



VMU240095LP8xxC



58"LP-LINEARHO DC MODULE, 2400mA MAX CURRENT

- Low Profile design, no magnets
- Direct mount to luminaire housing
- Superior thermal performance than standard LinearHO
- Higher aluminum material density
- Extruded Aluminum material for thermal management
- High lumen, high efficacy
- Accessories: Diffused lens compatible
- For use in UL Class 2 lighting systems
- Suitable for DLC applications: L70>54,000hrs / L90=39,000hrs
- Meets UL8750 recognized
- RoHS compliant
- The module is supplied by short circuit proof SELV controlgear

General Specifications

	Min.	Typical	Max.
Input Voltage ^①	30.7VDC	33.0VDC	35.9VDC
Input Current ^①	250mA	1050mA	2400mA
Input Power ^①	7.7W	34.6W	86.2W
Initial Lumens @4000K / 80CRI	1,748 lumens	6,914 lumens	15,314 lumens
Initial Lm/W @4000K / 80CRI	228 lm/W	200 lm/W	178 lm/W
Beam Angle	120°		
CRI	80CRI (standard), 90CRI available		
Storage Temperature Range	-40°C to 100°C / -40°F to 212°F		
Operating Temperature Range (ta)	-40°C to 55°C / -40°F to 131°F		
Maximum Case Temperature (Tc)	L70: Tc max 105°C / L90: Tc max 105°C		
Estimated Lumen Maintenance ^②	L70: >54,000Hrs / L90: 39,000Hrs		
Color Consistency	Binning per ANSI C78.377-2015 @ 25°C; 3 SDCM		
Overall Size	58" L x 1.26" W x 0.29" H (1472mm x 32mm x 7.4mm)		
PCB Material / Thermal Conductivity	MCPCB (Aluminum Clad)/ 1.5W / mK		
Extruded Material / Finish	Aluminum/surface treatment with Anodic Oxidation		
LED Quantity	180pcs.		
Module Weight	367g / 0.81lb		
PCB Part Number	PTL029C01M1		
Maximum Screw Installation Torque	25 inch - ounces		
Connector Type	WAGO #2060-452 / 998-404 (2 pin connector)		
Packaging: Master Carton	40pcs.		
Thermal Feedback	Not Available		
Safety/Compliance	cURus (File # E351548)		
	Suitable for UL Class 2 Lighting Systems		
	RoHS Compliant		
	Dry and Damp Location		
	CE (IEC 62031: 2008. AMD1: 2012, AMD2: 2014)		
	SELV		
Energy Efficiency Label (EEI-Label)	C		
Warranty	5 years @ Max. Tc from the date of manufacture		

^① Nominal ratings. Performance based on Tc mod = 25°C. See thermal de-rating chart (pg. 3) for higher temperature operation

^② TM-21 Reported Numbers



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Electrical and Optical Specifications

LED Module Part Number	Number of LED	Input Current	Nom. Forward Voltage	Nom. Rated Power	Max. Fwd. Voltage	Max. Rated Power	Nom. Lum. Flux @4000K/80 CRI	Nom. Efficacy @4000K/80 CRI
VMU240095LP8xxC (58")	180	250 mA	30.7 VDC	7.7 W	34 VDC	9 W	1748 lm	228 lm/W
		300 mA	30.9 VDC	9.3 W	34 VDC	10 W	2075 lm	224 lm/W
		350 mA	31.0 VDC	10.9 W	34 VDC	12 W	2402 lm	221 lm/W
		400 mA	31.2 VDC	12.5 W	34 VDC	14 W	2728 lm	219 lm/W
		450 mA	31.3 VDC	14.1 W	34 VDC	15 W	3053 lm	217 lm/W
		500 mA	31.5 VDC	15.7 W	35 VDC	18 W	3378 lm	215 lm/W
		550 mA	31.6 VDC	17.4 W	35 VDC	19 W	3702 lm	213 lm/W
		600 mA	31.8 VDC	19.1 W	35 VDC	21 W	4026 lm	211 lm/W
		650 mA	31.9 VDC	20.7 W	35 VDC	23 W	4349 lm	210 lm/W
		700 mA	32.0 VDC	22.4 W	35 VDC	25 W	4671 lm	208 lm/W
		750 mA	32.2 VDC	24.1 W	35 VDC	26 W	4993 lm	207 lm/W
		800 mA	32.3 VDC	25.9 W	36 VDC	29 W	5315 lm	206 lm/W
		850 mA	32.5 VDC	27.6 W	36 VDC	31 W	5636 lm	204 lm/W
		900 mA	32.6 VDC	29.3 W	36 VDC	32 W	5956 lm	203 lm/W
		950 mA	32.7 VDC	31.1 W	36 VDC	34 W	6276 lm	202 lm/W
		1000 mA	32.8 VDC	32.8 W	36 VDC	36 W	6595 lm	201 lm/W
		1050 mA	33.0 VDC	34.6 W	36 VDC	38 W	6914 lm	200 lm/W
		1100 mA	33.1 VDC	36.4 W	36 VDC	40 W	7232 lm	199 lm/W
		1150 mA	33.2 VDC	38.2 W	37 VDC	43 W	7550 lm	198 lm/W
		1200 mA	33.4 VDC	40.0 W	37 VDC	44 W	7867 lm	197 lm/W
		1250 mA	33.5 VDC	41.9 W	37 VDC	46 W	8183 lm	196 lm/W
		1300 mA	33.6 VDC	43.7 W	37 VDC	48 W	8499 lm	195 lm/W
		1350 mA	33.7 VDC	45.5 W	37 VDC	50 W	8815 lm	194 lm/W
		1400 mA	33.8 VDC	47.4 W	37 VDC	52 W	9130 lm	193 lm/W



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Electrical and Optical Specifications

LED Module Part Number	Number of LED	Input Current	Nom. Forward Voltage	Nom. Rated Power	Max. Fwd. Voltage	Max. Rated Power	Nom. Lum. Flux @4000K/80 CRI	Nom. Efficacy @4000K/80 CRI
VMU240095LP8xxC (58")	180	1450 mA	34.0 VDC	49.2 W	37 VDC	54 W	9444 lm	192 lm/W
		1500 mA	34.1 VDC	51.1 W	37 VDC	56 W	9758 lm	191 lm/W
		1550 mA	34.2 VDC	53.0 W	38 VDC	59 W	10071 lm	190 lm/W
		1600 mA	34.3 VDC	54.9 W	38 VDC	61 W	10384 lm	189 lm/W
		1650 mA	34.4 VDC	56.8 W	38 VDC	63 W	10696 lm	188 lm/W
		1700 mA	34.5 VDC	58.7 W	38 VDC	65 W	11007 lm	188 lm/W
		1750 mA	34.6 VDC	60.6 W	38 VDC	67 W	11319 lm	187 lm/W
		1800 mA	34.7 VDC	62.5 W	38 VDC	68 W	11629 lm	186 lm/W
		1850 mA	34.8 VDC	64.5 W	38 VDC	70 W	11939 lm	185 lm/W
		1900 mA	34.9 VDC	66.4 W	38 VDC	72 W	12249 lm	184 lm/W
		1950 mA	35.1 VDC	68.4 W	39 VDC	76 W	12558 lm	184 lm/W
		2000 mA	35.2 VDC	70.3 W	39 VDC	78 W	12866 lm	183 lm/W
		2050 mA	35.3 VDC	72.3 W	39 VDC	80 W	13174 lm	182 lm/W
		2100 mA	35.4 VDC	74.2 W	39 VDC	82 W	13481 lm	182 lm/W
		2150 mA	35.5 VDC	76.2 W	39 VDC	84 W	13788 lm	181 lm/W
		2200 mA	35.5 VDC	78.2 W	39 VDC	86 W	14094 lm	180 lm/W
		2250 mA	35.6 VDC	80.2 W	39 VDC	88 W	14400 lm	180 lm/W
		2300 mA	35.7 VDC	82.2 W	39 VDC	90 W	14705 lm	179 lm/W
		2350 mA	35.8 VDC	84.2 W	39 VDC	92 W	15010 lm	178 lm/W
		2400 mA*	35.9 VDC	86.2 W	40 VDC	96 W	15314 lm	178 lm/W

Luminous Flux De-Rating: CCT and CRI Multipliers

	2700K	3000K	3500K	4000K	5000K	5700K	6500K
CRI 80(R9> 0)	0.929	0.955	0.968	1.000	1.013	1.006	1.000
CRI 90(R9>50)	0.776	0.801	0.821	0.863	0.869	0.865	0.863

NOTES:

- 1) Performance based on Tc mod = 25°C. See thermal de-rating chart (pg. 4) for higher temperature operation
- 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.
- 4) The LED DC Module can be configured with different LED chip quantities, series and parallel design configurations to meet a specific design requirement. Contact Fulham for further assistance.
- 5) * Indicates maximum rated current. Modules may be operated at a current less than or equal to this value, below the Tc rating.
- 6) 70CRI is NOT available.

Thermal Specifications

LP-LinearHO DC Module

Storage Temperature Range	-40 to +100°C / -40 to +212°F
Operating Ambient Temperature Range (ta)	-40 to 55°C / -40 to 131°F
Maximum Case Temperature (Tc)	L70 = 105°C (221°F) / L90 = 105°C (221°F)

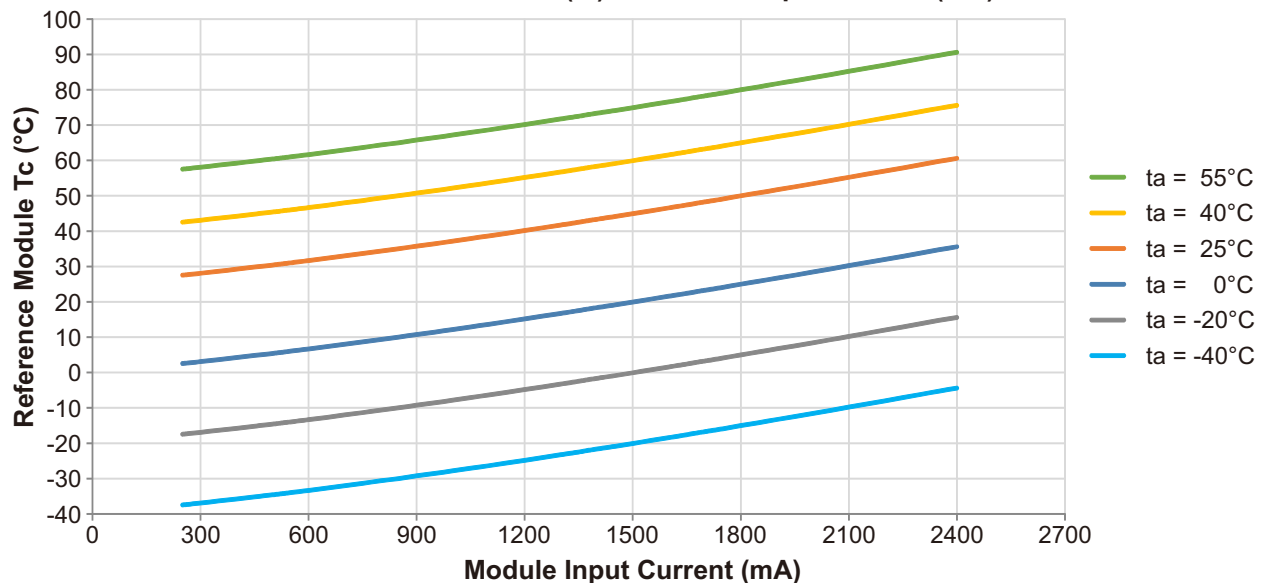


Thermal De-Rating

Tc vs. Luminous Flux vs. Forward Voltage

Module Case Temperature (Tc)	Total Vf Multiplier	Luminous Flux Multiplier
25°C	1.000	1.000
30°C	0.998	0.995
35°C	0.996	0.990
40°C	0.994	0.985
45°C	0.992	0.979
50°C	0.990	0.974
55°C	0.988	0.968
60°C	0.986	0.962
65°C	0.985	0.956
70°C	0.983	0.950
75°C	0.981	0.944
80°C	0.979	0.938
85°C	0.977	0.931
90°C	0.975	0.925
95°C	0.974	0.918
100°C	0.972	0.911
105°C	0.970	0.904

Module Tc vs. Ambient (ta) vs. Module Input Current (mA)



NOTES:

1) Chart "Module Tc vs. Ambient (ta) vs. Module Input Current (mA)" for reference only in an open ambient. The performance with in a luminaire will vary depending on the size and material of luminaire.



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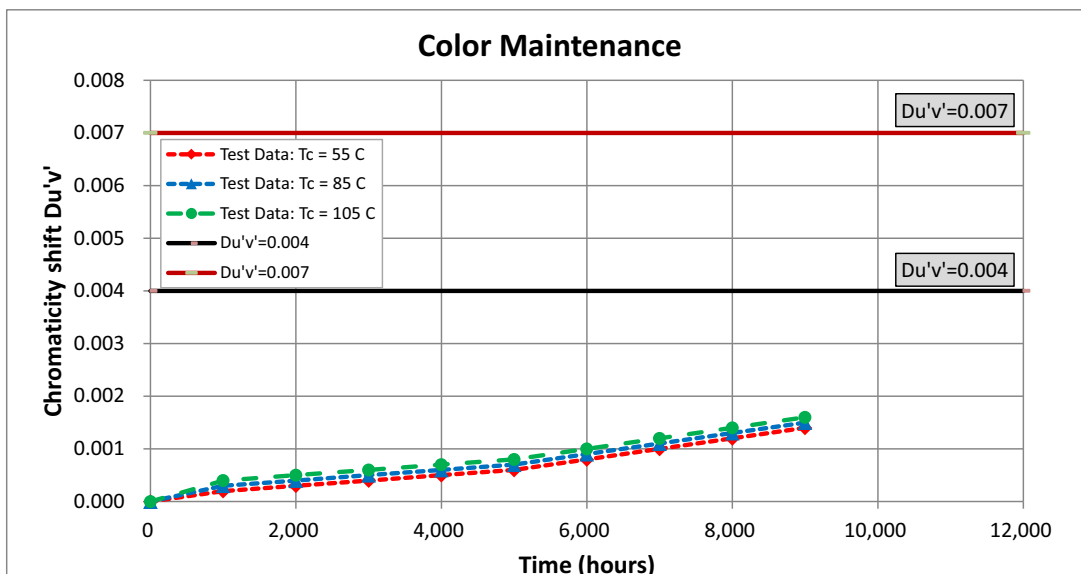
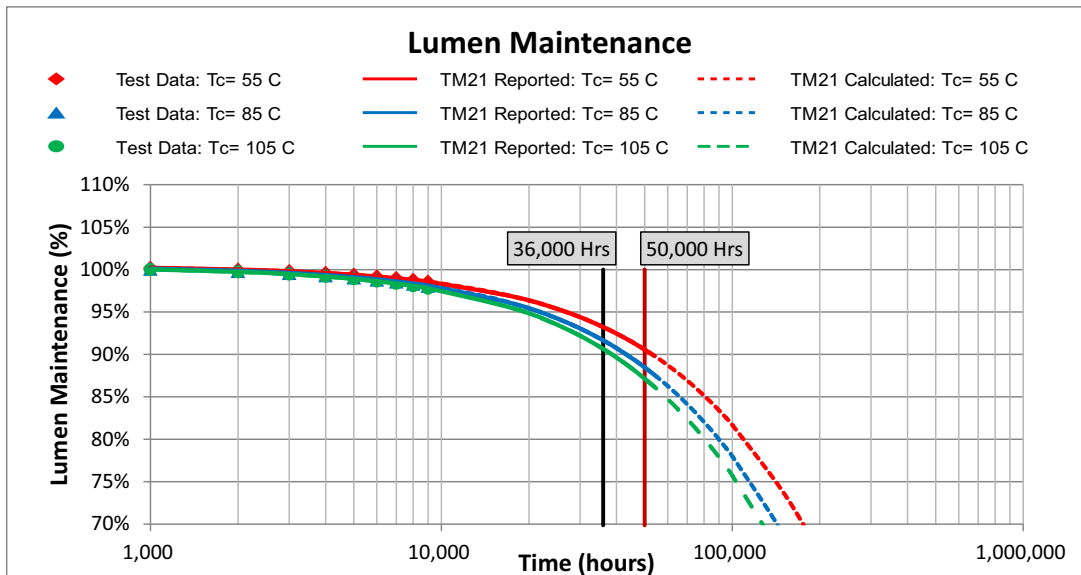
Certification Chart

Classification	Model
RoHS COMPLIANT	YES
cUL US	YES
CE UK CA	YES
Energy Efficiency Label (EEI-Label)	C
Suitable for UL Class 2 Lighting System	YES

Energy Star™ TM-21 Calculator Data

Tc Module	Reported L70	Reported L90
55°C	>54,000 Hrs	53,000 Hrs
85°C	>54,000 Hrs	43,000 Hrs
105°C	>54,000 Hrs	39,000 Hrs
Tc Module	Calculated L70	Calculated L90
55°C	174,000 Hrs	53,000 Hrs
85°C	142,000 Hrs	43,000 Hrs
105°C	127,000 Hrs	39,000 Hrs

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



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Mechanical Drawings

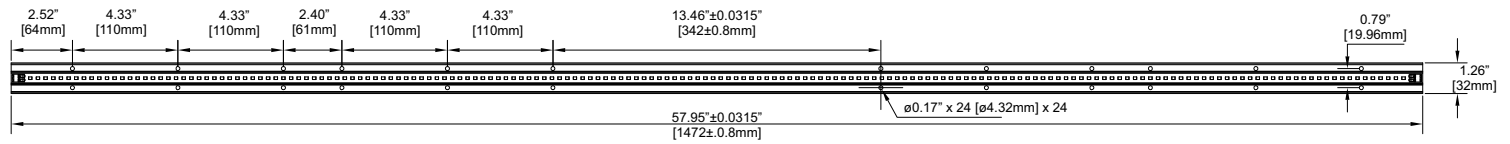
(Scale 1:10)

58"

[1472mm]

Overall Dimensions

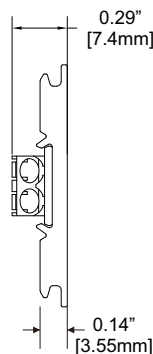
Length	58" [1472mm]
Width	1.26" [32mm]
Height	0.29" [7.4mm]



TOP VIEW



BOTTOM VIEW



SIDE VIEW

Unmarked General Tolerance

<4" [100mm]: ±0.0138" [±0.35mm]
 4"~11.8" [100~300mm]: ±0.0197" [±0.5mm]
 >11.8" [300mm]: ±0.0236" [±0.6mm]
 HOLES: ±0.002" [±0.05mm]

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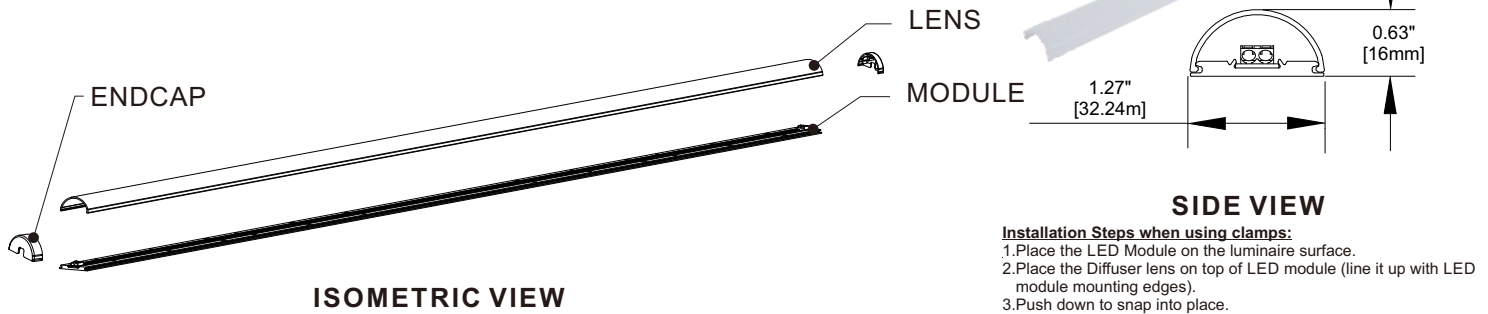


Accessories

Diffuser Lens

Fulham Part Number: **TLE-OPT-120-021 (58" Diffuser Lens - 120° Beam Angle)**

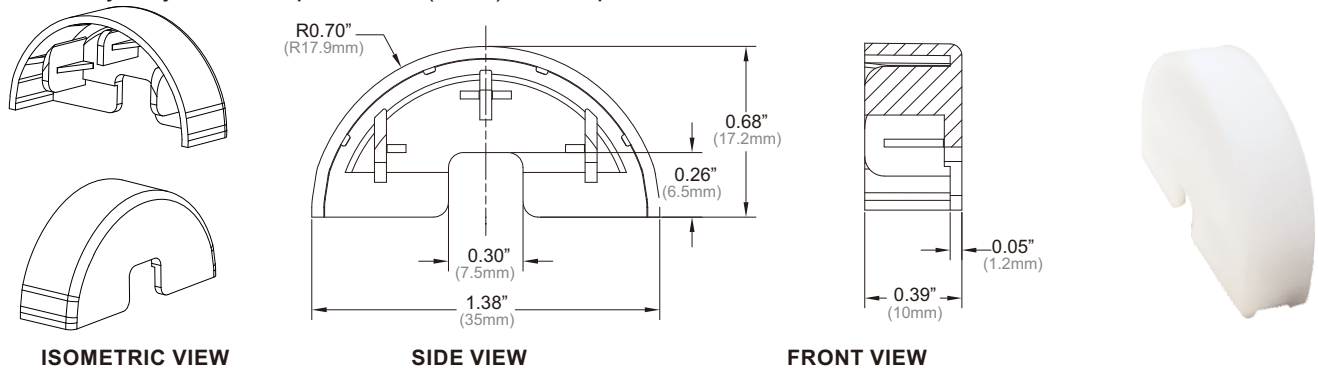
- White polycarbonate diffuser lens - 82% transmissivity at nominally rated currents.



Endcap

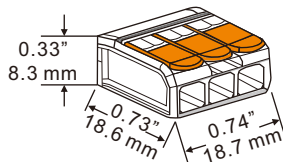
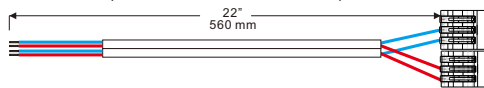
Fulham Part Number: **VLE-OPT-120-012**

- White Polybutylene Terephthalate (PBT) end caps

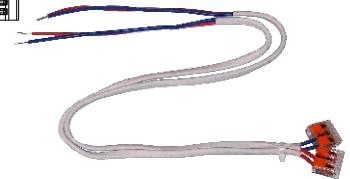
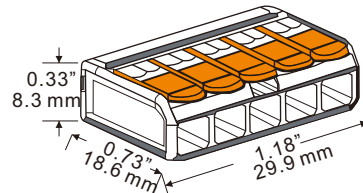
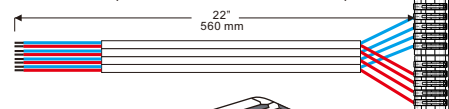


Harness

TLC-HN02 (1 and 2 module connection)



TLC-HN04 (3 and 4 module connection)

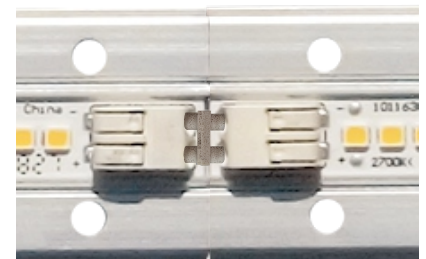


Interconnects

- Interconnect Type: WAGO Double pins to interconnect Modules (#2060-952/028-000)
- Approvals: cURus, UL 1977, and RoHS Compliant

NOTES:

- 1) Interconnects are NOT sold by Fulham.
- 2) Do not connect LinearHO Modules in parallel (end to end) if the current exceeds the maximum module rated current. This type of wiring would cause the pass-through current on the first module to exceed the rated current. This setup is in reference to wiring diagram #2 per Fulham's wiring diagram (see link on page #9). If the current is higher than the rated max, it is recommended to use wiring diagram #3.



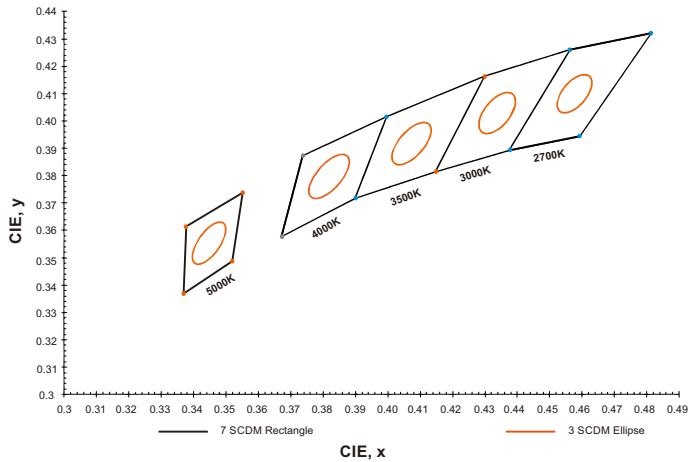
Top View



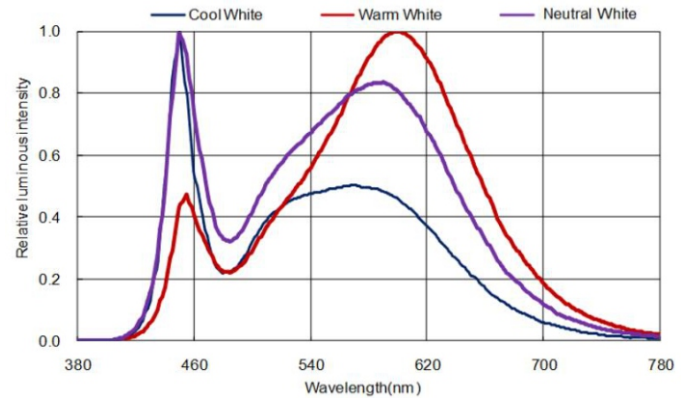
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Color and Binning



Optical Spectrum



Compatible Fulham Drivers

(Please use the links below for a complete list of compatible Fulham drivers and wiring diagrams)

- LP-LinearHO System Combination:
- Fulham's Wiring Diagrams: <https://cdn.fulham.com/PDFs/SpecSheets/DC-Modules-Wiring-Diagrams.pdf>
- Compatible with Fulham Hotspot EM Systems.

NOTES:

- 1) The Color and Binning and Optical Spectrum charts are for reference only. For more detailed info, contact factory.
- 2) Reference Seoul 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.
- 4) Driver not included.
- 5) Do not connect LinearHO Modules in parallel (end to end) if the current exceeds the maximum module rated current. This type of wiring would cause the pass-through current on the first module to exceed the rated current. This setup is in reference to wiring diagram #2 per Fulham's wiring diagram (see the link above). If the current is higher than the rated max, it is recommended to use wiring diagram #3.

Guidelines

Termination Notes

- Connector Type: WAGO #2060-452 / 998-404 (2 pin push wire connector)
 - AWG: 24...18 solid wire
 - Strip length: 7...9mm / 0.28...0.35in
 - Connector Max amp. rating: 9 Amps.

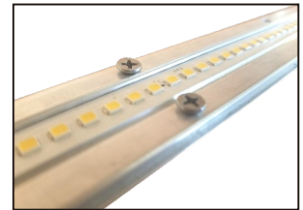


Connector

For more detail information, please visit Wago's website: <http://www.wago.com/infomaterial/pdf/51300133.pdf>

Fastening Notes

- If fastening by screw hole a recommended screw size: 6-20 x 5/8" flat head drilling screws. Use all available screw holes to ensure good contact between back side of module and mounting surface. Refer to max specified torque for installation.
- If fastening using double-sided tape, start with clean, oil-free and dust-free surface. Peel backing and place LED module on mounting surface. Firmly press down on the module to ensure good adherence. Follow the double-side tape manufacturer's installation instructions.
- BJB P2F (Push-to-Fix) fixing elements for PCBs can be used to fasten LED modules to mounting surface. Reference BJB's website for ordering information and specific model to use: <http://www.bjb.com/index.php?pid=376706&lid=10>.
- HEYCO HEYClip Snap Rivets 9035 is recommended for fast and easy installation with clean and finish look. For more detail information, please visit Heyco website: https://www.heyco.com/Nylon_PVC_Hardware/product.cfm?product=Snap-Rivets



Heyco Rivet 9035

Environmental Rating / Conformal Coating

- The DC LP-LinearHO Modules have been evaluated for use in dry or damp locations only. If used in wet locations, acceptability and the need for additional evaluation shall be determined in the end product.
- Fulham's LP-LinearHO modules are available with conformal coating; made to order with MOQ and lead time will apply. The conformal coating is a silicone based material which is double sprayed on the module only (LEDs and PCB). Conformal coating is recommended for the following applications: near ocean where salt is present, constant moisture, refrigeration, continuously high humidity, or outdoor applications. An IP rating of IP64 or IP65 is achieved when the conformal coating is used, but other factors should be considered. Fulham still recommends the luminaire also meet an IP64/65 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.

Thermal Management

- Proper thermal management should be employed to ensure life and reliability of product. Max Tc of module should not be exceeded.
- Use of thermal grease, paste, pad, or other material interface is highly recommended.

Polarity Notes

- DC LP-Modules are polarity sensitive.
- Ensure that "positive" from LED Driver is connected to "positive" of LED modules and that "negative" from LED Driver is connected to "negative" of LED modules.
- Polarities of modules are marked with "+" for positive and "-" for negative.



VMU240095LP8xxC



Part Number Matrix

V M U 240 095 LP 8 XX C

Product Line	Type	Control Type	Input Current	Max. Power	Design	CRI	Color Temperature	Option
V = Vizion	M = Module (UL Class 2)	U = None	240 = 2400mA Max.	095 = 95W	LP=Low Profile	8 = 80 9 = 90	27 = 2700K 30 = 3000K 35 = 3500K 40 = 4000K 50 = 5000K 57 = 5700K 65 = 6500K	C = Standard Ⓢ E = Conformal Coating (MTO)

Ⓢ See page #8 for Conformal Coating information. Made to order (MTO).
All CCT and CRI options are made to order with MOQ (minimum order quantities) and lead times.

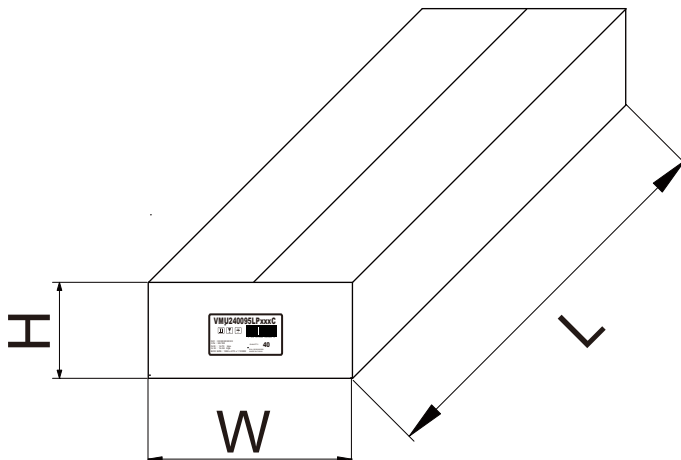
Product Image: LP-LinearHO Module



TOP VIEW

Packaging

Master Carton



OUTER DIMENSION		
L	W	H
59.37"(1508mm)	10.63"(270mm)	4.33"(110mm)
Net Weight	Gross Weight	QUANTITY
32.4 lbs. (14.70kg)	36.56 lbs. (16.58kg)	40pc.