

SECTION 23 82 46

ELECTRIC UNIT HEATERS

08/08

PART 1 GENERAL

1.1 REFERENCES

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.

UNDERWRITERS LABORATORIES (UL)

UL 1996 (2004; Rev Dec 2006) Standard for Electric Duct Heaters

1.2 GENERAL REQUIREMENTS

Section 26 00 00.00 20 BASIC ELECTRICAL MATERIALS AND METHODS applies to work specified in this section.

Include with the Manufacturer's Instructions for electric heaters the special provisions required to install equipment components and system packages. Detail impedances, hazards and safety precautions within the special notices.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for Contractor Quality Control approval. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Submit Equipment and Performance Data in accordance with paragraph entitled, "General Requirements," of this section.

Submit manufacturer's catalog data for the following items:

Electric Unit Heaters

SD-08 Manufacturer's Instructions

Submit Manufacturer's Instructions in accordance with paragraph entitled, "General Requirements," of this section.

PART 2 PRODUCTS

2.1 PRODUCT STANDARDS

Conform to the requirements of UL 1996 for electric unit heaters.

2.2 DESCRIPTION

Use 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.

Factory prewire Electric unit heaters, ready for field terminal connections.

### 2.3 CASINGS

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.

### 2.4 AIR DISTRIBUTION

Provide horizontal units with adjustable single- or double-deflection louvers.

### 2.5 HEATING ELEMENT

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:

Provide resistance wire not less than 20-helix wound alloy approximately 80-percent nickel and 20-percent chromium.

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.

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.

### 2.6 CONTROLS

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.

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.

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. Rate thermostat for operation at 24 volts, 60 hertz. Provide transformers,

wiring, and devices necessary to meet this requirement. Finish cases in brushed or satin chrome.

## 2.7 PROPELLERS AND MOTORS

Provide propellers with mill-aluminized,galvanized-steel, or all-aluminum blades and be 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.

Protect motors against damage by the heating element and resilient mount.

Conform to Section 26 60 13.00 40 LOW-VOLTAGE MOTORS for motors except that load-matched and custom-designed motors may be used and be so identified on the shop drawings. For motors not so identified conform to the requirements specified.

Subfractional and fractional custom-designed or applied motors may deviate from the preceding motor requirements as follows:

Shaded-pole motors rated less than 1/6-horsepower may be used for direct-drive service.

Permanent split-capacitor, split-phase, and capacitor-start motors rated 1/4-horsepower and less may be used for direct-drive service.

Split-phase and capacitor-start motors, rated 1/4-horsepower and less, may be used for belt-drive service.

Motor bearings may be manufacturer's standard prelubricated sleeve type except provide motor with antifriction thrust bearings, when specified. Lubricant provisions shall be extended service requiring replenishment not more than twice per year of continuous operation.

Provide motor identification plate per manufacturer's standard.

Provide motor speed and control per unit-heater manufacturer's standard.

## PART 3 EXECUTION

### 3.1 INSTALLATION

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

### 3.2 FIELD TESTING

Demonstrate in the presence of the Contracting Officer 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 --