

nano

Ultra-High Purity Nitrogen Generators

NITROGEN PURITY: 95% to 99.999%





Multi-Bank Design

The unique multi-bank design (GEN2 1110 to GEN2 12130) enables additional generators to be added in the future as demand increases and provides redundancy for ease of maintenance. Your GEN2 i4.0 nitrogen generator can grow with your company.

“We are so impressed with the operation and performance of the nano GEN₂ i4.0 nitrogen gas generators, we are looking to add additional modules next year.”

*Major peanut & snack food packager
- Southeastern US*





Nitrogen is a dry and inert gas that has proven to be an essential component in various commercial and industrial processes where oxygen can have detrimental effects.

While traditional methods of gas supply, such as bottled or liquid nitrogen, come with hidden costs such as rental fees, refill and delivery surcharges, order processing charges, and environmental fees, nitrogen generators offer a reliable and cost-effective alternative.

By using clean, dry compressed air, nitrogen generators produce a constant supply of high-purity nitrogen, making in-house nitrogen generation a highly efficient and dependable solution for wide-ranging applications.

nano GEN₂ i4.0 Nitrogen Gas Generators

- Payback typically between 6 to 24 months
- Easy installation with minimal 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.



Features

PLC/HMI Controlled Operation **i4.0**

- Operated by a reliable PLC control system with digital and optional analog outputs for remote monitoring and alarm capabilities.
- Provides the operator with continuous indication of column A, column B, inlet air & nitrogen outlet pressures and features an easy-to-operate touch screen graphical human-machine interface (HMI) which offers valuable information including:

- Power On Off
- Oxygen Purity
- Inlet & Outlet Pressure
- Online Column
- Service Required
- Run Hours

Communication

- Standard communication protocols include modbus TCP communications via RJ45 ethernet port and 4-20 mA signal to monitor nitrogen purity.
- An upgradable SD card records the performance of the generator and data that can be downloaded to any PC for analysis.

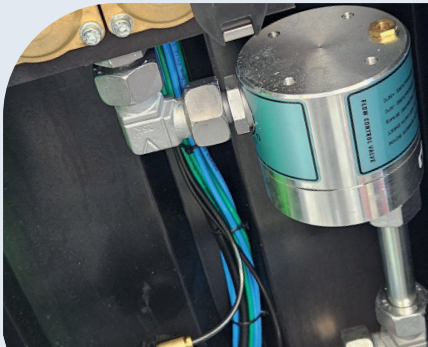
Purity Dependent Energy Saving (PDES)

- With the optional employment of 2 oxygen analysers, the PDES option 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.

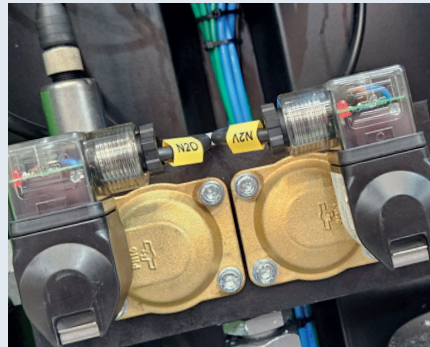
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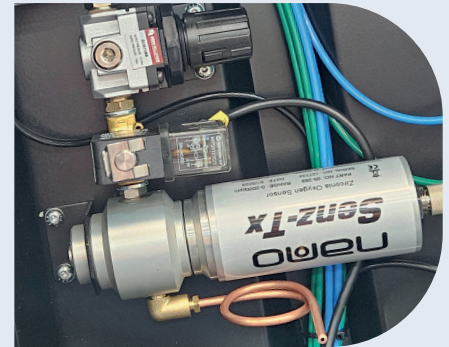
Benefits



Mass Flow Controller (MFC)



Purity Valves



Integral Oxygen Analyser

Guaranteed Performance

- 100% function and performance tested at our 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.
- *ecomode* energy savings control reduces energy consumption during periods of low demand.

Easy to Install

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

Safe & Reliable

- Eliminates the safety hazards of transporting and storing pressurised gas cylinders or liquid nitrogen.

Easy to Maintain

- Innovative piston valves significantly reduce maintenance schedules and minimise downtime.

Environmentally Friendly

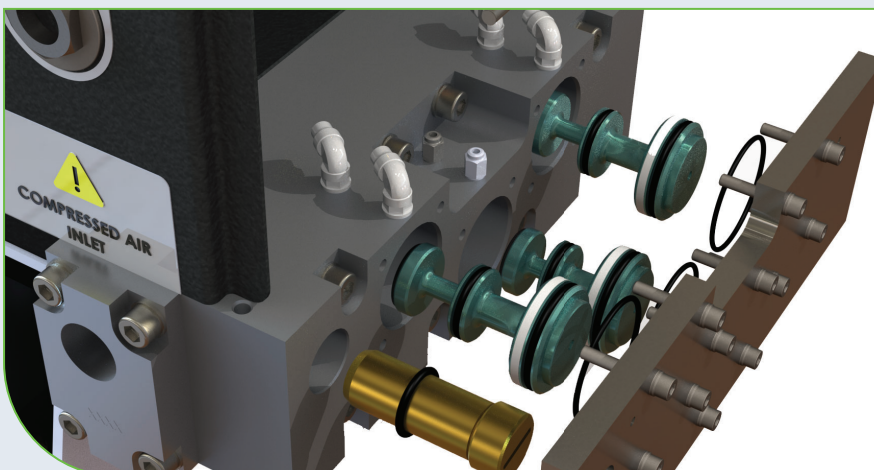
- Reduces carbon footprint by eliminating gas delivery to your facility.

Fits any Application

- Maximum design operating pressure of 16 barg available

Design Quality

- Mass flow controller - ensures correct application pressure and flow.
- Integral oxygen analyser - continuously measures gas quality.
- Purity valve - automatically ensures gas meets desired specifications.
- Remote monitoring - enables connection to remote management and generator control systems.



Reliable High Performance Valves

- Inlet, outlet and exhaust are managed through unique integrated nano piston valves, which are designed for reliability, long service life and ease of maintenance.
- Incorporates adjustable equalization valves which smooth the column switch over, improve air/ nitrogen ratios and extend CMS life.



How it works

Generating nitrogen gas from compressed air

The nano GEN2 i4.0 nitrogen generator represents the latest in cutting-edge technology, providing a continuous and uninterrupted stream of nitrogen gas from clean and dry compressed air. Operating on the Pressure Swing Adsorption (PSA) principle, this advanced system utilises dual chamber extruded aluminium columns that are filled with Carbon Molecular Sieve (CMS). These high-density filled columns produce a dual bed system that is connected via an upper and lower manifold, and our control system automatically switches the beds after a pre-set time. One bed is always online, generating nitrogen while the other is being regenerated. During the regeneration process, a small portion of the outlet nitrogen gas is expanded into the bed, causing the CMS to release oxygen, which is then exhausted into the atmosphere.

A Clean compressed air enters the inlet into GEN2 i4.0 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 side of the manifold under the extruded columns.

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 into the outlet manifold before exiting through the outlet valves.

E The nitrogen gas continues to the buffer vessel and the nano GFNB buffer vessel filter before returning to the GEN2 i4.0 unit for purity monitoring, flow & purity regulation.





Product specifications

Model	Rated Outlet Flow ⁽¹⁾	Nitrogen Purity* at the Outlet (Maximum Oxygen Content)												Dimensions (mm)			Weight
		99.999% (10 ppm)	99.995% (50 ppm)	99.99% (100 PPM)	99.975% (250 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	KG
GEN2 i4.0-1110	Nm³/h	0.9	1.7	2.0	2.5	3.0	3.6	5.2	5.8	7.3	8.3	9.5	10.3	1223	400	605	158
GEN2 i4.0-2110	Nm³/h	1.8	3.4	4.0	5.0	6.0	7.2	10.4	11.6	14.5	16.7	19.0	20.6	1223	400	773	209
GEN2 i4.0-3110	Nm³/h	2.7	5.1	6.0	7.5	9.0	10.8	15.6	17.3	21.8	25.0	28.5	30.9	1223	400	941	260
GEN2 i4.0-2130	Nm³/h	5.1	7.2	8.9	10.0	11.4	13.2	18.9	21.0	26.4	30.3	34.5	37.5	1823	400	773	262
GEN2 i4.0-3130	Nm³/h	7.7	10.8	12.6	15.0	17.1	19.8	28.4	31.5	39.6	45.5	51.8	56.3	1823	400	941	340
GEN2 i4.0-4130	Nm³/h	10.2	14.4	16.8	20.0	22.8	26.4	37.8	42.0	52.8	60.6	69.0	75.0	1823	400	1109	418
GEN2 i4.0-6130	Nm³/h	15.3	21.6	25.2	30.0	34.2	39.6	56.7	63.0	79.2	90.9	90.9	112.5	1823	400	1445	594
GEN2 i4.0-8130	Nm³/h	20.4	28.8	33.6	40.0	45.6	52.8	75.6	84.0	105.6	121.2	121.2	150.0	1823	400	1781	730
GEN2 i4.0-10130	Nm³/h	23.5	33.1	38.6	46.0	52.4	60.7	86.9	96.6	121.4	139.4	139.4	172.5	1823	400	2117	886
GEN2 i4.0-12130	Nm³/h	27.2	38.4	44.9	53.3	60.9	70.5	100.9	112.1	141.0	161.8	161.8	200.3	1823	400	2453	1036

*Nitrogen purity relative to oxygen content

Specifications

Design operating pressure range (barg) ⁽²⁾	6 to 12
Design operating temperature range (°C)	5 to 50
Recommended operating temperature range (°C)	20 to 25
Maximum inlet particulate (micron)	0.1
Maximum inlet dew point (°C PDP) ⁽³⁾	+3.3
Recommended inlet dew point (°C PDP)	-40
Maximum inlet oil content (ppm) ⁽⁴⁾	0.01
Supply voltage (Hz)	100 to 240V AC

Pressure Correction Factors ⁽⁵⁾

Operating pressure (barg)	6	7	8	9	10	11	12
Correction factor	0.88	1.00	1.10	1.20	1.30	1.40	1.50

Temperature Correction Factors ⁽⁵⁾

Inlet temp (°C)	5	10	15	20	25	30	35	40	45	50
Correction factor	0.8	0.9	0.94	1.00	1.00	0.98	0.95	0.90	0.85	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_uk@nano-purification.com.
- (2) 16 barg option available. Consult factory.
- (3) For low purity applications only
- (4) Including oil vapour.
- (5) To be used as a rough guide only. All applications should be confirmed by nano. Contact nano for sizing assistance.
- (6) Technical specifications subject to change without notice. Direct inquiries to sales_uk@nano-purification.com.



GEN2 1110 to GEN2 12130



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