RHINO PSV Series DIN Rail Power Supplies

Economical Power Supplies

Highlights and Features

15-100W Models

- Ultra-compact size
- Up to 89% efficiency and built-in active PFC
- Universal AC input voltage
- Full power from -10°C to +55°C
- Low earth leakage current < 0.5 ma @ 264VAC
- Extreme low temperature cold start at -40°C
- NEC Class 2 / Limited Power Source (LPS) certified
- Plastic housing
- UL/cUL 508
- UL/cUL Recognized 60950-1
- CE
- Three year warranty

120-480W Models

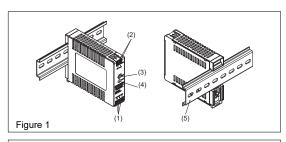
- Universal AC input voltage
- Built-in constant current circuit for reactive loads
- Up to 89% efficiency
- Full power from −10°C to +50°C
- Compliance to SEMI F47 @ 200VAC voltage sag immunity
- Metal housing
- UL/cUL 508
- UL/cUL Recognized 60950-1
- CE
- Three year warranty

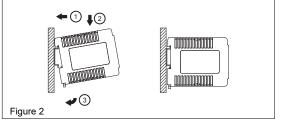


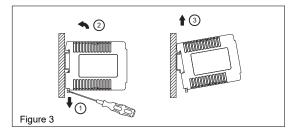


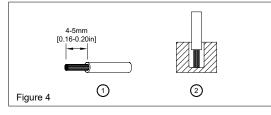
| | PSV Series Specifications | | | | | | |
|------------|---------------------------|-------------------|-------------------------|------------------------------|--|--|--|
| Part No. | Price | Output Voltage | Maximum Output Power | Efficiency (Typ @ 115VAC) | | | |
| PSV5-15S | | 5V | 15W | 79% | | | |
| PSV5-25S | | 5V | 25W | 82% | | | |
| PSV12-50S | | 12V | 48W | 88% | | | |
| PSV24-30S | | 24V | 30W | 87.5% | | | |
| PSV24-50S | | 24V | 50W | 89% | | | |
| PSV24-100S | | 24V | 91.2 W | 87% | | | |
| PSV24-120S | | 24V | 120W | 85% | | | |
| PSV24-240S | | 24V | 240W | 88% | | | |
| PSV24-480S | | 24V | 480W | 85% | | | |
| PSV48-120S | | 48V | 120W | 89% | | | |

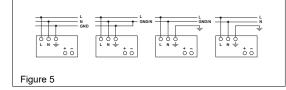
RHINO PSV5-15S Power Supply

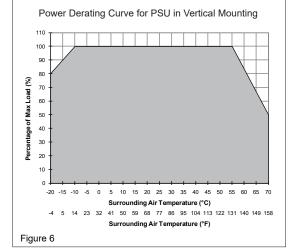












READ INSTRUCTIONS BEFORE INSTALLING OR OPERATING THIS DEVICE. KEEP FOR FUTURE REFERENCE.

1. Safety instructions

- Switch main power off before connecting or disconnecting the device. Risk of explosion!
- To guarantee sufficient convection cooling, please keep a distance of >40mm above and >20mm below the device as well as a lateral distance of >15mm to other cold source or heat source.
- Note that the enclosure of the device can become very hot depending on the ambient temperature and load of the power supply. Risk of burns!
- The main power must be turned off before connecting or disconnecting wires to the terminals!
- Do not introduce any objects into the unit!
 Dangerous voltage present for at least 5 minutes after disconnecting all sources of power.
- Dangerous voltage present for at least 5 minutes after disconnecting all sources of power.
 The power supplies are built-in units and must be installed in a cabinet or room (condensation)
- free environment and indoor location) that is relatively free of conductive contaminants.
- The unit must be installed in an IP54 enclosure or cabinet in the final installation.

CAUTION: FOR USE IN A CONTROLLED ENVIRONMENT.

- 2. Device description (Fig. 1)
 - (1) Input terminal block connector
 - (2) Output terminal block connector
 - (3) DC voltage adjustment potentiometer
 - (4) DC OK LED (green)
 - (5) Universal mounting rail system
- 3. Mounting (Fig. 2)

The power supply unit can be mounted on 35mm DIN rails in accordance with EN60715. The device should be installed with input terminal block on the bottom.

Each device is delivered ready to install.

Snap on the DIN rail as shown in Fig. 2:

- 1. Tilt the unit slightly upwards and put it onto the DIN rail.
- Push downwards until stopped.
- 3. Press against the bottom front side for locking.
- 4. Shake the unit slightly to ensure that it is secured.

4. Dismounting (Fig. 3)

To uninstall, use a flat screwdriver to pull or slide down the latch as shown in Fig. 3. Then slide the PSU in the opposite direction, release the latch and pull out the PSU from the rail.

5. Connection

The terminal block connectors allow easy and fast wiring.

You can use flexible (stranded wire) or solid cables with cross sections:

| Electrical Connections and Wire Size | | | | |
|--------------------------------------|----------|-----------|------|-------|
| | Strande | d / Solid | Tor | que |
| | mm² | AWG | N·m | lb•in |
| Input | 0.32-3.3 | 22-12 | 0.51 | 4.5 |
| Output | 0.52-3.3 | 20-12 | 0.51 | 4.5 |

To secure reliable and shock proof connections, the stripping length should be 4-5mm (see Fig. 4 (1)). Please ensure that wires are fully inserted into the connecting terminals as shown in Fig. 4 (2).

In accordance to EN60950 / UL60950, flexible cables require ferrules

Use appropriate copper cables that are designed to sustain operating temperature of at least 60°C/75°C for USA or at least 90°C for Canada.

5.1. Input connection (Fig. 1, Fig. 5)

Use L, N and GND connections of input terminal connector (see Fig. 1 (1)) to establish the 100-240 VAC connection. Typical connection methods are shown in Figure 5.

The unit is protected with an internal fuse (not replaceable) at L pin and it has been tested and approved on 20A (UL) and 16A (IEC) branch circuits without additional protection device. An external protection device is only required if the supplying branch has an ampacity greater than above. Thus, if an external protective device is necessary, or utilized, a minimum value of 10A B- or 6A C- characteristic breaker should be used.

The internal fuse must not be replaced by the user.

5.2. Output connection (Fig. 1 (2))

Use the "+" and "-" screw connections to establish the 5VDC connection. The output provides 5VDC. The output voltage can be adjusted from 5 to 5.5 VDC on the potentiometer. The green LED DC OK displays correct function of the output (Fig. 1 (4)). The device has a short circuit and overload protection and an overvoltage protection limited to 6.325-7.425 VDC.

5.3. Output characteristic curve

The device functions normal under operating line and load conditions. In the event of a short circuit or overload the output voltage and current collapses ($I_0 = 110-150\%$). The secondary voltage is reduced and bounces until short circuit or overload on the secondary side has been removed.

5.4. Thermal behavior (Fig. 6)

- In the case of ambient temperatures:
 - 1. At -10°C to -20°C [14°F to -4°F], the output capacity has to be reduced by 2% per degree Celsius increase in temperature.
 - Above +55°C [131°F], the output capacity has to be reduced by 3.33% per degree Celsius increase in temperature.

If the output capacity is not reduced when $T_{Amb} > 55^{\circ}C$ [131°F], the device will engage thermal protection by switching off, i.e., the output voltage will go into latch-off mode until the component temperature cools down and the AC power is recycled.

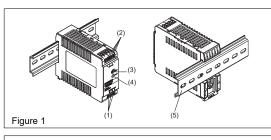
FOR TECHNICAL ASSISTANCE CALL

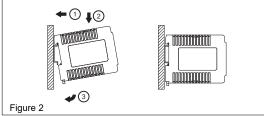
tPWR-71 Power Supplies

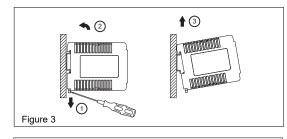
RHINO PSV5-15S Power Supply

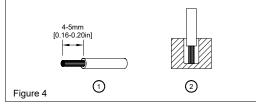
| | Technical Specifications |
|--|--|
| Input (AC) | |
| Nominal input voltage / frequency | 100-240 VAC / 50-60 Hz |
| Voltage range | 85-264 VAC |
| | 47-63 Hz |
| Frequency Nominal current | 4/-05 hz < 0.5 A @ 115VAC, < 0.3 A @ 230VAC |
| Inrush current limitation (+25°C, cold start) | < 35A @ 115VAC, < 65A @ 230VAC |
| | 20ms typ. @ 115VAC (100% load) |
| Mains buffering at nominal load (typ.) | 100ms typ. @ 230VAC (100% load) |
| Turn-on time | < 3s @ 115VAC, < 1.5 s @ 230VAC (100% load) |
| Internal fuse | T 3.15 A / 250V (non-replaceable) |
| Recommended backup protection | 10A B- or 6A C- characteristic circuit breaker |
| Leakage current | < 1mA @ 240VAC |
| Output (DC) | |
| Nominal output voltage U _N / tolerance | 5VDC ± 2 % |
| Voltage adjustment range | 5-5.5 VDC (maximum power \leq 15W) |
| Nominal current | 3A |
| Derating | Refer to Fig. 6 -10°C to -20°C (2% /°C) > 55°C (3.33% /°C) in vertical orientation |
| Startup with capacitive loads | -10°C to -20°C (2%/°C), > 55°C (3.33%/°C) in vertical orientation Max. 3.000µF |
| Max. power dissipation idling / nominal load approx. | 0.3 W / 4 W |
| Efficiency at 100% load | 78.0% typ. @ 115VAC, 79.0% typ. @ 230VAC |
| PARD (20MHz) at 100% load | 70.0 % typ. @ 1104A0, 190 % typ. @ 2004A0 < 75 mVpp |
| General Data | |
| Type of housing | Plastic (PC), enclosed |
| LED signals | Green LED DC OK |
| MTBF | > 350.000 hrs. as per Telcordia |
| Dimensions (L x W x H) | 75mm x 21mm x 89.5 mm [2.95 in x 0.83 in x 3.52 in] (See for complete engineering drawings.) |
| Weight | 0.11 kg [3.9 oz] |
| Connection method | Screw connection |
| Stripping length | 4-5mm [0.16-0.20 in] |
| Operating temperature (surrounding air temperature) | -20°C to +70°C [-4°F to +158°F] (Refer to Fig. 6) |
| Storage temperature | -40°C to +50°C [-40°F to +136°F] |
| Humidity at +25°C, no condensation | 5 to 95% RH |
| | Operating: IEC60068-2-6, Sine Wave: 10Hz to 500Hz @ 19.6m/s ² ; displacement of 0.35 mm, 60min per axis for all X, Y, Z |
| Vibration | directions |
| | Non-Operating: IEC60068-2-6, Random: 5Hz to 500Hz (2.09 Grms); 20 min. per axis for all X, Y, Z directions Operating: IEC60068-2-27, Half Sine Wave: 10G for a duration of 11ms, shock for 1 direction (X axis) |
| Shock | Non-Operating: IEC60068-2-27, Half Sine Wave: 50G for a duration of 11ms, 3 shock for a direction (X axis) |
| Pollution degree | 2 |
| Altitude (operating) | 2000m |
| Certification and Standards | |
| Safety entry low voltage | SELV (EN60950) |
| Electrical safety (of information technology equipment) | UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 60950-1 (File No. E198298), CB scheme to IEC60950-1, |
| | Limited Power Source (LPS) |
| Industrial control equipment | UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) |
| Class 2 power supply | UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) |
| CE | In conformance with EMC directive 2014/30/EU and Low Voltage Directive 2014/35/EU |
| Component power supply for general use | EN61204-3 EN55024, EN61000-6-1, EN61000-6-2 |
| Immunity | (EN61000-4-2, 3, 4, 5, 6, 8, 11) |
| Emission | EN55032, EN55011, EN61000-3-3, EN61000-6-3, EN61000-6-4 |
| C | E C LISTED LISTED LISTED LISTED LISTED LISTED LISTED LISTED E198298 |
| RoHS Compliant | Yes |
| Safety and Protection | |
| Surge voltage protection against internal surge voltages | No |
| Isolation voltage: | |
| Input / output | 3kVAC |
| Input / PE Output / PE | 3kVAC 0.5 kVAC |
| Protection degree | IP20 |
| Safety class | Class I with PE connection |
| outory olass | Class F With E Confidenci |

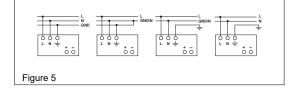
RHINO PSV5-25S Power Supply

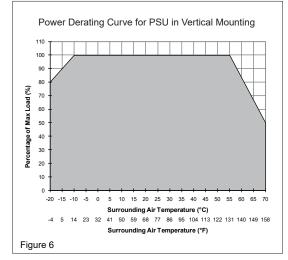












READ INSTRUCTIONS BEFORE INSTALLING OR OPERATING THIS DEVICE. **KEEP FOR FUTURE REFERENCE.**

1. Safety instructions

- Switch main power off before connecting or disconnecting the device. Risk of explosion!
- To guarantee sufficient convection cooling, please keep a distance of >40mm above and >20mm below the device as well as a lateral distance of >15mm to other cold source. In case the adjacent device is a heat source, the lateral distance will be >25mm.
- Note that the enclosure of the device can become very hot depending on the ambient temperature and load of the power supply. Risk of burns!
- The main power must be turned off before connecting or disconnecting wires to the terminals!
- Do not introduce any objects into the unit!
- Dangerous voltage present for at least 5 minutes after disconnecting all sources of power.
- The power supplies are built-in units and must be installed in a cabinet or room (condensation free environment and indoor location) that is relatively free of conductive contaminants.
- The unit must be installed in an IP54 enclosure or cabinet in the final installation.
- CAUTION: FOR USE IN A CONTROLLED ENVIRONMENT.

2. Device description (Fig. 1)

- (1) Input terminal block connector
- Output terminal block connector (2) (3)
- DC voltage adjustment potentiometer
- (4) DC OK LED (green)
- (5) Universal mounting rail system

3. Mounting (Fig. 2)

The power supply unit can be mounted on 35mm DIN rails in accordance with EN60715. The device should be installed with input terminal block on the bottom.

Each device is delivered ready to install.

- Snap on the DIN rail as shown in Fig. 2:
 - 1. Tilt the unit slightly upwards and put it onto the DIN rail.
 - 2. Push downwards until stopped.
 - 3. Press against the bottom front side for locking.
 - 4. Shake the unit slightly to ensure that it is secured.
- 4. Dismounting (Fig. 3)

To uninstall, use a flat screwdriver to pull or slide down the latch as shown in Fig. 3. Then slide the PSU in the opposite direction, release the latch and pull out the PSU from the rail.

5. Connection

The terminal block connectors allow easy and fast wiring.

You can use flexible (stranded wire) or solid cables with cross sections:

| Electrical Connections and Wire Size | | | | |
|--------------------------------------|-------------------------|-------|------|-------|
| | Stranded / Solid Torque | | | |
| | mm² | AWG | N·m | lb-in |
| Input | 0.32-3.3 | 22-12 | 0.51 | 4.5 |
| Output | 0.82-3.3 | 18-12 | 0.51 | 4.5 |

To secure reliable and shock proof connections, the stripping length should be 4-5mm (see Fig. 4 (1)). Please ensure that wires are fully inserted into the connecting terminals as shown in Fig. 4 (2).

In accordance to EN60950 / UL60950, flexible cables require ferrules.

Use appropriate copper cables that are designed to sustain operating temperature of at least 60°C/75°C for USA or at least 90°C for Canada.

5.1. Input connection (Fig. 1, Fig. 5)

Use L, N and GND connections of input terminal connector (see Fig. 1 (1)) to establish the 100-240 VAC connection. Typical connection methods are shown in Figure 5.

The unit is protected with an internal fuse (not replaceable) at L pin and it has been tested and approved on 20A (UL) and 16A (IEC) branch circuits without additional protection device. An external protection device is only required if the supplying branch has an ampacity greater than above. Thus, if an external protective device is necessary, or utilized, a minimum value of 20A B- or 10A C- characteristic breaker should be used.



The internal fuse must not be replaced by the user.

Use the "+" and "-" screw connections to establish the 5VDC connection. The output provides 5VDC. The output voltage can be adjusted from 5 to 5.5 VDC on the potentiometer. The green LED DC OK displays correct function of the output (Fig. 1 (4)). The device has a short circuit and overload protection and an overvoltage protection limited to 6.325-7.425 VDC.

5.3. Output characteristic curve

The device functions normal under operating line and load conditions. In the event of a short circuit or overload the output voltage and current collapses (I₀ = 110-160%). The secondary voltage is reduced and bounces until short circuit or overload on the secondary side has been removed.

5.4. Thermal behavior (Fig. 6)

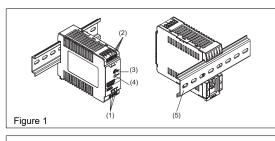
- In the case of ambient temperatures:
 - 1. At -10°C to -20°C [14°F to -4°F], the output capacity has to be reduced by 2% per degree Celsius increase in temperature
 - 2. Above +55°C [131°F], the output capacity has to be reduced by 3.33% per degree Celsius increase in temperature.

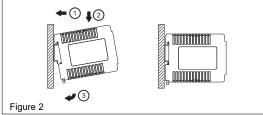
If the output capacity is not reduced when T_{Amb} > 55°C [131°F], the device will engage thermal protection by switching off, i.e., the output voltage will go into latch-off mode until the component temperature cools down and the AC power is recycled.

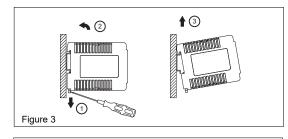
RHINO PSV5-25S Power Supply

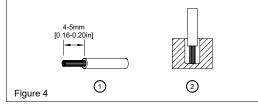
| Technical Specifications | | | | |
|--|--|--|--|--|
| Input (AC) | | | | |
| Nominal input voltage / frequency | 100-240 VAC / 50-60 Hz | | | |
| Voltage range | 85-264 VAC | | | |
| Frequency | 47-63 Hz | | | |
| Nominal current | < 0.8 A @ 115VAC, < 0.5 A @ 230VAC | | | |
| Inrush current limitation (+25°C, cold start) | < 35A @ 115VAC, < 60A @ 230VAC | | | |
| | 20ms typ. @ 115VAC (100% load) | | | |
| Mains buffering at nominal load (typ.) | 100ms typ. @ 230VAC (100% load) | | | |
| Turn-on time | < 3s @ 115VAC, < 1.5 s @ 230VAC (100% load) | | | |
| Internal fuse | T 3.15 A / 250V (non-replaceable) | | | |
| Recommended backup protection | 20A B- or 10A C- characteristic circuit breaker | | | |
| Leakage current | < 1mA @ 240VAC | | | |
| Output (DC) | | | | |
| Nominal output voltage U _N / tolerance | 5VDC ± 2 % | | | |
| Voltage adjustment range | 5-5.5 VDC (maximum power ≤ 25W) | | | |
| Nominal current | 54 | | | |
| Derating | Refer to Fig. 6 -10°C to -20°C (2%/°C), > 55°C (3.33%/°C) in vertical orientation | | | |
| Startup with capacitive loads | Max. 3,000µF | | | |
| Max. power dissipation idling / nominal load approx. | 0.4 W / 8 W | | | |
| Efficiency at 100% load | 79.0% typ. @ 115VAC, 80.0% typ. @ 230VAC | | | |
| PARD (20MHz) at 100% load | < 75 mVpp | | | |
| General Data | | | | |
| Type of housing | Plastic (PC), enclosed | | | |
| LED signals | Green LED DC OK | | | |
| MTBF | > 350,000 hrs. as per Telcordia | | | |
| Dimensions (L x W x H) | 75mm x 30mm x 89.5 mm [2.95 in x 1.18 in x 3.52 in] (See for complete engineering drawings.) | | | |
| Weight | 0.16 kg [5.6 oz] | | | |
| Connection method | Screw connection | | | |
| Stripping length | 4-5mm [0.16-0.20 in] | | | |
| | | | | |
| Operating temperature (surrounding air temperature) | -20°C to +70°C [-4°F to +158°F] (Refer to Fig. 6) | | | |
| Storage temperature | -40°C to +85°C [-40°F to +185°F] | | | |
| Humidity at +25°C, no condensation | 5 to 95% RH Operating: IEC60068-2-6, Sine Wave: 10Hz to 500Hz @ 19.6m/s ² , displacement of 0.35 mm, 60min per axis for all X, Y, Z | | | |
| Vibration | directions Non-Operating: IEC60068-2-6, Random: 5Hz to 500Hz (2.09 Grms); 20 min. per axis for all X, Y, Z directions | | | |
| Shock | Operating: IEC60068-2-27, Half Sine Wave: 10G for a duration of 11ms, shock for 1 direction (X axis) Non-Operating: IEC60068-2-27, Half Sine Wave: 50G for a duration of 11ms, 3 shocks for each 3 directions | | | |
| Pollution degree | 2 | | | |
| Altitude (operating) | 2000m | | | |
| Certification and Standards | | | | |
| Safety entry low voltage | SELV (EN60950) | | | |
| Electrical safety (of information technology equipment) | UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 60950-1 (File No. E198298), CB scheme to IEC60950-1, Limited Power Source (LPS) | | | |
| Industrial control equipment | UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) | | | |
| Class 2 power supply | UL/C-UL listed to UL506 and CSA C22.2 No.107.1-01 (File No. E197592) | | | |
| CE | | | | |
| CE Component power supply for general use | In conformance with EMC directive 2014/30/EU and Low Voltage Directive 2014/35/EU EN61204-3 | | | |
| | EN01204-3 EN05024, EN61000-6-1, EN61000-6-2 | | | |
| Immunity | (EN61000-4-2, 3, 4, 5, 6, 8, 11) | | | |
| Emission | EN55032, EN55011, EN61000-3-3, EN61000-6-3, EN61000-6-4 | | | |
| C | C C LISTED LISTE | | | |
| RoHS Compliant | Yes | | | |
| Safety and Protection | | | | |
| Surge voltage protection against internal surge voltages | No | | | |
| Isolation voltage: | | | | |
| Input / output | 3kVAC | | | |
| Input / PE Output / PE | 3kVAC 0.5 kVAC | | | |
| Protection degree | IP20 | | | |
| Safety class | Class I with PE connection | | | |
| Outory olado | Grass T WILLT E CONTROLLION | | | |

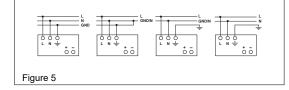
RHINO PSV12-50S Power Supply

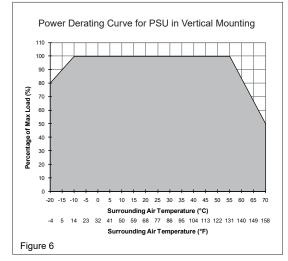












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1. Safety instructions

- Switch main power off before connecting or disconnecting the device. Risk of explosion!
- To guarantee sufficient convection cooling, please keep a distance of >40mm above and >20mm below the device as well as a lateral distance of >15mm to other cold source. In case the adjacent device is a heat source, the lateral distance will be >25mm.
- Note that the enclosure of the device can become very hot depending on the ambient temperature and load of the power supply. Risk of burns!
- The main power must be turned off before connecting or disconnecting wires to the terminals!
- Do not introduce any objects into the unit!
- Dangerous voltage present for at least 5 minutes after disconnecting all sources of power.
- The power supplies are built-in units and must be installed in a cabinet or room (condensation free environment and indoor location) that is relatively free of conductive contaminants.
- The unit must be installed in an IP54 enclosure or cabinet in the final installation.
- CAUTION: FOR USE IN A CONTROLLED ENVIRONMENT.

2. Device description (Fig. 1)

- (1) Input terminal block connector
- Output terminal block connector (2)
- DC voltage adjustment potentiometer (3)
- (4) DC OK LED (green)
- (5) Universal mounting rail system

3. Mounting (Fig. 2)

The power supply unit can be mounted on 35mm DIN rails in accordance with EN60715. The device should be installed with input terminal block on the bottom.

Each device is delivered ready to install.

- Snap on the DIN rail as shown in Fig. 2:
 - 1. Tilt the unit slightly upwards and put it onto the DIN rail.
 - 2. Push downwards until stopped.
 - 3. Press against the bottom front side for locking.
 - 4. Shake the unit slightly to ensure that it is secured.
- 4. Dismounting (Fig. 3)

To uninstall, use a flat screwdriver to pull or slide down the latch as shown in Fig. 3. Then slide the PSU in the opposite direction, release the latch and pull out the PSU from the rail.

5. Connection

The terminal block connectors allow easy and fast wiring.

You can use flexible (stranded wire) or solid cables with cross sections:

| Electrical Connections and Wire Size | | | | |
|--------------------------------------|-------------------------|-------|------|-------|
| | Stranded / Solid Torque | | | |
| | mm² | AWG | N·m | lb-in |
| Input | 0.32-3.3 | 22-12 | 0.51 | 4.5 |
| Output | 0.52-3.3 | 20-12 | 0.51 | 4.5 |

To secure reliable and shock proof connections, the stripping length should be 4-5mm (see Fig. 4 (1)). Please ensure that wires are fully inserted into the connecting terminals as shown in Fig. 4 (2).

In accordance to EN60950 / UL60950, flexible cables require ferrules.

Use appropriate copper cables that are designed to sustain operating temperature of at least 60°C/75°C for USA or at least 90°C for Canada.

5.1. Input connection (Fig. 1, Fig. 5)

Use L, N and GND connections of input terminal connector (see Fig. 1 (1)) to establish the 100-240 VAC connection. Typical connection methods are shown in Figure 5.

The unit is protected with an internal fuse (not replaceable) at L pin and it has been tested and approved on 20A (UL) and 16A (IEC) branch circuits without additional protection device. An external protection device is only required if the supplying branch has an ampacity greater than above. Thus, if an external protective device is necessary, or utilized, a minimum value of 20A B- or 13A C- characteristic breaker should be used.



The internal fuse must not be replaced by the user.

5.2. Output connection (Fig. 1 (2))

Use the "+" and "-" screw connections to establish the 12 VDC connection. The output provides 12 VDC. The output voltage can be adjusted from 12 to 15 VDC on the potentiometer. The green LED DC OK displays correct function of the output (Fig. 1 (4)). The device has a short circuit and overload protection and an overvoltage protection limited to 16-18.7 VDC.

5.3. Output characteristic curve

The device functions normal under operating line and load conditions. In the event of a short circuit or overload the output voltage and current collapses (I₀ = 110-150%). The secondary voltage is reduced and bounces until short circuit or overload on the secondary side has been removed.

5.4. Thermal behavior (Fig. 6)

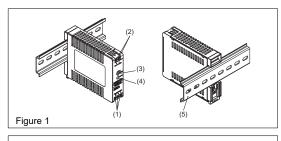
- In the case of ambient temperatures:
 - 1. At -10°C to -20°C [14°F to -4°F], the output capacity has to be reduced by 2% per degree Celsius increase in temperature
 - 2. Above +55°C [131°F], the output capacity has to be reduced by 3.33% per degree Celsius increase in temperature.

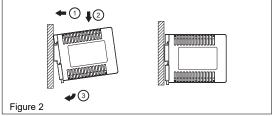
If the output capacity is not reduced when T_{Amb} > 55°C [131°F], the device will engage thermal protection by switching off, i.e., the output voltage will go into latch-off mode until the component temperature cools down and the AC power is recycled.

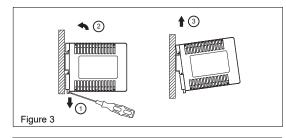
RHINO PSV12-50S Power Supply

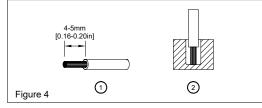
| | Technical Specifications |
|--|---|
| Input (AC) | |
| Nominal input voltage / frequency | 100-240 VAC / 50-60 Hz |
| Voltage range | 85-264 VAC |
| Frequency | 47-63 Hz |
| Nominal current | < 1.0 A @ 115VAC, < 0.6 A @ 230VAC |
| Inrush current limitation (+25°C, cold start) | < 35A @ 115VAC, < 60A @ 230VAC |
| Mains buffering at nominal load (typ.) | 20ms typ. @ 115VAC (100% load) 90ms typ. @ 230VAC (100% load) |
| Turn-on time | < 3s @ 115VAC, < 1.5 s @ 230VAC (100% load) |
| Internal fuse | T 3.15 A / 250V (non-replaceable) |
| Recommended backup protection | 20A B- or 13A C- characteristic circuit breaker |
| Leakage current | < 1mA @ 240VAC |
| Output (DC) | |
| Nominal output voltage U _N / tolerance | 12VDC ± 2 % |
| Voltage adjustment range | 12-15 VDC (maximum power ≤ 48W) |
| Nominal current | 4A |
| Derating | Refer to Fig. 6 -10°C to -20°C (2%/°C), > 55°C (3.33%/°C) in vertical orientation |
| Startup with capacitive loads | Max. 3,000µF |
| Max. power dissipation idling / nominal load approx. | 0.5 W / 7 W |
| Efficiency at 100% load | 86.0% typ. @ 115VAC, 88.0% typ. @ 230VAC |
| PARD (20MHz) at 100% load | < 75 mVpp |
| Parallel operation | PSB60-REM20S / PSB60-REM40S or with ORing Diode |
| General Data | |
| Type of housing | Plastic (PC), enclosed |
| LED signals | Green LED DC OK |
| MTBF | > 350,000 hrs. as per Telcordia |
| Dimensions (L x W x H) | 75mm x 30mm x 89.5 mm [2.95 in x 1.18 in x 3.52 in] (See for complete engineering drawings.) |
| Weight | 0.18 kg [6.3 oz] |
| Connection method | Screw connection |
| Stripping length | 4-5mm [0.16-0.20 in] |
| Operating temperature (surrounding air temperature) | -20°C to +70°C [-4°F to +158°F] (Refer to Fig. 6) |
| Storage temperature | -40°C to +85°C [-40°F to +185°F] |
| Humidity at +25°C, no condensation | 5 to 95% RH Operating: IEC60068-2-6, Sine Wave: 10Hz to 500Hz @ 19.6m/s ² , displacement of 0.35 mm, 60min per axis for all X, Y, Z |
| Vibration | directions Non-Operating: IEC60068-2-6, Random: 5Hz to 500Hz (2.09 Grms); 20 min. per axis for all X, Y, Z directions |
| Shock | Operating: IEC60068-2-27, Half Sine Wave: 10G for a duration of 11ms, shock for 1 direction (X axis) Non-Operating: IEC60068-2-27, Half Sine Wave: 50G for a duration of 11ms, 3 shocks for each 3 directions |
| Pollution degree | 2 |
| Altitude (operating) | 2000m |
| Certification and Standards | |
| Safety entry low voltage | 0511/(5100050) |
| | SELV (EN60950) |
| Electrical safety (of information technology equipment) | UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 60950-1 (File No. E198298), CB scheme to IEC60950-1, Limited Power Source (LPS) |
| Industrial control equipment | UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 60950-1 (File No. E198298), CB scheme to IEC60950-1, Limited Power Source (LPS) UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) |
| Industrial control equipment Class 2 power supply | UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 60950-1 (File No. E198298), CB scheme to IEC60950-1, Limited Power Source (LPS) UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) |
| Industrial control equipment Class 2 power supply CE | UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 60950-1 (File No. E198298), CB scheme to IEC60950-1, Limited Power Source (LPS) UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) In conformance with EMC directive 2014/30/EU and Low Voltage Directive 2014/35/EU |
| Industrial control equipment Class 2 power supply CE Component power supply for general use | UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 60950-1 (File No. E198298), CB scheme to IEC60950-1, Limited Power Source (LPS) UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) In conformance with EMC directive 2014/30/EU and Low Voltage Directive 2014/35/EU EN61204-3 |
| Industrial control equipment Class 2 power supply CE | UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 60950-1 (File No. E198298), CB scheme to IEC60950-1, Limited Power Source (LPS) UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) In conformance with EMC directive 2014/30/EU and Low Voltage Directive 2014/35/EU |
| Industrial control equipment Class 2 power supply CE Component power supply for general use | UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 60950-1 (File No. E198298), CB scheme to IEC60950-1, Limited Power Source (LPS) UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) In conformance with EMC directive 2014/30/EU and Low Voltage Directive 2014/35/EU EN61204-3 EN55024, EN61000-6-1, EN61000-6-2 |
| Industrial control equipment Class 2 power supply CE Component power supply for general use Immunity | UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 60950-1 (File No. E198298), CB scheme to IEC60950-1, Limited Power Source (LPS) UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) In conformance with EMC directive 2014/30/EU and Low Voltage Directive 2014/35/EU EN61204-3 EN55024, EN61000-6-1, EN61000-6-2 (EN61000-4-2, 3, 4, 5, 6, 8, 11) EN55032, EN55011, EN61000-6-3, EN61000-6-4 |
| Industrial control equipment Class 2 power supply CE Component power supply for general use Immunity Emission | UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 60950-1 (File No. E198298), CB scheme to IEC60950-1, Limited Power Source (LPS) UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) In conformance with EMC directive 2014/30/EU and Low Voltage Directive 2014/35/EU EN61204-3 EN55024, EN61200-6-1, EN61000-6-2 (EN61000-4-2, 3, 4, 5, 6, 8, 11) EN55032, EN55011, EN61000-3-3, EN61000-6-4 SPET E197592 E197592 E198298 |
| Industrial control equipment Class 2 power supply CE Component power supply for general use Immunity Emission | UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 60950-1 (File No. E198298), CB scheme to IEC60950-1, Limited Power Source (LPS) UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) In conformance with EMC directive 2014/30/EU and Low Voltage Directive 2014/35/EU EN61204-3 EN55024, EN61200-6-1, EN61000-6-2 (EN61000-4-2, 3, 4, 5, 6, 8, 11) EN55032, EN55011, EN61000-3-3, EN61000-6-4 SPET EISTED Ind. Cont. Eq. EISTED |
| Industrial control equipment Class 2 power supply CE Component power supply for general use Immunity Emission | UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 60950-1 (File No. E198298), CB scheme to IEC60950-1, Limited Power Source (LPS) UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) In conformance with EMC directive 2014/30/EU and Low Voltage Directive 2014/35/EU EN61204-3 EN55024, EN61200-6-1, EN61000-6-2 (EN61000-4-2, 3, 4, 5, 6, 8, 11) EN55032, EN55011, EN61000-3-3, EN61000-6-4 SPET EISTED Ind. Cont. Eq. EISTED |
| Industrial control equipment Class 2 power supply CE Component power supply for general use Immunity Emission RoHS Compliant Safety and Protection Surge voltage protection against internal surge voltages Isolation voltage: | UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 60950-1 (File No. E198298), CB scheme to IEC60950-1, Limited Power Source (LPS) UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) In conformance with EMC directive 2014/30/EU and Low Voltage Directive 2014/35/EU EN55024, EN61000-6-1, EN61000-6-2 (EN61000-4-2, 3, 4, 5, 6, 8, 11) EN55032, EN55011, EN61000-3-3, EN61000-6-3, EN61000-6-4 E198298 Ind. Cont. Eq. Yes |
| Industrial control equipment Class 2 power supply CE Component power supply for general use Immunity Emission RoHS Compliant Safety and Protection Surge voltage protection against internal surge voltages Isolation voltage: Input/ output | UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 60950-1 (File No. E198298), CB scheme to IEC60950-1, Limited Power Source (LPS) UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) In conformance with EMC directive 2014/30/EU and Low Voltage Directive 2014/35/EU EN61204-3 EN55024, EN61000-6-1, EN61000-6-2 (EN61000-4-2, 3, 4, 5, 6, 8, 11) EN55032, EN55011, EN61000-6-3, EN61000-6-4 E198298 US E198298 No No |
| Industrial control equipment Class 2 power supply CE Component power supply for general use Immunity Emission RoHS Compliant Safety and Protection Surge voltage protection against internal surge voltages Isolation voltage: | UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 60950-1 (File No. E198298), CB scheme to IEC60950-1, Limited Power Source (LPS) UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) In conformance with EMC directive 2014/30/EU and Low Voltage Directive 2014/35/EU EN55024, EN61000-6-1, EN61000-6-2 (EN61000-4-2, 3, 4, 5, 6, 8, 11) EN55032, EN55011, EN61000-3-3, EN61000-6-3, EN61000-6-4 E198298 Ind. Cont. Eq. Yes |
| Industrial control equipment Class 2 power supply CE Component power supply for general use Immunity Emission RoHS Compliant Safety and Protection Surge voltage protection against internal surge voltages Isolation voltage: Input / output Input / PE | UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 60950-1 (File No. E198298), CB scheme to IEC60950-1, Limited Power Source (LPS) UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) In conformance with EMC directive 2014/30/EU and Low Voltage Directive 2014/35/EU EN61204-3 EN561204-3 EN56024, EN61200-6-1, EN61000-6-2 (EN61000-4-2, 3, 4, 5, 6, 8, 11) EN555032, EN55011, EN61000-3-3, EN61000-6-4 SPET LISTED Ind. Cont. Eq. Yes No |

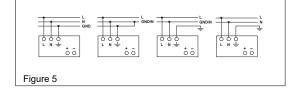
RHINO PSV24-30S Power Supply

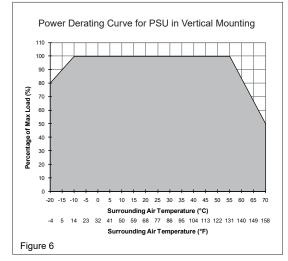












READ INSTRUCTIONS BEFORE INSTALLING OR OPERATING THIS DEVICE. KEEP FOR FUTURE REFERENCE.

1. Safety instructions

- Switch main power off before connecting or disconnecting the device. Risk of explosion!
- To guarantee sufficient convection cooling, please keep a distance of >40mm above and >20mm below the device as well as a lateral distance of >10mm to other cold source. In case the adjacent device is a heat source, the lateral distance will be >25mm.
- Note that the enclosure of the device can become very hot depending on the ambient temperature and load of the power supply. Risk of burns!
- The main power must be turned off before connecting or disconnecting wires to the terminals!
- Do not introduce any objects into the unit!
- Dangerous voltage present for at least 5 minutes after disconnecting all sources of power.
- The power supplies are built-in units and must be installed in a cabinet or room (condensation free environment and indoor location) that is relatively free of conductive contaminants.
- The unit must be installed in an IP54 enclosure or cabinet in the final installation.
- CAUTION: FOR USE IN A CONTROLLED ENVIRONMENT.

2. Device description (Fig. 1)

- (1) Input terminal block connector
- (2) Output terminal block connector
- (3) DC voltage adjustment potentiometer
- (4) DC OK LED (green)
- (5) Universal mounting rail system

3. Mounting (Fig. 2)

The power supply unit can be mounted on 35mm DIN rails in accordance with EN60715. The device should be installed with input terminal block on the bottom.

Each device is delivered ready to install.

- Snap on the DIN rail as shown in Fig. 2:
 - 1. Tilt the unit slightly upwards and put it onto the DIN rail.
 - Push downwards until stopped.
 - Press against the bottom front side for locking.
 - Shake the unit slightly to ensure that it is secured.
- 4. Dismounting (Fig. 3)

To uninstall, use a flat screwdriver to pull or slide down the latch as shown in Fig. 3. Then slide the PSU in the opposite direction, release the latch and pull out the PSU from the rail.

5. Connection

The terminal block connectors allow easy and fast wiring.

You can use flexible (stranded wire) or solid cables with cross sections:

| Electrical Connections and Wire Size | | | | | |
|--------------------------------------|------------------|-------|------|--------|--|
| | Stranded / Solid | | | Torque | |
| | mm² | AWG | N-m | lb•in | |
| Input | 0.32-3.3 | 22-12 | 0.51 | 4.5 | |
| Output | 0.52-3.3 | 20-12 | 0.51 | 4.5 | |

To secure reliable and shock proof connections, the stripping length should be 4-5mm (see Fig. 4 (1)). Please ensure that wires are fully inserted into the connecting terminals as shown in Fig. 4 (2).

In accordance to EN60950 / UL60950, flexible cables require ferrules.

Use appropriate copper cables that are designed to sustain operating temperature of at least 60°C/75°C for USA or at least 90°C for Canada.

5.1. Input connection (Fig. 1, Fig. 5)

Use L, N and GND connections of input terminal connector (see Fig. 1 (1)) to establish the 100-240 VAC connection. Typical connection methods are shown in Figure 5.

The unit is protected with an internal fuse (not replaceable) at L pin and it has been tested and approved on 20A (UL) and 16A (IEC) branch circuits without additional protection device. An external protection device is only required if the supplying branch has an ampacity greater than above. Thus, if an external protective device is necessary, or utilized, a minimum value of 13A B- or 8A C- characteristic breaker should be used.



The internal fuse must not be replaced by the user.

Use the "+" and "." screw connections to establish the 24VDC connection. The output provides 24VDC. The output voltage can be adjusted from 24 to 28 VDC on the potentiometer. The green LED DC OK displays correct function of the output (Fig. 1 (4)). The device has a short circuit and overload protection and an overvoltage protection limited to 30-34.8 VDC.

5.3. Output characteristic curve

The device functions normal under operating line and load conditions. In the event of a short circuit or overload the output voltage and current collapses ($I_O = 110-150\%$). The secondary voltage is reduced and bounces until short circuit or overload on the secondary side has been removed.

5.4. Thermal behavior (Fig. 6)

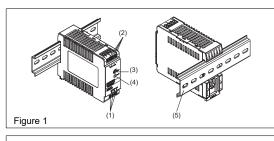
- In the case of ambient temperatures:
 - 1. At -10°C to -20°C [14°F to -4°F], the output capacity has to be reduced by 2% per degree Celsius increase in temperature.
 - Above +55°C [131°F], the output capacity has to be reduced by 3.33% per degree Celsius increase in temperature.

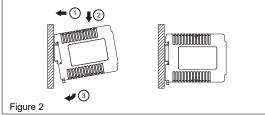
If the output capacity is not reduced when $T_{Amb} > 55^{\circ}C$ [131°F], the device will engage thermal protection by switching off, i.e., the output voltage will go into latch-off mode until the component temperature cools down and the AC power is recycled.

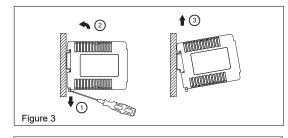
RHINO PSV24-30S Power Supply

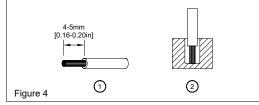
| | Technical Specifications |
|--|--|
| Input (AC) | |
| Nominal input voltage / frequency | 100-240 VAC / 50-60 Hz |
| Voltage range | 85-264 VAC |
| Frequency | 47-63 Hz |
| Nominal current | < 0.8 A @ 115VAC, < 0.4 A @ 230VAC |
| Inrush current limitation (+25°C, cold start) | < 35A @ 115VAC, < 60A @ 230VAC |
| Mains buffering at nominal load (typ.) | 20ms typ. @ 115VAC (100% load) 100ms typ. @ 230VAC (100% load) |
| Turn-on time | <pre></pre> |
| Internal fuse | T 3.15 A / 250V (non-replaceable) |
| Recommended backup protection | 13A B- or 8A C- characteristic circuit breaker |
| Leakage current | < 1mA @ 240VAC |
| Output (DC) | |
| Nominal output voltage U _N / tolerance | 24VDC ± 2 % |
| Voltage adjustment range | 24-28 VDC (maximum power ≤ 30W) |
| Nominal current | 1.25 A |
| Derating | Refer to Fig. 6 -10°C to -20°C (2%/°C), > 55°C (3.33%/°C) in vertical orientation |
| Startup with capacitive loads | Max. 3,000µF |
| Max. power dissipation idling / nominal load approx. | 0.5 W / 4.5 W |
| Efficiency at 100% load | 87.0% typ. @ 115VAC, 88.0% typ. @ 230VAC |
| PARD (20MHz) at +25°C, 100% load | <75 mVpp |
| Parallel operation | PSB60-REM20S / PSB60-REM40S or with ORing Diode |
| General Data | · · · · · · · · · · · · · · · · · · · |
| Type of housing | Plastic (PC), enclosed |
| LED signals | Green LED DC OK |
| MTBF | > 350,000 hrs. as per Telcordia |
| Dimensions (L x W x H) | 75mm x 21mm x 89.5 mm [2.95 in x 0.83 in x 3.52 in] (See for complete engineering drawings.) |
| Weight | 0.11 kg [3.9 oz] |
| Connection method | Screw connection |
| Stripping length | 4-5mm [0.16-0.20 in] |
| Operating temperature (surrounding air temperature) | -20°C to +70°C [-4°F to +158°F] (Refer to Fig. 6) |
| Storage temperature | -40°C to +85°C [-40°F to +185°F] |
| Humidity at +25°C, no condensation | 5 to 95% RH |
| Vibration | Operating: IEC60068-2-6, Sine Wave: 10Hz to 500Hz @ 19.6m/s ² ; displacement of 0.35 mm, 60min per axis for all X, Y, Z directions Non-Operating: IEC60068-2-6, Random: 5Hz to 500Hz (2.09 Grms); 20 min. per axis for all X, Y, Z directions |
| Shock | Operating: IEC60068-2-27, Half Sine Wave: 10G for a duration of 11ms, shock for 1 direction (X axis) Non-Operating: IEC60068-2-27, Half Sine Wave: 50G for a duration of 11ms, 3 shocks for each 3 directions |
| Pollution degree | 2 |
| Altitude (operating) | 2000m |
| Certification and Standards | |
| Safety entry low voltage | SELV (EN60950) |
| Electrical safety (of information technology equipment) | UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 60950-1 (File No. E198298), CB scheme to IEC60950-1, Limited Power Source (LPS) |
| Industrial control equipment | UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) |
| Class 2 power supply | UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) |
| CE | In conformance with EMC directive 2014/30/EU and Low Voltage Directive 2014/35/EU |
| Component power supply for general use | EN61204-3 |
| Immunity | EN55024, EN61000-6-1, EN61000-6-2 (EN61000-4-2, 3, 4, 5, 6, 8, 11) |
| Emission | EN55032, EN55011, EN61000-3-3, EN61000-6-3, EN61000-6-4 |
| Emission | 3PET SPET |
| RoHS Compliant | Yes |
| Safety and Protection | |
| Surge voltage protection against internal surge voltages | No |
| Isolation voltage: | 3kVAC |
| loput / output | |
| Input / output Input / PE | |
| Input / output Input / PE Output / PE | 3kVAC 3kVAC 0.5 kVAC |
| Input / PE | 3kVAC |

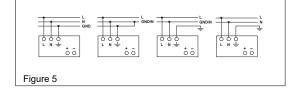
RHINO PSV24-50S Power Supply

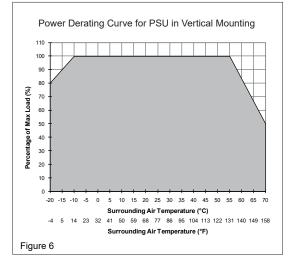












READ INSTRUCTIONS BEFORE INSTALLING OR OPERATING THIS DEVICE. **KEEP FOR FUTURE REFERENCE.**

1. Safety instructions

- Switch main power off before connecting or disconnecting the device. Risk of explosion!
- To guarantee sufficient convection cooling, please keep a distance of >40mm above and >20mm below the device as well as a lateral distance of >15mm to other cold source. In case the adjacent device is a heat source, the lateral distance will be >25mm.
- Note that the enclosure of the device can become very hot depending on the ambient temperature and load of the power supply. Risk of burns!
- The main power must be turned off before connecting or disconnecting wires to the terminals!
- Do not introduce any objects into the unit!
- Dangerous voltage present for at least 5 minutes after disconnecting all sources of power.
- The power supplies are built-in units and must be installed in a cabinet or room (condensation free environment and indoor location) that is relatively free of conductive contaminants.
- The unit must be installed in an IP54 enclosure or cabinet in the final installation.
- CAUTION: FOR USE IN A CONTROLLED ENVIRONMENT.

2. Device description (Fig. 1)

- (1) Input terminal block connector
- Output terminal block connector (2)
- DC voltage adjustment potentiometer (3)
- (4) DC OK LED (green)
- (5) Universal mounting rail system

3. Mounting (Fig. 2)

The power supply unit can be mounted on 35mm DIN rails in accordance with EN60715. The device should be installed with input terminal block on the bottom.

Each device is delivered ready to install.

- Snap on the DIN rail as shown in Fig. 2:
 - 1. Tilt the unit slightly upwards and put it onto the DIN rail.
 - 2. Push downwards until stopped.
 - 3. Press against the bottom front side for locking.
 - 4. Shake the unit slightly to ensure that it is secured.
- 4. Dismounting (Fig. 3)

To uninstall, use a flat screwdriver to pull or slide down the latch as shown in Fig. 3. Then slide the PSU in the opposite direction, release the latch and pull out the PSU from the rail.

5. Connection

The terminal block connectors allow easy and fast wiring.

You can use flexible (stranded wire) or solid cables with cross sections:

| Electrical Connections and Wire Size | | | | |
|--------------------------------------|-------------------------|-------|------|-------|
| | Stranded / Solid Torque | | | |
| | mm² | AWG | N·m | lb•in |
| Input | 0.32-3.3 | 22-12 | 0.51 | 4.5 |
| Output | 0.52-3.3 | 20-12 | 0.51 | 4.5 |

To secure reliable and shock proof connections, the stripping length should be 4-5mm (see Fig. 4 (1)). Please ensure that wires are fully inserted into the connecting terminals as shown in Fig. 4 (2).

In accordance to EN60950 / UL60950, flexible cables require ferrules.

Use appropriate copper cables that are designed to sustain operating temperature of at least 60°C/75°C for USA or at least 90°C for Canada.

5.1. Input connection (Fig. 1, Fig. 5)

Use L, N and GND connections of input terminal connector (see Fig. 1 (1)) to establish the 100-240 VAC connection. Typical connection methods are shown in Figure 5.

The unit is protected with an internal fuse (not replaceable) at L pin and it has been tested and approved on 20A (UL) and 16A (IEC) branch circuits without additional protection device. An external protection device is only required if the supplying branch has an ampacity greater than above. Thus, if an external protective device is necessary, or utilized, a minimum value of 20A B- or 13A C- characteristic breaker should be used.



The internal fuse must not be replaced by the user.

5.2. Output connection (Fig. 1 (2))

Use the "+" and "-" screw connections to establish the 24VDC connection. The output provides 24VDC. The output voltage can be adjusted from 24 to 28 VDC on the potentiometer. The green LED DC OK displays correct function of the output (Fig. 1 (4)). The device has a short circuit and overload protection and an overvoltage protection limited to 30-34.8 VDC.

5.3. Output characteristic curve

The device functions normal under operating line and load conditions. In the event of a short circuit or overload the output voltage and current collapses ($I_0 = 110-150\%$). The secondary voltage is reduced and bounces until short circuit or overload on the secondary side has been removed.

5.4. Thermal behavior (Fig. 6)

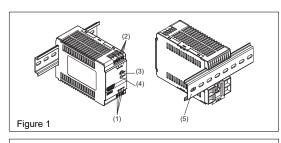
- In the case of ambient temperatures:
 - 1. At -10°C to -20°C [14°F to -4°F], the output capacity has to be reduced by 2% per degree Celsius increase in temperature.
 - 2. Above +55°C [131°F], the output capacity has to be reduced by 3.33% per degree Celsius increase in temperature

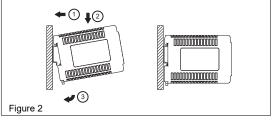
If the output capacity is not reduced when $T_{Amb} > 55^{\circ}C$ [131°F], the device will engage thermal protection by switching off, i.e., the output voltage will go into latch-off mode until the component temperature cools down and the AC power is recycled.

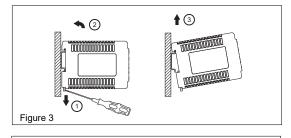
RHINO PSV24-50S Power Supply

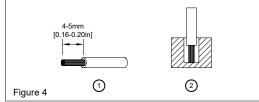
| Technical Specifications | | | | |
|--|--|--|--|--|
| Input (AC) | | | | |
| Nominal input voltage / frequency | 100-240 VAC / 50-60 Hz | | | |
| Voltage range | 85-264 VAC | | | |
| Frequency | 47-63 Hz | | | |
| Nominal current | < 1.0 A @ 115VAC, < 0.6 A @ 230VAC | | | |
| Inrush current limitation (+25°C, cold start) | < 35A @ 115VAC, < 60A @ 230VAC | | | |
| Mains buffering at nominal load (typ.) | 20ms typ. @ 115VAC (100% load) 90ms typ. @ 230VAC (100% load) | | | |
| Turn-on time | < 3s @ 115VAC, < 1.5 s @ 230VAC (100% load) | | | |
| Internal fuse | T 3.15 A / 250V (non-replaceable) | | | |
| Recommended backup protection | 20A B- or 13A C- characteristic circuit breaker | | | |
| Leakage current | < 1mA @ 240VAC | | | |
| Output (DC) | | | | |
| Nominal output voltage U _N / tolerance | 24VDC ± 2 % | | | |
| Voltage adjustment range | 24-28 VDC (maximum power ≤ 50W) | | | |
| Nominal current | 2.1 A | | | |
| Derating | Refer to Fig. 6 -10°C to -20°C (2%/°C), > 55°C (3.33%/°C) in vertical orientation | | | |
| Startup with capacitive loads | Max. 3,000µF | | | |
| Max. power dissipation idling / nominal load approx. | 0.5 W / 7W | | | |
| Efficiency at 100% load | 86.0% typ. @ 115VAC, 88.0% typ. @ 230VAC | | | |
| PARD (20MHz) at +25°C, 100% load | < 75 mVpp | | | |
| Parallel operation | PSB60-REM20S / PSB60-REM40S or with ORing Diode | | | |
| General Data | | | | |
| Type of housing | Plastic (PC), enclosed | | | |
| LED signals | Green LED DC OK | | | |
| MTBF | > 350,000 hrs. as per Telcordia | | | |
| Dimensions (L x W x H) | 75mm x 30mm x 89.5 mm [2.95 in x 1.18 in x 3.52 in] (See for complete engineering drawings.) | | | |
| Weight | 0.18 kg [6.3 oz] | | | |
| Connection method | Screw connection | | | |
| Stripping length | 4-5mm [0.16-0.20 in] | | | |
| Operating temperature (surrounding air temperature) | -20°C to +70°C [-4°F to +158°F] (Refer to Fig. 6) | | | |
| Storage temperature | -40°C to +85°C [-40°F to +185°F] | | | |
| Humidity at +25°C, no condensation | 5 to 95% RH | | | |
| Vibration | Operating: IEC60068-2-6, Sine Wave: 10Hz to 500Hz @ 19.6m/s ² , displacement of 0.35 mm, 60min per axis for all X, Y, Z directions Non-Operating: IEC60068-2-6, Random: 5Hz to 500Hz (2.09 Grms); 20 min. per axis for all X, Y, Z directions | | | |
| Shock | Operating: IEC60068-2-27, Half Sine Wave: 10G for a duration of 11ms, shock for 1 direction (X axis) Non-Operating: IEC60068-2-27, Half Sine Wave: 50G for a duration of 11ms, 3 shocks for each 3 directions | | | |
| Pollution degree | 2 | | | |
| Altitude (operating) | 2000m | | | |
| Certification and Standards | | | | |
| Safety entry low voltage | SELV (EN60950) | | | |
| Electrical safety (of information technology equipment) | UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 60950-1 (File No. E198298), CB scheme to IEC60950-1, Limited Power Source (LPS) | | | |
| Industrial control equipment | UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) | | | |
| Class 2 power supply | UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) | | | |
| CE | In conformance with EMC directive 2014/30/EU and Low Voltage Directive 2014/35/EU | | | |
| Component power supply for general use | EN61204-3 | | | |
| Immunity | EN55024, EN61000-6-1, EN61000-6-2 (EN61000-4-2, 3, 4, 5, 6, 8, 11) | | | |
| Emission | EN55032. EN55011. EN61000-3-3. EN61000-6-3. EN61000-6-4 | | | |
| | | | | |
| RoHS Compliant | Yes | | | |
| Safety and Protection | | | | |
| Surge voltage protection against internal surge voltages | No | | | |
| Isolation voltage: | 04/40 | | | |
| Input / output Input / PE | 3kVAC 3kVAC | | | |
| Output / PE | 0.5 kVAC | | | |
| Protection degree | IP20 | | | |
| Safety class | Class I with PE connection | | | |

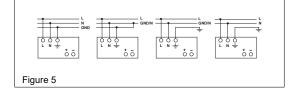
RHINO PSV24-100S Power Supply

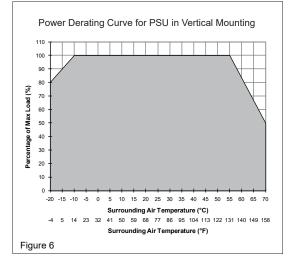












READ INSTRUCTIONS BEFORE INSTALLING OR OPERATING THIS DEVICE. KEEP FOR FUTURE REFERENCE.

1. Safety instructions

- Switch main power off before connecting or disconnecting the device. Risk of explosion!
 To guarantee sufficient convection cooling, please keep a distance of >40mm above and >20mm below the device as well as a lateral distance of >25mm to other cold source or heat source.
- Note that the enclosure of the device can become very hot depending on the ambient temperature and load of the power supply. Bisk of burns!
- The main power must be turned off before connecting or disconnecting wires to the terminals!
- Do not introduce any objects into the unit!
- Dangerous voltage present for at least 5 minutes after disconnecting all sources of power.
 The power supplies are built-in units and must be installed in a cabinet or room (condensation)
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 - (2) Output terminal block connector
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- (4) DC OK LED (green)

(5) Universal mounting rail system

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The power supply unit can be mounted on 35mm DIN rails in accordance with EN60715. The device should be installed with input terminal block on the bottom.

Each device is delivered ready to install.

Snap on the DIN rail as shown in Fig. 2:

- 1. Tilt the unit slightly upwards and put it onto the DIN rail.
- 2. Push downwards until stopped.
- 3. Press against the bottom front side for locking.
- 4. Shake the unit slightly to ensure that it is secured.

4. Dismounting (Fig. 3)

To uninstall, use a flat screwdriver to pull or slide down the latch as shown in Fig. 3. Then slide the PSU in the opposite direction, release the latch and pull out the PSU from the rail.

5. Connection

The terminal block connectors allow easy and fast wiring.

You can use flexible (stranded wire) or solid cables with cross sections:

| Electrical Connections and Wire Size | | | | |
|--------------------------------------|----------|-----------|------|-------|
| | Strande | d / Solid | Tor | que |
| | mm² | AWG | N·m | lb-in |
| Input | 0.32-3.3 | 22-12 | 0.51 | 4.5 |
| Output | 0.52-3.3 | 20-12 | 0.51 | 4.5 |

To secure reliable and shock proof connections, the stripping length should be 4-5mm (see Fig. 4 (1)). Please ensure that wires are fully inserted into the connecting terminals as shown in Fig. 4 (2).

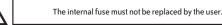
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Use appropriate copper cables that are designed to sustain operating temperature of at least $60^{\circ}C/75^{\circ}C$ for USA or at least $90^{\circ}C$ for Canada.

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Use L, N and GND connections of input terminal connector (see Fig. 1 (1)) to establish the 100-240 VAC connection. Typical connection methods are shown in Figure 5.

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5.2. Output connection (Fig. 1 (2))

Use the "+" and "." screw connections to establish the 24VDC connection. The output provides 24VDC. The output voltage can be adjusted from 22 to 24 VDC on the potentiometer. The green LED DC OK displays correct function of the output (Fig. 1 (4)). The device has a short circuit and overload protection and an overvoltage protection limited to 30-34.8 VDC.

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The device functions normal under operating line and load conditions. In the event of a short circuit or overload the output voltage and current collapses ($I_0 = 110-150\%$). The secondary voltage is reduced and bounces until short circuit or overload on the secondary side has been removed.

5.4. Thermal behavior (Fig. 6)

In the case of ambient temperatures

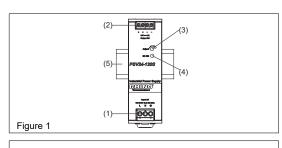
- At -10°C to -20°C [14°F to -4°F], the output capacity has to be reduced by 2% per degree Celsius increase in temperature.
- Above +55°C [131°F], the output capacity has to be reduced by 3.33% per degree Celsius increase in temperature.

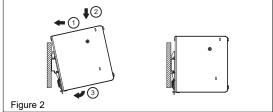
If the output capacity is not reduced when $T_{Amb} > 55^{\circ}C$ [131°F], the device will engage thermal protection by switching off, i.e., the output voltage will go into latch-off mode until the component temperature cools down and the AC power is recycled.

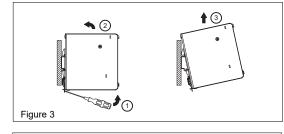
RHINO PSV24-100S Power Supply

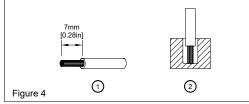
| Input (EQ) Using function 100-200 Wol/150-80 Hz Using rang 55-364 Wick Using rang 55-364 Wick Service (Construction) 46-51 Hz Named a careful find (ch2PC, cost dark) - Atta to Linking a Cranical back production 28 me 11964, Cost 0.000 Each Service (Cost and Cost 0.000 Each 28 me 11964, Cost 0.000 Each Service (Cost 0.000 Each 28 me 11964, Cost 0.000 Each Service (Cost 0.000 Each 28 me 11964, Cost 0.000 Each Service (Cost 0.000 Each 28 me 11964, Cost 0.000 Each Service (Cost 0.000 Each 28 me 11964, Cost 0.000 Each Service (Cost 0.000 Each 28 me 11964, Cost 0.000 Each Service (Cost 0.000 Each 28 me 1196, Cost 0.000 Each Service (Cost 0.000 Each 28 me 1196, Cost 0.000 Each Service (Cost 0.000 Each 28 me 1196, Cost 0.000 Each Service (Cost 0.000 Each 28 me 1196, Cost 0.000 Each Service (Cost 0.000 Each 28 me 1196, Cost 0.000 Each Service (Cost 0.000 Each 28 me 1196, Cost 0.000 Each Service (Cost 0.000 Each 28 me 1196, Cost 0.000 Each Service (Cost 0.000 Each | | Technical Specifications |
|--|---|--|
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| amerial camel < 1.2.4.2.1150A.c.05.6.9209/AC | | |
| methourer limitation (25°C, cold Sart) Arise bafferig at mainted load (pp.) Arise bafferig at mainted load (pp.) Brain the atomic load (pp.) Brain the cold Sart (10% load) Brain the cold | | |
| Same bufferig at contrail load (pp.) Same by @ 2018WC (10% load) Same by @ 2028WC (10% load) umment ime <.3.8.0.119WC, 11.5.3.9.2.23WOC (10% load) | | |
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| time is is 13.15.4 / 250/ (non-replocable) extermended backs portection 20.8-0r 0.8-0r 0.4000 model selage carted torput (D) 24.000 cr 12.% totag a significant crage 24.000 cr 21.% totag a significant crage 24.000 cr 21.% totag a significant crage 38.4 realing -10° 00 - 20° (25.0°//(25.0°) totag a significant crage -00° 00 - 20° (25.0°//(25.0°) totag a significant crage -00° 00 - 20° (25.0°//(25.0°) totag a significant crage -00° 00 - 20° (25.0°//(25.0°) totag a significant crage -00° 00 - 20° (25.0°//(25.0°) totag a significant crage -00° 00 - 20° (25.0°//(25.0°) totag a significant crage -00° 00 - 20° (25.0°//(25.0°) totag a significant crage -00° 00 - 20° (25.0°//(25.0°) totag a significant crage -00° 00 - 20° (25.0°//(25.0°) totag a significant crage -00° 00 - 20° (25.0°//(25.0°) totag a significant crage -00° 00 - 20° (25.0°//(25.0°) totag a significant crage -00° 00 - 20° (25.0°//(25.0°) totag a significant crage -00° 00 - 20° (25.0°//(25.0°) totag a significant crage -00° 00 - 20° (25.0°//(25.0°) totag a significant crage -00° 00 - 20° (25.0°//(25.0°) totag a significant crage -00° 00 - 20 | • (,, , , | |
| examenation backup protection 20A B- or 104 C- characteristic cloud breaker selage current Immedia duckup protection SA Registry of the select of the | Turn-on time | |
| eatage_const Darput (CO) Darput (CO) Bit of Fig. 6 Darput (CO) Darput (CO) Da | Internal fuse | |
| Dative (UC) 24/UC 12 % charmin logic adjustmet range 22/44 VUC (maximum power < 912 W) | | |
| Invinsi during by Ly (beance Othigs adjustment range Dilags adjustme | | < 1mA @ 240VAC |
| Ublge abjustmet range 22-24 V0C (Insurant om poset ≤ 912 W) Ormal Carret 88 A Barling -10°C to 20°C (28°C) (58°C (28°C) in vertical orientation Barling with capacitive loads 0.40°C 10.20°C (28°C) (58°C (28°C) in vertical orientation Barling with capacitive loads 0.40°C 10.20°C (28°C) (50°C (28°C) (50°C (28°C)) Barling with capacitive loads 0.40°C (28°C) (28°C (28°C) | | |
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| Heritary | | |
| Herming -10°C to -20°C (2%/C). SSYC (3.3%/C) in which individual indindia indino individual indino individual individual individual ind | Nominal current | |
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| Biology at 100% load | Startup with capacitive loads | |
| Biology at 100% load | Max. power dissipation idling / nominal load approx. | , , |
| ARD (20MHz) at -25°C, 100% load c75 mkpp ratalel operation PS680-HEX405 or with GRing Diode Reneral Data rype of housing PG880-HEX405 Or with GRing Data rype of housing PG880-HEX405 Or with GRing Diode Reneral Data rype of housing PG880-HEX405 Or with GRing Data rype of housing PG880-HEX405 Or with GRing Data rype of housing PG880-HEX405 Or with GRing Data Reneral Data rype of housing PG880-HEX405 Or with GRing Data Reneral Data Rener | Efficiency at 100% load | |
| PSB0-REM205 / PS90-REM405 or with ORing Diode Sameral Data Very of Nussing Passic (PC), enclosed ED signals Green LED DC OK ATBF > 350.000 hrs. sp er Feloradia Immersions (L x W x H) TSmm x 45mm x 100mm (2.95 in x 1.77 in x 3.94 in) (See for complete ingleering drawings.) Weight 0.325 kg (11.5.oz) Somedion method - 30000 hrs. sp er Feloradia Simersions (L x W x H) TSmm x 45mm x 100mm (2.95 in x 1.77 in x 3.94 in) (See for complete ingleering drawings.) Weight - 3000 hrs. sp er feloradia Simersions (L x W x H) - 300 hrs. sp er feloradia Simersions (L x W x H) - 300 hrs. sp er feloradia Simersions (L x W x H) - 45mm (0.16-0.20 in) Simersions (L x W x H) - 45mm (0.16-0.20 in) Simersions (L x W x H) - 45mm (D.16-0.20 in) Simersions (L x W x H) - 45mm (D.16-0.20 in) Simersions (L x W x H) - 45mm (D.16-0.20 in) Simersions (L x W x H) - 45mm (D.16-0.20 in) Simersions (L x W x H) - 45mm (D.16-0.20 in) Simersions (L x W x H) - 45mm (D.16-0.20 in) Simersions (L x W x H) - 50mm (S.100 Hrs. Sino K H X Y, Z directions | PARD (20MHz) at +25°C, 100% load | |
| Seneral Data Plastic (PC), enclosed Spin of housing Green LED DC OK ATBF > 350,000 hrs. as per Telcordia ATBF > 350,000 hrs. as per Telcordia ATBF > 350,000 hrs. as per Telcordia Comestion method 925 in x 1.71 in x 39 in [Gee for complete engineering drawings.) Veliph 0.825 kg [115 cc] Comestion method Serve connection Athropic hearing the perturb (surrounding air temperature) -20° C to +70° C [47° to +158° F] (Peter to Fig. 6) Derending temperature (surrounding air temperature) -20° C to +70° C [47° to +158° F] Unridly at +25° C, no condensation -45° C Horther to +158° F] Operating: IEC00068-2-6, Sine Wave: 10% to 50 Sin Ph H 0 Operating: IEC00068-2-6, Sine Wave: 10% to 50 Sine Ph 2.20 Sinne, 22 min, per asks for all X, Y, Z Nor-Operating: IEC00068-2-6, Sine Wave: 10% to 10 Sine, 20 Sine, 20 sine, per asks for all X, Y, Z Volution degree 2 Mor-Operating: IEC00068-2-7, Hell Sine Wave: 10% to 10 directon (Y ask) Nor-Operating: IEC00068-2-7, Hell Sine Wave: 10% to 20 Sine, 20 Sin | Parallel operation | |
| pipe of housing Plastic (PC), enclosed ED signals Green LED DC OK MTPE > 500.000 Nis: as per felocodia Dimensions (L x W x H) 75mm x 45mm x 100mm [2.95 in x 1.77 in x 3.94 in] (See for complete engineering drawings.) Veright 0.252 kg [11.5 cg] Dimensions (L x W x H) 75mm x 45mm x 100mm [2.95 in x 1.77 in x 3.94 in] (See for complete engineering drawings.) Veright 0.252 kg [11.5 cg] Dimension method -20° to r/0°C [-47 to 1.5457 H] Stronge temperature (surrounding air temperature) -20° to r/0°C [-47 to 1.5457 H] Unrolly at 425°C, no condensation 5 to 550 H Operating: IEC60068-2-6, Sine Wave: 104z to 500Hz (20 Strms; 20 min, per axis for all X, Y, 2 directions Non-Operating: IEC60068-2-6, Readows: 54z to 500Hz (20 Strms; 20 min, per axis for all X, Y, 2 directions Operating: IEC60068-2-6, Readows: 54z to 500Hz (20 Strms; 20 min, per axis for all X, Y, 2 directions Operating: IEC60068-2-7, Hall Sine Wave: 500 is a duration of Tims; 3 stocks for each 3 directions Operating: IEC60068-2-27, Hall Sine Wave: 500 is a duration of Tims; 3 stocks for each 3 directions Verofuerating: IEC60068-2-27, Hall Sine Wave: 20 is a duration of Tims; 3 stocks for each 3 directions Operating: IEC60068-2-27, Hall Sine Wave: 500 is a duration of Tims; 3 stocks for each 3 directions Operating: IEC60068-2-27, Hall Sine Wave: 500 is a duration of Tims; 3 stocks for each 3 directions Verofuerating: IEC6 | General Data | · · · · · · · · · · · · · · · · · · · |
| ED signals Green LED DC OK TRF > > 360,000 hrs. signal (See for complete engineering drawings.) Veight 0.325 kg [11.5 cc] Jornection method Scare connection Typinging length | Type of housing | Plastic (PC), enclosed |
| ATEF > 350,000 hrs. as per Teloordia immensions (L xW x H) 75mm x 45mm x 10mm (295 in x 1.77 in x 3.94 in [(See for complete engineering drawings.) impensions (L xW x H) 75mm x 45mm x 10mm (295 in x 1.77 in x 3.94 in [(See for complete engineering drawings.) ionnection method Screw connection atripping length -4.5mm (16 + 200 in] penating temperature (surrounding air temperature) -20°C to +70°C (44° to +185°F) [(Refer to Fig. 6) transport -40°C to +85°C (-40°F to +185°F) tumidity at +25°C, no condensation 51 95% H Operating: IEC60068-2-6, Sme Wave: 104K to 5004% (2.09 Grms); 20 min. per axis for all X, Y, Z directions Non-Operating: IEC60068-2-7, Hall Sine Wave: 106 to raduation of 11ms, 3 shock for 1 direction (X axis) Non-Operating: IEC60068-2-8, P. Hall Sine Wave: 506 for a duration of 11ms, 3 shock for rad 3 directions Voltacion and Standards 2 attitude (preating) 200m 2 2 Voltacion and Standards 2 attitude (preating) 2 Size 2 power supply UL/C-UL recognized to UL60950-1 and CSA C222 No 1071-01 (File No. E197592) Size 2 power supply UL/C-UL listed to UL609 and CSA C22 No 1071-01 (File No. E197592) Size 2 power supply for general use FESEQL (FING00-6-2 (ENS1000-4-2, 3, 4, 5, 6, 8, 11) minsion FESEQL (FING00-6-1, ENS1000-6-2 (ENS1000-4-3, 3, 4, 5, 6, 8, | LED signals | |
| Veight 0.325 kg [11.5 oz] Connection method Screw connection Strew connection Screw connection typipping length -45mm [0.16-0.20 in] typerating temperature (surrounding air temperature) -20°C to +70°C [-4°F to +158°F] (Heler to Fig. 6) torage temperature -40°C to +85°C (-10°F to +158°F) tumidity at -25°C, no condensation 5 to 59% FH of perating: IEC60068-2-6, Sine Ware: 10Fz to 500Fz (*2.10°F to a turstion of 11ms, shock tor all X, Y, Z directions Operating: IEC60068-2-6, Sine Ware: 10Fz to 500Fz (*2.10°F to a turstion of 11ms, shock tor all X, Y, Z directions Operating: IEC60068-2-6, Flait Sine Ware: 500 Fr (*2.10°F to a turstion of 11ms, shock tor all directions Non-Operating: IEC60068-2-7, Hall Sine Ware: 500 Fr (*2.10°F to a turstion of 11ms, shock tor all directions Non-Operating: IEC60068-2-8, Hall Sine Ware: 500 Fr (*2.10°F, a turstion of 11ms, shock tor all directions Non-Operating: IEC60068-2-8, Hall Sine Ware: 500 Fr (*2.10°F, a turstion of 11ms, shock tor all directions Non-Operating: IEC60068-2-8, Tell Sine Ware: 500 Fr (*2.10°F, a turstion of 11ms, shock tor all directions Non-Operating: IEC60068-2-8, Sine Ware: 500 Fr (*2.10°F, a turstion of 11ms, shock tor all directions Non-Operating: IEC60068-2-8, Net Society VILC-UL recognized to UL6050F1 and CSA C22.2 No. 107.1-01 (File No. E197592) Liaterial stelly (of information technology equipment) UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) <td>MTBF</td> <td>> 350,000 hrs. as per Telcordia</td> | MTBF | > 350,000 hrs. as per Telcordia |
| Veight 0.325 kg [11.5 oz] Connection method Screw connection Strew connection Screw connection typipping length -45mm [0.16-0.20 in] typerating temperature (surrounding air temperature) -20°C to +70°C [-4°F to +158°F] (Heler to Fig. 6) torage temperature -40°C to +85°C (-10°F to +158°F) tumidity at -25°C, no condensation 5 to 59% FH of perating: IEC60068-2-6, Sine Ware: 10Fz to 500Fz (*2.10°F to a turstion of 11ms, shock tor all X, Y, Z directions Operating: IEC60068-2-6, Sine Ware: 10Fz to 500Fz (*2.10°F to a turstion of 11ms, shock tor all X, Y, Z directions Operating: IEC60068-2-6, Flait Sine Ware: 500 Fr (*2.10°F to a turstion of 11ms, shock tor all directions Non-Operating: IEC60068-2-7, Hall Sine Ware: 500 Fr (*2.10°F to a turstion of 11ms, shock tor all directions Non-Operating: IEC60068-2-8, Hall Sine Ware: 500 Fr (*2.10°F, a turstion of 11ms, shock tor all directions Non-Operating: IEC60068-2-8, Hall Sine Ware: 500 Fr (*2.10°F, a turstion of 11ms, shock tor all directions Non-Operating: IEC60068-2-8, Tell Sine Ware: 500 Fr (*2.10°F, a turstion of 11ms, shock tor all directions Non-Operating: IEC60068-2-8, Sine Ware: 500 Fr (*2.10°F, a turstion of 11ms, shock tor all directions Non-Operating: IEC60068-2-8, Net Society VILC-UL recognized to UL6050F1 and CSA C22.2 No. 107.1-01 (File No. E197592) Liaterial stelly (of information technology equipment) UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) <td>Dimensions (L x W x H)</td> <td>75mm x 45mm x 100mm [2.95 in x 1.77 in x 3.94 in] (See for complete engineering drawings.)</td> | Dimensions (L x W x H) | 75mm x 45mm x 100mm [2.95 in x 1.77 in x 3.94 in] (See for complete engineering drawings.) |
| httpping length 4-5mm (0.16-0.20 in] berafting temperature (surrounding air temperature) -20°C to -70°C (1-4°F to +158°F] (Refer to Fig. 6) itorage temperature -40°C to +48°C (1-40°F to +188°F] iturdity at -25°C, no condensation 5 to 95% RH Operating: IEC60068-2-6, Sine Wave: 10Ft to 500Ft c0 196 m/s ² , displacement of 0.35 mm, 60min per axis for all X, Y, 2 directions Non-Operating: IEC60068-2-6, Random: 5k-to 500Ft c0 for a duration of 11ms, shock for 1 direction (X axis) Non-Operating: IEC60068-2-27, Half Sine Wave: 10G for a duration of 11ms, shock for 1 direction (X axis) Non-Operating: IEC60068-2-27, Half Sine Wave: 20G for a duration of 11ms, shock fo | Weight | |
| iperating temperature (surrounding air temperature) -20°C to +70°C [-4°F to +158°F] (Refer to Fig. 6) storage temperature -40°C to +80°C [-40°F to -158°F] turnidity at +25°C, no condensation 5 to 95% RH Operating: IEC60066-2-6, Sine Wave: 10Hz to 500Hz (2:09 Grms); 20 min. per axis for all X, Y, Z directions Non-Operating: IEC60066-2-6, Rendom: 5Hz to 500Hz (2:09 Grms); 20 min. per axis for all X, Y, Z directions Non-Operating: IEC60066-2-6, Rendom: 5Hz to 500Hz (2:09 Grms); 20 min. per axis for all X, Y, Z directions Operating: IEC60066-2-27; Hall Sine Wave: 10B to ra duration of 11ms, shocks for a directions Vibulion degree 2 2 2 Vibulion degree 2 </td <td>Connection method</td> <td>Screw connection</td> | Connection method | Screw connection |
| tarage temperature -40°C to +85°C [-40°F to +185°F] turnidity at +25°C, no condensation 0 perating: IEC60068-2-6, Sine Wave: 104:to 500H2 (2) 19 6ms/e displacement of 0.35 mm, 60min per axis for all X, Y, Z directions ihreation Non-Operating: IEC60068-2-6, Sine Wave: 104:to 500H2 (2) 09 Grms); 20 min, per axis for all X, Y, Z directions ihrock Operating: IEC60068-2-27, Hait Sine Wave: 106 to a duration of 11ms, shock for all X, Y, Z directions ihrock 2 villution degree 2 villution degree 2 villution degree 2 villution step 2 villution degree 1 villution degree 2 villution degree 2 villution degree 2 villution degree 1 villution degree 2 villution degree | Stripping length | 4-5mm [0.16-0.20 in] |
| turidity at +25°C, no condensation 5 to 95% RH Operating: IEC60068-2-6, Sine Wave: 10Hz to 500Hz (209 Grms); 20 min, 60min per axis for all X, Y, Z directions Non-Operating: IEC60068-2-2, Half Sine Wave: 106 for a duration of 11ms, 3 shocks for each 3 directions Non-Operating: IEC60068-2-2, Half Sine Wave: 106 for a duration of 11ms, 3 shocks for each 3 directions Non-Operating: IEC60068-2-2, Half Sine Wave: 106 for a duration of 11ms, 3 shocks for each 3 directions Von-Operating: IEC60068-2-2, Half Sine Wave: 506 for a duration of 11ms, 3 shocks for each 3 directions Volution degree 2 2 2000m 2 20 | Operating temperature (surrounding air temperature) | -20°C to +70°C [-4°F to +158°F] (Refer to Fig. 6) |
| Operating: IEC60068-2-6, Sine Wave: 10Hz to 500Hz @ 19.6m/s*, displacement of 0.35 mm, 60min per axis for all X, Y, Z ihradion Non-Operating: IEC60068-2-27, Hai Sine Wave: 10G for a duration of 11ms, shock for 1 directions work Operating: IEC60068-2-27, Hai Sine Wave: 10G for a duration of 11ms, shock for 1 direction (X axis) volution degree 2 volution degree 2 addep entry loc (perating) 2000m Certification and Standards 2 addep entry low voltage 2 Itatude (perating) 2000m Certification and Standards 2 addep entry low voltage SELV (EN60950) UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 60950-1 (File No. E198298), CB scheme to IEC60950-1, Limited Power Source (LPS) utaristic control equipment UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 107.1-01 (File No. E197592) Idads prime to aver supply UL/C-UL listed to UL508 and CSA C22.2 No. 107.1-01 (File No. E197592) Idads prime to aver supply for general use EN5024, BNS1000-6-1, EN61000-6-2 (EN81000-42, 3, 4, 5, 6, 8, 11) munity EN55032, EN55011, EN61000-6-3, EN61000-6-4 EN55032, EN55011, EN61000-6-3, EN61000-6-4 EN55032, EN55011, EN61000-6-3, EN61000-6-4 EN55032, EN55011, EN61000-6-3, EN61000-6-4 EN55032, EN55011, EN61000-6-3, | Storage temperature | -40°C to +85°C [-40°F to +185°F] |
| directions directions Non-Operating: IEC60068-2-6; Random: 5Ht to 500Hz (2.09 Gms); 20 min. per axis for all X, Y, Z directions Operating: IEC60068-2-27; Hall Sine Wave: 10G for a duration of 11ms, 3 shock for all X, Y, Z directions Oblidion degree 2 Non-Operating: IEC60068-2-27; Hall Sine Wave: 10G for a duration of 11ms, 3 shock for all X, Y, Z directions Oblidion degree 2 Non-Operating: IEC60068-2-27; Hall Sine Wave: 50G for a duration of 11ms, 3 shock for each 3 directions Operating: IEC60068-2-27; Hall Sine Wave: 50G for a duration of 11ms, 3 shock for all X, Y, Z directions Operating: IEC60068-2-27; Hall Sine Wave: 50G for a duration of 11ms, 3 shock for all X, Y, Z directions Operating: IEC60068-2-27; Hall Sine Wave: 50G for a duration of 11ms, 3 shock for all X, Y, Z directions 2 10 Certification and Standards 2 Safety entry low voltage 2 U/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) UE U/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) UE U/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) UE In conformance with EMC directive 2014/30;EU and Low Voltage Directive 2014/35;EU Every supply U/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) Inscion ENSto24; No1000-6-1; No1000-6-1 ENSto24; No1000-61; Eq. ENSt024; No1000-61; No100-62; Sinfo | Humidity at +25°C, no condensation | 5 to 95% RH |
| Non-Operating: IEC60088-2-4; Random: SHz to 500Hz (2.09 Grms); 20 min. per axis for all X, Y, Z directions phock Operating: IEC60088-2-27, Hall Sine Wave: 50G for a duration of 11ms, shock for 1 direction (X axis) Non-Operating: IEC60088-2-27, Hall Sine Wave: 50G for a duration of 11ms, shock for 1 direction (X axis) Non-Operating: IEC60088-2-27, Hall Sine Wave: 50G for a duration of 11ms, shock for 1 direction (X axis) Volution degree 2 2 Volution degree 2 2 Volution degree 2 2000m Certification and Standards Jately entry low voltage SELV (EN60950) UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 60950-1 (File No. E197592) Junct of the operating: IEC60008-2 and CSA C22.2 No. 107.1-01 (File No. E197592) UL/C-UL listed to UL508 and CSA C22.2 No. 107.1-01 (File No. E197592) Ind. contormance with EMC directive 2014/30/EU and Low Voltage Directive 2014/35/EU EN55024, EN61000-6-1 Set of user duration of 11ms, shock for 1 directions Ind. contormance with EMC directive 2014/30/EU and Low Voltage Directive 2014/35/EU EN55024, EN61000-6-1 Set of user direction EN55024, EN61000-6-2 | | |
| block Operating: IEC60068-2-27, Half Sine Wave: 106 for a duration of 11ms, shock for 1 direction (X axis) Non-Operating: IEC60068-2-27, Half Sine Wave: 506 for a duration of 11ms, 3 shocks for each 3 directions Volution degree 2 Volution degree SELV (EN60950) Volution degree Volution degree Volution degree Volution degree Volution degree Volution degree Volution degree Volution UL/C-UL listed to UL508 and CSA C22 2 No. 107.1-01 (File No. E197592) Volution Volution | Vibration | |
| Indir-Operating: 2 Indir-Operating: 2000m Certification and Standards 2000m Safety entry low voltage SELV (EN60950) idety entry low voltage UL/C-UL recognized to UL60960-1 and CSA C22.2 No. 1007.1-01 (File No. E198298), CB scheme to IEC60950-1, Limited Power Source (LPS) idety ical control equipment UL/C-UL listed to UL508 and CSA C22.2 No. 107.1-01 (File No. E197592) i2ass 2 power supply UL/C-UL listed to UL508 and CSA C22.2 No. 107.1-01 (File No. E197592) i2ass 2 power supply UL/C-UL listed to UL508 and CSA C22.2 No. 107.1-01 (File No. E197592) i2ass 2 power supply UL/C-UL listed to UL508 and CSA C22.2 No. 107.1-01 (File No. E197592) i2ass 2 power supply for general use EN61204-3 rmmunity EN55024, EN61000-6-1, EN61000-6-2 rmmunity EN55024, EN61000-6-3, EN61000-6-4 EStev game EN55032, EN55011, EN61000-3-3, EN61000-6-4 Setey game En95032, EN55011, EN61000-3-3, EN61000-6-4 EStev game E198298 IdHS Compliant Yes Sategy and Protection No | Shoel | Operating: IEC60068-2-27, Half Sine Wave: 10G for a duration of 11ms, shock for 1 direction (X axis) |
| 2000m Certification and Standards SELV (EN60950) SELV (EN60950) UU/C-UL recognized to UL60950-1 (Gile No. E198298), CB scheme to IEC60950-1, Limited Power Source (LPS) UU/C-UL recognized to UL60950-1 (Gile No. E198298), CB scheme to IEC60950-1, Limited Power Source (LPS) Output: Information technology equipment) UU/C-UL recognized to UL608 and CSA C22.2 No. 107.1-01 (File No. E197592) UU/C-UL listed to UL508 and CSA C22.2 No. 107.1-01 (File No. E197592) Idextrial control equipment UU/C-UL listed to UL508 and CSA C22.2 No. 107.1-01 (File No. E197592) Electron EN6100-0-0: EN97592) Idextrial to ULC-UL listed to UL508 and CSA C22.2 No. 107.1-01 (File No. E197592) EN6100-0: EN61000-0: | | |
| Certification and Standards SELV (EN60950) Valety entry low voltage SELV (EN60950) VL/C-UL recognized to UL60950-1 and CSA C22.2 No. 60360-1 (File No. E198298), CB scheme to IEC60950-1, Limited Power Source (LPS) vdustrial control equipment UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 107.1-01 (File No. E197592) vdustrial control equipment UL/C-UL listed to UL508 and CSA C22.2 No. 107.1-01 (File No. E197592) vdustrial control equipment UL/C-UL listed to UL508 and CSA C22.2 No. 107.1-01 (File No. E197592) Vdustrial control equipment UL/C-UL listed to UL508 and CSA C22.2 No. 107.1-01 (File No. E197592) Vdustrial control equipment UL/C-UL listed to UL508 and CSA C22.2 No. 107.1-01 (File No. E197592) Vdustrial control equipment UL/C-UL listed to UL508 and CSA C22.2 No. 107.1-01 (File No. E197592) Vdustrial control equipment ower supply for general use EN61204-3 mmunity EN55032, EN55011, EN61000-6-3, EN61000-6-2 feb/stopped EN55032, EN55011, EN61000-3, EN61000-6-4 Vdustrial control equipment Yes Stafety and Protection Yes Stafety and Protection sugnist internal surge voltages No solation voltage: No input / PE 0.5 KVAC voltactin PF 0.5 KVAC | | |
| Safety entry low voltage SELV (EN60950) ilectrical safety (of information technology equipment) UL/C-UL recognized to UL60950-1 and CSA C22 2. No. 60950-1 (File No. E198298), CB scheme to IEC60950-1, Limited Power Source (LPS) industrial control equipment UL/C-UL listed to UL508 and CSA C22.2 No. 107.1-01 (File No. E197592) VLX-UL listed to UL508 and CSA C22.2 No. 107.1-01 (File No. E197592) VLX-UL listed to UL508 and CSA C22.2 No. 107.1-01 (File No. E197592) VLX-UL listed to UL508 and CSA C22.2 No. 107.1-01 (File No. E197592) VLX-UL listed to UL508 and CSA C22.2 No. 107.1-01 (File No. E197592) VLX-UL listed to UL508 and CSA C22.2 No. 107.1-01 (File No. E197592) VLX-UL listed to UL508 and CSA C22.2 No. 107.1-01 (File No. E197592) VLX-UL listed to UL508 and CSA C22.2 No. 107.1-01 (File No. E197592) VLX UL/C-UL isted to UL508 and CSA C22.2 No. 107.1-01 (File No. E197592) VLX UL/C-UL isted to UL508 and CSA C22.2 No. 107.1-01 (File No. E197592) VLX UL/C-UL isted to UL508 and CSA C22.2 No. 107.1-01 (File No. E197592) VLX UL/C-UL isted to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) VLX UL/C-UL isted to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) VLX EN5032, EN5011, EN61000-6-1, EN61000-6-2 VLX EN55032, EN55011, EN61000-6-3, EN61000-6-4 VLX Yes Safety and Protection Yes Values voltage: No <td></td> <td>2000m</td> | | 2000m |
| UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 60950-1 (File No. E198298), CB scheme to IEC60950-1, Limited Power Source (LPS) Industrial control equipment UL/C-UL recognized to UL608 and CSA C22.2 No. 107.1-01 (File No. E197592) Stass 2 power supply UL/C-UL listed to UL508 and CSA C22.2 No. 107.1-01 (File No. E197592) VE In conformance with EMC directive 2014/30/EU and Low Voltage Directive 2014/35/EU Component power supply for general use EN51204-3 mmunity EN55024, EN61000-6-1, EN61000-6-2 (EN61000-4-2, 3, 4, 5, 6, 8, 11) imission EN55032, EN55011, EN61000-6-3, EN61000-6-4 Yes Safety and Protection Surge voltage protection against internal surge voltages No Soldation voltage: Input / PE Output / Output Input / PE Output / PE Output / PE In Soldation voltage: IP20 | | |
| Interfact safety (In information declinition declinition) Interfact safety (In information declinition) Industrial control equipment UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) Class 2 power supply UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) Class 2 power supply UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) Class 2 power supply UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) Class 2 power supply In conformance with EMC directive 2014/30/EU and Low Voltage Directive 2014/35/EU Component power supply for general use EN55024, EN61000-6-2 (EN61000-6-2 (EN61000-4-2, 3, 4, 5, 6, 8, 11) Immunity EN55032, EN55011, EN61000-6-3, EN61000-6-4 Immunity EN55032, EN55011, EN61000-6-3, EN61000-6-4 Immunity EN55032, EN55011, EN61000-6-3, EN61000-6-4 Immunity Enstepsion Immunity EN55032, EN55011, EN61000-6-3, EN61000-6-4 Immunity Enstepsion Immunity Enstepsion< | Safety entry low voltage | |
| Industrial control equipment UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) Class 2 power supply UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) XE In conformance with EMC directive 2014/30/EU and Low Voltage Directive 2014/35/EU Component power supply for general use EN61204-3 Tmmunity EN55024, EN61000-6-2 (EN61000-4-2, 3, 4, 5, 6, 8, 11) Imission EN55032, EN55011, EN61000-6-3, EN61000-6-4 Imission EN55032, EN55011, EN61000-3-3, EN61000-6-4 Imission Yes Stafety and Protection Yes Stafety and Protection No Solation voltage: No Input / PE 3KVAC Output / PE 0.5 KVAC Voluput / PE 0.5 KVAC Voluput / PE IP20 | Electrical safety (of information technology equipment) | |
| Class 2 power supply UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) Class 2 power supply In conformance with EMC directive 2014/30/EU and Low Voltage Directive 2014/35/EU Component power supply for general use EN61204-3 mmunity EN55024, EN61000-6-1, EN61000-6-2 (EN61000-4-2, 3, 4, 5, 6, 8, 11) imission EN55032, EN55011, EN61000-6-3, EN61000-6-4 Imission EN55032, EN55011, EN61000-3-3, EN61000-6-4 Imission Yes Safety and Protection Safety and Protection Input / output No </td <td>Industrial control equipment</td> <td></td> | Industrial control equipment | |
| EE In conformance with EMC directive 2014/30/EU and Low Voltage Directive 2014/35/EU Component power supply for general use EN61204-3 mmunity EN55024, EN61000-6-1, EN61000-6-2 (EN61000-4-2, 3, 4, 5, 6, 8, 11) imission EN55032, EN55011, EN61000-3, EN61000-6-3, EN61000-6-4 Imission EN55032, EN55011, EN61000-3, EN61000-6-4 Imission EN55032, EN55011, EN61000-6-3, EN61000-6-4 Imission EN55032, EN55011, EN61000-3, EN61000-6-4 Imission EN55032, EN55011, EN61000-3, EN61000-6-4 Imission EN55032, EN55011, EN61000-3, EN61000-6-4 Imission EN5502, EN55011, EN61000-3, EN61000-6-4 Imission Ensona Ensona Imission Ensona Ensona Imission Ensona Ensona Ensona Imission Ensona Ensona Ensona Imission Ensona Ensona Ensona Imission Ensona Imission< | Class 2 power supply | |
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| Instruction EN55024, EN61000-6-1, EN61000-6-2 (EN61000-4-2, 3, 4, 5, 6, 8, 11) Imission EN55032, EN55011, EN61000-6-3, EN61000-6-4 Imission Imission Imission Enstead Imission Yes State No Solation voltage: No Input / PE Instruct Output / PE Instruct Input / PE Input / PE | Component power supply for general use | |
| initiation Endet initiation initiation EN55032, EN55011, EN61000-6-3, EN61000-6-4 initiation Endet initiation initiation Endet initiation initiation Endet initiation initiation Endet initiation initiation Yes Endet initiation Yes Statety and Protection No Solation voltage: No Input / output 3kVAC Input / PE 0.5 kVAC Vortection degree IP20 | | EN55024, EN61000-6-1, EN61000-6-2 |
| Kee SPET CUSTED Ind. Cont. Eq. CONSULS E198298 toHS Compliant Yes Safety and Protection Yes Solation voltage: Input / output Input / PE Output / PE No Output / PE Output / PE 3kVAC 0.5 kVAC Protection degree IP20 | | |
| Constraint Constraint Stafety and Protection Yes Stafety and Protection No Solation voltage: No Input / output 3kVAC Input / output 1.5 kVAC Output / PE 0.5 kVAC Votescience IP20 | Emission | |
| LISTED Ind. Cont. Eq. E198298 ktoHS Compliant Yes Safety and Protection Yes Surge voltage protection against internal surge voltages No Solation voltage: Input / output Input / PE 3kVAC Output / PE 1.5 kVAC Output / PE 0.5 kVAC Input / PE 1.5 kVAC | | |
| Ind. Cont. Eq. IoHS Compliant Yes Safety and Protection No Surge voltage protection against internal surge voltages No Solation voltage: No Input / output 3kVAC Input / PE 0.5 kVAC Output / PE 0.5 kVAC irrotection degree IP20 | | |
| Yes Safety and Protection Surge voltage protection against internal surge voltages No solation voltage: 3kVAC Input / output 3kVAC Unput / PE 1.5 kVAC Output / PE 0.5 kVAC Irotection degree IP20 | | LISTED E198298 |
| Safety and Protection Surge voltage protection against internal surge voltages Solation voltage: Input / output Input / PE Output / PE Output / PE Input / OE Input / OE Input / PE Input / | PoHS Compliant | · · · · · · · · · · · · · · · · · · · |
| No No solation voltage: No Input / output 3kVAC Input / PE 1.5 kVAC Output / PE 0.5 kVAC Protection degree IP20 | | 165 |
| solation voltage: Input / output Input / PE Output / PE Vrotection degree IP20 | | N. |
| Input / output 3kVAC Input / PE 1.5 kVAC Output / PE 0.5 kVAC Protection degree IP20 | | N0 |
| Input / PE 1.5 kVAC Output / PE 0.5 kVAC Protection degree IP20 | Input / output | 3kVAC |
| rotection degree IP20 | Input / PE | 1.5 kVAC |
| | | |
| Class I with PE connection | Protection degree | |
| | Safety class | Class I with PE connection |

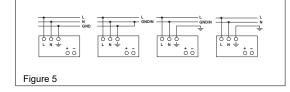
RHINO PSV24-120S Power Supply

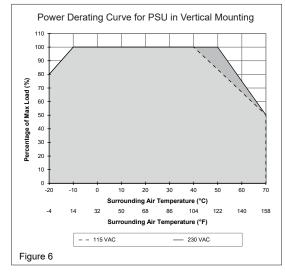












READ INSTRUCTIONS BEFORE INSTALLING OR OPERATING THIS DEVICE. KEEP FOR FUTURE REFERENCE.

1. Safety instructions

- Switch main power off before connecting or disconnecting the device. Risk of explosion!
- If the unit is used in a manner not specified by the manufacturer, the protection provided by the
 equipment may be impaired.
- To guarantee sufficient convection cooling, please keep a distance of 50mm above and 18cm below the device as well as a lateral distance of 10mm to other units.
- Note that the enclosure of the device can become very hot depending on the ambient temperature and load of the power supply. Bisk of burns!
- The main power must be turned off before connecting or disconnecting wires to the terminals!
 Do not introduce any objects into the unit!
- Dangerous voltage present for at least 5 minutes after disconnecting all sources of power.
- The power supplies are built-in units and must be installed in a cabinet or room (condensation)
- free environment and indoor location) that is relatively free of conductive contaminants.
- The unit must be installed in an IP54 enclosure or cabinet in the final installation.
- CAUTION: FOR USE IN A CONTROLLED ENVIRONMENT.

2. Device description (Fig. 1)

- (1) Input terminal block connector
- (2) Output terminal block connector
- (3) DC voltage adjustment potentiometer
- (4) DC OK LED (green)
- (5) Universal mounting rail system

3. Mounting (Fig. 2)

The power supply unit can be mounted on 35mm DIN rails in accordance with EN60715. For vertical mounting, the device should be installed with input terminal block on the bottom.

Each device is delivered ready to install.

- Snap on the DIN rail as shown in Fig. 2:
 - 1. Tilt the unit slightly upwards and put it onto the DIN rail.
 - 2. Push downwards until stopped.
 - 3. Press against the bottom front side for locking.
 - 4. Shake the unit slightly to ensure that it is secured.
- 4. Dismounting (Fig. 3)

To uninstall, use a flat screwdriver to pull or slide down the latch as shown in Fig. 3. Then slide the PSU in the opposite direction, release the latch and pull out the PSU from the rail.

5. Connection

The terminal block connectors allow easy and fast wiring.

You can use flexible (stranded wire) or solid cables with cross sections:

| | Electrical Connections and Wire Size | | | |
|--------|--------------------------------------|-----------|------|-------|
| | Strande | d / Solid | Tor | que |
| | mm² | AWG | N∙m | lb-in |
| Input | 0.823-8.365 | 18-8 | 1.01 | 9 |
| Output | 0.20-3.3 | 24-12 | 0.68 | 6 |

To secure reliable and shock proof connections, the stripping length should be 7mm (see Fig. 4 (1)). Please ensure that wires are fully inserted into the connecting terminals as shown in Fig. 4 (2). All wire strands must be fully inserted into the terminals with the screws securely fastened in order to ensure safety and maximum contact.

In accordance to EN60950 / UL60950, flexible cables require ferrules.

Use appropriate copper cables that are designed to sustain operating temperature of at least 60°C/75°C or more to fulfill UL requirements.

5.1. Input connection (Fig. 1, Fig. 5)

Use L N and GND connections of input terminal connector (see Fig. 1 (1)) to establish the 100-240 VAC connection. Typical connection methods are shown in Figure 5.

The unit is protected with an internal fuse (not replaceable) at L pin and it has been tested and approved on 20A (UL) and 16A (IEC) branch circuits without additional protection device. An external protection device is only required if the supplying branch has an ampacity greater than above.



The internal fuse must not be replaced by the user.

5.2. Output connection (Fig. 1 (2))

Use the "+" and "-" screw connections to establish the 24VDC connection. The output provides 24VDC. The output voltage can be adjusted from 22 to 28 VDC on the potentiometer. The green LED DC OK displays correct function of the output (Fig. 1 (4)). The device has a short circuit and overload protection and an overvoltage protection limited to 28.3-352 VDC.

5.3. Output characteristic curve

The device functions normal under operating line and load conditions. In the event of an overload ($I_{O} = 105-150\%$) the output voltage will start to droop until overload has been removed.

5.4. Thermal behavior (Fig. 6)

In the case of ambient temperatures:

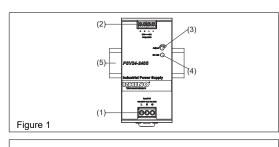
- At -10°C to -20°C [14°F to -4°F], the output capacity must be reduced by 2% per °C temperature increase.
 Above +40°C [104°F] (115VAC), the output capacity must be reduced by 1.67% per degree Celsius
- temperature increase.
- Above +50°C [122°F] (230VAC), the output capacity must be reduced by 2.5% per degree Celsius temperature increase.

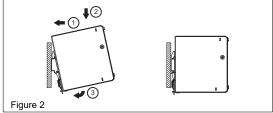
If the output capacity is not reduced when $T_{Amb} > 40^{\circ}C$ (115VAC) or > 50°C (230VAC), the device will engage thermal protection by switching off, i.e., the output voltage will go into latch-off mode until the component temperature cools down and the AC power is recycled.

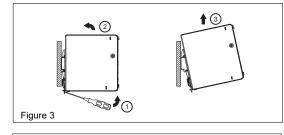
RHINO PSV24-120S Power Supply

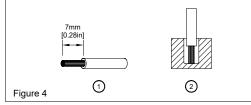
| Technical Specifications 100-240 VAC / 50-60 Hz 85-264 VAC 47-63 Hz 2.2 A typ. @ 115VAC, 1.2 A typ. @ 230VAC 20A typ. @ 115VAC, 40A typ. @ 230VAC 20ms typ. @ 115VAC, 40A typ. @ 230VAC 20ms typ. @ 115VAC, 400A typ. @ 230VAC 20ms typ. @ 115VAC, 400W load) 90ms typ. @ 230VAC (100% load) 200ms typ. @ 115VAC & 230VAC (100% load) 200ms typ. @ 115VAC & 230VAC (100% load) 200ms typ. @ 230VAC (100% load) 200ms typ. @ 240VAC (100% load) 200ms typ. @ 250VAC (100% load) 200ms typ. @ 240VAC (100% load) 200ms typ. @ 264VAC 24VDC ± 2 % 22-28 VDC (maximum power ≤ 120W) 5A Refer to Fig. 6 -10°C to -20°C (2%/°C), > 40°C (1.67%/°C) @ 115VAC -10°C to -20°C (2%/°C), > 50°C (2.5%/°C) @ 230VAC |
|---|
| $\frac{85-264 \text{ VAC}}{47-63 \text{ Hz}}$ 2.2 A typ. @ 115VAC, 1.2 A typ. @ 230VAC 20A typ. @ 115VAC, 40A typ. @ 230VAC 20ms typ. @ 115VAC (100% load) 90ms typ. @ 230VAC (100% load) 200ms typ. @ 115VAC & 230VAC (100% load) 200ms typ. @ 120VAC |
| $\frac{85-264 \text{ VAC}}{47-63 \text{ Hz}}$ 2.2 A typ. @ 115VAC, 1.2 A typ. @ 230VAC 20A typ. @ 115VAC, 40A typ. @ 230VAC 20ms typ. @ 115VAC (100% load) 90ms typ. @ 230VAC (100% load) 200ms typ. @ 115VAC & 230VAC (100% load) 200ms typ. @ 120VAC |
| $\begin{array}{c} 47-63 \ \text{Hz} \\ \hline 2.2 \ \text{A typ. @ 115VAC, 1.2 \ A typ. @ 230VAC} \\ \hline 20A typ. @ 115VAC, 40A typ. @ 230VAC \\ \hline 20ms typ. @ 115VAC (100% load) \\ \hline 90ms typ. @ 230VAC (100% load) \\ \hline 90ms typ. @ 115VAC & 230VAC (100% load) \\ \hline 200ms typ. @ 115VAC & 230VAC (100% load) \\ \hline C 4A / 250V (non-replaceable) \\ \hline < 0.25 \ \text{mA} @ 264VAC \\ \hline \\ $ |
| $\begin{array}{c} 2.2 \ A \ typ. @ 115 \ VAC, 1.2 \ A \ typ. @ 230 \ VAC\\ 20A \ typ. @ 115 \ VAC, 40A \ typ. @ 230 \ VAC\\ 20ms \ typ. @ 115 \ VAC (100\% \ load)\\ 90ms \ typ. @ 230 \ VAC (100\% \ load)\\ 200ms \ typ. @ 115 \ VAC & 230 \ VAC (100\% \ load)\\ \hline 200ms \ typ. @ 115 \ VAC & 230 \ VAC (100\% \ load)\\ \hline C \ C \ D \ D$ |
| 20A typ. @ 115VAC, 40A typ. @ 230VAC 20ms typ. @ 115VAC (100% load) 90ms typ. @ 230VAC (100% load) 200ms typ. @ 115VAC & 230VAC (100% load) T 4A / 250V (non-replaceable) < 0.25 mA @ 264VAC 24VDC ± 2 % 22-28 VDC (maximum power ≤ 120W) 5A Refer to Fig. 6 -10°C to -20°C (2%/°C), > 40°C (1.67%/°C) @ 115VAC |
| 20ms typ. @ 115VAC (100% load) 90ms typ. @ 230VAC (100% load) 200ms typ. @ 115VAC & 230VAC (100% load) T 4A / 250V (non-replaceable) < 0.25 mA @ 264VAC 24VDC ± 2 % 22-28 VDC (maximum power ≤ 120W) 5A Refer to Fig. 6 -10°C to -20°C (2%/°C), > 40°C (1.67%/°C) @ 115VAC |
| 90ms týp. @ 230VAC (100% load) 200ms typ. @ 115VAC & 230VAC (100% load) T 4A / 250V (non-replaceable) < 0.25 mA @ 264VAC 24VDC ± 2 % 22-28 VDC (maximum power ≤ 120W) 5A Refer to Fig. 6 -10°C to -20°C (2%/°C), > 40°C (1.67%/°C) @ 115VAC |
| T 4A / 250V (non-replaceable) < 0.25 mA @ 264VAC 24VDC $\pm 2 \%$ 22-28 VDC (maximum power $\le 120W$) 5A Refer to Fig. 6 -10°C to -20°C (2%/°C), > 40°C (1.67%/°C) @ 115VAC |
| < 0.25 mA @ 264VAC $24VDC \pm 2 \%$ 22-28 VDC (maximum power $\le 120W$) 5A Refer to Fig. 6 -10°C to -20°C (2%/°C), > 40°C (1.67%/°C) @ 115VAC |
| 24VDC ± 2 % 22-28 VDC (maximum power ≤ 120W) 5A Refer to Fig. 6 -10°C to -20°C (2%/°C), > 40°C (1.67%/°C) @ 115VAC |
| 22-28 VDC (maximum power ≤ 120W) 5A Refer to Fig. 6 -10°C to -20°C (2%/°C), > 40°C (1.67%/°C) @ 115VAC |
| 22-28 VDC (maximum power ≤ 120W) 5A Refer to Fig. 6 -10°C to -20°C (2%/°C), > 40°C (1.67%/°C) @ 115VAC |
| 5A Refer to Fig. 6 -10°C to -20°C (2%/°C), > 40°C (1.67%/°C) @ 115VAC |
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| -10°C to -20°C (2%/°C), > 40°Č (1.67%/°C) @ 115VAC |
| |
| Max. 8,000µF |
| 0.65 W / 13.3 W |
| 88.0% typ. @ 115VAC, 90.0% typ. @ 230VAC |
| < 120 mVpp |
| PSB60-REM20S / PSB60-REM40S or with ORing Diode |
| |
| SGCC (Case Cover) / Aluminum (Case Chassis) |
| Green LED DC OK |
| > 700,000 hrs. as per Telcordia |
| mm x 40mm x 117.6 mm [4.87 in x 1.57 in x 4.63 in] (See for complete engineering drawings.) |
| 0.54 kg [19 oz] |
| Screw connection |
| 7mm [0.28 in] |
| -20°C to +70°C [-4°F to +158°F] (Refer to Fig. 6) |
| -40°C to +85°C [-40°F to +185°F] |
| 5 to 95% RH |
| perating: IEC60068-2-6, Sine Wave: 10Hz to 50Hz (916.m/s² (2G peak); 10min per cycle, 60min for X direction Non-Operating: IEC60068-2-6, Random: 5Hz to 500Hz (2.09 Grms); 20 min. per axis for all X, Y, Z directions |
| Operating: IEC60068-2-27, Half Sine Wave: 10G for a duration of 11ms, shock for 1 direction (X axis) Non-Operating: IEC60068-2-27, Half Sine Wave: 50G for a duration of 11ms, 3 shocks for each 3 directions |
| 2 |
| 2000m for industrial application 5000m for ITE application |
| |
| SELV (EN60950) |
| UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 60950-1 (File No. E198298), CB scheme to IEC60950-1 |
| UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) |
| In conformance with EMC directive 2014/30/EU and Low Voltage Directive 2014/35/EU |
| EN61204-3 |
| EN55024, EN61000-6-1, EN61000-6-2 (EN61000-4-2, 3, 4, 5, 6, 8, 11, 12) |
| EN55032, EN55011, EN61000-3-2 Class A, EN61000-3-3, EN61000-6-3, EN61000-6-4 |
| SEMI F47 – 0706 @ 200VAC |
| C S S S S S S S S S S S S S S S S S S S |
| Yes |
| |
| Varistor |
| I _{surge} = 105-150% or Po _{max} typically |
| Yes |
| |
| 3kVAC |
| 204/00 |
| 2kVAC 0.5 kVAC |
| 2kVAC 0.5 kVAC IP20 |
| |

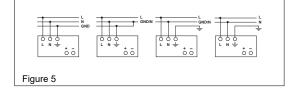
RHINO PSV24-240S Power Supply

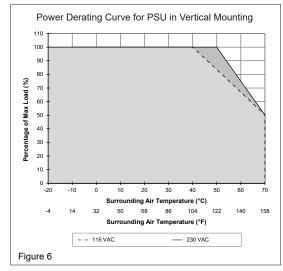












READ INSTRUCTIONS BEFORE INSTALLING OR OPERATING THIS DEVICE. KEEP FOR FUTURE REFERENCE.

1. Safety instructions

- Switch main power off before connecting or disconnecting the device. Risk of explosion!
- If the unit is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- To guarantee sufficient convection cooling, please keep a distance of 50mm above and 18cm below the device as well as a lateral distance of 10mm to other units.
- Note that the enclosure of the device can become very hot depending on the ambient temperature and load of the power supply. Risk of burns!
- The main power must be turned off before connecting or disconnecting wires to the terminals!
 Do not introduce any objects into the unit!
- Dangerous voltage present for at least 5 minutes after disconnecting all sources of power.
- The power supplies are built-in units and must be installed in a cabinet or room (condensation)
- free environment and indoor location) that is relatively free of conductive contaminants.
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- (1) Input terminal block connector
- (2) Output terminal block connector
- (3) DC voltage adjustment potentiometer
- (4) DC OK LED (green)
- (5) Universal mounting rail system

3. Mounting (Fig. 2)

The power supply unit can be mounted on 35mm DIN rails in accordance with EN60715. For vertical mounting, the device should be installed with input terminal block on the bottom.

Each device is delivered ready to install.

- Snap on the DIN rail as shown in Fig. 2:
 - 1. Tilt the unit slightly upwards and put it onto the DIN rail.
 - 2. Push downwards until stopped.
 - 3. Press against the bottom front side for locking.
 - 4. Shake the unit slightly to ensure that it is secured.
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To uninstall, use a flat screwdriver to pull or slide down the latch as shown in Fig. 3. Then slide the PSU in the opposite direction, release the latch and pull out the PSU from the rail.

5. Connection

The terminal block connectors allow easy and fast wiring.

You can use flexible (stranded wire) or solid cables with cross sections:

| Electrical Connections and Wire Size | | | | |
|--------------------------------------|---------|-----------|------|-------|
| | Strande | d / Solid | Tor | que |
| | mm² | AWG | N·m | lb•in |
| Input | 1.3-3.3 | 16-12 | 1.01 | 9 |
| Output | 1.3-3.3 | 16-12 | 0.68 | 6 |

To secure reliable and shock proof connections, the stripping length should be 7mm (see Fig. 4 (1)). Please ensure that wires are fully inserted into the connecting terminals as shown in Fig. 4 (2). All wire strands must be fully inserted into the terminals with the screws securely fastened in order to ensure safety and maximum contact.

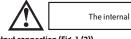
In accordance to EN60950 / UL60950, flexible cables require ferrules.

Use appropriate copper cables that are designed to sustain operating temperature of at least 60°C/75°C or more to fulfill UL requirements.

5.1. Input connection (Fig. 1, Fig. 5)

Use L N and GND connections of input terminal connector (see Fig. 1 (1)) to establish the 100-240 VAC connection. Typical connection methods are shown in Figure 5.

The unit is protected with an internal fuse (not replaceable) at L pin and it has been tested and approved on 20A (UL) and 16A (IEC) branch circuits without additional protection device. An external protection device is only required if the supplying branch has an ampacity greater than above.



The internal fuse must not be replaced by the user.

5.2. Output connection (Fig. 1 (2))

Use the "+" and "-" screw connections to establish the 24VDC connection. The output provides 24VDC. The output voltage can be adjusted from 22 to 28 VDC on the potentiometer. The green LED DC OK displays correct function of the output (Fig. 1 (4)). The device has a short circuit and overload protection and an overvoltage protection limited to 28.3-35.2 VDC.

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The device functions normal under operating line and load conditions. In the event of an overload $(I_{O} = 105-150\%)$ the output voltage will start to droop until overload has been removed.

5.4. Thermal behavior (Fig. 6)

- In the case of ambient temperatures:
 - Above +40°C [104°F] (115VAC), the output capacity has to be reduced by 1.67% per degree Celsius increase in temperature.
 - 2. Above +50°C [122°F] (230VAC), the output capacity has to be reduced by 2.5% per degree Celsius increase in temperature.

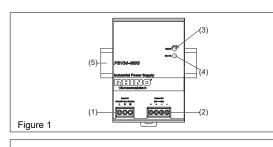
If the output capacity is not reduced when $T_{Amb} > 40^{\circ}C [104^{\circ}F] (115VAC) or > 50^{\circ}C [122^{\circ}F] (230VAC)$, the device will engage thermal protection by switching off, i.e., the output voltage will go into latch-off mode until the component temperature cools down and the AC power is recycled.

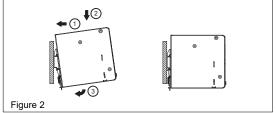
tPWR-85 Power Supplies

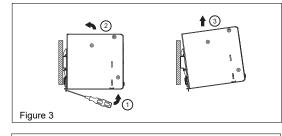
RHINO PSV24-240S Power Supply

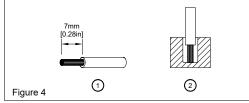
| | Technical Specifications |
|--|--|
| Input (AC) | |
| Nominal input voltage / frequency | 100-240 VAC / 50-60 Hz |
| Voltage range | 85-264 VAC |
| Frequency | 47-63 Hz |
| Nominal current | 2.8 A typ. @ 115VAC, 1.4 A typ. @ 230VAC |
| Inrush current limitation (+25°C, cold start) | 20A typ. @ 115VAC, 40A typ. @ 230VAC |
| Mains buffering at nominal load (typ.) | 10ms typ. @ 115VAC (100% load) |
| 0 000 | 16ms typ. @ 230VAC (100% load) |
| Turn-on time | 1000ms typ. @ 115VAC & 230VAC (100% load) |
| Internal fuse | T 6.3 A / 250V (non-replaceable) |
| Leakage current | < 1mA @ 264VAC |
| Output (DC) | 1 |
| Nominal output voltage U _N / tolerance | 24VDC ± 2 % |
| Voltage adjustment range | 22-28 VDC (maximum power ≤ 240W) |
| Output current | 10A |
| Derating | Refer to Fig. 6 > 40°C (1.67%)°C) @ 115VAC (90-229 VAC) > 50°C (2.5%)°C) @ 230VAC (230-264 VAC) |
| Startup with capacitive loads | Max. 8,000µF |
| | 4.62 W @ 115VAC (0% load) 2.14 W @ 230VAC (0% load) |
| Max. power dissipation idling / nominal load approx. | 31.53 W @ 115VAC (100% load) 25.44 W @ 230VAC (100% load) |
| Efficiency at 100% load | 88.0% typ. @ 115VAC, 90.0% typ. @ 230VAC |
| | <120mVpp @ -10°C to +70°C |
| PARD (20MHz) at 100% load | < 240mVpp @ -20°C to -10°C |
| Parallel operation | PSB60-REM20S / PSB60-REM40S or with ORing Diode |
| General Data | |
| Type of housing | SGCC (Case Cover) / Aluminum (Case Chassis) |
| LED signals | Green LED DC OK |
| MTBF | > 700,000 hrs. as per Telcordia |
| Dimensions (L x W x H) | 123.6 mm x 60mm x 117.6 mm [4.87 in x 2.36 in x 4.63 in] (See for complete engineering drawings.) |
| Weight | 0.80 kg [28 oz] |
| Connection method | Screw connection |
| Stripping length | 7mm [0.28 in] |
| Operating temperature (surrounding air temperature) | -20°C to +70°C [-4°F to +158°F] (Refer to Fig. 6) |
| Storage temperature | -40°C to +85°C [-40°F to +185°F] |
| Humidity at +25°C, no condensation | 5 to 95% RH |
| Vibration | Operating: IEC60068-2-6, Sine Wave: 10Hz to 500Hz @ 19.6m/s ² (2G peak); 10min per cycle, 60min for X direction Non-Operating: IEC60068-2-6, Random: 5Hz to 500Hz (2.09 Grms); 20 min. per axis for all X, Y, Z directions |
| Shock | Operating: IEC60068-2-27, Half Sine Wave: 10G for a duration of 11ms, shock for 1 direction (X axis) Non-Operating: IEC60068-2-27, Half Sine Wave: 50G for a duration of 11ms, 3 shocks for each 3 directions |
| Pollution degree | 2 |
| * | 2000m for industrial application |
| Altitude (operating) | 5000m for ITE application |
| Certification and Standards | |
| Safety entry low voltage | SELV (EN60950) |
| Electrical safety (of information technology equipment) | UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 60950-1 (File No. E198298), CB scheme to IEC60950-1 |
| Industrial control equipment | UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) |
| CE | In conformance with EMC directive 2014/30/EU and Low Voltage Directive 2014/35/EU |
| Component power supply for general use | EN61204-3 |
| Immunity | EN55024, EN61000-6-1, EN61000-6-2 (EN61000-4-2, 3, 4, 5, 6, 8, 11, 12) |
| Emission | EN55032, EN55011, EN61000-3-2 Class A, EN61000-3-3, EN61000-6-3, EN61000-6-4 |
| Voltage Sag Immunity | SEMI F47 - 0706 @ 200VAC |
| | 4ZW4 |
| RoHS Compliant | Yes |
| Safety and Protection | |
| Transient surge voltage protection | Varistor |
| Current limitation at short-circuits approx. | I _{surge} = 105-150% or Po _{max} typically |
| Surge voltage protection against internal surge voltages | Yes |
| Isolation voltage: | |
| Input / output | 3KVAC |
| Input / PE Output / PE | 2kVAC 0.5 kVAC |
| Protection degree | IP20 |
| Safety class | Class I with PE connection |
| | 01000 FW101 E 6011166001 |

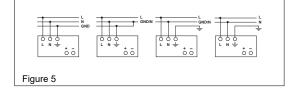
RHINO PSV24-480S Power Supply

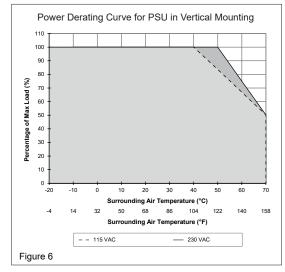












READ INSTRUCTIONS BEFORE INSTALLING OR OPERATING THIS DEVICE. **KEEP FOR FUTURE REFERENCE.**

1. Safety instructions

- Switch main power off before connecting or disconnecting the device. Risk of explosion!
- If the unit is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- To guarantee sufficient convection cooling, please keep a distance of 50mm above and 18cm below the device as well as a lateral distance of 10mm to other units.
- Note that the enclosure of the device can become very hot depending on the ambient temperature and load of the power supply. Risk of burns!
- The main power must be turned off before connecting or disconnecting wires to the terminals! Do not introduce any objects into the unit!
- Dangerous voltage present for at least 5 minutes after disconnecting all sources of power.
- The power supplies are built-in units and must be installed in a cabinet or room (condensation
- free environment and indoor location) that is relatively free of conductive contaminants.
- The unit must be installed in an IP54 enclosure or cabinet in the final installation.
- CAUTION: FOR USE IN A CONTROLLED ENVIRONMENT.

2. Device description (Fig. 1)

- (1) Input terminal block connector
- Output terminal block connector (2)
- (3)DC voltage adjustment potentiometer
- (4) DC OK LED (green)
- (5) Universal mounting rail system

3. Mounting (Fig. 2)

The power supply unit can be mounted on 35mm DIN rails in accordance with EN60715. For vertical mounting, the device should be installed with input terminal block on the bottom.

Each device is delivered ready to install.

- Snap on the DIN rail as shown in Fig. 2:
 - 1. Tilt the unit slightly upwards and put it onto the DIN rail.
 - 2. Push downwards until stopped.
 - 3. Press against the bottom front side for locking.
 - 4. Shake the unit slightly to ensure that it is secured.
- 4. Dismounting (Fig. 3)

To uninstall, use a flat screwdriver to pull or slide down the latch as shown in Fig. 3. Then slide the PSU in the opposite direction, release the latch and pull out the PSU from the rail.

5. Connection

The terminal block connectors allow easy and fast wiring.

You can use flexible (stranded wire) or solid cables with cross sections:

| Electrical Connections and Wire Size | | | | |
|--------------------------------------|------------------|-------|------|-------|
| | Stranded / Solid | | Tor | que |
| | mm² | AWG | N·m | lb-in |
| Input | 1.3-3.3 | 16-12 | 1.01 | 9 |
| Output | 1.3-3.3 | 16-12 | 0.68 | 6 |

To secure reliable and shock proof connections, the stripping length should be 7mm (see Fig. 4 (1)). Please ensure that wires are fully inserted into the connecting terminals as shown in Fig. 4 (2). All wire strands must be fully inserted into the terminals with the screws securely fastened in order to ensure safety and maximum contact

In accordance to EN60950 / UL60950, flexible cables require ferrules.

Use appropriate copper cables that are designed to sustain operating temperature of at least 60°C/75°C or more to fulfill UL requirements.

5.1. Input connection (Fig. 1, Fig. 5)

Use L, N and GND connections of input terminal connector (see Fig. 1 (1)) to establish the 100-240 VAC connection. Typical connection methods are shown in Figure 5.

The unit is protected with an internal fuse (not replaceable) at L pin and it has been tested and approved on 20A (UL) and 16A (IEC) branch circuits without additional protection device. An external protection device is only required if the supplying branch has an ampacity greater than above.



The internal fuse must not be replaced by the user.

5.2. Output connection (Fig. 1 (2))

Use the "+" and "-" screw connections to establish the 24VDC connection. The output provides 24VDC. The output voltage can be adjusted from 22 to 28 VDC on the potentiometer. The green LED DC OK displays correct function of the output (Fig. 1 (4)). The device has a short circuit and overload protection and an overvoltage protection limited to 28.8-35.2 VDC.

5.3. Output characteristic curve

The device functions normal under operating line and load conditions. In the event of an overload (I₀ = 109-130%) the output voltage will start to droop until overload has been removed.

5.4. Thermal behavior (Fig. 6)

- In the case of ambient temperatures:
 - 1. Above ++40°C [104°F] (115VAC), the output capacity has to be reduced by 1.67% per degree Celsius increase in temperature.
 - 2. Above +50°C [122°F] (230VAC), the output capacity has to be reduced by 2.5% per degree Celsius increase in temperature.

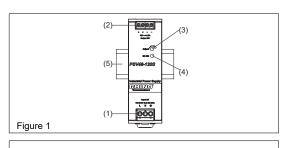
If the output capacity is not reduced when $T_{Amb} > 40^{\circ}C [104^{\circ}F] (115VAC)$ or $> 50^{\circ}C [122^{\circ}F] (230VAC)$, the device will engage thermal protection by switching off, i.e., the output voltage will go into latch-off mode until the component temperature cools down and the AC power is recycled.

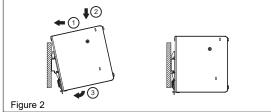
tPWR-87 **Power Supplies**

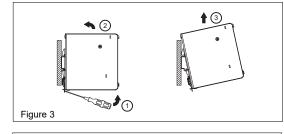
RHINO PSV24-480S Power Supply

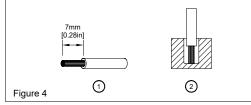
| | Technical Specifications |
|--|---|
| Input (AC) | |
| Nominal input voltage / frequency | 100-240 VAC / 50-60 Hz |
| Voltage range | 85-264 VAC |
| Frequency | 47-63 Hz |
| Nominal current | 5.4 A typ. @ 115VAC, 2.7 A typ. @ 230VAC |
| Inrush current limitation (+25°C, cold start) | 40A typ. @ 115VAC, 80A typ. @ 230VAC |
| | 10ms typ. @ 115VAC (100% load) |
| Mains buffering at nominal load (typ.) | 16ms typ. @ 230VAC (100% load) |
| Turn-on time | 1000ms typ. @ 115VAC & 230VAC (100% load) |
| Internal fuse | F 10 A / 250V (non-replaceable) |
| Leakage current | < 1mA @ 264VAC |
| Output (DC) | 1 |
| Nominal output voltage U _N / tolerance | 24VDC ± 2 % |
| Voltage adjustment range | 22-28 VDC (maximum power ≤ 480W) |
| Output current | 20A |
| Derating | Refer to Fig. 6 > 40°C (1.67%/°C) @ 115VAC (90-229 VAC) > 50°C (2.55%/°C) @ 230VAC (230-264 VAC) |
| Startup with capacitive loads | Max. 8,000µF |
| Max. power dissipation idling / nominal load approx. | 5W @ 115VAC (0% load) 4W @ 230VAC (0% load) |
| a procession of the construction of the constr | 50W @ 115VAC (100% load) 40W @ 230VAC (100% load) |
| Efficiency at 100% load | 85.0% typ. @ 115VAC, 88.0% typ. @ 230VAC |
| PARD (20MHz) at 100% load | < 120mVpp @ -10°C to +70°C < 240mVpp @ -20°C to -10°C |
| Parallel operation | PSB60-REM40S or with ORing Diode |
| General Data | |
| Type of housing | SGCC (Case Cover) / Aluminum (Case Chassis) |
| LED signals | Green LED DC OK |
| MTBF | >700,000 hrs. as per Telcordia |
| Dimensions (L x W x H) | 123.6 mm x 85.5 mm x 128.5 mm [4.87 in x 3.37 in x 5.06 in] (See for complete engineering drawings.) |
| Weight | 1.30 kg [45.9 oz] |
| Connection method | Screw connection |
| Stripping length | 7mm [0.28 in] |
| Operating temperature (surrounding air temperature) | -20°C to +70°C [-4°F to +158°F] (Refer to Fig. 6) |
| | -20 ° to +70 ° C (=4 ° to +100 ° J (Neter to 11g. 0) -40°C to +85°C [-40°F to +185°F] |
| Storage temperature Humidity at +25°C, no condensation | 5 to 95% RH |
| Vibration | Operating: IEC60068-2-6, Sine Wave: 10Hz to 500Hz @ 19.6m/s ² (2G peak); 10min per cycle, 60min for X direction Non-Operating: IEC60068-2-6, Random: 5Hz to 500Hz (2.09 Grms); 20 min. per axis for all X, Y, Z directions |
| Shock | Operating: IEC60068-2-27, Half Sine Wave: 10G for a duration of 11ms, shock for 1 direction (X axis) |
| | Non-Operating: IEC60068-2-27, Half Sine Wave: 50G for a duration of 11ms, 3 shocks for each 3 directions |
| Pollution degree | 2 2000m for industrial application |
| Altitude (operating) | 5000m for ITE application |
| Certification and Standards | |
| Safety entry low voltage | SELV (EN60950) |
| Electrical safety (of information technology equipment) | UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 60950-1 (File No. E198298), CB scheme to IEC60950-1 |
| Industrial control equipment | UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) |
| CE | In conformance with EMC directive 2014/30/EU and Low Voltage Directive 2014/35/EU |
| Component power supply for general use | EN61204-3 |
| Immunity | EN55024, EN61000-6-1, EN61000-6-2 |
| , | (EN61000-4-2, 3, 4, 5, 6, 8, 11, 12) |
| Emission | EN55032, EN55011, EN61000-3-2 Class A, EN61000-3-3, EN61000-6-3, EN61000-6-4 |
| | |
| Voltage Sag Immunity | SEMI F47 - 0706 @ 200VAC |
| | SEMI F47 - 0706 @ 200VAC |
| (| SEMI F47 - 0706 @ 200VAC E C C C C C C C C |
| RoHS Compliant | SEMI F47 - 0706 @ 200VAC |
| RoHS Compliant Safety and Protection | SEMI F47 - 0706 @ 200VAC E E LISTED E Ind. Cont. Eq. Yes |
| RoHS Compliant Safety and Protection Transient surge voltage protection | SEMI F47 - 0706 @ 200VAC SEMI F47 - 0706 @ |
| RoHS Compliant Safety and Protection Transient surge voltage protection Current limitation at short-circuits approx. | SEMI F47 – 0706 @ 200VAC SEMI F47 – 0706 @ |
| RoHS Compliant Safety and Protection Transient surge voltage protection Current limitation at short-circuits approx. Surge voltage protection against internal surge voltages | SEMI F47 - 0706 @ 200VAC SEMI F47 - 0706 @ |
| RoHS Compliant Safety and Protection Transient surge voltage protection Current limitation at short-circuits approx. Surge voltage protection against internal surge voltages Isolation voltage: | SEMI F47 – 0706 @ 200VAC SEMI F47 – 0706 @ |
| RoHS Compliant Safety and Protection Transient surge voltage protection Current limitation at short-circuits approx. Surge voltage protection against internal surge voltages Isolation voltage: Input / output Input / PE | SEMI F47 - 0706 @ 200VAC SEMI F47 - 0706 @ |
| RoHS Compliant Safety and Protection Transient surge voltage protection Current limitation at short-circuits approx. Surge voltage protection against internal surge voltages Isolation voltage: Input / output Input / PE Output / PE | SEMI F47 – 0706 @ 200VAC SEMI F47 – 0706 @ |
| RoHS Compliant Safety and Protection Transient surge voltage protection Current limitation at short-circuits approx. Surge voltage protection against internal surge voltages Isolation voltage: Input / output Input / PE | SEMI F47 - 0706 @ 200VAC SEMI F47 - 0706 @ |

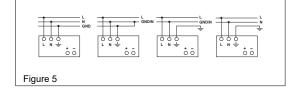
RHINO PSV48-120S Power Supply

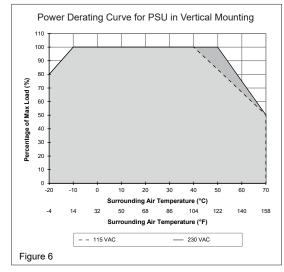












READ INSTRUCTIONS BEFORE INSTALLING OR OPERATING THIS DEVICE. **KEEP FOR FUTURE REFERENCE.**

1. Safety instructions

- Switch main power off before connecting or disconnecting the device. Risk of explosion!
- If the unit is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- To guarantee sufficient convection cooling, please keep a distance of 50mm above and 18cm below the device as well as a lateral distance of 10mm to other units.
- Note that the enclosure of the device can become very hot depending on the ambient temperature and load of the power supply. Risk of burns!
- The main power must be turned off before connecting or disconnecting wires to the terminals! Do not introduce any objects into the unit!
- Dangerous voltage present for at least 5 minutes after disconnecting all sources of power.
- The power supplies are built-in units and must be installed in a cabinet or room (condensation
- free environment and indoor location) that is relatively free of conductive contaminants.
- The unit must be installed in an IP54 enclosure or cabinet in the final installation.
- CAUTION: FOR USE IN A CONTROLLED ENVIRONMENT.

2. Device description (Fig. 1)

- (1) Input terminal block connector
- Output terminal block connector (2)
- (3)DC voltage adjustment potentiometer
- (4) DC OK LED (green)
- (5) Universal mounting rail system

3. Mounting (Fig. 2)

The power supply unit can be mounted on 35mm DIN rails in accordance with EN60715. For vertical mounting, the device should be installed with input terminal block on the bottom.

Each device is delivered ready to install.

- Snap on the DIN rail as shown in Fig. 2:
 - 1. Tilt the unit slightly upwards and put it onto the DIN rail.
 - 2. Push downwards until stopped.
 - 3. Press against the bottom front side for locking.
 - 4. Shake the unit slightly to ensure that it is secured.
- 4. Dismounting (Fig. 3)

To uninstall, use a flat screwdriver to pull or slide down the latch as shown in Fig. 3. Then slide the PSU in the opposite direction, release the latch and pull out the PSU from the rail.

5. Connection

The terminal block connectors allow easy and fast wiring.

You can use flexible (stranded wire) or solid cables with cross sections:

| Electrical Connections and Wire Size | | | | |
|--------------------------------------|-----------------|-----------|------|-------|
| | Strande | d / Solid | Tor | que |
| | mm ² | AWG | N·m | lb•in |
| Input | 0.823-8.365 | 18-8 | 1.01 | 9 |
| Output | 0.20-3.3 | 24-12 | 0.68 | 6 |

To secure reliable and shock proof connections, the stripping length should be 7mm (see Fig. 4 (1)). Please ensure that wires are fully inserted into the connecting terminals as shown in Fig. 4 (2). All wire strands must be fully inserted into the terminals with the screws securely fastened in order to ensure safety and maximum contact.

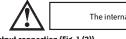
In accordance to EN60950 / UL60950, flexible cables require ferrules.

Use appropriate copper cables that are designed to sustain operating temperature of at least 60°C/75°C or more to fulfill UL requirements.

5.1. Input connection (Fig. 1, Fig. 5)

Use L, N and GND connections of input terminal connector (see Fig. 1 (1)) to establish the 100-240 VAC connection. Typical connection methods are shown in Figure 5.

The unit is protected with an internal fuse (not replaceable) at L pin and it has been tested and approved on 20A (UL) and 16A (IEC) branch circuits without additional protection device. An external protection device is only required if the supplying branch has an ampacity greater than above.



The internal fuse must not be replaced by the user.

5.2. Output connection (Fig. 1 (2))

Use the "+" and "-" screw connections to establish the 48 VDC connection. The output provides 48 VDC. The output voltage can be adjusted from 44 to 56 VDC on the potentiometer. The green LED DC OK displays correct function of the output (Fig. 1 (4)). The device has a short circuit and overload protection and an overvoltage protection limited to 56-67.2 VDC.

5.3. Output characteristic curve

The device functions normal under operating line and load conditions. In the event of an overload (I_O = 105-150%) the output voltage will start to droop until overload has been removed.

5.4. Thermal behavior (Fig. 6)

- In the case of ambient temperatures:
 - 1. At -10°C to -20°C [14°F to -4°F], the output capacity has to be reduced by 2% per degree Celsius increase in temperature
 - 2. Above +40°C [104°F] (115VAC), the output capacity has to be reduced by 1.67% per degree Celsius increase in temperature
 - 3. Above +50°C [122°F] (230VAC), the output capacity has to be reduced by 2.5% per degree Celsius increase in temperature.

If the output capacity is not reduced when $T_{Amb} > 40^{\circ}C [104^{\circ}F] (115VAC)$ or $> 50^{\circ}C [122^{\circ}F] (230VAC)$, the device will engage thermal protection by switching off, i.e., the output voltage will go into latch-off mode until the component temperature cools down and the AC power is recycled.



RHINO PSV48-120S Power Supply

| | Technical Specifications |
|--|--|
| Input (AC) | |
| Nominal input voltage / frequency | 100-240 VAC / 50-60 Hz |
| Voltage range | 85-264 VAC |
| Frequency | 47-63 Hz |
| Nominal current | 2.2 A typ. @ 115VAC, 1.2 A typ. @ 230VAC |
| Inrush current limitation (+25°C, cold start) | 20A typ. @ 115VAC, 1.2 A typ. @ 230VAC |
| | 20m typ. @ 115VAC, 40A typ. @ 250VAC 20ms typ. @ 115VAC (100% load) |
| Mains buffering at nominal load (typ.) | 90ms typ. @ 230VAC (100% load) |
| Turn-on time | 200ms typ. @ 115VAC & 230VAC (100% load) |
| Internal fuse | T 4A / 250V (non-replaceable) |
| Leakage current | < 0.25 mA @ 264VAC |
| Output (DC) | |
| Nominal output voltage U _N / tolerance | 48VDC ± 2 % |
| Voltage adjustment range | 44-56 VDC (maximum power ≤ 120W) |
| Output current | 2.5 A |
| | 2.5 A Refer to Fig. 6 |
| Derating | -10°C to -20°C (2%/°C), >40°C (1.67%/°C) @ 115VAC -10°C to -20°C (2%/°C), >50°C (2.5%/°C) @ 230VAC |
| Startup with capacitive loads | Max. 4,000µF |
| Max. power dissipation idling / nominal load approx. | 1.21 W / 13.3 W |
| Efficiency at 100% load | 89.0% typ. @ 115VAC, 90.0% typ. @ 230VAC |
| PARD (20MHz) at 100% load | <150 mVpp |
| Parallel operation | PSB60-REM20S / PSB60-REM40S or with ORing Diode |
| General Data | |
| Type of housing | SGCC (Case Cover) / Aluminum (Case Chassis) |
| LED signals | Green LED DC OK |
| | |
| MTBF | > 700,000 hrs. as per Telcordia |
| Dimensions (L x W x H) | 123.6 mm x 40mm x 117.6 mm [4.87 in x 1.57 in x 4.63 in] (See for complete engineering drawings.) |
| Weight | 0.54 kg [19 oz] |
| Connection method | Screw connection |
| Stripping length | 7mm [0.28 in] |
| Operating temperature (surrounding air temperature) | -20°C to +70°C [-4°F to +158°F] (Refer to Fig. 6) |
| Storage temperature | -40°C to +85°C [-40°F to +185°F] |
| Humidity at +25°C, no condensation | 5 to 95% RH |
| Vibration | Operating: IEC60068-2-6, Sine Wave: 10Hz to 500Hz @ 19.6m/s ² (2G peak); 10min per cycle, 60min for X direction Non-Operating: IEC60068-2-6, Random: 5Hz to 500Hz (2.09 Grms); 20 min. per axis for all X, Y, Z directions |
| Shock | Operating: IEC60068-2-27, Half Sine Wave: 10G for a duration of 11ms, shock for 1 direction (X axis) Non-Operating: IEC60068-2-27, Half Sine Wave: 50G or a duration of 11ms, 3 shocks for each 3 directions |
| Pollution degree | 2 |
| Altitude (operating) | 2000m for industrial application 5000m for ITE application |
| Certification and Standards | Sooom of the approaction |
| Safety entry low voltage | SELV (EN60950) |
| Electrical safety (of information technology equipment) | UL/C-UL recognized to UL60950-1 and CSA C22.2 No. 60950-1 (File No. E198298), CB scheme to IEC60950-1 |
| Industrial control equipment | UL/C-UL listed to UL508 and CSA C22.2 No.107.1-01 (File No. E197592) |
| CE | In conformance with EMC directive 2014/30/EU and Low Voltage Directive 2014/35/EU |
| Component power supply for general use | EN61204-3 |
| | EN01204-3 EN55024, EN61000-6-1, EN61000-6-2 |
| Immunity | (EN61000-4-2, 3, 4, 5, 6, 8, 11, 12) |
| Emission | EN55032, EN55011, EN61000-3-2 Class A, EN61000-3-3, EN61000-6-3, EN61000-6-4 |
| Voltage Sag Immunity | SEMI F47 – 0706 @ 200VAC |
| (| C C C LISTED LISTED Ind. Cont. Eq. |
| RoHS Compliant | Yes |
| Safety and Protection | |
| Transient surge voltage protection | Varistor |
| Current limitation at short-circuits approx. | I _{surge} = 105-150% or Po _{max} typically |
| Surge voltage protection against internal surge voltages | Yes |
| Isolation voltage: | |
| Input / output | 3kVAC |
| Input / PE Output / PE | 2kVAC 0.5 kVAC |
| | IP20 |
| Protection degree | |
| Safety class | Class I with PE connection |