

# Product data sheet

Specifications



## Regulated Power Supply, 100-240V AC, 24V 2.5 A, single phase, Modular

ABLM1A24025

### Main

|                             |                                                        |
|-----------------------------|--------------------------------------------------------|
| Range of product            | Modicon Power Supply                                   |
| Product or component type   | Power supply                                           |
| Power supply type           | Regulated switch mode                                  |
| Variant option              | Modular                                                |
| Enclosure material          | Plastic                                                |
| Nominal input voltage       | 100...240 V AC single phase<br>100...240 V AC 2 phases |
| Rated power in W            | 60 W                                                   |
| Output voltage              | 24 V DC                                                |
| Power supply output current | 2.5 A                                                  |

### Complementary

|                              |                                                                                                                                                                                                                                                     |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Input voltage limits         | 90...264 V AC                                                                                                                                                                                                                                       |
| Nominal network frequency    | 50...60 Hz                                                                                                                                                                                                                                          |
| Network system compatibility | TN<br>TT<br>IT                                                                                                                                                                                                                                      |
| Maximum leakage current      | 0.25 mA 240 V AC                                                                                                                                                                                                                                    |
| Input protection type        | Integrated fuse (not interchangeable) 3.15 A<br>External protection (recommended) 20 A Curve B<br>External protection (recommended) 20 A Curve C<br>External protection (recommended) 10 A Curve B<br>External protection (recommended) 6 A Curve C |
| Inrush current               | 30 A at 115 V<br>60 A at 230 V                                                                                                                                                                                                                      |
| Power factor                 | 0.50 at 115 V AC<br>0.39 at 230 V AC                                                                                                                                                                                                                |
| Efficiency                   | 90 % at 115 V AC<br>90 % at 230 V AC                                                                                                                                                                                                                |
| Output voltage adjustment    | 24...28 V                                                                                                                                                                                                                                           |
| Power dissipation in W       | 6.5 W                                                                                                                                                                                                                                               |
| Current consumption          | < 1.5 A 115 V AC<br>< 1 A 230 V AC                                                                                                                                                                                                                  |
| Turn-on time                 | < 2 s                                                                                                                                                                                                                                               |
| Holding time                 | > 20 ms 115 V AC<br>> 60 ms 230 V AC                                                                                                                                                                                                                |

|                                 |                                                                                                                                                                                                                                               |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Startup with capacitive loads   | 3000 µF                                                                                                                                                                                                                                       |
| Residual ripple                 | < 100 mV                                                                                                                                                                                                                                      |
| Meantime between failure [MTBF] | 1300000 h at 25 °C, full load<br>700000 h at 55 °C, 80 % load                                                                                                                                                                                 |
| Output protection type          | Against overload and short-circuits, protection technology: automatic reset<br>Against over temperature, protection technology: manual reset<br>Against overvoltage, protection technology: manual reset                                      |
| Connections - terminals         | Screw connection: 0.5...2.5 mm², (AWG 20...AWG 14) without wire end ferrule for output<br>Screw connection: 0.5...1.5 mm², (AWG 20...AWG 16) with wire end ferrule for output<br>Screw connection: 0.5...1.5 mm², (AWG 20...AWG 16) for input |
| Line and load regulation        | < 0.5 % at in line<br>< 1 % at 0 to 100 % load                                                                                                                                                                                                |
| Status LED                      | 1 LED (green) output voltage                                                                                                                                                                                                                  |
| Depth                           | 55.6 mm                                                                                                                                                                                                                                       |
| Height                          | 91 mm                                                                                                                                                                                                                                         |
| Width                           | 53 mm                                                                                                                                                                                                                                         |
| Net weight                      | 0.221 kg                                                                                                                                                                                                                                      |
| Output coupling                 | Serial<br>Parallel                                                                                                                                                                                                                            |
| Mounting support                | Top hat type TH35-15 rail conforming to IEC 60715<br>Top hat type TH35-7.5 rail conforming to IEC 60715<br>Double-profile DIN rail<br>panel mounting                                                                                          |
| Supply                          | SELV conforming to EN/IEC 60950-1<br>SELV conforming to EN/IEC 60204-1<br>SELV conforming to IEC 60364-4-41                                                                                                                                   |
| Dielectric strength             | 3000 V AC input/output                                                                                                                                                                                                                        |
| Service life                    | 10 year(s)                                                                                                                                                                                                                                    |

## Environment

|                                       |                                                                                                                                                                                                                                                                                                              |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Standards                             | EN 62368-1<br>EN/IEC 61010-1<br>EN 61010-2-201<br>EN/IEC 61204-3<br>EN 61000-6-1<br>EN 61000-6-2<br>EN 61000-6-3<br>EN 61000-6-4<br>EN 61000-3-2<br>EN 61000-3-3<br>UL 62368-1<br>UL 61010-1<br>UL 61010-2-201<br>CSA C22.2 No 62368-1<br>CSA C22.2 No 61010-1<br>CSA C22.2 No 61010-2-201<br>EN/IEC 62368-1 |
| Product certifications                | CE<br>CUL listed<br>CUL recognized<br>RCM<br>CB Scheme<br>EAC<br>KC<br>NEC: class 2                                                                                                                                                                                                                          |
| Operating altitude                    | < 2000 m overvoltage category III<br>2000 m...5000 m overvoltage category II                                                                                                                                                                                                                                 |
| Shock resistance                      | 100 m/s² for 11 ms                                                                                                                                                                                                                                                                                           |
| IP degree of protection               | IP20                                                                                                                                                                                                                                                                                                         |
| Ambient air temperature for operation | -25...-10 °C with current derating of 1 % per °C mounting position A < 2000 m<br>-10...55 °C without current derating mounting position A < 2000 m<br>55...70 °C with current derating of 2.67 % per °C mounting position A < 2000 m                                                                         |
| Electrical shock protection class     | Class II without PE connection                                                                                                                                                                                                                                                                               |

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pollution degree         | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Vibration resistance     | 3 mm (f= 2...9 Hz) conforming to IEC 60721-3-3<br>10 m/s² (f= 9...200 Hz) conforming to IEC 60721-3-3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Electromagnetic immunity | Immunity to electrostatic discharge - test level: 6 kV (contact discharge) conforming to EN/IEC 61000-4-2<br>Immunity to electrostatic discharge - test level: 9 kV (air discharge) conforming to EN/IEC 61000-4-2<br>Electromagnetic field immunity test - test level: 10 V/m (80 MHz...2 GHz) conforming to EN/IEC 61000-4-3<br>Electromagnetic field immunity test - test level: 5 V/m (2...2.7 GHz) conforming to EN/IEC 61000-4-3<br>Electromagnetic field immunity test - test level: 3 V/m (2.7...6 GHz) conforming to EN/IEC 61000-4-3<br>Immunity to fast transients - test level: 4 kV (on input-output) conforming to EN/IEC 61000-4-4<br>Surge immunity test - test level: 3 kV (between power supply and earth) conforming to EN/IEC 61000-4-5<br>Surge immunity test - test level: 1.5 kV (between phases) conforming to EN/IEC 61000-4-5<br>Immunity to conducted disturbances - test level: 10 Vrms (0.15...80 MHz) conforming to EN/IEC 61000-4-6<br>Immunity to magnetic fields - test level: 30 A/m (50...60 Hz) conforming to EN/IEC 61000-4-8<br>Immunity to voltage dips - test level: 100 % (1 cycle) conforming to EN/IEC 61000-4-11<br>Immunity to voltage dips - test level: 60 % (10 cycles) conforming to EN/IEC 61000-4-11<br>Immunity to voltage dips - test level: 30 % (25 cycles) conforming to EN/IEC 61000-4-11<br>Disturbing field emission conforming to EN 55016-2-3<br>Limits for harmonic current emissions conforming to EN 61000-3-2<br>Conducted disturbance emission conforming to EN 55016-1-2<br>Conducted disturbance emission conforming to EN 55016-2-1 |
| Electromagnetic emission | Conducted emissions conforming to EN 61000-6-3<br>Radiated emissions conforming to EN 61000-6-4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

### Packing Units

|                              |          |
|------------------------------|----------|
| Unit Type of Package 1       | PCE      |
| Number of Units in Package 1 | 1        |
| Package 1 Height             | 6.0 cm   |
| Package 1 Width              | 6.0 cm   |
| Package 1 Length             | 11.0 cm  |
| Package 1 Weight             | 227.0 g  |
| Unit Type of Package 2       | S02      |
| Number of Units in Package 2 | 24       |
| Package 2 Height             | 15 cm    |
| Package 2 Width              | 30 cm    |
| Package 2 Length             | 40 cm    |
| Package 2 Weight             | 5.681 kg |

### Offer Sustainability

|                            |                                                                                                                                                                                                                                                                                             |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sustainable offer status   | Green Premium product                                                                                                                                                                                                                                                                       |
| REACH Regulation           | <a href="#">REACH Declaration</a>                                                                                                                                                                                                                                                           |
| EU RoHS Directive          | Pro-active compliance (Product out of EU RoHS legal scope)<br><a href="#">EU RoHS Declaration</a>                                                                                                                                                                                           |
| Mercury free               | Yes                                                                                                                                                                                                                                                                                         |
| China RoHS Regulation      | <a href="#">China RoHS declaration</a>                                                                                                                                                                                                                                                      |
| RoHS exemption information | <a href="#">Yes</a>                                                                                                                                                                                                                                                                         |
| Environmental Disclosure   | <a href="#">Product Environmental Profile</a>                                                                                                                                                                                                                                               |
| Circularity Profile        | <a href="#">End of Life Information</a>                                                                                                                                                                                                                                                     |
| WEEE                       | The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins                                                                                                                                                                 |
| California proposition 65  | WARNING: This product can expose you to chemicals including: Lead and lead compounds, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to <a href="http://www.P65Warnings.ca.gov">www.P65Warnings.ca.gov</a> |

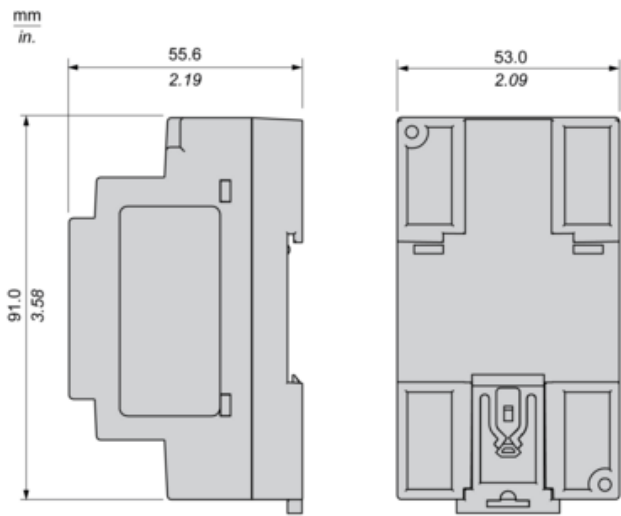
Electrical Safety

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- If the unit is use in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- For means of disconnection a switch or circuit breaker, located near the product, must be included in the installation. A marking as disconnecting devi
- The device has an internal fuse. The unit is tested and approved with branch circuit protective device up to 20A. This circuit breaker can be used as d
- The power supply is only suitable for audio, video, information, communication, industrial and control equipment.

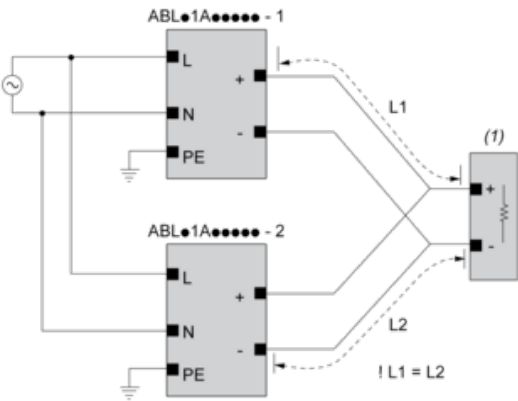
Dimensions

Side and Rear View



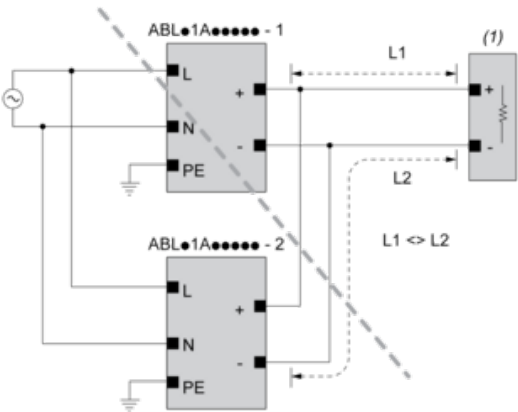
Connections and Schema

Correct Parallel Connection



(1) : Load

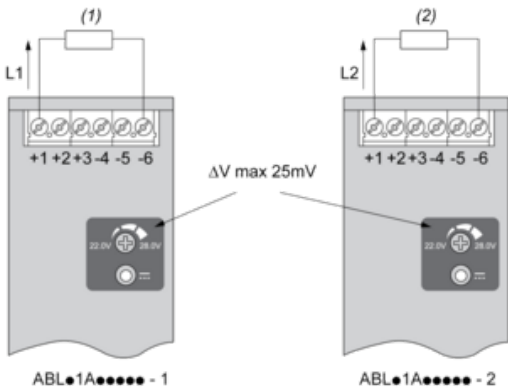
Incorrect Parallel Connection



(1) : Load

ABLx1Axxxxx-1 = ABLx1Axxxxx-2  
max 2 x ABLx1Axxxxx  
L1 = L2  
 $\Delta V$  max 25 mV  
 $L_{Load} < 90\% \times 2 \times L_{nom}$

Output Voltage Balancing

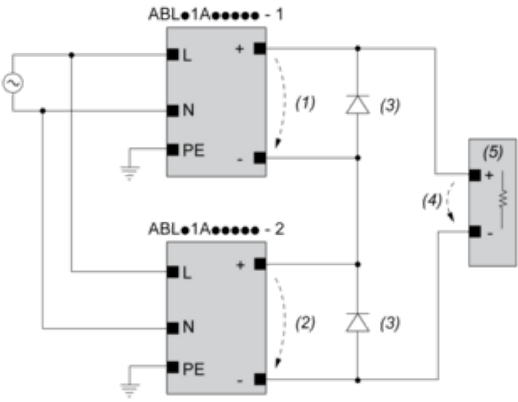


(1) :  $R_{Load1}$

(2) :  $R_{Load2}$

$R_{Load1} = R_{Load2}$   
 $I_1 = I_2 \sim I_{nom}$

Series Connection



- (1) :  $V_{out1}$
- (2) :  $V_{out2}$
- (3) : 2 x Diode,  $V_{RRM} > 2 \times V_{out1/2}$ ,  $I_F > 2 \times I_{nom1/2}$
- (4) :  $V_{Load} = 2 \times V_{out}$
- (5) : Load

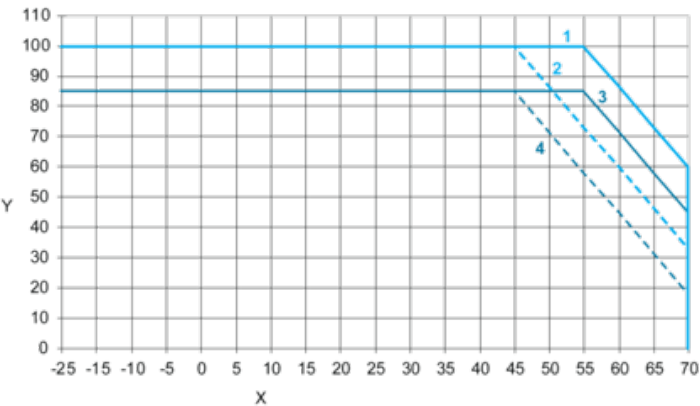
Connections and Schema

|             |        | (1)   |       |       |
|-------------|--------|-------|-------|-------|
|             |        | <40°C | <50°C | <70°C |
| ABLM1A24004 |        | 60°C  | 75°C  | 75°C  |
| ABLM1A12010 |        | 60°C  | 75°C  | 90°C  |
| ABLM1A24006 |        | 60°C  | 75°C  | 90°C  |
| ABLM1A05036 | Input  | 60°C  | 75°C  | 90°C  |
|             | Output | 75°C  | 90°C  | 90°C  |
| ABLM1A12021 |        | 60°C  | 75°C  | 90°C  |
| ABLM1A24012 |        | 60°C  | 75°C  | 90°C  |
| ABLM1A12042 |        | 60°C  | 75°C  | 90°C  |
| ABLM1A24025 |        | 60°C  | 75°C  | 90°C  |

(1) : Ambient



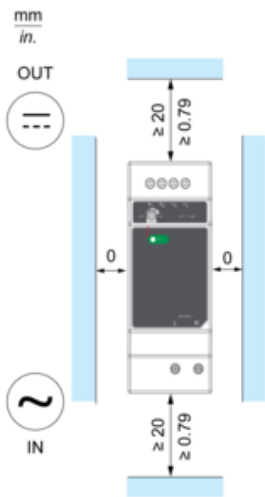
Performance Curve



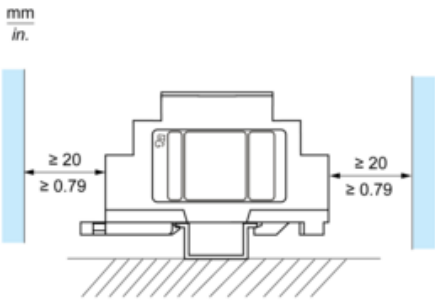
X : Ambient Temperature (°C)  
Y : Percentage of Max Load (%)  
1 : Altitude @2000M with Mounting A  
2 : Altitude @5000M with Mounting A  
3 : Altitude @2000M with Mounting B  
4 : Altitude @5000M with Mounting B

Mounting

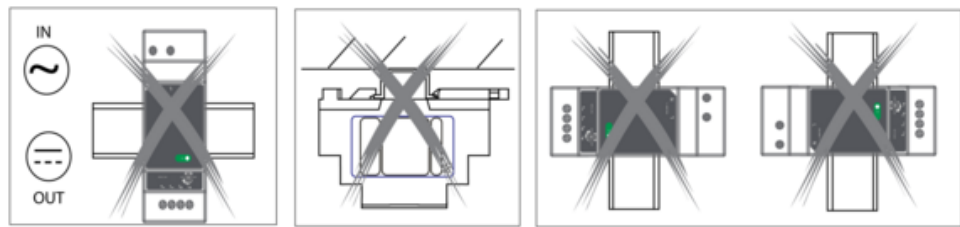
Mounting Position A



Mounting Position B



Incorrect Mounting



Recommended replacement(s)