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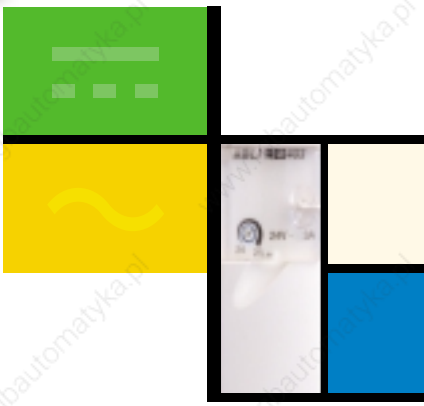
Telemecanique

Power supplies and transformers for control circuits

Catalogue
March
2000



Merlin Gerin
Modicon
Square D
Telemecanique

Expertise
in the service
of electrical
power supplies

Schneider Electric
We do more with electricity

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.

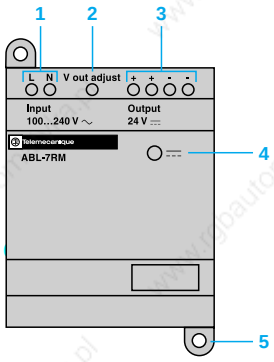
Switch mode power supply units are totally electronic and regulated. The use of electronics makes it possible to significantly improve the performance of these power supplies, which offer:
- compact size,
- integrated overload, short-circuit, overvoltage and undervoltage protection,
- a very wide range 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 approved, 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.

Power supplies and transformers
Phaseo modular regulated power supply units

Technical characteristics				
Type of power supply			**ABL 7RM1202**	**ABL 7RM2401**
Approvals			UL - CSA - TÜV - CTick	
Conforming to standards	Safety		IEC 950	
	EMC		EN 50081-2, IEC 61000-6-2 (EN 50082-2)	
Input circuit				
LED indication			no	no
Input voltage	Rated values	**V AC**	100…240	100…240
	Permissible values	**V AC**	85…264	85…264
	Permissible frequencies	**Hz**	47…63	47…63
	Efficiency at nominal load		> 80%	> 80%
	Current consumption	**A**	0.4 (100 V)/0.2 (240 V)	0.48 (100 V)/0.3 (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 DC**	12	24
Nominal output current		**A**	1.9	1.3
Precision	Output voltage		Adjustable 12 to 14.4 V	Adjustable 24 to 28.8 V
	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		< 2 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 yet calculated)	
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	

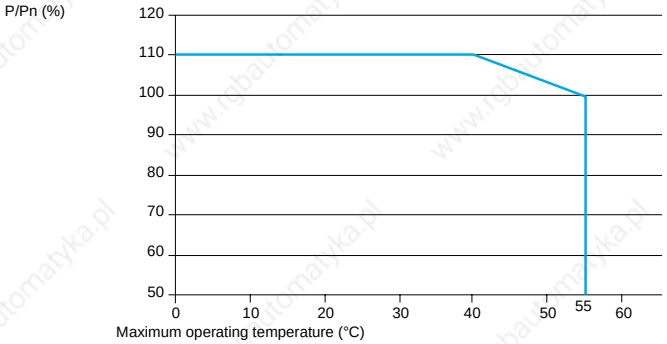
Power supplies and transformers
Phaseo modular regulated power supply units

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

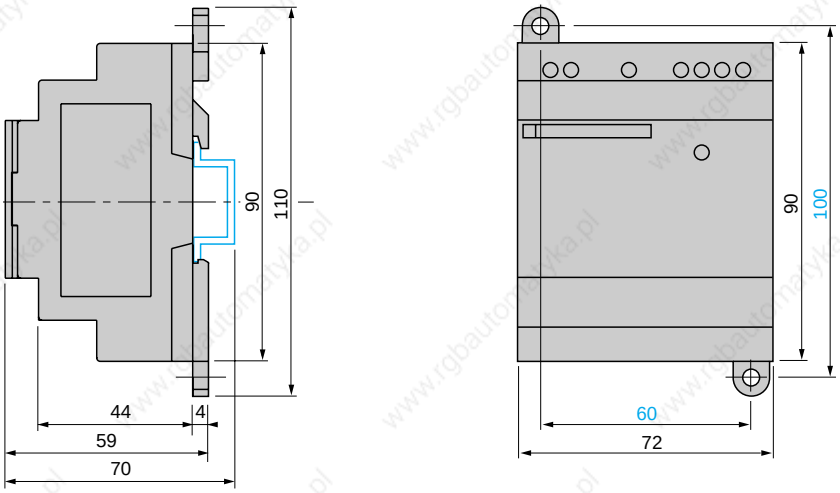
Mains supply	∿ 115 V single-phase			∿ 230 V single-phase		
Type of protection	Thermal-magnetic circuit-breaker		Gg fuse	Thermal-magnetic circuit-breaker		Gg fuse
Single-pole	GB2 CB●●	-	-	-	-	-
2-pole	GB2 DB●●	C60N	-	GB2 DB●●	C60N	-
ABL 7RM2401	GB2 CD/CB06	MG24516 (1) MG24184	1 A	GB2 CD/CB07	MG24517 (1) MG24185	1 A
ABL 7RM1202	GB2 CD/CB06	MG24516 (1) MG24184	1 A	GB2 CD/CB07	MG17453 MG24185	1 A

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	31	1.3	auto	**ABL 7RM2401**	0.182

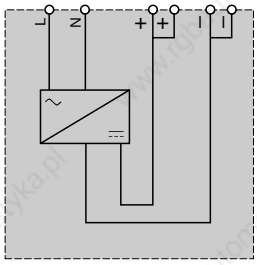
Dimensions

ABL 7RM●●●● power supply unit



Scheme

ABL 7RM●●●●



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Safety and isolation transformers (25 to 2500 VA)

Presentation

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 +15V and -15V 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 EN 60 742, IEC 742 standards and are UL approved.
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 60 °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 +/- 15V 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).

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Safety and isolation transformers (25 to 2500 VA)

Selection

Selection

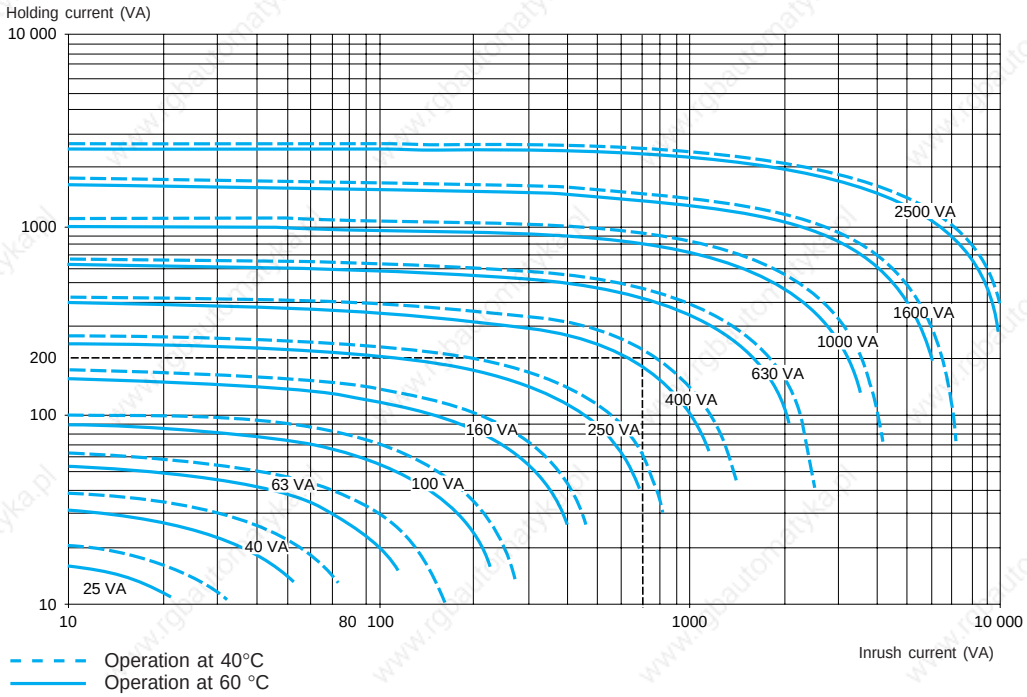
ABL-6T transformers are characterised by the apparent nominal power which they can supply continuously. But they are also designed to supply, when necessary, much higher powers, such as contactor inrush peaks.

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 60 °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 40 and 60 °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 60 °C. A 400 VA transformer is sufficient if the ambient temperature is 40 °C.

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Safety and isolation transformers (25 to 2500 VA)

Characteristics

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			EN 60742, VDE 0550-1, VDE 0550-3, UL 506, CSA C22.2 N°65
Certification			,c
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...+ 60
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

Power supplies and transformers

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Safety and isolation transformers (25 to 2500 VA)

Choice of protection

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.

Power supplies and transformers

Safety and isolation transformers (25 to 2500 VA)

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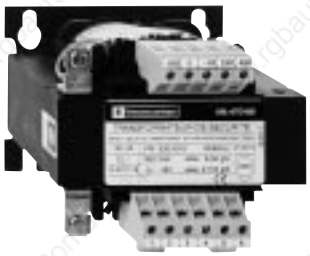
References

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

ABL-6TS●●●

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



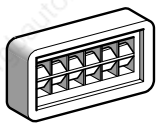
ABL-6TD●●●

Mounting accessories (4)

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



AR1-SB3

(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-6TSO4BP**)

Power supplies and transformers

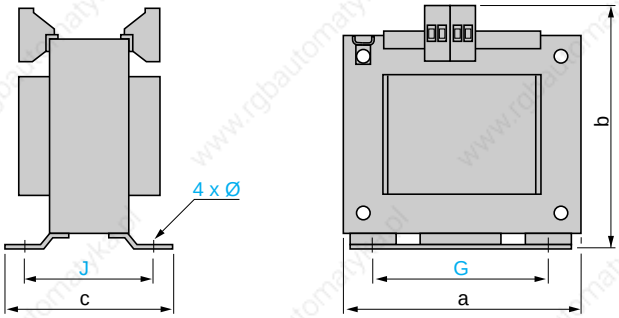
Safety and isolation transformers (25 to 2500 VA)

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

Dimensions, schemes

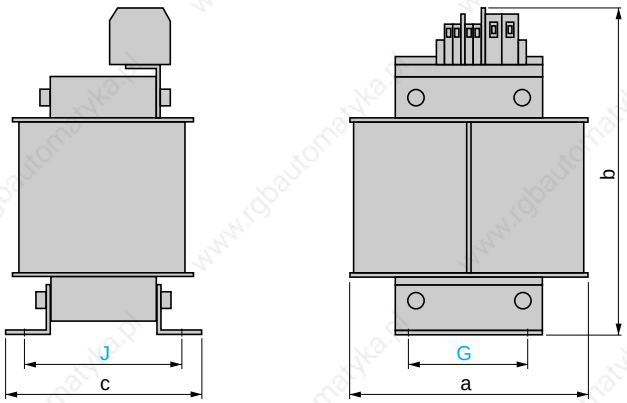
Dimensions

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

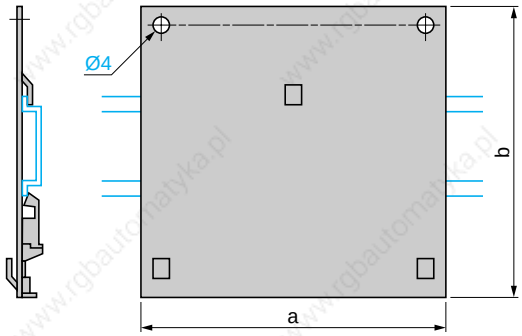


ABL-	a	b	c	G	J	Ø
6T●02●	66	90	55	55	42	4.8
6T●04●	78	90	68	56	47.5	4.8
6T●06●	78	90	80	56	56	4.8
6T●10●	85	94	86	64	65.5	4.8
6T●16●	106	109	81	80.5	63	5.8
6T●25●	120	122	85	90	74.5	5.8
6T●40●	136	140	120	104	87	5.8
6T●63●	150	152	138	122	107.5	7
6T●100●	174	180	146	135	111.5	7
6T●160●	174	221	167	135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

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



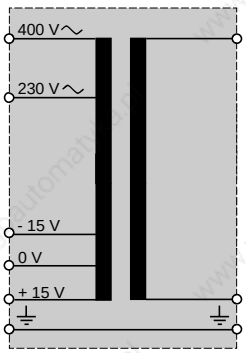
Mounting plates ABL-6AM0●



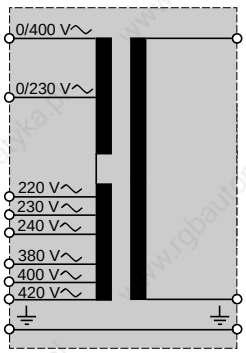
ABL-	a	b
6AM00	68	70
6AM01	78	70
6AM02	78	74
6AM03	84	78

Schemes

ABL-6TS02● to ABL-6TS160●

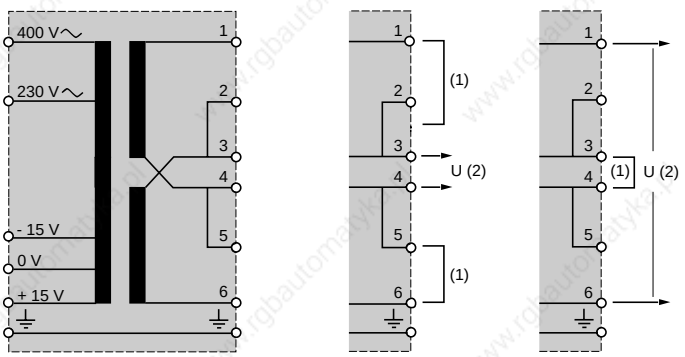


ABL-6TS250●

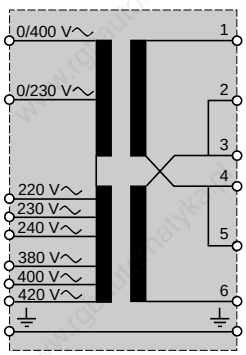


ABL-6TD02● to ABL-6TD160●

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●.

Characteristics :
pages 14054/2 to 14054/5
References :
pages 14056/2 and 14056/3
Dimensions :
pages 14057/2 and 14057/3
Schemes :
pages 14058/2 and 14058/3

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.
The products are also equipped with an output undervoltage control which causes the product to trip if the output voltage drops below 19 V, in order 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 1000-3-2).
  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 1131-2. 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.

Characteristics :
pages 14054/2 to 14054/5
References :
pages 14056/2 and 14056/3
Dimensions :
pages 14057/2 and 14057/3
Schemes :
pages 14058/2 and 14058/3

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 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 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 742, EN 60742, DIN/VDE 0551 T1 (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 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 (see catalogue “Measurement and control relays" n° 29709).

Operating voltage

- The acceptable 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 variations may be in the range - 10 % to + 6 % (defined by standard IEC 38) 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 (see catalogue n° 29709).

Characteristics :
pages 14054/2 to 14054/5
References :
pages 14056/2 and 14056/3
Dimensions :
pages 14057/2 and 14057/3
Schemes :
pages 14058/2 and 14058/3

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 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 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.

Power supplies and transformers

Presentation :
pages 14053/2 and 14053/3
Characteristics :
pages 14054/2 to 14054/5
References :
pages 14056/2 and 14056/3
Dimensions :
pages 14058/2 and 14057/3

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**

Power supplies and transformers

Presentation :
pages 14053/2 and 14053/3
References :
pages 14056/2 and 14056/3
Dimensions :
pages 14057/2 and 14057/3
Schemes :
pages 14058/2 and 14058/3

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

Characteristics

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 950		
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)		

Presentation :
pages 14053/2 and 14053/3
References :
pages 14056/2 and 14056/3
Dimensions :
pages 14057/2 and 14057/3
Schemes :
pages 14058/2 and 14058/3

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 1131-2; CSA-C22.2 N°234 or 950 DIN 19240		
Approvals			, c		

(1) At nominal input voltage and load

Presentation :
pages 14053/2 and 14053/3
Characteristics :
pages 14054/2 to 14054/5
References :
pages 14056/2 and 14056/3
Dimensions :
pages 14058/2 and 14057/3

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

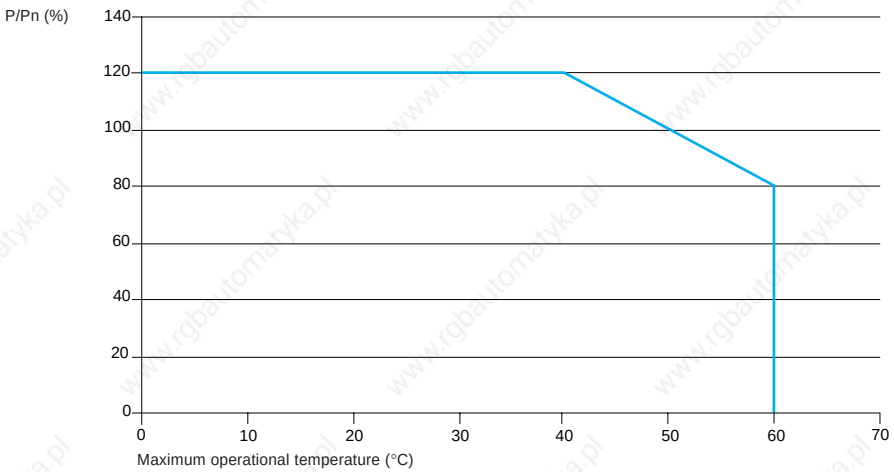
Output characteristics

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.

	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.		

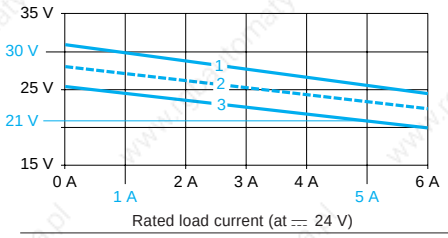
In all cases, there must be adequate convection round the products to ensure easier cooling; There must be a clear space of 50 mm above and below Phaseo power supplies and of 15 mm at the sides.

Presentation :
pages 14053/2 and 14053/3
Characteristics :
pages 14054/2 to 14054/5
References :
pages 14056/2 and 14056/3
Dimensions :
pages 14057/2 and 14057/3

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

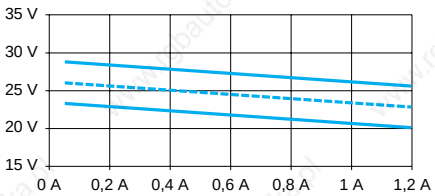
Output characteristics

Example using the graph

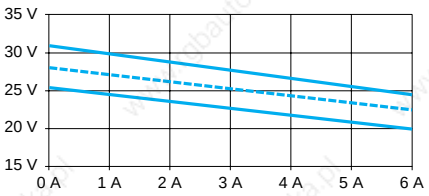


For an ABL-6RF2405 power supply used with a variable load of 1 to 5 A on a mains supply with Un ±10%, the graph shows the limits at the load terminals : 21 and 30 V.
Note : permitted loads are represented vertically as images of the rated load current at rated voltage.
1 Rated supply +10%
2 Rated supply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

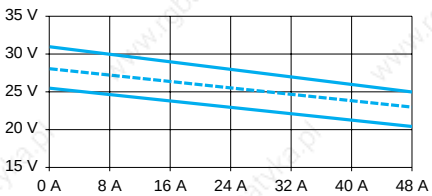
ABL-6RF2401/G2



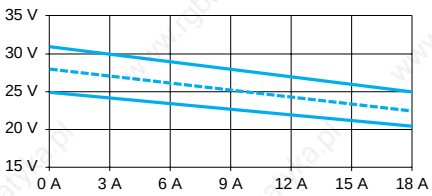
ABL-6RF2405/G2



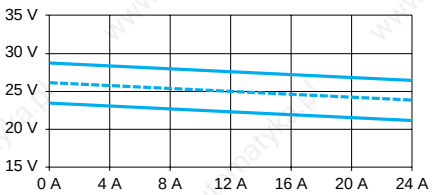
ABL-6RF2410



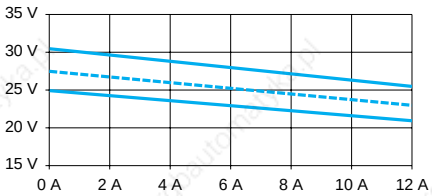
ABL-6RF2415



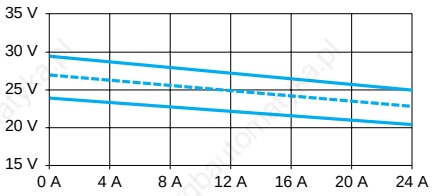
ABL-6RF2420



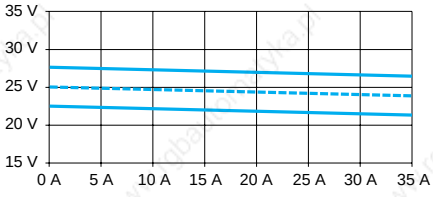
ABL-6RT2410



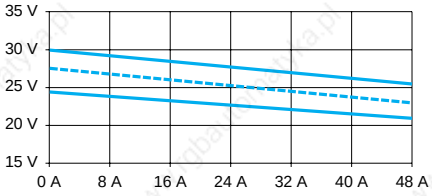
ABL-6RT2420



ABL-6RT2430



ABL-6RT2440



Power supplies and transformers

Presentation :
pages 14053/2 and 14053/3
References :
pages 14056/2 and 14056/3
Dimensions :
pages 14057/2 and 14057/3
Schemes :
pages 14058/2 and 14058/3

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 de 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

Power supplies and transformers

Presentation :
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pages 14056/2 and 14056/3
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Schemes :
pages 14058/2 and 14058/3

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	GB2-CB●●	–	–	–	–	–	–	–
	2-pole	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

Power supplies and transformers

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pages 14054/2 to 14054/4
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pages 14057/2 and 14057/3
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Power supplies for d.c. control circuits
Phaseo regulated switch mode power supplies

References

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

ABL-7RU2430

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**	2.900
		480	20	auto	yes	**ABL-7RU2420**	3.000
		720	30	auto	yes	**ABL-7RU2430** (1)	5.000
		960	40	auto	yes	**ABL-7RU2440** (1)	5.000

Single phase regulated switch mode power supplies ABL-7RE

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

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) Available : 3rd quarter 2000.

Power supplies and transformers

Presentation :
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pages 14054/2 to 14054/5
Dimensions :
pages 14057/2 and 14057/3
Schemes :
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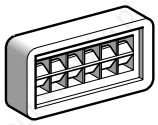
Power supplies for d.c. control circuits
Filtered rectified power supplies

References

ABL-6RT●●●●

ABL-6RF●●●●



AR1-SB3

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

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

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

(1) Separate protection and safety device : 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-6RF2401P**).

Presentation :
pages 14053/2 and 14053/3
Characteristics :
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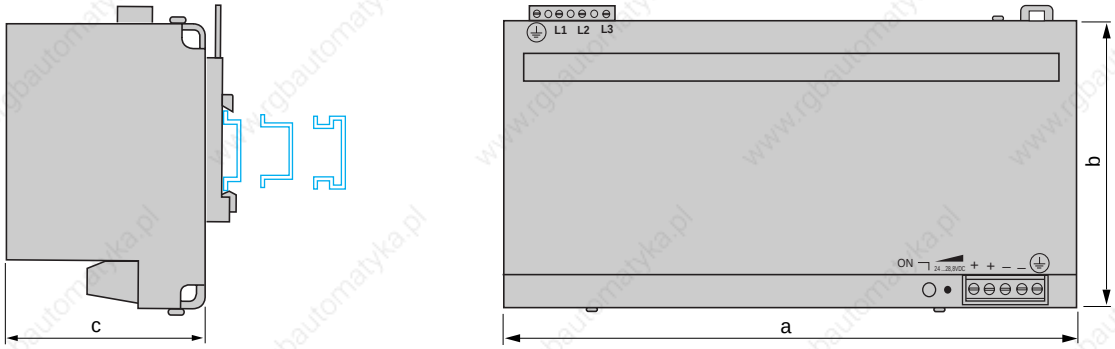
References :
pages 14056/2 and 14056/3
Schemes :
pages 14058/2 and 14058/3

Power supplies for d.c. control circuits

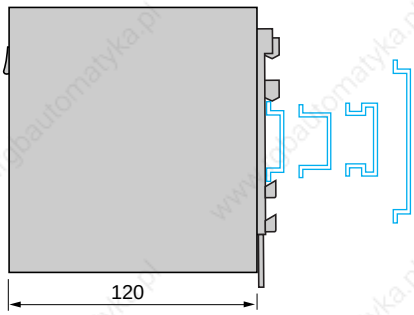
Dimensions

ABL-7RU24●0

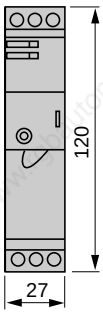


ABL-7RU	a	b	c
2410	260	130	90
2420	260	130	90
2430	320	170	115
2440	320	170	115

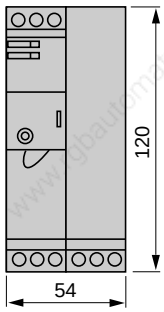
ABL-7RE24●●/ABL-7RP●●●●
Common side view
Clip-on mounting on 35 and 75 mm rails



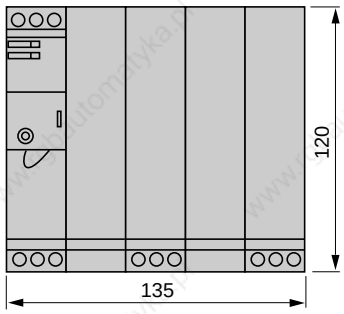
7RE2402/2403
7RP2403



7RE2405
7RP1205/2405/4803



7RE2410
7RP2410



Power supplies and transformers

Presentation :
pages 14053/2 and 14053/3
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References :
pages 14056/2 and 14056/3
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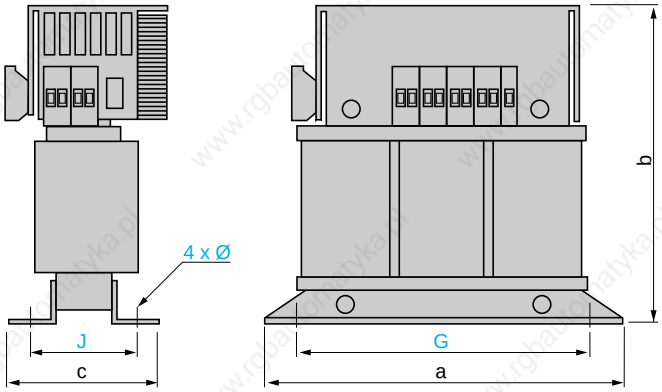
Power supplies for d.c. control circuits

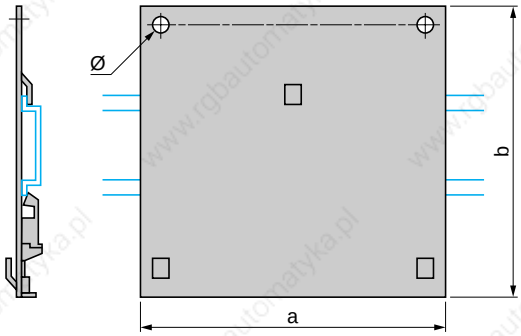
Dimensions

ABL-6RT24●0



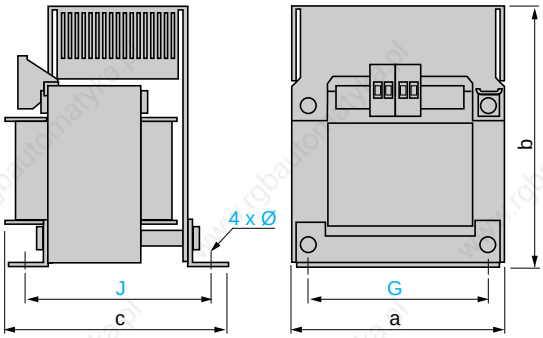
ABL-	a	b	c	G	J	Ø
6RT2410	185	177	100	164	71.5	6.5
6RT2420	220	212	121	196	79.5	8
6RT2430	244	236	130	215	97	8
6RT2440	284	268	143	256.5	105	11

Mounting plates ABL-6AM0i

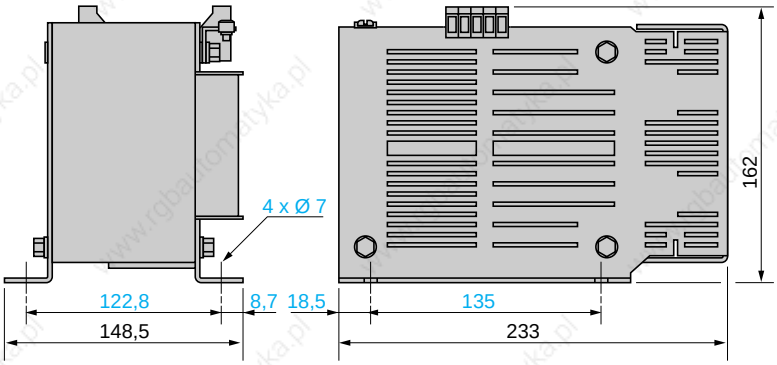


ABL-	a	b	Ø
6AM01	78	70	4
6AM03	84	78	4
6AM04	96	91	5

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

Presentation :
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Characteristics :
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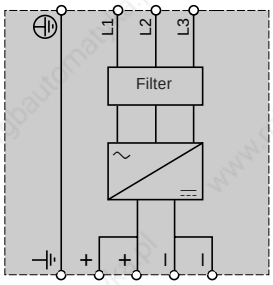
References :
pages 14056/2 and 14056/3
Dimensions :
pages 14057/2 and 14057/3

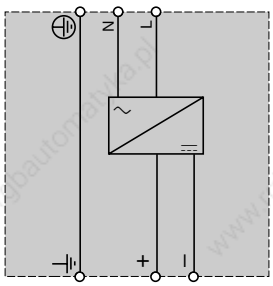
Power supplies for d.c. control circuits

Schemes

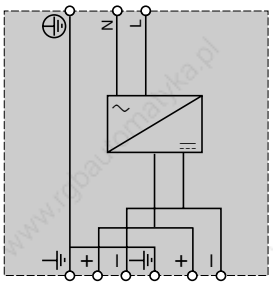
ABL-7RU24●0



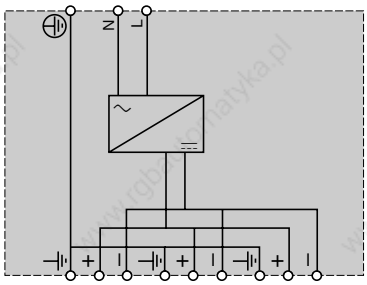
ABL-7RE2402/2403



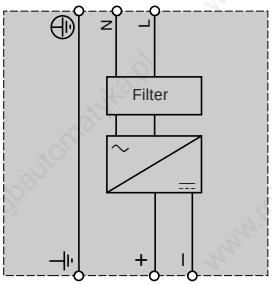
ABL-7RE2405



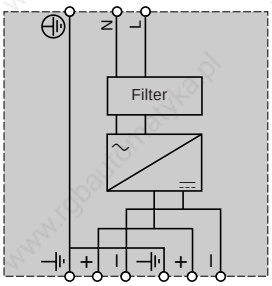
ABL-7RE2410



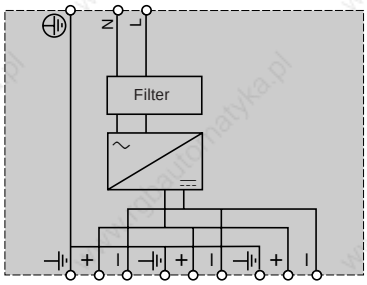
ABL-7RP2403



ABL-7RP1205/2405/4803



ABL-7RP2410



Presentation :
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References :
pages 14056/2 and 14056/3
Dimensions :
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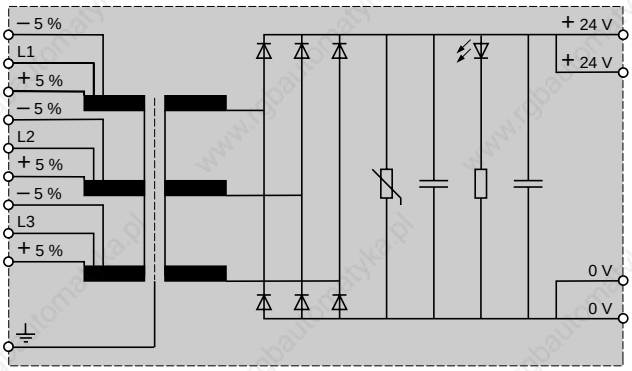
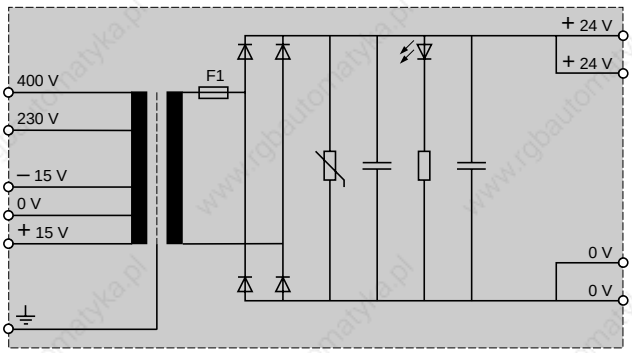
Power supplies for d.c. control circuits

Schemes

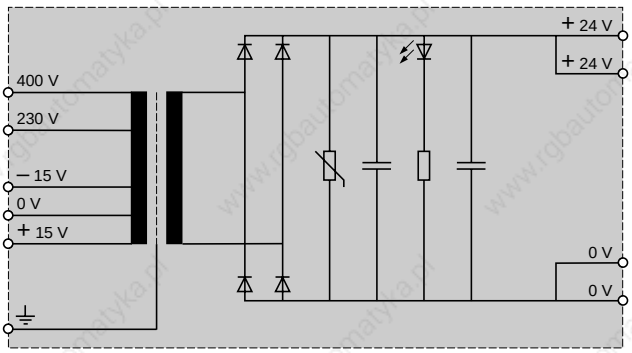
ABL-6RT24●0



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



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



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