



# Power Supplies PSD Series

## Versatile Switching Power Supplies with LED Display & Automatic Power Boost

AutomationDirect offers the RHINO PRO PSD DIN rail power supply series with LCD display. The LCD displays output current, output voltage, peak hold current, lifetime expectancy\* and ambient temperature data. The high power density product is designed according to major industrial safety standards. The PSD series provides 150% Power Boost up to 7 seconds, including the Advanced Power Boost (APB) feature. With multiple loads connected in a system, a large inrush current could be drawn (demanded) due to one fault load. This will be detected by APB. The APB will trip the circuit breaker (with appropriate rating based on the system load) on the current path of the fault load due to high current. This prevents the system from shutting down while the other connected current paths continue to operate without interruption.

## Features

- Universal AC input voltage range
- Lifetime expectancy alarm\* signal and monitoring
- Built-in active PFC\*\* with up to 94% efficiency
- Power Boost of 150% up to 7 seconds
- LCD display of output current / voltage / peak current and temperature
- Advanced Power Boost (APB) – protects system to ensure continuing operation when large inrush current detected due to faulty load on a multiple load connection
- DC OK Contact and LED indicator for DC OK/ Overload
- Conformal coating on PCBAs to protect against common dust and chemical pollutants

*The lifetime expectancy function indicates an approximate period of life left for the power supply unit, based on deterioration of the electrolytic capacitor.*

*\*\*Active Power Factor Correction (PFC) - Active wave shaping of the input current, filtering of the high frequency switching, feedback sensing of the source current for waveform control*



**PSD24-120-L**



**PSD24-240-L**



**PSD24-480-L**

## Industrial Power Supplies

| Part Number                        | Price    | Output Voltage [ $V_{nom}$ ] | Output Current [ $I_{max}$ ] | Output Power [ $P_{max}$ ] | Weight kg [lb] | Drawing Link        |
|------------------------------------|----------|------------------------------|------------------------------|----------------------------|----------------|---------------------|
| <a href="#"><b>PSD24-120-L</b></a> | \$204.00 | 24 VDC                       | 5.0 A                        | 120W                       | 0.75 [1.65]    | <a href="#">PDF</a> |
| <a href="#"><b>PSD24-240-L</b></a> | \$283.00 |                              | 10.0 A                       | 240W                       | 1.02 [2.25]    | <a href="#">PDF</a> |
| <a href="#"><b>PSD24-480-L</b></a> | \$359.00 |                              | 20.0 A                       | 480W                       | 1.45 [3.20]    | <a href="#">PDF</a> |

## Input Specifications

| Input Specifications               |                            |                        |                       |                                  |         |                                              |         |                       |                          |                           |
|------------------------------------|----------------------------|------------------------|-----------------------|----------------------------------|---------|----------------------------------------------|---------|-----------------------|--------------------------|---------------------------|
| Part Number                        | Nominal Input Voltage      | Input Voltage Range    | Input Frequency Range | Input Current [Typ. @ full load] |         | Inrush Current Limitation [ $<2ms$ ] @ +25°C |         | Max Power Dissipation | Efficiency [Typ] @120VAC | Circuit Breaker [Minimum] |
|                                    |                            |                        |                       | 120 VAC                          | 230 VAC | 120 VAC                                      | 230 VAC |                       |                          |                           |
| <a href="#"><u>PSD24-120-L</u></a> | 100 - 240VAC<br>110-300VDC | 85-264VAC<br>88-275VDC | 47-63 Hz              | 1.11 A                           | 0.61 A  | 5.5 A                                        | 10.1 A  | 14W                   | 90%                      | 6A B- or 3A C-            |
| <a href="#"><u>PSD24-240-L</u></a> |                            | 85-276VAC<br>88-275VDC |                       | 2.18 A                           | 1.16 A  | 6.0 A                                        | 7.0 A   | 22.4 W                | 92%                      | 6A B- or 4A C-            |
| <a href="#"><u>PSD24-480-L</u></a> |                            |                        |                       | 4.24 A                           | 2.29 A  | 9.0 A                                        | 7.0 A   | 46.0 W                | 93%                      | 10A B- or 6A C-           |



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## Output Specifications

| Part Number                        | Output Voltage | Output Voltage Adj. Range | Output Current [Max] | Power Boost [7s] | Output Overvoltage Protection | Startup with Capacitive Loads [Max.] | Startup Time @120VAC | Relay Output                                | MTBF [ @ 25°C] |
|------------------------------------|----------------|---------------------------|----------------------|------------------|-------------------------------|--------------------------------------|----------------------|---------------------------------------------|----------------|
| <a href="#"><u>PSD24-120-L</u></a> | 24VDC          | 24-28 VDC                 | 5.0 A                | 7.5 A            | 28.8- 35.2 V                  | 10,000µF                             | 750ms                | DC OK = contact closed [rated: 30 VDC 1.0A] | 1,444,000 hrs  |
| <a href="#"><u>PSD24-240-L</u></a> |                |                           | 10.0 A               | 15.0 A           |                               | 10,000µF                             | 650ms                |                                             | 1,268,000 hrs  |
| <a href="#"><u>PSD24-480-L</u></a> |                |                           | 20.0 A               | 30.0 A           |                               | 20,000µF                             | 1000ms               |                                             | 751,000 hrs    |

## General Specifications

| Specification                            | Description                                                                                                                                                                                   |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Temperature</b>                       | Operating (ambient): -25 to + 70°C max [-13 to 158°F]. Above +60°C [140°F] load derating.<br>Storage (non-operating): -40 to + 85°C max [-40 to 185°F]. Cooling: convection, no internal fan. |
| <b>Humidity</b>                          | 5-95% [non-condensing] relative humidity maximum                                                                                                                                              |
| <b>Isolation</b>                         | According to IEC/EN 60950, EN62477-1, EN60204, CSA                                                                                                                                            |
| <b>Mains Buffering at Nominal Load</b>   | See Product Insert                                                                                                                                                                            |
| <b>Output Line Regulation</b>            | 120W=20mV, 240W & 480W = 10mV [100% load]                                                                                                                                                     |
| <b>Output Load Regulation</b>            | 100mV peak-to-peak typical [20MHz bandwidth]                                                                                                                                                  |
| <b>Overload/Short Circuit Protection</b> | Current limit: > 150% of rated load current, Constant current, Hiccup Mode [Auto-Recovery]                                                                                                    |
| <b>Overvoltage Protection</b>            | 28.8 – 35.2V, SELV Output, Hiccup Mode, Non-Latching [Auto-Recovery]                                                                                                                          |
| <b>Overtemperature Protection</b>        | Switch off at over-temperature, automatic restart                                                                                                                                             |
| <b>Status Indicators</b>                 | 2 color LEDs [green: DC Ok, Red: Overload]                                                                                                                                                    |
| <b>Maximum Capacitive Load</b>           | 120W & 240W=10,000uF, 480W=20,000uF                                                                                                                                                           |
| <b>Noise (1 meter from power supply)</b> | Sound Pressure Level [SPL] < 25dBA                                                                                                                                                            |
| <b>Vibration</b>                         | IEC 60068-2-6, sine wave: 10-500Hz; 3G peak; displacement of 0.35mm; 60 min per axis for all X, Y, Z directions                                                                               |
| <b>Shock</b>                             | IEC 60068-2-27, half sine wave: 30G for a duration of 18ms; 3 times per direction, 6 times in total                                                                                           |
| <b>Enclosure Rating</b>                  | IP20                                                                                                                                                                                          |
| <b>Enclosure Material</b>                | Aluminum and plastic                                                                                                                                                                          |
| <b>Mounting</b>                          | Snap-on with self-locking spring for 35mm DIN rails                                                                                                                                           |
| <b>Connection</b>                        | Screw terminals, See insert for Wire size and Torque Ratings                                                                                                                                  |
| <b>Agency Approvals</b>                  | UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 60950-1; File No. E198298<br>, UL/C-UL listed to UL508 and CSA C22.2 No. 107.1-01; File No. E197592                                         |

Note: Unless otherwise stated all specifications are valid at nominal input voltage, full load and +25°C after warm up time.

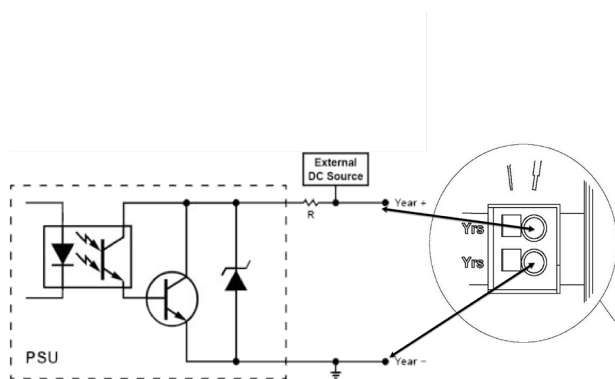


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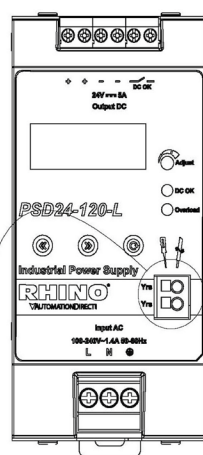
## General Specifications (Continued)

| Specification                                         | Standard                                                                          | Document Number                                                                                                                                                                                                                                                                                                                        |
|-------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Harmonic Limits</b>                                | Harmonic Current Limits                                                           | EN 61000-3-2, Class A for limited output power                                                                                                                                                                                                                                                                                         |
| <b>Safety Standards</b>                               | Information technology equipment                                                  | UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 60950-1; File No. E198298                                                                                                                                                                                                                                                            |
|                                                       | Industrial control equipment                                                      | UL508 and CSA C22.2 No. 107.1-01; File No. E197592                                                                                                                                                                                                                                                                                     |
|                                                       | Electrical equipment of machines                                                  | IEC60204-1 (over voltage category III)                                                                                                                                                                                                                                                                                                 |
|                                                       | Electronic equipment for power installation                                       | IEC/EN 62477-1 / IEC62103                                                                                                                                                                                                                                                                                                              |
|                                                       | Safety, Transient surge voltage protection                                        | VARISTOR                                                                                                                                                                                                                                                                                                                               |
| <b>Safety Approvals</b>                               | CB-Report per IEC 60950                                                           | IEC 60950-1, IEC 61010-1, IEC 61010-2-201                                                                                                                                                                                                                                                                                              |
| <b>Safety Class</b>                                   | Degree of electrical protection Class1                                            | Class I with GND connection                                                                                                                                                                                                                                                                                                            |
| <b>CE</b>                                             | In conformance with EMC directive 2014/30/EU and low voltage directive 2014/35/EU |                                                                                                                                                                                                                                                                                                                                        |
| <b>RoHS Compliant</b>                                 | RoHS Directive (EU) 2015/863 Compliant (EN 50581)                                 |                                                                                                                                                                                                                                                                                                                                        |
| <b>Electromagnetic Compatibility (EMC), Emissions</b> | EMC, Emissions                                                                    | EN55032, EN55011, EN61000-3-2 Class A, EN61000-3-3, EN61000-6-3                                                                                                                                                                                                                                                                        |
| <b>Electromagnetic Compatibility (EMC), Immunity</b>  | EMC, Immunity                                                                     | EN 55024, EN 61000-6-2 (EN61000-4-2, 3, 4, 5, 6, 8, 11, 12)                                                                                                                                                                                                                                                                            |
|                                                       | Electrostatic Discharge [ESD]                                                     | IEC 61000-4-2 Level 4 Criteria A Air Discharge: 15kV; Contact Discharge: 8kV                                                                                                                                                                                                                                                           |
|                                                       | Radiated RF field immunity [80-1000 MHz]                                          | IEC / EN 61000-4-3: 120W&240W:<br>80MHz-1GHz, 10V/M, 80% modulation [1kHz]<br>1.4GHz-2GHz, 3V/M, 80% modulation [1kHz]<br>2GHz-2.7GHz, 1V/M, 80% modulation [1kHz]<br>IEC / EN 61000-4-3: 480W:<br>80MHz-1GHz, 10V/ M, 80% modulation [1kHz]<br>1.4GHz-2GHz, 10V/M, 80% modulation [1kHz]<br>2GHz-2.7GHz, 10V/M, 80% modulation [1kHz] |
|                                                       | Electrical fast transient / burst immunity                                        | IEC / EN 61000-4-4 Level 4 Criteria A 4kV                                                                                                                                                                                                                                                                                              |
|                                                       | Surge immunity                                                                    | IEC / EN 61000-4-5 Level 4 Criteria A Common Mode: 4kV Differential Mode: 2kV                                                                                                                                                                                                                                                          |
|                                                       | Immunity to conducted RF disturbances [0.15 to 80 MHz]                            | IEC / EN 61000-4-6 Level 3 Criteria A 150kHz-80MHz, 10Vrms                                                                                                                                                                                                                                                                             |
|                                                       | Power frequency field immunity                                                    | IEC / EN 61000-4-8 30 A / m                                                                                                                                                                                                                                                                                                            |
|                                                       | Voltage dips                                                                      | IEC / EN 61000-4-11 [70% UN Crit. B/40%/100% UN Crit. C]                                                                                                                                                                                                                                                                               |
| <b>Pollution Degree</b>                               | 2                                                                                 |                                                                                                                                                                                                                                                                                                                                        |

## Years Alarm Signal Circuit and Wiring



\*The applied voltage should be 30VDC maximum with sink current of 10mA max.



### Years Alarm Signal Status

|             |                          |
|-------------|--------------------------|
| Status: Low | Reached Year check value |
|             | Status: High             |

- The years alarm signal is Low when the set value of alarm year has not been reached.
- The years alarm signal status will be changed from low to high when the set value of alarm year has been reached.



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## Engineering Data for RHINO PRO PSD Series Power Supplies

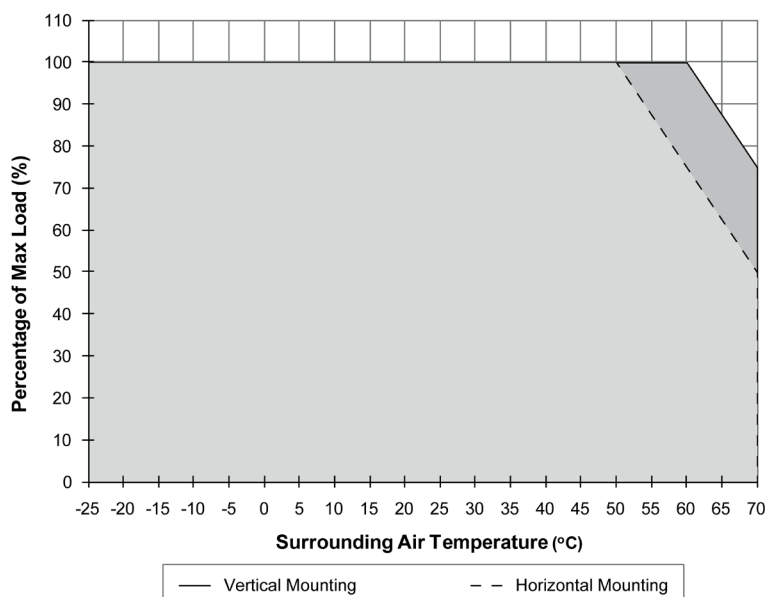
### Output Load De-rating vs. Surrounding Air Temperature

#### Note:

- Power supply components may degrade, or be damaged, when the power supply is continuously used outside the shaded region.
- If the output capacity is not reduced when the surrounding air temperature exceeds its specification as defined under "Temperature" in the General Specifications table, the device will run into Over Temperature Protection. When activated, the output voltage will go into bouncing mode and will recover when the surrounding air temperature is lowered or the load is reduced as far as necessary to keep the device in working condition.
- In order for the device to function in the manner intended, it is also necessary to keep a safety distance as recommended in the safety instructions while the device is in operation.
- Depending on the surrounding air temperature and output load delivered by the power supply, the device can be very hot!

### Power Derating Curve for [PSD24-120-L](#) and [PSD24-240-L](#)

| PSD24-120-L, PSD24-240-L Derating |                                    |
|-----------------------------------|------------------------------------|
| Part Number                       | Vertical or Horizontal Orientation |
| <a href="#">PSD24-120-L</a>       | > 60°C de-rate power by 2.5% / °C  |
| <a href="#">PSD24-240-L</a>       |                                    |



### Power Derating Curve for [PSD24-480-L](#)

| PSD24-480-L Derating        |                                    |
|-----------------------------|------------------------------------|
| Part Number                 | Vertical or Horizontal Orientation |
| <a href="#">PSD24-480-L</a> | > 60°C de-rate power by 2.5% / °C  |

