

SECTION 15457

WATER HEATERS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: A complete hot water generating system with necessary accessories as indicated on Construction Documents, as specified, and as required by code.

B. Related Sections:

1. 15260 - Thermal Insulation (Plumbing).
2. 15410 - Piping (Plumbing).
3. 15430 - Piping Specialties (Plumbing).

1.02 SUBMITTALS

A. Submit properly identified manufacturer's literature before starting work.

B. Shop Drawings:

1. Water Heaters and Boilers: Catalog cuts, performance characteristics.
2. Pressure and Temperature Relief Valve: Catalog cuts, capacity.
3. Gages: Catalog cuts.
4. Recirculating Pumps: Catalog cuts and performance characteristics.

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Gas Fired Water Heaters:

1. The work includes labor, materials, and equipment to furnish and install a domestic hot water supply system guaranteed to provide 80 percent draw without temperature drop. The system shall be installed and connected according to drawings furnished by the manufacturer.

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2. The system shall contain the following: Heaters, storage tank, pump, tank thermometer, temperature pressure relief valve, and tankstat.
3. Manufacturers: Weben Jarco or accepted equivalent.
4. Heaters shall be AGA certified and ASME inspected and stamped for 160 psi working pressure using natural gas at zero feet elevation.
 - a. The water tube heat exchanger shall be horizontal grid and constructed of at least 1 inch O.D. x 0.065" wall thickness integral copper finned tubes securely fitted to 3/8" boiler plate steel tube sheet in a manner to prevent water from contacting the tube sheets.
 - b. Heaters shall be heavy cast bronze with integral cast bronze baffles. Heat exchanger shall be readily cleanable in place and from the right or left sides.
 - c. Heat exchanger shall be explosion proof on the water side and have 100 percent copper and bronze waterways and shall be guaranteed for 5 years.
5. Equip heater with electric high limit control adjustable to 200 degrees F. Main electric gas valve to be 24 volt with 120/24 volt transformer.
 - a. Burners shall be quiet on ignition and extinction and fabricated from titanium stainless steel with round raised ports or cast iron with bronze burner tips. Burners shall be equipped with fixed primary air openings and mounted in a slide-out type drawer for ready access.
6. The storage tank shall be as shown on Construction Documents with 125 psi working pressure and shall be glass or epoxy lined. The tank shall be furnished with legs and guaranteed for 5 years.
7. The system circulating pump shall be wired for continuous operation or interlocked with boiler gas valve for intermittent operation with gas valve on call for heat from the tankstat.
8. Necessary controls and accessories including pump, tankstat, thermometer, temperature-pressure relief valve, shall be furnished by the manufacturer and installed on the system as shown on Construction

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Documents.

B. Gas Fired Boilers:

1. Copper fin packaged water heating system consisting of a copper finned water heater, a jacketed and insulated storage tank, a bronze-fitted circulating pump, ball valves (inlet and outlet) ASME rated temperature and pressure relief valve. Entire assembly shall be prepiped, assembled and skid mounted, pressure tested and ready for installation.
2. Manufacturer: Lochinvar, Weben Jarco, or accepted equivalent.
3. Water heater shall have an input of ____ Btu/hour, and a recovery of ____ at 100 degree temperature rise. The water containing section shall be of the copper fin tube design easily removable from either end for purposes of inspection, cleaning, or repair. The entire heat exchanger shall have a 5-year limited warranty against failure.
4. Operating controls shall be electric main gas valve, pilot with 100 percent safety shutdown, manual gas cock, gas pressure regulator, operating aquastat, electric high limit safety with automatic reset, and ASME temperature and pressure relief valve.
 - a. Heater shall bear the ASME "HLW" stamp and shall be National Board listed for 160 pounds and weatherproof.
 - b. Heater shall be constructed with a 16 gage metal jacket, and carry a full 5-year warranty.
 - c. Water heater shall have a draft diverter contained within the jacket itself. The jacket shall be insulated with 3-1/2" of high density fiberglass insulation to minimize heat loss.
 - d. The water heater shall meet the energy efficiency standards of ASHRAE 90A.
5. Circulating pump shall be sized to match heater, 120 volts, single phase, and shall provide rust-free performance. Pump shall be all bronze.
6. Storage tank shall be vertical Lochinvar Lock-Temp, Weben Jarco, or equivalent having a storage capacity of ____ gallons.
 - a. The tank shall be constructed with an inner chamber

- to eliminate turbulence, allowing an 80 percent drawdown of the tank capacity with no drop in outlet temperature, regardless of the rate of draw.
- b. Tank shall be constructed according to ASME requirements with the approval for 125 psi working pressure ASME.
 - c. Tank shall be epoxy coated or glass-lined and shall carry a 5-year warranty.
 - d. Tank shall be furnished with jacket and insulation.
 - e. Tank shall be encased in high density fiberglass insulation of sufficient thickness to meet the energy efficiency standards of ASHRAE 90A.
7. Firing control system shall be spark ignition, electronic pilot supervision, 4-second main gas shutdown, 24 volt, and firing modulation.
 8. Provide the following options:
 - a. Temperature gage mounted on the front of the cabinet with tank mounted remote sensor to register the water temperature in the upper portion of the tank.
 - b. Pressure gage mounted on the front of the cabinet with tank mounted remote sensor to register the water pressure within the tank.
 - c. Solid state intermittent pump controller. Stops tank/heater circulation during periods of no hot water demand.

C. Instant Type Water Heaters (Tankless):

1. Electric water heaters shall be tankless type with a flow activation switch operating only when hot water side of faucet is turned on.
2. The heat exchanger shall be constructed of a noncorrosive metal alloy. The units shall have high temperature thermal cutoffs for a maximum temperature of 190 degrees F. to shut down the heating elements and avoid a steam situation.
3. The minimum flow activation shall be 0.5 GPM and minimum pressure requirements shall be 5 psi.
4. Maximum operating pressure of 150 psi. Units shall be tested to UL 499.
5. Controls shall not allow water temperature to exceed 110 degrees F.
6. Provide 15 year warranty.

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7. Manufacturers:

- a. Cronomite Laboratories, Inc., Model S-90-1.
- b. Eemax Inc., Botsford, CT.
- c. Hot Aqua Inc., Culver City CA.

D. Electric Water Heaters:

- 1. 6 KW, 20, 40, or 60 gallon sizes, as indicated on Drawings.
- 2. Double element, drain pan, wired for simultaneous use.
- 3. 1 inch thick fiberglass or foamed plastic insulation jacket.
- 4. PESCXX-2 by Ruud or accepted equivalent.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Provide a gate valve and union at cold water connection to heater. A union shall be provided at hot water connection.
- B. Provide on cold water supply to heater a vacuum relief valve of sufficient size to protect tank from back pressures.
- C. Pressure relief valve and drain pan drain shall discharge to outside per code regulation or according to local ordinances.
- D. Provide thermometer on top of heater in oversized tee and nipple on outlet piping of heater.
- E. Adjust individually controlled elements to start at 5 degrees F. temperature differential for each heater element.
- F. The water heater shall fit properly in the floor space provided. Installation shall be according to local, municipal, state, and national codes.

END OF SECTION

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