

# RHINO Installation Instructions for PSB24-480-3 Power Supply



READ INSTRUCTIONS BEFORE INSTALLING OR OPERATING THIS DEVICE. KEEP FOR FUTURE REFERENCE.

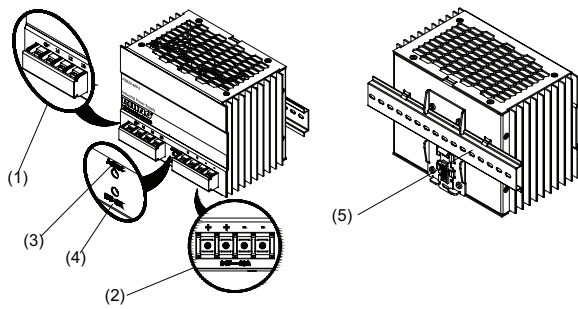


Figure 1

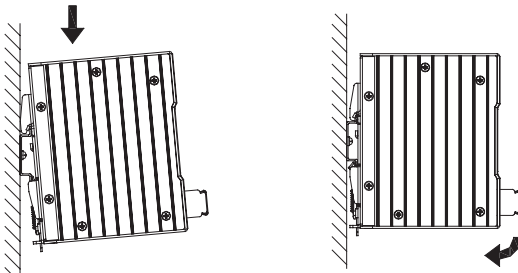


Figure 2

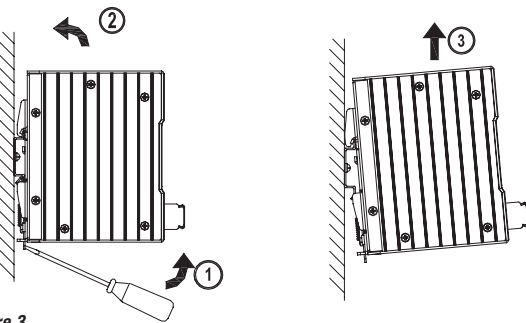


Figure 3



Figure 4

AutomationDirect P/N BM-00120 can be used.

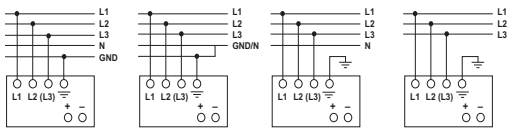


Figure 5

Power Derating Curve for PSU

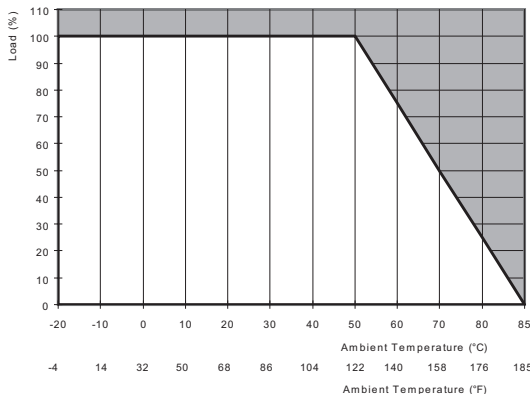


Figure 6

## 1. Safety instructions

- Switch main power off and wait 5 minutes before making any connection or disconnection on the device. Danger of serious injury or property damage!
- To guarantee sufficient convection cooling, please keep a distance of 50 mm [1.97 in] above and below the device as well as a lateral distance of 20 mm [0.79 in] to other units.
- Please note, that the enclosure of the device can become very hot depending on the ambient temperature and load of the power supply. Risk of burns!
- Only plug in and unplug connectors when power is turned off!
- Do not introduce any objects into the unit!
- Dangerous voltage present for at least 5 minutes after disconnecting all sources of power.
- To protect against access to live parts the power supply unit (PSU) must be installed in a protective enclosure.

## 2. Device description (Fig. 1)

- (1) Input terminal block connector
- (2) Output terminal block connector
- (3) DC voltage adjustment potentiometer
- (4) DC OK control LED (green)
- (5) Universal mounting rail system (DIN rail sold separately)

## 3. Mounting (Fig. 2)

The power supply unit can be mounted on 35 mm DIN rails in accordance with EN60715. The device should be installed with input terminal blocks on the bottom.

Each device is delivered ready to install.

Snap on the DIN rail as shown in Fig. 2:

1. Tilt the unit slightly upwards and put it onto the DIN rail.
2. Push downwards until stopped.
3. Press against the bottom front side for locking.
4. Shake the unit slightly to ensure that it is secured.

## 4. Dismounting (Fig. 3)

To uninstall, pull or slide down the latch as shown in Fig. 3. Then, slide the PSU in the opposite direction, release the latch and pull out the PSU from the rail.

## 5. Connection

The terminal block connectors allow easy and fast wiring. A plastic cover provides the necessary isolation of the electric connection.

You can use flexible (stranded wire) or solid wire with the following cross sections:

Table 1:	Standard / Solid		Torque	
	(mm <sup>2</sup> )	(AWG)	(Nm)	(lb in)
(1)	0.82 - 2.1	18-14	1.18-1.57	10.41-13.89
(2)	3.3 - 5.3	12-10		

To secure reliable and shock proof connections, the stripping length should be 7 mm [0.28 in].

In accordance to EN 60950 / UL 60950, flexible wires require ferrules.

Use appropriate copper wire that is designed to sustain operating temperature of at least 75°C [167°F] or more to fulfil UL requirements.

For stranded wires it is recommended to use suitable lug (ADC P/N BM00120) to crimp wires (see Fig. 4).

### 5.1. Input connection (Fig. 1, Fig. 5)

Use L1, L2, L3 and GND connections of input terminal connector (see Fig. 5) to establish the 3 x 400-500 VAC connection. Figure 5 shows the connection to the various network types.

In the event of a phase failure, unrestricted operation is possible with nominal capacity.

The device has an internal fuse. 3 x 16 A circuit breakers are recommended as backup.



The internal fuse must not be replaced by the user. In case of internal defect, the unit must be discarded or returned if still under warranty

### 5.2. Output connection (Fig. 1 (2))

Use the "+" and "-" screw connections to establish the 24 VDC connection. The output provides 24 VDC. The output voltage can be adjusted from 22 to 28 VDC by the potentiometer.

The green LED DC OK displays correct function of the output (Fig. 1 (4)).

The device has a short circuit and overload protection and an overvoltage protection limited to 35 VDC.

### 5.3. Output characteristic curve

The device functions normal under operating line and load conditions. In the event of a short circuit or over load the output voltage and current collapses (IO/L or IS/C is > Isurge (150%)). The secondary voltage is reduced and cycles on and off until short circuit or overload on the secondary side has been removed.

### 5.4. Thermal behavior (Fig. 6)

In the case of ambient temperatures above +50°C [122°F], the output capacity has to be reduced as shown in Figure 6. If the output capacity is not reduced when T<sub>Amb</sub> > 50°C [122°F] device will switch into thermal protection mode. The device will cycle output on and off to maintain internal power dissipation and will recover when ambient temperature is lowered or load is reduced as far as necessary to keep device in a normal operating mode.

# Technical Data For PSB24-480-3

## Input (AC)

Nominal input voltage	3 x 400-500 VAC
Voltage range	320-575 VAC (DC input range 450-800 VDC)
Frequency	47-63Hz (0 Hz @ DC input)
Nominal current	1.6 A @ 400 VAC approx.
Inrush current limitation. I2t (+25 °C [77°F]) typ.	< 50 A @ 400 VAC
Mains buffering at nominal load (typ.)	> 25 ms @ 3 x 400 VAC, > 50 ms @ 3 x 500 VAC
Turn-on time	< 1 sec.
Internal fuse	3.15 AH / 500 V (non-replaceable)
Recommended backup fuse	3 x circuit breakers or fuses, 16 A
Power circuit-breaker characteristic	B
Leakage current	< 3.5 mA

## Output (DC)

Nominal output voltage / Adjustment range	24 VDC $\pm$ 2 % / 22-28 VDC ( $\leq$ 480W)
Output power	480W
Nominal current	20 A
Derating above +50 °C [122°F]	2.5 % / °C.
Startup with capacitive loads	Max. 10,000 $\mu$ F
Max. power dissipation idling / nominal load approx.	72 W
Efficiency (at 400 VAC and nominal values)	> 86 % @ 3 x 400 VAC, > 85 % @ 3 x 500 VAC
Residual ripple/ peak switching (20 MHz) (at nominal values)	< 50 mV / < 240 mVpp
Parallel operation	With decoupling diode

## General Data

Type of housing	Aluminium (Al5052)
Signals	Green LED DC OK
MTBF	> 300,000 hrs.
Dimensions (L x W x H)	121 mm x 160 mm x 115 mm [4.76 in x 6.3 in x 4.53 in]
Weight	1.71 kg [3.77 lb]
Connection method	Screw connection
Wire size / torque	Table 1 (1) Standard/Solid 0.82-2.1 mm <sup>2</sup> (AWG 18-14) / Torque 1.18-1.57 Nm (10.41-13.89 lb in) Table 1 (2) Standard/Solid 3.3 - 5.3 mm <sup>2</sup> (AWG 12-10) / Torque 1.18-1.57 Nm (10.41-13.89 lb in)
Stripping length	7 mm [0.28 in] or use suitable lug to crimp
Ambient Operating temperature	-20 °C to +75 °C (> 50 °C [122°F] derating) [-4°F to +167°F]
Storage temperature	-25 °C to +85 °C [-18°F to +185°F]
Humidity at +25°C [77°F], no condensation	< 95 % RH
Shock	30g half sine, 3 times per direction, 6 directions, per IEC60068-2-27
Vibration (Non-operating)	10 to 150Hz, 3 g, 90 min. each axis per IEC60068-2-6
Pollution degree	2
Climatic class	3K3 according to EN 60721

## Certification and Standards

Electrical equipments of machines	IEC60204-1 (over voltage category III)
Electronic equipment for use in electrical power installations	EN50178 / IEC62103
Safety entry low voltage	PELV (EN60204), SELV (EN60950)
Electrical safety (of information technology equipment)	UL/C-UL recognized to UL60950-1, CSA C22.2 No.60950-1, CB scheme to IEC60950-1
Industrial control equipment	UL listed to UL508, CSA to CSA107.1-01
Protection against electric shock	DIN 57100-410
CE	In conformance with EMC directive 2004/108/EC and low voltage directive 2006/95/EC.
EMC for ITE	EN55032, EN61000-3-2, EN61000-3-3, EN55024
EMC for industrial	EN55011
Limitation of mains harmonic currents	EN61000-3-2
RoHS	Yes



## Safety and Protection

Transient surge voltage protection	VARISTOR
Current limitation at short-circuits approx.	I <sub>surge</sub> = 150 % of P <sub>o</sub> max typically
Surge voltage protection against internal surge voltages	Yes
Isolation voltage::	4 kVAC / 3 kVAC
Input/output (type test/routine test)	1.5 kVAC / 1.5 kVAC
Input/GND (type test/routine test)	1.5 kVAC / 500 VAC
Output/GND (type test/routine test)	
Protection degree	IPX0
Safety class	Class I with GND connection