PNEUMATECH®

Nitrogen Generators

PMNG Commercial Series

Section 50
Bulletin A-20

All nitrogen generators are not created equal. Some may cost less and appear great on the outside. Look closer and we think you'll agree that Pneumatech offers a superior product, greater durability and a better overall value.

Whatever the problem; Pneumatech has the solution.

THE PROBLEM:
Oil Contamination

The membrane separator is the heart of the nitrogen generator and accounts on average 65% and up to 80% of the cost, depending on model size and options.

Oil from the compressor can ruin the membrane. Everyone claims a 10 year membrane life, but the truth is that most competitive filtration systems may not do the job. If present at all, carbon elements only have a few grams of carbon and these filters must be changed frequently to achieve these claims.

THE SOLUTION:
6-Stage Premium Filtration System E

Our optional premium filtration system provides dependable insurance against costly oil contamination. Our carbon bed has from 2 – 18 lbs. of carbon (depending on model). It ensures no oil vapor break-through during maintenance cycle. The system is also very forgiving should you forget to change the carbon on time.

Strategic Multi-Staging of Filters
The ultimate in membrane protection with minimal pressure loss over maintenance cycle

The re-assurance of redundancy

THE PROBLEM:
Inconsistent Nitrogen Purity

Over 90% of nitrogen applications have cyclical demand which causes nitrogen pressure to drop in the system. Without proper control this will result in "Off Spec" nitrogen delivered to the application.

- Most competitive purity controls do not solve this problem OR are complicated multiple component solutions.

THE SOLUTION:
True Purity Controller J

Pneumatech offers a controller that delivers true, consistent purity downstream in ANY flow situation. Our simple design allows for adjustments to be made easily, with a single screw.

THE PROBLEM:
Constant Air Demand

Membranes continuously consume compressed air as long as they are pressurized. This wastes air and electricity when nitrogen is not needed, and creates wear and tear on the compressed air and nitrogen systems.

THE SOLUTION:
EconoMizer™ System F

Our simple pneumatic system starts and stops the nitrogen generator based on the system's demand. This saves on the utility costs of operating the compressor, and reduces wear and tear on the air and nitrogen systems. It is simple and easy to adjust.

● – refer to flow diagram on pages 4-5.

Typical Applications

- Food processing, packaging, blanketing and perishable storage
- Pharmaceutical, electronics and refrigeration manufacturing
- Metallurgical heat treatment, annealing, carborizing
- Plasma and laser cutting for assist and beam purge
- Chemical blanketing, purging, inerting, transfer
- Seal gas applications
- Laboratory applications, purging analytical instruments
- Corrosive liquid cooling
- Wine and beer dispensing
- Tire inflation
- Sparging and mixing

Exclusive Benefits

Cost Efficient

- Pneumatech nitrogen generators significantly reduce nitrogen costs over traditional sources of supply
- ROI usually less than one year (See ROI Table)
- Reduce labor costs from cylinder handling

Reliable Operation

- Simple design with no moving parts
- Designed with high quality components for 24-hour, non-stop operation, with minimal maintenance and attention

Flexible

- Purity levels from 90% - 99.9%
- Seven (7) standard cabinet models to meet most requirements
- 6 Packaged Optional Configurations offer customized solutions

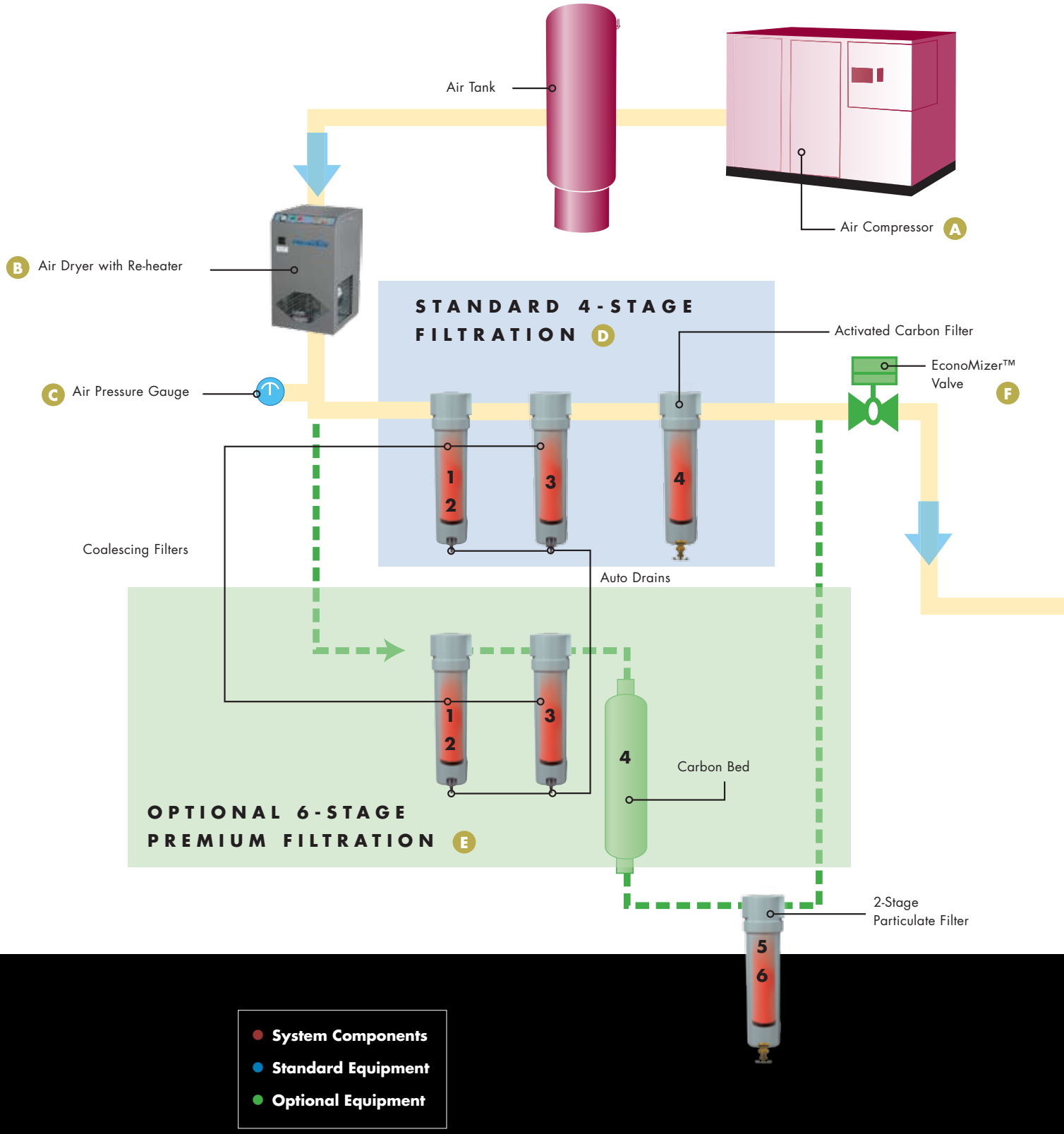
PMNG-C Series Performance Data						
Percent Nitrogen + Inerts						
Purity	95%	96%	97%	98%	99%	99.5%
Model	Nitrogen Flow in SCFH					
PMNG-20	26	22	18	14	10	7
PMNG-40	51	44	36	28	20	15
PMNG-80	168	142	116	90	60	43
PMNG-160	336	284	232	180	120	86
PMNG-240	504	426	348	270	180	129
PMNG-320	672	568	464	360	240	172
PMNG-500	1120	945	770	595	420	245

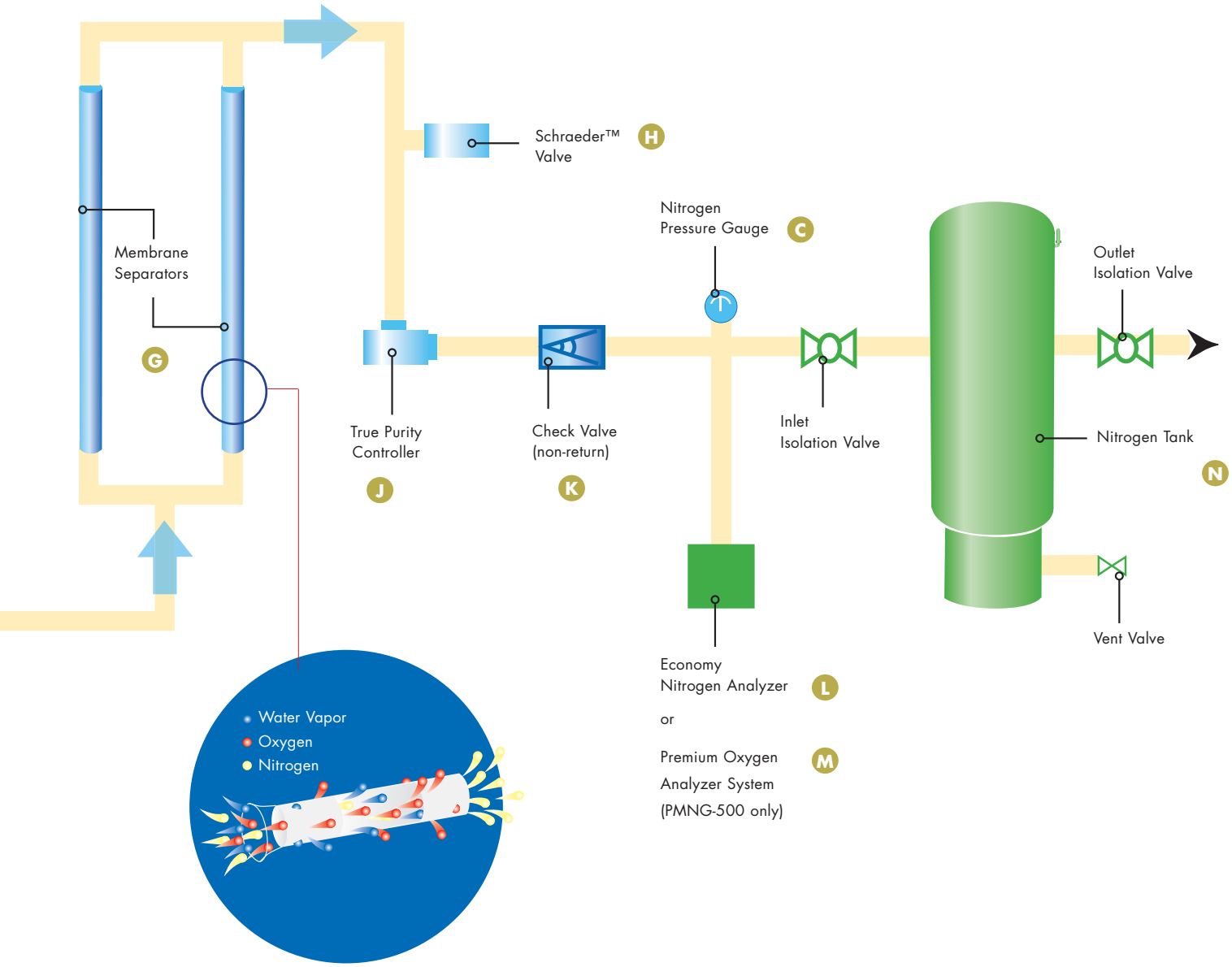
Performance is based on 77°F (25° C), 101.5 PSI (7 bar) at the Membrane and is +/- 5%.
Data will vary with temperature and pressure.

Tank Mounted Units - 80 Gallon Tank					
Dimensions & Weights					
Model	Height	Width	Depth	Net Wt.	Ship. Wt.
PMNG-20	72 9/16″	34 7/16″	31″	328 LBS	430 LBS
PMNG-40	72 9/16″	34 7/16″	31″	332 LBS	434 LBS
PMNG-80	72 9/16″	34 7/16″	31″	341 LBS	443 LBS
PMNG-160	72 9/16″	34 7/16″	31″	350 LBS	452 LBS
PMNG-240	72 9/16″	34 7/16″	31″	365 LBS	467 LBS
PMNG-320	72 9/16″	34 7/16″	31″	374 LBS	476 LBS

Wall or Floor Mounted Units					
Approximate Dimensions & Weights					
MODEL	Height	Width	Depth	Net Wt.	Ship. Wt.
PMNG-20	46 3/4″	22 1/2″	10 1/2″	110 LBS	164 LBS
PMNG-40	46 3/4″	22 1/2″	10 1/2″	114 LBS	168 LBS
PMNG-80	46 3/4″	22 1/2″	10 1/2″	119 LBS	173 LBS
PMNG-160	46 3/4″	22 1/2″	10 1/2″	129 LBS	183 LBS
PMNG-240	46 3/4″	22 1/2″	10 1/2″	145 LBS	199 LBS
PMNG-320	46 3/4″	22 1/2″	10 1/2″	155 LBS	209 LBS
PMNG-500	60 3/4″	24 3/8″	20 5/8″	324 LBS	405 LBS

FLOW SCHEMATIC





Here's how it works

Atmospheric air contains essentially 78% nitrogen and 21% oxygen. This air is compressed (A), dried (B) and filtered (D or E), prior to passing through a technically advanced bundle of hollow membrane fibers (G). Nitrogen gas is separated from the feed air by selective permeation. Water vapor and oxygen rapidly permeate safely to the atmosphere, while the nitrogen gas is discharged under pressure into the user's nitrogen piping system. Pressure, flow rate, and temperature are the main variables that affect nitrogen production. Nitrogen purity is controlled by throttling the outlet flow (J) from the membrane separators (G). Lower flow rate results in a higher percentage of nitrogen. Higher pressure and temperature yield higher nitrogen flow rates at a given purity. Pneumatech membrane systems can achieve purity from 90-99.9%.

Check out what makes Pneumatech's Nitrogen Generators better.

Standard Features/Benefits:

G High quality membrane separator

Superior membranes constructed from high quality aluminum with technically advanced fiber for outstanding performance from 90-99.9% nitrogen. Generation achieved with no moving parts.

Simple, reliable and user friendly

Engineered for simplicity, durability and ease of use make the PMNG what we believe to be the most user friendly unit on the market.

J True purity controller

This device truly sets us apart from the competition. Ensures nitrogen purity from the PMNG unit remains constant under all flow conditions with a single screw adjustment. No one else offers this degree of control.

D 4-stage standard filtration includes:

- 2-stage initial high efficiency pre-filter (Stage 1 & 2) with automatic drain
- Instrument grade coalescing filter (Stage 3) with automatic drain
- Stages 1-3 have combined 99.999999% Overall efficiency with 5 ppmW inlet condition (less than 0.0001 parts per billion carryover)
- Conservatively sized activated carbon filter to protect the membrane from oil vapor
- A maximum pressure drop of 3.0 PSI

Small Footprint

Vertical design Saves Space – Available in Wall/Floor or Tank mounted configurations

Fast Access Cabinet

Unlike competitve units that may be difficult to service, three (3) quarter turn latches allow full access to entire system for servicing

C Dual Pressure Gauges

Panel mounted air inlet pressure and nitrogen discharge pressure gauges – Provide valuable information to the user

H Schraeder™ Valve

For checking nitrogen purity with an optional hand held nitrogen analyzer

K Check Valve

Keeps nitrogen from flowing back from the nitrogen system

Optional Equipment and Accessories/Benefits

Simple Low Cost Installation

Single point air inlet, nitrogen outlet, and filter drain outlet

N Tank Mounting

Vertical 80 gallon nitrogen tank available on models PMNG-20 thru -320

Tank is powder coated and is ASME/CRN approved and stamped.

Includes:

- Inlet & Outlet Isolation Valves – Keeps nitrogen in tank when stopped
- ASME/CRN relief valve – for safety
- Vent Valve – For purging oxygen from tank on start-ups
- Schraeder™ Valve – For checking purity in tank with Optional Hand Held Analyzer
- PMNG-500 is a stand-alone floor mounted unit available with an optional remote tank

Instrumentation Package

F EconoMizer™ - Automatic Air Start & Stop System

- Simple, unique design is fully pneumatic
- Simple to adjust operating range
- Saves wear and tear on compressor and conserves energy
- Nitrogen tank required for proper operation

L Nitrogen Analyzer System

- Complete nitrogen purity monitoring system
- For complete description see next page

Full Equipped Deluxe Unit

Includes:

- Base Unit with all standard features PLUS
- 6-Stage Premium Filtration System (see "E", next column)
- Instrumentation Package (EconoMizer™ & Nitrogen Analyzer) described above
- Wall/Floor mounted OR Tank mounted as described above

E 6-Stage Premium Filtration

- 2-stage initial high efficiency pre-filter (Stage 1 & 2) with automatic drain
- Instrument grade coalescing filter (Stage 3) with automatic drain
- Stages 1-3 have combined 99.999999% OVERALL efficiency with 5 ppmW inlet condition (less than 0.0001 parts per billion carryover)
- Carbon Bed (Stage 4) with pounds of Pelletized carbon to capture ALL the oil vapor from the compressor
- The best insurance policy you can buy to protect your nitrogen investment!
  - Much more forgiving than the carbon element type filter systems with only grams of carbon.
  - 2-stage final high efficiency dust filter (Stage 5 & 6) with manual drain
  - A maximum pressure drop of 3.0 PSI

N Remote Nitrogen Tanks

- Various sizes 30 gallons & larger for system customization
- Standard Features – See "N" Tank Mounting, previous column
- Check with factory for CRN availability

Filter Kit – Standard 4-Stage Filtration

Consists of 3 filter elements required for six month maintenance

Filter Kit – Premium 6-Stage Filtration

Consists of 3 filter elements and an additional supply of carbon pellets required for 6 month maintenance.

– refer to flow diagram on pages 4-5.

NITROGEN ANALYZER SYSTEM

HAND HELD NITROGEN ANALYZER

PREMIUM OXYGEN ANALYZER
(PMNG–500 only)

Nitrogen Analyzer System

- Battery Operated with 24 month warranty
- On/Off Button – With auto shutoff to conserve battery life
- Calibrate button & 3-way valve allows user to easily calibrate the sensor and monitor the nitrogen content of the product gas
- Includes complete nitrogen sampling system
  - Some competitive systems waste nitrogen by not having this feature

Hand Held Nitrogen Analyzer

- Low cost alternative for monitoring nitrogen purity
- All nitrogen models have Schraeder™ valve to allow gas sampling
- Plugs directly onto Schraeder™ valve via included tire chuck

Premium Oxygen Analyzer – PMNG–500 Only

- Requires 115-1-50/60 electricity
- Zirconia type oxygen analyzer with:
  - Two (2) user adjustable alarms
  - 4-20 mA AND 0-10VDC outputs
  - RS-232 serial port
  - Large display with easy to use menu system
- 4-Way valve for calibration and sampling
  - Monitor Nitrogen Out
  - Monitor Nitrogen Tank
  - Calibrate – Compressed Air
  - Calibrate – Instrument Air
- Complete sampling system includes:
  - Panel mounted pressure regulator
  - Panel mounted sample pressure gauge
  - Flow restrictor & sample flow meter
  - Back-flow preventer

Return On Investment (ROI) Make Your Own Nitrogen and Save over 90%

The following ROI table is based on national average selling prices for bulk liquid, liquid cylinders, and high pressure cylinders. Cost includes evaporation rate on liquid, delivery charges, labor to monitor and change out cylinders. Membrane generator costs are based on 100 PSI air, power cost of $.10/kWh, equipment selling price, average cost of freight, installation, power cost for feed air production and drying, maintenance cost of parts and labor to maintain and monitor unit. Common costs are based on a consumption of 170 SCFH N_2, plant labor cost of $50/hr, 4000 hours per year.

PMNG vs. Traditional Resources

System:	PMNG @ 95%	PMNG @ 99%	Bulk Liquid	Liquid Cylinders	High Pressure Cylinders
Gas Cost:	NA	NA	$6,800	$15,778	$23,546
Equipment Cost:*	$9,500	$10,600	NA	NA	NA
Delivery Charges:	$350	$350	$1,040	$1,000	$1,000
Rental Charges:	NA	NA	$4,500	$1,095	$1,320
In-Plant Labor:**	$2,166	$2,166	$2,166	$7,889	$9,811
Operating Cost:***	$1,018	$1,305	NA	NA	NA
1st Yr Annual Cost Total:	$13,034	$14,421	$14,506	$25,762	$35,677
Annual Cost after ROI:	$3,184	$3,471	$14,506	$25,762	$35,677
Total Cost/100CF	$0.47	$0.51	$2.13	$3.79	$5.25
ROI in Months - 99% N_2:	NA	NA	11.9	6.7	4.9
ROI in Months - 95% N_2:	NA	NA	10.8	6.1	4.4

* Includes Equipment and basic installation
** Includes monitoring equipment, receiving, moving, connect/disconnect cylinders.
*** Includes power cost for compressor & dryer, semi-annual maintenance kits

PNEUMATECH®

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