

## **SECTION 23 82 39 – UNIT HEATERS**

### **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.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Propeller unit heaters with hot-water coils.

#### **1.3 DEFINITIONS**

- A. BAS: Building automation system.
- B. CWP: Cold working pressure.
- C. PTFE: Polytetrafluoroethylene plastic.
- D. TFE: Tetrafluoroethylene plastic.

#### **1.4 SUBMITTALS**

- A. Product Data: Include rated capacities, operating characteristics, furnished specialties, and accessories for each product indicated.
- B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
  - 1. Plans, elevations, sections, and details.
  - 2. Location and size of each field connection.
  - 3. Details of anchorages and attachments to structure and to supported equipment.
  - 4. Equipment schedules to include rated capacities, operating characteristics, furnished specialties, and accessories.
  - 5. Location and arrangement of piping valves and specialties.
  - 6. Location and arrangement of integral controls.
  - 7. Wiring Diagrams: Power, signal, and control wiring.
- C. 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, based on input from installers of the items involved:

1. Suspended ceiling components.
  2. Structural members to which 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.
  6. Perimeter moldings for exposed or partially exposed cabinets.
  7. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
  8. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- D. Field quality-control test reports.
- E. Operation and Maintenance Data: For cabinet unit heaters to include in emergency, operation, and maintenance manuals.

## **1.5 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 PROPELLER UNIT HEATERS**

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Airtherm; a Mestek Company.
  2. Engineered Air Ltd.
  3. McQuay International.
  4. Rosemex Products.
  5. Ruffneck Heaters; a division of Lexa Corporation.
  6. Trane.

- B. Description: An assembly including casing, coil, fan, and motor in horizontal discharge configuration with adjustable discharge louvers.
- C. Comply with UL 2021.
- D. Cabinet: Removable panels for maintenance access to controls.
- E. Cabinet Finish: Manufacturer's standard baked enamel applied to factory-assembled and -tested propeller unit heater before shipping.
- F. Discharge Louver: Adjustable fin diffuser for horizontal units and conical diffuser for vertical units.
- G. General Coil Requirements: Test and rate hot-water propeller unit heater coils according to ASHRAE 33.
- H. Hot-Water Coil: Copper tube, minimum 0.025-inch (0.635-mm) wall thickness, with mechanically bonded aluminum fins spaced no closer than 0.1 inch (2.5 mm) and rated for a minimum working pressure of 200 psig (1380 kPa) and a maximum entering-water temperature of 325 deg F (163 deg C), with manual air vent. Test for leaks to 350 psig (2413 kPa) underwater.
- I. Fan: Propeller type with aluminum wheel directly mounted on motor shaft in the fan venturi.
- J. Fan Motors: Comply with requirements in Division 23 Section "Common Motor Requirements for HVAC Equipment."
  - 1. Motor Type: Permanently lubricated, multispeed.
- K. Control Devices:
  - 1. Wall-mounted, variable fan-speed switch.
  - 2. Wall-mounting thermostat.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine areas to receive unit heaters for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Examine roughing-in for piping and electrical connections to verify actual locations before unit heater installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 INSTALLATION**

- A. Install wall boxes in finished wall assembly; seal and weatherproof. Joint-sealant materials and applications are specified in Division 07 Section "Joint Sealants."

- B. Install cabinet unit heaters to comply with NFPA 90A.
- C. Install propeller unit heaters level and plumb.
- D. Suspend cabinet unit heaters from structure with elastomeric hangers. Vibration isolators are specified in Division 23 Section "Vibration and Seismic Controls for HVAC Piping and Equipment."
- E. Suspend propeller unit heaters from structure with all-thread hanger rods and spring hangers with vertical-limit stop. Hanger rods and attachments to structure are specified in Division 23 Section "Hangers and Supports for HVAC Piping and Equipment."
- F. Install wall-mounting thermostats and switch controls in electrical outlet boxes at heights to match lighting controls. Verify location of thermostats and other exposed control sensors with Drawings and room details before installation.
- G. Install new filters in each fan-coil unit within two weeks of Substantial Completion.

### **3.3 CONNECTIONS**

- A. Piping installation requirements are specified in other Division 23 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to machine to allow service and maintenance.
- C. Connect piping to cabinet unit heater's factory, hot-water piping package. Install the piping package if shipped loose.
- D. Comply with safety requirements in UL 1995.
- E. Unless otherwise indicated, install union and gate or ball valve on supply-water connection and union and calibrated balancing valve on return-water connection of unit heater. Hydronic specialties are specified in Division 23 Section "Hydronic Piping."
- F. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."
- G. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

### **3.4 FIELD QUALITY CONTROL**

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust field-assembled components and equipment installation, including connections, and to assist in field testing. Report results in writing.
- B. Perform the following field tests and inspections and prepare test reports:
  - 1. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.

2. Test and adjust controls and safety devices. Replace damaged and malfunctioning controls and equipment.

- C. Remove and replace malfunctioning units and retest as specified above.

### **3.5 ADJUSTING**

- A. Adjust initial temperature set points.
- B. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.

### **3.6 DEMONSTRATION**

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain cabinet unit heaters. Refer to Division 01 Section "Demonstration and Training."

### **END OF SECTION**