



International, Inc.

Suggested Specifications:

KC-1000

Single Domestic Water Heater

Furnish and install as shown on plans in accordance with all codes and authorities having jurisdiction, Water Heater Model KC1000. Plant shall consist of ___ Model KC1000GWW Style 01 (304L stainless steel pressure vessel) or ___ Model KC1000GWW Style 210711 (copper-lined carbon steel pressure vessel) as manufactured by AERCO International, Inc. Heater shall be UL Listed, ASME coded and stamped, and incorporate a gas train designed in accordance with ___ FM or ___ IRI. Heater shall have an input of 1000 mbh with a gross output of 930 mbh when fired with _____ gas. Unit shall operate with a minimum ANSI Z-21 of 93% efficiency. Water heating plant shall have a recovery of _____ gallons per hour at a ___ F temperature rise.

CONSTRUCTION

Water heater shall be of gas fired, condensing fire tube design with a modulating power burner and positive pressure discharge. Burner shall be capable of 20:1 turndown of firing rate for natural gas units and 14:1 for propane units, without loss of combustion efficiency. Heat exchanger/combustion chamber shall incorporate a 90/10 copper-nickel helical fire tube design that will be self-supporting, baffle free, and warranted to withstand thermal shock. Heat exchanger shall be ASME stamped for working pressure not less than 155 psig. Unit shall have an ASME approved temperature/pressure relief valve with a setting of 150 psig. Exhaust manifold shall be of corrosion resistant porcelain enameled cast iron, with a 6" diameter flue connection. Exhaust manifold shall have a gravity drain for the elimination of condensation with collecting reservoir.

The water heater control system shall be segregated into three components: "C-More" Control Panel, Power Box, and Input/Output Connection Box. The entire system shall be Underwriters Laboratories Recognized.

The "C-More" control panel shall consist of 6 individual circuit boards utilizing state-of-the-art surface-mount technology, in a single enclosure. These circuit boards shall be defined as follows: display board incorporating LED display to read temperature, and a VFD display module for all message annunciation; CPU board which houses all control functions; electric low water cutoff board with test and manual reset functions; power supply board; ignition /stepper board incorporating flame safeguard control; and connector board. Each board shall be individually field replaceable. The combustion safeguard/flame monitoring system shall utilize spark ignition and a rectification type flame sensor. The control panel hardware shall support both RS-232 and RS-485 remote communications. The controls shall annunciate boiler & sensor status and include extensive self-diagnostic capabilities that incorporates a minimum of 8 separate status messages and 34 separate fault messages.

The water heater control system shall incorporate the following additional features for enhanced external system interface: auxiliary start delay timer; auxiliary temperature sensor; mA output feature which allows for simple monitoring of either temperature setpoint, outlet temperature, or fire rate; remote interlock circuit; delayed interlock circuit; and fault relay for simple remote fault alarm.

Each water heater shall utilize an electric single seated safety shutoff valve with proof of closure switch in its gas train and incorporate dual over-temperature protection with manual reset in accordance with ASME Section IV. The water heater shall operate on 120V/1/60Hz electrical service.



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INSTALLATION

All aspects of installation of Water Heater Plant shall be in strict accordance with manufacturer's instructions. Materials shall conform to all manufacturer's recommendations and shall include a Stainless Steel AL-29-4C positive pressure U/L Listed vent system.

Water heater plant piping shall be field constructed of materials as specified. Water heater shall have individually isolating shutoff valves for service and maintenance, and a hot water hose connection for field testing. Water heater shall require a minimum gas pressure of ___ 8.5" W.C. (FM gas train) ___ 8.9" W.C. (IRI gas train) at 1,000 scfh (full load rated capacity). The water heater shall be provided with an individual supply gas regulator for proper gas regulation with a 1.25" NPT connection.

MODE OF OPERATION

Heater shall include integral factory wired operating controls to control all operation and energy input. Control of discharge water temperature shall be set through an internal setpoint with a field adjustment of 100F to 200F. Unit shall maintain discharge temperature within specified range through domestic water flow variations from 0 to 100%. Heater shall be capable of maintaining the outlet temperature within an accuracy of +/- 4F. This shall be accomplished by modulation of firing rate from 100% to 5% of rated input for natural gas units, and 100% to 7% for propane units. Unit shall operate with an Inverse Efficiency Curve, with known Part Load Value Efficiencies. Maximum efficiency shall be achieved at minimum firing input.

CONTROLS INTEROPERABILITY

The "C-More" control panel shall utilize the MODBUS open protocol to interface with third party 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 RS-485 port of the "C-More" water heater control panel. The AERCO Communications Gateway shall be comprised of a microprocessor based control utilizing the MODBUS protocol to communicate with the water heater via the RS-485. Non-volatile backup of all point mappings and programs shall be internally provided as standard. Connection between Gateway and individual water heater shall be "daisy chain" with shielded, twisted pair, low voltage wiring for ease of installation.

WARRANTY

The pressure vessel shall carry a 10-year warranty against leakage due to defects in materials or workmanship or corrosion. The heat exchanger tubes/ combustion chamber assembly shall be warranted against failure due to thermal stress failure or condensate corrosion for a prorated five-year period.

The six individual circuit boards of the "C-More" control panel assembly shall carry a 2 year warranty against failure due to defective materials or workmanship. A Warranty Certificate must be issued to the owner from the manufacturer and a copy of the warranty is submitted for engineer's approval.



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FIELD SERVICES

Contractor shall provide the services of a local factory authorized representative to supervise all phases of equipment startup. A letter of compliance with all factory recommendations and installation instructions shall be submitted to the engineer with operation and maintenance instructions.