

SECTION 15830

HEATING & COOLING TERMINAL UNITS

PART 1 – DESIGN DIRECTIVES

1.1 DESIGN CRITERIA

- A. All fan coil units shall be sized to meet design load while operating at medium speed. In extreme noise sensitive areas, low speed will be the design speed.

1.2 DESCRIPTION OF TERMINAL UNITS

- A. Fan Coil units.
- B. Valance units.
- C. Finned tube radiation.
- D. Wall Panel Radiators.
- E. Ceiling Heating Radiant Panels.
- F. Convector.
- G. Unit heaters.
- H. Cabinet heaters.

1.3 QUALITY ASSURANCE

- A. Comply with the latest applicable ARI, UL, ASHRAE, & I=B=R standards.

1.4 SUBMITTALS

- A. Submittals shall be project specific clearly indicating the size, model, capacity, and electrical data for the units proposed.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Handle terminal units and components carefully to prevent damage, breaking, denting and scoring. Do not install damaged terminal units or components; replace with new.
- B. Store terminal units and components in clean dry place. Protect from weather, dirt, fumes, water, construction debris, and physical damage.

PART 2 – PRODUCTS

2.1 FAN COIL UNITS

- A. All vertical cabinet units shall have a minimum 12" wide valve pockets the side opposite the drain connections. The discharge grille shall be linear extruded aluminum grille. Fan speed selector switch shall be integral to the unit.
- B. Ceiling recessed units shall be equipped with flanged duct connectors for both the supply and return sides. The pre-finished bottom panel shall be designed to provide access to the entire unit and be exposed in the occupied space. The fan selector switch shall be wall mounted.

- C. Ceiling exposed units shall be pre-finished on all six sides. Pipe appurtenances shall be located on the exterior of the unit. The bottom panel shall swing down to allow access to the filter and motors. The fan selector switch shall be wall mounted.
- D. Provide positive draining drain pans constructed of stainless steel. Insulate with polystyrene, elastomeric, or polyurethane insulation. Exposed cabinet parts shall be factory finished, owner / architect shall chose from manufacturer's offering of standard colors. Provide two sets of filters, one for construction, and the other for turnover to the owner.
- E. Manufacturer: Subject to compliance with requirements, provide fan-coil units of one of the following:
  - 1. Airtherm Mfg. Co.
  - 2. Dunham-Bush, Inc.
  - 3. McQuay Inc.

**2.2 VALANCE UNITS**

- A. The heat transfer element shall be an aluminum plate fin on copper tubes. Plastic slides shall be attached to the fins at 3' spacing and be held in place by the element support structure.
- B. The longitudinal support for the valance unit, including drain pan, ceiling baffle, and heat transfer element, shall be provided by the element support structure. The support structure shall consist of two aluminum channels enclosing the heat transfer element, cross brace as required, and shall run the length of the valance resting on the valance support brackets. Valance units shall only be installed full length wall to wall.
- C. The valance condensate pan shall be pre-finished 0.032 aluminum. The drain pan shall be lined with closed cell insulation having a solid waterproof surface facing the heat transfer element.
- D. The interior drain connection shall be an integral part of the valance pan, affixed to the drain pan with a mechanical seal, and be caulked with a silicone sealant. The drain shall include a length of flexible tubing for connection to the drain risers.
- E. Control valves & thermostats shall be specified in Automatic Temperature Controls.
- F. Subject to compliance with requirements, provide valance units manufactured by Edwards Engineering Corp.

**2.3 FINNED TUBE RADIATION**

- A. Commercial radiation shall be a minimum 18 gauge cold-rolled steel full backplate, minimum 16 gauge front. Brace and reinforce front minimum of 4'-0" o.c. without visible fasteners. Elements shall be copper tube and aluminum fins, with tube mechanically expanded into fin. Exposed parts shall be factory finished baked enamel, color to be selected from manufacturer's offering of standard colors. Include all accessories as required to install a complete system including end caps, access panels, etc.
- B. Subject to compliance with requirements, provide products manufactured by one of the following:
  - 1. Dunham-Bush, Inc.
  - 2. Sterling Radiator; Div. of Reed National Corp.
  - 3. Vulcan Radiator Co.
- C. Residential and light commercial radiation shall be pre-finished white steel enclosure with copper tube and aluminum fins. Include all accessories as required to install a complete system including end caps, access panels, etc. Manufacturer shall be Sterling Petite 9.

**2.4 WALL PANEL RADIATORS**

- A. Elements shall be constructed of cold rolled low carbon steel, fully welded and consisting of header pipes at each end, connected by flat oval water tubes. Elements shall run from wall to wall with space left for piping risers. Radiators must be manufactured to the nearest 3" increment or smaller. Headers shall be square tube with 0.109" wall thickness and have a key operated air vent at highest point. Radiators shall be pre-finished, color to be selected from manufacturer's offering of standard colors.
- B. Subject to compliance with requirements, provide products manufactured by one of the following:
  - 1. Runtal Radiator
  - 2. Dunham-Bush Thermoline
  - 3. Panel Radiator Inc.

**2.5 CEILING HEATING RADIANT PANELS**

- A. Hydronic type, extruded aluminum, 0.115" thick, with fluted face pattern. Copper tube (L), type L, shall be mechanically bonded to panel with heat conductive paste. Provide interconnecting piping between panels: Provide hangers, expansion joints, and hold-down clips as required and as recommended by manufacturer. Provide 3" unfaced fiberglass blanket insulation pre-cut for installation above panels. Color to be selected from manufacturer's offering of standard colors.
- B. Subject to compliance with requirements, provide products manufactured by one of the following:
  - 1. Aerotech Mfg., Inc.
  - 2. AirTex Radiant Ceiling Systems

**2.6 CONVECTORS**

- A. Minimum 16 gauge painted steel front and top panels, 18 gauge painted side panels, and 20 gauge galvanized back panels. Secure fronts in place with quick opening slide bolts or camlock fasteners. Elements shall consist of aluminum fins on copper tubes, and cast iron headers suitable for use in steam or hot water systems. Convectors shall be pre-finished, color to be selected from manufacturer's offering of standard colors.
- B. Subject to compliance with requirements, provide products manufactured by one of the following:
  - 1. Airtherm Mfg. Co,
  - 2. Dunham-Bush, Inc.
  - 3. Sterling Radiator; Div. of Reed National Corp.

**2.7 UNIT HEATERS**

- A. Horizontal unit heaters shall be constructed of steel, phosphatized inside and out, and finished with baked enamel. Provide motor-mounted panel, minimum of 18gauge steel. Fabricate casing to enclose coil, louvers, and fan blades. Fans shall be constructed of aluminum, and factory balanced.
- B. Vertical unit heaters shall be constructed of steel, phosphatized inside and out, and finished with baked enamel. Design casing to enclose fan, motor, and coil, design fan orifice formed into discharge panel. Fans shall be constructed of aluminum and factory balanced. Motor and fan assembly is removable through fan outlet panel.
- C. Coils shall be constructed of plate type aluminum fins, mechanically bonded to copper tubes. Design coil for use in steam or hot water applications. Provide totally enclosed motors with built in overload protection.

- D. Subject to compliance with requirements, provide products manufactured by one of the following:
  - 1. Airtherm Mfg. Co.
  - 2. Dunham-Bush, Inc.
  - 3. Modine Mfg. Co.
  - 4. Sterling Radiator; Div. of Reed National Corp.

**2.8 CABINET HEATERS**

- A. Minimum 16 gauge painted steel front and top panels, 18 gauge painted side panels, and 20 gauge galvanized back panels. Secure fronts in place with quick opening slide bolts or camlock fasteners. Elements shall consist of aluminum fins on copper tubes, and cast iron headers suitable for use in steam or hot water systems. Provide 1" thick throwaway type filters. Cabinet heaters shall be pre-finished, color to be selected from manufacturer's offering of standard colors.
- B. Provide centrifugal, forward curved double width fans. Construct fan scrolls of galvanized steel. Motors shall be shaded pole motors with integral thermal over load protection. Provide two sets of filters, one for construction, and the other for turnover to the owner.
- C. Subject to compliance with requirements, provide products manufactured by one of the following:
  - 1. Airtherm Mfg. Co.
  - 2. Dunham-Bush, Inc.
  - 3. McQuay Inc.
  - 4. Sterling Radiator; Div. of Reed National Corp.

**PART 3 - EXECUTION**

**3.1 INSTALLATION OF VALANCE UNITS**

- A. Fasten wall brackets to wall substrate. Brackets must be concealed by wall finish.
- B. Install balance of hangers as required for valance length. Provide suitable space for maintenance access to the zone valve.
- C. For valance units used for cooling, adjust the rear clips to provide positive drainage of the condensate.

**3.2 INSTALLATION OF FINNED TUBE RADIATION**

- A. Install end caps where units butt against walls. Install access panels centered in front of each shutoff valve, steam trap, & temperature control valve.

**3.3 INSTALLATION OF UNIT HEATERS**

- A. Hang units from building substrate, not from piping. Mount as high as possible to maintain greatest headroom possible.

3.4 ADJUSTING AND CLEANING

- A. After construction is completed, including painting, clean unit exposed surfaces, vacuum clean terminal coils and inside of cabinets. Repair any marred or scratched surfaces of factory-finished cabinets, using finish materials furnished by manufacturer. Install new filter units for terminals so equipped.

END OF SECTION 15830