

Operation Manual

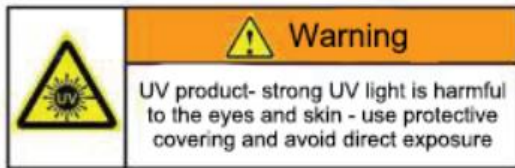
# **LED High Power UV Germicidal Lamp.**

LEDi2, Inc.

©2020 LEDi2 all rights reserved. Information, specifications, diagrams, images, and instructions herein are subject to change without notice. LEDi2 logo and identifying product names and numbers herein are trademarks of LEDi2. Copyright protection claimed includes all forms and matters of copyrightable materials and information now allowed by statutory or judicial law or hereinafter granted.

LEDi2 and all affiliated companies hereby disclaim any and all liabilities for property, equipment, building, and electrical damages, injuries to any persons, and direct or indirect economic loss associated with the use or reliance of any information contained within this document, and/or as a result of the improper, unsafe, insufficient and negligent assembly, installation, rigging, and operation of this product.

LEDi2 USA 10611 Harwin Dr, Suite 406. | Houston, TX 77036 USA Tel: (713) 636-9152 | Fax: 832-831-8639 | [www.ledi2.com](http://www.ledi2.com) | [info@ledi2.com](mailto:info@ledi2.com)



RISK GROUP 3 - RISK OF EXPOSURE TO ULTRAVIOLET (UV) RADIATION! FIXTURE EMITS HIGH INTENSITY WAVELENGTH OF ULTRAVIOLET LIGHT AT A WAVELENGTH OF 260NM – 285NM. WEAR PROPER EYE AND SKIN PROTECTION. DO NOT OPERATE FIXTURE WITH

DAMAGED/MISSING EXTERNAL COVER PROTECTIVE LENS. DO NOT LOOK DIRECTLY INTO THE UV LIGHT AND/OR VIEW UV LIGHT DIRECTLY WITH OPTICAL INSTRUMENTS THAT MAY CONCENTRATE THE LIGHT/RADIATION OUTPUT. AVOID PROLONGED PERIODS OF EXPOSURE. IF EXPOSURE IS NECESSARY, AVOID WEARING WHITE-COLORED CLOTHING OR UV PAINT. INDIVIDUALS SUFFERING FROM A RANGE OF EYE CONDITIONS, TAKING MEDICATION FOR PHOTOSENSITIVITY, OR WITH SUNLIGHT EXPOSURE DISORDERS MAY FEEL DISCOMFORT IF EXPOSED TO THE UV LIGHT EMITTED FROM THIS FIXTURE.

## **CONTENTS**

Product Information	3
Limited Warranty (USA Only)	6
Safety Guidelines	7
Maintenance Guidelines	8
Overview	9
Installation Guidelines	10
Technical Specifications	11
Mounting Bracket Dimensions	12
Matters of Attention	13

## **Product INFORMATION**

### **PRODUCT INTRODUCTION**

Please read and understand all instructions in this manual carefully and thoroughly before attempting to operate this product. These instructions contain important safety and use information.

Get familiar with the product: This product is patent-pending, and include many inventions from LEDi2 and associated partners.

(Diagram here), please spend some time to study the product, the major parts are the Driver(1), Heatsink, (2) UV LED chips (3), Quartz Lens (4), front cover (5) and the mounting arm (6).

Here is how this light works in killing viruses, bacteria and other pathogens:

The virucidal power is from the UV chips, in our case these chips have a UVC wavelength, 260-285 nm, effective range of killing the viruses, including Covid-19 (SARS-CoV2). The chips are rated at 2.8% of UV generating, which is among the highest level of uvc chip in the market. Also each chip consumes 8W, and the total UVC chips combines to 300W total power with a 8W UVC output. This is an engineering marvel at this high level in such a small area, to deliver a lethal force to the viruses.

The heatsink is another proprietary invention to protect the high-performance uvc chips, which generate tremendous of heat yet very vulnerable in heat tolerance. With this combination, the expected life-span is more than 10,000 operating hours, while keeping at least 90-95% of the original virus-killing power at the end of the recommended duration.

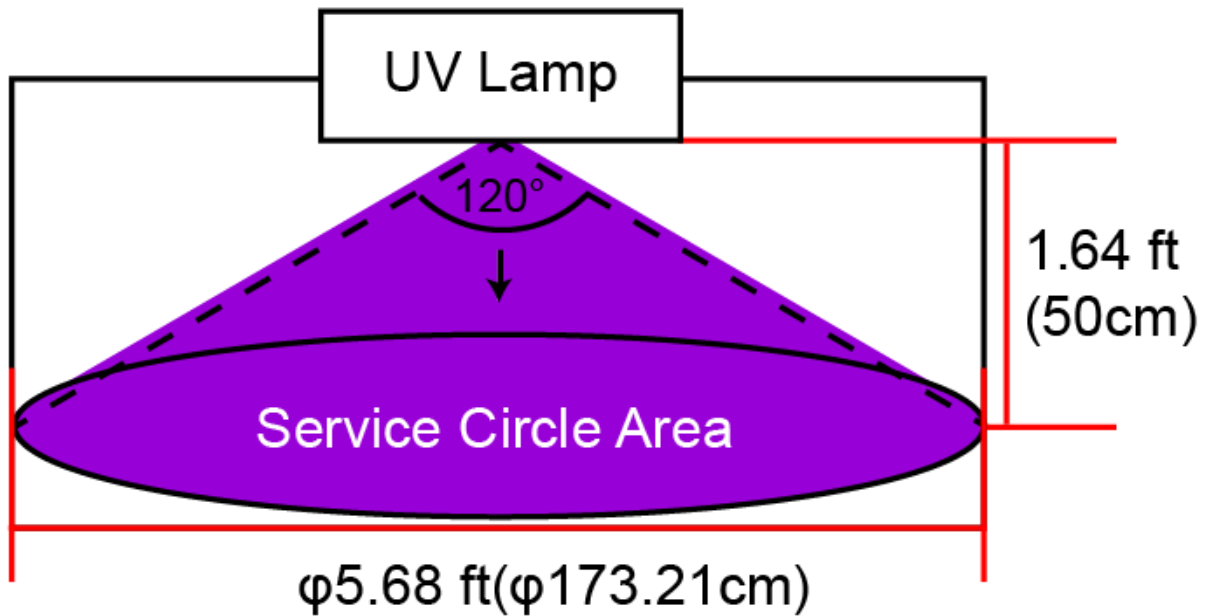
Drive is another crucial component that feeds constant current of power to the LED chips.

Quartz lens, placed in front of the UVC LED chips, provide a protection to the precious chips from dust and other environmental factors. Because of the super short wave-length, the UVC light demand the highest level of optical transparency of these lenses, or significant loss will happen with lower grade glasses.

Light direction and effective Circle:

Obviously, the UVC light projects forward. Again, read the safety guideline, as UVC is out of human perception that we can't really tell if the light is on or not, but a weak blue-purple can be seen when it's on, protective gear, please.

This model has a beam angle of 120 degrees, the following is chart on the diameter versus the distance, please use this chart to determine the effective circle, which we recommend to place the target 10 cm inside the circle line to ensure effectiveness.



Service Circle Area: 25.36ft<sup>2</sup>(23,561.94cm<sup>2</sup>)

N95 mask dimensions: 5 x 5 inch

120 minutes to complete 115 pieces N95 masks on both sides to kill Covid-19 virus

Disinfect 460 pieces N95 masks in 8 hours

#### Operating Distance and Virus-killing power

We recommend a maximum distance of 50cm for surface virus disinfection, including Covid-19 (SARS-CoV2), when possible, move the light closer to the target will give more UVC killing power, as the chart indicate.

300W UV Lamp

Distance	100cm	90cm	80cm	70cm	60cm	50cm	40cm	30cm	20cm	10cm	1cm
μW/cm <sup>2</sup>	135	160	207	267	375	550	930	1700	3400	11000	78000

**Scientific Report on this light in real Covid-19 experiment:**

This high power UV germicidal light is designed for surface disinfection of viruses, bacteria and other pathogens. With the UVC wavelength (260-285nm), it kills viruses by disrupting their RNA or DNA and protein coats. Studies by NIH (National Institute of Health) Scientist Robert Fischer et al in Dr. Vincent Munster’s Virology Group, also found great results for disinfecting the COVID-19 virus on N95 masks and steel surfaces, while using this particular model from LEDi2 as their UV source in the experiments. This is the link for the publication: <https://medrxiv.org/cgi/content/short/2020.04.11.20062018v1>. The high point of the findings is that this model, when placed at a distance of 50cm, can kill the COVID-19 virus (SARS-COV-2) in N95 mask in minutes, with a 99.99% kill rate within one hour. Furthermore, the results confirmed that this model caused minimal damage to the integrity of the N95 masks, and the authors suggest that N95 masks disinfected in this method can be re-used up to 3 times, resulting in saving money, reducing contaminated medical waste, and most importantly, relieve the shortage and huge demand for these N95 masks in the heat of a pandemic.

In addition, the report showed a much faster disinfection rate for COVID-19 (SARS-COV-2) on steel surfaces, from the same distance of 50 cm.

Here are two graph from the same paper mentioned: Please use these results as a general guideline for Covid-19 virus disinfection in both N95 masks and steel surfaces.

Table S1. Effect of decontamination method on SARS-CoV-2 viability and N95 mask integrity. half-life (min) time to one thousandth (min) time to one millionth (min) Treatment Material median 2.5% 97.5% median 2.5% 97.5% median 2.5% 97.5% Control N95 mask 78 65.3 89.7 777 650 894 1.55e+03 1.3e+03 1.79e+03 Steel 286 243 324 2.85e+03 2.42e+03 3.23e+03 5.7e+03 4.84e+03 6.45e+03 Ethanol N95 mask 0.639 0.55 0.721 6.37 5.49 7.19 12.7 11 14.4 Steel 1.06 0.888 1.23 10.6 8.85 12.2 21.2 17.7 24.5 Heat N95 mask 4.64 3.87 5.41 46.3 38.5 53.9 92.6 77 108 Steel 8.83 7.49 10.1 88 74.7 101 176 149 201 UV N95 mask 6.26 5.31 7.15 62.4 52.9 71.2 125 106 142 Steel 0.733 0.649 0.802 7.31 6.47 7.99 14.6 12.9 16 VHP N95 mask 0.78 0.685 0.858 7.78 6.82 8.55 15.6 13.6 17.1 Steel 0.765 0.669 0.843 7.63 6.67 8.4 15.3 13.3 16.8

The recommended set-up for N95 masks is at a distance of 50cm, and place the masks directly in the efficient circle of \_\_\_\_\_, to ensure complete disinfection, the masks should be at 10 min inside the effective circle.

For other surfaces, there is no study of UVs effects on Covid-19, so use a reference of the data from the paper, and start disinfection within 50 cm distance from the surface. As you move the light

In practical use, one can place this light closer to the target and expect even faster results.

**RECOMMENDED USES**

Decontamination of COVID-19 and other viruses to sterilize surfaces, including protective masks.

## **CUSTOMER SUPPORT**

Tel: (713) 636-9152 | Fax: 832-831-8639 | [www.ledi2.com](http://www.ledi2.com) | [info@ledi2.com](mailto:info@ledi2.com)

## **WARRANTY RETURNS**

All returned service items, whether under warranty or not, must be sent by prepaid freight with accompanying return merchandise authorization (R.M.A.) number. The R.M.A. number must be clearly written on the outside of the return package. A brief written description of the problem as well as the R.M.A. number must also be included in the shipping container. If the unit is under warranty, you must provide a copy of your proof of purchase invoice. Items returned without a R.M.A. number clearly marked on the outside of the package will be refused and returned at customer's expense. You may obtain a R.M.A. number by contacting customer support.

## **LEDi2 MANUFACTURER'S LIMITED WARRANTY (USA)**

A. LEDi2, hereby warrants, as the original manufacturer, to be free of manufacturing defects in material and workmanship for a prescribed period from the date of purchase (see specific warranty period on reverse). This warranty shall be valid only if the product is purchased within the United States of America, including possessions and territories. It is the owner's responsibility to establish the date and place of purchase by acceptable evidence, at the time service is sought.

B. For warranty service you must obtain a Return Merchandise Authorization number (RMA#) before sending back the product, please contact LEDi2 RMA Department at (713) 636-9152 ext. 322. Send the product only to the LEDi2. All shipping charges must be prepaid. If the requested repairs or service (including parts replacement) are within the terms of this warranty, LEDi2 will pay return shipping charges only to a designated point within the United States. If the entire instrument is sent, it must be shipped in its original package. No accessories should be shipped with the product. If any accessories are shipped with the product, LEDi2 shall have no liability whatsoever for loss of or damage to any such accessories, or for the safe return thereof.

C. This warranty is void if the serial number has been altered or removed; if the product is modified in any manner, after inspection, affects the reliability of the product; if the product has been repaired or serviced by anyone other than the LEDi2; if the product is damaged because it was not properly maintained as set forth in the instruction manual.

D. This is not a service contract, and this warranty does not include maintenance, cleaning or periodic check-up. During the period specified above, LEDi2 will replace defective parts at its expense with new or refurbished parts and will absorb all expenses for warranty service and repair labor by reason of defects in material or workmanship. The sole responsibility of LEDi2 under this warranty shall be limited to the repair of the product, or replacement thereof, including parts, at the sole discretion of LEDi2. All products covered by this warranty were manufactured after March 2020, and bear identifying marks to that effect.

E. LEDi2 reserves the right to make changes in design and/or improvements upon its products without any obligation to include these changes in any products therefore manufactured. No warranty, whether expressed or implied, is given or made with respect to any accessory supplied with products described above. Except to the extent prohibited by applicable law, all implied warranties made by LEDi2 in connection with this product, including warranties of merchantability or fitness, are limited in duration to the warranty period set forth above. And no warranties, whether expressed or implied, including warranties of merchantability or fitness, shall apply to this product after said period has expired. The consumer's and/or Dealer's sole remedy shall be such repair or replacement as is expressly provided above; and under no circumstances shall LEDi2 be liable for any loss or damage, direct or consequential, arising out of the use of, or inability to use, this product. This warranty is the only written warranty applicable to LEDi2, and supersedes all prior warranties and written descriptions of warranty terms and conditions heretofore published.

MANUFACTURER'S LIMITED WARRANTY PERIODS: LEDi2 UV products = 3-year (1095 days) Limited Warranty



## **SAFETY GUIDELINES**

To ensure proper operation, please follow all instructions and guidelines in this manual. LEDi2 is not responsible for damages and/or injuries resulting from improper use or maintenance that does not follow the information provided in this manual. Only certified professionals should perform installation of these devices, using the original mounting hardware provided with the product.

DO NOT look directly into the light source- risk of retinal damage

DO NOT directly expose any persons to the UV light- if an individual needs to be in the room during operation, make sure they are wearing full protective clothing and eyewear.

DO NOT touch light during operation, as it may be hot

DO NOT place device near flammable materials during operation

DO NOT allow unqualified or untrained individuals to operate the light

DO NOT expose to rain and/or moisture- indoor use only

DO NOT shake or use excessive force during installation or operation

DO NOT remove, break or modify any components or parts- this will void your warranty

ALWAYS disconnect device from main power before cleaning and maintenance

ALWAYS ensure proper ventilation before operation

ALWAYS have a certified service professional handle repairs and services when:

- the power cord or plugs are damaged
- the device is damaged by debris or from being dropped
- when liquid gets into the device for any reason
- the device shows abnormal operation or shows a noticeable difference in performance

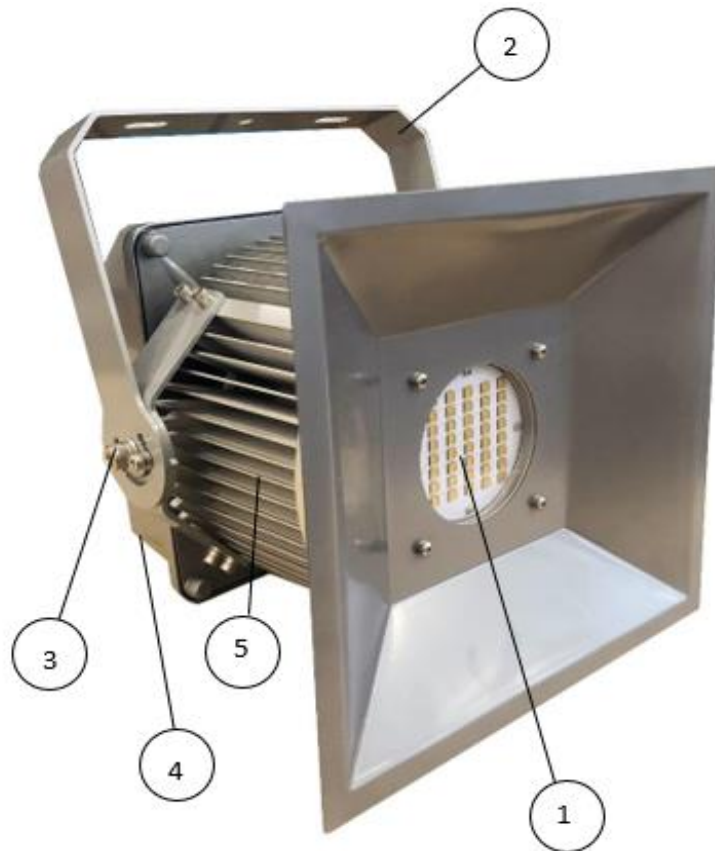
**UNPACKING:** This product has been thoroughly tested and has been shipped in perfect condition. Carefully check the shipping carton for damage that may have occurred during shipping. If the carton appears to be damaged, carefully inspect your product for damage and be sure all accessories necessary to assemble the product have arrived intact. In the event that damage has been found or parts are missing, please contact our customer support team for further instructions.

Please do not return this product to your dealer without first contacting customer support at the number listed below. Please do not discard the shipping carton in the trash. Please recycle whenever possible.

## OVERVIEW

### INCLUDED ITEMS

- (1) LED High Power UV Germicidal Lamp



UV LED Chip  
Yoke Mount Bracket  
Hexagon Screw (4)  
Power Cable  
Heat Sink Fin

### MAJOR COMPONENTS WITH PART NUMBER

1: **LED chips:** rated at 8W each chip, with an overall UV efficacy of 2.8 %. These UV chips are susceptible to electrostatic shock and high temperature, and decay rapidly once the operating temperature reaches above 60°C.

#### Part #: I2-WM-UVC-300W/8W-NT-Chip

2. **Heatsink:** The heatsink is based on patented technology, with a hollow low-pressure column, filled with a small amount of a special formulated organic medium. Heat is transferred rapidly via the phase change from liquid to gas. The medium will form a rapid vortex inside the specially fitted grooves, where the liquid evaporates into a gas that will be cooled as it transfers heat to the walls connected to fins, becoming a liquid and continuing the cycle without added energy.

The end result is that we can maintain a continuous operating temperature under 55°C, even with such a powerful system (300W) in such a small area.

**Part #: I2-WM-UVC-300W/8W-NT-HS**

3. The **Quartz Lens** protects the LED chips and ensures minimal loss of short wave UVC light that passes through.

**Part #: I2-WM-UVC-300W/8W-NT-QL**

4. **Front cover** is built with soft aluminum, reducing the impact of possible collisions with the valuable objects.

**Part #: I2-WM-UVC-300W/8W-NT-FC**

LED Driver	I2-WM-UVC-300W/8W-NT-Driver
UV LED Chips	I2-WM-UVC-300W/8W-NT-Chip
Quartz Glass Lens	I2-WM-UVC-300W/8W-NT-QL
Front Aluminum Cover	I2-WM-UVC-300W/8W-NT-FC
Heat Sink Body	I2-WM-UVC-300W/8W-NT-HS
Yoke Mount Bracket	I2-WM-UVC-300W/8W-NT -Ubracket
Hexagon Screw	I2-WM-UVC-300W/8W-NT-Screw
Power Cable Sealing	I2-WM-UVC-300W/8W-NT-PCS
Power Cable	I2-WM-UVC-300W/8W-NT-PC

## **INSTALLATION INSTRUCTIONS**



### **FLAMMABLE MATERIAL WARNING**

Keep devices minimum 5.0 feet (1.5m) away from flammable materials and/or pyrotechnics.



### **ELECTRICAL CONNECTIONS**

A qualified electrician should be used for all electrical connections and/or installations.



### **DO NOT INSTALL THE DEVICES IF YOU ARE NOT QUALIFIED TO DO SO!**

OVERHEAD MOUNTING REQUIRES EXTENSIVE EXPERIENCE, INCLUDING AMONGST OTHERS CALCULATING WORKING LOAD LIMITS, INSTALLATION MATERIAL BEING USED, AND PERIODIC SAFETY INSPECTION OF ALL INSTALLATION MATERIAL. IF YOU LACK THESE QUALIFICATIONS, DO NOT ATTEMPT THE INSTALLATION YOURSELF. IMPROPER INSTALLATION CAN RESULT IN BODILY INJURY.

BEFORE MOUNTING DEVICES TO ANY METAL TRUSS/STRUCTURE OR CEILING, A PROFESSIONAL EQUIPMENT INSTALLER MUST BE CONSULTED TO DETERMINE IF THE METAL TRUSS/STRUCTURE OR CEILING IS PROPERLY CERTIFIED TO SAFELY HOLD THE COMBINED WEIGHT OF THE LIGHT FIXTURE<sup>1</sup>, CLAMPS, CABLES, AND ACCESSORIES.

BEFORE MOUNTING DEVICES TO ANY SURFACE OR STRUCTURE, MAKE SURE THE SURFACE OR STRUCTURE CAN HOLD A MINIMUM POINT LOAD OF 4 TIMES THE WEIGHT OF THE DEVICES.

MAKE SURE SCREWS AND/OR EXPANSION BOLTS (NOT INCLUDED) FIT INTO MOUNTING HOLES! FOR ADDED PROTECTION, MOUNT DEVICES IN AREAS OUTSIDE WALKING PATHS, SEATING AREAS, OR IN AREAS WERE UNAUTHORIZED PERSONNEL CAN REACH THE DEVICES.

SECURE FIXTURE WITH A SECONDARY SAFETY ATTACHMENT, SUCH AS AN APPROPRIATE SAFETY CABLE. (NOT INCLUDED) NEVER STAND DIRECTLY BELOW THE DEVICES WHEN MOUNTING, REMOVING OR SERVICING.

DEVICES MUST ALL BE INSTALLED FOLLOWING ALL LOCAL, NATIONAL, AND COUNTRY COMMERCIAL ELECTRICAL AND CONSTRUCTION CODES AND REGULATIONS.

## **INSTALLATION**

Do not connect the UV LED germicidal lamp to the high-voltage power supply before installation. Only connect it strictly according to the product's nominal working electrical parameters. The power supply voltage must not exceed the rated operating voltage of the lamp.

1. When the lamp is installed, the mounting structure supporting the lamp must be able to bear at least four times the weight of the lamp. Install expansion bolts and hanging plates. When installing the lamps, the external power cord wiring and connection points are sealed to prevent leakage; corresponding waterproof and water leakage measures must be taken. This lamp cannot be used in violation of any fire protection regulations. Please find a professional electrician for the installation of a three-core cable of 0.75-1mm.
2. Adjust the lamp to a suitable angle, and then tighten the screws on both sides.
3. Fixture will automatically turn on once plugged in. Remote control switch or separate socket is highly recommended.
4. Hand-held operation or mounted on a moving carts is allowed as long as the operators are equipped with UVC protective gear for eyes and all body skins, and there is no one in the same area without protective gear.

## TECHNICAL SPECIFICATIONS

**Product Name:** UVC High Power UV LED Germicidal Lamp

**Model:** AntiV-i2-300W

**Rated Electrical Power:** 300W

**Rated UV Power:** 8W

**Effective UV Wavelength:** 260-285 nm

**Input Voltage (V):** 100~240V AC

**Material and Technology:** Aluminum body, UV LED, Quartz Lens

**Overall Dimensions(mm):** 365\*345\*410 365\*345\*500

**Beam Angle:** 120 Degrees

**Ideal Usage Distance:** Within 50cm

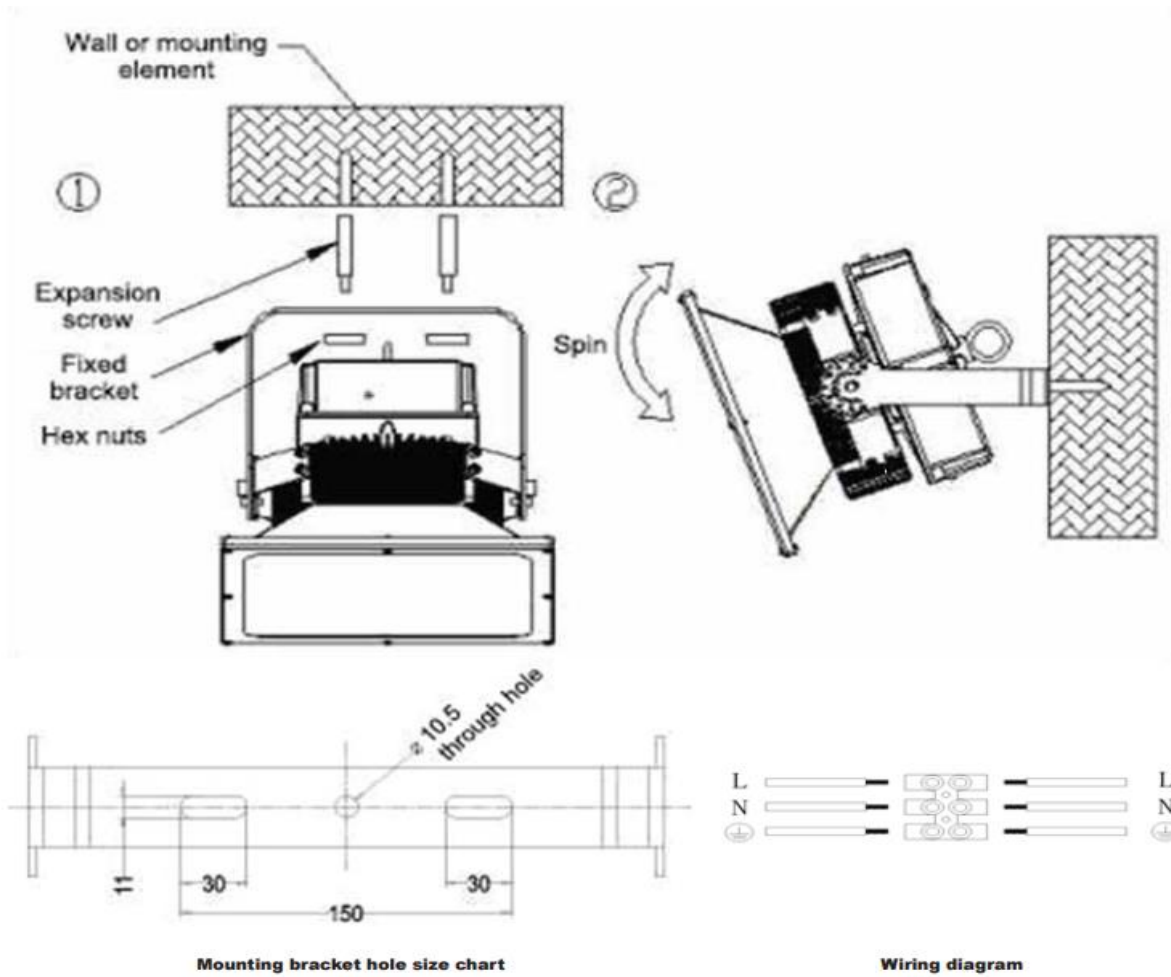
**Ideal Disinfection Area:** 23,550cm<sup>2</sup>

**Rated Lifetime:** 10,000 hours

Specifications subject to change without any prior written notice.

Treatment	Material	half-life (min)			time to one thousandth (min)			time to one millionth (min)		
		median	2.5%	97.5%	median	2.5%	97.5%	median	2.5%	97.5%
Control	N95 mask	78	65.3	89.7	777	650	894	1.55e+03	1.3e+03	1.79e+03
	Steel	286	243	324	2.85e+03	2.42e+03	3.23e+03	5.7e+03	4.84e+03	6.45e+03
Ethanol	N95 mask	0.639	0.55	0.721	6.37	5.49	7.19	12.7	11	14.4
	Steel	1.06	0.888	1.23	10.6	8.85	12.2	21.2	17.7	24.5
Heat	N95 mask	4.64	3.87	5.41	46.3	38.5	53.9	92.6	77	108
	Steel	8.83	7.49	10.1	88	74.7	101	176	149	201
UV	N95 mask	6.26	5.31	7.15	62.4	52.9	71.2	125	106	142
	Steel	0.733	0.649	0.802	7.31	6.47	7.99	14.6	12.9	16
VHP	N95 mask	0.78	0.685	0.858	7.78	6.82	8.55	15.6	13.6	17.1
	Steel	0.765	0.669	0.843	7.63	6.67	8.4	15.3	13.3	16.8

## MOUNTING BRACKET DIMENSIONS (mm)



Overall Dimensions(mm): 365\*345\*410 365\*345\*500

## **MATTERS OF ATTENTION**

Ultraviolet rays have a strong lethality to bacteria but can also cause a certain degree of harm to the human body. The most vulnerable part of the human body is the cornea of the eyes. To avoid injury, do not look directly at the lighted lamps at any time. If it is necessary, use ordinary glass (ex. Wearing glasses) or a transparent plastic sheet as a protective mask. Do not use quartz glass. Exposure can lead to red, puffy, irritated eyes; if treated properly, recovery may take 3-4 days. If injured, it is recommended to immediately consult with a doctor or physician.

When sterilizing a surface or item with UV rays, the irradiated surface should be directly irradiated with ultraviolet rays **inside the effective circle** to ensure a sufficient irradiation dose.

After disinfecting the room with the UV lamp, ventilate the room as soon as possible for no less than 1 hour.

## **MAINTENANCE GUIDELINES**



**DISCONNECT POWER BEFORE PERFORMING ANY MAINTENANCE!**

### **CLEANING**

Frequent cleaning is recommended to ensure proper function, optimized light output, and an extended life. The frequency of cleaning depends on the environment in which the device operates; damp, smoky or particularly dirty environments can cause greater accumulation of dirt on the fixture housing and/or light fixture optics.

Clean the external surface at least every 20 days with a soft cloth to avoid dirt/debris accumulation.

The frontal cover is made with a soft aluminum material to reduce impact in potential collisions. Clean regularly with a soft cloth.

No corrosive liquid such as chlorine or household cleaner should be used to clean the chassis of the fixture. Alcohol wipes can be used to remove greasy dirt. Do not use running water or water sprays to clean.

The heat sink fin structure should be cleaned with gently compressed air. Be careful at the sharp edges to avoid possible cutting and injuries.

The quartz lens is a precise optical component and therefore needs to be cleaned like an optical object. Any damage to the quartz lens will affect and reduce overall performance, as the shorter wavelength of UVC will amplify the imperfections, nicks, greasy spots and cleaning marks. Use a squeeze air ball or gentle air blower to remove dust before any wiping. Only optical grade cleaning paper or fine cloth should be used. As you would with a camera lens, start gently wiping from the center in a circular motion towards the edge, and never reuse the paper or cloth. Apply optical grade cleaning detergent when needed to clean greasy spots.

## **MAINTENANCE**

Regular inspections are recommended to ensure proper function and extended life. There are no user serviceable parts inside these devices; please refer all service issues to LEDi2. Should you need any spare parts, please order genuine parts from LEDi2. Please refer to the following points during routine inspections:

During use, the surface of the ultraviolet lamp should be kept clean. Be sure to clean before use if you find that the surface of the lamp is dusty or oily.

Calibrate the UV intensity meter at least once a year. With proper maintenance, the UV lamp's operational life should exceed 80,000 hours of usage.

Be sure all screws and fasteners are always securely tightened. Loose screws may fall out during normal operation resulting in damage or injury as larger parts could fall.

Check for any deformations on the light housing, lens, gel frame, hanging hardware. Deformations could allow for dust to enter the devices. Damaged hanging hardware could cause the devices to fall and seriously injure a person(s).

Electric power supply cables must not show any damage, material fatigue or sediments.