

**SECTION 23 82 46
ELECTRIC UNIT HEATERS**

PART 1 - GENERAL

1. REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.
- B. UNDERWRITERS LABORATORIES (UL) UL 1996 (2009; Reprint Nov 2011) Electric Duct Heaters

2. SUBMITTALS

- A. Section 26 0511 REQUIREMENTS FOR ELECTRICAL INSTALLATIONS applies to work specified in this section.
- B. Include unit heaters in submitted Fabrication Drawings.
- C. Submit Equipment and Performance Data for electric heaters life, test, system functional flows, safety features, and mechanical automated details.
- D. Submit Manufacturer's Instructions for electric heaters stating the special provisions required to install equipment components and system packages. Detail impedances, hazards and safety precautions within the special notices.
- E. Submit warranty data.

PART 2 – PRODUCTS

1. PRODUCT STANDARDS

- A. Provide products conforming to the requirements of UL 1996 for electric unit heaters.

2. DESCRIPTION

- A. Provide suspended electric unit heaters and arrange for discharge of air as indicated. Provide electric unit heaters with not less than the indicated capacity and conform to requirements specified herein. Ensure electric unit heaters are factory prewired, ready for field terminal connections.

3. CASINGS

- A. Construct casings with smoothly contoured propeller orifice rings of not less than 20-gage cold-rolled carbon steel. Provide casing surface finish with phosphate pretreatment, prime coating, and baked-enamel finish.

4. AIR DISTRIBUTION

- A. Fit vertical discharge units with louver-cone diffusers. Provide horizontal units with adjustable single- or double-deflection louvers.

5. HEATING ELEMENT

- A. Construct heating element of a resistance wire insulated by highly compacted refractory insulation protected by a sealed metallic-finned sheath. Component materials are as follows:
 - 1. Provide resistance wire not less than 20-helix wound alloy approximately 80-percent nickel and 20-percent chromium.
 - 2. Provide refractory insulation of magnesium oxide with a resistance of not less than 50,000-ohms after exposure to an ambient temperature and humidity of 90 degrees F and 85 plus or minus 5-percent relative humidity, respectively, for not less than 24 hours.
 - 3. Provide sheathing consisting of aluminum fins cast around an internal steel sheath containing refractory insulation and resistance wire or carbon-steel fins permanently attached to a tubular carbon-steel sheath containing refractory insulation and resistance wire and with external surfaces porcelainized.

6. CONTROLS

- A. Fit units up to and including 5 kilowatts with integral controls including thermal overload cutout switches, necessary transformers, liquid-vapor system, and low-mass bimetal thermostat as required. Provide automatically resettable cutout switch.
- B. If indicated on the electrical drawings, provide unit with a remote unfused disconnect switch that opens ungrounded conductors in the OFF position and a thermostat with integral controls including thermal overload cutout switches, magnetic contactors, necessary transformers, and thermostat protection as required. Provide automatically resettable cutout switches.
- C. If indicated on the mechanical drawings, provide wall-mounted thermostats complete with thermometer, mechanical high-limit stop, calibrated operator, and an adjustable heater to effect anticipation and to prevent override of space temperature with a range between 55 and 105 degrees F and a differential not exceeding 1.5 degrees F. Provide thermostat rated for operation at 24 volts, 60 hertz. Provide transformers, wiring, and devices necessary to meet this requirement. Finish cases in brushed or satin chrome.

7. PROPELLERS AND MOTORS

- A. Provide propellers with mill-aluminized blades statically and dynamically balanced to within 0.5 percent. Provide units with fan-inlet safety guards. AMCA certify propellers and motors for air performance and noise level.
- B. Protect motors against damage by the heating element and resilient mount. Motor bearings may be manufacturer's standard prelubricated sleeve type.
- C. Provide motor identification plate per manufacturer's standard.
- D. Provide motor speed and control per unit-heater manufacturer's standard.

PART 3 – EXECUTION

1. INSTALLATION

- A. Install unit heaters in accordance with the manufacturer's instructions at the mounting heights indicated.

2. FIELD TESTING

- A. Demonstrate that the unit heaters operate satisfactorily. Cycle unit heaters five times, from start to operating thermal conditions to off, to verify adequacy of construction, system controls, and component performance. Conduct an operational test for a minimum of 6 hours.

END OF SECTION 23 82 46