

ultra-high purity nitrogen generators

nitrogen purity: 95% to 99.999%

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 often 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.

multi-bank design

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



When you purchase a nitrogen gas generator you can expect:

- new sleek design
- larger HMI screen with multilingual electronic control system
- upgraded zirconia oxygen analyser
- upgraded internal stainless steel pipework with increased diameter and reduced complexity
- reversible inlet and outlet blocks
- durable laser cut symbols providing multilingual clarity
- increased standard pressure rating to 12 barg
- nitrogen quality certified to food grade E941 standard
- payback typically between 6 to 24 months
- easy installation with minimum cost and disruption
- easier service capability
- 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% 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



fits any application

- maximum design operating pressure of 16 barg available

design quality

- mass flow controller - ensures correct application pressure and flow
- integral oxygen analyzer - continuously measures and guarantees gas quality
- purity guarantee valve - automatically ensures gas meets desired specifications
- remote monitoring - enables connection to proprietary remote management and generator control systems

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



HOW IT WORKS

The technologically nitrogen generator operates on the Pressure Swing Adsorption (PSA) principle to produce a continuous uninterrupted stream of nitrogen gas from clean dry compressed air. Dual chamber extruded aluminum columns are filled with Carbon Molecular Sieve (CMS). Joined via an upper and lower manifold, the high density filled columns produce a dual bed system. After a preset 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 is exhausted to atmosphere. A small portion of the outlet nitrogen gas is expanded into the bed to accelerate the regeneration process.



FEATURES & OPTIONS

PLC/HMI controlled operation

Each GEN₂ nitrogen generator is operated by a reliable PLC control system with digital and optional analog outputs for remote monitoring and alarm capabilities. GEN₂ provides the operator with continuous indication of column A, column B, inlet air & N₂ outlet pressures and features an easy-to-operate touch screen graphical human-machine interface (HMI) which offers valuable information including:

- power on/off
- O₂ purity
- ECO Mode hours
- inlet & outlet pressure
- online column
- contact details
- service required
- run hours
- performance data

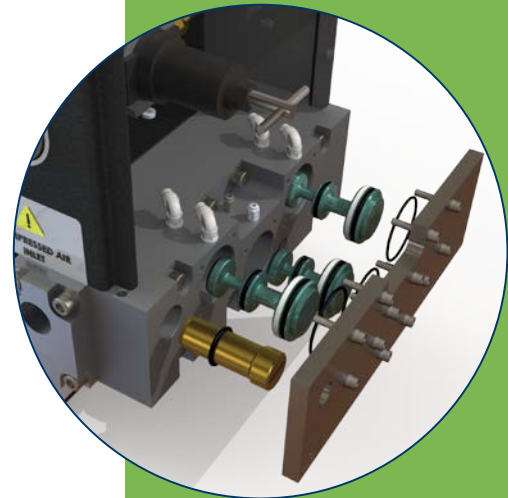


reliable high performance valves

Inlet, outlet and exhaust are managed through unique integrated piston valves, which are designed for reliability, long service life and ease of maintenance. The generator also incorporates adjustable equalisation valves which smooth the column switch over, improve air/ N₂ ratios and extend CMS life.

communication

With a small software change, full communication protocols including modbus, profibus and other building management system connections can be achieved. This is via an RS485 or ethernet RJ45 port. There is an upgraded SD card recording the performance of the generator and that data can be downloaded to any PC for analysis.



purity dependent energy saving (PDES)

With the optional employment of 2 oxygen analyzers, the PDES option allows additional energy saving to be attained by keeping the purity within a narrow band of the required value. This is achieved by elongating the adsorption cycle and consequently saving valuable compressed air and nitrogen consumed by the generator during column changeover.

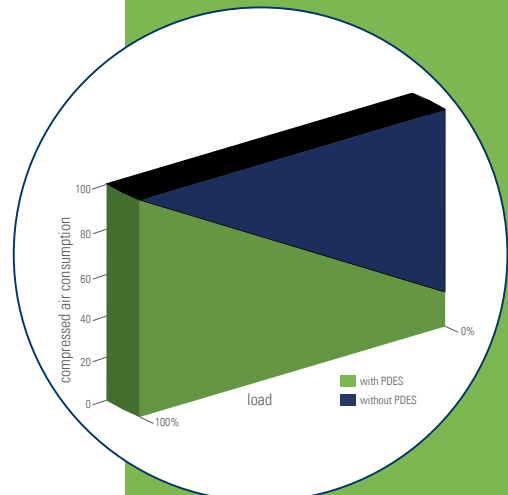
dewpoint monitoring ^[*]

In many applications the moisture content of the outlet nitrogen or inlet compressed air is critical. With the inclusion of a dewpoint meter, the inlet air dewpoint or the outlet nitrogen dewpoint may be monitored and recorded.

pressure & low monitoring ^[*]

The options of the new GEN₂ nitrogen generator include the measurement of column pressure and to accommodate a signal from an external flow meter. Both these parameters may be monitored and recorded.

* if communication module is activated



SPECIFICATIONS

generator model	rated outlet flow ⁽¹⁾	nitrogen purity at the outlet (maximum oxygen content)												dimensions (mm)			weight (kg)
		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	
TORNADO.1110	Nm ³ /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	161
TORNADO.2110	Nm ³ /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	188
TORNADO.3110	Nm ³ /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	241
TORNADO.2130	Nm ³ /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	253
TORNADO.3130	Nm ³ /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	336
TORNADO.4130	Nm ³ /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
TORNADO.6130	Nm ³ /h	15.3	21.6	25.2	30.0	34.2	39.6	56.7	63.0	79.2	90.9	103.5	112.5	1823	400	1445	640
TORNADO.8130	Nm ³ /h	20.4	28.8	33.6	40.0	45.6	52.8	75.6	84.0	105.6	121.2	138.0	150.0	1823	400	1781	748
TORNADO.10130	Nm ³ /h	23.5	33.1	38.6	46.0	52.4	60.7	86.9	96.6	121.4	139.4	158.7	172.5	1823	400	2117	913
TORNADO.12130	Nm ³ /h	27.2	38.4	44.9	53.3	60.9	70.5	100.9	112.1	141.0	161.8	184.2	200.3	1823	400	2453	1079
Air factor		6.8	5.1	4.6	3.6	3.5	3.4	2.8	2.7	2.4	2.2	2.1	2.0				

specifications

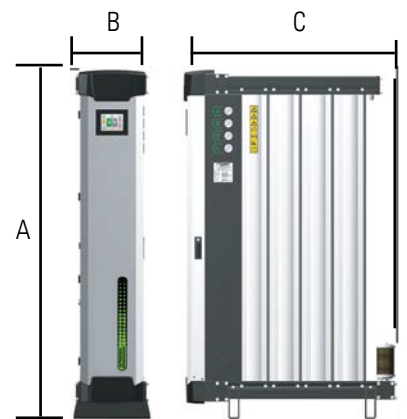
design operating pressure range	6 - 12 barg ⁽²⁾
design operating temperature range	5 - 50°C
recommended operating temperature	5 - 25°C
maximum inlet particulate	0.1 micron
maximum inlet oil content	0.01 ppm ⁽⁴⁾
recommended inlet dew point	-40°C PDP ⁽³⁾
supply voltage	100 - 240 VAC (50 or 60Hz)
power rating	72W

pressure correction factors ⁽⁵⁾

operating pressure (psig)	87	101	116	130	145	160	174
operating pressure (barg)	6	7	8	9	10	11	12
correction factor	0.90	1.00	1.10	1.20	1.30	1.40	1.50

temperature correction factors ⁽⁵⁾

inlet temperature (°F)	41	50	59	68	77	86	95	104	113	122
inlet temperature (°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.
- (2) 16 barg is available upon request. Consult factory
- (3) recommended for high purity applications
- (4) including oil vapor
- (5) to be used as a rough guide only. All applications should be confirmed.
- (6) technical specifications subject to change without notice.

EXPERIENCE. CUSTOMER. SERVICE.

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

Our commitment 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. We recognise 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 GEN₂ 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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