

# PACKAGED STEAM GENERATORS

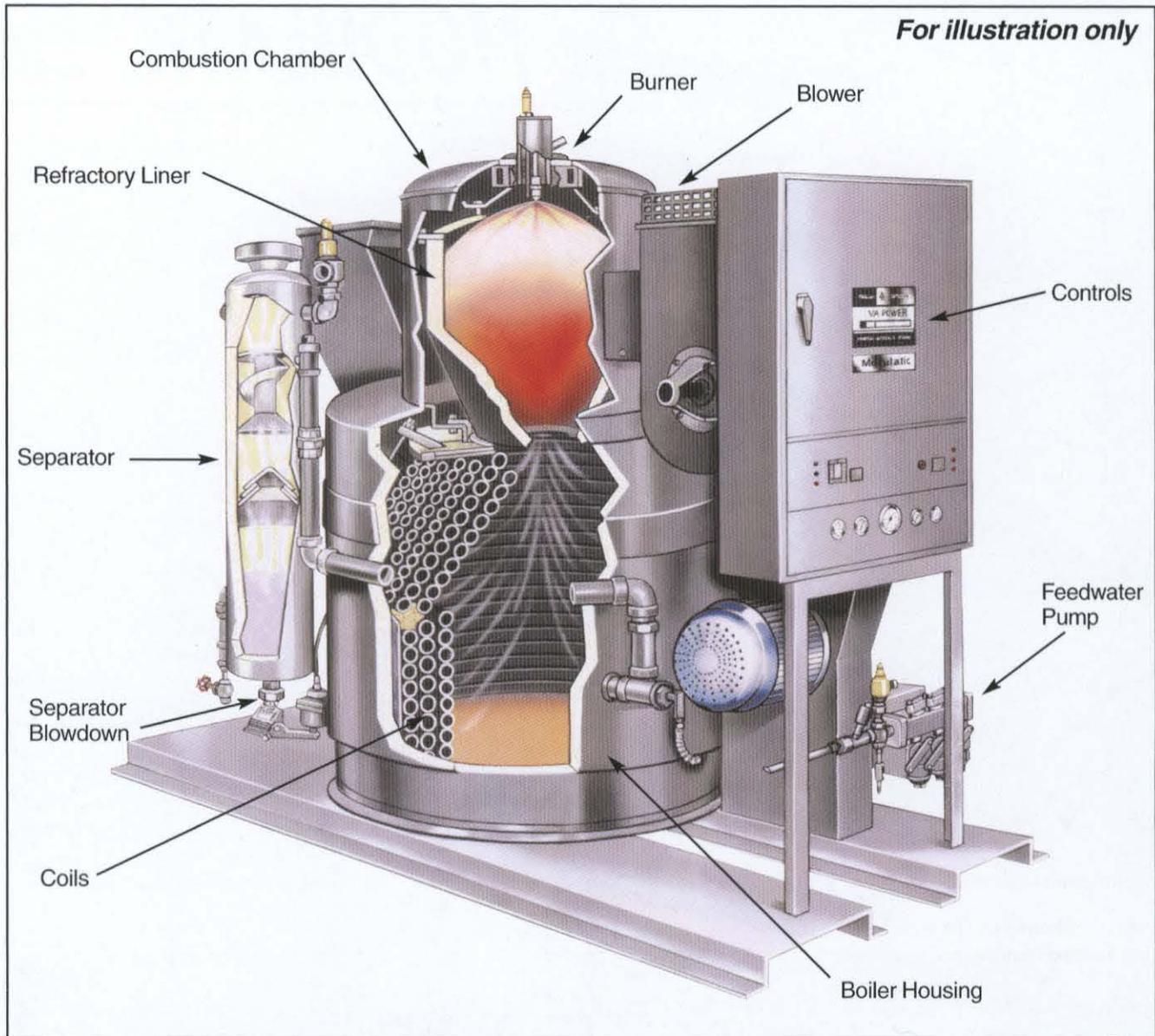
## *The MODULATIC<sup>®</sup> Line*



Single Pass Water Tube Units to:  
300 BHP and 3100 psig  
10,350 lbs. per hour

**VAPOR POWER INTERNATIONAL**

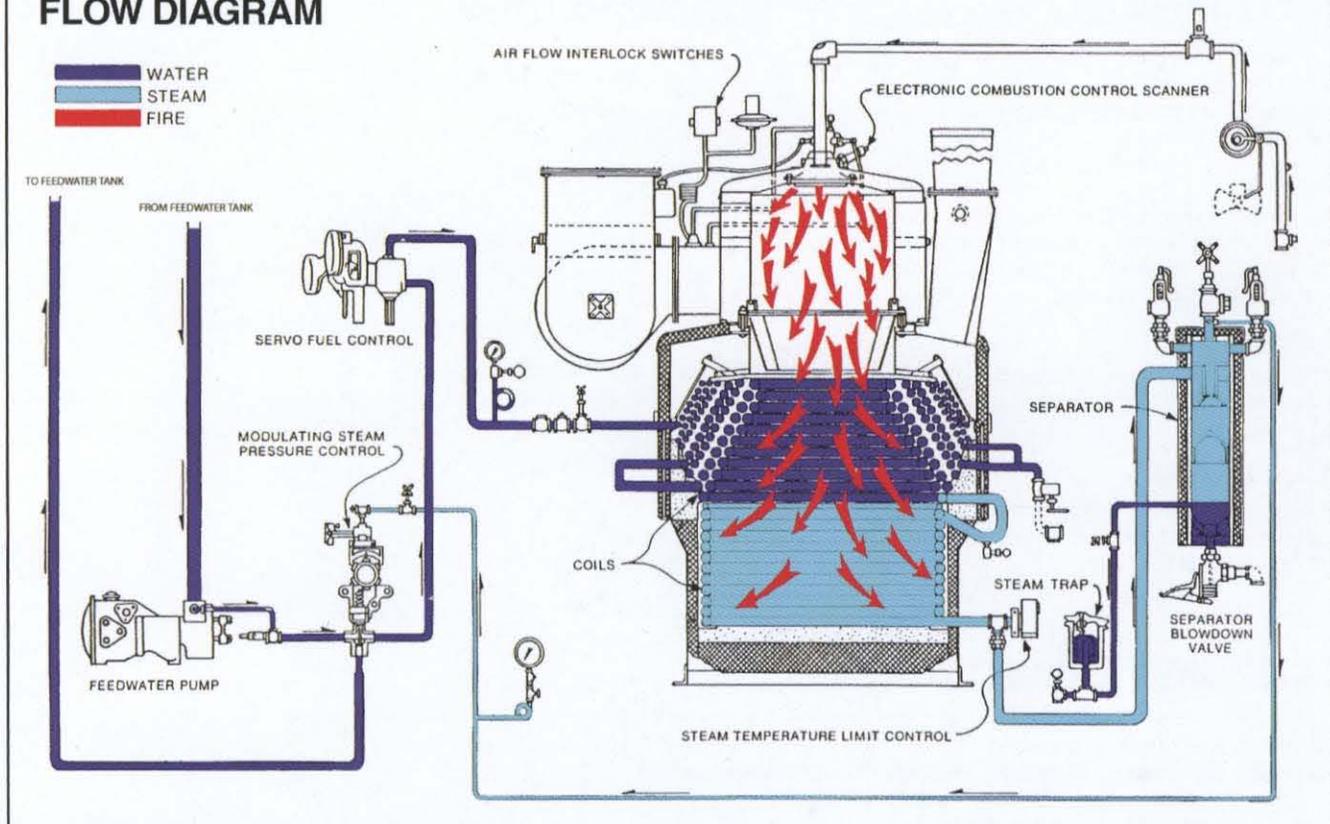
# Low cost, high pressure steam for Industrial Applications



## User Benefits you can rely on —

- Rapid startup — from cold start to full load in less than 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 refractory lined chamber for complete combustion.
- Quick response to load changes — cycle time of less than one minute.
- Complete line — seven sizes permit proper selection for any application.
- Long life expectancy, rugged design and components, ASME design.
- Easy access to burners — top mounted burner is simple to maintain.
- Low cost coil replacement — multiple coil design permits replacement of only the damaged coil.
- Minimum pre-purge energy loss — smaller size unit allows proper pre-purge in seconds.
- Simplified fuel switching — only have to turn selector switch, no burner changes required.
- Minimum off-on cycling — turndown ratios up to 13 to 1 for handling wide range of loads.
- Low installation costs — packaged, compact units require only 60% of floor space needed for firetube boilers.
- Safe design — no latent energy in the unit. Risk of catastrophic failure is eliminated.
- Coils are designed for a minimum of 1000 psi in thicker coil walls for longer life.

## FLOW DIAGRAM



## Operating Concept

The MODULATIC steam generator is a once through, forced circulation, water tube boiler in which water under pressure circulates at high velocity through a series of coils while forced draft combustion gases travel across the outside of 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 is forced by the feedwater pump into the series connected multiple coil assembly where 90% of the water is converted to steam. The steam and the remaining 10% unevaporated water are carried from the boiler to the separator (where unevaporated water is separated from the steam), providing 99%+ dry steam output. Solids collect at the separator bottom and are blown out when the blow down valve is opened.

Close tracking of load variations is possible through use of a patented bypass regulator which continuously senses steam pressure. The control changes feedwater volume to the coils in response to every change in steam demand. This modulated flow of feedwater varies the amount of steam output without the thermal shock of on-off feedwater pump action experienced in conventional boilers.

In addition, a patented servo fuel control accurately adjusts fuel and air for the most efficient combustion mixture by continually monitoring changes in the feedwater flow. Inefficient burner cycling is eliminated, fluctuating demands are satisfied and steam pressure is held constant. The design is such that the boiler cannot be fired without water being fed into the coils.

## 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.

## 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.

## Built to Meet Standards

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

# MODULATIC — General Specifications

## Type Boiler

Sectionalized coil tube type, forced circulation, forced draft fired.

## Burners

Air atomized burner for #2 fuel oil.  
Multi-orificed burner for natural gas or LPG.  
Combination of above for dual fuel applications.  
Burners available to meet Low NOx regulations.

## Ignition

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

## Safety Controls

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

## Operating Pressures

Adjustable from:           5-13 psig           400-810 psig  
                                  100-250 psig       400-1500 psig  
                                  200-540 psig       500-2700 psig

Consult factory for special operating pressure ranges.

## Electric Power

Main - 230 or 460 VAC, 3 Ph, 60 Hz  
Control - 120 VAC, 1 Ph, 60 Hz  
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 ♦ Fuel Consumption			Dimensions ○ Inches			Approximate Shipping ○ Wt. in Lbs.
				Oil GPH	IMP Gal.	Gas CFH	L	W	H	
18★	620	602	15 - 3100	5.5	4.6	770	54	41	48	1,500
40	1,380	1,339	15 - 3100	12.0	10.0	1,720	72	52	70	4,000
65	2,240	2,176	15 - 3100	20.0	16.7	2,800	84	48	77	4,200
100	3,450	3,348	15 - 3100	30.0	25.0	4,300	87	60	82	5,300
150	5,175	5,021	15 - 3100	48.0	40.0	6,800	100	60	109	7,200
200	6,900	6,695	15 - 3100	60.0	50.0	8,600	96	63	106	7,700
300	10,350	10,042	15 - 3100	88.3	73.3	12,700	120	84	130	17,500

- ♦ - Based on #2 fuel oil at 141,000 Btu per U.S. gallon and natural gas of 1000 Btu per cubic foot heat content.
- - Based on 300 PSIG design unit.
- ★ - All models except 18 BHP are available as oil fired, gas fired or combination gas/oil units. 18 BHP unit has off-on automatic control.

All units are 240v or 480v, 3 phase, 60 cycle, 120 VAC control power factory wired. Other voltages on request.

## Application Assistance

With over 50 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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