



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.



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

| DIN Rail Power Supplies | | | | | |
|----------------------------|------------|---------------------|----------------|----------------------|---------------------------|
| Part Number | Price | Drawing Link | Output Voltage | Maximum Output Power | Efficiency [Typ @ 115VAC] |
| PSH-12-080 | \$02eus: | PDF | 12V | 80W | 90% |
| PSH-24-080 | \$,-028j: | PDF | 24V | | 91% |
| PSH-48-080 | \$02euu: | PDF | 48V | | 91% |
| PSH-12-120 | \$,-02eut: | PDF | 12V | 120W | 91% |
| PSH-24-120 | \$028k0: | PDF | 24V | | 92% |
| PSH-48-120 | \$02euv: | PDF | 48V | | 93% |
| PSH-24-240 | \$028k1: | PDF | 24V | 240W | 93% |
| PSH-48-240 | \$02eux: | PDF | 48V | | 94% |
| PSH-24-480 | \$028k2: | PDF | 24V | 480W | 93% |
| PSH-48-480 | \$02euy: | PDF | 48V | | 94% |



PSH-xx-080



PSH-xx-120



PSH-xx-240



PSH-xx-480



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 | | 0.1 % max. | | | |
| Input Variation | | [10–90 %] 0.5 % max. | | | |
| Load Variation | | | | | |
| 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 | | 100% of Iout nominal | | | |
| Peak Power Operation | | 105–150% of Iout nominal | | | |
| Constant Current (CC) | | 155% of Iout nominal | | | |
| Duty Cycle (for peak and cc mode) (Note 4) | | > 105 % | | | |
| Threshold | | 4s max. [switch off] | | | |
| CC or Peak Operation Timer | | < 6s typ [automatic restart after switch off or peak and cc operation timer reset] | | | |
| Normal Operation / Off Period | | | | | |
| 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:

- 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.
- 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.
- 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.
- 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

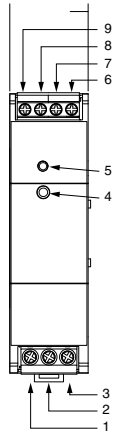
| Technical Specification (continued) | | | |
|--|---|------------|------------|
| Part Number | PSH-12-080 | PSH-24-080 | PSH-48-080 |
| General Data | | | |
| Weight g [oz] | 367 [12.95] | | |
| Leakage Current (max.) | 0.75 mA | | |
| Network Configuration | TN-S, TN-C, TT, IT | | |
| Enclosure Material (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 Ⓢ 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 | <div>CE CB cULus cRUus Ex</div> <div>Scheme UL508 UL60950-1</div> | | |



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

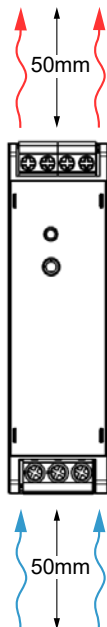
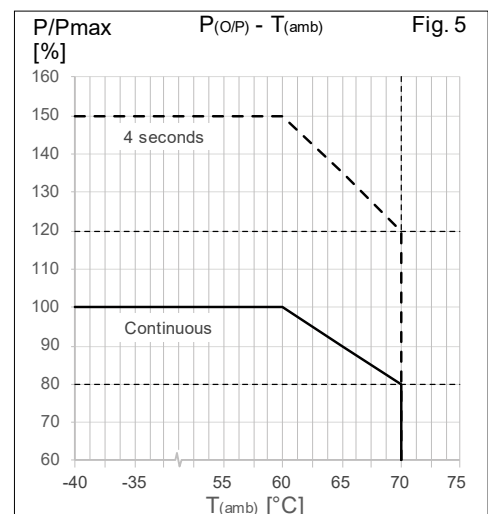
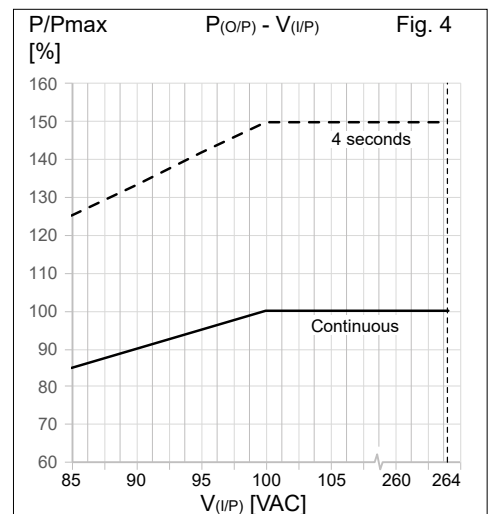


Fig. 3



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:

- 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.
- 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.
- 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.
- 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

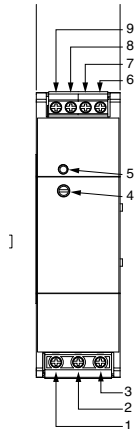
Power Supplies

| Technical Specifications (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 Ⓢ 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 | <div>CE CB cULus cULus EEx</div> <div>Scheme ILL508 ILL60950-1</div> | | |



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

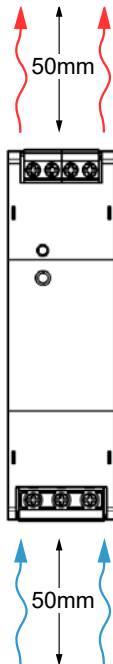
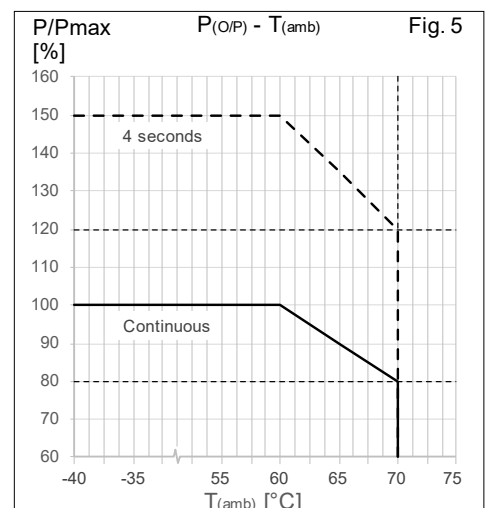
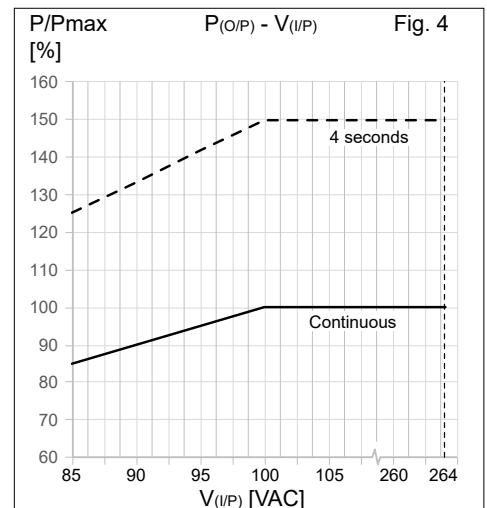


Fig. 3



| 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] |





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 | | 0.1 % max. | |
| Input Variation | | [10–90 %] 0.5 % max. | |
| Load Variation | | | |
| 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 | | 100% of Iout nominal | |
| Peak Power Operation | | 105–150% of Iout nominal | |
| Constant Current (CC) | | 155% of Iout nominal | |
| Duty Cycle (for peak and cc mode) (Note 4) | | | |
| Threshold | | > 105 % | |
| CC or Peak Operation Timer | | 4s max. [switch off] | |
| Normal Operation / Off Period | | < 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:

- 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.
 - 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.
 - 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.
 - 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

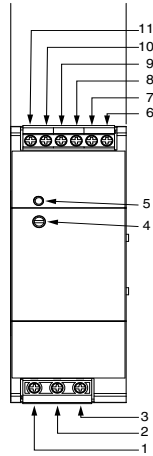
Power Supplies

| Technical 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 Ⓢ 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 | <div>CECBcULUSUL508UL60950-1</div> <div>ULUSUL60950-1</div> <div>Ex</div> | |



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 - |

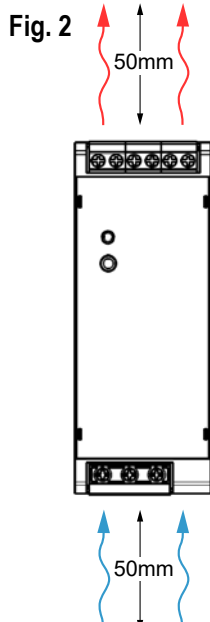
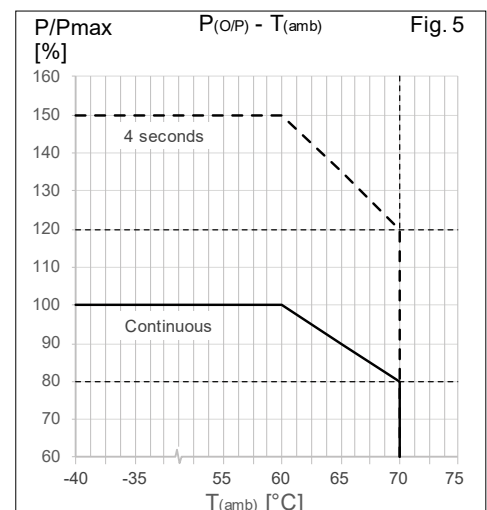
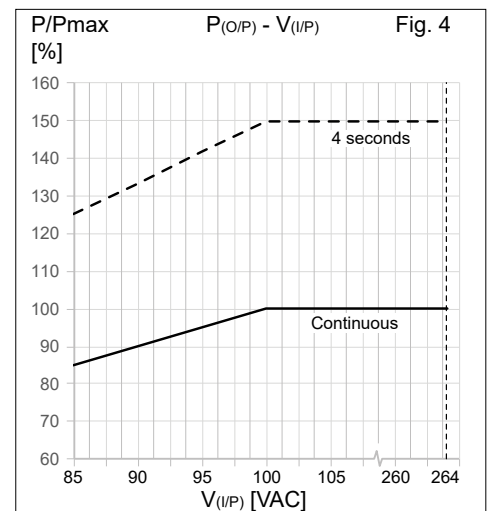


Fig. 3



| 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 | 100% of Iout nominal | | | |
| | Peak Power Operation | 105–150% of Iout nominal | | | |
| | Constant Current (CC) | 155% of Iout nominal | | | |
| Duty Cycle (for peak and cc mode) (Note 4) | | > 105 % | | | |
| Threshold | | 4s max. [switch off] | | | |
| CC or Peak Operation Timer | | < 10s typ [automatic restart after switch off or peak and cc operation timer reset] | | | |
| Normal Operation / Off Period | | Switch off after 4s delay, automatic restart (Note 4) | | | |
| Short Circuit Protection | | Switch off after 4s delay, automatic restart (Note 4) | | | |
| DC OK Signal | Threshold for Vout | ON: | > 22.5 V typ. | ON: | > 45V typ. |
| | | OFF: | < 21.5 V 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)

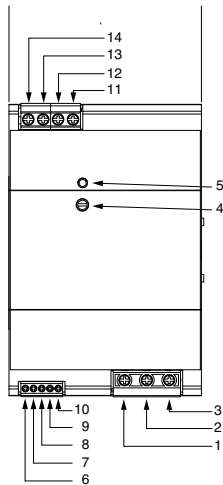
| Part Number | PSH-24-480 | PSH-48-480 |
|--|---|------------|
| General Data | | |
| Weight g [oz] | 1018 [35.91] | |
| Leakage Current (max.) | 2.3 mA | |
| Network Configuration | TN-S, TN-C, TT, IT | |
| Enclosure Material (Chassis/Cover) | Aluminum / Stainless Steel | |
| Cooling | Convection cooling, 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 Ⓢ 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 | <div>CE CB cULus cRUus Ex</div> <div>Scheme UL508 UL60950-1</div> | |



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 + |

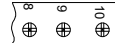
Remote On/Off

Normal operation



ON = open
OFF = closed

Reversed operation



ON = closed
OFF = open



Fig. 2

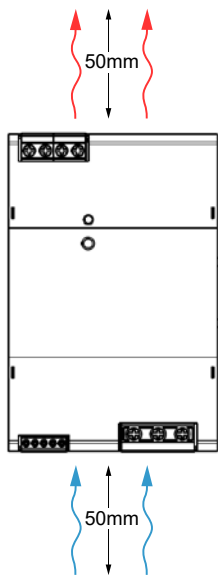
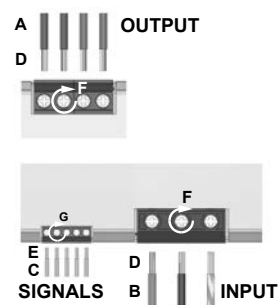


Fig. 3



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] |

