SECTION 238219 - FAN-COIL UNITS

PART 1 - GENERAL

1.1 SUMMARY
   A. This Section includes fan-coil units and accessories.

1.2 SUBMITTALS
   A. Product Data: For each model indicated, provide dimensions, weights, capacities at scheduled conditions, required clearances, electrical requirements, components, and location and size of field connections.
   B. Operation and maintenance data.

1.3 QUALITY ASSURANCE
   A. 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.

PART 2 - PRODUCTS

2.1 MANUFACTURERS
   A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      1. York International Corp.
      2. Daikin
      3. Trane Company

2.2 DUCTLESS FAN COIL UNITS
   A. Description: An assembly including cabinet, filter, chassis, coil, drain pan(s), fan, and motor. Factory-packaged and tested units rated according to ARI 440, ASHRAE 33, and UL 1995.
   B. Coil Section Insulation: 1/2-inch thick, coated glass fiber complying with ASTM C 1071 and attached with adhesive complying with ASTM C 916. Fire-Hazard Classification: Insulation and adhesive shall have a combined maximum flame-spread index of 25 and smoke-developed index of 50 when tested according to ASTM E 84.
   C. Main and Auxiliary Drain Pans: Plastic or insulated steel as scheduled, formed to slope from all directions to the drain connection as required by ASHRAE 62. Provide extended or auxiliary drain pan for piping connections.
D. Chassis: Galvanized steel where exposed to moisture. Floor-mounting units shall have leveling leg screws.

E. Cabinet: Steel with galvanized or baked enamel finish as scheduled.
   1. Panels: Removable, steel, with discharge grille and channel-formed edges, cam fasteners, and insulation on back of panel.
   2. Steel recessing flanges for recessing fan-coil units into ceiling or wall.

F. Filter Rack: Filter rack with access panel or door. Size filter rack to use two inch thick standard size filters at not more than 500 feet per minute face velocity.

G. Hydronic Coils: Copper tube, with mechanically bonded aluminum fins spaced no closer than 0.1 inch, rated for a minimum working pressure of 200 psig and a maximum entering-water temperature of 220 deg F. Include manual air vent and drain valve.

H. Provide single-point electrical connection for heater and fan. Unit shall include control transformer and magnetic contactor.

I. Electric-Resistance Heating Coils: Nickel-chromium heating wire, free of expansion noise and hum, mounted in ceramic inserts in a galvanized-steel housing; with fuses in terminal box for over-current protection and limit controls for high-temperature protection. Terminate elements in stainless-steel machine-staked terminals secured with stainless-steel hardware.

J. Fan and Motor Board: Removable.
   1. Fan: Forward curved, double width, centrifugal; directly connected to motor. Thermoplastic or painted-steel wheels, and aluminum, painted-steel, or galvanized-steel fan scrolls.
   3. Wiring Termination: Connect motor to chassis wiring with plug connection.

2.3 DUCTED FAN-COIL UNITS

A. Description:
   1. An assembly including cabinet, filter, chassis, coil, drain pan(s), fan, and motor.
   2. Factory-packaged and -tested units rated according to ARI 440, ASHRAE 33, and UL 1995.

B. Coil Section Insulation: 1-inch thick coated glass fiber complying with ASTM C 1071 and attached with adhesive complying with ASTM C 916.
   1. Fire-Hazard Classification: Insulation and adhesive shall have a combined maximum flame-spread index of 25 and smoke-developed index of 50 when tested according to ASTM E 84.

C. Drain Pans: Insulated stainless steel formed to slope from all directions to the drain connection as required by ASHRAE 62. Provide extended drain pan or auxiliary drain pan for piping connections.

D. Chassis: Galvanized steel where exposed to moisture, with baked-enamel finish and removable access panels.

E. Cabinets: Steel with galvanized or baked-enamel finish in manufacturer’s standard paint color.
F. Dampers: Galvanized steel with extruded-vinyl blade seals, flexible-metal jamb seals, and interlocking linkage.

G. Filter Rack: Side access filter rack with access panel or door. Size filter rack to accept two inch thick standard size filters at not more than 500 feet per minute face velocity.

H. Hydronic Coils: Copper tube, with mechanically bonded aluminum fins spaced no closer than 0.1 inch, rated for a minimum working pressure of 200 psig and a maximum entering-water temperature of 220 deg F. Include manual air vent and drain.

I. Electric-Resistance Heating Coils: Nickel-chromium heating wire, free of expansion noise and hum, mounted in ceramic inserts in a galvanized-steel housing; with fuses in terminal box for overcurrent protection and limit controls for high-temperature protection of heaters. Terminate elements in stainless-steel machine-staked terminals secured with stainless-steel hardware.

J. Provide single-point electrical connection for heater and fan. Unit shall include control transformer and magnetic contactor.

K. Direct-Driven Fans: Double width, forward curved, centrifugal; with permanently lubricated, multispeed motor resiliently mounted in the fan inlet. Aluminum or painted-steel wheels, and painted-steel or galvanized-steel fan scrolls.

L. Belt-Driven Fans: Double width, forward curved, centrifugal; with permanently lubricated, single-speed motor installed on an adjustable fan base resiliently mounted in the cabinet. Aluminum or painted-steel wheels, and painted-steel or galvanized-steel fan scrolls.

M. Motors: Comply with requirements in Section 230513 "Common Motor Requirements for HVAC Equipment."

PART 3 - EXECUTION

3.1 INSTALLATION

A. The fan coil units and associated components shall be installed in accordance with the manufacturer’s published installation instructions and their listings.

B. Install fan-coil units to comply with NFPA 90A.

C. Suspend fan-coil units from structure with spring hangers as specified in Section 230548 "Vibration Controls for HVAC Piping and Equipment."

D. Install new filters in each fan-coil unit within two weeks after Substantial Completion.

E. Piping installation requirements are specified in other Division 23 Sections. Drawings indicate general arrangement of piping, fittings, and specialties. Specific requirements are as follows:

1. Install piping adjacent to machine to allow service and maintenance.
2. Connect piping to fan-coil-unit as detailed on the drawings.
3. Connect condensate drain to indirect waste.
4. Install condensate trap of adequate depth to seal against the pressure of fan. Unions shall be provided on both sides of the trap assembly. Install cleanouts in piping at changes of direction.
F. Connect supply and return ducts to fan-coil units with flexible duct connectors specified in Section 233300 "Duct Accessories." Comply with safety requirements in UL 1995 for duct connections.

3.2 FIELD QUALITY CONTROL

A. The fan coil units and associated components shall be installed in accordance with the manufacturer’s installation instructions.

B. Perform the following field tests and inspections and prepare test reports:
   1. Complete the pre-start up procedure and checklist included in the manufacturer’s installation instructions.
   2. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation. Complete the startup procedure and checklist included in the manufacturer’s installation instructions.
   3. Test and adjust controls and safety devices. Replace damaged and malfunctioning controls and equipment.

END OF SECTION