NITROGEN / ZERO AIR

NGLab

On-site nitrogen generation

NGLab combines an oil-free compressor, air treatment and gas generation in one unit. The PLC controls drying, separation and storage automatically. Models are available for research and analytical laboratories and cleanrooms.



UHP / SP / ZERO AIR
Choose UHP or SP nitrogen, or hydrocarbon-free zero air.
See page 03 for models and specifications.

EXPERIENCE FROM LIQUID NITROGEN PRODUCTION

IMTEK's liquid nitrogen systems compress, dry and purify air before liquefaction. We applied that experience to NGLab's air treatment and PSA separation. Reducing the compressed air needed for each litre of nitrogen reduces the work done by the compressor.

SYSTEM FEATURES

01

Incoming air monitoring

Monitors humidity, oxygen, solvent vapours and airborne contaminants in the incoming air before compression and purification.

02

Compressed-air use

Coordinates the dryer and PSA cycle to reduce purge losses and the air needed to produce nitrogen.

03

Drying

Uses waste heat and coordinates the dryer with nitrogen production to remove moisture and limit compressed-air losses.

04

Operation and standby

Uses runtime and stabilisation algorithms for continuous running, short standby periods and long standby periods.

05

Nitrogen storage

Stores nitrogen at different pressures to separate production from consumption and help keep delivery pressure steady.

06

Maintenance access

Modular subsystems and accessible components make routine service easier.

Product images illustrate the enclosure family. Features depend on the selected configuration.

From air to nitrogen gas.

Pressure swing adsorption (PSA) separates nitrogen from compressed air. The two adsorbent beds alternate between production and regeneration. A buffer stores nitrogen for delivery while the beds switch.

01 Compress the incoming air

An oil-free compressor pressurises the incoming air. The air buffer steadies the flow into the treatment section. Filters and drying are still needed because ambient air contains particles and water vapour.

02 Remove water and contaminants

Filters remove particles and liquid carry-over. The dryer removes water vapour before air enters the carbon molecular sieve. This protects the adsorbent from moisture and helps the generator produce dry nitrogen at a consistent purity.

03 Separate nitrogen under pressure

The active bed contains carbon molecular sieve (CMS). Under pressure, the CMS preferentially adsorbs oxygen; nitrogen passes through to the buffer. Bed size, air supply and cycle conditions determine how much nitrogen can be produced at the required purity.

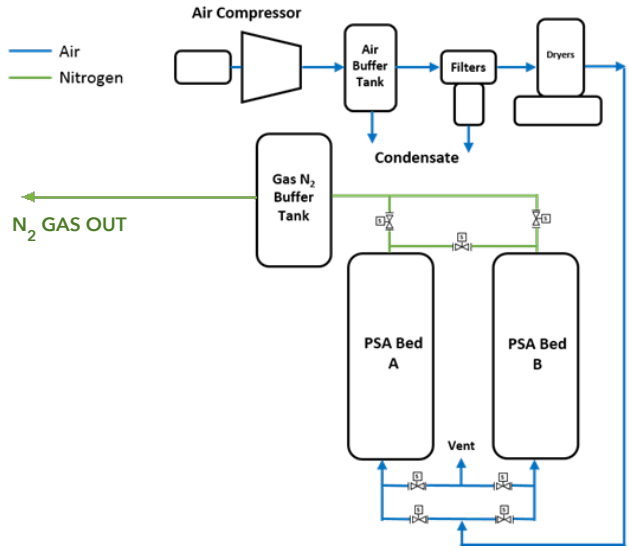
04 Regenerate, then switch beds

Lowering the pressure in the second bed releases the adsorbed gases through the exhaust. Purge gas helps clear the bed before it is pressurised again. The valves then switch which bed produces nitrogen and which regenerates.

05 Buffer and deliver the gas

The buffer supplies nitrogen while the beds switch and demand changes. NGLab stores nitrogen at different pressures to separate production from consumption and help stabilise delivery pressure. Gas flows to the application. Liquefaction needs a separate refrigeration stage.

NITROGEN PROCESS / SIMPLIFIED



Simplified nitrogen process adapted from CNP21. Component layout and controls vary by NGLab model. NGLab35ZA produces hydrocarbon-free air and is not represented here.

ALTERNATING PSA BEDS

Cycle	Bed A	Bed B
First phase	Produces N_2	Regenerates
Next phase	Regenerates	Produces N_2

Production and standby

NGLab coordinates the dryer and PSA cycle to reduce air lost through purging. Runtime and stabilisation algorithms control continuous production and short or long standby periods.

Specifying the gas supply

Purity

Check the instrument's oxygen limit and any other impurity limits. Specify these alongside the nitrogen purity.

Flow

Size the generator for the instruments that will run together. At higher purities, the available PSA flow generally falls.

Pressure

Confirm the pressure needed at the instrument under load, including losses through the distribution line.

Dryness

Specify the dew point and its measurement pressure. Dew point indicates how much moisture remains in the gas.

Models and specifications

ULTRA-HIGH PURITY / UHP

Model suffix	1UHP	5UHP	10UHP	35UHP	70UHP
Gas	N_2	N_2	N_2	N_2	N_2
Maximum purity	99.999%	99.999%	99.999%	99.99%	99.99%
Maximum flow, L/min	1	5	10	35	70
Maximum power, W[1]	≤250-270	≤700-750	≤1100-1200	≤1100-1200	≤2200-2400
Dew point	≤ -75 °C	≤ -75 °C	≤ -75 °C	≤ -75 °C	≤ -75 °C

STANDARD PURITY / SP AND ZERO AIR

Model suffix	35SP	70SP	35ZA
Gas	N_2	N_2	Zero air
Maximum purity	99.5%	99.5%	HC-free air
Maximum flow, L/min	35	70	35
Maximum power, W[1]	≤1100-1200	≤2200-2400	≤1100-1200
Dew point	≤ -40 °C	≤ -40 °C	≤ -40 °C

Across the range: outlet pressure up to 8 bar · 100-240 VAC, 1 phase, 50/60 Hz
Internal oil-free compressor · Plug-and-produce installation

[1] Power ranges follow the source specification. Maximum purity and maximum flow are stated separately. Confirm purity at the required flow, impurity limits and test conditions.

UHP APPLICATION GUIDE

3 Ideal / 2 Recommended / 1 Suitable / - Unrated

Application	1UHP	5UHP	10UHP	35UHP	70UHP
GC-MS	1	3	3	3	3
GC carrier gas	3	3	3	2	1
Trace analysis	3	3	3	2	1
Calibration laboratories	3	3	3	2	1
Single GC	3	3	3	2	1
Multiple GC systems	1	3	3	3	3
ELSD	-	1	2	3	3
CAD	-	-	1	3	3
Single LC-MS	-	1	2	3	3
LC-MS/MS	-	-	-	3	3
Triple quadrupole MS	-	-	-	2	3
Orbitrap MS	-	-	-	1	3
Central laboratory N_2 supply	-	-	1	2	3
Sample evaporation	-	1	2	3	3

Check the instrument's gas requirements before selecting a model. Features depend on the order configuration and may change.

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