Ultra High Purity Hydrogen Generators

- **Hydrogen on demand, Up to 1200 cc/min.**
- **Certified safety**
- **All models at least 99.9995% pure**
- **SPE Technology eliminates caustic solution**
- **No more changing cylinders**

ChromGas ultra high purity (UHP) hydrogen generators from Parker are designed as hazard-free alternatives to high pressure gas cylinders. They can be used with any instrumentation requiring high purity hydrogen – anywhere a standard electrical supply is available.

Deionized water is all that is required to generate hydrogen for weeks of continuous operation.

With an output capacity of up to 1200 cc/minute, one generator can now supply 99.99999% pure carrier gas to four to six GC's, and fuel gas to ten to twelve FID's. Based on cylinder gas savings alone, a ChromGas Parker hydrogen generator pays for itself in less than a year.

Certified Safety

Parker's hydrogen generators use an exclusive Proton Exchange Membrane to produce UHP hydrogen on demand. Only 100mL is stored in the system at any time and at low pressure. A built-in sensing circuit shuts the generator down if a hydrogen leak is detected.

That's why Parker hydrogen generators meet the strict, safety guidelines of the National Fire Protection Agency (NFPA) and the regulations of the Occupational Safety and Health Association (OSHA-1910.103). Most importantly, they are the only hydrogen generators certified for laboratory use by CSA, UL and IEC 1010.

99.99999% Pure

The exclusive proton exchange membrane has been complemented with a scrubber to generate 99.99999% pure hydrogen. That's why Parker hydrogen generators are recommended by GC and column manufacturers.

Parker's ChromGas proprietary replaceable desiccant cartridge provides fuel grade purity 99.9995% and ensures consistent reproducible results. The model A9800 comes standard with a palladium purifier module to reach levels of gas purity up to 99.99999%.

Proven Technology

Parker's exclusive Proton Exchange electrolyte Electrolyzer eliminates the use of liquid electrolytes with hydrogen generators.

Proven in over 20,000 GC installations worldwide, Parker's generators are the most reliable hydrogen generators on the market. Maintenance requires only a few minutes per year – no inconvenient, extended downtime. Simply change the deionizer bag every six months and the desiccant cartridge whenever it turns beige. And if contaminated water or low water level is detected, the system activates a warning light and shuts off the generator – avoiding damage to the electrolyte cell.

Specifications:

Flow rates:	Model A9090: 90 cc/min. Model B9150: 160 cc/min. Model B9200: 250 cc/min. Model B9400: 500 cc/min. Model A9800: 1,200 cc/min.
Purity:	99.99999% Purity (A9800); 99.9995% (all others) Oxygen < 1ppm Moisture < 1ppm Hydrocarbons/halocarbons, 1ppb
Delivery pressure:	2-30 psi ±3%, 30-100 psi ±2%
Pressure control:	5-20 psi ±0.5%, 20-100 psi ±0.2%
DI Water reservoir:	Refill as needed
Deionizer bags:	Replace every six months or whenever the "change water" indicator is on. Two required.
Desiccant cartridge:	Replace when it turns from blue to light grey or beige
Dimensions:	14.75" (H) x 13" (W) x 14" (D) (all except A9800) 14.5" (H) x 13" (W) x 17" (D), (A9800)
Weight:	40 lbs. dry (18 kg)
Safety:	CE Certified
Warranty:	1 year

Hydrogen Generators

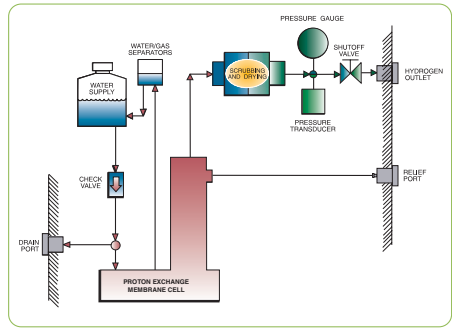
Cat. No.	Description
A9090	Hydrogen generator 90 cc/min.
B9150	Hydrogen generator 160 cc/min.
B9200	Hydrogen generator 250 cc/min.
B9400	Hydrogen generator 500 cc/min.
A9800	Hydrogen generator 1200 cc/min.

Replacement Components

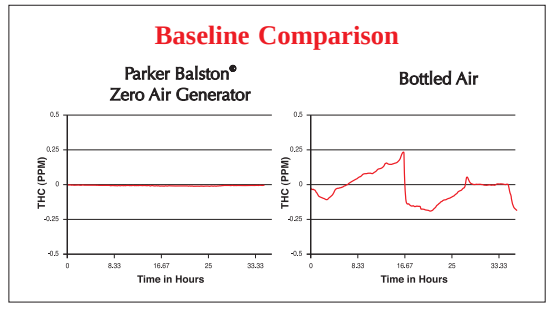
1647727	Desiccant cartridge*
7601132	Replacement deionizer bag, 2/pk

**Replacement cartridge for A9090, B9100, B9200, B9400.*

Hydrolysis of Water Followed by Membrane Separation of Hydrogen from Oxygen



Ultra High Purity Zero Air Generators



- **Hydrocarbon-free air generators**
- **Simple**
- **Typical payback period <1 year**
- **Low, stable baselines**

Hydrocarbon-free Air Generators

Parker's zero air generators produce a continuous flow of ultra pure zero grade air from an existing compressed air supply. When used in conjunction with a Parker hydrogen generator, gas chromatographers can totally automate and control their gas supply for GC-FID's.

The UHP zero air generators reduces the total hydrocarbon content (THC) to less than 0.1ppm measured as methane. The generator produces lower, more stable baselines than cylinders thus significantly enhancing the sensitivity of GC-FID analysis.

Simple

Now you can convert house air or compressed air into UHP zero air in just three easy steps: 1) supply standard AC electrical power; 2) wait just a few minutes to warm up the catalytic converter – an operating light indicates when the system is ready; 3) supply air flow and begin using your instrument.

The zero air generator produces gas equivalent to UHP zero air cylinder gas at a fraction of the cost. An inlet 0.5 micron coalescing filter removes particles, oil and water from the air supply. Hydrocarbons are removed when the compressed air is passed over a convertor containing a heated catalyst. And, after the air is cooled, a 0.01 micron cellulose filter is used to remove any residual particles.

Cost Effective

Parker's zero air generators produce UHP zero air, at low pressures of 2 to 125 psi – on demand. They afford the advantage of on-site gas generation. In gas savings alone, a UHP zero air generator can pay for itself in as little as six months of operation.

Time Savings

In addition to cost savings, there are valuable time savings. Now you can eliminate changing gas cylinders and save the time required to recalibrate your instrument after each cylinder change.

Low, Stable Baselines

Parker's generators provide years of stable and reliable UHP zero air supply and GC operation. Unlike other zero air generators, Parker's 3500 UHP zero air generators have a built-in electronic control to maintain the voltage convertor and its optimum operating temperature. Line voltage and ambient temperature variations will not affect the absolute temperature of the heated catalyst. The quality of the produced hydrocarbon-free air is maintained for years.

This worry-free operation will also give you years of predictable GC performance. UHP zero air generators increase the accuracy of the analysis by producing a cleaner baseline readout. They also significantly reduce the cleaning requirement of the FID.

Model Number	Number of FIDs*
ZA1000	Up to 3
ZA3500	Up to 11
ZA7000	Up to 23

**Based on a 300 ccm fuel air rate.*

Specifications:

Flow rates:	Model ZA1000: 1,000 cc/min. Model ZA3500: 3,500 cc/min.
Inlet air pressure:	2 to 25 psi
Pressure drop:	5 psi at max flow rate
Stabilization:	< 2 min flowrate pressure stabilization
Outlet THC as methane:	< 0.1ppm
Max inlet THC:	200ppm
Max inlet air temp:	40° C (104° F)
Overheat shutdown:	Yes
Time for max THC purity:	30 min. w/o air flow; 45 min. with air flow
Dimensions:	10" (H) x 6" (W) x 12" (D), (ZA1000) 12" (H) x 7" (W) x 15" (D), (ZA3500) 16" (H) x 10" (W) x 13" (D), (ZA7000)
Weight:	ZA1000: 11 lbs; ZA3500: 20 lbs.
Safety:	CE Certified
Warranty:	1 year

Zero Air Generators

Cat. No.	Description
ZA1000	Model 1000, 1000 cc/min., 120V*
ZA3500	Model 3500, 3500 cc/min., 120V*
ZA7000	Model 7000, 7000 cc/min., 120V*

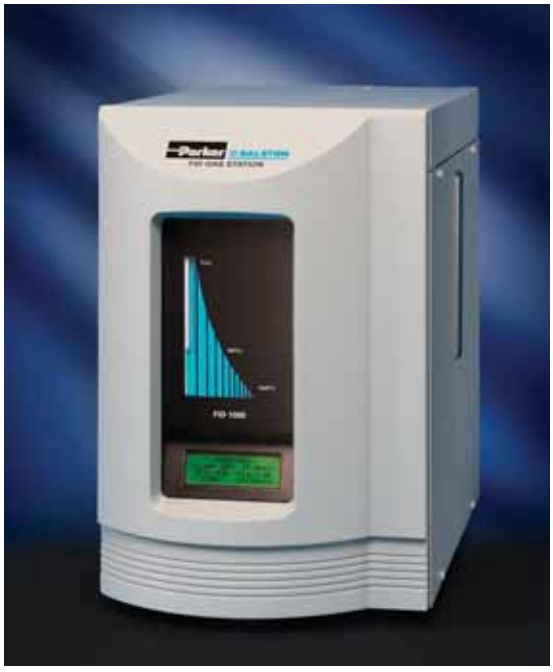
**Also available in 220V*

Replacement Components

1647731	Inlet filter for ZA1000, also outlet filter for both ZA1000, ZA3500
1647736	Inlet filter for ZA3500
MK7840	Inlet and outlet filter for ZA7000

System maintenance is minimal. *We recommend replacing the inlet and outlet filters every six months.*

Parker Balston® FID Gas Station



- **Save time and avoid injury by eliminating hydrogen and air cylinders**
- **Save bench space by using one unit to replace two generators**
- **Generate UHP zero grade air from compressed air**
- **Generate pure hydrogen (99.9995%) from deionized water**
- **Ideal for 2 FIDs**
- **Payback period of approximately 14 months**
- **Automatic water fill capability**
- **Silent operation and minimal operator attention required**

Gas Generator Benefits

The FID-1000 FID Gas Station is a complete system with state-of-the-art, highly reliable components engineered for easy installation, operation, and long term performance. The Parker Balston FID-1000 FID Gas Station eliminates all the inconveniences and cost of zero air and hydrogen cylinder gas supplies and dependence on outside vendors. Uncontrollable price increases, contract negotiations, long term commitments, and tank rentals are no longer a concern. With the FID Gas Generator, you control your gas supply.

Proven Technology

The Parker Balston's FID-1000 FID Gas Station provides both hydrogen gas and zero grade air for FID detectors on gas chromatographs. This system is specifically designed to provide fuel gas to 2 Flame Ionization Detectors.

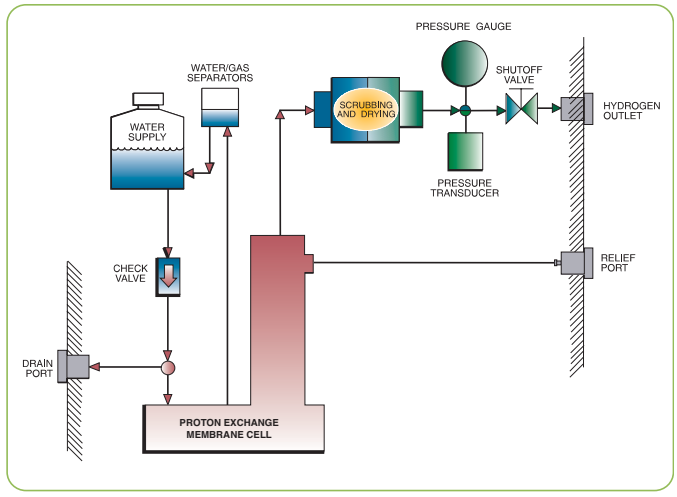
Zero Air Technology

Zero air is produced by purifying onsite compressed air to a total hydrocarbon concentration of less than 0.1ppm (measured as methane). The FID-1000 FID Gas Station produces up to 1000cc/min of zero grade air.

Meets OSHA and NFPA Requirements

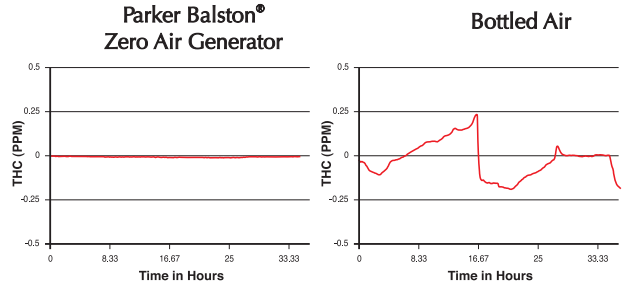
All Parker Balston® gas generators meet NFPA and OSHA 1910.103 regulations governing the storage of hydrogen.

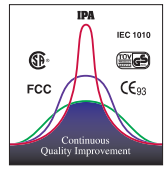
Hydrolysis of Water Followed by Membrane Separation of Hydrogen from Oxygen



Baseline Comparison

The chromatograms compare baselines produced by a Parker Balston Zero Air Generator and bottled air. The baseline produced by the Parker Balston Generator is very flat, with no fluctuations or baseline shifts, in comparison with the chromatogram of the bottled air fuel supply, which has many baseline shifts ranging from 0.25ppm to -0.25ppm.





Built to International Standards

Produced and supported by an ISO 9001 registered organization, Parker Balston® generators are the first built to meet the toughest laboratory standards in the world: CSA, UL, CE, and IEC 1010.

Specifications:

FID-1000	Hydrogen Specification	Zero Air
Product Purity:	99.9995% Pure Hydrogen	<0.1ppm THC
Flow Rate:	90 cc/min	1,000cc/min
Delivery Pressure:	0-90 psi	40-125 psi
Inlet Connection:	NA	1/4" NPT (female)
Power Requirements:	120 VAC/amp	
Dimensions:	16.5" H x 10.5" W x 17" D	
Weight Dry:	46 lbs	
Outlet:	1/8" Compression	

FID Gas Station Ordering Information

Cat. No.	Description
FID-1000	FID Gas Station, 110V

LXFD12-8

SF Series

Atlas Copco Air Compressors

- **100% Oil free air**
- **SF Series: 35° F - 39° F Integral refrigerant air dryer – Air cooled, fully packaged**
- **High efficiency**
- **Whisper quiet operation**
- **24-hour Continuous duty applications**
- **Approved for all Parker Hannifin gas generators**

The **SF and LXFD Series** are 100% oil-free operation, which guarantees there is no possibility of oil based residues building up in sensitive equipment. The **SF Series** compressors are ideal for supplying 'quality air' for Nitrogen generators.

The **LXFD** compressors can be supplied as complete 'quality air' packages for Parker Zero Air Generators, which include an in-line pre-filter and single column desiccant air dryer, ensuring the removal of particulate contaminants and moisture, thus preventing condensation within your compressed air system.

Each compressor configuration is totally pre-piped and wired for easy and economical installation. Simply select your desired compressor from the table below and order from Chrom Tech. Full service and warranty are provided exclusively from Atlas Copco.

Each compressor includes Atlas Copco "Certified Start-up Assistance Service*" as standard.

** Excludes electrical supply work, due to local code restrictions. Electrician may be required.*

Compressors for Parker Gas Generators

Cat. No.	Description
L330	SF Series compressor (Nitrogen generators)
L189	SF Series compressor (Nitrogen generators)
LXF12D-8	LXFD compressor (Zero air generators)

Air Compressor Specifications:

Model	L330	L189	LXFD12-8
Motor HP	3	5	1.29
Capacity AFCM[1]			
100 psi	9.0 ft³/min	14.7 ft³/min	(58 psi) 6.3 ft³/min
125 psi	6.8 ft³/min	na	(116 psi) 5.3 ft³/min
150 psi	6.0	na	
Sound level (dBA)[2]	58	59	60
Net weight (lbs)	260	289	53
Reciever tank (gallons)	30	60	20

1 Unit performance measured according to Pneurop/CAGIPN2CPTC2
2 Maximum noise level measured at a distance of 3 ft. according to Pneurop/CAGIPN8NTC2 test code

Membrane Air Dryers

- **Dry air for hazardous areas**
- **No electricity required – low operating costs**
- **No refrigerants or freons – environmentally sound**
- **Explosion proof**

Parker Balston® Membrane Air Dryers are engineered for easy installations, operation, and long term reliability. The dryers incorporate the highest efficiency membrane available, offering low cost operation and minimal maintenance. Designed to operate continuously, 24 hours per day, 7 days per week. The only maintenance required is changing the prefilter cartridge once each year. This annual maintenance takes 5 minutes. The dryers are lightweight, compact, and can be easily installed on an existing air line. A high efficiency coalexcing prefilter is installed directly upstream from the dryer module to protect the membrane from potential contamination caused by pipe scale, liquids, or other solids.

Cat. No.	Description
64-01	Membrane air dryer, up to 113 LPM
64-02	Membrane air dryer, up to 307 LPM
64-10	Membrane air dryer, up to 1,203 LPM
MK7601	Maintenance kit for 64-01, 64-02
MK7610	Maintenance kit for 64-10

Membrane Air Dryer Specifications:

Model	64-01	64-02	64-10
Max flow rate[1] at -40°C dewpoint	47 LPM	125 LPM	517 LPM
Max flow rate[1] at 0°C dewpoint	113 LPM	307 LPM	1,203 LPM
Min/Max inlet air temp[2]	4°C/60°C	4°C/60°C	4°C/60°C
Recommended operating temp	16°C-38°C	16°C-38°C	16°C-38°C
Min/Max inlet pressure	60 psi/150 psi	60 psi/150 psi	60 psi/150 psi
Max pressure drop	<4 psi	<4 psi	<4 psi
Wall mountable	yes	yes	yes
Inlet/Outlet port size	1/4"	1/4"	1/4"
Shipping weight	9 lbs	10 lbs	18 lbs
Dimensions (W x H x D)	6" x 22" x 5"	6" x 23" x 5"	6" x 37" x 5"

Notes:
1. Dewpoint specified with inlet air at 38°C saturated at 100 psi.
2. Inlet compressed air dewpoint must not exceed the ambient air temperature.

In-Line Check Valves for Gas Lines

- **Recommended check valve to be used when implementing a back up cylinder with a single generator configuration**

The 415 series piston check valve incorporates a piston with an embedded o-ring that seals on the seat. Pressure in the flow direction moves the piston and seal off the seat and exposes the cross holes in the piston.

415 Series Check Valve Specifications:

Max Pressure, Temp:	500 psi, 180 °F
Body Material:	316 SS Body and Piston
O-ring Seal:	Ethylene Propylene
Fittings:	1/4" FNPT Inlet x 1/4" FNPT Outlet
Cracking Pressure:	302 Stainless Spring, 1/3 psi

Cat. No.	Description
CT-CV415	415 In-line check valve

Parker Balston® Nitrogen Generators

High Purity Nitrogen Generator

- **Produces a continuous supply of high purity nitrogen gas from existing compressed air**
- **Eliminates the need for costly, dangerous, inconvenient nitrogen cylinders in the laboratory**
- **Compact design frees up valuable laboratory space**
- **Offers long term cost stability –** uncontrollable vendor price increases, contract negotiations, long term commitments and tank rentals are no longer a concern
- **Ideal for carrier gas, make-up gas or solvent evaporation applications**

Parker Balston® Models 76-92, 76-94, and 76-96 Nitrogen Generators are completely engineered to transform standard compressed air into 99.99% or 99.9999% nitrogen, exceeding the specification of UHP cylinder gas. Models 76-92 and 76-94 can produce up to 1.1 LPM of UHP nitrogen gas and Model 76-96 can produce up to 2.0 LPM. Nitrogen is produced by utilizing a combination of state-of-the art purification technologies and high efficiency filtration.

Pressure swing adsorption removes O_2, CO_2, and water vapor. A catalyst module is incorporated in the 76-94 Model to oxidize hydrocarbons from the inlet air supply. High efficiency coalescing prefilters and a 0.1µm (absolute) membrane filter is also incorporated into the design of the generators.
The Parker Balston UHP Nitrogen Generators are engineered and packaged in a small cabinet to fit on or under any benchtop. The systems eliminate the need for costly, inconvenient high pressure nitrogen cylinders. The 76-92* and 76-94 are ideal for carrier gas and make-up gas applications. The 76-96 is ideal for solvent evaporation applications (on select equipment).

*Model 76-92 has the same specifications as model 76-94 except for Hydrocarbon removal.

Parker Balston Nitrogen Generator Ordering Information

Cat. No.	Description
76-96	High purity Nitrogen generator
76-92	Ultra high purity Nitrogen generator
76-94	Ultra high purity Nitrogen generator *w/hydrocarbon removal*
MK7692	Maintenance kit* for 76-92 and 76-96
MK7694	Maintenance kit* for 76-94

**Kit includes a one year supply of prefilters and final filters*

Parker Balston Nitrogen Generator Specifications:

Model	76-92/76-94	76-96	75-A72, 75A720 75-A74, 75-A740
Max Nitrogen flow rate	See flow table	2LPM	See flow table
Nitrogen Purity	99.9999%	99.99%	95.0 - 99.5%
Max Nitrogen output pressure	See flow table	90psi	input dependent
CO concentration	< 1ppm	NA	-
CO_2 concentration	< 1ppm	< 1ppm	-
O_2 concentration	< 1ppm	< 100ppm	-
H_2O concentration	≤ 2ppm	≤ 2ppm	-
Hydrocarbon concentration[1]	< 0.1ppm	NA	-
Argon concentration[2]	0.9%	0.9%	-
Min/Max inlet pressure	60/125 psi	75/120 psi	60/145 psi
Recommended inlet temp.	≤ 78°F (25°C)	≤ 78°F (25°C)	≤ 78°F (25°C)
Max ambient operating temp.	100°F (38°C)	100°F (38°C)	110°F (43°C)
Max air consumption	42 LPM	42 LPM	-
Inlet connection	1/4" NPT (female)	1/4" NPT (female)	1/4" NPT
Outlet connection	1/8" compression	1/8" compression	1/4" NPT
Electrical requirements[3]	120 VAC/60 Hz	120 VAC/60 Hz	120V/60Hz/25 Watts 75-A72, 75-A74: None
Dimensions	12"w x 16"d x 35"h	12"w x 16"d x 35"h	16"w x 16"d x 50"h
Shipping weight	115 lbs (52kg)	115 lbs (52 kg)	75 lbs - 106 lbs

[1] Models 76-92 and 76-96 do not remove hydrocarbons
[2] Purity specification for Nitrogen does not include Argon concentration
[3] Power consumption is as follows: 76-92 = 25 Watts; 76-94 = 700 Watts; 76-96 = 25 Watts

Nitrogen Flow Table:

Inlet Air Pressure	Max Outlet Flow	Max Outlet Pressure
Models 76-92 and 76-94		
125 psi	1100 cc/min	85 psi
110 psi	1000 cc/min	75 psi
100 psi	900 cc/min	65 psi
90 psi	800 cc/min	60 psi
80 psi	700 cc/min	50 psi
70 psi	600 cc/min	45 psi
60 psi	500 cc/min	35 psi
Model 76-96		
75-120 psi	2000 cc/min	90 psi

Membrane N_2 Generator Purity/Flow Chart:

	Max Flow @ 145 psi inlet pressure	
N_2 Purity	75-A72, 75-A720	75-A74, 75-A740
99.5%	8 LPM	16 LPM
99%	14 LPM	28 LPM
98%	20 LPM	40 LPM
97%	24 LPM	48 LPM
96%	29 LPM	58 LPM
95%	36 LPM	72 LPM

Membrane Nitrogen Generators

- **Applications: LC/MS, solvent evaporation**

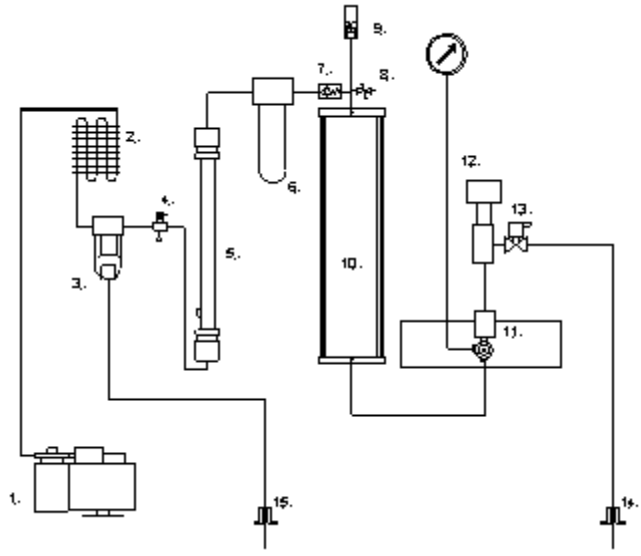
These Parker Balston Nitrogen generation systems produce up to 72 LPM of compressed nitrogen, on-site. The purity level of the nitrogen stream is defined by the user, for the application, and may range from 95% to 99.5%.

These generators transform standard compressed air into nitrogen at safe, regulated pressures, on demand, without the need for operator attention. A high efficiency prefiltration system pretreats the compressed air to remove all contaminants down to 0.01µm. Hollow fiber membranes subsequently separate the clean air into a concentrated nitrogen output stream and an oxygen enriched permeate stream, which is vented from the system. The combination of these technologies produces a continuous on demand supply of pure nitrogen.

Parker Membrane Nitrogen Generator Ordering Information:

Cat. No.	Nitrogen Generator Flow Range:
75-A72	Up to 36 LPM
75-A720	Up to 36 LPM, includes oxygen analyzer
75-A74	Up to 72 LPM
75-A740	Up to 72 LPM, includes oxygen analyzer
MK7572C	Filter maintenance kit (for current models)

PEAK Scientific Nitrogen Generators



Membrane Standard Diagram

- **Up to 30 Liters/Minute**
- **> 99.9 % Purity**
- **Easy installation**
- **Optional built in air compressor**
- **24 hour continuous gas supply**
- **Replaces bulky gas cylinders/dewars**

Peak Scientific Instruments Membrane Generators utilize Hollow Fiber Membrane Technology to efficiently separate Nitrogen from other gases present in ambient air. The membrane operates on the principal of selective permeation in that "fast" gases such as H_2O, CO_2 & Oxygen will permeate through the membrane wall. While "slow" gases will not permeate and will continue along the membrane tube and are thus available for collection and use.

NM18LA and NM30LA

The NM18LA and NM30LA are self-contained Nitrogen Generators with a built-in Air Compressor. No additional equipment is required. Quiet in operation, these generators utilize membrane technology to selectively remove oxygen, moisture and other gases to leave clean, dry, phthalates free nitrogen.

NM18L and NM30L

If you have an air supply (oil free or pretreated air @ 110 psi is required), the NM18L and NM30L can be attached to your air line. Requiring no electrical connection, it is simple to install and wall mountable. With a pressure drop of only 8 psi it is the lowest on the market, making it easier to use house air.

Peak Scientific Nitrogen Generator Ordering Information

Cat. No.	Description
NM18L	18 LPM Nitrogen
NM18LA	18 LPM Nitrogen (includes air supply)
NM30L	30 LPM Nitrogen
NM30LA	30 LPM Nitrogen (includes air supply)
08-4429	Filter maintenance kit (L models)
08-4435	Filter maintenance kit (LA models)

Air is drawn into the system by the Compressor (1) and passed through the Heat Exchanger (2) and the Filter/Separator (3) into the Membrane (5). After the Membrane (6) the separated Nitrogen is passed through an Activated Carbon Filter (8) to remove any remaining impurities and into the Receiver (10). The stored nitrogen is regulated (11) to give the required output pressure and flow. Humidity measurement of the Nitrogen can be provided as an option by the TransmetR (12 & 13). Receiver pressure is measured (9) to allow the generator to unload (4) and shutdown should demand cease.

PEAK Scientific Nitrogen Generator Specifications:

Model	NM18LA	NM18L	NM30LA	NM30L
Max Flow Rate (ATP)	18 LPM	18 LPM	30 LPM	30 LPM
Outlet Pressure	7 Bar/100 psi	input dep.	7 Bar/100 psi	input dep.
Air Compressor	Yes	No	Yes	No
Maximum Purity	>99.9%	>99.9%	>99.9%	>99.9%
Start up time for Purity	45 minutes	45 minutes	45 minutes	45 minutes
Nitrogen Pressure Dewpoint	-70ºC / -94ºF	-70ºC / -94ºF	-70ºC / -94ºF	-70ºC / -94ºF
Particles >0.01 µm	None	None	None	None
Suspended Liquids	None	None	None	None
Phthalates	None	None	None	None
Commercially Sterile	Yes	Yes	Yes	Yes
Min-Max Air Inlet Pressure	N/A	110 - 150 psi	N/A	110 - 150 psi
Max Ambient Op. Temp	37ºC / 98ºF	37ºC / 98ºF	37ºC / 98ºF	37ºC / 98ºF
Noise Level	<53 dB (A) 3 ft.	None	<53 dB (A) 3 ft.	None
Electrical Requirements	230V, 50/60 Hz	None	230V, 50/60 Hz	None
Dimensions (HxWxD)	36"x24"x24"	30"x10"x6.5"	36"x24"x24"	30"x10"x6.5"
Weight	90 lbs	22 lbs	198 lbs	29 lbs

Service contracts now available on PEAK Gas Generators. Please call Chrom Tech for a quote.