

## VWR ANALYTICAL GAS GENERATORS FOR CHROMATOGRAPHY APPLICATIONS

Convenient

Safe

Cost Effective



# VWR LABORATORY GAS GENERATORS

## Improve Laboratory Operations with the VWR Laboratory Gas Generators

With the new laboratory gas generators from VWR, you can reduce your need for compressed cylinder gases in your laboratory. VWR gas generators replace the high pressure cylinders, giving you a safer laboratory for your employees. Additionally, a laboratory gas generator reduces cost and provides you with a reliable on-demand source of gases you need to run an efficient laboratory.



### BENEFITS FOR THE MODERN LAB

#### Safety

- Eliminate high pressure cylinders
- Only small volumes of gas stored
- No more moving un-safe gas cylinders in the laboratory

#### Convenience

- Use your time on experiments, and not moving cylinders
- No worries about running out of needed gas
- Reduces purchasing time
- Small compact systems

#### Cost Savings

- Most gas generators have a payback of less than one year
- Eliminate monthly charges
- Eliminate transportation costs
- Improves lab efficiency

#### Reliability

- Certified for laboratory use by CSA, UL, IEC, and CE
- On demand gas source
- Consistent purity

### APPLICATIONS

#### Gas Chromatography

- GC-FID
- GC-FPD
- GC-NPD
- GC-ECD

#### LC/MS

- Solvent evaporators
- Clean instrument air
- API-MS







## Products for Chromatography

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## Hydrogen Generators for Fuel Gas

VWR's fuel gas hydrogen generators utilize proton exchange membrane, which eliminates the use of liquid electrolytes with hydrogen generators.

Proven in over 40,000 GC installations worldwide. VWR's generators are the most reliable hydrogen generators on the market. Maintenance requires only a few moments per year—no inconvenient, extended downtime. Simply change the filters every six months and the desiccant cartridge whenever it turns dark brown.

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

Automatic water filling is available for all fuel gas hydrogen generators. Simply connect your in-house supply of deionized water to the nitrogen generator for virtually hands-free operation.

With an output capacity of up to 510 cc/minute, one generator can supply 99.9995% pure hydrogen for up to several FID's. Based on cylinder gas savings alone, a VWR hydrogen generator pays for itself in less than a year.

All VWR hydrogen generators meet NFPA requirements and OSHA 1910.103 regulations governing the storage of hydrogen.

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



**2 Year Cell Warranty !**





### Features and Benefits

- Ideal for fuel gas for up to 14 FID's
- Eliminates dangerous and expensive hydrogen gas cylinders from the laboratory
- Exclusive water management system and control circuitry maximize uptime
- Unique display lighting changes color for easy status checks and water level indication
- Remote control and remote monitoring capable by adding USB options bay controller
- Compact and reliable — only one square foot of bench space required
- No liquid caustics required

### Principal Specifications

Cat. No.	97001-250	97001-252	97001-254	97001-256
Purity	99.9995%	99.9995%	99.9995%	99.9995%
Flow Rates	100 cc/min	165 cc/min	260 cc/min	510 cc/min
Outlet Port	1/8" compression	1/8" compression	1/8" compression	1/8" compression
Delivery Pressure	5-100 psig ± 0.5 psig	5-100 psig ± 0.5 psig	5-100 psig ± 0.5 psig	5-100 psig ± 0.5 psig
Electrical	100 Vac/230 Vac	100 Vac/230	Vac 100 Vac/230 Vac	100 Vac/230 Vac
Dimensions	33W x 38.1D x 35.6H cm (13 x 15 x 14")	33W x 38.1D x 35.6H cm (13 x 15 x 14")	33W x 38.1D x 35.6H cm (13 x 15 x 14")	33W x 38.1D x 35.6H cm (13 x 15 x 14")
Shipping Weight	27 kg (59 lbs.) Dry	27 kg (59 lbs.) Dry	27 kg (59 lbs.) Dry	27 kg (59 lbs.) Dry

### Ordering Information

Description	Cat. No.	Cat. No.	Cat. No.	Cat. No.
Hydrogen Gas Generator	97001-250	97001-252	97001-254	97001-256
Desiccant Cartridge (1 each)	82031-468	82031-468	82031-468	82031-468
6-Month Service Kit	97034-222	97034-222	97034-222	97034-222
24-Month Service Kit	89497-502	89497-502	89497-502	89497-502
Preventive Maintenance Plan	89497-504	89497-506	89497-508	89497-510
Installation Service	89497-512	89497-514	89497-516	89497-518

## Hydrogen Generators for Fuel and Carrier Gas

The VWR UHP Hydrogen Generator is an excellent source of ultra pure, dry hydrogen for a wide range of laboratory uses.

The generator is used extensively with Gas Chromatographs, as a fuel gas for Flame Ionization Detectors (FID), as a reaction gas for Hall Detectors, and as a carrier gas to ensure absolute repeatability of retention times.

In high sensitivity Trace Hydrocarbon Analyzers and air pollution monitors, the hydrogen produced ensures the lowest possible background noise. Other applications include using hydrogen for hydrogenation reactions and for FID's used in the analysis of engine gas emissions in the automobile industry. In all applications the VWR Hydrogen Generator sets the standard for safety, operational performance, and dependability.

VWR Hydrogen Generators eliminate the need for expensive, dangerous, high pressure cylinders of hydrogen in the laboratory. It is no longer necessary to interrupt important analysis to change cylinders. Generator flow capacities of up to 300 cc/min. of ultra high purity hydrogen are available.

VWR Hydrogen Generators are compact benchtop units designed for use in the laboratory or in the field. Hydrogen gas is produced by electrolytic dissociation of water.

The resultant hydrogen stream then passes through a palladium membrane to assure carrier grade purity. 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 guaranteed purity two orders of magnitude greater than desiccant or silica gel technologies.

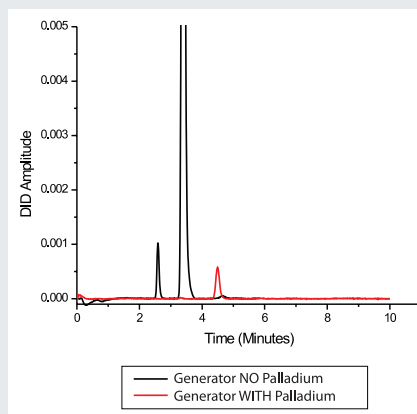
VWR Hydrogen Generators offer many special features to ensure safe and convenient operation. These features include smart-display technology system status at a glance and automatic water fill for endless operation.



### Simple Experimental Results:

The two merged baselines in the right chromatogram were created using a Gow-Mac Gas Chromatograph Series 590 equipped with a (DID) discharge ionization detector with hydrogen separator. In creating both baselines (black and red) the gas sample is hydrogen from a hydrogen generator. Both generators produce hydrogen gas in the same way, but differ slightly as one generator incorporates a desiccant drying tube as a final purifier while the second generator has a palladium membrane as the final purifier.

The large black peak represents a combined 12ppm concentration of oxygen and nitrogen, suitable for hydrogen fuel gas while the corresponding point in the red baseline represents a combined 12ppb concentration of oxygen and nitrogen, suitable for either fuel or carrier gas.







### Features and Benefits

- Eliminates dangerous and expensive hydrogen gas cylinders from the laboratory
- Exceeds OSHA 1910.103 and NFPA 50A safety guidelines
- Produces only as much gas as you need
- Produces a continuous supply of 99.99999+% pure hydrogen gas without snap-on downstream purifiers
- Compact and reliable — only one square foot of bench space required and designed to run continuously 24 hours/day
- Includes automatic water fill
- Unique (NM) no maintenance palladium membrane prevents baseline drift unlike auto-drying technologies
- Certified for laboratory use by CSA, UL, IEC 1010, and CE Mark

### Principal Specifications

	89209-862	89209-864
<b>Cat. No.</b>	89209-862	89209-864
<b>Purity</b>	99.99999+%	99.99999+%
<b>Oxygen Content</b>	< .01 ppm	< .01 ppm
<b>Moisture Content</b>	< 1.0 ppm	< 1.0 ppm
<b>Max Hydrogen Flow Rate</b>	150 cc/min	300 cc/min
<b>Outlet Port</b>	1/8" Compression	1/8" Compression
<b>Hydrogen Outlet Pressure</b>	Adjustable, 0 to 60 psig	Adjustable, 0 to 60 psig
<b>Certifications</b>	IEC 1010-1; CSA; UL 3101; CE Mark	IEC 1010-1; CSA; UL 3101; CE Mark
<b>Electrical Requirements</b>	120 VAC/60 Hz, 3.15 amps	120 VAC/60 Hz, 3.15 amps
<b>Dimensions</b>	30W x 33D x 58H cm (12 x 12 x 22")	30W x 33D x 58H cm (12 x 12 x 22")
<b>Shipping Weight</b>	26 kg (58 lbs.)	26 kg (58 lbs.)

### Ordering Information

Description	Cat. No.	Cat. No.
<b>Hydrogen Gas Generator</b>	89209-862	89209-864
<b>Electrolyte Solution (*)</b>	89497-520	89497-520
<b>Installation Kit</b>	89497-522	89497-522
<b>Preventive Maintenance Plan</b>	89497-524	89497-526
<b>Extended Support (24-Month Warranty)</b>	89497-528	89497-530

(\*) Not required for generators ordered after 2015.

## Hydrogen Generators for Fuel and Carrier Gas

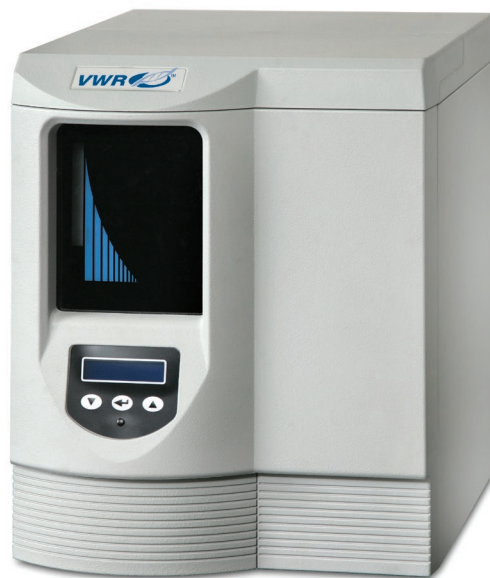
The VWR UHP Series of Hydrogen Generators are an excellent source of ultra pure, dry hydrogen for a wide range of laboratory uses. The generator is used extensively with Gas Chromatographs, as a fuel gas for Flame Ionization Detectors (FID), as a reaction gas for Hall Detectors, and as a carrier gas to ensure absolute repeatability of retention times. In high sensitivity trace hydrocarbon analyzers and air pollution monitors, the hydrogen produced ensures the lowest possible background noise.

Other applications include using hydrogen for hydrogenation reactions and for FIDs used in the analysis of engine gas emissions in the automobile industry.

With an output capacity of up to 1,300 cc/minute, one generator can supply 99.99999+% pure carrier gas at up to 100 psig to multiple GCs, and fuel gas up to 45 FIDs. The VWR UHP series of Hydrogen generators use a Proton Exchange Membrane (PEM) to produce hydrogen on demand. Each generator incorporates a maintenance free palladium purifier module to remove oxygen down to <0.01ppm and moisture down to <1.0ppm. Only 100mL of hydrogen gas is stored in the system at any time. Based on cylinder gas savings alone, a VWR generator pays for itself in less than one year.

The VWR series of hydrogen generators incorporate breakthrough software and microprocessor controls to provide many new features. Up to 32 hydrogen generators can be connected together using VWRs' cascading, load balancing software to supply gas to a large gas delivery system. Built in remote monitoring capability enables users to view system performance from a PC; multiple systems can be monitored at one time. Data logging of gas generator performance is incorporated into the VWR series for use in regulated environments where system validation may be required.

VWR 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). VWR hydrogen generators are certified for laboratory use by CSA, IEC 1010, and CE. Proven in over 40,000 GC installations worldwide, VWR generators are the most reliable hydrogen generators on the market. Maintenance requires only a few moments per year with no inconvenient, extended downtime. Simply change the deionizer cartridge every six months. In all applications the Parker Balston Hydrogen Generator sets the standard for safety, operational performance, and dependability.

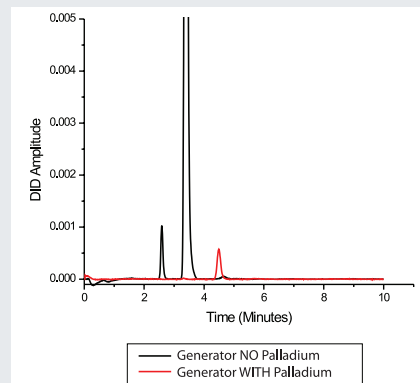


**3 Year Cell Warranty !**

### Simple Experimental Results:

The two merged baselines in the right chromatogram were created using a Gow-Mac Gas Chromatograph Series 590 equipped with a (DID) discharge ionization detector with hydrogen separator. In creating both baselines (black and red) the gas sample is hydrogen from a hydrogen generator. Both generators produce hydrogen gas the same way, but differ slightly as one generator incorporates a desiccant drying tube as a final purifier while the second generator has a palladium membrane as the final purifier.

The large black peak represents a combined 12ppm concentration of oxygen and nitrogen, suitable for hydrogen fuel gas while the corresponding point in the red baseline represents a combined 12ppb concentration of oxygen and nitrogen, suitable for either fuel or carrier gas.







### Features and Benefits

- Flow capacity up to 1,300 cc/min
- Delivery pressure of up to 100 PSIG; ideal for high speed and fast GC applications
- Eliminates dangerous and expensive helium and hydrogen gas cylinders
- Produces only as much gas as you need
- Produces a continuous supply of 99.99999+% pure hydrogen gas; palladium membrane prevents baseline drift, unlike auto-drying technologies
- Compact and reliable — only one square foot of bench space required
- Automatic water feed for continuous operation, 24/7
- Balancing feature enables users to connect as many as 32 hydrogen generators together to supply a large number of instruments
- Remote PC monitoring features
- Advanced PEM electrochemical cell protection system with microprocessor controls
- Simple maintenance, without snap-on downstream purifiers
- Certified for laboratory use by CSA, IEC 1010, and CE Mark

### Principal Specifications

	89497-446	89497-450	89497-454	89497-458	89497-462
Hydrogen Generators	89497-446	89497-450	89497-454	89497-458	89497-462
Hydrogen Purity	99.99999+%	99.99999+%	99.99999+%	99.99999+%	99.99999+%
Oxygen Content	< 0.01 ppm	< 0.01 ppm	< 0.01 ppm	< 0.01 ppm	< 0.01 ppm
Moisture Content	< 1 ppm	< 1 ppm	< 1 ppm	< 1 ppm	< 1 ppm
Max Hydrogen Flow Rate	510 cc/min	650 cc/min	850 cc/min	1100 cc/min	1300 cc/min
Outlet Port	1/4" Compression	1/4" Compression	1/4" Compression	1/4" Compression	1/4" Compression
Outlet Pressure	100 or 175 psig (6.8 or 11.9 bar)	100 or 175 psig (6.8 or 11.9 bar)	100 or 175 psig (6.8 or 11.9 bar)	100 or 175 psig (6.8 or 11.9 bar)	100 or 175 psig (6.8 or 11.9 bar)
Electrical Requirements	100 to 230 VAC, 50/60Hz	100 to 230 VAC, 50/60Hz	100 to 230 VAC, 50/60Hz	100 to 230 VAC, 50/60Hz	100 to 230 VAC, 50/60Hz
Dimensions	34.2W x 53.3D x 43H cm (13 1/2 x 21 x 17")				
Shipping Weight	27.4 kg (60 lbs) for all models				

### Ordering Information

Description	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
Hydrogen Generator w/ output pressure up to 100 psig	89497-446	89497-450	89497-454	89497-458	89497-462
Annual Preventive Maintenance	89497-466	89497-468	89497-470	89497-472	89497-474

## Zero Air Generators

VWR Zero Air Generators are systems manufactured with state-of-the-art, highly reliable components engineered for easy installation, operation, and long term performance. VWR Zero Air Generators are much easier to install than dangerous, high pressure gas cylinders, and only need to be installed once! All that is required is a standard compressed air line and an electrical outlet.

VWR Zero Air Generators are easy to operate, there is no complicated operating procedure to learn or any labor intensive monitoring required.

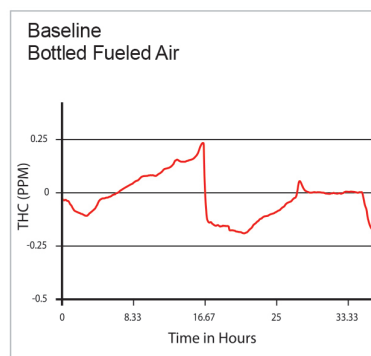
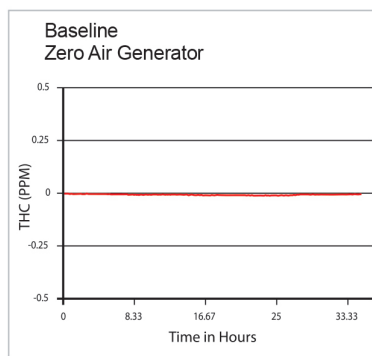
VWR Zero Air Generators eliminate all the inconveniences and costs of cylinder gas supplies and dependence on outside vendors. Uncontrollable vendor price increases, contract negotiations, long term commitments, and tank rentals are no longer a concern; VWR Zero Air Generators offer long term cost stability.

There is no need to use valuable laboratory floor space to store excessive reserves to protect yourself from late deliveries, transportation interruptions, or periods of tight supplies. With a VWR Zero Air Generator, you control your supply.



### Simple Experimental Results:

The Chromatograms (left) compare baselines produced by a VWR Zero Air Generator and bottled fuel air. The baseline produced by the VWR 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 -0.25ppm to 0.25ppm.







### Features and Benefits

- Produce UHP Zero Air from house compressed air (<0.05 ppm THC)
- Eliminate inconvenient and dangerous zero air cylinders from the laboratory
- 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

### Number of FIDs\*

Description	Cat. No.
Up to 2	89237-564
Up to 8	89234-566
Up to 16	26000-024
Up to 40	26000-026
Up to 66	26000-028

\*Based on a 450 ccm fuel air rate

### Principal Specifications

Cat. No.	89237-564	89237-566	26000-024	26000-026	26000-028
Max Zero Air Flow Rate	1 lpm	3.5 lpm	7 lpm	18 lpm	30 lpm
Outlet Hydrocarbon Concentration (as methane)	< 0.1 ppm	< 0.05 ppm	< 0.05 ppm	< 0.05 ppm	< 0.1 ppm
Min/Max Inlet Air Pressure	40 psig/125 psig	40 psig/125 psig	40 psig/125 psig	40 psig/125 psig	40 psig/125 psig
Max Inlet Hydrocarbon Concentration (as methane)	100 ppm	100 ppm	100 ppm	100 ppm	100 ppm
Pressure Drop at Max Flow Rate	4 psig	4 psig	4 psig	4 psig	4 psig
Max Inlet Air Temperature	78 °F (25 °C)	78 °F (25 °C)	78 °F (25 °C)	78 °F (25 °C)	78 °F (25 °C)
Inlet/Outlet Ports	1/4" NPT (female)	1/4" NPT (female)	1/4" NPT (female)	1/4" NPT (female)	1/4" NPT (female)
Electrical Requirements	120 VAC, 0.5 amp	120 VAC, 2.0 amp	120 VAC, 2.0 amp	120 VAC, 4.0 amp	120 VAC, 4.0 amp
Dimensions	25.4W x 7.6D x 30.5H cm (10 x 3 x 12")	28W x 33D x 40.6H cm (11 x 13 x 16")	28W x 33D x 40.6H cm (11 x 13 x 16")	28W x 33D x 40.6H cm (11 x 13 x 16")	28W x 33D x 40.6H cm (11 x 13 x 16")
Shipping Weight	3 kg (7 lbs.)	19 kg (41 lbs.)	19 kg (41 lbs.)	19 kg (41 lbs.)	19 kg (41 lbs.)

### Ordering Information

Description	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
Zero Air Generator	89237-564	89237-566	26000-024	26000-026	26000-028
Maintenance Kit	89237-568	82031-472	82031-472	82031-472	82031-472
Installation Kit for All Models	82031-484	82031-484	82031-484	82031-484	82031-484
Preventive Maintenance Plan	89497-544	89497-546	89497-548	89497-550	89497-552
Extended Support (24-Month Warranty)	89497-554	89497-556	89497-558	89497-560	89497-562

## FID Gas Stations

VWR FID Gas Stations provide both hydrogen gas and zero grade air to FID detectors on Gas Chromatographs. These systems are specifically designed to provide fuel gas and support air to 10-11 Flame Ionization Detectors, Flame Photometric Detectors, or Total Hydrocarbon Analyzers.

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 500 cc/min of 99.9995% pure hydrogen with pressures to 60 psig.

Zero air is produced by purifying on-site compressed air to a total hydrocarbon concentration of < 0.1ppm (measured as methane). The zero air compartment produces up to 3500 cc/min of Zero Grade Air. The FID Gas Stations are state-of-the-art systems with highly reliable components engineered for easy installation, operation, and long term performance.

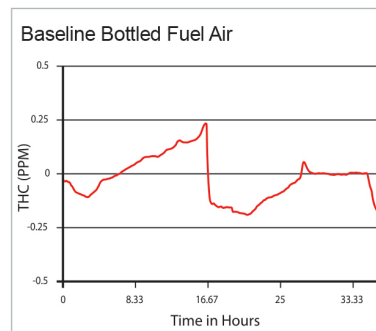
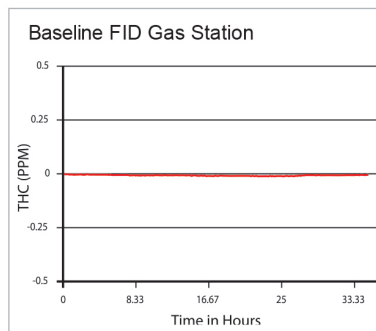
The VWR FID Gas Stations eliminate all the inconveniences and cost of zero air and hydrogen cylinder gas supplies and dependence on outside vendors. Uncontrollable price increases, contract negotiations, long term commitments, and tank rentals are no longer a concern. With an FID Gas Station, you control your gas supply.

All VWR gas generators exceed NFPA 50A and OSHA 1910.103 regulations which outline the storage of hydrogen. Produced and supported by an ISO 9001 registered organization, VWR's hydrogen generators are the first built to meet the toughest laboratory standards in the world: CSA, UL, CE and IEC 1010.

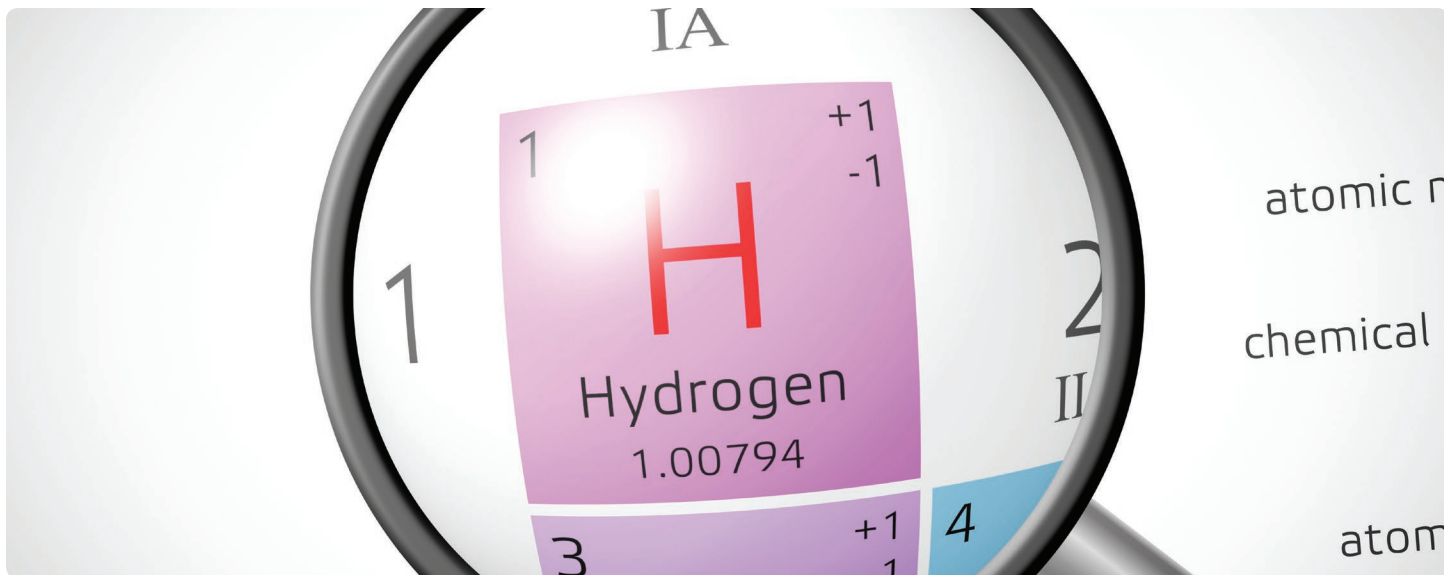


### Simple Experimental Results:

The Chromatograms (at right) compare baselines produced by a VWR Zero Air Generator and bottled fuel air. The baseline produced by the VWR 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 -0.25ppm to 0.25ppm.







### Features and Benefits

- Ideal for up to 10-11 FIDs
- Produces UHP zero air from house compressed air (<0.1 ppm THC) and 99.9995% pure hydrogen in one enclosure
- Eliminates inconvenient and dangerous zero air and hydrogen cylinders from the laboratory
- Increases the accuracy of analysis
- Reduces the cleaning requirement for the detector
- Recommended and used by many GC and column manufacturers
- Typical payback period of less than one year
- Automatic water fill
- Silent operation and minimal operator attention required

### Principal Specifications

Cat. No.	26000-034	26000-036
Hydrogen Purity	99.9995%	99.9995%
Zero Air Purity	< 0.1 ppm (total hydrocarbon as methane)	< 0.05 ppm (total hydrocarbon as methane)
Max. Hydrogen Flow Rate	90 cc/min	250 cc/min
Max. Zero Air Flow Rate	1000 cc/min	2500 cc/min
Inlet Port	1/4" NPT compressed air supply	1/4" NPT compressed air supply
Outlet Ports	1/8" compression	1/8" compression
Hydrogen Outlet Pressure	60 psig	60 psig
Zero Air Outlet Pressure	40-125 psig	40-125 psig
Certifications	IEC 1010-1; CSA 1010; UL 3101; CE Mark	IEC 1010-1; CSA 1010; UL 3101; CE Mark
Electrical Requirements (*)	120VAC, 60Hz, 4 amps	120VAC, 60Hz, 4 amps
Dimensions	26.6W x 43D x 42H cm (10 1/2 x 17 x 16 1/2")	26.6W x 43D x 42H cm (10 1/2 x 17 x 16 1/2")
Shipping Weight	24 kg (53 lbs.)	24 kg (53 lbs.)

### Ordering Information

Description	Cat. No.	Cat. No.
FID Gas Station	26000-034	26000-036
Installation Service	89497-484	89497-486
Annual Maintenance Kit	82031-474	82031-474
Preventive Maintenance Plan	89497-488	89497-490
Extended Support (24-Month Warranty)	89497-492	89497-494

## Nitrogen Generators with Research Grade Purity

The VWR UHPN2 Nitrogen Generator is completely engineered to transform standard compressed air into 99.9999% nitrogen, exceeding the specification of UHP cylinder gas. This system can produce up to 1.1Lpm of UHP nitrogen gas. Nitrogen is produced by utilizing a combination of state-of-the-art purification technologies and high efficiency filtration.

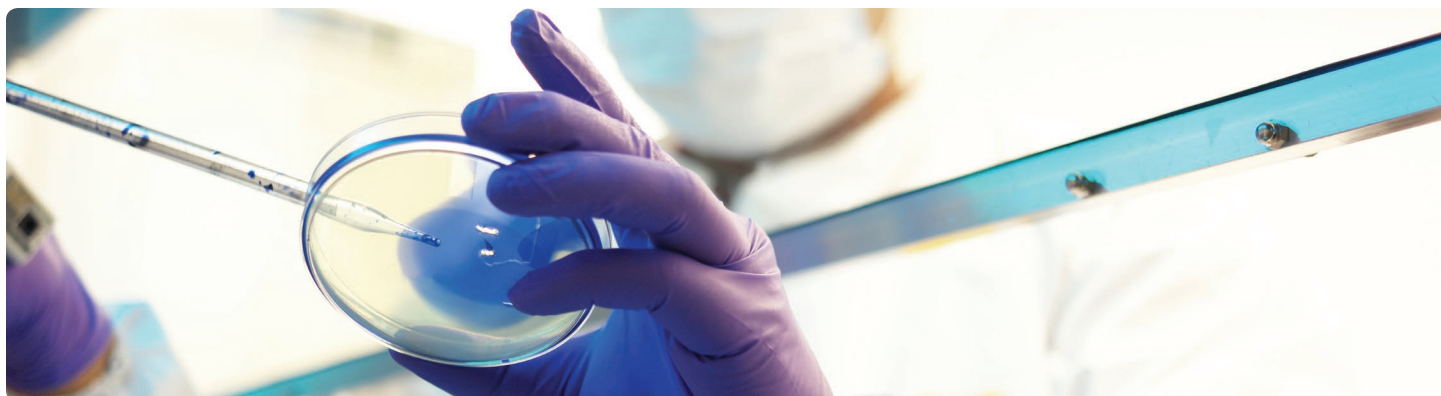
Pressure swing adsorption removes O<sub>2</sub>, CO<sub>2</sub>, and water vapor. A catalyst module is incorporated in the UHPN2 Series to oxidize hydrocarbons from the inlet air supply. High efficiency coalescing prefilters and a 0.01 micron (absolute) membrane filter is also incorporated into the design of the generators.

The VWR UHPN2 Nitrogen Generator is engineered and packaged in a small cabinet to fit on or under any benchtop. The system eliminates the need for costly, inconvenient high pressure nitrogen cylinders.

Typical applications include GC carrier and make-up gas and low flow sample concentrators.







### Features and Benefits

- Produce a continuous supply of high purity nitrogen gas from existing compressed air
- Eliminate the need for costly, dangerous, inconvenient nitrogen cylinders in the laboratory
- Compact design frees up valuable laboratory floor 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 applications and nitrogen makeup gas

### Principal Specifications

Cat. No.	<b>26000-008</b>
Nitrogen Purity	99.9999%
CO Concentration	< 1 ppm
CO <sub>2</sub> Concentration	< 1 ppm
O <sub>2</sub> Concentration	< 1 ppm
H <sub>2</sub> O Concentration	< 1 ppm
Hydrocarbon concentration	< 0.1 ppm
Argon Concentration <sup>(1)</sup>	0.9%
Max. Nitrogen Flow Rate	See Flow Table
Max Air Consumption	42 lpm (1.5 scfm)
Ambient Operating Temperature	60 °F-100 °F (16 °C-38 °C)
Inlet Connection	1/4" NPT (female)
Recommended Inlet Temperature	78 °F (25 °C)
Min/Max Inlet Pressure	60 psig/125 psig
Nitrogen Output Pressure	35 psig/85 psig
Outlet Port	1/8" NPT (female)
Electrical Requirements	120 VAC/60 Hz, 700W
Dimensions	30.5W x 40.6D x 89H cm (12 x 16 x 35")
Shipping Weight	50 kg (137 lbs.)

Notes <sup>1</sup>: Purity specification for Nitrogen does not include Argon concentration.

### Flow table

Inlet Air Pressure (psig)	Max Outlet Flow (cc/min.)	Max Outlet Pressure (psig)
<b>Cat. No. 26000-008</b>		
125	1100	85
110	1000	75
100	900	65
90	800	60
80	700	50
70	600	45
60	500	35

### Ordering Information

Description	Cat. No.
<b>Ultra High Purity Nitrogen Generator</b>	<b>26000-008</b>
Purity Indicator/Scrubber	Contact Your VWR Sales Representative
Optional Prefilter Scrubber Assembly	Contact Your VWR Sales Representative
Pressure Regulator	Contact Your VWR Sales Representative
Maintenance Kit	<b>82031-478</b>
Installation Kit for All Models	<b>82031-486</b>
Preventive Maintenance Plan	<b>89497-566</b>
Extended Support (24-Month Warranty)	<b>89497-572</b>

# LOW AND MID FLOW NITROGEN GENERATORS

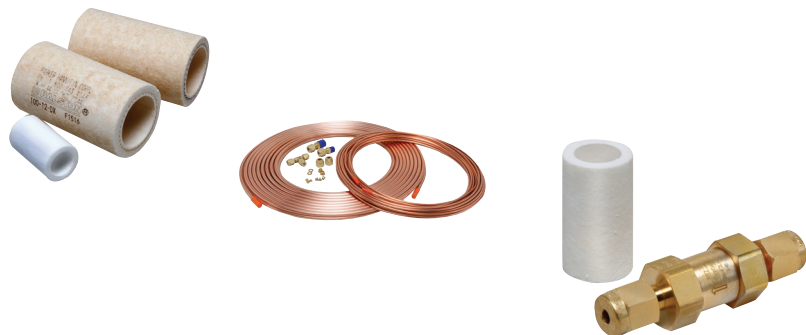
## Low and Mid Flow Nitrogen Generators

VWR Low Flow and Mid Flow Nitrogen Generators produce up to 88 SLPM 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%.

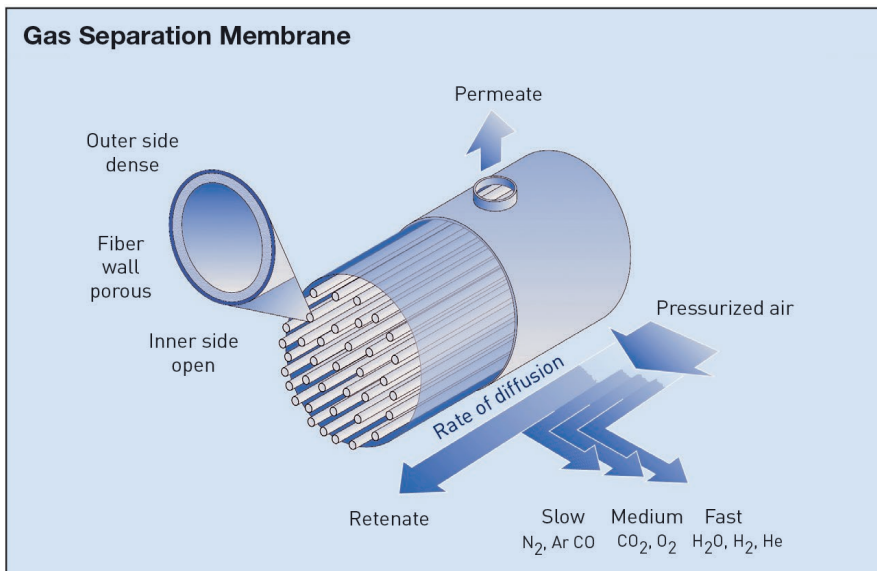
VWR Nitrogen Generators are complete systems engineered to transform standard compressed air into nitrogen at safe, regulated pressures, on demand, without the need for operator attention. The systems eliminate the need for costly, dangerous dewars and cylinders in the laboratory.

Nitrogen is produced by utilizing a combination of filtration and membrane separation technologies. A high efficiency prefiltration system pretreats the compressed air to remove all contaminants down to 0.01 micron. 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.

Typical applications include: LC/MS, nebulizer gas, chemical and solvent evaporation, instrument purge and supply, evaporative light scattering detector use (ELSD), and sparging.



This Technology Features Advanced HiFlux Fiber





## Features and Benefits

- Recommended and used by all major LC/MS manufacturers
- Eliminates the need for costly, dangerous, inconvenient nitrogen cylinders in the laboratory
- Compact design frees up valuable laboratory floor space
- Phthalate-free, no organic vapors
- Unlike PSA technology, membrane will not suppress corona needle discharge

### Nitrogen Purity / Flow Chart

Flow measured in SLPM at indicated Operating Pressure, psig. Flows for Model 26000-014 printed in black, flow for Model 26000-016 in red.

	145	145	145	125	125	110	110	100	100	90	90	80	80	70	70	60	60
99.5	–	–	11	–	10	–	9	–	8	–	7	–	6	–	5	–	4
99	6	18	5	16	5	15	4	13	4	11	3	10	3	8	2	7	
98	11	29	10	25	9	25	8	20	7	18	6	16	5	13	4	11	
97	15	40	13	34	13	33	10	27	9	25	8	21	7	18	6	15	
96	20	50	17	43	16	42	13	34	12	31	10	26	9	22	7	19	
95	24	60	21	52	20	51	17	42	15	37	13	32	11	28	9	24	

### Nitrogen Purity / Flow Chart

Flow measured in SLPM at indicated Operating Pressure, psig. Flows for Model 26000-018 printed in black.

	145	145	125	110	100	90	80	70	60
99.5	19	16	14	13	12	10	9	17	
99	29	25	22	20	18	15	13	11	
98	44	38	34	30	27	24	20	17	
97	59	50	45	40	36	31	26	23	
96	73	63	56	50	45	39	32	27	
95	88	77	69	61	55	48	41	35	

## Principal Specifications

Models	Low and Mid Flow Nitrogen Generators
Nitrogen Purity	95.0% - 99.5%
Atmospheric Dewpoint	-58 °F (-50 °C)
Suspended Liquids	None
Particles > 0.01µm	None
Commercially Sterile	Yes
Phthalate-free	Yes
Hydrocarbon-free	Yes
Min./Max. Operating Pressure	60/ 145 psig
Max. Press. Drop @ 99% N <sub>2</sub> Purity, 125 psig	10 psig
Recommended Ambient Operating Temperature	68 °F (20 °C)
Max. Inlet Air Temperature	110 °F (43 °C)
Inlet/Outlet Ports	1/4" NPT
Dimensions, 26000-014	27W x 34D x 40.6H cm (10 <sup>3</sup> / <sub>4</sub> x 13 <sup>1</sup> / <sub>2</sub> x 16")/ Weight: 19 kg (41 lbs.)
Dimensions, 26000-016, 26000-018	45.7W x 41.1D x 130.8H cm (18 x 16 <sup>1</sup> / <sub>4</sub> x 51 <sup>1</sup> / <sub>2</sub> ")/ Weight: 50 kg (153 lbs.)

## Ordering Information

Description	Cat. No.	Cat. No.	Cat. No.
Nitrogen Generator	26000-014	26000-016	26000-018
Annual Maintenance Kit	82031-472	82031-480	82031-480
Installation Kit	82031-488	82031-488	82031-488
Preventive Maintenance Plan	89497-576	89497-578	89497-580
Extended Support (24-Month Warranty)	89497-582	89497-584	89497-586

## NitroFlow Lab Self-Contained LC/MS Membrane Nitrogen Generators

The VWR LC/MS NitroFlowLab is a self-contained membrane nitrogen generator that produces LC/MS grade nitrogen with output pressure to 116psig. Nitrogen is produced by utilizing a combination of compressors, carefully matched with filtration and membrane separation technology components.

Intake ambient air from the laboratory is filtered using an inlet suction breather filter to remove airborne organic and particulate impurities. This purified air is delivered to a long life low pressure air compressor that provides an air stream to hollow fiber membranes, which subsequently separate the clean air into a concentrated nitrogen retentate and oxygen enriched permeate. The separated air is then cycled through the system. Prior to exiting the system pure nitrogen retentate is delivered to a nitrogen amplification compressor to assure proper pressure flow, and purity to the LC/MS.

The VWR LC/MS NitroFlow Lab will deliver a continuous or on demand supply of pure nitrogen making it the smart alternative to cylinders. Superior engineering with carefully matched filtration, membrane separation, and compression technologies have resulted in a system with the utmost reliability and longevity. Additional applications include: nebulizer gases, chemical and solvent evaporation, instrument supply and purge, evaporative light scattering equipment, and sparging.



**Here's what your colleagues say:**

"We've used the VWR Nitroflow® (combined compressor and nitrogen generator) on our LCMS for 3 years. In just over two years, it more than paid for itself in nitrogen savings, but the real advantages of the nitrogen generator are the continuous supply of high quality nitrogen and the tremendous amount of time saved from not having to check, order, and switch high pressure liquid nitrogen tanks."

Karl J. Dria, PhD.  
Assistant Research Scientist Department of Chemistry and Chemical Biology Indiana University-Purdue University Indianapolis



**Features and Benefits**

- Flow capacity to 32 LPM
- Ideal for all derivatives of and APCI modes
- Includes state-of-the-art, oil-less compressors
- Unlike PSA Hosmer technologies, membrane will not suppress corona needle discharge
- Special sound insulation design ensures quiet operation
- Includes 2 year compressor warranty

**Principal Specifications / Ordering Information**

<b>Cat. No.</b>	<b>97021-300</b>
<b>Nitrogen</b>	Phthalate free with flow to 32 lpm @ sea level
<b>Hydrocarbon Content</b>	< 2ppm (excluding methane)
<b>Atmospheric Dewpoint</b>	-58 °F (-50 °C)
<b>Min/Max Ambient Temperature</b>	50 °F/95 °F (10 °C/35 °C)
<b>Outlet Port</b>	Female 1/4" NPT
<b>Max. Outlet Pressure</b>	116 psig (8 barg)
<b>Electrical Requirements</b>	120Vac/60Hz/20Amp / NEMA 5 - 20 Straight Blade
<b>Dimensions</b>	31W x 90D x 70H cm (12 1/4 x 35 1/2 x 27 1/2")
<b>Shipping Weight</b>	92.5 kg (204 lbs.)

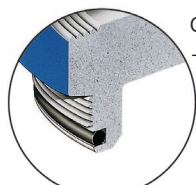


## Laboratory Membrane Air Dryers

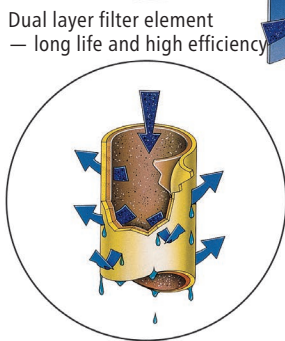
The VWR Membrane Air Dryers will supply oil and particulate free dry compressed air to atmospheric dewpoints as low as -40 °F (-40 °C), and at flow rates of up to 25 SCFM. VWR Membrane Air Dryers are engineered for easy installation, operation, and long term reliability. The dryers incorporate the highest efficiency membrane available, offering low cost operation and minimal maintenance.

VWR Membrane Air Dryers are 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 approximately 5 minutes.

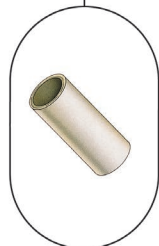
The dryers are lightweight, compact, and can be easily installed on an existing air line. In a vertical or horizontal orientation (depending upon model), a high efficiency coalescing prefilter is installed directly upstream from the dryer module to protect the membrane from potential contamination caused by pipe scale, liquids, or other solids. VWR Membrane Air Dryers require no electrical connections, making them ideal for remote and point-of-use installations or for installation in hazardous areas.



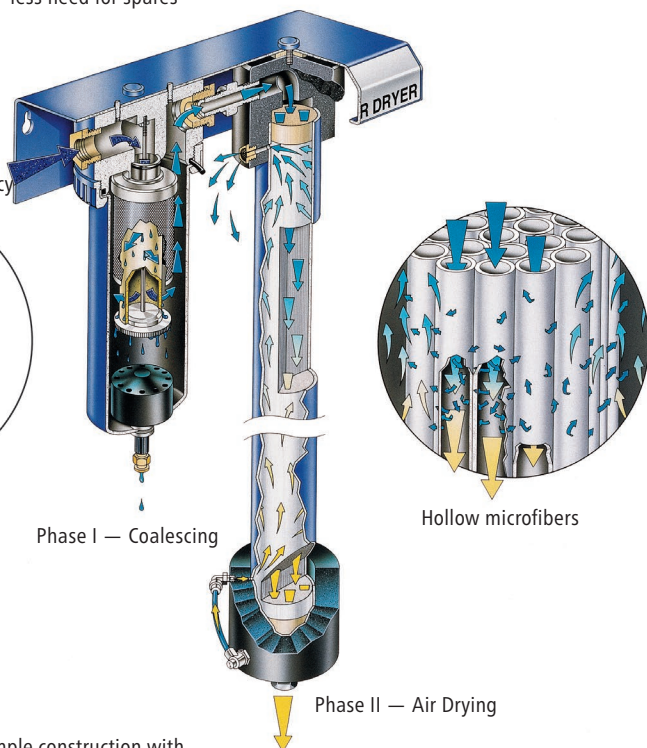
Captive 'O' Rings  
— less need for spares



Dual layer filter element  
— long life and high efficiency



Simple construction with economical consumables is kinder to the environment



- **Phase 1:** Coalescing Filtration; oil, water droplets and particulate contamination removed with an efficiency of 99.99% at 0.01 micron. Water-laden air passes through membrane filter.
- **Phase 2:** Drying - As the compressed air passes through the hollow membrane fibers, water vapor permeates through the fiber walls, and dry air exits the end of the fiber, piping to the application.



### Features and Benefits

- Low dewpoint instrument air prevents analytical instrument contamination
- Dry air for hazardous areas
- No electricity required
- No refrigerants or freons
- Explosion proof
- No moving parts or motors for silent operation

### Principal Specifications

Cat. No.	26000-030	26000-032
Max. Flow Rate <sup>(1)</sup> at 4.4 °C (40 °F)	28 LPM	57 LPM
Max. Flow Rate <sup>(1)</sup> at 0 °C (32 °F)	71 LPM	142 LPM
Recommended Operating Temp. Range	60 °F-100 °F (16 °C-38 °C)	60 °F-100 °F (16 °C-38 °C)
Min/Max Inlet Air Temp. <sup>(2)</sup>	40 °F/140 °F (4 °C/60 °C)	40 °F/140 °F (4 °C/60 °C)
Maximum Pressure Drop	<4 psig	<4 psig
Min/Max Inlet Pressure	60 psig/150 psig	60 psig/150 psig
Inlet/Outlet Port	1/4" NPT (female)	1/4" NPT (female)
Wall Mountable	Yes	Yes
Electrical Requirements	None	None
Dimensions	15.2W x 12.7D x 58H cm (6 x 5 x 22")	15.2W x 12.7D x 58H cm (6 x 5 x 22")
Shipping Weight	4 kg (9 lbs.)	5 kg (10 lbs.)

<sup>1</sup> Dewpoint specified with inlet air at 100 °F (38 °C) saturated at 100 psig.

<sup>2</sup> Inlet compressed air dewpoint must not exceed the ambient air temperature.

### Ordering Information

Description	Cat. No.	Cat. No.
Membrane Air Dryer	26000-030	26000-032
Maintenance Kit	82031-482	82031-482
Installation Kit	82031-488	82031-488
Pressure Regulator	Contact your VWR Sales Representative	Contact your VWR Sales Representative

## RECOMMENDED GAS GENERATORS FOR ANALYTICAL INSTRUMENTS

Model	Gas Requirements	Gas Purity Requirements	Flow Rates	Generator Recommendation	Cat. No.
<b>Atomic Thermal Desorber</b>	Zero Air	Clean, Dry, Hydrocarbon-free	Up to 1600 ml/min.	Zero Air or TOC Gas Generator	89237-566
	Hydrogen for FID	Clean, Dry, Ultra-High Purity	Up to 40 ml/min. per FID	Hydrogen Generator	97001-250, 97001-252, 97001-254, 97001-256
<b>Atmospheric Pressure Ionization (API-MS)</b>	Air for Nebulizer Gas	Clean, Dry, Hydrocarbon-free	<18 LPM	Zero Air Generator	26000-026
	Nitrogen for Curtain, Sheath and Shield gas	99% or higher	<20 LPM	Nitrogen Generator	26000-016, 26000-018
<b>Gas Chromatograph (GC) GC-FID</b>	Zero Air as Flame Support Air	Clean, Hydrocarbon-free	150-600 cc/min.	Zero Air Generator	89237-566
	Hydrogen as Flame Fuel Gas	Ultra High Purity	30-40 cc/min.	Hydrogen Generator	97001-250
	Hydrogen as Capillary Carrier Gas	Ultra High Purity	Varies	Hydrogen Generator	89497-446
	Nitrogen as Packed Carrier Gas	Ultra High Purity, Zero Grade	Varies	UHP Nitrogen Generator	26000-008
	Nitrogen as Make up Gas	Ultra High Purity, Zero Grade	<100 cc/min	UHP Nitrogen Generator	26000-008
<b>GC-FPD</b>	Zero Air as Flame Support Air	Clean, Hydrocarbon-free	<200 cc/min	Zero Air Generator	89237-566
	Hydrogen as Flame Fuel Gas	Ultra High Purity	50-70 cc/min	Hydrogen Generator	89209-864
	Hydrogen as Capillary Carrier Gas	Ultra High Purity	Varies	Hydrogen Generator	89497-446
	Nitrogen as Packed Carrier Gas	Ultra High Purity	Varies	UHP Nitrogen Generator	26000-008
<b>GC-NPD</b>	Zero Air to Rubidium/Thermonic Bead	Dry, Clean, Hydrocarbon-Free	60-200 cc/min.	Zero Air Generator Membrane Air Dryer	89237-566, 26000-030
	Hydrogen as Detector Support Gas	Ultra High Purity	<10 cc/min	Hydrogen Generator	89209-862
	Hydrogen as Capillary Carrier Gas	Ultra High Purity	Varies	Hydrogen Generator	89209-862
	Nitrogen as Packed Carrier Gas	Ultra High Purity	Varies	UHP Nitrogen Generator	26000-008
<b>GC-ECD</b>	Nitrogen as Carrier Gas	Ultra High Purity, Zero Grade	Varies	UHP Nitrogen Generator	26000-008
	Nitrogen as Make up Gas	Ultra High Purity, Zero Grade	<100 cc/min	UHP Nitrogen Generator	26000-008
<b>GC-ELCD, HALL</b>	Hydrogen as Reaction Gas	Ultra High Purity	70-200 cc/min	Hydrogen Generator	89209-862
<b>GC-TCD</b>	Hydrogen as Carrier & Reference Gas	Ultra High Purity	Varies	Hydrogen Generator	89497-446
<b>LC/MS</b>	Nitrogen as a Curtain Gas	LC/MS Grade	3-30 lpm	Nitrogen Generator	26000-016, 26000-018
<b>Ozone Generator</b>	Supply Air	Clean, Dry	3-20 SCFM	Air Dryer	26000-030, 26000-032
<b>Protein Analyzer</b>	Dry Air, Nitrogen	Clean, Dry	40 psig	Nitrogen Generator	26000-016
<b>Total Oxygen Demand (TOD)</b>	Nitrogen Carrier Gas	Ultra High Purity	300 cc/min	Nitrogen Generator	26000-008
<b>Thermal Gravimetric Analyzer (TGA)</b>	Nitrogen as Furnace Purge	Clean, Dry, Inert	<100 cc/min	Nitrogen Generator	26000-008
<b>Total Hydrocarbon Analyzer (THA)</b>	Zero Air for FID	Clean, Hydrocarbon-Free	50-500 cc/min	Zero Air Generator	89237-564
	Hydrogen as Flame Fuel Gas	High Purity	5-50 cc/min	Hydrogen Generator	97001-250









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