

# H Series

## Hydrogen Generation Systems



MODEL	H2	H4	H6
	On-site hydrogen generator in an integrated, automated, site-ready enclosure. Load Following operation automatically adjusts output to match demand.		
<b>ELECTROLYTE</b>			
	Proton Exchange Membrane (PEM) - caustic-free		
<b>HYDROGEN PRODUCTION</b>			
Net Production Rate Nm <sup>3</sup> /hr @ 0°C, 1 bar SCF/hr @ 70°F, 1 atm SLPM @ 70°F, 1 atm kg per 24 hours	2 Nm <sup>3</sup> /hr 76 SCF/hr 35.8 SLPM 4.31 kg/24hr	4 Nm <sup>3</sup> /hr 152 SCF/hr 71.7 SLPM 8.63 kg/24hr	6 Nm <sup>3</sup> /hr 228 SCF/hr 107.6 SLPM 12.94 kg/24hr
Delivery Pressure - Nominal	15 barg (218 psig) / 30 barg option (435 psig)		
Power Consumed per Volume of H <sub>2</sub> Gas Produced	7.3 kWh/Nm <sup>3</sup> 19.2 kWh/100 ft <sup>3</sup>	7.0 kWh/Nm <sup>3</sup> 18.5 kWh/100 ft <sup>3</sup>	6.8 kWh/Nm <sup>3</sup> 17.8 kWh/100 ft <sup>3</sup>
Purity (Concentration of Impurities)	99.9995% (Water Vapor < 5 ppm, -65°C (-85°F) Dewpoint, N <sub>2</sub> < 2 ppm, O <sub>2</sub> < 1 ppm, All Others Undetectable)		
Turndown Range	0 to 100% net product delivery (Automatic)		
Upgradeability	Field Upgradeable to a maximum of 6 Nm <sup>3</sup> /hr (228 SCF/hr)		N/A
<b>DI WATER REQUIREMENT</b>			
Rate at Max Consumption Rate	1.83 L/hr 0.50 gal/hr	3.66 L/hr 0.96 gal/hr	5.50 L/hr 1.42 gal/hr
Temperature	5°C to 50°C / 41°F to 122°F		
Pressure	1.5 to 4 barg / 21.8 to 58.0 psig		
Input Water Quality	ASTM Type II Deionized Water required, < 1 micro Siemen/cm (> 1 MegOhm-cm) ASTM Type I Deionized Water recommended, < 0.1 micro Siemen/cm (> 10 MegOhm-cm)		
<b>HEAT LOAD AND COOLANT REQUIREMENT</b>			
Cooling <sup>1</sup>	Liquid-Cooled; Anti-freeze, non-fouling; 5°C to 35°C (41°F to 95°F) *25°C cooling water maximum for ambient temperatures above 40°C		
Max Heat Load (Cooling Requirement)	8.1 kW 27,368 BTU/hr (2.3 tons refrigeration)	16.1 kW 54,936 BTU/hr (4.6 tons refrigeration)	23.7 kW 80,868 BTU/hr (6.8 tons refrigeration)
Coolant Flowrate	Up to 45 L/min (12 gal/min)	Up to 68 L/min (18 gal/min)	Up to 87 L/min (23 gal/min)
Pressure Drop (at full flow)	Up to ~3.4 barg (~50 psig)	Up to ~3.4 barg (~50 psig)	Up to ~3.4 barg (~50 psig)
<b>ELECTRICAL SPECIFICATIONS</b>			
Recommended Breaker Rating	22 kVA	38 kVA	55 kVA
Electrical Specification	480 VAC, 3 phase, 60 Hz or 380-415 VAC, 3 phase, 50 Hz		

	H2	H4	H6
<b>INTERFACE CONNECTIONS - Consult Mechanical Interface Diagram drawing, PD-9900-0003 for details -</b>			
H <sub>2</sub> Product Port	1/4" Parker CPI™ compression tube fitting, SS		
H <sub>2</sub> /H <sub>2</sub> O Vent Port	1/2" FNPT, SS		
DI Water Port	1/4" FNPT, SS		
Calibration-Gas Port	1/8" FNPT, brass		
Coolant Supply Port	1" FNPT, brass		
Coolant Return Port	1" FNPT, brass		
Drain Port	3/8" FNPT, brass		
Electrical	Connect to on-board circuit breaker		
Communications	Ethernet		
<b>CONTROL SYSTEMS</b>			
Standard Features	<ul style="list-style-type: none"> <li>Fully automated, push button start/stop</li> <li>E-stop</li> <li>On-board H<sub>2</sub> leak detection</li> </ul>		<ul style="list-style-type: none"> <li>Automatic fault detection and system depressurization</li> </ul>
Remote Alarm	Form C relay, 5A, 250V, 150W Max. rated switch		
Remote Shutdown	Safety circuit trip		
<b>ENCLOSURE CHARACTERISTICS</b>			
Dimensions, W x D x H	Product	71" x 32" x 75" / 180 cm x 81 cm x 191 cm	
	Est. Shipping	81" x 41" x 85" / 206 cm x 104 cm x 216 cm	
		Note: add 8 cm (3") to height for installed lifting brackets	
Weight	Product	1500 lbs / 682 kg	1600 lbs / 727 kg
	Est. Shipping	1776 lbs / 807 kg	1887 lbs / 858 kg
IP Rating	IP66 for electronics compartment. IP43 for fluids compartment; Upgradeable to IP56.		
<b>ENVIRONMENTAL CONSIDERATIONS - Do Not Freeze -</b>			
Standard Siting Location	Indoor, level ± 1°, 0 to 90% RH non-condensing, Non-hazardous/non-classified environment		
Storage/Transport Temperature	5°C to 60°C / 41°F to 140°F		
Ambient Temperature Range	5°C to 50°C / 41°F to 122°F		
Altitude Range- Sea Level	2400 m / 7874 ft		
Ventilation	Proper ventilation must be provided from a non-hazardous area, at a rate in accordance with IEC60079-10, Zone 2 NE		
<b>SAFETY AND REGULATORY CONFORMITY</b>			
Maximum On-board H <sub>2</sub> Inventory at Full Production	0.040 Nm <sup>3</sup> @ 15 barg; 0.08 Nm <sup>3</sup> @ 30 barg 1.5 SCF @ 15 barg; 2.9 SCF @ 30 barg 0.0036 kg @ 15 barg; 0.0069 kg @ 30 barg		
Cabinet Ventilation with Environment	NFPA 69 and EN 1127-1, Clause 6.2. Vent fan draws fresh air up to 28 Nm <sup>3</sup> /min (1000 ft <sup>3</sup> /min)		
Noise dB(A) at 1 Meter	< 83		
Conformity	cTUVus (UL and CSA equivalent), CE (PED, ATEX, LVD, Mach. Dir., EMC), NYFD		

Specifications are subject to change. Please contact Proton OnSite for solutions to best fit your needs.

<sup>1</sup>Consult Proton OnSite Applications Engineering Department for proper installation guidelines.



PD-0600-0062 Rev F  
 © 2011-2016 Proton OnSite. All Rights Reserved.  
 Proton, Proton OnSite, Proton Energy Systems and the Proton symbol are trademarks of Proton Energy Systems, Inc. d/b/a Proton OnSite.

