



AirSep PSA Nitrogen Systems



For Commercial Applications

AirSep® Corporation — An Organization with a Global Presence

Quality and long-term value are built into every AirSep product for total customer satisfaction. AirSep's commitment to world leadership in expertise, capabilities, and products inspires technologically advanced, innovative solutions for every aspect of oxygen and nitrogen supply needs.

Pressure Swing Adsorption (PSA) Nitrogen Systems

AirSep is the world leader in Pressure Swing Adsorption (PSA) technology. AirSep Nitrogen Systems use at least two vessels filled with carbon molecular sieve as adsorbers. As compressed air passes through one of the adsorbers, the carbon molecular sieve adsorbs the nitrogen. This allows the separated nitrogen to pass through the upper outlet connection of the adsorber vessel, which is then stored in the nitrogen buffer tank. Before the adsorber becomes saturated with nitrogen and breakthrough occurs, both the inlet air and the nitrogen outlet valve close and the partially pressurized vessel equalizes with the second adsorber that is waiting to come online. This allows for a pre-charging of the second adsorber before the first adsorber is then regenerated by desorbing the remaining adsorbed enriched-nitrogen gas through a depressurization cycle step. The complete cycle is then repeated. Under normal operating conditions, the carbon molecular sieve is completely regenerated and will last indefinitely.

AirSep PSA Nitrogen Systems Features:

- Nitrogen-compatible components
- Produces nitrogen from an independent compressed air source
- PLC process control
- Highest process efficiency and low operating cost
- Automatic and unattended operation
- Touch-screen control panel with maintenance-free, solid-state purity monitor, including alarm and shutdown capability
- Automatic and fail-safe backup nitrogen options are available
- Easy to install and maintain

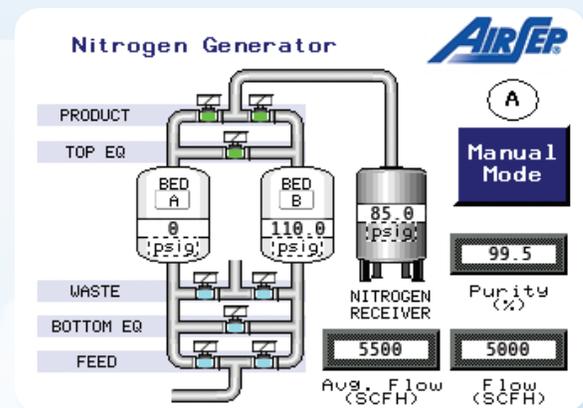
AirSep PSA Control Systems

AirSep Standard Generator models N2-AS-D+ through N2-AS-Z are equipped with a NEMA 4 HMI touchscreen control panel with an integrated nitrogen monitor. The touchscreen provides a normal start-up system, monitors/controls the operation of the process valves, monitors signals coming from the pressure transducers, and provides an alarm system, as well as a fail-safe shutdown mode. This control panel also features diagnostic capabilities and Ethernet access for remote monitoring of process parameters. The various color screens are easy to follow as the user-friendly interface maintains a consistent template design.

Advanced Features and Controls:

Control and Monitoring

- 5.7" multi-color touchscreen operation interface
- Zirconium oxide sensor used to measure oxygen content to determine nitrogen concentration
- Data logging
- Remote monitoring capability
- Multi-level secured access for supervisory control
- Multi-language option
- Alarm and process parameters notification via email
- Visual recommended service maintenance reminders
- Parameters display option in metric or imperial units
- Real time trends of process parameters
- General maintenance guidelines



PSA System Major Components



Air Compressor



Nitrogen Generator



Nitrogen Receiver

Optional Equipment



Oxygen Analyzer



Refrigerated Dryer



Desiccant Dryer



Carbon Filter

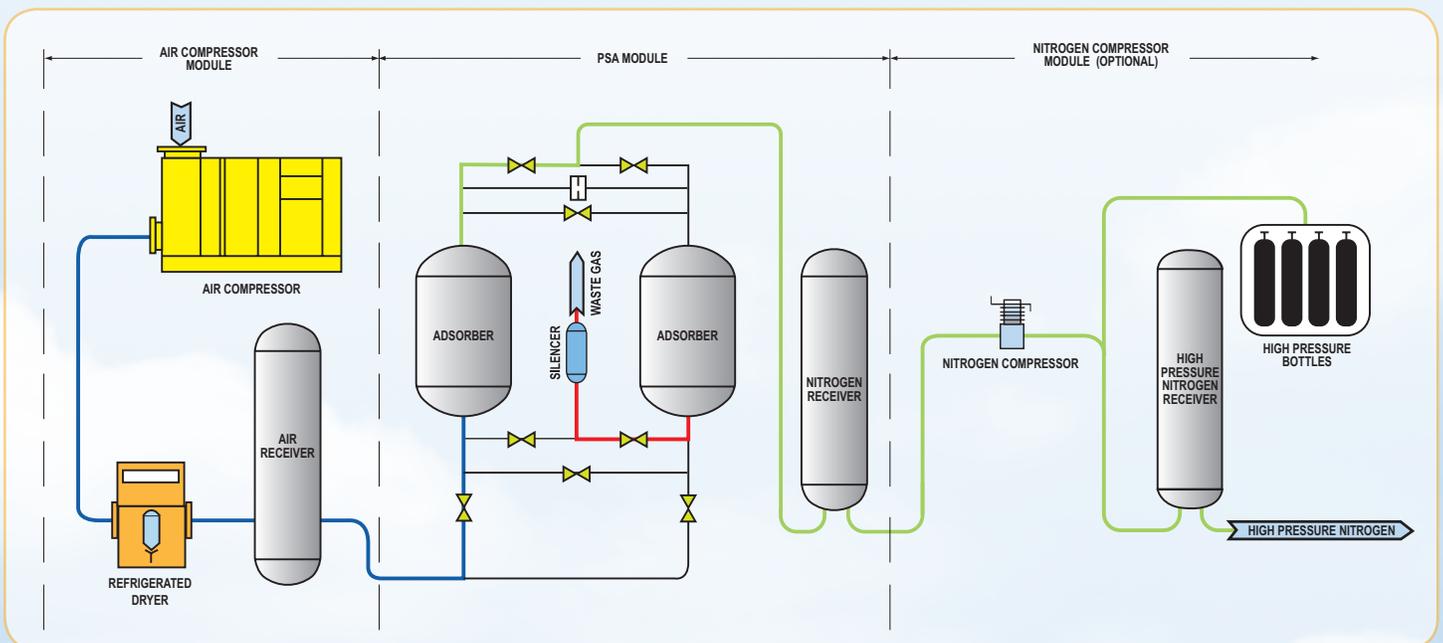


Coalescer Filter



Gas Booster

PSA Plant Schematic — Typical



Typical Applications & Industries Served

Oil & Gas/Power Generation

- Chemical & LNG Tankers
- Enhanced Oil Recovery (EOR)
- Mechanical Gas Seal Inerting
- Nitrogen Blanketing/Inerting/Displacement
- Offshore/Onshore Exploration

Food & Beverage

- Controlled Atmosphere (CA)/Fruit Storage
- Modified Atmosphere Packaging (MAP)
- Nitrogen CO2 Gas Mix Beer Drafting
- Wine Bottle Capping

Manufacturing

- Cutting/Brazing/Soldering
- Heat Treatment
- High Pressure Plastic Injection Molding

Mining

- Control of Lower Explosive Limits (LEL)

Automotive

- Tire Inflation



AirSep Nitrogen Generators

AirSep has served customer oxygen needs globally for over 30 years and has expanded its existing product portfolio to include nitrogen generation equipment. Stationary two-bed Standard PSA Nitrogen Generators, Containerized Shipboard Systems, as well as expandable, cabinet-mounted Modular PSA Series gas generators, are offered by AirSep.

AirSep standard PSA Generators are available with capacities up to 46,905 SCFH (1,233.04 Nm³/hr) and may be placed on an existing foundation, or skid-mounted as a turnkey system with compressors, dryers and per-filtration. PSA technology is ideal for higher purity applications at or above 99.5 – 99.995%. Cylinder-fill options are available upon customer request.

AirSep's highly engineered gas generation system packages continue to be the most reliable on-site sources for the Medical and Commercial marketplace. AirSep's Nitrogen systems can be fabricated in accordance with all relevant local codes (e.g., ASME, ANSI, NEMA, CSA, CRN, ISO 9001, ISO 13485, and U1A Industry Standards).



Nitrogen PSA Expandable Series

Model	@ 75°F/110 psig	@ min. 80 psig	@ N ₂ %
	Air Usage (SCFH) ¹	N ₂ Flow (SCFH) ¹	
N2EXPSA-4	1,242	250	99.99%
	1,328	335	99.95%
	1,412	380	99.9%
	1,552	512	99.5%
	1,628	580	99.0%
	1,828	730	98.0%
N2EXPSA-8	2,484	500	99.99%
	2,654	670	99.95%
	2,824	760	99.9%
	3,104	1,024	99.5%
	3,256	1,160	99.0%
	3,656	1,460	98.0%
N2EXPSA-12	3,726	750	99.99%
	3,982	1,005	99.95%
	4,236	1,140	99.9%
	4,658	1,536	99.5%
	4,886	1,740	99.0%
	5,486	2,190	98.0%
N2EXPSA-16	4,968	1,000	99.99%
	5,308	1,340	99.95%
	5,648	1,520	99.9%
	6,210	2,048	99.5%
	6,514	2,320	99.0%
	7,314	2,920	98.0%

¹ SCF (standard cubic foot) gas measured at 1 atmosphere and 70°F Nm³ (Normal cubic meter) gas measured at 1 atmosphere 0°C. Specify nitrogen flow and pressure at time of order. The above flows are accurate within ±10%.



N2-AS-J, N2-AS-G, and N2-AS-D+
Generators

Standard Generators

AirSep Nitrogen Generators eliminate the expense, inconvenience, hazardous handling, and storage problems often associated with purchased liquid or high pressure cylinder nitrogen. The standard models AirSep offers are the most efficient and reliable generators available today. With their proprietary mufflers, these units also achieve the lowest sound levels in the industry.

Fully automatic, the generators require no specialized operating personnel. Simply connect an air compressor or central air supply to the generator and your application or nitrogen distribution system to the generator's nitrogen receiver. Then connect the power cord to a grounded electrical outlet, turn the unit on, and set your nitrogen delivery pressure. A simple on-off switch supplies nitrogen whenever you need it.

Packaged Systems

Skid-mounted or containerized, turnkey packaged nitrogen systems are ideal for locations where a compressed air supply is limited or unavailable. Containerized units used for military applications are built to ISO 1-C construction standards. All AirSep Standard Nitrogen Generators can be packaged using customer-specified or AirSep-recommended components.

The nitrogen generator within a containerized unit produces nitrogen from an air compressor that's included in the package. These rugged systems perform in extreme temperatures, high humidity conditions, and at high elevations. Applications include, on shipboard, offshore platforms, fire prevention, emergency response, and search/recovery efforts.



Containerized Packaged Plant



Cylinder Refilling Plant

Cylinder Refilling Systems

AirSep Nitrogen Cylinder Refilling Plants enable customers to fill nitrogen cylinders for existing needs or to supply others. AirSep manufactures a complete line of turnkey nitrogen cylinder refilling plants — with capacities from 8-100s of cylinders per day that operate automatically. Complete plants include a feed air compressor, feed air dryer, nitrogen generator, nitrogen compressor, cylinder evacuation pump, and a cylinder filling rack. The nitrogen compressor delivers nitrogen at up to 2,200 psig (15,169 kPa or 151.6 barg) to a high pressure manifold capable of filling up to 10 cylinders at a time.

For special applications, an optional high purity module can be added to the plant to increase nitrogen concentration to 99.999% +/-0.5%



Typical Nitrogen System Specifications

Model	Capacity ¹	Pressure	Dimensions ²	Weight ²
N2-AS-D+	450 SCFH (12 Nm ³ /hr)	85 – 90 psig (586 – 621 kPa) (5.8 – 6.2 barg)	27 x 22 x 69 in (69 x 56 x 175 cm)	498 lb (226 kg)
N2-AS-E	979 SCFH (25.74 Nm ³ /hr)	85 – 90 psig (586 – 621 kPa) (5.8 – 6.2 barg)	33 x 27 x 68 in (84 x 69 x 173 cm)	721 lb (327 kg)
N2-AS-G	1,634 SCFH (42.95 Nm ³ /hr)	85 – 90 psig (586 – 621 kPa) (5.8 – 6.2 barg)	42 x 33 x 74 in (107 x 84 x 188 cm)	956 lb (434 kg)
N2-AS-J	3,311 SCFH (87.04 Nm ³ /hr)	85 – 90 psig (586 – 621 kPa) (5.8 – 6.2 barg)	42 x 34 x 78 in (107 x 86 x 198 cm)	1,771 lb (803 kg)
N2-AS-K	4,823 SCFH (127 Nm ³ /hr)	85 – 90 psig (586 – 621 kPa) (5.8 – 6.2 barg)	58 x 38 x 91 in (147 x 97 x 231 cm)	2,690 lb (1,220 kg)
N2-AS-L	7,020 SCFH (184.5 Nm ³ /hr)	85 – 90 psig (586 – 621 kPa) (5.8 – 6.2 barg)	62 x 40 x 100 in (158 x 102 x 254 cm)	3,400 lb (1,542 kg)
N2-AS-N	10,012 SCFH (263 Nm ³ /hr)	85 – 90 psig (586 – 621 kPa) (5.8 – 6.2 barg)	84 x 48 x 110 in (213 x 122 x 279 cm)	4,950 lb (2,245 kg)
N2-AS-P	14,097 SCFH (371 Nm ³ /hr)	85 – 90 psig (586 – 621 kPa) (5.8 – 6.2 barg)	85 x 64 x 111 in (216 x 163 x 282 cm)	6,250 lb (2,835 kg)
N2-AS-Q	18,228 SCFH (479 Nm ³ /hr)	85 – 90 psig (586 – 621 kPa) (5.8 – 6.2 barg)	112 x 61 x 140 in (284 x 155 x 356 cm)	8,025 lb (3,640 kg)
N2-AS-R	25,122 SCFH (660 Nm ³ /hr)	80 – 85 psig (551 – 586 kPa) (5.5 – 5.8 barg)	114 x 73 x 157 in (290 x 185 x 399 cm)	12,906 lb (5,854 kg)
N2-AS-W	34,494 SCFH (907 Nm ³ /hr)	85 – 90 psig (586 – 621 kPa) (5.8 – 6.2 barg)	122 x 87 x 196 in (310 x 221 x 498 cm)	17,012 lb (7,717 kg)
N2-AS-Z	46,905 SCFH (1,233.04 Nm ³ /hr)	85 – 90 psig (586 – 621 kPa) (5.8 – 6.2 barg)	114 x 88 x 197 in (290 x 224 x 500 cm)	20,002 lb (9,073 kg)

¹ SCF (standard cubic foot) gas measured at 1 atmosphere and 70°F Nm³ (Normal cubic meter) gas measured at 1 atmosphere 0°C. Specify nitrogen flow and pressure at time of order.

² Dimensions and weight specifications are estimated.

All AirSep PSA Nitrogen Systems have an expected power consumption of:

3.2 kWh ±10% per 100 SCFH of total flow, nominal 99.5% nitrogen at up to maximum 85 psig product pressure at maximum plant capacity

1.22 kWh ±10% per Nm³ of total flow, nominal 99.5% nitrogen at 4.5 barg product pressure at maximum plant capacity.



AirSep Corporation excels as the leading supplier of PSA Nitrogen Systems — worldwide — offering cost-effective, reliable, and safe nitrogen sources for today's diverse nitrogen applications.



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