# CV60 Series

## 60W Multiple-Stage Output Current LED Power Supply




Case: 8917HQ
123.5 x 81.5 x 23 mm

### Features

- Output current level selectable by DIP S.W.
- 180~295VAC input only
- Built-in active PFC function
- Protections: Short circuit / Over voltage / Over temperature
- Cooling by free air convection
- Fully isolated plastic case
- Class II power unit, no FG
- Built-in 0~10Vdc and PWM signal dimming function
- Built-in 12V/50mA auxiliary output
- Logarithm or linear dimming curve selectable (meet IEC62386-207)
- Temperature compensation function by external NTC
- No load power consumption <1W(Note.7)
- Power supplies synchronization function up to 10 units
- Suitable for indoor LED lighting applications
- 3 years warranty

### Specification

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **INPUT** | **Voltage** | 180V ~ 295VAC 254 ~ 417VDC | | | | | |
| | **Frequency** | 47 ~ 63 Hz | | | | | |
| | **Power Factor** | PF ≧ 0.975/230VAC, PF ≧ 0.96/277VAC at rated power (Please refer to "Power Factor Characteristic" curve) | | | | | |
| | **Total Harmonic Distortion** | Total harmonic distortion will be lower than 20% when output loading is 75% or higher | | | | | |
| | **Efficiency** | 92% | | | | | |
| | **AC Current (Typ.)** | 0.32A/230VAC 0.27A/277VAC | | | | | |
| | **Inrush Current (typ.)** | Cold start 20A(twidth=270μs measured at 50% Ipeak) at 230VAC | | | | | |
| | **Leakage Current** | <0.5mA / 240VAC | | | | | |
| **OUTPUT** | **Selectable Current** | **500mA** | **600mA** | **700mA** | **900mA** | **1050mA** | **1400mA** |
| | **DC Voltage Range** | 2 ~ 90V | 2 ~ 90V | 2 ~ 86V | 2 ~ 67V | 2 ~ 57V | 2 ~ 42V |
| | **Rated Power** | 60.3W | | | | | |
| | **Ripple Current** | ±5.0% | | | | | |
| | **No Load Output Voltage** | 95V | | | 73V | | |
| | **Ripple & Noise** | 700mVp-p | | | | | |
| | **Current Accuracy** | ±5.0% | | | | | |
| | **Set Up, Rise Time** | 500ms, 80ms/230VAC at rated power | | | | | |
| | **Hold Up Time** | 16ms/230VAC at rated power | | | | | |
| **PROTECTION** | **Short Circuit** | Constant current limiting, recovers automatically after fault condition is removed | | | | | |
| | **Over Voltage** | 105 ~ 125V<br>Protection type: Shutdown o/p voltage, re-power on to recover | | | | | |
| | **Over Temperature** | Shut down o/p voltage, re-power on to recover | | | | | |
| **FUNCTION** | **Auxilary Power** | 12V @ 50mA for driving fan; Tolerance ± 5% | | | | | |
| | **Temp. Compensation** | By external NTC (not provided with power supply), please see "Temperature Compensation Operation" | | | | | |
| | **Dimming** | Please see "Dimming Operation" | | | | | |
| | **Synchronisation** | Please see "Synchronisation Operation" | | | | | |
| **ENVIRONMENT** | **Working Temperature** | -30 ~ +60°C (Refer to Derating Curve) | | | | | |
| | **Working Humidity** | 20 ~ 90% RH non-condensing | | | | | |
| | **Storage Temperature** | -40 ~ +80C, 10 ~ 95% RH | | | | | |
| | **Temp. Coefficient** | ±0.03%/°C (0-50°C) | | | | | |
| | **Vibration** | 10 ~ 500Hz, 2G 10 min./1cycle, period for 60min. each long X, Y, Z axes | | | | | |
| **SAFETY & EMC** | **Safety Standards** | UL8750, ENEC EN61347-1, EN61347-2-13, EN62384 independent approved | | | | | |
| | **Withstand Voltage** | I/P-O/P:3.75KVAC | | | | | |
| | **Isolation Resistance** | I/P-O/P:>100M Ohms / 500VDC / 25°C / 70% RH | | | | | |
| | **EMC Emission** | Compliance to EN55015, EN61000-3-2 Class C(≧40% rated power) ; EN61000-3-3 | | | | | |
| | **EMC Immunity** | Compliance to EN61000-4-2,3,4,5,6,8,11, EN55024, EN61547 light industry level (surge 2KV), criteriaA | | | | | |
| **OTHERS** | **MTBF** | 260.6K hrs min. MIL-HDBK-217F (25°C) | | | | | |
| | **Packing** | 0.24kg; 54pcs/15Kg/1.12CUFT | | | | | |

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 0.1uf parallel capacitor.
3. Please see DIP switch table.
4. Derating may be needed under low input voltage. Please check the static characteristics for more details.
5. Length of set up time is measured at first cold start. Turning the power supply ON/OFF may lead to increase of the set up time.
6. Efficiency is measured at 900mA/67V output set by DIP switch.
7. No load power consumption <1W is measured at 180~277VAC, with lighting fixture connected and output current dimmed to 0%.
8. The lower supply is considered as a component that will be operated in combination with final equipment. Since EMC performance will be affected by the complete installation, the final equipment manufacturers must re-qualify EMC Directive on the complete installation again.
9. To fulfill requirements of the latest ErP regulation for lighting fixtures, this LED power supply can only be used behind a switch without permanently connected to the mains.

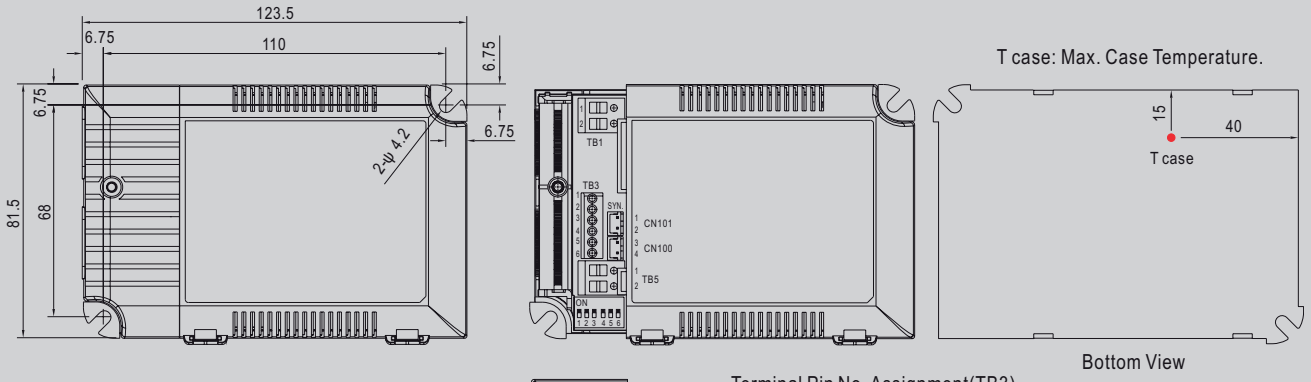
**Sunpower Technology LLP** Orion House, Calleva Park, Aldermaston, Berkshire RG7 8SN Tel: +44 (0)118 981 1001 • E-mail: sales@sunpower-uk.com

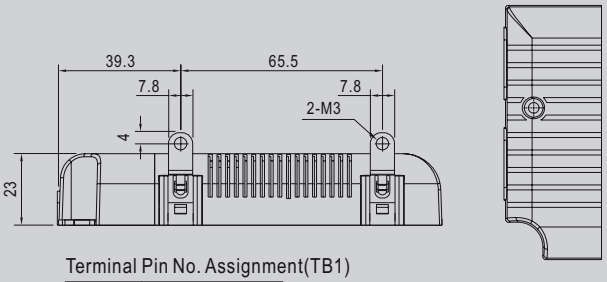
# CV60 Series

60W Multiple-Stage Output Current LED Power Supply

## Mechanical Specification

Unit:mm




Terminal Pin No. Assignment(TB3)

| Pin No. | Assignment | Pin No. | Assignment |
|---|---|---|---|
| 1 | +FAN | 4 | -NTC |
| 2 | -FAN | 5 | DIM+ |
| 3 | +NTC | 6 | DIM- |

Terminal Pin No. Assignment(TB5)

| Pin No. | Assignment |
|---|---|
| 1 | +Vo |
| 2 | -Vo |

Terminal Pin No. Assignment(TB1)

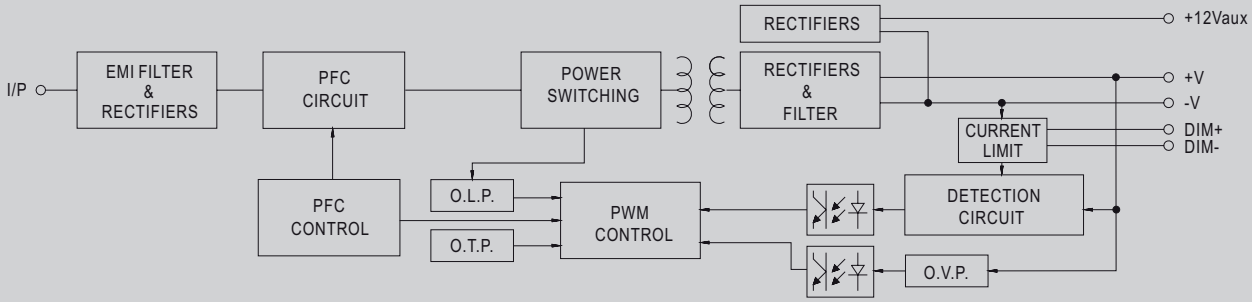
| Pin No. | Assignment |
|---|---|
| 1 | AC/L |
| 2 | AC/N |

SYN. Connector(CN101/CN100):JST B2B-XH or equivalent

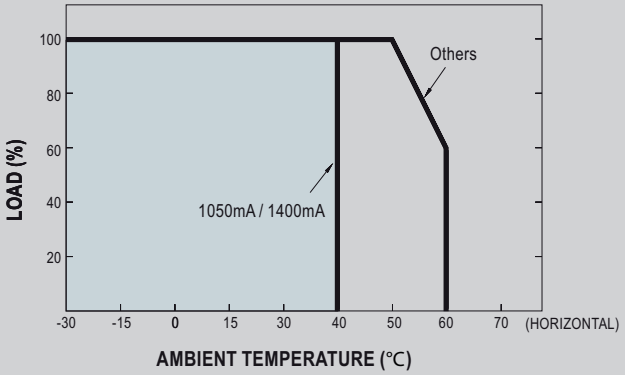
| Pin No. | Assignment | Mating Housing | Terminal |
|---|---|---|---|
| 1,3 | + | JST XHP or equivalent | JST SXH-001T-P0.6 or equivalent |
| 2,4 | – | | |

PFC fosc : 60KHz
PWM fosc : 80KHz

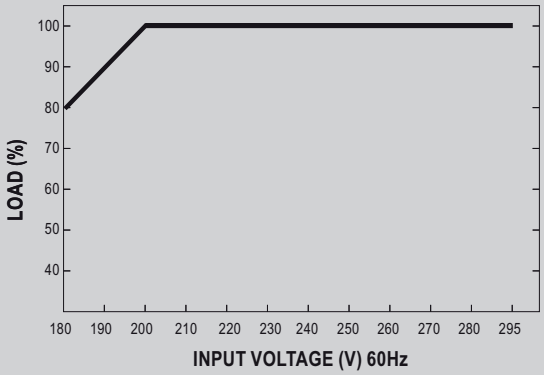
## Block Diagram




## Derating Curve




## Static Characteristics



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60W Multiple-Stage Output Current LED Power Supply

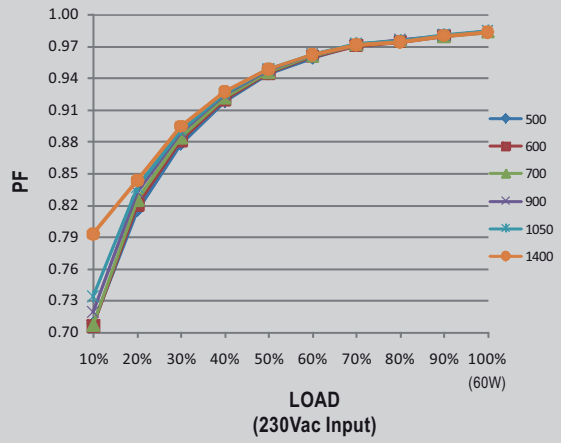
## DIP Switch Table

CV-60 is a multiple-stage output current supply, selection of output current through DIP switch as table below.

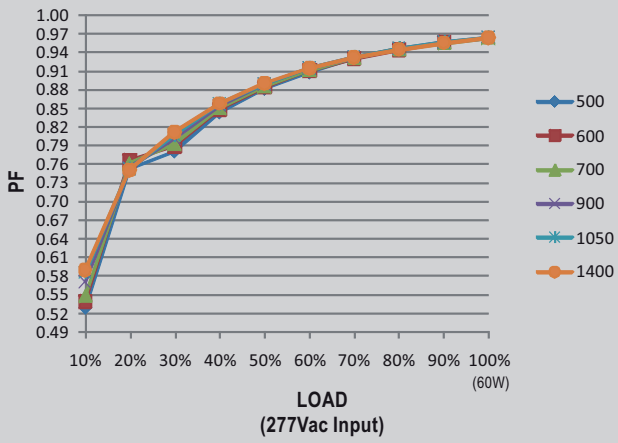
| Io \ DIP S.W. | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| 500mA | ---- | ---- | ---- | ---- | ---- | ---- |
| 600mA | ON | ---- | ---- | ---- | ---- | ---- |
| 700mA(Factory Setting) | ON | ON | ---- | ---- | ---- | ---- |
| 900mA | ON | ON | ON | ---- | ---- | ON |
| 1050mA | ON | ON | ON | ON | ---- | ON |
| 1400mA | ON | ON | ON | ON | ON | ON |

## Power Factor Characteristic

### Constant Current Mode

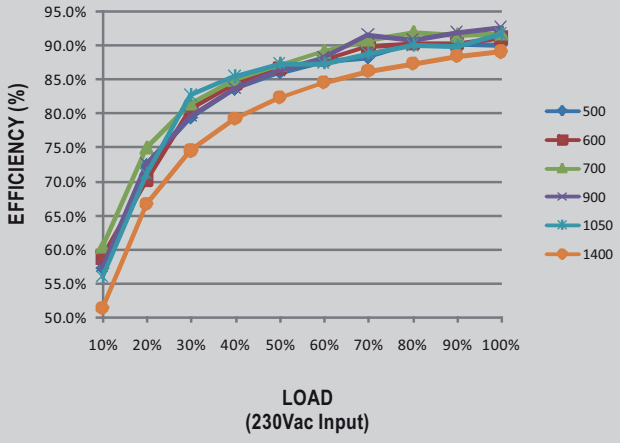


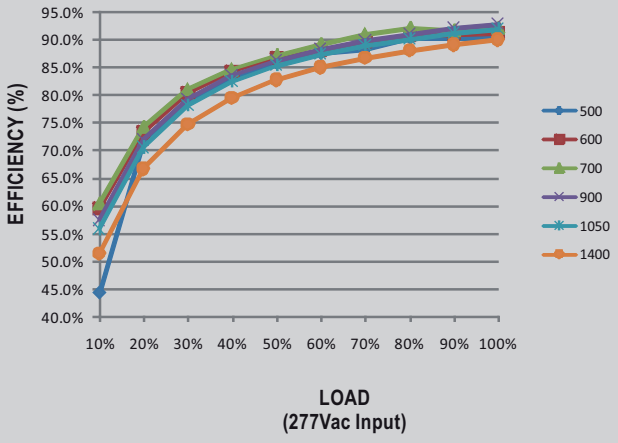

### Constant Current Mode



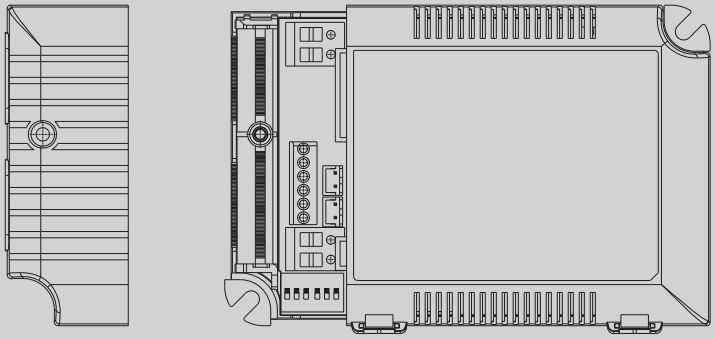

## Efficiency vs Load

CV-60 series possess superior working efficiency that up to 92% can be reached in field applications.



## Dimming Operation



Built-in 3 in 1 dimming function, output constant current level can be adjusted through output terminal by connecting a resistance or 0 ~ 10Vdc or 10V PWM signal between DIM+ and DIM-.
Please DO NOT connect "DIM-" to "-Vo".
Reference resistance value for output current adjustment (Typical)

| Resistance value | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Single driver | Short | 10KΩ | 20KΩ | 30KΩ | 40KΩ | 50KΩ | 60KΩ | 70KΩ | 80KΩ | 90KΩ | 100KΩ | OPEN |
| | Multiple drivers (N=driver quantity for synchronized dimming operation) | Short | 10KΩ /N | 20KΩ /N | 30KΩ /N | 40KΩ /N | 50KΩ /N | 60KΩ /N | 70KΩ /N | 80KΩ /N | 90KΩ /N | 100KΩ /N | ----- |
| Percentage of rated current | | 0% | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% | 100%~108% |

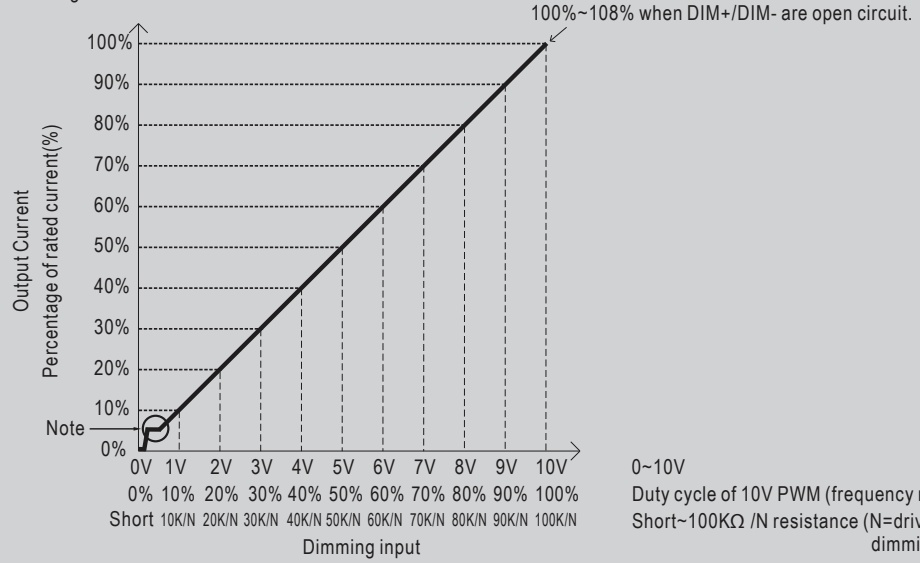
0 ~ 10V dimming function for output current adjustment (Typical)

| Dimming value | 0V | 1V | 2V | 3V | 4V | 5V | 6V | 7V | 8V | 9V | 10V | OPEN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Output current | 0% | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% | 100%~108% |

10V PWM signal for output current adjustment (Typical): Frequency range :100Hz ~ 3KHz

| Duty value | 0% | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% | OPEN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Output current | 0% | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% | 100%~108% |

Dimming Characteristic

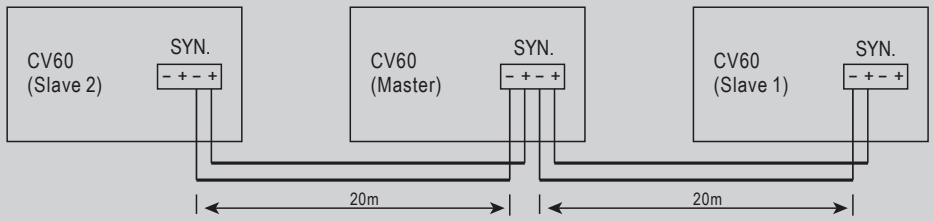



0~10V
Duty cycle of 10V PWM (frequency range = 100~3KHz)
Short~100KΩ /N resistance (N=driver quantity for synchronized dimming operation )

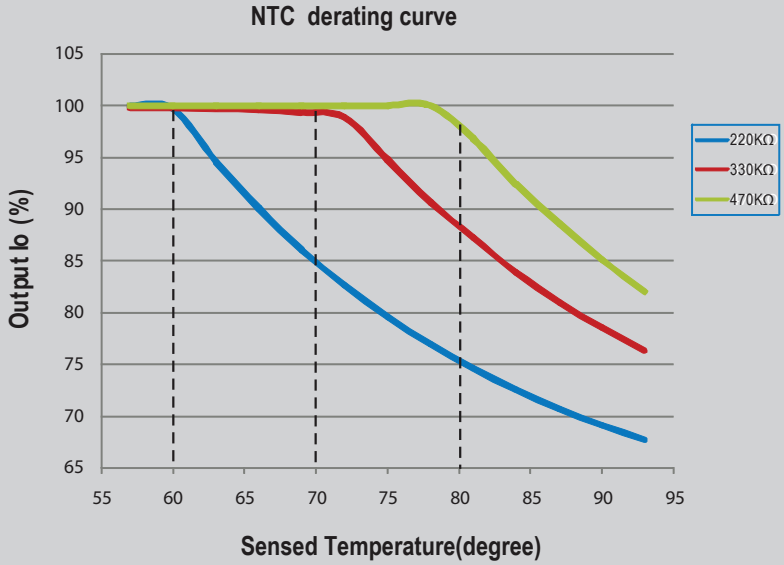
Note : 1. Min. dimming level is about 6%
2. The output current is not defined when 0%<Iout<6%
3. The output current could drop down to 0% when dimming input is about 0KΩ or 0Vdc, or 10V PWM signal with 0% duty cycle

## Synchronisation Operation

- 10 drivers(max.) synchronization (1 master + 9 slaves)
- Maximum cable length between each units : 20 meter.




## Temperature Compensation Operation




CV60 have the built-in temperature compensation function (T ↑ ,Io ↓ ). By connecting a temperature sensor (NTC resistor) between the NTC +/- terminal of CV60 and the detecting point on the lighting system or the surrounding environment, output current of CV60 could be correspondingly changed to ensure the long life of LED.

1. CV60 can still be operated well when the NTC resistor is not connected and the value of output current will be the current level that you set through the DIP switch.
2.

| NTC resistance | Output Current |
|---|---|
| 220K | < 60°C, 100% of the rated current (corresponds to the setting current level)<br>> 60°C, output current begin to reduce, details please refer to the curve. |
| 330K | < 70°C, 100% of the rated current (corresponds to the setting current level)<br>> 70°C, output current begin to reduce, details please refer to the curve. |
| 470K | < 80°C, 100% of the rated current (corresponds to the setting current level)<br>> 80°C, output current begin to reduce, details please refer to the curve. |

Notes: 1. MW does not offer the NTC resistor and all the data above are measured by using THINKING TTC03 series.
2. If other brands of NTC resistor is applied,please check the temperature curve first.