

University of Houston Master Specification

<Insert Project Name>

<Insert U of H Proj #>

<Insert Issue Name>

<Insert Issue Date>

SECTION 23 8239 – ELECTRIC UNIT HEATERS

Maintain Section format, including the UH master spec designation and version date in bold in the center columns of the header and footer. Complete the header and footer with Project information.

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

Delete hidden text after this Section has been edited for the Project.

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.
- B. The Contractor's attention is specifically directed, but not limited, to the following documents for additional requirements:
 - 1. The current version of the *Uniform General Conditions for Construction Contracts*, State of Texas, available on the web site of the Texas Facilities Commission.
 - 2. The University of Houston's Supplemental General Conditions and Special Conditions for Construction.

1.2 DESCRIPTION OF WORK:

- A. Work Included: Provide electric unit heaters and related controls and accessories as shown, scheduled and indicated on the Drawings.

1.3 QUALITY ASSURANCE:

- A. Manufacturers: Provide products complying with these specifications and produced by one of the following:
 - 1. Bryant Electric Company.
 - 2. Emerson-Chromalox Division, Emerson Electric Company.
 - 3. I.L.G.
 - 4. Singer.

- B. UL-Listing: Provide heaters which are UL-listed.

1.4 SUBMITTALS:

- A. Submittals: Shop drawing submittals shall include, but not be limited to, the following:
 - 1. Cut sheets on electric wall heaters, clearly marked to show sizes, ratings, capacities, configuration, construction, features, accessories and other pertinent information.
 - 2. Manufacturers recommended installation instructions.

<Insert A/E Name>

AE Project #: <Insert Project Number>

Electric Unit Heaters
UH Master: 08.2023

23 8239 – 1

University of Houston Master Specification

<Insert Project Name>

<Insert U of H Proj #>

<Insert Issue Name>

<Insert Issue Date>

3. Additional information as required in Section 23 01 00.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING:

- A. Deliver unit heaters in factory-fabricated water-resistant wrapping.
- B. Handle unit heaters carefully to avoid damage to material component, enclosure and finish.
- C. Store unit heaters in a clean, dry space and protect from the weather.

PART 2 - PRODUCTS

2.1 MATERIALS AND COMPONENTS:

A. General: Provide electric unit heater manufacturer's standard materials and components as indicated by published product information, designed and constructed as recommended by the manufacturer and as required for a complete installation.

B. Heating Elements:

1. General: Provide elements of the indicated duty and rated for the indicated capacity consisting of resistance elements in steel sheath with extended fins or in spiral sheath. Provide automatic reset thermal cutoff switch and pressure differential flow switch. Protect the element with a fusible link mixed in series with the heater. Element shall not glow when operating at rated capacity.

2. Electric Heating Capacity: Size element for the indicated cfm and electric input (watts, voltage, and phase).

C. Cabinets:

1. General: Provide cabinets braced and reinforced to provide required stiffness and containing adjustable heating element supports. Provide ½-inch thick, two-pound density, glass fiber insulation on the interior of the front panel. Phosphatize and paint cabinets inside and out with one coat of baked-on primer. Include discharge air grilles in the cabinet, die-formed with fixed directional louvers or duct connections as indicated on the Drawings. Provide cabinets with removable front panels secured by slide bolt, camlock or Phillips head screws. Fabricate from 16-gauge galvanized steel.

2. Cabinet Accessories: Provide manufacturer's standard accessories of the following types; manufacturer's option if more than one type is indicated for each accessory:

- a. Gaskets between the front panel and the enclosure, manufacturer's standard gasket material.
- b. Hinged access doors with tamperproof latches.
- c. Removable discharge grilles, steel or aluminum, with single or double deflection or duct connections where indicated on the Drawings.

<Insert A/E Name>

AE Project #: <Insert Project Number>

Electric Unit Heaters

UH Master: 08.2023

23 8239 – 2

University of Houston Master Specification

<Insert Project Name>

<Insert U of H Proj #>

<Insert Issue Name>

<Insert Issue Date>

- d. Removable inlet grilles to match discharge grilles or duct connection where indicated on the Drawings.
- e. Tamperproof panel fasteners consisting of either Allen head machine screws or spanner wrench operating cam fasteners.
- f. Unit levelers
- g. Swivel mounting bracket.

3. Cabinet Finish: Where cabinets are exposed, finish, and color selection shall be submitted to the Engineer for approval.

D. Motors:

1. General: Provide permanent split capacitor motors, resiliently mounted at four points, tap wound with built-in thermal overload protection and of the permanently lubricated-type.

2. Internal Wiring: Provide high temperature, heat resistant wiring in flexible metal conduit from terminal junction box to electrical devices. Provide fuses in motor and control circuit wiring.

3. Devices: Provide the following devices:

- a. Thermally activated fan switch to keep fan motor operating until residual heat is dissipated.
- b. Disconnect switch.
- c. Automatic reset, high limit cutout switch located in discharge air stream.
- d. Magnetic contactor.
- e. Remote-mounted thermostat. Refer to Division 25 "Building Management Systems" for thermostat standards.

E. Fans:

1. General: Provide propeller fans, balanced statically and dynamically, of the indicated capacity. Connect fan to a single or double extended motor shaft, with fan, housing and motor mounted as an integral assembly on a motor-board.

2. Construction:

- a. Wheels: Steel or aluminum.
- b. Housing: Galvanized steel.
- c. Motor board: Galvanized steel.

<Insert A/E Name>

AE Project #: <Insert Project Number>

Electric Unit Heaters

UH Master: 08.2023

23 8239 – 3

University of Houston Master Specification

<Insert Project Name>

<Insert U of H Proj #>

<Insert Issue Name>

<Insert Issue Date>

F. Controls: Heaters shall be controlled by a concealed, built-in thermostat that is adjustable over a range of 55°F to 85°F and includes a "no-heat" position. Thermostat shall be adjusted by inserting a screwdriver through the front grille. There shall be no evidence of the thermostat visible on the front grille. Heaters shall include a fan delay switch to energize the fan only after residual heat in the elements has been dissipated. An interface relay shall be factory-installed and wired to allow remote interruption of the heater control circuit by the control system specified under Division 25 "Building Management Systems."

G. Disconnect Switches: Provide factory-furnished, installed and wired disconnect switch inside the heater cabinet.

PART 3 - EXECUTION

3.1 INSTALLATION:

A. General: Install unit heaters, including components required, in accordance with manufacturer's instructions.

B. Location: Locate each unit accurately in the position indicated in relation to other work. Position unit with sufficient clearance for normal service and maintenance, including clearance for cabinet removal.

C. Damaged Fins: Comb out damaged, bent, or crushed fins before closing elements in cabinets.

3.2 TESTING:

A. General: Test electric unit heaters to demonstrate proper operation. Repair or replace unit heater as required. Retest to demonstrate proper operation.

B. Replacement: Replace unit heater elements which have heavily damaged fins. Replace accessories which are damaged beyond restoration to an acceptable condition.

3.3 IDENTIFICATION:

A. Refer to Section 23 0300 "Basic Materials and Methods" for applicable painting, nameplate, and labeling requirements.

END OF SECTION 23 8239

<Insert A/E Name>

AE Project #: <Insert Project Number>

Electric Unit Heaters

UH Master: 08.2023

23 8239 – 4