Power Supplies PSN Series

Versatile Switching power supplies with Automatic Power Boost

AutomationDirect offers the RHINO PRO PSN power supply series which includes compliance with harmonic current IEC/EN 61000-3-2, class A, built-in DC OK contacts, and an LED for indicating DC OK and Overload conditions. In addition to having Power Boost of 150% up to 7 seconds, the PSN series features Advanced Power Boost (APB). With multiple loads connected in a system, a large inrush current could be drawn 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.

PSN24-080

PSN24-120

Features

- Universal AC input voltage range (1 Phase Units)
- Built-in constant current circuit for charging applications (3 Phase Units)
- Built-in active PFC* with up to 96% efficiency
- Full power from -25 to +60°C @ 5,000m (16,400 ft.)
- Power Boost of 150% up to 7 seconds
- Advanced Power Boost (APB) – protects the system and ensures continuing operation when a large inrush current is detected due to faulty load on a multiple load connection
- Built-in DC OK Contact and LED indicator for DC OK/Overload
- Conformal coating on PCBAs to protect against common dust and chemical pollutants

** 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*

PSN24-240

PSN24-480

PSN24-960

PSN24-480-3

PSN24-960-3

Industrial Power Supplies PSN Series						
Part Number	***Price***	***Output Voltage [V_{nom}]***	***Output Current [I_{max}]***	***Output Power [P_{max}]***	***Weight kg [lb]***	***Drawing Links***
PSN24-080	$04q10:	24VDC	3.4 A	80W	0.50 [1.10]	PDF
PSN24-120	$04q12:		5.0 A	120W	0.63 [1.39]	PDF
PSN24-240	$04q13:		10.0 A	240W	0.94 [2.07]	PDF
PSN24-480	$04q14:		20.0 A	480W	1.40 [3.09]	PDF
PSN24-960	$04q15:		40.0 A	960W	2.87 [6.33]	PDF
PSN24-480-3	$04q0_:		20.0 A	480W	1.18 [2.60]	PDF
PSN24-960-3	$04q0#:		40.0 A	960W	2.30 [5.07]	PDF

Power Supplies PSN Series

Input Specifications

Part Number	Nominal Input Voltage Range	Operating Voltage min/max	Input Frequency Range	Input Current [Typ. @ full load]		Inrush Current Limitation [<2ms) @+25°C]		Max Power Dissipation	Efficiency [Typ]	Circuit Breaker [Minimum]
				120VAC	230VAC	120VAC	230VAC			
PSN24-080	100-240 VAC 110-300 VDC	85-276 VAC 88-375 VDC	47-63Hz	0.76 A	0.44 A	7.0 A	13.0 A	9.5 W	91% @ 120VAC	6A to 16A
PSN24-120				1.09 A	0.60 A	15.0 A	15.0 A	12.6 W	92% @ 120VAC	
PSN24-240				2.17 A	1.16 A	10.0 A	10.0 A	23.5 W	93% @ 120VAC	
PSN24-480				4.24 A	2.29 A	13A	13A	46W	93% @ 120VAC	
PSN24-960	85-264 VAC	5-276 VAC		8.60 A	4.50 A		17 A	70W	95% @ 120VAC	
PSN24-480-3	3 x 400-500 VAC	3 x 320-575 VAC		400VAC	480VAC	400VAC	480VAC	26.4 W	95% @ 480VAC	6A B-type 3A C-type
				0.78 A	0.67 A	10A	10A			
PSN24-960-3				1.53 A	1.28 A	14.2 A	17A	48.4 W	96% @ 480VAC	6A

Output Specifications

Part Number	Output Voltage	Output Voltage Adj. Range	Output Current [Max]	Power Boost [7 seconds]	Output Overvoltage Protection	Startup with Capacitative Loads [Max]	Startup Time	Relay Output	MTBF [@ 25°C]
PSN24-080	24VDC	24-28 VDC	3.4 A	5.0 A	28.8-35.2 V	8,000 µF	370ms @120VAC	DC OK = contact closed [rated:30 VDC 1.0 A]	2,164,300 hrs
PSN24-120			5.0 A	7.5 A		10,000 µF	750ms @ 120VAC		1,831,000 hrs
PSN24-240			10.0 A	15A			650ms @120VAC		1,476,000 hrs
PSN24-480			20.0 A	30A		20,000 µF	1000ms @ 120VAC		778,800 hrs
PSN24-960			40.0 A	60A		40,000 µF	800ms @ 120VAC		513,800 hrs
PSN24-480-3			20.0 A	30A	<32 V	20,000 µF	500ms @ 480VAC		750,000 hrs
PSN24-960-3			40.0 A	60A		40,000 µF	1000ms @ 480VAC		568,300 hrs

Power Supplies PSN Series

General Specifications			
Specification	***Description***		
Temperature	Operating [ambient]: -25 to 70°C max [-13 to 158°F]. Above +60°C[140°F] load derating Storage [non-operating]: -40 to 85°C max [-40 to 185°F]. Cooling: convection, no internal fan		
Humidity	5-95% [non-condensing] relative humidity maximum		
Isolation	According to IEC/EN 60950, EN62477-1, EN60204, CSA		
Mains Buffering at Nominal Load	See Product Insert		
Output Regulation	10mV [except 120W = 20mV] [100% load]		
Output Voltage Ripple	100mVpp [except 80W/120W/240W 1-Ph :50mV] [20 MHz bandwidth]		
Output Protection	1Ph models: > 150% of rated load current, Constant current, Hiccup Mode [Auto-Recovery]	480W 3Ph: 160-195% of rated load current, Constant current, Hiccup Mode [Auto-Recovery]	960W 3Ph: 150-200% of rated load current, Constant current, Hiccup Mode [Auto-Recovery]
Overtemperature Protection	Switch off at over-temperature, automatic restart		
Status Indicators	Two color LEDs [green: DC Ok, Red: Overload]		
Maximum Capacitative Load	1Ph 80W: 8,000uF, 1Ph 120W: 10,000uF, 1Ph 240W: 10,000uF, 1Ph 480W: 20,000uF, 1Ph 960W: 40,000uF, 3Ph 480W: 20,000uF, 3Ph 960W: 40,000uF		
Noise (1 meter from power supply)	Sound Pressure Level [SPL] < 25dBA		
Vibration	IEC 60068-2-6, Sine Wave: 10-500Hz; 3G peak; displacement of 0.35mm; 60 min per axis for all X, Y, Z directions		
Shock	IEC 60068-2-27, Half Sine Wave: 30G for a duration of 18ms; 3 times per direction, 6 times in total		
Enclosure Rating	IP20		
Enclosure Material	Aluminum		
Mounting	Snap-on with self-locking spring for 35mm DIN rails		
Connection	Screw terminals, See Insert for wire size and torque ratings		
Agency Approvals	UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 60950-1; File No. E198298, UL/C-UL recognized to UL62368-1 and CSA C22.2 No. 62368-1; File No. E508040, UL/C-UL listed to UL508 and CSA C22.2 No. 107.1-01; File No. E197592 Single-phase only: CSA C22.2 No. 107.1-01; File No. 249074		

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

Standards/Directives		
Specification	***Standard***	***Document Number***
Harmonic Limits	Harmonic Current Limits	EN 61000-3-2, Class A for limited output power
Safety Standards	Information technology equipment	UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 60950-1; File No. E198298, UL/C-UL recognized to UL62368-1 and CSA C22.2 No. 62368-1; File No. E508040
	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. E249074, except 3 Phase input.
	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
Safety Approvals	CB-Report per IEC 60950	IEC 60950-1, IEC 61558-1, IEC 61558-2-16, IEC 61010-1, IEC 61010-2-201
Safety Class	Degree of electrical protection Class1	Class I with GND connection
CE	In conformance with EMC directive 2014/30/EU and low voltage directive 2014/35/EU	
RoHS Compliant	Yes	
Electromagnetic Compatibility (EMC), Emissions	EMC, Emissions	Generic Standards: EN 61000-6-3 CISPR 32, EN 55032, CISPR 11, EN 55011, FCC Title 47: Class B
Electromagnetic Compatibility (EMC), Immunity	EMC, Immunity	EN 55024, EN 61000-6-2
	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 80MHz-1GHz, 10V/M, 80% modulation [1kHz]; 1.4GHz-2GHz, 10V/M, 80% modulation [1kHz]; 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]
Pollution Degree	2	

Power Supplies PSN Series

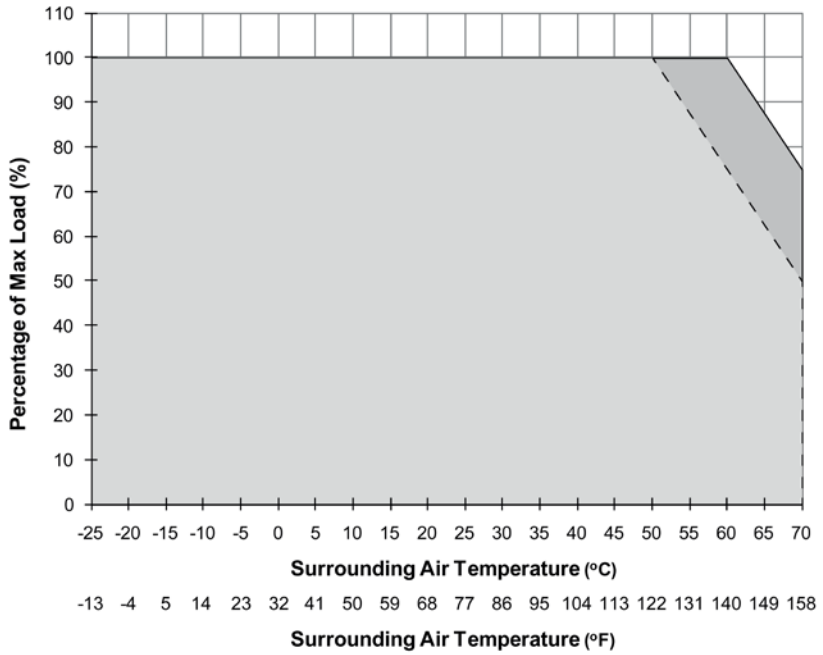
Engineering Data for RHINO PRO PSN Series Power Supplies

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!

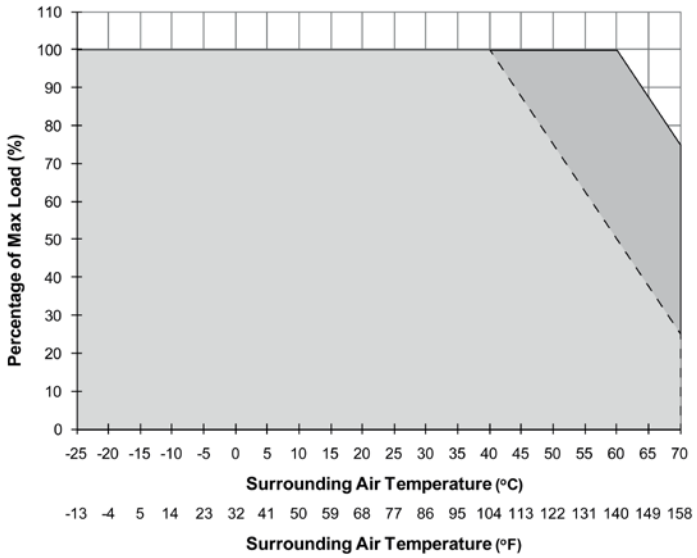
Power Derating Curve for PSN24-080, PSN24-120, PSN24-240



PSN Series Derating for Mounting Position		
Part Number	***Vertical Orientation***	***Horizontal Orientation***
PSN24-080	> 60°C de-rate power by 2.5% / °C	> 50°C de-rate power by 2.5% / °C
PSN24-120		
PSN24-240		

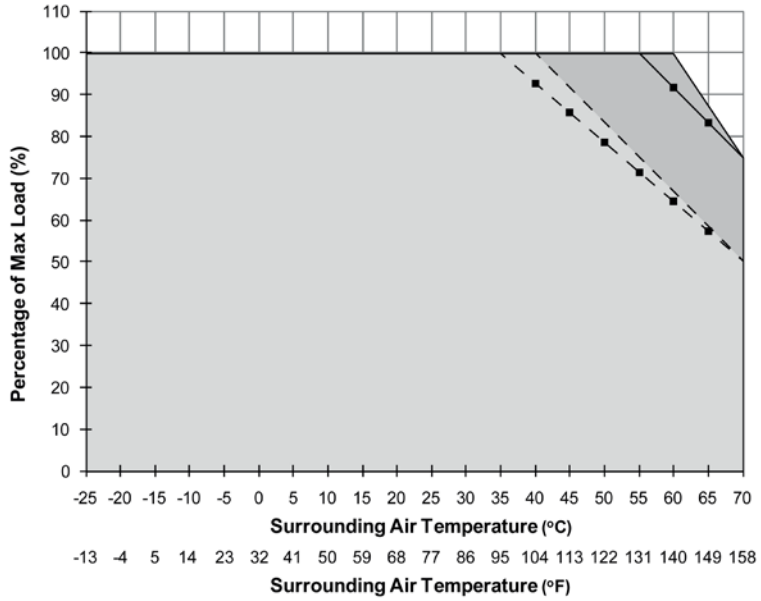
Power Supplies PSN Series

Power Derating Curve for PSN24-480



RHINO PRO PSN Series Derating for Mounting Position		
Part Number	***Vertical Orientation***	***Horizontal Orientation***
PSN-480	> 60°C de-rate power by 2.5% / °C	> 40°C de-rate power by 1.67% / °C

Power Derating Curve for PSN24-960

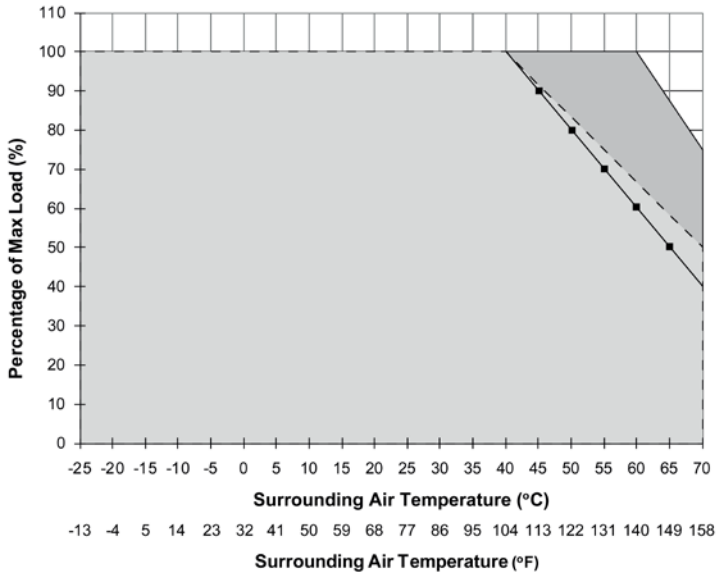


90-246 VAC	———	- - - - -
<90 VAC	—◆—	- - ◆ - -

Derating for Mounting Position PSN Series				
Part Number	***Vertical Orientation***		***Horizontal Orientation***	
	<90 VAC	***90-264 VAC***	***<90 VAC***	***90-264 VAC***
PSN24-960	> 55°C de-rate power by 1.67% / °C	> 60°C de-rate power by 2.5% / °C	> 35°C de-rate power by 1.43% / °C	> 40°C de-rate power by 1.67% / °C

Power Supplies PSN Series

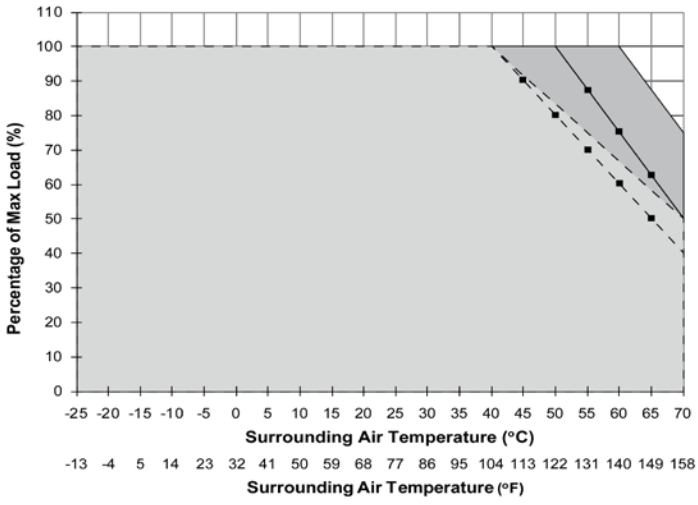
Power Derating Curve for PSN24-480-3



V_{in}	Vertical Mounting	Horizontal Mounting
3-Phase	———	- - - - -
2-Phase	—◆—	- - ◆ - -

Derating for Mounting Position PSN Series				
Part Number	*Vertical Orientation*		*Horizontal Orientation*	
	3-Phase	*2-Phase*	*3-Phase*	*2-Phase*
PSN24-480-3	> 60°C de-rate power by 2.5% / °C		> 40°C de-rate power by 1.67% / °C	> 40°C de-rate power by 2.0% / °C

Power Derating Curve for PSN24-960-3



V_{in}	Vertical Mounting	Horizontal Mounting
3-Phase	———	- - - - -
2-Phase	—◆—	- - ◆ - -

Derating for Mounting Position PSN Series				
Part Number	*Vertical Orientation*		*Horizontal Orientation*	
	3-Phase	*2-Phase*	*3-Phase*	*2-Phase*
PSN24-960-3	> 60°C de-rate power by 2.5% / °C	> 50°C de-rate power by 2.5% / °C	> 40°C de-rate power by 1.67% / °C	> 40°C de-rate power by 2% / °C