



## **SECTION 23 41 00 – PHOTOCATALYTIC OXIDATION (PCO) SYSTEM**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. This Section includes the following:
  - 1. UL listed Photocatalytic Oxidation using TiO<sub>2</sub> media.

#### **1.2 REFERENCES**

- A. Air Movement and Control Association International, Inc.:
  - 1. AMCA 99 - Standards Handbook.
  - 2. AMCA 210 - Laboratory Methods of Testing Fans for Aerodynamic Performance Rating.
  - 3. AMCA 301 - Methods for Calculating Fan Sound Ratings from Laboratory Test Data.
- B. Air-Conditioning and Refrigeration Institute:
  - 1. ARI 430 - Central-Station Air-Handling Units.
  - 2. ARI Guideline D - Application and Installation of Central Station Air-Handling Units.
- C. OSHPD:
  - 1. OSP - Seismic Qualification of Mechanical and Electrical Equipment.
- D. Underwriters Laboratories Inc.:
  - 1. UL 900 - Air Filter Units.
  - 2. ULC-S111 - Standard Method of Fire Tests for Air Filter Units.
  - 3. UL 1598 – Luminaires.

#### **1.3 SUBMITTALS**

- A. Product Data: Manufacturer's literature for Photocatalytic Oxidation System should indicate:
  - 1. Dimensions, weights, capacities and ratings.
  - 2. Catalog cuts, engineering data sheets, list of unit numbers, UVGI output and power consumption
  - 3. Wiring diagrams, fixtures and control panel.
  - 4. Provide installation, operation and maintenance manuals
  - 5. Photocatalytic Oxidation Unit components and accessories, including number and length of UVGI lamps required to activate the TiO<sub>2</sub> media.
  - 6. Heat output of lamps into air handling unit or air stream for each size of air handling unit scheduled.



7. Calculated intensity profile of entire irradiated surface demonstrating minimum intensity ( $\text{mW}/\text{cm}^2$ ).

#### **1.4 QUALITY ASSURANCE**

- A. System to be factory tested and the design, construction and installation to be in accordance with all state, local, federal or other regulations having jurisdiction.
- B. Competency of Supplier/Manufacturer/Installer
  1. The supplier/manufacturer/installer of the Photocatalytic Oxidation system to have a qualified service organization in active operation for a minimum of five (5) years. The organization to have had a history of competent service experience in designing, installing and maintaining the specific types of systems described in the specifications, and has on its payroll sufficient qualified experienced personnel to guarantee satisfactory performance of the installation. All maintenance personnel used in fulfilling the requirements of the installation shall be qualified to maintain this type of equipment.

#### **1.5 WARRANTY**

- A. The Photocatalytic Oxidation system, less lamps, shall be warranted to be free from defects in material and workmanship for a period of five (5) years.

### **PART 2 - PRODUCTS**

#### **2.1 MANUFACTURERS**

- A. Basis-of-Design Product: Subject to compliance with requirements, acceptable manufacturers are:
  1. **IAQ Solutions, Inc**
  2. **Genesis Air**
  3. **Trane Photocatalytic Air Cleaner**

#### **2.2 PHOTOCATALYTIC OXIDATION**

- A. Provide photocatalytic oxidation for bacteria, mold, and odor control (including organic fuel exhaust fumes) inside each equipment it is installed in. The UV dosage shall be calculated for theoretical 99% air disinfection at air velocity and temperature and shall be adequate to deactivate microbial growth on all exposed surfaces within the irradiated profile. Unit shall be rated for a maximum air velocity across the unit face of 500 feet per minute.
- B. Construction. Casing shall be of single wall construction, fabricated of 22 gauge galvanized steel. All elements of casing shall be free from sharp edges and burs. Casing shall be 5.8" deep. Safety limit switches and Exterior SPST On/Off switches shall be pre-wired and factory installed in a weatherproof junction box. All exterior safety signage shall be permanently affixed to each access door having direct line of sight to the lamps with UL



warning requirements. The photocatalyst unit shall be complete with all miscellaneous accessories required to form a complete unit.

- C. Photocatalytic Oxidation (PCO) media shall consist of 6 six-inch (nominal) non-metallic media with face area to match casing opening, pleated at one pleat per inch (nominal), with a 40-200 nanometer TiO<sub>2</sub> coating. PCO media shall be placed perpendicular to the air stream in the unit casing. Media shall have an internal mechanism to eliminate the silica produced by the oxidation of ethanol. Unit shall be configured to operate with 120V/1ph/60Hz. electrical power. Unit shall be provided with junction box.
- D. Racking System shall be constructed of galvanized sheet metal as either a face-loading or side-loading design. Either system must show proof of conformance to LABC 2014 and ICC AC -156 (2010). The catalyst, accessory panel, and the racking system shall bear an OSP certification number.
- E. Independent Testing. The device submitted shall be classified by UL (Underwriters Laboratories) as an Air Duct Mounted Accessory (ABQK) and also meet the UL Standards 1598, UL 153, UL 1995. Manufacturers UL file number shall be permanently marked on the exterior of the product. UL compliance is to be verified by the UL Online Certifications Directory.
- F. Safety. The assembly shall employ a safety interlock switches, which interrupts power when the Air Handler is opened for servicing. The product employs germicidal lamps, which emit UV-C radiation, thereby posing a potential risk of exposure to eyes and bare skin during maintenance. Access doors shall have a glass visual examination port as provided by air handling equipment manufacturer. Warning signage provided by PCO equipment manufacturer shall be permanently mounted on each access door with direct line of sight to the lamps with UL requirements as to safety aspects.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Install per manufacturer's recommendation.

### **3.2 TRAINING**

- A. Train LAWA Maintenance personnel to adjust, operate and maintain the system.
- B. Provide minimum of 12 hours each (3 shifts) of classroom and hands on training to LAWA Maintenance personnel.

END OF SECTION 23 41 00