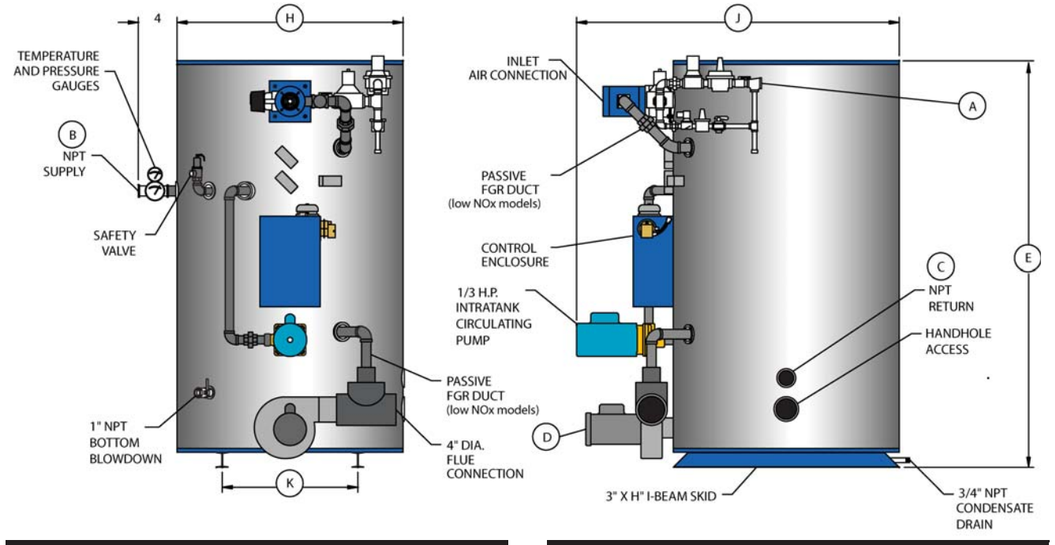
Performance and Dimensions

	Boiler Horsepower ►	11	16	21	28
	Input Btu/h	399,000	565,000	750,000	1,000,000
	Max Output Btu/h (ANSI Z21.13)*	371,000	525,000	697,500	930,000
	Burner Operation	on-off	on-off	on-off	lo-hi-lo, 3:1 turndown
	Maximum Operating Temperature - °F	210	210	210	210
	Minimum Return Water Temperature - °F	no minimum	no minimum	no minimum	no minimum
	Minimum Temperature Rise - °F	10	10	10	15
	Maximum Water Flow - gpm	75	105	150	125
	Minimum Water Flow - gpm	no minimum	no minimum	no minimum	no minimum
	Minimum Flow Gas Pressure - inches W.C.	4.5	4.5	4.5	4.5
	Maximum Static Gas Pressure - inches W.C.	14	14	14	14
	Maximum Vent Length (6" dia.)	500 eq. ft.	500 eq. ft.	500 eq. ft.	390 eq. ft.
	Maximum Combustion Air Length (6" dia.)	120 eq.ft.	120 eq.ft.	120 eq.ft.	120 eq.ft.
A	Gas Connection - NPT	3/4	1	1	1-1/4
B	Return Connection (cold inlet) - NPT	2	2	3	3
C	Supply Connection (hot outlet) - NPT	2	2	3	3
D	Blower Motor Horsepower/Amps @ 115V	1/3 6	1/3 6	1/2 8	3/4 11
E	Overall Height	79	79	81	81
H	Width	34-1/2	34-1/2	45	45
J	Overall Depth	54	54	63	63
K	Distance Between Skids	23	23	27	27
	Approximate Shipping Weight - lbs	1560	1660	2190	2400
	Approximate Operating Weight - lbs	2280	2330	3606	3628

Output varies with changes in return (entering) boiler water temperature. Output shown is with maximum efficiency.
Intra-tank circulating pump operates only during a firing cycle.



VENTING REQUIREMENTS
Positive Pressure - Condensing (category IV) Stainless Steel, Positive Pressure Vent Required

STANDARD ELECTRICAL REQUIREMENTS
Circulating Pump: 1/3 hp, 115V, 8 amp. Blower Motor: Refer to chart.

EPV Series

Condensing Water Boiler

400,000 to 1,000,000 Btu/h
11 to 28 Boiler Horsepower
Low NOx available

Up to 97% Efficiency
Direct Vents up to 500 Equivalent Feet

H UL ULC

Riverside HYDRONICS

EPV Series

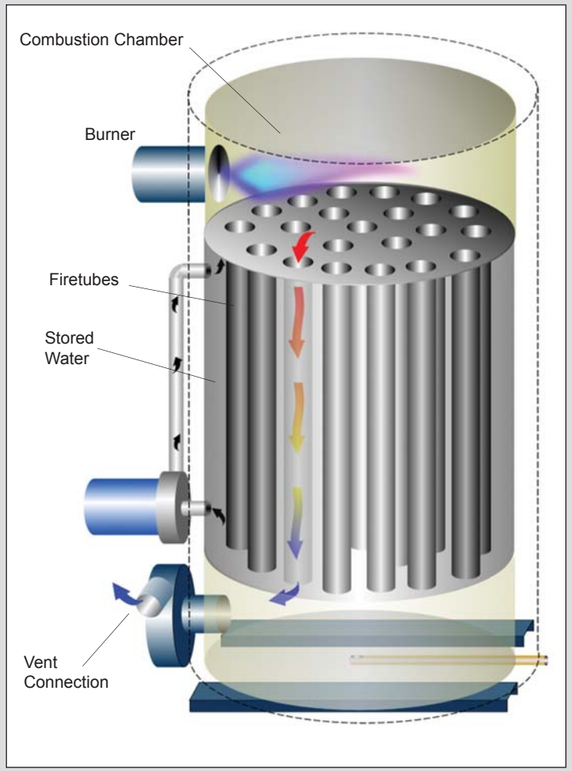
Condensing Firetube Water Boiler

MODE OF OPERATION

EPV is a high-efficiency, down-fired, vertical steel firetube boiler. With typical boiler system temperatures, it will operate at no less than 87.5% thermal efficiency. With cooler return water entering the boiler, the efficiency of EPV will reach 93%, and the stage-fired 1,000,000 Btu EPV will approach full thermal utilization with an efficiency **in excess of 97%.**

The boiler features a top-mounted combustion chamber with flue products drawn downward through the appliance's firetubes by an induced-draft blower. Efficiency improvement is achieved by increasing the ratio of heat transfer surface to Btu input. This increased area of heat transfer promotes the cooling of flue gases below the point where water vapor entrained in the flue gases condenses to liquid (dewpoint temperature). Greater fuel utilization is accomplished in this condensing mode by capturing the latent heat of the vapor-to-liquid phase change. The down-fired design facilitates condensing operation by creating a natural, gravity-induced method of collecting and evacuating the resulting condensate.

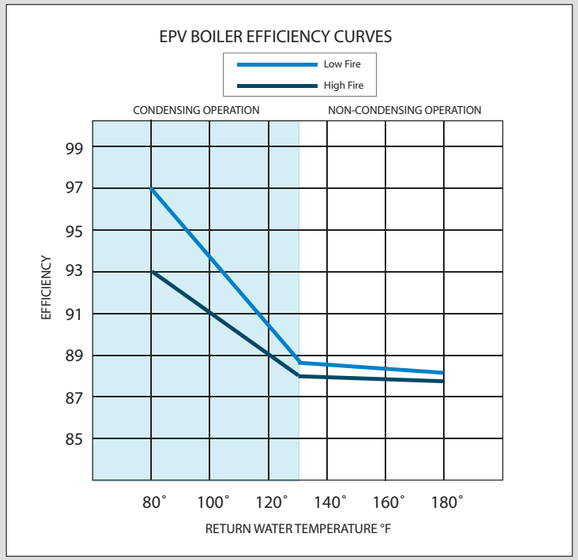
Condensate collects at the base of the unit and is evacuated from the appliance. In areas of the boiler where condensate forms and collects, stainless steel, electroless nickel plating and acid-inert polymers augment the steel vessel.



NO MINIMUM RETURN WATER TEMPERATURE for MAXIMUM OPERATING EFFICIENCY

When return water to the EPV boiler falls below 130°F, it becomes possible to reduce the temperature of flue gases in the boiler to below their dewpoint (≈ 130ºF), thereby capturing the latent heat released when water vapor becomes liquid. As a general rule, the colder the return water, the lower the resulting flue gas temperature and the greater the operating efficiency.

To take maximum advantage of condensing operation, EPV has no lower limit on the temperature of returning water. This enables building energy management strategies, such as outdoor reset or nighttime setback, to be utilized to their fullest. EPV can also be installed into traditional low-temperature applications such as A/C reheat, heat pump and snow melt without the addition of low-temperature bypass piping and valves.



MEDIUM MASS DESIGN

EPV boilers contain a moderate amount of stored water. As result, EPV provides several installation and operating advantages when compared to instantaneous or low mass boilers.

NO MINIMUM FLOW

Boiler loops utilizing variable frequency drives (VFD) to reduce flow rates through the main heating loop are becoming more common as an energy saving measure. With these systems, maximum savings are realized when flow can be reduced by as much as 1/3 during times of no building occupancy or low demand on the heating system. Because it requires no minimum flow, a EPV boiler offers seamless integration into boiler systems utilizing VFD. Instantaneous boilers often have minimum flow requirements and put limitations on the use of VFD.

PRIMARY-ONLY PIPING

EPV boilers can be installed in a primary-only boiler piping system. This reduces the cost of installation by eliminating the piping manifolds necessary with primary/secondary piping systems.

A primary-only piping system also simplifies boiler setup and operation. In primary/secondary systems, flow rates through the boilers, sizing of manifold piping and sizing of individual pumps are critical to boiler operation. Primary-only piping avoids these complexities.

REDUCED CYCLING, LOW STANDBY LOSS

The moderate water storage in the EPV boiler serves as a Btu "bank" that provides heat during low demand periods while reducing the frequency of burner cycles. Heat loss through the storage vessel is reduced to neglible levels due to ASHRAE-compliant insulation.

The 1-million-Btu EPV boiler also includes staged firing with a turndown rate of 3-to-1 to further improve load matching and reduce burner cycles during low demand periods.

Off cycle losses are lowered due to the combined effect of an air damper and a small static pressure fan at the combustion air inlet. During off cycles, these devices counteract the movement of air through the boiler and the loss of energy out the boiler venting.

ADDITIONAL FEATURES

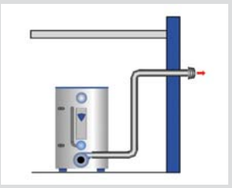
SIMPLE and RELIABLE CONTROLS

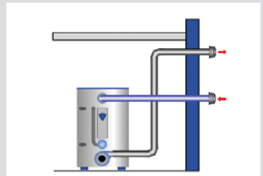
EPV boilers use controls that are easily understood and are non-proprietary; two factors that help to reduce maintenance time and cost. These temperature and combustion controls are widely used in the boiler industry and are highly regarded for their reliability.

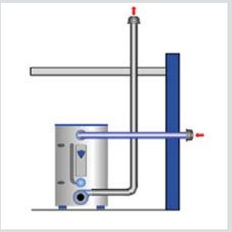
Staged firing is accomplished with a single, constant rpm blower with a two-position air damper and dual gas valves.

VENTING SIMPLICITY and FLEXIBILITY

EPV boilers vent under postitive pressure through the roof or directly through a sidewall for up to 500 equivalent feet. Direct combustion air can be vented to the boiler for up to 120 equivalent feet.







DURABLE STEEL CONSTRUCTION for YEARS OF SERVICE

EPV boilers are ASME stamped to section IV for an operating pressure of 125 psi. Steel tubes of 1/8" wall thickness are rolled, beaded and welded into 1/2" thick steel tubesheets. This is similar to the tubejoint on high-pressure steam boilers. Vertical tube boilers do not experience significant thermal stress but, for added protection, the fireside of the furnace tubesheet is insulated from the heat of combustion with a patented thermal barrier.

EPV boilers are provided with 10 years of thermal shock warranty protection.