Hydrogen Generators for Fuel Gas

Parker Balston'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. Parker Balston'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 Parker Balston hydrogen generator pays for itself in less than a year.

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

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

H2PEM Hydrogen Generator

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
- Includes 2 year cell warranty
- No liquid caustics required

Hydrogen Generators for Fuel Gas

Principal Specifications

Description	H2PEM-100	H2PEM-165	H2PEM-260	H2PEM-510
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
Electrical[1]	100/230VAC, 60/50Hz	100/230VAC, 60/50Hz	100/230VAC, 60/50Hz	100/230VAC, 60/50Hz
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
Shipping Weight	70 lb (32 kg) dry	70 lb (32 kg) dry	70 lb (32 kg) dry	70 lb (32 kg) dry
Dimensions	17"h x 13.4"w x 18"d (43cm x 34.2cm x 45cm)	17"h x 13.4"w x 18"d (43cm x 34.2cm x 45cm)	17"h x 13.4"w x 18"d (43cm x 34.2cm x 45cm)	17"h x 13.4"w x 18"d (43cm x 34.2cm x 45cm)

NOTES
1 Refer to voltage appendix for electrical and plug configurations for outside North America.

Ordering Information

for assistance, call 800-343-4048, 8 to 5 Eastern Time

Description	Model
Desiccant Cartridge (1 each)	MKH2PEM-D
6 Month Service Kit	MKH2PEM-6M
24 Month Service Kit	MKH2PEM-24M
Preventive Maintenance Plan	H2PEM-100-PM H2PEM-165-PM H2PEM-260-PM H2PEM-510-PM
Installation Service	H2PEM-100-INST H2PEM-165-INST H2PEM-260-INST H2PEM-510-INST
USB Remote Control Accessory	604970894

Hydrogen Generators for Fuel and Carrier Gas

The Parker Balston 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 Parker Balston Hydrogen Generator sets the standard for safety, operational performance, and dependability. Parker Balston 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.

Parker Balston 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.

Parker Balston 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.

Model H2PD-300 Hydrogen Generator

Features and Benefits

- Eliminates dangerous and expensive hydrogen gas cylinders from the laboratory
- Exceeds OSHA 1910.103 and NFPA 50A safety guidelines
- Safe - 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
- 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

"Our H2 generator has saved us time, space, and money over a traditional tank configuration. We realized a return on our investment in less than one year and no longer have to manage bulky and unsightly tanks in the lab."

John Ross
Director Corporate Quality
Ungerer & Company

Hydrogen Generators for Fuel and Carrier Gas

Principal Specifications

Hydrogen Generators	H2PD-150	H2PD-300
Hydrogen Purity	99.99999+%	99.99999+%
Oxygen Content	< .01 ppm	< .01 ppm
Moisture Content	< 1.0 ppm	< 1.0 ppm
Max Hydrogen Flow Rate	150 cc/min	300 cc/min
Electrical Requirements [1]	120/230 VAC, 60/50 Hz, 3.5 Amps	120/230 VAC, 60/50 Hz, 3.5 Amps
Hydrogen Outlet Pressure	Adjustable, 0 to 60 psig	Adjustable, 0 to 60 psig
Certifications	IEC 1010-1; CSA; UL 3101; CE Mark	IEC 1010-1; CSA; UL 3101; CE Mark
Dimensions	12"w x 12"d x 22"h (30cm x 33cm x 58cm)	12"w x 12"d x 22"h (30cm x 33cm x 58cm)
Outlet Port	1/8" Compression	1/8" Compression
Shipping Weight	55 lbs (25 kg)	55 lbs (25 kg)

NOTES
1 Refer to voltage appendix for electrical and plug configurations for outside North America.

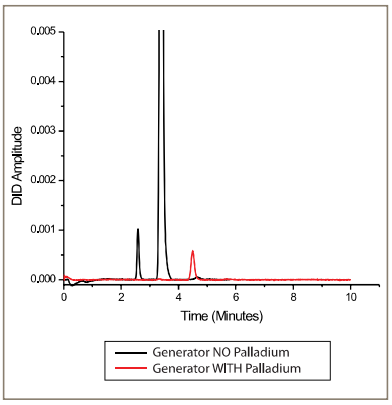
Ordering Information

for assistance, call 800-343-4048, 8 to 5 Eastern Time

Description	Model Number
Hydrogen Gas Generator	H2PD-150, H2PD-300
Pressure Regulator	W-425-4032-000
Installation Kit	IK7532
Preventive Maintenance plan	H2PD-150-PM, H2PD-300-PM
Extended Support (24 Month Warranty)	H2PD-150-DN2, H2PD-300-DN2

Simple Experimental: 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 are the same - as hydrogen gas is produced from water via electrolytic disassociation, 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 12 ppm concentration of oxygen and nitrogen, suitable for hydrogen fuel gas while the corresponding point in the red baseline represents a combined 12 ppb concentration of oxygen and nitrogen, suitable for either fuel or carrier gas.



Hydrogen Generators for Fuel and Carrier Gas

The Parker Balston H2PEMPD 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 175 psig to multiple GCs, and fuel gas up to 45 FIDs. The Parker Balston H2PEMPD 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 <0.01 ppm and moisture down to <1.0 ppm. Only 100 mL of hydrogen gas is stored in the system at any time. Based on cylinder gas savings alone, a Parker Balston hydrogen generator pays for itself in less than one year.

The H2PEMPD 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 Parkers' 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 H2PEMPD series for use in regulated environments where system validation may be required.

Parker Balston 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). Parker Balston hydrogen generators are certified for laboratory use by CSA, IEC 1010, and CE. Proven in over 40,000 GC installations worldwide, Parker Balston 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 deionizer cartridge every six months. In all applications the Parker Balston Hydrogen Generator sets the standard for safety, operational performance and dependability.

Model H2PEMPD Hydrogen Generator

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Features and Benefits

- Flow capacity up to 1,300 cc/min
- Delivery pressure of up to 175 PSIG; ideal for high speed and fast GC applications
- Eliminates dangerous and expensive helium and hydrogen gas cylinders
- Safe - 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
- Standard automatic water feed for continuous operation, 24/7
- Optional cascading 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

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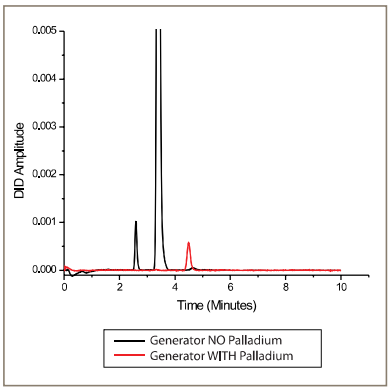

Principal Specifications

	H2PEMPD-510	H2PEMPD-650	H2PEMPD-850	H2PEMPD-1100	H2PEMPD-1300
Hydrogen Purity	99.99999+%	99.99999+%	99.99999+%	99.99999+%	99.99999+%
Max Hydrogen Flow Rate	510 cc/min	650 cc/min	850 cc/min	1100 cc/min	1300 cc/min
Oxygen Content	< 0.01 ppm	< 0.01 ppm	< 0.01 ppm	< 0.01 ppm	< 0.01 ppm
Water Content	< 0.01 ppm	< 0.01 ppm	< 0.01 ppm	< 0.01 ppm	< 0.01 ppm
Max Outlet Pressure (1)	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 (2)	100 to 230 VAC, 50/60 Hz	100 to 230 VAC, 50/60 Hz	100 to 230 VAC, 50/60 Hz	100 to 230 VAC, 50/60 Hz	100 to 230 VAC, 50/60 Hz
Outlet Connection	1/4" Compression	1/4" Compression	1/4" Compression	1/4" Compression	1/4" Compression
Dimensions	17.1"h x 13.5"w x 21"d (43.5cm x 34cm x 53cm) for all models				
Shipping Weight	94 lb (42.6 kg) for all models				

NOTES

1 H2PEMPD Hydrogen Generators are available with maximum pressure of either 100 of 175 PSIG. See Ordering Information for pressure selection

2 Refer to voltage appendix for electrical and plug configurations for outside North America.

Ordering Information

for assistance, call 800-343-4048, 8 to 5 Eastern Time

	H2PEMPD-510	H2PEMPD-650	H2PEMPD-850	H2PEMPD-1100	H2PEMPD-1300
Max Outlet Pressure to 100 PSIG (6.8 bar)	H2PEMPD-510-100	H2PEMPD-650-100	H2PEMPD-850-100	H2PEMPD-1100-100	H2PEMPD-1300-100
Max Outlet Pressure to 175 PSIG (11.9 bar)	H2PEMPD-510-175	H2PEMPD-650-175	H2PEMPD-850-175	H2PEMPD-1100-175	H2PEMPD-1300-175
Annual Preventive Maintenance	H2PEMPD-510-PM	H2PEMPD-650-PM	H2PEMPD-850-PM	H2PEMPD-1100-PM	H2PEMPD-1300-PM
Semi Annual Preventive Maintenance	H2PEMPD-510-PMPLUS	H2PEMPD-650-PMPLUS	H2PEMPD-850-PMPLUS	H2PEMPD-1100-PMPLUS	H2PEMPD-1300-PMPLUS