



HYDROGEN GENERATORS

PROTON EXCHANGE MEMBRANE TECHNOLOGY





INTERNAL VIEW OF PROTON HYDROGEN PLANT

Hydrogen Production

Controls & Rectification

MVS Engineering, founded in 1977, is an Engineering company with in-depth knowledge and unparalleled experience in the Air & Gas Industry.

We are India's largest manufacturer and supplier of Nitrogen & Oxygen Gas generators & are leading supplier of various types of Hydrogen Gas Generators including Water Electrolysis, Ammonia Cracking and Hydrocarbon cracking methods such as Methanol and Natural Gas.



Proton OnSite, USA is the world's largest manufacturer of Bipolar Water Electrolysis Hydrogen Generators utilizing solid electrolyte technology. Proton has supplied its equipment to all 7 continents, over 65 countries and several thousand units are successfully operating the world over.



3 Independent Electrolyzers

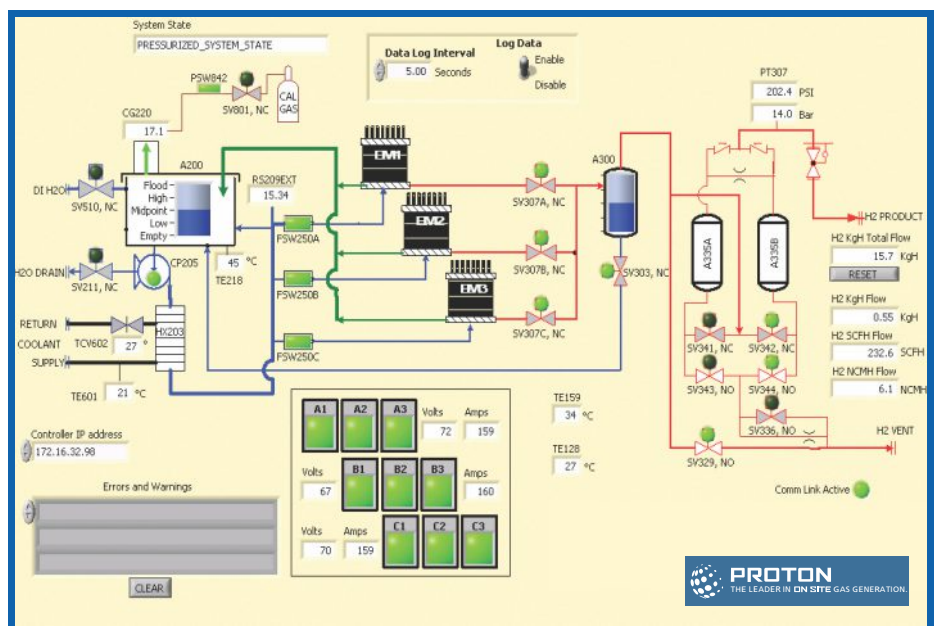
3 Independent Rectifiers

Front View
Doors Open

Proton OnSite offers the latest PEM technology based Hydrogen generators which they pioneered in 1996. Proton manufactures complete Hydrogen generators in USA at their facility near New York. MVS Engineering - Proton's engineering partner for South Asia, provides support and service across India and several other regions through our extensive team of engineers.

MVS Engineering has executed hundreds of Turnkey equipment installations in India and we are very adept at customizing the right-fit solution for our customer's gas needs. **MVS Engineering undertakes complete Turnkey solutions with the Proton Hydrogen Generator at the heart of the solution.**

REMOTE MONITORING INTERFACE



TECHNICAL SPECIFICATIONS



HYDROGEN PRODUCTION	S-SERIES	H-SERIES	C-SERIES
Model	S-10, S-20, S-40	H-2, H-4, H-6	C-10, C-20, C-30
Net Production Rate	0.265 Nm ³ /hr - 1.05 Nm ³ /hr	2 Nm ³ /hr - 6 Nm ³ /hr	10 Nm ³ /hr - 30 Nm ³ /hr
Delivery Pressure - Nominal	15 barg	15 barg Standard / 30 barg Optional	30 barg
Power Consumed	6.7 kWh/Nm ³ - H ₂	7.3 - 6.8 kWh/Nm ³ - H ₂	6.2 - 5.8 kWh/Nm ³ - H ₂
Purity	99.9995% H ₂ ; O ₂ < 1 PPM Water Vapour <5 PPM, -65°C Dewpoint	99.9995% H ₂ ; O ₂ < 1 PPM Water Vapour <5 PPM, -65°C Dewpoint	99.9998% H ₂ ; O ₂ < 1 PPM Water Vapour <2 PPM, -72°C Dewpoint
Turndown Range	0 to 100% net Product Delivery (Automatic)	0 to 100% net Product Delivery (Automatic)	0 to 100% net Product Delivery (Automatic)
DI WATER REQUIREMENT			
Rate at Max Consumption Rate	0.235 L/hr - 0.94 L/hr	1.83 L/hr - 5.50 L/hr	9 L/hr - 26.9 L/hr
Pressure	1.5 to 4 barg	1.5 to 4 barg	1.0 to 4.1 barg
Input Water Quality	ASTM Type II Deionized water <1 micro Siemen/ cm (> 1 megOhm-cm)	ASTM Type II Deionized water <1 micro Siemen/ cm (> 1 megOhm-cm)	ASTM Type II Deionized water <1 micro Siemen/ cm (> 1 megOhm-cm)
HEAT LOAD AND COOLANT REQUIREMENT			
Cooling	Air Cooled	Liquid - Cooled: Non-Fouling, 3 barg; 5°C to 30°C	Liquid - Cooled: Non-Fouling, 3 barg; 5°C to 30°C
Heat load from System	1.1 kW - 4.3 kW Max.	8.1 kW - 23.7 kW Max.	33.5 kW - 100.2 kW Max.
Coolant	Ambient Air, 5°C to 40°C	2 m ³ /hr - 5 m ³ /hr	7 m ³ /hr - 25 m ³ /hr
ELECTRICAL SPECIFICATIONS			
Recommended Breaker Rating	4 kVA - 12 kVA	22 kVA - 58 kVA	100 kVA - 275 kVA
Electrical Specification	205 V to 240 VAC, Single Phase, 50 Hz	380 V to 480 VAC, 3 Phase, 50 Hz	380, 400, 415 VAC, 3-Phase, 50 Hz (+/-) 10% from Nominal voltage
ENCLOSURE CHARACTERISTICS			
Dimensions (W x D x H)	79 cm x 97 cm x 107 cm (31" x 38" x 42")	180 cm x 81 cm x 191 cm (71" x 32" x 75")	Electrolyzer Enclosure: 239 cm x 91 cm x 201 cm (94" x 36" x 79") Power Supply Enclosure: 188 cm x 91 cm x 201 cm (74" x 36" x 79")
Weight	216 kg	682 - 773 kg	2041 - 2812 kg
Rating	IP22	IP66 for electronic compartment. IP43 for fluids compartment; Upgradeable to IP 56	Overall unit rating of IP56
ENVIRONMENTAL CONSIDERATIONS * DO NOT FREEZE*			
Standard Siting Location	Indoor, Non- hazardous/ non- classified environment	Indoor, Non- hazardous/ non- classified environment	Indoor/Sheltered, level ± 1', 0 to 100% RH non-condensing; Non-hazardous/ non-classified environment
Ambient temperature range	5°C to 40°C	5°C to 50°C	5°C to 40°C
SAFETY & REGULATORY CONFORMITY			
Maximum On-board H ₂ Inventory at full Production	0.016 Nm ³	0.04 Nm ³ @ 15 barg; 0.08 Nm ³ @ 30 barg	0.10 Nm ³ - 0.16 Nm ³ @ 30 barg
Approvals	cTUVus (UL and CSA equivalent), CE (PED, ATEX, LVD, Mach. Dir., EMC), NYFD Approval	cTUVus (UL and CSA equivalent), CE (PED, ATEX, LVD, Mach. Dir., EMC), NYFD Approval	cTUVus, Tmark (ISO22734-1 , UL508A) CE (PED, ATEX, LVD, Mach. Dir., EMC)

Technology Highlights

- **Alkaline-free technology.** No Potassium Hydroxide used.
- Compact Size.
- Can be installed in any Industrial premises and **does not require a separate building or shed.**
- Built to comply with following standards – **CE, UL, ATEX, NFPA.**
- **Does not require area under Group II C classification.**
- Hydrogen produced at high pressure without using booster compressor.
- Oxygen produced at low pressure and vented to atmosphere.
- No possibility of Oxygen mixing with Hydrogen due to differential pressure design.
- Operate automatically from 0 to 100% as per the process requirement.
- Fully unmanned operation.
- Life of components is very long due to circulation of pure **DM water** only inside the system.
- PLC redundancy is not necessary.
- No UPS is required for safe shutdown of hydrogen system.



6 Nm³/hr Hydrogen Generator
Installed inside TG Building in U.P.



20 Nm³/hr Hydrogen Generator
at Power Plant in M.P.



2 Nos. 30 Nm³/hr Hydrogen Generators
in Karnataka at world's largest MIM part manufacturer

INDUSTRIAL APPLICATIONS FOR HYDROGEN

- Metallurgical Processes (Annealing, Brazing, Sintering, Heat Treatment)
- Argon Purification
- Chemical & Petrochemicals
- Fuel Cell based Power Generation
- Power Plant – Alternator Cooling
- Glass Cutting/Forming
- Industrial Diamonds/Crystals
- Semi-Conductor (Epitaxy) / MOCVD
- Float Glass Furnace
- Hydrogenation Processes
- Powder Metallurgy
- High temperature welding
- Metals Processing
- Gas Chromatography

*Large Capacities of up to
400 m³/hr also available*

*Ask our Sales Team for
Technical Literature*



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