

Power supplies & transformers

Phaseo

*Bring energy to your
automated systems!*

Catalogue
January

07



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- Complete library: technical documents, catalogs, certificates, FAQs, brochures...
- Selection guides from the e-catalog.
- Product discovery sites and their Flash animations.

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To live automation solutions every day!



Flexibility

- Interchangeable modular functions, to better meet the requirements for extensions
- Software and accessories common to multiple product families



Ingenuity

- Auto-adapts to its environment, "plug & play"
- Application functions, control, communication and diagnostics embedded in the products
- User-friendly operation either directly on the product or remotely



Simplicity

- Cost effective "optimum" offers that make selection easy for most typical applications
- Products that are easy to understand for users, electricians and automation specialists
- User-friendly intuitive programming



Compactness

- High functionality in a minimum of space
- Freedom in implementation



Openness

- Compliance with field bus, connection, and software standards
- Enabling decentralised or remote surveillance via the web with Transparent Ready products

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Power supplies

Regulated switch mode

Phaseo Modular range and Optimum range industrial power supplies



Input voltage

100...240 V ~
120...250 V --- (see pages 13 and 14)

Connection to world-wide line supplies

- United States
 - 120 V (in phase-to-neutral)
 - 240 V (in phase-to-phase)
- Europe
 - 230 V (in phase-to-neutral)
 - 400 V (in phase-to-phase)
- United States
 - 277 V (in phase-to-neutral)
 - 480 V (in phase-to-phase)

Single-phase (N-L1) or 2-phase (L1-L2) connection

Single-phase (N-L1) connection

–

IEC/EN 61000-3-2 conformity

Yes for ABL 7RP, not for ABL 8REM and not applicable for ABL 8MEM and ABL 7RM

Protection against undervoltage

Yes

Protection against overloads and short-circuits

Yes, voltage detection. Automatic restart on elimination on the fault

Diagnostic relay

–

Compatibility with function modules

–

Power reserve (Boost)

1,25 to 1,4 In during 1 minute, depending on model (with ABL 8MEM) No

Output voltage

5 V --- 12 V --- 24 V --- 48 V ---

Output current

- 0.3 A
- 0.6 A
- 1.2 A
- 2 A
- 2.5 A
- 3 A
- 4 A
- 5 A
- 6 A
- 10 A
- 20 A
- 40 A

		ABL 8MEM24003 (Modular)	
		ABL 8MEM24006 (Modular)	
		ABL 8MEM24012 (Modular)	
	ABL 8MEM12020 (Modular)		
		ABL 7RM24025 (Modular)	ABL 7RP4803 (Optimum)
		ABL 8REM24030 (Optimum)	
ABL 8MEM05040 (Modular)			
	ABL 7RP1205 (Optimum)	ABL 8REM24050 (Optimum)	

Pages

17 17 (Modular) and 23 (Optimum) 23

Regulated switch mode

Phaseo Universal range industrial power supplies



100...120 V ~ and 200...500 V ~ (1)	380...500 V ~	24 V ---	
Single-phase (N-L1) or 2-phase (L1-L2) connection	–	–	
	3-phase (L1-L2-L3) connection	–	
	3-phase (L1-L2-L3) connection	–	
Yes	–	–	
Yes	–	–	
Yes, current limitation or undervoltage detection	Yes, current limitation		
Yes, depending on model			
Yes with buffer module, battery and battery control modules, redundancy module and discriminating downstream protection module			
1,5 In during 4 secondes	No		
24 V ---	5 V ---	7...12 V ---	
			ABL 8DCC12020 (2)
ABL 8RPS24030			
ABL 8RPS24050			
	ABL 8DCC05060 (2)		
ABL 8RPS24100			
ABL 8RPM24200	ABL 8WPS24200		
	ABL 8WPS24400		
31	36		

(1) Except **ABL 8RPM24200**. ~ 100...120 V and ~ 200...240 V.

(2) --- / --- converter module, requires to be associated with the Phaseo Universal range power supply.

Power supplies

Regulated switch mode

Phaseo Dedicated range power supplies for repetitive machines



Input voltage

100...240 V ~
120...370 V --- (see page 55)

Connection to world-wide line supplies
United States
- 120 V (in phase-to-neutral)
- 240 V (in phase-to-phase)

Single-phase (N-L1) or 2-phase (L1-L2) connection

Europe
- 230 V (in phase-to-neutral)
- 400 V (in phase-to-phase)

Single-phase (N-L1)

United States
- 277 V (in phase-to-neutral)
- 480 V (in phase-to-phase)

Single-phase (N-L1)

IEC/EN 61000-3-2 conformity

Yes for ABL 1RP, not applicable for ABL1REM24025/12050

Protection against undervoltage

–

Protection against overloads and short-circuits

Yes, voltage detection. Automatic restart on elimination on the fault

Diagnostic relay

–

Compatibility with function modules

–

Power reserve (Boost)

No

Output voltage

12 V ---

24 V ---

Output current 0.5 A

1 A

2 A

2.5 A

3 A

4 A

4.2 A

4.8 A

5 A

6 A

6.2 A

8.3 A

10 A

15 A

20 A

30 A

40 A

60 A

ABL 1REM24025

ABL 1R◉M24042

ABL 1REM12050

ABL 1R◉M24062

ABL 1RPM12083

ABL 1R◉M24100

Rectified and filtered		Regulated switch mode	
Phaseo Rectified range for harsh environment		Phaseo range AS-Interface for AS-Interface cabling system	
			
230 V ~ and 400 V ~	400 V ~	100...240 V ~	
–		Single-phase (N-L1) connection	
Single-phase (N-L1) or 2-phase (L1-L2) connection	3-phase (L1-L2-L3) connection	Single-phase (N-L1) connection	
–		–	
Yes		No	Yes
No		–	Yes
Yes depending on model, by fuse	Yes, by external protection	Yes	
No		–	
No		–	
No		No	
24 V ⎓		30 V ⎓	24 V ⎓
ABL 8FEQ24005			
ABL 8FEQ24010			
ABL 8FEQ24020			
		ASI ABLB3002 ASI ABLD3002 (1) ASI ABLM3024 (2)	
			ASI ABLM3024 (2)
ABL 8FEQ24040			
		ASI ABLB3004 ASI ABLD3004 (1)	
ABL 8FEQ24060			
ABL 8FEQ24100	ABL 8TEQ24100		
ABL 8FEQ24150			
ABL 8FEQ24200	ABL 8TEQ24200		
	ABL 8TEQ24300		
	ABL 8TEQ24400		
	ABL 8TEQ24600		

70

(1) With earth fault detection.
(2) Power supply with one output 30 V ⎓ and one output 24 V ⎓ ± 5 %.

Power supplies and transformers
Transformers for AC control circuits
Phaseo transformers

Transformers for AC control circuits


Phaseo Economic range transformers

Phaseo Optimum range transformers



Tension d'entrée	
Connection to world-wide line supplies	United States
	- 120 V (in phase-to-neutral) - 240 V (in phase-to-phase)
	Europe
	- 230 V (in phase-to-neutral) - 400 V (in phase-to-phase)
Applications	
Secondary winding	
Signalling	
Standards	
Certifications	

230 V ~, ± 15 V
–
–
Single-phase (N-L1) connection
Safety transformer (SELV)
Single winding
–
IEC 61558-2-6, EN 61558-2-6
–

230 V ~ and 400 V ~, ± 15 V
–
2-phase (L1-L2) connection
Single-phase (N-L1) connection 2-phase (L1-L2) connection
Safety transformer (SELV)
Single winding
–
IEC 61558-2-6, EN 61558-2-6, UL 506
C  us

Output voltage	
Nominal power	25 VA
	40 VA
	63 VA
	100 VA
	160 VA
	250 VA
	320 VA
	400 VA
	630 VA
	1 000 VA
	1 600 VA
	2 500 VA

24 V ~
ABT 7ESM004B
ABT 7ESM006B
ABT 7ESM010B
ABT 7ESM016B
ABT 7ESM025B
ABT 7ESM032B
ABT 7ESM040B

12 V ~	24 V ~
ABL 6TS02J	ABL 6TS02B
ABL 6TS04J	ABL 6TS04B
ABL 6TS06J	ABL 6TS06B
ABL 6TS10J	ABL 6TS10B
ABL 6TS16J	ABL 6TS16B
ABL 6TS25J	ABL 6TS25B
	ABL 6TS40B
	ABL 6TS63B
	ABL 6TS100B
	ABL 6TS160B
	ABL 6TS250B

Phaseo Optimum range transformers



230 V ~ and 400 V ~, ± 15 V

–
2-phase (L1-L2) connection

Single-phase (N-L1) connection
2-phase (L1-L2) connection

Isolation transformer

Single winding

–

IEC 61558-2-4, EN 61558-2-6, UL 506

C  us

Phaseo Universal range transformers



230 V ~ and 400 V ~, ± 15 V

–
2-phase (L1-L2) connection

Single-phase (N-L1) connection
2-phase (L1-L2) connection

Safety transformer (SELV)


Isolation transformer

Double winding

Presence of input voltage by LED (up to 320 VA)

IEC 61558-2-6, EN 61558-2-6,
UL 506

IEC 61558-2-4, EN 61558-2-6,
UL 506

C  us, ENEC

115 V ~	230 V ~
ABL 6TS02G	ABL 6TS02U
ABL 6TS04G	ABL 6TS04U
ABL 6TS06G	ABL 6TS06U
ABL 6TS10G	ABL 6TS10U
ABL 6TS16G	ABL 6TS16U
ABL 6TS25G	ABL 6TS25U
ABL 6TS40G	ABL 6TS40U
ABL 6TS63G	ABL 6TS63U
ABL 6TS100G	ABL 6TS100U
ABL 6TS160G	ABL 6TS160U
ABL 6TS250G	ABL 6TS250U

2 x 24 V ~	2 x 115 V ~
ABT 7PDU002B	ABT 7PDU002G
ABT 7PDU004B	ABT 7PDU004G
ABT 7PDU006B	ABT 7PDU006G
ABT 7PDU010B	ABT 7PDU010G
ABT 7PDU016B	ABT 7PDU016G
ABT 7PDU025B	ABT 7PDU025G
ABT 7PDU032B	ABT 7PDU032G
ABT 7PDU040B	ABT 7PDU040G
ABT 7PDU063B	ABT 7PDU063G
ABT 7PDU100B	ABT 7PDU100G
ABT 7PDU160B	ABT 7PDU160G
ABT 7PDU250B	ABT 7PDU250G

Presentation

The Phaseo electronic switch mode power supply offer is designed to provide the DC voltage necessary for the PLC and automation system equipment control circuits. Comprising five ranges:

- Modular, Optimum and Universal for common applications
- AS-Interface for the AS-Interface cabling system
- Dedicated for repetitive equipment

the Phaseo offer meets all the needs encountered in industrial, commercial and residential applications. With phase-to-neutral (N-L1), phase-to-phase (L1-L2) or 3-phase (L1-L2-L3) connection to the line supply, these electronic switch mode power supplies provide a quality of output current that is suitable for the loads supplied and compatible with the line supply available in the equipment. Clear guidelines are given for selecting protection devices which are often used with them, and thus a comprehensive solution is provided that can be used in total safety.

Phaseo switch mode power supplies

Phaseo switch mode power supplies are totally electronic and their output voltage is regulated. The use of electronics makes it possible to significantly improve the performance of these power supplies, which offer:

- Very compact size
- Integrated overload, short-circuit, overvoltage and undervoltage protection (1)
- A very wide input voltage range for the Universal range
- A high degree of output voltage stability
- Good performance
- Diagnostics via LED indicators on the front panel
- Remote diagnostics via a relay contact for the Universal range

Phaseo power supplies deliver a stabilized --- output voltage that is precise to 3%, whatever the load from a \sim line supply, within the ranges of:

- For Modular, Optimum, Dedicated and AS-Interface ranges:
 - 100 to 240 V \sim for phase-to-neutral (N-L1) or phase-to-phase (L1- L2) connection
- For the Universal range:
 - 85 to 550 V \sim for phase-to-neutral (N-L1) or phase-to-phase (L1- L2) connection
 - 360 to 550 V \sim for 3-phase connection (L1-L2-L3)

Conforming to IEC standards and UL, CSA, TÜV and C-Tick certified, they are suitable for industrial use. The inclusion of overload and short-circuit protection makes downstream protection unnecessary if discrimination is not required. To provide discrimination whenever faults occur, it is advisable to use discriminating electronic downstream protection modules.

Phaseo power supplies also incorporate:

- An output voltage adjustment potentiometer in order to be able to compensate for any line voltage drops in installations with long cable runs
- Direct mounting on 35 mm --- rails, optional on Dedicated range (2)

(1) The inclusion of overload and short-circuit protection makes downstream protection unnecessary if discrimination is not required (see page 50).

(2) The Optimum and AS-Interface ranges can also take 75 mm --- rails.



ABL 8MEM12020



ABL 8REM24030



ABL 8RPS24100



ABL 8BUF24400



ASI ABL3004



ASI ABL3002



ABL 1R0M000



ABL 1R0M24100

Presentation (continued)

Phaseo switch mode power supplies (continued)

Phaseo regulated switch mode industrial supplies are offered in three ranges (Modular, Optimum and Universal), complemented by the range for the AS-Interface cabling system and the Dedicated range for repetitive machines:

Phaseo Modular range

The Phaseo Modular range meets all the needs of simple automation systems with power ratings from 7 to 60 W and an output voltage of 5 V \pm , 12 V \pm or 24 V \pm . The shape and compact nature of its casing mean that it can be incorporated either in a modular panel or mounted on a U rail in a cabinet. Direct mounting on a panel (using its two retractable lugs) and the choice of wires exiting at the top or bottom (except for the **ABL 7RM24025** model) make it an easy product to integrate.

Phaseo Optimum range

The Phaseo Optimum range is the low-cost solution for applications supplied in 12 V \pm , 24 V \pm or 48 V \pm and requiring currents between 3 and 5 A. The Optimum range of Phaseo power supplies delivers a voltage that can guarantee the PLC logic states, but in the event of an overload the power supply protection trips so that, once the fault has been eliminated, the power supply reverts to its nominal state.

Since the 24 V \pm Optimum range of Phaseo power supplies does not have PFC (*Power Factor Correction*), they do not meet the requirements of standard IEC/EN 61000-3-2 (except for **ABL 7RP1205/7RP4803** models).

Phaseo Universal range

The Universal range of Phaseo power supplies covers power ratings from 72 to 960 W in 24 V \pm and adapts to the majority of power distribution systems used throughout the world. The same power supply can thus be connected phase-to-neutral (N-L1) or phase-to-phase for line supplies ranging from 100 V \sim to 500 V \sim nominal. In addition, this range offers:

- Diagnostic functions (local or remote)
- User choice of operating mode in the event of an overload (current limiting or stop)
- Function modules to ensure continuity of service:
 - Protection against microbreaks or prolonged outages by means of the Buffer module and Battery control modules
 - Paralleling and redundancy functions by means of the Redundancy module
 - Discriminating protection against application overloads by means of discriminating electronic downstream Protection modules
- A power reserve (boost function) for absorbing the transient current peaks required by the application

With the Universal range of power supplies, it is possible to satisfy the need for auxiliary voltage (5 V \pm to 15 V \pm) using \pm / \pm Converter modules.

The incorporation of a PFC (*Power Factor Correction*) input filter reduces harmonic pollution to a minimum level across the entire Universal range, ensuring compliance with the requirements of standard IEC/EN 61000-3-2.

Phaseo AS-Interface range

The 72 and 144 W AS-Interface range of Phaseo power supplies is designed to deliver a voltage of 30 V \pm , which is a prerequisite for the AS-Interface cabling system. These electronic switch mode power supplies with phase-to-neutral (N-L1) connection ensure the quality of the output current in accordance with the electrical characteristics and in compliance with standard EN 50295.

Phaseo Dedicated range

The Dedicated range of Phaseo power supplies from 60 to 240 W is designed for integration in repetitive equipment requiring a voltage of 12 V \pm or 24 V \pm . These electronic switch mode power supplies, with phase-to-neutral (N-L1) connection, with or without anti-harmonic filter and UL 508, CSA and TÜV certified, meet all the needs encountered in commercial machines and standard catalog machines.

Power supplies and transformers

Power supplies for DC control circuits

Phaseo regulated switch mode power supplies

Characteristics of the 24 V --- operating voltage

The permissible tolerances for the operating voltage are listed in publications IEC/EN 61131-2 and DIN 19240.

For a nominal voltage U_n of 24 V --- , the extreme operating values are from - 15% to + 20% of voltage U_n , whatever the supply fluctuations in the range - 10% to + 6% (defined by standard IEC 38) with load variations in the range 0 to 100% of nominal current I_n .

All 24 V --- Phaseo power supplies are designed to provide an output voltage within these ranges.

It may be necessary to use a voltage measurement relay to detect when the normal voltage limits are being surpassed and to deal with the consequences of this. The Universal range has integrated voltage detection.

Recommendations for the use of 24 V --- voltage

The Phaseo range of power supplies can be used to supply control circuits with Protection Extra Low Voltage (PELV) or Safety Extra Low Voltage (SELV) in compliance with standard IEC 60364-4-41.

They have the following characteristics:

- Double insulation between the input circuit (connected to the line supply) and the low voltage output circuit via an integrated isolation transformer
- Internal device limiting the output voltage to less than 60 V in the event of an internal fault

Harmonic pollution (power factor)

The current drawn by a power supply is not sinusoidal. This leads to the generation of harmonic currents that pollute the distribution system. European standard IEC/EN 61000-3-2 limits the harmonic currents produced by power supplies.

This standard covers all devices between 75 and 1000 W, drawing up to 16 A per phase and connected directly to the public distribution system. Devices connected downstream of a private, low voltage general transformer are therefore excluded. Regulated switch mode supplies always consume harmonic currents; a filter circuit (*Power Factor Correction* or PFC) must therefore be added to comply with standard IEC/EN 61000-3-2.

The **ABL 8RPS/8RPM/8WPS 24●●0** Universal range and the **ABL 1RPM** Dedicated range of Phaseo power supplies comply with standard IEC/EN 61000-3-2 and can therefore be connected directly to public distribution systems.

Since the **ABL 8MEM240●●** Modular range and **ABL 7RM24025** and **ABL 1REM12050/24025** Dedicated range of Phaseo power supplies have power ratings of < 75 W, they are not subject to the requirements of standard IEC/EN 61000-3-2. They can therefore be connected directly to public distribution systems.

The **ABL 8REM** Optimum range and the **ABL 1REM** Dedicated range of Phaseo power supplies must only be connected downstream of a private, low voltage general transformer.



ABL 8MEM..... Zelio Logic

Switch mode power supplies: Modular range

The **ABL 8MEM/7RM** power supply offer is designed to provide the DC voltage necessary for the control circuits of automation system equipment consuming 7 to 60 W in 5, 12 and 24 V DC . Comprising six products, this range meets the needs encountered in industrial, commercial, and residential applications. These modular electronic switch mode power supplies provide a quality of output current that is suitable for the loads supplied and compatible with the **Zelio Logic** range. Clear guidelines are given on selecting the upstream protection devices which are often used with them, and thus a comprehensive solution is provided that can be used in total safety.

The Modular range of Phaseo power supplies can be connected in phase-to-neutral (N-L1) or in phase-to-phase (1) (L1-L2). They deliver a voltage that is precise to 3%, whatever the load and whatever the type of line supply, within a range of 85 to 264 V \sim . Conforming to IEC standards and UL, CSA and TUV certified, they are suitable for universal use. The inclusion of overload and short-circuit protection makes downstream protection unnecessary if discrimination is not required.

Due to their low power, the Modular range of Phaseo power supplies consume very little harmonic current and thus are not subject to the requirements of standard IEC/EN 61000-3-2 concerning harmonic pollution.

All the Modular range of Phaseo power supplies have protection devices to ensure optimum performance of the automation system with an automatic reset mode on elimination of the fault.

All products are equipped with an output voltage adjustment potentiometer in order to be able to compensate for any line voltage drops in installations with long cable runs.

These power supplies also have a cable run inside the unit so that the outputs can be connected at the top or bottom of the product as required.

These power supplies are designed for direct mounting on 35 mm DIN rails, or on a mounting plate using their retractable fixing lugs.

There are six references available in the Phaseo Modular range:

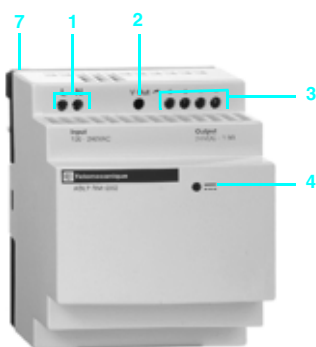
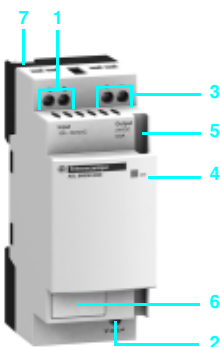
■ ABL8MEM24003	7 W	300 mA	24 V DC
■ ABL8MEM24006	15 W	600 mA	24 V DC
■ ABL8MEM24012	30 W	1.2 A	24 V DC
■ ABL7RM24025	60 W	2.5 A	24 V DC
■ ABL8MEM05040	20 W	4 A	5 V DC
■ ABL8MEM12020	25 W	2 A	12 V DC

(1) 240 V \sim nominal.

Description


ABL 8MEM.....

ABL7RM24025




- 1 2.5 mm² screw terminal for connection of the AC input voltage
- 2 Output voltage adjustment potentiometer
- 3 2.5 mm² screw terminal for connection of the output voltage
- 4 LED indicating presence of the DC output voltage
- 5 Duct for throughwiring of the output voltage conductors at the bottom (except for model ABL 7RM24025)
- 6 Clip-on marker label (except for model ABL 7RM24025)
- 7 Retractable fixing lugs for panel mounting

Technical characteristics

Power supply type			ABL 8MEM24003	ABL 8MEM24006	ABL 8MEM24012	ABL 7RM24025
Certifications				cULus 508, cCSAus (CSA 22.2 No 950-1), TUV 60950-1, C€, C-Tick		cULus 508, CSA, TUV 60950-1, C€, C-Tick
Conformity to standards	Safety		IEC/EN 60950-1, SELV			
	EMC		IEC/EN 61000-6-2, EN 61000-6-3, IEC/EN 61204-3, EN 55022 Class B			
Input circuit						
LED indication			No			
Input values	Nominal voltage	V	100...240 ~			
	Limit voltage	V	85...264 ~ 120...250 --- (1)			85...264 ~
	Current consumption	A	0.25 (100 V ~) 0.18 (240 V ~)	0.4 (100 V ~) 0.25 (240 V ~)	0.65 (100 V ~) 0.4 (240 V ~)	1.2 (120 V ~) 0.7 (240 V ~)
	Permissible frequencies	Hz	47...63			
	Maximum inrush current	A	20			90 for 1 ms
	Power factor		> 0.5			
	Efficiency at nominal load		> 78%	> 80%	> 82%	> 84%
	Dissipated power at nominal load	W	2	3.8	6.6	11.4
Output circuit						
LED indication			Green LED			
Nominal output values	Voltage (U _{Out})	V	24 ---			
	Current	A	0.3	0.6	1.2	2.5
	Power	W	7	15	30	60
Precision	Output voltage	V	Adjustable from 22.8 to 28.8			
	Line and load regulation		± 3%			
	Residual ripple - noise	mV	250			200
Holding time for I max.	U _{In} = 100 V ~	ms	≥ 10			
	U _{In} = 230 V ~	ms	≥ 150			
Protection	Against short-circuits		Permanent			
	Against undervoltages	V	–			< 19
	Thermal		Yes			–
Operating and environmental characteristics						
Connections	Input	mm ²	2 x 0.14...2.5 screw terminals (26...14 AWG)			
	Output	mm ²	2 x 0.14...2.5 screw terminals (26...14 AWG)		4 x 0.14...2.5 screw terminals (26...14 AWG)	
Mounting			On  rail, 35 x 7.5 mm and 35 x 15 mm or on panel (2 x Ø 4 mm)			
Operating position			Vertical			
Connections	Series		Possible, see page 15			
	Parallel		Possible, see page 15			
Environment	Operating temperature	°C	- 25...+ 70 (derating from 55°C, see page 15)			- 25...+ 55
	Storage temperature	°C	- 40...+ 70			
	Relative humidity		90% during operation 95% in storage			
	Degree of protection		IP 20 conforming to IEC/EN 60529			
	Vibrations acc. to IEC/EN 61131-2		3...11.9 Hz amplitude 3.5 mm and 11.9 -150 Hz acceleration 2 g			
Protection class according to VDE 0106 1			Class II			
Dielectric strength 50 Hz for 1 min	Input/output	V rms	3000 ~			
Input fuse incorporated			Yes (not interchangeable)			
Emissions according to EN 61000-6-3			EN 50081-1 (generic)			
	Radiation		EN 55022 Class B			
	Conducted on the power line		EN 55022 Class B			
	Harmonic currents		IEC/EN 61000-3-2			
Immunity according to IEC/EN 61000-6-2	Electrostatic discharge		IEC/EN 61000-4-2 (6 kV contact/8 kV air)			IEC/EN 61000-4-2 (4 kV contact/8 kV air)
	Radiated electromagnetic fields		IEC/EN 61000-4-3 level 3 (10 V/m)			
	Induced electromagnetic fields		IEC/EN 61000-4-6 level 3 (10 V/m)			
	Rapid transients		IEC 61000-4-4 (4 kV)			
	Surges		IEC/EN 61000-4-5 (1 kV)			
	Primary outages		IEC 61000-4-11 (voltage dips and interruptions)			

(1) cULus 508, cCSAus and TUV 60950-1 certifications are not valid for DC input voltages.

Technical characteristics

Power supply type		ABL 8MEM05040	ABL 8MEM12020	
Certifications		cULus 508, cCSAus (CSA22.2 No 950-1), TUV EN 60950-1, C€, C-Tick		
Conformity to standards	Safety	IEC/EN 60950-1, SELV		
	EMC	IEC/EN 61000-6-2, EN 61000-6-3, IEC/EN 61204-3, EN 55022 Class B		
Input circuit				
LED indication		No		
Input values	Nominal voltage	V	100...240 ~	
	Limit voltage	V	85...264 V ~ 120...250 V --- (1)	
	Current consumption	A	0.55 (100 V ~) 0.35 (240 V ~)	0.6 (100 V ~) 0.35 (240 V ~)
	Permissible frequencies	Hz	47...63	
	Maximum inrush current	A	20	
	Power factor		> 0.5	
	Efficiency at nominal load		> 75%	> 80%
	Dissipated power at nominal load	W	6.7	6.2
	Output circuit			
LED indication		Green LED		
Nominal output values	Voltage (U _{Out})	V	5 ---	12...15 ---
	Current	A	4	2.1
	Power	W	20	25
Precision	Output voltage	V	Adjustable from 4.75 to 6.25	Adjustable from 11.4 to 15
	Line and load regulation		± 3%	
	Residual ripple - noise	mV	250	
Holding time for I _{max}	U _{In} min	ms	≥ 10	
Protection	Against short-circuits		Permanent	
	Against undervoltages		–	
	Thermal		–	
Operating and environmental characteristics				
Connections	Input	mm ²	2 x 0.14...2.5 screw terminals (26...14 AWG)	
	Output	mm ²	4 x 0.14...2.5 screw terminals (26...14 AWG)	
Mounting			On  rail, 35 x 7.5 mm and 35 x 15 mm or on panel (2 x Ø 4 mm)	
Operating position	On vertical plane		Vertical	
Connections	Series		Possible, see page 15	
	Parallel		Possible, see page 15	
Environment	Operating temperature	°C	- 25...+ 70 (derating from 55°C, see page 15)	
	Storage temperature	°C	- 40...+ 70	
	Maximum relative humidity		90% during operation 95% in storage	
	Degree of protection		IP 20 conforming to IEC/EN 60529	
	Vibrations acc. to IEC/EN 61131-2		3...11.9 Hz amplitude 3.5 mm and 11.9 -150 Hz acceleration 2 g	
Protection class according to VDE 0106 1			Class II	
Dielectric strength 50 Hz for 1 min	Input/output	V _{rms}	3000 ~	
Input fuse incorporated			Yes (not interchangeable)	
Emissions according to EN 61000-6-3			EN 50081-1 (generic)	
	Radiation		EN 55022 Class B	
	Conducted on the power line		EN 55022 Class B	
	Harmonic currents		IEC/EN 61000-3-2	
Immunity according to EN 61000-6-2	Electrostatic discharge		IEC/EN 61000-4-2 (6 kV contact/8 kV air)	
	Radiated electromagnetic fields		IEC/EN 61000-4-3 level 3 (10 V/m)	
	Induced electromagnetic fields		IEC/EN 61000-4-6 level 3 (10 V/m)	
	Rapid transients		IEC 61000-4-4 (4 kV)	
	Surges		IEC/EN 61000-4-5 (1 kV)	
	Primary outages		IEC 61000-4-11 (voltage dips and interruptions)	

(1) cULus 508, cCSAus and TUV 60950-1 certifications are not valid for DC input voltages.

Output characteristics

Behavior in the event of short-circuits and overloads

Phaseo power supplies are equipped with an electronic protection device.

In the event of an overload or short-circuit, the integrated protection interrupts the current supply before the output voltage drops below 19 V.

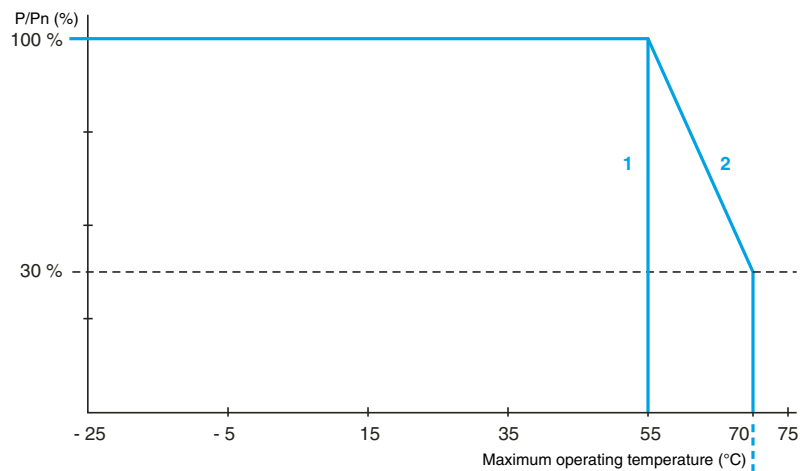
The output voltage reverts to its nominal value on elimination of the fault, which avoids having to take any action.

Derating

The ambient temperature is a determining factor that limits the power an electronic power supply can deliver continuously. If the temperature around the electronic components is too high, their life will be significantly reduced.

The nominal ambient temperature for the Modular range of Phaseo power supplies is 55°C. Above this temperature, derating is necessary up to a maximum temperature of 70°C (except for the ABL 7RM24025 model).

The graph below shows the power as a percentage of the nominal power that the power supply can deliver continuously, depending on the ambient temperature.



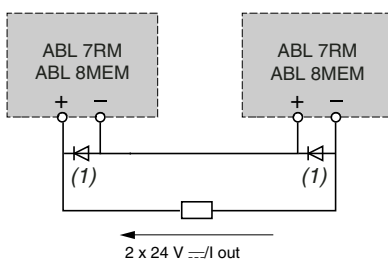
- 1 With an ABL 7RM24025
- 2 With an ABL 8MEM series

Temporary overloads

The ABL 8MEM series Modular range of power supplies have an energy reserve that can be used to supply the application with 125% to 140% of the nominal output current for a maximum of 1 minute, depending on the model.

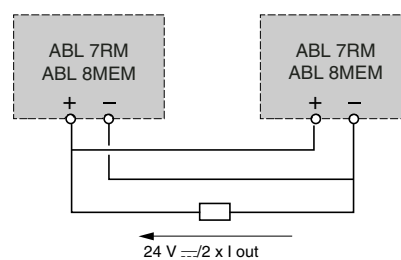
Series or parallel connection

Series connection



(1) Two Schottky diodes I_{min} = power supply I_n and V_{min} = 50 V

Parallel connection



Family	Series	Parallel
ABL 7RM/8MEM	2 products max.	2 products max.

Nota : Series or parallel connection is only recommended for products with identical references.

Selection of protection for the power supply primary

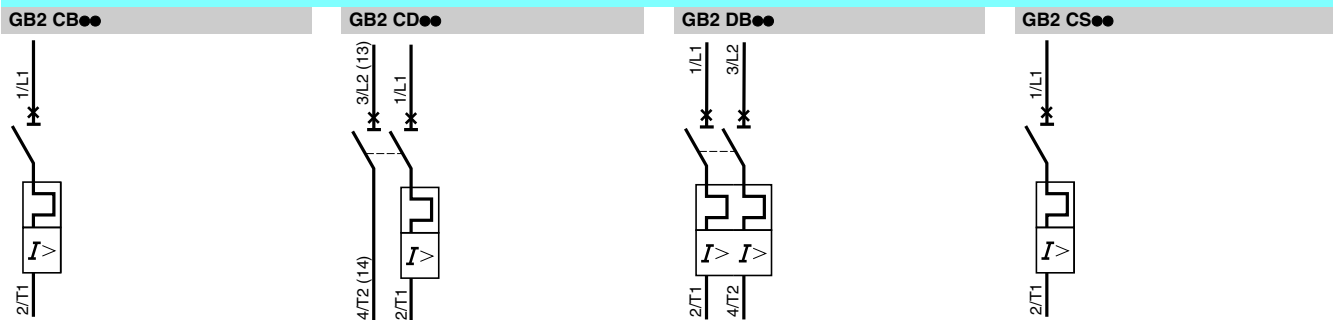
Type of line supply	100 to 240 V ~ single-phase		
Type of protection	Thermal-magnetic circuit-breaker		gG fuse
	GB2 (IEC) (1)	C60N (IEC) C60N (UL/CSA)	
ABL 8MEM05040	GB2 ●●07 (2)	24581 24517	2 A
ABL 8MEM12020			
ABL 8MEM24003			
ABL 8MEM24006			
ABL 8MEM24012	GB2 ●●08 (2)	24582 24518	3 A
ABL 7RM24025			

(1) UL pending

(2) Complete the reference by replacing ●● as required:

- **CB** for single-pole circuit-breaker with magnetic trip threshold 12 to 16 In
- **CD** for single-pole + neutral circuit-breaker with magnetic trip threshold 12 to 16 In
- **DB** for 2-pole circuit-breaker with magnetic trip threshold 12 to 16 In
- **CS** for single-pole circuit-breaker with magnetic trip threshold 5 to 7 In

Circuit-breaker schemes



Power supplies and transformers

Power supplies for DC control circuits

Regulated switch mode power supplies

Phaseo Modular range

References






ABL 8MEM05040/12020/24012



ABL 8MEM24003/24006



ABL 7RM24025

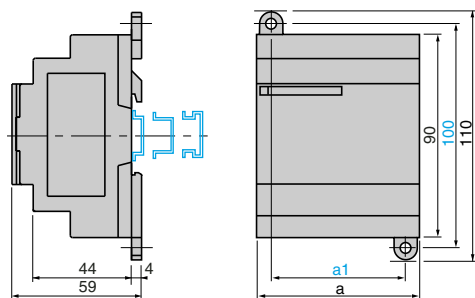
Input voltage	Secondary			Reset	Conforming to standard IEC/EN 61000-3-2 (1)	Reference	Weight kg
	Output voltage	Nominal power	Nominal current				
Single-phase (N-L1) or 2-phase (L1-L2) connection							
100...240 V -15%, + 10% 50/60 Hz	5 V 	20 W	4 A	Automatic	Not applicable	ABL 8MEM05040	0.195
	12 V 	25 W	2 A	Automatic	Not applicable	ABL 8MEM12020	0.195
	24 V 	7 W	0.3 A	Automatic	Not applicable	ABL 8MEM24003	0.100
		15 W	0.6 A	Automatic	Not applicable	ABL 8MEM24006	0.100
		30 W	1.2 A	Automatic	Not applicable	ABL 8MEM24012	0.195
		60 W	2.5 A	Automatic	Not applicable	ABL 7RM24025	0.255

Designation	Use	Order in multiples of	Unit reference	Weight kg
Clip-on marker labels	Replacement parts for ABL 8MEM power supplies	100	LAD 90	0.030

(1) Due to their power < 75 W, the **ABL 8MEM/7RM** Modular range of power supplies is not subject to the requirements of standard IEC/EN 61000-3-2.

Dimensions

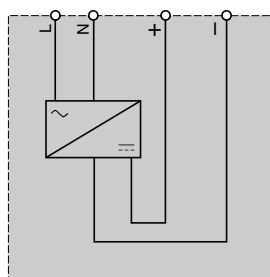
ABL 8MEM●●●●/ABL 7RM24025 power supply



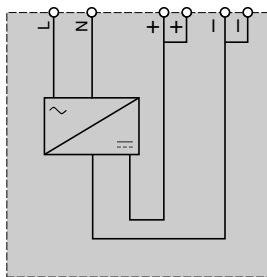
	a	a1
ABL 8MEM05040	54	42
ABL 8MEM12020	54	42
ABL 8MEM24003	36	24
ABL 8MEM24006	36	24
ABL 8MEM24012	54	42
ABL 7RM24025	72	60

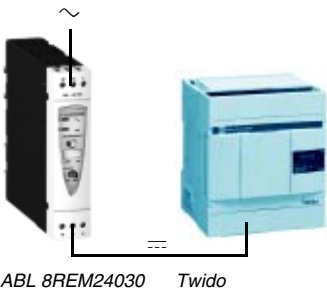
Internal schemes

ABL 8MEM2400●



ABL 8MEM05040/8MEM12020/8MEM24012/7RM24025





Switch mode power supplies: Optimum range

The **ABL 8REM/7RP** power supply offer is designed to provide the DC voltage necessary for the control circuits of automation system equipment consuming 60 to 144 W in 12, 24 and 48 V --- . Comprising four products, this range meets the needs encountered in industrial, commercial, and residential applications. With phase-to-neutral (N-L1) or phase-to-phase (1) (L1-L2) connection, these slim electronic switch mode power supplies provide a quality of output current that is suitable for the loads supplied and compatible with both the **Twido** range and the smallest **Modicon M340** configurations, making them ideal partners. Their simplified characteristics in comparison with the Universal offer also make them the low-cost solution for applications less affected by problems with the line supply, such as harmonic pollution and outages. Clear guidelines are given on selecting the upstream protection devices which are often used with them, and thus a comprehensive solution is provided that can be used in total safety.

The Optimum range of Phaseo power supplies delivers a voltage that is precise to 3%, whatever the load and whatever the type of line supply, within a range of 85 to 264 V \sim . Conforming to IEC standards and UL, CSA and TUV certified, they are suitable for universal use. The inclusion of overload and short-circuit protection makes downstream protection unnecessary if discrimination is not required.

ABL 8REM power supplies do not have an anti-harmonic filter and do not satisfy the requirements of standard IEC/EN 61000-3-2 concerning harmonic pollution.

ABL 7RP power supplies, however, are equipped with a PFC (*Power Factor Correction*) filter, thus ensuring compliance with standard IEC/EN 61000-3-2.

All the Optimum range of Phaseo power supplies have protection devices to ensure optimum performance of the automation system with an automatic reset mode on elimination of the fault.

In the event of an overload or short-circuit, the integrated protection interrupts the current supply before the output voltage drops below 19 V --- . The protection device resets itself automatically on elimination of the fault, which avoids having to take any action or change a fuse.

All products are equipped with an output voltage adjustment potentiometer in order to be able to compensate for any line voltage drops in installations with long cable runs.

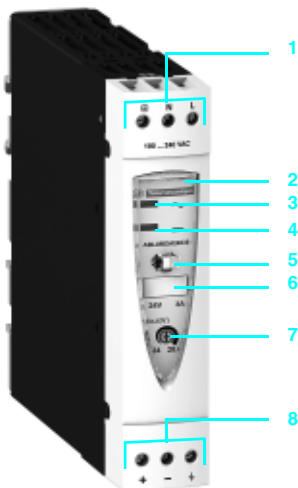
These power supplies are designed for direct mounting on 35 and 75 mm --- rails.

There are four references available in the Optimum range of Phaseo power supplies:

■ ABL 8REM24030	72 W	3 A	24 V ---
■ ABL 8REM24050	120 W	5 A	24 V ---
■ ABL 7RP1205	60 W	5 A	12 V ---
■ ABL 7RP4803	144 W	3 A	48 V ---


Description

- 1 2.5 mm² enclosed screw terminals for connection of the input voltage (single-phase N-L1, phase-to-phase L1-L2 (1))
- 2 Protective glass flap
- 3 Input voltage status LED (orange).
- 4 Output DC voltage status LED (green).
- 5 Locking catch for the glass flap (sealable)
- 6 Clip-on marker label.
- 7 Output voltage adjustment potentiometer
- 8 2.5 mm² enclosed screw terminal block for connection of the DC output voltage



(1) 240 V \sim nominal.

Technical characteristics

Type of power supply		ABL 7RP1205	ABL 7RP4803	ABL 8REM24030	ABL 8REM24050		
Certifications			cULus 508, cCSAus (CSA22.2 n950-1), TUV 60950-1, C€, C-Tick				
Conformity to standards	Safety		IEC/EN 60950, IEC 61496-1-2, SELV		IEC/EN 60950, SELV		
	EMC		EN 50081-1, IEC/EN 61000-6-2 (EN 50082-2)				
Input circuit							
LED indication			Orange LED				
Input values	Nominal voltage	V	100...240 ~ compatible with 110...220 --- (1)		100...240 ~ compatible with 110...220 --- (1)		
	Limit voltage	V	85...264 ~ compatible with 100...250 --- (1)		85...264 ~ single-phase compatible with 100...250 --- (1)		
	Current consumption	U _{in} = 240 V ~	A	0.4	0.6	0.83	1.2
		U _{in} = 100 V ~	A	0.8	1	1.46	1.9
	Permissible frequencies	Hz	47...63				
	Maximum inrush current	A	30				
	Power factor		0.98 approx.		0.65 approx.		
	Efficiency at nominal load		> 85%				
Dissipated power at nominal load		W	10.6	25.4	12.7	21.2	
Output circuit							
LED indication			Green LED				
Nominal output values	Voltage (U _{Out})	V	12 ---	48 ---	24 ---		
	Current	A	5	3	3	5	
	Power	W	60	144	72	120	
Precision	Output voltage	V	Adjustable from 100 % to 120 % of U _{out} voltage				
	Line and load regulation		± 3%				
	Residual ripple - noise	mV	< 200 (peak-peak)				
Holding time for I max	U _{in} = 240 V ~	ms	≥ 20		≥ 10		
	U _{in} = 100 V ~	ms	≥ 20		≥ 10		
Protection	Against short-circuits		Permanent/automatic or manual restart		Permanent/automatic restart		
	Against overloads		1.1 I _n				
	Against overvoltages		Tripping if U _{Out} > 1.5 U _n				
	Against undervoltages		Tripping if U _{Out} < 0.8 U _n				
Operating and environmental characteristics							
Connections	Input	mm ²	2 x 0.14...2.5 screw terminals (26...14 AWG) + ground				
	Output	mm ²	2 x 0.14...2.5 screw terminals (26...14 AWG) + ground, multiple output, depending on model				
Mounting	On  rail	mm	35 x 7.5, 35 x 15 and 75 x 7.5				
Operating position	On vertical plane		Vertical				
Connections	Series		Possible, see page 21				
	Parallel		Possible, see page 21				
Degree of protection			IP 20 conforming to IEC/EN 60529				
Environment	Operating temperature	°C	0... + 60 (derating from 50 °C, see page 20)				
	Storage temperature	°C	- 25...+ 70				
	Maximum relative humidity		95% without condensation or dripping water				
	Vibration acc. to IEC/EN 61131-2		3...11.9 Hz amplitude 3.5 mm and 11.9 -150 Hz acceleration 2 g				
Protection class according to VDE 0106 1			Class I				
Dielectric strength 50 and 60 Hz for 1 min	Input/output	V rms	3000				
	Input/ground	V rms	3000				
	Output/ground (and output/output)	V rms	500				
Input fuse incorporated			Yes (not interchangeable)				
Emissions according to EN 61000-6-3			EN 50081-1 (generic)				
	Conducted/radiated		EN 55011/EN 55022 cl. B				
Immunity according to IEC/EN 61000-6-2	Electrostatic discharge		IEC/EN 61000-4-2 (6 kV contact/8 kV air)				
	Radiated electromagnetic fields		IEC/EN 61000-4-3 level 3 (10 V/m)				
	Induced electromagnetic fields		IEC/EN 61000-4-6 level 3 (10 V/m)				
	Rapid transients		IEV 61000-4-4 level 3 (2 kV)				
	Surges		IEC/EN 61000-4-5 (2 kV)				
	Primary outages		IEC 61000-4-11 (voltage dips and interruptions)				

(1) cULus 508, cCSAus and TUV 60950-1 certifications are not valid for DC input voltages.

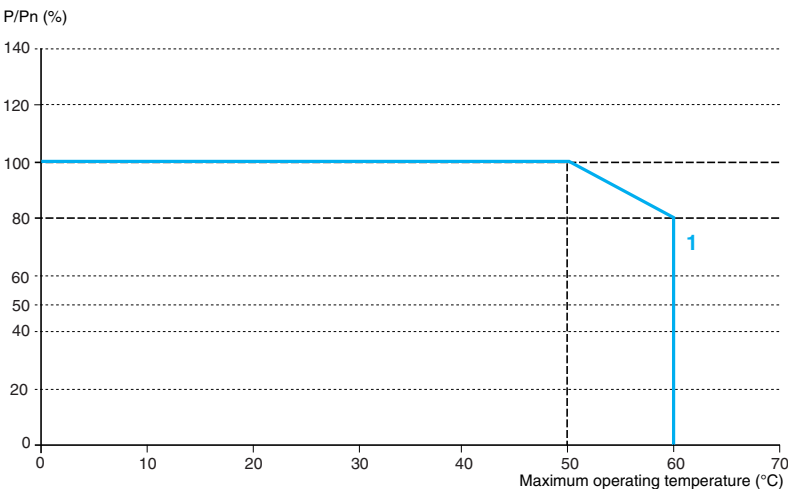
Output characteristics

Derating

The ambient temperature is a determining factor that limits the power an electronic power supply can deliver continuously. If the temperature around the electronic components is too high, their life will be significantly reduced.

The nominal ambient temperature for the Optimum range of Phaseo power supplies is 50 °C. Above this temperature, derating is necessary up to a maximum temperature of 60 °C.

The graph below shows the power as a percentage of the nominal power that the power supply can deliver continuously, depending on the ambient temperature.



1 ABL 8REM, ABL 7RP mounted vertically

Derating should be considered in extreme operating conditions:

- Intensive operation (output current permanently close to the nominal current, combined with a high ambient temperature)
- Output voltage set above 24 V --- (to compensate for line voltage drops, for example)
- Parallel connection to increase the total power

General rules to be complied with

Intensive operation	See derating on above graph. Example for ABL 8REM: - Without derating, from 0°C to 50°C - Derating of nominal current by 2%, per additional °C, up to 60°C
Rise in output voltage	The nominal power is fixed. Increasing the output voltage means that the current delivered must be reduced.
Parallel connection to increase the total power	The total power is equal to the sum of the power supplies used, but the maximum ambient temperature for operation is 50°C. To improve heat dissipation, the power supplies must not be in contact with each other.

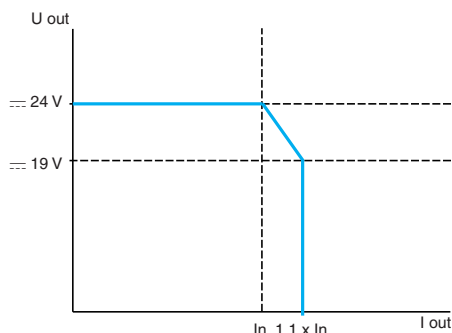
In all cases, there must be adequate convection around the products to assist cooling. There must be sufficient clearance around the Optimum range of Phaseo power supplies:

- 50 mm above and below
- 15 mm on the sides

Output characteristics (continued)

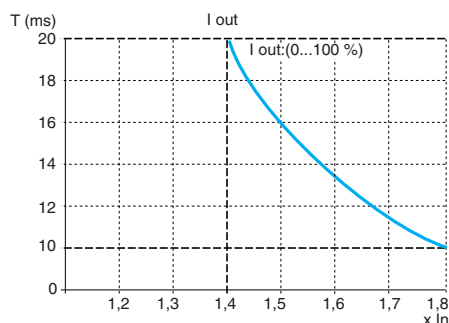
Load limit

ABL 8REM240●●/ABL 7RP●●●●



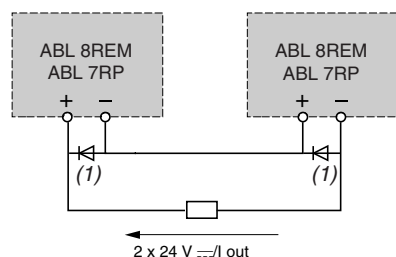
Temporary overloads

ABL 8REM/ABL 7RP

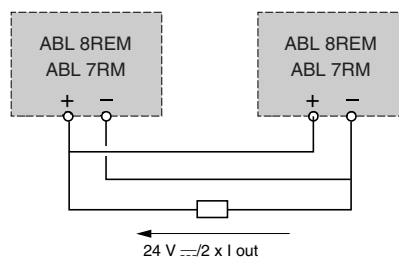


Series or parallel connection

Series connection



Parallel connection



Family	Series	Parallel
ABL 8REM/7RP	2 products max.	2 products max.

(1) Two Schottky diodes I_{min} = power supply I_n and V_{min} = 50 V

Nota : Series or parallel connection is only recommended for products with identical references.

Selection of protection for the power supply primary

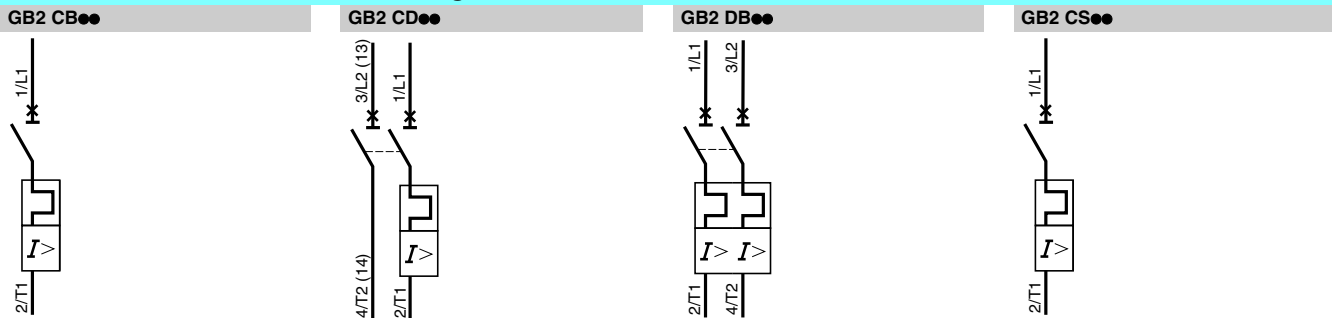
Type of line supply	100 V ~			240 V ~		
Type of protection	Thermal-magnetic circuit-breaker		gG fuse	Thermal-magnetic circuit-breaker		gG fuse
	GB2 (IEC) (1)	C60N (IEC) C60N (UL)		GB2 (IEC) (1)	C60N (IEC) C60N (UL)	
ABL 7RP1205	GB2 ●●06 (2)	24580 24516	2 A	GB2 ●●06 (2)	24580 24516	1 A
ABL 8REM24030	GB2 ●●07 (2)	24581 24517	2 A	GB2 ●●06 (2)	24580 24516	1 A
ABL 8REM24050	GB2 ●●07 (2)	24581 24517	2 A	GB2 ●●06 (2)	24580 24516	1 A
ABL 7RP4803	GB2 ●●07 (2)	24581 24517	2 A	GB2 ●●06 (2)	24580 24516	1 A

(1) UL pending

(2) Complete the reference by replacing ●● with:

- **CB** for single-pole circuit-breaker with magnetic trip threshold 12 to 16 In
- **CD** for single-pole + neutral circuit-breaker with magnetic trip threshold 12 to 16 In
- **DB** for 2-pole circuit-breaker with magnetic trip threshold 12 to 16 In
- **CS** for single-pole circuit-breaker with magnetic trip threshold 5 to 7 In

Schemes for GB2 ●●0● thermal-magnetic circuit-breakers



Power supplies and transformers

Power supplies for DC control circuits

Regulated switch mode power supplies

Phaseo Optimum range

Regulated switch mode power supplies: Phaseo Optimum range






ABL 7RP1205/4803



ABL 8REM24030



ABL 8REM24050

Input voltage	Secondary			Reset	Conforming to standard IEC/EN 61000-3-2	Reference	Weight kg
	Output voltage	Nominal power	Nominal current				
Single-phase (N-L1) or phase-to-phase (L1-L2) connection							
100...240 V ~ - 15%, + 10% 50/60 Hz	12 V 	60 W	5 A	Automatic or manual	Yes	ABL 7RP1205	1.000
	24 V 	72 W	3 A	Automatic	No	ABL 8REM24030	0.520
		120 W	5 A	Automatic	No	ABL 8REM24050	1.000
	48 V 	144 W	2.5 A	Automatic or manual	Yes	ABL 7RP4803	1.000

Dimensions

ABL 7RP●●●●

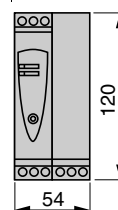
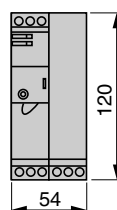
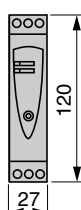
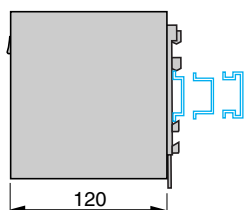
Common side view

Mounted on 35 and 75 mm rails

ABL 8REM24030

ABL 7RP1205/4803

ABL 8REM24050

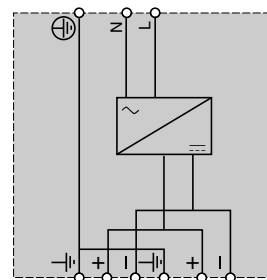
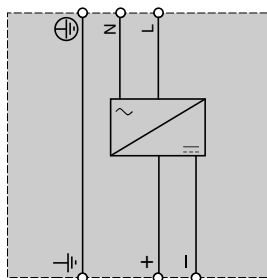
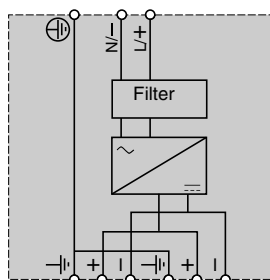


Internal schemes

ABL 7RP1205/48030

ABL 8REM24030

ABL 8REM24050



Power supplies and transformers

Power supplies for DC control circuits

Regulated switch mode power supplies

Phaseo Universal range



ABL 8RPS24050 --- Modicon M340 automation platform

Switch mode power supplies: Universal range

The **ABL 8RPS/RPM/WPS** power supply offer is designed to provide the DC voltage necessary for the control circuits of automation system equipment. Comprising six products, this range meets the needs encountered in industrial and commercial applications. These compact electronic switch mode power supplies provide a quality of output current that is suitable for the loads supplied and compatible with the **Modicon M340, Premium and Quantum** ranges. When used with additional function modules, they ensure continuity of service in the event of network power outages or application malfunctions. Clear guidelines are given on selecting the function modules and upstream protection devices which are often used with them, and thus a comprehensive solution is provided that can be used in total safety.

The Universal range of Phaseo power supplies must be connected in phase-to-neutral or phase-to-phase for **ABL 8RPS/RPM**, and in 3-phase for **ABL 8WPS**. They deliver a voltage that is precise to 3%, whatever the load and whatever the type of line supply, within the ranges:

- 85 to 132 V ~ and 170 to 550 V ~ for **ABL 8RPS**
- 85 to 132 V ~ and 170 to 264 V ~ for **ABL 8RPM**
- 340 to 550 V ~ for **ABL 8WPS**

Their very wide input voltage range allows a considerable reduction of parts held in stock and offers a distinct advantage in terms of machine design.

Conforming to IEC standards and UL and CSA certified, they are suitable for universal use.

ABL 8RPS/RPM and ABL 8WPS power supplies are all equipped with a harmonic filter, ensuring compliance with standard IEC/EN 61000-3-2 concerning harmonic pollution.

All the Universal range of Phaseo power supplies have protection devices to ensure optimum performance of the automation system. Their operating mode can be configured as required by the user:

■ **Manual reset protection mode:** Priority is given to the voltage so as to guarantee the PLC logic states and nominal operation of the supplied actuators.

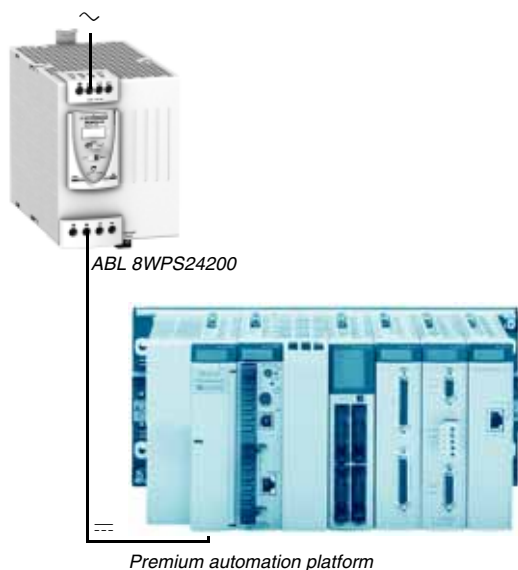
■ **Automatic reset protection mode:** Priority is given to the current to allow troubleshooting for example, or to ensure continuity of service until the arrival of the maintenance team.

The Universal range of Phaseo power supplies also has a power reserve, allowing them to deliver a current of 1.5 I_n at regular intervals. This avoids the need to oversize the power supply if the device has a high inrush current, while ensuring optimum performance of the automation system.

The diagnostics for the Universal range of Phaseo power supplies are available on the front of the device via LEDs (U_{out} and I_{out}) and via a volt-free relay contact (whether or not the PLC states are guaranteed).

All products are equipped with an output voltage adjustment potentiometer in order to be able to compensate for any line voltage drops in installations with long connection cable runs.

These power supplies are designed for direct mounting on a 35 mm rail.



Switch mode power supplies: Universal range (continued)

There are four references available in the Universal range of Phaseo power supplies for phase-to-neutral or phase-to-phase connection:

■ ABL 8RPS24030	72 W	3 A	24 V ---
■ ABL 8RPS24050	120 W	5 A	24 V ---
■ ABL 8RPS24100	240 W	10 A	24 V ---
■ ABL 8RPM24200	480 W	20 A	24 V ---

The Universal range of Phaseo power supplies also features two references for 3-phase connection:

■ ABL 8WPS24200	480 W	20 A	24 V ---
■ ABL 8WPS24400	960 W	40 A	24 V ---

A range of function modules also allows functions to be added to the Universal range of Phaseo power supplies so as to ensure continuity of service:

- A Buffer module or Battery control modules combined with their batteries to ensure continuity of service in the event of a network power outage (see selection tables on pages 38 and 39)
- A Redundancy module to meet the most demanding requirements for continuity of service even if the power supply fails
- Downstream electronic Protection modules to ensure that the protection in the application is discriminating
- Converter modules delivering nominal voltages of 5 and 12 V --- from the 24 V --- output of the Universal range of Phaseo power supplies

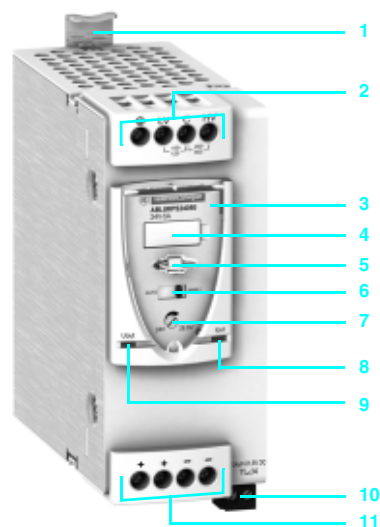
Description

Universal range of power supplies


The Universal range of Phaseo regulated switch mode power supplies,

ABL 8RPS24●●0/RPM24200/WPS24●00, comprise:


- 1 Spring clip for 35 mm U_L rail
- 2 4 mm² enclosed screw terminals for connection of the AC voltage (single-phase, phase-to-phase or 3-phase connection)
- 3 Protective glass flap
- 4 Clip-on marker label
- 5 Locking catch for the glass flap (sealable)
- 6 Protection mode selector
- 7 Output voltage adjustment potentiometer
- 8 Output voltage status LED (green and red)
- 9 Output current status LED (green, red and orange)
- 10 Screw terminals for connection of the diagnostic relay contact, except **ABL 8RPS24030**
- 11 4 mm² (10 mm² on **ABL 8WPS24●00** and **ABL 8RPM24200**) enclosed screw terminals for connection of the DC output voltage



Technical characteristics

Type of power supply		ABL 8RPS24030	ABL 8RPS24050	ABL 8RPS24100	ABL 8RPM24200	
Certifications		CB scheme IEC/EN 60950-1, UL, cCSAus, C-Tick, C€				
Conformity to standards	Safety	IEC/EN 60950-1, IEC/EN 61204-3, SELV				
	EMC	EN 61000-6-1, IEC/EN 61000-6-2, EN 61000-6-3, IEC/EN 61000-6-4, IEC/EN 61204-3				
Input circuit						
Input values phase-to-neutral (N-L1) or phase-to-phase (L1-L2)	Nominal voltage	V	100...120 V ~/200...500 V ~			100...120 V ~ / 200...240 V ~
	Limit voltage	V	85...132 V ~/170...550 V ~			85...132 V ~ / 170...264 V ~
	Permissible frequencies	Hz	47...63			
	Maximum inrush current	A	30 for 2 ms max.			
	Power factor		0.59 at 120 V ~/0.51 at 240 V ~		0.69 at 120 V ~/0.68 at 240 V ~	
	Efficiency at nominal load		> 87 %		> 88 %	
	Dissipated power at nominal load	W	7.8	15.5	31	57.6
Anti-harmonic filtering	According to IEC 61000-3-2	Yes, via integrated PFC (<i>Power Factor Correction</i>) passive filter				
Output circuit						
Compatibility with function modules		Buffer, battery and battery control unit, redundancy, discriminating protection				
Diagnostics	LEDs on front panel	Current (green, orange and red), voltage (green, red and off)				
	Relay	–		Relay closed U _{Out} > 21.6 V contact 230 V ~, 0.5 A max; 24 V ---, 5 mA min		
Nominal output values	Nominal output voltage (U _{Out})	V	24 ---			
	Current	A	3	5	10	20
	Power	W	72	120	240	480
Permissible temporary inrush current (boost)		A	1.5 In for 4 s maximum, see curves on page 29			
Precision	Nominal output voltage (U _{Out})	V	Adjustable 24...28.8			
	Line and load regulation		1 %...3 %			
	Residual ripple - noise	mV	< 200 (peak-peak)			
Holding time for I max.	U _{In} = 100 V ~	ms	≥ 20			
	U _{In} = 240 V ~	ms	≥ 40			
	U _{In} = 400 V ~	ms	≥ 120			–
Protection	Against short-circuits		Permanent, automatic or manual restart			
	Against overloads		Permanent, automatic or manual restart			
	Against overvoltages	V	30...32 ---, manual restart only			
	Against undervoltages	V	Tripping if U _{Out} < 21.6 (in manual mode)			
	Thermal		Yes, automatic restart only			
Operating and environmental characteristics						
Connections	Input	mm ²	2 x 0.5....4 screw terminals (22....12 AWG) + ground			
	Output	mm ²	4 x 0.5....4 screw terminals (24....10 AWG) + ground (1)			
	Diagnostic relay	mm ²	–		2 x 2.5 removable screw terminal block	
Mounting	On  rail		35 x 7.5 mm and 35 x 15 mm			
Operating position			Vertical			
Connections	Series		Possible, see page 30			
	Parallel		Possible, see page 30			
Degree of protection	Conforming to IEC/EN 60529		IP 20			IP 20 except output terminals (+, -) IP 10
Environment	Operating temperature	°C	- 25...+ 60 (derating from 50°C, see page 28)			
	Storage temperature	°C	- 40...+ 70			
	Maximum relative humidity		90% during operation, 95% in storage			
	Vibration acc. to IEC/EN 61131-2		3...11.9 Hz amplitude 3.5 mm & 11.9 -150 Hz acceleration 2 g			
Protection class	According to VDE 0106 1		Class I			
Dielectric strength 50 Hz for 1 min	Input/output	V rms	4000 ~			3000 ~
	Input/ground	V rms	3500 ~			2500 ~
	Output/ground	V rms	500 ~			
Input fuse incorporated			No			
Emissions according to EN 61000-6-3	Radiation		EN 55022 Class B and GL levels			
	Conducted on the power line		EN 55022 Class B and GL levels			
	Harmonic currents		IEC/EN 61000-3-2			
Immunity according to CEI/EN 61000-6-2	Electrostatic discharge		IEC/EN 61000-4-2 (8 kV contact/15 kV air)			
	Radiated electromagnetic fields		IEC/EN 61000-4-3 level 3 (10 V/m)			
	Induced electromagnetic fields		IEC/EN 61000-4-6 level 3 (30 V/m)			
	Magnetic field		EN 61000-4-8 (30 A/m)			
	Rapid transients		IEC 61000-4-4 (4 kV)			
	Surges, IEC/EN 61000-4-5		Input: 4 kV in common mode, 2 kV in differential mode Output: 2 kV in common mode, 1 kV in differential mode			
	Primary outages		IEC 61000-4-11 (voltage dips and interruptions)			

(1) No ground screw on ABL 8RPM 24200 power supply

Technical characteristics				
Type of power supply		ABL 8WPS24200		ABL 8WPS24400
Certifications		CB scheme IEC/EN 60950-1, UL, cCSAus, C-Tick, C€		
Conformity to standards	Safety	IEC/EN 60950-1, EN 61204, SELV		
	EMC	EN 61000-6-1, IEC/EN 61000-6-2, EN 61000-6-3, IEC/EN 61000-6-4, IEC/EN 61204-3		
Input circuit				
LED indication			–	
Input values 3 phase (L1-L2-L3)	Nominal values	V	380-500 V ~	
	Permissible values	V	320-550 V ~	
	Permissible frequencies	Hz	47...63	
	Maximum inrush current	A	25 for 2 ms max.	
	Power factor		0.65	0.85
	Efficiency at nominal load		> 92%	
	Dissipated power at nominal load	W	38.4	76.8
Anti-harmonic filtering	According to IEC 61000-3-2	Yes, via integrated PFC (<i>Power Factor Correction</i>) passive filter		
Operating mode in the event of phase failure		V	Operation possible for a few minutes then protection trips	
Output circuit				
Compatibility with function modules			Buffer, battery and battery control unit, redundancy, discriminating protection	
Diagnostics	LEDs on front panel		Current (green, orange and red), voltage (green, red and off)	
	Relay		Closed relay U _{out} > 21.6 V, contact 230 V ~, 0.5 A max; 24 V ---, 5 mA min	
Nominal output values	Output voltage (U _{Out})	V	24 ---	
	Current	A	0...20	0...40
	Power	W	480	960
Permissible temporary inrush current (boost)		A	1.5 I _n for 4 s maximum, see curves on page 29	
Precision	Output voltage (U _{Out})	V	Adjustable 24...28.8	
	Line and load regulation		1 %...3 %	
	Residual ripple - noise	mV	< 200 (peak-peak)	
Holding time for I _{max}	U _{in} = 400 V ~	ms	≥ 18	≥ 14
Protection	Against short-circuits		Permanent, automatic or manual restart	
	Against overloads		Permanent, automatic or manual restart	
	Against overvoltages	V	30...32 ---, manual restart only	
	Against undervoltages	V	Tripping if U _{Out} < 21.6 (in manual mode)	
	Thermal		Yes, automatic restart only	
Operating and environmental characteristics				
Connections	Input	mm ²	3 x 0.5....4 screw terminals (22....12 AWG) + ground	
	Output	mm ²	4 x 0.5....10 screw terminals (22....8 AWG)	
	Diagnostic relay	mm ²	2 x 2.5 removable screw terminal block	
Mounting	On  rail		35 x 7.5 mm and 35 x 15 mm	
Operating position			Vertical	
Connections	Series		Possible, see page 30	
	Parallel		Possible, see page 30	
Degree of protection	Conforming to IEC/EN 60529		IP 20 except output terminals (+, -) IP 10	
Environment	Operating temperature	°C	- 25...+ 60 (derating from 50°C, see page 28)	
	Storage temperature	°C	- 40...+ 70	
	Maximum relative humidity		90% during operation, 95% in storage	
	Vibration acc. to IEC/EN 61131-2		3...11.9 Hz amplitude 3.5 mm & 11.9 -150 Hz acceleration 2 g	
Protection class according to VDE 0106 1			Class I	
Dielectric strength 50 Hz for 1 min	Input/output	V rms	4000 ~	
	Input/ground	V rms	3500 ~	
	Output/ground	V rms	500 ~	
Input fuse incorporated			No	
Emissions according to EN 61000-6-3	Radiation		EN 55022 Class B and GL levels	
	Conducted on the power line		EN 55022 Class B and GL levels	
	Harmonic currents		IEC/EN 61000-3-2	
Immunity according to IEC/EN 61000-6-2	Electrostatic discharge		IEC/EN 61000-4-2 (8 kV contact/15 kV air)	
	Radiated electromagnetic fields		IEC/EN 61000-4-3 level 3 (10 V/m)	
	Induced electromagnetic fields		IEC/EN 61000-4-6 level 3 (30 V/m)	
	Magnetic field		EN 61000-4-8 (30 A/m)	
	Rapid transients		IEC 61000-4-4 (4 kV)	
	Surges, IEC/EN 61000-4-5		Input: 4 kV in common mode, 2 kV in differential mode Output: 2 kV in common mode, 1 kV in differential mode	
	Primary outages		IEC 61000-4-11 (voltage dips and interruptions)	

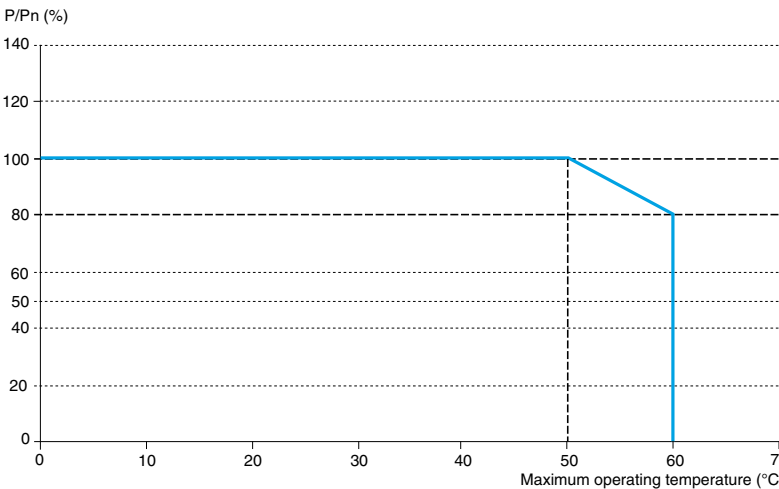
Output characteristics

Derating

The ambient temperature is a determining factor that limits the power an electronic power supply can deliver continuously. If the temperature around the electronic components is too high, their life will be significantly reduced.

The nominal ambient temperature for the Universal range of Phaseo power supplies is 50°C. Above this temperature, derating is necessary up to a maximum temperature of 60°C.

The graph below shows the power (in relation to the nominal power) that the power supply can deliver continuously, depending on the ambient temperature.



ABL 8RPM, ABL 8RPS, ABL 8WPS mounted vertically

- Derating should be considered in extreme operating conditions:
- ☐ Intensive operation (output current permanently close to the nominal current, combined with a high ambient temperature)
 - ☐ Output voltage set above 24V (to compensate for line voltage drops, for example)
 - ☐ Parallel connection to increase the total power

General rules to be complied with

Intensive operation	See derating on above graph. Example for ABL 8RPS: - Without derating, from 0°C to 50°C - Derating of nominal current by 2%, per additional °C, up to 60°C
Rise in output voltage	The nominal power is fixed. Increasing the output voltage means that the current delivered must be reduced.
Mounting	To allow heat dissipation, the power supplies must not be in contact with each other.

- In all cases, there must be adequate convection around the products to assist cooling. There must be sufficient clearance around the Universal range of Phaseo power supplies:
- ☐ 50 mm above and below
 - ☐ 10 mm on the sides

Output characteristics (continued)

Behavior in the event of overloads

Behavior in the event of overloads:

■ **Automatic reset protection mode (current limiting):** If the output current exceeds approximately $1.2 I_n$, the output current is limited to this value. The value of the output voltage can then be less than 21 V but the diagnostic relay opens, allowing the anomaly to be fed back to the automation system and thus prevent feedback of any undefined logic state. On elimination of the overload, the output voltage reverts to its preset value.

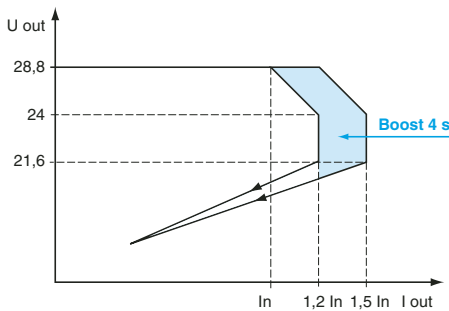
■ **Manual reset protection mode (undervoltage detection):** If the output current exceeds approximately $1.2 I_n$, the power supply stops completely before the output voltage drops below 21 V and no longer delivers any current. The fault is memorized as long as voltage is present at the power supply primary. The power supply will become operational again, if the fault has disappeared, after de-energizing the primary for a few seconds.

Nota : In both these modes, any overload of less than $1.5 I_n$ and lasting less than 4 s will be absorbed by the "boost" circuit and the voltage delivered will stay within the specified limits (adjustment voltage $\pm 3\%$).

Load limit

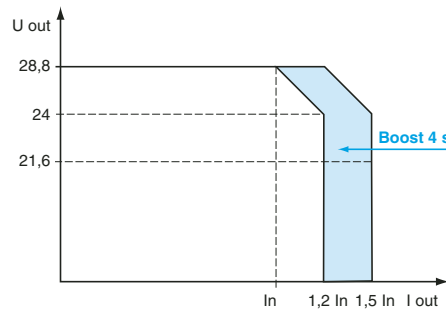
Manual reset protection mode

ABL 8RPM24200/ABL 8RPS24●●●/ABL 8WPS24●●●

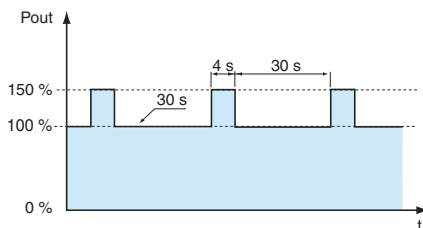


Automatic reset protection mode

ABL 8RPM24200/ABL 8RPS24●●●/ABL 8WPS24●●●



"Boost" repeat accuracy



The **ABL 8RPS/RPM/WPS** Universal range of Phaseo power supplies has a power reserve, allowing them to supply the application with energy up to 1.5 times the nominal current at the intervals illustrated by the graph opposite.

The "boost" amplitude and repeat accuracy depend on:

- ☐ The overload duration
- ☐ The overload intensity
- ☐ The period between each consumption peak

When the power supply can no longer cope (repeated overloads, overload duration > 4 seconds, power rating > 150% of nominal power) the integrated protection trips.

This type of operation is described in detail in the user manual, which can be downloaded from our website, www.telemecanique.com.

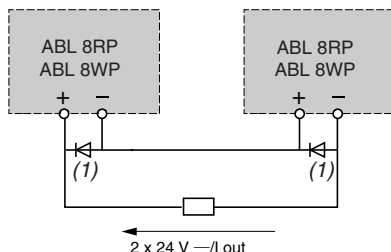
Behavior in the event of phase failure on three-phase power supplies

The **ABL 8WPS24●00** Universal range of Phaseo power supplies is capable of starting and delivering a nominal current and voltage for a few minutes in the event of failure of one phase. Their protection (thermal) then trips and they are reset automatically.

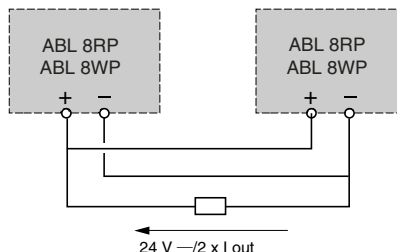
Output characteristics (continued)

Series or parallel connection

Series connection



Parallel connection



Family	Series	Parallel
ABL 8RPS/8RPM/8WPS	2 products max. (1)	2 products max.

Nota : Series or parallel connection is only recommended for products with identical references.

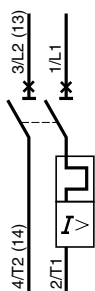
For better availability, the power supplies can also be connected in parallel using the **ABL8 RED24400** Redundancy module.

Selection of protection on the power supply primaries

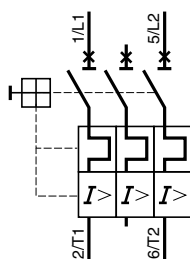
Type of line supply	115 V ~ phase-to-neutral			230 V ~ phase-to-phase			400 V ~ phase-to-phase	
Type of protection	Thermal-magnetic circuit-breaker		gG/gL fuse	Thermal-magnetic circuit-breaker		gG/gL fuse	Thermal-magnetic circuit-breaker	gG/gL fuse
	Telemecanique GB2 (IEC) (2)	Merlin Gerin C60N (IEC) C60N (UL)		Telemecanique GB2 (IEC) (2)	Merlin Gerin C60N (IEC) C60N (UL)		Telemecanique GV2 (IEC/UL)	
ABL 8RPS24030	GB2 CD07	MG24443	2 A (8 x 32)	GB2 CD07	MG24443	2 A (8 x 32)	GV2 RT06 GV2 ME06 (3)	2 A (14 x 51)
ABL 8RPS24050	GB2 CD08	MG24444	4 A (8 x 32)	GB2 CD07	MG24443	2 A (8 x 32)	GV2 RT06 GV2 ME06 (3)	2 A (14 x 51)
ABL 8RPS24100	GB2 CD12	MG24447	6 A (8 x 32)	GB2 CD08	MG24444	4 A (8 x 32)	GV2 RT07 GV2 ME07 (3)	4 A (14 x 51)
ABL 8RPM24200	GB2 CD16	MG24449	10 A (8 x 32)	GB2 CD12	MG24447	6 A (8 x 32)	—	—
ABL 8WPS24200	—	—	—	—	—	—	GV2 ME06 (4)	2 A (14 x 51)
ABL 8WPS24400	—	—	—	—	—	—	GV2 ME07 (4)	4 A (14 x 51)

Schemes

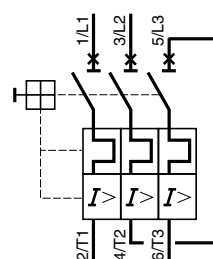
GB2 CD●●



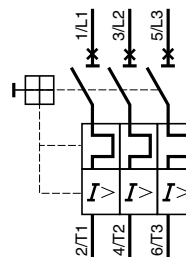
GV2 RT0●



GV2 ME0●



(3) Connection in single-phase (L-N) or phase-to-phase (L1-L2)



(4) Connection in 3 phase (L1-L2-L3)

(1) Two Schottky diodes I_{min} = power supply I_n and V_{min} = 50 V

(2) UL certification pending



ABL 8RPS24050



ABL 8RPM24200



ABL 8WPS24200



ABL 8BUF24400



ABL 8BBU24200



ABL 8RED24400

Regulated switch mode power supplies: Phaseo Universal range

Input voltage	Secondary Output voltage	Nominal power	Nominal current	Reset	Conforming to standard CEI/EN 61000-3-2	Reference	Weight kg
Single-phase (N-L1) or phase-to-phase (L1-L2) connection							
100...120 V -	24...28.8 V	72 W	3 A	Auto/man	Yes	ABL 8RPS24030	0.300
200...500 V ~	---	120 W	5 A	Auto/man	Yes	ABL 8RPS24050	0.700
- 15%, + 10%	---	240 W	10 A	Auto/man	Yes	ABL 8RPS24100	1.000
50/60 Hz							
100...120 V/	24...28.8 V	480 W	20 A	Auto/man	Yes	ABL 8RPM24200	1.600
200...240 V ~	---						
- 15%, + 10%							
50/60 Hz							
3-phase connection (L1-L2-L3)							
380...500 V ~	24...28.8 V	480 W	20 A	Auto/man	Yes	ABL 8WPS24200	1.600
± 10 %	---	960 W	40 A	Auto/man	Yes	ABL 8WPS24400	2.700
50/60 Hz							

Function modules for continuity of service (1)

Function	Use	Designation	Reference	Weight kg
Continuity after a power outage	Holding time 100 ms at 40 A and 2 s at 1 A	Buffer module	ABL 8BUF24400	1.200
	Holding time 9 min at 40 A...2 hrs at 1 A (depending on use with a battery control module-battery unit and load) (2)	Battery control module 20 A output current	ABL 8BBU24200 ▲	0.500
		Battery control module 40 A output current	ABL 8BBU24200 ▲	0.700
		3.2 Ah battery module (3)	ABL 8BPK24A03 ▲	3.500
		7 Ah battery module (3)	ABL 8BPK24A03 ▲	6.500
		12 Ah battery module (3)	ABL 8BPK24A12 ▲	12.000
Continuity after a malfunction	Paralleling and redundancy of the power supply to ensure uninterrupted operation of the application excluding AC line failures and application overloads	Redundancy module	ABL 8RED24400	0.700
Discriminating downstream protection	Electronic protection (1...10 A overload or short-circuit) with 4 output terminals from a Universal range Phaseo power supply	Protection module with 2-pole breaking (4)	ABL 8PRP24100 ▲	0.470

--- / --- converters (1)

Primary (5)	Universal range power supply module output current	Secondary Output voltage	Nominal current	Reference	Weight kg
24 V ---	2.2 A	5...6.5 V ---	6 A	ABL 8DCC05060	0.300
- 9%, + 24%	1.7 A	7...15 V ---	2 A	ABL 8DCC12020	0.300

Separate and replacement parts

Designation	Used	Composition	Unit reference	Weight kg
Fuse assemblies	ABL 8PRP24100 discriminating Protection module	4 x 3 A, 4 x 7.5 A and 4 x 15 A	ABL 8FUS01	0,018
	ABL 8BKP24A●● Battery	4 x 20 A and 6 x 30 A	ABL 8FUS02	0,015
Clip-on marker labels	All products except ABL 8PRP24100	Order in multiples of 100	LAD 90	0.030
	ABL 8PRP24100 discriminating Protection module	Order in multiples of 22	ASI20 MACC5	0,015
DIN rail mounting kit	ABL 8BPK2403 Battery Module	—	ABL 1A02	—
EEPROM memory	Backup and duplication of ABL8 BBU 24●00 parameters	—	SR2 MEM02	0.010

(1) For use with Universal range of Phaseo power supplies.

(2) For table of compatibility of battery control module-battery unit with holding time depending on the load, see page 39.

(3) Supplied with 20 or 30 A fuse depending on the model.

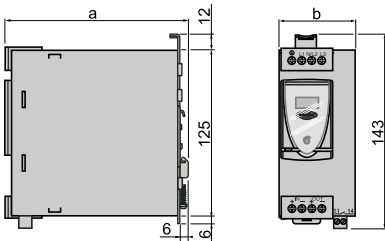
(4) Local reset via pushbutton or automatic reset on elimination of the fault and diagnostic relay. Supplied with four 15 A fuses.

(5) Voltage from a 24 V --- Universal range Phaseo power supply.

▲ Available 1st quarter 2008

Dimensions

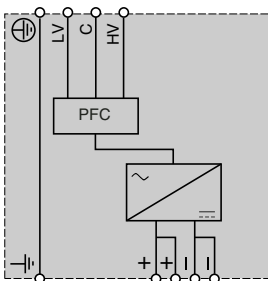
ABL 8RPS24●●●/ABL 8RPM24200/ABL 8WPS24●●●
Common side view



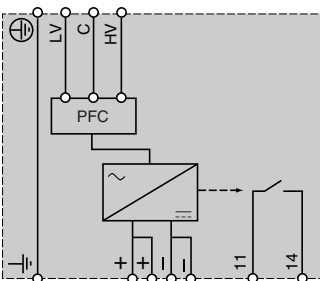
ABL 8	a	b
RPS24030	120	44
RPS24050	120	56
RPS24100	140	85
RPM24200	140	145
WPS24200	155	95
WPS24400	155	165

Internal schemes

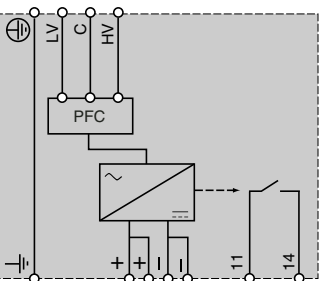
ABL 8RPS24030



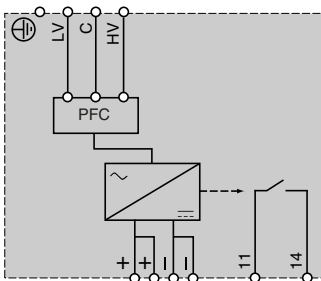
ABL 8RPS24050



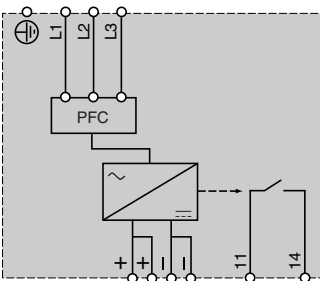
ABL 8RPS24100



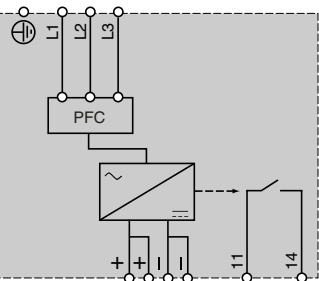
ABL 8RPM24200



ABL 8WPS24200

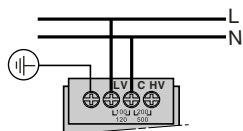


ABL 8WPS24400

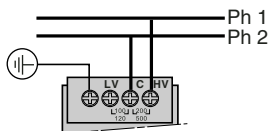


Line supply connection schemes

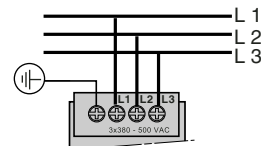
Single-phase (L-N) 100 to 120 V



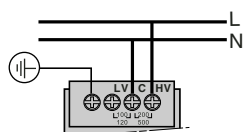
Phase-to-phase (L1-L2) 200 to 500 V



3-phase (L1-L2-L3) 3 x 380 to 500 V



Single-phase (L-N) 200 to 500 V



Supplying 5 V --- and 12 V --- auxiliary voltages

The Phaseo range offers modules that convert the 24 V --- voltage to a 5 to 15 V --- voltage.

These modules can be used to make savings in the:

- ☐ Upstream protection normally used with the 5 to 15 V --- power supply
- ☐ Connection to the line supply

There are two references available for this solution:

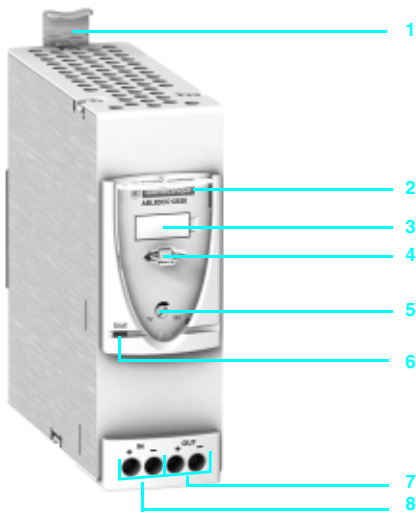
- **ABL 8DCC05060** : 5...6.5 V --- , 6 A converter module
- **ABL 8DCC12020** : 7...15 V --- , 2 A converter module


Description

5 V --- and 12 V --- Converter modules

The front panel of the **ABL 8DCC●●0●0** $\text{---}/\text{---}$ Converter modules comprises:

- 1 Spring clip for 35 mm --- rail
- 2 Protective glass flap
- 3 Clip-on marker label
- 4 Locking catch for the glass flap (sealable)
- 5 Output voltage adjustment potentiometer
- 6 Output current status LED (green)
- 7 4 mm² enclosed screw terminals for connection of the 24 V --- input voltage
- 8 4 mm² enclosed screw terminals for connection of the 5 V --- or 12 V --- output voltage



Technical characteristics					
Type of module			Converter		
			ABL 8DCC05060		ABL 8DCC12020
Certifications			CB scheme IEC/EN 60950-1, UL (pending), cCSAus		
Conformity to standards	Safety		IEC/EN 60950-1, IEC 61204		
	EMC		EN 50081-1, CEI/EN 61000-6-2, EN 61000-6-3		
Input circuit					
Input values	Nominal voltage	V	24...28.8 ---		
	Limit voltage	V	22...30 ---		
	Protection against reverse polarity		Yes		
	Efficiency at nominal load		> 80%		> 82%
	Dissipated power at nominal load	W	7	4	
Output circuit					
Diagnostics	LEDs on front panel		Voltage > 4 V --- (green)		Voltage > 6 V --- (green)
Nominal output values	Output voltage (U _{Out})	V	5 ---	12 ---	
	Current	A	Adjustable from 5...6.5 ---	Adjustable from 7...15 ---	
	Power	W	6	2	
Precision	Line and load regulation		30		
	Residual ripple - noise	mV	< 100		
Protection	Against short-circuits		Permanent, automatic restart		
	Against overloads		Permanent, automatic restart		
	Against overvoltages	V	Permanent, automatic restart U _{Out} > 7.8	Permanent, automatic restart U _{Out} > 18	
	Thermal		—		
Operating and environmental characteristics					
Connections	Input	mm ²	2 x 0.5...4 (24...10 AWG)		
	Output	mm ²	2 x 0.5...4 (24...10 AWG)		
Mounting	On  rail		35 x 7.5 mm and 35 x 15 mm		
Operating position	Vertical plane		Mounted vertically Mounted horizontally with derating of maximum power by 40% from 50°C		Vertical or horizontal position
Degree of protection	Conforming to IEC/EN 60529		IP 20		
Environment	Temperature	Operation	°C	- 25...+ 60	
		Storage	°C	- 40...+ 85	
	Relative humidity	Operation		90%	
		Storage		95%	
	Vibrations acc. to CEI/EN 61131-2			3...11.9 Hz amplitude 3.5 mm; 11.9... 150 Hz acceleration 2 g	
Protection class			Class III		
Dielectric strength 50 Hz for 1 min	Input/output	V rms	500 ~		
	Input/ground	V rms	500 ~		
	Output/ground	V rms	500 ~		
Emissions according to EN 61000-6-3	Conducted/radiated		EN 55022 - Class B		
Immunity according to IEC/EN 61000-6-2	Electrostatic discharge		IEC/EN 61000-4-2 (6 kV contact/8 kV air)		
	Radiated electromagnetic fields		IEC/EN 61000-4-3 level 3 (10 V/m)		
	Induced electromagnetic fields		IEC/EN 61000-4-6 level 3 (10 V/m)		
	Rapid transients		IEC 61000-4-4 level 3 (2 kV)		
	Surges		IEC/EN 61000-4-5 level 2 (1 kV)		



ABL 8DCC050060/12020

References

---/--- converters (for use with Universal range of Phaseo power supplies)

Primary (1)		Secondary		Reference	Weight
Input voltage	Universal range power supply module output current	Output voltage	Nominal current		kg
24 V ---	2.2 A	5...6.5 V ---	6 A	ABL 8DCC05060	0.300
- 9%,+ 24%	1.7 A	7...15 V ---	2 A	ABL 8DCC12020	0.300

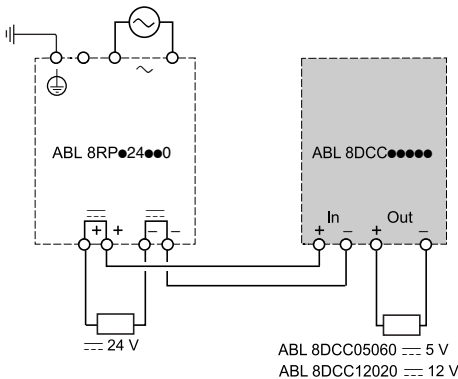
Replacement part

Designation	Composition	Unit reference	Weight kg
Clip-on marker labels	Order in multiples of 100	LAD 90	0.030

(1) Voltage from a 24 V --- Phaseo Universal range power supply

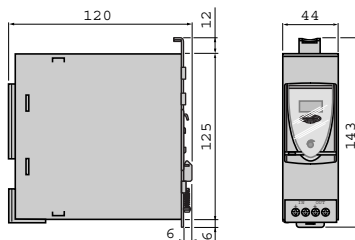
Scheme of use with a Universal range power supply

With ABL 8DCC●●0●0 Converter module



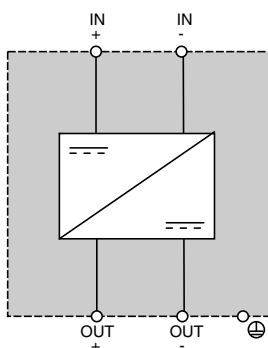
Dimensions

ABL 8DCC05060 and ABL 8DCC12020 Converter modules



Internal scheme

ABL 8DCC05060 and ABL 8DCC12020 Converter modules



Presentation

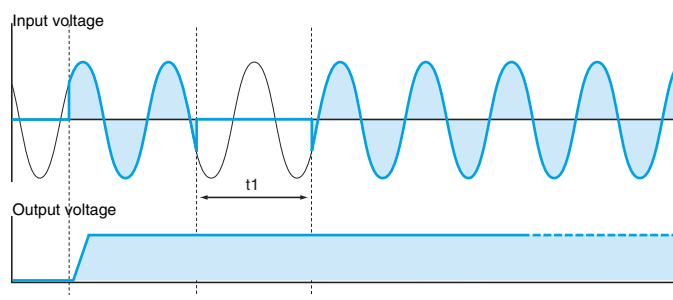
The **ABL 8** Function module offer complements the **ABL 8RPS/RPM/WPS** electronic switch mode power supply offer, thus forming a set of solutions to meet the needs for continuity of service in the most demanding applications.

These modules, connected to the electronic switch mode power supply outputs, offer solutions such as:

- Immunity to microbreaks (see pages 38 to 45)
- Voltage holding in the event of power outages (see pages 38 to 45)
- Voltage holding in the event of power supply equipment failure (see pages 46 to 49)
- Discrimination in the application's protection against overloads and short-circuits (see pages 50 to 53)

Continuity of service: Immunity to microbreaks

ABL 8RPS/RPM/WPS power supplies can deliver their nominal power in the event of a microbreak of less than 20 ms. When outages exceed this value, the **ABL 8BUF24400** Buffer Function module, combined with an **ABL 8 RPS/RPM/WPS** Universal power supply, is used. In the event of short interruptions, the Buffer module takes over and continues to provide the 24 V \pm voltage. The table below indicates the maximum time for immunity to microbreaks t_1 .



Power supply		Typical time for immunity to microbreaks with Buffer module (40 A) at Un t1	
		100% load at the Buffer module output	2 A at the Buffer module output
ABL 8RPS24030	Single-phase or 2-phase 3 A, 72 W	0.912 s	0.984 s
ABL 8RPS24050	Single-phase or 2-phase 5 A, 120 W	0.472 s	1.33 s
ABL 8RPS24100	Single-phase or 2-phase 10 A, 240 W	0.220 s	1.34 s
ABL 8RPM24200	Single-phase or 2-phase 20 A, 480 W	0.206 s	1.82 s
ABL 8WPS24200	3-phase 20 A, 480 W	0.056 s (1)	1.18 s
ABL 8WPS24400	3-phase 40 A, 960 W	0.092 s (1)	1.29 s

Nota : In order to maximize the immunity time, it is advisable to connect only those circuits requiring protection against microbreaks (controller or PLC power supply) at the Buffer module output.

(1) Values liable to increase significantly. Please consult our website www.telemecanique.com

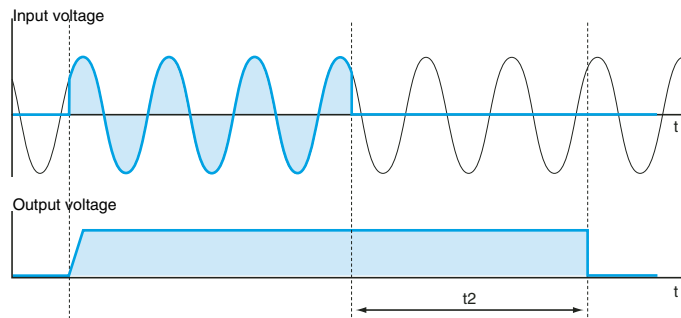
Continuity of service: Voltage holding in the event of a power outage (continued)

For applications that are sensitive to unintended stopping, the **ABL 8** range of Function modules offers a solution comprising:

- Electronic switch mode power supply and Buffer module for holding times t_2 up to two seconds
- Electronic switch mode power supply, Battery control module and Battery module for holding times t_2 of between two seconds and a few hours

These solutions are used to supply voltage after loss of the line supply, thus enabling saving of current values or fallback of some actuators supplied with 24 V $\overline{\text{---}}$.

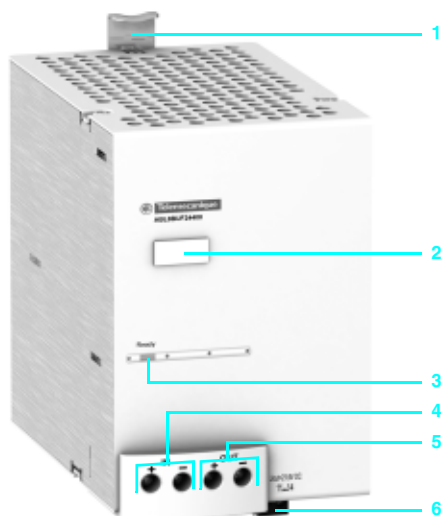
The table below indicates the possible holding times according to the equipment combinations and the current required.



Holding current	Holding time t2																											
	Seconds									Minutes															Hours			
	0.1	0.2	0.5	1	2	5	10	30	1	2	3	4	5	6	7	8	9	10	15	20	30	40	50	1	2	3	5	
1 A	1	1	1	1	1	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+5	2+5	
2 A	1	1	1	1	1	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+5	2+6	2+6	
3 A	1	1	1	1	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+5	2+5	2+5	2+6	2+6	2+6 +6
4 A	1	1	1	1	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+5	2+5	2+5	2+5	2+6	2+6 +6	2+6 +6
5 A	1	1	1	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+5	2+5	2+5	2+6	2+6 +6	2+6 +6		
6 A	1	1	1	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+5	2+5	2+5	2+6	2+6	2+6	2+6 +6	2+6 +6	
7 A	1	1	1	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+5	2+5	2+5	2+5	2+5	2+5	2+6	2+6	2+6	2+6	2+6 +6		
8 A	1	1	1	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+5	2+5	2+5	2+5	2+5	2+5	2+5	2+6	2+6	2+6	2+6 +6	2+6 +6			
10 A	1	1	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+5	2+5	2+5	2+5	2+5	2+5	2+5	2+6	2+6	2+6 +6	2+6 +6	2+6 +6				
15 A	1	1	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+4	2+5	2+5	2+5	2+5	2+5	2+6	2+6	2+6	2+6	2+6 +6	2+6 +6	2+6 +6					
20 A	1	1	2+5	2+5	2+5	2+5	2+5	2+5	2+5	2+5	2+5	2+5	2+6	2+6	2+6	2+6	2+6	2+6	2+6 +6	2+6 +6	2+6 +6							
25 A	1	3+5	3+5	3+5	3+5	3+5	3+5	3+5	3+5	3+5	3+5	3+6	3+6	3+6	3+6	3+6	3+6 +6	3+6 +6	3+6 +6	3+6 +6								
30 A	1	3+5	3+5	3+5	3+5	3+5	3+5	3+5	3+5	3+5	3+6	3+6	3+6 +6	3+6 +6	3+6 +6	3+6 +6	3+6 +6	3+6 +6	3+6 +6	3+6 +6								
35 A	1	3+5	3+5	3+5	3+5	3+5	3+5	3+5	3+5	3+6	3+6	3+6	3+6 +6	3+6 +6	3+6 +6	3+6 +6	3+6 +6	3+6 +6	3+6 +6									
40 A	1	3+6	3+6	3+6	3+6	3+6	3+6	3+6	3+6	3+6	3+6	3+6 +6	3+6 +6	3+6 +6	3+6 +6	3+6 +6	3+6 +6											

Function modules	Reference	Code
40 A Buffer module	ABL 8BUF24400	1
20 A Battery control module	ABL 8BBU24200	2
40 A Battery control module	ABL 8BBU24400	3
3.2 Ah Battery module	ABL 8BPK24A03	4
7 Ah Battery module	ABL 8BPK24A07	5
12 Ah Battery module	ABL 8BPK24A12	6

Nota : Several Buffer modules (up to a maximum of three) can be connected in parallel to increase the immunity time. The times given in the table above (boxes marked 1) should be multiplied by the number of modules used (2 or 3).

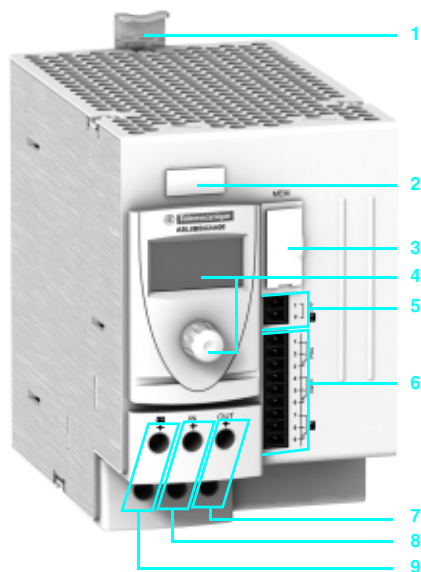


Description

40 A Buffer module

The front panel of the **ABL 8BUF24400** Buffer Function module comprises:

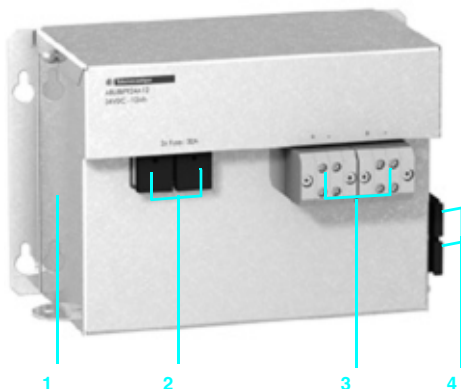
- 1 Spring clip for 35 mm rail
- 2 Clip-on marker label
- 3 LED indicator (green): module ready (maximum load)
- 4 10 mm² enclosed screw terminals for connection of the 24 V --- input voltage
- 5 10 mm² enclosed screw terminals for connection of the 24 V --- output voltage
- 6 Removable screw terminal block for connection of the diagnostic contact: module ready (maximum load)



20 A and 40 A Battery control modules

The front panel of the **ABL 8BBU2400** Battery control Function modules comprises:

- 1 Spring clip for 35 mm rail
- 2 Clip-on marker label
- 3 Memory card slot for backup and duplication of the configuration parameters
- 4 Display and configuration parameter browse/selection button
- 5 Removable screw connector for connection of the battery voltage inhibit input (terminal block supplied)
- ⚠ This contact must always be volt-free.
- 6 Removable screw connector for connection of the diagnostic contacts: power supply presence, battery alarm and presence (terminal block supplied)
- 7 10 mm² enclosed screw terminals for connection of the 24 V --- output voltage
- 8 10 mm² enclosed screw terminals for connection of the power supply 24 V --- input voltage
- 9 10 mm² enclosed screw terminals for connection of the battery voltage 24 V --- input voltage



3.2 Ah, 7 Ah, and 12 Ah Battery modules

The front panel of the **ABL 8BPK24A** Battery Function modules comprises:

- 1 A metal box that can be fixed on a vertical or horizontal panel
- 2 Fuse carrier (one or two depending on the model), which, in addition to protecting the output, can be used to disable the battery module (fuse supplied but not fitted)
- 3 10 mm² enclosed screw terminals for connection of the Battery module 24 V --- output voltage (depending on the model, allows two Battery modules to be connected in parallel)
- 4 Fuse storage attachment



Green: Nominal status/information



Orange: Warning



Red: Fault

Examples of Battery control module diagnostic screens

Functions

ABL 8BBU24●00 Battery control modules

The main module functions are:

- Charging and checking the associated battery
- Automatic switching between the power supply and the battery in the event of a power outage
- Diagnostics

The Battery control modules offer a three-color LCD screen and a navigation button that can be used to:

- Display the status and diagnostic data
- Access the service and maintenance functions
- Set the module parameters

These modules also have a diagnostic relay (C/O contacts) relating to:

- The power supply status
- The Battery module status
- The alarm

The following functions are available:

- Inhibition or activation (local or remote) of the battery to ensure the safety of maintenance operations on the application
- Battery test
- Backup and download of a configuration via a memory card enabling storage and duplication of the configuration parameters so as to eliminate repetitive operations when setting up the Battery control modules

The module parameters can be set in order to define:

- The user language
- The rating of the battery connected to the Battery control module
- The operating temperature for the battery in order to optimize its life
- The length and cross-section of the connection to compensate for voltage losses due to the length of the line
- The duration of the battery-powered supply
- The threshold voltage provided by the power supply below which the battery takes over

Whichever solution is used, the output terminals for the power supplies, Buffer modules and Battery control modules have been designed to make it easier to isolate a backed-up circuit and a non-backed-up circuit to ensure discrimination in continuity of service after a power outage.

ABL 8BPK24A●● Battery modules

Each Battery module consists of:

- Lead-sealed batteries (two in series)
- Its automotive type fuse protection





Only these modules are compatible with the **ABL 8BBU** Battery control modules.




In the event of the Battery control module-Battery module combination not being used for long periods (approximately 1 week minimum) the following is recommended:

- Fully charge the Battery module for at least 72 hours, then
- Remove the fuse(s) from the Battery module(s) and store them in the allocated slots [2](#)

Technical characteristics

Type of Function module			Buffer module ABL 8BUF24400	Battery control module ABL 8BBU24200		ABL 8BBU24400
Certifications			CB scheme IEC/EN 60950-1, UL, cCSAus			
Conformity to standards	Safety		IEC/EN 60950-1, IEC/EN 61204-3			
	EMC		IEC/EN 61000-6-2, EN 61000-6-3			
Input circuit						
Input values	Nominal voltage		V	24...28.8 ---		
	Limit voltage		V	22...30 ---		
	No-load/On-load/Max. consumption		A	0.1/0.6/40.6	0.1/1.7/21.7	0.1/1.7/41.7
	Activation threshold		V	U _{In} - 1 and 22 --- min.		
	Protection against reverse polarity		Yes			
Dissipated power at nominal load			W	< 15	< 7	< 12
Output circuit						
Nominal output values	Voltage (U _{Out})		V	Nominal mode: U _{In} -0.25 Buffer mode: U _{In} -1	Nominal mode: U _{In} -0.25 Battery mode: U _{battery} -0.5	
	Max. current		A	40	20	40
Precision	Residual ripple - noise		mV	< 200		
Holding time	I = 0.5 A		6 s		See page 39	
	I = 40 A		0.1 s		See page 39	
Protection	Against short-circuits	Power-supplied mode	Permanent, automatic restart		Power supply protection	
		Battery-backed mode	–		Permanent, automatic restart	
	Against overloads		> 45 A		1.5 I _n	
	Against overvoltages		V	–		–
	Against undervoltages		V	Tripping if U _{Out} < 19		–
	Thermal		–			
Operating and environmental characteristics						
Connections	Input		mm ²	2 x 0.5...10 screw terminals (20...8 AWG)		
	Output		mm ²	2 x 0.5...10 screw terminals (20...8 AWG)		
	Diagnostic relay		mm ²	2.5	0.75	
Mounting	On  rail		35 x 7.5 mm and 35 x 15 mm			
Operating position	Vertical plane		Mounted vertically Mounted horizontally (with derating of maximum power by 20% from 50°C)			
Connections	Series		–			
	Parallel		Yes		–	
Degree of protection	Conforming to IEC/EN 60529		IP 10			
Environment	Temperature	Operation	°C	- 25...+ 60		
		Storage	°C	- 40...+ 85		
	Relative humidity	Operation	90%			
		Storage	95%			
	Vibrations acc. to IEC/EN 61131-2			3...11.9 Hz amplitude 3.5 mm; 11.9... 150 Hz acceleration 2 g		
Protection class according to VDE 0106 1			Class II			
Charging time			s	< 25	Depending on the battery used	
Control input				–	Battery inhibit input  /OFF: terminals 1 and 2 linked = battery off  This contact must always be volt-free.	
Diagnostics	Via LED			Green: Buffer ready Off: Load < 95%	–	
	LCD screen			–	Green: nominal status, orange: warning, red: fault	
	Via relay			Open: Load < 95% Closed: Buffer ready	3 C/O relays: for power supply status, battery and alarm status PSU: relay tripped (contact 1-2 closed): 24 V present on In input  : relay tripped (contact 4-5 closed): backup mode, current supplied by the battery Alarm: relay untripped (contact 7-9 closed): battery insufficient battery power in backup mode, battery not functioning or disconnected, output overload	
Relay characteristic				230 V ~ 0.5 A, 24 V --- 5 mA min.		
Dielectric strength 50 Hz for 1 min	Input/ground		V rms	500 ~		
	Output/ground		V rms	500 ~		
Emissions	Conducted/radiated		According to EN 61000-6-3, EN 55022 - Class B			
Immunity according to CEI/EN 61000-6-2	Electrostatic discharge		IEC/EN 61000-4-2 (6 kV contact/8 kV air)			
	Radiated electromagnetic fields		IEC/EN 61000-4-3 level 3 (10 V/m)			
	Induced electromagnetic fields		IEC/EN 61000-4-6 level 3 (10 V/m)			
	Rapid transients		IEC 61000-4-4 level 3 (2 kV)			
	Surges		IEC/EN 61000-4-5 level 2 (1 kV)			

Technical characteristics						
Type of Function module			Battery			
			ABL 8BPK24A03	ABL 8BPK24A07	ABL 8BPK24A12	
Battery type			Lead-sealed battery			
Certifications			Certification pending, please consult our website www.telemecanique.com			
Conformity to standards		Safety	Conformity pending, please consult our website www.telemecanique.com			
Input circuit						
Input values	Nominal voltage		V	24...28.8 ---		
	Limit voltage		V	22...29 ---		
	Load current		A	0.3	0.7	1.2
	Protection against reverse polarity		Yes			
	Charging time		h	72 max.		
Output circuit						
Nominal output values	Voltage (Un)		V	24 ---		
	Max. current		A	32	40	75
	Capacity		Ah	3.2	7	12
Holding time at 20°C	Maximum		h	20 at 0.16 A	20 at 0.35 A	20 at 0.6 A
	Minimum		min	5 at 8.4 A	5 at 18.2 A	5 at 31.3 A
Protection	Against short-circuits and overloads by automotive type fuse protection			1 x 20 A	1 x 30 A	2 x 30 A
	Self-discharge rate	1 month		3%		
		3 months		9%		
		6 months		15%		
Operating and environmental characteristics						
Connections	Input		mm ²	2 x 0.5...10 (20...6 AWG)		4 x 0.5...10 (20...6 AWG)
	Output		mm ²	2 x 0.5...10 (20...6 AWG)		4 x 0.5...10 (20...6 AWG)
Mounting	On  rail			35 x 7.5 mm and 35 x 15 mm (1)	—	
	On vertical panel			With 4 screws Ø 5 mm		
	On horizontal panel			With 2 screws Ø 5 mm		
Operating position				Vertical or horizontal		
Connections	Series			—		
	Parallel			Yes		
Degree of protection			Conforming to IEC/EN 60529		IP 10	
Environment	Temperature	Operation	°C	0...+ 40		
		Storage	°C	- 20...+ 50		
Vibration acc. to IEC/EN 61131-2				3...11.9 Hz amplitude 3.5 mm and 11.9 -150 Hz acceleration 2 g		
Protection class according to VDE 0106 1				Class III		
Service life (approximate)	20°C	h	44,000			
	25°C	h	31,000			
	30°C	h	22,000			
	35°C	h	15,000			
	40°C	h	11,000			
	45°C	h	7,300			
	50°C	h	5,000			

(1) With mounting kit on ABL 1A02 rail

Power supplies and transformers

Regulated switch mode power supplies

Phaseo Universal range: Function modules

Solutions to microbreaks and power outages



ABL 8BUF24400



ABL 8BBU24200

References

Function modules

Function	Use	Designation	Reference	Weight kg
Continuity after a power outage	Holding time 100 ms at 40 A and 2 s at 1 A	Buffer module	ABL 8BUF24400	1.200
	Holding time 9 min at 40 A...2 hrs at 1 A (depending on use with a battery control module-battery unit and load) (1)	Battery control module 20 A output current	ABL 8BBU24200 ▲	0.500
		Battery control module, 40 A output current	ABL 8BBU24400 ▲	0.700
		3.2 Ah battery module (2)	ABL 8BPK24A03 ▲	3.500
		7 Ah battery module (2)	ABL 8BPK24A07 ▲	6.500
		12 Ah battery module (2)	ABL 8BPK24A12 ▲	12.000

Separate and replacement parts

Designation	Description	Composition	Unit reference	Weight kg
Fuse assemblies	For ABL 8BPK24A●● battery	4 x 20 A and 6 x 30 A	ABL 8FUS02	—
Clip-on marker labels	All products except ABL 8PR●24100	Order in multiples of 100	LAD 90	0.030
Kit for mounting on rail	For ABL 8BPK2403 Battery module	Single unit	ABL 1A02	—
EEPROM memory	Backup and duplication of ABL8 BBU parameters	Single unit	SR2 MEM02	0.010

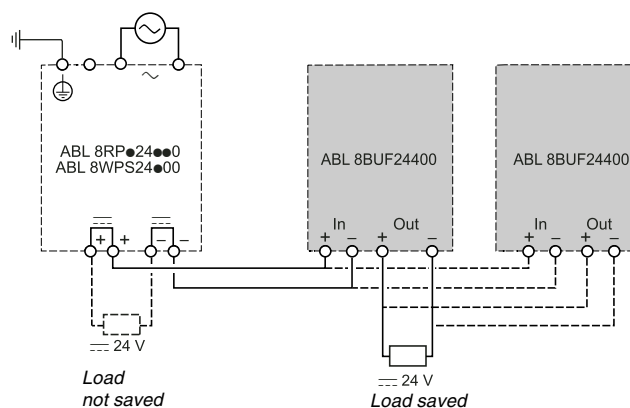
(1) For table of compatibility of battery control module-battery unit with holding time depending on the load, see page 39.

(2) Supplied with 20 or 30 A fuse depending on the model

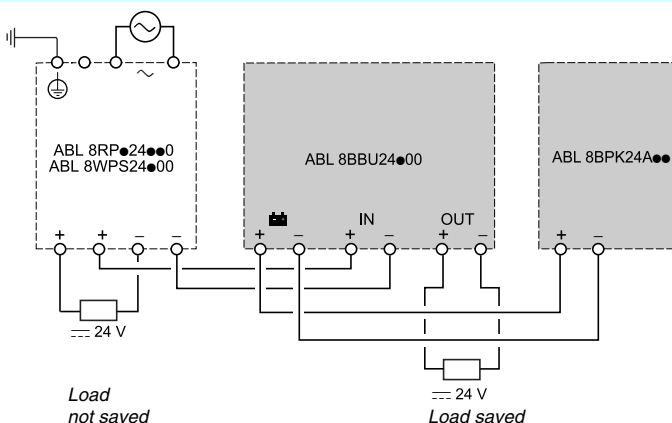
▲ Available 1st quarter 2008

Schemes of use with a Universal range power supply

With ABL 8BUF24400 Buffer module

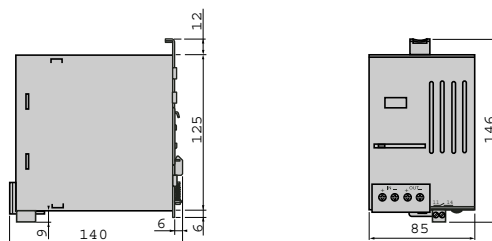


With ABL 8BBU24●00 Battery control module

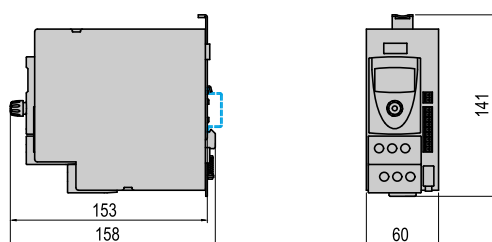


Dimensions

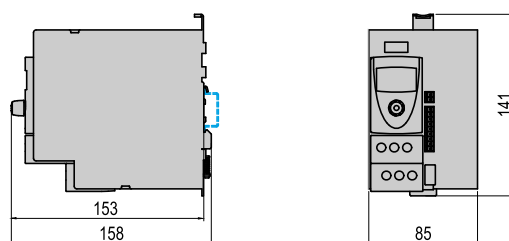
ABL 8BUF24400 Buffer module



ABL 8BBU24200 Battery control module

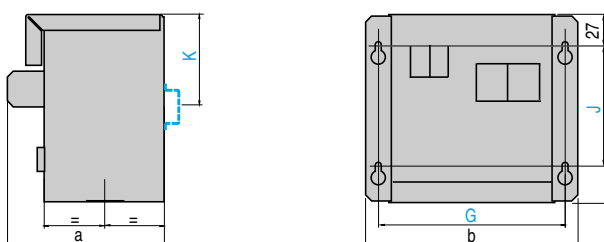


ABL 8BBU24400 Battery control module



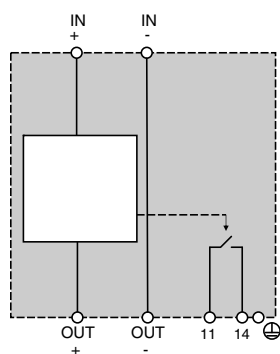
ABL 8BPK24A03/A07/A12 Battery modules

ABL 8BPK	a	b	c	G	J	K
24A03	97	185	140	157	83	78
24A07	133	170	158	152	100	—
24A12	130	237	157	219	100	—

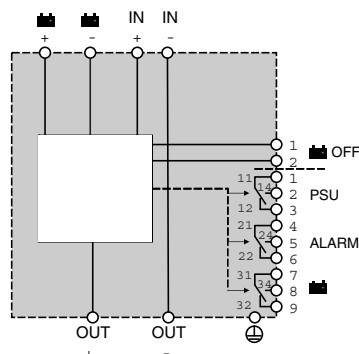


Internal schemes

ABL 8BUF24400 Buffer module



ABL 8BBU24200 and ABL 8BBU24400 Battery control modules



Continuity of service: Failure of power supply equipment

Where continuous operation of the application is the prime concern, it is necessary to ensure that when one power supply malfunctions, a second power supply takes over. The **ABL 8RED24400** Redundancy module can perform this function, ensuring that the failure of one power supply does not disturb the second (for example, in the event of a short-circuit of one of the power supply outputs).

The **ABL 8RED24400** Redundancy module, used with two electronic switch mode power supplies of the same type, can be used to supply the nominal power to the application even if one of the power supplies fails.

The various diagnostics - on the front panel (LED) and remote (relay) - inform the maintenance team as soon as the first fault occurs on one of the power supplies.







When continuity of service is critical for the application, it may be necessary to provide redundancy for the Redundancy module. See schemes page 48

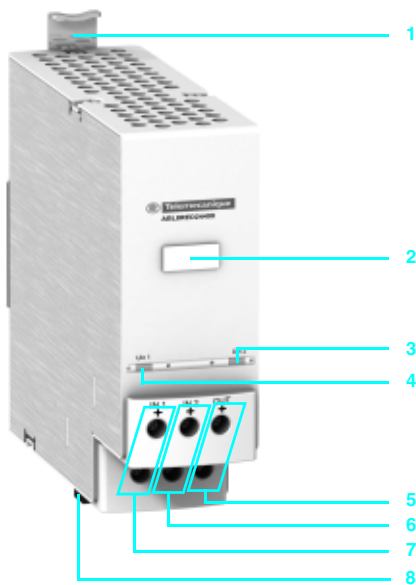
Nota : The Redundancy module can be used to connect two power supplies with a maximum rating of 20 A in parallel. To connect two 40 A **ABL 8WPS24400** power supplies, two **ABL 8RED24400** Redundancy modules must be used.


Description

2 x 20 A Redundancy module

The **ABL 8RED24400** Redundancy Function module comprises:

- 1 Spring clip for 35 mm  rail
- 2 Clip-on marker label
- 3 Input voltage status LED (green) for the first 24 V  power supply
- 4 Input voltage status LED (green) for the second 24 V  power supply
- 5 10 mm² enclosed screw terminals for connection of the 24 V  output voltage
- 6 10 mm² enclosed screw terminals for connection of the input voltage for the second 24 V  power supply ($I \leq 20$ A)
- 7 10 mm² enclosed screw terminals for connection of the input voltage for the first 24 V  power supply ($I \leq 20$ A)
- 8 Removable screw terminal block for connection of the diagnostic contact: power supply connected to a faulty input



Technical characteristics				
Type of Function module			Redundancy	
			ABL 8RED24400	
Certifications			CB scheme IEC/EN 60950-1, UL, cCSAus, C-Tick, C€	
Conformity to standards	Safety		IEC/EN 60950-1, IEC/EN 61204	
	EMC		IEC/EN 61000-6-2, EN 61000-6-3	
Input circuit				
Input values	Nominal voltage (U _{In})	V	24...28.8 ---	
	Limit voltage	V	22...30 ---	
	Input limit current	A	20 per input	
	Protection against reverse polarity		Yes	
Output circuit				
Nominal output values	Output voltage (U _{Out})	V	U _{In} - 0.2	
	Max. current (I _{Out})	A	40	
Number of channels			1	
Protection	Against short-circuits		Provided by the power supplies	
	Against overloads		Provided by the power supplies	
Operating and environmental characteristics				
Connections	Input	mm ²	2 x 0.5...10 (20...8 AWG)	
	Output	mm ²	2 x 0.5...10 (20...8 AWG)	
	Diagnostic relay	mm ²	2.5	
Mounting	On  rail		35 x 7.5 mm and 35 x 15 mm	
Operating position	Vertical plane		Vertical or horizontal position	
Connections	Series		—	
	Parallel		Yes for 2 x 40 A	
Degree of protection	Conforming to IEC/EN 60529		IP 10	
Environment	Temperature	Operation	°C	- 25...+ 60
		Storage	°C	- 40...+ 85
	Relative humidity	Operation		90%
		Storage		95%
	Vibrations acc. to IEC/EN 61131-2		3...11.9 Hz amplitude 3.5 mm; 11.9... 150 Hz acceleration 2 g	
Protection class according to VDE 0106 1		Class II		
Diagnostics	Via LED		1 LED per input Green: power supply operational	
	Via relay		Closed: 2 power supplies operational	
Dielectric strength 50 Hz for 1 min	Input/output	V rms	No isolation	
	Input/ground	V rms	500 ~	
	Output/ground	V rms	500 ~	
Emissions according to EN 61000-6-3			EN 50081-1 (generic)	
	Conducted/radiated		EN 55022 - Class B	
Immunity according to IEC/EN 61000-6-2	Electrostatic discharge		IEC/EN 61000-4-2 (6 kV contact/8 kV air)	
	Radiated electromagnetic fields		IEC/EN 61000-4-3 level 3 (10 V/m)	
	Induced electromagnetic fields		IEC/EN 61000-4-6 level 3 (10 V/m)	
	Rapid transients		IEC 61000-4-4 level 3 (2 kV)	
	Surges		IEC/EN 61000-4-5 level 2 (1 kV)	

Power supplies and transformers

Regulated switch mode power supplies

Phaseo Universal range: Function modules

Redundancy solution

Function module



ABL 8RED24400

Function	Use	Designation	Reference	Weight kg
Continuity after a failure	Paralleling and redundancy of the power supply to ensure uninterrupted operation of the application excluding AC line failures and application overloads	Redundancy module	ABL 8RED24400	0.700

Replacement part

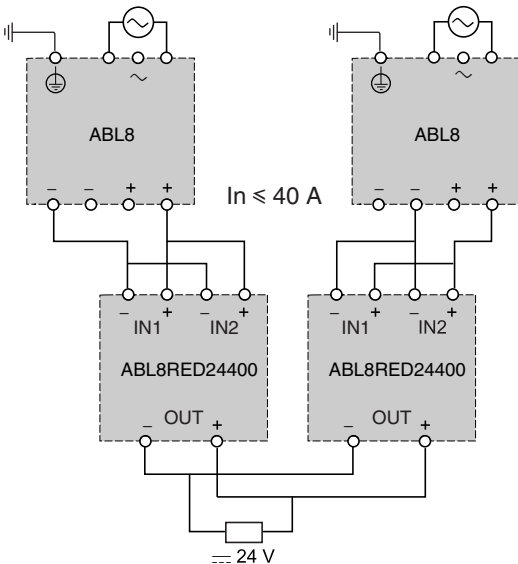
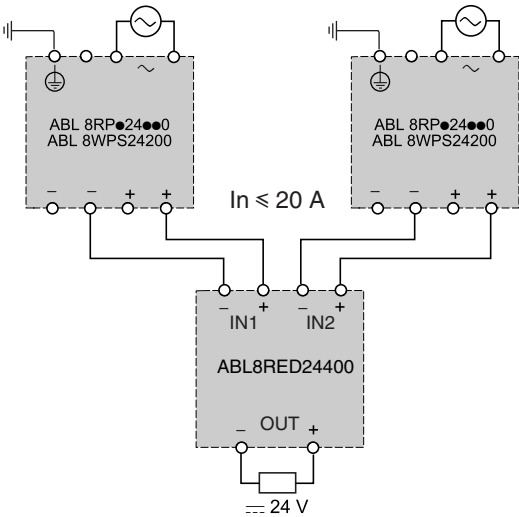
Designation	Composition	Unit reference	Weight kg
Clip-on marker labels	Order in multiples of 100	LAD 90	0.030

Schemes of use with Universal range power supplies

With ABL 8RED24400 Redundancy module

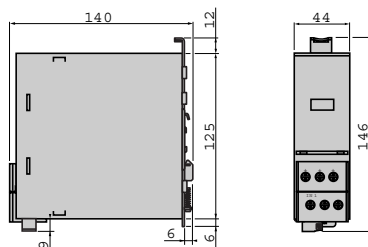
ABL 8RPS24000/ABL 8RPM24200/ABL 8WPS24200

ABL 8WPS24400 or full system redundancy



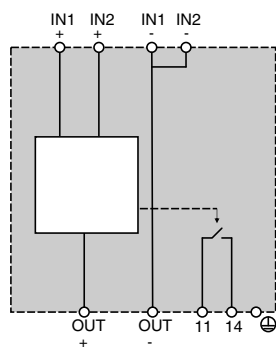
Dimensions

ABL 8RED24400 Redundancy module



Internal scheme

ABL 8RED24400 Redundancy module



Power supplies and transformers

Regulated switch mode power supplies

Phaseo Universal range: Function modules

Solution for discriminating protection of the application

Continuity of service: Discrimination of protection against overloads and short-circuits

There is no point in using thermal-magnetic circuit-breakers or fuses downstream of an electronic switch mode power supply in the majority of cases. When a short-circuit or very quick overload occurs in the application, the electronic protection is faster than the thermal-magnetic circuit-breaker or fuse. In this case, none of the circuits are powered.

To provide discriminating protection in the event of an overload or short-circuit, the Universal Phaseo power supply electronic protection function has been integrated in four-channel modules. These discriminating downstream Protection modules can be daisy-chained to provide protection discrimination on as many application segments as necessary.

The **ABL 8PRP24100** discriminating downstream Protection modules have:

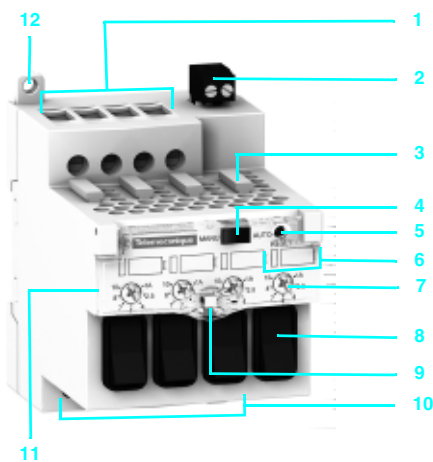
- Overload and short-circuit protection on each of their four channels:
 - Each channel can be calibrated by the user from 1 to 10 A, according to the needs of the application
 - One fuse per channel (15 A supplied by default) assures ultimate protection in the event of a module fault. This fuse can be replaced by a fuse with a lower rating that is appropriate for the conductor c.s.a. used for cabling. see separate part page 52.
- A 2-pole isolator on each of its channels
- An automatic or manual reset mode for the protection
- Memorization of the fault even in the event of failure of the 24 V --- voltage to be protected
- A diagnostic relay indicating that all channels are operational
- One diagnostic LED per channel
- Manual reset on the front panel
- One switch per channel that can be used, like thermal-magnetic circuit-breakers, to open or close the circuits during test, maintenance or installation periods


Description

2-pole downstream electronic Protection modules

The front panel of the **ABL 8PRP24100** 4-channel downstream electronic Protection modules comprises:

- 1 10 mm² enclosed screw terminals for connection of the 24 V --- voltage to be protected
- 2 Enclosed screw terminals for connection of the diagnostic relay contact
- 3 Line protection fuses (one 15 A fuse per channel by default)
- 4 Automatic or manual reset mode selector
- 5 Reset pushbutton
- 6 Diagnostic LEDs (green and red) and clip-on marker tag holder (1 per channel)
- 7 1...10 A output nominal current selector (1 per channel)
- 8 Channel isolator switch (1 per channel)
- 9 Locking catch for the glass flap (sealable).
- 10 4 mm² enclosed screw terminals for connection of the four channels (2-pole)
- 11 Protective glass flap
- 12 Retractable fixing lugs for panel mounting (— rail mounting also possible)



Technical characteristics			
Type of Function module			Discriminating downstream electronic protection ABL 8PRP24100
Certifications			CB scheme IEC/EN 60950-1, UL (pending), cCSAus (pending), C-Tick, C€
Conformity to standards	Safety		IEC/EN 60950-1, CEI/EN 61204-3
	EMC		IEC/EN 61000-6-2, EN 61000-6-3
Input circuit			
Input values	Nominal voltage	V	24...28.8 ---
	Limit voltage	V	19...32 ---
	Input limit current	A	40
Output circuit			
Nominal output values	Voltage (U _{Out})	V	U _{In} - 0.3 V
	Max. current (I _{Out})	A	10 per channel
	Rating	A	1/2.5/4/5/7/8/10 per channel
Number of channels			4
Protection	Against short-circuits		Permanent, automatic or manual restart
	Against overloads		1.3 I _n
Isolation	Type		2-pole switch (+ 24 V and 0 V)
	Breaking capacity (fuse)		1000 A at 32 V ---
Operating and environmental characteristics			
Connections	Input	mm ²	4 x 0.5...10 (20...8 AWG)
	Output	mm ²	8 x 0.5...4 (20...10 AWG)
	Diagnostic relay	mm ²	2.5
Mounting	On  rail		35 x 7.5 mm and 35 x 15 mm
Operating position	Vertical plane		Mounted vertically
Degree of protection	Conforming to IEC/EN 60529		IP 10
Environment	Temperature	Operation	°C - 25...+ 60
		Storage	°C - 40...+ 85
	Relative humidity	Operation	90%
		Storage	95%
	Vibrations, acc. to IEC/EN 61131-2		
Protection class according to VDE 0106 1			Class II
Diagnostics	Via LED		1 LED per channel Green: Channels operating Red: Overload Off: U _{In} < 19 V or switch open
	Via relay		Closed: channels operating and all isolating switches closed Open: if one channel faulty or one or more isolating switches open
Dielectric strength 50 Hz for 1 min	Input/output	V rms	No isolation
	Input/ground	V rms	500 ~
	Output/ground	V rms	500 ~
Emissions according to EN 61000-6-3	Conducted/radiated		EN 50081-1 (generic) EN 55022 - Class B
Immunity according to IEC/EN 61000-6-2	Electrostatic discharge		IEC/EN 61000-4-2 (6 kV contact/8 kV air)
	Radiated electromagnetic fields		IEC/EN 61000-4-3 level 3 (10 V/m)
	Induced electromagnetic fields		IEC/EN 61000-4-6 level 3 (10 V/m)
	Rapid transients		IEC 61000-4-4 level 3 (2 kV)
	Surges		IEC/EN 61000-4-5 level 2 (1 kV)

Power supplies and transformers

Regulated switch mode power supplies

Phaseo Universal range: Function modules

Solution for discriminating protection of the application



ABL 8PRP24100

References

Function module: Discriminating downstream Protection

Function	Use	Designation	Reference	Weight kg
Discriminating downstream Protection	Electronic protection (1...10 A overload or short-circuit) of 4 output terminals from a Phaseo Universal range power supply	Universal Protection module with 2-pole breaking (1)	ABL 8PRP24100 ▲	0.470

Separate part

Designation	Used	Composition	Unit reference	Weight kg
Fuse assemblies	ABL 8PRP24100 discriminating Protection module	4 x 5 A, 4 x 7.5 A and 4 x 10 A	ABL 8FUS01	0,018

Replacement part

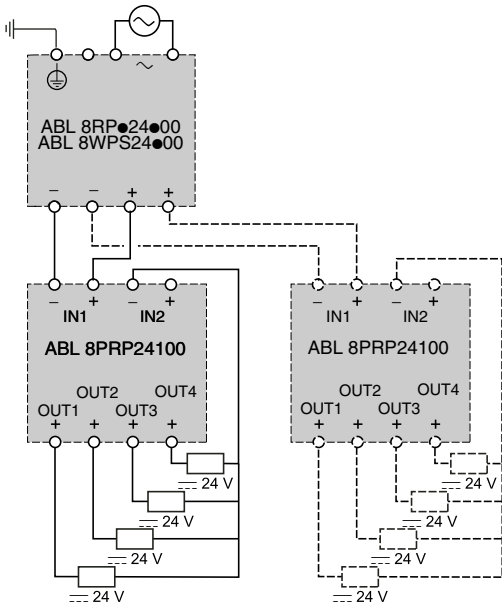
Designation	Used	Order in multiples of	Unit reference	Weight kg
Clip-on marker labels	ABL 8PRP24100 discriminating Protection module	22	ASI20 MACC5	0.015

(1) Local reset via pushbutton or automatic reset on elimination of the fault. Supplied with four 15 A fuses

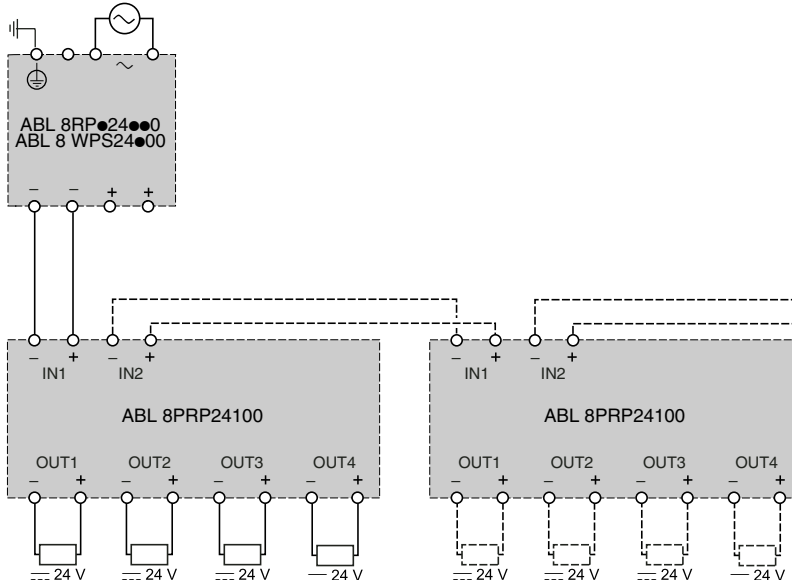
▲ Available 1st quarter 2008

Connections

--- 24 V output terminals with common point



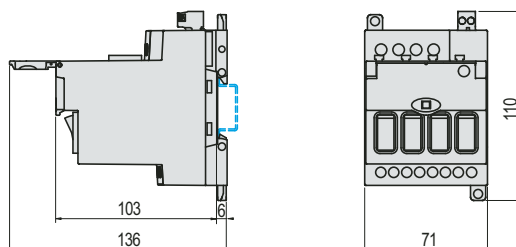
--- 24 V output terminals without common point



⚠ IN1 and IN2 terminals limited to 40 A

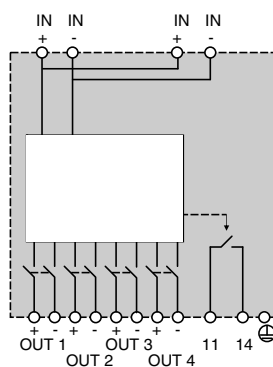
Dimensions

ABL 8PRP24100 discriminating downstream electronic Protection module



Internal schemes

ABL 8PRP24100 downstream electronic Protection module (2-pole breaking)





Presentation

ABL 1REM/RPM Phaseo Dedicated range regulated switch mode power supplies are specially designed to provide the d.c. voltage necessary for electrical equipment operating on a safety extra low voltage (SELV). Split into two ranges, they are able to meet all the needs encountered in standard commercial machines.

These single-phase power supplies, with or without anti-harmonic distortion filter, conform to world-wide standards. Switch mode technology guarantees the quality of the output current with regulation below 3%.

As machine components, **ABL 1REM/RPM** Phaseo Dedicated range power supplies must be easy to install; only setting-up may vary from one application to another. The ABL 1 range has been specially designed for machine manufacturers.

ABL 1REM/RPM regulated switch mode power supplies are totally electronic and regulated. They provide the following benefits:

- A wide input voltage range from 85 to 264 V ~ and 120 to 370 V --- (not indicated on the product).
- Products with anti-harmonic distortion input filter.
- A high degree of output voltage stability, adjustable by potentiometer.
- Built-in thermal overload protection.
- Conformity to world-wide standards.
- Conformity to standard EN 55022 class B.
- UL 508, CSA and TÜV certifications.
- Overload and short-circuit protection.
- Considerably reduced weight.
- Identical mounting accessories for all models.

ABL 1 power supplies for electrical equipment are split into two ranges :

- **ABL 1REM**, single-phase:
 - 60 W for the 12 V --- version,
 - 60 W, 100 W, 150 W and 240 W for the 24 V --- versions.
- **ABL 1RPM**, single-phase with anti-harmonic distortion filter:
 - 100 W for the 12 V --- version,
 - 100 W, 150 W and 240 W for the 24 V --- versions.

Electromagnetic compatibility

Levels of conducted and radiated emissions are defined in standards EN 55011 and EN 55022.

The products in the ABL 1 range are class B, the strictest level, and can be used without any restrictions due to their low emissions..

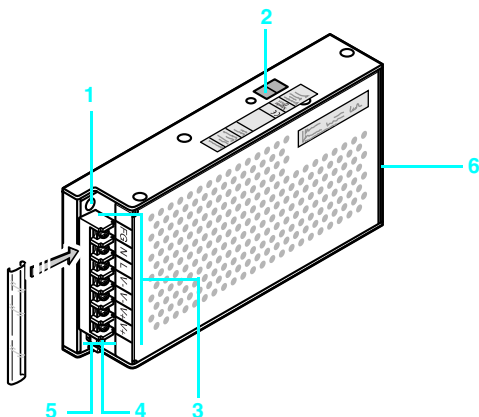
Behaviour in the event of short-circuits

ABL 1 power supplies are equipped with electronic and thermal overload protection. This protection resets itself automatically on elimination of the fault, which avoids having to take any action or change a fuse.

Description

ABL 1REM/RPM regulated switch mode power supplies comprise:

- 1 Two fixing holes for M4 x 20 screws.
- 2 A 115/230 V input voltage selector (on 150 W and 240 W versions only).
- 3 A 4 mm² screw clamp terminal block for connection of the AC input voltage and DC output voltage.
- 4 A green LED indicating presence of the d.c. output voltage.
- 5 An output voltage adjustment potentiometer ($\pm 10\%$).
- 6 A removable, transparent, clip-on cover.



Technical characteristics

Type of power supply			ABL 1REM					ABL 1RPM				
			12050	24025	24042	24062	24100	12083	24042	24062	24100	
Product certifications/markings			UL 508, cCSAus, CSA 22.2 n° 60950-1, UL 60950-1, TÜV, C-Tick, C€									
Conforming to standards	Safety		IEC/EN 60950-1, SELV									
	Generic EMC		EN 50081-1, IEC/EN 61000-6-2 (EN 50082-2), EN 61000-6-3									
	Low frequency harmonic currents		–					IEC/EN 61000-3-2				
Input circuit												
LED indication				–								
Input voltages	Nominal voltage	V	100...240 ~			100...120 ~ 200...240 ~		100...240 ~		100...120 ~ 200...240 ~		
	Limit voltage	~	V 85...264			85...132/170...264		85...264		85...132/170...264		
		--- compatible	V 120...370 (1)			180...370 (1)		120...370 (1)		180...370 (1)		
	Current consumption	U _{in} = 240 V	A	1		0.7	2.5	3	0.7	2.5	3	
		U _{in} = 100 V	A	2		1.4	5	6	1.7	5	6	
	Permissible frequencies	Hz	47...63									
	Maximum inrush current	A	50									
	Power factor		0.65 approx.						0.7...0.95 approx. (depending on model)			
	Efficiency at nominal load		> 80 %									
	Dissipated power at nominal load	W	15	25		37.5	60	25	37.5		60	
Output circuit												
LED indicationL			Green LED									
Nominal output values	Voltage (U _{Out})	V	2 --- 24 ---					12 ---	24 ---			
	Current	A	5	2.5	4.2	6.2	10	8.3	4.2	6.2	10	
	Power	W	60			100	150	240	100	150 240		
Precision	Adjustable output voltage	V	10.8...13.2	21.6...26.4				10.8...13.2	21.6...26.4			
	Line and load regulation		± 3 %									
	Residual ripple - noise	mV	< 200 (peak-peak)									
Holding time for I max.	U _{in} = 240 V	ms	≥ 40									
	U _{in} =100 V	ms	≥ 10									
Protections	Against shorts-circuits		Permanent, automatic restart									
	Against overloads		1.1...1.5 I _n , see curve, page 57									
	Against undervoltages		U > 1.25 U _{Out}									
	Thermal		Yes (limiting operation above a temperature between 50 & 60 °C, depending on the load rating)									
Operating and environmental characteristics												
Connections	Input	mm ²	(2 + earth) x 4 (12 AWG)									
	Output	mm ²	2 x 4 (12 AWG)			4 x 4 (12 AWG)						
Mounting			On panel or on ABL 1A01 reversible mounting bracket									
Operating position			All positions with derating, see page 56									
Connections	Series		Possible (2 max.), see page 57									
	Parallel		Possible (2 max.), see page 57									
Degree of protection			Conforming to IEC/EN 60950									
Overvoltage category			II									
Environment	Temperature	Operating	°C	0...+ 60 (derating from 45 °C), see page 56								
		Storage		- 25... + 85								
	Max. relative humidity			20...90 %								
Vibrations, according to IEC/EN 61131-2			5...9 Hz amplitude 3.5 mm and 9...150 Hz acceleration 2 g									
Protection class			According to VDE 0106 1									
Degree of pollution			2									
MTBF at 40 °C			> 100 000 h at 100 % load									
Dielectric strength 50 and 60 Hz for 1 min	Input/output	V rms	~ 3000									
	Input/earth	V rms	~ 1500									
	Output/earth	V rms	~ 500									
Input fuse incorporated			Yes (not interchangeable)									
Emissions according to EN 61000-6-3			IEC/EN 61000-6-3 (generic)									
	Conducted/radiated		IEC/EN 55011, EN 55022 class B									
Immunity according to IEC/EN 61000-6-2	Electrostatic discharge		IEC/EN 61000-4-2 level 3 (4 kV contact/8 kV air)									
	Radiated electromagnetic fields		IEC/EN 61000-4-3 level 3 (10 V/m)									
	Induced electromagnetic fields		IEC/EN 61000-4-6 level 3 (10 V/m)									
	Rapid transients		IEC 61000-4-4 level 3 (2 kV)									
	Surges		IEC/EN 61000-4-5									
	Conducted interference		EN 61000-4-8 level 4, IEC/EN 61000-4-12 level 3									
	Primary outage		IEC 61000-4-11 (voltage dips and interruptions)									

(1) Not indicated on the products.

Power supplies and transformers

Power supplies for DC control circuits

Regulated switch mode power supplies

Phaseo Dedicated range

Output characteristics

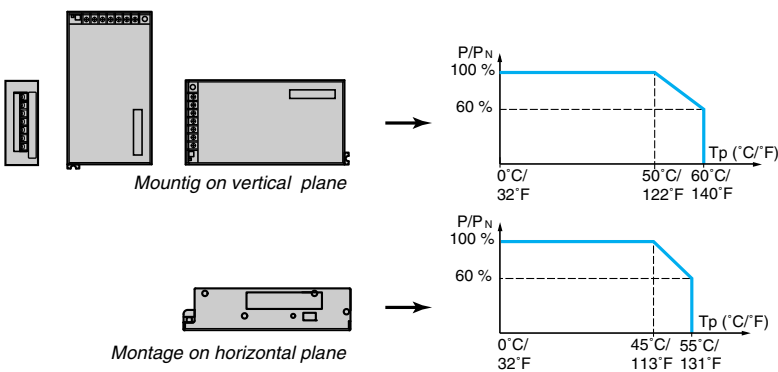
Derating

The ambient temperature is a determining factor which limits the power that an electronic power supply can deliver continuously. If the temperature around the electronic components is too high, their life will be significantly reduced.

ABL 1R•M24100 (240 W) power supplies are mechanically ventilated as from an ambient temperature > 40 °C approx., or for a load rating > 90 % approx.

The rated ambient temperature for **ABL 1REM/1RPM** power supplies is + 50 °C. Above this, derating is necessary up to a maximum temperature of + 60 °C.

The curves below show the power (in relation to the nominal power) which the power supply can deliver continuously, according to the ambient temperature.



Extreme operating conditions

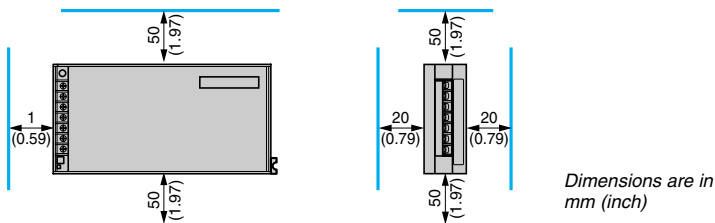
Derating should be considered in extreme operating conditions:

- intensive operation (output current permanently close to the nominal current, combined with a high ambient temperature),
- output voltage set above 24 V (to compensate for line voltage drops, for example),
- parallel connection to increase the total power.

General rules to be complied with

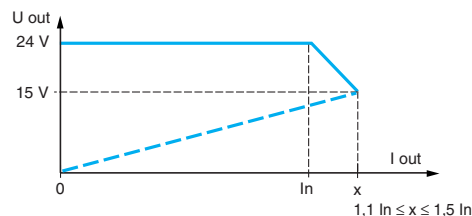
Intensive operation	See derating on above curves. Example for ABL 1 mounted vertically: - without derating, from 0 °C to 50 °C, - derating of nominal current by 4 %, per additional °C, up to 60 °C.
Rise in output voltage	The nominal power is fixed. Increasing the output voltage means that the current delivered must be reduced.
Parallel connection to increase the power	The total power is equal to the sum of the power supplies used, but the maximum ambient temperature for operation is 50 °C. To improve heat dissipation, the power supplies must not be in contact with each other.

In all cases, there must be adequate convection round the products to ensure easier cooling. There must be a clear space of 50 mm (1.97 inch) above and below the power supplies, and of 20 mm (0.79 inch) at the sides.



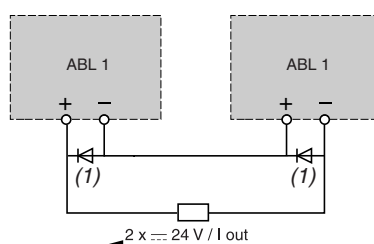
Output characteristics (continued)

Load limits

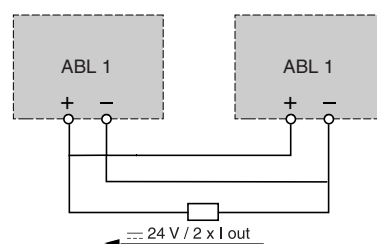


Series or parallel connection

Series connection



Parallel connection



(1) 8 A/100 V Shottky diode for ABL 1REM12050/1REM24025/1R●M24042.
15 A/100 V Shottky diode for ABL 1RPM12083/1R●M24062/1R●M24100.

Selection of protection for the power supply primary

Type of mains supply Type of protection (2 poles protected)	~ 115 V single-phase			~ 230 V single-phase		
	Thermal-magnetic circuit-breaker		gG fuse	Thermal-magnetic circuit-breaker		gG fuse
	GB2 (IEC) (1)	C60N (IEC) C60N (UL)		GB2 (IEC) (1)	C60N (IEC) C60N (UL)	
ABL 1REM12050	GB2 DB07	24517	2 A	GB2 DB07	24517	2 A
ABL 1REM24025	GB2 DB07	24517	2 A	GB2 DB07	24517	2 A
ABL 1RPM12083	GB2 DB07	24517	2 A	GB2 DB07	24517	2 A
ABL 1REM24042	GB2 DB07	24517	2 A	GB2 DB07	24517	2 A
ABL 1RPM24042	GB2 DB07	24517	2 A	GB2 DB07	24517	2 A
ABL 1REM24062	GB2 DB07	24517	2 A	GB2 DB08	24518	4 A
ABL 1RPM24062	GB2 DB07	24517	2 A	GB2 DB08	24518	4 A
ABL 1REM24100	GB2 DB08	24518	4 A	GB2 DB10	17454	6 A
ABL 1RPM24100	GB2 DB08	24518	4 A	GB2 DB10	17454	6 A

(1) Pending UL certification.

108710



ABL 1REM24025

108711



ABL 1R●M24042

108712

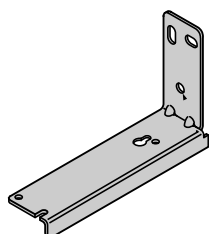


ABL 1R●M24062

108713



ABL 1R●M24100



ABL 1A01

References

Regulated switch mode power supplies: ABL 1REM Phaseo Dedicated range

Input voltage 47...63 Hz	Output voltage	Nominal power	Nominal current	Auto-protect reset	Conforming to standard IEC/EN 61000-3-2	Reference	Weight
100...240 V ~ (1) single-phase wide range	12 V =	60 W	5 A	Automatic	No	ABL 1REM1205	0.440
	24 V =	60 W	2.5 A	Automatic	No	ABL 1REM24025	0.440
		100 W	4.2 A	Automatic	No	ABL 1REM24042	0.640
100...120 V ~ 200...240 V ~ (2) single-phase	24 V =	150 W	6.2 A	Automatic	No	ABL 1REM24062	0.730
		240 W	10 A	Automatic	No	ABL 1REM24100	0.880

Regulated switch mode power supplies: ABL 1RPM Phaseo Dedicated range

Input voltage 47...63 Hz	Output voltage	Nominal power	Nominal current	Auto-protect reset	Conforming to standard IEC/EN 61000-3-2	Reference	Weight
100...240 V ~ (1) single-phase wide range	12 V =	100 W	8.3 A	Automatic	Yes	ABL 1RPM12083	0.640
	24 V =	100 W	4.2 A	Automatic	Yes	ABL 1RPM24042	0.640
100...120 V ~ 200...240 V ~ (2) single-phase	24 V =	150 W	6.2 A	Automatic	Yes	ABL 1RPM24062	0.970
		240 W	10 A	Automatic	Yes	ABL 1RPM24100	1.230

Mounting accessories

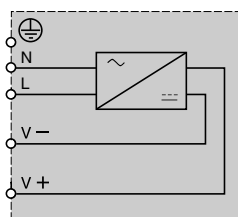
Description	For power supplies	Sold in lots of	Unit reference	Weight kg
Reversible mounting bracket	For the mounting on the back of cabinet of ABL 1R●M●●●● power supply	5	ABL 1A01	0.085
Clip-on mounting plate for 35 mm mounting rail	- ABL 1REM12050/24025: the plate mounting on 35 mm requires one mounting plate - ABL 1RPM12083 and ABL 1R●M24042/24062/24100: the plate mounting on 35 mm requires 2 mounting plates - ABL 1R●M●●●●: the mounting on the back of cabinet on the 35 mm rail requires one mounting plate	5	ABL 1A02	0.035

(1) Compatible input voltage = 120...370 V not indicated on the product.

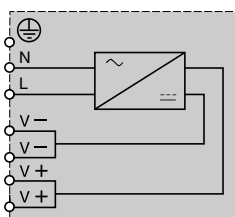
(2) Compatible input voltage = 180...370 V not indicated on the product.

Schemes

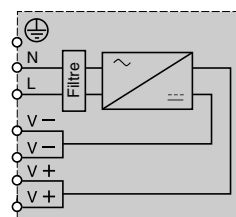
ABL 1REM12050, 1REM24025



ABL 1REM24042, 1REM24062, 1REM24100

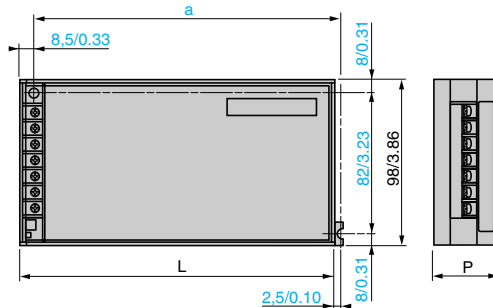


ABL 1RPM●●●●●



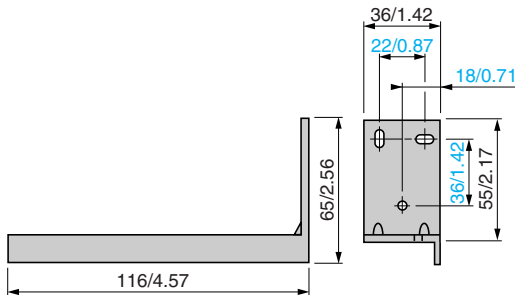
Dimensions (the dimensions are in mm/inch)

ABL 1R●M●●●●●



ABL	L	P	a	b	c
1REM12050	150/5.91	38/1.5	144/5.67	38/1.5	58/2.28
1REM24025	150/5.91	38/1.5	144/5.67	38/1.5	58/2.28
1REM24042	200/7.87	38/1.5	194/7.64	38/1.5	58/2.28
1REM24062	200/7.87	50/1.97	194/7.64	28/1.10	48/1.89
1REM24100	200/7.87	65/2.56	194/7.64	28/1.10	48/1.89
1RPM12083	200/7.87	38/1.5	194/7.64	38/1.5	58/2.28
1RPM24042	200/7.87	38/1.5	194/7.64	38/1.5	58/2.28
1RPM24062	200/7.87	50/1.97	194/7.64	28/1.10	48/1.89
1RPM24100	200/7.87	65/2.56	194/7.64	28/1.10	48/1.89

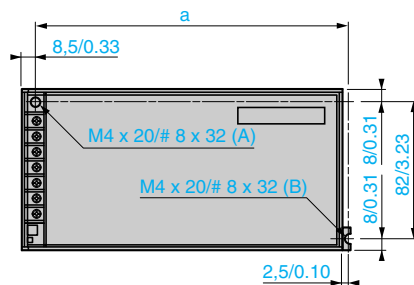
ABL 1A01



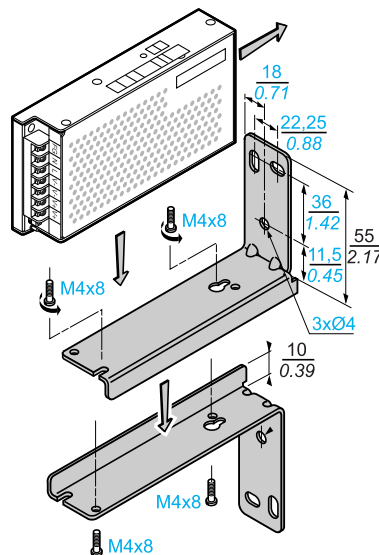
Mounting

ABL 1R●M●●●●●

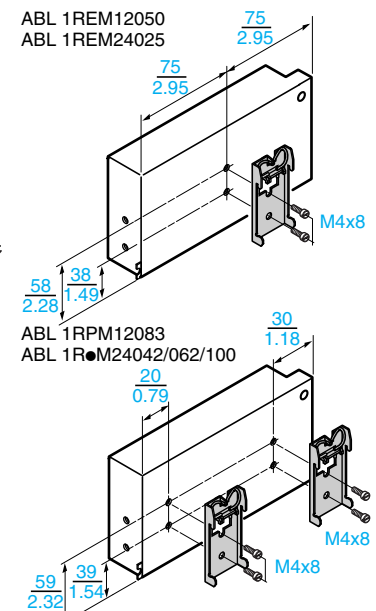
Direct mounting by 2 M4 x 20 screws



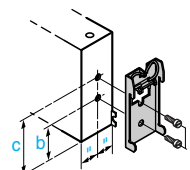
Mounting on the back on ABL 1A01 reversible bracket by 3 Ø 4 mm screws



Mounting on ABL 1A02 clip-on mounting on 35 mm rail



Mounting by the back
ABL 1R●M●●●●● :



Power supplies and transformers

Power supplies for control circuits for

AS-Interface cabling system

Regulated switch mode power supplies

Phaseo AS-Interface range

Power supplies for AS-Interface cabling system

Consistent with the standard Phaseo line, the range of **ASI ABL** power supplies is designed to deliver a \sim voltage, as required by AS-Interface cabling systems. Three versions are available to meet all needs encountered in industrial applications, in enclosures, cells or floor-standing enclosures. These single-phase, electronic, switch mode power supplies guarantee the quality of the output current, in accordance with the electrical characteristics and conforming to standard EN 50295.

ASI ABLB300●

Operating on a 100 to 240 V \sim supply, this power supply delivers a voltage of 30 V \sim . Available in 2.4 and 4.8 A ratings, the outgoing terminal block allows the cable to be connected separately to the AS-Interface interface modules and to the AS-Interface master. Input and output LEDs allow fast and continuous diagnostics.



ASI ABLB3002

ASI ABLD300●

Operating on a 100 to 240 V \sim supply, this power supply delivers a voltage of 30 V \sim . Available in 2.4 and 4.8 A ratings, it allows diagnosis and management of earth faults on AS-Interface interface modules. In the event of an earth fault, the Phaseo power supply stops dialogue on the AS-Interface cabling system and puts the installation in a fallback condition. Restarting is only possible after deliberate acknowledgement of the fault. Two inputs/outputs enable dialogue with a processing unit. The outgoing terminal block is used to connect the AS-Interface cable separately to the interface modules and master modules. Input, output and earth fault LED's allow fast and continuous diagnostics.



ASI ABLD3004

ASI ABLM3024

Operating on a 100 to 240 V \sim supply, this product provides two separate power supplies, which are totally independent in the way they operate. Two output voltages - 30 V/2.4 A (AS-Interface line supply) and 24 V/3 A - are available, so making it possible to supply the control equipment without an additional power supply. Input and output LEDs allow fast and continuous diagnostics.



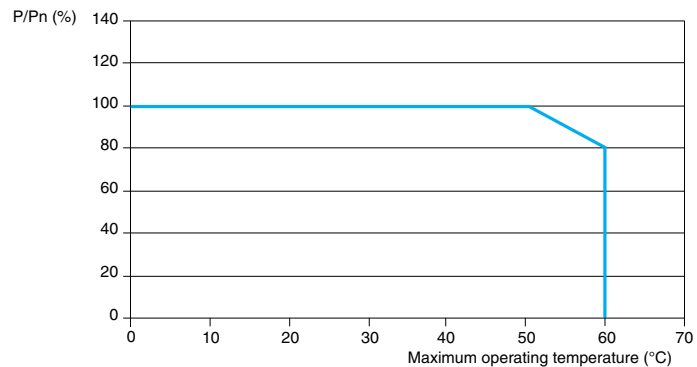
ASI ABLM3024

Technical characteristics														
Type of power supply			ASI ABLB3002		ASI ABLB3004		ASI ABLD3002		ASI ABLD3004		ASI ABLM3024			
Functions			Supply to the AS-Interface line (30 V ---)								30 V --- supply		24 V --- supply	
Product certifications			UL 508, CSA 22.2 No. 950, TÜV 60950-1											
Conforming to standards	Safety		EN 60950-1											
	EMC		EN 50081-1, IEC/EN 61000-6-2, EN 55022 class B											
	Low frequency harmonic currents		No											
Input circuit														
LED indication			Orange LED											
Input voltage	Rated values	V	~ 100...240											
	Permissible values	V	~ 85...264											
	Current consumption	A	0.5		1		0.5		1					
	Permissible frequencies	Hz	47...63											
	Current at switch-on	A	< 30											
	Power factor		0.65											
	Efficiency at nominal load	%	> 83								> 83		> 80	
	Dissipated power at nominal load	W	14.7		29.5		14.7		29.5		14.7		36	
Output circuit														
LED indication			Green LED											
Nominal output values	Voltage (U _{out})	V	30 (AS-Interface)								--- 30		--- 24	
	Current	A	2.4		4.8		2.4		4.8		2.4		3	
	Power	W	72		144		72		144		72		72	
Precision	Adjustable output voltage	V	—								—		100 to 120 %	
	Line and load regulation		3 %											
	Residual ripple - noise	mV	300 - 50											
Holding time for I max	U _{in} min	ms	≥ 10											
Protection	Against short-circuit		Permanent. Automatic restart after elimination of the fault											
	Against overload		1.1 In											
	Against overvoltage		Tripping if U > 1.2 Un								U > 1.2 Un		U > 1.5 Un	
	Against undervoltage		Tripping if U < 0.95 Un								U < 0.95 Un		U < 0.8 Un	
Operating characteristics														
Connections	Input	mm ²	2 x 2.5 screw terminals + earth											
	Output	mm ²	2 x 2.5 screw terminals + earth, multiple output											
Environment	Operating temperature	°C	0 to + 60 (derating from 50, see page 62)											
	Storage temperature	°C	- 25 to + 70											
	Maximum relative humidity		95 % (without condensation or dripping water)											
	Degree of protection		IP 20, conforming to IEC/EN 60529											
	Vibrations		Conforming to IEC/EN 61131-2											
Operating position			Vertical											
MTBF		h	> 100000 (conforming to Bell core, at 40 °C)											
Dielectric strength 50 Hz during 1 min	Input/output	V rms	3000											
	Input/earth	V rms	3000											
	Output/earth (and output/output)	V rms	500											
Input fuse incorporated			Yes (not interchangeable)											
Emission according to EN 61000-6-3	Conducted/radiated		Class B (conforming to EN 55022)											
Immunity according to IEC/EN 61000-6-2	Electrostatic discharge		IEC/EN 61000-4-2 (4 kV contact/8 kV air)											
	Radiated lectromagnetic field		IEC/EN 61000-4-3 level 3 (10 V/m)											
	Induced electromagnetic field		IEC/EN 61000-4-6 (10 V/m)											
	Rapid transients		IEC 61000-4-4 level 3 (2 kV),											
	Primary outages		IEC 61000-4-11 (voltage dips and interruptions)											

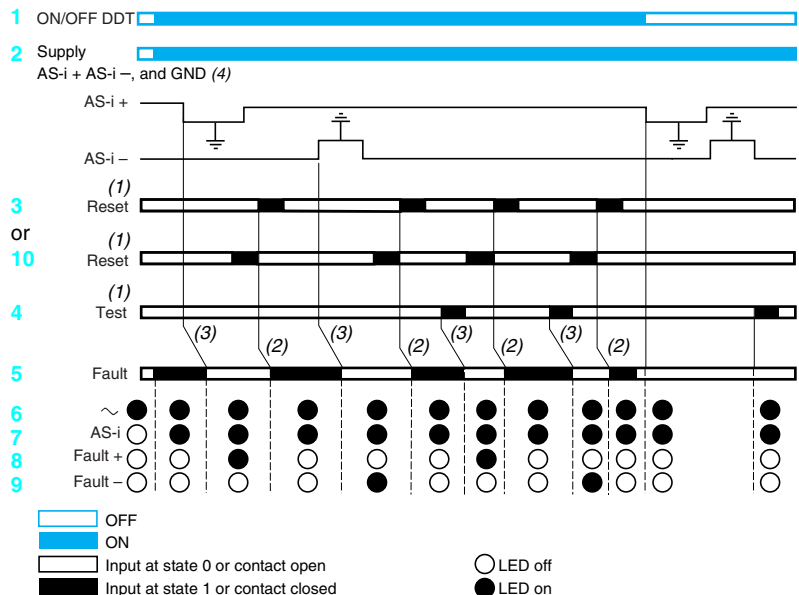
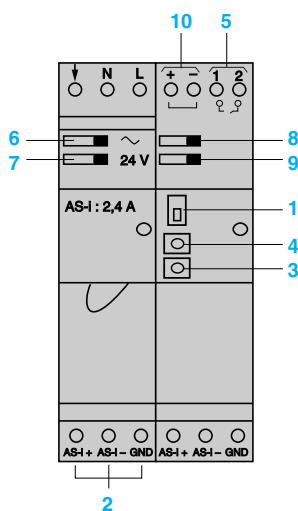
Output characteristics

Derating

The ambient temperature is a determining factor which limits the power that an electronic power supply can deliver continuously. If the temperature around the electronic components is too high, their life will be significantly reduced. The graph below shows the power (in relation to the nominal power) which the power supply can deliver continuously, according to the ambient temperature.



Function diagram



(1) 30 ms min.

(2) 15 ms.

(3) 20 ms.

(4) Warning: the earth fault detector will only operate if the earth (GND) terminal is connected.

Warning

The earth (GND) (4) connection must be made. In the event of disconnection, the built-in detector becomes inoperative. To obtain earth connection diagnostics, it is recommended that an ASI_ABLD300 power supply be used with built-in insulation control.

An appearance of accidental earth fault triggers, in the following cases, the activation of built-in protection:

- case 1: fault between AS-i "+" and earth,
- case 2: fault between AS-i "-" and earth,
- case 3: fault between sensors/actuators (supplied by ASI_ABLD300) and earth.

Depending in the case:

- Cases 1, 2 with switch 1 ON -> OFF: maintain of fault, any exchange between master and slaves.
- Case 3 with switch 1 ON -> OFF: restart of exchanges between master and slaves but the states of inputs/outputs of affected module are not guaranteed.

Power supplies and transformers

Power supplies for control circuits for

AS-Interface cabling system

Regulated switch mode power supplies

Phaseo AS-Interface range ###

Selection of protection on the power supply primaries

Type of mains supply	~ 115 V single-phase			~ 230 V single-phase		
Power supply	Thermal-magnetic circuit-breaker	Gg fuse		Thermal-magnetic circuit-breaker	Gg fuse	
ASI ABLB3002	GB2 ●B07 (1)	MG24517 (2)	2 A	GB2 DB06	MG24516 (2)	2 A
ASI ABLB3004	GB2 ●B08 (1)	MG24518 (2)	4 A	GB2 DB07	MG17453 (2)	2 A
ASI ABLD3002	GB2 ●B07 (1)	MG24517 (2)	2 A	GB2 DB06	MG24516 (2)	2 A
ASI ABLD3004	GB2 ●B08 (1)	MG24518 (2)	4 A	GB2 DB07	MG17453 (2)	2 A
ASI ABLM3024	GB2 ●B07 (1)	MG24517 (2)	2 A	GB2 DB06	MG17453 (2)	2 A

(1) For single-pole protection, replace ● by C, for 2-pole protection by D.

(2) UL certified circuit-breaker.

References



ASI ABL3002

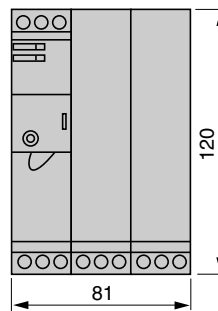
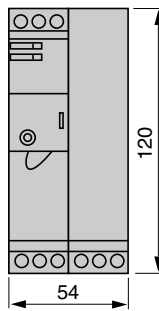
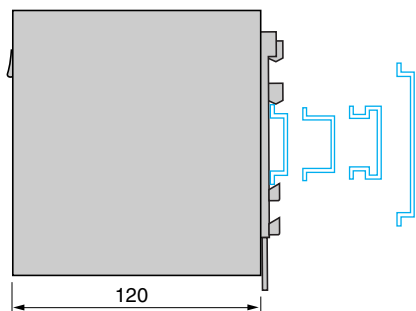
Input voltage	Secondary Output voltage	Nominal power	Nominal current	Auto-protect reset	Earth fault detection	Reference	Weight kg
Single phase (N-L1) or 2-phase (L1-L2)							
~ 100...240 V - 15 %, + 10 % 50/60 Hz	~ 30 V	72 W	2,4 A	Auto	No	ASI ABLB3002	0.800
		144 W	4,8 A	Auto	No	ASI ABLB3004	1.300
		72 W	2,4 A	Auto	Yes	ASI ABLD3002	0.800
		144 W	4,8 A	Auto	Yes	ASI ABLD3004	1.300
	~ 30 V	72 W	2,4 A	Auto	No	ASI ABLM3024	1.300
	~ 24 V	72 W	3 A				

Dimensions

Common side view
Mounting on 35 et 75 mm rail

ASI ABLB3002
ASI ABLD3002

ASI ABLB3004 / ABLD3004
ASI ABLM3024

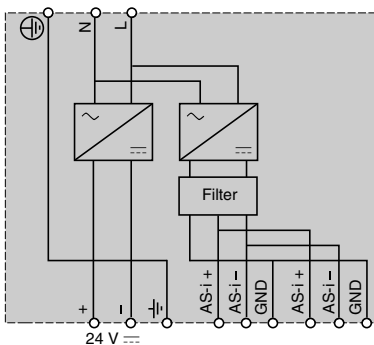
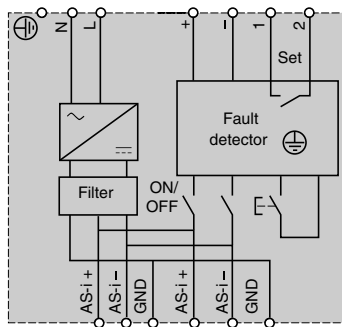
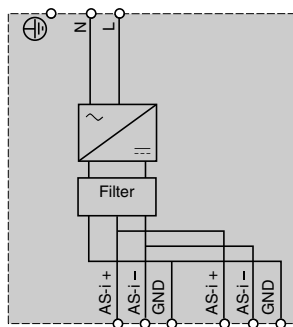


Schemes

ASI ABLB300●

ASI ABLD300●

ASI ABLM3024





ABL 8FEQ24040



ABL 8FEQ24000



ABL 8TEQ

ABL 8FEQ/8TEQ power supplies

The **ABL 8FEQ/8TEQ** range of power supplies is designed to provide the DC voltage necessary for the control circuits of automation system equipment. Comprising two families, this range meets all the needs encountered in industrial, commercial and residential applications. With phase-to-neutral or 3-phase connection, of the conventional type with rectifier, they provide a quality of output current that is suitable for the loads supplied and compatible with the line supply available in the equipment. Clear guidelines are given for selecting protection devices which are often used with them, and thus a comprehensive solution is provided that can be used in total safety.

Filtered rectified power supplies

Filtered rectified power supplies are built using a safety transformer equipped with a bridge rectifier and smoothing capacitors.

With no regulation system, and of simple and rugged construction, their output voltage will withstand line voltage variations and load variations while remaining within the range defined in standards IEC/EN 61131-2.

These power supplies are split into two families:

- The **ABL 8FEQ** family, with phase-to-neutral or phase-to-phase connection, rectified and filtered, enables connection to European 230/400 V line supplies. Power supplies from 0.5 A to 4 A are available for direct mounting on a rail.
- The **ABL 8TEQ** family, with 3-phase connection, filtered and rectified, is particularly suitable where a high power level is required for controlling actuators and preactuators. This is especially true for "All 24 V ---" equipment, or for pilot operation of DC valves and solenoid valves.

Selection of power supplies

Quality of the line supply

Rectified power supplies provide a non-regulated voltage, sensitive to load and line supply fluctuations. They can only be used on good-quality line supplies, with fluctuations limited to -10%... + 10% of the nominal value.

Graphs showing the output voltage as a function of the current, the load and the input voltage for **ABL 8FEQ** and **ABL 8TEQ** supplies are given on pages 67 and 68.

If the quality of the line supply is not suitable for a rectified power supply, a regulated supply must be used.

Harmonic pollution (power factor)

By design, **ABL 8FEQ** and **ABL 8TEQ** rectified power supplies consume very little harmonic current; they meet the requirements of standard EN 61000-3-2 and can therefore be connected directly to public distribution systems.

Behavior in the event of short-circuits

In the event of an overload or short-circuit, rectified power supplies must be protected by a downstream fuse or circuit-breaker to prevent their destruction. **ABL 8FEQ** models up to 6 A are fitted with a 5 x 20 mm glass fuse and do not need any external downstream protection.

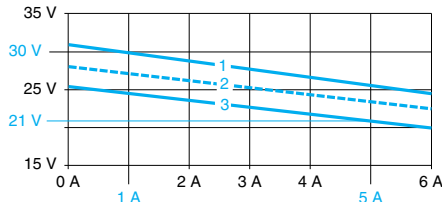
Technical characteristics										
Type of power supply			ABL 8FEQ							
			24005	24010	24020	24040	24060	24100	24150	24200
Certifications			cULus, ENEC, CE							
Conformity to standards	Safety		IEC 61558-2-6, EN 61558-2-6, UL 60950-1, UL 508							
	EMC		IEC 62041, IEC/EN 61000-3-2							
Input circuit										
LED indication			Voltage LED (orange)							–
Input values	Nominal voltage	V	230 or 400 ~ phase-to-neutral or phase-to-phase with - 15 V and + 15 V connectors							
	Limit voltage	V	207...253 ~ 360...440 ~							
	Permissible frequencies	Hz	47...63							
	Maximum inrush current	230 V ~	1.68 A		4.8 A	9 A	10 A	16 A	27.8 A	31.9 A
		400 V ~	0.97 A		2.77 A	5.2 A	5.78 A	9.24 A	16 A	18.4 A
	Power factor	230 V ~	0.656	0.764	0.737	0.689	0.781	0.783	0.693	0.698
		400 V ~	0.881	0.905	0.863	0.867	0.860	0.834	0.663	0.671
	Efficiency at nominal load	%	71	75				80		
Dissipated power at nominal load	W	3.48	6	12	24	36	48	72	96	
Output circuit										
Diagnostics			Voltage LED (green)							
Nominal values	Voltage	V	24 V ---							
	Current	A	0.5	1	2	4	6	10	15	20
	Power	W	12	24	48	96	144	240	360	480
Limit values	Output voltage		See graphs on pages 67 and 68							
	Voltage variation at nominal load	%	10...16	18...25	14...21	13...20	15...21	14...21	12...16	12...15
	Residual ripple - noise		≤ 5 %							
Holding time		ms	17	15	14	15			14	10
Protection	Against overloads and short-circuits		Fuse 5 x 20 0.5 AT	Fuse 5 x 20 1 AT	Fuse 5 x 20 2 AT	Fuse 5 x 20 4 AT	Fuse 5 x 20 6.3 AT	External, depending on the output current		
	Against overvoltages		2 J peak limiter							
Operating and environmental characteristics										
Connections	Input	mm²	2 x 2.5...4 (AWG 14/11) + Ground					2 x 2.5 (AWG 14) + Ground		
	Output	mm²	2 x 2.5...4 (AWG 14/11) + Ground					2 x 4 (AWG 11) + Ground		
Mounting			On □ rail, 35 x 7.5 mm and 35 x 15 mm or via 4 screws (not supplied)					4 screws (not supplied)		
Operating position			Vertical: 60°C Horizontal: 40°C							
Connections	Series		Possible							
	Parallel		Possible							
Degree of protection	Conforming to IEC/EN 60529		IP 20							
Environment	Storage temperature	°C	- 40...+ 80							
	Operating temperature	°C	- 20...+ 60							
	Maximum relative humidity		95% without condensation or dripping water							
	Vibration acc. to IEC 60068-1 (ability to stay attached to the rail)		3...13.9 Hz amplitude 1 mm and 13.9...47 Hz acceleration 0.7 g 47...57 Hz amplitude 0.05 mm and 57...150 Hz acceleration 1 g					–		
Protection class according to VDE 0106 1			Class I							
Dielectric strength 50 Hz for 1 min	Input/output	V rms	4600 ~							
	Input/ground	V rms	2000 ~							
	Output/ground	V rms	500 ~							
Emissions according to EN 61000-6-3			EN 50081-1 (generic)							
	Conducted/radiated		EN 55011 - Class B							
Immunity according to CEI/EN 61000-6-2	Electrostatic discharge		IEC/EN 61000-4-2 (4 kV contact and 8 kV air)							
	Rapid transients		IEC 61000-4-4 (2 kV)							
	Surges		IEC/EN 61000-4-5 (2 kV)							

Technical characteristics

Type of power supply			ABL 8TEQ				
			24100	24200	24300	24400	24600
Certifications			cULus, ENEC, CE				
Conformity to standards	Safety		IEC 61558-2-6, EN 61558-2-6, UL 60950-1, UL 508				
	EMC		IEC 62041, IEC/EN 61000-3-2				
Input circuit							
LED indication			—				
Input values	Nominal voltage	V	400 V ~ 3-phase with - 20 V and + 20 V connectors				
	Limit voltage	V	360...440 ~				
	Permissible frequencies	Hz	47...63				
	Maximum inrush current	400 V ~	7 A	14 A	20 A	30 A	41 A
	Power factor	400 V ~	0.872	0.81	0.835	0.857	0.757
	Efficiency at nominal load	%	73	78	77	78	
	Dissipated power at nominal load	W	64	105	165	211	316
Output circuit							
Diagnostics			Voltage LED (green)				
Nominal values	Voltage	V	24 V ---				
	Current	A	10	20	30	40	60
	Power	W	240	480	720	960	1440
Limit values	Output voltage		See graphs on pages 67 and 68				
	Voltage variation at nominal load	%	17.08	14.25	18.67	14.58	15.29
	Residual ripple - noise		≤ 2 %				
Holding time		ms	4	6	7	5	4
Protection	Against overloads and short-circuits		External, depending on the output current				
	Against overvoltages		2 J peak limiter				
Operating and environmental characteristics							
Connections	Input	mm²	2 x 2.5...4 (AWG 14/11) + Ground				
	Output	mm²	2 x 4 (AWG 11)	2 x 10...16 (AWG 8/6)		2 x 16 (AWG 6)	
Mounting			4 screws (not supplied)				
Operating position			Vertical: 55°C Horizontal: 40°C				
Connections	Series		Possible				
	Parallel		Possible				
Degree of protection	Conforming to IEC/EN 60529		IP 20				
Environment	Storage temperature	°C	- 40...+ 80				
	Operating temperature	°C	- 20...+ 55				
	Maximum relative humidity		95% without condensation or dripping water				
Dielectric strength 50 Hz for 1 min	Input/output	V rms	4600 ~				
	Input/ground	V rms	2000 ~				
	Output/ground	V rms	500 ~				
Protection class according to VDE 0106 1			Class I				
Emissions			EN 50081-1 (generic)				
according to EN 61000-6-3	Conducted/radiated		EN 55011 - Class B				
Immunity according to EN 61000-6-2	Electrostatic discharge		IEC/EN 61000-4-2 (4 kV contact and 8 kV air)				
	Rapid transients		IEC 61000-4-4 (2 kV)				
	Surges		IEC/EN 61000-4-5 (2 kV)				

Output characteristics

Example of how to use the graph



For an ABL 8FEQ power supply, used with a variable load of 1 to 5 A, on a line supply $U_n \pm 10\%$, the graph gives the limits at the load terminals: 21 and 30 V.

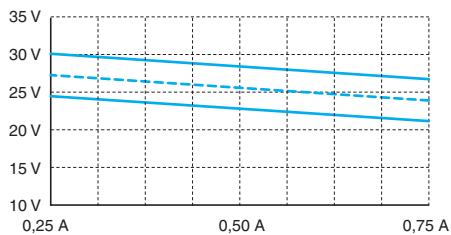
Note: The load lines are represented by vertical lines, images of the nominal current for the load supplied at its nominal voltage.

1 Nominal line supply +10%

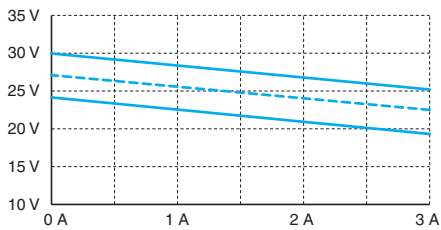
2 Nominal line supply

3 Nominal line supply -10%

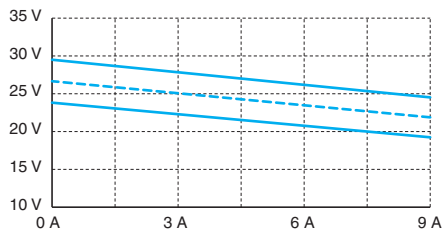
ABL 8FEQ24005



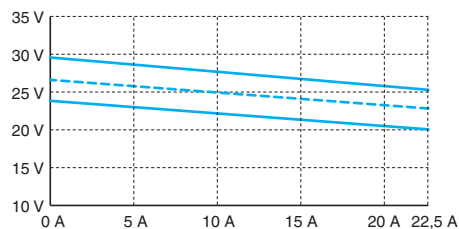
ABL 8FEQ24020



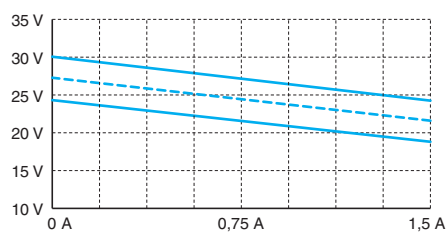
ABL 8FEQ24150



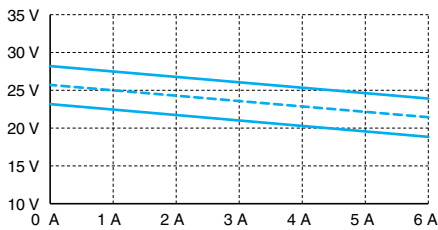
ABL 8FEQ24150



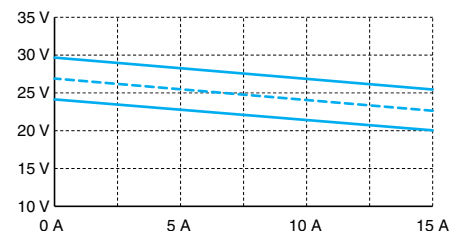
ABL 8FEQ24010



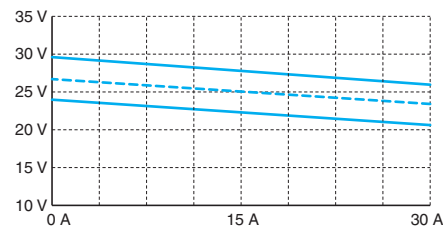
ABL 8FEQ24040



ABL 8FEQ24100

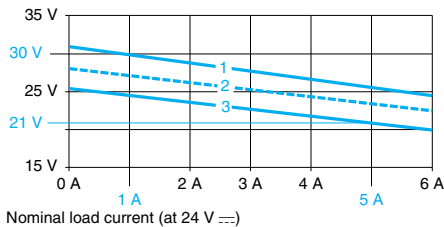


ABL 8FEQ24200



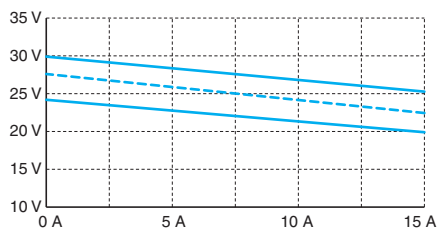
Output characteristics (continued)

Example of how to use the graph

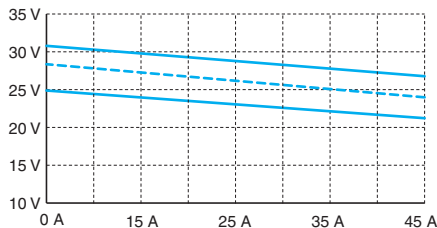


For an ABL 8TEQ power supply, used with a variable load of 10 to 60 A, on a line supply $U_n \pm 10\%$, the graph gives the limits at the load terminals: 21 and 30 V.
Note: The load lines are represented by vertical lines, images of the nominal current for the load supplied at its nominal voltage.
1 Nominal line supply +10%
2 Nominal line supply
3 Nominal line supply -10%

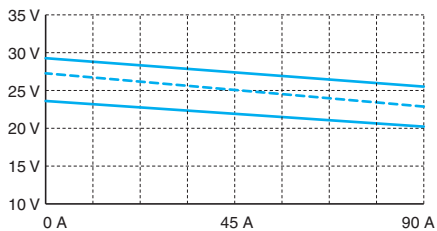
ABL 8TEQ24100



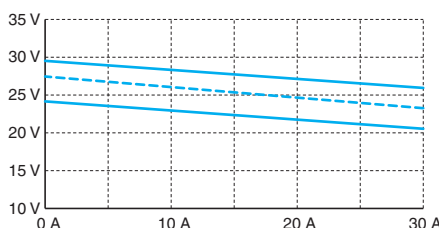
ABL 8TEQ24300



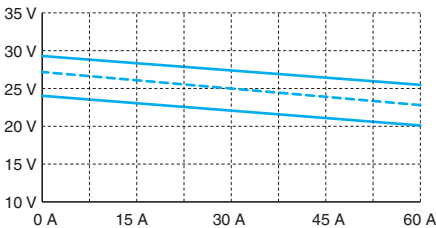
ABL 8TEQ24600



ABL 8TEQ24200



ABL 8TEQ24400



Selection

ABL 8TEQ power supplies: protection of the primary and secondary voltages

Type of line supply		400 V ~ 3-phase, primary voltage				24 V =, secondary voltage	
Type of protection	Nominal power	3-pole thermal-magnetic circuit-breaker		UL listed FNQ type fuse	aM type fuse	gC type fuse	T type fuse
		Telemecanique	Merlin Gerin C60N (1)				
ABL 8TEQ24100	240 W	GV2 RT04	24532	0.8 A	1 A	12 A	12 A
ABL 8TEQ24200	480 W	GV2 RT06	17470	1.5 A	1 A	25 A	25 A
ABL 8TEQ24300	720 W	GV2 RT07	24533	2 A	2 A	40 A	–
ABL 8TEQ24400	960 W	GV2 RT07	24534	3 A	2 A	50 A	–
ABL 8TEQ24600	1440 W	GV2 RT08	24535	4 A	4 A	80 A	–

ABL 8FEQ power supplies: protection of the primary and secondary voltages

Type of line supply		400 V ~ single-phase, primary voltage				230 V ~ single-phase, primary voltage			
Type of protection	Nominal power	3-pole thermal-magnetic circuit-breaker		UL listed FNQ type fuse	aM type fuse	Thermal-magnetic circuit-breaker		UL listed MDL type fuse	aM type fuse
		Telemecanique	Merlin Gerin C60N 2 poles (1)			Telemecanique	Merlin Gerin C60N 1 pole (1)		
ABL 8FEQ24005	12 W	GB2 DB05	17451	0.1 A	0.25 A	GB2●●05	17421	0.125 A	0.25 A
ABL 8FEQ24010	24 W	GB2 DB05	17451	0.15 A	0.25 A	GB2●●05	17421	0.2 A	0.25 A
ABL 8FEQ24020	48 W	GB2 DB05	17451	0.3 A	0.25 A	GB2●●05	17421	0.5 A	0.25 A
ABL 8FEQ24040	96 W	GB2 DB06	24516	0.5 A	0.5 A	GB2●●06	24500	1 A	0.5 A
ABL 8FEQ24060	144 W	GB2 DB06	24516	1 A	0.5 A	GB2●●07	17422	1.25 A	1 A
ABL 8FEQ24100	240 W	GB2 DB06	24516	1.25 A	1 A	GB2●●07	24501	2 A	1 A
ABL 8FEQ24150	360 W	GB2 DB07	24517	2 A	1 A	GB2●●08	24502	3 A	2 A
ABL 8FEQ24200	480 W	GB2 DB07	24517	2.5 A	1 A	GB2●●09	24503	4 A	2 A
Type of line supply		24 V =, secondary voltage							
Type of protection	Nominal power	gC type fuse				T type fuse			
ABL 8FEQ24005	12 W	–				0.5 A (internal fuse)			
ABL 8FEQ24010	24 W	–				1 A (internal fuse)			
ABL 8FEQ24020	48 W	–				2 A (internal fuse)			
ABL 8FEQ24040	96 W	–				4 A (internal fuse)			
ABL 8FEQ24060	144 W	–				6.3 A (internal fuse)			
ABL 8FEQ24100	240 W	12 A				12 A			
ABL 8FEQ24150	360 W	20 A				20 A			
ABL 8FEQ24200	480 W	25 A				25 A			

(1) UL certified circuit-breaker

Power supplies and transformers

Power supplies for DC control circuits

Rectified and filtered power supplies

Phaseo Rectified range



ABL 8FEQ24

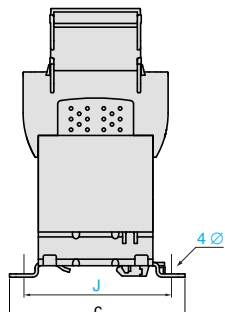
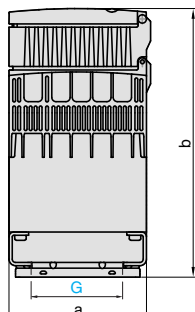


ABL 8TEQ24

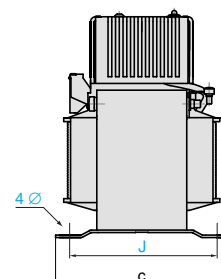
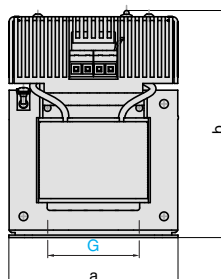
References						
Input voltage	Secondary			Reference	Weight	
	Output voltage	Nominal power	Output current			
Protection by 5 x 20 fuse						
Rectified and filtered power supplies: Phaseo Rectified range						
Single-phase (N-L1) or 2-phase (L1-L2) connection						
230/400 V ~ ±15 V 50/60 Hz	24 V ---	12 W	0.5 A	Yes	ABL 8FEQ24005	1.280
		24 W	1 A	Yes	ABL 8FEQ24010	1.300
		48 W	2 A	Yes	ABL 8FEQ24020	2.200
		96 W	4 A	Yes	ABL 8FEQ24040	2.900
		144 W	6 A	Yes	ABL 8FEQ24060	4.940
		240 W	10 A	No	ABL 8FEQ24100	7.660
		360 W	15 A	No	ABL 8FEQ24150	8.820
		480 W	20 A	No	ABL 8FEQ24200	13.220
3-phase connection (L1-L2-L3)						
400 V ~ ± 20 V 50/60 Hz	24 V ---	240 W	10 A	No	ABL 8TEQ24100	4.720
		480 W	20 A	No	ABL 8TEQ24200	9.900
		720 W	30 A	No	ABL 8TEQ24300	13.000
		960 W	40 A	No	ABL 8TEQ24400	17.500
		1440 W	60 A	No	ABL 8TEQ24600	26.500
Marking accessory						
Designation	Size		Order in multiples of	Unit reference	Weight	
Vhd0gkhvlyh#p dunhu#dj# krog hu	20 x 10 mm		50	AR1 SB3	0.010	

Dimensions

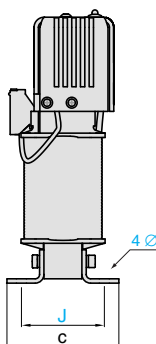
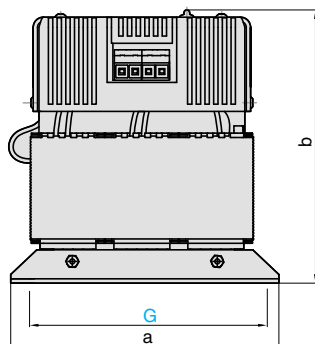
ABL 8FEQ24005/24010/24100



ABL 8FEQ24150/24200



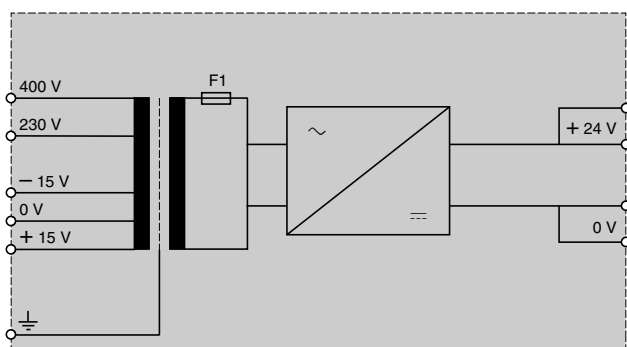
ABL 8TEQ24000



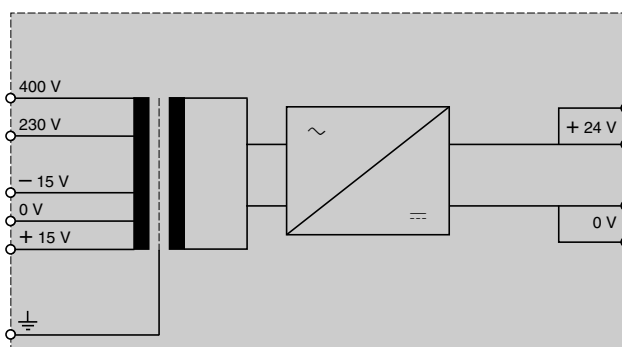
ABL	a	b	c	G	J	Ø
8FEQ24005	87	124	108	60	96	5.5
8FEQ24010	87	124	108	60	96	5.5
8FEQ24020	87	142	108	60	96	5.5
8FEQ24040	87	165	108	60	96	5.5
8FEQ24060	123	153	153	82	136	6.5
8FEQ24100	123	185	153	82	136	6.5
8FEQ24150	135	185	138	105	125	6.5
8FEQ24200	175	215	128	135	105	6.5
8TEQ24100	185	190	78	165	58	6.5
8TEQ24200	220	215	104	200	80	8
8TEQ24300	240	252	108	220	87	8
8TEQ24400	310	310	140	260	95	11
8TEQ24600	310	310	154	260	130	11

Internal schemes

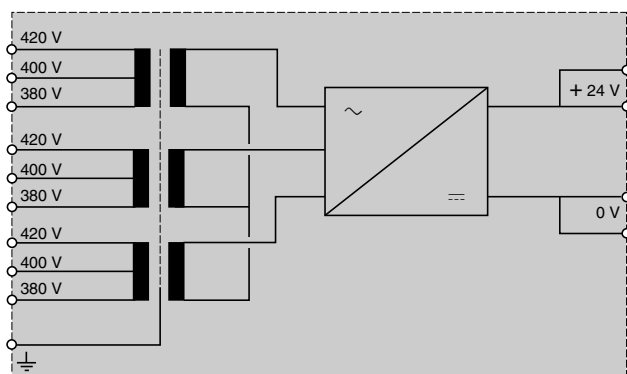
ABL 8FEQ24005/24010/24020/24040/24060



ABL 8FEQ24100/24150/24200



ABL 8TEQ24100/24200/24300/24400/24600




Presentation

The Phaseo **ABL 6TS** and **ABT 7** single-phase transformers offer is designed to supply control circuits in electrical equipment from a 230 V ~ or 400 V ~ supply (depending on the model) at 50 or 60 Hz. ± 15 V connectors at the primary ensure adaptation to the actual values of the supply networks to which they are connected.

Universal range (25 VA to 2500 VA)


This range of transformers with double winding features a particularly innovative design and offers high-level characteristics (depending on the model) such as:

- 230 V/400 V ~ ± 15 V input voltage
- 2 x 115 V or 2 x 24 V ~ output voltage
- Clip-on  rail mounting (depending on the model) or panel mounting (using 4 screws)
- Series or parallel connection of secondary winding and grounding via internal jumpers
- LED indicator
- Operating temperature of 60°C
- cURus, ENEC certifications

All these components are concealed behind a plastic cover making it easier to integrate the Universal range of Phaseo transformers in control cabinets.

Optimum range (25 VA to 2500 VA)

The following characteristics demonstrate the suitability of this tried and tested range of single-winding transformers for standard applications:

- 230 V/400 V ~ ± 15 V input voltage
- 12 V, 24 V, 115 V or 230 V ~ output voltage
- Panel mounting, using 4 screws (or clip-on  rail-mounting option available depending on the model)
- Operating temperature of 50°C
- cURus certifications

Economic range (25 VA to 400 VA)

This range of simplified single-winding transformers is primarily designed for repetitive applications and offers the following as standard:

- 230 V ~ ± 15 V input voltage
- 24 V ~ output voltages
- Panel mounting using 4 screws
- Operating temperature of 40°C

ABL 6TS and **ABT 7** transformers provide enhanced electrical isolation between the line supply and the application. The whole range features an electrostatic screen to limit the spread of electromagnetic interference and improve user safety.


Protection

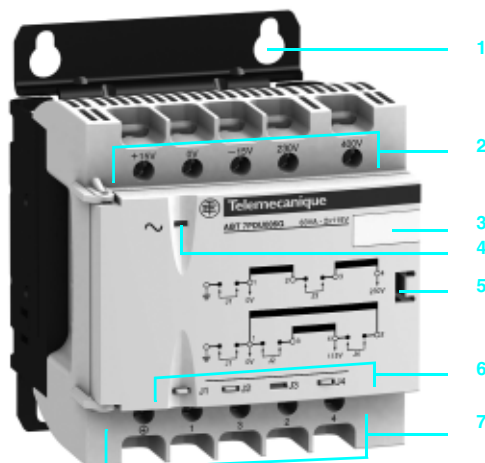
The transformers can be protected against short-circuits by means of fuses or thermal-magnetic circuit-breakers mounted on the secondary.

For operation in compliance with UL standards, short-circuit protection must be achieved using fuses (UL approved) mounted on the primary.

Where the control circuit is isolated from the ground (IT system), a leakage detector will indicate any accidental ground faults.

Description

- 1 Mounted using 4 screws or, depending on the model in the Universal range, by clipping on a 35 mm  rail
- 2 Screw terminals with ± 15 V connectors for connection of the AC input voltage
- 3 Clip-on marker tag or self-adhesive marker tag holder **AR1 SB3**
- 4 LED (green) indicating presence of input voltage (depending on the model in the Universal range)
- 5 Access to the jumpers for selecting the secondary connection (opened using a screwdriver)
- 6 Windows (depending on the model in the Universal range) for viewing the connection via jumpers of the:
 - 0 V to ground (J1 jumper)
 - Series connection, totally freeing up the "customer" secondary wiring capacity (J3 jumper)
 - Parallel connection, totally freeing up the "customer" secondary wiring capacity (J2 and J4 jumpers)
- 7 Screw terminals for connection of the AC output voltage



ABT 7PDU002...7PDU032

Selection

ABL 6TS and **ABT 7** transformers are characterized by the apparent nominal power they can supply continuously. However, they are also designed to supply, when necessary, significantly higher powers, such as contactor inrush peaks.

Contactor inrush peaks can reach 10 to 20 times the required holding current. This leads to the transformer being oversized in relation to the continuous power it has to supply. The transformer must be sized so that the voltage drop at its terminals, caused by the inrush, remains within the permissible limits for the contactor to close properly.

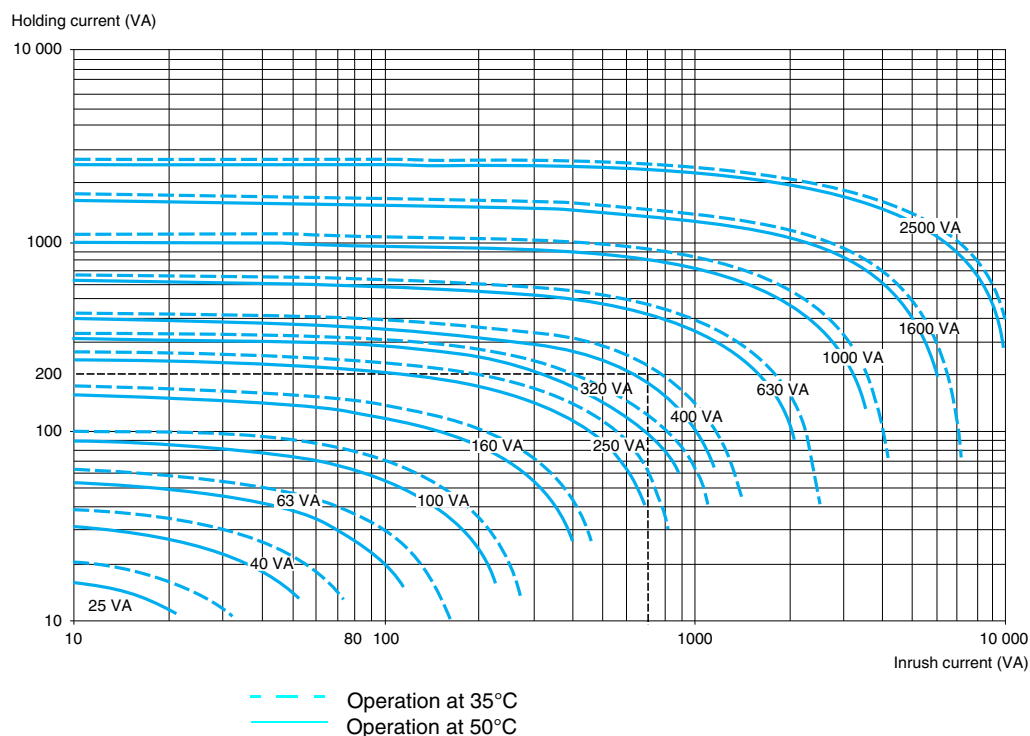
The two power values that need to be taken into account to determine which transformer rating to use are therefore:

- The continuous power the transformer has to supply
- The maximum inrush power it has to provide

In practice, only the sum of the holding currents and the largest contactor inrush current need to be considered.

For **ABL 6TS** transformers, the graph below can be used to select the appropriate rating according to these two currents. This ensures a maximum voltage drop of 5% at the moment of inrush, compatible with correct operation of the entire installation. However, these transformers have been designed for continuous operation at nominal load and at an ambient temperature of 50°C. A reduction in the ambient temperature may uprate the transformer, which, in some cases, allows a lower rating to be used. The graph below has therefore been drawn up for ambient temperatures of 35...50°C.

The inrush values of the contactor coils are given on the contactor control circuit characteristics pages.



Example: A device with a total holding current of 200 VA and inrush current of the largest contactor of 700 VA can be supplied by a 630 VA transformer if it is used at an ambient temperature of 50°C. A 400 VA transformer is sufficient if the ambient temperature is 35°C.

Technical characteristics


Type of transformer			ABT 7ESM●●●B							
			004	006	010	016	025	032	040	
Conformity to standards			IEC 61558-2-6, CE							
Product certifications			None							
Input circuit										
Input values	Nominal voltage	V	230 ~ single-phase with - 15 V and + 15 V connectors							
	Limit voltage	V	207...253 ~							
	Permissible frequencies	Hz	47...63							
	Efficiency at nominal load	%	74	82	83	87	89	90		
	Dissipated power at nominal load	W	14.1	13.8	20.5	23.9	30.9	39.6	44.4	
Output circuit										
Nominal output values	Voltage	V	24 ~							
	Power	VA	40	63	100	160	250	320	400	
Voltage variation at nominal load			%	13.50	11.60	9.25	6.12	5.04	5.08	4.29
Protection	Against short-circuits		External, depending on the power rating, (see page 78)							
	Against overloads									
	Against overvoltages									
Sustained overvoltage (no-load, hot state)		%	15.50	13.60	10.20	7.50	6.30	6.10	5	
Voltage drop (at nominal load)		%	15.80	14.13	11.04	7.42	6.25	6.50	5.75	
No-load losses		W	3.8	5.7	6.7	9.6	12.3	16.7	19.3	
Short-circuit voltage		%	16	13.30	11.30	9	8.30	6.20	5.50	
Operating and environmental characteristics										
Connections	Input	mm²	2 x 2.5...4 (AWG 14/11) + ground							
	Output	mm²	2 x 2.5...4 (AWG 14/11) + ground							
Mounting			On panel (4 Ø 5 mm)							
Operating position	Vertical plane		Vertical or horizontal position							
	Horizontal plane									
Degree of protection		Conforming to IEC/EN 60529	IP 20							
Environment	Operating temperature	°C	- 20...+ 40							
	Storage temperature	°C	- 40...+ 80							
	Maximum relative humidity		95% during operation							
Protection class according to VDE 0106 1			Class I							
Dielectric strength 50 Hz for 1 min	Input/output	V rms	5100 ~							
	Input/ground	V rms	3200 ~							
	Output/ground	V rms	3200 ~							
Electrical insulation class			Class B							

Technical characteristics																
Type of transformer			ABL 6TS													
			02●	04●	06●	10●	16●	25●	40●	63●	100●	160●	250●			
Conformity to standards	ABL TS●●●J/B (12/24 V ~)			IEC 61558-2-6, UL 506, C€												
	ABL TS●●●G/U (115/230 V ~)			IEC 61558-2-4, UL 506, C€												
Product certifications				UL												
Input circuit																
Input values	Nominal voltage		V	230 or 400 ~ single-phase with - 15 V and + 15 V connectors												
	Limit voltage		V	207...253 ~ or 360...440 ~												
	Permissible frequencies		Hz	47...63												
	Efficiency at nominal load		%	79	81	84	86	88	90	92	93	94	96	96		
	Dissipated power at nominal load			6.6	9.4	12.0	16.3	21.8	27.8	34.8	47.4	63.8	66.7	104.2		
Output circuit																
Nominal output values	Voltage		V	12, 24, 115 or 230 ~								24, 115 or 230 ~				
	Power		VA	25	40	63	100	160	250	400	630	1000	1600	2500		
Protection	Against short-circuits			External, depending on the power rating (see page 79)												
	Against overloads															
	Against overvoltages															
Sustained overvoltage (no-load, hot state)	Secondary voltage	12 V ~ (J)	%	16	14	9		7	5	—						
		24 V ~ (B)	%	15	11	9		7	6	4	3		2			
		115 V ~ (G)	%	15	12	9	8	6	5	4	3		2	3		
		230 V ~ (U)	%	9				7	5	4	3					
Voltage drop (at nominal load)	Secondary voltage	12 V ~ (J)	%	0.6	0	1.3	0.3	0.4	0.6	—						
		24 V ~ (B)	%	0.3	0.2	0.2	0.0	0.3	0.1	0.7	0.5	- 0.3	0.0	0.5		
		115 V ~ (G)	%	0	0.4	0.1	0.6	0.7	0.7	0.5	0.3	0.5	0.1	- 0.3		
		230 V ~ (U)	%	5.9	4	1.4	0.6	0.9	0.7	0.7	0.4	5	0.0	0.0		
No-load losses			W	3	4.4	5.3	7.1	9.1	12.5	12.4	18.9	26.5	23.7	23.4		
Short-circuit voltage	Secondary voltage	12 V ~ (J)	%	14.74	12.13	9.63	8	6.9	5.47	—						
		24 V ~ (B)	%	13.52	10.27	8.62	7.86	6.81	5.51	4.50	3.41	2.93	2.50	2.85		
		115 V ~ (G)	%	14.03	10.71	7.92	7.51	6.65	5.28	4.66	3.47	3.04	2.45	2.61		
		230 V ~ (U)	%	14.34	11.46	9.08	8.32	7.5	5.85	4.77	3.68	3.24	2.65	8.73		
Operating and environmental characteristics																
Connections	Primary		mm ²	4 (AWG 11)												
	Secondary	12 V ~ (J)	mm ²	4 (AWG 11)						—						
		24 V ~ (B)	mm ²	4 (AWG 11)						10 (AWG 6)			16 (AWG 4)	35 (AWG 2)		
		115 V ~ (G)	mm ²	4 (AWG 11)									10 (AWG 6)			
		230 V ~ (U)	mm ²	4 (AWG 11)												
Mounting	On panel			4 Ø 4.8 mm or on with ABL 6AM0● plate				4 Ø 5.8 mm			4 Ø 7 mm			4 Ø 10 mm		
Operating position	Vertical plane			Vertical or horizontal position												
	Horizontal plane			With derating to 90%												
Degree of protection	Conforming to IEC/EN 60529			IP 20												
Protective treatment				"TC"												
Environment	Operating temperature		°C	- 20...+ 50												
	Storage temperature		°C	- 40...+ 80												
Protection class according to VDE 0106 1				Class I												
Dielectric strength 50 Hz for 1 min	Primary/secondary		V rms	4000												
	Winding/ground		V rms	2000												
Electrical insulation class				Class F: ABL 6TS160● and ABL 6TS250●, Class B: other ABL 6TS references												

Power supplies and transformers


Safety and isolation transformers (25 to 2500 VA)
Universal range of transformers,
24 or 48 V ~ output voltage

Technical characteristics

Type of transformer			ABT 7PDU●●●B												
			002	004	006	010	016	025	032	040	063	100	160	250	
Conformity to standards			IEC 61558-2-6, UL 506, C €												
Product certifications			cURus, ENEC												
Input circuit															
Input values	Nominal voltage	V	230 or 400 ~ single-phase with - 15 V and + 15 V connectors												
	Limit voltage	V	207...253 ~ or 360...440 ~												
	Permissible frequencies	Hz	47...63												
	Efficiency at nominal load	%	74	79	83	86	88	90	91	90	90	92	94	96	
	Dissipated power at nominal load	W	8.8	10.6	12.9	16.3	21.8	27.8	31.6	44.4	70.0	87.0	102.1	104.2	
Diagnostics			LED (orange) indicating presence of voltage at the primary								–				
Output circuit															
Nominal output values	Voltage	V	24 or 48 ~ depending on connection												
	Power	VA	25	40	63	100	160	250	320	400	630	1000	1600	2500	
Voltage variation at nominal load	230 ~	%	9.12	6.16	4.79	4.04	3.29	3.12	3.12	3.66	4.16	3.37	2.7	1.45	
	400 ~	%	9.40	6.50	4.70	4.29	3.16	3.00	3.58	3.29	4.54	3.62	3.29	2.12	
Protection	Against short-circuits		External, depending on the power rating (see pages 80 and 81)												
	Against overloads														
	Against overvoltages														
Sustained overvoltage (no-load, hot state)		%	3.30	2.40	3.30	2.60	2.40	2.10	2.30	4.00	4.80	3.70	2.80	0.50	
Voltage drop (at nominal load)		%	9.54	6.00	3.88	3.63	2.83	2.50	2.79	3.79	4.37	4.46	3.71	2.29	
No-load losses		W	5.07	6.73	8.11	10.69	14.32	14.68	15.10	21.67	24.01	32.95	26.33	40.50	
Short-circuit voltage		%	15.10	10.60	7.50	6.60	6.80	6.50	6.70	4.00	5.00	4.70	4.00	2.80	
Operating and environmental characteristics															
Mounting	On panel		4 Ø 5.5 mm				4 Ø 6.5 mm			4 Ø 7 mm			4 Ø 10 mm		
	On  rail		35 x 15 mm					–							
Operating position	Vertical plane		Vertical or horizontal position												
	Horizontal plane		With derating to 90%												
Winding connection	Series or parallel		Via internal jumpers								Via external links				
Grounding of the secondary			Via internal jumper								–				
Degree of protection	Conforming to IEC/EN 60529		IP 20												
Environment	Operating temperature	°C	- 20...+ 60												
	Storage temperature	°C	- 40...+ 80												
	Maximum relative humidity		95% during operation												
Protection class according to VDE 0106 1			Class I												
Dielectric strength 50 Hz for 1 min	Input/output	V rms	5100 ~												
	Input/ground	V rms	3200 ~												
	Output/ground	V rms	3200 ~												
Electrical insulation class			Class B									Class F			

Power supplies and transformers

Safety and isolation transformers (25 to 2500 VA)
Universal range of transformers,
115 or 230 V ~ output voltage

Technical characteristics															
Type of transformer		ABT 7PDU●●●G													
		002	004	006	010	016	025	032	040	063	100	160	250		
Conformity to standards			IEC 61558-2-4, UL 506, C €												
Product certifications			cURus, ENEC												
Input circuit															
Input values	Nominal voltage	V	230 or 400 ~ single-phase with - 15 V and + 15 V connectors												
	Limit voltage	V	207...253 ~ or 360...440 ~												
	Permissible frequencies	Hz	47...63												
	Efficiency at nominal load	%	76	81	84	86	88	90	91	90	90	92	94	96	
	Dissipated power at nominal load	W	7.9	9.4	12.0	16.3	21.8	27.8	31.6	44.4	70.0	87.0	102.1	104.2	
Diagnostics			LED (orange) indicating presence of voltage at the primary								–				
Output circuit															
Nominal output values	Voltage	V	115 or 230 ~ depending on connection												
	Power	VA	25	40	63	100	160	250	320	400	630	1000	1600	2500	
Voltage variation at nominal load	230 ~	%	6.95	5.47	3.82	4.00	3.39	3.13	2.86	3.75	3.58	3.15	3.06	1.70	
	400 ~	%	7.73	5.73	4.26	4.17	3.30	3.13	3.13	3.90	4.17	3.40	2.86	1.89	
Protection	Against short-circuits		External, depending on the power rating (see pages 80 and 81)												
	Against overloads														
	Against overvoltages														
Sustained overvoltage (no-load, hot state)		%	5.40	4.20	2.50	4.90	2.50	1.80	1.40	3.30	4.90	3.50	2.70	1.50	
Voltage drop (at nominal load)		%	7.90	6.16	4.28	4.23	3.61	3.37	3.63	4.17	4.89	4.08	3.14	1.70	
No-load losses		W	4.89	5.93	7.37	11.26	9.53	13.68	15.68	21.28	23.55	31.09	26.38	31.60	
Short-circuit voltage		%	11.50	8.70	6.60	6.20	6.70	6.60	6.80	4.10	4.80	3.80	3.50	2.20	
Operating and environmental characteristics															
Mounting	On panel		4 Ø 5.5 mm				4 Ø 6.5 mm			4 Ø 7 mm			4 Ø 10 mm		
	On  rail		35 x 15 mm					–							
Operating position	Vertical plane		Vertical or horizontal position												
	Horizontal plane		With derating to 90%												
Winding connection	Series or parallel		Via internal jumpers								Via external links				
Grounding of the secondary			Via internal jumper								–				
Degree of protection	Conforming to IEC/EN 60529		IP 20												
Environment	Operating temperature	°C	- 20...+ 60												
	Storage temperature	°C	- 40...+ 80												
	Maximum relative humidity		95% during operation												
Protection class according to VDE 0106 1			Class I												
Dielectric strength 50 Hz for 1 min	Input/output	V rms	5100 ~												
	Input/ground	V rms	3200 ~												
	Output/ground	V rms	3200 ~												
Electrical insulation class			Class B									Class F			

Recommended protection for the primary

Protection by fuses

Transformer		230 V ~ single-phase input voltage	
Reference	Power (V ~)	Fuse carrier/isolator	
		MDL fuses UL Listed (1)	aM fuses
ABT 7ESM004B	40	0.3 A	0.5 A
ABT 7ESM006B	63	0.4 A	0.5 A
ABT 7ESM010B	100	0.6 A	1 A
ABT 7ESM016B	160	1 A	2 A
ABT 7ESM025B	250	1.25 A	2 A
ABT 7ESM032B	320	2 A	4 A
ABT 7ESM040B	400	2 A	6 A

Protection by thermal-magnetic circuit-breakers

Transformer		230 V ~ single-phase input voltage	
Reference	Power	Circuit-breaker	
		Telemecanique (2) GB2 (IEC)	Merlin Gerin C60N single-pole (IEC) (UL)
ABT 7ESM004B	40 VA	GB2●●05	17421
ABT 7ESM006B	63 VA	GB2●●05	17421
ABT 7ESM010B	100 VA	GB2●●06	24500
ABT 7ESM016B	160 VA	GB2●●06	24500
ABT 7ESM025B	250 VA	GB2 ●●07	17422
ABT 7ESM032B	320 VA	GB2 ●●07	17422
ABT 7ESM040B	400 VA	GB2 ●●08	24502

Recommended protection for the secondary

Protection by fuses

Transformer		24 V ~ secondary	
Reference	Power (V ~)	Fuses	
		gG	T
ABT 7ESM004B	40	1 A	1.6 A
ABT 7ESM006B	63	2 A	2.5 A
ABT 7ESM010B	100	4 A	4 A
ABT 7ESM016B	160	6 A	7 A
ABT 7ESM025B	250	10 A	10 A
ABT 7ESM032B	320	12 A	14 A
ABT 7ESM040B	400	16 A	20 A

Protection by thermal-magnetic circuit-breakers

Transformer		24 V ~ secondary	
Reference	Power	Circuit-breaker (1)	
		Telemecanique (2) GB2 (IEC)	Merlin Gerin C60N single-pole (IEC) (UL)
ABT 7ESM004B	40 VA	GB2 ●●07	24426
ABT 7ESM006B	63 VA	GB2 ●●08	24427
ABT 7ESM010B	100 VA	GB2 ●●10	24430
ABT 7ESM016B	160 VA	GB2 ●●12	24432
ABT 7ESM025B	250 VA	GB2 ●●20	24434
ABT 7ESM032B	320 VA	GB2 ●●21	24434
ABT 7ESM040B	400 VA	GB2 ●●22	24435

(1) For operation in compliance with UL.

(2) GB2 CB●●: single-pole, GB2 CD●●: 1 pole protected and 1 pole switched, GB2 DB●●: 2 poles protected. UL certification pending.

Recommended protection for the primary

Protection by fuses

Transformer		230 V ~ single-phase input voltage		400 V ~ single-phase input voltage	
Reference	Power (V ~)	Fuse carrier/isolator		Fuse carrier/isolator	
		MDL fuses UL Listed (1)	aM fuses	MDL fuses UL Listed (1)	aM fuses
ABL 6TS002●	25	2/10 A	0.5 A	15/100 A	0.5 A
ABL 6TS004●	40	1/4 A	0.5 A	15/100 A	0.5 A
ABL 6TS006●	63	4/10 A	0.5 A	2/10 A	0.5 A
ABL 6TS010●	100	6/10 A	1 A	3/10 A	0.5 A
ABL 6TS016●	160	1 A	2 A	1/2 A	1 A
ABL 6TS025●	250	1 1/2 A	2 A	8/10 A	1 A
ABL 6TS040●	400	2 A	4 A	12/10 A	2 A
ABL 6TS063●	630	3 2/10 A	6 A	2 A	4 A
ABL 6TS100●	1000	5 A	8 A	3 A	6 A
ABL 6TS160●	1600	8 A	10 A	5 A	8 A
ABL 6TS250●	2500	2 A	16 A	7 A	10 A

Protection by thermal-magnetic circuit-breakers

Transformer		230 V ~ single-phase input voltage		400 V ~ single-phase input voltage	
Reference	Power	Circuit-breaker		Circuit-breaker	
		Telemecanique (2) GB2 (IEC)	Merlin Gerin C60N single-pole (IEC) (UL)	Telemecanique (2) GB2 2-pole (IEC)	Merlin Gerin C60N 2-pole (IEC) (UL)
ABL 6TS002●	25 VA	GB2●●05	17421	GB2 DB05	17451
ABL 6TS004●	40 VA	GB2●●05	17421	GB2 DB05	17451
ABL 6TS006●	63 VA	GB2●●05	17421	GB2 DB05	17451
ABL 6TS010●	100 VA	GB2●●06	24500	GB2 DB05	17451
ABL 6TS016●	160 VA	GB2 ●●07	17422	GB2 DB06	24516
ABL 6TS025●	250 VA	GB2 ●●07	17422	GB2 DB06	24516
ABL 6TS040●	400 VA	GB2 ●●08	24502	GB2 DB07	24517
ABL 6TS063●	630 VA	GB2 ●●10	24503	GB2 DB08	24518
ABL 6TS100●	1000 VA	GB2 ●●14	24504	GB2 DB09	24519
ABL 6TS160●	1600 VA	GB2 ●●20	—	GB2 DB14	24520
ABL 6TS250●	2500 VA	—	—	GB2 DB20	24522

Recommended protection for the secondary

Protection by fuses

Transformer		12 V ~ secondary		24 V ~ secondary		48 V ~ secondary		115 V ~ secondary		230 V ~ secondary	
Reference	Power (V ~)	Fuses gG T		Fuses gG T		Fuses gG T		Fuses gG T		Fuses gG T	
ABL 6TS002●	25	2 A	2 A	1 A	1 A	0.5 A	0.5 A	—	0.2 A	—	0.1 A
ABL 6TS004●	40	4 A	3.15 A	1 A	1.6 A	0.5 A	0.8 A	—	0.315 A	—	0.16 A
ABL 6TS006●	63	6 A	5 A	2 A	2.5 A	1 A	1.25 A	0.5 A	0.5 A	—	0.25 A
ABL 6TS010●	100	8 A	—	4 A	4 A	2 A	2 A	0.5 A	0.8 A	—	0.4 A
ABL 6TS016●	160	12 A	—	6 A	—	2 A	3.15 A	1 A	1.4 A	0.5 A	0.63 A
ABL 6TS025●	250	20 A	—	10 A	—	4 A	5 A	2 A	2 A	1 A	1 A
ABL 6TS040●	400	—	—	16 A	—	8 A	—	2 A	3.15 A	1 A	1.6 A
ABL 6TS063●	630	—	—	25 A	—	12 A	—	4 A	5 A	2 A	2.5 A
ABL 6TS100●	1000	—	—	40 A	—	20 A	—	8 A	—	4 A	4 A
ABL 6TS160●	1600	—	—	63 A	—	32 A	—	12 A	—	6 A	—
ABL 6TS250●	2500	—	—	100 A	—	50 A	—	20 A	—	10 A	—

Protection by thermal-magnetic circuit-breakers

Transformer		12 V secondary	24 V ~ secondary	48 V ~ secondary	115 V ~ secondary	230 V ~ secondary
Reference	Power	Circuit-breaker (2)	Circuit-breaker (2)	Circuit-breaker (2)	Circuit-breaker (2)	Circuit-breaker (2)
ABL 6TS002●	25 VA	GB2 ●●07 24426	GB2●●06 24425	—	—	—
ABL 6TS004●	40 VA	GB2 ●●09 24428	GB2 ●●07 24426	—	—	—
ABL 6TS006●	63 VA	GB2 ●●10 24430	GB2 ●●08 24427	—	—	—
ABL 6TS010●	100 VA	GB2 ●●14 24432	GB2 ●●09 24428	—	—	—
ABL 6TS016●	160 VA	— 24434	GB2 ●●12 24430	—	—	—
ABL 6TS025●	250 VA	— 24435	GB2 ●●16 24432	—	—	—
ABL 6TS040●	400 VA	— —	— 24434	—	—	—
ABL 6TS063●	630 VA	— —	— 24436	—	—	—
ABL 6TS100●	1000 VA	— —	— 24438	—	—	—
ABL 6TS160●	1600 VA	— —	— 24440	—	—	—
ABL 6TS250●	2500 VA	— —	— —	—	—	—

(1) For operation in compliance with UL.

(2) Telemecanique circuit-breaker (IEC), GB2 CB●●: single-pole, GB2 CD●●: 1 pole protected and 1 pole switched, GB2 DB●●: 2 poles protected. UL certification pending. Merlin Gerin circuit-breaker (IEC, UL), 24●●●.

Recommended protection for the primary

Protection by fuses

Transformer		230 V ~ single-phase input voltage		400 V ~ single-phase input voltage	
		Fuse carrier/isolator		Fuse carrier/isolator	
		MDL fuses UL Listed (1)	aM fuses	MDL fuses UL Listed (1)	aM fuses
Reference	Power (V ~)				
ABT 7PDU002●	25	0.2 A	0.25 A	0.15 A	0.25 A
ABT 7PDU004●	40	0.25 A	0.25 A	0.2 A	0.25 A
ABT 7PDU006●	63	0.4 A	0.25 A	0.3 A	0.25 A
ABT 7PDU010●	100	0.6 A	0.5 A	0.4 A	0.5 A
ABT 7PDU016●	160	1 A	0.5 A	0.6 A	0.5 A
ABT 7PDU025●	250	1.5 A	1 A	1 A	1 A
ABT 7PDU032●	320	2 A	1 A	1.25 A	1 A
ABT 7PDU040●	400	2.5 A	2 A	1.5 A	2 A
ABT 7PDU063●	630	4 A	2 A	2.5 A	2 A
ABT 7PDU100●	1000	6 A	4 A	3.5 A	4 A
ABT 7PDU160●	1600	8 A	6 A	5 A	6 A
ABT 7PDU250●	2500	–	8 A	8 A	8 A

Protection by thermal-magnetic circuit-breakers

Transformer		230 V ~ single-phase input voltage		400 V ~ single-phase input voltage	
		Circuit-breaker		Circuit-breaker	
		Telemecanique (2) GB2 (IEC)	Merlin Gerin C60N single-pole (IEC) (UL)	Telemecanique (2) GB2 (IEC)	Merlin Gerin C60N single-pole (IEC) (UL)
Reference	Power				
ABT 7PDU002B/G	25 VA	GB2●●05	17421	GB2 DB05	17451
ABT 7PDU004B/G	40 VA	GB2●●05	17421	GB2 DB05	17451
ABT 7PDU006B/G	63 VA	GB2●●05	17421	GB2 DB05	17451
ABT 7PDU010B/G	100 VA	GB2●●06	24500	GB2 DB05	17451
ABT 7PDU016B/G	160 VA	GB2●●06	24500	GB2 DB06	24516
ABT 7PDU025B/G	250 VA	GB2 ●●07	17422	GB2 DB06	24516
ABT 7PDU032B/G	320 VA	GB2 ●●07	17422	GB2 DB06	24516
ABT 7PDU040B/G	400 VA	GB2 ●●08	24502	GB2 DB07	24517
ABT 7PDU063B/G	630 VA	GB2 ●●09	24503	GB2 DB07	24517
ABT 7PDU100B/G	1000 VA	GB2 ●●12	24504	GB2 DB08	24518
ABT 7PDU160B/G	1600 VA	GB2 ●●14	–	GB2 DB10	24520
ABT 7PDU250B/G	2500 VA	GB2 ●●20	–	GB2 DB14	24522

(1) For operation in compliance with UL.

(2) GB2 CB●● : single-pole, GB2 CD●●: 1 pole protected and 1 pole switched, GB2 DB●●: 2 poles protected. UL certification pending.

Recommended protection for the secondary

Protection by fuses

Transformer Reference	Power (V ~)	2 x 24 V ~ secondary				2 x 115 V ~ secondary			
		Parallel connection		Series connection		Parallel connection		Series connection	
		Fuses gG	T	Fuses gG	T	Fuses gG	T	Fuses MDL	aM
ABT 7PDU002●	25	1 A	1 A	0.5 A	0.5 A	0.5 A	0.4 A	0.2 A	0.25 A
ABT 7PDU004●	40	1 A	1.6 A	0.5 A	0.8 A	0.5 A	0.5 A	0.25 A	0.25 A
ABT 7PDU006●	63	2 A	2.5 A	1 A	1.25 A	0.5 A	0.8 A	0.4 A	0.25 A
ABT 7PDU010●	100	4 A	4 A	2 A	2 A	0.5 A	1.25 A	0.6 A	0.5 A
ABT 7PDU016●	160	6 A	7 A	2 A	3.15 A	1 A	2 A	1 A	0.5 A
ABT 7PDU025●	250	10 A	10 A	4 A	5 A	2 A	3 A	1.5 A	1 A
ABT 7PDU032●	320	12 A	14 A	6 A	7 A	2 A	4 A	2 A	1 A
ABT 7PDU040●	400	16 A	20 A	8 A	10 A	2 A	5 A	2.5 A	2 A
ABT 7PDU063●	630	25 A	30 A	12 A	14 A	4 A	8 A	4 A	2 A
ABT 7PDU100●	1000	40 A	—	20 A	20 A	8 A	10 A	6 A	4 A
ABT 7PDU160●	1600	63 A	—	32 A	—	12 A	15 A	8 A	6 A
ABT 7PDU250●	2500	100 A	—	50 A	—	20 A	25 A	12 A	8 a

Protection by thermal-magnetic circuit-breakers

Transformer Reference	Power	24 V ~ secondary		48 V ~ secondary		115 V ~ secondary		230 V ~ secondary	
		Circuit-breaker (1)		Circuit-breaker (1)		Circuit-breaker (1)		Circuit-breaker (1)	
ABT 7PDU002B	25 VA	GB2 ●●07	24426	GB2●●06	24425	—	—	—	—
ABT 7PDU004B	40 VA	GB2 ●●07	24426	GB2●●06	24425	—	—	—	—
ABT 7PDU006B	63 VA	GB2 ●●08	24427	GB2 ●●07	24426	—	—	—	—
ABT 7PDU010B	100 VA	GB2 ●●10	24430	GB2 ●●08	24427	—	—	—	—
ABT 7PDU016B	160 VA	GB2 ●●12	24432	GB2 ●●09	24428	—	—	—	—
ABT 7PDU025B	250 VA	GB2 ●●20	24434	GB2 ●●12	24430	—	—	—	—
ABT 7PDU032B	320 VA	GB2 ●●21	24434	GB2 ●●14	24432	—	—	—	—
ABT 7PDU040B	400 VA	GB2 ●●22	24435	GB2 ●●16	24432	—	—	—	—
ABT 7PDU063B	630 VA	—	24437	GB2 ●●21	24434	—	—	—	—
ABT 7PDU100B	1000 VA	—	24439	—	24436	—	—	—	—
ABT 7PDU160B	1600 VA	—	—	—	24438	—	—	—	—
ABT 7PDU250B	2500 VA	—	—	—	24440	—	—	—	—
ABT 7PDU002G	25 VA	—	—	—	—	GB2●●05	24425	GB2●●05	24425
ABT 7PDU004G	40 VA	—	—	—	—	GB2●●05	24425	GB2●●05	24425
ABT 7PDU006G	63 VA	—	—	—	—	GB2●●06	24425	GB2●●05	24425
ABT 7PDU010G	100 VA	—	—	—	—	GB2●●06	24425	GB2●●05	24425
ABT 7PDU016G	160 VA	—	—	—	—	GB2 ●●07	24426	GB2●●06	24425
ABT 7PDU025G	250 VA	—	—	—	—	GB2 ●●08	24427	GB2 ●●07	24426
ABT 7PDU032G	320 VA	—	—	—	—	GB2 ●●08	24427	GB2 ●●07	24426
ABT 7PDU040G	400 VA	—	—	—	—	GB2 ●●09	24428	GB2 ●●07	24426
ABT 7PDU063G	630 VA	—	—	—	—	GB2 ●●12	24430	GB2 ●●08	24427
ABT 7PDU100G	1000 VA	—	—	—	—	GB2 ●●16	24430	GB2 ●●10	24430
ABT 7PDU160G	1600 VA	—	—	—	—	GB2 ●●21	24434	GB2 ●●14	24432
ABT 7PDU250G	2500 VA	—	—	—	—	—	24438	GB2 ●●20	24434

(1) Telemecanique circuit-breaker (IEC), GB2 CB●●: single-pole, GB2 CD●●: 1 pole protected and 1 pole switched, GB2 DB●●: 2 poles protected. UL certification pending. Merlin Gerin circuit-breaker (IEC, UL), 241●●.



ABT 7ESM000B



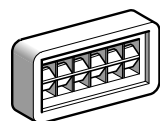
ABL 6TS000



ABT 7PDU002...032



ABT 7PDU040...250



AR1 SB3

Transformers with phase-to-neutral (N-L1) or phase-to-phase (L1-L2) connection

Input voltage	Secondary Type	Voltage	Nominal power	Reference to be completed (1)	Secondary voltage marking	Weight kg
Economic range of transformers						
230 V \pm 15 V single-phase, 50/60 Hz	Single winding	24 V (B)	40 VA	ABT 7ESM004B	–	1.020
			63 VA	ABT 7ESM006B	–	1.140
			100 VA	ABT 7ESM010B	–	1.900
			160 VA	ABT 7ESM016B	–	2.720
			250 VA	ABT 7ESM025B	–	3.540
			320 VA	ABT 7ESM032B	–	4.080
			400 VA	ABT 7ESM040B	–	5.100

Optimum range of transformers

230/400 V \pm 15 V single-phase 50/60 Hz	Single winding	12 V (J) or 24 V (B) or 115 V (G) or 230 V (U)	25 VA	ABL 6TS020	J B G U	0.700
			40 VA	ABL 6TS040	J B G U	1.200
			63 VA	ABL 6TS060	J B G U	1.600
			100 VA	ABL 6TS100	J B G U	2.100
			160 VA	ABL 6TS160	J B G U	3.200
			250 VA	ABL 6TS250	J B G U	4.400
			400 VA	ABL 6TS400	B G U	6.500
			630 VA	ABL 6TS630	B G U	9.800
			1000 VA	ABL 6TS1000	B G U	14.300
			1600 VA	ABL 6TS1600	B G U	19.400
			2500 VA	ABL 6TS2500	B G U	27.400

Universal range of transformers

With cover, connected by internal jumpers with LED indicators

230/400 V \pm 15 V single-phase 50/60 Hz	Double winding	2 x 24 V (B) or 2 x 115 V (G)	25 VA	ABT 7PDU0020	B G	1.100
			40 VA	ABT 7PDU0040	B G	1.400
			63 VA	ABT 7PDU0060	B G	1.940
			100 VA	ABT 7PDU0100	B G	2.860
			160 VA	ABT 7PDU0160	B G	4.400
			250 VA	ABT 7PDU0250	B G	5.600
			320 VA	ABT 7PDU0320	B G	7.100

Without cover, connected by external jumpers

230/400 V \pm 15 V single-phase 50/60 Hz	Double winding	2 x 24 V (B) or 2 x 115 V (G)	400 VA	ABT 7PDU0400	B G	7.400
			630 VA	ABT 7PDU0630	B G	7.900
			1000 VA	ABT 7PDU1000	B G	14.000
			1600 VA	ABT 7PDU1600	B G	20.000
			2500 VA	ABT 7PDU2500	B G	28.000

Separate parts

Designation	Use	Order in multiples of	Unit reference	Weight kg
Plates for mounting on rail	Optimum ABL 6TS020	5	ABL 6AM00	0.045
	Economic ABT 7ESM004B/006B	5	ABL 6AM01	0.050
	Optimum ABL 6TS040	5	ABL 6AM02	0.055
	Optimum ABL 6TS060	5	ABL 6AM03	0.065
	Economic ABT 7ESM010B	5	ABL 6AM04	0.085
	Optimum ABL 6TS100	5		
	Economic ABT 7ESM016B	5		
Self-adhesive marker tag holder	20 x 10 mm	50	AR1 SB3	0.001

Replacement parts

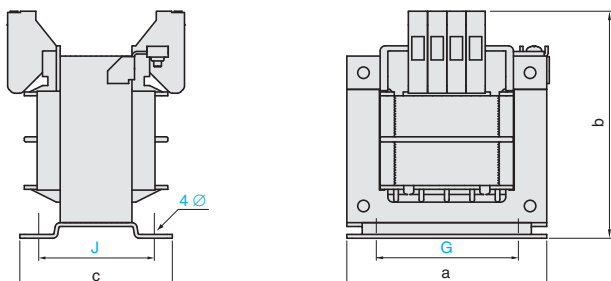
Designation	Use	Reference	Weight kg
Pack of 10 jumpers	Universal range double-winding transformer	ABT 7JMP01	0.010

(1) Reference to be completed with the marking on the secondary voltage.

Dimensions

Economic range of transformers

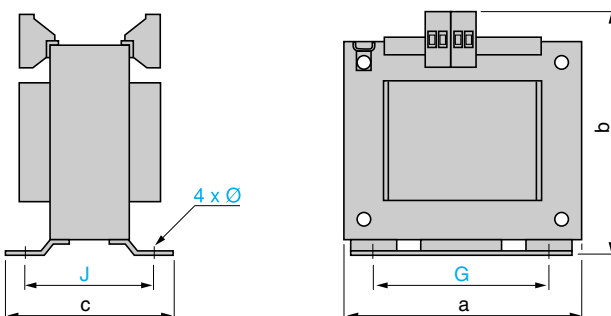
ABT 7ESM00●B/01●B/025B/032B/040B



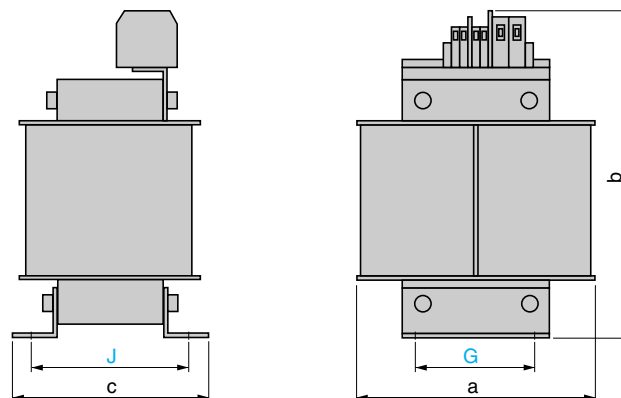
ABT	a	b	c	G	J	Ø
7ESM004B	79	90	70	56	48	5
7ESM006B	79	90	70	56	48	5
7ESM010B	85	94	86	64	67	5
7ESM016B	97	104	92	84	78	5
7ESM025B	98	106	105	84	86	5
7ESM032B	121	122	92	90	75	5
7ESM040B	121	122	103	90	86	5

Optimum range of transformers

ABL 6TS002● to ABL 6TS100●

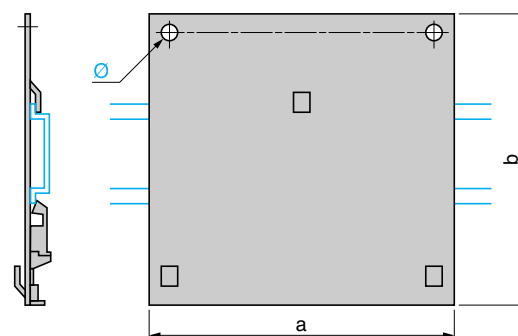


ABL 6TS160● and ABL 6TS250●



ABL	a	b	c	G	J	Ø
6TS02●	66	90	55	55	42	4.8
6TS04●	78	90	68	56	47.5	4.8
6TS06●	78	90	80	56	56	4.8
6TS10●	85	94	86	64	65.5	4.8
6TS16●	106	109	81	80.5	63	5.8
6TS25●	120	122	85	90	74.5	5.8
6TS40●	136	140	120	104	87	5.8
6TS63●	150	152	138	122	107.5	7
6TS100●	174	180	146	135	111.5	7
6TS160●	174	221	167	135	138	7
6TS250●	198	335	145	125	117	10

ABL 6AM0● mounting plates



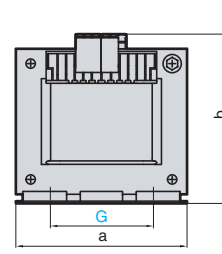
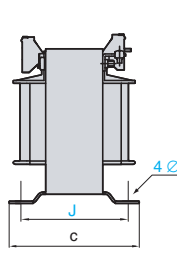
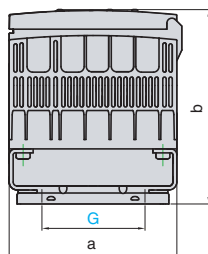
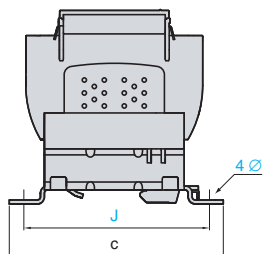
	a	b	Ø
ABL 6AM00	68	70	4
ABL 6AM01	78	70	4
ABL 6AM02	78	74	4
ABL 6AM03	84	78	4
ABL 6AM04	96	91	5

Dimensions (continued)

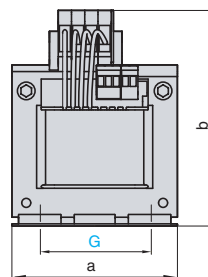
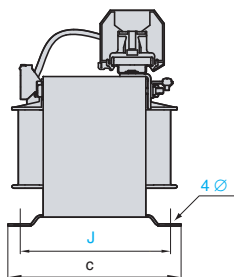
ABT 7PDU000 transformers

ABT 7PDU002/004/006/010/025/032

ABT 7PDU040/063/1006/1606/2506



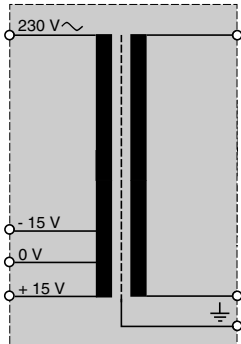
ABT 7PDU100B/160B/250B



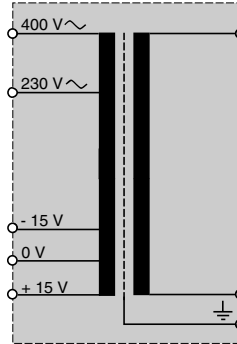
ABT	a	b	c	G	J	Ø
7PDU002	85	98	108	60	96	5.5
7PDU004	87	104	108	60	96	5.5
7PDU006	87	116	108	60	96	5.5
7PDU010	87	139	108	60	96	5.5
7PDU016	123	128	153	82	136	6.5
7PDU025	123	142	153	82	136	6.5
7PDU032	123	160	153	82	136	6.5
7PDU040B	151	160	113	122	95	7
7PDU040G	151	146	113	122	95	7
7PDU063B	151	166	125	122	95	7
7PDU063G	151	146	113	122	95	7
7PDU100B	151	197	157	122	140	7
7PDU100G	151	146	156	122	140	7
7PDU160B	175	222	170	135	145	7
7PDU160G	175	162	168	135	145	7
7PDU250B	193	245	188	150	150	10
7PDU250G	193	206	188	150	150	10

Internal schemes

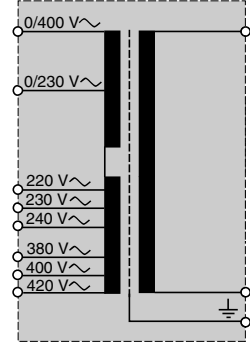
ABT 7ESM004B to ABT 7ESM040B



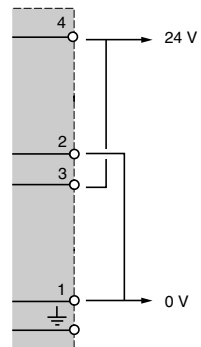
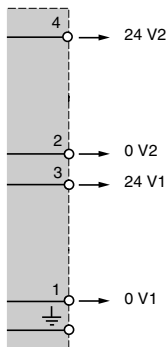
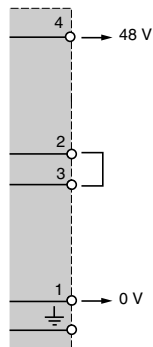
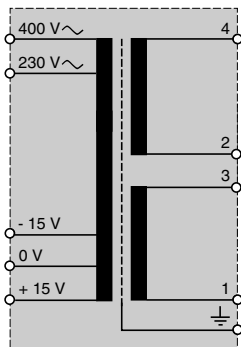
ABL 6TS002● to ABL 6TS160●



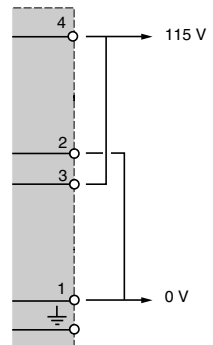
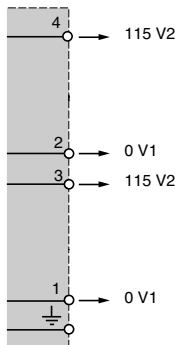
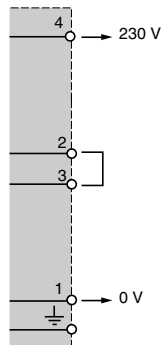
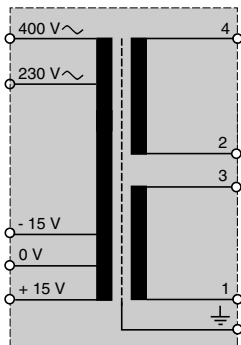
ABL 6TS250●



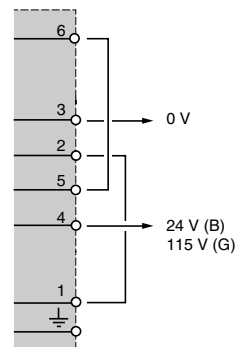
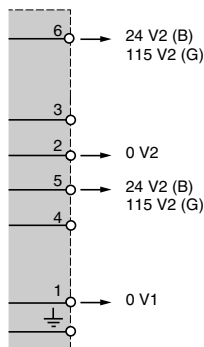
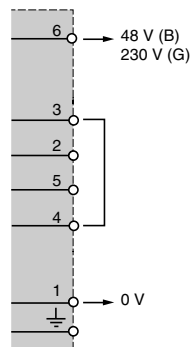
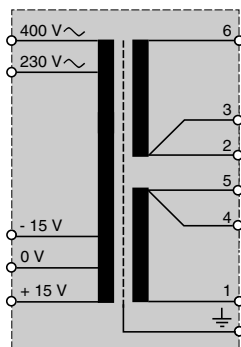
ABT 7PDU002B to ABT 7PDU032B, ABT 7PDU100B to ABT 7PDU250B



ABT 7PDU002G to ABT 7PDU032G



ABT 7PDU040B and ABT 7PDU063B, ABT 7PDU040G to ABT 7PDU250G



Technical information

Automation products certifications





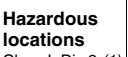

In some countries, certification of certain electrical components is enforced by law. A standard conformity certificate is then issued by the official organization. Each certified product must carry approval symbols when enforced. Use on board merchant navy vessels generally requires prior approval (= certification) of an electrical device by certain marine classification authorities.

Key	Certification body	Country
CSA	Canadian Standards Association	Canada
C-Tick	Australian Communication Authority	Australia
GOST	Gost Standard Scientific Research Institute	C.I.S., Russia
UL	Underwriters Laboratories	USA
Key	Classification authority	Country
IACS	International Association of Classification Societies	International
ABS	American Bureau of Shipping	USA
BV	Bureau Veritas	France
DNV	Det Norske Veritas	Norway
GL	Germanischer Lloyd	Germany
LR	Lloyd's Register	United Kingdom
RINA	Registro Italiano Navale	Italy
RMRS	Russian Maritime Register of Shipping	C.I.S.

The table below shows the situation as at 01.09.2007 for certifications obtained or pending from organizations for base PLCs. An overview of certificates for Telemecanique products is available on our Internet website:

www.telemecanique.com

Product certifications

	Approvals					
	 UL USA	 CSA Canada	 ACA Australia	 GOST CIS, Russia	 Hazardous locations Class I, Div 2 (1) USA, Canada	 ATEX Europe
Advantys OTB						
Advantys STB					FM	
Advantys Telefast ABE 7						
ConneXium					(2)	
Magelis iPC	(3)				UL	
Magelis XBT GT						Cat 3 G-D
Magelis XBT F/FC/HM/PM						
Magelis XBT N/R					CSA/UL	Cat 3 G-D
Modicon M340					CSA	
Modicon Momentum						
Modicon Premium				(2)	CSA	
Modicon Quantum				(2)	FM (2)	
Modicon TSX Micro						
Phaseo	(3) (4)					
Twido	(5)	(5)			CSA/UL (5)	

(1) **Hazardous locations:** UL 1604, CSA 22.2 no. 213 or FM 3611, certified products are acceptable for use in hazardous locations of Class I, division 2, groups A, B, C and D or unclassified only.

(2) Depending on product, consult our website: www.telemecanique.com

(3) **cULus** North American certification (Canada and USA).

(4) Except Universal power supplies and Function modules: UL certification pending.

(5) Except TWD NCO1M CANopen module, only C€.








Local certifications		
BG	Germany	TSX DPZ 10D2A safety module (Modicon TSX Micro). TSX PAY 262/282 safety modules (Modicon Premium).
SIMTARS	Australia	Modicon TSX Micro automation platform Modicon Premium automation platform (PL7)
AS-Interface	Europe	TWD NOI 10M3 master module (Twido). TSX SAZ 10 master module (ModiconTSX Micro). TSX SAY 1000 master modules (Modicon Premium).

Technical information

Automation products certifications

Community regulations

Marine classification

	Marine classification authorities						
	 ABS	 BV	 DNV	 GL	 LR	 RINA	 RMRS
	USA	France	Norway	Germany	UK	Italy	C.I.S.
Advantys OTB							
Advantys STB	(1)						
Advantys Telefast ABE 7							
ConneXium				(2)			
Magelis iPC							
Magelis XBT GT							
Magelis XBT F/FC/HM/PM							
Magelis XBT N/R							
Modicon M340							
Modicon Momentum							
Modicon Premium (3)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Modicon Quantum				(2)		(2)	
Modicon TSX Micro							
Phaseo							
Twido			(2)	(2)	(2)		

(1) Also meets US Navy requirements, **ABS-NRV** part 4.

(2) Depending on product, consult our website: www.telemecanique.com

(3) Modicon Premium, also **KRS** (Korean register of Shipping) certified.

Community regulations

European directives

The opening of European markets implies a harmonization of regulations in the various European Union member states.

European Directives are documents used to remove obstacles to the free movement of goods and their application is compulsory in all states of the European Union. Member states are obliged to transcribe each Directive into their national legislation and, at the same time, to withdraw any conflicting regulations.

The Directives, particularly those of a technical nature with which we are concerned, only set objectives, called "general requirements".

The manufacturer must take all necessary measures to ensure that his products conform to the requirements of each Directive relating to his equipment.

As a general rule, the manufacturer affirms that his product conforms to the necessary requirements of the Directive(s) by applying the **CE** marking. The **CE** marking is applied to Telemecanique products where relevant.

The significance of **CE** marking

- The **CE** marking on a product means that the manufacturer certifies that his product conforms to the relevant European Directives; it is necessary in order that a product which is subject to a Directive(s) can be marketed and freely moved within the European Union.
- The **CE** marking is intended solely for the national authorities responsible for market regulation.

For electrical equipment, conformity of the product to standards indicates that it is suitable for use. Only the guarantee of a recognized manufacturer provides an assurance of high quality.

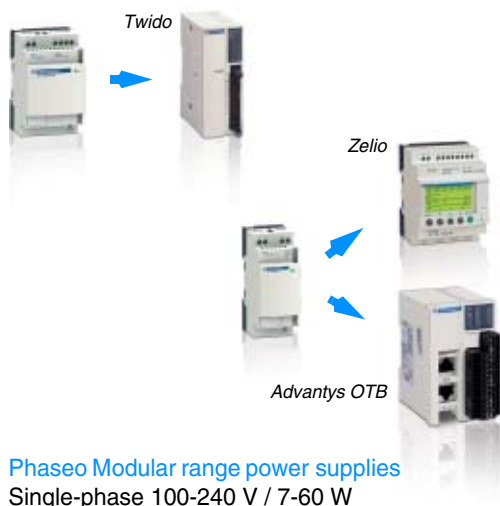
One or more Directives, as appropriate, may apply to our products, in particular:

- The Low Voltage Directive 72/23/EEC amended by Directive 93/68/EEC: The **CE** marking under the terms of this Directive is compulsory as of January 1, 1997.
- The Electromagnetic Compatibility Directive 89/336/EEC, amended by Directives 92/31/EEC and 93/68/EEC: The **CE** marking on the products covered by this Directive has been compulsory since January 1, 1996.
- Directive **CE** ATEX 94/9/EC.

A		L		S	
ABL 1A01	58	ABT 7ESM025B	82	LAD 90	17, 31,
ABL 1A02	31, 44 and 58	ABT 7ESM032B	82		36, 44 and 48
ABL 1REM12050	58	ABT 7ESM040B	82	SR2 MEM02	31 and 44
ABL 1REM24025	58	ABT 7JMP01	82		
ABL 1REM24042	58	ABT 7PDU002●	82		
ABL 1REM24062	58	ABT 7PDU004●	82		
ABL 1REM24100	58	ABT 7PDU006●	82		
ABL 1RPM12083	58	ABT 7PDU010●	82		
ABL 1RPM24042	58	ABT 7PDU016●	82		
ABL 1RPM24062	58	ABT 7PDU025●	82		
ABL 1RPM24100	58	ABT 7PDU032●	82		
ABL 6AM00	82	ABT 7PDU040●	82		
ABL 6AM01	82	ABT 7PDU063●	82		
ABL 6AM02	82	ABT 7PDU100●	82		
ABL 6AM03	82	ABT 7PDU160●	82		
ABL 6TS02●	82	ABT 7PDU250●	82		
ABL 6TS04●	82	AR1 SB3	70 and 82		
ABL 6TS06●	82	ASI ABLB3002	63		
ABL 6TS100●	82	ASI ABLB3004	63		
ABL 6TS10●	82	ASI ABLD3002	63		
ABL 6TS160●	82	ASI ABLD3004	63		
ABL 6TS16●	82	ASI ABLM3024	63		
ABL 6TS250●	82	ASI20 MACC5	31 and 52		
ABL 6TS25●	82				
ABL 6TS40●	82				
ABL 6TS63●	82				
ABL 7RM24025	17				
ABL 7RP1205	23				
ABL 7RP4803	23				
ABL 8BBU24200	31 and 44				
ABL 8BBU24400	31 and 44				
ABL 8BBU24400	44				
ABL 8BPK24A03	31 and 44				
ABL 8BPK24A07	31 and 44				
ABL 8BPK24A12	31 and 44				
ABL 8BUF24400	31 and 44				
ABL 8DCC05060	31 and 36				
ABL 8DCC12020	31 and 36				
ABL 8FEQ24005	70				
ABL 8FEQ24010	70				
ABL 8FEQ24020	70				
ABL 8FEQ24040	70				
ABL 8FEQ24060	70				
ABL 8FEQ24100	70				
ABL 8FEQ24150	70				
ABL 8FEQ24200	70				
ABL 8FUS01	31 and 52				
ABL 8FUS02	31 and 44				
ABL 8MEM05040	17				
ABL 8MEM12020	17				
ABL 8MEM24003	17				
ABL 8MEM24006	17				
ABL 8MEM24012	17				
ABL 8PRP24100	31 and 52				
ABL 8RED24400	31 and 48				
ABL 8REM24030	23				
ABL 8REM24050	23				
ABL 8RPM24200	31				
ABL 8RPS24030	31				
ABL 8RPS24050	31				
ABL 8RPS24100	31				
ABL 8TEQ24100	70				
ABL 8TEQ24200	70				
ABL 8TEQ24300	70				
ABL 8TEQ24400	70				
ABL 8TEQ24600	70				
ABL 8WPS24200	31				
ABL 8WPS24400	31				
ABT 7ESM004B	82				
ABT 7ESM006B	82				
ABT 7ESM010B	82				
ABT 7ESM016B	82				

Substitution table

Old reference	New reference	Fonctionnal characteristics, to check in case of product substitution
Regulated switch mode power supplies		
ABL 7RM1202	ABL 8MEM12020	Distance of fixing
ABL 7RM2401	ABL 8MEM24012	Distance of fixing
ABL 7RM24025	ABL 7RM24025	–
ABL 7CEM24003	ABL 8MEM24003	Dimensions, location and size of terminal blocks
ABL 7CEM24006	ABL 8MEM24006	Dimensions, location and size of terminal blocks
ABL 7CEM24012	ABL 8MEM24012	Dimensions, location and size of terminal blocks
ABL 7RE2402	ABL 8REM24030	–
ABL 7RE2403	ABL 8REM24030	–
ABL 7RE2405	ABL 8REM24050	–
ABL 7RE2410	ABL 8RPS24100	Depth of cabinet, location and number of connecting terminals
ABL 7RP2403	ABL 8RPS24030	Location of terminal blocks
ABL 7RP2405	ABL 8RPS24050	Location of terminal blocks
ABL 7RP2410	ABL 8RPS24100	Depth of cabine, location and number of connecting terminals
ABL 7REQ24050	ABL 8RPS24050	Height of product, location of terminal blocks
ABL 7REQ24100	ABL 8RPS24100	Dimensions, location of terminal blocks
ABL 7UEQ24100	ABL 8RPS24100	Raccordement au réseau, dimensions, location of terminal blocks
ABL 7UEQ24200	ABL 8WPS24200	Dimensions, type of fixing, location of terminal blocks
ABL 7UES24050	ABL 8RPS24050	Connection to line supply, height of product, location of terminal blocks
ABL 7UPS24100	ABL 8RPS24100	Connection to line supply, dimensions, location of terminal blocks
ABL 7UPS24200	ABL 8WPS24200	Dimensions, type of fixing, location of terminal blocks
ABL 7UPS24400	ABL 8WPS24400	Dimensions, type of fixing, location of terminal blocks
ABL 1●●●	ABL 1●●●	–
ASI ABL●●●	ASI ABL●●●	–
Rectified and filtered power supplies		
ABL 6RF2401	ABL 8FEQ24010	Dimensions, distance of fixing
ABL 6RF2402	ABL 8FEQ24020	Dimensions, distance of fixing
ABL 6RF2405	ABL 8FEQ24060	Dimensions, distance of fixing
ABL 6RF2410	ABL 8FEQ24100	Dimensions, distance of fixing
ABL 6RF2415	ABL 8FEQ24150	Dimensions, distance of fixing
ABL 6RF2420	ABL 8FEQ24200	Dimensions, distance of fixing
ABL 6RT2410	ABL 8TEQ24100	Dimensions, distance of fixing
ABL 6RT2420	ABL 8TEQ24200	Dimensions, distance of fixing
ABL 6RT2430	ABL 8TEQ24300	Dimensions, distance of fixing
ABL 6RT2440	ABL 8TEQ24400	Dimensions, distance of fixing
Safety and isolation transformers		
ABL 6TS●●●	ABL 6TS●●●	–
ABL 6TD02B/02BP	ABT 7PDU002B	Dimensions, distance of fixing
ABL 6TD02G/02GP	ABT 7PDU002G	Dimensions, distance of fixing
ABL 6TD04B/04BP	ABT 7PDU004B	Dimensions, distance of fixing
ABL 6TD04G/04GP	ABT 7PDU004G	Dimensions, distance of fixing
ABL 6TD06B/06BP	ABT 7PDU006B	Dimensions, distance of fixing
ABL 6TD06G/06GP	ABT 7PDU006G	Dimensions, distance of fixing
ABL 6TD10B/10BP	ABT 7PDU010B	Dimensions, distance of fixing
ABL 6TD10G/10GP	ABT 7PDU010G	Dimensions, distance of fixing
ABL 6TD16B	ABT 7PDU016B	Dimensions, distance of fixing
ABL 6TD16G	ABT 7PDU016G	Dimensions, distance of fixing
ABL 6TD25B	ABT 7PDU025B	Dimensions, distance of fixing
ABL 6TD25G	ABT 7PDU025G	Dimensions, distance of fixing
ABL 6TD40B	ABT 7PDU040B	Dimensions, distance of fixing
ABL 6TD40G	ABT 7PDU040G	Dimensions, distance of fixing
ABL 6TD63B	ABT 7PDU063B	Dimensions, distance of fixing
ABL 6TD63G	ABT 7PDU063G	Dimensions, distance of fixing
ABL 6TD100B	ABT 7PDU100B	Dimensions, distance of fixing
ABL 6TD100G	ABT 7PDU100G	Dimensions, distance of fixing
ABL 6TD160B	ABT 7PDU160B	Dimensions, distance of fixing
ABL 6TD160G	ABT 7PDU160G	Dimensions, distance of fixing
ABL 6TD250B	ABT 7PDU250B	Dimensions, distance of fixing
ABL 6TD250G	ABT 7PDU250G	Dimensions, distance of fixing



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