



1000W Single Output with PFC Function

HRPG-1000 series



User's Manual



UL62368-1

BS EN/EN62368-1

TPTC004

IEC62368-1



## Features

- Universal AC input / Full range
- Built-in active PFC function, PF>0.95
- High efficiency up to 94%
- Withstand 300VAC surge input for 5 seconds
- Protections: Short circuit / Overload / Over voltage / Over temperature
- Built-in cooling fan ON-OFF control
- Current sharing up to 4000W (3+1)
- Built-in DC OK signal
- Built-in remote ON-OFF control
- Standby 5V@0.3A
- Built-in remote sense function
- No load power consumption<0.75W (Note.6)
- 5 years warranty

## Applications

- Factory control or automation apparatus
- Test and measurement instrument
- Laser related machine
- Aging equipment
- RF application

## GTIN CODE

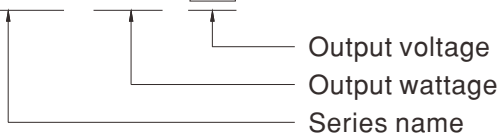
MW Search: <https://www.meanwell.com/serviceGTIN.aspx>

## Description

HRPG-1000 is a single output enclosed type AC/DC power supply providing 1000 W output power for a wide range of industrial applications. This series operates for 90~264 VAC input voltage and offers models with different rated voltage ranging between 12 and 48 V that can satisfy the demands for all kinds of industrial equipments. Each model is cooled by the built-in fan with speed control, working for the temperature up to 70°C. Moreover, HRPG-1000 has various built-in functions such as auxiliary power, remote sense and remote on-off control, offering vast design flexibility for industrial application.

## Model Encoding / Order Information

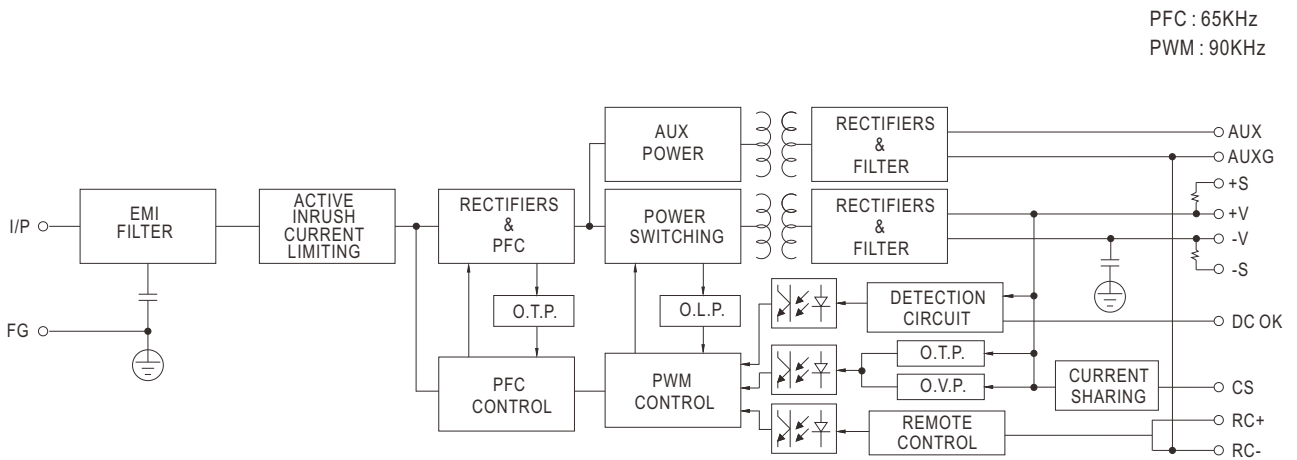
HRPG - 1000 - 12



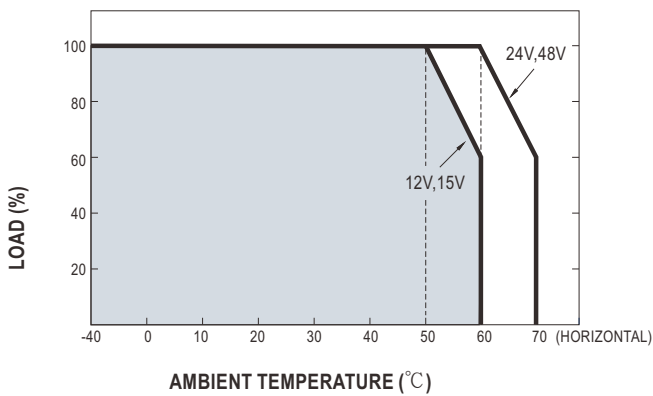
## SPECIFICATION

| MODEL                          | HRPG-1000-12  | HRPG-1000-15  | HRPG-1000-24   | HRPG-1000-48                            |                   |  |
|--------------------------------|---|---|--|---|-------------------|--|
| OUTPUT                         | DC VOLTAGE  | 12V   | 15V  | 24V                                     | 48V               |  |
|                                | RATED CURRENT   | 80A   | 64A  | 42A                                     | 21A               |  |
|                                | CURRENT RANGE   | 0 ~ 80A   | 0 ~ 64A  | 0 ~ 42A                                 | 0 ~ 21A           |  |
|                                | RATED POWER   | 960W (max. 1000W for 3 sec.)  | 960W (max. 1000W for 3 sec.)   | 1008W                                   | 1008W             |  |
|                                | RIPPLE & NOISE (max.) Note.2  | 150mVp-p  | 150mVp-p   | 200mVp-p                                | 250mVp-p          |  |
|                                | VOLTAGE ADJ. RANGE  | 11 ~ 14V  | 14 ~ 17V   | 22 ~ 28V                                | 46 ~ 56V          |  |
|                                | VOLTAGE TOLERANCE Note.3  | ±2.0%   | ±1.5%  | ±1.0%                                   | ±1.0%             |  |
|                                | LINE REGULATION   | ±0.5%   | ±0.5%  | ±0.5%                                   | ±0.5%             |  |
|                                | LOAD REGULATION   | ±2.0%   | ±1.5%  | ±0.5%                                   | ±0.5%             |  |
|                                | SETUP, RISE TIME  | 1000ms, 50ms/230VAC    2000ms, 50ms/115VAC at full load   |  |   |                   |  |
| HOLD UP TIME (Typ.)            | 16ms/230VAC    16ms/115VAC at full load   |   |  |   |                   |  |
| INPUT                          | VOLTAGE RANGE Note.4  | 90 ~ 264VAC(300VAC for 5 sec.)  |  | 127 ~ 370VDC                            |                   |  |
|                                | FREQUENCY RANGE   | 47 ~ 63Hz   |  |   |                   |  |
|                                | POWER FACTOR (Typ.)   | PF>0.95/230VAC  |  | PF>0.99/115VAC at full load             |                   |  |
|                                | EFFICIENCY (Typ.)   | 91.5%   | 92%  | 93%                                     | 94%               |  |
|                                | AC CURRENT (Typ.)   | 8.5A/115VAC    5A/230VAC  |  |   |                   |  |
|                                | INRUSH CURRENT (Typ.)   | 25A/115VAC    40A/230VAC  |  |   |                   |  |
|                                | LEAKAGE CURRENT   | <1.2mA/ 240VAC  |  |   |                   |  |
| PROTECTION                     | OVERLOAD  | 105 ~ 135% rated output power<br>Protection type : Constant current limiting, recovers automatically after fault condition is removed |  |   |                   |  |
|                                | OVER VOLTAGE  | 14.5 ~ 16.5V  | 18.2 ~ 20.6V   | 29 ~ 33V                                | 58 ~ 65V          |  |
|                                | OVER TEMPERATURE  | Shut down o/p voltage, recovers automatically after temperature goes down   |  |   |                   |  |
| FUNCTION                       | CURRENT SHARING   | Up to 4000W or (3+1) units. Please refer to the Function Manual.  |  |   |                   |  |
|                                | REMOTE ON-OFF CONTROL   | Power ON : short; Power OFF : open. Please refer to the Function Manual.  |  |   |                   |  |
|                                | REMOTE SENSE  | Compensate voltage drop on the load wiring up to 0.5V. Please refer to the Function Manual.   |  |   |                   |  |
|                                | DC-OK SIGNAL  | The TTL signal out, PSU turn on = 3.3 ~ 5.6V ; PSU turn off = 0 ~ 1V. Please refer to the Function Manual.                            |  |   |                   |  |
|                                | 5V STANDBY  | 5VSB : 5V@0.3A ; tolerance ±5%, ripple : 50mVp-p(max.)  |  |   |                   |  |
|                                | FAN CONTROL   | Fan on/off by NTC(RT50) or 30% load min.  |  |   |                   |  |
| 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 7)          | SAFETY STANDARDS  | UL62368-1, CAN/CSA C22.2 No. 62368-1, TUV BS EN/EN62368-1, AS/NZS62368.1, EAC TP TC 004 approved                                      |  |   |                   |  |
|                                | WITHSTAND VOLTAGE   | I/P-O/P:3KVAC    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  | Parameter   | Standard   |   | Test Level / Note |  |
|                                |   | Conducted   | BS EN/EN55032 (CISPR32)  |   | Class B           |  |
|                                |   | Radiated  | BS EN/EN55032 (CISPR32)  |   | Class B           |  |
|                                |   | Harmonic Current  | BS EN/EN61000-3-2  |   | Class A           |  |
|                                |   | Voltage Flicker   | BS EN/EN61000-3-3  |   | -----             |  |
|                                | EMC IMMUNITY  | BS EN/EN55024, BS EN/EN61000-6-2  |  |   |                   |  |
|                                |   | Parameter   | Standard   |   | Test Level / Note |  |
| ESD                            |   | BS EN/EN61000-4-2   |  | Level 3, 8KV air ; Level 2, 4KV contact |                   |  |
| Radiated                       |   | BS EN/EN61000-4-3   |  | Level 3                                 |                   |  |
| EFT / Burst                    |   | BS EN/EN61000-4-4   |  | Level 3                                 |                   |  |
| Surge                          |   | BS EN/EN61000-4-5   |  | Level 4, 2KV/Line-Line 4KV/Line-Earth   |                   |  |
| Conducted                      |   | BS EN/EN61000-4-6   |  | Level 3                                 |                   |  |
| Magnetic Field                 |   | BS EN/EN61000-4-8   |  | Level 4                                 |                   |  |
| Voltage Dips and Interruptions | BS EN/EN61000-4-11  |   | >95% dip 0.5 periods, 30% dip 25 periods, >95% interruptions 250 periods |   |                   |  |
| OTHERS                         | MTBF  | 862.1K hrs min.    Telcordia SR-332 (Bellcore) ; 105.9K hrs min.    MIL-HDBK-217F (25°C)  |  |   |                   |  |
|                                | DIMENSION   | 218*105*63.5mm (L*W*H)  |  |   |                   |  |
|                                | PACKING   | 1.53Kg;8pcs/13.3Kg/1.34CUFT   |  |   |                   |  |
| NOTE                           | <p>1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25°C of ambient temperature.</p> <p>2. Ripple &amp; noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf &amp; 47uf parallel capacitor.</p> <p>3. Tolerance : includes set up tolerance, line regulation and load regulation.</p> <p>4. Derating may be needed under low input voltages. Please check the derating curve for more details.</p> <p>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.</p> <p>6. No load power consumption&lt;0.75W when RC+ &amp; RC- (CN100 pin3,4) open.</p> <p>7. 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*700mm 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 <a href="http://www.meanwell.com">http://www.meanwell.com</a>)</p> <p>8. 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).</p> <p>※ Product Liability Disclaimer : For detailed information, please refer to <a href="https://www.meanwell.com/serviceDisclaimer.aspx">https://www.meanwell.com/serviceDisclaimer.aspx</a></p> |   |  |   |                   |  |

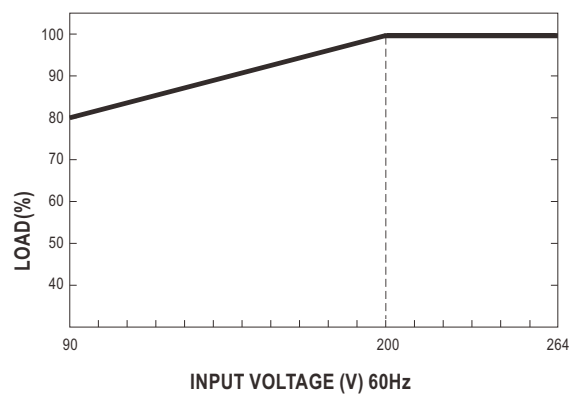
### Block Diagram



### Derating Curve



### Output Derating VS Input Voltage



## ■ Function Description of CN100

| Pin No. | Function | Description   |
|---------|----------|---|
| 1       | AUXG     | Auxiliary voltage output ground.  |
| 2       | AUX      | Auxiliary voltage output, 4.75~5.25V, referenced to pin 1(AUXG). The maximum load current is 0.3A. This output is not controlled by the "remote ON/OFF control".  |
| 3       | RC+      | Turns the output on and off by electrical or dry contact between pin 4 (RC-), Short: Power ON, Open: Power OFF.   |
| 4       | RC-      | Remote control ground.  |
| 5       | CS       | Current sharing signal. When units are connected in parallel, the CS pins of the units should be connected to allow current balance between units.  |
| 6,8     | GND      | This pin connects to the negative terminal(-V). Return for DC-OK signal output.   |
| 7       | DC-OK    | DC-OK signal is a TTL level signal, referenced to pin8(DC-OK GND). High when PSU turns on.  |
| 9       | +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. |
| 10      | -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.

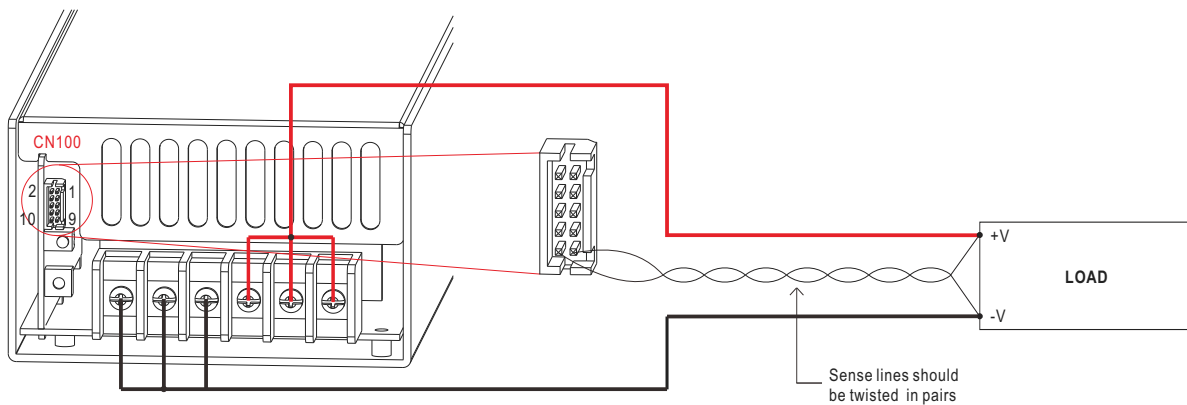


Fig 1.1

### 2. DC-OK Signal

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

| Between DC-OK(pin7) and GND(pin6,8) | Output Status |
|-------------------------------------|---------------|
| 3.3 ~ 5.6V                          | ON            |
| 0 ~ 1V                              | OFF           |

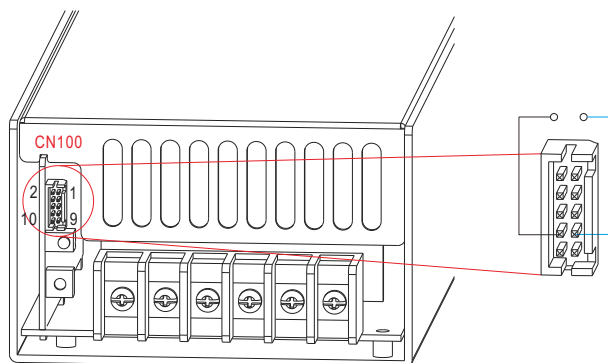


Fig 2.1

### 3. Remote ON-OFF Control

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

| Between RC+(pin3) and RC-(pin4) | Output Status |
|---------------------------------|---------------|
| SW ON (Short)                   | ON            |
| SW OFF (Open)                   | OFF           |

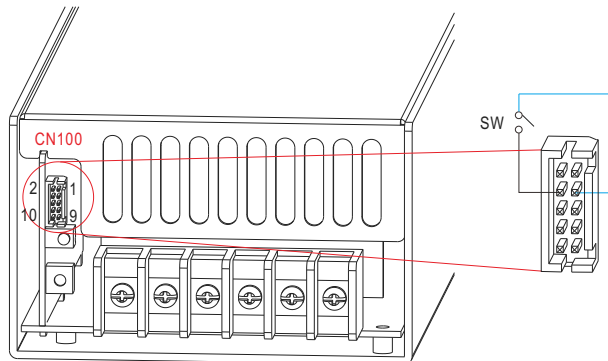


Fig 3.1

### 4. Current Sharing

HRPG-1000 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 the total output current is less than 5% of the total rated current, or say  $(5\% \text{ of Rated current per unit}) \times (\text{Number of unit})$  the current shared among units may not be fully balanced.

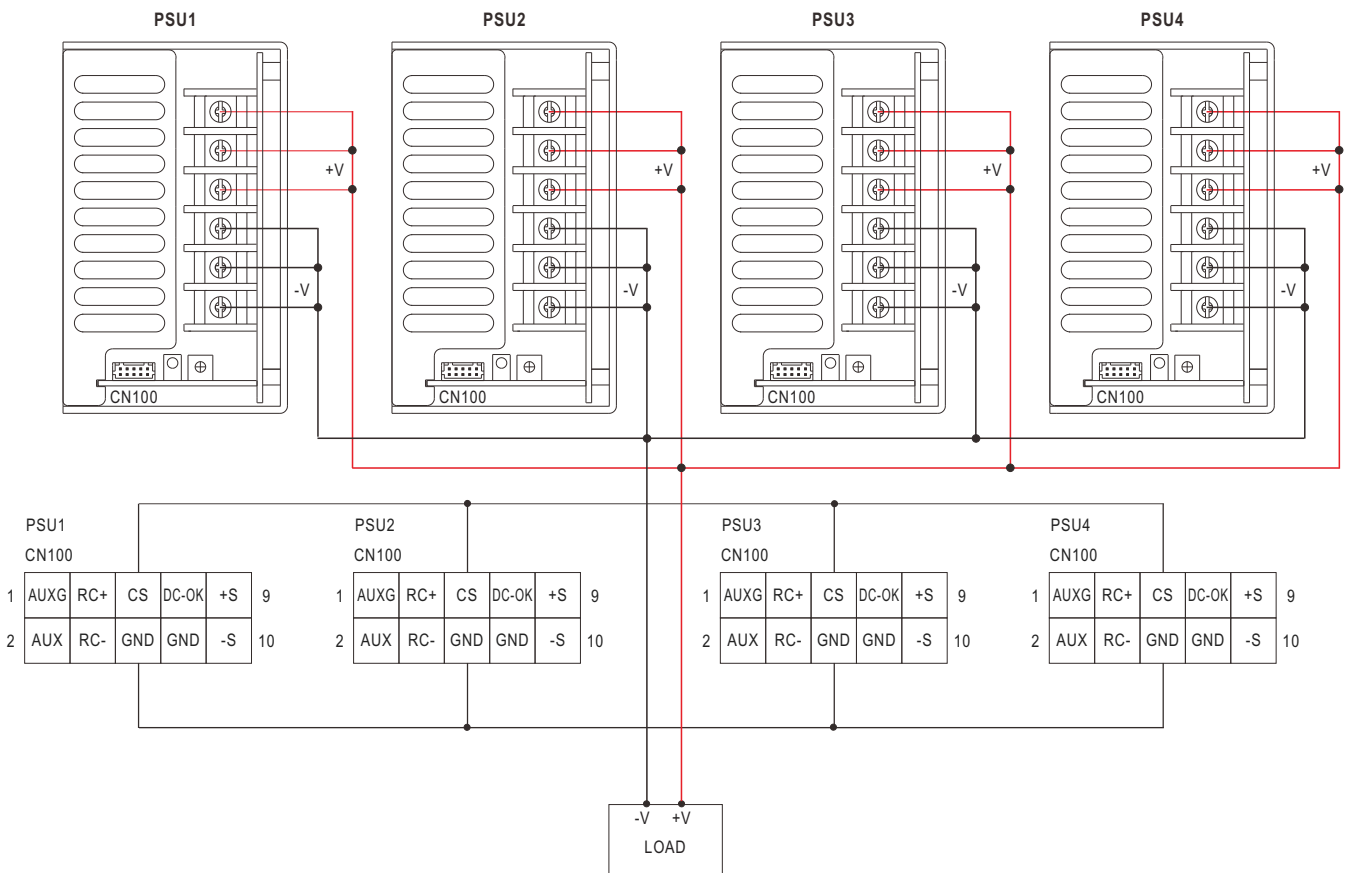
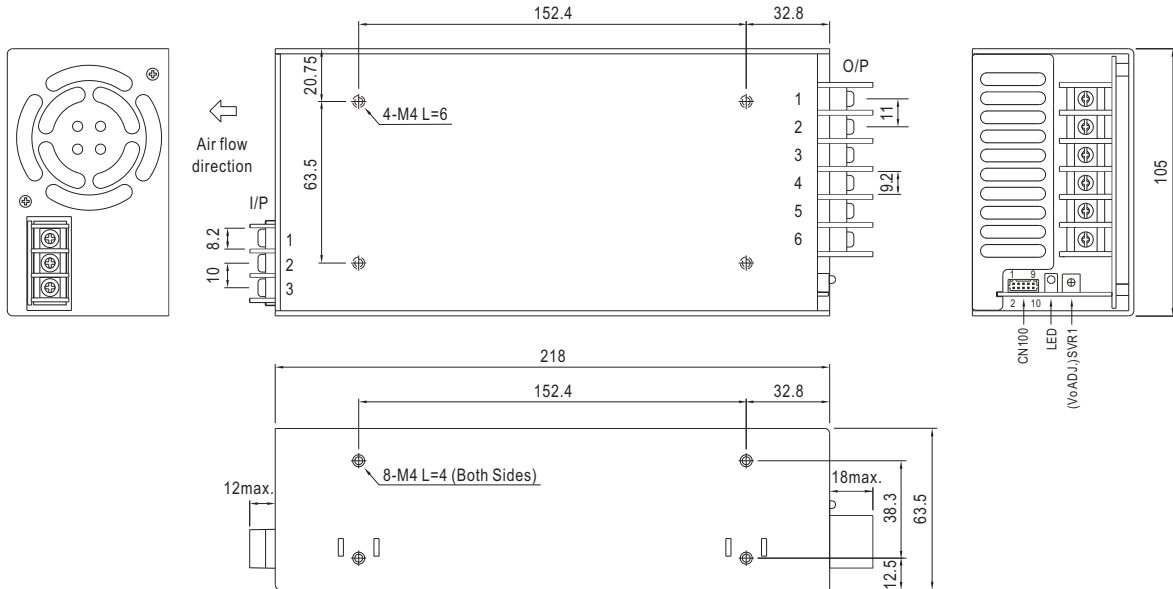


Fig 4.1

■ Mechanical Specification

Case No. 977 Unit: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 DF11-10DP-2DS or equivalent

| Pin No. | Assignment | Pin No. | Assignment | Mating Housing              | Terminal                    |
|---------|------------|---------|------------|-----------------------------|-----------------------------|
| 1       | AUXG       | 6,8     | GND        | HRS DF11-10DS or equivalent | HRS DF11-**SC or equivalent |
| 2       | AUX        | 7       | DC-OK      |                             |                             |
| 3       | RC+        | 9       | +S         |                             |                             |
| 4       | RC-        | 10      | -S         |                             |                             |
| 5       | CS         |         |            |                             |                             |

■ Installation Manual

Please refer to : <http://www.meanwell.com/manual.html>