

C.I. HAYES

HAYES SERIES IGG ENDOTHERMIC GAS GENERATOR

DESCRIPTION

The Hayes IGG Series Endothermic Generator can produce atmosphere in the following adjustable ranges of analysis: (Natural Gas) 0.0 to 0.5% carbon dioxide, 17.5 to 21.5% carbon monoxide, 30 to 35% hydrogen, 0.0 to 2.5% methane, and dew points of plus 30°F to approximately 10°F with the balance being nitrogen.

The gas compositions are obtained by catalytically reacting natural gas and air in varying ratios and at varying temperatures. With natural gas, a temperature of approximately 1950°F is optimum for long life of heating elements, catalysts, and insulation. For weekend shutdowns, we recommend that the temperatures be lowered to 1400°F. To prevent the formation of excessive sooting, we recommend that dew points be controlled above 10°F.

The IGG is a compact unit consisting of a rectangular, electrically heated retort chamber and control panel mounted vertically on a steel frame. The unit is designed and constructed so that all parts of the equipment are easily accessible with special attention given to the placement and positioning of the retorts and the heating elements.

OPERATING TEMPERATURE:

For gases other than natural gas, the normal operating temperature is 1850°F; for natural gas, the construction, insulation and heating elements used in the Hayes unit are suitable for continuous operation at 1950°F.

CONSTRUCTION AND DESCRIPTION:

The shell is constructed of 10 gauge steel, seam-welded and reinforced where necessary. The frame is fabricated of structural steel shapes with all joints rigidly welded. Thermal insulation consists of the highest quality insulating brick suitable for the maximum continuous operating temperature.

The ceramic elements are mounted horizontally on either side of the retort chamber. The terminal ends extend out of either side of the chamber allowing for quick and easy changing of the elements without coming into contact or working around the hot retort.

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Vertical tube-type retorts for cracking the gas-air mixture are constructed of Inconel tubing and filled with a special nickel catalyst. The retorts are placed vertically in the heating chamber to obtain maximum surface contact between the catalyst and gas-air mixture.

The Hayes Endothermic Generators use a modular design to obtain the various capacities required by industry. Up to 1000 scfh, each generator contains one properly sized retort. For 2000 scfh, two 1000 scfh retorts are provided for 3000 scfh, three retorts are provided, etc. Means are provided to balance the flow between retorts.

The generator is equipped with a water cooled and baffled heat exchanger. The design and construction insures maximum cooling of the output gas and is easily cleaned and maintained.

The generator is furnished with flow indicators calibrated for natural gas, air and endothermic atmosphere. A flowmeter is included for each retort for balancing flow. Other fuel gases may be utilized and should be specified if required.

Quoted price includes the following equipment:

- A. Indicating control instrument to maintain proper heating chamber temperature (temperature controller).
- B. Flow indicators for measuring the gas and air input and the combusted gas output.
- C. A flow indicator for measuring each retort flow.
- D. Combustion controller for automatic control of gas and air ratio in the combustion chamber.
- E. Gauges to indicate the backpressure of each retort.
- F. Push-button for easy Start/Stop operation of the pumping equipment.
- G. ON/OFF Control Switch Station and light (panel mounted) to provide separate control of the heating elements in the retort chamber.

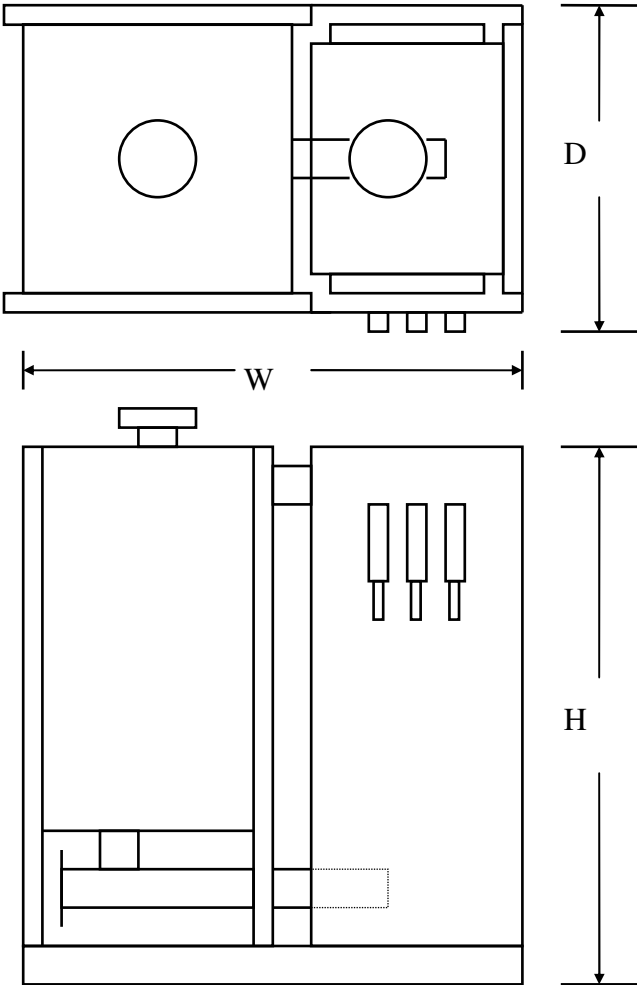
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H. Generator is equipped with the following safety devices as listed below:

1. High and low gas pressures cutouts
2. Automatic firecheck cutouts
3. Power failure cutouts
4. Automatic vent valve (automatically vents if the output line to the furnace is accidentally closed).
5. Overtemperature Protection including overtemperature instrument and thermocouple assembly.
6. Undertemperature Protection including undertemperature instrument and thermocouple assembly
7. Safety - shut-off valve
8. Nitrogen purge System
9. Alarm horn and alarm "silence" system for audible and visual indication of any of the following conditions:
 - a) Overtemperature
 - b) Undertemperature
 - c) High Gas Pressure
 - d) Low Gas Pressure
 - e) Fire Check Operation

IGG GENERATOR



MODEL	POWER	H	W	D	WATER	DRAIN	GAS	ENDO	VENT	WATER	WT
CFH	KW				IN		IN			GPM	
150	7.5	75"	24"	24"	0.5"	0.5"	0.5"	1.0"	0.75"	1	1300
500	15	77"	64"	33"	0.5"	1.25"	0.75"	1.25"	1.25"	1	1500
1000	22	77"	68"	45"	0.5"	1.25"	1.0"	1.25"	1.25"	2	4500
1500	36	87"	72"	48"	0.5"	1.25"	1.0"	1.50"	1.50"	2-3	5200
2000	50	87"	81"	50"	0.5"	1.25"	1.0"	1.50"	1.50"	3	6000
3000	50	87"	82"	62"	0.5"	1.25"	1.25"	1.50"	1.50"	3-4	6500