

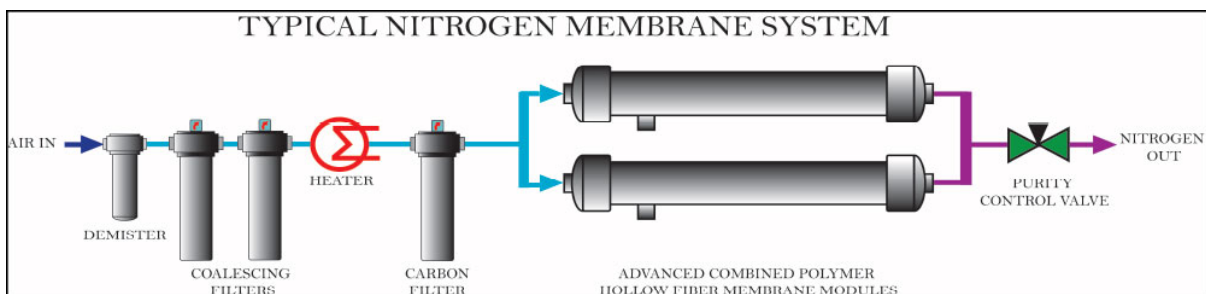


Membrane Nitrogen Generating System



Compressed air from feed-air screw compressors is delivered to the common manifold for delivery to the membrane bundles in the membrane package. Bundles are composed of millions of polymer-based hair-fine tubes. Because they are so small, it is critical that moisture, dust, dirt particles, and trace oil vapours be removed prior to processing to protect the membranes. A sophisticated filtration system is included in the membrane skid package.

After the air is filtered, it is directed to the header system in the membrane package, which splits the stream and delivers it to a module. A module is a pressure vessel that contains high-pressure membrane bundles. Bundles look like ponytails and are held together with epoxy tube sheets and then o-ringed into a module. Since the tubes are tightly packed and are of small diameter, void space is minimal.



For more information: www.D5energy.services



Membrane Nitrogen Generating System

Typically the membrane modules operate at an efficiency rate of about 50% with the volume of air processed determining the number of modules required. As air passes through the millions of tiny semi-permeable tubes, the faster molecules permeate on contact with the membrane walls because the outer membrane pressure is lower than the inner pressure. The molecules that pass through the membrane walls, which are primarily oxygen, carbon dioxide, and water vapour, are vented at atmospheric pressure through vent ports on the sides of the module cases. Since nitrogen is a slower gas, it does not permeate under flowing conditions through the membranes as quickly and travels to the module's discharge outlet. Discharge pressure for the nitrogen is about 350 psig (24 bar) and 110°F (43°C), with a purity of between 95% and 97%. Discharged nitrogen from the membrane unit then flows to the booster compressor(s).

Oxygen purity and nitrogen flow rate sensors are integrated with the Membrane Nitrogen Unit. These can continuously measure and record the oxygen purity and nitrogen flow rate for further display at the command centre, to the DAQ system, client office, etc.

Technical data	
Maximum air injection pressure	350 psig (24 barg)
Nitrogen delivery	3,000 scfm (4,815 Nm ³ /min)
Typical nitrogen purity	95% - 97%
Hazard classification	Electrical equipment classified to Class 1, Division 2
Dimensions	20 ft ISO container
Air aftercooler	14,500 kg gross weight

Advantages of membrane generated nitrogen over cryogenic

- Enhanced mobility and rapid deployment.
- Ideal for remote locations, offshore and onshore.
- No need to haul in liquid nitrogen or nitrogen tube trailers.
- No risk of running out of liquid nitrogen.
- Can produce purities from 92-99.9%.
- 50°F to +140°F (-45°C to +60°C)
- Nitrogen Dew Point down to – 700°F (-570°C)
- Hydrocarbon free

For more information: www.D5energy.services



Membrane Nitrogen Generating System

Rated output for a Generon 3000 scfm membrane nitrogen unit

N2 purity	N2 out (Sm ³ /hr)	Air in (Sm ³ /hr)	Losses	N2 out scfm	Air in scfm
93%	6,970	11,120	37%	4,100	6,540
94%	5,950	10,080	41%	3,500	5,930
95%	5,100	9,180	44%	3,000	5,400
96%	4,300	8,330	48%	2,530	4,900
97%	3,500	7,450	53%	2,060	4,380
98%	2,720	6,590	59%	1,600	3,875
99%	1,860	5,680	67%	1,090	3,340
99.5%	1,150	4,080	72%	680	2,400

For more information: www.D5energy.services