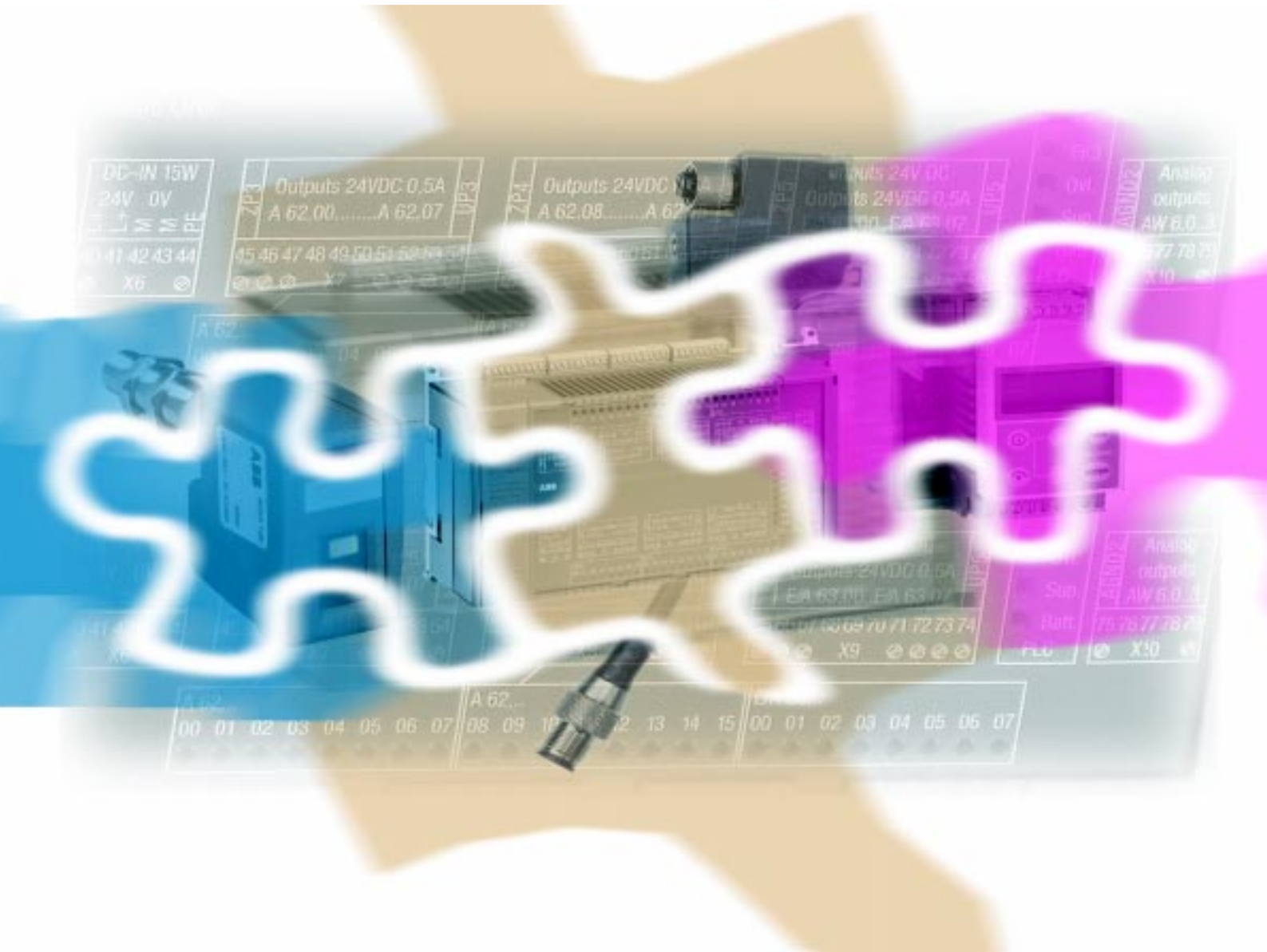




Components that suit each other

Programmable Logic Controllers,
I/O-Modules & Operator Terminals



Sensors & Wireless
Proximity Switches



FBP – FieldBusPlug Communicative Switching and Automation Components



FBP FieldBusPlug

The FieldBusPlug concept

This new ABB product family is a communication device range with switching and automation components which can be combined easily with standard fieldbus systems.

One device for all fieldbus types

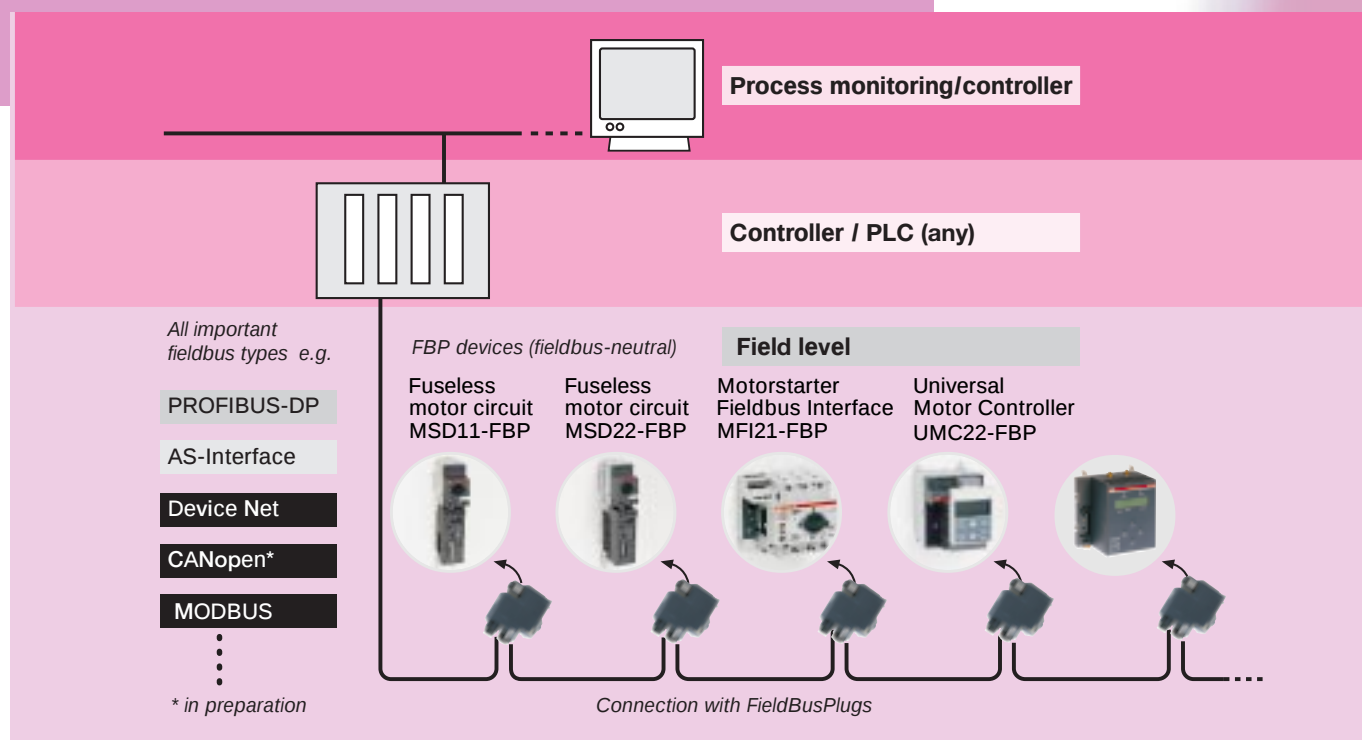
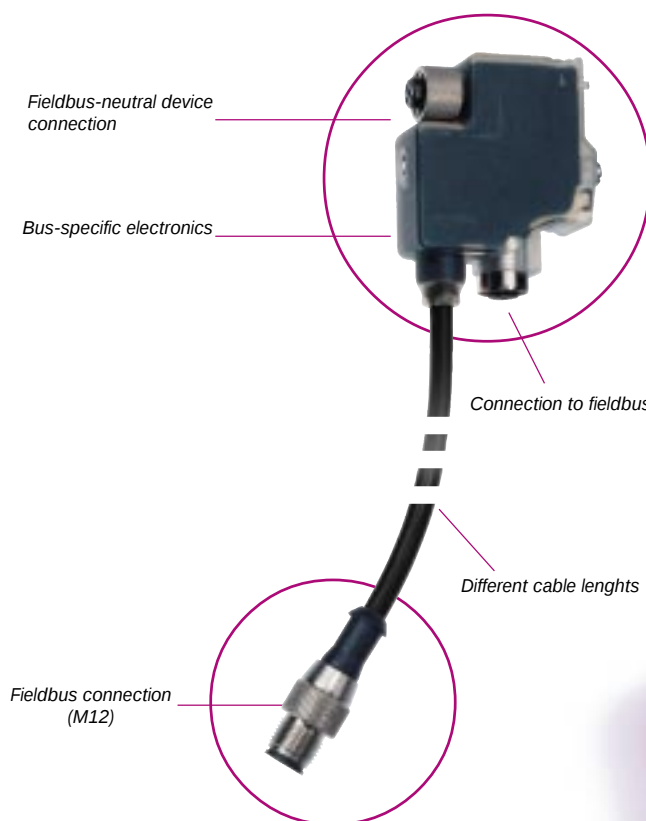
Each complete device, and each function module within the product family, has a fieldbus-neutral interface. A specially prefabricated connection cable establishes the communications connection with its bus-specific plug interface.

In this way, flexibility, transparency and reliability in the process are achieved. The connecting, operating and diagnostic elements are placed at the front of all devices providing increased ease of installation.

The components

The fieldbus plug (FieldBusPlug) is the central communications element of the new product family. It connects devices and device combinations of different functions and characteristics as well as simple sensors with automation devices.

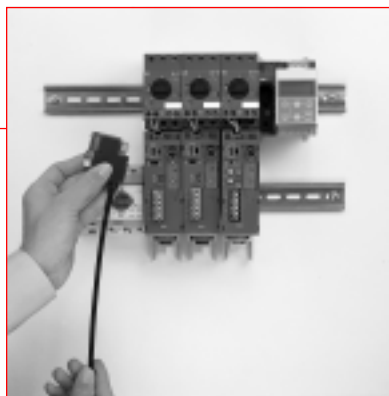
A great variety of switching and automation modules belong to the product family separated into similar performance characteristics, e.g. devices for motor protection, motor control and standard sensors.





FBP FieldBusPlug

Communicative Switching and Automation components



FBP-System

Contents

System Description	1/ 2
Survey - Fields of Application for FBP Terminal Devices	1/ 4
Survey - FBP-Terminal Device Data	1/ 5
Survey - Device Data Overview	1/ 8
Dimensions Drawings	1/ 9
Ordering Data for Communicative Motorstarters - Compact Devices	1/11
Motorstarter Direct	
Motorstarter Reverse	
Ordering Data for Communicative Motorstarters with Control Functions	1/12
Motorstarter Fieldbus Interface	
Universal Motor Controller	
Further FBP Terminal Devices	1/13
Power Circuit Breakers Tmax T4/T5	
Soft starters PST	
Position sensors	
Ordering Data for FieldBusPlug Connectors and Accessories	
AS-Interface	1/14
PROFIBUS DP / DPV1	1/16
DeviceNet, CANopen, MODBUS-RTU	1/18
Ordering Data for System Accessories and Documentation	1/20

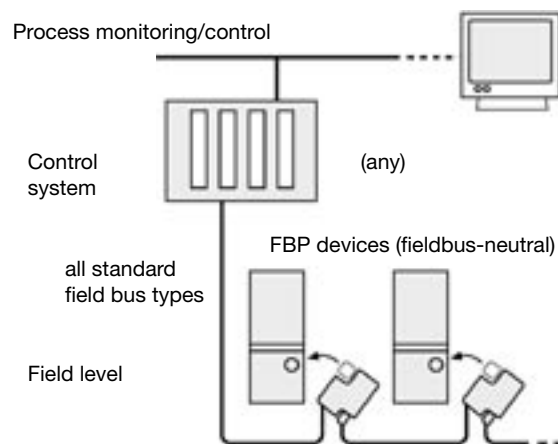
FBP FieldBusPlug

System Description - General Information

The FBP system connects switching devices and other similar components via any fieldbus types with usual automation systems (PLCs) in a simple and cost-efficient way. The switching devices are independent of the chosen fieldbus type. Connection to the various fieldbus types is established via the fieldbus-specific FieldBusPlug cables (FBP cables).

One device for all field bus types

Each device, and each function module within the product family, has a fieldbus-neutral interface. A specially prefabricated connection cable establishes the communications connections with its bus-specific plug interface. In this way, flexibility, transparency and reliability in the process are achieved. The connecting, operating and diagnostic elements are placed at the front of all devices providing increased ease of installation. Process monitoring/control



The components

The FieldBusPlug cable is used inside as well as outside of the control cabinet. Particularly for usage outside of the control cabinet the FBP cable complies with IP65, being at the same time a small and robust device excellently suitable for industrial usage. One of the outstanding advantages is the presence of the 24 V DC supply voltage inside the FBP cable which makes additional wiring unnecessary because the available current is sufficient for most applications. Examples of typical devices for connection are sensors, push-buttons/switches, signal lamps, motor contactors, motor branch connections, etc.

The FieldBusPlug connects

The FieldBusPlug provides a name to the new product family as a connecting element.

The various FieldBusPlugs can be used with different fieldbus types.

The definitions of the respective fieldbus standards apply.



B11_3282



B12_3282



B14_3282

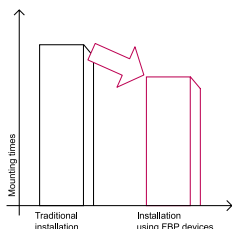


SST05595

FBP FieldBusPlug

System Description - General Information

The FieldBusPlug system, with its new installation concept, opens a multitude of further possibilities for centralized and decentralized applications. Simple integration into the process, the compact and space-saving designs of the devices, the flexibility during planning and designing as well as the cost-effective assembly and commissioning are further application-specific features. This offers considerably effects for the conception of a machine or plant:



Shorter throughput and realization times

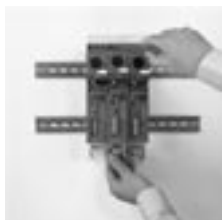
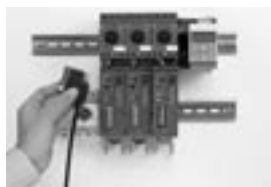
Until now, wiring and cabling has been expensive and time-consuming in machines and plants. Standardized plug-in fieldbus connections now provide fast installation and the highest level of flexibility.

Higher quality in machines and plants

Prefabricated devices, plug-in technology and less wiring expenditure reduce failures. Standards make general planning and project planning more reliable, the assembly more effective and reduce the commissioning time.

Smaller control cabinets

The FBP product range includes particularly compact device versions. The products provide a high level of functionality in minimal space. For example, the small dimensions of the only 45 mm wide reverse motor starter MSR22-FBP makes additional space in the control cabinet.

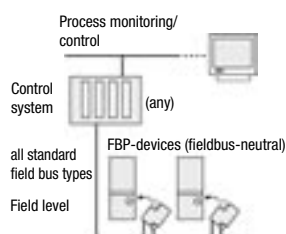


Improved response time

Reacting flexibly to customer requirements means being able to carry out modifications even shortly before completion. All devices can be replaced in a minimum of time. Due to the devices' independence of the fieldbus type, the determination of the field bus system can be made just before the control cabinet is to be delivered.

Effortless connection to the process

The FBP system also shows its high adaptability when inserted into the automation level and thus into the process. With the aid of standardized software functions, the FBP components and automation devices can be integrated into the process via standard fieldbusses. Via the fieldbus, all device information are transmitted to the automation level and thus can be visualized in the entire process. Which data are forwarded depends on the performance data of the chosen fieldbus system.



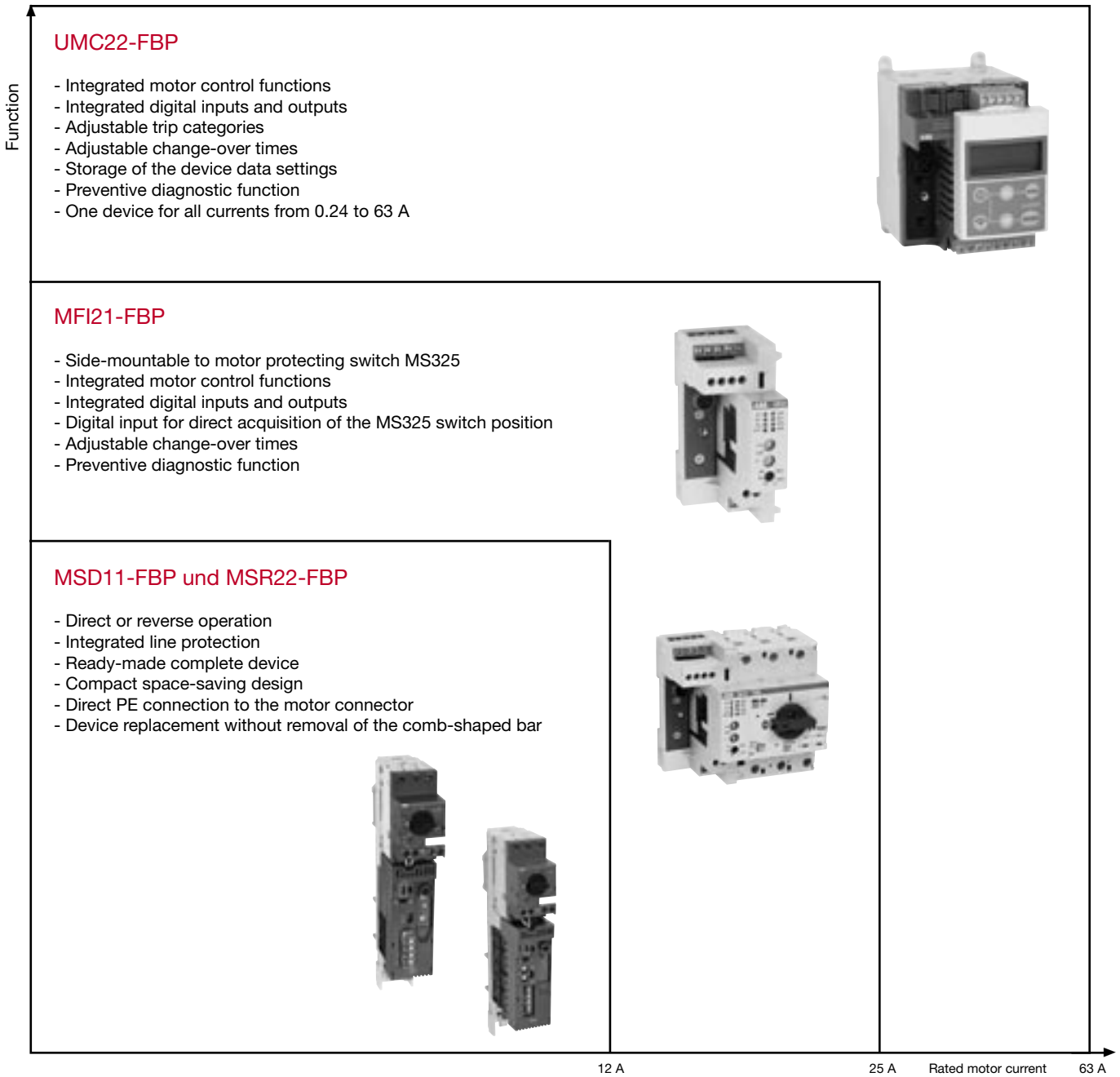
Increased availability of machines and plants

The FBP components have extensive diagnostic functions. For example, the status of each FBP device and fieldbus plug as well as of the bus is indicated by LEDs. Depending on the functionality of the device, a preventive diagnostic function enables preventive maintenance (e.g. by counting the number of switching cycles) and operating data of the motor can be displayed on an operating panel.

This allows possible malfunctions to be recognized before downtimes and production failures occur. An occurring error can be visualized thanks to the communication ability of the components and can therefore be remedied faster.

FBP FieldBusPlug

Survey - Fields of Application for FBP Terminal Devices



Applicability of device functions depending on the fieldbus system performance	FieldBusPlug terminal devices				Terminal device functions completely usable with FieldBusPlug ...						
Device functions	MSD11-FBP	MSR22-FBP	MFI21-FBP	UMC22-FBP	ASD11-FBP (AS-Interface)	ASP22-FBP*) (AS-Interface)	PDP21-FBP (PROFIBUS DP/V0)	PDP22-FBP (PROFIBUS DP/v1)	DNP21-FBP (DeviceNet)	COP21-FBP (CANopen)	MRP21-FBP (MODBUS RTU)
Integrated motor control functions											
Direct starting	x		x	x	x	x	x	x	x	x	x
Reverse starting		x	x	x		x	x	x	x	x	x
Servo-drive				x		x	x	x	x	x	x
Star-delta starting			x	x		x	x	x	x	x	x
Transparent mode			x	x			x	x	x	x	x

For detailed technical information please refer to the FieldBusPlug system documentation (see page 3/56)

*) restricted use with UMC22-FBP

FBP FieldBusPlug

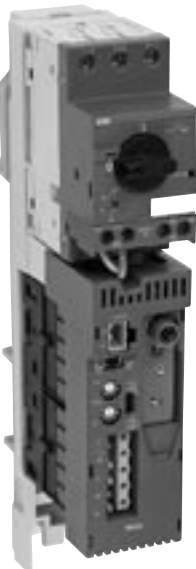
Survey - FBP Terminal Device Data

Communicative motor starters - compact devices



B11_3282

Motor Starter Direct
MSD11-FBP



B13_3282

Motor starter Reverse
MSR22-FBP

Motor Starter Direct MSD11-FBP

Dimensions	45 x 260 x 120 (138) mm
Mounting	DIN rail, on 1 or 2 rails as desired (spacing 125 mm), usage of 2 rails increases vibration resistance
Optional	Woehner conductor rail system adapter, Rittal, Germany
Degree of protection	IP 20
Power feeding	Comb-shaped rail or cable
Operating voltage V_i	400 V AC, 50 and 60 Hz, three-phase current
Control voltage feeding	Simplest feeding via bus connector; switchable to ext. feeding
External attachment plug	1.5 mm ² max. (supplied on delivery)
Control voltage	24 V DC (+ 30%, - 20%)
Motor connection	Plug-in conn. on front-side (plug supplied on del.) L1, L2, L3, PE
Conductor cross section	2.5 mm ² max.
Motor protection	Integr. motor protecting switch MS116 (overload, short-circuit)
Conductor cross section	2 x 1...4 mm ² (single- or multiple-wire) 2 x 0.75...2.5 mm ² (fine-wire with wire-end ferrules)
Nominal current ranges	11
Applicability	0.1...12 A
Short-circuit capacity ICS	50 kA (0.1 - 6.3 A), 12.5 kA (6.3 - 10 A), 10 kA (10 - 12 A)
Switching frequency (motor starting)	max. 15 starts per hour max. 60 starts per hour at 40 % duty ratio and $t_{starting} = 1$ s
Contactor	Integrated contactor B7
Contact rating	12 A max., AC-3, 400 V AC
Contact lifetime	700,000 switching cycles at 12 A, AC-3
Integrated diagnostic functions	LED for control voltage LED for contactor switch position LED for motor protection

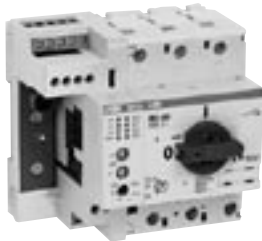
Motor Starter Reverse MSR22-FBP

Dimensions	45 x 260 x 120 (150) mm
Mounting	DIN rail, on 1 or 2 rails as desired (spacing 125 mm), usage of 2 rails increases vibration resistance
Optional	Woehner conductor rail system adapter, Rittal, Germany
Degree of protection	IP 20
Power feeding	Comb-shaped rail or cable
Operating voltage V_i	400 V AC, 50 and 60 Hz, three-phase current
Control voltage feeding	Simplest feeding via bus connector; switchable to ext. feeding
External attachment plug	1.5 mm ² max. (supplied on delivery)
Control voltage	24 V DC (+ 30%, - 20%)
Motor connection	Plug-in conn. on front-side (plug supplied on del.) L1, L2, L3, PE
Conductor cross section	2.5 mm ² max.
Motor protection	Integr. motor protecting switch MS116 (overload, short-circuit)
Conductor cross section	2 x 1...4 mm ² (single- or multiple-wire) 2 x 0.75...2.5 mm ² (fine-wire with wire-end ferrules)
Nominal current ranges	11
Applicability	0.1...12 A
Short-circuit capacity ICS	50 kA (0.1 - 6.3 A), 12.5 kA (6.3 - 10 A), 10 kA (10 - 12 A)
Switching frequency (motor starting)	max. 15 starts per hour max. 60 starts per hour at 40 % duty ratio and $t_{starting} = 1$ s
Contactor	Integrated contactor 2 x B7
Contact rating	12 A max., AC-3, 400 V AC
Contact lifetime	700,000 switching cycles at 12 A, AC-3
Integrated diagnostic functions	LED for control voltage LED for contactors switch positions LED for motor protection

FBP FieldBusPlug

Survey - FBP Terminal Device Data

Communicative motor starters with control functions



B12_3282

Motor Starter Fieldbus
Interface MFI21-FBP

Motor Starter Fieldbus Interface MFI21-FBP

Dimensions	36 (90) x 90 x 70 mm
Mounting	DIN rail
	Mechanical coupling to motor protecting switch MS 325
Degree of protection	IP 20
Power feeding	see MS 325
Control voltage feeding	simplest feeding via bus connector; switchable to ext. feeding
Connection	max. 1.5 mm ²
Control voltage	24 V DC (+ 30%, - 20%)
Motor connection	see MS 325
Conductor cross section terminals	max. 1 x 2.5 mm ² or max. 2 x 1.5 mm ²
Integrated inputs	3 digital inputs 24 V DC 1 digital input, mechanically coupled with MS325 switch position
Integrated outputs	3 relay outputs with common supply
Voltage switching capacity	24 V AC/DC ... 250 V AC/DC
Current switching cap. per relay	
240 V AC (AC 15)	max. 1.5 A
120 V AC (AC 15)	max. 3 A
250 V DC (DC 13)	max. 0.11 A
24 V DC (DC 13)	max. 1 A
Load current via common	$I_{max} = 3 \text{ A}$ (thermal limit)
Relay contact lifetime	> 5 x 10 ⁶ switching cycles - mechanical lifetime > 1 x 10 ⁶ switching cycles - at 230 V AC, 0.5 A
Protective circuits with inductive loads	for direct current free-wheeling diodes, for alternating current varistors / VDRs
Integrated control functions	Direct starting, reverse starting, star-delta starting, transparent mode (not for AS-Interface)
Diagnosis at the device	LED - Internal supply voltage LED - Device error LED - Status of the digital inputs and outputs Contactor switching cycles count and data transmission to the automation device (not for AS-Interface)

Note:

MS325 is not supplied on delivery (see chapter 4 - Motor Protecting Switches)

FBP FieldBusPlug

Survey - FBP Terminal Device Data

Communicative motor starters with control functions



B14_3282

Universal Motor Controller UMC22-FBP

Dimensions	70 x 105 x 87,5 (110) mm
Mounting	On DIN rail or with screws (4 screws M4)
Degree of protection	IP 20
Power feeding	Bar-type current transf. max. 25 mm ² (max. diameter. = 11 mm)
Operating voltage U _e	690 V AC, 50 and 60 Hz, 3-phase AC
Nominal motor current	0.24 ... 63 A with protective current transformers up to 850 A
Short-circuit protection	By fuse on mains side
Control voltage feeding	Simplest feeding via bus connector; switchable to ext. feeding
Connection	max. 1.5 mm ²
Control voltage	24 V DC (+30%, -20%)
Conductor cross section terminals	max. 1 x 2.5 mm ² or max. 2 x 1.5 mm ²
Integrated inputs	6 digital inputs 24 V DC
Integrated outputs	3 relay outputs with common supply
Voltage switching capacity	24 V AC/DC ... 250 V AC/DC
Current switching cap. per relay	
240 V AC (AC 15)	max. 1.5 A
120 V AC (AC 15)	max. 3 A
250 V DC (DC 13)	max. 0.11 A
24 V DC (DC 13)	max. 1 A
Load current via common	I _{max} = 4 A (thermal limit)
Relay contact lifetime	> 5 x 10 ⁶ switching cycles - mechanical lifetime > 1 x 10 ⁶ switching cycles - at 230 V AC, 0.5 A
Protective circuits with inductive loads	For direct current free-wheeling diodes, For alternating current varistors / VDRs
Integrated control functions	Direct starting, reverse starting, star-delta-starting, servo-drive, transparent mode (not for AS-Interface) Stand alone operation (operation also without bus connection)
Integrated motor protection functions	Adjustm. of starting and change-over times via operat. panel Error acknowledgement via operating panel or bus Selectable disabling of outputs on error (PLC or bus) Overload monitoring / phase failure detection Detection of blocking motors Integrated storage of parameters and motor data
Integrated diagnostic functions	LED for control voltage LED for "motor running" LED for "device ready for operation" LED for state indication of digital inputs and outputs Contactor switching cycles count and data transmission to automation device (not for AS-Interface)
Optional operating panel	For adjustment and visualization of motor and device data as well as of bus parameters

FBP FieldBusPlug

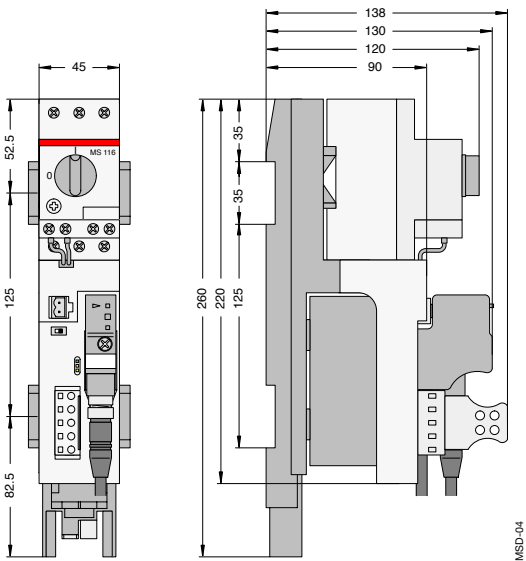
Survey - Device Data Overview

FieldBusPlug terminal devices FieldBusPlug bus connectors		FieldBusPlug terminal devices				Full usability of terminal device functions with FieldBusPlug ...				Remarks
Functions and technical data		MSD11-FBP	MSR22-FBP	MF121-FBP	UMC22-FBP	ASD11-FBP	ASP22-FBP	PDP21-FBP PDP22-FBP	DNP21-FBP COP22-FBP MRP21-FBP	For detailed technical information please refer to the FieldBusPlug system documentation
Integrated diagnostic functions										
	LED supply voltage	x	x	x		x	x	x	x	green
	LED ready to operation				x					green
	LED switch pos. contactor(s)	x	x							yellow
	LED switch pos. motor protection	x								yellow
	LED bus failure					x	D / B	x	x	red
	LED function failure		x	x	x			x	x	red
	LED motor running				x					yellow
	LED for states of digital I/Os			x	x					yellow
	Bus info contactors	x	x	x	x	x	x	x	x	Information to PLC
	Bus info contactors			x				x	x	Information to PLC
	Bus info motor protection				x			x	x	Information to PLC
	Bus info motor current			x	x			x	x	Information to PLC
Parameter settings										
	Change-over time via potentiometer			x						fixed basic time 50 ms
	Change-over time via operat. panel				x					fixed basic time 50 ms
	Change-over time via PLC program			x	x			x	x	fixed basic time 50 ms
	Motor current	x	x	x		x	x	x	x	at the motor protecting switch
	Motor current, trip category				x			x	x	optional operating panel
	Motor current, trip category				x			x	x	PLC program
Mounting										
	Mounting on DIN rail	x	x	x	x					35 mm DIN rail
	Mounting on 2 DIN rails	x	x							increased vibration resistance
	Mounting by screws				x					4 Screws M4
Connections and conductor cross sections										
	Connecting terminals	x	x	x	x					1 x 2.5 bzw. 2 x 1.5 mm² max.
	PE tapping directly on DIN rail	x	x							to motor connecting plug
	Bus connection via FBP conn.	x	x	x	x	x	x	x	x	
	Bushing-type transformer				x					25 mm² max. (diameter 11 mm)
Ambient conditions										
	Degree of protection IP20	IP20				IP65				
	Storage temp. - 40 ... + 80°C	x	x	x	x	x	x	x	x	
	Operating temp. 0 ... + 55°C	x	x	x	x	x	x	x	x	
Approvals										
	CE, UL, CSA, GL, BV, LRS	x	x	x	x	x	x	x	x	partly in preparation
	ATEX				x					

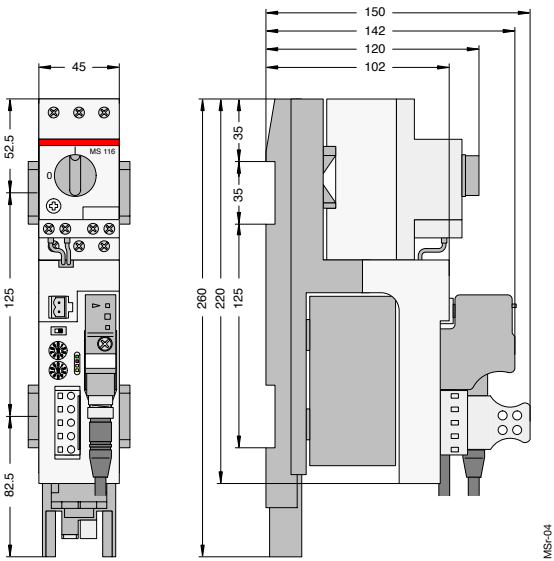
FBP FieldBusPlug Dimensioned Drawings

Communicative motor starters - compact devices

Diameter in mm

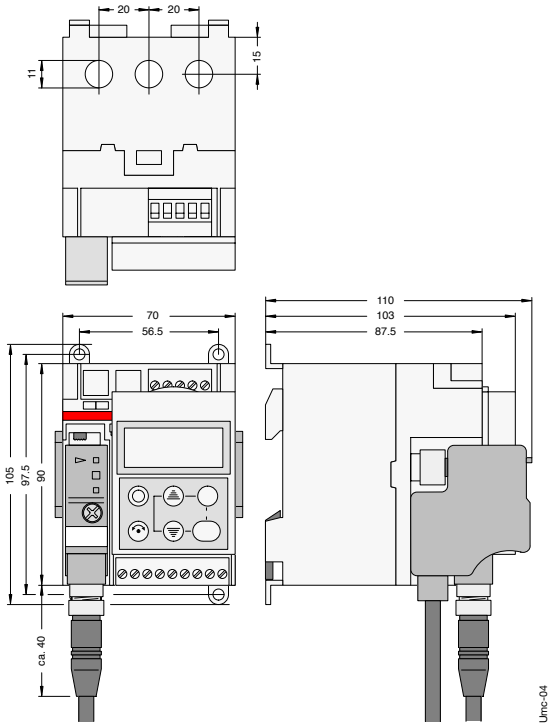


Motor Starter Direct MSD11-FBP

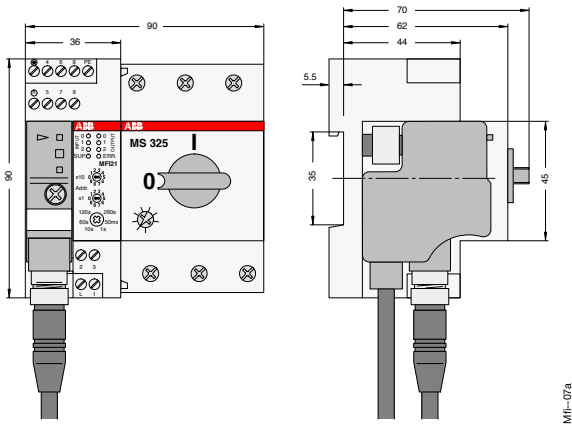


Motor Starter Reverse MSR22-FBP

Communicative motor starters with control functions



Universal Motor Controller UMC22-FBP



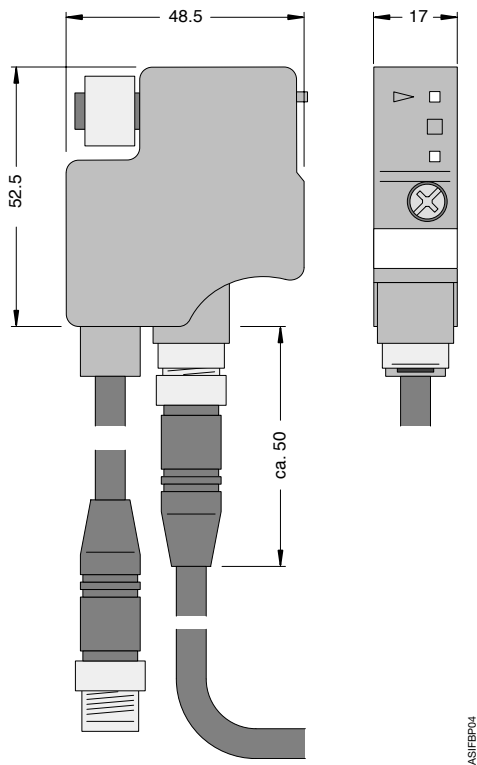
Motor Starter Fieldbus Interface MFI21-FBP

FBP-System

FBP FieldBusPlug Dimensioned Drawings

FieldBusPlugs

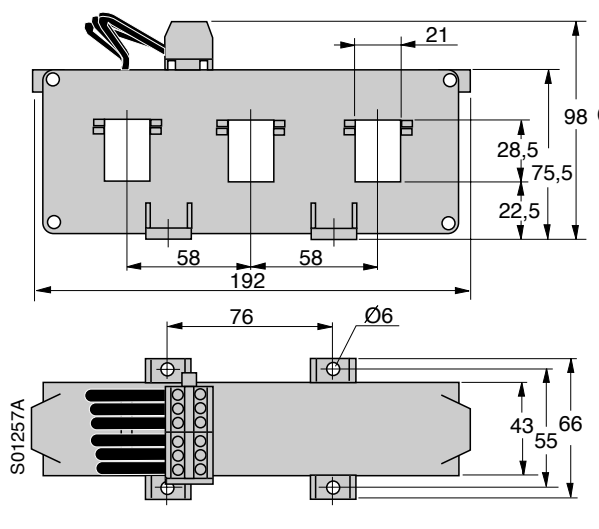
Dimensions in mm



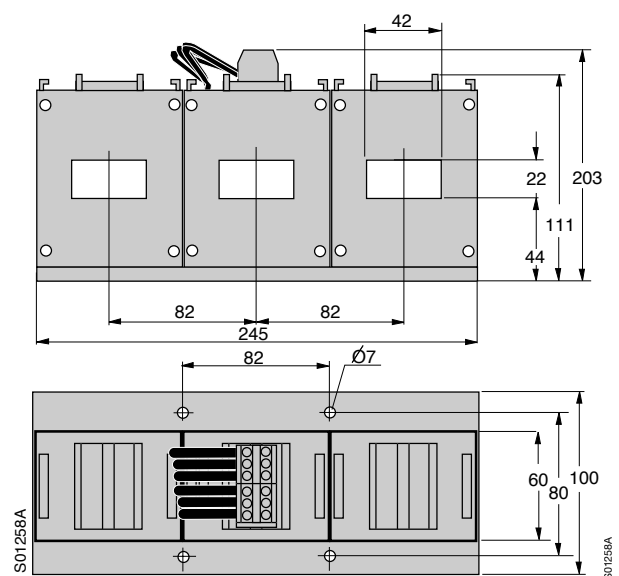
AS-Interface FieldBusPlug Direct
AS-Interface FieldBusPlug Performance
PROFIBUS DP/V0 FieldBusPlug
PROFIBUS DP/V1 FieldBusPlug
DeviceNet FieldBusPlug
CANopen FieldBusPlug
MODBUS-RTU FieldBusPlug

ASD11-FBP
ASP22-FBP
PDP21-FBP
PDP22-FBP
DNP21-FBP
COP21-FBP
MRP21-FBP

Current transformers for use with Universal Controller UMC22-FBP



Current transformer KORK 4L185 R/4
KORK 4L310 R/4



Current transformer KORK 5L500 R/4
KORK 5L850 R/4

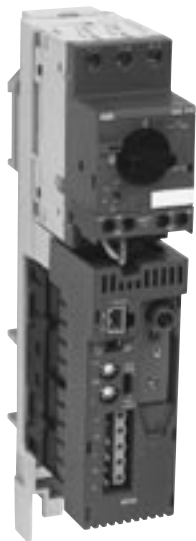
FBP FieldBusPlug

Communicative Motor Starters - Compact Devices



MSD11-FBP

MSD11



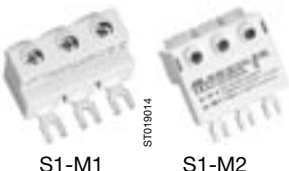
MSR22-FBP

MSR22



PS1-x-0

ST022014



S1-M1

S1-M2

ST019014

ST022014

Motor Starter Direct MSD11-FBP

Fuseless motor branch circuit for 1 motor, 1 direction of rotation, IP 20.

Motor protection with thermal and electromagnetic tripping.

Compact device with fieldbus-independent interface for connection to FBP fieldbus connector.

400 V AC, 12 A max., incl. motor connecting plug and plug for external control voltage (24 V DC).

Type	Motor Starter Direct Setting range	I _{CS} kA	Order number	Pack. size	Weight p. piece kg
MSD11-FBP.0.16	0.1-0.16A	50	1SAJ 310 000 R0001	1	0.65
MSD11-FBP.0.25	0.16-0.25A	50	1SAJ 310 000 R0002	1	0.65
MSD11-FBP.0.4	0.25-0.4A	50	1SAJ 310 000 R0003	1	0.65
MSD11-FBP.0.63	0.4-0.63A	50	1SAJ 310 000 R0004	1	0.65
MSD11-FBP.1	0.63-1.0A	50	1SAJ 310 000 R0005	1	0.65
MSD11-FBP.1.6	1.0-1.6A	50	1SAJ 310 000 R0006	1	0.65
MSD11-FBP.2.5	1.6-2.5A	50	1SAJ 310 000 R0007	1	0.65
MSD11-FBP.4	2.5-4.0A	50	1SAJ 310 000 R0008	1	0.65
MSD11-FBP.6.3	4.0-6.3A	50	1SAJ 310 000 R0009	1	0.65
MSD11-FBP.10	6.3-10.0A	12.5	1SAJ 310 000 R0010	1	0.65
MSD11-FBP.12	10.0-12A	10	1SAJ 310 000 R0011	1	0.65

Motor Starter Reverse MSR22-FBP

Fuseless motor branch circuit for 1 motor, 2 directions of rotation, IP 20.

Motor protection with thermal and electromagnetic tripping.

Compact device with fieldbus-independent interface for connection to FBP fieldbus connector.

400 V AC, 12 A max., incl. motor connecting plug and plug for external control voltage (24 V DC).

Type	Motor Starter Reverse Setting range	I _{CS} kA	Order number	Pack. size	Weight p. piece kg
MSR22-FBP.0.16	0.1-0.16A	50	1SAJ 320 000 R0001	1	0.85
MSR22-FBP.0.25	0.16-0.25A	50	1SAJ 320 000 R0002	1	0.85
MSR22-FBP.0.4	0.25-0.4A	50	1SAJ 320 000 R0003	1	0.85
MSR22-FBP.0.63	0.4-0.63A	50	1SAJ 320 000 R0004	1	0.85
MSR22-FBP.1	0.63-1.0A	50	1SAJ 320 000 R0005	1	0.85
MSR22-FBP.1.6	1.0-1.6A	50	1SAJ 320 000 R0006	1	0.85
MSR22-FBP.2.5	1.6-2.5A	50	1SAJ 320 000 R0007	1	0.85
MSR22-FBP.4	2.5-4.0A	50	1SAJ 320 000 R0008	1	0.85
MSR22-FBP.6.3	4.0-6.3A	50	1SAJ 320 000 R0009	1	0.85
MSR22-FBP.10	6.3-10.0A	12.5	1SAJ 320 000 R0010	1	0.85
MSR22-FBP.12	10.0-12A	10	1SAJ 320 000 R0011	1	0.85

Accessories for Motor Starters MSD11-FBP and MSR22-FBP

Busbar blocks for MSD11-FBP and MSR22-FBP for cross-wiring.

Feeder blocks for busbar blocks for MSD11-FBP and MSR22-FBP.

Max. current-carrying capacity 63 A, conductor cross section 25/16 mm² multiple/fine-wire.

Type	Designation	Order number	Pack. size	Weight p. piece kg
PS1-2-0	Busbar block for 2 devices	1SAM 201 906 R1002	10	0.035
PS1-3-0	Busbar block for 3 devices	1SAM 201 906 R1003	10	0.056
PS1-4-0	Busbar block for 4 devices	1SAM 201 906 R1004	10	0.080
PS1-5-0	Busbar block for 5 devices	1SAM 201 906 R1005	10	0.102
S1-M1	Feeder block, flat design	1SAM 201 907 R1001	10	0.039
S1-M2	Feeder block, high design	1SAM 201 907 R1002	10	0.053

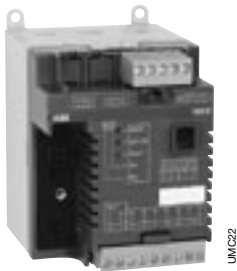
Note: For system accessories and documentation please refer to page 3/56.

FBP FieldBusPlug

Communicative Motor Starters with Control Functions



MFI21-FBP



UMC22-FBP



ACS100-PAN



KORC 4L...



KORC 5L...

Motor starter Fieldbus Interface MFI21-FBP

Fieldbus interface, IP20, for coupling to motor protecting switch MS325 ¹⁾
Integrated motor control functions: Direct starting, reverse starting, star-delta starting. Diagnostic functions, integrated potentiometer. 3 digital inputs, 3 relay outputs, 1 direct-coupled digital input for switch position detection of MS325, fieldbus-independent interface for connection to FBP fieldbus connectors.

Type	Designation	Order number	Pack. size	Weight p. piece kg
MFI21-FBP.0	Motor starter Fieldbus Interface	1SAJ 410 000 R0100	1	0.12

1) For motor protecting switch MS325 and accessories for MS325 please refer to chapter 4 - Motor Protecting Switches

Universal Motor Controller UMC22-FBP

Universal motor controller with thermal overload protection 0.24 - 63 A in a single device type. Bushing-type transformer, cable cross section 25 mm² (max. diameter incl. insulation = 11 mm). Integrated motor control functions: Direct starting, reverse starting, star-delta starting, servo-drive functions. Diagnostic functions: Overload, phase failure, trip categories 5, 10, 20, 30. Integrated storage of parameters and motor data. 6 digital inputs, 3 relay outputs. Fieldbus-independent interface for connection to FBP fieldbus connectors, interface to operating panel ACS100-PAN.

Type	Designation	Nominal motor current	Order number	Pack. size	Weight p. piece kg
UMC22-FBP.0	Universal Motor-Controller	0.24 - 63 A	1SAJ 510 000 R 0100	1	0.36
UMC22-FBP.0	Universal Motor-Controller ATEX-Version	0.24 - 63 A	1SAJ 510 000 R 0200	1	0.36

Accessories for Universal Motor Controller UMC22-FBP

Operating, diagnostics and parameter setting panel for Universal Motor Controller UMC22-FBP. Setting of motor and bus parameters.

Type	Designation	Usage with	Order number	Pack. size	Weight p. piece kg
ACS100-PAN	Operating panel	UMC22-FBP	1SAJ 510 001 R0001	1	0.04

Accessories for operating panel ACS100-PAN

Extension cable 3 m and door mounting set IP65 (front side) for ACS100-PAN operating panel

Type	Designation	Usage with	Order number	Pack. size	Weight p. piece kg
ACS100-CAB.300	Extension cable 3m with door mounting set	ACS100-PAN	1SAJ 510 002 R0001	1	0.40
ACS100-CAB.070	Extension cable 3m with front mounting set	ACS100-PAN	1SAJ 510 003 R0001	1	0.40

Current transformers for use with the Universal Controller UMC22-FBP

Secondary-linear transformer, 3-phase with terminal block, intended for conductors Cu 2.5 mm²

Type	Designation	Current range recommended	Order number	Pack. size	Weight p. piece kg
KORC 4L 185 R/4	Current transformer	60 ... 185 A	1SCA 022 193 R 7830	1	1.550
KORC 4L 310 R/4	Current transformer	180 ... 310 A	1SCA 022 181 R 0760	1	1.442
KORC 5L 500 R/4	Current transformer	300 ... 500 A	1SCA 022 208 R 1010	1	1.700
KORC 5L 850 R/4	Current transformer	500 ... 850 A	1SCA 022 208 R 1440	1	1.900

Connection kit for use with the KORC-current-transformers

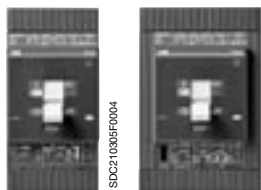
Connection kit for applications with KORC-current-transformers with A-series-contactors

Type	Designation	Appropriate for contactor type	Order number	Pack. size	Weight p. piece kg
DT 450 / A185	Connection kit	AF145 - AF185	1SAZ 501 901 R 1001	1	0.500
DT 450 / A300	Connection kit	AF260 - AF300	1SAZ 501 902 R 1001	1	0.750
DT 500 / AF460L	Connection kit ¹⁾	AF400 - AF460	1SAX 701 902 R 1001	1	0.500
DT 800 / AF750L	Connection kit ¹⁾	AF580 - AF750	1SAX 801 902 R 1001	1	0.750

¹⁾ Connection kit for Star-Delta-Starter

FBP FieldBusPlug

Further FBP Terminal Devices



Tmax T4/T5

Communicative Power Circuit Breakers Tmax T4 / T5

FBP interface module for connection to the FieldBusPlug.



Soft Starter PST

Communicative Soft Starter PST

Compact device with fieldbus-neutral interface for connection to the FieldBusPlug.



SST05497

Position sensors inductive and capacitive

PNP-NO with M12 connection, operating at all FieldBusPlugs.



SST05597

Position Sensors



2CDC35001F0003

Input module WDI

Input module for Wireless Proximity Switches

Input module with fieldbus-neutral interface for connection up to 120 wireless position sensors.

FBP FieldBusPlug

AS-Interface FieldBusPlug

Ordering Data



ASD11-FBP



ASP22-FBP

AS-Interface FieldBusPlug Direct

Ready-made AS-Interface slave fieldbus interface with various cable lengths.
Applicable with MSD11-FBP and terminal devices with max. 2 input and 1 output signals.
Degree of protection IP65, diagnostic LED.

Type	Designation	Cable length	Order number		Pack. size	Weight p.piece kg
ASD11-FBP.025	AS-Interface FBP Direct	0.25 m	1SAJ 210 000 R 0003		1	0.09
ASD11-FBP.050	AS-Interface FBP Direct	0.50 m	1SAJ 210 000 R 0005		1	0.10
ASD11-FBP.100	AS-Interface FBP Direct	1.00 m	1SAJ 210 000 R 0010		1	0.13
ASD11-FBP.500	AS-Interface FBP Direct	5.00 m	1SAJ 210 000 R 0050		1	0.33

AS-Interface FieldBusPlug Performance

Ready-made AS-i slave fieldbus interface with various cable lengths.
Applicable with all FBP motor starters and terminal devices with max. 4 input and 3 output signals.
Degree of protection IP65, diagnostic LED.

Type	Designation	Cable length	Order number		Pack. size	Weight p.piece kg
ASP22-FBP.025	AS-Interface FBP Performance	0.25 m	1SAJ 220 000 R 0003		1	0.09
ASP22-FBP.050	AS-Interface FBP Performance	0.50 m	1SAJ 220 000 R 0005		1	0.10
ASP22-FBP.100	AS-Interface FBP Performance	1.00 m	1SAJ 220 000 R 0010		1	0.13
ASP22-FBP.500	AS-Interface FBP Performance	5.00 m	1SAJ 220 000 R 0050		1	0.33

Note: For system accessories and documentation please refer to page 3/56.

FBP FieldBusPlug

AS-Interface Accessories

Ordering Data

Accessories for the AS-Interface Bus Connection

AS-Interface round cables for bus junctions

Ready-made bus cable with M12 connector and open cable end.

Applicable for bus junctions such as e.g. AS-Interface couplers or devices with integrated AS-Interface communication.

Type	AS-Interface round cable for bus junctions	Cable length	Order number		Pack. size	Weight p. piece kg
ASF11-FBP.030	Round cable with female connector	0.30 m	1SAJ 922 002 R 0003		1	0.03
ASM11-FBP.030	Round cable with male connector	0.30 m	1SAJ 922 003 R 0003		1	0.03

AS-Interface round cables for bus extensions

Ready-made AS-Interface bus cable, round cable with M12 female and male connectors (ASX11-FBP.xxx), AS-Interface bus cable, round cable on coil (ASC11-FBP.999).

Type	AS-Interface extension cables	Cable length	Order number		Pack. size	Weight p. piece kg
ASX11-FBP.100	Ready-made	1.00 m	1SAJ 922 001 R 0010		1	0.08
ASX11-FBP.300	Ready-made	3.00 m	1SAJ 922 001 R 0030		1	0.18
ASX11-FBP.500	Ready-made	5.00 m	1SAJ 922 001 R 0050		1	0.28
ASC11-FBP.999	Coil	100 m	1SAJ 922 004 R 1000		1	5.20

AS-Interface accessories for the bus extension

Type	AS-Interface cable connectors	Order number		Pack. size	Weight p. unit kg
ASM11-FBP.0	Male AS-Interface round c. conn.	1SAJ 922 005 R 0001		5	0.15
ASF11-FBP.0	Female AS-Interf. round c. conn.	1SAJ 922 006 R 0001		5	0.15
AST11-FBP.0	Flat cable branch circuit with M12 socket (junction to round cable)	1SAJ 922 007 R 0001		1	0.11

AS-Interface addressing unit, miscellaneous accessories

Type	Designation	Order number		Pack. size	Weight p. unit kg
ASA21-FBP.0	Addressing unit incl. plug-in power supply unit	1SAJ 922 010 R 0001		1	0.56

Note: For system accessories and documentation please refer to page 3/56 .

FBP FieldBusPlug

PROFIBUS DP/V0, DP/V1 FieldBusPlug

Ordering Data



2CDC341046F003

PDP21-FBP
PDP22-FBP

PROFIBUS DP/V0 FieldBusPlug

Ready-made PROFIBUS DP/V0 fieldbus interface with various cable lengths.
Applicable with all FBP motor starters and other terminal devices.
Degree of protection IP65, diagnostic LED.

Type	Designation	Cable length	Order number		Pack. size	Weight p. piece kg
PDP21-FBP.025	PROFIBUS DP/V0-FBP	0.25 m	1SAJ 240 000 R 0003		1	0.09
PDP21-FBP.050	PROFIBUS DP/V0-FBP	0.50 m	1SAJ 240 000 R 0005		1	0.10
PDP21-FBP.100	PROFIBUS DP/V0-FBP	1.00 m	1SAJ 240 000 R 0010		1	0.13
PDP21-FBP.200	PROFIBUS DP/V0-FBP	2.00 m	1SAJ 240 000 R 0020		1	0.20
PDP21-FBP.500	PROFIBUS DP/V0-FBP	5.00 m	1SAJ 240 000 R 0050		1	0.36

PROFIBUS DP/V1 FieldBusPlug

Ready-made PROFIBUS DP/V1 fieldbus interface with various cable lengths.
Applicable with all FBP motor starters and other terminal devices.
Degree of protection IP65, diagnostic LED.

Type	Designation	Cable length	Order number		Pack. size	Weight p. piece kg
PDP22-FBP.025	PROFIBUS DP/V1-FBP	0.25 m	1SAJ 240 100 R 0003		1	0.09
PDP22-FBP.050	PROFIBUS DP/V1-FBP	0.50 m	1SAJ 240 100 R 0005		1	0.10
PDP22-FBP.100	PROFIBUS DP/V1-FBP	1.00 m	1SAJ 240 100 R 0010		1	0.13
PDP22-FBP.500	PROFIBUS DP/V1-FBP	5.00 m	1SAJ 240 100 R 0050		1	0.36

Note: For system accessories and documentation please refer to page 3/56.

FBP FieldBusPlug

PROFIBUS DP/V0, DP/V1 Accessories

Ordering Data

Accessories for the PROFIBUS DP/V0, DP/V1 Bus Connection

PROFIBUS DP/V0, DP/V1 round cables for bus junctions

Ready-made bus cable with M12 connector and open cable end.
Applicable for bus junctions such as e.g. PROFIBUS DP/V0, DP/V1 couplers or devices with integrated Profibus DP/V0, DP/V1 communication.

Type	PROFIBUS DP/V0, DP/V1 round cable for bus junctions	Cable length	Order number	Pack. size	Weight p. piece kg
PDF11-FBP.050	Round cable with female connector	0.50 m	1SAJ 924 002 R0005	1	0.04
PDM11-FBP.050	Round cable with male connector	0.50 m	1SAJ 924 003 R0005	1	0.04

PROFIBUS DP/V0, DP/V1 round cables for the bus extension

Ready-made PROFIBUS DP/V0, DP/V1 bus cable, round cable with M12 female and male connectors (PDX11-FBP.xxx).
PROFIBUS DP/V0, DP/V1 bus cable, round cable on coil (PDC11-FBP.999).

Type	PROFIBUS DP/V0, DP/V1 extension cable	Cable length	Order number	Pack. size	Weight p. piece kg
PDX11-FBP.100	Ready-made	1.00 m	1SAJ 924 001 R 0010	1	0.08
PDX11-FBP.300	Ready-made	3.00 m	1SAJ 924 001 R 0030	1	0.20
PDX11-FBP.500	Ready-made	5.00 m	1SAJ 924 001 R 0050	1	0.31
PDC11-FBP.999	Coil	100 m	1SAJ 924 004 R 1000	1	5.60

PROFIBUS DP/V0, DP/V1 accessories for the bus extension

Type	PROFIBUS DP/V0, DP/V1 cable connectors	Order number	Pack. size	Weight p. piece kg
PDM11-FBP.0	Male round cable connector	1SAJ 924 005 R 0001	1	0.03
PDF11-FBP.0	Female round cable connector	1SAJ 924 006 R 0001	1	0.03

PROFIBUS DP/V0, DP/V1 line termination, feeding connector, adaptor

Type	Designation	Order number	Pack. size	Weight p. piece kg
PDR11-FBP.150	Line termination 150 Ohm	1SAJ 924 007 R 0001	1	0.03
PDV11-FBP.0	Feeding connector 24 V DC Code B-A	1SAJ 924 008 R 0001	1	0.04
PDV12-FBP.0	Feeding connector 24 V DC Code A-A	1SAJ 924 011 R 0001	1	0.04
PDA11-FBP.050	Adaptor M12-Dsub9-M12 cable length 0.50 m	1SAJ 924 009 R 0005	1	0.04
PDA12-FBP.050	Adaptor M12-Dsub9-M12 cable length 2 x 0.50 m	1SAJ 924 010 R 0005	1	0.04

PDF11-FBP.050



2CDC341048F003



2CDC341048F003

PDM11-FBP.050



2CDC341047F003

PDX11-FBP



2CDC341051F003

2CDC341050F003

PDM11-FBP.0

PDF11-FBP.0



2CDC341053F003

PDV11-FBP.0
PDV12-FBP.0



2CDC341034F003

PDR11-FBP.150



2CDC341008F004

PDA11-FBP.050



2CDC341007F004

PDA12-FBP.050

FBP FieldBusPlug

DeviceNet, CANopen and MODBUS-RTU FieldBusPlugs

Ordering Data



B10_3282_RET

DNP21-FBP
COP21-FBP
MRP21-FBP

DeviceNet FieldBusPlug

Ready-made DeviceNet fieldbus interface with various cable lengths. Applicable with all FBP motor starters and other terminal devices. Degree of protection IP65, diagnostic LED.

Type	Designation	Cable length	Order number		Pack. size	Weight p. piece kg
DNP21-FBP.025	DeviceNet-FBP	0.25 m	1SAJ 230 000 R0003		1	0.09
DNP21-FBP.050	DeviceNet-FBP	0.50 m	1SAJ 230 000 R0005		1	0.10
DNP21-FBP.100	DeviceNet-FBP	1.00 m	1SAJ 230 000 R0010		1	0.13
DNP21-FBP.500	DeviceNet-FBP	5.00 m	1SAJ 230 000 R0050		1	0.36

CANopen FieldBusPlug*

Ready-made CANopen fieldbus interface with various cable lengths. Applicable with all FBP motor starters and other terminal devices. Degree of protection IP65, diagnostic LED.

Type	Designation	Cable length	Order number		Pack. size	Weight p. piece kg
COP21-FBP.025	CANopen-FBP	0.25 m	1SAJ 230 100 R0003		1	0.09
COP21-FBP.050	CANopen-FBP	0.50 m	1SAJ 230 100 R0005		1	0.10
COP21-FBP.100	CANopen-FBP	1.00 m	1SAJ 230 100 R0010		1	0.13
COP21-FBP.500	CANopen-FBP	5.00 m	1SAJ 230 100 R0050		1	0.36

* not yet available

MODBUS-RTU FieldBusPlug

Ready-made MODBUS-RTU fieldbus interface with various cable lengths. Applicable with all FBP motor starters and other terminal devices. Degree of protection IP65, diagnostic LED.

Type	Designation	Cable length	Order number		Pack. size	Weight p. piece kg
MRP21-FBP.025	MODBUS-RTU-FBP	0.25 m	1SAJ 250 000 R0003		1	0.09
MRP21-FBP.050	MODBUS-RTU-FBP	0.50 m	1SAJ 250 000 R0005		1	0.10
MRP21-FBP.100	MODBUS-RTU-FBP	1.00 m	1SAJ 250 000 R0010		1	0.13
MRP21-FBP.500	MODBUS-RTU-FBP	5.00 m	1SAJ 250 000 R0050		1	0.36

FBP FieldBusPlug

DeviceNet, CANopen, MODBUS-RTU Accessories

Ordering Data



DNF11-FBP.050

ST05301



DNR11-FBP.050

ST05201



DNX11-FBP

ST04801



DNM11-FBP.0

DNF11-FBP.0

ST05701

ST06401



DNR11-FBP.120

ST05501

Accessories for the DeviceNet, CANopen, MODBUS-RTU bus connection

DeviceNet, CANopen, MODBUS-RTU round cables for bus junctions

Ready-made bus cable with an M12 plug and an open cable end.

Applicable with bus junctions such as DeviceNet, CANopen, MODBUS-RTU couplers or devices with an integrated DeviceNet, CANopen, MODBUS-RTU communication.

Type	DeviceNet, CANopen MODBUS-RTU round cables for bus junctions	Cable length	Order number		Pack. size	Weight p. piece kg
DNF11-FBP.050	Round cable with male plug	0.50 m	1SAJ 923 002 R 0005		1	0.04
DNM11-FBP.050	Round cable with female plug	0.50 m	1SAJ 923 003 R 0005		1	0.04

DeviceNet, CANopen, MODBUS-RTU round cables for the bus extension

Ready-made DeviceNet, CANopen, MODBUS-RTU bus cable, round cable with M12 male and female plugs (DNX11-FBP.xxx).

DeviceNet, CANopen, MODBUS-RTU bus cable, round cable as a coil (MRC11-FBP.999).

Type	DeviceNet, CANopen, MODBUS-RTU extension cables	Cable length	Order number		Pack. size	Weight p. piece kg
DNX11-FBP.100	Ready-made	1.00 m	1SAJ 923 001 R 0010		1	0.08
DNX11-FBP.300	Ready-made	3.00 m	1SAJ 923 001 R 0030		1	0.20
DNX11-FBP.500	Ready-made	5.00 m	1SAJ 923 001 R 0050		1	0.31
DNC11-FBP.999	Coil (Drop cable)	100.00 m	1SAJ 923 004 R 1000		1	5.60

DeviceNet, CANopen, MODBUS-RTU Accessories for the bus extension

Type	DeviceNet, CANopen, MODBUS-RTU cable connectors	Order number		Pack. size	Weight p. piece kg
DNM11-FBP.0	Round cable male plug	1SAJ 923 005 R 0001		5	0.15
DNF11-FBP.0	Rund cable female plug	1SAJ 923 006 R 0001		5	0.15

DeviceNet, CANopen, MODBUS-RTU termination resistor and other accessories

Type	DeviceNet, CANopen, MODBUS-RTU bus accessories	Order number		Pack. size	Weight p. piece kg
DNR11-FBP.120	Terminating resistor 120 Ohm	1SAJ 923 007 R 0001		1	0.02

Note: For system accessories and documentation please refer to page 3/56.

FBP FieldBusPlug

System Accessories and Documentation

Ordering Data

FieldBusPlug addressing labels

For addressing the FieldBusPlug connectors.

Type	Designation	Order number		Pack. size	Weight p. unit kg
CAL11-FBP.0	400 Addressing labels for FBPs	1SAJ 929 005 R0001		1	0.15

FieldBusPlug power supply unit

Supply voltage 90...260 V AC, 47...63 Hz.

Adjustable output voltage 23...28 V DC, 5 A.

Type	Designation	Order number		Pack. size	Weight p. unit kg
CP-24/5.0	Netzteil 24 V / 5 A	1SVR 423 416 R0100		1	0.58

FBP addressing set for PROFIBUS DP/V0, DP/V1, DeviceNet, CANopen, MODBUS-RTU

For setting the FieldBusPlug connector address (PROFIBUS DP and DeviceNet). Consisting of software package for notebook, level converter incl. battery and cable to notebook.

Type	Designation	Order number		Pack. size	Weight p. unit kg
CAS21-FBP.0	Addressing set for PROFIBUS DP/V0, DP/V1, DeviceNet, CANopen, MODBUS-RTU	1SAJ 929 003 R0001		1	0.40

FieldBusPlug accessories for installation inside control cabinet drawer systems

Fixing bracket for passive plug for installation of FBP terminal devices in drawer systems.

FBP passive cable for installation of FBP terminal devices in drawer systems.

Type	Designation	Length	Order number		Pack. size	Weight p. piece kg
CDP11-FBP.0	Passive plug fixing bracket for drawer systems.		1SAJ 929 100 R 0001		50	0.50
CDP12-FBP.100	Passive cable for drawer systems (outside)	1.00 m	1SAJ 929 120 R 0001		1	0.20
CDP13-FBP.100	Passive cable for drawer systems (inside)	1.00 m	1SAJ 929 110 R 0001		1	0.31

FieldBusPlug system documentation

Complete system documentation for planning and project planning.

Technical data, software, examples, FAQs.

Type	Designation	Language	Order number		Pack. size	Weight p. piece kg
FieldBusPlug documentation	CD-ROM Version	German English	2CDC 190 008 E 0401		1	0.01

Notes

This image shows a full page of blank graph paper. The grid consists of thin, light gray horizontal and vertical lines that intersect to form small squares across the entire surface. There are no margins, text, or other markings on the paper.

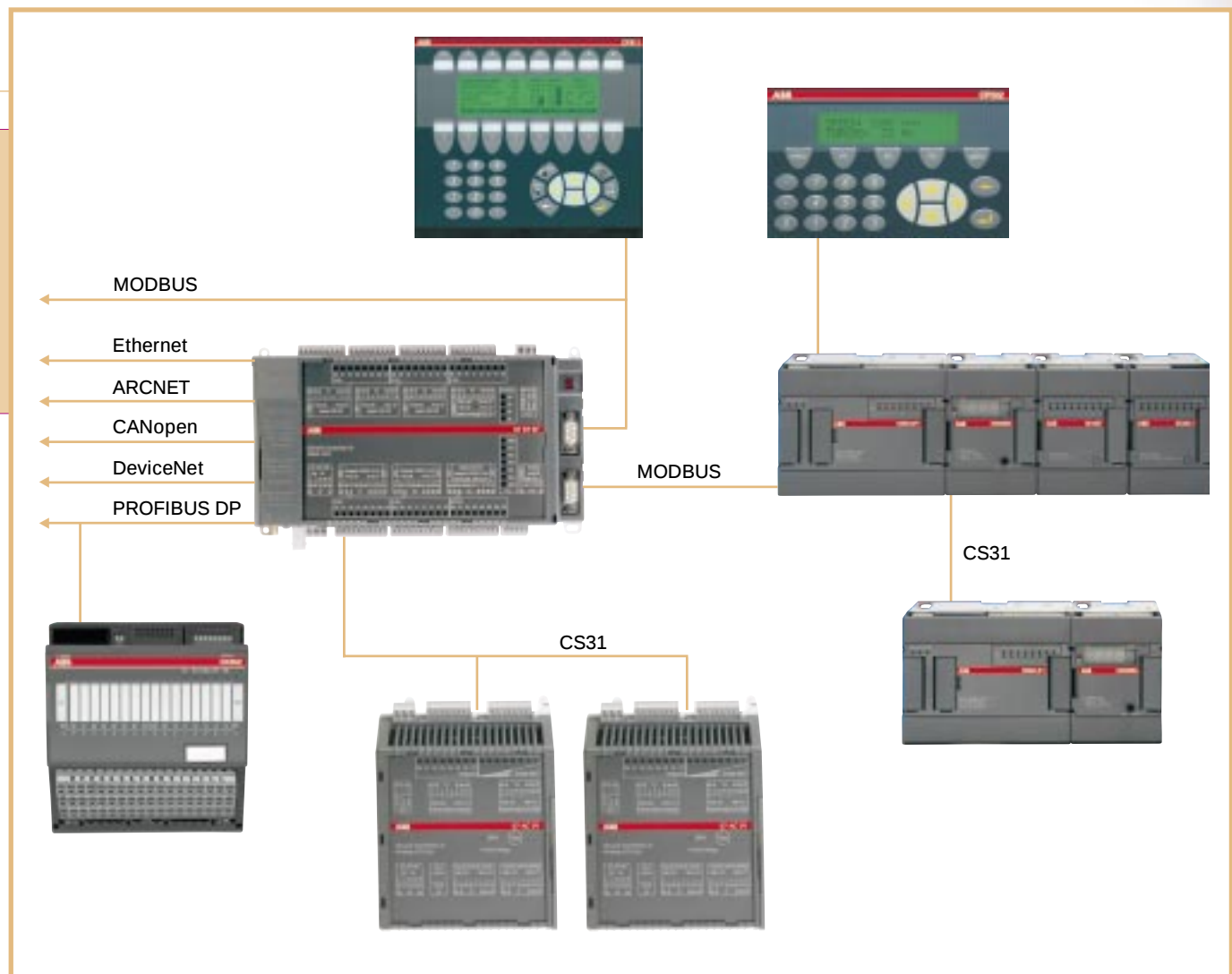
Control^{IT} Automation Devices

Communication via fieldbus

The ideal automation solution has three components: capable and compact automation devices, user-friendly programming software and appropriate operator devices.

The CS31 fieldbus forms the basis of communication between the AC31 components. Up to 31 bus devices can be integrated in the system via this especially fast RS-485 two-wire bus with interference immunity.

Compatible bus systems for Advant Controller 31



But also other means of communication such as:

- ARCNET
- CANopen
- DeviceNet
- Ethernet
- MODBUS
- PROFIBUS DP
- and RCOM data communication

can be used with AC31 components for communication depending on the system environment and prevailing preconditions.



Control^{IT} Automation Devices Programmable Controllers, I/O-Modules & Operator Terminals

Contents

Control^{IT} Automation Devices

Overview Automation devices	2/	2
• Control IT AC31 PLC family		
• The communication protocols		
• Safety-related controllers AC31-S – Safety First		
• Programming package 907AC1131		
Overview logic module AC010	2/	7
System data AC31	2/	9
Overview Central Units AC31	2/	12
Overview I/O-modules AC31 series 40..50, series 90 and S500	2/	14
Dimensions drawings central units, I/O-modules and communication-modules	2/	16
Ordering data small PLC – AC31 series 40..50	2/	18
• Central units		
• I/O-modules		
• Communication module MODBUS		
• Accessories		
Ordering data compact PLC – AC31 series 90 and Slot-PLC	2/	21
• Central Units		
• I/O-modules		
• Communication modules		
• Accessories		
Ordering data programming package 907AC1131	2/	23
Ordering data safety PLC – AC31-S	2/	24
Ordering data repeater for CS31 fieldbus	2/	25
Ordering data I/O-modules for PROFIBUS DP – S500	2/	27

Operator Terminals

Overview	2/	31
Ordering data operator terminals with text display	2/	34
Ordering data operator terminals with graphic display	2/	34
Ordering data operator terminals with touch screens	2/	34
Ordering data accessories	2/	35

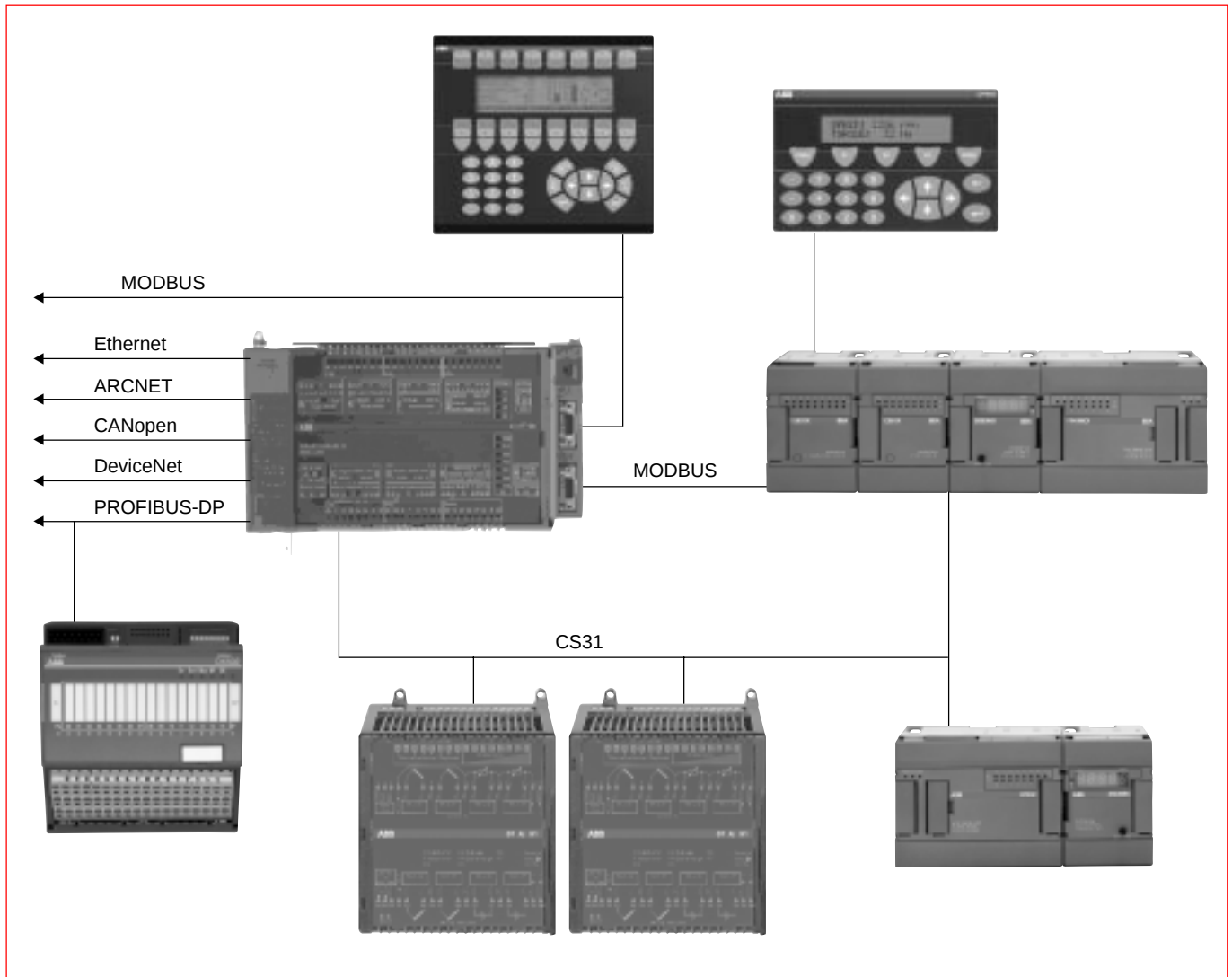
Control^{IT} Automations Devices Overview

Operation			
	text	graphics	touch screen
Control			
	logic module AC010	small PLC	compact PLC
I/O-Modules			
	decentral S500	central + decentral	decentral
		AC31 series 40...50	AC31 series 90

With these components you will be able to realize the right automation solution for every applications:

Operation Terminals:	text display, graphic display or touch screens.
Logic modules AC010:	for small, economic applications. Available in different performance modules for varying voltage ranges.
Small PLC AC31 series 40 ..50:	small but high-performance. Expandable centrally and decentrally.
Compact PLC AC31 series 90:	for demanding applications. Easily expandable decentrally. With up to 5 integrated interfaces for open communication. With 60 integrated I/O.
Programming package 907 AC 1131:	acc. to IEC61131-3 (incl. extensive libraries + configurators).
For higher safety:	safety-related PLC AC31-S.
I/O-modules S500:	for PROFIBUS DP.

Control^{IT} Automation Devices Overview



PLC etc.

Control IT PLC family AC31

AC31 offers compact, high performance central units in varying designs with the possibility of decentral networking.

All central units are universally programmable according to IEC 61131-3, beginning with the small PLC (series 40..50) up to the high-performance compact PLC (series 90).

They offer high functionality within a small space with up to 1 MByte user memory, with 60 integrated I/Os (analogue and digital), with two serial interfaces (both of which are configurable for MODBUS or ASCII) and with a plug-in smart media card for the uploading of user programmes or for data saving.

Up to two further communication interfaces with their own processors are already integrated within the central unit.

The user can choose varying combinations of integrated fieldbusses resp. network protocols: e.g. Ethernet + PROFIBUS DP, ARCNET + CANopen or also CANopen + Ethernet.

The couplers are integrated within the standard housing of the central unit in order to save space. Tools for the configuration of the fieldbusses used are already an integral part of the software package 907 AC 1131.

The components of AC31 series 40..50 and of AC31 series 90 can be mixed according to will. This way it is even possible to combine I/O-modules of series 40..50 with the compact controllers of series 90 or vice versa to combine I/O-modules of series 90 with a small PLC of series 50.

All components are Industrial IT – certified. The respective Aspect-Object-files are available upon request.

Control^{IT} Automation Devices

Overview

The communication protocols – an overview

Communication processor/module	Description
MODBUS	Due to its high dissemination, this protocol offers connectivity for controllers of different origin, to operating panels and PC operating stations. The MODBUS interface(s) is integrated in the CPU. A further MODBUS coupler with 2 additional interfaces can be attached. Max. number of participants with RS 485: 32. Max distance with RS 485: 1.2 km. Possibility for connecting a user-to-user modems. Network design: Point-to-point and multipoint-line.
Ethernet	Supports sending and receiving data via TCP/IP and/or UDP/IP. Further application layers can be implemented by download. It is even possible to run TCP/IP, UDP/IP and application layers simultaneously. The protocols: IP, TCP, UDP, ARP, RP, BOOTP, DHCP are supported as standard. A communication with third-party-systems is possible using either MODBUS/TCP or customer specific applications layers. Transfer rate 10 / 100 Mbit/s.
CANopen	Standardised layer-7-protocol on the basis of Controller Area Network (CAN) and of the CAN application layer (CAL). The access method is based on the master-slave-principal. It allows for the combined operation of several busmasters as well as the synchronized data transmission to multiple subscribers and up to 2.048 different communication objects. Baud rate of up to 1 Mbit/s. Protocols: event-triggered, cyclical, acyclical, on demand.
PROFIBUS DP	Allows for the master-and-slave communication in the field. Connection to automation systems of third-party manufacturers as well as intelligent preprocessors like drives, control panels and sensors. Max. length of the net (RS 485): 1200 m at 9.6 kBit/s. 32 stations per net max (master and slave). 126 with repeater. Transfer rate 9,6 kBit/s up to 12 MBit/s.
ARCNET	is the basis for an economical and fast integration of AC31 programmable controllers. Also suited for the process visualisation or for connection of other systems. Data transfer rate of 2.5 MBit/s. Collision free data transfer due to token bus with automated login and logoff of participants. Automated reconfiguration of the net when a station activates or deactivates. Up to 255 masters on the same net. Overall net length 300 m, up to 6 km with repeaters . All net forms e. g. net, star.
RCOM	is a communication protocol designed for the remote data transmission. It is suited for transmissions using a user-to-user or dial-up connection. Standard modems establish the connection between stations.
DeviceNet	For fast data exchange on the field level. For coupling of decentral field devices like I/O, drives and valves.
CS31	Bus for the easy connection of CPUs and I/O devices . The CS31 system bus is a RS 485-2-wire bus, designed for a fast and interference resistant data transfer. Up to 31 I/O-devices. Max. length: 500 m resp. 2000 m with repeater. With repeaters you can also achieve bus redundancy. Transfer rate: 187.5 Kbaud.
AC31 Safety-Fieldbus	For the certified transmission of safety signals between safety-related controllers and the safety-related I/O devices (AC31-S only). Mixing of safety-related signals and operation signals

Control^{IT} Automation Devices Overview

	07KT51	07KT94-S	07KT95	07KT96	07KT97	07KT98	07SL97
MODBUS	X	X	X	X	X	X	X
Ethernet					X	X	
CANopen					X	X	
PROFIBUS DP					X	X	X
ARCNET		X			X	X	X
DFÜ RCOM		X	X	X	X	X	
DeviceNet					X	X	X
CS31 system bus	X	X	X	X	X	X	X
AC31 Safety Fieldbus		X					

Safety PLC AC31-S - Safety First

Nowadays, machine and plant manufacturers are confronted by ever more extensive and ever more stringent safety conditions, in line with the demand that the safety of machines and systems must be implemented optimally and in line with the "state of the art" for protection of man, machine and the environment. The safety-related automation system AC31-S allows small, distributed control units to be designed and standardised. They operate autonomously at a local level where the safety function is required. The relevant, related inputs and outputs are installed in the field where the signal is detected or output. They are connected to their central unit via the AC31 Safety Fieldbus. This helps, once again, to save on cables. These control units can be networked flexibly and can exchange data among each other or with a higher-level system.

Economical

The Advant Controller 31-S requires no redundant central unit for safety functions, so this system is lowcost both as regards hardware and as regards engineering. The I/O units at a local level already feature an internal 2-channel structure and monitor themselves, including passive error and fault detection.

One set of hardware for all functions

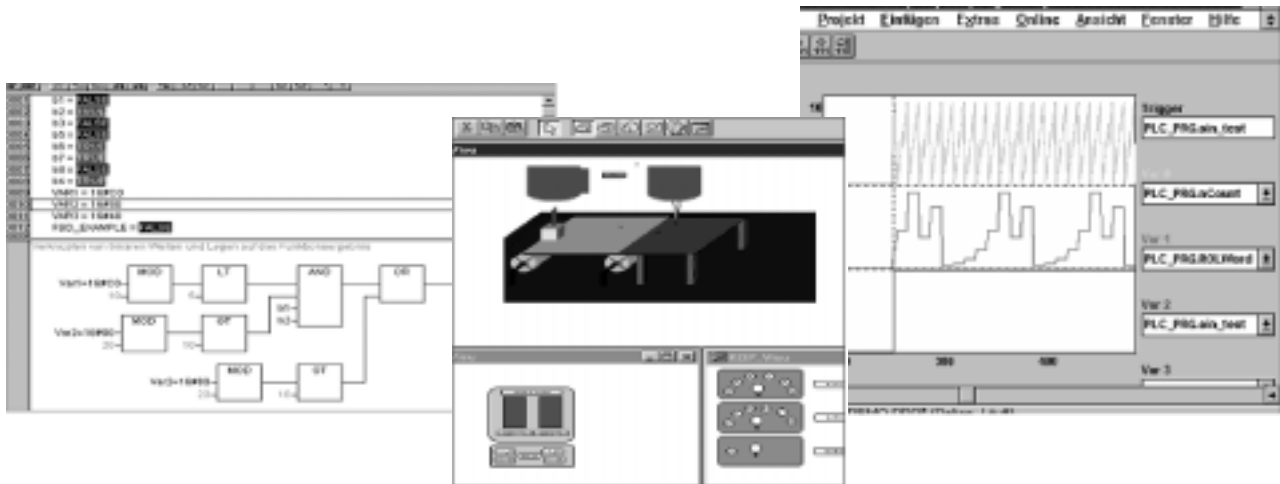
The hardware of the Advant Controller 31-S supports the safety functions and operating functions simultaneously. At the AC31 safety field bus safety-related I/O modules and standard I/Os can be mixed.

The safety-related functions are programmed with the help of certified function blocks.

The controller is certified for requirement class 4 and safety categorie 3.

Control^{IT} Automation Devices

Overview



Programming package 907AC1131

For the integrated programming of AC31 central units according to IEC61131-3.

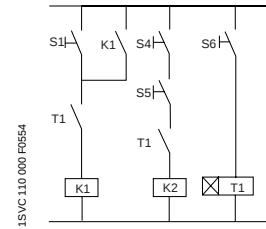
907AC 131 offers the following functionalities:

- **6 programming languages:** Function Block Diagram (FBS), Instruction List (IL), Ladder Diagram (LD), Structured Text (ST) and Sequential Function Chart (SFC) and Continuous Function Chart (CFC).
- **Debugger:** for the step-by-step processing of the automation program, including setting of breakpoints.
- **Offline simulations:** IEC-61131-3 commands including fault behaviour can be simulated for an external controller. After testing, the application can be transferred to the controller.
- **Sampling Trace** (chronological portrayal of process variables) and a visualisation – with integration of pictures and illustrations and display of process-variables from the controller.
- **Recipe administration and watch lists:** values of selected variables can be displayed. Variables can be preallocated with dedicated values and be transferred to the controller all at once. („Writing the recipe“). Current values of the controller can be imported and saved in the same manner into the recipe and watch list manager as preallocations („Reading the recipe“). These functions are especially helpful e.g. for the adjustment and gathering of control parameters.
- **Visualization** with color changes, moving elements, bitmaps, textdisplay, set value input and display of process variables from the controller. Dynamic columns, alarm and event processing, function keys. The graphics are created with the help of the software package 907 AC1311 and can be also used with the operator version that is available separately on the CD.
- **Configuration** for PROFIBUS-DP, DeviceNet, Ethernet, CANopen.
- **Open interfaces** DDE and OPC.
- **Programming** using ARCNET and Ethernet.
- **Engineering interface** for accessing an external project data base from the programming system, where data is administered that accumulates while building an automation project. The use of an external data base ensures the consistency of the data, which then can be used mutually by several users, projects and programs.
- Extensive libraries.
- Windows 32 bit standard.
- Operating systems Windows 98, NT, 2000 und XP.
- **Visualisation package:** program for the operation of a machine or installation. Graphics created with the programming software are displayed online.

Logic module AC010

Concept

Logical control instructions instead of wiring



Concept

The logic modules AC010 are ideally suited for small to mid-sized control duties and are a simple and fast replacement for logical wirings.

Many applications can be found in control areas as well as for time functions, e.g.:

- in buildings, lighting installations, air conditionings, for general control functions,
- in small machines and installations,
- as stand-alone control module for small applications.

Steps for the implementation of AC010

- AC010 is suited for simple, fast and convenient implementation without having to spend too much time on planning and programming.
- In no time the user can learn about the advantages and benefits of logic modules like AC010.
- AC010 takes over the control functions according to the programmed basic wiring diagram.
- Setup, saving, simulation and documentation is done with the compact, easy-to-use software package AC010-PS001.

Software attributes

- Display on a PC monitor according to DIN, ANSI.
- Choose between various languages.
- Easy installation on all Windows operating systems.

Technical data

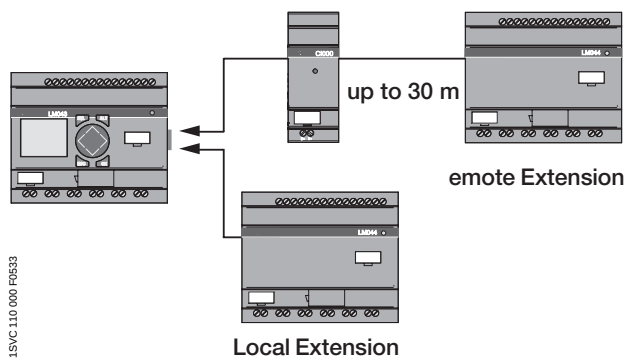
central und decentral extension modules.
Max. extensions: 24 inputs/ 16 outputs.

- digital inputs
- 2 analogue inputs
- relay outputs, 8 A max.
- transistor outputs, 0.5 A
- with or without display

Software attributes

- logical combinations
- time functions
- counter
- time control with week function
- real-time clock
- comparison functions

Extension



AC010 12/6-8 I/O logic modules are easily extendable.
These I/O-extensions are possible locally as well as decentrally.

Approvals	LMxxx	DO	DX
UL	•	•	•
SP	•	•	•
PC	•	•	•

Logic module AC010

Applications and Benefits

Product overview

Applications

Industrial

- machine building
- compressor control
- gas- / airdryer
- packaging machines
- transport systems
- etc.

Building technology

- control of lights and doors
- fans
- air conditioning systems

Power engineering

- generators
- solar- and wind technology
- water supply
- sewage technology
- etc.

Oil, gas and water

- pump control
- tank- und level control
- etc.

Costsaving benefits

- Control programmes, logical functions, time modules, relay in one device
- Saves time and costs in the planning and adaption of the project
- Fast and economical solution for logic control and wiring
- Fast and easy handling
- Very little investment of time necessary for getting to know AC010 applications
- Extendable up to 40 I/Os
- Display for text informationen, parameters, wiring and status
- Memory card for saving the program or for saving times and functions
- Password protection
- Compact and convenient software for programming and documentation

Product overview

Type	Supply 115/230 V AC	Supply 24 V DC	Supply 12 V DC	Inputs	Outputs: R = Relay, T = Transistor	Continuous current Outputs	LC Display, key pad	Text display	Week function time control	Extendable with modules in following columns	DO001-EX02R (only lokally)	DX001-EX18RAC	DX011-EX18RDC	DX021-EX20TDC
LM021-12RDC		x		8	4R	8 A	x		—	—				
LM022-C12RDC		x		8	4R	8 A	x		x	—				
LM023-C12RDC12V			x	8	4R	8 A	x		x	—				
LM024-CX12RDC		x		8	4R	8 A	—		x	—				
LM025-C12TDC		x		8	4T	0.5 A	x		x	—				
LM026-CX12TDC		x		8	4T	0.5 A	—		x	—				
LM041-CE18RDC		x		12	6R	8 A	x	x	x	x	x	x	x	x
LM042-CXE18RDC		x		12	6R	8 A	—		x	x	x	x	x	x
LM043-CE20TDC		x		12	8T	0.5 A	x	x	x	x	x	x	x	x
LM044-CXE20TDC		x		12	8T	0.5 A	—		x	x	x	x	x	x
LM001-12RAC	x			8	4R	8 A	x		—	—				
LM002-C12RAC	x			8	4R	8 A	x		x	—				
LM003-CX12RAC	x			8	4R	8 A	—		x	—				
LM011-CE18RAC	x			12	6R	8 A	x	x	x	x	x	x	x	x
LM012-CXE18RAC	x			12	6R	8 A	x	x	x	x	x	x	x	x

Control^{IT} Automation Devices

System data

System data AC31 series 40..50

Operation and environmental conditions

Environmental conditions

• Temperature:	
Operation: horizontal	0 °C to + 55 °C
vertikal	0 °C to + 40 °C
Storage	– 40 °C to + 75 °C
Transport	– 25 °C to + 75 °C
• Humidity:	DIN 40040 class F without bedewing
Annual average	≤ 75%
up to 30 day of the year	95%
occasional	85%
• Air pressure:	DIN 40050
Operation	≥ 800 hPa (≤ 2000 m)
Storage	≥ 600 hPa (≤ 3500 m)

Mechanical data

• Protection class	IP 20
• Housing	UL V2
• Vibration resistance	CEI68-2-8 Test Fc
• Shock resistance	CEI68-2-27 Test Ea

Tolerances for line voltage

• 24 V DC	9.2 to 30 V (– 20%, + 25%)
• 120 V AC (50 / 60 Hz)	97.75 to 126.5 V (– 18.5%, + 5.5%)
• 230 V AC (50 / 60 Hz)	195.5 to 253 V (– 15%, + 10%)

Control^{IT} Automation Devices

System data

System data AC31 series 90

Operation and environmental conditions

• Voltages		
24 V DC	operation and supply voltage	24 V DC (+ 20%, – 15% without ripple)
	absolut limits	19.2 V ... 30 V, incl. ripple
	ripple	≤ 5%
120 V AC	supply voltage	120 V AC (+ 10%, – 15%)
	frequency	50 Hz (+ 5%, – 5%) oder 60 Hz (+ 5%, – 5%)
230 V AC	supply voltage	230 V AC (+ 10%, – 15%)
	frequency	50 Hz (+ 5%, – 5%) oder 60 Hz (+ 5%, – 5%)
• voltage interruption bridging time		
	DC-supply	interruption ≤ 10 ms, time between two interruptions ≥ 1 s
	AC-supply	interruption ≤ 0.5 periods, time between two interruptions ≥ 1 s
• temperature	operation	0 °C ... + 55 °C
	storage	– 25 °C ... + 75 °C
	transport	– 25 °C ... + 75 °C
• humidity		50 ... 95%, without bedewing
• air pressure	operation	≥ 800 hPa / ≤ 2000 m
	storage	≥ 660 hPa / ≤ 3500 m

Creeping and sparking distances

Creeping and sparking distances comply with	surge category II, pollution degree 2
---	---------------------------------------

Check voltages

230 V circuits (net, 230 V I/Os)	
against other circuits	2500 V
120 V circuits (net) against other circuits	1500 V
24 V circuits (feed, 24 V I/Os), if they are potentially separated against other circuits	500 V
CS31-Bus against other circuits	500 V

Electromagnetic compatibility

• interference resistance		
against electrostatic discharge (ESD)		acc. to DIN 61000-4-2
– interference voltage air discharges		8 kV
– interference voltage contact discharges		4 kV
• Capacitance immunity (CW radiated)		acc. to DIN 61000-4-5
– field intensity at check		10 V / m
• interference resistance against transient noise voltages (burst)		acc. to DIN 61000-4-6
– voltage supply (AC / DC)		2 kV
– digital I/Os (24 V DC)		1 kV
– digital I/Os (120 / 230 V AC)		2 kV
– analogue I/Os		1 kV
– CS31 system bus		2 kV
– serial interfaces (COM)		0.5 kV
– ARCnet		0.5 kV
• interference resistance against radio-frequency noise power (CW conducted)		acc. to DIN 61000-4-6
– test voltage		10 V
• emitted interference		acc. to EN 55011 Funkstörgrad A and to EN 55022 Funkstörgrad A (communication modules only)

Control^{IT} Automation Devices

System data

System data AC31 series 90 (cont.)

Mechanical data

Connection types / Terminals

for terminal block ECZ

screw terminal for slot- and crosstip screwdriver,
conductor connection: max. 2 x 2.5 mm²

for plug-in row clamps (large)

screw terminal for slot- and crosstip screwdriver,
conductor connection: max. 2.5 mm²

for plug-in row clamps (small)

screw terminal for slot- and crosstip screwdriver,
conductor connection: max. 1.5 mm²

• Protection class

IP 20

• Housing

acc. to UL 94

• Vibration resistance

for all three axis

10 Hz ... 57 Hz continuous: 0,0375 mm
peak: 0,075 mm

57 Hz ... 150 Hz continuous: 0,5 g
peak: 1,0 g

• Shock resistance

for all three axis

15 g, 11 ms, halbsinusförmig

Mounting

DIN-rail acc. to DIN EN 50022,
only for terminal block ECZ:

35 mm, height 15 mm

height 7.5 mm and 15 mm

Screw mounting

screws, diameter 4 mm

Interfaces

between central unit and I/O modules

EIA RS-485 (CS31 system bus)

for the programming units and the connection with a
terminal, 9-pol. D-SUB jack

EIA RS-232

PLC etc.

Control^{IT} Automation Devices

Overview Central Units

	Small PLC AC31 series 40..50						Slot-PLC AC31 series 90		
Details	Type:	CR41	CT41	CR42	CT42	KR51	KT51	SL97	
Program memory Flash EPROM and RAM [KByte]		32				32		480	
Supply voltage 24 V DC 120 / 230 V AC		x x	x –	x x	x –	x x	x –		
Pug-in Smart Media Card		–				–		x	
Cycle time for 1 KByte [ms] 100% binary values 65% binary values and 35% text		0.4 1.2				0.4 1.2		– 0.22	
Number of inputs and outputs Integrated (DI / DO / DC) DI/DO maximum integrated (AI / AO) AI/AO maximum		8 / 6 / – 110 – / – 36		8 / 6 / – 110 3 / – 36		8 / 6 / – 1000 – / – 222		– / – / – 992 – / – 224 / 224	
Digital inputs 24 V DC		x				x		–	
Digital outputs: Transistor (T) 24 V DC, 0,5 A Relays (R) 120 / 230 V AC, 2 A		– x	x –	– x	x –	– x	x –	– –	
Analogue input range ± 10 V 0 ... 10 V, 0 ... 5 V, ± 5 V 0 ... 20 mA, 4 ... 20 mA PT100 (– 50 °C ... + 400 °C) PT100 (– 30 °C ... + 70 °C) PT100 (– 100 °C ... + 524 °C) configurable as DI		– – – – – – –		x – – – – x –		– – – – – – –		– – – – – – –	
Analogue output range ± 10 V 0 ... 20 mA, 4 ... 20 mA		– –				– –		– –	
Data buffering via battery		integrated				integrated		optional	
Real-time clock		x				x		x	
Programming package 907 AC 1131 907 PC 331 AC31GRAF		x x x				x x x		x – –	
Programm execution cyclical or time driven multitasking		x x				x x		x x	
user program protection password		x				x		x	
Serial interfaces RS232 (programming, MODBUS, ASCII) RS485 (CS31 as MODBUS)		1 –				1 (RS232 or RS485) 1		1 –	
Integrated potentiometer		2				2		–	
Data memory [KByte]		2				2		256, incl. 16 KB RETAIN	
Timers		unlimited (42 at the same time)				unlimited (42 at the same time)		unlimited	
Counters		unlimited (function)				unlimited (function)		unlimited	
High-speed counters (number/frequency)		2 / 7 kHz				2 / 7 kHz		–	
Interfaces / Protocols CS31 ASCII MODBUS® Ethernet ARCNET PROFIBUS-DP CANopen DeviceNet AC31Safety-Fieldbus RCOM (additional coupler)		– x x – – – – – – –				x x x – – – – – –		x x x – x x – x – –	
Note:		centrally expandable with 6 I/O modules of series 40 ... 50, max. Up to 110 digital or up to 36 analogue or mixed.							

Control^{IT} Automation Devicesers

Overview Central Units

Compact PLC AC31 series 90				Safety PLC AC31 series 90
KT95	KT96	KT97	KT98	KT94-S
480	480	480	1000	240
x —	x —	x —	x —	x —
x	x	x	x	x
— 0.22	— 0.22	— 0.22	— 0.07	— 0.22
12 / 8 / 0 1012 4 / 2 228 / 226	24 / 16 / 0 1032 — 224 / 224	24 / 16 / 8 1040 8 / 4 232 / 228	24 / 16 / 8 1040 8 / 4 232 / 228	24 / 16 / 8 992 8 / 4 224 / 224
x	x	x	x	x
x —	x —	x —	x —	x —
x x — — — — —	— — — — — — —	x x x x x — x	x x x x x — x	x x x x x — x
x —	— —	x x	x x	x x
optional	optional	optional	optional	optional
x	x	x	x	x
x — —	x — —	x — —	x — —	— x —
x x	x x	x x	x x	— —
x	x	x	x t	x
2 —	2 —	2 —	2 —	2 —
—	—	—	—	—
256, incl. 16 KB RETAIN	256, incl. 16 KB RETAIN	256, incl. 16 KB RETAIN	1256, incl. 256 KB RETAIN	256, incl. 16 KB RETAIN
unlimited	unlimited	unlimited	unlimited	unlimited (80 at the same time)
unlimited	unlimited (function)	unlimited (function)	unlimited	unlimited
2 / 50 kHz	2 / 50 kHz	2 / 50 kHz	2 / 50 kHz	2 / 50 kHz
x x x — — — — — — x	x x x — — — — — — x	x x x x x x x — x	x x x x x x x — x	x x x — — — — — x x
Note:				Connection of safety-related-I/O and standard-I/O

PLC etc.

Control^{IT} Automation Devices

I/O modules AC31 series 40..50, series 90 and S500

Overview

Digital I/O modules	Bus modules series 50 ^{*1)}			Series 40 .. 50							
				Only in connection with bus modules or CPU							
	ICMK 14 F1	ICMK 14 F1	ICMK 14 N1	XI 16 E1	XO 16 N1	XO 08 Y1	XO 08 R1 *2)	XO 08 R2	XC 08 L1	XK 08 F1	XC 32 L1 *3)
Supply voltage 24 V DC 230 V AC	x —	— x	x —	x x	x x	x x	x x	x x	x x	x x	x x
Number of digital I/Os (DI / DO / DC)	8 / 6 / -	8 / 6 / -	8 / 6 / -	16 / - / -	- / 16 / -	- / 8 / -	- / 8 / -	- / 8 / -	- / - / 8	4 / 4 / -	- / - / 32
Digital inputs 24 V DC				—	—	—	—	—	x	x	x
Digital outputs : relay (R) 120 / 230 V AC, 2 A transistor (T) 24 V DC, 2 A transistor (T) 24 V DC, 0.5	x — —	x — —	— — x	— — —	— — —	— — —	x — —	x — —	— — x	x — —	— — x
Short circuit- / overload-proof	x	x	x	x	x	x	x	x	x	x	x
Interfaces / protocols CS31 field bus PROFIBUS-DP	x —	x —	x —	— —	— —	— —	— —	— —	— —	— —	— —
Connection type (1=1-cond., 3=3-cond.) spring-type terminal screw terminal M12	1 1 —	1 1 —	1 1 —	1 1 —	1 1 —	1 1 —	1 1 —	1 1 —	1 1 —	1 1 —	with HE10 connector
Protection class IP67	—	—	—	—	—	—	—	—	—	—	—
Note:	^{*1)} centrally expandable with up to 6 I/O modules of series 40...50. (Max. 8 AI and 4 AO) ^{*2)} 4 normally open outputs + 4 normally open and normally closed outputs ^{*3)} 4 counters 20 kHz / 4 frequency meters can be connected to the pre-wiring system INTERFAST										

Analogue I/O modules	Series 40 .. 50				Series 90		S500		
	only with bus module or CPU						only with bus module		
	XM 06 B5	XE 08 B5	XC 08 ^{*4)}	XC 32 L2 ^{*5)}	07 AI 91	07 AC 91 ^{*6)}	AI511	AI512	AX511
Supply voltage 24 V DC 230 V AC	x x	x x	x x	x x	x —	x —	x —	x —	x —
Number of analogue I/Os AI / AO / AC	4 / 2 / -	8 / - / -	8 intern.	8 / - / -	8 / - / -	- / - / 16	4 / - / -	8 / - / -	4 / 4 / -
Analogue input signals 0 ... 10 V ± 10 V ± 20 mA 0 ... 20 mA 4 ... 20 mA ± 50 mV, ± 500 mV, ± 5 V PT100, PT1000 thermo-couple	— x x — x — x —	— x x — x — x —	— — — — — — — —	x — — — — — — —	— x — x — — x x	— x — x — — — —	x x x x x — — —	x x x x x — — —	x x x x x — — —
Analogue output signals ± 10 V 0 ... 20 mA, 4 ... 20 mA ± 20 mA	x x —	— — —	— — —	— — —	— — —	x x —	— — —	— — —	x x x
Short-circuit- / overload-proof	x	x	x	x	x	x	x	x	x
Interfaces/ Protocols CS31-Feldbus PROFIBUS DP	— —	— —	— —	— —	x —	x —	— x	— x	— x
Connection type (1=1-cond., 3=3-cond.) spring-type terminal screw terminal	1 1	1 1	1 1	with HE10 connection	1 1	1 1	3 3	3 3	3 3
Display channel number / value	x	x	x	—	—	—	—	—	—
Note:	^{*4)} Display for 8 internal channels ^{*5)} plus 24 configurable digitals (DC). Same as XC 32 L1 but 8 out of 32 DC can be used for AI. ^{*6)} incl. 1 x DI for shut-off of all AO of module. with 2 modes of operation: (1) 8 AI and 8 AO with 12 Bit resolution or (2) in pairs as AI or AO with 8 Bit.								

Control^{IT} Automation Devices

I/O modules AC31 series 40..50, series 90 and S500

Overview

Series 90							Bus modules S500 ^{*6)}		S500 only in connection with bus module		
07 DI 92	07DI93-I	07DO93-I	07DK93-I	07 DC 91	07 DC 92	07 TC90 / TC91 ^{*5)}	DX501-DP	DX502-DP	DX511	DI511	DO511
x —	x —	x —	x —	x —	x —	x —	x —	x —	x —	x —	x —
— / — / 32	16 / — / —	— / 8 / —	8 / 4 / —	16 / 8 / 8	— / — / 32	32 / 32 / —	8 / 8 / —	8 / 8 / —	8 / 8 / —	16 / — / —	— / 16 / —
x	x	—	x	x	x	—	x	x	x	x	—
—	—	—	—	—	—	—	—	—	—	—	—
—	—	x	x	—	—	—	—	—	—	—	—
x	—	—	—	x	x	—	x	x	x	—	x
x x	x	x	x	x	—	x	x	x	x	—	—
x —	x —	x —	x —	x —	x —	x —	— x	— x	— —	— —	— —
—	—	—	—	—	—	—	3	3	3	3	3
1	—	—	—	1	1	—	3	3	3	3	3
—	x	x	x	—	—	—	—	—	—	—	—
—	x	x	x	—	—	—	—	—	—	—	—
^{*5)} Special key pad for the connection of operating panels with up to 32 buttons / switches and 32 LEDs at the CS31 field bus.							^{*6)} Centrally expandable with up to 7 I/O modules of series S500, up to four of which can be analogue. Additional extension box available (digital or analogue channels in 1-conductor technology)				

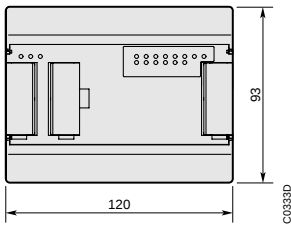
Safety-related I/O modules	07 DI 90-S	07 DO 90-S	07 AI 90-S
Supply voltage 24 V DC	x	x	x
Number of safety-related digital I/Os (DI / DO)	8 / — / —	— / 8 / —	— / — / —
Number of safety-related analogue I/Os (AI / AO)	— / —	— / —	4 / —
Digital inputs 24 V DC	x	—	—
Digital outputs: transistor (T) 24 V DC, 0.5 A	—	x	—
Analogue outputs: 4 ... 20 mA	—	—	x
Short circuit- / overload-proof	x	x	x
Interfaces / protocols AC31 Safety field bus	x	x	x
Connection type (1=1-cond., 3=3-cond.) screw terminal	1	1	1
Protection class IP67	—	—	—
Fault detection:			
short circuit	x	x	x
overload	—	x	—
breakd in cicuits	x	—	x
forbidden signal level	x	—	x
area over-, underrun	—	—	x
passive error	x	x	x
internal error	x	x	x
Internal 2-channel structures	x	x	x
Requirement class 4 (DIN19250)	x	x	x
Category 3 (EN954-1)	x	x	X
Note:	only in connection with saftey-related CPU KT94-S		

Control^{IT} Automation Devices

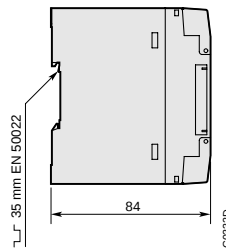
Central units, Communication couplers

Dimension Drawings

Central Units series 40..50 and bus module

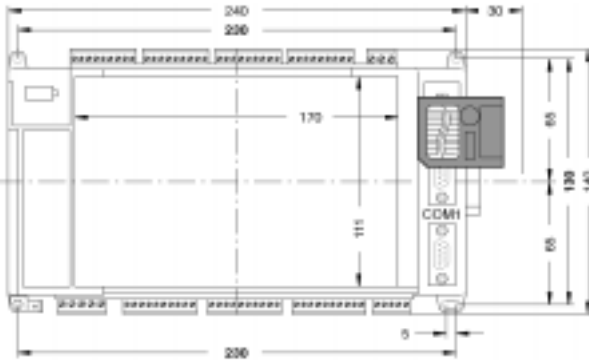


07CR41/42, 07CT41/42, 07KR51, 07KT51
and ICMK 14 F1N1

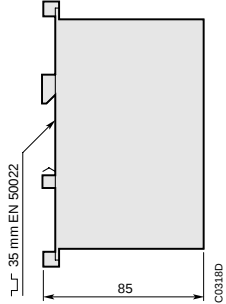


W x H x D [mm]	120 x 93 x 84
W x H x D [inches]	4.72 x 3.66 x 3.31
Mounting	35 mm – DIN rail acc. to DIN EN 50 022 or screw mounting

Central Units series 90

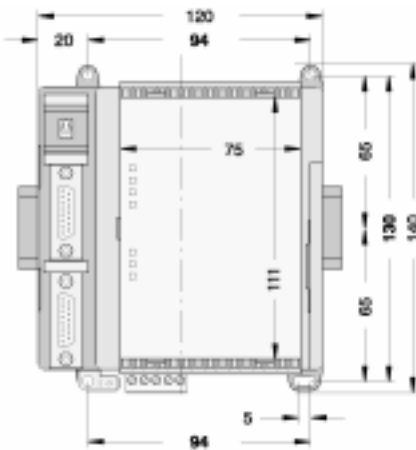


07KT94, 07KT94-S, 07KT96, 07KT97 and 07KT98



W x H x D [mm]	240 x 140 x 85
W x H x D [inches]	9,45 x 5,51 x 3,35
Mounting	35 mm – DIN rail acc. to DIN EN 50 022 or screw mounting

Communication modules series 90



07KP90, 07KP93

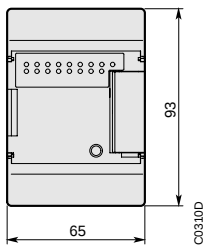
W x H x D [mm]	120 x 140 x 85
W x H x D [inches]	4,72 x 5,51 x 3,35
Mounting	35 mm – DIN rail acc. to DIN EN 50 022 or screw mounting

Control^{IT} Automation Devices

I/O modules

Dimension Drawings

I/O modules and communication modules series 40..50



W x H x D [mm]	65 x 93 x 84,5
W x H x D [inches]	2,56 x 3,66 x 3,33
Mounting	35 mm – DIN rail acc. to DIN EN 50 022 or screw mounting

XI16E1, XO16N1, XO08R1, XO08Y1, XC08L1, XK08F1, XM06B5, XE06B5, 07KP53

Approvals

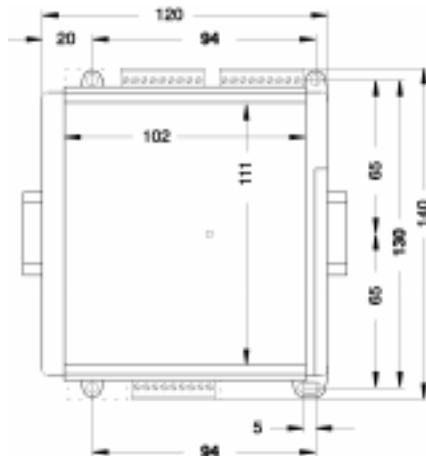


Germanischer Lloyd



Lloyds Register of Shipping

I/O modules series 90



W x H x D [mm]	120 x 140 x 85
W x H x D [inches]	4,72 x 5,51 x 3,35
Mounting	35 mm – DIN rail acc. to DIN EN 50 022 or screw mounting

07DI92, 07DC91/92, 07AI91, 07AC91, 07DO90-2, 07DI90-S, AI90-S



Germanischer Lloyd



UL



CSA

Lloyds Register of Shipping

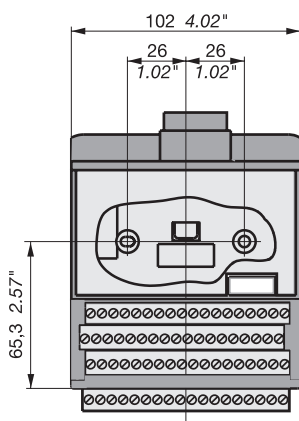
Det Norske Veritas



TÜV, BG
for
AC 31-s

Büro Veritas

I/O module S500 for PROFIBUS-DP



W x H x D [mm]	102 x 65,3 x 79
W x H x D [inches]	4,02 x 2,57 x 3,11
Mounting	35 mm – DIN rail acc. to DIN EN 50 022 or screw mounting



PLC etc.

Control^{IT} Automation Devices

Small PLC – AC31 series 40..50

Ordering data



07 CR 41

SB767C3

Central Units AC31 series 40

Description: see „Overview Central Units“. Centrally expandable with up to 6 I/O modules. CRxx: relay outputs, CTxx: transistor outputs. Program memory without / with online changes: 34 [kB] / 16 [kB].

Type	I/O (DI / DO / AI) integrated	Counter inputs/ impulse outputs integrated	Supply voltage	Connection type	Order Number		Weight 1 piece kg
07 CR 41	8 / 6 / –	2 / –	24 V DC	screw terminal	1SBP 26 0020 R1001		0.400
				spring-type terminal	1SBP 26 0520 R1001		0.400
			120/230 AC	screw terminal	1SBP 26 0021 R1001		0.800
				spring-type terminal	1SBP 26 0521 R1001		0.800
07 CT 41	8 / 6 / –	2 / 1	24 V DC	screw terminal	1SBP 26 0022 R1001		0.400
				spring-type terminal	1SBP 26 0522 R1001		0.400
07 CR 42	8 / 6 / 3	2 / –	24 V DC	screw terminal	1SBP 26 0023 R1001		0.400
			120/230 AC	screw terminal	1SBP 26 0024 R1001		0.800
07 CT 42	8 / 6 / 3	2 / 1	24 V DC	screw terminal	1SBP 26 0025 R1001		0.400

Central units AC31 series 50

Description: see „Overview Central Units“. Integrated CS31 field bus. Centrally expandable with up to 6 I/O modules, decentrally up to 31 I/O modules. KRxx: relay outputs, KTxx: transistor outputs. Program memory without / with online changes: 34 [kB] / 16 [kB].

Type	I/O (DI / DO / AI) integrated	Counter inputs/ impulse outputs integrated	Supply voltage	Connection type	Order Number		Weight 1 piece kg
07 KR 51	8 / 6 / –	2 / –	24 V DC	screw terminal	1SBP 26 0010 R1001		0.400
				spring-type terminal	1SBP 26 0510 R1001		0.400
			120/230 AC	screw terminal	1SBP 26 0011 R1001		0.800
				spring-type terminal	1SBP 26 0511 R1001		0.800
07 KT 51	8 / 6 / –	2 / 1	24 V DC	screw terminal	1SBP 26 0012 R1001		0.400
				spring-type terminal	1SBP 26 0512 R1001		0.400



07 KR 51

SB764C3

Bus modules series 40..50

Description: see „Overview I/O modules“. Integrated CS31 field bus. Centrally expandable with up to 6 I/O modules (Max. 8 AI / Max. 4 AO).

Type	Number DI / DO	Relay/ transistor- outputs	Supply voltage	Connection type	Order Number		Weight 1 piece kg
ICMK 14 F1	8 / 6	Relay	24 V DC	screw terminal	1SBP 26 0050 R1001		0.400
				spring-type terminal	1SBP 26 0550 R1001		0.400
ICMK 14 F1	8 / 6	Relay	120/230 AC	screw terminal	1SBP 26 0051 R1001		0.800
				spring-type terminal	1SBP 26 0551 R1001		0.800
ICMK14 N1	8 / 6	Transistor	24 V DC	screw terminal	1SBP 26 0052 R1001		0.400
				spring-type terminal	1SBP 26 0552 R1001		0.400



ICMK 14 F1

SB765C3

Bus modules series 40..50

Description: see „Overview I/O modules“. MODBUS RTU slave integrated. Automatic baudrate adaption. Centrally expandable with up to 6 I/O modules, either digital or analogue.

Type	Number DI / DO	Relay/ transistor- outputs	Supply voltage	Connection type	Order Number		Weight 1 piece kg
ICMK 14 F1-M	8 / 6	Relay	24 V DC	screw terminal	1SBP 26 0053 R1001		0.400
ICMK 14 F1-M	8 / 6	Relay	120/230 AC	screw terminal	1SBP 26 0054 R1001		0.800
ICMK14 N1-M	8 / 6	Transistor	24 V DC	screw terminal	1SBP 26 0055 R1001		0.400

Control^{IT} Automation Devices

Small PLC – AC31 series 40..50

Ordering data



XI 16 E1

SB7666C2

Digital I/O modules series 40..50

Description: see „Overview I/O modules“.

Type	Number of DI / DO / DC	Input signal	Output signal	Connection type	Order Number		Weight 1 piece kg
XI 16 E1	16 / – / –	24 V DC	–	screw terminal	1SBP 26 0100 R1001		0.220
				spring-type terminal	1SBP 26 0600 R1001		0.220
XO 16 N1	– / 16 / –	–	24 V DC, 0.5 A	screw terminal	1SBP 26 0105 R1001		0.220
				spring-type terminal	1SBP 26 0605 R1001		0.220
XO 08 Y1	– / 8 / –	–	24 V DC, 2 A	screw terminal	1SBP 26 0108 R1001		0.220
				spring-type terminal	1SBP 26 0608 R1001		0.220
XO 08 R1	– / 8 / –	–	250 V AC, 2 A	screw terminal	1SBP 26 0101 R1001		0.220
				spring-type terminal	1SBP 26 0601 R1001		0.220
XO 08 R2^{*)}	– / 8 / –	–	250 V AC, 2 A	screw terminal	1SBP 26 0109 R1001		0.220
				spring-type terminal	1SBP 26 0609 R1001		0.220
XC 08 L1	– / – / 8	24 V DC	24 V DC, 0.5 A	screw terminal	1SBP 26 0102 R1001		0.220
				spring-type terminal	1SBP 26 0602 R1001		0.220
XK 08 F1	4 / 4 / –	24 V DC	250 V AC, 2 A	screw terminal	1SBP 26 0104 R1001		0.220
				spring-type terminal	1SBP 26 0604 R1001		0.220
XC 32 L1^{**)}	– / – / 32	24 V DC	24 V DC, 0.5 A	HE10 connector	1SBP 26 0110 R1001		0.220

^{*)} 4 normally open outputs + 4 normally open and normally closed outputs

^{**)} 4 counters 20 kHz/4 frequency meters can be connected to prewiring system INTERFAST. HE10 not included

Analogue I/O modules series 40..50

Description: see „Overview I/O modules“.



XM 06 B5

SB7668C2

Type	Number of AI / AO	Input signal	Output signal	Connection	Order Number		Weight 1 piece kg
XM 06 B5	4 / 2	± 10 V, ± 20 mA 4 ... 20 mA, PT100, PT1000	± 10 V, 0 ... 20 mA, 4 ... 20 mA	screw terminal	1SBP 26 0103 R1001		0.220
				spring-type terminal	1SBP 26 0603 R1001		0.220
XE 08 B5	8 / –	± 10 V, ± 20 mA 4 ... 20 mA, PT100, PT1000	–	screw terminal	1SBP 26 0106 R1001		0.220
				spring-type terminal	1SBP 26 0606 R1001		0.220
XC 32 L2^{*)}	8 / –	0-10 V	–	HE10 connector	1SBP 26 0111 R1001		0.220

^{*)} plus 24 configurable digitals (DC) Same as XC 32 L1, but 8 out of 32 DC can be used for AI

4 counters 20 kHz/4 frequency meters can be connected to prewiring system INTERFAST. HE10 not included

Communication modules for Central Units of series 40..50

Networking interface for small-sized controller AC31 series 40..50. Connection with the central unit via ribbon cable. Voltage supply from central unit. Cable: see accessories.

Type	Protocol	Software	Interfaces	Order Number		Weight 1 piece kg
07 KP 53	MODBUS	included (in AC1131 and AC31GRAF)	2 independent MODBUS, RTU, Master or Slave (RS232/RS485)	1SBP 26 0162 R1001		0.220

Display series 40..50

Supplied by central unit or bus module

Type	Description	Order Number		Weight 1 piece kg
XTC 08	Display for 8 internal channels (4 digits + signs + selected channel)	1SBP 26 0107 R1001		0.220

Control^{IT} Automation Devices

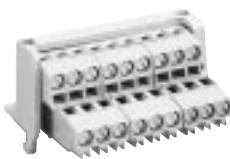
Small PLC – AC31 series 40..50

Ordering data



07 SK 50

SB7628C3



07 ST 50

SB7630C3

Accessories series 40..50

Type	Accessories for	Description	Order Number		Weight 1 piece kg
07 SK 50	Central units Series 40 ... 50 MODBUS Coupler KP53	Programming cable. PC-Sub D, 9-poles	1SBN 26 0200 R1001		0,220
07 SK 52		Programming cable. without connector on the PC side	1SBN 26 0202 R1001		0,220
07 SK 51		Communication cable MODBUS/ASCII, PC-Sub D9 plug	1SBN 26 0201 R1001		0,100
07 SK53		Communication cable MODBUS/ASCII, without connector on the PC side	1SBN 26 0203 R1001		0,220
07 SG 50	Central units Series 40 ... 50	Simulation device for CPUs 8 switches	1SAY 11 0811 R0001		0,220
LAF100/HE10- 20/UNI/662/UL*	I/O modules XC32L1 / XC32L2	Cable with HE10 connector for exten. and naked wire on the other side length: 1 meter	003900706		
LAF150/HE10- 20/UNI/662/UL*	I/O modules XC32L1 / XC32L2	Cable with HE10 connector for exten. and naked wire on the other side length: 1.5 meters	003900825		
LAF200/HE10- 20/UNI/662/UL*	I/O modules XC32L1 / XC32L2	Cable with HE10 connector for exten. and naked wire on the other side length: 2 meters	003900906		
LAF300/HE10- 20/UNI/662/UL*	I/O modules XC32L1 / XC32L2	Cable with HE10 connector for exten. and naked wire on the other side length: 3 meters	003901104		
LAF500/HE10- 20/UNI/662/UL*	I/O modules XC32L1 / XC32L2	Cable with HE10 connector for exten. and naked wire on the other side length: 5 meters	003901322		
07 ST 50	CPUs and bus modules series 40..50, digital I/O modules	2-tier terminal for digital, 3-wire sensors / actuators, 2 pieces	1SBN 26 0300 R1001		0,220
07 ST 51	XM06B5, XE08B5	2-tier terminal for analogue, 3-wire sensors, 2 pieces	1SBN 26 0301 R1001		0,220
07 ST 52		2-tier spring-type terminal for digital, 3-wire sensors / actuators, 2 pieces	1SBN 26 0302 R1001		0,052
07 ST 54	CPUS and bus modules series 40..50	spring-type terminal set	1SBN 26 0311 R1001		0,052
07 ST 55	XI16E1, XO16N1, XE08B5	spring-type terminal set	1SBN 26 0312 R1001		0,052
07 ST 56	XO08R1, XC08L1, XK08F1	spring-type terminal set	1SBN 26 0313 R1001		0,052
07 ST 57	XM06B5	spring-type terminal set	1SBN 26 0314 R1001		0,052
	Series 40..50	labels for marking of the I/O channels	1SBN 26 0310 R1001		
Documentation	Series 40 ... 50	englisch	1SBC 26 0400 R1001		0.200
Documentation	Series 40 ... 50	french	1SBC 26 0401 R1001		0.200

* ref. to prewiring system INTERFAST documentation for additional information

INTERFAST harnesses are also available for Series 40 ... 50 central units + remote modules XI16E1, XO16N1, DC92

Control^{IT} Automation Devices

AC31 Series 90 – Compact PLC and Slot-PLC

Ordering data



07 KT 95

07_KT_94_perspective



07 KT 97

07_KT_94_perspective



07 KT 98

07_KT_94_perspective



07 SL 97

SL97

Compact PLC AC31 series 90

Description: see „Overview Central Units“. Integrated CS31 field bus.
Optional: Smart Media Card for saving data and user programm backup and battery (ref. accessories).

Type	Digital I/O (DI / DO / DC) integrated	Analogue I/O (AI / AO) integrated	Counter inputs	Program memory [kB]	Order Number		Weight 1 piece kg
07 KT 95	12 / 8 / –	4 / 2	2	480	GJR 525 2800 R0200		1.3
07 KT 96	24 / 16 / –	– / –	2	480	GJR 525 2900 R0200		1.3
07 KT 97	24 / 16 / 8	8 / 4	2	480	GJR 525 3000 R0200		1.3

Compact PLC AC31 series 90 – with up to 2 integrated communication processors

Description: see „Overview Central Units“. Integrated CS31 field bus.
Number I/Os identical with 07 KT 97.
Optional: Smart Media Card for saving data and user programm backup and battery (ref. accessories).

Type	Processor 1	Processor 2	Program memory [kB]	Order Number		Weight 1 piece kg
07 KT 97 - Profibus	PROFIBUS-DP	–	480	GJR 525 3000 R0220		1.3
07 KT 97 - CANopen	CANopen	–	480	GJR 525 3000 R0280		1.3
07 KT 97 - DeviceNet	DeviceNet	–	480	GJR 525 3000 R0250		1.3
07 KT 97 - Ethernet	Ethernet	–	480	GJR 525 3000 R0270		1.3
07 KT 97 - ARCNET	ARCNET	–	480	GJR 525 3000 R0260		1.3
07 KT 97 - Ethernet - ARCNET	Ethernet	ARCNET	480	GJR 525 3000 R0276		1.3
07 KT 97 - Ethernet - Profibus	Ethernet	PROFIBUS-DP	480	GJR 525 3000 R0272		1.3
07 KT 97 - Ethernet - CANopen	Ethernet	CANopen	480	GJR 525 3000 R0278		1.3
07 KT 97 - Ethernet - DeviceNet	Ethernet	DeviceNet	480	GJR 525 3000 R0275		1.3
07 KT 97 - Ethernet - Ethernet	Ethernet	Ethernet	480	GJR 525 3000 R0277		1.3
07 KT 97 - ARCNET - Profibus	ARCNET	PROFIBUS-DP	480	GJR 525 3000 R0262		1.3
07 KT 97 - ARCNET - CANopen	ARCNET	CANopen	480	GJR 525 3000 R0268		1.3
07 KT 98 - Profibus	PROFIBUS-DP	–	1000	GJR 525 3100 R0220		1.3
07 KT 98 - CANopen	CANopen	–	1000	GJR 525 3100 R0280		1.3
07 KT 98 - DeviceNet	DeviceNet	–	1000	GJR 525 3100 R0250		1.3
07 KT 98 - Ethernet	Ethernet	–	1000	GJR 525 3100 R0270		1.3
07 KT 98 - ARCNET	ARCNET	–	1000	GJR 525 3100 R0260		1.3
07 KT 98 - Ethernet - ARCNET	Ethernet	ARCNET	1000	GJR 525 3100 R0276		1.3
07 KT 98 - Ethernet - Profibus	Ethernet	PROFIBUS-DP	1000	GJR 525 3100 R0272		1.3
07 KT 98 - Ethernet - CANopen	Ethernet	CANopen	1000	GJR 525 3100 R0278		1.3
07 KT 98 - Ethernet - DeviceNet	Ethernet	DeviceNet	1000	GJR 525 3100 R0275		1.3
07 KT 98 - Ethernet - Ethernet	Ethernet	Ethernet	1000	GJR 525 3100 R0277		1.3
07 KT 98 - ARCNET - Profibus	ARCNET	PROFIBUS-DP	1000	GJR 525 3100 R0262		1.3
07 KT 98 - ARCNET - CANopen	ARCNET	CANopen	1000	GJR 525 3100 R0268		1.3

Slot-PLC AC31 series 90 (PCI fullsize) – with up to 2 integrated communication processors

Description: see „Overview Central unit“. Integrated ARCNET communication processor and CS31 field bus.
With own power supply 24 V DC, independent of PC. For operating systems MS-Windows like software package 907AC1131. Programming via PCI-interface or vial serial interface with second PC.
Optional: Smart Media Card for saving data and user programm backup and battery (ref. accessories).

Type	Number PC-Slots	Processor 2	Program memory [kB]	Order Number		Weight 1 piece kg
07 SL 97-ARCNET	1	–	480	GJR 525 3400 R0160		1.3
07 SL 97-ARCNET-Profibus	2	PROFIBUS-DP	480	GJR 525 3400 R0162		1.3
07 SL 97-ARCNET-DeviceNet	2	DeviceNet	480	GJR 525 3400 R0165		1.3

PLC etc.

Control^{IT} Automation Devices

AC31 Series 90 – Compact PLC and Slot-PLC

Ordering data

Digital I/O modules series 90

Description: see „Overview I/O modules“. Integrated CS31 field bus.
DC: Channels configurable as in- or outputs.

Type	Number DI / DO / DC	Input signal	Output signal	Details	Order Number	Weight 1 piece kg
07 DI 92	32 / – / –	24 V DC	–	input delay 7 ms	GJR 525 2400 R0101	0.25
07 DI 93-I	16 / – / –	24 V DC	–	input delay 1 ms. IP67. M12-connector s. acces.	GJV 307 5613 R0202	0.25
07 DO 93-I	– / – / 8	–	24 V DC / 2 A (T)		GJV 307 5611 R0202	0.25
07 DK 93-I	8 / 4 / –	24 V DC	24 V DC / 2 A (T)		GJV 307 5623 R0202	0.25
07 DC 91	16 / 8 / 8	24 V DC	24 V DC / 0,5 A (T)	input delay 7 ms	GJR 525 1400 R0202	0.25
07 DC 92	– / – / 32	24 V DC	24 V DC / 0,5 A (T)	input delay 7 ms in groups of 8 electrical isolation	GJR 525 2200 R0101	0.25
07 TC 90	– / – / –	– / – / –	–	Keypad controller for the connection of operating panels with up to 32 keys / switches and 32 LEDs on the CS31 bus, Voltage supply 24 V DC, without housing	GJR 525 1800 R0101	0.1
07 TC 91	– / – / –	– / – / –	–		GJR 525 2700 R0101	0.1

Analogue I/O modules series 90

Description: see „Overview I/O modules“. Integrated CS31 field bus.
AC: Channels configurable as in- or outputs.

Type	Number AI / AO / AC	Input signal	Output signal	Order Number	Weight 1 piece kg
07 AI 91	8 / – / –	± 10V, 0 ... 20mA, ± 50 mV, ± 500 mV, ± 5 V, PT100, PT1000, thermo-couple, 12 Bit	–	GJR 525 1600 R0202	0.25
07 AC 91*)	– / – / 16	± 10 V, 0 ... 20 mA, 4 ... 20 mA, 12 Bit	± 10 V, 0 ... 20mA, 4 ... 20 mA, 12 Bit	GJR 525 2300 R0101	0.25

*) incl. 1xDI for the shut-off of all AO of the module.
with 2 modes of operation: (1) 8 AI and 8 AO with 12 Bit resolution or (2) as pairs as AI or AO with 8 Bit.

Communication modules series 90

Further networking interfaces compac controllers AC31 series 90. Connection with the Central unit via ribbon cable. Voltage supply 24 V DC.

Type	Protocol	Software	Interfaces	Order Number	Weight 1 piece kg
07 KP 90	RCOM	included	2 (1) RCOM (RS232/RS485); (2) RS232 for commissioning	GJR 525 1000 R0303	0.45
07 KP 93	MODBUS	included	2 MODBUS, RTU, Master or Slave (RS232/RS485)	GJR 525 3200 R1161	0.4

ARCNET: Communication interfaces to PC

For the communication between ARCNET controllers and PC (programming, visualisation).

Type	Description	Order Number	Weight 1 piece kg
SH FARC E3 K	ARCNET-KOAX interface card for ISA bus, without RS485 transfer rate 2,5 Mbps	1SAY 11 1401R0001	
SH ARC PCI K	ARCNET-KOAX-interface card for PCI bus, transfer rate 2,5 Mbps	1SAY 11 1402R0001	
SH ARC PCMCIA	ARCNET-PCMCIA interface card (basic card)	1SAY 11 1403R0001	
SH KOAX- PCMCIA	KOAX interface module for basic card	1SAY 11 1404R0001	

Control^{IT} Automation Devices

Accessories Series 90, Software Package 907AC1131

Ordering data

Accessories series 90

Type	Accessory for	Description	Order Number		Weight 1 piece kg
07 SK 90	CPUs AC31 series 90 (KT94-S, KT95-KT98)	Programming cable incl. adapter 25/9-poles. Cable length 5 m	GJR 525 0200 R0001		
07 SK 92		System cable for modem	GJR 525 0400 R0001		
07 MC 90	CPUs 07KT94-S and 07KT94	Smart Media Card for saving data and backup of user program, 2 MB	GJR 525 2600 R0102		
07 MC 90	CPUs 07KT95 / 96 / 97 / 98 and 07SL97	Smart Media Card for saving data and backup of user program, 8 MB	GJR 525 2600 R0201		
07 LE 90	CPUs AC31 series 90 (07KT94-S, 07KT95, 07KT98, 07SL97)	Lithium battery for data buffering	GJR 525 0700 R0001		
German		Manual for AC31 (as in software package 907 AC 1131) Complete hard- und software- description. Includes CD-ROM with documentation.	1SAC 133 947 R0101		
English			1SAC 133 947 R0201		
-	Digital IP67 I/O modules DI93-I, DO93-I, DK93-I	Plug 5 poles, M12 straight. Connection for basic I/Os with FE connection	GJV 307 5617 R0001		
-		Plug 5 poles. M12 bent. AConnection for basic I/Os with FE connection	GJV 307 5618 R0001		
-		Plug 4 poles. M12 straight for double connection.	GJV 307 5624 R0001		
-	RCOM coupler 07KP90	For commissioning interface Adapter for programming cable 07SK90	GJV 307 3915 R0001		
-	AC31-S: 07KP94-S	interface cable incl. adapter for KT94-S with operating panel (passive mode)	GJR 525 0300 R0001		
07 SK 93	07SL97 Slot CPU	Programming cable MIN DIN 8/PC-SUB D	GJR 525 3500 R0001		
07 SK 94		Communication cable MIN DIN 8/-	GJR 525 3600 R0001		

Programming package 907AC1131 (acc. to IEC61131-3)

For small PLC AC 31 series 40...50 (functionalities adjusted), compact PLC AC31 series 90 and Slot-PLC 07 SL 97. Operating system: Windows 98 / NT / 2000 / XP. Description: see „Overview Software Package“.

Programming cable: see accessories.

Integrated: 6 programming languages, sampling trace, debugging, offline simulation,
trace recording (multichannel) recipe management, visualisation,
field bus configurators, online visualisation package and more.

Delivery includes: software, libraries and documentation on CD-ROM, update service.

Type	Language Manual	Description	Order Number		Weight
907 AC 1131	German	Programming package version 5.0	GJP 520 6900 R0102		
907 AC 1131	English	Programming package version 5.0	GJP 520 7000 R0102		

Programming package AC31GRAF (based on IEC61131-3)

For small PLC AC 31 series 40...50. Operating system: Windows 98 / NT / 2000.

Description: see „Overview Software Package“.

Programming cable: see accessories.

Integrated: 4 programming languages, debugging, visualisation, and much more.
Can be used with previous PLC Central units type 30 series and 07KT91 ... KT94

Delivery includes: software, libraries and documentation on CD-ROM.

Type	Language Manual	Description	Order Number		Weight
AC31GRAF	English	Programming package	1SBS 260 250 R0101		
AC31GRAF	French	Programming package	1SBS 260 251 R0101		
AC31GRAF	Italian	Programming package	1SBS 260 252 R0101		

Control^{IT} Automation Devices

Safety PLC AC31-S

Ordering data



07 KT 94-S



07 DI 90-S



07 DO 90-S



07 AI 90-S

Safety PLC AC31-S, Central Unit

Description: see „Overview CPUs“. Integrated AC31 safety field bus.
For programming of safety-related and operation functions in one CPU.
Integrated I/O for operation signals (not safety-related). Decentrally expandable with I/O modules for operation and for safety related signals on the AC31 safety field bus.

Type	Digital I/O (DI / DO / DC) integrated	Analogue I/O (AI / AO) integrated	Counter inputs	Program memory [kB]	Order Number		Weight 1 piece kg
07 KT 94-S	24 / 16 / 8	8 / 4	2	240	GJR 525 2100 R2101		1.3
07 KT 94-S *) ARCNET	24 / 16 / 8	8 / 4	2	240	GJR 525 2100 R2161		1.3

*) ARCNET integrated

Safety In-/Output modules

Decentral, internally redundant I/O modules, safety-related, power supply 24 V DC.
Screw terminals. Integrated AC31 safety field bus connection, electric isolation against bus.

Type	Digital I/O DI / DO / AI	Input signal	Output signal	Fault detection	Order Number		Weight 1 piece kg
07 DI 90-S	8 / - / -	24 V DC	-	Fault detection: short circuit after 0V and UP, wire break, forbidden input level range, passive fault, internal faults like bus disconnection.	GJR 525 0900 R0202		0.25
07 DO 90-S	- / 8 / -	-	24 V DC / 5 A (T)	Fault detection: Overload, resp. short circuit after ZP, passive fault, internal fault.	GJR 525 0800 R0202		0.25
07 AI 90-S	- / - / 4	4 ... 20 A	-	Fault detection: area over or underrun, short circuit, wire break, passive fault, internal fault.	GJR 525 1200 R0202		0.25

Programming software for safety-related programming

For safety PLC AC 31-S. Operating system: MS-DOS.
Programming cable: see accessories.
The programming software consists of the packages 907 PC 33 + 907 PC 331 + 907 PC 339.

Type	Description	Language of manual	Order Number		Weight 1 piece kg
907 PC 33	General description of the programming interface. Also includes: manual	German	GJP 520 3900 R0302		
		English	GJP 520 4000 R0302		
907 PC 331	Programming and test software. Programming languages: IL, FBD, LD. Includes: programming software on disc, manuals, update service.	German	GJP 520 4500 R0402		
		English	GJP 520 4600 R0402		
907 PC 339	Add-on safety-related functions for programming software 907 PC 331. For AC31-S central unit 07 KT94-S. Includes: safety manual, software on discs, update service.	German	GJP 520 7500 R0102		
		English	GJP 520 7600 R0102		

Control^{IT} Automation Devices

Bus Repeater

Ordering data

Bus repeater for CS31 field bus

Type	Supply voltage	Description	Ordering Number		Weight 1 piece kg
NCB	24 V DC	Repeater for CS31 bus max. length 2000 m (3 repeaters)	FPR 347 1200 R1002		0.34
NCBR	24 V DC	Repeater for CS31 bus for redundant, ring or star shaped bus configuration	FPR 347 1300 R1002		0.34

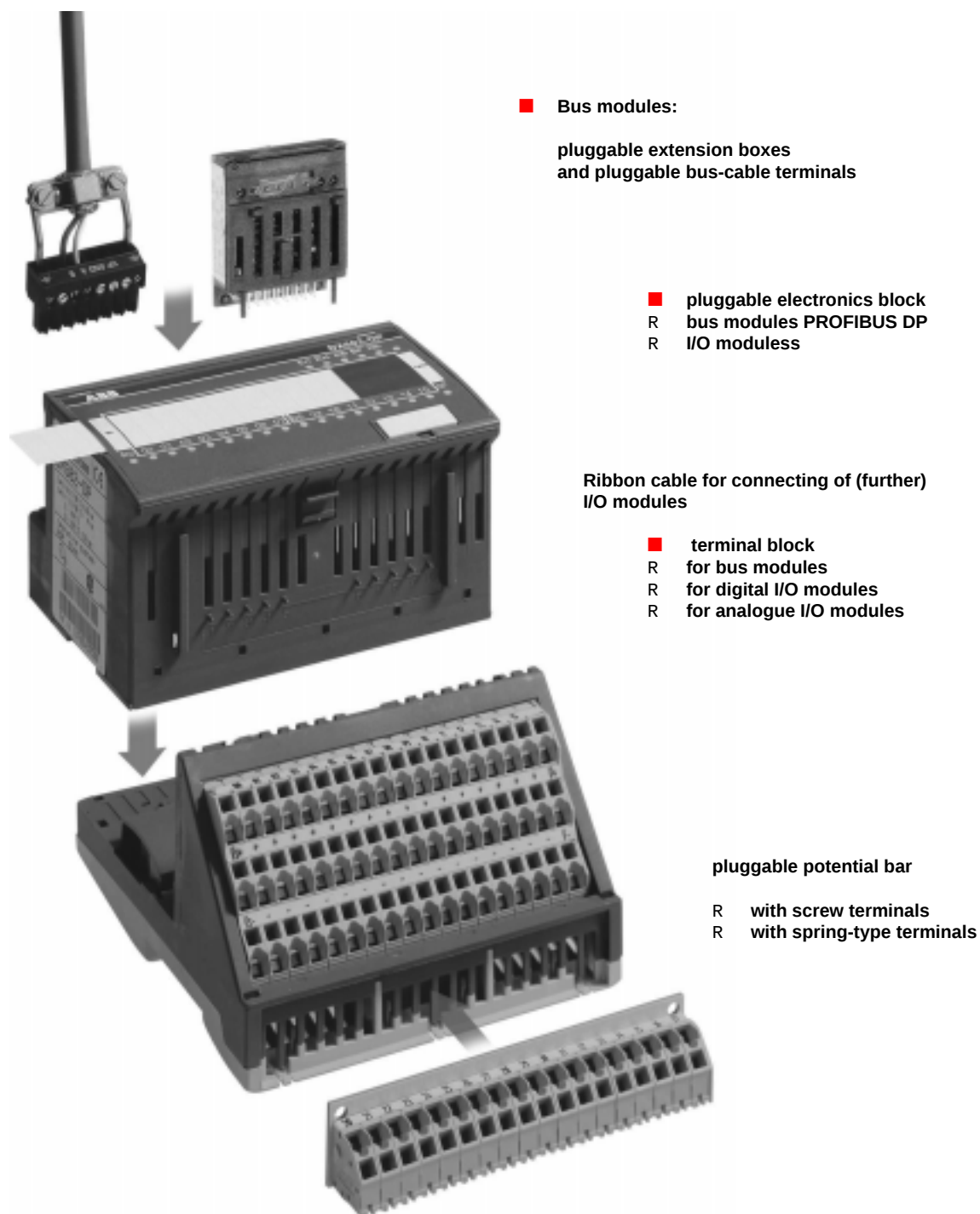
Bus repeater for RS485 MODBUS RTU network

Type	Supply voltage	Description	Ordering Number		Weight 1 piece kg
NCBR-M	24 V DC	Repeater for MODBUS communication. For redundant, ring or star shaped bus configuration	1SBP 260 161 R1001		0.34

S500 - decentral In-/Output modules for PROFIBUS DP

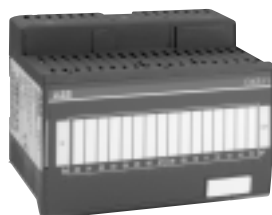
The PROFIBUS DP I/O modules S500 consist of a pluggable electronics block and the respective terminal block. The bus connection is achieved via a bus module. Up to 7 extension modules can be connected to the bus module (via ribbon cable).

Applicable with controllers with a PROFIBUS DP connection.



S500 - decentral In-/Output modules for PROFIBUS DP

Ordering data



2CDC33104P0003

DX 502-DP

S500 Bus modules for PROFIBUS DP

With bus connection to PROFIBUS DP. Integrated In-/Outputs. Centrally expandable with 7 expansion modules. Pluggable electronics module. The required, fitting terminal module for the connection of the I/Os has to be ordered separately, also see next table.

Type	Integrated inputs, digital (DI)	Integrated outputs (DO)	Voltage supply	Transfer rate	Order Number		Weight 1 piece kg
DX501-DP	8	8 transistor, 0.5 A	24 V DC	1.5 Mbit/s	1SVP 426 422 R0000		0.150
DX502-DP	8	8 transistor, 0.5 A	24 V DC	12 Mbit/s	1SVP 426 422 R5000		0.150



2CDC331025P0003

TU502

S500 terminal modules for bus modules

3-wire connection, 4-wire connection via optional potential bar. Screw- or spring type terminal. Fuses (5 x 20 mm) for the in- and outputs. Mounting on DIN rail or with screws. Direct shield connection via DIN rail.

Type	Description	Order Number		weight 1 piece kg
TU501	with screw terminals	1SVP 426 470 R0000		0.230
TU502	with spring-type terminals	1SVP 426 470 R1000		0.290



2CDC331009P0003

DI501

S500 digital extension box for bus modules

One extension each (digital or analogue) can be plugged into the back side of the bus module.

Type	Integrated inputs, digital (DI)	Integrated outputs (DO)	Connection via	Order Number		Weight 1 piece kg
DI501	4	–	pluggable terminal block	1SVP 426 463 R0000		0.020



2CDC331003P0003

AX501

S500 analogue extension box for bus modules

0-10 V, resolution 8 Bit. One extension each (digital or analogue) can be plugged into the back side of the bus module.

Type	Integrated inputs, digital (AI)	Integrated outputs (AO)	Connection via	Order Number		Gewicht 1 Stück kg
AX501	3	1	pluggable terminal block	1SVP 426 461 R0000		0.020

S500 - decentral In-/Output modules for PROFIBUS DP Ordering data



DX511

2CDC33101EP0003

S500 digital expansion modules

Pluggable electronics module. The required, fitting terminal module for the connection of the I/Os has to be ordered separately, also see next table..

Type	Integrated inputs, digital (DI)	Integrated outputs (DO)	Supply voltage	Order Number		Weight 1 piece kg
DX511	8	8 transistor, 0.5 A	24 V DC	1SVP 426 450 R0000		0.090
DI511	16	–	24 V DC	1SVP 426 430 R0000		0.090
DO511	–	16 transistor, 0.5 A	24 V DC	1SVP 426 451 R0000		0.900



DU511

2CDC331027F0003

S500 terminal modules for digital expansion modules

3-wire connection, 4-wire connection via optional potential bar. Screw- or spring type terminal. Fuses (5 x 20 mm) for the in- and outputs. Mounting on DIN rail or with screws. Direct shield connection via DIN rail.

Type	Description	Order Number		Weight 1 piece kg
TU511	with screw terminals	1SVP 426 471 R0000		0.230
TU512	with spring-type terminals	1SVP 426 471 R1000		0.190



AX511

2CDC331004F0003

S500 analogue expansion modules

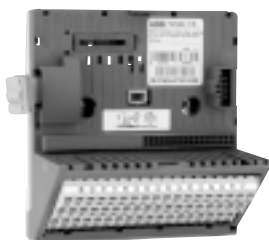
Pluggable electronics module. The required, fitting terminal module for the connection of the I/Os has to be ordered separately, also see next table..

Inputs: w 20 mA, w 10 V, 0 ... 20 mA, 4 ... 20 mA, 0 - 10 V

Outputs: w 20 mA, w 10 V, 0 ... 20 mA, 4 ... 20 mA

Resolution: 12 Bit (11 Bit + sign)

Typ	Integrated inputs, digital (AI)	Integrated outputss (AO)	Supply voltage	Order Number		Weight 1 piece kg
AI511	4	–	24 V DC	1SVP 426 435 R0000		0.110
AI512	8	–	24 V DC	1SVP 426 436 R0000		0.150
AX511	4	4	24 V DC	1SVP 426 455 R0000		0.150



TU526

2CDC331031F0003

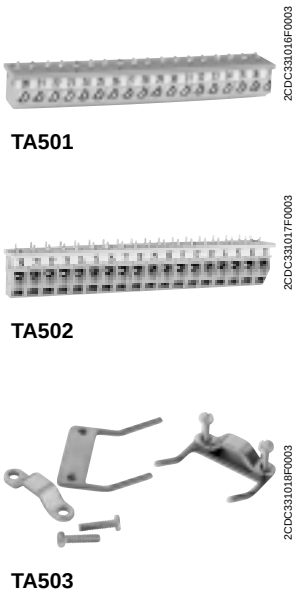
S500 terminal modules for analogue expansion modules

Screw- or spring type terminal. Mounting on DIN rail or with screws. Direct shield connection via DIN rail.

Type	Description	Order Number		Weight 1 piece kg
TU525	with screw terminals	1SVP 426 473 R0000		0.230
TU526	with spring-type terminals	1SVP 426 473 R1000		0.190

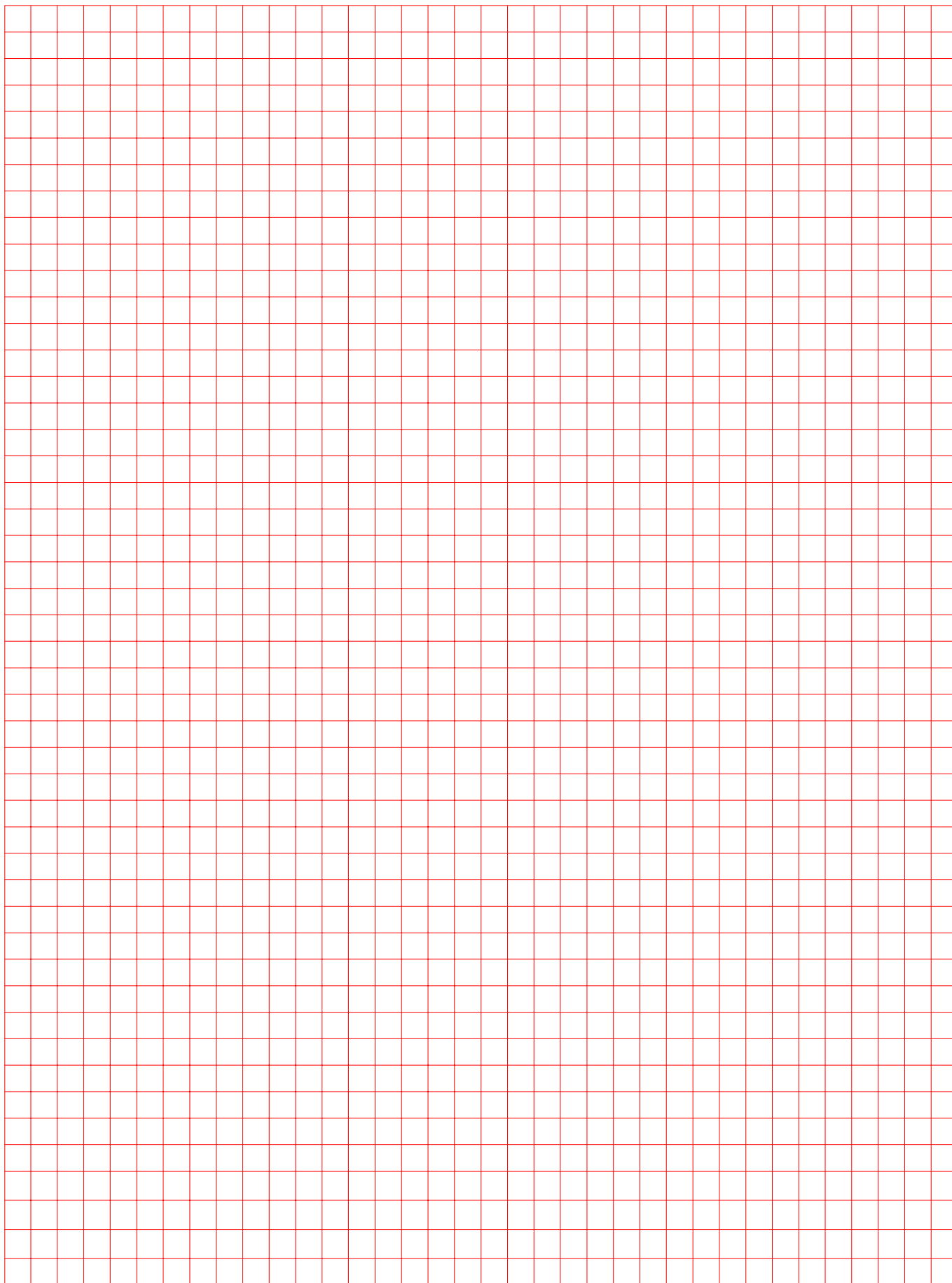
S500 - decentral In-/Output modules
for PROFIBUS DP
Ordering data

Accessories for S500



Type	Description	Order Number		Weight 1 piece kg
TA501	Potential bar with screw terminal (for 4-wire connection)	1SVP 426 480 R0000		0.020
TA502	Potential bar with spring-type terminal (for 4-wire connection)	1SVP 426 480 R1000		0.020
TA503	Cable shield for bus connection, 2 pieces	1SVP 426 481 R0000		0.010
TA504	Marking stripes, 10 pieces	1SVP 426 482 R1000		0.100
TA505	Fuse 5 x 20 mm 8 A, 10 pieces	1SVP 426 483 R0000		0.050
	Configuration data GSD PROFIBUS DP (Disc)	1SVP 426 401 R5000		0.010
	User manual German	2CDC 124 002 M0101		
	User manual English	2CDC 124 002 M0201		
	User manual French	2CDC 124 002 M0301		

Notes





CP501

1SBC 49118 5F0304



CP551

1SBC 49119 5F0304



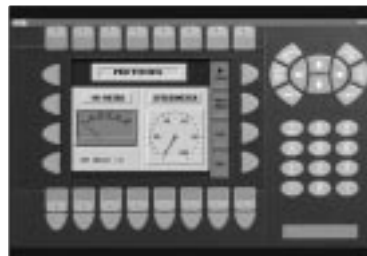
CP554

1SBC 49123 5F0304



CP555

1SBC 49125 5F0304



CP513

1SBC 49127 5F0304



CP502

1SBC 49120 5F0304

Communication between user and machine

The operator terminals CP5xx ideally fulfil the requirements of automated processes for more transparency and efficiency: they create insight into the activities and the conditions of machines and installations and they allow for an intervention into the proceedings that happen there.

To this end we offer an extensive line of operator terminals, that ranges from the basic CP 501 for the display of text to devices that provide a graphics screen to the touch-panel CP 555 with a color display. They communicate with the controllers of the Advant Controller 31 system and have read and write access to the data of these controllers. The communication between operator terminal and controller happen via the serial interface. When running complex applications Ethernet or various other bus systems can also be used.

The same software is used for all devices for fast and easy configuration. The commands and programming language are identical for all devices.

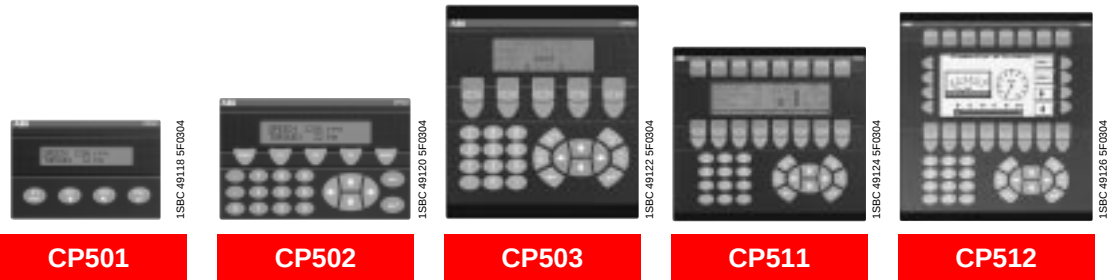
The function keys of most devices consist of switchable 2-color LEDs, marking stripes allow for the labeling and thus support the convenient operator guidance.

The front cover of all devices offer protection class IP65.

Depending on the type, the operator terminals offer the following functions:

- Real-time clock
- Alarm management in numerous groups
- Trends
- Recipe management
- Print-outs of reports
- Pass-word protection
- Memory up to 1600 kB Flash

Operator Terminals Overview



	CP501	CP502	CP503	CP511	CP512
Display type	STN-LCD with background illum.	STN-LCD with background illum.	STN-LCD with background illum.	STN-LCD with background illum.	B/W-STN-LCD with background illum.
Display	text	text	text	graphics und text	graphics and text
Display size	2 lines x 16 characters	2 lines x 20 characters	4 lines x 20 characters	240 x 64 Pixel	240 x 128 Pixel
Display area W x H (mm)	55.7 x 11.0	73.5 x 11.5	70.4 x 20.8	127.2 x 33.9	120.0 x 64.0
Text height (mm)	5	5	5	variable	variable
LEDs			5 (2 colors)	16 (2 colors)	16 (2 colors)
Function keys	4	3	5	8	16 (8 with labels to write on)
Web functions				●	●
Buzzer				●	●
Alarm management			1 groups	4 groups	4 groups
Time channel		●	●	●	●
Real-time clock		●	●	●	●
Trends				real time	trend
Recipe managment		●	●	●	●
Print-outs of reports		●	●	●	●
Pass-word protection		8 levels	8 levels	8 levels	8 levels
Multi language support		●	●	●	●
Memory for applications	16 kB Flash	64 kB Flash	64 kB Flash	400 kB Flash	400 kB Flash
Voltage supply	24 V DC	24 V DC	24 V DC	24 V DC	24 V DC
Current consumption			150 mA	450 mA	450 mA
Ambient temperature	0 – 50 °C	0 – 50 °C	0 – 50 °C	0 – 50 °C	0 – 50 °C
Communication interface	RS232 oder RS422	RS232, RS422/ RS485	RS232, RS422	RS232, RS422	RS232, RS422
Extension slot	–	–	–	1	1
Protection class front cover	IP65	IP65	IP65	IP65	IP65
Dimensions W x H x D (mm)	104 x 69 x 38	142 x 100 x 29	147 x 163,5 x 38	211 x 198 x 69	214 x 232 x 87
Weight (kg)	0.2	0.5	0.7	1.5	1.4

Operator Terminals Overview



1SBC 49127 5F0004

CP513



1SBC 49119 5F0004

CP551



1SBC 49121 5F0004

CP552



1SBC 49123 5F0004

CP554



1SBC 49125 5F0004

CP555

Color-LCD with background illum.	Touch-B/W-STN with background illum.	Touch-LCD 16 gray scales	Color-Touch-Display, TFT	Color-Touch-Display, TFT
graphics and text	graphics and text	graphics and text	graphics and text	graphics and text
320 x 240 Pixel	320 x 240 Pixel	320 x 240 Pixel	320 x 240 Pixel	640 x 480 Pixel
5.7" 115.2 x 86.4	3.8" 78.0 x 58.5	5.7" 115.2 x 86.4	5.7" 115.2 x 86.4	10.4" 211.2 x 158.4
variable	variable	variable	variable	variable
16 (2 colors)				
16 (8 with labels to write on)				
●	●	●	●	●
●	●	●	●	●
16 groups	4 groups	5 groups	5 groups	11 groups
●	●	●	●	●
●	●	●	●	●
trend	trend	trend	trend	trend
●	●	●	●	●
●	●	●	●	●
8 levels	8 levels	8 levels	8 levels	8 levels
●	●	●	●	●
400 kB Flash	400 kB Flash	400 kB Flash	400 kB Flash	1600 kB Flash
24 V DC	24 V DC	24 V DC	24 V DC	24 V DC
550 mA	450 mA	400 mA	450 mA	1 A
0 – 50 °C	0 – 50 °C	0 – 50 °C	0 – 50 °C	0 – 50 °C
RS232, RS422	Ethernet RS232, RS422/ RS485	RS232, RS422/ RS485	RS232, RS422/ RS485	RS232, RS422
2		1	1	2
IP65	IP65	IP65	IP65	IP65
276 x 198 x 89	138 x 100 x 30	200 x 150 x 69	200 x 150 x 69	290 x 250 x 105
1.7	1.4	1.5	1.5	3.3

PLC etc.

Operator Terminals

Ordering data

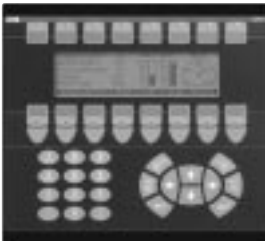


CP502

Operator Terminals with text display

- LCD with background illumination
- Voltage supply 24 V DC
- CP502/503: with real-time clock
- Recipe management
- Pass word protection in 8 levels
- Multi language support

Type	Lines	characters/ line	Function/ other keys	LEDs	Interfaces	Order Number		Weight 1 piece kg
CP501	2	16	4		RS232 or RS422	1SBP 260170 R1001		0.2
CP502	2	20	3 / 20		RS232, RS422, RS485	1SBP 260171 R1001		0.5
CP503	4	20	5 / 22	5	RS232, RS422	1SBP 260172 R1001		0.7



CP511

Operator Terminals with graphics display

- LCD with background illumination
- CP513 with color display
- Voltage supply 24 V DC
- Graphics- and text display
- Real-time clock
- Trends
- Recipe management
- Pass word protection in 8 levels
- Multi language support
- Memory 400 kB

Type	Pixel	Function/ other keys	LEDs	Interfaces	Order Number		Weight 1 piece kg
CP511	240 x 64	8 / 22	16	RS232, RS422	1SBP 260173 R1001		1.5
CP512	240 x 128	16 / 22	16	RS232, RS422	1SBP 260174 R1001		1.4
CP513	320 x 240	16 / 22	16	RS232, RS422	1SBP 260175 R1001		1.7



CP555

Operator Terminals with touch-display

- LCD with background illumination
- CP554 and CP555 with TFT color-display
- Voltage supply 24 V DC
- Graphics- and text display
- Real-time clock
- Trends
- Recipe management
- Pass word protection in 8 levels
- Multi language support
- Memory 400 kB (CP555: 1600 kB)

Type	Pixel	Display	Interfaces	Order Number		Weight 1 piece kg
CP551	320 x 240	B/W - STN	RS232, RS422, RS485	1SBP 260176 R1001		1.4
CP552	320 x 240	B/W - STN	RS232, RS422, RS485	1SBP 260177 R1001		1.5
CP554	320 x 240	Color TFT	RS232, RS422, RS485	1SBP 260178 R1001		1.5
CP555	640 x 480	Color TFT	RS232, RS422	1SBP 260179 R1001		3.3

Operator Terminals

Ordering data

Programming cable

Type	Interface	Ordering Number		Weight 1 piece kg
CAB5	RS232	1SBN 260210 R1001		
CAB6	RS232/RS422 converter	1SBN 260211 R1001		

Communications cable

Type	Controller	Ordering Number		Weight 1 piece kg
CAB45	series 40 / 50 MiniDin	1SBN 260213 R1001		
CAB90	series 90	1SBN 260214 R1001		
CAB8	RS422/RS485 converter	1SBN 260212 R1001		

Programming software for operator terminals CP5xx

For all operator terminals CP5xx, delivery on CD-ROM.
Includes documentation for all operator terminals CP5xx.

Type	Description	Ordering Number		Weight 1 piece kg
CPsoft	Software, documentation on CD	1SBS 260283 R0101		

Accessories

Type	Description	Ordering Number		Weight 1 piece kg
CK516	Add-on keyboard	1SBP 260180 R1001		
IFCPBDP	Communication interface PROFIBUS DP	1SBN 260320 R1001		
IFCETTP	Communication interface Ethernet	1SBN 260322 R1001		
IFC-PI	Printer interface	1SBN 260325 R1001		
IFC-MC	Interface for Smart Media Card (memory card not included)	1SBN 260324 R1001		
PCMCIA 4MB	Smart Media Card 4 MB	1SBN 260326 R1001		
PCMCIA 8MB	Smart Media Card 8 MB	1SBN 260327 R1001		
Protection sheet CP551	Protection sheet for display CP551 (5 pcs.)	1SBN 260330 R1001		
Protection sheet CP552	Protection sheet for display CP552 (5 pcs.)	1SBN 260328 R1001		
Protection sheet CP554	Protection sheet for display CP554 (5 pcs.)	1SBN 260331 R1001		
Protection sheet CP555	Protection sheet for display CP555 (5 pcs.)	1SBN 260329 R1001		

Sensors & Wireless Proximity Switches

- Inductive
- Capacitive
- Photoelectric
- Ultrasonic





Sensors & Wireless Proximity Switches

Contents

Wireless proximity switches

Description	7/ 2
Type key	7/ 2
Ordering data	7/ 3
Technical data sensorheads WSIF..., WSIN...	7/ 4
Technical data communication module	7/ 6
Technical data input module	7/ 7
Technical data current supply	7/ 8
Technical data antennas	7/ 9
Technical data primary loops	7/10

Position sensors

Ordering data	7/13
Type key	7/18

Technical data and dimension drawings of

Inductive sensors

- small, cylindrical	7/19
- with thread M8 ... M30	7/20
- Block- and square housing	7/40
- Analogue sensor	7/47

Capacitive sensors	7/48
--------------------------	------

Photoelectric sensors

- Through Beam Photoelectric Sensors	7/49
- Retroreflective Sensors	7/51
- Diffuse Reflective Sensors	7/56

Ultrasonic sensors	7/63
--------------------------	------

Wireless Proximity Switches

The system

Description, Type key

Description

Wireless proximity switches work according to the induction principle. In contrast to conventional proximity switches these do not require any cable connection between sensor and machine control system. An electromagnetic field that is produced by two power supplies with a pair of primary loops respectively supplies all proximity switches within a production line with the energy needed for their sensory functions as well as the radio communication. The proximity switches transmit their signals per radio communication to an input module which to this end is connected to a pair of antennas.

Design

Wireless proximity switches consist of the sensor head and the communication module, which receives its power from the electromagnetic field. Communication with the input module takes place according to the standard ETS300328 in the 2.4 GHz band. Up to 120 sensors can be allocated to one input module delivering their proximity changes within typically 20ms (REAL-TIME SUITED). The input module transmits the sensor signals to the machine control system via an ABB FieldBusPlug. A continuous function messaging of each wireless proximity switch ensures an immediate detection of failures.

Energy transfer

The electromagnetic field used for the power transfer is produced by two pairs of primary loops. The two pairs of primary loops supply a volume of 1m x 1m x 1m up to 3m x 3m x 3m which can be enlarged modularly. Up to 360 wireless proximity switches can be used within this space.

Advantages of the wireless proximity switches:

- ≠ high flexibility in use
- ≠ reduced engineering
- ≠ short commissioning times
- ≠ high reliability and availability of the production system

Type key

Type of sensor

WSI = Wireless sensor inductive

Mounting type

- F** = flush-mounted
N = non flush-mounted

Nominal switching distance S_n

- 0.15** = 1.5 mm nominal switching distance
0.20 = 2.0 mm nominal switching distance
0.40 = 4.0 mm nominal switching distance
0.50 = 5.0 mm nominal switching distance
0.80 = 8.0 mm nominal switching distance
0.100 = 10.0 mm nominal switching distance
0.150 = 15.0 mm nominal switching distance

Housing

- M** = Metric

8, 12, 18, 30 = diameter in mm

N = Normal overall length

WSI

F

015

M8N



Wireless Proximity Switches

Ordering details



WSIN150-M30N



WSIX100-B50N



WDI100-120FBP



WAT100



WPC100-N

Type	Order code	EAN-Number	Price 1 piece e	Packing unit piece/meter	Weight 1 piece kg
------	------------	------------	-----------------------	--------------------------------	-------------------------

Sensor heads

WSIF015-M8N	1SAF108911R3000	4013614348303		1	0.025
WSIN020-M8N	1SAF108921R3000	4013614348310		1	0.025
WSIF020-M12N	1SAF112911R3000	4013614348327		1	0.030
WSIN040-M12N	1SAF112921R3000	4013614348334		1	0.025
WSIF050-M18N	1SAF118911R3000	4013614348341		1	0.060
WSIN080-M18N	1SAF118921R3000	4013614348358		1	0.055
WSIF100-M30N	1SAF130911R3000	4013614348365		1	0.140
WSIF150-M30N	1SAF130921R3000	4013614348372		1	0.120

Communication module one per sensor head

WSIX100-B50N	1SAF900100R3000	4013614365898		1	0.125
--------------	-----------------	---------------	--	---	-------

Power supply

WPU100-24	1SAF900200R0001	4013614365911		1	15.000
-----------	-----------------	---------------	--	---	--------

Input module

WDI100-120FBP	1SAF900300R0001	4013614365928		1	0.410
---------------	-----------------	---------------	--	---	-------

Antennas for input module

WAT100-R	1SAF900600R0001	4013614365935		1	0.100
WAT100-L	1SAF900600R0002	4013614365966		1	0.100

Antenna cable for input module

WAC100-N03	1SAF900600R1030	4013614365973		3 m	0.370
WAC100-N05	1SAF900600R1050	4013614365980		5 m	0.600

Antenna fitting

WAM100-N	1SAF900900R0001	4013614365997		1	0.095
----------	-----------------	---------------	--	---	-------

Primary loop

WPC100-N10	1SAF900800R1100	4013614366000		10 m	1.280
WPC100-N11	1SAF900800R1110	4013614366017		11 m	1.410
WPC100-N12	1SAF900800R1120	4013614366024		12 m	1.535
WPC100-N13	1SAF900800R1130	4013614366031		13 m	1.665
WPC100-N14	1SAF900800R1140	4013614366048		14 m	1.790
WPC100-N15	1SAF900800R1150	4013614366055		15 m	1.920
WPC100-N16	1SAF900800R1160	4013614366079		16 m	2.050
WPC100-N17	1SAF900800R1170	4013614366086		17 m	2.175
WPC100-N18	1SAF900800R1180	4013614366093		18 m	2.305
WPC100-N19	1SAF900800R1190	4013614366109		19 m	2.430
WPC100-N20	1SAF900800R1200	4013614366116		20 m	2.550
WPC100-N21	1SAF900800R1210	4013614366123		21 m	2.690
WPC100-N22	1SAF900800R1220	4013614366130		22 m	2.815
WPC100-N23	1SAF900800R1230	4013614366154		23 m	2.945
WPC100-N24	1SAF900800R1240	4013614366161		24 m	3.070
WPC100-N12	1SAF900800R1250	4013614366178		25 m	3.200
WPC100-N26	1SAF900800R1260	4013614366185		26 m	3.330
WPC100-N27	1SAF900800R1270	4013614366192		27 m	3.455
WPC100-N28	1SAF900800R1280	4013614366208		28 m	3.585

System documentation

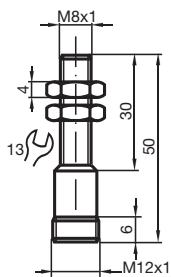
CD-ROM (german/englisch)	2CDC142003E0406	–		1	0.020
--------------------------	-----------------	---	--	---	-------

Wireless proximity switches

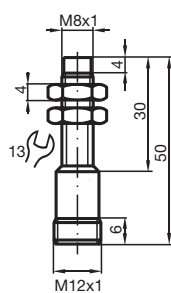
Technical data sensor heads WSIF..., WSIN...

Sensor heads

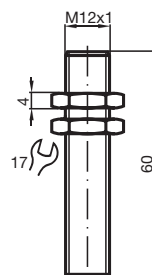
Switching distance S_n , mounting	1,5 mm flush-mounted	2 mm non flush-mounted	2 mm flush-mounted	4 mm non flush-mounted
Type	M8x1 flush-mounted	M8x1 non flush-mounted	M12x1 flush-mounted	M12x1 non flush-mounted
Identification	WSIF015-M8N	WSIN020-M8N	WSIF020-M12N	WSIN040-M12N
Switching distance [mm]	0 ... 1.21	0 ... 1.62	0 ... 1.62	0 ... 3.24
Reduction factor	r_{V2A} 0.75	0.75	0.75	0.8
	r_{AL} 0.4	0.4	0.3	0.45
	r_{Cu} 0.4	0.4	0.25	0.4
Nominal signal transfer rate 1/s	5 (signal changes per second, typically 20ms)			
Hystereses H [%]	≤ 10	≤ 10	≤ 10	≤ 10
Reproducibility [%]	≤ 10	≤ 10	≤ 10	≤ 10
Temperature drift [%]	± 10	± 10	± 10	± 10
Short circuit protection	no, because usage only in connection with the communication module.			
Reverse polarity protection	no, because usage only in connection with the communication module.			
Indication	see communication module			
Operating temperature range [°C]	-25 ... +70			
Storage temperature range [°C]	-40 ... +70			
Permissible shock and vibration loading	shock $b \leq 30g$, $T \leq 11ms$			
Protection class acc. to IEC 60529	IP67			
In compliance with	EN 60 947-5-2			
Connection	M12 connector for one communication module			
Housing material	Nickel plated brass			
Sensing face	PBT (Crastin)			
Starting torque recommended/maximum [Nm]	3/5	3/5	10/15	10/15
Drawing number	120025	120026	117740	118943



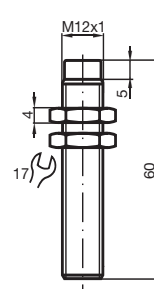
120025



120026



117740



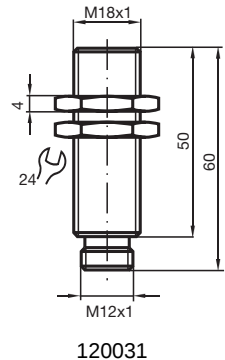
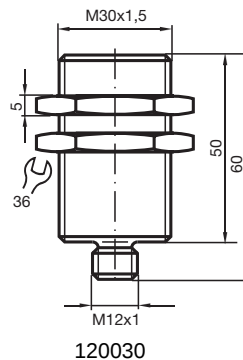
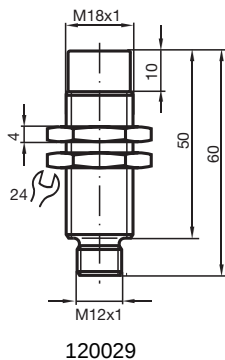
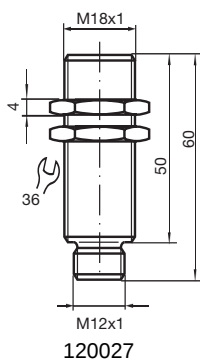
118943

Wireless proximity switches

Technical data sensor heads WSIF..., WSIN...

Sensor heads

Switching distance S_n , mounting	5 mm flush-mounted	8 mm non flush-mounted	10 mm flush-mounted	15 mm non flush-mounted
Type	M18x1 flush-mounted	M18x1 non flush-mounted	M30x1.5 flush-mounted	M30x1.5 non flush-mounted
Identification	WSIF050-M18N	WSIN080-M18N	WSIF100-M30N	WSIN150-M30N
Switching distance [mm]	0 ... 4.05	0 ... 6.5	0 ... 8.1	0 ... 12.15
Reduction factor	r_{V2A} 0.75	0.75	0.75	0.7
	r_{AL} 0.35	0.45	0.45	0.45
	r_{Cu} 0.3	0.4	0.25	0.35
Nominal signal transfer rate	1/s	5 (signal changes per second, typically 20ms)		
Hystereses H [%]	≤ 10	≤ 10	≤ 10	≤ 10
Reproducibility [%]	≤ 10	≤ 10	≤ 10	≤ 10
Temperature drift [%]	± 10	± 10	± 10	± 10
Short circuit protection	no, because usage only in connection with the communication module.			
Reverse polarity protection	no, because usage only in connection with the communication module.			
Indication	see communication module			
Operating temperature range [°C]	-25 ... +70			
Storage temperature range [°C]	-40 ... +70			
Permissible shock and vibration loading	shock $b \leq 30g$, $T \leq 11ms$			
Protection class acc. to IEC 60529	IP67			
In compliance with	EN 60 947-5-2			
Connection	M12 connector for one communication module			
Housing material	Nickel plated brass			
Sensing face	PBT (Crastin)			
Starting torque recommended/maximum [Nm]	30/50	30/50	30/100	30/100
Drawing number	120027	120029	120030	120031



Wireless proximity switches

Technical data communication module

Short description

The communication module is attached to one of the eight heads of an inductive sensor as if it were a conventional sensor plug. The communication module for all sensor head variations is identical.

The communication module receives its energy for the sensor functions and radio communication with the input module from an electromagnetic field.

Type	WSIX100-B50N
Nominal signal transfer rate 1/s	5 (signal changes per second)
Latency (99,9%)	20 ms (max. 34 ms) until the signal is available on the fieldbus
Switch status	LED, yellow
Operating status	LED, green
Operation	1 foil push-button
Operating temperatur range	-25 ... +55 °C
Storage temperatur range	-40 ... +70 °C
Permissible shock and vibration loading	shock $b \leq 30g$, $T \leq 11$ ms
Protection class in acc. with IEC 60529	IP67
In compliance with	EN 60 947-5-2
Connection	Connector M12 with connecting nut for sensor heads for wireless proximity switches
Housing material	Bergamit A700 (PA6.6 not fortified)
Power consumption	≤ 6 mW
Frequency of the power transfer	120 kHz
Frequency band	2,4 GHz ISM band in accordance with ETSI standard ETS 300 328
Maximum number of communication modules in one machine cell (3x3x3 m³)	360
Maximum transfer rate	10 m/s
Error rate	10^{-9}
Range for communication	5 m
Frequency change	Frequency hopping method
Address storage	Adresses cannot be lost



Wireless proximity switches

Technical data input module

Short description

One input module transmits the information of up to 120 wireless position sensors to the machine control. The sensor signals reach the input module via two antennas and are then transferred to the machine control system via a FieldBusPlug.

Communication takes place in the 2.4 GHz band according to the standard ETS 300 328. A frequency hopping process with varying frequency sequences is used for reliable data transfer.

Every 500 ms the input module expects a status report of all its assigned sensors. This way the input module monitors the correct functioning of the sensors.

Additionally, the input module is equipped with functions for the configuration and diagnosis of wireless position sensors.

Type	WDI100-120FBP	
Number of inputs	120 digital inputs for wireless position sensors 120 valid-status signals for wireless position sensors	
Frequency band (communication)	2.4 GHz ISM band in acc. with ETSI standard ETS 300 328	
Frequency-/antenna change	Frequency hopping method with varying frequency sequences Alternation between emitting- and receiving antenna	
Error rate (per input)	10 ⁻⁹	
Latency (99,9 %)	20 ms (max. 34 ms) until the signal is available on the fieldbus	
Range (of antenna)	5 m	
Maximum number of input modules per machine cell	3	
Operating display	- LCD-Display, double-spaced with 16 characters each - 4 foil push-buttons	
Electrical connection	- 2 coaxial connectors: antenna cable - 1 connector: interface to ABB-FieldBusPlug - 1 set of screw terminals: 24 VDC supply	
Protection class in acc. with IEC 60529	IP20	
Supply voltage	24 V DC (+20%,-15%)	
Operating temperature range	0 ... +50°C	
Storage temperature range	-25 ... +70°C	
Permissible humidity for operation	+50 ... +95 %, without bedewing	
Dimensions (h x w x d)	140 mm x 120 mm x 85 mm	
Mounting	- DIN-rail in acc. with DIN EN 50022 - Mounting holes for screws up to 4 mm diameter	



Wireless proximity switches

Technical data power supply

Short description

The power supply WPU100 provides the energy for the generation of an electromagnetic field of 120 kHz with the help of the connected primary loops. This again supplies the wireless position sensors. The installation in pairs generates a two-dimensional, rotating, electromagnetic field.

Type	WPU100-24
Output frequency	120 kHz
Output voltage	up to 700 V at the connected primary loops
Output current	4 ... 24 A adjustable in 16 stages
Permissible inductivity at output	0,011 ... 0,058 mH (primary loops including feed line)
Control elements	1 green LED, System ready 2 red LEDs for signalling of errors 16-stage rotary switch for the selection of output current 1 DIL-switch for phase selection (0°/90°) 1 DIL-switch for the selection of operating mode (Master/Slave)
Electrical connection	2 terminals for the electrical connection of primary loops 1 terminal: synchronisation input 1 terminal: synchronisation output 1 terminal: supply voltage
Synchronisation	Automatic synchronisation with a second power supply for the generation of a two-dimensional, rotating electromagnetic field
Supply voltage	120 ... 230 V AC (+10%, -15%), (50 ... 60 Hz (±5%))
Power consumption	100 ... 700 W
Operating temperature range	0 ... +45°C
Storage temperature range	-25 ... +70°C
Protection class in acc. with IEC 60529	IP67
Mounting	4 mounting holes for screw mounting
Dimensions (h x w x d)	400 mm x 310 mm x 150 mm
Weight	15 kg
Suitable synchronized wires	screened twisted-pair-cable, screen applied one-sided
Suitable primary loops	Solely the prepacked primary loops that are offered within this product range



Wireless proximity switches

Technical data antenna

Technical data primary loops

Short description

The antennas WAT100 transmit and receive the signals between an input module and the wireless proximity switches. Two antennas with varying polarisation are connected to each input module.

Type	WAT100-R, WAT100-L
Frequency range	2.4 ... 2.5 GHz
Polarisation	Right- resp. leftcircular polarized (-R, -L)
Impedancy	50 Ω
Dimensions (h x w x d)	101 mm x 95 mm x 32 mm
Antenna cable	Prepacked coaxial cable (length: 3 m and 5 m)
Accessories	Antenna mounting kit



Short description

The primary loops WPC100 emit an electromagnetic field of 120kHz with the help of the connected power supply for wireless position sensors. The installation in pairs generates a two-dimensional, rotating electromagnetic field.

Type	WPC100-N
Rated voltages	1000 V AC, suitable for installation in acc. with VDE100-520
Total diameter	9.4 $\pm$ 0.5 mm
Total cross section	6.6 mm ²
Properties	Halogene-free, bio-diesel resistant, UV-resistant
Conductor insulation	Silicone (Si/Y); wall thickness 1.3 mm; colour: red
Exterior insulation	TPE/U (thermoplastic polyurethan); wall thickness 1.3 mm; colour: light grey
Availabe types	prepacked cable (cable shoes on both ends) for the connection to the power supply for wireless position sensors Lengths between 10 m and 28 m, graduation 1 m



Position Sensors

Ordering data



SIF1,5-M8N-V2-PO

SST 060 97



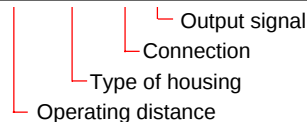
SIN4-M12N-C1-PO

SST 064 97

Type	Order Number	EAN-Number		Pack. size/ pieces	Weight 1 piece kg
------	--------------	------------	--	--------------------	-------------------

Inductive Sensors

SIF0,8-Z4N-V2-PO	1SAF 104 211 R 1000	4013614241130		1	0.020
SIF0,8-Z4N-C8-PO	1SAF 104 411 R 1000	4013614241147		1	0.010
SIF1,5-Z6N-U2-PO	1SAF 106 211 R 1000	4013614241154		1	0.030
SIF1,5-Z6N-C8-PO	1SAF 106 411 R 1000	4013614241161		1	0.010
SIF1,5-M8N-V2-PO	1SAF 108 111 R 1000	4013614241178		1	0.050
SIF1,5-M8N-V2-NO	1SAF 108 111 R 3000	4013614241185		1	0.044
SIF1,5-M8S-U2-PO	1SAF 109 211 R 1000	4013614241284		1	0.040
SIF1,5-M8S-C1-PO	1SAF 108 511 R 1000	4013614241246		1	0.030
SIF1,5-M8E-C1-PO	1SAF 108 511 R 1001	4013614295188		1	0.035
SIF1,5-M8E-C1-NO	1SAF 108 511 R 3001	4013614295195		1	0.035
SIN2-M8N-V2-PO	1SAF 108 122 R 1000	4013614241208		1	0.040
SIN2-M8N-V2-NO	1SAF 108 122 R 3000	4013614241215		1	0.040
SIN2-M8S-U2-PO	1SAF 109 222 R 1000	4013614241291		1	0.040
SIN2-M8N-C1-PO	1SAF 108 522 R 1000	4013614241260		1	0.030
SIN2-M8N-C1-NO	1SAF 108 522 R 3000	4013614241277		1	0.030
SIN3-M8N-V2-PO	1SAF 108 123 R 1000	4013614241222		1	0.050
SIN3-M8N-C8-PO	1SAF 108 423 R 1000	4013614241239		1	0.030
SIF2-M12N-V2-PO	1SAF 112 111 R 1000	4013614241307		1	0.030
SIF2-M12N-V2-PK	1SAF 112 111 R 1200	4013614241314		1	0.074
SIF2-M12N-V2-NO	1SAF 112 111 R 3000	4013614241321		1	0.030
SIF2-M12N-V2-NK	1SAF 112 111 R 3200	4013614241338		1	0.074
SIF2-M12N-V2-DO	1SAF 112 111 R 5000	4013614241345		1	0.040
SIF2-M12N-V2-AO	1SAF 112 111 R 6000	4013614241352		1	0.085
SIF2-M12S-V2-PO	1SAF 113 211 R 1000	4013614241512		1	0.030
SIF2-M12N-C1-PO	1SAF 112 511 R 1000	4013614241437		1	0.020
SIF2-M12N-C1-NO	1SAF 112 511 R 3000	4013614241444		1	0.020
SIF2-M12S-C1-PO	1SAF 113 511 R 1000	4013614241529		1	0.020
SIF2-M12E-C1-PO	1SAF 112 511 R 1001	4013614296710		1	0.065
SIF2-M12E-V2-AC	1SAF 112 111 R 6100	4013614291685		1	0.125
SIN4-M12N-V2-PO	1SAF 112 122 R 1000	4013614241369		1	0.030
SIN4-M12N-V2-PK	1SAF 112 122 R 1200	4013614241376		1	0.074
SIN4-M12N-V2-NO	1SAF 112 122 R 3000	4013614241383		1	0.030
SIN4-M12N-V2-NK	1SAF 112 122 R 3200	4013614241390		1	0.074
SIN4-M12N-V2-DO	1SAF 112 122 R 5000	4013614241406		1	0.040
SIN4-M12S-V2-PO	1SAF 113 122 R 1000	4013614241505		1	0.030
SIN4-M12N-V2-AO	1SAF 112 122 R 6000	4013614241413		1	0.085
SIN4-M12N-C1-PO	1SAF 112 522 R 1000	4013614241451		1	0.020
SIN4-M12S-C1-PO	1SAF 113 522 R 1000	4013614241536		1	0.020
SIN4-M12N-C1-NO	1SAF 112 522 R 3000	4013614241468		1	0.020
SIN6-M12N-V2-PO	1SAF 112 123 R 1000	4013614241420		1	0.090
SIN6-M12N-C1-PO	1SAF 112 523 R 1000	4013614241475		1	0.020



Position Sensors

Ordering data



SIF5-M18N-V2-PO

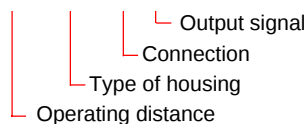
SST 057 97



SIF5-M18N-C1-PO

SST 058 97

Type	Order Number	EAN-Number		Pack. size/ pieces	Weight 1 piece kg
Inductive Sensors					
SIF5-M18N-V2-PO	1SAF 118 111 R 1000	4013614241543		1	0.100
SIF5-M18N-V2-NO	1SAF 118 111 R 3000	4013614241567		1	0.100
SIF5-M18N-V2-NK	1SAF 118 111 R 3200	4013614241550		1	0.120
SIF5-M18N-V2-PK	1SAF 118 111 R 1200	4013614241574		1	0.120
SIF5-M18N-V2-DO	1SAF 118 111 R 5000	4013614241581		1	0.120
SIF5-M18N-V2-AO	1SAF 118 111 R 6000	4013614241598		1	0.130
SIF5-M18N-V2-AC	1SAF 118 111 R 6100	4013614241604		1	0.130
SIF5-M18N-C1-PO	1SAF 118 511 R 1000	4013614241697		1	0.060
SIF5-M18N-C1-NO	1SAF 118 511 R 3000	4013614241703		1	0.060
SIF5-M18E-C1-PO	1SAF 118 511 R 1001	4013614296741		1	0.125
SIF5-M18E-C1-NO	1SAF 118 511 R 3001	4013614296772		1	0.125
SIN8-M18N-V2-PO	1SAF 118 122 R 1000	4013614241611		1	0.100
SIN8-M18N-V2-PK	1SAF 118 122 R 1200	4013614241628		1	0.120
SIN8-M18N-V2-NO	1SAF 118 122 R 3000	4013614241635		1	0.100
SIN8-M18N-V2-NK	1SAF 118 522 R 3200	4013614241734		1	0.120
SIN8-M18N-V2-DO	1SAF 118 122 R 5000	4013614241642		1	0.120
SIN8-M18N-V2-AO	1SAF 118 122 R 6000	4013614241659		1	0.130
SIN8-M18N-V2-AC	1SAF 118 122 R 6100	4013614241666		1	0.130
SIN8-M18N-C1-PO	1SAF 118 522 R 1000	4013614241710		1	0.060
SIN8-M18N-C1-NO	1SAF 118 522 R 3000	4013614241727		1	0.060
SIN8-M18E-C1-PO	1SAF 118 522 R 1001	4013614296789		1	0.235
SIN12-M18N-V2-PO	1SAF 118 123 R 1000	4013614241673		1	0.120
SIN12-M18N-C1-PO	1SAF 118 523 R 1000	4013614243431		1	0.060
SIF10-M30N-V2-PO	1SAF 130 111 R 1000	4013614241840		1	0.120
SIF10-M30N-V2-PK	1SAF 130 111 R 1200	4013614241857		1	0.130
SIF10-M30N-V2-NO	1SAF 130 111 R 3000	4013614241864		1	0.120
SIF10-M30N-V2-NK	1SAF 130 111 R 3200	4013614241871		1	0.130
SIF10-M30N-V2-DO	1SAF 130 111 R 5000	4013614241888		1	0.200
SIF10-M30N-V2-AO	1SAF 130 111 R 6000	4013614241895		1	0.280
SIF10-M30N-V2-AC	1SAF 130 111 R 6100	4013614241901		1	0.280
SIF10-M30N-C1-PO	1SAF 130 511 R 1000	4013614241987		1	0.130
SIF10-M30N-C1-NO	1SAF 130 511 R 3000	4013614241994		1	0.130
SIF10-M30E-C1-PO	1SAF 130 511 R 1001	4013614296796		1	0.129
SIN15-M30N-V2-PO	1SAF 130 122 R 1000	4013614241918		1	0.120
SIN15-M30N-V2-PK	1SAF 130 122 R 1200	4013614241925		1	0.130
SIN15-M30N-V2-NO	1SAF 130 122 R 3000	4013614241932		1	0.120
SIN15-M30N-V2-NK	1SAF 130 122 R 3200	4013614241949		1	0.130
SIN15-M30N-V2-AO	1SAF 130 122 R 6000	4013614241963		1	0.280
SIN15-M30N-V2-AC	1SAF 130 122 R 6100	4013614241970		1	0.280
SIN15-M30N-C1-PO	1SAF 130 522 R 1000	4013614242007		1	0.120
SIN15-M30N-C1-NO	1SAF 130 522 R 3000	4013614242014		1	0.120
SIN15-M30E-C1-PO	1SAF 130 522 R 1001	4013614296802		1	0.131



Position Sensors

Ordering data



SIF15-Q40N-T-PO

SST 054 97

Type	Order Number	EAN-Number		Pack. size/ pieces	Weight 1 piece kg
------	--------------	------------	--	--------------------	-------------------

Inductive Sensors

SIF2-B28N-V0,1-PO	1SAF 123 111 R 1000	4013614241796		1	0.010
SIF2-B28N-V0,1-NO	1SAF 123 111 R 3000	4013614241819		1	0.010
SIF6-B45N-U2-PO	1SAF 125 111 R 1000	4013614241833		1	0.100
SIF15-Q40N-T-PO	1SAF 144 811 R 1000	4013614242113		1	0.280
SIF15-Q40N-T-PK	1SAF 144 811 R 1200	4013614242120		1	0.280
SIF15-Q40N-T-NO	1SAF 144 811 R 3000	4013614242137		1	0.280
SIF15-Q40N-C1-PO	1SAF 144 511 R 1000	4013614242090		1	0.280
SIF20-Q40N-T-PO	1SAF 144 822 R 1000	4013614242151		1	0.280
SIN20-Q40N-T-AK	1SAF 144 822 R 6200	4013614242205		1	0.280
SIN30-Q40N-T-PO	1SAF 144 823 R 1000	4013614242212		1	0.280
SIN30-Q40N-T-PK	1SAF 144 823 R 1200	4013614242229		1	0.280
SIN30-Q40N-T-AK	1SAF 144 823 R 6200	4013614242250		1	0.280
SIF20-Q40S-C1-PO	1SAF 145 812 R 1000	4013614244902		1	0.140
SIF20-Q40T-C1-PO	1SAF 146 812 R 1000	4013614244919		1	0.140
SIF20-Q40T-C1-PK	1SAF 146 812 R 1200	4013614244926		1	0.140
SIN30-Q40S-C1-PO	1SAF 145 823 R 1000	4013614244933		1	0.140
SIN30-Q40T-C1-PK	1SAF 146 823 R 1200	4013614244940		1	0.140
SIF40-Q80N-T-PK	1SAF 148 811 R 1200	4013614242328		1	0.460
SIN50-Q80N-T-PO	1SAF 148 822 R 1000	4013614242335		1	0.415
SIN50-Q80N-T-PK	1SAF 148 822 R 1200	4013614242342		1	0.415
SIF5-M18N-V2-M	1SAF 118 112 R 8000	4013614268830		1	0.170

Output signal
 Connection
 Type of housing
 Operating distance



SCF10-M30N-V2-AO

SST 055 97

Type	Order Number	EAN-Number		Pack. size/ pieces	Weight 1 piece kg
------	--------------	------------	--	--------------------	-------------------

Capacitive Sensors

SCF10-M30N-V2-PO	1SAF 230 111 R 1000	4013614242359		1	0.280
SCF10-M30N-C1-PO	1SAF 230 511 R 1000	4013614242373		1	0.148
SCF10-M30N-V2-AO	1SAF 230 111 R 6000	4013614242366		1	0.270
SCF10-M30N-V2-PK	1SAF 230 111 R 1200	4013614290923		1	0.240
SCF10-M30N-C1-PK	1SAF 230 511 R 1200	4013614290916		1	0.140

Output signal
 Connection
 Type of housing
 Operating distance

Position Sensors

Ordering data



SOD500-B45N-C1-PKS

Type	Order Number	EAN-Number		Pack. size/ pieces	Weight 1 piece kg
------	--------------	------------	--	--------------------	-------------------

Photoelectric Sensors

SOT 20M - B75N-T-KK	1SAF 320 750 R 1100	4013614269677		1	0.190
SOR 1500 - M18N-C1-PO	1SAF 318 542 R 1001	4013614268793		1	0.100
SOR 4000 - M18N-C1-PO	1SAF 318 542 R 1002	4013614366833		1	0.110
SOD 200 - M18N-C1-PO	1SAF 318 553 R 1000	4013614242441		1	0.070
SOR 2000 - B26N-U2-PO	1SAF 323 242 R 1000	4013614242458		1	0.070
SOD 400 - B26N-U2-PO	1SAF 323 253 R 1000	4013614242465		1	0.100
SOR 5000 - B75N-T-POS	1SAF 328 842 R 1000	4013614242564		1	0.200
SOR 5000 - B75N-T-KK	1SAF 328 842 R 1100	4013614269660		1	0.110
SOD 500 - B45N-C1-PKS	1SAF 325 553 R 1210	4013614295263		1	0.060
SOD 500 - B45N-C1-NKS	1SAF 325 553 R 3210	4013614295270		1	0.060
SOR 6000 - B45N-C1-PKS	1SAF 325 545 R 1210	4013614295287		1	0.060
SOR 6000 - B45N-C1-NKS	1SAF 325 545 R 3210	4013614295294		1	0.060
SOT 15M - B45N- C1-PKS	1SAF 325 586 R 1210	4013614295300		1	0.120
SOT 15M - B45N- C1-NKS	1SAF 325 586 R 3210	4013614295317		1	0.120
SORG 2000- B45N- C1-PKS	1SAF 325 543 R 1210	4013614295324		1	0.060
SORG 2000- B45N- C1-NKS	1SAF 325 543 R 3210	4013614295331		1	0.060
SOD 800 - B75N-T-POS	1SAF 328 853 R 1000	4013614242571		1	0.200
SOD 2000- B75N-T-KK	1SAF 328 853 R 1100	4013614269653		1	0.110

— Output signal
 — Connection
 — Type of housing
 — Operating distance

Photoelectric Sensors with Waveguides

Type	Order Number	EAN-Number		Pack. size/ pieces	Weight 1 piece kg
SOLX- B50N-C8-PKS	1SAF 325 160 R 1000	4013614242533		1	0.120
SOLD 50- B50N-PVM6	1SAF 325 152 R 0001	4013614242526		1	0.020
SOLD15- B50N-PVM3	1SAF 325 151 R 0001	4013614242519		1	0.020
SOLT150- B50N-PVM4	1SAF 325 163 R 0001	4013614242540		1	0.011
SOLT150- B50N-PVM3	1SAF 325 163 R 0002	4013614242557		1	0.011

Ultrasonic Sensors

Type	Order Number	EAN-Number		Pack. size/ pieces	Weight 1 piece kg
SUD 500-M30N-C1-POS	1SAF 430 651 R 1002	4013614243738		1	0.200
SUD2000-M30N-C1-POS	1SAF 430 653 R 1002	4013614339820		1	0.200
SUD4000-M30N-C1-POS	1SAF 430 654 R 1002	4013614339844		1	0.210
SUD6000-M30N-C1-POS	1SAF 430 655 R 1002	4013614339868		1	0.400
SUD 500-M30N-C1-NOS	1SAF 430 651 R 3002	4013614339806		1	0.200
SUD2000-M30N-C1-NOS	1SAF 430 653 R 3002	4013614339837		1	0.200
SUD4000-M30N-C1-NOS	1SAF 430 654 R 3002	4013614339851		1	0.210
SUD6000-M30N-C1-NOS	1SAF 430 655 R 3002	4013614339875		1	0.400
SUD 500-M30N-C1-M	1SAF 430 551 R 8002	4013614366895		1	0.220
SUD2000-M30N-C1-M	1SAF 430 553 R 8002	4013614366901		1	0.220
SUD4000-M30N-C1-M	1SAF 430 554 R 8002	4013614366918		1	0.300
SUD6000-M30N-C1-M	1SAF 430 555 R 8002	4013614366925		1	0.400

— Output signal
 — Connection
 — Type of housing
 — Operating distance



SUD500-M30N-C1-M

Position Sensors

Ordering data

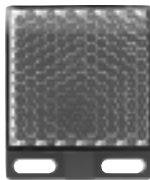
Type Code



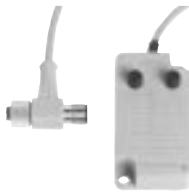
MB-5 Kit



ST-1



RFL-1



SZP2>PROG



OPUS-Software

Type	Order Number	EAN-Number		Pack. size/ pieces	Weight 1 piece kg
------	--------------	------------	--	--------------------	-------------------

Accessories

SZP2>PROG	1SAF 912 030 R 7000	4013614269684		1	0.020
SZC1>4POL-0	1SAF 912 020 R 4000	4013614243745		1	0.050
SZC1/4POL-0	1SAF 912 010 R 4000	4013614243752		1	0.050
SZC1>U5-3POL-LED0	1SAF 912 225 R 3100	4013614243769		1	0.200
SZC8>U5-3POL-LED0	1SAF 908 225 R 3100	4013614243776		1	0.200
SZC1>V5-4POL-0	1SAF 912 125 R 4000	4013614243790		1	0.200
SZC1/V5-4POL-0	1SAF 912 115 R 4000	4013614243806		1	0.200
MB5-Kit	1SAF 950 988 R 9403	4013614286490		1	0.100
ST-1	1SAF 950 988 R 9401	4013614286513		1	0.141
RFL-1	1SAF 950 988 R 9402	4013614286506		1	0.120
OPUS-Software	1SAF 950 988 R 9404	4013614317323		1	0.020
MH04-Mounting tool	1SAF 950 988 R 9405	4013614339752		1	0.282

Type Code

Inductive / Capacitive / Photoelectric and Ultrasonic Sensors

Type of Sensor

SI = Inductive
SC = Capacitive
SO = Photoelectric
SU = Ultrasonic
SOL = Light guide

Installation method

F = flush mounting (inductive and capacitive)
N = non-flush mounting (inductive and capacitive)
R = Retroreflective
D = Diffuse reflective (photoelectric and ultrasonic)
T = Through beam (photoelectric)

Sensing range

in mm

Housing

Z = cylindrical **4, 6** = diameter (mm)
M = Thread **8, 12, 18, 30** = diameter (mm)
Q = block with square front **30, 40, 80** = diagonal (mm)
B = block **26, 40, 45, 75** = corner distance (mm)

N = normal type lenght

S = short type lenght

T = short type lenght

E = stainless steel

Connections

V2 = PVC, 2m cable
U2 = PUR, 2m Kable
C1 = M12 connector with 3-5 pins
C3 = M12 connector, AC
C8 = M8 connector with 3 pins
T = Terminal connection

Output signals

PO = 24 VDC, 3-wire PNP, NO
PC = 24 VDC, 3-wire PNP, NC
PK = 24 VDC, 4-wire PNP, NO/NC combination
NO = 24 VDC, 3-wire NPN, NO
NK = 24 VDC, 4-wire NPN, NO/NC combination
DO = 24 VDC, 2-wire, NO
AO = 230 VAC, 2-wire, NO
AC = 230 VAC, 2-wire, NC
AK = 230 VAC, 4-wire, NO/NC combination.
KK = 12 ... 240 VDC / 24 ... 240 VAC, 4-wire PNP, Relais output
M = analogue signal

SI F2 M12N V2

PO

Position Sensors

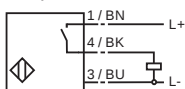
Technial Data, Dimension Drawings

Inductive Sensors, small, cylindrical

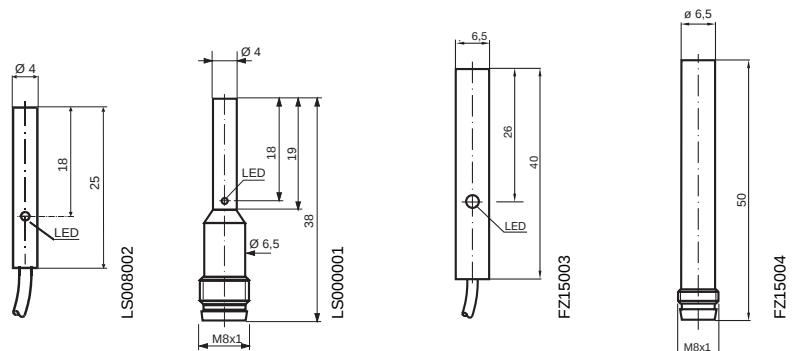
Operating distance S_n , mounting		0.8 mm flush	0.8 mm flush	1.5 mm flush	1.5 mm flush
PNP	NO	SIF0,8-Z4N-V2-PO	SIF0,8-Z4N-C8-PO	SIF1,5-Z6N-U2-PO	SIF1,5-Z6N-C8-PO
	NC				
	Antivalent				
NPN	NO				
	Antivalent				
DC 2-wire	NO				
AC	NO				
	NC				
	Antivalent				
Switching distance	[mm]	0 ... 0.648	0 ... 0.648	0 ... 1.215	0 ... 1.215
Reduction factor	r_{VZA}	0.85	0.85	0.7	0.7
	r_{AL}	0.45	0.45	0.25	0.25
	r_{Cu}	0.4	0.4	0.2	0.2
Operating voltage	[V]	10 ... 30	10 ... 30	10 ... 60	10 ... 60
Operating current	[mA]		200	200	100 100
Switching frequency	[Hz]	3000	3000	500	500
Idle current / residual current	[mA]	10 / -	10 / -	15 / -	15 / -
Line voltage drop	[V]	2	22	3	3
Short circuit protection		clocking	clocking	clocking	clocking
Inverse polarity protection		yes	yes	yes	yes
Indication	output signal	LED yellow	LED yellow	LED yellow	-
	voltage	-	-	-	-
Operating temperature range	[°C]	-25 ... 70	-25 ... 70	-25 ... 70	-25 ... 70
In compliance with		EN60947-5-2	EN60947-5-2	EN60947-5-2	EN60947-5-2
Protection class acc. to IEC 60529		IP67	IP67	IP67	IP67
Connection type		2 m, PVC-cable	Connector M8	2 m, PUR-cable	Connector M8
Conductor diameter		0.14 mm ²	-	0.14 mm ²	-
Housing material		stainless steel	stainless steel	stainless steel	stainless steel
Front face		PBT (Crastin)	PBT (Crastin)	PBT (Crastin)	PBT (Crastin)
Drawing No.		LS008002	LS000001	FZ015003	FZ015004

Output signals

Output PO



Dimensions in mm



Position Sensors

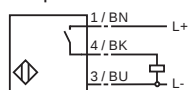
Technical Data, Dimension Drawings

Inductive Sensors, with thread M 8 x 1

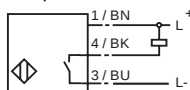
Operating distance S_n , mounting		1.5 mm flush	1.5 mm flush	1.5 mm flush	
PNP	NO	SIF1,5-M8N-V2-PO	SIF1,5-M8S-U2-PO	SIF1,5-M8S-C1-PO	
	NC				
	Antivalent				
NPN	NO	SIF1,5-M8N-V2-NO			
	Antivalent				
DC 2-wire	NO				
AC	NO				
	NC				
	Antivalent				
Switching distance	[mm]	0 ... 1.215	0 ... 1.215	0 ... 1.215	
Reduction factor	r_{V2A}	0.75	0.7	0.75	
	r_{AL}	0.45	0.25	0.45	
	r_{Cu}	0.35	0.2	0.35	
Operating voltage	[V]	10 ... 30	10 ... 60	10 ... 30	
Operating current	[mA]	100	100	100	
Switching frequency	[Hz]	1500	500	1500	
Idle current / residual current	[mA]	15 / -	15 / -	15 / -	
Line voltage drop	[V]	3	3	3	
Short circuit protection		clocking	clocking	clocking	
Inverse polarity protection		yes	yes	yes	
Indication	output signal	LED yellow	LED yellow	LED yellow	
	voltage	-	-	-	
Operating temperature range	[°C]	-25 ... 70	-25 ... 70	-25 ... 70	
In compliance with		EN60947-5-2	EN60947-5-2	EN60947-5-2	
Protection class acc. to IEC 60529		IP67	IP67	IP67	
Connection type		2 m, PVC-cable	2 m, PUR-cable	Connector M12	
Conductor diameter		0,14 mm ²	0,14 mm ²	-	
Housing material		nickel-plated brass	stainless steel	nickel-plated brass	
Front face		PBT (Crastin)	PBT (Crastin)	PBT (Crastin)	
Drawing No.		FZ015013	FZ015015	FZ015009	

Output signals

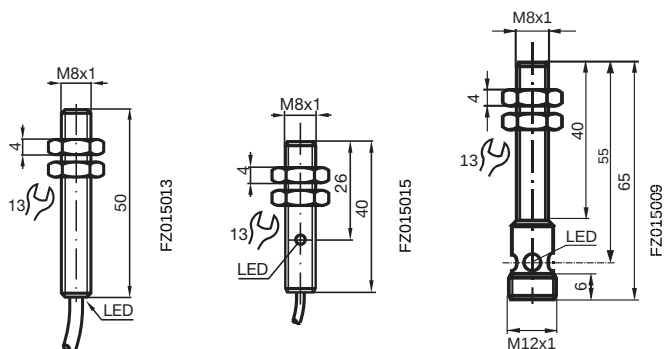
Output PO



Output NO



Dimensions in mm



Position Sensors

Technical Data, Dimension Drawings

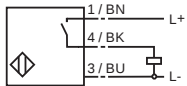
Inductive Sensors, with thread M 8 x 1

Operating distance S_n , mounting		1.5 mm flush	1.5 mm flush	
PNP	NO	SIF1,5-M8E-C1-PO		
	NC			
	Antivalent			
NPN	NO		SIF1,5-M8E-C1-NO	
	Antivalent			
DC 2-wire	NO			
AC	NO			
	NC			
	Antivalent			
Switching distance	[mm]	0 ... 1.215	0 ... 1.215	
Reduction factor	r_{V2A}	0.7	0.67	
	r_{AL}	0.25	0.24	
	r_{Cu}	0.2	0.21	
Operating voltage	[V]	10 ... 60	10 ... 60	
Operating current	[mA]	100	100	
Switching frequency	[Hz]	500	5000	
Idle current / residual current	[mA]	15	10	
Line voltage drop	[V]	3	2,6	
Short circuit protection		clocking	clocking	
Inverse polarity protection		yes	yes	
Indication	output signal	LED yellow	LED yellow	
	voltage	-	-	
Operating temperature range	[°C]	-25 ... 70	-25 ... 70	
In compliance with		EN60947-5-2	EN60947-5-2	
Protection class acc. to IEC 60529		IP67	IP67	
Connection type		Connector M12	Connector M12	
Conductor diameter		-	-	
Housing material		stainless steel	stainless steel	
Front face		PBT (Crastin)	PBT (Crastin)	
Drawing No.		EZ015009	EZ015020	

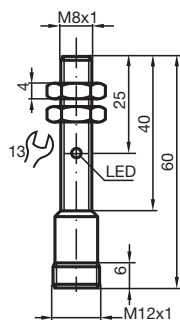
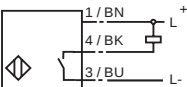
Output signals

Dimensions in mm

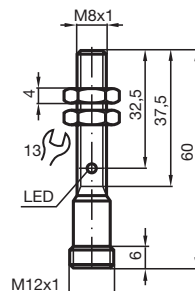
Output PO



Output NO



EZ015009



EZ015020

Position Sensors

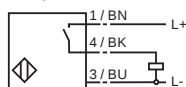
Technical Data, Dimension Drawings

Inductive Sensors, with thread M 8 x 1

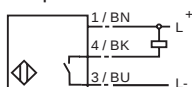
Operating distance S_n , mounting		2 mm non-flush	2 mm non-flush	2 mm non-flush	3 mm quasi flush
PNP	NO	SIN2-M8N-V2-PO	SIN2-M8S-U2-PO	SIN2-M8N-C1-PO	SIN3-M8N-V2-PO
	NC				
	Antivalent				
NPN	NO	SIN2-M8N-V2-NO		SIN2-M8N-C1-NO	
	Antivalent				
DC 2-wires	NO				
AC	NO				
	NC				
	Antivalent				
Switching distance	[mm]	0 ... 1.62	0 ... 1.62	0 ... 1.62	0 ... 2.43
Reduction factor	r_{VZA}	0.75	0.7	0.75	0.77
	r_{AL}	0.45	0.4	0.45	0.36
	r_{Cu}	0.35	0.35	0.35	0.27
Operating voltage	[V]	10 ... 30	10...60	10 ... 30	10 ... 30
Operating current	[mA]	100	100	100	200
Switching frequency	[Hz]	1500	400	1500	1000
Idle current / residual current	[mA]	15 / -	15 / -	15 / -	10 / -
Line voltage drop	[V]	3	3	3	2
Short circuit protection		clocking	clocking	clocking	no
Inverse polarity protection		yes	yes	yes	yes
Indication	output signal	LED yellow	LED yellow	Multi-hole-LED yellow	LED yellow
	voltage	-	-	-	-
Operating temperature range	[°C]	-25 ... 70	-25 ... 70	-25 ... 70	-25 ... 70
In compliance with		EN60947-5-2	EN60947-5-2	EN60947-5-2	EN60947-5-2
Protection class acc. to IEC 60529		IP67	IP67	IP67	IP67
Connection type		2 m, PVC-cable	2 m, PUR-cable	Connector M12	2 m, PVC-cable
Conductor diameter		0.14 mm ²	0.14 mm ²	-	0.14 mm ²
Housing material		nickel-plated brass	stainless steel	nickel-plated brass	chrome-plated brass
Front face		PBT (Crastin)	PBT (Crastin)	PBT (Crastin)	PBT (Crastin)
Drawing No.		FZ020038	FZ020002	FZ015032	FZ030001

Output signals

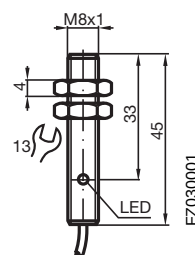
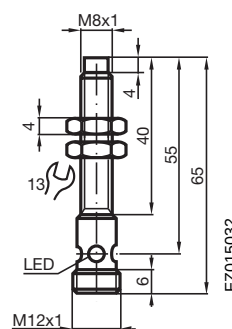
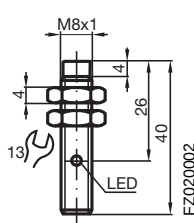
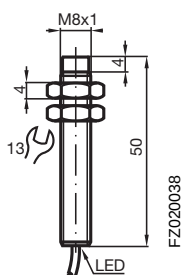
Output PO



Output NO



Dimensions in mm



Position Sensors

Technical Data, Dimension Drawings

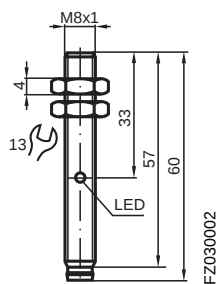
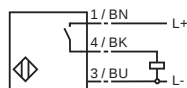
Inductive Sensors, with thread M 8 x 1

Operating distance S_n , mounting		3 mm quasi flush			
PNP	NO	SIN3-M8N-C8-PO			
	NC				
	Antivalent				
NPN	NO				
	Antivalent				
DC 2-wire	NO				
AC	NO				
	NC				
	Antivalent				
Switching distance	[mm]	0 ... 2.43			
Reduction factor	r_{V2A}	0.77			
	r_{AL}	0.36			
	r_{Cu}	0.27			
Operating voltage	[V]	10 ... 30			
Operating current		[mA] 200			
Switching frequency	[Hz]	1000			
Idle current / residual current	[mA]	10 / -			
Line voltage drop		[V] 2			
Short circuit protection		no			
Inverse polarity protection		yes			
Indication	output signal	LED yellow			
	voltage	-			
Operating temperature range	[°C]	-25 ... 70			
In compliance with		EN60947-5-2			
Protection class acc. to IEC 60529		IP67			
Connection type		Connector M8			
Conductor diameter		-			
Housing material		chrome-plated brass			
Front face		PBT (Crastin)			
Drawing No.	FZ030002				

Output signals

Dimensions in mm

Output PO



Position Sensors

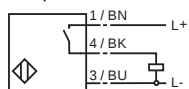
Technical Data, Dimension Drawings

Inductive Sensors, with thread M 12 x 1

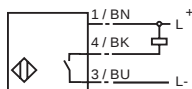
Operating distance S_n , mounting		2 mm flush	2 mm flush	2 mm flush	
PNP	NO	SIF2-M12N-V2-PO			
	NC				
	Antivalent		SIF2-M12N-V2-PK		
NPN	NO	SIF2-M12N-V2-NO			
	Antivalent		SIF2-M12N-V2-NK		
DC 2-wire	NO			SIF2-M12N-V2-DO	
AC	NO				
	NC				
	Antivalent				
Switching distance	[mm]	0 ... 1.62	0 ... 1.62	0 ... 1.62	
Reduction factor	r_{V2A}	0.7	0.66	0.67	
	r_{AL}	0.3	0.25	0.18	
	r_{Cu}	0.2	0.15	0.12	
Operating voltage	[V]	10 ... 30	10 ... 30	6 ... 60	
Operating current	[mA]		200	200 4 ... 100	
Switching frequency	[Hz]		1500	1000 2000	
Idle current / residual current	[mA]	17 / -	20 / -	- / 0.7	
Line voltage drop	[V]	3	3	6	
Short circuit protection		clocking	clocking	no	
Inverse polarity protection		yes	yes	yes	
Indication	output signal	LED yellow	LED yellow	LED yellow	
	voltage	-	-	-	
Operating temperature range	[°C]	-25 ... 70	-25 ... 70	-25 ... 70	
In compliance with		EN60947-5-2	EN60947-5-2	EN60947-5-2	
Protection class acc. to IEC 60529		IP67	IP67	IP67	
Connection type		2 m, PVC-Kabel	2 m, PVC-Kabel	2 m, PVC-Kabel	
Conductor diameter		0.14 mm ²	0.14 mm ²	0.,14 mm ²	
Housing material		nickel-plated brass	nickel-plated brass	nickel-plated brass	
Front face		PBT (Crastin)	PBT (Crastin)	PBT (Crastin)	
Drawing No.		FZ020010	FZ020044	FZ020020	

Output signals

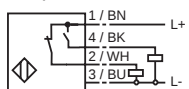
Output PO



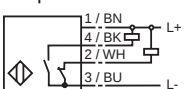
Output NO



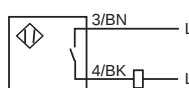
Output PK



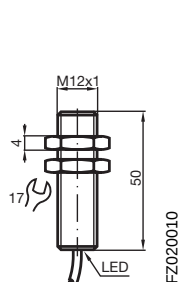
Output NK



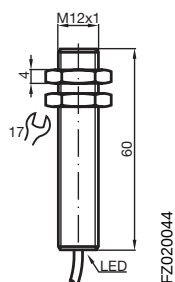
Output DO



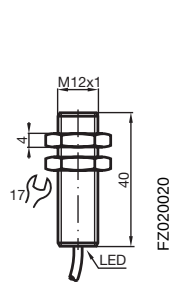
Dimensions in mm



FZ020010



FZ020044



FZ020020

Position Sensors

Technical Data, Dimension Drawings

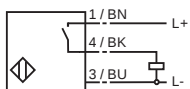
Inductive Sensors, with thread M 12 x 1

Operating distance S_n , mounting		2 mm flush	2 mm flush		
PNP	NO	SIF2-M12E-C1-PO			
	NC				
	Antivalent				
NPN	NO				
	Antivalent				
DC 2-wire	NO				
AC	NO				
	NC		SIF2-M12E-V2-AC		
	Antivalent				
Switching distance	[mm]	0 ... 1.62	0 ... 1.62		
Reduction factor	r_{V2A}	0.7	0.65		
	r_{AL}	0.23	0.15		
	r_{Cu}	0.21	0.1		
Operating voltage	[V]	10 ... 60	20 ... 253		
Operating current	[mA]		200		
Switching frequency	[Hz]	3000	25		
Idle current / residual current	[mA]	11	0,8		
Line voltage drop	[V]	3	5		
Short circuit protection		clocking	no		
Inverse polarity protection		yes	no		
Indication	output signal	LED yellow	LED red		
	voltage	-	-		
Operating temperature range	[°C]	-25 ... 70	-25 ... 70		
In compliance with		EN60947-5-2	EN60947-5-2		
Protection class acc. to IEC 60529		IP67	IP67		
Connection type		Connector M12	2 m, PVC-cable		
Conductor diameter		-	0.34 mm ²		
Housing material		stainless steel	stainless steel		
Front face		PBT (Crastin)	PBT (Crastin)		
Drawing No.		EZ020014	FZ020014		

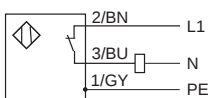
Output signals

Dimensions in mm

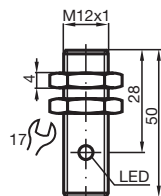
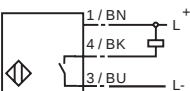
Output PO



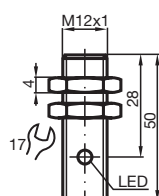
Output AC



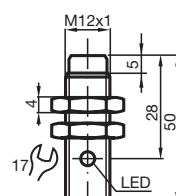
Output NO



EZ020014



FZ020014



EZ020008

Position Sensors

Technical Data, Dimension Drawings

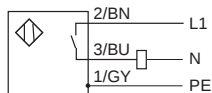
Inductive Sensors, with thread M 12 x 1

Operating distance S_n , mounting		2 mm flush	2 mm flush	2 mm flush	2 mm flush
PNP	NO		SIF2-M12S-V2-PO	SIF2-M12N-C1-PO	SIF2-M12S-C1-PO
	NC				
	Antivalent				
NPN	NO			SIF2-M12N-C1-NO	
	Antivalent				
DC 2-wire	NO				
AC	NO	SIF2-M12N-V2-AO			
	NC				
	Antivalent				
Switching distance	[mm]	0 ... 1.62	0 ... 1.62	0 ... 1.62	0 ... 1.62
Reduction factor	r_{V2A}	0.65	0.7	0.7	0.7
	r_{AL}	0.15	0.3	0.3	0.3
	r_{Cu}	0.1	0.2	0.2	0.2
Operating voltage	[V]	20 ... 253	10...30	10 ... 30	10...30
Operating current	[mA]	5...200	100	200	100
Switching frequency	[Hz]	25	1000	1500	1000
Idle current / residual current	[mA]	- / 0,8	15 / -	17 / -	15 / -
Line voltage drop	[V]	5	3	3	3
Short circuit protection		no	clocking	clocking	clocking
Inverse polarity protection		no	yes	yes	yes
Indication	output signal	LED red	LED yellow	Multi-hole LED yellow	LED yellow
	voltage	-	-	-	-
Operating temperature range	[°C]	-25 ... 70	-25 ... 70	-25 ... 70	-25 ... 70
In compliance with		EN60947-5-2	EN60947-5-2	EN60947-5-2	EN60947-5-2
Protection class acc. to IEC 60529		IP67	IP67	IP67	IP67
Connection type		2 m, PVC-cable	2 m, PVC-cable	Connector M12	Connector M12
Conductor diameter			0.34 mm ²	0.14 mm ²	- -
Housing material		stainless steel	nickel-plated brass	nickel-plated brass	nickel-plated brass
Front face		PBT (Crastin)	PBT (Crastin)	PBT (Crastin)	
Drawing No.		FZ0200017	WZ000003	FZ020046	WZ060002

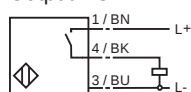
Output signals

Dimensions in mm

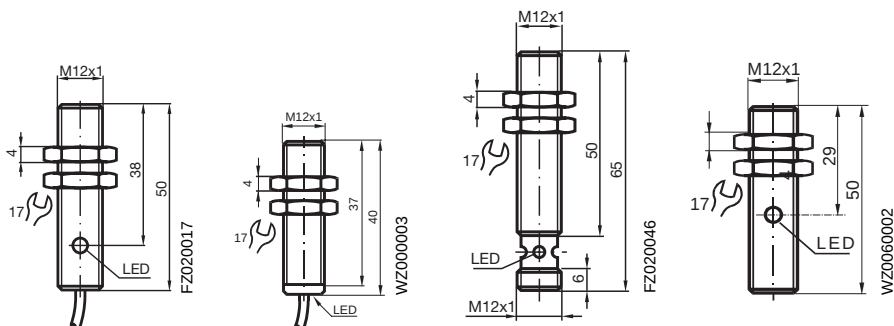
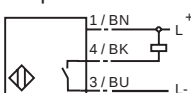
Output AO



Output PO



Output NO



Position Sensors

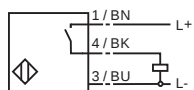
Technical Data, Dimension Drawings

Inductive Sensors, with thread M 12 x 1

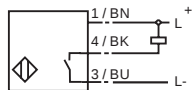
Operating distance S_n , mounting		4 mm non-flush	4 mm non-flush	4 mm non-flush	4 mm non-flush
PNP	NO	SIN4-M12N-V2-PO			SIN4-M12S-V2-PO
	NC				
	Antivalent		SIN4-M12N-V2-PK		
NPN	NO	SIN4-M12N-V2-NO			
	Antivalent		SIN4-M12N-V2-NK		
DC 2-wire	NO			SIN4-M12N-V2-DO	
AC	NO				
	NC				
	Antivalent				
Switching distance	[mm]	0 ... 3.24	0 ... 3.24	0 ... 3.24	0 ... 3.24
Reduction factor	r_{VZA}	0.8	0.75	0.74	0.75
	r_{AL}	0.5	0.45	0.37	0.45
	r_{Cu}	0.4	0.4	0.36	0.4
Operating voltage	[V]	10 ... 30	10 ... 30	6 ... 60	10 ... 30
Operating current	[mA]	200	200	4 ... 100	200
Switching frequency	[Hz]	1200	1000	2000	1500
Idle current / residual current	[mA]	17 / -	20 / -	- / 0.7	15 / -
Line voltage drop	[V]	3	3	6	3
Short circuit protection		clocking	clocking	no	clocking
Inverse polarity protection		yes	yes	yes	yes
Indication	output signal	LED yellow	LED yellow	LED yellow	LED yellow
	voltage	-	-	-	-
Operating temperature range	[°C]	-25 ... 70	-25 ... 70	-25 ... 70	-25 ... 70
In compliance with		EN60947-5-2	EN60947-5-2	EN60947-5-2	EN60947-5-2
Protection class acc. to IEC 60529		IP67	IP67	IP67	IP67
Connection type		2 m, PVC-cable	2 m, PVC-cable	2 m, PVC-cable	2 m, PVC-cable
Conductor diameter		0.14 mm ²	0.14 mm ²	0.14 mm ²	0.14 mm ²
Housing material		nickel-plated brass	nickel-plated brass	nickel-plated brass	nickel-plated brass
Front face		PBT (Crastin)	PBT (Crastin)	PBT (Crastin)	PBT (Crastin)
Drawing No.		FZ040005	FZ040021	FZ040013	WZ000002

Output signals

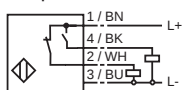
Output PO



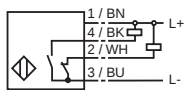
Output NO



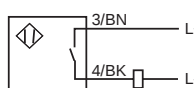
Output PK



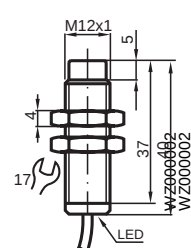
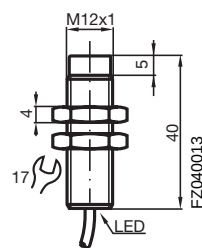
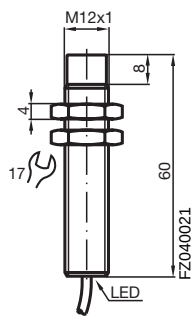
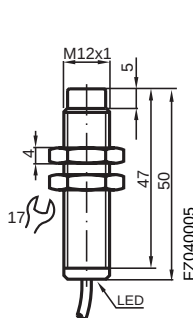
Output NK



Ausgang DO



Dimensions in mm



Position Sensors

Technical Data, Dimension Drawings

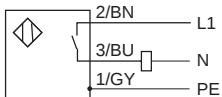
Inductive Sensors, with thread M 12 x 1

Operating distance S_n , mounting		4 mm non-flush	4 mm non-flush	4 mm non-flush	
PNP	NO		SIN4-M12N-C1-PO	SIN4-M12S-C1-PO	
	NC				
	Antivalent				
NPN	NO		SIN4-M12N-C1-NO		
	Antivalent				
DC 2-wire	NO				
AC	NO	SIN4-M12N-V2-AO			
	NC				
	Antivalent				
Switching distance	[mm]	0 ... 3.24	0 ... 3.24	0 ... 3.24	
Reduction factor	r_{V2A}	0.8	0.8	0.75	
	r_{AL}	0.45	0.5	0.45	
	r_{Cu}	0.4	0.4	0.4	
Operating voltage	[V]	20 ... 253	10 ... 30	10 ... 30	
Operating current	[mA]	5 ... 200	200	100	
Switching frequency	[Hz]	25	1200	800	
Idle current / residual current	[mA]	- / 0,8	17 / -	15 / -	
Line voltage drop	[V]	5	3	3	
Short circuit protection		nein	taktend	taktend	
Inverse polarity protection		nein	ja	ja	
Indication	output signal	LED red	Multi-hole LED yellow	LED yellow	
	voltage	-	-	-	
Operating temperature range	[°C]	-25 ... 70	-25 ... 70	-25 ... 70	
In compliance with		EN60947-5-2	EN60947-5-2	EN60947-5-2	
Protection class acc. to IEC 60529		IP67	IP67	IP67	
Connection type		2 m, PVC-cable	Connector M12	Connector M12	
Conductor diameter		0.34 mm ²	-	-	
Housing material		stainless steel	nickel-plated brass	nickel-plated brass	
Front face		PBT (Crastin)	PBT (Crastin)	PBT (Crastin)	
Drawing No.		FZ040009	FZ040028	FZ040008	

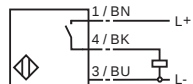
Output signals

Dimensions in mm

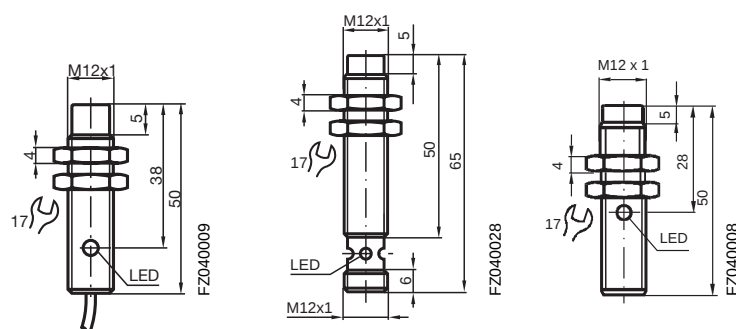
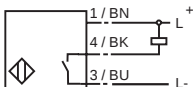
Output AO



Output PO



Output NO



Position Sensors

Technical Data, Dimension Drawings

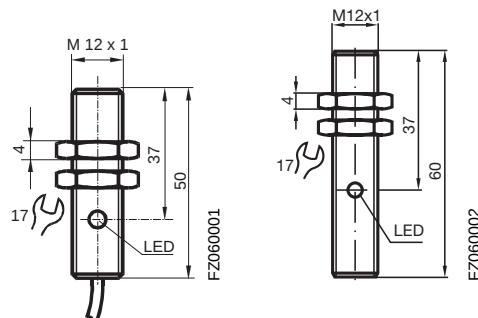
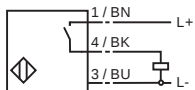
Inductive sensors, with thread M 12 x 1

Operating distance S_n , mounting		6 mm quasi flush	6 mm quasi flush		
PNP	NO	SIN6-M12N-V2-PO	SIN6-M12N-C1-PO		
	NC				
	Antivalent				
NPN	NO				
	Antivalent				
DC 2-wire	NO				
AC	NO				
	NC				
	Antivalent				
Switching distance	[mm]	0 ... 4.86	0 ... 4.86		
Reduction factor	r_{V2A}	0.67	0.67		
	r_{AL}	0.28	0.28		
	r_{Cu}	0.2	0.2		
Operating voltage	[V]	10 ... 30	10 ... 30		
Operating current	[mA]	200	200		
Switching frequency	[Hz]	800	800		
Idle current / residual current	[mA]	10 / -	10 / -		
Line voltage drop	[V]	2	2		
Short circuit protection		no	no		
Inverse polarity protection		yes	yes		
Indication	output signal	LED yellow	LED yellow		
	voltage	-	-		
Operating temperature range	[°C]	-25 ... 70	-25 ... 70		
In compliance with		EN 60947-5-2	EN 60947-5-2		
Protection class acc. to IEC 60529		IP 67	IP 67		
Connection type		2 m, PVC-cable	Connector M12		
Conductor diameter		0.34 mm ²	-		
Housing material		chrome-plated brass	chrome-plated brass		
Front face		PBT (Crastin)	PBT (Crastin)		
Drawing No.	FZ060001	FZ060002			

Output signals

Dimensions in mm

Output PO



Position Sensors

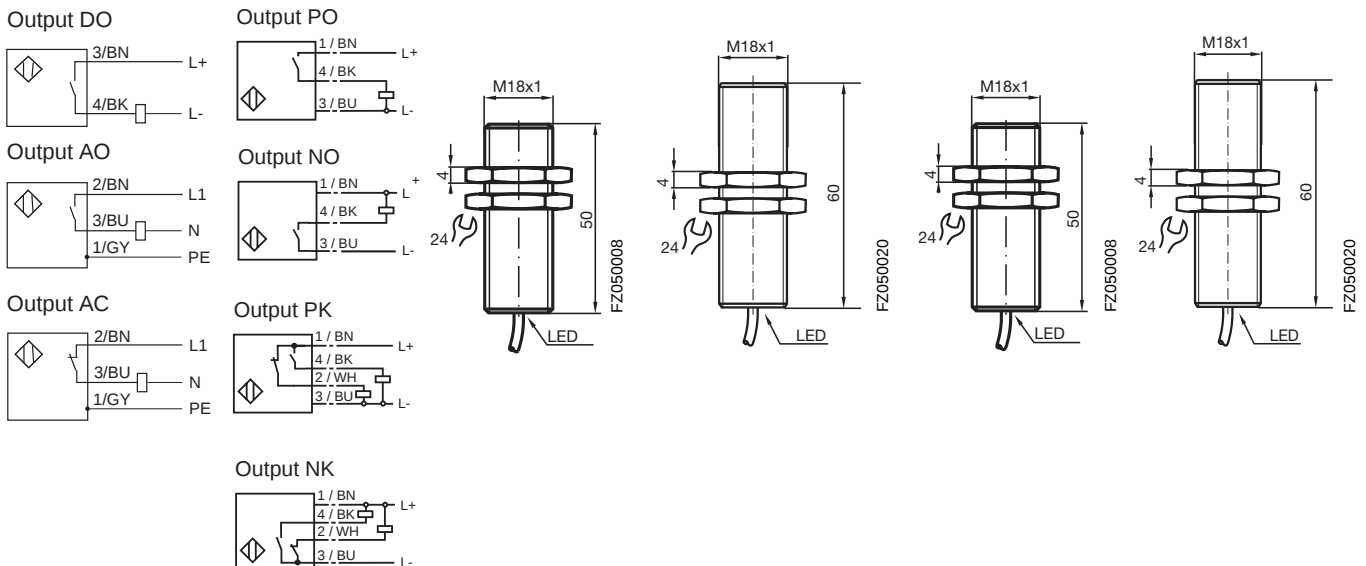
Technical Data, Dimension Drawings

Inductive sensors, with thread M 18 x 1

Operating distance S_n , mounting		5 mm flush	5 mm flush	5 mm flush	5 mm flush
PNP	NO	SIF5-M18N-V2-PO			
	NC				
	Antivalent		SIF5-M18N-V2-PK		
NPN	NO	SIF5-M18N-V2-NO			
	Antivalent		SIF5-M18N-V2-NK		
DC 2-wire	NO			SIF5-M18N-V2-DO	
AC	NO				SIF5-M18N-V2-AO
	NC				SIF5-M18N-V2-AC
	Antivalent				
Switching distance	[mm]	0 ... 4.05	0 ... 4.05	0 ... 4.05	0 ... 4.05
Reduction factor	r_{V2A}	0.7	0.66	0.72	0.62
	r_{AL}	0.3	0.25	0.34	0.2
	r_{Cu}	0.3	0.15	0.31	0.15
Operating voltage	[V]	10 ... 30	10 ... 30	6 ... 60	20 ... 253
Operating current	[mA]	200	200	4...100	200
Switching frequency	[Hz]	800	800	1500	20
Idle current / residual current	[mA]	20 / -	20 / -	- / 0,7	- / 1,7
Line voltage drop	[V]	3	3	6	8
Short circuit protection		clocking	clocking	no	no
Inverse polarity protection		yes	yes	yes	no
Indication	output signal	LED yellow	LED yellow	LED yellow	LED yellow
	voltage	-	-	-	-
Operating temperature range	[°C]	-25 ... 70	-25 ... 70	-25 ... 70	-25 ... 70
In compliance with		EN 60947-5-2	EN 60947-5-2	EN 60947-5-2	EN 60947-5-2
Protection class acc. to IEC 60529		IP 67	IP 67	IP 67	IP 67
Connection type		2 m, PVC-cable	2 m, PVC-cable	2 m, PVC-cable	2 m, PVC-cable
Conductor diameter		0.14 mm ²	0.34 mm ²	0.34 mm ²	0.34 mm ²
Housing material		nickel-plated brass	nickel-plated brass	nickel-plated brass	nickel-plated brass
Front face		PBT (Crastin)	PBT (Crastin)	PBT (Crastin)	PBT (Crastin)
Drawing No.		FZ050008	FZ050020	FZ050008	FZ050020

Output signals

Dimensions in mm



Position Sensors

Technical Data, Dimension Drawings

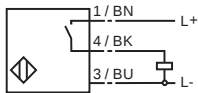
Inductive sensors, with thread M 18 x 1

Operating distance S_n , mounting		5 mm flush	8 mm non-flush	8 mm non-flush	
PNP	NO	SIF5-M18N-C1-PO	SIN8-M18N-V2-PO		
	NC				
	Antivalent			SIN8-M18N-V2-PK	
NPN	NO	SIF5-M18N-C1-NO	SIN8-M18N-V2-NO		
	Antivalent			SIN8-M18N-V2-NK	
DC 2-wire	NO				
AC	NO				
	NC				
	Antivalent				
Switching distance	[mm]	0 ... 4.05	0 ... 6.48	0 ... 6.48	
Reduction factor	r_{V2A}	0.7	0.7	0.75	
	r_{AL}	0.3	0.5	0.45	
	r_{Cu}	0.3	0.4	0.4	
Operating voltage	[V]	10 ... 30	10 ... 30	10 ... 30	
Operating current	[mA]	200	200	200	
Switching frequency	[Hz]	800	500	700	
Idle current / residual current	[mA]	20 / -	18 / -	20 / -	
Line voltage drop	[V]	3	3	3	
Short circuit protection		clocking	clocking	v	
Inverse polarity protection		yes	yes	yes	
Indication	output signal	Mult-hole LED yellow	LED yellow	LED yellow	
	voltage	-	-	-	
Operating temperature range	[°C]	-25 ... 70	-25 ... 70	-25 ... 70	
In compliance with		EN 60947-5-2	EN 60947-5-2	EN 60947-5-2	
Protection class acc. to ICE 60529		IP 67	IP 67	IP 67	
Connection type		Connector M12	2m, PVC-cable	2m, PVC-cable	
Conductor diameter		-	0.34 mm ²	0.34 mm ²	
Housing material		nickel-plated brass	nickel-plated brass	nickel-plated brass	
Front face		PBT (Crastin)	PBT (Crastin)	PBT (Crastin)	
Drawing No.		FZ050032	FZ080003	FZ080013	

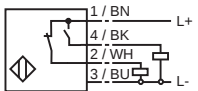
Output signals

Dimensions in mm

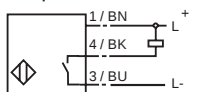
Output PO



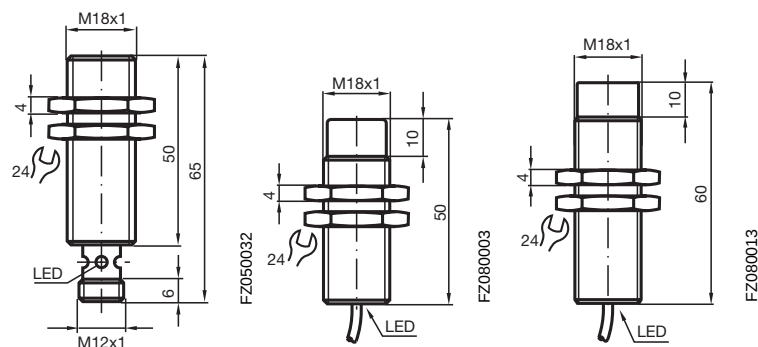
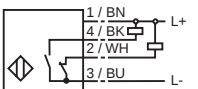
Output PK



Output NO



Output NK



Position Sensors

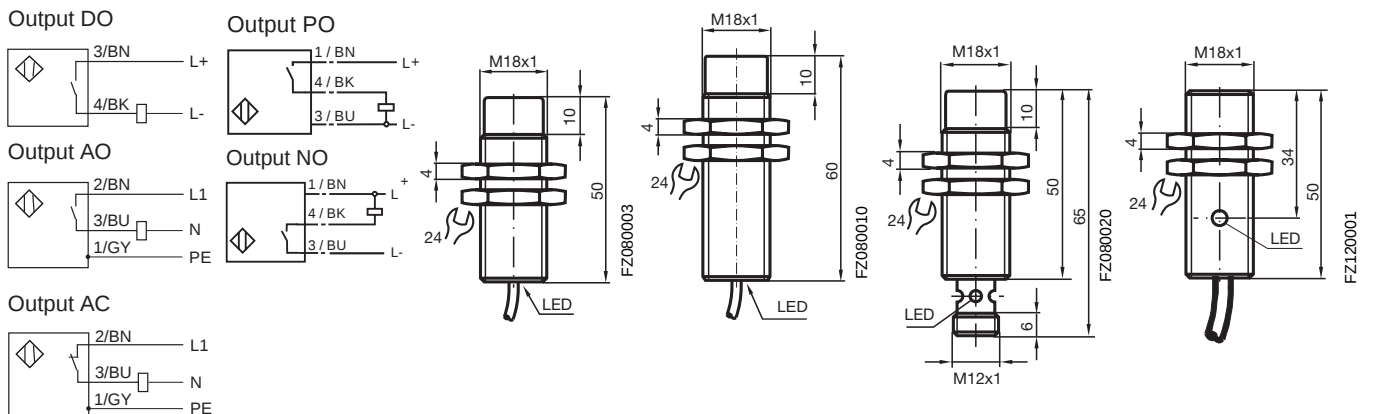
Technical Data, Dimension Drawings

Inductive sensors, with thread M 18 x 1

Operating distance S_n , mounting		8 mm non-flush	8 mm non-flush	8 mm non-flush	12 mm quasi flush
PNP	NO			SIN8-M18N-C1-PO	SIN12-M18N-V2-PO
	NC				
	Antivalent				
NPN	NO			SIN8-M18N-C1-NO	
	Antivalent				
DC 2-wire	NO	SIN8-M18N-V2-DO			
AC	NO		SIN8-M18N-V2-AO		
	NC		SIN8-M18N-V2-AC		
	Antivalent				
Switching distance	[mm]	0 ... 6.5	0 ... 6.5	0 ... 6.48	0 ... 9.72
Reduction factor	r_{V2A}	0.73	0.72	0.7	0.63
	r_{AL}	0.43	0.42	0.5	0.26
	r_{Cu}	0.42	0.4	0.4	0.2
Operating voltage	[V]	6 ... 60	20 ... 253	10 ... 30	10 ... 30
Operating current	[mA]		4 ... 100	200	200 200
Switching frequency	[Hz]		1000	20	500 500
Idle current / residual current	[mA]	- / 0.7	- / 1.7	18 / -	10 / -
Line voltage drop	[V]	6	8	3	2
Short circuit protection		no	no	clocking	no
Inverse polarity protection		yes	no	yes	yes
Indication	output signal	LED yellow	LED yellow	Multi-hole LED yellow	LED yellow
	voltage	-	-	-	-
Operating temperature range	[°C]	-25 ... 70	-25 ... 70	-25 ... 70	-25 ... 70
In compliance with		EN 60947-5-2	EN 60947-5-2	EN 60947-5-2	EN 60947-5-2
Protection class acc. to ICE 60529		IP 67	IP 67	IP 67	IP 67
Connection type		2 m, PVC-cable	2 m, PVC-cable	Connector M12	2 m, PVC-cable
Conductor diameter		0.34 mm ²	0.34 mm ²	-	0.5 mm ²
Housing material		nickel-plated brass	nickel-plated brass	nickel-plated brass	chrome-plated brass
Front face		PBT (Crastin)	PBT (Crastin)	PBT (Crastin)	PBT (Crastin)
Drawing No.		FZ080003	FZ080010	FZ080020	FZ120001

Output signals

Dimensions in mm



Position Sensors

Technical Data, Dimension Drawing

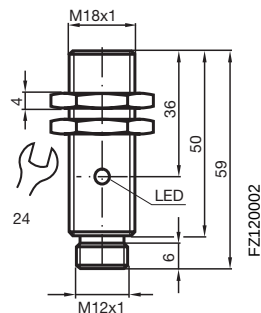
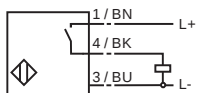
Inductive sensors, with thread M 18 x 1

Operating distance S_n , mounting		12 mm quasi flush			
PNP	NO	SIN12-M18N-C1-PO			
	NC				
	Antivalent				
NPN	NO				
	Antivalent				
DC 2-wire	NO				
AC	NO				
	NC				
	Antivalent				
Switching distance	[mm]	0 ... 9.72			
Reduction factor	r_{V2A}	0.63			
	r_{AL}	0.26			
	r_{Cu}	0.2			
Operating voltage	[V]	10 ... 30			
Operating current	[mA]	200			
Switching frequency	[Hz]	500			
Idle current / residual current	[mA]	10 / -			
Line voltage drop	[V]	2			
Short circuit protection		no			
Inverse polarity protection		yes			
Indication	output signal	LED yellow			
	voltage	-			
Operating temperature range	[°C]	-25 ... 70			
In compliance with		EN 60947-5-2			
Protection class acc. to ICE 60529		IP 67			
Connection type		Connector M12			
Conductor diameter		-			
Housing material		chrome-plated brass			
Front face		PBT (Crastin)			
Drawing No.		FZ120002			

Output signals

Dimensions in mm

Output PO



Position Sensors

Technical Data, Dimension Drawing

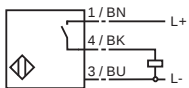
Inductive sensors, with thread M 18 x 1

Operating distance S_n , mounting		5 mm flush	8 mm non-flush		
PNP	NO	SIF5-M18E-C1-PO	SIN8-M18E-C1-PO		
	NC				
	Antivalent				
NPN	NO	SIF5-M18E-C1-NO			
	Antivalent				
DC 2-wire	NO				
AC	NO				
	NC				
	Antivalent				
Switching distance	[mm]	0 ... 4.05	0 ... 6.48		
Reduction factor	r_{V2A}	0.62	0.72		
	r_{AL}	0.2	0.42		
	r_{Cu}	0.15	0.4		
Operating voltage	[V]	10 ... 60	10 ... 60		
Operating current	[mA]	200	200		
Switching frequency	[Hz]	1500	1000		
Idle current / residual current	[mA]	8.5	8.5		
Line voltage drop	[V]	3	3		
Short circuit protection		clocking	clocking		
Inverse polarity protection		yes	yes		
Indication	output signal	LED yellow	LED yellow		
	voltage	-	-		
Operating temperature range	[°C]	-25 ... 70	-25 ... 70		
In compliance with		EN 60947-5-2	EN 60947-5-2		
Protection class acc. to ICE 60529		IP 67	IP 67		
Connection type		Connector M12	Connector M12		
Conductor diameter		-	-		
Housing material		stainless steel	stainless steel		
Front face		PBT (Crastin)	PBT (Crastin)		
Drawing No.		EZ050013	SIN8-M18E-C1-PO		

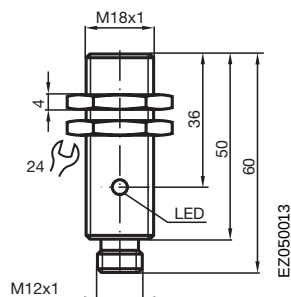
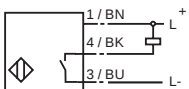
Output signals

Dimensions in mm

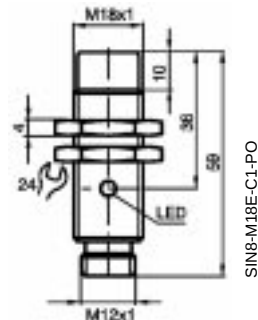
Output PO



Output NO



EZ050013



SIN8-M18E-C1-PO

Position Sensors

Technical Data, Dimension Drawings

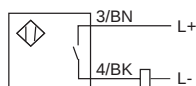
Inductive sensors, with thread M 30 x 1,5

Operating distance S_n , mounting		10 mm flush	10 mm flush	10 mm flush	10 mm flush
PNP	NO	SIF10-M30N-V2-PO			
	NC				
	Antivalent		SIF10-M30N-V2-PK		
NPN	NO	SIF10-M30N-V2-NO			
	Antivalent		SIF10-M30N-V2-NK		
DC 2-wire	NO			SIF10-M30N-V2-DO	
AC	NO				SIF10-M30N-V2-AO
	NC				SIF10-M30N-V2-AC
	Antivalent				
Switching distance	[mm]	0 ... 8.1	0 ... 8.1	0 ... 8.1	0 ... 8.1
Reduction factor	r_{VZA}	0.8	0.66	0.7	0.71
	r_{AL}	0.3	0.25	0.3	0.29
	r_{Cu}	0.3	0.15	0.25	0.26
Operating voltage	[V]	10 ... 30	10 ... 30	6 ... 60	20 ... 253
Operating current	[mA]		200	200	4 ... 100 5 ... 200
Switching frequency	[Hz]		200	200	700 20
Idle current / residual current	[mA]	20 / -	20 / -	- / 0.7	- / 1.7
Line voltage drop	[V]		3	3	6 8
Short circuit protection		clocking	clocking	no	no
Inverse polarity protection		yes	yes	yes	no
Indication	output signal	LED yellow	LED yellow	LED yellow	LED yellow
	voltage	-	-	-	-
Operating temperature range	[°C]	-25 ... 70	-25 ... 70	-25 ... 70	-25 ... 70
In compliance with		EN 60947-5-2	EN 60947-5-2	EN 60947-5-2	EN 60947-5-2
Protection class acc. to ICE 60529		IP 67	IP 67	IP 67	IP 67
Connection type		2 m, PVC-Kabel	2 m, PVC-Kabel	2 m, PVC-Kabel	2 m, PVC-Kabel
Conductor diameter		0.34 mm ²	0.34 mm ²	0.34 mm ²	0.34 mm ²
Housing material		nickel-plated brass	nickel-plated brass	nickel-plated brass	nickel-plated brass
Front face		PBT (Crastin)	PBT (Crastin)	PBT (Crastin)	PBT (Crastin)
Drawing No.		FZ100007	FZ100021	FZ100007	FZ100021

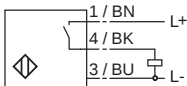
Output signals

Dimensions in mm

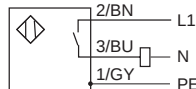
Output DO



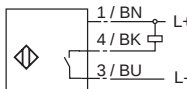
Output PO



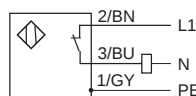
Output AO



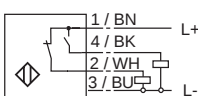
Output NO



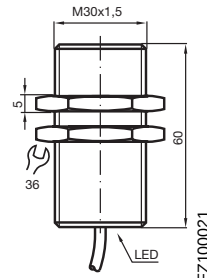
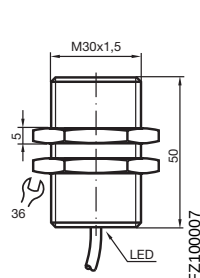
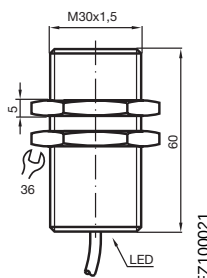
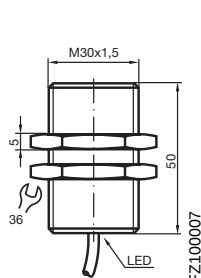
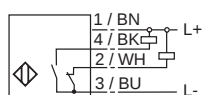
Output AC



Output PK



Output NK



Position Sensors

Technical Data, Dimension Drawings

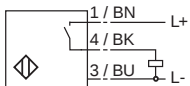
Inductive sensors, with thread M 30 x 1,5

Operating distance S_n , mounting		10 mm flush	15 mm non-flush	15 mm non-flush	
PNP	NO	SIF10-M30N-C1-PO	SIN15-M30N-V2-PO		
	NC				
	Antivalent			SIN15-M30N-V2-PK	
NPN	NO	SIF10-M30N-C1-NO	SIN15-M30N-V2-NO		
	Antivalent			SIN15-M30N-V2-NK	
DC 2-wire	NO				
AC	NO				
	NC				
	Antivalent				
Switching distance	[mm]	0 ... 8.1	0 ... 12.15	0 ... 12.15	
Reduction factor	r_{V2A}	0.8	0.8	0.75	
	r_{AL}	0.3	0.5	0.45	
	r_{Cu}	0.3	0.4	0.4	
Operating voltage	[V]	10 ... 30	10 ... 30	10 ... 30	
Operating current	[mA]	200	200	200	
Switching frequency	[Hz]	200	200	200	
Idle current / residual current	[mA]	20 / -	15 / -	20 / -	
Line voltage drop	[V]	3	3	3	
Short circuit protection		clocking	clocking	clocking	
Inverse polarity protection		yes	yes	yes	
Indication	output signal	Multi hole LED yellow	LED yellow	LED yellow	
	voltage	-	-	-	
Operating temperature range	[°C]	-25 ... 70	-25 ... 70	-25 ... 70	
In compliance with		EN 60947-5-2	EN 60947-5-2	EN 60947-5-2	
Protection class acc. to ICE 60529		IP 67	IP 67	IP 67	
Connection type		Connector M12	2m, PVC-cable	2m, PVC-cable	
Conductor diameter		-	0.34 mm ²	0.34 mm ²	
Housing material		nickel-plated brass	nickel-plated brass	nickel-plated brass	
Front face		PBT (Crastin)	PBT (Crastin)	PBT (Crastin)	
Drawing No.		FZ100035	FZ150003	FZ150014	

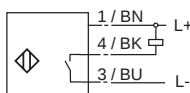
Output signals

Dimensions in mm

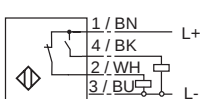
Output PO



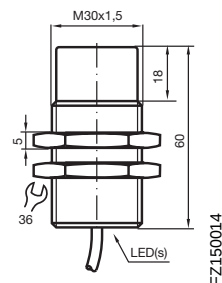
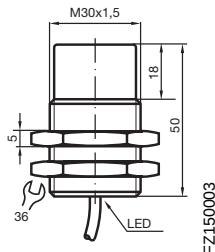
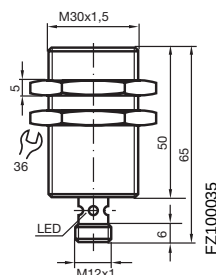
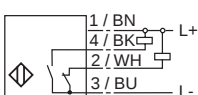
Output NO



Output PK



Output NK



Position Sensors

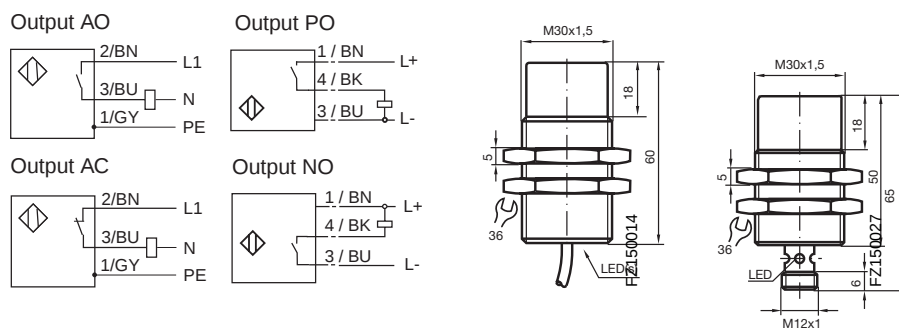
Technical Data, Dimension Drawings

Inductive sensors, with thread M 30 x 1,5

Operating distance S_n , mounting		15 mm non-flush	15 mm non-flush	
PNP	NO		SIN15-M30N-C1-PO	
	NC			
	Antivalent			
NPN	NO		SIN15-M30N-C1-NO	
	Antivalent			
DC 2-wire	NO			
AC	NO	SIN15-M30N-V2-AO		
	NC	SIN15-M30N-V2-AC		
	Antivalent			
Switching distance	[mm]	0 ... 12.2	0 ... 12.15	
Reduction factor	r_{V2A}	0.82	0.8	
	r_{AL}	0.43	0.5	
	r_{Cu}	0.41	0.4	
Operating voltage	[V]	20 ... 253	10 ... 30	
Operating current	[mA]	5 ... 200	200	
Switching frequency	[Hz]	20	200	
Idle current / residual current	[mA]	- / 1.7	20 / -	
Line voltage drop	[V]	8	3	
Short circuit protection		no	clocking	
Inverse polarity protection		no	yes	
Indication	output signal	LED yellow	Multi-hole LED yellow	
	voltage	-	-	
Operating temperature range	[°C]	25 ... 70	-25 ... 70	
In compliance with		EN 60947-5-2	EN 60947-5-2	
Protection class acc. to ICE 60529		IP 67	IP 67	
Connection type		2 m, PVC-cable	Connector M12	
Conductor diameter		0.34 mm ²	-	
Housing material		nickel-plated brass	nickel-plated brass	
Front face		PBT (Crastin)	PBT (Crastin)	
Drawing No.		FZ 150014	FZ 150027	

Output signals

Dimensions in mm



Position Sensors

Technical Data, Dimension Drawings

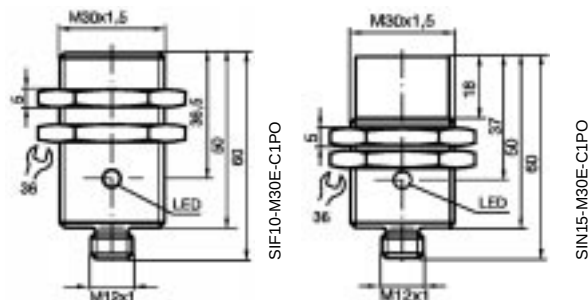
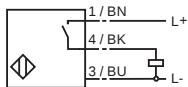
Inductive sensors, with thread M 30 x 1,5

Operating distance S_n , mounting		15 mm flush	15 mm non-flush		
PNP	NO	SIF10-M30E-C1-PO	SIN15-M30E-C1-PO		
	NC				
	Antivalent				
NPN	NO				
	Antivalent				
DC 2-wire	NO				
AC	NO				
	NC				
	Antivalent				
Switching distance	[mm]	0 ... 8.1	0 ... 12.15		
Reduction factor	r_{V2A}	0.72	0.71		
	r_{AL}	0.34	0.4		
	r_{Cu}	0.32	0.38		
Operating voltage	[V]	10 ... 60	10 ... 60		
Operating current	[mA]	200	200		
Switching frequency	[Hz]	650	500		
Idle current / residual current	[mA]	9	12		
Line voltage drop	[V]	2,8	2,8		
Short circuit protection		clocking	clocking		
Inverse polarity protection		yes	yes		
Indication	output signal	LED yellow	LED yellow		
	voltage	-	-		
Operating temperature range	[°C]	-25 ... 70	-25 ... 70		
In compliance with		EN 60947-5-2	EN 60947-5-2		
Protection class acc. to ICE 60529		IP 67	IP 67		
Connection type		Connector M12	Connector M12		
Conductor diameter		-	-		
Housing material		stainless steel	stainless steel		
Front face		PBT (Crastin)	PBT (Crastin)		
Drawing No.		SIF10-M30E-C1-PO	SIN15-M30E-C1-PO		

Output signals

Dimensions in mm

Output PO



Position Sensors

Technical Data, Dimension Drawings

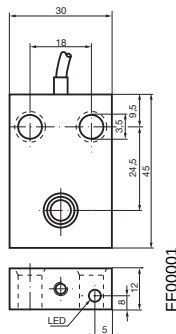
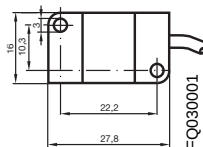
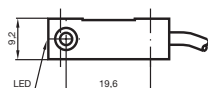
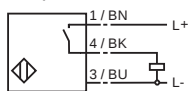
Inductive sensors, Block- and square housings

Operating distance S_n , mounting		2 mm flush	6 mm flush	
PNP	NO	SIF2-B28N-V0,1-PO	SIF6-B45N-U2-PO	
	NC			
	Antivalent			
NPN	NO	SIF2-B28N-V0,1-NO		
	Antivalent			
DC 2-wire	NO			
AC	NO			
	NC			
	Antivalent			
Switching distance	[mm]	0 ... 1.62	0 ... 4.8	
Reduction factor	r_{V2A}	0.7	0.7	
	r_{AL}	0.35	0.22	
	r_{CU}	0.2	0.2	
Operating voltage	[V]	10 ... 30	10 ... 60	
Operating current	[mA]	100	200	
Switching frequency	[Hz]	1000	500	
Idle current / residual current	[mA]	15 / -	20 / -	
Line voltage drop	[V]	3	3	
Short circuit protection		clocking	clocking	
Inverse polarity protection		yes	yes	
Indication	output signal	LED yellow	LED yellow	
	voltage	-	-	
Operating temperature range	[°C]	-25 ... 70	-25 ... 70	
In compliance with		EN 60947-5-2	EN 60947-5-2	
Protection class acc. to ICE 60529		IP 67	IP 67	
Connection type		0.1 m, PVC-cable	2 m, PUR-cable	
Conductor diameter		0.14 mm ²	0.34 mm ²	
Housing material		PBT (Crastin)	PBT (Crastin)	
Front face		PBT (Crastin)	PBT (Crastin)	
Drawing No.		FQ030001	FF00001	

Output signals

Dimensions in mm

Output PO



Position Sensors

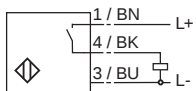
Technical Data, Dimension Drawings

Inductive sensors, Block- and square housings

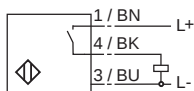
Operating distance S_n , mounting		15 mm flush	15 mm flush	20 mm flush	20 mm non-flush
PNP	NO	SIF15-Q40N-T-PO	SIF15-Q40N-C1-PO	SIF20-Q40N-T-PO	
	NC				
	Antivalent	SIF15-Q40N-T-PK			
NPN	NO	SIF15-Q40N-T-NO			
	Antivalent				
DC 2-wire	NO				
AC	NO				
	NC				
	Antivalent				SIN20-Q40N-T-AK
Switching distance	[mm]	0 ... 12.15	0 ... 12,15	0 ... 16,2	0 ... 16.2
Reduction factor	r_{VZA}	0.75	0.75	0.8	0.8
	r_{AL}	0.3	0.3	0.3	0.35
	r_{Cu}	0.25	0.25	0.3	0.35
Operating voltage	[V]	10 ... 60	20 ... 253	10 ... 60	20 ... 2 53
Operating current	[mA]	200	8 ... 500	200	8 ... 500
Switching frequency	[Hz]	150	20	150	20
Idle current / residual current	[mA]	10 / -	- / 1.95	10 / -	- / 1.95
Line voltage drop	[V]	2.8	12	2.8	12
Short circuit protection		clocking	no	clocking	no
Inverse polarity protection		yes	no	yes	no
Indication	output signal	LED yellow	LED yellow	LED yellow	LED yellow
	voltage	-	-	-	-
Operating temperature range	[°C]	-25 ... 70	-25 ... 70	-25 ... 70	-25 ... 70
In compliance with		EN 60947-5-2	EN 60947-5-2	EN 60947-5-2	EN 60947-5-2
Protection class acc. to ICE 60529		IP 68	IP 68	IP 68	IP 68
Connection type		terminal connection	Connector M12	terminal connection	terminal connection
Conductor diameter		up to 2,5 mm ²	up to 2,5 mm ²	up to 2,5 mm ²	up to 2,5 mm ²
Housing material		PBT (Crastin)	PBT (Crastin)	PBT (Crastin)	PBT (Crastin)
Front face		PBT (Crastin)	PBT (Crastin)	PBT (Crastin)	PBT (Crastin)
Drawing No.		CV150002	CV150002	CV150002	CV150002

Output signals

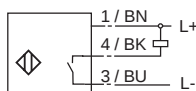
Output PO



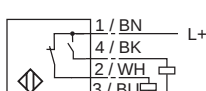
Output PO



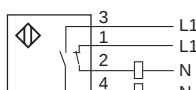
Output NO



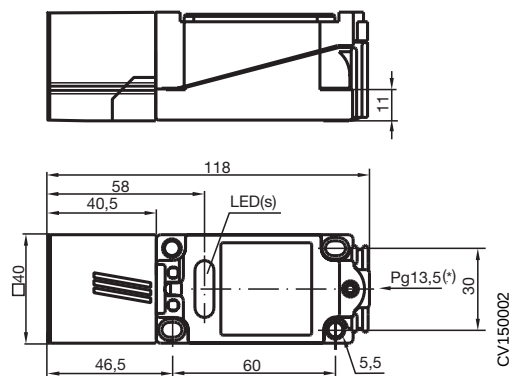
Output PK



Output AK



Dimensions in mm



(*) Cable inlet acc. to new standard henceforth in M20

Position Sensors

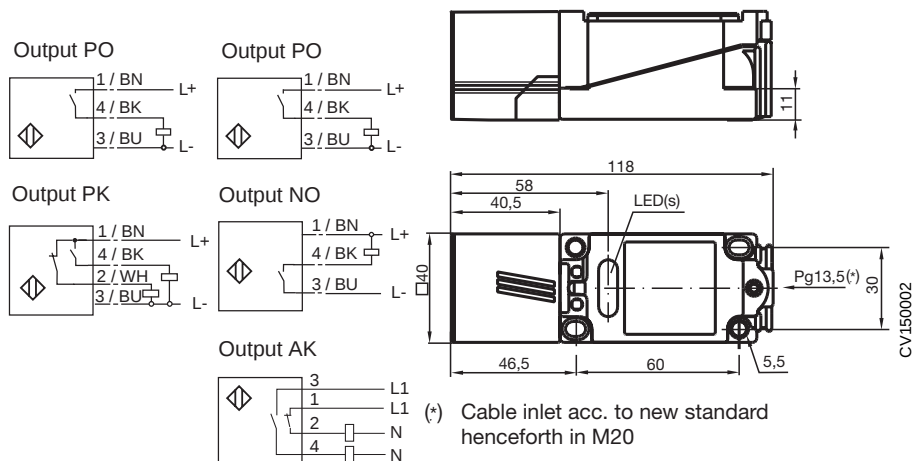
Technical Data, Dimension Drawings

Inductive sensors, Block- and square housings

Operating distance S_n , mounting		30 mm non-flush	30 mm non-flush		
PNP	NO	SIN30-Q40N-T-PO			
	NC				
	Antivalent	SIN30-Q40N-T-PK			
NPN	NO				
	Antivalent				
DC 2-wire	NO				
AC	NO				
	NC				
	Antivalent		SIN30-Q40N-T-AK		
Switching distance	[mm]	0 ... 24.3	0 ... 24.3		
Reduction factor	r_{V2A}	0.8	0.8		
	r_{AL}	0.45	0.45		
	r_{Cu}	0.4	0.4		
Operating voltage	[V]	10 ... 60	20 ... 253		
Operating current	[mA]	200	8 ... 500		
Switching frequency	[Hz]	100	20		
Idle current / residual current	[mA]	10 / -	- / 1.95		
Line voltage drop	[V]	2,8	12		
Short circuit protection		clocking	no		
Inverse polarity protection		yes	no		
Indication	output signal	LED yellow	LED yellow		
	voltage	-	-		
Operating temperature range	[°C]	-25 ... 70	-25 ... 70		
In compliance with		EN 60947-5-2	EN 60947-5-2		
Protection class acc. to ICE 60529		IP 68	IP 68		
Connection type		terminal connection	terminal connection		
Conductor diameter		up to 2.5 mm ²	up to 2.5 mm ²		
Housing material		PBT (Crastin)	PBT (Crastin)		
Front face		PBT (Crastin)	PBT (Crastin)		
Drawing No.		CV150002	CV150002		

Output signals

Dimensions in mm



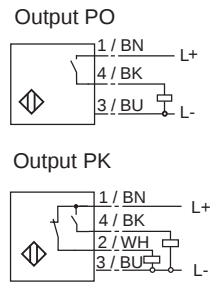
Position Sensors

Technical Data, Dimension Drawings

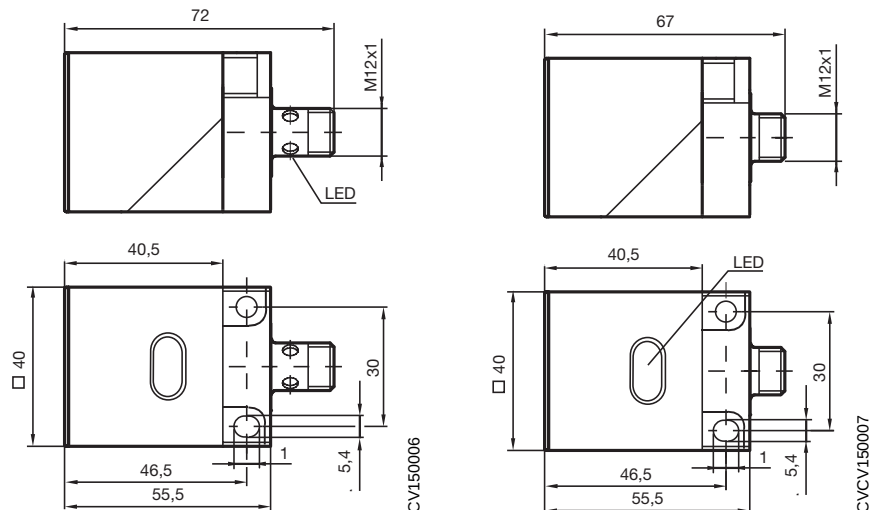
Inductive sensors, Block- and square housings

Operating distance S_n , mounting		20 mm, flush	30 mm, non-flush	20 mm, flush	30 mm non-flush
PNP	NO	SIF20-Q40S-C1-PO	SIN30-Q40S-C1-PO	SIF20-Q40T-C1-PO	
	NC				
	Antivalent			SIF20-Q40T-C1-PK	SIN30-Q40T-C1-PK
NPN	NO				
	Antivalent				
DC 2-wire	NO				
AC	NO				
	NC				
	Antivalent				
Switching distance	[mm]	0 ... 16,2	0 ... 24,3	0 ... 16,2	0 ... 24,3
Reduction factor	r_{V2A}	0,85	0,85	0,85	0,85
	r_{AL}	0,4	0,5	0,4	0,5
	r_{Cu}	0,35	0,45	0,35	0,45
Operating voltage	[V]	10 ... 30	10 ... 30	10 ... 30	10 ... 30
Operating current	[mA]	200	200	200	200
Switching frequency	[Hz]	150	150	150	150
Idle current / residual current	[mA]	20 / -	20 / -	20 / -	20 / -
Line voltage drop	[V]		3	3	3 3
Short circuit protection		clocking	clocking	clocking	clocking
Inverse polarity protection		yes	yes	yes	yes
Indication	output signal	Multi-hole LED yellow	Multi-hole LED yellow	LED yellow	LED yellow
	voltage	-	-	-	-
Operating temperature range	[°C]	-25 ... 70	-25 ... 70	-25 ... 70	-25 ... 70
In compliance with		EN 60947-5-2	EN 60947-5-2	EN 60947-5-2	EN 60947-5-2
Protection class acc. to ICE 60529		IP 67	IP 67	IP 67	IP 67
Connection type		Connector M12	Connector M12	Connector M12	Connector M12
Conductor diameter		-	-	-	-
Housing material		PBT (Crastin)	PBT (Crastin)	PBT (Crastin)	PBT (Crastin)
Front face		PBT (Crastin)	PBT (Crastin)	PBT (Crastin)	PBT (Crastin)
Drawing No.		CV150006	CV150006	CV150007	CV150007

Output signals



Dimensions in mm



Position Sensors

Technical Data, Dimension Drawings

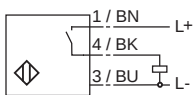
Inductive sensors, Block- and square housings

Operating distance S_n , mounting		40 mm flush	50 mm non-flush		
PNP	NO		SIN50-Q80N-T-PO		
	NC				
	Antivalent	SIF40-Q80N-T-PK	SIN50-Q80N-T-PK		
NPN	NO				
	Antivalent				
DC 2-wire	NO				
AC	NO				
	NC				
	Antivalent				
Switching distance	[mm]	0 ... 32.4	0 ... 40.5		
Reduction factor	r_{V2A}	0.83	0.85		
	r_{AL}	0.38	0.4		
	r_{Cu}	0.38	0.3		
Operating voltage	[V]	10 ... 60	10 ... 60		
Operating current	[mA]	200	200		
Switching frequency	[Hz]	100	100		
Idle current / residual current	[mA]	20 / -	20 / -		
Line voltage drop	[V]	3	3		
Short circuit protection		clocking	clocking		
Inverse polarity protection		yes	yes		
Indication	output signal	LED yellow	LED yellow		
	voltage	LED green	LED green		
Operating temperature range	[°C]	-25 ... 7	-25 ... 70		
In compliance with		EN 60947-5-2	EN 60947-5-2		
Protection class acc. to ICE 60529		IP 67	IP 67		
Connection type		terminal connection	terminal connection		
Conductor diameter		up to 2.5 mm ²	up to 2.5 mm ²		
Housing material		PBT (Crastin)	PBT (Crastin)		
Front face		PBT (Crastin)	PBT (Crastin)		
Drawing No.		CFP40001	CFP40002		

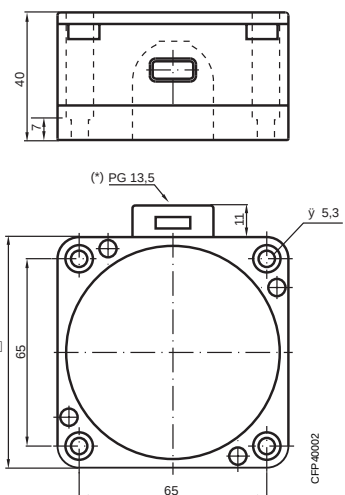
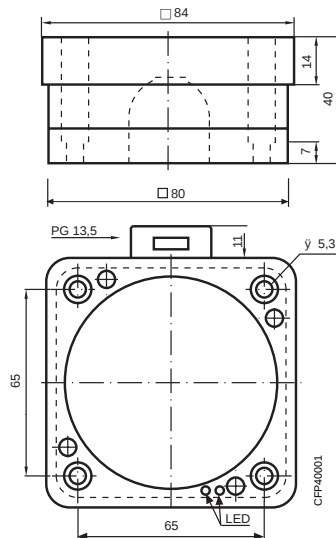
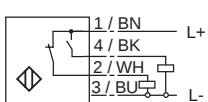
Output signals

Dimensions in mm

Output PO



Output PK



(*) Cable input according to new norm henceforth in M20

Position Sensors

Technical Data, Dimension Drawings

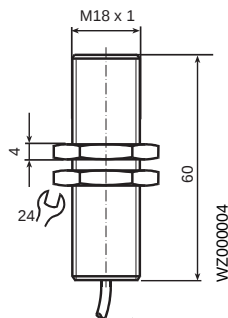
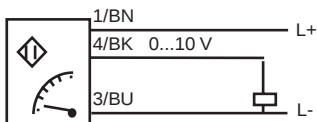
Inductive sensors, Analogue sensor

Metering range	2 mm ... 5 mm			
Type	SIF5-M18N-V2-M			
Operating voltage [V]	15 ... 30			
Compensation tolerance zero-point [%]	±2			
Frequency limit (3 dB) [Hz]	ca. 110			
Reproducibility [µm]	6			
Output signal [mA]	0 ... 20			
Load resistance [Ω]	0 ... 500			
Output ripple	ca.±0,15% of final value			
Inverse polarity protection	yes			
Temperature drift	ca.±0,1%/K of final value			
Idle current [mA]	8			
Operating temperature range [°C]	-10 ... 70			
In compliance with	EN 60947-5-2			
Protection class acc. to ICE 60529	IP 67			
Connection type	2 m PVC-cable			
Conductor diameter	0.5 mm ²			
Housing material	nickel-plated brass			
Front face	PBT (Crastin)			
Drawing No.	WZ000004			

Output signals

Dimensions in mm

Output M



Position Sensors

Technical Data, Dimension Drawings

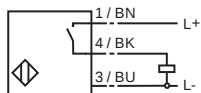
Capacitive sensors, with thread M 30 x 1,5

Operating distance S_n , mounting		10 mm flush	10 mm flush	10 mm flush	
PNP	NO	SCF10-M30N-V2-PO	SCF10-M30N-C1-PO		
	NC				
	Antivalent	SCF10-M30N-V2-PK	SCF10-M30N-C1-PK		
NPN	NO				
	Antivalent				
DC 2-Draht	NO				
AC	NO			SCF10-M30N-V2-AO	
	NC				
	Antivalent				
Switching distance	[mm]	1 ... 10	1 ... 10	1 ... 10	
Reduction factor	r_{VZA}	-	-	-	
	r_{AL}	-	-	-	
	r_{CU}	-	-	-	
Operating voltage	[V]	10 ... 60	10 ... 60	20 ... 253	
Operating current	[mA]	200	200	200	
Switching frequency	[Hz]	10	10	10	
Idle current / residual current	[mA]	20 / 0.5	20 / 0.5	- / 1.5	
Line voltage drop	[V]	2,8	2,8	8	
Short circuit protection		clocking	clocking	no	
Inverse polarity protection		yes	yes	yes	
Indication	output signal	LED yellow	LED yellow	LED yellow	
	voltage	-	-	-	
Operating temperature range	[°C]	-25 ... 70	-25 ... 70	-25 ... 70	
In compliance with		EN 60947-5-2	EN 60947-5-2	EN 60947-5-2	
Protection class acc. to ICE 60529		IP 67	IP 67	IP 67	
Connection type		2 m, PVC-cable	Connector	2 m, PVC-cable	
Conductor diameter		0.75 mm ²	-	0.75 mm ²	
Housing material		stainless steel	stainless steel	stainless steel	
Front face		PBT (Crastin)	PBT (Crastin)	PBT (Crastin)	
Drawing No.		LS100018	LS100019	LS100018	

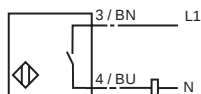
Output signals

Dimensions in mm

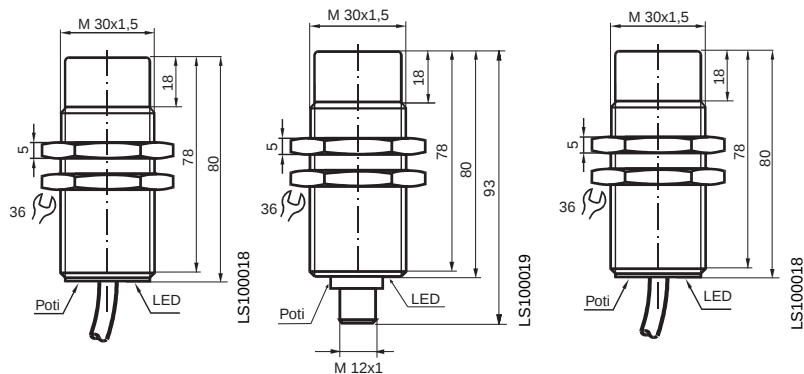
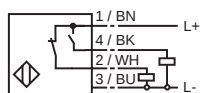
Output PO

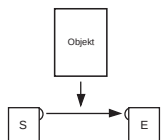


Output AO



Output PK





Position Sensors

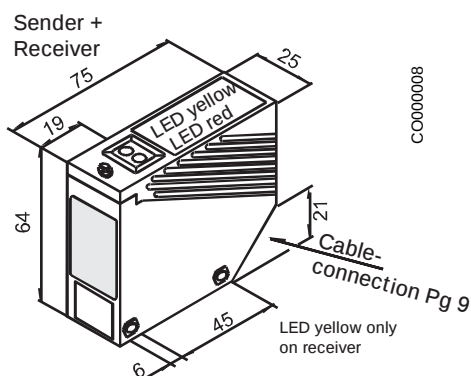
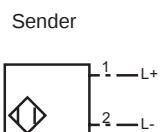
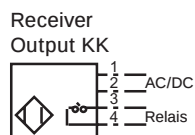
Technical Data, Dimension Drawing

Photoelectric sensors: Through Beam sensors

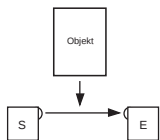
Device identification	SOT20M-B75N-T-KK	
Sensing range Output	20 000 mm DC, PNP	
Operating data Polarized Reference value Range setting Switching frequency (1:1) / response time Readiness delay Range hysteresis Detectable object:	no through beam photoelectric receiver with potentiometer 25 Hz / ≤ 20 ms ≤ 50 ms - opaque	
Operating mode LED yellow LED red Type of light External light limit daylight / halogen light	Light ON/dark ON, selectable only receiver: Output status rec.: stability control output, send.: net on IR-light 940 nm ≤ 10 000 Lux / ≤ 7 500 Lux	
Operating temperature range Storage temperature range	-25°C ... +55°C -40°C ... +55°C	
Electrical data Operating voltage Idle current Output Rated operational current Line voltage drop Stability control output Rated operational current Short-circuit and overload protection Inverse polarity protection	12 ... 240 VDC, ±10% 24 ... 240 VAC, ±10%; 50 ... 60 Hz - NC/NO relay: ≤ 240 VAC, ≤ 30 VDC, ≤ 3 A - - - no no	
Mechanical data Protection class acc. to EN 60529 Optical system Permissible shock- and vibration resistance Connection type Weight In compliance with Drawing No.	IP 66 PMMA lenses, pole filter shock b ≤ 30 g, T ≤ 11 ms vibrations f ≤ 55 Hz, a ≤ 1mm Terminal compartment, cable Ø 10 mm emitter: 90 g, receiver: 100 g EN 60 947-5-2 CO000008	

Output signals

Dimensions in mm



CO000008



Position Sensors

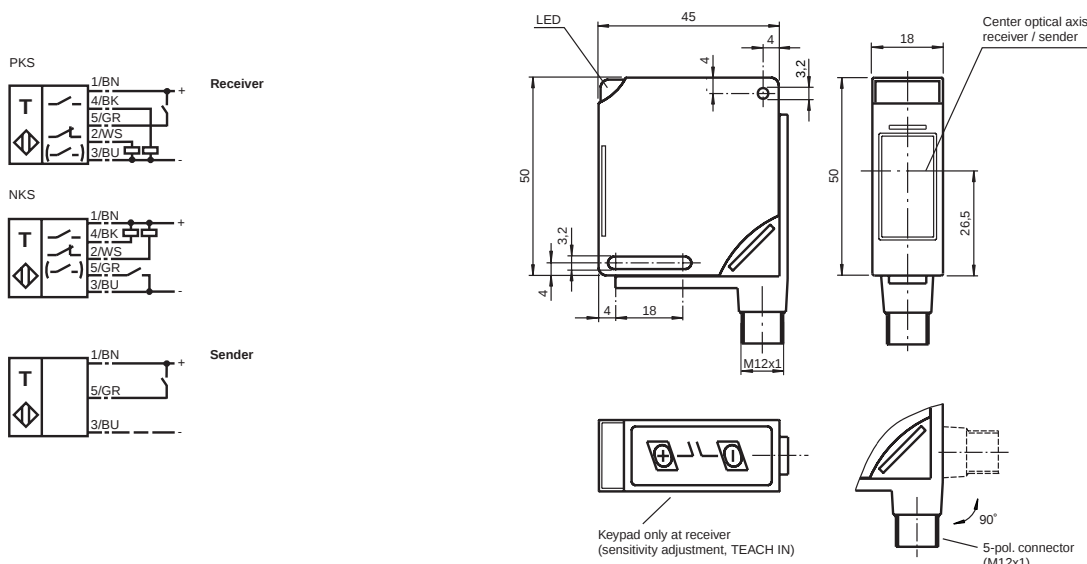
Technical Data, Dimension Drawings

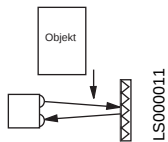
Photoelectric sensors: Through Beam sensors

Device identification	SOT15M-B45N-C1-PKS	SOT15M-B45N-C1-NKS
Sensing range Output	2000 mm ... 15 000 mm DC, PNP	2000 mm ... 15 000 mm DC, NPN
Operating data Polarized Reference value Range setting Switching frequency (1:1) / response time Readiness delay Range hysteresis Detectable object:	no receiver with +/- keys max. 1 kHz / ≤ 3 ms < 400 ms, with switch-on standardisation - opaque, reflective	no receiver with +/- keys max. 1 kHz / ≤ 3 ms < 400 ms, with switch-on standardisation - opaque, reflective
LED red LED yellow LED green Type of light External light limit daylight / halogen light	stability control output flashing 2 Hz, fault indication in teach-in mode 1,5 s switching condition operating status, in teach-in mode flashing visible red light 660 nm ≤ 10 000 Lux / ≤ 7 500 Lux	stability control output flashing 2 Hz, fault indication in teach-in mode 1,5 s switching condition operating status, in teach-in mode flashing visible red light 660 nm ≤ 10 000 Lux / ≤ 7 500 Lux
Operating temperature range Storage temperature range	-25 °C ... +55 °C -40 °C ... +55 °C	-25 °C ... +55 °C -40 °C ... +55 °C
Electrical data Operating voltage Idle current Rated operational current Line voltage drop Input voltage Short-circuit and overload protection Inverse polarity protection	10 VDC ... 30 VDC ±10% ca. 25 mA per device 200 mA per device ≤ 2,5 V for control / test: < 2 V off / > 7 V on yes yes	10 VDC ... 30 VDC ±10% ca. 25 mA per device 200 mA per device ≤ 2,5 V for control / test: < 2 V off / > 7 V on yes yes
Mechanical data Protection class acc. to EN 60529 Optical system Permissible shock- and vibration resistance Connection type Weight In compliance with Housing material	> IP 67, materials approved for use in food production PMMA lenses shock b ≤ 30 g, T ≤ 11 ms vibrations f ≤ 55 Hz, a ≤ 1mm Connector M12 x 1, 5 - pole, 90 ° pivoting 60 g per device EN 60 947-5-2 PBT (Crastin), plug and dovetail AISi	> IP 67, materials approved for use in food production PMMA lenses shock b ≤ 30 g, T ≤ 11 ms vibrations f ≤ 55 Hz, a ≤ 1mm Connector M12 x 1, 5 - pole, 90 ° pivoting 60 g per device EN 60 947-5-2 PBT (Crastin), plug and dovetail AISi

Output signals

Dimensions in mm





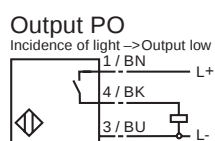
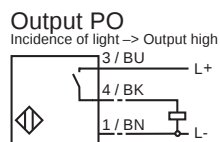
Position Sensors

Technical Data, Maßbild

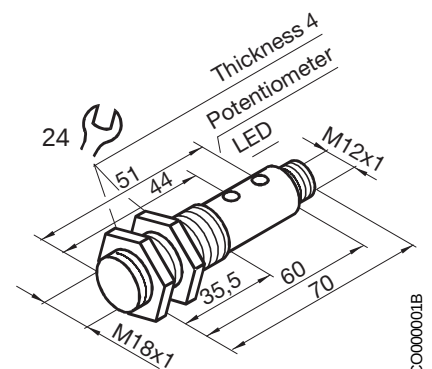
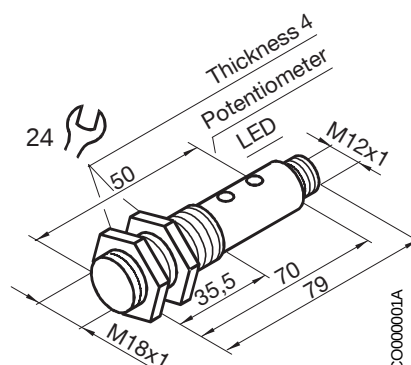
Photoelectric sensors: Retroreflective sensors

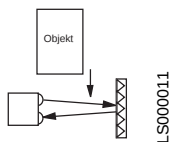
Device identification	SOR1500-M18N-C1-PO	SOR4000-M18N-C1-PO
Sensing range Output	1 500 mm DC, PNP	4 000 mm DC, PNP
Operating data Polarized Reference value Range setting Switching frequency (1:1) / response time Readiness delay Range hysteresis Detectable object:	yes Retroreflector 50mm x 50mm with potentiometer 300 Hz / ≤ 1,5 ms ≤ 50 ms - opaque, reflective	yes Retroreflector 50mm x 50mm with potentiometer ≤ 500 Hz ≤ 25 ms - opaque, reflective
Mode of operation LED yellow LED red Type of light External light limit daylight / halogen light	Light ON/dark ON, selectable by wiring switching condition - red light 660 nm ≤ 10 000 Lux / ≤ 3 000 Lux	Light ON/dark ON, selectable electronically switching condition - red light 660 nm ≤ 10 000 Lux / ≤ 3 000 Lux
Operating temperature range Storage temperature range	-25°C ... +55°C -40°C ... +70°C	-25°C ... +55°C -40°C ... +70°C
Electrical data Operating voltage Idle current Output Rated operational current Line voltage drop Stability control output Rated operational current Short-circuit and overload protection Inverse polarity protection	10 VDC ... 30 VDC, ripple 10% _{ss} ≤ 20 mA NC/NO 100 mA ≤ 2,5 V - - yes yes	10 VDC ... 30 VDC ≤ 25 mA NC/NO 100 mA ≤ 2,5 V - - yes yes
Mechanical data Protection class acc. to EN 60529 Optical system Permissible shock- and vibration resistance Connection type Housing material Weight In compliance with Drawing No.	IP 67 PMMA lenses, pole filter shock b ≤ 30 g, T ≤ 11 ms vibrations f ≤ 55 Hz, a ≤ 1mm Connector M12 nickel-plated brass 45 g EN 60 947-5-2 CO000001A	IP 67 PMMA lenses, pole filter shock b ≤ 30 g, T ≤ 11 ms vibrations f ≤ 55 Hz, a ≤ 1mm Connector M12 nickel-plated brass 45 g EN 60 947-5-2 CO000001B

Output signals



Dimensions in mm





Position Sensors

Technical Data, Dimension Drawing

Photoelectric sensors: Retroreflective sensors

Device identification	SOR2000-B26N-U2-PO	
Sensing range Output	2 000 mm DC, PNP	
Operating data Polarized Reference value Range setting Switching frequency (1:1) / response time Readiness delay Range hysteresis Detectable object:	no Retroreflector 50mm x 50mm with potentiometer 500 Hz / ≤ 1 ms ≤ 30 ms - opaque	
Mode of operation LED yellow LED red Type of light External light limit daylight / halogen light	Light ON/dark ON, selectable switching condition stability control output IR-light 950 nm ≤ 20 000 Lux / ≤ 5 000 Lux	
Operating temperature range Storage temperature range	-25°C ... +70°C -25°C ... +70°C	
Electrical data Operating voltage Idle current Output Rated operational current Line voltage drop Stability control output Rated operational current Short-circuit and overload protection Inverse polarity protection	10 VDC ... 30 VDC, ripple 10% _{ss} ≤ 30 mA NC/NO 200 mA ≤ 2,5 V - - yes yes	
Mechanical data Protection class acc. to EN 60529 Optical system Permissible shock- and vibration resistance Connection type Housing material Weight In compliance with Drawing No.	IP67 PC lenses shock b ≤ 30 g, T ≤ 11 ms vibrations f ≤ 55 Hz, a ≤ 1mm 2 m cable, 3 x 0.14mm ² , PUR black PBT (Crastin) 20 g EN 60 947-5-2 CO000003	

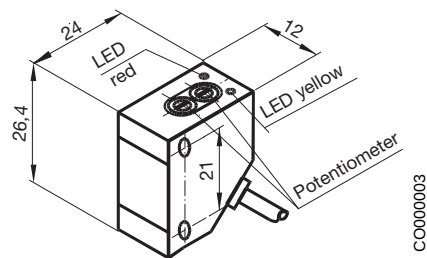
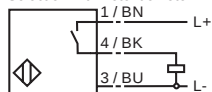
Output signals

Dimensions in mm

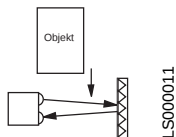
Output PO

Output low / high:

Selection with Potentiometer



CO000003



Position Sensors

Technical Data, Dimension Drawing

Photoelectric sensors: Retroreflective sensors

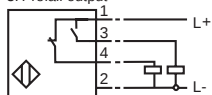
Device identification	SOR5000-B75N-T-POS	SOR5000-B75N-T-KK
Sensing range Output	5 000 mm DC, PNP	5 000 mm DC, PNP
Operating data Polarized Reference value Range setting Switching frequency (1:1) / response time Readiness delay Range hysteresis Detectable object:	yes Retroreflector 50mm x 50mm with potentiometer 300 Hz / ≤ 15 ms ≤ 50 ms - opaque, reflective	yes Retroreflector 50mm x 50mm with potentiometer 25 Hz / ≤ 20 ms ≤ 50 ms - opaque, reflective
Mode of operation LED yellow LED red Type of light External light limit daylight / halogen light	Light ON/dark ON, switchable switching condition stability control output red light 660 nm ≤ 10 000 Lux / ≤ 7 500 Lux	Light ON/dark ON, switchable switching condition stability control output red light 660 nm ≤ 10 000 Lux / ≤ 7 500 Lux
Operating temperature range Storage temperature range	-25°C ... +55°C -40°C ... +55°C	-25°C ... +55°C -40°C ... +55°C
Electrical data Operating voltage Idle current Output Rated operational current Line voltage drop Stability control output Rated operational current Short-circuit and overload protection Inverse polarity protection	10 VDC ... 30 VDC, ripple 10% _{ss} ≤ 35 mA NC/NO 200 mA ≤ 3 V NO 200 mA short-circuit/overload proof yes yes	12 ... 240 VDC ±10% 24 ... 240 VAC ±10%, 50 ... 60 Hz - NC/NO relay: ≤ 240 VAC, 30 VDC, ≤ 3 A - - - no no
Mechanical data Protection class acc. to EN 60529 Optical system Permissible shock- and vibration resistance Connection type Housing material Weight In compliance with Drawing No.	IP 66 PMMA lenses, polarisation filter shock b ≤ 30 g, T ≤ 11 ms vibrations f ≤ 55 Hz, a ≤ 1mm Terminal compartment, cable ø 10 mm PBT (Crastin) 100 g EN 60 947-5-2 CO000006	IP 66 PMMA lenses, polarisation filter shock b ≤ 30 g, T ≤ 11 ms vibrations f ≤ 55 Hz, a ≤ 1 mm Terminal compartment, cable ø 10 mm PBT (Crastin) 110 g EN 60 947-5-2 CO000006

Output signals

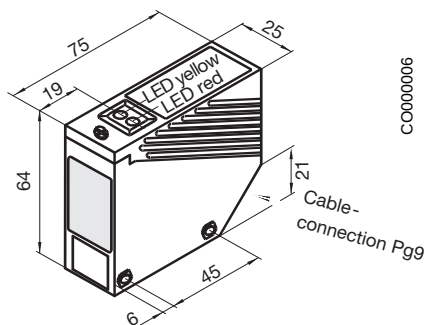
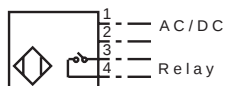
Dimensions in mm

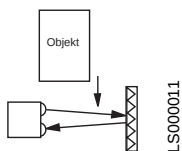
Output POS

4: Switchin output low / high
reversible
3: Prefail output



Output KK





Position Sensors

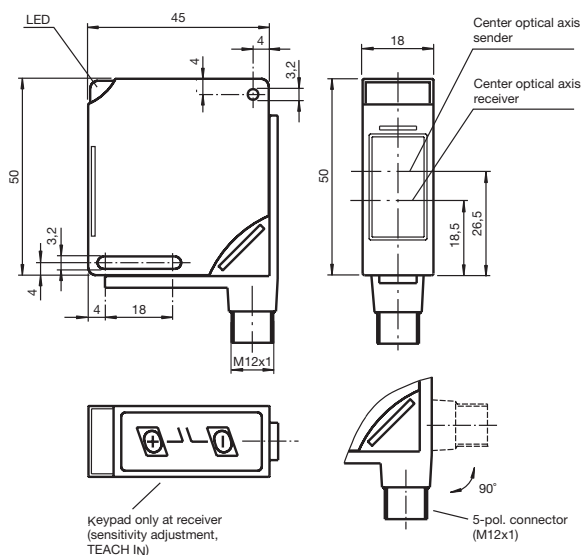
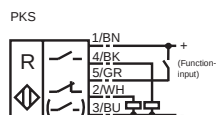
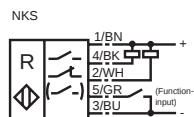
Technical Data, Dimension Drawing

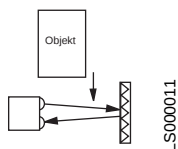
Photoelectric sensors: Retroreflective sensors

Device identification	SOR6000-B45N-C1-PKS	SOR6000-B45N-C1-NKS
Sensing range	0 mm ... 4000 mm with 50 x 50 mm ² Reflector 0 mm ... 6000 mm with 100 x 100 mm ² Reflector	0 mm ... 4000 mm with 50 x 50 mm ² Reflector 0 mm ... 6000 mm with 100 x 100 mm ² Reflector
Output	DC, PNP	DC, NPN
Operating data		
Polarized	no	no
Reference value	included reflector 50 x 50 mm ² alternatively 100 x 100 mm ² reflector	included reflektor 50 x 50 mm ² alternatively 100 x 100 mm ² reflector
Range setting	with +/- keys	with +/- keys
Switching frequency (1:1) / response time	max. 1 kHz / ≤ 3 ms	max. 1 kHz / ≤ 3 ms
Readiness delay	< 80 ms, with Einschaltnorm	< 80 ms, with Einschaltnorm
Range hysteresis	adjustable	adjustable
Detectable object:	opaque, reflective	opaque, reflective
LED red	Stability control output flashing 2 Hz, Fault indication in teach-in mode 1,5 s	Stability control output flashing 2 Hz, Fault indication in teach-in mode 1,5 s
LED yellow	switching condition	switching condition
LED green	operating status, in teach-in mode flashing	operating status, in teach-in mode flashing
Type of light	visible red light 660 nm	visible red light 660 nm
External light limit daylight / halogen light	≤ 10 000 Lux / ≤ 7 500 Lux	≤ 10 000 Lux / ≤ 7 500 Lux
Operating temperature range	-25 °C ... +55 °C	-25 °C ... +55 °C
Storage temperature range	-40 °C ... +55 °C	-40 °C ... +55 °C
Electrical data		
Operating voltage	10 VDC ... 30 VDC ±10%	10 VDC ... 30 VDC ±10%
Idle current	ca. 25 mA	ca. 25 mA
Rated operational current	200 mA	200 mA
Line voltage drop	≤ 2,5 V	≤ 2,5 V
Input voltage	for control / test: < 2 V off / > 7 V on	for control / test: < 2 V off / > 7 V on
Short-circuit and overload protection	yes	yes
Inverse polarity protection	yes	yes
Mechanical data		
Protection class acc. to EN 60529	> IP 67, materials approved for use in food production PMMA lenses	> IP 67, materials approved for use in food production PMMA lenses
Optical system	shock b ≤ 30 g, T ≤ 11 ms	shock b ≤ 30 g, T ≤ 11 ms
Permissible shock- and vibration resistance	vibrations f ≤ 55 Hz, a ≤ 1 mm	vibrations f ≤ 55 Hz, a ≤ 1 mm
Connection type	Connector M12 x 1, 5 - pole, 90 ° pivoting	Connector M12 x 1,5-pole, 90 ° pivoting
Housing material	PBT (Grastin), plug and dovetail AISi	PBT (Grastin), plug and dovetail AISi
Weight	60 g	60 g
In compliance with	EN 60 947-5-2	EN 60 947-5-2

Output signals

Dimensions in mm





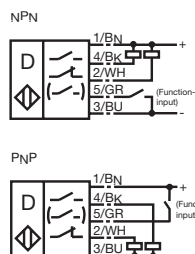
Position Sensors

Technical Data, Dimension Drawings

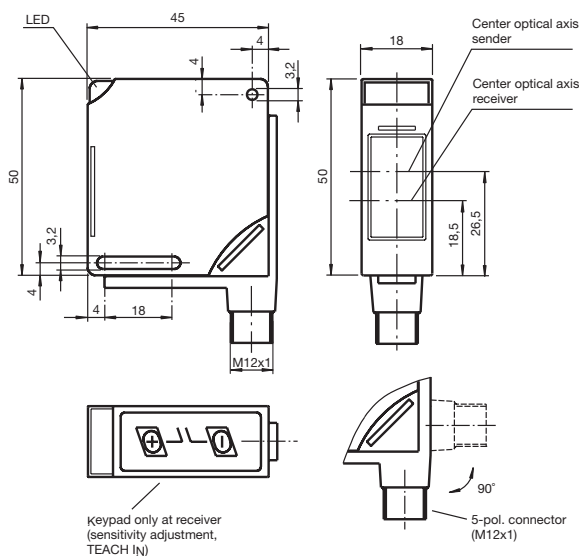
Photoelectric sensors: Retroreflective sensors for the detection of transparent objects

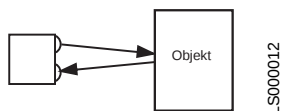
Device identification	SORG2000-B45N-C1-PKS	SORG2000-B45N-C1-NKS
Sensing range Output	0 mm ... 2000 mm with 50 x 50 mm² reflector DC, PNP	0 mm ... 2000 mm with 50 x 50 mm² reflector DC, NPN
Operating data Polarized Reference value Range setting Switching frequency (1:1) / response time Readiness delay Range hysteresis Detectable object:	yes Reflector 50 x 50 mm ² with +/- keys max. 1 kHz / ≤ 3 ms < 80 ms, with Einschaltnorm adjustable opaque, transparent (z.B. Klarglas, PET, Folien)	yes Reflektor 50 x 50 mm ² with +/- keys max. 1 kHz / ≤ 3 ms < 80 ms, with Einschaltnorm adjustable opaque, transparent (z.B. Klarglas, PET, Folien)
LED red LED yellow LED green Type of light External light limit daylight / halogen light	Stability control output flashing 2 Hz, Fault indication in teach-in mode 1,5 s switching condition operating status, in teach-in mode flashing visible red light 660 nm ≤ 10 000 Lux / ≤ 7 500 Lux	Stability control output flashing 2 Hz, Fault indication in teach-in mode 1,5 s switching condition operating status, in teach-in mode flashing visible red light 660 nm ≤ 10 000 Lux / ≤ 7 500 Lux
Operating temperature range Storage temperature range	-25 °C ... +55 °C -40 °C ... +55 °C	-25 °C ... +55 °C -40 °C ... +55 °C
Electrical data Operating voltage Idle current Rated operational current Line voltage drop Input voltage Short-circuit and overload protection Inverse polarity protection	10 VDC ... 30 VDC ±10% ca. 25 mA 200 mA ≤ 2,5 V for control / test: < 2 V off / > 7 V on yes yes	10 VDC ... 30 VDC ±10% ca. 25 mA 200 mA ≤ 2,5 V for control / test: < 2 V off / > 7 V on yes yes
Mechanical data Protection class acc. to EN 60529 Optical system Permissible shock- and vibration resistance Connection type 90 ° schwenkbar Housing material Weight In compliance with	> IP 67, materials approved for use in food production PMMA lenses shock b ≤ 30 g, T ≤ 11 ms vibrations f ≤ 55 Hz, a ≤ 1mm Connector M12 x 1, 5 - pole, 90 ° pivoting PBT (Grastin), plug and dovetail AISi 60 g EN 60 947-5-2	> IP 67, materials approved for use in food production PMMA lenses shock b ≤ 30 g, T ≤ 11 ms vibrations f ≤ 55 Hz, a ≤ 1mm Connector M12 x 1, 5 - pole, 90 ° pivoting PBT (Grastin), plug and dovetail AISi 60 g EN 60 947-5-2

Output signals



Dimensions in mm





Position Sensors

Technical Data, Dimension Drawings

Photoelectric sensors: Diffuse Reflective sensors

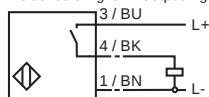
Device identification	SOD200-M18N-C1-PO	SOD400-B26N-U2-PO
Sensing range Output	200 mm DC, PNP	400 mm DC, PNP
Operating data Polarized Reference value Range setting Switching frequency (1:1) / response time Readiness delay Range hysteresis Detectable object:	no white 200mm x 200mm with potentiometer 300 Hz / ≤ 1,5 ms ≤ 50 ms ≤ 15 % opaque	no white 100mm x 100mm with potentiometer 500 Hz / ≤ 1 ms ≤ 30 ms ≤ 15 % opaque, transparent
Mode of operation LED yellow LED red Type of light External light limit daylight / halogen light	Light ON/dark ON, selectable by wiring switching condition - IR-light 940 nm ≤ 10 000 Lux / ≤ 3 000 Lux	Light ON/dark ON, switchable switching condition stability control output IR-light 950 nm ≤ 20 000 Lux / ≤ 5 000 Lux
Operating temperature range Storage temperature range	-25°C ... +55°C -40°C ... +70°C	-25°C ... +70°C -25°C ... +70°C
Electrical data Operating voltage Idle current Output Rated operational current Line voltage drop Stability control output Rated operational current Short-circuit and overload protection Inverse polarity protection	10 VDC ... 30 VDC, ripple 10% _{ss} ≤ 20 mA NC / NO 100 mA ≤ 2,5 V - - - yes yes	10 VDC ... 30 VDC, ripple 10% _{ss} ≤ 30 mA NC/NO 200 mA ≤ 2,5 V - - - yes yes
Mechanical data Protection class acc. to EN 60529 Optical system Permissible shock- and vibration resistance Connection type Housing material Weight In compliance with Drawing No.	IP 67 PC lenses shock b ≤ 30 g, T ≤ 11 ms vibrations f ≤ 55 Hz, a ≤ 1 mm Connector M12 nickel-plated brass 45 g EN 60 947-5-2 CO000001	IP 67 PC lenses shock b ≤ 30 g, T ≤ 11 ms vibrations f ≤ 55 Hz, a ≤ 1 mm 2m cable PUR black, 3 x 0.14 mm ² PBT (Crastin) 20 g EN 60 947-5-2 CO000003

Output signals

Dimensions in mm

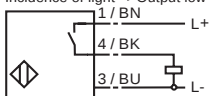
Output PO

Incidence of light → Output high



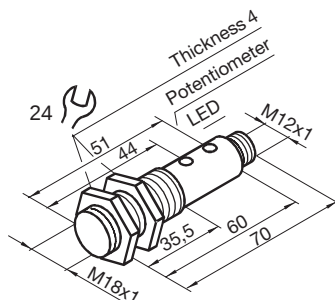
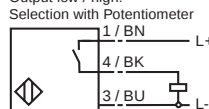
Output PO

Incidence of light → Output low

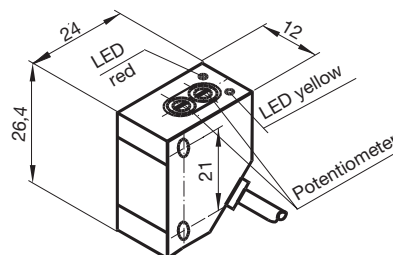


Output PO

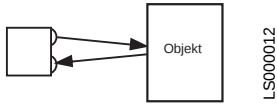
Output low / high:
Selection with Potentiometer



CO000001



CO000003



Position Sensors

Technical Data, Dimension Drawings

Photoelectric sensors: Diffuse Reflective sensors

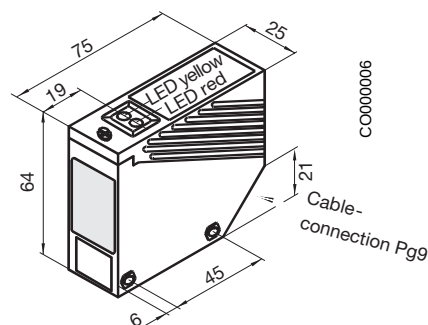
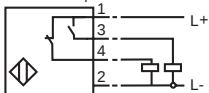
Device identification	SOD800-B75N-T-POS
Sensing range Output	800 mm DC, PNP
Operating data Polarized Reference value Range setting Switching frequency (1:1) / response time Readiness delay Range hysteresis Detectable object:	no white 100mm x 100mm with potentiometer 300 Hz / ≤ 15 ms ≤ 50 ms ≤ 15 % opaque, transparent
Mode of operation LED yellow LED red Type of light External light limit daylight / halogen light	Light ON/dark ON, switchable switching condition stability control output IR-light 940 nm $\leq 10\,000$ Lux / $\leq 7\,500$ Lux
Operating temperature range Storage temperature range	-25°C ... +70°C -40°C ... +80°C
Electrical data Operating voltage Idle current Output Rated operational current Line voltage drop Stability control output Rated operational current Short-circuit and overload protection Inverse polarity protection	10 VDC ... 30 VDC, ripple 10% _{ss} ≤ 25 mA NC/NO 200 mA short circuit/overload proof ≤ 3 V NO 10 mA yes yes
Mechanical data Protection class acc. to EN 60529 Optical system Permissible shock- and vibration resistance Connection type Housing material Weight In compliance with Drawing No.	IP 66 PMMA lenses shock $b \leq 30$ g, $T \leq 11$ ms vibrations $f \leq 55$ Hz, $a \leq 1$ mm Terminal compartment, cable $\varnothing 10$ mm PBT (Crastin) 100 g EN 60 947-5-2 CO000006

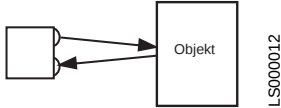
Output signals

Dimensions in mm

Output POS

4: Switchin output low / high
reversible
3: Prefail output





Position Sensors

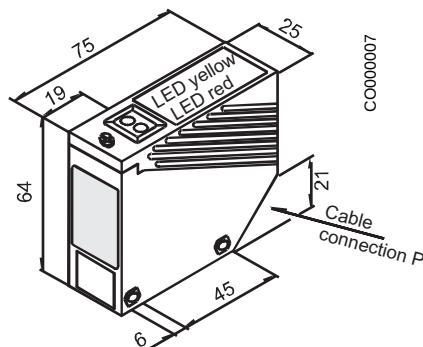
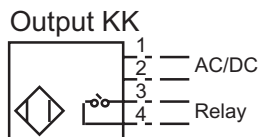
Technical Data, Dimension Drawing

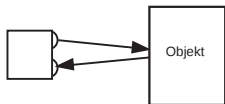
Photoelectric sensors: Diffuse Reflective sensors

Device identification	SOD2000-B75N-T-KK	
Sensing range Output	2000 mm DC, PNP	
Operating data Polarized Reference value Range setting Switching frequency (1:1) / response time Readiness delay Range hysteresis Detectable object:	no white 200mm x 200mm with potentiometer 300 Hz / $\leq 1,5$ ms ≤ 50 ms ≤ 15 % opaque, transparent	
Mode of operation LED yellow LED red Type of light External light limit daylight / halogen light	Light ON/dark ON, switchable switching condition stability control output IR-light 940 nm $\leq 10\,000$ Lux / $\leq 7\,500$ Lux	
Operating temperature range Storage temperature range	-25°C ... +55°C -40°C ... +55°C	
Electrical data Operating voltage Idle current Output Rated operational current Line voltage drop Stability control output Rated operational current Short-circuit and overload protection Inverse polarity protection	12 ... 240 VDC, $\pm 10\%$ 24 ... 240 VAC, $\pm 10\%$; 50 ... 60 Hz - NC/NO relay: ≤ 240 VAC, ≤ 30 VDC, ≤ 3 A - - - no no	
Mechanical data Protection class acc. to EN 60529 Optical system Permissible shock- and vibration resistance Connection type Weight In compliance with Drawing No.	IP 66 PMMA lenses shock $b \leq 30$ g, $T \leq 11$ ms vibrations $f \leq 55$ Hz, $a \leq 1$ mm Terminal compartment, cable $\varnothing 10$ mm 110 g EN 60 947-5-2 CO000007	

Output signals

Dimensions in mm





Position Sensors

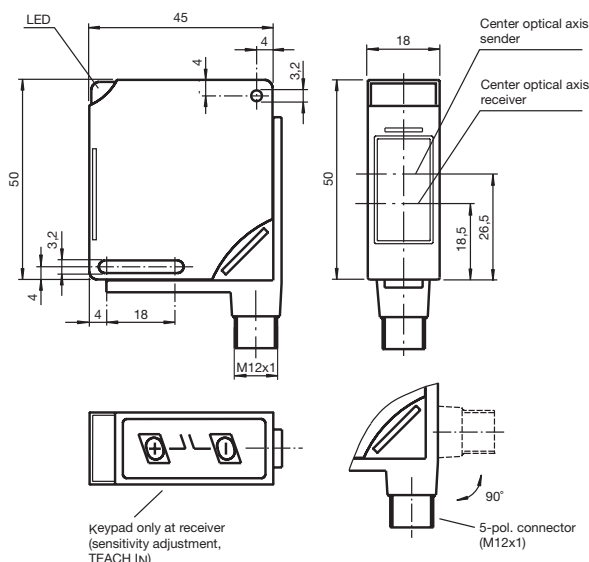
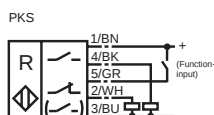
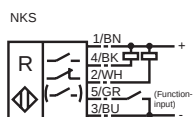
Technical Data, Dimension Drawings

Photoelectric sensors: Diffuse Reflective sensors

Device identification	SOD500-B45N-C1-PKS	SOD500-B45N-C1-NKS
Sensing range		
Output	DC, PNP	DC, NPN
Operating data		
Polarized	no	no
Reference value	standard white 100 x 100 mm ²	standard white 100 x 100 mm ²
Range setting	with +/- keys	with +/- keys
Switching frequency (1:1) / response time	max. 1 kHz / ≤ 3 ms	max. 1 kHz / ≤ 3 ms
Readiness delay	< 80 ms, with activation standard	< 80 ms, with activation standard
Range hysteresis	adjustable	adjustable
Detectable object:	opaque	opaque
LED ret		
LED yellow	stability control output flashing 2 Hz,	stability control output flashing 2 Hz,
LED green	Fault indication in learning mode 1,5 s	Fault indication in learning mode 1,5 s
Type of light	switching condition	switching condition
External light limit	Operation indication, flashing in teach-in mode	Operation indication, flashing in teach-in mode
daylight / halogen light	visible red light 660 mm	visible red light 660 mm
Operating temperature range	≤ 10 000 Lux / ≤ 7 500 Lux	≤ 10 000 Lux / ≤ 7 500 Lux
Storage temperature range	-25 °C ... +55 °C	-25 °C ... +55 °C
	-40 °C ... +55 °C	-40 °C ... +55 °C
Electrical data		
Operating voltage	10 VDC ... 30 VDC ±10%	10 VDC ... 30 VDC ±10%
Idle current	ca. 25 mA	ca. 25 mA
Rated operational current	200 mA	200 mA
Line voltage drop	≤ 2,5 V	≤ 2,5 V
Input voltage	for control/ test: < 2 V off / > 7 V on	for control/ test: < 2 V off / > 7 V on
Short-circuit and overload protection	yes	yes
Inverse polarity protection	yes	yes
Mechanical data		
Protection class acc. to EN 60529	> IP 67, materials approved for use in food production	> IP 67, materials approved for use in food production
Optical system	PMMA lenses	PMMA lenses
Permissible shock- and vibration resistance	shock b ≤ 30 g, T ≤ 11 ms	shock b ≤ 30 g, T ≤ 11 ms
Connection	vibrations f ≤ 55 Hz, a ≤ 1 mm	vibrations f ≤ 55 Hz, a ≤ 1 mm
Housing material	Connector M12 x 1.5 - pole, 90 ° pivoting	Connector M12 x 1.5-pole, 90 ° pivoting
Weight	PBT (Grastin), plug and dovetail AISi	PBT (Grastin), plug and dovetail AISi
In compliance with	60 g	60 g
	EN 60 947-5-2	EN 60 947-5-2

Output signals

Dimensions in mm



Positions Sensors

Technical Data, Dimension Drawings

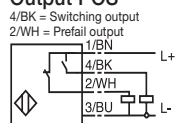
Fibre-optic photoelectric sensors: diffuse-reflective and thru-beam

Device identification	SOLX-B50N-C8-PKS	Programming via encoding switch				
Output Sensing ranges with optical waveguides Diffuse-reflective SOLD50-B50N-PVM6: 50 mm SOLD15-B50N-PVM3: 15 mm Thru-beam SOLT150-B50N-PVM4: 150 mm SOLT150-B50N-PVM3: 150 mm	DC, PNP 50 mm 15 mm 150 mm 150 mm	Switch output:	NO/ NC			
		Pulse frequency:	frequency 1 / frequency 2			
		Pulse prolongation:	0 ms / 20 ms ±20% only for diffuse-reflective op.			
		Switching rate:	200 Hz / 1,5 kHz			
		Encoding switch	Switch output	Pulse freq.	Pulse prolong. ¹⁾	Switching rate
Reference target Centered/ right angle Range setting Switching rate (mark:space1:1) no stability control at 1,5 kHz Response time at 200 Hz / 1.5 kHz Readiness delay Repeatability Detectable object Operating mode Pulse prolongation (als Lichttaster) Protection against mutual interaction LED yellow DUAL-LED green LED red, blinking at 2 Hz Type of light External light limits: daylight/ halogen light Operating temperature range Storage temperature range	white object 50mm x 50mm	0	NO	1	0 ms	200 Hz
		1	NO	1	0 ms	1.5 kHz
	with potentiometer	2	NO	1	20 ms	200 Hz
	200 Hz / 1.5 kHz switchable	3	NO	1	20 ms	1.5 kHz
		4	NO	2	0 ms	200 Hz
	2.5 ms / 0.3 ms	5	NO	2	0 ms	1.5 kHz
	20 ms	6	NO	2	20 ms	200 Hz
	≤ 0,5 % of sensing range	7	NO	2	20 ms	1.5 kHz
	depending on fibre-optic waveguide type	8	NC	1	0 ms	200 Hz
	Light ON/dark ON selectable	9	NC	1	0 ms	1.5 kHz
	20 ms ± 20 %, switchable	A	NC	1	20 ms	200 Hz
		B	NC	1	20 ms	1.5 kHz
	2 pulse frequencies, selectable	C	NC	2	0 ms	200 Hz
	ouput status	D	NC	2	0 ms	1.5 kHz
	Power on	E	NC	2	20 ms	200 Hz
	Stability control indication (dynamic)	F	NC	2	20 ms	1.5 kHz
	red light 660 nm	1) only for diffuse-reflective operation				
≤ 40 000 Lux / ≤ 30 000 Lux	Plastic fibre-optic waveguides for Type B50N: The length of the fibre-optic waveguides is 2 m. A cutting tool is also supplied. The minimum bending radius is 15 mm. The fibre-optic waveguide may not be bent in the area of 15 mm at the sensor and waveguide head. The fibre-optic waveguides must be pressed into the sensor's opening, whereby slight resistance will be felt. Fix the fibre-optic waveguide in positions with the screw.					
-25°C.... +70°C	Fibre-optic waveguides for diffuse mode Reference target 50mm x 50mm white					
-40°C... +80°C	SOLD50-B50N-PVM6 Nominal range: 50 mm					
	SOLD15-B50N-PVM3 Nominal range 15 mm					
	Fibre-optic waveguides for thru-beam mode SOLT150-B50N-PVM4 (1 set = 2 pieces) Nominal range 150 mm					
	SOLT150-B50N-PVM3 (1 set = 2 pieces) Nominal range 150 mm					
Elektrical data						
Operational voltage	10 VDC... 30 VDC, ripple10% _{ss}					
Idle current	≤ 30 mA					
Switch output	NO/NC, switchable					
Rated operational current	200 mA					
Line voltage drop	≤ 2.5 V					
Stability control output	NO (dynamical)					
Rated operational current	10 mA, short-circuit/overload proof					
Short-circuit and overload predection	yes					
Reverse polarity predection	yes					
Mechanical data						
Predection class acc. to EN 60529	IP 63					
Permissible shock-	shock b ≤ 30 g, T ≤ 11 ms					
and vibration loading	vibrations f ≤ 55 Hz, a ≤ 1 mm					
Mounting	DIN rail					
Connection	C8-connection, 4 pin					
Housing material	PBT (Crastin)					
Weight	80 g					
In compliance with	EN 60 947-5-2					

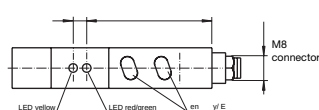
Output signals

Dimensions in mm

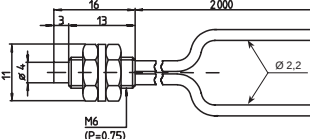
Output POS



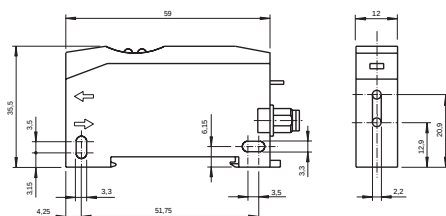
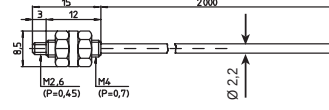
SOLX-B50N-C8-PKS



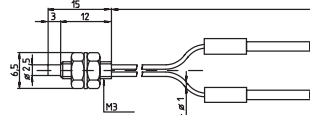
SOLD50-B50N-PVM6



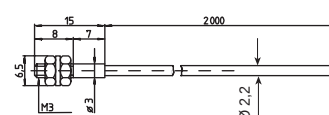
SOLT150-B50N-PVM4



SOLD15-B50N-PVM3



SOLT150-B50N-PVM3



Positions Sensors

Tuning on target object, Series B45, Photoelectric sensors

Dynamic TEACH-IN for moving objects



If necessary, press the "+"- und "-"- keys at the same time for 5 s (until the green LED flashes once). The sensor is now "unlocked".



Move the objects to be detected (one object should be enough) through the sensing range in the desired distance. The green LED will flash with a higher frequency (4 Hz) for a short period of time. The teach-in has been successful when an object is within the sensing range and the LED flashes with its original frequency again.

Note

It might happen that the change in frequency is not always noticeable.



Press the "+"- und "-"- keys at the same time (about 1 s) until the red LED is turned off. The sensor now is in the "teach in" mode and announces that through a flashing (2 Hz) green LED.



To conclude the TEACH-IN you now have to press either the "+"- or the "-"- key. This way the sensor returns to "normal mode".

Static TEACH-IN of objects with a set distance



If necessary, press the "+"- und "-"- keys at the same time for 5 s (until the green LED flashes once). The sensor is now "unlocked".



The green LED will flash with a higher frequency (4 Hz) for a short period of time. The teach-in has been successful when the LED flashes with its original frequency again.



Move the objects to be detected into the sensing range in the desired distance.

Press the "+"- und "-"- keys at the same time (about 1 s) until the red LED is turned off. The sensor now is in the "teach in" mode and announces that through a flashing (2 Hz) green LED.

Note

The sensor is not yet unlocked if the red LED does not start flashing when pressing the keys.



To conclude the TEACH-IN you now have to press either the "+"- or the "-"- key. This way the sensor returns to "normal mode".

Position Sensors

OPUS-Software-Set

This program is a multi-lingual user interface for the read-in and editing the parameters of photoelectric sensors of series B45. It is a menu-driven program that contains numerous help- and support functions.

The sensors communicate with the PC using an photoelectric-serial interface.

The program shows, which sensor is connected. The program data used as well as the parameters obtained from the sensor can be saved on hard drive or disc, printed out and exported to a database for external use.

The software opens up a variety of setting options for sensors:

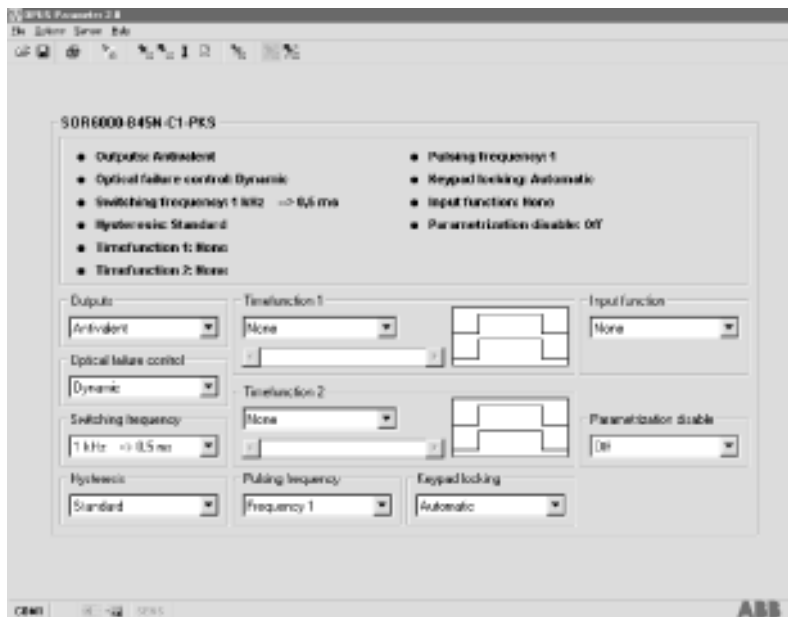
- Choosing the output function: NO/NC
- Type of stability control: dynamic/static
- Switching frequency: 1.5 kHz ... 20 Hz
- Hystereses: small/standard/large
- Readiness delay: none/ 0.1 s ... 25.5 s
- Falling delay/ impulse extension/wiper function
- 3 different pulse frequencies
- Key-lock: off/automatic/always
- Choice of kind of function input: test-/logical-input/div.
- Set-up lock: on/off
- Default read-in/reset

Requirements:

The OPUS parameterization software runs on every PC or Laptop using Windows 3.x, 95 or later that has a free interface for the connection to the sensors.

Included:

- 2 disks 3,5", 1.44 MB for the installation of the OPUS software
- One B45 combi clip
- Manual



Positions Sensors

Technical Data, Dimension Drawings

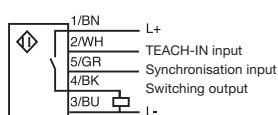
Ultrasonic sensors (switch output)

Device identification:	SUD500-M30N-C1-POS (...-NOS)	SUD2000-M30N-C1-POS (...-NOS)
Sensing range: Output signal:	60...500 mm (NOS), 30...500 mm (POS) PNP, NO (NPN, NO)	200...2000 mm (NOS), 80...2000 mm (POS) PNP, NO (NPN, NO)
Characteristics: Standard test target (min. flat surface) Beam divergence angle Transducer frequency Response time Hysteresis Repeatability Temperature drift	100 mm x 100 mm approx. 5 ° at -3 dB approx. 375 kHz approx. 38 ms ≤ 1 % of set operating distance ≤ 1 % 0,2 % / K	100 mm x 100 mm v. 5 ° at -3 dB approx. 175 kHz approx. 145 ms ≤ 1 % of set operating distance ≤ 1 % 0,2 % / K
Electrical data: Operating voltage U_B / ripple Reverse polarity protection Rated operational current Switch output (PNP-output) Teach-in input (2/WH): near switch point far switch point Synchronisation input (5/GR) for continuous measurement Synchronisation (used for 2 or more sensors) Measuring time/ switching rate Change of output signals after: Synchronisation pulse / pause length Synchronisation input levels (5/GR) / impedance Indicators: LED green LED red LED yellow	20 ... 30 VDC / +/- 10 % _{ss} yes ≤ 60 mA 200 mA, U_B -3V short-circuit/overload proof - U_B near switch point + U_B far switch point ≤ 1s low level or open input Start with falling edge approx. 6,5 ms / ≤ 13Hz 5 impulses / ≥ 60 ms ≥ 100 μs / ≥ 100 μs Low P. 0...1 V, High P. 5V ...+ U_B ca. 27 kΩ Power on, Teach-in function, object detected Fault, object uncertain Output status indicator, Teach-in function, no object detected	20 ... 30 VDC / +/- 10 % _{ss} yes ≤ 60 mA 200 mA, U_B -3V short-circuit/overload proof - U_B near switch point + U_B far switch point ≥ 1s low level or open input Start with falling edge approx. 25 ms / ≤ 3,4 Hz 5 impulses / ≥ 150 ms ≥ 100 μs / ≥ 100 μs Low P. 0...1 V, High P. 5V ...+ U_B ca. 27 kΩ Power on, Teach-in function, object detected Fault, object uncertain Output status indicator, Teach-in function, no object detected
Mechanical data: Operating temperature range Storage temperature range Protection class acc. to DIN 40 050 Housing material Transducer material Cover and head Permissible shock- and vibration resistance Connection In compliance with Drawing No.	-25°C ... +70°C -40°C ... +85°C IP 65 nickel-plated brass Epoxy resin/hollow glass bead composite expanded PUR (Polyurethan) PBT (Crastin) b ≤ 30 g, T ≤ 11 ms f ≤ 55 Hz, a ≤ 1 mm Connector M12 EN 60974-5-2 CU000001	-25°C ... +70°C -40°C ... +85°C IP 65 nickel-plated brass Epoxy resin/hollow glass bead composite expanded PUR (Polyurethan) PBT (Crastin) b ≤ 30 g, T ≤ 11 ms f ≤ 55 Hz, a ≤ 1mm Connector M12 EN 60974-5-2 CU000001

Output signals

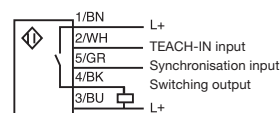
Dimensions in mm

Output POS



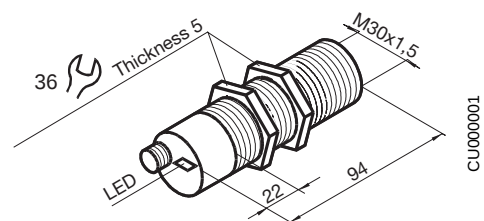
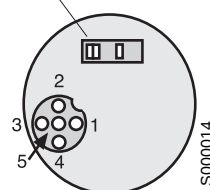
LS000013

Output NOS



LS000013A

Connector side of sensor
LEDs: green / red / yellow



Positions Sensors

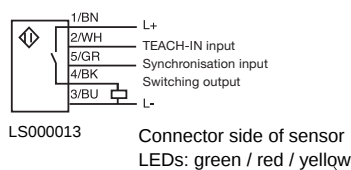
Technical Data, Dimension Drawings

Ultrasonic sensors (switch output)

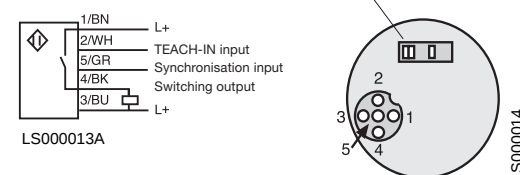
Device identification:	SUD4000-M30N-C1-POS (...-NOS)	SUD6000-M30N-C1-POS (...-NOS)
Sensing range:	500...4000 mm (NOS), 200...4000 mm (POS)	800...6000 mm (NOS), 350...6000 mm (POS)
Output signal:	PNP, NO (NPN, NO)	PNP, NO (NPN, NO)
Characteristics:		
Standard test target (min. flat surface)	100 mm x 100 mm	100 mm x 100 mm
Beam divergence angle	approx. 5° at -3 dB	approx. 5° at -3 dB
Transducer frequency	approx. 85 kHz	approx. 65 kHz
Response time	approx. 280 ms	approx. 480 ms
Hysteresis	≤ 1 % of set operating distance	≤ 1 % of set operating distance
Repeatability	≤ 1 %	≤ 1 %
Temperature drift	0.2 % / K	0.2 % / K
Electrical data:		
Operating voltage U_B / ripple	20 ... 30 VDC / +/- 10 % _{ss}	20 ... 30 VDC / +/- 10 % _{ss}
Reverse polarity protection	yes	yes
Rated operational current	≤ 60 mA	≤ 60 mA
Switch output (PNP-output)	200 mA, U_B -3V short-circuit/overload proof	200 mA, U_B -3V short-circuit/overload proof
Teach-in input (2/WH): near switch point far switch point	- U_B near switch point + U_B far switch point	- U_B near switch point + U_B far switch point
Synchronisation input (5/GR) for continuous measurement	≥ 1s low level or open input	≤ 1s low level or open input
Synchronisation (used for s2 or more sensors)	Start with falling edge	Start with falling edge
Measuring time/ switching rate	ca. 48 ms / ≤ 1,7 Hz	ca. 66 ms / ≤ 1,2 Hz
Change of output signals after:	5 impulses / ≥ 265 ms	5 impulses / ≥ 355 ms
Synchronisation pulse / pause length	≥ 100 μs / ≥ 100 μs	≤ 100 μs / ≥ 100 μs
Synchronisation input levels (5/GR) / impedance	Low P. 0...1 V, High P. 5V ...+ U_B approx. 27 kΩ	Low P. 0...1 V, High P. 5V ...+ U_B approx. 27 kΩ
Indicators:		
LED green	Power on, Teach-in function, object detected	Power on, Teach-in function, object detected
LED red	Fault, object uncertain	Fault, object uncertain
LED yellow	Output status indicator, Teach-in function, no object detected	Output status indicator, Teach-in function, no object detected
Mechanical data:		
Operating temperature range	-25°C ... +70°C	-25 °C ... +70 °C
Storage temperature range	-40°C ... +85°C	-40 °C ... +85 °C
Protection class acc. to DIN 40 050	IP 65	IP 65
Housing material	nickel-plated brass	nickel-plated brass
Transducer material	Epoxy resin/hollow glass bead composite expanded PUR (Polyurethan)	Epoxy resin/hollow glass bead composite expanded PUR (Polyurethan)
Cover and head	PBT (Crastin)	PBT (Crastin)
Permissible shock- and vibration resistance	b ≤ 30g, T ≤ 11 ms f ≤ 55 Hz, a ≤ 1 mm	b ≤ 30 g, T ≤ 11 ms f ≤ 55 Hz, a ≤ 1 mm
Connection	Connector M12	Round Connector M12
In compliance with	EN 60974-5-2	EN 60974-5-2
Drawing No.	CU000002	CU000003

Output signals

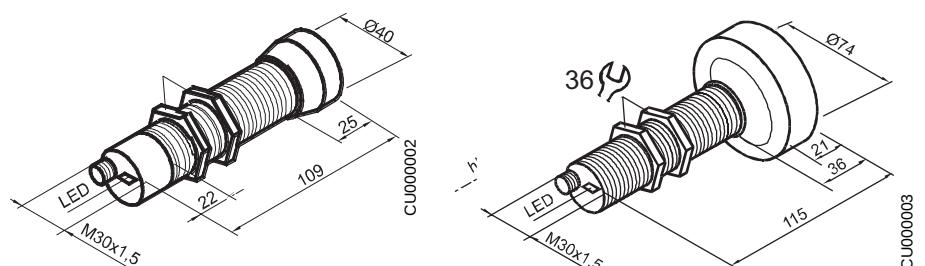
Output POS



Output NOS



Dimensions in mm



Positions Sensors

Technical Data

Ultrasonic sensors (switch output)

Setting the switching points:

The ultrasonic sensor is provided with a switch output with 2 teachable switch points. These are set by applying the supply voltage $-U_B$ or $+U_B$ at the teach-in input. The supply voltage should be applied to the teach-in input for at least 1 s. During the teach-in process, the LEDs indicate whether the sensor has detected the target. The switch points A1 and A2 are taught by voltage $-U_B$ and $+U_B$ respectively.

Five different modes can be set:

1. Window mode, NO function
2. Window mode, NC function
3. One switch point, NO function
4. One switch point, NC function
5. Detection of presence of an object

1. Teach-in Window mode, NO function

- Set object at near switch point
- Teach in switch point A1 with $-U_B$
- Set object at far switch point
- Teach in switch point A2 with $+U_B$

2. Teach-in Window mode, NC function

- Set object at near switch point
- Teach in switch point A2 with $+U_B$
- Set object at far switch point
- Teach in switch point A1 with $-U_B$

3. Teach-in one switch point, NO function

- Set object at near switch point
- Teach in switch point A2 with $+U_B$
- Cover sensor with the palm of your hand or remove all objects from the detection range of sensor
- Teach in switch point A1 with $-U_B$

4. Teach-in one switch point, NC function

- Set object at near switch point
- Teach in switch point A1 with $-U_B$
- Cover sensor with the palm of your hand or remove all objects from the detection range of sensor
- Teach in switch point A2 with $+U_B$

5. Teach-in detection of presence of object

- Cover sensor with the palm of your hand or remove all objects from the detection range of sensor
- Teach in switch point A1 with $-U_B$
- Teach in switch point A2 with $+U_B$

Presetting the switch points:

A1: near range

A2: nominal range

Synchronisation:

The sensor features a synchronisation input in order to suppress mutual interference. If the input is not connected, the sensor operates with an internally generated pulse rate. The sensor can be synchronised by applying a square-wave voltage. A synchronisation pulse at the synchronisation input enables one measuring cycle to be completed. The pulse width must be greater than 100 μ s. The measuring cycle commences with the falling edge. The state of the switch output changes after the switching threshold has been exceeded five times, as determined internally by five measurements. A low level 1 s or an open synchronisation input result in normal operation of the sensor. Synchronisation cannot be carried out during teach-in and vice versa.

Two operating modes are possible:

1. Multiple sensors are controlled with the same synchronising signal but the sensors operate on the same pulse
2. The synchronising pulses are fed cyclically to only one sensor at one time. The sensors operate in multiplex mode. A high level at the synchronisation input deactivates the sensor

Accessory: Programming device SZP2>PROG

The programming device ZP2>PROG is available as accessory for the easy programming of ultrasonic sensors with switch output. The device is equipped with a 2 m cable, whose connector/socket can be placed between the connector of the ultrasonic sensor and its connection cable. The sensing range of the sensor can be memorized with two keys A1 and A2. Otherwise follow the teach-in process according to the description above.

Technical data:

Dimensions:

H x W x D [mm]: 22 x 39 x 69

Electric connection:

2 m cable with device connector and socket M12

Indication as a function of operating condition	LED green	LED red	LED yellow
Teach-in switch point			
Object detected	flashing	off	off
No object detected	flashing	off	off
Object uncertain (teach-in invalid)	off	flashing	off
Normal operation	off	off	output status
Fault (e.g. compressed air)	off	flashing	last status

Mode of operation of the switch output depending on setting

Window mode, NO function

A1 < A2: 

Window mode, NC function

A2 < A1: 

one switch point, NO function

A1 -> ∞: 

one switch point, NC function

A2->∞: 

A₁->∞, A₂->∞: Detection for presence of object

Object detected: switch output closed / no object detected: switch output open

Positions Sensors

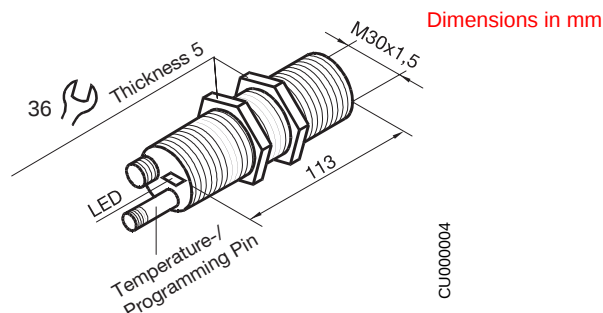
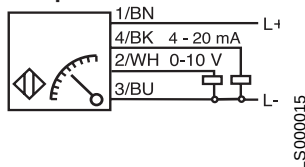
Technical Data, Dimension Drawings

Ultrasonic sensors (Analogue outputs)

Device identification:	SUD500-M30N-C1-M	SUD2000-M30N-C1-M
General data		
Sensing range	30 ... 500 mm	80 ... 2000 mm
Operating range	50 ... 500 mm	120 ... 2000 mm
Blind zone	0 ... 30 mm	0 ... 80 mm
Standard test target	100 mm x 100 mm	
Transducer frequency	approx. 380 kHz	approx. 180 kHz
Response time	21 ms minimum 63 ms default	65 ms minimum 195 ms default
Indicator/Operating elements		
LED green	permanent: Power on	
LED yellow 1	flashing: standby or teach-in function: object detected permanent: object in operating range flashing: teach-in function	
LED yellow 2	permanent: object in sensing range flashing: teach-in function	
LED red	permanent: temperature-/program plug not plugged in flashing: fault or teach-in function object not detected	
Temperature-/program plugs	temperature compensation, teach-in of operating range , switching of output functions	
Electrical data		
Operating voltage	10 ... 30 V DC , ripple 10 %ss	
Power consumption Po	≤ 900 mw	
In-/Output		
synchronisation	bidirectional 0-level: $-U_B \dots +1 \text{ V}$ 1-level: $+4 \text{ V} \dots +U_B$ input impedance: $> 12 \text{ K}\Omega$ synchronisation impulse: $\geq 100 \mu\text{s}$ synchronisation impulse pause: $\geq 2 \text{ ms}$	
Synchronisation frequency		
Common mode	≤ 95 Hz	≤ 30 Hz
Multiplex mode	≤ 95/n Hz, n = number of sensors	≤ 30/n Hz, n = number of sensors
Output		
Output type	1 current output: 4 ... 20 mA 1 voltage output: 0 ... 10 V Evaluation limit [mm]/4000,	
Resolution	but ≤ 0.05 mm	but ≤ 0.35 mm
Characteristic deviation	≤ 0,2 % of final value	
Reproducibility	≤ 0,1 % of final value	
Load impedance	current output: ≤ 500 Ohm voltage output: ≥ 1000 Ohm	
Temperature influence	≤ 2 % of final value (with temperature compensation) ≤ 0.2 %/K (without temperature compensation)	
Norms	EN 60947-5-2	
In compliance with		
Ambient conditions		
Ambient temperature	-25 ... 70 °C (248 ... 343 K)	
Storage temperature	-40 ... 85 °C (233 ... 358 K)	
Mechanical Data		
Protection Class	IP65	
Connection	Connector V1 5 (M12 x 1), 5-pole	
Material		
Housing	stainless steel 1.4303 plastic parts PBT	
Transducer	Epoxy resin/hollow glass bead composite; expanded PUR (polyurethane)	

Output signals

Output M



Positions Sensors

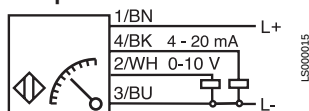
Technical Data, Dimension Drawings

Ultrasonic sensors (Analogue outputs)

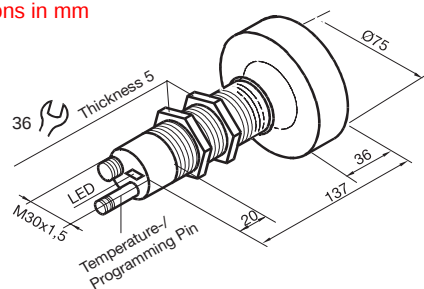
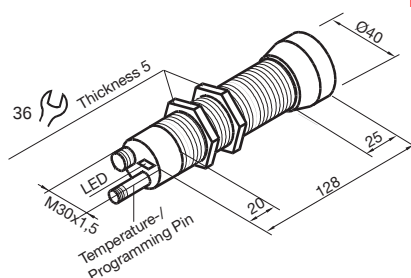
Device identification:	SUD4000-M30N-C1-M	SUD6000-M30N-C1-M
General data		
Sensing range	200 ... 4000 mm	350 ... 6000 mm
Operating range	240 ... 4000 mm	400 ... 2000 mm
Blind zone	0 ... 200 mm	0 ... 350 mm
Standard test target	100 mm x 100 mm	
Transducer frequency	ca. 85 kHz	ca. 65 kHz
Response time	145 ms minimum 440 ms default	285 ms minimum 850 ms default
Indicator/Operating elements		
LED green	permanent: Power on	
LED yellow 1	flashing: standby or teach-in function: object detected	
LED yellow 2	permanent: object in operating range flashing: teach-in function	
LED red	permanent: object in sensing range flashing: teach-in function	
Temperature-/program plug	permanent: temperature-/program plug not plugged in flashing: fault or teach-in function object not detected temperature compensation, teach-in of operating range , switching of output functions	
Electrical data		
Operating voltage	10 ... 30 V DC , ripple 10 %ss	
Power consumption Po	≤ 900 mw	
In-/Output		
synchronisation	bidirectional 0-level: $-U_B \dots +1 \text{ V}$ 1-level: $+4 \text{ V} \dots +U_B$ Eingangsimpedanz: $> 12 \text{ K}\Omega$ synchronisation impulse: $\geq 100 \mu\text{s}$ synchronisation impulse pause: $\geq 2 \text{ ms}$	
Synchronisation frequency		
Common mode operation	≤ 13 Hz	≤ 7 Hz
Multiplex operation	≤ 13/n Hz, n = number of sensors	≤ 7/n Hz, n = number of sensors
Output		
Output type	1 current output: 4 ... 20 mA 1 voltage output: 0 ... 10 V	
Resolution	evaluation limit [mm]/4000, but ≤ 0,35 mm	
Characteristic deviation	≤ 0,2 % of final value	
Reproducibility	≤ 0,1 % of final value	
Load impedancy	current output: ≤ 500 Ohm voltage output: ≥ 1000 Ohm	
Temperature influence	≤ 2 % of final value (with temperature compensation) ≤ 0,2 %/K (without temperatur compensation)	
Norms		
In compliance with	EN 60947-5-2	
Ambient conditions		
Ambient temperature	-25 ... 70 °C (248 ... 343 K)	
Storage temperature	-40 ... 85 °C (233 ... 358 K)	
Mechanical Data		
Protection Class	IP65	
Connection	Connector VI 5 (M12 x 1), 5-pole	
Material		
Housing	stainless steel 1.4303 plastic parts PBT	
Transducer	Epoxy resin/hollow glass bead composite; expanded PUR (polyurethane)	

Output signals

Output M



Dimensions in mm



Positions Sensors

Technical Data

Ultrasonic sensors (analogue output)

Description of the sensor functions

This ultrasonic sensor is equipped with a four-pin temperature/teach-in plug, which can be inserted in four different positions. These positions have the significances shown in the table

Plug position	Significance
A1	Teach-in evaluation limit A1
A2	Teach-in evaluation limit A2
E2/E3	Rising/falling ramp Output characteristics of the voltage output go through the zero point
T	Temperature compensation

Description of the teach-in procedure

Teach-in of program evaluation limit 1 resp. 2
 Disconnect the supply voltage
 Disconnect the plug
 Connect the supply voltage (reset)
 Set target on desired switch position
 Insert and then remove program plug into Position A1 resp. A2
 This triggers the teach-in of the evaluation limits A1 resp. A2

Note

The values of the object position will be memorized with the removal of the temperature/teach-in plug.

You can supervise the teach-in process with the LEDs. The green LED flashes if the object has been detected, the red LED flashes, when no object has been detected.

Insert plug into position T to end the teach-in process and to save the taught-in distance. The sensor goes back to normal operation.

Teach-in of analogue functions

Disconnect the supply voltage
 Disconnect the plug
 Connect the supply voltage (reset)
 Insert teach-in plug in position E2/E3
 Repeated plug-ins allow for the programming of 3 different operation modes in cyclical sequence:
 1) rising ramp, LED A2 flashes
 2) falling ramp, LED A1 flashes
 3) zero point straight line
 LED A1 and A2 flash
 Insert plug into position T to end the teach-in process and to save the taught-in distance.
 The sensor goes back to normal operation.

Note

If the temperature/teach-in plug is not inserted into the T-position the sensor will go back to normal operation (with the values saved last) without temperature compensation.

Synchronisation

The sensor is equipped with a synchronisation input for the suppression of interferences. If this input is not on-line the sensor uses with an internally produced clock-speed. The sensor can be synchronised by impressing a square wave voltage. A falling range will lead to the emission of a single ultrasonic impulse. A low level $\approx 1s$ or an open synchronisation input will lead to the normal operation mode. A high-level $\approx 1s$ will lead to the stand-by operation mode of the sensor (green LED "ON"). The outputs remain in the status they were in before.

While teaching-in the sensors can not be synchronised and vice versa.

Different modes of operation are possible:

- 2 (or up to 5) sensors can be synchronized by connecting their respective synchronisation inputs. This way the sensors emit ultrasonic impulses in turn.
- Several sensors are controlled by the same synchronisation signal. The sensors operate in common mode
- The synchronisations impulses are cyclically fed to one sensor at a time. The sensors operate in multiplex mode.
- A high-level at the synchronisation input deactivates the sensor

The response time of a sensor increases in synchronised mode since the synchronisation also increases the measuring cycle time.

Note

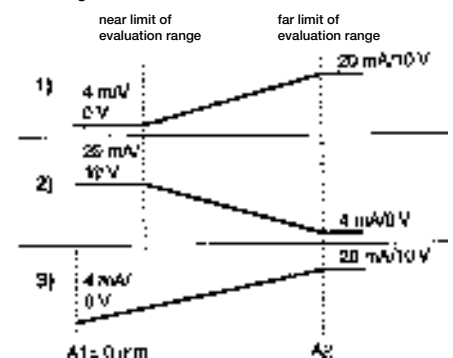
If you don't want to use the synchronisation make sure that either the synchronisation input is grounded or that the sensor is operated with a 4-pole connection cable.

Default

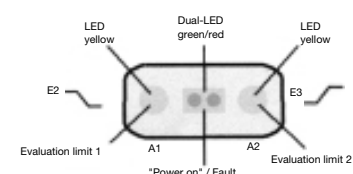
A1: Close-up range
 A2: Nominal range
 Direction of action: rising ramp

Programming of the analogue output

Analogue functions



LED-Window



LED-indicator/Analogue output

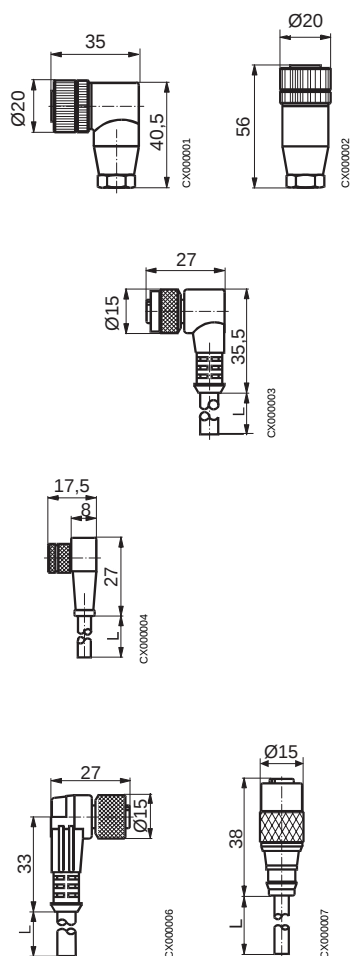
Indications depending on operating mode	Dual LED green	Dual LED red	LED yellow A1	LED yellow A2	Analogue output
Teach-in evaluation limit 1					
Object detected	flashing	off	flashing	off	un-changed
Object not detected	off	flashing	flashing	off	
Teach-in evaluation limit 2					
Object detected	flashing	off	off	flashing	un-changed
Object not detected	off	flashing	off	flashing	
Teach-in operation mode (E2/E3)					
rising ramp	on	off	off	flashing	un-changed
falling ramp	on	off	flashing	off	
zero-point straight-line	on	off	flashing (common mode)	flashing (common mode)	
Normal operation					
temperature compensated	on	off	on, if object in evaluation range	on, if object in evaluation range	Analogue value
Plug disconn./shorted	off	on			
Standby	flashing	off	last status	last status	unchanged
Fault (e.g. compressed air)	off	flashing	last status	last status	unchanged or fault value

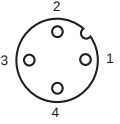
Positions Sensors

Technical Data, Dimension Drawings

Accessories

Dimension in mm



SZC1>4POL-0	Socket M12 angled 4 pin	Terminals of plug on Sensor
SZC1>4POL-0	Socket M12 straight 4 pin	 (cannot be used on ultrasonic sensors)
SZC1>U5-3POL-LED0	Cable socket M12 angled Cable 5 m, PUR, 3 polig, LED 1 – 3 LED 4 – 3	Terminals of plug on sensor 1 - BN 3 - BU 4 - BK (not available: 2-WH and 5 – GR)
SZC8>U5-3POL-LED0	Cable socket M8 angled Cable 5 m, PUR, 3 pin, LED 1 – 3 LED 4 – 3	Terminals of plug on sensor 1 - BN 3 - BU 4 - BK
SZC1>V5-4POL-0	Cable socketM12 angled Cable 5 m, PVC	Terminals 1 - BN 2 - WH
SZC1>V5-4POL-0	Cable socketM12 straight Cable 5 m, PVC	3 - BU 4 - BK

Notes

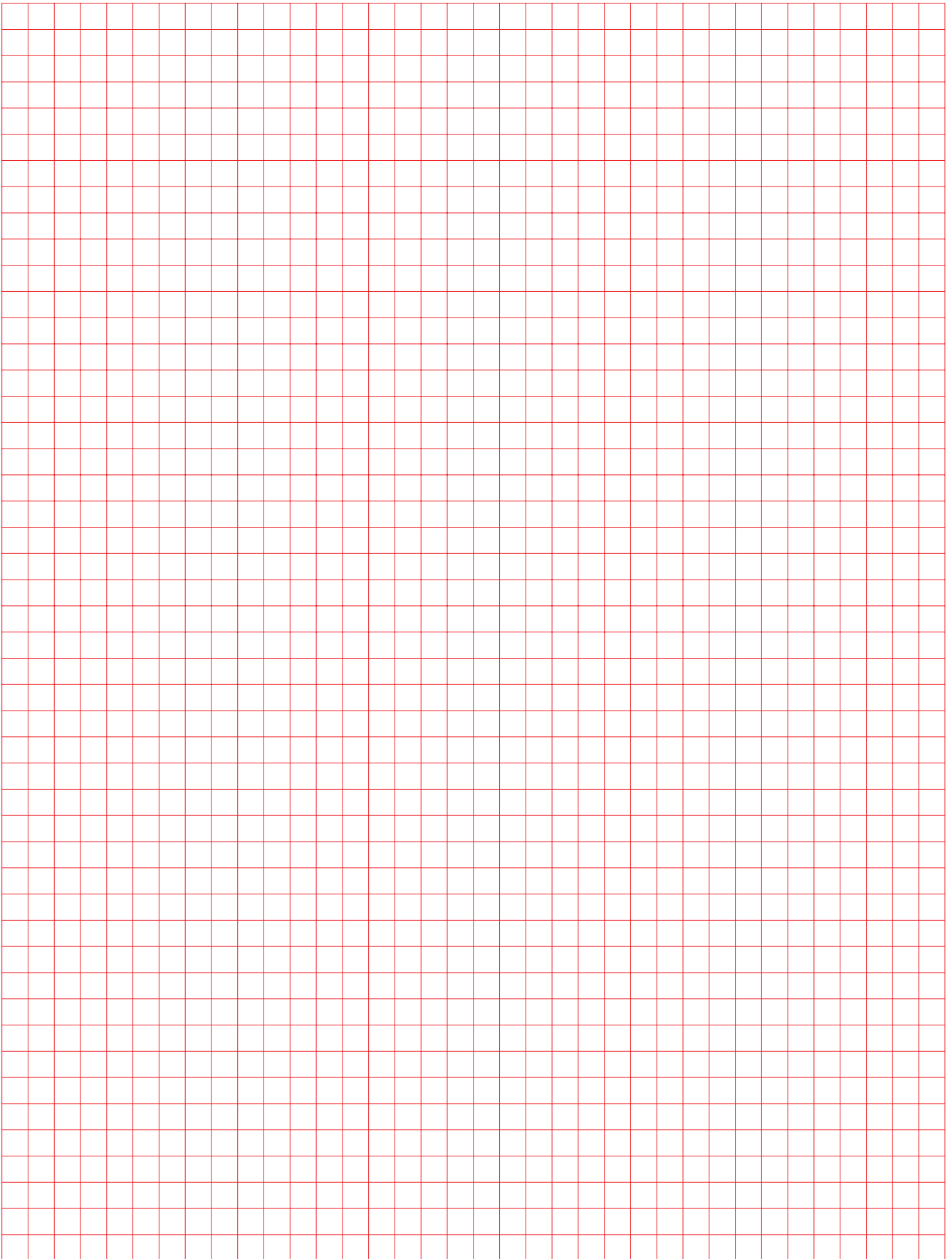




ABB STOTZ-KONTAKT GmbH
P. O. Box 10 16 80
69006 Heidelberg
Germany
Telephone: ++49 62 21 / 701-0
Telefax: ++49 62 21 / 701-729
<http://www.abb.de/stotz-kontakt>
Email: desst.info@de.abb.com

ABB Global Contact Directory

The ABB Contact Directory (<http://www.abb.com/contacts/>) helps you find local contacts for ABB products in your country. Please select the relevant product group from the dropdown menu to the right or from the page.