



TJTUNV015ACxxxB

JA8-2016



DirectAC UNV Retrofit Kit Engines

- Integrated AC Direct Drive (No DC Driver)
- Universal Voltage (120~277) AC Engine
- Suitable for open or fully enclosed luminaires
- Suitable for luminaires with plastic and glass lenses
- All 90CRI product meets CEC Title 24 requirement
- cULus Classified 1598C
- cULus Recognized 8750
- Energy Star Luminaire 2.1 Listed (for rebate programs)^①
- Energy Star Luminaire CSD^①

General Specifications

Input Voltage / Frequency ^②	120~277VAC (+/- 10%) / 50-60Hertz
Input Current ^②	~0.125 @120V ~0.066A @230V ~0.055A @277V
Input Power ^②	15W (+/- 1W)
Input PF	>0.98
THD	<20%
Operating Frequency	120Hz
Max Lumen Output @ Full Power ^②	1680 lumens @ 4000K / 80 CRI
Dimming Type/Range @120V ONLY	Leading Edge (TRIAC) or Trailing Edge (ELV) /100% ~ 10%
Beam Angle	120°
CRI	80 (standard), 90 available (MTO)
Operating Temperature Range (Ta)	-35 to 50°C / -31°F to 122°F
Maximum Engine Case Temperature	L70: Tc max=100°C (Ts=105°C) / L90: Tc max=100°C (Ts=105°C)
Maximum Lens Temperature	Lens: 90°C / 194°F
Estimated Lumen Maintenance (at Max Tc)	L70= >54,000 hours / L90= 21,000 hours
Color Consistency	Binning per ANSI C78.377-2015 @25°C; 3 SDCM
Overall Size	5.08" diameter x 0.75" H (129.03mm Dia. x 19.05mm H)
Wire Type/ Length	18AWG / 12" Black and White wires
LED Quantity	48 Pcs.
Weight	123.37g / 0.27lbs.
Packaging: Carton / Master Carton	24pcs / 96pcs
Maximum Screw Installation Torque	60in-lb (960in-ozf)
Safety/Compliance	DirectAC Engines: cURus (File # E486778) TATUNV015AxxxxA DirectAC Retrofit Kits: cULus (File # E486779) TJTUNV015AxxxxB RoHS Compliant Dry and Damp Location IC Over Temperature Control Energy Star Luminaire 2.1 Listed ^① Energy Star Luminaire CSD ^① CEC JA8-2016
RFI/EMI	FCC Part 15B Consumer, EN55015
Input Surge Test	2.5kV Common and Differential mode (Per ES Ring Wave Test)
Sound Rating / Noise	A / <24 dBA
Percent Flicker / Flicker Index	<23% / <0.0597
Protective Lens / Enclosure	High Voltage Barrier / 3mm Clear Polycarbonate 5VA Flame rated
Lens Transmittance	>92%
PCB Material	MCPCB
Warranty	5 years @ Max. Tc from the date of manufacture
Electrolytic Capacitor Rating	>60,000 hours

^① See page #4 "Certification Chart" for exact models.

^② Measured electrical data per UL file



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Part Number Matrix

T J T U N V 0 1 5 A C 8 4 0 B

① J = Engine Type: DirectAC Engine Retrofit Kit (Classified)
 T = Dimming: TRIAC/ELV
 U N V = Input Voltage: 120V~277V
 0 1 5 = Input Power: 15W
 A = Material: MCPCB+wire
 C = Shape: Circular
 ③ 8 = 80 CRI
 9 = 90 CRI
 ③ 27 = 2700K Color Temperature
 ③ 30 = 3000K
 ③ 35 = 3500K
 ③ 40 = 4000K
 50 = 5000K
 ① B = Option: DirectAC Engine +Lens (Retrofit Kit)

Electrical and Optical Specifications

Color Temperature	DirectAC Engine Part Number	Input Power	Nominal Luminous Flux @ 90 CRI	Engine Efficacy @ 90 CRI	Nominal Luminous Flux @ 80 CRI	Engine Efficacy @ 80 CRI
2700K	TJTUNV015ACx27B	15W	1310 lumens	87 lm/W	1529 lumens	102 lm/W
3000K	TJTUNV015ACx30B	15W	1361 lumens	91 lm/W	1596 lumens	106 lm/W
3500K	TJTUNV015ACx35B	15W	1378 lumens	92 lm/W	1613 lumens	108 lm/W
4000K	TJTUNV015ACx40B	15W	1428 lumens	95 lm/W	1680 lumens	112 lm/W
5000K	TJTUNV015ACx50B	15W	1462 lumens	97 lm/W	1714 lumens	114 lm/W

Luminous Flux De-Rating: CCT and CRI Multipliers

CCT \ CRI	2700K	3000K	3500K	4000K	5000K
80(R9>0)	0.91	0.95	0.97	1.00	1.02
90(R9>50)	0.78	0.81	0.83	0.85	0.87

NOTES:

- 1) DirectAC Engines standard model "B" comes with engine and lens.
- 2) Nominal luminous flux includes a 7.5% loss due to lens. Use a 1.075 multiplier when lens is removed.
- 3) Electrical and optical specifications are based on Tc mod = 25°C. Reference Amb. Temp. vs Rel. Lum. Flux for other temperatures.
- 4) Specifications are subject to change without notice.
- 5) All 90CRI product meets CEC Title 24 requirement.

③ Standard Product offering, in addition to 90CRI / 3000K (All other options are made to order with MOQ and lead time).

④ LED Engine Retrofit Kit includes mounting hardware, retrofit labels, and installation instructions.



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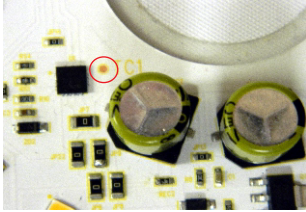
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Thermal Specifications

⑤ DirectAC Engine Retrofit Kit (B)

Storage Temperature Range	-40°C(-40°F) to 80°C(176°F)
Operating Ambient Temperature Range	-35°C(-31°F) to 50°C(122°F)
Maximum Engine Case Temperature (Tc)	L70: Tc max=100°C (Ts=105°C) / L90: Tc max=100°C (Ts=105°C)
Maximum Lens Temperature	90°C (194°F)



Tc located on module

Thermal De-Rating: Tc vs. Luminous Flux

Module Case Temperature (Tc)	Luminous Flux Multiplier
25°C	1.000
30°C	0.991
35°C	0.982
40°C	0.974
45°C	0.965
50°C	0.956
55°C	0.947
60°C	0.939
65°C	0.921
70°C	0.912
75°C	0.904
80°C	0.895
85°C	0.886
90°C	0.877
95°C	0.868
100°C	0.860

NOTES:

- 1) Refer to LED Engine Retrofit Kit Installation Instructions for further detail.
- 2) This LED Engine Kit can retrofit any luminaire with a dimension/volume greater or equal to the minimum dimensions shown below and on the Installation Instructions.
- 3) This LED Engine Kit can be used with luminaires similar to the one illustrated on the Installation Instructions.

⑤ Suitable for surface mounted luminaire with minimum dimensions or volume: 8.5" Dia. x 4.75" H or 173.92 cubic inches



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Certification Chart

Model	TJTUNV015ACxxxB
Classification	
RoHS COMPLIANT	YES
cUL US	TJTUNV015ACxxxA
CLASSIFIED cUL US	TJTUNV015ACxxxB
ENERGY STAR Listed	YES (80/90 CRI)
ENERGY STAR CSD	YES (80/90 CRI)

Energy Star™ TM-21 Calculator Data

Tc Module	Reported L70	Reported L90
50°C	>54,000 Hrs	34,000 Hrs
80°C	>54,000 Hrs	26,000 Hrs
100°C	>54,000 Hrs	21,000 Hrs
Tc Module	Calculated L70	Calculated L90
50°C	112,000 Hrs	34,000 Hrs
80°C	84,000 Hrs	26,000 Hrs
100°C	70,000 Hrs	21,000 Hrs

Product Image: 15W Round AC Engine Kit

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CAUTION: THIS LUMINAIRE HAS BEEN MODIFIED TO OPERATE LED LAMPS. DO NOT ATTEMPT TO INSTALL OR OPERATE FLUORESCENT/ INCANDESCENT LAMPS IN THIS LUMINAIRE. Min. 75°C SUPPLY CONDUCTORS.

NOTICE - THIS LUMINAIRE HAS BEEN MODIFIED AND CAN NO LONGER OPERATE THE ORIGINALLY INTENDED LAMP (WITH RESPECT TO FIRE AND SHOCK ONLY) FOR USE ONLY WITH PRODUCTS DESCRIBED AND INSTALLED IN ACCORDANCE WITH THE INSTRUCTION PROVIDED WITH THIS RETROFIT KIT.



Hardware Kit: TLC-HW10



Installation Instructions

NOTES:

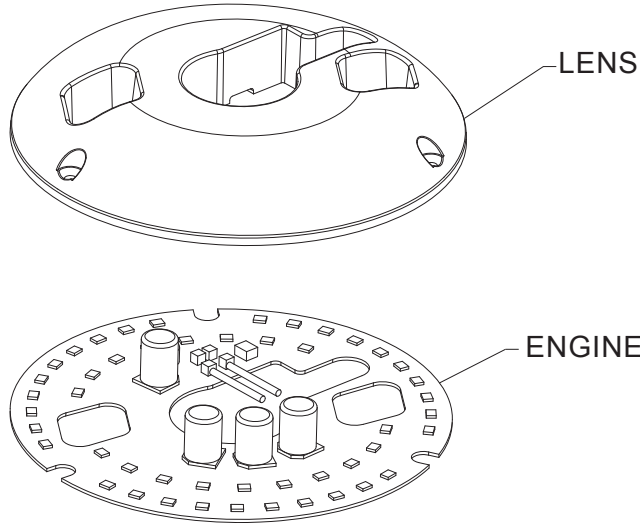
DirectAC UNV Retrofit Kit Engines:
Hardware, Quick disconnect, Labels & Installation Instructions

- Energy Star CSD:
https://www.energystar.gov/products/lighting_fans/certified_lighting_subcomponent_database_csd
- Energy Star Listed:
https://www.energystar.gov/productfinder/product/certified-light-fixtures/results?scrollTo=342&search_text=fulham&fixture_type_isopen=&markets_filter=United+States&zip_code_filter=&product_types=Select+a+Product+Category&sort_by=light_output_lumens&sort_direction=asc&page_number=0&lastpage=0



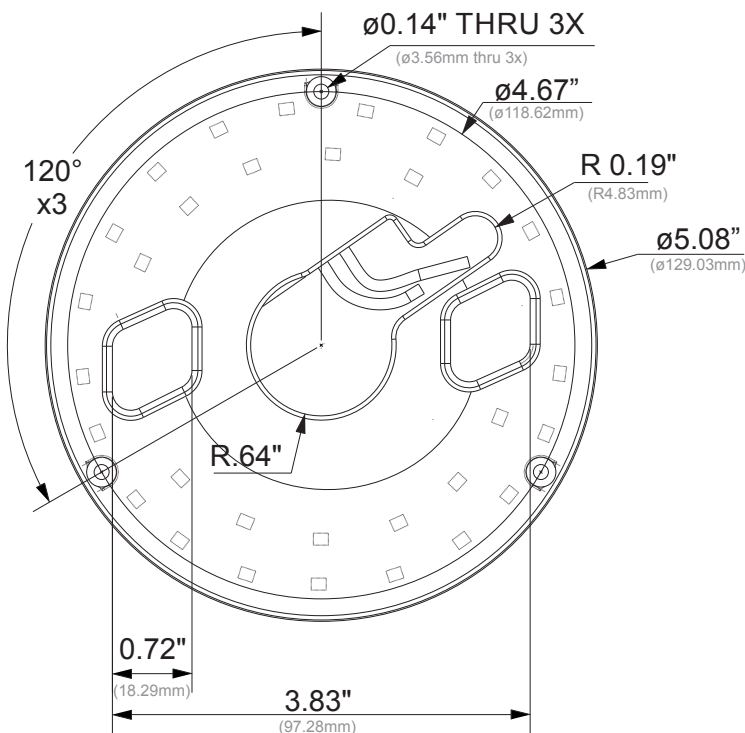
Mechanical Drawings

(Scale 3 : 4)

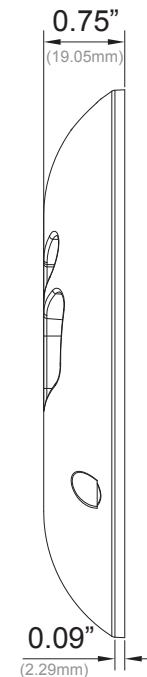


Exploded View

Overall Dimensions	
Diameter	5.08" [129.03mm]
Height	0.75" [19.05mm]
Wire Length AC Input (Black / White)	12" [304.8mm]



Top View



Side View



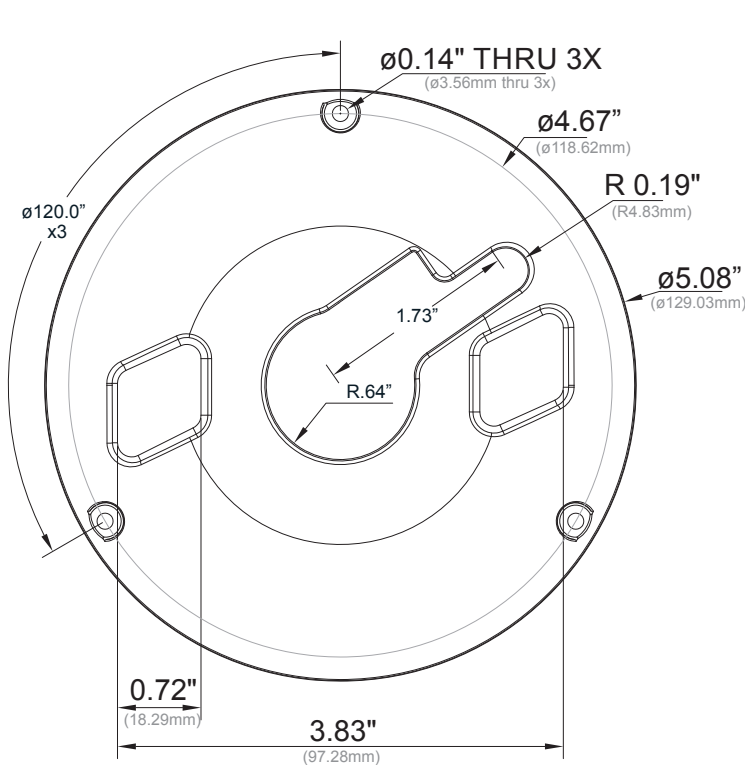
Accessories: Diffused lens sold separately

VLE-OPT-120-002 (Diffused Lens)

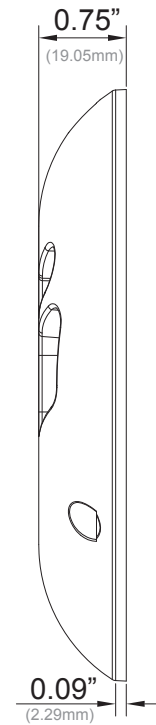
- High Voltage Barrier
- 2.5mm Diffused Polycarbonate 5VA Flame rated.
- Lens Transmittance >85%
- Lens Sold Separately
- 15% Light Reduction



Lens
41g



Top View



Side View



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Compatible Tested Dimmers

(Contact Fulham for other alternatives)

(TRIAC or ELV Dimmers)

Manufacture	Model	Type
Core	SI061BR-PTA	TRIAC (Leading Edge) Incandescent Analog
Legrand	RH703PTC	TRIAC (Leading Edge) Incandescent Analog
Leviton	002-6633-PLW	TRIAC (Leading Edge) Incandescent Analog
Leviton	DDE06-BLZ	ELV (Trailing Edge)
Leviton	IPL06-10Z	TRIAC (Leading Edge)
Leviton	R62-6674-P0W	CFL / LED
Leviton	R70-6631-1LW	TRIAC (Leading Edge) Incandescent Analog
Leviton	RDL06-10Z	TRIAC (Leading Edge)
Lutron	CT-600P	TRIAC (Leading Edge)
Lutron	DV-600P	TRIAC (Leading Edge)
Lutron	LG-600P	TRIAC (Leading Edge)
Lutron	NTLV-600	TRIAC (Leading Edge)
Lutron	D-600R	TRIAC (Leading Edge) Incandescent Analog
Lutron	SELV-303P	ELV (Trailing Edge)
Lutron	S-600	TRIAC (Leading Edge)
Lutron	S-603P	TRIAC (Leading Edge) Incandescent Analog



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DirectAC Engine Equivalency Chart

DirectAC Engine/Kit (15W)				CFL					
Engine/Kit Part Number	System Wattage	Lumen Output	Efficacy	CFL Style	Lamp Wattage	# of Lamps	Total Wattage	Lumen Output	Efficacy
TJTUNV015AC8xxB	15W	1680 lm (4K/80CRI)	112 lm/W	Quad	13W	2	26W	1550 lm	59 lm/W
					18W	1	18W	1075 lm	
					26W	1	26W	1550 lm	
				Triple	13W	2	26W	1650 lm	63 lm/W
					18W	1	18W	1020 lm	56 lm/W
					26W	1	26W	1536 lm	59 lm/W
				Circline T9	22W	1	22W	775 lm	35 lm/W
				Circline T5	22W	1	22W	1530 lm	69 lm/W

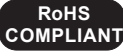
NOTES:

- 1) For reference only, several factors apply.
- 2) Emergency systems are not UL classified for field installation.



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Flicker Test Data Summary
(Test performed by third party lab using, Lutron S-600P dimmer)

With Dimmer at 100%

100% Light Output Percent Amplitude Modulation					
No Filter	40 Hz	90 Hz	200 Hz	400 Hz	1000 Hz
22.55%	0.22%	1.81%	19.56%	21.90%	21.74%
Measurement Period:		2.000 sec	Noise:		19.5 dBA
Recording Interval:		4.00E-05 sec	Fraction of rated light output:		100%
Flicker Index:		0.0597			

With Dimmer at 20%

20% Light Output Percent Amplitude Modulation					
No Filter	40 Hz	90 Hz	200 Hz	400 Hz	1000 Hz
18.70%	0.87%	2.10%	13.58%	16.54%	17.64%
Measurement Period:		2.000 sec	Noise:		19.6 dBA
Recording Interval:		4.00E-05 sec	Fraction of rated light output:		19%
Flicker Index:		0.0436			

With Dimmer at Minimum Light Output

Minimum Light Output Percent Amplitude Modulation					
No Filter	40 Hz	90 Hz	200 Hz	400 Hz	1000 Hz
15.55%	0.89%	1.58%	10.13%	12.77%	13.40%
Measurement Period:		2.000 sec	Noise:		19.9 dBA
Recording Interval:		4.00E-05 sec	Fraction of rated light output:		9%
Flicker Index:		0.0308			

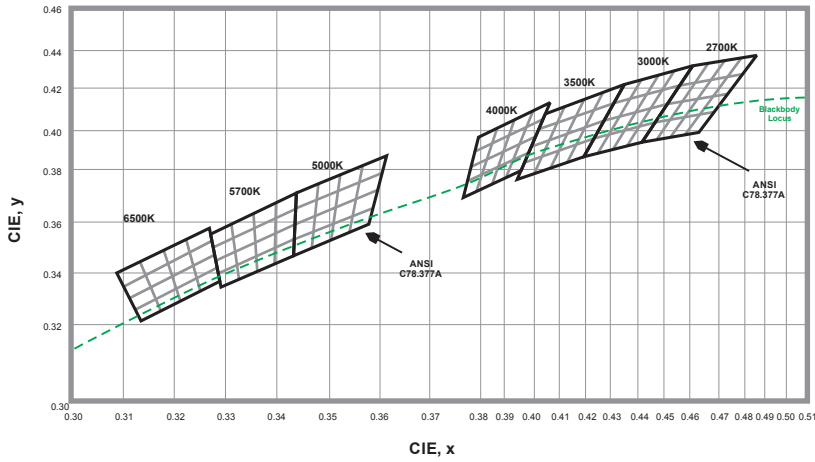


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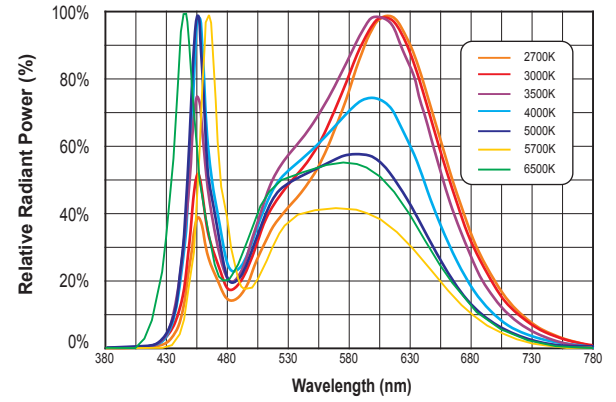
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Color and Binning



Optical Spectrum



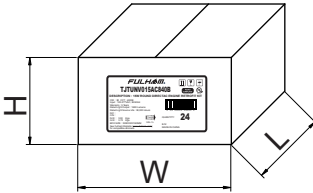
NOTES:

- 1) The Color and Binning and Optical Spectrum charts are for reference only. For more detailed info, contact factory.
- 2) Reference Samsung 2835 LM283B Series. Binning per ANSI C78.377-2015 @ 25°C; 3 SDCM.
- 3) The Optical Spectrum values vary depending on product type and color rank.



Packaging

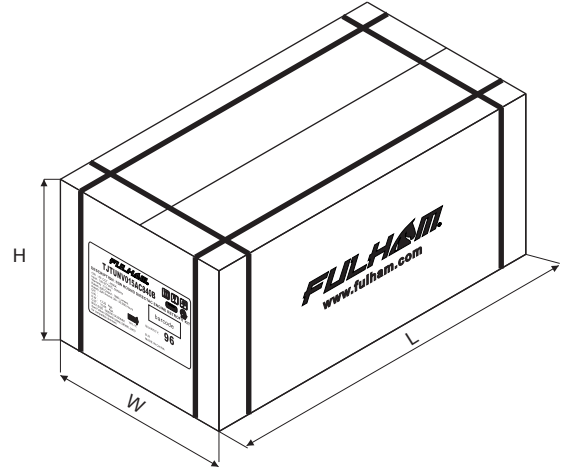
Carton



Twenty-Four (24) LED AC Engine retrofit kits inside each carton.

OUTER DIMENSION		
L	W	H
15.55"(395mm)	12.99"(330mm)	6.30"(160mm)
Net Weight	Gross Weight	QUANTITY
7.28 lbs. (3.30kg)	8.16 lbs. (3.70kg)	24pc.

Master Carton



Four (4) cartons inside each Master Carton.

OUTER DIMENSION		
L	W	H
26.77"(680mm)	16.33"(415mm)	13.78"(350mm)
Net Weight	Gross Weight	QUANTITY
29.10 lbs. (13.20kg)	34.83 lbs. (15.80kg)	96pcs.



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Guidelines

Reduced Flicker Operation Feature

- DirectAC Engine models have added circuitry to help reduce the Flicker when operated on the 50/60Hz power lines. The Flicker percentage on these models is below 30% when operated at line voltage, per CEC requirement. Dimming by line voltage devices may increase the Flicker percentage as the power levels are reduced.

Hi-Pot Testing (Caution)

- All DirectAC Engine models are Hi-Pot tested on the Fulham production line. We advise NOT to apply AC Hi-voltage Dielectric test to LED products as this may damage the sensitive electronic components as well as the LEDs. Please inspect the connection wires for any nicks or cuts in the insulation during and after installation.

Termination Notes

- A luminaire disconnect UL listed connector is included, as part of Fulham's retrofit kit only, to meet Energy Star requirements.
- Use solid wire size 18AWG/12" per pole, rated at max 600V load and 105°C operating temperature.
- Strip wires to 11-13mm (0.47in.).
- Connector not for multiple use.
- For additional information on Wago's 873 Series Lumi-Nuts® connector, please visit: http://www.wago.com/infomaterial/wago_ebook/51261593/flipviewerxpress.html



Environmental Rating

- DirectAC Engines are rated for dry and damp locations.

IC Over Temperature Control

- DirectAC Engine models have built in Thermal management, if the unit experiences higher than normal ambient temperatures the circuit by design will reduce the drive current to the LED there by reducing the thermal impact on the LED's.

Fastening to Luminaire

- When installing by "mounting thru holes" (recommended), use any screw with diameter less than 0.13in. [3.4mm]. Mount on a flat surface and use all 3 mounting holes to ensure good contact between back side of Engine and mounting surface. Refer to max specified torque for installation. Suggested screw sizes: #5 or M3 Pan/Flat Head screw. Fulham provides four 6-20 X 5/8" Flat Head Self Drilling Screws, see instruction sheets for further details.

Electrostatic Sensitive Product (ESD)

- Fulham LED products should be handled with proper measures to protect against any potential ESD damage.
- When servicing, personnel should be ground and direct contact with LED should be avoided.

Thermal Management

- Proper thermal management should be employed to ensure life and reliability of product.

Wiring

- Intended for 120~277V application ONLY.
- Connect the Black wire from the DirectAC Engine to the building Line by using the proper connectors or wire nuts.
- Connect the White wire from the DirectAC Engine to the building/source Neutral by using the proper connectors or wire nuts.
- DirectAC Engine does not need grounding, but the luminaire must be grounded.
- Intended to be wired on dedicated lighting branch circuit.
- Do not wire on same branch circuit as motors, heating elements, inductive type loads or heavy machinery which may introduce spikes, noise and other abnormalities onto the Line. Doing so may result in damage to the unit or abnormal lighting conditions.