# CSP-3000 series

3000W Power Supply with Single Output

User's Manual

Video

Dimension

| L | * | W | * | H | |
|---|---|---|---|---|---|
| 278 | * | 177.8 | * | 63.5(2U) | mm |
| 10.9 | * | 7 | * | 2.5 (2U) | inch |

UL62368-1 BS EN/EN62368-1 IEC62368-1

## Features

- AC input 180~264VAC
- Built-in active PFC function
- High efficiency up to 93%
- Forced air cooling by built-in DC fans
- Output voltage / current programmable
- Active current sharing up to 9000W(2+1)
- Built-in remote ON-OFF control / auxiliary power / power OK signal
- Protections: Short circuit / Overload / Over voltage / Over temperature / Fan failure
- Conformal coating
- 5 years warranty

## Applications

- Factory control or automation apparatus
- Test and measurement instrument
- Laser related machine
- UV curing equipment
- Fish lamp
- Burn-in facility

## GTIN CODE

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

## Description

CSP-3000 is a 3KW single output enclosed type AC/DC power supply. This series operates for 180~264VAC 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 65℃. Moreover, CSP-3000 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

**CSP - 3000 - 250**

- 250 — Output voltage (120V/250V/400V)
- 3000 — Output wattage
- CSP — Series name

## SPECIFICATION

| MODEL | | CSP-3000-120 | CSP-3000-250 | CSP-3000-400 |
|---|---|---|---|---|
| OUTPUT | DC VOLTAGE | 120V | 250V | 400V |
| | RATED CURRENT | 25A | 12A | 7.5A |
| | CURRENT RANGE | 0 ~ 25A | 0 ~ 12A | 0 ~ 7.5A |
| | RATED POWER | 3000W | 3000W | 3000W |
| | RIPPLE & NOISE (max.) Note.2 | 800mVp-p | 1000mVp-p | 1200mVp-p |
| | CONSTANT CURRENT REGION | 90 ~ 120V | 125 ~ 250V | 200 ~ 400V |
| | VOLTAGE TOLERANCE Note.3 | ±1.0% | ±1.0% | ±1.0% |
| | LINE REGULATION | ±0.5% | ±0.5% | ±0.5% |
| | LOAD REGULATION | ±0.5% | ±0.5% | ±0.5% |
| | SETUP, RISE TIME | 1000ms, 80ms / 230VAC at full load | | |
| | HOLD UP TIME (Typ.) | 10ms at full load | | |
| INPUT | VOLTAGE RANGE Note.4 | 180 ~ 264VAC 254 ~ 370VDC | | |
| | FREQUENCY RANGE | 47~63Hz | | |
| | POWER FACTOR (Typ.) | PF≧0.95/230VAC at full load | | |
| | EFFICIENCY (Typ.) | 92% | 92.5% | 93% |
| | AC CURRENT (Typ.) | 20A/180VAC 16A/230VAC | | |
| | INRUSH CURRENT (Typ.) | Cold start 60A/230VAC | | |
| | LEAKAGE CURRENT | <0.3mA / 240VAC | | |
| PROTECTION | SHORT CIRCUIT | Shut down and latch off o/p voltage, re-power on to recover | | |
| | OVER CURRENT | 105 ~ 120% rated output power | | |
| | | User adjustable continuous constant current limiting or constant current limiting with delay shutdown after 3 seconds, re-power on to recover (Please refer to the Function Manual) | | |
| | OVER VOLTAGE | 127 ~ 150V | 265 ~ 315V | 420 ~ 500V |
| | | 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 or re-power on to recover | | |
| FUNCTION | OUTPUT VOLTAGE PROGRAMMABLE(PV) | Please refer to the Function Manual. | | |
| | OUTPUT CONSTANT CURRENT PROGRAMMABLE(PC) | Please refer to the Function Manual. | | |
| | CURRENT SHARING | Please refer to the Function Manual. | | |
| | AUXILIARY POWER(AUX) | 12V @ 0.4A | | |
| | REMOTE ON-OFF CONTROL | Please refer to the Function Manual | | |
| | ALARM SIGNAL OUTPUT | Power OK signal. Please refer to the Function Manual | | |
| ENVIRONMENT | WORKING TEMP. | -20 ~ +65℃ (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 ~ 50℃) | | |
| | VIBRATION | 10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes | | |
| SAFETY & EMC (Note 5) | SAFETY STANDARDS | UL62368-1, BS EN/EN62368-1, EAC TP TC004, GB4943.1 | | |
| | 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℃/ 70% RH | | |
| | EMC EMISSION | **Parameter** | **Standard** | **Test Level / Note** |
| | | Conducted | BS EN/EN55032(CISPR32) | Class A |
| | | Radiated | BS EN/EN55032(CISPR32) | Class A |
| | | Harmonic Current | BS EN/EN61000-3-2 | ----- |
| | | Voltage Flicker | BS EN/EN61000-3-3 | ----- |
| | EMC IMMUNITY | BS EN/EN55035 ,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 3, 2KV/Line-Earth ; Level 2, 1KV/Line-Line |
| | | 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 | 721.1K hrs min. Telcordia SR-332 (Bellcore) ; 80.5K hrs min. MIL-HDBK-217F (25℃) | | |
| | DIMENSION | 278*177.8*63.5mm (L*W*H) | | |
| | PACKING | 4Kg; 4pcs/16Kg/1.39CUFT | | |

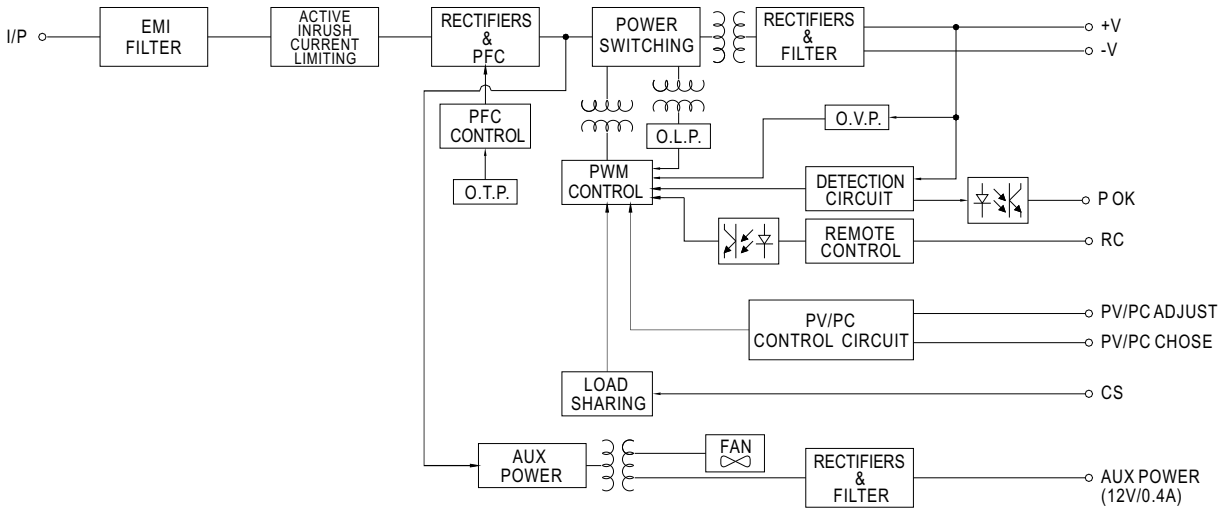
**NOTE**

1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25℃ of ambient temperature.
2. In the PV Mode: 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. Turn off the output when input voltage is less than 160VAC.
5. 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 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 https://www.meanwell.com//Upload/PDF/EMI_statement_en.pdf)
6. 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).

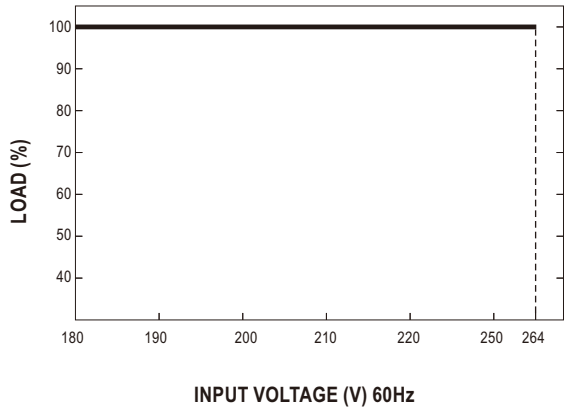
※ Product Liability Disclaimer : For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx

## Block Diagram

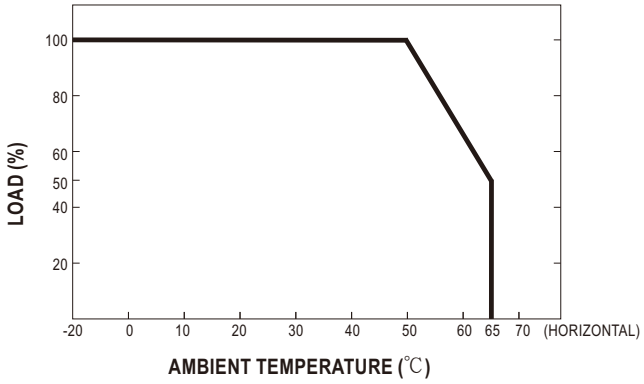
PFC fosc : 85KHz
PWM fosc : 100KHz



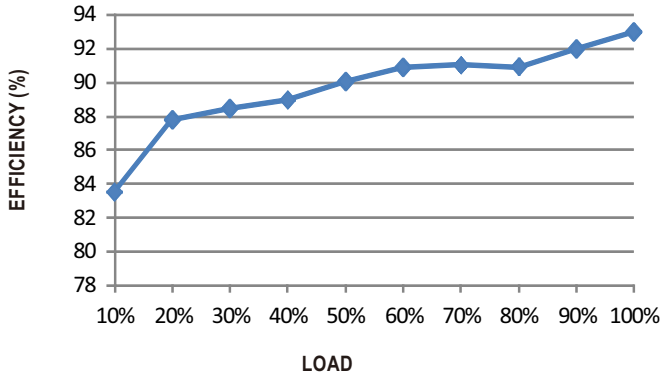

## Static Characteristics




## Derating Curve




## Efficiency vs Load (400V Model)

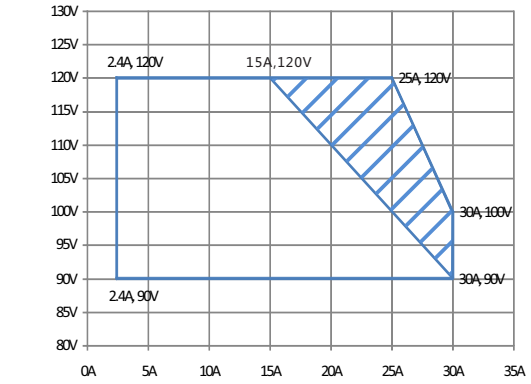



※ The curve above is measured at 230VAC.

## ■ DRIVING METHODS OF LED MODULE

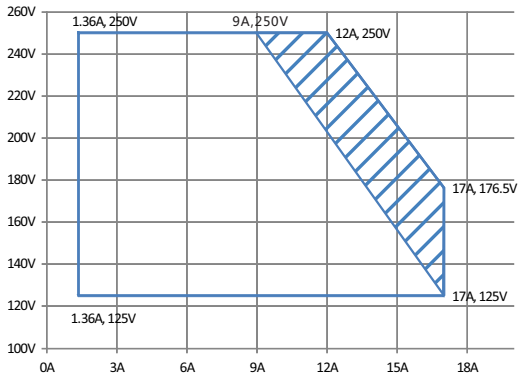
※ I-V Operating Area(for PC mode only)

◎ **CSP-3000-120**



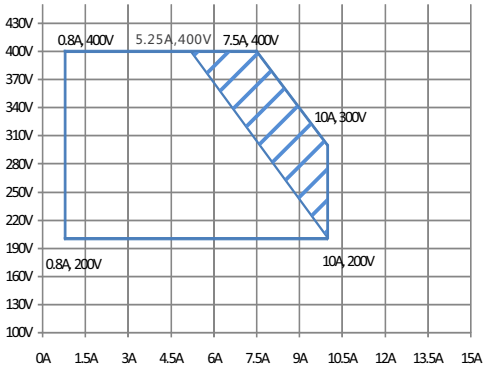

Recommended High Performance Region  Allowed Operational Region

◎ **CSP-3000-250**




Recommended High Performance Region  Allowed Operational Region

◎ **CSP-3000-400**




Recommended High Performance Region  Allowed Operational Region

## ■ Function Manual

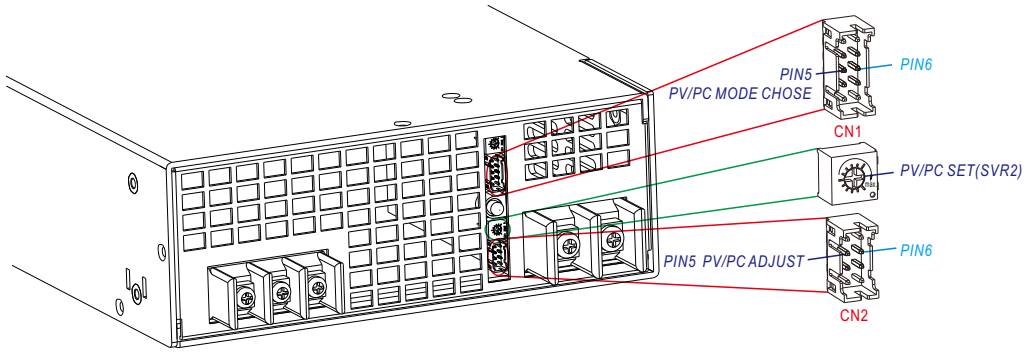
### 1. Output Voltage/Current Programming

※ Mode Setting

**CN1:**

| | CONDITION | MODE | FUNCTION |
|---|---|---|---|
| PIN5/PIN6 | SHORT | PV MODE | Output Voltage Programming |
| | OPEN | PC MODE | Output Current Programming |

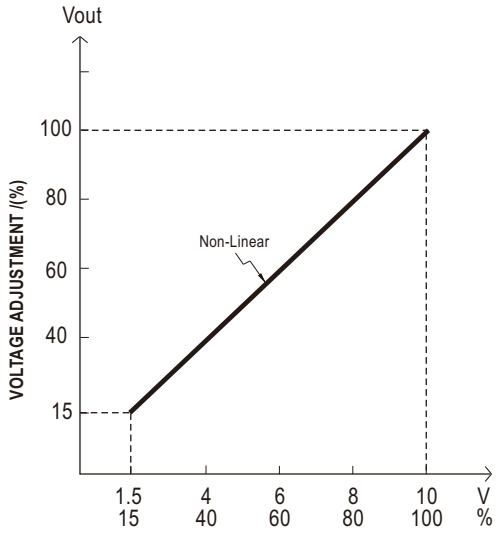
※ The factory default settings:PV mode output max voltage pin5/pin6 short by jumper cap.
When pull out the jumper cap,the default settings: PC mode output max constant current.



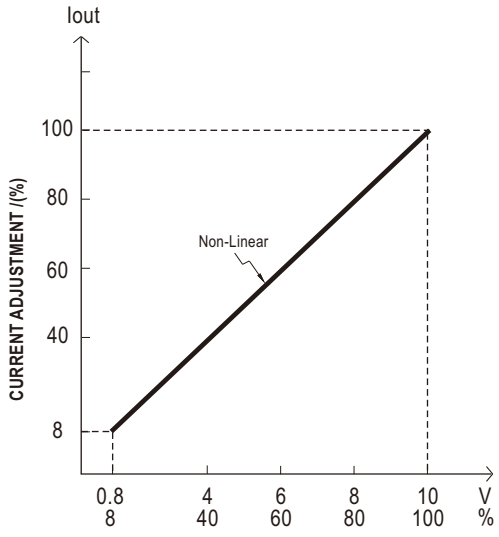

※ PV/PC Set adjustment

◎ Adjust the resistance(SVR2) can set output voltage or constant current point, the adjusting range is 20%-100% of max voltage or max constant current point.

◎ In the CN2, pin5/pin6 access external 10V voltage signal or 500-1KHz PWM signal can adjust the output voltage or constant current point.
CN2:PIN5/PIN6 needs to operate with a 10V sinking signal or PWM signal,Max. sink current 1mA.




PIN5/PIN6 ACCESS TO EXTERNEL VOLTAGE SIGNALS(DC/PWM)

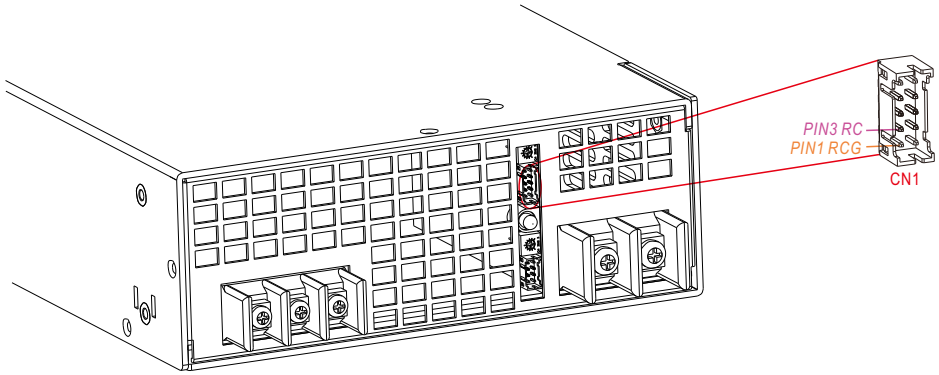



PIN5/PIN6 ACCESS TO EXTERNEL VOLTAGE SIGNALS(DC/PWM)

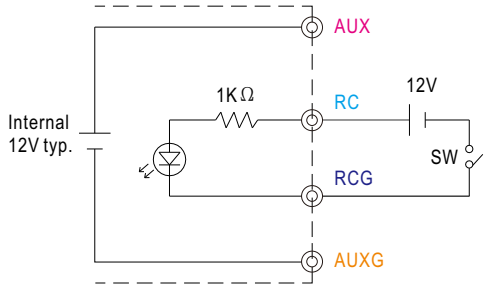
| MODEL | 120V | 250V | 400V |
|---|---|---|---|
| PV range | 18 ~ 120V(max.) | 37.5 ~ 250V(max.) | 60 ~ 400V(max.) |
| PC range | 2.4 ~ 30A(max.) | 1.4~ 17A(max.) | 0.8 ~ 10A(max.) |

**2.Remote ON-OFF**

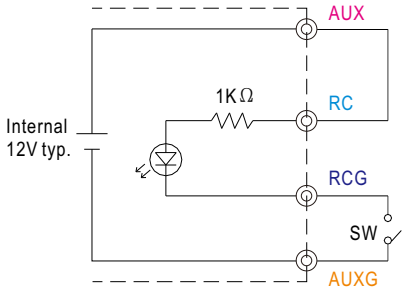
※ Remote ON-OFF is activated by the configuration with respect to CN1 as shown in the following diagram.



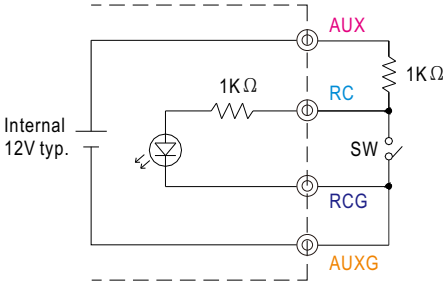

Example 2.2(A): Using external voltage source




Example 2.2(B): Using internal 12V auxiliary output




Example 2.2(C): Using internal 12V auxiliary output

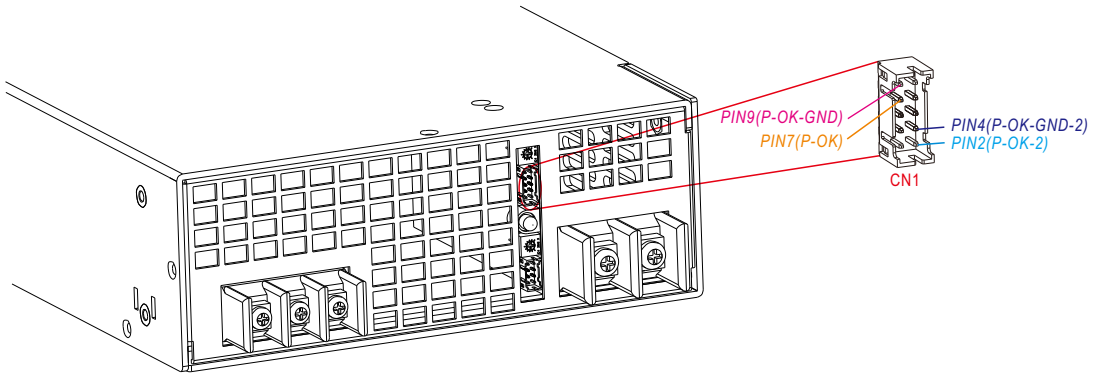



◎ Connection Method

| | | Example 2.2(A) | Example 2.2(B) | Example 2.2(C) |
|---|---|---|---|---|
| SW Logic | Power supply output ON | SW Open(open) | SW Open(open) | SW Close(short) |
| | Power supply output OFF | SW Close(short) | SW Close(short) | SW Open(open) |

### 3.Alarm Signal Output

※ Alarm signal is sent out through "*P OK*" & "*P OK GND*" and *P OK2 & P OK GND2* pins on CN1. Please acknowledge an external voltage source is required for this function.




| Function | Description | Output of alarm(P OK, Relay Contact) | Output of alarm(P OK2, TTL Signal) |
|---|---|---|---|
| P OK | The signal is "Low" when the power supply is above 80% of the rated output voltage, or, say, Power OK | Low<br>(0.5V max at 500mA) | Low<br>(0.5V max at 10mA) |
| | The signal turns to be "High" when the power supply is under 80% of the rated output voltage, or, say, Power Fail | High or open<br>(External applied voltage, 500mA max.) | High or open<br>(External applied voltage, 10mA max.) |

Table 3.1 Explanation of alarm

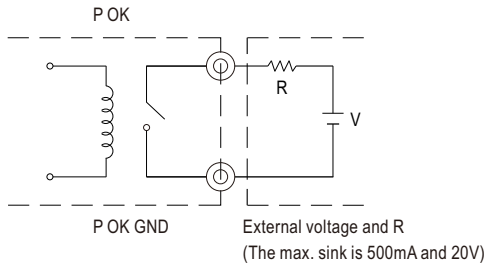



Fig. 3.2 Internal circuit of P OK (Relay, total is 10W)

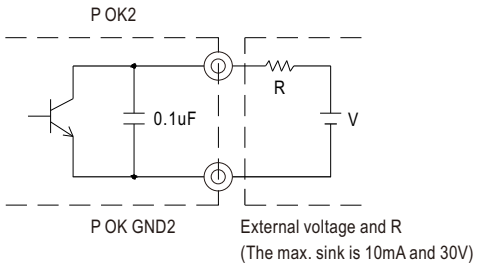



Fig. 3.3 Internal circuit of P OK2 (Open collector method)

### 4.Select Overload Protection Type

(1)Insert the shorting connector on CN1 that is shown in Fig 4.1, the Overload Protection Type will be "constant current limiting with delay shutdown after 3 seconds, re-power on to recover". This is the factory default.

(2)Remove the shorting connector on CN1 that is shown in Fig 4.2, the Overload Protection Type will be "continuous constant current limiting".

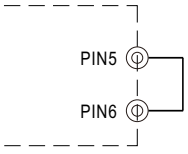



Fig. 4.1 Insert the CN1
Overload Protection Type : constant current limiting with delay shutdown after 3 seconds

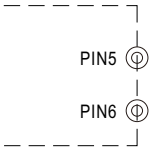



Fig. 4.2 Remove the CN1
Overload Protection Type : constant current limiting

**5.Current Sharing**

CSP-3000 has the built-in active current sharing function and can be connected in parallel, up to 3 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.

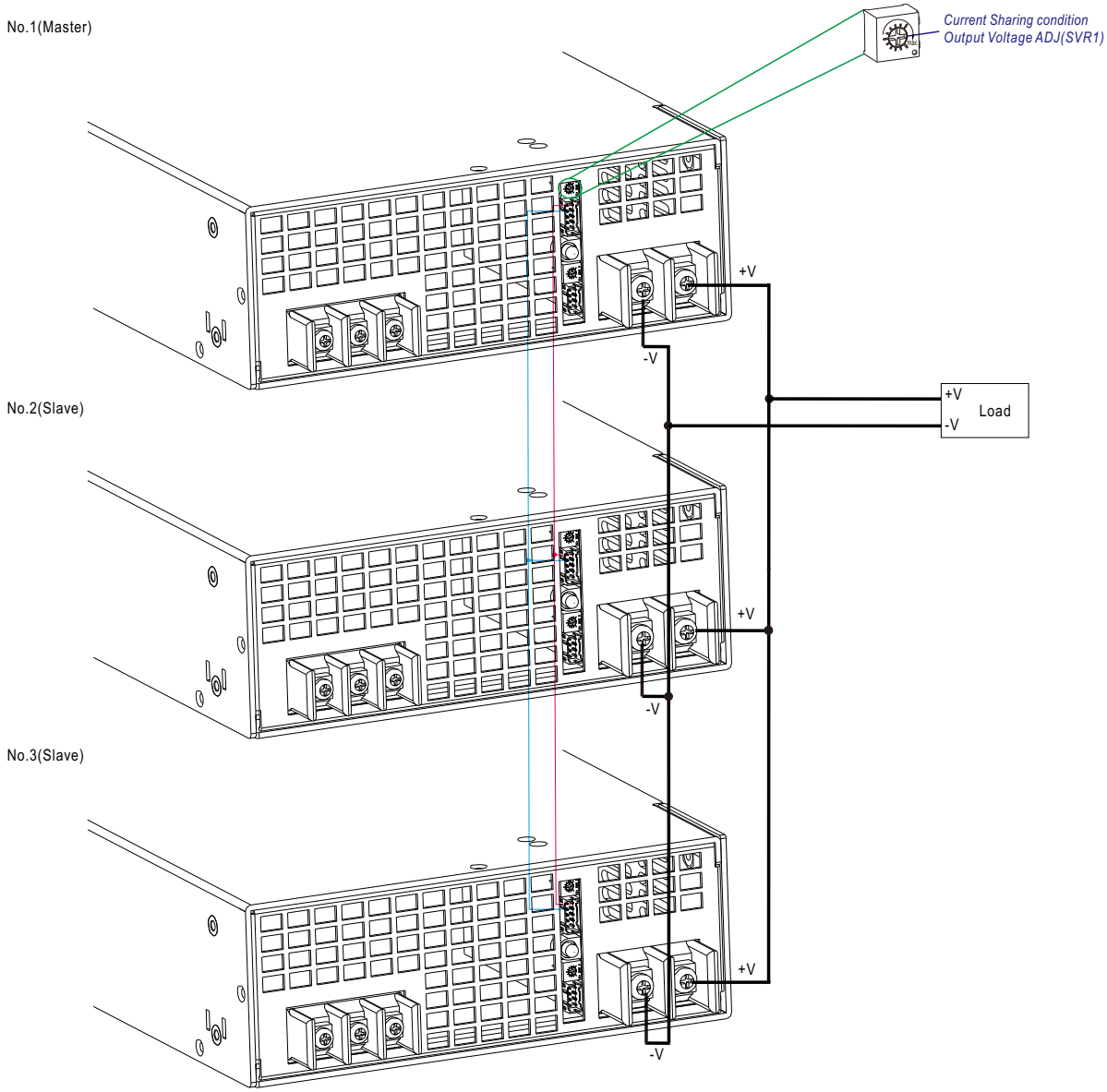
※ Difference of output voltages among parallel units should be less than 0.2V(Can Fine tune by SVR1).

※ The total output current must not exceed the value determined by the following equation:
Maximum output current at parallel operation=(Rated current per unit)×(Number of unit)×0.9

※ When out current<( 50% rate current)×(Number of unit),
the current shared among units may not be fully balanced.

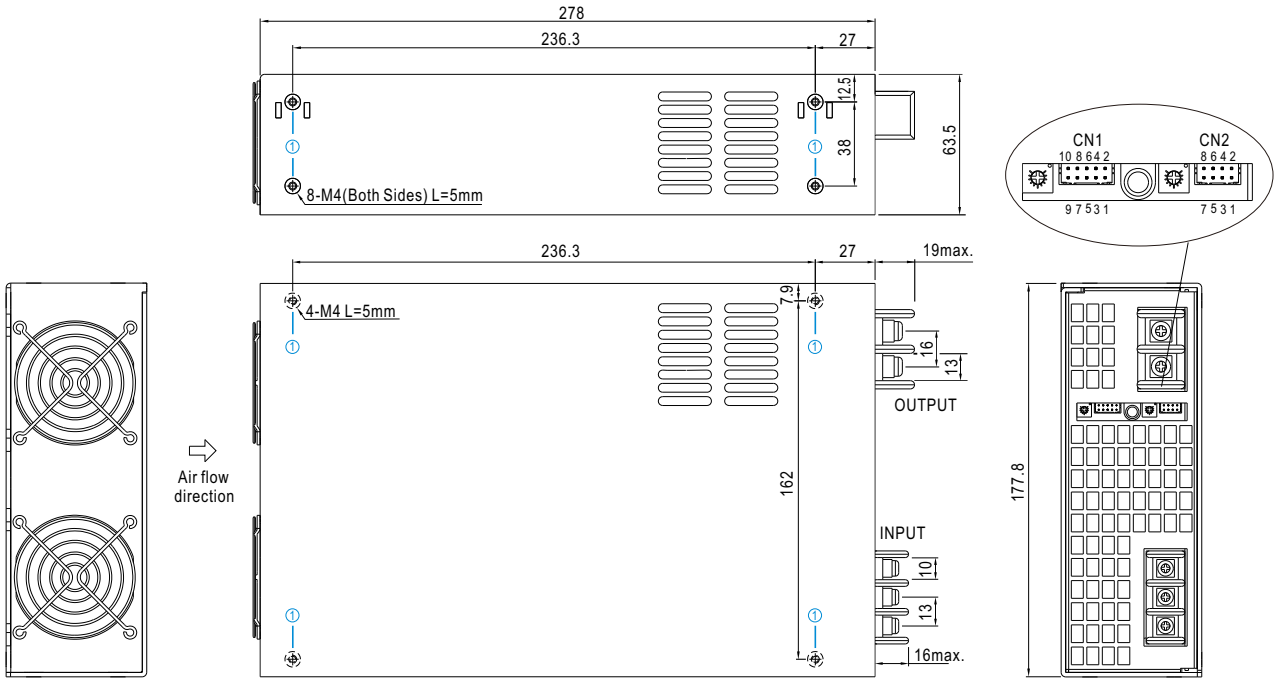
◎ *CS+/CS-* on CN1 are connected mutually in parallel(Note:CS+/CS- do not reverse connection).

◎ Under parallel operation, the "PV/PC" function is not available.



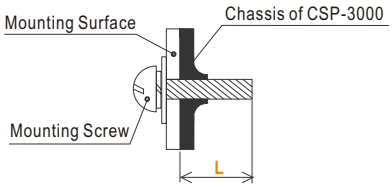
## ■ Mechanical Specification

Case No.982B Unit:mm

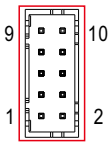



※ Mounting Instruction

| Hole No. | Recommended Screw Size | MAX. Penetration Depth L | Recommended mounting torque |
|---|---|---|---|
| ① | M4 | 5mm | 7~10Kgf-cm |



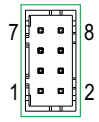

※ Control Pin No. Assignment (CN1) : HRS DF11-10DP-2DS or equivalent




| | |
|---|---|
| Mating Housing | HRS DF11-10DS or equivalent |
| Terminal | HRS DF11-**SC or equivalent |

| Pin No. | Function | Description |
|---|---|---|
| 1 | RCG | Remote ON-OFF Ground |
| 2 | P-OK-2 | Power OK Signal(TTL Signal) |
| 3 | RC | Remote ON-OFF |
| 4 | P-OK-GND-2 | Power OK Ground |
| 5 | GND | PV/PC Mode Choose Ground |
| 6 | Mode | PV/PC Mode Choose |
| 7 | P-OK | Power OK Signal(Relay Contact) |
| 8 | CS+ | Current Sharing Signal+ |
| 9 | P-OK GND | Power OK Ground |
| 10 | CS- | Current Sharing Signal- |

※Control Pin No. Assignment (CN2) : HRS DF11-8DP-2DS or equivalent




| Mating Housing | HRS DF11-8DS or equivalent |
|---|---|
| Terminal | HRS DF11-**SC or equivalent |

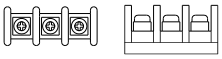
| Pin No. | Function | Description |
|---|---|---|
| 1 | 12V AUXG | Auxiliary output GND |
| 2 | 12V AUX+ | Auxiliary output+ |
| 3 | NC | |
| 4 | NC | |
| 5 | PV/PC+ | PV/PC adjust+ |
| 6 | PV/PC- | PV/PC adjust- |
| 7 | NC | |
| 8 | NC | |

Note: NC pins, please keep open circuit and do not connect to other pins/signals.

※LED status indication

| LED | LED Signal | Description |
|---|---|---|
| Green LED nornal | ——— | Power supper working normllly |
| Green LED slow flash (Cycle1.4S) | - - - | Standby power supply(Remote off) |
| Red LED of flash (Cycle200mS) | - - - - - | Power OVP , output voltage too low |
| Red LED slow flash (Cycle1.4S) | - - - | NTC fault, power OTP, temperature switch action |
| Red LED nornal | ——— | Power fan fault |
| Red LED of flash (Cycle 200mS) Green LED of flash | - - - - - - - - - - | Line fault,CN2 pin7/8 signal abnormal |

※AC Input Terminal Pin No. Assignment

| Pin No. | Assignment | Diagram | Maximum mounting torque |
|---|---|---|---|
| 1 | AC/L |  | 18Kgf-cm |
| 2 | AC/N | | |
| 3 | FG ⏚ | | |

※DC Output Terminal Pin No. Assignment

| Pin No. | Assignment | Diagram | Maximum mounting torque |
|---|---|---|---|
| 1 | V- |  | 18Kgf-cm |
| 2 | V+ | | |

## ■ Installation Manual

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