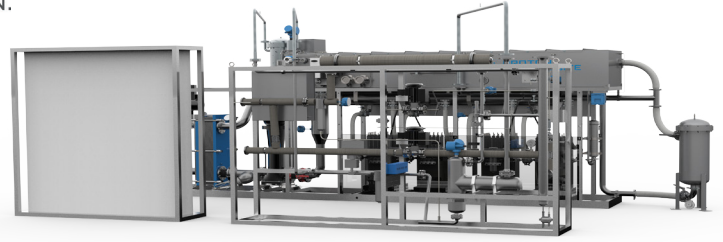


M Series

Hydrogen Generation Systems



MODEL	M100	M200	M400
Features	Fully-automated MW-class on-site hydrogen generator utilizing a modular skid-based design. Tri-mode operation (selectable): <ul style="list-style-type: none"> • Command-following mode allows operation based on available input power. • Load Following mode automatically adjusts output 0-100% to match demand. • Tank Filling mode operates 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 SCF/hr @ 70°F, 1 atm SLPM @ 70°F, 1 atm kg per 24 hours	104 Nm ³ /hr 3970 SCF/hr 1874 SLPM 225 kg/24hr	209 Nm ³ /hr 7970 SCF/hr 3762 SLPM 452 kg/24hr	417 Nm ³ /hr 15882 SCF/hr 7495 SLPM 902 kg/24hr
Delivery Pressure - Nominal	30 barg / 435 psig; Full Differential Pressure H ₂ Over O ₂		
Hydrogen Purity	> 99.9% Water Vapor < 500 ppm, N ₂ < 2 ppm, O ₂ < 1 ppm, All others undetectable		
With Optional High Purity Dryer	ISO 14687-1:1999 Type 1 Grade C / ISO 14687-2:2012 Type 1 grade D > 99.9995% Water Vapor < 2 ppm, N ₂ < 2 ppm, O ₂ < 1 ppm, All others undetectable		
ELECTRICAL POWER CONSUMPTION			
MW's @ Cell Stack(s)	0.51	1.0	2.1
MW's @ System	0.55	1.1	2.2
Power Consumed per Volume of H ₂ Gas Produced ¹ Mass of H ₂ Gas	5.3 kWh/Nm ³ 59 kWh/kg		
SYSTEM OPERATION			
Start-Up Time (from Off State)	<5 min		
Turndown Range	10 to 100% (Input Power Mode); 0 to 100% (H ₂ Demand Mode)		
Ramp-Up Time (Minimum to Full Load)	<10 Sec		
Ramp Rate (% of Full-Scale)	≥ 15% per sec (Power Input Mode)		
Upgradeability	Upgradeable in 250 kW (52 Nm ³ /hr) Increments		
DI WATER REQUIREMENT			
Consumption Rate at Maximum Production	93 L/hr 25 gal/hr	187 L/hr 49 gal/hr	373 L/hr 99 gal/hr
Maximum Inlet Flowrate	187 L/hr 49 gal/hr	373 L/hr 99 gal/hr	747 L/hr 197 gal/hr
Temperature	5°C to 40°C / 41°F to 104°F		
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)		

MODEL	M100	M200	M400
PHYSICAL CHARACTERISTICS- MASS (KG)			
Classified Area			
Water Circulation Skid (Operating)	5163	5481	10403
H2 Gas Management Skid	909	909	909
Unclassified Area			
Power Conversion Assembly (each) (Includes Rectifiers, Transformer, and AC Distribution)	6500	6500	6500
Power Conversion Quantity	1	2	4
MCC	909	909	909
Controls	300	300	300
PHYSICAL CHARACTERISTICS -DIMENSIONS (MM)			
Classified Area			
Water Circulation Skid	7197 W x 820 D x 2563 H	7197 W x 820 D x 2563 H	9918 W x 820 D 2141 H
H2 Gas Management Skid	3317 W x 575 D x 2083 H	3317 W x 575 D x 2083 H	3317 W x 575 D x 2083 H
Unclassified Area			
Power Conversion Assembly (each)		6200 W x 1200 D x 2850 H	
MCC		2032 W x 549 D x 2210 H	
Controls		1550 W x 382 D x 2190 H	
ENVIRONMENTAL CONSIDERATIONS			
Standard Siting Location	Indoor, 10-90% RH non-condensing for Classified & Unclassified Equipment Outdoor Siting Options Available		
Storage/Transport Temperature	5°C to 60°C / 41°F to 140°F		
Ambient Temperature Range	10°C to 40°C / 50°F to 104°F		
Altitude Range-Sea Level	1000 m /3281 ft		
ELECTRICAL SPECIFICATIONS			
Electrical specification	Typical installation: 10 kV and 20 kV, 3 phase + Neutral, 50Hz/60Hz; For lower voltage connection, consult Proton Applications Engineering Department for specific requirements and options. Ancillary equipment powered by Customer or optionally powered by Proton OnSite		
Power Quality	Designed to German TAB Specification		
OPTIONS			
<ul style="list-style-type: none"> • Factory Matched RO/DI Water System • Factory Matched Thermal Control Unit 	<ul style="list-style-type: none"> • Dew Point Monitoring • High Purity Hydrogen Dryer 	<ul style="list-style-type: none"> • Air Compressor • Containerization 	

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



PD-0600-0119 Rev A
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