

# ABL1 Power Supplies

Class 8440

Catalog  
June

05



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# ABL1 Power Supplies

## **PRODUCT DESCRIPTION**

The characteristics to consider when selecting a power supply are:

- the supply voltage available in the installation,
- the required output voltage and current.

This may, however, result in several products being selected as suitable. Therefore, other selection criteria must be considered.

### **Power Supply Voltage**

The ABL1 range is the solution because it guarantees regulation of 3% on the output voltage, whatever the load current and the input voltage. In addition, the wide input voltage range of ABL1 power supplies allows them to be connected to all voltage supplies within this range, without any adjustment on 60 and 100 W versions, and via a selector on 150 and 240 W versions.

### **Short Circuit Protection**

ABL1 power supplies are equipped with electronic and thermal overload protection. This protection resets itself automatically on elimination of the fault, which avoids having to take any action or change a fuse.

### **Electromagnetic Compatibility**

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

The products in the ABL1 range are class B, the strictest level, and can be used without any restrictions due to their low emissions.

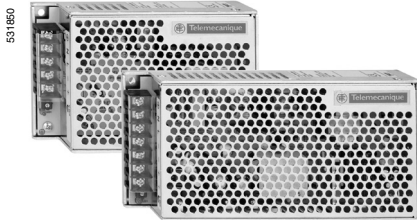
### **Power Factor**

The current drawn by a power supply is not sinusoidal. This leads to the existence of harmonic currents which pollute the voltage supply.

Regulated switch mode supplies always produce harmonic currents; therefore, a filter circuit (Power Factor Correction or PFC) must be added to comply with standard EN 61000-3-2.

ABL1RPM power supplies conform to standard EN 61000-3-2 and can therefore be connected directly to public voltage power supplies.

## ABL1 Power Supplies Product Description



ABL1 regulated switch mode power supplies are designed to provide the dc voltage necessary for simple, dedicated control circuits. Divided into two families, these power supplies are able to meet all the needs encountered in standard commercial machines.

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

As machine components, ABL1 power supplies are easy to install—only the setup may vary from one application to another. The ABL1 range is specially designed for machine manufacturers.

ABL1 regulated switch mode power supplies are totally electronic and regulated, and provide the following benefits:

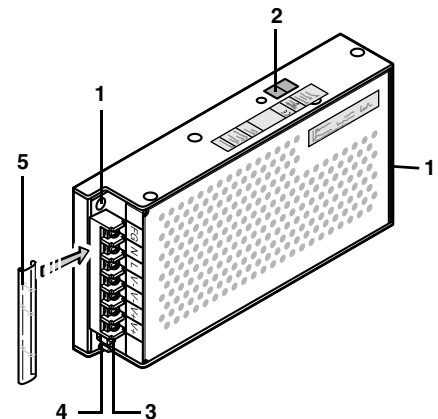
- A wide input voltage range from 100–240 Vac and either 120–370 Vdc or 180–370 Vdc (not indicated on the product).
- Output currents ranging from 2.5–10 A.
- Products with anti-harmonic distortion input filtering (ABL1RPM).
- A high degree of output voltage stability, adjustable by potentiometer.
- Built-in thermal overload and short-circuit protection.
- Conformity to world-wide standards.
- Conformity to standard EN 55022 class B.
- UL508, CSA, and CE certifications.
- Considerably reduced weight in comparison to competition 0.97–2.71 lb (0.44–1.23 kg).
- Two optional mounting accessories to fit all models.

**ABL1 power supplies for electrical equipment are split into two families:**

- **ABL1REM**, single-phase:
  - 60 W for the 12 Vdc version
  - 60 W, 100 W, 150 W and 240 W for the 24 Vdc versions
- **ABL1RPM**, single-phase with anti-harmonic distortion filtering:
  - 100 W for the 12 Vdc version
  - 100 W, 150 W and 240 W for the 24 Vdc versions

**ABL1 regulated switch mode power supplies are comprised of:**

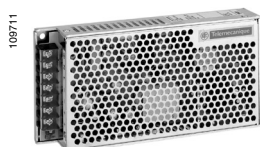
1. Two holes for M4 x 20 screws.
2. A 115/230 V input voltage selector (150 and 240 W versions only).
3. A green LED indicating presence of the dc output voltage.
4. An output voltage adjustment potentiometer ( $\pm 10\%$ ).
5. A removable, transparent, clip-on cover.



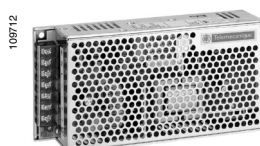
## SELECTION



ABL1REM24025



ABL1RPM24042



ABL1RPM24062



ABL1RPM24100

### ABL1REM Single-Phase Regulated Switch Mode Power Supplies

Input Voltage 47–63 Hz	Output voltage	Nominal power	Nominal current	Automatic Protection Reset	Conforms to standard EN 61000-3-2	Catalog Number	Weight lb (kg)
100–240 Vac <sup>(1)</sup> single-phase wide range	12 Vdc	60 W	5 A	Automatic	No	ABL1REM12050	0.97 (0.44)
	24 Vdc	60 W	2.5 A	Automatic	No	ABL1REM24025	0.97 (0.44)
100–120/ 200–240 Vac <sup>(2)</sup> single-phase		100 W	4.2 A	Automatic	No	ABL1REM24042	1.41 (0.64)
	150 W	6.2 A	Automatic	No	ABL1REM24062	1.61 (0.73)	
	240 W	10 A	Automatic	No	ABL1REM24100	1.94 (0.88)	

### ABL1RPM Single-Phase Regulated Switch Mode Power Supplies

Input Voltage 47–63 Hz	Output voltage	Nominal power	Nominal current	Automatic Protection Reset	Conforms to standard EN 61000-3-2	Catalog Number	Weight lb (kg)
100–240 Vac <sup>(1)</sup> single-phase wide range	12 Vdc	100 W	8.3 A	Automatic	Yes	ABL1RPM12083	1.41 (0.64)
	24 Vdc	100 W	4.2 A	Automatic	Yes	ABL1RPM24042	1.41 (0.64)
100–120/ 200–240 Vac <sup>(2)</sup> single-phase	24 Vdc	150 W	6.2 A	Automatic	Yes	ABL1RPM24062	2.13 (0.97)
		240 W	10 A	Automatic	Yes	ABL1RPM24100	2.71 (1.23)

### Mounting Accessories

Description	Sold in lots of	Catalog Number	Weight lb (kg)
Reversible mounting bracket	5	ABL1A01 <sup>(3)</sup>	0.20 (0.085)
Clip-on mounting plate for 35 mm mounting rail	5	ABL1A02 <sup>(3)</sup>	0.09 (0.035)

(1) Compatible input voltage 120–370 Vdc not indicated on the product.  
 (2) Compatible input voltage 180–370 Vdc not indicated on the product.  
 (3) Can be used with any ABL1 power supply.

### ABL1REM, RPM

	E164867 NMTR
	E164867 NMTR7
	204701 5311 07
	204701 5311 87



# ABL1 Power Supplies

## Specifications and Characteristics

### SPECIFICATIONS AND CHARACTERISTICS

		ABL1REM●●●●●	ABL1RPM●●●●●	
<b>Technical Characteristics</b>	<b>Catalog Number</b>			
	<b>Approvals</b>	cULus, cCSAus, TÜV / CTick, CE		
	<b>Conforming to standards</b>	Products	UL508, CSA 22.2 n° 60950-1, UL 60950-1	
		Safety	EN 60950-1, SELV	
		Generic EMC	EN 61000-6-2, EN 61000-6-3	
		Low frequency harmonic currents	No   EN 61000-3-2	
<b>Input Circuit</b>	<b>LED indication</b>	None		
	<b>Input voltages</b>	Rated values	100–240 Vac (60 and 100 W), 100–120/200–240 Vac (150 and 240 W)	
		Permissible values	85–264 Vac (60 and 100 W), 85–132/170–264 Vac (150 and 240 W) 120–370 Vdc(60 and 100 W), 180–370 Vdc(150 and 240 W) compatible	
		Frequency	47–63 Hz	
		Efficiency at nominal load	> 80 %	
		Current consumption U <sub>e</sub> = 240 V	1 A @ 60 W / 0.7 A @ 100 W / 2.5 A @ 150 W / 3 A @ 240 W	
		Current consumption U <sub>e</sub> = 100 V	2 A @ 60 W / 1.4 A @ 100 W / 5 A @ 150 W / 6 A @ 240 W	
		Current at switch-on	< 50 A	
	Power factor	0.65 % approx.   0.7 to 0.95 % approx. (depending on model)		
<b>Output Circuit</b>	<b>LED indication</b>	Green LED		
	<b>Nominal output voltage (U out)</b>	12 or 24 Vdc		
	<b>Nominal output current</b>	5 A, 8.3 A at 12 V; 2.5 A, 4.2 A, 6.2 A, 10 A at 24 V		
	<b>Precision</b>	Output voltage	± 10 %	
		Line and load regulation	± 3 %	
		Residual ripple	< 200 mV (peak to peak)	
	<b>Micro-breaks</b>	Holding time at I max and U <sub>e</sub> = 240 V	40 ms	
		Holding time at I max and U <sub>e</sub> = 100 V	10 ms	
	<b>Temporary overloads</b>	See graph on page 8		
	<b>Protection</b>	Short-circuit	Permanent, automatic restart	
Overload		1.1 to 1.5 in		
Overvoltage		U > 1.25 U out		
Thermal		Yes (limiting operation above a temperature between 122 and 140 °F (50 and 60 °C), depending on the load rating)		
<b>Protection class</b>	1			
<b>Degree of pollution</b>	2			
<b>Overvoltage category</b>	II			
<b>Connections</b>	Input	2 x 4 mm <sup>2</sup> + ground		
	Output	2 x 4 mm <sup>2</sup> (60 W) doubled for 100, 150 and 240 W		
<b>Tightening torque</b>	7.0 lb-in (0.8 Nm)			
<b>Ambient conditions</b>	Storage temperature	- 13 to 185 °F (- 25 to +85 °C)		
	Operating temperature	See graphs on page 7		
	Maximum relative humidity	20–90 % RH		
	Degree of protection	Conforming to standard EN 60950 with clip-on cover over connection terminal block		
	Vibrations	Exceeding standard EN 61131-2 (5–9 Hz: 3.5 mm; 9–150 Hz: 2 g)		
<b>Operating position</b>	All positions with derating			
<b>MTBF at 104 °F (40 °C)</b>	> 100 000 h at 100% load			
<b>Connections</b>	Serial	Possible (2 power supplies maximum)		
	Parallel	Possible (2 power supplies maximum)		
<b>Dielectric strength</b>	Input/output	3000 V / 50 and 60 Hz / 1 min		
	Input/ground	1500 V / 50 and 60 Hz / 1 min		
	Output/ground	500 V / 50 and 60 Hz / 1 min		
<b>Input fuse incorporated</b>	Yes			
<b>Emissions</b>	Generic	EN 61000-6-3		
	Conducted/radiated	EN 55011, EN 55022 Class B		
<b>Immunity</b>	Generic	EN 61000-6-2		
	Electrostatic discharge	EN 61000-4-2 level 3 (4 kV contact/8 kV air)		
	Electromagnetic discharge	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, EN 61000-4-12 level 3		
	Supply interference	Conforming to standard EN 61000-4-11(voltage drops and cuts)		

**TECHNICAL OVERVIEW**

**OUTPUT CHARACTERISTICS**

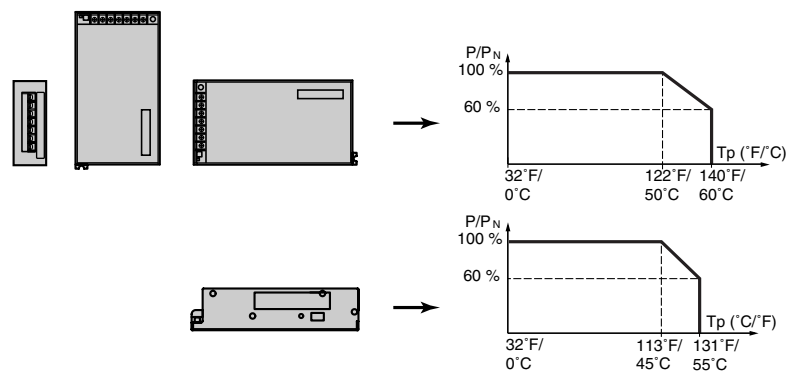
**Derating**

The ambient temperature is a determining factor that 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.

ABL1R●M24100 (240 W) power supplies are mechanically ventilated as from an approximate ambient temperature > 104 °F (40 °C) or for an approximate load rating > 90%.

The rated ambient temperature for ABL1 power supplies is 122 °F (+ 50 °C). Above this, derating is necessary up to a maximum temperature of 140 °F (+ 60 °C).

The graphs below show the power (in relation to the nominal power) which the power supply 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 24 V (to compensate for line voltage drops, for example)
- parallel connection to increase the total power

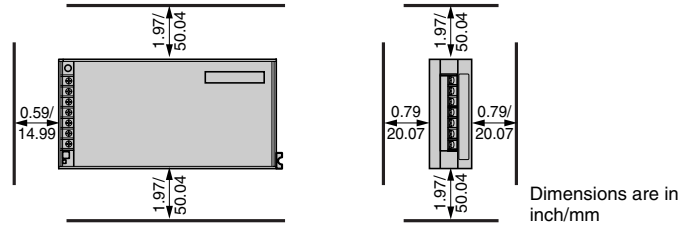
**General rules to follow:**

	(See graphs above for derating information.)
Intensive operation	Example for ABL1 mounted vertically: <ul style="list-style-type: none"> <li>• without derating, from 32 °F to 122 °F (0 °C to 50 °C),</li> <li>• derating of nominal current by 4%, per additional °C, up to 140 °F (60 °C).</li> </ul>
Rise in output voltage	The nominal power is fixed. Increasing the output voltage means that the current delivered must be reduced.
Parallel connection to increase the power	The total power is equal to the sum of the power supplies used, but the maximum ambient temperature for operation is 122 °F (50 °C). To improve heat dissipation, the power supplies must not be in contact with each other.

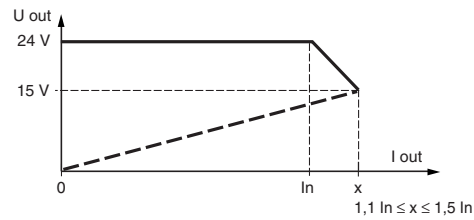
# ABL1 Power Supplies Technical Overview

## Output Characteristics, continued...

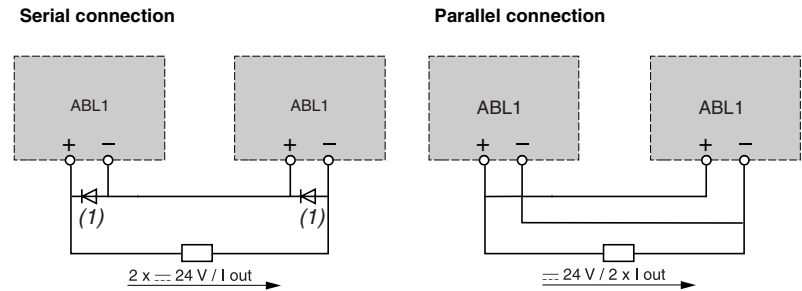
In all cases, there must be adequate convection around the products to ensure proper cooling. There must be a clear space of 1.97 in. (50 mm) above and below the power supplies, and of 0.79 in. (20 mm) on the sides.



## LOAD LIMITS



## Serial or parallel connection



(1) 8 A/100 V Shottky diode for ABL1REM12050/1REM24025/1R●M24042.  
15 A/100 V Shottky diode for ABL1RPM12083/1R●M24062/1R●M24100.

## Protection Devices for ABL1 Power Supplies

For use with	120 Vac Single-Phase			240 Vac Single-Phase		
	Thermal-magnetic circuit-breaker GB2	MG	gG fuse	Thermal-magnetic circuit-breaker GB2	MG	gG fuse
ABL1REM12050	DB07	24517	2 A	DB07	24517	2 A
ABL1REM24025	DB07	24517	2 A	DB07	24517	2 A
ABL1RPM12083	DB07	24517	2 A	DB07	24517	2 A
ABL1REM24042	DB07	24517	2 A	DB07	24517	2 A
ABL1RPM24042	DB07	24517	2 A	DB07	24517	2 A
ABL1REM24062	DB07	24517	2 A	DB08	24518	4 A
ABL1RPM24062	DB07	24517	2 A	DB08	24518	4 A
ABL1REM24100	DB08	24518	4 A	DB10	17454	6 A
ABL1RPM24100	DB08	24518	4 A	DB10	17454	6 A

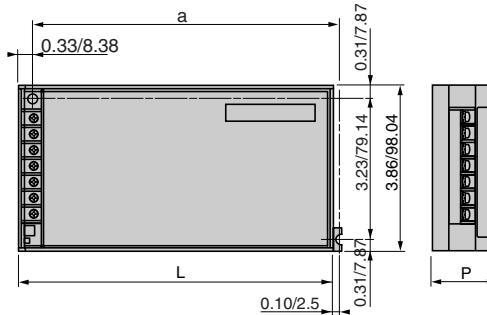


## DIMENSIONS AND WIRING DIAGRAMS

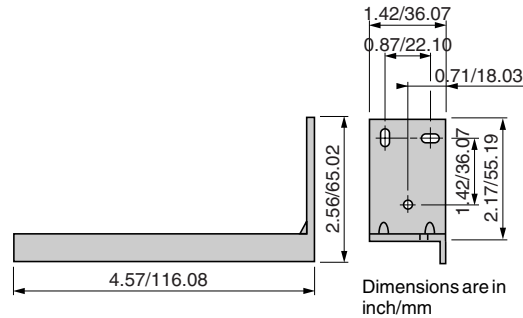
### Dimensions

**ABL1REM●●●●●**

Part Number	L (in/mm)	P (in/mm)	a (in/mm)
<b>ABL1REM12050</b>	5.91/150.11	1.50/38.10	5.67/144.02
<b>ABL1REM24025</b>	5.91/150.11	1.50/38.10	5.67/144.02
<b>ABL1RPM12083</b>	7.87/199.90	1.50/38.10	7.64/194.06
<b>ABL1RPM24042</b>	7.87/199.90	1.50/38.10	7.64/194.06
<b>ABL1RPM24062</b>	7.87/199.90	1.97/50.04	7.64/194.06
<b>ABL1RPM24100</b>	7.87/199.90	2.56/65.02	7.64/194.06

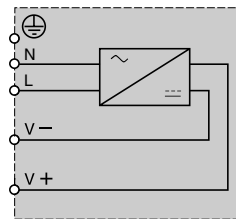


**ABL1A01**

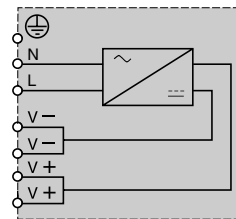


### Wiring Diagrams

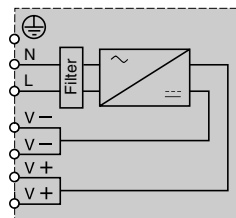
**ABL1REM12050, 1REM24025**



**ABL1REM24042, 1REM24062, 1REM24100**



**ABL1RPM●●●●●**

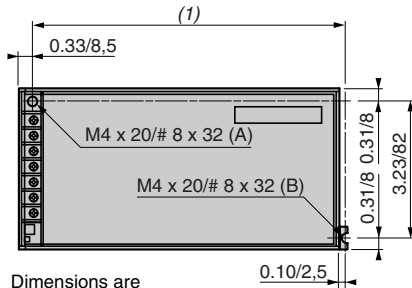


# ABL1 Power Supplies Mounting Instructions

## MOUNTING INSTRUCTIONS

### Mounting the ABL1

ABL1 power supplies can be mounted directly, without accessories using the provided holes, (A) and (B). See figure to the left.

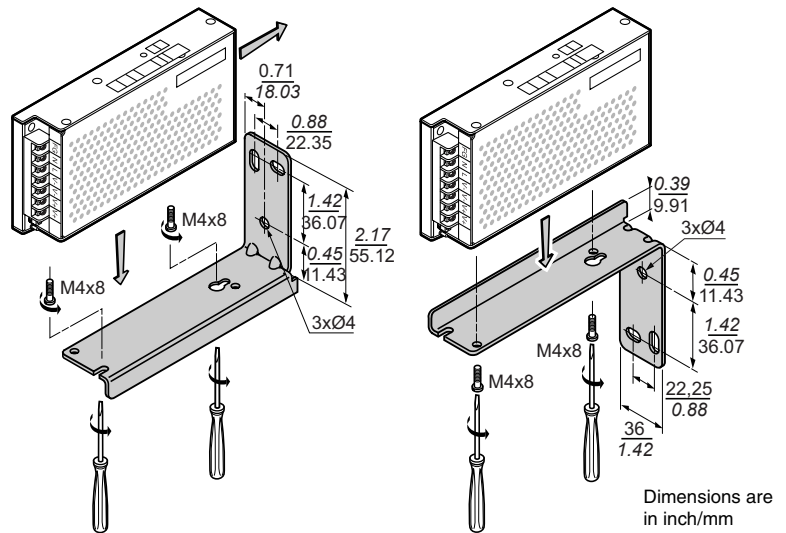


Dimensions are in inch/mm

(1) 5.67/144.02 for ABL1REM12050 and ABL1REM24025.  
7.64/194.06 for ABL1REM12083 and ABL1R●M24042/24062/24100

### Mounting Bracket ABL1A01

To minimize the amount of space required, the power supplies can be mounted by the base using mounting bracket **ABL1A01**. This type of mounting is not recommended in the case of persistent vibrations or for on-board equipment.

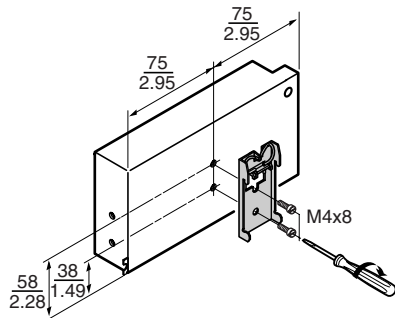


Dimensions are in inch/mm

### Mounting Plate ABL1A02

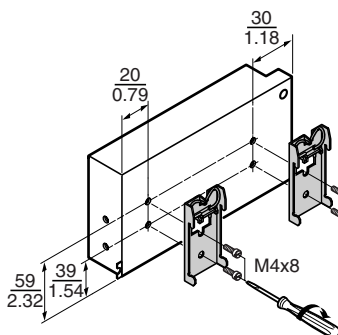
Mounting plate **ABL1A02** enables mounting on a 35 mm mounting rail.

#### ABL1REM12050/24025

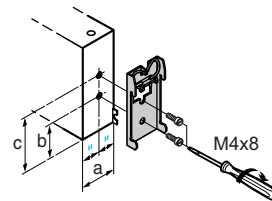


Dimensions are in inch/mm

#### ABL1RPM12083 ABL1R●M24042/24062/24100



#### ABL1R●M●●●●●



ABL	a in/mm	b in/mm	c in/mm
1REM12050	1.50/38.10	1.50/38.10	2.28/57.91
1REM24025			
1RPM12083			
1R●M24042			
1R●M24062	1.96/49.78	1.10/27.94	1.89/48.01
1R●M24100	2.56/65.02	1.10/27.94	1.89/48.01

**INDEXED CATALOG NUMBERS**

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ABL1REM24062	5
ABL1REM24100	5
ABL1RPM12083	5
ABL1RPM24042	5
ABL1RPM24062	5
ABL1RPM24100	5

*NOTE: Protective devices  
are listed on page 8.*

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