

Advantages of the COBREX® Storage Water Heater



No steam control valve needed with ≤15 psi steam

Provides simplified heater operation and lower maintenance cost. Design eliminates a typically large and expensive steam control valve and actuator and the associated maintenance and replacement cost

Circulation flow diffusers

Diffusers dissipate the pressure and velocity of the water circulating back into the tank from the heat exchanger. This allows 80% of the water stored in the tank to exit the heater at usable temperature

Redundant temperature and safety controls

The combination of an electronic controller, high limit, pump shutoff, condensate shutoff valve and heat trap piping at the heat exchanger outlet prevent an over-temperature condition in the tank

Circulation pump and condensate control system

Scaling in the heat exchanger is minimized by constant water circulation during a call for heat and a pump delay after the call for heat terminates. The condensate shut-off valve quickly causes the exchanger to completely fill with condensate and stops the flow of steam. Stopping steam flow and continuing domestic water flow combine to cool the exchanger below the temperature threshold where scale can precipitate from the water.

BAS connectible operating control

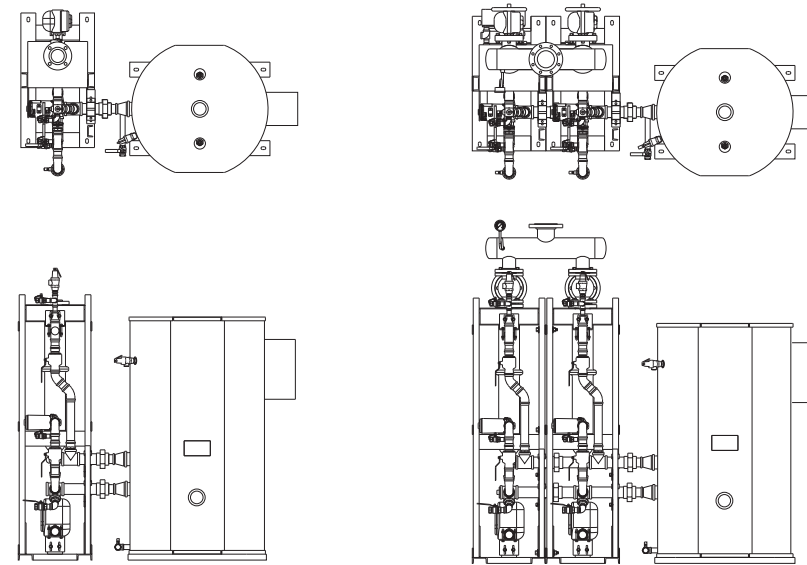
Full read/write capability through electronic operating control with Modbus protocol. Bacnet and Lonworks gateways are available. Functions such as temperature setback, and remote over-temperature alarm notification are available.

COBREX® STORAGE

Available Configurations and Performance

Model Prefix	Btuh Output (@ 15 psi steam)	GPH recovery 40° to 140°F	Configuration	Standard Storage Tanks
1200	840,000	1010	single exchanger	150 to 400
1800	1,530,000	1840	single exchanger	150 to 400
2700	3,000,000	3600	single exchanger	150 to 400
3600	3,500,000	4215	single exchanger	150 to 400
1200-2	1,680,000	2020	dual exchanger	150 to 400
1800-2	3,070,000	3680	dual exchanger	150 to 400
2700-2	6,000,000	7200	dual exchanger	150 to 400
3600-2	7,000,000	8425	dual exchanger	150 to 400

Vertical storage tanks up to 4500 gallons and horizontal tanks of various capacity are available. Contact your PVI representative.



Single Exchanger Configuration

Dual Exchanger Configuration

Standard equipment

- Heat exchanger ASME stamped, section VIII for 150 psi
- Storage tank ASME stamped, section IV HLW for 150 psi
- Three year heat exchanger warranty
- 25-year tank warranty
- Completely pre-fabricated tank-to-exchanger piping is all non-ferrous and includes pump, y-strainer, isolation valves, unions, CIP valves and ASME relief valve
- Factory-authorized startup and first year service policy
- Bottom tank drain valve and ASME relief valve

- Float and thermostatic steam trap
- Electronic operating control with MODBUS capability
- High-temperature limit
- Manway tank access (250 to 900 gallons)
- Complies with latest ASHRAE 90.1 standard
- Low lead compliant

Refer to document PV8570 for complete list of standard and optional equipment



PV 8590 5-2016

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COBREX® STORAGE

Steam-fired Domestic Hot Water Generator

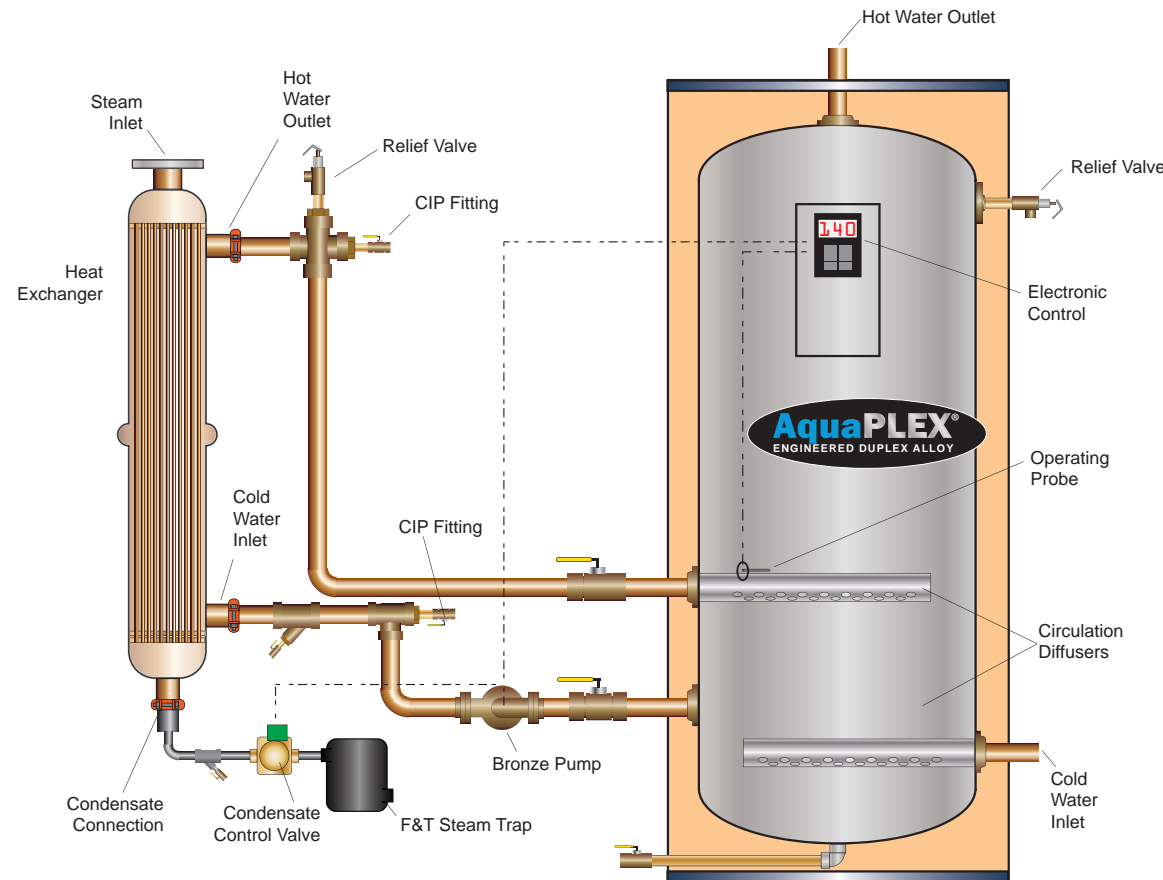


- Up to 7,000,000 Btuh Output
- Up to 8425 gph Hot Water Delivery from 40°F to 140°F
- Duplex Stainless Steel Tanks from 150 to 4500 Gallons
- **Twenty-five Year Tank Corrosion Warranty**
- 100% Copper and Brass, Double-Wall, Shell-and-Tube Heat Exchanger with Single-Pass, Counterflow Design
- Redundant Dual Heat Exchangers Available
- No Steam Control Valve Required at ≥ 15 psi Steam



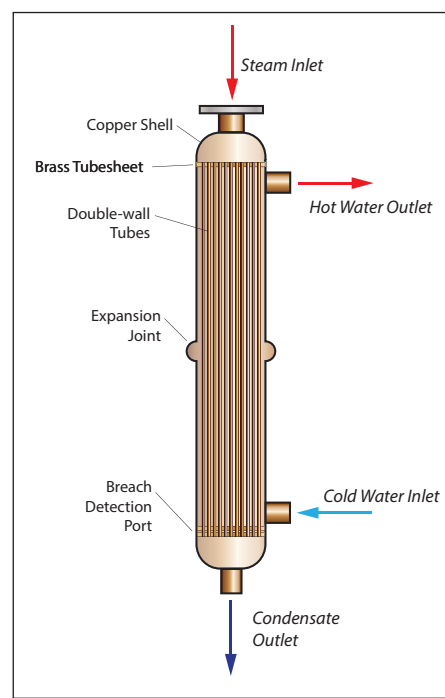
COBREX[®] STORAGE

Steam-fired Domestic Hot Water Generator

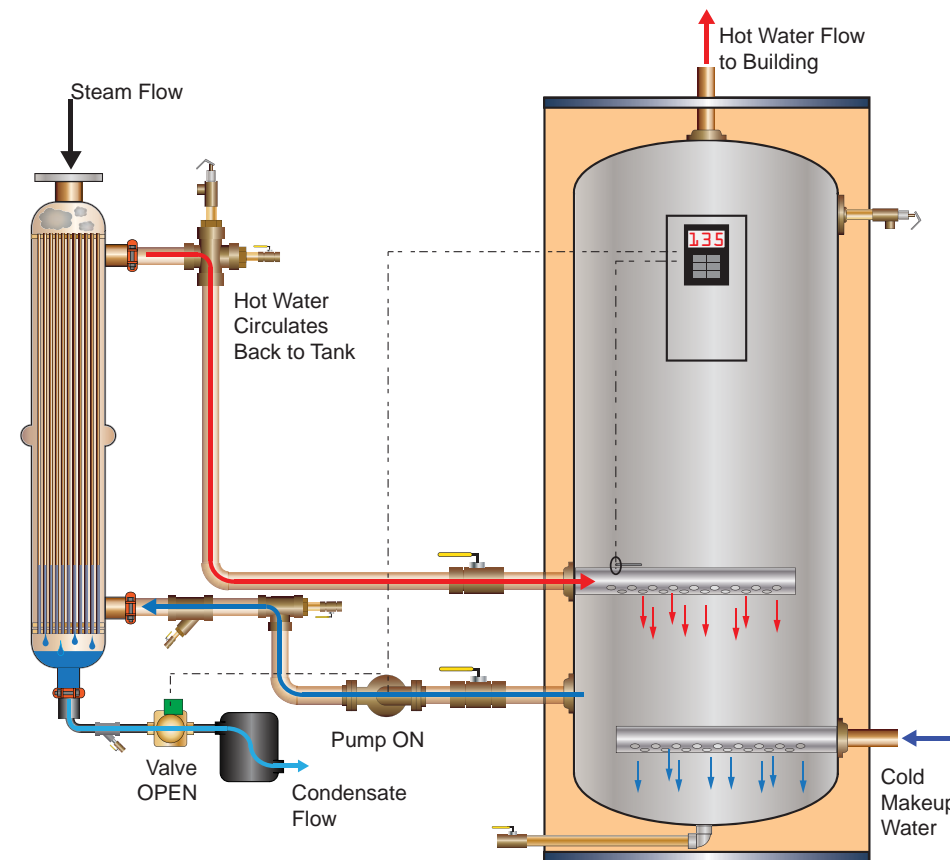


The COBREX heat exchanger is a shell-and-tube design with domestic water in the shell and steam/condensate in the tubes. The exchanger is vertically oriented and single-pass. Steam and water paths are 100% counterflow and provide the greatest possible temperature differential at all points in the heat exchanger. The domestic water side also contains several baffles to create a circuitous and high velocity flow. This allows large amounts of hot water to be generated from a remarkably small heat exchanger.

The straight, copper, double-wall tubes are brazed into brass tube sheets and contained within a solid copper shell. The exchanger is ASME stamped to Section VIII for 150psi maximum allowable working pressure (MAWP).



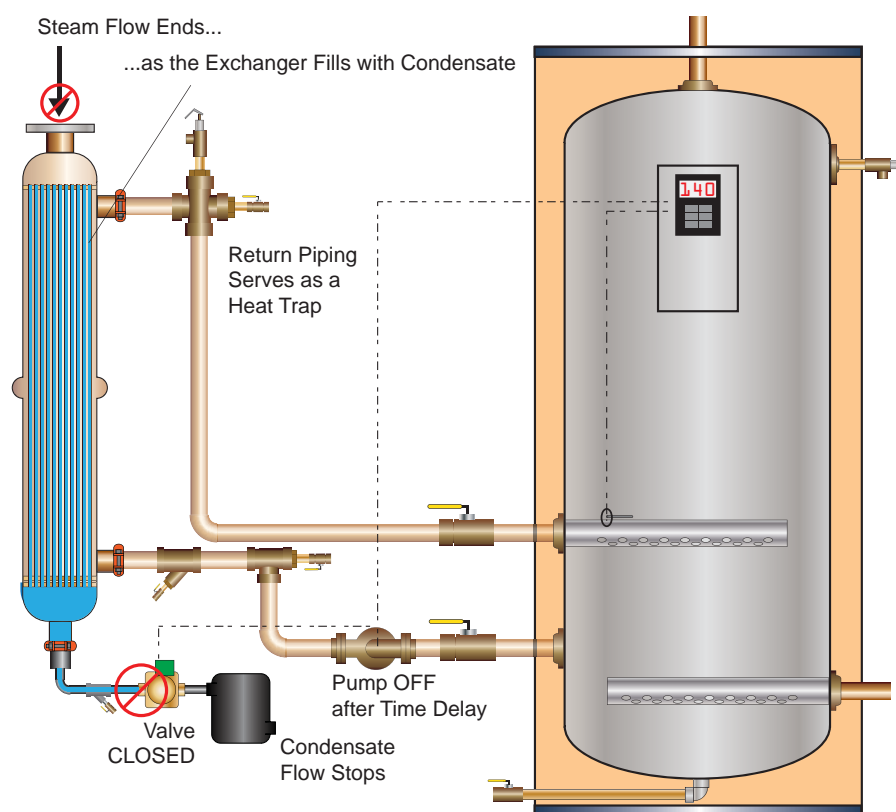
HEATER OPERATION Heat Transfer and Condensate Control System



Call for Heat Begins

Demand for hot water causes cold makeup water to enter the storage tank and reduces tank temperature. This temperature drop is sensed by the operating probe, which signals the control to energize the pump between the tank and heat exchanger and opens the condensate valve. The pump draws cold domestic water through the exchanger which extracts heat from the steam causing the steam to condense. This condensate is evacuated from the exchanger through the steam trap. The pressure drop caused by condensing steam causes more steam to enter the exchanger and the process continues. The heated water flows back to the storage tank through diffuser tubes that prevent the circulated flow from disturbing the natural stratification of water in the tank and allows more than 80% of usable hot water from storage to enter the building piping at the required temperature.

When demand for hot water ends, the pump will continue to operate until the tank returns to the required stored water temperature. The probe will then signal an end to the call for heat.



Call for Heat Ends (condensate control system)

Immediately after the call for heat terminates, the condensate valve is closed which traps condensate in the heat exchanger. Steam continues to condense until the exchanger is entirely filled with condensate and the flow of steam is stopped completely. The pump remains energized for an additional minute to extract any residual heat from the exchanger and transfers it into the domestic water in the tank. The pump delay will only raise tank temperature an additional 2°F.

Advantages of the COBREX[®] Storage Water Heater



Heat exchanger and tank on separate skids

Installation of the entire system is greatly simplified by reducing the size and weight of the individual parts. The piping between the tank and heat exchanger is fully fabricated at the factory for simple field installation.

Heat exchanger not immersed in the tank

Heat exchanger removal is greatly simplified and the required pull space is only one heat exchanger diameter (maximum 10") away from the mounting stand

Heat exchanger is lighter weight and easier to move

The largest heat exchanger is only 100 lbs. and is a fraction of the weight of a typical double-wall u-tube exchangers of equal capacity and greatly simplifies replacement if necessary

Clean-in-place fittings for heat exchanger

The heat exchanger can be de-scaled in place without disconnecting any plumbing

Redundancy

Dual heat exchanger product comes standard with selection switches, common steam header manifold, and steam isolation valves.

AquaPLEX[®] storage tank

Standard 25-year corrosion warranty. The duplex stainless steel tank is fully pickle-passivated and is naturally immune to corrosion in all potable waters. The tank requires no linings and no anodes rods or induced current anodes for corrosion protection. Unlike 316L or 304L stainless tanks, there is no concern about chloride stress corrosion cracking.