

SECTION 15191 – UVC EMITTERS FOR HVAC EQUIPMENT

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install UVC emitters.
- B. All UVC emitters shall be new and manufactured for the specific use to the HVAC system indicated.
- C. All system components shall be installed in accordance with local codes including seismic isolation.
- D. Secure all permits and local/state approval for the components as specified and included under this Section.

1.2 RELATED SECTIONS

- A. Examine all drawings and criteria sheets and all other Sections of the Specifications for requirements which affect work under this Section whether or not such work is specifically mentioned in this Section.
- B. Electrical work, Division 16.

1.3 REFERENCES

- A. Comply with UL Standard 900 as applicable to listing of air filters.
- B. Comply with UL 984 – Safety Standards for Hermetic motor Compressors.
- C. Comply with UL/C-UL under Category Code ABQK (Accessories, Air Duct Mounted), UL Standards: 153, 1598 & 1995 respectively.

1.4 QUALITY ASSURANCE

- A. ISO 9001 Certification. The UVC emitter manufacturer shall be registered to ISO 9001, establishing quality assurance requirements from design and development to production to installation and servicing.

1.5 SUBMITTALS

- A. See Section 15050 and General Condition for additional submittal requirements.
- B. Submit unit performance including: capacity, nominal and operating performance.
- C. Submit Mechanical Specifications for unit and accessories describing construction, components and options.
- D. Submit shop drawings indicating overall dimensions as well as installation, operation and service clearances. Indicate lift points and recommendations. Indicate unit shipping, installation and operating weights including dimensions.
- E. Submit data on electrical requirements and connection points. Include recommended wire and fuse sizes or MCA, sequence of operation, safety and start-up instructions.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store UVC Fixtures in a clean, dry place and protect from weather and construction traffic. Handle UVC Fixtures carefully to avoid damage to components, enclosures and finish. Leave factory-shipping covers in place until installation is complete. Do not install any damaged components; instead replace them and return damaged components to equipment manufacturer.
- B. Comply with manufacturers' installation instructions regarding wiring and testing and to the drawings and/or specification regarding exact fixture placement for proper energy distribution.

PART 2 – PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. UltraViolet Devices, Inc., ALTRU·V Products
- B. Steril-Air, Inc., Model DE Series

2.2 QUALITY ASSURANCE

- A. Qualifications: UVC products shall be from an ISO 9001 manufacturer or the supplier shall provide proof of 100% inbound and outbound testing of equipment.
- B. Fixtures: Fixtures shall have been tested, Listed and labeled as UL/C-UL under Category Code ABQK (Accessories, Air Duct Mounted), UL Standards: 153, 1598 & 1995 respectively.

- C. Lamps: Each lamp shall contain no more than 8 milligrams of mercury consistent with current environmental practices while producing the specific output at 500 fpm in temperatures of 55-135°F. Useful lamp life shall be 9000 hours with no more than a 20% output loss at the end of one year of continuous use. They shall be constructed with UVC proof metal bases and shall not produce ozone.

2.3 WARRANTY

- A. Fixtures shall be warranted to be free from defects for a period of one year.
- B. Lamps shall be warranted to be free from defects for a period of one year.

2.4 DESIGN REQUIREMENTS

- A. Irradiation: lamps and fixtures are to be installed in sufficient quantity and in such a manner so as to provide an equal distribution of UVC energy. When installed, the average intensity striking the intended surface shall not be less than 200 microwatts per square centimeter. Note: the applied energy and its distribution average shall be verified using third party math modeling and that verification shall be included with the submittal.
- B. Intensity: The minimal UVC energy striking a surface shall be sufficient to continuously destroy a mono-layer of mold and bacteria as typically found in HVC systems in less than six hours. The third party mathematical modeling shall include the destruction time for at least four of the most common HVAC microbes and an energy distribution map.
- C. Installation: Fixture rows shall be electrically terminated to factory supplied Hard Wire Boxes to meet UL and local electrical codes. Fixtures shall be mounted to irradiate the intended surface(s) as well as all of the available line of sight airstream by proper placement and incident angle reflection. Third party irradiation and intensity calculations (modeling) shall determine fixture placement and energy distribution and shall be provided in the submittal if such placement is absent on the plans.

2.5 EQUIPMENT

- A. Fixtures shall be track mounted to the appropriate factory supplied hardware to form horizontal rows that provide for the proper fixture support. Fixtures shall be equipped with UL approved fixture-to-fixture mechanical and electrical connections that facilitate proper installation and coupling to A/C power from one end. Fixtures shall be capable of being mounted anywhere in the system and/or as shown on the plans.
- B. When used for surface irradiation, the fixture assembly shall be designed and installed such that the sum of the lamp arc lengths in a row shall be equal to a minimum of 90% of the surfaces total width.

- C. Fixtures shall meet the “UL” drip proof design and each fixture shall be equipped with an electrical interlock, which will not allow the fixture to energize unless it’s properly installed to its factory supplied mounting track.
- D. Fixtures shall be constructed of Type 304 stainless steel to preclude corrosion.
- E. Power supplies shall be of the high efficiency electronic type, matched to the lamp and designed to maximize UVC photon production, radiance and reliability. They shall be UL Listed and labeled for use in air-streams of 55-135°F. They shall be capable of producing the specified output and organism destruction as specified under irradiation and intensity at no more than 13 Watts of power consumption for each square foot of treated, cross sectional plane.
- F. Each lamp shall contain no more than 8 milligrams of mercury consistent with current environmental practices while producing the specified output at 500 fpm in temperatures of 55-135°F. Useful lamp life shall be 9000 hours with no more than a 20% output loss at the end of one year of continuous use. They shall be constructed with UVC proof metal bases and shall not produce ozone.

PART 3 – EXECUTION

3.1 INSTALLATION OF UVC FIXTURES

- A. Coordinate with installation of HVAC equipment and install fixtures as indicated above after such equipment is properly installed.
- B. Provide an interlock switch on all access panels and doors leading to the UVC assembly and/or within view of the fixtures to assure that the UVC assembly will be de-energized when any of these accesses are opened.
- C. When specified and/or called out on the drawings, install a relative indicating radiometer and adjust and set in accordance with manufacturer recommendations.
- D. Install Caution Labels on all accesses to the Fixtures.

END OF SECTION