



120V LED DirectAC Engine and Retrofit Kits

- Suitable for open or fully enclosed luminaires
- Suitable for luminaires with plastic and glass lenses
- Integrated AC Direct Drive (No DC Driver)
- 120VAC dedicated Input
- <25% Flicker
- TRIAC / ELV Dimmable with Smooth Dimming
- Full CCT Option Available (Standard CCT's: 2700K,3000K,4000K)
- 80 CRI standard and 90 CRI available
- UL Classified (B/C option)
- UL Recognized (A option)
- High Voltage Barrier and 5VA rated Lens
- Energy Star Listed Luminaire 2.0

General Specifications

Input Voltage [Ⓞ]	120VAC (108~132VAC);50/60 Hz
Input Current [Ⓞ]	~0.125A
Input Power [Ⓞ]	15W
Input PF	>0.98
THD	<20%
Operating Frequency	120Hz
Max Lumen Output @ Full Power [Ⓞ]	1740 lumens @ 4000K / 80 CRI
Dimming Type/Range	Leading Edge (TRIAC) or Trailing Edge (ELV) /100% ~ 10%
Beam Angle	120°
CRI	80 (standard), 90 available
Operating Ambient Temperature Range (Ta)	-35 to 50°C / -31 to 122°F
Maximum Engine Case Temperature	L70: Tc max=90°C (Ts=95°C) / L90: Tc max=85°C (Ts=90°C)
Maximum Lens Temperature	Lens: 90°C / 194°F
Estimated Lumen Maintenance (at Max Tc)	L70= >54,000 / L90= >17,000 hours
Color Consistency	Binning per ANSI C78.377-2011 @25°C; 4 SDCM
Overall Size	5.08" diameter x 0.69" H ("B"option with lens)
Wire Type/ Length	18AWG / 12" Black and White wires
LED Quantity	32 Pcs.
Weight	A:(Engine Only) 42g B:(Eng + Lens) 83g C:(Kit) 169g
Maximum Screw Installation Torque	35 inch - ounces
Safety/Compliance	DirectAC Engines: cURus (File # E486778) TAT120015ACxxxA Retrofit Kits: cULus (File # E486779) TJT120015ACxxxB, cULus (File # E486779) TJT120015ACxxxC RoHS Compliant Dry and Damp Location IC Over Temperature Control
RFI/EMI	FCC Part 15B Consumer, EN55015
Input Surge Protection	2.5kV Common and Differential mode (Per ES Ring Wave Test)
Sound Rating / Noise	A / <22 dBA
Percent Flicker	<25%
Flicker Index	<0.0621
Protective Lens/Enclosure	High Voltage Barrier / 3mm Clear Polycarbonate 5VA Flame rated
Lens Transmittance	<7.5%
PCB Material	MCPCB
Warranty	5 years @ Max. Tc from the date of manufacture
Electrolytic Capacitor Rating	>60,000 hours

Ⓞ Measured electrical data per UL file



Part Number Matrix

T J T 120 015 A C 8 40 B

Engine Type
 A= DirectAC Engine (Recognized)
 J= DirectAC Engine Retrofit Kit (Classified)

Dimming
 T = TRIAC/ELV

Input Voltage
 120 = 120VAC

Input Power
 015 = 15W

Material
 A=MCPCB+wire

Shape
 C=Circular

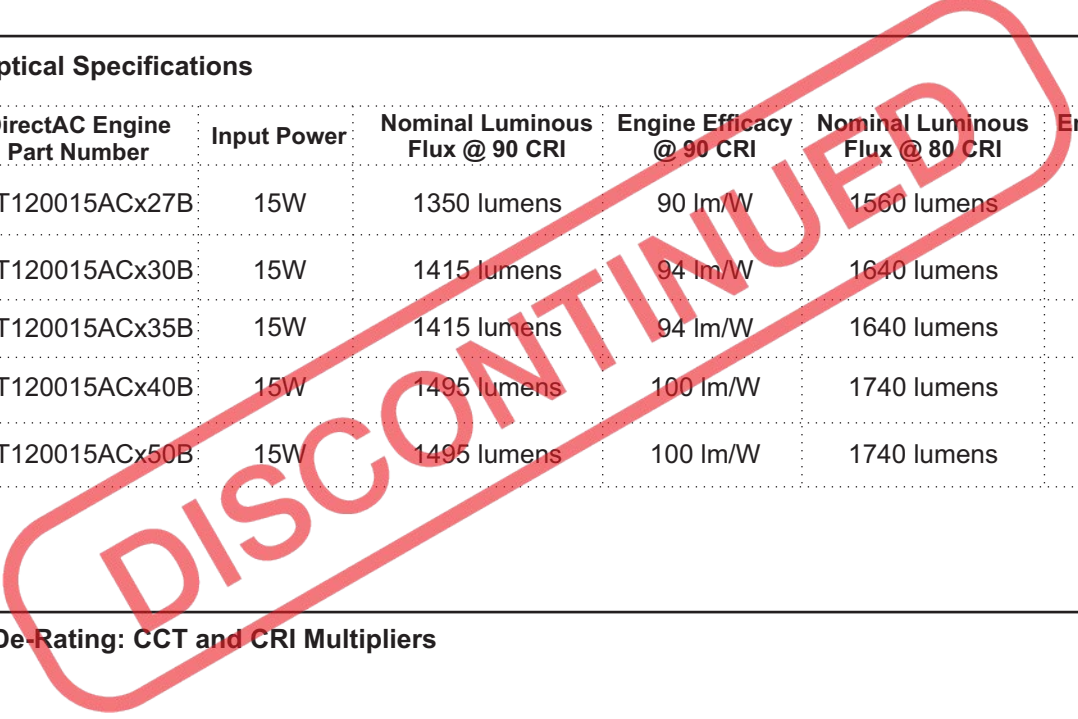
CRI
 8 = 80
 9 = 90

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

Option
 A = DirectAC Engine
 B = DirectAC Engine +Lens (Retrofit Kit)
 C = DirectAC Engine +Lens +Plate (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	TJT120015ACx27B	15W	1350 lumens	90 lm/W	1560 lumens	104 lm/W
3000K	TJT120015ACx30B	15W	1415 lumens	94 lm/W	1640 lumens	109 lm/W
3500K	TJT120015ACx35B	15W	1415 lumens	94 lm/W	1640 lumens	109 lm/W
4000K	TJT120015ACx40B	15W	1495 lumens	100 lm/W	1740 lumens	116 lm/W
5000K	TJT120015ACx50B	15W	1495 lumens	100 lm/W	1740 lumens	116 lm/W



Luminous Flux De-Rating: CCT and CRI Multipliers

	2700K	3000K	3500K	4000K	5000K
CRI 80(R9>0)	0.90	0.94	0.94	1.00	1.00
CRI 90(R9>50)	0.78	0.81	0.81	0.86	0.86

NOTES:

1) DirectAC Engines standard model "B" comes with engine and lens.

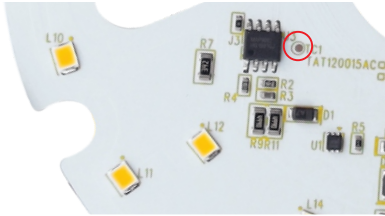
② Standard Product offering (All other options are made to order with MOQ and lead time)

③ LED Engine Retrofit Kit includes mounting hardware, retrofit labels, and installation instructions.



Thermal Specifications

	DirectAC Engine (A)	④ DirectAC Engine Retrofit Kit (B)	④ DirectAC Engine Retrofit Kit (C)
Storage Temperature Range	-35°C(-31°F) to 100°C(212°F)	-35°C(-31°F) to 100°C(212°F)	-35°C(-31°F) to 100°C(212°F)
Operating Ambient Temperature Range	-35°C(-31°F) to 50°C(122°F)	-35°C(-31°F) to 40°C(104°F)	-35°C(-31°F) to 45°C(113°F)
Maximum Engine Case Temperature (Tc)	L70: Tc max=90°C (Ts=95°C) / L90: Tc max=85°C (Ts=90°C)		
Maximum Lens Temperature	90°C (194°F)		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	1.000
35°C	0.991
40°C	0.972
45°C	0.963
50°C	0.953
55°C	0.944
60°C	0.935
65°C	0.925
70°C	0.916
75°C	0.897
80°C	0.888
85°C	0.879
90°C	0.869
95°C	0.850
100°C	0.841



NOTES:

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

④ Suitable for ceiling luminaire with minimum dimensions: 8.5" diameter with a height of 1.1".



Certification Chart

Energy Star™ TM-21 Calculator Data

Model	TAT120015ACxxxA TJT120015ACxxxB TJT120015ACxxxC
Classification	
	YES
	YES
	TJT120015ACxxxB TJT120015ACxxxC
	TJT120015AC8xxxB TJT120015AC8xxxC
	NO

Tc Module	Reported L70	Reported L90
50°C	>54,000 Hrs	>17,000 Hrs
80°C	>54,000 Hrs	17,000 Hrs
100°C	37,000 Hrs	11,000 Hrs
Tc Module	Calculated L70	Calculated L90
50°C	>55,000 Hrs	>17,000 Hrs
80°C	55,000 Hrs	17,000 Hrs
100°C	37,000 Hrs	11,000 Hrs

Product Image: 15W Round AC Engine Kit TJT120015ACxxxB



CAUTION: THIS LUMINAIRE HAS BEEN MODIFIED TO OPERATE LED LAMPS. DO NOT ATTEMPT TO INSTALL OR OPERATE FLUORESCENT LAMPS IN THIS LUMINAIRE.

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.



LED Engine Retrofit Kit
only: Hardware and Labels

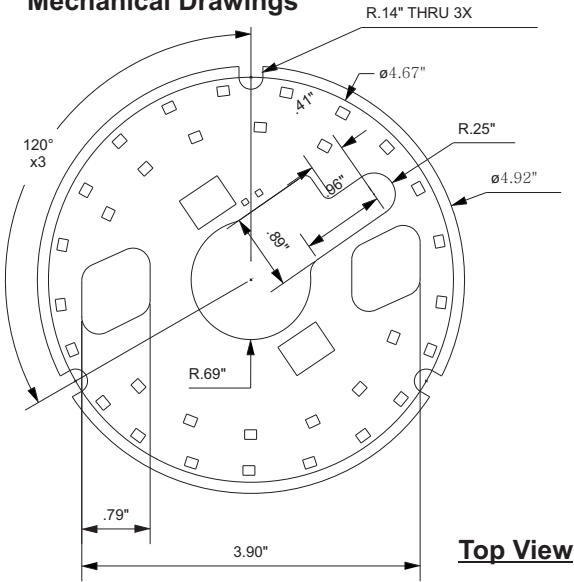
NOTES:

1) 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

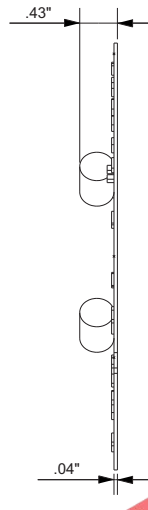


Mechanical Drawings

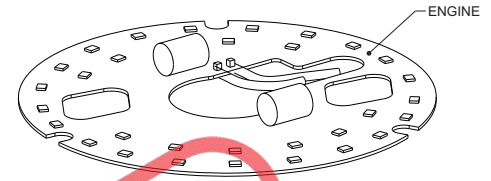


Top View

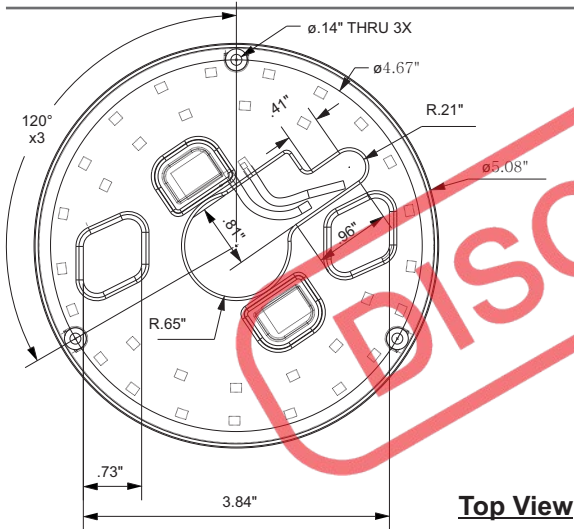
**TAT120015ACxxxA
(Engine Only)**



Side View

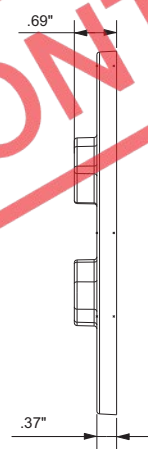


Exploded View

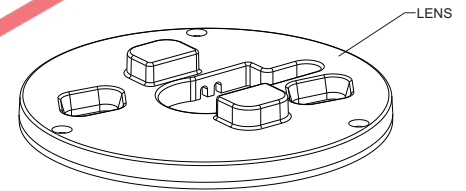


Top View

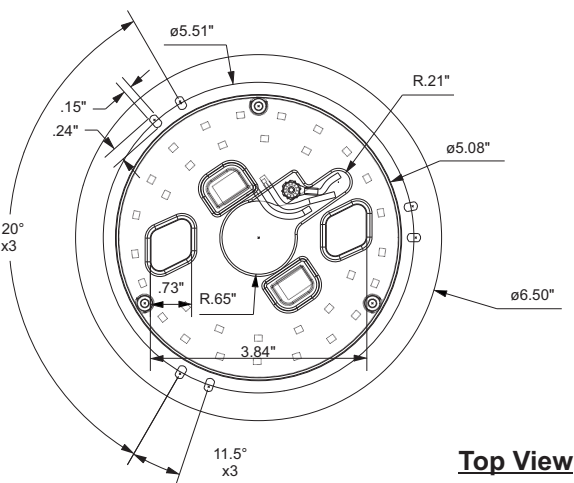
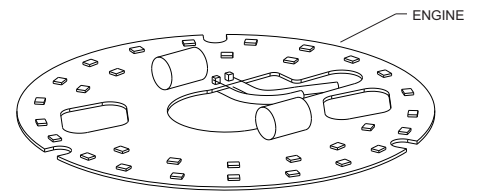
**TJT120015ACxxxB
(Engine + Lens)**



Side View

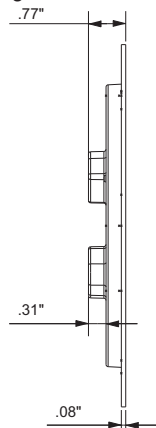


Exploded View

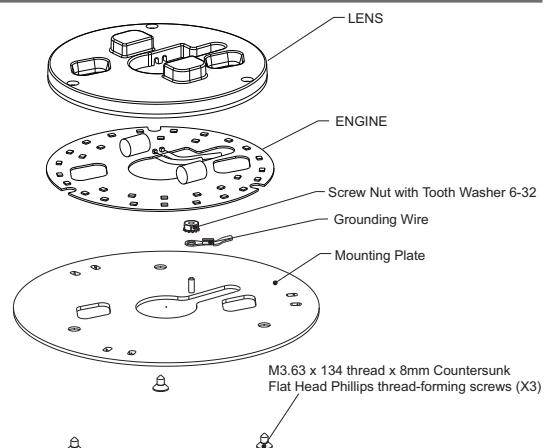


Top View

**TJT120015ACxxxC
(Engine + Lens + Plate)**



Side View



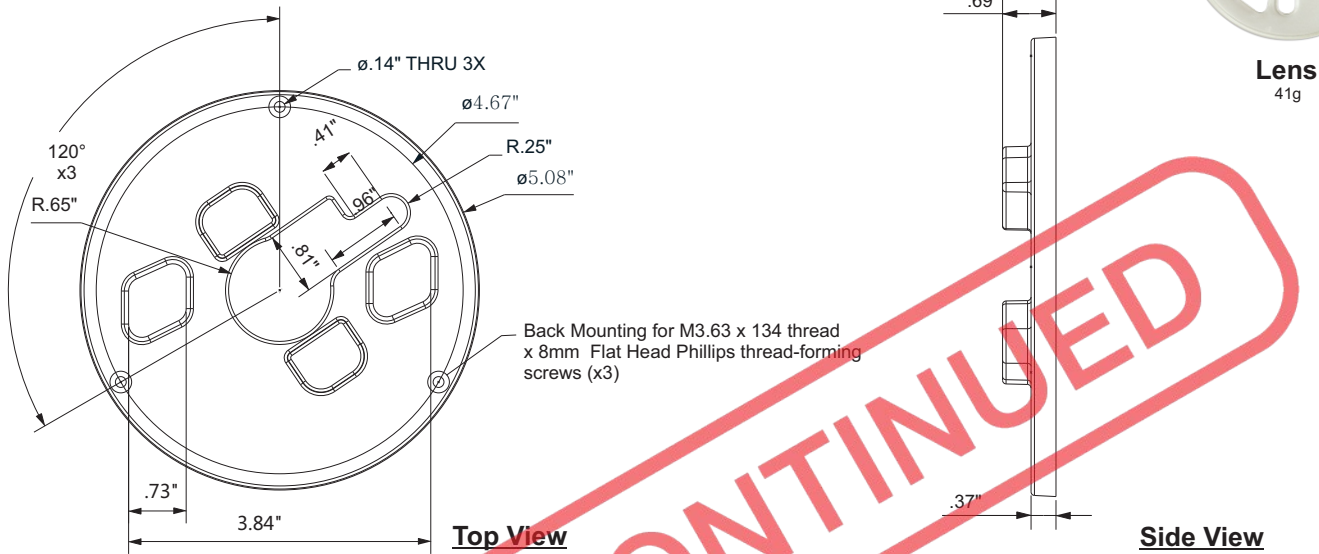
Exploded View



Accessories

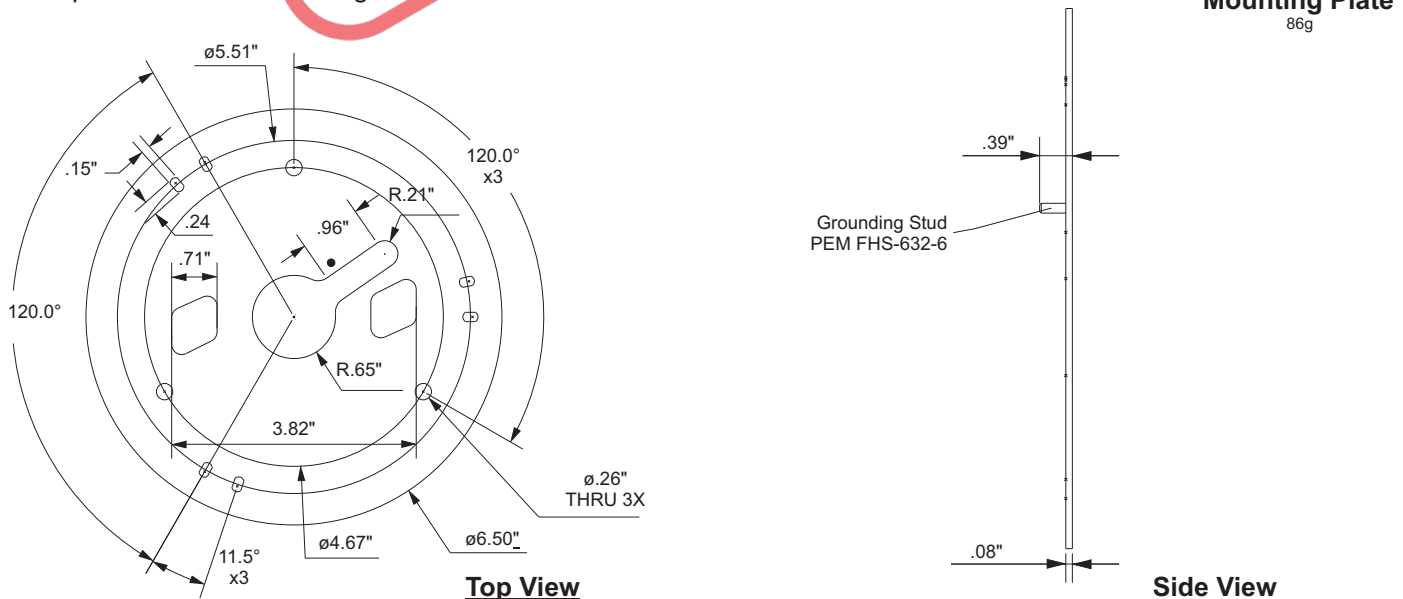
TLEOPT120-007 (Lens)

- Clear polycarbonate protective lens acts as a high voltage barrier and meets the 5VA Flame rating. It can be order separately and used with TAT120015ACxxxA option as UL Recognize component product. Hardware not included.



TLE-HSK-005 (Mounting Plate)

- Mounting Plate, can be use for improved thermals and ease of mounting. It can be order separately and used with TAT120015ACxxxA option as a UL Recognized component product or with TJT120015ACxxxB option as a UL Classified product. Three thread forming screws (M3.63 x 134 thread 8mm) are provided in order to attach the lens and DirectAC Engine to the Mounting Plate. Ground wire pre-attached to Mounting Plate.





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/flipviewerexpress.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 Head screw.

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

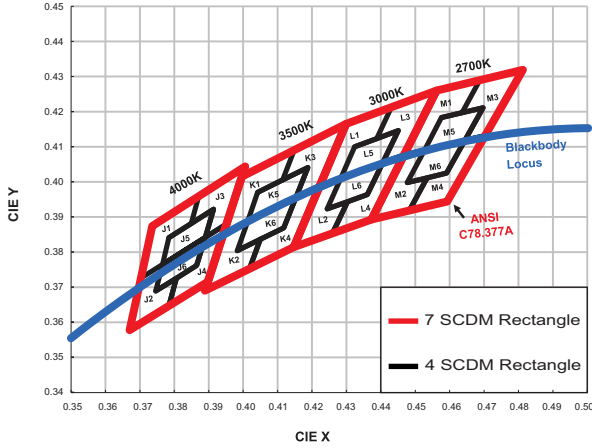
- Proper thermal management should be employed to ensure life and reliability of product.

Wiring

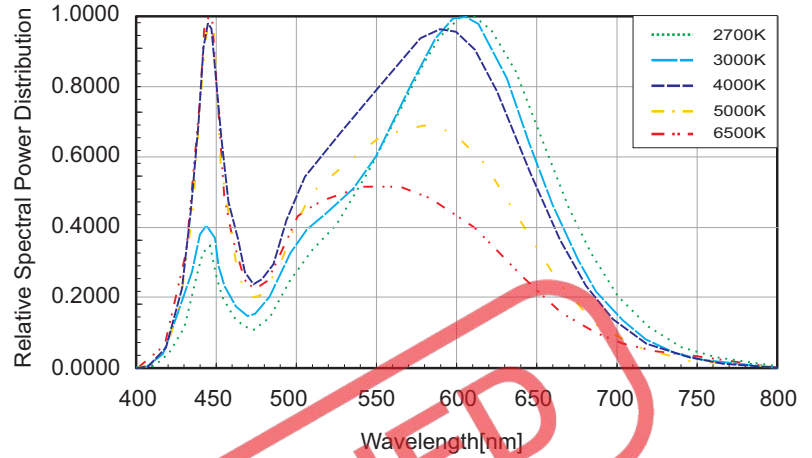
- Intended for 120V application ONLY.
- Connect the Black wire from the DirectAC Engine to the building Line by using the proper connectors or wire nuts.
- Connect the White wire from the DirectAC Engine to the building/source Neutral by using the proper connectors or wire nuts.
- DirectAC Engine does not need grounded, but the luminaire must be grounded.



Color and Binning



Optical Spectrum



DISCONTINUED

NOTES:

- 1) The Color and Binning and Optical Spectrum charts are for reference only. For more detailed info, contact factory.
- 2) Reference Bridgelux Chromaticity Diagram for Color and Binning. Binning per ANSI C78.377-2011 @ 25°C; 4 SDCM.
- 3) The Optical Spectrum values vary depending on product type and color rank.

TAT120015ACxxxA
TJT120015ACxxxB
TJT120015ACxxxC



Compatible Tested Dimmers
(Contact Fulham for other alternatives)

(TRIAC or ELV Dimmers)

Manufacture	Model	Type
Leviton	ILLUMATECH IPL06	TRIAC (Leading Edge)
Lutron	NOVA T NTLV-600	TRIAC (Leading Edge)
Lutron	SLYLARK S-600	TRIAC (Leading Edge)
Leviton	IG4005 6631	TRIAC (Leading Edge)
Lutron	LUMEA LG-600P	TRIAC (Leading Edge)
Leviton	VPE06	(ELV) Trailing Edge
Lutron	SELV-303P	(ELV) Trailing Edge





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				
TJT120015AC8xxB	15W	1740 lm (4K/80CRI)	116 lm/W	Quad	13W	2	26W	1550 lm	59 lm/W				
					18W	1	18W	1075 lm					
					26W	1	26W	1550 lm					
				TJT120015AC8xxC	15W	1740 lm (4K/80CRI)	116 lm/W	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
TJT120015AC8xxC	15W	1740 lm (4K/80CRI)	116 lm/W	Circline T9	22W	1	22W	775 lm	35 lm/W				
				Circline T5	22W	1	22W	1530 lm	69 lm/W				

DISCONTINUED

NOTES:

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



Flicker Test Data Summary

(Test performed by third party lab using, Lutron Skylark S-600-WH dimmer)

With Dimmer at 100%

100% Light Output Percent Amplitude Modulation					
No Filter	40 Hz	90 Hz	200 Hz	400 Hz	1000 Hz
21.68%	0.46%	1.57%	19.95%	20.53%	20.84%
Measurement Period: 1,000 sec			Noise: 22.3 dBA		
Recording Interval: 4.00E-05 sec			Fraction of rated light output: 100%		
Flicker Index:	0.0621				

With Dimmer at 20%

20% Light Output Percent Amplitude Modulation					
No Filter	40 Hz	90 Hz	200 Hz	400 Hz	1000 Hz
14.38%	2.87%	4.34%	13.45%	14.00%	13.99%
Measurement Period: 1,000 sec			Noise: 21 dBA		
Recording Interval: 4.00E-05 sec			Fraction of rated light output: 21%		
Flicker Index:	0.0319				

With Dimmer at Minimum Light Output

Minimum Light Output Percent Amplitude Modulation					
No Filter	40 Hz	90 Hz	200 Hz	400 Hz	1000 Hz
11.20%	0.66%	1.70%	9.45%	10.27%	10.52%
Measurement Period: 1,000 sec			Noise: 21 dBA		
Recording Interval: 4.00E-05 sec			Fraction of rated light output: 11%		
Flicker Index:	0.0262				

No Dimmer

Light Output Percent Amplitude Modulation					
No Filter	40 Hz	90 Hz	200 Hz	400 Hz	1000 Hz
19.11%	0.49%	1.26%	18.13%	17.89%	17.88%
Measurement Period: 1,000 sec					

