

SECTION 23 82 39
HYDRONIC UNIT HEATERS

PART 1 - GENERAL

1.1 STIPULATIONS

- A. The specifications sections "General Conditions to the Construction Contract", "Special Conditions" and "Division 01 - General Requirements" form a part of this Section by this reference thereto, and shall have the same force and effect as if printed herewith in full.

1.2 ADDITIONAL RELATED DOCUMENTS

- A. Division 23 Section 230513 "Common Motor Requirements for HVAC Equipment".

1.3 SUMMARY

- A. This Section includes propeller unit heaters and cabinet unit heaters for hydronic heating applications.

1.4 ACTION SUBMITTALS

- A. Product data for each type of product specified, including capacities, operating characteristics, furnished specialties, and accessories.
- B. Shop Drawings:
 - 1. Include plans, elevations, sections, and details.
 - 2. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 3. Include details of anchorages and attachments to structure and to supported equipment.
 - 4. Indicate location and arrangement of piping valves and specialties.
 - 5. Indicate location and arrangement of integral controls.
 - 6. Wiring diagrams detailing power and control wiring and differentiating clearly between manufacturer-installed wiring and field-installed wiring.
- C. Samples of cabinet finish colors for approval. Samples shall be paint chips (i.e. not a color PDF file).

1.5 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.
- B. Coordination Drawings: Floor plans, reflected ceiling plans, and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 - 1. Suspended ceiling components.

2. Structural members to which cabinet unit heaters will be attached.
3. Method of attaching hangers to building structure.
4. Size and location of initial access modules for acoustical tile.
5. Items penetrating finished ceiling, including the following:
 - a. Lighting fixtures.
 - b. Air outlets and inlets.
 - c. Speakers.
 - d. Sprinklers.
 - e. Access panels.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance data for heating units to include in the operation and maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Comply with NFPA 70 for components and installation.
- B. Listing and Labeling: Provide products specified in this Section that are listed and labeled.
 1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.

1.8 EXTRA MATERIALS

- A. Furnish the following extra materials, matching products installed, packaged with protective covering for storage and with identification labels clearly describing contents.
- B. Cabinet Unit Heater Filters: Furnish one spare filter for each filter installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Daikin
 2. Engineered Air
 3. Reznor, a Division of Nortek Co.
 4. Rittling, a Zehnder Group Company
 5. Sigma Corporation
 6. Sterling Radiator, a Div. of Mestek, Inc.
 7. Trane
 8. Vulcan, a Div. of Mestek, Inc.
 9. Or equal as approved by the Professional.

2.2 PROPELLER HYDRONIC UNIT HEATERS

- A. Casing: Minimum 18-gauge sheet steel with hanging brackets and removable access panels to remove, service, and maintain major components. Provide cabinet with factory baked enamel finish.
- B. Coil: Fin-and-tube coil fabricated of copper with aluminum fins spaced no closer than 0.1 inch, and galvanized steel casing. Provide coil with vent and drain fittings. Test for leaks to 450 psig under water. Coil shall be suitable for no less than 200 psig working pressure and a maximum entering water temperature of 220 deg. F.
- C. Fan and Motor: Direct-drive propeller fan and manufacturer's standard permanent split-capacitor or ECM type motor, as scheduled, with thermal overload protection and disconnect switch.
- D. Unit Control System: All controls shall be provided by the Building DDC System Supplier as specified in Division 23 Section "Instrumentation and Controls for HVAC".
- E. Unit Configuration: Horizontal or vertical discharge, as indicated, with adjustable louvers.
- F. Accessories: Include the following:
 - 1. Disconnect switch.
 - 2. Hanger rods with vibration isolators.

2.3 HYDRONIC CABINET UNIT HEATERS

- A. Description: Surface-mounted and recessed-mounted cabinets; for floor, wall and ceiling mounting applications, minimum 16-gauge sheet steel with integral air inlet and air outlet grilles. Finish cabinet with manufacturer's standard baked enamel, color as selected by the Architect. Provide no less than five (5) color choices. If less than five colors are available, provide a custom color as selected by the Architect.
- B. Coil: Fin-and-tube coil fabricated of copper with aluminum fins spaced no closer than 0.1 inch, and galvanized steel casing. Provide coil with vent and drain fittings. Test for leaks to 450 psig under water. Coil shall be suitable for no less than 200 psig working pressure and a maximum entering water temperature of 220 deg. F.
- C. Coil Section Insulation: ASTM C 1071; surfaces exposed to airstream shall have aluminum-foil facing or erosion-resistant coating to prevent erosion of glass fibers.
 - 1. Minimum Thickness: 1/2 inch.
 - 2. Thermal Conductivity (k-Value): 0.26 Btu x in./h x sq. ft. at 75 deg. F mean temperature.
- D. Fan and Motor: Centrifugal blower, direct driven by a single-phase, 2-speed electric PSC type or ECM type motor with inherent overload protection, resilient motor/fan mount and fan speed switch.
- E. Filter: Pleated throwaway filter, 1 inch thick, on inlet of each fan., rated for 80 percent arrestance and MERV 5.
- F. Unit Control System: All controls shall be provided by the Building DDC System Supplier as specified in Division 23 Section "Instrumentation and Controls for HVAC".

G. Accessories: Include the following:

1. Disconnect switch.
2. Kickplate base with leveling legs for floor-mounted units.
3. Trim kit for recessed wall and ceiling applications.
4. Hanger rods with vibration isolators for ceiling mounted units.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and supports to receive unit heaters for compliance with requirements for installation tolerances and other conditions affecting performance of units. Do not proceed with installation until unsatisfactory conditions have been corrected.
- B. Examine roughing-in for piping and electrical connections to verify actual locations before unit-heater installation.

3.2 INSTALLATION

- A. Install unit heaters as indicated, according to manufacturer's written instructions and NFPA 90A.
- B. Install recessed wall units in finished wall assembly; seal joints. Joint-sealant materials and applications are specified in Division 07.
- C. Suspend cabinet unit heaters from structure with spring vibration hangers with a minimum static deflection of 1/2". Vibration isolators are specified in Division 23 Section "Vibration Controls for HVAC."
- D. Connect heating units and components to piping according to Division 23 Section "Hydronic Piping."
- E. Connect unit heaters and components to wiring systems and to ground as indicated and instructed by manufacturer. Tighten connectors and terminals, including screws and bolts, according to equipment manufacturer's published torque-tightening values for equipment connectors. Where manufacturer's torque requirements are not indicated, tighten connectors and terminals according to tightening requirements specified in UL 486A.

3.3 FIELD QUALITY CONTROL

- A. Testing: After installing unit heaters and after electrical circuitry has been energized, demonstrate product capability and compliance with requirements.
- B. Remove and replace malfunctioning units with new units and retest.

3.4 CLEANING

- A. Replace filters in each cabinet unit heater.

- B. After completing system installation, including outlet fittings and devices, inspect exposed finish. Clean units to remove dirt and construction debris and repair damaged finishes.

- 1. Touch-up Painting: Apply touchup paint to match factory finish on minor scratches in the cabinet finish. Large visible scratches will require cabinet replacement, at the direction of the Architect / Engineer.

3.5 DEMONSTRATION

- A. Train Client Agency's maintenance personnel to adjust, operate, and maintain unit heaters.

END OF SECTION