



Gas-Fired Water Boilers



Boiler Manual

- Installation
- Maintenance
- Startup
- Parts



Mobile Product Library

WARNING

This manual must only be used by a qualified heating installer/service technician. BEFORE installing, read all instructions in this manual and all other information shipped with the boiler. Perform steps in the order given. Failure to comply could result in severe personal injury, death or substantial property damage.

Part number 550-142-054/1211



How it works . . .

1 Integrated boiler control

The integrated boiler control (IBC) responds to signals from the room thermostat, air pressure switch, inlet water sensor and boiler limit circuit to operate the circulators, gas valve, igniter and blower. When a room thermostat calls for heat, the IBC starts the system circulator and blower.

The IBC runs the blower to purge the boiler flue passages, then turns on the igniter and lets it warm up.

After igniter warm-up, the IBC opens the gas valve, turns the igniter off, and checks for flame. The flame must come on within 4 seconds or the IBC will shut down and try the full cycle again.

When the room thermostat is satisfied, the IBC turns off the boiler components and waits for the next heat call.

The IBC indicator lights show normal sequence when the lights are on steady. When a problem occurs, the IBC flashes combinations of lights which indicate the most likely reason for the problem.

2 Transformer

The control transformer reduces line voltage to 24 volts for the gas valve and limit circuit.

3 Blower

The blower pulls in air and mixes it with gas from the gas valve. The blower forces this mixture into the burner for combustion inside the boiler chamber.

4 Recuperator

The recuperator is a stainless steel heat exchanger that increases boiler efficiency by extracting additional heat from the flue gases. Return water passes through the recuperator before entering the boiler.

5 Water temperature limit switch

The water temperature limit switch turns off the gas valve if the temperature in the boiler goes above its setting. (The circulators will continue to run as long as there is a call for heat.)

6 System circulator

The system circulator circulates water through the external (system) piping. The flow rate of the circulator is controlled by the IBC, depending on the temperature of the water entering the boiler sections. Pump must remain on boiler — do not remove.

7 Bypass circulator

The IBC operates the bypass circulator to mix hot water from the boiler outlet with colder return water from the system as needed to prevent condensation of flue gases in the cast iron heat exchanger.

When the water returning to the boiler is below 140°F, the IBC regulates the bypass circulator and system circulator flow rates to raise the return water temperature up to 140°F before it enters the cast iron sections. By balancing these flow rates, the IBC can protect against condensation in the cast iron heat exchanger even if return water is as low as 60°F. Pump must remain on boiler — do not remove.

8 Air pressure switch

The air pressure switch signals the IBC, telling the control whether air is moving through the blower.

9 Water temperature sensor

The water temperature sensor monitors the temperature of the water entering the boiler sections. The sensor sends this information to the IBC. The IBC determines how much to adjust the circulator flow rates to provide at least 140°F water to the cast iron heat exchanger.

LEGEND

- a Supply to system, 1" NPT
- b Return from system, 1" NPT
- c Combustion air inlet fitting — 3" PVC connection
- d Flue outlet — 3" PVC connection
- e Gas valve — negative pressure regulated gas control
- f Pressure/temperature gauge
- g Flueway inspection port cover
- h Sensor hose trap
- i Manual air vent
- j Relief valve
- k Thermal fuse — a one-time fuse device that shuts boiler off if flue temperature exceeds its setpoint
- m Condensate trap line — shipped loose with boiler, field installed
- n Condensate drain connection — 1/2" PVC female



This boiler uses a negative-pressure-regulated gas valve, set for an outlet pressure approximately -0.20" water column.

DO NOT set the outlet pressure higher than factory setting.

GV90+ Water Boiler

