TSX Series

Modicon Manuals

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Modicon TSX Micro automation platform

Phaseo power supplies for d.c. control circuits

Functions	Supplies for d.c. control circuits				
Type of product	**Single-phase, modular switch mode power supplies**		**Single-phase, regulated switch mode power supplies**		
					
Applications	Industrial, commercial or residential applications. Modular format allowing integration into panels.		Simple, low power equipment.	Industrial applications, low and medium power. Machine equipment applications.	Industrial or commercial applications on sites sensitive to mains interference. Protection against accidental restarting.
Nominal power	22 W	30 W	7 W…30 W	48…240 W	60…240 W
Input voltage	∿ 100…240 V single-phase		∿ 100…240 V single-phase ⎓ 110…220 V compatible *(1)*	∿ 100…240 V single-phase	∿ 100…240 V single-phase, ⎓ 110…220 V compatible *(1)*
Output voltage	⎓ 12 V adjustable	⎓ 24 V adjustable	⎓ 24 V adjustable	⎓ 24 V adjustable	⎓ 12, 24 V or 48 V adjustable
Technology	Primary switch mode electronic power supplies.				
Secondary protection	Integrated, against overloads and short-circuits, with automatic reset.				Integrated, against overloads and short-circuits, with manual and automatic reset.
Signalling	Output indicator lamp.			Output and input indicator lamp.	
Other characteristics	–		Connection by lug-clamps possible	–	Anti-harmonic distortion filter
Mounting	Direct on ⎓ rail		Direct, on ⎓ rail and on panel	Direct on ⎓ rail	
Disturbance (conforming to EN55011/22) conducted and radiated	cl.B		cl.A (7/15 W) cl.B (30 W)	cl.B	
Conforming to standards	EN 50081-1, IEC 61000-6-2 (EN 50082-2), IEC 950, EN61131-2/A11		EN 50081-2, IEC 61000-6-2, EN 60950	EN 50081-1, IEC 61000-6-2, (EN 50082-2), IEC 950	EN 50081-1, IEC 61000-6-2, (EN 50082-2), IEC 950, 61000-3-2
Approvals	UL, CSA, TÜV		cULus, TÜV	UL, CSA, TÜV, CTick	
Device type	**ABL 7RM**		**ABL 7CEM**	**ABL 7RE**	**ABL 7RP**
Pages	–		2/52		

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

2-phase regulated switch mode power supplies	3-phase regulated switch mode power supplies			Regulated switch mode power supplies for AS-i		
						
Industrial applications.	Industrial applications. In-line continuous process equipment, machine tools, injection presses, etc.			Industrial applications. Supply of d.c. voltage necessary for AS-i systems.		
120 and 240 W	240 and 480 W	120 W	240…960 W	72 W	145 W	2 x 72 W
∿ 2 x 380…415 V 2-phase	∿ 3 x 380…415 V 3-phase	∿ 3 x 400…520 V 3-phase	∿ 3 x 400…520 V 3-phase	∿ 100…240 V single-phase		
⎓ 24 V adjustable				⎓ 30 V		⎓ 24 V adjustable
Primary switch mode electronic power supplies.						
Integrated, against overloads and short-circuits, with manual and automatic reset.				Integrated, against overloads and short-circuits, overvoltage and undervoltage.		
Output indicator lamp.				Output and input indicator lamps.		
–	–		Anti-harmonic distortion filter	–		
Direct on ⎓ rail	Direct on ⎓ rail (except ABL-7UPS 24200 and ABL-7UPS24400)			Direct on ⎓ rail		
cl.B	cl.B			cl.B		
EN 50081-1, EN 50082-2, EN 60950	EN 50081-1, EN 50082-2, EN 60950		EN 50081-1, EN 50082-2, EN 60950, IEC 61000-3-2	EN 50081-1, IEC 61000-6-2, EN 55022 class B		
–	–		cULus, c UL us	UL, CSA, TÜV		
ABL 7REQ	**ABL 7UEQ**	**ABL 7UES**	**ABL 7UPS**	**ASI ABL**		
2/52				–		

Modicon TSX Micro automation platform
Power supplies for d.c. control circuits

ABL-7 power supplies

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

Phaseo switch mode power supplies

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

Phaseo power supplies are available in single-phase and 3-phase versions. They deliver a voltage which is precise to 3%, whatever the load and whatever the type of mains supply, within a range of 85 to 264 V for single-phase, or 360 to 550 V for 3-phase. Conforming to IEC standards and UL and CSA certified, they are suitable for universal use. The inclusion of overload and short-circuit protection makes downstream protection unnecessary if discrimination is not required.

ABL-7 RE and ABL-7 RP supplies are also equipped with an output undervoltage control which causes the product to trip if the output voltage drops below 19 V, in order to ensure that the voltage delivered is always usable by the actuators being supplied. All the products are fitted with an output voltage adjustment potentiometer in order to be able to compensate for any line voltage drops in installations with long cable runs. Most of our power supplies are designed for direct mounting on 35 and 75 mm ⊔ rails.

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

108700-13-M

ABL 7CEM

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

43367-15-M

ABL-7RP

Universal single-phase supplies ABL-7RE and ABL-7RP:
- ■ **ABL-7RE**
  - □ power between 48 W (2 A) and 240 W (10 A),
  - □ compact size,
  - □ for all machine equipment,
  - □ suitable for use in automation system environments based on the Micro and Premium platforms, or in any automation system configuration requiring a ⎓ 24 V supply.
- ■ **ABL-7RP**
  - □ power between 60 W (2.5 A) and 240 W (10 A),
  - □ output voltage available: ⎓ 12, 24 and 48 V,
  - □ input filter (PFC) for commercial and residential environments (conforming to standard EN 61000-3-2),
  - □ two operating modes possible for handling of overload and short-circuit faults:
    - "AUTO" mode which provides automatic restarting of the power supply on elimination of the fault,
    - "MANU" mode which requires manual resetting of the power supply to restart. Resetting is achieved by switching off the mains power.

Characteristics : pages 2/56 to 2/59 | References : page 2/61 | Dimensions : page 2/62 | Schemes : page 2/63

Modicon TSX Micro automation platform
Power supplies for d.c. control circuits

108387-25-M

ABL-7UPS

530894

ABL-7REQ

Phaseo switch mode power supplies (continued)

3-phase and single-phase process supplies ABL-7U and ABL-7REQ:

■ **ABL-7UE**

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

■ **ABL-7UPS**

□ power between 120 W (10 A) and 960 W (40 A).

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

■ **ABL-7 REQ**

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

Using ⎓ 24 V

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

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

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

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

Telemecanique power supplies meet these requirements.

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

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

Operating voltage

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

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

■ It may be necessary to use a voltage measurement relay to detect when the normal voltage limits are being surpassed and to deal with the consequences of this (please consult your Regional Sales Office).

Characteristics : pages 2/56 to 2/59
References : page 2/61
Dimensions : page 2/62
Schemes : page 2/63

Modicon TSX Micro automation platform
Power supplies for d.c. control circuits

Selection of power supplies

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

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

■ The quality of the mains power supply

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

■ Harmonic pollution (power factor)

The current drawn by a power supply is not sinusoidal. This leads to the existence of harmonic currents which pollute the mains supply. European standard EN 61000-3-2 limits the harmonic currents produced by power supplies. This standard covers all devices between 75 W and 1000 W, drawing up to 16 A per phase, and connected directly to the public mains power supply. Devices connected downstream of a private, low voltage general transformer are therefore excluded.
Regulated switch mode supplies always produce harmonic currents; a filter circuit (Power Factor Correction or PFC) must therefore be added to comply with standard EN 61000-3-2.
Phaseo ABL-7RP and ABL-7UPS power supplies conform to standard EN 61000-3-2 and can therefore be connected directly to public mains power supplies.

■ Electromagnetic compatibility

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

■ Behaviour in the event of short-circuits

Phaseo power supplies are equipped with an electronic protection device. This protection device resets itself automatically on elimination the fault (around 1 second for ABL-7 RE/RP, around 3 seconds for ABL-7 UE/UP/REQ) which avoids having to take any action or change a fuse. In addition, the Phaseo ABL-7RP/U/REQ ranges allow the user to select the reset mode in the event of a fault:
- in the "AUTO" position, resetting is automatic,
- in the "MANU" position, resetting occurs after elimination of the fault and after switching the mains power off and back on.

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

■ Behaviour in the event of phase failure

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

■ Selection of reset mode

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

Modicon TSX Micro automation platform

Power supplies for d.c. control circuits

Selection according to application characteristics

Type of mains supply		Single-phase				2-phase	3-phase		
Rated mains supply voltage		~ 100…240 V 50/60 Hz ⎓ 110… 220 V *(1)* Wide range			100…240 V 50/60 Hz Wide range	2 x 380…415 V 50/60 Hz	3 x 380…415 V 50/60 Hz	3 x 400…520 V 50/60 Hz Wide range	3 x 380…520 V 50/60 Hz Wide range
Permissible variation		85…264 V, 47…63 Hz ⎓ 100...250 V *(1)*, ⎓ 105...370 V *(2)*			85…264 V 47…63 Hz	340…460 V 47…63 Hz	340…460 V 47…63 Hz	360…550 V 47…63 Hz	340…550 V 47…63 Hz
Output voltage		12 V	48 V	24 V	24 V	24 V	24 V	24 V	24 V
Output current	0.3 A			**ABL-7CEM24003**					
	0.6 A			**ABL-7CEM24006**					
	1.2 A			**ABL-7CEM24012**					
	2 A				**ABL-7RE2402**				
	2.5 A		**ABL-7RP4803**						
	3 A			**ABL-7RP2403**	**ABL-7RE2403**				
	5 A	**ABL-7RP1205**		**ABL-7RP2405**	**ABL-7RE2405**	**ABL-7REQ24050**		**ABL-7UES24050**	
	10 A			**ABL-7RP2410**	**ABL-7RE2410**	**ABL-7REQ24100**	**ABL-7UEQ24100**		**ABL-7UPS24100**
	20 A						**ABL-7UEQ24200**		**ABL-7UPS24200**
	40 A								**ABL-7UPS24400**
Conforming to EN 61000-3-2		Yes (not applicable for **ABL-7CEM**)			No	No	No	No	Yes
Integrated automatic protection		Yes Automatic or manual restart on **ABL-7RP** Automatic restart only on **ABL-7CEM**			Yes Automatic restart	Yes Automatic or manual restart			

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

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

Modicon TSX Micro automation platform

Power supplies for d.c. control circuits

Phaseo regulated switch mode power supplies

Technical characteristics

Type of power supply			ABL-7CEM	ABL-7RE	ABL-7RP
Product certifications			cULus, TÜV	UL, CSA, TÜV, CTick	
Conforming to standards			UL 508	UL 508, CSA 22.2 n° 950	
	Safety		IEC/EN 60950		IEC/EN 61496-1-2
	EMC		EN 50081-2, EN 50082-2	EN 50081-1, IEC 61000-6-2 (EN 50082-2)	
	Low frequency harmonic currents		–	–	EN 61000-3-2
Input circuit					
LED indication			–	Orange LED	Orange LED
Input voltages	Rated values	**V**	∿ 100…240, ⎓ 110…220 compatible *(1)*	∿ 100…240	∿ 100…240, ⎓ 110…220 compatible *(1)*
	Permissible values	**V**	∿ 85…264, ⎓ 105…370 compatible *(1)*	∿ 85…264 single-phase	∿ 85…264, ⎓ 100…250 compatible *(1)*
	Permissible frequencies	**Hz**	47…63		
	Efficiency at nominal load		> 70 %	> 85 %	
	Current consumption Ue = 240 V	**A**	0.1 (7 W)/0.2 (15 W)/0.45 (30 W)	0.6 (48 W)/0.83 (72 W) 1.2 (120 W)/2.5 (240 W)	0.4 (72 W)/0.6 (120 W) 1.3 (240W)
	Current consumption Ue = 100 V	**A**	0.17 (7 W)/0.3 (15 W)/0.68 (30 W)	1.2 (48 W)/1.46 (72 W) 1.9 (120 W)/3.6 (240 W)	0.8 (72 W)/1 (120 W)/2.8 (240 W)
	Current at switch-on	**A**	< 50	< 30	
	Power factor		0.45 approx.	0.65 approx.	0.98 approx.
Output circuit					
LED indication			Green LED	Green LED	Green LED
Nominal output voltage (U out)		**V**	⎓ 24		12, 24 and 48
Nominal output current		**A**	0.3/0.6/1.2	2/3/5/10	2.5/5/10
Precision	Output voltage		Adjustable from 90 to 110 %	Adjustable from 100 to 120 %	
	Line and load regulation		2 % max	± 3 %	
	Residual ripple - interference	**mV**	< 200 (peak-peak)		
Micro-breaks	Holding time at I max and Ve min	**ms**	> 20	> 10	> 20
Temporary overloads	Permissible inrush current (U out >19V)		See curves page 2/59		
Protection	Short-circuit		Permanent/automatic restart	Permanent/automatic restart	Permanent/automatic restart or restart after switching off mains power
	Overload		1.05 In	1.1 In	
	Overvoltage		U > 1.2	Tripping if U > 1.5 Un	
	Undervoltage		–	Tripping if U < 0.8 Un	
Operating and environmental characteristics					
Connections	Input	**mm^2**	2 x 2.5 + earth		
	Output	**mm^2**	2 x 2.5	2 x 2.5 + earth, multiple output, depending on model	
Ambient conditions	Storage temperature	**°C**	- 25… + 70		
	Operating temperature	**°C**	- 10… + 60 (derating as from 50° C, mounted vertically)	0… + 60 (derating as from 50° C, mounted vertically)	
	Max. relative humidity		20…90 %	95 % without condensation or dripping water	
	Degree of protection		IP 20 conforming to IEC 529		
	Vibrations		Conforming to IEC 61131-2		
Operating position			Vertical and horizontal (see derating curve, page 2/58)	Vertical	
MTBF at 40°			> 100 000 h		
Connections	Series		Possible (see page 2/59)		
	Parallel		No	Possible (max. temperature 50° C)	
Dielectric strength	Input/output		3000 V/50 and 60 Hz 1 min	3000 V/50 and 60 Hz 1 min	
	Input/earth		2000 V/50 and 60 Hz 1 min	3000 V/50 and 60 Hz 1 min	
	Output/earth (and output/output)		500 V/50 and 60 Hz 1 min	500 V/50 and 60 Hz 1 min	
Input fuse incorporated			Yes (not interchangeable)		
Disturbance			EN 50081-2 (generic)	EN 50081-1	
	Conducted		EN 55011/EN 55022 class A (7 and 15 W) EN 55011/EN 55022 class B (30W)	EN 55011/EN 55022 class B	
	Radiated		EN 55011/EN 55022 class B		
Immunity			IEC 61000-6-2 (generic)		
	Electrostatic discharge		EN 61000-4-2 (4 kV contact/8 kV air)		
	Electromagnetic		EN 61000-4-3 level 3 (10 V/m)		
	Conducted interference		EN 61000-4-4 level 3 (2 kV) , EN 61000-4-5, EN 61000-4-6 level 3, EN 61000-4-8 level 4		
	Mains interference		EN 1000-4-11 (voltage drops and cuts)		

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

Presentation : pages 2/52 and 2/53 | References : page 2/61 | Dimensions : page 2/62 | Schemes : page 2/63

Modicon TSX Micro automation platform

Power supplies for d.c. control circuits

Phaseo regulated switch mode power supplies

Technical characteristics

Type of power supply			ABL-7REQ24●	ABL-7UEQ24●	ABL-7UES24●	ABL-7UPS24●
Product certifications			–			cULus, c UL us
Conforming to standards						
	Safety		EN 60950			
	EMC		EN 50081-1, EN 50082-2			
	Low frequency harmonic currents		–			EN 61000-3-2
Input circuit						
LED indication			–			
Input voltages						
	Rated values	**V**	∿ 2 x 380…415	∿ 3 x 380…415	∿ 3 x 400…520	∿ 3 x 400…520
	Permissible values	**V**	∿ 2 x 340…460	∿ 3 x 340…460	∿ 3 x 360…550	∿ 3 x 360…550
	Permissible frequencies	**Hz**	50…60			
	Efficiency at nominal load		> 85 %	> 90 %		
	Current consumption					
	Ue = 400 V	**A**	0.65 (120 W)/1.2 (240 W)	0.75 (240 W)/1.5 (480 W)	0.7 (240 W)/1.2 (480 W)/1.7 (960 W)	
	Current at switch-on	**A**	<35			
	Power factor		0.6	0.55	0.7	0.7/0.9 (960 W)
2-phase operating mode		**V**	–	Relaxation if input voltage < ∿ 450		
Output circuit						
LED indication			Green LED			
Nominal output voltage (U out)		**V**	⎓ 24			
Nominal output current		**A**	5/10	10/20	5	10/20/40
Precision						
	Output voltage		Adjustable from 100 to 116%			
	Line and load regulation		1 % max			
	Residual ripple - interference	**mV**	< 200 (peak-peak)			
Micro-breaks						
	Holding time for I max and Ve min	**ms**	15	10		Between 8 and 13
Temporary overloads						
	Permissible inrush current (U out >19V)		See curves, page 2/59			
Protection						
	Short-circuit		Permanent/automatic or normal restart			
	Overload		1.20 In < 50 ms			
	Overvoltage	**V**	28.5 typical			
	Undervoltage	**V**	19 typical			
Operating and environmental characteristics						
Connections	Input	**mm²**	2 x 1.5…2.5 mm² + earth			
	Output	**mm²**	4 x 1.5…2.5 mm²	4 x 4…6 mm²	4 x 1.5…2.5 mm²	4 x 1.5…2.5 mm² + earth (240 W) 4 x 4…6 mm² + earth (480 W) 4 x 4…10 mm² + earth (960 W)
Ambient conditions	Storage temperature	**°C**	- 25…+ 70			
	Operating temperature	**°C**	0° C…+ 60° C			
	Maximum relative humidity		30…90 %			
	Degree of protection		IP 20 or IP XXB			
	Vibrations		Conforming to IEC 61131-2			
Operating position			Vertical			
MTBF			> 100 000 h			
Connections	Series		Possible			
	Parallel		See page 2/58			
Dielectric strength	Input/output		3750 V/50 and 60 Hz 1 min			
	Input/earth		3500 V/50 and 60 Hz 1 min			
	Output/earth (and output/output)		500 V/50 and 60 Hz 1 min			
Input fuse incorporated			No			
Disturbance	Conducted/radiated		EN 55011/EN 5022 - class B			
Immunity	Electrostatic discharge		EN 61000-4-2 (4 kV contact/8 kV air)			
	Electromagnetic		EN 61000-4-3 level 3 (10 V/m)			
	Conducted interference		EN 61000-4-4 level 3 (2 kV) , EN 61000-4-5, EN 61000-4-6 level3, EN 61000-4-8 level 4 (for ABL-7RE/RP)			
	Mains interference		EN 61000-4-11 (voltage drops and cuts)			

Presentation : pages 2/52 and 2/53
References : page 2/61
Dimensions : page 2/62
Schemes : page 2/63

Modicon TSX Micro automation platform

Power supplies for d.c. control circuits

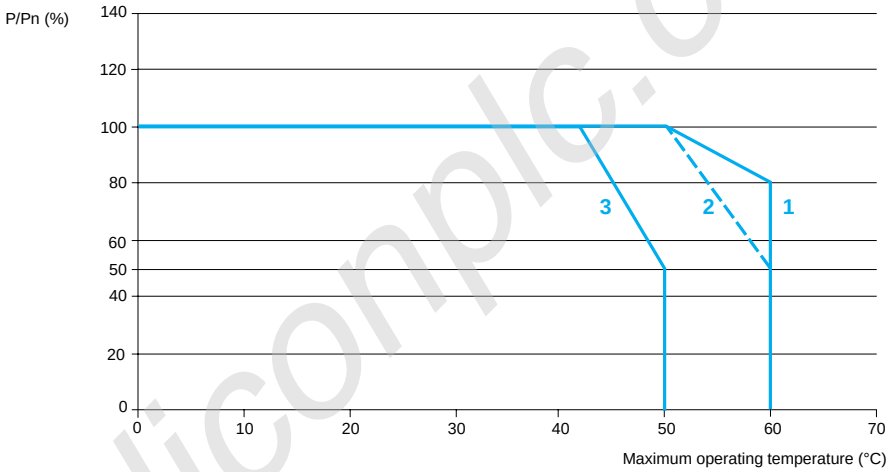
Phaseo regulated switch mode power supplies

Derating

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

The rated ambient temperature for Phaseo power supplies is 50 °C. Above this, 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 can deliver continuously, according to the ambient temperature.



1 ABL-7RE, ABL-7RP, ABL-7U mounted vertically
2 ABL-7CEM mounted vertically
3 ABL-7CEM mounted horizontally

Derating should be considered in extreme operating conditions:

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

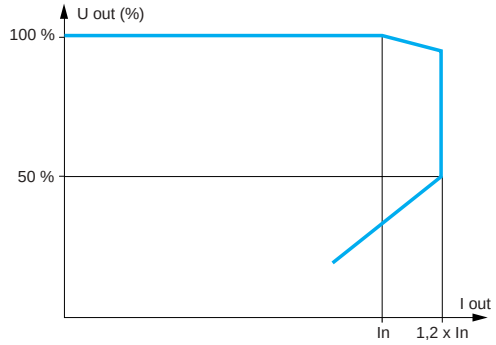
General rules to be complied with

Intensive operation	See derating on above graph. Example for ABL-7RE: - without derating, from 0 °C to 50 °C, - derating of nominal current by 2%, per additional °C, up to 60 °C.
Rise in output voltage	The nominal power is fixed. Increasing the output voltage means that the current delivered must be reduced
Parallel connection to increase the power (except ABL-7CEM)	The total power is equal to the sum of the 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

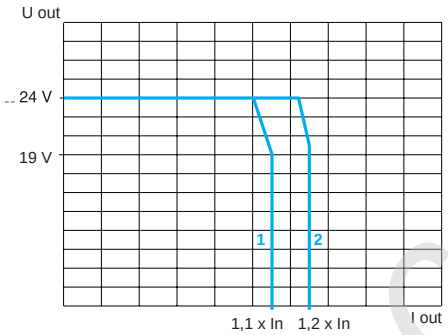
In all cases, there must be adequate convection round the products to ensure easier cooling. There must be a clear space of 50 mm above and below Phaseo power supplies and of 15 mm at the sides.

Load limit

ABL-7CEM24●●●



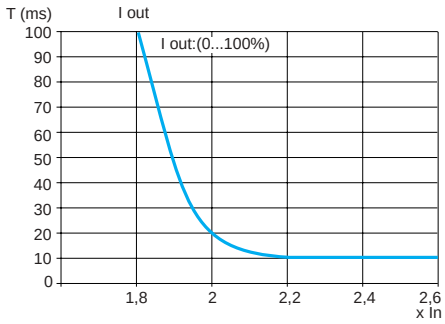
ABL-7RE24●●/ABL-7RP●●●●
ABL-7U●●24●●/ABL-7REQ●●●●



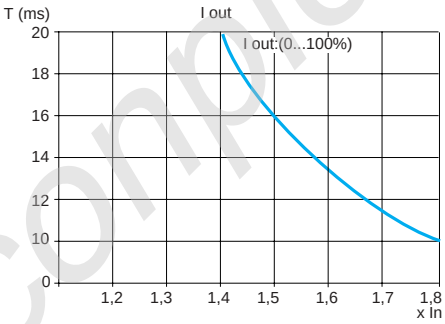
1 ABL-7RE24●●/ABL-7RP●●●●
2 ABL-7U●●24●●/ABL-7REQ●●●●

Temporary overloads

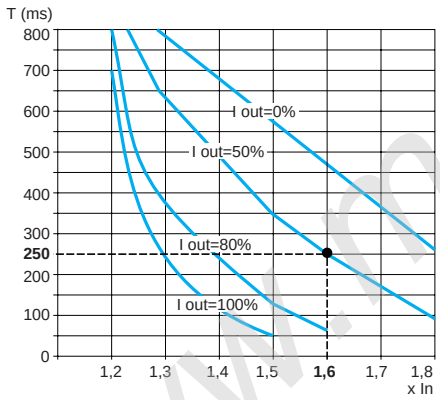
ABL-7CEM



ABL-7RE/ABL-7RP



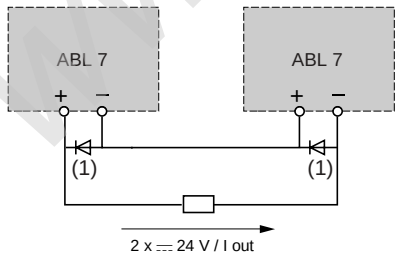
ABL-7U



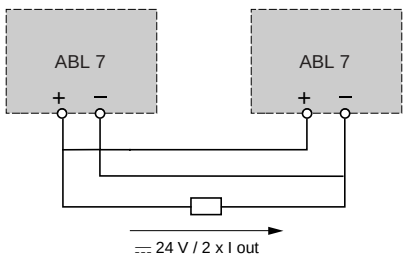
Example: For an ABL-7UPS24●●● power supply with 50 % loading. (I out = 50 %), this power supply can absorb a current peak of 1.6 x In for 250 ms with an output voltage ⩾ 19 V.

Series or parallel connection

Series connection



Parallel connection



Family	Series	Parallel
ABL-7CEM	2 products max *(1)*	No
ABL-7RE/RP	2 products max	2 products max
ABL-7U/REQ	2 products max	2 products max

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

Presentation : pages 2/52 and 2/53
References : page 2/61
Dimensions : page 2/62
Schemes : page 2/63

Modicon TSX Micro automation platform

Phaseo regulated switch mode power supplies
Upstream protection

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

Type of 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
	GB2	C60N		GB2	C60N	
ABL-7CEM24003	GB2-CD06	24183 MG24516 *(1)*	2A	GB2-CD07	24184 MG24517 *(1)*	2 A
ABL-7CEM24006	GB2-CD07	24184 MG24517 *(1)*	2A	GB2-CD08	24185 MG24518 *(1)*	2 A
ABL-7CEM24012	GB2-CD07	24184 MG24517 *(1)*	2A	GB2-CD08	24185 MG24518 *(1)*	2 A
ABL-7RE2402	GB2-●B07	MG24517 *(1)*	2A	GB2-DB06	MG24516 *(1)*	2 A
ABL-7RE2403	GB2-●B07	MG24517 *(1)*	2 A	GB2-DB06	MG24516 *(1)*	2 A
ABL-7RE2405	GB2-●B08	MG24518 *(1)*	4 A	GB2-DB07	MG17453 *(1)*	2 A
ABL-7RE2410	GB2-●B12	MG17454 *(1)*	6 A	GB2-DB08	MG24518 *(1)*	4 A
ABL-7RP2403	GB2-●B07	MG24517 *(1)*	2 A	GB2-DB07	MG24516 *(1)*	2 A
ABL-7RP2405	GB2-●B07	MG24517 *(1)*	2 A	GB2-DB07	MG24516 *(1)*	2 A
ABL-7RP2410	GB2-●B09	MG24519 *(1)*	4 A	GB2-DB07	MG24516 *(1)*	2 A
ABL-7RP4803	GB2-●B07	MG24517 *(1)*	2 A	GB2-DB07	MG24516 *(1)*	2 A

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

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

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

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

(1) UL certified circuit-breaker.

Modicon TSX Micro automation platform

Power supplies for d.c. control circuits

Phaseo regulated switch mode power supplies

ABL-7CEM

ABL 7CEM single-phase regulated switch mode power supplies

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

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

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

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

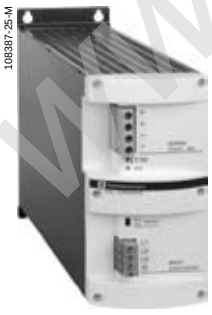
ABL-7RP single-phase regulated switch mode power supplies

Mains input voltage 47...63 Hz	Output voltage	Nominal power	Nominal current	Auto-protect reset	Conforming to standard EN 61000-3-2	Reference	Weight
V	⎓ V	W	A				kg
∿ **100...240** single-phase wide range ⎓ **110...220** *(1)*	12	60	5	auto/man	yes	**ABL-7RP1205**	1.000
	24	72	3	auto/man	yes	**ABL-7RP2403**	0.520
		120	5	auto/man	yes	**ABL-7RP2405**	1.000
		240	10	auto/man	yes	**ABL-7RP2410**	2.200
	48	144	2.5	auto/man	yes	**ABL-7RP4803**	1.000

ABL-7REQ

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

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



ABL-7UPS

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

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

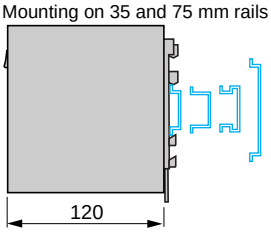
(1) Compatible input voltage, not indicated on the product.

Presentation : pages 2/52 and 2/53
Characteristics : pages 2/56 to 2/59
Dimensions : page 2/62
Schemes : page 2/63

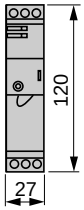
Modicon TSX Micro automation platform
Power supplies for d.c. control circuits

ABL-7RE24●●/ABL-7RP●●●●

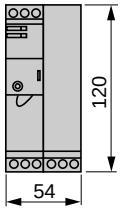
Common side view
Mounting on 35 and 75 mm rails



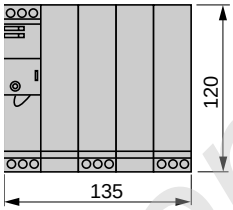
ABL-7RE2402/2403
ABL-7RP2403



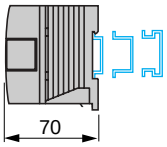
ABL-7RE2405
ABL-7RP1205/2405/4803



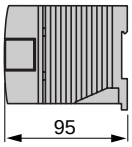
ABL-7RE2410
ABL-7RP2410



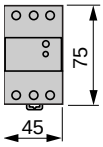
ABL-7CEM24●●●
ABL-7CEM24003



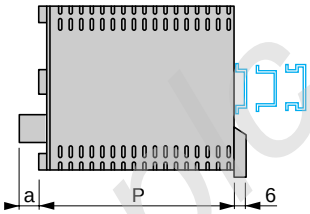
ABL-7CEM24006/
ABL-7CEM24012

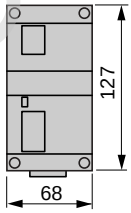


Common front view

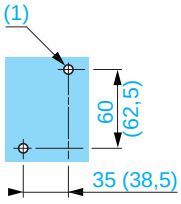


ABL-7REQ24●●●/ABL-7UEQ24100/ABL-7UES24050/
ABL-7UPS24100





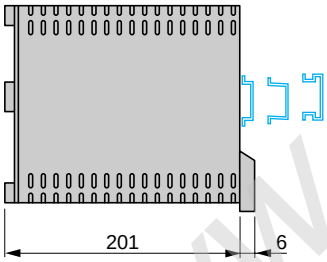
Panel mounting

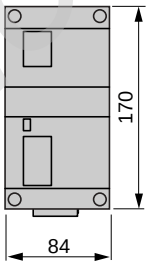


(1) 2 x M4 or 2 x Ø4.5

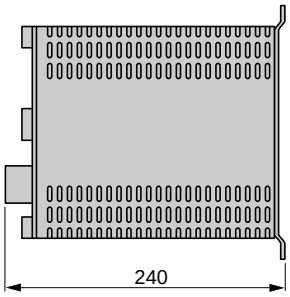
ABL-	P mm	a mm
7REQ24050	130	–
7REQ24100	154	–
7UEQ24100	154	–
7UES24050	171	15
7UPS24100	171	15

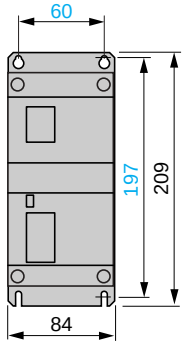
ABL-7UEQ24200



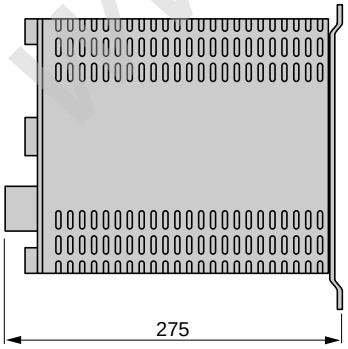


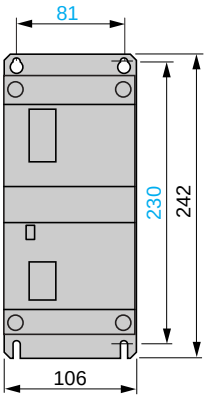
ABL-7UPS24200





ABL-7UPS24400

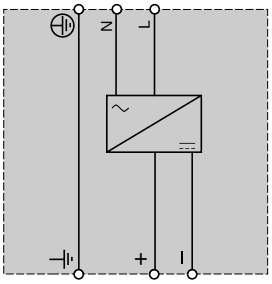




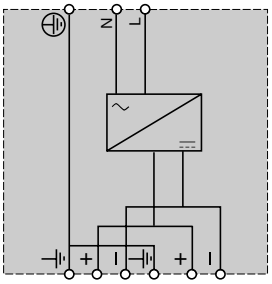
Modicon TSX Micro automation platform

Power supplies for d.c. control circuits

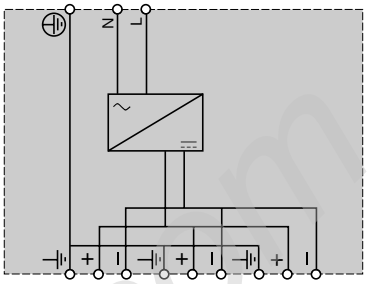
ABL-7RE2402/2403



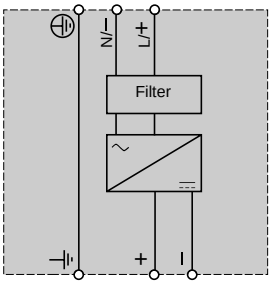
ABL-7RE2405



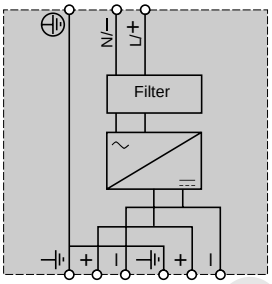
ABL-7RE2410



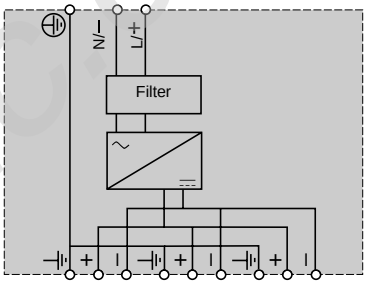
ABL-7RP2403



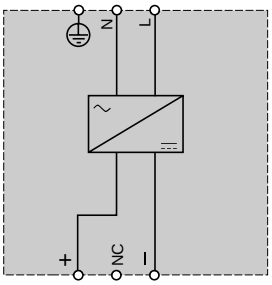
ABL-7RP1205/2405/4803



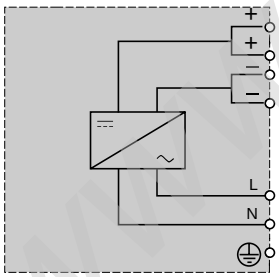
ABL-7RP2410



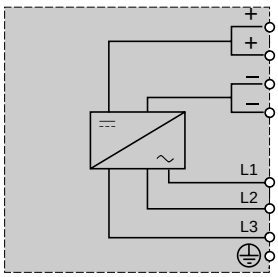
ABL-7CEM24●●●



ABL-7REQ24●●●



ABL-7UE●●●●●



ABL-7UP●●●●●