

Atmosphere Gas Generators

Standard Model Series

Extensively used in a variety of fields, such as the chemical, petroleum, synthetic resin and food industries, these generators are also important for the heat treatment of metals.

Atmosphere Gas Generators from Chugai Ro's Many Years of Experience and Expertise. A Full Lineup to Meet Diversified Needs.

Ever since we first introduced an atmosphere gas generator for heat treatment of metals in Japan, our atmosphere gas generators have been used in a variety of fields and they have earned a reputation among our customers for quality, service and versatility. With continuing efforts to improve the design and to develop new models, we now introduce a full line of atmosphere gas generators to supply any desired atmosphere gases with stable composition, at low cost.

We offer a wide selection of models ranging from small to large capacity to meet any individual requirements.



Exothermic Gas Generators

■ CRG-D

This gas generator produces an atmosphere gas composed mainly of N_2 to protect metal surfaces and minimize oxidation and decarburization. It is widely used for bright annealing, clean annealing and brazing of low carbon steel and non-ferrous metals. The chemical composition of the gas can be varied between lean and rich by simply changing the raw gas-air ratio. Eleven sizes are available with capacities ranging from 14 to 900 $m^3 N/h$.

Typical gas composition (% by volume)

	CO ₂	CO	H ₂	CH ₄	H ₂ O	Dew point	N ₂
Rich	7.3	10.2	7.6	0.5	0.8	5°C	Rest
Lean	12.8	1.5	0.8	0.0	0.8	5°C	Rest

Note) This table indicates the composition when using butane as the raw gas.



■ CRG-N

This gas generator produces a gas composed of over 97% N_2 with very small amounts of CO and H_2 by burning hydrocarbon gas mixed with an amount of air less than that required for theoretical combustion and by removing CO_2 and H_2 after cooling. This gas is inert, incombustible, and widely used not only for heat treatment and chemical processes but also in food processing where the presence of O_2 , H_2O , CO_2 , etc. is not desired. Six sizes are available with capacities ranging from 14 to 280 $m^3 N/h$.

Typical gas composition (% by volume)

	CO ₂	CO	H ₂	CH ₄	H ₂ O	Dew point	N ₂
Butane	0.1	1.8	0.9	0.0	0.0	-40°C	Rest
Propane	0.1	1.8	1.0	0.0	0.0	-40°C	Rest
Natural gas	0.1	0.5	0.5	0.0	0.0	-40°C	Rest



■ CRG-HNC

Atmosphere gas is produced by adding steam to nitrogen-rich gas to cause a reaction in which CO is converted to CO_2 and H_2O to H_2 . The generated CO_2 is then removed. This gas does not contain either C or O_2 and is best suited for bright annealing steel to be galvanized or tinned. It is also suitable for heat treatment of silicon steel, stainless steel and other materials which are easily oxidized. Four sizes are available with capacities ranging from 70 to 280 $m^3 N/h$.

Typical gas composition (% by volume)

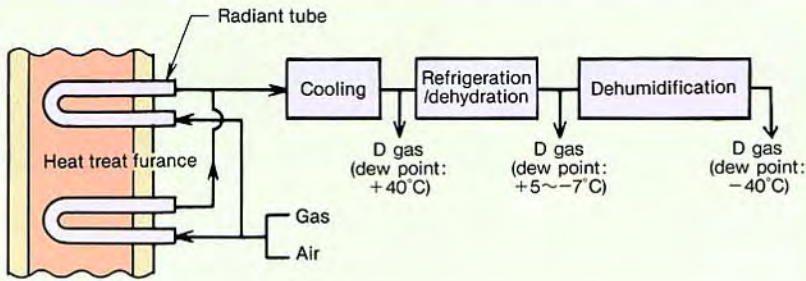
	CO ₂	CO	H ₂	CH ₄	H ₂ O	Dew point	N ₂
Butane	0.1	0.1	3.0~10.0	0.0	0.0	-40°C	Rest
Propane	0.1	0.1	3.0~10.0	0.0	0.0	-40°C	Rest
Natural gas	0.1	0.1	3.0~10.0	0.0	0.0	-40°C	Rest



Exothermic Gas Generators Using Furnace Waste Heat

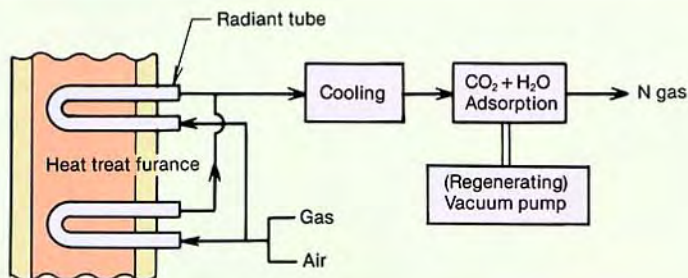
■ CRG-D-F

This energy-saving gas generator produces D gas by recovering the exhaust gas burnt in the combustion chamber. The combustion chamber is connected to the radiant tubes installed in a furnace to which D gas is supplied. Four sizes are available with capacities ranging from 60 to 240 m³N/h.



■ CRG-N-F

This generator produces N gas according to the same principle as that of the CRG-D generator. Eight sizes are available with capacities ranging from 40 to 320 m³N/h.



Hydrogen/ Nitrogen Mixed Gas Generator

■ CRM-HN

This equipment is used to precisely mix H₂ and N₂ in any desired ratio. It uses H₂ from A gas or electrolytic hydrogen and N₂ from air separator or HNC gas. A 1:6.5 mixture of A gas and N₂, for example, will produce an atmosphere with 90% N₂ and 10% H₂, which is ideal for annealing strip coils. By including a deoxidation device, it is possible to reduce the content of O₂ to less than 1 ppm. Various sizes are available with capacities ranging from 100 to 500 m³N/h.

Gas composition

H ₂	3 ~ 20% (Any chosen content)
N ₂	97 ~ 80% (Balance)
O ₂	5 ppm or less



Endothermic Gas Generators

■ CRG-R (Separate type)

Propane, butane, methane or other hydrocarbon gas is catalytically cracked to produce an atmosphere gas for carburizing, carbonitriding, brazing, sintering, bright hardening and clean hardening. Six standard sizes are available with capacities ranging from 14 to 160 m³N/h. This type of generator can be electrically heated or gas or oil fired.

Typical gas composition (% by volume)

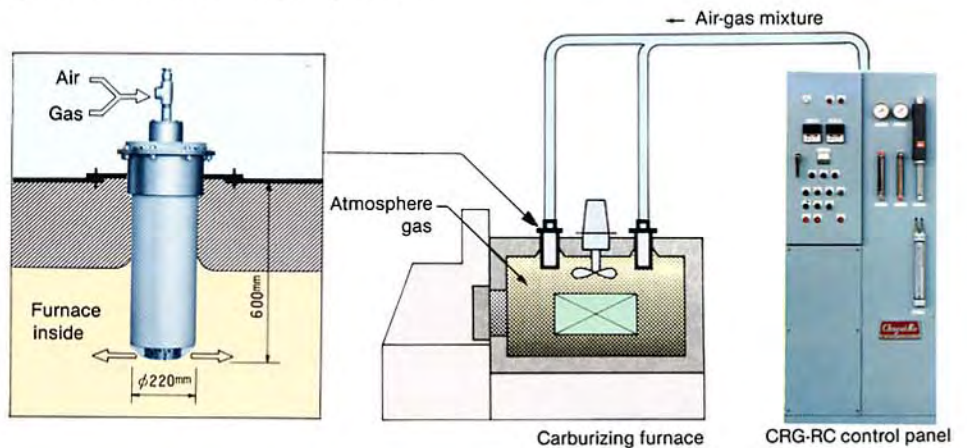
	CO ₂	CO	H ₂	CH ₄	H ₂ O	Dew point	N ₂
Butane	0.3	24.5	32.1	0.05	0.0	±0°C	Rest
Propane	0.3	24.0	33.4	0.05	0.0	±0°C	Rest
Natural gas	0.3	20.9	40.7	0.05	0.0	±0°C	Rest



■ CRG-RC (Cartridge type)

This is a cartridge type gas generator which uses a newly developed high-performance catalyst and is designed so that the reaction tube can be directly inserted into a heat treat furnace. Carburizing atmosphere gas (R gas) is generated at low cracking temperatures

of 850 to 950°C. The gas composition and applications are the same as those for the CRG-R generator. The capacity of one reaction tube is 12 m³N/h, and for applications requiring a larger capacity, more than one reaction tube can be used.



■ CRG-A

Ammonia gas is catalytically cracked to generate atmosphere gas. The gas composition is 75% H₂ and 25% N₂, and the dew point is about -40°C. This generated gas has strong reducing characteristics and is used for annealing stainless steel and plating, reducing, brazing or sintering various metals. Eight sizes are available with capacities ranging from 14 to 360 m³N/h.

Typical gas composition (% by volume)

	CO ₂	CO	H ₂	CH ₄	H ₂ O	Dew point	N ₂
Ammonia	0.0	0.0	75.0	0.0	0.0	-40°C	25.0

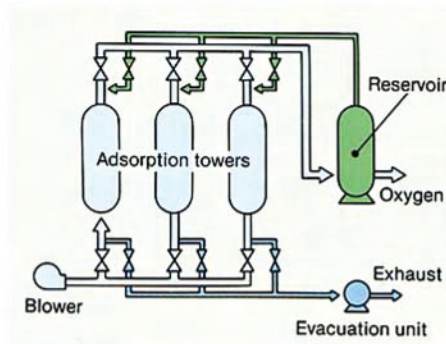


Adsorption Type Oxygen Generator

■ CPO

This is a PSA oxygen generator producing low-cost oxygen by simple operation. Air is fed to adsorption towers filled with molecular sieves, to separate and generate oxygen with a maximum concentration of 94%. It has a variety of

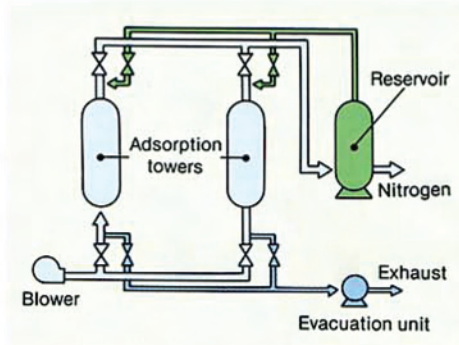
applications such as preliminary fusing and cutting in an electric arc furnace, aeration in sewage treatment, and oxygen enriched combustion. Six sizes are available with capacities ranging from 6 to 180m³N/h(at 90% O₂).



Adsorption Type Nitrogen Generator

■ CPN

This is a PSA nitrogen generator that produces low-cost nitrogen by simple operation. Compressed air is fed to adsorption towers filled with molecular sieving carbon, to separate and generate nitrogen. Nitrogen can be produced in concentrations of 99.9% and 99.99% and used for a variety of applications. Capacities range from 10 to 200m³N/h.



SAFETY PRECAUTIONS: Read the instruction manual carefully before using the equipment.

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