

**SECTION 23 82 00**  
**SPACE TERMINAL HEATING UNITS**

**PART 1 GENERAL**

1.1 WORK INCLUDED

- A. The work of this section shall include, but is not limited to the following:
  - 1. Unit heaters
  - 2. Cabinet heaters
  - 3. Thermostatic control valves

1.2 RELATED DOCUMENTS

- A. Section 23 05 01 - Mechanical General Provisions
- B. Section 23 05 23 - Valves
- C. Section 23 21 01 - Hydronic System Specialties
- D. Section 23 82 16 - Hydronic Cooling and Heating Coils

1.3 SUBMITTALS

- A. Submit manufacturer's latest information on construction details, capacity data and installation data.

1.4 QUALITY ASSURANCE

- A. Hot water units shall be rated and tested for pressure as shown on the Drawings.

**PART 2 PRODUCTS**

2.1 ACCEPTABLE MANUFACTURERS

- A. Hydronic Cabinet Heaters and Unit Heaters: Trane, Modine, York, Vulcan
- B. Thermostatic Control Valves: ISTA

2.2 UNIT HEATERS – PROPELLER FAN TYPE

- A. Provide propeller type unit heaters with heater elements, motor driven propeller type fans, all installed in a minimum 20-gauge formed steel casing, finished with baked enamel paint.
- B. Motor speeds shall not exceed 1,500 revolutions per minute. Remove and replace any unit heaters, which are objectionably noisy.
- C. Provide an "On/Off" switch, overload protection and a line voltage thermostat.
- D. The heaters shall be controlled automatically by means of thermostats, to start and stop the fans. The thermostats shall be adjustable and designed to operate on a 3-degree F differential over a temperature range of approximately 20 degrees F to 75 degrees F.
- E. Each unit heater shall be properly isolated and supported from building construction and braced, as necessary, to prevent sway. Include seismic restraints. Unit heaters shall be supported independently of the piping to which they are connected.

- F. For hydronic heating systems, provide copper tube/aluminum fin heating elements. Install an aquastat in the supply connection to each heater, wired to prevent the fan from operating when there is no heat available.

### 2.3 CABINET HEATERS – CENTRIFUGAL FAN TYPE

- A. Provide cabinet heaters of type shown on the Drawings with integral thermostats controlling the unit fan. Also provide an On/Off switch with overload protection and an aquastat in the supply connection to each heater, wired to prevent the fan from operating when there is no heat available.
- B. Heating elements for hydronic systems shall be copper tube/aluminum fin construction.
- C. Construct enclosures of formed steel, rigidly braced throughout and fabricated of not less than 16-gauge steel. Valves to be installed within the enclosure. Provide hand access doors for access to the valves. Where the cabinet heater is shown to be recessed or semi-recessed, provide neat, close-fitting metal trim strips to form a permanent bond between the unit heater and the wall.
- D. Provide all enclosures and trim strips with baked enamel prime coat of paint.

### 2.4 THERMOSTATIC CONTROL VALVES

- A. Provide self-contained, non-electric temperature regulating valves with temperature range from 40 degrees F to 80 degrees F. The actuator shall have freeze protection marked and a positive shut-off position marked. The temperature sensor element expands or contracts with the room temperature. This movement adjusts the valve opening, which increases or decreases the flow of hot water. This continual modulation maintains even temperature levels in each separate heating zone of plus or minus 1 degree F.
- B. Valves shall be designed for very low flow sound level and minimum expansion noise. Valve stems and balancing spring shall be stainless steel and the valve disc shall be EPDM (Ethylene-Propylene-Dienemonomer Material). Provide tool to exchange the entire valve insert (O-rings, disc, etc.) without draining or stopping the heating system. All thermostatic valves ( $\frac{1}{2}$ -inch,  $\frac{3}{4}$ -inch, 1-inch, 1 $\frac{1}{4}$ -inch straight, angle or horizontal angle) shall have the same size valve insert to accommodate any type of thermostatic actuator.
- C. Service:
  - 1. Maximum Temperature: 248 degrees F
  - 2. Maximum Pressure: 150 psi – hot water
  - 3. Valves shall meet ASHRAE Standard 102-1983

## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. Provide shut-off and isolation valves, balancing cocks and manual air vent for each radiator, convectors or finned tube element.
- B. All piping and control valves serving finned tube or panel radiators shall be concealed or installed within empty sections of radiator cabinet.

END OF SECTION