# 320W AC/DC High Reliable Multi-Industries Enclosed Type Power Supply NSP-320 series


User's Manual

IEC62368-1
IEC61558-1/-2-16
IEC61010-1/-2-201
IEC60601-1
IEC60335-1
IEC62477-1

BS EN/EN62368-1
BS EN/EN61558-1/-2-16
BS EN/EN61010-1/-2-201
BS EN/EN60601-1
BS EN/EN60335-1
BS EN/EN62477-1

UL62368-1
ANSI/AAMI ES60601-1

LISTED
UL61010

ECO Automate Industrial Security Network
Telecom Household Medical 2xMOPP BF rated

AS/NZS61558-1/-2-16
AS/NZS62368-1

GB4943.1

CNS15598-1

KC62368-1
(By request)

IS13252
(By request)

TPTC004

## Features

- 85~305Vac input with PFC(277Vac available)
- No load power consumption <0.3~0.5W by R.C.
- Global certificates in multi-fields (ITE 62368-1, Medical 60601-1,Household 60335-1, Industrial 61558-1/2-16/61010-1, Energy converter 62477-1)
- 200% peak power capability(12~60V models)
- High efficiency up to 93.5%
- -40~85℃ wide range operation temperature(> +60℃ derating)
- Extremely low leakage current<350μA, 2 x MOPP, suitable for BF medical applications
- Built-in constant current limiting circuit
- Protections: Short circuit / Overload / Over voltage / Over temperature
- Forced air cooling by built-in DC fan with noise <40dB and fan ON/OFF control
- Built-in remote ON/OFF control/Remote Sense/ DC OK signal
- Over voltage category III (OVC III)
- Operating altitude up to 5000 meters
- Conformal coating
- 5 years warranty

## Applications

- Industrial automation machinery/ control system
- Security system
- Mechanical and electrical equipment
- Electronic instruments, equipments orapparatus
- Network equipment
- Telecom devices
- Power sourcing equipment of PoE
- Home automation
- Medical devices
- Charging application

## GTIN CODE

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

## Description

The NSP-320 series is a 320W AC/DC power supply with PFC function, designed for high reliability and suitable for multiple industries. Key features include: compact size (179*99*30 mm) for better space utilization in system installations, ultra-wide input range of 85~305Vac for global compatibility, up to 93.5% efficiency and low standby power consumption (<0.3~0.5W by models) for energy-saving and carbon reduction, constant current design with 200% peak power capability, wide operating temperature range from -40 to +85°C(+60°C at full load), compliance with OVC III, built-in Remote Control /Remote Sense/DC OK signal, internal PCB coating, complete protections, certifications for multiple safety standards including 62368-1, 60601-1, 61558-1, 60335-1, 62477-1, and 61010-1, as well as 2 X MOPP compliance and extremely low leakage current (<350μA). It is suitable for BF-rated medical equipment and comes with a 5-years warranty, making it a highly cost-effective solution for industrial power supply needs.

## Model Encoding

NSP -320- 24

- 24 → Output voltage (5V/7.5V/12V/15V/24V/27V/36V/48V/60V)
- 320 → Output wattage
- NSP → Series name

MEAN WELL

# 320W AC/DC High Reliable Multi-Industries Enclosed Type Power Supply NSP-320 series

| SPECIFICATION | NSP-320-5 | NSP-320-7.5 | NSP-320-12 | NSP-320-15 | NSP-320-24 | NSP-320-27 | NSP-320-36 | NSP-320-48 | NSP-320-60 |
|---|---|---|---|---|---|---|---|---|---|
| **OUTPUT** | | | | | | | | | |
| DC VOLTAGE | 5V | 7.5V | 12V | 15V | 24V | 27V | 36V | 48V | 60V |
| RATED CURRENT | 60A | 40A | 26.7A | 21.4A | 13.4A | 11.9A | 8.9A | 6.7A | 5.4A |
| CURRENT RANGE | 0 ~ 60A | 0 ~ 40A | 0 ~ 26.7A | 0 ~ 21.4A | 0 ~ 13.4A | 0 ~ 11.9A | 0 ~ 8.9A | 0 ~ 6.7A | 0 ~ 5.4A |
| RATED POWER | 300W | 300W | 320.4W | 321W | 321.6W | 321.3W | 320.4W | 321.6W | 324W |
| PEAK CURRENT(5 sec.) | N/A | N/A | 53.4A | 42.7A | 26.7A | 23.7A | 17.8A | 13.4A | 10.7A |
| PEAK POWER(5 sec.) | N/A | N/A | 640W | 640W | 640W | 640W | 640W | 640W | 640W |
| RIPPLE & NOISE (max.) Note.2 | 200mVp-p | 200mVp-p | 200mVp-p | 200mVp-p | 240mVp-p | 240mVp-p | 240mVp-p | 240mVp-p | 300mVp-p |
| VOLTAGE ADJ. RANGE | 4.7 ~ 5.5V | 6.8 ~ 9V | 10.8 ~ 14V | 15 ~ 19V | 21 ~ 26V | 26 ~ 32V | 32 ~ 43V | 44 ~ 57V | 54 ~ 72V |
| VOLTAGE TOLERANCE Note.3 | ±2.0% | ±2.0% | ±2.0% | ±2.0% | ±1.0% | ±1.0% | ±1.0% | ±1.0% | ±1.0% |
| LINE REGULATION | ±0.5% | ±0.5% | ±0.5% | ±0.5% | ±0.5% | ±0.5% | ±0.5% | ±0.5% | ±0.5% |
| LOAD REGULATION | ±1.0% | ±1.0% | ±0.5% | ±0.5% | ±0.5% | ±0.5% | ±0.5% | ±0.5% | ±0.5% |
| SETUP, RISE TIME | 1500ms, 80ms/115Vac 1000ms, 80ms/230Vac 1000ms, 80ms/277Vac | | | | | | | | |
| HOLD UP TIME (Typ.) | 16ms at full load | | | | | | | | |
| **INPUT** | | | | | | | | | |
| VOLTAGE RANGE Note.4 | 85 ~ 305Vac 120 ~ 431Vdc | | | | | | | | |
| NO LOAD POWER CONSUMPTION(Typ.) Remote Power OFF | 0.3W/115Vac 0.5W/230Vac 0.5W/277Vac | | | | | | | | |
| NO LOAD POWER CONSUMPTION(Typ.) Remote Power ON | 3W/115Vac 3W/230Vac 3W/277Vac | | | | | | | | |
| FREQUENCY RANGE | 47 ~ 63Hz | | | | | | | | |
| POWER FACTOR (Typ.) | PF>0.98/115Vac, PF>0.93/230Vac, PF>0.9/277Vac at full load | | | | | | | | |
| EFFICIENCY (Typ.) | 91% | 91% | 93.5% | 93.5% | 93.5% | 93.5% | 93.5% | 93.5% | 93.5% |
| AC CURRENT (Typ.) | 3.2A/115Vac 1.6A/230Vac 1.4A/277Vac | | | | | | | | |
| INRUSH CURRENT (Typ.) | COLD START 20A/115Vac 40A/230Vac 50A/277Vac | | | | | | | | |
| LEAKAGE CURRENT | Earth leakage current <350μA(rms)@277Vac, touch current<100μA(rms) @ 277Vac | | | | | | | | |
| **PROTECTION** | | | | | | | | | |
| SHORT CIRCUIT | 5V | Hiccup mode,recovers automatically after fault condition is removed | | | | | | | |
| SHORT CIRCUIT | 7.5V ~ 60V | Constant current limiting for more than 5 seconds (Vout<30%) and then shut down o/p voltage, AC re-power on to recover | | | | | | | |
| OVERLOAD | 5V | 105%~170% rated output power; Hiccup mode,recovers automatically after fault condition is removed | | | | | | | |
| OVERLOAD | 7.5V | 105%~150% rated output power; Constant current limiting for more than 5 seconds and then shut down o/p voltage, AC re-power on to recover | | | | | | | |
| OVERLOAD | 12V ~ 60V | Normally works within 105 ~ 200% rated output power for more than 5 seconds and then constant current limiting without shutdown(Vout>30%), recovers automatically after fault condition is removed, or shut down o/p voltage when Vout<30%,AC re-power on to recover | | | | | | | |
| OVERLOAD | 12V ~ 60V | >200% rated power, constant current limiting (Vout>30%)with auto-recovery after fault condition is removed, or shut down o/p voltage when Vout<30%,AC re-power on to recover | | | | | | | |
| OVER VOLTAGE | 5.8 ~ 7.5V | 9.2 ~ 13V | 15 ~ 19V | 20 ~ 25V | 28 ~ 36V | 33~ 42V | 44 ~ 54V | 58~ 70V | 73~ 86V |
| OVER VOLTAGE | Protection type : Shut down o/p voltage, AC re-power on to recover | | | | | | | | |
| OVER TEMPERATURE | Shut down o/p voltage, AC re-power on to recover | | | | | | | | |
| **FUNCTION** | | | | | | | | | |
| REMOTE CONTROL | POWER ON: RC+~RC- 0~0.8Vdc or open<br>POWER OFF: RC+~RC- 3.3~10Vdc by external voltage | | | | | | | | |
| REMOTE SENSE | Compensate voltage drop on the load wiring up to 0.3V. Please refer to the Function Manual | | | | | | | | |
| DC OK SIGNAL | By phototransistor, contact rating(max.):15Vdc/10mA resistive load. Please refer to the Function Manual. | | | | | | | | |
| FAN NOISE(Typ.) | Fan ON/OFF control, RTH3≥50℃ ±10℃ FAN ON ; RTH3≤40℃ ±10℃ FAN OFF | | | | | | | | |
| FAN NOISE(Typ.) | 40dB | | | | | | | | |
| **ENVIRONMENT** | | | | | | | | | |
| WORKING TEMP. | -40 ~ +85℃ (Refer to "Derating Curve") | | | | | | | | |
| WORKING HUMIDITY | 20 ~ 90% RH non-condensing | | | | | | | | |
| STORAGE TEMP., HUMIDITY | -40 ~ +85℃, 10 ~ 95% RH non-condensing | | | | | | | | |
| TEMP. COEFFICIENT | ±0.05%/℃ (0 ~ 60℃) | | | | | | | | |
| VIBRATION | 10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes | | | | | | | | |

# 320W AC/DC High Reliable Multi-Industries Enclosed Type Power Supply NSP-320 series

| | | | |
|---|---|---|---|
| **SAFETY & EMC (Note 6)** | | | |
| **SAFETY STANDARDS** | CB IEC62368-1, IEC60335-1, IEC61558-1/-2-16, IEC61010-1/-2-201, IEC60601-1; IEC62477-1<br>DEKRA BS EN/EN62368-1, BS EN/EN60335-1, BS EN/EN61558-1/-2-16, BS EN/EN61010-1/-2-201, BS EN/EN60601-1(3.2 Version);BS EN/EN62477-1<br>UL UL62368-1, ANSI/AAMI ES60601-1(3.2 Version),UL61010-1/-2-201<br>RCM AS/NES 62368-1, AS/NES61558-1/-2-16<br>CCC GB4943.1<br>BSMI CNS15598-1<br>EAC TP TC 004 approved;<br>KC/BIS KC62368-1 and BIS IS 13252(Part 1) :2010 certified, no stock by request, contact sale for inquires | | |
| **ISOLATION RESISTANCE** | Primary-Secondary: 2xMOPP, Primary-Earth: 1xMOPP, Secondary-Earth: 1xMOPP | | |
| **OVER VOLTAGE CATEGORY** | IEC/EN 61558-1/-2-16 (OVC III, altitude up to 2000M)<br>IEC/EN/UL 62368-1 (OVC II , altitude up to 5000M)<br>IEC/EN 60335-1 (OVC II , altitude up to 5000M)<br>IEC/EN 60601-1 (OVC II , altitude up to 4000M)<br>IEC/EN 61010-1/-2-201 (OVC II , altitude up to 5000M)<br>IEC/EN 62477-1 (OVC II , altitude up to 5000M) | | |
| **SAFETY EXTRA-LOW VOLTAGE(SELV)** | IEC/EN 61558-2-16 (SELV, 5 ~ 36V)<br>IEC/EN 60335-1 (SELV, 5 ~ 36V)<br>IEC/EN/UL 62368-1 (SELV/ES1, 5 ~ 36V) | | |
| **WITHSTAND VOLTAGE** | I/P-O/P:4.2KVac I/P-FG:2.1KVac O/P-FG:1.5KVac | | |
| **ISOLATION RESISTANCE** | I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25℃/ 70% RH | | |
| **EMC EMISSION** | **Parameter** | **Standard** | **Test Level / Note** |
| | Conducted | BS EN/EN55032(CISPR32),CNS 15936 | Class B |
| | | BS EN/EN55014-1(CISPR14-1) | |
| | | BS EN/EN55011(CISPR11) | Class B |
| | Radiated | BS EN/EN55032(CISPR32),CNS 15936 | Class B |
| | | BS EN/EN55014-1(CISPR14-1) | |
| | | BS EN/EN55011(CISPR11) | Class B |
| | Harmonic Current | BS EN/EN61000-3-2(IEC61000-3-2) | Class A |
| | Voltage Flicker | BS EN/EN61000-3-3(IEC61000-3-3) | ----- |
| **EMC IMMUNITY** | BS EN/EN55035(CISPR35),BS EN/EN61000-6-2(IEC61000-6-2),BS EN/EN60601-1-2(IEC60601-1-2), BS EN/EN55014-2(CISPR14-2) | | |
| | **Parameter** | **Standard** | **Test Level / Note** |
| | ESD | BS EN/EN61000-4-2 | Level 4, 15KV air ; Level 4, 8KV contact |
| | Radiated | BS EN/EN61000-4-3 | Level 3, 10V/m(80MHz~2.7GHz)<br>Table 9, 9~28V/m(385MHz~5.78GHz) |
| | EFT / Burst | BS EN/EN61000-4-4 | Level 3, 2KV |
| | Surge | BS EN/EN61000-4-5 | Level 4, 2KV/Line-Line 4KV/Line-Earth |
| | Conducted | BS EN/EN61000-4-6 | Level 3, 10V |
| | Magnetic Field | BS EN/EN61000-4-8 | Level 4, 30A/m |
| | Voltage Dips and Interruptions | BS EN/EN61000-4-11 | >95% dip 0.5 periods, 30% dip 25 periods, >95% interruptions 250 periods |
| **OTHERS** | | | |
| **MTBF** | 1699.1K hrs min. Telcordia SR-332 (Bellcore) ; 257.1K hrs min. MIL-HDBK-217F (25℃) | | |
| **DIMENSION (L*W*H)** | **179*99*30mm** | | |
| **PACKING** | 0.67Kg; 18pcs/12.5Kg/0.65CUFT | | |

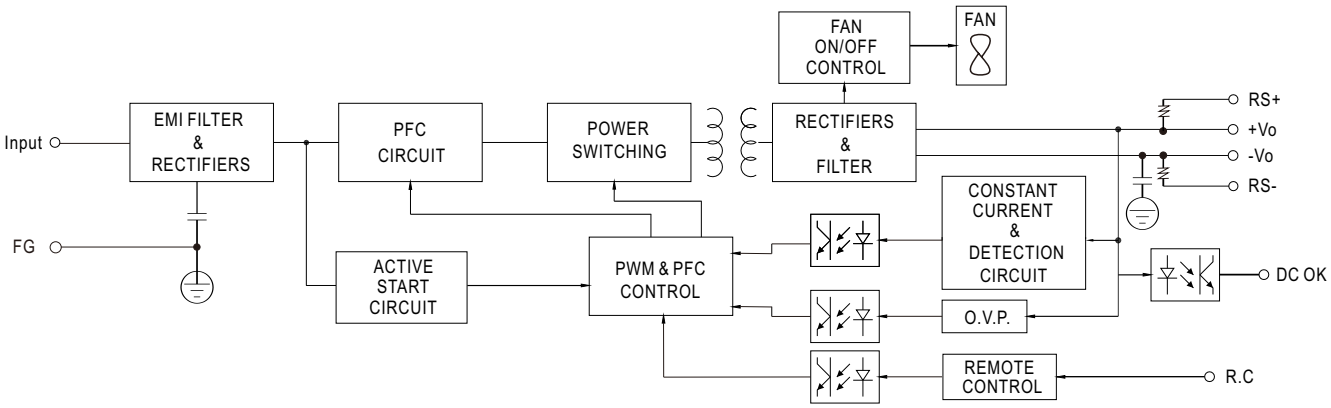
**NOTE**

1. All parameters NOT specially mentioned are measured at 230Vac input, rated load and 25℃ 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. Derating may be need under low input voltages. Please refer to "STATIC CHARACTERISTIC" sections for details.
5. The ambient temperature derating of 3.5℃/1000m with fanless models and 5℃/1000m with fan models for operating altitude higher than 2000m(6500ft).
6. 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." (as available on https://www.meanwell.com//Upload/PDF/EMI_statement_en.pdf)
7. RCM is on voluntary basis and meets relevant IEC or AS/NZS standards complying with AS/NZS 4417.1.

※ Product Liability Disclaimer: For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx

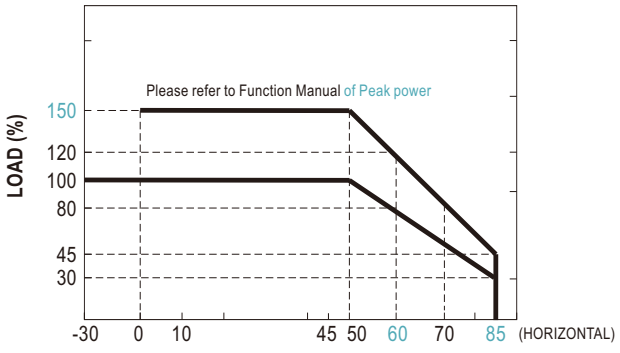
## ■ Block Diagram

PFC fosc : 65KHz
PWM fosc : 80KHz




## ■ Derating Curve

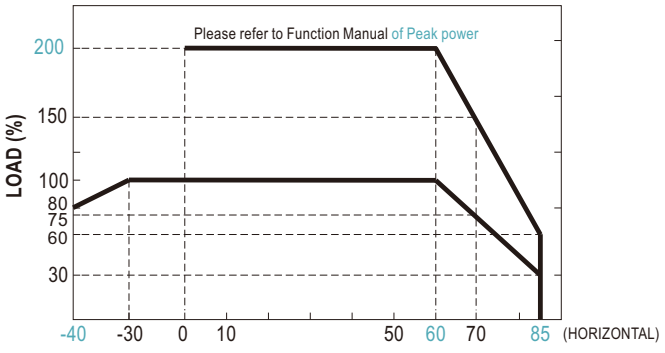
Suitable for 100/110/115/120Vac System
(85~135Vac)




**AMBIENT TEMPERATURE (℃)**

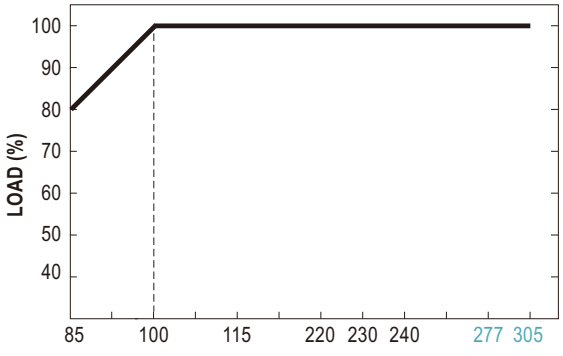
Note: Below 100Vac @-30℃ there may be a restart situation within 3 seconds after power-on

Suitable for 220/230/240/277Vac System
(180~305Vac)




**AMBIENT TEMPERATURE (℃)**

## ■ Output Derating vs Input Voltage




**INPUT VOLTAGE (Vac) 60Hz**

## ■ Function Manual

### 1. Peak Power

$$P_{av} = \frac{P_{pk} \times t + P_{npk} \times (T-t)}{T} \leqslant P_{rated}$$

$$Duty = \frac{t}{T} \times 100\% \leqslant 35\%$$

$t \leqslant 5$ sec

$P_{av}$ : Average output power (W)

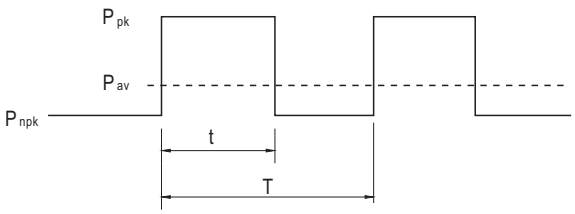
$P_{pk}$ : Peak output power (W)

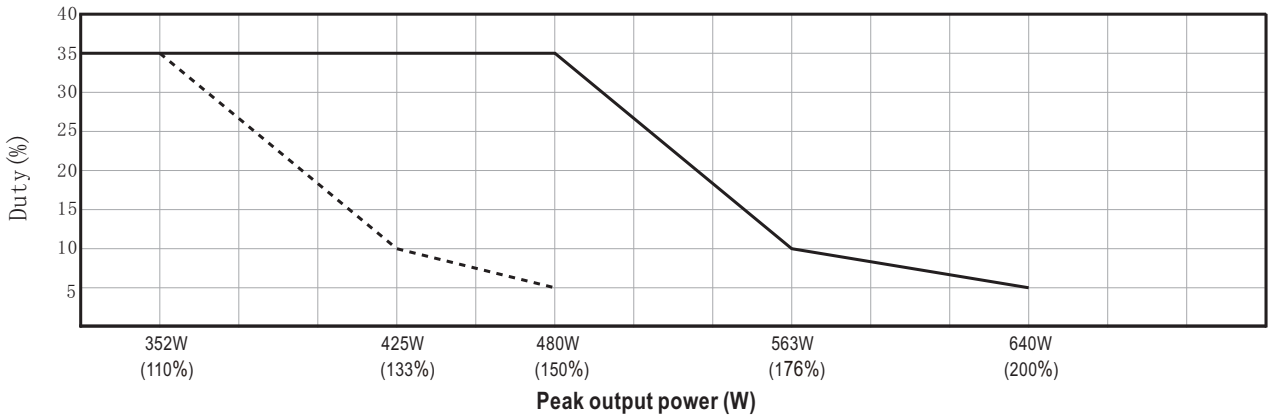
$P_{npk}$ : Non-peak output power (W)

$P_{rated}$ : Rated output power (W)

t : Peak power width (sec)

T : Period (sec)




**For example (24V model) :**

Vin = 200Vac Duty_max = 5%

$P_{av} = P_{rated} = 320W$

$P_{pk} = 640W$

$t \leqslant 5$ sec

$$T \geqq \frac{5\ sec}{5\%} \geqq 100sec$$

$$P_{npk} \leqslant \frac{T P_{av} - t P_{pk}}{T-t}$$

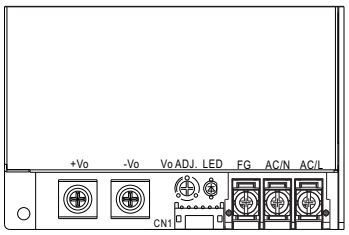
$P_{npk} \leqslant 303W$

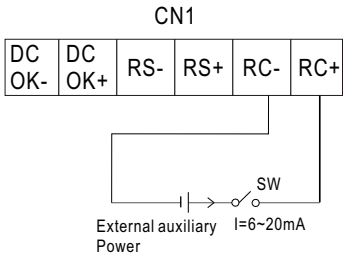
Note: When the output voltage is adjusted to the upper limit, the peak power is 150% rated power.

## 2.Remote Control

The PSU can be turned ON/OFF by using the
"Remote Control" function with external switch and auxiliary power

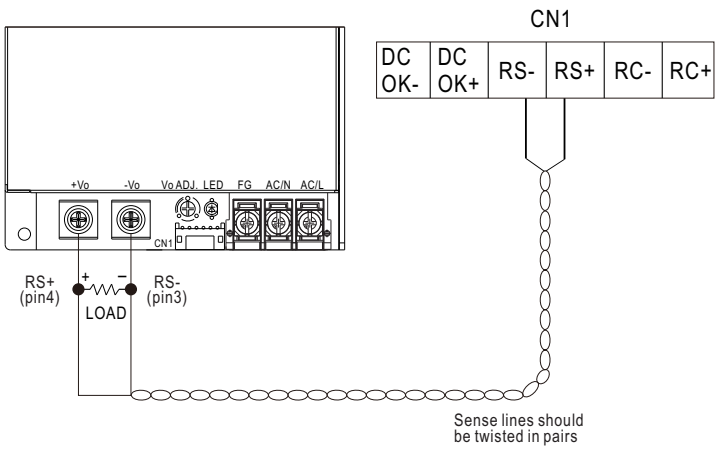
| | |
|---|---|
| PSU Vo Status | Between RC-(pin5) and RC+(pin6) on CN1 |
| POWER ON | SW open or keep 0~0.8Vdc |
| POWER OFF | SW short or keep 3.3~10Vdc |



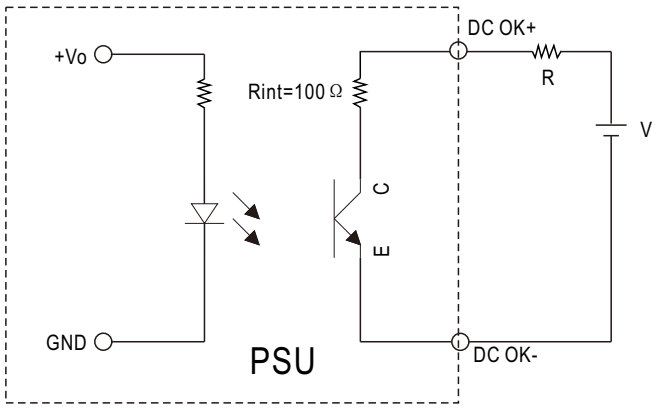

## 3.Remote Sense

The remote sensing compensates voltage drop on the
load wiring up to 0.3Vdc




## 4.DC_OK signal

※ DC_OK is a collector shorted signal. It is used by an optocoupler in the power supply which indicates the output status of the power supply as exhibited below.



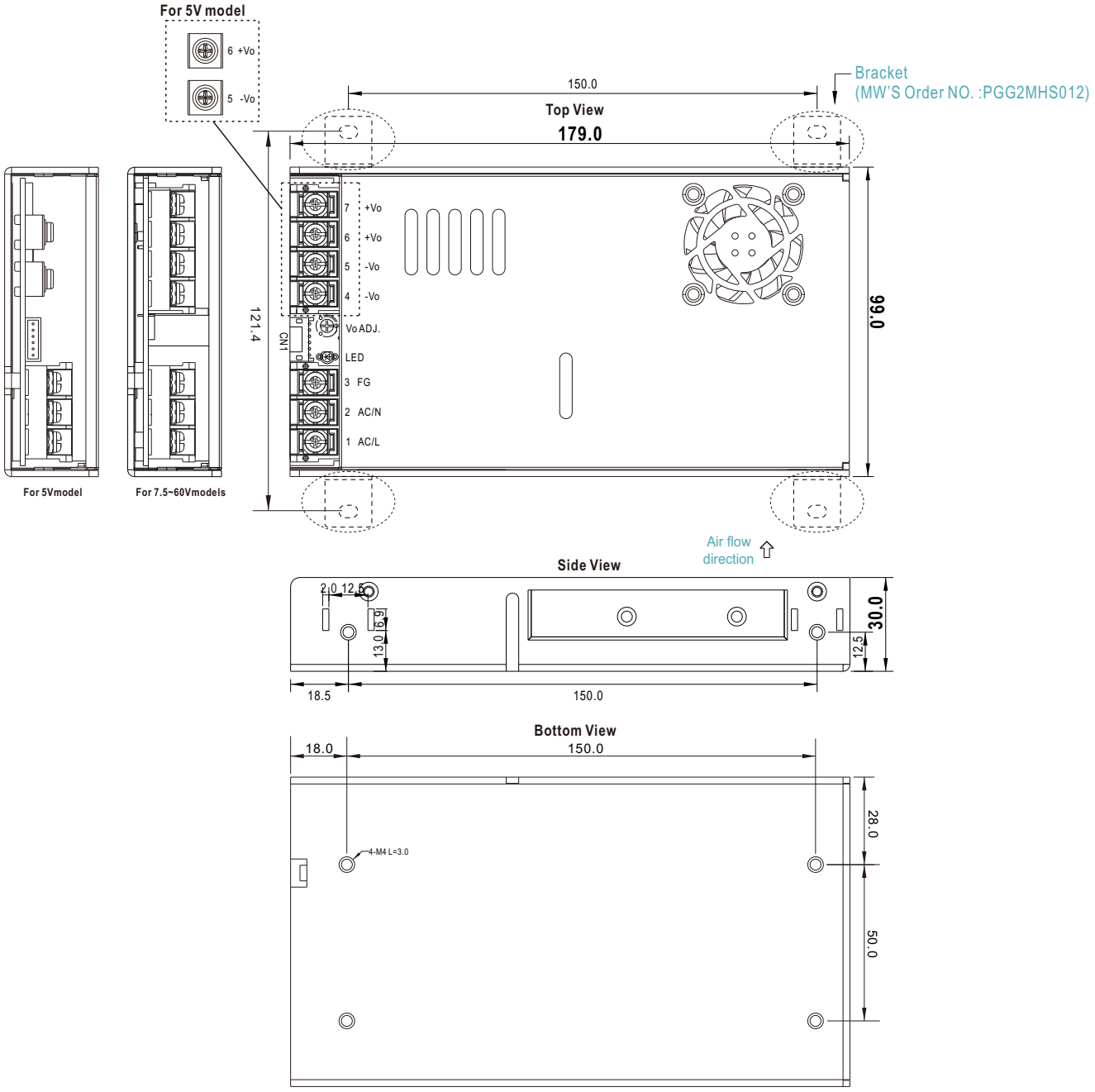

External voltage soure(V)
and resistor(R)

| | |
|---|---|
| PSU Vo Status | Photo transistor |
| POWER ON | Conduct(Low impedance) |
| POWER OFF | Open(High impedance) |

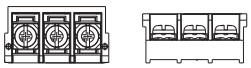
Optocoupler Rating(max.) 15Vdc/10mA resistive load

## ■ Mechanical Specification

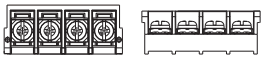
Case No.309A Unit:mm Tolerance:±1




※ Input Terminal Pin No. Assignment

| Pin No. | Assignment | | Screw thread | Mounting torque |
|---|---|---|---|---|
| 1 | AC/L or DC input +Vin |  | M3.5 | 8~10Kgf.cm |
| 2 | AC/N or DC input -Vin | | | |
| 3 | FG ⏚ | | | |

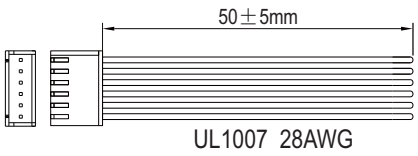
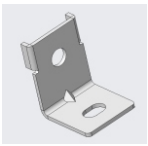
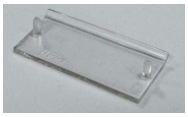
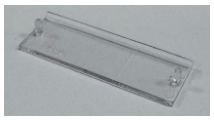
※ DC Output Terminal Pin No. Assignment

| Pin No. | Assignment | Diagram | Screw thread | Mounting torque |
|---|---|---|---|---|
| 5 | -Vo | For 5V models  | M4 | 10~12Kgf.cm |
| 6 | +Vo | | | |
| 4,5 | -Vo | For 7.5~60V models  | M3.5 | 8~10Kgf.cm |
| 6,7 | +Vo | | | |

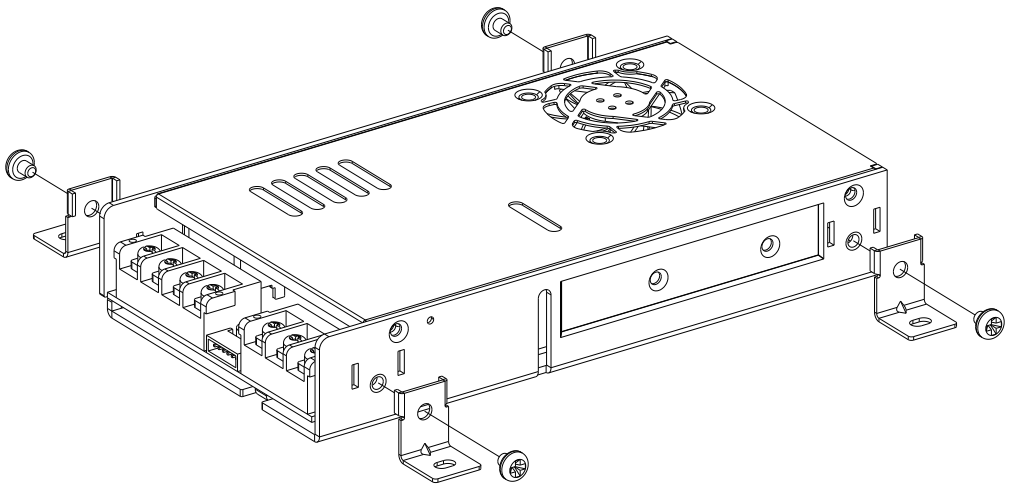
Connector Pin No. Assignment (CN1): DJS-1125R-06 or equivalent

| Pin No. | Assignment | Mating Housing | Terminal |
|---|---|---|---|
| 1 | DC OK- | JS-11242-06 or equivalent | DJS-1125R-06 or equivalent |
| 2 | DC OK+ | | |
| 3 | RS- | | |
| 4 | RS+ | | |
| 5 | RC- | | |
| 6 | RC+ | | |

## ■ Accessory List

| No. | Item | | Quantity |
|---|---|---|---|
| 1 | Control function interface(CN1) mating wire along with NSP-320 (standard accessory) |  | 1pcs/per model |
| 2 | Bracket<br>MW'S Order NO. :PGG2MHS012<br>(By request accessory,should ordered seperatey) |  | 4pcs/per model<br>(Please refer to Installation Diagram) |
| 3 | Terminal cover<br>MW'S Order NO. :PEE4TBC-03<br>(By request accessory,should ordered seperatey) |  | 1pcs/per model |
| 4 | Terminal cover<br>MW'S Order NO. :PEE4TBC-04<br>(By request accessory,should ordered seperatey) |  | 1pcs/per model |

## ■ Installation Diagram



## ■ Installation Manual

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