



450W Single Output Medical Type

MSP-450 series



## ■ Features :

- Universal AC input / Full range
- Built-in active PFC function, PF>0.95
- High efficiency up to 89.5%
- Withstand 300VAC surge input for 5 seconds
- Protections: Short circuit / Overload / Over voltage / Over temperature
- Built-in constant current limiting circuit
- Medical safety approved (MOOP level)
- Built-in cooling Fan ON-OFF control
- Built-in DC OK signal
- Built-in remote ON-OFF control
- Stand by 5V@0.3A
- Built-in remote sense function
- No load power consumption<0.6W (Note.6)
- 5 years warranty

User's Manual



## ■ GTIN CODE

MW Search: <https://www.meanwell.com/serviceGTIN.aspx>

## SPECIFICATION



| MODEL                 | MSP-450-3.3   | MSP-450-5  | MSP-450-7.5 | MSP-450-12  | MSP-450-15   | MSP-450-24   | MSP-450-36   | MSP-450-48   |              |
|-----------------------|---|--|-------------|-------------|--------------|--------------|--------------|--------------|--------------|
| OUTPUT                | DC VOLTAGE  | 3.3V   | 5V          | 7.5V        | 12V          | 15V          | 24V          | 36V          | 48V          |
|                       | RATED CURRENT   | 90A  | 90A         | 60A         | 37.5A        | 30A          | 18.8A        | 12.5A        | 9.5A         |
|                       | CURRENT RANGE   | 0 ~ 90A  | 0 ~ 90A     | 0 ~ 60A     | 0 ~ 37.5A    | 0 ~ 30A      | 0 ~ 18.8A    | 0 ~ 12.5A    | 0 ~ 9.5A     |
|                       | RATED POWER   | 297W   | 450W        | 450W        | 450W         | 450W         | 451.2W       | 450W         | 456W         |
|                       | RIPPLE & NOISE (max.) Note.2  | 80mVp-p  | 80mVp-p     | 100mVp-p    | 120mVp-p     | 150mVp-p     | 150mVp-p     | 240mVp-p     | 240mVp-p     |
|                       | VOLTAGE ADJ. RANGE  | 2.8 ~ 3.8V   | 4.3 ~ 5.8V  | 6.8 ~ 9V    | 10.2 ~ 13.8V | 13.5 ~ 18V   | 21.6 ~ 28.8V | 28.8 ~ 39.6V | 40.8 ~ 55.2V |
|                       | VOLTAGE TOLERANCE Note.3  | ±2.0%  | ±2.0%       | ±2.0%       | ±1.0%        | ±1.0%        | ±1.0%        | ±1.0%        | ±1.0%        |
|                       | LINE REGULATION   | ±0.5%  | ±0.5%       | ±0.5%       | ±0.3%        | ±0.3%        | ±0.2%        | ±0.2%        | ±0.2%        |
|                       | LOAD REGULATION   | ±1.0%  | ±1.0%       | ±1.0%       | ±0.5%        | ±0.5%        | ±0.5%        | ±0.5%        | ±0.5%        |
|                       | SETUP, RISE TIME  | 1000ms, 100ms/230VAC    2500ms, 100ms/115VAC at full load  |             |             |              |              |              |              |              |
| HOLD UP TIME (Typ.)   | 16ms/230VAC    16ms/115VAC at full load   |  |             |             |              |              |              |              |              |
| INPUT                 | VOLTAGE RANGE Note.4  | 85 ~ 264VAC    120 ~ 370VDC  |             |             |              |              |              |              |              |
|                       | FREQUENCY RANGE   | 47 ~ 63Hz  |             |             |              |              |              |              |              |
|                       | POWER FACTOR (Typ.)   | PF>0.95/230VAC    PF>0.99/115VAC at full load  |             |             |              |              |              |              |              |
|                       | EFFICIENCY (Typ.)   | 80%  | 83%         | 86.5%       | 88%          | 89%          | 88%          | 89%          | 89.5%        |
|                       | AC CURRENT (Typ.)   | 5A/115VAC    2.4A/230VAC   |             |             |              |              |              |              |              |
|                       | INRUSH CURRENT (Typ.)   | 35A/115VAC    70A/230VAC   |             |             |              |              |              |              |              |
| LEAKAGE CURRENT       | Earth leakage current < 300 $\mu$ A/264VAC , Touch leakage current < 100 $\mu$ A/264VAC |  |             |             |              |              |              |              |              |
| PROTECTION            | OVERLOAD  | 105 ~ 135% rated output power<br>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 |
|                       | OVER TEMPERATURE  | Protection type : Shut down o/p voltage, re-power on to recover<br>Shut down o/p voltage, recovers automatically after temperature goes down                                     |             |             |              |              |              |              |              |
| FUNCTION              | 5V STANDBY  | 5VSB : 5V@0.3A ; tolerance ±5%, ripple : 50mVp-p(max.)   |             |             |              |              |              |              |              |
|                       | DC OK SIGNAL  | PSU turn on : 3.3 ~ 5.6V ; PSU turn off : 0 ~ 1V   |             |             |              |              |              |              |              |
|                       | REMOTE CONTROL  | RC+ / RC-: 4 ~ 10V or open = power on ; 0 ~ 0.8V or short = power off  |             |             |              |              |              |              |              |
|                       | FAN CONTROL (Typ.)  | Load 20 ± 10% or RTH2 ≥ 50°C Fan on  |             |             |              |              |              |              |              |
| ENVIRONMENT           | WORKING TEMP.   | -40 ~ +70°C (Refer to "Derating Curve")  |             |             |              |              |              |              |              |
|                       | WORKING HUMIDITY  | 20 ~ 90% RH non-condensing   |             |             |              |              |              |              |              |
|                       | STORAGE TEMP., HUMIDITY   | -40 ~ +85°C, 10 ~ 95% RH non-condensing  |             |             |              |              |              |              |              |
|                       | TEMP. COEFFICIENT   | ±0.03%/°C (0 ~ 50°C)   |             |             |              |              |              |              |              |
|                       | VIBRATION   | 10 ~ 500Hz, 5G 10min./1cycle, 60min. each along X, Y, Z axes   |             |             |              |              |              |              |              |
| SAFETY & EMC (Note 8) | SAFETY STANDARDS  | IEC 60601-1:2005+A1+A2, ANSI/AAMI ES60601-1:2005+A2, CAN/CSA C22.2 No. 60601-1:2014+A2<br>EAC TP TC 004 approved; Design refer to BS EN/EN60335-1, BS EN/EN 62368-1 (by request) |             |             |              |              |              |              |              |
|                       | ISOLATION LEVEL   | Primary-Secondary: 2×MOOP, Primary-Earth: 1×MOOP, Secondary-Earth: 1×MOOP  |             |             |              |              |              |              |              |
|                       | WITHSTAND VOLTAGE   | I/P-O/P: 4KVAC    I/P-FG: 2KVAC    O/P-FG: 0.5KVAC   |             |             |              |              |              |              |              |
|                       | ISOLATION RESISTANCE  | I/P-O/P, I/P-FG, O/P-FG: 100M Ohms / 500VDC / 25°C / 70% RH  |             |             |              |              |              |              |              |
|                       | EMC EMISSION  | Compliance to BS EN/EN55011 (CISPR11) Class B, BS EN/EN61000-3-2,-3, EAC TP TC 020   |             |             |              |              |              |              |              |
| OTHERS                | EMC IMMUNITY  | Compliance to BS EN/EN61000-4-2,3,4,5,6,8,11, BS EN/EN60601-1-2, EAC TP TC 020   |             |             |              |              |              |              |              |
|                       | MTBF  | 159.3K hrs min.    MIL-HDBK-217F (25°C)  |             |             |              |              |              |              |              |
|                       | DIMENSION   | 218*105*41mm (L*W*H)   |             |             |              |              |              |              |              |
| PACKING               | 1.19Kg; 12pcs/15.3Kg/0.81CUFT   |  |             |             |              |              |              |              |              |

| 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 0.1 $\mu$ F & 47 $\mu$ F parallel capacitor.   |
| 3. Tolerance : includes set up tolerance, line regulation and load regulation.   |
| 4. Derating may be needed under low input voltages. Please check the derating curve for more details.  |
| 5. Length of set up time is measured at first cold start. Turning ON/OFF the power supply may lead to increase of the set up time.   |
| 6. No load power consumption<0.5W when RC- & RC+ (CN100 pin1,2) 0 ~ 0.8V or short.   |
| 7. When the input voltage is less than 40VAC, the SPS may exhibit degradation of performance. The final product manufacturers must re-confirm this deviation that does not affect basic safety or essential performance.   |
| 8. The power supply is considered a component which will be installed into a final equipment. All the EMC tests are been executed by mounting 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."<br>(as available on <a href="https://www.meanwell.com/Upload/PDF/EMI_statement_en.pdf">https://www.meanwell.com/Upload/PDF/EMI_statement_en.pdf</a> ) |
| 9. The ambient temperature derating of 3.5°C/1000m with fanless models and of 5°C/1000m with fan models for operating altitude higher than 2000m(6500ft).  |
| ※ Product Liability Disclaimer : For detailed information, please refer to <a href="https://www.meanwell.com/serviceDisclaimer.aspx">https://www.meanwell.com/serviceDisclaimer.aspx</a>   |

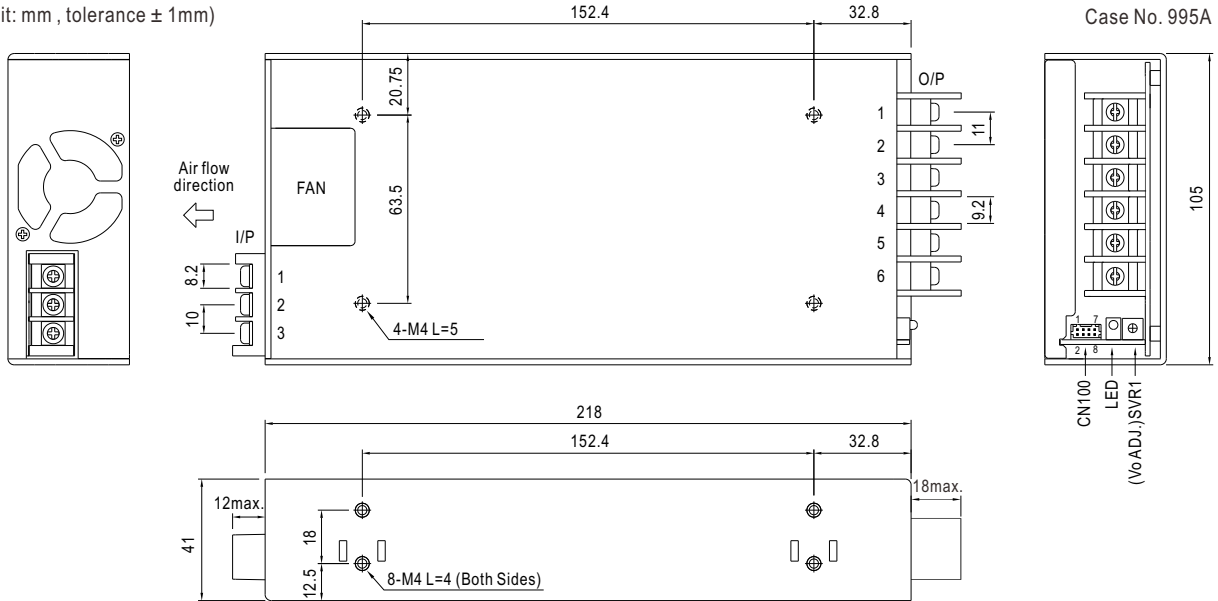


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**Mechanical Specification**

(Unit: mm , tolerance  $\pm 1$ mm)



AC Input Terminal Pin No. Assignment

| Pin No. | Assignment |
|---------|------------|
| 1       | AC/L       |
| 2       | AC/N       |
| 3       | FG $\perp$ |

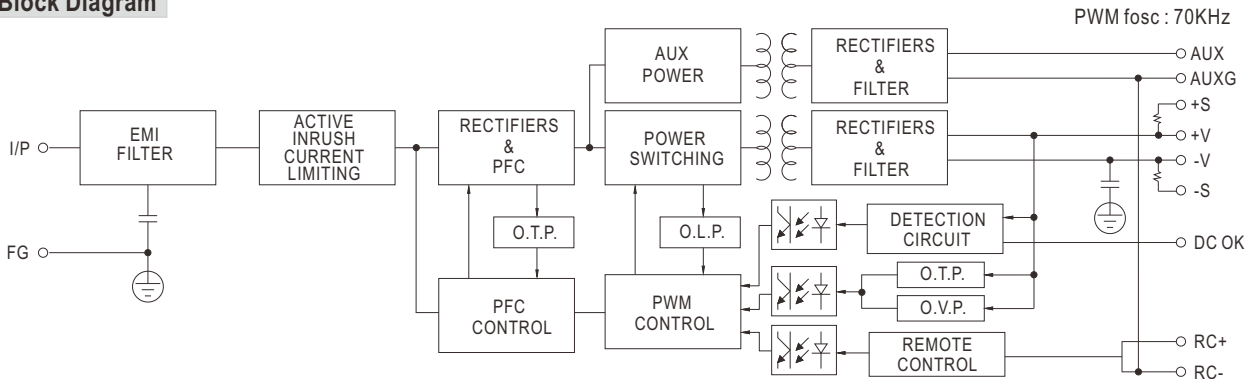
DC Output Terminal Pin No. Assignment

| Pin No. | Assignment |
|---------|------------|
| 1~3     | -V         |
| 4~6     | +V         |

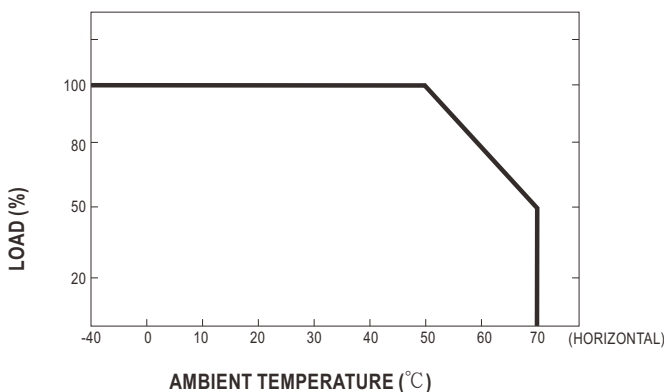
Connector Pin No. Assignment (CN100) : HRS DF11-8DP-2DS or equivalent

| Pin No. | Assignment | Pin No. | Assignment | Mating Housing             | Terminal                    |
|---------|------------|---------|------------|----------------------------|-----------------------------|
| 1       | RC+        | 5       | DC-OK      | HRS DF11-8DS or equivalent | HRS DF11-**SC or equivalent |
| 2       | RC-        | 6       | GND        |                            |                             |
| 3       | AUX        | 7       | +S         |                            |                             |
| 4       | AUXG       | 8       | -S         |                            |                             |

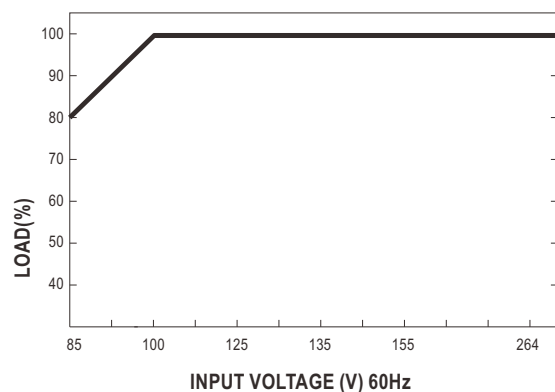
**Block Diagram**



**Derating Curve**



**Output Derating VS Input Voltage**



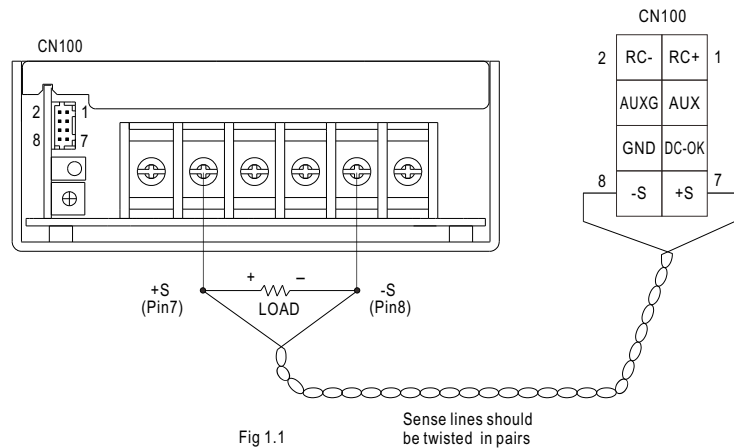
■ Function Description of CN100

| Pin No. | Function | Description   |
|---------|----------|---|
| 1       | RC+      | Turns the output on and off by electrical or dry contact between pin 2 (RC-), Short: Power OFF, Open: Power ON.   |
| 2       | RC-      | Remote control ground.  |
| 3       | AUX      | Auxiliary voltage output, 4.75~5.25V, referenced to pin 4(AUXG). The maximum load current is 0.3A. This output is not controlled by the "remote ON/OFF control".  |
| 4       | AUXG     | Auxiliary voltage output ground. The signal return is isolated from the output terminals (+V & -V).   |
| 5       | DC-OK    | DC-OK Signal is a TTL level signal, referenced to pin6(DC-OK GND). High when PSU turns on.  |
| 6       | GND      | This pin connects to the negative terminal(-V). Return for DC-OK signal output.   |
| 7       | +S       | 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. |
| 8       | -S       | 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. |

■ Function Manual

1. Remote Sense

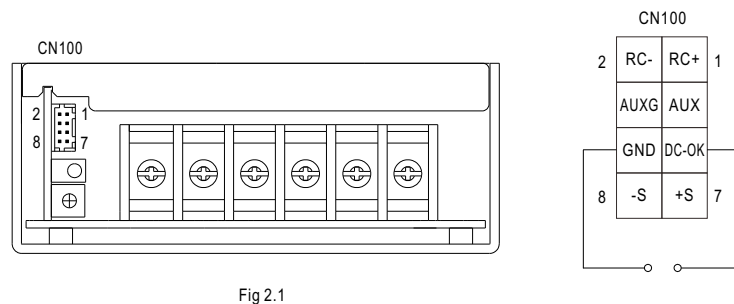
The remote sensing compensates voltage drop on the load wiring up to 0.5V.



2. DC-OK Signal

DC-OK signal is a TTL level signal. High when PSU turns on.

| Between DC-OK(pin5) and GND(pin6) | Output Status |
|-----------------------------------|---------------|
| 3.3 ~ 5.6V                        | ON            |
| 0 ~ 1V                            | OFF           |



3. Remote Control

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

| Between RC+(pin1) and RC-(pin2) | Output Status |
|---------------------------------|---------------|
| SW ON (Short)                   | OFF           |
| SW OFF (Open)                   | ON            |

