



FHUPS1-UNV-25L-SD



IP20



GENERAL INSTALLATION GUIDELINES FOR LED EMERGENCY MICRO INVERTER

IMPORTANT SAFE PRACTICES

When using electrical equipment and this lighting device basic safety precaution should be followed at all times including but not limited to the following:

PLEASE READ CAREFULLY AND FOLLOW ALL INSTRUCTIONS FOR YOUR OWN SAFETY

IMPORTANT: Do not connect battery until fixture is installed.

IMPORTANT: An un-switched AC power source of 100VAC to 277VAC is required.

This device is designed for use in fixtures listed for dry and damp locations.

CAUTION: For use with a metal enclosed wiring system.

CAUTION: Make sure all electrical connections conform to the National Electrical Code and all applicable local regulations.

CAUTION: Do not let power supply cords touch hot surfaces.

CAUTION: Do not mount near gas or electric heaters.

CAUTION: Do not use outdoors.

CAUTION: Battery is rechargeable LiFePO4 type and must be recycled or disposed of properly. Do not use this emergency driver with accessory equipment other than recommended by manufacturer; failure to follow this may cause an unsafe condition. Servicing should only be performed by qualified service personnel. Do not use this emergency driver for other than intended use.

CAUTION: Equipment should be mounted in locations and at heights where it will not readily be subjected to tampering by unauthorized personnel.

IMPORTANT: The output EM power will be the maximum of connected battery unless programmed to a lesser value. EM output power will not exceed the battery rating.

IMPORTANT: Indicator (LED light) illuminated indicates battery in charge mode when AC power is applied.

It is recommended and required by applicable code to test emergency function to ensure proper operation of the system; push the test switch for thirty (30) seconds every 30 days to ensure the emergency driver is functioning as LED light source illuminated. Conduct a ninety minute (90) discharge test one time (1) per year; LED light source should be illuminated for a minimum of ninety minutes (90).

ASSEMBLY and FIELD INSTALLATION WIRING: WARNING: AC power must be off before proceeding with assembly or installation of emergency driver.

TESTING SYSTEM: The emergency battery requires a charge minimum of one (1) hour before testing the circuit. A full charge requires twelve (12) hours (Refer to battery chart).

IMPORTANT: In order to maintain proper operation and warranty coverage, the battery must be recharged once per year prior to installation.

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Manufacturer:
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4th Floor, Building #18, co.park.No.8 Heying Road, Changping District, Beijing, P.R. China.

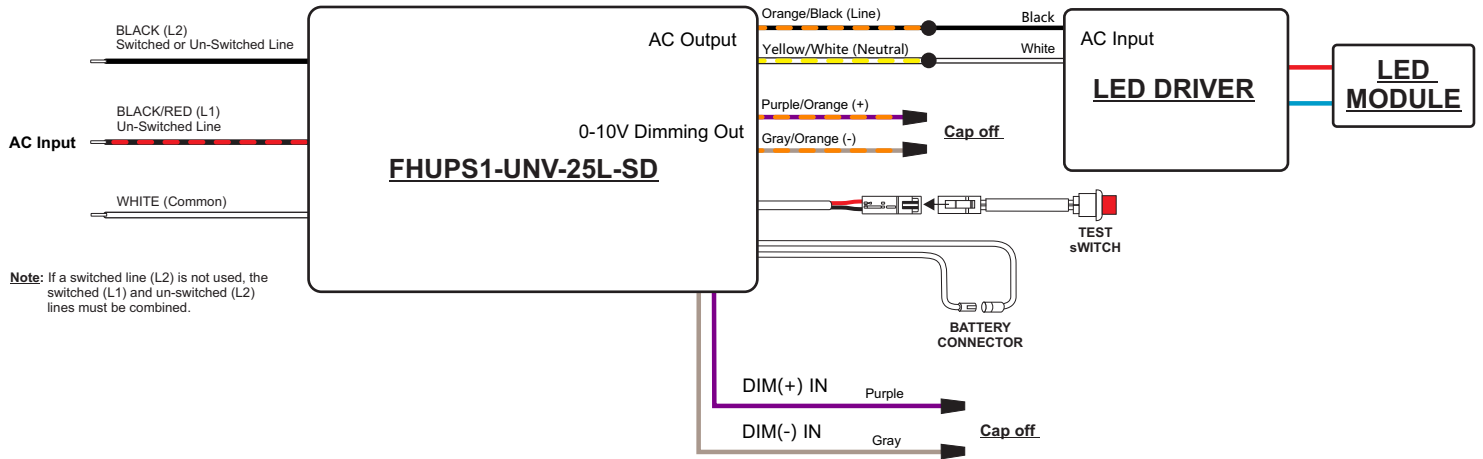
SAVE THESE INSTRUCTIONS



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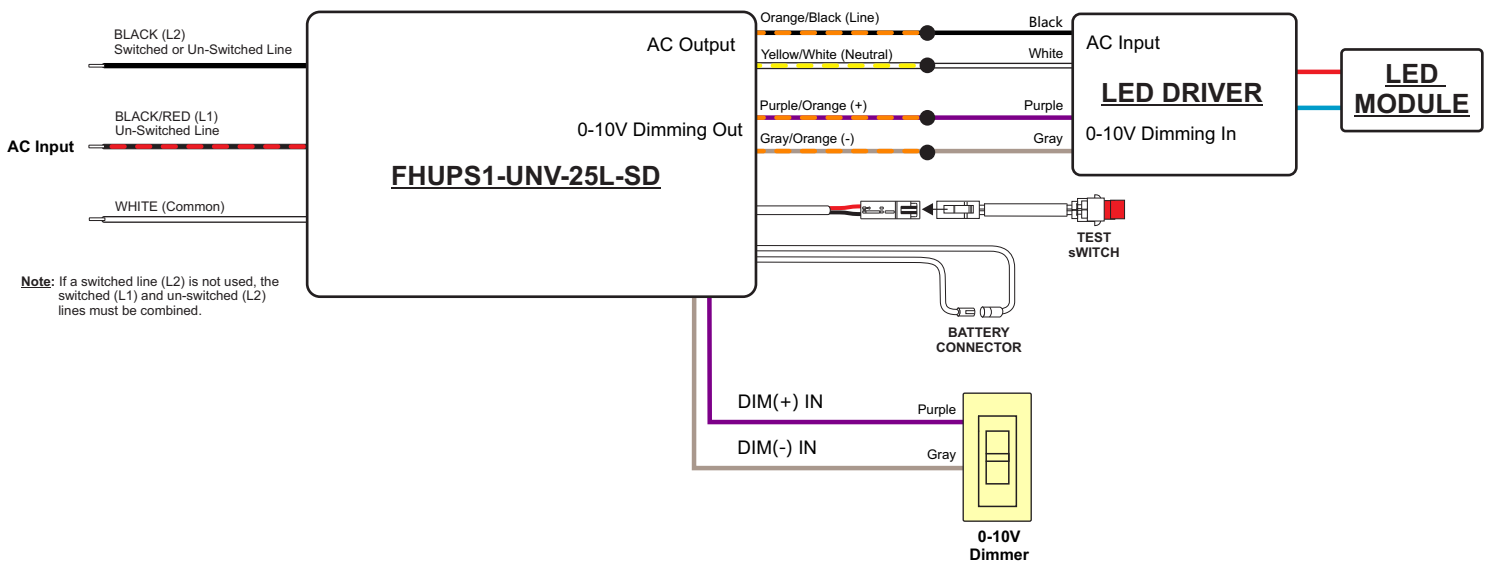


Wiring Diagram 1



For LED Driver with an output power less than 25W (45VA) and Non 0-10 dimming function

Wiring Diagram 2



For LED Driver with an output power less than 150W (170VA) and have 0-10 dimming function



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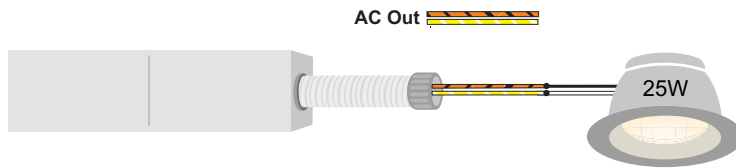


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Wiring Diagram 3

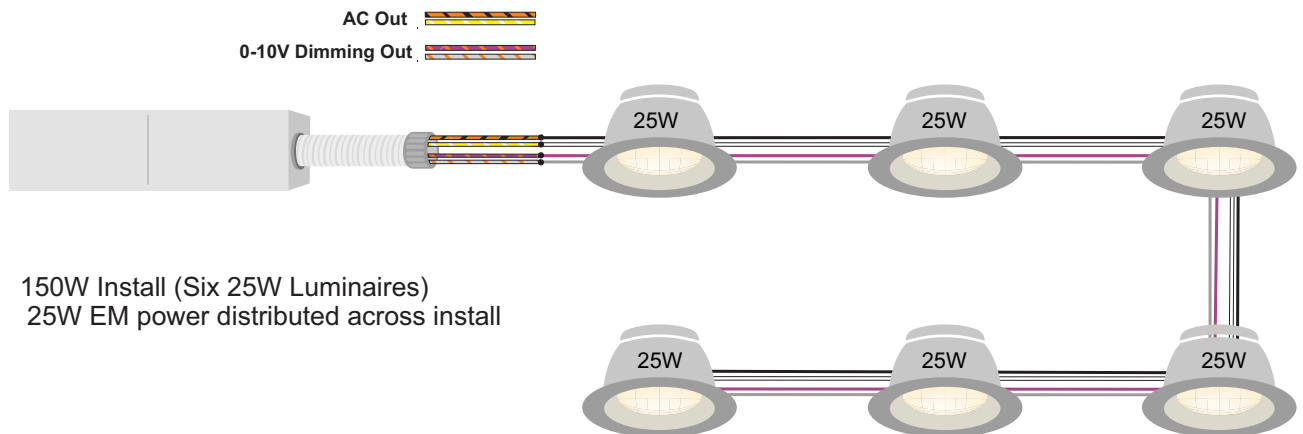
Wiring one single luminaire without 0-10V dimming



- One 25W luminaire powered at 100% during emergency

Wiring Diagram 4

Wiring multiple luminaires with 0-10V dimming



- 150W Install (Six 25W Luminaires)
- 25W EM power distributed across install



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Guideline on calculating emergency illumination level

The purpose of this guideline is to identify the illumination level of the LED luminaire when used with Fulham's FHUPS1-UNV-25L-SD LED emergency driver. The path of egress illumination level during emergency operation is determined by types of luminaires, Luminaire Efficiency, Luminaire Mounting Height, Emergency Power and some other effects in real application.

Step 1: Select an LED Luminaire, and make sure the LED light source is electrically compatible with Fulham's LED emergency driver. Get the Light Distribution data (usually an .ies file) and Rated Efficiency data (lumen per watt) from luminaire supplier.

If the luminaire is DesignLights Consortium™ (DLC) compliant, you can also get the efficiency information from DLC website.

- Open DLC Qualified Product List (QPL) database search page: <https://www.designlights.org/search/>
- Searching keywords by model, brand name or manufacturer for the luminaire used.
- Find the "Efficiency" data listed on website or calculated by dividing "Light output" by "Wattage", the efficiency value should be shown in lumen per watt (lm/W).

If the luminaire is ENERGY STAR compliant, you can also get the luminaire efficiency information from ENERGY STAR website.

- Open ENERGY STAR certified Light Fixtures database search page: <https://www.energystar.gov/productfinder/product/certified-light-fixtures/results>
- Searching keywords by model, brand name or manufacturer for the luminaire used.
- Find the "Energy Efficiency" data listed on website. If it is showed as "Measured at the Source", please contact with luminaire supplier for additional light loss for this light source inside the fixture. The value should be shown in lumen per watt (lm/W).

Step 2: Determine the Emergency Power and calculate the Emergency Light Output.

FHUPS1-UNV-25L-SD is programmable output; setting a proper Emergency Power is vital to achieve desired illumination.

Emergency Light Output is equal to the Emergency Power multiply by luminaire efficiency. For example, if the luminaire is 120lm/W and in 3W emergency operation, the total Emergency Light Output is 120lm/W × 3W = 360lm.

Step 3: Use industry lighting design software to calculate the illumination level according to the luminaire layout in room, luminaire mounting height, the original .ies file and Emergency Light Output calculated above. If the illumination level cannot meet life safety codes, go back to Step 2 to use a higher Emergency Power or go back to Step 1 to select a higher efficiency luminaire or use more luminaires in the room.

Fulham's FHUPS1-UNV-25L-SD LED emergency driver is compliant with UL924 standard, according to UL test data, Table 1 and Table 2 below give basic indication to determine the min. Emergency Power and Luminaire Max. Mounting Height for 1 foot-candle illumination based on a single luminaire with typical Lambertian distribution. It is the light designer/ construction contractor's responsibility to validate the real illumination level on site, to assure the emergency light illumination level is in accordance with the requirement of Federal, state and local municipal codes. It may differ to the theoretical calculation or simulation on computer.

Table 1. Min. EM Power for 1fc @ 10ft vs. Luminaire Efficiency

Luminaire Efficiency (lm/W)	Min. EM Power to achieve 1fc @ 10ft Mounting Height
80	5.0W
100	4.0W
120	3.3W
140	2.8W
160	2.5W
180	2.2W

Table 2. Max. Mounting Height vs. Luminaire Efficiency

Luminaire Efficiency (lm/W)	Max. Mounting Height for 1fc		
	EM3W	EM5W	EM10W
80	8.1ft	10.1ft	13.9ft
100	8.9ft	11.2ft	15.4ft
120	9.6ft	12.1ft	16.8ft
140	10.3ft	13.0ft	18.1ft
160	10.9ft	13.9ft	19.3ft
180	11.5ft	14.6ft	20.4ft



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TEST SWITCH INDICATOR STATUS:

LED Indicator Status	EM Driver Status/Mode
● Solid Green	System OK/AC OK(Self-diagnostic Enabled or Disabled)
● Slow Flashing Red, 4s on/1s off	Battery not detected, check battery switch or connection.
● Flashing Red, 1s on/1s off	Battery failure, replace battery.
● Flashing Green, 2s on/2s off	Self-diagnostic test underway.
● Fast Flashing Red, 0.1s on/0.1s off	Abnormal driver performance, replace driver.
● None. Both LEDs OFF	Normal working in EM mode
● Very Slow Flashing Red, 1s on/7s off	OTPor other internal protections triggered.

*Notes: OTP= OverTemperature Protection; ensures max temperature ratings are not exceeded. .

TEST SWITCH OPERATIONS:

- 1.EMTest: Press and hold test button to enter EM mode for testing, in all normalAC powered situations including low power standby modes.
- 2.Manual Self-Diagnostic:Battery voltage greater than 20.5 hours ,or change for 12 hours. quickly press the test button three times within three seconds to force the controller enter a Self-Diagnostic cycle.To quit the self-diagnostic cycle after engaged press and hold the test button for ten seconds.
- 3.Enable/DisableAuto Self-Diagnostic: Press and hold the test button for two seconds, then release and quickly press the test button two times, then release and press and hold the test button for two more seconds. When properly executed the indicator on the test button will display the appropriate Enable/Disable status.Aflashing of 2.5s ON/0.5s OFF means“Enabled”, while a flashing of 0.5s ON/2.5s OFF means“Disabled”. Once Enable/Disable is set the status color on the test button will remain the same throughout normal operation (refer to Indicator StatusTable).

Programming:

Unless otherwise programmed the output will self-program to the maximum rating of the battery.This EM driver can be programmed using the Fulham SmartSetTPSB-100(E). Programming features include the following:

OTP Protection

Enable / Disable Self-Diagnostic



SmartSet Software



TPSB-100(E) SmartSet Controller