

# ***PRISM® High Purity Nitrogen Systems – Micro HPN Series***



“The challenge was to engineer a competitive high purity on-site nitrogen generator optimised for customers with smaller flow requirements, whilst maintaining a competitive product cost coupled with Air Products’ high standards of reliability and performance. The outcome is the *PRISM®* Micro HPN range.”

*Gavin Jones,  
Project Development  
Micro HPN Product Line*



*Air Products has designed, engineered, manufactured and operated on-site gas generation systems for over 40 years, which has created an outstanding global product line.*

Air Products’ *PRISM®* Micro HPN (High Purity Nitrogen) Systems provide state-of-the-art technology in nitrogen production. These systems offer a highly-reliable supply of nitrogen and can provide significant cost savings over alternative supply.

*PRISM®* Micro HPN nitrogen gas generation systems offer to smaller-volume customers, who require liquid-quality gas, an economical reliable on-site method of supply. Standard features are available to meet the specific needs of many diverse industries, with optional features available to meet specific customer requirements.

Among many of the industries we serve: metals, electronics, chemicals, petrochemicals and food, feature as some of the most significant.

*PRISM®* Micro HPN generators have been developed to satisfy the market demand for small, high purity, low cost gaseous nitrogen. With their inherent ability to increase or decrease production flow rates across a wide range of requirements, they are the ultimate in flexible supply. The units achieve this significantly low cost for gaseous nitrogen through adopting a low capital, low power and low operating costs philosophy, whilst maintaining the utmost in reliability and continuing to meet Air Products’ high safety standards.

## ***Features and Benefits***

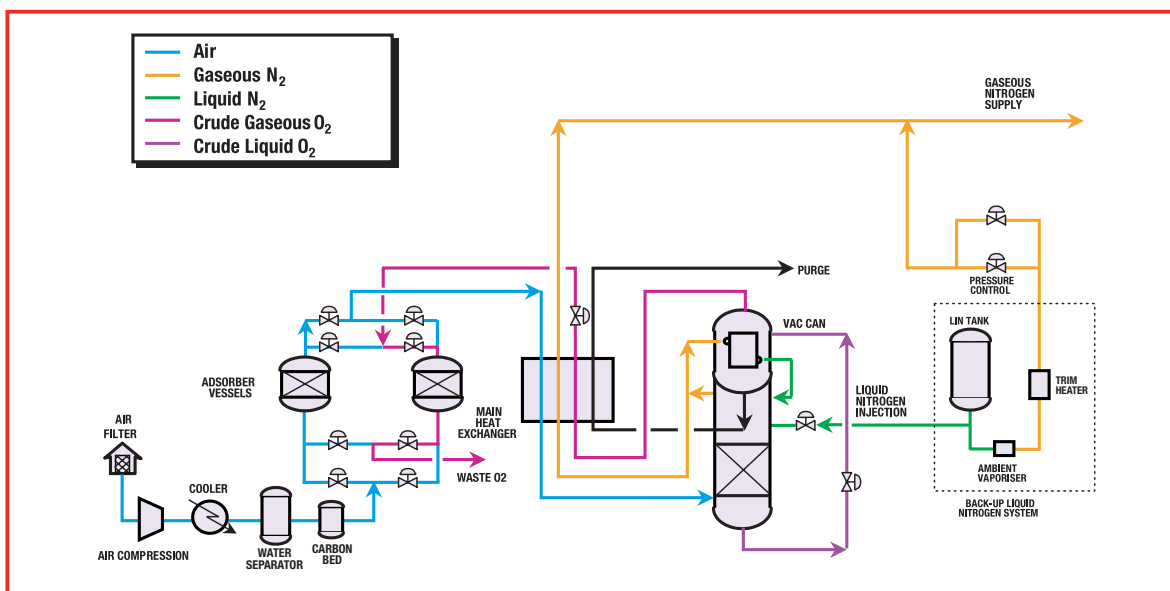
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|---------------------------|--|
| <b>Low Capital Cost</b>   | <ul style="list-style-type: none"> <li>• Highly skidded, modular design</li> <li>• Quick and efficient installation, minimising any disruption to the customer</li> <li>• Minimal foot print required</li> </ul>   |
| <b>High Reliability</b>   | <ul style="list-style-type: none"> <li>• Fully-automatic controls giving flexibility as well as high reliability</li> <li>• Capability for local and remote operation, automatic call out facilities standard</li> <li>• Minimum rotating machinery</li> </ul> |
| <b>Low operating cost</b> | <ul style="list-style-type: none"> <li>• Automatic plant start up by single push-button operation</li> <li>• No process or cooling water required, minimising requirements of customer utilities</li> <li>• Unmanned operation</li> </ul>                      |
| <b>Flexibility</b>        | <ul style="list-style-type: none"> <li>• Support for customer specific requirements</li> <li>• Equipment to supply wide ranging flow requirements</li> <li>• Can be located in low noise environments</li> </ul>   |

### Process Description

The **PRISM**® Micro HPN Nitrogen Generator utilises cryogenic distillation technology to separate air into its two principal components – nitrogen and oxygen. Air is filtered through an automatic air pre-treatment system, which removes moisture and carbon dioxide, and is then cooled and partially liquefied in the main heat exchanger by the outgoing process streams. The air then flows into the distillation column where it is separated into gaseous nitrogen product and an oxygen-enriched

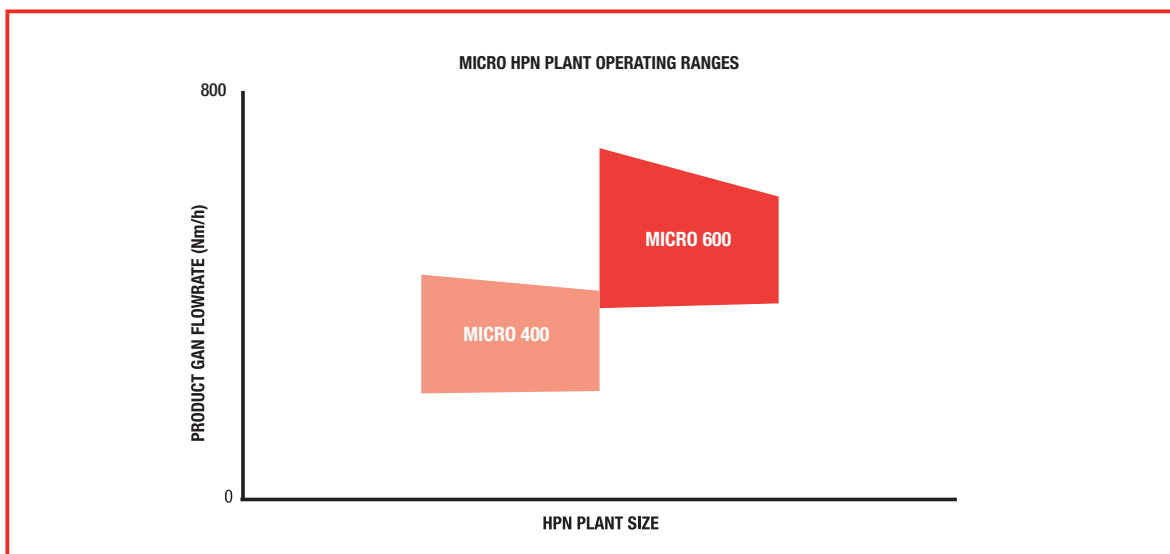
vent stream. The vent stream is used to regenerate the air pre-treatment vessels before being released.

The HPN process uses a small stream of liquid nitrogen (LIN) from the storage tank to provide refrigeration to the nitrogen generator. The liquid nitrogen tank also provides automatic plant back-up product.

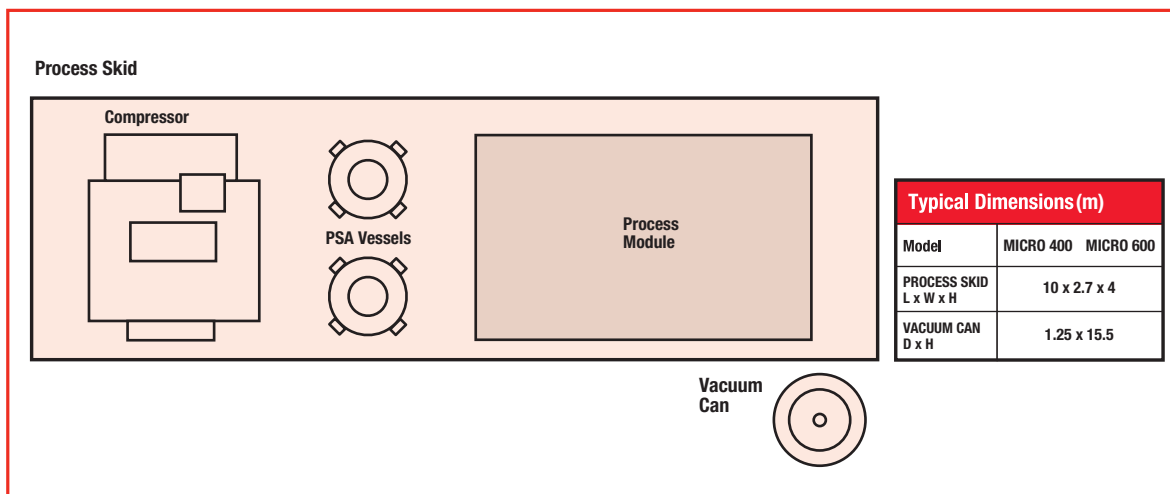


### PRISM® Micro HPN Performance

The **PRISM**® nitrogen Micro HPN system covers a range of gaseous nitrogen duties. The map below outlines the general performance capabilities of the various plants in the range. The capacity of each plant is shown across a pressure range of 4.5–11 bar g gaseous nitrogen product. Purities in nitrogen of ppb level oxygen and trace inerts can be achieved.



## Typical Plant Layout



## Standards and Specifications

### Safety, Health & Environment

Air Products believes that nothing is more important than safety.

We have extensive Safety Management systems, procedures (including HAZOP analysis) and detailed engineering standards, as well as 50 years of Air Separation plant operation experience. This expertise is applied to all plant and equipment that Air Products operates and sells, to ensure the safety of employees, customers and the general community. As a result Air Products is widely acknowledged to be the safety leader in the industrial gas industry and also has one of the leading performances in the chemical industry as a whole.

### Quality

Air Products PLC engineering and manufacturing operates under QA procedures, certified under ISO9001 since 1983.

### Pressure vessels

These are normally manufactured to ASME VIII U-stamp and to European, but other codes can be accommodated where necessary.

### Piping

ASME B31.3 as standard, DIN where required.

### Electrics

IEC, CE plated as standard, NEMA where required.

### Noise level

85 dB(A) at 1 metre as standard, in a "free field" area with no other noise sources considered. Lower levels can be achieved where required.

## Typical Project Schedule

A typical milestone schedule for a Micro HPN plant.

All times are in months from the date of formal commitment. Project schedule is dependent on equipment lead times and is subject to change.

	1	2	3	4	5	6
Project Kick Off & Equipment Fabrication	█					
Customer Site Scope				█		
Delivery to Site					█	
Equipment Installation						█
Commissioning & Start-up						█
Months	1	2	3	4	5	6

## Scope of Supply

### Descriptions:

Air Products **PRISM**® System products have been designed to meet a wide range of applications in order to satisfy the requirements of each Customer. The scope of supply of each plant can also be tailored to best address the interests of the Customer. As well as supplying the generation system, Air Products offers a broad complement of service options. These service options build on the base equipment package to provide a full product supply system, complete with ongoing operation, maintenance, and ownership of the equipment. An Air Products Commercial Manager would work directly with the Customer to identify the optimum level of service options.

### Available service options:

- Licence and Permit Assistance
- Foundation Design and Construction
- Product Compression
- Equipment Delivery and Full Installation
- Utilities Design and Supply
- Startup and Commissioning of System
- Plant Overview and Safety Training
- Ongoing Operation and Maintenance
- Liquid Supply System for Backup & Peakshaving
- Product Pipe Line to Point of Use
- Application Testing & Optimisation
- Product Validation

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