1 Power supply

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Power supplies and transformers

Power supplies and transformers

Power supplies and transformers for control circuits

Selection guide

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Functions	Supplies for d.c. control circuits		
Type of product	Switch mode power supplies		
			
Applications	High power supplies to large installations. Connection to 3-phase mains supplies.	Standard, low and medium power industrial applications.	Industrial or commercial applications on sites sensitive to mains interference. Protected against sudden restarting.
Nominal power	240...960 W	48...240 W	72...240 W
Input voltage	∿ 360...550 V 3-phase	∿ 85...264 V single-phase	∿ 85...264 V single-phase
Output voltages	⎓ 24 V adjustable from 100 to 120%	⎓ 24 V adjustable from 100 to 120%	⎓ 12, 24 or 48 V adjustable from 100 to 120%
Technology	Primary switch mode electronic power supplies.		
Protection	Integrated, against overloads and short-circuits with automatic reset	Integrated, against overloads and short-circuits with automatic reset	Integrated, against overloads and short-circuits with automatic or manual reset.
Signalling	Output indicator lamp.	Output and input indicator lamps.	Output and input indicator lamps.
Other characteristics	Passive anti harmonic distortion filter.	–	Active anti-harmonic distortion filter.
Mounting	Direct on ⎓ rail	Direct on ⎓ rail	Direct on ⎓ rail
Conforming to standards	EN 61131-2, 55011/22-B, 61000-3-2, 60950	EN 61131-2, 55011/22-B, 60950	EN 61131-2, 55011/22-B, 60950, 61000-3-2
Approvals	UL, CSA	UL, CSA, TUV	UL, CSA, TUV
Device type	ABL-7RU●●●●	ABL-7RE●●●●	ABL-7RP●●●●
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Supplies for a.c. control circuits

Filtered rectified power supplies

All ⎓ 24 V circuits.
Pilot operation of valves and solenoid valves and double coil contactors.

240…960 W

∿ 380-400-420 V (± 10 %) 3-phase.

⎓ 24 V

3-phase filtered rectified power supply.

External

Output indicator lamp

Input connectors for regulating undervoltages or overvoltages.
Earth screen on all products.

Oblong holes.

EN 60742, DIN 19240,
UL 1950, CSA C22.2 N° 234

ABL-6RT●●●●

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Harsh environments.
Supply fluctuating within the range - 10…+ 10 %.
Non-sensitive load: contactors, relays, etc.

24…480 W

∿ 215-220-235-385-400-415 V or
∿ 105-120-135-225-240-255 V (± 10 %).

⎓ 24 V

3-phase filtered rectified power supply.

External or integrated, depending on model.

Output indicator lamp

Input connectors for regulating undervoltages or overvoltages.
Earth screen on all products.

Oblong holes.
Plate for mounting on ⎓ rail: option for ABL-6RF2401 to ABL-6RF2405.

EN 60742, DIN 19240,
UL 1950, CSA C22.2 N° 950

ABL-6RF●●●●

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Transformers

All control circuits.
Us < 50 V = safety transformer (SELV).
Us > 50 V = isolation transformer

25…2500 VA

∿ 230-400 V
with ± 15 V connectors, single-phase

∿ 12V, 24 V, 115 V or 230 V

∿ 24-48 V or 115 -230 V

Safety and isolation transformers

Single wound secondary

Double wound secondary

External

–

Earth screen on all products.

Oblong holes.
Plate for mounting on ⎓ rail: option for ABL-6T●02 to ABL-6T●10.

EN 60742, UL 506, CSA C22.2 N° 66

ABL-6TS●●●

ABL-6TD●●●

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Power supplies for d.c. control circuits

Presentation

ABL-●R power supplies

The ABL-●R range of power supplies is designed to provide the d.c. voltage necessary for the control circuits of most control system equipment. Split into five families, this range meets all the needs encountered in industrial, commercial and residential applications. Whether they are single-phase or 3-phase, electronic switch mode or conventional type with rectifier, they provide a quality of output current 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 supplies

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 permitted input voltages, without any adjustment,
- a high degree of output voltage stability,
- good performance,
- considerably reduced weight.

Phaseo power supplies are available in single-phase and 3-phase versions. They supply a voltage which is precise to 3%, whatever the load and whatever the type of mains supply, within a range of 85 to 364 V for single-phase, or 360 to 550 V for 3-phase. Conforming to IEC standards and UL and CSA approved, they are suitable for universal use. The inclusion of overload and short-circuit protection makes downstream protection unnecessary if discrimination is not required.
In accordance with IEC 61131-2, the products are also equipped with an output undervoltage control which causes the product to trip if the output voltage drops below 19 V. This is in order to ensure that the voltage supplied is always usable by the actuators being supplied. All the products are fitted with an output voltage adjustment potentiometer (in the range 24 to 28.8 V) 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 mm and 75 mm ⎓ rails.

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

- The ABL-7RE family includes products that are excellent for typically industrial applications. They are extremely compact and very easy to install, as well as being attractively priced.

- The ABL-7RP family of products is more general-purpose. These supplies are fitted with an input filter (PFC) which enables them to be used in commercial and residential environments (conforming to standard IEC 61000-3-2).
  In addition, they offer two operating modes for dealing with overloads and short-circuits:
  - “AUTO” mode which ensures automatic restarting of the supply as soon as the fault is cleared;
  - “MANU” mode which requires the supply to be reset before restarting is possible. Resetting is achieved by switching off the mains supply (on the product).

- The ABL-7RU family, for use on 3-phase mains supplies, is designed for applications that include high consumption loads. They can supply up to 960 W, in both industrial and commercial environments.

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 61131-2. They are particularly suitable for applications with high current inrush.

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 controlling d.c. valves and solenoid valves.

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Power supplies for d.c. control circuits

Presentation

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 NFC 12-201 and in standard IEC 60364-4-41.

- 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 usage 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 60742, EN 60742, DIN/VDE 0551 T1 (safety transformers).
  - IEC 60664 (coordination of isolation).

Telemecanique power supplies meet these requirements.

- Moreover, to ensure that these products will operate correctly in relation to the demands of the reinforced isolation, it is recommended that the products 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 tightening to 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 (1).

Operating voltage

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

- For nominal voltage Un = ⎓ 24 V, the extreme operating values are from - 15 % to + 20 % of Un, whatever the supply variations may be in the range - 10 % to + 6 % (defined by standard IEC 6038) and load variations in the range In 0-100%.

  Consequently the values are as follows :
  - maximum voltage (peak) : 30 V
  - nominal voltage : 24 V
  - minimum voltage (peak) : 19.2 V

All Telemecanique ⎓ 24 V supplies have been 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 (1).

(1) For further information on measurement and control relays please see pages 3/28 to 3/67

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Power supplies for d.c. control circuits

Selection

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 below.
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

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 1/11.
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 3% on 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, 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, ABL-6RT and Phaseo ABL-7RP and ABL-7RU 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 mm x 20 mm glass fuse.
Phaseo power supplies, on the other hand, are fitted with electronic protection. This protection automatically resets as soon as the fault is cleared, so avoiding the need to take action or replace a fuse. In addition, with the Phaseo RP range, the user can select the reset method in the event of a fault:
- in the "AUTO" position, resetting is automatic,
- in the "MANU" position, resetting will take place after the fault has been cleared and after the mains power has been switched off and back on (on the power supply). This feature means that Phaseo RP can be used in installations where the risks associated with sudden restarting are high.

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Power supplies for d.c. control circuits

Selection

Selection table according to application characteristics

Technology		Regulated switch mode					Filtered rectified		
Rated mains supply voltage		~ 100...240 V 50/60 Hz ⎓ 100... 250 V Wide range			100...240 V 50/60Hz Wide range	3x400...500 V 50/60 Hz Wide range	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		85...264 V, 47...63 Hz ⎓ 85...250V			85...264 V 47...63 Hz	360...550 V 47...63 Hz	+/-10 % 47...63 Hz		
Output voltage		12 V	48 V	24 V			24 V		
Output current	1 A						ABL-6RF2401G2	ABL-6RF2401	
	2 A				ABL-7RE2402				
	2.5 A						ABL-6RF2402G2	ABL-RF2402	
	3 A		ABL-7RP4803	ABL-7RP2403	ABL-7RE2403				
	5 A	ABL-7RP1205		ABL-7RP2405	ABL-7RE2405		ABL-6RF2405G2	ABL-6RF2405	
	10 A			ABL-7RP2410	ABL-7RE2410	ABL-7RU2410		ABL-6RF2410	ABL-6RT2410
	15 A							ABL-6RF2415	
	20 A					ABL-7RU2420		ABL-6RF2420	ABL-6RT2420
	30 A					ABL-7RU2430			ABL-6RT2430
	40 A					ABL-7RU2440			ABL-6RT2440
EN61000-3-2		Yes			No	Yes	Yes		Yes
Integrated protection		Yes Automatic or manual restart			Yes Automatic restart		Yes from 1 to 5 A by fuse No above 5 A		No
Fault memory		Yes			No	No	Not applicable		Not applicable
Reference		ABL-7RP			ABL-7RE	ABL-7RU	ABL-6RF		ABL-6RT

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

Characteristics

1

Technical characteristics

Type of power supply		ABL-7RE	ABL-7RP	ABL-7RU
Approvals		UL508, CSA 22.2 n° 950, TÜV		UL508, CSA 22.2 n° 950
Conforming to standards				
Safety		IEC 60950		
EMC		EN50081- 2, IEC61000-6-2 (EN50082-2)		
Low frequency harmonic currents		–	EN61000-3-2	

Input circuit

Input voltages				
Rated values	**V**	∿ 100...240	∿ 100...240, ⎓ 110...220	3 x ∿ 400...500
Permissible values	**V**	∿ 85…264 single-phase	∿ 85…264 single-phase ⎓ 99... 250	∿ 360…550 3-phase
Permissible frequencies	**Hz**	47…63		
Efficiency at nominal load		> 85 %		> 90 %
Current at switch-on	**A**	< 30		< 10
Power factor		∿ 0.65	∿ 0.98	∿ 0.70

Output circuit

Precision				
Output voltage		Adjustable, from 100 to 120 %		
Line and load regulation		± 3 %		± 1 %
Residual ripple - interference	**mV**	< 200		
Micro-breaks				
Holding time at I max and Ve min	**ms**	> 10	> 20	> 3.3
Overloads				
Permissible peak current		Unlimited for 100 ms		
Protection				
Short-circuit		Permanent/automatic restart	Permanent/automatic restart or manual restart on product	Permanent/automatic restart
Overload		1.1 In		1.1 In
Overvoltage		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		3 x 2.5 + earth
output	**mm²**	2 x 2.5 + earth, multiple output, depending on model		4 x 10 + earth
Ambient conditions				
Storage temperature	**°C**	- 25... + 70		
Operating temperature	**°C**	0... + 60° C (derating as from 55° C)		0... + 60
Maximum relative humidity		95 % without condensation or dripping water		
Degree of protection		IP 20 conforming to IEC529		
Vibrations		Conforming to EN61131-2		
Operating position		Vertical		
MTBF		> 100 000 h (Conforming to Bell Core, at 40° C)		
Connections				
Series		Possible		
Parallel		Possible (maximum temperature 50° C)		
Dielectric strength				
Input/output		3000 V/50 Hz 1 min		3750 V/50 Hz 1 min
Input/earth		3000 V/50 Hz 1 min		3500 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		No
Emissions		EN50081-1 (Generic)		
Conducted/radiated		EN55011/EN55022 cl.B		
Immunity		IEC61000-6-2 (Generic)		
Electrostatic discharge		EN61000-4-2 (4 kV contact/8 kV air)		
Electromagnetic		EN61000-4-3 level 3 (10 V/m)		
Conducted interference		EN61000-4-4 level 3 (2 kV) , EN61000-4-5, EN61000-4-6 level 3, EN61000-4-8 level 4.		
Mains interference		EN1000-4-11 (Voltage drops and cuts)		

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

Characteristics

Type of power supplies				ABL-6RT				ABL-6RF					
				2410	2420	2430	2440	2401●	2402●	2405●	2410	2415	2420

Technical characteristics

Input	Input voltages	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				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	- 25…+ 60									
Maximum relative humidity				90 % without condensation or dripping water									
Degree of protection				IP 20									
Protective treatment				"TC"									
Operating position				All positions				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				EN 60742; UL 1950; IEC 61131-2; CSA-C22.2 N°234 or 950 DIN 19240									
Approvals				, c									

(1) At nominal input voltage and load

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

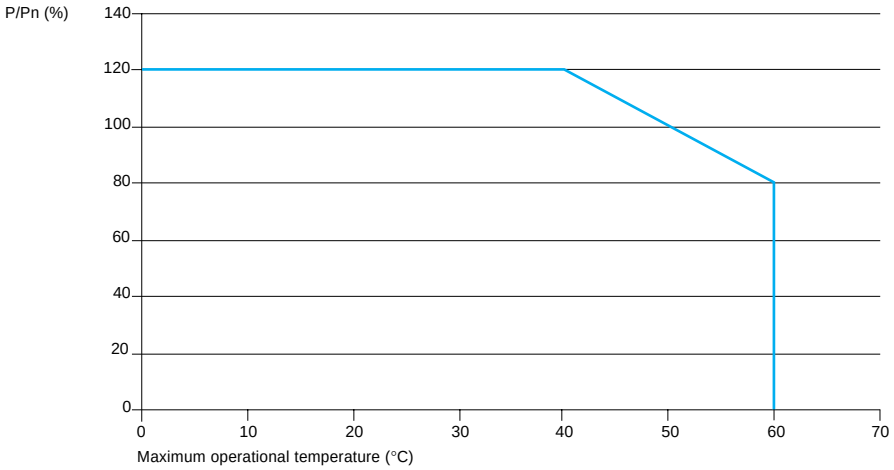
Output characteristics

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. Below this, an increase in rating is possible up to 120% of the nominal power. 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.



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 (1).

	Phaseo RE	Phaseo RP	Phaseo RU
Intensive operation	Without derating, from 0°C to 50°C Derating of nominal current by 1% per additional °C up to 60°C		Without derating, from 0°C 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 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.

(1) Maximum of 2 power supplies of the same reference. Output voltages must be set to the same value before paralleling.

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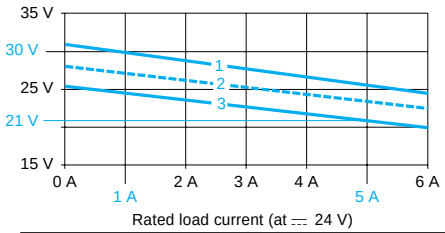
Power supplies for d.c. control circuits
Rectified power supplies

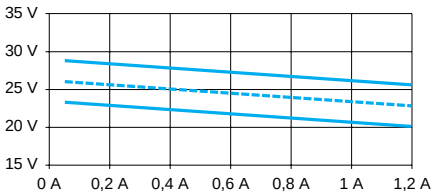
Output characteristics

Example using the graph

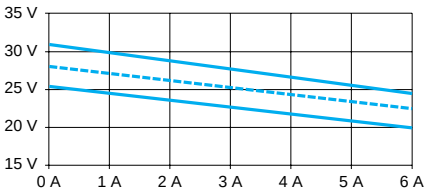


For an ABL-6RF2405 power supply used with a variable load of 1 to 5 A on a mains supply with Un ±10%, the graph shows the limits at the load terminals : 21 and 30 V.
Note : permitted loads are represented vertically as images of the rated load current at rated voltage.
1 Rated supply +10%
2 Rated supply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

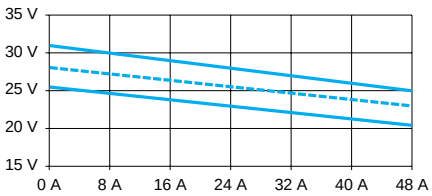
ABL-6RF2401/G2



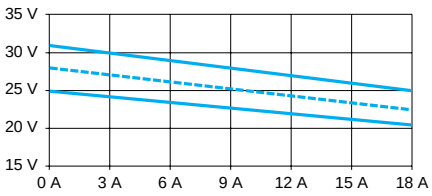
ABL-6RF2405/G2



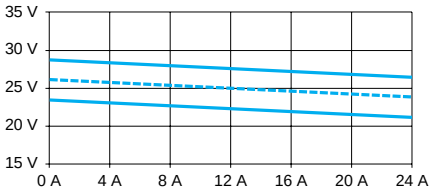
ABL-6RF2410



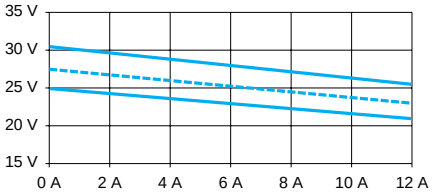
ABL-6RF2415



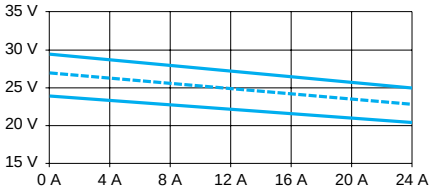
ABL-6RF2420



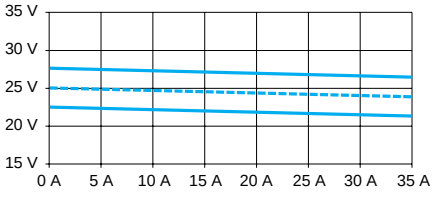
ABL-6RT2410



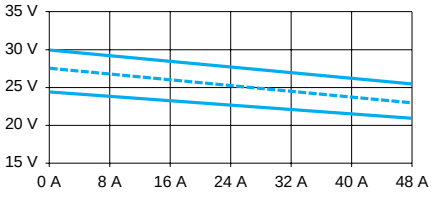
ABL-6RT2420



ABL-6RT2430



ABL-6RT2440



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

Selection

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

Type of supply		~ **400 V 3-phase**			~ **480 V 3-phase**		
Type of protection		Thermal-magnetic circuit-breaker		Fuse	Thermal-magnetic circuit-breaker		Fuse
	3-pole	GV2-RT	C60N		GV2-RT	C60N	
ABL-7RU2410		GV2-RT05 adjustment 0.63	MG24532	1 A aM	GV2-RT04 adjustment 0.5 A	MG 24532	1 A aM
ABL-7RU2420		GV2-RT06 adjustment 1A	MG24533	2 A gG	GV2-RT05 adjustment 0.8 A	MG 24533	2 A gG
ABL-7RU2430		GV2-RT06 adjustment 1.2	MG24533	2 A gG	GV2-RT06 adjustment 1 A	MG 24533	2 A gG
ABL-7RU2440		GV2-RT07 adjustment 2 A	MG24534	4 A gG	GV2-RT06 adjustment 1.5 A	MG 24534	2 A gG
Type of 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		GB2-DB●●	C60N	
ABL-7RE2402		GB2-●B07	MG24517	2A	GB2-DB06	MG 24516	2 A
ABL-7RE2403		GB2-●B07	MG24517	2 A	GB2-DB06	MG 24516	2 A
ABL-7RE2405		GB2-●B08	MG24518	4 A	GB2-DB07	MG 17453	2 A
ABL-7RE2410		GB2-●B12	MG17454	6 A	GB2-DB08	MG24518	4 A
ABL-7RP2403		GB2-●B07	MG 24517	2 A	GB2-DB07	MG24516	2 A
ABL-7RP2405		GB2-●B07	MG24517	2 A	GB2-DB07	MG24516	2 A
ABL-7RP2410		GB2-●B09	MG24519	4 A	GB2-DB07	MG24516	2 A
ABL-7RP4803		GB2-●B07	MG24517	2 A	GB2-DB07	MG24516	2 A

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

Selection

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

Type of supply	~ 400 V 3-phase			
Type of protection	Thermal-magnetic 3-pole circuit-breaker	Thermal regulation	C60N	FNQ fuse UL listed (1)	aM fuse
ABL-6RT2410	GV2-RT05	0.63 A	MG 24532	0.5 A T	2 A
ABL-6RT2420	GV2-RT07	1.6 A	MG 24533	1.125 A T	4 A
ABL-6RT2430	GV2-RT07	2 A	MG 24533	1.6 A T	4 A
ABL-6RT2440	GV2-RT08	2.6 A	MG 24534	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 2-pole	GB2-CB●● GB2-DB●●	– C60N	– –	– –	– GB2-DB●●	– C60N	– –	– –
ABL-6RF2401		GB2-●B05	MG 24516	0.315 A T	0.5 A	–	MG 24516	0.15 A T	0.5 A
ABL-6RF2402		GB2-●B06	MG 24516	0.63 A T	0.5 A	GB2-DB05	MG 24516	0.3 A T	0.5 A
ABL-6RF2405		GB2-●B07	MG 17453	1.4 A T	2 A	GB2-DB06	MG 24516	0.6 A T	1 A
ABL-6RF2410		GB2-●B09	MG 24519	3.15 A T	4 A	GB2-DB07	MG 17453	1.25 A T	2 A
ABL-6RF2415		GB2-●B10	MG 17454	5 A T	6 A	GB2-DB08	MG 24517	2 A T	4 A
ABL-6RF2420		GB2-●B14	MG 24520	6 A T	6 A	GB2-DB14	MG 24518	2.5 A T	6 A

(1) For operation conforming to UL

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

References

ABL-7RU2430

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

Mains input voltage 47...63 Hz	Output voltage	Nominal power	Nominal current	Automatic protection reset	Complies with standard EN 61000-3-2	Reference	Weight
∿ **V**	⎓ **V**	**W**	**A**				kg
400...500 3-phase wide range	24	240	10	auto	yes	**ABL-7RU2410** (1)	2.900
		480	20	auto	yes	**ABL-7RU2420** (1)	3.000
		720	30	auto	yes	**ABL-7RU2430** (1)	5.000
		960	40	auto	yes	**ABL-7RU2440** (1)	5.000

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	Complies with 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	Complies with standard EN 61000-3-2	Reference	Weight
V	⎓ **V**	**W**	**A**				kg
∿ **100...240** ⎓ **100...250** single phase wide range	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

(1) For details of availability please telephone our Customer information centre : 0870 608 8 608.

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Power supplies for d.c. control circuits
Filtered rectified power supplies

References

Three 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%) three 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

ABL-6RT●●●●

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 per cartridge fuse 5 x 20	Reference	Weight kg
215-230-245 (±10%)	24	24	1	With	**ABL-6RF2401** (2)	1.300
385-400-415 (±10%)		60	2.5	With	**ABL-6RF2402** (2)	2.000
single phase		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%)	24	24	1	With	**ABL-6RF2401G2** (2)	1.300
225-240-255 (±10%)		60	2.5	With	**ABL-6RF2402G2** (2)	2.000
single phase		120	5	With	**ABL-6RF2405G2** (2)	3.100

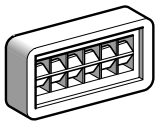
ABL-6RF●●●●

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-6AM02**	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



AR1-SB3

(1) Separate protection and safety device : see recommended product references page 1/12.
(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-6RF2401P**).

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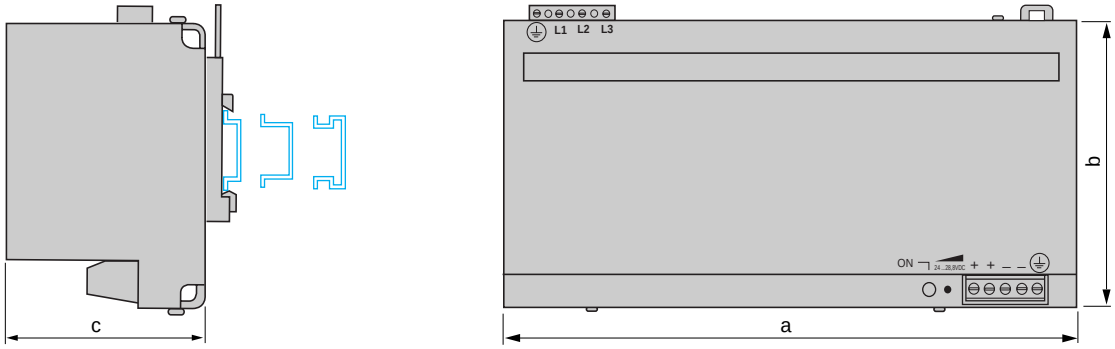
Power supplies for d.c. control circuits

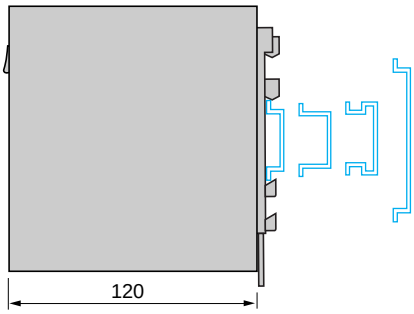
Dimensions

ABL-7RU24●0

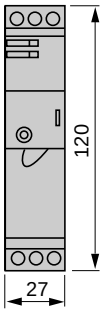


ABL-7RU	a	b	c
2410	260	130	90
2420	260	130	90
2430	320	170	115
2440	320	170	115

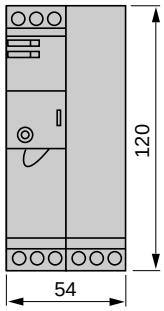
ABL-7RE24●●/ABL-7RP●●●●
Common side view
Clip-on mounting on 35 and 75 mm rails



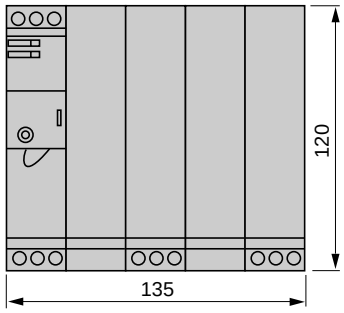
7RE2402/2403
7RP2403



7RE2405
7RP1205/2405/4803



7RE2410
7RP2410



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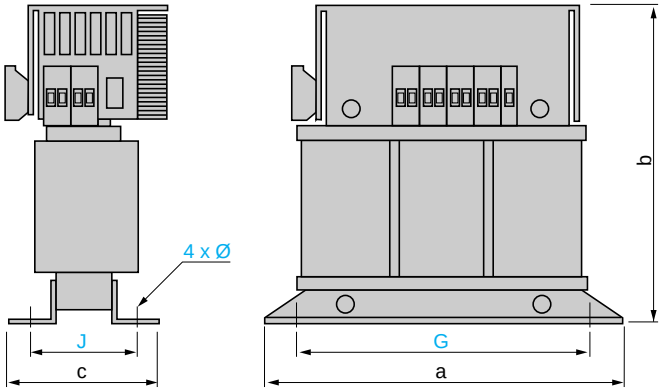
Power supplies for d.c. control circuits

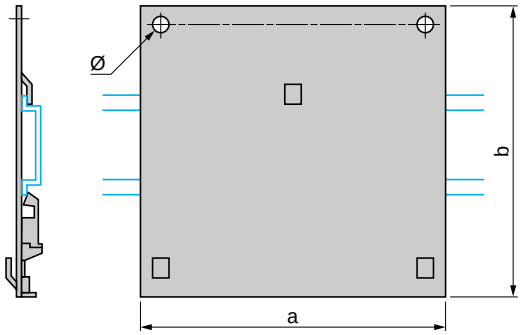
Dimensions

ABL-6RT24●0



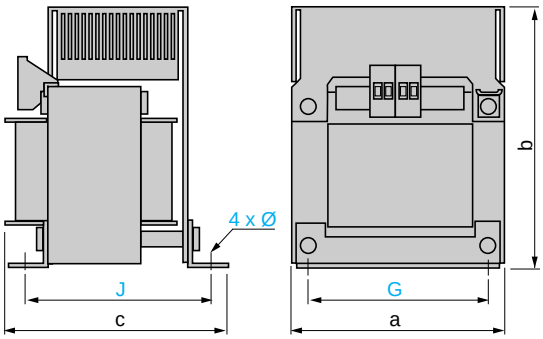
ABL-	a	b	c	G	J	Ø
6RT2410	185	177	100	164	71.5	6.5
6RT2420	220	212	121	196	79.5	8
6RT2430	244	236	130	215	97	8
6RT2440	284	268	143	256.5	105	11

Mounting plates ABL-6AM0i

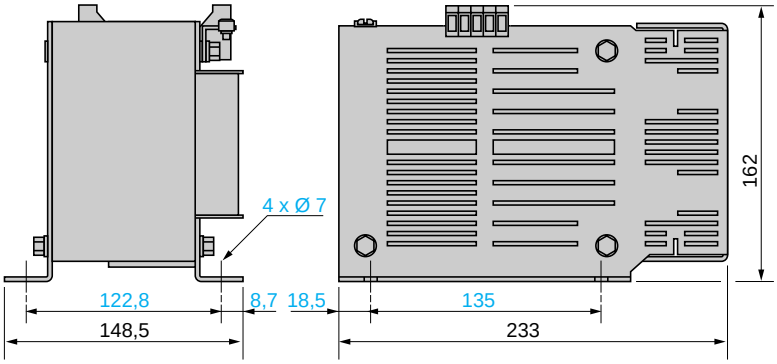


ABL-	a	b	Ø
6AM01	78	70	4
6AM03	84	78	4
6AM04	96	91	5

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	5.8
6RF2410	120	175	119	90	94.5	5.8
6RF2415	135	187	124	104	97	5.8

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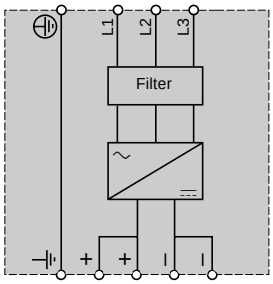
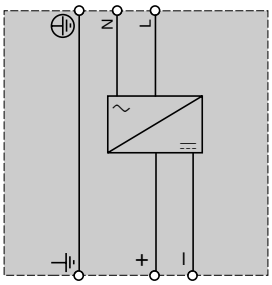
Power supplies for d.c. control circuits

Schemes

ABL-7RU24●0



ABL-7RE2402/2403



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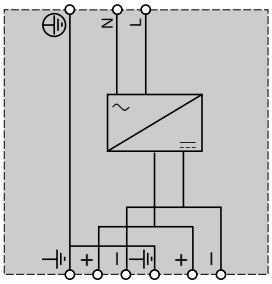

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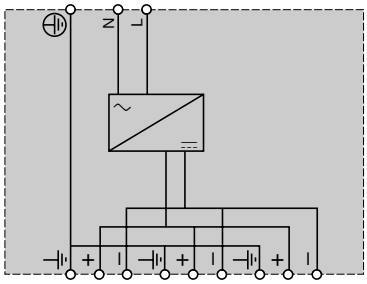
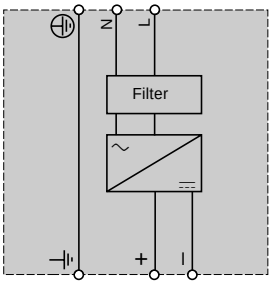
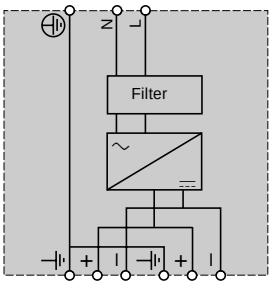


ABL-7RP2403



ABL-7RP1205/2405/4803



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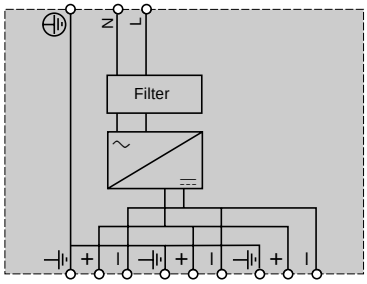

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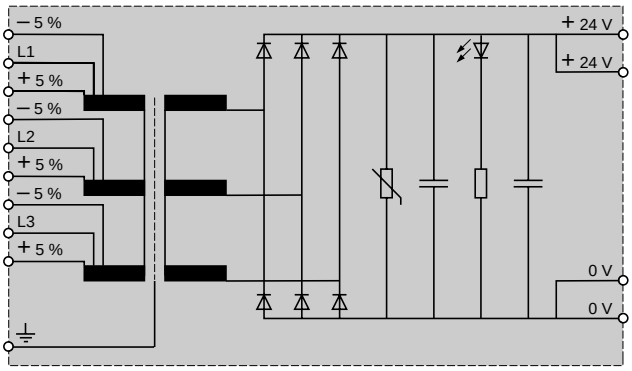
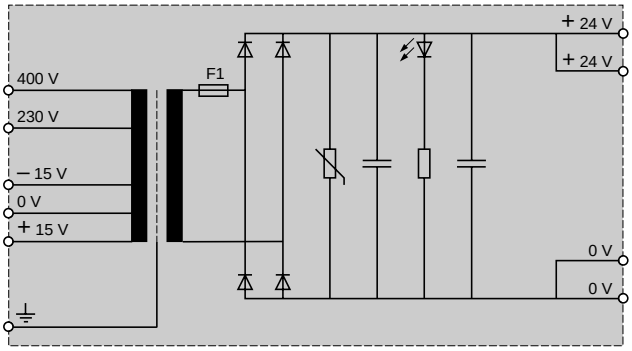
Power supplies for d.c. control circuits

Schemes

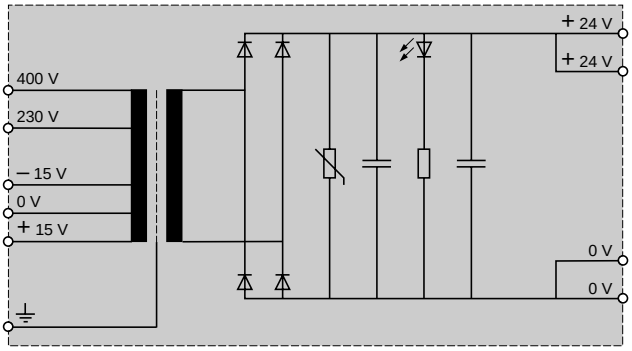
ABL-6RT24●0



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



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



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