SECTION TABLE OF CONTENTS

DIVISION 23 - HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)

SECTION 23 82 46.00 40

ELECTRIC UNIT HEATERS

05/17

PART 1 GENERAL

1.1 REFERENCES
1.2 ADMINISTRATIVE REQUIREMENTS
   1.2.1 Preinstallation Meetings
1.3 SUBMITTALS

PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION
2.2 COMPONENTS
   2.2.1 Heating Element
   2.2.2 Controls
   2.2.3 Propellers and Motors

PART 3 EXECUTION

3.1 INSTALLATION
   3.1.1 Casings
   3.1.2 Air Distribution
3.2 FIELD QUALITY CONTROL

-- End of Section Table of Contents --
PART 1 GENERAL

NOTE: If Section 26 00 00.00 20 BASIC ELECTRICAL MATERIALS AND METHODS is not included in the project specification, insert applicable requirements therefrom and delete the following paragraph.

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

1.1 REFERENCES

NOTE: This paragraph is used to list the publications cited in the text of the guide
specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a Reference Identifier (RID) outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

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 (2009; Reprint Jul 2016) UL Standard for Safety Electric Duct Heaters

1.2 ADMINISTRATIVE REQUIREMENTS

1.2.1 Preinstallation Meetings

The Contracting Officer will schedule a preinstallation meeting within [30] [____] days of Contract Award. Provide the following for review and approval:

a. Submit fabrication drawings for electric heaters, indicating the fabrication and assembly details to be performed in the factory.

b. Submit manufacturer's instructions for electric heaters, stating the special provisions necessary to install equipment components and system packages. Detail the impedances, hazards and safety precautions within the special notices.

1.3 SUBMITTALS

******************************************************************************

NOTE: Review Submittal Description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list to reflect only the submittals required for the project.

The Guide Specification technical editors have designated those items that require Government approval, due to their complexity or criticality, with a "G." Generally, other submittal items can be reviewed by the Contractor's Quality Control System. Only add a "G" to an item, if the submittal is sufficiently important or complex in context of the project.

******************************************************************************
For submittals requiring Government approval on Army projects, a code of up to three characters within the submittal tags may be used following the "G" designation to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

An "S" following a submittal item indicates that the submittal is required for the Sustainability eNotebook to fulfill federally mandated sustainable requirements in accordance with Section 01 33 29 SUSTAINABILITY REPORTING. Locate the "S" submittal under the SD number that best describes the submittal item.

Choose the first bracketed item for Navy, Air Force and NASA projects, or choose the second bracketed item for Army projects.

**************************************************************************

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are [for Contractor Quality Control approval.] [for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] Submittals with an "S" are for inclusion in the Sustainability eNotebook, in conformance to Section 01 33 29 SUSTAINABILITY REPORTING. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings
   Fabrication Drawings
SD-03 Product Data
   Performance Data; G[, [___]]
   Electric Unit Heaters; G[, [___]]
   Heating Element; G[, [___]]
   Controls; G[, [___]]
   Casings; G[, [___]]
   Propellers and Motors; G[, [___]]
SD-08 Manufacturer's Instructions
   Manufacturer's Instructions

SECTION 23 82 46.00 40 Page 4
PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION

Provide suspended electric unit heaters, and arrange for the discharge of air as indicated.

Provide electric unit heaters with at least the indicated capacity and ensure that they conform to the requirements specified herein. Ensure that the electric unit heaters are factory-rewired and ready for field terminal connections.

Ensure products conform to the requirements of UL 1996 for electric unit heaters.

Submit performance data for electric heaters, including use life, test, system functional flows, safety features, and mechanical automated details.

2.2 COMPONENTS

2.2.1 Heating Element

Provide a heating element constructed of a resistance wire insulated by highly compacted refractory insulation protected by a sealed metallic-finned sheath. Provide component materials as follows:

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

b. Provide a refractory insulation of magnesium oxide with a resistance of not less than 50,000 ohms after exposure to an ambient temperature and humidity of 32 degrees C 90 degrees F and 85 plus or minus 5-percent relative humidity, respectively, for not less than 24 hours.

c. Provide a 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.

[Ensure that the maximum surface temperature of porcelain-protected steel sheathing is[ 370 ] [_____] degrees C [700] [_____] degrees F.

][Ensure that the maximum surface temperature of cast-aluminum sheathing is [260] [_____] degrees C [500] [_____] degrees F.

2.2.2 Controls

Fit units up to and including 5 kilowatts with integral controls, including thermal overload cutout switches, necessary transformers, a liquid-vapor system, and low-mass bimetal thermostat as required. Provide a cutout switch that can be automatically reset.

][Provide the 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 cutout switches that can be automatically reset.
3.1.1 Casings

Provide casings with smoothly contoured propeller orifice rings of at least 20-gage cold-rolled carbon steel. Provide a casing surface finish with phosphate pretreatment, prime coating, and baked-enamel finish.
3.1.2 Air Distribution

[Fit vertical discharge units with louver-cone diffusers.

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

3.2 FIELD QUALITY CONTROL

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 --