

## NGM+ 1-7

### ATLAS COPCO MEMBRANE NITROGEN GENERATOR

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#### General Description

The NGM+ 1-7 range is a highly efficient nitrogen generator range utilizing membrane technology. These generators are designed to produce nitrogen from compressed air for a variety of applications. Purities range from 95% up to 99.9% (residual oxygen contents of 5% up to 0.1%). The innovative design offers a cost efficient on-demand source of compressed nitrogen for oil and gas, food packaging, general blanketing, plastics, tire filling, and many other industries.

The generator consists of one or multiple high performant membranes that are used together to achieve the nominal inlet flow. This membrane setup ensures a maximum output of compressed nitrogen for a minimum input of compressed air, at a wide range of operating conditions.

Safe and efficient operation of the complete unit is monitored and controlled by the in house designed Elektronikon® unit controller.

In order to allow continuous operation for more than 15 years, these nitrogen generators are equipped with a 3-stage premium prefiltration system ensuring an inlet air quality of [1:-:1] according ISO8573-1:2010. This eliminates the risk of the membrane being damaged by low quality compressed air supply, poor start-ups and unexpected shutdowns.



## Operating Principle / Working Principle

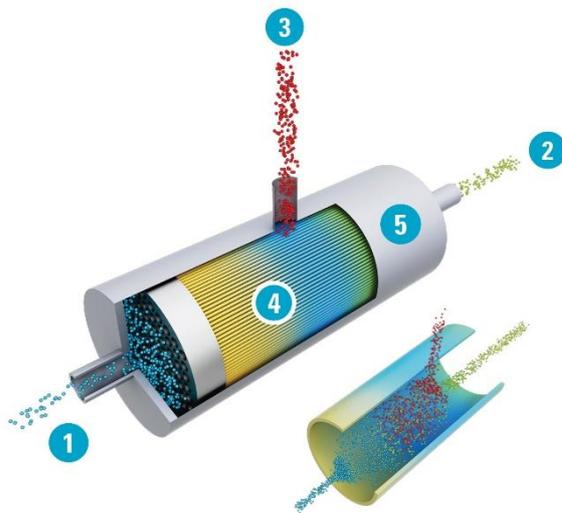
Membrane separation is a commonly used technology to separate gases from a mixture.

In a typical membrane process, the gas is first preconditioned to make sure all components that could harm the membrane are taken out before entrance. Next the gas is lead into thousands of single membranes that are all packed together in one membrane housing.

The separation itself is caused by the different permeation speed of the gases through the membrane fiber wall. Some gases will permeate very fast through the wall, meaning they won't show up at the membrane outlet but at the permeate vent instead. Other gases will take a much longer time or won't permeate at all, they will remain in big quantities at the membrane module's outlet. Typically these are the gases we want to capture with our membrane.

In the case of a nitrogen generator, a membrane is selected that will permeate the oxygen very fast and the nitrogen only slowly. That way we can get a good nitrogen purity at the outlet of the generator while having only very few nitrogen losses through the permeate vent.

Both the right selection of the membrane and the control algorithm for the complete nitrogen generator are key to obtain a high quality nitrogen generator.



1. Compressed air inlet.
2. Nitrogen outlet (retentate)
3. Enriched oxygen vent (permeate)
4. Membrane fibres
5. Membrane housing

## Scope of supply



## Air inlet circuit

- Inlet piping with screw piping connection
- Two actuated inlet valves in parallel for smooth pressure build up
- Generator inlet temperature sensor
- Generator inlet pressure sensor
- Generator inlet air pressure dew point sensor (optional)
- 3 stage premium filtration, consisting of coalescing filters (UD<sup>+</sup>), oil vapour filter (QDT) and dry dust filter (PDp<sup>+</sup>)
- Electronic drain for UD<sup>+</sup> filter
- Oil indicator on QDT (optional)
- Membrane inlet pressure sensor

## Membrane module

- High performance, high durable membrane with no ageing over lifetime
- Connection flange for membrane permeate vent, for ducting away the enriched oxygen (optional sales kit)
- Depending on the generator size, multiple membranes will be installed in series and/or parallel as shown in table below

	SINGLE	DOUBLE	TOTAL
NGM1+	1	0	1
NGM2+	2	0	2
NGM3+	3	0	3
NGM4+	0	2	4
NGM5+	0	3	6
NGM6+	0	4	8
NGM7+	0	5	10

## Nitrogen outlet circuit

- Purity regulation valve
- Nitrogen outlet pressure sensor
- Purity (oxygen) sensor
- Nitrogen flow sensor (optional)
- Outlet piping with screw piping connection

## Other components

- Elektronikon graphic controller with colour display
- CAN and Ethernet connection for remote visualization
- Remote alarm, remote start/stop and Auto restart (after power failure) functions
- Maintenance indicators (including filter pressure drop monitoring)
- Structural base frame with integrated forklift slots
- Fully enclosed canopy protecting the generator

## Features & Benefits

### Extremely fast start-up

After a push on the start button, the NGM+ only takes a few seconds to have your nitrogen available at the outlet.

- Nitrogen available right when you need it
- No specialist installation or commissioning, you only need a supply of dry compressed air

### High performant membrane

Get the most nitrogen for the compressed air you put in.

- No ageing, our membrane keeps the full performance over the entire lifetime
- Long lifetime due to 3-stage pre filtration built in the generator
- Zero performance loss at high ambient temperatures (high ambient option required)

### Maximum uptime

Your nitrogen is available 24 hours a day, 7 days a week.

- Risk of production breakdown due to gas running out is eliminated
- Very low service intensity, only required for oxygen sensor and the built in filters
- Continuous monitoring and control by our Elektronikon controller

### Cost savings

Get a secure supply of nitrogen and save money at the same time.

- Low operating expenses due to low air factor
- No additional costs such as order processing, refills and delivery charges.
- Low maintenance cost

### High nitrogen quality

A perfect match with your application requirement.

- Purities from 95% up to 99.9% (residual oxygen content levels from 5% up to 0.1%)
- Outlet nitrogen dew point of -40°C
- Very easy to adjust to another desired purity on the Elektronikon controller



## Complete machine

All the bells and whistles are available for you.

- Integrated 3 stage filtration
- Integrated oxygen sensor
- Integrated inlet air PDP and outlet nitrogen flow sensor (option)

