

# RHINO PSB Power Supply Accessories

## Redundancy Module Overview

The RHINO PSB60-REM series redundancy modules are used with two RHINO PSB series power supplies in parallel to create redundancy to help prevent costly downtime due to power supply failure. The redundancy module decouples the outputs of the two connected power supplies so that in case of failure, one power supply cannot overload the other. The modules can handle power supply voltages from 22 to 60VDC and provides alarm relay contacts for remote monitoring.

## Features

- Provides redundancy and parallel operation of two RHINO PSB power supplies
- Wide input and output range 22–60 VDC
- Input voltage OK LED and relay alarm indication
- Corrosion resistant aluminum housing
- Approved for use in Class I, Division 2 hazardous locations
- 3-year warranty



| Redundancy Modules                      |                                                                                                                                                                                                                                                                                         |              |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| Part Number                             | PSB60-REM20S                                                                                                                                                                                                                                                                            | PSB60-REM40S |
| Price                                   | \$41.00                                                                                                                                                                                                                                                                                 | \$50.00      |
| Weight kg [lb]                          | 0.375 [0.83]                                                                                                                                                                                                                                                                            | 0.515 [1.14] |
| Redundancy Module Input Specifications  |                                                                                                                                                                                                                                                                                         |              |
| Nominal Input Voltage                   | 24 / 48 VDC                                                                                                                                                                                                                                                                             |              |
| Voltage Range                           | 22–60 VDC                                                                                                                                                                                                                                                                               |              |
| Nominal Current                         | 20A max                                                                                                                                                                                                                                                                                 | 40A max      |
| Input Voltage Alarm/Relay Contacts      | 24V system: both Vin1 & Vin2 >18V ± 5% or < 30V max. relay contacts<br>48V system: both Vin1 & Vin2 >36V ± 5% or <60V max. relay contacts                                                                                                                                               |              |
| Input Voltage LED Operation             | The LED will turn on when the Vin1 & Vin2 >18V± 5% (for 24V systems) or >36V ± 5% (for 48V system) and not more than 30V (for 24V systems) or not more than 60V (for 48V systems), the relay contacts will be closed. If Vin1 & Vin2 is under or over this range, the LED will turn off |              |
| Redundancy Module Output Specifications |                                                                                                                                                                                                                                                                                         |              |
| Nominal Output Voltage UN / Tolerance   | Vin-0.65V [Typ]                                                                                                                                                                                                                                                                         |              |
| Nominal Current                         | 20A max                                                                                                                                                                                                                                                                                 | 40A max      |
| Derating above +50°C                    | >50°C [2.5% / K]                                                                                                                                                                                                                                                                        |              |
| Short Circuit / Over Load Limit         | <25A                                                                                                                                                                                                                                                                                    | <50A         |
| Efficiency                              | >97% typical                                                                                                                                                                                                                                                                            |              |

Note: The overload condition must be controlled by the power supply units in parallel; The limit of input current should not be more than 25A (for 20A module) or not more than 50A (for 40A module)

| Redundancy Module Certification / Standards                    |                                                                                                                                                            |
|----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Electrical Equipment of Machines                               | IEC60204-1 [over voltage category III]                                                                                                                     |
| Electrical Safety (IT equipment)                               | UR/cUR recognized to UL60950-1 File no. E198298, CB test certificate and report to IEC60950-1 and CE                                                       |
| Industrial Control Equipment                                   | UL/cUL recognized to UL508 and CSA C22.2 No. 107.1-01File no. E197592                                                                                      |
| Hazardous Location                                             | cCSAus to CSA C22.2 No. 213-M1987, ANSI / ISA 12.12.01:2007 [Class I, Division 2, Group A,B,C,D T4, Ta = -40 to +80°C (> +50°C derating)], File no. 249074 |
| Electronic Equipment For Use in Electrical Power Installations | EN50178 / IEC62103                                                                                                                                         |
| Safety Entry Low Voltage                                       | PELV [EN60204], SELV [EN60950]                                                                                                                             |
| RoHS Compliant                                                 | Yes, RoHS directive, WEEE directive                                                                                                                        |
| Protection Against Electric Shock                              | DIN 57100-410                                                                                                                                              |

# RHINO PSB Power Supply Accessories

## Redundancy Module General Specifications (continued)

|                                                                      |                                             |
|----------------------------------------------------------------------|---------------------------------------------|
| <b>Isolation Voltage:</b><br><i>Input / PE</i><br><i>Output / PE</i> | 1.5 KVAC / 1.5 KVAC<br>1.5 KVAC / 1.5 KVAC  |
| <b>Degree of Protection</b>                                          | IP20                                        |
| <b>Class of Protection</b>                                           | Class II with PE connection                 |
| <b>MTBF</b>                                                          | >800,000 hrs. per BELL CORE STD or IEC61709 |
| <b>Type of Housing</b>                                               | Aluminum [AL1100F]                          |

## Redundancy Module Environmental Specifications

|                                           |                                                                                                                                                                                         |
|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Humidity at +25°C, no condensation</b> | <95% RH                                                                                                                                                                                 |
| <b>Vibration</b>                          | 10Hz to 500Hz @ 30 m/S2 [3G peak]; displacement of 0.35 mm; 60 min per axis for all X, Y, Z direction.<br>Refer to IEC 60068-2-6. Note: all figures quoted are amplitudes [peak values] |
| <b>Shock (in all directions)</b>          | IEC60068-2-27, 30G [300m/s2] for duration 18ms 1 Shock in 2 directions tested with fixture with EUT mounted on DIN rail in vertical and horizontal position                             |
| <b>Pollution Degree</b>                   | 2 according to EN50178                                                                                                                                                                  |
| <b>Climatic Class</b>                     | 3K3 according to EN60721                                                                                                                                                                |

## Additional Data

| Part Number                  | Wire Size / Torque*                                          |                                                              | Terminal Block Type   | Ambient Operating Temperature** | Storage Temperature           | Drawing Link        |
|------------------------------|--------------------------------------------------------------|--------------------------------------------------------------|-----------------------|---------------------------------|-------------------------------|---------------------|
|                              | Input                                                        | Output                                                       |                       |                                 |                               |                     |
| <a href="#">PSB60-REM20S</a> | 3.3–5.3 mm <sup>2</sup> [AWG 12–10] /<br>0.72 Nm [6.3 lb-in] | 3.3–5.3 mm <sup>2</sup> [AWG 12–10] /<br>0.72 Nm [6.3 lb-in] | Fixed screw terminals | -25 to 80°C<br>[-13 to 176°F]   | -25 to 85°C<br>[-13 to 185°F] | <a href="#">PDF</a> |
| <a href="#">PSB60-REM40S</a> |                                                              |                                                              |                       |                                 |                               | <a href="#">PDF</a> |

\*Stripping length 7 mm [0.28 in] or use suitable lug to crimp

\*\* See output specifications for temperature derating

[PSB60-REM20S](#)

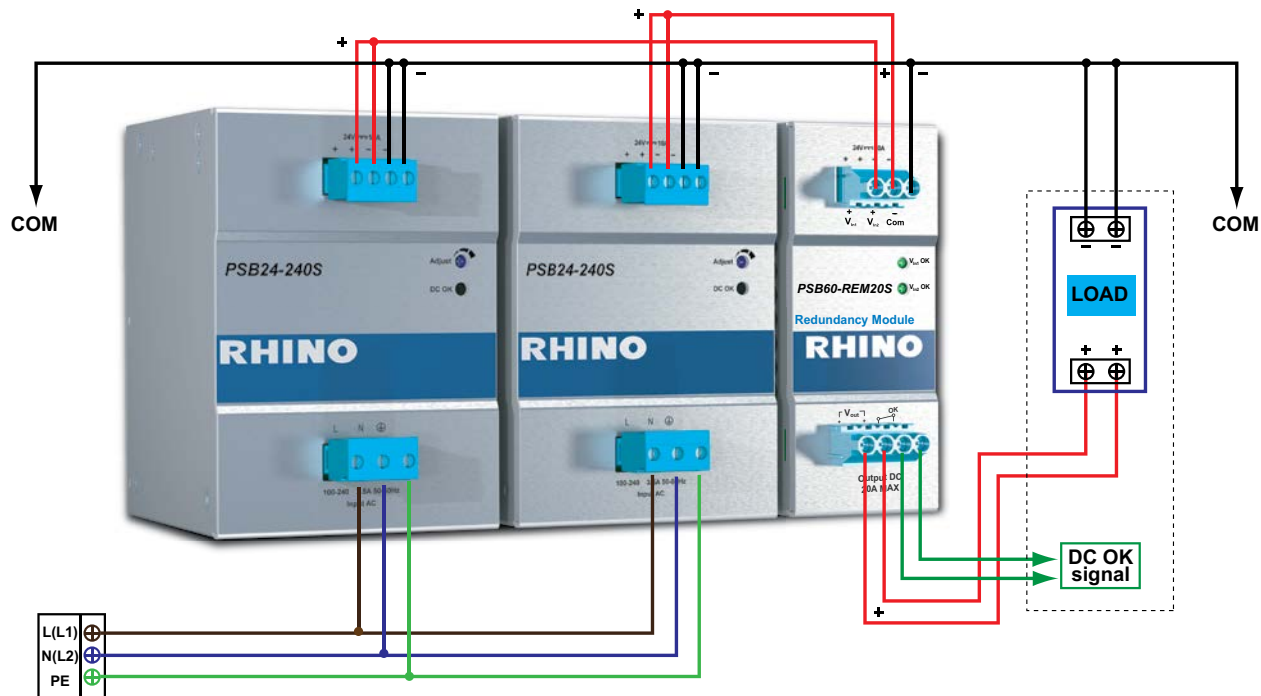
[PSB60-REM40S](#)

## Wiring Connection

| Input |        | Output |             |
|-------|--------|--------|-------------|
| Vin1  | Line 1 | Vout+  | Output +    |
| Vin2  | Line 2 | Vout+  | Output +    |
| Com   | Common | OK     | Alarm Relay |
|       |        | OK     | Alarm Relay |

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## Redundancy Module Wiring



## Parallel Operation

When 2 power supplies are connected in parallel, they can share the load if the following steps are taken.

Step 1: Measure the output voltages at no load from Vin1 to Com of power supply 1 and Vin2 to Com of power supply 2. If the voltages are not the same, follow Step 2. If they are the same, skip to Step 3.

Step 2: Adjust the output voltages, with the help of the adjustment pot on the power supply front panel marked as ADJUST, to the same level. For example, if power supply 1 is measuring 24.15 VDC and power supply 2 is measuring 24.25 VDC, adjust the output voltage of one to be the same as the other.

Step 3: Connect the power supply to the end system load and measure the output voltages from Vin1 to Com of power supply 1 and Vin2 to Com of power supply 2. Ensure that the output voltages are the same even after the 2 power supplies are connected to load. If not, adjust them with the adjustment pot available on the front panel. A tolerance of  $\pm 25\text{mV}$  would be acceptable.

### Note:

- 1) If the output voltage of any power supply is higher, it will take the initial load and share the maximum load.
- 2) If the output voltages are the same, then an equal load current sharing between the 2 power supplies can be achieved.