

PACKAGED STEAM GENERATORS

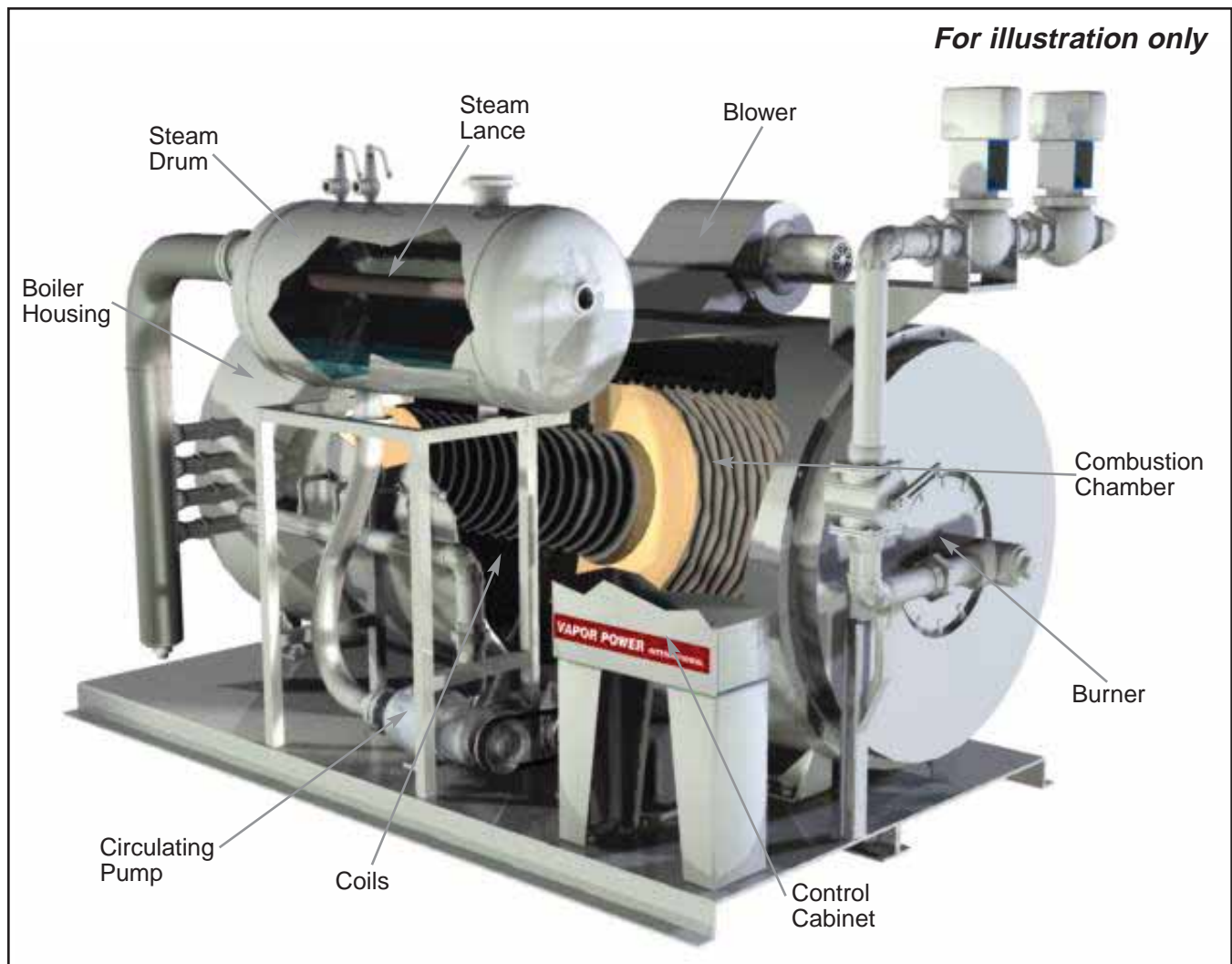
The CIRCULATIC® Line



Recirculating Water Tube Units to:
600 BHP and 530 psig
20,700 lbs. per hour

VAPOR POWER INTERNATIONAL

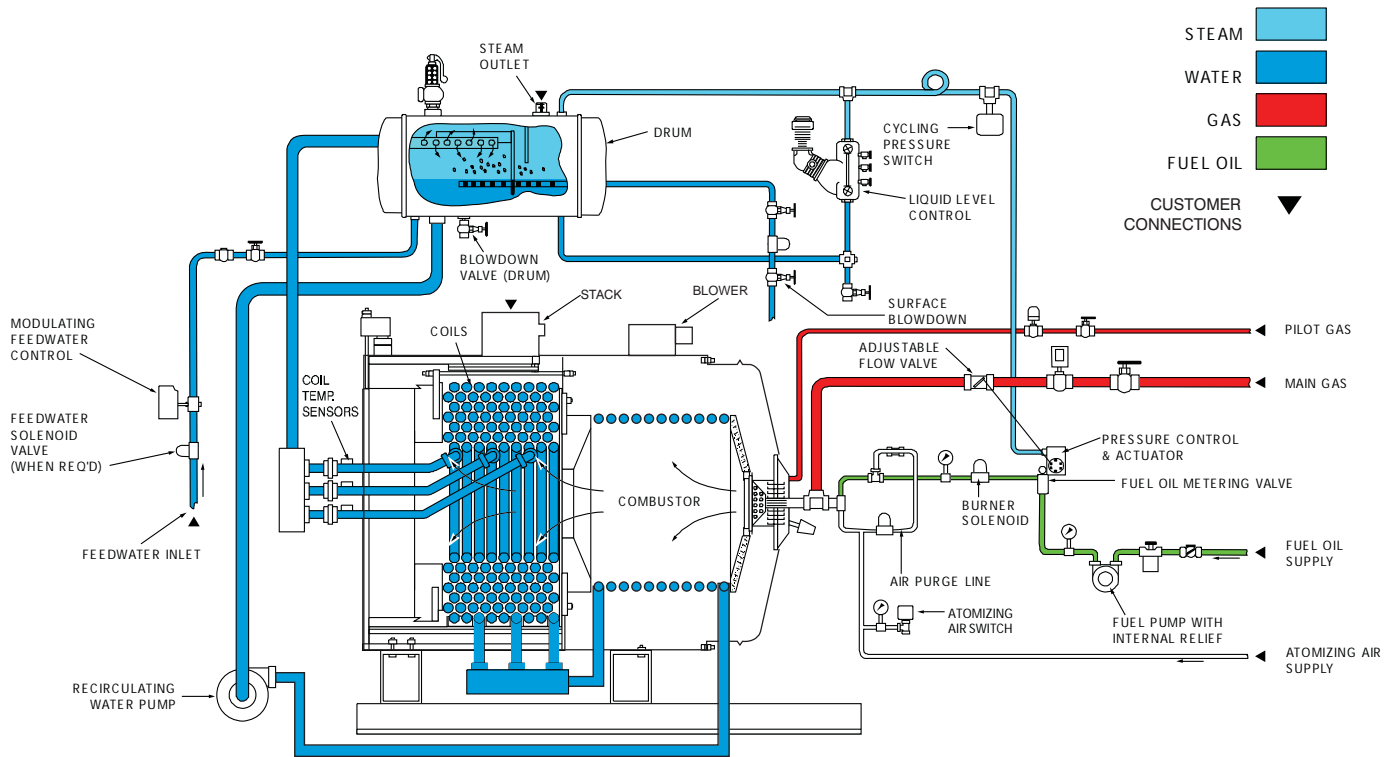
Low cost, process and heating steam for Industrial and Commercial Applications



User Benefits you can rely on —

- Rapid start up – from cold start to full load in five minutes.
- High quality steam – guaranteed 99%+ dry steam.
- Minimal soot problems – separate combustion chamber prevents coating coils with partially burned fuels.
- Low fuel requirements – air preheating and combustion zone for complete combustion.
- Quick response to load changes – cycle time of less than one minute.
- Complete line – eleven sizes to permit proper selection for any application.
- Long life with minimum maintenance – coil design pressure of 1000 psig result in thicker coil walls for longer life.
- Optimum efficiency at any load – full modulation of water, air, fuel and output.
- Easy access to burners – end mounted burner is simple to maintain.
- Low cost coil replacement – multiple coil design permits replacement of only the damaged coil.
- Minimum prepurge energy loss – smaller size unit allows proper prepurge in seconds.
- Simplified fuel switching – only have to turn selector switch, no burner changes required.
- Minimum off-on cycling – turndown ratios up to 10 to 1 for handling wide range of loads.
- Low installation costs – packaged, compact units require only 60% of floor space needed for firetube boilers.
- Easy installation skid mounted assembly including control console.
- Maximum safety – steam drum located outside of firing zone.

Circulatic Flow Diagram



Operating Concept

The CIRCULATIC steam generator is a forced recirculation water tube boiler in which water under pressure circulates at high velocity through a set of nested, parallel connected, coils while forced draft combustion gases travel across the coils. The hot gases envelope the entire tube surface making maximum use of both radiant and convective heat to achieve very high heat transfer rates.

Water at saturation temperature is drawn from the steam drum and forced through the coils at three times the maximum steaming rate by the recirculating pump.

The water is then carried back to a steam lance, in the top of the same drum, where steam is released and effectively separated. The 99%+ dry steam is withdrawn

from the drum and the water forms a reservoir of heat saturated water to feed the recirculating centrifugal pump. Solids collect at the bottom of the drum and are blow out when the blow-down valve is opened.

A pressure sensitive control which responds to the steam pressure in the drum, regulates the supply of fuel and air to the burner and provides efficient combustion over the complete modulating range of the boiler. High efficiency is obtained, without thermal shock, over the full operating range, not only at rated output.

The built-in safeguards which monitor the main flame and initiate shutdown in the event of loss of flame, as well as the location of the steam drum out of the firing area, assures maximum operational safety of the boiler.

Controls

An integral control panel contains all controls and indicators necessary for the safe operation of the unit. A programmed operating sequence is also incorporated for simplified startup. Available optional equipment includes linkageless burner controls, touch screen controls interface, variable speed combustion air blower, oxygen trim, remote communication and data acquisition, and more.

Built to Meet Standards

Every unit is built to ASME Standards, Hartford inspected and National Board registered. CSA, Coast Guard, American Bureau of Shipping, Factory Mutual, Lloyds and other approvals are also available upon request.

Factory Tested

All units are fire tested at the factory, with their individual controls to assure proper operation and to allow for control adjustments which avoid installation delays.

CIRCULATIC — General Specifications

Type Boiler

Multiple parallel coil, watertube type, forced circulation, forced draft fired.

Burners

Air atomized burner for #2 fuel oil.
Multi-orificed burner for natural gas or LPG.
Burners available to meet NOx regulations.

Ignition

Electric spark ignited, interrupted gas pilot on most units.
Direct electric spark optional on #2 oil units where permitted.

Safety Controls

Programmed flame safeguard control with flame detector, coil temperature control, low water cut-off control and steam pressure control.

Operating Pressures

Adjustable from:
3-13 psig, 50-135 psig, 100-225 psig, 250-475 psig.
Consult factory for special operating pressure ranges.

Electric Power

Main - 230, 460, or 575 VAC, 3 Ph, 60 Hz
Control - 120 VAC, 1 Ph, 60 HZ, factory wired. Special voltages are available on request.

Optional Equipment

Automatic Blowdown, Stack Switch, Automatic Multiple Boiler Control, Annunciator Systems and equipment to meet special codes.

Data and Dimensions

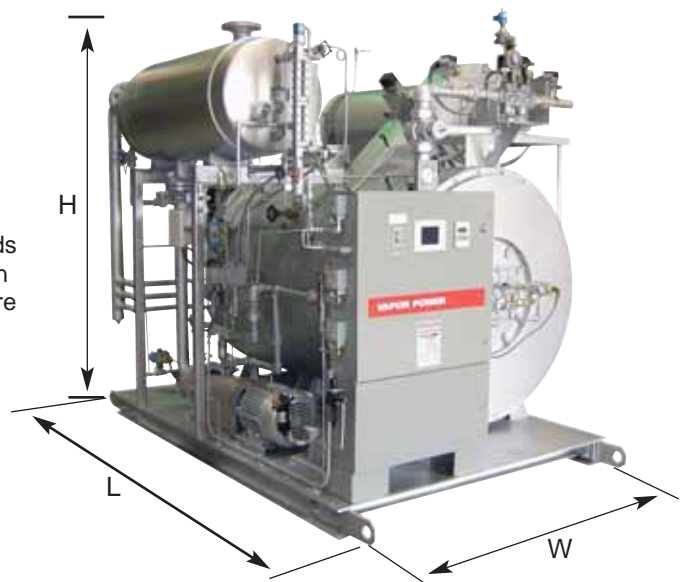
Rated Capacity BHP	Equivalent Evaporation PPH from & at 212°F	Thermal Capacity Btu's/hr x 1000	Design Pressure psig	Approximate \diamond Fuel Consumption			Dimensions Inches			Approximate Shipping Weight in Lbs.
				Oil GPH	IMP Gal.	Gas CFH	L	W	H	
75	2,580	2,510	15-530	22.0	18.3	3,138	104	78	90	5,300
100	3,450	3,350	15-530	29.3	24.4	4,188	110	78	96	5,800
150	5,175	5,025	15-530	44.0	36.7	6,281	120	78	96	7,700
200★	6,900	6,700	15-530	58.7	48.9	8,375	122	92	107	9,800
250★	8,625	8,370	15-530	73.3	61.1	10,463	130	92	107	11,900
300★	10,350	10,050	15-530	88.0	73.3	12,563	130	92	107	11,900
350★	12,075	11,725	15-530	102.7	85.6	14,656	130	92	107	13,000
400★	13,800	13,400	15-530	117.3	97.8	16,750	151	92	107	15,500
450★	15,525	15,075	15-530	132.0	110.0	18,844	155	92	116	17,500
500★	17,250	16,750	15-530	146.7	122.2	20,938	164	119	144	33,000
600★	20,700	20,100	15-530	176.0	146.7	25,125	180	119	144	36,000

\diamond - Based on #2 fuel oil at 141,000 Btu/U.S. gal. and natural gas at 1000 Btu/cu.ft. heat content.

★ - Available with heavy oil combustion system.

Application Assistance

With over 75 years experience in the design and manufacture of steam generators, and thousands of operating units. Vapor stands ready to assist with any specific application. Computer simulation of process systems and heat loss analysis are available to ensure the proper system for your application.



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Printed in U.S.A. 1/03 But. No. C-1000