

SECTION 22 33 00**ELECTRIC DOMESTIC WATER HEATERS****PART 1 - GENERAL****1.1 DESCRIPTION:**

This section describes the requirements for installing a complete electric domestic water heater system ready for operation including the water heaters, thermometers, and all necessary accessories, connections, and equipment.

1.2 RELATED WORK:

- A. Section 22 05 11, COMMON WORK RESULTS FOR PLUMBING.
- B. Section 22 05 23, GENERAL-DUTY VALVES FOR PLUMBING PIPING
- C. Section 22 11 00, FACILITY WATER DISTRIBUTION: Piping, Fittings, Valves and Gages.

1.3 QUALITY ASSURANCE:

- A. Comply with American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) for efficiency performance:
 - 1. ASHRAE 90.1, Energy Efficient Design of New Buildings except Low-Rise Residential Buildings, "for commercial water heaters."
- B. Electrical components, devices and accessories shall be listed and labeled B as defined in NFPA 70 by a qualified testing agency, and marked for intended location and application.
- C. ASME code construction shall be a vessel fabricated in compliance with the ASME boiler and Pressure Vessel Code: Section VIII, Division 1.
- D. Fabricate and label equipment components that will be in contact with potable water to comply with NSF 61, "Drinking Water System Components - Health Effects"

1.4 SUBMITTALS:

- A. Submit manufacturer's literature and data pertaining to the water heater in properly bound package, in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES. Include the following as a minimum:
 - 1. Water Heaters.
- B. For each electric domestic hot water heater type and size, the following characteristics shall be submitted:
 - 1. Rated Capacities.
 - 2. Operating characteristics.

- 3. Electrical characteristics.
- 4. Furnished specialties and accessories.
- C. Shop drawings shall include wiring diagrams for power, signal and control functions.
- D. The domestic water heater shall be certified and labeled by a testing agency.

1.5 APPLICABLE PUBLICATIONS:

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. American Society of Sanitary Engineering (ASSE):
1005.....Performance Requirements for Water Heater Drain Valves, 20 mm (3/4 inch) size
- C. American National Standard Institute (ANSI):
Z21.22B-2001.....Relief Valves for Hot Water Supply Systems
- D. American Society of Mechanical Engineers (ASME):
B1.20.1-83(R 2006).....Pipe Threads, General Purpose (Inch)
B16.5-03.....Standard for Pipe Flanges and Flanged Fittings:
NPS ½ through NPS 24
B16.24-06.....Cast Copper Alloy Pipe Flanges and Flanged Fittings: Classes 150, 300, 400, 600, 900, 1500, and 2500.
PTC 25.3-02.....Pressure Relief Devices
- E. National Fire Protection Association (NFPA)
70-06.....National Electrical Code
- F. Underwriters Laboratories, Inc. (UL):
1453-04.....Water Heaters, Electric Booster and Commercial Storage Tank
499-05.....Standard for Safety Electric Heating Appliances

1.6 AS-BUILT DOCUMENTATION

- A. Four sets of manufacturer's literature and data updated to include submittal review comments and any equipment substitutions.
- B. Four sets of operation and maintenance data updated to include submittal review comments shall be inserted into a three ring binder. All aspects of system operation and maintenance procedures, including piping isometrics, wiring diagrams of all circuits, a written description of system design, control logic, and sequence of operation shall be included in the operation and maintenance manual. The

operations and maintenance manual shall include troubleshooting techniques and procedures for emergency situations. Notes on all special systems or devices such as damper and door closure interlocks shall be included. A List of recommended spare parts (manufacturer, model number, and quantity) shall be furnished. Information explaining any special knowledge or tools the owner will be required to employ shall be inserted into the As-Built documentation.

PART 2 - PRODUCTS

2.1 ELECTRIC, TANKLESS, DOMESTIC WATER HEATER

- A. Electric, Tankless, domestic water heaters shall be constructed with copper piping or tubing complying with NSF 61 barrier materials for potable water without storage capacity.
- B. The pressure rating shall be 1035 kPa (150 psig).
- C. The heating element shall be resistance heating system type.
- D. Temperature control shall be made with flow control fittings.
- E. The safety control shall be a high temperature limit cutoff device or system.
- F. The heater shall have a bracket for wall mounting and have an aluminum or steel with enameled jacket.

PART 3 - EXECUTION

3.1 INSTALLATION:

- A. The water heaters shall be installed level and plumb and securely anchored.
- B. The water heaters shall be installed and connected in accordance with manufacturer's written instructions.
- C. The thermostatic control shall be set for a maximum setting of 54 degrees C (130 degrees F).
- D. Shutoff valves shall be installed on the domestic water supply piping to the water heater and on the domestic hot water outlet piping.
- E. All manufacturers' required clearances shall be maintained.

3.2 PERFORMANCE TEST:

All of the remote water outlets shall have a minimum of 49°C (120°F) and a maximum of 54°C (130°F) water flow at all times. If necessary, make all corrections to balance the return water system or reset the thermostat to make the system comply with design requirements.

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