



## FOCUSED ON ANALYTICAL GAS SYSTEMS

Bulletin LFAGS-L



ENGINEERING **YOUR** SUCCESS.

## FOCUSED ON PURITY

Offering a wide range of advantages over the traditional cylinder gas supply, gas generators are increasingly becoming the popular choice in many laboratories.

In chemical sectors such as pharmaceuticals, polymer, environmental monitoring, CRO, and forensics, scientists rely upon specialized instruments for fast and accurate analysis of compound properties.

A consistent, safe supply of high-purity make-up, carrier, and fuel gases is essential to ensure precise results in separation techniques such as gas chromatography.

The challenge is to find a gas supply solution that meets the quality criteria while being easy to use, cost-efficient, and reliable.



Parker on-site gas generation allows us to have a high-purity, safe, and consistent supply of gas."

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### Consistent, reliable purity

Gas purity varies significantly from cylinder to cylinder, and impurities can be introduced via the pipeline during changeover. In contrast, on-site generators supply consistently high-purity gas, preventing variations in quality, and ensuring ultra-sensitive analysis, every time.

Supported by proven, advanced technologies, you can trust Parker gas generators to deliver the reliability and consistency your work demands.

### Expert gas generation solutions

With a history of expertise in gas generation, Parker is perfectly placed to support profitable operations in analytical science. Working with partners in laboratories across a range of sectors, our industry-leading solutions enable consistent accuracy through a constant, on-demand supply of nitrogen, hydrogen, and zero air for carrier, make-up and fuel gas.

## FOCUSED ON PERFORMANCE

### A safer choice

High-pressure cylinders are inherently linked to safety issues – from the chance of injury through manual handling to the risk of gas leaks, which can make the atmosphere potentially explosive or deficient in oxygen.

Gas generators from Parker are a safe alternative, thanks to leak detection technology with 'auto shut off' and integral alarms. They also operate at a fraction of the pressure and with low volumes of stored gas, further reducing the potential for harm.

These generators eliminate many of the inconveniences of dependence on outside vendors, such as uncontrollable price increases, dewar ice and condensation, contract negotiations, long term commitments, and tank rentals. With a Parker generator, you control your gas supply.

### Cost-efficient with the lowest lifetime cost

In some cases, you can expect to have recouped the cost of your gas generator in less than one year. Energy efficient technologies keep running costs down, there are no hidden charges such as on-going delivery costs, cylinder rental or storage fees for spares and empty cylinders, and maintenance and part replacement costs are minimal.





### Global support for your peace of mind

We know that business continuity is vital to your work. That's why we offer a comprehensive package of expert service, care, and maintenance across our complete analytical gas systems range, worldwide.

From installation, scheduled maintenance, and in very rare cases, emergency assistance, wherever you are, you can trust Parker to give you complete peace of mind.

### Continuous supply, available on-demand

Parker gas generators are engineered to transform standard compressed air into nitrogen at safe, regulated pressures, on demand, without operator attention. Engineered for easy installation, operation, and long term performance, and permanently installed at the point of use, an on-site generator provides you with straightforward access to an unlimited supply of gas. Always at the correct pressure, flow, and temperature, Parker gas generators improve the stability of your instruments and the accuracy of your results.





# Zero Air Generators

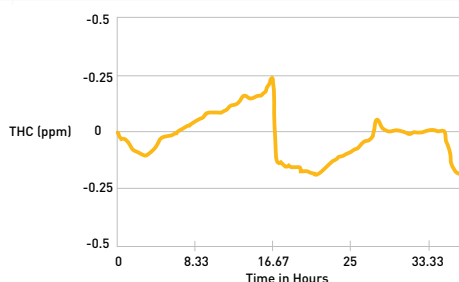
## HPZA Series

### 75-83NA & 76-98N100

#### Baseline Comparison

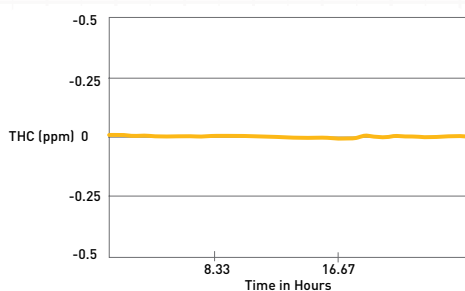
##### Non-Hydrocarbon Free Fuel Air Supply

Baseline of Beckman 400 Hydrocarbon Analyzer run with house compressed air as fuel air supply (Approx. 3 PPM THC air as sample), hydrogen fuel pressure 25 PSIG, fuel air pressure 15 PSIG, Sample flow 2300 CC/Min; 7.26.90



##### Parker Zero Air Generator

Baseline of Beckman 400 Hydrocarbon Analyzer: Parker HPZA-300 Zero Air Generator (<.05 PPM THC) as fuel air supply; Ultra zero bottled air (<.1 PPM THC) as sample, hydrogen fuel pressure 25 PSIG, fuel air pressure 15 PSIG, Sample flow 2300 CC/Min; 8.6.90



The chromatograms (above) compare baselines produced by a Parker Zero Air Generator (right) and Bottled fuel air (left). The baseline produced by the Parker generator is very flat, with no fluctuations or peaks, in comparison with the chromatogram of the bottled air fuel supply, which has many peaks ranging from .25 ppm to -.25 ppm.

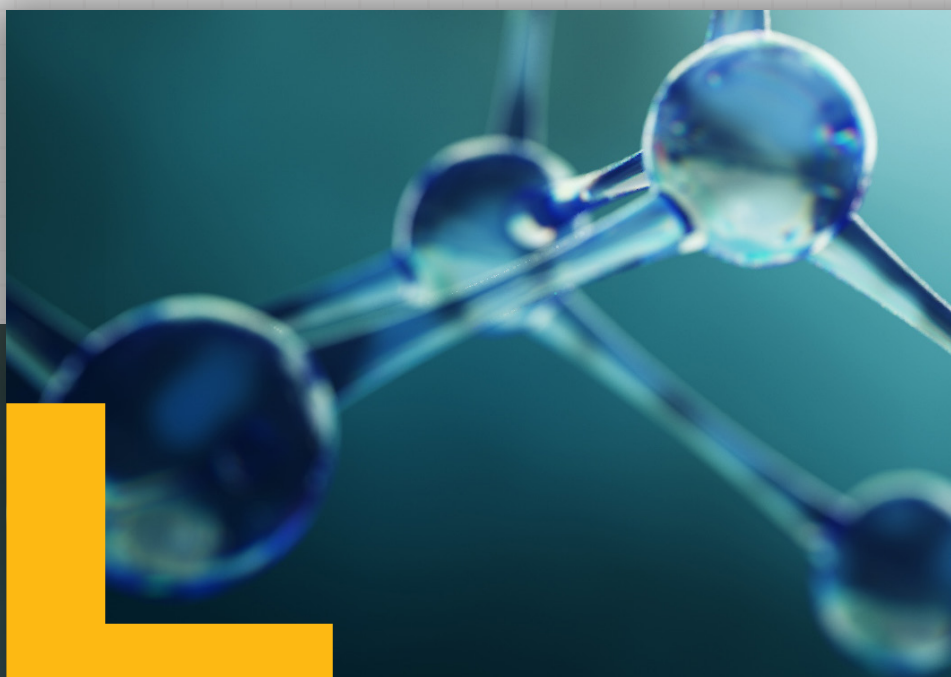
- Produce UHP Zero Air from lab house compressed air supply
- Easy installation and operation
- Gas purity below 0.05 ppm Total Hydrocarbon Content (as methane)
- Increase the accuracy of analysis and reduce the cleaning requirement of the detector
- Qualitative SMART-Display provides operational status at a glance
- Recommended and used by many GC and column manufacturers
- Typical payback period of less than 1 year
- Silent operation and minimal operator attention required
- Models available to service up to 66 FIDs

#### Applications

- Oxidant/support gas for GC with FID, FPD and NPD detectors
- Support gas for Total Hydrocarbon Analyzers
- Source and exhaust pump gas for LC/MS instruments

#### Zero Air Generator Selection Chart

Model Number	Flow Capacity
75-83NA	1.0 lpm
HPZA-3500	3.5 lpm
HPZA-7000	7 lpm
HPZA-18000	18 lpm
HPZA-30000	30 lpm
76-98N100	140 lpm
76-98N200	280 lpm



# Hydrogen Generators

## H2PEM Series

## H2PD Series

Parker Hydrogen Generators are compact benchtop instruments engineered to produce ultra high purity nitrogen at flow capacities up to 1300 cc/min.

- Produce a continuous on-demand supply of 99.9995% to 99.99999+% pure hydrogen gas
- Compact and reliable - only one square foot of bench space required
- Designed to operate continuously, 24/7
- Certified for laboratory use by CSA, UL, IEC 1010, and CE mark
- Safe - produce only as much gas as you need

### Applications

- Fuel and carrier gas for GC's
- Reaction gas for ELCD's
- Reagent Gas for AED's

Hydrogen gas is produced by electrolytic dissociation of water. The resultant hydrogen stream then passes through a palladium membrane.

Only hydrogen and its isotopes can penetrate the palladium membrane; therefore, the purity of the output gas is guaranteed to be 99.99999+% consistently. This technology produces hydrogen at a purity two orders of magnitude greater than competitive technologies using silica gel, desiccants, and drying tubes.

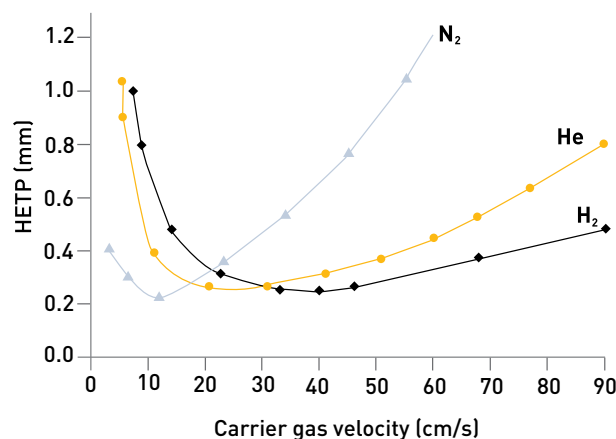
Parker Hydrogen Generators offer many special features to ensure safe and convenient operation. These features include low-water audible alarms to indicate when the water reservoir needs filling and automatic shutdown to protect expensive laboratory equipment.



### Gas Generator Selection Chart

Flow Capacity	Model Number
H2PEM-100 <sup>1</sup>	100 cc/min
H2PD-150	150 cc/min
H2PEM-165 <sup>1</sup>	165 cc/min
H2PEM-260 <sup>1</sup>	260 cc/min
H2PD-300	300 cc/min
H2PEM <sup>1</sup> -510	510 cc/min
H2PEMPD <sup>2</sup> -510	510 cc/min
H2PEMPD <sup>2</sup> -650	650 cc/min
H2PEMPD <sup>2</sup> -850	850 cc/min
H2PEMPD <sup>2</sup> -1100	1100 cc/min
H2PEMPD <sup>2</sup> -1300	1300 cc/min

1. \*99.9995% Fuel Grade Purity, no Palladium
2. Available with 100 or 175 psi outlet pressure





# Nitrogen Generator with Research Grade Purity

## Model UHPN2-1100

The Parker UHPN2 Series Nitrogen Generator is engineered to transform standard compressed air into 99.9999% nitrogen, exceeding the specification of UHP cylinder gas.

- Compact design frees up valuable laboratory floor space
- Offers long term cost stability
- Ideal for carrier gas applications

This system can produce up to 1.1 lpm of UHP nitrogen gas of research grade purity. Nitrogen is produced by utilizing a combination of state-of-the-art purification technologies and high efficiency filtration.

Pressure swing adsorption removes O<sub>2</sub>, CO<sub>2</sub>, and water vapor. A catalyst module is incorporated in the UHPN2 Series to oxidize hydrocarbons from the inlet air supply.

High efficiency coalescing prefilters and a 0.01 micron (absolute) membrane filter is also incorporated into the design of the generators.

The UHPN2 Series Nitrogen Generator is packaged in a small cabinet to fit on or under any benchtop, and eliminates the need for costly, inconvenient high pressure nitrogen cylinders. Typical applications include GC carrier and make-up gas and low flow sample concentrators.

### Gas Generator Selection Chart

Model	Purity	Hydrocarbon Removal	Flow
UHPN2-3200	99.9999%	Y	1100 cc/min







## Zero Nitrogen Generators for GC Carrier Gas and Makeup Gas Applications

Parker Zero Nitrogen Generators are engineered to transform standard compressed air in to a safe regulated supply of 99.9995% pure nitrogen, with <0.1ppm of hydrocarbons.

- Ideal for make-up and carrier gas applications including ECD
- Available with integral oil free compressors with noise reduction technology
- Integral compressors with standard economy mode: increasing compressor life and reducing running costs
- Designed to run 24 hours a day

Typical applications include GC make up gas and carrier gas, including ECD (Electron Capture Detector), DSC (Differential Scanning Calorimeter) and virtually any analytical instrument that requires a small flow of ultra high purity zero nitrogen.

Nitrogen is produced by utilizing a combination of filtration and pressure swing adsorption (PSA) technology. Standard compressed air is filtered by high efficiency coalescing filters to remove all contaminants down to 0.01 micron. For ultra sensitive applications such as ECD, units also include the addition of a heated catalyst module to ensure hydrocarbons are removed to < 0.1ppm.

The air then passes through two columns filled with proprietary carbon molecular sieve (CMS) which adsorb O<sub>2</sub>, CO<sub>2</sub>, moisture and hydrocarbons. These are desorbed to the atmosphere during the pressure swing cycle leaving a supply of ultra pure nitrogen.

### Gas Generator Selection Chart

Model	Purity	Hydrocarbon Removal	Flow
UHP2N2-3200	99.9995%	Y	3200 cc/min
HPN2-600	99.9995%	N	600 cc/min
HPN2-800	99.9995%	N	800 cc/min
HPN2-1600	99.9995%	N	1600 cc/min
HPN2-3200	99.9995%	N	3200 cc/min
HPN2-5200	99.999%	N	5200 cc/min
HPN2-8000	99.9%	N	8000 cc/min
HPN2-10500	99.8%	N	10500 cc/min
HPN2-14000	99.5%	N	14000 cc/min





# Membrane Nitrogen Generators

## N2 Series

## NitroFlow Series



Recommended, certified, tested, and used by all major LC/MS instrument manufacturers, Parker Membrane Nitrogen Generators are designed to supply single or multiple LC/MS instruments with dry nitrogen at purities of 99% to 99.5%. The generators can also be used for solvent evaporation as well as supplying dry nitrogen to analytical instruments.

### Applications

- LC/MS
- Solvent evaporation
- Analytical instruments requiring nitrogen

### Nitrogen Generator Purity/Flow Chart

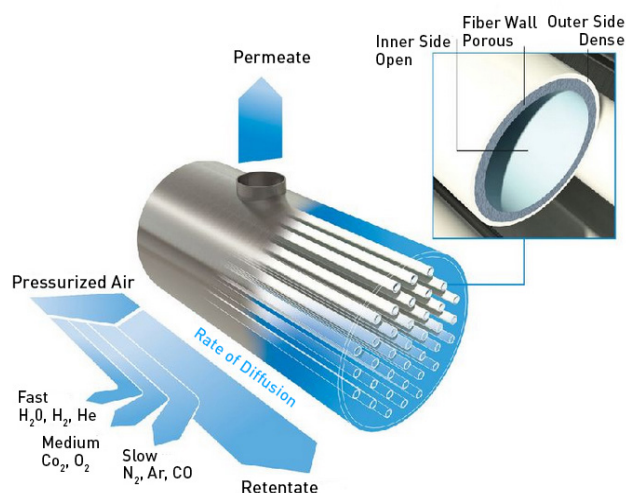
Model Number	Flow Capacity
N2-04	2-24
N2-14, N2-14A	4-60
NITROFLOWLAB <sup>(1)</sup>	32
N2-22, N2-22A	7-88
N2-35, N2-35A	11-131
N2-45, N2-45A	16-62
N2-80, N2-80A	28-70
NITROVAP-LV	140-287
N2-135, N2-135A	56-512
NITROFLOW60 <sup>(1)</sup>	60
NITROFLOW60D <sup>(1)</sup>	60+5 LPM Dry Air
NITROFLOWTG2 <sup>(1)(2)</sup>	70

1. With internal compressor.

2. Tri-Gas System; Nitrogen, HC Free Air, & Dry Air

- LC/MS grade nitrogen purity enhances instrument performance
- Minimal maintenance required
- No electricity required (NitroVap, N2 ANA models)
- ROI in 6 months to 2 years
- Phthalate-free, no organic vapors
- Unlike PSA technology, membrane will not suppress corona needle discharge.

Installation requires a minimum of 60 psig of compressed air to a 1/4", 1/2" or 3/8" inlet connection. The outlet nitrogen supply is then directed to your analytical instruments. No electrical connections are required and the only maintenance is to change prefilters periodically. The nitrogen generators are also available with purity monitors.







## TOC Gas Generators

### TOC-1250

### TOC-625

Parker TOC Gas Generators purify an existing compressed air supply in carrier/combustion gas for TOC instruments, eliminating the need to purchase expensive, inconvenient, high pressure cylinders of oxygen or nitrogen.

- Replace high pressure oxygen or nitrogen with hydrocarbon free, CO<sub>2</sub> free compressed gas for TOC analyzers
- Ensures consistent, reliable, TOC operation and significantly reduces instrument service and maintenance costs
- Operational display shows system status
- Minimal annual maintenance
- Compact design frees up valuable floor space
- Purity meets or exceeds all TOC manufacturer's gas purity requirements
- Easy installation and operation

Parker TOC Gas Generators utilize catalytic oxidation and pressure swing adsorption technologies to remove hydrocarbons to 0.1 ppm (measured as methane), CO<sub>2</sub> to 1 ppm, and water vapor to 1 ppm (-100°F/-73°C dewpoint).

### Applications

- Combustion/carrier gas for TOC's
- Supply gas for Total Organic Halogen Analyzers

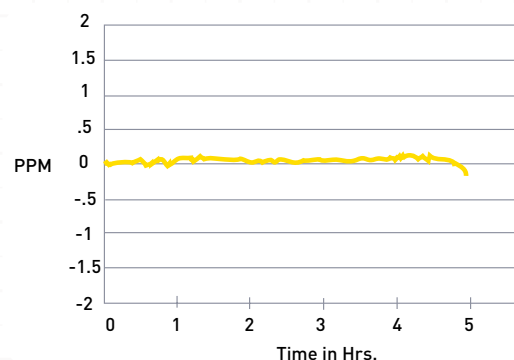
### Gas Generator Selection Chart

Flow Capacity	Model
625 cc/min	TOC-625
1,250 cc/min	TOC-1250



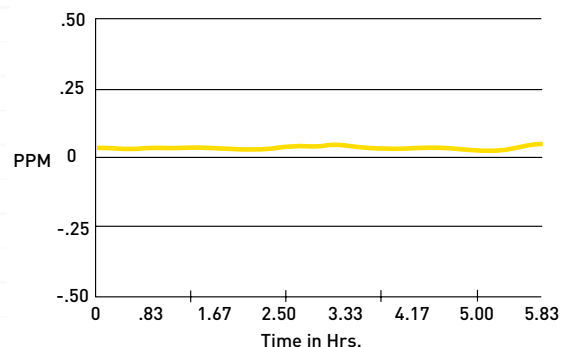
### CO<sub>2</sub> Base Chart

Baseline of Horiba CO<sub>2</sub> analyzer: 100 psig to TOC-1250 to back pressure regulator (60 psig) to 11131 (41 psig) to Horiba; Inlet Pressure= 7 psig; Flow = 500 cc/min.



### THC Base Chart

Baseline of Beckman 400 HC analyzer: 100 psig to TOC-1250 to back pressure regulator (60 psig) to 11131 (41 PSIG) to fuel air supply (15 psig). Total flow = 1.25 LPM. Ultra Zero Sample: (THC< .1 PPM); Flow = 1.25 LPM; H<sub>2</sub> Fuel Press = 25 PSIG



Respective baselines of THC (left) and CO<sub>2</sub> (right) analyzers over 5 hours, supplied by a Parker TOC Gas Generator.



## FT-IR Purge Gas Generators

Model 74-5041NA

Spectra 15 & 30

Parker FT-IR Purge Gas Generators are specifically designed for use with FT-IR Spectrometers to provide a purified purge gas and air bearing gas from compressed air. The generators supply carbon dioxide-free air at less than  $-100^{\circ}\text{F}$  ( $-73^{\circ}\text{C}$ ) dew point with no suspended impurities larger than  $0.01\text{ }\mu\text{m}$ .

- Increases FT-IR sample and maximizes up-time
- Safe - operates at low pressure
- Cost effective - payback typically less than one year
- Compact - free up valuable laboratory floor space
- Improves signal-to-noise ratio even on non-purge applications



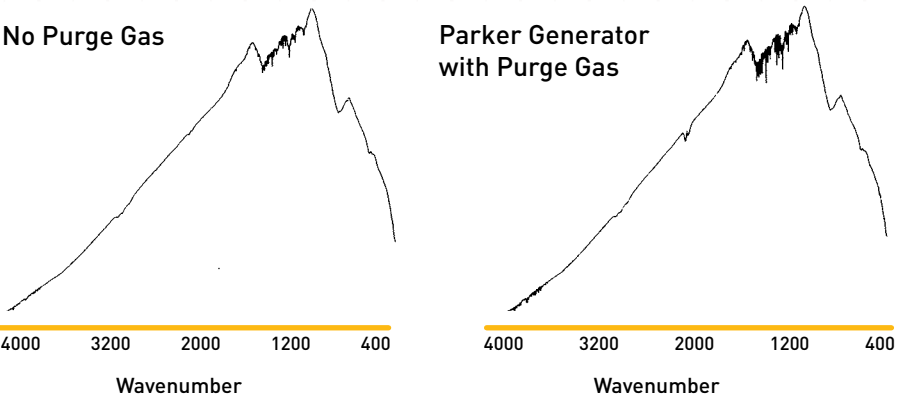
The units are designed to operate continuously 24/7. Each system offers cleaner background spectra in a shorter period of time and more accurate analysis by improving the signal-to-noise ratio. The generators are also ideally suited for use with  $\text{CO}_2$  Analyzers in addition to supplying other laboratory instruments. Each generator is quiet, reliable, and easy to install - simply attach the inlet air and outlet purge lines, plug the power cord into a wall outlet, and enjoy trouble-free operation. The model 74-5041NA Self Contained FT-IR Purge Gas Generator includes a state-of-the-art compressor.





### Comparative Spectral Analysis in Purging an FT-IR Sample Chamber

This spectra comparison illustrates that a Parker FT-IR Purge Gas Generator allows an FT-IR to be purged at a much higher flow rate than is practical with nitrogen. The sample chamber purging of CO<sub>2</sub> and water by the Parker unit is faster than the sample compartment purged with nitrogen.



### Gas Generator Selection Chart

Flow Capacity	Model
Up to 17 lpm	Spectra 15
Up to 34 lpm	Spectra 30
Up to 102 lpm	75-62NA
Up to 28 lpm	74-5041NA <sup>1</sup>

1. With internal compressor.

A Parker FT-IR Purge Gas Generator and Self-Contained Lab Gas Generator were used in conjunction with the Society for Applied Spectroscopy Fourier Transform Infrared Spectrometry Workshop at the University of Georgia (organized by Dr. James A. de Haseth and Dr. Peter R. Griffiths). The Self-Contained Lab Gas Generator provided excellent purge for six spectrometers. The organizers were so pleased with the performance of the Parker systems, they have requested that Parker Hannifin Corporation participate in future workshops.

- Dr. James A. de Haseth and Dr. Peter R. Griffiths



## Air Dryers for Analytical Instruments

### Compressed Air Dryer UDA-300

Parker Model UDA-300NA Compressed Air Dryer provides ultra-dry, purified compressed air for analytical instruments. The dryer reduces the dewpoint to  $-100^{\circ}\text{F}$  ( $-73^{\circ}\text{C}$ ) without operator attention. It comes complete with a high efficiency prefiltration system, automatic drains, a  $0.01\text{ }\mu\text{m}$  final filter, a moisture indicator, and pretested controls.

- Reduces the dewpoint of compressed air to  $-100^{\circ}\text{F}$
- Compact design frees up floor space
- Low dewpoint instrument air to protect analytical instruments

### Air Dryer Selection Chart

Flow Capacity	Model
Compressed Air Dryers	
283 lpm	UDA-300NA
Membrane Air Dryers	
71 lpm	64-01
142 lpm	64-02
708 lpm	64-10

### Applications | Compressed Air Dryers

- NMR Spectrometers
- AA Spectrophotometers
- Electron microscopes
- Thermal analyzers
- Mask aligners
- Solvent evaporators
- Any analytical instrument requiring moisture-free and particle-free air





## Membrane Air Dryers 64-01, 02, & 03

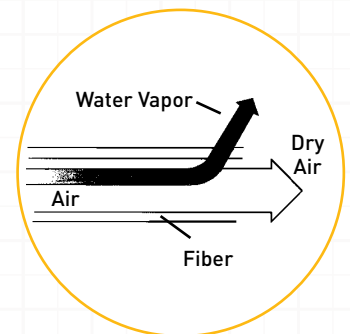
The Parker 64-01, 64-02, and 64-10 Membrane Air Dryers will supply oil and particulate-free dry compressed air to dewpoints as low as -40°F, and at flow rates of up to 25 SCFM.

- Dry air for hazardous areas
- No electricity required - low operating costs
- No refrigerants or freons - environmentally sound
- Explosion proof
- No moving parts or motors - silent operation

The membrane air dryers are engineered for easy installation, operation, and long term reliability. They incorporate the highest efficiency membrane available, offering low cost operation and minimal maintenance. The dryers are lightweight, compact, can be easily installed on an existing air line and require no electrical connections, making them ideal for remote and point-of-use installations or those in hazardous areas.

If oxygen is not a concern, the air dryer is ideal for all laboratory applications requiring ultra-dry, purified compressed gas.

Water vapor quickly permeates the membrane, and is released harmlessly to atmosphere. Air flows along the membrane fiber as a separate product stream.





## FID Gas Stations

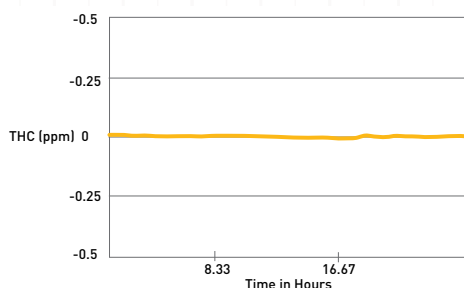
### FID-1000 & -2500



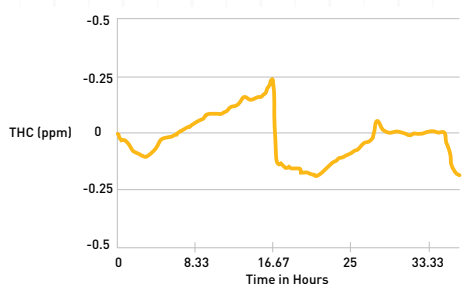
#### Gas Station Selection Chart

# of FIDs	Model
Up to 2 FIDs	FID-1000
Up to 6 FIDs	FID-2500

#### Baseline FID-2500



#### Baseline Bottled Air



Parker FID Gas Stations can provide both 99.9995% pure hydrogen gas and zero grade air to FID detectors on gas chromatographs. These systems are specifically designed to provide fuel gas and support air for up to 6 FIDs, flame photometric detectors, or total hydrocarbon analyzers.

- Produces UHP Zero Air from house compressed air (<0.05 ppm THC) and 99.9995% pure hydrogen in one enclosure
- Increases the accuracy of analysis and reduces the cleaning requirement of the detector
- Recommended by many GC and column manufacturers
- Payback period of typically less than one year
- Automatic water fill as standard
- Silent operation
- Minimal operator attention required

Hydrogen gas is produced from deionized water using a Proton Exchange Membrane Cell. The hydrogen generator compartment utilizes the principle of electrolytic dissociation of water and hydrogen proton conduction through the membrane. The hydrogen supply produces up to 250 cc/min of 99.9995% pure hydrogen with pressures up to 60 psig. Zero air is produced by purifying on-site compressed air to a total hydrocarbon concentration of less than 0.05 ppm (measured as methane). The zero air supply is up to 2500 cc/min of zero grade air.

All Parker gas generators meet NFPA 50A and OSHA 1910.103 regulations governing the storage of hydrogen.

Produced and supported by an ISO 9001 registered organization, Parker's FID Gas Stations are the first built to meet the toughest laboratory standards in the world: CSA, UL, CE, and IEC 1010.





## Parker also offers Gas Generators for these Applications

### Products for LC-MS & Evaporation

- High purity nitrogen for LCMS instruments and solvent evaporation
- Tri-gas units available for instruments that require nitrogen, dry air, and zero grade air
- Produce a continuous supply of high purity nitrogen from an existing compressed air supply
- Integrated compressor systems eliminate the need for house air
- Systems available to support one or dozens of instruments

### Products for Spectroscopy

- Remove water and CO<sub>2</sub> from compressed air
- Protect expensive optics from damage from water vapor
- Increase Signal to Noise Ratio and maximize instrument sensitivity
- Ultra dry air for NMR injecting, spinning, and ejecting samples

### Products for Ultra Dry Air

- Gas generators for dilution and calibration of Emissions Analyzers
- Exceed instrument manufacturer specifications
- Nitrogen and specialty blend gasses available

### Products for Chromatography

- Hydrogen, Zero Air, and UHP Nitrogen Generators for gas chromatography
- Combination systems available to provide multiple gasses from one unit
- Highest purities available from any supplier

### Analytical Gas Supplies

- Installation kits, compressors, purifiers, flow-meters, regulators, and all the materials needed to equip your lab
- High quality components, designed specifically for use with Parker gas generators, to deliver high purity gas to your instruments

### Products for TOC Analysis

- Generate gasses for all combustion, UV persulfate, and wet oxidation techniques
- Ensures consistent, reliable, instrument operation and reduces instrument service and maintenance costs

# Recommended Gas Generators for Analytical Instruments

Instrument	Gas Requirements	Gas Purity Requirements	Flow Rates	Generator Recommendation/Model
Atomic Absorption (AA) with Flame	Air for Oxidant Gas	Clean, dry	1-7 SCFM	<b>AA Gas Purifier Model 73-100</b>
Atomic Thermal Desorber	Zero Air Hydrogen for FID Fuel	Clean, dry, hydrocarbon-free Clean, dry, high purity	Up to 1600 ml/min.	<b>Zero Air or TOC Gas Generator</b> HPZA-3500 or TOC-1250
Atmospheric Pressure Ionization (API-MS)	Air for nebulizer gas, nitrogen for curtain, sheath, and shield gas	Clean, dry, hydrocarbon-free 99% or higher (Nitrogen or Zero Air)	20-67 lpm	<b>Nitrogen Generator</b> N2-14, N2-22, N2-35, N2-45, N2-80, N2-135, N2-200, NitroflowLab, Nitroflow60, NitroflowTG1, NitroflowTG2, 76-98-N100, 76-98-N200, 76080
Autosamplers for Various Instruments	Air for pneumatic controls, nitrogen for sample injector	Clean, dry Ultra high purity	<1 SCFM <550 cc/min	<b>Membrane Air Dryer 64-02</b> <b>UHP Nitrogen Generator UHPN2-1100</b>
CO <sub>2</sub> Analyzers	Calibration Air	CO <sub>2</sub> free	0.5-1.0 SLPM	<b>FT-IR Purge Gas Generator</b> Spectra15, Spectra30
Continuous Emissions Monitoring (CEM)	Calibration Air Dilution Air	Dry, CO <sub>2</sub> , SO <sub>2</sub> , NO <sub>x</sub> , Hydrocarbon-free	10-15 SLPM	<b>CEM Zero Air Generator 75-45-M744</b>
Emissions Analyzers	Zero Air	Hydrocarbon-free	2-15 SLPM	<b>Zero Air Generator HPZA-18000</b>
Fourier Transform Infrared Spectrometer (FT-IR)	Air for sample compartment, optics, and/or air-bearing	Clean, dry, CO <sub>2</sub> -free	0.5-3 SCFM	<b>FT-IR Purge Gas Generator</b> Spectra15, Spectra30 <b>Lab Gas Generator 74-5041NA</b>
Gas Chromatograph (GC) GC-FID	Zero air as flame support air Hydrogen as flame fuel gas Hydrogen as capillary carrier gas Nitrogen as packed carrier gas Nitrogen as make up gas	Clean, hydrocarbon-free Ultra high purity Ultra high purity Ultra high purity, zero grade Ultra high purity, zero grade	150-600 cc/min. 30-40 cc/min. Varies Varies <100 cc/min	<b>Zero Air Generator HPZA-3500</b> <b>Hydrogen Generator H2PEM-260</b> <b>Hydrogen Generator H2PD-300</b> <b>UHP Nitrogen Generator UHPN2-1100</b> <b>UHP Nitrogen Generator UHPN2-1100</b>
GC-FPD	Zero Air as Flame Support Air Hydrogen as Flame Fuel Gas Hydrogen as Capillary Carrier Gas Nitrogen as Packed Carrier Gas	Clean, hydrocarbon-free Ultra high purity Ultra high purity Ultra high purity	<200 cc/min 50-70 cc/min Varies Varies	<b>Zero Air Generator HPZA-3500</b> <b>Hydrogen Generator H2PEM-260</b> <b>Hydrogen Generator H2-1200</b> <b>UHP Nitrogen Generator UHPN2-1100</b>
GC-NPD	Zero Air to Rubidium/Thermonic Bead Hydrogen as Detector Support Gas Hydrogen as Capillary Carrier Gas Nitrogen as Packed Carrier Gas	Dry, clean, hydrocarbon-free Ultra high purity Ultra high purity Ultra high purity	<200 cc/min <10 cc/min Varies Varies	<b>Zero Air Generator HPZA-3500</b> <b>Hydrogen Generator H2PEM-100</b> <b>Hydrogen Generator (Palladium) H2PD-300</b> <b>UHP Nitrogen Generator UHPN2-1100</b>

## Legal Notifications



### WARNING

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE. This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application and review the information concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met. The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

Instrument	Gas Requirements	Gas Purity Requirements	Flow Rates	Generator Recommendation/Model
GC-TCD	Hydrogen as carrier & reference gas	Ultra high purity	Varies	<b>Hydrogen generator</b> H2PD-300
LC-MS	Nitrogen as a curtain gas	LC-MS Grade	3-30 lmp	<b>Nitrogen generator</b> N2-14, NitroFlowLab, NitroFlow60, N2-35
ICP Spectrometer	Nitrogen as Optic/Camera Purge	Ultra high Purity	<1-5 lmp	<b>Nitrogen generator</b> 76-98NA
Nuclear Magnetic Resonance (NMR)	Air for lifting, spinning	Clean, dry	<10 SCFM	<b>Air dryer</b> UDA-300NA <b>Lab gas generator</b> 74-5041NA
Ozone generator	Supply air	Clean, dry	.3-20 SCFM	<b>Air dryer</b> 64-01, 64-02, 64-10, UDA-300NA
Protein analyzer	Dry air, nitrogen	Clean, dry	Up to 5 SCFM	<b>Nitrogen generator</b> N2-14, N2-22, NitroFlowLab, N2-35
Solvent evaporators (sample concentrators)	Nitrogen	Clean, dry nitrogen	2-15 SLPM	<b>Zero Air Generator</b> Nitrovap-1LV, Nitrovap-2LV
Stack gas sampler	Dilution air	Clean, dry	<1.0 SCFM	<b>CEM zero air generator</b> (75-45-M744)
Total oxygen demand (TOD)	Nitrogen as a carrier gas	Ultra high purity	300 cc/min	<b>Nitrogen Generator</b> UHPN2-1100
Thermal gravimetric analyzer (TGA)	Nitrogen as furnace purge	Clean, dry, inert	<100 cc/min	<b>Zero Air Generator</b> HPZA-3500 <b>Hydrogen Generator</b> H2PEM-260 <b>Hydrogen Generator</b> H2PEMPD-1300-100 <b>UHP Nitrogen Generator</b> UHPN2-1100
Differential scanning calorimeter (DSC)	Air for air shield	Clean, dry	<100 cc/min	<b>Dry Air Generator</b> 64-01, UDA-300
Total hydration analyzer (THA)	Zero Air for FID Hydrogen as flame fuel gas	Clear, hydrocarbon free Ultra high purity	50-500 cc/min 5-50 cc/min	<b>Zero Air Generator</b> 75-82S, 75-83NA <b>Hydrogen Generator</b> H2PEM-100
Total organic carbon analyzer (TOC)	Dry air or nitrogen for carrier gas Combustion gas	Clean, dry, hydrocarbon-free, CO <sub>2</sub> Free, Ultra high purity	100-500 SLPM 50-700 cc/min	<b>TOC gas generator</b> TOC-625, TOC-1250 <b>UHP Nitrogen Generator</b> UHPN2-1100



# Worldwide Filtration Manufacturing Locations

## North America

### Compressed Air Treatment

#### Industrial Gas Filtration and Generation Division

Lancaster, NY  
716 686 6400  
[www.parker.com/igfg](http://www.parker.com/igfg)

Haverhill, MA  
978 858 0505  
[www.parker.com/igfg](http://www.parker.com/igfg)

### Engine Filtration

#### Racor

Modesto, CA  
209 521 7860  
[www.parker.com/racor](http://www.parker.com/racor)

Holly Springs, MS  
662 252 2656  
[www.parker.com/racor](http://www.parker.com/racor)

### Hydraulic Filtration

#### Hydraulic & Fuel Filtration

Metamora, OH  
419 644 4311  
[www.parker.com/hydraulicfilter](http://www.parker.com/hydraulicfilter)

Laval, QC Canada  
450 629 9594  
[www.parkerfarr.com](http://www.parkerfarr.com)

Velcon  
Colorado Springs, CO  
719 531 5855  
[www.velcon.com](http://www.velcon.com)

### Process Filtration

#### domnick hunter Process Filtration SciLog

Oxnard, CA  
805 604 3400  
[www.parker.com/processfiltration](http://www.parker.com/processfiltration)

### Water Purification

#### Village Marine, Sea Recovery, Horizon Reverse Osmosis

Carson, CA  
310 637 3400  
[www.parker.com/watermakers](http://www.parker.com/watermakers)

## Europe

### Compressed Air Treatment

#### domnick hunter Filtration & Separation

Gateshead, England  
+44 (0) 191 402 9000  
[www.parker.com/dhfn](http://www.parker.com/dhfn)

#### Parker Gas Separations

Etten-Leur, Netherlands  
+31 76 508 5300  
[www.parker.com/dhfn](http://www.parker.com/dhfn)

#### Hiross Zander

Essen, Germany  
+49 2054 9340  
[www.parker.com/hzfd](http://www.parker.com/hzfd)

Padova, Italy  
+39 049 9712 111  
[www.parker.com/hzfd](http://www.parker.com/hzfd)

### Engine Filtration & Water Purification

#### Racor

Dewsbury, England  
+44 (0) 1924 487 000  
[www.parker.com/rfde](http://www.parker.com/rfde)

#### Racor Research & Development

Stuttgart, Germany  
+49 (0)711 7071 290-10

### Hydraulic Filtration

#### Hydraulic Filter

Arnhem, Holland  
+31 26 3760376  
[www.parker.com/hfde](http://www.parker.com/hfde)

Urdala, Finland  
+358 20 753 2500

#### Condition Monitoring Parker Kittiwake

West Sussex, England  
+44 (0) 1903 731 470  
[www.kittiwake.com](http://www.kittiwake.com)

### Process Filtration

#### domnick hunter Process Filtration Parker Twin Filter BV

Birtley, England  
+44 (0) 191 410 5121  
[www.parker.com/processfiltration](http://www.parker.com/processfiltration)

## Asia Pacific

### Australia

Castle Hill, Australia  
+61 2 9634 7777  
[www.parker.com/australia](http://www.parker.com/australia)

### China

Shanghai, China  
+86 21 5031 2525  
[www.parker.com/china](http://www.parker.com/china)

### India

Chennai, India  
+91 22 4391 0700  
[www.parker.com/india](http://www.parker.com/india)

### Parker Fowler

Bangalore, India  
+91 80 2783 6794  
[www.johnfowlerindia.com](http://www.johnfowlerindia.com)

### Japan

Tokyo, Japan  
+81 45 870 1522  
[www.parker.com/japan](http://www.parker.com/japan)

### Korea

Hwaseon-City  
+82 31 359 0852  
[www.parker.com/korea](http://www.parker.com/korea)

### Singapore

Jurong Town, Singapore  
+65 6887 6300  
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### Thailand

Bangkok, Thailand  
+66 2186 7000  
[www.parker.com/thailand](http://www.parker.com/thailand)

## Latin America

### Parker Comercio Ltda.

Filtration Division  
Sao Paulo, Brazil  
+55 12 4009 3500  
[www.parker.com/br](http://www.parker.com/br)

### Pan American Division

Miami, FL  
305 470 8800  
[www.parker.com/panam](http://www.parker.com/panam)

## Africa

Aeroporto Kempton Park, South Africa  
+27 11 9610700  
[www.parker.com/africa](http://www.parker.com/africa)



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