EVERGREEN® Pro

Condensing Gas Boilers – Suggested Specifications

Series 2 Models EVG 110/155/220/299/300/399 MBH

I. General Requirements

A. Furnish and install _____ (qty) packaged, modulating, sealed combustion, power-vented, high efficiency gas-fired boiler(s) with stainless steel fire-tube heat exchangers that use outside air for combustion (direct vent).

B. Install packaged boiler unit(s) according to manufacturer's installation instructions. All work to be done in a neat and workmanlike manner.

C. _____ (quantity) Weil-McLain Evergreen -_____ (size), packaged boiler(s) capable of burning natural or propane gas.

D. Boiler(s) shall have an AHRI gross output at 100% fire rate of _____ MBH per boiler.

E. Boiler(s) model EVG 110-299 shall be 95.0% AFUE, minimum DOE efficient as required by National Energy Conservation Act or ASHRAE 90.1. Model EVG 399 to have a minimum thermal efficiency of 96.0%.

F. Boiler(s) model EVG 110-399 shall have an independent laboratory rating of < 20 PPM for Oxides of Nitrogen (NOx) to meet the requirements of South Coast Air Quality Management District in Southern California and the requirements of Texas Commission on Environmental Quality.

G. Boiler shall be capable of full modulation firing with a turn down of up to 10 to 1 (220-299) and 5 to 1 (110-155).

H. Boiler(s) to conform to Section IV of the ASME Boiler and Pressure Vessel Code.

1. Fire-tube stainless steel heat exchanger to be fire tested and hydrostatically pressure tested at factory in accordance with ASME requirements.
2. Maximum allowable working pressure of 80 PSIG (220-399) and 30 PSIG (70-155) water as listed on the rating label.
3. Boiler(s) and controls to comply with applicable regulations.
4. Boiler(s) shall be fully factory packaged.

II. Product

A. Acceptable boiler manufacturer(s) include(s)

1. As specified in Part I, Paragraph C.
2. Other manufacturer or other Weil-McLain boiler(s) must comply with specifying engineer's requirements, including:
   (a) Full intent of these specifications.
   (b) Provide complete submittal including literature, manuals, wiring diagrams, fuel piping diagrams, and a list of similar installations. Any alternate must be of similar size and footprint, piping configuration, clearance requirements and heating surface.
   (c) Submittal presented to engineer at least seven working days before bid opening for approval. Substitutions are not permitted after contract is awarded.

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B. Boiler Construction

1. Boiler(s) heat exchanger:
   (a) Fire-tube stainless steel heat exchanger.
   (b) The boiler must have non-metallic condensate collector to capture condensate from both, the vent system and heat exchanger.
2. Factory Assembled and Tested.
3. Boiler(s) main components:
   (a) The combustion chamber will be sealed and located at the top which will be of counter flow design to assure that sediment and any lime that might form will fall to the bottom away from the crown sheet area.
   (b) Boiler(s) shall be supplied with a gas valve designed with negative pressure regulation (fan venturi effect "pulls" gas through valve rather than gas pressure “pushing” gas through valve). Negative pressure regulation enables the boiler to operate in a safe condition at 3.5” W.C. inlet gas pressure. The inlet (natural or propane) gas pressure to the boiler gas valve should be a minimum of 3.5” W.C. and a maximum of 14” W.C. If inlet gas pressure exceeds 13” W.C., a 100% lock-up type gas pressure regulator of adequate size must be installed in gas supply piping and adjusted to prevent pressure in excess of 13” W.C.
   (c) The burner shall be premix combustion type, made with stainless steel and a woven metal fiber outer covering to provide a wide range of modulating firing rates.
   (d) The boiler shall be equipped with a variable speed blower system capable of modulating the boiler firing rate.
   (e) The boiler shall be equipped with a device capable of controlling the air/fuel ratio through a 5 to 1 for 110-155, and 10 to 1 for 220-399 turndown ratio.
   (f) The control system shall have an electronic display for boiler set-up, boiler status, and boiler diagnostics.
   (g) Taco ECM circulator (110-155), Taco 0014 (220/299), Taco 0013 (399).

C. Venting and Combustion Air

1. Boiler(s) must be capable of using outside air piped directly to boiler for combustion. Inlet and termination of these pipes must be connected to either through-the-roof or sidewall terminations as recommended by the manufacturer.
2. Internal vent pipe must be non-metallic.
3. The boiler shall be direct vent using PVC, CPVC, PP or SS.

D. Boiler Trim

1. All electrical components to be of a high quality.
2. Water boiler(s) controls furnished:
   (a) High limit temperature control with manual reset (190 degrees F maximum allowable boiler water temperature).
   (b) Combination pressure-temperature gauge. Gauge dial clearly marked and easy to read.
   (c) ASME certified pressure relief valve set to relieve at 30 PSIG (110-155) and 80 PSIG (220-399) maximum.
   (d) Flue gas, outlet water temperature, and return water temperature sensors.
   (e) Low water protection with manual reset.
   (f) Built-in freeze protection.

4. Boiler Control to be UL 353 Listed with:
   (a) Built-in MODBUS communication.
   (b) 4 outputs for use with circulators, dampers or systems aux.
   (c) Auxiliary input/output capability.
   (d) Variable temperature zones that require no mixing valves.
   (e) 4 thermostat inputs.
   (f) Outdoor reset for each priority.
   (g) Zone and priority based setup options.
   (h) 2 Network and 2 local priorities available on each cascaded boiler.
   (i) Flue gas, outlet water temperature, and return water temperature sensors.
   (j) LCD, touchscreen display.
   (k) Alarm contact that triggers during manual lockout, flame failure, high temperature limit and low water cut off.
   (l) Remote modulation capable of interfacing with Building Automation Systems and Multiple Boiler Systems.
   (m) Ability to control additional heat demand.

E. Boiler Manuals

1. The boiler(s) shall be provided with complete instruction manuals, including:
   (a) Boiler Installation Manual.
   (b) User's Manual.

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