

HOGEN[®]

Hydrogen Generation Systems



C Series Hydrogen Generators

Model	C10	C20	C30
DESCRIPTION			
	On-site hydrogen generator in two integrated, automated, site-ready enclosures. Load Following operation automatically adjusts output to match demand. Automated tank topping operating with power-conservation mode during standby.		
ELECTROLYTE			
	Proton Exchange Membrane (PEM) - caustic-free		
HYDROGEN PRODUCTION			
Net Production Rate:			
Nm ³ / hr @ 0° C, 1 bar	10 Nm ³ / hr	20 Nm ³ / hr	30 Nm ³ / hr
SCF / hr @ 70° F, 1 atm	382 SCF / hr	764 SCF / hr	1146 SCF / hr
SLPM @ 70° F, 1 atm	178 SLPM	356 SLPM	535 SLPM
kg per 24 hours	21.8 kg / 24hr	43.3 kg / 24hr	65 kg / 24hr
Delivery Pressure - Nominal	30 barg (435 PSIG)		
Power Consumed per Volume of Mass	6.0 kWh / Nm ³	5.9 kWh / Nm ³	5.8 kWh / Nm ³
H ₂ Gas Produced	15.8 kWh / 100 ft ³	15.5 kWh / 100 ft ³	15.3 kWh / 100 ft ³
	70.1 kWh / kg	69.0 kWh / kg	67.8 kWh / kg
Purity (Concentration of Impurities)	99.9998% (Water Vapor < 2 PPM, -72°C (-98°F) Dewpoint, N ₂ < 2 ppm O ₂ < 1 PPM, All Others Undetectable)		
Turndown Range	0 to 100% Net product Delivery (Automatic)		
Upgradeability	Field Upgradeable to a maximum of 30 Nm ³ / hr (1140 SCF / hr)		N / A
DI WATER REQUIREMENT			
Rate at Max Consumption Rate	9 L / hr (2.4 gal / hr)	17.9 L / hr (4.7 gal / hr)	26.9 L / hr (7.1 gal / hr)
Temperature	+5°C to 50°C (41°F to 122°F)		
Pressure	1.4 to 4.1 barg (20 to 60 PSIG)		
Input Water Quality	ASTM Type II Deionized Water required, < 1 micro Siemen / cm (>1 megOhm-cm) ASTM Type I Deionized Water preferred, < 0.1 micro Siemen / cm (> 10 megOhm-cm)		
HEAT LOAD AND COOLANT REQUIREMENT			
Fluids	Cooling	Liquid Cooled; Non-fouling; +5°C to 50°C (41°F to 122°F); 1.4 to 6.9 barg (20 to 100 PSIG)	
	Coolant	Flowrate: up to 133 L / min (35 gal / min) Pressure Drop: ~1.7 barg (~25 psig)	
	Heat Load	28.7 kW	58.4 kW
Hydrogen Dryer & Power Supply	Cooling	Liquid Cooled; Non-fouling; +5°C to 40°C (41°F to 104°F); 1.4 to 6.9 barg (20 to 100 PSIG)	
	Coolant	Flowrate: up to 76 L / min (20 gal / min) Pressure Drop: ~1.0 barg (~15 psig)	
	Heat Load	4.8 kW	8.4 kW



The Leader in On-site Hydrogen Generation

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ELECTRICAL SPECIFICATIONS

Recommended Breaker Rating	100 kVA	200 kVA	250 kVA
Electrical Specification	342 to 456 VAC, 3 phase, 50 Hz 432 to 528 VAC, 3 phase, 60 Hz		

INTERFACE CONNECTIONS *Consult Installation Manual for details*

H ₂ Product Port	3/8" Parker CPI™ compression tube fitting, SS
H ₂ / H ₂ O Vent Port	1" FNPT, SS
DI Water Port	3/8" FNPT, SS
Calibration-Gas Port	1/8" FNPT, brass
Coolant Supply and Return Ports	Fluids Enclosure: 1-1/2" FNPT, brass (Cell Stack); 1/2" FNPT, brass (Hydrogen Dryer) Power Supply Enclosure 3/4" FNPT, brass (Power Supply Cooling)
Drain Port	1/2" FNPT, brass
O ₂ Vent Port	1" FNPT, brass
Protonic Vent Port	1" FNPT, brass
Electrical	Connect to inlet of disconnect box
Communications	Ethernet

CONTROL SYSTEMS

Standard Features	Fully automated, push button start / stop. E-stop. On-board H ₂ Leak detection. Automatic fault detection and system depressurization.
Remote Alarm	Form C relay, 5A, 250V, 150W Max. rated switching
Remote Shutdown	Safety circuit trip

ENCLOSURE CHARACTERISTICS

Dimensions, W x D x H (Product)	Fluids Enclosure: 2388mm x 914 mm x 1828 mm (94" x 36" x 72") Power supply Enclosure: 1880 mm x 914 mm x 1828 mm (74" x 36" x 72")		
Weight (Product)	2041 kg (4500 lbs)	2449 kg (5400 lbs)	2812 kg (6200 lbs)
Rating	IP66 for power supply compartment. IP56 for fluids compartment.		

ENVIRONMENTAL CONSIDERATIONS *Do Not Freeze*

Standard Siting Location	Indoor; level ± 1°, 0 to 100% 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 to:	2000 m (6562 ft)
Ventilation	Proper ventilation must be provided from a non-hazardous area at a rate in accordance with IEC60079-10, Zone 2 NE

SAFETY AND REGULATORY CONFORMITY

Maximum On-board H ₂ Inventory at Full Production	0.08 Nm ³ @ 30 barg 2.9 SCF @ 30 barg 0.0069 kg @ 30 barg
Cabinet Ventilation with Environment	Vent fan draws fresh air up to 7 m ³ / min (250 ft ³ / min)
Noise dB(A) at 1 Meter	< 75
Approvals (Pending)	CE (ISO 22734-1, PED, ATEX, LVD, Mach, Dir., EMC); cTUVus (CSA, UL equivalent)

OPTIONS

-On board DI water system	-Remote Datalogging	-Factory Matched Cooler / Chiller	-Product Oxygen @ 1.5 barg
-Dewpoint Meter	-Outdoor Operation Package	-Higher Efficiency	(98% purity overall; 99.5% excluding water)
-Dedicated Datalogging computer	-Programmable time of day		

Proton Energy Systems offers a wide range of options to tailor your HOGEN hydrogen generation system to meet your specific operational requirements.

Please contact your local representative to discuss the current list of options available to best fit your needs.

Preliminary; subject to change without notice. Proton Energy reserves the right to make changes without further notice to this product.

Consult Proton Energy Systems Applications Department for proper installation guidelines. Specifications subject to change.



PD-0600-0068 Rev. 5
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