

Germicidal UV Technology to Inhibit Microbial Growth and Limit Transfer of Infections in Hospitals

UVC can be utilized to inhibit microbial growth and transfer in hospitals through installation in HVAC systems and stand-alone fixtures as follows:

- **Cooling Coil disinfection** ^(a): Installation of UVC fixtures for direct irradiation of the cooling coils
- **Air disinfection in duct system** ^(a): Installation of in-duct UVC air cleaners
- **Air disinfection in-Room** : In-room UVC fixtures can be used for upper air disinfection
- **Surface Sterilization**: With direct UVC fixtures
- **UVC for Operating Rooms**: A unique combination of air and surface sterilization systems specifically designed for Operating Rooms.
- **Sterilization of occupied and unoccupied rooms**: Portable UV sterilizers to use in unoccupied rooms and portable sterilizers for occupied rooms.

(a): See our information bulletin "UVC Applications in HVAC systems" .



Air disinfection & surface sterilization in Operating Room

OR (Operating Room) UVC sterilization is a specifically developed sterilization solution. Ensuring a sterile environment is very important for preventing complications during organ transplantation or open joint surgical procedures. Achieving and maintaining a sterile environment in operating rooms is crucial for patients with weak immune systems due to cancer or AIDS. Operating room UVC sterilization package compiles all implementations of the germicidal UV technology to ensure the required clean environment.

Operating Room UVC sterilization is achieved with two distinctive, although overlapping processes. First, before the operating room is occupied by people, it is entirely irradiated with direct UVC fixtures that sterilize all surfaces exposed to the UV rays. These fixtures must be turned off or turned down before personnel or patients enter the operating room. Second, the air of the operating room is irradiated with indirect germicidal fixtures to ensure sterile environment and stop the transfer of pathogenic or toxic microorganisms through air. The indirect fixtures stay on all the time. They either enclose the UV lamps or are equipped with louvers that direct the UV light to areas above eye level.

**UVGI OPERATING ROOM EQUIPMENT “PACKAGE”
FOR REDUCING SURGICAL SITE INFECTIONS (See layout next page)**



Reduced infection rates mean:

- ✓ Fewer post-operation complications
- ✓ Fewer deaths & less insurance cost.
- ✓ Fewer repeated procedures



**Direct SM Fixtures
(ceiling mounted)**

Surface Mounted SM units. There are a total of eight (8) of these fixtures. Four (4) are positioned around the O.R. table, one on either side, and one at each end. The remaining four (4) are positioned equidistant from *each* other around the perimeter of the room.



**Indirect Wall Mounted
Upper Air UVGI Fixtures**

Wall mounted 7.5' - 8' above Floor. Typically installed on opposite walls to cover room area appropriately. Fixtures operate all full power at all times, even during procedures.



**Door Barrier
UV Fixtures**

Mounted over all access doors to operating suite to provide a protective “curtain” of UV energy. Fixtures operate at full power during procedures. Microorganisms are blocked from entering or exiting the operating theater when doors are opened.



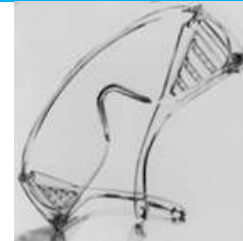
Variable Transformer (dimmer)

Wired to Direct, Surface-Mounted SM fixtures. Acts as a “dimmer” to dial down lamp intensity to desired level ($23 \mu\text{W}/\text{cm}^2$) at the surgical site. Adjustability allows maximum lamp life use.



UVC Radiometer

IL-1400 Meter & Sensor: This device measures the intensity of UV light on the O.R. table. The sensor is placed on the O.R. table. The measurement of UV intensity is expressed in $\mu\text{W}/\text{cm}^2$.

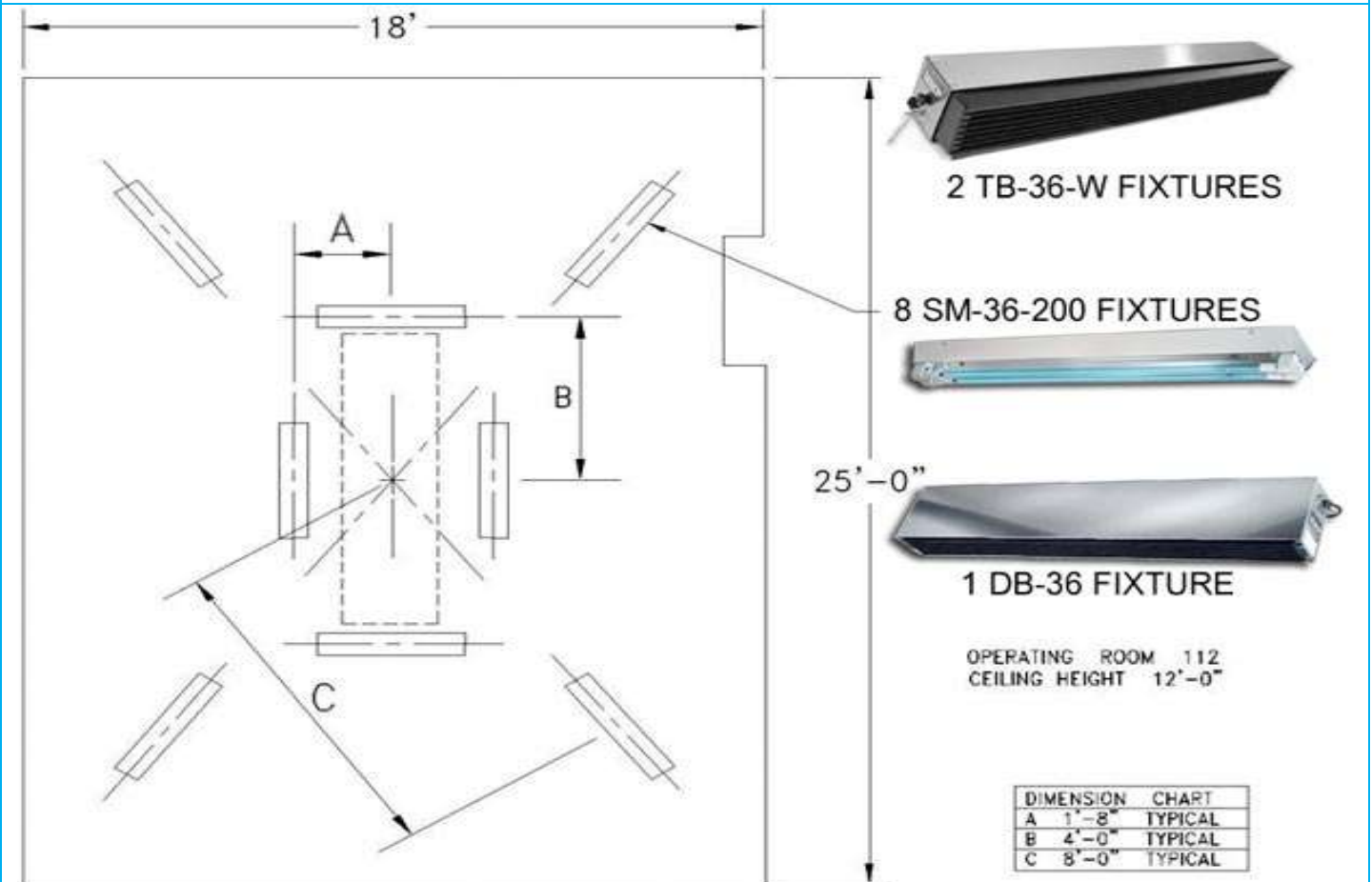


Safety during operation

UVC safety goggles and UV absorbing cream are provided with package to ensure safety of all personnel in OR.

Complete UV Package for Operating Room

A sample layout of the direct SM-36-200 UV fixtures shown below.



- The TB-36-W systems are wall mounted and stay at full power at all times during procedure for upper air disinfection.
- The DB-36 system is installed above the door to create a UV curtain for air disinfection. The DB systems also stay at full power during operation procedures. More than one DB UV fixtures may be required depending on the width of the door.
- The SM-36-200, are direct germicidal UV systems installed in various patterns on the ceiling above the operating table. The UV intensity of these fixtures is controlled by a variable transformer to avoid over-exposure during surgery.

UVGI HOSPITAL MOBILE & PORTABLE PRODUCTS

MRS MOBILE ROOM STERILIZERS (UNOCCUPIED ROOM)

Model MRS3684P/220

These mobile 8-lamp UV sterilizers feature 2-minute "ON" delay and 24-hour timer for total room irradiation. They are designed for operating rooms, sterile areas, laboratories, unoccupied patient rooms, clean rooms and all other applications where permanent fixtures are not practical. Each unit is equipped with casters for maximum portability.

Effective area: 30' x 40' – 20 minutes

UV lamps: 8 Nos. GML100 lamps 36" (120 μ W/cm² @ 1m each lamp)

Lamps rated life if used continuously: 12,000 hours

Voltage: 220V /1Ph /50 Hz

Dimensions - 20" L x 20" W x 48" H



RM9U105/50 PORTABLE 1 LAMP AIR CLEANER(OCCUPIED ROOM):

Portable one lamp UV air cleaner to cover up to 200 square feet.

The UV light is directed so the room can be occupied while the unit is ON.

Features:

- Internal Air Filter
- High intensity 9W germicidal UV lamp
- Light weight – 8 lbs
- Compact unit – 5½" x 9½" x 7¼"
- Variable speed fan 10 –100 cfm (220 v/1 Ph/50Hz)
- Lamp effective life: 10,000 hours



PORTABLE UN AIR PURIFIER AP600-2 LAMPS (OCCUPIED ROOM):

The AP-600/50 portable air purifiers utilize 2 high intensity UV lamps and cover up to 300 square feet. The UV light is enclosed so the room can be occupied.

Features:

- Electrostatic Air Filter
- Light weight – 10 lbs
- Compact unit – 10" x 10" x 10"
- Variable speed fan 10 –100 cfm (220v/1 Ph/50 Hz)



UVGI HOSPITAL- PORTABLE PRODUCTS

HANDHELD UV SURFACE STERILIZER

The AAW Handheld UV wand is a portable direct germicidal UV system for surface disinfection. It can help control the growth of germs such as viruses, bacteria, mold and mold spores and reduce spreading of infections. AAW Handheld UV wand is a portable system for applications where a permanent UVC installation is not desired or needed. The UV system can help reduce or eliminate microbial contamination in spaces that do not need constant exposure to UVC light. Common environments include laboratories, hospitals and food plants. The High Output UV lamp emits high intensity UV so the system should be positioned in a way to avoid exposing people to direct or reflected UV light.

System's features:

- On/off switch
- Safety glasses
- Tool-free lamp change
- 14" high output shatterproof lamp
- 6' three-prong power cord
- Oversized handle
- Spectrally polished reflector



AAW-TBE-14-1 UV PORTABLE OR WALL MOUNTED UV SYSTEM:

The AAW-TBE-14-1 is a totally enclosed air-movement germicidal UV system for in-room control of airborne TB and flu, as well as other airborne viruses, bacteria and mold. AAW-TBE-14-1 is designed to be portable or wall mounted. The system features stainless, steel chassis, pull-chain switch, power cord, a fan and two filters. The High Output UV lamp is completely enclosed so the system can be ON at all times protecting personnel and providing maximum germicidal irradiation.

Features and Benefits:

- Improves Indoor Air Quality (IAQ) by reducing airborne bacteria, viruses, mold and spores
- Reduces the risk of airborne transmission of cold, flu, TB and other illnesses
- High output UV lamp.



UVGI HOSPITAL- SURFACE-MOUNT DIRECT SURFACE UV STERILIZERS

SM SURFACE MOUNTED FIXTURES:

Designed to be mounted to (or suspended from) ceilings. Surface Mounted fixtures incorporate a spectrally polished aluminum reflector designed for maximum dispersion of UVC energy throughout a room. The unique shape prevents dust and sediment from settling on the reflector surface and, thus improves fixture efficiency. Surface Mount fixtures are 5.625" wide with a depth of 4.125", with the exception of Guard Rail fixtures. Guard Rail fixtures are 4.625" in depth.

Available in 18 ½", 27" or 37" length, in single or double lamps.



SM-36 and SM-36-2 have electronic ballast which can automatically handle 110/220/277V / 50/60Hz. For all other models, voltage must be specified when ordering. All ballasts are UL Listed.

RT RECESSED TROFFERS UV OR UV + LIGHTING:

These germicidal ultraviolet fixtures are constructed of die-formed, one-piece steel and highly reflective aluminum. They are manufactured to meet hospital, pharmaceutical, clean room and laboratory ultraviolet requirements. Two models are available, with two lamps (RT-36-2G) or four germicidal lamps (RT-36-4G). Also available in 2 germicidal lamps + 2 fluorescent illumination lamps combination (RT-2G2C).

- **Ceiling height up to 9.5':** One RT-36-2G per 75sq. ft. or one RT-36-4G per 125sq. ft. fixtures required.
- **Ceiling height 9.5' to 11':** One RT-36-2G per 50sq. ft. or one RT-36-4G per 100sq. ft. fixtures required.
- **Ceiling height 11' to 14':** One RT-36-2G per 40sq. ft. or one RT-36-4G per 70sq. ft. fixtures required.



Dimensions: 4' L x 2' W x 4¼" D)

CE Closed End Germicidal UV Surface Sterilizers

In various models with UV lamp configurations of one to four, the CE UV surface sterilizers direct and confine the ultraviolet light to disinfect specific areas. The Closed End reflector UV surface sterilizers are designed for use over conveyor lines, laboratory benches and ventilation hoods or with adjustable legs for UV product sterilization. UV lamp lengths of 4, 6, 8, 12, 18, 27 & 36 inches are available with germicidal ultraviolet (UVC) and/or backlight ultraviolet. Lengths 18", 27" and 37" with up to 4 lamps.



Dimensions:

18" L x 7-1/4" W x 7-1/2" D)
27" L x 7-1/4" W x 7-1/2" D
37" L x 7¼" W x 7½" D

UVGI HOSPITAL- UPPER ROOM AIR UV STERILIZERS

WALL MOUNT TB-W PASSIVE MODELS:

Models TB-W are designed to be wall-mounted to reduce upper air contamination. TB-W fixtures feature adjustable louvers to allow unlimited direction of the ultraviolet rays while protecting personnel and providing maximum germicidal irradiation. The units are constructed of high grade stainless steel with an alzak aluminum reflector. They mount 7 feet above the floor and use SBL lamps. TB-W fixtures include a grounded power cord, pull-chain switch, ultraviolet lamp and louver. The TB in-room fixtures control tuberculosis, as well as other airborne pathogens and mold.



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TB-12-W/50, 18 ½" L for 75 M2 area
TB-24-W/50, 27 ¾" L for 200 M2 area
TB-36-W/50, 37 ½" L for 300 M2 area

FAN POWERED ROOM AIR STERILIZER RAM36-2:

The RAM36-2 is a totally enclosed air-movement UV system. This fixture comes complete with filters, fans and 2 ultraviolet lamps. It is designed for rooms where congestion or ceiling height prohibits the use of wall-mounted indirect fixtures. Constructed of high grade stainless steel, each fixture produces four or more air changes per hour in rooms up to 200 square feet.



RAM36-2, 47 ¼" L, 100 CFM airflow, covers 200 Ft2 area

CORNER MOUNT CM15 UV AIR CLEANER:

Designed to mount in room corners with two keyhole slots at a height of seven feet (7'), these attractive indirect UV air cleaners incorporate one high intensity UV lamp and cover up to 75 square feet. The Corner Mount UV air cleaner's optional equipment includes an eight-foot power cord and an on/off switch.

The high intensity UV lamp is installed with reflectors for equal distribution of the germicidal UV irradiation. The louver restricts and concentrates the ultraviolet rays above eye level so personnel can occupy the room while the air cleaners are operating.



DOOR BARRIERS GERMICIDAL FIXTURES:

DB-36 UV air cleaner is fabricated of heavy gauge electro-welded steel with white enamel finishing. By creating a curtain of germicidal ultraviolet rays, this UV air cleaner provides effective control of airborne microorganisms between areas. It confines the germicidal UV radiation to a narrow beam, providing full coverage of a three-foot doorway. Larger openings require multiple UV air cleaners.



Dimensions: 37" L x 7" H x 4" D
UV Lamp positioned behind louvers