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Upper Room Indirect Germicidal Ultraviolet Air Disinfection Fixture



Source References : WUHAN Hospital

Application

Utilizing ultraviolet lamp technology, the AirSteril UR products kill up to 99.9% of airborne bacteria and viruses, black mold and fungal growth, reduce odors and respiratory allergens and reduce airborne transmission of influenza, colds, and viruses.

laboratories hospitals clinics maternity areas labor & delivery areas pathology labs kidney dialysis labs operating rooms methadone clinics burn centers TB clinics homeless shelters prisons and jails detention centers nursing homes universities schools veterinary clinics animal husbandry kennels food industry food processing dairy processing bakeries office buildings conference rooms clean rooms pharmaceutical mfg. electronic production cosmetic production

Construction / Finish

- Anodized aluminum extrusion housing.
- Solid extruded high reflective twin focus reflector design.
- Wall mount construction.
- On/off switch is standard.
- Shipping weight 5 kg.
- Minimum mounting height is 7.2ft. (2.2 meter)

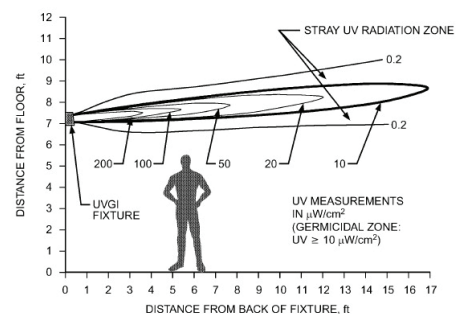


Fig. 6 Typical Elevation View Showing UVC Placed above Heads of Room Occupants for Safety

Recommended by : ASHRAE Handbook 2015 HVAC Applications

Advantages

Economical

System requires very little power to operate.

Safe

Low risk of over-exposure.

Fast

Disinfects air in seconds, reducing the risk of cross infection and exposure of occupants to infectious airborne microbes.

Automatic

Continuous disinfection without special attention.

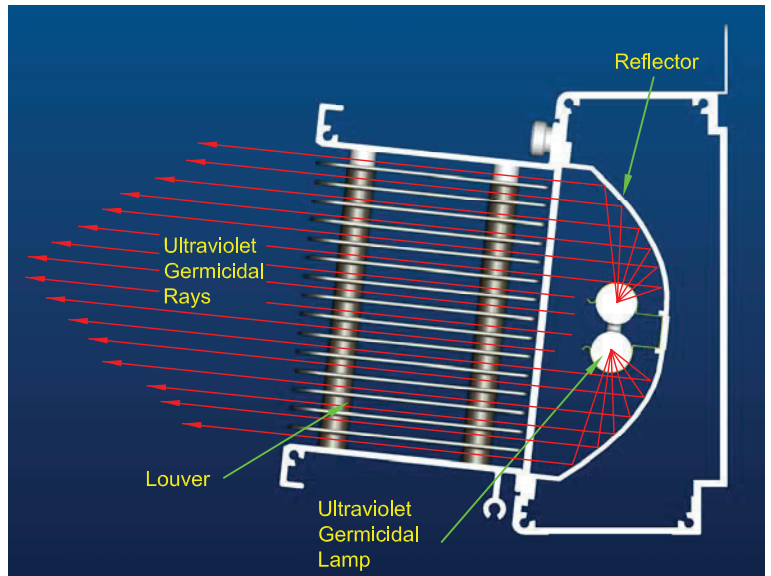
Durable

Extruded aluminum construction.

Low Maintenance

Annual lamp replacement and periodic cleaning is all that is required

Principle of operation



The AirSteril UR design has been carefully conceived to provide germicidal ultraviolet rays to purify the upper room air of occupied spaces in order to reduce the risk of cross infection and exposures of occupants to infectious airborne microbes. The dosage, as it applies to ultraviolet disinfection, is a function of time, and the intensity, of ultraviolet radiation, to which the air is exposed. The exposure time, in seconds, is the total time it takes the air to move through the ultraviolet field, produced by the germicidal lamp. Exposure time is related to the airflow rate, the higher the airflow, the lower the exposure time or the lower the airflow, the higher the exposure time.

The operation of the AirSteril is as follows:

1. Ultraviolet rays project across the upper room air.
2. Bacteria and viruses that are carried into the ultraviolet field by convection currents or air circulation are destroyed.
3. The air in the room is continuously being purified.

SPECIFICATIONS : 220 VAC

Model	Lamp	Power Consumption	Exterior Housing Dimensions			Rated Average Lamp Life
			Length	Width	Depth	
UR460	1 x 30w PLL twin tube	30 Watts	460mm	186mm	186mm	9000 Hours

SPECIAL FEATURES

Aluminum Extrusion Construction

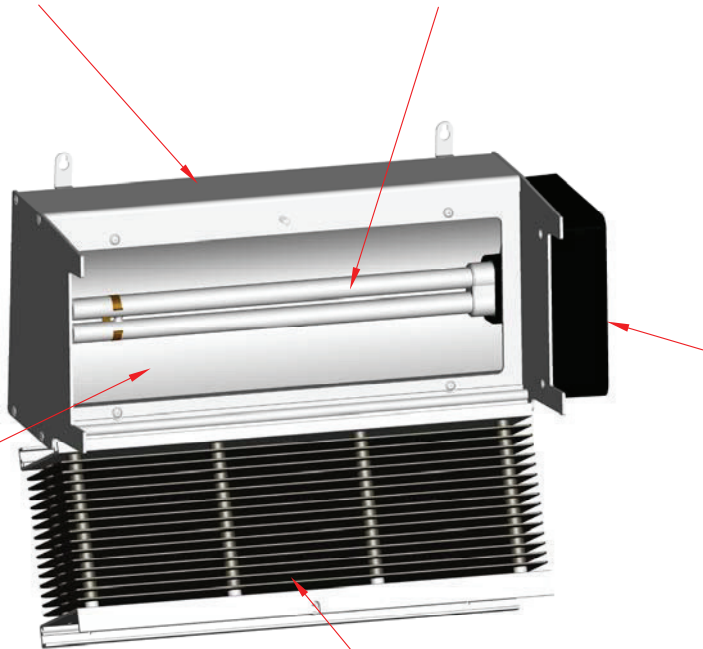
The unit is manufactured in solid anodized aluminum extrusion for unparalleled strength, durability and an attractive finish.

High quality double tube PLL germicidal lamp

Lamp is rapid starting and provides the utmost in quality, sustained output and longevity.

Polished Reflector

Interior surface includes a special twin focus polished reflector which provides a highly reflective surface to maximize ultraviolet intensity.



DigiTronix Electronic Smart Ballast

UL and ENEC listed state-of-the-art high power factor electronic ballasts with 120-277V input are designed to operate ultraviolet lamps. The Smart ballast offers these advantages over conventional ballasts:

- Class P No PCB's
- delivers higher uv lamp output
- preheat soft start low inrush
- eliminates stroboscopic effect
- small and lightweight
- operates cooler for longer life
- saves energy through higher efficiency and provides silent operation

Louvers

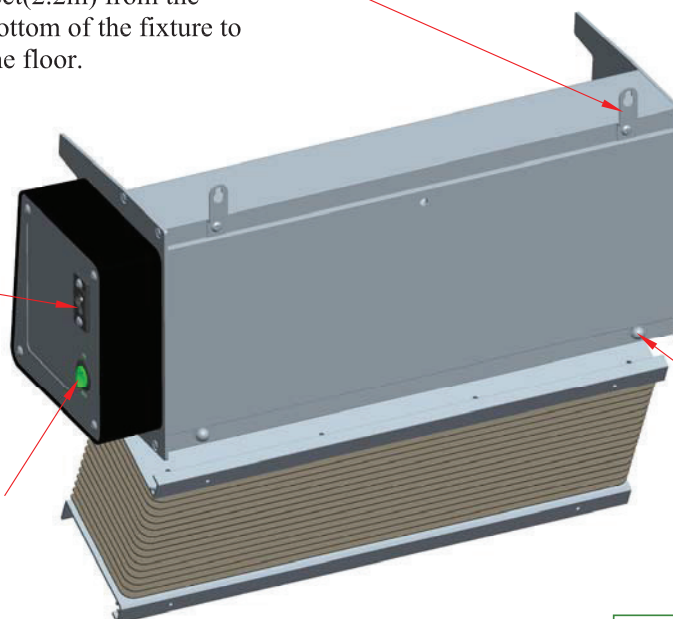
Unique construction directs ultraviolet rays to the upper portion of the room

Stainless Steel Mounting Bracket

This fixture is to be mounted on a plumb and vertical surface, at a minimum height of 7.2 feet(2.2m) from the bottom of the fixture to the floor.

Detachable power cable socket

On-off switch



Adjustable screws

Screws give louvers an extra 5 degree toward ceiling adjustment feature while protecting personnel and providing maximum germicidal UV air irradiation..

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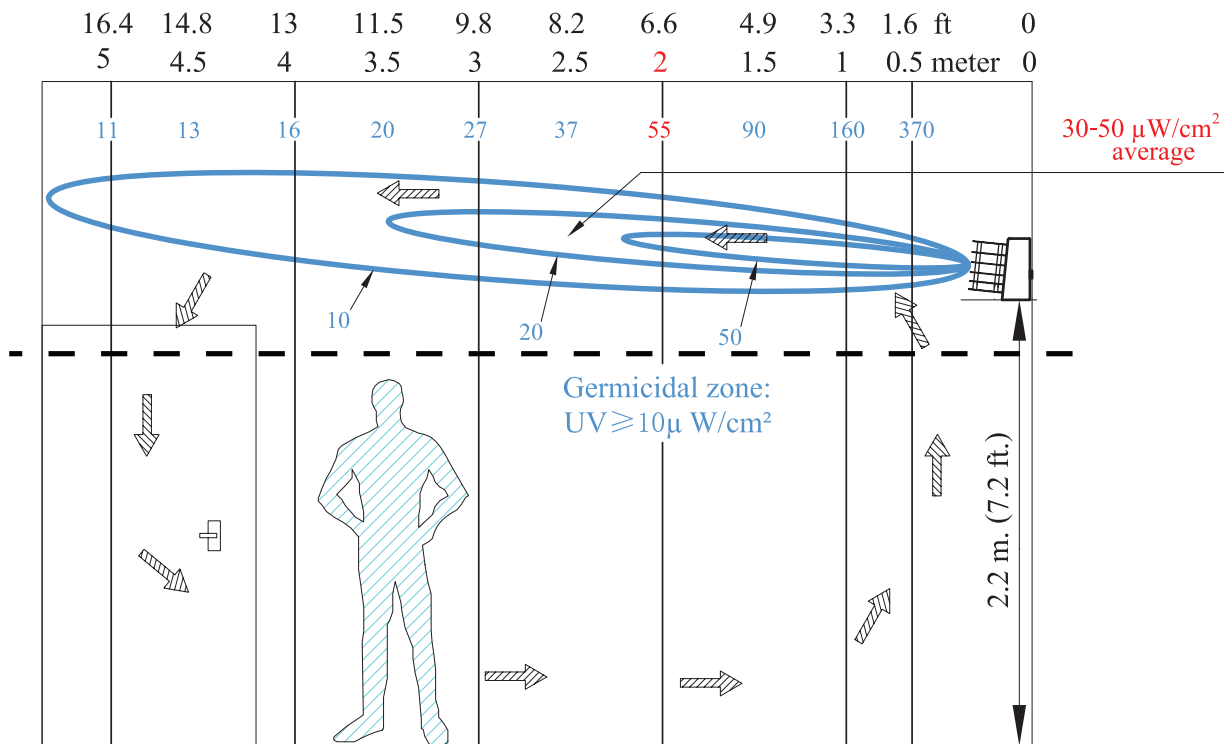
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UR460 UV measurements given in microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$)



ASHRAE HVAC applications: Ideal UV-C intensity for effective disinfection $> 10 \mu\text{W}/\text{cm}^2$
CDC guidelines: average UV fluence rate in the upper room in the range of $30 \mu\text{W}/\text{cm}^2$ to $50 \mu\text{W}/\text{cm}^2$

ULTRAVIOLET DOSAGE

Germicidal lamps provide effective protection against microorganisms. A small cross-section is shown below. Nominal Ultraviolet dosage ($\mu\text{WSec}/\text{cm}^2$) necessary to inactivate better than 99% of specific microorganism.

ORGANISM	ALTERNATE NAME	TYPE	DISEASE	DOSE*
Corynebacterium diphtheriae	C. diphtheriae	Bacteria	Diphtheria	6,600 (D99)
Legionella pneumophila	L. pneumophila	Bacteria	Legionnaire's Disease	3,800 (D99)
Mycobacterium tuberculosis	M. tuberculosis	Bacteria	Tuberculosis (TB)	1,000 (D99)
Pseudomonas aeruginosa	P. aeruginosa	Bacteria		4,400 (D99)
Serratia Marcescens	S. marcescens	Bacteria		4,800 (D99)
Influenza virus	FLU	Virus	Infectious Disease	3,400 (D99)
Corona virus	CoV	Virus		1,320 (D99)

*Corona virus CoV Virus 660 (D90)

Example:

Inactivation of airborne Corona virus requires UV dose (D99) of 1320 microwatt seconds per square centimeter., * UV dose (D90) of 660 microwatt seconds per square centimeter.

In a typical 2 meter distance from the UR460 in the ultraviolet irradiation zone, one minute irradiation time would be needed to inactivate the corona virus.

Calculation:

UV intensity of UR460@ 2 meter = 55 microwatts per square centimeter

Time taken to inactivate the corona virus : $1320 / 55 = 24$ second (D99)

* Time taken to inactivate the corona virus : $660 / 55 = 12$ second (D90)

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