

Atlas Copco

Nitrogen generators PSA technology

NGP+ 8-130

Guaranteed nitrogen purity at the lowest energy cost

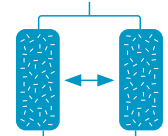
When your production requires high-quality nitrogen, there is no better solution than the Atlas Copco NGP+ 8-130. Our state-of-the-art PSA generator lets you produce your own, reliable supply of nitrogen with a purity of up to 99.999%. To ensure the integrity and continuity of your production, the NGP+ monitors the quality of your feed air and your gas output 24/7. It does this with superior efficiency to give you an industry-leading combination of peace of mind and the lowest cost of ownership.



best-in-class
efficiency

40% extra energy
savings

PSA inside



Cost savings

- On-site PSA gas generation with the lowest total cost of ownership.
- Minimal energy consumption per unit of N₂.
- Best-in-class adsorbent media utilization for maximum feed air efficiency, even in low-load conditions.



Hands-off performance

- Easy nitrogen purity selection via the controller for maximum operational savings.
- Continuous gas purity measurement protects your N₂ applications and products.
- Automated monitoring and routing of the feed air safeguard the integrity of the adsorbent.



Reliability

- Continuous supply of N₂ at a guaranteed purity.
- Self-protective design and operation ensure a long lifetime.
- In-house qualified valves for maximum uptime.
- Can be combined with a cylinder or bulk gas supply system.



The complete nitrogen generator

- Proven, modular design with extruded aluminum tubes ensures a compact footprint, reliable operation and a long lifetime.
- Fully automated for a superior performance:
 - Feed air check continuously monitors the feed air and blocks it from entering when its quality is below standard.
 - Nitrogen check ensures your N₂ output matches the selected purity.
 - VCS optimizes the PSA cycle during lower demand and in colder temperatures, giving you up to 40% additional energy savings.
 - Automatic start-up and stand-by mode allow for easy operation and avoid energy waste.
- Digital zirconia gas purity sensor, flow meter, and pressure regulator included as standard.
- Advanced Elektronikon® Touch controller with large HD color touchscreen offers easy gas purity selection, purity alarm, feed air monitoring and interception, and connectivity options.



Technical specifications

Type		Nitrogen capacity											Dimensions (W x D x H)		Weight	
		95%	96%	97%	98%	99%	99.5%	99.9%	99.95%	99.99%	99.995%	99.999%	mm	in	kg	lbs
NGP 8 ⁺	Nm ³ /h	18.2	16.1	14.1	12.0	9.6	8.1	5.7	4.3	3.1	2.8	1.9	775 x 840 x 2015	31 x 33 x 79	266	586
	Scfm	10.7	9.5	8.3	7.1	5.7	4.8	3.3	2.5	1.9	1.6	1.1				
NGP 10 ⁺	Nm ³ /h	23	21	18.1	15.5	12.4	10.4	7.3	5.5	4.0	3.6	2.5	775 x 840 x 2015	31 x 33 x 79	279	615
	Scfm	13.8	12.2	10.6	9.1	7.3	6.1	4.3	3.2	2.4	2.1	1.5				
NGP 12 ⁺	Nm ³ /h	29	25	22	18.9	15.2	12.7	8.9	6.7	4.9	4.4	3.0	775 x 840 x 2015	31 x 33 x 79	292	644
	Scfm	16.9	14.9	13.0	11.2	8.9	7.5	5.3	4.0	2.9	2.6	1.8				
NGP 15 ⁺	Nm ³ /h	36	32	28	24	19.3	16.2	11.3	8.5	6.3	5.5	3.8	775 x 840 x 2015	31 x 33 x 79	326	719
	Scfm	21	19.0	16.5	14.2	11.4	9.5	6.7	5.0	3.7	3.3	2.3				
NGP 20 ⁺	Nm ³ /h	47	41	36	31	25	21	14.6	11.0	8.1	7.1	4.9	775 x 840 x 2015	31 x 33 x 79	352	776
	Scfm	28	24	21	18.2	14.6	12.3	8.6	6.5	4.8	4.2	2.9				
NGP 25 ⁺	Nm ³ /h	57	51	44	38	30	25	17.9	13.4	9.9	8.7	6.0	775 x 840 x 2015	31 x 33 x 79	379	836
	Scfm	34	30	26	22	17.9	15.0	10.5	7.9	5.8	5.1	3.6				
NGP 30 ⁺	Nm ³ /h	70	62	54	46	37	31	22	16.5	12.1	11.0	8.0	1400 x 840 x 2015	55 x 33 x 79	608	1340
	Scfm	41	37	32	27	22	18.4	12.9	9.7	7.1	6.5	4.7				
NGP 35 ⁺	Nm ³ /h	86	76	66	57	46	38	27	20	14.8	13.4	9.7	1400 x 840 x 2015	55 x 33 x 79	648	1429
	Scfm	51	45	39	33	27	23	15.8	11.9	8.7	7.9	5.7				
NGP 40 ⁺	Nm ³ /h	94	83	72	62	50	42	29	22	16.2	14.6	10.6	1400 x 840 x 2015	55 x 33 x 79	681	1501
	Scfm	55	49	43	36	29	25	17.2	12.9	9.5	8.6	6.2				
NGP 50 ⁺	Nm ³ /h	115	101	89	76	61	51	36	27	19.8	17.9	13.0	1400 x 840 x 2015	55 x 33 x 79	734	1618
	Scfm	68	60	52	45	36	30	21	15.8	11.7	10.5	7.6				
NGP 60 ⁺	Nm ³ /h	129	115	99	86	68	57	41	33	24	22	15.9	1400 x 970 x 2015	55 x 38 x 79	764	1684
	Scfm	76	68	58	51	40	34	24	19.4	14.3	12.9	9.4				
NGP 70 ⁺	Nm ³ /h	158	141	122	105	83	70	50	40	30	27	19.5	1400 x 970 x 2015	55 x 38 x 79	1039	2291
	Scfm	93	83	72	62	49	41	29	24	17.5	15.8	11.5				
NGP 90 ⁺	Nm ³ /h	185	168	147	130	106	90	64	54	41	36	26	1421 x 970 x 2015	56 x 38 x 79	1140	2513
	Scfm	109	99	86	77	62	53	38	32	24	21	15.5				
NGP 105 ⁺	Nm ³ /h	211	193	168	147	120	102	73	62	46	41	30	1421 x 970 x 2015	56 x 38 x 79	1140	2513
	Scfm	124	113	99	87	71	60	43	36	27	24	17.5				
NGP 130 ⁺	Nm ³ /h	264	241	210	184	150	128	91	77	58	51	37	1421 x 970 x 2015	56 x 38 x 79	1560	3439
	Scfm	156	142	124	108	88	75	54	45	34	30	22				

Performance reference conditions:

- Compressed air effective inlet pressure: 7 bar(g)/102 psi(g)
- Ambient/inlet air temperature: 20°C/68°F
- Inlet air quality [1:4:1] according to ISO 8573-1:2010

Flow unit reference conditions:

- Nm³/h: 20°C – 1 bar(a) – 0% RH
- Scfm: 68°F – 14.5 psi(a) – 0% RH

General notes:

- Nitrogen purity expressed as 100% minus oxygen content
- Nitrogen capacity can vary up to +/- 5%
- Outlet nitrogen quality [1:2:1] according to ISO 8573-1:2010

Options

- Low ambient temperature settings (-10°C/14°F)
- Nitrogen quality (PDP) monitoring
- Ultra-low nitrogen PDP (-70°C/-94°F)
- Room oxygen alarm (wall mount)

Product Description: NGP+ 8-130

ATLAS COPCO PSA NITROGEN GENERATOR

1. General description

The Nitrogen Generator makes use of Pressure Swing Adsorption (PSA) technology to produce nitrogen by passing pre-treated compressed air through a vessel containing carbon molecular sieves (CMS). The PSA process is inherently a batch process, as the adsorbent bed requires periodic desorption. In order to secure steady flow, the Nitrogen Generator PSA systems contain two adsorbent vessels to provide operational continuity. One vessel is active while the other one is inactive. At the end of each cycle they switch roles.



2. Operating Principle

The active vessel is pressurized, and pre-treated compressed air enters the active vessel and flow up through the CMS. Oxygen molecules are being adsorbed while the nitrogen molecules pass through.

When the adsorbing vessel approaches saturation, the regenerated vessel is partly re-pressurized with the compressed gas from the adsorbing vessel. This is called the equalization step and is intended to save compressed air.

When pressure from the saturated vessel is released, the regeneration process starts. At the same time the regenerated vessel is being pressurized up to working pressure with the compressed air from the inlet at the bottom and nitrogen from the product tank at the top. The cycle starts over again.

3. Scope of Supply

The NGP+8-130 Nitrogen generators consist of the following:

3.1 Inlet air circuit

The inlet air quality is constantly monitored to make sure the inlet requirement is always met. By doing this, the CMS is protected and the lifetime of the nitrogen generator guaranteed.

- Inlet air moisture level (PDP) sensor
- Inlet air temperature sensor
- Inlet air pressure sensor
- Inlet air pressure indicator
- Inlet air purge valve: to flush the inlet air when the inlet air moisture level (PDP) is worse than requested
- Pilot air connection: pilot air circuit consists of:
 - o Pressure regulator and indicator

- Pilot solenoid valve block

3.2 PSA process

The PSA process of a nitrogen generator consists mainly of two assemblies:

- The adsorbers
 - Aluminum extruded profiles filled with Carbon Molecular Sieves (CMS), which adsorb the oxygen from the incoming compressed air. The CMS is densely packed and spring-loaded to prevent fluidization.
- The valve system controlling the PSA process: pneumatic actuated angle seat valves
 - Inlet transfer valves to guide the compressed air into the adsorbers
 - Equalization valves to allow an equalization of the adsorbers in order to save compressed air
 - Blow-off valves to vent the adsorbers to atmospheric pressure in order to release the oxygen from the CMS.
 - Outlet transfer valves to guide the nitrogen from the adsorbers to the product tank and to allow a back-flow from the product tank to the adsorbers during pressurization
 - A purge orifice to help escape the oxygen from the regenerating adsorber

3.3 Minimum pressure valve

The minimum pressure valve allows automatic start-up, by allowing a restricted flow through a parallel orifice. The minimum pressure valve also protects the adsorbers from over-flow thus guarantees a long lifetime of the CMS.

3.4 Outlet gas instrumentation

To guarantee the quality of the outlet nitrogen gas, the outlet nitrogen gas parameters are constantly monitored:

- Outlet pressure sensor
- Outlet pressure indicator
- Nitrogen moisture level (PDP) sensor (optional)
- Nitrogen flow meter
- Nitrogen purity sensor (zirconia long life oxygen sensor)
- Outlet flushing valve: to prevent the nitrogen gas from flowing to the application when the purity is lower than requested.

3.5 Outlet circuit

After the product tank, two valves are foreseen to control the flow of the nitrogen:

- Consumer valve: opens when the requested purity of the nitrogen is available in the nitrogen receiver.
- Outlet flushing valve: opens when the requested purity of the nitrogen is not reached. This way, bad purity nitrogen is flushed to atmosphere through the silencer.
- Pressure regulator: to reduce the nitrogen pressure to the requested pressure.
- Flow regulator: to set and restrict the flow to the required amount.

3.6 Elektronikon®

NGP+ 8-130 nitrogen generators are controlled by the Atlas Copco Mk5 touch controller and expansion modules IO34 and IO2 SSR. They control the PSA cycle of the generator, the regulation of the nitrogen purity and the protection of the CMS bed:

- PSA cycle control:
 - Manual mode: The PSA cycle will operate independent from the consumed nitrogen flow.
 - Automatic mode: Variable Cycle Saver (VCS): the cycle time will be altered depending on the level of consumed nitrogen. This way, less compressed air is needed to feed the generator and energy is saved when the generator is not running at full load. This algorithm also compensates for altering ambient conditions (thus the generator uses less compressed air at lower temperatures) and altering purity settings (the generator will use less compressed air at lower purity settings). When no nitrogen is consumed, the generator will enter stand-by mode and not use any compressed air at all.
- Automatic start-up: enables the user to start the generator with the push of a button. The generator will fill the nitrogen receiver with a specific flow which will result in the fastest initial start-up procedure possible.
- Guaranteed purity: when the nitrogen purity is less than requested, the flushing mode will shut off the nitrogen flow to the user and direct it over the flushing nozzle. This way, the purity will be recovered as fast as possible.

3.7 Warnings and alarms

The following diagnostics are foreseen:

- Indications:
 - Operation mode indication
 - Running state
 - Running time
 - Inputs:
 - Nitrogen purity level
 - Nitrogen flow
 - Inlet air pressure
 - Inlet air temperature
 - Inlet moisture level (PDP)
 - Pressure inside adsorber A
 - Pressure inside adsorber B
 - Nitrogen temperature
 - Nitrogen moisture level (PDP) (optional)
- Alarms:
 - Low nitrogen purity alarm
 - Failed to blow off vessel A
 - Failed to blow off vessel B
 - Failed to pressurize
 - High air inlet pressure
 - High air inlet temperature
 - High air inlet dewpoint
 - High nitrogen flow
- Retransmitting signals (4-20mA):
 - Inlet air moisture level (PDP)
 - Nitrogen purity level
 - Nitrogen flow
 - Nitrogen outlet moisture level (PDP) (optional)
- Other:
 - Service indication

- Password protected administrator settings
- Changeable settings for alarm levels

3.8 Available options

Low ambient temperature settings

This option is to be selected when the nitrogen generator is used in temperatures below 5°C. With this option, temperatures down to -10°C are allowed. It does not limit the maximum working temperature of 60°C.

This option requires the installation of a dryer that can provide an inlet PDP of -20°C or lower.

Nitrogen outlet PDP sensor

This option includes the installation of a dewpoint sensor that measures the pressure dewpoint of the nitrogen product gas.

The nitrogen PDP can be monitored through Smartlink and 4-20mA signal.

Low inlet PDP sensor

With the low inlet PDP option an inlet dewpoint sensor is supplied to measure pressure dewpoints of -50°C and lower.

The sensor can still measure dewpoints up to +20°C but with reduced accuracy above a PDP of 0°C compared to the standard sensor. Therefore, this option is only recommended when inlet pressure dewpoints of -50° and below are expected.

As with the standard PDP sensor, low inlet PDP sensor can be monitored through Smartlink and 4-20mA signal.

External oxygen analyser (wall mount)

This option includes an external oxygen analyser (wall mount) that measures the ambient oxygen concentration and gives a visual and audible alarm when the ambient oxygen concentration is too high or too low. The external oxygen analyser does not connect to the unit but the output can be read through 4-20mA or RS232. It also includes 2 configurable alarm relays.