

**SECTION 22 33 00**  
**ELECTRIC DOMESTIC WATER HEATERS**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. Domestic electric water heater system complete, ready for operation including: water heater and accessories, connections and equipment.

**1.2 RELATED WORK**

- A. Section 22 05 11, COMMON WORK RESULTS FOR PLUMBING
- B. Insulation: Section 23 07 11, HVAC AND PLUMBING INSULATION.
- C. Piping, Fittings, Valves and Gages: 22 05 23, GENERAL-DUTY VALVES FOR PLUMBING PIPING, and 22 11 00, FACILITY WATER DISTRIBUTION.

**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 Standard for Buildings Except Low-Rise Residential Buildings, Performance Requirements for Water Heating Equipment.

**1.4 SUBMITTALS**

- A. Submit manufacturer's literature and data pertaining to the water heater in a properly bound package, in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES. Include the following as a minimum:
  - 1. Water Heater.
  - 2. Pressure and Temperature Relief Valve.
  - 3. Thermometer
  - 4. Pressure Gage
  - 5. Vacuum Breaker

**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 National Standard Institute (ANSI):
  - Z21.22B-2001.....Relief Valves for Hot Water Supply systems
- C. American Society of Mechanical Engineers (ASME):
  - B1.20.1-83(R 2006).....Pipe Threads, General Purpose (Inch)
  - B16.5-03.....Pipe Flanges and Flanged Fittings
  - B16.24-2006.....Cast Copper Alloy Pipe Flanges and Flanged Fittings: Classes 150, 300, 600, 900, 1500 and 2500
  - PTC 25-2008.....Pressure Relief Devices

Section VIII-07.....Rules for Construction of Pressure Vessels

Division 1

D. National Fire Protection Association (NFPA)

70-08.....National Electrical Code

E. Underwriters Laboratories, Inc. (UL):

174.....Household Electric Storage Tank Water Heaters

**PART 2 - PRODUCTS**

**2.1 ELECTRIC WATER HEATERS**

- A. Tank Construction: Steel shell, glass lined, and ASME-Code construction with 1035 kPa (150 psig) working pressure rating.
- B. Tapping (openings): Factory fabricated of materials compatible with the tank and in accordance with appropriate ASME standards for piping connection, pressure and temperature relief valve, pressure gauge, thermometer, drain valve, anode rods and controls.
- C. Heater insulation: Comply with ASHRAE 90.1.
- D. Tapping (Fittings): Factory fabricated of materials compatible with the tank and in accordance with appropriate ASME standards for piping connection, pressure and temperature relief valve, pressure gauge, thermometer, drain valve, anode rods and controls as required:
  - 1. 50-mm (2 inch) and smaller: Threaded ends according to ASME B1.20.1.
- E. Heating Element: double element, immersion type, thermostatically adjustable. Set thermostat for maximum water temperature of 49 degrees C (120 degrees F). Phase and voltage as shown on the drawings.
- F. Combination Pressure and Temperature Relief Valves: ASME rated, constructed of all brass or bronze with a self-closing reseating valve. Pressure setting shall be less than water heater working pressure, and relieving capacity shall not be less than heat input.

**2.2 THERMOMETERS**

- A. Straight stem, iron case, red reflecting mercury thermometer or red liquid-filled thermometers, approximately 175 mm (7 inches) high, 4 to 115 degrees C (40 to 240 degrees F).

**PART 3 - EXECUTION**

**3.1 INSTALLATION**

- A. Refer to Section 22 05 11, COMMON WORK RESULTS FOR PLUMBING
- B. Install water heaters level and plumb.
- C. Install and connect water heaters in accordance with manufacturer's written instructions.
- D. Pipe pressure and temperature relief valve discharge to nearby floor drain.
- E. Install thermometers on water heater inlet and outlet piping.

- F. Set the thermostat for a minimum setting of 60 degrees C (140 degrees F). The thermostatic mixing valve assembly on the discharge of the water heater shall reduce the water temperature to 54.4 degrees C (130 degrees F).

**3.2 PERFORMANCE TEST**

- A. Ensure that all water outlets have minimum 48.8 degrees C (120 degrees F) and maximum of 54.4 degrees C (130 degrees F) water at all times. If necessary, make correction to balance the return water system or reset the thermostat to make the system comply with design requirements.

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