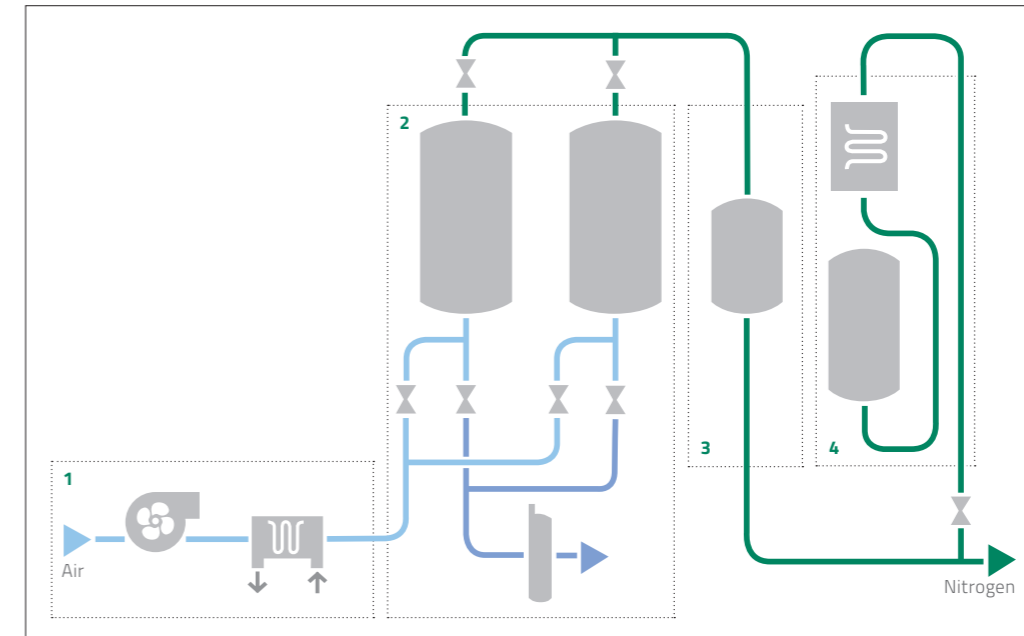


# NITROSWING

## The nitrogen generator



1 Air compression unit 2 Air separation unit 3 Nitrogen buffer vessel 4 Back-up system

### PLANT FEATURES

**Capacities from 200 to 4,000 Nm<sup>3</sup>/h**

**Product pressure between 6-9 bar(abs)**  
(at exit nitrogen PSA, higher pressure on demand)

**Purities (N<sub>2</sub> + Ar) up to 99,99 vol.-%**  
(higher purities on demand)

**Dew point min. -40 °C**

**Product flexibility regarding flow and purity**

**Design for long lifetime**

**High availability and reliability:**

Many years of experience in plant design and manufacturing guarantee high availability and reliability of all NITROSWING systems.

**Fast start-up:**

Each NITROSWING system has a start-up period less than 5 minutes.

**Full automation:**

All NITROSWING systems are designed for unattended operation and automatic load adjustment.

**Minimal space requirements:**

Packaged units minimize the space required (containerization possible).

**Completely pre-manufactured skids**

**Independent and low-cost on-site production:**

- Production is not affected by road transportation or weather conditions
- Low power consumption
- Minimized maintenance and operating costs

## The basic process

Mahler AGS' NITROSWING systems are based on the principle of physical adsorption and regeneration. Nitrogen is obtained by separating the oxygen from compressed air. The whole process is defined by three main steps.

### Pretreatment of process air

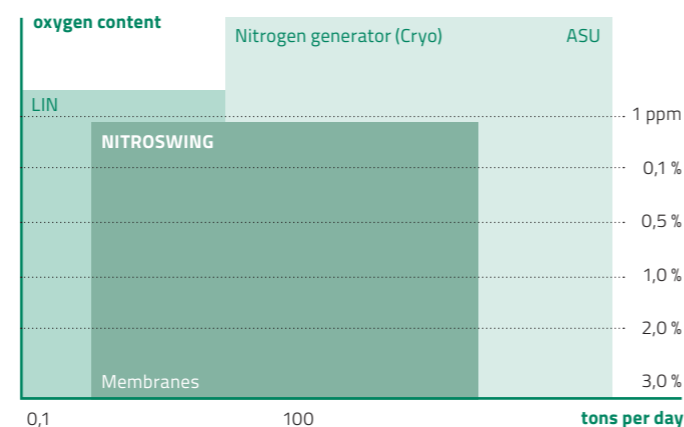
Ambient air is filtered before being compressed by an air compressor and dried by an air dryer system. Mahler AGS applies only state of the art compressors from renowned suppliers and can offer either oil-free or oil-injected compression solutions, depending on the process and environmental conditions. Also available process air can be used as feed for our NITROSWING plants.

### Generation of nitrogen

The pre-treated process air enters one of the two available adsorption vessels which are filled with a selected carbon molecular sieve (CMS). This CMS is the adsorption material which removes the oxygen from the process air. Thus a nitrogen rich product is obtained. The residual oxygen content within the product gas can be as low as 100 ppmv (higher purities on demand). While one adsorption vessel is producing nitrogen the other is in regeneration. The crucial and important regeneration step is achieved by lowering the pressure inside the vessel.

### Continuous production

By means of a process buffer vessel and a flow control unit, NITROSWING plants are constantly providing nitrogen at a given flowrate, pressure and quality. A particle filter is applied to ensure a clean product. The dew point of the generated nitrogen is well below the atmospheric freezing point (-40 °C and less).



## Applications

The Mahler AGS' NITROSWING systems give a broad spectrum of applications, e.g.:

### Petrochemical industry

- Purging and blanketing

### Metallurgy / Heat treatment

- Annealing
- Hardening and brazing
- Powdered metal sintering

### Chemical and pharmaceutical industry

- Purging of tanks and vessels
- Pipelines blanketing
- Prevention of oxidation during processing and storage of plastics
- Pneumatic conveyance

### Food industry

- Controlled atmosphere storage of fruits and vegetables
- Packaging of foods
- Blanketing of wines and oils

### Electronics industry

- Nitrogen atmosphere for manufacturing of semi-conductors and electrical components

### Mining industry

- Nitrogen plants for explosion protection and fire fighting

## Highlights

- Mahler AGS has built one of the world's biggest nitrogen plants with a total capacity of 210 tpd
- Mahler AGS has installed more than 200 industrial plants in the range of 1-210 tpd worldwide
- Plants in operation for more than 30 years with initial filling of carbon molecular sieve