FULHAM HOTSPOT2™

NiCd/LiFePO4

c UL us E313578

RoHS COMPLIANT

SPECIFICATION SHEET : FHS2-UNV-36L

This Is An Original Product From Fulham Co., Inc

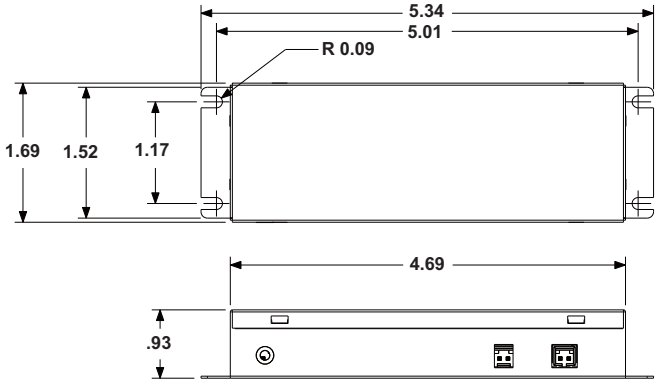
Description : Emergency LED Driver For Back-up Lighting

This driver will operate constant current LED arrays with a working voltage between 11-36VDC and not exceeding 20W.

ELECTRICAL DATA

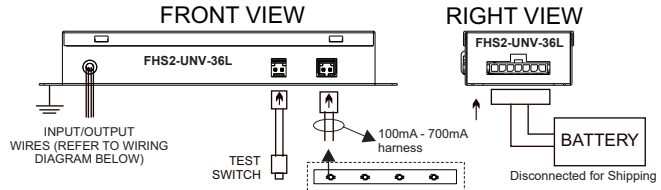
INPUT VOLTAGE	100V ~ 277V ± 10%, 50/60Hz
SURGE PROTECTION	C62.41 (MOV)
OVER CURRENT PROTECTION	Fuse
INPUT CURRENT	0.07 A
INPUT POWER	< 4 W
THROUGHPUT CURRENT HANDLING	
RED LEAD	3A, 60V Max.
WHITE/BLACK LEAD	100W Max.
OUTPUT CURRENT	100mA - 700mA (Refer to accesory chart)
OUTPUT WORKING VOLTAGE	11-36VDC
OUTPUT SHORT CIRCUIT PROTECTION	Self Resetting PTC
RECHARGE TIME REQUIRED	24 - 48 Hours (Refer to battery chart)
BATTERY TYPE	NiCd 9.6VDC or LiFePO4 9.6VDC
BATTERY CAPACITY AVAILABLE	.9Ah, 1Ah, 1.2Ah, 1.5Ah, 1.8Ah, 3Ah, 4Ah, 6Ah
ILLUMINATION TIME	MINIMUM 90MIN, UPTO 360MIN (AVAILABLE)
TOTAL MAXIMUM LED POWERED	20W
OUTPUT CLASSIFICATION	Class 2
AMBIENT TEMPERATURE	0°C-50°C NiCd, 10°C-50°C LiFePO4, -20°C-50°C (FHSBATCC3-3)
CERTIFICATIONS	cURus 1310, cURus 924
EMERGENCY LED DRIVER & LiFePO4 BATTERIES	RoHS compliant

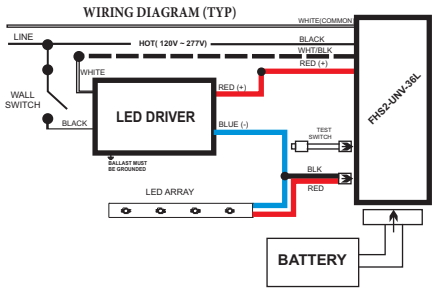
MECHANICAL DATA



WIRING DIAGRAMS

WIRE	BLACK	WHITE	RED	BLK/WHT	BATTERY-LED ARRAY-TEST SWITH-PILOT LIGHT
LENGTH - INCHES	12"±1"	12"±1"	24"±1"	18"±1"	24"±1"





Accessory Harness (Wire length 24")			
Part Number	Description	Part Number	Description
FHS-HARNESS-100	100 mA LED Harness	FHS-HARNESS-150	150 mA LED Harness
FHS-HARNESS-200	200 mA LED Harness	FHS-HARNESS-250	250 mA LED Harness
FHS-HARNESS-300	300 mA LED Harness	FHS-HARNESS-350	350 mA LED Harness
FHS-HARNESS-400	400 mA LED Harness	FHS-HARNESS-450	450 mA LED Harness
FHS-HARNESS-500	500 mA LED Harness	FHS-HARNESS-550	550 mA LED Harness
FHS-HARNESS-600	600 mA LED Harness	FHS-HARNESS-650	650 mA LED Harness
FHS-HARNESS-700	700 mA LED Harness		

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RoHS COMPLIANT

GENERAL INSTALLATION GUIDELINES FOR LED EMERGENCY DRIVER

MODEL : FHS2-UNV-36L

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:** Battery is rechargeable Ni-Cad 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: 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 ballast to ensure proper function 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 twenty four (24) or thirty six (36) or forty eight (48) hours, depending upon battery pack. Please refer to battery chart for charging time.

SAVE THESE INSTRUCTIONS

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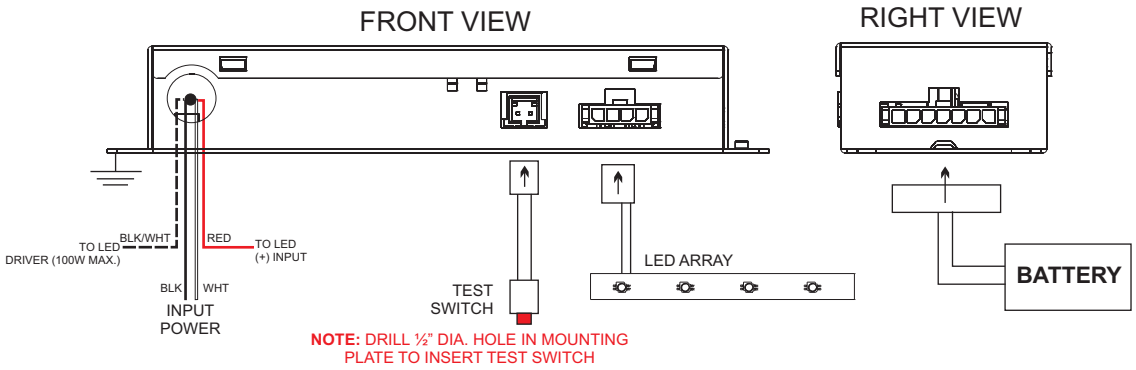
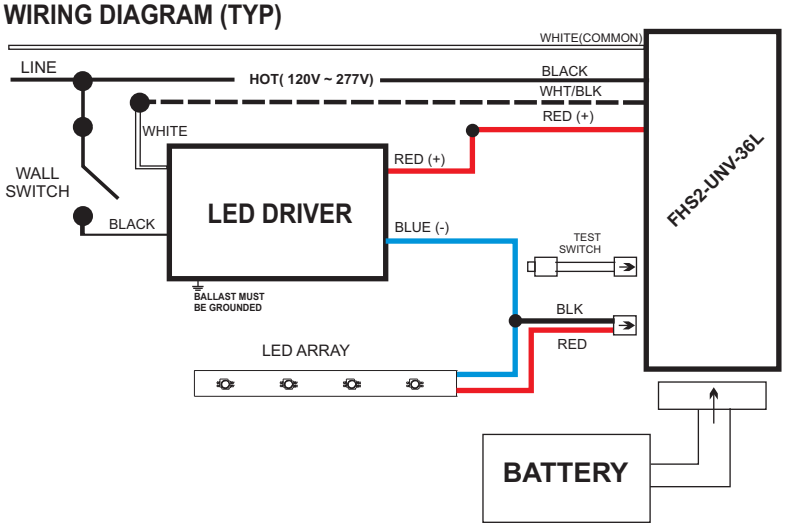
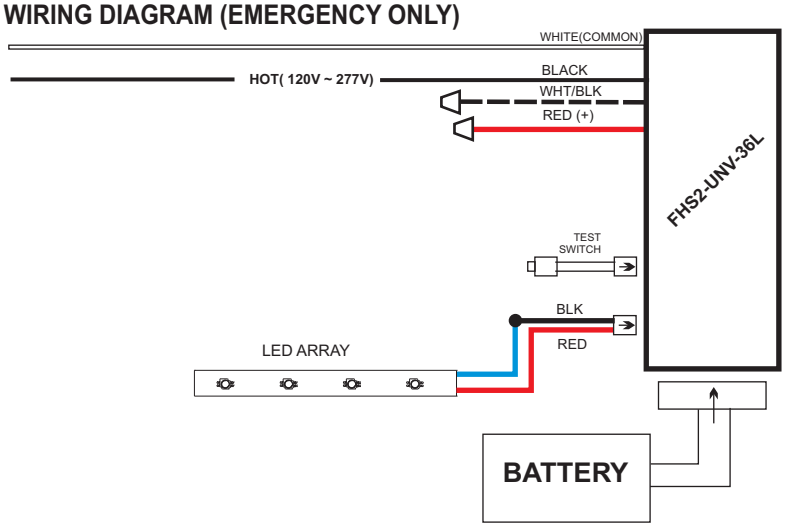


NOTE: DRILL ½" DIA. HOLE IN MOUNTING PLATE TO INSERT TEST SWITCH

WIRING DIAGRAM (TYP)



WIRING DIAGRAM (EMERGENCY ONLY)



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MODEL : FHS2-UNV-36L

Battery Chart

Fulham Model No.	Chemistry	Compliant	Pack Capacity	Max Load for 90 min.	Battery Voltage	Recharge Time
FHSBATT8-AA.9	NiCd		900mAh	4W	9.6V	24Hrs
FHSBATT8-C3	NiCd		3000mAh	16W	9.6V	32Hrs
FHSABATT8-D4	NiCd		4000mAh	20W	9.6V	32Hrs
FHSBATL3-1	LiFePO4	RoHS	1000mAh	4W	9.6V	24Hrs
FHSBATL3-1.5	LiFePO4		1500mAh	8W	9.6V	24Hrs
FHSBATL3-3	LiFePO4		3000mAh	16W	9.6V	32Hrs
FHSBATL6-1.5	LiFePO4		3000mAh	16W	9.6V	32Hrs
FHSBATL6-3	LiFePO4		6000mAh	20W	9.6V	48Hrs
FHSBATL6-.6	LiFePO4		1200mAh	6W	9.6V	24Hs
FHSBATL9-.6	LiFePO4		1800mAh	10W	9.6V	24Hrs
FHSBATL6-1.5L*	LiFePO4		3000mAh	16W	9.6V	32Hrs
FHSBATL6-3L*	LiFePO4		6000mAh	20W	9.6V	48Hrs
FHSBATT8-C3L*	NiCd		3000mAh	16W	9.6V	32Hrs
FHSBATCC3-3	LiFePO4	RoHS	3000mAh	10W	9.6V	32Hrs
FHSBATL6-1.5S	LiFePO4	RoHS	3000mAh	16W	9.6V	32Hrs
FHSBATL3-1.5S	LiFePO4	RoHS	1500mAh	8W	9.6V	24Hrs

CAUTION: Replace battery only with corresponding part number.

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

Harness Extension		
Battery Model Number	Harness Part Number	Description
FHSBATT8-AA.9	FHS-EXT12L	HotSpot 12" Battery Extension
FHSBATT8-C3	FHS-EXT12M	HotSpot 12" Battery Extension
FHSBATT8-D4	FHS-EXT12H	HotSpot 12" Battery Extension
FHSBATL3-1	FHS-EXT12M	HotSpot 12" Battery Extension
FHSBATL3-1.5	FHS-EXT12M	HotSpot 12" Battery Extension
FHSBATL3-3	FHS-EXT12M	HotSpot 12" Battery Extension
FHSBATL6-1.5	FHS-EXT12M	HotSpot 12" Battery Extension
FHSBATL6-3	FHS-EXT12M	HotSpot 12" Battery Extension
FHSBATL6-.6	FHS-EXT12M	HotSpot 12" Battery Extension
FHSBATL9-.6	FHS-EXT12M	HotSpot 12" Battery Extension
FHSBATCC3-3	FHS-EXT12M	HotSpot 12" Battery Extension
FHSBATL6-1.5S	FHS-EXT12M	HotSpot 12" Battery Extension
FHSBATL3-1.5S	FHS-EXT12M	HotSpot 12" Battery Extension

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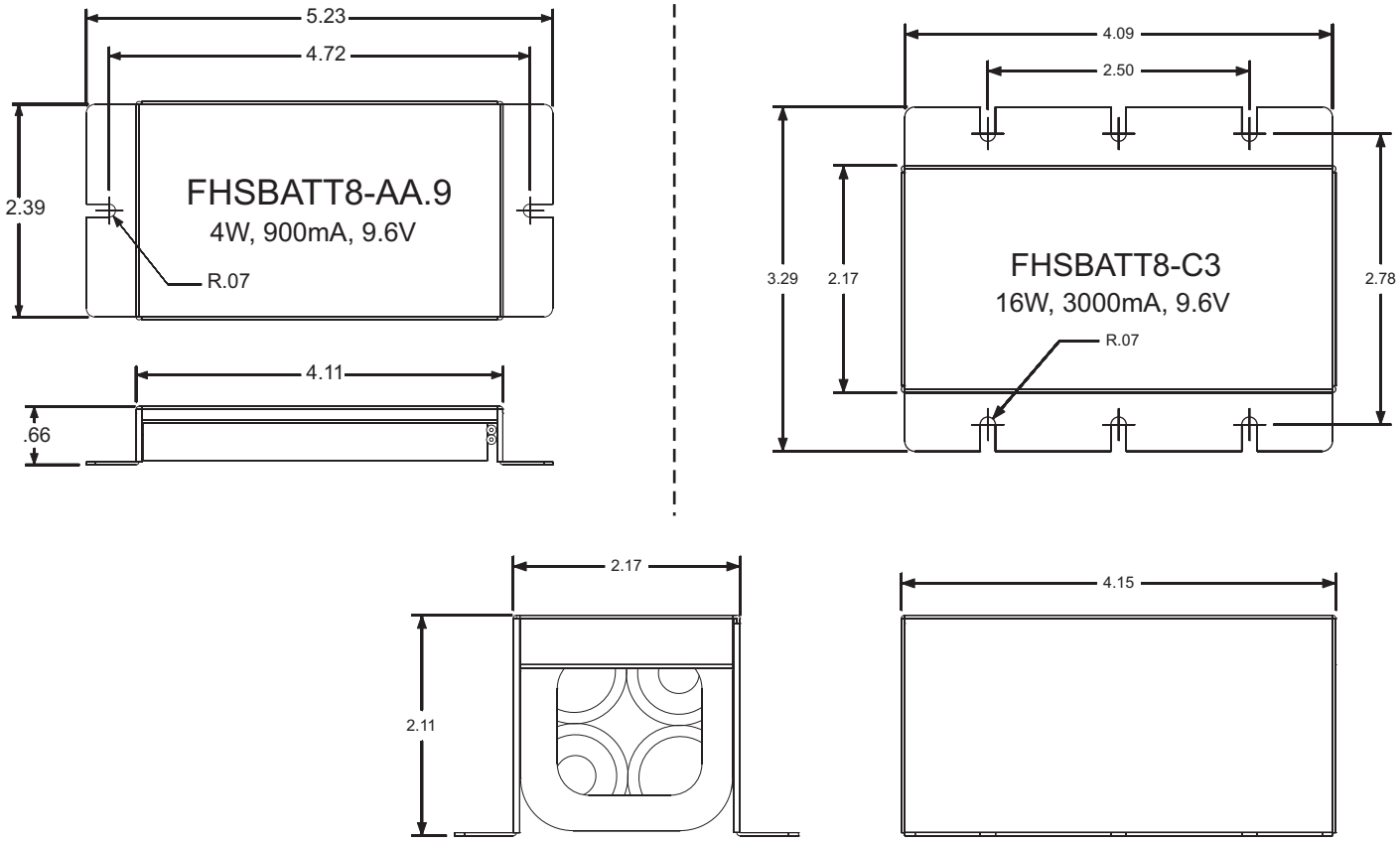
Battery Dimensions



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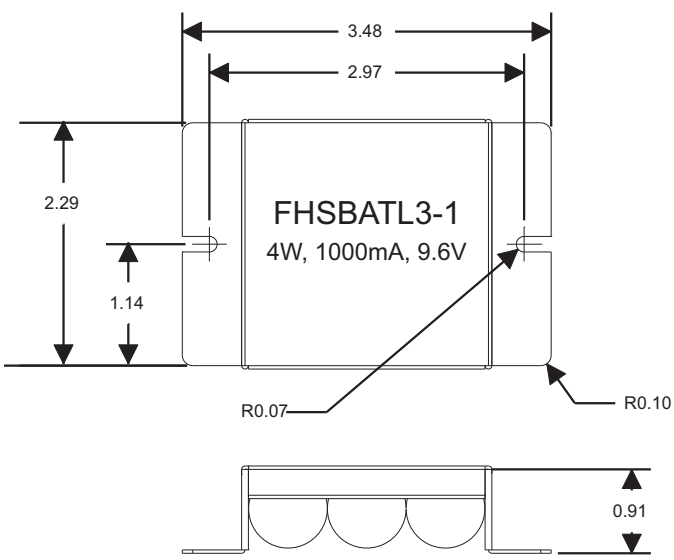

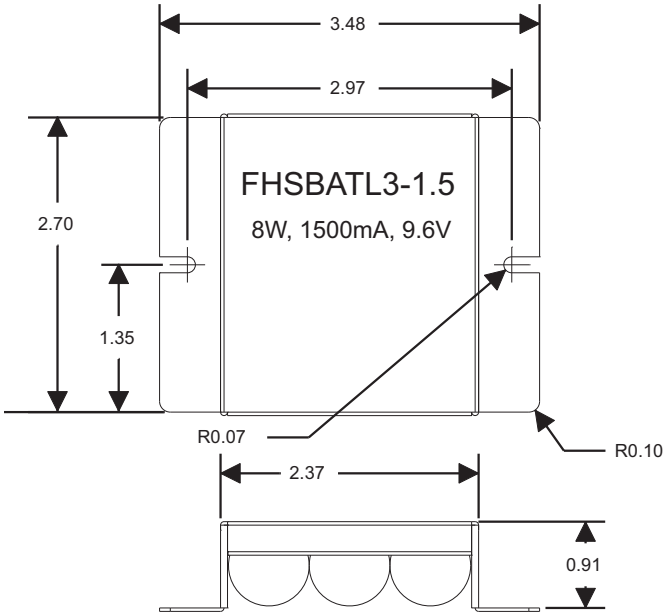

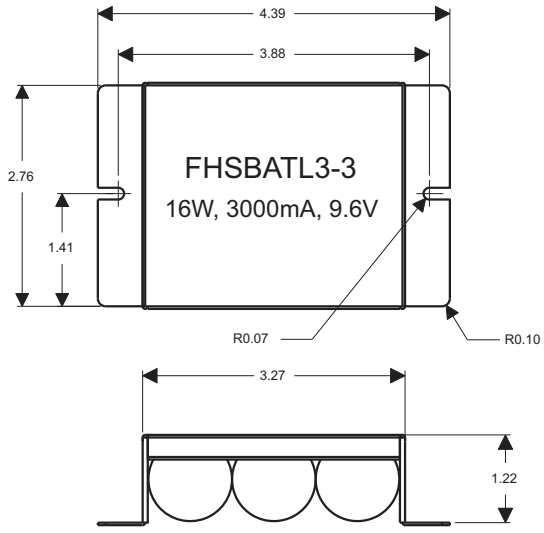

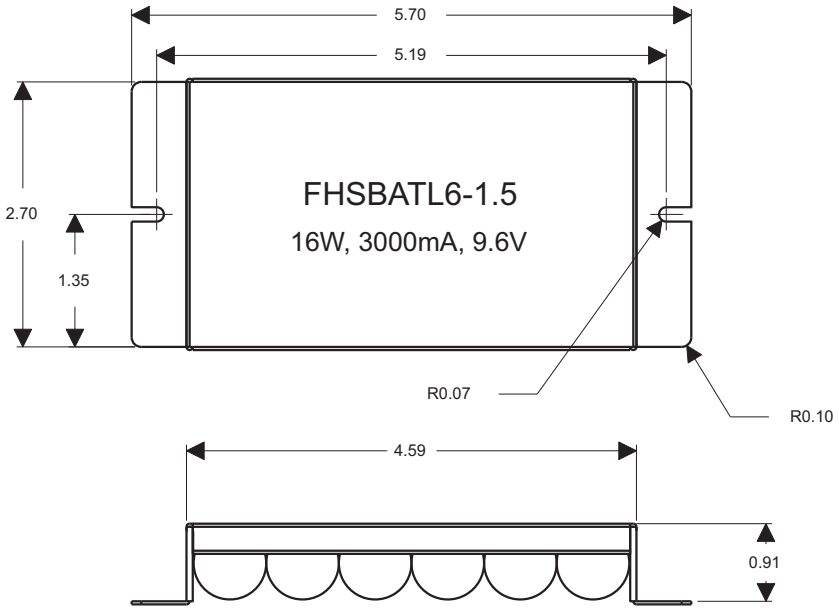

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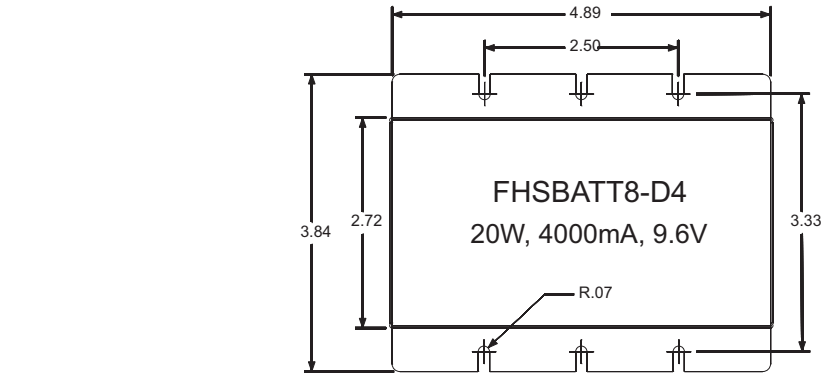

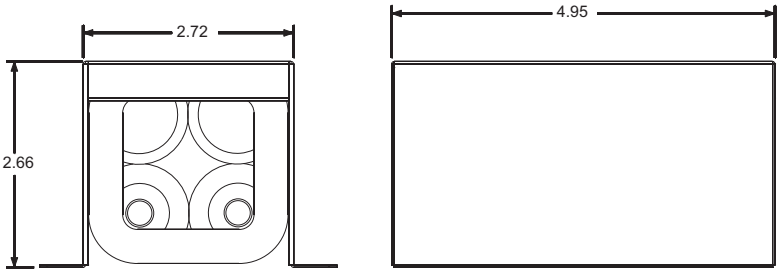

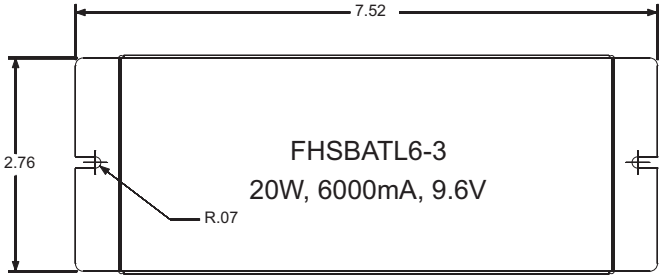

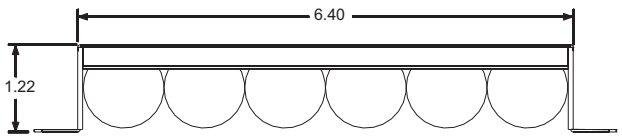

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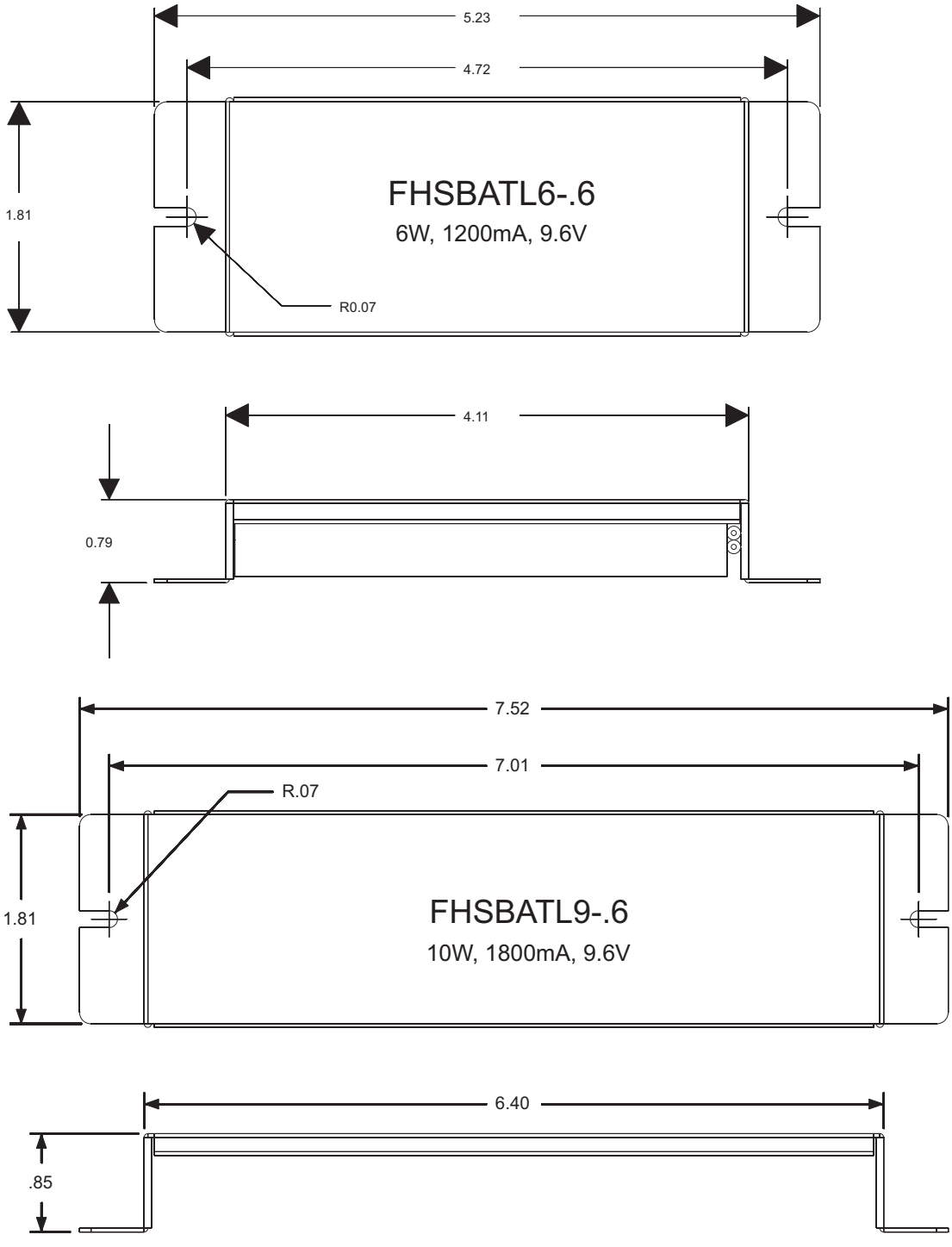

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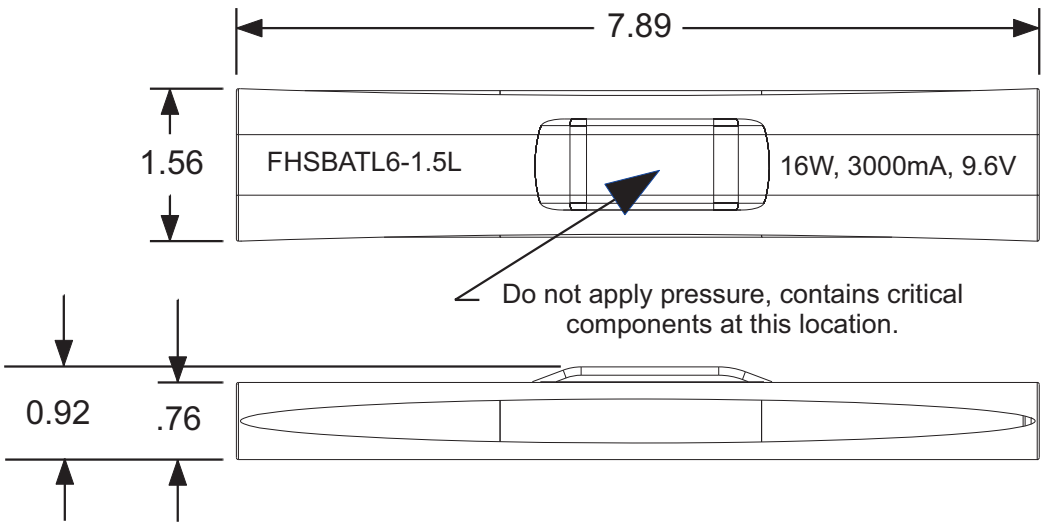
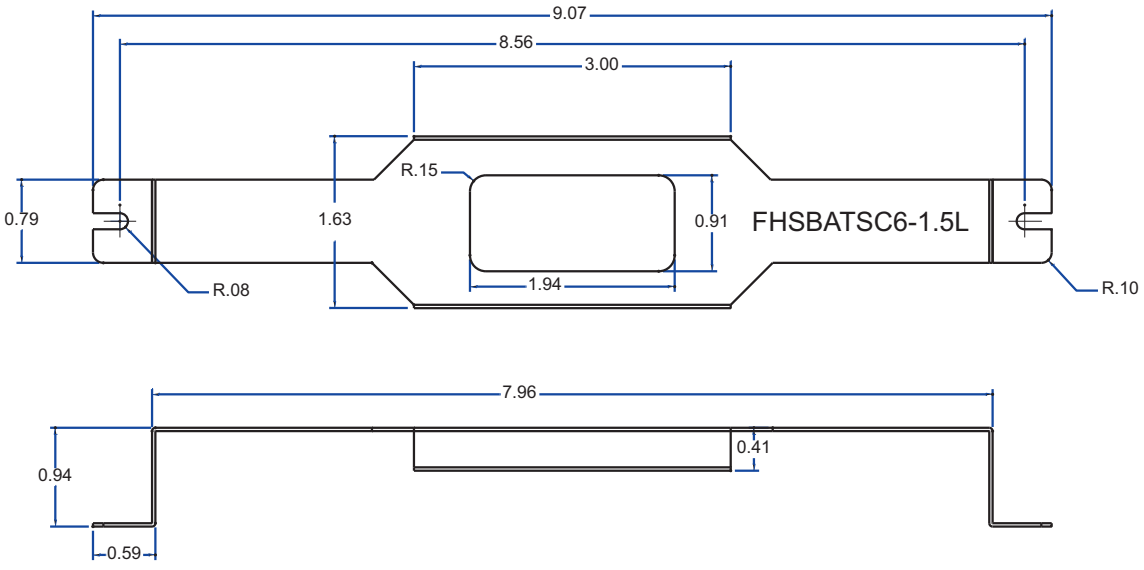


Mounting Bracket Dimensions (Optional)



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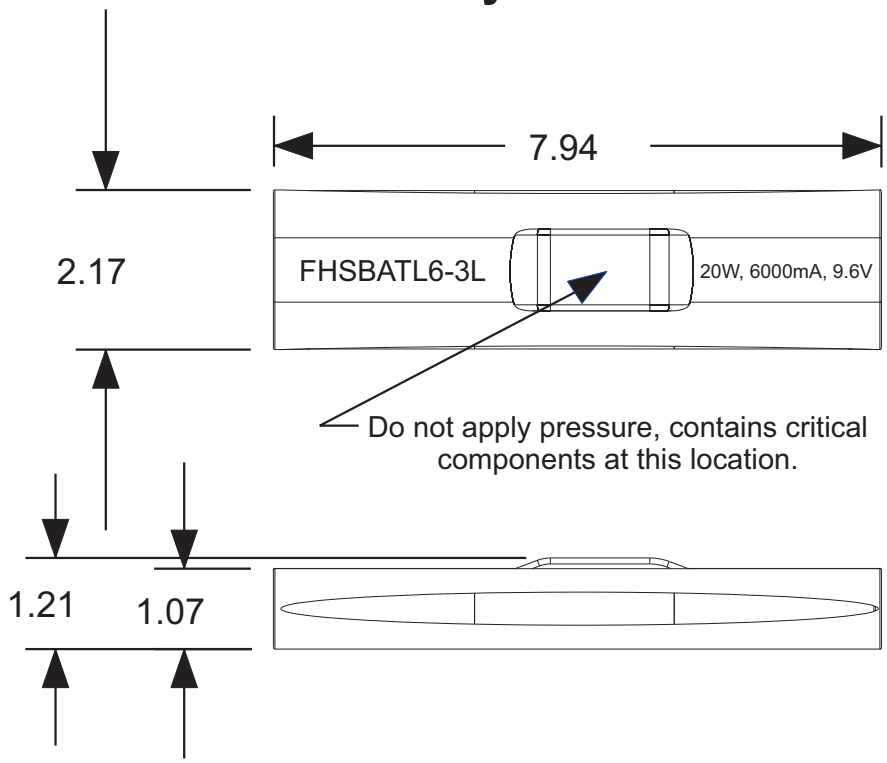

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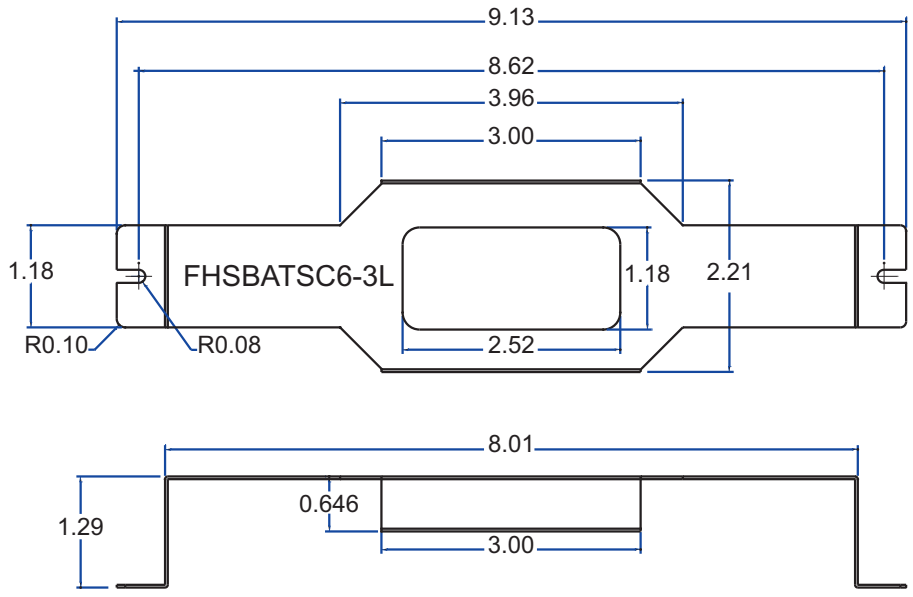

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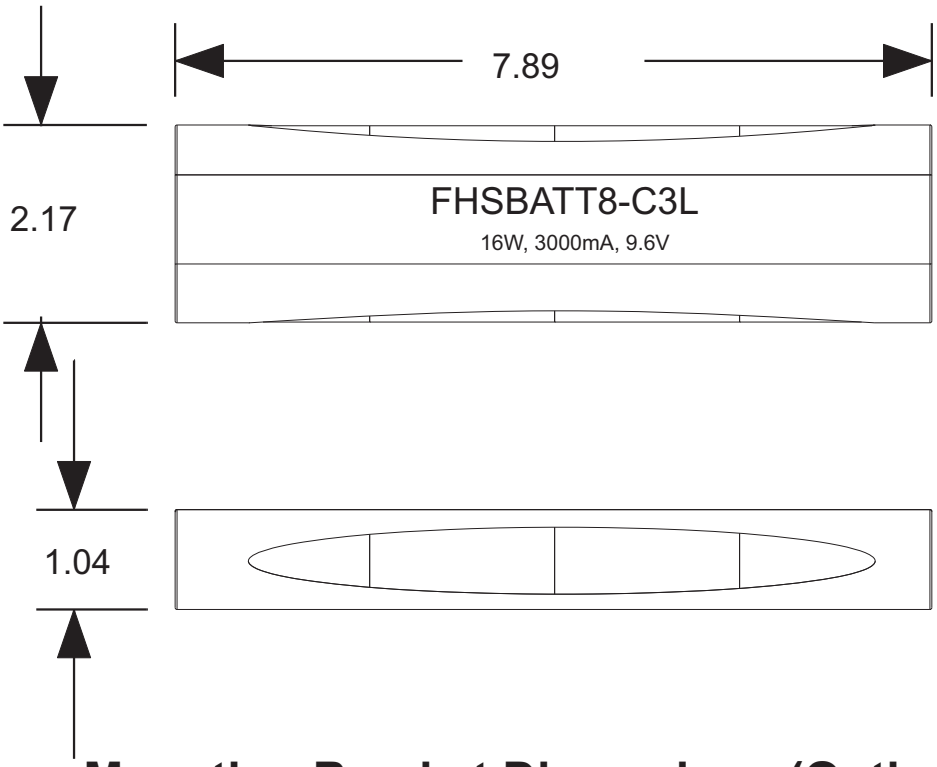

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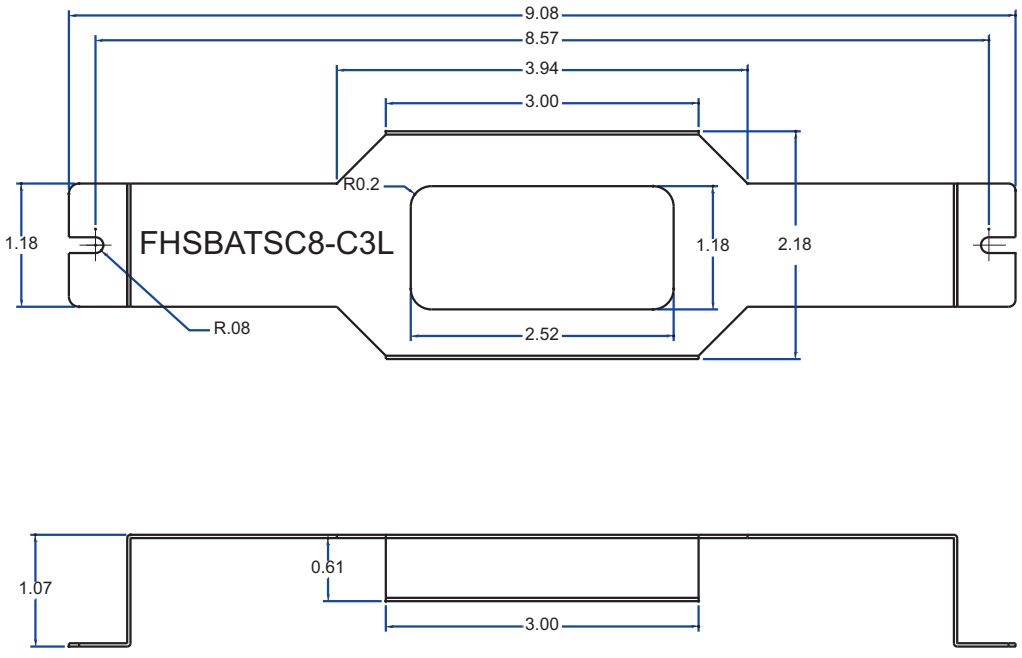

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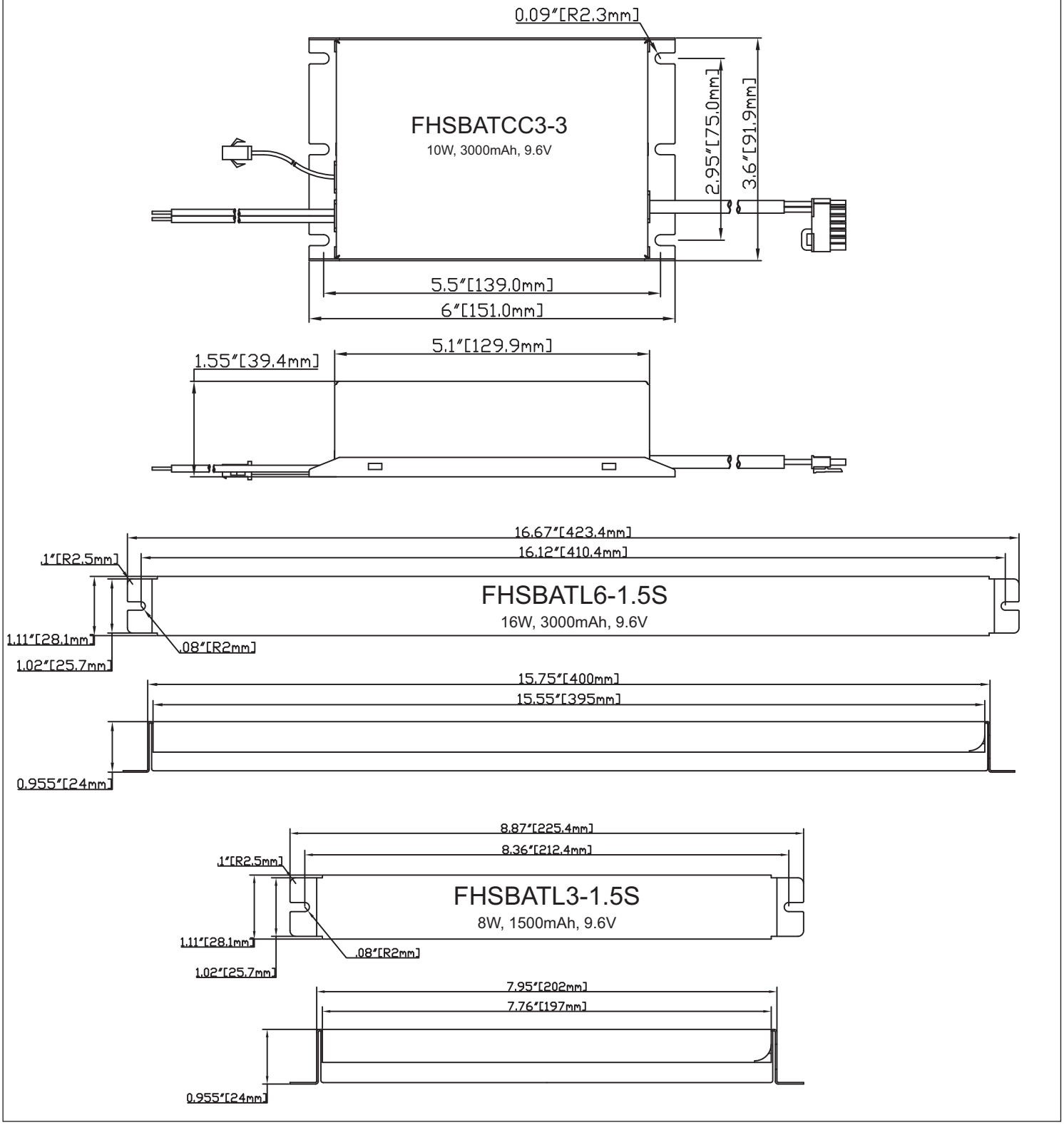

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ILB-SL-CP10

CONSTANT POWER LED EMERGENCY DRIVER

MODEL NO: _____

TYPE: _____

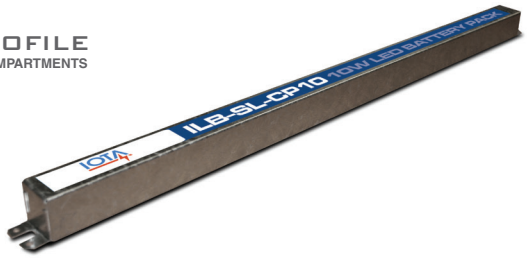
PROJECT: _____

COMMENTS: _____

CP CONSTANT POWER EMERGENCY OUTPUT

SLIM PROFILE FOR NARROW COMPARTMENTS

RoHS COMPLIANT



LED OPERATION

10W LED Load @ 10-60VDC nom.[1]

OUTPUT

10 Watts (Constant)

DESCRIPTION

The **ILB-SL-CP10** from IOTA is a UL Classified LED emergency driver that allows the same LED fixture to be used for both normal and emergency operation. In the event of a power failure, the **ILB-SL-CP10** switches to the emergency mode and operates the existing fixture for **90 minutes**. The unit contains a battery, charger, and converter circuit in a single slim profile can for installation within the channel space or wireway. The **ILB-SL-CP10** will operate an LED array load at **10 watts** with **constant power** at a rated output voltage of **10-60 VDC**. The Constant Power design of the **ILB-SL-CP10** maintains the output wattage to the LED array even as the system voltage diminishes, providing a consistent illumination level for the full 90-minute emergency duration.

SPECIFICATIONS

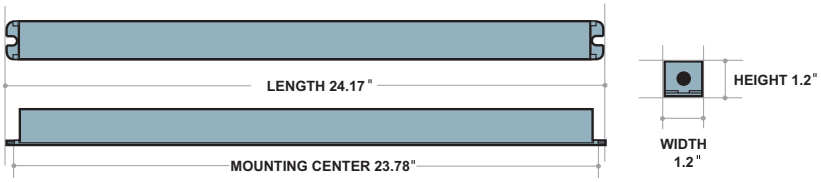
Input Voltage	(Universal) 120-277V, 50/60Hz
Input Rating	3.7 Watts (max)
Output Voltage[1]	10-60 VDC Class 2 Compliant
Output Current	1.0A (@10VDC) - 0.167A (@60VDC)
Output Power	10 Watts (constant)
Power Factor	≥ 0.9
Emergency Operation	90 minutes
Operating Temp	0° to 55° C
THD	< 20%
Battery	High Temp Nickel Cadmium 24 Hour Recharge 7-10 Year Life Expectancy
Weight	3.5 lbs.
Approval	UL and CUL Classified as an LED emergency driver for field installation

[1]Max. output voltage in emergency mode is 58.5 VDC with a + tolerance of 1.5 volts

CLASSIFIED c UL us

DIMENSIONS

24.17″ x 1.2″ x 1.2″ (mounting center 23.78″)



PRODUCT ADVANTAGES

- **Classified for field installation**
- **Constant Power Design maintains illumination throughout the 90-minute runtime with no light degradation**
- **Slim Profile housing allows integral installation within restrictive and narrow channel spaces of strip and troffer fixtures**
- **Two-wire universal AC input**
- **Self-sensing output voltage allows the CP Series to operate various product types, reducing product SKUs for emergency options**

FEATURES

- UL 924 Listed, UL Classified to FTBV
- UL 1310 Certified, Output Class 2 Compliant
- Long life high temperature recyclable Ni-Cad battery
- Galvanized steel case
- Includes single-piece TBTS test switch and charge indicator accessory kit
- For use with switched or unswitched fixtures
- **5-Year Warranty.** See Warranty Page for details.
- Meets or exceeds all NEC, IBC, and Life Safety Code Emergency Lighting Requirements
- Rated for use in Plenum, Damp Location, Recessed Type IC, and Enclosed and Gasketed Luminaires
- RoHS Compliant

IOTA POWERING YOUR WAY ®

Patented. See **www.iotaengineering.com/patents** for details.

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ILB-SL-CP10

CONSTANT POWER LED EMERGENCY DRIVER

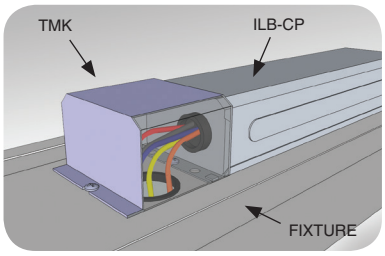
TEST KIT CONFIGURATION

● TBTS

ACCESSORIES

○ TMK-ISL Top Mount Cover

When top-mounting the ILB-SL-CP unit, the TMK-ISL is used to cover the exposed wiring that goes from the battery pack into the fixture.



ILB-SL-CP10 SAMPLE SPECIFICATION

Supply and install IOTA ILB-SL-CP10 Constant Power emergency LED driver system as indicated on the plans. The emergency driver shall be designed for internal or external mounting to the luminaire including a self-contained, high-temperature, sealed, maintenance-free nickel cadmium battery rated for a 10-year service life. The unit shall be provided complete with an illuminated push to test switch. The emergency driver system shall be UL class 2 certified in accordance with UL 1310 and shall be UL listed for use in damp locations and in enclosed and gasketed fixtures with a temperature range of 0° to 55° C.

The AC input shall be a two-wire, universal voltage capable 120 thru 277 VAC, 50/60 Hz and be UL Classified to Category Control Number (CCN) FTBR, Emergency Lighting and Power Equipment, and FTBV, Emergency Light-Emitting-Diode Drivers for field installation. Maximum input power of the emergency driver shall be 3.7 watts.

The unit charger shall consist of a two-stage charging system which samples the battery in relation to its temperature, state of charge and input voltage fluctuations. The charger shall be current limited, temperature compensated, short-circuit protected with reverse polarity protection. A low voltage battery disconnect (LVD) circuit shall be provided and will disconnect the load and circuitry from the battery when it reaches approximately 80 to 85% of its nominal terminal voltage, preventing a non-recoverable, deep-discharge condition as well as equipment initialization failure when utility power is restored. The unit shall achieve a full recharge in 24-hours.

The emergency driver shall accommodate an LED load with a forward voltage requirement ranging from 10 to 60 VDC. The output voltage sensing shall be automatic and instantaneous with a resulting, inversely-proportional current to maintain constant power to the LED array with an output tolerance of +/- 3%. The unit shall supply the rated load for a minimum of 1 1/2 hours or to 87 1/2% of rated battery terminal voltage. The output power to the LED load during emergency operation shall be held constant 10 watts from minute one throughout the entire emergency run time resulting in no loss or degradation of the light source during emergency operation.

The unit shall be furnished with an electronic, AC-lockout circuit which will connect the battery when the AC circuit is activated, and an electronic brownout circuit which will enable a transfer to emergency operation when utility power dips below an acceptable level. Maximum remote mounting distance of the emergency driver shall be 50-feet.

SPECIFICATION TOOLS FOR UL CLASSIFIED FIELD INSTALLATION

The **ILB-SL-CP10** is UL Classified for Field Installation. Refer to the "**CP Series Compatibility and Suitability of Use Guidelines**" addendum for complete project installation requirements.

IOTA ILB-CP PERFORMANCE CALCULATOR

Visit **www.iotaengineering.com/cptools** to access our on-line CP performance calculator for assistance when determining lumen output and operating specifications for your unit, in addition to convenient links to other specification materials.

Patented. See **www.iotaengineering.com/patents** for details.

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BSL310 (polycarbonate case)
BSL310C (metal case with conduit)
BSL310M (metal case without conduit)
BSL310C-DF (metal case with dual conduit)

Emergency Driver for Linear LED Strips
Class 2 Output

PHILIPS
bodine

A Division Of Philips Electronics North America Corporation

Product Summary

UL RECOGNIZED
Factory Installation *
(Indoor and Damp)
Output Class 2 Compliant
*BSL310 is field installable when used with the Philips EvoKit G2 LED Retrofit luminaire.

Illumination Time
90 Minutes

Full Warranty
5 Years (NOT pro-rata)

Universal Input Voltage
120-277 VAC, 50/60 Hz

AC Input Current
60 mA Maximum

AC Input Power Rating
4.0 W Maximum

Output Current and Voltage
Selectable (See Table 1)
Without Selector: minimum 200 mA, 35-50 VDC, minimum 300 mA over optimized range (30-34 VDC)
With Selector: minimum 400 mA, 10-29 VDC

Output Power
10.0 W (Maximum)

Test Switch/Charging Indicator Light
Illuminated Test Switch

Battery
High-Temperature,
Maintenance-Free
Nickel-Cadmium Battery
7- to 10-Year Life Expectancy

Battery Charging Current
180 mA

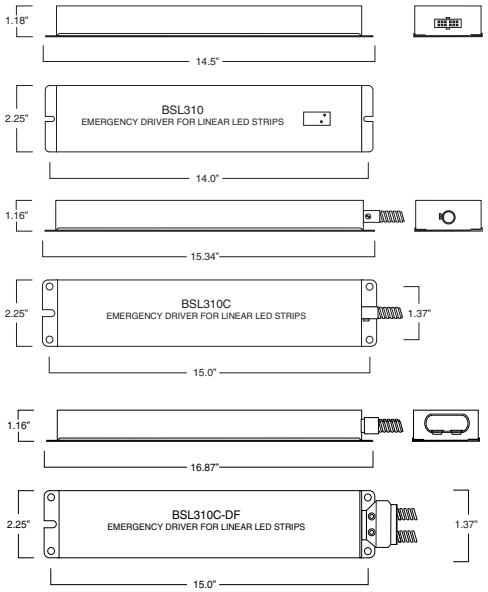
Recharge Time
24 Hours

Temperature Rating (Ambient)
0°C to +55°C
(32°F to 131°F)

Dimensions (BSL310)
14.5" x 2.25" x 1.18"
(369 mm x 58 mm x 30 mm)
Mounting Center 14.0" (356 mm)

Dimensions (BSL310C/M)
15.34" x 2.25" x 1.16"
(390 mm x 58 mm x 29 mm)
Mounting Center 15.0" (381 mm) x 1.37" (34.8mm)

Weight
2.25 lbs. (1.0 kg) - polycarbonate
3.15 lbs. (1.43kg)- metal w/o conduit
3.45 lbs. (1.56kg)- metal w/conduit
3.80 lbs. (1.73kg)- metal w/dual conduit



Application

The BSL310 universal input (120-277 V) emergency LED driver works in conjunction with an AC LED driver that has an output current not to exceed 3.0 A. The emergency driver consists of a high-temperature nickel-cadmium battery, charger and electronic circuitry in one case. The BSL310 can deliver up to 10 watts to an LED load (measured at nominal battery voltage) for 90 minutes. If used in an emergency-only fixture, no AC driver is necessary. The BSL310 is suitable for indoor and damp locations. For more information about specific LED and AC driver compatibility, please call the factory.

Operation

When AC power fails, the BSL310 immediately switches to the emergency mode, operating the LEDs at a reduced lumen output for a minimum of 90 minutes. When AC power is restored, the emergency driver automatically returns to the charging mode. A patented circuit delays AC LED driver operation for up to 5 seconds to prevent over current of LED's that would occur if both drivers supply the load at the same time.

Installation

The BSL310 does not affect normal fixture operation and may be used with either a switched or unswitched fixture. If a switched fixture is used, an unswitched hot lead must be connected to the emergency driver. The emergency driver must be fed from the same branch circuit as the AC driver. Per UL requirements, the polycarbonate BSL310 must be enclosed if remote mounted outside of the fixture. Installation is not recommended with fixtures where the ambient temperature may fall below 0° C. The product is suitable for installation in sealed and gasketed fixtures. For LED loads rated less than 30V, connect the load select per Table 1 for proper operation and optimum performance. The BSL310C-DF is offered in two options. Both are equipped with two flexible metal conduits. For option A, the illuminated test switch is located in one conduit and product wiring in the other. *BSL310 is field installable when used with the Philips EvoKit G2 LED Retrofit luminaire. Option B contains the illuminated test switch wiring in its own conduit, with the test switch and a wall plate included in a separate parts kit.

UL and Code Compliance

The BSL310 has been tested by Underwriters Laboratories in accordance with the standards set forth in UL UL 924, "Emergency Lighting and Power Equipment," and by the Canadian Standards Association (CSA) in accordance with the standards set forth in C22.2 No. 141, "Unit Equipment for Emergency Lighting." The BSL310 is UL Listed and CSA Certified for factory or field installation. Emergency illumination time exceeds the National Electrical Code (NEC), Life Safety Code (NFPA-LSC), National Building Code of Canada (NBC), National Fire Code of Canada (NFC) and UL 90-minute requirements.

L2300211

Specifiers Reference

Project _____ Type _____ Model No. _____

Comments _____

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(polycarbonate case) **BSL310**

(metal case with conduit) **BSL310C**

(metal case without conduit) **BSL310M**

(metal case with dual conduit) **BSL310C-DF**

Emergency Driver for Linear LED Strips
Class 2 Output

Emergency Illumination

The BSL310 operates an LED load of up to 10.0 W at nominal battery voltage for a minimum of 90 minutes.

Specification

Emergency lighting shall be provided by using a LED fixture equipped with a Philips Bodine BSL310 universal input (120-277 V) emergency driver. A patented circuit delays AC LED driver operation for up to 5 seconds to prevent over current of LED's that would occur if both drivers supply the load at the same time. This emergency driver shall consist of a high-temperature, maintenance-free nickel-cadmium battery, charger and electronic circuitry contained in one case. An illuminated test switch (ITS) to monitor charger and battery and installation hardware shall be provided. The emergency driver shall be capable of delivering up to 10 watts to an LED load for a minimum of 90 minutes. The BSL310 is suitable for indoor and damp locations. The BSL310 shall have a maximum of 4.0 watts of input power and a 24.0 Watt-hour battery capacity and shall comply with emergency standards set forth by the current NEC. The emergency driver shall be UL Recognized for factory installation only and shall be warranted for a full five years from date of purchase.

Warranty

Model BSL310 is warranted for five (5) full years from date of purchase. This warranty covers only properly installed Philips Bodine emergency LED drivers used under normal conditions. For the warranty period, Philips Emergency Lighting will, at its option, repair or replace without charge a defective emergency LED driver, provided it is returned to the factory transportation prepaid and our inspection determines it to be defective under terms of the warranty. Repair or replacement, as stated above, shall constitute the purchaser's exclusive warranty, which does not extend to transportation, installation, labor or any other charges; nor does it apply to any equipment of another manufacturer used in conjunction with the emergency driver.

IMPORTANT TEXT: REFER TO TABLE 1 REGARDING LOAD SELECT

Table 1 LOAD SELECT OPTIONS

MAXIMUM LOAD VOLTAGE	LOAD SELECT
10V - 29V	CONNECTED
30V - 50V	NOT CONNECTED

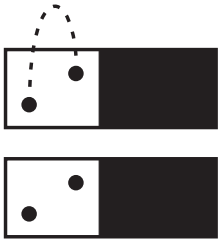

TABLE 2a. UL CLASSIFIED LOADS

Manufacturer	Series Reference	Manufacturer's Part Number
Philips	Fortimo LED Line	1ft 1100lm 830 3R HV1
Philips	Fortimo LED Line	1ft 1100lm 835 3R HV1
Philips	Fortimo LED Line	1ft 1100lm 840 3R HV1
Philips	Fortimo LED Line	1ft 1100lm 850 3R HV1
Philips	Fortimo LED Line	1ft 1100lm 865 3R HV1
Philips	Fortimo LED Line	L2EVO1.5 ft 1250lm 830-1
Philips	Fortimo LED Line	L2EVO1.5 ft 1250lm 835-1
Philips	Fortimo LED Line	L2EVO1.5 ft 1250lm 830-1

TABLE 2b. Listed Luminaires

Manufacturer	Model Number
Philips	EvoKit LED Retrofit Luminaire

Benefits:

- Enables LED Linear strip fixtures to meet Emergency Code requirements
- Emergency mode lumen output of up to 1300 lumens
- Universal input (120-277 VAC)
- 2 wire input reduces wiring errors
- Compatible with a variety of LED strip manufacturers
- Compatible with AC drivers and LED loads rated for Class 2
- Selectable Output

Compatible With*

Philips Xitanium 40 W SR Driver
Philips LEDline
Samsung U990048
LG Lightbox

*Contact Factory for compatibility with other LED applications

Philips LEDline

Table 3 REMOTE DISTANCES

Wire Gauge (AWG)	Maximum Remote Mounting Distance* (ft)	Maximum Wire Length** (ft)
10	500	1000
12	300	600
14	200	400
16	125	250
18	75	150
20	50	100
22	30	60
24	20	40
26	13	26

* Total wire length can NOT exceed that given in Maximum Wire Length column.
** Distance is round trip wire length.
Distances are for Emergency Driver only. Consult AC Driver specification for remote mounting distances when using AC Driver.

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