RHINO PRO DIN Rail Power Supplies PSH Series

High Efficiency Power Supplies

AutomationDirect's RHINO PRO PSH series DIN rail power supplies offer best-in-class efficiency, temperature performance, and agency approvals for extreme conditions. With efficiencies of up to 94% and an operating temperature range of −25°C to 70°C, RHINO PRO PSH supplies will keep going when other supplies won't. There are 10 models, with output power from 80W to 480W and output voltages from 12 to 48 VDC. They feature universal 120/240 VAC input voltage, adjustable DC output, DC-OK LED indication, and output current limitation.

Well suited for harsh environments and hazardous locations, the rugged aluminum and stainless steel housings easily install with included 35mm DIN rail mounting adapters. The DIN rail clips can be moved to the side of the power supply for side mounting in flat panels. These high-quality power supplies are backed by a 5-year warranty, UL 508 and hazardous location listed, UL 60950 recognized, ATEX certified, CE marked and RoHS compliant.

UL508 UL60950-1

Features

- 12, 24 and 48 VDC models
- −40°C start-up on all models
- ATEX & UL Class 1, Div. 2
- Battery control module available
- Alternative side-mounting for flat panels
- Very high efficiency, up to 94%
- Back power immunity
- 150% peak current for 4 sec.
- Operating temperature range: −25 to +70°C max. [Full load to 60°C]
- Adjustable output voltage
- DC-OK indicator
- Short circuit and overload protection
- 5-year warranty

PSH-xx-080

PSH-xx-120

PSH-xx-240

PSH-xx-480

DIN Rail Power Supplies					
Part Number	*Price*	*Drawing Link*	*Output Voltage*	*Maximum Output Power*	*Efficiency [Typ @ 115VAC]*
PSH-12-080	$130.00	PDF	12V	80W	90%
PSH-24-080	$122.00	PDF	24V		91%
PSH-48-080	$118.00	PDF	48V		91%
PSH-12-120	$173.00	PDF	12V	120W	91%
PSH-24-120	$157.00	PDF	24V		92%
PSH-48-120	$172.00	PDF	48V		93%
PSH-24-240	$206.00	PDF	24V	240W	93%
PSH-48-240	$218.00	PDF	48V		94%
PSH-24-480	$309.00	PDF	24V	480W	93%
PSH-48-480	$324.00	PDF	48V		94%

RHINO PRO PSH-xx-080 Power Supplies

Technical Specifications				
Part Number		***PSH-12-080***	***PSH-24-080***	***PSH-48-080***
Input (AC)				
Nominal Input Voltage		100–240VAC		
Nominal Input Current		2–0.9 A		
Operational Input Voltage Range		85–264VAC		
Input Voltage Frequency Range		45–65Hz		
Inrush Current (115/230 VAC)		15/30A		
Standby Power Consumption		0.9/1.45 W [115/230 VAC]		
Active Power Factor Correction (PFC)		0.48/0.48 [115/230 VAC]		
Harmonic limits – acc. EN 61000-3-2		Class A		
Circuit Breaker Rating / Characteristic		6-16 A /B, C [IEC]; 20 A /B, C[USA]		
Output (DC)				
Max. Output Power		80W		
Output Voltage		12V	24V	48V
Max. Output Current / Max. Output Current 4s ("Boost power" which facilitates the activation of stepper motors, solenoids, or actuators)		6.7 A / 10A	3.4 A / 5A	1.7 A / 2.5 A
Output Voltage Adjustment Range		11.8–15V	23.5–28V	47.5–56V
Typical Efficiency (@ 115/230 VAC)		90/88 %	91/89 %	91/89 %
Regulation ***Input Variation*** ***Load Variation***		0.1 % max. [10–90 %] 0.5 % max.		
Output Power Derating - Temperature		2%/K above 60°C		
Output Power Derating - Input Voltage		3%/V below 90VAC		
Hold-up time		20/160ms min. [115/230 VAC]		
Start-up time		2s max.		
Ripple and Noise (20MHz bandwidth) (Note 1)		100mVp-p max.	100mVp-p max.	200mVp-p max.
Output Overvoltage Protection (OVP) (Note 2)		16–19V	32–35V	56–60V
Power Back Immunity (Note 3)		< OVP level		
Operation ***Nominal Operation*** ***Peak Power Operation*** ***Constant Current (CC)***		100% of Iout nominal 105–150% of Iout nominal 155% of Iout nominal		
Duty Cycle (for peak and cc mode) (Note 4) ***Threshold*** ***CC or Peak Operation Timer*** ***Normal Operation / Off Period***		> 105 % 4s max. [switch off] < 6s typ [automatic restart after switch off or peak and cc operation timer reset]		
Short Circuit Protection		Switch off after 4s delay, automatic restart (Note 4)		
DC OK Signal	***Threshold for Vout***	ON: > 10.9 V typ. OFF :< 10.7 V typ.	ON: > 22.5 V typ. OFF:< 21.5 V typ.	ON: > 45V typ. OFF:< 43V typ.
	DC ON	Relay contact closed, max. 1A, < 100mOhm, also indicated by green LED		
	DC OFF	Relay contact open, max 30V		

Notes:

1. Output voltage can be adjusted as indicated. However, output power has to be maintained at nominal value. This means the output nominal current has to be reduced in accordance with the increase of output voltage.

2. In case of an internal error, a second voltage regulation loop keeps the output voltage at a safe level, and the power supply turns off and restarts after 10 seconds.

3. When external voltage is supplied above set output voltage and below OVP threshold, the power supply will function normally without switch off or destruction, even if external voltage is applied continuously.

4. In case of overload or short circuit, the unit switches the output voltage off after 4 seconds and tries to restart every 10 seconds.

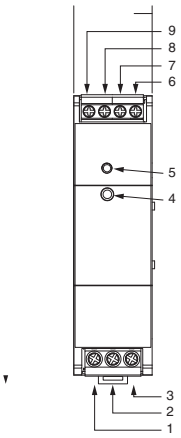
Continued on following page.

RHINO PRO PSH-xx-080 Power Supplies

Technical Specification (continued)			
Part Number	***PSH-12-080***	***PSH-24-080***	***PSH-48-080***
General Data			
Weight g [oz]	367 [12.95]		
Leakage Current (max.)	0.75 mA		
Network Configuration	TN-S, TN-C, TT, IT		
Enclosure Material (Chassis/Cover)	Aluminum / Stainless Steel		
Cooling	Convection cooling, no internal fan		
Over Temperature Protection	Switch off at over temperature		
Isolation Voltage	Input/Output 4250VDC Input/Chassis 1500VDC Output/Chassis 750VDC		
Creepage Clearance	Input/Output 8mm Input/Chassis 4mm Output/Chassis 1.5 mm		
Safety / Environmental			
Surrounding Ambient Temperature Range	-40 to 70°C [-40 to 158°F]		
Temperature Coefficient	0.02 %/K		
Humidity	5–95%, non-condensing		
Storage Temperature	-40 to 85°C [-40 to 185°F]		
Maximum Altitude	2000m		
Safety Standards	Information technology equipment IEC/EN 60950-1, UL 60950-1 CSA 22.2 No 60950-1-03, File No. E198298 Safety low voltage switchgear and controlgear UL 508, File No. E197592 Process Control Equipment Haz Loc, File No. E502478 ATEX ⟨Ex⟩ II 3 G Ex ec nC IIC T4 Gcw		
MTBF (acc. to IEC 61709 at 25°C)	> 1,950,000 hours		
Protection Class	Class I		
Degree of Protection	IP20		
Electromagnetic compatibility (EMC)			
Emissions	EN 61000-6-3, EN 61204-3		
Conducted RI Suppression On Input	EN 55032, EN 55011 class B,		
Radiated RI Suppression	EN 55032, EN 55011 class B,		
Immunity	EN 61000-6-2, EN 61204-3		
Railway Applications Signaling Apparatus	EN 50121-4		
Railway Applications Rolling Stock Apparatus	EN 50121-3-2		
Electrostatic Discharge (ESD)	IEC/EN 61000-4-24 kV/8 kV, criteria A		
Radiated RF Field Immunity	IEC/EN 61000-4-310 V/m, criteria A		
Electrical Fast Transient / Burst Immunity	IEC/EN 61000-4-42 kV, criteria B		
Surge Immunity	IEC/EN 61000-4-51 kV/2 kV, criteria B		
Immunity To Conducted RF Disturbances	IEC/EN 61000-4-610 V, criteria A		
Power Frequency Field Immunity	IEC/EN 61000-4-830 A/m, criteria A		
Mains Voltage Dips And Interruptions	IEC/EN 61000-4-11, criteria B/C		
Voltage Sag Immunity	SEMI F47230VAC, criteria B/C		
Environment			
Railway Applications Shock and Vibration	According EN 61373		
Vibration Acc. IEC 60068-2-6-3	3 axis, 2 g sine sweep, 10–55Hz, 11 oct/min		
Shock Acc. IEC 60068-2-27	3 axis, 25g half sine, 11ms		
Approvals	CE CB Scheme c UL us UL508 c UL us UL60950-1 ⟨Ex⟩		

RHINO PRO PSH-xx-080 Power Supplies

Fig. 1



Identification of Features (Fig.1)	
1	Input Terminal L
2	Input Terminal N
3	Input Terminal GND
4	Output Voltage adjustment potentiometer
5	DC ON LED
6/7	DC OK Contact
8	Output Connection Terminal +
9	Output Connection Terminal –

Fig. 2

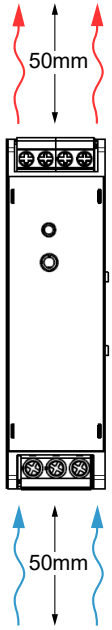


Fig. 3

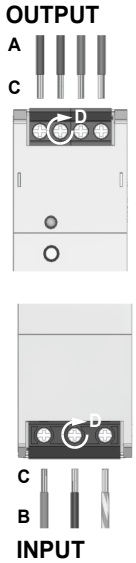


Fig. 4

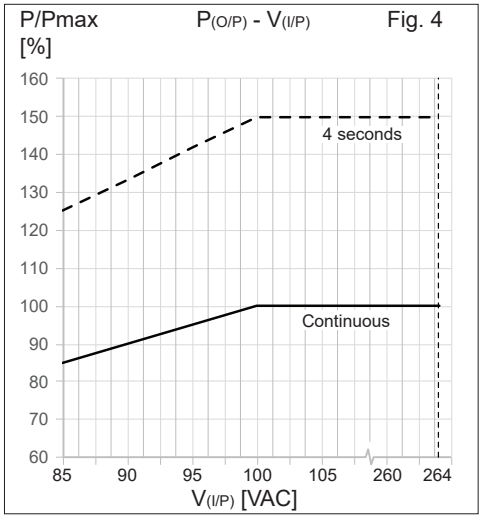
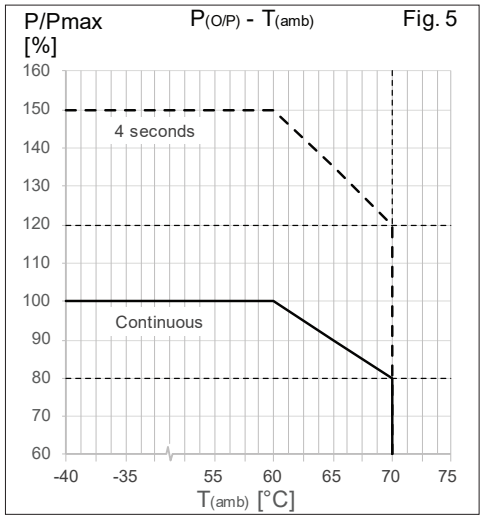


Fig. 5



Wiring Specifications (Fig. 3)		
A	Wire Size, Output	18–10 AWG
B	Wire Size, Input	18–10 AWG
C	Strip Length	10mm [0.39 in]
D	Tightening Torque	0.7 N·m [6.2 lb·in]

RHINO PRO PSH-xx-120 Power Supplies

Technical Specifications				
Part Number		**PSH-12-120**	**PSH-24-120**	**PSH-48-120**
Input (AC)				
Nominal Input Voltage		100–240 VAC		
Nominal Input Current		1.5–0.78 A		
Operational Input Voltage Range		85–264VAC		
Input Voltage Frequency Range		45–65Hz		
Inrush Current (115/230 VAC)		15/30A		
Standby Power Consumption		2.2/2.2 W [115/230 VAC]		
Active Power Factor Correction (PFC)		0.97/0.8 [115/230 VAC]		
Harmonic limits – acc. EN 61000-3-2		Class A, D		
Circuit Breaker Rating / Characteristic		6-16 A /B, C [IEC]; 20 A /B, C [USA]		
Output (DC)				
Max. Output Power		120W		
Output Voltage		12V	24V	48V
Max. Output Current / Max. Output Current 4s ("Boost power" which facilitates the activation of stepper motors, solenoids, or actuators)		10A / 15A	5A / 7.5 A	2.5 A / 3.75 A
Output Voltage Adjustment Range		11.8–15 V	23.5–28 V	47.5–56 V
Typical Efficiency (@ 115/230 VAC)		91/93 %	92/94 %	93/94 %
Regulation **Input Variation** **Load Variation**		0.1 % max. [10–90 %] 0.5 % max.		
Output Power Derating - Temperature		2%/K above 60°C, refer to Fig. 5		
Output Power Derating - Input Voltage		3%/V below 90 VAC, refer to Fig. 4		
Hold-up time		20ms min.		
Start-up time		2s max.		
Ripple and Noise (20MHz bandwidth) (Note 1)		100mVp-p max.	100mVp-p max.	200mVp-p max.
Output Overvoltage Protection (OVP) (Note 2)		16–19V	32–35V	56–60V
Power Back Immunity (Note 3)		< OVP level		
Operation **Nominal Operation** **Peak Power Operation** **Constant Current (CC)**		100% of Iout nominal 105–150% of Iout nominal 155% of Iout nominal		
Duty Cycle (for peak and cc mode) (Note 4) **Threshold** **CC or Peak Operation Timer** **Normal Operation / Off Period**		> 105 % 4s max. [switch off] < 10s typ [automatic restart after switch off or peak and cc operation timer reset]		
Short Circuit Protection		Switch off after 4s delay, automatic restart [Note 4]		
DC OK Signal	**Threshold for Vout**	ON: > 10.9 V typ. OFF:< 10.7 V typ.	ON: > 22.5 V typ. OFF:< 21.5 V typ.	ON: > 45V typ. OFF:< 43V typ.
	DC ON	Relay contact closed, max. 1A, < 100mOhm, also indicated by green LED		
	DC OFF	Relay contact open, max 30V		

Notes:
1. Output voltage can be adjusted as indicated. However, output power has to be maintained at nominal value. This means the output nominal current has to be reduced in accordance with the increase of output voltage.
2. In case of an internal error, a second voltage regulation loop keeps the output voltage at a safe level, and the power supply turns off and restarts after 10 seconds.
3. When external voltage is supplied above set output voltage and below OVP threshold, the power supply will function normally without switch off or destruction, even if external voltage is applied continuously.
4. In case of overload or short circuit, the unit switches the output voltage off after 4 seconds and tries to restart every 10 seconds.
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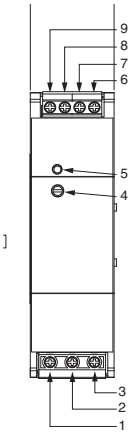
RHINO PRO PSH-xx-120 Power Supplies

Technical Specifications (continued)			
Part Number	**PSH-12-120**	**PSH-24-120**	**PSH-48-120**
General Data			
Weight g [oz]	461 [16.26]		
Leakage Current (max.)	0.9 mA		
Network Configuration	TN-S, TN-C, TT, IT		
Enclosure Material (Chassis/Cover)	Aluminum / Stainless Steel		
Cooling	Convection cooling, no internal fan		
Over Temperature Protection	Switch off at over temperature		
Isolation Voltage	Input/Output 4250VDC Input/Chassis 1500VDC Output/Chassis 750VDC		
Creepage Clearance	Input/Output 8mm Input/Chassis 4mm Output/Chassis 1.5 mm		
Safety / Environmental			
Surrounding Ambient Temperature Range	-40 to 70°C [-40 to 158°F]		
Temperature Coefficient	0.02 %/K		
Humidity	5–95%, non-condensing		
Storage Temperature	-40 to 85°C [-40 to 185°F]		
Maximum Altitude	2000m		
Safety Standards	Information technology equipment IEC/EN 60950-1, UL 60950-1 CSA 22.2 No 60950-1-03, File No. E198298 Safety low voltage switchgear and controlgear UL 508, File No. E197592 Process Control Equipment Haz Loc, File No. E502478 ATEX ⟨Ex⟩ II 3 G Ex ec nC IIC T4 Gcw		
MTBF (acc. to IEC 61709 at 25°C)	> 1,450,000 hrs		
Protection Class	Class I		
Degree of Protection	IP20		
Electromagnetic compatibility (EMC)			
Emissions	EN 61000-6-3, EN 61204-3		
Conducted RI Suppression On Input	EN 55032, EN 55011 class B,		
Radiated RI Suppression	EN 55032, EN 55011 class B,		
Immunity	EN 61000-6-2, EN 61204-3		
Railway Applications Signaling Apparatus	EN 50121-4		
Railway Applications Rolling Stock Apparatus	EN 50121-3-2		
Electrostatic Discharge (ESD)	IEC/EN 61000-4-24 kV/8 kV , criteria A		
Radiated RF Field Immunity	IEC/EN 61000-4-310 V/m , criteria A		
Electrical Fast Transient / Burst Immunity	IEC/EN 61000-4-42 kV , criteria B		
Surge Immunity	IEC/EN 61000-4-51 kV/2 kV , criteria B		
Immunity To Conducted RF Disturbances	IEC/EN 61000-4-610 V , criteria A		
Power Frequency Field Immunity	IEC/EN 61000-4-830 A/m , criteria A		
Mains Voltage Dips And Interruptions	IEC/EN 61000-4-11criteria B/C		
Voltage Sag Immunity	SEMI F47 230VAC, criteria B/C		
Environment			
Railway Applications Shock and Vibration	According EN 61373		
Vibration Acc. IEC 60068-2-6-3	3 axis, 2g sine sweep, 10–55Hz, 11 oct/min		
Shock Acc. IEC 60068-2-27	3 axis, 25g half sine, 11ms		
Approvals	CE CB Scheme c UL us UL508 c UL us UL60950-1 Ex		

RHINO PRO PSH-xx-120 Power Supplies

Fig. 1



Identification of Features (Fig.1)	
1	Input Terminal L
2	Input Terminal N
3	Input Terminal GND
4	Output Voltage adjustment potentiometer
5	DC ON LED
6/7	DC OK Contact
8	Output Connection Terminal +
9	Output Connection Terminal –

Fig. 2

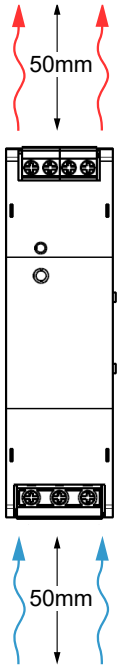
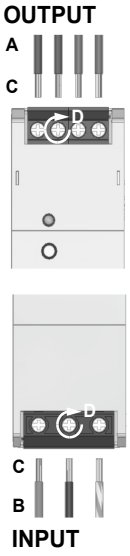


Fig. 3



Wiring Specifications (Fig. 3)		
A	Wire Size, Output	18–10AWG
B	Wire Size, Input	18–10AWG
C	Strip Length	10mm [0.39 in]
D	Tightening Torque	0.7 N·m [6.2 lb·in]

Fig. 4 $P_{(O/P)}$ - $V_{(I/P)}$

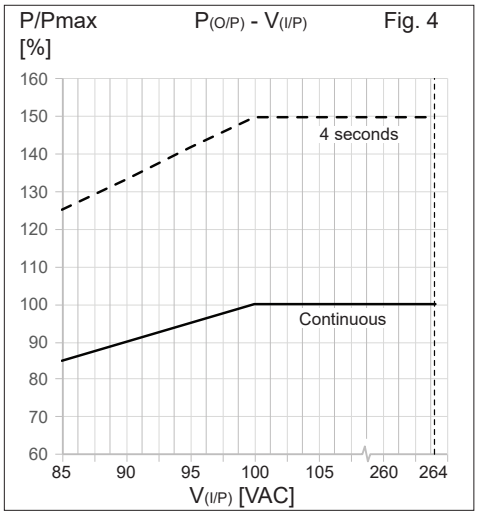
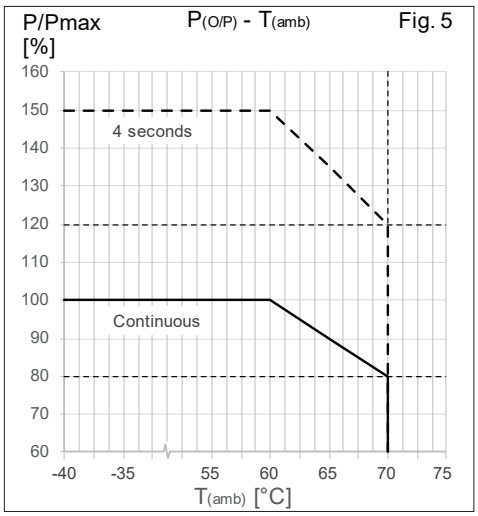


Fig. 5 $P_{(O/P)}$ - $T_{(amb)}$



RHINO PRO PSH-xx-240 Power Supplies

Technical Specifications			
		PSH-24-240	PSH-48-240
Input (AC)			
Nominal Input Voltage		100–240 VAC	
Nominal Input Current		2.89–1.27 A	
Operational Input Voltage Range		85–264VAC	
Input Voltage Frequency Range		45–65Hz	
Inrush Current (115/230 VAC)		15/30A	
Standby Power Consumption		2.3/2.3 W [115/230 VAC]	
Active Power Factor Correction (PFC)		0.98/0.92 [115/230 VAC]	
Harmonic limits – acc. EN 61000-3-2		Class A, D	
Circuit Breaker Rating / Characteristic		6-16 A /B, C [IEC]; 20 A /B, C [USA]	
Output (DC)			
Max. Output Power		240W	
Output Voltage		24V	48V
Max. Output Current / Max. Output Current 4s ("Boost power" which facilitates the activation of stepper motors, solenoids, or actuators)		10A / 15A	5A / 7.5 A
Output Voltage Adjustment Range		23.5–28 V	47.5–56 V
Typical Efficiency (@ 115/230VAC)		93/95 %	94/95 %
Regulation *Input Variation* *Load Variation*		0.1 % max. [10–90 %] 0.5 % max.	
Output Power Derating - Temperature		2%/K above 60°C, refer to Fig. 5	
Output Power Derating - Input Voltage		3%/V below 90 VAC, refer to Fig. 4	
Hold-up time		20 ms min.	
Start-up time		2s max.	
Ripple and Noise (20MHz bandwidth) (Note 1)		100 mVp-p max.	200 mVp-p max.
Output Overvoltage Protection (OVP) (Note 2)		32–35V	56–60V
Power Back Immunity (Note 3)		< OVP level	
Operation *Nominal Operation* *Peak Power Operation* *Constant Current (CC)*		100% of Iout nominal 105–150% of Iout nominal 155% of Iout nominal	
Duty Cycle (for peak and cc mode) (Note 4) *Threshold* *CC or Peak Operation Timer* *Normal Operation / Off Period*		> 105 % 4s max. [switch off] < 10s typ [automatic restart after switch off or peak and cc operation timer reset]	
Short Circuit Protection		Switch off after 4s delay, automatic restart (Note 4)	
DC OK Signal	*Threshold for Vout*	ON: > 22.5 V typ. OFF: < 21.5 V typ.	ON: > 45V typ. OFF: < 43V typ.
	DC ON	Relay contact closed, max. 1A, < 100mOhm, also indicated by green LED	
	DC OFF	Relay contact open, max 30V	

Notes:

1. Output voltage can be adjusted as indicated. However, output power has to be maintained at nominal value. This means the output nominal current has to be reduced in accordance with the increase of output voltage.

2. In case of an internal error, a second voltage regulation loop keeps the output voltage at a safe level, and the power supply turns off and restarts after 10 seconds.

3. When external voltage is supplied above set output voltage and below OVP threshold, the power supply will function normally without switch off or destruction, even if external voltage is applied continuously.

4. In case of overload or short circuit, the unit switches the output voltage off after 4 seconds and tries to restart every 10 seconds.

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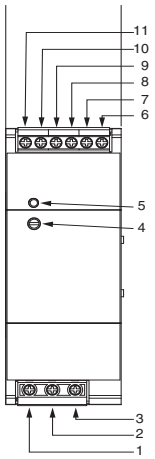
RHINO PRO PSH-xx-240 Power Supplies

Technical Specifications (continued)		
	PSH-24-240	PSH-48-240
General Data		
Weight g [oz]	643 [22.68]	
Leakage Current (max.)	1.2 mA	
Network Configuration	TN-S, TN-C, TT, IT	
Enclosure Material (Chassis/Cover)	Aluminum / Stainless Steel	
Cooling	Convection cooling, no internal fan	
Over Temperature Protection	Switch off at over temperature	
Isolation Voltage	Input/Output 4250VDC Input/Chassis 1500VDC Output/Chassis 750VDC	
Creepage Clearance	Input/Output 8mm Input/Chassis 4mm Output/Chassis 1.5 mm	
Safety / Environmental		
Surrounding Ambient Temperature Range	-40 to 70°C [-40 to 158°F]	
Temperature Coefficient	0.02 %/K	
Humidity	5–95%, non-condensing	
Storage Temperature	-40 to 85°C [-40 to 185°F]	
Maximum Altitude	2000m	
Safety Standards	Information technology equipment IEC/EN 60950-1, UL 60950-1 CSA 22.2 No 60950-1-03, File No. E198298 Safety low voltage switchgear and controlgear UL 508, File No. E197592 Process Control Equipment Haz Loc, File No. E502478 ATEX ⟨Ex⟩ II 3 G Ex ec nC IIC T4 Gcw	
MTBF (acc. to IEC 61709 at 25°C)	> 1,300,000 hrs	
Protection Class	Class I	
Degree of Protection	IP20	
Electromagnetic compatibility (EMC)		
Emissions	EN 61000-6-3, EN 61204-3	
Conducted RI Suppression On Input	EN 55032, EN 55011 class B,	
Radiated RI Suppression	EN 55032, EN 55011 class B,	
Immunity	EN 61000-6-2, EN 61204-3	
Railway Applications Signaling Apparatus	EN 50121-4	
Railway Applications Rolling Stock Apparatus	EN 50121-3-2	
Electrostatic Discharge (ESD)	IEC/EN 61000-4-24 kV/8 kV , criteria A	
Radiated RF Field Immunity	IEC/EN 61000-4-310 V/m , criteria A	
Electrical Fast Transient / Burst Immunity	IEC/EN 61000-4-42 kV , criteria B	
Surge Immunity	IEC/EN 61000-4-51 kV/2 kV , criteria B	
Immunity To Conducted RF Disturbances	IEC/EN 61000-4-610 V , criteria A	
Power Frequency Field Immunity	IEC/EN 61000-4-830 A/m , criteria A	
Mains Voltage Dips And Interruptions	IEC/EN 61000-4-11criteria B/C	
Voltage Sag Immunity	SEMI F47 230VAC, criteria B/C	
Environment		
Railway Applications Shock and Vibration	According EN 61373	
Vibration Acc. IEC 60068-2-6-3	3 axis, 2g sine sweep, 10–55Hz, 11 oct/min	
Shock Acc. IEC 60068-2-27	3 axis, 25g half sine, 11ms	
Approvals	CE CB Scheme c UL us UL508 c UL us UL60950-1 Ex	

RHINO PRO PSH-xx-240 Power Supplies

Fig. 1



Identification of Features (Fig.1)	
1	Input Terminal L
2	Input Terminal N
3	Input Terminal GND
4	Output Voltage adjustment potentiometer
5	DC ON LED
6/7	DC OK Contact
8	Output Connection Terminal +
9	Output Connection Terminal +
10	Output Connection Terminal –
11	Output Connection Terminal –

Fig. 2

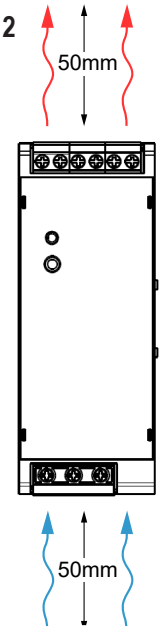


Fig. 3

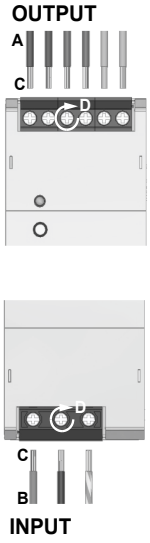


Fig. 4

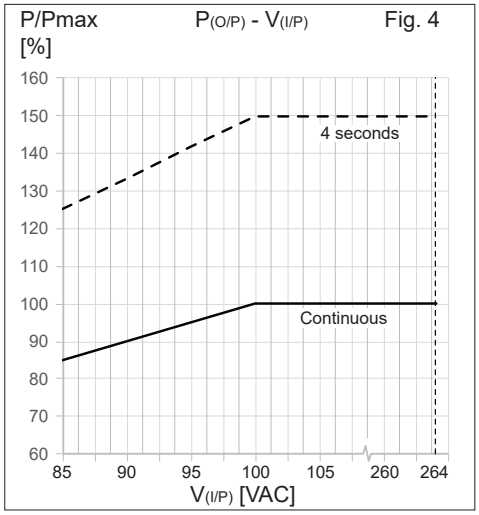
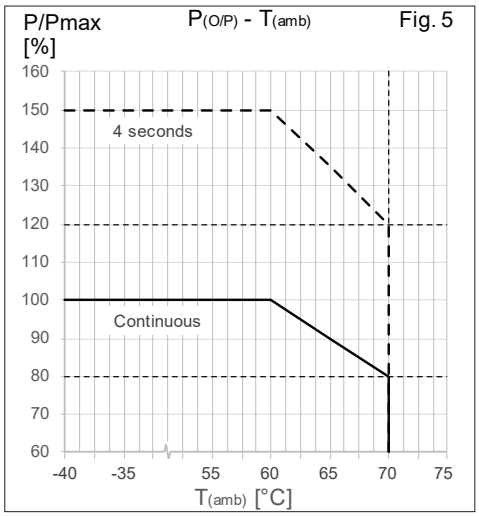


Fig. 5



Wiring Specifications (Fig. 3)		
A	Wire Size, Output	16–10AWG
B	Wire Size, Input	18–10AWG
C	Strip Length	10mm [0.39 in]
D	Tightening Torque	0.7 N·m [6.2 lb·in]

RHINO PRO PSH-xx-480 Power Supplies

Technical Specifications			
Part Number		***PSH-24-480***	***PSH-48-480***
Input (AC)			
Nominal Input Voltage		100–240 VAC	
Nominal Input Current		5.8–2.5 A	
Operational Input Voltage Range		85–264VAC	
Input Voltage Frequency Range		45–65Hz	
Inrush Current (115/230 VAC)		15/30A	
Standby Power Consumption		4.8/3.8 W [115/230 VAC]	
Active Power Factor Correction (PFC)		0.99/0.97[115/230 VAC]	
Harmonic limits – acc. EN 61000-3-2		Class A, D	
Circuit Breaker Rating / Characteristic		6-16 A /B, C[IEC]; 20 A /B, C [USA]	
Output (DC)			
Max. Output Power		480W	
Output Voltage		24V	48V
Max. Output Current / Max. Output Current 4s ("Boost power" which facilitates the activation of stepper motors, solenoids, or actuators)		20A / 30A	10A / 15A
Output Voltage Adjustment Range		23.5–28 V	47.5–56 V
Typical Efficiency (@ 115/230 VAC)		93/95 %	94/95 %
Regulation	***Input Variation*** ***Load Variation***	0.1 % max. [10–90 %] 0.5 % max.	
Output Power Derating - Temperature		2%/K above 60°C, refer to Fig. 5	
Output Power Derating - Input Voltage		3%/V below 90 VAC, refer to Fig. 4	
Hold-up time		20ms min.	
Start-up time		2s max.	
Ripple and Noise (20MHz bandwidth) (Note 1)		100 mVp-p max.	200 mVp-p max.
Output Overvoltage Protection (OVP) (Note 2)		32–35V	56–60V
Power Back Immunity (Note 3)		< OVP level	
Operation	***Nominal Operation*** ***Peak Power Operation*** ***Constant Current (CC)***	100% of Iout nominal 105–150% of Iout nominal 155% of Iout nominal	
Duty Cycle (for peak and cc mode) (Note 4) ***Threshold*** ***CC or Peak Operation Timer*** ***Normal Operation / Off Period***		> 105 % 4s max. [switch off] < 10s typ [automatic restart after switch off or peak and cc operation timer reset]	
Short Circuit Protection		Switch off after 4s delay, automatic restart (Note 4)	
DC OK Signal	***Threshold for Vout***	ON: > 22.5 V typ. OFF: < 21.5 V typ.	ON: > 45V typ. OFF: < 43V typ.
	DC ON	Relay contact closed, max. 1A, < 100mOhm, also indicated by green LED	
	DC OFF	Relay contact open, max 30V	

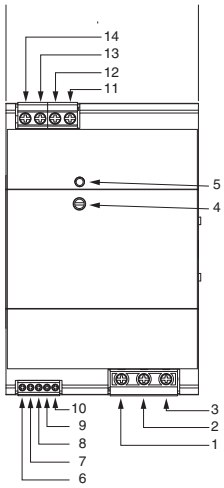
1. Output voltage can be adjusted as indicated. However, output power has to be maintained at nominal value. This means the output nominal current has to be reduced in accordance with the increase of output voltage.
2. In case of an internal error, a second voltage regulation loop keeps the output voltage at a safe level, and the power supply turns off and restarts after 10 seconds.
3. When external voltage is supplied above set output voltage and below OVP threshold, the power supply will function normally without switch off or destruction, even if external voltage is applied continuously.
4. In case of overload or short circuit, the unit switches the output voltage off after 4 seconds and tries to restart every 10 seconds.
Continued on next page.

RHINO PRO PSH-xx-480 Power Supplies

Technical Specifications (continued)		
Part Number	***PSH-24-480***	***PSH-48-480***
General Data		
Weight g [oz]	1018 [35.91]	
Leakage Current (max.)	2.3 mA	
Network Configuration	TN-S, TN-C, TT, IT	
Enclosure Material (Chassis/Cover)	Aluminum / Stainless Steel	
Cooling	Convection cooling, no internal fan	
Over Temperature Protection	Switch off at over temperature	
Isolation Voltage	Input/Output 4250VDC Input/Chassis 1500VDC Output/Chassis 750VDC	
Creepage Clearance	Input/Output 8mm Input/Chassis 4mm Output/Chassis 1.5 mm	
Remote On/Off	The unit can be controlled by external relay contact or open collector signal.	
Contact Rating	Open: 15V; leakage current max 100µA Close: 0.3 V; max drop at 15mA	
Safety / Environmental		
Surrounding Ambient Temperature Range	-40 to 70°C [-40 to 158°F]	
Temperature Coefficient	0.02 %/K	
Humidity	5–95%, non-condensing	
Storage Temperature	-40 to 85°C [-40 to 185°F]	
Maximum Altitude	2000m	
Safety Standards	Information technology equipment IEC/EN 60950-1, UL 60950-1 CSA 22.2 No 60950-1-03, File No. E198298 Safety low voltage switchgear and controlgear UL 508, File No. E197592 Process Control Equipment Haz Loc, File No. E502478 ATEX ⟨Ex⟩ II 3 G Ex ec nC IIC T4 Gcw	
MTBF (acc. to IEC 61709 at 25°C)	> 1,000,000 hrs	
Protection Class	Class I	
Degree of Protection	IP20	
Electromagnetic compatibility (EMC)		
Emissions	EN 61000-6-3, EN 61204-3	
Conducted RI Suppression On Input	EN 55032, EN 55011 class B,	
Radiated RI Suppression	EN 55032, EN 55011 class B,	
Immunity	EN 61000-6-2, EN 61204-3	
Railway Applications Signaling Apparatus	EN 50121-4	
Railway Applications Rolling Stock Apparatus	EN 50121-3-2	
Electrostatic Discharge (ESD)	IEC/EN 61000-4-2 4 kV/8 kV, criteria A	
Radiated RF Field Immunity	IEC/EN 61000-4-3 10 V/m, criteria A	
Electrical Fast Transient / Burst Immunity	IEC/EN 61000-4-4 2 kV, criteria B	
Surge Immunity	IEC/EN 61000-4-5 1 kV/2 kV, criteria B	
Immunity To Conducted RF Disturbances	IEC/EN 61000-4-6 10 V, criteria A	
Power Frequency Field Immunity	IEC/EN 61000-4-8 30 A/m, criteria A	
Mains Voltage Dips And Interruptions	IEC/EN 61000-4-11 criteria B/C	
Voltage Sag Immunity	SEMI F47 230VAC, criteria B/C	
Environment		
Railway Applications Shock and Vibration	According EN 61373	
Vibration Acc. IEC 60068-2-6-3	3 axis, 2g sine sweep, 10–55Hz, 11 oct/min	
Shock Acc. IEC 60068-2-27	3 axis, 25g half sine, 11ms	
Approvals	CE CB Scheme c UL us UL508 c UL us UL60950-1 ⟨Ex⟩	

RHINO PRO PSH-xx-480 Power Supplies

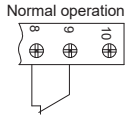
Fig. 1



Identification of Features (Fig.1)	
1	Input Terminal L
2	Input Terminal N
3	Input Terminal GND
4	Output Voltage adjustment potentiometer
5	DC ON LED
6/7	DC OK Contact
8–10	Remote On/Off
11	Output Connection Terminal –
12	Output Connection Terminal –
13	Output Connection Terminal +
14	Output Connection Terminal +

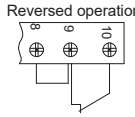
Remote On/Off

Normal operation



ON = open
OFF = closed

Reversed operation



ON = closed
OFF = open

Fig. 4

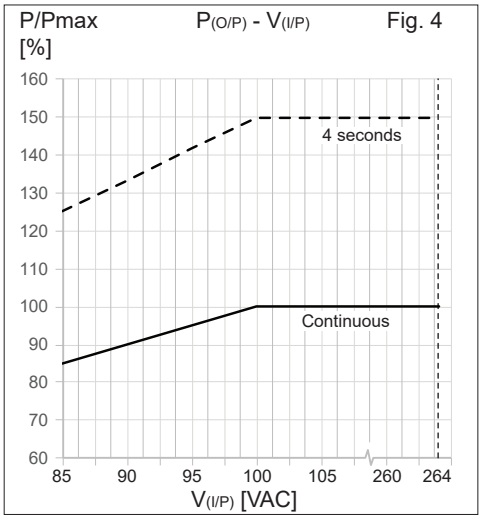


Fig. 2

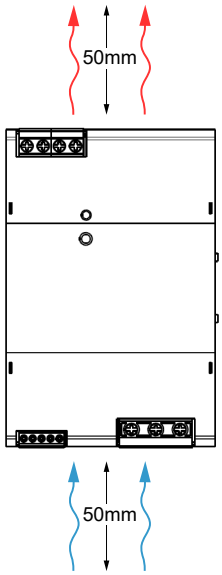
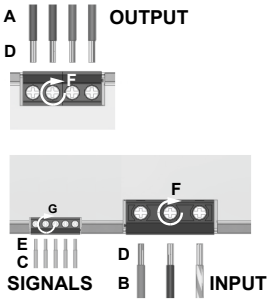


Fig. 3



Wiring Specifications (Fig. 3)		
A	Wire Size, Output	12–10AWG
B	Wire Size, Input	18–10AWG
C	Wire Size, Signal	30–16AWG
D	Strip Length, Input/Output	10mm [0.39 in]
E	Strip Length, Signal	5mm [0.20 in]
F	Tightening Torque, Input/Output	0.7 N·m [6.2 lb·in]
G	Tightening Torque, Signal	0.2 N·m [1.8 lb·in]

Fig. 5