

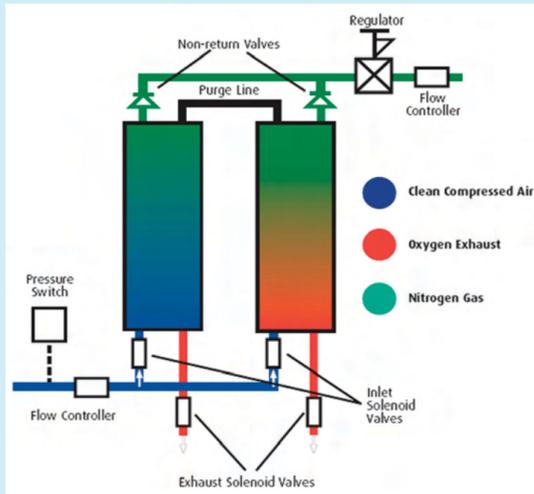
## How it Works

The technology used to produce a continuous flow of high purity N<sub>2</sub> is pressure swing adsorption (PSA). PSA uses a combination of molecular sieves to selectively eliminate O<sub>2</sub> and other contaminants in the ambient air.

The CMS column(s) alternate between the purification and regeneration modes to ensure continuous N<sub>2</sub> production. The gas generator is designed to take pre-filtered compressed air at 7 to 18 bar (102 or 261 psi - depending on model) from the existing air supply or via a dedicated air compressor.

This flow of filtered compressed air then passes through the CMS column which is in the purification mode. At this point, the O<sub>2</sub>, CO<sub>2</sub>, humidity and hydrocarbons are eliminated from the compressed air, producing a flow of clean and dry high purity nitrogen.

Nitrogen purity can range from 95% to 99.999% with flow-rates from 1Nm<sup>3</sup> to greater than 5000 Nm<sup>3</sup>. All our systems are modular and can be easily expanded at a later date, depending on demand.



| Nitrogen Outlet Flowrate - Nm <sup>3</sup> / Hr (ATP) Oxygen Concentration |       |        |        |        |      |      |      |       |       |       |       |
|--|-------|--------|--------|--------|------|------|------|-------|-------|-------|-------|
| Model  | 10ppm | 100ppm | 250ppm | 500ppm | 0.1% | 0.5% | 1.0% | 2.0%  | 3.0%  | 4.0%  | 5.0%  |
| DEG1068  | 0.55  | 1.2    | 1.5    | 1.9    | 2.4  | 3.4  | 4.3  | 5.8   | 7.2   | 8.4   | 9.4   |
| DEG1070  | 1.20  | 2.4    | 3.2    | 3.9    | 4.7  | 6.9  | 8.5  | 11.6  | 14.3  | 16.7  | 18.8  |
| DEG1072  | 1.5   | 3.2    | 4.2    | 5.3    | 6.5  | 9.5  | 11.5 | 15.2  | 18.7  | 21.7  | 24.5  |
| DEG1170  | 1.97  | 3.2    | 6.7    | 8.1    | 9.0  | 14.1 | 17.8 | 22.0  | 25.8  | 29.0  | 32.2  |
| DEG1172  | 3.0   | 4.8    | 10.0   | 12.1   | 13.4 | 21.2 | 26.6 | 32.8  | 38.7  | 43.5  | 48.3  |
| DEG1174  | 4.0   | 6.4    | 13.4   | 16.2   | 18.0 | 28.3 | 35.5 | 43.8  | 51.6  | 58.0  | 64.4  |
| DEG1176  | 5.0   | 8.0    | 16.8   | 20.2   | 22.4 | 35.3 | 44.4 | 54.7  | 64.5  | 72.5  | 80.4  |
| DEG1178  | 6.0   | 9.6    | 20.1   | 24.2   | 26.8 | 42.4 | 53.3 | 65.7  | 77.4  | 87.1  | 96.5  |
| DEG1182  | 7.9   | 12.8   | 25.5   | 30.7   | 34.0 | 53.7 | 67.5 | 83.2  | 98.1  | 110.3 | 122.3 |
| DEG1186  | 9.80  | 16.00  | 30.9   | 37.2   | 41.2 | 65.0 | 81.7 | 100.7 | 118.7 | 133.5 | 148.0 |

Greater flows and pressures are available by multibank systems and increased inlet air pressures. Weights and dimensions vary for each system supplied.

### Technical Specifications:

Standard operating temperature between 15-25 degrees Celsius  
Other operating temperatures on application  
Nitrogen outlet pressure: up to 16.5 bar or greater (if needed up to 300 bar)

### Standard equipment includes:

- Oxygen analyser for continuous monitoring of nitrogen purity
- Analogue outputs of remote monitoring
- Alarm connections

### Inlet air quality:

Dewpoint: -40 degrees Celsius  
Particulate: <0.1 micron  
Oil: <0.01 mg/m<sup>3</sup>  
Electrical supply: 220V/1ph/50Hz or 110V/1ph/60Hz  
Inlet / Outlet connections: Air G 1 / Nitrogen G1/2

### Optional extras:

- T Mass flow meters
- External tank analysers
- Containerised systems



## Dalco Nitrogen Systems

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### United Arab Emirates (U.A.E.)



**DALCO**  
Nitrogen Systems



**Don't Buy Nitrogen Gas ... Make it!**

General Nitrogen Use



Wine / Beverages



Chemical Handling



Food Packaging



Pharmaceuticals



Engineering



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**Dalco Nitrogen System's** head office is based in Co. Meath, Ireland and has offices in the UK and Australia. We are one of Europe's leading manufacturers of Nitrogen Gas Generation Systems across all industries. Our systems allow our customers to make their own Nitrogen Gas requirements on site rather than paying for bottled or bulk nitrogen.

We have worked with some of the world's top companies with typical savings of 90% per annum. Dalco Engineering Systems was formed in 1993 by its current Managing Director John Daly. The company has grown over that time and developed into a European leader in Nitrogen Gas Generation Systems.

We are holder of an ISO 9002 Quality Award. In compliance with the ISO structure Dalco operates to strict quality procedures in every stage of the manufacturing and servicing process. Dalco has a dedicated team of professional and friendly staff to guide you through the selection, installation and servicing of your bespoke system.

We specialise in complete turnkey packages whereby we evaluate a customer's nitrogen gas requirements and design a complete production alternative to using bottled or bulk gas. All our systems can either come as open skid packages or containerised systems or be installed in plant rooms if provided, with all the necessary equipment to allow the systems to operate effectively and independently. Most of our systems are drop, plug and play.

### Advantages of Nitrogen Generation

- On site gas generation
- Massive price savings up to 95%
- Variable gas purity 95%-99.999%
- No need for bulk delivery or storage of bottles.
- Very quick capital pay-back period – usually within a year
- Low running costs i.e. 0.03 cent M3 or less as against buying nitrogen gas
- Versatility for expansion - modular design
- Guaranteed quality with oxygen analyser built in
- Pure dry nitrogen
- Flow rates from 8L/min-5000 NM<sup>3</sup>/hr
- Fully independent systems with own compressor
- Complete containerised systems available
- Easy and inexpensive to service annually
- No health and safety issues



### Food Packaging

Improving product quality and extending shelf-life

#### Benefits of MAP

- Preservation of product flavour, aroma, texture and nutritional value
- Increased sales through high quality product
- Fewer product returns
- Increased production efficiency with longer product runs
- Better product colour and texture at point of sale
- Extended shelf life
- Increased export opportunities to new geographic market



### Pharmaceutical

#### Nitrogen applications:

- Transfer
- Purging
- Aseptic Packaging
- Analytical Testing
- Nitrogen Purity
- Blanketing
- Drug Manufacture
- Filtration Separation Purification



### Wine Making

#### Nitrogen applications:

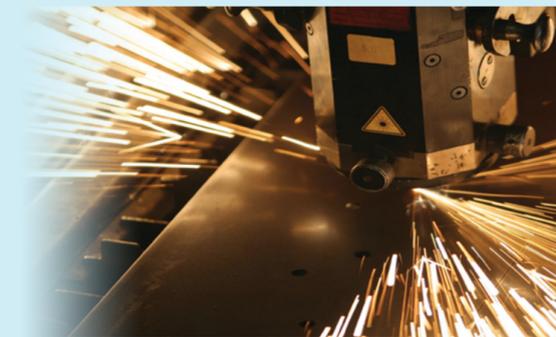
- Must lifting
- Tank blanketing
- Pressure transfer
- Membrane filter integrity testing
- De-alcoholisation
- Sparging
- Clarification
- Corking
- Flushing
- Purging equipment



### Laser Cutting

#### Nitrogen applications:

- Increased production through higher cutting speed
- Clean edges that require less material handling
- No overheating from exothermic reactions
- Improved corrosion resistance
- Reduced discoloration
- Oxide-free cuts
- Dross-free cuts
- Systems can be bottle filling stations or online production



### Chemical Handling

#### Nitrogen applications:

- Blanketing
- Protective Cleaning
- Cooling
- Transfer
- Safeguard



### Bespoke Products

Part of every new customer installation is an onsite inspection and assessment. We look at how your business works and custom build a Nitrogen Gas System to exactly meet your needs. You can even see Nitrogen gas being manufactured in our onsite demonstration unit. No capital available? We can rent you a system and still save you money (at least 50% savings).

All our systems come with a full 2 Year Guarantee. Our manufacturing and servicing is of the highest standard. We are proud to be accredited by the NSAI with ISO 9001:2000.



We are the only Nitrogen Gas Generator System manufacturer based in Ireland with a dedicated team of after-sales technicians ready to handle any service needs you might have. Once we install your system we provide complete backup for any additional servicing that the unit may have. Our dedicated team ensure that your nitrogen gas supply is constant and guaranteed removing your reliance on bottle or bulk nitrogen gas.