

VUU24V005LP270C-8

8"LP-LINEARHO UVC MODULE, 24V CONSTANT VOLTAGE INPUT

- Deep ultraviolet light, suitable for surface sterilization and purification.
- High UV radiation power density, high irradiance
- 270nm UVC +395nm UVA combined, visible to human eyes when UV radiates
- Extruded Aluminum material, superior thermal performance
- Low-profile design, suitable for limited space mounting
- For use in UL Class 2 lighting systems
- Meets UL8750 recognized
- RoHS compliant

General Specifications

Input Voltage	24VDC \pm 5%	
Input Current	0.19A	
Input Power	4.5W	
Peak Wavelength	UVC Chip: 270-280nm	UVA Chip: 395-405nm
Radiation Power @ 24V Input	UVC Chip: 45mW	UVA Chip: 100mW
Irradiance @ 24V Input, 5" distance	UVC Chip: 107 μ W/cm ²	UVA Chip: 86 μ W/cm ²
Irradiance @ 24V Input, 8" distance	UVC Chip: 42 μ W/cm ²	UVA Chip: 37 μ W/cm ²
Beam Angle	130°	
Storage Temperature Range	-40°C to 100°C / -40°F to 212°F	
Operating Temperature Range (ta)	-20°C to 40°C / -4°F to 104°F	
Maximum Case Temperature (Tc)	Tc max 50°C	
Estimated Radiation Maintenance	L50 = 16,000 hrs	
Overall Size	8" L x 1.26" W x 0.29" H (203.2mm 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	9pcs.	
Module Weight	52g / 0.12lb	
PCB Part Number	PTL046C01M1	
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	
Warranty	3 years @ Max. Tc from the date of manufacture	



VUU24V005LP270C-8

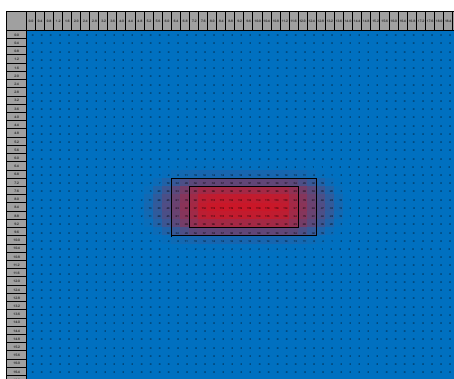
Electrical and Optical Specifications

Module Part Number	Number of LED	Input Voltage	Nom. Current	Nom. Rated Power	UVC Chip Radiation	UVA Chip Radiation
VUU24V005LP270C-8	9	24.0 VDC	0.19 A	4.5 W	45 mW	100 mW

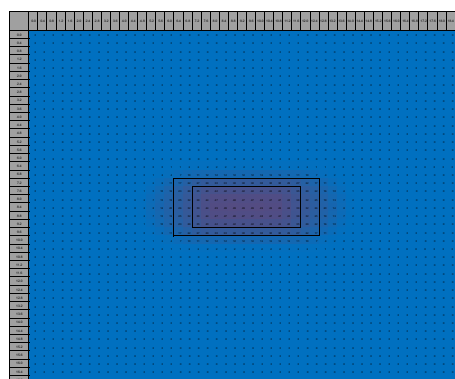
VUU24V005LP270C-8

Distance	Irradiance ($\mu\text{W}/\text{cm}^2$)
1" (25.4mm)	1502
2" (50.8mm)	493
3" (76.2mm)	250
4" (101.6mm)	154
5" (127.0mm)	107
6" (152.4mm)	76
7" (177.8mm)	58
8" (203.2mm)	42
9" (228.6mm)	35
10" (254.0mm)	29

Simulation $107\mu\text{W}/\text{cm}^2$ @ 5" distance



Simulation $42\mu\text{W}/\text{cm}^2$ @ 8" distance



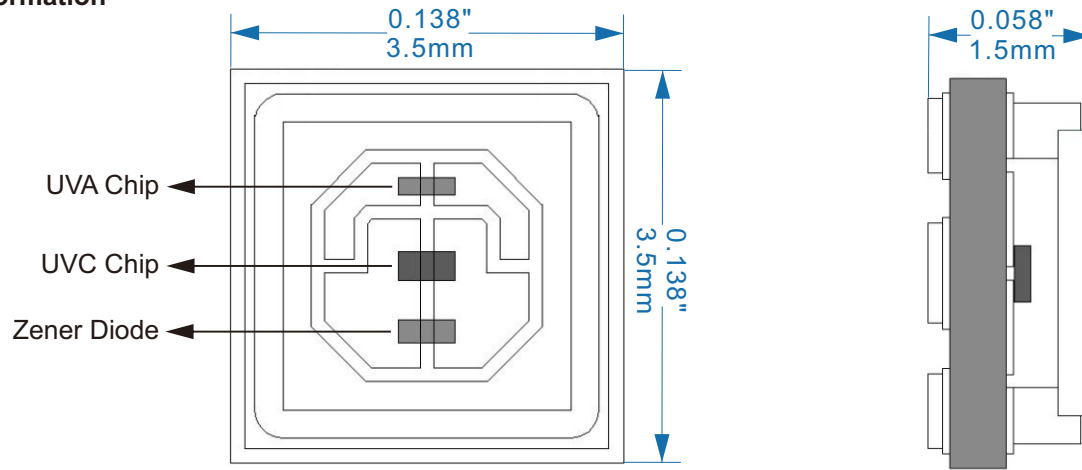
NOTES:

- 1) Performance based on $T_c \text{ mod} = 25^\circ\text{C}$. See thermal de-rating chart for higher temperature operation.
- 2) Per the design, UVA and UVC chips will radiates simultaneously, 395nm UVA is visible to human eye as UV indication. Proper protection is still needed from UV harzard.
- 2) The LED DC Module can be configure with different LED chip quantities, series and parallel design configurations to meet a specific design requirement.
Contact Fulham for further assistance.
- 3) Specifications are subject to change without notice.



VUU24V005LP270C-8

LED Information

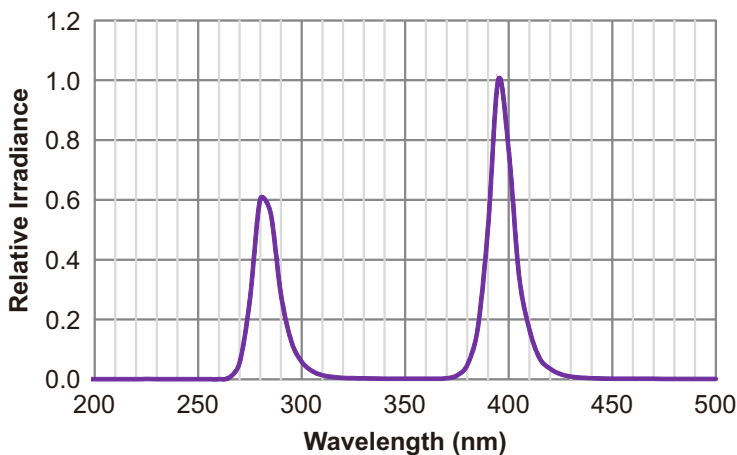


3535 UVA+UVC LED

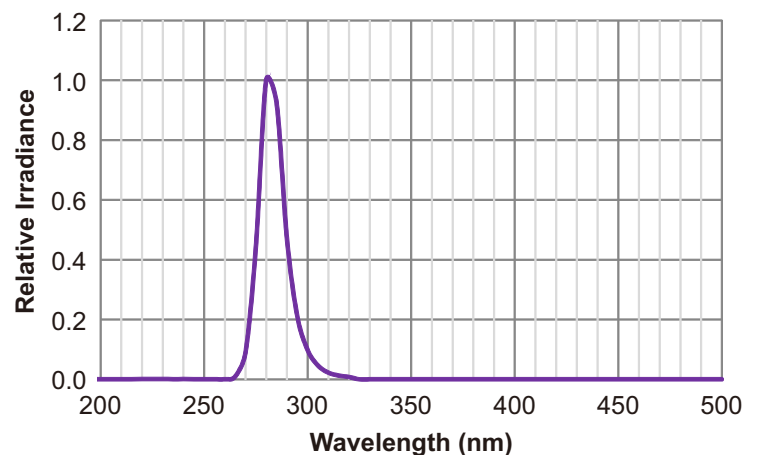
Substrate material: Al_2O_3 Ceramic

Housing material: Al_2O_3 Ceramic

UVA + UVC



UVC Only



CAUTION

UV emitted from this product. Eye or Skin irritation may result from exposure. Use appropriate shielding.

- UV LEDs emit high intensity UV light.
- Do not look directly into the UV light during operation.
- Wear protective clothing and eyewear to avoid exposure to UV light.
- Attach caution labels to your products which contain UV LEDs.
- Keep out of reach of children.



VU024V005LP270C-8

Disinfection Time Estimation

UV-C dosage, also called exposure dosage, is a way to measure how much total UV-C energy has radiated a particular surface. Dosage is determined not only by the strength of the UV-C that falls on a surface, but also how long that surface is exposed.

$$\text{Exposure Dosage (mJ/cm}^2\text{)} = \text{UV Irradiance (mW/cm}^2\text{)} \times \text{Time (seconds)}$$

The reduction of micro-organisms is classified using a logarithmic scale. A single log reduction is a 90% reduction of organisms. A two log reduction is a 99% reduction of organisms, followed by a three log reduction (99.9%), etc.

Bacteria	UV dosage in mJ/cm ² 99.9% (3 log reduction)	Disinfection Time VU024V005LP270C-8 @ 5" distance	
Bacillus anthracis	13.6	129 s	2.2 mins
B. Megatherium sp. (vegetative)	3.9	37 s	0.6 mins
B. Megatherium sp. (spores)	8.2	78 s	1.3 mins
B. paratyphosus	9.6	91 s	1.5 mins
B. subtilis (vegetative)	17.4	166 s	2.8 mins
B. subtilis (spores)	61	581 s	9.7 mins
Clostridium tetani	22	210 s	3.5 mins
Corynebacterium diptheriae	10.1	96 s	1.6 mins
Eberthella typhosa	6.4	61 s	1.0 mins
Escherichia coli	9	86 s	1.4 mins
Leptospira interrogans	9.5	90 s	1.5 mins
Micrococcus candidus	18.2	173 s	2.9 mins
Micrococcus sphaeroides	30	286 s	4.8 mins
Mycobacterium tuberculosis	18.6	177 s	3.0 mins
Neisseria catarrhalis	13.2	126 s	2.1 mins
Phytonomas tumefaciens	13.2	126 s	2.1 mins
Proteus vulgaris	9	86 s	1.4 mins
Pseudomonas aeruginosa	16.5	157 s	2.6 mins
Pseudomonas fluorescens	10.5	100 s	1.7 mins
Salmonella enteritidis	12	114 s	1.9 mins
Salmonella paratyphi	9.6	91 s	1.5 mins
Salmonella typhimurium	24	229 s	3.8 mins
Salmonella typhosa (Typhoid)	6.5	61 s	1.0 mins
Sarcina lutea	59.1	563 s	9.4 mins
Serratia marcescens	7.3	69 s	1.2 mins
Shigella dysenteriae (Dysentery)	6.6	63 s	1.0 mins
Shigella paradyenteriae	5.0	48 s	0.8 mins
Spirillum rubrum	13.2	126 s	2.1 mins
Staphylococcus albus	5.5	53 s	0.9 mins
Staphylococcus aureus	7.8	74 s	1.2 mins
Streptococcus hemolyticus	6.5	62 s	1.0 mins
Streptococcus lactis	18.5	176 s	2.9 mins
Streptococcus viridans	6	57 s	1.0 mins
Viruses	UV dosage in mJ/cm ² 99.9% (3 log reduction)	Disinfection Time VU024V005LP270C-8 @ 5" distance	
Bacteriophage - E. Coli	7.8	74 s	1.2 mins
Infectious Hepatitis	17.4	166 s	2.8 mins
Influenza	10.2	97 s	1.6 mins
Poliovirus - Poliomyelitis	9.5	90 s	1.5 mins
Rotavirus	140	1333 s	22.2 mins
Tobacco mosaic	440	4190 s	69.8 mins
2019-nCoV	22	210 s	3.5 mins
Molds	UV dosage in mJ/cm ² 99.9% (3 log reduction)	Disinfection Time VU024V005LP270C-8 @ 5" distance	
Aspergillus flavus	180	1714 s	28.6 mins
Aspergillus glaucus	132	1257 s	21.0 mins
Aspergillus niger	396	3771 s	62.9 mins
Mucor racemosus A	51	486 s	8.1 mins
Mucor racemosus B	51	486 s	8.1 mins
Oospora lactis	15	143 s	2.4 mins
Penicillium expansum	39	371 s	6.2 mins
Penicillium roqueforti	39	371 s	6.2 mins
Penicillium digitatum	132	1257 s	21.0 mins
Rhizopus nigricans	333	3171 s	52.9 mins
Yeasts	UV dosage in mJ/cm ² 99.9% (3 log reduction)	Disinfection Time VU024V005LP270C-8 @ 5" distance	
Baker's yeast	11.7	111 s	1.9 mins
Brewers yeast	9.9	94 s	1.6 mins
Common yeast cake	18	171 s	2.9 mins
Saccharomyces cerevisiae	18	171 s	2.9 mins
Saccharomyces ellipsoideus	18	171 s	2.9 mins
Saccharomyces spores	24	229 s	3.8 mins

NOTES:

- Above 3 log reduction UV dosage is based on article on below website, different researches may vary on the dosage needed.
<https://www.clordsys.com/pdfs/misc/UV%20Data%20Sheet.pdf>
- The dosage stated in the table refers to 254nm mercury lamp, the dosage using this 275nm UVC LED may vary. Spectrum effect difference is not taking into account.
- The UV irradiance will vary based on distance, radiation angle and working temperature, above disinfection time is for reference only.



VUU24V005LP270C-8

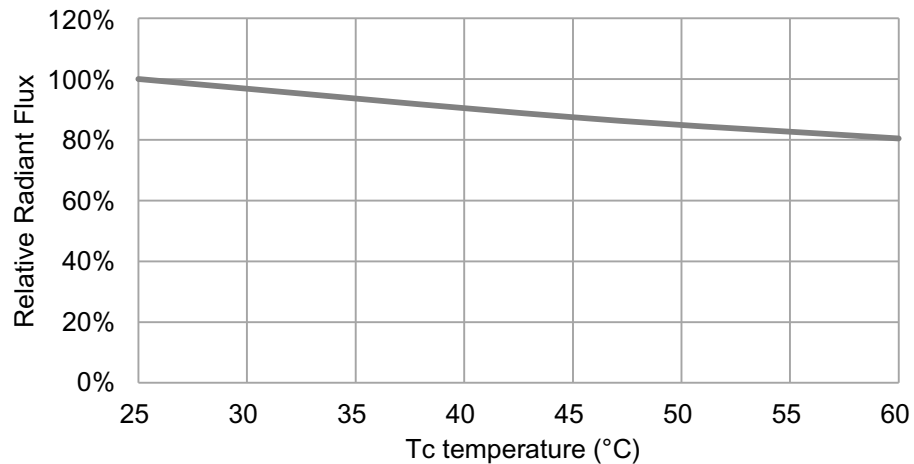
Thermal Specifications

LP-LinearHO UVC DC Module




Storage Temperature Range	-40 to 100°C / -40 to 212°F
Operating Ambient Temperature Range (ta)	-20 to 40°C / -4 to 104°F
Maximum Case Temperature (Tc)	50°C / 122°F



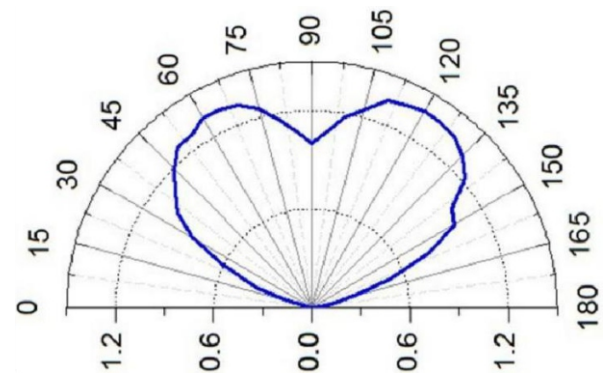
Thermal De-Rating



Certification Chart

Model	VUU24V005LP270C-8
Classification	
	YES
	YES
	N/A
Energy Efficiency Label (EEL-Label)	N/A
Suitable for UL Class 2 Lighting System	YES

Radiation Pattern





VUU24V005LP270C-8

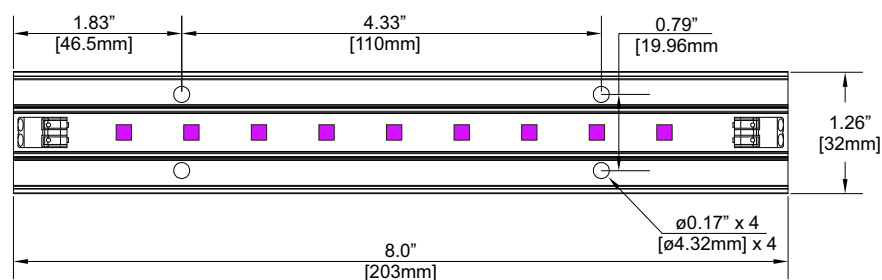
Mechanical Drawings

8"

[203mm]

Overall Dimensions

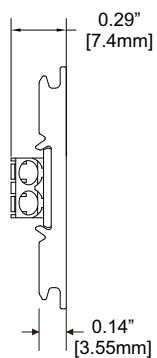
Length	8.0" [203mm]
Width	1.26" [32mm]
Height	0.29" [7.4mm]



TOP VIEW



BOTTOM VIEW



SIDE VIEW

VUU24V005LP270C-8

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.

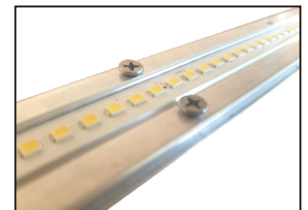


Connector

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.



VUU24V005LP270C-8

Part Number Matrix

V U U 24V 005 LP 270C-8

Product Line	Type	Control Type	Input Voltage	Max. Power	Design	Peak Wavelength	Length
V = Vizion	U = UV (UL Class 2)	U = None	24V = 24VDC	005 = 5W	LP = Low Profile	270 = 270nm UVC	8 = 8 inch

① Standard Product offering (All other options are made to order with MOQ and lead time)

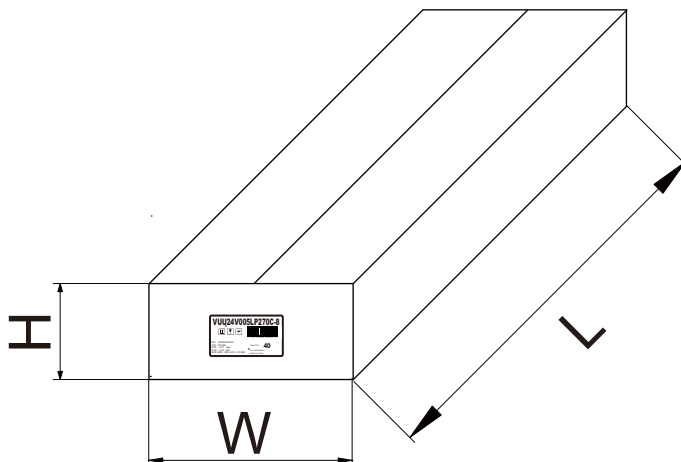
Product Image: LP-LinearHO UV Module



TOP VIEW

Packaging

Master Carton



OUTER DIMENSION		
L	W	H
12.20"(310mm)	10.63"(270mm)	4.33"(110mm)
Net Weight	Gross Weight	QUANTITY
4.4 lbs. (2.00kg)	5.51 lbs. (2.50kg)	40pc.