



TJTUNV023AC9xxB

JA8-2016

DirectAC UNV Retrofit Kit Engines

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

General Specifications

Input Voltage / Frequency ①	120~277VAC (+/- 10%) / 50-60Hertz		
Input Current ①	~0.192A @120V	~0.100A @230V	~0.083A @277V
Input Power ①	23W (+/- 1W)		
Input PF	>0.98		
THD	<20%		
Operating Frequency @120V/60Hz	120Hz		
Max Lumen Output @ Full Power ②	2159 lumens @ 4000K / 90 CRI		
Dimming Type/Range @120V ONLY	Leading Edge (TRIAC) or Trailing Edge (ELV) /100% ~ 10%		
Beam Angle	120°		
CRI / CCT	90 / 2700K, 3000K, 3500K, 4000K; 5000K is made to order (MTO)		
Operating Temperature Range (ta)	-35 to 50°C / -31°F to 122°F		
Maximum Engine Case Temperature (Tc)	L70: Tc max=85°C (185°F) / L90: Tc max=85°C (185°F)		
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 @85°C; 3 SDCM		
Overall Size	6.97" diameter x 0.71" H (177.04mm Dia. x 18.03mm H)		
Wire Type/ Length	18AWG / 12" Black and White wires		
LED Quantity	64 Pcs.		
Weight	195.5g / 0.43lbs.		
Packaging: Master Carton	24pcs		
Maximum Screw Installation Torque	60in-lb (960in-ozf)		
Safety/Compliance	DirectAC Engines: cURus (File # E486778) TATUNV023AxxxxA DirectAC Retrofit Kits: cULus (File # E486779) TJTUNV023AxxxxB RoHS Compliant Dry and Damp Location IC Over Temperature Control CEC JA8-2016		
RFI/EMI	FCC Part 15B Consumer, EN55015		
Input Surge Test	2.5kV Ring Wave Common and Differential mode		
Sound Rating / Noise	A / <24 dBA		
Percent Flicker / Flicker Index	<25% / <0.0706		
Protective Lens/Enclosure	High Voltage Barrier / 3mm Clear Polycarbonate 5VA Flame rated		
Lens Transmittance	>92.5%		
PCB Material	MCPCB		
Warranty	5 years @85°C (185°F) Tc from the date of manufacture		
Electrolytic Capacitor Rating	>60,000 hours		

① Measured electrical data per UL file



TJTUNV023AC9xxB

JA8-2016



Electrical and Optical Specifications

Color Temperature	DirectAC Engine Part Number	Input Power	Nominal Luminous Flux @ 90 CRI	Engine Efficacy @ 90 CRI
2700K	TJTUNV023AC927B	23W	1981 lumens	86 lm/W
3000K	TJTUNV023AC930B	23W	2057 lumens	89 lm/W
3500K	TJTUNV023AC935B	23W	2083 lumens	91 lm/W
4000K	TJTUNV023AC940B	23W	2159 lumens	94 lm/W
5000K	TJTUNV023AC950B	23W	2210 lumens	96 lm/W

NOTES:

- 1) Nominal luminous flux includes a 7.5% loss due to lens. Use a 1.075 multiplier when lens is removed.
- 2) Electrical and optical specifications are based on Tc mod = 25°C @120V. Reference Amb. Temp. vs Rel. Lum. Flux for other temperatures.
- 3) Specifications are subject to change without notice.
- 4) Meets CEC Title 24 requirement.
- 5) ~10% lumen depreciation @277V input.



TJTUNV023AC9xxB

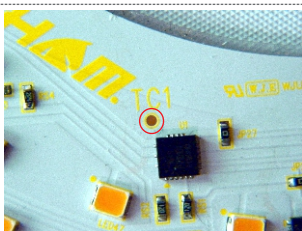
JA8-2016



Thermal Specifications

⑤ DirectAC Engine Retrofit Kit (B)

Storage Temperature Range	-40°C (-40°F) to 80°C (176°F)
Operating Ambient Temperature Range (ta)	-35°C (-31°F) to 50°C (122°F)
Maximum Engine Case Temperature (Tc)	L70: Tc max=85°C (185°F) / L90: Tc max=85°C (185°F)
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	0.988
35°C	0.975
40°C	0.963
45°C	0.951
50°C	0.938
55°C	0.926
60°C	0.914
65°C	0.901
70°C	0.889
75°C	0.877
80°C	0.864
85°C	0.852
90°C	0.840
95°C	0.827
100°C	0.815

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



TJTUNV023AC9xxB

JA8-2016



Certification Chart

Model Classification	TJTUNV023AC9xxB
RoHS COMPLIANT	YES
cULUS	YES
CLASSIFIED cULUS	YES

TM-21 Calculator Data

Tc Module	Reported L70	Reported L90
50°C	>54,000 Hrs	>54,000 Hrs
100°C	>54,000 Hrs	35,000 Hrs
110°C	>54,000 Hrs	30,000 Hrs

Tc Module	Calculated L70	Calculated L90
50°C	180,000 Hrs	55,000 Hrs
100°C	116,000 Hrs	35,000 Hrs
110°C	99,000 Hrs	30,000 Hrs



TJTUNV023AC9xxB

JA8-2016



Compatible Tested Dimmers

(Contact Fulham for other alternatives)

(TRIAC or ELV Dimmers)

Manufacture	Model	Type
Core	SI061BR-PTA	TRIAC (Leading Edge) Incandescent Analog
Legrand	ADTP703TUM4	Universal
Legrand	RH703PTC	TRIAC (Leading Edge) Incandescent Analog
Legrand	RH703PTUTC	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



TJTUNV023AC9xxB

JA8-2016



DirectAC Engine Equivalency Chart

DirectAC Engine/Kit (23W)				CFL					
Engine/Kit Part Number	System Wattage	Lumen Output	Efficacy	CFL Style	Lamp Wattage	# of Lamps	Total Wattage	Lumen Output	Efficacy
TJTUNV023AC9xxB	23W	2159 lm (4K/90CRI)	94 lm/W	Quad	13W	3	39W	2475 lm	59 lm/W
					18W	2	36W	2150 lm	59 lm/W
				Triple	13W	3	39W	2535 lm	59 lm/W
					18W	2	36W	2040 lm	56 lm/W
					32W	1	32W	2040 lm	63 lm/W
					42W	1	42W	2720 lm	64 lm/W
				Circline T9	32W	1	32W	1500 lm	46 lm/W
					40W	1	40W	1975 lm	49 lm/W

NOTES:

1) For reference only, several factors apply.



TJTUNV023AC9xxB

JA8-2016



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
24.65%	0.29%	1.78%	23.07%	23.76%	23.92%
Measurement Period:			2.000 sec	Noise:	20.4 dBA
Recording Interval:		4.00E-05		Fraction of rated light output: 100%	
Flicker Index:		0.0706			

With Dimmer at 20%

20% Light Output Percent Amplitude Modulation					
No Filter	40 Hz	90 Hz	200 Hz	400 Hz	1000 Hz
24.17%	0.92%	2.65%	17.35%	21.53%	23.08%
Measurement Period:			2.000 sec		Noise: 19.9 dBA
Recording Interval:		4.00E-05 sec		Fraction of rated light output: 19%	
Flicker Index:		0.0571			

With Dimmer at Minimum Light Output

Minimum Light Output Percent Amplitude Modulation					
No Filter	40 Hz	90 Hz	200 Hz	400 Hz	1000 Hz
20.18%	0.80%	1.65%	13.20%	16.88%	17.58%
Measurement Period:		2.000 sec	Noise:		20.5 dBA
Recording Interval:		4.00E-05 sec	Fraction of rated light output:		9%
Flicker Index:		0.0411			



TJTUNV023AC9xxB

JA8-2016



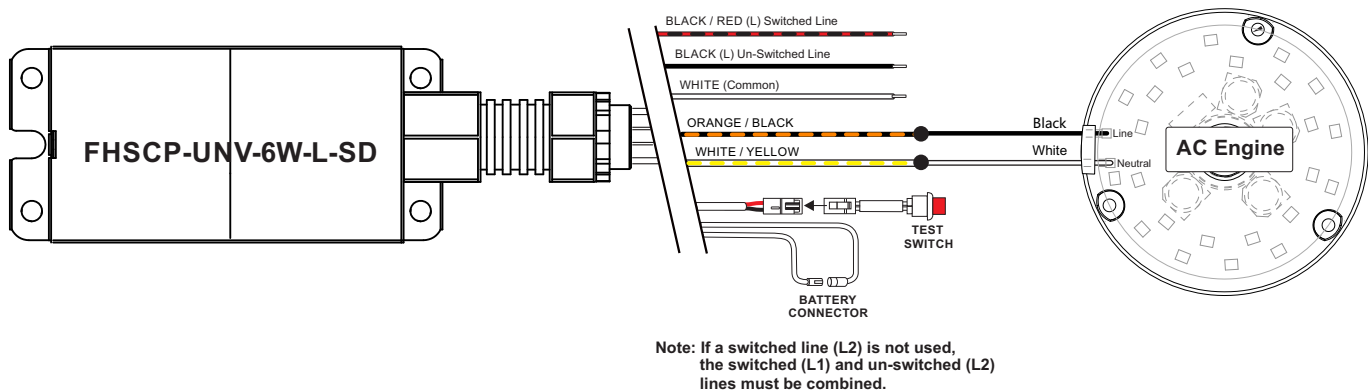
RoHS COMPLIANT

Battery Backup Option

- **FHSCP-UNV-6W-L-SD:** Emergency LED Driver for Direct AC Engines
- **FHUPS1-UNV-25L-SD:** 25W Micro Inverter
- **FHUPS1-UNV-50L-SD:** 50W Micro Inverter



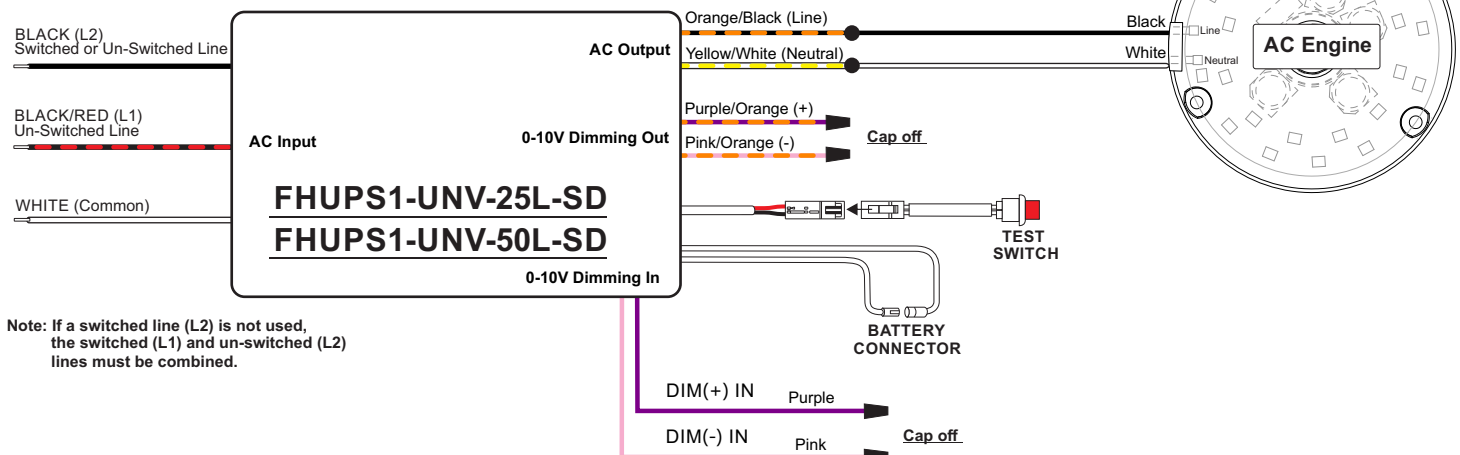
Wiring Diagram



Multiple Luminaires

FHUPS1-UNV-25L-SD can connect up to one(1x) TJTUNV023AC9xxB engine.

FHUPS1-UNV-50L-SD can connect up to two(2x) TJTUNV023AC9xxB engines.



NOTES:

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



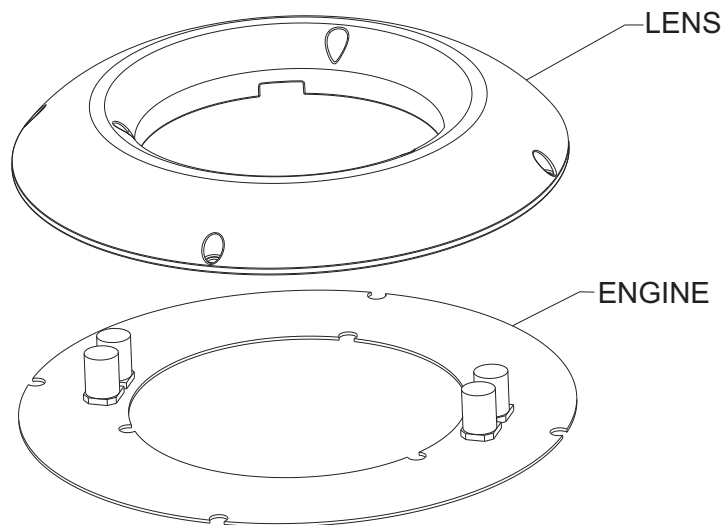
TJTUNV023AC9xxB

JA8-2016



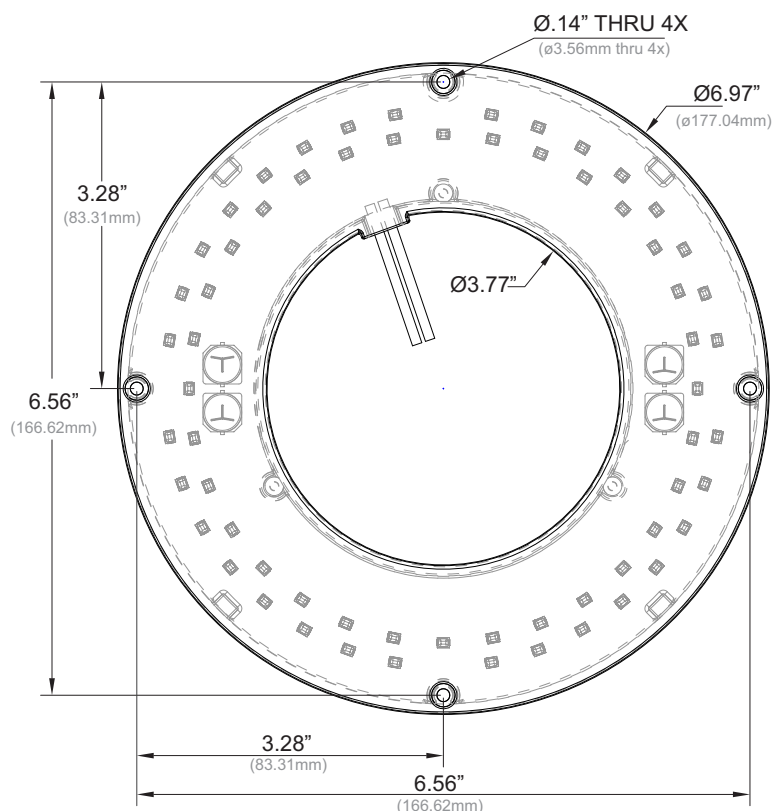
Mechanical Drawings

(Scale 13 : 20)

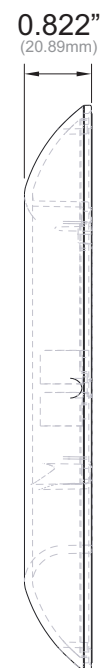


Overall Dimensions	
Diameter	6.97" [177.04mm]
Height	0.71" [18.03mm]
Wire Length AC Input (Black / White)	12" [304.8mm]

Exploded View



Top View



Side View



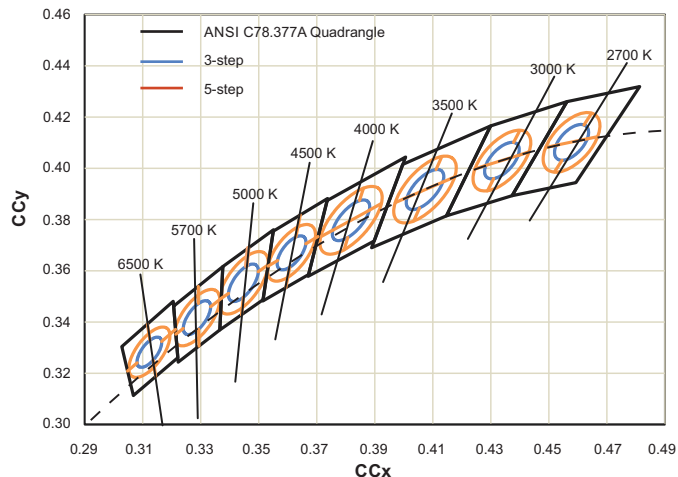
TJTUNV023AC9xxB

JA8-2016

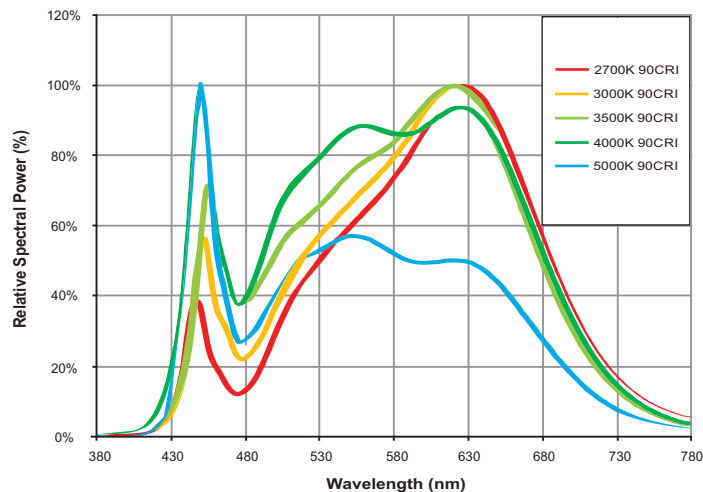


RoHS COMPLIANT

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) Binning per ANSI C78.377-2015 @ 85°C; 3 SDCM.
- 3) The Optical Spectrum values vary depending on product type and color rank.



TJTUNV023AC9xxB

JA8-2016



RoHS COMPLIANT

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 high 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.
- 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® and IDEAL's 102X connector, please visit:
http://www.wago.com/infomaterial/wago_ebook/51261593/flipviewerxpress.html
<https://idealind.com/shop/30-102x.html>



Daisy Chain

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 this LED Engine use screws with a diameter less than 0.13in. [3.4mm]. The LED Engine must be mounted on a flat surface and all mounting holes must be used to ensure good contact between the back side of the LED Engine and the mounting surface. Refer to max specified torque for installation. Suggested screw sizes: #5 or M3 Pan Head screw. Fulham provides four 6-20 X 5/8" Flat Head Self Drilling Screws, see instruction sheets for further details
- During installation process do not remove plastic film backing.

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/source 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, 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.



TJTUNV023AC9xxB

JA8-2016



RoHS COMPLIANT

Part Number Matrix

T J T UNV 023 AC 9 40 B

Engine Type	Dimming	Input Voltage	Input Power	Material & Shape	CRI	Color Temperature	Option
② J = DirectAC Engine Retrofit Kit (Classified)	T = TRIAC/ELV @120V Only	UNV = 120V~277V	023 = 23W	AC = MCPCB+wire Circular	③ 9 = 90	③ 27 = 2700K ③ 30 = 3000K ③ 35 = 3500K ③ 40 = 4000K 50 = 5000K	⑤ B = DirectAC Engine+Lens (Retrofit Kit)

NOTES:


- 1) DirectAC Engines standard model "B" comes with engine and lens.
- 2) Specifications are subject to change without notice.
- 3) All 90CRI product meets CEC Title 24 requirement.
- ⑤ Standard Product offering. (90CRI / 5000K option is made to order with MOQ and lead time.)
- ⑥ LED Engine Retrofit Kit includes mounting hardware, retrofit labels, and installation instructions.

Product Image: 23W DirectAC UNV Round Engine Kit

TJTUNV023AC9xxB



Installation Instructions

Avertissement: Risque d'incendie et d'électrocution, câblage des luminaires et pièces électriques peuvent être endommagés lors du forage pour l'installation du kit de conversion à DEL. Vérifier le câblage et les composants ci-joint.	WARNING: Risk of fire and electrical shock. Luminaire wiring and electrical parts may be damaged when drilling for installation of LED retrofit kit. Check for enclosed wiring and components.
 WARNING: Cancer and Reproductive Harm	www.P65Warnings.ca.gov



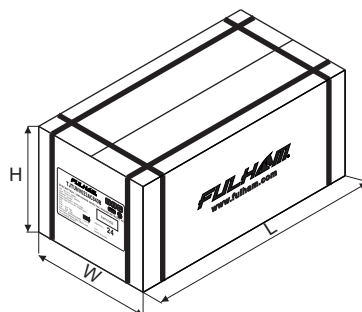
or



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

Packaging

Master Carton



OUTER DIMENSION		
L	W	H
16.92"(430mm)	16.92"(430mm)	8.07"(205mm)
Net Weight	Gross Weight	QUANTITY
11.02 lbs. (5.00kg)	13.22 lbs. (6.00kg)	24pcs.

Twenty-Four (24) Individual DirectAC LED Engine bags inside each Master Carton.