

STERIL-AIRE®

UVC for HVAC™

Model ESEN Series for Enhanced UVC Emitters™

Enhanced Single-Ended NEMA, Very High Output Germicidal UVC for HVAC Systems



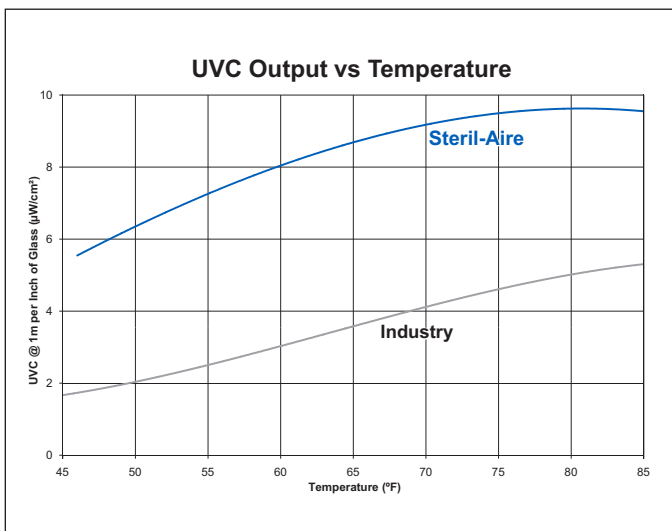
Competitors UVC lamps must be changed every 3-4 months because they quickly lose the output or “killing power” needed to maintain biofilm control. The UVC Emitter, by contrast, has a 12-month service life – and even after a full year, it has more than 3 times greater output than competitive devices deliver on Day 1! As a result, only Steril-Aire can ensure the germicidal performance you need.

Applications

Steril-Aire Enhanced Single-Ended NEMA 4X (ESEN Series) fixtures combine the externally mounted design of the ESE Series with a weather resistant NEMA 4X fixture. Installed from the exterior of rooftop A/C units or ductwork, they provide ideal solutions for rooftop AHUs. By creating two 1” holes in the equipment wall and mounting the fixture, the Emitter may be installed vertically or horizontally. Only the Emitter penetrates the system, while the power supply remains external. The ESEN Series is available in nine lengths (12”, 16”, 20”, 24”, 30”, 36”, 42”, 50” and 61”) with a 120-277 V power supply.

Benefits

- Supports Emitters up to 61” in length from an easy to install NEMA 4X rated Aluminum fixture that mounts on the outside of the unit.
- Maintenance of the Power Supply and Emitter replacement is simple and accessible without disruption of AC Unit operation.
- Includes a Conditional Lifetime Warranty on the Power Supply and fixture.
- Reduces HVAC energy costs by restoring heat transfer and net cooling capacity.
- Uses germicidal UVC irradiation proven as an effective inactivation method for mold, bacteria and viruses.
- Eliminates costly cleaning programs and the use of harmful chemicals and disinfectants by continuously cleaning coils, drain pans, plenums and ducts.
- Delivers up to 6 times the output of competitive UVC products at HVAC operating temperatures, for longer life and more reliable germicidal control.
- Produces no ozone or other secondary contaminants.
- Installs quickly and easily – ideal for small systems and/or ducts.
- Improves Indoor Air Quality (IAQ).



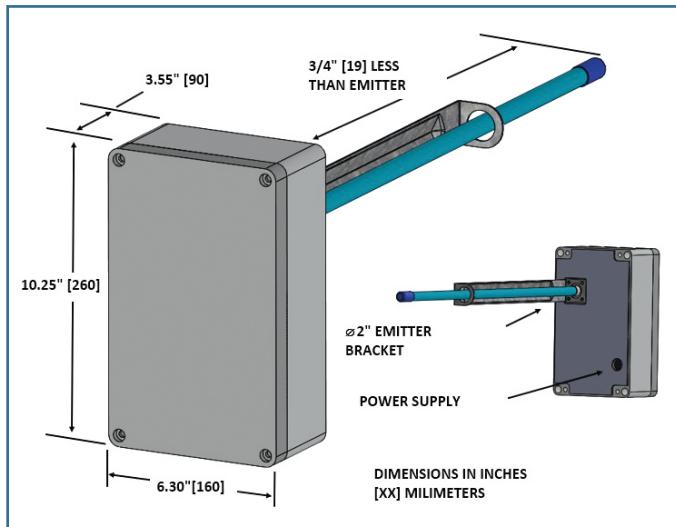
Steril-Aire’s multi-patented UVC Emitter provides the best and longest-lasting UVC performance available. As shown in the comparison graph (above), it has been independently tested to deliver up to 6 times the output of other ultraviolet devices under HVAC operating conditions (50°F @ 400 fpm air velocity).

Model ESEN Specifications

The **UVC Emitter** and fixture shall be factory assembled and tested. They shall consist of a fixture, power supply, support bracket/reflector, Emitter socket and Emitter.

The **fixture** shall be constructed to NEMA 4X standards to withstand outdoor environments and shall be equipped with a 1/2" electrical conduit opening to facilitate wiring. All components shall be incorporated into one integral assembly that maximizes serviceability.

It shall be designed for mounting from outside the airstream with only the Emitter in the conditioned air. Emitter shall be held in



place and supported in the airstream by a patented integral collar, O-ring, heavy-duty spring wire fastener and omnidirectional support bracket/reflector. The housing shall include an on-off switch and an indicator light to verify electrical power. Clearance on the side of the AHU should be allocated to facilitate installation and service (clearance length must be equal to or greater than Emitter length).

The **power supply** shall be a Class P2, electronic rapid start type with a power factor of >0.98 and a power conversion of >90%. It shall be available in 120-277 V, 50/60 Hz, single phase (will perform satisfactorily @ 100 V - 277 V). It shall be designed to maximize photon production, irradiance and reliability in cold airstreams of 0-140°F, 100% RH. The design shall include RF and EMI suppression.

The **socket** shall be a Steril-Aire Enhanced® 4 pin type with sufficient wire length to facilitate service.

The **Emitter** shall be a very high output, hot cathode, T5 diameter, Steril-Aire Enhanced® type that produces a germicidal UVC band of 253.7 nm. The EGTS Emitter shall operate in air velocities of up to 2000 fpm and air temperatures of 35-140°F. It shall produce no ozone or other secondary contaminants.

Independent testing: The unit shall be tested by an independent test laboratory, and shall be verified to provide output per one-inch arc length of not less than $7.8\mu\text{W}/\text{cm}^2$ at 1 meter in a 400-fpm airstream of 50°F.

Unit shall comply with ANSI/UL Standards 153, 1598, 1995 and CSA and CE Standards. The manufacturer shall be an ISO 9001:2015 and ISO 14001:2015 certified facility.

Ordering Information

Fixture	Part No.	Description	Emitter Length	Electrical
ESEN 1 VO	12004000	Enhanced Single-Ended NEMA Fixture	16"–61"	120-277 V
UVC Emitter				
EGTS 16 VO	21000110	Enhanced UVC Emitter	16"	55 W
EGTS 20 VO	21000210	Enhanced UVC Emitter	20"	64 W
EGTS 24 VO	21000310	Enhanced UVC Emitter	24"	72 W
EGTS 30 VO	21000410	Enhanced UVC Emitter	30"	86 W
EGTS 36 VO	21000510	Enhanced UVC Emitter	36"	100 W
EGTS 42 VO	21000610	Enhanced UVC Emitter	42"	110 W
EGTS 50 VO	21000910	Enhanced UVC Emitter	50"	130 W
EGTS 61 VO	21000810	Enhanced UVC Emitter	61"	155 W

STERIL-AIRE®

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Represented By:

The qualified installer (licensed electrician / trained contractor) must use factory kits or accessories when installing this product. Refer to the individual instructions packaged with kits or accessories when installing them.

Follow all safety codes and any warnings or cautions attached to any accessed area. Consult local building codes and the National Electrical Code (NEC) for special requirements.

	DANGER
Indicates an imminently hazardous situation that, if not avoided, will cause severe personal injury or death.	
	WARNING
Indicates a hazardous situation that, if not avoided, could cause severe personal injury or death.	
	CAUTION
Indicates a hazardous situation that, if not avoided, may cause minor or moderate personal injury or property damage.	

Improper installation, adjustment, alteration, service, maintenance, or use can cause fire, electrical shock, or other conditions which may cause personal injury or property damage. Consult a qualified installer, service agency, or your supplier for information or assistance. In regard to the statements below, understand the signal words **DANGER**, **WARNING**, or **CAUTION**. These words are universally used for overall safety.

NOTE: The WARNINGS & IMPORTANT SAFETY INSTRUCTIONS appearing in this manual are not meant to cover all possible conditions and situations that may occur. Common sense, caution and care must be exercised when installing, maintaining, or operating Steril-Aire products.

Safety Decals

Safety decals appear at crucial locations on the machine. Failure to maintain legible safety decals could result in injury to the operator or service technician.

Use manufacturer-authorized spare parts to avoid safety hazards.

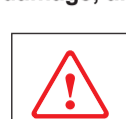


Never touch Emitters with bare-hands. Damage to Emitter may result. Oil from fingerprints will permanently etch glass of Emitter and weaken structure. If necessary, clean Emitter using a Steril-Aire cleaning kit.



Before installing fixture or performing maintenance or service on fixture, turn off main power switch to unit. Electrical shock can cause injury or death. There may be more than one disconnects switch.

Machine installations must comply with minimum specifications and requirements stated in the applicable Installation Manual, any applicable municipal building codes, electrical wiring regulations and any other relevant statutory regulations. Due to varied requirements and applicable local codes, this machine must be installed, adjusted, and serviced by qualified maintenance personnel familiar with applicable local codes and the construction and operation. They must also be familiar with the potential hazards involved. Failure to observe this warning may result in personal injury, property damage, and/or equipment damage, and will void the warranty.



Turn all supply power off to Emitter(s). Never expose eyes to UVC light from any source, as personal injury WILL result. Wear gloves, face shield/goggles (per ANSI Z87.1) and cover all exposed skin (as much as possible).

Use only genuine Steril-Aire UVC Emitters with this fixture. This ensures warranty coverage, maintains peak UVC output levels, guarantees proper fit, and maintains UL and CE certifications. A lower wattage or incorrect Emitter usage can result in damage to fixture and/or Emitter.

Voltages outside of the operating range of the unit will void the warranty and do permanent damage to the entire unit.

Emitter contains a small quantity of mercury. If an Emitter breaks, clean and dispose of with care as it would be done for a standard fluorescent lamp.

RECOMMENDATION:

It is recommended using an interlock switch to turn off germicidal Emitters when access door is opened. Emitter must be off before entering HVAC unit to perform maintenance or service.

UVC energy may cause damage to non-metallic components except for UV-rated and HVAC-style drain pans. Select mounting locations that prevent exposure to vulnerable components. If mounting locations are limited, non-UV resistant components shall be protected with UV resistant material such as aluminum foil, aluminum duct tape, metallic shields, etc.

Permanently installed radiometer(s) / UVC Controller(s) are the recommended choice for monitoring the relative output of a sensitive or large Air Handler system in determining Emitter change-out. In general, UVC installations are sized to allow for an approximate 50% drop in total UVC output for mold control.

Reflecting UVC energy is recommended as it enhances irradiance. Lining the UVC cavity with "polished finish" aluminum allows photons to bounce, reducing possible shadow areas and thus increasing efficacy.

Steril-Aire strongly recommend installing a viewport.

PREPARATION

Consult all applicable codes before installing. Check fixture label(s) for the correct power requirements and supply the correct voltage from a suitable, protected (fused), and grounded power source.

The Emitter access panel or door is to be interlocked (if applicable) with the power source to turn Emitter(s) off when the System is opened. It should have signs provided in appropriate languages alerting maintenance personnel to the possible hazard of looking at or exposing skin to the UVC energy service accesses may be equipped with a glass or polycarbonate window to view Emitters. A view port made of thermoplastic or polycarbonate material may also be installed to view Emitters. UVC energy does not penetrate any of the aforementioned materials.

Once viewport installation (if applicable): determine the mounting location of the viewport on the AHU (Air Handling Unit) wall/panel to avoid supports and obstacles for an unobstructed field of view of the Steril-Aire UVC Emitters. Refer to the individual instructions packaged with viewports

when installing them. Cut the appropriate size hole at the chosen location and ensure that the hole passes through completely, especially through any insulation. Place the viewport into the hole and ensure proper visibility.

LOCATION SELECTION

Emitters may be installed anywhere to clean an air stream or surfaces with germicidal UVC energy. It is best that they be located at known growth areas such as downstream of the cooling coil and over the drain pan or where best accommodates the system. They may also be placed in a return air duct, supply duct, mixed air area, point of delivery or any combination thereof to suit the application.

When choosing the installation site, make sure that the fixture can be supplied with the necessary power requirements. **Also, the installation site should have enough space for future service access.**

GENERAL INSTALLATION & OPERATION

NOTE: ENSURE THAT EMITTER IS INSTALLED BEFORE POWER IS APPLIED. INSTALLING EMITTER AFTER POWER HAS BEEN APPLIED MAY TRIGGER THE "END-OF-LAMP-LIFE CIRCUIT" AND THE EMITTER MAY FAIL TO LIGHT. IF THIS HAPPENS, SHUT OFF POWER FOR 10 SECONDS AND THEN TURN POWER BACK ON. EMITTER WILL THEN LIGHT.

1. WHERE APPLICABLE: Once determined installation location of fixture: use the fixture as a template to mark and drill mounting holes (~ $\varnothing 3/16" = .01875"$) for the appropriate #10 fastener ($\varnothing 0.1935"$) for your application. Install fixture(s) and wire to electrical code. **Use Steril-Aire Wire Kits to wire fixtures together using wire nuts up to 10 amps total per circuit. If the fixtures in a row (circuit**

total more than 10 amps, consult local codes and/or the National Electrical Code for appropriate wire size.

2. Insert Emitter into fixture without touching glass with bare hands and clean using a Steril-Aire Cleaning Kit. Install Emitter by gripping each end (non-glass portion). Carefully push pins into pin slots of each socket until seated. Rotate 90° until **one distinct click** is heard, locking Emitter securely in place.
3. **Note: One click is required to hold Emitter safely.**
4. Test all circuits and turn system on. A "blue light" will glow from each Emitter indicating that each fixture is working. **Caution: View only with as much as skin covered and use full face shield/goggles (ANSI Z87.1).**
5. Attach the Caution Label to air handler access panel so it is clearly visible. Protect labels against poor conditions if needed; replace when worn.
6. Affix the included Change Date label to the outside of the housing for changing the Emitter.
7. Once the installation is complete, fixtures should be operated continuously to preclude the development of mold and bacteria. It is not recommended to cycle the Emitters by time clock or fan operation.

WARRANTY

Steril-Aire warrants that its products shall be free from defects in material or workmanship for the periods of time set forth below. This warranty is voided if adjustments, repairs or parts replacement is required because of an accident, unusual physical, electrical or electro-mechanical stress, neglect, misuse, failure of electric power, transportation, unauthorized repair actions, or if installation or maintenance is not in accordance with Steril-Aire's specifications. Steril-Aire's obligation under this warranty shall not arise until the Purchaser of the Product returns the defective part to Steril-Aire. This warranty is limited to the repair and replacement of parts or fixtures at Steril-Aire's option. This warranty does not cover any labor, or any subsequent damage incurred as the result of product failure.

Under the conditions specified above, Steril-Aire warrants all its multivoltage power supplies to include this conditional lifetime warranty. Buyer must provide proof of purchase. Warranty for power supplies will be void if Emitters are not replaced every year or if Emitters are not replaced with factory supplied Steril-Aire Emitters.

Except for the express warranties stated here, Steril-Aire disclaims all warranties on products furnished hereunder, including without limitations, all implied warranties of merchantability and fitness; and the stated express warranties are in lieu of all obligations or liabilities on the part of Steril-Aire arising out of or in connection with the performance of the Products.



ESEN INSTALLATION, OPERATION, & MAINTENANCE

Ensure that Emitter is installed before power is applied. Installing Emitter after power has been applied may trigger the "end-of-lamp-life circuit" and the Emitter may fail to light. If this happens, shut off power for 10 seconds and then turn power back on. Emitter will then light.

EMITTER SHOULD BE AT LEAST 1" AWAY FROM HEATING COIL

1. INTERNAL WIRING IS ALREADY DONE.
2. DECIDE ON MOUNTING LOCATION. BOX ORIENTATION IS FLEXIBLE AND CAN BE SET AS SURFACE AREA ALLOWS.
3. MARK UP THE MOUNTING HOLE LOCATIONS.
4. TAKE OFF THE COVER. THE GROUNDING WIRE IS CONNECTED TO THE COVER. IF NECESSARY, TAKE OFF THE GROUND WIRE FROM COVER.
5. ALIGN THE BASE MOUNTING HOLES TO MARK UP.
6. BASED ON THE MOUNTING HOLE LOCATION, MARK UP TWO LOCATIONS, ONE FOR BRACKET/EMITTER AND ONE FOR ELECTRICAL CONNECTION.
7. DRILL ALL THE HOLES - BRACKET/EMITTER, ELECTRICAL, & BOX MOUNTING HOLES.
8. INSTALL EMITTER BRACKET. THE BRACKET CAN BE ORIENTED 360° AT 90° INTERVALS. IF THE EMITTER IS LESS THAN 36", THEN THE EMITTER BRACKET INSTALLATION IS OPTIONAL.
9. MOUNT THE EMITTER POWER SUPPLY BOX.
10. CONNECT THE ESEN POWER SUPPLY TO AN UNINTERRUPTED POWER SOURCE.



11. INSERT EMITTER THROUGH THE HOLE AND SECURE IT WITH SPRING CLIP
12. PLUG IN POWER (Emitter won't light up at this time)
13. ORIENT COVER TO MAKE CONTACT WITH THE INTERLOCK SWITCH ON BASE.
14. **Never expose eyes to UVC light from any source, as personal injury WILL result. Wear gloves, face shield/goggles (per ANSI Z87.1) and cover all exposed skin (as much as possible).**
15. PRESS DOWN SLIGHTLY ON ALIGNED COVER AND YOU WILL HEAR LITTLE "CLICK". THIS IS CAUSED BY THE ENGAGEMENT WITH THE INTERLOCK SWITCH.
16. SCREW THE COVER IN PLACE AND TURN ON CIRCUIT BREAKER. (Emitter should light).
17. ATTACH CAUTION AND LAMP CHANGE DATE LABEL WHERE IT IS HIGHLY VISIBLE.

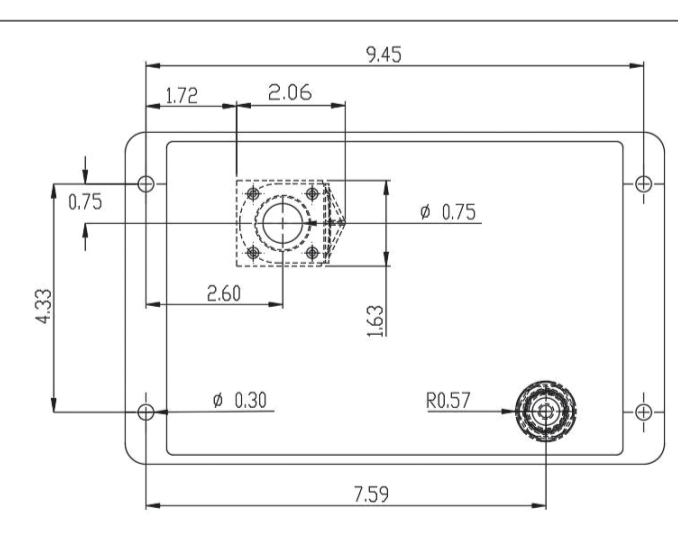


FIGURE 1: MOUNTING INSTRUCTION

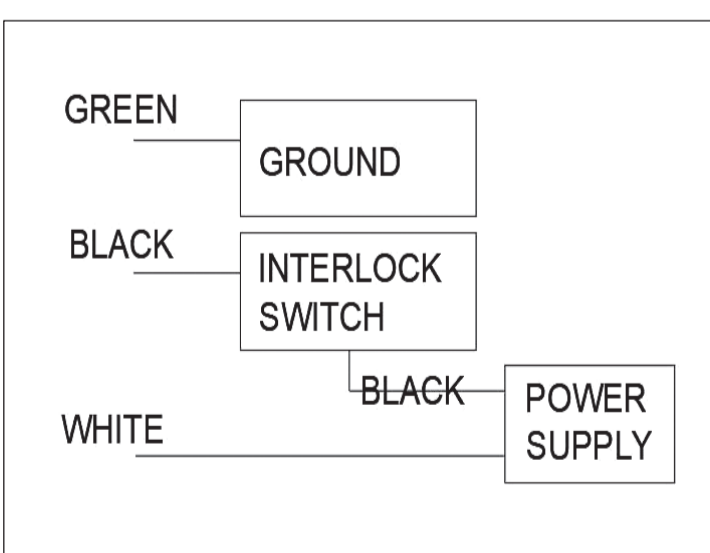


FIGURE 2: WIRING DIAGRAM

TROUBLE SHOOTING

Symptom	Possible Causes	Corrective Action
Emitter does not light	Momentary loss of power	<u>Reset Power</u> Turn off power for 10 Seconds, and then turn power on.
Visibly Weak Light	Emitter reaching end of life	Replace Emitter.
	Emitter too Cold	If emitter is at or below 35°F (1°C), Emitter is too cold to operate properly.
Red/Orange Emitter	Emitter reaching end of life	Replace Emitter.

REPLACEMENT PARTS

Part Number	Description
Emitters	
21000110	EGTS 16 VO - Enhanced 16" Single Ended Emitter
21000210	EGTS 20 VO - Enhanced 20" Single Ended Emitter
21000310	EGTS 24 VO - Enhanced 24" Single Ended Emitter
21000410	EGTS 30 VO - Enhanced 30" Single Ended Emitter
21000510	EGTS 36 VO - Enhanced 36" Single Ended Emitter
21000610	EGTS 42 VO - Enhanced 42" Single Ended Emitter
21000910	EGTS 50 VO - Enhanced 50" Single Ended Emitter
21000810	EGTS 61 VO - Enhanced 61" Single Ended Emitter
Power Supply	
10000177	ESEN Replacement Power Supply 120-277 V

Thank you for choosing the #1 "UVC for HVAC" product sold worldwide. Please contact your local supplier or Steril-Aire directly if we can provide any further information or service. Your satisfaction is very important to us. Please call **1-818-565-1128** or log onto www.steril-aire.com.