

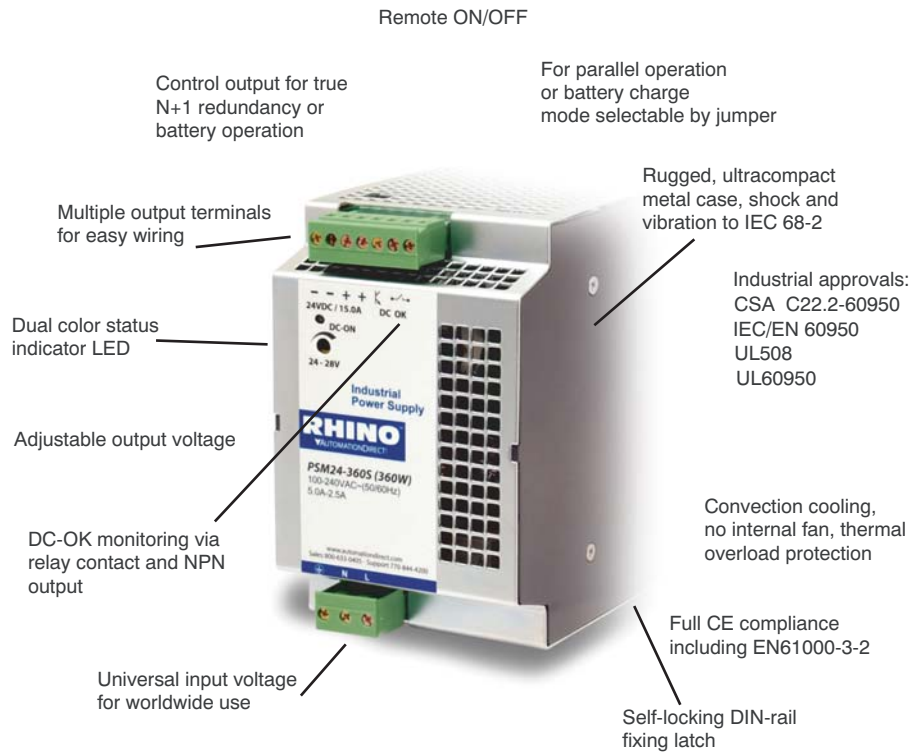
RHINO PSM Series Power Supplies

Versatile switching power supplies are DIN-rail mountable

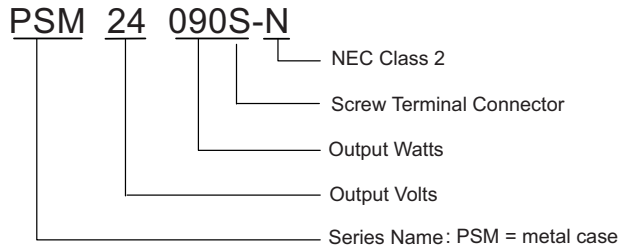
AUTOMATIONDIRECT offers the most practical industrial control power supplies available. The RHINO PSM series power supplies are industrial grade switching DC output supplies with a sturdy steel case to withstand harsh environments. Autoselect inputs for 115 VAC or 230 VAC and international agency approvals make the RHINO PSM series suitable for worldwide use. RHINO PSM power supplies are available in 12 or 24 VDC output, with adjustable output voltages, and feature low output ripple along with overload and overtemperature protection. The seven models offer power ratings from 78W to 600W, and up to 25A output current.

Features

- Industrial grade design
- Sturdy metal case to withstand harsh industrial environments
- Model PSM24-090S-N meets NEC Class 2
- Universal 100/230 VAC input voltage
- Adjustable output voltage
- Low output ripple
- Short-circuit, overvoltage and overtemperature protection
- Power Good signal
- Remote ON/OFF
- Optional wall mounting
- Specialty modules for redundancy, power backup and UPS
- Terminal connectors included
- 3-year product warranty



Part Numbering System



RHINO PSM Industrial Power Supplies			
Part Number	*Output Voltage (V_{nom})	**Output Current (I_{max})	***Output Power (P_{max})
PSM12-078S	12 VDC	6.5 A	78 W
PSM24-090S	24 VDC	3.75 A	90 W
PSM24-090S-N	24 VDC	3.75 A	90 W
PSM12-156S	12 VDC	13.0 A	156 W
PSM24-180S	24 VDC	7.5 A	180 W
PSM24-360S	24 VDC	15.0 A	360 W
PSM24-600S	24 VDC	25.0 A	600 W

*12V models adjustable from 12 to 14 VDC. 24V models adjustable from 24 - 28 VDC

**Maximum current at nominal output voltage

***Up to an operating temperature of +40°C

RHINO PSM Series Power Supplies Specifications

Input Specifications									
Part Number	Input Voltage Range	Input Frequency Range	Input Current (Typical) at full load		Inrush Current max (<2ms) @ +25°C		Holdup Time	Efficiency (Typical) @ 115VAC	Circuit Breaker or Fuse (slo-blo)
			115 VAC	230 VAC	115 VAC	230 VAC			
PSM12-078S	100 - 240 VAC 85 - 264 VAC (47 - 63 Hz)	47-63 Hz	2.0 A	1.0 A	<12 A	<20 A	20 ms min. (full load 115/230 VAC)	82%	6.0 A to 16.0 A
PSM24-090S			2.1 A	1.0 A				85%	
PSM24-090S-N			2.1 A	1.0 A				85%	
PSM12-156S	100 - 120 VAC/ 220 - 230 VAC		2.5 A	1.4 A	<13 A	<25 A		85%	
PSM24-180S	85 - 132 VAC/ 187 - 264 VAC		2.8 A	1.5 A				88%	
PSM24-360S	(47 - 63 Hz) Autoselect		5.0 A	2.5 A				87%	
PSM24-600S		10.0 A	5.0 A	<25 A	<30 A	89%	16.0 A to 25.0 A		

Output Specifications									
Part Number	Output Voltage	Output Voltage Adj. Range	Output Current (Max.)	Output Power (Max.)	Output Overvoltage Protection	Power - Good Signal			MTBF (IEC 61709 @ 25°C)
						Trigger Threshold	Active Output Signal	Relay Output	
PSM12-078S	12 VDC	12 - 14 VDC	6.5 A	78 watts	20 V	9 - 11 V	11 V ± 1 V/20 mA max.	DC OK = contact closed (rated:30 VDC 1.0A)	350,000 hours
PSM24-090S	24 VDC	24 - 28 VDC	3.75 A	90 watts	35 V	18 - 22 V	22 V ± 2 V/10 mA max		
PSM24-090S-N			3.75 A	90 watts	35 V				
PSM12-156S	12 VDC	12 - 14 VDC	13.0 A	156 watts	20 V	9 - 11 V	11 V ± 1 V/40 mA max.		
PSM24-180S	24 VDC	24 - 28 VDC	7.5 A	180 watts	35 V	18 - 22 V	22 V ± 2 V/20 mA max		
PSM24-360S			15.0 A	360 watts	35 V				
PSM24-600S			25.0 A	600 watts	35 V				

General Specifications	
Specification	Description
Temperature	Operating (ambient): -25°C to +70°C max (-13°F to 158°F). Above +40°C(104°F) load derating. Storage (non-operating): -25°C to +85°C max (-13°F to 185°F). Temperature drift: 0.02%/C. Cooling: convection, no internal fan
Humidity	95% (non-condensing) relative humidity maximum
Isolation	According to IEC/EN 60950, EN50178, EN61558-2-8, EN60204, CSA
Output Regulation	Input variation: 0.5% maximum. Load variation (10 to 100%): 0.5% maximum
Output Voltage Ripple	100 mV peak-to-peak typical (20 MHz bandwidth), (200 mV peak - peak maximum at I _{max})
Output Protection	Current limit: 110% constant current, automatic recovery, thermal protection, output rating, Voltage limit: 140% V _{out} nom
Overtemperature Protection	Switch off at overtemperature, automatic restart
Status Indicator	Dual color LED (green: DC Ok; Red: DC Off)
Remote ON/OFF	By external contact. DC On: -S contact open. DC Off: -S connected via 1 KΩ to -V _{out}
Maximum Capacitive Load	Unlimited
Vibration	IEC 60068-2-6: 3 axis, sine sweep, 10-55 Hz, 1g, 1 oct/min
Shock	IEC 60068-2-27: 3 axis, 15g half sine, 11ms
Enclosure Rating	IP20 (IEC 529)
Enclosure Material	Aluminum (chassis) / zinc plated steel (cover)
Mounting	Snap-on with self-locking spring for 35mm DIN rails per EN 50022-35x15/75, or wall mount with bracket
Connection	Pluggable screw terminals (plugs included) 2 terminals per output (not available in 600 watt unit.)
Agency Approvals	UL 508 Listed File E157382, UL 60950 Recognized File E198298; CSA C22.2-60950 File 229285; CE
<i>Note: Unless otherwise stated all specifications are valid at nominal input voltage, full load and +25°C after warmup time.</i>	

PLC Overview

DL05/06 PLC

DL105 PLC

DL205 PLC

DL305 PLC

DL405 PLC

Field I/O

Software

C-more HMIs

Other HMI

AC Drives

Motors

Steppers/ Servos

Motor Controls

Proximity Sensors

Photo Sensors

Limit Switches

Encoders

Current Sensors

Pushbuttons/ Lights

Process

Relays/ Timers

Comm.

TB's & Wiring

Power

Circuit Protection

Enclosures

Appendix

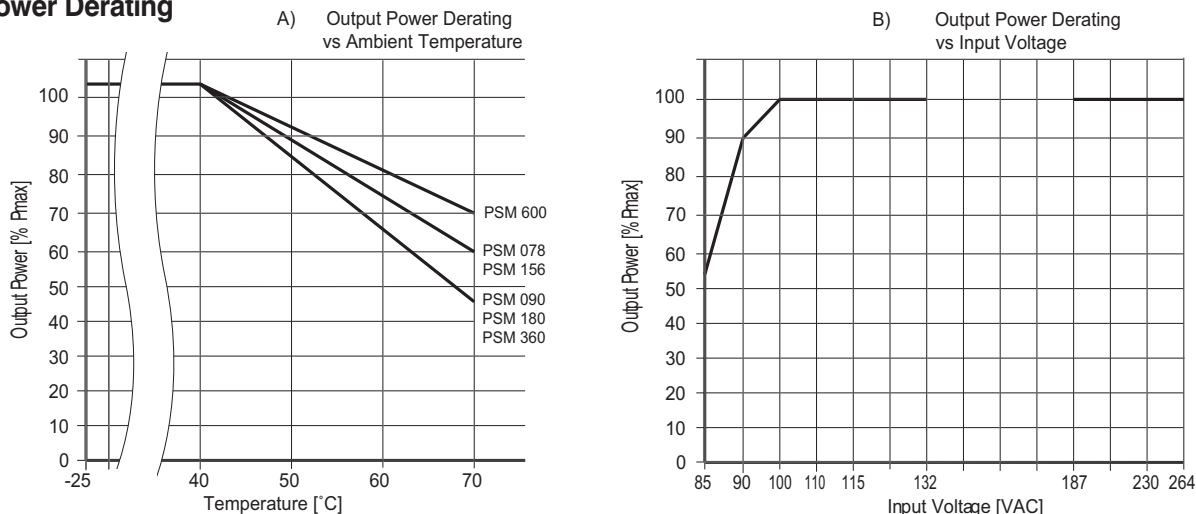
Part Index

RHINO PSM Series Power Supplies Specifications

General Specifications (continued)		
Specification	Standard	Document Number
Harmonic Limits	Harmonic Current Limits	EN 61000-3-2, Class A for limited output power
Safety Standards	Information technology equipment	IEC/EN60950; CSA 60950-1-03/UL 60950-1
	Industrial control equipment	UL 508
	Electrical equipment of machines	EN 60204
	Electronic equipment for power installation	EN 50178
	Safety, transformers	EN 61558-2-8
	Limited power source (model PSM24-090S-N)	EN 60950 sect. 2.5 and NEC Class 2
Safety Approvals	CB-Report per IEC 60950	EN 50178, EN 60079-15 EN 61558-2-8, CSA
Safety Class	Degree of electrical protection Class1	IEC 536
Electromagnetic Compatibility (EMC), Emissions	EMC, Emissions	EN 61204-3, EN61000-6-3
	Conducted RI suppression on input	EN 55011 class B, EN 55022 class B
	Radiated RI suppression	EN 55011 class B, EN 55022 class B
Electromagnetic Compatibility (EMC), Immunity	EMC, Immunity	EN 61000-6-2, EN 61204-3
	Electrostatic Discharge (ESD)	IEC / EN 61000-4-2 4 kV (contact discharge) / 8 kV (air discharge)
	Radiated RF field immunity (80-1000 MHz)	IEC / EN 61000-4-3 10 V / m
	Electrical fast transient / burst immunity	IEC / EN 61000-4-4 2 kV
	Surge immunity	IEC / EN 61000-4-5 1 kV / 2 kV
	Immunity to conducted RF disturbances (0.15 to 80 MHz)	IEC / EN 61000-4-6 10 V
	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*	

*Note: Normally, only non-conductive pollution occurs. Temporary conductivity caused by condensation is to be expected.

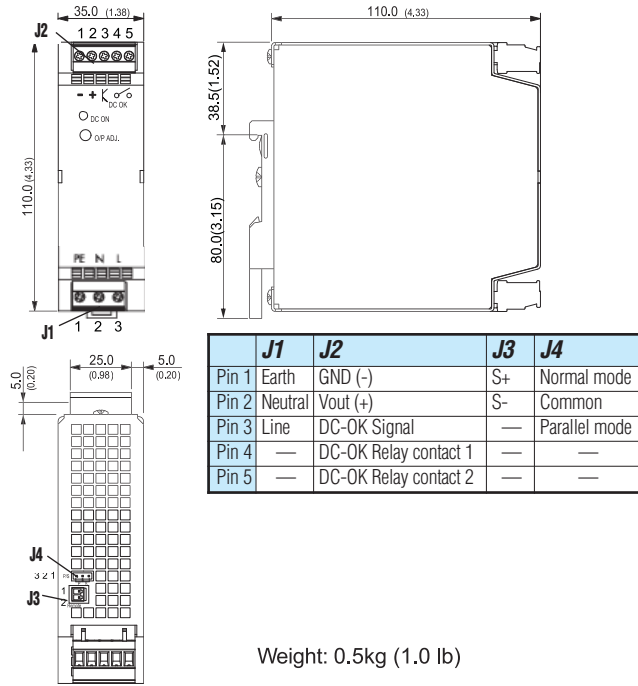
Output Power Derating



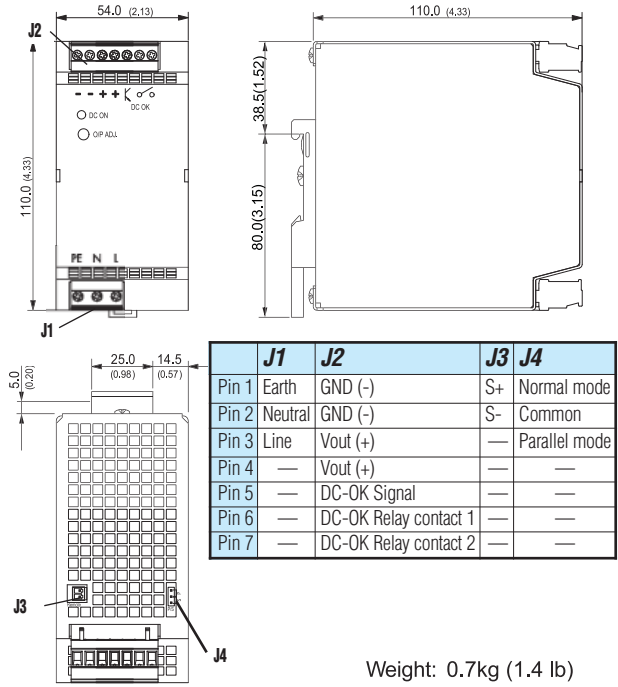
Note: Unless otherwise stated, all specifications are valid at nominal input voltage, full load and +25°C after warmup time.

RHINO PSM Series Dimensions/Connections

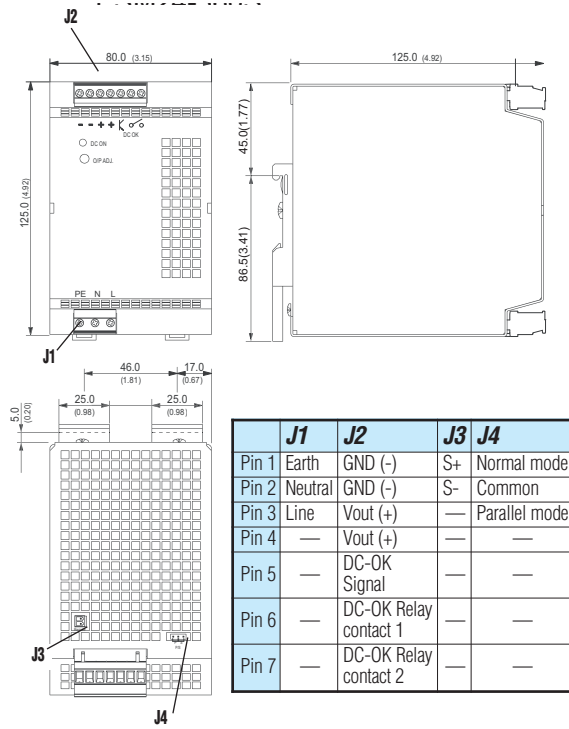
PSM12-078S, PSM24-090S, PSM24-REM360S, PSM24-BCM360S



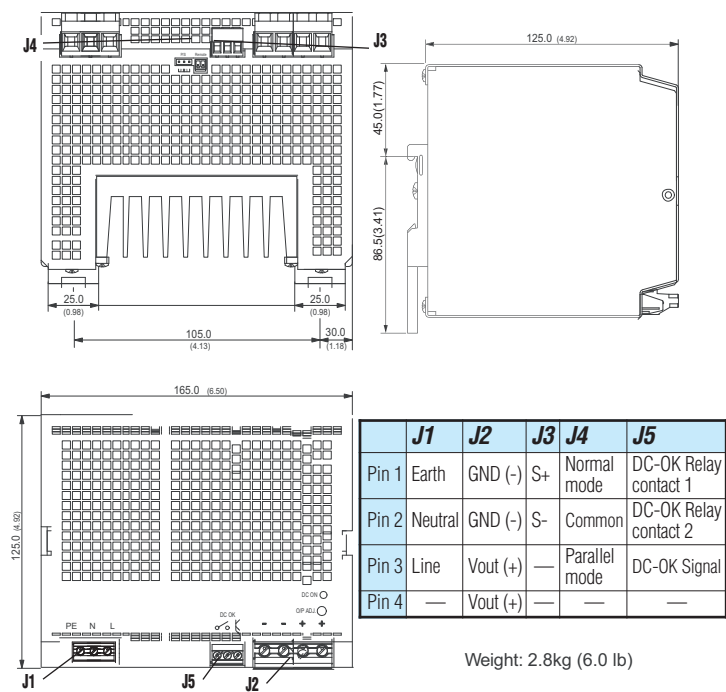
PSM12-156S, PSM24-180S, PSM24-BFM600S



PSM24-360S



PSM24-600S



All dimensions in millimeters (inches)
Tolerances: ±0.5mm (±0.02")

PLC Overview

DL05/06 PLC

DL105 PLC

DL205 PLC

DL305 PLC

DL405 PLC

Field I/O

Software

C-more HMIs

Other HMI

AC Drives

Motors

Steppers/Servos

Motor Controls

Proximity Sensors

Photo Sensors

Limit Switches

Encoders

Current Sensors

Pushbuttons/Lights

Process

Relays/Timers

Comm.

TB's & Wiring

Power

Circuit Protection

Enclosures

Appendix

Part Index

RHINO PSM24-REM360S Redundancy Module

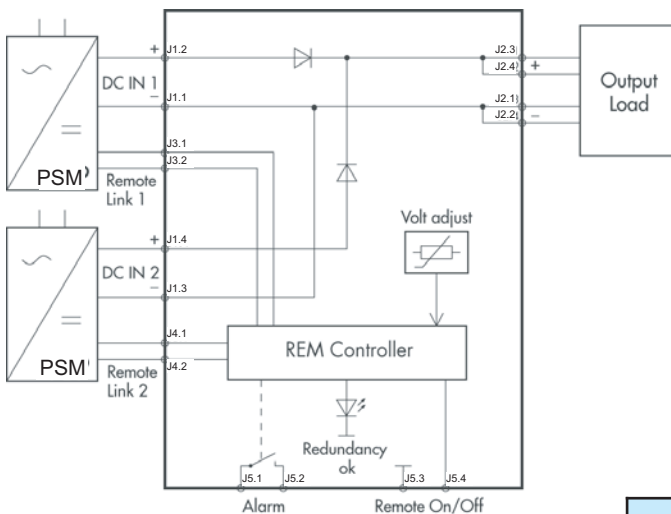
Using two PSM24 power supplies and a redundancy module, you can configure a redundant power system, featuring active current sharing, without any additional components. Even if one power supply fails or becomes disconnected, the second unit will supply full current to the load. The module has an alarm contact for monitoring of operations. The inputs are hot-swappable and can be loaded up to 15A each.



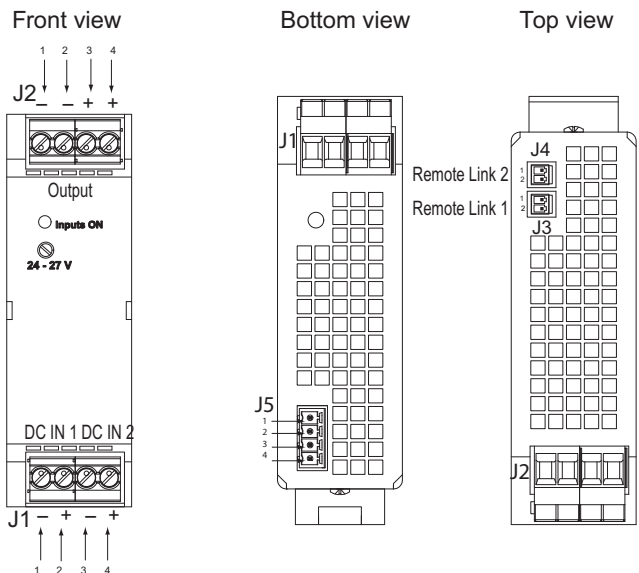
Redundancy Module					
Part Number		Input	Max Power per Input	Output Voltage Adjust	Output Power Max
PSM24-REM360S (includes terminal plugs)		2 x 24 VDC 2 x Control Input	2 x 360 W	24 VDC (24 - 27 VDC)	360 W

General Specifications	
Operating Temperature	-25°C to +70°C max (-13°F to +158°F), derating above 40°C (104°F)
Electromagnetic Compatibility	In correspondence to connected units (no internal switching device)
Redundancy OK Signal	Trigger threshold at 18 to 22 VDC. Contact closed if one or both inputs failed
Dimensions	Same as model PSM24-090S (see dimensions page)
Remote Link Wire 0.5m	Two cables included with PSM24-REM360S module
Remote ON/OFF	By external contact: ON = J5.3 + J5.4 not shorted OFF = J5.3 + J5.4 shorted
Alarm Contact Rating	30 VDC/1.0 A max

Redundancy Module Function Diagram



Redundancy Module Connector Positions



	J1	J2	J3 Voltage control 1 for Input 1	J4 Voltage control 2 for Input 2	J5
Pin 1	Input 1 -Vin	GND (-)	S+	S+	DC-OK Signal
Pin 2	Input 1 +Vin	GND (-)	S-	S-	DC-OK Relay contact
Pin 3	Input 2 -Vin	Vout (+)	—	—	Remote ON/OFF
Pin 4	Input 2 +Vin	Vout (+)	—	—	Remote ON/OFF

Note: this redundancy module only works with the PSM series. Other series of power supplies are not compatible.

RHINO PSM24-BCM360S Battery Control Module

The battery control module, when combined with a PSM24 power supply, makes a perfect DC-UPS system by providing the means to charge and monitor an external lead acid battery. The power supply charges the connected battery and keeps it in a charged mode. Consequently, the output voltage of the system is equivalent to the battery voltage.

To avoid overcharging the battery, an external temperature sensor (sold separately) automatically adjusts the battery voltage to the required end of charge voltage. This configuration extends the battery life.

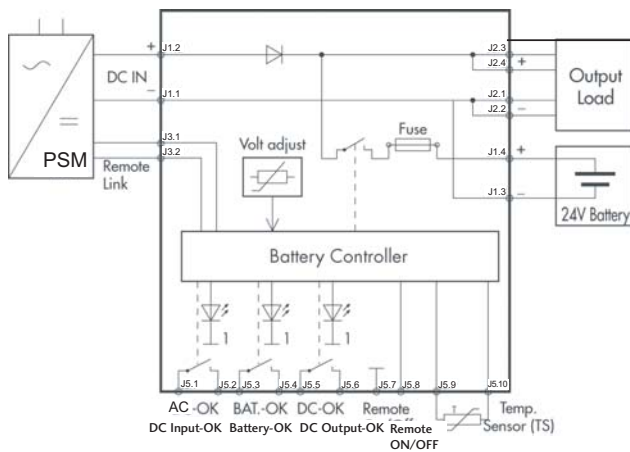


Battery Control Module					
Part Number		Input	Input Power Max	Output Voltage Nom	*Output Power Max
PSM24-BCM360S (includes terminal plugs)		24 VDC power supply and 24 VDC battery	360 W	24 VDC	360 W

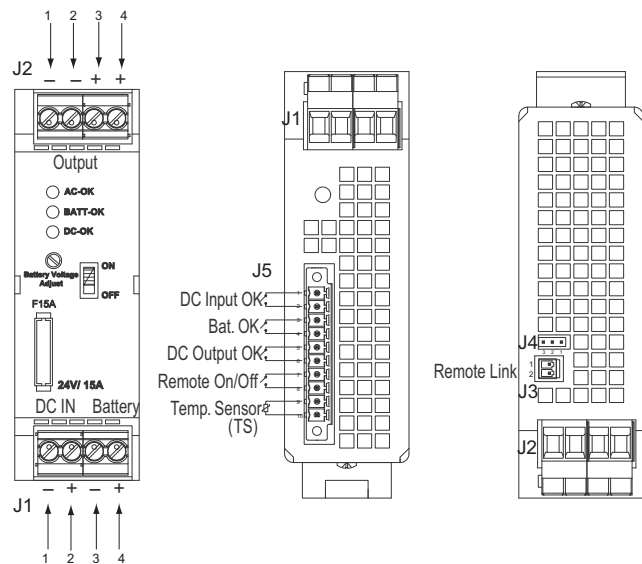
*reduce maximum output current by battery charging current.

General Specifications	
Operating Temperature	-25°C to +70°C max (-13°F to +158°F) 1.5%/K, derating above 40°C (104°F)
Electromagnetic Compatibility	In correspondence to connected units (no internal switching device)
Battery Protection	Over voltage, deep discharge, short-circuit and reverse connection (built-in fuse)
Status Signals	DC-OK input, DC-OK output, BAT OK (all relay contacts closed at status OK)
Rating per Relay Contact	30 VDC / 1.0 A max.
Dimensions	Same as model PSM24-090S (see dimensions page)
Remote Link Wire 0.5m	One cable included with PSM24-BCM360S module
Remote ON/OFF	By external contact: ON = J5.7 + J5.8 not shorted OFF = J5.7 + J5.8 shorted

Battery Control Module Function Diagram



Battery Control Module Connector Positions



	J1	J2	J3	J4	J5
Pin 1	- Vin (DC In)	GND (-)	S+	15 sec test	DC Input-OK Signal
Pin 2	+ Vin (DC In)	GND (-)	S-	Common	DC-OK Relay contact
Pin 3	- Bat in	Vout (+)	—	10 min test	Bat-OK Signal
Pin 4	+ Bat in	Vout (+)	—	—	Bat-OK Relay Contact
Pin 5	—	—	—	—	DC Output OK Signal
Pin 6	—	—	—	—	DC Output OK Relay Contact
Pin 7	—	—	—	—	Remote ON/OFF
Pin 8	—	—	—	—	Remote ON/OFF
Pin 9	—	—	—	—	Temperature Sensing
Pin 10	—	—	—	—	Temperature Sensing

- PLC Overview
- DL05/06 PLC
- DL105 PLC
- DL205 PLC
- DL305 PLC
- DL405 PLC
- Field I/O
- Software
- C-more HMIs
- Other HMI
- AC Drives
- Motors
- Steppers/Servos
- Motor Controls
- Proximity Sensors
- Photo Sensors
- Limit Switches
- Encoders
- Current Sensors
- Pushbuttons/Lights
- Process
- Relays/Timers
- Comm.
- TB's & Wiring
- Power
- Circuit Protection
- Enclosures
- Appendix
- Part Index

RHINO PSM24-BFM600S Buffer Module



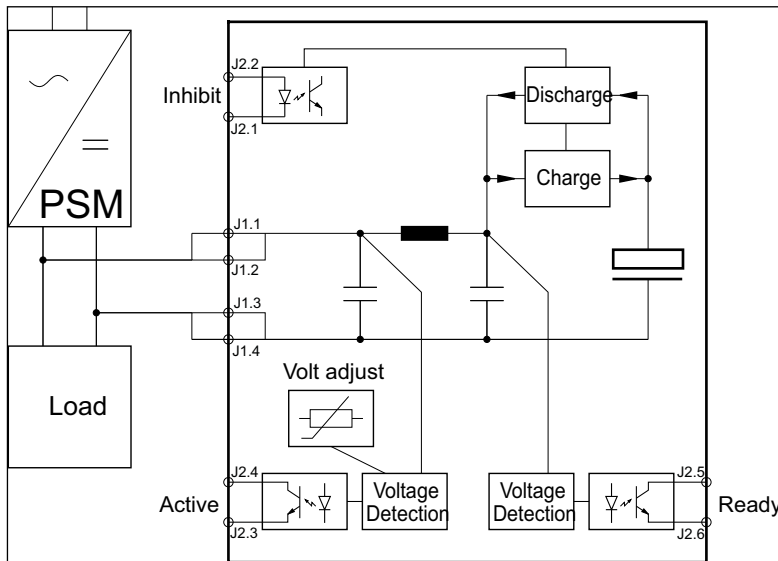
The buffer module will maintain the output voltage of a 24 VDC power supply after brownouts or voltage dips for up to 200 ms at 25 amps. It is a cost effective alternative to a battery-based backup system. The operation modes are indicated by an LED on the front panel.

Storing the energy in a capacitor bank, this backup solution is completely maintenance free. Its storage capacity does not deteriorate over the lifetime of the unit.

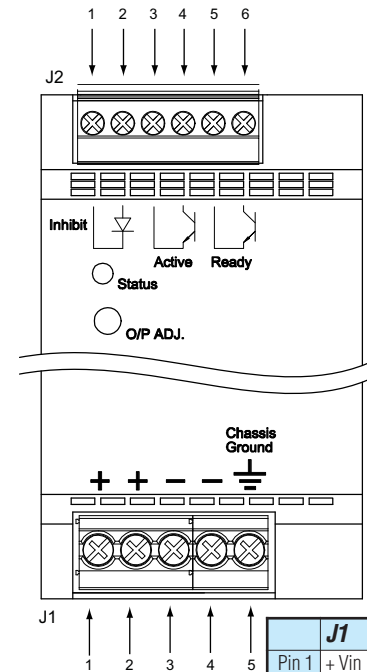
Buffer Module					
Part Number		Input	Operating Voltage Range	Buffer Time	Output Power Max
PSM24-BFM600S (includes terminal plugs)		24 VDC	22 to 28 VDC	200 msec typical @ 25A max load 4.0 sec maximum @ 1.2A load	25.0 A (600 W)

General Specifications	
Operating Temperature	-25°C to +70°C max (-13°F to +158°F), derating above 40°C (104°F)
Electromagnetic Compatibility	In correspondence to connected units (no internal switching device)
Buffer Voltage	Adjustable, >1 V below input voltage, min. 22 VDC
Charging	0.6 A max/30s max
Status Signals	Buffer Active, Buffer Ready (optocoupler output), dual-color LED for status indication
Inhibit Input	Optocoupler input: supply between 5 VDC and 28 VDC to Inhibit
Dimensions	Same as model PSM12-156S (see dimensions page)
Signal Output Ratings	10 mA

Buffer Module Function Diagram



Buffer Module Connector Positions



	J1	J2
Pin 1	+ Vin	Inhibit GND
Pin 2	+ Vin	Inhibit +
Pin 3	- Vin	Active GND
Pin 4	- Vin	Active Signal
Pin 5	FG	Ready GND
Pin 6	—	Ready Signal

RHINO PSM Power Supplies - Accessories

A variety of accessories is available to complement the RHINO PSM power supplies. Choose panel mounting brackets and replacement plug kits from the table below, based on the size of the power supply. There is also a temperature sensor for the battery control module and replacement link cable for the redundancy and battery control modules.



Accessories		
Part Number		Description
PSM-PANEL1		Panel mounting bracket. 1 bracket type A includes M4-screw (DIN 74-4fA) for 78W, 90W, 156W, 180W PSM power supplies
PSM-PANEL2		Panel mounting bracket. 2 brackets type A include M4-screws (DIN 74-4fA) for 360W, 600W PSM power supplies
PSM-PK1		Replacement plug kit for PSM series with 78W and 90W outputs
PSM-PK2		Replacement plug kit for PSM series with 156W, 180W and 360W outputs
PSM-PK3		Replacement plug kit for PSM series redundancy module
PSM-PK4		Replacement plug kit for PSM series buffer module
PSM-PK5		Replacement plug kit for PSM series battery control module
PSM-TS		Temperature sensor for PSM24-BCM360S battery control module
PSM-JC01		Replacement link cable for PSM series redundancy module PSM24-REM360S and battery control module PSM24-BCM360S

Mounting

PSM power supplies are designed for mounting on a DIN rail. Please allow minimum free space of 80 mm (3.15") above and below, and 50 mm (1.97") on each side of the power supply for air convection. To attach unit onto the DIN rail, hook the top part of clip on DIN rail, then push down and inward until you hear the clipping sound. To remove, pull the latch of the clip using an insulated flat-head screwdriver.

For wall or chassis mounting, use mounting brackets PSM-PANEL1 (for 78W to 180W PSM style power supplies) or PSM-PANEL2 (for 360W and 600W PSM power supplies). Remove the DIN clips and replace with the brackets. Use the countersink screws included with the wall mount kit to attach the brackets to the power supply.

To attach the power supply to the DIN rail

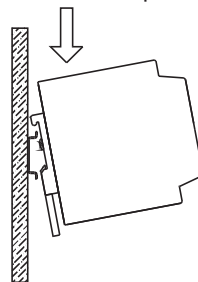


Fig. 2.1

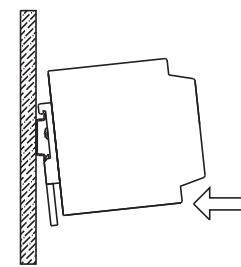


Fig. 2.2

To remove the power supply from DIN rail

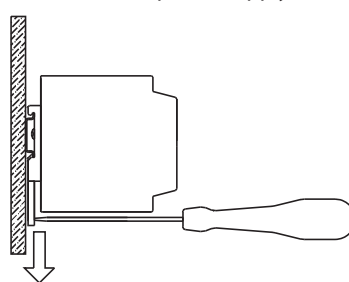


Fig. 2.3

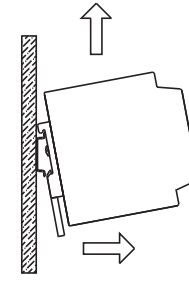


Fig. 2.4

PLC Overview

DL05/06 PLC

DL105 PLC

DL205 PLC

DL305 PLC

DL405 PLC

Field I/O

Software

C-more HMIs

Other HMI

AC Drives

Motors

Steppers/ Servos

Motor Controls

Proximity Sensors

Photo Sensors

Limit Switches

Encoders

Current Sensors

Pushbuttons/ Lights

Process

Relays/ Timers

Comm.

TB's & Wiring

Power

Circuit Protection

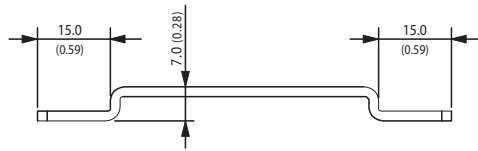
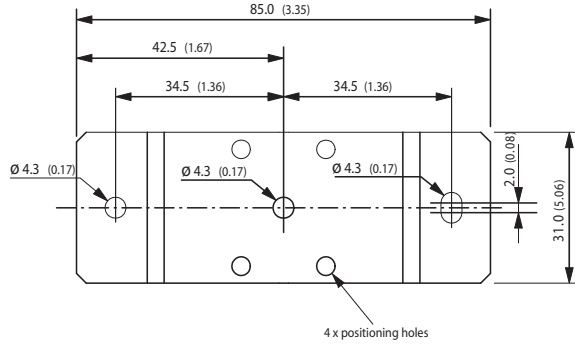
Enclosures

Appendix

Part Index

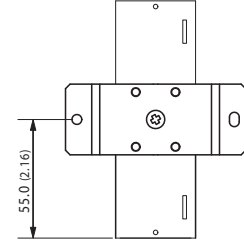
RHINO PSM Panel Mounting Bracket Dimensions

PSM-PANEL1

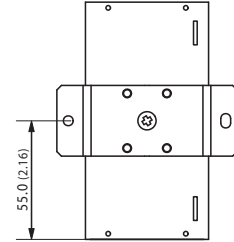


Material: 2 mm Mild Steel
Tolerance: $\pm 0.1\text{mm}$ (± 0.004)

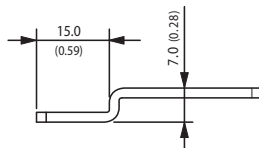
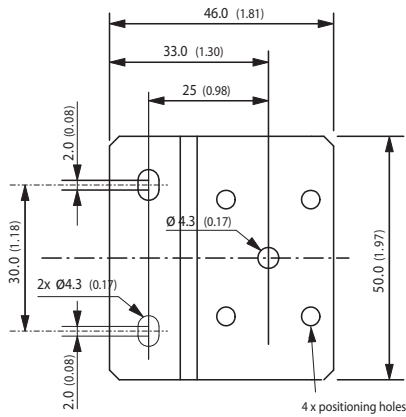
PSM12-078S, PSM24-090S



PSM12-156S, PSM24-180S



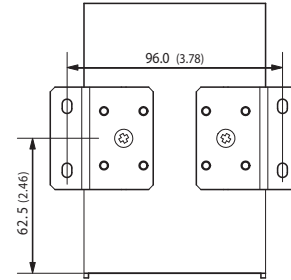
PSM-PANEL2



Material: 2 mm Mild Steel
Tolerance: $\pm 0.1\text{mm}$ (± 0.004)

Dimensions: [mm] () = Inch

PSM24-360S



PSM24-600S

