

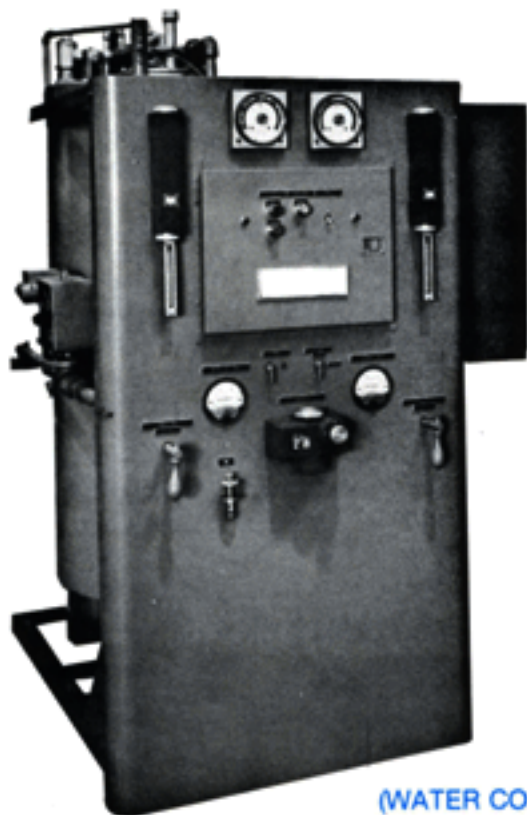
FOR EFFICIENT PRODUCTION OF ENDOTHERMIC ATMOSPHERES

ENDOTHERMIC GENERATOR

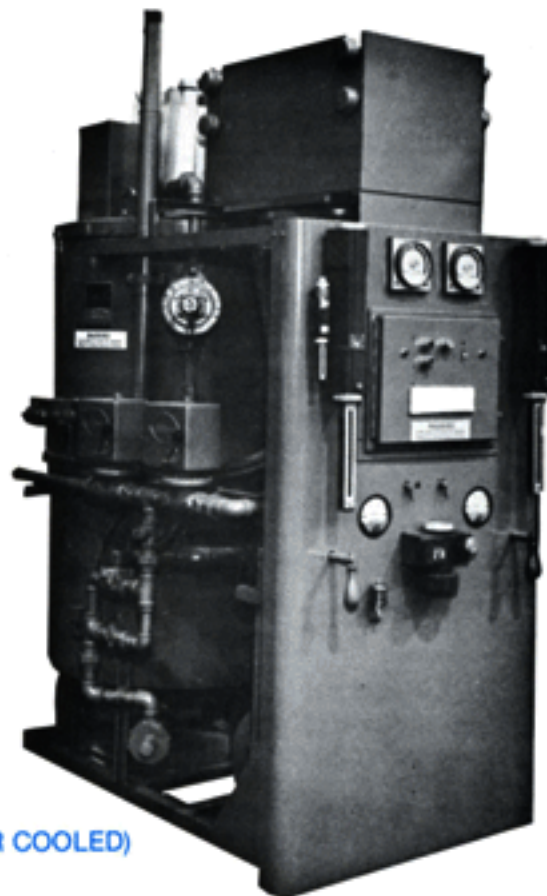
BULLETIN B-900

Features:

- 3/16" Inconel plate retort
- Double-pass retort design
- Convenient carbon cleanouts
- Lower operating temperatures
- Constant discharge pressures



(WATER COOLED)



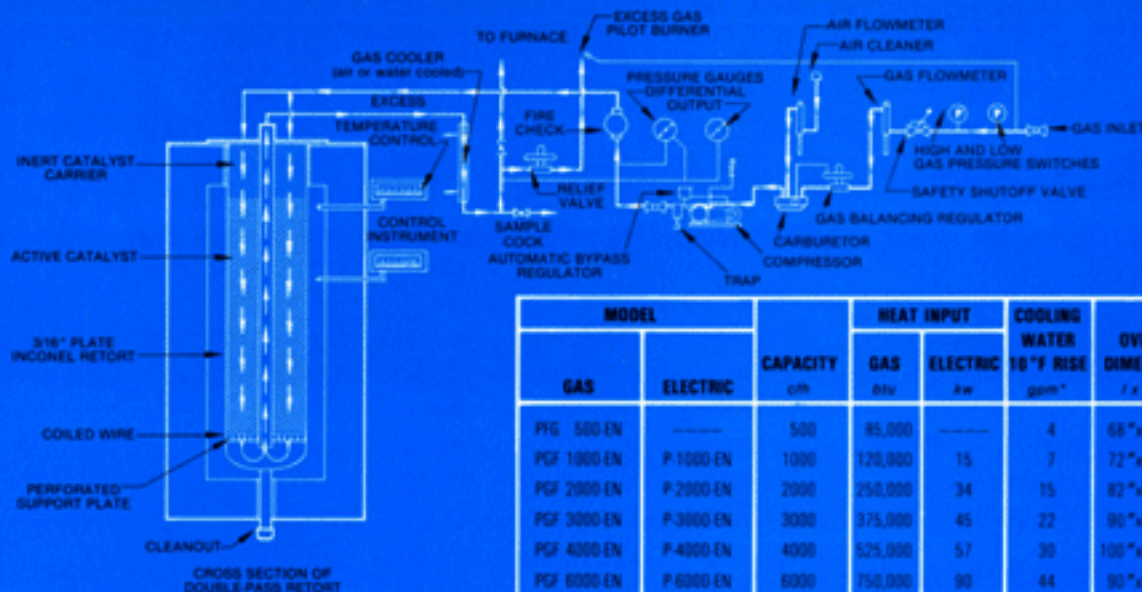
(AIR COOLED)

Endothermic atmosphere, generated by cracking a mixture of natural gas and air over a heated catalyst bed, provides the most flexible and effective protective atmosphere for general heat treating of steels. The Selas Endothermic Generator is the preferred atmosphere source for clean hardening, tempering, brazing, or for a carrier gas in carburizing and carbonitriding.

Reliable low cost performance from any endothermic generator depends on sound basic design of the retort and catalyst assembly, together with a full complement of the necessary gas control components. Only the Selas line of endothermic gas generators fully meets these basic parameters.

selas
Heat Treating Equipment Div.

TYPICAL SCHEMATIC FLOW DIAGRAM INCORPORATING OPTIONAL FM/IRI (FIA) SAFETY EQUIPMENT



MODEL		CAPACITY cfh	HEAT INPUT		COOLING WATER 10°F RISE gpm*	OVERALL DIMENSIONS l x w x h	SHIPPING WEIGHT lbs.
GAS	ELECTRIC		GAS Btu	ELECTRIC kw			
PG 500 EN	—	500	85,000	—	4	68"x45"x75"	3,400
PGF 1000 EN	P-1000 EN	1000	120,000	15	7	72"x45"x78"	3,700
PGF 2000 EN	P-2000 EN	2000	250,000	34	15	82"x45"x85"	4,800
PGF 3000 EN	P-3000 EN	3000	375,000	45	22	90"x45"x88"	6,000
PGF 4000 EN	P-4000 EN	4000	525,000	57	30	100"x48"x93"	7,500
PGF 6000 EN	P-6000 EN	6000	750,000	90	44	90"x75"x90"	10,000

*Air cooled unit an option

Specifications subject to change without notice.

Double Pass Retort design uses the heat energy of the cracked gas to heat the catalyst bed, thus reducing the amount of total energy required to run the generator. The high length/diameter ratio in the double pass concept assures a more uniform temperature across the bed. This is enhanced by the heating accomplished in the center of the bed by the return pass.

The fuel-air mixture is introduced at the top of the retort, passing first through a layer of inert catalyst carrier, which pre-heats and diffuses the mixture uniformly across the area of the retort. The mixture passes through the long, uniformly heated, active catalyst to produce the "cracked" endothermic gas. The gas then passes up the center pipe, heating the center of the catalyst bed and reducing the gas temperature.

As the retort and catalyst are heated, the Inconel retort expands more than the nickel impregnated ceramic catalysts, which tends to settle and occupy the resulting space. On cooling, the retort is stretched and repeated cycling can split the retort. Again Selas minimizes the problem with the slim retort. In addition, the catalyst bed is supported on wire coils which gradually collapse to provide expansion — another Selas exclusive!

Process Control requires that the fuel-gas ratio remain constant and that the produced gas be delivered at constant pressure. Selas supplies an automatic carburetor to maintain constant ratio together with a compressor and pressure regulator to ensure discharge pressure. Furnaces may be placed in service or removed without affecting the produced atmosphere or changing the output pressure. Other furnaces thus are not affected.

Gas and Air Flowmeters are provided upstream of the carburetor to meter the fuel-air inputs. An optional BY-PASS flowmeter may be used to provide a vernier adjustment of the mixture ratio. A produced gas meter is also an available option.

Safety Features are an important consideration in the generator design since both fuel and produced gases

are potentially combustible. A fire check is included as standard. Full FM/IRI (FIA) safety equipment, optional at extra cost, is strongly recommended for all installations. It includes safety shut-off valve, high and low pressure switches, and pilot monitoring for gas-fired models. Optional excess temperature control for the heating chamber is also recommended.

Easy Cleanout is an important maintenance feature. Sooting can occur in any generator from excessive operation at low dewpoints. Selas provides a generous measure of flanged joints and plugged crosses for easy disassembly or cleaning. Note also that the exclusive Selas doublepass retort design permits carbon accumulated in the catalyst bed to settle out to the bottom without clogging. Only the Selas design provides for retort cleanout without disassembly.

Catalyst Replacement is required less frequently with a Selas double-pass design. When it does become necessary, the center pipe is removed with the retort cover plate leaving a hole in the center of the catalyst bed. This greatly simplifies loosening and removal of the used catalyst without damaging the retort.

Catalyst Regeneration. All endothermic generators require periodic regeneration of the catalyst bed. Selas takes the guesswork out of this procedure by providing a panel-mounted differential pressure gage to measure the pressure drop across the catalyst bed.

The commonly used method of scheduling regeneration on a time interval basis is simply not reliable. If too frequent, the life of the catalyst bed is shortened, and if left too long, costly failures will result.

Gas-Fired or Electric models are essentially identical except for the heating system. Selas quality 2000°F furnace construction is used for the heating chamber. Models for propane or butane in place of natural gas are available.

Accessory Equipment such as portable dewpointers and automatic carbon potential control systems are available.

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