WÄRTSILÄ

Moss nitrogen generator system

PRODUCT LEAFLET

Wärtsilä is a market leader in the development, design, manufacture and servicing of advanced inert gas and nitrogen solutions for marine and offshore oil and gas applications. Our leading-edge, customised solutions ensure high quality and advanced levels of safety for vessels operating in regulated areas. We are certified by ISO 9001:2000, ISO 14001:2004 and OHSAS 18001:2007. Our strong reputation in inert gas solutions is based on over 50 years of experience and include over 2500 vessels installed with our inert gas equipment.

Wärtsilä Moss nitrogen generators are dependable outlets for nitrogen. As the name implies, these systems are designed to generate, or create, a dry, clean inert gas. The use of nitrogen generators eliminates the problems associated with handling gas cylinders.

The Wärtsilä Moss nitrogen generators use state of the art membrane technology and are designed for their flexibility. We always adapt to our customers needs, and are capable of installing our systems into the most challenging locations. They are also designed to deliver various purities in the same system, giving our customers even greater flexibility.

MAIN PURPOSES

- Inerting purposes where a dry, clean inert gas is required
- Purging and padding of cargo tanks, piping and valves
- Compressor sealing
- Insulation protection on gas carriers
- Corrosion protection in hostile environments

Nitrogen generators are used in multi-purpose areas:

MARINE APPLICATIONS

- Chemical carriers
- LNG / LPG carriers
- PSV (platform supply vessels)

OFFSHORE APPLICATIONS

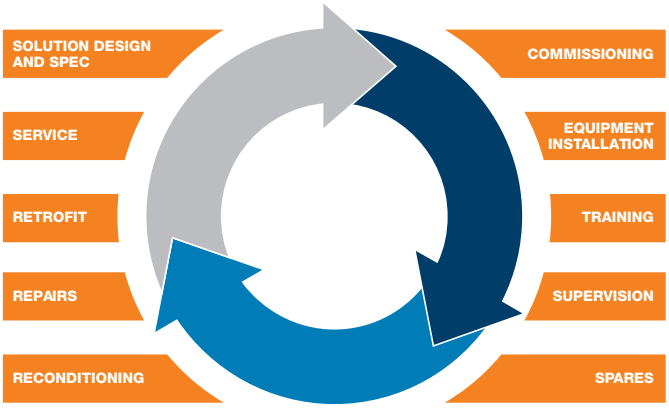
- FPSO
- Drill ships/rigs
- Power solutions

LAND BASED INDUSTRY

- Mining
- Power stations
- Storage systems
- Cargo handling stations

PIONEERING INNOVATION
A HISTORY OF FIRSTS

- First to manufacture and install an inert gas system.
- First compact vertical generator design.
- First to develop a dryer system for a gas carrier systems.
- First to pioneer bilge tank run-off.
- First to create a purpose-built testing and training facility.
- First use of higher grade steel with higher temperature tolerance.
- First to stage quiet centrifugal fans for gas carriers instead of roots blowers.
- First to offer the option of indirect cooling for gas carriers.
- First to provide 100% redundancy for the systems.
- First to develop cost-saving automatic gas capacity controls.
- First to develop an inert gas system in alloy 59.
- First all titanium inert system (for the offshore industry).
- First to develop/secure commercial orders for combined igg/gcu.



CUSTOMER BENEFITS

- Higher specification raw materials
- Complete understanding of the application
- Engineering focus on reliability
- Specification focus on lowest total cost of ownership
- Industry-leading full scale product testing, pre-installation
- No off-the-shelf technology: every wärtsilä system tailored to customer needs
- Smart adaptations of existing technology > clean sheet bespoke engineering

Purpose built training & testing facility

WÄRTSILÄ MOSS NITROGEN GENERATOR SYSTEM
SPECIAL FEATURES:

MEMBRANE SELECTION AND ASSEMBLY

Wärtsilä Moss choose membranes based on the intended purpose of nitrogen. Different polymers have different characteristics for high pressure or high purity solutions. The required numbers of membranes are assembled in handy cabinets or racks. The design caters for low space requirement as well as easy installation and maintenance.

Membranes separate gases by the principle of selective permeation across the hollow-fibre membrane wall. Ambient air is compressed, rigorously filtered, and temperature controlled before entering one or more membrane modules, each containing thousands of hollow fibres. Within these fibres, the separation of air takes place producing nitrogen gas under pressure. The resulting nitrogen is dry and depleted of carbon dioxides.

FILTER AND HEATER ASSEMBLY

The various components are normally on a skid; either a separate filter skid or on one common unit. For smaller systems the components might also be installed in a cabinet.

CONTROL SYSTEM

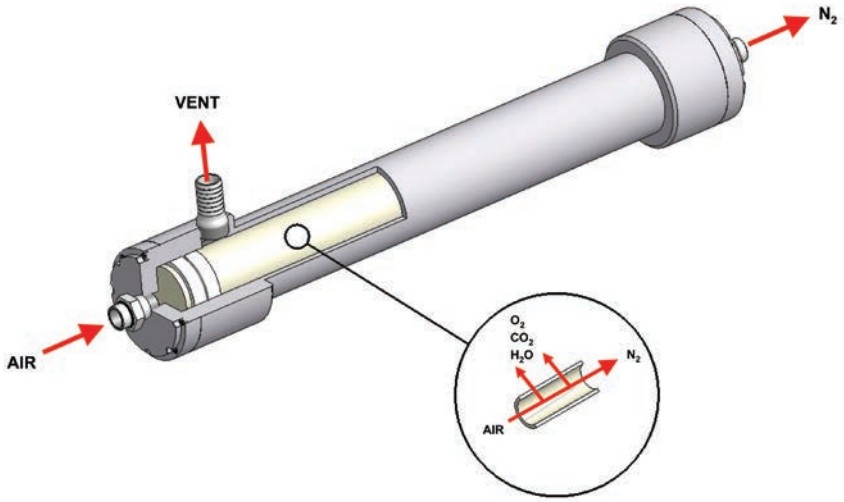
The control system is based on a Programmable Logical Control (PLC). The control panel is of the touch screen type. Several mimic flow diagrams are implemented as well as the controls required for safe and easy operation with a minimum of operator supervision. Additional functions like user manuals and condition monitoring can also be included.

On chemical/product carriers a double block and bleed system or Wärtsilä Moss pressure/vacuum breaker may be provided. On board LNG/LPG carriers the consumer is normally a buffer tank.

A design based on tailor made systems for each project result in cost efficient solutions with optimal performance. The design is compact, yet flexible, with open design to ease maintenance. The Wärtsilä Moss nitrogen generator system offers valuable savings in space and installation costs both for newbuildings and for retrofitting on existing vessels.

MEMBRANE SEPARATION PRINCIPLE

Each membrane separator module contains thousands of polymer hollow fibres bundled together. Air fed at specified optimal pressure and temperature to one side of the membrane, dissolves and diffuses across the fibre material and desorbs as permeate at the low-pressure side of the membrane. As the air comprises different constituents, each component dissolves in the matrix to a different extent and permeates at a different rate. The more rapidly permeating components such as oxygen, carbon dioxide and water vapor are enriched in the low-pressure stream, which is safely vented to the atmosphere. The slower permeating components like nitrogen and argon are retained in the high-pressure stream and further removed from the membrane module as the nitrogen gas product.



Produced Nitrogen purity:
Up to 99.9%.

Product capacity:
10 to 6 000 Nm^3/h or more.

Ambient temperature:
+2 to +45°C (possible +55°C, special design).

Product dew point:
Down to -70°C (Atmospheric pressure) depending on application and capacity.

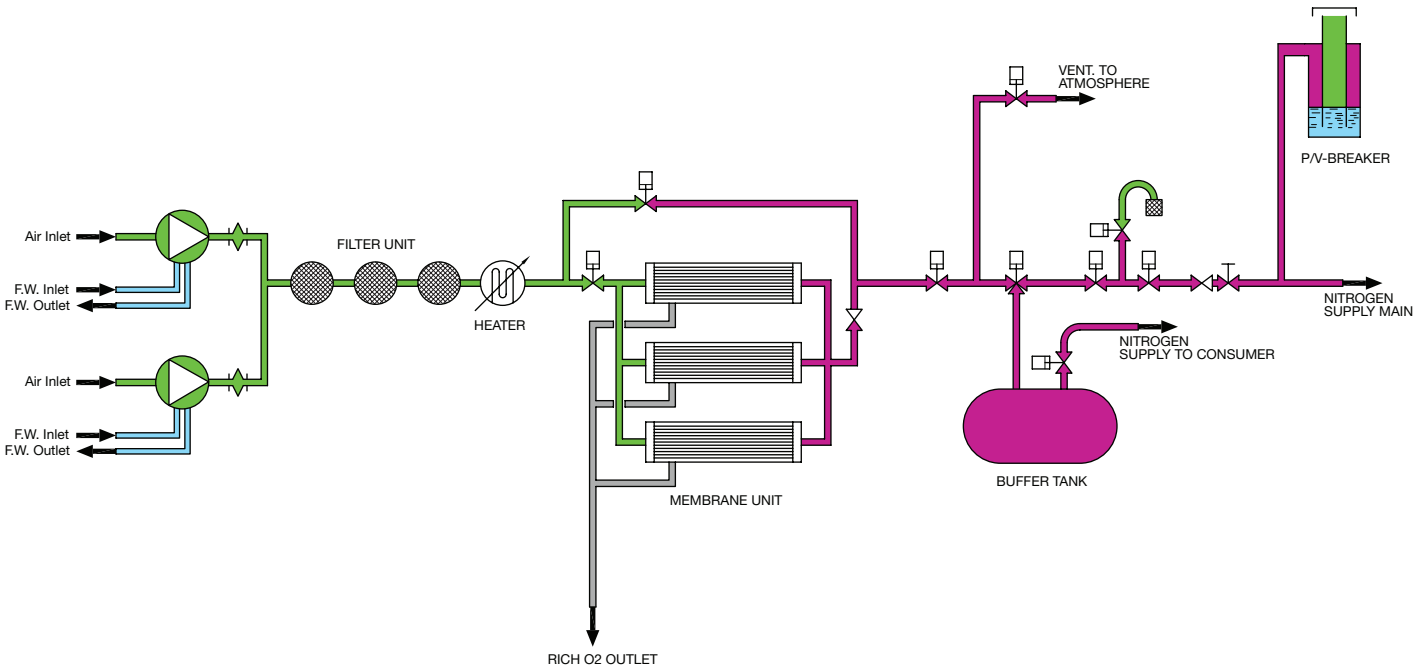
Product CO_2:
Less than 5 ppm.

Delivery pressure:
Up to 11.5 bar g, using 13barg compressor(s).

Nominal el. power consumption:
Approx. 0.3 kW/Nm^3/h gas at 95% N_2 (excluding water pump).

Nominal sea/fresh water consumption:
11.5 l/Nm^3 gas at 95% N_2.

Typical schematic of a Wärtsilä Moss nitrogen generator system



UACC MASAFI

SCOPE OF SUPPLY

Wärtsilä Moss has supplied a Moss nitrogen generator system to 183m product/ chemical tanker UACC Masafi. Wärtsilä Moss nitrogen generators are designed for flexibility and use state of the art membrane technology. The system was delivered in 2011, and the contract included deliveries for five more product/chemical tankers for the same owner which were all successfully delivered.

Shipowner.....United Arab Chemical Carriers, UAE

Shipyard.....SLS Shipbuilding, South Korea

SUPPORT THROUGHOUT THE ENTIRE LIFECYCLE

WÄRTSILÄ SPARES & SERVICE - UNRIVALLED GLOBAL SUPPORT

- 100k+ parts shipped worldwide every year
- 24 hour spares and components order response pledge - 96%
- Same day parts dispatch
- Smart delivery based on local knowledge
- Assured 80% spares availability
- Strength of Wärtsilä network across 200 locations in 70 countries
- No minimum order size
- 24/7 emergency contact number: +47 91796874

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