

Coil Cleaning UVC Irradiation Specifications

PART 1 – GENERAL SIZING AND SERVICE PERFORMANCE

- 1.1 The specified products sizing shall be adequately engineered for each coil size using a surface irradiation calculation software.
The supplier proposal shall include for each coil the following mandatory technical data:
 - 1.1.1. An iso-contour map where the UVC intensity in microwatt/cm² is plotted on the coil face. The UVC intensity shall not be less than 250 microwatt/cm² anywhere on the coil surface.
 - 1.1.2. The maximum, minimum and average UVC intensity values on the coil in microwatt/cm².
 - 1.1.3. An iso-contour map where the calculated survival time of bio-contaminants is plotted on the coil face to obtain 99% disinfection based on *Aspergillus Niger* as the upper controlling reference mold.
 - 1.1.4. The maximum, minimum, and average survival time of *Aspergillus Niger* on the coil face.
 - 1.1.5. The maximum time for elimination of 99% of *Aspergillus Niger* shall not exceed 60 minutes anywhere on the coil face.
 - 1.1.6. A complete detailed installation diagram showing the exact position of each UV lamp fixture to be installed in front of the coil including their distance from the coil face.
 - 1.1.7. The total required input power in Watts for each coil.
- 1.2 The engineering sizing software shall account for fouling factor of the UV lamps when installed downstream of a cooling coil where lamps are susceptible to receive condensing water mist that is susceptible to leave a residue upon evaporation.
- 1.3 All of the calculations provided must be based on UV lamp end of life i.e. 17,000 hrs depreciated output. The supplier shall declare the % output depreciation of their lamps after 17,000 hours.

PART 2 – UVC LAMP and REFLECTOR

- 2.1 The UVC lamp shall be proven T6 tube size well adapted to air and surfaces sterilization. T5 lamps derived from drinking water sterilization applications will not be accepted.
- 2.2 The UVC lamps shall be of T-6 diameter (19 mm diameter) with a Single Ended, Circuline 4-pin type connection.
- 2.3 The UVC lamps shall be available in lengths of 12, 18, 24, 30, 40, 50 and 60 inches.
- 2.4 The UVC lamps electrical connector shall include a rubber covering boot to protect the lamp connection from moisture and corrosion.
- 2.5 To effectively irradiate the HVAC coil surface and maximize the UV irradiation onto the coil, each UVC lamp will be encapsulated into a protective curved parabolic wide angle type reflector made of aluminum to efficiently spread the UVC output of the lamp onto the coil.
- 2.6 The lamp encapsulating aluminum parabolic wide angle reflector will be built from extruded anodised aluminum for optimum UVC reflectivity. Having a poor UVC reflectivity coefficient, stainless steel shall not be used as a reflector since according to ASHRAE 2008 Chapter 16 entitled Ultraviolet Lamp Systems, p.16.6 Table 2 indicates that the reflectivity of stainless steel is between only 20 and 30% whereas aluminum ranges from 73 to 88% reflectivity.

PART 3 – ELECTRICAL

- 3.1 Equipment to be CE, CSA/UL/or ETL certified.

3.2 The ballast and its electrical box shall be mounted outside of the air handler in an adequately ventilated aluminum enclosure that will enable it to be mounted on a rigid surface, therefore protecting the ballast from moisture aerosol, hot and cold air, and humidity. Ballast mounted inside the harsh and variable air handler environment will not be accepted.

PART 4 – INSTALLATION

- 4.1 Each lamp and its reflector will be clamp-mounted for easy installation, positioning and maintenance onto standard ¾-inch (1.87 cm) electrical conduit or aluminum tubing, supplied by the vendor or field supplied and installed as a permanent support structure. The support structure will be adequately secure with non-corrosive hardware so that the UVC lamp and reflector assembly does not vibrate or loosen.
- 4.2 Safety interlock switches are to be installed on all access doors where UV intensity may be present. Manufacturer will provide multi-lingual CAUTION LABELS to be installed on these access doors.

PART 5 – SYSTEM MAINTENANCE MONITORING

- 5.1 Each externally mounted and visually accessible Ballast Box shall be equipped with an electronic maintenance monitoring system that will enable the monitoring of:
 - 5.1.1 Lamp on GREEN indicator to insure that a lamp is functioning
 - 5.1.2 Lamp out RED indicator to warn if a lamp has failed.
 - 5.1.3 Lamp replacement indicator YELLOW to notify that the lamp has reached its design performance specification (17,000 operating hours), and is due for replacement.
- 5.2 Monitoring system shall include dry contact connection for hook-up to the building management system (BMS).

PART 6 – WARRANTY

- 6.1 The ballast shall carry a 15-year warranty.
- 6.2 The high intensity UVC lamp shall be guaranteed for 17,000 hours or 2 years, whichever happens first.
- 6.3 The monitoring electronics shall carry a 1-year warranty.

PART 7 - Approved Manufacturers:

- 7.1 Sanuvox Technologies, model IL-CoilClean Object Sterilizer or equivalent.