to 50°C)
Other switching frequencies	See the derating curves in the Installation Manual, available on www.br-automation.com		
Reduction of continuous output current depending on altitude			
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	41.3 A	49.5 A	81 A
Maximum transient current for 2 s	45.3 A	54.5 A	89.1 A
Output frequency range	0.5 to 1600 Hz	0.5 to 1600 Hz	0.5 to 1600 Hz
Rated switching frequency	4 kHz	4 kHz	4 kHz
Minimum	1 kHz	1 kHz	1 kHz
Maximum	16 kHz	16 kHz	16 kHz
Transient overtorque (typical value)		170% of the nominal motor torque (typical value at ± 10%) for 60 s 220% of the nominal motor torque (typical value at ± 10%) for 2 s	
Braking torque			
With braking resistor		Up to 150% of nominal motor torque	
Without braking resistor (typical value)		30% of nominal motor torque	
Motor control profiles			
Asynchronous motor		Flux Vector Control (FVC) with sensor (current vector) Sensorless Flux Vector Control (SFVC) (voltage or current vector) Voltage/frequency ratio (2 or 5 points)	
Synchronous motor		ENA (Energy Adaptation) System for unbalanced loads Vector control without speed feedback	
Maximum motor cable length ¹⁾			
Shielded cable	50 m	50 m	100 m
Unshielded cable	100 m	100 m	150 m
Main drive protection features		Thermal protection against overheating of the power stage Protection against: Short-circuits between motor phases, input phase breaks, overcurrents between output phases and earth, overvoltages on the DC bus, a break on the control circuit, exceeding the limit speed Safety function for: Line supply overvoltage and undervoltage, input phase loss in three-phase	
Motor protection		Thermal protection integrated in drive via continuous calculation of I ² t taking speed into account: - The motor thermal state is saved when the drive is powered down. - Function can be modified via operator dialogue terminals, depending on the type of motor (force-cooled or self-cooled). Protection against motor phase breaks	
¹⁾ These values are given for nominal switching frequency.			
Braking chopper	8I84T200550.01P-1	8I84T200750.01P-1	8I84T201100.01P-1
Integrated dynamic brake transistors	Yes	Yes	Yes
Operating factor for the dynamic brake transistors		The dynamic brake transistor is sized so that it can tolerate: - The nominal motor power continuously - 150% of the nominal motor power for 60 s	
Minimum resistor value (external) ¹⁾	11 Ω	8 Ω	3 Ω

¹⁾ The minimum ohmic value is determined at a temperature of 20°C. In an environment where the temperature is below 20°C, make sure that the minimum ohmic value recommended in the table is observed.

24 VDC supply	8I84T200550.01P-1	8I84T200750.01P-1	8I84T201100.01P-1
Input voltage	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)
Power consumption	30 W	30 W	30 W
Available internal supplies	8I84T200550.01P-1	8I84T200750.01P-1	8I84T201100.01P-1
Output voltage	10.5 VDC ($\pm 5\%$)	10.5 VDC ($\pm 5\%$)	10.5 VDC ($\pm 5\%$)
Max. output current	10 mA	10 mA	10 mA
Output voltage	24 VDC (min. 21 V, max. 27 V)	24 VDC (min. 21 V, max. 27 V)	24 VDC (min. 21 V, max. 27 V)
Max. output current	200 mA	200 mA	200 mA
Digital inputs	8I84T200550.01P-1	8I84T200750.01P-1	8I84T201100.01P-1
Number of inputs ¹⁾	5	5	5
Input circuit	Source or Sink	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Sampling time	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms
Input impedance	3.5 k Ω	3.5 k Ω	3.5 k Ω
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
1) 1 logic input, switch-configurable as a logic input or as an input for PTC probes. Input for a maximum of 6 PTC probes mounted in series: Nominal value < 1.5 k Ω , trip resistance 3 k Ω , reset value 1.8 k Ω , short-circuit protection < 50 Ω			
Relay outputs	8I84T200550.01P-1	8I84T200750.01P-1	8I84T201100.01P-1
Number of outputs	2	2	2
Design			
Relay 1	1 N/O contact and 1 N/C contact with common point	1 N/O contact and 1 N/C contact with common point	1 N/O contact and 1 N/C contact with common point
Relay 2	1 N/O contact	1 N/O contact	1 N/O contact
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity			
Minimum	3 mA for 24 VDC	3 mA for 24 VDC	3 mA for 24 VDC
Maximum			
on resistive load ($\cos \phi = 1$ and L/R = 0 ms)	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC
on inductive load ($\cos \phi = 0.4$ and L/R = 7 ms)	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC
Response time (maximum)	< 7 ms \pm 0.5 ms	< 7 ms \pm 0.5 ms	< 7 ms \pm 0.5 ms
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No
Analog inputs	8I84T200550.01P-1	8I84T200750.01P-1	8I84T201100.01P-1
Number of inputs	2	2	2
Input			
Voltage	± 10 V	± 10 V	± 10 V
Voltage / Current	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	11 bit + 1 sign bit	11 bit + 1 sign bit	11 bit + 1 sign bit
Sampling time	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms
Input impedance			
Voltage	30 k Ω	30 k Ω	30 k Ω
Current	242 Ω	242 Ω	242 Ω
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No

ACOPOSinverter P84

3-phase 200-240V

Analog outputs			
	8I84T200550.01P-1	8I84T200750.01P-1	8I84T201100.01P-1
Number of outputs	1	1	1
Output ¹⁾	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	10 bit	10 bit	10 bit
Update time	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms
Min. load impedance			
Voltage	470 Ω	470 Ω	470 Ω
Current	500 Ω	500 Ω	500 Ω
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No
1) The current output can be configured as a 24 V logic output, max. 20 mA, min. load impedance 1.2 kΩ			
Safety input power removal			
	8I84T200550.01P-1	8I84T200750.01P-1	8I84T201100.01P-1
Number of inputs	1	1	1
Input circuit	Sink	Sink	Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Response time	≤ 100 ms	≤ 100 ms	≤ 100 ms
Switching threshold			
LOW	< 5 V	< 5 V	< 5 V
HIGH	> 15 V	> 15 V	> 15 V
Input impedance	1.5 kΩ	1.5 kΩ	1.5 kΩ
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
Operational conditions			
	8I84T200550.01P-1	8I84T200750.01P-1	8I84T201100.01P-1
Ambient temperature	-10 to +50°C	-10 to +50°C	-10 to +50°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 3000 m	Up to 3000 m	Up to 3000 m
Operating position			
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C1 and 3S2	Class 3C1 and 3S2	Class 3C1 and 3S2
Degree of protection	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)
1) With derating and removing the protective cover on top of the drive. See the possible mounting types and derating curves in the Installation Manual, available on www.br-automation.com .			
2) From 1000 m to 3000 m current derating of 1% per 100 m.			
Storage conditions			
	8I84T200550.01P-1	8I84T200750.01P-1	8I84T201100.01P-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Mechanical characteristics			
	8I84T200550.01P-1	8I84T200750.01P-1	8I84T201100.01P-1
Dimensions			
Width	175 mm	210 mm	230 mm
Height	215 mm	295 mm	400 mm
Depth	187 mm	213 mm	213 mm
Weight	5.5 kg	7 kg	22 kg

Optional accessories for 8I84T200550.01P-1

8IOFT035.300-1	EMC filter 3-phase 35 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 5.5 kW and 3x380-480 V 5.5 kW - 7.5 kW
8IOCT030.000-1	Line choke 3-phase 30 A for ACOPOSinverter X64 3x200-240 V 4 kW - 7.5 kW and 3x380-500 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 4 kW - 5.5 kW and 3x380-480 V 11 kW - 15 kW
8IOBR015.000-1	Braking resistor 15 Ohm, continuous braking power 1kW for ACOPOSinverter X64 3x200-240 V 5.5 kW - 7.5 kW, for ACOPOSinverter P84 3x200-240 V 5.5 kW - 7.5 kW and 3x380-480 V 18.5 kW - 30 kW
8IOMF003.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 5.5 kW and 3x380-480 V 5.5 kW - 7.5 kW

Optional accessories for 8I84T200750.01P-1

8IOFT046.300-1	EMC filter 3-phase 46 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 7.5 kW and 3x380-480 V 11 kW
8IOCT060.000-1	Line choke 3-phase 60 A for ACOPOSinverter X64 3x200-240 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 7.5 kW - 11 kW and 3x380-480 V 18.5 kW - 22 kW
8IOBR015.000-1	Braking resistor 15 Ohm, continuous braking power 1kW for ACOPOSinverter X64 3x200-240 V 5.5 kW - 7.5 kW, for ACOPOSinverter P84 3x200-240 V 5.5 kW - 7.5 kW and 3x380-480 V 18.5 kW - 30 kW
8IOMF004.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 7.5 kW and 3x380-480 V 11 kW

Optional accessories for 8I84T201100.01P-1

8IOFT072.300-1	EMC filter 3-phase 72 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 11 kW - 15 kW and 3x380-480 V 15 kW - 18.5 kW
8IOCT060.000-1	Line choke 3-phase 60 A for ACOPOSinverter X64 3x200-240 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 7.5 kW - 11 kW and 3x380-480 V 18.5 kW - 22 kW
8IOBR010.000-1	Braking resistor 10 Ohm, continuous braking power 1 kW for ACOPOSinverter X64 3x200-240 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 11 kW and 3x380-480 V 37 kW
8IOMF005.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 11 kW - 15 kW and 3x380-480 V 15 kW - 18.5 kW

ACOPOSinverter P84

3-phase 200-240V



Motor power	8184T201500.01P-1	8184T201850.01P-1	8184T202200.01P-1
Indicated on rating plate	15 kW 20 HP	18.5 kW 25 HP	22 kW 30 HP
Power mains connection	8184T201500.01P-1	8184T201850.01P-1	8184T202200.01P-1
Mains input voltage	3x 200 VAC - 15% to 240 VAC + 10%	3x 200 VAC - 15% to 240 VAC + 10%	3x 200 VAC - 15% to 240 VAC + 10%
Frequency	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%
Apparent power (at 240 VAC)	25.6 kVA	28.7 kVA	33.3 kVA
Max. prospective line I _{sc} (short circuit current at the connection point)	22 kA	22 kA	22 kA
Line current ¹⁾			
at 200 VAC	71.7 A	77 A	88 A
at 240 VAC	61.6 A	69 A	80 A
Max. line current with optional line choke at 230 VAC	50.0 A	60.9 A	71.0 A
Dissipated power at nominal load and nominal switching frequency	620 W	657 W	766 W
Integrated EMC filter ²⁾	No	No	No

1) Typical value for the indicated motor power and for the maximum prospective line I_{sc}.

2) EMC plate delivered with the drive.

Conducted and radiated EMC emissions	8184T201500.01P-1	8184T201850.01P-1	8184T202200.01P-1
With integrated filter			
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	-	-	-
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	-	-	-
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	-	-	-
With additional filter			
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	810FT072.300-1 ≤ 50 m ²⁾ or ≤ 25 m ³⁾	810FT090.300-1 ≤ 50 m ⁴⁾ or ≤ 25 m ⁵⁾	810FT090.300-1 ≤ 50 m ⁴⁾ or ≤ 25 m ⁵⁾
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	≤ 100 m ²⁾ or ≤ 50 m ³⁾	≤ 100 m ⁴⁾ or ≤ 50 m ⁵⁾	≤ 100 m ⁴⁾ or ≤ 50 m ⁵⁾
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	-	-	-

1) For a shielded motor cable

2) At a switching frequency from 3.5 to 4 kHz

3) At a switching frequency from 4.1 to 12 kHz

4) At a switching frequency from 2 to 2.5 kHz

5) At a switching frequency from 2.6 to 12 kHz




Motor connector	8I84T201500.01P-1	8I84T201850.01P-1	8I84T202200.01P-1
Maximum continuous output current (I _n) ¹⁾ at 230 VAC	66 A	75 A	88 A
Reduction of continuous output current depending on the ambient temperature	See the derating curves in the Installation Manual, available on www.br-automation.com		
At nominal switching frequency (4 kHz or 2.5 kHz for bigger drive ratings)	No reduction (up to 50°C)	No reduction (up to 50°C)	No reduction (up to 50°C)
Other switching frequencies	See the derating curves in the Installation Manual, available on www.br-automation.com		
Reduction of continuous output current depending on altitude	See the derating curves in the Installation Manual, available on www.br-automation.com		
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	99 A	112 A	132 A
Maximum transient current for 2 s	109 A	124 A	145 A
Output frequency range	0.5 to 1600 Hz	0.5 to 1600 Hz	0.5 to 1600 Hz
Rated switching frequency	4 kHz	2.5 kHz	2.5 kHz
Minimum	1 kHz	1 kHz	1 kHz
Maximum	16 kHz	16 kHz	16 kHz
Transient overtorque (typical value)	170% of the nominal motor torque (typical value at ± 10%) for 60 s 220% of the nominal motor torque (typical value at ± 10%) for 2 s		
Braking torque	See the derating curves in the Installation Manual, available on www.br-automation.com		
With braking resistor	Up to 150% of nominal motor torque		
Without braking resistor (typical value)	30% of nominal motor torque		
Motor control profiles	See the derating curves in the Installation Manual, available on www.br-automation.com		
Asynchronous motor	Flux Vector Control (FVC) with sensor (current vector) Sensorless Flux Vector Control (SFVC) (voltage or current vector) Voltage/frequency ratio (2 or 5 points) ENA (Energy Adaptation) System for unbalanced loads		
Synchronous motor	Vector control without speed feedback		
Maximum motor cable length ¹⁾	See the derating curves in the Installation Manual, available on www.br-automation.com		
Shielded cable	100 m	100 m	100 m
Unshielded cable	150 m	150 m	150 m
Main drive protection features	Thermal protection against overheating of the power stage Protection against: Short-circuits between motor phases, input phase breaks, overcurrents between output phases and earth, overvoltages on the DC bus, a break on the control circuit, exceeding the limit speed Safety function for: Line supply overvoltage and undervoltage, input phase loss in three-phase		
Motor protection	Thermal protection integrated in drive via continuous calculation of I ² t taking speed into account: - The motor thermal state is saved when the drive is powered down. - Function can be modified via operator dialogue terminals, depending on the type of motor (force-cooled or self-cooled). Protection against motor phase breaks		
1) These values are given for nominal switching frequency.			
Braking chopper	8I84T201500.01P-1	8I84T201850.01P-1	8I84T202200.01P-1
Integrated dynamic brake transistors	Yes	Yes	Yes
Operating factor for the dynamic brake transistors	The dynamic brake transistor is sized so that it can tolerate: - The nominal motor power continuously - 150% of the nominal motor power for 60 s		
Minimum resistor value (external) ¹⁾	3 Ω	4 Ω	3.3 Ω

1) The minimum ohmic value is determined at a temperature of 20°C. In an environment where the temperature is below 20°C, make sure that the minimum ohmic value recommended in the table is observed.

ACOPOSinverter P84

3-phase 200-240V

24 VDC supply	8184T201500.01P-1	8184T201850.01P-1	8184T202200.01P-1
Input voltage	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)
Power consumption	30 W	30 W	30 W
Available internal supplies	8184T201500.01P-1	8184T201850.01P-1	8184T202200.01P-1
Output voltage	10.5 VDC ($\pm 5\%$)	10.5 VDC ($\pm 5\%$)	10.5 VDC ($\pm 5\%$)
Max. output current	10 mA	10 mA	10 mA
Output voltage	24 VDC (min. 21 V, max. 27 V)	24 VDC (min. 21 V, max. 27 V)	24 VDC (min. 21 V, max. 27 V)
Max. output current	200 mA	200 mA	200 mA
Digital inputs	8184T201500.01P-1	8184T201850.01P-1	8184T202200.01P-1
Number of inputs ¹⁾	5	5	5
Input circuit	Source or Sink	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Sampling time	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms
Input impedance	3.5 k Ω	3.5 k Ω	3.5 k Ω
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
1) 1 logic input, switch-configurable as a logic input or as an input for PTC probes. Input for a maximum of 6 PTC probes mounted in series: Nominal value < 1.5 k Ω , trip resistance 3 k Ω , reset value 1.8 k Ω , short-circuit protection < 50 Ω			
Relay outputs	8184T201500.01P-1	8184T201850.01P-1	8184T202200.01P-1
Number of outputs	2	2	2
Design			
Relay 1	1 N/O contact and 1 N/C contact with common point	1 N/O contact and 1 N/C contact with common point	1 N/O contact and 1 N/C contact with common point
Relay 2	1 N/O contact	1 N/O contact	1 N/O contact
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity			
Minimum	3 mA for 24 VDC	3 mA for 24 VDC	3 mA for 24 VDC
Maximum			
on resistive load ($\cos \phi = 1$ and L/R = 0 ms)	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC
on inductive load ($\cos \phi = 0.4$ and L/R = 7 ms)	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC
Response time (maximum)	< 7 ms \pm 0.5 ms	< 7 ms \pm 0.5 ms	< 7 ms \pm 0.5 ms
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No
Analog inputs	8184T201500.01P-1	8184T201850.01P-1	8184T202200.01P-1
Number of inputs	2	2	2
Input			
Voltage	± 10 V	± 10 V	± 10 V
Voltage / Current	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	11 bit + 1 sign bit	11 bit + 1 sign bit	11 bit + 1 sign bit
Sampling time	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms
Input impedance			
Voltage	30 k Ω	30 k Ω	30 k Ω
Current	242 Ω	242 Ω	242 Ω
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No

Analog outputs	8I84T201500.01P-1	8I84T201850.01P-1	8I84T202200.01P-1
Number of outputs	1	1	1
Output ¹⁾	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	10 bit	10 bit	10 bit
Update time	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms
Min. load impedance			
Voltage	470 Ω	470 Ω	470 Ω
Current	500 Ω	500 Ω	500 Ω
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No
1) The current output can be configured as a 24 V logic output, max. 20 mA, min. load impedance 1.2 kΩ			
Safety input power removal	8I84T201500.01P-1	8I84T201850.01P-1	8I84T202200.01P-1
Number of inputs	1	1	1
Input circuit	Sink	Sink	Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Response time	≤ 100 ms	≤ 100 ms	≤ 100 ms
Switching threshold			
LOW	< 5 V	< 5 V	< 5 V
HIGH	> 15 V	> 15 V	> 15 V
Input impedance	1.5 kΩ	1.5 kΩ	1.5 kΩ
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
Operational conditions	8I84T201500.01P-1	8I84T201850.01P-1	8I84T202200.01P-1
Ambient temperature	-10 to +50°C	-10 to +50°C	-10 to +50°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 3000 m	Up to 3000 m	Up to 3000 m
Operating position			
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C1 and 3S2	Class 3C1 and 3S2	Class 3C1 and 3S2
Degree of protection	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)
1) With derating and removing the protective cover on top of the drive. Control card fan kit needed for specific drives. See Optional accessories. See the possible mounting types and derating curves in the Installation Manual, available on www.br-automation.com .			
2) From 1000 m to 3000 m current derating of 1% per 100 m.			
Storage conditions	8I84T201500.01P-1	8I84T201850.01P-1	8I84T202200.01P-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Mechanical characteristics	8I84T201500.01P-1	8I84T201850.01P-1	8I84T202200.01P-1
Dimensions			
Width	230 mm	240 mm	240 mm
Height	400 mm	420 mm	420 mm
Depth	213 mm	236 mm	236 mm
Weight	22 kg	30 kg	30 kg

ACOPOSinverter P84

3-phase 200-240V

Optional accessories for 8184T201500.01P-1

810FT072.300-1	EMC filter 3-phase 72 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 11 kW - 15 kW and 3x380-480 V 15 kW - 18.5 kW
810CT100.000-1	Line choke 3-phase 100 A for ACOPOSinverter P84 3x200-240 V 15 kW and 3x380-480 V 30 kW - 55 kW
810BR008.000-1	Braking resistor 8 Ohm, continuous braking power 1 kW for ACOPOSinverter P84 3x200-240 V 15 kW
810MF005.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 11 kW - 15 kW and 3x380-480 V 15 kW - 18.5 kW

Optional accessories for 8184T201850.01P-1

810FT090.300-1	EMC filter 3-phase 90 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 18.5 kW - 22 kW and 3x380-480 V 22 kW
810CT230.000-1	Line choke 3-phase 230 A for ACOPOSinverter P84 3x200-240 V 18.5 kW - 45 kW
810BR005.000-1	Braking resistor 5 Ohm, continuous braking power 1.3 kW for ACOPOSinverter P84 3x200-240 V 18.5 kW - 22 kW and 3x380-480 V 45 kW - 75 kW
810MF006.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 18.5 kW - 22 kW and 3x380-480 V 22 kW
810FX004.300-1	Control card fan kit for ACOPOSinverter P84 3x200-240 V 18.5 kW - 22 kW and 3x380-480 V 22 kW, for operation at ambient temperature between 50 and 60°C

Optional accessories for 8184T202200.01P-1

810FT090.300-1	EMC filter 3-phase 90 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 18.5 kW - 22 kW and 3x380-480 V 22 kW
810CT230.000-1	Line choke 3-phase 230 A for ACOPOSinverter P84 3x200-240 V 18.5 kW - 45 kW
810BR005.000-1	Braking resistor 5 Ohm, continuous braking power 1.3 kW for ACOPOSinverter P84 3x200-240 V 18.5 kW - 22 kW and 3x380-480 V 45 kW - 75 kW
810MF006.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 18.5 kW - 22 kW and 3x380-480 V 22 kW
810FX004.300-1	Control card fan kit for ACOPOSinverter P84 3x200-240 V 18.5 kW - 22 kW and 3x380-480 V 22 kW, for operation at ambient temperature between 50 and 60°C



Motor power	8I84T203000.01P-1	8I84T203700.01P-1	8I84T204500.01P-1
Indicated on rating plate	30 kW 40 HP	37 kW 50 HP	45 kW 60 HP
Power mains connection	8I84T203000.01P-1	8I84T203700.01P-1	8I84T204500.01P-1
Mains input voltage	3x 200 VAC - 15 % to 240 VAC + 10 %	3x 200 VAC - 15 % to 240 VAC + 10 %	3x 200 VAC - 15 % to 240 VAC + 10 %
Frequency	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%
Apparent power (at 240 VAC)	45.7 kVA	52.8 kVA	61.1 kVA
Max. prospective line I _{sc} (short circuit current at the connection point)	22 kA	22 kA	22 kA
Line current ¹⁾			
at 200 VAC	124 A	141 A	167 A
at 240 VAC	110 A	127 A	147 A
Max. line current with optional line choke at 230 VAC	95.6 A	116.7 A	140.6 A
Dissipated power at nominal load and nominal switching frequency	980 W	1154 W	1366 W
Integrated EMC filter ²⁾	No	No	No

1) Typical value for the indicated motor power and for the maximum prospective line I_{sc}.

2) EMC plate delivered with the drive.

Conducted and radiated EMC emissions	8I84T203000.01P-1	8I84T203700.01P-1	8I84T204500.01P-1
With integrated filter			
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	-	-	-
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	-	-	-
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	-	-	-
With additional filter			
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	≤ 50 m ²⁾ or ≤ 25 m ³⁾	≤ 50 m ²⁾ or ≤ 25 m ³⁾	≤ 50 m ²⁾ or ≤ 25 m ³⁾
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	≤ 100 m ²⁾ or ≤ 50 m ³⁾	≤ 100 m ²⁾ or ≤ 50 m ³⁾	≤ 100 m ²⁾ or ≤ 50 m ³⁾
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	-	-	-

1) For a shielded motor cable

2) At a switching frequency from 2 to 2.5 kHz

3) At a switching frequency from 2.6 to 12 kHz

ACOPOSinverter P84

3-phase 200-240V




Motor connector	8184T203000.01P-1	8184T203700.01P-1	8184T204500.01P-1
Maximum continuous output current (I _n) ¹⁾ at 230 VAC	120 A	144 A	176 A
Reduction of continuous output current depending on the ambient temperature	See the derating curves in the Installation Manual, available on www.br-automation.com		
At nominal switching frequency (4 kHz or 2.5 kHz for bigger drive ratings)	No reduction (up to 50°C)	No reduction (up to 50°C)	No reduction (up to 50°C)
Other switching frequencies	See the derating curves in the Installation Manual, available on www.br-automation.com		
Reduction of continuous output current depending on altitude	See the derating curves in the Installation Manual, available on www.br-automation.com		
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	180 A	216 A	264 A
Maximum transient current for 2 s	198 A	238 A	290 A
Output frequency range	0.5 to 1600 Hz	0.5 to 1600 Hz	0.5 to 500 Hz
Rated switching frequency	2.5 kHz	2.5 kHz	2.5 kHz
Minimum	1 kHz	1 kHz	1 kHz
Maximum	16 kHz	16 kHz	16 kHz
Transient overtorque (typical value)	170% of the nominal motor torque (typical value at ± 10%) for 60 s 220% of the nominal motor torque (typical value at ± 10%) for 2 s		
Braking torque	See the derating curves in the Installation Manual, available on www.br-automation.com		
With braking resistor	Up to 150% of nominal motor torque		
Without braking resistor (typical value)	30% of nominal motor torque		
Motor control profiles	See the derating curves in the Installation Manual, available on www.br-automation.com		
Asynchronous motor	Flux Vector Control (FVC) with sensor (current vector) Sensorless Flux Vector Control (SFVC) (voltage or current vector) Voltage/frequency ratio (2 or 5 points) ENA (Energy Adaptation) System for unbalanced loads		
Synchronous motor	Vector control without speed feedback		
Maximum motor cable length ¹⁾	See the derating curves in the Installation Manual, available on www.br-automation.com		
Shielded cable	100 m	100 m	100 m
Unshielded cable	150 m	150 m	150 m
Main drive protection features	Thermal protection against overheating of the power stage Protection against: Short-circuits between motor phases, input phase breaks, overcurrents between output phases and earth, overvoltages on the DC bus, a break on the control circuit, exceeding the limit speed Safety function for: Line supply overvoltage and undervoltage, input phase loss in three-phase		
Motor protection	Thermal protection integrated in drive via continuous calculation of I ² t taking speed into account: - The motor thermal state is saved when the drive is powered down. - Function can be modified via operator dialogue terminals, depending on the type of motor (force-cooled or self-cooled). Protection against motor phase breaks		
1) These values are given for nominal switching frequency.			
Braking chopper	8184T203000.01P-1	8184T203700.01P-1	8184T204500.01P-1
Integrated dynamic brake transistors	Yes	Yes	Yes
Operating factor for the dynamic brake transistors	The dynamic brake transistor is sized so that it can tolerate: - The nominal motor power continuously - 150% of the nominal motor power for 60 s		
Minimum resistor value (external) ¹⁾	3.3 Ω	1.7 Ω	1.7 Ω

1) The minimum ohmic value is determined at a temperature of 20°C. In an environment where the temperature is below 20°C, make sure that the minimum ohmic value recommended in the table is observed.

24 VDC supply	8I84T203000.01P-1	8I84T203700.01P-1	8I84T204500.01P-1
Input voltage	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)
Power consumption	30 W	30 W	30 W
Available internal supplies	8I84T203000.01P-1	8I84T203700.01P-1	8I84T204500.01P-1
Output voltage	10.5 VDC ($\pm 5\%$)	10.5 VDC ($\pm 5\%$)	10.5 VDC ($\pm 5\%$)
Max. output current	10 mA	10 mA	10 mA
Output voltage	24 VDC (min. 21 V, max. 27 V)	24 VDC (min. 21 V, max. 27 V)	24 VDC (min. 21 V, max. 27 V)
Max. output current	200 mA	200 mA	200 mA
Digital inputs	8I84T203000.01P-1	8I84T203700.01P-1	8I84T204500.01P-1
Number of inputs ¹⁾	5	5	5
Input circuit	Source or Sink	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Sampling time	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms
Input impedance	3.5 k Ω	3.5 k Ω	3.5 k Ω
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
1) 1 logic input, switch-configurable as a logic input or as an input for PTC probes. Input for a maximum of 6 PTC probes mounted in series: Nominal value < 1.5 k Ω , trip resistance 3 k Ω , reset value 1.8 k Ω , short-circuit protection < 50 Ω			
Relay outputs	8I84T203000.01P-1	8I84T203700.01P-1	8I84T204500.01P-1
Number of outputs	2	2	2
Design			
Relay 1	1 N/O contact and 1 N/C contact with common point	1 N/O contact and 1 N/C contact with common point	1 N/O contact and 1 N/C contact with common point
Relay 2	1 N/O contact	1 N/O contact	1 N/O contact
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity			
Minimum	3 mA for 24 VDC	3 mA for 24 VDC	3 mA for 24 VDC
Maximum			
on resistive load ($\cos \phi = 1$ and L/R = 0 ms)	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC
on inductive load ($\cos \phi = 0.4$ and L/R = 7 ms)	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC
Response time (maximum)	< 7 ms \pm 0.5 ms	< 7 ms \pm 0.5 ms	< 7 ms \pm 0.5 ms
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No
Analog inputs	8I84T203000.01P-1	8I84T203700.01P-1	8I84T204500.01P-1
Number of inputs	2	2	2
Input			
Voltage	± 10 V	± 10 V	± 10 V
Voltage / Current	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	11 bit + 1 sign bit	11 bit + 1 sign bit	11 bit + 1 sign bit
Sampling time	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms
Input impedance			
Voltage	30 k Ω	30 k Ω	30 k Ω
Current	242 Ω	242 Ω	242 Ω
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No

ACOPOSinverter P84

3-phase 200-240V

Analog outputs			
Number of outputs	8184T203000.01P-1	8184T203700.01P-1	8184T204500.01P-1
Number of outputs	1	1	1
Output ¹⁾	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	10 bit	10 bit	10 bit
Update time	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms
Min. load impedance			
Voltage	470 Ω	470 Ω	470 Ω
Current	500 Ω	500 Ω	500 Ω
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No
1) The current output can be configured as a 24 V logic output, max. 20 mA, min. load impedance 1.2 kΩ			
Safety input power removal			
Number of inputs	8184T203000.01P-1	8184T203700.01P-1	8184T204500.01P-1
Number of inputs	1	1	1
Input circuit	Sink	Sink	Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Response time	≤ 100 ms	≤ 100 ms	≤ 100 ms
Switching threshold			
LOW	< 5 V	< 5 V	< 5 V
HIGH	> 15 V	> 15 V	> 15 V
Input impedance	1.5 kΩ	1.5 kΩ	1.5 kΩ
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
Operational conditions			
Ambient temperature	8184T203000.01P-1	8184T203700.01P-1	8184T204500.01P-1
Ambient temperature	-10 to +50°C	-10 to +50°C	-10 to +50°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 3000 m	Up to 3000 m	Up to 3000 m
Operating position			
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C1 and 3S2	Class 3C1 and 3S2	Class 3C1 and 3S2
Degree of protection	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)
1) With derating and removing the protective cover on top of the drive. Control card fan kit needed for specific drives. See Optional accessories. See the possible mounting types and derating curves in the Installation Manual, available on www.br-automation.com .			
2) From 1000 m to 3000 m current derating of 1% per 100 m.			
Storage conditions			
Storage temperature	8184T203000.01P-1	8184T203700.01P-1	8184T204500.01P-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Mechanical characteristics			
8184T203000.01P-1			
8184T203700.01P-1			
8184T204500.01P-1			
Dimensions			
Width	320 mm	320 mm	320 mm
Height	550 mm	550 mm	550 mm
Depth	266 mm	266 mm	266 mm
Weight	37 kg	37 kg	37 kg

Optional accessories for 8184T203000.01P-1

81OFT180.300-1	EMC filter 3-phase 180 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 30 kW - 45 kW and 3x380-480 V 45 kW - 75 kW
81OCT230.000-1	Line choke 3-phase 230 A for ACOPOSinverter P84 3x200-240 V 18.5 kW - 45 kW
81OBR004.000-1	Braking resistor 4 Ohm, continuous braking power 1 kW for ACOPOSinverter P84 3x200-240 V 30 kW
81OMF008.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 30 kW - 45 kW
81OXF006.300-1	Control card fan kit for ACOPOSinverter P84 3x200-240 V 30 kW - 45 kW, for operation at ambient temperature between 50 and 60°C

Optional accessories for 8184T203700.01P-1

81OFT180.300-1	EMC filter 3-phase 180 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 30 kW - 45 kW and 3x380-480 V 45 kW - 75 kW
81OCT230.000-1	Line choke 3-phase 230 A for ACOPOSinverter P84 3x200-240 V 18.5 kW - 45 kW
81OBR003.000-1	Braking resistor 2.5 Ohm, continuous braking power 1 kW for ACOPOSinverter P84 3x200-240 V 37 kW - 45 kW
81OMF008.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 30 kW - 45 kW
81OXF006.300-1	Control card fan kit for ACOPOSinverter P84 3x200-240 V 30 kW - 45 kW, for operation at ambient temperature between 50 and 60°C

Optional accessories for 8184T204500.01P-1

81OFT180.300-1	EMC filter 3-phase 180 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 30 kW - 45 kW and 3x380-480 V 45 kW - 75 kW
81OCT230.000-1	Line choke 3-phase 230 A for ACOPOSinverter P84 3x200-240 V 18.5 kW - 45 kW
81OBR003.000-1	Braking resistor 2.5 Ohm, continuous braking power 1 kW for ACOPOSinverter P84 3x200-240 V 37 kW - 45 kW
81OMF008.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 30 kW - 45 kW
81OXF006.300-1	Control card fan kit for ACOPOSinverter P84 3x200-240 V 30 kW - 45 kW, for operation at ambient temperature between 50 and 60°C

ACOPOSinverter P84

3-phase 380-480V



Motor power	8184T400075.01P-1	8184T400150.01P-1	8184T400220.01P-1
Indicated on rating plate	0.75 kW 1 HP	1.5 kW 2 HP	2.2 kW 3 HP
Power mains connection	8184T400075.01P-1	8184T400150.01P-1	8184T400220.01P-1
Mains input voltage	3x 380 VAC - 15% to 480 VAC + 10%	3x 380 VAC - 15% to 480 VAC + 10%	3x 380 VAC - 15% to 480 VAC + 10%
Frequency	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%
Apparent power (at 380 VAC)	2.4 kVA	3.8 kVA	5.4 kVA
Max. prospective line I _{sc} (short circuit current at the connection point)	5 kA	5 kA	5 kA
Line current ¹⁾			
at 380 VAC	3.7 A	5.8 A	8.2 A
at 480 VAC	3 A	5.3 A	7.1 A
Max. line current with optional line choke at 400 VAC	1.8 A	3.3 A	5.0 A
Dissipated power at nominal load and nominal switching frequency	44 W	64 W	87 W
Integrated EMC filter ²⁾	Yes	Yes	Yes

1) Typical value for the indicated motor power and for the maximum prospective line I_{sc}.

2) EMC plate delivered with the drive.

Conducted and radiated EMC emissions	8184T400075.01P-1	8184T400150.01P-1	8184T400220.01P-1
With integrated filter			
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	-	-	-
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	≤ 10 m ²⁾ or ≤ 5 m ³⁾	≤ 10 m ²⁾ or ≤ 5 m ³⁾	≤ 10 m ²⁾ or ≤ 5 m ³⁾
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	-	-	-
With additional filter			
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	810FT012.300-1 ≤ 50 m ²⁾ or ≤ 20 m ³⁾	810FT012.300-1 ≤ 50 m ²⁾ or ≤ 20 m ³⁾	810FT012.300-1 ≤ 50 m ²⁾ or ≤ 20 m ³⁾
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	≤ 100 m ²⁾ or ≤ 50 m ³⁾	≤ 100 m ²⁾ or ≤ 50 m ³⁾	≤ 100 m ²⁾ or ≤ 50 m ³⁾
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	-	-	-

1) For a shielded motor cable

2) At a switching frequency of 4 kHz

3) At a switching frequency from 4.1 to 16 kHz

Motor connector	8I84T400075.01P-1	8I84T400150.01P-1	8I84T400220.01P-1
Maximum continuous output current (In) ¹⁾			
at 380 VAC	2.3 A	4.1 A	5.8 A
at 460 VAC	2.1 A	3.4 A	4.8 A
Reduction of continuous output current depending on the ambient temperature			
At nominal switching frequency (4 kHz or 2.5 kHz for bigger drive ratings)	No reduction (up to 50°C)	No reduction (up to 50°C)	No reduction (up to 50°C)
Other switching frequencies	See the derating curves in the Installation Manual, available on www.br-automation.com		
Reduction of continuous output current depending on altitude			
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	3.5 A	6.2 A	8.7 A
Maximum transient current for 2 s	3.8 A	6.8 A	9.6 A
Output frequency range	0.5 to 1600 Hz	0.5 to 1600 Hz	0.5 to 1600 Hz
Rated switching frequency	4 kHz	4 kHz	4 kHz
Minimum	1 kHz	1 kHz	1 kHz
Maximum	16 kHz	16 kHz	16 kHz
Transient overtorque (typical value)	170% of the nominal motor torque (typical value at ± 10%) for 60 s 220% of the nominal motor torque (typical value at ± 10%) for 2 s		
Braking torque			
With braking resistor	Up to 150% of nominal motor torque		
Without braking resistor (typical value)	30% of nominal motor torque		
Motor control profiles			
Asynchronous motor	Flux Vector Control (FVC) with sensor (current vector) Sensorless Flux Vector Control (SFVC) (voltage or current vector) Voltage/frequency ratio (2 or 5 points) ENA (Energy Adaptation) System for unbalanced loads		
Synchronous motor	Vector control without speed feedback		
Maximum motor cable length ¹⁾			
Shielded cable	50 m	50 m	50 m
Unshielded cable	100 m	100 m	100 m
Main drive protection features	Thermal protection against overheating of the power stage Protection against: Short-circuits between motor phases, input phase breaks, overcurrents between output phases and earth, overvoltages on the DC bus, a break on the control circuit, exceeding the limit speed Safety function for: Line supply overvoltage and undervoltage, input phase loss in three-phase		
Motor protection	Thermal protection integrated in drive via continuous calculation of I ² t taking speed into account: - The motor thermal state is saved when the drive is powered down. - Function can be modified via operator dialogue terminals, depending on the type of motor (force-cooled or self-cooled). Protection against motor phase breaks		

1) These values are given for nominal switching frequency.




Braking chopper	8I84T400075.01P-1	8I84T400150.01P-1	8I84T400220.01P-1
Integrated dynamic brake transistors	Yes	Yes	Yes
Operating factor for the dynamic brake transistors	The dynamic brake transistor is sized so that it can tolerate: - The nominal motor power continuously - 150% of the nominal motor power for 60 s		
Minimum resistor value (external) ¹⁾	56 Ω	56 Ω	56 Ω

1) The minimum ohmic value is determined at a temperature of 20°C. In an environment where the temperature is below 20°C, make sure that the minimum ohmic value recommended in the table is observed.

ACOPOSinverter P84

3-phase 380-480V

24 VDC supply	8184T400075.01P-1	8184T400150.01P-1	8184T400220.01P-1
Input voltage	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)
Power consumption	30 W	30 W	30 W
Available internal supplies	8184T400075.01P-1	8184T400150.01P-1	8184T400220.01P-1
Output voltage	10.5 VDC ($\pm 5\%$)	10.5 VDC ($\pm 5\%$)	10.5 VDC ($\pm 5\%$)
Max. output current	10 mA	10 mA	10 mA
Output voltage	24 VDC (min. 21 V, max. 27 V)	24 VDC (min. 21 V, max. 27 V)	24 VDC (min. 21 V, max. 27 V)
Max. output current	200 mA	200 mA	200 mA
Digital inputs	8184T400075.01P-1	8184T400150.01P-1	8184T400220.01P-1
Number of inputs ¹⁾	5	5	5
Input circuit	Source or Sink	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Sampling time	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms
Input impedance	3.5 k Ω	3.5 k Ω	3.5 k Ω
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
1) Logic input, switch-configurable as a logic input or as an input for PTC probes. Input for a maximum of 6 PTC probes mounted in series: Nominal value < 1.5 k Ω , trip resistance 3 k Ω , reset value 1.8 k Ω , short-circuit protection < 50 Ω			
Relay outputs	8184T400075.01P-1	8184T400150.01P-1	8184T400220.01P-1
Number of outputs	2	2	2
Design			
Relay 1	1 N/O contact and 1 N/C contact with common point	1 N/O contact and 1 N/C contact with common point	1 N/O contact and 1 N/C contact with common point
Relay 2	1 N/O contact	1 N/O contact	1 N/O contact
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity			
Minimum	3 mA for 24 VDC	3 mA for 24 VDC	3 mA for 24 VDC
Maximum			
on resistive load ($\cos \phi = 1$ and L/R = 0 ms)	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC
on inductive load ($\cos \phi = 0.4$ and L/R = 7 ms)	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC
Response time (maximum)	< 7 ms \pm 0.5 ms	< 7 ms \pm 0.5 ms	< 7 ms \pm 0.5 ms
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No
Analog inputs	8184T400075.01P-1	8184T400150.01P-1	8184T400220.01P-1
Number of inputs	2	2	2
Input			
Voltage	± 10 V	± 10 V	± 10 V
Voltage / Current	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	11 bit + 1 sign bit	11 bit + 1 sign bit	11 bit + 1 sign bit
Sampling time	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms
Input impedance			
Voltage	30 k Ω	30 k Ω	30 k Ω
Current	242 Ω	242 Ω	242 Ω
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No

Analog outputs	8I84T400075.01P-1	8I84T400150.01P-1	8I84T400220.01P-1
Number of outputs	1	1	1
Output ¹⁾	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	10 bit	10 bit	10 bit
Update time	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms
Min. load impedance			
Voltage	470 Ω	470 Ω	470 Ω
Current	500 Ω	500 Ω	500 Ω
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No
1) The current output can be configured as a 24 V logic output, max. 20 mA, min. load impedance 1.2 kΩ			
Safety input power removal	8I84T400075.01P-1	8I84T400150.01P-1	8I84T400220.01P-1
Number of inputs	1	1	1
Input circuit	Sink	Sink	Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Response time	≤ 100 ms	≤ 100 ms	≤ 100 ms
Switching threshold			
LOW	< 5 V	< 5 V	< 5 V
HIGH	> 15 V	> 15 V	> 15 V
Input impedance	1.5 kΩ	1.5 kΩ	1.5 kΩ
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
Operational conditions	8I84T400075.01P-1	8I84T400150.01P-1	8I84T400220.01P-1
Ambient temperature	-10 to +50°C	-10 to +50°C	-10 to +50°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 3000 m	Up to 3000 m	Up to 3000 m
Operating position			
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C1 and 3S2	Class 3C1 and 3S2	Class 3C1 and 3S2
Degree of protection	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)
1) With derating and removing the protective cover on top of the drive. See the possible mounting types and derating curves in the Installation Manual, available on www.br-automation.com .			
2) From 1000 m to 3000 m current derating of 1% per 100 m.			
Storage conditions	8I84T400075.01P-1	8I84T400150.01P-1	8I84T400220.01P-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Mechanical characteristics	8I84T400075.01P-1	8I84T400150.01P-1	8I84T400220.01P-1
Dimensions			
Width	130 mm	130 mm	130 mm
Height	230 mm	230 mm	230 mm
Depth	175 mm	175 mm	175 mm
Weight	3 kg	3 kg	3 kg

ACOPOSinverter P84

3-phase 380-480V

Optional accessories for 8184T400075.01P-1

810FT012.300-1	EMC filter 3-phase 12 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 0.37 kW - 1.5 kW and 3x380-480 V 0.75 kW - 2.2 kW
810CT004.000-1	Line choke 3-phase 4 A for ACOPOSinverter X64 3x200-240 V 0.18 kW - 0.75 kW and 3x380-500 V 0.37 kW - 1.5 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 1.5 kW
810BR100.000-1	Braking resistor 100 Ohm, continuous braking power 0.05 kW for ACOPOSinverter X64 1x200-240 V 0.18 kW - 1.5 kW and 3x200-240 V 0.18 kW - 1.5 kW and 3x380-500 V 0.37 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 4 kW
810MF001.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 0.37 kW - 1.5 kW and 3x380-480 V 0.75 kW - 2.2 kW

Optional accessories for 8184T400150.01P-1

810FT012.300-1	EMC filter 3-phase 12 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 0.37 kW - 1.5 kW and 3x380-480 V 0.75 kW - 2.2 kW
810CT004.000-1	Line choke 3-phase 4 A for ACOPOSinverter X64 3x200-240 V 0.18 kW - 0.75 kW and 3x380-500 V 0.37 kW - 1.5 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 1.5 kW
810BR100.000-1	Braking resistor 100 Ohm, continuous braking power 0.05 kW for ACOPOSinverter X64 1x200-240 V 0.18 kW - 1.5 kW and 3x200-240 V 0.18 kW - 1.5 kW and 3x380-500 V 0.37 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 4 kW
810MF001.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 0.37 kW - 1.5 kW and 3x380-480 V 0.75 kW - 2.2 kW

Optional accessories for 8184T400220.01P-1

810FT012.300-1	EMC filter 3-phase 12 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 0.37 kW - 1.5 kW and 3x380-480 V 0.75 kW - 2.2 kW
810CT010.000-1	Line choke 3-phase 10 A for ACOPOSinverter X64 3x200-240 V 1.1 kW - 1.5 kW and 3x380-500 V 2.2 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 1.5 kW - 2.2 kW and 3x380-480 V 2.2 kW - 4 kW
810BR100.000-1	Braking resistor 100 Ohm, continuous braking power 0.05 kW for ACOPOSinverter X64 1x200-240 V 0.18 kW - 1.5 kW and 3x200-240 V 0.18 kW - 1.5 kW and 3x380-500 V 0.37 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 4 kW
810MF001.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 0.37 kW - 1.5 kW and 3x380-480 V 0.75 kW - 2.2 kW



Motor power	8I84T400300.01P-1	8I84T400400.01P-1	8I84T400550.01P-1
Indicated on rating plate	3 kW	4 kW	5.5 kW
	-	5 HP	7.5 HP
Power mains connection	8I84T400300.01P-1	8I84T400400.01P-1	8I84T400550.01P-1
Mains input voltage	3x 380 VAC - 15 % to 480 VAC + 10 %	3x 380 VAC - 15 % to 480 VAC + 10 %	3x 380 VAC - 15 % to 480 VAC + 10 %
Frequency	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%
Apparent power (at 380 VAC)	7 kVA	9.3 kVA	13.4 kVA
Max. prospective line I _{sc} (short circuit current at the connection point)	5 kA	5 kA	22 kA
Line current ¹⁾			
at 380 VAC	10.7 A	14.1 A	20.3 A
at 480 VAC	9 A	11.5 A	17 A
Max. line current with optional line choke at 400 VAC	6.4 A	8.3 A	11.4 A
Dissipated power at nominal load and nominal switching frequency	114 W	144 W	185 W
Integrated EMC filter ²⁾	Yes	Yes	Yes

1) Typical value for the indicated motor power and for the maximum prospective line I_{sc}.

2) EMC plate delivered with the drive.

Conducted and radiated EMC emissions	8I84T400300.01P-1	8I84T400400.01P-1	8I84T400550.01P-1
With integrated filter			
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	-	-	-
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	≤ 10 m ²⁾ or ≤ 5 m ³⁾	≤ 10 m ²⁾ or ≤ 5 m ³⁾	-
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	-	-	≤ 10 m ²⁾ or ≤ 5 m ³⁾
With additional filter			
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	8I0FT026.300-1 ≤ 50 m ²⁾ or ≤ 20 m ³⁾	8I0FT026.300-1 ≤ 50 m ²⁾ or ≤ 20 m ³⁾	8I0FT035.300-1 ≤ 50 m ²⁾ or ≤ 20 m ³⁾
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	≤ 100 m ²⁾ or ≤ 50 m ³⁾	≤ 100 m ²⁾ or ≤ 50 m ³⁾	≤ 100 m ²⁾ or ≤ 50 m ³⁾
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	-	-	-

1) For a shielded motor cable

2) At a switching frequency of 4 kHz

3) At a switching frequency from 4.1 to 16 kHz

ACOPOSinverter P84




3-phase 380-480V

Motor connector	8I84T400300.01P-1	8I84T400400.01P-1	8I84T400550.01P-1
Maximum continuous output current (I _n) ¹⁾			
at 380 VAC	7.8 A	10.5 A	14.3 A
at 460 VAC	6.2 A	7.6 A	11 A
Reduction of continuous output current depending on the ambient temperature			
At nominal switching frequency (4 kHz or 2.5 kHz for bigger drive ratings)	No reduction (up to 50°C)	No reduction (up to 50°C)	No reduction (up to 50°C)
Other switching frequencies	See the derating curves in the Installation Manual, available on www.br-automation.com		
Reduction of continuous output current depending on altitude			
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	11.7 A	15.8 A	21.5 A
Maximum transient current for 2 s	12.9 A	17.3 A	23.6 A
Output frequency range	0.5 to 1600 Hz	0.5 to 1600 Hz	0.5 to 1600 Hz
Rated switching frequency	4 kHz	4 kHz	4 kHz
Minimum	1 kHz	1 kHz	1 kHz
Maximum	16 kHz	16 kHz	16 kHz
Transient overtorque (typical value)	170% of the nominal motor torque (typical value at ± 10%) for 60 s 220% of the nominal motor torque (typical value at ± 10%) for 2 s		
Braking torque			
With braking resistor	Up to 150% of nominal motor torque		
Without braking resistor (typical value)	30% of nominal motor torque		
Motor control profiles			
Asynchronous motor	Flux Vector Control (FVC) with sensor (current vector) Sensorless Flux Vector Control (SFVC) (voltage or current vector) Voltage/frequency ratio (2 or 5 points)		
Synchronous motor	ENA (Energy Adaptation) System for unbalanced loads Vector control without speed feedback		
Maximum motor cable length ¹⁾			
Shielded cable	50 m	50 m	50 m
Unshielded cable	100 m	100 m	100 m
Main drive protection features	Thermal protection against overheating of the power stage Protection against: Short-circuits between motor phases, input phase breaks, overcurrents between output phases and earth, overvoltages on the DC bus, a break on the control circuit, exceeding the limit speed Safety function for: Line supply overvoltage and undervoltage, input phase loss in three-phase		
Motor protection	Thermal protection integrated in drive via continuous calculation of I ² t taking speed into account: - The motor thermal state is saved when the drive is powered down. - Function can be modified via operator dialogue terminals, depending on the type of motor (force-cooled or self-cooled). Protection against motor phase breaks		
1) These values are given for nominal switching frequency.			
Braking chopper	8I84T400300.01P-1	8I84T400400.01P-1	8I84T400550.01P-1
Integrated dynamic brake transistors	Yes	Yes	Yes
Operating factor for the dynamic brake transistors	The dynamic brake transistor is sized so that it can tolerate: - The nominal motor power continuously - 150% of the nominal motor power for 60 s		
Minimum resistor value (external) ¹⁾	34 Ω	34 Ω	23 Ω
1) The minimum ohmic value is determined at a temperature of 20°C. In an environment where the temperature is below 20°C, make sure that the minimum ohmic value recommended in the table is observed.			

24 VDC supply	8I84T400300.01P-1	8I84T400400.01P-1	8I84T400550.01P-1
Input voltage	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)
Power consumption	30 W	30 W	30 W
Available internal supplies	8I84T400300.01P-1	8I84T400400.01P-1	8I84T400550.01P-1
Output voltage	10.5 VDC (± 5%)	10.5 VDC (± 5%)	10.5 VDC (± 5%)
Max. output current	10 mA	10 mA	10 mA
Output voltage	24 VDC (min. 21 V, max. 27 V)	24 VDC (min. 21 V, max. 27 V)	24 VDC (min. 21 V, max. 27 V)
Max. output current	200 mA	200 mA	200 mA
Digital inputs	8I84T400300.01P-1	8I84T400400.01P-1	8I84T400550.01P-1
Number of inputs ¹⁾	5	5	5
Input circuit	Source or Sink	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Sampling time	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms
Input impedance	3.5 kΩ	3.5 kΩ	3.5 kΩ
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
1) logic input, switch-configurable as a logic input or as an input for PTC probes. Input for a maximum of 6 PTC probes mounted in series: Nominal value < 1.5 kΩ, trip resistance 3 kΩ, reset value 1.8 kΩ, short-circuit protection < 50 Ω			
Relay outputs	8I84T400300.01P-1	8I84T400400.01P-1	8I84T400550.01P-1
Number of outputs	2	2	2
Design			
Relay 1	1 N/O contact and 1 N/C contact with common point	1 N/O contact and 1 N/C contact with common point	1 N/O contact and 1 N/C contact with common point
Relay 2	1 N/O contact	1 N/O contact	1 N/O contact
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity			
Minimum	3 mA for 24 VDC	3 mA for 24 VDC	3 mA for 24 VDC
Maximum			
on resistive load (cos φ = 1 and L/R = 0 ms)	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC
on inductive load (cos φ = 0.4 and L/R = 7 ms)	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC
Response time (maximum)	< 7 ms ± 0.5 ms	< 7 ms ± 0.5 ms	< 7 ms ± 0.5 ms
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No
Analog inputs	8I84T400300.01P-1	8I84T400400.01P-1	8I84T400550.01P-1
Number of inputs	2	2	2
Input			
Voltage	± 10 V	± 10 V	± 10 V
Voltage / Current	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	11 bit + 1 sign bit	11 bit + 1 sign bit	11 bit + 1 sign bit
Sampling time	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms
Input impedance			
Voltage	30 kΩ	30 kΩ	30 kΩ
Current	242 Ω	242 Ω	242 Ω
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No

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3-phase 380-480V

Analog outputs	8I84T400300.01P-1	8I84T400400.01P-1	8I84T400550.01P-1
Number of outputs	1	1	1
Output ¹⁾	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	10 bit	10 bit	10 bit
Update time	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms
Min. load impedance			
Voltage	470 Ω	470 Ω	470 Ω
Current	500 Ω	500 Ω	500 Ω
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No
1) The current output can be configured as a 24 V logic output, max. 20 mA, min. load impedance 1.2 kΩ			
Safety input power removal	8I84T400300.01P-1	8I84T400400.01P-1	8I84T400550.01P-1
Number of outputs	1	1	1
Input circuit	Sink	Sink	Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Response time	≤ 100 ms	≤ 100 ms	≤ 100 ms
Switching threshold			
LOW	< 5 V	< 5 V	< 5 V
HIGH	> 15 V	> 15 V	> 15 V
Input impedance	1.5 kΩ	1.5 kΩ	1.5 kΩ
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
Operational conditions	8I84T400300.01P-1	8I84T400400.01P-1	8I84T400550.01P-1
Ambient temperature	-10 to +50°C	-10 to +50°C	-10 to +50°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 3000 m	Up to 3000 m	Up to 3000 m
Operating position			
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C1 and 3S2	Class 3C1 and 3S2	Class 3C1 and 3S2
Degree of protection	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)
1) With derating and removing the protective cover on top of the drive. See the possible mounting types and derating curves in the Installation Manual, available on www.br-automation.com .			
2) From 1000 m to 3000 m current derating of 1% per 100 m.			
Storage conditions	8I84T400300.01P-1	8I84T400400.01P-1	8I84T400550.01P-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Mechanical characteristics	8I84T400300.01P-1	8I84T400400.01P-1	8I84T400550.01P-1
Dimensions			
Width	155 mm	155 mm	175 mm
Height	260 mm	260 mm	295 mm
Depth	187 mm	187 mm	187 mm
Weight	4 kg	4 kg	5.5 kg

Optional accessories for 8I84T400300.01P-1

8IOFT026.300-1	EMC filter 3-phase 26 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 2.2 kW - 4 kW and 3x380-480 V 3 kW - 4 kW
8IOCT010.000-1	Line choke 3-phase 10 A for ACOPOSinverter X64 3x200-240 V 1.1 kW - 1.5 kW and 3x380-500 V 2.2 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 1.5 kW - 2.2 kW and 3x380-480 V 2.2 kW - 4 kW
8IOBR100.000-1	Braking resistor 100 Ohm, continuous braking power 0.05 kW for ACOPOSinverter X64 1x200-240 V 0.18 kW - 1.5 kW and 3x200-240 V 0.18 kW - 1.5 kW and 3x380-500 V 0.37 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 4 kW
8IOMF002.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 2.2 kW - 4 kW and 3x380-480 V 3 kW - 4 kW

Optional accessories for 8I84T400400.01P-1

8IOFT026.300-1	EMC filter 3-phase 26 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 2.2 kW - 4 kW and 3x380-480 V 3 kW - 4 kW
8IOCT010.000-1	Line choke 3-phase 10 A for ACOPOSinverter X64 3x200-240 V 1.1 kW - 1.5 kW and 3x380-500 V 2.2 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 1.5 kW - 2.2 kW and 3x380-480 V 2.2 kW - 4 kW
8IOBR100.000-1	Braking resistor 100 Ohm, continuous braking power 0.05 kW for ACOPOSinverter X64 1x200-240 V 0.18 kW - 1.5 kW and 3x200-240 V 0.18 kW - 1.5 kW and 3x380-500 V 0.37 kW - 4 kW, for ACOPOSinverter P84 3x200-240 V 0.37 kW - 0.75 kW and 3x380-480 V 0.75 kW - 4 kW
8IOMF002.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 2.2 kW - 4 kW and 3x380-480 V 3 kW - 4 kW

Optional accessories for 8I84T400550.01P-1

8IOFT035.300-1	EMC filter 3-phase 35 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 5.5 kW and 3x380-480 V 5.5 kW - 7.5 kW
8IOCT016.000-1	Line choke 3-phase 16 A for ACOPOSinverter X64 3x200-240 V 2.2 kW - 3 kW and 3x380-500 V 5.5 kW - 7.5 kW, for ACOPOSinverter P84 3x200-240 V 3 kW and 3x380-480 V 5.5 kW - 7.5 kW
8IOBR060.000-1	Braking resistor 60 Ohm, continuous braking power 0.1 kW for ACOPOSinverter X64 1x200-240 V 2.2 kW and 3x200-240 V 2.2 kW - 3 kW and 3x380-500 V 5.5 kW - 7.5 kW, for ACOPOSinverter P84 3x200-240 V 1.5 kW - 2.2 kW and 3x380-480 V 5.5 kW - 7.5 kW
8IOMF003.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 5.5 kW and 3x380-480 V 5.5 kW - 7.5 kW

ACOPOSinverter P84

3-phase 380-480V



Motor power	8I84T400750.01P-1	8I84T401100.01P-1	8I84T401500.01P-1
Indicated on rating plate	7.5 kW 10 HP	11 kW 15 HP	15 kW 20 HP
Power mains connection	8I84T400750.01P-1	8I84T401100.01P-1	8I84T401500.01P-1
Mains input voltage	3x 380 VAC - 15% to 480 VAC + 10%	3x 380 VAC - 15% to 480 VAC + 10%	3x 380 VAC - 15% to 480 VAC + 10%
Frequency	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%
Apparent power (at 380 VAC)	17.8 kVA	24.1 kVA	31.6 kVA
Max. prospective line I _{sc} (short circuit current at the connection point)	22 kA	22 kA	22 kA
Line current ¹⁾			
at 380 VAC	27 A	36.6 A	48 A
at 480 VAC	22.2 A	30 A	39 A
Max. line current with optional line choke at 400 VAC	15 A	21.9 A	28.8 A
Dissipated power at nominal load and nominal switching frequency	217 W	320 W	392 W
Integrated EMC filter ²⁾	Yes	Yes	Yes

1) Typical value for the indicated motor power and for the maximum prospective line I_{sc}.

2) EMC plate delivered with the drive.

Conducted and radiated EMC emissions	8I84T400750.01P-1	8I84T401100.01P-1	8I84T401500.01P-1
With integrated filter			
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	-	-	-
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	-	-	-
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	≤ 10 m ²⁾ or ≤ 5 m ³⁾	≤ 10 m ²⁾ or ≤ 5 m ³⁾	≤ 10 m ²⁾ or ≤ 5 m ³⁾
With additional filter			
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	≤ 50 m ²⁾ or ≤ 20 m ³⁾	≤ 50 m ²⁾ or ≤ 20 m ³⁾	≤ 100 m ⁴⁾ or ≤ 100 m ⁵⁾
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	≤ 100 m ²⁾ or ≤ 50 m ³⁾	≤ 100 m ²⁾ or ≤ 50 m ³⁾	≤ 300 m ⁴⁾ or ≤ 200 m ⁵⁾
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	-	-	-

1) For a shielded motor cable

2) At a switching frequency of 4 kHz

3) At a switching frequency from 4.1 to 16 kHz

4) At a switching frequency from 3.5 to 4 kHz

5) At a switching frequency from 4.1 to 12 kHz




Motor connector	8I84T400750.01P-1	8I84T401100.01P-1	8I84T401500.01P-1
Maximum continuous output current (In) ¹⁾			
at 380 VAC	17.6 A	27.7 A	33 A
at 460 VAC	14 A	21 A	27 A
Reduction of continuous output current depending on the ambient temperature			
At nominal switching frequency (4 kHz or 2.5 kHz for bigger drive ratings)	No reduction (up to 50°C)	No reduction (up to 50°C)	No reduction (up to 50°C)
Other switching frequencies	See the derating curves in the Installation Manual, available on www.br-automation.com		
Reduction of continuous output current depending on altitude			
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	26.4 A	41.6 A	49.5 A
Maximum transient current for 2 s	29 A	45.7 A	54.5 A
Output frequency range	0.5 to 1600 Hz	0.5 to 1600 Hz	0.5 to 1600 Hz
Rated switching frequency	4 kHz	4 kHz	4 kHz
Minimum	1 kHz	1 kHz	1 kHz
Maximum	16 kHz	16 kHz	16 kHz
Transient overtorque (typical value)	170% of the nominal motor torque (typical value at ± 10%) for 60 s 220% of the nominal motor torque (typical value at ± 10%) for 2 s		
Braking torque			
With braking resistor	Up to 150% of nominal motor torque		
Without braking resistor (typical value)	30% of nominal motor torque		
Motor control profiles			
Asynchronous motor	Flux Vector Control (FVC) with sensor (current vector) Sensorless Flux Vector Control (SFVC) (voltage or current vector) Voltage/frequency ratio (2 or 5 points) ENA (Energy Adaptation) System for unbalanced loads		
Synchronous motor	Vector control without speed feedback		
Maximum motor cable length ¹⁾			
Shielded cable	50 m	50 m	50 m
Unshielded cable	100 m	100 m	100 m
Main drive protection features	Thermal protection against overheating of the power stage Protection against: Short-circuits between motor phases, input phase breaks, overcurrents between output phases and earth, overvoltages on the DC bus, a break on the control circuit, exceeding the limit speed Safety function for: Line supply overvoltage and undervoltage, input phase loss in three-phase		
Main drive protection features	Thermal protection against overheating of the power stage Protection against: Short-circuits between motor phases, input phase breaks, overcurrents between output phases and earth, overvoltages on the DC bus, a break on the control circuit, exceeding the limit speed Safety function for: Line supply overvoltage and undervoltage, input phase loss in three-phase		
1) These values are given for nominal switching frequency.			
Braking chopper	8I84T400750.01P-1	8I84T401100.01P-1	8I84T401500.01P-1
Integrated dynamic brake transistors	Yes	Yes	Yes
Operating factor for the dynamic brake transistors	The dynamic brake transistor is sized so that it can tolerate: - The nominal motor power continuously - 150% of the nominal motor power for 60 s		
Minimum resistor value (external) ¹⁾	19 Ω	12 Ω	7 Ω

1) The minimum ohmic value is determined at a temperature of 20°C. In an environment where the temperature is below 20°C, make sure that the minimum ohmic value recommended in the table is observed.

ACOPOSinverter P84

3-phase 380-480V

24 VDC supply	8184T400750.01P-1	8184T401100.01P-1	8184T401500.01P-1
Input voltage	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)
Power consumption	30 W	30 W	30 W
Available internal supplies	8184T400750.01P-1	8184T401100.01P-1	8184T401500.01P-1
Output voltage	10.5 VDC ($\pm 5\%$)	10.5 VDC ($\pm 5\%$)	10.5 VDC ($\pm 5\%$)
Max. output current	10 mA	10 mA	10 mA
Output voltage	24 VDC (min. 21 V, max. 27 V)	24 VDC (min. 21 V, max. 27 V)	24 VDC (min. 21 V, max. 27 V)
Max. output current	200 mA	200 mA	200 mA
Digital inputs	8184T400750.01P-1	8184T401100.01P-1	8184T401500.01P-1
Number of inputs ¹⁾	5	5	5
Input circuit	Source or Sink	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Sampling time	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms
Input impedance	3.5 k Ω	3.5 k Ω	3.5 k Ω
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
1) logic input, switch-configurable as a logic input or as an input for PTC probes.			
Input for a maximum of 6 PTC probes mounted in series: Nominal value < 1.5 k Ω , trip resistance 3 k Ω , short-circuit protection < 50 Ω			
Relay outputs	8184T400750.01P-1	8184T401100.01P-1	8184T401500.01P-1
Number of outputs	2	2	2
Design			
Relay 1	1 N/O contact and 1 N/C contact with common point	1 N/O contact and 1 N/C contact with common point	1 N/O contact and 1 N/C contact with common point
Relay 2	1 N/O contact	1 N/O contact	1 N/O contact
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity			
Minimum	3 mA for 24 VDC	3 mA for 24 VDC	3 mA for 24 VDC
Maximum			
on resistive load ($\cos \phi = 1$ and L/R = 0 ms)	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC
on inductive load ($\cos \phi = 0.4$ and L/R = 7 ms)	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC
Response time (maximum)	< 7 ms \pm 0.5 ms	< 7 ms \pm 0.5 ms	< 7 ms \pm 0.5 ms
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No
Analog inputs	8184T400750.01P-1	8184T401100.01P-1	8184T401500.01P-1
Number of inputs	2	2	2
Input			
Voltage	± 10 V	± 10 V	± 10 V
Voltage / Current	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	11 bit + 1 sign bit	11 bit + 1 sign bit	11 bit + 1 sign bit
Sampling time	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms
Input impedance			
Voltage	30 k Ω	30 k Ω	30 k Ω
Current	242 Ω	242 Ω	242 Ω
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No

Analog outputs	8I84T400750.01P-1	8I84T401100.01P-1	8I84T401500.01P-1
Number of outputs	1	1	1
Output ¹⁾	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	10 bit	10 bit	10 bit
Update time	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms
Min. load impedance			
Voltage	470 Ω	470 Ω	470 Ω
Current	500 Ω	500 Ω	500 Ω
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No
1) The current output can be configured as a 24 V logic output, max. 20 mA, min. load impedance 1.2 kΩ			
Safety input power removal	8I84T400750.01P-1	8I84T401100.01P-1	8I84T401500.01P-1
Number of outputs	1	1	1
Input circuit	Sink	Sink	Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Response time	≤ 100 ms	≤ 100 ms	≤ 100 ms
Switching threshold			
LOW	< 5 V	< 5 V	< 5 V
HIGH	> 15 V	> 15 V	> 15 V
Input impedance	1.5 kΩ	1.5 kΩ	1.5 kΩ
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
Operational conditions	8I84T400750.01P-1	8I84T401100.01P-1	8I84T401500.01P-1
Ambient temperature	-10 to +50°C	-10 to +50°C	-10 to +50°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 3000 m	Up to 3000 m	Up to 3000 m
Operating position			
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C1 and 3S2	Class 3C1 and 3S2	Class 3C1 and 3S2
Degree of protection	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)
1) With derating and removing the protective cover on top of the drive. See the possible mounting types and derating curves in the Installation Manual, available on www.br-automation.com .			
2) From 1000 m to 3000 m current derating of 1% per 100 m.			
Storage conditions	8I84T400750.01P-1	8I84T401100.01P-1	8I84T401500.01P-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Mechanical characteristics	8I84T400750.01P-1	8I84T401100.01P-1	8I84T401500.01P-1
Dimensions			
Width	175 mm	210 mm	230 mm
Height	295 mm	295 mm	400 mm
Depth	187 mm	213 mm	213 mm
Weight	5.5 kg	7 kg	22 kg

ACOPOSinverter P84

3-phase 380-480V

Optional accessories for 8184T400750.01P-1

810FT035.300-1	EMC filter 3-phase 35 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 5.5 kW and 3x380-480 V 5.5 kW - 7.5 kW
810CT016.000-1	Line choke 3-phase 16 A for ACOPOSinverter X64 3x200-240 V 2.2 kW - 3 kW and 3x380-500 V 5.5 kW - 7.5 kW, for ACOPOSinverter P84 3x200-240 V 3 kW and 3x380-480 V 5.5 kW - 7.5 kW
810BR060.000-1	Braking resistor 60 Ohm, continuous braking power 0.1 kW for ACOPOSinverter X64 1x200-240 V 2.2 kW and 3x200-240 V 2.2 kW - 3 kW and 3x380-500 V 5.5 kW - 7.5 kW, for ACOPOSinverter P84 3x200-240 V 1.5 kW - 2.2 kW and 3x380-480 V 5.5 kW - 7.5 kW
810MF003.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 5.5 kW and 3x380-480 V 5.5 kW - 7.5 kW

Optional accessories for 8184T401100.01P-1

810FT046.300-1	EMC filter 3-phase 46 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 7.5 kW and 3x380-480 V 11 kW
810CT030.000-1	Line choke 3-phase 30 A for ACOPOSinverter X64 3x200-240 V 4 kW - 7.5 kW and 3x380-500 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 4 kW - 5.5 kW and 3x380-480 V 11 kW - 15 kW
810BR028.000-1	Braking resistor 28 Ohm, continuous braking power 0.2 kW for ACOPOSinverter X64 3x200-240 V 4 kW and 3x380-500 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 3 kW - 4 kW and 3x380-480 V 11 kW - 15 kW
810MF004.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 7.5 kW and 3x380-480 V 11 kW

Optional accessories for 8184T401500.01P-1

810FT072.300-1	EMC filter 3-phase 72 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 11 kW - 15 kW and 3x380-480 V 15 kW - 18.5 kW
810CT030.000-1	Line choke 3-phase 30 A for ACOPOSinverter X64 3x200-240 V 4 kW - 7.5 kW and 3x380-500 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 4 kW - 5.5 kW and 3x380-480 V 11 kW - 15 kW
810BR028.000-1	Braking resistor 28 Ohm, continuous braking power 0.2 kW for ACOPOSinverter X64 3x200-240 V 4 kW and 3x380-500 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 3 kW - 4 kW and 3x380-480 V 11 kW - 15 kW
810MF005.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 11 kW - 15 kW and 3x380-480 V 15 kW - 18.5 kW



Motor power	8I84T401850.01P-1	8I84T402200.01P-1	8I84T403000.01P-1
Indicated on rating plate	18.5 kW 25 HP	22 kW 30 HP	30 kW 40 HP
Power mains connection	8I84T401850.01P-1	8I84T402200.01P-1	8I84T403000.01P-1
Mains input voltage	3x 380 VAC - 15 % to 480 VAC + 10 %	3x 380 VAC - 15 % to 480 VAC + 10 %	3x 380 VAC - 15 % to 480 VAC + 10 %
Frequency	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%
Apparent power (at 380 VAC)	29.9 kVA	32.9 kVA	43.4 kVA
Max. prospective line I _{sc} (short circuit current at the connection point)	22 kA	22 kA	22 kA
Line current ¹⁾			
at 380 VAC	45.5 A	50 A	66 A
at 480 VAC	37.5 A	42 A	56 A
Max. line current with optional line choke at 400 V			
Dissipated power at nominal load and nominal switching frequency	486 W	574 W	799 W
Integrated EMC filter ²⁾	Yes	Yes	Yes

1) Typical value for the indicated motor power and for the maximum prospective line I_{sc}.

2) EMC plate delivered with the drive.

Conducted and radiated EMC emissions	8I84T401850.01P-1	8I84T402200.01P-1	8I84T403000.01P-1
With integrated filter			
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	-	-	-
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	-	-	-
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	≤ 50 m ²⁾ or ≤ 25 m ³⁾	≤ 50 m ²⁾ or ≤ 25 m ³⁾	≤ 50 m ²⁾ or ≤ 25 m ³⁾
With additional filter			
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	≤ 100 m ⁴⁾ or ≤ 100 m ⁵⁾	≤ 100 m ⁴⁾ or ≤ 100 m ⁵⁾	≤ 100 m ⁴⁾ or ≤ 100 m ⁵⁾
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	≤ 300 m ⁴⁾ or ≤ 200 m ⁵⁾	≤ 300 m ⁴⁾ or ≤ 200 m ⁵⁾	≤ 300 m ⁴⁾ or ≤ 200 m ⁵⁾
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	-	-	-

1) For a shielded motor cable

2) At a switching frequency of 4 kHz

3) At a switching frequency from 4.1 to 16 kHz

4) At a switching frequency from 3.5 to 4 kHz

5) At a switching frequency from 4.1 to 12 kHz

ACOPOSinverter P84

3-phase 380-480V

Motor connector	8I84T401850.01P-1	8I84T402200.01P-1	8I84T403000.01P-1
Maximum continuous output current (In) ¹⁾			
at 380 VAC	33 A	41 A	48 A
at 460 VAC	27 A	34 A	40 A
Reduction of continuous output current depending on the ambient temperature			
At nominal switching frequency (4 kHz or 2.5 kHz for bigger drive ratings)	No reduction (up to 50°C)	No reduction (up to 50°C)	No reduction (up to 50°C)
Other switching frequencies	See the derating curves in the Installation Manual, available on www.br-automation.com		
Reduction of continuous output current depending on altitude			
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	49.5 A	61.5 A	72 A
Maximum transient current for 2 s	54.5 A	67.7 A	79.2 A
Output frequency range	0.5 to 1600 Hz	0.5 to 1600 Hz	0.5 to 1600 Hz
Rated switching frequency	4 kHz	4 kHz	4 kHz
Minimum	1 kHz	1 kHz	1 kHz
Maximum	16 kHz	16 kHz	16 kHz
Transient overtorque (typical value)	170% of the nominal motor torque (typical value at $\pm 10\%$) for 60 s 220% of the nominal motor torque (typical value at $\pm 10\%$) for 2 s		
Braking torque			
With braking resistor	Up to 150% of nominal motor torque		
Without braking resistor (typical value)	30% of nominal motor torque		
Motor control profiles			
Asynchronous motor	Flux Vector Control (FVC) with sensor (current vector) Sensorless Flux Vector Control (SFVC) (voltage or current vector) Voltage/frequency ratio (2 or 5 points) ENA (Energy Adaptation) System for unbalanced loads		
Synchronous motor	Vector control without speed feedback		
Maximum motor cable length ¹⁾			
Shielded cable	100 m	100 m	100 m
Unshielded cable	150 m	150 m	150 m
Main drive protection features	Thermal protection against overheating of the power stage Protection against: Short-circuits between motor phases, input phase breaks, overcurrents between output phases and earth, overvoltages on the DC bus, a break on the control circuit, exceeding the limit speed Safety function for: Line supply overvoltage and undervoltage, input phase loss in three-phase		
Motor protection	Thermal protection integrated in drive via continuous calculation of I^2t taking speed into account: - The motor thermal state is saved when the drive is powered down. - Function can be modified via operator dialogue terminals, depending on the type of motor (force-cooled or self-cooled). Protection against motor phase breaks		

¹⁾ These values are given for nominal switching frequency.




Braking chopper	8I84T401850.01P-1	8I84T402200.01P-1	8I84T403000.01P-1
Integrated dynamic brake transistors	Yes	Yes	Yes
Operating factor for the dynamic brake transistors	The dynamic brake transistor is sized so that it can tolerate: - The nominal motor power continuously - 150% of the nominal motor power for 60 s		
Minimum resistor value (external) ¹⁾	19 Ω	12 Ω	7 Ω

¹⁾ The minimum ohmic value is determined at a temperature of 20°C. In an environment where the temperature is below 20°C, make sure that the minimum ohmic value recommended in the table is observed.

24 VDC supply	8I84T401850.01P-1	8I84T402200.01P-1	8I84T403000.01P-1
Input voltage	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)
Power consumption	30 W	30 W	30 W
Available internal supplies	8I84T401850.01P-1	8I84T402200.01P-1	8I84T403000.01P-1
Output voltage	10.5 VDC ($\pm 5\%$)	10.5 VDC ($\pm 5\%$)	10.5 VDC ($\pm 5\%$)
Max. output current	10 mA	10 mA	10 mA
Output voltage	24 VDC (min. 21 V, max. 27 V)	24 VDC (min. 21 V, max. 27 V)	24 VDC (min. 21 V, max. 27 V)
Max. output current	200 mA	200 mA	200 mA
Digital inputs	8I84T401850.01P-1	8I84T402200.01P-1	8I84T403000.01P-1
Number of inputs ¹⁾	5	5	5
Input circuit	Source or Sink	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Sampling time	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms
Input impedance	3.5 k Ω	3.5 k Ω	3.5 k Ω
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
1) logic input, switch-configurable as a logic input or as an input for PTC probes.			
Input for a maximum of 6 PTC probes mounted in series: Nominal value < 1.5 k Ω , trip resistance 3 k Ω , reset value 1.8 k Ω , short-circuit protection < 50 Ω			
Relay outputs	8I84T401850.01P-1	8I84T402200.01P-1	8I84T403000.01P-1
Number of outputs	2	2	2
Design			
Relay 1	1 N/O contact and 1 N/C contact with common point	1 N/O contact and 1 N/C contact with common point	1 N/O contact and 1 N/C contact with common point
Relay 2	1 N/O contact	1 N/O contact	1 N/O contact
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity			
Minimum	3 mA for 24 VDC	3 mA for 24 VDC	3 mA for 24 VDC
Maximum			
on resistive load ($\cos \phi = 1$ and L/R = 0 ms)	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC
on inductive load ($\cos \phi = 0.4$ and L/R = 7 ms)	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC
Response time (maximum)	< 7 ms \pm 0.5 ms	< 7 ms \pm 0.5 ms	< 7 ms \pm 0.5 ms
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No
Analog inputs	8I84T401850.01P-1	8I84T402200.01P-1	8I84T403000.01P-1
Number of inputs	2	2	2
Input			
Voltage	± 10 V	± 10 V	± 10 V
Voltage / Current	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	11 bit + 1 sign bit	11 bit + 1 sign bit	11 bit + 1 sign bit
Sampling time	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms
Input impedance			
Voltage	30 k Ω	30 k Ω	30 k Ω
Current	242 Ω	242 Ω	242 Ω
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No

ACOPOSinverter P84

3-phase 380-480V

Analog outputs	8184T401850.01P-1	8184T402200.01P-1	8184T403000.01P-1
Number of outputs	1	1	1
Output ¹⁾	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	10 bit	10 bit	10 bit
Update time	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms
Min. load impedance			
Voltage	470 Ω	470 Ω	470 Ω
Current	500 Ω	500 Ω	500 Ω
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No
1) The current output can be configured as a 24 V logic output, max. 20 mA, min. load impedance 1.2 kΩ			
Safety input power removal	8184T401850.01P-1	8184T402200.01P-1	8184T403000.01P-1
Number of outputs	1	1	1
Input circuit	Sink	Sink	Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Response time	≤ 100 ms	≤ 100 ms	≤ 100 ms
Switching threshold			
LOW	< 5 V	< 5 V	< 5 V
HIGH	> 15 V	> 15 V	> 15 V
Input impedance	1.5 kΩ	1.5 kΩ	1.5 kΩ
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
Operational conditions	8184T401850.01P-1	8184T402200.01P-1	8184T403000.01P-1
Ambient temperature	-10 to +50°C	-10 to +50°C	-10 to +50°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 3000 m	Up to 3000 m	Up to 3000 m
Operating position			
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C1 and 3S2	Class 3C1 and 3S2	Class 3C1 and 3S2
Degree of protection	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)
1) With derating and removing the protective cover on top of the drive. Control card fan kit needed for specific drives. See Optional accessories See the possible mounting types and derating curves in the Installation Manual, available on www.br-automation.com .			
2) From 1000 m to 3000 m current derating of 1% per 100 m.			
Storage conditions	8184T401850.01P-1	8184T402200.01P-1	8184T403000.01P-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Mechanical characteristics	8184T401850.01P-1	8184T402200.01P-1	8184T403000.01P-1
Dimensions			
Width	230 mm	240 mm	240 mm
Height	400 mm	420 mm	550 mm
Depth	213 mm	236 mm	266 mm
Weight	22 kg	30 kg	37 kg

Optional accessories for 8I84T401850.01P-1

8IOFT072.300-1	EMC filter 3-phase 72 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 11 kW - 15 kW and 3x380-480 V 15 kW - 18.5 kW
8IOCT060.000-1	Line choke 3-phase 60 A for ACOPOSinverter X64 3x200-240 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 7.5 kW - 11 kW and 3x380-480 V 18.5 kW - 22 kW
8IOBR015.000-1	Braking resistor 15 Ohm, continuous braking power 1kW for ACOPOSinverter X64 3x200-240 V 5.5 kW - 7.5 kW, for ACOPOSinverter P84 3x200-240 V 5.5 kW - 7.5 kW and 3x380-480 V 18.5 kW - 30 kW
8IOMF005.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 11 kW - 15 kW and 3x380-480 V 15 kW - 18.5 kW

Optional accessories for 8I84T402200.01P-1

8IOFT090.300-1	EMC filter 3-phase 90 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 18.5 kW - 22 kW and 3x380-480 V 22 kW
8IOCT060.000-1	Line choke 3-phase 60 A for ACOPOSinverter X64 3x200-240 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 7.5 kW - 11 kW and 3x380-480 V 18.5 kW - 22 kW
8IOBR015.000-1	Braking resistor 15 Ohm, continuous braking power 1kW for ACOPOSinverter X64 3x200-240 V 5.5 kW - 7.5 kW, for ACOPOSinverter P84 3x200-240 V 5.5 kW - 7.5 kW and 3x380-480 V 18.5 kW - 30 kW
8IOMF006.300-1	Feed through mounting kit for ACOPOSinverter P84 3x200-240 V 18.5 kW - 22 kW and 3x380-480 V 22 kW
8IOXF004.300-1	Control card fan kit for ACOPOSinverter P84 3x200-240 V 18.5 kW - 22 kW and 3x380-480 V 22 kW, for operation at ambient temperature between 50 and 60°C

Optional accessories for 8I84T403000.01P-1

8IOFT092.300-1	EMC filter 3-phase 92 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x380-480 V 37 kW
8IOCT100.000-1	Line choke 3-phase 100 A for ACOPOSinverter P84 3x200-240 V 15 kW and 3x380-480 V 30 kW - 55 kW
8IOBR015.000-1	Braking resistor 15 Ohm, continuous braking power 1kW for ACOPOSinverter X64 3x200-240 V 5.5 kW - 7.5 kW, for ACOPOSinverter P84 3x200-240 V 5.5 kW - 7.5 kW and 3x380-480 V 18.5 kW - 30 kW
8IOMF007.300-1	Feed through mounting kit for ACOPOSinverter P84 3x380-480 V 30 kW - 37 kW
8IOXF005.300-1	Control card fan kit for ACOPOSinverter P84 3x380-480 V 30 kW - 37 kW, for operation at ambient temperature between 50 and 60°C

ACOPOSinverter P84

3-phase 380-480V



Motor power	8184T403700.01P-1	8184T404500.01P-1
Indicated on rating plate	37 kW 50 HP	45 kW 60 HP
Power mains connection	8184T403700.01P-1	8184T404500.01P-1
Mains input voltage	3x 380 VAC - 15% to 480 VAC + 10%	3x 380 VAC - 15% to 480 VAC + 10%
Frequency	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%
Apparent power (at 380 VAC)	55.3 kVA	68.5 kVA
Max. prospective line I _{sc} (short circuit current at the connection point)	22 kA	22 kA
Line current ¹⁾		
at 380 VAC	84 A	104 A
at 480 VAC	69 A	85 A
Max. line current with optional line choke at 400 VAC	67.3 A	81.5 A
Dissipated power at nominal load and nominal switching frequency	861 W	1060 W
Integrated EMC filter ²⁾	Yes	Yes
Conducted and radiated EMC emissions	8184T403700.01P-1	8184T404500.01P-1
With integrated filter		
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	-	-
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	-	-
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	≤ 50 m ²⁾ or ≤ 25 m ³⁾	≤ 50 m ²⁾ or ≤ 25 m ³⁾
With additional filter		
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	≤ 100 m ²⁾ or ≤ 100 m ³⁾	≤ 100 m ²⁾ or ≤ 100 m ³⁾
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	≤ 300 m ²⁾ or ≤ 200 m ³⁾	≤ 300 m ²⁾ or ≤ 200 m ³⁾
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	-	-

1) Typical value for the indicated motor power and for the maximum prospective line I_{sc}.

2) EMC plate delivered with the drive.

1) For a shielded motor cable

2) At a switching frequency from 2 to 2.5 kHz

3) At a switching frequency from 2.6 to 12 kHz

Motor connector	8184T403700.01P-1	8184T404500.01P-1
Maximum continuous output current (I _n) ¹⁾		
at 380 VAC	79 A	94 A
at 460 VAC	65 A	77 A
Reduction of continuous output current depending on the ambient temperature		
At nominal switching frequency (4 kHz or 2.5 kHz for bigger drive ratings)	No reduction (up to 50°C)	No reduction (up to 50°C)
Other switching frequencies	See the derating curves in the Installation Manual, available on www.br-automation.com	
Reduction of continuous output current depending on altitude		
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	118.5 A	141 A
Maximum transient current for 2 s	130 A	155 A
Output frequency range	0.5 to 1600 Hz	0.5 to 500 Hz
Rated switching frequency	2.5 kHz	2.5 kHz
Minimum	1 kHz	1 kHz
Maximum	16 kHz	16 kHz
Transient overtorque (typical value)	170% of the nominal motor torque (typical value at ± 10%) for 60 s 220% of the nominal motor torque (typical value at ± 10%) for 2 s	
Braking torque		
With braking resistor	Up to 150% of nominal motor torque	
Without braking resistor (typical value)	30% of nominal motor torque	
Motor control profiles		
Asynchronous motor	Flux Vector Control (FVC) with sensor (current vector) Sensorless Flux Vector Control (SFVC) (voltage or current vector) Voltage/frequency ratio (2 or 5 points)	
Synchronous motor	ENA (Energy Adaptation) System for unbalanced loads Vector control without speed feedback	
Maximum motor cable length ¹⁾		
Shielded cable	100 m	100 m
Unshielded cable	150 m	150 m
Main drive protection features	Thermal protection against overheating of the power stage Protection against: Short-circuits between motor phases, input phase breaks, overcurrents between output phases and earth, overvoltages on the DC bus, a break on the control circuit, exceeding the limit speed Safety function for: Line supply overvoltage and undervoltage, input phase loss in three-phase	
Motor protection	Thermal protection integrated in drive via continuous calculation of I ² t taking speed into account: - The motor thermal state is saved when the drive is powered down. - Function can be modified via operator dialogue terminals, depending on the type of motor (force-cooled or self-cooled). Protection against motor phase breaks Protection with PTC probes	

1) These values are given for nominal switching frequency.



Braking chopper	8184T403700.01P-1	8184T404500.01P-1
Integrated dynamic brake transistors	Yes	Yes
Operating factor for the dynamic brake transistors	The dynamic brake transistor is sized so that it can tolerate: - The nominal motor power continuously - 150% of the nominal motor power for 60 s	
Minimum resistor value (external) ¹⁾	6.7 Ω	5 Ω

1) The minimum ohmic value is determined at a temperature of 20°C. In an environment where the temperature is below 20°C, make sure that the minimum ohmic value recommended in the table is observed.

ACOPOSinverter P84

3-phase 380-480V

24 VDC supply		
Input voltage	8184T403700.01P-1 24 VDC (min. 19 V, max. 30 V)	8184T404500.01P-1 24 VDC (min. 19 V, max. 30 V)
Power consumption	30 W	30 W
Available internal supplies		
Output voltage	8184T403700.01P-1 10.5 VDC ($\pm 5\%$)	8184T404500.01P-1 10.5 VDC ($\pm 5\%$)
Max. output current	10 mA	10 mA
Output voltage	24 VDC (min. 21 V, max. 27 V)	24 VDC (min. 21 V, max. 27 V)
Max. output current	200 mA	200 mA
Digital inputs		
Number of inputs ¹⁾	5	5
Input circuit	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC
Sampling time	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms
Input impedance	3.5 k Ω	3.5 k Ω
Electrical isolation		
Input - ACOPOSinverter	Yes	Yes
Input - Input	No	No
1) logic input, switch-configurable as a logic input or as an input for PTC probes. Input for a maximum of 6 PTC probes mounted in series: Nominal value < 1.5 k Ω , trip resistance 3 k Ω , reset value 1.8 k Ω , short-circuit protection < 50 Ω		
Relay outputs		
Number of outputs	2	2
Design		
Relay 1	1 N/O contact and 1 N/C contact with common point	1 N/O contact and 1 N/C contact with common point
Relay 2	1 N/O contact	1 N/O contact
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity		
Minimum	3 mA for 24 VDC	3 mA for 24 VDC
Maximum		
on resistive load ($\cos \phi = 1$ and L/R = 0 ms)	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC
on inductive load ($\cos \phi = 0.4$ and L/R = 7 ms)	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC
Response time (maximum)	< 7 ms \pm 0.5 ms	< 7 ms \pm 0.5 ms
Electrical isolation		
Output - ACOPOSinverter	Yes	Yes
Output - Output	No	No
Analog inputs		
Number of inputs	2	2
Input		
Voltage	± 10 V	± 10 V
Voltage / Current	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	11 bit + 1 sign bit	11 bit + 1 sign bit
Sampling time	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms
Input impedance		
Voltage	30 k Ω	30 k Ω
Current	242 Ω	242 Ω
Electrical isolation		
Input - ACOPOSinverter	Yes	Yes
Input - Input	No	No

Analog outputs		
	8184T403700.01P-1	8184T404500.01P-1
Number of outputs	1	1
Output ¹⁾	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	10 bit	10 bit
Update time	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms
Min. load impedance		
Voltage	470 Ω	470 Ω
Current	500 Ω	500 Ω
Electrical isolation		
Output - ACOPOSinverter	Yes	Yes
Output - Output	No	No
1) The current output can be configured as a 24 V logic output, max. 20 mA, min. load impedance 1.2 kΩ		
Safety input power removal		
	8184T403700.01P-1	8184T404500.01P-1
Number of inputs	1	1
Input circuit	Sink	Sink
Rated voltage	24 VDC	24 VDC
Response time	≤ 100 ms	≤ 100 ms
Switching threshold		
LOW	< 5 V	< 5 V
HIGH	> 15 V	> 15 V
Input impedance	1.5 kΩ	1.5 kΩ
Electrical isolation		
Input - ACOPOSinverter	Yes	Yes
Input - Input	No	No
Operational conditions		
	8184T403700.01P-1	8184T404500.01P-1
Ambient temperature	-10 to +50°C	-10 to +50°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 3000 m	Up to 3000 m
Operating position		
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C1 and 3S2	Class 3C1 and 3S2
Degree of protection	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)
1) With derating and removing the protective cover on top of the drive. Control card fan kit needed for specific drives. See Optional accessories. See the possible mounting types and derating curves in the Installation Manual, available on www.br-automation.com .		
2) From 1000 m to 3000 m current derating of 1% per 100 m.		
Storage conditions		
	8184T403700.01P-1	8184T404500.01P-1
Storage temperature	-25 to +70°C	-25 to +70°C
Mechanical characteristics		
	8184T403700.01P-1	8184T404500.01P-1
Dimensions		
Width	240 mm	320 mm
Height	550 mm	630 mm
Depth	266 mm	290 mm
Weight	37 kg	44 kg

ACOPOSinverter P84

3-phase 380-480V

Optional accessories for 8184T403700.01P-1

810FT092.300-1	EMC filter 3-phase 92 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x380-480 V 37 kW
810CT100.000-1	Line choke 3-phase 100 A for ACOPOSinverter P84 3x200-240 V 15 kW and 3x380-480 V 30 kW - 55 kW
810BR010.000-1	Braking resistor 10 Ohm, continuous braking power 1 kW for ACOPOSinverter X64 3x200-240 V 11 kW - 15 kW, for ACOPOSinverter P84 3x200-240 V 11 kW and 3x380-480 V 37 kW
810MF007.300-1	Feed through mounting kit for ACOPOSinverter P84 3x380-480 V 30 kW - 37 kW
810XF005.300-1	Control card fan kit for ACOPOSinverter P84 3x380-480 V 30 kW - 37 kW, for operation at ambient temperature between 50 and 60°C

Optional accessories for 8184T404500.01P-1

810FT180.300-1	EMC filter 3-phase 180 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 30 kW - 45 kW and 3x380-480 V 45 kW - 75 kW
810CT100.000-1	Line choke 3-phase 100 A for ACOPOSinverter P84 3x200-240 V 15 kW and 3x380-480 V 30 kW - 55 kW
810BR005.000-1	Braking resistor 5 Ohm, continuous braking power 1.3 kW for ACOPOSinverter P84 3x200-240 V 18.5 kW - 22 kW and 3x380-480 V 45 kW - 75 kW
810MF009.300-1	Feed through mounting kit for ACOPOSinverter P84 3x380-480 V 45 kW - 75 kW
810XF007.300-1	Control card fan kit Control card fan kit, for ACOPOSinverter P84 3x380-480 V 45 kW - 75 kW, for operation at ambient temperature between 50 to 60°C



Motor power	8I84T405500.01P-1	8I84T407500.01P-1
Indicated on rating plate	55 kW 75 HP	75 kW 100 HP
Power mains connection	8I84T405500.01P-1	8I84T407500.01P-1
Mains input voltage	3x 380 VAC - 15 % to 480 VAC + 10 %	3x 380 VAC - 15 % to 480 VAC + 10 %
Frequency	50 to 60 Hz ± 5 %	50 to 60 Hz ± 5 %
Apparent power (at 380 VAC)	79 kVA	109.9 kVA
Max. prospective line I _{sc} (short circuit current at the connection point)	22 kA	22 kA
Line current ¹⁾		
at 380 VAC	120 A	167 A
at 480 VAC	101 A	137 A
Max. line current with optional line choke at 400 VAC	98.9 A	135.7 A
Dissipated power at nominal load and nominal switching frequency	1210 W	1720 W
Integrated EMC filter ²⁾	Yes	Yes
Conducted and radiated EMC emissions	8I84T405500.01P-1	8I84T407500.01P-1
With integrated filter		
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	-	-
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	-	-
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	≤ 50 m ²⁾ or ≤ 25 m ³⁾	≤ 50 m ²⁾ or ≤ 25 m ³⁾
With additional filter	8I0FT180.300-1	8I0FT180.300-1
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	≤ 100 m ²⁾ or ≤ 100 m ³⁾	≤ 100 m ²⁾ or ≤ 100 m ³⁾
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	≤ 300 m ²⁾ or ≤ 200 m ³⁾	≤ 300 m ²⁾ or ≤ 200 m ³⁾
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	-	-

1) Typical value for the indicated motor power and for the maximum prospective line I_{sc}.

2) EMC plate delivered with the drive.

1) For a shielded motor cable

2) At a switching frequency from 2 to 2.5 kHz

3) At a switching frequency from 2.6 to 12 kHz

ACOPOSinverter P84

3-phase 380-480V



Motor connector	8I84T405500.01P-1	8I84T407500.01P-1
Maximum continuous output current (I _n) ¹⁾		
at 380 VAC	116 A	160 A
at 460 VAC	96 A	124 A
Reduction of continuous output current depending on the ambient temperature		
At nominal switching frequency	No reduction (up to 50°C)	No reduction (up to 50°C)
(4 kHz or 2.5 kHz for bigger drive ratings)	See the derating curves in the Installation Manual, available on www.br-automation.com	
Other switching frequencies		
Reduction of continuous output current depending on altitude		
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	174 A	240 A
Maximum transient current for 2 s	191 A	264 A
Output frequency range	0.5 to 500 Hz	0.5 to 500 Hz
Rated switching frequency	2.5 kHz	2.5 kHz
Minimum	1 kHz	1 kHz
Maximum	16 kHz	16 kHz
Transient overtorque (typical value)	170% of the nominal motor torque (typical value at ± 10%) for 60 s 220% of the nominal motor torque (typical value at ± 10%) for 2 s	
Braking torque		
With braking resistor	Up to 150% of nominal motor torque	
Without braking resistor (typical value)	30% of nominal motor torque	
Motor control profiles		
Asynchronous motor	Flux Vector Control (FVC) with sensor (current vector) Sensorless Flux Vector Control (SFVC) (voltage or current vector) Voltage/frequency ratio (2 or 5 points) ENA (Energy Adaptation) System for unbalanced loads	
Synchronous motor	Vector control without speed feedback	
Maximum motor cable length ¹⁾		
Shielded cable	100 m	100 m
Unshielded cable	150 m	150 m
Main drive protection features	Thermal protection against overheating of the power stage Protection against: Short-circuits between motor phases, input phase breaks, overcurrents between output phases and earth, overvoltages on the DC bus, a break on the control circuit, exceeding the limit speed Safety function for: Line supply overvoltage and undervoltage, input phase loss in three-phase	
Motor protection	Thermal protection integrated in drive via continuous calculation of I ² t taking speed into account: - The motor thermal state is saved when the drive is powered down. - Function can be modified via operator dialogue terminals, depending on the type of motor (force-cooled or self-cooled). Protection against motor phase breaks	
1) These values are given for nominal switching frequency.		
Braking chopper	8I84T405500.01P-1	8I84T407500.01P-1
Integrated dynamic brake transistors	Yes	Yes
Operating factor for the dynamic brake transistors	The dynamic brake transistor is sized so that it can tolerate: - The nominal motor power continuously - 150% of the nominal motor power for 60 s	
Minimum resistor value (external) ¹⁾	5 Ω	3.3 Ω

1) The minimum ohmic value is determined at a temperature of 20°C. In an environment where the temperature is below 20°C, make sure that the minimum ohmic value recommended in the table is observed.

24 VDC supply		
Input voltage	8184T405500.01P-1 24 VDC (min. 19 V, max. 30 V)	8184T407500.01P-1 24 VDC (min. 19 V, max. 30 V)
Power consumption	30 W	30 W
Available internal supplies		
Output voltage	8184T405500.01P-1 10.5 VDC ($\pm 5\%$)	8184T407500.01P-1 10.5 VDC ($\pm 5\%$)
Max. output current	10 mA	10 mA
Output voltage	24 VDC (min. 21 V, max. 27 V)	24 VDC (min. 21 V, max. 27 V)
Max. output current	200 mA	200 mA
Digital inputs		
Number of inputs ¹⁾	5	5
Input circuit	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC
Sampling time	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms
Input impedance	3.5 k Ω	3.5 k Ω
Electrical isolation		
Input - ACOPOSinverter	Yes	Yes
Input - Input	No	No
1) logic input, switch-configurable as a logic input or as an input for PTC probes. Input for a maximum of 6 PTC probes mounted in series: Nominal value < 1.5 k Ω , trip resistance 3 k Ω , reset value 1.8 k Ω , short-circuit protection < 50 Ω		
Relay outputs		
Number of outputs	2	2
Design		
Relay 1	1 N/O contact and 1 N/C contact with common point	1 N/O contact and 1 N/C contact with common point
Relay 2	1 N/O contact	1 N/O contact
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity		
Minimum	3 mA for 24 VDC	3 mA for 24 VDC
Maximum		
on resistive load ($\cos \phi = 1$ and L/R = 0 ms)	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC
on inductive load ($\cos \phi = 0.4$ and L/R = 7 ms)	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC
Response time (maximum)	< 7 ms \pm 0.5 ms	< 7 ms \pm 0.5 ms
Electrical isolation		
Output - ACOPOSinverter	Yes	Yes
Output - Output	No	No
Analog inputs		
Number of inputs	2	2
Input		
Voltage	± 10 V	± 10 V
Voltage / Current	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	11 bit + 1 sign bit	11 bit + 1 sign bit
Sampling time	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms
Input impedance		
Voltage	30 k Ω	30 k Ω
Current	242 Ω	242 Ω
Electrical isolation		
Input - ACOPOSinverter	Yes	Yes
Input - Input	No	No

ACOPOSinverter P84

3-phase 380-480V

Analog outputs	8I84T405500.01P-1	8I84T407500.01P-1
Number of outputs	1	1
Output ¹⁾	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	10 bit	10 bit
Update time	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms
Min. load impedance		
Voltage	470 Ω	470 Ω
Current	500 Ω	500 Ω
Electrical isolation		
Output - ACOPOSinverter	Yes	Yes
Output - Output	No	No
1) The current output can be configured as a 24 V logic output, max. 20 mA, min. load impedance 1.2 kΩ		
Safety input power removal	8I84T405500.01P-1	8I84T407500.01P-1
Number of outputs	1	1
Input circuit	Sink	Sink
Rated voltage	24 VDC	24 VDC
Response time	≤ 100 ms	≤ 100 ms
Switching threshold		
LOW	< 5 V	< 5 V
HIGH	> 15 V	> 15 V
Input impedance	1.5 kΩ	1.5 kΩ
Electrical isolation		
Input - ACOPOSinverter	Yes	Yes
Input - Input	No	No
Operational conditions	8I84T405500.01P-1	8I84T407500.01P-1
Ambient temperature	-10 to +50°C	-10 to +50°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 3000 m	Up to 3000 m
Operating position		
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C1 and 3S2	Class 3C1 and 3S2
Degree of protection	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)
1) With derating and removing the protective cover on top of the drive. Control card fan kit needed for specific drives. See tables on page [Product Overview] See the possible mounting types and derating curves in the Installation Manual, available on www.br-automation.com .		
2) From 1000 m to 3000 m current derating of 1% per 100 m.		
Storage conditions	8I84T405500.01P-1	8I84T407500.01P-1
Storage temperature	-25 to +70°C	-25 to +70°C
Mechanical characteristics	8I84T405500.01P-1	8I84T407500.01P-1
Dimensions		
Width	320 mm	320 mm
Height	630 mm	630 mm
Depth	290 mm	290 mm
Weight	44 kg	44 kg

Optional accessories for 8I84T405500.01P-1

8IOFT180.300-1	EMC filter 3-phase 180 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 30 kW - 45 kW and 3x380-480 V 45 kW - 75 kW
8IOCT100.000-1	Line choke 3-phase 100 A for ACOPOSinverter P84 3x200-240 V 15 kW and 3x380-480 V 30 kW - 55 kW
8IOBR005.000-1	Braking resistor 5 Ohm, continuous braking power 1.3 kW for ACOPOSinverter P84 3x200-240 V 18.5 kW - 22 kW and 3x380-480 V 45 kW - 75 kW
8IOMF009.300-1	Feed through mounting kit for ACOPOSinverter P84 3x380-480 V 45 kW - 75 kW
8IOXF007.300-1	Control card fan kit Control card fan kit, for ACOPOSinverter P84 3x380-480 V 45 kW - 75 kW, for operation at ambient temperature between 50 to 60°C

Optional accessories for 8I84T407500.01P-1

8IOFT180.300-1	EMC filter 3-phase 180 A, mounting underneath or beside the inverter for ACOPOSinverter P84 3x200-240 V 30 kW - 45 kW and 3x380-480 V 45 kW - 75 kW
8IOCT184.000-1	Line choke 3-phase 100 A for ACOPOSinverter P84 3x200-240 V 15 kW and 3x380-480 V 30 kW - 55 kW
8IOBR005.000-1	Braking resistor 5 Ohm, continuous braking power 1.3 kW for ACOPOSinverter P84 3x200-240 V 18.5 kW - 22 kW and 3x380-480 V 45 kW - 75 kW
8IOMF009.300-1	Feed through mounting kit for ACOPOSinverter P84 3x380-480 V 45 kW - 75 kW
8IOXF007.300-1	Control card fan kit Control card fan kit, for ACOPOSinverter P84 3x380-480 V 45 kW - 75 kW, for operation at ambient temperature between 50 to 60°C

ACOPOSinverter P84

3-phase 380-480V



Motor power	8184T409000.01P-1 ¹⁾	8184T411000.01P-1 ¹⁾	8184T413200.01P-1 ¹⁾
Indicated on rating plate	90 kW 125 HP	110 kW 150 HP	132 kW 200 HP

1) Drives supplied with a DC choke.

Power mains connection	8184T409000.01P-1	8184T411000.01P-1	8184T413200.01P-1
Mains input voltage	3x 380 VAC - 15% to 480 VAC + 10%	3x 380 VAC - 15% to 480 VAC + 10%	3x 380 VAC - 15% to 480 VAC + 10%
Frequency	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%
Apparent power (at 380 VAC)	109.3 kVA	133 kVA	157.3 kVA
Max. prospective line I _{sc} (short circuit current at the connection point)	35 kA	35 kA	35 kA
Line current with DC choke ¹⁾			
at 380 VAC	166 A	202 A	239 A
at 480 VAC	134 A	163 A	192 A
Dissipated power at nominal load and nominal switching frequency	2403 W	2726 W	3191 W
Integrated EMC filter ²⁾	Yes	Yes	Yes

1) Typical value for the indicated motor power and for the maximum prospective line I_{sc}.

2) Drive supplied without EMC plate.

Conducted and radiated EMC emissions	8184T409000.01P-1	8184T411000.01P-1	8184T413200.01P-1
With integrated filter			
Motor cable length according to IEC/EN 61800-3	-	-	-
Cat. C1 ¹⁾ Environment 1 (public network)	-	-	-
Motor cable length according to IEC/EN 61800-3	-	-	-
Cat. C2 ¹⁾ Environment 1 (public network)	-	-	-
Motor cable length according to IEC/EN 61800-3	≤ 50 m ²⁾ or ≤ 25 m ³⁾	≤ 50 m ²⁾ or ≤ 25 m ³⁾	≤ 50 m ²⁾ or ≤ 25 m ³⁾
Cat. C3 ¹⁾ Environment 2 (industrial network)			
With additional filter			
Motor cable length according to IEC/EN 61800-3	810FT273.300-1	810FT273.300-1	810FT273.300-1
Cat. C1 ¹⁾ Environment 1 (public network)	≤ 50 m ²⁾ or ≤ 25 m ³⁾	≤ 50 m ²⁾ or ≤ 25 m ³⁾	≤ 50 m ²⁾ or ≤ 25 m ³⁾
Motor cable length according to IEC/EN 61800-3	≤ 300 m ²⁾ or ≤ 150 m ³⁾	≤ 300 m ²⁾ or ≤ 150 m ³⁾	≤ 300 m ²⁾ or ≤ 150 m ³⁾
Cat. C2 ¹⁾ Environment 1 (public network)			
Motor cable length according to IEC/EN 61800-3	-	-	-
Cat. C3 ¹⁾ Environment 2 (industrial network)			

1) For a shielded motor cable

2) At a switching frequency from 2 to 4 kHz

3) At a switching frequency from 4.1 to 6 kHz




Motor connector	8I84T409000.01P-1	8I84T411000.01P-1	8I84T413200.01P-1
Maximum continuous output current (In) ¹⁾	179 A	215 A	259 A
Reduction of continuous output current depending on the ambient temperature	See the derating curves in the Installation Manual, available on www.br-automation.com		
At nominal switching frequency (4 kHz or 2.5 kHz for bigger drive ratings)	No reduction (up to 50°C)	No reduction (up to 50°C)	No reduction (up to 50°C)
Other switching frequencies	See the derating curves in the Installation Manual, available on www.br-automation.com		
Reduction of continuous output current depending on altitude	See the derating curves in the Installation Manual, available on www.br-automation.com		
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	269 A	323 A	388 A
Maximum transient current for 2 s	295 A	355 A	427 A
Output frequency range	0.5 to 500 Hz	0.5 to 500 Hz	0.5 to 500 Hz
Rated switching frequency	2.5 kHz	2.5 kHz	2.5 kHz
Minimum	1 kHz	1 kHz	1 kHz
Maximum	8 kHz	8 kHz	8 kHz
Transient overtorque (typical value)	170% of the nominal motor torque (typical value at ± 10%) for 60 s 220% of the nominal motor torque (typical value at ± 10%) for 2 s		
Braking torque	See the derating curves in the Installation Manual, available on www.br-automation.com		
With braking resistor	Up to 150% of nominal motor torque		
Without braking resistor (typical value)	30% of nominal motor torque		
Motor control profiles	See the derating curves in the Installation Manual, available on www.br-automation.com		
Asynchronous motor	Flux Vector Control (FVC) with sensor (current vector) Sensorless Flux Vector Control (SFVC) (voltage or current vector) Voltage/frequency ratio (2 or 5 points)		
Synchronous motor	ENA (Energy Adaptation) System for unbalanced loads Vector control without speed feedback		
Maximum motor cable length ¹⁾	See the derating curves in the Installation Manual, available on www.br-automation.com		
Shielded cable	100 m	100 m	100 m
Unshielded cable	150 m	150 m	150 m
Main drive protection features	Thermal protection against overheating of the power stage Protection against: Short-circuits between motor phases, input phase breaks, overcurrents between output phases and earth, overvoltages on the DC bus, a break on the control circuit, exceeding the limit speed Safety function for: Line supply overvoltage and undervoltage, input phase loss in three-phase		
Motor protection	Thermal protection integrated in drive via continuous calculation of I ² t taking speed into account: - The motor thermal state is saved when the drive is powered down. - Function can be modified via operator dialogue terminals, depending on the type of motor (force-cooled or self-cooled). Protection against motor phase breaks Protection with PTC probes		
1) These values are given for nominal switching frequency.			
Braking chopper	8I84T409000.01P-1	8I84T411000.01P-1	8I84T413200.01P-1
Integrated dynamic brake transistors	Yes	Yes	Yes
Operating factor for the dynamic brake transistors	The dynamic brake transistor is sized so that it can tolerate: - 75% of the nominal motor power continuously - 150% of the nominal motor power for 10 s		
Minimum resistor value (external) ¹⁾	2.5 Ω	1.9 Ω	1.9 Ω

1) The minimum ohmic value is determined at a temperature of 20°C. In an environment where the temperature is below 20°C, make sure that the minimum ohmic value recommended in the table is observed.

ACOPOSinverter P84

3-phase 380-480V

24 VDC supply	8184T409000.01P-1	8184T411000.01P-1	8184T413200.01P-1
Input voltage	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)
Power consumption	30 W	30 W	30 W
Available internal supplies	8184T409000.01P-1	8184T411000.01P-1	8184T413200.01P-1
Output voltage	10.5 VDC ($\pm 5\%$)	10.5 VDC ($\pm 5\%$)	10.5 VDC ($\pm 5\%$)
Max. output current	10 mA	10 mA	10 mA
Output voltage	24 VDC (min. 21 V, max. 27 V)	24 VDC (min. 21 V, max. 27 V)	24 VDC (min. 21 V, max. 27 V)
Max. output current	200 mA	200 mA	200 mA
Digital inputs	8184T409000.01P-1	8184T411000.01P-1	8184T413200.01P-1
Number of inputs ¹⁾	5	5	5
Input circuit	Source or Sink	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Sampling time	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms
Input impedance	3.5 k Ω	3.5 k Ω	3.5 k Ω
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
1) 1 logic input, switch-configurable as a logic input or as an input for PTC probes. Input for a maximum of 6 PTC probes mounted in series: Nominal value < 1.5 k Ω , trip resistance 3 k Ω , short-circuit protection < 50 Ω			
Relay outputs	8184T409000.01P-1	8184T411000.01P-1	8184T413200.01P-1
Number of outputs	2	2	2
Design			
Relay 1	1 N/O contact and 1 N/C contact with common point	1 N/O contact and 1 N/C contact with common point	1 N/O contact and 1 N/C contact with common point
Relay 2	1 N/O contact	1 N/O contact	1 N/O contact
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity			
Minimum	3 mA for 24 VDC	3 mA for 24 VDC	3 mA for 24 VDC
Maximum			
on resistive load ($\cos \phi = 1$ and L/R = 0 ms)	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC
on inductive load ($\cos \phi = 0.4$ and L/R = 7 ms)	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC
Response time (maximum)	< 7 ms \pm 0.5 ms	< 7 ms \pm 0.5 ms	< 7 ms \pm 0.5 ms
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No
Analog inputs	8184T409000.01P-1	8184T411000.01P-1	8184T413200.01P-1
Number of inputs	2	2	2
Input			
Voltage	± 10 V	± 10 V	± 10 V
Voltage / Current	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	11 bit + 1 sign bit	11 bit + 1 sign bit	11 bit + 1 sign bit
Sampling time	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms
Input impedance			
Voltage	30 k Ω	30 k Ω	30 k Ω
Current	242 Ω	242 Ω	242 Ω
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No

Analog outputs			
	8I84T409000.01P-1	8I84T411000.01P-1	8I84T413200.01P-1
Number of outputs	1	1	1
Output ¹⁾	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	10 bit	10 bit	10 bit
Update time	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms
Min. load impedance			
Voltage	470 Ω	470 Ω	470 Ω
Current	500 Ω	500 Ω	500 Ω
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No
1) The current output can be configured as a 24 V logic output, max. 20 mA, min. load impedance 1.2 kΩ			
Safety input power removal			
	8I84T409000.01P-1	8I84T411000.01P-1	8I84T413200.01P-1
Number of outputs	1	1	1
Input circuit	Sink	Sink	Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Response time	≤ 100 ms	≤ 100 ms	≤ 100 ms
Switching threshold			
LOW	< 5 V	< 5 V	< 5 V
HIGH	> 15 V	> 15 V	> 15 V
Input impedance	1.5 kΩ	1.5 kΩ	1.5 kΩ
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
Operational conditions			
	8I84T409000.01P-1	8I84T411000.01P-1	8I84T413200.01P-1
Ambient temperature	-10 to +50°C	-10 to +50°C	-10 to +50°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 3000 m	Up to 3000 m	Up to 3000 m
Operating position			
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C1 and 3S2	Class 3C1 and 3S2	Class 3C1 and 3S2
Degree of protection	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)
1) With derating and removing the protective cover on top of the drive. Control card fan kit needed for specific drives. See tables on page [Product Overview] See the possible mounting types and derating curves in the Installation Manual, available on www.br-automation.com .			
2) From 1000 m to 3000 m current derating of 1% per 100 m.			
Storage conditions			
	8I84T409000.01P-1	8I84T411000.01P-1	8I84T413200.01P-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Mechanical characteristics			
	8I84T409000.01P-1	8I84T411000.01P-1	8I84T413200.01P-1
Dimensions			
Width	320 mm	360 mm	340 mm
Height	920 mm	1022 mm	1190 mm
Depth	377 mm	377 mm	377 mm
Weight	60 kg	74 kg	80 kg

ACOPOSinverter P84

3-phase 380-480V

Optional accessories for 8184T409000.01P-1

810FT273.300-1	EMC filter 3-phase 273 A, for ACOPOSinverter P84 3x380-480 V 90 kW - 132 kW
810CT184.000-1	Line choke 3-phase 184 A for ACOPOSinverter P84 3x380-480 V 75 kW - 90 kW
810BR003.001-1	Braking resistor 2.75 Ohm, continuous braking power 25 kW for ACOPOSinverter P84 3x380-480 V 90 kW
810MF010.300-1	Feed through mounting kit, for ACOPOSinverter P84 3x380-480 V 90 kW

Optional accessories for 8184T411000.01P-1

810FT273.300-1	EMC filter 3-phase 273 A, for ACOPOSinverter P84 3x380-480 V 90 kW - 132 kW
810CT222.000-1	Line choke 3-phase 222 A for ACOPOSinverter P84 3x380-480 V 110 kW
810BR002.000-1	Braking resistor 2.1 Ohm, continuous braking power 37 kW for ACOPOSinverter P84 3x380-480 V 110 kW - 132 kW
810MF011.300-1	Feed through mounting kit for ACOPOSinverter P84 3x380-480 V 110 kW

Optional accessories for 8184T413200.01P-1

810FT273.300-1	EMC filter 3-phase 273 A, for ACOPOSinverter P84 3x380-480 V 90 kW - 132 kW
810CT264.000-1	Line choke 3-phase 264 A for ACOPOSinverter P84 3x380-480 V 132 kW
810BR002.000-1	Braking resistor 2.1 Ohm, continuous braking power 37 kW for ACOPOSinverter P84 3x380-480 V 110 kW - 132 kW
810MF012.300-1	Feed through mounting kit for ACOPOSinverter P84 3x380-480 V 132 kW



Motor power	8184T416000.01P-1 ¹⁾	8184T420000.01P-1 ¹⁾	8184T425000.01P-1 ¹⁾
Indicated on rating plate	160 kW 250 HP	200 kW 300 HP	220 kW 350 HP
1) Drives supplied with a DC choke.			
Power mains connection	8184T416000.01P-1	8184T420000.01P-1	8184T425000.01P-1
Mains input voltage	3x 380 VAC - 15% to 480 VAC + 10%	3x 380 VAC - 15% to 480 VAC + 10%	3x 380 VAC - 15% to 480 VAC + 10%
Frequency	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%
Apparent power (at 380 VAC)	190.2 kVA	235 kVA	260.6 kVA
Max. prospective line lsc (short circuit current at the connection point)	50 kA	50 kA	50 kA
Line current with DC choke ¹⁾			
at 380 VAC	289 A	357 A	396 A
at 480 VAC	233 A	286 A	320 A
Dissipated power at nominal load and nominal switching frequency	3812 W	4930 W	5873 W
Integrated EMC filter ²⁾	Yes	Yes	Yes

1) Typical value for the indicated motor power and for the maximum prospective line lsc.

2) Drive supplied without EMC plate.

Conducted and radiated EMC emissions	8184T416000.01P-1	8184T420000.01P-1	8184T425000.01P-1
With integrated filter			
Motor cable length according to IEC/EN 61800-3	-	-	-
Cat. C1 ¹⁾ Environment 1 (public network)			
Motor cable length according to IEC/EN 61800-3	-	-	-
Cat. C2 ¹⁾ Environment 1 (public network)			
Motor cable length according to IEC/EN 61800-3	≤ 50 m ²⁾ or ≤ 25 m ³⁾	≤ 50 m ²⁾ or ≤ 25 m ³⁾	≤ 50 m ²⁾ or ≤ 25 m ³⁾
Cat. C3 ¹⁾ Environment 2 (industrial network)			
With additional filter			
Motor cable length according to IEC/EN 61800-3	810FT546.300-1 ≤ 50 m ²⁾ or ≤ 25 m ³⁾	810FT546.300-1 ≤ 50 m ²⁾ or ≤ 25 m ³⁾	810FT546.300-1 ≤ 50 m ²⁾ or ≤ 25 m ³⁾
Cat. C1 ¹⁾ Environment 1 (public network)			
Motor cable length according to IEC/EN 61800-3	≤ 300 m ²⁾ or ≤ 150 m ³⁾	≤ 300 m ²⁾ or ≤ 150 m ³⁾	≤ 300 m ²⁾ or ≤ 150 m ³⁾
Cat. C2 ¹⁾ Environment 1 (public network)			
Motor cable length according to IEC/EN 61800-3	-	-	-
Cat. C3 ¹⁾ Environment 2 (industrial network)			

1) For a shielded motor cable

2) At a switching frequency from 2 to 4 kHz

3) At a switching frequency from 4.1 to 6 kHz

ACOPOSinverter P84

3-phase 380-480V

Motor connector	8I84T416000.01P-1	8I84T420000.01P-1	8I84T425000.01P-1
Maximum continuous output current (In) ¹⁾	314 A	387 A	427 A
Reduction of continuous output current depending on the ambient temperature	See the derating curves in the Installation Manual, available on www.br-automation.com		
At nominal switching frequency (4 kHz or 2.5 kHz for bigger drive ratings)	No reduction (up to 50°C)	No reduction (up to 50°C)	No reduction (up to 50°C)
Other switching frequencies	See the derating curves in the Installation Manual, available on www.br-automation.com		
Reduction of continuous output current depending on altitude	See the derating curves in the Installation Manual, available on www.br-automation.com		
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	471 A	580 A	640 A
Maximum transient current for 2 s	518 A	638 A	704 A
Output frequency range	0.5 to 500 Hz	0.5 to 500 Hz	0.5 to 500 Hz
Rated switching frequency	2.5 kHz	2.5 kHz	2.5 kHz
Minimum	1 kHz	1 kHz	1 kHz
Maximum	8 kHz	8 kHz	8 kHz
Transient overtorque (typical value)	170% of the nominal motor torque (typical value at $\pm 10\%$) for 60 s 220% of the nominal motor torque (typical value at $\pm 10\%$) for 2 s		
Braking torque	Up to 150% of nominal motor torque		
With braking resistor	Up to 150% of nominal motor torque		
Without braking resistor (typical value)	30% of nominal motor torque		
Motor control profiles	Flux Vector Control (FVC) with sensor (current vector) Sensorless Flux Vector Control (SFVC) (voltage or current vector) Voltage/frequency ratio (2 or 5 points) ENA (Energy Adaptation) System for unbalanced loads Vector control without speed feedback		
Asynchronous motor	Flux Vector Control (FVC) with sensor (current vector) Sensorless Flux Vector Control (SFVC) (voltage or current vector) Voltage/frequency ratio (2 or 5 points) ENA (Energy Adaptation) System for unbalanced loads Vector control without speed feedback		
Synchronous motor	ENA (Energy Adaptation) System for unbalanced loads Vector control without speed feedback		
Maximum motor cable length ¹⁾	Thermal protection against overheating of the power stage		
Shielded cable	100 m	100 m	100 m
Unshielded cable	150 m	150 m	150 m
Main drive protection features	Thermal protection against overheating of the power stage Protection against: Short-circuits between motor phases, input phase breaks, overcurrents between output phases and earth, overvoltages on the DC bus, a break on the control circuit, exceeding the limit speed Safety function for: Line supply overvoltage and undervoltage, input phase loss in three-phase		
Motor protection	Thermal protection integrated in drive via continuous calculation of I^2t taking speed into account: - The motor thermal state is saved when the drive is powered down. - Function can be modified via operator dialogue terminals, depending on the type of motor (force-cooled or self-cooled). Protection against motor phase breaks Protection with PTC probes		

1) These values are given for nominal switching frequency.




Braking chopper	8I84T416000.01P-1	8I84T420000.01P-1	8I84T425000.01P-1
Integrated dynamic brake transistors	Yes	No External braking chopper 8I0BC200.300-1	No External braking chopper 8I0BC200.300-1
Operating factor for the dynamic brake transistors	The dynamic brake transistor is sized so that it can tolerate: - 75% of the nominal motor power continuously - 150% of the nominal motor power for 10 s		
Minimum resistor value (external) ¹⁾	1.9 Ω	-	-

1) The minimum ohmic value is determined at a temperature of 20°C. In an environment where the temperature is below 20°C, make sure that the minimum ohmic value recommended in the table is observed.

24 VDC supply	8I84T416000.01P-1	8I84T420000.01P-1	8I84T425000.01P-1
Input voltage	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)
Power consumption	30 W	30 W	30 W
Available internal supplies	8I84T416000.01P-1	8I84T420000.01P-1	8I84T425000.01P-1
Output voltage	10.5 VDC ($\pm 5\%$)	10.5 VDC ($\pm 5\%$)	10.5 VDC ($\pm 5\%$)
Max. output current	10 mA	10 mA	10 mA
Output voltage	24 VDC (min. 21 V, max. 27 V)	24 VDC (min. 21 V, max. 27 V)	24 VDC (min. 21 V, max. 27 V)
Max. output current	200 mA	200 mA	200 mA
Digital inputs	8I84T416000.01P-1	8I84T420000.01P-1	8I84T425000.01P-1
Number of inputs ¹⁾	5	5	5
Input circuit	Source or Sink	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Sampling time	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms
Input impedance	3.5 k Ω	3.5 k Ω	3.5 k Ω
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
1) 1 logic input, switch-configurable as a logic input or as an input for PTC probes. Input for a maximum of 6 PTC probes mounted in series: Nominal value < 1.5 k Ω , trip resistance 3 k Ω , reset value 1.8 k Ω , short-circuit protection < 50 Ω			
Relay outputs	8I84T416000.01P-1	8I84T420000.01P-1	8I84T425000.01P-1
Number of outputs	2	2	2
Design			
Relay 1	1 N/O contact and 1 N/C contact with common point	1 N/O contact and 1 N/C contact with common point	1 N/O contact and 1 N/C contact with common point
Relay 2	1 N/O contact	1 N/O contact	1 N/O contact
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity			
Minimum	3 mA for 24 VDC	3 mA for 24 VDC	3 mA for 24 VDC
Maximum			
on resistive load ($\cos \phi = 1$ and L/R = 0 ms)	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC
on inductive load ($\cos \phi = 0.4$ and L/R = 7 ms)	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC
Response time (maximum)	< 7 ms \pm 0.5 ms	< 7 ms \pm 0.5 ms	< 7 ms \pm 0.5 ms
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No
Analog inputs	8I84T416000.01P-1	8I84T420000.01P-1	8I84T425000.01P-1
Number of inputs	2	2	2
Input			
Voltage	± 10 V	± 10 V	± 10 V
Voltage / Current	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	11 bit + 1 sign bit	11 bit + 1 sign bit	11 bit + 1 sign bit
Sampling time	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms	< 2 ms \pm 0.5 ms
Input impedance			
Voltage	30 k Ω	30 k Ω	30 k Ω
Current	242 Ω	242 Ω	242 Ω
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No

ACOPOSinverter P84

3-phase 380-480V

Analog outputs	8I84T416000.01P-1	8I84T420000.01P-1	8I84T425000.01P-1
Number of outputs	1	1	1
Output ¹⁾	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	10 bit	10 bit	10 bit
Update time	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms
Min. load impedance			
Voltage	470 Ω	470 Ω	470 Ω
Current	500 Ω	500 Ω	500 Ω
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No
1) The current output can be configured as a 24 V logic output, max. 20 mA, min. load impedance 1.2 kΩ			
Safety input power removal	8I84T416000.01P-1	8I84T420000.01P-1	8I84T425000.01P-1
Number of outputs	1	1	1
Input circuit	Sink	Sink	Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Response time	≤ 100 ms	≤ 100 ms	≤ 100 ms
Switching threshold			
LOW	< 5 V	< 5 V	< 5 V
HIGH	> 15 V	> 15 V	> 15 V
Input impedance	1.5 kΩ	1.5 kΩ	1.5 kΩ
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
Operational conditions	8I84T416000.01P-1	8I84T420000.01P-1	8I84T425000.01P-1
Ambient temperature	-10 to +50°C	-10 to +50°C	-10 to +50°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 3000 m	Up to 3000 m	Up to 3000 m
Operating position			
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C1 and 3S2	Class 3C1 and 3S2	Class 3C1 and 3S2
Degree of protection	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)
1) With derating and removing the protective cover on top of the drive. Control card fan kit needed for specific drives. See tables on page [Product Overview] See the possible mounting types and derating curves in the Installation Manual, available on www.br-automation.com .			
2) From 1000 m to 3000 m current derating of 1% per 100 m.			
Storage conditions	8I84T416000.01P-1	8I84T420000.01P-1	8I84T425000.01P-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Mechanical characteristics	8I84T416000.01P-1 ¹⁾	8I84T420000.01P-1	8I84T425000.01P-1
Dimensions			
Width	440 mm	595 mm	595 mm
Height	1190 mm	1190 mm	1190 mm
Depth	377 mm	377 mm	377 mm
Weight	110 kg	140 kg	140 kg

Optional accessories for 8184T416000.01P-1

810FT546.300-1	EMC filter 3-phase 546 A, for ACOPOSinverter P84 3x380-480 V 160 kW - 280 kW
81OCT344.000-1	Line choke 3-phase 344 A for ACOPOSinverter P84 3x380-480 V 160 kW
81OBR002.001-1	Braking resistor 2.1 Ohm, continuous braking power 44 kW for ACOPOSinverter P84 3x380-480 V 160 kW
810MF013.300-1	Feed through mounting kit for ACOPOSinverter P84 3x380-480 V 160 kW

Optional accessories for 8184T420000.01P-1

810FT546.300-1	EMC filter 3-phase 546 A, for ACOPOSinverter P84 3x380-480 V 160 kW - 280 kW
81OCT450.000-1	Line choke 3-phase 450 A Line choke 3-phase 450 A, for ACOPOSinverter P84 3x380-480 V 200 kW and 400 kW (2x)
81OBR001.001-1	Braking resistor 1.05 Ohm, continuous braking power 56 kW for ACOPOSinverter P84 3x380-480 V 200 kW
81OBC200.300-1	Braking chopper, continuous braking power 200 kW, for ACOPOSinverter P84 200 kW - 280 kW
810MF014.300-1	Feed through mounting kit for ACOPOSinverter P84 3x380-480 V 200 kW - 280 kW without braking chopper
810MF015.300-1	Feed through mounting kit for ACOPOSinverter P84 3x380-480 V 200 kW - 280 kW with braking chopper

Optional accessories for 8184T425000.01P-1

810FT546.300-1	EMC filter 3-phase 546 A, for ACOPOSinverter P84 3x380-480 V 160 kW - 280 kW
81OCT613.000-1	Line choke 3-phase 613 A for ACOPOSinverter P84 3x380-480 V 250 kW - 280 kW and 500 kW (2x)
81OBR001.002-1	Braking resistor 1.05 Ohm, continuous braking power 75 kW for ACOPOSinverter P84 3x380-480 V 250 kW - 280 kW
81OBC200.300-1	Braking chopper, continuous braking power 200 kW, for ACOPOSinverter P84 200 kW - 280 kW
810MF014.300-1	Feed through mounting kit for ACOPOSinverter P84 3x380-480 V 200 kW - 280 kW without braking chopper
810MF015.300-1	Feed through mounting kit for ACOPOSinverter P84 3x380-480 V 200 kW - 280 kW with braking chopper

ACOPOSinverter P84

3-phase 380-480V



Motor power	8184T425000.01P-1 ¹⁾	8184T428000.01P-1 ¹⁾	8184T431500.01P-1 ¹⁾
Indicated on rating plate	250 kW 400 HP	280 kW 450 HP	315 kW 500 HP

1) Drives supplied with a DC choke.

Power mains connection	8184T425000.01P-1	8184T428000.01P-1	8184T431500.01P-1
Mains input voltage	3x 380 VAC - 15% to 480 VAC + 10%	3x 380 VAC - 15% to 480 VAC + 10%	3x 380 VAC - 15% to 480 VAC + 10%
Frequency	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%	50 to 60 Hz ± 5%
Apparent power (at 380 VAC)	292.2 kVA	325.1 kVA	365.3 kVA
Max. prospective line Isc (short circuit current at the connection point)	50 kA	50 kA	50 kA
Line current with DC choke ¹⁾			
at 380 VAC	444 A	494 A	555 A
at 480 VAC	357 A	396 A	444 A
Dissipated power at nominal load and nominal switching frequency	5873 W	6829 W	7454 W
Integrated EMC filter ²⁾	Yes	Yes	Yes

1) Typical value for the indicated motor power and for the maximum prospective line Isc.

2) Drive supplied without EMC plate.

Conducted and radiated EMC emissions	8184T425000.010	8184T428000.01P-1	8184T431500.01P-1
With integrated filter			
Motor cable length according to IEC/EN 61800-3	-	-	-
Cat. C1 ¹⁾ Environment 1 (public network)	-	-	-
Motor cable length according to IEC/EN 61800-3	-	-	-
Cat. C2 ¹⁾ Environment 1 (public network)	-	-	-
Motor cable length according to IEC/EN 61800-3	≤ 50 m ²⁾ or ≤ 25 m ³⁾	≤ 50 m ²⁾ or ≤ 25 m ³⁾	≤ 50 m ²⁾ or ≤ 25 m ³⁾
Cat. C3 ¹⁾ Environment 2 (industrial network)			
With additional filter			
Motor cable length according to IEC/EN 61800-3	810FT546.300-1	810FT546.300-1	810FT728.300-1
Cat. C1 ¹⁾ Environment 1 (public network)	≤ 50 m ²⁾ or ≤ 25 m ³⁾	≤ 50 m ²⁾ or ≤ 25 m ³⁾	≤ 50 m ²⁾ or ≤ 25 m ³⁾
Motor cable length according to IEC/EN 61800-3	≤ 300 m ²⁾ or ≤ 150 m ³⁾	≤ 300 m ²⁾ or ≤ 150 m ³⁾	≤ 300 m ²⁾ or ≤ 150 m ³⁾
Cat. C2 ¹⁾ Environment 1 (public network)			
Motor cable length according to IEC/EN 61800-3	-	-	-
Cat. C3 ¹⁾ Environment 2 (industrial network)			

1) For a shielded motor cable

2) At a switching frequency from 2 to 4 kHz

3) At a switching frequency from 4.1 to 6 kHz

Motor connector	8I84T425000.01P-1	8I84T428000.01P-1	8I84T431500.01P-1
Maximum continuous output current (In) ¹⁾	481 A	550 A	616 A
Reduction of continuous output current depending on the ambient temperature	See the derating curves in the Installation Manual, available on www.br-automation.com		
At nominal switching frequency (4 kHz or 2.5 kHz for bigger drive ratings)	No reduction (up to 50°C)	No reduction (up to 50°C)	No reduction (up to 50°C)
Other switching frequencies	See the derating curves in the Installation Manual, available on www.br-automation.com		
Reduction of continuous output current depending on altitude	See the derating curves in the Installation Manual, available on www.br-automation.com		
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	721 A	825 A	924 A
Maximum transient current for 2 s	793 A	907 A	1016 A
Output frequency range	0.5 to 500 Hz	0.5 to 500 Hz	0.5 to 500 Hz
Rated switching frequency	2.5 kHz	2.5 kHz	2.5 kHz
Minimum	1 kHz	1 kHz	1 kHz
Maximum	8 kHz	8 kHz	8 kHz
Transient overtorque (typical value)	170% of the nominal motor torque (typical value at ± 10%) for 60 s 220% of the nominal motor torque (typical value at ± 10%) for 2 s		
Braking torque	See the derating curves in the Installation Manual, available on www.br-automation.com		
With braking resistor	Up to 150% of nominal motor torque		
Without braking resistor (typical value)	30% of nominal motor torque		
Motor control profiles	See the derating curves in the Installation Manual, available on www.br-automation.com		
Asynchronous motor	Flux Vector Control (FVC) with sensor (current vector) Sensorless Flux Vector Control (SFVC) (voltage or current vector) Voltage/frequency ratio (2 or 5 points)		
Synchronous motor	ENA (Energy Adaptation) System for unbalanced loads Vector control without speed feedback		
Maximum motor cable length ¹⁾	See the derating curves in the Installation Manual, available on www.br-automation.com		
Shielded cable	100 m	100 m	100 m
Unshielded cable	150 m	150 m	150 m
Main drive protection features	Thermal protection against overheating of the power stage Protection against: Short-circuits between motor phases, input phase breaks, overcurrents between output phases and earth, overvoltages on the DC bus, a break on the control circuit, exceeding the limit speed Safety function for: Line supply overvoltage and undervoltage, input phase loss in three-phase		
Motor protection	Thermal protection integrated in drive via continuous calculation of I ² t taking speed into account: - The motor thermal state is saved when the drive is powered down. - Function can be modified via operator dialogue terminals, depending on the type of motor (force-cooled or self-cooled). Protection against motor phase breaks Protection with PTC probes		

1) These values are given for nominal switching frequency.




Braking chopper	8I84T425000.01P-1	8I84T428000.01P-1	8I84T431500.01P-1
Integrated dynamic brake transistors	No	No	No
	External braking chopper 8I0BC200.300-1	External braking chopper 8I0BC200.300-1	External braking chopper 8I0BC400.300-1
Operating factor for the dynamic brake transistors	-	-	-
Minimum resistor value (external) ¹⁾	-	-	-

1) The minimum ohmic value is determined at a temperature of 20°C. In an environment where the temperature is below 20°C, make sure that the minimum ohmic value recommended in the table is observed.

ACOPOSinverter P84

3-phase 380-480V

24 VDC supply	8184T425000.01P-1	8184T428000.01P-1	8184T431500.01P-1
Input voltage	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)
Power consumption	30 W	30 W	30 W
Available internal supplies	8184T425000.01P-1	8184T428000.01P-1	8184T431500.01P-1
Output voltage	10.5 VDC (± 5%)	10.5 VDC (± 5%)	10.5 VDC (± 5%)
Max. output current	10 mA	10 mA	10 mA
Output voltage	24 VDC (min. 21 V, max. 27 V)	24 VDC (min. 21 V, max. 27 V)	24 VDC (min. 21 V, max. 27 V)
Max. output current	200 mA	200 mA	200 mA
Digital inputs	8184T425000.01P-1	8184T428000.01P-1	8184T431500.01P-1
Number of inputs ¹⁾	5	5	5
Input circuit	Source or Sink	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Sampling time	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms
Input impedance	3.5 kΩ	3.5 kΩ	3.5 kΩ
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
1) 1 logic input, switch-configurable as a logic input or as an input for PTC probes. Input for a maximum of 6 PTC probes mounted in series: Nominal value < 1.5 kΩ, trip resistance 3 kΩ, reset value 1.8 kΩ, short-circuit protection < 50 Ω			
Relay outputs	8184T425000.01P-1 ¹⁾	8184T428000.01P-1	8184T431500.01P-1
Number of outputs	2	2	2
Design			
Relay 1	1 N/O contact and 1 N/C contact with common point	1 N/O contact and 1 N/C contact with common point	1 N/O contact and 1 N/C contact with common point
Relay 2	1 N/O contact	1 N/O contact	1 N/O contact
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity			
Minimum	3 mA for 24 VDC	3 mA for 24 VDC	3 mA for 24 VDC
Maximum			
on resistive load (cos φ = 1 and L/R = 0 ms)	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC
on inductive load (cos φ = 0.4 and L/R = 7 ms)	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC
Response time (maximum)	< 7 ms ± 0.5 ms	< 7 ms ± 0.5 ms	< 7 ms ± 0.5 ms
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No
Analog inputs	8184T425000.01P-1	8184T428000.01P-1	8184T431500.01P-1
Number of inputs	2	2	2
Input			
Voltage	± 10 V	± 10 V	± 10 V
Voltage / Current	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	11 bit + 1 sign bit	11 bit + 1 sign bit	11 bit + 1 sign bit
Sampling time	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms
Input impedance			
Voltage	30 kΩ	30 kΩ	30 kΩ
Current	242 Ω	242 Ω	242 Ω
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No

Analog outputs	8I84T425000.01P-1	8I84T428000.01P-1	8I84T431500.01P-1
Number of outputs	1	1	1
Output ¹⁾	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	10 bit	10 bit	10 bit
Update time	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms
Min. load impedance			
Voltage	470 Ω	470 Ω	470 Ω
Current	500 Ω	500 Ω	500 Ω
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No
1) The current output can be configured as a 24 V logic output, max. 20 mA, min. load impedance 1.2 kΩ			
Safety input power removal	8I84T425000.01P-1	8I84T428000.01P-1	8I84T431500.01P-1
Number of outputs	1	1	1
Input circuit	Sink	Sink	Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Response time	≤ 100 ms	≤ 100 ms	≤ 100 ms
Switching threshold			
LOW	< 5 V	< 5 V	< 5 V
HIGH	> 15 V	> 15 V	> 15 V
Input impedance	1.5 kΩ	1.5 kΩ	1.5 kΩ
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
Operational conditions	8I84T425000.01P-1	8I84T428000.01P-1	8I84T431500.01P-1¹⁾
Ambient temperature	-10 to +50°C	-10 to +50°C	-10 to +50°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 3000 m	Up to 3000 m	Up to 3000 m
Operating position			
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C1 and 3S2	Class 3C1 and 3S2	Class 3C1 and 3S2
Degree of protection	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)
1) With derating and removing the protective cover on top of the drive. Control card fan kit needed for specific drives. See tables on page [Product Overview] See the possible mounting types and derating curves in the Installation Manual, available on www.br-automation.com .			
2) From 1000 m to 3000 m current derating of 1% per 100 m.			
Storage conditions	8I84T425000.01P-1	8I84T428000.01P-1	8I84T431500.01P-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Mechanical characteristics	8I84T425000.01P-1	8I84T428000.01P-1	8I84T431500.01P-1
Dimensions			
Width	595 mm	595 mm	595 mm
Height	1190 mm	1190 mm	1390 mm
Depth	377 mm	377 mm	377 mm
Weight	140 kg	140 kg	215 kg

ACOPOSinverter P84

3-phase 380-480V

Optional accessories for 8184T425000.01P-1¹⁾

810FT546.300-1	EMC filter 3-phase 546 A, for ACOPOSinverter P84 3x380-480 V 160 kW - 280 kW
810CT613.000-1	Line choke 3-phase 613 A for ACOPOSinverter P84 3x380-480 V 250 kW - 280 kW and 500 kW (2x)
810BR001.002-1	Braking resistor 1.05 Ohm, continuous braking power 75 kW for ACOPOSinverter P84 3x380-480 V 250 kW - 280 kW
810BC200.300-1	Braking chopper, continuous braking power 200 kW, for ACOPOSinverter P84 200 kW - 280 kW
810MF014.300-1	Feed through mounting kit for ACOPOSinverter P84 3x380-480 V 200 kW - 280 kW without braking chopper
810MF015.300-1	Feed through mounting kit for ACOPOSinverter P84 3x380-480 V 200 kW - 280 kW with braking chopper

Optional accessories for 8184T428000.01P-1¹⁾

810FT546.300-1	EMC filter 3-phase 546 A, for ACOPOSinverter P84 3x380-480 V 160 kW - 280 kW
810CT613.000-1	Line choke 3-phase 613 A for ACOPOSinverter P84 3x380-480 V 250 kW - 280 kW and 500 kW (2x)
810BR001.002-1	Braking resistor 1.05 Ohm, continuous braking power 75 kW for ACOPOSinverter P84 3x380-480 V 250 kW - 280 kW
810BC200.300-1	Braking chopper, continuous braking power 200 kW, for ACOPOSinverter P84 200 kW - 280 kW
810MF014.300-1	Feed through mounting kit for ACOPOSinverter P84 3x380-480 V 200 kW - 280 kW without braking chopper
810MF015.300-1	Feed through mounting kit for ACOPOSinverter P84 3x380-480 V 200 kW - 280 kW with braking chopper

Optional accessories for 8184T431500.01P-1¹⁾

810FT728.300-1	EMC filter 3-phase 728 A, for ACOPOSinverter P84 3x380-480 V 315 kW - 400 kW
810CT720.000-1	Line choke 3-phase 720 A Line choke 3-phase 720 A, for ACOPOSinverter P84 3x380-480 V 315 kW
810BR001.003-1	Braking resistor 2.75 Ohm, continuous braking power 25 kW for ACOPOSinverter P84 3x380-480 V 90 kW
810BC400.300-1	Braking chopper, continuous braking power 400 kW, for ACOPOSinverter P84 315 kW - 500 kW



Motor power	8184T440000.01P-1 ¹⁾	8184T440000.01P-1 ¹⁾	8184T450000.01P-1 ¹⁾
Indicated on rating plate	355 kW	400 kW	500 kW
	-	600 HP	700 HP

1) Drives supplied with a DC choke.

Power mains connection	8184T440000.01P-1	8184T440000.01P-1	8184T450000.01P-1
Mains input voltage	3x 380 VAC - 15 % to 480 VAC + 10 %	3x 380 VAC - 15 % to 480 VAC + 10 %	3x 380 VAC - 15 % to 480 VAC + 10 %
Frequency	50 to 60 Hz ± 5 %	50 to 60 Hz ± 5 %	50 to 60 Hz ± 5 %
Apparent power (at 380 VAC)	419.3 kVA	466.6 kVA	576.6 kVA
Max. prospective line Isc (short circuit current at the connection point)	50 kA	50 kA	50 kA
Line current with DC choke ¹⁾			
at 380 VAC	637 A	709 A	876 A
at 480 VAC	512 A	568 A	699 A
Dissipated power at maximum output current	9291 W	9291 W	11345 W
Integrated EMC filter ²⁾	Yes	Yes	Yes

1) Typical value for the indicated motor power and for the maximum prospective line Isc.

2) Drive supplied without EMC plate.

Conducted and radiated EMC emissions	8184T440000.01P-1	8184T440000.01P-1	8184T450000.01P-1
With integrated filter			
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	-	-	-
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	-	-	-
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	≤ 50 m ²⁾ or ≤ 25 m ³⁾	≤ 50 m ²⁾ or ≤ 25 m ³⁾	≤ 50 m ²⁾ or ≤ 25 m ³⁾
With additional filter			
Motor cable length according to IEC/EN 61800-3 Cat. C1 ¹⁾ Environment 1 (public network)	810FT728.300-1 ≤ 50 m ²⁾ or ≤ 25 m ³⁾	810FT728.300-1 ≤ 50 m ²⁾ or ≤ 25 m ³⁾	810FT14M.300-1 ≤ 50 m ²⁾ or ≤ 25 m ³⁾
Motor cable length according to IEC/EN 61800-3 Cat. C2 ¹⁾ Environment 1 (public network)	≤ 300 m ²⁾ or ≤ 150 m ³⁾	≤ 300 m ²⁾ or ≤ 150 m ³⁾	≤ 300 m ²⁾ or ≤ 150 m ³⁾
Motor cable length according to IEC/EN 61800-3 Cat. C3 ¹⁾ Environment 2 (industrial network)	-	-	-

1) For a shielded motor cable

2) At a switching frequency from 2 to 4 kHz

3) At a switching frequency from 4.1 to 6 kHz

ACOPOSinverter P84

3-phase 380-480V

Motor connector	8I84T440000.01P-1	8I84T440000.01P-1	8I84T450000.01P-1
Maximum continuous output current (In) ¹⁾	671 A	759 A	941 A
Reduction of continuous output current depending on the ambient temperature	See the derating curves in the Installation Manual, available on www.br-automation.com		
At nominal switching frequency (4 kHz or 2.5 kHz for bigger drive ratings)	No reduction (up to 50°C)	No reduction (up to 50°C)	No reduction (up to 50°C)
Other switching frequencies	See the derating curves in the Installation Manual, available on www.br-automation.com		
Reduction of continuous output current depending on altitude	See the derating curves in the Installation Manual, available on www.br-automation.com		
Starting at 1000 m above sea level	1% per 100 m	1% per 100 m	1% per 100 m
Maximum transient current for 60 s	1006 A	1138 A	1411 A
Maximum transient current for 2 s	1107 A	1252 A	1552 A
Output frequency range	0.5 to 500 Hz	0.5 to 500 Hz	0.5 to 500 Hz
Rated switching frequency	2.5 kHz	2.5 kHz	2.5 kHz
Minimum	1 kHz	1 kHz	1 kHz
Maximum	8 kHz	8 kHz	8 kHz
Transient overtorque (typical value)	170% of the nominal motor torque (typical value at ± 10%) for 60 s 220% of the nominal motor torque (typical value at ± 10%) for 2 s		
Braking torque	Up to 150% of nominal motor torque		
With braking resistor	Up to 150% of nominal motor torque		
Without braking resistor (typical value)	30% of nominal motor torque		
Motor control profiles	Flux Vector Control (FVC) with sensor (current vector) Sensorless Flux Vector Control (SFVC) (voltage or current vector) Voltage/frequency ratio (2 or 5 points) ENA (Energy Adaptation) System for unbalanced loads Vector control without speed feedback		
Asynchronous motor	Flux Vector Control (FVC) with sensor (current vector) Sensorless Flux Vector Control (SFVC) (voltage or current vector) Voltage/frequency ratio (2 or 5 points) ENA (Energy Adaptation) System for unbalanced loads Vector control without speed feedback		
Synchronous motor	ENA (Energy Adaptation) System for unbalanced loads Vector control without speed feedback		
Maximum motor cable length ¹⁾	Thermal protection against overheating of the power stage		
Shielded cable	100 m	100 m	100 m
Unshielded cable	150 m	150 m	150 m
Main drive protection features	Thermal protection against overheating of the power stage Protection against: Short-circuits between motor phases, input phase breaks, overcurrents between output phases and earth, overvoltages on the DC bus, a break on the control circuit, exceeding the limit speed Safety function for: Line supply overvoltage and undervoltage, input phase loss in three-phase		
Motor protection	Thermal protection integrated in drive via continuous calculation of I ² t taking speed into account: - The motor thermal state is saved when the drive is powered down. - Function can be modified via operator dialogue terminals, depending on the type of motor (force-cooled or self-cooled). Protection against motor phase breaks Protection with PTC probes		

1) These values are given for nominal switching frequency.




Braking chopper	8I84T440000.01P-1	8I84T440000.01P-1	8I84T450000.01P-1
Integrated dynamic brake transistors	No	No	No
External braking chopper	8I0BC400.300-1	8I0BC400.300-1	8I0BC400.300-1
Operating factor for the dynamic brake transistors	-	-	-
Minimum resistor value (external) ¹⁾	-	-	-

1) The minimum ohmic value is determined at a temperature of 20°C. In an environment where the temperature is below 20°C, make sure that the minimum ohmic value recommended in the table is observed.

24 VDC supply	8I84T440000.01P-1	8I84T440000.01P-1	8I84T450000.01P-1
Input voltage	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)	24 VDC (min. 19 V, max. 30 V)
Power consumption	30 W	30 W	30 W
Available internal supplies	8I84T440000.01P-1	8I84T440000.01P-1	8I84T450000.01P-1
Output voltage	10.5 VDC (± 5%)	10.5 VDC (± 5%)	10.5 VDC (± 5%)
Max. output current	10 mA	10 mA	10 mA
Output voltage	24 VDC (min. 21 V, max. 27 V)	24 VDC (min. 21 V, max. 27 V)	24 VDC (min. 21 V, max. 27 V)
Max. output current	200 mA	200 mA	200 mA
Digital inputs	8I84T440000.01P-1	8I84T440000.01P-1	8I84T450000.01P-1
Number of inputs ¹⁾	5	5	5
Input circuit	Source or Sink	Source or Sink	Source or Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Sampling time	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms
Input impedance	3.5 kΩ	3.5 kΩ	3.5 kΩ
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
1) 1 logic input, switch-configurable as a logic input or as an input for PTC probes. Input for a maximum of 6 PTC probes mounted in series: Nominal value < 1.5 kΩ, trip resistance 3 kΩ, reset value 1.8 kΩ, short-circuit protection < 50 Ω			
Relay outputs	8I84T440000.01P-1	8I84T440000.01P-1	8I84T450000.01P-1
Number of outputs	2	2	2
Design			
Relay 1	1 N/O contact and 1 N/C contact with common point	1 N/O contact and 1 N/C contact with common point	1 N/O contact and 1 N/C contact with common point
Relay 2	1 N/O contact	1 N/O contact	1 N/O contact
Rated voltage	30 VDC / 250 VAC	30 VDC / 250 VAC	30 VDC / 250 VAC
Switching capacity			
Minimum	3 mA for 24 VDC	3 mA for 24 VDC	3 mA for 24 VDC
Maximum			
on resistive load (cos φ = 1 and L/R = 0 ms)	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC	2 A for 250 VAC or 30 VDC
on inductive load (cos φ = 0.4 and L/R = 7 ms)	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC	1.5 A for 250 VAC or 30 VDC
Response time (maximum)	< 7 ms ± 0.5 ms	< 7 ms ± 0.5 ms	< 7 ms ± 0.5 ms
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No
Analog inputs	8I84T440000.01P-1	8I84T440000.01P-1	8I84T450000.01P-1
Number of inputs	2	2	2
Input			
Voltage	± 10 V	± 10 V	± 10 V
Voltage / Current	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	11 bit + 1 sign bit	11 bit + 1 sign bit	11 bit + 1 sign bit
Sampling time	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms
Input impedance			
Voltage	30 kΩ	30 kΩ	30 kΩ
Current	242 Ω	242 Ω	242 Ω
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No

ACOPOSinverter P84

3-phase 380-480V

Analog outputs	8184T440000.01P-1	8184T440000.01P-1	8184T450000.01P-1
Number of outputs	1	1	1
Output ¹⁾	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA	0 to 10 V or 0 to 20 mA
Resolution	10 bit	10 bit	10 bit
Update time	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms	< 2 ms ± 0.5 ms
Min. load impedance			
Voltage	470 Ω	470 Ω	470 Ω
Current	500 Ω	500 Ω	500 Ω
Electrical isolation			
Output - ACOPOSinverter	Yes	Yes	Yes
Output - Output	No	No	No
1) The current output can be configured as a 24 V logic output, max. 20 mA, min. load impedance 1.2 kΩ			
Safety input power removal	8184T440000.01P-1	8184T440000.01P-1 ¹⁾	8184T450000.01P-1
Number of outputs	1	1	1
Input circuit	Sink	Sink	Sink
Rated voltage	24 VDC	24 VDC	24 VDC
Response time	≤ 100 ms	≤ 100 ms	≤ 100 ms
Switching threshold			
LOW	< 5 V	< 5 V	< 5 V
HIGH	> 15 V	> 15 V	> 15 V
Input impedance	1.5 kΩ	1.5 kΩ	1.5 kΩ
Electrical isolation			
Input - ACOPOSinverter	Yes	Yes	Yes
Input - Input	No	No	No
Operational conditions	8184T440000.01P-1	8184T440000.01P-1	8184T450000.01P-1
Ambient temperature	-10 to +50°C	-10 to +50°C	-10 to +50°C
Max. ambient temperature ¹⁾	Up to +60°C	Up to +60°C	Up to +60°C
Relative humidity according to IEC 60068-2-3	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water	5 to 95%, non condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	Up to 3000 m	Up to 3000 m	Up to 3000 m
Operating position			
Maximum ambient pollution according to IEC/EN 61800-5-1	2 (non-conductive material)	2 (non-conductive material)	2 (non-conductive material)
Environmental conditions according IEC 60721-3-3	Class 3C1 and 3S2	Class 3C1 and 3S2	Class 3C1 and 3S2
Degree of protection	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)	IP 21 and IP 41 on upper part IP 54 on lower part (heatsink)
1) With derating and removing the protective cover on top of the drive. Control card fan kit needed for specific drives. See tables on page [Product Overview] See the possible mounting types and derating curves in the Installation Manual, available on www.br-automation.com .			
2) From 1000 m to 3000 m current derating of 1% per 100 m.			
Storage conditions	8184T440000.01P-1	8184T440000.01P-1	8184T450000.01P-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Mechanical characteristics	8184T440000.01P-1	8184T440000.01P-1	8184T450000.01P-1
Dimensions			
Width	890 mm	890 mm	1120 mm
Height	1390 mm	1390 mm	1390 mm
Depth	377 mm	377 mm	377 mm
Weight	215 kg	225 kg	300 kg

Optional accessories for 8184T440000.01P-1

810FT728.300-1	EMC filter 3-phase 728 A, for ACOPOSinverter P84 3x380-480 V 315 kW - 400 kW
81OCT450.000-1 ¹⁾	Line choke 3-phase 450 A Line choke 3-phase 450 A, for ACOPOSinverter P84 3x380-480 V 200 kW and 400 kW (2x)
81OBR001.003-1	Braking resistor 0.7 Ohm, continuous braking power 112 kW for ACOPOSinverter P84 3x380-480 V 315 kW - 400 kW
81OBC400.300-1	Braking chopper, continuous braking power 400 kW, for ACOPOSinverter P84 315 kW - 500 kW

Optional accessories for 8184T450000.01P-1

81OFT14M.300-1	EMC filter 3-phase 1456 A, for ACOPOSinverter P84 3x380-480 V 500 kW
81OCT613.000-1 ¹⁾	Line choke 3-phase 613 A for ACOPOSinverter P84 3x380-480 V 250 kW - 280 kW and 500 kW (2x)
81OBR001.004-1	Braking resistor 0.7 Ohm, continuous braking power 150 kW for ACOPOSinverter P84 3x380-480 V 500 kW
81OBC400.300-1	Braking chopper, continuous braking power 400 kW, for ACOPOSinverter P84 315 kW - 500 kW

1) Two line chokes for one drive needed

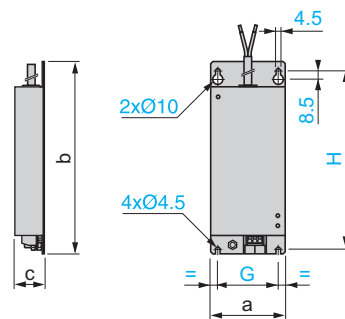
Additional EMC input filters for ACOPOSinverter S44 810FS, 810FT



- Additional EMC input filters are designed to reduce conducted emissions on the line supply below the limits of standard IEC/EN 61800-3, category C1, C2 or C3, in environment 1 (public network) or 2 (industrial network), depending on the drive rating.
- See the “Conducted and radiated EMC emissions” characteristics of the ACOPOSinverter S44 drive to check the permitted shielded motor cable length.
- Additional EMC input filters can only be used on TN (neutral connection) and TT (neutral to earth) type systems.

Power mains connection	810FS011.100-1	810FS024.100-1
Maximum nominal voltage	1x 240 VAC + 10%	1x 240 VAC + 10%
Filter nominal current	11 A	24 A
Maximum earth leakage current	In preparation	In preparation
Dissipated power	In preparation	In preparation
General information	810FS011.100-1	810FS024.100-1
Conformity to standards	In preparation	In preparation
Operational conditions	810FS011.100-1	810FS024.100-1
Ambient temperature	In preparation	In preparation
Maximum relative humidity according to IEC 60068-2-3	In preparation	In preparation
Installation altitudes above sea level	In preparation	In preparation
Maximum installation altitude	In preparation	In preparation
Degree of protection	In preparation	In preparation
Storage conditions	810FS011.100-1	810FS024.100-1
Storage temperature	In preparation	In preparation
Mechanical characteristics	810FS011.100-1	810FS024.100-1
Mounting	Underneath the inverter	Underneath the inverter
Weight	1.12 kg	1.455 kg

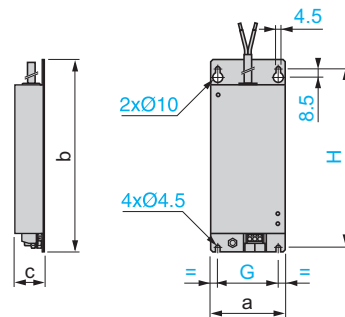
Dimensions



	a	b	c	G	H
810FS011.100-1	75	194	30	61	180
810FS024.100-1	117	184	40	97	170

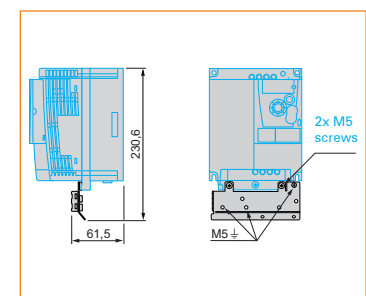
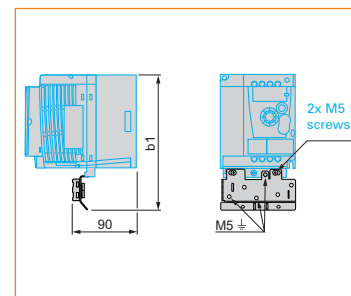
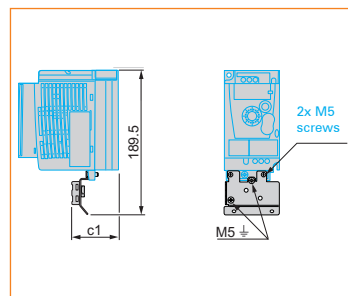
Power mains connection	810FT006.100-1	810FT015.100-1
Maximum nominal voltage	3x 240 VAC + 10%	3x 240 VAC + 10%
Filter nominal current	6 A	15 A
Maximum earth leakage current	In preparation	In preparation
Dissipated power	In preparation	In preparation
General information	810FT006.100-1	810FT015.100-1
Conformity to standards	In preparation	In preparation
Operational conditions	810FT006.100-1	810FT015.100-1
Ambient temperature	In preparation	In preparation
Maximum relative humidity according to IEC 60068-2-3	In preparation	In preparation
Installation altitudes above sea level	In preparation	In preparation
Maximum installation altitude	In preparation	In preparation
Degree of protection	In preparation	In preparation
Storage conditions	810FT006.100-1	810FT015.100-1
Storage temperature	In preparation	In preparation
Mechanical characteristics	810FT006.100-1	810FT015.100-1
Mounting	Underneath the inverter	Underneath the inverter
Weight	1.21 kg	1.44 kg

Dimensions



	a	b	c	G	H
810FT006.100-1	75	194	40	61	180
810FT015.100-1	117	190	40	97	170

EMC plates for ACOPOSinverter S44



Brief overview	810XP001.100-1	810XP002.100-1	810XP003.100-1
Contents of delivery	1 EMC plate 4 clamps and fixing accessories	1 EMC plate 4 clamps and fixing accessories	1 EMC plate 4 clamps and fixing accessories

Additional EMC input filters for ACOPOSinverter X64 810FS, 810FT

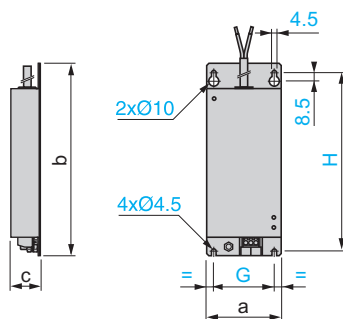


- Additional EMC input filters are designed to reduce conducted emissions on the line supply below the limits of standard IEC/EN 61800-3, category C1, C2 or C3, in environment 1 (public network) or 2 (industrial network), depending on the drive rating.
- See the “Conducted and radiated EMC emissions” characteristics of the ACOPOSinverter X64 drive to check the permitted shielded motor cable length.
- Additional EMC input filters can only be used on TN (neutral connection) and TT (neutral to earth) type systems.

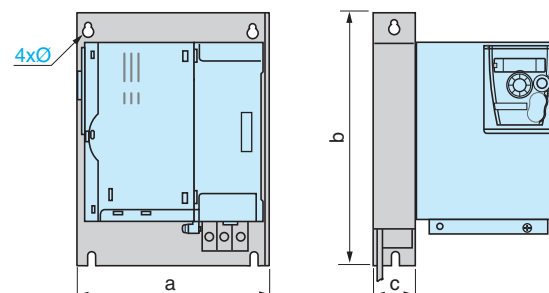
Power mains connection	810FS009.200-1	810FS016.200-1	810FS022.200-1
Maximum nominal voltage	1x 240 VAC + 10%	1x 240 VAC + 10%	1x 240 VAC + 10%
Filter nominal current	9 A	16 A	22 A
Maximum earth leakage current	100 mA	150 mA	80 mA
Dissipated power	3.7 W	6.9 W	7.5 W
General information	810FS009.200-1	810FS016.200-1	810FS022.200-1
Conformity to standards	EN 133200	EN 133200	EN 133200
Operational conditions	810FS009.200-1	810FS016.200-1	810FS022.200-1
Ambient temperature	-10 to +60°C	-10 to +60°C	-10 to +60°C
Maximum relative humidity according to IEC 60068-2-3	In preparation	In preparation	In preparation
Installation altitudes above sea level ¹⁾	0 to 1000 m	0 to 1000 m	0 to 1000 m
Degree of protection	IP 21 and IP 41 on upper part	IP 21 and IP 41 on upper part	IP 21 and IP 41 on upper part
1) Above 1000 m current derating of 1% per 100 m			
Storage conditions	810FS009.200-1	810FS016.200-1	810FS022.200-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Mechanical characteristics	810FS009.200-1	810FS016.200-1	810FS022.200-1
Mounting	Underneath or beside the inverter	Underneath or beside the inverter	Underneath or beside the inverter
Weight	0.6 kg	0.775 kg	1.13 kg

Dimensions

Mounting the filter Underneath the inverter



Mounting the filter beside the inverter



	a	b	c	G	H	D
810FS009.200-1	72	195	37	52	180	4.5
810FS016.200-1	107	195	35	85	180	4.5
810FS022.200-1	140	235	35	120	215	4.5

Power mains connection	810FT007.200-1	810FT015.200-1	810FT025.200-1
Maximum nominal voltage	3x 500 VAC + 10%	3x 500 VAC + 10%	3x 500 VAC + 10%
Filter nominal current	7 A	15 A	25 A
Maximum earth leakage current	7 mA	15 mA	35 mA
Dissipated power	2.6 W	9.9 W	15.8 W
General information	810FT007.200-1	810FT015.200-1	810FT025.200-1
Conformity to standards	EN 133200	EN 133200	EN 133200
Operational conditions	810FT007.200-1	810FT015.200-1	810FT025.200-1
Ambient temperature	-10 to +60°C	-10 to +60°C	-10 to +60°C
Maximum relative humidity according to IEC 60068-2-3	95% non-condensing, no dripping water	95% non-condensing, no dripping water	95% non-condensing, no dripping water
Installation altitudes above sea level ¹⁾	0 to 1000 m	0 to 1000 m	0 to 1000 m
Degree of protection	IP 21 and IP 41 on upper part	IP 21 and IP 41 on upper part	IP 21 and IP 41 on upper part
1) Above 1000m current derating of 1% per 100 m			
Storage conditions	810FT007.200-1	810FT015.200-1	810FT025.200-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Mechanical characteristics	810FT007.200-1	810FT015.200-1	810FT025.200-1
Mounting	Underneath or beside the inverter	Underneath or beside the inverter	Underneath or beside the inverter
Weight	0.65 kg	1.0 kg	1.65 kg

Dimensions

	a	b	c	G	H	D
810FT007.200-1	72	195	37	52	180	4.5
810FT015.200-1	107	195	42	85	180	4.5
810FT025.200-1	140	235	50	120	215	4.5

Power mains connection	810FT047.200-1	810FT049.200-1	810FT083.200-1
Maximum nominal voltage	3x 500 VAC + 10%	3x 500 VAC + 10%	3x 500 VAC + 10%
Filter nominal current	47 A	49 A	83 A
Maximum earth leakage current	45 mA	45 mA	15 mA
Dissipated power	19.3 W	27.4 W	35.2 W
General information	810FT047.200-1	810FT049.200-1	810FT083.200-1
Conformity to standards	EN 133200	EN 133200	EN 133200
Operational conditions	810FT047.200-1	810FT049.200-1	810FT083.200-1
Ambient temperature	-10 to +60°C	-10 to +60°C	-10 to +60°C
Maximum relative humidity according to IEC 60068-2-3	95% non-condensing, no dripping water	95% non-condensing, no dripping water	95% non-condensing, no dripping water
Installation altitudes above sea level ¹⁾	0 to 1000 m	0 to 1000 m	0 to 1000 m
Degree of protection	IP 21 and IP 41 on upper part	IP 21 and IP 41 on upper part	IP 21 and IP 41 on upper part
1) Above 1000m current derating of 1% per 100 m			
Storage conditions	810FT047.200-1	810FT049.200-1	810FT083.200-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Mechanical characteristics	810FT047.200-1	810FT049.200-1	810FT083.200-1
Mounting	Underneath or beside the inverter	Underneath or beside the inverter	Underneath or beside the inverter
Weight	3.15 kg	4.75 kg	5.3 kg

Dimensions

	a	b	c	G	H	D
810FT047.200-1	180	305	60	140	285	5.5
810FT049.200-1	245	395	60	205	375	5.5
810FT083.200-1	245	395	80	205	375	5.5

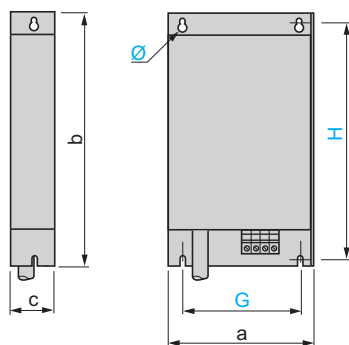
Additional EMC input filters for ACOPOSinverter P84 810FT



- Additional EMC input filters are designed to reduce conducted emissions on the line supply below the limits of standard IEC/EN 61800-3, category C1, C2 or C3, in environment 1 (public network) or 2 (industrial network), depending on the drive rating.
- See the “Conducted and radiated EMC emissions” characteristics of the ACOPOSinverter P84 drive to check the permitted shielded motor cable length.
- Additional EMC input filters can only be used on TN (neutral connection) and TT (neutral to earth) type systems.

Power mains connection	810FT012.300-1	810FT026.300-1	810FT035.300-1
Maximum nominal voltage	3x 480 VAC + 10%	3x 480 VAC + 10%	3x 480 VAC + 10%
Filter nominal current	12 A	26 A	35 A
Maximum earth leakage current			
at 200-240VAC	4 mA	4.4 mA	3 mA
at 380-480VAC	7 mA	8 mA	7 mA
Dissipated power			
at 200-240VAC	10 W	18 W	24 W
at 380-480VAC	5 W	6 W	14 W
General information	810FT012.300-1	810FT026.300-1	810FT035.300-1
Conformity to standards	EN 133200	EN 133200	EN 133200
Operational conditions	810FT012.300-1	810FT026.300-1	810FT035.300-1
Ambient temperature	-10 to +50°C	-10 to +50°C	-10 to +50°C
Maximum relative humidity according to IEC 60068-2-3	93% non-condensing, no dripping water	93% non-condensing, no dripping water	93% non-condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ¹⁾	3000 m	3000 m	3000 m
Degree of protection	IP 21 and IP 41 on upper part	IP 21 and IP 41 on upper part	IP 21 and IP 41 on upper part
<small>1) From 1000 m to 3000 m current derating of 1% per 100 m. Limited to 2000 m for the „Corner grounded“ distribution network.</small>			
Storage conditions	810FT012.300-1	810FT026.300-1	810FT035.300-1
Storage temperature	-40 to +65°C	-40 to +65°C	-40 to +65°C
Mechanical characteristics	810FT012.300-1	810FT026.300-1	810FT035.300-1
Mounting	Underneath or beside the inverter	Underneath or beside the inverter	Underneath or beside the inverter
Weight	2.2 kg	4.0 kg	5.8 kg

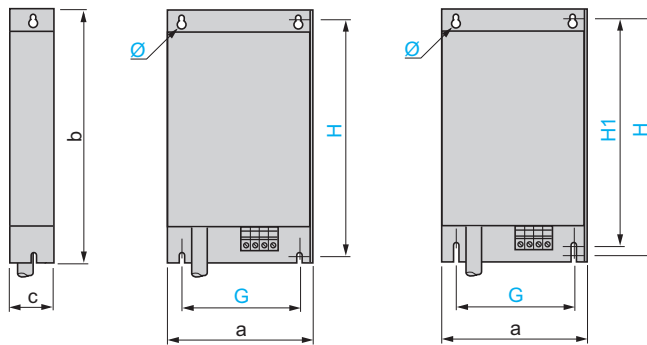
Dimensions



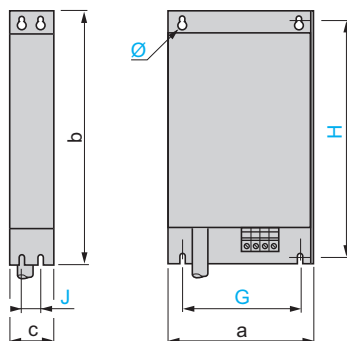
	a	b	c	G	H	Ø
810FT012.300-1	130	290	40	105	275	4.5
810FT026.300-1	155	324	50	130	309	4.5
810FT035.300-1	175	370	60	150	355	6.5

Power mains connection	810FT046.300-1	810FT072.300-1	810FT090.300-1
Maximum nominal voltage	3x 480 VAC + 10%	3x 480 VAC + 10%	3x 480 VAC + 10%
Filter nominal current	46 A	72 A	90 A
Maximum earth leakage current			
at 200-240VAC	10 mA	33 mA	33 mA
at 380-480VAC	14 mA	60 mA	60 mA
Dissipated power			
at 200-240VAC	19 W	34 W	34 W
at 380-480VAC	13 W	14 W	11 W
General information	810FT046.300-1	810FT072.300-1	810FT090.300-1
Conformity to standards	EN 133200	EN 133200	EN 133200
Operational conditions	810FT046.300-1	810FT072.300-1	810FT090.300-1
Ambient temperature	-10 to +50°C	-10 to +50°C	-10 to +50°C
Maximum relative humidity according to IEC 60068-2-3	93% non-condensing, no dripping water	93% non-condensing, no dripping water	93% non-condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ¹⁾	3000 m	3000 m	3000 m
Degree of protection	IP 21 and IP 41 on upper part	IP 21 and IP 41 on upper part	IP 21 and IP 41 on upper part
1) From 1000 m to 3000 m current derating of 1% per 100 m. Limited to 2000 m for the „Corner grounded“ distribution network.			
Storage conditions	810FT046.300-1	810FT072.300-1	810FT090.300-1
Storage temperature	-40 to +65°C	-40 to +65°C	-40 to +65°C
Mechanical characteristics	810FT046.300-1	810FT072.300-1	810FT090.300-1
Mounting	Underneath or beside the inverter	Underneath or beside the inverter	Underneath or beside the inverter
Weight	7.0 kg	12.0 kg	15.0 kg

Dimensions



	a	b	c	G	H	H1	Ø
810FT046.300-1	210	380	60	190	365	-	6.5
810FT072.300-1	230	498.5	62	190	479.5	460	6.5

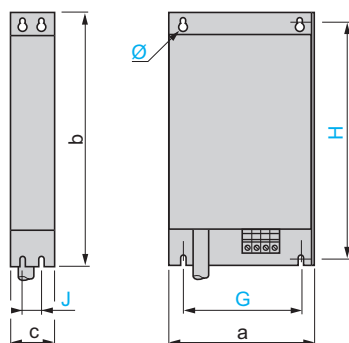


	a	b	c	G	H	J	Ø
810FT090.300-1	240	522	79	200	502.5	40	9

Additional EMC input filters for ACOPOSinverter P84 810FT

Power mains connection	810FT092.300-1	810FT180.300-1	810FT273.300-1
Maximum nominal voltage	3x 480 VAC + 10%	3x 480 VAC + 10%	3x 480 VAC + 10%
Filter nominal current	92 A	180 A	273 A
Maximum earth leakage current			
at 200-240VAC	-	80 mA	-
at 380-480VAC	60 mA	140 mA	500 mA
Dissipated power			
at 200-240VAC	-	58 W	-
at 380-480VAC	30 W	58 W	60 W
General information	810FT092.300-1	810FT180.300-1	810FT273.300-1
Conformity to standards	EN 133200	EN 133200	EN 133200
Operational conditions	810FT092.300-1	810FT180.300-1	810FT273.300-1
Ambient temperature	-10 to +50°C	-10 to +50°C	-10 to +45°C
Maximum relative humidity according to IEC 60068-2-3	93% non-condensing, no dripping water	93% non-condensing, no dripping water	93% non-condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ¹⁾	3000 m	3000 m	3000 m
Degree of protection	IP 21 and IP 41 on upper part	IP 21 and IP 41 on upper part	IP 00
<small>1) From 1000 m to 3000 m current derating of 1% per 100 m. Limited to 2000 m for the „Corner grounded“ distribution network.</small>			
Storage conditions	810FT092.300-1	810FT180.300-1	810FT273.300-1
Storage temperature	-40 to +65°C	-40 to +65°C	-40 to +85°C
Mechanical characteristics	810FT092.300-1	810FT180.300-1	810FT273.300-1
Mounting	Underneath or beside the inverter	Underneath or beside the inverter	Next to the inverter
Weight	17.0 kg	40.0 kg	22.0 kg

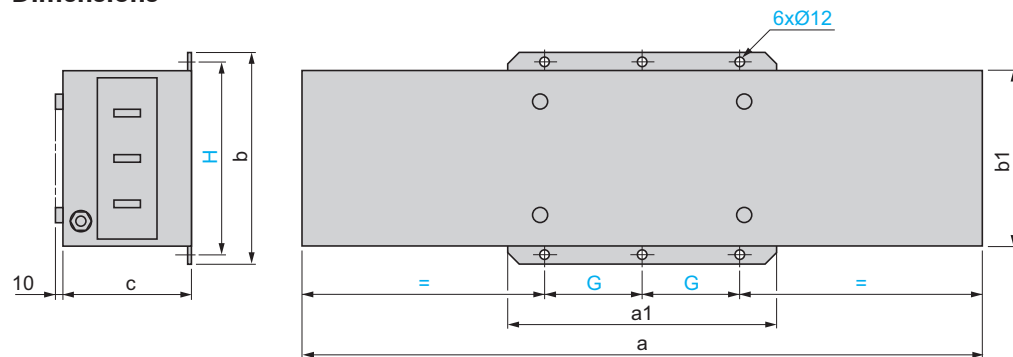
Dimensions



	a	b	c	G	H	J	Ø
810FT092.300-1	240	650	79	200	631	40	9
810FT180.300-1	320	750	119	280	725	80	9

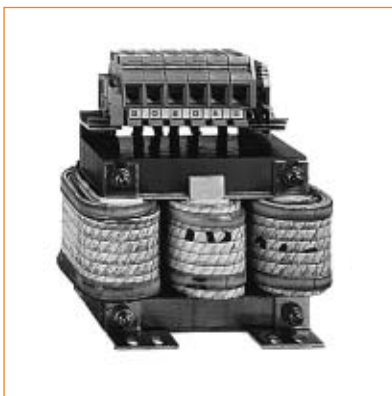
Power mains connection	810FT546.300-1	810FT728.300-1	810FT14M.300-1
Maximum nominal voltage	3x 480 VAC + 10%	3x 480 VAC + 10%	3x 480 VAC + 10%
Filter nominal current	546 A	728 A	1456 A
Maximum earth leakage current			
at 200-240VAC	-	-	-
at 380-480VAC	500 mA	500 mA	200 mA
Dissipated power			
at 200-240VAC	-	-	-
at 380-480VAC	125 W	210 W	380 W
General information	810FT546.300-1	810FT728.300-1	810FT14M.300-1
Conformity to standards	EN 133200	EN 133200	EN 133200
Operational conditions	810FT546.300-1	810FT728.300-1	810FT14M.300-1
Ambient temperature	-10 to +45°C	-10 to +45°C	-10 to +45°C
Maximum relative humidity according to IEC 60068-2-3	93% non-condensing, no dripping water	93% non-condensing, no dripping water	93% non-condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ¹⁾	3000 m	3000 m	3000 m
Degree of protection	IP 00	IP 00	IP 00
1) From 1000 m to 3000 m current derating of 1% per 100 m. Limited to 2000 m for the „Corner grounded“ distribution network.			
Storage conditions	810FT546.300-1	810FT728.300-1	810FT14M.300-1
Storage temperature	-40 to +85°C	-40 to +85°C	-40 to +85°C
Mechanical characteristics	810FT546.300-1	810FT728.300-1	810FT14M.300-1
Mounting	Next to the inverter	Next to the inverter	Next to the inverter
Weight	25.0 kg	25.0 kg	34.0 kg

Dimensions



	a	a1	b	b1	c	G	H
810FT273.300-1	800	302	261	219	139	120	235
810FT546.300-1	800	302	261	219	139	120	235
810FT728.300-1	900	352	281	239	174	145	255
810FT14M.300-1	1000	401	301	259	164	170	275

Line chokes for ACOPOSinverter X64 and P84 810CS



- Line chokes provide improved protection against overvoltages on the line supply and reduce harmonic distortion of the current produced by the drive.
- The recommended chokes limit the line current.
- The use of line chokes is recommended under the following circumstances:
 - Close connection of several drives in parallel
 - Line supply with significant disturbance from other equipment (interference, overvoltages)
 - Line supply with voltage imbalance between phases > 1.8% of nominal voltage
 - Drive supplied by a line with very low impedance (in the vicinity of a power transformer 10 times more powerful than the drive rating)
 - Installation of a large number of frequency inverters on the same line
 - Reduction of overloads on the $\cos \varphi$ correction capacitors, if the installation includes a power factor correction unit

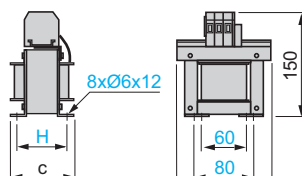
Power mains connection	810CS004.000-1	810CS007.000-1	810CS018.000-1
Inductance value	10 mH	5 mH	2 mH
Nominal current	4 A	7 A	18 A
Dissipated power	17 W	20 W	30 W
Voltage drop	Between 3% and 5% of the nominal line voltage. Values higher than this will cause loss of torque.		
General information	810CS004.000-1	810CS007.000-1	810CS018.000-1
Conformity to standards	IEC 61800-5-1 (VDE 0160 level 1 high-energy overvoltages on the line supply)		
Operational conditions	810CS004.000-1	810CS007.000-1	810CS018.000-1
Ambient temperature	0 to +45°C	0 to +45°C	0 to +45°C
Max. ambient temperature ¹⁾	Up to +55°C	Up to +55°C	Up to +55°C
Maximum relative humidity	95% non-condensing, no dripping water	95% non-condensing, no dripping water	95% non-condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	3000 m	3000 m	3000 m
Degree of protection			
Choke	IP 00	IP 00	IP 00
Terminals	IP 20	IP 20	IP 20

1) With current derating of 2% per °C above 45°C

2) From 1000 m to 3000 m current derating of 1% per 100 m

Storage conditions	810CS004.000-1	810CS007.000-1	810CS018.000-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Mechanical characteristics	810CS004.000-1	810CS007.000-1	810CS018.000-1
Weight	0.63 kg	0.88 kg	1.99 kg

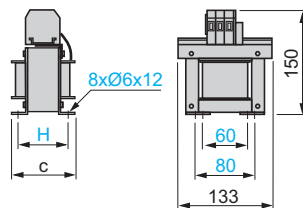
Dimensions



	a	b	c	G	H	Ø
810CS004.000-1	60	100	80	50	44	4x9
810CS007.000-1	60	100	95	50	60	4x9
810CS018.000-1	85	120	105	70	70	5x11

Power mains connection	810CS025.000-1	810CS045.000-1
Inductance value	2 mH	1 mH
Nominal current	45 A	45 A
Dissipated power	50 W	50 W
Voltage drop	Between 3% and 5% of the nominal line voltage. Values higher than this will cause loss of torque.	
General information	810CS025.000-1	810CS045.000-1
Conformity to standards	IEC 61800-5-1 (VDE 0160 level 1 high-energy overvoltages on the line supply)	
Operational conditions	810CS025.000-1	810CS045.000-1
Ambient temperature	0 to +45°C	0 to +45°C
Max. ambient temperature ¹⁾	Up to +55°C	Up to +55°C
Maximum relative humidity	95% non-condensing, no dripping water	95% non-condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	3000 m	3000 m
Degree of protection		
Choke	IP 00	IP 00
Terminals	IP 20	IP 20
1) With current derating of 2% per °C above 45°C		
2) From 1000 m to 3000 m current derating of 1% per 100 m		
Storage conditions	810CS025.000-1	810CS045.000-1
Storage temperature	-25 to +70°C	-25 to +70°C
Mechanical characteristics	810CS025.000-1	810CS045.000-1
Weight	3.5 kg	3.5 kg

Dimensions

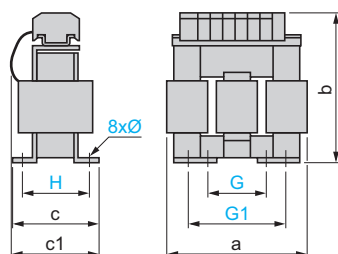


	a	H
810CS025.000-1	95	65
810CS045.000-1	105	77

Line chokes for ACOPOSinverter X64 and P84 810CT

Power mains connection	810CT004.000-1	810CT010.000-1	810CT016.000-1
Inductance value	10 mH	4 mH	2 mH
Nominal current ¹⁾	4 A	10 A	16 A
Current of saturation	-	-	-
Dissipated power	45 W	65 W	75 W
Voltage drop	Between 3% and 5% of the nominal line voltage. Values higher than this will cause loss of torque.		
1) Maximum current = 1.65 x nominal current for 60 seconds			
General information	810CT004.000-1	810CT010.000-1	810CT016.000-1
Conformity to standards	IEC 61800-5-1 (VDE 0160 level 1 high-energy overvoltages on the line supply)		
Operational conditions	810CT004.000-1	810CT010.000-1	810CT016.000-1
Ambient temperature	0 to +45°C	0 to +45°C	0 to +45°C
Max. ambient temperature ¹⁾	Up to +55°C	Up to +55°C	Up to +55°C
Maximum relative humidity	95% non-condensing, no dripping water	95% non-condensing, no dripping water	95% non-condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	3000 m	3000 m	3000 m
Degree of protection			
Choke	IP 00	IP 00	IP 00
Terminals	IP 20	IP 20	IP 20
1) With current derating of 2% per °C above 45°C			
2) From 1000 m to 3000 m current derating of 1% per 100 m			
Storage conditions	810CT004.000-1	810CT010.000-1	810CT016.000-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Mechanical characteristics	810CT004.000-1	810CT010.000-1	810CT016.000-1
Weight	1.5 kg	3.0 kg	3.5 kg

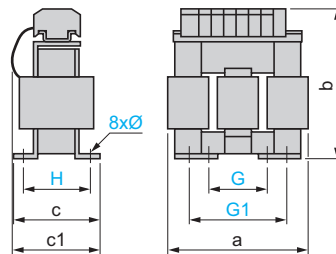
Dimensions



	a	b	c	c1	G	G1	H	D
810CT004.000-1	100	135	55	60	40	60	42	6x9
810CT010.000-1	130	155	85	90	60	80.5	62	6x12
810CT016.000-1	130	155	85	90	60	80.5	62	6x12

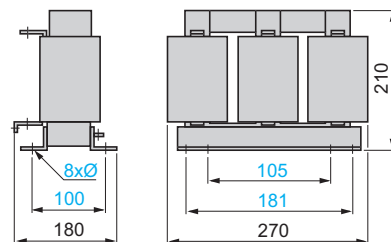
Power mains connection	810CT030.000-1	810CT060.000-1	810CT100.000-1
Inductance value	1 mH	0.5 mH	0.3 mH
Nominal current ¹⁾	30 A	60 A	100 A
Current of saturation	-	-	-
Dissipated power	90 W	94 W	260 W
Voltage drop	Between 3% and 5% of the nominal line voltage. Values higher than this will cause loss of torque.		
1) Maximum current = 1.65 x nominal current for 60 seconds			
General information	810CT030.000-1	810CT060.000-1	810CT100.000-1
Conformity to standards	IEC 61800-5-1 (VDE 0160 level 1 high-energy overvoltages on the line supply)		
Operational conditions	810CT030.000-1	810CT060.000-1	810CT100.000-1
Ambient temperature	0 to +45°C	0 to +45°C	0 to +45°C
Max. ambient temperature ¹⁾	Up to +55°C	Up to +55°C	Up to +55°C
Maximum relative humidity	95% non-condensing, no dripping water	95% non-condensing, no dripping water	95% non-condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	3000 m	3000 m	3000 m
Degree of protection			
Choke	IP 00	IP 00	IP 00
Terminals	IP 10	IP 10	IP 00
1) With current derating of 2% per °C above 45°C			
2) From 1000 m to 3000 m current derating of 1% per 100 m			
Storage conditions	810CT030.000-1	810CT060.000-1	810CT100.000-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Mechanical characteristics	810CT030.000-1	810CT060.000-1	810CT100.000-1
Weight	6.0 kg	11.0 kg	16.0 kg

Dimensions



	a	b	c	c1	G	G1	H	Ø
810CT030.000-1	155	170	115	135	75	107	90	6x12
810CT060.000-1	180	210	125	165	85	122	105	6x12

810CT100.00-1



Line chokes for ACOPOSinverter P84 810CT

Power mains connection	810CT184.000-1	810CT222.000-1	810CT230.000-1
Inductance value	0.155 mH	0.12 mH	0.15 mH
Nominal current ¹⁾	184 A	222 A	230 A
Current of saturation	370 A	346 A	-
Dissipated power	220 W	278 W	400 W
Voltage drop	Between 3% and 5% of the nominal line voltage. Values higher than this will cause loss of torque.		

1) Maximum current = 1.65 x nominal current for 60 seconds

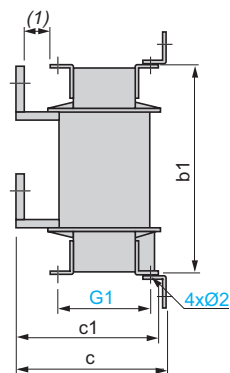
General information	810CT184.000-1	810CT222.000-1	810CT230.000-1
Conformity to standards	IEC 61800-5-1 (VDE 0160 level 1 high-energy overvoltages on the line supply)		
Operational conditions	810CT184.000-1	810CT222.000-1	810CT230.000-1
Ambient temperature	0 to +45°C	0 to +45°C	0 to +45°C
Max. ambient temperature ¹⁾	Up to +55°C	Up to +55°C	Up to +55°C
Maximum relative humidity	95% non-condensing, no dripping water	95% non-condensing, no dripping water	95% non-condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	3000 m	3000 m	3000 m
Degree of protection	IP 00		
Choke	IP 00	IP 00	IP 00
Terminals	IP 00	IP 00	IP 00

1) With current derating of 2% per °C above 45°C

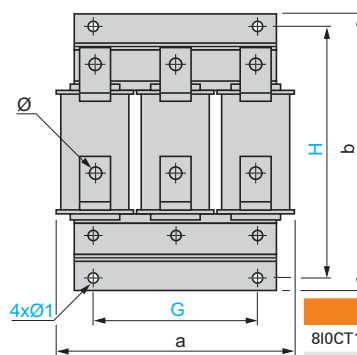
2) From 1000 m to 3000 m current derating of 1% per 100 m

Storage conditions	810CT184.000-1	810CT222.000-1	810CT230.000-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Mechanical characteristics	810CT184.000-1	810CT222.000-1	810CT230.000-1
Weight	31.0 kg	35.0 kg	45.0 kg

Dimensions

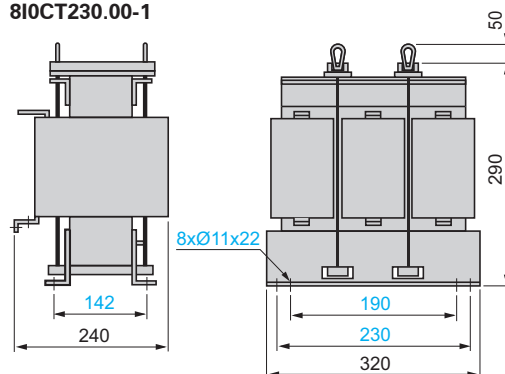


(1) 25 mm minimum.



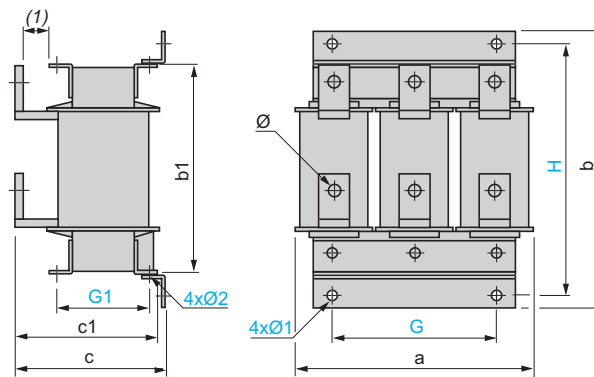
	a	b	b1	c	c1	G	G1	H	Ø	Ø1	Ø2
810CT184.000-1	280	305	240	210	200	200	125	275	9	9	9
810CT222.000-1	280	330	260	210	200	200	125	300	11	9	9

810CT230.00-1



Power mains connection	810CT264.000-1	810CT344.000-1	810CT450.000-1
Inductance value	0.098 mH	0.066 mH	0.060 mH
Nominal current ¹⁾	264 A	344 A	450 A
Current of saturation	530 A	685 A	574 A
Dissipated power	245 W	258 W	335 W
Voltage drop	Between 3% and 5% of the nominal line voltage. Values higher than this will cause loss of torque.		
1) Maximum current = 1.65 x nominal current for 60 seconds			
General information	810CT264.000-1	810CT344.000-1	810CT450.000-1
Conformity to standards	IEC 61800-5-1 (VDE 0160 level 1 high-energy overvoltages on the line supply)		
Operational conditions	810CT264.000-1	810CT344.000-1	810CT450.000-1
Ambient temperature	0 to +45°C	0 to +45°C	0 to +45°C
Max. ambient temperature ¹⁾	Up to +55°C	Up to +55°C	Up to +55°C
Maximum relative humidity	95% non-condensing, no dripping water	95% non-condensing, no dripping water	95% non-condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	3000 m	3000 m	3000 m
Degree of protection			
Choke	IP 00	IP 00	IP 00
Terminals	IP 10	IP 10	IP 00
1) With current derating of 2% per °C above 45°C			
2) From 1000 m to 3000 m current derating of 1% per 100 m			
Storage conditions	810CT264.000-1	810CT344.000-1	810CT450.000-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Mechanical characteristics	810CT264.000-1	810CT344.000-1	810CT450.000-1
Weight	45.0 kg	47.0 kg	70.0 kg

Dimensions



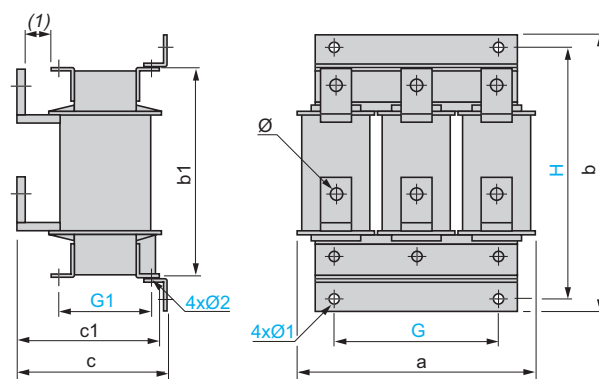
(1) 25 mm minimum.

	a	b	b1	c	c1	G	G1	H	Ø	Ø1	Ø2
810CT264.000-1	320	380	300	210	200	255	150	350	11	9	9
810CT344.000-1	320	380	300	210	200	255	150	350	11	9	9
810CT450.000-1	320	380	300	250	230	225	150	350	13	11	11

Line chokes for ACOPOSinverter P84 810CT

Power mains connection	810CT613.000-1	810CT720.000-1
Inductance value	0.038 mH	0.032 mH
Nominal current ¹⁾	613 A	720 A
Current of saturation	1150 A	1352 A
Dissipated power	307 W	428 W
Voltage drop	Between 3% and 5% of the nominal line voltage. Values higher than this will cause loss of torque.	
1) Maximum current = 1.65 x nominal current for 60 seconds		
General information	810CT613.000-1	810CT720.000-1
Conformity to standards	IEC 61800-5-1 (VDE 0160 level 1 high-energy overvoltages on the line supply)	
Operational conditions	810CT613.000-1	810CT720.000-1
Ambient temperature	0 to +45°C	0 to +45°C
Max. ambient temperature ¹⁾	Up to +55°C	Up to +55°C
Maximum relative humidity	95% non-condensing, no dripping water	95% non-condensing, no dripping water
Installation altitudes above sea level	0 to 1000 m	0 to 1000 m
Maximum installation altitude ²⁾	3000 m	3000 m
Degree of protection		
Choke	IP 00	IP 00
Terminals	IP 00	IP 00
1) With current derating of 2% per °C above 45°C		
2) From 1000 m to 3000 m current derating of 1% per 100 m		
Storage conditions	810CT613.000-1	810CT720.000-1
Storage temperature	-25 to +70°C	-25 to +70°C
Mechanical characteristics	810CT613.000-1	810CT720.000-1
Weight	73.0 kg	82.0 kg

Dimensions



(1) 25 mm minimum.

	a	b	b1	c	c1	G	G1	H	Ø	Ø1	Ø2
810CT613.000-1	320	380	300	250	230	225	150	350	13	11	11
810CT720.000-1	385	440	340	275	250	300	125	400	2xØ13	13.5	13.5

Braking resistor for ACOPOSinverter X64 and P84 810BR



- The braking resistor enables the ACOPOSinverter drive to operate while braking to a standstill or during slowdown braking, by dissipating the braking energy.
- It enables maximum transient braking torque.
- The resistors are designed to be mounted on the outside of the enclosure, but should not inhibit natural cooling. Air inlets and outlets must not be obstructed in any way.
- The air must be free of dust, corrosive gas and condensation.

Characteristics	810BR100.000-1	810BR060.000-1	810BR028.000-1
Resistance value at 20°C	100 Ω	60 Ω	28 Ω
Average power available at 50°C ¹⁾	0.05 kW	0.1 kW	0.2 kW
Thermal protection	Via temperature controlled switch or via the drive		
Temperature controlled switch ²⁾			
Activation temperature	120°C	120°C	120°C
Max. voltage / max. current	250 VAC / 1 A	250 VAC / 1 A	250 VAC / 1 A
Min. voltage / min. current	24 VDC / 0.1 A	24 VDC / 0.1 A	24 VDC / 0.1 A
Maximum contact resistance	60 mΩ	60 mΩ	60 mΩ

1) Load factor for resistors: the value of the average power that can be dissipated at 50°C from the resistor into the casing is determined for a load factor during braking that corresponds to most common applications.

For 810BR100.000-1 to 810BR003.000-1:

- 2 s braking with a 0.6 T_n braking torque for a 40 s cycle
- 0.8 s braking with a 1.5 T_n braking torque for a 40 s cycle

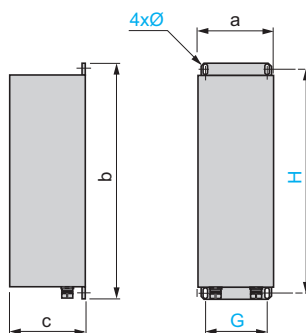
For 810BR003.001-1 to 810BR001.004-1:

- 10 s braking with a 2 T_n braking torque for a 30 s cycle

2) The switch should be connected in the sequence (use for signalling, or in the line contactor control)

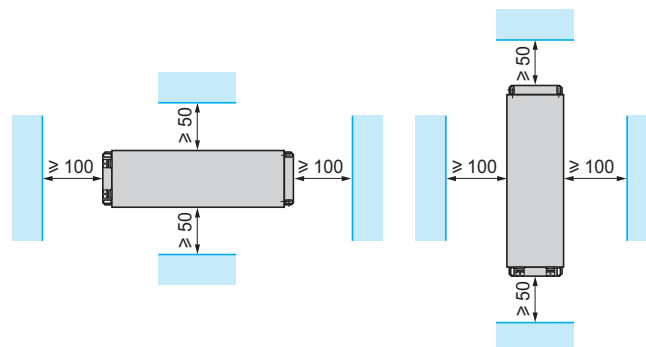
Operational conditions	810BR100.000-1	810BR060.000-1	810BR028.000-1
Ambient temperature	0 to +50°C	0 to +50°C	0 to +50°C
Degree of protection of the casing	IP 20	IP 20	IP 20
Storage conditions	810BR100.000-1	810BR060.000-1	810BR028.000-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Mechanical characteristics	810BR100.000-1	810BR060.000-1	810BR028.000-1
Weight	1.9 kg	2.4 kg	3.5 kg

Dimensions



	a	b	c	G	H	Ø
810BR100.000-1	95	293	95	70	275	6 x 12
810BR060.000-1	95	293	95	70	375	6 x 12
810BR028.000-1	140	393	120	120	375	6 x 12

Mounting recommendations



Braking resistors for ACOPOSinverter P84 8IOBR

Characteristics	8IOBR015.000-1	8IOBR010.000-1	8IOBR008.000-1
Resistance value at 20°C	15 Ω	10 Ω	8 Ω
Average power available at 50°C ¹⁾	1 kW	1 kW	1 kW
Thermal protection	Via temperature controlled switch or via the drive		
Temperature controlled switch ²⁾			
Activation temperature	120°C	120°C	120°C
Max. voltage / max. current	250 VAC / 1 A	250 VAC / 1 A	250 VAC / 1 A
Min. voltage / min. current	24 VDC / 0.1 A	24 VDC / 0.1 A	24 VDC / 0.1 A
Maximum contact resistance	60 mΩ	60 mΩ	60 mΩ

1) Load factor for resistors: the value of the average power that can be dissipated at 50°C from the resistor into the casing is determined for a load factor during braking that corresponds to most common applications.

For 8IOBR100.000-1 to 8IOBR003.000-1:

- 2 s braking with a 0.6 T_n braking torque for a 40 s cycle
- 0.8 s braking with a 1.5 T_n braking torque for a 40 s cycle

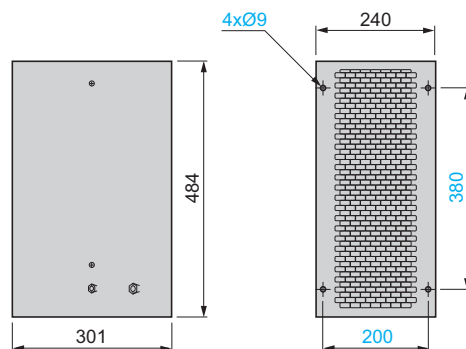
For 8IOBR003.001-1 to 8IOBR001.004-1:

- 10 s braking with a 2 T_n braking torque for a 30 s cycle

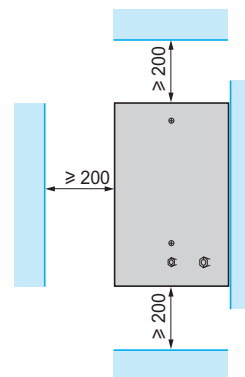
2) The switch should be connected in the sequence (use for signalling, or in the line contactor control)

Operational conditions	8IOBR015.000-1	8IOBR010.000-1	8IOBR008.000-1
Ambient temperature	0 to +50°C	0 to +50°C	0 to +50°C
Degree of protection of the casing	IP 20	IP 20	IP 20
Storage conditions	8IOBR015.000-1	8IOBR010.000-1	8IOBR008.000-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Mechanical characteristics	8IOBR015.000-1	8IOBR010.000-1	8IOBR008.000-1
Weight	11 kg	11 kg	11 kg

Dimensions



Mounting recommendations



Characteristics	8I0BR005.000-1	8I0BR004.000-1	8I0BR003.000-1
Resistance value at 20°C	5 Ω	4 Ω	2.5 Ω
Average power available at 50°C ¹⁾	1.3 kW	1 kW	1 kW
Thermal protection	Via temperature controlled switch or via the drive		
Temperature controlled switch ²⁾			
Activation temperature	120°C	120°C	120°C
Max. voltage / max. current	250 VAC / 1 A	250 VAC / 1 A	250 VAC / 1 A
Min. voltage / min. current	24 VDC / 0.1 A	24 VDC / 0.1 A	24 VDC / 0.1 A
Maximum contact resistance	60 mΩ	60 mΩ	60 mΩ

1) Load factor for resistors: the value of the average power that can be dissipated at 50°C from the resistor into the casing is determined for a load factor during braking that corresponds to most common applications.

For 8I0BR100.000-1 to 8I0BR003.000-1:

- 2 s braking with a 0.6 T_n braking torque for a 40 s cycle
- 0.8 s braking with a 1.5 T_n braking torque for a 40 s cycle

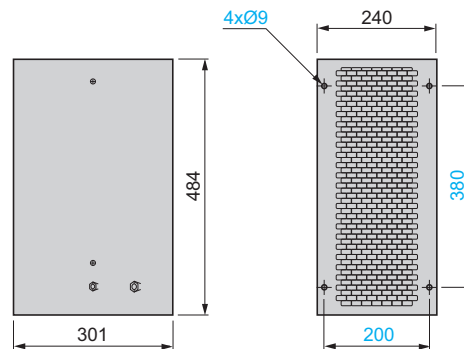
For 8I0BR003.001-1 to 8I0BR001.004-1:

- 10 s braking with a 2 T_n braking torque for a 30 s cycle

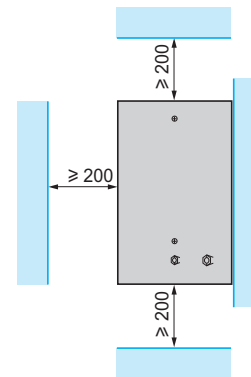
2) The switch should be connected in the sequence (use for signalling, or in the line contactor control)

Operational conditions	8I0BR005.000-1	8I0BR004.000-1	8I0BR003.000-1
Ambient temperature	0 to +50°C	0 to +50°C	0 to +50°C
Degree of protection of the casing	IP 20	IP 20	IP 20
Storage conditions	8I0BR005.000-1	8I0BR004.000-1	8I0BR003.000-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Mechanical characteristics	8I0BR005.000-1	8I0BR004.000-1	8I0BR003.000-1
Weight	11 kg	11 kg	11 kg

Dimensions



Mounting recommendations



Braking resistors for ACOPOSinverter P84 8IOBR

Characteristics	8IOBR003.001-1	8IOBR002.000-1	8IOBR002.001-1
Resistance value at 20°C	2.75 Ω	2.1 Ω	2.1 Ω
Average power available at 50°C ¹⁾	25 kW	37 kW	44 kW

Thermal protection

Via thermal overload relay

1) Load factor for resistors: the value of the average power that can be dissipated at 50°C from the resistor into the casing is determined for a load factor during braking that corresponds to most common applications.

For 8IOBR100.000-1 to 8IOBR003.000-1:

- 2 s braking with a 0.6 Tn braking torque for a 40 s cycle

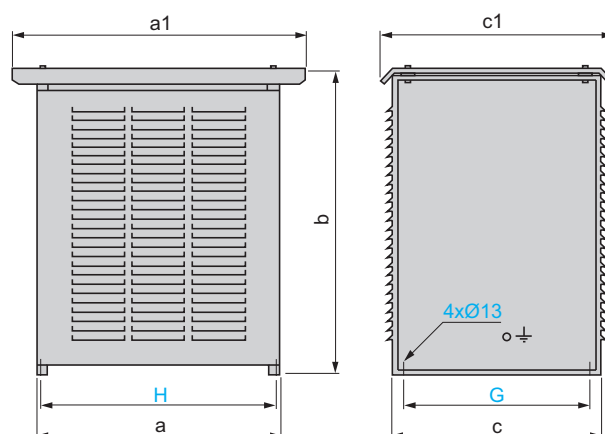
- 0.8 s braking with a 1.5 Tn braking torque for a 40 s cycle

For 8IOBR003.001-1 to 8IOBR001.004-1:

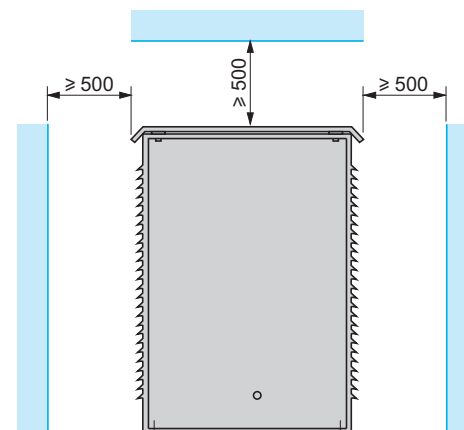
- 10 s braking with a 2 Tn braking torque for a 30 s cycle

Operational conditions	8IOBR003.001-1	8IOBR002.000-1	8IOBR002.001-1
Ambient temperature	0 to +50°C	0 to +50°C	0 to +50°C
Degree of protection of the casing	IP 23	IP 23	IP 23
Storage conditions	8IOBR003.001-1	8IOBR002.000-1	8IOBR002.001-1
Storage temperature	-25 to +70°C	-25 to +70°C	-25 to +70°C
Mechanical characteristics	8IOBR003.001-1	8IOBR002.000-1	8IOBR002.001-1
Weight	80 kg	86 kg	104 kg

Dimensions



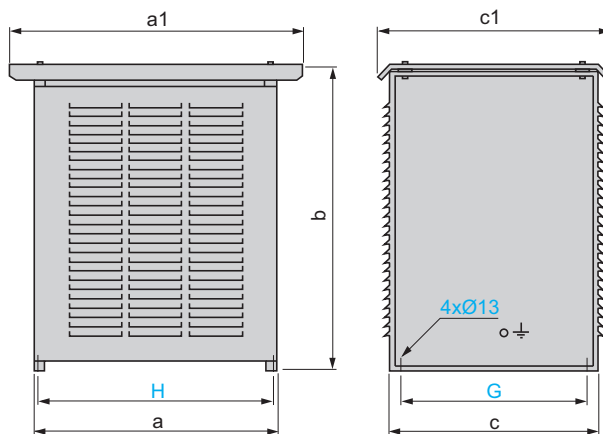
Mounting recommendations



	a	a1	b	c	c1	G	H
8IOBR003.001-1	860	1040	690	480	560	400	832
8IOBR002.000-1	960	1140	1150	380	460	300	932
8IOBR002.001-1	860	1040	1150	540	620	460	832

Characteristics	8I0BR001.001-1	8I0BR001.002-1
Resistance value at 20°C	1.05 Ω	1.05 Ω
Average power available at 50°C ¹⁾	55 kW	75 kW
Thermal protection	Via thermal overload relay	
1) Load factor for resistors: the value of the average power that can be dissipated at 50°C from the resistor into the casing is determined for a load factor during braking that corresponds to most common applications.		
For 8I0BR100.000-1 to 8I0BR003.000-1:		
- 2 s braking with a 0.6 Tn braking torque for a 40 s cycle		
- 0.8 s braking with a 1.5 Tn braking torque for a 40 s cycle		
For 8I0BR003.001-1 to 8I0BR001.004-1:		
- 10 s braking with a 2 Tn braking torque for a 30 s cycle		
Operational conditions	8I0BR001.001-1	8I0BR001.002-1
Ambient temperature	0 to +50°C	0 to +50°C
Degree of protection of the casing	IP 23	IP 23
Storage conditions	8I0BR001.001-1	8I0BR001.002-1
Storage temperature	-25 to +70°C	-25 to +70°C
Mechanical characteristics	8I0BR001.001-1	8I0BR001.002-1
Weight	136 kg	172 kg

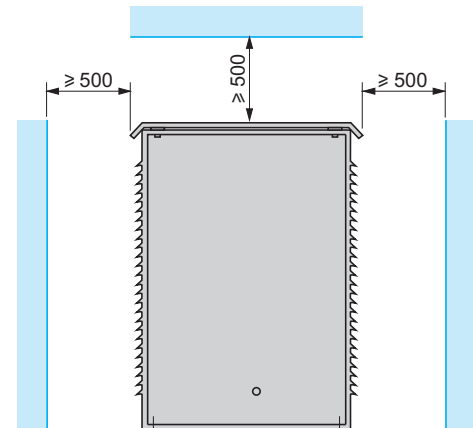
Dimensions



	a	a1	b	c	c1	G	H
8I0BR001.001-1	960	1140	1150	540	620	460	932
8I0BR001.002-1 ¹⁾	960	1140	1150	740	820	660	932

1) For mounting in series or parallel, a space of 300 mm must be left between each resistor.

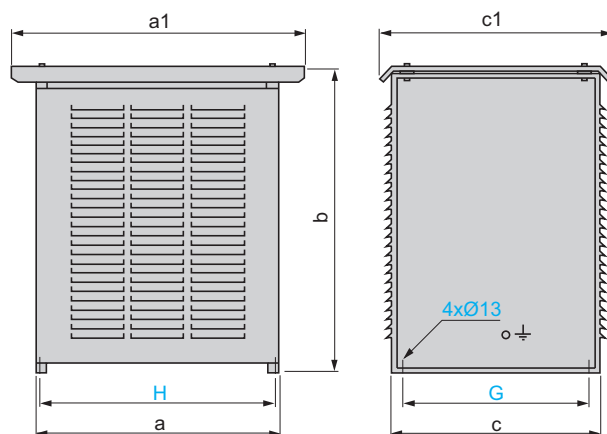
Mounting recommendations



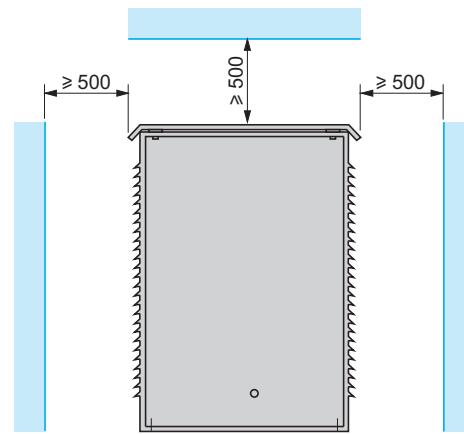
Braking resistors for ACOPOSinverter P84 8IOBR

Characteristics	8IOBR001.003-1	8IOBR001.004-1
Resistance value at 20°C	0.7 Ω	0.7 Ω
Average power available at 50°C ¹⁾	112 kW	150 kW
Thermal protection	Via thermal overload relay	
1) Load factor for resistors: the value of the average power that can be dissipated at 50°C from the resistor into the casing is determined for a load factor during braking that corresponds to most common applications. For 8IOBR100.000-1 to 8IOBR003.000-1: - 2 s braking with a 0.6 Tn braking torque for a 40 s cycle - 0.8 s braking with a 1.5 Tn braking torque for a 40 s cycle For 8IOBR003.001-1 to 8IOBR001.004-1: - 10 s braking with a 2 Tn braking torque for a 30 s cycle		
Operational conditions	8IOBR001.001-1	8IOBR001.002-1
Ambient temperature	0 to +50°C	0 to +50°C
Degree of protection of the casing	IP 23	IP 23
Storage conditions	8IOBR001.001-1	8IOBR001.002-1
Storage temperature	-25 to +70°C	-25 to +70°C
Mechanical characteristics	8IOBR001.001-1	8IOBR001.002-1
Weight	266 kg	350 kg

Dimensions



Mounting recommendations



	a	a1	b	c	c1	G	H
8IOBR001.003-1 ^{1) 2)}	960	1140	1150	540	620	460	932
8IOBR001.004-1 ^{1) 2)}	960	1140	1150	740	820	660	932

- 1) For mounting in series or parallel, a space of 300 mm must be left between each resistor.
- 2) The dimension is given for 1 component. References 8IOBR001.003-1 and 8IOBR001.004-1 comprise two components; all components must be taken into account to determine the overall dimensions. A space of 300 mm must be left between each component.

Braking resistors for ACOPOSinverter X64 and P84 810BR

Characteristic curves for braking resistors Example of using characteristic curves

810BR003.001-1 (P continuous = 25 kW) for 2.75 Ω at 20°C

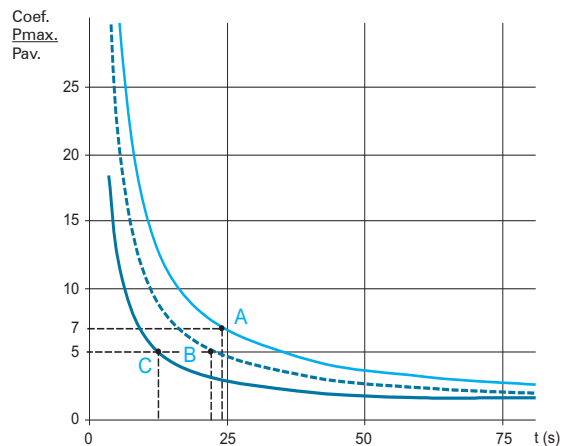
Example of using the curves:

Point A For a 200 s cycle, the resistance of 2.75 Ω accepts an overload of 7 x 25 kW (continuous power) for 24 s, i.e. braking 175 kW every 200 s.

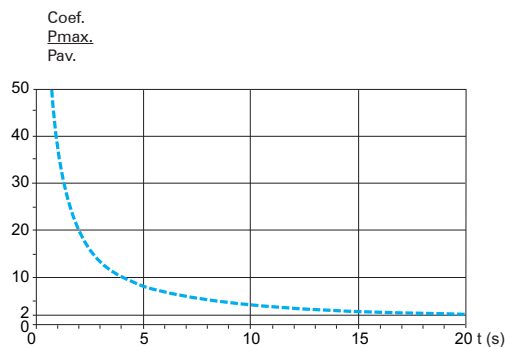
Point B For a 120 s cycle, the resistance of 2.75 Ω accepts an overload of 5 x 25 kW (continuous power) for 20 s, i.e. braking 125 kW every 120 s.

Point C For a 60 s cycle, the resistance of 2.75 Ω accepts an overload of 5 x 25 kW (continuous power) for 10 s, i.e. braking 125 kW every 60 s.

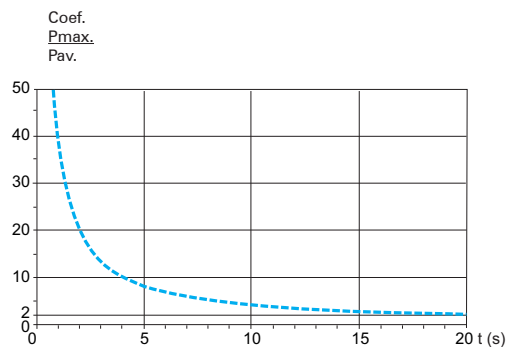
— P max./P av. (60 s cycle)
- - - P max./P av. (120 s cycle)
— P max./P av. (200 s cycle)



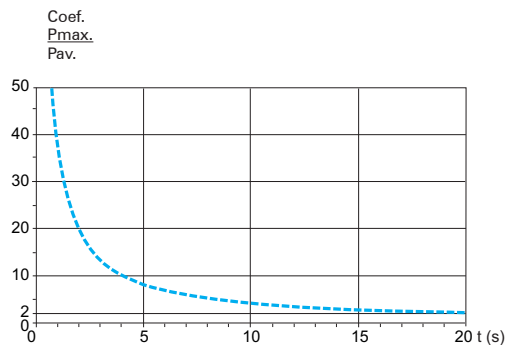
810BR100.000-1 (P continuous = 0.05 kW)



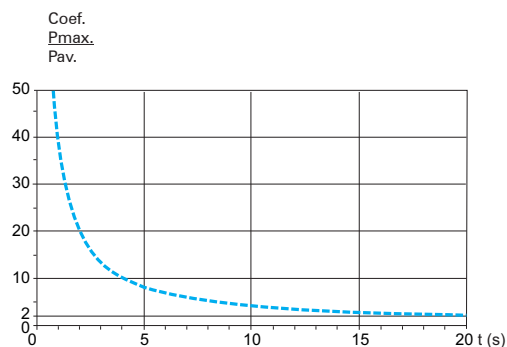
810BR060.000-1 (P continuous = 0.1 kW)



810BR028.000-1 (P continuous = 0.2 kW)

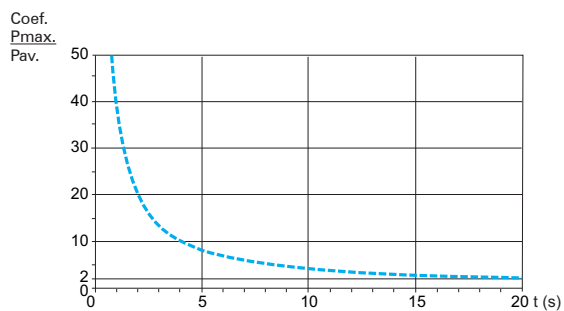


810BR015.000-1
810BR010.000-1 (P continuous = 1 kW)
810BR008.000-1

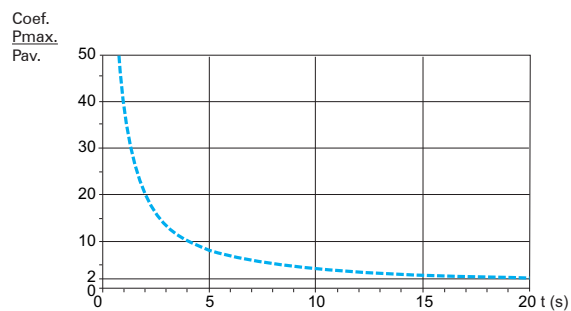


Braking resistors for ACOPOSinverter X64 and P84 810BR

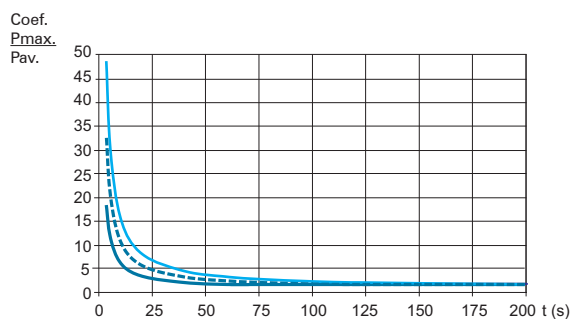
810BR005.000-1 (P continuous = 1.3 kW)



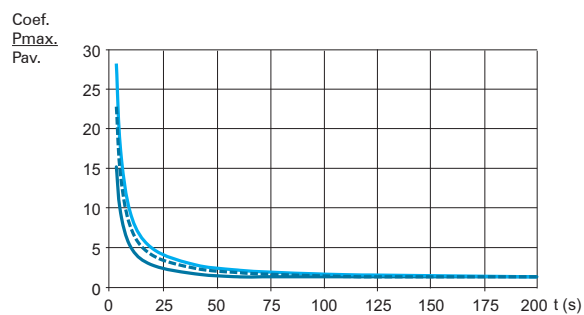
810BR004.000-1 (P continuous = 1 kW)
810BR003.000-1



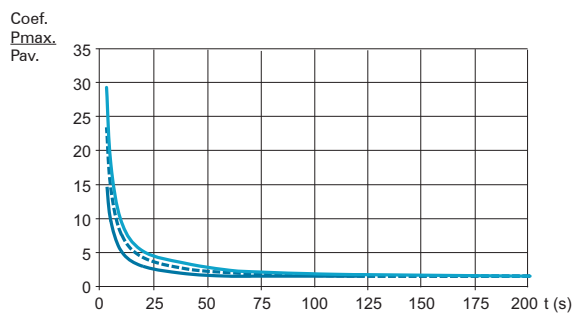
810BR003.001-1 (P continuous = 25 kW)



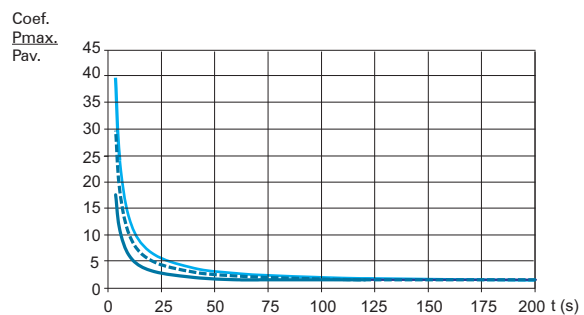
810BR002.000-1 (P continuous = 37 kW)



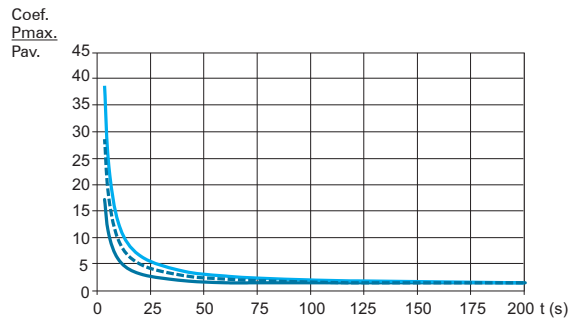
810BR002.001-1 (P continuous = 44 kW)



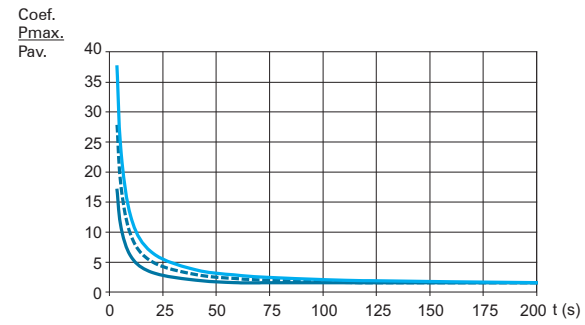
810BR001.001-1 (P continuous = 56 kW)



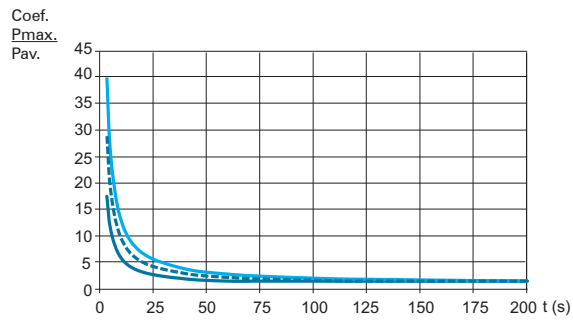
810BR001.002-1 (P continuous = 75 kW)



810BR001.003-1 (P continuous = 112 kW)



810BR001.004-1 (P continuous = 150 kW)



- P max./P av. (60 s cycle)
- - - P max./P av. (120 s cycle)
- ... P max./P av. (200 s cycle)

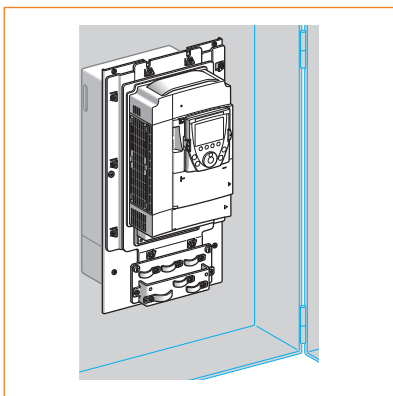
Braking choppers for ACOPOSinverter P84 810BC



- External braking choppers for ACOPOSinverter P84 from 200 kW to 500 kW

Characteristics	810BC200.300-1	810BC400.300-1
Maximum continuous braking power	200 kW	400 kW
Engage threshold	785 VDC ± 1%	785 VDC ± 1%
Maximum DC bus voltage	850 VDC	850 VDC
Thermal protection	Integrated, via thermal probe	
Minimum resistor value	1.05 Ω	0.7 Ω
Dissipated power at nominal load	550 W	1050 W
Operational conditions	810BC200.300-1	810BC400.300-1
Ambient temperature	-10 to +50°C	-10 to +50°C
Maximum relative humidity	In preparation	In preparation
Installation altitudes above sea level	0 to 2000 m	0 to 2000 m
Degree of protection of the casing	IP 20	IP 20
Storage conditions	810BC200.300-1	810BC400.300-1
Storage temperature	-25 to +70°C	-25 to +70°C
Mechanical characteristics	810BC200.300-1	810BC400.300-1
Dimensions		
Width	75 mm	310 mm
Height	950 mm	1150 mm
Depth	377 mm	377 mm
Weight	20 kg	80 kg

Feed through mounting kit for ACOPOSinverter P84 8I0MF



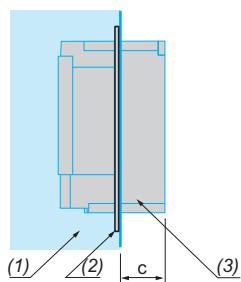
- Kit for feed through mounting of ACOPOSinverter P84 in a dust-proof and damp-proof enclosure
- This kit can be used to mount the power section of the drive outside the enclosure (IP 54 degree of protection), which reduces the power dissipated into the enclosure.
- With this type of mounting, the maximum internal temperature in the enclosure can reach 60°C without a derating of the drive current. Between 50°C and 60°C, a control card fan kit must be used for following ACOPOSinverter P84 drives: 3x200-240V 18,5kW - 45kW and 3x380-480V 22kW – 75kW.

Model number	For ACOPOSinverter P84	c
8I0MF001.300-1	8I84T200037.01P-1, 8I84T200075.01P-1, 8I84T200150.01P-1 8I84T400075.01P-1, 8I84T400150.01P-1, 8I84T400220.01P-1	60 mm
8I0MF002.300-1	8I84T200220.01P-1, 8I84T200300.01P-1, 8I84T200400.01P-1 8I84T400300.01P-1, 8I84T400400.01P-1	70 mm
8I0MF003.300-1	8I84T200550.01P-1 8I84T400550.01P-1, 8I84T400750.01P-1	70 mm
8I0MF004.300-1	8I84T200750.01P-1 8I84T401100.01P-1	90 mm
8I0MF005.300-1	8I84T201100.01P-1, 8I84T201500.01P-1, 8I84T401500.01P-1, 8I84T401850.01P-1	90 mm
8I0MF006.300-1	8I84T201850.01P-1, 8I84T202200.01P-1 8I84T402200.01P-1	105 mm
8I0MF007.300-1	8I84T403000.01P-1, 8I84T403700.01P-1	105 mm
8I0MF008.300-1	8I84T203000.01P-1, 8I84T203700.01P-1, 8I84T204500.01P-1	105 mm
8I0MF009.300-1	8I84T404500.01P-1, 8I84T405500.01P-1, 8I84T407500.01P-1	105 mm
8I0MF010.300-1	8I84T409000.01P-1	150 mm
8I0MF011.300-1	8I84T411000.01P-1	250 mm
8I0MF012.300-1	8I84T413200.01P-1	250 mm
8I0MF013.300-1	8I84T416000.01P-1	250 mm
8I0MF014.300-1 ¹⁾	8I84T420000.01P-1, 8I84T425000.01P-1, 8I84T428000.01P-1	250 mm
8I0MF015.300-1 ²⁾	8I84T420000.01P-1, 8I84T425000.01P-1, 8I84T428000.01P-1	250 mm

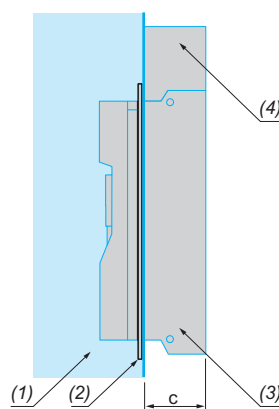
1) For above listed drives without optional braking chopper

2) For above listed drives with optional braking chopper

Side view



Side view



(1) Dust and damp proof enclosure

(2) Kit for feed through mounting in a dust and damp proof enclosure

(3) Drive power section outside the enclosure

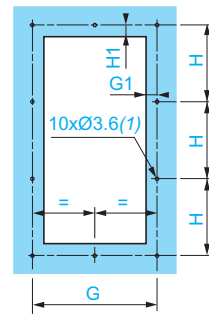
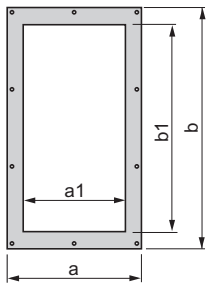
(4) DC choke for ACOPOSinverter P84 from 90 kW to 280 kW

Feed through mounting kit for ACOPOSinverter P84 8I0MF

Dimensions



Cut-outs and drill holes

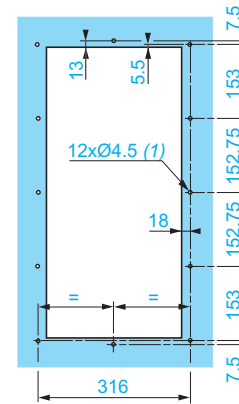
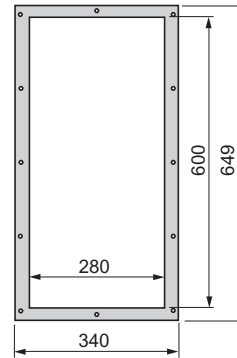


(1) Ø 3.6 hole for M4 self-tapping screw.

	a	a1	b	b1	G	G1	H	H1
8I0MF001.300-1	222	170	397	351	205	17.5	127	15
8I0MF002.300-1	250	198	429.5	384.5	233	17.5	137.5	14
8I0MF003.300-1	267	215	465	419	250	17.5	149.5	14.5
8I0MF004.300-1	302	250	481.5	438	285	17.5	155	13
8I0MF005.300-1	324.5	270	584.5	537.5	305	17.5	189.5	15.5



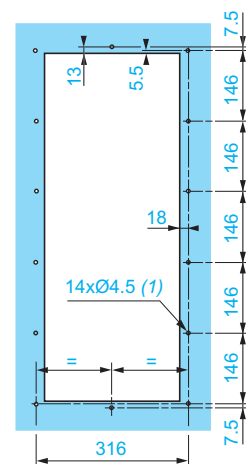
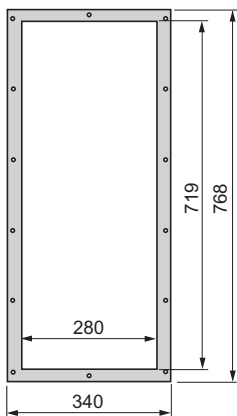
Cut-outs and drill holes



(1) Ø 4.5 hole for M5 self-tapping screw.



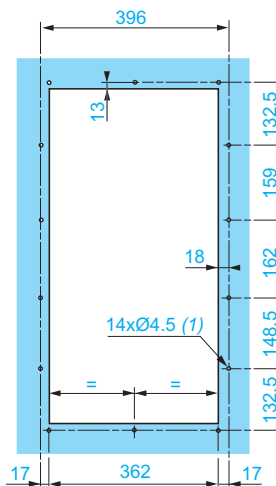
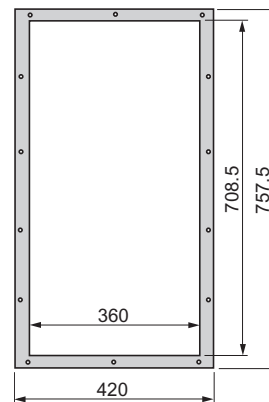
Cut-outs and drill holes



(1) Ø 4.5 hole for M5 self-tapping screw.



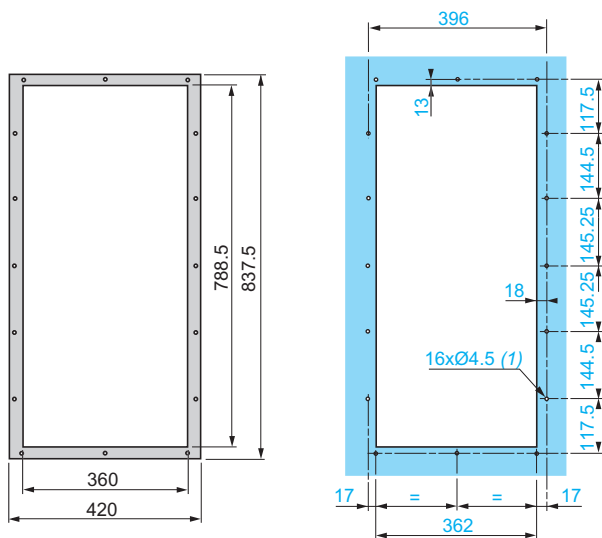
Cut-outs and drill holes



(1) Ø 4.5 hole for M5 self-tapping screw.

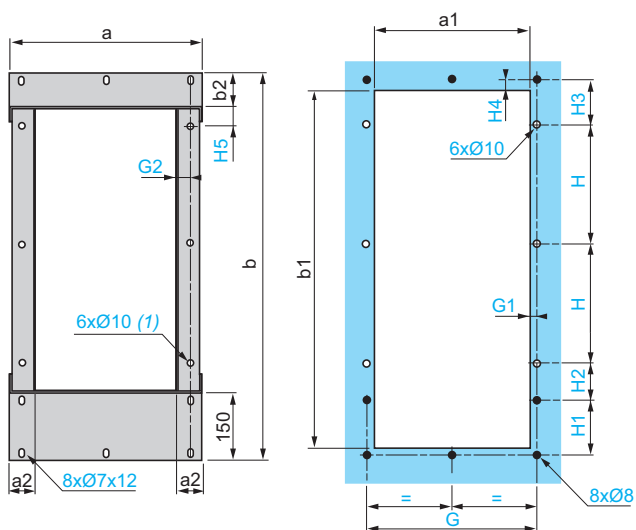
8I0MF009.300-1

Cut-outs and drill holes



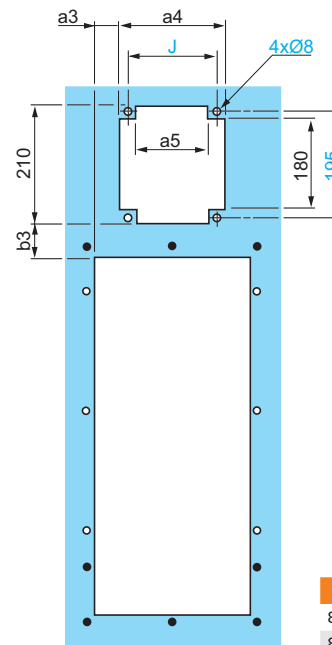
(1) Ø 4.5 hole for M5 self-tapping screw.

Cut-outs and drill holes without DC choke



(1) Ø 3.6 hole for M4 self-tapping screw.

Cut-outs and drill holes with DC choke

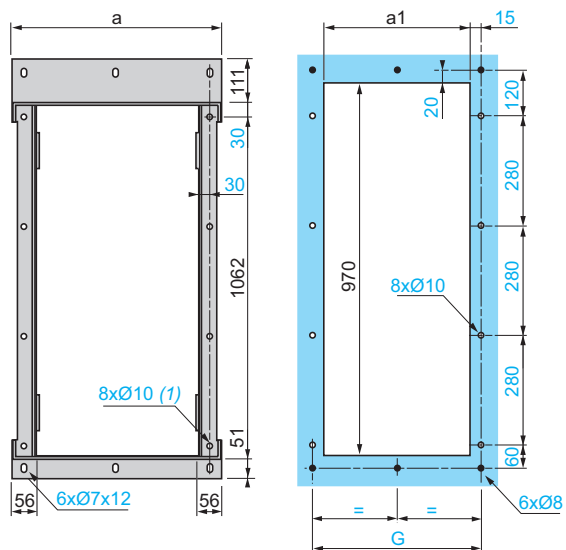


	a	a1	a2	b	b1	b2	G	G1
8I0MF010.300-1	420	340	55	850	790	80	370	15
8I0MF011.300-1	440	360	45	885	845	66	396	18
	G2	H	H1	H2	H3	H4	H5	
8I0MF010.300-1	30	260	120	80	100	15	35	
8I0MF011.300-1	23	310	70	91.5	83.5	10	27.5	

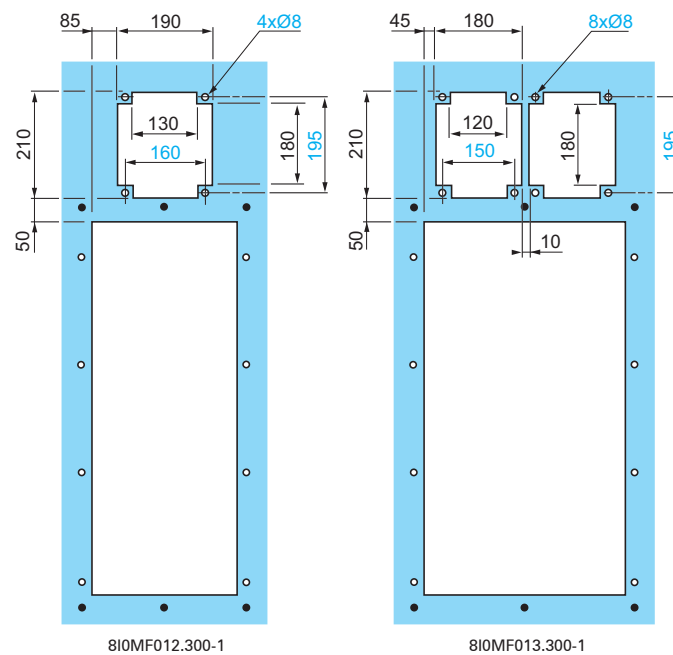
	a3	a4	a5	b3	J
8I0MF010.300-1	82.5	180	120	45	150
8I0MF011.300-1	87.5	190	130	35	160

Feed through mounting kit for ACOPOSinverter P84 8I0MF

Cut-outs and drill holes
without DC choke



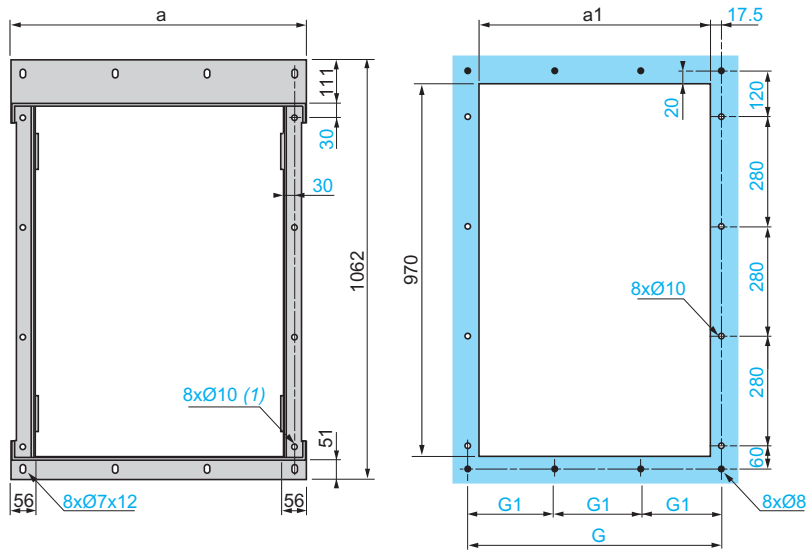
Cut-outs and drill holes with DC choke



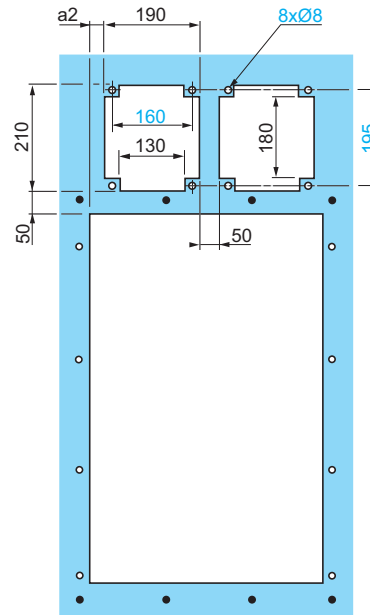
(1) For fixing using an M8 minimum screw.

	a	a1	b
8I0MF012.300-1	442	360	390
8I0MF013.300-1	542	460	490

Cut-outs and drill holes without DC choke



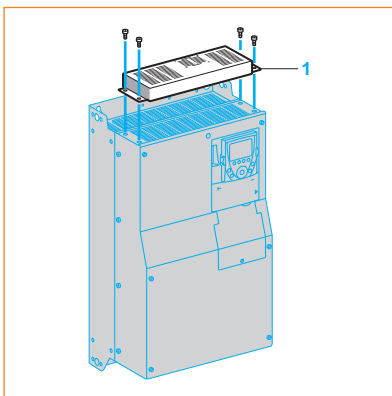
Cut-outs and drill holes with DC choke



(1) For fixing using an M8 minimum screw.

	a	a1	a2	G	G1
810MF014.300-1	697	610	90	645	215
810MF015.300-1	772	685	165	720	240

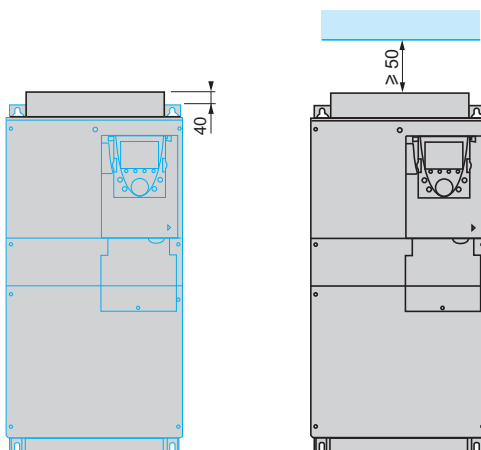
Control card fan kit for ACOPOSinverter P84 810XF



- This kit is required for ACOPOS-inverter P84 drives (3x200-240V 18,5kW - 45kW and 3x380-480V 22kW – 75kW) to operate at ambient temperatures between 50°C and 60°C.

Model number	For ACOPOSinverter P84
810XF004.300-1	8184T201850.01P-1, 8184T202200.01P-1 8184T402200.01P-1
810XF005.300-1	8184T403000.01P-1, 8184T403700.01P-1
810XF006.300-1	8184T203000.01P-1, 8184T203700.01P-1, 8184T204500.01P-1
810XF007.300-1	8184T404500.01P-1, 8184T405500.01P-1, 8184T407500.01P-1

Mounting recommendations

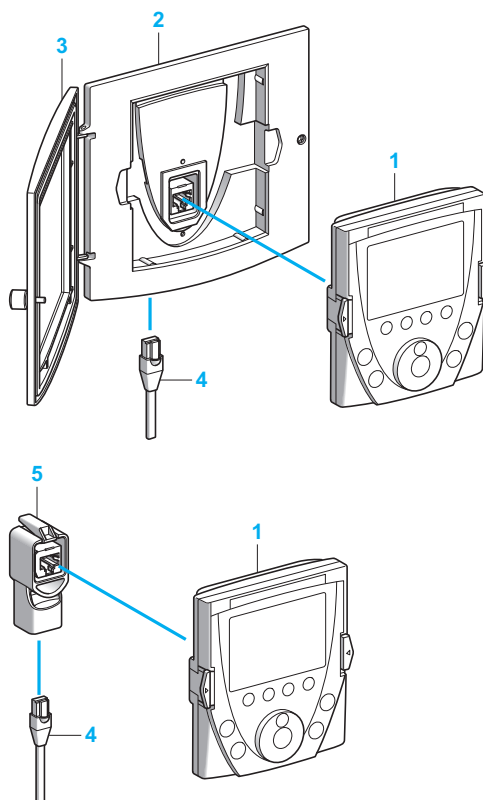


Graphic display terminal for ACOPOSinverter P84 810XD

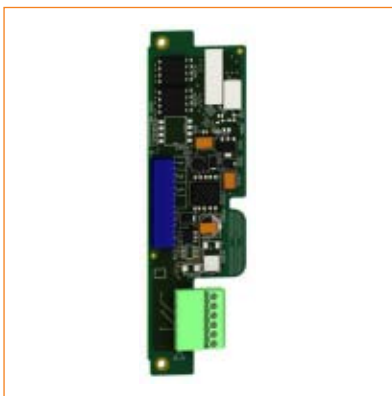


- The optional graphic display terminal is attached to the front of the ACOPOSinverter P84 drive.
- It can be used:
 - To control, adjust and configure the drive
 - To display the current values (motor, input/output values, etc.)
 - To save and download configurations (4 configuration files can be saved)
- The following accessories are available:
 - A remote mounting kit for mounting on an enclosure door with IP 54 degree of protection
 - A transparent door which attaches to the remote mounting mechanism to achieve IP 65 degree of protection
 - A cable to connect the graphic display terminal to the ACOPOSinverter P84 drive
 - An RJ45 adapter for connecting the graphic display terminal to the remote cable

Model number	For ACOPOSinverter P84
810XD301.300-1 (1)	Graphic display terminal 8 lines, 240 x 160 pixels Assignable function keys F1, F2, F3, F4 "STOP/RESET" key: local control of motor stop/fault reset "RUN" key: local control of motor operation "FWD/REV" key: reverses the direction of rotation of the motor Navigation button and "ESC" key for navigation in the drive menu IP54 protection
810XD302.300-1 (2)	Remote mounting kit IP54 protection
810XD303.300-1 (3)	Front door IP65 protection
810XD304.301-1 (4)	Remote cable 1 m
810XD304.303-1 (4)	Remote cable 3 m
810XD304.305-1 (4)	Remote cable 5 m
810XD304.310-1 (4)	Remote cable 10 m
810XD305.300-1 (5)	RJ45 adapter



Incremental encoder interface for ACOPOSinverter P84 810AC



- Encoder interface cards are used for Flux Vector Control operation with sensor (FVC mode) for asynchronous motors. It therefore improves drive performance irrespective of the motor load state:
 - Zero speed torque
 - Accurate speed regulation
 - Torque accuracy
 - Shorter response times on a torque surge
 - Improved dynamic performance in transient state
- For asynchronous motors, in the other control modes (voltage vector control, voltage/frequency ratio), encoder interface cards improve static speed accuracy.
- Three types of cards are available depending on the encoder technology:
 - RS 422 compatible differential outputs
 - Open collector outputs (NPN)
 - Push-pull outputs

General information	810AC123.300-1	810AC123.301-1
Type fo encoder	Encoder interface cards with RS422 compatible differential outputs	
Module type	ACOPOSinverter plug-in module	ACOPOSinverter plug-in module
Encoder input	810AC123.300-1	810AC123.301-1
Connection	Terminal block	Terminal block
Maximum encoder cable length	50 m	100 m
Encoder supply	810AC123.300-1	810AC123.301-1
Short-circuit and overload protection	Yes	Yes
Supply voltage	5 VDC (min. 5 V, max. 5.5 V)	15 VDC (min. 15 V, max. 16 V)
Maximum current	200 mA	175 mA
Incremental encoder	810AC123.300-1	810AC123.301-1
Maximum input frequency	300 kHz	300 kHz
Input signals	A, A\, B, B\	A, A\, B, B\
Impedance	440 Ω	440 Ω
State 0		
State 1		
Number of pulses/encoder revolution	5000 maximum	5000 maximum

General information	810AC123.302-1	810AC123.303-1
Type fo encoder	Encoder interface card with open collector outputs	
Module type	ACOPOSinverter plug-in module	ACOPOSinverter plug-in module
Encoder input	810AC123.302-1	810AC123.303-1
Connection	Terminal block	Terminal block
Maximum encoder cable length	500 m	500 m
Encoder supply	810AC123.302-1	810AC123.303-1
Short-circuit and overload protection	Yes	Yes
Supply voltage	12 VDC (min. 12 V, max. 13 V)	15 VDC (min. 15 V, max. 16 V)
Maximum current	175 mA	175 mA
Incremental encoder	810AC123.302-1	810AC123.303-1
Maximum input frequency	300 kHz	300 kHz
Input signals	A, A\, B, B\ / AB / A	A, A\, B, B\ / AB / A
Impedance	1 Ω	1 Ω
State 0		
State 1		
Number of pulses/encoder revolution	5000 maximum	5000 maximum

General information	8I0AC123.304-1	8I0AC123.305-1	8I0AC123.306-1
Type fo encoder		Encoder interface card with push-pull outputs	
Module type	ACOPOSinverter plug-in module	ACOPOSinverter plug-in module	ACOPOSinverter plug-in module
Encoder input	8I0AC123.304-1	8I0AC123.305-1	8I0AC123.306-1
Connection	Terminal block	Terminal block	Terminal block
Maximum encoder cable length	500 m	500 m	500 m
Encoder supply	8I0AC123.304-1	8I0AC123.305-1	8I0AC123.306-1
Short-circuit and overload protection	Yes	Yes	Yes
Supply voltage	12 VDC (min. 12 V, max. 13 V)	15 VDC (min. 15 V, max. 16 V)	24 VDC (min. 20 V, max. 30 V)
Maximum current	175 mA	175 mA	175 mA
Incremental encoder	8I0AC123.304-1	8I0AC123.305-1	8I0AC123.306-1
Maximum input frequency	300 kHz	300 kHz	300 kHz
Input signals	A, A\, B, B\	A, A\, B, B\ / AB / A	A, A\, B, B\ / AB / A
Impedance	1 Ω	1 Ω	1.6 Ω
State 0	< 1.5 V	< 1.5 V	< 1.5 V
State 1	> 7.7 V and < 13 V	If > 7.7 V and < 16 V	> 11.5 V and < 25 V
Number of pulses/encoder revolution	5000 maximum	5000 maximum	5000 maximum



Stepper motors

The market demands cost-effective solutions. To answer this demand, B&R offers stepper motors as a cost-effective and powerful addition to the existing product portfolio.

Product overview

Stepper motors with an encoder



Model number	Short description	
80MPD1.300S014-01	Stepper motor, 2-pin, 56 mm flange, length 66 mm, 3 A, ABR	458
80MPD1.600S014-01	Stepper motor, 2-pin, 56 mm flange, length 66 mm, 6 A, ABR	458
80MPD3.300S014-01	Stepper motor, 2-pin, 56 mm flange, length 79 mm, 3 A, ABR	458
80MPD3.600S014-01	Stepper motor, 2-pin, 56 mm flange, length 79 mm, 6 A, ABR	458
80MPD5.300S014-01	Stepper motor, 2-pin, 56 mm flange, length 102 mm, 3 A, ABR	458
80MPD5.600S014-01	Stepper motor, 2-pin, 56 mm flange, length 102 mm, 6 A, ABR	458
80MPH1.300S014-01	Stepper motor, 2-pin, 86 mm flange, length 87 mm, 3 A, ABR	458
80MPH1.600S014-01	Stepper motor, 2-pin, 86 mm flange, length 87 mm, 6 A, ABR	458
80MPH3.300S014-01	Stepper motor, 2-pin, 86 mm flange, length 119 mm, 3 A, ABR	458
80MPH3.600S014-01	Stepper motor, 2-pin, 86 mm flange, length 119 mm, 6 A, ABR	458
80MPH4.300S014-01	Stepper motor, 2-pin, 86 mm flange, length 119 mm, 3 A, ABR	458
80MPH4.600S014-01	Stepper motor, 2-pin, 86 mm flange, length 119 mm, 6 A, ABR	458
80MPH4.500S014-01	Stepper motor, 2-pin, 86 mm flange, length 119 mm, 5 A, ABR	458
80MPH4.101S014-01	Stepper motor, 2-pin, 86 mm flange, length 119 mm, 10 A, ABR	458
80MPH6.300S014-01	Stepper motor, 2-pin, 86 mm flange, length 151 mm, 3 A, ABR	458
80MPH6.600S014-01	Stepper motor, 2-pin, 86 mm flange, length 151 mm, 6 A, ABR	458

Accessories

Model number	Short description	
80XMPDXRE.W1-10	Accessory, stepper motor 56 mm, 10x IP cover	460
80XMPHXRE.W1-10	Accessory, stepper motor 86 mm, 10x IP cover	460
80XMPXAC0.00-01	Accessory, stepper motor, connector kit for encoder	460



Encoder option for stepper motors 80MPD, 80MPH, ABR



Technical data

Supply voltage	18 - 30 VDC
Current requirements	Max. 12 mA + output load
Output circuit	Push / Pull level, asymmetric
Max. output current	+/- 10 mA per output
Number of outputs	3
	A / B / R
Resolution	1024 increments per revolution
Output protection	Short circuit protection

ABR encoder X1

Pin	Signal
1	A
2	B
3	R
4	NC
5	NC
6	+24 VDC encoder supply
7	GND
8	NC

Expansions option X2

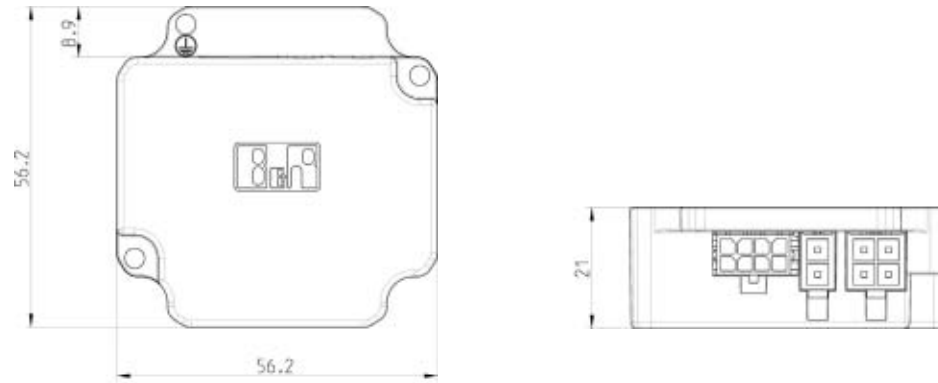
Pin	Signal
1	NC
2	NC

Motor connector X3

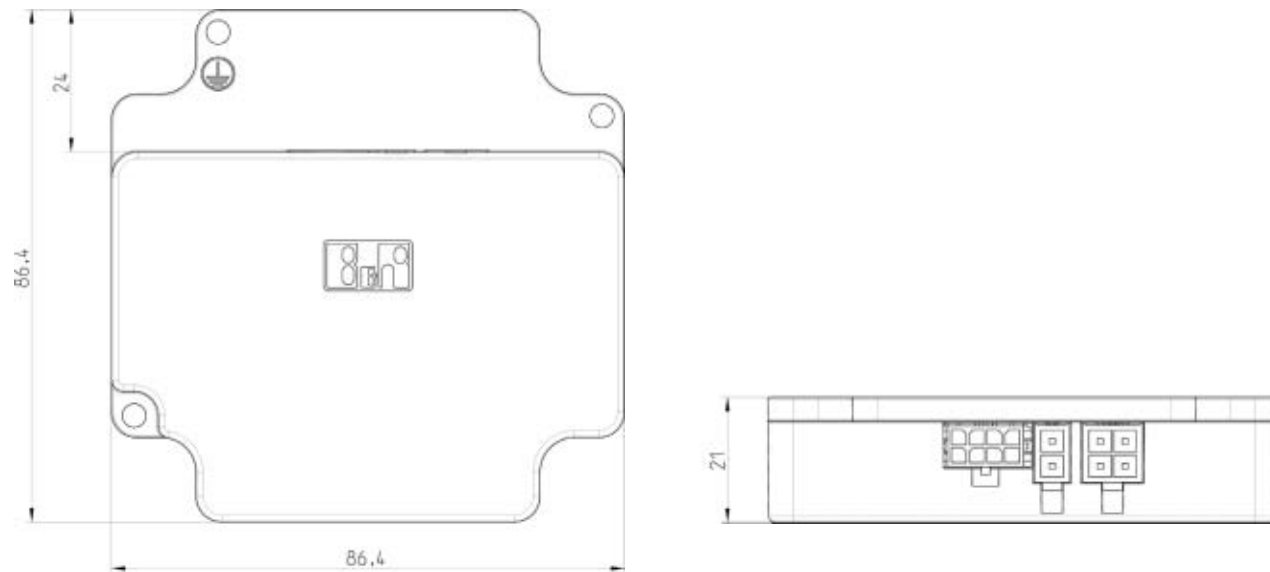
Pin	Signal
1	Motor phase A\
2	Motor phase B\
3	Motor phase A
4	Motor phase B



Dimensions



Dimensions of the encoder option for stepper motors with flange size 56 mm (all measurements in mm)



Dimensions of the encoder option for stepper motors with flange size 86 mm (all measurements in mm)

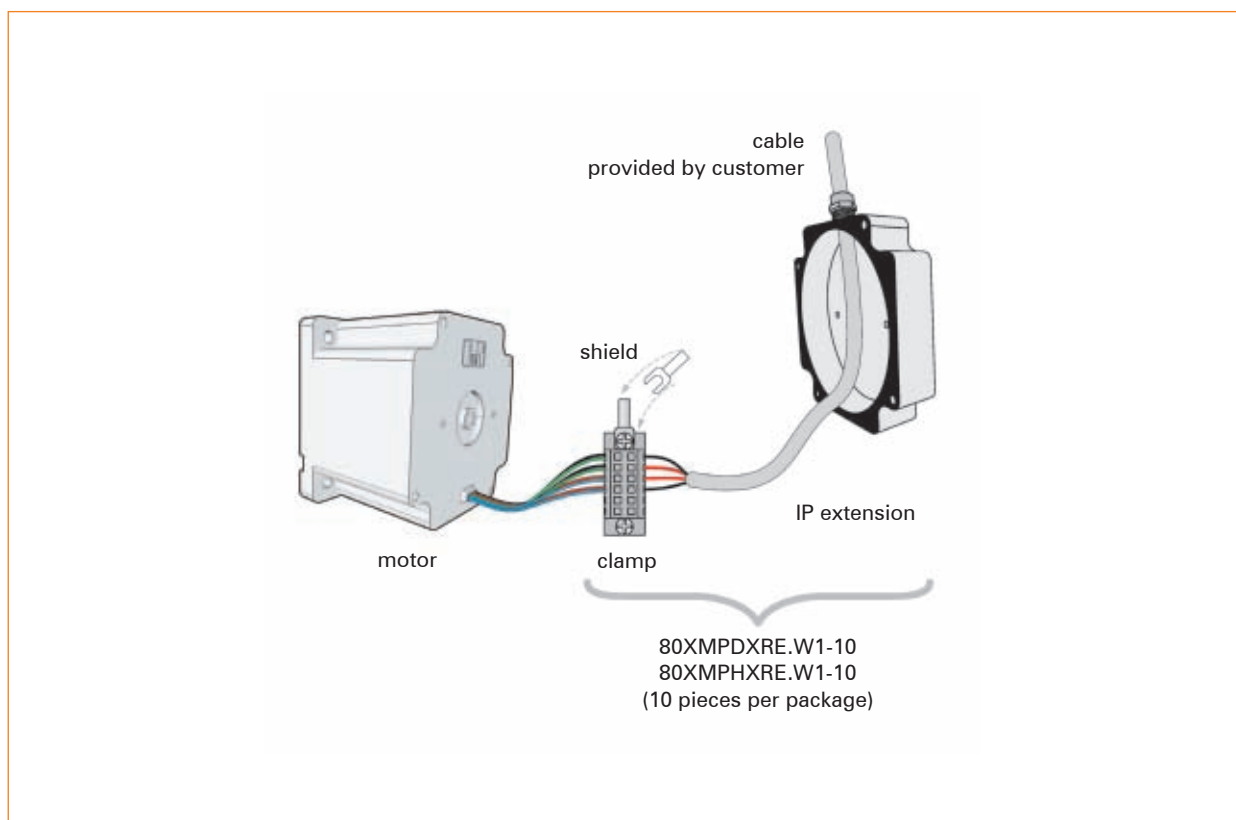
Accessories

IP expansion for 56 mm and 86 mm stepper motors

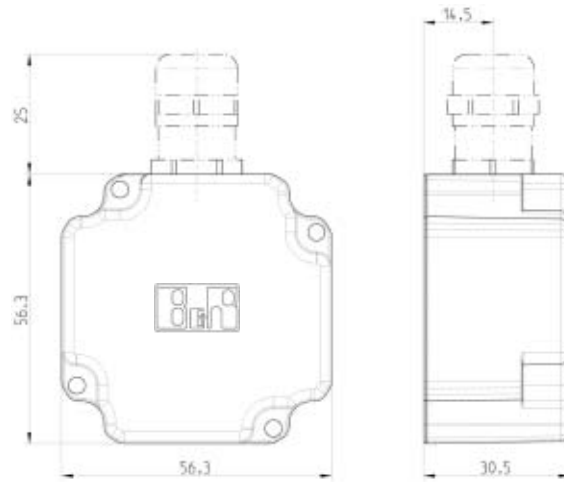


Short description	80XMPxXRE.W1-10
80XMPDXRE.W1-10	Accessory, stepper motor 56 mm, 10x IP cover
80XMPHXRE.W1-10	Accessory, stepper motor 86 mm, 10x IP cover
Technical data	80XMPxXRE.W1-10
IP protection class for 56 mm motors	IP40*
IP protection class for 86 mm motors	IP65*

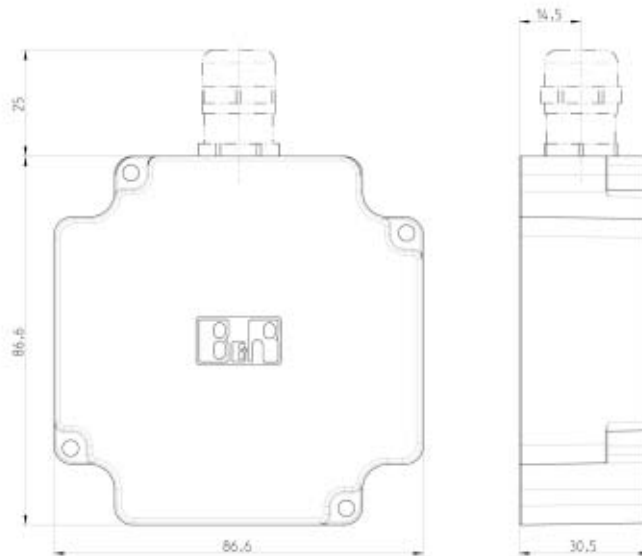
* Without the gap between the shaft and the flange



Dimensions



Dimensions of the IP expansion for stepper motors with flange size 56 mm (all measurements in mm)



Dimensions of the IP expansion for stepper motors with flange size 86 mm (all measurements in mm)




8LS three-phase synchronous motors **Dynamic precision drives**

Modern machine concepts require mechatronic solutions. The AC servo motor series from B&R provides ways for the machine manufacturer to further optimize service and production processes.

System characteristics

Motor encoder system

The 8LS three-phase synchronous motors with inductive encoders listed below are now ready for delivery. The encoder system is listed as part of the model number in the form of a 2-digit code (ee). (see also order key  465)

EnDat encoder

General information

EnDat is a standard developed by Johannes Heidenhain GmbH (www.heidenhain.de) that incorporates the advantages of absolute and incremental position measurement and also offers read/write parameter memory in the encoder. With absolute position measurement (absolute position is read in serially), the homing procedure is usually not required. When necessary, a multi-turn encoder (4096 revolutions) should be installed. To save costs, a single-turn encoder and a reference switch can also be used. In this case, a homing procedure must be carried out. The incremental process allows the short delay times necessary for position measurement on drives with exceptional dynamic properties. With the sinusoidal incremental signal and the fine resolution in the EnDat module, a very high positioning resolution is achieved in spite of the moderate signal frequencies used.

Technical data

Different types of EnDat encoders can be used depending on the requirements:

Name	Order code (ee)	
	EA ¹⁾	EB ¹⁾
Encoder type	EnDat single-turn	EnDat multi-turn
Resolution	32-line	32-line
Recognizable revolutions	---	4096
Accuracy	±280"	±280"
Limit frequency	≥ 6 kHz (-3 dB)	≥ 6 kHz (-3 dB)
Vibration during operation 55 < f ≤ 2000 Hz	≤ 100 m/s ²	≤ 100 m/s ²
Shock during operation Length 6 ms	≤ 1000 m/s ²	≤ 1000 m/s ²
Manufacturer	Dr. Johannes Heidenhain GmbH	Dr. Johannes Heidenhain GmbH
Internet address	www.heidenhain.de	www.heidenhain.de
Manufacturer's product ID	ECI1319	EQI1331

¹⁾ Only available for size 3 to 7 motors

Note

The inductive encoders with the model number "EA" and "EB" replace the encoder types with the model number "E2" and "E3". These encoders should be used in all new applications.

ACOPOS and ACOPOSmulti devices with firmware V.2.18.0 or higher are compatible for use of the listed encoders.

Order key

8LS

b

c

d

.

ee

nnn

ff

gg

-

h

Cooling type (see section "Cooling types", [1464](#))

A ... self-cooling (no separate surface cooling)

C ... separately cooled (surface cooling with independent fan module attached)

Size (see section "Sizes", [1465](#))

Valid values: **2, 3, 4, 5, 6, 7, 8**

Length (see section "Lengths", [1465](#))

Valid values: **3, 4, 5, 6, 7, A, B, C**

Encoder system (see section "Motor encoder systems", [464](#))

E0 ... EnDat single-turn, 512 lines (ECN1313) ¹⁾

E1 ... EnDat multi-turn, 512 lines (EQN1325), 4,096 revolutions ¹⁾

E2 ... EnDat single-turn, 32 lines, inductive (ECI1317) ²⁾

E3 ... EnDat multi-turn, 32 lines, inductive (EQI1329), 4,096 revolutions ²⁾

E4 ... EnDat single-turn, 512 lines (ECN1113) ⁴⁾

E5 ... EnDat multi-turn, 512 lines (EQN1125), 4,096 revolutions ⁴⁾

EA ... EnDat single-turn, 32 lines, inductive (ECI1319) ^{3) 5)}

EB ... EnDat multi-turn, 32 lines, inductive (EQI1130) ^{3) 5)}

R0 ... Resolver

1) Only available for size 3 to 8 motors.

2) Only available for size 3 to 7 motors. Not available for 8LSx5A/B/C motors.

3) Only available for size 3 to 7 motors

4) Only available for size 2 motors.

5) See note on page 4.

Motor options (see section "Motor options", [1467](#), and section "Determining the order code for motor options (ff)", [1470](#))

nnn .. Rated rotational speed/100; e.g.: 030 corresponds to a rated speed of 3000 min⁻¹

Motor options (see section "Motor options", [1467](#))

Special motor options (see section "Special motor options", [1471](#)) ¹⁾

Cooling type A:

00 ... No special motor options

04 ... Reinforced A side bearing ^{3) 4)}

Cooling type C:

05 ... No special motor options

11 ... Reinforced A side bearing ^{2) 4)}

1) Special options must be arranged with B&R. If no special motor options are required, enter 00 for gg (for cooling type A) or 05 for gg (for cooling type C).

2) Special motor option only available for motor sizes 4, 5 and 6.

3) Special motor option only available for motor sizes 4, 5, 6 and 8. (in a new line)

4) Not possible in combination with "holding brake" motor option.

Motor version

Valid values: **0,1** ¹⁾

1) Motor version "0" for sizes 2,3,4,7 and 8. Motor version "1" for sizes 5 and 6.

System characteristics

Sample order 1

A three-phase synchronous motor (type **8LSA45**) with a rated speed of 3000 min^{-1} was selected for an application. Because of the construction, the cables can only be connected on the top of the motor ("top" connection direction). The motor should also be equipped with a holding brake, a keyed shaft and a 16-line EnDat single-turn encoder.

The code (ee) for the encoder system is **EA** (see "EnDat encoder", 464).

The code (nnn) for a rated speed of 3000 min^{-1} is **030**.

The code (ff) for the other options (such as oil seal, holding brake, keyed shaft and connection direction) is **C3** (see "Motor option key codes (ff)", 1470).

Therefore the model number for the motor required is: **8LSA45.EA30C300-0**

Sample order 2

A three-phase synchronous motor (type **8LSA56**) with a rated speed of 4500 min^{-1} was selected for an application. Because of the construction, the cables can only be connected on the back of the motor (swivel connectors). The motor should also be equipped with a holding brake, a smooth shaft, an oil seal and a 16 line EnDat multi-turn encoder.

The code (ee) for the encoder system is **EB** (see "Technical data for the EnDat encoder", 464).

The code (nnn) for a rated speed of 4500 min^{-1} is **045**.

The code (ff) for the other options (such as oil seal, holding brake, smooth shaft and connection direction) is **D8** (see "Motor option key codes (ff)", 1470).

Therefore the model number for the motor required is: **8LSA56.EB045D800-1**




8JS three-phase synchronous motors Dynamic precision drives

Modern machine concepts demand compact and powerful motors. The compact AC servo motor series from B&R provides ways for the machine manufacturer to further optimize service and production processes.



System characteristics

Motor encoder system

The 8JS three-phase synchronous motors with the inductive encoders listed below can now be delivered. The encoder system is listed as part of the model number in the form of a 2-digit code (ee). (see also order key  471)

EnDat encoder

General information

EnDat is a standard developed by Johannes Heidenhain GmbH (www.heidenhain.de) that incorporates the advantages of absolute and incremental position measurement and also offers a read/write parameter memory in the encoder. With absolute position measurement (absolute position is read in serially), the homing procedure is usually not required. When necessary, a multi-turn encoder (4096 revolutions) should be installed. To save costs, a single-turn encoder and a reference switch can also be used. In this case, a homing procedure must be carried out. The incremental process allows the short delay times necessary for position measurement on drives with exceptional dynamic properties. With the sinusoidal incremental signal and the fine resolution in the EnDat module, a very high positioning resolution is achieved in spite of the moderate signal frequencies used.

Technical data

Different types of EnDat encoders can be used depending on the requirements:

Name	E8 ¹⁾	E9 ¹⁾	EA ²⁾	EB ²⁾
Encoder type	EnDat single-turn	EnDat multi-turn	EnDat single-turn	EnDat multi-turn
Resolution	16-line	16-line	32-line	32-line
Recognizable revolutions	---	4096	---	4096
Accuracy	±480"	±480"	±280"	±280"
Limit frequency	≥ 6 kHz (-3 dB)	≥ 6 kHz (-3 dB)	≥ 6 kHz (-3 dB)	≥ 6 kHz (-3 dB)
Vibration during operation 55 < f ≤ 2000 Hz	≤ 300 m/s ²	≤ 300 m/s ²	≤ 100 m/s ²	≤ 100 m/s ²
Shock during operation Length 6 ms	≤ 1000 m/s ²	≤ 1000 m/s ²	≤ 1000 m/s ²	≤ 1000 m/s ²
Manufacturer	Dr. Johannes Heidenhain GmbH	Dr. Johannes Heidenhain GmbH	Dr. Johannes Heidenhain GmbH	Dr. Johannes Heidenhain GmbH
Internet address	www.heidenhain.de	www.heidenhain.de	www.heidenhain.de	www.heidenhain.de
Manufacturer's product ID	ECI1118	EQI1130	ECI1319	EQI1331

1) Only available for size 2 and 3 motors.

2) Only available for size 4, 5, 6 and 7 motors.

Order key

8JS	b	c	d	.	ee	nnn	ff	gg	-	h
-----	---	---	---	---	----	-----	----	----	---	---

Cooling type (see section "Cooling types", 1590)

A self-cooling (no separate surface cooling)

Size (see section "Sizes", 1591)

Valid values: **2, 3, 4, 5, 6, 7**

Length (see section "Lengths", 1591)

Valid values: **1, 2, 3, 4, 5**

Encoder system (see section "Motor encoder systems", 470)

E4 ... EnDat single-turn, 512 lines (ECN1113) ¹⁾

E5 ... EnDat multi-turn, 512 lines (EQN1125), 4,096 revolutions ¹⁾

E6 ... EnDat single-turn, 2048 lines (ECN1313) ²⁾

E7 ... EnDat multi-turn, 2048 lines (EQN1325), 4,096 revolutions ²⁾

E8 ... EnDat single-turn, 16 lines, inductive (ECI1118) ¹⁾

E9 ... EnDat multi-turn, 16 lines, inductive (EQI1130) ¹⁾

EA ... EnDat single-turn, 32 lines, inductive (ECI1319) ²⁾

EB ... EnDat multi-turn, 32 lines, inductive (ECI1319) ²⁾

R0 ... Resolvers

¹⁾ Only available for size 2 and 3 motors.

²⁾ Only available for size 4, 5, 6 and 7 motors.

Motor options (see section "Motor options", 1593, and section "Determining the order code for motor options (ff)", 1596)

nnn .. Rated rotational speed/100; e.g.: 030 corresponds to a rated speed of 3000 min⁻¹

Motor options (see section "Motor options", 1593)

Special motor options

00 ... No special motor options

Motor version

Valid values: **0**


System characteristics

Example order 1

A three-phase synchronous motor (type **8JSA44**) with a rated speed of 4000 min^{-1} was selected for an application. The motor should also be equipped with a holding brake, a keyed shaft and a 16-line EnDat multi-turn encoder.

The code (ee) for the encoder system is **E9** (see "EnDat encoder",  470).


The code (nnn) for a rated speed of 4000 min^{-1} is **040**.

The code (ff) for the other options (such as oil seal, holding brake, keyed shaft and connection direction) is **D3** (see "Motor option key codes (ff)",  1597).


Therefore the model number for the motor required is: **8JSA44.E9040D300-0**

Example order 2

A three-phase synchronous motor (type **8JSA54**) with a rated speed of 5000 min^{-1} was selected for an application. The motor should also be equipped with a holding brake, a smooth shaft, an oil seal and a 32-line EnDat single-turn encoder.

The code (ee) for the encoder system is **EA** (see "Technical data for the EnDat encoder",  470).

The code (nnn) for a rated speed of 5000 min^{-1} is **050**.

The code (ff) for the other options (such as oil seal, holding brake, keyed shaft and connection direction) is **D8** (see "Motor option key codes (ff)",  1597).

Therefore the model number for the motor required is: **8JSA54.EA050D800-0**



Documentation

B&R's dedication to perfection doesn't stop with the products, it is also reflected in the documentation.



Documentation

We pay as much attention to detail when creating our manuals and other information material as we do when developing our products. In direct cooperation with the development department, our technical writers collect all relevant information and work it into our manuals. This process results in the yearly product catalog, product brochures and manuals, which provide extremely detailed information about our products.

In addition to the English and German languages, we also provide our documentation in French, Italian, Chinese, Czech and Polish, just to name a few.

A current and complete list of all available documentation can be found on our homepage at www.br-automation.com

General documentation

Model number	Short description
MM-D00536.309	Image brochure, German
MM-E00536.310	Image brochure, English
MM-D00516.267	Product profile, German
MM-E00516.268	Product profile, English
MM-D00537.314	High-tech manufacturing, German
MM-E00537.315	High-tech manufacturing, English

Product documents

Model number	Short description
MM-D00937.770	Innovations 2010, German
MM-E00937.771	Innovations 2010, English
MM-D00525.278	The M class, German
MM-E00530.291	The M class, English
MM-D00525.279	Multi-talented, German
MM-E00530.292	Multi-talented, English
MM-D00545.333	Integrated safety, German
MM-E00545.334	Integrated safety, English
MM-E00443.232	ETHERNET Powerlink, English
MM-D00615.380	Process control system, German
MM-E00615.381	Process control system, English
MM-D00540.318	APROL R 3.0 process control system, German
MM-E00540.319	APROL R 3.0 process control system, English

Industry-specific flyers

Model number	Short description
MM-D00540.324	Industry-specific flyer for plastics, German
MM-E00540.325	Industry-specific flyer for plastics, English
MM-D00523.276	Industry-specific flyer for packaging, German
MM-E00523.277	Industry-specific flyer for packaging, English
MM-D00605.356	Industry-specific flyer for printing, German
MM-E00605.357	Industry-specific flyer for printing, English
MM-D00537.315	Industry-specific flyer for woodworking, German
MM-E00536.311	Industry-specific flyer for woodworking, English
MM-D00735.557	Industry-specific flyer for the metal industry, German
MM-E00735.558	Industry-specific flyer for the metal industry, English
MM-D00633.434	Industry-specific flyer for the textile industry, German
MM-E00633.435	Industry-specific flyer for the textile industry, English

Manuals

Model number	Short description
MA4SERV-0	B&R System 2000 maintenance for end customers, German
MA4SERV-E	B&R System 2000 maintenance for end customers, English
MACOGETST-ENG	CANopen Getting Started user's manual, German
MACOGETST-ENG	CANopen Getting Started user's manual, English
MADNGETST-ENG	DeviceNet Getting Started user's manual, German
MADNGETST-ENG	DeviceNet Getting Started user's manual, English
MADNGETSTOM-ENG	DeviceNet - Getting Started for OMRON PLC
MAEIP-ENG	EtherNet/IP user's manual, German
MAEIP-ENG	EtherNet/IP user's manual, English
MAEIPGETST-ENG	EtherNet/IP Getting Started user's manual, English
MAMB-GER	Modbus TCP user's manual, German
MAMB-ENG	Modbus TCP user's manual, English
MAPBGETST-ENG	Profibus DP Getting Started user's manual, German
MAPBGETST-ENG	Profibus DP Getting Started user's manual, English
MASAFETY-GER	Integrated Safety Technology user's manual, German
MASAFETY-ENG	Integrated Safety Technology user's manual, English
MASAFETY1-GER	Integrated Safety Technology user's manual (without PLCopen function blocks), German
MASAFETY1-ENG	Integrated Safety Technology user's manual (without PLCopen function blocks), English
MASAFETY2-GER	Integrated Safety Technology - PLCopen function blocks user's manual, German
MASAFETY2-ENG	Integrated Safety Technology - PLCopen function blocks user's manual, English
MASYS22003-E	System 2003 user's manual, German
MASYS22003-E	System 2003 user's manual, English
MASYS22005-0	System 2005 user's manual, German
MASYS22005-E	System 2005 user's manual, English
MAX20-ENG	X20 System user's manual, German
MAX20-ENG	X20 System user's manual, English
MAX67-ENG	X67 System user's manual, German
MAX67-ENG	X67 System user's manual, English
MACIS-ENG	Compact Inverter System user's manual, German
MACIS-ENG	Compact Inverter System user's manual, English
MACIO-ENG	Compact I/O System user's manual, German
MACIO-ENG	Compact I/O System user's manual, English
MAPWHW-E	Panelware Hardware user's manual, German
MAPWHW-E	Panelware Hardware user's manual, English
MAPWP127-0E	Panelware P127 user's manual, German/English
MAPWC130-0E	Panelware C130 user's manual, German/English
MAPP01-E	Power Panel 15/21/35/41 user's manual, German
MAPP01-E	Power Panel 15/21/35/41 user's manual, English
MAPP45-ENG	PP45 user's manual, German
MAPP45-ENG	PP45 user's manual, English
MAPP100.200-GER	PP100/200 user's manual, German
MAPP100.200-ENG	PP100/200 user's manual, English
MAMP100.200-ENG	MP100/200 user's manual, German

Model number	Short description
MAMP100.200-ENG	MP100/200 user's manual, English
MAAPC620-ENG	APC620 user's manual, German
MAAPC620-ENG	APC620 user's manual, English
MAAPC680-GER	APC680 user's manual, German
MAAPC680-ENG	APC680 user's manual, English
MAPPC700-GER	PPC700 user's manual, German
MAPPC700-ENG	PPC700 user's manual, English
MAAP800-ENG	AP800 user's manual, German
MAAP800-ENG	AP800 user's manual, English
MAAP900-ENG	AP900 user's manual, German
MAAP900-ENG	AP900 user's manual, English
MAPRV2000-GER	Provit 2000 user's manual, German
MAPRV2000-ENG	Provit 2000 user's manual, English
MAPRV5000-ENG	Provit 5000 user's manual, German
MAPRV5000-ENG	Provit 5000 user's manual, English
MASAFETYGUIDE-X	Safety guidelines, multi-language
MAUPS24VDC-GER	UPS 24V user's manual, German
MAUPS24VDC-ENG	UPS 24V user's manual, English
MAACP2-ENG	ACOPOS user's manual, German
MAACP2-NG	ACOPOS user's manual English
MAACPM-ENG	ACOPOSmulti user's manual, German
MAACPM-ENG	ACOPOSmulti user's manual, English
MAMOT1-E	8MS three-phase synchronous motors user's manual, German
MAMOT1-E	8MS three-phase synchronous motors user's manual, English
MAMOT2-GER	8LS three-phase synchronous motors user's manual, German
MAMOT2-ENG	8LS three-phase synchronous motors user's manual, English
MAMKEY-GER	Mkey user's manual, German
MAMKEY-ENG	Mkey user's manual, English
MAPPC300-GER	PPC300 user's manual, German
MAPPC300-ENG	PPC300 user's manual, English
MAMPCBX-ENG	MP connection box user's manual, German
MAMPCBX-ENG	MP connection box user's manual, English
MAMP40.50-GER	MP40/50 user's manual, German
MAMP40.50-ENG	MP40/50 user's manual, English
MAPP300.400-ENG	PP300/400 user's manual, German
MAPP300.400-ENG	PP300/400 user's manual, English
MAAPC800-ENG	APC800 user's manual, German
MAAPC800-ENG	APC800 user's manual, English
MAACPMI-GER	ACOPOSmicro user's manual, German
MAACPMI-ENG	ACOPOSmicro user's manual, English
MASMOT1-GER	Stepper motor user's manual, German
MASMOT1-ENG	Stepper motor user's manual, English



Accessories

Terminals, infrastructure components,
memory, batteries, cables, etc.

Product overview

B&R CompactFlash



Model number	Short description
5CFCRD.0512-04	CompactFlash 512 MB B&R
5CFCRD.1024-04	CompactFlash 1024 MB B&R
5CFCRD.2048-04	CompactFlash 2048 MB B&R
5CFCRD.4096-04	CompactFlash 4096 MB B&R
5CFCRD.8192-04	CompactFlash 8192 MB B&R





Release delay
Delay time required until the holding torque of the holding brake is reduced to the operating voltage has been returned to the holding torque.

Reliability

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