Hydrogen Generators for Fuel Gas

▲ Ideal for fuel gas, up to 14 FID’s
▲ Eliminates dangerous and expensive hydrogen gas cylinders from the laboratory
▲ Certified for laboratory use by CSA, UL, IEC, 1010, and CE Mark
▲ Compact and reliable - only one square foot of bench space required
▲ Uses no liquid caustics

Parker Balston’s Proton Exchange Membrane (PEM) Cell 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 deionizer bag every six months and the desiccant cartridge whenever it turns from light blue to grey.

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

With an output capacity of up to 500 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.
## Principal Specifications

<table>
<thead>
<tr>
<th>Model Number</th>
<th>H2-90NA</th>
<th>9150</th>
<th>9200</th>
<th>9400</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purity</td>
<td>99.9995%</td>
<td>99.9995%</td>
<td>99.9995%</td>
<td>99.9995%</td>
</tr>
<tr>
<td>Flow Rates</td>
<td>90 cc/min</td>
<td>160 cc/min</td>
<td>250 cc/min</td>
<td>500 cc/min</td>
</tr>
<tr>
<td>Outlet Port</td>
<td>1/8” compression</td>
<td>1/8” compression</td>
<td>1/8” compression</td>
<td>1/8” compression</td>
</tr>
<tr>
<td>Electrical</td>
<td>117 Vac/234 Vac</td>
<td>117 Vac/234 Vac</td>
<td>117 Vac/234 Vac</td>
<td>117 Vac/234 Vac</td>
</tr>
<tr>
<td>Pressure Control</td>
<td>5 to 20 psig±0.5%</td>
<td>5 to 20 psig±0.5%</td>
<td>5 to 20 psig±0.5%</td>
<td>5 to 20 psig±0.5%</td>
</tr>
<tr>
<td>Delivery Pressure</td>
<td>2 to 30 psig±0.3%</td>
<td>2 to 30 psig±0.3%</td>
<td>2 to 30 psig±0.3%</td>
<td>2 to 30 psig±0.3%</td>
</tr>
<tr>
<td>Shipping Weight</td>
<td>40 lb (18 kg) dry</td>
<td>40 lb (18 kg) dry</td>
<td>40 lb (18 kg) dry</td>
<td>40 lb (18 kg) dry</td>
</tr>
<tr>
<td>Dimensions</td>
<td>13”H x 15”W x 14”D (33cm x 38cm x 36cm)</td>
<td>13”H x 15”W x 14”D (33cm x 38cm x 36cm)</td>
<td>13”H x 15”W x 14”D (33cm x 38cm x 36cm)</td>
<td>13”H x 15”W x 14”D (33cm x 38cm x 36cm)</td>
</tr>
</tbody>
</table>

## Ordering Information

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

<table>
<thead>
<tr>
<th>Model Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1647727</td>
<td>Dessicant cartridge (1 each)</td>
</tr>
<tr>
<td>7601132</td>
<td>Deionizer bags (2 each)</td>
</tr>
<tr>
<td>Preventative Maintenance Contract</td>
<td>SPEH2-PM</td>
</tr>
<tr>
<td>Extended Support with 24 Month Warranty</td>
<td>H2-90-DN2, 9150-DN2, 9200-DN2, 9400-DN2</td>
</tr>
</tbody>
</table>
Hydrogen Generators for Fuel and Carrier Gas

- Eliminates dangerous and expensive hydrogen gas cylinders from the laboratory
- Exceeds OSHA 1910.103 and NFPA 50A safety requirements
- Safe - produces only as much gas as you need
- Unique electron beam palladium cell technology
- Produces a continuous supply of 99.99999+% pure hydrogen gas, ideal for carrier and fuel gas applications
- Compact and reliable - only one square foot of bench space required and designed to run continuously 24 hours/day
  - includes automatic water fill
- Simple annual maintenance, no desiccant cartridges
- Certified for laboratory use by CSA, UL, IEC 1010, and CE Mark

**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.

**Applications**

- Gas Chromatographs
- Emissions Test Equipment
- Hydrogenation Reactors
- ICP-MS Collision Gas
- Fuel Cells
### Principal Specifications

<table>
<thead>
<tr>
<th>Hydrogen Generators</th>
<th>Models</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen Purity</td>
<td>H2PD-150</td>
<td>99.99999+%</td>
</tr>
<tr>
<td>Oxygen Content</td>
<td>H2PD-300</td>
<td>&lt;0.01 ppm</td>
</tr>
<tr>
<td>Moisture Content</td>
<td></td>
<td>&lt;1.0 ppm</td>
</tr>
<tr>
<td>Max Hydrogen Flow Rate</td>
<td>H2PD-150</td>
<td>150 cc/min</td>
</tr>
<tr>
<td></td>
<td>H2PD-300</td>
<td>300 cc/min</td>
</tr>
<tr>
<td>Electrical Requirements</td>
<td></td>
<td>120 VAC/60 Hz, 3.15 Amps</td>
</tr>
<tr>
<td>Hydrogen Outlet Pressure</td>
<td></td>
<td>Adjustable, 0 to 60 psig</td>
</tr>
<tr>
<td>Certifications</td>
<td></td>
<td>IEC 1010-1; CSA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UL 3101; CE Mark</td>
</tr>
<tr>
<td>Dimensions</td>
<td></td>
<td>12”w x 12”d x 22”h</td>
</tr>
<tr>
<td>Outlet Port</td>
<td></td>
<td>(30cm x 33cm x 58cm)</td>
</tr>
<tr>
<td>Shipping Weight</td>
<td></td>
<td>58 lbs (26 kg)</td>
</tr>
</tbody>
</table>

### Ordering Information

**Description**

- Hydrogen Gas Generator
- Electrolyte Solution: 920071
- Pressure Regulator: W-425-4032-000
- Installation Kit: IK7532
- Preventative Maintenance Contract: PDH2-PM
- Extended Support with 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.

---

**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.
Hydrogen Generators for Fuel and Carrier Gas

- Flow capacity up to 1,200 cc/min
- Ideal for high speed and fast GC applications
- Eliminates dangerous and expensive helium and hydrogen gas cylinders from the laboratory
- Safe — produces only as much gas as you need
- Produces a continuous supply of 99.99999% pure hydrogen gas at 100 psig, ideal for carrier and fuel gas applications
- Compact and reliable — only one square foot of bench space required and designed to run continuously 24 hours/day
- Smart display indicates system status at a glance
- Automatic water feed for continuous operation
- Simple maintenance, without desiccants
- Certified for laboratory use by CSA, UL, IEC 1010, and CE Mark

The Parker Balston® Hydrogen Generator is designed as a hazard-free alternative to high pressure gas cylinders. The generator 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 1,200 cc/minute, one generator can supply 99.99999% pure carrier gas, at 100 psig, to multiple GCs, and fuel gas up to 40 FIDs. Based on cylinder gas savings alone, a Parker Balston hydrogen generator pays for itself in less than one year.

The Parker Balston H2-500NA, H2-800NA and H2-1200NA Hydrogen generators use a Proton Exchange Membrane (PEM) to produce UHP hydrogen on demand. Each generator incorporates a palladium purifier module to remove oxygen down to less than 0.01 ppm and moisture down to <1.0 ppm. Only 100 mL of hydrogen gas is stored in the system at any time and at a maximum of 140 psig. That’s why the Parker Balston hydrogen generator meets 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, the Parker Balston hydrogen generator is certified for laboratory use by CSA, UL, IEC 1010, and CE. 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 deionizer bag every six months. If contaminated water or low water level is detected, the system activates a warning light and shuts off the generator - avoiding harm to the system.
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.

*Does not include automatic waterfeed feature and has maximum pressure output of 90 psig.

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.