



- Features :
 - Universal AC input / Full range
 - Built-in active PFC function
 - Protections: Short circuit / Overload / Over voltage / Over temperature
 - Cooling by free air convection
 - OCP point adjustable through output cable or internal potential meter
 - IP67 / IP65 design for indoor or outdoor installations
 - Optional dimming function (1~10Vdc or PWM signal or resistor)
 - Suitable for LED lighting and moving sign applications
 - Compliance to worldwide safety regulations for lighting
 - Suitable for dry / damp / wet location or outdoor application
 - 3 years warranty



HLG-185-12 [A] Blank : IP67 rated. Cable for I/O connection.
 A : IP65 rated. Output voltage and constant current level can be adjusted through internal potential meter.
 B : IP67 rated. Constant current level adjustable through output cable with 1~10Vdc or PWM signal or resistor.

SPECIFICATION

| MODEL | HLG-185-12 | HLG-185-15 | HLG-185-20 | HLG-185-24 | HLG-185-30 | HLG-185-36 | HLG-185-42 | HLG-185-48 | HLG-185-54 | | |
|-------------------------|--|--|--------------|--------------|--|------------|------------|----------------------------|-------------|--------------|--|
| 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 | 13A | 11.5A | 9.3A | 7.8A | 6.2A | 5.2A | 4.4A | 3.9A | 3.45A | |
| | RATED POWER | 156W | 172W | 186W | 187.2W | 186W | 187.2W | 184.8W | 187.2W | 186.3W | |
| | RIPPLE & NOISE (max.) Note.2 | 150mVp-p | 150mVp-p | 150mVp-p | 150mVp-p | 200mVp-p | 200mVp-p | 200mVp-p | 200mVp-p | 200mVp-p | |
| | VOLTAGE ADJ. RANGE Note.6 | 10.8 ~ 13.5V | 13.5 ~ 17V | 17 ~ 22V | 22 ~ 27V | 27 ~ 33V | 33 ~ 40V | 38 ~ 46V | 43 ~ 53V | 49 ~ 58V | |
| | CURRENT ADJ. RANGE | Can be adjusted by internal potential meter or through output cable | | | | | | | | | |
| | | 6.5 ~ 13A | 5.75 ~ 11.5A | 4.65 ~ 9.3A | 3.9 ~ 7.8A | 3.1 ~ 6.2A | 2.6 ~ 5.2A | 2.2 ~ 4.4A | 1.95 ~ 3.9A | 1.72 ~ 3.45A | |
| | VOLTAGE TOLERANCE Note.3 | ±2.5% | ±2.0% | ±1.0% | ±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 | 2500ms, 80ms at full load 230VAC / 115VAC | | | | | | | | | | |
| HOLD UP TIME (Typ.) | 16ms at full load 230VAC / 115VAC | | | | | | | | | | |
| INPUT | VOLTAGE RANGE Note.5 | 90 ~ 264VAC | | 127 ~ 370VDC | | | | | | | |
| | FREQUENCY RANGE | 47 ~ 63Hz | | | | | | | | | |
| | POWER FACTOR | PF ≥ 0.95/230VAC | | | PF ≥ 0.98/115VAC at full load and rated output voltage | | | PF ≥ 0.9 at 50 ~ 100% load | | | |
| | EFFICIENCY (Typ.) | 92% | 93% | 93.5% | 94% | 94% | 94% | 94% | 94% | 94% | |
| | AC CURRENT | 1.9A / 115VAC 0.95A / 230VAC | | | | | | | | | |
| | INRUSH CURRENT (Typ.) | COLD START 75A/230VAC | | | | | | | | | |
| LEAKAGE CURRENT | <0.75mA / 240VAC | | | | | | | | | | |
| PROTECTION | OVER CURRENT Note.4 | 95 ~ 108% | | | | | | | | | |
| | | Protection type : Constant current limiting, recovers automatically after fault condition is removed | | | | | | | | | |
| | SHORT CIRCUIT | Constant current limiting, recovers automatically after fault condition is removed | | | | | | | | | |
| | OVER VOLTAGE | 14 ~ 17V | 18 ~ 21V | 23 ~ 27V | 28 ~ 34V | 34 ~ 38V | 41 ~ 46V | 47 ~ 53V | 54 ~ 60V | 59 ~ 65V | |
| | Protection type : Shut down o/p voltage with auto-recovery or re-power on to recovery | | | | | | | | | | |
| OVER TEMPERATURE | 100°C ±10°C (RTH2) | | | | | | | | | | |
| | Protection type : Shut down o/p voltage, recovers automatically after temperature goes down | | | | | | | | | | |
| ENVIRONMENT | WORKING TEMP. | -30 ~ +60°C @ full load ; +70°C @ 60% load (Refer to derating curve) | | | | | | | | | |
| | WORKING HUMIDITY | 20 ~ 95% RH non-condensing | | | | | | | | | |
| | STORAGE TEMP., HUMIDITY | -40 ~ +80°C, 10 ~ 95% RH | | | | | | | | | |
| | TEMP. COEFFICIENT | ±0.03%/°C (0 ~ 50°C) | | | | | | | | | |
| | VIBRATION | 10 ~ 500Hz, 5G 12min./1cycle, period for 72min. each along X, Y, Z axes | | | | | | | | | |
| SAFETY & EMC | SAFETY STANDARDS Note.7 | EN61347-1, EN61347-2-13 independent approved ; Design refer to UL8750, UL60950-1, TUV EN60950-1 | | | | | | | | | |
| | WITHSTAND VOLTAGE | I/P-O/P:3.75KVAC | | | I/P-FG:1.88KVAC | | | O/P-FG:0.5KVAC | | | |
| | ISOLATION RESISTANCE | I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25°C / 70% RH | | | | | | | | | |
| | EMI CONDUCTION & RADIATION | Compliance to EN55015, EN55022 (CISPR22) Class B | | | | | | | | | |
| | HARMONIC CURRENT | Compliance to EN61000-3-2 Class C (≥50% load) ; EN61000-3-3 | | | | | | | | | |
| EMS IMMUNITY | Compliance to EN61000-4-2,3,4,5,6,8,11; ENV50204, EN61547, EN55024, light industry level (surge 4KV), criteria A | | | | | | | | | | |
| OTHERS | MTBF | 192.2Khrs min. MIL-HDBK-217F (25°C) | | | | | | | | | |
| | DIMENSION | 222.2*68*38.8mm (L*W*H) | | | | | | | | | |
| | PACKING | 1.15Kg; 12pcs/14.8Kg/0.76CUFT | | | | | | | | | |

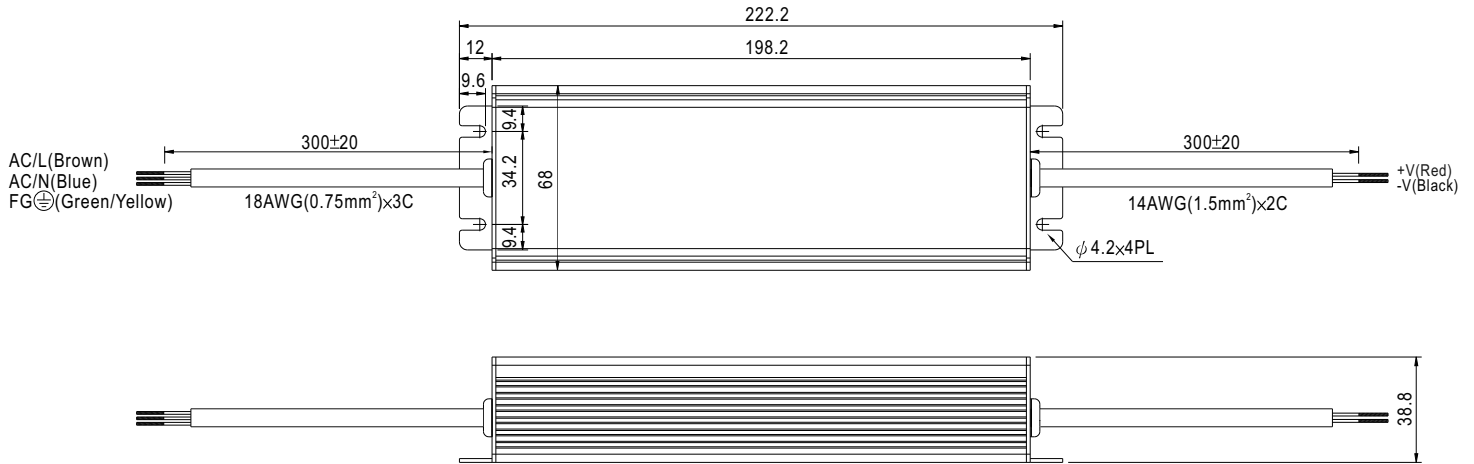
NOTE

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 & 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. Type A only.
7. Safety and EMC design refer to EN60598-1, 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.

Mechanical Specification

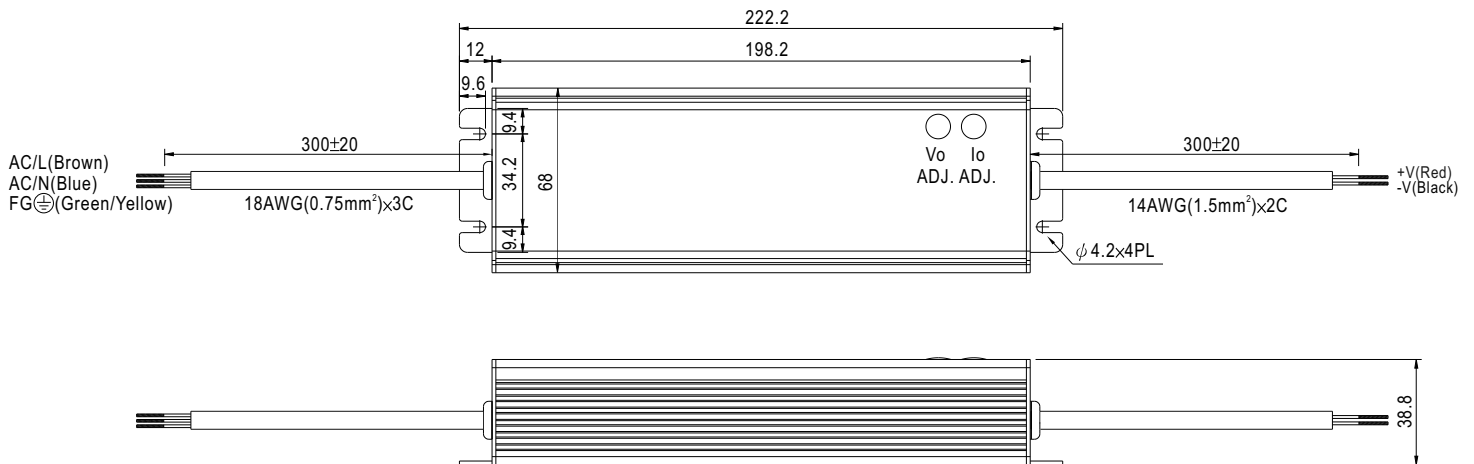
Case No.994D Unit:mm

Blank:(HLG-185)



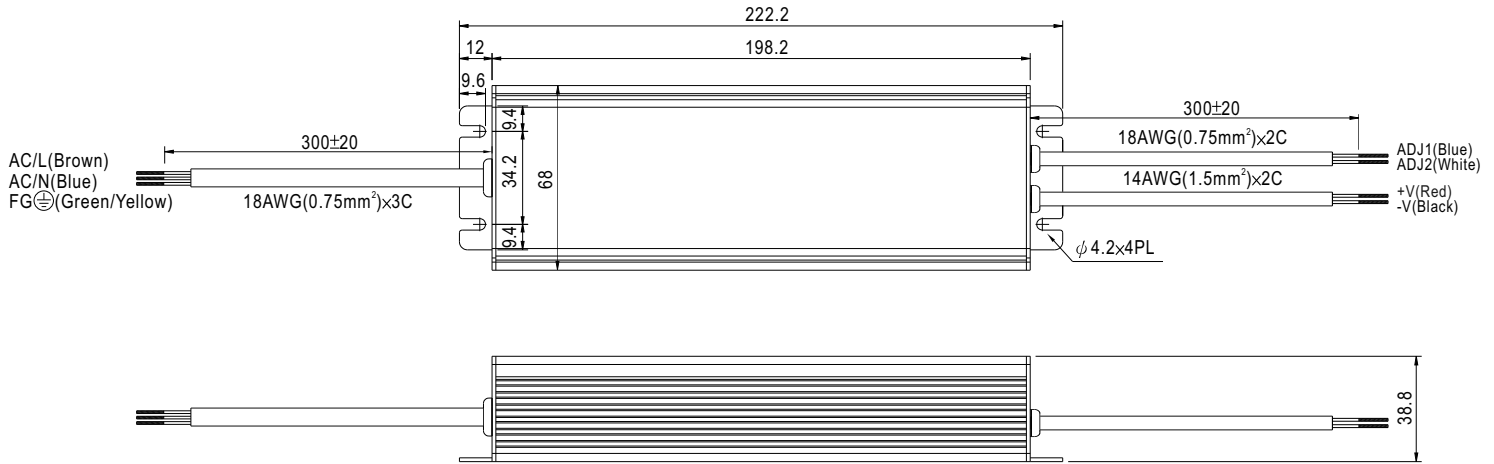
※IP67 rated. Cable for I/O connection.

A Type:(HLG-185- A)



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

B Type:(HLG-185-B)



※ IP67 rated. Output constant current level can be adjusted through output cable by connecting a resistor or 1 ~ 10Vdc or PWM signal between ADJ1 and ADJ2.

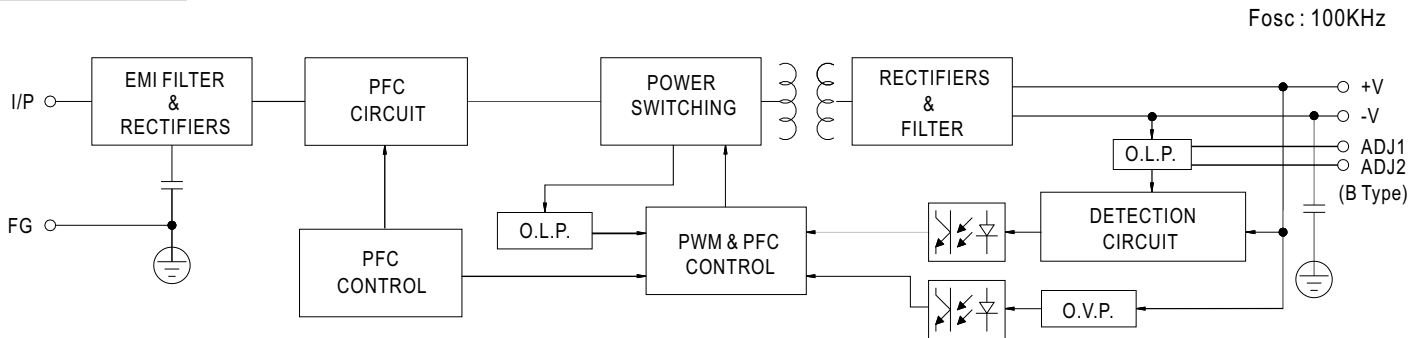
※ Reference resistance value for output current adjustment (Typical)

| | | | | | | | | | | |
|-----------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|
| Resistance value | 10K Ω | 20K Ω | 30K Ω | 40K Ω | 50K Ω | 60K Ω | 70K Ω | 80K Ω | 90K Ω | 100K Ω |
| Percentage of rated current | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% |

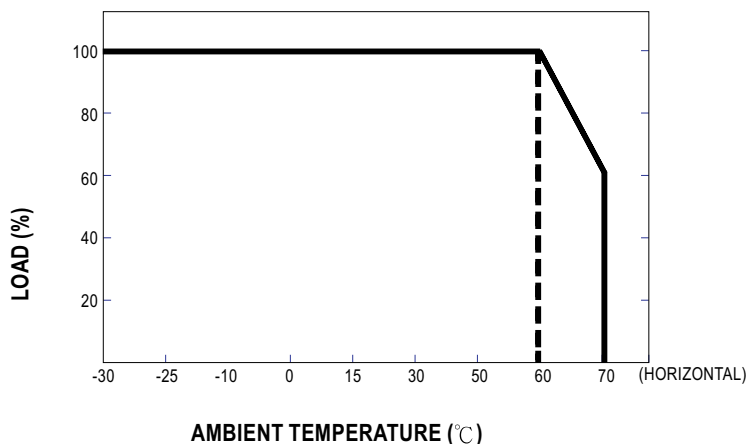
※ 1 ~ 10V dimming function for output current adjustment (Typical)

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

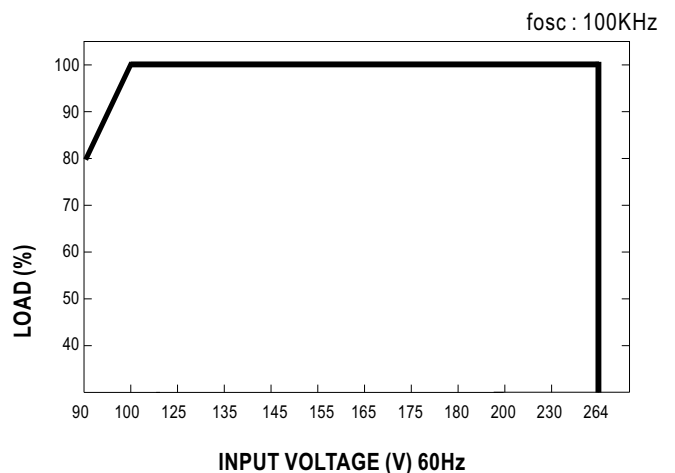
Block Diagram



Derating Curve



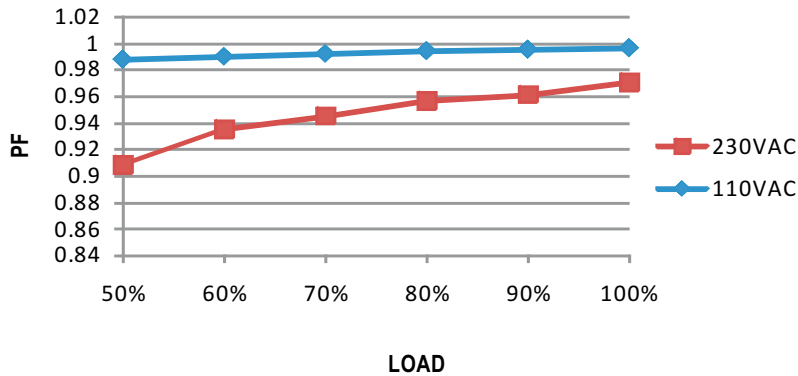
Static Characteristics



Power Factor Characteristic

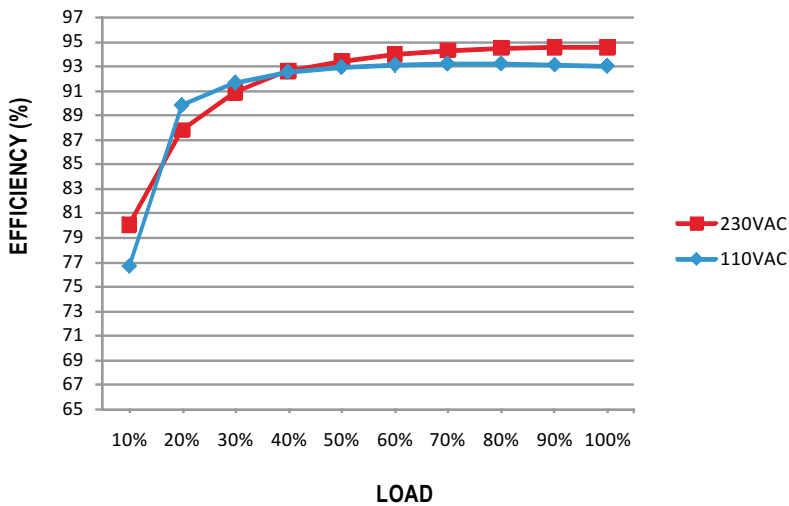
Power factor will be higher than 0.9 when output loading is 50% or higher.

Constant Current Mode



EFFICIENCY vs LOAD (48V Model)

HLG-185 series possess superior working efficiency that up to 94% can be reached in field applications.

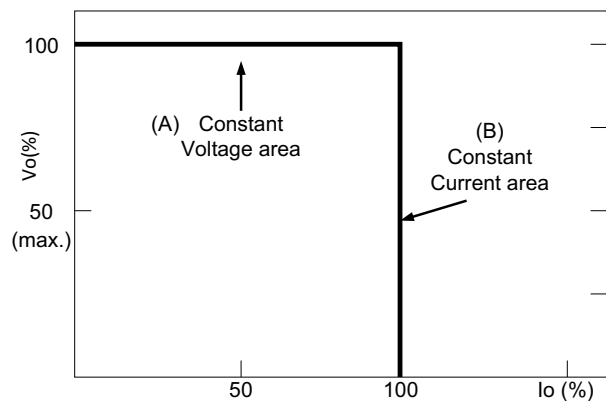


DRIVING METHODS OF LED MODULE

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 (CV) or constant current mode (CC)" to drive the LEDs.

Mean Well's LED power supply with CV+ CC characteristic can be operated at both CV mode (with LED driver, at area (A) and CC mode (direct drive, at area (B)).

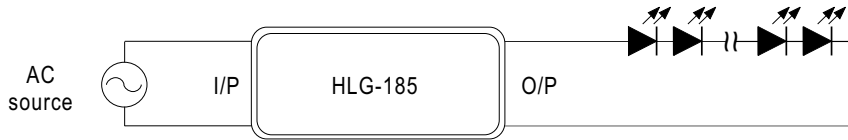


Typical LED power supply I-V curve

⊙ **Direct driving :**

Under direct driving, the power supply will work in "constant current mode (CC)" and output voltage of the power supply will be clamped by sum of forward voltage (V_f) of the LED strip.

The total forward voltage of series connecting LEDs is suggested for 60%~95% of power supply rated output voltage due to concern of the best PF value and efficiency.

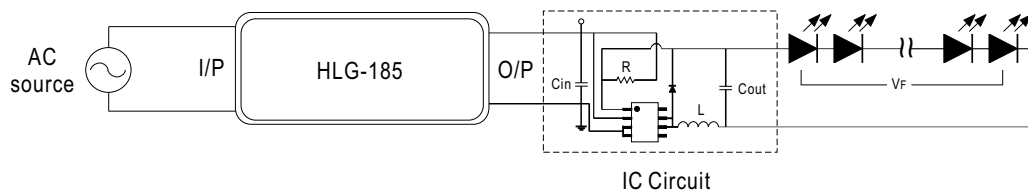


⊙ **With LED driver :**

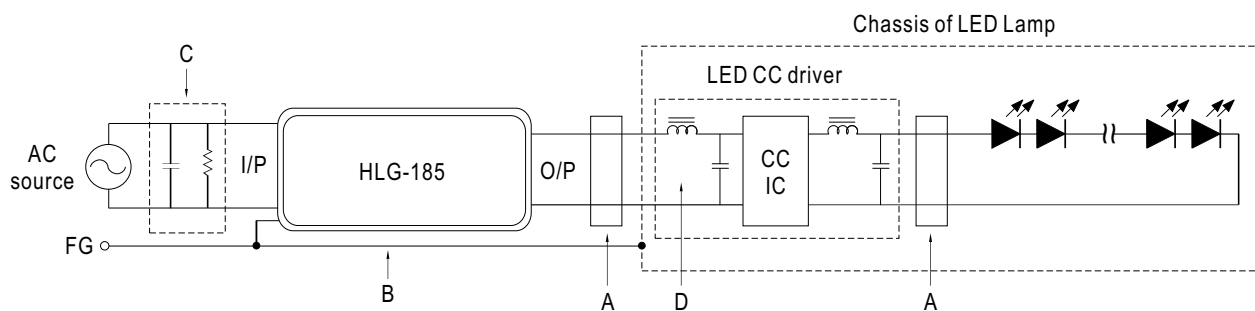
Using additional driver, the power supply will work in "constant voltage mode (CV)" and output voltage of the power supply will be kept in rated value.

In this drive mode, several design issues need to be considered:

1. Output voltage of PSU must be higher than total forward voltage of series connecting LEDs by 3V minimum.
2. Input capacitor (C_{in}) of LED driver circuit should use 47 μ F ~ 100 μ F (typ.) of rating depends on the operating frequency of the LED driver.
The higher the operating frequency is used, the smaller value of C_{in} should be chosen, and vice versa.



■ **EMI DEBUG SUGGESTION**

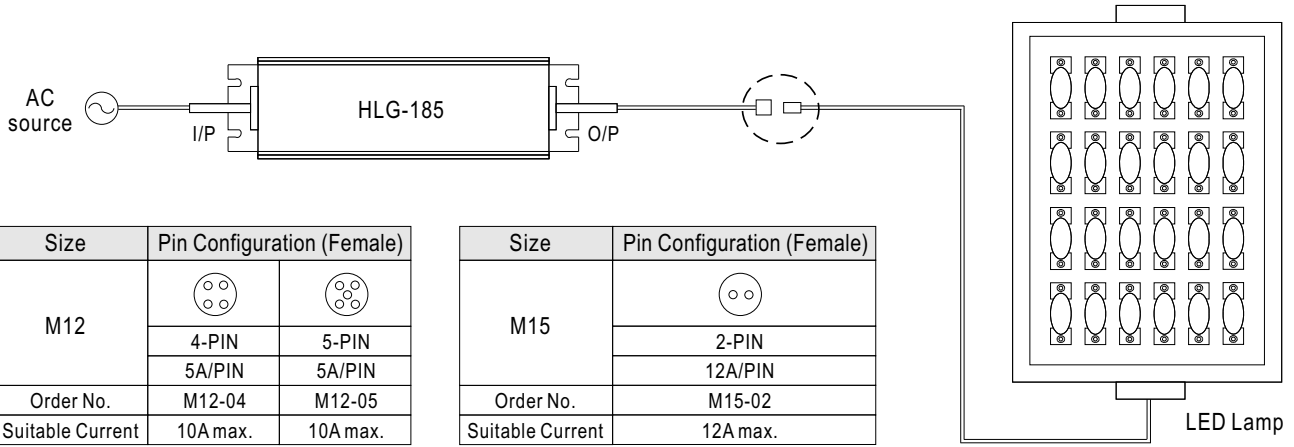


- A. Add a common mode ferrite choke on output wires to reduce the common emission between 10M ~ 300MHz per lighting EMI regulation.
- B. Chassis of LED lamp and chassis of HLG-185 or the FG wire should be connected to the safety ground to reduce the EMI noise, including the conduction and radiation emission.
- C. The additional X-Cap and discharge resistor can reduce the low frequency conduction noise between 9K ~ 1MHz per lighting EMI regulation.
- D. L-C filter should be added at the DC input of LED constant current driver to avoid the differential emission and high frequency noise generated by the CC driver.

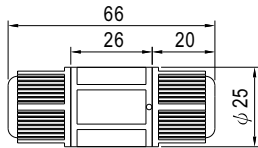
■ WATERPROOF CONNECTION

⊙ Waterproof connector

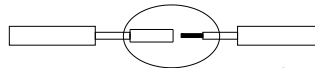
Waterproof connector can be assembled on the output cable of HLG-185 to operate in dry/wet/damp or outdoor environment.



⊙ Cable Joiner



Suitable for 14AWG~22AWG



Up to four wires can be connected through this cable joiner by soldering or clamping by tools.

