N.GEN®
ON-SITE NITROGEN GENERATION SYSTEM

COST-EFFECTIVE NITROGEN GENERATION
HyGear offers Nitrogen supply ranging from 100 Nm3/h to 3000 Nm3/h by means of small scale on-site generation systems. There are 3 models available in 2 different purities; the N.GEN® at purity 99.5% and N.GEN® pure at purity 99.999%, which are containerised and can be placed in parallel. This makes them highly suitable to be installed at industrial sites.

The highly efficient on-site nitrogen generator is based on HyGear’s extensive experience in PSA gas separation technology and gas processing systems. Due to its high quality components, the N.GEN® requires minimum maintenance while having extended operation lifetime. The systems are flexible in capacity and can be combined with HyGear’s on-site hydrogen and oxygen generation systems to offer total on-site gas supply.

**Applications**
- Flat glass industry
- Metal industry
- Food industry
- Electronics industry
- Oil & Gas industry
- Chemical industry

**KEY BENEFITS**
- Cost-effective
- 100% reliability through backup supply
- Flexible contracting
- Low maintenance
- Autonomous and safe operation
- Compact and modular system
- Independency of third party supply
- Energy efficient process
In the first section of the N.GEN® atmospheric air is compressed. The compressed air is subsequently fed in the air treatment module (ATM), to remove water, oil and impurities. The ATM consists of multiple filters, a dryer and an activated carbon oil remover. The clean, dry and oil-free compressed air is captured in the buffer tank.

The second stage of the N.GEN® is the adsorption process. HyGear uses highly efficient Pressure Swing Adsorption (PSA) technology. The PSA separates the nitrogen from other gaseous species by using the differences in adsorption properties. The two parallel active vessels enable a continuous cleaning process.

The produced nitrogen is stored in a storage tank to balance the pressure fluctuation and ensure a stable nitrogen supply. Depending on the required pressure, a compressor can be added.

**Highly efficient PSA technology**
The N.GEN® is based on very efficient and reliable PSA technology to increase the nitrogen production yield and purity. The N.GEN has one of the world’s best air-to-nitrogen ratios, resulting in minimised energy consumption.

**Qualitative adsorption material**
HyGear has selected the best Carbon Molecular Sieve (CMS) as adsorption material for the N.GEN®. This CMS minimises the air and power consumption, while maintaining the required purity levels over time. A special CMS filling method is used to ensure higher density and better distribution of the adsorption material. This increases the production efficiency and ensures a longer lifetime of the material.

**Selective air treatment**
The selective filtration module ensures accurate pre-treatment of the compressed air and prevents impurities and water from entering the PSA.

**Advanced compressor**
HyGear uses high quality compressors to minimise maintenance and shutdowns and to lower the energy consumption.

**Secure and easy operation**
An advanced control system is integrated in the N.GEN®, to monitor and control the performance of the system from HyGear’s head office. The control system enables autonomous and safe operation.
WHAT’S INSIDE

1. Air compressor
2. Pre-treatment
3. Air receiver tank
4. Nitrogen buffer
5. Control box
6. PSA-vessels
# SPECIFICATIONS

## OUTPUT

<table>
<thead>
<tr>
<th>MODEL</th>
<th>N.GEN® 100</th>
<th>N.GEN® 250</th>
<th>N.GEN® 500</th>
<th>N.GEN®pure 100</th>
<th>N.GEN®pure 250</th>
<th>N.GEN®pure 500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purity</td>
<td>99.5%</td>
<td>99.5%</td>
<td>99.5%</td>
<td>99.999%</td>
<td>99.999%</td>
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<tr>
<td>Nominal nitrogen flow</td>
<td>92 Nm³/h</td>
<td>230 Nm³/h</td>
<td>460 Nm³/h</td>
<td>92 Nm³/h</td>
<td>230 Nm³/h</td>
<td>460 Nm³/h</td>
</tr>
<tr>
<td>Pressure</td>
<td>6 bar(g)</td>
<td>6 bar(g)</td>
<td>6 bar(g)</td>
<td>6 bar(g)</td>
<td>6 bar(g)</td>
<td>6 bar(g)</td>
</tr>
</tbody>
</table>

## TYPICAL CONSUMPTION DATA

| Process air | 267 Nm³/h | 668 Nm³/h | 1336 Nm³/h | 293 Nm³/h | 734 Nm³/h | 1467 Nm³/h |
| Electricity consumption | 0.001 kWh/Nm³ N² | 0.001 kWh/Nm³ N² | 0.001 kWh/Nm³ N² | 0.001 kWh/Nm³ N² | 0.001 kWh/Nm³ N² | 0.001 kWh/Nm³ N² |
| Air compressor electrical consumption | 0.407 kWh/Nm³ N² | 0.407 kWh/Nm³ N² | 0.402 kWh/Nm³ N² | 0.432 kWh/Nm³ N² | 0.432 kWh/Nm³ N² | 0.427 kWh/Nm³ N² |
| Instrument air (at 6 bar(g)) | 2 Nm³/h | 3 Nm³/h | 4 Nm³/h | 2 Nm³/h | 3 Nm³/h | 4 Nm³/h |
| Hydrogen | 0 | 0 | 0 | 1.2 Nm³/h | 3 Nm³/h | 6 Nm³/h |
| Cooling water | 0 | 0 | 0 | 10 l/min | 24 l/min | 48 l/min |

## DIMENSIONS

| Size | 20 ft | 20 ft | 40 ft | 40 ft | 40 ft | 40 ft |
| Weight | 7,000 kg | 10,000 kg | 17,000 kg | 10,000 kg | 15,000 kg | 20,000 kg |

## OPERATING CONDITIONS

| Start up time | 15 min | 15 min | 15 min | 30 min | 30 min | 30 min |
| Ambient temperature range | -20 °C to +40 °C | -20 °C to +40 °C | -20 °C to +40 °C | -20 °C to +40 °C | -20 °C to +40 °C | -20 °C to +40 °C |

All data and values are indicative and based on nominal and non-frost conditions.
Values might differ due to local circumstances and feedstock characteristics.
Normal conditions (Nm³) is defined at temperature of 0°C and pressure of 1.013 bar(a).

**IF YOU REQUIRE OTHER SPECIFICATIONS, CONTACT US TO ASSIST YOU WITH THE MOST OPTIMAL SOLUTION.**