1500W Single Output Power Supply

RSP-1500 series

**Features**
- Universal AC input / Full range
- Built-in active PFC function
- High efficiency up to 91%
- Forced air cooling by built-in DC fan
- Output voltage programmable
- Active current sharing up to 6000W (3+1)
- Built-in remote ON-OFF control / remote sense / auxiliary power / power OK signal
- Protections: Short circuit / Overload / Over voltage / Over temperature
- Optional conformal coating
- 5 years warranty

**Certificates**
- Safety: UL/EN/IEC 60950-1
- EMC: EN 55022 / 55024

**Applications**
- Factory control or automation apparatus
- Test and measurement instrument
- Laser related machine
- Burn-in facility
- Digital broadcasting
- RF application

**Description**
RSP-1500 is a 1.5KW single output enclosed type AC/DC power supply. This series operates for 90~264VAC input voltage and offers the models with the DC output mostly demanded from the industry. Each model is cooled by the built-in fan with fan speed control, working for the temperature up to 70℃. Moreover, RSP-1500 provides vast design flexibility by equipping various built-in functions such as the output programming, active current sharing, remote ON-OFF control, auxiliary power, etc.

**Model Encoding / Order Information**

RSP - 1500 - **[48]**

- Output voltage (5V/12V/15V/24V/27V/48V)
- Output wattage
- Series name

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File Name: RSP-1500-SPEC 2016-01-20
### SPECIFICATION

#### OUTPUT VOLTAGE ADJ. RANGE
- **RSP-1500-5**
  - 5V
- **RSP-1500-12**
  - 12V
- **RSP-1500-15**
  - 15V
- **RSP-1500-24**
  - 24V
- **RSP-1500-27**
  - 27V
- **RSP-1500-48**
  - 48V

#### OUTPUT
- **RSP-1500-SPEC**
  - DC VOLTAGE: 5V
  - RATED CURRENT: 240A
  - CURRENT RANGE: 0 to 240A
  - RATED POWER: 1200W
  - RIPPLE & NOISE (max.): 150mVp-p
  - VOLTAGE ADJ. RANGE: 4.5 ~ 5.5V
  - VOLTAGE TOLERANCE: ±2.0%
  - LINE REGULATION: ±0.5%
  - LOAD REGULATION: ±2.0%
  - SETUP, RISE TIME: 1500ms, 100ms at full load
  - HOLD UP TIME (Typ.): 10ms at full load
  - VOLTAGE RANGE: 90 ~ 264VAC
  - FREQUENCY RANGE: 47 ~ 63Hz
  - POWER FACTOR (Typ.): 0.9/230VAC
  - EFFICIENCY (Typ.): 80%
  - AC CURRENT (Typ.): 17A
  - INRUSH CURRENT (Typ.): 8A
  - LEAKAGE CURRENT: <2.0mA / 240VAC
  - OVERLOAD: 105 ~ 135% rated output power
  - OVER VOLTAGE: 5.75 ~ 6.75V
  - OVER TEMPERATURE: 50°C
  - PROTECTION:
    - Protection type: Constant current limiting unit will shut down o/p voltage after 5sec. Re-power on to recover
    - Protection type: Shut down o/p voltage, re-power on to recover
    - Protection type: Power OK signal. Please see the Function Manual.
  - OUTPUT VOLTAGE PROGRAMMABLE(PV): Adjustment of output voltage is allowable to 70 ~ 100% of nominal output voltage. Please refer to the Function Manual.
  - CURRENT SHARING: Up to 6000W or (3+1) units. Please refer to the Function Manual.
  - AUXILIARY POWER: 12V@0.1A(Only for Remote ON-OFF control)
  - TEMPERATURE:
    - TYP. COEFFICIENT: ±0.05%/°C
    - WORKING TEMP.: -20 ~ +70°C
    - STORAGE TEMP., HUMIDITY: -40 ~ +85°C
    - TEMP. COEFFICIENT: ±0.05%/°C
  - ISOLATION RESISTANCE: I/P-O/P: 100M Ohms / 500VDC / 25 / 70% RH
  - EMF CURRENT: I/P-FG: 100M Ohms / 500VDC / 25 / 70% RH
  - TEMPERATURE:
    - TYP. COEFFICIENT: ±0.05%/°C
    - WORKING TEMP.: -20 ~ +70°C
    - STORAGE TEMP., HUMIDITY: -40 ~ +85°C
    - TEMP. COEFFICIENT: ±0.05%/°C
  - VIBRATION: 10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes
  - SAFETY STANDARDS: UL60950-1, TUV EN60950-1 approved
  - WITHSTAND VOLTAGE: I/P-O/P: 3KVAC / 17A@0.1A / O/P-FG: 2KVAC / O/P-FG: 0.5KVAC
  - ISOLATION RESISTANCE: I/P-O/P, I/P-FG, O/P-FG: 100 Ohms / 500VDC / 25°C / 70% RH
  - SAFETY & EMC (Note 4)
  - EMC EMISSION:
    - Conducted: EN55022 (CISPR22) / EN55011 (CISPR11) Class A
    - Radiated: EN55022 (CISPR22) / EN55011 (CISPR11) Class A
    - Harmonic Current: EN61000-3-2
    - Voltage Flicker: EN61000-3-3
  - EMC IMMUNITY:
    - Conducted: EN61000-4-6
    - Radiated: EN61000-4-3
    - SURGE: EN61000-4-5 Level 3
    - Magnetic Field: EN61000-4-8 Level 4
    - Voltage Dips and Interruptions: EN61000-4-11 >95% dip 0.5 periods, 30% dip 25 periods, >95% interruptions 250 periods
  - OTHERS:
    - MTFB: 265.3K hrs min.
    - DIMENSION: 278*127*83.5mm (L*W*H)
    - PACKING: 3.0Kg, 4pcs/13kg/1.1CUFT

#### NOTE
1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25°C of ambient temperature.
2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor.
3. Tolerance: includes set up tolerance, line regulation and load regulation.
4. The power supply is considered a component which will be installed into a final equipment. All the EMC tests are executed by mounting the unit on a 720mm*360mm metal plate with 1mm of thickness. The final equipment must be re-confirmed that it still meets EMC directives. For guidance on how to perform these EMC tests, please refer to "EMI testing of component power supplies." (as available on http://www.meanwell.com)
5. Derating may be needed under low input voltages. Please check the derating curve for more details.
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### Block Diagram

- **Block Diagram**
  - I/P
  - EMI FILTER
  - ACTIVE INRUSH CURRENT LIMITING
  - RECTIFIERS & PFC
  - POWER SWITCHING
  - PWM CONTROL
  - LOAD SHARING
  - AUX POWER
  - FILTER & RECTIFIERS
  - DETECTION CIRCUIT
  - REMOTE CONTROL
  - RC
  - LS
  - FAN
  - O.V.P.
  - O.L.P.
  - P.F.C. fosc : 70KHz
  - PWM fosc : 100KHz
  - +S
  - -S
  - +V
  - -V

### Static Characteristics

#### Input Voltage (V) 60Hz

<table>
<thead>
<tr>
<th>Load (%)</th>
<th>90 VAC</th>
<th>100~264 VAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>90</td>
<td>1209.6W</td>
<td>960W</td>
</tr>
<tr>
<td>120</td>
<td>1228.8W</td>
<td>192A</td>
</tr>
<tr>
<td>140</td>
<td>1209.6W</td>
<td>50.4A</td>
</tr>
<tr>
<td>150</td>
<td>1209.6W</td>
<td>63A</td>
</tr>
<tr>
<td>180</td>
<td>1209.6W</td>
<td>100A</td>
</tr>
<tr>
<td>200</td>
<td>1209.6W</td>
<td>1512W</td>
</tr>
<tr>
<td>220</td>
<td>1209.6W</td>
<td>27V</td>
</tr>
<tr>
<td>240</td>
<td>1209.6W</td>
<td>48V</td>
</tr>
</tbody>
</table>

### Derating Curve

#### AMBIENT TEMPERATURE (°C)

### Efficiency vs Load (48V Model)

#### LOAD (%) vs EFFICIENCY (%)

- The curve above is measured at 230VAC.
1. Remote Sense

※ The Remote Sense compensates voltage drop on the load wiring up to 0.3V

Sense lines should be twisted in pairs to minimize noise pick-up.

2. Output Voltage Programming (or, PV / remote voltage programming / remote adjust / margin programming / dynamic voltage trim)

※ In addition to the adjustment via the built-in potentiometer, the output voltage can be trimmed to 70~100%(Typ.) of the nominal voltage by applying external resistance.

Connect an external resistor between TRIM(pin4) & -S(pin3 or pin4 or pin5) on CN1 or CN2, and +S & +V, -S & -V also need to be connected.

![Fig. 2.2 External Resistance (Typical)](image-url)
3. Remote ON-OFF

※ Remote ON-OFF is activated by the configuration with respect to CN1, CN2 and CN3 as shown in the following diagram.

Example 3.2(A): Using external voltage source

Example 3.2(B): Using internal 12V auxiliary output

Example 3.2(C): Using internal 12V auxiliary output

◎ Connection Method

<table>
<thead>
<tr>
<th>SW Logic</th>
<th>Fig. 3.2(A)</th>
<th>Fig. 3.2(B)</th>
<th>Fig. 3.2(C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output on</td>
<td>SW Open</td>
<td>SW Open</td>
<td>SW Close</td>
</tr>
<tr>
<td>Output off</td>
<td>SW Close</td>
<td>SW Close</td>
<td>SW Open</td>
</tr>
</tbody>
</table>
4. Alarm Signal Output

※ Alarm signal is sent out through "P_OK" & "P_OK GND" and pins on CN3. Please acknowledge an external voltage source is required for this function.

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
<th>Output of alarm (P_OK)</th>
</tr>
</thead>
<tbody>
<tr>
<td>P_OK</td>
<td>The signal is &quot;Low&quot; when the power supply is above 65% of the rated output voltage, or say, Power OK</td>
<td>Low (0.5V max at 10mA)</td>
</tr>
<tr>
<td></td>
<td>The signal turns to be &quot;High&quot; when the power supply is under 65% of the rated output voltage, or say, Power Fail</td>
<td>High or open (External applied voltage 10mA max.)</td>
</tr>
</tbody>
</table>

Table 4.1 Explanation of alarm

Fig. 4.1 Internal circuit of P_OK (Open collector method)
5. Current Sharing with Remote Sense

RSP-1500 has the built-in active current sharing function and can be connected in parallel, up to 4 units, to provide higher output power as exhibited below:

- The power supplies should be paralleled using short and large diameter wiring and then connected to the load.
- Difference of output voltages among parallel units should be less than 0.2V.
- The total output current must not exceed the value determined by the following equation:
  \[
  \text{Maximum output current at parallel operation} = (\text{Rated current per unit}) \times (\text{Number of unit}) \times 0.9
  \]

When remote sensing is used in parallel operation, the sensing wire must be connected only to the master unit.

Sense lines should be twisted in pairs to minimize noise pick-up.

\( +S, -S \) and \( \text{CS} \) are connected mutually in parallel.
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### Mechanical Specification

Case No. 943A Unit: mm

- **Air flow direction:**
  - **CN1 CN2 CN3**

- **Mounting Instruction**
  - **Hole No.**
  - **Recommended Screw Size:** M4
  - **MAX. Penetration Depth L:** 5mm
  - **Recommended mounting torque:** 7~10Kgf·cm

- **Control Pin No. Assignment (CN1,CN2):**
  - HRS DF11-8DP-2DS or equivalent
  - HRS DF11-**SC or equivalent

- **Mounting Screw**
  - Mounting Surface
  - Chassis of RSP-1500

- **CN1 and CN2 are connected internally.**

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<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RCG</td>
<td>Remote ON-OFF Ground</td>
</tr>
<tr>
<td>2</td>
<td>RC2</td>
<td>Remote ON-OFF</td>
</tr>
<tr>
<td>3, 5, 7</td>
<td>-S</td>
<td>Negative sensing for remote sense</td>
</tr>
<tr>
<td>4</td>
<td>TRIM</td>
<td>Connection for output voltage programming</td>
</tr>
<tr>
<td>6</td>
<td>LS(Current Share)</td>
<td>Current Share</td>
</tr>
<tr>
<td>8</td>
<td>+S</td>
<td>Positive sensing for remote sense</td>
</tr>
</tbody>
</table>

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※Control Pin No. Assignment (CN3) : HRS DF11-6DP-2DS or equivalent

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>P OK GND</td>
<td>Power OK Ground</td>
</tr>
<tr>
<td>2</td>
<td>P OK</td>
<td>Power OK Signal</td>
</tr>
<tr>
<td>3</td>
<td>RCG</td>
<td>Remote ON-OFF Ground</td>
</tr>
<tr>
<td>4</td>
<td>AUXG</td>
<td>Auxiliary Ground</td>
</tr>
<tr>
<td>5</td>
<td>RC1</td>
<td>Remote ON-OFF</td>
</tr>
<tr>
<td>6</td>
<td>AUX</td>
<td>Auxiliary Output</td>
</tr>
</tbody>
</table>

※AC Input Terminal Pin No. Assignment

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Assignment</th>
<th>Diagram</th>
<th>Maximum mounting torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>FG</td>
<td><img src="image1.png" alt="Diagram" /></td>
<td>18Kgf-cm</td>
</tr>
<tr>
<td>2</td>
<td>AC/N</td>
<td><img src="image2.png" alt="Diagram" /></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>AC/L</td>
<td><img src="image3.png" alt="Diagram" /></td>
<td></td>
</tr>
</tbody>
</table>

**Installation Manual**

Please refer to : [http://www.meanwell.com/webnet/search/InstallationSearch.html](http://www.meanwell.com/webnet/search/InstallationSearch.html)