SECTION 23 82 20 - UNIT VENTILATORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes unit ventilators and accessories.

1.3 SUBMITTALS

A. Product Data: Include rated capacities, operating characteristics, and furnished specialties and accessories for each unit type and configuration.

B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection. Include plans, elevations, sections, details and wiring diagrams.

C. Samples for Initial Selection: Provide color charts for units with factory applied color finish.

D. Operation and Maintenance Data.

E. Submittals for Unit Ventilators will require a coordination review by the HVAC Controls sub-contractor prior to submission to the Engineer.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain all unit ventilators through one source from a single manufacturer, regularly engaged in production of unit ventilators.

B. Unit Ventilators to be tested and certified with AHRI 840.

C. Comply with NFPA 90A.

1.5 COORDINATION

A. Coordinate layout and installation of unit ventilators and suspension system components with other construction that penetrates or is supported by ceilings, including light fixtures, HVAC equipment, fire-suppression-system components, and partition assemblies.

B. Where applicable coordinate size and location of wall sleeves and louvers.

1.6 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Unit Ventilator Filters: Furnish two spare filter(s) for each installed unit.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Carrier Corporation.
2. Daiken.
3. Trane.
4. Airedale.

2.2 MANUFACTURED UNITS

A. Description: provide factory packaged and tested units rated according to ARI 840, including finished cabinet, filter, coil(s), drain pan, supply-air fan and motor in blow through or draw through configuration.

B. Provide unit ventilators matching the configurations of the units indicated on the drawings.

2.3 CABINETS

A. Exterior cabinetry and end panels are to be constructed using the manufacturer’s standard heavy-gauge metal with all exposed edges rounded to safeguard against injury. All interior sheet metal shall be of galvanized steel.

B. On vertical units, the front plane of the unit shall consist of a three-panel design with control compartment accessible without removing the entire front panel. The discharge air grille to have rounded edged steel bars, and placed at a 15-degree angle to provide proper airflow deflection. Access for inspection and cleaning of the unit drain pan, coils, and fan section is provided. Provide minimum 1-inch thick, closed-cell insulation. Insulation to meet the Underwriters’ Laboratories Fire Hazard Classification. Piping and control end pockets are to be a minimum of 12-inches wide to facilitate piping, auxiliary drain pan, and service access. The vertical units are to be furnished in the depth indicated on the drawings.

C. Horizontal units: the bottom plane of the unit shall consist of a two-panel design. A hinged panel option is provided as part of the equipment options to help alleviate hazards from falling panels during maintenance or inspection purposes. The control compartment is to be accessible without removing the entire bottom panel. The unit discharge grilles are to be welded or screwed in-place to become an integral part of the unit structure. The rounded edge steel bars are placed at a 10° slope to provide proper airflow deflection. Access for inspection and cleaning of the unit drain pan, coils, and fan section are provided. Cabinet insulation is 1/2-inch thick, dual density bonded glass fiber. Insulation shall meet the Underwriters’ Laboratories Fire Hazard Classification. Piping and control end pockets are a minimum of 12-inches wide to facilitate coil piping and service access.

D. Final cabinet finish to be a phosphatized and painted cabinet with an electrostatic powder spray system, with a minimum thickness of 1.5 mil to avoid visible runs and resist abrasion. Cabinet color to be selected by the Architect from the manufacturer's standard colors.

E. Drain Pans: Provide a drain pan fabricated form a corrosion resistant material. The drain pan to be insulated with a dual slope to the drain connection. The drain pan shall be removable.

2.4 COILS

A. Hydronic Coils: Hydronic coils to be rated in accordance with AHRI -840. All hydronic coils are to be a plate-fin type and mechanically bonded to tubes. Hydrostatically test each coil to 350 psi and burst tested to 450 psi. The coils are rated in accordance with ARI 840, 440 or 220. Provide a threaded drain plug at the header's lowest point, and a manual air vent at the coil's highest point. Refer to the drawings for location on the heating which will may be in a preheat or reheat location.

2.5 FANS AND MOTORS

A. Fans: The unit fan board assembly shall ship from the factory wired to the commission schedule for engineered cfm expectancy. Provide a motor speed switch mounted in the unit for motor speed adjustment. The fan board is a single, rigid construction, made from corrosion resistive material. The fans contain a double width/double inlet, forward curved centrifugal design to sustain appropriate air throw into the space. Fan wheels are to be galvanized metal. The dynamically balanced fan and motor are of direct drive style.

B. Motors All motors are brushless electronically commutated motors (ECM) factory-programmed and run-tested in assembled units. The motor controller is mounted in a touch-safe control box with a built-in integrated user interface and LED tachometer. If adjustments are needed, motor parameters can be adjusted through momentary contact switches accessible without factory service personnel on the motor control board. Motors will soft-ramp between speeds to lessen the acoustics due to sudden speed changes. The motor will choose the highest speed if there are simultaneous/conflicting speed requests. All motors have integral thermal overload protection with a maximum ambient operating temperature of 104°F and are permanently lubricated. Motors are capable of starting at 50 percent of rated voltage and operating at 90 percent of rated voltage on all speed settings. Motors can operate up to 10 percent over voltage.

2.6 FILTERS

A. Provide units equipped with 1 inch MERV 13 filters have a rating based on ASHRAE Standard 52.2. The average dust spot efficiency is no less than 90 percent efficiency on 1–3 micron particles and greater than 90 percent efficiency on 3–10 micron particles when tested in accordance with ASHRAE Test Standard 52.2

2.7 CONDENSATE OVERFLOW SYSTEM

A. Where noted on the drawings provide condensate overflow protection for the units. The system can be factory supplied with the unit(s) or field installed. Provide a float switch installed in the primary drain pan to detect a high condensate water level. Should the condensate level rise in the primary drain pan the float switch will sense the high-water level and stop the supply fan and close the heating control valve and outdoor air damper where applicable. The float switch shall have manual reset.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install unit ventilators level and plumb, in accordance with manufacturer's written instructions.

B. Install units with adequate clearance for service and maintenance.

C. Where units are to be supported from the structure provide the required number of spring vibration isolation hangers with threaded rod. Verify number of connection points with the unit manufacturer.

D. When required provide all necessary controls for a condensate overflow protection system.

E. At the direction of the Owner’s Representative the contractor shall remove and dispose of filters from the respective units and install a new filter obtained from the Extra Materials required in Part 1 of this specification. If additional filter installation is not required, forward filters to the owner as extra stock, at the completion of the project.

3.2 CONNECTIONS

A. Drawings indicate general arrangement of piping, fittings, and specialties. Install piping adjacent to machine to allow service and maintenance.

B. Connect ducts to unit ventilators with flexible duct connectors.

3.3 HYDRONIC PIPING INSTALLATION

A. Install hydronic piping according to Specification Section 23 21 10, “Hydronic Piping”.

B. Identify hydronic piping and valves according to Section 23 05 70 "Identification for HVAC Systems."

C. Provide insulation for all hydronic piping per Specification Section 23 07 00; “HVAC System Insulation”.

3.4 FIELD QUALITY CONTROL AND DEMONSTRATION

A. Perform operational tests per the manufacturer’s installation and operation instructions.

B. Verify proper operation of all controls.

C. Remove and replace malfunctioning units and retest as specified above.

D. Train Owner’s personnel to adjust, operate, and maintain unit ventilators.

END OF SECTION 23 82 20