SELV IP65 IP67

## Features

Universal AC input / Full range (up to 305VAC)
Built-in active PFC function
No load power consumption <0.5W at remote OFF
High efficiency up to 96%
-40 ~ +70 wide operating range
Protections: Short circuit / Over current / Over voltage / Over temperature
Fanless design, cooling by free air convection
IP67 / IP65 design for indoor or outdoor installations
Withstand 5G vibration test
Three in one dimming function (0~10Vdc or PWM signal or resistance)
LED indicator for power on (A-Type)
Suitable for dry / damp / wet location
5 years warranty (Note.10)

## Applications

LED street lighting
LED high-bay lighting
Parking space lighting
LED searchlight
LED fishing lamp

## Description

HB-600 series is a high performance dustproof and waterproof AC-to-DC LED power supply up to 600W . The fully-potted silicone and the aluminum case facilitate the heat dissipation. Above all, it delivers the efficiency up to 96% that tops the LED power supply field. Other features include the wide working temperature range between -40 and +70 , the fan-less design, the adjustable output voltage and current, the surge susceptibility up to 4KV (EN61000-4-5), low no-load power consumption (<0.5W) at remote OFF and workable for 277VAC input. These attributes all make HLG-600H the fit for the indoor/outdoor LED lighting application requiring remarkable reliability.

## Model Encoding

HB - 600 - 12 A

- A : IP65, Vo and Io level can be adjusted through internal potentiometer.
- B : IP67, Io adjustable with 0~10Vdc, PWM signal or resistance.

Function mode option
Output voltage
High input voltage up to 305VAC
Output wattage
Series name

# 600W Single Output Switching Power Supply HB-600 series

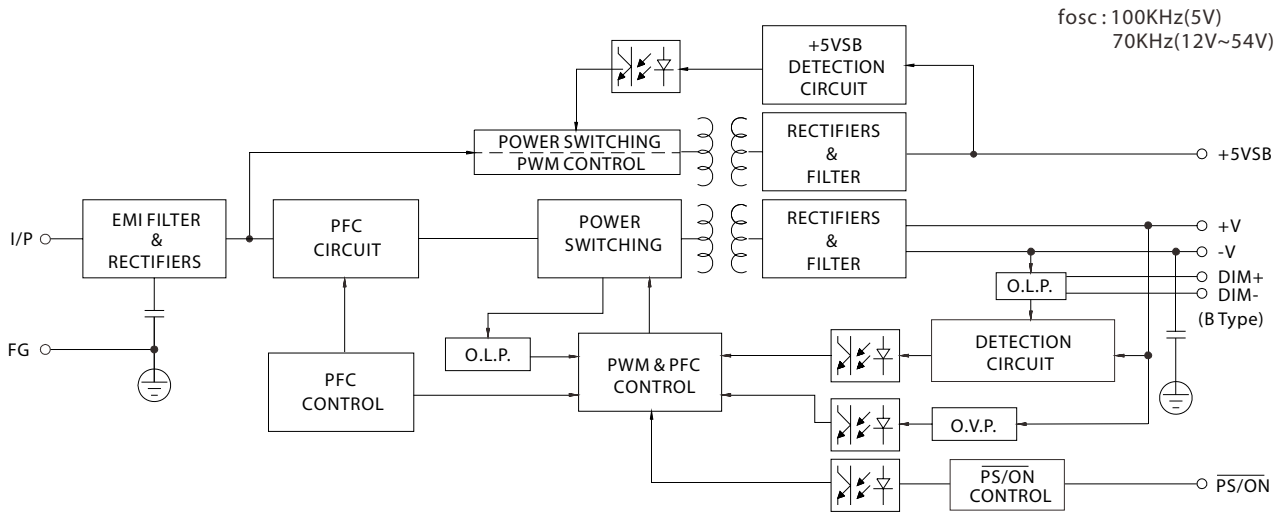
## SPECIFICATION

| MODEL | | | HB-600-12 ☐ | HB-600-15 ☐ | HB-600-20 ☐ | HB-600-24 ☐ | HB-600-30 ☐ | HB-600-36 ☐ | HB-600-42 ☐ | HB-600-48 ☐ | HB-600-54 ☐ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OUTPUT | DC VOLTAGE | | 12V | 15V | 20V | 24V | 30V | 36V | 42V | 48V | 54V |
| | CONSTANT CURRENT REGION Note.4 | | 6 ~12V | 7.5 ~ 15V | 10 ~ 20V | 12 ~ 24V | 15 ~ 30V | 18 ~ 36V | 21 ~ 42V | 24 ~ 48V | 27 ~ 54V |
| | RATED CURRENT | | 40A | 36A | 28A | 25A | 20A | 16.7A | 14.3A | 12.5A | 11.2A |
| | RATED POWER | | 480W | 540W | 560W | 600W | 600W | 601.2W | 600.6W | 600W | 604.8W |
| | RIPPLE & NOISE (max.) Note.2 | | 150mVp-p | 150mVp-p | 150mVp-p | 150mVp-p | 200mVp-p | 250mVp-p | 250mVp-p | 250mVp-p | 350mVp-p |
| | VOLTAGE ADJ. RANGE Note.6 | | 10.2 ~ 12.6V | 12.7 ~ 15.8V | 17 ~ 21V | 20.4 ~ 25.2V | 25.5 ~ 31.5V | 30.6 ~ 37.8V | 35.7 ~ 44.1V | 40.8 ~ 50.4V | 45.9 ~ 56.7V |
| | CURRENT ADJ. RANGE | | Can be adjusted by internal potentiometer A type only | | | | | | | | |
| | | | 20 ~ 40A | 18 ~ 36A | 14 ~ 28A | 12.5 ~ 25A | 10 ~ 20A | 8.3 ~ 16.7A | 7.1 ~ 14.3A | 6.2 ~ 12.5A | 5.6 ~ 11.2A |
| | VOLTAGE TOLERANCE Note.3 | | ± 3.0% | ± 2.0% | ± 1.5% | ± 1.0% | ± 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 | | ± 2.0% | ± 1.5% | ± 1.0% | ± 0.5% | ± 0.5% | ± 0.5% | ± 0.5% | ± 0.5% | ± 0.5% |
| | SETUP, RISE TIME Note.8 | | 500ms, 80ms at full load 230VAC /115VAC | | | | | | | | |
| | HOLD UP TIME (Typ.) | | 15ms at full load 230VAC /115VAC | | | | | | | | |
| INPUT | VOLTAGE RANGE Note.5 | | 90 ~ 305VAC 127 ~ 431VDC | | | | | | | | |
| | FREQUENCY RANGE | | 47 ~ 63Hz | | | | | | | | |
| | POWER FACTOR (Typ.) | | PF>0.98/115VAC, PF>0.95/230VAC, PF>0.93/277VAC at full load (Please refer to "Power Factor Characteristic" curve) | | | | | | | | |
| | TOTAL HARMONIC DISTORTION | | THD< 20% when output loading 50% at 115VAC/230VAC input and output loading 75% at 277VAC input | | | | | | | | |
| | EFFICIENCY (Typ.) | 230VAC | 92% | 93.5% | 94.5% | 95% | 95% | 95.5% | 96% | 96% | 96% |
| | | 277VAC | 92.5% | 93.5% | 94.5% | 95% | 95% | 95.5% | 96% | 96% | 96% |
| | AC CURRENT (Typ.) | | 7A / 115VAC 3.3A / 230VAC 2.9A / 277VAC | | | | | | | | |
| | INRUSH CURRENT(Typ.) | | COLD START 70A(t =1000 s measured at 50% I ) at 230VAC | | | | | | | | |
| | LEAKAGE CURRENT | | <0.75mA / 277VAC | | | | | | | | |
| PROTECTION | OVER CURRENT Note.4 | | 95 ~ 108% | | | | | | | | |
| | | | Protection type : Constant current limiting, recovers automatically after fault condition is remove | | | | | | | | |
| | SHORT CIRCUIT | | Constant current limiting, recovers automatically after fault condition is removed | | | | | | | | |
| | OVER VOLTAGE | | 13 ~ 16V | 16.5 ~ 20.5V | 22 ~ 26V | 26 ~ 30V | 32.5 ~ 36.5V | 39.5 ~ 43.5V | 46 ~ 50V | 52.5 ~ 56.5V | 59 ~ 63V |
| | | | Protection type : Shut down o/p voltage, re-power on to recover | | | | | | | | |
| | OVER TEMPERATURE | | Shut down o/p voltage, re-power on to recover | | | | | | | | |
| FUNCTION | REMOTE ON/OFF CONTROL | | Power on : "Hi" >2 ~ 5V or Open circuit Power off : "Low" <0 ~ 0.5V or Short circuit | | | | | | | | |
| | 5V STANDBY | | $5V_{SB}$ : 5V@0.5A ; tolerance± 5%, ripple : 100mVp-p(max.) | | | | | | | | |
| ENVIRONMENT | WORKING TEMP. | | -40 ~ +70 (Refer to "Derating Curve") | | | | | | | | |
| | WORKING HUMIDITY | | 20 ~ 95% RH non-condensing | | | | | | | | |
| | STORAGE TEMP., HUMIDITY | | -40 ~ +85 , 10 ~ 95% RH | | | | | | | | |
| | TEMP. COEFFICIENT | | 0.03%/ (0 ~ 60 ) | | | | | | | | |
| | VIBRATION | | 10 ~ 500Hz, 5G 12min./1cycle, period for 72min. each along X, Y, Z axes | | | | | | | | |
| SAFETY & EMC | SAFETY STANDARDS Note.7 | | UL8750, CSA C22.2 No. 250.13-12, ENEC EN61347-1, EN61347-2-13 independent ,EN62384, IP65 or IP67 approved | | | | | | | | |
| | WITHSTAND VOLTAGE | | I/P-O/P:3.75KVAC I/P-FG:2KVAC 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 | | Compliance to EN55015, EN55022(CISPR22) Class B, EN61000-3-2 Class C ( 50% load) ; EN61000-3-3 | | | | | | | | |
| | EMC IMMUNITY | | Compliance to EN61000-4-2,3,4,5,6,8,11, EN61547, EN55024, light industry level (surge 4KV), criteria A | | | | | | | | |
| OTHERS | MTBF | | 76.9K hrs min. MIL-HDBK-217F (25 ) | | | | | | | | |
| | DIMENSION | | 280*144*48.5mm (L*W*H) | | | | | | | | |
| | PACKING | | 3.9Kg; 4pcs/16.6Kg/0.9CUFT | | | | | | | | |

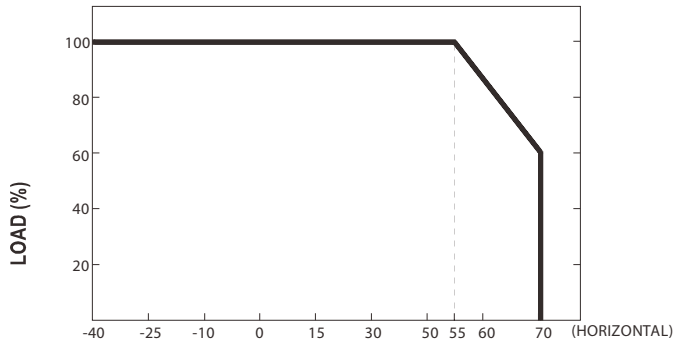
NOTE

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. Constant current operation region is within 50%~100% rated output voltage. This is the suitable operation region for LED related applications, but please reconfirm special electrical requirements for some specific system design.
5. Derating may be needed under low input voltages. Please check the static characteristics for more details.
6. A type only.
7. Safety and EMC design refer to EN60598-1, subject CNS15233, GB7000.1, FCC part18.
8. Length of set up time is measured at cold first start. Turning ON/OFF the power supply may lead to increase of the set up time.
9. The power 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.
10. Refer to warranty statement

## ■ Block Diagram

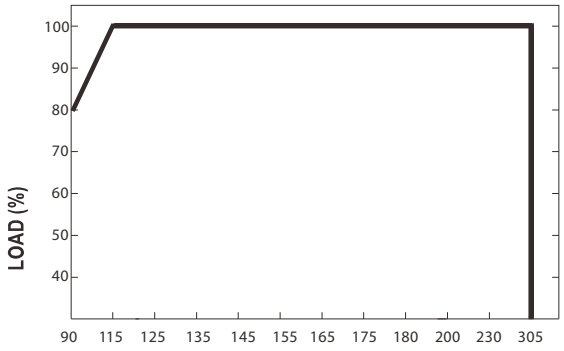



## ■ Derating Curve




AMBIENT TEMPERATURE (℃)

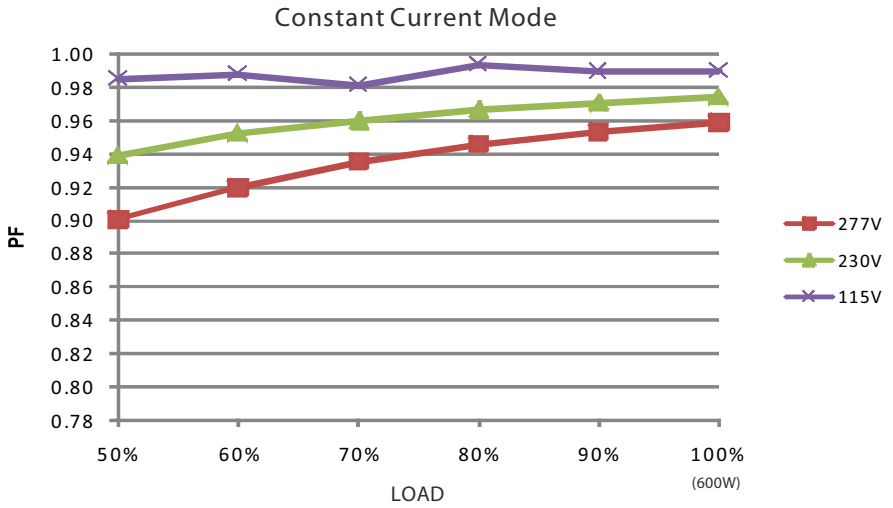
## ■ Static Characteristics




INPUT VOLTAGE (V) 60Hz

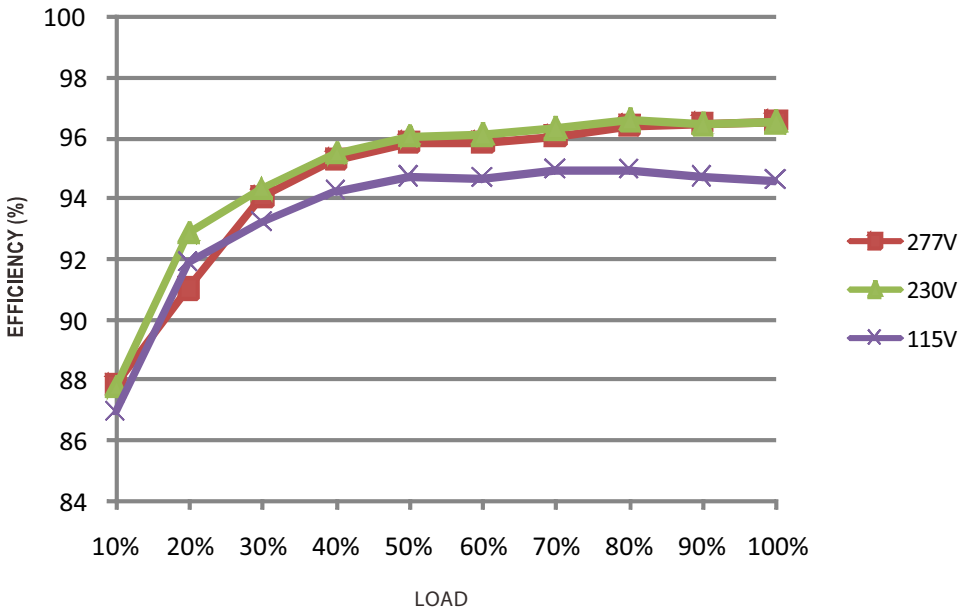
Note : At high ambient temperature Ta=70 ℃, if HLG-600H operates in C.C mode, the maximal current must not be greater than 60% of the rated current.

## ■ Power Factor Characteristic



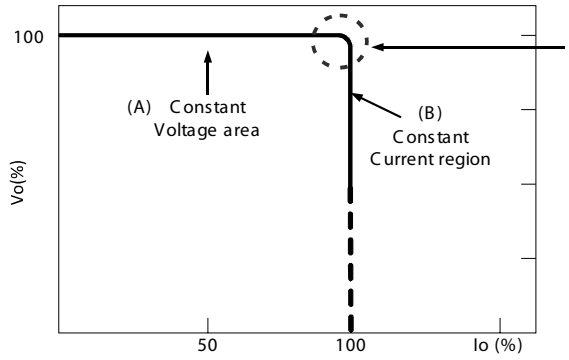
## ■ EFFICIENCY vs LOAD (54V Model)

HB-600 series possess superior working efficiency that up to 96% can be reached in field applications.




## ■ DRIVING METHODS OF LED MODULE

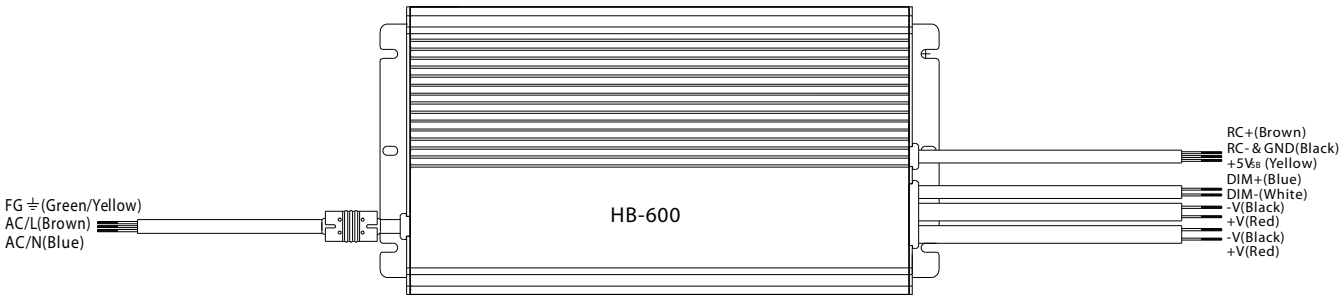
There are two major kinds of LED drive method "direct drive" and "with LED driver".
A typical LED power supply may either work in "constant voltage mode (C.V) or constant current mode (C.C)" to drive the LEDs.
LED power supply with C.V+ C.C characteristic can be operated at both C.V mode (with LE D driver, at area (A) and C.C mode (direct drive, at area (B).




In the constant current region, the highest voltage at the output of the driver depends on the configuration of the end systems.

Typical LED power supply I-V curve

## ■ DIMMING OPERATION (for B-type only)




Built-in 3 in 1 dimming function, IP67 rated. Output constant current level can be adjusted through output cable by connecting
a resistance or 0 ~ 10Vdc or 10V PWM signal between DIM+ and DIM-.
Please DO NOT connect "DIM-" to "-V".
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% | 95%~108% |

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

| Dimming value | 0V | 1V | 2V | 3V | 4V | 5V | 6V | 7V | 8V | 9V | 10V | OPEN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Percentage of rated current | 0% | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% | 95%~108% |

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

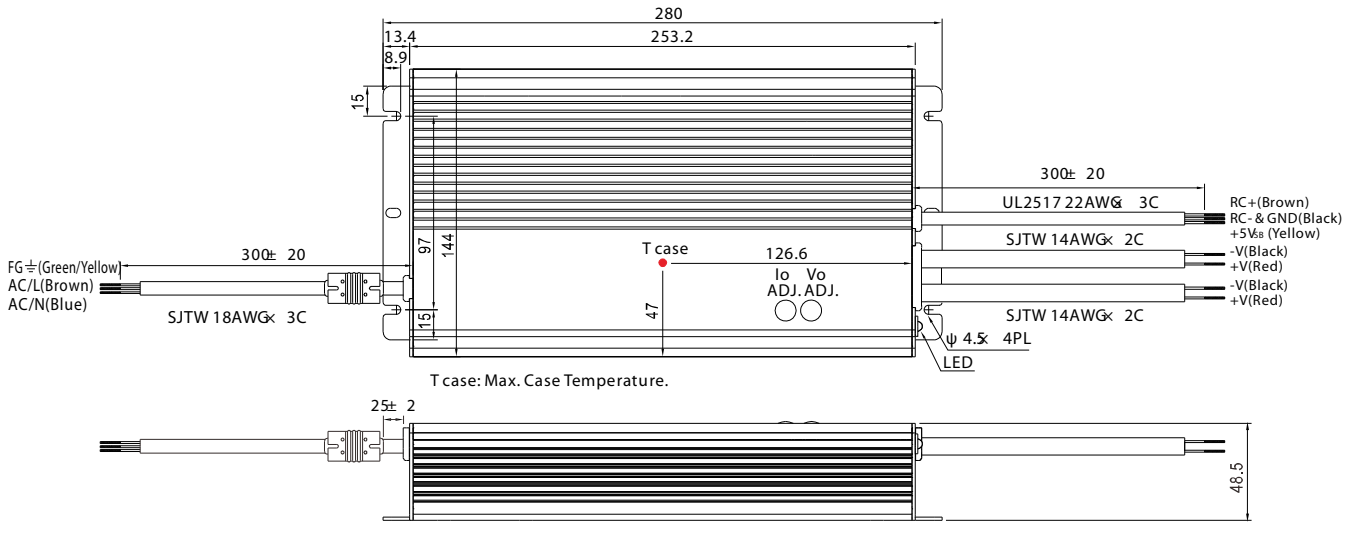
| Duty value | 0% | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% | OPEN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Percentage of rated current | 0% | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% | 95%~108% |

Direct connecting to LEDs is suggested, but is not suitable for using additional drivers.

## ■ Mechanical Specification

Case No. 228 Unit:mm

A Type:(HB-600-_A)




IP65 rated. Output voltage and constant current level can be adjusted through internal potentiometer.
(Can access by removing the rubber stopper on the case.)

B Type:(HB-600-_B)