

EMX Series

Steel Firetube Water Boiler

Gas • Oil • Combination Gas/Oil
400,000 to 1,400,000 Btu/h
10 to 34 Horsepower



Medium Mass
82% Efficiency with Gas • 84% Efficiency with Oil



Riverside[®]
HYDRONICS

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MODE OF OPERATION

EMX is a mid-efficiency, medium-mass, vertical firetube steel boiler. Combustion is provided by a fan-assisted, flame retention burner and occurs beneath the boiler pressure vessel in an insulated chamber. Combustion is controlled and monitored by a solid-state flame safeguard. Under the force of fan pressure, flue products move upward through the boiler heating tubes transferring heat to the stored water. Flue baffling ensures sufficient back pressure and flue gas turbulence to achieve a thermal efficiency of up to 84%. At the point of exiting the boiler, flue gases are no longer under positive pressure and rise by natural buoyancy through a category I vent system.

DURABLE STEEL CONSTRUCTION for YEARS OF SERVICE

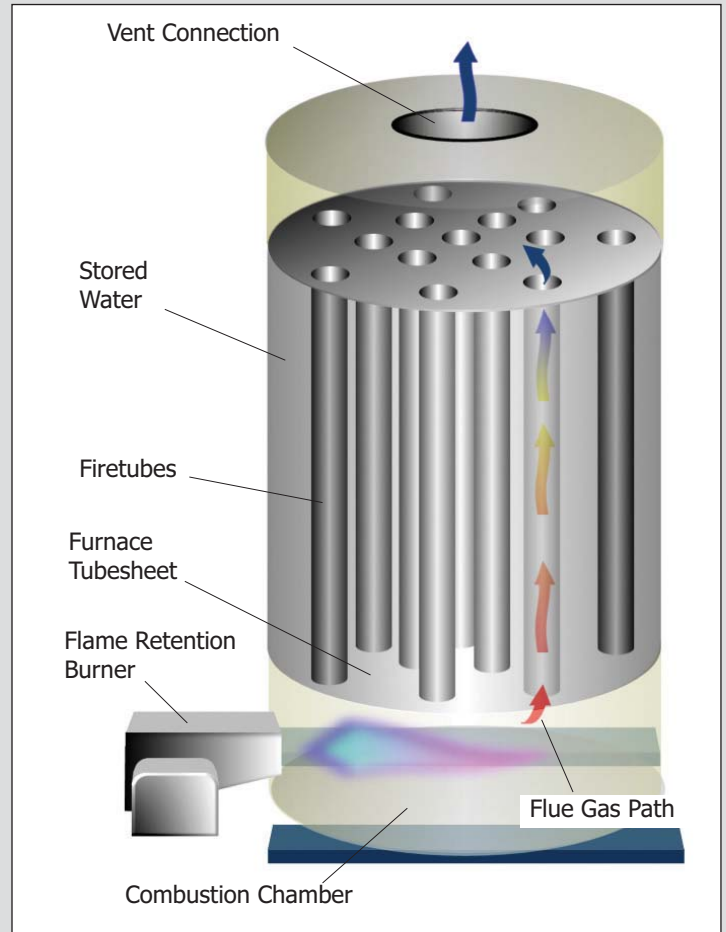
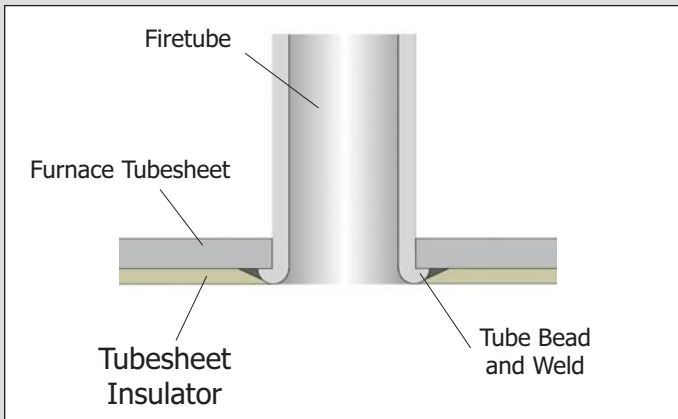
EMX boilers are ASME stamped to section IV for an operating pressure of 125 psi. Steel tubes of 1/8-inch wall thickness are rolled, beaded and welded into 1/2-inch-thick steel tubesheets. This is similar to the tubejoint on high-pressure steam boilers. Vertical tube boilers do not experience significant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

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



Tube-to-tubesheet weld.

EMX Tubesheet Detail



APPLICATION

HIGH or LOW RETURN WATER TEMPERATURE

Unlike many non-condensing boilers, EMX can accept return water below 120°F without condensing and without low-temperature bypass piping. Inlet temperatures can be as low as 70°F as long as the temperature rise across the boiler increases outlet water to 120°F or higher. This capability makes EMX suitable for low-temperature applications; such as snow melt and heat pumps, and suitable for temperature setback strategies as well.

In a more typical hydronic heating application, EMX boilers can generate outlet temperatures of 230°F maximum.

MULTIPLE BOILER SYSTEMS

EMX boilers are intended to be used in a multiple boiler system, providing the turndown capability inherent with multiple burners. Additional load matching can be achieved by the available staged-firing of oil or combination gas/oil boilers.

MEDIUM MASS DESIGN

EMX boilers contain a moderate amount of stored water. As a result, EMX 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 80% during times of no building occupancy or low demand on the heating system. Because it requires no minimum flow, an EMX boiler offers seamless integration into boiler systems utilizing VFD. Instantaneous boilers have minimum flow requirements and put limitations on the use of VFD.

PRIMARY-ONLY PIPING

EMX boilers can be installed in a primary-only boiler piping system, meaning the building pump provides all the needed circulation through the boilers. This reduces the cost of installation by eliminating the many boiler pumps and piping manifolds necessary with primary/secondary piping systems. It also helps to reduce operating cost because there is no secondary pump operation accompanying each firing cycle.

A primary-only piping system also simplifies boiler setup and operation. In primary/secondary systems, flow rates through the boilers and sizing of manifold piping are critical to the operation of the system. EMX boilers with primary only avoid these issues.

REDUCED CYCLING, LOW STANDBY LOSS

The moderate water storage in the EMX boiler serves as a Btu “bank” that provides heat during low demand periods. The number of firing cycles during periods of minimal demand is reduced when compared to instantaneous boilers.

In addition, in the primary-only piping system, the EMX boilers can each be isolated from the boiler loop during an off cycle by 2-way valves. Stopping flow through the boiler during burner off cycles limits the amount of energy that can be lost by convection during periods of standby.

ADDITIONAL FEATURES

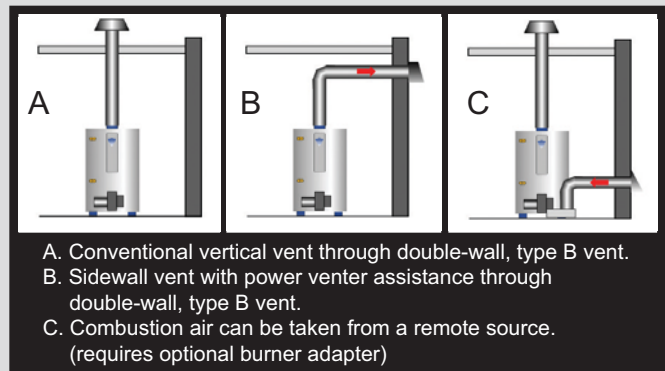
ELECTRONIC OPERATOR



EMX boilers use an electronic operating control that provides for setpoint operation, outdoor reset, and nighttime setback. It provides digital readout of temperatures, operating status and alarms. Most parameters are fully user programmable. The operator can be connected to a building automation system through an optional serial port with ModBus RTU.

VENTING FLEXIBILITY

EMX boilers can be vented through several configurations depending upon the requirements of the installation. Configurations include conventional through the roof, through a sidewall with assistance from a power venter and with either room air or connection to a remote air source through up to 120 equivalent feet.



SAFE OPERATION

EMX boilers are ETL-listed as a packaged boiler/burner unit. The boilers are also FM compliant and meet the requirements for ASME CSD-1 controls and GE/GAP insurance.

Standard controls include:

- Operating thermostat adjustable to 230°F
- Manual-reset high temperature limit
- Electronic low-water cutoff
- Electronic flame safeguard with pre-purge
- Dual safety shutoff valves (>400 MBH)
- Gas pressure regulators on main and pilot
- Air proving switch
- ASME-rated pressure relief valve

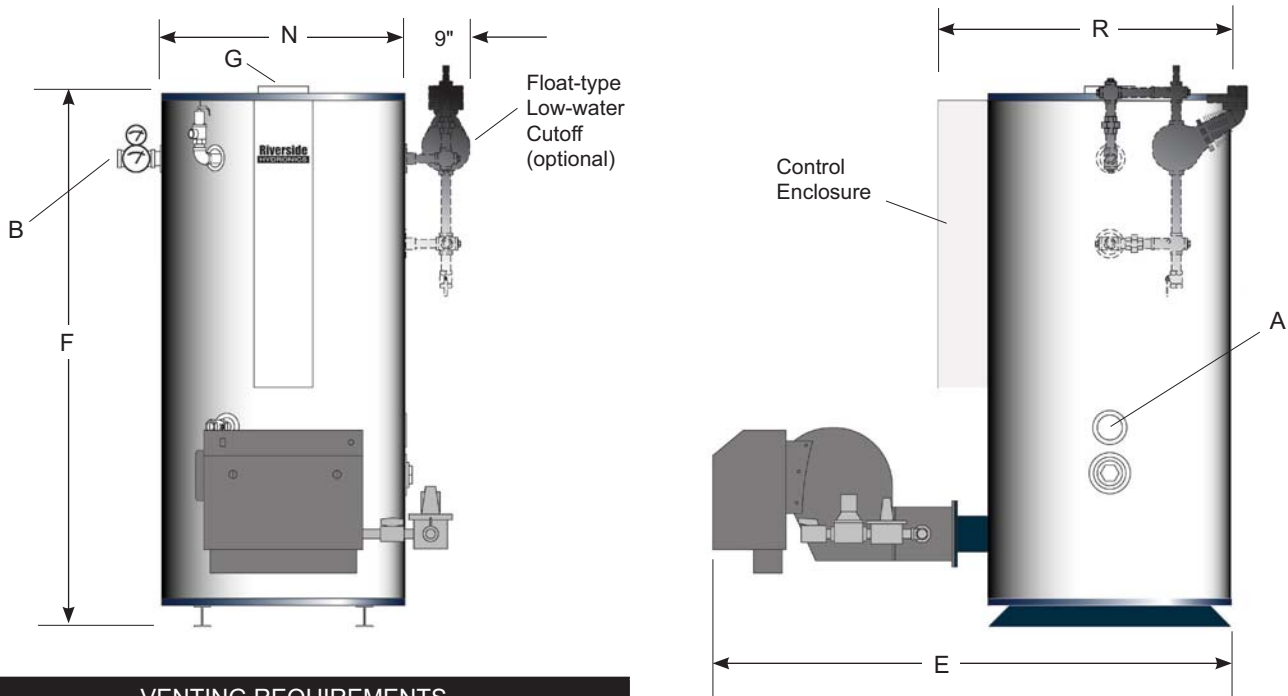
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Performance and Dimensions

	Boiler Horsepower ▶	10	13	18	20	25	29	34							
	Input Btu/h	399,000	540,000	720,000	800,000	1,000,000	1,200,000	1,400,000							
	Output Btu/h (gas)	327,000	442,800	590,400	656,000	820,000	984,000	1,148,000							
	Output Btu/h (oil)	335,160	453,600	604,800	n/a	840,000	1,008,000	1,176,000							
A	Cold Inlet - NPT	2	2	2	2	3	3	3							
B	Hot Outlet - NPT	2	2	2	2	3	3	3							
E	Overall Depth - Gas	45	52	52	54	63	63	63							
	Oil	55	55	55	n/a	63	63	63							
	Gas/Oil	68	68	68	n/a	77	77	82							
F	Overall Height	75	82	82	82	82	82	82							
G	Flue Connection Diameter	7	8	10	10	10	12	12							
N	Width	34-1/2	34-1/2	34-1/12	34-1/12	45	45	45							
R	Front to Back	41	41	41	41	52	52	52							
	Standard Blower Motor	HP	amps	HP	amps	HP	amps	HP	amps	HP	amps	HP	amps	HP	amps
	Gas	1/6	1.75	1/3	8	1/3	8	1/3	8	1/2	10	1/2	10	1/2	10
	Oil	1/2	10	1/2	10	1/2	10	n/a		1/2	10	1/2	10	1/2	10
	Combination Gas/Oil	1/3	8	1/3	8	1/2	10	n/a		1/2	10	1/2	10	3/4	12

Specifications may change without notice. Visit www.riversidehydronics.com for the most up-to-date submittal data.



VENTING REQUIREMENTS

- .02 to -.06 inches W.C. (Category I)
Double-wall venting required.

THE ENTIRE VENT SYSTEM SHOULD NEVER BE SIZED BASED UPON THE VENT CONNECTION DIAMETER EXCLUSIVELY. FOR PROPER VENT SIZING, CONSULT THE NATIONAL FUEL GAS CODE UNDER "FAN ASSISTED."

STANDARD ELECTRICAL REQUIREMENTS

Supply 115 Volt, 60 Hertz through 20 amp circuit.

Alternate motor voltages are available.
230V 1Ø, 208V 3Ø, 230V 3Ø, 460V 3Ø