FHSCP-UNV-10P-L-SD

INSTALLATION INSTRUCTIONS

NiCd/LiFePO4 BC EL-T IP20 RoHS COMPLIANT LISTED E477042

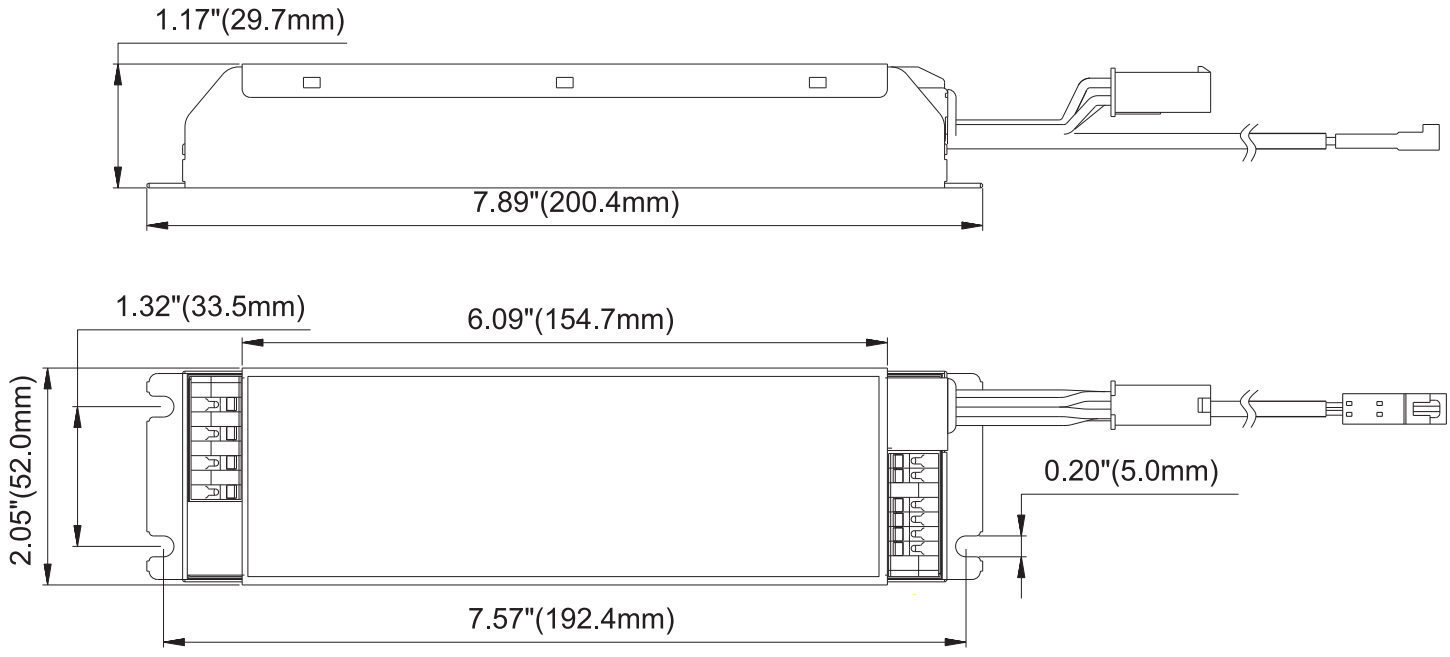
- Emergency LED Driver
- Universal Voltage: 100-277VAC, 50/60Hz
- Output Power: 10W Max.
- Output Current: 0.62A
- Output voltage range of 16-55V⎓
- Long Case and Terminal
- IP20
- U-OUT: 60VDC

This Driver Will Operate The Following LED Modules: Any LED module designed to accept input voltage range of 16-55VDC and can operate up to current of 0.62A.

General Specifications

Input Voltage	100-277V~, 50/60Hz
Input Current	60mA
Input Power	6W
AC LED Driver Input Current (LED Driver Neutral)	3A Max.
Standby Input Power	<0.5W
Driver Type	Constant Power
Output Current	0.62A
Output Voltage Range	16-55V⎓
Output Power	10W Max. (1-10W @ 3000mAh Battery, 1-6W @ 1800mAh Battery, 1-5W @ 1500mAh Battery)
AC LED Driver Output(LED Driver Output+)	3A Max., 55V Max.
Number of Output Channels	1 Channel
RFI/EMI	FCC Part 15A Non-Consumer
Output Type	LED Class 2
Battery Type	NiCd 9.6VDC / LiFePO4 9.6VDC
Battery Capacity Available	3000mAh, 1800mAh, 1500mAh
Battery Recharge Time	24 Hours@NiCd / 12 Hours@LiFePO4(Refer To Battery chart)
Battery Discharge Time	90 Minutes Min.
ta	NiCd 0°C to 55°C (32°F to 131°F) / LiFePo4 10°C to 55°C (50°F to 131°F)
Sound Rating	A
Input Surge Protection	Line-Neutral 2kV, Line & Neutral-Ground 2kV
Protections	Over / Under Voltage Protection Output Open Circuit Protection Overload Protection
Service Life	50,000 hours
Approvals / Class	RoHS, IP20, CEC Title 20 cUL LISTED

Mechanical Data



Tolerance=±0.02"

Fulham extends a limited warranty to the original purchaser or first user for a period of 5 years from the date of manufacture when properly installed and operated under normal conditions of use. For complete terms and conditions, please refer to the Warranty Center at www.fulham.com. Specifications subject to change without notice.

GENERAL INSTALLATION GUIDELINES FOR LED EMERGENCY DRIVER

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: 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 NiCd or 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.

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.

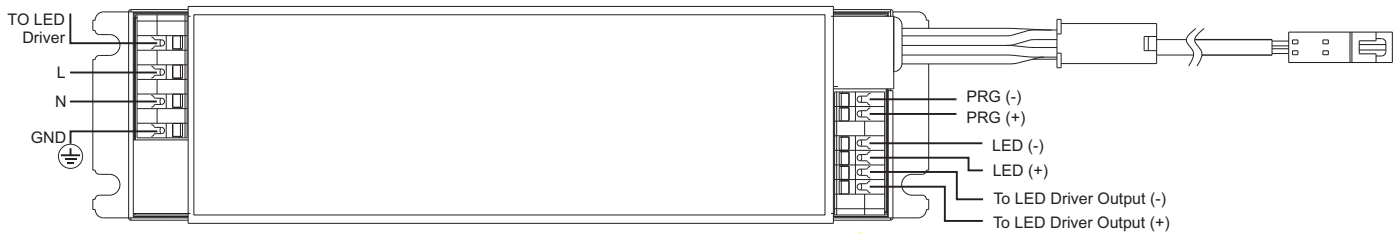
TESTING SYSTEM: The emergency battery requires a charge minimum of one (1) hour before testing the circuit. A full charge requires twelve (12) or twenty four (24) hours (Refer to battery chart).

Fulham Head Quarters:
Fulham Co., Inc
12705 South Van Ness Ave.
Hawthorne, CA 90250

Manufacturer:
North China
Fulham Electronic Co. Ltd.
No. 9 Xingchang Road, Nanshao Zhen Changping Science Park, Beijing, P.R. China

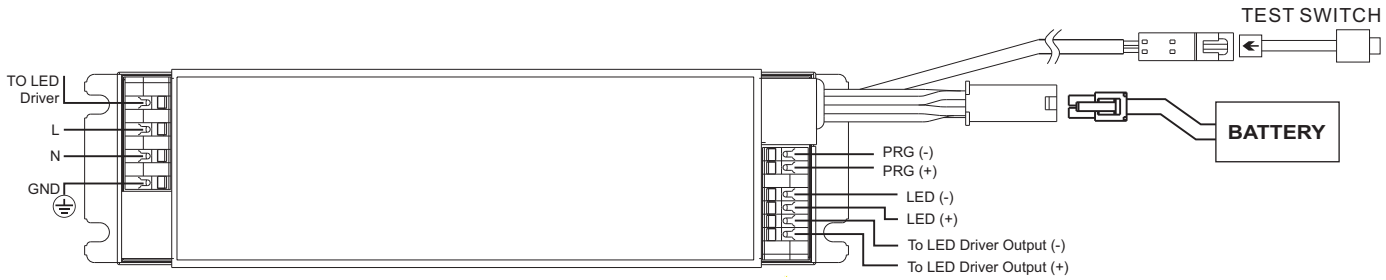
SAVE THESE INSTRUCTIONS

INSTALLATION INSTRUCTIONS

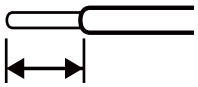


NOTE:This driver has four mounting holes,two on each side.
Mount using all four holes or two catercorner holes.

A Mounting the LEDdriver



AWG 18
0.82-1mm²

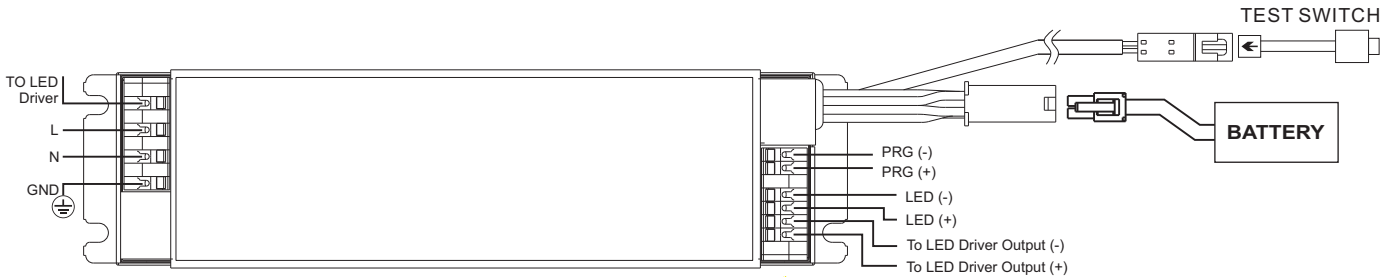


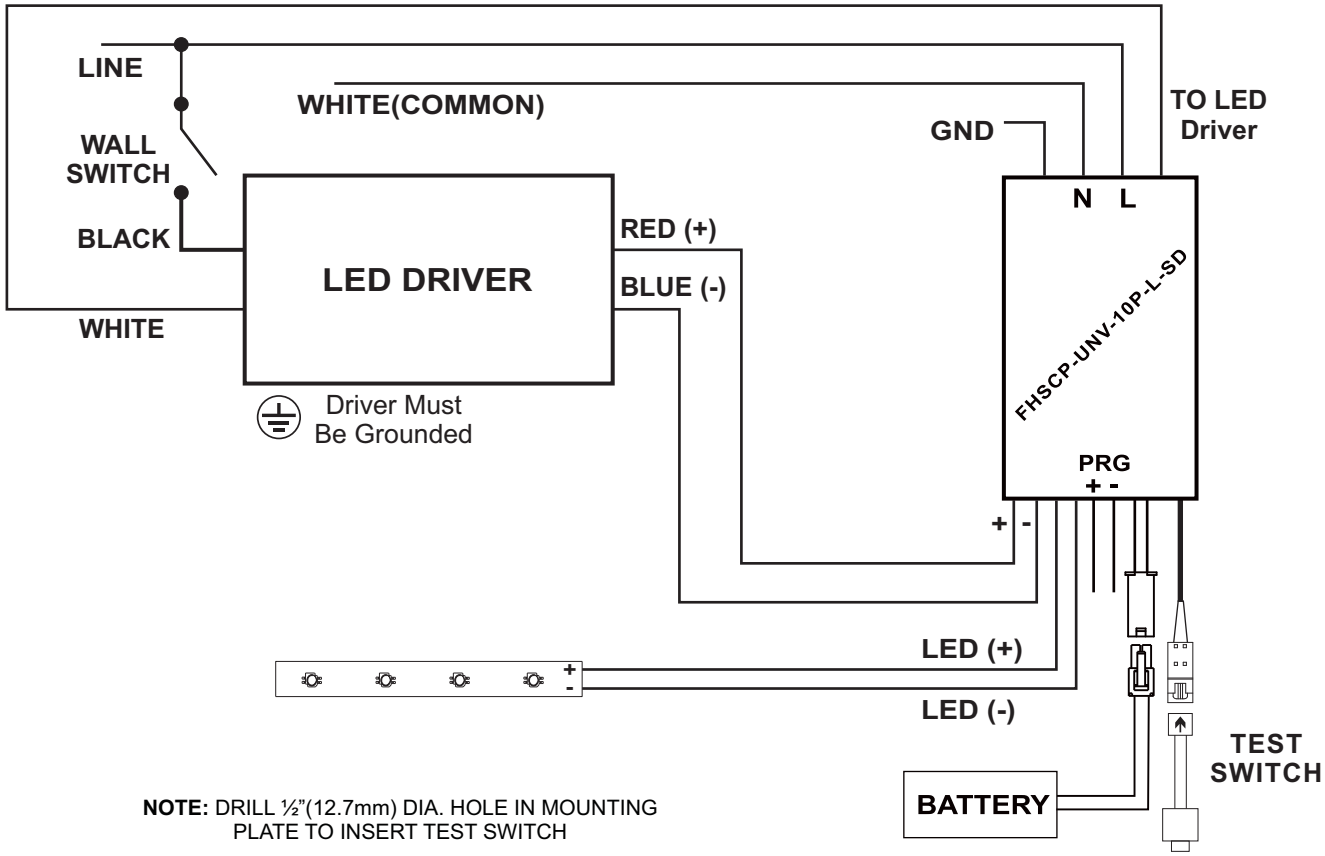
9mm 11/32 in.

NOTE :
1.This Driver Must Be Grounded

B Making the wire connections

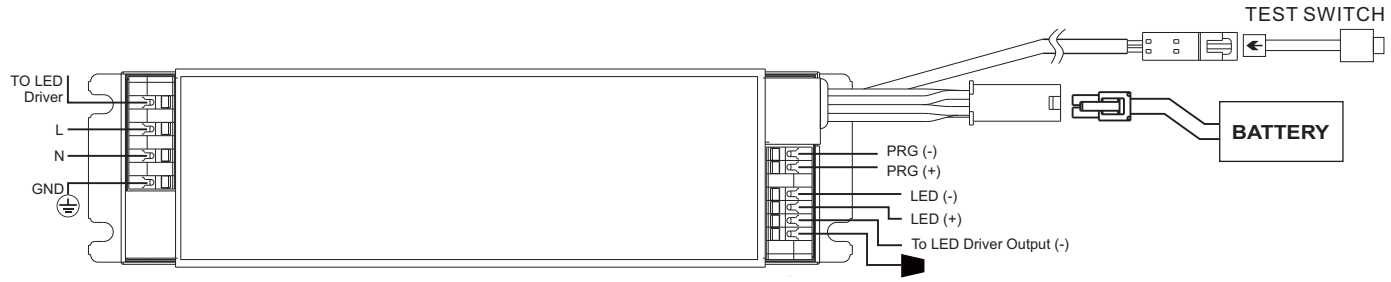
Wiring Diagrams 1

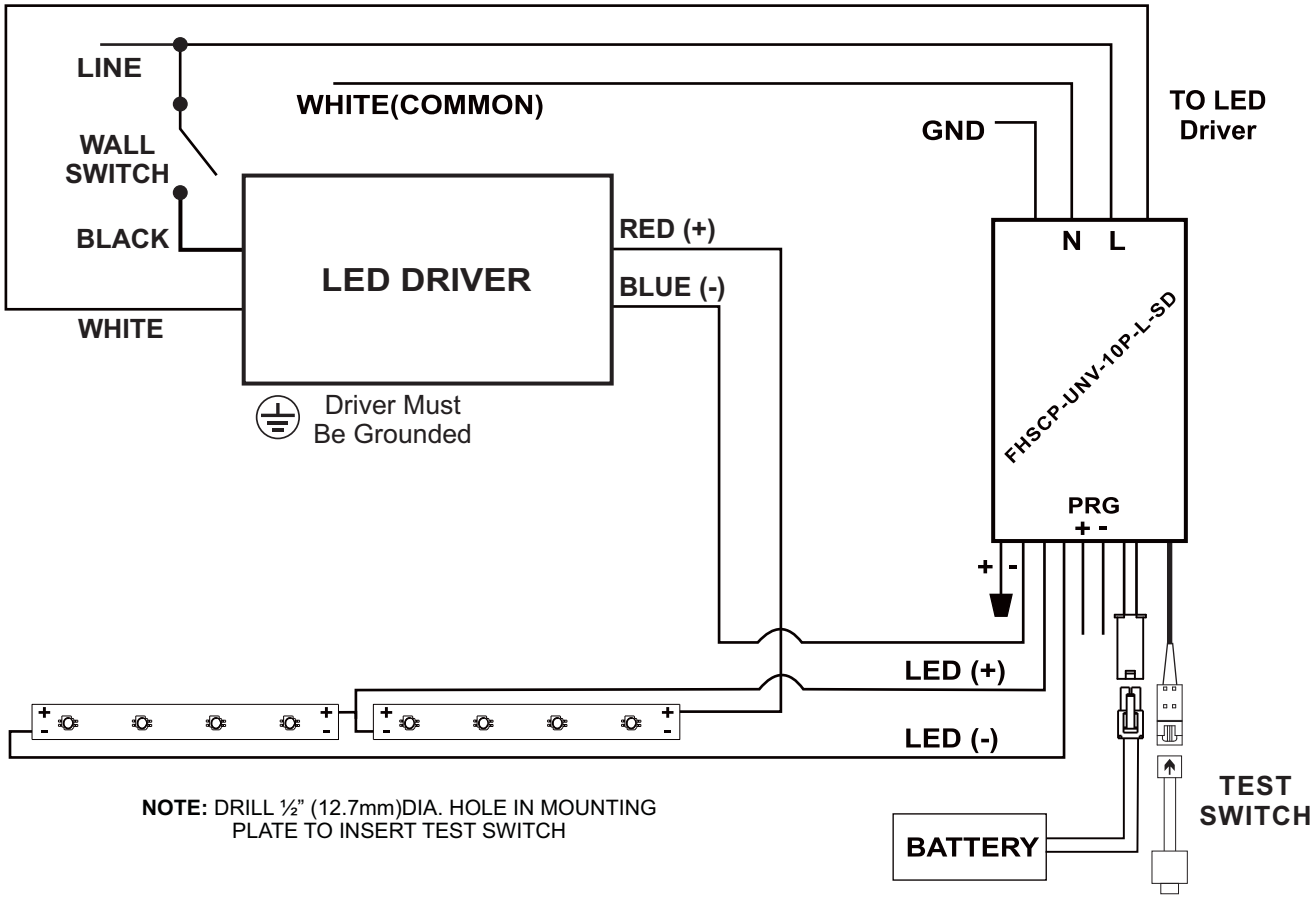




NOTE: DRILL ½"(12.7mm) DIA. HOLE IN MOUNTING PLATE TO INSERT TEST SWITCH

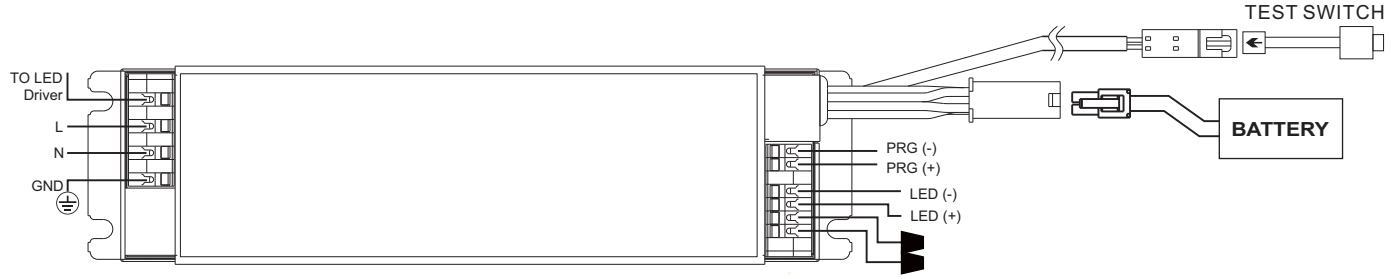
Wiring Diagrams 2

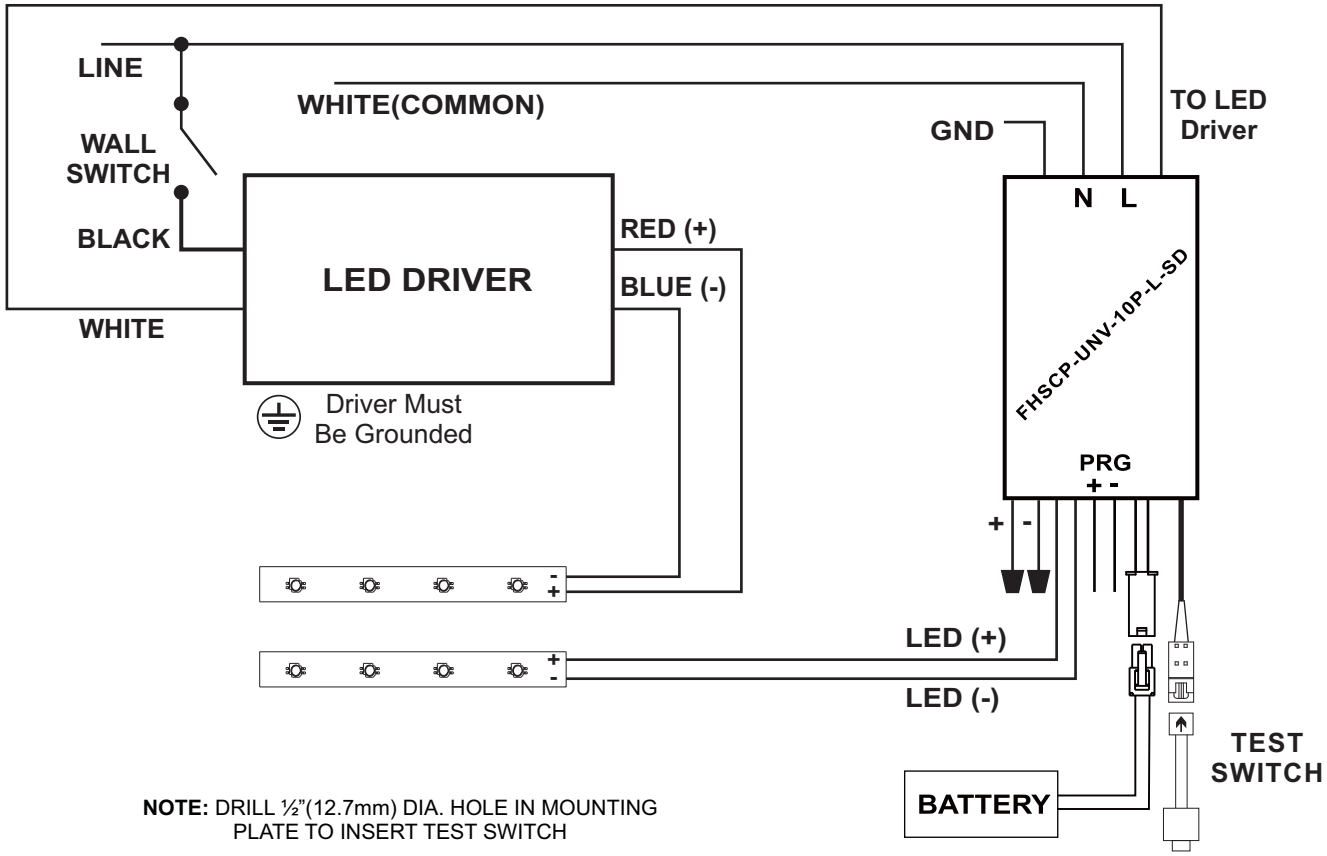




NOTE: DRILL ½" (12.7mm)DIA. HOLE IN MOUNTING PLATE TO INSERT TEST SWITCH

Wiring Diagrams 3





NOTE: DRILL ½"(12.7mm) DIA. HOLE IN MOUNTING PLATE TO INSERT TEST SWITCH

Battery Chart

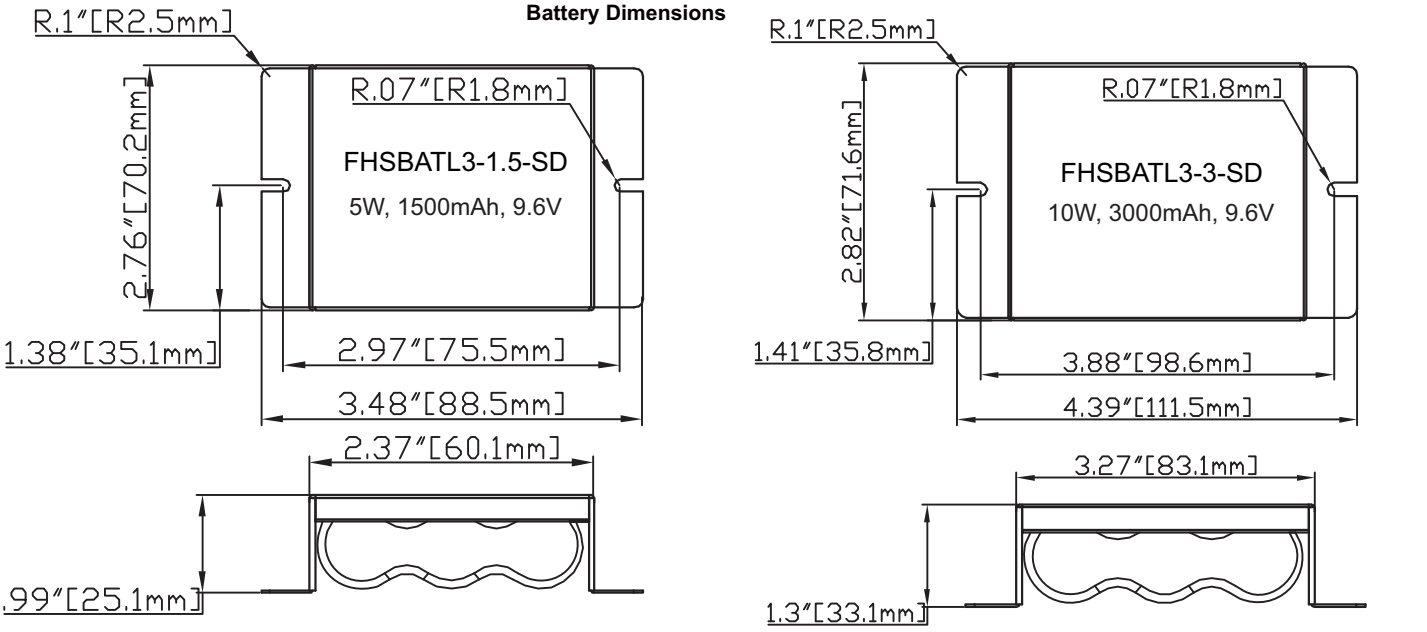
Fulham Model No.	Chemistry	RoHS	Pack Capacity	Max Load for 90 min.	Battery Voltage	Recharge Time
FHSBATL3-1.5-SD	LiFePO4	Compliant	1500mAh	5W	9.6V	12Hrs
FHSBATL3-3-SD	LiFePO4	Compliant	3000mAh	10W	9.6V	12Hrs
FHSBATL9-.6-SD	LiFePO4	Compliant	1800mAh	6W	9.6V	12Hrs
FHSBATL6-1.5L-SD *	LiFePO4	Compliant	3000mAh	10W	9.6V	12Hrs
FHSBATT8-C3L-SD	NiCd	Exempt	3000mAh	10W	9.6V	24Hrs

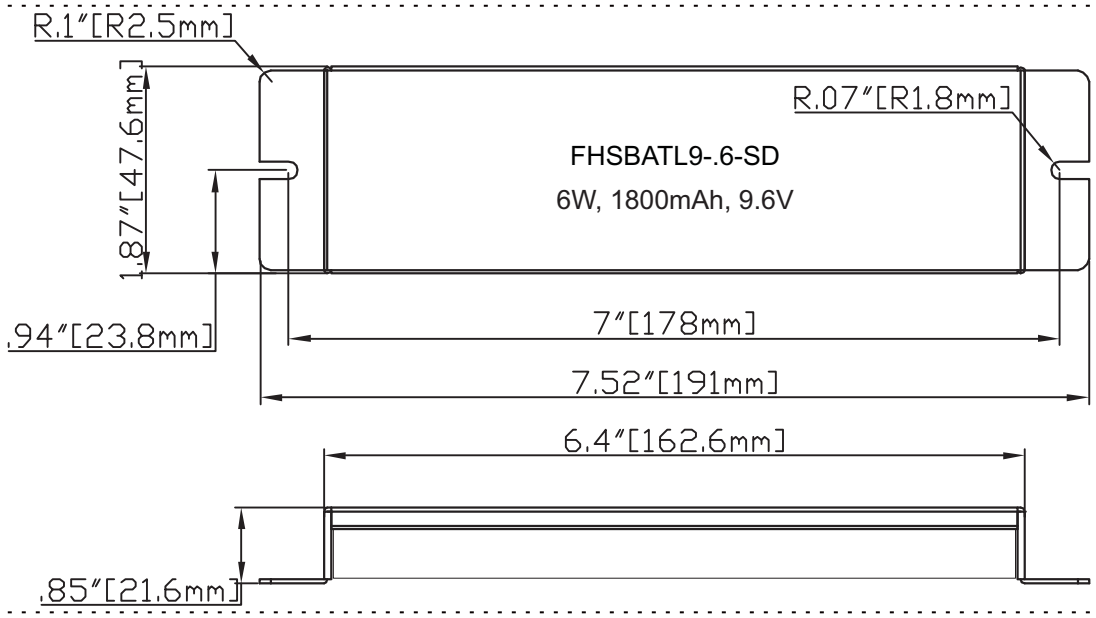
CAUTION: Replace battery only with corresponding part number.

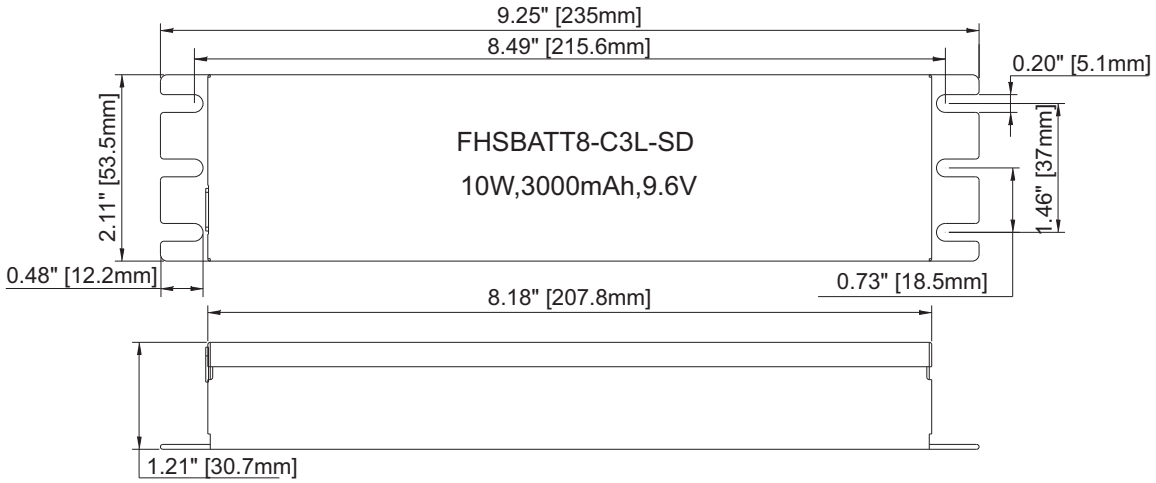
*** Note:** These batteries do not include mounting means, separate mounting brackets are available.

Fulham extends a limited warranty to the original purchaser or first user for a period of 5 years from the date of manufacture when properly installed and operated under normal conditions of use. For complete terms and conditions, please refer to the Warranty Center at www.fulham.com. Specifications subject to change without notice.

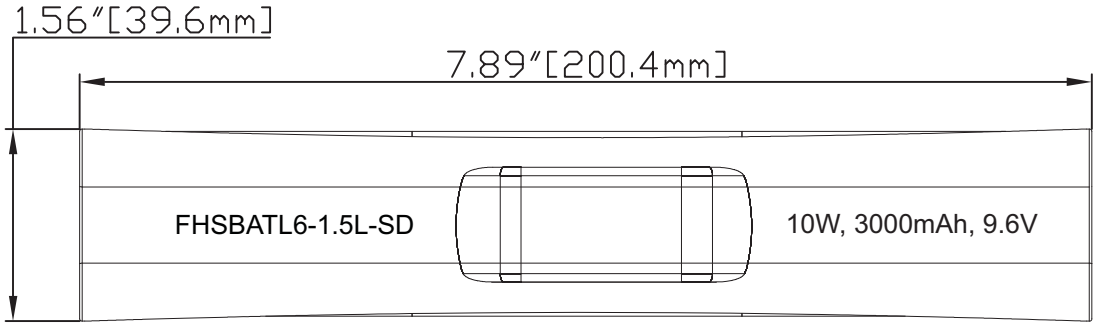
Battery Dimensions

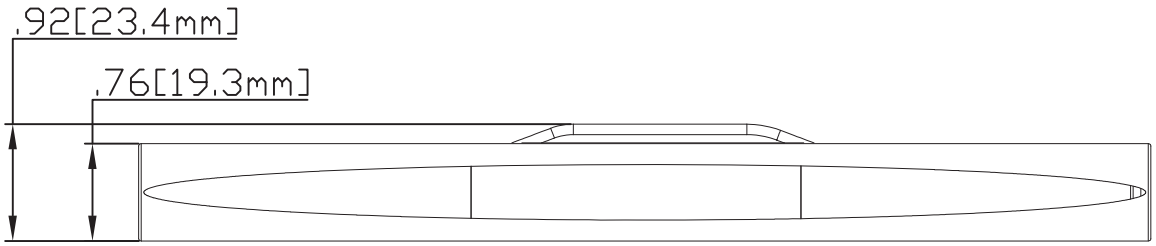




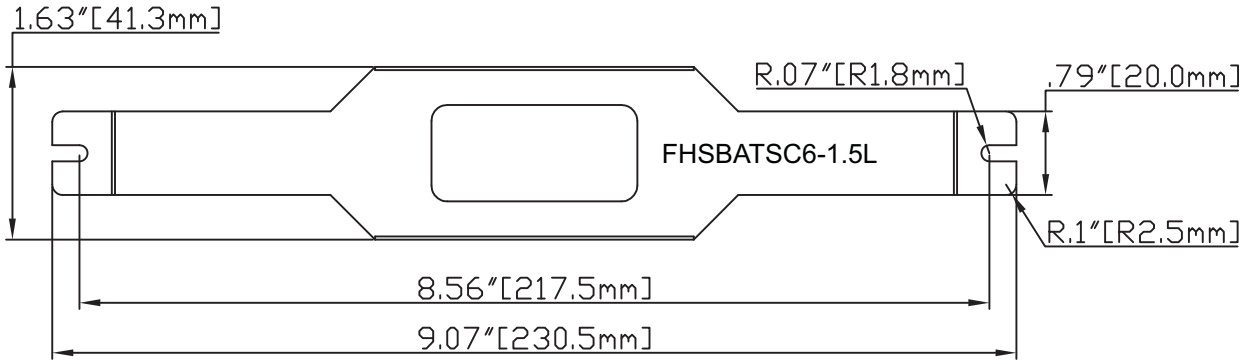


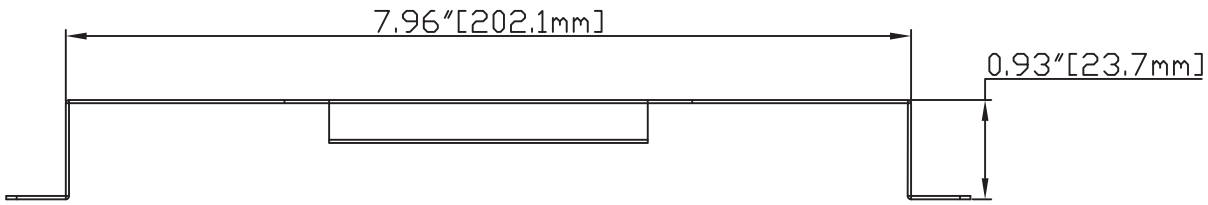
Battery Dimensions





Mounting Bracket Dimensions (Optional)





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 FHSCP-UNV-10P-L-SD LED emergency driver. The path of egress illumination level during emergency operation is determined by types of luminaires, Luminaire Efficacy, 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 Efficacy data (lumen per watt) from luminaire supplier.

If the luminaire is DesignLights ConsortiumTM (DLC) compliant, you can also get the efficacy 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 “Efficacy” data listed on website or calculated by dividing “Light output” by “Wattage”, the efficacy value should be shown in lumen per watt (lm/W).

If the luminaire is ENERGY STAR compliant, you can also get the luminaire efficacy 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.
FHSCP-UNV-10P-L-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 efficacy. 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 Step2 to use a higher Emergency Power or go back to Step1 to select a higher efficacy luminaire or use more luminaires in the room.

Fulham's FHSCP-UNV-10P-L-SD LED emergency driver is compliant with UL 924 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 diff to the theoretical calculation or simulation on computer.

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

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

Table 2. Max. Mounting Height vs. Luminaire Efficacy

Luminaire Efficacy (lm/W)	Max. Mounting Height for 1fc		
	EM 3W	EM 5W	EM 10W
80	8.1 ft	10.1 ft	13.9 ft
100	8.9 ft	11.2 ft	15.4 ft
120	9.6 ft	12.1 ft	16.8 ft
140	10.3 ft	13.0 ft	18.1 ft
160	10.9 ft	13.9 ft	19.3 ft
180	11.5 ft	14.6 ft	20.4 ft

TEST SWITCH INDICATOR STATUS:

LED Indicators 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**	**OTP or other internal protections triggered.**

***Notes:** OTP = Over Temperature Protection; ensure max temperature ratings are not exceeded.

TEST SWITCH OPERATIONS:

1. EM Test: Press and hold test button to enter EM mode for testing, in all normal AC powered situations including low power standby modes.
2. Manual Self-Diagnostic: quickly press the test button three times within three seconds to force the controller to enter a Self-Diagnostic cycle. To quit the self-diagnostic cycle after engaged press and hold the test button for five seconds.
3. Enable/Disable Auto 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 color for the Enable/Disable status. A flashing 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 Status Table).

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

* Output EM power - 1W to 10W
* Enable / Disable Self-Diagnostic