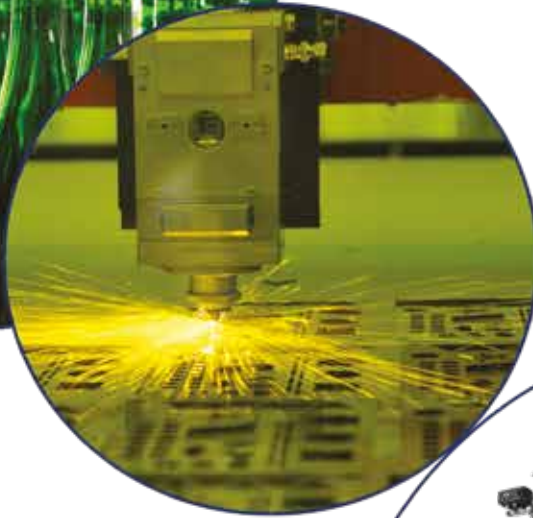


nano



high-capacity nitrogen generators

nitrogen purity: 95% to 99.999%

“The GEN₂-MAX unit allow liquid nitrogen deliveries and

equipment manufacturer - southeastern US

Nitrogen is a dry, inert gas which is used in many commercial and industrial applications to improve quality or where oxygen may be harmful to the product or processes.

With traditional methods of gas supply such as liquid or bottled nitrogen, users are oftentimes responsible for hidden costs such as rental fees, refill and delivery surcharges, order processing charges as well as environmental fees.

Nitrogen generators begin with clean, dry compressed air to create a continuous supply of high purity nitrogen. Generating nitrogen in-house is a cost-effective and reliable alternative to the use of cylinder or liquid nitrogen across a wide range of applications.

PSA nitrogen generation

Pressure Swing Adsorption (PSA) nitrogen generation uses air which is 79% nitrogen and removes the oxygen to provide the higher purities needed for your process.



ved for us to eliminate our
reduce our operating cost.”

nano GEN₂-MAX high-capacity nitrogen gas generators

- for large flow applications up to 2871.3 Nm³/hr
- payback typically between 6 to 24 months
- easy installation with minimum cost and disruption
- user has complete control fulfilling nitrogen gas demand
- generate as little or as much nitrogen gas as needed at a fraction of delivered gas cost



BENEFITS

guaranteed performance

- 100% functional tested at our factory
- 1 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
- ecomode energy savings control reduces energy consumption during periods of low demand resulting in significant reduction of operational cost



design quality

- advanced welded vessels designed for operation at high temperatures guarantees ultimate reliability in the most extreme operating conditions
- compliance with international electrical and mechanical codes saves administration costs to comply with local standards

complete scope of supply

- nitrogen flow meter as standard
- advanced integral zirconia oxygen analyser - continuously measures and guarantees gas quality (5 year zirconia sensor life)
- outlet pressure control valve
- inlet compressed air pressure dew point sensor as standard; outlet nitrogen pressure dew point sensor available as option

easy to install & maintain

- rigid base frame with integrated forklift slots facilitates ease of movement and placement using standard forklift
- inter-connecting piping and wiring assures quick installation, commissioning and start up with minimal installation costs

safe & reliable

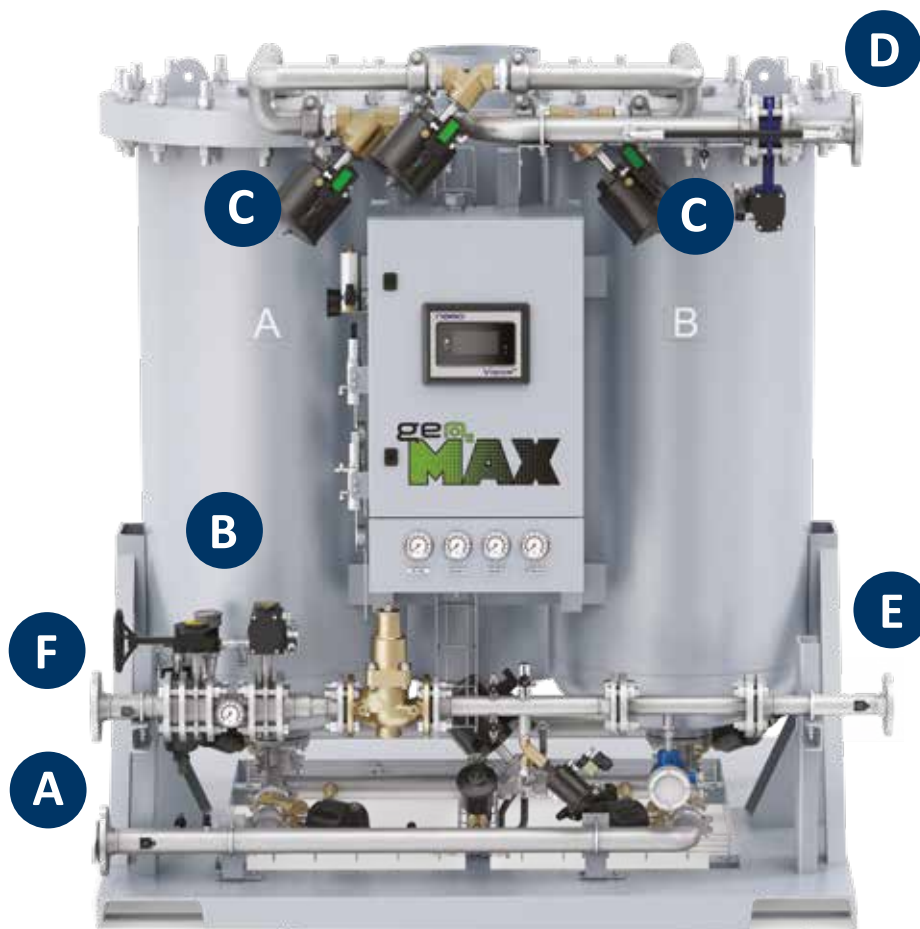
- eliminates the safety hazards of transporting and storing pressurized gas cylinders or liquid nitrogen



HOW IT WORKS

The technologically advanced nano GEN₂-MAX nitrogen generator operates on the Pressure Swing Adsorption (PSA) principle to produce a continuous uninterrupted stream of nitrogen gas from clean dry compressed air. Two specially designed welded vessels with full size top flanges are filled with Carbon Molecular Sieve (CMS) for the most effective, high density filling. Joined via inter-connecting piping, the high density filled vessels produce a dual bed system. After a preset time the control system automatically switches the beds. One bed is online generating nitrogen while the other is being regenerated.

During regeneration, the oxygen that has been collected in the CMS stage is exhausted to atmosphere. A small portion of the outlet nitrogen gas is expanded into the bed to accelerate the regeneration process.



- A** Clean compressed air enters the inlet into GEN₂-MAX unit where the inlet valves direct the flow to either the left or right column sets
- B** After passing through the inlet valve, the compressed air enters one of the two welded vessels
- C** The compressed air then flows up through the Carbon Molecular Sieve (CMS) beds where oxygen and other trace gases are preferentially adsorbed and allows the nitrogen to pass through
- D** The nitrogen gas then passes through the supporting bed layer with integrated filter into the outlet manifold before exiting through the outlet valves
- E** The nitrogen gas continues to the buffer vessel (not shown) and nano F1 buffer vessel filter before returning to the GEN₂-MAX unit for purity monitoring, flow & purity regulation
- F** High purity nitrogen is now ready to leave the unit for the application

FEATURES

VISION⁰¹ PLC/HMI controlled operation

- user-friendly PLC uses advanced algorithms for maximum reliability
- comprehensive, pro-active maintenance display
- ethernet connection for local monitoring via LAN/DCS system
- optional remote service and performance monitoring

quality components

- reliable high performance butterfly valves designed for reliability, long service life and ease of maintenance

vessel construction

- specially designed absorber vessels with full size top flange for the most effective, high density filling of the high-grade carbon molecular sieve (CMS)
- equipped with full size bottom inlet strainer to achieve maximum flow distribution preventing movement and crushing of CMS as well as minimizing possibility of channeling and maximizing performance in adsorption of oxygen

CMS protection

- to allow continuous operation for more than 15 years, units are equipped with safety features to eliminate the risk of CMS being damaged by low quality compressed air supply, poor start-ups and unexpected shutdowns
- continuous monitoring of the compressed air quality via a Pressure Dew Point (PDP) sensor installed at the compressed air inlet prevents CMS damage

self-regulation and stable purity

- user controlled outlet flow, pressure and purity

ecomode

- ecomode allows additional energy saving to be attained by keeping the purity within a narrow band of the required value
- achieved by elongating the adsorption cycle and consequently saving valuable compressed air and nitrogen consumed by the generator during column changeover



SPECIFICATIONS

generator model	rated outlet flow ⁽¹⁾	nitrogen purity at the outlet (maximum oxygen content)*										dimensions (mm)			approx. weight (kg)
		99.999% (10 ppm)	99.99% (100 ppm)	99.95% (500 ppm)	99.9% (0.10%)	99.5% (0.50%)	99% (1%)	98% (2%)	97% (3%)	96% (4%)	95% (5%)	A	B	C	
		GEN2-MAX 5.5K	Nm ³ /hr	46	69	88	116	157	184	225	255	284	313	1830	
GEN2-MAX 7K	Nm ³ /hr	58	86	111	146	198	231	283	320	356	393	1830	1700	2370	2581
GEN2-MAX 9.5K	Nm ³ /hr	68	105	138	180	252	298	363	420	468	518	2235	1803	2620	3200
GEN2-MAX 12K	Nm ³ /hr	87	136	178	232	325	385	470	543	605	669	2591	1803	2633	3800
GEN2-MAX 15K	Nm ³ /hr	107	167	218	284	398	471	575	665	741	820	2667	1803	2620	4800
GEN2-MAX 17K	Nm ³ /hr	127	197	258	337	471	557	680	787	876	970	2718	2108	3028	6400
GEN2-MAX 20K	Nm ³ /hr	155	242	315	412	577	682	833	963	1073	1187	2870	2108	3022	7000
GEN2-MAX 25K	Nm ³ /hr	186	289	377	493	690	816	997	1152	1284	1421	2946	2108	3025	7700
GEN2-MAX 31K	Nm ³ /hr	232	362	473	618	865	1023	1249	1444	1608	1780	3708	3124	3987	10300
GEN2-MAX 39K	Nm ³ /hr	295	459	600	784	1097	1298	1584	1831	2040	2258	3784	3124	4211	12000
GEN2-MAX 50K	Nm ³ /hr	375	584	762	996	1395	1650	2014	2329	2594	2871	3861	3124	4423	14200

temperature correction factors ⁽⁴⁾

inlet temperature (°C)	5	10	15	20	25	30	35	40	45	50
correction factor (% units)	1.00	1.00	1.00	1.00	0.98	0.95	0.92	0.88	0.83	0.78
correction factor (ppm units)	1.02	1.02	1.00	1.00	0.96	0.93	0.88	0.83	0.78	0.72

(1) at 7 barg inlet pressure and 20 - 25°C inlet temperature. For outlet flow at all other conditions refer to the correction factors above or contact sales@n-psi.co.uk

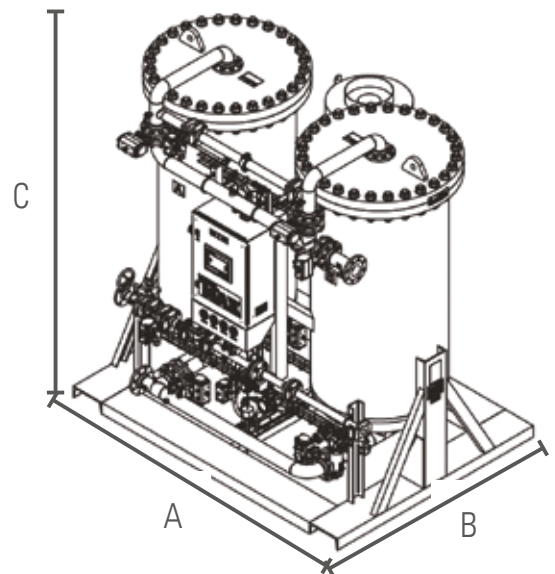
(2) PDP must always be lower than ambient temperature

(3) including oil vapour

(4) technical specifications subject to change without notice. Direct inquiries to sales@n-psi.co.uk

specifications

design operating pressure range	5 - 10 barg
design operating temperature range	5 - 50°C
recommended operating temperature range	5 - 35°C
maximum inlet particulate	0.1 micron
maximum inlet dew point	+7°C PDP ⁽²⁾
recommended inlet dew point	+4°C PDP ⁽²⁾
maximum inlet oil content	0.01 ppm ⁽³⁾
supply voltage	100 - 240 VAC (50 or 60Hz)



GEN₂-MAX 5.5k To GEN₂-Max 50k

EXPERIENCE. CUSTOMER. SERVICE.

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

Our commitment at nano 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. nano recognize that world-class customer *service* is the most important component to any successful business.



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 GEN₂-MAX range of nitrogen generators are manufactured in our state-of-the-art facility to the highest standards of build quality to ensure equipment reliability and high levels of performance.

ENVIRONMENTALLY FRIENDLY

Through both product development and manufacturing, we strive to produce high quality products compliant to both local and global environmental legislation. Reduction of carbon footprint through energy saving products and use of environmentally friendly components are our commitment to you.



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Gateshead, Tyne and Wear
United Kingdom

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Charlotte, North Carolina
United States

nano-purification solutions TN
Maryville, Tennessee
United States

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St. Catharines, Ontario
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nano-purification solutions GmbH
Erkelenz, Germany

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Singapore