Power supplies and transformers

Power supplies and transformers for control circuits

Functions	**Supplies for d.c. control circuits**
Type of product	**Filtered rectified power supplies**

Applications	All ⎓ 24 V circuits. Pilot operation of valves and solenoid valves and double coil contactors.
Nominal power	240…960 W
Input voltage	∿ 380-400-420 V (± 10 %) 3-phase.
Output voltage	⎓ 24 V
Technology	Filtered rectified power supply.
Protection	External
Signalling	Output indicator lamp.
Other characteristics	Input connectors for regulating undervoltages or overvoltages. Earth screen on all products.
Mounting	Oblong holes
Conforming to standards	IEC 61558-2-6, EN 61558-2-6, DIN 19240, UL 1950, CSA C22.2 N° 950
Approvals	c UL us
Device type	**ABL-6RT●●●●**
Pages	14062/2

Transformers

Harsh environments. Supply fluctuating within the range - 10…+ 10 %. Non-sensitive load: contactors, relays, etc.	All control circuits. Us < 50 V = safety transformer (SELV). Us > 50 V = isolation transformer	
24…480 W	25…2500 VA	
∿ 215-220-235-385-400-415 V or ∿ 105-120-135-225-240-255 V (± 10 %)	∿ 230-400 V with + or - 15 V connectors, single-phase	
⎓ 24 V	∿ 12 V, 24 V, 115 V or 230 V	∿ 24-48 V or 115-230 V
Single-phase filtered rectified power supply	Safety and isolation transformers	
	Single wound secondary	Double wound secondary
External or integrated, depending on model	External	
Output indicator lamp.	–	
Input connectors for regulating undervoltages or overvoltages Earth screen on all products	Earth screen on all products	
Oblong holes Plate for mounting on ⎓ rail: option for ABL-6RF2401 to ABL-6RF2405	Oblong holes Plate for mounting on ⎓ rail: option for ABL-6T●02 to ABL-6T●10	
IEC 61558-2-6, EN 61558-2-6, DIN 19240, UL 1950, CSA C22.2 N° 950	IEC 61558-2-6, EN 61558-2-6, UL 506	
c UL us	c UL us	
ABL-6RF●●●	**ABL-6TS●●●**	**ABL-6TD●●●**
14062/2	14052/2	

Power supplies and transformers

Filtered rectified power supplies for d.c. control circuits

ABL-6R● power supplies

The ABL-6R● range of power supplies is designed to provide the d.c. voltage necessary for the control circuits of automation system equipment. Split into two families, this range meets all the needs encountered in industrial, commercial and residential applications. Single-phase or 3-phase, of the conventional type with rectifier, they provide a quality of output which is suitable for the loads supplied and compatible with the mains supply available in the equipment. Clear guidelines are given on selecting protection devices which are often used with them, and thus a comprehensive solution is provided which can be used in total safety.

Filtered rectified power supplies

Filtered rectified power supplies are built using a safety transformer fitted with a bridge rectifier and filter capacitors.
With no regulation system, of simple and rugged construction, their output voltage will withstand mains voltage variations and load variations while remaining within the range defined in standards IEC 1131-2. They are particularly suitable for applications with high current inrush.

ABL-6RF●●●●

These supplies are split into two families:

- The single-phase filtered rectified ABL-6RF family is suitable for connection to European 230-400 V and American 120/240 V single-phase supplies. An optional mounting plate, for mounting on a ⎓ rail, simplifies their installation.
- The 3-phase filtered rectified ABL-6RT family is particularly suitable where a high power level is required for actuators and preactuators. In particular for "All ⎓ 24 V" equipment, or for pilot operation of d.c. valves and solenoid valves.

Selection of power supplies

The characteristics to be taken into account when selecting a power supply are:
- the required output voltage and current,
- the mains voltage available in the installation.

An initial selection can be made using the table opposite.
This may however result in several products being selected as suitable.
Other selection criteria must therefore be taken into account.

● The quality of the mains power supply

ABL-6RT●●●●

Filtered rectified power supplies provide a non-regulated voltage, sensitive to load and mains power supply fluctuations. They can only be used where a good quality mains supply is available, with fluctuations limited to -10 %… + 10 % of the nominal value.
Graphs showing the output voltage as a function of the rated current of the load and the input voltage for ABL-6RF and ABL-6RT supplies are given on page 14054/5.
If the quality of the mains supply is not suitable for a rectified power supply, a regulated supply must be used.
The Phaseo range is the solution because it guarantees precision to within 3% of the output voltage, whatever the load current and the input voltage. In addition, the wide input voltage range of Phaseo power supplies allows them to be connected to all mains supplies within the nominal range, without any adjustment.
The Phaseo RP family can also be connected to ⎓ 110 and 220 V emergency supplies.

● Harmonic pollution (power factor)

The current drawn by a power supply is not sinusoidal. This leads to the existence of harmonic currents which pollute the mains supply. European standard EN 61000-3-2 limits the harmonic currents produced by power supplies. This standard covers all devices of more than 75 W, drawing up to 16 A per phase, and connected directly to the public mains power supply. Devices connected downstream of a private, low voltage, general transformer are therefore excluded.
By design, rectified power supplies produce very little harmonic current and can therefore be used on the public mains supply. However, regulated switch mode supplies produce much more harmonic current and a filter circuit (Power Factor Correction or PFC) must therefore be added to comply with standard EN 61000-3-2.
Power supplies ABL-6RF and ABL-6RT conform to standard EN 61000-3-2 and can therefore be connected directly to public mains power supplies.

● Behaviour in the event of short-circuits

In the event of an overload or short-circuit, rectified power supplies must be protected by an upstream fuse or circuit breaker to prevent their destruction. Models ABL-6RF2401, ABL-6RF2402 and ABL-6RF2405 are fitted, as standard, with a 5 x 20 mm glass fuse.

Characteristics : pages 14063/2 and 14063/3
References : page 14064/3
Dimensions: page 14065/2
Schemes : page 14065/3

Power supplies and transformers

Filtered rectified power supplies for d.c. control circuits

Selection according to applications characteristics

Rated mains supply voltage		120-240 V ± 15 V 50/60 Hz	230-400 V ± 15 V 50/60 Hz	3x400 V ± 15 V 50/60 Hz
Permissible variation		+/-10 % 47...63 Hz		
Output voltage		24 V		
Output current	**1 A**	**ABL-6RF2401G2**	**ABL-6RF2401**	
	2.5 A	**ABL-6RF2402G2**	**ABL-RF2402**	
	5 A	**ABL-6RF2405G2**	**ABL-6RF2405**	
	10 A		**ABL-6RF2410**	**ABL-6RT2410**
	15 A		**ABL-6RF2415**	
	20 A		**ABL-6RF2420**	**ABL-6RT2420**
	30 A			**ABL-6RT2430**
	40 A			**ABL-6RT2440**
EN61000-3-2		Yes		Yes
Integrated protection		Yes from 1 to 5 A by fuse No above 5 A		No

Power supplies and transformers

Filtered rectified power supplies for d.c. control circuits

Type of power supply				ABL-6RT				ABL-6RF					
				2410	2420	2430	2440	2401●	2402●	2405●	2410	2415	2420
Technical characteristics													
Input	Input voltage	Permissible values	**V**	400 3-phase (- 10…+ 10 %) with + 5 % and - 5 % connectors				All products: 230 or 400 single-phase (- 10…+ 10 %) with -15 V and +15 V connectors except ABL-6RF24●●G2: 120 or 240 single-phase (- 10…+ 10 %) with - 15 V and + 15 V connectors					
		Permissible frequencies	**Hz**	47…63				47…63					
		Efficiency (1)	**%**	73	78	77	78	71	75	75	80	80	93
Output	Precision	Output voltage	**V**	24 nominal Min: 20.4 - Max: 28.8				24 nominal Min: 20.4 - Max: 28.8					
		Output current	**A**	10	20	30	40	1	2,5	5	10	15	20
		Residual ripple (1)		≤ 2 %				≤ 5 %					
	Protection	Overload and short-circuit		External, depending on output current				External, depending on output current, except **ABL-6RF2401●, ABL-6RF2402●, ABL-6RF2405●** : 5 x 20 internal fuse					
		Transient output overvoltage		Peak limiter 2 J				Peak limiter 2 J					
Environment													
Connections		Input	**mm²**	1 x 4 + earth									
		Output	**mm²**	2 x 4 + earth				2 x 4…2 x 16 + earth					
Ambient air temperature around the device		Storage	**°C**	- 40…+ 80									
		Operation	**°C**	- 20…+ 60				- 20…+ 50					
Maximum relative humidity				90 % without condensation or dripping water									
Degree of protection				IP 20									
Protective treatment				"TC"									
Operating position				Any position				Vertical					
Dielectric strength		Input/output	**V**	∿ 4000									
		Input/earth	**V**	∿ 2000									
		Output/earth	**V**	∿ 2000									
Connections		Series		Possible									
		Parallel		Possible, with 20 % derating									
Conforming to standards				IEC 61558-2-6 ; EN 61558-2-6 ; UL 1950 ; IEC 1131-2 ; CSA-C22.2 N°950									
Approvals				c UL us									

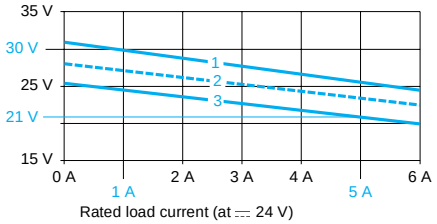
(1) At nominal input voltage and load

Presentation : page 14062/2 References : page 14064/3 Dimensions : page 14065/2 Schemes : page 14065/3

Power supplies and transformers

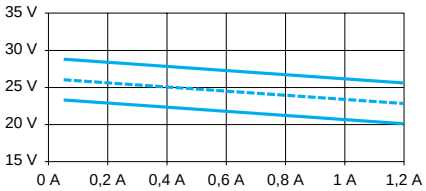
Filtered rectified power supplies for d.c. control circuits

Example using the graph

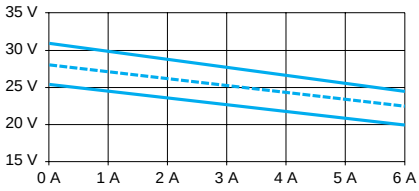


For an ABL-6RF2405 power supply used with a variable load of 1 to 5 A on a mains supply with Un ±10%, the graph shows the limits at the load terminals: 21 and 30 V.
Note: permitted loads are represented vertically as images of the rated load current at rated voltage.
1 Rated supply +10%
2 Rated supply
3 Rated supply -10%

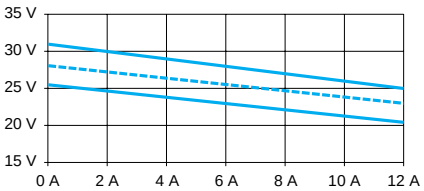
ABL-6RF2401/G2



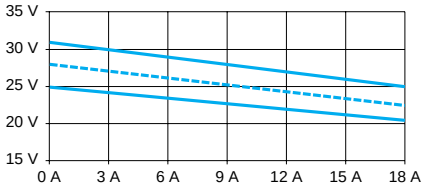
ABL-6RF2405/G2



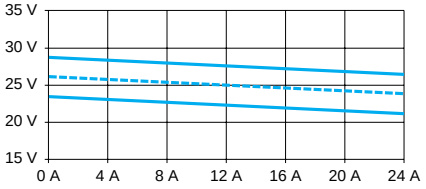
ABL-6RF2410



ABL-6RF2415

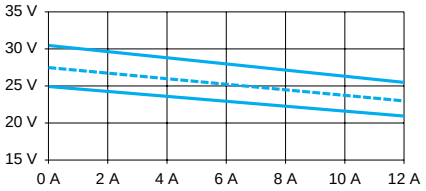


ABL-6RF2420

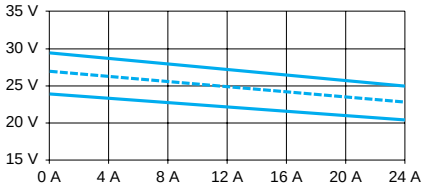


ABL-6RT2410

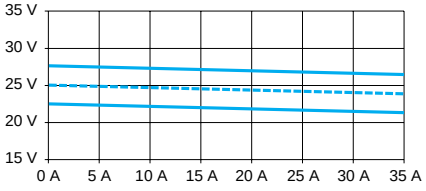
ABL-6RT2420

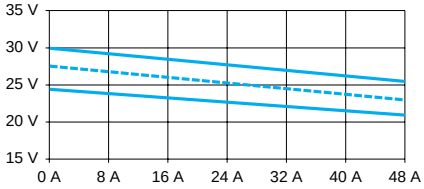


ABL-6RT2430



ABL-6RT2440





Power supplies and transformers

Filtered rectified power supplies for d.c. control circuits

ABL-6RT power supplies: protection of the power supply line

Type of supply	~ 400 V 3-phase			
Type of protection	Thermal magnetic circuit-breaker 3-pole	Thermal regulation	C60N	FNQ fuse UL listed (1)	aM fuse
ABL-6RT2410	GV2-RT05	0.63 A	MG 24532 (1)	0.5 A T	2 A
ABL-6RT2420	GV2-RT07	1.6 A	MG 24533 (1)	1.125 A T	4 A
ABL-6RT2430	GV2-RT07	2 A	MG 24533 (1)	1.6 A T	4 A
ABL-6RT2440	GV2-RT08	2.6 A	MG 24534 (1)	2.5 A T	4 A

ABL-6RF power supplies: protection of the power supply line

Type of supply		~ 230 V single-phase				400 V ~ single-phase			
Type of protection		Thermal magnetic circuit-breaker		MDL fuse UL listed (1)	aM fuse	Thermal magnetic circuit-breaker		FNQ fuse UL listed (1)	aM fuse
	Single-pole	GB2-CB●●	–	–	–	–	–	–	–
	2-pole	GB2-DB●●	C60N	–	–	GB2-DB●●	C60N	–	–
ABL-6RF2401		GB2-●B05	MG 24516 (1)	0.315 A T	0.5 A	–	MG 24516 (1)	0.15 A T	0.5 A
ABL-6RF2402		GB2-●B06	MG 24516 (1)	0.63 A T	0.5 A	GB2-DB05	MG 24516 (1)	0.3 A T	0.5 A
ABL-6RF2405		GB2-●B07	MG 17453 (1)	1.4 A T	2 A	GB2-DB06	MG 24516 (1)	0.6 A T	1 A
ABL-6RF2410		GB2-●B09	MG 24519 (1)	3.15 A T	4 A	GB2-DB07	MG 17453 (1)	1.25 A T	2 A
ABL-6RF2415		GB2-●B10	MG 17454 (1)	5 A T	6 A	GB2-DB08	MG 24517 (1)	2 A T	4 A
ABL-6RF2420		GB2-●B14	MG 24520 (1)	6 A T	6 A	GB2-DB14	MG 24518 (1)	2.5 A T	6 A

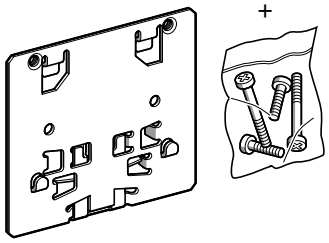
(1) UL certified circuit-breaker

Power supplies and transformers

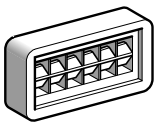
Filtered rectified power supplies for d.c. control circuits

ABL-6RT●●●●

ABL-6RF●●●●



ABL-6AM●● (2)



AR1-SB3

3-phase filtered rectified power supplies (1)

Mains input voltage 50/60 Hz ∿ V	Nominal output voltage ⎓ V	Nominal power W	Maximum output current A	Reference	Weight kg
380-400-420 (±10%) 3-phase	24	240	10	**ABL-6RT2410**	6.200
		480	20	**ABL-6RT2420**	10.700
		720	30	**ABL-6RT2430**	15.150
		960	40	**ABL-6RT2440**	19.800

Single-phase filtered rectified power supplies (1)

Mains input voltage 50/60 Hz ∿ V	Nominal output voltage ⎓ V	Nominal power W	Maximum output current A	Protection by cartridge fuse 5 x 20	Reference	Weight kg
215-230-245 (±10%) 385-400-415 (±10%) single-phase	24	24	1	With	**ABL-6RF2401** (2)	1.300
		60	2,5	With	**ABL-6RF2402** (2)	2.000
		120	5	With	**ABL-6RF2405** (2)	3.100
		240	10	Without	**ABL-6RF2410**	6.100
		360	15	Without	**ABL-6RF2415**	8.450
		480	20	Without	**ABL-6RF2420**	12.300
105-120-135 (±10%) **225-240-255** (±10%) single-phase	24	24	1	With	**ABL-6RF2401G2**	1.300
		60	2,5	With	**ABL-6RF2402G2**	2.000
		120	5	With	**ABL-6RF2405G2**	3.100

Mounting accessories

Description	For power supplies	Sold in lots of	Reference	Weight kg
Plate for mounting (2) **on 35 mm Omega or combination rail**	ABL-6RF2401●	5	**ABL-6AM01**	0.050
	ABL-6RF2402●	5	**ABL-6AM03**	0.065
	ABL-6RF2405●	5	**ABL-6AM04**	0.085

Marking accessories

Description	Size mm	Sold in lots of	Reference	Weight kg
Self-adhesive marker tag holder	20 x 10	50	**AR1-SB3**	0.010

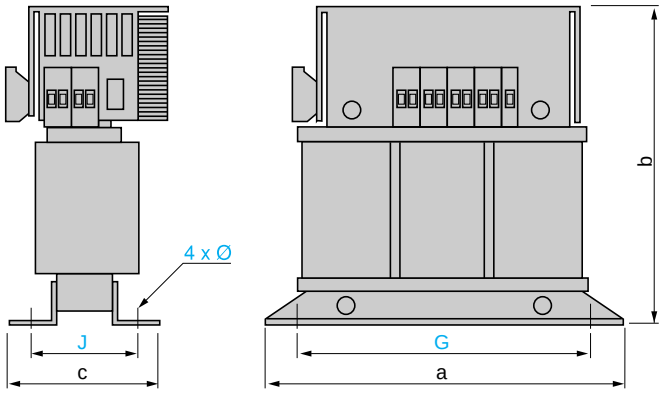
(1) Separate protection and safety devices: see recommended product references page 14055/2.
(2) It is possible to order a power supply with its corresponding mounting plate. To do this, add the letter **P** to the reference of the selected power supply (example: **ABL-6RF-2401P**).

Presentation : page 14062/2
Characteristics : pages 14063/2 and 14063/3
Dimensions : page 14065/2
Schemes : page 14065/3

Power supplies and transformers

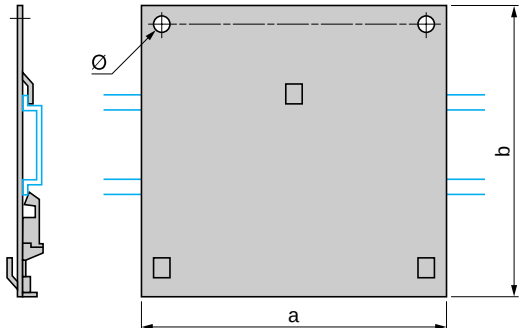
Filtered rectified power supplies for d.c. control circuits

ABL-6RT24●0



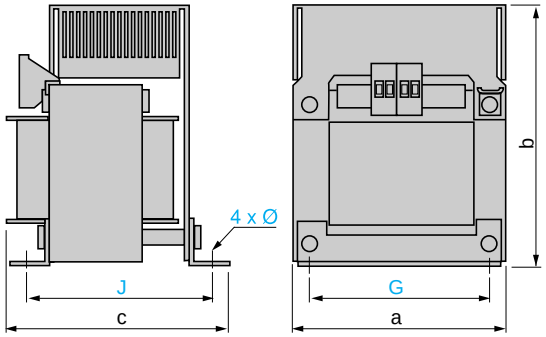
ABL-	a	b	c	G	J	Ø
6RT2410	185	177	100	164	71.5	6.5
6RT2420	220	212	121	196	79.5	8
6RT2430	244	236	130	215	97	8
6RT2440	284	268	143	256.5	105	11

Mounting plates ABL-6AM0●

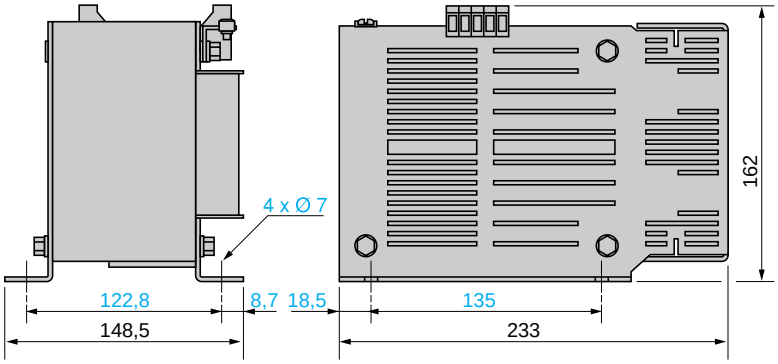


ABL-	a	b	Ø
6AM01	78	70	4
6AM03	84	78	4
6AM04	96	91	5

ABL-6RF24●●



ABL-6RF2420

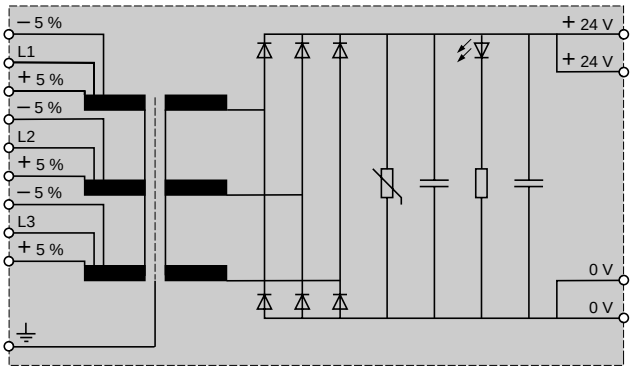


ABL-	a	b	c	G	J	Ø
6RF2401●	78	120	72	56	47.5	4.8
6RF2402●	84	122	87	64	65.5	4.8
6RF2405●	96	132	91	84	75.3	5.
6RF2410	120	175	119	90	94.5	5.8
6RF2415	135	187	124	104	97	5.8

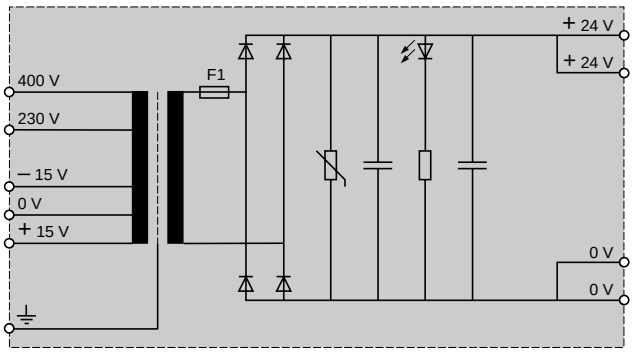
Power supplies and transformers

Filtered rectified power supplies for d.c. control circuits

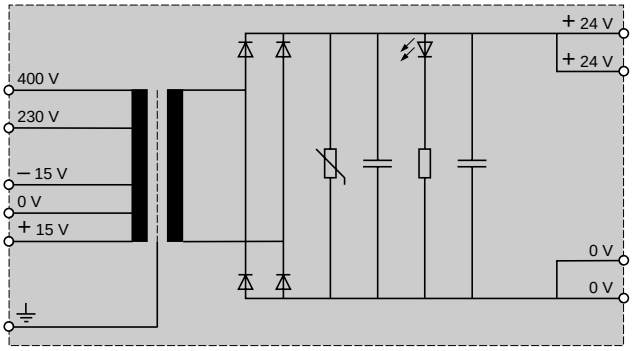
ABL-6RT24●0



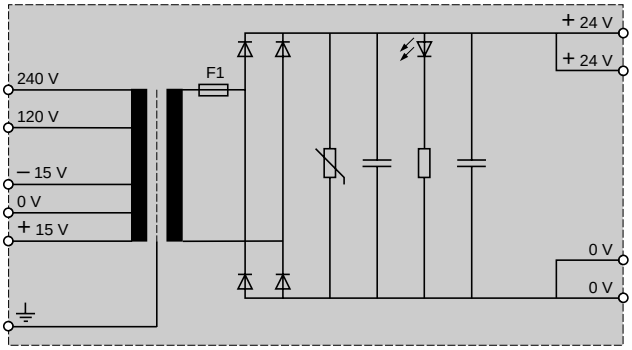
ABL-6RF2401, ABL-6RF2402, ABL-6RF2405



ABL-6RF2410, ABL-6RF2415, ABL-6RF2420



ABL-6RF2401G2, ABL-6RF2402G2, ABL-6RF2405G2



Power supplies and transformers
Safety and isolation transformers (25 to 2500 VA)

Presentation

The ABL-6T range of single phase transformers is designed to supply the control circuits of electrical equipment from a 230 or 400 V supply at 50 or 60 Hz. Additional +15 V and -15 V connectors can provide better adaptation to the local network if necessary.

ABL-6T transformers ensure electrical isolation between the supply and application. The entire range is fitted with an earth screen in order to reduce the spreading of electromagnetic interference and increase user safety. ABL-6T transformers are protection class I and are supplied with no housing, degree of protection IP 20.

They conform to IEC 61558-2-6, EN 61558-2-6 standards and are UL certified
They are manufactured to insulation classification B or F depending on the product.
The windings are vacuum impregnated with solvent free resin.
The maximum operating temperature is 50 °C without derating.

Connections

The product range makes it possible to cover a power range from 25 to 2500 VA.

All products have a 230/400 V +/- 15 V dual voltage primary and are available in standard versions with voltages for 12, 24, 48, 115 and 230 V control circuits.
ABL-6T transformers are available as a single secondary winding version (12, 24, 115 and 230 V) and a double secondary winding version (2 x 24 or 2 x 115 V) to enable series (to obtain 48 or 230 V) or parallel connections.

Protection

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

To operate according to UL standards, short-circuit protection must be achieved using fuses (with UL approval) on the primary.

Where the control circuit is isolated from the earth (IT scheme), a earth leakage detector will indicate any accidental isolation fault (see “Measurement and control relays” catalogue n° 29709).

Characteristics: page 14051/4
References: page 14052/2
Dimensions: page 14052/3
Schemes: page 14052/3

Power supplies and transformers

Safety and isolation transformers (25 to 2500 VA)

Selection

ABL-6T transformers are characterised by the apparent nominal power which they can supply continuously. But they are also designed to supply, when necessary, much higher powers, such as contactor inrush peaks.

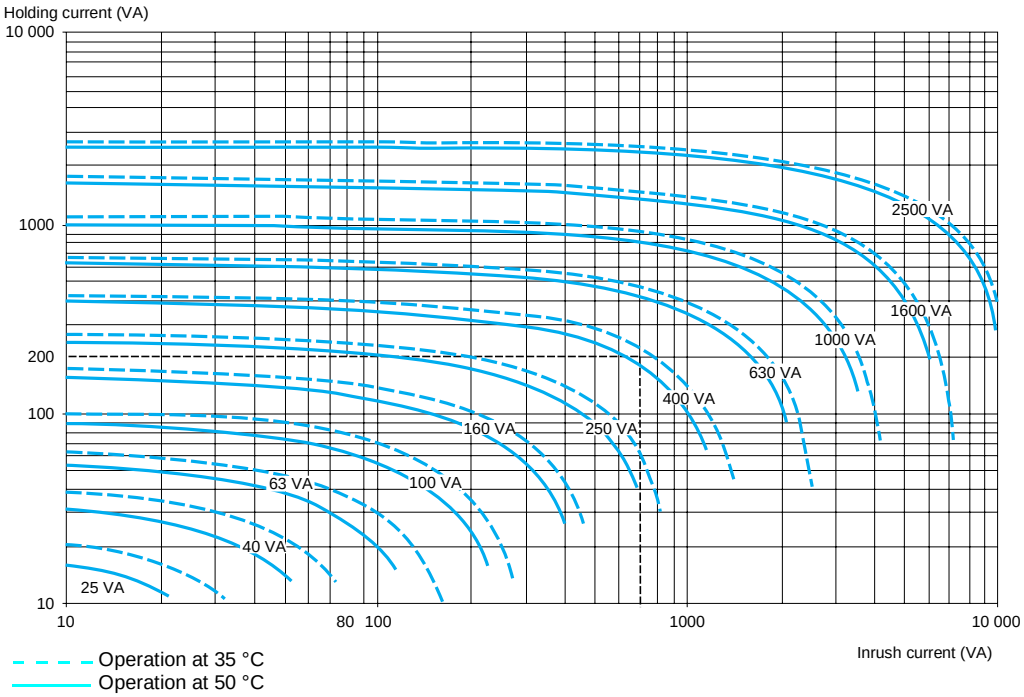
Contactor inrush peaks can reach 10 to 20 times the required holding current. This leads to the transformer being oversized in relation to the continuous power it is to supply. The transformer must be sized so that the voltage drop at its terminals, caused by the inrush, remains within the permissible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

The two power values which need to be taken into account to determine which transformer rating to use are thus
- the continuous power which the transformer is to supply
- and the maximum inrush current which it must provide.

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

For Telemecanique transformers, the graph below can be used to select the rating to use according to these two currents. This ensures a maximum voltage drop of 5 % at the moment of the 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, enables a lower rating to be used.
The graph below has therefore been drawn for 35 and 50 °C.

The inrush values of the contactor coils are given in 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.

Characteristics: page 14051/4
References: page 14052/2
Dimensions: page 14052/3
Schemes: page 14052/3

Power supplies and transformers

Safety and isolation transformers (25 to 2500 VA)

Technical characteristics

Input voltage		**V**	230 and 400 single phase with - 15 V and + 15 V connectors
Input frequency		**Hz**	47…63

Operating and environmental characteristics

Conforming to standards			IEC 61558-2-6, EN 61558-2-6, UL506
Certification			ℜ
Degree of protection	Conforming to IEC 529		IP 20
Protective treatment			"All climates"
Dielectric strength	Primary/secondary	**V**	4000
	Winding/earth	**V**	2000
Protection class			I
Insulation			Class F: **ABL-6T●160●** and **ABL-6T●250●**, class B: other references
Ambient air temperature around device	Storage	**°C**	- 40…+ 80
	Operation	**°C**	- 20…+ 50
Operating position			Any
Mounting	Direct		Oblong holes on all models
	On ⊓ rail		Optional mounting plate for **ABL-6T●02●, ABL-6T●04●, ABL-6T●06●** and **ABL-6T●10●**

Characteristics

Power		**VA**	**25**	**40**	**63**	**100**	**160**	**250**	**400**	**630**	**1000**	**1600**	**2500**
Overvoltage no load, hot state	**ABL-6TS●●B**	**%**	15	11	9	9	7	6	4	3	3	2	2
	ABL-6TS●●G	**%**	15	12	9	8	6	5	4	3	3	2	3
	ABL-6TS●●J	**%**	16	14	9	9	7	5	–	–	–	–	–
	ABL-6TS●●U	**%**	9	9	9	9	7	5	4	3	3	3	3
	ABL-6TD●●B	**%**	4	4	3	4	4	4	4	3	3	2	2
	ABL-6TD●●G	**%**	9	9	9	9	7	6	4	3	3	2	3
Voltage drop at nominal load	**ABL-6TS●●B**	**%**	0.3	0.2	0.2	0.0	0.3	0.1	0.7	0.5	-0.3	0.0	0.5
	ABL-6TS●●G	**%**	0	0.4	0.1	0.6	0.7	0.7	0.5	0.3	0.5	0.1	- 0.3
	ABL-6TS●●J	**%**	0.6	0	1.3	0.3	0.4	0.6	–	–	–	–	–
	ABL-6TS●●U	**%**	5.9	4	1.4	0.6	0.9	0.7	0.7	0.4	5	0	0
	ABL-6TD●●B	**%**	10.3	6.1	4.3	3.8	2.9	1.8	0.7	0.6	- 0.2	0.1	0.4
	ABL-6TD●●G	**%**	5.9	3.6	0.5	0.2	0.4	0.3	0.4	0.3	0.1	0.3	- 0.3
Efficiency	**ABL-6T●●●●**	**%**	79	81	84	86	88	90	92	93	94	96	96
No-load losses	**ABL-6T●●●●**	**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	**ABL-6TS●●B**	**%**	13.52	10.27	8.62	7.86	6.81	5.51	4.50	3.41	2.93	2.50	2.85
	ABL-6TS●●G	**%**	14.03	10.71	7.92	7.51	6.65	5.28	4.66	3.47	3.04	2.45	2.61
	ABL-6TS●●J	**%**	14.74	12.13	9.63	8	6.9	5.47	–	–	–	–	–
	ABL-6TS●●U	**%**	14.34	11.46	9.08	8.32	7.5	5.85	4.77	3.68	3.24	2.65	8.73
	ABL-6TD●●B	**%**	13.79	9.32	7.38	7.52	6.46	5.34	4.46	3.46	3.02	2.53	2.73
	ABL-6TD●●G	**%**	13.34	11.08	8.30	8.05	7.15	5.63	4.58	3.53	3.16	2.57	2.65
Connections Primary		**mm²**	4	4	4	4	4	4	4	4	4	4	4
Secondary	**ABL-6TD●●G**	**mm²**	4	4	4	4	4	4	4	4	4	4	4
	ABL-6TS●●G	**mm²**	4	4	4	4	4	4	4	4	4	4	10
	ABL-6TS●●J	**mm²**	4	4	4	4	4	4	–	–	–	–	–
	ABL-6TS●●U	**mm²**	4	4	4	4	4	4	4	4	4	4	4
	ABL-6TD●●B	**mm²**	4	4	4	4	4	4	4	4	10	10	10
	ABL-6TS●●B	**mm²**	4	4	4	4	4	4	10	10	10	16	35

Presentation and selection: pages 14051/2 and 14051/3
References: page 14052/2
Dimensions: page 14052/3
Schemes: page 14052/3

Power supplies and transformers

Safety and isolation transformers (25 to 2500 VA)

Protection by fuses

Recommended protection for the transformer primary

Transformer Reference	Power	Input voltage ∿ 230 V single phase Fuse carrier/isolator MDL fuses UL Listed (1)	aM fuses	∿ 400 V single phase Fuse carrier/isolator FNQ fuses UL Listed (1)	aM fuses
ABL-6T●02●	25 VA	2/10 A	0.5 A	15/100 A	0.5 A
ABL-6T●04●	40 VA	1/4 A	0.5 A	15/100 A	0.5 A
ABL-6T●06●	63 VA	4/10 A	0.5 A	2/10 A	0.5 A
ABL-6T●10●	100 VA	6/10 A	1 A	3/10 A	0.5 A
ABL-6T●16●	160 VA	1 A	2 A	1/2 A	1 A
ABL-6T●25●	250 VA	1 1/2 A	2 A	8/10 A	1 A
ABL-6T●40●	400 VA	2 A	4 A	12/10 A	2 A
ABL-6T●63●	630 VA	3 2/10 A	6 A	2 A	4 A
ABL-6T●100●	1000 VA	5 A	8 A	3 A	6 A
ABL-6T●160●	1600 VA	8 A	10 A	5 A	8 A
ABL-6T●250●	2500 VA	2 A	16 A	7 A	10 A

Recommended protection for the transformer secondary

Transformer Reference	Power	Secondary 12 V Fuses gG	T	Secondary ∿ 24 V Fuses gG	T	Secondary ∿ 48 V Fuses gG	T	Secondary ∿ 115 V Fuses gG	T	Secondary ∿ 230 V Fuses gG	T
ABL-6T●02●	25 VA	2 A	2 A	1 A	1 A	0.5 A	0.5 A	–	0.2 A	–	0.1 A
ABL-6T●04●	40 VA	4 A	3.15 A	1 A	1.6 A	0.5 A	0.8 A	–	0.315 A	–	0.16 A
ABL-6T●06●	63 VA	6 A	5 A	2 A	2.5 A	1 A	1.25 A	0.5 A	0.5 A	–	0.25 A
ABL-6T●10●	100 VA	8 A	–	4 A	4 A	2 A	2 A	0.5 A	0.8 A	–	0.4 A
ABL-6T●16●	160 VA	12 A	–	6 A	–	2 A	3.15 A	1 A	1.4 A	0.5 A	0.63 A
ABL-6T●25●	250 VA	20 A	–	10 A	–	4 A	5 A	2 A	2 A	1 A	1 A
ABL-6T●40●	400 VA	–	–	16 A	–	8 A	–	2 A	3.15 A	1 A	1.6 A
ABL-6T●63●	630 VA	–	–	25 A	–	12 A	–	4 A	5 A	2 A	2.5 A
ABL-6T●100●	1000 VA	–	–	40 A	–	20 A	–	8 A	–	4 A	4 A
ABL-6T●160●	1600 VA	–	–	63 A	–	32 A	–	12 A	–	6 A	–
ABL-6T●250●	2500 VA	–	–	100 A	–	50 A	–	20 A	–	10 A	–

Protection by thermal magnetic circuit-breaker

Recommended protection for the transformer primary

Transformer Reference	Power	Input voltage ∿ 230 V single phase Circuit-breaker Telemecanique (2)	Merlin Gerin 1-pole	Merlin Gerin 2-pole	∿ 400 V single phase Circuit-breaker Telemecanique 2-pole	Merlin Gerin 2-pole
ABL-6T●02●	25 VA	GB2-●●05	24493	24494	GB2-DB05	24494
ABL-6T●04●	40 VA	GB2-●●05	24493	24494	GB2-DB05	24494
ABL-6T●06●	63 VA	GB2-●●05	24493	24494	GB2-DB05	24494
ABL-6T●10●	100 VA	GB2-●●06	24565	24580	GB2-DB05	24494
ABL-6T●16●	160 VA	GB2-●●07	24566	24581	GB2-DB06	24580
ABL-6T●25●	250 VA	GB2-●●07	24566	24581	GB2-DB06	24580
ABL-6T●40●	400 VA	GB2-●●08	24567	24582	GB2-DB07	24581
ABL-6T●63●	630 VA	GB2-●●10	24568	24583	GB2-DB08	24582
ABL-6T●100●	1000 VA	GB2-●●14	24569	24584	GB2-DB09	24583
ABL-6T●160●	1600 VA	GB2-●●20	–	24586	GB2-DB14	24584
ABL-6T●250●	2500 VA	–	–	24587	GB2-DB20	24586

Recommended protection for the transformer secondary

Transformer Reference	Power	Secondary 12 V Circuit-breaker (2)		Secondary ∿ 24 V Circuit-breaker (2)		Secondary ∿ 48 V Circuit-breaker (2)		Secondary ∿ 115 V Circuit-breaker (2)		Secondary ∿ 230 V Circuit-breaker (2)	
ABL-6T●02●	25 VA	GB2-●●07	24171	GB2-●●06	24170	GB2-●●05	24058	–	–	–	
ABL-6T●04●	40 VA	GB2-●●09	24173	GB2-●●07	24171	GB2-●●06	24170	–	24058	–	
ABL-6T●06●	63 VA	GB2-●●10	24174	GB2-●●08	24172	GB2-●●07	24170	GB2-●●05	24059	–	
ABL-6T●10●	100 VA	GB2-●●14	24175	GB2-●●09	24173	GB2-●●07	24171	GB2-●●06	24170	GB2-●●05	24058
ABL-6T●16●	160 VA	–	24176	GB2-●●12	24174	GB2-●●08	24172	GB2-●●07	24171	GB2-●●06	24059
ABL-6T●25●	250 VA	–	24177	GB2-●●16	24175	GB2-●●10	24174	GB2-●●07	24171	GB2-●●06	24170
ABL-6T●40●	400 VA	–	–	–	24176	GB2-●●14	24175	GB2-●●08	24173	GB2-●●07	24171
ABL-6T●63●	630 VA	–	–	–	24178	GB2-●●20	24176	GB2-●●10	24174	GB2-●●08	24172
ABL-6T●100●	1000 VA	–	–	–	24180	–	24177	GB2-●●14	24175	GB2-●●09	24173
ABL-6T●160●	1600 VA	–	–	–	24182	–	24179	GB2-●●20	24176	GB2-●●12	24174
ABL-6T●250●	2500 VA	–	–	–	–	–	24181	–	24177	GB2-●●16	24175

(1) For operation conforming to UL.

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

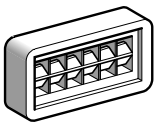
Characteristics: page 14051/4 **References:** page 14052/2 **Dimensions:** page 14052/3 **Schemes:** page 14052/3

Power supplies and transformers

Safety and isolation transformers (25 to 2500 VA)

ABL-6TS●●●

ABL-6TD●●●



AR1-SB3

Transformers, dual voltage primary, with earth screen (1)

Primary voltage 50/60 Hz	Secondary	Output voltage	Nominal power	Basic reference to be completed (2)	Usual secondary voltages	Weight
V		**V**	**VA**			kg
230/400 single phase	Single winding	12 (**J**) or 24 (**B**) or 115 (**G**) or 230 (**U**)	25	**ABL-6TS02●** (4)	**J B G U**	0.700
			40	**ABL-6TS04●** (4)	**J B G U**	1.200
			63	**ABL-6TS06●** (4)	**J B G U**	1.600
			100	**ABL-6TS10●** (4)	**J B G U**	2.100
			160	**ABL-6TS16●**	**J B G U**	3.200
			250	**ABL-6TS25●**	**J B G U**	4.400
			400	**ABL-6TS40●**	**B G U**	6.500
			630	**ABL-6TS63●**	**B G U**	9.800
			1000	**ABL-6TS100●**	**B G U**	14.300
			1600	**ABL-6TS160●**	**B G U**	19.400
			2500	**ABL-6TS250●**	**B G U**	27.400
	Double winding (3)	24/48 (**B**) or 115/230 (**G**)	25	**ABL-6TD02●** (4)	**B G**	0.700
			40	**ABL-6TD04●** (4)	**B G**	1.200
			63	**ABL-6TD06●** (4)	**B G**	1.600
			100	**ABL-6TD10●** (4)	**B G**	2.100
			160	**ABL-6TD16●**	**B G**	3.200
			250	**ABL-6TD25●**	**B G**	4.400
			400	**ABL-6TD40●**	**B G**	6.500
			630	**ABL-6TD63●**	**B G**	9.800
			1000	**ABL-6TD100●**	**B G**	14.300
			1600	**ABL-6TD160●**	**B G**	19.400
			2500	**ABL-6TD250●**	**B G**	27.400

Mounting accessories

Description	For transformers	Sold in lots of	Unit reference	Weight kg
Plate for mounting on ⊓ rail	ABL-6T●02●	5	**ABL-6AM00**	0.045
	ABL-6T●04●	5	**ABL-6AM01**	0.050
	ABL-6T●06●	5	**ABL-6AM02**	0.055
	ABL-6T●10●	5	**ABL-6AM03**	0.065

Marking accessories

Description	Size **mm**	Sold in lots of	Unit reference	Weight kg
Self-adhesive marker tag holder	20 x 10	50	**AR1-SB3**	0.001

(1) Separate protection and safety devices: see characteristics page 14051/3
(2) Reference to be completed with the code for the secondary voltage.
Secondary voltages available

	Secondary with single winding				Secondary with double winding	
Volts 50/60 Hz	12	24	115	230	24/48 (3)	115/230 (3)
Code	**J**	**B**	**G**	**U**	**B**	**G**

(3) 48 or 230 V, series connection (see schemes on page opposite)
(4) It is possible to order a transformer with its corresponding mounting plate. To do this, add the letter **P** to the reference of the selected transformer (example: **ABL-6TS-02BP**).

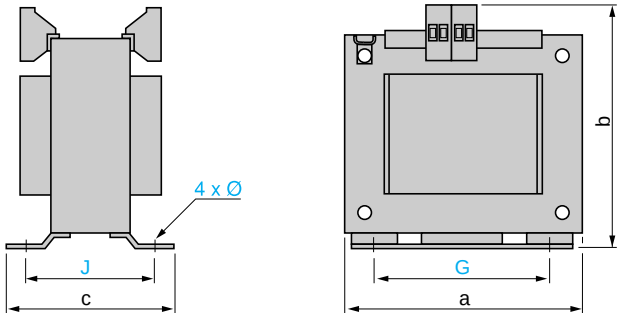
Presentation: page 14051/2 | Characteristics: page 14051/3 | Dimensions: page 14052/3 | Schemes: page 14052/3

Power supplies and transformers

Safety and isolation transformers (25 to 2500 VA)

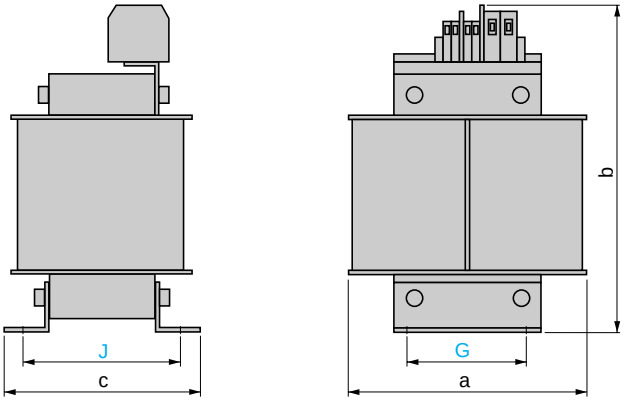
Dimensions

Transformers ABL-6T●02● to ABL-6T●100●

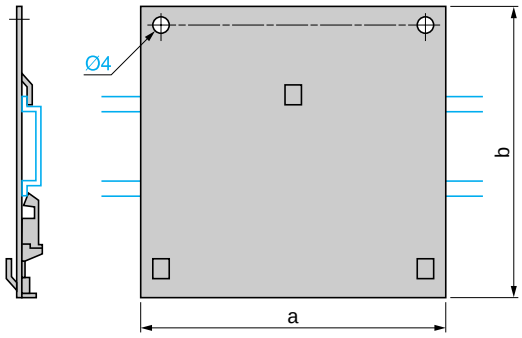


ABL-	a	b	c	G	J	Ø
6T●02●	66	90	55	55	42	4.8
6T●04●	78	90	68	56	47.5	4.8
6T●06●	78	90	80	56	56	4.8
6T●10●	85	94	86	64	65.5	4.8
6T●16●	106	109	81	80.5	63	5.8
6T●25●	120	122	85	90	74.5	5.8
6T●40●	136	140	120	104	87	5.8
6T●63●	150	152	138	122	107.5	7
6T●100●	174	180	146	135	111.5	7
6T●160●	174	221	167	135	138	7
6T●250●	198	335	145	125	117	10

Transformers ABL-6T●160● and ABL-6T●250●



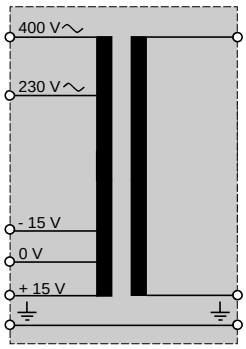
Mounting plates ABL-6AM0●



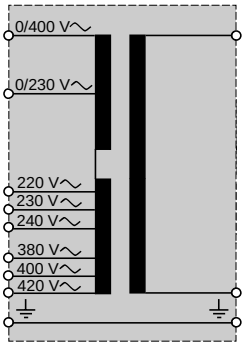
ABL-	a	b
6AM00	68	70
6AM01	78	70
6AM02	78	74
6AM03	84	78

Schemes

ABL-6TS02● to ABL-6TS160●

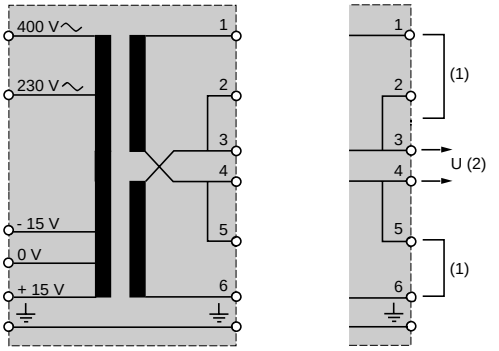


ABL-6TS250●

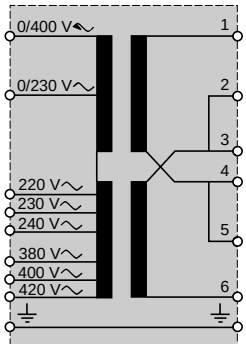


ABL-6TD02● to ABL-6TD160●

Parallel connection Series connection



ABL-6TD250●



(2) Output voltage obtained

Reference	Connection	
ABL-	Parallel	Series
6TD●●●B	24 V	115 V
6TD●●●G	115 V	230 V

(1) Connection links are supplied with the products. The connection principle is identical for transformers ABL-6TD250●.

Presentation: page 14051/2
Characteristics: page 14051/3
References: page 14052/2

Power supplies and transformers
Power supplies for d.c. control circuits

Functions	Supplies for d.c. control circuits				
Type of product	**Single-phase, modular switch mode power supplies**		**Single-phase, regulated switch mode power supplies**		
					
Applications	Industrial, commercial or residential applications. Modular format allowing integration into panels.		Simple, low power equipment.	Industrial applications, low and medium power. Machine equipment applications.	Industrial or commercial applications on sites sensitive to mains interference. Protection against accidental restarting.
Nominal power	22 W	30 W	7 W…30 W	48…240 W	60…240 W
Input voltage	∿ 100…240 V single-phase		∿ 100…240 V single-phase ⎓ 110…220 V compatible *(1)*	∿ 100…240 V single-phase	∿ 100…240 V single-phase, ⎓ 110…220 V compatible *(1)*
Output voltage	⎓ 12 V adjustable	⎓ 24 V adjustable	⎓ 24 V adjustable	⎓ 24 V adjustable	⎓ 12, 24 V or 48 V adjustable
Technology	Primary switch mode electronic power supplies.				
Secondary protection	Integrated, against overloads and short-circuits, with automatic reset.				Integrated, against overloads and short-circuits, with manual and automatic reset.
Signalling	Output indicator lamp.			Output and input indicator lamp.	
Other characteristics	–		Connection by lug-clamps possible	–	Anti-harmonic distortion filter
Mounting	Direct on ⎓ rail		Direct, on ⎓ rail and on panel	Direct on ⎓ rail	
Conforming to standards	EN 50081-2, IEC 61000-6-2 (EN 50082-2), IEC 950, EN61131-2/A11		EN 50081-2, IEC 61000-6-2, EN 60950	EN 50081-2, IEC 61000-6-2, (EN 50082-2), IEC 950	EN 50081-2, IEC 61000-6-2, (EN 50082-2), IEC 950, 61000-3-2
Approvals	UL, CSA, TÜV		cULus, TÜV	UL, CSA, TÜV, CTick	
Device type	**ABL-7RM**		**ABL-7CEM**	**ABL-7RE**	**ABL-7RP**
Pages	14060/2		14053/2		

(1) Compatible input voltage, not indicated on the product.

2-phase regulated switch mode power supplies	3-phase regulated switch mode power supplies			Regulated switch mode power supplies for AS-i		
						
Industrial applications.	Industrial applications. In-line continuous process equipment, machine tools, injection presses, etc.			Industrial applications. Supply of d.c. voltage necessary for AS-i systems.		
120 and 240 W	240 and 480 W	120 W	240…960 W	72 W	145 W	2 x 72 W
∿ 2 x 380…415 V 2-phase	∿ 3 x 380…415 V 3-phase	∿ 3 x 400…520 V 3-phase	∿ 3 x 400…520 V 3-phase	∿ 100…240 V single-phase		
⎓ 24 V adjustable				⎓ 30 V		⎓ 24 V adjustable
Primary switch mode electronic power supplies.						
Integrated, against overloads and short-circuits, with manual and automatic reset.				Integrated, against overloads and short-circuits, overvoltage and undervoltage.		
Output indicator lamp.				Output and input indicator lamps.		
–	–		Anti-harmonic distortion filter	–		
Direct on ⎓ rail						
EN 50081-2, EN 50082-2, EN 60950	EN 50081-2, EN 50082-2, EN 60950		EN 50081-2, EN 50082-2, EN 60950, IEC 61000-3-2	EN 50081-2, IEC 61000-6-2, EN 55022 class B		
–	–		cULus, c UL us	UL, CSA, TÜV		
ABL-7REQ	**ABL-7UEQ**	**ABL-7UES**	**ABL-7UPS**	**ASI-ABL**		
14053/2	14053/2			14061/2		

Power supplies and transformers
Phaseo modular regulated power supply units

ABL 7RM modular switch mode power supply units

The ABL 7RM range of power supply units is designed to provide the d.c. voltage necessary for the control circuits of automation system equipment. Comprising 2 products, this range meets all the needs encountered in industrial, commercial and residential applications. These single-phase, modular, electronic switch mode power supply units provide a quality of output current with is suitable for the loads supplied and compatible with the Zelio logic range, making them ideal partners. Clear guidelines are given on selecting the upstream protection devices which are often used with them, and thus a comprehensive solution is provided which can be used in total safety.

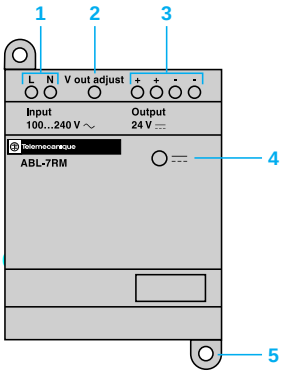
Switch mode power supply units are totally electronic and regulated. The use of electronics makes it possible to significantly improve the performance of these power supplies, which offer:
- compact size,
- integrated overload, short-circuit, overvoltage and undervoltage protection,
- a very wide range of permitted input voltages, without any adjustment,
- a high degree of output voltage stability,
- good performance,
- considerably reduced weight,
- a modular format allowing incorporation into control panels.

Phaseo power supply units are single-phase. They deliver a voltage which is precise to 3%, whatever the load and whatever the type of mains supply, within a range of 85 to 264 V for single-phase voltage. Conforming to IEC standards and UL and CSA certified, they are suitable for universal use. The inclusion of overload and short-circuit protection makes downstream protection unnecessary if discrimination is not required.
The products are also 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 supply units are designed for direct mounting on 35 mm and 75 mm ⊔ rails, or on a mounting plate by means of retractable fixing lugs.

These power supply units are single-phase and two references are available :

- ABL 7RM2401 (24 V⎓/1.3 A).
- ABL 7RM1202 (12 V⎓/1.9 A) .

Description



1 2.5 mm² screw terminal for connection of the incoming a.c. supply voltage.
2 Output voltage adjustment potentiometer.
3 2.5 mm² screw terminal for connection of the output voltage.
4 LED indicating presence of the d.c. output voltage.
5 Retractable fixing lugs.

Characteristics : pages 14060/3
References : pages 14060/5
Dimensions : pages 14060/5

Power supplies and transformers
Phaseo modular regulated power supply units

Technical characteristics				
Type of power supply			**ABL 7RM1202**	**ABL 7RM2401**
Approvals			UL - CSA - TÜV	
Conforming to standards	Safety		IEC/EN 60950 - IEC/EN 61131-2/A11	
	EMC		EN 50081-2, IEC 61000-6-2 (EN 50082-2)	
Input circuit				
LED indication			no	no
Input voltage	Rated values	**V**	∿ 100…240	∿ 100…240
	Permissible values	**V**	∿ 85…264	∿ 85…264
	Permissible frequencies	**Hz**	47…63	47…63
	Efficiency at nominal load		> 80%	> 80%
	Current consumption	**A**	0.5 (100 V)/0.3 (240 V)	0.6 (100 V)/0.4 (240 V)
	Current at switch-on	**A**	< 20	< 20
	Power factor		0.6	0.6
Output circuit				
LED indication			Green LED	Green LED
Nominal output voltage		**V**	⎓ 12	⎓ 24
Nominal output current		**A**	1.9	1.3
Precision	Output voltage		Adjustable 100 to 120 %	
	Line and load regulation		± 4 %	± 3 %
	Residual ripple - interference	**mV**	200	250
Micro-breaks	Holding time for I max and Ve min	**ms**	> 10	> 10
Protection	Short-circuit			
	Overvoltage, cold state		< 1.7 In	< 1.6 In
	Undervoltage	**V**	< 10.5	< 19
Operating characteristics				
Connections	Input	**mm²**	1 x 2.5 or 2 x 1.5 screw terminals	
	Output	**mm²**	1 x 2.5 or 2 x 1.5 screw terminals	
Environment	Storage temperature	**°C**	- 25 to + 70	
	Operating temperature	**°C**	- 25 to + 55	
	Maximum relative humidity		95 %	
	Degree of protection		IP2x	
	Vibration		EN 61131-2, IEC 68-2-6 test Fc	
Operating position			Vertical	
MTBF			Not available	
Connections	Serial		No	No
	Parallel		Yes (same references)	Yes (same references)
Dielectric strength	Input/Output		3000 VAC/50 Hz/1 min	
Protection class conforming to VDE 0106 1			Class II without PE	
Input fuse incorporated			Yes (not interchangeable)	
Emissions	Conducted/radiated		EN 50081-2 (generic standard), EN 55011, EN 55022 Cl:B	
Immunity	Electrostatic discharge		EN 61000-6-2 (generic standard), EN 61000-4-2 (4 kV contact/8 kV air)	
	Electromagnetic		EN 61000-4-3 level 3 (10 V/m)	
	Conducted interference		EN 61000-4-4 level 3 (2 kV), EN 61000-4-6 (10 V)	
	Mains interference		EN 61000-4-11	

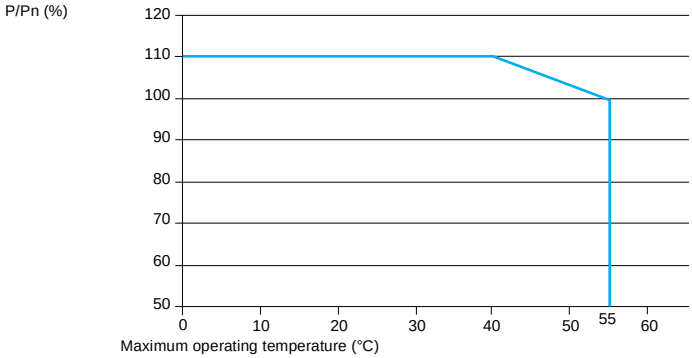
Presentation : pages 14060/2
References : pages 14060/5
Dimensions : pages 14060/5

Output characteristics

Derating

The ambient temperature is a determining factor which limits the power that an electronic power supply unit can deliver continuously. If the temperature around the electronic components is too high, their life will be significantly reduced. Conversely, a power supply unit can deliver more than its rated power if the ambient temperature remains well below the nominal operating temperature.

The maximum ambient temperature for Phaseo power supply units is 55°C. Below this temperature, derating is possible up to 110% of the nominal power.
The graph below shows the power (in relation to the nominal power) which the power supply unit can deliver continuously, according to the ambient temperature.



Selection

Upstream protection of power supply units

Mains supply	∿ 115 V single-phase			∿ 230 V single-phase		
Type of protection	Thermal-magnetic circuit-breaker		Gg fuse	Thermal-magnetic circuit-breaker		Gg fuse
Single-pole	GB2 CB●●	-	-	-	-	-
2-pole	GB2 DB●●	C60N	-	GB2 DB●●	C60N	-
ABL 7RM2401	GB2 CB/DB06	MG24516 *(1)* 24184	1 A	GB2 CB/DB07	MG24517 *(1)* 24185	1 A
ABL 7RM1202	GB2 CB/DB06	MG24516 *(1)* 24184	1 A	GB2 CB/DB07	MG17453 *(1)* 24185	1 A

(1) UL certified circuit-breaker

Presentation : pages 14060/2
References : pages 14060/5
Dimensions : pages 14060/5

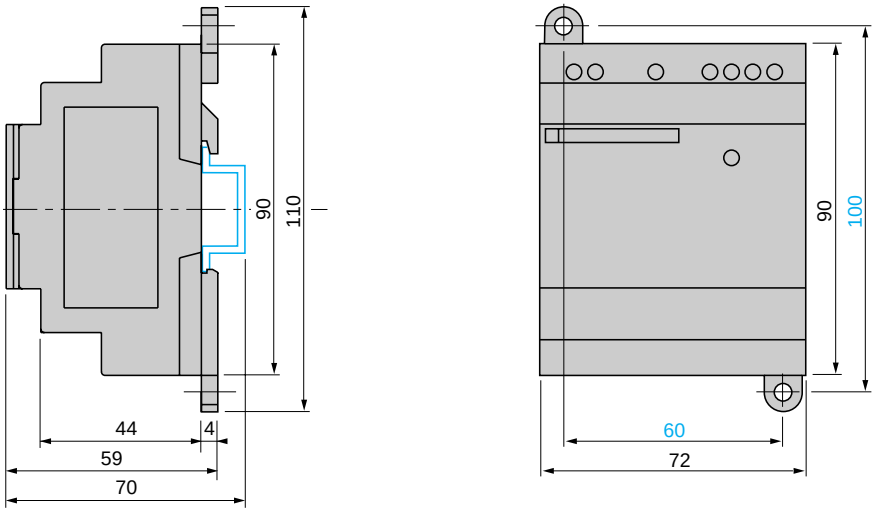
Power supplies and transformers
Phaseo modular regulated power supply units

ABL 7RM modular regulated switch mode power supply units

Mains input voltage 47…63 Hz	Output voltage	Nominal power	Nominal current	Auto-protect reset	Reference	Weight
V	⎓ V	W	A			kg
100…240 single-phase wide range	12	22	1.9	auto	**ABL 7RM1202**	0.180
	24	30	1.3	auto	**ABL 7RM2401**	0.182

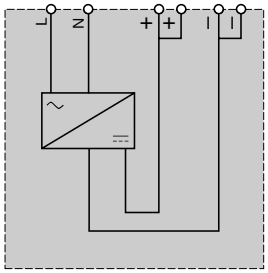
Dimensions

ABL 7RM●●●● power supply unit



Scheme

ABL 7RM●●●●



Presentation : pages 14060/2
Characteristics : pages 14060/3

Power supplies and transformers

Power supplies for d.c. control circuits

ABL-7 power supplies

The ABL-7 range of power supplies is designed to provide the d.c. voltage necessary for the control circuits of automation system equipment. Split into three families, this range meets all the needs encountered in industrial, commercial and residential applications. Single-phase or 3-phase, of the electronic switch mode type, they provide a quality of output which is suitable for the loads supplied and compatible with the mains supply available in the equipment. Clear guidelines are given on selecting protection devices which are often used with them, and thus a comprehensive solution is provided which can be used in total safety.

Phaseo switch mode power supplies

These switch mode power supplies are totally electronic and regulated. The use of electronics makes it possible to significantly improve the performance of these power supplies which offer:
- compact size,
- integrated overload, short-circuit, overvoltage and undervoltage protection,
- a very wide range of permissible input voltages, without any adjustment,
- a high degree of output voltage stability,
- good performance,
- LED indicators on the front panel.

Phaseo power supplies are available in single-phase and 3-phase versions. They deliver a voltage which is precise to 3%, whatever the load and whatever the type of mains supply, within a range of 85 to 264 V for single-phase, or 360 to 550 V for 3-phase. Conforming to IEC standards and UL and CSA 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-7 RE and ABL-7 RP supplies are also equipped with an output undervoltage control which causes the product to trip if the output voltage drops below 19 V, in order to ensure that the voltage delivered is always usable by the actuators being supplied. All the products are fitted with an output voltage adjustment potentiometer in order to be able to compensate for any line voltage drops in installations with long cable runs. Most of our power supplies are designed for direct mounting on 35 and 75 mm ⎓ rails.

These power supplies are available in single-phase and 3-phase versions and are split into three families:

108700-13-M

ABL 7CEM

- Compact single-phase supply **ABL-7CEM** :
  - power less than or equal to 30 W (1.2 A),
  - compact size,
  - for all low power equipment,
  - suitable for use in automation system environments based on the Nano and Twido platforms or in any automation system configuration requiring a ⎓ 24 V supply.

43367-15-M

ABL-7RP

- Universal single-phase supplies **ABL-7RE** and **ABL-7RP** :
  ABL-7RE
  - power between 48 W (2 A) and 240 W (10 A),
  - compact size,
  - for all machine equipment,
  - suitable for use in automation system environments based on the Micro and Premium platforms or in any automation system configuration requiring a ⎓ 24 V supply.

  ABL-7RP
  - power between 72 W (3 A) and 240 W (10 A),
  - input filter (PFC) for commercial and residential environments (conforming to standard EN 61000-3-2),
  - two operating modes possible for handling of overload and short-circuit faults :
    . "AUTO" mode which provides automatic restarting of the power supply on elimination of the fault,
    . "MANU" mode which requires manual resetting of the power supply to restart. Resetting is achieved by switching off the mains power.

108387-25-M

ABL-7UPS

530894

ABL-7REQ

- 3-phase and single-phase process supplies **ABL-7U** and **ABL-7REQ** :
  ABL-7UE
  - power between 120 W (5 A) and 480 W (20 A),
  - compact size,
  - voltages between 3 x 380 V and 3 x 500 V,
  - for use in industrial applications, for all in-line or continuous process equipment, machine tools and injection presses etc.,
  - suitable for use in automation system environments based on the Premium and Quantum platforms or in any automation system configuration requiring a ⎓ 24 V supply.

  ABL-7UPS
  - power between 120 W (10 A) and 960 W (40 A).

  Like the **ABL-7UE** range, this power supply includes a filter (PFC) which means that it can be connected directly to the public mains supply, in compliance with standard EN 61000-3-2. This product, for world-wide use, is UL certified.

  ABL-7 REQ
  - power between 120 W (5 A) and 240 W (10 A),
  - compact size,
  - can be connected to **2-phase** input voltages between 380 V and 415 V, to replace older power supplies connected by only two wires. Economical, more competitive, yet with a smaller input voltage range, it can in certain cases be used in place of the 3-phase versions.

Characteristics : pages 14054/2 to 14054/5 | References : page 14055/3 | Dimensions : page 14057/2 | Schemes : page 14057/3

Power supplies and transformers

Power supplies for d.c. control circuits

Using ⎓ 24 V

- Using ⎓ 24 V enables so-called protection installations (PELV) to be built. Using PELV is a measure designed to protect people from direct and indirect contact. Measures relating to these installations are defined in publication NF C 12-201 and in standard IEC 364-4-41.

- The application of these measures to the electrical equipment in machines is defined in standard NF EN 60204-1 and requires:
  - that the voltage used is below 60 V d.c. in dry environments and below 30 V in damp environments,
  - the connection of one side of the PELV circuit, or one point of the source, to the equipotential protection circuit associated with higher voltages.
  - the use of switchgear and control gear on which measures have been taken to ensure "safety separation" between power circuits and control circuits.

- A safety separation is necessary between power circuits and control circuits in PELV circuits. Its aim is to warn of the appearance of dangerous voltages in ⎓ 24 V safety circuits.

- The reference standards involved are:
  - IEC 61558-2-6 and EN 61558-2-6 (safety transformers),
  - IEC 664 (coordination of isolation).

Telemecanique power supplies meet these requirements.

- Moreover, to ensure that these products will operate correctly in relation to the demands of their reinforced isolation, it is recommended that they be mounted and wired as indicated below:
  - they should be placed on an earthed mounting plate or rail,
  - they should be connected using flexible cables, with a maximum of two wires per connection, and tightened to the nominal torque,
  - conductors of the correct insulation class must be used.

- If the d.c. circuit is not connected to an equipotential protection conductor, an earth leakage detector will indicate any accidental insulation faults (please consult your Regional Sales Office).

Operating voltage

- The permissible tolerances for the operating voltage are listed in publications IEC 1131-2 and DIN 19240.

- For nominal voltage Un = ⎓ 24 V, the extreme operating values are from - 15 % to + 20 % of Un, whatever the supply fluctuations in the range - 10 % to + 6 % (defined by standard IEC 38) and load variations in the range 0-100 % of In.

All Telemecanique ⎓ 24 V power supplies are designed to provide a voltage within this range.

- 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 (please consult your Regional Sales Office).

Power supplies and transformers
Power supplies for d.c. control circuits

Selection of power supplies

The characteristics to be taken into account when selecting a power supply are:
- the required output voltage and current,
- the mains voltage available in the installation.

An initial selection can be made using the table opposite.
This may however result in several products being selected as suitable.
Other selection criteria must therefore be taken into account.

● **The quality of the mains power supply**
The Phaseo range is the solution because it guarantees precision to 3% of the output voltage, whatever the load current and the input voltage. In addition, the wide input voltage range of Phaseo power supplies allows them to be connected to all mains supplies within the nominal range, without any adjustment.
The Phaseo RP family can also be connected to ⎓ 110 and 220 V emergency supplies.

● **Harmonic pollution (power factor)**
The current drawn by a power supply is not sinusoidal. This leads to the existence of harmonic currents which pollute the mains supply. European standard EN 61000-3-2 limits the harmonic currents produced by power supplies. This standard covers all devices between 75 W and 1000 W, drawing up to 16 A per phase, and connected directly to the public mains power supply. Devices connected downstream of a private, low voltage, general transformer are therefore excluded.

Regulated switch mode supplies always produce harmonic currents; a filter circuit (Power Factor Correction or PFC) must therefore be added to comply with standard EN 61000-3-2.
Phaseo ABL-7RP and ABL-7UPS power supplies conform to standard EN 61000-3-2 and can therefore be connected directly to public mains power supplies.

● **Electromagnetic compatibility**
Levels of conducted and radiated emissions are defined in standards EN 55011 and EN 55022.
The majority of products in the Phaseo range have class B certification and can be used without any restrictions, due to their low emissions.
ABL-7CEM24003 and ABL-7CEM24006 power supplies have class A certification. It is recommended that they should **not** be used in the following equipment: trains, aircraft, nuclear applications and in any environment where malfunctioning could cause serious injuries or lead to death. These products are designed for use in industrial equipment and are not suitable for use in residential environments.

● **Behaviour in the event of short-circuits**
Phaseo power supplies are equipped with an electronic protection device. This protection device resets itself automatically on elimination of the fault, which avoids having to take any action or change a fuse. In addition, the Phaseo ABL-7RP/U/REQ ranges allow the user to select the reset mode in the event of a fault:
- in the "AUTO" position, resetting is automatic,
- in the "MANU" position, resetting occurs after elimination of the fault and after switching the mains power off and back on.

This feature allows Phaseo ABL-7RP/U/REQ power supplies to be used in installations where the risks associated with untimely restarting are significant.

● **Behaviour in the event of phase failure**
In the event of failure of one phase, all Phaseo 3-phase power supplies switch to relaxation mode for as long as the input voltage is < 450 V.
For operation on higher voltages (e.g. 480 V), use of an upstream GV2 type residual current protection device is recommended.

● **Selection of reset mode**
- on ABL-7RP family of products:
  By microswitch on the front panel of the product.
- on ABL-7U/REQ family of products:
  By jumper on the front panel. **Warning: selection of the function is only possible after the mains power supply has been switched off for at least 5 minutes**. The jumper is moved using a pair of insulated, flat-nose pliers.

Power supplies and transformers

Power supplies for d.c. control circuits

Selection according to applications characteristics

Type of supply		Single-phase				2-phase	3-phase		
Rated mains supply voltage		~ 100…240 V 50/60 Hz ⎓ 110… 220 V (1) Wide range			100…240 V 50/60 Hz Wide range	2 x 380…415 V 50/60 Hz	3 x 380…415 V 50/60 Hz	3 x 400…520 V 50/60 Hz Wide range	3 x 380…520 V 50/60 Hz Wide range
Permissible variation		85…264 V, 47…63 Hz ⎓ 100...250 V (1), ⎓ 105...370 V (2)			85…264 V 47…63 Hz	340…460 V 47…63 Hz	340…460 V 47…63 Hz	360…550 V 47…63 Hz	340…550 V 47…63 Hz
Output voltage		12 V	48 V	24 V	24 V	24 V	24 V	24 V	24 V
Output current	0.3 A			ABL-7CEM24003					
	0.6 A			ABL-7CEM24006					
	1.2 A			ABL-7CEM24012					
	2 A				ABL-7RE2402				
	2.5 A		ABL-7RP4803						
	3 A			ABL-7RP2403	ABL-7RE2403				
	5 A	ABL-7RP1205		ABL-7RP2405	ABL-7RE2405	ABL-7REQ24050		ABL-7UES24050	
	10 A			ABL-7RP2410	ABL-7RE2410	ABL-7REQ24100	ABL-7UEQ24100		ABL-7UPS24100
	20 A						ABL-7UEQ24200		ABL-7UPS24200
	40 A								ABL-7UPS24400
Compliance with EN61000-3-2		Yes (not applicable for **ABL-7CEM**)			No	No	No	No	Yes
Integrated automatic protection		Yes Automatic or manual restart on **ABL-7RP** Automatic restart only on **ABL-7CEM**			Yes Automatic restart	Yes Automatic or manual restart			

(1) Values for **ABL-7RP** power supplies, not indicated on the product.
(2) Values for **ABL-7CEM** power supplies, not indicated on the product.

Power supplies and transformers

Power supplies for d.c. control circuits
Phaseo regulated switch mode power supplies

Technical characteristics

			ABL-7CEM	ABL-7RE	ABL-7RP
Type of power supply					
Approvals			cULus, TÜV	UL, CSA, TÜV, CTick	
Conforming to standards			UL 508	UL 508, CSA 22.2 n° 950	
	Safety		IEC/EN 60950		
	EMC		EN 50081-2, EN 50082-2	EN 50081- 2, IEC 61000-6-2 (EN 50082-2)	
	Low frequency harmonic currents		–	–	EN 61000-3-2

Input circuit

LED indication			–	Orange LED	Orange LED
Input voltages	Rated values	**V**	(1) ∿ 100…240, ⎓ 110…220 compatible (1)	∿ 100…240	∿ 100…240, ⎓ 110…220 compatible (1)
	Permissible values	**V**	∿ 85…264, ⎓ 105…370 compatible (1)	∿ 85…264 single-phase	∿ 85…264, ⎓ 100…250 compatible (1)
	Permissible frequencies	**Hz**	47…63		
	Efficiency at nominal load		> 70 %	> 85 %	
	Current consumption Ue = 240 V	**A**	0.1 (7 W)/0.2 (15 W)/0.45 (30 W)	0.6 (48 W)/0.83 (72 W) 1.2 (120 W)/2.5 (240 W)	0.4 (72 W)/0.6 (120 W) 1.3 (240W)
	Current consumption Ue = 100 V	**A**	0.17 (7 W)/0.3 (15 W)/0.68 (30 W)	1.2 (48 W)/1.46 (72 W) 1.9 (120 W)/3.6 (240 W)	0.8 (72 W)/1 (120 W)/2.8 (240 W)
	Current at switch-on	**A**	< 50	< 30	
	Power factor		0.45 approx.	0.65 approx.	0.98 approx.

Output circuit

LED indication			Green LED	Green LED	Green LED
Nominal output voltage (U out)		**V**	⎓ 24		12, 24 and 48
Nominal output current		**A**	0.3/0.6/1.2	2/3/5/10	3/5/10
Precision	Output voltage		Adjustable, from 90 to 110 %	Adjustable, from 100 to 120 %	
	Line and load regulation		2 % max.	± 3 %	
	Residual ripple - interference	**mV**	< 200 (peak-peak)		
Micro-breaks	Holding time at I max. and Ve min.	**ms**	> 20	> 10	> 20
Temporary overloads	Permissible inrush current (U out >19 V)		See curves page 14054/5		
Protections	Short-circuit		Permanent/automatic restart	Permanent/automatic restart	Permanent/automatic restart or manual restart on product
	Overload		1.05 In	1.1 In	
	Overvoltage		U > 1.2	Tripping if U > 1.5 Un	
	Undervoltage		–	Tripping if U < 0.8 Un	

Operational and environmental characteristics

Connections	input	**mm²**	2 x 2.5 + earth	
	output	**mm²**	2 x 2.5	2 x 2.5 + earth, multiple output, depending on model
Ambient conditions	Storage temperature	**°C**	- 25… + 70	
	Operating temperature	**°C**	- 10… + 60 (derating as from 50 °C, mounted vertically)	0… + 60 (derating as from 50 °C, mounted vertically)
	Maximum relative humidity		20…90 %	95 % without condensation or dripping water
	Degree of protection		IP 20 conforming to IEC 529	
	Vibrations		Conforming to EN 61131-2	
Operating position			Vertical and horizontal (see derating curve, page 14054/4)	Vertical
MTBF at 40 °			> 100 000 h	
Connections	Series		Possible	
	Parallel		No	Possible (maximum temperature 50° C)
Dielectric strength	Input/output		3000 V/50 Hz 1 min	3000 V/50 Hz 1 min
	Input/earth		2000 V/50 Hz 1 min	3000 V/50 Hz 1 min
	Output/earth (and output/output)		500 V/50 Hz 1 min	500 V/50 Hz 1 min
Input fuse incorporated			Yes, not interchangeable	
Emissions			EN 50081-1 (Generic)	
	Conducted		EN 55011/EN 55022 cl.A (7 and 15 W) EN 55011/EN 55022 cl.B (30 W)	EN 55011/EN 55022 cl.B
	Radiated		EN 55011/EN 55022 cl.B	
Immunity			IEC 61000-6-2 (Generic)	
	Electrostatic discharge		EN 61000-4-2 (4 kV contact/8 kV air)	
	Electromagnetic		EN 61000-4-3 level 3 (10 V/m)	
	Conducted interference		EN 61000-4-4 level 3 (2 kV), EN 61000-4-5, EN 61000-4-6 level 3, EN 61000-4-8 level 4.	
	Mains interference		EN 1000-4-11 (Voltage drops and cuts)	

(1) Compatible input voltage, not indicated on the product.

Presentation: pages 14053/2 and 14053/3
References: page 14055/3
Dimensions: page 14057/2
Schemes: page 14057/3

Power supplies and transformers

Power supplies for d.c. control circuits
Rectified power supplies

Technical characteristics

Type of power supply		**ABL-7REQ24●**	**ABL-7UEQ24●**	**ABL-7UES24●**	**ABL-7UPS24●**
Approvals					cULus, c UL us
Conforming to standards					
Safety		EN 60950			
EMC		EN 50081-2, EN 50082-2			
Low frequency harmonic currents		–			

Input circuit

LED indication		–			
Input voltages					
Rated values	**V**	∿ 2 x 380…415	∿ 3 x 380…415	∿ 3 x 400…520	∿ 3 x 400…520
Permissible values	**V**	∿ 2 x 340…460	∿ 3 x 340…460	∿ 3 x 360…550	∿ 3 x 340…550
Permissible frequencies	**Hz**	50…60			
Efficiency at nominal load		> 85 %	> 90 %		
Current consumption					
Ue = 400 V	**A**	0.65 (120 W)/1.2 (240 W)	0.75 (240 W)/1.5 (480 W)	0.6 (240 W)/1.2 (480 W)/1.7 (960 W)	
Current at switch-on	**A**	< 25	< 15		
Power factor		0.6	0.55	0.7	0.7/0.9 (960 W)
2-phase operating mode	**V**	–	Relaxation if input voltage < ∿ 450		

Output circuit

LED indication		Green LED			
Nominal output voltage (U out)	**V**	⎓ 24			
Nominal output current	**A**	5/10	10/20	5	10/20/40
Precision					
Output voltage		Adjustable 100 to 116%			
Line and load regulation		1 % max.			
Residual ripple - interference	**mV**	< 200 (peak-peak)			
Micro-breaks					
Holding time at I max and Ve min	**ms**	15	10		between 8 and 13
Temporary overloads					
Permissible inrush current (U out > 19V)		See curves, page 14054/5			
Protections					
Short-circuit		Permanent/automatic or normal restart			
Overload		1.05 In < 50 ms			
Overvoltage	**V**	28.5 typical			
Undervoltage	**V**	19 typical			

Operational and environmental characteristics

Connections					
input	**mm**	2 x 1.5…2.5 mm^2 + earth			
output	**mm^2**	4 x 1.5…2.5 mm^2	4 x 4…6 mm	4 x 1.5…2.5 mm^2	2 x 1.5…2.5 mm^2 + earth (240 W) 2 x 4…6 mm^2 + earth (480 W) 2 x 4…10 mm^2 + earth (960 W)
Ambient conditions					
Storage temperature	**°C**	- 25…+ 70			
Operating temperature	**°C**	0° C…+ 60° C			
Humidité relative maximale		30…90 %			
Degree of protection		IP 20 or IP XXB			
Vibrations		Conforming to EN 61131-2			
Operating position		Vertical			
MTBF		> 100 000 h			
Connections					
Series		Possible			
Parallel		Possible 3 max., possible 5 max.			
Dielectric strength					
Input/output		3750 V/50 Hz 1 mn			
Input/earth		3500 V/50 Hz 1 mn			
Output/earth (and output/output)		500 V/50 Hz 1 mn			
Input fuse incorporated		No			
Emissions					
Conducted/radiated		EN 55011/EN 5022 - class B			
Immunity					
Electrostatic discharge		EN 61000-4-2 (4 kV contact/8 kV air)			
Electromagnetic		EN 61000-4-3 level 3 (10 V/m)			
Conducted interference		EN 61000-4-4 level 3 (2 kV), EN 61000-4-5, EN 61000-4-6 level 3, EN 61000-4-8 level 4 (for ABL-7RE/RP)			
Mains interference		EN 61000-4-11 (Voltage drops and cuts)			

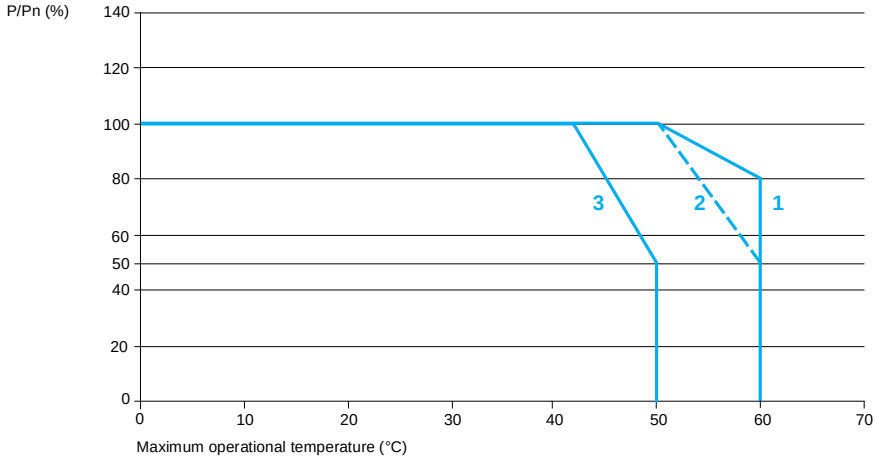
Presentation: pages 14053/2 and 14053/3
References: page 14055/3
Dimensions: page 14057/2
Schemes: page 14057/3

Derating

The ambient temperature is a determining factor which limits the power that an electronic power supply can deliver continuously. A temperature which is too high around the electronic components significantly reduces their life. However, if the ambient temperature remains largely below the rated operating temperature, then a power supply can deliver more than its nominal power.

The rated ambient temperature for Phaseo power supplies is 50°C. Above 50°C, a derating is necessary up to a maximum temperature of 60°C.

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



1 ABL-7RE, ABL-7RP, ABL-7U vertical mounting
2 ABL-7CEM vertical mounting
3 ABL-7CEM vertical mounting

Derating should be considered in the following 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 followed

Intensive operation	See derating information on the graph above. Example for ABL-7RE: - 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 power (except ABL-7CEM)	The total power is equal to the sum of the powers 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.

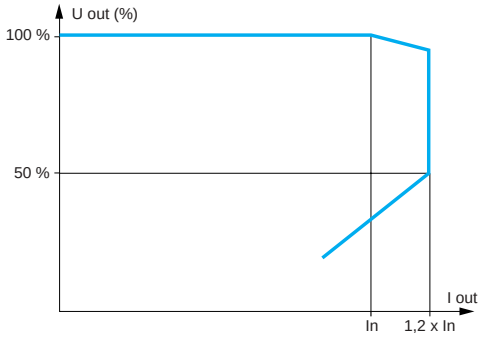
In all cases, there must be adequate convection round the products to ensure easier cooling. There must be a clear space of 50 mm above and below Phaseo power supplies and of 15 mm at the sides.

Power supplies and transformers

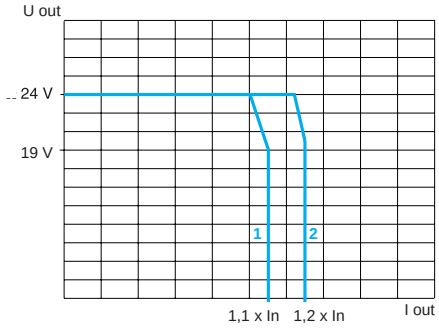
Power supplies for d.c. control circuits
Rectified power supplies

Load limit

ABL-7CEM24●●●



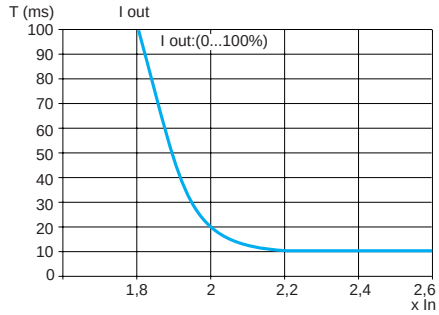
ABL-7RE24●●/ABL-7RP●●●●
ABL-7U●●24●●/ABL-7REQ●●●●



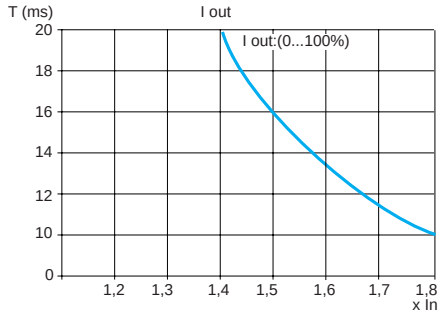
1 ABL-7RE24●●/ABL-7RP●●●●
2 ABL-7U●●24●●/ABL-7REQ●●●●

Temporary overloads

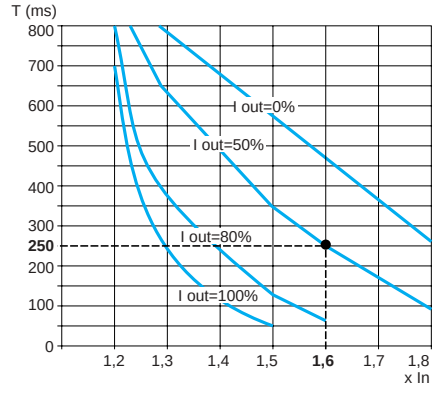
ABL-7CEM



ABL-7RE/ABL-7RP



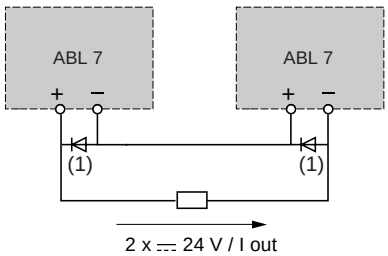
ABL-7U



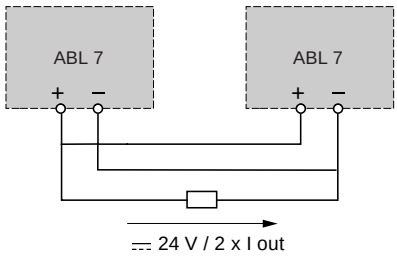
Example : For an ABL-7UPS24●●● power supply, 50 % loaded (I out = 50 %), this power suppy can withstand a current peak of 1.6 x In for 250 ms with an output voltage ⩾19 V.

Series or parallel connection

Series connection



Parallel connection



Family	Series	Parallel
ABL-7CEM	2 products max (1)	Not possible
ABL-7RE/RP	2 products max	2 products max
ABL-7U/REQ	2 products max	2 products max

(1) 2 Shottky diodes, 2 A/100 V, on ABL-7CEM only.

Presentation: pages 14053/2 and 14053/ | **References:** 3 | **Dimensions:** page 14055/3 | **Schemes:** page14057/2 | page14057/3

Power supplies and transformers

Power supplies for d.c. control circuits
Upstream protection for Phaseo regulated switch mode power supplies

ABL-7CEM ABL-7RE and ABL-7RP power supplies: protection of the power supply line

Type de supply	~ 115 V single-phase			~ 230 V single-phase		
Type of protection	Thermal-magnetic circuit-breaker		gG fuse	Thermal-magnetic circuit-breaker		gG fuse
Single-pole 2-pole	GB2-CB●● GB2-DB●●	C60N	2A	GB2-DB●●	C60N	
ABL-7CEM24003	GB2-●B05	24183 MG24516 (1)	2A	GB2-DB05	24183 MG24516 (1)	2 A
ABL-7CEM24006	GB2-●B05	24183 MG24516 (1)	2A	GB2-DB05	24183 MG24516 (1)	2 A
ABL-7CEM24012	GB2-●B06	24183 MG24516 (1)	2A	GB2-DB06	24183 MG24516 (1)	2 A
ABL-7RE2402	GB2-●B07	MG24517 (1)	2A	GB2-DB06	MG 24516 (1)	2 A
ABL-7RE2403	GB2-●B07	MG24517 (1)	2 A	GB2-DB06	MG 24516 (1)	2 A
ABL-7RE2405	GB2-●B08	MG24518 (1)	4 A	GB2-DB07	MG 17453 (1)	2 A
ABL-7RE2410	GB2-●B12	MG17454 (1)	6 A	GB2-DB08	MG24518 (1)	4 A
ABL-7RP2403	GB2-●B07	MG 24517 (1)	2 A	GB2-DB07	MG24516 (1)	2 A
ABL-7RP2405	GB2-●B07	MG24517 (1)	2 A	GB2-DB07	MG24516 (1)	2 A
ABL-7RP2410	GB2-●B09	MG24519 (1)	4 A	GB2-DB07	MG24516 (1)	2 A
ABL-7RP4803	GB2-●B07	MG24517 (1)	2 A	GB2-DB07	MG24516 (1)	2 A

ABL-7REQ power supply: protection of the power supply line

Type de supply	~ 400 V 2-phase		
Type of protection	Thermal-magnetic circuit-breaker		gG fuse
2-pole	GB2-DB●●	C60N	
ABL-7REQ24050	DB07	24100	10 A
ABL-7REQ24100	DB08	24100	10 A

ABL-7UEQ ABL-7UES and ABL-7UPS power supplies: protection of the power supply line

Type de réseau	~ 400…480 V 3-phase		
Type de protection	Thermal-magnetic circuit-breaker		gG fuse
2-pole	GV2-ME●● GV2-ME●●	C60N	
ABL-7UEQ24100	GV2-ME08 (1)	24212	4 A
ABL-7UEQ24200	GV2-ME08 (1)	24213	6 A
ABL-7UES24050	GV2-ME08 (1)	24210	2 A
ABL-7UPS24100	GV2-ME08 (1)	24210	2 A
ABL-7UPS24200	GV2-ME08 (1)	24211	3 A
ABL-7UPS24400	GV2-ME08 (1)	24212	4 A

(1) UL certified circuit-breaker.

Presentation: pages 14053/2 and | 14053/3 References: | page 14055/3 Dimensions: | page 14057/2 Schemes: | page 14057/3

Power supplies and transformers

Power supplies for d.c. control circuits
Upstream protection for rectified power supplies

ABL-7CEM

Single-phase regulated switch mode power supplies ABL-7CEM

Mains input voltage 47...63 Hz	Output voltage	Nominal power	Nominal current	Automatic protection reset	Conforms to standard EN 61000-3-2	Reference	Weight
V	⎓ V	W	A				kg
∿ **100…240** single-phase wide range ⎓ **110…220** (1)	24	7	0.3	auto	no	**ABL-7CEM24003**	0.150
		15	0.6	auto	no	**ABL-7CEM24006**	0.180
		30	1.2	auto	no	**ABL-7CEM24012**	0.220

ABL-7RE2405
ABL-7RP2405
ABL-7RP4803

Single-phase regulated switch mode power supplies ABL-7RE

Mains input voltage 47...63 Hz	Output voltage	Nominal power	Nominal current	Automatic protection reset	Conforms to standard EN 61000-3-2	Reference	Weight
V	⎓ V	W	A				kg
∿ **100…240** single-phase wide range	24	48	2	auto	no	**ABL-7RE2402**	0.520
		72	3	auto	no	**ABL-7RE2403**	0.520
		120	5	auto	no	**ABL-7RE2405**	1.000
		240	10	auto	no	**ABL-7RE2410**	2.200

Single-phase regulated switch mode power supplies ABL-7RP

Mains input voltage 47...63 Hz	Output voltage	Nominal power	Nominal current	Automatic protection reset	Conforms to standard EN 61000-3-2	Reference	Weight
V	⎓ V	W	A				kg
∿ **100...240** single-phase wide range ⎓ **110...220** (1)	12	60	5	auto/man	yes	**ABL-7RP1205**	1.000
	24	72	3	auto/man	yes	**ABL-7RP2403**	0.520
		120	5	auto/man	yes	**ABL-7RP2405**	1.000
		240	10	auto/man	yes	**ABL-7RP2410**	2.200
	48	144	3	auto/man	yes	**ABL-7RP4803**	1.000

ABL-7REQ

2-phase regulated switch mode power supplies ABL-7REQ

Mains input voltage 47...63 Hz	Output voltage	Nominal power	Nominal current	Automatic protection reset	Conforms to standard EN 61000-3-2	Reference	Weight
V	⎓ V	W	A				kg
∿ **380…415**	24	120	5	auto/man	no	**ABL-7REQ24050**	0.850
		240	10	auto/man	no	**ABL-7REQ24100**	1.200

ABL-7UPS

3-phase regulated switch mode power supplies ABL-7U

Mains input voltage 47...63 Hz	Output voltage	Nominal power	Nominal current	Automatic protection reset	Conforms to standard EN 61000-3-2	Reference	Weight
V	⎓ V	W	A				kg
∿ **3x380…415**	24	240	10	auto/man	no	**ABL-7UEQ24100**	1.200
		480	20	auto/man	no	**ABL-7UEQ24200**	2.100
∿ **3x400…520**	24	120	5	auto/man	no	**ABL-7UES24050**	1.300
		240	10	auto/man	yes	**ABL-7UPS24100**	1.300
		480	20	auto/man	yes	**ABL-7UPS24200**	2.300
		960	40	auto/man	yes	**ABL-7UPS24400**	4.500

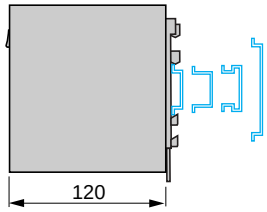
(1) Compatible input voltage not indicated on the product.

Présentation:pages 14053/2 and 14053/3 | Characteristics: pages 14054/2 to 14054/ | 5 Dimensions: | page 14057/2 Schemes: | page 14057/3

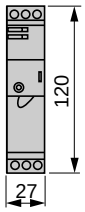
Power supplies and transformers

Power supplies for d.c. control circuits

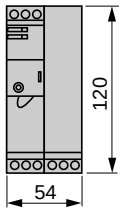
ABL-7RE24●●/ABL-7RP●●●●
Common side view
Mounting on 35 and 75 mm rails



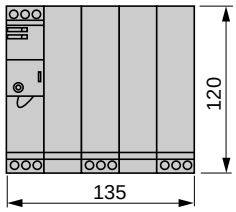
ABL-7RE2402/2403
ABL-7RP2403



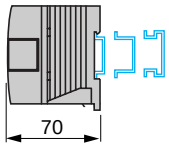
ABL-7RE2405
ABL-7RP1205/2405/4803



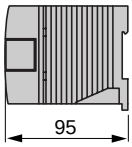
ABL-7RE2410
ABL-7RP2410



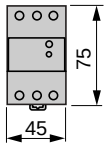
ABL-7CEM24●●●
ABL-7CEM24003



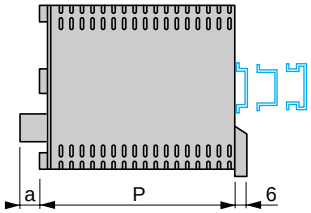
ABL-7CEM24006/
ABL-7CEM24012

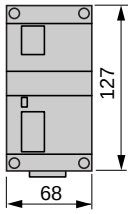


Common front view

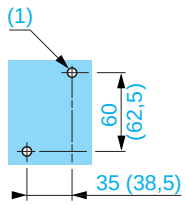


ABL-7REQ24●●●/ABL-7UEQ24100/ABL-7UES24050/
ABL-7UPS24100





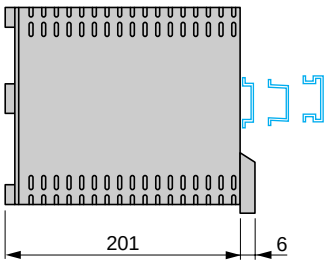
Panel mounting

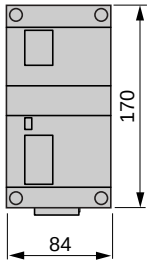


(1) 2 x M4 or 2 x Ø4.5

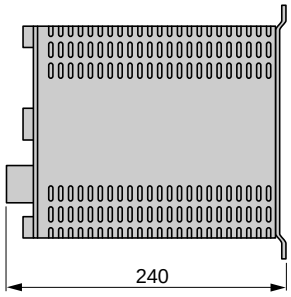
ABL-	P mm	a mm
7REQ24050	130	–
7REQ24100	154	–
7UEQ24100	154	–
7UES24050	171	15
7UPS24100	171	15

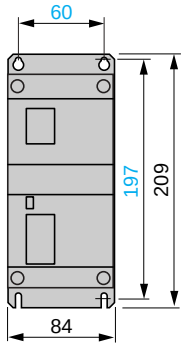
ABL-7UEQ24200



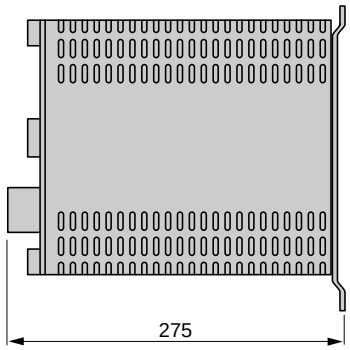


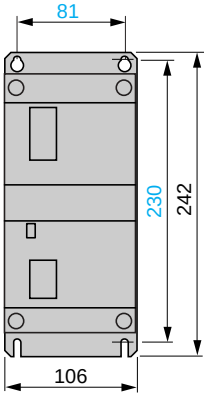
ABL-7UPS24200





ABL-7UPS24400



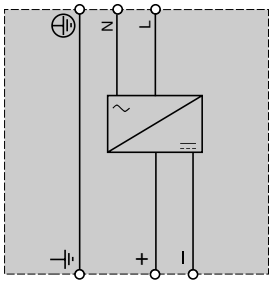


Presentation: pages 14053/2 and 14053/3
Characteristics: pages 14054/2 to 14054/5
References: page 14055/3
Schemes: page 14057/3

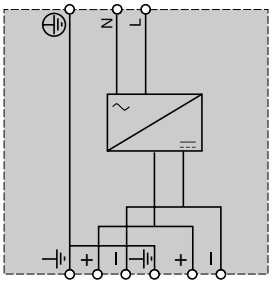
Power supplies and transformers

Power supplies for d.c. control circuits

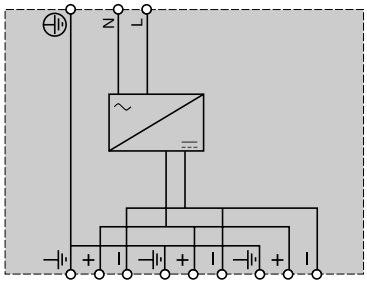
ABL-7RE2402/2403



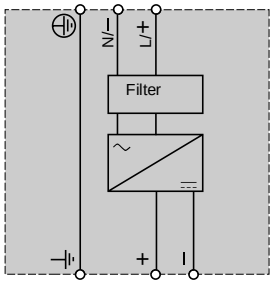
ABL-7RE2405



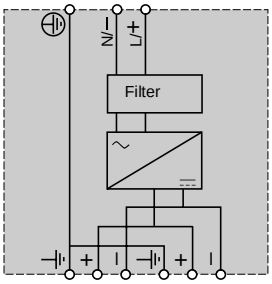
ABL-7RE2410



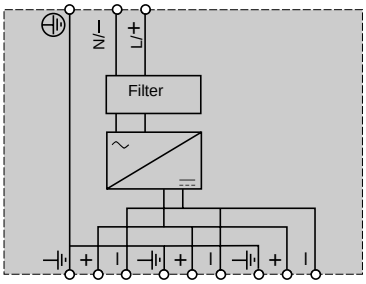
ABL-7RP2403



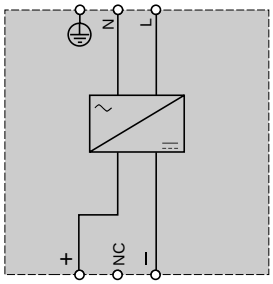
ABL-7RP1205/2405/4803



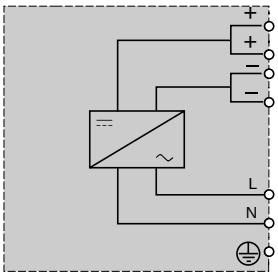
ABL-7RP2410



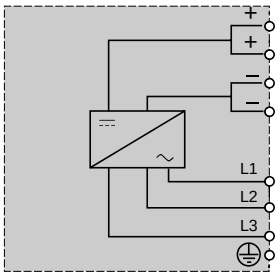
ABL-7CEM24●●●



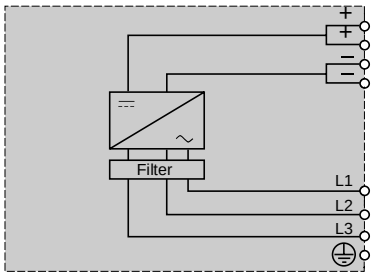
ABL-7REQ24●●●



ABL-7UE●●●●●



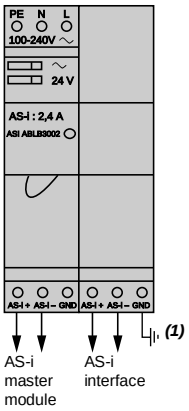
ABL-7UP●●●●●



Power supplies and transformers
Phaseo regulated switch mode power supplies for AS-i

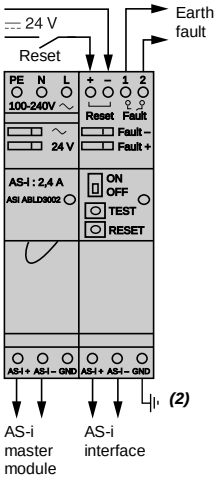
Power supplies for AS-i

Consistent with the standard Phaseo line, the range of ASI ABL power supplies is designed to deliver a d.c. voltage, as required by networks operating under the AS-i protocol. 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●

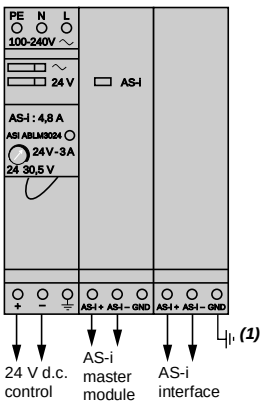
Operating on a 100 to 240 V a.c. supply, this power supply delivers a voltage of 30 V d.c. Available in 2.4 and 4.8 A ratings, the parallel output terminal blocks allow the bus to be connected separately to the slaves and the master. Input and output LEDs allow fast and continuous diagnostics.



■ ASI ABLD300●

Operating on a 100 to 240 V a.c. supply, this power supply delivers a voltage of 30 V d.c. Available in 2.4 and 4.8 A ratings, it allows diagnosis and management of earth faults on AS-i networks. In the event of an earth fault, the Phaseo power supply trips out, thus stopping dialogue on the bus. Restarting is only possible after deliberate acknowledgement of the fault. Two I/O are provided, which may be used to monitor status. The parallel output terminal blocks are used to connect the bus separately to the slaves and the AS-i master. Input, output and fault LED's allow fast and continuous diagnostics.

Warning : the earth (GND) (2) 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 ABLB300● power supply be used together with insulation relay RMO PAS 101.



■ ASI ABLM3024

Operating on a 100 to 240 V a.c. supply, this product delivers two d.c. outputs which are totally independent in the way they operate.
Two output voltages - 30 V d.c./2.4 A (AS-i supply) and 24 V d.c./3 A - are available, so making it possible to supply the control eqiupment without an additional power supply. Input and output LEDs allow fast and continuous diagnostics.

(1) Recommended connection.
(2) Compulsory connection.

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References : page 14061/5
Dimensions : page 14061/5

Power supplies and transformers
Phaseo regulated switch mode power supplies for AS-i

Technical characteristics

			ASI ABLB3002	ASI ABLB3004	ASI ABLD3002	ASI ABLD3004	ASI ABLM3024
Type of power supply							
Functions			Supply to the AS-i system				24 V ⎓ supply
Product certifications			UL 508, CSA 22-2 n° 950				
Conforming to standards	Safety		EN 60950, TÜV				
	EMC		EN 50081-2, IEC 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				
	Permissible frequencies	**Hz**	47…63				
	Efficiency at nominal load	**%**	> 83				> 80
	Current consumption		0.5	1	0.5	1	1
	Current at switch-on	**A**	< 30				
	Power factor		> 0.65				

Output circuit

LED indication			Green LED				
Nominal output voltage		**V**	⎓ 30 (AS-i)				⎓ 24
Nominal output current		**A**	2.4	4.8	2.4	4.8	2.4	3
Precision	Adjustable output voltage	**V**	–	–	–	–	–	100 to 120 %
	Line and load regulation		3 %				
	Residual ripple - interference	**mV**	300 - 50				
Micro-breaks	Holding time for I max and Ve min	**ms**	10				
Protection	Short-circuit		Permanent/automatic restart after elimination of the fault				
	Overload		1.1 In				
	Overvoltage		Tripping if U > 1.2 Un				U > 1.5 Un
	Undervoltage		Tripping if U < 0.95 Un				U < 0.8 Un

Operating characteristics

Connections	Input	**mm²**	2 x 2.5 screw terminals + earth
	Output	**mm²**	2 x 2.5 screw terminals + earth, multiple output
Environment	Storage temperature	**°C**	- 25 to + 70
	Operating temperature	**°C**	0 to + 60 (derating from 50)
	Maximum relative humidity		95 % (without condensation or dripping water)
	Degree of protection		IP 20 (conforming to IEC 529)
	Vibration		EN 61131-2
Operating position			Vertical
MTBF		**h**	> 100000 (conforming to Bell core, at 40 °C)
Dielectric strength	Input/output		3000 V/50 Hz/1 mm
	Input/earth		3000 V/50 Hz/1 mm
	Output/earth (and input/output)		500 V/50 Hz/1 mm
Input fuse incorporated			Yes (not interchangeable)
Emissions	Conducted/radiated		Class B (conforming to EN 55022)
Immunity	Electrostatic discharge		EN 61000-4-2 (4 kV contact/8 kV air)
	Electromagnetic		EN 61000-4-3 level 3 (10 V/m)
	Conducted interference		EN 61000-4-4 level 3 (2 kV), EN 61000-4-6 (10 V)
	Mains interference		EN 61000-4-11

Presentation : page 14061/2
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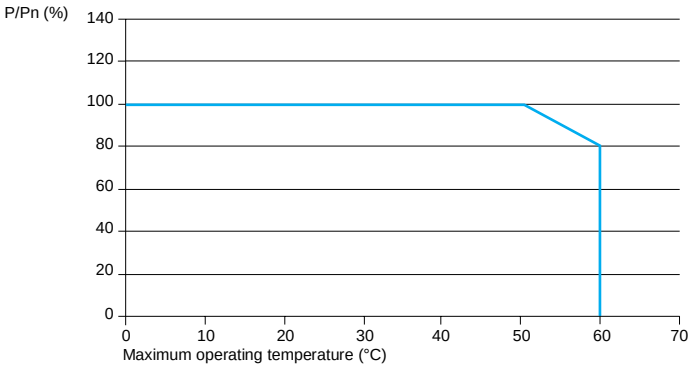
Power supplies and transformers
Phaseo regulated switch mode power supplies for AS-i

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.



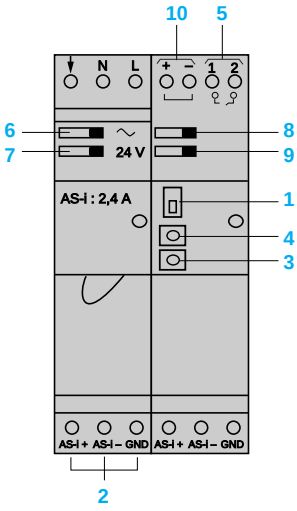
Selection

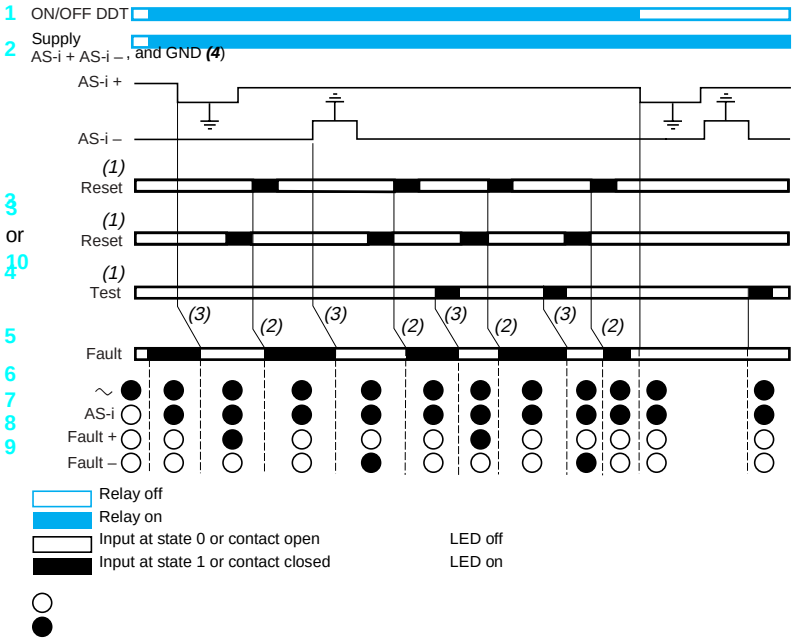
Upstream protection of power supplies for use on the AS-i system

Mains supply	∿ 115 V single-phase			∿ 230 V single-phase		
Type of protection	Thermal-magnetic circuit-breaker		Gg fuse	Thermal-magnetic circuit-breaker		Gg fuse
Single-pole	GB2 CB●●					
2-pole	GB2 DB●●	C60N		GB2 DB●●	C60N	
ASI ABLB3002	GB2 ●B07	MG24517 ***(1)***	2 A	GB2 DB06	MG24516 ***(1)***	2 A
ASI ABLB3004	GB2 ●B08	MG24518 ***(1)***	4 A	GB2 DB07	MG17453 ***(1)***	2 A
ASI ABLD3002	GB2 ●B07	MG24517 ***(1)***	2 A	GB2 DB06	MG24516 ***(1)***	2 A
ASI ABLD3004	GB2 ●B08	MG24518 ***(1)***	4 A	GB2 DB07	MG17453 ***(1)***	2 A
ASI ABLM3024	GB2 ●B07	MG24517 ***(1)***	2 A	GB2 DB06	MG17453 ***(1)***	2 A

(1) UL certified circuit-breaker.

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.

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Characteristics : page 14061/3
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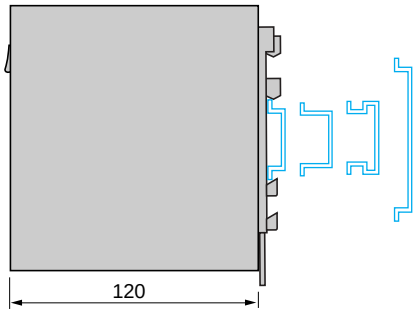
Power supplies and transformers
Phaseo regulated switch mode power supplies

ASI ABL regulated switch mode power supplies

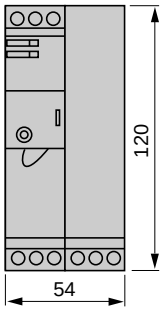
Mains input voltage 47…63 Hz	Output voltage	Nominal power	Nominal current	Auto-protect reset	Earth fault detection	Reference	Weight
V	⎓ V	W	A				kg
100…240 single-phase wide range	30	72	2.4	auto	no	**ASI ABLB3002**	0.800
		145	4.8	auto	no	**ASI ABLB3004**	1.300
		72	2.4	auto	yes	**ASI ABLD3002**	0.800
		145	4.8	auto	yes	**ASI ABLD3004**	1.300
	30 + 24	2 x 72	2.4 + 3	auto	no	**ASI ABLM3024**	1.300

Dimensions

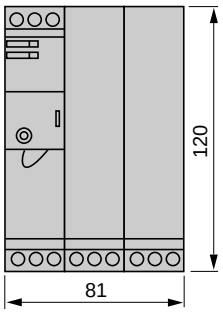
Common side view
Mounting on 35 and 75 mm rails



ASI ABLB3002
ASI ABLD3002

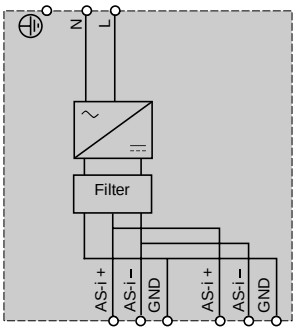


ASI ABLM3024
ASI ABL●3004

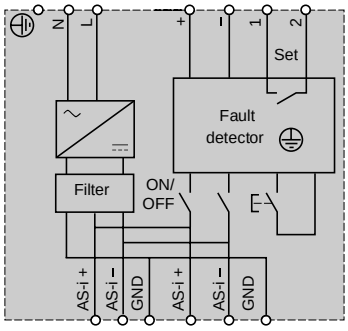


Schemes

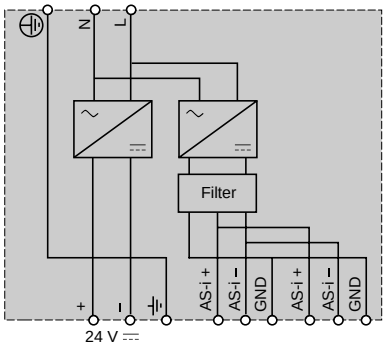
ASI ABLB300●



ASI ABLD300●



ASI ABLM3024



Presentation : page 14061/2
Characteristics : page 14061/3
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