

PSH Series DIN Rail Power Supplies

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.









RHINO PRO PSH Series Specifications Drawing Output Maximum Output **Efficiency** Part Number Price Link Voltage Power [Typ @ 115VAC] PSH-12-080 \$115.00 PDF 12V PSH-24-080 \$108.00 **PDF** 24V 80W 91% \$104.00 48V PSH-48-080 **PDF** 91% \$153.00 PSH-12-120 **PDF** 12V 91% \$139.00 24V 120W PSH-24-120 **PDF** 92% PSH-48-120 \$152.00 PDF 48V 93% PSH-24-240 \$182.00 PDF 24V 93% 240W \$193.00 PDF 48V 94% PSH-48-240 \$273.00 24V PSH-24-480 **PDF** 93%

48V

480W

94%

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

\$286.00

PDF

PSH-48-480



RHINO PRO PSH-xx-080 Power Supplies

| Technical Specifications | | | | |
|--|--|---|--|----------------------------------|
| Part Number | | PSH-12-080 PSH-24-080 PSH-48-080 | | |
| Input (AC) | | | | |
| Nominal In | put Voltage | | 100-240VAC | |
| Nominal In | put Current | | 2-0.9 A | |
| Operationa | al Input Voltage Range | 85–264VAC | | |
| Input Volta | ge Frequency Range | 45–65Hz | | |
| Inrush Cur | rent (115/230 VAC) | 15/30A | | |
| Standby Po | ower Consumption | 0.9/1.45 W [115/230 VAC] | | |
| Active Pow | ver Factor Correction (PFC) | | 0.48/0.48 [115/230 VAC] | |
| Harmonic I | limits – acc. EN 61000-3-2 | | Class A | |
| Circuit Bre | aker Rating / Characteristic | | 6-16 A /B, C [IEC]; 20 A /B, C[USA] | |
| Output (DC) | | | | |
| Max. Outpo | ut Power | | 80W | |
| Output Vol | tage | 12V 24V 48V | | |
| power" wh | ut Current / Max. Output Current 4s ("Boost ich facilitates the activation of stepper lenoids, or actuators) | 6.7 A / 10A | 3.4 A / 5A | 1.7 A / 2.5 A |
| Output Vol | tage Adjustment Range | 11.8–15V 23.5–28V 47.5–56V | | 47.5-56V |
| Typical Eff | iciency (@ 115/230 VAC) | 90/88 % 91/89 % 91/89 % | | 91/89 % |
| Regulation Input Variation Load Variation | | | 0.1 % max. [10–90 %] 0.5 % max. | |
| Output Pov | wer Derating - Temperature | | 2%/K above 60°C | |
| Output Pov | wer Derating - Input Voltage | | 3%/V below 90VAC | |
| Hold-up tin | ne | | 20/160ms min. [115/230 VAC] | |
| Start-up tir | пе | 2s max. | | |
| Ripple and | Noise (20MHz bandwidth) (Note 1) | 100mVp-p max. 100mVp-p max. 200mVp-p max. | | 200mVp-p max. |
| Output Ove | ervoltage Protection (OVP) (Note 2) | 16–19V 32–35V 56–60V | | 56–60V |
| Power Bac | k Immunity (Note 3) | < OVP level | | |
| Operation Nominal Operation Peak Power Operation Constant Current (CC) | | 100% of lout nominal 105–150% of lout nominal 155% of lout 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 | 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. |
| Signal | DC ON | Relay contact closed, max. 1A, < 100mOhm, also indicated by green LED | | |
| | DC OFF | Relay contact open, max 30V | | |
| Notes: | <u> </u> | Total contact open, man our | | |

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.



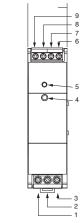
RHINO PRO PSH-xx-080 Power Supplies

| Tec | hnical 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 © 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 | | |
| Radiated RF Field Immunity | | IEC/EN 61000-4-310 V/m, criteria A | 1 | |
| Electrical Fast Transient / Burst Immunity | IEC/EN 61000-4-42 kV, criteria B | | | |
| Surge Immunity | | IEC/EN 61000-4-51 kV/2 kV, criteria | R | |
| 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 | | Appending CN 04070 | | |
| Railway Applications Shock and Vibration | | According EN 61373 | blasia | |
| Vibration Acc. IEC 60068-2-6-3 | 3 axis, 2 g sine sweep, 10–55Hz, 11 oct/min | | | |
| Shock Acc. IEC 60068-2-27 Approvals | CE | 3 axis, 25g half sine, 11ms C B c us c Scheme UL508 UL60950-1 | us Œx | |



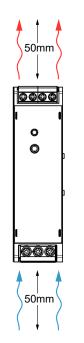
RHINO PRO PSH-xx-080 Power Supplies

Fig. 1



| | dentification 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 – | |

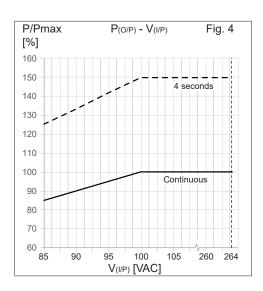
Fig. 2

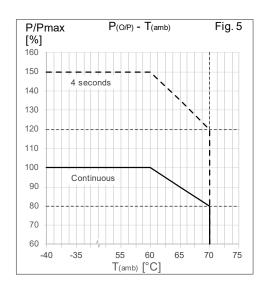




| Wiring Specifications (Fig. 3) | | | | |
|--------------------------------|-------------------|---------------------|--|--|
| Α | Wire Size, Output | 18–10 AWG | | |
| В | Wire Size, Input | 18–10 AWG | | |
| A B C | Strip Length | 10mm [0.39 in] | | |
| D | Tightening Torque | 0.7 N·m [6.2 lb·in]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









RHINO PRO PSH-xx-120 Power Supplies

| Technical Specifications | | | | |
|--|--|--|----------------------------------|--|
| Part Number | PSH-12-120 | <u>PSH-24-120</u> | <u>PSH-48-120</u> | |
| 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 | | 47.5–56 V | |
| Typical Efficiency (@ 115/230 VAC) | 91/93 % 92/94 % 93/94 % | | 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. | | 200mVp-p max. | |
| Output Overvoltage Protection (OVP) (Note 2) | 16–19V 32–35V 56–60V | | 56–60V | |
| Power Back Immunity (Note 3) | < OVP level | | | |
| Operation Nominal Operation Peak Power Operation Constant Current (CC) | | 100% of lout nominal 105–150% of lout nominal 155% of lout 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 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. | |
| Signal 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.



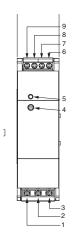
RHINO PRO PSH-xx-120 Power Supplies

| Technical | Specifications (co | ntinued) | | |
|--|---|------------------------------------|-------------------|--|
| Part Number | PSH-12-120 | PSH-24-120 | <u>PSH-48-120</u> | |
| 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 fa | n | |
| 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 © 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 c us c scheme c ulsos c ulsosso-1 | | | |



RHINO PRO PSH-xx-120 Power Supplies

Fig. 1



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

Fig. 2

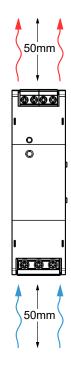
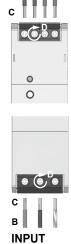


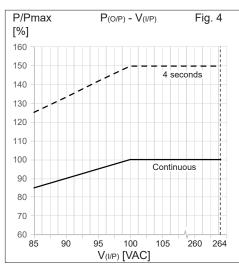
Fig. 3

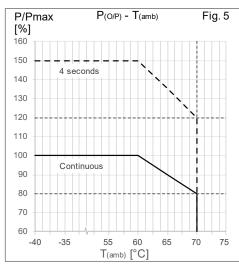


OUTPUT

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









RHINO PRO PSH-xx-240 Power Supplies

| PSH-24-240 PSH-48-240 PSH | Technical Specifications | | | | |
|--|--|---|---------------------|--|--|
| Nominal Input Voltage | | | <u> PSH-48-240</u> | | |
| Section Sect | Input (AC) | | | | |
| SE-264VAC Standby Power Consumption SE-264VAC Standby Power Consumption SE SE SE SE SE SE SE S | Nominal Input Voltage | 100–24 | 10 VAC | | |
| ### Application | Nominal Input Current | 2.89– | 1.27 A | | |
| 15/30A 15/30A 15/30A 15/30A 15/30A 15/30A 15/30A 15/30A 15/30A 15/30 15/230 VAC 15/23 | Operational Input Voltage Range | 85–26 | 4VAC | | |
| Standby Power Consumption 2.3/2.3 W [115/230 VAC] Active Power Factor Correction (PFC) 0.98/0.92 [115/230 VAC] Active Power Factor Correction (PFC) 0.98/0.92 [115/230 VAC] Active Power Factor Correction (PFC) 0.98/0.92 [115/230 VAC] Active Breaker Rating / Characteristic Class A, D Circuit Breaker Rating / Characteristic Coupting to the property of the property | Input Voltage Frequency Range | 45–65Hz | | | |
| Active Power Factor Correction (PFC) Class A, D Circuit Breaker Rating / Characteristic Cutput (DC) Max. Output Power Output Voltage Max. Output Current / Max. Output Current 4s ("Boost power" which facilitates the activation of stepper motors, solenoids, or actuators) Output Voltage Adjustment Range Typical Efficiency (@ 115/230VAC) Regulation nput Variation Output Power Derating - Temperature Output Power Derating - Input Voltage 10.0 98/0.92 [115/230 VAC] Class A, D Clas A Class A, D Class A, D Class A, D Clas A Class A, D Clas | Inrush Current (115/230 VAC) | 15/30A | | | |
| Class A, D Circuit Breaker Rating / Characteristic Cutput (DC) Max. Output Power Output Voltage As Output Current / Max. Output Current 4s ("Boost notors, solenoids, or actuators) Cutput Voltage Adjustment Range Cutput Voltage Adjustment Range Cutput Voltage Adjustment Range Cutput Variation Codd Variation Codd Variation Codd Variation Cutput Power Derating - Temperature Cutput Power Derating - Input Voltage Cutput Voltage Adjustment Range Cutput Power Derating - Input Voltage Cut | Standby Power Consumption | 2.3/2.3 W [115/230 VAC] | | | |
| Circuit Breaker Rating / Characteristic Output (DC) Max. Output Power Output Voltage Max. Output Current / Max. Output Current 4s ("Boost power" which facilitates the activation of stepper motors, solenoids, or actuators) Output Voltage Adjustment Range Output Voltage Adjustment Range Project Efficiency (@ 115/230VAC) Regulation Input Variation Output Power Derating - Temperature Output Power Derating - Input Voltage Output Power Derating - Input Voltage Abold-up time Output include Adjustment Range 34V 48V 48V 48V 48V 48V 48V 48V | Active Power Factor Correction (PFC) | 0.98/0.92 [115/230 VAC] | | | |
| Dutput (DC) Max. Output Power Dutput Voltage Max. Output Current / Max. Output Current 4s ("Boost bower" which facilitates the activation of stepper motors, solenoids, or actuators) Dutput Voltage Adjustment Range Dutput Voltage Adjustment Range Typical Efficiency (@ 115/230VAC) Regulation Input Variation Coutput Power Derating - Temperature Dutput Power Derating - Input Voltage Advisor Delay (Delay (| Harmonic limits – acc. EN 61000-3-2 | Class | A, D | | |
| Max. Output Power Output Voltage 24V 48V Max. Output Current / Max. Output Current 4s ("Boost power" which facilitates the activation of stepper notors, solenoids, or actuators) Output Voltage Adjustment Range 23.5–28 V 47.5–56 V Typical Efficiency (@ 115/230VAC) Regulation Input Variation Input Variation Input Variation Input Variation Input Power Derating - Temperature Output Power Derating - Input Voltage Addition Typical Efficiency Input Variation Input Varia | Circuit Breaker Rating / Characteristic | 6-16 A /B, C [IEC]; | ; 20 A /B, C [USA] | | |
| Dutput Voltage Max. Output Current / Max. Output Current 4s ("Boost power" which facilitates the activation of stepper motors, solenoids, or actuators) Dutput Voltage Adjustment Range 23.5–28 V 47.5–56 V Typical Efficiency (@ 115/230VAC) Regulation Input Variation Load Variation Dutput Power Derating - Temperature Dutput Power Derating - Input Voltage Hold-up time 24V 48V 48V 48V 48V 48V 48V 48V | Output (DC) | | | | |
| Max. Output Current / Max. Output Current 4s ("Boost bower" which facilitates the activation of stepper motors, solenoids, or actuators) Output Voltage Adjustment Range 23.5–28 V 47.5–56 V Typical Efficiency (@ 115/230VAC) Regulation nput Variation Output Power Derating - Temperature Output Power Derating - Input Voltage Hold-up time 10A / 15A 5A / 7.5 A 5A / 7.5 | Max. Output Power | 240 | DW . | | |
| power" which facilitates the activation of stepper motors, solenoids, or actuators) Dutput Voltage Adjustment Range 23.5–28 V 47.5–56 V Typical Efficiency (@ 115/230VAC) Regulation nput Variation Load Variation Dutput Power Derating - Temperature Dutput Power Derating - Input Voltage Addition 10A / 15A 5A / 7.5 A 47.5–56 V 93/95 % 94/95 % 0.1 % max. [10–90 %] 0.5 % max. 2%/K above 60°C, refer to Fig. 5 2%/K above 60°C, refer to Fig. 4 20 ms min. | Output Voltage | 24V | 48V | | |
| Typical Efficiency (@ 115/230VAC) 93/95 % 94/95 % Regulation input Variation coad 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. | Max. Output Current / Max. Output Current 4s ("Boost power" which facilitates the activation of stepper motors, solenoids, or actuators) | | 5A / 7.5 A | | |
| Regulation nput Variation .coad Variation .toad Variation .toa | Output Voltage Adjustment Range | 23.5–28 V | 47.5–56 V | | |
| nput Variation Output Power Derating - Temperature Dutput Power Derating - Input Voltage Hold-up time 0.1 % max. [10–90 %] 0.5 % max. 2 %/K above 60°C, refer to Fig. 5 3 %/V below 90 VAC, refer to Fig. 4 20 ms min. | Typical Efficiency (@ 115/230VAC) | 93/95 % | 94/95 % | | |
| Output Power Derating - Input Voltage 3%/V below 90 VAC, refer to Fig. 4 Hold-up time 20 ms min. | Regulation Input Variation Load Variation | | | | |
| Hold-up time 20 ms min. | Output Power Derating - Temperature | 2%/K above 60° | C, refer to Fig. 5 | | |
| | Output Power Derating - Input Voltage | 3%/V below 90 VA | AC, refer to Fig. 4 | | |
| Start-up time 2s max. | Hold-up time | 20 ms | s min. | | |
| | Start-up time | 2s n | nax. | | |
| Ripple and Noise (20MHz bandwidth) (Note 1) 100 mVp-p max. 200 mVp-p 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 | Output Overvoltage Protection (OVP) (Note 2) | 32–35V | 56–60V | | |
| Power Back Immunity (Note 3) < OVP level | Power Back Immunity (Note 3) | < OVP level | | | |
| Nominal Operation 100% of lout nominal 105–150% of lout nominal | Operation Nominal Operation Peak Power Operation Constant Current (CC) | 105–150% of lout nominal | | | |
| Threshold > 105 % CC or Peak Operation Timer 4s max. [switch off] | Duty Cycle (for peak and cc mode) (Note 4) Threshold CC or Peak Operation Timer Normal Operation / Off Period | 4s max. [switch off] | | | |
| Short Circuit Protection Switch off after 4s delay, automatic restart (Note 4) | Short Circuit Protection | | | | |
| Threshold for Vout ON: | Threshold for Vout | 1 - 71 | . 71 | | |
| | | Relay contact closed, max. 1A, < 100mOhm, also indicated by green LED | | | |
| DC OFF Relay contact open, max 30V | 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.



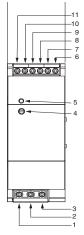
RHINO PRO PSH-xx-240 Power Supplies

| Technical S | Technical Specifications (continued) | | | | |
|--|---|--|--|--|--|
| | <u>PSH-24-240</u> | | | | |
| 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 Il 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 | | | | | |
| 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 c us c us | | | | |

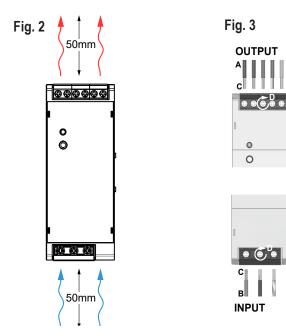


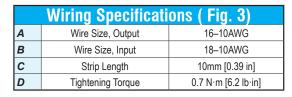
RHINO PRO PSH-xx-240 Power Supplies

Fig. 1

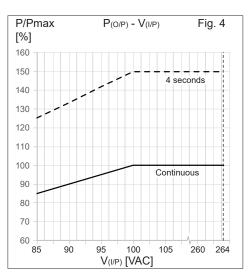


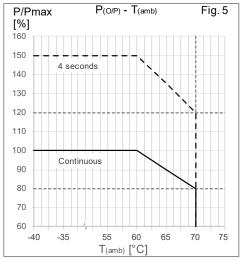
| | Identification of Features (Fig.1) | |
|-----|---|--|
| 1 | Input Terminal L | |
| 2 | Input Terminal N | |
| 3 | Input Terminal GND | |
| 4 | Output Voltage adjustment potentiometer | |
| 5 | DC ON LED | |
| 6/7 | DC OK Contact | |
| 8 | Output Connection Terminal + | |
| 9 | Output Connection Terminal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













RHINO PRO PSH-xx-480 Power Supplies

| Technical Specifications | | | | |
|--|--|-----------------------------------|--|--|
| Part Number | PSH-24-480 | <u>PSH-48-480</u> | | |
| 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 | 4 | 5–65Hz | | |
| Inrush Current (115/230 VAC) | · | 15/30A | | |
| Standby Power Consumption | 4.8/3.8 W | 4.8/3.8 W [115/230 VAC] | | |
| Active Power Factor Correction (PFC) | 0.99/0.97 | 0.99/0.97[115/230 VAC] | | |
| Harmonic limits – acc. EN 61000-3-2 | CI | ass A, D | | |
| Circuit Breaker Rating / Characteristic | 6-16 A /B, C[IE | EC]; 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 Load Variation | 0.1 % max. [10–90 %] 0.5 % max. | | | |
| Output Power Derating - Temperature | 2%/K above 6 | 60°C, refer to Fig. 5 | | |
| Output Power Derating - Input Voltage | | O VAC, refer to Fig. 4 | | |
| Hold-up time | 20 | Oms 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 Operation Constant Current (CC) | 100% of lout nominal 105–150% of lout nominal 155% of lout 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 | **** | ay, automatic restart (Note 4) | | |
| Threshold for Vout | ON: > 22.5 V typ. OFF: < 21.5 V typ. | ON: > 45V typ. OFF: < 43V typ. | | |
| Signal DC ON | Relay contact closed, max. 1A, < 100mOhm, also indicated by green LED | | | |
| DC OFF | Relay conta | act 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.



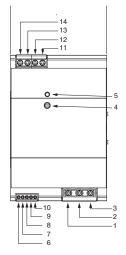
RHINO PRO PSH-xx-480 Power Supplies

| 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 ⊚ 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 culsos cases us 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



Fig. 2

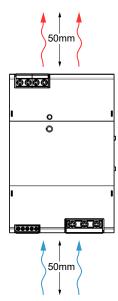
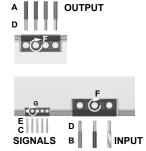


Fig. 3



| Wiring Specifications (Fig. 3) | | |
|---------------------------------|---------------------------------|---------------------|
| Α | Wire Size, Output | 12–10AWG |
| В | Wire Size, Input | 18–10AWG |
| С | 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] |



