



## UVC Emitter Ultraviolet Disinfection

For IAQ & Heat Transfer Efficiency: HVAC Mould, Bacteria & Odour Control

### GENERAL

Specification requirements of germicidal UVC Emitters to achieve the restoration of heat transfer, reduced maintenance costs, reduction in chemicals on Air Handling Unit Cooling Coils and Drain Pans.

Requirements and performance for UVC Energy Fields on Cooling Coils to remove Biofilm and prevent Biofilm from forming.

### **QUALITY ASSURANCE & AUSTRALIAN/NZ SAFETY COMPLIANCE (MANDATORY):**

UL Compliance: Comply with UL Standard 1995, 153, 1598 as applicable to usage of UVC Emitters in HVAC Equipment.

**Australian/NZ Electrical Safety Approval (ASA): Tested to comply with AS/NZS 61347.1:2016 + A1, AS/NZS 61347.2.3:2016, AS/NZS 60335.2.65:2015 & AS/NZS 60335.1:2020.**

**EMC Testing to Standard AS/NZS CISPR 15**

Acceptable Manufacturers: Steril-Aire LLC, Models SE, RSE GTS & EGTS Series

### **UVC EMITTER PERFORMANCE & EQUIPMENT DESIGN REQUIREMENTS:**

As per AIRAH DA15 Manual Section 12.7.4 HVAC UVGI Cooling Coil Applications:

**Dose On the Down Stream Coil Face At Extremities: The UVC dose at the extreme edges of the coil shall not be less than 930  $\mu\text{W}/\text{cm}^2$  and end of life intensity on the coil face shall exceed 740  $\mu\text{W}/\text{cm}^2$  at the end of the 18000 hours of operation period measured in 2.0 m/s airflow at 13 Deg C. (Necessary to remove and prevent Biofilm from forming)**

Units shall be high output, HVAC-type, germicidal UVC light sources, factory assembled and tested. Components shall include a high efficiency electronic power source, Emitter sockets and Emitter tube, all constructed to withstand HVAC environments.

High efficiency electronic power sources shall be 115, 208/230 and 277 V, 50/60 Hz and capable of igniting each Emitter at temperatures from 1<sup>o</sup> - 70<sup>o</sup> C in airflow velocities common to HVAC systems. **They shall be Programmed Start and equipped with RF, line noise suppression and End of Emitter Life Circuit Protection.**

Emitter tube shall be of the high output, hot cathode, T5 (15mm) diameter, and medium bi-pin type. They shall produce 95% of their energy at 254 nm and be capable of producing the

specified output at airflow velocities common to HVAC systems and at temperatures of 1° - 70° C. **UVC Emitters shall produce no ozone or other secondary contamination.**

**WARRANTY:**

Fixture and Emitter shall be 100% warranted to be free from factory defects for a period of 18000 hours of Operation.

The Power Supplies/Electronic Ballasts shall have a lifetime warranty.

**VERIFICATION:**

Provide Cooling Coil UVC Energy Field drawings showing irradiance on all parts of the cooling coil measured in 2-2.5 m/s airflow at 10-13 degrees C.

Irradiance drawings shown in **still, ambient** air will not be accepted.

Provide 5 Australian/NZ Independently Validated Case Studies showing HVAC Efficiency & IAQ Improvements.

**DESIGN REQUIREMENTS:**

Irradiation - Emitters are to be installed down stream of the coil horizontally across the full face of the coil **without the use of reflectors** in sufficient quantity and in such an arrangement so as to provide an output as specified in this document and equal distribution of UVC energy on the coil and in the drain pan. To maintain energy efficiency, the UVC energy produced shall be of the lowest possible reflected and shadowed losses.

**INSTALLATION OF UVC EMITTERS:**

Coordinate with installation of HVAC equipment and install Emitters as indicated after such equipment is properly installed.

Provide an interlock switch on access to the UVC Emitters to turn the lights off when the access is opened.

Provide a view port to enable the maintenance technician to view Emitters to determine that they are operating.

Install provided Caution Labels on all access to the Emitters.

Provide control for cycling the Emitters with the AHU run times if not 24/7 operation.

If specified (optional) provide fault/status monitoring capable of informing BMS if there is an Emitter failure.

Optional (recommended):

**CARRIED OUT DURING COMMISSIONING AND WITNESSED BY CLIENT REPRESENTATIVE:**

Intensity - UVC measurement shall be made at the coil using a calibrated radiometer/photometer accurate to +/- 3% radiometric and photometric for NIST transfer standards in the monochromatic irradiance at 254nm

UVC system shall be commissioned by manufacturer field representative. Commissioning shall verify system intensity level for each UVC system demonstrating that it has met or exceeded the minimum and average UVC intensities as specified in the UVC Emitter Germicidal Lamp Disinfection Schedule in the Mechanical Drawings Section.

The commissioning shall be performed upon installation of UVC system for each AHU during operating conditions.

Points of measurements for UVC system minimum intensity shall be demonstrated by measuring at the four extreme corners (extreme position is defined as one square centimetre of coil at one corner of the area covered by the lamp) of the coil surface in the same plane as the irradiated surface. Each corner shall meet or exceed specified minimum intensity as defined in the UVC Emitter Germicidal Lamp Disinfection Schedule.

Additionally, points of measurements shall be taken every one(1) square metre across the face of the coil.

The average intensities shall be calculated by averaging the four (4) corner measurements with those measurements taken every one (1) square metre.

Points of measurement shall be made using a calibrated radiometer/photometer accurate to +/- 3% radiometric and photometric for NIST transfer standards in the monochromatic irradiance at 254nm or similar. This measurement shall be used to verify compliance.

Upon completion of the commissioning report demonstrating and verifying design intensity levels, actual recorded levels, and measurement locations all data shall be presented upon submission of an Operation and Maintenance Manual.

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