

# RHINO Installation Instructions for PSD24-240-L Power Supply



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

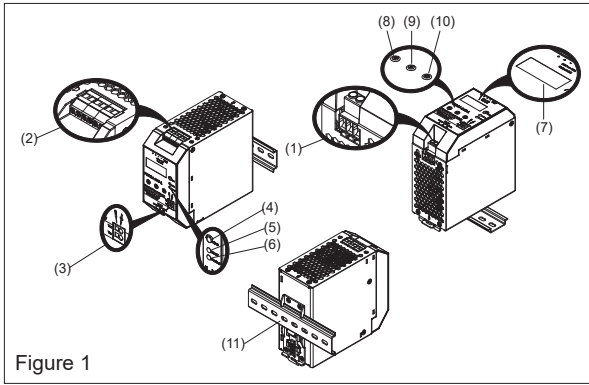


Figure 1

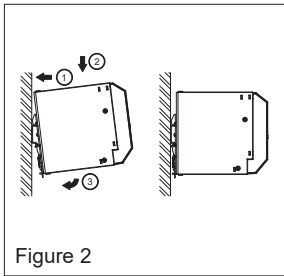


Figure 2

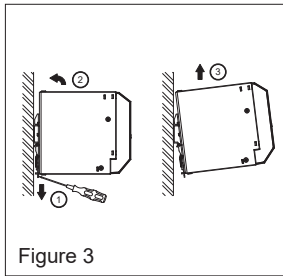


Figure 3

	Overload LED	DC OK LED	DC OK Contact
Normal mode	OFF	ON	Closed
During Power Boost	OFF	ON	Closed
Overload ( $V_{out} < 90\%$ )	Flashing	OFF	Open
Output short circuit	Flashing	OFF	Open
Temperature shut down	Flashing	OFF	Open
No input power	OFF	OFF	Open

Figure 4

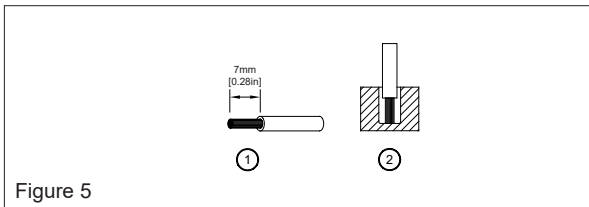


Figure 5

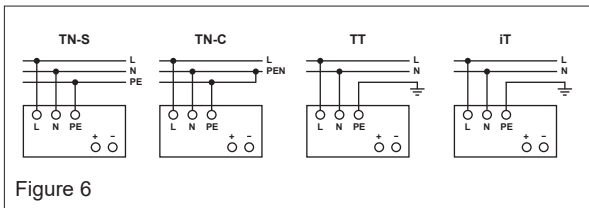


Figure 6

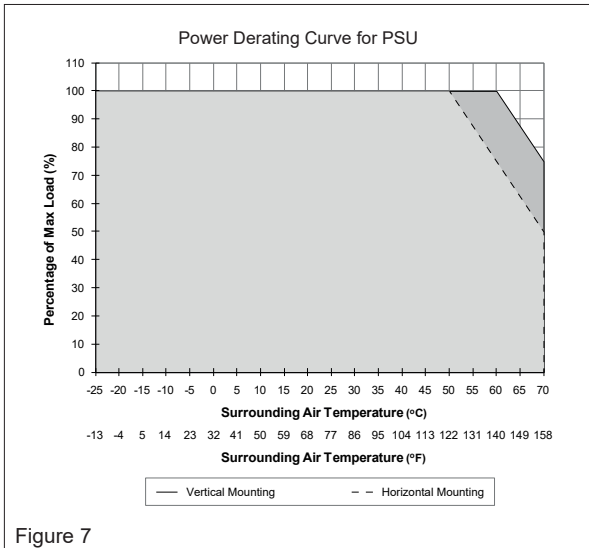


Figure 7

## 1. Safety instructions

- An easily accessible disconnecting device shall be provided to disconnect the unit from the mains supply for servicing.
- Switch main power off before connecting or disconnecting the device. Risk of explosion!
- If the unit is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- To guarantee sufficient convection cooling, please refer to the following instructions to ensure sufficient clearance around the device.
  - Vertical Mounting: 40 mm [1.57 in] above and 20 mm [0.79 in] below the device as well as a lateral distance of 5 mm [0.20 in] to other units. In case the adjacent device is a heat source, the lateral distance will be 15 mm [0.59 in].
  - Horizontal Mounting: 40 mm [1.57 in] above and below the device as well as a lateral distance of 20 mm [0.79 in] to other units.
- The external enclosure where the unit will be installed shall meet the requirements for mechanical, electrical and fire enclosure.
- 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 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) Alarm signal terminal block connector
- (4) DC voltage adjustment potentiometer
- (5) DC OK LED (green)
- (6) Overload LED (red)
- (7) LCD display
- (8) Back key
- (9) Forward key
- (10) Mode key
- (11) 35mm DIN rail mounting (DIN rail sold separately)

## 3. Mounting and dismounting (Fig. 2, Fig. 3)

The power supply unit can be mounted on 35 mm DIN rails 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.

- Tilt the unit slightly upwards and put it onto the DIN rail. Snap on the DIN rail as shown in Fig. 2.
- Push downwards until stopped.
- Press against the bottom front side for locking.
- Shake the unit slightly to ensure that it is secured.
- 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.

## 4. 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)	0.82-8.4	18-8	0.91	8.1
(2)	1.3-3.3	16-12	0.61	5.4
(3)	0.52-1.3 (solid cable)	20-16 (solid cable)	-	-

To secure reliable and shock proof connections, the stripping length should be 7 mm [0.28 in] (see Fig. 5 (1)). Please ensure that wires are fully inserted into the connecting terminals as shown in Fig. 5 (2). All wire strands must be fully inserted into the terminals with the screws securely fastened in order to ensure safety and maximum contact. 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 60°C / 75°C (140°F / 167°F) for USA.
- At least 90°C (194°F) for Canada and IEC/EN61010-1, IEC/EN61010-2-201.

### 4.1. Input connection (Fig. 1, Fig. 6)

For AC input connections, use L, N and PE connections on the input terminal connector (see Fig. 1 (1)) to establish the 100-240 VAC connection. Fig. 6 shows the connection to the various network types.

For DC input connections, connect L pin to + from DC source and connect N pin to - from DC source.

The unit is protected with internal fuse (not replaceable) at L pin and it has been tested and approved on 20A (UL) and 16A (IEC) branch circuits without additional protection device. An external protection device is only required if the supplying branch has an ampacity greater than above. Thus, if an external protective device is necessary, or, utilized, a minimum value of 6A B- or 4A C- characteristic breaker should be used.



The internal fuse must not be replaced by the user.

### 4.2. 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 (5)). The device has a short circuit and overload protection and an overvoltage protection limited to 35 VDC.

### 4.3. Output characteristic curve

The device functions normal under operating line and load conditions. In the event of an over load ( $I_O > 150\%$ ) the output voltage will start to droop and bounce until over load has been removed.

### 4.4. Indicators and relay contacts (Fig. 4)


### 4.5. Thermal behavior (Fig. 7)

If the output capacity is beyond what is recommended in Fig. 7, the device will run into thermal protection by switching off i.e. device will go in bouncing mode and will recover when ambient temperature is lowered or load is reduced as far as necessary to keep device in working condition.

FOR TECHNICAL ASSISTANCE CALL 770-844-4200





# Technical Data For PSD24-240-L

**■ What is the “Lifetime Expectancy Function”?**  
The lifetime expectancy function indicates an approximate period of life left for the power supply unit, based on deterioration of the electrolytic capacitor. It does not predict failures caused by other reasons.

**■ Mode Change**  
Press and hold  (mode key) for 5 seconds or more to change the mode.

Power ON → Display Mode ↔ Setting Mode

**■ Display Mode**  
By default, the power supply unit is set to auto display mode and will show the status in the following sequence below.

- Press  (mode key) to freeze the current indicated status on the LCD display.
- Press  or  (back or forward key) to move between each status.
- Press  (mode key) to return to auto display mode.

**VOLTAG** 24.00 V **Output voltage**  
Values will show up to 2 decimal places (accuracy of output voltage indication is ±2%).

**CURRENT** 18.87 A **Output current**  
Values will show up to 2 decimal places (accuracy of output current indication is ±5%)\*

**PEAK** 11.71 A **Peak hold current**  
Values will show up to 2 decimal places (accuracy of peak hold current indication is ±5%)\*. The minimum signal width required for hold current is 20 ms.


**OCPP Life** 10.0 Y **Lifetime expectancy**  
Values will show up to 1 decimal place. The lifetime expectancy is calculated by the amount of deterioration of the electrolytic capacitor according to the running hours and inside ambient temperature.

**TEMP.** 32.3 C **Ambient temperature**  
This is ambient temperature inside the power supply unit. Monitored readings will be displayed about 30 seconds after it is turned on. Values will show up to 1 decimal place.




**KWH** 0.0 **KWH**  
Values will show up to 1 decimal place. The KWH is calculated based on the running hours and output power.

\*If Io < 5%, accuracy is ±10%.



**■ Setting Mode**

- Press and hold  (mode key) for 5 seconds or more to change from “Display Mode” to “Setting Mode”.
- The power supply unit will show the items in the following sequence below.


**ALARM** 10.0 Y

- Press  or  (back or forward key) to increase or decrease the alarm setting.
- Factory setting is 10.0 years and minimum setting is 0.5 years.
- Press  (mode key) to go to “Reset”.


**RESET** !


- Press  (back key) to reset peak hold current.
- Press  (forward key) to reset KWH.

**RESET** ! PK CLR?      **RESET** ! KWH CLR?

Press  (mode key) to confirm and clear peak hold current or KWH value.

**RESET** ! PK CLR!      **RESET** ! KWH CLR!

Note: To return to auto display mode, press and hold  (mode key) for 5 seconds or more.




**■ Failure Mode Display**  
Press  (mode key) to clear error messages and return to auto display mode.

**ERROR** ! OVP      When overvoltage protection occurs (Auto-recovery)

**ERROR** ! OLP      When overload/overcurrent protection occurs (Auto-recovery)

**ERROR** ! OIP      When short circuit protection occurs (Auto-recovery)

**ERROR** ! OTP      When over temperature protection occurs (Auto-recovery)

Input (AC)	
Nominal input voltage / frequency	100-240 VAC / 50-60Hz; or 110-300 VDC (for ITE only)
Voltage range	85-276 VAC (DC input range 88-375 VDC)
Frequency	47-63Hz
Nominal current	< 2.65 A @ 100 VAC, < 1.22 A @ 230 VAC < 2.37 A @ 110 VDC, < 0.85 A @ 300 VDC
Inrush current limitation (+25°C, cold start)	6 A typ. @ 120 VAC, 7 A typ. @ 230 VAC
Mains buffering at nominal load (typ.)	27 ms typ. @ 120 VAC, 28 ms typ. @ 230 VAC
Turn-on time	< 650 ms @ 120 VAC, > 340 ms @ 230 VAC
Internal fuse	T 6.3 A / 500 VAC or 400 VDC min.
Leakage current	TN/TT-system / IT-system: < 0.29 mA / 0.82 mA @ 110 VAC, 50Hz TN/TT-system / IT-system: < 0.38 mA / 1.02 mA @ 132 VAC, 50Hz TN/TT-system / IT-system: < 0.74 mA / 2.25 mA @ 264 VAC, 50Hz
Output (DC)	
Nominal output voltage U <sub>v</sub>	24 VDC
Adjustment range of the voltage	24-28 VDC
Nominal current	10 A (V <sub>out</sub> = 24 VDC) 8.57 A (V <sub>out</sub> = 28 VDC) 15 A (for 5 s, V <sub>out</sub> = 24 VDC) 13.5 A (for 5 s, V <sub>out</sub> = 28 VDC)
Derating	> 60°C [140°F] (2.5% / °C) in Vertical > 50°C [122°F] (2.5% / °C) in Horizontal
Startup with capacitive loads	10,000 µF typ.
Max. power dissipation idling / nominal load approx.	6.1W / 16.7W
Efficiency	92.6% typ. @ 120 VAC, 93.5% typ. @ 230 VAC
PAR (20MHz) at 100% load	< 50 mVpp
Max. relay contact rating	30V (SELV) / 1 A resistive load
Parallel operation	PSB60-REM20S / PSB60-REM40S
General Data	
Type of housing	Aluminum
Signals	Green LED DC OK Red LED Overload
MTBF	> 1,268,000 hrs. as per Telcordia SR-332 (I/P: 100 VAC; O/P: 24V, 10 A; Ta: 25°C)
Dimensions (L x W x H)	124 mm x 60 mm x 139 mm [4.88 in x 2.36 in x 5.47 in]
Weight	1.02 kg [2.25 lb]
Connection method	Screw connection
Wire size / torque	See Table 1
Stripping length	7 mm [0.28 in]
Operating temperature (surrounding air temperature)	-25°C to +70°C [-13°F to 158°F] (Refer to Fig. 7)
Storage temperature	-40°C to +85°C [-40°F to 185°F]
Humidity at +25°C, no condensation	5 to 95% RH
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 directions in acc. with IEC60068-2-6
Shock (non-operating, in all directions)	30G (300m/S <sup>2</sup> ) in all directions according to IEC60068-2-27
Pollution degree	2
Altitude (operating)	5000m
Certification and Standards	
Electrical equipment of machines	IEC60204-1 (over voltage category III)
Electronic equipment for use in electrical power installations	IEC/EN 62477-1 / IEC62103
Safety entry low voltage	PELV (EN 60204-1), SELV (EN 60950-1)
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 IEC 60950-1, IEC 61010-1, IEC 61010-2-201
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)
CE	In conformance with EMC directive 2014/30/EU and low voltage directive 2014/35/EU
Component power supply for general use	EN61204-3
Immunity	EN 55024, EN 61000-6-2 (EN61000-4-2, 3, 4, 5, 6, 8, 11, 12)
Emission	EN55032, EN55011, EN61000-3-2 Class A, EN61000-3-3, EN61000-6-3
  	
RoHS Compliant	Yes
Safety and Protection	
Transient surge voltage protection	VARISTOR
Current limitation at short-circuits approx.	I <sub>surge</sub> = 150 % of P <sub>omax</sub> typically (continuous current)
Surge voltage protection against internal surge voltages	Yes
Isolation voltage:	
Input / Output	3.00 kVAC
Input / PE	2.00 kVAC
Input / DC OK*	3.00 kVAC
Output / PE	1.50 kVAC
Output / DC OK	0.50 kVAC
DC OK / PE	1.50 kVAC
Protection degree	IP20
Safety class	Class I with GND connection

\*Recommend connecting DC OK pins to output pins.