nano
PURIFICATION SOLUTIONS

N-Series
ultra-high purity Nitrogen generators
Nitrogen purity: 95% to 99.999%

N2 plus

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Leading edge technology and more than 100 years of **experience**...nano-purification solutions, your world-class provider of state-of-the-art compressed air and gas solutions to industry.

Our commitment at n-psi is to work alongside our **customers** and provide unique solutions with the highest quality products to solve your specific challenges.

A wealth of experience and leading edge products are only part of the equation. n-psi realize that world-class customer **service** is the most important component to any successful business.

Experience. Customer. Service...**n-psi**

Dry and Pure

Nitrogen is used in many commercial and industrial applications to improve the quality of a product or process, or as a safety measure to prevent combustion. Liquid or bottled Nitrogen delivery and storage can be expensive, unreliable, and a safety concern. Nitrogen generators allow users to produce Nitrogen in-house simply and inexpensively using an existing compressed air system.

n-psi recognizes the importance of having a safe, reliable and cost effective supply of high-purity Nitrogen. We have developed the N-Series, N_2 *plus* Nitrogen generator to meet the increasing demand for high quality complete packaged solutions which save energy and time, while fulfilling the needs of their intended application.

Design

Our experienced team of design engineers are always looking for new and unique technologies and products to bring you the highest level of performance and lowest overall operating cost.

Research & Development

Our R&D team endeavor to provide solutions that go beyond developing an existing product. They are continually researching new technologies which can provide unique advantages over competitive offerings.

Manufacture

The reliable and energy saving nano N-Series N_2 *plus* Nitrogen generators are manufactured in a state of the art facility to the highest standards of build quality to ensure reliability and high levels of performance.

nano N-Series Nitrogen generators

Nitrogen is a dry, inert gas which is used in a wide range of applications where Oxygen may be harmful to the product or processes. Nitrogen generators use regular compressed air to deliver a continuous supply of high purity Nitrogen - offering a cost effective and reliable alternative to the use of cylinder or liquid Nitrogen across a wide range of applications.

The advanced nano N_2 *plus* range of Nitrogen generators use integrated Adsorbent Media Tube (AMT) drying cartridges to provide dehydration of the compressed air prior to separation. This innovative feature (patent pending) eliminates the need for a separate desiccant dryer - saving up to 20% purge loss, significantly reducing capital and installation costs and reducing overall pressure drop by 10 psig or more over traditional Nitrogen generation systems.

A few of the many industries making the switch to nano N-Series Nitrogen generators include:

- Food (MAP)
- Beverage (bottling)
- Plastics (PET)
- Pharmaceutical (product transfer)
- Chemicals (blanketing)
- Laser Metal Cutting (burring reduction)
- Fire Prevention (eliminating combustion)
- Electronics (wave soldering)

Adsorbent Media Tubes (AMT)

Reliability is built in... and backed by a 2 year warranty.

benefits - get more for your money

Guaranteed Performance

- Reliable performance based on decades of experience with pressure swing adsorption technology
- 100% function and performance tested at the factory
- 2 year warranty

Rapid Return on Investment

- Significant cost savings over cylinder or liquid supply provides a typical return on investment of less than 24 months

Environmentally Friendly

- Lower air consumption and refined controls provide greater energy efficiency
- Reduces carbon footprint by eliminating gas delivery to your facility

Safe & Reliable

- Eliminates the safety hazards of transporting and storing pressurized gas cylinders or liquid Nitrogen

Easy to Install

- The compact design allows installation in spaces too small for twin tower generator systems

Easy to Maintain

- Integrated Adsorbent Media Tube (AMT) dryer cartridges eliminate the need for an external dryer of any type
- Integrated exhaust silencers require no maintenance or replacement and ensure proper performance
- Advanced controls simplify operation and require minimal training
- Innovative valves significantly reduce maintenance schedules and minimize downtime

Fits Any Application

- Available in a wide range of flow rates and purities (Oxygen contents from 5% to less than 10 ppm)
- Can handle any incoming power supply from 120 to 240 VAC in 50 or 60 Hz, or 24VDC - with just the flick of a switch

nano N-Series Nitrogen generators

Integrated AMT dryer cartridge

Traditional Nitrogen generators often require installing and operating an external desiccant dryer. The innovative nano N_2 *plus* Nitrogen generators feature an integrated Adsorbent Media Tube (AMT) drying cartridge which eliminates the need for a pre-treatment dryer of any type. The integrated drying system reduces purge loss by approximately 20% and reduces pressure drop by 10 psi or more, providing significant energy savings over a traditional generator system.

Ecomode energy saving control

This unique control feature utilizes an outlet pressure monitor to reduce energy consumption during periods of low demand to ensure a continuous uninterrupted Nitrogen supply while minimizing power consumption.

PLC controlled operation

Each N_2 *plus* Nitrogen generator is operated by a robust and reliable PLC control system with digital and analog outputs for remote monitoring with alarm capabilities. A backlit, clear text display offers valuable features including 'power on', 'hours run', 'Oxygen purity', 'pressure', 'online column' and 'service required' indicators. In addition, four pressure gauges provide the operator with continuous indication of column A, column B, air inlet and Nitrogen outlet pressures.

Floor or wall installation

The smallest NNG 1110 model can be floor or wall mounted - simply by rotating the feet 90°.

Multi-bank design

The unique multi-bank design (NNG 2110 to NNG 12130) enables additional generators to be added in the future as demand increases. Your N_2 *plus* Nitrogen generator can grow with your company.

Reliable high performance valves

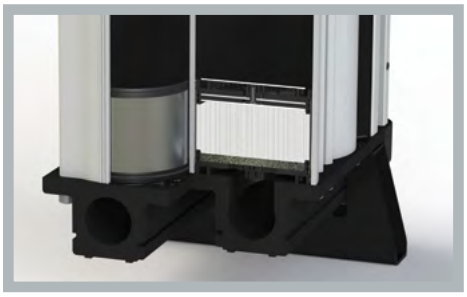
Inlet, exhaust and control air are managed through coaxial flow valves integrated into the upper and lower manifolds . These low maintenance valves provide unrestricted flow capacity. They are designed for durability, ease of maintenance and long service life and are backed by a comprehensive two year warranty.

Maximum corrosion protection

High tensile aluminum columns are first alocromed and then powder coated to provide maximum protection for corrosive environments.

Optional Oxygen analyzer

Continuously monitors the Oxygen concentration in the Nitrogen stream. Analyzer is incorporated into the PLC controls to guarantee downstream purity levels are consistently maintained.



Integrated AMT drying cartridges

Adsorbent Media Tubes (AMT)

The technologically advanced nano N_2 *plus* Nitrogen generator operates on the Pressure Swing Adsorption (PSA) principle to produce a continuous uninterrupted stream of Nitrogen gas from clean dry compressed air.

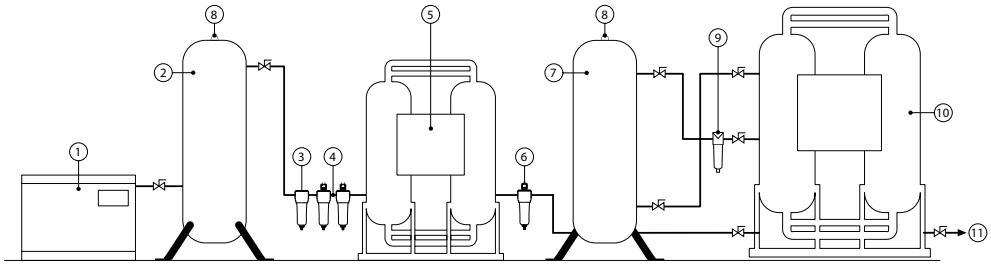
Pairs of dual chamber extruded aluminum columns are fitted with Adsorbent Media Tube (AMT) dryer cartridges and filled with Carbon Molecular Sieve (CMS). Joined via an upper and lower manifold the columns produce a two bed system.

Compressed air enters the bottom of the 'online' bed and flows up through the AMT stage drying the compressed air. The clean and dry air then flows up through the CMS stage where Oxygen and other trace gases are preferentially adsorbed allowing the Nitrogen to pass through.

After a pre-set time the control system automatically switches the beds. One bed is always online generating Nitrogen while the other is being regenerated.

During regeneration the Oxygen that has been collected in the CMS stage and the moisture that has been collected in the AMT stage are exhausted to atmosphere. A small portion of the outlet Nitrogen gas is expanded into the bed to accelerate the regeneration process.

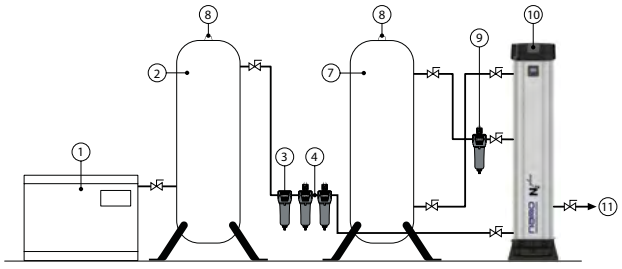
Typical Nitrogen generator installation



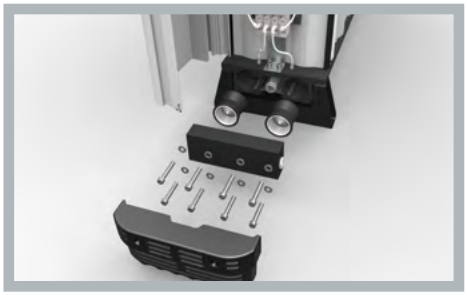
1	Compressor
2	Wet Air Receiver
3	Water Separator
4	Pre Filters
5	Dryer *
6	Dust Filter *
7	Buffer Vessel
8	Pressure Relief Valves
9	Dust Filter
10	Nitrogen Generator
11	Nitrogen Outlet

** Not required with nano N_2 plus*

nano N_2 *plus* installation



PLC controls with clear text display



Reliable & durable coaxial flow valves

nano N-Series sizing & specifications

Model	Outlet Flow (1)	Maximum Oxygen Content in Outlet Gas (Purity)												Dimensions in (mm)			Weight lbs (kg)
		10 ppm	50 ppm	100 ppm	250 ppm	500 ppm	0.10%	0.50%	1%	2%	3%	4%	5%	A	B	C	
NNG 1110	scfh	19	35	56	67	74	88	132	159	194	230	265	291	49 (1240)	16 (400)	12 (300)	176 (50)
	m3/hr	0.6	1.0	1.6	1.9	2.1	2.5	3.8	4.5	5.5	6.5	7.5	8.3				
NNG 2110	scfh	39	75	120	144	162	180	288	342	420	495	570	600	47 (1200)	16 (400)	26 (650)	242 (110)
	m3/hr	1.1	2.1	3.4	4.1	4.6	5.1	8.2	9.7	12	14	16	17				
NNG 3110	scfh	58	106	169	201	222	265	396	477	583	689	794	874	47 (1200)	16 (400)	32 (820)	374 (170)
	m3/hr	1.6	3.0	4.8	5.7	6.3	7.5	11	13	16	19	22	25				
NNG 2130	scfh	78	141	226	268	297	353	530	636	777	918	1059	1165	71 (1800)	16 (400)	26 (650)	365 (166)
	m3/hr	2.2	4.0	6.4	7.6	8.4	10	15	18	22	26	30	33				
NNG 3130	scfh	117	212	339	403	445	530	794	953	1165	1377	1589	1748	71 (1800)	16 (400)	32 (820)	490 (222)
	m3/hr	3.3	6.0	9.6	11	13	15	22	27	33	39	45	49				
NNG 4130	scfh	155	282	452	537	593	706	1059	1271	1554	1836	2119	2330	71 (1800)	16 (400)	39 (990)	610 (277)
	m3/hr	4.4	8.0	13	15	17	20	30	36	44	52	60	66				
NNG 6130	scfh	233	424	678	805	890	1059	1589	1907	2330	2754	3178	3496	71 (1800)	16 (400)	52 (1320)	852 (387)
	m3/hr	6.6	12	19	23	25	30	45	54	66	78	90	99				
NNG 8130	scfh	311	565	904	1073	1186	1412	2119	2542	3107	3672	4237	4661	71 (1800)	16 (400)	65 (1660)	1100 (550)
	m3/hr	8.8	16	26	30	34	40	60	72	88	104	120	132				
NNG 10130	scfh	388	706	1130	1342	1483	1766	2648	3178	3884	4590	5297	5826	71 (1800)	16 (400)	79 (2000)	1350 (610)
	m3/hr	11	20	32	38	42	50	75	90	110	130	150	165				
NNG 12130	scfh	466	847	1356	1610	1780	2119	3178	3813	4661	5508	6356	6991	71 (1800)	16 (400)	92 (2330)	1600 (722)
	m3/hr	13	24	38	46	50	60	90	108	132	156	180	198				

Inlet Air Purity Requirements			Inlet Temperature		Working Pressure		Outlet Gas Dewpoint	Supply Voltage
Particulate	Dewpoint	Oil Content	Minimum	Maximum	Minimum	Maximum		
< 0.1 micron	< 80°F (27°C) PDP	< 0.1 ppm (2)	35°F (1.5°C)	95°F (35°C)	87 psig (6 barg)	145 psig (3) (10 barg)	< -40° F (-40°C) PDP (4)	120-240 VAC 50 or 60 Hz or 24 VDC

Correction Factors	To calculate the outlet flow for any model at operating conditions other than those above: Outlet Flow (from table above) x K1 x K2 (from tables below) = Outlet Flow at new conditions (5)						
Inlet Temperature - °F (°C)	35 - 67°F (1.5 - 19°C)			68 - 77°F (20 - 25°C)		78 - 95°F (26 - 35°C)	
K1	Consult Factory			1		0.95	
Inlet Pressure - psig (barg)	87 (6)	100 (7)	116 (8)	130 (9)	145 (10)	160 (11)	174 - 232 (12 - 16)
K2	0.90	1.00	1.10	1.20	1.25	1.30	1.35

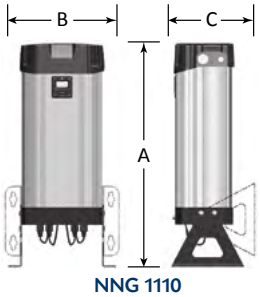
(1) At 100 psig inlet pressure and 68 - 77°F inlet temperature. For outlet flow at all other conditions, refer to the correction factors above or contact support@n-psi.com.

(2) Including oil vapor.

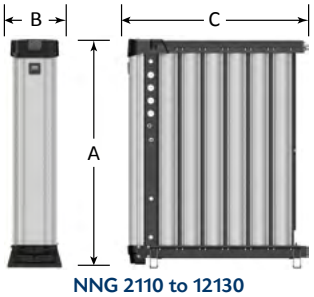
(3) 232 psig (16 barg) maximum working pressure models are available on request.

(4) Outlet gas dewpoint is < -76°F (-60°C) in high purity applications.

(5) To be used as a rough guide only. All applications should be confirmed by n-psi. Contact us for sizing assistance.



NNG 1110



NNG 2110 to 12130

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