

## SECTION 15485 - ELECTRIC, DOMESTIC WATER HEATERS

## PART 1 - GENERAL

## 0.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

## 0.2 SUMMARY

- A. This Section includes the following for domestic water systems:
  - 1. Tankless, electric water heaters.
  - 2. Commercial, electric water heaters.
  - 3. Compression tanks.
  - 4. Accessories.

## 0.3 QUALITY ASSURANCE

- A. Source Limitations: Obtain same type of water heaters through one source from a single manufacturer.
- B. Product Options: Drawings indicate size, profiles, and dimensional requirements of water heaters and are based on specific units indicated. Other manufacturers' products complying with requirements may be considered. Refer to Division 1 Section "Substitutions."
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- D. ASME Compliance: Fabricate and label water heater, hot-water storage tanks to comply with ASME Boiler and Pressure Vessel Code: Section VIII, "Pressure Vessels," Division 1.
- E. ASHRAE Standards: Comply with performance efficiencies prescribed for the following:
  - 1. ASHRAE 90.1, "Energy Efficient Design of New Buildings except Low-Rise Residential Buildings," for commercial water heaters.

## 0.4 WARRANTY

- A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

- B. Special Warranty: Written warranty, executed by manufacturer agreeing to repair or replace components of water heaters that fail in materials or workmanship within specified warranty period.
1. Failures include heating elements and storage tanks.
  2. Warranty Period: From date of Substantial Completion:
    - a. Heating Elements: 1 year.
    - b. Storage Tanks: 6 years.

## PART 2 - PRODUCTS

### 0.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Point-of-Use, Tankless, Electric Water Heaters:
    - a. Chronomite Laboratories, Inc.
    - b. Eemax, Inc.
    - c. PVI Industries, Inc.
  2. Commercial, Point-of-Use, Small-Capacity, Electric Water Heaters:
    - a. Lochinvar Corp.
    - b. Rheem Manufacturing Co.; Ruud Water Heater Div.
    - c. Smith: A. O. Smith Water Products Co.
    - d. State Industries.
  3. Water Heater Stand and Drain Pan Units:
    - a. Safety: W. H. Safety Products, Inc.
  4. Compression Tanks:
    - a. Amtrol, Inc.
    - b. Armstrong Pumps, Inc.
    - c. Myers: F. E. Myers.
    - d. Smith: A. O. Smith; Aqua-Air Div.
    - e. State Industries.
    - f. Taco, Inc.
    - g. Wessels Co.
    - h. Zurn Industries, Inc.; Wilkins Div.

### 0.2 POINT-OF-USE, STORAGE, ELECTRIC WATER HEATERS

- A. Description: Automatic, electric vertical storage type with capacity, recovery rates, and electrical characteristics as scheduled with 100 degrees F temperature rise, 150 psig maximum working pressure.
- B. Storage Tank Construction: non-ASME code steel with 150-psig (1035-kPa) working-pressure rating.
  - 1. Tappings: Factory fabricated of materials compatible with tank for piping connections, relief valve, drain, anode rod, and controls as required. Attach tappings to tank before testing and labeling. Include ASME B1.20.1, pipe thread.
  - 2. Interior Finish: Materials and thicknesses complying with NSF 61, barrier materials for potable-water tank linings. Extend finish into and through tank fittings and outlets.
  - 3. Insulation: Comply with ASHRAE 90.1. Surround entire storage tank except connections and controls.
  - 4. Jacket: Steel, with enameled finish.
- C. Heating Elements: Two, unless otherwise indicated; electric, screw-in, immersion type.
  - 1. Temperature Control: Adjustable thermostat.
- D. Anode Rod: Factory installed, magnesium.
- E. Drain Valve: ASSE 1005, corrosion-resistant metal, factory installed.
- F. Special Requirement: NSF 5 construction.

### 0.3 POINT-OF-USE, INSTANTANEOUS, ELECTRICAL WATER HEATERS

- A. Tankless point of use water heater for instantaneous/unlimited hot water demand with electrical characteristics as scheduled, and 150 psig maximum working pressure.
- B. Cast aluminum alloy casing, plastic element assembly with stainless steel heating coils.
- C. Differential pressure flow activated switch and integral high temperature cut-off at 190 degrees F.

### 0.4 COMPRESSION TANKS

- A. Description: Steel, pressure-rated tank constructed with welded joints and factory-installed, butyl-rubber diaphragm. Include air precharge to minimum system-operating pressure at tank.
- B. Construction: 150-psig (1035-kpa) working-pressure rating.
- C. Tappings: Factory-fabricated steel, welded to tank before testing and labeling. Include ASME B1.20.1, pipe thread.
- D. Tank Interior Finish: Materials and thicknesses complying with NSF 61, barrier materials for potable-water tank linings. Extend finish into and through tank fittings and outlets.
- E. Tank Exterior Finish: Manufacturer's standard, unless finish is indicated.
- F. Air-Charging Valve: Factory installed.

## 0.5 WATER HEATER ACCESSORIES

- A. Combination Temperature and Pressure Relief Valves: ASME rated and stamped and complying with ASME PTC 25.3. Include relieving capacity at least as great as heat input and include pressure setting less than water heater working-pressure rating. Select relief valve with sensing element that extends into tank.
  - 1. Option: Separate temperature and pressure relief valves are acceptable instead of combination relief valve.
  - 2. Exception: Omit combination temperature and pressure relief valve for tankless water heater, and furnish pressure relief valve for installation in piping.
- B. Vacuum Relief Valves: Comply with ASME PTC 25.3. Furnish for installation in piping.
  - 1. Exception: Omit if water heater has integral vacuum-relieving device.
- C. Water Heater Stand and Drain Pan Units: High-density-polyethylene-plastic, 18-inch- (457-mm-) high, enclosed-base stand complying with IAPMO PS 103 and IAS No. 2. Include integral or separate drain pan with raised edge and NPS 1 (DN25) drain outlet with ASME B1.20.1, pipe thread.
- D. Water Heater Stands: Water heater manufacturer's factory-fabricated, steel stand for floor mounting and capable of supporting water heater and water. Include dimension that will support bottom of water heater a minimum of 18 inches (457 mm) above the floor.
- E. Water Heater Mounting Brackets: Water heater manufacturer's factory-fabricated, steel bracket for wall mounting and capable of supporting water heater and water.
- F. Drain Pans: Corrosion-resistant metal with raised edge. Include dimensions not less than base of water heater and include drain outlet not less than NPS 3/4 (DN20).

## PART 3 - EXECUTION

## 0.1 WATER HEATER INSTALLATION

- A. Install water heaters on concrete bases.
  - 1. Exception: Omit concrete bases for commercial water heaters if installation on stand, bracket, suspended platform, or direct on floor is indicated.
- B. Install water heaters, level and plumb, according to layout drawings, original design, and referenced standards. Maintain manufacturer's recommended clearances. Arrange units so controls and devices needing service are accessible.
- C. Anchor water heaters to substrate.
- D. **[Install seismic restraints for water heaters when specified by local codes.] [Anchor to substrate.]**
- E. Install temperature and pressure relief valves in top portion of storage tanks. Use relief valves with sensing elements that extend into tanks. Extend relief valve outlet with water piping in continuous downward pitch and discharge onto closest floor drain.

- F. Install vacuum relief valves in cold-water-inlet piping.
- G. Install water heater drain piping as indirect waste to spill into open drains or over floor drains. Install hose-end drain valves at low points in water piping for water heaters that do not have tank drains. Refer to Division 15 Section "Plumbing Specialties" for drain valves.
- H. Install thermometers on water heater inlet and outlet piping.
- I. Fill water heaters with water.
- J. Charge compression tanks with air.
- K. Install instantaneous water heaters in accordance with manufacturer's instructions.

## 0.2 CONNECTIONS

- A. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to machine to allow service and maintenance.
- C. Make connections with dielectric fittings where piping is made of dissimilar metal.
- D. Electrical Connections: Power wiring and disconnect switches are specified in Division 16 Sections. Arrange wiring to allow unit service.
- E. Ground equipment.
  - 1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

## 0.3 FIELD QUALITY CONTROL

- A. Engage a factory-authorized service representative to perform startup service.
- B. In addition to manufacturer's written installation and startup checks, perform the following:
  - 1. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
  - 2. Verify that piping system tests are complete.
  - 3. Check for piping connection leaks.
  - 4. Check for clear relief valve inlets, outlets, and drain piping.
  - 5. Test operation of safety controls, relief valves, and devices.
  - 6. Energize electric circuits.
  - 7. Adjust operating controls.
  - 8. Adjust hot-water-outlet temperature settings. Do not set above 140 deg F (60 deg C) unless piping system application requires higher temperature.

END OF SECTION 15485