

Professionally approved products.

Datasheet

Dimmable Constant Voltage LED Driver 187.2W 48V 3.9A RS HLG-185-48A

RS Stock number 738-2431



■ Features :

- Universal AC input / Full range
- Built-in active PFC function
- High efficiency up to 94%
- 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
- Three in one dimming function (1~10Vdc or PWM signal or resistor)
- Suitable for LED lighting and street lighting applications
- Compliance to worldwide safety regulations for lighting
- Suitable for dry / damp / wet locations

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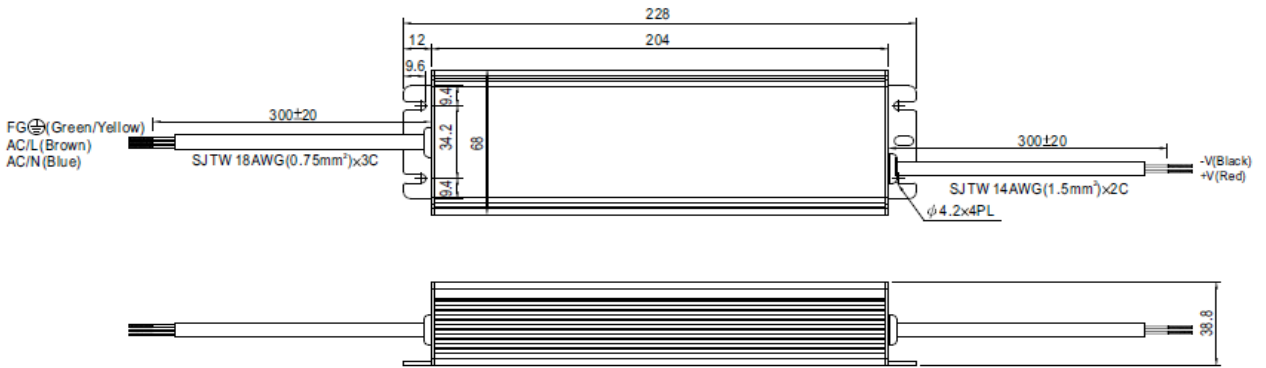
| MODEL | | HLG-185-12 | HLG-185-15 | HLG-185-20 | HLG-185-24 | HLG-185-30 | HLG-185-36 | HLG-185-42 | HLG-185-48 | HLG-185-54 | |
|--|--|---|---------------|--------------|--|------------|------------|------------|----------------------------|--------------|--|
| OUTPUT | DC VOLTAGE | 12V | 15V | 20V | 24V | 30V | 36V | 42V | 48V | 54V | |
| | CONSTANT CURRENT REGION <small>Note.4</small> | 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.) <small>Note.2</small> | 150mVp-p | 150mVp-p | 150mVp-p | 150mVp-p | 200mVp-p | 200mVp-p | 200mVp-p | 200mVp-p | 200mVp-p | |
| | VOLTAGE ADJ. RANGE <small>Note.6</small> | 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 <small>Note.3</small> | ±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 <small>Note.8</small> | 2500ms, 80ms at full load 230VAC / 115VAC ; B type 2500ms, 200ms at 95% load 230VAC / 115VAC | | | | | | | | | | |
| HOLD UP TIME (Typ.) | 16ms at full load 230VAC / 115VAC | | | | | | | | | | |
| INPUT | VOLTAGE RANGE <small>Note.5</small> | 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 | 12V | 1.8A / 115VAC | | 0.8A / 230VAC | | | | | | |
| | | 15V ~ 54V | 2.1A / 115VAC | | 0.9A / 230VAC | | | | | | |
| | INRUSH CURRENT (Typ.) | COLD START 75A/230VAC | | | | | | | | | |
| LEAKAGE CURRENT | <0.75mA / 240VAC | | | | | | | | | | |
| PROTECTION | OVER CURRENT <small>Note.4</small> | 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. | -40 ~ +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 <small>Note.7</small> | UL8750, EN61347-1, EN61347-2-13 independent IP65 or IP67 approved ; Design refer to 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 ; EN550204, EN61547, EN55024, heavy industry level (surge 4KV), criteria A | | | | | | | | | |
| OTHERS | MTBF | 192.2Khrs min. MIL-HDBK-217F (25°C) | | | | | | | | | |
| | DIMENSION | 228*68*38.8mm (L*W*H) | | | | | | | | | |
| | PACKING | 1.15Kg; 12pcs/14.8Kg/0.76CUFT | | | | | | | | | |

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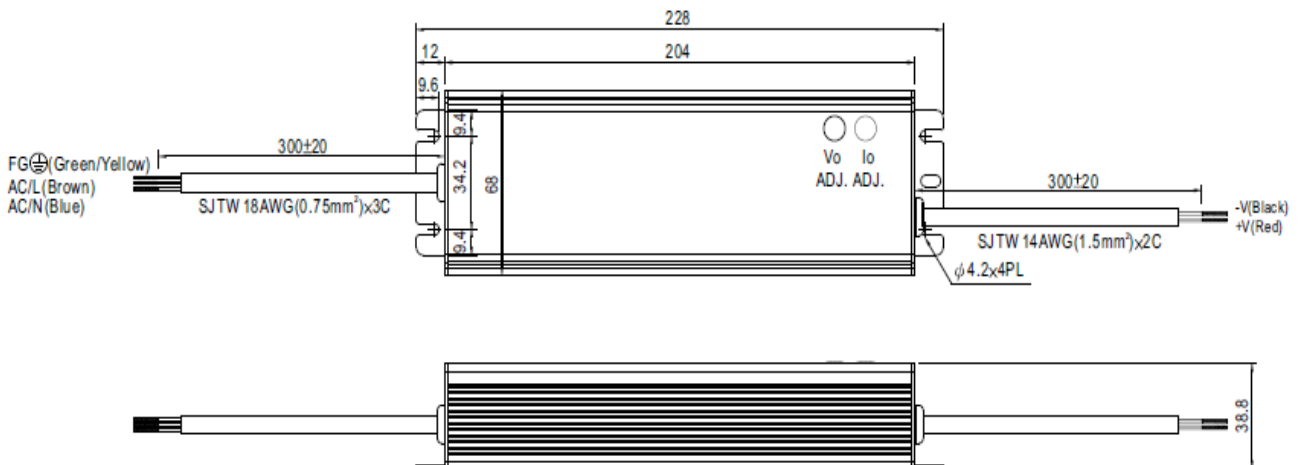
Mechanical Specification

Case No.994D Unit:mm

Blank: (HLG-185)



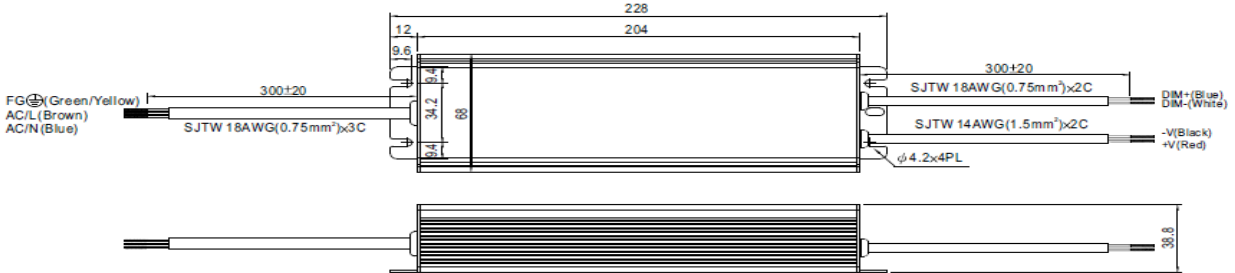
A Type: (HLG-185-A)



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B Type:(HLG-185_B)



※ IP67 rated. Output constant current level can be adjusted through output cable by connecting a resistor or 1 ~ 10V dc 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 | 10KΩ | 20KΩ | 30KΩ | 40KΩ | 50KΩ | 60KΩ | 70KΩ | 80KΩ | 90KΩ | 100KΩ | OPEN |
|-----------------------------|------|------|------|------|------|------|------|------|------|-------|-----------|
| Percentage of rated current | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% | 102%~108% |

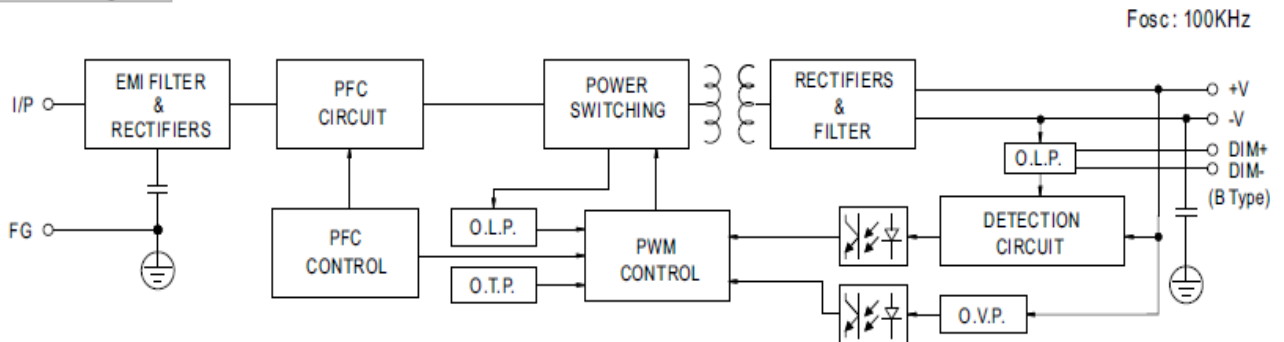
※ 1 ~ 10V dimming function for output current adjustment (Typical)

| Dimming value | 1V | 2V | 3V | 4V | 5V | 6V | 7V | 8V | 9V | 10V | OPEN |
|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----------|
| Percentage of rated current | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% | 102%~108% |

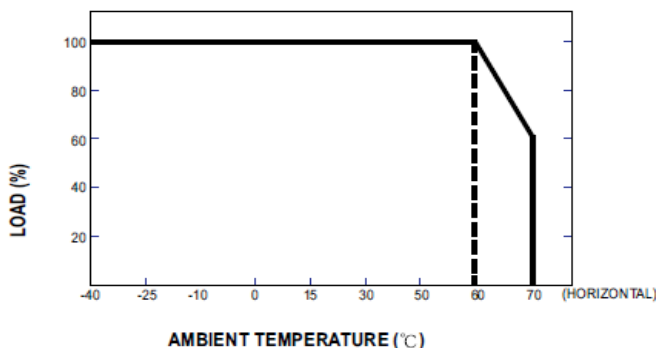
※ 10V PWM signal for output current adjustment (Typical): Frequency range : 100HZ ~ 3KHz

| Duty value | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% | OPEN |
|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----------|
| Percentage of rated current | 10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100% | 102%~108% |

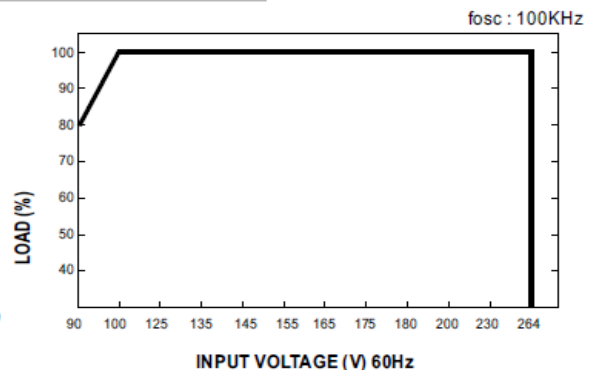
Block Diagram



Derating Curve



Static Characteristics

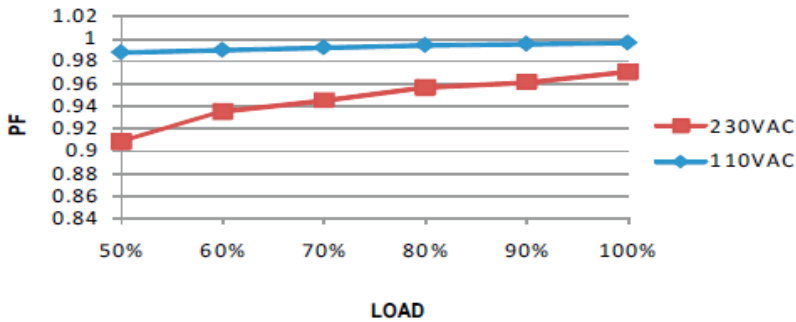


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Power Factor Characteristic

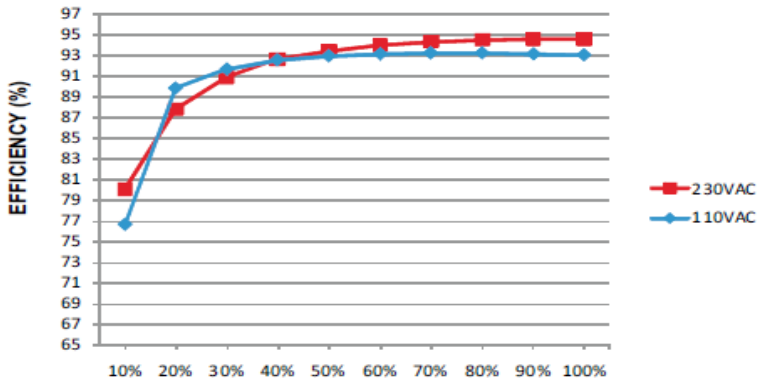
Power factor will be higher than 0.9 when output loading is 50% or higher.

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.

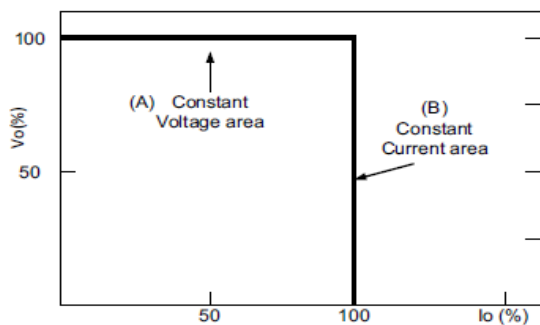


DRIVING METHODS OF LED MODULE

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

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⊙ Direct driving :

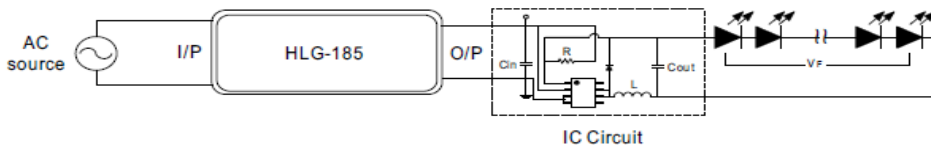
Under direct driving, the power supply will work in "constant current mode (CC)" and output voltage of the power supply will be clamped by sum of forward voltage (V_f) of the LED strip.
The total forward voltage of series connecting LEDs is suggested for 60%~95% of power supply rated output voltage due 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:

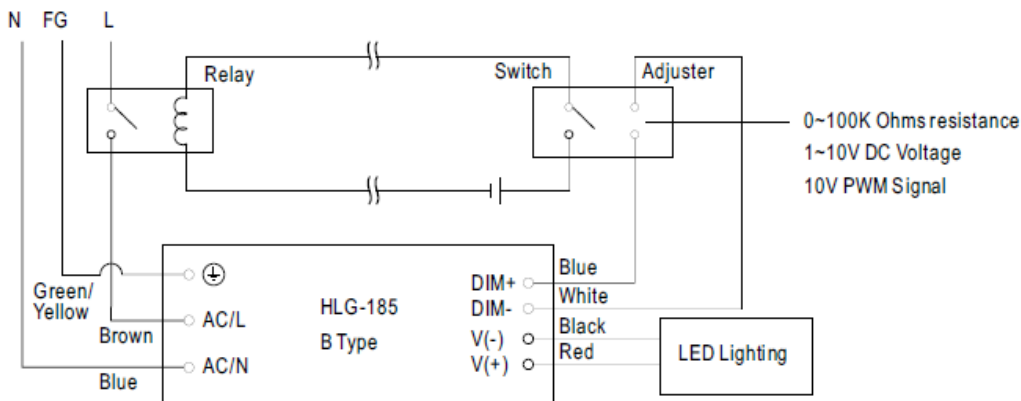
1. Output voltage of PSU must be higher than total forward voltage of series connecting LEDs by 3V minimum.
2. Input capacitor (C_{in}) of LED driver circuit should use $47\mu F \sim 100\mu F$ (typ.) of rating depends on the operating frequency of the LED driver. The higher the operating frequency is used, the smaller value of C_{in} should be chosen, and vice versa.
3. Do not use B type with LED driver.



■ DIMMING OPERATION (for B-type only)

Using the built-in dimming function on B-type model can't turn the lighting fixture totally dark. Please refer to the connection method below to achieve 0% brightness of the lighting fixture connecting to the LED power supply unit.

⊙ Dimming connection diagram for turning the lighting fixture ON/OFF :



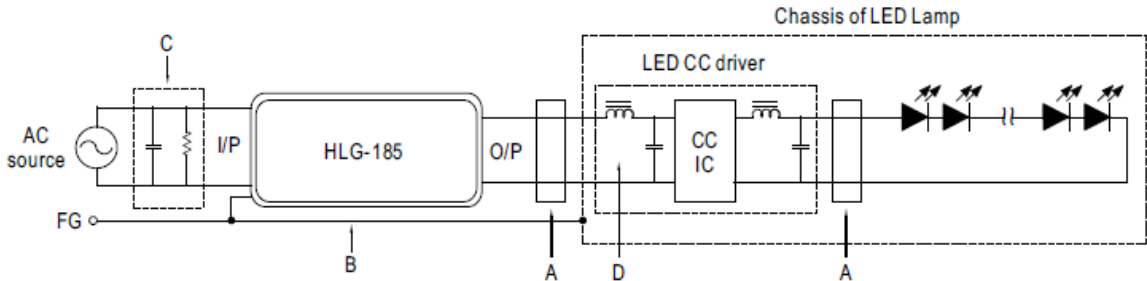
Using a switch and relay can turn ON/OFF the lighting fixture.

1. Output constant current level can be adjusted through output cable by connecting a resistor or 1~10Vdc or 10V PWM signal between DIM+ and DIM-.
2. The LED lighting fixture can be turned ON/OFF by the switch.

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EMI DEBUG SUGGESTION

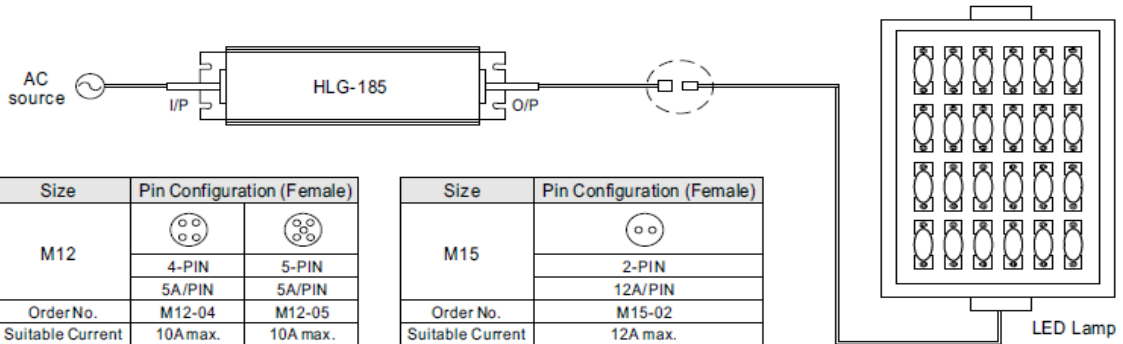


- Add a common mode ferrite choke on output wires to reduce the common emission between 10M ~ 300MHz per lighting EMI regulation.
- Chassis of LED lamp and chassis of HLG-185 or the FG wire should be connected to the safety ground to reduce the EMI noise, including the conduction and radiation emission.
- The additional X-Cap and discharge resistor can reduce the low frequency conduction noise between 9K ~ 1MHz per lighting EMI regulation.
- 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

