

Furnish and install as shown on plans in accordance with all codes and authorities having jurisdiction ___ water heater(s) Model SWDW-___/___/ EC, as manufactured by AERCO INTERNATIONAL, INC.

Each heater shall be rated to heat ___ GPM of water from ___ °F to ___ °F when supplied with ___ lbs/hr of saturated steam at ___ PSIG to the control valve.

Design & Construction: Each heater shall be of the vertical, U-tube, Semi-instantaneous design, having service water in the shell and steam in the tubes. The ratio of hot water volume to steam volume shall be a minimum of 5:1. The U-tube shall be atmospherically vented with clearly labeled, visible leak detection port.

The water vessel shall be designed to allow no greater than 5 FPS average water velocity when traveling through the shell at design flow conditions to ensure no heat exchanger erosion. Total domestic water pressure drop through the heater shall not exceed 7 PSI at design flow. The tube bundle shall be constructed of double wall tubing and utilize Teflon baffles spaced 2 ½" apart to maximize performance.

The water pressure vessel shall be designed and manufactured in accordance with ASME section VIII, Div. 1 for not less than 180 PSIG @ 250 °F working pressure and temperature. The tube bundle shall be designed and manufactured in accordance with ASME Section VIII, Div. 1 for not less than 52 PSIG @ 300 °F working pressure and temperature. The entire heat exchanger shall be UL listed as acceptable for use heating potable water in commercial installations. Any doublewall heat exchanger, which does not have an equivalent third party listing, shall not be deemed acceptable.

All pressure vessel and heat exchanger surfaces in contact with the domestic water shall be a non-ferrous alloy. Materials of construction shall be: 3/16" 304 stainless steel shell(schedule 10), 0.049" outer wall and 0.025" inner wall copper tubes, 0.25" Naval Brass upper tubesheet, 7/8" carbon steel middle tubesheet, 0.25" Naval Brass lower tubesheet, and 304L stainless steel top head. The outer tube shall be silver-brazed to the upper tubesheet and the inner tube shall be silver-brazed to the lower tubesheet.

Electronic Control System: The heater shall maintain +/- 4 °F Max temperature fluctuation from temperature setpoint under normal diversified load conditions (load fluctuations of up to 25% of water heater capacity).

The system shall consist of an electronic control valve, constant speed domestic water circulator pump, control panel enclosure housing a PID temperature controller with digital indication of shell outlet water temperature, digital over-temperature limit switch, and feed-forward and feedback temperature sensors. The limit switch shall close the control valve and open a solenoid valve to function as a secondary water relief valve in an over-temperature condition.

The system shall have the following additional characteristics:

- Controller temperature setpoint range between 50 °F to 205 °F maximum
- Configured for 120V/1 Phase/60 Hz and 220V/1 Phase/ 50 Hz.
- Easy start-up. Dial in setpoint & walk away.

The electronic steam control valve shall be manufactured by water heater manufacturer and be of the balanced, pilot-operated type, having a soft seat for ANSI Class VI bubble tight shut-off and equal percentage flow characteristics. Valves shall be applied directly for specified steam pressure without the need for extraneous PRV's. The valve shall have the following performance characteristics:

- 50 to 1 Turndown.
- Electronic Actuator with Fail Closed Design-particularly on loss of power
- Time to Full Open Position: 7 seconds on 1 to 2 Inch; 9 seconds on 2 ½ to 4 inch
- Time to Full Closed Position: 7 seconds on 1 to 2 Inch; 9 seconds on 2 ½ to 4 inch, including failsafe mode.

The PID temperature controller shall incorporate a feed-forward function and be password protected. The controller either ___ shall or ___ shall not be capable of remote communications via an optional add-in board that incorporates either: ___ RS-232 port or ___RS-485 port & utilizes the MODBUS protocol for interoperability with Building Automation Systems (BAS).

Controls interface with BACnet, Lonworks, and N2 shall utilize an ___ optional AERCO Communications Gateway to act as a MODBUS interface/translator between the BAS and the MODBUS port of the temperature controller. The AERCO Communications Gateway shall be comprised of a microprocessor based control utilizing the MODBUS protocol to communicate with the temperature controller. Non-volatile backup of all point mappings and programs shall be internally provided as standard. Connection between Gateway and individual water heaters shall be “daisy chain” with shielded, twisted pair, low voltage wiring for ease of installation.

The following information shall be accessible locally at the controller or remotely via the communications port:

- Setpoint – can be changed remotely
- Outlet Temperature
- Over Temperature Alarm
- Control Output Signal to valve

Each heater shall be supplied by the manufacturer ready to accept existing boiler water and domestic water lines, and furnished with the following accessories:

- a. Minimum 1-1/2” thick resilient insulation having “K” value of 0.25 BTU-in/hr-ft² -°F, meeting or exceeding ANSI/ASHRAE/IES standard 90.1- 1989.
- b. Low Lead (<0.25% lead by weight in wetted area) T&P relief valve conforming to ANZI Z21.22, set at 150 PSIG/210°F

The heater shall carry the following manufacture's warranty from date of shipment for domestic water service*:

- Pressure vessel – The pressure vessel consisting of shell and top head shall carry a non-prorated 20-year guarantee against leakage due to internal corrosion.
- All other components – Shall carry an 18 month guarantee against failure due to manufacturing or material defect.

* Note to specifying engineer: The above warranty is for domestic water service. For other services, such as wash down, laundry, etc, and for other details, please contact your local AERCO representative.