



**Unique solutions for
food grade nitrogen**

SHAPING THE FUTURE

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Competence and Trust

The unique and patented technology applied for our NITROSWING® and OXYSWING® modular PSA generators has set market standards in terms of flexibility, efficiency and reliability. Our special packages for instrument air, nitrogen or oxygen generation, designed according to customer's specifications and suitable even for operation at extreme ambient conditions, are well known for their high level of engineering and outstanding quality.

Behind all our activities lies trust: the trust our customers have in our ability to meet their specific needs in terms of both quality standards and agreed delivery terms. Our prime aim is to establish a long-term professional relationship based on transparency and reliability. Our customers appreciate our capacity for smooth project execution and on-time delivery.



Main Applications for Food Grade Nitrogen.

Producers of foodstuff and beverages can reduce considerably their nitrogen costs by utilizing onsite nitrogen generating systems for the following main applications:

Beverages

Nitrogen is used for a variety of applications, like beverage storage, CO₂ mixing, beverage transport and beverage dispensing to end users. To avoid discoloration and off-flavours of non-carbonated beverages, like wine, iced tea, fruit juices or milk type beverages, nitrogen may be used for sparging or inerting purposes. Sparging is a technology to effectively remove dissolved oxygen from beverages by introducing nitrogen in the form of very fine bubbles.

Nitrogen is also used during wine bottling to purge the bottles before and after filling. These applications are ideally suited to onsite nitrogen generation due to the continuous nitrogen flow requirement.

Blanketing of Silos and Bulk Storage Tanks

The presence of an inert nitrogen gas at slight overpressure which covers food produce contained in bulk storage silos or vessels will help prevent oxidation and contamination from possible external atmospheric sources

Coffee Packaging

Whether your company is packaging whole beans, ground coffee or espresso pods, flushing your product with nitrogen will preserve freshness and greatly extend the product shelf life. Coffee packaging is very well suited to onsite generation of food grade nitrogen as packaging is a relatively continuous process.

Controlled Atmosphere Fruit Storage

Large gas tight temperature and oxygen controlled bulk stores are typically used for fruit, vegetables and salads. Purging with nitrogen gas removes oxygen and carbon dioxide which will slow product deterioration from weeks to many months. In addition to land based CA stores, marine units provide the same level of benefit for specially modified cargo holds within ships and allow the most economical transportation of perishable foods from all areas of the world. Onsite nitrogen generating technology is well suited and widely used to provide a very cost effective supply of nitrogen for this application.

Fluffing

Nitrogen gas is often used to create micro-bubbles in products, such as cream and certain desserts, to increase bulk and improve texture. Nitrogen is used in preference to air as it is inert so that it will prevent oxidation of the product which would affect its taste.

Food Grade Nitrogen Applications

Insect and Larvae Reduction

Storage of produce such as cereals and grains can be purged and blanketed with nitrogen gas to eradicate insects or the development of their larvae inside silos and storage tanks.

Modified Atmosphere Packaging (MAP)

Modified Atmosphere Packaging (MAP) stands for packaging of foodstuff under a protective atmosphere by using nitrogen or gas mixtures consisting of nitrogen, carbon dioxide and / or oxygen. This technology is widely used in the food packaging industry to prevent spoilage, preserve freshness, maintain flavour and greatly extend product shelf life. Nitrogen is also used in soft packages that must retain their shape in order to preserve fragile products such as potato chips.

The application of a nitrogen / carbon dioxide mixture as filling gas for MAP neutralises the carbon dioxide's absorption effect and also reduces the vacuum effect. Prepared salads and vegetables, fresh chilled ready meals, meat, poultry, fish, dairy produce (including cheese), breads, as well as snack foods such as potato chips and nuts can all benefit from MAP. Food packaging is very well suited to onsite nitrogen generation as packaging is a relatively continuous process.

Pressure Transfer

Nitrogen gas is used as an inert, non oxidizing motive force to convey powders and liquids where it is undesirable or not possible to employ traditional pumping methods.

Using nitrogen gas gives the additional benefit of fire and explosion suppression, often associated with powders, dust and flammable liquids.



Automatic food packaging line from Goglio – www.goglio.it





Specific Know-How & Services from NOXERIOR.

Vast Knowledge of Food Applications

NOXERIOR has decades of experience with nitrogen supply for food and beverage applications. We can assist you with a detailed consultancy regarding the specific nitrogen consumption of any kind of HFFS (horizontal form-fill-seal) or VFFS (vertical form-fill-seal) packaging machine, independent whether you apply (semi) rigid packages or “pillow-pack” pouches.

We also have a wide experience with the particular conditions regarding the nitrogen supply to either thermo-forming packaging machines or vacuum chamber machines. Even with limited information, like bag volume or package size, product volume and packing speed we will be able to calculate a reliable nitrogen consumption for all kind of packing machines.

In case of beverages we can provide you a reliable nitrogen supply for both standard and isobaric bottling machines. Additionally, we will do a detailed simulation and analysis of the overall nitrogen consumption profile, including peak consumptions, to guarantee a correct dimensioning of our NITROSWING® Modular PSA Nitrogen Generator which will bring the economical benefits you expect.

Food Grade Nitrogen by NITROSWING®, an unique Solution.

The unique NITROSWING® Modular PSA Nitrogen Generators from NOXERIOR apply the Pressure Swing Adsorption (PSA) process for the on-site production of nitrogen from clean compressed air.

The patented design and process technology of our NITROSWING® Modular PSA Nitrogen Generators offer you unique features to overcome the major disadvantages of conventional PSA Nitrogen Generators:

- Unlimited flexibility to adjust the production capacity of already installed systems;
- Compact dimensions for installations even in small spaces of your production facility;
- Application of non-corrosive materials, like aluminium and stainless steel, as standard for all process components.

Flexibility & System Upgrade

You can increase the capacity of your NITROSWING® Modular PSA Nitrogen Generator at any time simply by adding PSA modules or by installing a so-called Dual-Bank in parallel without additional modifications.

A Dual-Bank is a PSA nitrogen Generator identical to the standard NITROSWING® PSA Nitrogen Generators, but without PLC and power supply, which will be installed parallel to the standard Nitrogen Generator.

The Dual Bank will get its power and control signals from the NITROSWING® Modular PSA Nitrogen Generator through a single cable connection (master/slave principle).

One NITROSWING® Modular PSA Nitrogen Generator is able to control up to maximum of three Duals Banks in parallel.

Certified Quality

Maximum product safety in combination with a reliable and stable nitrogen production conform the E941 specification for food grade nitrogen and the relevant JECFA monograph (JECFA = Joint FAO/WHO Expert Committee on Food Additives) are of fundamental importance according to NOXERIOR's internal standards.

Therefore, the NITROSWING® Modular PSA Nitrogen Generators have a Full Quality Assurance certification to Annex III (Module H) of the European Pressure Equipment Directive 97/23/EC.





NITROSWING® Advantages

Enhanced Safety

Low operating pressures, no hazardous storage. The use of heavy, high pressure gas cylinders no longer needed. Hazardous storage of cryogenic nitrogen can be avoided.

Convenience

Automatic and unattended operation. Fully automatic starting and stopping of the nitrogen production in direct response to demand from your downstream nitrogen consumption.

Cost Savings

A low investment combined with very low operating costs result in a significant reduction of your expenses for food grade nitrogen with savings up to 60%.

High System Reliability & Quality

First-class components, stainless steel process piping, valves and regulators, heavy-duty PLC. It should work. Always.

Guaranteed Stable Nitrogen Purity

Real-time purity monitoring in combination with an automatic blow-off system and a nitrogen discharge flow regulation guarantees you that your produced food grade nitrogen always corresponds with the specifications of your Quality System, even if nitrogen demand would exceed the maximum production capacity of your NITROSWING® nitrogen generation system.

Unlimited Flexibility

Best fit solution for any food grade nitrogen supply requirement. No risk for excessive oversized systems.

Easy System Adjustment

In case your nitrogen requirements would change, simply adjust your NITROSWING® system by varying the number of PSA modules. Just by yourself, no other modifications to the system required.

Compact

All NITROSWING® Modular PSA Nitrogen Generators fit through standard door openings and can be handled easily by manual pallet trucks. Installation possible even in the smallest angle of your production facility or inside ISO freight containers.

Easy Fleet Management

Identical components for the entire model range = limited spare part management & easy maintenance.



Technical Specifications

| NITROSWING® PSA Generator | PSA Modules | Eg41 Food Grade Nitrogen Production Nm³/h / scfh | | | |
|------------------------------|----------------|---|------------------------|-------------------------|-------------------------|
| | | Master Unit | with 1 Dual Bank | with 2 Dual Banks | with 3 Dual Banks |
| NS-5 | 1 | 8,0 305 | n/a | n/a | n/a |
| NS-10 | 2 | 16,0 610 | n/a | n/a | n/a |
| NS-20 | 3 | 24,0 915 | n/a | n/a | n/a |
| NS-25 | 4 | 32,0 1,215 | n/a | n/a | n/a |
| NS-30 | 5 | 40,0 1,520 | 80 3,045 | 120 4,565 | 160 6,090 |
| NS-35 | 6 | 48,0 1,825 | 96 3,650 | 144 5,480 | 192 7,305 |
| NS-40 | 7 | 56,0 2,130 | 112 4,260 | 168 6,390 | 224 8,520 |
| NS-45 | 8 | 64,0 2,435 | 128 4,870 | 192 7,305 | 256 9,740 |

Feed Air Pressure = 7,0 bar(g) / 100 psig
Nitrogen Discharge Pressure = 6,0 bar(g) / 87 psig
Nitrogen Dew Point = < -40 °C / -40 F at atmospheric pressure

| NITROSWING® PSA Generator | Dimensions L x W x H mm / inch | Weight kg / lbs |
|------------------------------|--------------------------------------|--------------------|
| NS-5 | 520 x 640 x 1.345 21 x 25 x 53 | 210 465 |
| NS-10 | 520 x 865 x 1.345 21 x 34 x 53 | 315 695 |
| NS-20 | 520 x 1.095 x 1.345 21 x 43 x 53 | 420 925 |
| NS-25 | 520 x 1.321 x 1.345 21 x 52 x 53 | 525 1,155 |
| NS-30 | 520 x 1.550 x 1.345 21 x 61 x 53 | 630 1,390 |
| NS-35 | 520 x 1.775 x 1.345 21 x 70 x 53 | 735 1,620 |
| NS-40 | 520 x 2.005 x 1.345 21 x 79 x 53 | 840 1,850 |
| NS-45 | 520 x 2.235 x 1.345 21 x 88 x 53 | 945 2,085 |

Options

- Dual Bank (max. 3)
- Electronic Product Flow Meter
- Product Flow Totaliser
- Feed Air Pressure and Temperature Transmitter
- Nitrogen Pressure and Temperature Transmitter
- Set of external Nitrogen Sterile Filters
- Special Devices and Systems for Mixing, Metering and Analysing of Gases based on a composition of N₂, CO₂ and/or O₂

| NITROSWING® PSA Generator | PSA Modules | Eg41 Food Grade Nitrogen Production Nm³/h / scfh | | | |
|------------------------------|----------------|---|------------------------|-------------------------|-------------------------|
| | | Master Unit | with 1 Dual Bank | with 2 Dual Banks | with 3 Dual Banks |
| NS-5 | 1 | 10,0 380 | n/a | n/a | n/a |
| NS-10 | 2 | 20,1 765 | n/a | n/a | n/a |
| NS-20 | 3 | 30,1 1,145 | n/a | n/a | n/a |
| NS-25 | 4 | 40,2 1,529 | n/a | n/a | n/a |
| NS-30 | 5 | 50,2 1,910 | 100,4 3,820 | 150,6 5,730 | 200,8 7,640 |
| NS-35 | 6 | 60,2 2,290 | 120,4 4,580 | 180,6 6,870 | 240,8 9,160 |
| NS-40 | 7 | 70,3 2,674 | 140,6 5,350 | 210,9 8,020 | 281,2 10,695 |
| NS-45 | 8 | 80,3 3,055 | 160,6 6,110 | 240,9 9,165 | 321,2 12,220 |

Feed Air Pressure = 10,0 bar(g) / 150 psig
Nitrogen Discharge Pressure = 8,0 bar(g) / 116 psig
Nitrogen Dew Point = < -40 °C / -40 F at atmospheric pressure

Standard Components

- Feed Air Filters
- PSA Adsorber Vessel Module(s) in anodised Aluminium
- Process Valves, Regulators and Piping in Stainless Steel and compatible for Food Grade Nitrogen
- Exhaust Silencers in Stainless Steel
- Control System with Allen-Bradley PLC for fully automatic operation of the NITROSWING® Generator, including EtherNet/IP Connection for remote monitoring & control
- Touch Panel based Human Machine Interface (HMI) with System Diagnostics
- Onboard Oxygen Analyser with Zirconium Oxide Sensor
- System for Automatic Venting of Off-Spec Nitrogen

Special Products

Due to the unique features of the design of the NITROSWING® Modular PSA Nitrogen Generators, NOXERIOR can supply you the most compact units for the production of food grade nitrogen on the market.

Our systems can be supplied turn-key installed either on a single skid or inside an ISO freight container and will be suitable for operation even under harsh ambient conditions. Please contact us directly in case you would be interested in our special products.

Quality

All activities within our company strictly comply with the procedures of our certified quality management system to both ISO 9001:2008 and ISO 13485:2012, which are regularly updated and optimised. Before packing and shipment each NITROSWING® Nitrogen Generator will be thoroughly tested.

Health, Safety & Environment

According to our environmental management system certified to ISO14001:2004 and EMAS we constantly verify and correct our consumption of utilities and our waste disposal and we pay special attention to the material selected for our products and services. Our Health & Safety system is implemented and applied according to national Italian legislation with periodic external verification by local authorities.

After-Sales Service

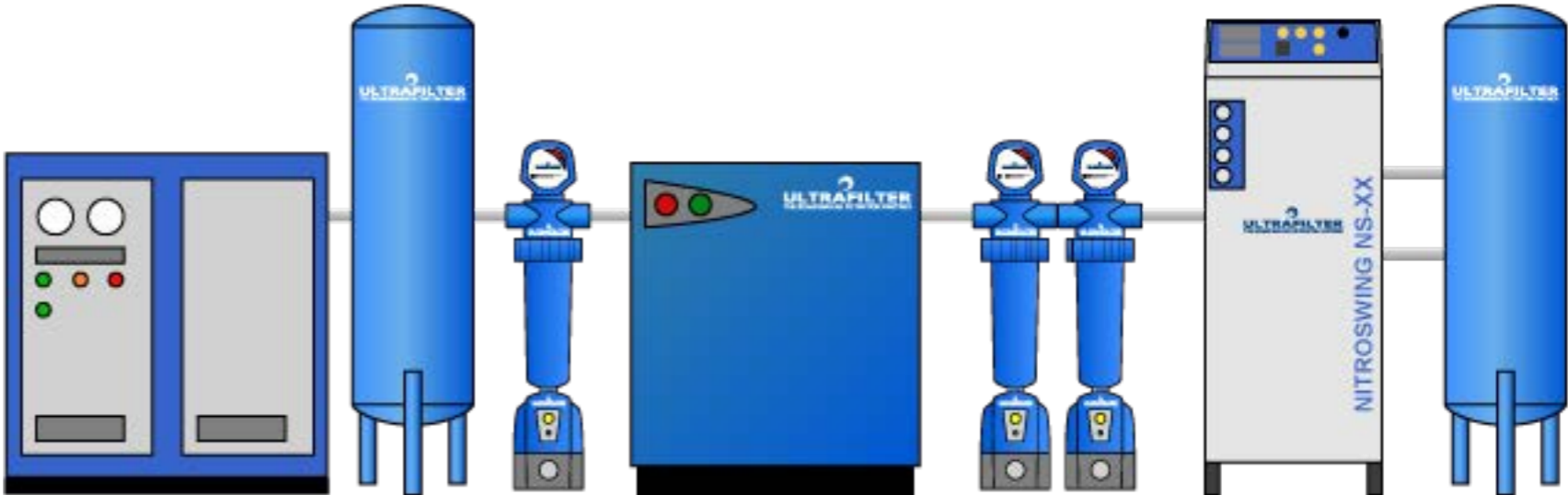
A reliable and responsive after-sales service is an integral part of NOXERIOR's business philosophy. Our technicians or our local distributors for the NITROSWING® Modular PSA Nitrogen Generators are able to assist you with correct installation and maintenance of your system.

Critical spare parts are always available on stock and can be supplied immediately to any location in the world.

References

The NITROSWING® Modular PSA Nitrogen Generators are producing food grade nitrogen at many food and beverage production facilities all over the world.

Please ask for the latest version of our reference list.





Kronsbein ultrafilter®

ABOUT US

The ultrafilter group is a privately owned family company. Founded by Dipl. Ing. Dean Kronsbein in Germany, the group now serves the global filtration market with local presence throughout Europe, the Americas, Asia and Australia.

With the help of our products from ultrafilter GmbH in Germany, world renowned, market leading companies have made ultrafilter GmbH their first choice for the Purification of compressed air, technical gases and liquids.

Our passion to manufacture superior and innovative products is the guarantee for cost effective and reliable filtration solutions.



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