



**INNOVATIVE  
GAS SYSTEMS**

*Highest Efficiency  
Membranes on  
the Market*

**GENERON® ENGINEERED SYSTEMS**

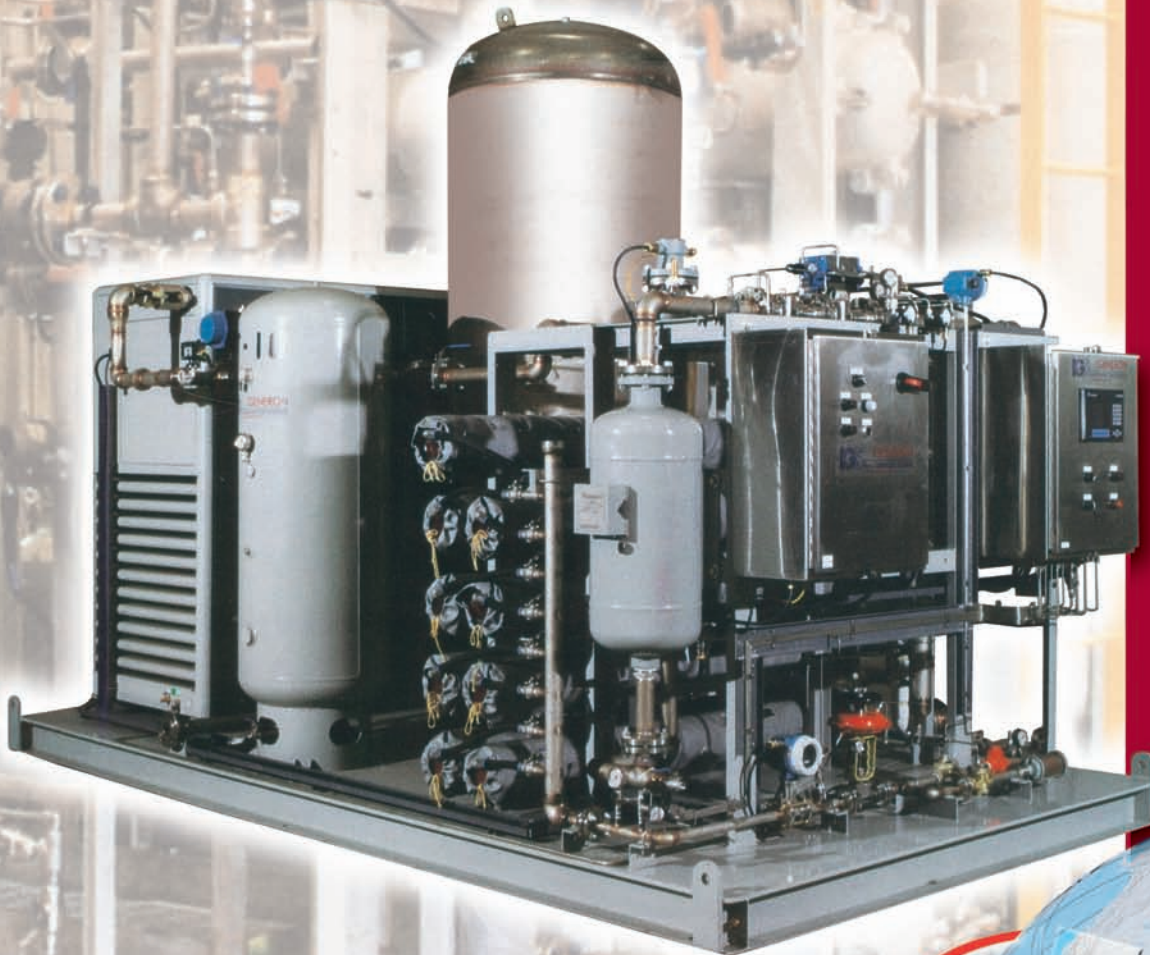
*Over 1,000  
Systems Sold*

*Product  
Blanketing &  
Transport*

*General  
Inerting  
Systems*

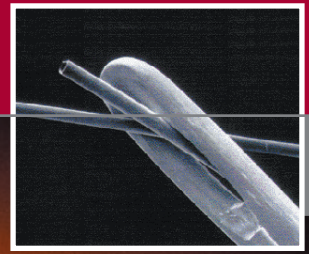
*Specialized  
Systems*

*Drilling  
Support*



**From Concept To Completion,  
We Provide Solutions!**

# Generon® Membrane Technology



## TECHNOLOGY

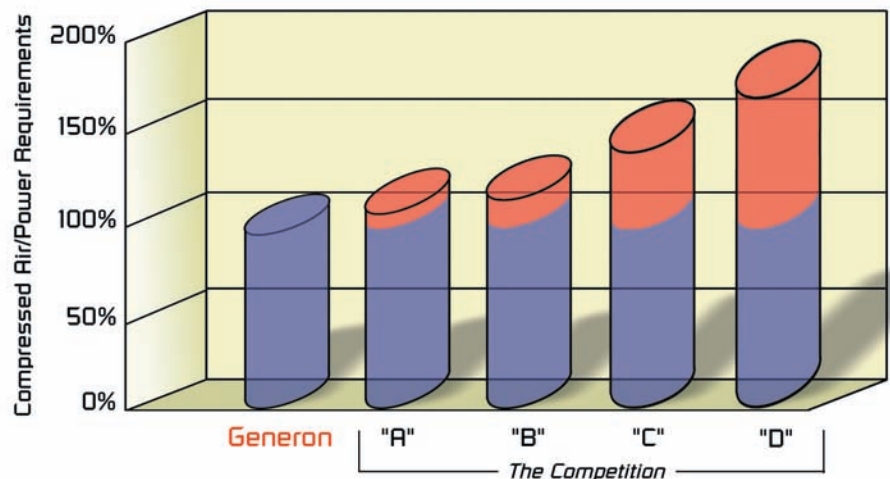
- Highest efficiency membranes on the market
- Long term commitment to R&D at our California module fabrication and research center
- Generon® has over 41 patents for its innovative polymer design
- Systems are designed by our experienced engineering team and assembled in our Houston manufacturing facility
- Generon® maintains a staff of engineers with extensive experience in system design and compression packaging to meet your individual needs



## PERFORMANCE

- Significant savings over bulk liquid or bottled Nitrogen
- Utilizes 12-90% less feed air than competitive systems
- Product durability assured through extensive product testing  
Every membrane design must pass a 10,000 cycle pressure/temperature durability test simulating 10 years of operation
- Quality Manufacturing Operations  
ISO 9001:2000 Certified

Power/Air Consumption Per Unit Of N2 Produced  
(Product comparisons at 99% purity)



- ▲ Nitrogen purities to 99.9%
- ▲ Product Dew Point to -84°F (-64°C)
- ▲ Extensive product range for the smallest module producing 25 scfh (.7 Nm<sup>3</sup>/h) to large integrated system producing 187,000 scfh (4,915 Nm<sup>3</sup>/h)
- ▲ Product pressures available in two standards  
200 psig / 14 barg and 330 psig / 23 barg
- ▲ System designed to 10,000 psig / 689 barg with post compression

## Generon® Engineered Systems

Nitrogen is used extensively for a variety of applications which include product blanketing and inerting, purging, equipment and product storage, and others. Nitrogen can be generated on-site at high pressures and low Oxygen levels to safely prevent ignition of flammable gases, and to protect vital equipment and instruments as well as applications where Oxygen and water can create process problems and potential hazards. Generon® IGS systems are highly engineered to meet all customer and third party specifications.

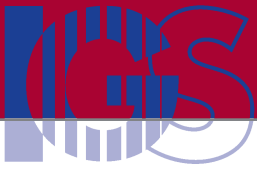
### *ENGINEERED SYSTEMS NITROGEN MEMBRANE UNIT SPECIFICATIONS*

- Designed and built to your specifications
- System design is offered in cabinet or skidded configuration
- Purity from 95% to 99.9%
- Nitrogen output from 25 scfh (0.7 Nm<sup>3</sup>/h) to 187,000 scfh (4,915 Nm<sup>3</sup>/h)
- Input pressure to 200 psig (14 barg)
- Nitrogen dew point to -84°F (-64°C)
- Unit weight from 100 lbs (45 kg) to 25,000 lbs (11,340 kg)
- Electrical power per customer requirements
- Control system manual or automatic
- Standard features include feed air pre-heater
- Optional feature - Oxygen analyzer
- Feed air flow requirements 46 scfh (1.2 Nm<sup>3</sup>/h) to 240,000 scfh (6309 Nm<sup>3</sup>/h)
- Horsepower requirements 3HP (2.2kW) to 1600 HP (1193 kW)
- Integrated system packages with primary and post compression



### *BOP CLOSURE SYSTEMS*

- Mitsubishi Heavy Industries
- 15 scfm (0.4 Nm<sup>3</sup>/m)
- 98% Purity
- 7,500 psig (517 barg) Final Pressure
- Totally Redundant System



# Generon® Engineered Systems

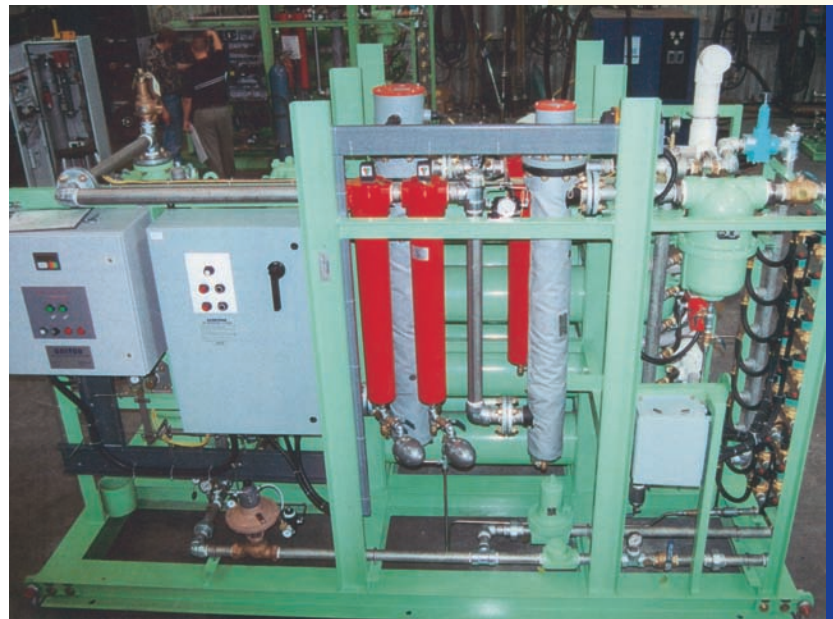


## *GAS COMPRESSOR BUFFER SEALS*

- ChevronTexaco - Sanha Condensate
- 200 scfm (5.26 Nm<sup>3</sup>/m)
- 97% Purity
- Rated for Class 1 Div 2

## *CONTROLLED ATMOSPHERE FRUIT/VEGETABLE TRANSPORTATION*

- CSBC Shipyard
- 63 scfm (16.7 Nm<sup>3</sup>/m)
- 95% Purity



## *PIPELINE AND TANK INERTING*

- Saudi Aramco
- 228 scfm (6.0 Nm<sup>3</sup>/m)
- 95% Purity

## GENERAL PIPELINE PURGING AND TANK INERTING

- Chicago Bridge and Iron
- 1,170 scfm (31 Nm<sup>3</sup>/m)
- 95% Purity
- Rated For High Ambient Temperature of 131°F (55°C)



## GENERAL FPSO PURGING AND INERTING

- Exxon/Mobil; Falcon/Yoho; Atlantic; Eagle and Myras
- 65 scfm (1.7 Nm<sup>3</sup>/m)
- 96.5% Purity
- Rated For Class 1 Div 2 and Zone 2



## INTEGRATED ON SITE SYSTEMS

- CNPC/China
- 750 scfm (20 Nm<sup>3</sup>/m)
- 95% Purity
- Final Nitrogen Pressure Boosted to 5,000 psig (345 barg)



# Custom-Designed Systems To Your Exact Specifications

## RIG INSTRUMENTATION & MAINTENANCE PURGING CABINET SERIES SPECIFICATIONS @ 100 PSIG INPUT

Model Designation	2000	4000	6000
N <sub>2</sub> Output @ 95% N <sub>2</sub> + Inerts	.4 scfm / .01 Nm <sup>3</sup> /m 1.5 scfm / .04 Nm <sup>3</sup> /m	4.3 scfm / .11 Nm <sup>3</sup> /m 8.5 scfm / .22 Nm <sup>3</sup> /m	15.6 scfm / .41 Nm <sup>3</sup> /m 184 scfm / 4.83 Nm <sup>3</sup> /m
Maximum Working Pressure	200 psig / 14 barg	200 psig / 14 barg	200 psig / 14 barg
N <sub>2</sub> Dew Point (Atm)	< -84°F / < -64°C		
Dimensions (LxWxH) ft/m	3' x 2' x 1' / .9 x .6 x .3	4' x 2' x 1' / 1.2 x .6 x .3	2'9" x 2'9" x 7'6" / .8 x .8 x 2.3
Weight (lbs/kg)	100-115 lbs / 45-52 kg	220-240 lbs / 100-109 kg	450-650 lbs / 205-295 kg
Operating Temperature Range	-40°F / 131°F (-40°C / 55°C)		
Electrical Power	480V / 3Ph/60Hz Standard, customer to specify alternate power supply		
Control System	Manual	Manual	Manual
Heater	Standard	Standard	Standard
Oxygen Analyzer	Standard	Standard	Standard
Feed Air Flow Requirement	.77 scfm / .02 Nm <sup>3</sup> /m 3.05 scfm / .08 Nm <sup>3</sup> /m	8.9 scfm / .23 Nm <sup>3</sup> /m 17.9 scfm / .47 Nm <sup>3</sup> /m	31.3 scfm / .82 Nm <sup>3</sup> /m 343 scfm / 8.99 Nm <sup>3</sup> /m
Horsepower Requirements	3 HP (2.2 kW)	4 HP (3 kW) - 7.5 HP (5.6 kW)	15 HP (11.2 kW) - 150 HP (112 kW)

## SKIDDED SERIES SPECIFICATIONS @ 175 PSIG INPUT

Model Designation	6200	6500	7200
N <sub>2</sub> Output @ 95% N <sub>2</sub> + Inerts	160 scfm / 4.2 Nm <sup>3</sup> /m 767 scfm / 20.16 Nm <sup>3</sup> /m	200 scfm / 5.25 Nm <sup>3</sup> /m 958 scfm / 25.18 Nm <sup>3</sup> /m	97 scfm / 2.56 Nm <sup>3</sup> /m 1,947 scfm / 51.18 Nm <sup>3</sup> /m
Maximum Working Pressure	200 psig / 14 barg	200 psig / 14 barg	200 psig / 14 barg
N <sub>2</sub> Dew Point (Atm)	< -84°F / < -64°C		
Dimensions (LxWxH) ft/m	9' x 4' x 7'3" / 2.74 x 1.2 x 2.2 9' x 7' x 7'3" / 2.74 x 2.1 x 2.2	9' x 4' x 7'3" / 2.74 x 1.2 x 2.2 9' x 7' x 7'3" / 2.74 x 2.1 x 2.2	9' x 4'9" x 7'8" / 2.74 x 1.5 x 2.4 9' x 7'6" x 7'8" / 2.74 x 2.3 x 2.4
Weight (lbs/kg)	1,500-3,800 lbs / 680-1,724 kg	1,500-3,800 lbs / 680-1,724 kg	1,800-25,000 lbs / 816-11,340 kg
Operating Temperature Range	-40°F / 131°F (-40°C / 55°C)		
Electrical Power	480V-220V / 3Ph/60Hz Standard, customer to specify alternate power supply		
Control System	Manual/Automatic (PLC)	Manual/Automatic (PLC)	Manual/Automatic (PLC)
Heater	Standard	Standard	Standard
Oxygen Analyzer	Standard	Standard	Standard
Heavy Duty Base Skid	Standard	Standard	Standard
Remote Telemetry	Optional	Optional	Optional
Area Classification	Non-Hazardous Standard	Non-Hazardous Standard	Non-Hazardous Standard
Feed Air Flow Requirement	303 scfm / 7.96 Nm <sup>3</sup> /m 1,454 scfm / 38.22 Nm <sup>3</sup> /m	372 scfm / 9.78 Nm <sup>3</sup> /m 1,783 scfm / 46.87 Nm <sup>3</sup> /m	185 scfm / 4.86 Nm <sup>3</sup> /m 3,692 scfm / 97.06 Nm <sup>3</sup> /m
Horsepower Requirements	125 HP (93.2 kW) 605 HP (451.2 kW)	150 HP (111.9 kW) 670 HP (499.6 kW)	100 HP (74.6 kW) 1,600 HP (1193.2 kW)

## IGS Generon® References, Standards and Track Record

### *Sampling of Customer Reference List*

- ▲ ADM
- ▲ Aker Kvaerner
- ▲ Allied Signal
- ▲ AMEC
- ▲ Amerada Hess
- ▲ Aramco
- ▲ BASF
- ▲ Bayer
- ▲ Bechtel
- ▲ Bilnam
- ▲ BJ Services
- ▲ BOC
- ▲ BP
- ▲ Burk Royalty
- ▲ Celanese
- ▲ Chevron/Texaco
- ▲ Chiquita
- ▲ Conoco/Phillips
- ▲ Daewoo
- ▲ Dome Petroleum
- ▲ Dow Chemical
- ▲ Global Santa Fe
- ▲ Halliburton
- ▲ Hamworthy
- ▲ Hibernia
- ▲ Hoek Loos
- ▲ Hutchinson
- ▲ KBR
- ▲ Linde
- ▲ Lubrizol
- ▲ Mitsubishi Heavy Industries
- ▲ Modec
- ▲ Nestle
- ▲ Odra Gas
- ▲ Oilvest
- ▲ Pemex
- ▲ Rexroth
- ▲ Sener Petrol
- ▲ Sinopec
- ▲ Statoil
- ▲ Shell
- ▲ Transocean
- ▲ Unitor
- ▲ Weatherford

### *Industry Standards*

- ▲ ASME
- ▲ CE/PED
- ▲ ATEX/CENELEC
- ▲ DNV
- ▲ Lloyds Register
- ▲ CSA
- ▲ Bureau Veritas
- ▲ ABS
- ▲ Baseefa
- ▲ IEC/NEC
- ▲ NFPA RINA
- ▲ Class I Div 2
- ▲ Zone 2
- ▲ GOST
- ▲ Class NK
- ▲ Germanischer Lloyd
- ▲ NEMA/IP
- ▲ Customer Specifications

### *System History*

- ▲ Over 22,000 Nitrogen/Dehydration Membranes Sold To Date  
Including:
  - 100+ NPU Systems
  - 500+ Engineered Systems
  - 189+ Cabinet Systems



# IGS INNOVATIVE GAS SYSTEMS

- ❑ Innovative Gas Systems is a global technology company with operational centers in North America, South America, Europe and Asia.
- ❑ Our products are world class with over 75 patents supporting our innovative technology in Nitrogen/Dehydration membranes, Nitrogen PSA and Oxygen PSA/VPSA.
- ❑ Please visit our website for a review of the complete list of products from IGS or contact one of our local sales associates directly.



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