Nitrogen generation

SemN$_2$

Functional description of membrane based nitrogen generator

Dry, compressed air is fed to the Nitrogen Generation Package from the air system. The feed air passes through the particle filter which filters all particles above 0.01 micron size.

The filtered air then passes through an electrical air preheater. The air is heated to approximately 50 °C. The air preheater serves two functions. One to elevate the feed air temperature above its dew point to avoid any liquid water from entering the membrane modules. Its second function is to give steady process conditions to the membrane modules for system stability.

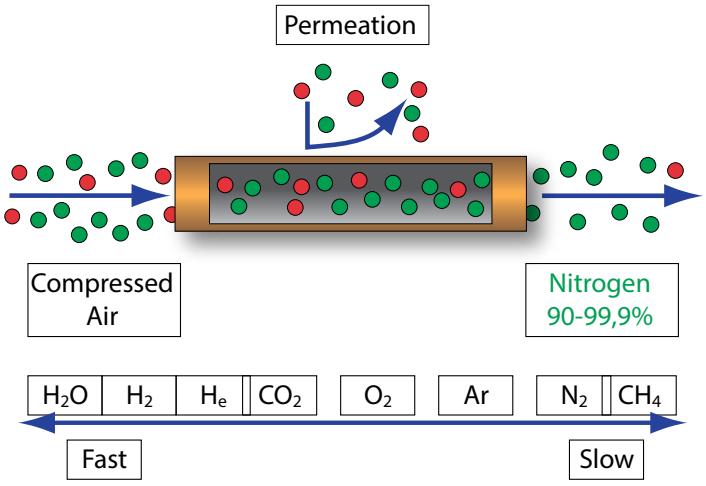
The heated air is then fed via manifolds to the membrane modules. The modules upstream temperature transmitters protect the membranes from high temperatures which may damage the fibres. A high set-point for warning and a high-high set-point for shut-down of system is included.

Nitrogen outlet flow is monitored and controlled by a flow controller which regulates the flow control valve.

The nitrogen product is sampled and led to the in-line oxygen analyser which continuously monitors the oxy-gen content of the product stream. If the oxygen content exceeds the set value a pre-alarm (High O2) will be initiated. If the oxygen content continues to rise and reaches the high-high set point, the pneumatic operated product outlet ball valve will close and the pneumatic operated “off-spec” ball valve will open. The “off-spec” nitrogen is led to the permeate outlet manifold and vented to outside of room. When product is back to specification the valves will then operate vice versa and the system is back in “normal operation” producing nitrogen to consumers. This nitrogen can be “boosted” to compress the gas even further.

Principle of membrane-based nitrogen separation

- The separation takes place in bundles of hollow fibre membranes made of polymer-based material.
- Each membrane module contains several millions of fibres contained in a pressure vessel.
- Pressurised air is fed into the bore side of the hollow fibres.
- As the air flows along the hollow fibres, O2, CO2 and H2O contained in the feed air, permeate faster than nitrogen to the low-ressure side of the fibres.
- The enriched nitrogen stream exits the fibres at the module end.



SEMCO maritime

Nitrogen generation

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Typical application

- Closed drain
- Sea sump
- Collection sump
- OBM drain tank
- HP flare header
- Cooling medium expansion tank
- Compressor seals
- Glycol regeneration package
- Drain tanks
- Utility stations
- Drilling drain tank
- Open drain caisson
- Hydraulic power units
- Chemical injection package
- Scale inhibitor package
- Pressure equalisation tank
- Reclaimed oil sump
- Liquid waste holding tanks
- Flare header

Typical skid performance

Operation mode	Nitrogen product	
	Flow rate	Purity
Normal	According to client specification	90-99,9 vol% N_2

For further information, addresses, email addresses and phone numbers - please see our website:

www.semcomaritime.com