



TMU240095CL8xxA



44" LINEARHO DC MODULE, 2400mA MAX CURRENT

- Extruded Aluminum material for thermal management
- Magnets pre-mounted, for ease of installation
- High lumen, high efficacy
- Accessories: Diffused lens and End-Caps available
- 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	33.8VDC	35.9VDC
Input Current ^①	250mA	1400mA	2400mA
Input Power ^①	7.7W	47.4W	86.2W
Initial Lumens @4000K / 80CRI	1,639 lumens	8,559 lumens	14,357 lumens
Initial Lm/W @4000K / 80CRI	213 lm/W	181 lm/W	167 lm/W
Beam Angle	120°		
CRI	80CRI		
Storage Temperature Range	-40°C to 100°C / -40°F to 212°F		
Operating Ambient 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	44.1" x 1.73" x 0.39" (1120mm x 44mm x 10mm)		
PCB Material / Thermal Conductivity	CEM3 (CCP-308) High Thermal Conductive/ 1.5W/mK		
Extruded Material / Finish	Aluminum/surface treatment with Anodic Oxidation		
LED Quantity	180pcs.		
Module Weight	220g / 0.49lb.		
PCB Part Number	PTL006C01C3		
Magnets Quantity / Magnetic Force	3 / 2N (.45lbf) per magnet		
Maximum Screw Installation Torque	25 inch - ounces		
Connector Type	WAGO #744-392 (2 pin connector)		
Packaging: Master Carton	20pcs.		
Thermal Feedback	Not Available		
Safety/Compliance	cURus (File # E351548)		
	Suitable for UL Class 2 Lighting System		
	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. 4) for higher temperature operation.

^② TM-21 Reported Numbers



TMU240095CL8xxA



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
TMU240095CL8xxA (44")	180	250 mA	30.7 VDC	7.7 W	34 VDC	9 W	1639 lm	213 lm/W
		300 mA	30.9 VDC	9.3 W	34 VDC	10 W	1945 lm	210 lm/W
		350 mA	31.0 VDC	10.9 W	34 VDC	12 W	2251 lm	207 lm/W
		400 mA	31.2 VDC	12.5 W	34 VDC	14 W	2557 lm	205 lm/W
		450 mA	31.3 VDC	14.1 W	34 VDC	15 W	2862 lm	203 lm/W
		500 mA	31.5 VDC	15.7 W	35 VDC	18 W	3167 lm	201 lm/W
		550 mA	31.6 VDC	17.4 W	35 VDC	19 W	3471 lm	200 lm/W
		600 mA	31.8 VDC	19.1 W	35 VDC	21 W	3774 lm	198 lm/W
		650 mA	31.9 VDC	20.7 W	35 VDC	23 W	4077 lm	197 lm/W
		700 mA	32.0 VDC	22.4 W	35 VDC	25 W	4379 lm	195 lm/W
		750 mA	32.2 VDC	24.1 W	35 VDC	26 W	4681 lm	194 lm/W
		800 mA	32.3 VDC	25.9 W	36 VDC	29 W	4983 lm	193 lm/W
		850 mA	32.5 VDC	27.6 W	36 VDC	31 W	5284 lm	192 lm/W
		900 mA	32.6 VDC	29.3 W	36 VDC	32 W	5584 lm	190 lm/W
		950 mA	32.7 VDC	31.1 W	36 VDC	34 W	5884 lm	189 lm/W
		1000 mA	32.8 VDC	32.8 W	36 VDC	36 W	6183 lm	188 lm/W
		1050 mA	33.0 VDC	34.6 W	36 VDC	38 W	6482 lm	187 lm/W
		1100 mA	33.1 VDC	36.4 W	36 VDC	40 W	6780 lm	186 lm/W
		1150 mA	33.2 VDC	38.2 W	37 VDC	43 W	7078 lm	185 lm/W
		1200 mA	33.4 VDC	40.0 W	37 VDC	44 W	7375 lm	184 lm/W
		1250 mA	33.5 VDC	41.9 W	37 VDC	46 W	7672 lm	183 lm/W
		1300 mA	33.6 VDC	43.7 W	37 VDC	48 W	7968 lm	182 lm/W
		1350 mA	33.7 VDC	45.5 W	37 VDC	50 W	8264 lm	182 lm/W
		1400 mA	33.8 VDC	47.4 W	37 VDC	52 W	8559 lm	181 lm/W
		1450 mA	34.0 VDC	49.2 W	37 VDC	54 W	8854 lm	180 lm/W
		1500 mA	34.1 VDC	51.1 W	37 VDC	56 W	9148 lm	179 lm/W



TMU240095CL8xxA



Electrical and Optical Specifications (Cont.)

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
TMU240095CL8xxA (44")	180	1550 mA	34.2 VDC	53.0 W	38 VDC	59 W	9442 lm	178 lm/W
		1600 mA	34.3 VDC	54.9 W	38 VDC	61 W	9735 lm	177 lm/W
		1650 mA	34.4 VDC	56.8 W	38 VDC	63 W	10027 lm	177 lm/W
		1700 mA	34.5 VDC	58.7 W	38 VDC	65 W	10319 lm	176 lm/W
		1750 mA	34.6 VDC	60.6 W	38 VDC	67 W	10611 lm	175 lm/W
		1800 mA	34.7 VDC	62.5 W	38 VDC	68 W	10902 lm	174 lm/W
		1850 mA	34.8 VDC	64.5 W	38 VDC	70 W	11193 lm	174 lm/W
		1900 mA	34.9 VDC	66.4 W	38 VDC	72 W	11483 lm	173 lm/W
		1950 mA	35.1 VDC	68.4 W	39 VDC	76 W	11773 lm	172 lm/W
		2000 mA	35.2 VDC	70.3 W	39 VDC	78 W	12062 lm	172 lm/W
		2050 mA	35.3 VDC	72.3 W	39 VDC	80 W	12350 lm	171 lm/W
		2100 mA	35.4 VDC	74.2 W	39 VDC	82 W	12639 lm	170 lm/W
		2150 mA	35.5 VDC	76.2 W	39 VDC	84 W	12926 lm	170 lm/W
		2200 mA	35.5 VDC	78.2 W	39 VDC	86 W	13213 lm	169 lm/W
		2250 mA	35.6 VDC	80.2 W	39 VDC	88 W	13500 lm	168 lm/W
		2300 mA	35.7 VDC	82.2 W	39 VDC	90 W	13786 lm	168 lm/W
		2350 mA	35.8 VDC	84.2 W	39 VDC	92 W	14072 lm	167 lm/W
		2400 mA*	35.9 VDC	86.2 W	40 VDC	96 W	14357 lm	167 lm/W

Luminous Flux De-Rating: CCT and CRI Multipliers

	2700K	3000K	3500K	4000K	5000K	5700K	6500K
CRI 80(R9> 0)	0.924	0.951	0.965	1.000	1.014	1.007	1.000
CRI 90(R9>50)	0.774	0.836	0.829	0.850	0.864	0.864	0.850

NOTES:

- 1) Performance based on Tc mod = 25°C. See thermal de-rating chart (pg. 3) 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.



TMU240095CL8xxA



Thermal Specifications

LinearHO 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)

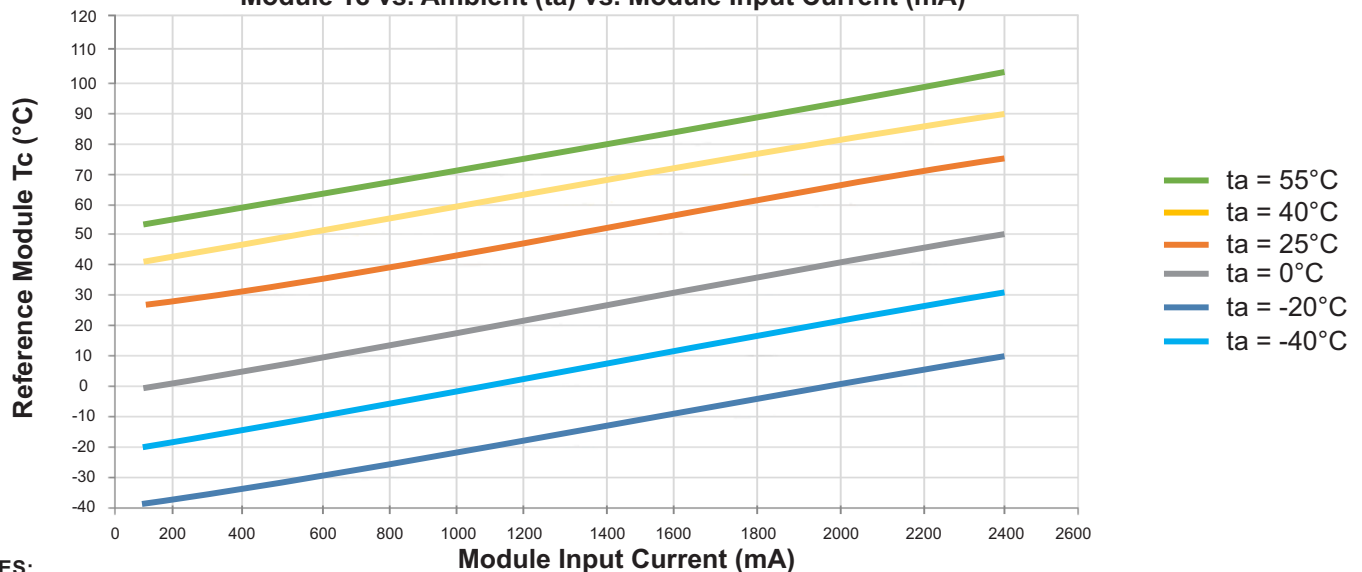


Thermal De-Rating:

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.



TMU240095CL8xxA



Certification Chart

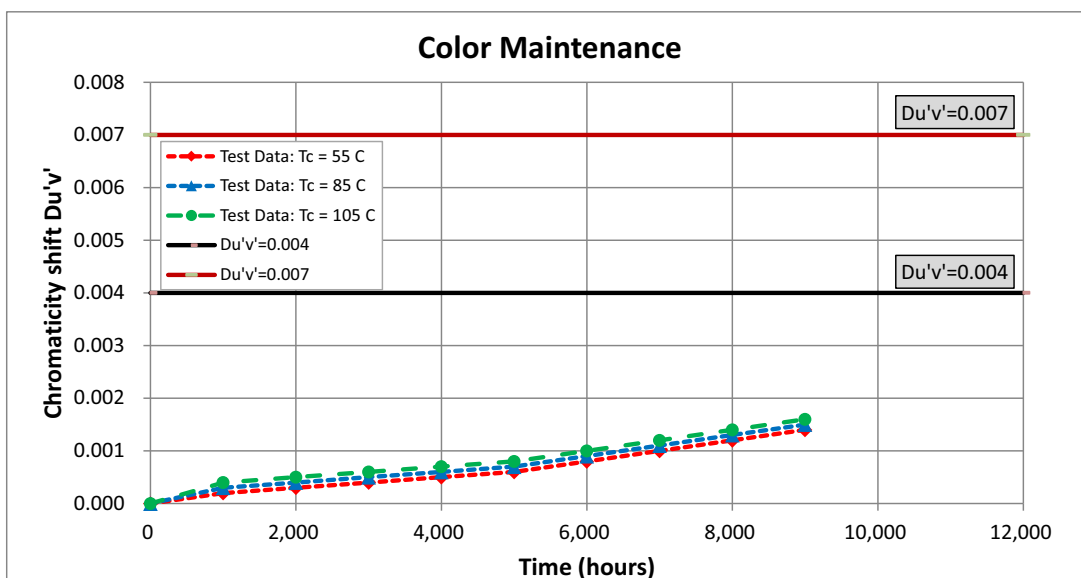
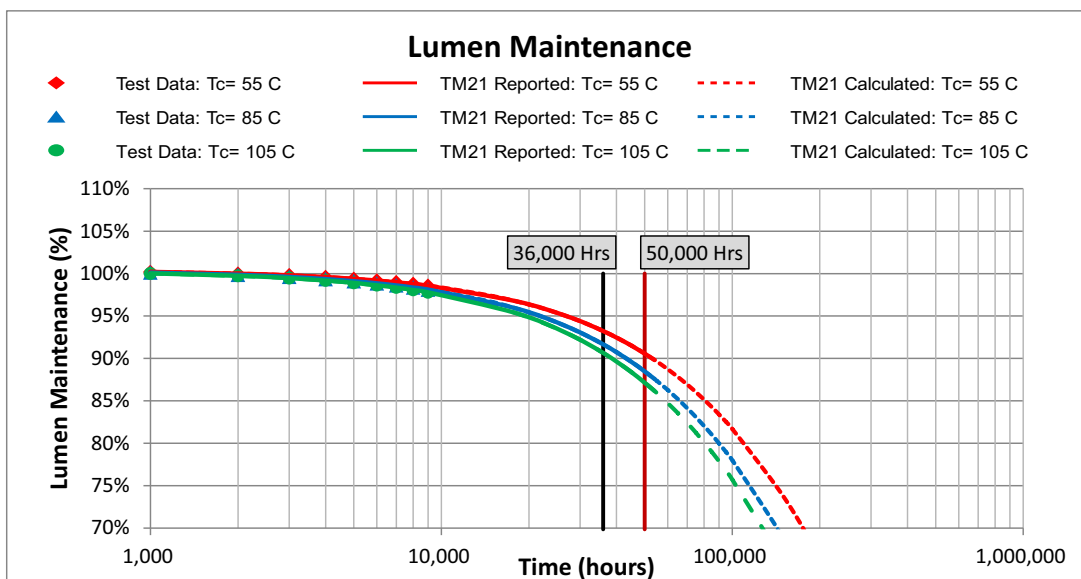
Classification	Model
RoHS COMPLIANT	TMU240095CL8xxA
cUL US	YES
CE UK CA	YES
Energy Efficiency Label (EEI-Label)	C
Suitable for UL Class 2 Lighting System	YES

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



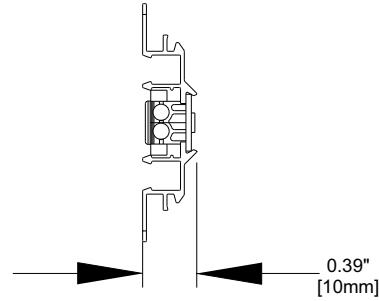


TMU240095CL8xxA



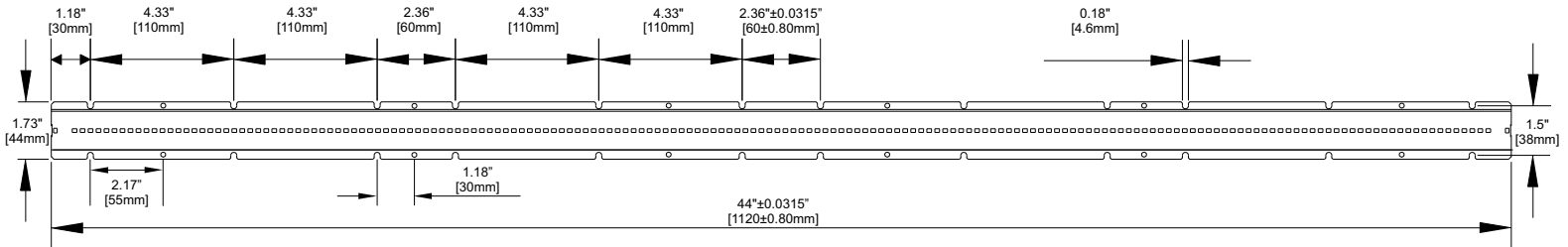
Mechanical Drawings

44"
[1120mm]

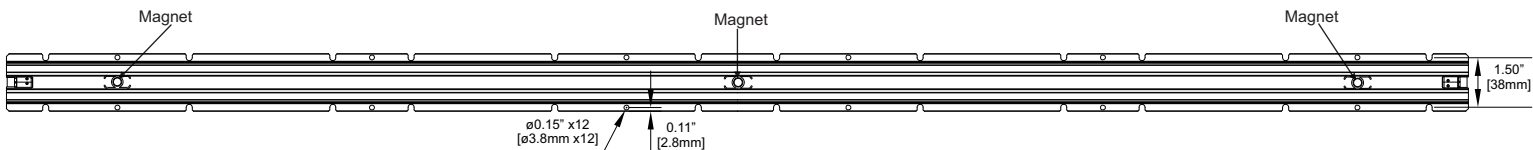


SIDE VIEW

Overall Dimensions	
Length	44" [1120mm]
Width	1.73" [44mm]
Height	0.39" [10mm]



TOP VIEW



BOTTOM VIEW

Unmarked General Tolerance

<4" [100mm]: $\pm 0.0138"$ [$\pm 0.35\text{mm}$]
 4"~11.8" [100~300mm]: $\pm 0.0197"$ [$\pm 0.5\text{mm}$]
 >11.8" [300mm]: $\pm 0.0236"$ [$\pm 0.6\text{mm}$]
 HOLES: $\pm 0.002"$ [$\pm 0.05\text{mm}$]

TMU240095CL8xxA

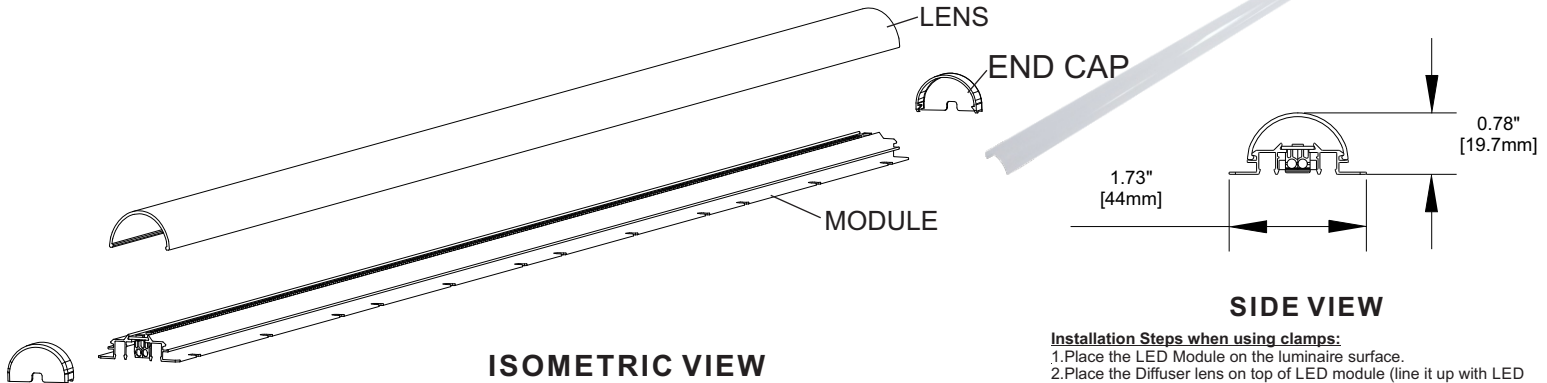


Accessories

44" Diffuser Lens

Fulham Part Number: **TLE-OPT-120-013**

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



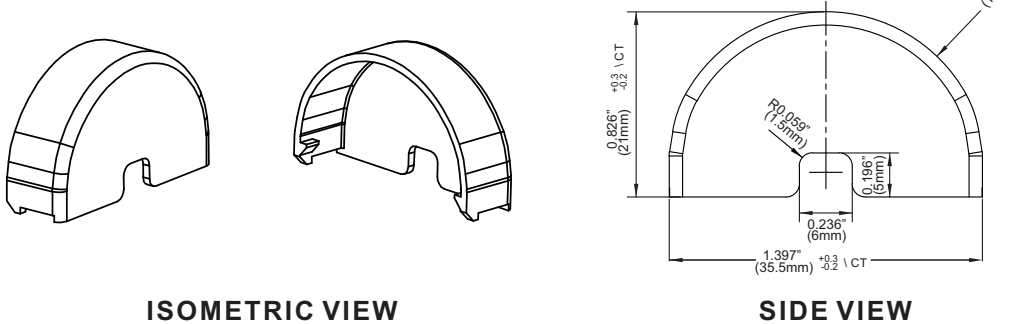
Installation Steps when using clamps:

1. Place the LED Module on the luminaire surface.
2. Place the Diffuser lens on top of LED module (line it up with LED module mounting edges).
3. Push down to snap into place.

End Caps

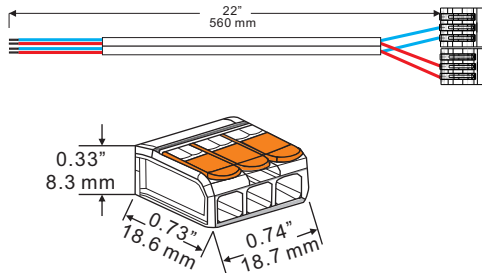
Fulham Part Number: **TLE-OPT-120-020**

- White Polybutylene Terephthalate (PBT) end caps

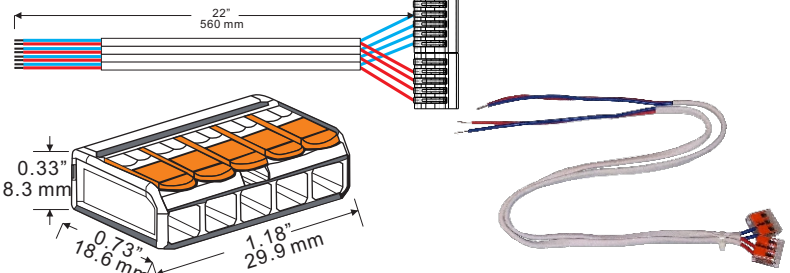


Harness

TLC-HN02 (1 and 2 module connection)

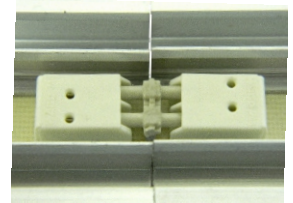


TLC-HN04 (3 and 4 module connection)



Interconnects

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



BOTTOM VIEW

NOTES:

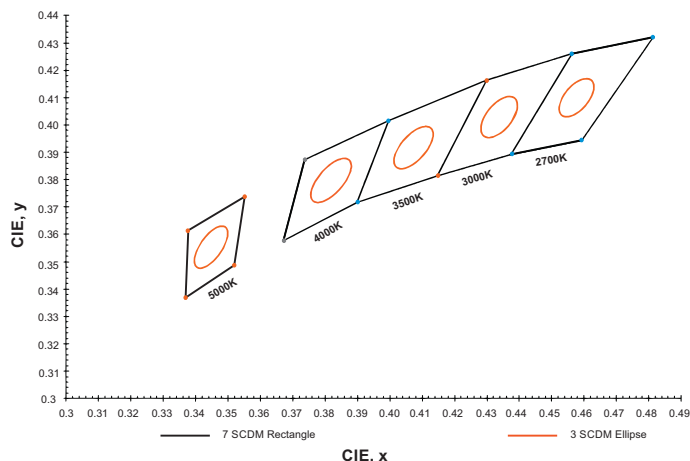
- 1) Interconnects are NOT sold by Fulham.
- 2) Do not connect LinearHO Modules in parallel (end to end) if the current exceeds the maximum module rated current. This type of wiring would cause the pass-through current on the first module to exceed the rated current. This setup is in reference to wiring 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.



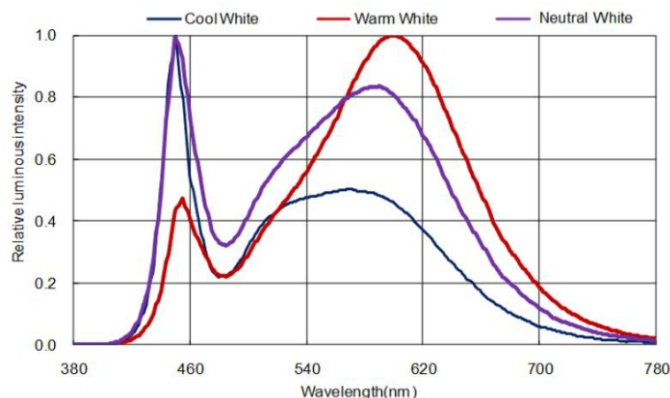
TMU240095CL8xxA



Color and Binning



Optical Spectrum



Compatible Fulham Drivers

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

- LinearHO System Combination: <https://www.fulham.com/PDFs/SpecSheets/TMU240095CL8xxA-2017-710-System-Combination.pdf>
- 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.



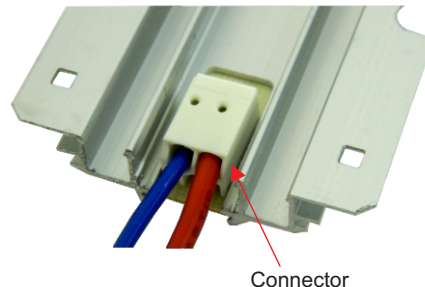
TMU240095CL8xxA



Guidelines

Termination Notes

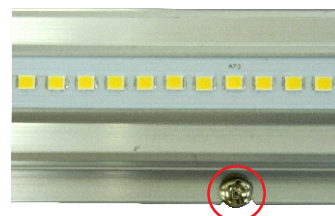
- Connector Type: WAGO #744-392 (2 pin push wire connector)
- AWG: 20...16 solid wire
- Strip length: 8...9mm / 0.31...0.35in
- Connector Max amp. rating: 6 Amps.



Connector

Fastening Notes

- If fastening by screw hole, use any screw with diameter less than 0.185 in (4.7mm). Use all available screw holes to ensure good contact between back side of module and mounting surface. Refer to max specified torque for installation. Suggested screw sizes: #6 or M4 Pan Head screw.
- 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>.



Environmental Rating / Conformal Coating

- The DC 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 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 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.



TMU240095CL8xxA



Part Number Matrix

T M U 240 095 C L 850 A

Type
M = Module
(UL Class 2)

Control Type
U = None

Input Current
240 = 2400mA Max..

Max. Power
095 = 95W

Material
C = CEM3 + Conn

Shape
L=Linear

CRI
8 = 80
9 = 90

Color Temperature
27 = 2700K
30 = 3000K
35 = 3500K
40 = 4000K
50 = 5000K
57 = 5700K
65 = 6500K

Option
A = Standard
D = Conformal
Coating
(MTO)

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

④ See page #9 for Conformal Coating information. Made to order (MTO).

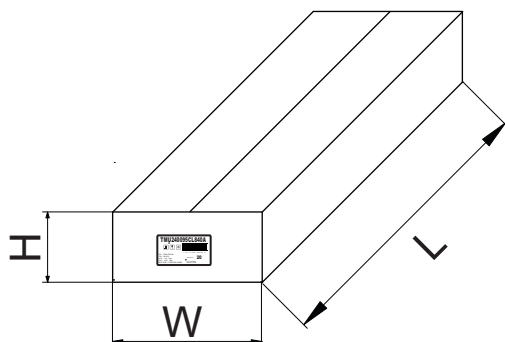
Product Image: LinearHO Module



TOP VIEW

Packaging

Master Carton



OUTER DIMENSION		
L	W	H
45.47"(1155mm)	10.63"(270mm)	4.33"(110mm)
Net Weight	Gross Weight	QUANTITY
10.58 lbs. (4.8kg)	13.34 lbs. (6.05kg)	20pc.