### MSP-200 series

#### SPECIFICATION

**FEATURES:**
- Universal AC input / Full range
- Built-in active PFC function, PF>0.95
- High efficiency up to 89%
- Withstand 300VAC surge input for 5 seconds
- Protections: Short circuit / Overload / Over voltage / Over temperature
- Cooling by free air convection
- Built-in constant current limiting circuit
- 1U low profile 38mm
- Medical safety approved (MOOP level)
- Built-in remote ON-OFF control
- Standby 5V@0.3A
- Built-in remote sense function
- No load power consumption<0.5W (Note.6)
- 5 years warranty

### OUTPUT

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>DC VOLTAGE</td>
<td>3.3V</td>
<td>5V</td>
<td>7.5V</td>
<td>12V</td>
<td>15V</td>
<td>24V</td>
<td>36V</td>
<td>48V</td>
</tr>
<tr>
<td>RATED CURRENT</td>
<td>40A</td>
<td>35A</td>
<td>26.7A</td>
<td>16.7A</td>
<td>13.4A</td>
<td>8.4A</td>
<td>5.7A</td>
<td>4.3A</td>
</tr>
<tr>
<td>CURRENT RANGE</td>
<td>0 ~ 40A</td>
<td>0 ~ 35A</td>
<td>0 ~ 26.7A</td>
<td>0 ~ 16.7A</td>
<td>0 ~ 13.4A</td>
<td>0 ~ 8.4A</td>
<td>0 ~ 5.7A</td>
<td>0 ~ 4.3A</td>
</tr>
<tr>
<td>RATED POWER</td>
<td>132W</td>
<td>175W</td>
<td>200.3W</td>
<td>200.4W</td>
<td>201W</td>
<td>201.6W</td>
<td>205.2W</td>
<td>208.4W</td>
</tr>
<tr>
<td>RIPPLE &amp; NOISE (max.) Note.2</td>
<td>80mVp-p</td>
<td>90mVp-p</td>
<td>100mVp-p</td>
<td>120mVp-p</td>
<td>150mVp-p</td>
<td>150mVp-p</td>
<td>250mVp-p</td>
<td>250mVp-p</td>
</tr>
<tr>
<td>VOLTAGE ADJ. RANGE</td>
<td>2.8 ~ 3.8V</td>
<td>4.3 ~ 5.8V</td>
<td>6.8 ~ 9V</td>
<td>10.2 ~ 13.8V</td>
<td>13.5 ~ 16V</td>
<td>21.6 ~ 28.8V</td>
<td>28.8 ~ 39.6V</td>
<td>40.8 ~ 55.2V</td>
</tr>
<tr>
<td>VOLTAGE TOLERANCE Note.3</td>
<td>±2.0%</td>
<td>±2.0%</td>
<td>±2.0%</td>
<td>±1.0%</td>
<td>±1.0%</td>
<td>±1.0%</td>
<td>±1.0%</td>
<td>±1.0%</td>
</tr>
<tr>
<td>LINE REGULATION</td>
<td>±0.5%</td>
<td>±0.5%</td>
<td>±0.5%</td>
<td>±0.3%</td>
<td>±0.3%</td>
<td>±0.2%</td>
<td>±0.2%</td>
<td>±0.2%</td>
</tr>
<tr>
<td>LOAD REGULATION</td>
<td>±1.5%</td>
<td>±1.0%</td>
<td>±1.0%</td>
<td>±0.5%</td>
<td>±0.5%</td>
<td>±0.5%</td>
<td>±0.5%</td>
<td>±0.5%</td>
</tr>
<tr>
<td>SETUP, RISE TIME</td>
<td>1000ms</td>
<td>50ms</td>
<td>230VAC</td>
<td>2500ms</td>
<td>50ms</td>
<td>115VAC at full load</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HOLD UP TIME (Typ.)</td>
<td>16ms</td>
<td>230VAC</td>
<td>16ms</td>
<td>115VAC at full load</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FREQUENCY RANGE</td>
<td>47 ~ 63Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>POWER FACTOR (Typ.)</td>
<td>PF&gt;0.95/230VAC</td>
<td>PF&gt;0.99/115VAC at full load</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EFFICIENCY (Typ.)</td>
<td>80%</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>AC CURRENT (Typ.)</td>
<td>2.2A/115VAC</td>
<td>1.1A/230VAC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INRUSH CURRENT (Typ.)</td>
<td>35A/115VAC</td>
<td>70A/230VAC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEAKAGE CURRENT Note.4</td>
<td>Earth leakage current &lt; 300mA/264VAC , Touch leakage current &lt; 100mA/264VAC</td>
<td></td>
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</tbody>
</table>

### PROTECTION

**OVERLOAD:**
105 ~ 135% rated output power
Protection type: Constant current limiting, recovers automatically after fault condition is removed

**OVER VOLTAGE:**
3.96 ~ 4.62V
6 ~ 7V
9.4 ~ 10.9V
14.4 ~ 16.8V
18.8 ~ 21.8V
30 ~ 34.8V
41.4 ~ 48.6V
57.6 ~ 67.2V
Protection type: Shut down o/p voltage, re-power on to recover

**OVER TEMPERATURE:**
Shut down o/p voltage, recovers automatically after temperature goes down

**FUNCTION**
5V STANDBY
5VSB: 5V@0.3A; tolerance ±5%, ripple: 50mVp-p(max.)
REMOTE CONTROL
RC+ / RC-: 4 ~ 10V or open = power on; 0 ~ 0.8V or short = power off

**WORKING TEMP.**
-40 ~ +70°C (Refer to "Derating Curve")

**WORKING HUMIDITY**
20 ~ 90% RH non-condensing

**ENVIRONMENT**
STORAGE TEMP., HUMIDITY
-40 ~ +85°C, 10 ~ 95% RH
TEMP. COEFFICIENT
±0.03%/°C (0 ~ 90°C)

**SAFETY & EMC (Note 4)**
VIBRATION
10 ~ 500Hz, 5G 10min./cycle, 60min. each along X, Y, Z axes
SAFETY STANDARDS
ANSII/AMI E60801-1, IEC60801-1, EAC TP TC 004 approved
ISOLATION LEVEL
Primary-Secondary: 2MOOP. Primary-Earth: 1MOOP
WITHSTAND VOLTAGE
3KV/1min 2000V DC:
O/P-FG:2KVAC
I/P-O/P:3KVAC
O/P-FG:0.5KVAC
ISOLATION RESISTANCE
3KV/1min 2000M Ohms /500VDC /25 °C /70% RH
EMC EMISSION
Compliance to EN55011 (CISPR11) Class B, EN61000-3-2, -3, EAC TP TC 020
EMC IMMUNITY
Compliance to EN61000-4-2, 3, 4, 5, 6, 8, 11, EN61000-1-2, EAC TP TC 020

**OTHERS**
MTBF
209.4K hrs min. MIL-HDBK-217F (25 °C)
DIMENSION
199*98*38mm (L*W*H)
PACKING
0.77Kg; 18pcs/14.9Kg/0.87CUFT

**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 20kHz 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 onto the unit on a 360mm*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.
6. No load power consumption<0.5W when RC+ & RC- (CN100 pin1,2) 0 ~ 8V or short.
7. Touch current was measured from primary input to DC output.
8. The ambient temperature derating of 3.5%/1000m with fanless models and of 5%/1000m with fan models for operating altitude higher than 2000m(6500ft).

File Name:MSP-200-SPEC  2020-10-20

![Mean Well Logo](https://www.meanwell.com/serviceDisclaimer.aspx)
### Mechanical Specification

**Terminal Pin No. Assignment**

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Assignment</th>
<th>Pin No.</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AC/L</td>
<td>4, 5</td>
<td>DC OUTPUT -V</td>
</tr>
<tr>
<td>2</td>
<td>AC/N</td>
<td>6, 7</td>
<td>DC OUTPUT +V</td>
</tr>
<tr>
<td>3</td>
<td>FG</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Connector Pin No. Assignment (CN100):**

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Assignment</th>
<th>Mating Housing</th>
<th>Terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RC</td>
<td>HRS DF11-6DS</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>RC</td>
<td>or equivalent</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>AUX</td>
<td>HRS DF11-**SC</td>
<td>or equivalent</td>
</tr>
<tr>
<td>4</td>
<td>AUXG</td>
<td>or equivalent</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>+S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>-S</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Block Diagram

**EMI FILTER**

**ACTIVE INRUSH CURRENT LIMITING**

**RECTIFIERS & PFC**

**PWM CONTROL**

**RECTIFIERS & FILTER**

**POWER SWITCHING**

**O.T.P.**

**O.L.P.**

**DETECTION CIRCUIT**

**REMOTE CONTROL**

**PWM** fosc : 70KHz

### Derating Curve

![Derating Curve Graph](image)

**LOAD (%)**

**AMBIENT TEMPERATURE (°C)**

### Output Derating VS Input Voltage

![Output Derating VS Input Voltage Graph](image)

**LOAD (%)**

**INPUT VOLTAGE (V) 60Hz**

File Name: MSP-200-SPEC 2020-10-20
200W Single Output Medical Type

MSP-200 series

### Function Description of CN100

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RC+</td>
<td>Turns the output on and off by electrical or dry contact between pin 2 (RC-). Short: Power OFF, Open: Power ON.</td>
</tr>
<tr>
<td>2</td>
<td>RC-</td>
<td>Remote control ground.</td>
</tr>
<tr>
<td>3</td>
<td>AUX</td>
<td>Auxiliary voltage output, 4.75~5.25V, reference to pin 4 (AUXG). The maximum load current is 0.3A. This output has the built-in oring diodes and is not controlled by the &quot;remote ON/OFF control&quot;.</td>
</tr>
<tr>
<td>4</td>
<td>AUXG</td>
<td>Auxiliary voltage output ground. The signal return is isolated from the output terminals (+V &amp; -V).</td>
</tr>
<tr>
<td>5</td>
<td>+S</td>
<td>Positive sensing. The +S signal should be connected to the positive terminal of the load. The +S and -S leads should be twisted in pair to minimize noise pick-up effect. The maximum line drop compensation is 0.5V.</td>
</tr>
<tr>
<td>6</td>
<td>-S</td>
<td>Negative sensing. The -S signal should be connected to the negative terminal of the load. The -S and +S leads should be twisted in pair to minimize noise pick-up effect. The maximum line drop compensation is 0.5V.</td>
</tr>
</tbody>
</table>

### Function Manual

#### 1. Remote Control

The PSU can be turned ON/OFF by using the "Remote ON/OFF" function

<table>
<thead>
<tr>
<th>Between RC-(pin2) and RC+(pin1)</th>
<th>Output Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW ON (Short)</td>
<td>OFF</td>
</tr>
<tr>
<td>SW OFF (Open)</td>
<td>ON</td>
</tr>
</tbody>
</table>

#### 2. Remote Sense

The remote sensing compensates voltage drop on the load wiring up to 0.5V.
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