

ANYTHING IS POSSIBLE

WITH VERSATILE PRODUCTS & PRACTICES

CUSTOMIZATIONS • ORIGINAL INNOVATIONS • FLEXIBILITY



FULHAM
Harness the Horsepower

WHAT'S NEXT? FLYING HORSES? UNICORNS? WHO KNOWS? ANYTHING IS POSSIBLE!



From the dawn of time, we humans have utilized creativity and inventiveness to manipulate our world through innovation. Imagining what is not yet but what could be, then making it so has been a hallmark trait of some of the most noteworthy among us – those with an “Anything is Possible” mentality, even in the face of adversity, peer ridicule or doubt.

The imagination that advances our civilization applies to every facet of our lives, including lighting. From our humblest beginnings – merely trying to lengthen our days with artificial light – to present day lighting technologies, we’ve been obsessed with controlling lighting. Our ability to do so has evolved through the dogged effort and ingenuity of generations of curious, brilliant humans.

Light is a physical phenomenon. Electromagnetic radiation. A universal raw material: photons, wavelengths, particles, optical receptors. . . but Lighting is the conscious manipulation of Light, developed over thousands of years. In these pages, we review the strides we’ve made in our field via the “giants” of our field who see no limits to what’s possible.

THE SUN, MOON & STARS

This was Square One. But life couldn’t come to a grinding halt just because the sun went down...



FIRE

Fire was good. It was humanity’s first stab at producing light on demand. Fire sparked our entry into controlled lighting. Over the ages, it led to candles, oil lamps and gas lighting. Although fire produced cheery light, it did have its dark side, like accidentally burning down the house. Still, it was generally agreed that fire was... hot!



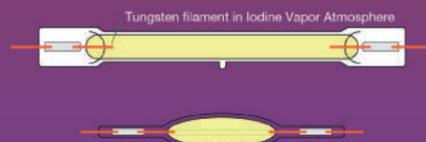
INCANDESCENT

The incandescent lamp (“light bulb”) came into widespread use roughly a century ago. Light is produced by a heated, glowing filament sealed in a gas-filled (or vacuum) tube. Electricity surges in; a filament heats up; the bulb glows, produces light.



HALOGEN

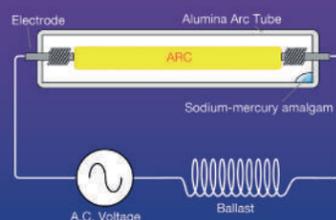
Halogen lamps are souped-up incandescent bulbs with a tungsten filament. The filament is engulfed in inert gas, spiked with one of the halogen group of gases. When the tungsten heats up, its interaction with the gases triggers a chemical reaction.



During this halogen cycle, tungsten atoms stream from the bulb’s inside surface and back onto the tungsten filament. The lamp can run safely at higher temperatures, can last longer, and has the added benefit of shining brighter per unit of electricity flowing through it.

HID

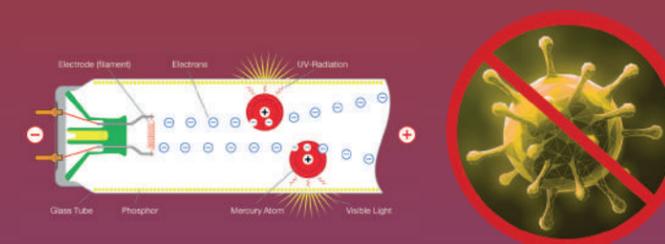
High Intensity Discharge (HID) lamps fall into the gas discharge lamp category. Their light output comes from electricity coursing between tungsten electrodes inside a tube filled with gas and metal salts.



Sparking the arc charges the salts into a “plasma” that glows intensely -- hence the word “intensity.” Despite their brilliance, HID lamps consume less energy than incandescent or fluorescent lamps, delivering more lumens per watt.

FLUORESCENT

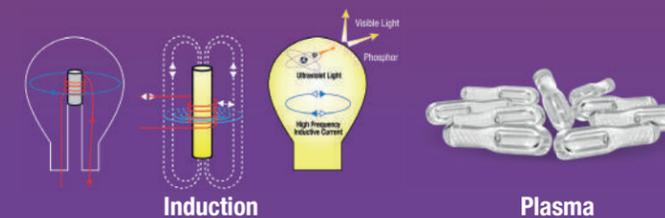
Fluorescent lights are basically airtight tubes full of reactive gases that light up when electricity charges up their atoms, which then become... fluorescent. We even adapted this technology for specialty applications, such as UV germicidal purposes for purifying air and water, via modified lamps to kill germs. (See [UV Germicidal Ballasts](#) on page 50.)



Compact Fluorescent Lamps (CFLs) are often either pin-based replacement lamps or self-ballasted, screw-based lamps that operate using fluorescent technology in various residential and commercial applications, due to their relatively small sizes and lesser energy draw versus incandescent.



ELECTRODELESS TECHNOLOGIES

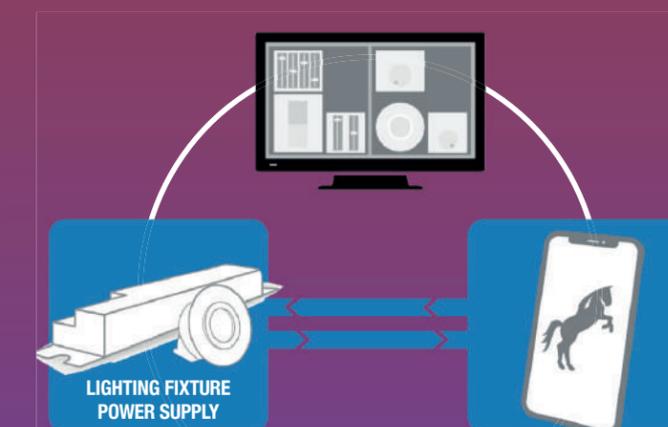
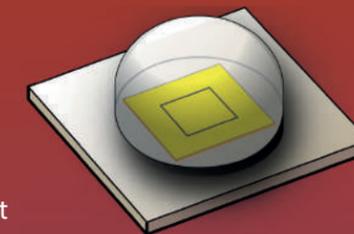


Induction is essentially an offshoot of fluorescent technology but whose light-generating reaction uses an external electromagnetic field, rather than electrodes. It lasts longer than standard fluorescent, but as the cost of LEDs fell, the utility of Induction severely diminished. Plasma was dubbed electrodeless HID. Plasma is created by heat or streamed electromagnetism. Radiating microwaves transform certain gases and other materials

into light-emitting plasma. This technology delivers remarkable illumination from tiny lamps, but the cost of these fixtures has made commercial adoption impractical.

LED

Light Emitting Diodes (LEDs) operate by electroluminescence – an optical phenomenon in which electrical current triggers light emission as it passes through semiconductor material. An LED light fixture is comprised of a fixture body, a diffuser lens, and an LED Light Engine. The LED Light Engine generally consists of an array of white (or color) LEDs placed on a printed circuit board (PCB) which is powered by an LED driver, an electronic component which precisely controls the flow of electricity through the LEDs to ensure both quality of light and long life. LED Light Engines are generally tailored to specific fixtures in order to meet efficiency, aesthetics, color consistency and life requirements.



WIRELESSLY CONNECTED LIGHTING CONTROL

Wireless Connectivity is to light what advanced music systems are to sound. Just as acoustic scientists created precise technologies to faithfully record, fine tune, control and distribute music within sound environments, today’s lighting engineers have made equivalent advances in visual environments. Now one simple “smart” device can control a full range of lighting situations. You can program lighting to automatically manage a great variety of scenes, locally or remotely, by computer – even over the internet – from any place at any time with a handheld device.



Shuji Nakamura



Michael Faraday



Edward E. Hammer



Jaap Haartsen



Nick Holonyak

ON THE SHOULDERS OF GIANTS

According to the ancient parable he was citing, even a dwarf can see further than a giant if he stands on the giant's shoulders. Sir Isaac -- indisputably an intellectual giant himself -- modestly credited the "shoulders of giants" for his success. The expression acknowledges the contribution of earlier workers for one's own achievements, since knowledge advances on the basis of previous knowledge.

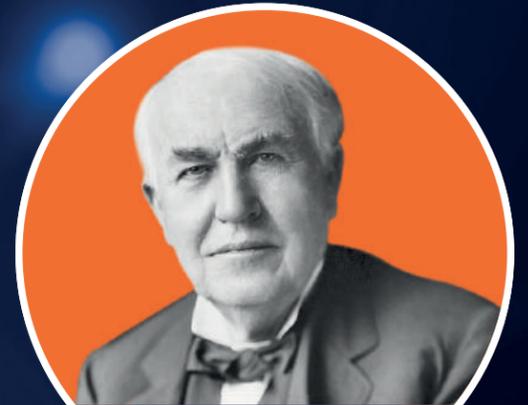
But sometimes giants stand upon the shoulders of other giants. Consider the sequence of advances made by "giants" like Michael Faraday, James Maxwell, Nikola Tesla and Thomas Edison.

The solitary work of individual geniuses created a series of inspired lighting inventions. This established the foundation for a universe of practical applications, developed by later generations of scientists and technicians. The lonely eccentric's makeshift workshop has given way to extravagantly equipped lab complexes staffed with teams of trained researchers. Nowadays it is common to see close collaboration among colleagues half a world apart; speaking different languages; people from vastly divergent cultural backgrounds -- all working together in the common interest.

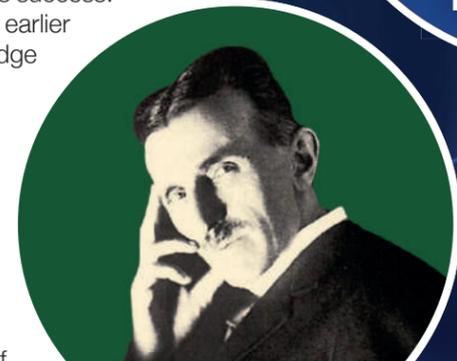
Technological and production advances will always be driven by inspired individual efforts. But in general, progress in our industry is the result of solid teamwork. Nowhere is trans-national teamwork more evident than at Fulham. We are a worldwide company in manufacturing, marketing, sales and distribution. We also have world class R&D facilities in Asia, India and at our U.S. Headquarters. Our international research team includes some of the best brains in the industry from many diverse backgrounds. All are united in Fulham's dedication to exceeding customer expectations. This commitment has grown us into a company that is truly trusted worldwide for cost efficient, innovative, reliable, relevant lighting solutions.

If I have seen further than other men, it is because I have stood upon the shoulders of giants.

-- Sir Isaac Newton (1642 - 1727)



Thomas Edison



Nikola Tesla



Charles Steinmetz



Peter Cooper Hewitt



Elmer Fridich

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A Pioneer in Lighting Electronics

From its beginnings in 1994, Fulham has been dedicated to creative, sustainable lighting programs that give our users the power to build or install smart, differentiated, versatile lighting. Fulham's revered product quality and world-class customer responsiveness make us the preferred partner to over 3,000 lighting manufacturers and distributors worldwide.

From our headquarters in Los Angeles and design centers in China and India, our teams of product managers and engineers work with our customers to conceive, design, manufacture and supply reliable, sustainable lighting solutions that bring cutting-edge, relevant innovation to a global market.



LED Emergency Lighting Solutions

Emergency Lighting has been an ESSENTIAL focus area for Fulham since the onset of the company, with its FireHorse branded products. Across time, Fulham's "Anything is Possible" mentality has led to industry accolades for introduction of entirely new EM innovations – whether our HotSpot1 and HotSpot2 Systems, our Micro-inverters, our smallest form factor constant power 4W driver in the industry, our slim profile units, or Programmable EM Drivers for versatility and convenience. Don't see it? Ask for it, because Fulham's Custom Capabilities are also ready to help make the impossible possible!





HotSpot Plus LED Driver & Emergency System

The revolutionary HotSpot Plus LED Driver & Emergency System combines the functions of a dimmable, programmable LED driver, emergency LED driver, and replaceable backup battery in a single compact unit. Under normal conditions this all-in-one solution operates as a constant current driver; during a power outage the integrated battery automatically activates, providing reliable emergency illumination for safe building egress. Benefits include smaller size, simplified installation, and the ability to bring emergency LED capability to smaller luminaires.

- Programmable output current in 1mA increments
- UL 924 Self-Diagnostics
- Selectable emergency output:
 - 40W models: 5W for 180 minutes or 10W for 90 minutes
 - 70W model: 7W for 90 minutes, programmable for lower power and longer runtime
- Compact size and simple installation for maximum flexibility



HotSpot Plus LED Driver and Emergency System

Watts	Output Current (mA)	Output Voltage (VDC)	Model Number	Input Voltage (VAC)	Dimming Type	Ch.	Dimensions (L x W x H)	Case Type
40	250-1400	11-55	FHSAC1-UNV-40BLS*	120-277; 50/60Hz	0-10V	1	6.37" x 3.13" x 1.54"	Compact w/ Bottom Leads
40	250-1400	11-55	FHSAC1-UNV-40C*	120-277; 50/60Hz	0-10V	1	6.32" x 3.13" x 1.14"	Compact w/ End Leads
40	250-1400	11-55	FHSAC1-UNV-40L**	120-277; 50/60Hz	0-10V	1	9.49" x 2.40" x 1.34"	Linear w/ End Leads
70	350-2400	11-55	FHSAC1-UNV-70S***	120-277; 50/60Hz	0-10V	1	16.70" x 1.18" x 1.00"	Linear w/ Terminals

*cURus **cULus, CE ***cULus

HotSpot Plus Accessories

FHS-TSTWL-BC	IP67, bicolor LED Indicator / test switch for use in exposed, outdoor-rated luminaires for 40W models
FHS-TSTWL-BC-S*	IP67, bicolor LED Indicator / test switch for use in exposed, outdoor-rated luminaires for 70W model
FHS-EXT-48-TST	48" test switch extension cable

*Made to Order

= Self-Diagnostic

The Power of Programmability

All HotSpot LED drivers feature Fulham's innovative SmartSet programming platform, which gives the user the power to create the right driver for any situation.

- Auto-Programming capability for high volume usage
- Driver does not need to be powered during programming
- Programming via handheld controller or PC software



TPSB-100 SmartSet Controller



SmartSet Software

To see the Fulham SmartSet programming platform in action visit the links below:

Overview of basic programming features: www.fulham.com/smartsetprogramming

One touch Auto-Programming: www.fulham.com/smartsetauto

Programming custom dimming curves: www.fulham.com/smartsetdimmingcurve



HotSpot Constant Power Programmable LED Emergency Driver

Provides programmable, constant power emergency output for existing LED modules. Advanced features include self-diagnostics and detailed data logging. Meets CEC Title 20 battery charger requirements. Complete system includes emergency driver and emergency battery.



Specifications

Model Number	FHSCP-UNV-10P-L-SD	Output Type	Class 2
Input Voltage	100-277VAC, 50/60Hz	RFI/EMI	FCC Part 15A Non-Consumer
Input Current	0.06A Max.	Ambient Operating Temperature Range	10°C to 55°C (50°F to 131°F)
Output Power	3-10W	Dimensions (L x W x H)	7.91" x 2.05" x 1.17"
Output Current	620mA Max.	Battery Type / Recharge Time	LiFePO4 9.6VDC / 12 Hours
Output Voltage Range	16-55VDC	Input Surge Protection	Line-Neutral 2kV, Line & Neutral-Ground 2kV
Number of Output Channels	1	Warranty	5 years
Self-Diagnostics	Factory-enabled by default, can be disabled by luminaire manufacturer		
Bicolor LED Indicator	Included LED indicator/test switch provides automatic system status updates		

HotSpot Constant Power Programmable Battery Packs

Model Number	Max. Load for 90 Min	Capacity	Battery Voltage	Battery Type	RoHS	Recharge Time	Dimensions (L x W x H)
FHSBATL3-1.5-SD*	5W	1500mAh	9.6V	LiFePO4	Compliant	12 hours	3.48" x 2.87" x 0.96"
FHSBATL9-.6-SD*	6W	1800mAh					7.52" x 1.87" x 0.79"
FHSBATL3-3-SD*	10W	3000mAh					4.39" x 2.92" x 1.30"
FHSBATL6-1.5L-SD	10W	3000mAh					9.13" x 1.63" x 0.97"
FHSBATT8-C3L-SD*	10W	3000mAh		NiCd	Exempt	24 hours	9.25" x 2.11" x 1.21"

*Made to Order



HotSpot Constant Power LED Emergency Drivers

Adds field-installable emergency capability to LED luminaires. Provides backup power to the luminaire's LED modules for at least 90 minutes. The cULus Classified driver is designed for flexibility, with multiple mounting options, a conduit feed, and an illuminated test switch.



Specifications

Input Voltage	120-277V (UNV)	Recharge Time	24 Hours	Illumination Time	Minimum 90 minutes
Output Voltage	10-55VDC	Ambient Temperature	0°C - 50°C	RFI/EMI	FCC Part 15A Non-Consumer
Surge Protection	Per C62.41 (TVS)	Output Type	Class 2		

HotSpot Constant Power LED Emergency Drivers

Model Number (CEC Title 20)	Output Power (W)	Output Lumens*	Output Current (mA)	Dimensions (L x W x H)
FHSCP-UNV-5WL	5	800	90-500	11.5" x 2.6" x 1.5"
FHSCP-UNV-7.8WL	7.8	1250	140-780	15.4" x 2.6" x 1.5"
FHSCP-UNV-10.7WL	10.7	1700	195-1007	15.4" x 2.6" x 1.5"
FHSCP-UNV-13.7WL†	13.7	2200	250-1370	19.2" x 3.03" x 1.63"
FHSCP-UNV-17WL	17	2700	300-1700	19.2" x 3.03" x 1.63"

* Based on 160 lumens/Watt light source

† Made to Order



CONSTANT POWER IN-FIXTURE EM

FHSCP-UNV-4W-L The Lighting Industry's Smallest 4 Watt Emergency Constant Power LED Driver

Provides constant power emergency output for existing LED modules. Meets CEC Title 20 battery charger requirements. This system includes emergency driver and integrated battery.



Specifications			
Model Number	FHSCP-UNV-4W-L	Output Type	Class 2
Input Voltage	120-277VAC, 50/60Hz	RFI/EMI	FCC Part 15A Non-Consumer
Input Current	0.1A Max.	Ambient Operating Temperature Range	5°C to 55°C (41°F to 131°F)
Output Power	4W	Dimensions (L x W x H)	5.34" x 1.69" x 1.01"
Output Current	333mA Max.	Battery Type / Recharge Time	LiFePO4 6.4VDC / 12 Hours
Output Voltage Range	12-55VDC	Input Surge Protection	Line-Neutral 1kV, Line & Neutral-Ground 2kV
Number of Output Channels	1	Warranty	5 years



CONSTANT POWER EMERGENCY LED DRIVER

FHSCP-UNV-12W-L-SD

- 120-277V~ (UNV), 50/60Hz
- 12-55VDC Output
- Output Wattage: 12W
- IP20
- Battery Charge Time 90 Mins
- LED Class 2 Output Class
- Remote Mount Test Switch
- Battery Over / Under Voltage Protection
- Battery Hot Plug at Normal and Emergency Mode Protection
- Output Open Protection
- Output Short Protection
- 5 Year Warranty



FHSCP-UNV-10P-S-SD

10 Watt Slim Emergency System Approximately 50% smaller than competition

Provides programmable, constant power emergency output for existing LED modules. Advanced features include self-diagnostics and detailed data logging. Meets CEC Title 20 battery charger requirements. This system includes emergency driver and integrated battery.



Specifications			
Model Number	FHSCP-UNV-10P-S-SD	Output Type	Class 2
Input Voltage	120-277VAC, 50/60Hz	RFI/EMI	FCC Part 15A Non-Consumer
Input Current	0.1A Max.	Ambient Operating Temperature Range	0°C to 55°C (32°F to 131°F)
Output Power	3-10W	Dimensions (L x W x H)	16.7" x 1.18" x 1.00"
Output Current	666mA Max.	Battery Type / Recharge Time	Lithium 11.1VDC / 12 Hours
Output Voltage Range	15-55VDC	Input Surge Protection	Line-Neutral 1kV, Line & Neutral-Ground 2kV
Number of Output Channels	1	Warranty	5 years
Self-Diagnostics	Factory-enabled by default, can be disabled by luminaire manufacturer		
Bicolor LED Indicator	Included LED indicator/test switch provides automatic system status updates		

= Self-Diagnostic



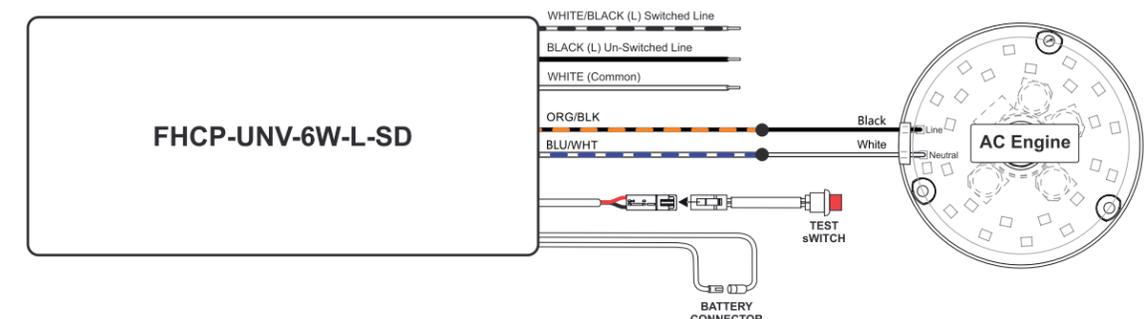
FHSCP-UNV-6W-L-SD

Field-Installable 6 Watt Emergency Driver for AC Engines

Most cost-effective emergency solution designed to operate Fulham AC LED engines (Ex. linear, round, rectangular)



Specifications			
Model Number	FHSCP-UNV-6W-L-SD	Output Type	Class 1
Input Voltage	120-277VAC, 50/60Hz	RFI/EMI	FCC Part 15A
Input Current	0.85A Max.	Ambient Operating Temperature Range	0°C to 50°C (32°F to 122°F)
Output Power	6W	Dimensions (L x W x H)	9.5" x 2.4" x 1.49"
Normal Output Voltage Range	120-277VAC	Battery Type / Recharge Time	Ternary Lithium Battery 11.1VDC / 12 Hours
Emergency Output Voltage Range	60-230VDC	Input Surge Protection	Line-Neutral 1kV, Line & Neutral-Ground 2kV
Number of Output Channels	1	Warranty	5 years
Self-Diagnostics	Factory-enabled by default, can be disabled in the field		
Bicolor LED Indicator	Included LED Indicator/test switch provides automatic system status updates		





25W Micro-Inverter / Emergency Power Supply

Expected mid-2024: 50W Inverter FHUPS1-UNV-50-L-SD, 120/220/277 VAC Output, 320W Fixture max, 0-10V Dimming

Fulham's innovative, new Micro-Inverter offers the ability to power any fixture in emergency mode at 25W for a period of 90 minutes.

Its uniqueness stems from its ability to run a fixture GREATER than 25W by using built-in 0-10V dimming wires. For example, the unit will scale down the power of a 150W fixture to 25W in Emergency Mode, allowing customers to use this inverter in high output applications where previously a costly inverter was the only solution.

The FHUPS1-UNV-25L-SD can support one fixture rated for 150W or multiple fixtures whose system wattage adds up to 150W in normal operation (although anything greater exceeds the input power rating of the unit.) This reduces the number of SKUs needed for emergency fixtures to save money.

- Works with any 0-10V fixture(s) ≤150W for 25W of Constant Emergency Power for 90 minutes
- Uninterrupted Power Supply
- UL listed and CEC Title 20 compliant
- Dims luminaires of up to 150W down to 25W(45VA) in emergency with 0-10V dimming; 25W(45VA) max without 0-10V dimming
- Conduit for leads



- Under voltage protection, short circuit protection, overload protection
- Easy installation time: no need to open up a luminaire to connect this device to the driver.
- Can be used with luminaires where the driver is not accessible, e.g. UFO high bays
- Saves money: higher wattage fixtures previously required a higher wattage/higher cost inverter
- Self diagnostic standard
- RJ11 port allows Bluetooth compatibility

Specifications

Model Number	FHUPS1-UNV-25L-SD	Output Type	Class 1
Input Voltage	100-277VAC, 50/60Hz	RFI/EMI	FCC Part 15A
Input Current	0.12A Max.	Ambient Operating Temperature Range	0°C to 50°C (32°F to 122°F)
Input Power	11W	AC Drive Input Power	150W Max (0-10V dimming required past 25W)
Output Power	25W (45VA) Max	Dimensions (L x W x H)	15.3" x 2.9" x 1.5"
Normal Output Voltage Range	120-277VAC	Battery Type / Recharge Time	LiFoPo4 3600mAh / 12 Hours
Emergency Output Voltage Range	120/220/277VAC	Input Surge Protection	Line-Neutral 1kV, Line & Neutral-Ground 2kV
Number of Output Channels	1	Warranty	5 years
Self-Diagnostics	Factory-enabled by default, can be disabled in the field		
Bicolor LED Indicator	Included LED Indicator/test switch provides automatic system status updates		

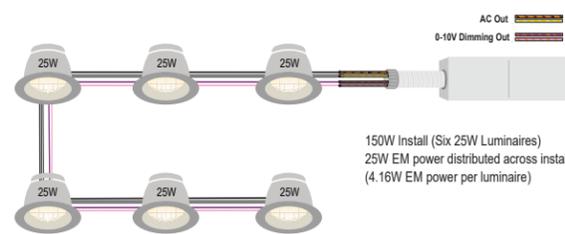
Wiring one single luminaire without 0-10V dimming



Wiring multiple luminaires without 0-10V dimming



Wiring multiple luminaires with 0-10V dimming



= Self-Diagnostic



Fluorescent Emergency Ballasts

- Wide range of lamp and ballast compatibility
- CEC Title 20 Compliance Standard

- UL listed for damp locations
- Integrated LED power indicator/test switch



Specifications

Operating Voltage	120-277V (UNV)	Fixture Wiring	Switched or Unswitched
Frequency	50/60Hz	Minimum Emergency Operation	90 Mins.
Regulatory Compliance	Meets or Exceeds N.E.C./LSC	Min. Required Charging Time	24 Hours
Battery Type	High Temp. Long Life Rechargeable NiCd	Test Switch / Indicator	LED Push Button
		Optional Wall Plate: FHSWLPWH	Used for remote mounting of test switch

FireHorse Ballast Models

Model Number	AC Input (W)	Standby Power Rating (W)	Max Charge Current	Battery Voltage (VDC)	Battery Rating (Wh)	Dimensions (L x W x H)	Weight (lbs)	Warranty (Yrs.)
FH7-UNV-500L-CEC	3	0.7	120VAC: 40 mA	277VAC: 30mA	6.0	12.0	9.60" x 2.16" x 1.13"	1.7
FH11-UNV-750L-CEC	4	0.4	120VAC: 53mA	277VAC: 30mA	3.6	14.4	9.37" x 2.33" x 1.53"	2.0
FH11-UNV-750L-CEC-A†	4	0.4	120VAC: 53mA	277VAC: 30mA	3.6	14.4	9.37" x 2.33" x 1.53"	2.0
FH12-UNV-1400L-CEC	4	0.7	120VAC: 60mA	277VAC: 40mA	12.0	24.0	14.58" x 2.17" x 1.23"	1.7

† Conduit feed

FireHorse Lamp Operation | Also works with TLEDs. Check lamp manufacturers' specifications for compatibility.

LAMP APPLICATIONS	FH7	FH11	FH12
FT - 4 pin			
FT18W	1	2	
FT24W	1	1 or 2	2
FT27W	1	1 or 2	
FT36W	1	1	1 or 2
FT39W	1	1	
FT40W	1	1	1
FT50W		1	
FT55W		1	1
CFQ - 4 pin			
CFQ13W	1	2	
CFQ18W	1		2
CFQ26W	1	1	2
CFTR - 4 pin			
CFTR13W	1	2	
CFTR18W	1	2	
CFTR26W	1	2	
CFTR32W	1	1	2
CFTR42W	1	1	
Circular-FCRT5			
22WCRT5	1	1	
40WCRT5	1		1
55WCRT5		1	
Circular-FCRT9			
32WCRT9	1	1	
40WCRT9	1	1	

LAMP APPLICATIONS	FH7	FH11	FH12
2D - 4 pin			
2D21W	1		
2D28W	1	1 or 2	1 or 2
2D - 4 pin			
2D38W	1	1 or 2	1 or 2
T5-Standard			
F14T5	1	1	2
F21T5	1	1	1
F28T5	1	1	1
F35T5		1	1
T5-HO High Output			
F24T5HO	1	1	2
F39T5HO	1	1	1 or 2
F49T5HO			1
F54T5HO (49W)	1	1	
F54T5HO	1	1	1
T8- Standard			
F17T8	1	2	2
F25T8	1	1 or 2	2
FB29T8			1
FBO31T8			1
F32T8 (25W)	1	1	
F32T8 (28W)	1	1	2
F32T8 (30W)	1	1	
F32T8 (32W)	1	1	1 or 2
F40T8	1	1	1

LAMP APPLICATIONS	FH7	FH11	FH12
T8- Standard (continued)			
F58T8		1	1
F70T8		1	1
T8-HO High Output			
F60T8HO		1	1
F72T8HO		1	1
T8-SL Slim Line			
F96T8SL			1
T12-Standard			
F20T12	1	2	2
F30T12		2	2
FB34T12	1 or 2		
F40T12			1 or 2
F40T12 ES (34W)	1 or 2		
F75T12, F85T12	1		
F85T12	1		
T12-HO High Output			
F48T12HO		1	
F60T12HO		1	1
F72T12HO			1
F96T12HO (95W)		1	
F96T12HO (110W)		1	1
T12-SL Slim Line			
F60T12SL		1	
F96T12SL		1	1



HotSpot2 LED Emergency System



Unlike the HotSpot1 LED Emergency System that comes equipped with separate LED modules, the HotSpot2 system operates a fixture's existing LED modules in emergency mode. HotSpot2 is a CEC-compliant, UL924 recognized emergency lighting system for use with LED modules driven by a constant current source.

The battery charger automatically adjusts to the connected battery, and output current can be set by a wiring harness or Fulham's SmartSet programming software, allowing a wide range of lumen outputs and runtimes. Self-diagnostic capability reduces liability and maintenance costs.



HotSpot2 LED Emergency System



The HotSpot2 emergency lighting system drives existing constant current LED modules during power outages. A complete system is composed of an emergency driver, emergency battery, and output wire harness. A wide range of lumen output and run times are available.



HotSpot2 Drivers		
Model Number (CEC Title 20)	FHS2-UNV-36L	FHS2-UNV-56S
Input Voltage	100-277VAC	
Input Frequency	50/60Hz	
Input Current	0.1A Max	
LED Currents	100mA - 700mA	
Standby Input Power	<0.8W	
Total LED Power	20W	
Input Surge Protection	2.5KV Ring Wave	
Over Current Protection	Fuse	
Illumination Time	90 - 350 Min	
LED Connection	Series	
LED Output Protection	Self Resetting PTC	
Output Classification	UL1310/Class 2	
Bicolor LED Indicator	Included LED indicator / test switch provides automatic system status updates	
Output Voltage	12 - 55VDC	12 - 56VDC
Dimension (L x W x H)	5.34" x 1.69" x .93"	9.5" x 1.18" x 1"

LED Fixture in Normal Operation



HotSpot2 in Operation During Power Outage



HotSpot2 Emergency Battery Packs

Model Number	Dimensions (L x W x H)	Chemistry	Capacity (mAh)	Battery Count	Recharge Time	Max. Load for 90 min. (W)	
						-36L	-56S
FHSBATT8-AA.9	5.23" x 2.5" x 0.7"	NiCd	900	8 Cells	24Hrs	4	4
FHSBATL3-1	3.48" x 2.35" x 0.99"	LiFePO4	1000	3 Cells	24Hrs	4	4
FHSBATL6-.6	5.23" x 1.87" x 0.85"	LiFePO4	1200	6 Cells	24Hrs	6	4
FHSBATL3-1.5	3.48" x 2.76" x 0.99"	LiFePO4	1500	3 Cells	24Hrs	8	8
FHSBATL3-1.5S	8.87" x 1.11" x 0.96"	LiFePO4	1500	3 Cells	24Hrs	8	8
FHSBATL9-.6	7.52" x 1.87" x 0.85"	LiFePO4	1800	9 Cells	24Hrs	10	8
FHSBATCC3-3†	6.00" x 3.60" x 1.55"	LiFePO4	3000	3 Cells	24Hrs	14*	14*
FHSBATL6-1.5	5.70" x 2.76" x 0.99"	LiFePO4	3000	6 Cells	24Hrs	16	14
FHSBATL6-1.5L (with optional mounting bracket)	7.89" x 1.56" x 0.92"	LiFePO4	3000	6 Cells	24Hrs	16	14
FHSBATL6-1.5S	16.67" x 1.11" x 0.96"	LiFePO4	3000	6 Cells	24Hrs	16	14
FHSBATT8-C3	4.15" x 3.29" x 2.11"	NiCd	3000	8 Cells	24Hrs	16	16
FHSBATT8-C3L (with optional mounting bracket)	7.89" x 2.17" x 1.04"	NiCd	3000	8 Cells	24Hrs	16	16
FHSBATL3-3	9.07" x 2.18" x 1.07"	NiCd	3000	8 Cells	24Hrs	16	16
FHSBATT8-D4***	4.39" x 2.82" x 1.3"	LiFePO4	3000	3 Cells	24Hrs	16	16
FHSBATL6-3	4.89" x 3.84" x 2.72"	NiCd	4000	8 Cells	24Hrs	20	20
FHSBATL6-3L (with optional mounting bracket)	7.52" x 2.82" x 1.3"	LiFePO4	6000	6 Cells	32Hrs	20**	20**
FHSBATL6-3L (with optional mounting bracket)	7.94" x 2.17" x 1.21"	LiFePO4	6000	6 Cells	32Hrs	20**	20**
FHSBATL6-3L (with optional mounting bracket)	9.13" x 2.21" x 1.28"	LiFePO4	6000	6 Cells	32Hrs	20**	20**
FHSBATCC3-3-40C††	6.00" x 3.87" x 1.87"	LiFePO4	3600	3 Cells	24Hrs	20	20

† Cold Pack Battery: -20°C minimum operating temperature * Rated 10W for Canada ** Rated 16W for Canada *** Made to Order †† -20°C =20W, -30°C =10W, -40°C =6W rating

HotSpot2 Accessories

FHS-TSTWL	IP67, test switch for use in exposed, outdoor-rated luminaires					
FHS-TSTWL-BC	IP67, bicolor LED Indicator / test switch for use in exposed, outdoor-rated luminaires					
Wiring harnesses: Used to set the output current to the LED module during emergency operation. Using lower current will allow longer run times.	Model Number	mA	Model Number	mA	Model Number	mA
	FHS-HARNESS-100	100	FHS-HARNESS-250	250	FHS-HARNESS-550	550
	FHS-HARNESS-125	125	FHS-HARNESS-300	300	FHS-HARNESS-600	600
	FHS-HARNESS-150	150	FHS-HARNESS-350	350	FHS-HARNESS-650	650
	FHS-HARNESS-175	175	FHS-HARNESS-400	400	FHS-HARNESS-700	700
	FHS-HARNESS-200	200	FHS-HARNESS-450	450		
	FHS-HARNESS-225	225	FHS-HARNESS-500	500		
FHS-EXT12M	12" battery extension cable					
FHS-EXT-48-TST	48" test switch extension cable					

Also available: battery mounting brackets and wallplates. For more information, visit www.fulham.com



HotSpot1 LED Emergency System

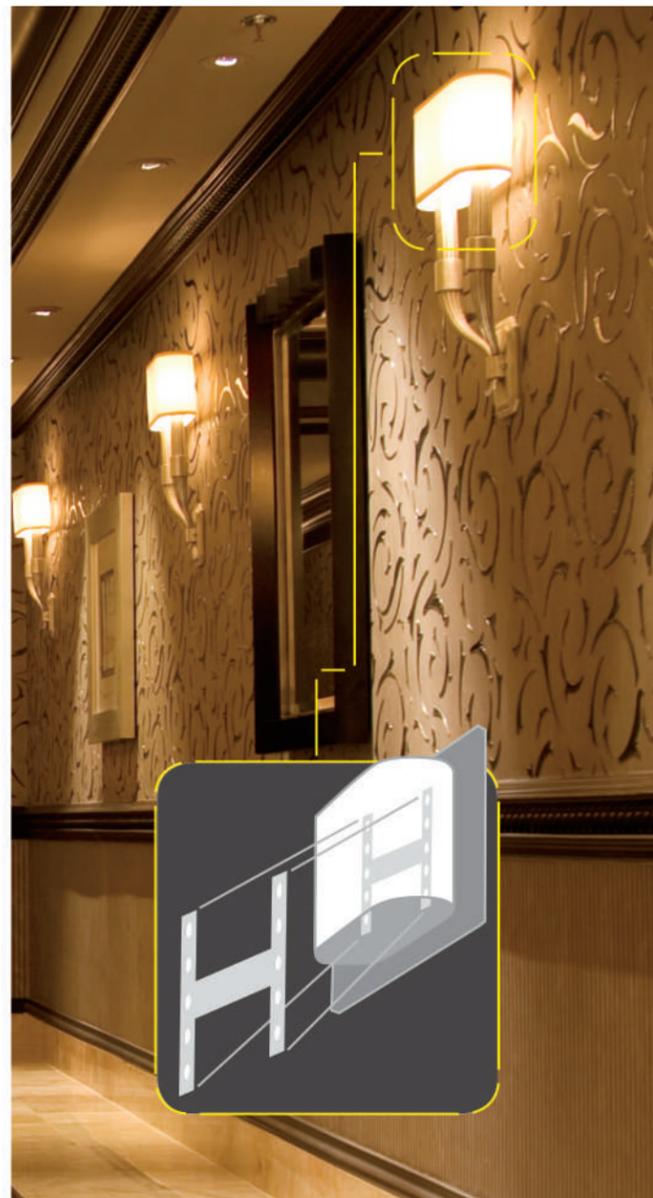


Seamlessly add inconspicuous emergency lighting capability to existing non-emergency fixtures, such as recessed lighting and wall sconces, with the HotSpot1 modular LED systems.

A wide choice of lumen output levels, run times, discrete size, universal input voltage, and plug-n-play low voltage output wiring provide extreme adaptability, low cost of installation, and a high level of safety during operation.



Linear



H-configuration



HotSpot1 LED Emergency System



HotSpot1 systems add LED emergency lighting capability to existing luminaires, including TLED luminaires and retrofit projects. UL Classified kits are approved for field installation and are ideal for both fluorescent and Type A and B LED tubes. A complete kit includes an emergency driver, module, battery, installation instructions, and all necessary hardware and labels. The system operates independently of the luminaire's light source, ensuring compatibility with many types of luminaires.



HotSpot1 Emergency Driver

Model Number	FHS1-UNV-3.6L
Input Voltage	100-277VAC (UNV)
Input Frequency	50/60Hz
Input Current	0.06 A Max.
Input Wattage	10W Max.
Standby Input Power	<0.8W
Compatible Batteries	NiCd, 3.6 VDC
Battery Capacities	3AH, 4AH, 8AH
Total LED Power	1-10W
Illumination Time	90 - 360 Min.
Surge Protection	C62.41 (TVS)
Over Current Protection	Fuse
Recharge Time	32 - 48 Hrs
LED Connection	Parallel
LED Output Protection	Self Resetting PTC
Output Classification	UL1310/Class 2

HotSpot1 Emergency Modules

Model Number	Watts	Shape	Applications
FHS6-AR-3WL	3	Linear	Wall sconce, ceiling flush mount, low level lighting
FHS1-AR4-WL	4	Linear	Wall sconce, ceiling flush mount, low level lighting
FHS3-AR-6W-SH	6	Small-H	Wall sconce, ceiling flush mount
FHS4-AR-8W-LH	8	Large-H	Wall sconce, ceiling flush mount
FHS3-AR-10W-SH	10	Small-H	Wall sconce, ceiling flush mount
FHS4-AR-10W-LH	10	Large-H	Wall sconce, ceiling flush mount

HotSpot1 Emergency Battery Packs

Model Number	Battery Qty/Type	Operation Duration	Output Power/Time	Dimensions (L x W x H)
FHSBATT3-C3	3/C	3 Amp/Hrs	4W: 145min, 6W: 90min	3.1" x 2.00" x 1.00"
FHSBATT3-D4	3/D	4 Amp/Hrs	4W: 200min, 6W: 125min, 8W: 90min	4.00" x 2.50" x 1.35"
FHSBATT3-F7	3/F	8 Amp/Hrs	4W: 360min, 6W: 235min, 8W: 175min, 10W: 135min	4.00" x 3.60" x 1.35"
FHSBATT3-F7L	3/F	8 Amp/Hrs	4W: 360min, 6W: 235min, 8W: 175min, 10W: 135min	11.75" x 1.56" x 1.37"

HotSpot1 LED Emergency Retrofit Kits



Model Number	Watts	Lumen Output	Comparable Fluorescent Lumen Output	Estimated Run Time (Mins)	Module Dimensions (L x W)	Case Qty.
Linear Module						
FHSKITT03LNC†	3	450	720	145	4.68" x 0.82"	10
FHSKITT03LND†	3	450	720	200	4.68" x 0.82"	10
FHSKITT03LNF†	3	450	720	360	4.68" x 0.82"	20
FHSKITT03LNFL**	3	450	720	360	4.68" x 0.82"	20
FHSKITT04LNC	4	500	800	145	4.68" x 0.82"	10
FHSKITT04LND	4	500	800	200	4.68" x 0.82"	10
FHSKITT04LNF	4	500	800	360	4.68" x 0.82"	20
Linked Linear (2 Modules)						
FHSKITT07LND†	7	900	1440	100	4.68" x 0.82"	10
FHSKITT07LNF†	7	900	1440	180	4.68" x 0.82"	20
FHSKITT07LNFL**	7	900	1440	180	4.68" x 0.82"	20
Linked Linear (3 Modules)						
FHSKITT10LNF	10	1350	2160	120	4.68" x 0.82"	20
FHSKITT10LNFL*	10	1350	2160	120	4.68" x 0.82"	20
Small-H Module						
FHSKITT06SHC	6	750	1200	90	3.54" x 3.93"	10
FHSKITT06SHD	6	750	1200	125	3.54" x 3.93"	10
FHSKITT06SHF	6	750	1200	235	3.54" x 3.93"	20
FHSKITT10SHF	10	1250	2000	135	3.54" x 3.93"	20
Large-H Module						
FHSKITT08LHD	8	1000	1600	90	5.71" x 3.93"	10
FHSKITT08LHF	8	1000	1600	175	5.71" x 3.93"	20
FHSKITT10LHF	10	1250	2000	135	5.71" x 3.93"	20

* Linear battery

† 3W and 7W kits are UL Marine Classified



EXIT Signs & Emergency Fixtures

Fulham's suite of EXIT Signs, Running Man Signage and Emergency fixtures has been developed to cover all common applications (including some regional requirements, such as NYC EXITS), while also enhancing convenience with features such as self-diagnostic or remote capability. Looking for wet location, cold temp, impact resistant or high lumen output options? Look no further!



EMERGENCY

EMERGENCY



Emergency Lighting

Reliable, energy-efficient emergency lights in a variety of styles and sizes



Low Profile Emergency Lighting

Model Number	Housing Color	Light Source	Operation Mode	Features
FHEM10W**				Adjustable Heads
FHEM10WH**	White	LED	Battery Back Up	High Lumen Output
FHEM10WHU				High Lumen Output / Universal Voltage
FHEM12W†				Fully Adjustable Heads
FHEM12WW†	White	LED	Battery Back Up	Fully Adjustable Heads / Wet Location
FHEM16W* ††	White	LED	Battery Back Up	High Lumen Output / Remote Capability Available
FHEM17	White	LED	Battery Back Up	800 Lumens / Fully-adjustable Square Heads / Impact Resistant / Dual Voltage 120V/277V / 90 min EM operation / Damp Location
FHEM18W*	White	LED	Battery Back Up	600 Lumens / Thin with Round Adjustable Heads / Remote Capable Option / Self-Diagnostic Option

* CEC Title 20 Compliant
 † These models are UL Listed, not cULus.
 †† The FHEM16W is not available with Self-Diagnostic

= Self-Diagnostic



Emergency Lighting / Exit Sign Combo

Versatile emergency light and exit sign combination units with remote head capability



Emergency Lighting / Exit Sign Combo

Model Number	Description	Housing Color	Letter Color	Operation Mode	Features
FHEC30WR	Combo	White	Red	Battery Back Up	Micro LED Heads
FHEC30WG			Green		
FHEC33WR	High Brightness Combo	White	Red	Battery Back Up	LED High Output Heads / Remote Capability Available
FHEC33WG			Green		LED High Output Heads
FHEC34R*	Wet Location Combo	White	Red	Battery Back Up	Red Only: Cold Weather Heater for use down to -20°C
FHEC34G*			Green		Wet Location / Remote Capability Available
FHEC35R	Thermoplastic Slim Adjustable Combo	White	Red	Battery Back Up	Self-Diagnostics and Remote Capability Available
FHEC35G			Green		

*These models are UL Listed, not cULus.

= Self-Diagnostic



LED Exit Signs

Dependable LED exit signs with slim profile and edge-lit options



Model Number	Description	Housing Color	Letter Color	Operation Mode	Features
FHEX20WREM**	Slim Profile Thermoplastic Micro LED Exit Sign	White	Red	Battery Back Up	Micro LED
FHEX20WGEM**			Green		
FHEX21WREM	Thin Profile Thermoplastic LED Exit Sign	White	Red	Battery Back Up	Self Diagnostic Capability Available
FHEX21WGEM			Green		
FHEX21WRAC			Red	AC Only	
FHEX21WGAC			Green		
FHEX23ASGEM	Edge-Lit LED Exit Sign	Aluminum	Green	Battery Back Up	Recessed Mount
FHEX24ASREM*	Edge-Lit LED Exit Sign	Aluminum	Red	Battery Back Up	Surface Mount
FHEX24ASGEM*			Green		
FHEX26R	Wet Location LED Exit Sign	White	Red	Battery Back Up	Cold Weather Heater available for use down to -20°C
FHEX26G			Green		Wet Location / Remote Capability Available

* Refer to Spec Sheet for active part numbers.
 ** This model is cULus Listed.

= Self-Diagnostic



Running Man LED Exit Sign

Single or double face with changeable legends. Comes standard with three pictogram legends for directional selection. cULus Listed, Damp Location Rated. 120VAC / 347VAC Input, Input Power 4W. High quality NiCad battery. Low power consumption and LED light source for reduced operation and maintenance costs. 75,000 hr life. High impact UV flame rated thermoplastic. Universal Mounting: Ceiling, wall or side mount.



FHEU20

We also offer Regional Emergency Exit items available for review online such as:



New York City Approved Exit Lighting
FHNY11



New York City Approved Exit Signage
FHNY31



LED Drivers

Frequent LED Driver line extensions, improvements and new product launches are a predictable trait, as we march ahead with growing numbers of Programmable and/or Current Selectable indoor and outdoor drivers of many form factors for nearly all applications. Fulham serves an international clientele requiring the highest quality and reliability standards for Constant Current and Constant Voltage drivers. Trust us to do the same for you, and let the Fulham Custom Shop work to your advantage, if you don't see what you need.





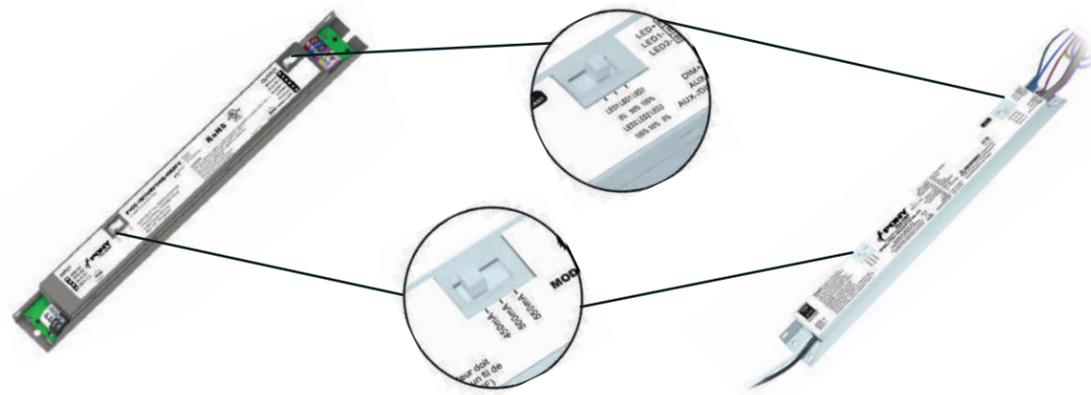
PONY Selectable Current IP20 LED Drivers

- Versatility and Convenience of Selectable Current with 3 preset currents per model (50mA intervals)
- Mitigates Supply Shortages for dedicated items that are hard to find
- Applications: Indoor - Office
- Class 2 output
- cULus listed, Class P
- 0-10V dimmable from 100%-10%
- Linear form factor with wires
- IP20 rating
- EMI: FCC Part 15 Class A
- Input Surge Protection: Line-Neutral 1kV, Line & Neutral-Ground 2kV, RingWave 2.5kV
- Ambient Temperature: -25°C - 50°C



PONY Selectable Current IP20 LED Drivers

Part Number	Max Output Power	Input Voltage	Output Voltage Range (VDC)	Selectable Current Range (mA)	0-10V Dimming Range	Typical Efficiency at Max Load	Dimensions (inches)		
							L	W	H
PYCC-1M1UNV040S-20L	20W	120-277VAC	30~42Vdc	300 / 350 / 400	100-10%	86%	11.02"	1.18"	0.83"
PYCC-1M1UNV055S-30L	30W	120-277VAC	30~42Vdc	450 / 500 / 550	100-10%	86%	11.02"	1.18"	0.83"
PYCC-1M1UNV070S-30L	30W	120-277VAC	30~42Vdc	600 / 650 / 700	100-10%	86%	11.02"	1.18"	0.83"
PYCC-1M1UNV085S-40L	40W	120-277VAC	30~42Vdc	750 / 800 / 850	100-10%	86%	11.02"	1.18"	0.83"
PYCC-1M1UNV100S-40L	40W	120-277VAC	30~40Vdc	900 / 950 / 1000	100-10%	86%	11.02"	1.18"	0.83"
PYCC-1M1UNV115S-50L	50W	120-277VAC	30~42Vdc	1050 / 1100 / 1150	100-10%	86%	11.02"	1.18"	0.83"
PYCC-1M1UNV130S-60L	60W	120-277VAC	30~42Vdc	1200 / 1250 / 1300	100-10%	86%	11.02"	1.18"	0.83"



Part Numbering Key Made to order options: MQQ of 500pcs (special lead time applies)

P Y C C - 1 M 1 U N V 0 4 0 S - 2 0 E - A F C

With connectors (E), Leads (L)
 With Auxiliary power/dim to off (A)
 With Flicker Free, <4% (F)
 CCT Selectable (C)



Programmable Constant Current LED Drivers

- Versatile, Convenient Programmable Drivers
- Mitigates Supply Shortages for dedicated items that are hard to find
- Universal Input 120-277VAC, Class 2 output
- cULus listed, Class P or cURus
- 0-10V dimmable from 100%-1%, dim-to-off or 100%-0%
- Form factors: Linear/Compact with Connectors
- IP20 rating
- Options with Auxiliary output
- Handheld programmer or SmartSet software (TPSB-100)



Part Number	Form Factor	Max Output Power	Input Voltage	Output Voltage Range (VDC)	Programmable Output Current Range (mA)	0-10V Dimming Range	Typical Efficiency at Max Load	AUX Output	Customizable Dimming Curves/Step Dimming	Dimensions (inches)		
										L	W	H
THCC-1M1UNV105P-30E	Linear	30W	120-277VAC	12~55VDC	350-1050mA	100-1%, Dim to off	85%	12VDC/200mA	N/A	11.02"	1.14"	1.02"
T1M1UNV105P-40E	Linear	40W	120-277VAC	10~57VDC	250-1050mA	100-0%	85%	N/A	YES	10.83"	1.22"	0.98"
THCC-1M1UNV140P-50E	Linear	50W	120-277VAC	12~55VDC	400-1400mA	100-1%, Dim to off	86%	12VDC/200mA	N/A	11.02"	1.14"	1.02"
T1M1UNV105P-60E	Linear	60W	120-277VAC	10~57VDC	250-1050mA	100-0%	88%	N/A	YES	9.33"	1.59"	1.18"
T1M1UNV105P-60F	Compact	60W	120-277VAC	10~57VDC	250-1050mA	100-0%	88%	N/A	YES	4.98"	2.99"	1.22"
THCC-1M1UNV240P-85E*	Linear	85W	120-277VAC	10~55VDC	700-2400mA	100-1%, Dim to off	86%	12VDC/200mA	N/A	16.73"	1.14"	1.02"

*Coming Soon

The Power of Programmability

Fulham's LED drivers feature our innovative SmartSet programming platform, which gives the user the power to create the right driver for any situation.

- Auto-Programming capability for high volume usage
- Driver does not need to be powered during programming
- Programming via handheld controller or PC software



TPSB-100 SmartSet Controller



SmartSet Software

To see the Fulham SmartSet programming platform in action visit the links below:
 Overview of basic programming features: www.fulham.com/smartsetprogramming
 One touch Auto-Programming: www.fulham.com/smartsetauto
 Programming custom dimming curves: www.fulham.com/smartsetdimmingcurve



LED Programmable Drivers (IP65 and IP66)

- Versatile Programmable Outdoor Drivers
- Class 2 output
- 0-10V Dimmable
- Wire Type
- EMI: FCC Part 15 Class B
- Input Surge Protection: Line-Neutral 6KV, Line & Neutral-Ground 10KV
- Aluminum Extrusion heatsink housing
- Type HL
- IP65 or IP66
- SmartSet and Handheld Programmer: TPSB-100



Part Number	Max Output Power	Input Voltage	Input Surge	Output Voltage Range	Programable Output Current Range (mA)	0-10V Dimming	Certification	IP Rating	Efficiency @ Max Load 277VAC	Dimensions (inches)		
										L	W	H
T1M1UNV210P-60L*	60W	120-277VAC	Line-Neutral 4kV, Line & Neutral-Ground 6kV	10-57VDC	500-2100mA	100-1%, Dim to Off	cULus Listed, Class P	IP65	89%	9.49"	1.69"	1.14"
WHCC-1M1UNV210P-75L	75W	120-277VAC	Line-Neutral 6kV, Line & Neutral-Ground 10kV	28-56VDC	350-2100mA	100%-10%	cULus Listed, Class P	IP66	91.5%	5.71"	2.6"	1.44"
T1M1UNV240P-96L*	96W	120-277VAC	Line-Neutral 4kV, Line & Neutral-Ground 6kV	30-56VDC	700-2400mA	100%-10%	cULus Listed, Class P	IP65	88%	6.69"	2.56"	1.26"
WHCC-1M1UNV260P-100L	96W	120-277VAC	Line-Neutral 6kV, Line & Neutral-Ground 10kV	28-56VDC	350-2670mA	100%-10%	cULus Listed, Class P	IP66	91.5%	5.71"	2.6"	1.44"

*RoHS Compliant



IP66 Dimmable Constant Current LED Driver

Coming Soon

- Application: Outdoor, Warehouse, Industrial
- Universal Voltage Input: 120-277VAC
- Efficiency > 90% at Full load
- Non-Class 2 Output
- Programmable Output Current with Fulham's SmartSet: TPSB-100
- Dimmable: 0-10V from 100%-10%
- Certification: cULus Listed (Class P), RoHS, IP66 rated, Dry, Damp, Type HL (IP67/Wet location option available)
- Wire Type
- EMI: FCC Part 15 Class B
- Input Surge Protection: Line-Neutral 6KV, Line & Neutral-Ground 10KV
- Aluminum Extrusion heatsink housing



Part Number	Max Output Power	Output Voltage Range (VDC)	Programable Output Current Range (mA)	Efficiency @ Max Load	Dimensions (inches)		
				@ 277VAC	L	W	H
WHSG-1M1UNV105P-75L	75W	53-107	350-1050	92.30%	5.71"	2.6"	1.44"
WHSG-1M1UNV140P-100L	96W	53-107	350-1400	92.30%	5.71"	2.6"	1.44"
WHSG-1M1UNV069P-100L	96W	96-102	500-690	92.30%	5.71"	2.6"	1.44"
WHSG-1M1UNV420P-150L	150W	28-56	700-4200	91.50%	6.5"	2.6"	1.44"
WHSG-1M1UNV208P-150L	150W	56-107	500-2080	91.50%	6.5"	2.6"	1.44"
WHSG-1M1UNV100P-150L	150W	107-214	350-1000	91.50%	6.5"	2.6"	1.44"
WHSG-1M1UNV560P-200L	200W	28-56	700-5600	92.50%	7.68"	2.6"	1.44"
WHSG-1M1UNV210P-200L	200W	75-150	500-2100	93.40%	7.68"	2.6"	1.44"
WHSG-1M1UNV110P-200L	200W	143-286	350-1100	93.60%	7.68"	2.6"	1.44"
WHSG-1M1UNV670P-240L	240W	28-56	700-6700	92.80%	7.68"	2.6"	1.44"
WHSG-1M1UNV210P-240L	240W	90-180	500-2100	93.60%	7.68"	2.6"	1.44"
WHSG-1M1UNV110P-240L	240W	171-342	350-1100	93.80%	7.68"	2.6"	1.44"
WHSG-1M1UNV760P-320L	320W	30-60	1500-7600	93.40%	9.57"	2.99"	1.63"
WHSG-1M1UNV210P-320L	320W	120-240	500-2100	94.20%	9.57"	2.99"	1.63"
WHSG-1M1UNV110P-320L	320W	229-457	350-1100	94.30%	9.57"	2.99"	1.63"



SugarCube Constant Current Drivers



- Small or compact form factor LED drivers
- Dedicated or Universal Voltage input
- Class 2
- Multiple Dimming types offered
- Dedicated or Programmable Current

Part Number	Max Output Power	Input Voltage	Output Voltage Range (VDC)	Programable Output Current Range (mA)	Dimming Type & Range	Typical Efficiency at Max Load	Certification	Dimensions (inches)			IP Rating
								L	W	H	
T1T11200350-15L	15W	120VAC	20~42VDC	350mA	TRIAC/ELV, 100%-10%	82%	cURus	3.94"	1.18"	0.91"	IP64
TC11200350-15C*	15W	120VAC	24~50VDC	350mA	N/A	>80%	cURus	2.57"	1.77"	0.98"	Damp
T1M1UNV0350-15L***	15W	120-277VAC	18~45VDC	350mA	0-10V, 100%-10%	85%	cULus Listed, Class P	3.94"	1.18"	0.9"	IP64
T1T11200700-30L	30W	120VAC	21~42VDC	700mA	TRIAC/ELV, 100%-10%	82%	cURus	4.65"	1.18"	1.16"	IP64
T1T11200700-30C	30W	120VAC	21~42VDC	700mA	TRIAC/ELV, 100%-10%	82%	cURus	3.35"	2.56"	0.75"	IP64
T1M1UNV0700-30L***	30W	120-277VAC	18~45VDC	700mA	0-10V, 100%-10%	86%	cULus Listed, Class P	4.65"	1.18"	1.16"	IP64

*Planned Phase-Out ***RoHS Compliant



EliteBlue Driver (T2C1)



- Universal Input: 120-277VAC
- Class 2 output
 - Programmable output current: 250mA-1500mA
 - Output Voltage range: 10-57V
- cULus listed, Class P
- 0-10V dimmable: 100%-1% or 0% (off)
- Bluetooth Dimmable – Compatible with Fulham Smartlink
- Linear form factor with wires
- IP20 rating
- Input Surge Protection: 2.5KV, common and differential mode
- SmartSet and Handheld Programmer: TPSB-100



Part Number	Max Output Power	Input Voltage	Output Voltage Range (VDC)	Programable Output Current Range (mA)	0-10V Dimming Range	Typical Efficiency at Max Load	AUX Output	Dimensions (inches)		
								L	W	H
T2C1UNV150P-40L	40W	120-277VAC	10~57VDC	250-1500mA	100-1%, Dim to off	89%	N/A	6.61"	1.97"	1.18"



Dont see it? Ask for it!

Fulham's revered product quality and world-class customer responsiveness make us the preferred partner to over 3000 lighting manufacturers and distributors worldwide.

Fulham's rigorous quality control program ranks among the highest in the industry. Come to us with your application details and requirements. We can get back to you with the feasibility of a Custom solution!



ENGINEERED FOR RELIABILITY

An active surge suppressor protects the driver from disturbances on the mains.

ENGINEERED FOR DURABILITY

Large highest commercial grade electrolytic capacitors on the output side, specified for 10,000 hours at 105 degrees. Within the driver we have a self-regulating temperature design ensuring our confident 5 year warranty.

ENGINEERED FOR PERFORMANCE

The Lumo Series' low ripple design creates a very stable power output for flicker-free lighting and smooth dimming. Making your LED lighting perform to the highest possible standards.

ENGINEERED FOR PERFORMANCE

Low ripple design creates very stable power output for flicker-free lighting and smooth dimming. Making your LED lighting perform to the highest possible standards.

ENGINEERED FOR SIMPLICITY

A wide voltage range that can power a wide variation of LED fixtures. Taking out the complexity of your Supply chain.

ENGINEERED FOR EFFICIENCY

Active flyback leakage energy recovery circuit bringing the driver efficiency up to 92% or higher, minimizing temperature increase.

Factors considered when deciding whether to use Constant Current or Constant Voltage include how the system will be installed, how it will be configured, and overall system efficiency requirements.

With Constant Current, the LED driver feeds a steady current through all LEDs on the module. Since each individual LED requires a certain voltage for the current to flow (known as Vf), the driver must provide enough voltage to equal the sum total of all the voltages of that module's LEDs. Note that, while the LED module is frequently designed with all LEDs connected in one continuous serial electrical chain, it is also possible to create branches that split the current flowing through the module. So it's essential to understand the design of the module's circuitry, and

the electrical rating of the LEDs themselves when connecting a Constant Current driver to Constant Current LED modules. Constant Current architectures offer higher operating efficiency than Constant Voltage, but less flexibility in connecting different modules and LEDs to the driver.

DID YOU KNOW?

There are 2 different approaches to the electrical interconnection between LED driver and modules: Constant Current and Constant Voltage

With Constant Voltage, the LED driver provides a steady voltage supply that enables power to flow through all LEDs connected. Since any given current flow requires a specific amount of voltage for each individual LED, it is necessary to buffer or regulate the voltage with a resistor (or equivalent component) in line with the connected LEDs. With proper resistance selection, the series connected LEDs receive proper -- never excessive -- voltage to regulate the current inflow. The Constant Voltage approach is most commonly used when the number of LED modules varies widely from different installations or product designs.



Dimmable Constant Voltage LED Drivers

- 12VDC or 24VDC Output
- 0-10V Dimming; 100% -10%
- Linear form factor
- Surge protection, overload protection
- Low temperature performance
- Ideal for signage, cove, and niche applications



Dimmable Constant Voltage LED Drivers

Model Number	Output Watts (W)	Output Current (mA)	Output Voltage (VDC)	Input Voltage (VAC)	Ch.	Surge Protection		IP	Dimensions (L x W x H)	Case Type
						L-N	L&N-G			
T1M1UNV012V-20L†	20	1660	12	100-277; 50/60Hz	1	1kV	2kV	62	6.30" x 1.57" x 0.98"	Linear w/End Leads
T1M1UNV024V-20L	20	833	24	100-277; 50/60Hz	1	1kV	2kV	64	6.30" x 1.57" x 0.98"	Linear w/End Leads
T1M1UNV012V-60L†	60	5000	12	100-277; 50/60Hz	1	2kV	4kV	64	9.49" x 1.69" x 1.22"	Linear w/End Leads
T1M1UNV024V-60L*	60	2500	24	100-277; 50/60Hz	1	2kV	4kV	64	9.49" x 1.69" x 1.22"	Linear w/End Leads
T1M1UNV012V-75L†	75	6250	12	100-277; 50/60Hz	1	2kV	4kV	64	9.49" x 1.69" x 1.22"	Linear w/End Leads
T1M1UNV024V-75L	75	3125	24	100-277; 50/60Hz	1	2kV	4kV	64	9.49" x 1.69" x 1.22"	Linear w/End Leads

* Made to Order

† Pending phase out; check with your Fulham rep for availability.



Non-Dimmable Constant Voltage LED Drivers

- 12VDC or 24VDC Output
- Linear form factor
- Surge protection, overload protection
- Low temperature performance



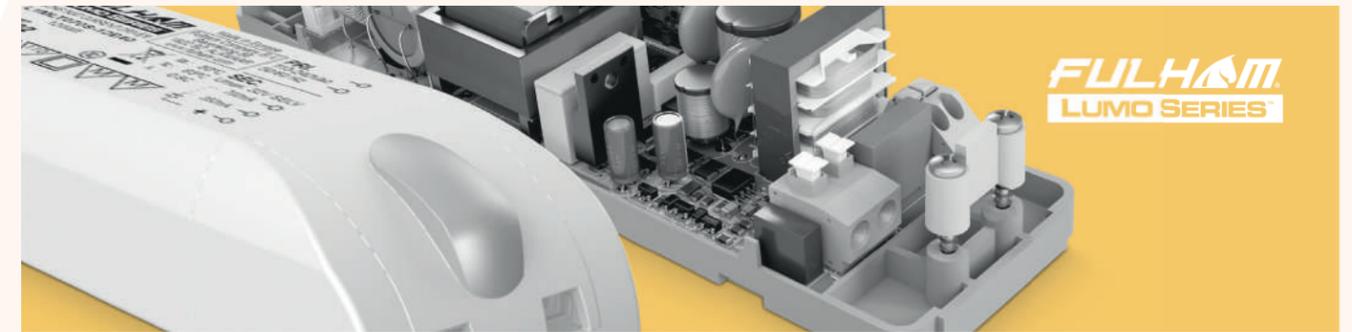
Non-Dimmable Constant Voltage LED Drivers

Model Number	Output Watts (W)	Output Current (mA)	Output Voltage (VDC)	Input Voltage (VAC)	Ch.	Surge Protection		IP	Dimensions (L x W x H)	Case Type
						L-N	L&N-G			
T1UNV024V-20L*	20	833	24	100-277; 50/60Hz	1	1kV	2kV	62	6.30" x 1.57" x 0.98"	Linear w/End Leads
T1UNV012V-60LF †	60	5000	12	100-277; 50/60Hz	1	2kV	4kV	64	9.49" x 1.69" x 1.22"	Linear w/End Leads
T1UNV024V-60L	60	2500	24	100-277; 50/60Hz	1	2kV	4kV	66	9.49" x 1.70" x 1.21"	Linear w/End Leads
T1UNV012V-60LG*	60	5000	12	100-277; 50/60Hz	1	2kV	4kV	68	9.53" x 1.67" x 1.34"	Linear w/End Leads
T1UNV024V-60LF	60	2500	24	100-277; 50/60Hz	1	2kV	4kV	64	9.49" x 1.69" x 1.22"	Linear w/End Leads
T1UNV012V-75L* †	75	6250	12	100-277; 50/60Hz	1	2kV	4kV	64	9.49" x 1.69" x 1.22"	Linear w/End Leads
T1UNV024V-75L* †	75	3125	24	100-277; 50/60Hz	1	2kV	4kV	64	9.49" x 1.69" x 1.22"	Linear w/End Leads
THCV1UNV024V-100L**	100	4100	24	120-277; 50/60Hz	1	2kV	4kV	64	10.47" x 1.69" x 0.96"	Linear w/End Leads

* Made to Order

**This driver is cULus Listed.

† Pending phase out; check with your Fulham rep for availability.



Exporting to Europe? Fulham Lumo Series is your answer.

Fulham Lumo Series drivers are built on core engineering design principles for exceptional standards of performance and reliability in LED systems. Highest grade critical components together with design features for thermal management ensure excellent reliability. Low ripple designs create flicker-free lighting and perfectly smooth dimming. Simplicity of specification and installation is a key characteristic of all Fulham Lumo Series drivers, hence the wide voltage and current ranges and industry leading low inrush current.

Ask your Fulham representative for more details about the Fulham Lumo Series.

fulham.com/product-systems/led-systems/lumoseries/



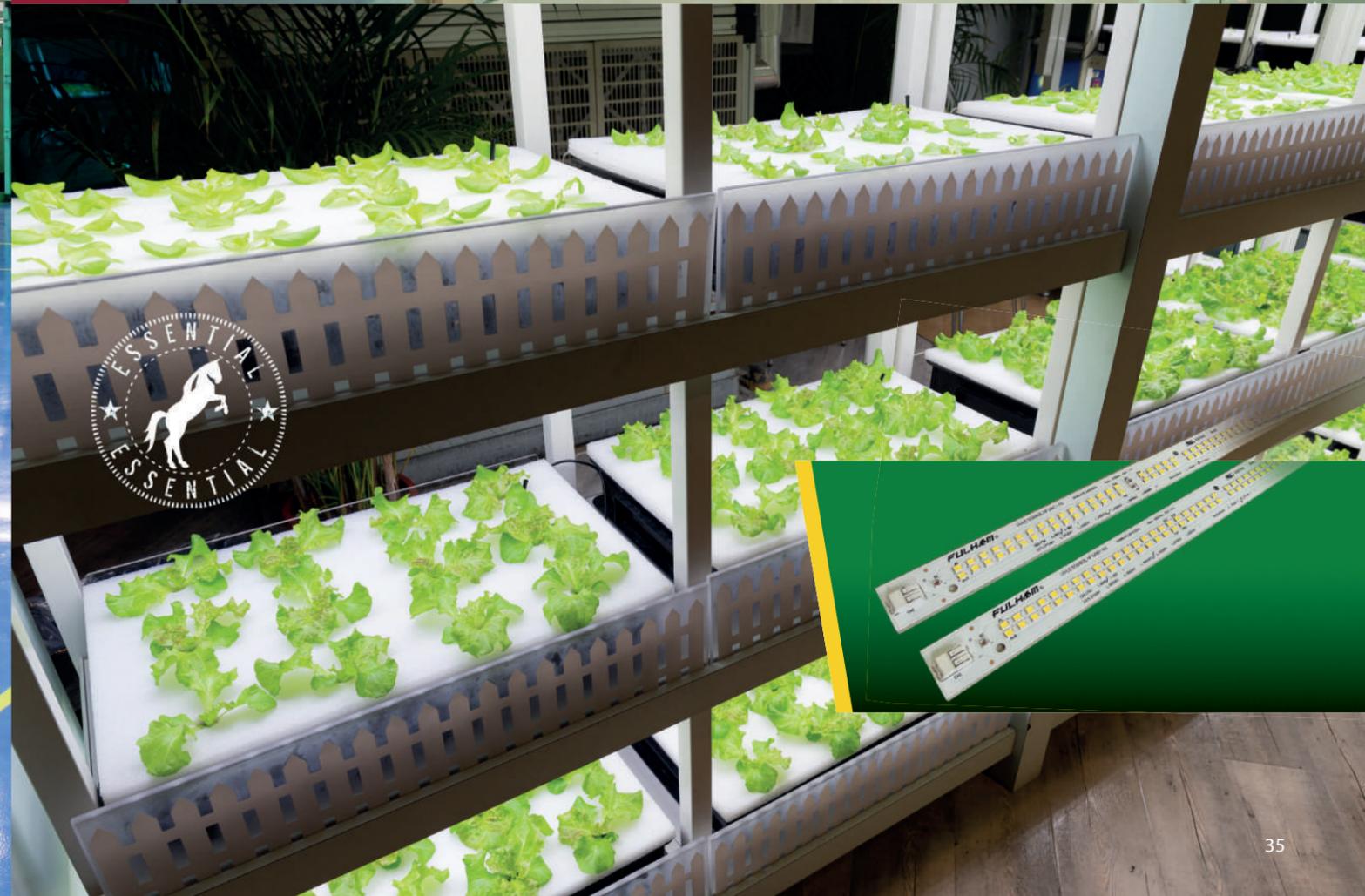
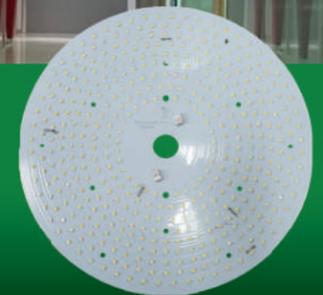
DRIVERS

DRIVERS



LED Modules & LED Retrofit Kits

If you have not reviewed Fulham's LED Module and Retrofit Kit offerings and capabilities lately, you may be surprised at the breadth and depth of the product lines. This is another focus area for Fulham that contains both general use items, as well as ESSENTIAL specialty ones for applications such as Germicidal UV and Horticulture luminaires. As you page through, pay particular attention to our cuttable modules and outdoor ones for wall packs, canopies and more. The development of custom modules is another area in which Fulham shines. We're capable of quick turn samples and rapid development for the right opportunities. Ask us how!





450mA ECO Series DC LED Modules



- Range of common lengths and wattages to fit a variety of luminaires
- High efficacy: up to 150 lm/W @ 350mA, 4000K/90 CRI
- On board connectors allow easy wire connections and end-to-end board linking
- 3 SDCM for high color consistency
- CRI90 Standard, meets CEC Title 24 requirement

Beam Angle	120°
Operating Temperature Range	-35°C to +45°C (-31°F to 113°F)
Lumen Maintenance	L70 = 60,000hrs @ Tc=105°C / L90 = 40,000hrs @ Tc=105°C
Color Consistency	Binning per ANSI C78.377-2008; 4 SDCM
PCB Material	FR-4
Warranty	5 years @ Max Tc from the date of manufacture
Safety/compliance	cURus (File # E351548), Class 2 Lighting System, RoHS Compliant

Model Number	Number of LEDs	Nominal Input Current* (mA)	Forward Voltage (VDC)	Nominal Power (W)	Dimensions (L x W) (including connector)	Lumens @4000K/80CRI (lm)	Nom. Efficacy @4000K / 80 CRI (lm/W)
VMU045005EC9xxA	12	350	11.5	4.0	1.5" x 0.94" x 0.22"	554	138
VMU045005EC9xxB	12	350	11.5	4.0	5" x 0.71" x 0.22"	605	150
VMU045010EC9xxA	24	350	23.0	8.1	5" x 0.71" x 0.22"	1096	136
VMU045010EC9xxB	24	350	23.0	8.1	11" x 0.71" x 0.22"	1172	145
VMU045010EC9xxC	24	350	23.0	8.1	17" x 0.71" x 0.22"	1172	145

* Max input current 450mA. See specification sheets for detailed information on input current levels.



VIZION Cuttable LED Modules

Next generation flexible designs for high output linear applications. 46" length cuttable at the center. Push-in connectors for easy wiring. Standard mounting hole patterns for compatibility with existing luminaires.

- Cover up to 16,000 lumens per single module
- Up to 175lm/W at maximum input power
- Typical 3 SDCM for high color consistency
- Ideal for DLC Standard and Premium
- Long lifetime: L70 > 60,000hrs; L90 = 40,000hrs
- Warranty: 5 years



Model Number	LED Qty	Lumens @ 4000K/80CRI	Max Input Current	Input Power	Forward Voltage	Efficacy	L (")	W (")	H (")	Master Carton Qty	Standard Stock
VMU096030CT8xxA-46	60	4,338	960mA	28.4W	29.5VDC	153lm/W	46	0.72	0.22	100	MTO
VMU096045CT8xxB-46	90	7,452	960mA	42.6W	44.4VDC	175lm/W	46	0.72	0.22	100	MTO
VMU160070CT8xxA-46	144	10,122	1600mA	66.2W	41.4VDC	153lm/W	46	0.72	0.22	100	MTO
VMU260095CT8xxA-46	192	16,126	2600mA	92.4W	35.6VDC	175lm/W	46	0.72	0.22	100	MTO
VMU252095CT8xxCT-48	144	14,385	2520mA	91.6W	36.4VDC	157lm/W	47.95	0.75	0.17	100	MTO



Low Profile Linear High Output DC LED Modules

- Ideal replacement for T5HO in linear highbays, water/vapor proof, and recessed and wall luminaires
- Aluminium extrusion mount provides superior thermal management
- Low profile design for use in smaller luminaires
- Constant current, high-efficiency LEDs, 3 SDCM for high color consistency
- Up to 219 lm/W; output range 234 lm to 14,699 lm (@4000K/80CRI)
- Optional lenses snap on in seconds (See page 25)



Specifications

Operating Temp. Range	-40°C to 55°C / -40°F to 131°F	PCB Material	MCPCB (Aluminium Clad)
Color Consistency	Binning per ANSI C78.377-2015 @ 25°C; 3 SDCM	Warranty	5 years @ 105°C Tc from the date of manufacture
Lumen Maintenance	L70: >60,000Hrs / L90: 40,000Hrs (meets DLC Premium and Standard requirements)	Safety/compliance	cURus (File # E351548), UL Class 2 Lighting System, CE, SELV, RoHS Compliant

Product Models

Model Number / Dimension (L x W x H)	Number of LEDs	Input Current (mA)	Nom. Fwd. Voltage (VDC)	Nom. Rated Power (W)	Max. Fwd. Voltage (V)	Max. Rated Power (W)	Nom. Lum. @4000K/80CRI (lm)	Nom. Efficacy @4000K/80CRI (lm/W)
VMU048012LPyxxA 5.51" x 1.26" x 0.29" (140mm x 32mm x 7.4mm)	24	175	22.3	3.9	25	4	799	205
		350	23.1	8.1	25	9	1518	187
		480*	23.8	11.40	26	12	1959	172
VMU064025LPyxxA 10.94" x 1.26" x 0.29" (278mm x 32mm x 7.4mm)	48	350	34.0	11.9	37	13	2347	197
		450	34.7	15.6	38	17	2942	189
		640*	35.6	22.8	39	25	3919	172
VMU080030LPyxxA 22.01" x 1.26" x 0.29" (559mm x 32mm x 7.4mm)	60	350	33.7	11.8	37	13	2380	202
		700	35.1	24.6	39	27	4418	180
		800*	35.6	28.5	39	31	4899	172
VMU125050LPyxxA 22.01" x 1.26" x 0.29" (559mm x 32mm x 7.4mm)	96	350	32.9	11.5	35	12	2425	211
		700	34.1	23.9	36	26	4698	197
		1250*	35.5	44.4	38	49	7700	173
VMU140055LPyxxB† 33.07" x 1.26" x 0.29" (840mm x 32mm x 7.4mm)	108	700	33.8	23.7	36	25	4736	200
		1050	34.7	36.4	38	39	6847	188
		1400*	35.5	49.7	39	55	8656	174
VMU140055LPyxxA 44.13" x 1.26" x 0.29" (1121mm x 32mm x 7.4mm)	108	700	33.8	23.7	36	25	4736	200
		1050	34.7	36.4	38	39	6847	188
		1400*	35.5	49.7	39	55	8656	174
VMU140055LPyxxC† 45.98" x 1.26" x 0.29" (1168mm x 32mm x 7.4mm)	108	700	33.8	23.7	36	25	4736	200
		1050	34.7	36.4	38	39	6847	188
		1400*	35.5	49.7	39	55	8656	174
VMU240095LPyxxA 44.13" x 1.26" x 0.29" (1121mm x 32mm x 7.4mm)	180	700	33.0	23.1	35	24	4838	209
		1400	34.2	47.9	37	52	9331	195
		2400*	35.6	85.4	39	94	14,699	172
VMU240095LPyxxC† 57.95" x 1.26" x 0.29" (1472mm x 32mm x 7.4mm)	180	700	33.0	23.1	35	24	4838	209
		1400	34.2	47.9	37	52	9331	195
		2400*	35.6	85.4	39	94	14,699	172

* Indicates maximum rated current. Modules may be operated at a current less than or equal to this value, below the Tc rating.
† Made to order. Minimum order quantity applies.

Part Numbering Key

V M U 240 095 LP 8 30 A

Color Temperature
Standard: 30 = 3000K, 35 = 3500K, 40 = 4000K, 50 = 5000K
Made-to-order: 27 = 2700K, 57 = 5700K, 65 = 6500K

CRI
Standard: 8 = 80, 9 = 90
Made-to-order: 8 = 80, 9 = 90



Linear High Output DC LED Modules

- Ideal replacement for T5HO in linear highbays, water/vapor proof, and recessed and wall luminaires
- Aluminum extrusion mount for thermal management with positioning magnets
- LED at each end and connector underneath for even light distribution
- Constant current, high-efficacy LEDs, 3 SDCM for high color consistency
- Up to 198 lm/W; output range 2,200 lm to 13,310 lm (@4000K/80CRI)



Specifications			
Operating Temp. Range	-40°C to 55°C / -40°F to 131°F	PCB Material	CEM3
Color Consistency	Binning per ANSI C78.377-2015 @ 25°C; 3 SDCM	Warranty	5 years @ 105°C Tc from the date of manufacture
Lumen Maintenance	L70: >60,000Hrs / L90: 40,000Hrs (meets DLC Premium and Standard requirements)	Safety/compliance	cURus (File # E351548), UL Class 2 Lighting System, CE, SELV, RoHS Compliant

Product Models

Model Number / Dimension (L x W x H)	Number of LEDs	Input Current (mA)	Nom. Fwd. Voltage (VDC)	Nom. Rated Power (W)	Max. Fwd. Voltage (V)	Max. Rated Power (W)	Nom. Lum. @ 4000K/80CRI (lm)	Nom. Efficacy @ 4000K/80CRI (lm/W)
TMU125050CLyxxA 22" x 1.73" x 0.39" (560mm x 44mm x 10mm)	96	350	33	12	35	12	2245	195
		1050	35	37	38	40	6210	169
		1250*	36	44	39	49	7130	161
TMU140055CLyxxA 44.1" x 1.73" x 0.39" (1120mm x 44mm x 10mm)	108	350	33	11	34	12	2255	196
		1050	35	36	38	39	6340	174
TMU140055CLyxxB† 33.7" x 1.73" x 0.39" (840mm x 44mm x 10mm)	180	1400*	36	50	39	55	8015	161
		350	32	11	34	12	2230	198
TMU240095CLyxxA 44.1" x 1.73" x 0.39" (1120mm x 44mm x 10mm)	180	1400	34	48	37	52	8640	180
TMU240095CLyxxC† 58" x 1.73" x 0.52" (1473.2mm x 44mm x 13.3mm)		2400*	36	85	39	94	13610	159

* Indicates maximum rated current. Modules may be operated at a current less than or equal to this value, below the Tc rating.

† Made to order. Minimum order quantity applies.

Part Numbering Key

T M U 240 095 CL 8 30 A

Color Temperature
Standard: 30 = 3000K
35 = 3500K
40 = 4000K
50 = 5000K
Made-to-order: 27 = 2700K
57 = 5700K
65 = 6500K

CRI
Standard: 8 = 80
Made-to-order: 9 = 90

Accessories for Low Profile Linear HO & Linear HO Output DC Modules

Model Number	Description	Model Number	Description
TLE-OPT-120-002	5.5" snap-on lens, 82% transmissivity	TLE-OPT-120-021*	58" snap-on lens, 82% transmissivity
TLE-OPT-120-003	11" snap-on lens, 82% transmissivity	TLE-OPT-120-020	Standard LinearHO module end caps (2 pieces)
TLE-OPT-120-004	22" snap-on lens, 82% transmissivity	VLE-OPT-120-012*	Low Profile LinearHO module end caps (2 pieces)
VLE-OPT-120-033D*	33" snap-on lens, 82% transmissivity	TLC-HN02	22" wire harness for 1 or 2 modules in parallel
TLE-OPT-120-013	44" snap-on lens, 82% transmissivity	TLC-HN04	22" wire harness for 3 or 4 modules in parallel
TLE-OPT-120-014*	46" snap-on lens, 82% transmissivity		

*Made to order.



Linear High Output LED Retrofit Kits

- Complete LED retrofit kit: modules, driver, wiring harness, installation hardware, and UL labels
- Universal voltage (120V-277V) with high power factor and low THD
- Multiple color temperatures: 3000K, 3500K, 4000K, 5000K
- Modules feature aluminum extrusion heatsink with positioning magnets
- UL Classified for field installation: 5-10 minutes per kit installation
- Optimized for use with Fulham HotSpot LED Emergency backup systems
- 0-10V dimmable
- 5-year warranty
- Listed on DLC Qualified Product List for utility rebate eligibility. Visit www.fulham.com/utilityrebates to learn more.



Product Models

Model Number	Length	Number of LED Modules	Number of LED Drivers	Input Voltage (VDC)	Input Current (A)		Total System Power (W)	Driver Efficacy (%)	Total System Lumens (lm)	Total System Efficiency (lm/W)
					120V	277V				
VR22-MU-150-840-0350A	22"	1	1	120-277	0.117	0.053	13.7	84	2245	164
VR22-MU-250-840-0350A		2	1	120-277	0.114	0.052	13.3	84	2266	170
VR22-MU-250-840-0700A		2	1	120-277	0.241	0.109	27.1	85	4490	166
VR22-MU-250-840-1050A	44"	2	1	120-277	0.347	0.157	41.4	85	6634	160
VR44-MU-195-840-0700A		1	1	120-277	0.242	0.110	27.2	85	4480	165
VR44-MU-295-840-0700A		2	1	120-277	0.237	0.107	26.6	85	4460	168
VR44-MU-295-840-1050A	44"	2	1	120-277	0.337	0.153	40.2	85	6756	168
VR44-MU-295-840-1400A		2	1	120-277	0.445	0.202	52.5	88	8960	171
VR44-MU-495-840-2400A		4	1	120-277	0.746	0.339	87.1	90	15,404	177

Values reflect performance at 277VAC unless otherwise specified.

Luminous Flux De-Rating: CCT and CRI Multipliers

	2700K	3000K	3500K	4000K	5000K	5700K	6500K
CRI 80	0.92	0.95	0.97	1.00	1.01	1.01	1.00

“ DID YOU KNOW? ”

The correlated color temperature (CCT) of white light is expressed in degrees Kelvin (K)

Degrees Kelvin is a temperature measurement as commonly understood. But in the context of “color temperature” it can be misleading, since that expression refers to the spectral quality of the color emitted by a light source -- not its hotness, chill or color saturation.

That quality of light, described in Kelvin (K), ranges from yellowish “soft white” at the low end (standard household bulbs); through “bright white” (big retail store lighting); to “daylight” at the upper (bluish-white) end. The lower the “K” (2700 - 3000) the “warmer” the light quality; the higher the “K” the “cooler” as it rises to the blue end of the spectrum (5000+K).

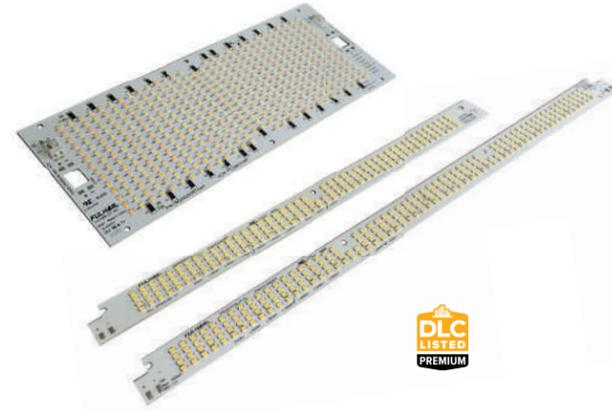
Fulham offers several different popular color temperatures to meet customer requirements.



Outdoor Street, Wallpack and Canopy Modules

Fulham's versatile outdoor series modules are ideal for street lights, wallpacks and canopy applications. Each module comes with push-in connectors for easy wiring, and standard mounting hole patterns for compatibility with 3rd party lenses and standard luminaires.

- Suitable for 30W – 200W per single module
- Each input channel for use in UL Class 2 applications
- High lumen output, high efficacy
- Compatible with a wide range of 3rd party lenses
- Typical 3 SDCM for high color consistency
- Ideal for DLC Standard and Premium
- Warranty: 5 years



Outdoor Street Modules

Model Number	LED Qty	Lumens @ 4000K/80CRI	Max Input Current	Input Power	Forward Voltage	Efficacy (lm/W)	L (")	W (")	H (")	Master Carton Qty	Standard Stock
VMU200100HS7xxA	16	11,129	2000mA	100W	50VDC	111	2.76	2.76	0.24	100	MTO
VMU140052RT7xxA	12	8,638	1400mA	51.8W	37VDC	167	5.71	1.71	0.24	100	MTO

Outdoor Wallpack Modules

Model Number	LED Qty	Lumens @ 4000K/80CRI	Max Input Current	Input Power	Forward Voltage	Efficacy	L (")	W (")	H (")	Master Carton Qty	Standard Stock
VM2150170LN8xxA-16	240	25,410	1500mA*2	164.8W	54.9VDC	154lm/W	16.20	0.92	0.06	100	MTO
VMU140050LN8xxA-12	108	8,030	1400mA	49.8W	35.6VDC	161lm/W	12.20	0.92	0.06	100	MTO
VMU240090LN8xxA-12	180	13,721	2400mA	85.7W	35.7VDC	160lm/W	12.20	0.92	0.06	100	MTO

Outdoor Canopy Modules

Model Number	LED Qty	Lumens @ 4000K/80CRI	Max Input Current	Input Power	Forward Voltage	Efficacy	L (")	W (")	H (")	Master Carton Qty	Standard Stock
VM2240100RT8TWA (Tunable White)	420	18,021	2400mA	95.4W	39.8VDC	189lm/W	11	4	0.29	20	MTO
VM2240200RT8xxA	420	34,901	2400mA*2	198.6W	41.4VDC	176lm/W	11	4	0.29	20	MTO
VMU240100RT8xxA	210	17,450	2400mA	99.3W	41.4VDC	176lm/W	11	4	0.29	20	MTO



Highbay and Lowbay LED Modules

- 13" diameter round constant current DC modules
- Suitable for high output low bay and high bay applications
- 3 SDCM for high color consistency
- Options for dual-channel 200W max. and single-channel 100W max.
- Each channel for use in UL Class2 lighting system
- High efficacy up to 200lm/W; output range 3,000 lm to 32,000lm



Specifications

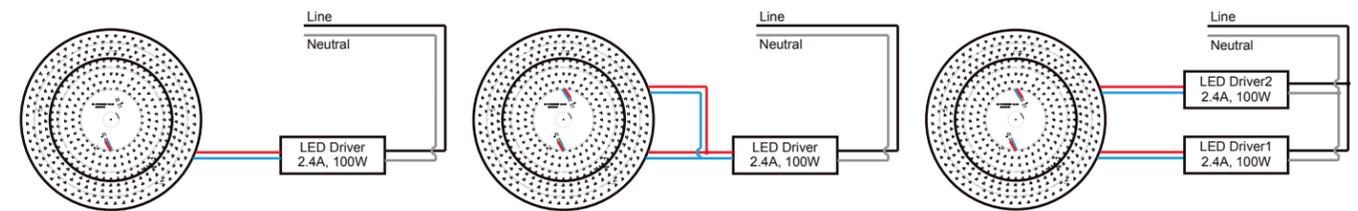
Operating Temp. Range	-40°C to 55°C / -40°F to 131°F	PCB Material	MCPCB (Aluminium Clad)
Color Consistency	Binning per ANSI C78.377-2015 @ 25°C; 3 SDCM	Warranty	5 years @ 105°C Tc from the date of manufacture
Lumen Maintenance	L70: >60,000Hrs / L90: 40,000Hrs (meets DLC Premium and Standard requirements)	Safety/compliance	cURus (File # E351548), UL Class 2 Lighting System, RoHS Compliant

Product Models

Model Number	Number of LEDs	Number of Input Channels	Wiring Diagram	Input Current* (mA)	Forward Voltage (VDC)	Nominal Power (W)	Lumens @ 4000K/80CRI (lm)	Nom. Efficacy @ 4000K / 80 CRI (lm/W)
VMU240095HB8xxA**	208	1	#1	1200	36.4	43.7	8085	185
				2400	38.2	98.7	14701	160
VMU240095HB8xxB**	312	1	#1	1200	35.8	42.9	8416	196
				2400	37.0	88.9	16074	181
VM2240190HB8xxA**	416	2	#2	1200	35.4	42.4	8320	196
				2400	36.5	87.4	16170	185
				1200 x 2	36.4	87.4	16170	185
VMU2240190HB8xxB**	624	2	#3	2400 x 2	38.2	183.4	29401	160
				1200	34.9	41.8	8549	204
				2400	35.8	85.8	16833	196
			#3	1200 x 2	35.8	85.8	16833	196
				2400 x 2	37.0	177.8	32149	181

* Max input current 2400mA. See specification sheets for detailed information on input current levels.

** Made to Order across seven CCT options (2700, 3000, 3500, 4000, 5000, 5700 and 6500K). The xx in each part number denotes CCT through use of the first two digits of each, e.g. 27 = 2700K. Limited stock of 80CRI 3000K & 5000K is available.



Wiring Diagram #1

Wiring Diagram #2

Wiring Diagram #3



DirectAC LED Retrofit Kits

- Very low flicker, meets Title 24 requirements
- DirectAC Drive with integrated LED board
- Smooth TRIAC/ELV dimming down to 10%
- Kits include installation hardware and labels

- High voltage barrier and 5VA flame rated lens - suitable for open or fully enclosed luminaires
- JA8 Compliant



Specifications

Input Voltage	UNV (120-277VAC) 50/60 Hz
Beam Angle	120°
Estimated Lumen Maintenance (L70)	Circular and Rectangular models: L70 > 54,000hrs / L90 = 20,000hrs Linear models: L90 = 35,000hrs
Flicker Percentage	<30%
Operating Ambient Temp. Range (Ta)	-35°C to +50°C
PCB Material / Lens Material	MCPCB (superior thermal management) / Optical Grade Polycarbonate (5VA Flame rated)
Safety/Compliance	cULus Classified (File# E486779), cURus (File# E486778), RoHS Compliant, JA8 Compliant (2700-4000K @90CRI)
Protections	Surge 2.5V Common and Differential mode; Over Temperature Protection
Warranty	5 Years @ specified Tc from the date of manufacture

Product Models

Model Number	Input Power	Max Lumens @4000K**	CRI	Available CCT	Shape	Dimensions (Inches)
TJTUNV010AC9xxB	10W	1065	90	Standard options: 2700K, 3000K, 3500K, 4000K	Circular	3.11 Dia. x 0.71 H
VJTUNV010LN9xxB05	10W	1087	90		Linear	5.52 L x 2.21 W x 0.67 H
VJTUNV015LN9xxB11	15W	1644	90	Made-to-order: 5000K	Linear	11.03 L x 2.21 W x 0.67 H
TJTUNV015AC9xxB	15W	1680	90		Circular	5.08 Dia. x 0.75 H
TJTUNV015AR9xxB	15W	1725	90		Rectangular	7.40 L x 4.00 W x 0.71 H
TJTUNV023AC9xxB	23W	2540	90		Circular	6.97 Dia. x 0.71 H
VJTUNV030LN9xxB22	30W	3235	90		Linear	22.06 L x 2.21 W x 0.67 H
TJTUNV034AC9xxB	34W	3685	90		Circular	9.55 Dia. x 0.81 H

Part Numbering Key

V J T UNV 030 LN 9 30 B 22

Shape
AC = Circular
LN = Linear
AR = Rectangular

CRI
9 = 90

Color Temperature
Standard: 27 = 2700K
30 = 3000K
35 = 3500K
40 = 4000K
Made-to-order: 50 = 5000K



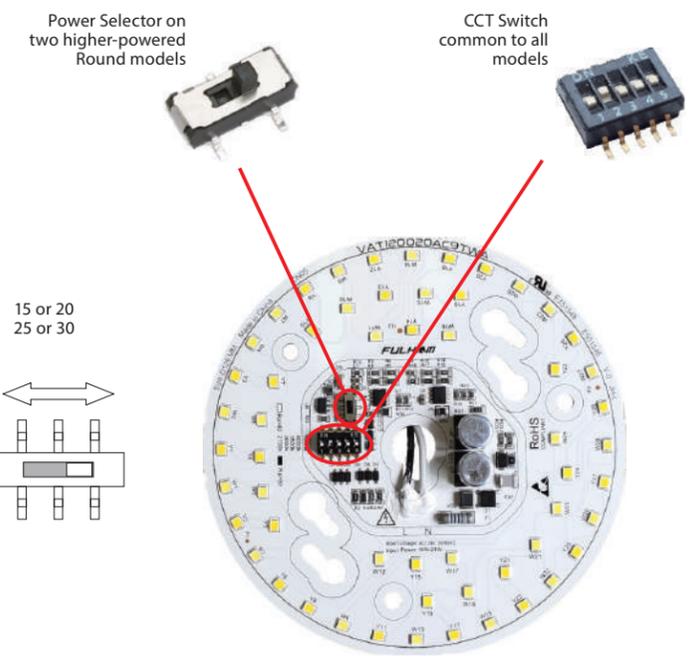
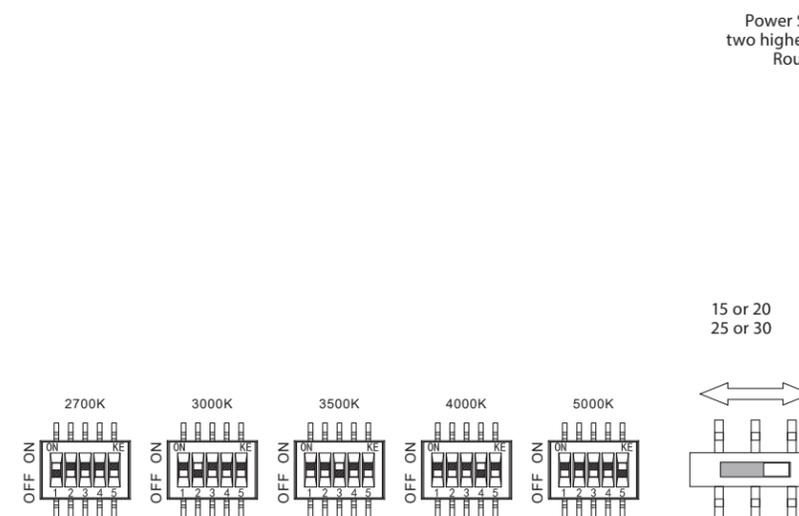
VividHorse 120VAC AC Engine Retrofit Kits - CCT Selectable & Power Selectable

- Dedicated 120V input AC Engine
- CCT Selectable: 2700K, 3000K, 3500K, 4000K, 5000K (Two Power-Selectable Models, as well)
- CRI90 standard, meet CEC Title 24 requirement
- Potassium Fluorosilicate (PFS) phosphor LEDs to achieve as high efficacy as today's CRI80 LEDs Simple installation can be done in the field in minutes
- Suitable for open or fully enclosed luminaires
- Suitable for luminaires with plastic and glass lenses
- cULus Classified 1598C as complete kit
- Uses cURus Recognized 8750 individual components
- Compatible with Fulham Emergency Driver FHSCP-UNV-6W-L-SD and Fulham 25W Micro-Inverter FHUPS1-UNV-25L-SD



Product Models

Model Number	Max Input Power(W)	Lumens @4000K	Standard CRI	Shape	Dimensions (inches)
VJT120010AC9TWB	10	980	90	Circular	3.11 Dia x 0.71 H
VJT120010LN9TWB-06	10	980	90	Linear	6.2 L x 2.41 W x 0.67 H
VJT120020AC9TWB	15 or 20 (power selectable)	1500 or 2000	90	Circular	5.12 Dia x 0.65 H
VJT120030AC9TWB	25 or 30 (power selectable)	2500 or 3000	90	Circular	6.64 Dia x 0.65 H



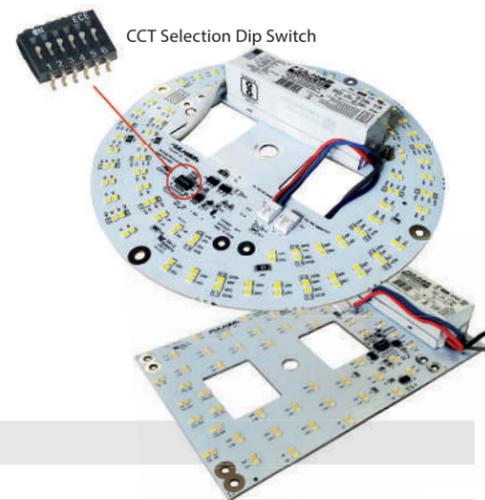
MODULES

MODULES



VividHorse DC LED Engine Retrofit Kits - CCT Selectable

- Dual channel LEDs, Dip Switch on PCB for six-level-CCT selectable: 2700K, 3000K, 3500K, 4000K, 4500K and 5000K
- CRI90 standard; advanced phosphor technology LEDs for superior CRI90 efficacy
- Protects investment by preserving existing luminaires
- No bulbs to change means lower maintenance costs
- Simple installation can be done in the field in minutes
- Kits include installation hardware, required UL Classified labels, and installation instructions



Specifications

Input Voltage	120~277VAC +/- 10% (50/60Hz)
Operating Temperature Range	-35°C to 60°C / -31°F to 140°F
Lumen Maintenance @105°C	L70= >60,000 hours / L90= 36,000 hours (@Tc max = 96°C)
Dimming Type / Range	0-10V / 100% ~ 10%
Color Consistency	Binning per ANSI C78.377-2015 @25°C; 3 SDCM
PCB Material / Connector Qty / Em. Connection	CEM1 / 2 / Yes
Input Surge Test	2.5kV Common and Differential mode (Per ES Ring Wave Test)
Warranty	5 years @ Max. Tc from the date of manufacture
Safety/compliance	cURus (File # E351548, E342838), cULus (File # E365124), RoHS Compliant

Product Models

Model Number	Number of LEDs	Input Power (W)	Nom. Lum. @4000K/90CRI (lm)	Engine Efficacy @90CRI (lm/W)	Shape	Dimensions (inches)
VKMUNV008RD930A	48+48	10	1400	140	Round	7.83 Dia. x 0.92 H
VKMUNV008RT930A	48+48	10	1400	140	Rectangular	7.4 L x 4.7 W x 0.92 H
VKMUNV012RD930A	72+72	14.5	2160	148	Round	7.83 Dia. x 0.92 H
VKMUNV018RD930A	48+48	21	2650	126	Round	7.83 Dia. x 0.92 H
VKMUNV018RT930A	48+48	21	2650	126	Rectangular	7.4 L x 4.7 W x 1.18 H
VKMUNV025RD930A	72+72	29.5	3730	126	Round	7.83 Dia. x 1.18 H

Part Numbering Key

V K M UNV 025 RD 9 30 A

Default CCT setting is 3000K.
Pre-setting to other CCTs is made to order. Contact Fulham for details

RD = Round
RT = Rectangular

Color Temperature
27 = 2700K 40 = 4000K
30 = 3000K 45 = 4500K
35 = 3500K 50 = 5000K

Modules Only (2022 Series)

Model Number	Nominal Input Power @ Max. Input Current	Shape	Max Input Current	Nom. Lum. Flux @5000K/90 CRI
VMU095023RD9TWA	23W	Round	950mA	3,463lm
VMU095034RD9TWA	34.5W	Round	950mA	5,194lm
VMU095023RT9TWA	23W	Rectangular	950mA	3,463lm



VividHorse LED Troffer Retrofit

- Suitable for 2'x2' and 2'x4' luminaires
- Universal Voltage with 0-10V dimming
- Meets CEC Title 24 JA10
- 3 selectable power levels per Model
- Offers opportunities for SKU reduction
- Optional Occupancy Sensor (ELMOPLX00SR)
- LED Troffer retrofit kits completely assembled within frame DLC Listed
- Roomside Installable
- CCT Selectable (3500K-5000K)
- UL 1598C, suitable for dry or damp locations
- 12VDC AUX output
- Compatible with Fulham Emergency Driver FHSCP-UNV-4W-L



Product Models

Model Number	Input Power(W)	Lumens @4000K	Standard CRI	Dimensions (inches)
VTR-22-MU-30-9TW-A	20 / 25 / 30	2640 / 3225 / 3,780	90	23.8 L x 23.8 W x 3.09 H
VTR-24-MU-45-9TW-A	34 / 38 / 45	4488 / 4902 / 5,670	90	47.8 L x 23.8 W x 3.09 H



VividHorse LED Panel Retrofit

- Suitable for 2'x2' and 2'x4' luminaires
- Universal Voltage with 0-10V dimming
- Meets CEC Title 24 JA10
- 3 selectable power levels per Model
- Offers opportunities for SKU reduction
- LED Panel retrofit kits completely assembled within frame DLC Listed
- Roomside Installable
- CCT Selectable (3500K-5000K)
- UL 1598C, suitable for dry or damp locations
- 12VDC AUX output
- Compatible with Fulham Emergency Driver FHSCP-UNV-4W-L



Product Models

Model Number	Input Power(W)	Lumens @4000K	Standard CRI	Dimensions (inches)
VPR-22-MU-25-9TW-A	18 / 22 / 25	2376 / 2838 / 3150	90	23.8 L x 23.8 W x 2.2 H
VPR-24-MU-36-9TW-A	23 / 30 / 36	3036 / 3870 / 4536	90	47.8 L x 23.8 W x 2.2 H

MODULES

MODULES



Horticultural Modules



- White & Red Spectrum for Horticulture Applications
- Suitable for Multi-layer Cultivation of Leafy Vegetables
- PPF/W up to 3.0 umol/j at Hot State
- 46" in length



Product Models
Made to Order
VHU150080LNFWRB-46
VHU150080LNFWRB-46



UVA LED Products



- Ideal UVA light source for curing, Photo-catalyst and detecting applications
- Near-UV (UVA) and visible light range, harmless to human body or eyes
- Available in 365nm and 395nm peak wavelength options
- Available in rigid 11" & 22" strips
- For use in UL Class 2 lighting systems



Specifications

Operating Temp. Range	-20°C to 55°C / -4°F to 131°F	Max. Tc temperature	80°C / 176°F
Warranty	5 years @ 80°C Tc from the date of manufacture	Safety/compliance	cURus (File # E351548), UL Class 2 Lighting System, RoHS Compliant

Product Models

Model Number	Number of LEDs	Dimension (L x W x H)	Type	Peak Wavelength (nm)	Input Current* (mA)	Forward Voltage (VDC)	Nominal Power (W)	Radiation Power (W)
VUU064025LP365A†	48	10.94" x 1.26" x 0.29" (278 x 32 x 7.4mm)	Constant Current	365 - 370	640*	38.8	24.8	0.60
VUU064025LP395A†				395 - 400	640*	38.8	24.8	8.97
VUU125050LP365A†	96	22.01" x 1.26" x 0.29" (559 x 32 x 7.4mm)	Constant Current	365 - 370	1250*	38.9	48.6	1.17
VUU125050LP395A†				395 - 400	1250*	38.9	48.6	17.53

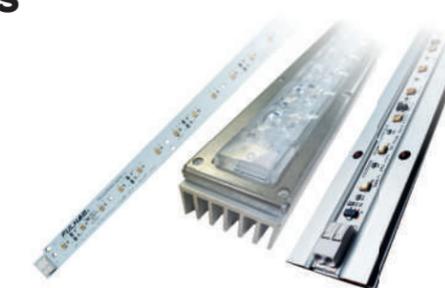
† Made to Order



UVC LED Products



- High efficiency germicidal UVC radiation, 270nm peak wavelength
- 395nm UVA + 270nm UVC in-one LED package, visual indicator when UVC is on
- 8"L x 1.26"W rigid strip with aluminum extrusion, superior thermal management
- 24VDC constant voltage input, for use in UL Class 2 lighting systems
- 11" Compatible with LEDiL VIOLET 12X1 UVC lens



Specifications

Operating Temp. Range	-20°C to 45°C / -4°F to 113°F	Max. Tc temperature	50°C / 122°F
Warranty	3 years @ 50°C Tc from the date of manufacture	Safety/compliance	cURus (File # E351548), UL Class 2 Lighting System, RoHS Compliant

Product Models

Model Number	Number of LEDs	Dimension (L x W x H)	Type	Peak Wavelength (nm)	Input Current* (mA)	Input Voltage (VDC)	Nominal Power (W)	UVC Radiation Power (mW)
VUU24V005LP270C -8*	9	8" x 1.26" x 0.29" (203 x 32 x 7.4mm)	Constant Voltage	UVC: 270 - 280 UVA: 395 - 405	145	24.0	4.5	45
VUU24V007LN270C -11*	12	11" x 0.756" x 0.27" (281 x 19.2 x 6.8mm)	Constant Voltage	UVC: 270 - 280 UVA: 395 - 405	270	24.0	6.5	60

* Made to Order



Dont see it? Ask for it!

A distinct advantage of Fulham is that we are the actual design engineers. Fulham is not merely a buyer / multiple-lister / re-brander and reseller.

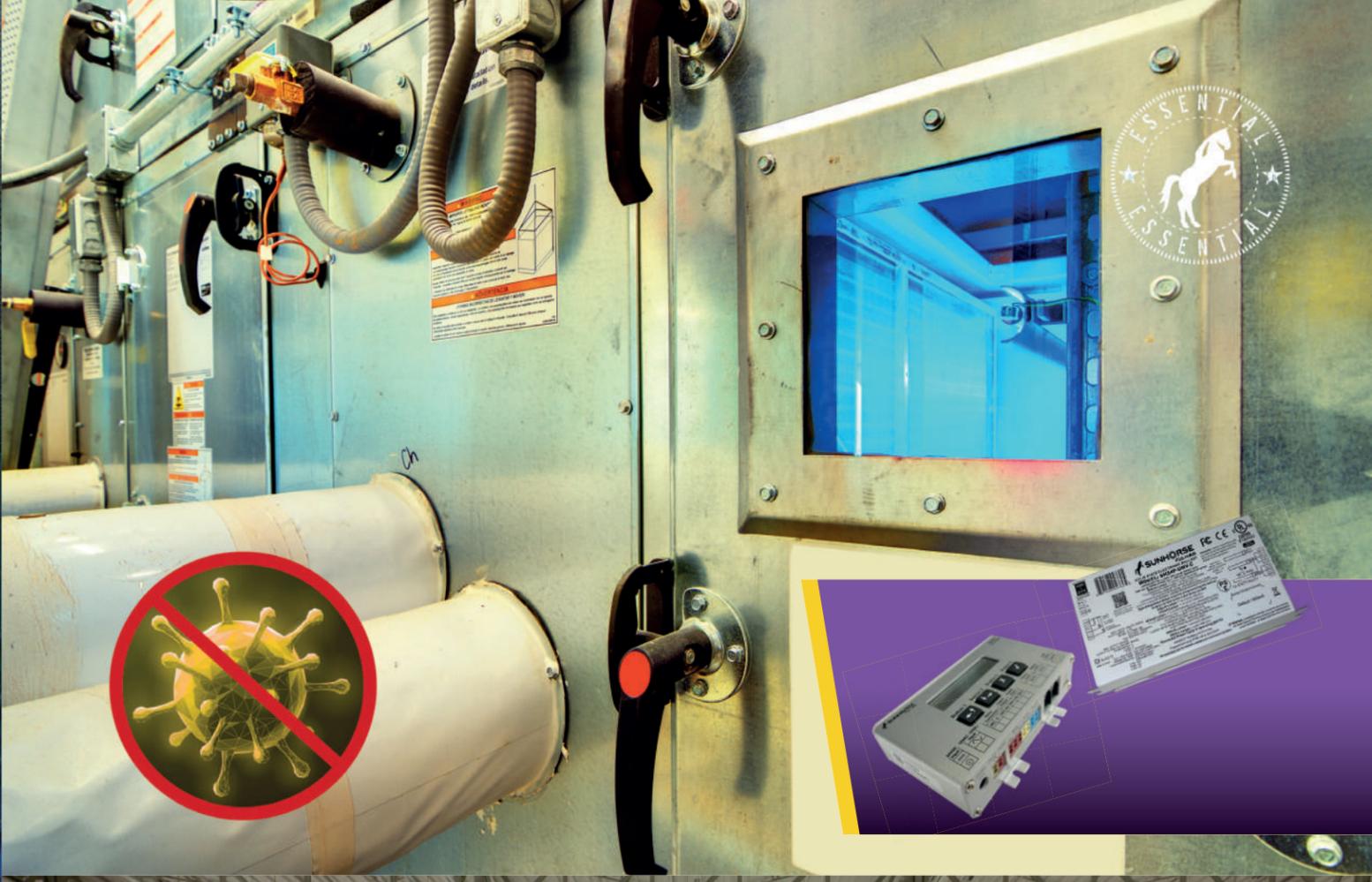
Come to us with your specific application details and requirements. We'll get back to you with the feasibility of producing a custom solution!





Fluorescent Ballasts

Fulham's fluorescent programs are the bread and butter upon which its reputation was established more than a quarter century ago. The products were so well engineered that many remain as relevant today as when introduced and are known industry-wide as the reliable "workhorses" that inspired their first branding. Jump to today, and Fulham has expanded to include ESSENTIAL Refrigeration ballasts and Programmable Germicidal UV Ballasts, as well as Remote Mount, CFL, and small form factor varieties for numerous field replacement and factory install scenarios.





Low Temperature Ballasts

that automatically adjust in cold temperatures to provide optimal light output.

REACTIVE CIRCUIT INSIDE



Standard Molex® Connectors

for Plug-n-Play commercial refrigeration applications

Molex is a registered trademark of Molex Incorporated.

MINIMUM STARTING TEMPERATURE
-30°C -22°F
Operates T8, T10 & T12 Lamps

Specifications

Input Voltage	120V-277V; 50/60Hz
High Power Factor	> 0.98
ATHD	< 10%
Lamp Operation Mode	Programmed Start
Ignition Method	Programmed Pre-Heat Start
Min. Operating Temperature	-30°C (-22°F)
Case Qty. (pcs.)	25

Fluorescent Low Temperature Electronic Ballasts

Model Number	Max. Current (A)	Max. Power (W)	Dimensions (L x W x H)	Weight (lbs)	Case Qty. (pcs.)	# of Lamps	Lamp Type / Designation
IH1-UNV-232-T8	.85	100	12.03" x 1.71" x 1"	1.4	25	1 or 2	F25 / F32 / F40 T8
IH2-UNV-270-T8	1.35	155		1.5	25	1 or 2	F58 / F70 T8
IH3-UNV-272T12HO	1.38	150		1.4	25	1 or 2	F48 / F60 T8HO, F48 / F60 T10VHO, F48 / F60 / F72 T12HO
						1	F72T8HO, F72T10VHO, F96T12VHO

Lamp Operation



UV Germicidal & Tanning Ballasts

for air and water purification purposes



Model Number	Operating Voltage (VAC)	Max. Input Current (A)	Factory Set Output Current Range (mA)	Default Output Current (mA)	# of Lamps	Max. Total Lamp Load	Certification	Dimming Type	Min. Operating Temp.	Max. Case Temp.	Dimensions (L x W x H)	
Non-Dimming												
SHS1-UNV-C*	120-277	0.55A	170-425	425	1 or 2	55W	UL US CECB	-	-30°C	75°C	5.06" x 2.36" x 0.988"	
SHS1-UNV-C-I	120-277	0.40A	-	400	1 or 2	45W	UL US CECB	-	-30°C	75°C	5.06" x 2.36" x 0.988"	
SHS1-UNV-C-0170*	100-277	0.29A	-	170	1 or 2	28.2W	UL US CE PSE	-	-30°C	90°C	5.06" x 2.36" x 0.988"	
SHS2-MLT-L*	120-240	0.33A	-	400	1	41W	UL US CE	-	0°C	75°C	6.45" x 1.49" x 0.96"	
SHS3-MLT-L*	120-240	0.29A	-	800	1	58W	UL US CE	-	0°C	75°C	6.45" x 1.49" x 0.96"	
SHS5-024-C	24	2.59A	-	400	1 or 2	41W	UL US	-	0°C	75°C	3.64" x 3.12" x 1.01"	
SHS10-UNV-H*	120-277	1.4A	800-1000	1000	1	190W	UL US CECB	-	-20°C	70°C	10" x 2.55" x 1.26"	
SHS11-UNV-H	120-277	1.4A	680-1000	800	1 or 2	200W	UL US CECB	-	-20°C	70°C	10" x 2.55" x 1.26"	
SHS14-UNV-H	120-277	1.282A	400-600	425	1 or 2	160W	UL US CECB	-	-20°C	70°C	10" x 2.55" x 1.26"	
SHS15-UNV-H*	120-277	2.7A	800-1200	800	1 or 2	310W@<1050mA 260W@>1050mA	UL US CECB	-	-20°C	83°C	10" x 2.8" x 1.79"	
SHGS1-MID-2-200-L* [§]	200-277	2.1A	1400-2200	1600	1 or 2	400W	CECB	-	0°C	70°C	9.84" x 3.49" x 1.55"	
SHGS1-MID-2-200-N** [§]	200-277	2.1A	1400-2200	1600	1 or 2	400W	CECB	-	0°C	70°C	9.84" x 3.49" x 1.55"	
SHGS1-MID-2-200-N-C** [†]	200-277	2.1A	1400-2200	1600	1 or 2	400W	CECB	-	0°C	70°C	9.84" x 3.49" x 1.55"	
FEP-120-600-L	120	2.86A	-	600 - 800 per wire	1, 2, 3 or 4	320W	UL US	-	-18°C	70°C	19.25" x 3" x 1.25"	
FEP-230-600-L	230	1.50A	-	600 - 800 per wire	2, 3 or 4	320W	UL US	-	0°C	70°C	19.25" x 3" x 1.25"	
Dimmable												
SHGA1-MID-2-200-N** [§]	200-277	2.1A	1400-2200	1600	1 or 2	400W	CECB	DALI**	0°C	70°C	9.84" x 3.49" x 1.55"	
SHGA1-MID-2-200-N-C** [†]	200-277	2.1A	1400-2200	1600	1 or 2	400W	CECB	DALI**	0°C	70°C	9.84" x 3.49" x 1.55"	
SHGA1-MID-2-200-L*	200-277	2.1A	1400-2200	1600	1 or 2	400W	CECB	DALI**	0°C	70°C	9.84" x 3.49" x 1.55"	
SHD21-230-L-I	230	1.64A	-	2100	1	320W	UL US	0-10V***	0°C	70°C	16.69" x 1.72" x 1.18"	

Note: To order a specific factory set current other than the default set current add -XXXX after part number where XXXX is replace with the output current desired. For example if 500mA is required you would add -0500 after the part number to order this model. This would be a made to order model. Additional validation testing will be required and updates to any safety certifications will be required for any lamp combination not already listed with the ballast.

* Made to order. Minimum order quantities will apply. † Open Frame PCBA. No enclosure and no potting. § Flying leads connection type ** 100%,75%,50% *** 100%-50%



Programmable SunHorse Ballasts

for Germicidal UV applications and Tanning



Specifications

	SHS15P-UNV-H	SHS4P-UNV-C
Output Current Range (+/-10%)	800-1050mA @310W 1060-1200mA @260W 800mA default	340-840mA 800mA default
Input Voltage	120-277V (UNV)	112W: 120-277V (UNV) 95W: 100V
Frequency Rating	50/60Hz	50/60Hz
Max Ballast Wattage	310W/260W	112/95W
Power Factor	>0.9	>0.9@≥60W load
Total Harmonic Distortion	See spec sheet	≤20%@≥60W load
Start Type	Programmed Rapid Start Type R.5	Programmed Rapid Start Type R.5
L x W x H (in)	10.00 x 2.80 x 1.79	6.77 x 3.02 x 1.27
L x W x H (mm)	254 x 71.1 x 45.4	172 x 76.7 x 32.2
Minimum Starting Temperature	-20°C (-4°F)	-20°C (-4°F)
CULUS and CE	Yes	Yes
PSE (for Japan)	-	Yes



Legacy Fulham Programmer TPSB-100 & New Display SHS-DISP

The new SunHorse Digital LCD Display SHS-DISP is a more robust device that expands user options. Attributes include:

- Remote ON/OFF Port Connection turns Output ON/OFF w/o removing input power to ballast
- NO/NC Relay
- Lamp Status 5VDC Digital Output
- Future I2C Sensor Implementation
- Multi-Ballast Monitoring/Control
- Audible buzzer alarm notifications
- Lamp failure and lamp hour end of life notifications
- 5VDC Digital Input for use with Smart and non-smart ballasts
- Can operate as a standalone lamp hour counter for non-smart ballasts
- Powered by SHS Ballast RJ12 connection (directly from the ballast), 24VDC Barrel Plug, 12VAC/24VAC, or USB-C
- Displays stored data about lamp manufacturer and part number from SunHorse ballast memory



SHS15P-UNV-H & SHS-DISP combination spec sheet



TPSB-100 spec sheet



SHS4P-UNV-C & SHS-DISP combination spec sheet

FLUORESCENT

FLUORESCENT



Fluorescent Ballasts



Universal Voltage (120-277V)

Model Number	Dimensions (L x W x H)	Input Current	Master Carton Qty.
WH41-UNV-L*	9.48" x 1.41" x 1.02"	0.496A	25
WH43-UNV-L	9.48" x 1.41" x 1.02"	0.88A	25
WH44-UNV-L	9.48" x 1.41" x 1.02"	0.496A	25

*Made to order.



Dedicated Voltage (120, 230, and 277V)

Series	Model Number	Input Voltage (V)	Max Power (W)	Max Current (Amp)	Dimensions (L x W x H)	Configuration	Case Qty.
WORKHORSE 1	WH1-120-L	120	28	.10	5.92" x 0.94" x .76"	Linear case, side leads	90
	WH2-120-L	120		.33	5.52" x 1.25" x 1.02"	Linear case, side leads	50
WORKHORSE 2	WH2-120-C	120	35	.33	3.36" x 1.84" x 1.01"	Compact case, side leads	50
	WH2-277-L	277		.15	5.52" x 1.25" x 0.99"	Linear case, side leads	50
	WH2-277-C	277		.15	3.37" x 2.32" x 1"	Compact case, side leads	50
WORKHORSE 22	WH22-120-L	120	35	.25	5.52" x 1.25" x 1.02"	Linear case, side leads	50
	WH22-120-C	120		.25	3.36" x 1.84" x 1.01"	Compact case, side leads	50
	WH3-120-L	120		.56	6.48" x 1.50" x 1.02"	Linear case, side leads	50
WORKHORSE 3	WH3-120-C	120	64	.56	3.8" x 2.5" x 1.01"	Compact case, side leads	60
	WH3-230-L*	230		.29	6.45" x 1.5" x 1"	Linear case, side leads	50
	WH3-277-L	277		.24	6.48" x 1.5" x 1.02"	Linear case, side leads	50
WORKHORSE 33	WH3-277-C	277	64	.24	3.83" x 3.11" x 1.01"	Compact case, side leads	60
	WH33-120-L	120		.53	6.48" x 1.5" x 1.02"	Linear case, side leads	50
WORKHORSE 4	WH33-120-C	120	70	.53	3.64" x 3.12" x 1.01"	Compact case, side leads	60
	WH4-120-L	120		.56	6.48" x 1.5" x 1.02"	Linear case, side leads	50
WORKHORSE 5	WH5-120-L	120	128	1.15	8.5" x 1.73" x 1.01"	Linear case, side leads	50
	WH5-230-L	230		0.57	9.5" x 1.73" x 1.01"	Linear case, side leads	50
	WH5-277-L	277		0.48	9.5" x 1.73" x 1.01"	Linear case, side leads	50
WORKHORSE 6	WH6-120-L	120	140	1.04	8.5" x 1.73" x 1.01"	Linear case, side leads	50
	WH6-277-L	277		0.50	9.5" x 1.73" x 1.01"	Linear case, side leads	50
WORKHORSE 7	WH7-120-L	120	220	1.82	19.24" x 1.72" x 1.03"	Linear case, side leads	25
	WH7-120-H	120		1.82	11.73" x 3.23" x 1.23"	H can w/ magnetic footprint	16
	WH7-230-L	230		1.10	19.24" x 1.72" x 1.03"	Linear case, side leads	25
WORKHORSE 8	WH8-120-L	120	220	1.8	19.24" x 1.72" x 1.03"	Linear case, side leads	25
	WH8-230-L*	230		0.79			

*Made to order.



Fluorescent Specifier Grade Ballasts



Specifier Grade T8 Specifications

Power Factor	98.5% Min.
ATHD	Less than 10%
EMI	FCC CFR Title 47 Part 18 non-consumer
Ballast Factor	>.87
Starting Method	Instant Start
Regulatory Approvals	UL & cULus Listed Type 1 or Type 2
Inherent Thermal Protection	Class P
Transient Protection	C62.41 Class A 7 strikes
Dimensions (L x W x H)	WHS2: 9.50" x 1.38" x 0.99" WHS3: 9.53" x 1.32" x 1.05" WHS4: 9.53" x 1.32" x 1.05"
Lamp CF	< 1.7
Min. Starting Temp.	0°F (-18°C)
Weight	1.5 lbs. (700g)



Specifier Grade T8 Ballasts

Model Number	Input Voltage (VAC)	Input Power (W)	Max. Current (A)	Black/White Wires	Red Wires	Blue Wires	Yellow Wires	Case Qty (pcs.)
WHS2-UNV-T8-IS	120-277; 50/60Hz	59	.50	25"	46"	31"	N/A	25
WHS3-UNV-T8-IS	120-277; 50/60Hz	85	.71	25"	46"	31"	N/A	25
WHS4-UNV-T8-IS	120-277; 50/60Hz	112	.93	25"	46"	31"	46"	25



Remote Mount Electronic Ballasts



Specifications

Power Factor	>0.9
THD	<34.6%
EMI/RFI Compliance	FCC Part 18-A
Sound Rating	"A"
Ballast Type	Instant Start
Voltage Transients	ANSI C82.11 - 1993
Input / Protection	FUSE
Remote Mounting	20ft Max
Min. Operating Temp	-30°C (-20°F)
Max. Case Temp	70°C (158°F)
Approvals / Class	cULus Listed, Class "P", 1 or 2 Outdoor

- Operates up to 20ft. from lamp
- Versatile
- High Power Factor
- Energy Saving
- Lightweight
- Solid-State Electronics



Fluorescent Low Temperature Electronic Ballasts

Model Number	Lamp Watts / Type	Lamps Operated	Input Watts	Line Current	Ballast Factor	Efficacy Factor
LH4-120L	F28T5	2	55	0.48	1.0	1.7

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Find WorkHorse and LongHorse wiring diagrams here: <https://www.fulham.com/contact-us/wiring-diagrams/>

Or scan this QR Code with your SmartPhone's camera >





Compact Fluorescent (CFL) Electronic Ballasts



Specifications	
Operating Voltage	120V-277V; 50/60Hz
ATHD	< 10%
Over Current	Fuse
Transient Protection	C62.41 Class A 7 strikes
Regulatory Approvals	UL & cULus Listed Type 1 Outdoor
EMI	FCC CFR Title 47 Part 18 non-consumer
High Power Factor	> .98
Ballast Maximum Case Temp.	167°F (75°C) - 5 Year Warranty
Ballast Maximum Case Temp.	194°F (90°C) - 3 Year Warranty
Lamp Starting Mode	Programmed Start
Inherent Thermal Protection	Class P



CFL Ballasts & Kits					
Model Number	Max Load	Max. Current	Dimensions (L x W x H)	Weight	Case Quantity
RHA-UNV-226-C	57W	.52 A	5.1" x 2.4" x 1" (4.3" L case)	5.2 oz.	C Models: 50 pcs/ case Kits (K): 60 pcs/ case



T5HO & T5HE Fluorescent Electronic Ballasts



T5HO & T5HE Fluorescent Ballasts					
Model Number	Max. Load (W)	Max. Current (A)	Dimensions (L x W x H)	Connector Type	Case Qty (pcs.)
RHA-UNV-254-LT5	120W	1.0 A	9.53" x 1.32" x 1.05"	Leads	25
RHA-UNV-454-LT5†	240W	2.0 A	16.88" x 1.69" x 1.18"	Leads	20

† Made to order. Minimum order quantity applies.



Pony Electronic Ballasts



Pony Electronic Ballasts			
Model	Model Number	Operates Lamps	Dimensions (Inches)
Pony for CFL	NPY-120-118-CFL*	1 x 13CFT/E, 18CFQ/E, 18CFTR/E	H 1.03", W 1.76", L 3.36"
	NPY-120-126-CFL	1 x 18CFT/E, 24/27CFT/E, 26CFQ/E, 26CFQ/E, 26CFTR/E, 32CFTR/E, 22CRT9	H 1.02", W 2.39", L 3.36"
	NPY-120-218-CFL	2 x 13CFT/E, 18CFQ/E, 18CFTR/E	H 1.02", W 2.39", L 3.36"

*Made to order.



SugarCube Ballasts



SugarCube Electronic Ballasts			
Model	Model Number	Operates Lamps	Dimensions (Inches)
For T5 / T8 / T12	SC-120-108-LT5	1 x F4T5, F6T5, F8T5	H 4.76", W 1.05", L .76"
	SC-120-213-LT5	1 x F21T5, F8T5 + F13T5; 2 x F13T5, F14T5, F15T8	H 5.53", W 1.27", L 1.01"
	SC-120-115-CT8†	1 x F14T8, F15T8, F17T8, F14T12, F15T12, F20T12, CFQ13W	H 3.09", W 1.45", L 1"
	SC-120-132-T8XL*	1 x F15T8, F17T8, F25T8, F32T8	H 6.3", W 1.08", L 1.01"
For CFL & Circle	SC-120-113-CFL	1 x 13CFQ/E, F15T8, F17T8, 13W Spiral	H 3.09", W 1.45", L 1"
	SC-120-287-CUV	1 x 180mm T5 UV, 287mm T5 UV	H 3.07", W 1.46", L 1"
For UV Lamps	SC-230-287-CUV	1 x 180mm T5 UV, 287mm T5 UV	H 3.07", W 1.46", L 1"
	For 230V	SC-230-113-CFL*	1 x 13CFQ/E, 13FTR/E

* Made to Order

† These models are UL listed, not cULus.



U.S INNOVATION BY
FULHAM

Fulham has a rich history of developing innovative, award-winning lighting solutions. From Fulham's U.S. Headquarters near Los Angeles, California, Fulham Product Managers, Engineers, Salespeople and Marketers team up to develop innovative, new product ideas that are then researched, designed and manufactured by Fulham's own factories abroad. This all occurs under Fulham's direct supervision as a Prime Manufacturer, thus guaranteeing the extremely high quality upon which Fulham has built its reputation for over 25 years.

Our global lighting programs include:

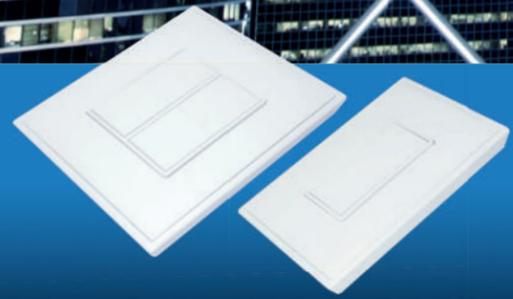
- Wireless Control Systems
- Programmable LED Drivers
- Standard LED Modules & Drivers
- Horticulture Modules
- Everyday Electronic Fluorescent Ballasts
- Specialty Ballasts such as UV/Germicidal, Refrigeration, or Remote Mount
- Emergency lighting
- Custom solutions
- And more...



EliteControl
FULHAM

Controllable Lighting Solutions

Wireless controllable lighting is an emerging area of focus and import for Fulham where our SIG Qualified Bluetooth® Mesh Lighting Control System attempts to marry convenience and function with lesser degrees of installation or usage complexity than are associated with other comparable systems. Fulham's solution allows you to start small in just one room, and then expand into larger areas, floors or an entire building as needs change. Our solution is supported by all the occupancy and daylighting sensors that you'd need to minimize energy usage and hasten ROI. Manage the system offsite via the EliteBlue web portal or on site from your SmartPhone.





SIG Qualified Bluetooth® Mesh Lighting Control System



Bluetooth mesh is an emerging platform for connected lighting that is paving the way to IoT smart lighting. It provides fast, reliable performance, unmatched scalability, high-level security and out-of-the-box interoperability, creating opportunities for larger, more efficient lighting networks.

- **Wireless** High speed communication at distances of over 300 feet, creating massive savings on installation and wiring
- **Scalable** Start small with a single room, or connect thousands of devices in a building-wide installation
- **Secure** Advanced encryption standards with multiple authentication keys for maximum protection
- **Reliable** Self-healing network prevents communication losses and allows devices to be added or removed without disruption
- **Interoperable** All SIG Qualified Bluetooth mesh devices can communicate seamlessly, regardless of manufacturer

Fulham eliteBlue Commissioning Software

Fulham's eliteBlue commissioning software provides an intuitive set of tools for commissioning and monitoring qualified Bluetooth mesh lighting devices. Using simple web and iOS apps, users can easily customize lighting control parameters in accordance with site-specific needs and building energy codes.

- **Web portal**
Used off site to manage lighting installation projects and plan commissioning, including mapping zones within a building, setting up control scenarios for zones and managing users collaborating on the project.
Try it at eliteblue.fulham.com
- **Mobile app for iOS**
Used onsite to commission devices and fine-tune installations. No specialized training or lighting control expertise is needed- the intuitive interface lets you add Bluetooth mesh lighting devices to a wireless network in no time.



Connected Driver

A 40W, 0-10V constant current driver with the unique ability to add Bluetooth mesh connectivity by attaching an intelligent Bluetooth antenna. Compatible with third-party sensors, wall switches, and other devices, the connected driver serves as the core component for powerful, easy-to-expand connected systems.

- 0-10V dimming standard. Add Bluetooth dimming with optional ESLI01HB01 SmartLink
- Compatible with Fulham's SmartSet programming platform



Specifications

Model Number	Input Voltage (VAC)	Watts	Output Voltage (VDC)	Dimensions (L x W x H)	Case Type	Case Qty.
T2C1UNV150P-40L	UNV (120-277)	40	10-57	6.61" x 1.97" x 1.18"	Compact w/End Leads	20

Bluetooth to 0-10V SmartBridge

A simple, easy-to-install component that connects to an existing 0-10V driver to add SIG Qualified Bluetooth mesh capability. The SmartBridge is an ideal solution for manufacturers looking to develop their Bluetooth product lines or contractors seeking to provide wireless lighting options in the field.



Specifications

Model Number	Max Load (W)	Max Input Current (A)	Input Voltage (VAC)	IP	Features	Dimensions (L x W x H)	Case Qty.
CTBRBC02JM02	600	5	UNV (120-277)	66	On / Off, 0-10V Dimming Control, Sensor Input	5.17" x 2.26" x 1.29"	30
CTBRBC03JM03-PC*					On / Off, 0-10V Dimming Control, Sensor Input, Color Control, Power Metering		

*Made to order.

Bluetooth Accessories

Model Number	Description
ESLTOPJX00SR	Short-range PIR occupancy, daylight harvesting sensor and Bluetooth Radio for connected LED driver
ESLTOPJX00LR	Long-range PIR occupancy, daylight harvesting sensor and Bluetooth Radio for connected LED driver
ESLI01HB01	Bluetooth SmartLink (attaches to T2C1UNV150P-40L to provide Bluetooth capability)
ELIOPJX00SR	Short-range PIR occupancy and daylight harvesting sensor for SmartBridge
ELIOPJX00LR	Long-range PIR occupancy and daylight harvesting sensor for SmartBridge
ESRPB-W-EO	Single Rocker EnOcean Switch
EDRPB-W-EO	Double Rocker EnOcean Switch
CTGATBPOE*	IoT Bluetooth Gateway extends a mesh network with Internet access to visualize/analyze data

* Made to Order



WHY CHOOSE FULHAM?

- **Known and Trusted Worldwide:**
Successful Global Operation
- **Stable:**
Nearly 30 Year Legacy, Stand Behind Our Products
- **Reputation for Quality:**
Minimal In-Field Service or Re-installations Required
- **Always Growing and Innovating:**
We are the Engineers (Not Just Buyers and Resellers)
- **Relevant:**
Strong foothold with new items in emerging markets; ongoing sales of legacy goods
- **Diversified in Technologies Served:**
Powered Light, Emergency and Control all under one roof
- **Varied Solutions (General & Essential Specialty):**
23 Year Germicidal UV Program, Programs in Refrigeration, Horticulture and more
- **Resilient:**
Diverse Customer Base
- **Differentiated:**
Unique Sales and Marketing Approaches, broad product offering not reliant on one technology
- **Leading:**
#1 Independent Innovator of globally-mandated Emergency Lighting Solutions
- **Insulated:**
Redundant Sources of Supply (both India and Asia manufacturing)



LIMITED WARRANTY

Length of Warranty and Coverage

Warranty period will be determined from the date of manufacture as indicated by the date code stamped on each product and will be covered as follows:

- EliteControl™ - 5 Years
- FireHorse™ - 5 Years
- FireHorse HotSpot™ - 5 Years*
- IceHorse™ Ballast - 3 Years
- LongHorse™ Electronic Remote Fluorescent Ballast - 5 Years
- LumoSeries™ - 5 Years
- PONY™ Electronic Ballast - 2 Years
- PONY™ Electronic SugarCube™ - 2 Years
- PONY™ Electronic Transformer - 2 Years
- RaceHorse™ Electronic Ballast – 70°C 5 Years, 90°C 3 Years
- SunHorse™ Ballast - 3 Years
- SineHorse™ Ballast - 3 Years
- LED Drivers - 2 to 5 Years
- VividHorse™ Retrofit Kits - 5 Years*
- Vizion™ Modules/Engines - 5 Years*
- Vizion™ Retrofit - 5 Years*
- Vizion™ Luminaire - 5 Years*
- WorkHorse™ Electronic Fluorescent Ballast - 5 Years

* Covered defects for Vizion, VividHorse, and HotSpot LED modules. For purposes of this limited warranty, a defect in a module shall be defined as one or more individual LEDs dark at initial installation or greater than 10% of individual LEDs dark during the Warranty Period. Replacement and/or repair of individual Vizion, VividHorse, or HotSpot LED Modules does not extend this limited warranty beyond the original Warranty Period.

Warranty Conditions

Fulham extends this express limited warranty only to the original purchaser or to the first user. This constitutes the complete warranty for the product. Fulham is not responsible for any auxiliary equipment not furnished by Fulham, which is used in connection with or attached to the product, or for operation of the product with any auxiliary equipment. Damage to all such equipment is expressly excluded from this warranty. In addition, Fulham is not responsible for any damage to the product resulting from the use of auxiliary equipment not supplied by Fulham.

Warranty Conditions Not Covered

This warranty is not applicable to any product manufactured by Fulham not installed and operated in accordance with:

- * Underwriters Laboratories Inc. (UL)
- * National Electrical Code (NEC)
- * Standards set by the International Electrotechnical Commission (IEC)
- * European Norms Electrical Certification (ENEC)
- * Applicable international federal, state and local codes
- * Remote applications beyond maximum distance noted on product specification sheet. If maximum distance is not provided, remote application is not covered.
- * Fulham specific, most recent instructions and application guidelines provided for installation of the product

Additionally, this warranty is not applicable to Fulham manufactured products that have been subjected to excessive stress including, but not limited to, operating temperatures exceeding the recommended maximum temperature on any part of the product.

Obtaining Warranty Service

If within the warranty period it appears that the installed product does not meet the warranty conditions specified, the purchaser must notify Fulham of its warranty claim. Fulham or its authorized service company will provide warranty service directly to you.

General Provisions

All responsibilities regarding the product are set forth by this warranty. Replacement or repairs of the product is your exclusive remedy. For purposes of clarity, "replacement or repairs of the product" does not include any removal or reinstallation costs or expenses, including, without limitation, any labor costs or expenses, shipping costs to return non-conforming products or any damages that may occur during the return of product to Fulham. If Fulham chooses to replace the product and is not able to do so because it has been discontinued or is not available, Fulham may replace it with a comparable product. Fulham reserves the right to use new, reconditioned, refurbished, repaired or remanufactured products or parts in the repair or replacement of any product covered by this warranty. If no replacement product is available, Fulham, solely at its discretion, may issue a credit for the product, prorated for its remaining warranty life.

This warranty is given in lieu of all other express warranties. Implied warranties, including those without limitation, warranties of merchant ability and fitness for a particular purpose, are limited to the duration of this limited warranty. Fulham shall in no event be liable for damages in excess of the purchase price of the product, for any loss of use, loss of time, inconvenience, commercial loss, lost profits or savings or other incidental, special or consequential damages arising out of the use or inability to use such product, to the full extent such may be claimed by law.

Local Exceptions

Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, or limitations on how long an implied warranty lasts, therefore the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and purchasers may have other rights that vary by jurisdiction.

Returned Materials Authorizations (RMA)

Customers shall contact Fulham directly for all RMA's.

After receiving the RMA, the user shall promptly return the product at the user's expense to Fulham after receiving instructions as to when and where to ship product. Failure to follow this procedure shall void this warranty. Should the number of pieces received by Fulham differ from the RMA either +/-, the customer will be notified and adjustments will be made at that time.

Fulham reserves the right to examine all failed products to determine the cause of failure and patterns of usage and reserves the right to be the sole judge as to whether any products are defective and covered under this warranty.

Contact Information

Fulham North America	+1 323 599 5001 warranty@fulham.com
Fulham Europe	+31 72 572 3000 warranty.eu@fulham.com

Effective: August 1st, 2018

Last Edit: June 16, 2023

FULHAM®

Harness the Horsepower



North America U.S. Headquarters

12705 S. Van Ness Avenue
Hawthorne, CA 90250

**Order processing,
technical support, product
information, requests for
quotations**

Tel: +1 323.599.5000
Fax: +1 323.754.9060
order@fulham.com

Warranty Department

Tel: +1 323.599.5001
warranty@fulham.com

India

Fulham Pvt. Ltd.

201, Kaliandas Udyog Bhavan
Sadanand Tandel Marg
Century Bazaar Lane
Prabhadevi, Mumbai-400025
Tel: +91.22.66388775-8
sgaikwad@fulham.com

Fulham Pvt. Ltd.

Survey No. 26-3
Village Narhe
Taluka Haveli, Dist: Pune -
411041
Tel: +91.20.24690703/4
Fax: +91.20.24690712
sgaikwad@fulham.com

Europe

Fulham Europe

sales.eu@fulham.com

China

Fulham Electronic Co. Ltd.

6th Floor, Building #23,
Champion Bio,
No. 79, Shuangying West Road,
Nanshao County,
Changping District, Beijing,
P.R.China, 102200
Tel: +86-10-6073-5858
order.china@fulham.com.cn

Hong Kong

Fulham Company Ltd.

Unit 6, 6/F Kowloon Plaza
485 Castle Peak Road
Cheung Sha Wan, Kowloon
Hong Kong
Tel: +852.2314.4801
Fax: +852.2314.4186
hongkongsales@fulham.com

www.fulham.com

