

VJTMIE020AC9TWB

5" Round VividHorse 230-277VAC Power & CCT Selectable AC Engine Retrofit Kit

- 230-277V input AC Engine Retrofit Kit
- Power Selectable: 16W & 21W (Factory Default 21W)
- CCT Selectable: 2700K, 3000K(Default), 3500K, 4000K, 5000K
- CRI90 standard
- Potassium Fluorosilicate (PFS) phosphor LEDs to achieve as high efficacy as today's CRI80 LEDs
- 5VA flame rated multi-lens included
- cULus Classified Retrofit Kit per UL1598C standard
- Compatible with Fulham emergency solutions
- Suitable for open or fully enclosed luminaires
- Suitable for luminaires with plastic and glass lenses

General Specifications

Input Voltage / Frequency ^①	230-277VAC (+/- 10%), 50/60Hz
Input Current ^①	16W: ~0.073A@230V; ~0.063A@277VAC 21W: ~0.098A@230V; ~0.082A@277VAC
Input Power ^②	Typ. 15W / 20W selectable without dimmer; Max. 16W / 21W with TRIAC dimmer
Input PF	>0.9
THD	<40%
Max Lumen Output @ 4000K/90CRI	16W: 1695 lumens@230VAC, 1545 lumens@277VAC 21W: 2260 lumens@230VAC, 2060 lumens@277VAC
Dimming Type/Range	Leading Edge (TRIAC) or Trailing Edge (ELV) / 100% ~ 10% ^②
Beam Angle	140° with lens
Color Rendering Index	CRI (Ra) ≥ 90 / R9 ≥ 50 / TM-30 R _a ≥ 85 / TM-30 R _f ≥ 100
Storage Temperature Range	-35°C to 100°C / -31°F to 212°F
Operating Ambient Temperature Range (Ta)	-35°C to 50°C / -31°F to 122°F
Maximum Module Case Temperature	Safety: 105°C(221°F) / L70(>72Khrs): 105°C(221°F) / L90(36Khrs): 95°C(203°F)
Estimated Lumen Maintenance	L70= >54,000 hours @ Tc max 105°C / L90= 36,000 hours @ Tc max 95°C
Color Consistency (Color Center@25°C)	2700K (0.458, 0.410); 3000K (0.431, 0.397); 3500K (0.405, 0.384) 4000K (0.380, 0.372); 5000K (0.345, 0.335), Typ. 3 SDCM, Max. 6 SDCM
Flicker Percentage per CEC JA10	<6% with 200Hz cut-off
Flicker P _{st} / SVM	P _{st} : <0.35 SVM: <0.15
Start-up Time	<15ms
Overall Size with optical lens	5.12"Dia. x 0.654"H (130mm Dia. x 16.6mm H)
Wire Type / Length	18AWG / 12" Black & White wires
LED Quantity	30pcs. CW + 30pcs. WW
Weight	115g / 0.254lbs.
Packaging: Master Carton	60pcs
Maximum Screw Installation Torque	35in-lb (560in-ozf)
Safety	DirectAC Module (without lens): cURus File # E351548, VATMIE020AC9TWA DirectAC Retrofit Kits: cULus Classified File # E365124, VJTMIE020AC9TWB
Compliance	RoHS Compliant Dry and Damp Location
RFI/EMI	FCC Part15 Class B, EN55015
Input Surge Test	1KV / 2KV combined wave; 2.5KV ring wave
Sound Rating / Noise	A / <24 dBA
Protective Lens / Enclosure	High Voltage Barrier / 3mm frosted Polycarbonate 5VA flame rated
Lens Transmittance	>92%
PCB Material	MCPCB
Warranty	5 years @ Max. Tc 95°C (203°F) from the date of manufacture

① Measured electrical data per UL file

② With some phase cut dimmers, the engine will be dimmed to off

VJTMIE020AC9TWB

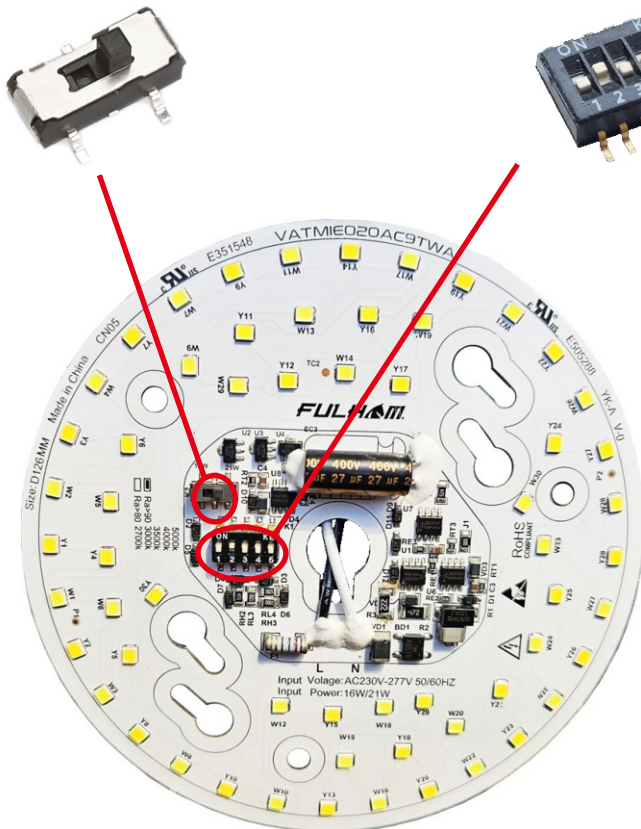
Power & CCT Selection Indication

1. The VividHorse DirectAC Engine Retrofit Kit is a dual-channel LED product that allows for Power & CCT selection via dip switches on the PCB. Available CCTs include 2700K, 3000K, 3500K, 4000K and 5000K.
2. A pre-set Power & CCT will come from the factory. Check the product label or packaging to see the pre-set level.
3. Change the Power dip switch for desired power level.
4. Change the CCT dip switch position to "ON" (1~5) to set the desired CCT level.
5. Setting all CCT dip switches to the "OFF" position will result in no light output.

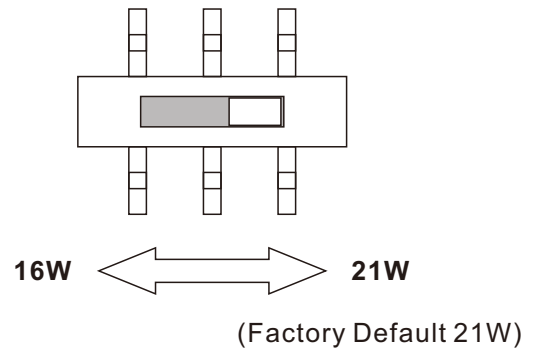
NOTE: ONLY keep one CCT dip switch in the "ON" position; failing to do so may result in an undesired CCT.

Power Selection Dip Switch

CCT Selection Dip Switch

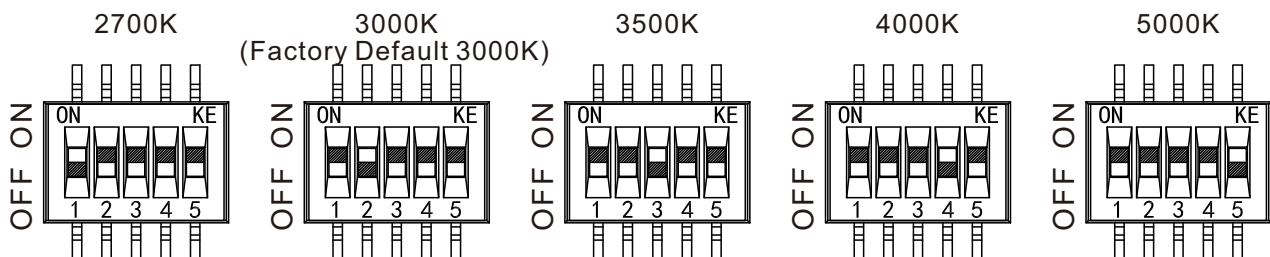


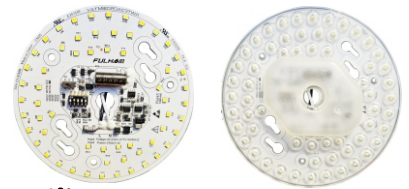
Power Indication



CCT Indication

	1	2	3	4	5
2700K	ON	OFF	OFF	OFF	OFF
3000K	OFF	ON	OFF	OFF	OFF
3500K	OFF	OFF	ON	OFF	OFF
4000K	OFF	OFF	OFF	ON	OFF
5000K	OFF	OFF	OFF	OFF	ON
No Light	OFF	OFF	OFF	OFF	OFF





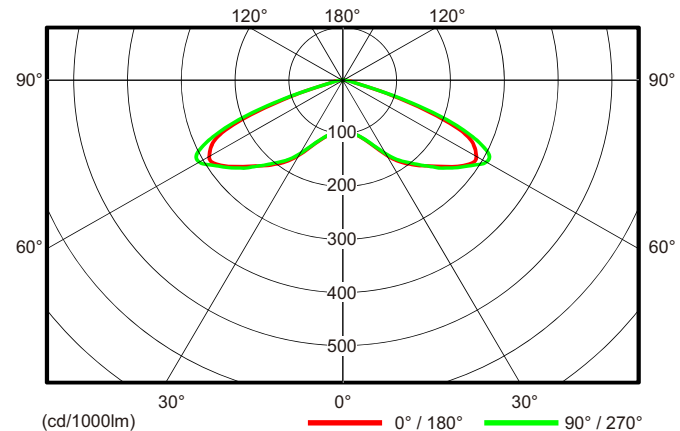
VJTMIE020AC9TWB

Electrical and Optical Specifications

CRI	DirectAC Retrofit Kit Part Number	Selected Input Power:	Input Voltage	Selected CCT	Nominal Luminous Flux @ 90 CRI	Engine Efficacy @ 90 CRI
90	VJTMIE020AC9TWB	15W (No Dimmer)	230VAC	2700K	1590 lumens	106 lm/W
				3000K	1650 lumens	110 lm/W
				3500K	1695 lumens	113 lm/W
				4000K	1695 lumens	113 lm/W
				5000K	1650 lumens	110 lm/W
			277VAC	2700K	1455 lumens	97 lm/W
				3000K	1500 lumens	100 lm/W
				3500K	1545 lumens	103 lm/W
				4000K	1545 lumens	103 lm/W
				5000K	1500 lumens	100 lm/W
		20W (No Dimmer)	230VAC	2700K	2120 lumens	106 lm/W
				3000K	2200 lumens	110 lm/W
				3500K	2260 lumens	113 lm/W
				4000K	2260 lumens	113 lm/W
5000K	2200 lumens			110 lm/W		
277VAC	2700K		1940 lumens	97 lm/W		
	3000K		2000 lumens	100 lm/W		
	3500K		2060 lumens	103 lm/W		

Light Distribution

Zone	Zone Flux	Zone Flux%	Sum Zone Flux	Sum Zone Flux%
0 ~ 10	18.1	0.9%	18.1	0.9%
10 ~ 20	59.5	3.1%	77.6	4.0%
20 ~ 30	123.3	6.4%	200.9	10.4%
30 ~ 40	224.8	11.7%	425.7	22.1%
40 ~ 50	344.6	17.9%	770.3	40.0%
50 ~ 60	482.9	25.1%	1253.2	65.0%
60 ~ 70	491.5	25.5%	1744.7	90.5%
70 ~ 80	141.5	7.3%	1886.1	97.9%
80 ~ 90	29.6	1.5%	1915.7	99.4%
90 ~ 180	11.3	0.6%	1927.0	100.0%



NOTES:

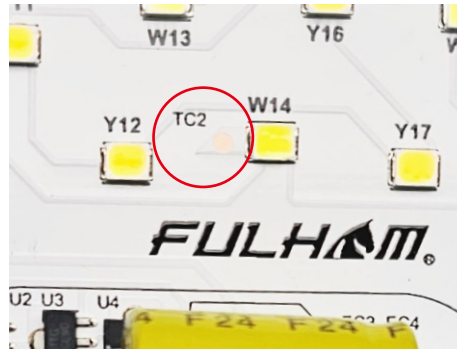
- Nominal luminous flux includes a 8% loss due to lens. Use a 1.08 multiplier when lens is removed.
- Electrical and optical specifications are based on Tc mod = 25°C. Reference Amb. Temp. vs Rel. Lum. Flux for other temperatures.
- Performance for these components have been tested in accordance with UL8750
- Specifications are subject to change without notice.
- 70CRI & 80CRI are NOT available.

VJTMIE020AC9TWB

Thermal Specifications

© DirectAC Engine Retrofit Kit

Storage Temperature Range	-35°C to 100°C / -31°F to 212°F
Operating Ambient Temperature Range	-35°C to 50°C / -31°F to 122°F
Maximum Module Case Temperature	105°C / 221°F



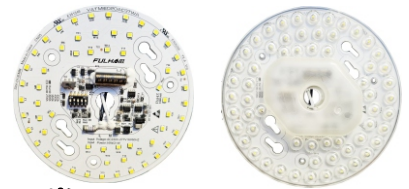
Tc located on module

Thermal De-Rating: Tc vs. Luminous Flux

Module Case Temperature (Tc)	Total Vf Multiplier	Luminous Flux Multiplier
25°C	1.000	1.000
30°C	0.998	0.992
35°C	0.995	0.984
40°C	0.993	0.976
45°C	0.990	0.967
50°C	0.988	0.958
55°C	0.986	0.949
60°C	0.984	0.940
65°C	0.982	0.931
70°C	0.980	0.922
75°C	0.978	0.913
80°C	0.977	0.904
85°C	0.976	0.895
90°C	0.974	0.886
95°C	0.973	0.877
100°C	0.971	0.867
105°C	0.969	0.858

NOTES:

- 1) Refer to DirectAC Engine Retrofit Kit Installation Instructions for further detail.
 - 2) This AC Engine Retrofit 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 AC Engine Retrofit Kit can be used with luminaires similar to the one illustrated on the Installation Instructions.
- © Suitable for surface mounted luminaire with minimum dimensions or volume: 8.5" diameter with a height of 4.75" or 173.92 cubic inches. All target luminaires shall conclude a metal back plate at size diameter 5.2" or larger with grounding means.



VJTMIE020AC9TWB

Certification Chart

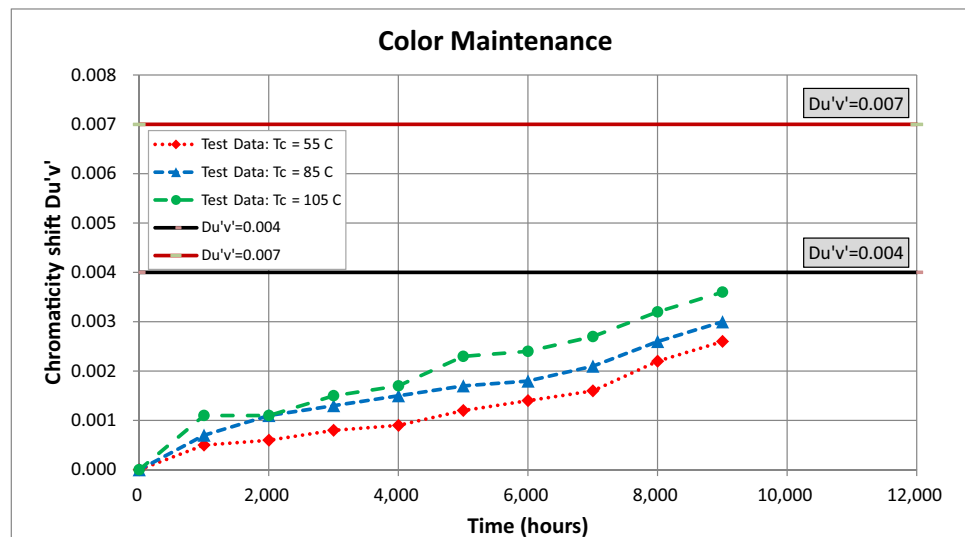
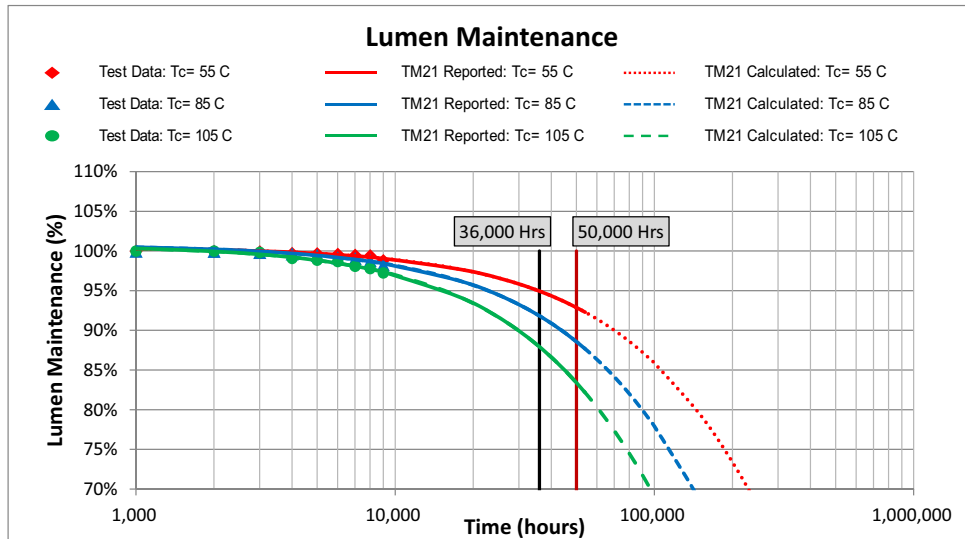
Classification	Model	VJTMIE020AC9TWB
		YES
		YES
		YES

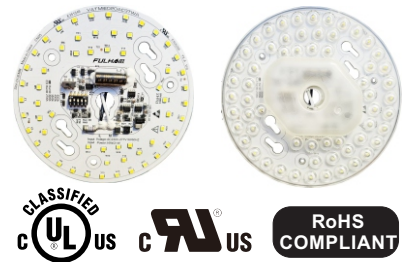
Energy Star™ TM-21 Calculator Data

Tc Module	Reported L70	Reported L90
55°C	>54,000 Hrs	>54,000 Hrs
85°C	>54,000 Hrs	44,000 Hrs
95°C	>54,000 Hrs	36,000 Hrs
105°C	>54,000 Hrs	30,000 Hrs

Tc Module	Calculated L70	Calculated L90
55°C	230,000 Hrs	70,000 Hrs
85°C	141,000 Hrs	44,000 Hrs
95°C	116,000 Hrs	36,000 Hrs
105°C	96,000 Hrs	30,000 Hrs

LED Lumen & Color Maintenance Data per LM-80 report and TM-21 Calculator





VJTMIE020AC9TWB

Compatible Tested Dimmers (TRIAC or ELV Dimmers)

(Contact Fulham for other alternatives)

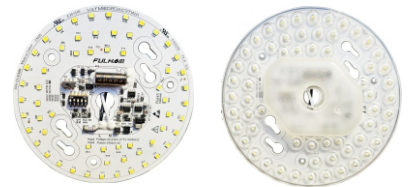
Manufacture	Model	Type
Leviton	IPX06-70Z	277VAC TRIAC
Klemko	Lumiko 891038	230VAC ELV
Schneider	KB31RD400	230VAC
Varilight	JQP252W	230VAC ELV
Varilight	KQP221W	230VAC TRIAC

Note: Slight flickering observed at a single point ~20% dimming with Leviton IPX06-70Z @ 277V

Flicker Test Results per EnergyStar (NEMA77-2017 Test Methods)

Test Condition	Input Voltage(V)	Power(W)	Pst	SVM	Flicker% (200Hz cut-off)
230VAC No Dimmer	230	20.2	0.087	0.148	5.26%
277VAC No Dimmer	277	19.2	0.319	0.051	1.72%
230VAC 20% Dimming	230	4.0	/	/	1.96%
277VAC 20% Dimming	277	2.5	/	/	3.16%

Note: Flicker Percent Amplitude Modulation is no longer required by EnergyStar.
The test data per CEC JA10-2016 are from Fulham internal lab.

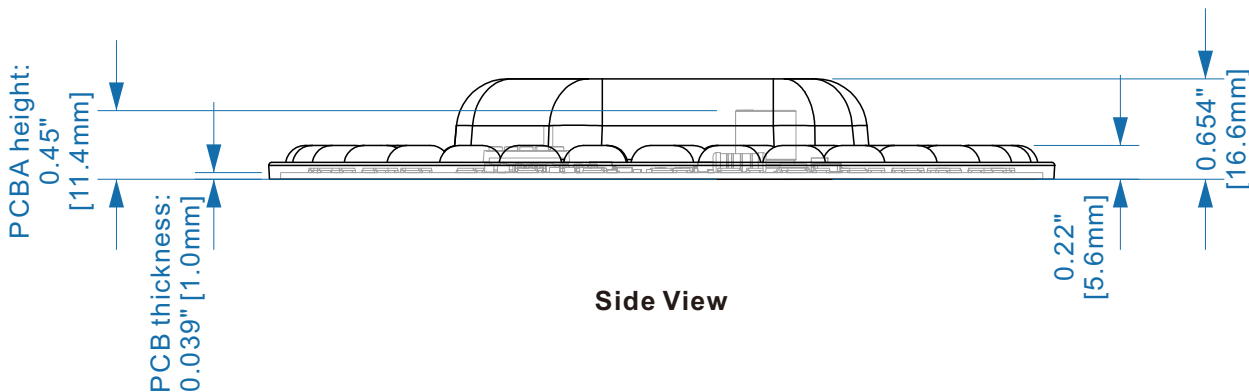
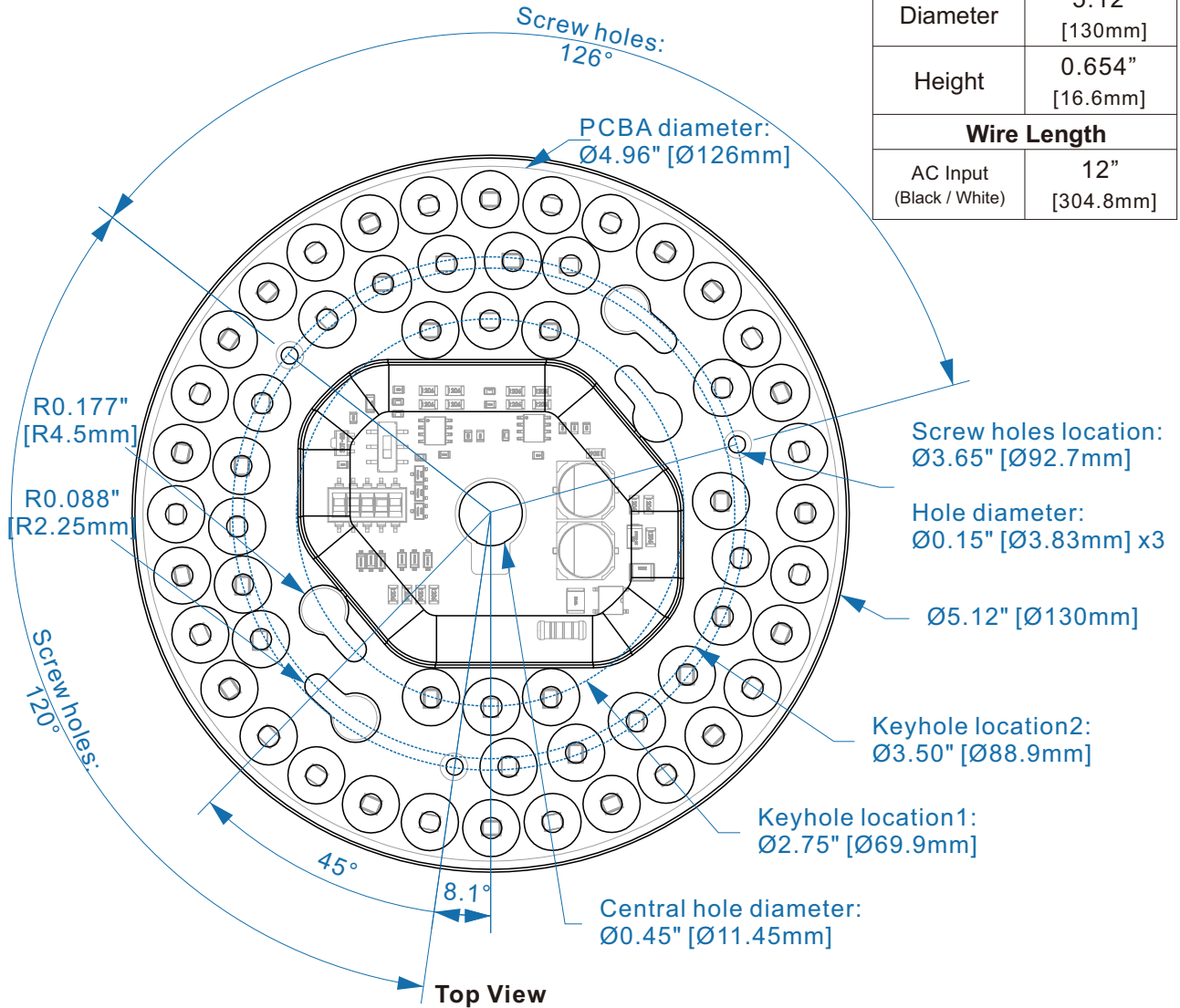


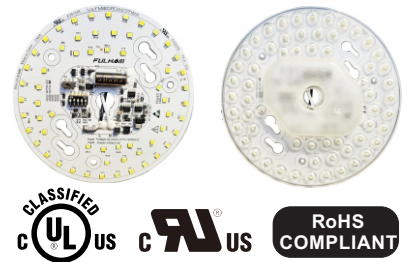
VJTMIE020AC9TWB

Mechanical Drawings

Φ5.12" [130mm]

Overall Dimensions with 5VA Lens	
Diameter	5.12" [130mm]
Height	0.654" [16.6mm]
Wire Length	
AC Input (Black / White)	12" [304.8mm]





VJTMIE020AC9TWB

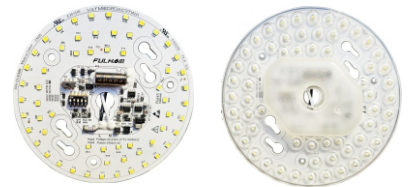
DirectAC Engine Retrofit Kit Equivalency Chart: FLUO to LED

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
VJTMIE020AC9TWB	15W	1500 lm (4K/90CRI)	100 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

DirectAC Engine/Kit (20W)				CFL					
Engine/Kit Part Number	System Wattage	Lumen Output	Efficacy	CFL Style	Lamp Wattage	# of Lamps	Total Wattage	Lumen Output	Efficacy
VJTMIE020AC9TWB	20W	2000 lm (4K/90CRI)	100 lm/W	Quad	13W	3	39W	2475 lm	59 lm/W
					18W	2	36W	2150 lm	
				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
				Circline T9	42W	1	42W	2720 lm	64 lm/W
					32W	1	32W	1500 lm	46 lm/W
				40W	1	40W	1975 lm	49 lm/W	

NOTES:

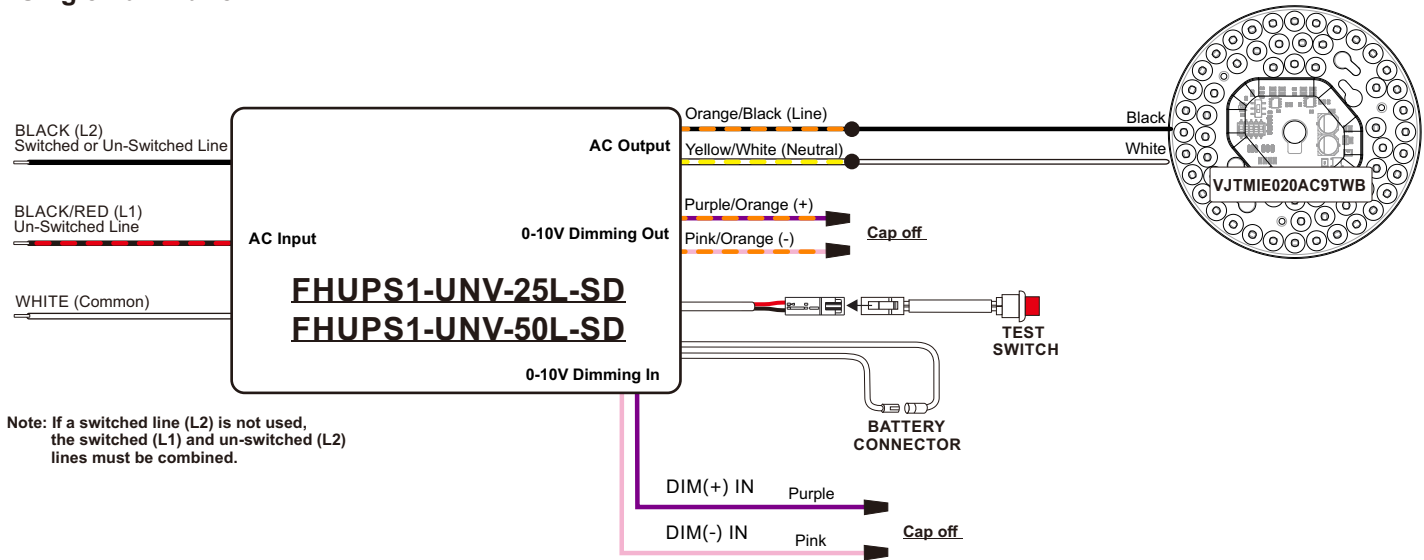
- 1) LED is a point source and FLUO is 360, there is more light lost with FLUO especially during the reflection. Therefore it is recommended to use a 65 percent of the original light source total lumens when converting FLUO to LED. For example original FLUO lumens of 2000 x .65% = 1300 LED lumens. This is only a recommendation, and the installer should consider other factors for the application.
- 2) For reference only, several factors apply.



VJTMIE020AC9TWB

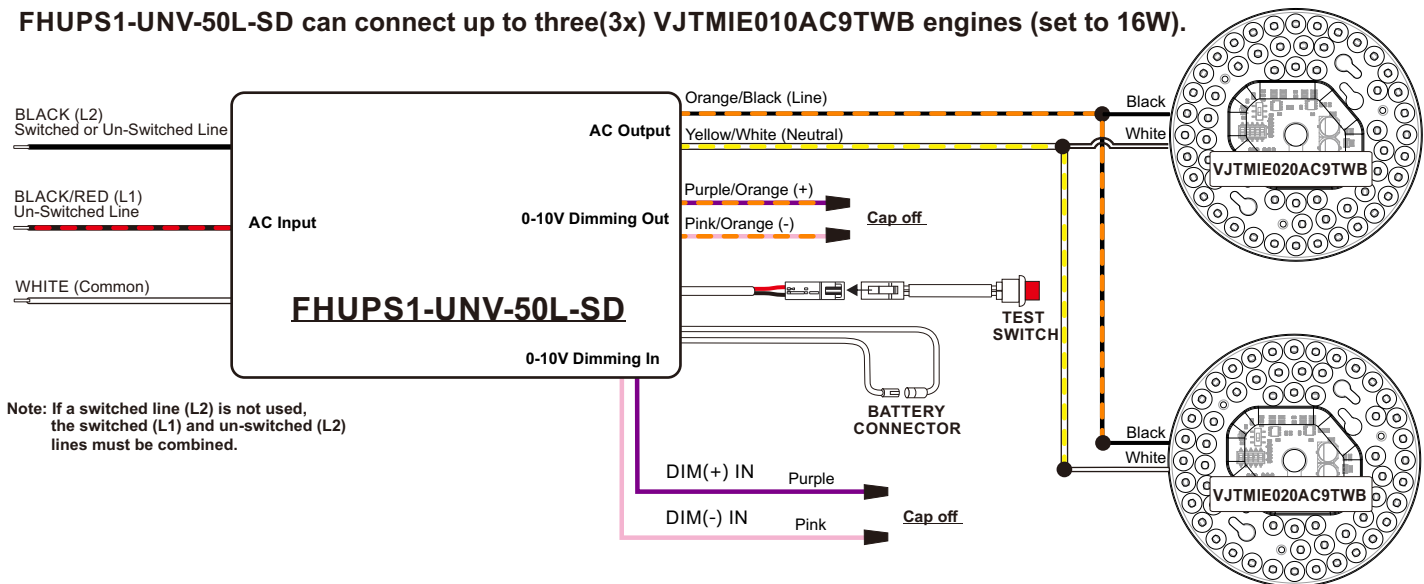
Wiring Diagram with Fulham Emergency Micro Inverter: FHUPS1-UNV-25L-SD & FHUPS1-UNV-50L-SD

Single Luminaire



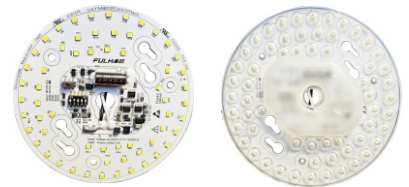
Multiple Luminaires

FHUPS1-UNV-50L-SD can connect up to two(2x) VJTMIE010AC9TWB engines (set to 21W).
 FHUPS1-UNV-50L-SD can connect up to three(3x) VJTMIE010AC9TWB engines (set to 16W).



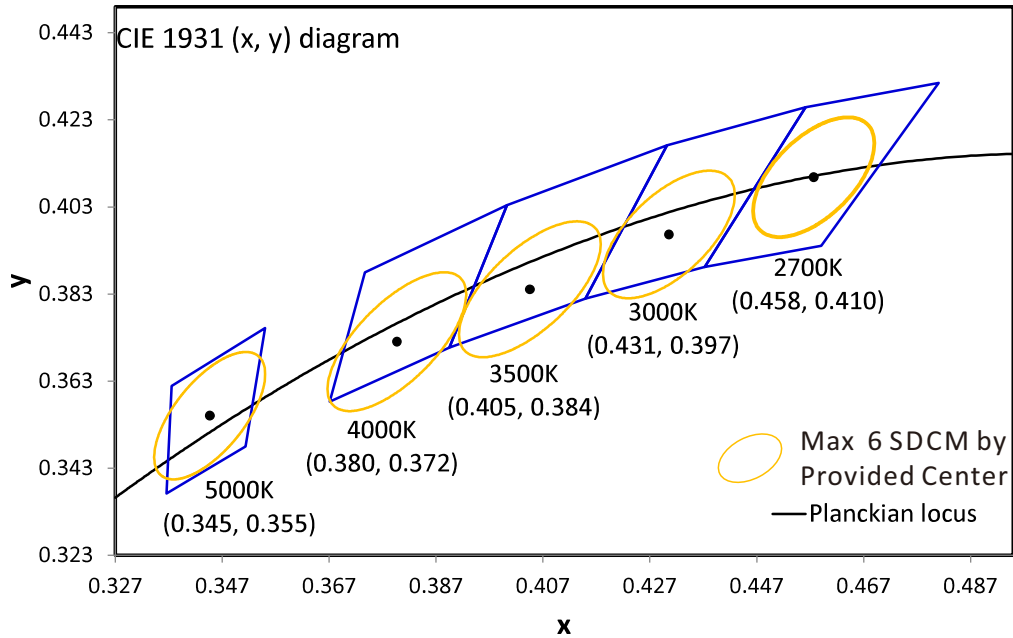
NOTES:

- 1) For reference only, several factors apply.
- 2) Emergency systems are not UL classified for field installation.
- 3) Not compatible with Fulham FHSCP-UNV-6W-L-SD emergency driver.

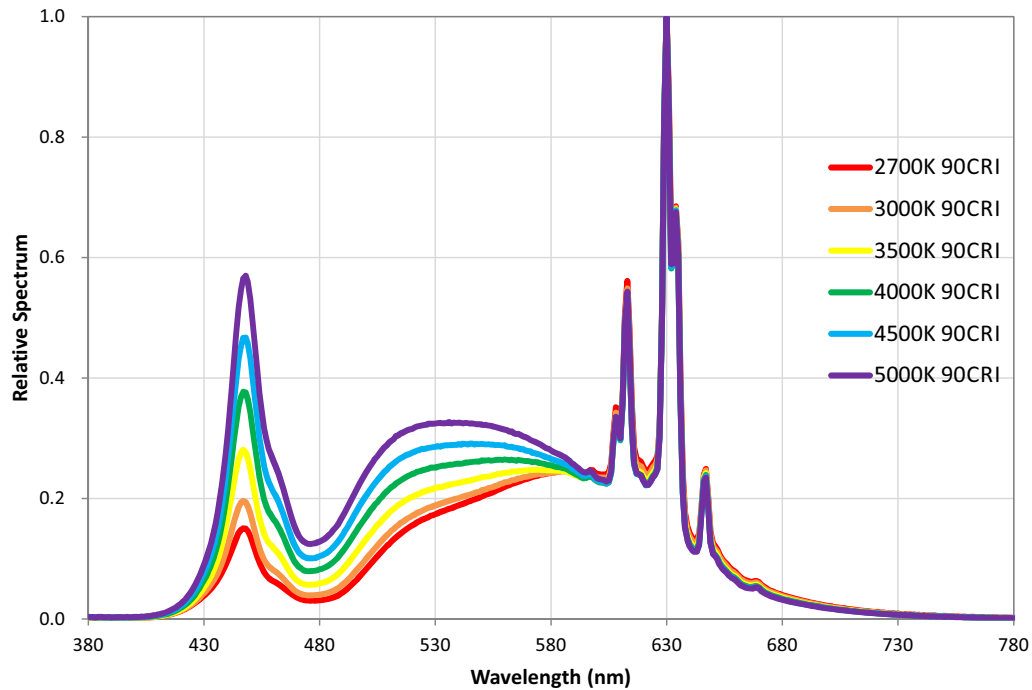


VJTMIE020AC9TWB

Color and Binning

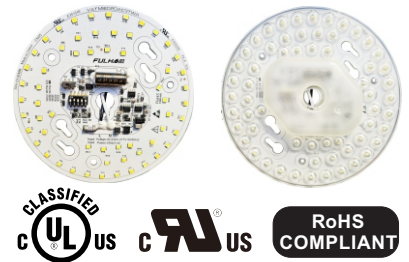


Optical Spectrum



NOTES:

- 1) The Color and Binning and Optical Spectrum charts are for reference only. For more detailed info, contact factory.
- 2) Reference Chromaticity Diagram for Color and Binning. Binning per given center point@ 25°C; Max. 6 SDCM.
- 3) The Optical Spectrum values vary depending on product type and color rank.



VJTMIE020AC9TWB

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 DC Engine Retrofit Kit 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 Engine Retrofit Kits 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 temperature, the circuit will reduce the drive current to the LED there by reducing the thermal impact on the product.

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 mounting holes to ensure good contact between back side of DirectAC Engine Retrofit Kit and mounting surface.
- Refer to max specified torque for installation. Suggested screw sizes: #6 or M3 Pan Head screw. Fulham provides three 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 230-277VAC (+/-10%) application ONLY.
- Connect the Black wire from the DirectAC Engine Retrofit Kit to the building Line by using the proper connectors or wire nuts.
- Connect the White wire from the DirectAC Engine Retrofit Kit 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.
- 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.

VJTMIE020AC9TWB

Part Number Matrix

V	J	T	MIE	020	AC	9	TW	B
Product Line V = VividHorse	Compliance ⓉJ= DirectAC Retrofit Kit (cULus Classified)	Dimming T = TRIAC	Input Voltage MIE = 230-277VAC	Estimated Power 020 = 20W (21W, 16W Selectable) Factory Default 21W	Shape AC= Circular	CRI Ⓣ9 = 90	Color Temperature ⓉTW = 2700-5000K CCT Selectable, Factory Default 3000K	

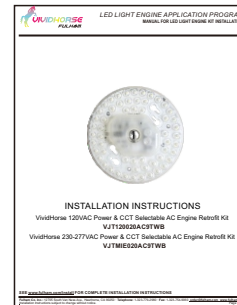
- Ⓣ Standard Product offering. Default Power setting is 21W, default CCT setting is 3000K.
- Ⓣ DirectAC Engine Retrofit Kit includes mounting hardware, retrofit labels, and installation instructions.

Product Image: 20W Round AC Engine Kit

VJTMIE020AC9TWB



This luminaire has been modified to operate LED lamps. Do not attempt to install or operate original lamps in this luminaire.
REPLACE ONLY WITH FULHAM ELECTRONIC CO.: VJTMIE020AC9TWB
 Ce luminaire a été modifié et ne peut plus utiliser la lampe prévue à l'origine.
REPLACER UNIQUEMENT AVEC FULHAM ELECTRONIC CO.: VJTMIE020AC9TWB

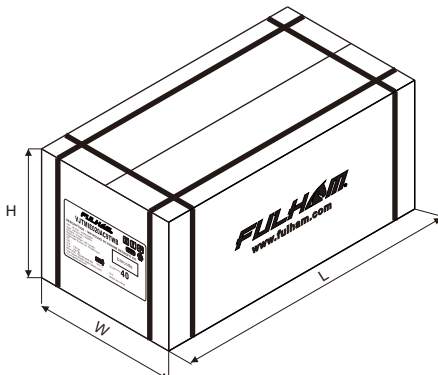


Hardware Kit: TLC-HW08

230-277V DirectAC Engine Retrofit Kits:
 Hardware, Quick disconnect, Labels & Installation Instructions

Packaging

Master Carton



OUTER DIMENSION		
L	W	H
19.69"(500mm)	12.20"(310mm)	13.19"(335mm)
Net Weight	Gross Weight	QUANTITY
15.21 lbs. (6.9 kg)	18.98 lbs. (8.61 kg)	60pcs.