

# RHINO Installation Instructions for PSB24-240S-3 Power Supply

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

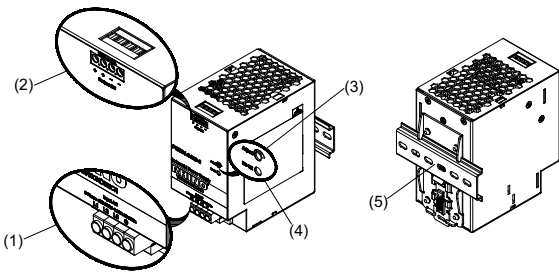


Figure 1

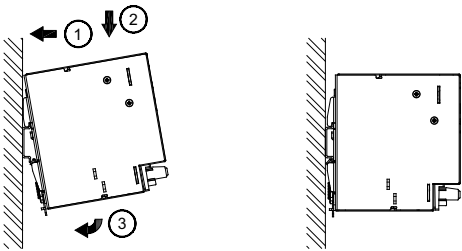


Figure 2

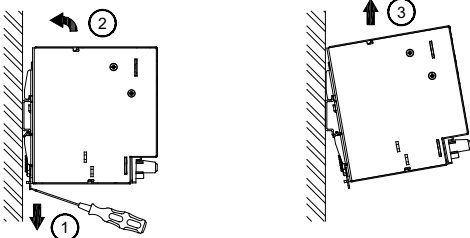


Figure 3

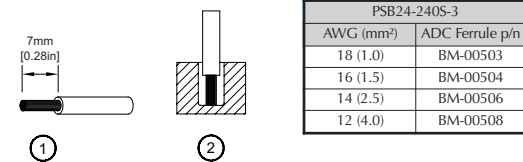


Figure 4

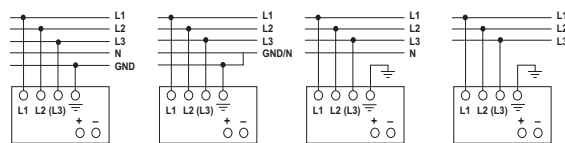


Figure 5

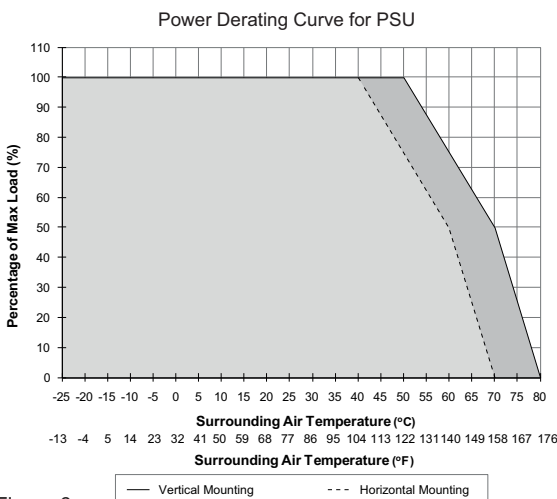


Figure 6

## 1. Safety instructions

- Switch main power off before connecting or disconnecting the device. Risk of explosion!
- To guarantee sufficient convection cooling, keep a distance of 50 mm [1.97in] above and below the device as well as a lateral distance of 5 mm [0.20 in] (for Vertical Mounting) or 50mm [1.97in] (for Horizontal Mounting) 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!
- The main power must be turned off before connecting or disconnecting wires to the terminals.
- Do not introduce any objects into the unit!
- Dangerous voltage present for at least 5 minutes after disconnecting all sources of power.
- The power supply unit should be installed in an IP54 minimum rated enclosure.
- The power supplies are built in units and must be installed in a cabinet or room (condensation free environment and indoor location) that is relatively free of conductive contaminants.
- **CAUTION:** "For use in a controlled environment".

## 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) 35mm DIN rail mounting (DIN rail sold separately)

## 3. Mounting (Fig. 2)

The power supply unit can be mounted on 35 mm DIN rail in accordance with EN60715. For Vertical Mounting, the device should be installed with input terminal block on the bottom. For Horizontal Mounting, the device should be installed with input terminal block on the left side.

Each device is delivered ready to install. Snap onto 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. Tug on 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 power supply unit (PSU) up, release the latch and pull out the PSU from the rail.

## 5. Connection

The terminal block connectors allow easy and fast wiring.

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

Table 1 Refer to Fig. 1:	Standard / Solid		Torque	
	(mm <sup>2</sup> )	(AWG)	(Nm)	(lb in)
(1)	0.82 - 3.3	18-12	0.92	8.1
(2)	1.3 - 3.3	16-12	0.61	5.4

To secure reliable and shock proof connections, the stripping length should be 7 mm [0.28 in] (see Fig. 4 (1)). Please ensure that wires are fully inserted into the connecting terminals as shown in Fig. 4 (2).

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

Use appropriate copper wire that is designed to sustain operating temperature of:

1. At least 60°C / 75°C (140°F / 167°F) or more to fulfill UL requirements.
2. At least 75°C (167°F) for ambient not exceeding 40°C (104°F), and 90°C (194°F) for ambient exceeding 50°C (122°F) for Canada.

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

Use L1, L2, L3 with GND connections of input terminal connector (See Fig. 5) to establish 3 x 400-500VAC connection. Fig. 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 power circuit-breakers 16A are recommended as supplementary protection. The unit shall be installed with branch circuit protection device 20A (UL489 listed).



The internal fuse must not be replaced by the user.

### 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 24 to 28 VDC on 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 ( $I_{O/L}$  or  $I_{S/C}$  is  $> I_{surge}$  (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] (Vertical) or 40°C [104°F] (Horizontal) the output capacity has to be reduced by 2.5% per degree Celsius increase in temperature and at 70°C to 80°C [158°F to 176°F] (Vertical) or 60°C to 70°C [140°F to 158°F] (Horizontal) the output capacity has to be reduced by 5% per degree Celsius increase in temperature. If the output capacity is not reduced when  $T_{Amb} > 50°C$  [122°F] (Vertical) or  $T_{Amb} > 40°C$  [104°F] (Horizontal), the device will run into thermal protection by switching off i.e. device will cycle on and off and will recover when ambient temperature is lowered or load is reduced as far as necessary to keep device in working condition.

# Technical Data For PSB24-240S-3

<b>Input (AC)</b>	
Nominal input voltage and frequency	3 x 400-500 VAC / 50-60Hz
Voltage range	320-600 VAC
Frequency	47-63Hz
Nominal current	< 0.75 A @ 3 x 400 VAC
Inrush current limitation. I <sub>2t</sub> (+25 °C) typ.	< 40 A @ 3 x 400 VAC & 3 x 500 VAC, AC Source capability up to 3KVA < 60 A @ 3 x 400 VAC & 3 x 500 VAC, AC Source capability up to 18KVA
Mains buffering at nominal load (typ.)	> 20 ms @ 3 x 400 VAC, > 40 ms @ 3 x 500 VAC
Turn-on time	< 1 sec.
Internal fuse	T 3.15 A / 500 VDC, 600 VAC (non-replaceable)
Recommended backup circuit breaker: Power circuit-breaker characteristic	3 x circuit breakers 16 A B
Leakage current	< 3.5 mA
<b>Output (DC)</b>	
Nominal output voltage U <sub>N</sub> / tolerance	24VDC ± 2 %
Adjustment range of the voltage	24-28 VDC (maximum power ≤ 240W)
Nominal current	10A
Derating	Vertical: > 50°C [122°F] (2.5 % / °C), > 70°C [158°F] (5 % / °C) Horizontal: > 40°C [104°F] (2.5 % / °C), > 60°C [140°F] (5 % / °C)
Startup with capacitive loads	Max. 10,000 µF
Max. power dissipation idling / nominal load approx.	26.7W
Efficiency	> 90.0% @ 3 x 400 VAC & 3 x 500 VAC
Residual ripple/ peak switching (20 MHz) (at nominal values)	< 50 mVpp / < 150 mVpp
Parallel operation	PSB60-REM20S / PSB60-REM40S or with ORing Diode
<b>General Data</b>	
Type of housing	Aluminum
Signals	Green LED DC OK
MTBF	> 300,000 hrs. as per Telcordia
Dimensions (L x W x H)	121 mm x 70 mm x 117.3 mm [4.76 in x 2.76 in x 4.62 in]
Weight	0.89 kg [1.96 lb]
Connection method	Screw connection
Wire size / torque	See Table 1
Stripping length	7 mm [0.28 in]
Ambient operating temperature	-25°C to +80°C [-13°F to 176°F] (Refer to Fig. 6)
Storage temperature	-25°C to +85°C [-13°F to 185°F]
Humidity at +25°C, no condensation	<95 % RH
Shock	30G (300m/s <sup>2</sup> ) in all directions according to IEC60068-2-27
Vibration (non-operating)	10 to 500Hz @ 30m/s <sup>2</sup> (3G peak), displacement of 0.35mm, 60 min per axis for all X, Y, Z direction. in accordance with IEC 60068-2-6
Pollution degree	2
Altitude (operating)	2000 Meters for industrial application; 2500 Meters for ITE application
Climatic class	3K3 according to EN 60721
<b>Certification and Standards</b>	
Electrical equipment of machines	IEC60204-1 (over voltage category III)
Electronic equipment for use in electrical power installations	EN 50178 / IEC62103
Safety entry low voltage	PELV (EN 60204), SELV (EN 60950)
Electrical safety (of information technology equipment)	UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 60950-1 (file no. E198298), CB scheme to IEC60950-1
Industrial control equipment	UL/C-UL listed to UL508 and CSA C22.2 No. 107.1-01 (file no. E197592), CSA to CSA C22.2 No. 107.1-01 (file no. 249074)
Protection against electric shock	DIN 57100-410
CE	In conformance with EMC directive 2004/108/EC and low voltage directive 2006/95/EC
Component power supply for general use	EN61204-3
ITE	EN55022, EN61000-3-2, EN61000-3-3, EN55024
Industrial	EN55011
Limitation of mains harmonic currents	EN61000-3-2
RoHS	Yes
   	
<b>Safety and Protection</b>	
Transient surge voltage protection	VARISTOR
Current limitation at short-circuits approx.	I <sub>surge</sub> = 150 % of P <sub>o,max</sub> typically
Surge voltage protection against internal surge voltages	Yes
Isolation voltage:	
Input/output	4.0 kVAC
Input/GND	2.0 kVAC
Output/GND	1.5 kVAC
Protection degree	IP20
Safety class	Class I with GND connection