



GENERON
INNOVATIVE GAS SYSTEMS



Nitrogen Generators

Pressure Swing Adsorption (PSA)

Nitrogen On Demand

Largest Product Offering

Highest Efficiency

Highest Purity

Proven Dependability



Nitrogen Generators – Highlights & System Features

HIGHLIGHTS

- ✓ Proven designs with over 30 years experience, IGS is building one of the world's largest portfolio of nitrogen generators with units from 0.6 Nm³/h / 22 SCFM to 3,200 Nm³/h / 2,030 SCFM.
- ✓ Over 10,000 industrial systems installed worldwide.
- ✓ IGS's long history in manufacturing PSAs has enabled it to design systems for years of trouble free operation.
- ✓ Cost advantage of a Generon IGS Nitrogen PSA Generator
 - Cost saving of 50% to 300% over Bulk Liquid, Dewars and Nitrogen Cylinders.
 - No safety or handling issues with bulky high pressure cylinders or dangers of cryogenic liquids
 - No complicated supply contracts with ever escalating charges

SYSTEM TYPES

IGS supplies three types of PSA Generators:

- Bank PSA Nitrogen Generators
- Compact PSA Nitrogen Generators
- Twin Tower Nitrogen Generators

Generon IGS's technical specialist will accurately select and size your system to meet your specific requirements.

OPTIONS

- Refrigerated Dryer
- Oxygen Analyzer
- Product Flow Meter
- Air Receiver Tank
- Nitrogen Buffer Tank
- Bottle Filling Station
- Purities to 99.9999% with DeOxo System
- Feed Air Compressor
- Product Booster Compressor
- Enhanced PLC with Telemetry
- Dew Point Analyzer
- Classified or Unclassified Areas

KEY FEATURES

- Purities up to 99.9995%
- Automatic part load operation to 30% of design capacity
- Exhaust Muffler
- PLC Piping & Instrumentation
- Safety Valve
- Nitrogen Pressure and Flow Regulator
- Control System
- Skid Mounted
- Hour Meter
- Air Filters
- Adsorber Vessels
- Fully automated unattended operation
- Pneumatic Valves
- Pressure Switch for automated Idle-Mode

Nitrogen Generators—Standard Systems

Nitrogen NITROSWING® Bank PSA Series

This patented design was specifically designed to meet our client's requirements for a highly compact, expandable and durable PSA product. Able to produce Nitrogen Purities of up to 99.995%, this patented design allows for a client to purchase a unit to meet the demands of today and expand the unit as their demand increases by the addition of "PSA Modules" without having to purchase a new unit.

Input Pressures: up to 145 PSIG (10 barg)
Output Pressures: up to 110 PSIG (7.5 barg)
Flows: up to 4300 SCFH (112 Nm³/hr) @ 99.9%



Nitrogen Compact PSA Series

Continuing to be the leader in innovative designs, Generon IGS has developed the Compact PSA Systems. This design allows for the nitrogen and air buffer tanks to be on the same skid, saving space and installation time. 99.9995%

Input Pressures: up to 145 PSIG (10 barg)
Output Pressures: up to 110 PSIG (7.5 barg)
Flows: up to 1744 SCFH (46 Nm³/h) @ 99.9%



Nitrogen Twin Tower PSA

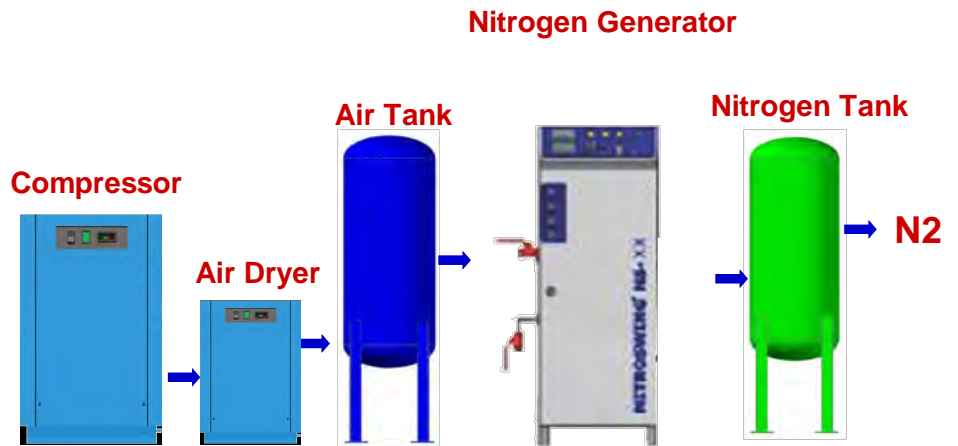
Using the most efficient Carbon Molecular Sieve on the market to date, our Twin Tower PSA System provides maximum output flow with a smaller footprint than most common PSAs on the market. 99.9995%

Input Pressures: up to 150 PSIG (10.3 barg)
Output Pressures: up to 120 PSIG (8.3 barg)
Flows: up to 44166 SCFH (1160 Nm³/h) @ 99.9%

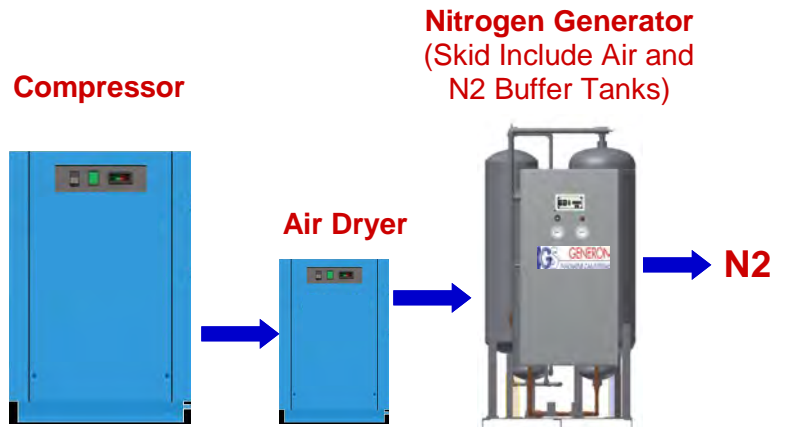


Nitrogen Generators—PSA System Components

Nitrogen NITROSWING® Bank PSA Series



Nitrogen Compact PSA Series



Nitrogen Twin Tower PSA



Nitrogen Generators – PSA Technology

IGS has over 30 years experience in the design and manufacturing of Pressure Swing Adsorption (PSA) plants. We are at the forefront of this technology and have the flexibility to provide the right package to meet all customer requirements. IGS' Nitrogen Generator Systems use the basic principle of passing air over adsorbent material which bonds with oxygen to leave a rich stream of nitrogen.

The adsorption separation is accomplished in the following process steps:

1. FEED AIR COMPRESSION AND CONDITIONING

The ambient (inlet) air is compressed by an air compressor, subsequently dried by an air dryer and filtered before entering the process vessels.

2. PRESSURIZATION AND ADSORPTION

The pre-treated air is passes into a vessel filled with Carbon Molecular Sieve (CMS) where the oxygen is adsorbed preferentially in the CMS pores so that nitrogen with an adjustable purity (down to a residual O₂ content of 50 ppm) remains in the gas stream. Before the adsorption capacity of the CMS is fully utilized, the nitrogen separation process is interrupted, and the switching of the adsorber vessels is initiated.

3. DESORPTION

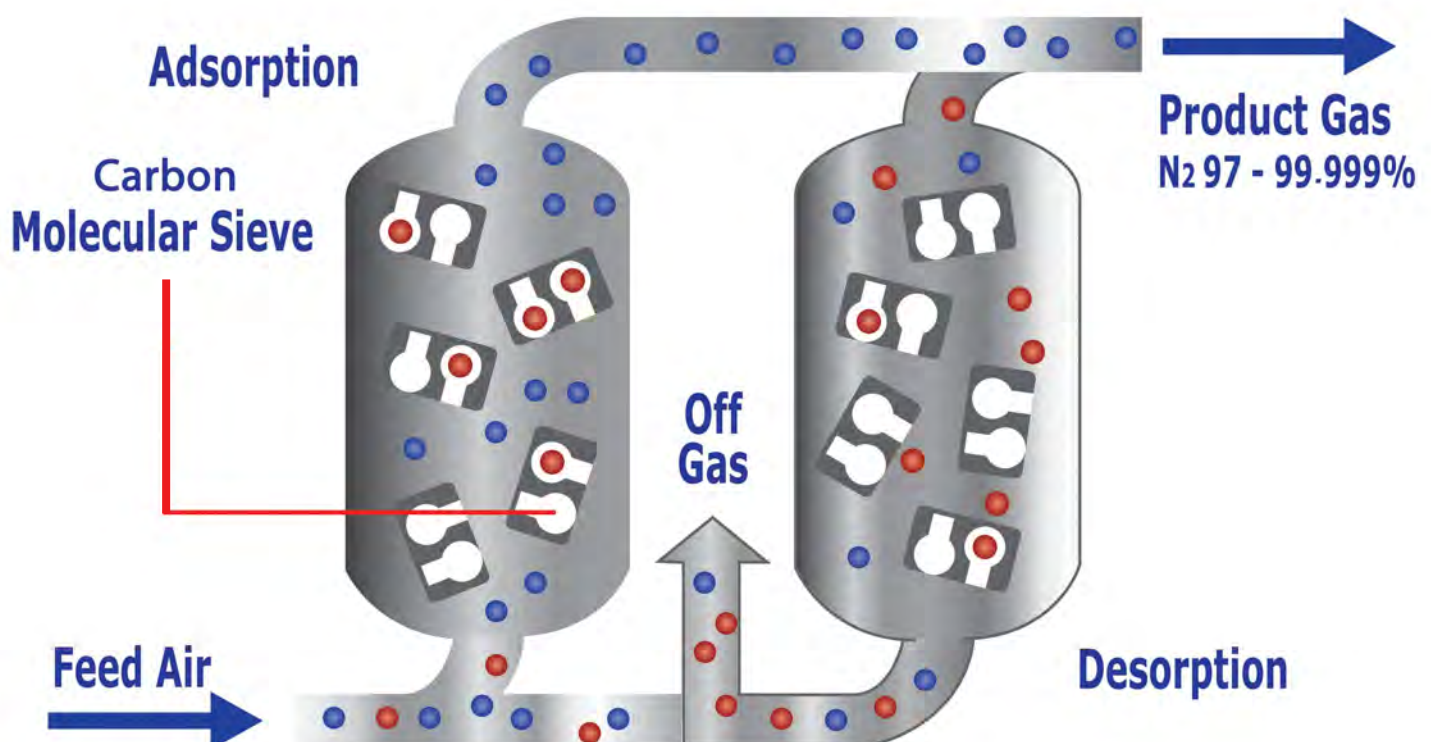
The saturated CMS is regenerated (i.e. the adsorbed gases are released) by means of pressure reduction below that of the adsorption step. This is achieved by a simple pressure release system. The resultant waste stream is vented into atmosphere. The regenerated adsorbent can now be used again for the generation of nitrogen.

4. NITROGEN RECEIVER

Adsorption and desorption take place alternately at equal time intervals. This means that the continuous generation of nitrogen can be achieved with two adsorbers, one being switched at adsorption and the other at regeneration. Constant product flow and purity is ensured by a connected product buffer vessel that stores the nitrogen at purities up to 99.9995% and pressures up to 7.5 bar (g) / 110 PSIG.

5. NITROGEN PRODUCT

The result is a constant stream of on-site produced high purity nitrogen at cost significantly below that of liquid or bottled gases.



Nitrogen Generators – Which Technology to use?

Generon® IGS is in an unique position, where we offer both Nitrogen PSA Systems and Nitrogen Membrane Systems. Our sales and engineering team will be with you to help you decide which technology is right for your application. Generon IGS has been designing and manufacturing both PSA and Membrane systems for over 40 years.

Generon IGS Selection Chart				
System Type	Purity	Pressure	Ease of Operation	Ambient Temperature
Pressure Swing Adsorption (PSA)	PSAs are ideal for generating high purity nitrogen up to 99.999%	Product delivery pressures up to 115 PSIG (7.93 barg)	PSA systems though reliable, have significantly more components to maintain. Refrigerated air dryer required and 8 switching valves.	PSA performance declines rapidly above 95°F TO 104°F (35°C to 40°C) depending on product purity.
Hollow Fiber Membrane	Membrane Systems are ideal for generating nitrogen between 95% and 99%	Pressures available up to 500 PSIG (34.47 barg)	Membrane systems are relatively simple with no moving parts to maintain	Membrane Systems perform well up to 165°F (73°C)

So Why Choose Generon® IGS for your Nitrogen Generator Supplier?

COST SAVINGS

You can save up to 300% of Nitrogen costs by generating your our nitrogen on-site.

By generating your on nitrogen on site, you can dramatically reduce your nitrogen consumption costs.

Save on:

- Delivery Costs
- Bulk Liquid Evaporation Loss
- Monthly Cylinder / Tank Rental Fees
- Handling and Purchasing Costs
- Site Liability Insurance

RELIABILITY / EXPERIENCE

The key to making the investment in nitrogen Generation equipment is purchasing from a dependable company. Generon® IGS has thousands of systems that have been installed worldwide.

Generon® IGS has over 40 years of experience of designing and manufacturing Pressure Swing Adsorption (PSA) systems. Our systems have are designed for on shore and offshore applications.

Other Generon® Products

Primary Compression Packages

All custom designed to your specifications



Twin Tower Desiccant Air Dryers

Custom designed to your specifications in the Oil & Gas and Petrochemical Industries.



Nitrogen Membrane Generators

Available in flows up to 4,000 SCFM



Post Compression Packages

Custom designed systems available up to 5,000 PSIG



Process Gas Separation Systems

Membrane and PSA systems available, H₂, CH₄, CO₂, He, SF₆



Booster Compressors

Custom systems available to meet your specifications with Zone II rating, Class I, Div II

