



TRMUNV220AC840A

TRMUNV220AC850A



UNIVERSAL VOLTAGE HIGHBAY RETROFIT KIT/LUMINAIRE

- Suitable for Acrylic Highbays and Lowbays
- Suitable replacement for applications using 400W HID
- Surge Rating: L-N 4kV, L&N-G 6kV
- Integrated Thermal Management for optimal performance
- Programmable Driver, allowing flexibility of power and lumen output
- Compatible with 0-10V sensor
- UL Classified for Field Installation/ UL Listed
- DesignLights Consortium Qualified system

General Specifications

Input Voltage ①	120-277VAC; 50/60 Hz	
Input Current ①	1.79A Max @ 120VAC	0.77A Max @ 277VAC
Input Power ①	214WAC @ 120VAC	208WAC @ 277VAC
Input PF	>0.996 @ 120VAC	>0.975 @ 277VAC
THD	<5% @120VAC	<10% @ 277VAC
Module Operating Voltage	200V @ 1.5A	
Max Lumen Output @ Full Power	25,466 lumens @ 5000K / 80 CRI / 25°C	
Dimming Type / Range	0-10V Dimming; 100%-10%, 0%	
Beam Angle	120°	
CRI	80	
Storage Temperature Range	-25 to +100°C / -13 to 212°F	
Operating Ambient Temperature Range (Ta)	-25 to +45°C / -13 to +113°F	
Maximum Driver Case Temperature (Tc)	90°C: 20,000hrs Service Life / 75°C: 50,000hrs Service Life	
Maximum Module Case Temperature (Tc)	L70: Tc max=105°C (Ts=110°C) / L90: Tc max=85°C (Ts=90°C)	
Estimated Lumen Maintenance ②	L70: >60,000Hrs / L90: 38,000Hrs	
Color Consistency	Binning per ANSI C78.377-2015 @ 25°C; 3 SDCM	
Overall Size	11.5" diameter x 12.4" H	
Weight	9.92 lbs	
Packaging: Master Carton	1pc	
Driver Part Number	T1M1UNV140P-200L	
DC Module Part Number	TNU150300AC840A, TNU150300AC850A	
Safety/Compliance	Driver: cULus Listed (E342838: T1M1UNV140P-200L)	
	Module: cURus (E351548: TNU150300ACxxxA)	
	Retrofit Kit: cULus (E365124: TRMUNV220ACxxxA)	
	DLC 4.2: Indoor HighBay Retrofit (I.D: PM7968PZ) (4K)	
	DLC 4.2: Indoor HighBay Retrofit (I.D: P54E56DR) (5K)	
	Luminaire: cULus (E493026: TRMUNV220ACxxxA)	
	DLC 4.2: Indoor HighBay (I.D: P9ZFMGVK) (4K)	
	DLC 4.2: Indoor HighBay (I.D: P2PZWIIN) (5K)	
	Non-Class 2 Lighting System	
	IP Rating: IP20	
	Dry and Damp Locations	
	Surge Protection: L-N 4kV, L&N-G 6kV	
	RoHS compliant	
	RFI/EMI	
	FCC Part 15B Consumer, EN55015	
Sound Rating / Noise	A / <24 dBA	
Thermal Feedback	Yes	
Service Life	50,000hrs @ Ta <= 45°C (Tc mod <=100°C; Tc driver <= 75°C)	
Protective Lens/Enclosure	High Voltage Barrier/3mm Clear Polycarbonate 5VA Flame rated	
Lens Transmittance	>90%	
Warranty	5 years @ Max. Tc from the date of manufacture	

① Measured electrical data per UL file ② TM-21 Reported Numbers



Part Number Matrix

T R M U N V 2 2 0 A C 8 5 0 A

Control Type
M = 0-10V

Input Voltage
UNV = 120-277VAC

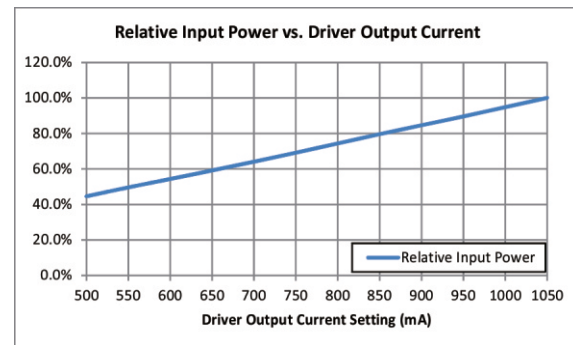
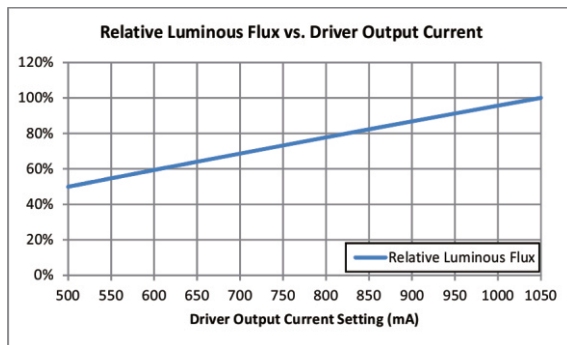
Max. Input Power
220 = 220W

CRI
③ 8 = 80

Color Temperature
③ 40 = 4000K
③ 50 = 5000K

Electrical and Optical Specifications

CCT & CRI	Retrofit Kit	Driver Output Current Setting	Input Power	Nominal Luminous Flux	Efficacy
5000K /80CRI	TRMUNV220AC850A	1050mA (Max./Default)	214W	25,466 lm	119 lm/W
		950mA	192W	23,232 lm	121 lm/W
		850mA	170W	20,910 lm	123 lm/W
		750mA	148W	18,648 lm	126 lm/W
		650mA	126W	16,254 lm	129 lm/W
		550mA	106W	13,992 lm	132 lm/W
		500mA (Min.)	95W	12,730 lm	134 lm/W



CCT & CRI vs. Luminous Flux

	2700K	3000K	3500K	4000K	5000K	5700K
CRI 70	0.96	0.97	1.01	1.02	1.03	1.03
CRI 80(R9> 0)	0.87	0.91	0.93	0.96	1.00	0.98
CRI 90(R9>50)	0.68	0.71	0.72	0.74	0.77	0.77

NOTES:

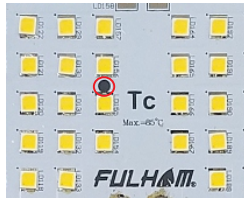
- 1) All retrofit kits are programmed to the max. 1050mA driver output.
- 2) Standard lumen output and efficacy is calculated for standard options. Reference CCT & CRI vs Luminous Flux chart for lumen ratio calculation.
- 3) Specifications are subject to change without notice.

③ Standard Product offering (All other options are made to order with MOQ and lead time)

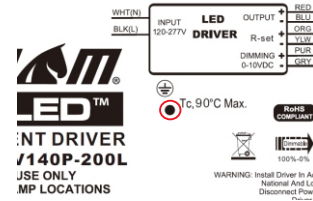


Thermal Specifications

	Luminaire/Retrofit Kit ^④
Storage Temperature Range	-25 to +100°C / -13 to 212°F
Operating Ambient Temperature Range	-25 to +45°C / -13 to 113°F
Maximum Driver Case Temperature (Tc) ^③	90°C / 194°F
Maximum Module Case Temperature (Tc)	L70 = 105°C (Ts= 110°C) / L90 = 85°C (Ts= 90°C)



Tc located on module



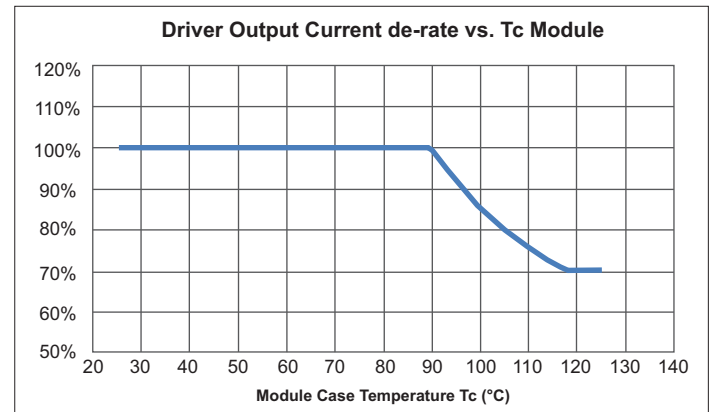
Tc located on driver

Thermal Feedback Protection

1. NTC resistor on Module is internally connected on R-set port of Driver.
2. When the Module Tc temperature exceeds safe level, the Thermal Feedback Protection will be activated. The diagram shows a typical Driver Output Current versus Module Temperature (Tc).

NOTE:

- 1) +/-5°C tolerance is allowed to account for the varying of the starting protection ambient due to the NTC and driver dimming curve tolerance.



Thermal De-Rating: Tc vs. Luminous Flux

Module Case Temperature (Ts)	Luminous Flux Multiplier	Fwd. Voltage Change
25°C	1.000	1.000
30°C	0.996	0.994
35°C	0.992	0.989
40°C	0.987	0.984
45°C	0.981	0.979
50°C	0.976	0.975
55°C	0.970	0.972
60°C	0.963	0.968
65°C	0.957	0.964
70°C	0.950	0.961
75°C	0.943	0.957
80°C	0.936	0.953
85°C	0.929	0.950
90°C	0.921	0.946
95°C	0.914	0.942
100°C	0.905	0.938

NOTES:

- 1) Retrofit kit suitable for 822, 825, and S22 series.

^④ Refer to LED Engine Retrofit Kit Installation Instructions for further detail. This LED Engine Kit can retrofit any luminaire with a length/height greater or equal to the minimum dimensions shown on the Installation Instructions. This LED Engine Kit can be used with luminaires similar to the one illustrated on the Installation Instructions.

^③ Driver Tc max. 90°C for 20,000hrs service life; Driver Tc max. 75°C for 50,000hrs service life.



Certification Chart

Model	TRMUNV220AC8X0A
Classification	
RoHS COMPLIANT	YES
UL US	YES
CLASSIFIED UL US	YES
DLC (Retrofit kit)	YES
DLC (Luminaire)	YES

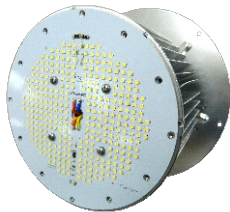
Energy Star™ TM-21 Calculator Data

Ts Module	Reported L70	Reported L90
55°C	>60,000 Hrs	>60,000 Hrs
85°C	>60,000 Hrs	38,000 Hrs
105°C	>60,000 Hrs	21,000 Hrs
Ts Module	Calculated L70	Calculated L90
55°C	200,000 Hrs	60,000 Hrs
85°C	140,000 Hrs	38,000 Hrs
105°C	100,000 Hrs	21,000 Hrs

Product Image: Highbay Retrofit Kit



Side View



Isometric View

LED Module Heat Sink And
LED Driver Housing

(LED Module and LED Driver are Pre-Installed)



LED Module Lens
And Screws



Safety Cable with Carabiner



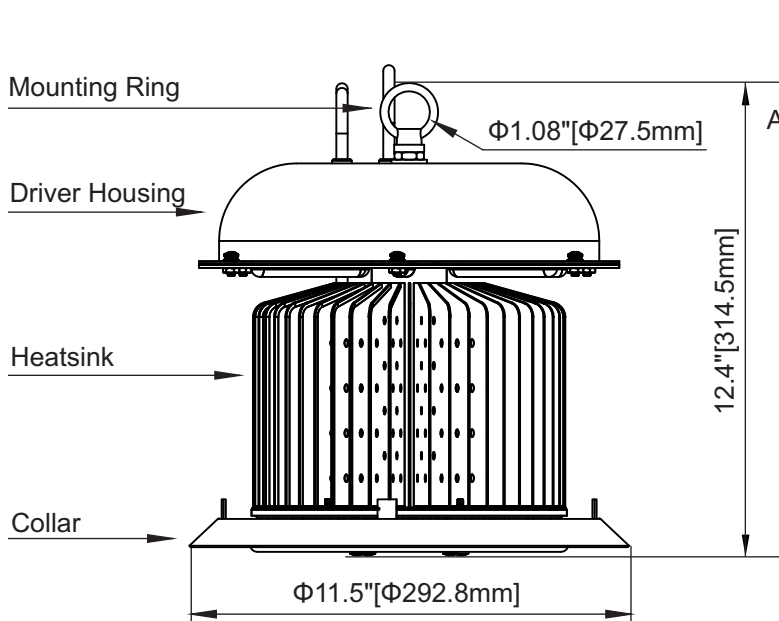
LED Highbay Mount Collar
And Screws



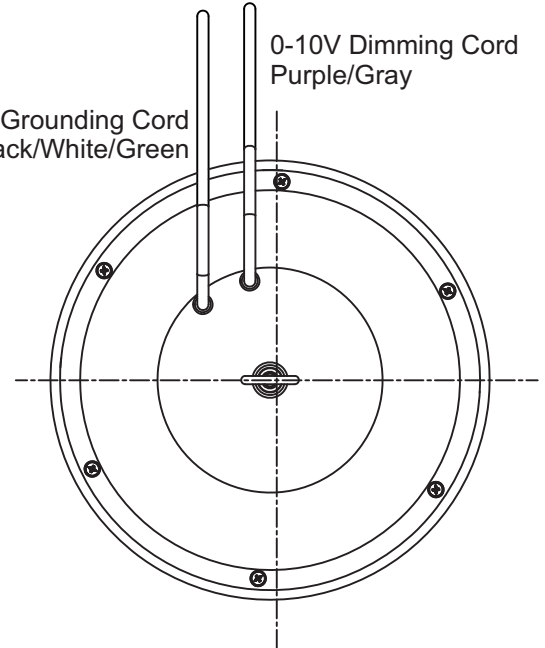
Converter



Mechanical Drawings: Highbay



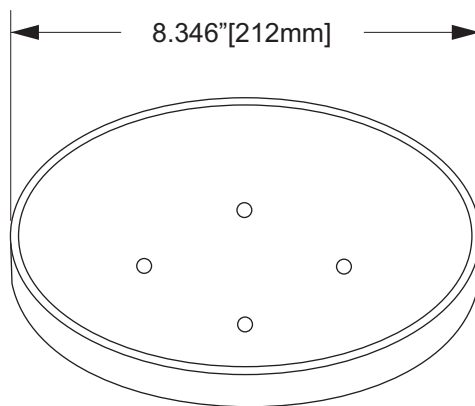
Side View



Top View

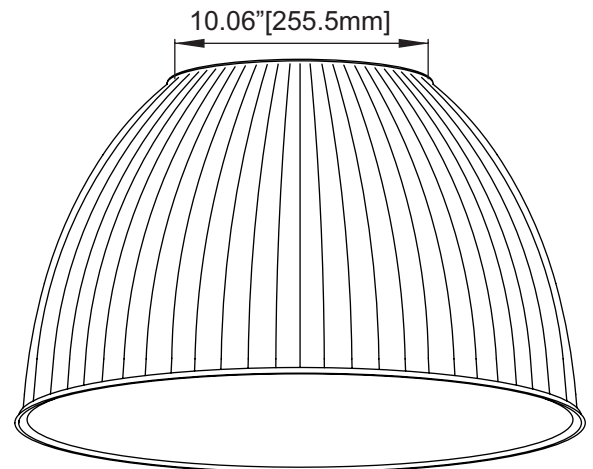
LED Module Lens

Clear polycarbonate protective lens acts as a high voltage barrier and meets the 5VA Flame rating



Isometric View

**Suitable for Acrylic Highbay Refractors
with a top diameter of >10.06"**



Isometric View

Wire Function	- Color (Polarity)	Wire Length
AC Input	- Black (L) / White (N)	3 feet
Grounding	- Green	3 feet
0-10V Dimming	- Purple (10V+) / Gray (10V-)	3 feet

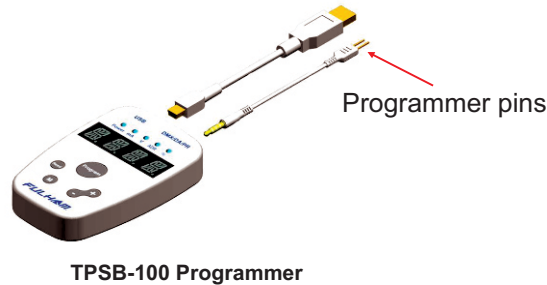
NOTES:

- 1) Suitable for 822, 825, and S22 series.
- 2) Acrylic Refractor not provided.

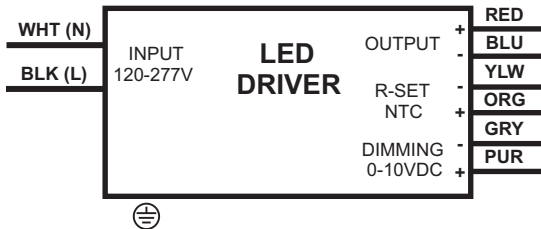


Reprogramming Instructions:

To program use the Fulham programmer TPSB-100

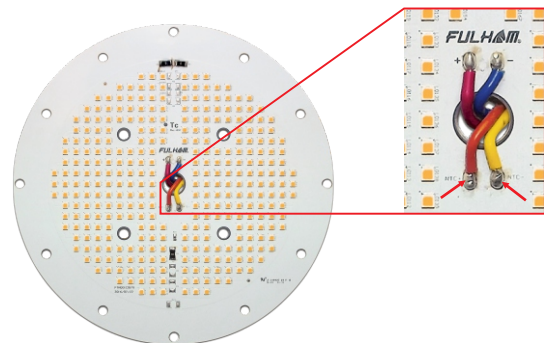


- Connect the TPSB-100 Programmer pins to the LED driver's leads, Orange and Yellow.



or

- Connect the TPSB-100 Programmer pins to the LED module, Orange and Yellow.



Follow the instructions per the following links:

- Fulham Design Guide Programmable Drivers:
<https://cdn.fulham.com/PDFs/SpecSheets/Fulham-Design-Guide-Programmable-Drivers.pdf>
- Fulham Programmable LED Drivers: Auto Program Demo:
https://www.youtube.com/watch?v=vQhZOrC_FGY
- Programming via handheld controller or PC software:
<https://cdn.fulham.com/PDFs/Fulham-WorkHorseLED-Extreme.pdf>

WARNING

To prevent damage to the LED driver, the R-set / NTC / PRG inputs (Orange and Yellow) must never make contact with LED output (Red and Blue).

NOTES:

- 1) Contact Fulham for Pre-programming options done at the factory
- 2) Driver DOES NOT need to be powered during programming
- 3) Highbay Kit can be programmed during the ON or OFF state



Guidelines

Instruction Sheets

- Refer to Instruction Sheet for detailed Step by Step Installation.

Environmental Rating

- Rated for Dry and Damp location when used with provided lens on the LED Highbay retrofit kit.
- Clear polycarbonate protective lens acts as a high voltage barrier and meets the 5VA Flame rating.

Electrostatic Sensitive Product (ESD)

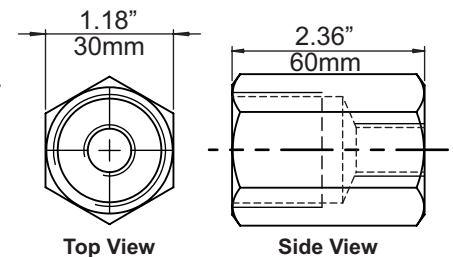
- Fulham LED products should be handled with proper measures to protect against any potential ESD damage.
- When servicing, personnel should be ground and direct contact with LED should be avoided.

Wiring

- Intended for Universal Voltage (UNV) application.
- Connect the green wire (Ground) from SO Cord found on the driver housing lid to the Ground that is being fed by the power source. Connect these two wires by using a wire connector with a minimum 18AWG rating.
- Connect the white wire (Neutral) from SO Cord found on the driver housing lid to the Neutral being fed by the power source. Connect these two wires by using a wire connector with a minimum 18AWG rating.
- Connect the Black wire (Line) from SO Cord found on the driver housing lid to the Line being fed by the power source. Connect these two wires by using a wire connector with a minimum 18AWG rating.
- Please refer to page #5 and Instruction Sheet for further details.

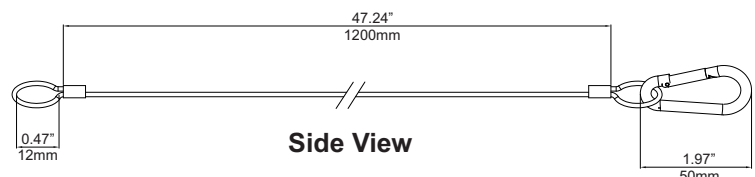
Converter

- The convertor allows for a 3/4" thread pipe to be used for pendant mount applications.



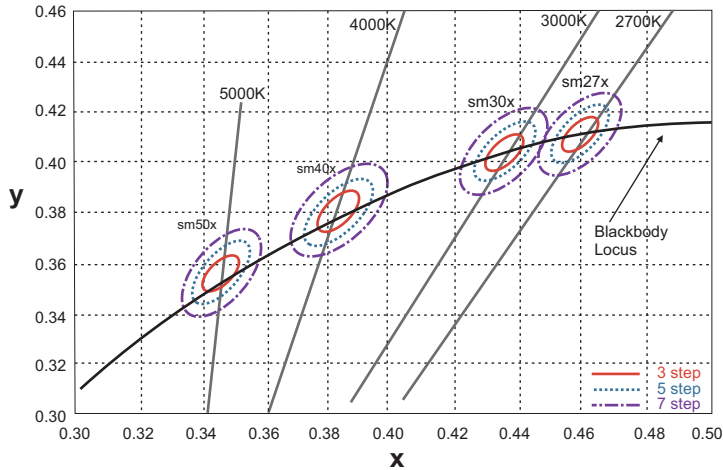
Safety Cable with Carabiner

- Safety cable with carabiner can be used to secure the kit. At the same time the carabiner can be used as a mounting option.

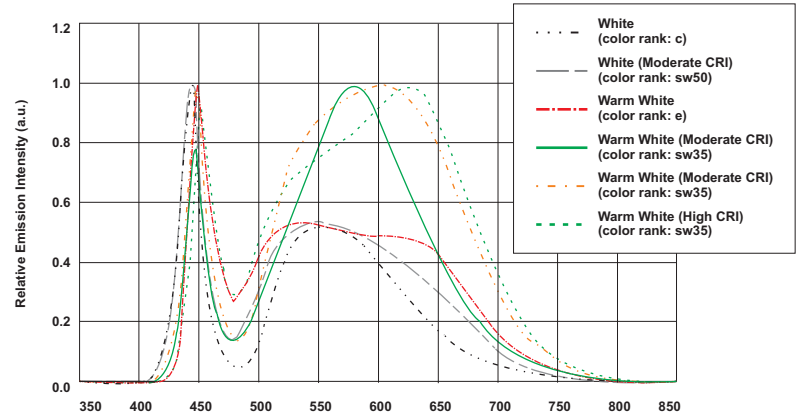




Color and Binning



Optical Spectrum



NOTES:

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



Highbay Retrofit Kit Equivalency Chart

Highbay Retrofit Kit									HID										
Retrofit Kit Part Number	System Wattage (W)	Initial Lumen Output (lm)	Mean Lumens (lm)	CRI	Efficacy (lm/W)	SP Ratio	Initial Visually Effective Lumens (Vels)	Mean Visually Effective Lumens (Vels)	HID Type	Lamp Wattage	# of Lamps	System Wattage (W)	Initial Lumen Output (lm)	Mean Lumens (lm)	CRI	Efficacy (lm/W)	SP Ratio	Initial Visually Effective Lumens (Vels)	Mean Visually Effective Lumens (Vels)
TRMUNV220AC840A	214	25466	17826	80	119	2	50932	35652	HPS	1000	1	1150	130000	78000	20	110	0.62	80600	48360
TRMUNV220AC840A	214	25466	17826	80	119	2	50932	35652	HPS	750	1	800	110000	66000	20	110	0.62	68200	40920
TRMUNV220AC840A	192	23232	16262	80	121	2	46464	32525	HPS	600	1	650	90000	54000	20	110	0.62	55800	33480
TRMUNV220AC840A	106	13992	9794	80	132	2	27984	19589	HPS	400	1	450	50000	30000	20	110	0.62	31000	18600
TRMUNV220AC840A	95	12730	8911	80	134	2	25460	17822	HPS	310	1	340	37000	22200	20	108	0.62	22940	13764
TRMUNV220AC840A	95	12730	8911	80	134	2	25460	17822	HPS	250	1	275	28000	16800	20	110	0.62	17360	10416
TRMUNV220AC840A	95	12730	8911	80	134	2	25460	17822	HPS	200	1	220	22000	13200	20	100	0.62	13640	8184
TRMUNV220AC840A	95	12730	8911	80	134	2	25460	17822	HPS	150	1	175	16000	9600	20	110	0.62	9920	5952
TRMUNV220AC840A	95	12730	8911	80	134	2	25460	17822	HPS	100	1	120	9500	5700	20	80	0.62	5890	3534
TRMUNV220AC840A	214	25466	17826	80	119	2	50932	35652	MV	1000	1	1150	58000	34800	45	50	1.08	62640	37584
TRMUNV220AC840A	106	13992	9794	80	132	2	27984	19589	MV	400	1	450	23000	13800	45	50	1.08	24840	14904
TRMUNV220AC840A	95	12730	8911	80	134	2	25460	17822	MV	250	1	270	12500	7500	45	45	1.08	13500	8100
TRMUNV220AC840A	95	12730	8911	80	134	2	25460	17822	MV	175	1	205	8400	5040	45	45	1.08	9072	5443
TRMUNV220AC840A	95	12730	8911	80	134	2	25460	17822	MV	100	1	120	4100	2460	45	40	1.08	4428	2657
TRMUNV220AC840A	192	23232	16262	80	121	2	46464	32525	MH	400	1	450	36000	21600	65	80	1.49	53640	32184
TRMUNV220AC840A	170	20910	14637	80	123	2	41820	29274	MH	330	1	350	33000	19800	80	95	1.49	49170	29502
TRMUNV220AC840A	126	16254	11378	80	129	2	32508	22756	MH	250	1	270	22000	13200	65	80	1.49	32780	19668
TRMUNV220AC840A	106	13992	9794	80	132	2	27984	19589	MH	200	1	220	19000	11400	65	80	1.49	28310	16986
TRMUNV220AC840A	95	12730	8911	80	134	2	25460	17822	MH	175	1	205	14000	8400	50	80	1.49	20860	12516
TRMUNV220AC840A	95	12730	8911	80	134	2	25460	17822	MH	150	1	170	12500	7500	50	80	1.49	18625	11175

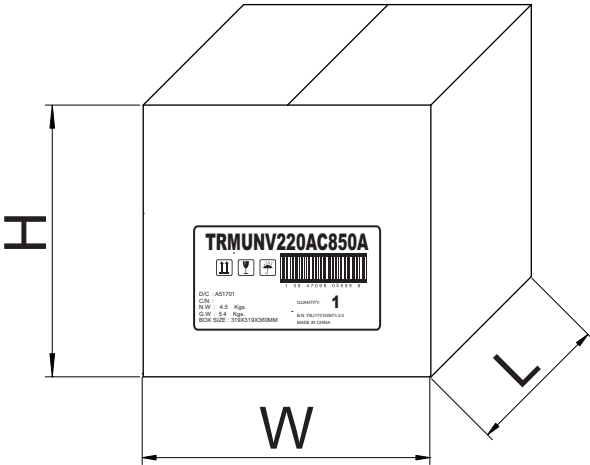
NOTES:

- 1) Calculations done with initial and mean lumen output at light source level.
- 2) The scotopic/photopic ratio, or S/P ratio, is a multiplier that measures how much light is useful to the human eye (Photoreceptors rod and Cones). A lamp with a higher S/P ratio, like LEDs, will provide illumination as well as better color rendering.
- 3) Visual Effective Lumens (Vels) is obtained by multiplying the lumens with the SP ratio of the light source.
<http://www.lrc.rpi.edu/programs/solidstate/assist/pdf/AR-VisualEfficacy-Jan2009.pdf>



Packaging

Master Carton



One (1) Highbay retrofit kit inside each Master carton.

OUTER DIMENSION		
L	W	H
12.56" (319mm)	12.56" (319mm)	14.17" (360mm)
Net Weight	Gross Weight	QUANTITY
9.92 lbs. (4.5kg)	11.91 lbs. (5.4kg)	1pc.