# SECTION 23 82 10 - FAN COIL UNITS

## 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 fan-coil units and accessories.

### 1.3 SUBMITTALS

A. Product Data: Include rated capacities, operating characteristics, furnished specialties, and accessories.

B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, components, and location and size of each field connection. Provide wiring diagrams for power, signal, and control wiring.

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

D. Operation and Maintenance Data.

### 1.4 QUALITY ASSURANCE

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

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1-2004, Section 5 - "Systems and Equipment" and Section 7 - "Construction and Startup."

D. ASHRAE/IESNA 90.1-2004 Compliance: Applicable requirements in ASHRAE/IESNA 90.1-2004, Section 6 - "Heating, Ventilating, and Air-Conditioning."

### 1.5 COORDINATION

A. Coordinate layout and installation of fan-coil units 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 for outdoor-air intake.

1.6 EXTRA MATERIALS

A. In addition to the filter supplied with each fan coil unit, provide two extra sets of filters for all units installed on the project. When directed by the owner's representative, install both sets of filters if necessary. If additional filter installation is not required, all filters shall be given to the owner as extra stock at the completion of the project.

PART 2 - PRODUCTS

2.1 FAN-COIL UNITS

A. Manufacturers: Subject to compliance with requirements, provide fan-coil units manufactured by Carrier. Subject to review, equipment meeting the full requirements of the specifications and project installation limitations manufactured by the following will be considered:

1. Trane Company.
2. Johnson Controls.
3. Nailor Industries.
4. Daiken.

B. Description: Factory-packaged and -tested units rated according to ARI 440.

C. Construction: The units shall include a chassis, coil(s), fan wheel(s), fan casing(s), fan board and motor(s). Units also include a noncorrosive, ABS main drain pan, positively sloped in every plane and insulated with closed-cell insulation. All steel parts exposed to moisture are fabricated of galvanized steel. The fan board assembly and drain pans are required to be easily removable. The fan board assembly includes a quick-disconnect motor plug. The chassis construction is 18-gage galvanized steel. The unit is to be acoustically and thermally insulated with closed-cell insulation. All panels are made rigid by channel forming.

D. Concealed/Recessed Units: Exposed panels on recessed units are to be minimum 18- gage steel construction. Bottom panels on horizontal recessed models ship standard with tamperproof screw fasteners and a safety chain.

E. Fans: Provide aluminum fan wheels with centrifugal forward-curved and double-width construction. Fan wheels and housings are constructed of corrosion resistant materials. Fan housing construction is formed sheet metal.

F. Motors: Provide brushless electronically commutated motors (ECM) factory programmed and run-tested in assembled units. The motor controller is mounted in a control box with a built-in integrated user interface and LED tachometer. Provide adjustment 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. Motors can be operated at three speeds or with a field-supplied variable speed controller. 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

G. Coils: All water coils to be burst tested at 450 psig and air leak tested at 100 psig under water. Maximum main coil working pressure to be minimum 300 psig. Maximum entering water temperature to be 200°F. Tubes and u-bends to be minimum 3/8" OD copper. Fins to be aluminum and mechanically bonded to the copper tubes. Coil connections to be are 5/8" OD copper tubing. Heating coils are to be in the pre-heat position unless otherwise indicated on the drawings.

H. Reheat Coils: Hot water maximum working pressure to be 300 psig, and the maximum entering water temperature is 200°F (93°C). The reheat coils to be constructed of single circuit 5/8” copper tubes with aluminum fins. Piping connections to accept standard copper tubing 5/8” OD.

I. Filters: Provide MERV 13 filters. Filters to be accessible and easily removable.

2.2 CONDENSATE OVERFLOW PROTECTION SYSTEM

A. Where indicated 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 EXAMINATION

A. Examine areas to receive fan-coil units for compliance with requirements for installation tolerances and other conditions affecting performance. Examine roughing-in for piping and electrical connections to verify actual locations before fan-coil-unit installation. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install fan coil level and plumb, in accordance with manufacturer's written instructions.

B. Install fan coil 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.

3.3 CONNECTIONS

A. Comply with requirements for piping specified in other Sections. Drawings indicate general arrangement of piping, fittings, and specialties. Install piping adjacent to the unit to allow service and maintenance. Connect piping to air-handling units mounted on vibration isolators with flexible connectors.

B. Hydronic Piping: Install shutoff valve and union or flange at each coil supply connection. Refer to contract drawings for piping connection details.

C. Coordinate duct installations and specialty arrangements with schematics on Drawings and with requirements specified in other sections.

D. Connect duct to air-handling units with flexible connections.

E. Provide duct mounted motor operated dampers, where indicated on the drawings.

## 3.4 STARTUP SERVICE

A. Provide all factory recommended startup service.

B. Do not operate units for any purpose, temporary or permanent, until ductwork is clean, filters in place, bearings lubricated (if applicable), condensate properly trapped, piping connections verified and leak-tested, belts aligned and tensioned, all shipping braces removed, bearing set screws torqued, and fan has been test run under observation.

## 3.5 CLEANING

A. After completing system installation and testing, adjusting, and balancing air-handling unit and air-distribution systems and after completing startup service, clean units internally to remove foreign material and construction dirt and dust. Clean fan wheels, cabinets, dampers, coils, and filter housings, and install new, clean filters.

## 3.6 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain air-handling units.

END OF SECTION 23 82 10