



H Series

Proton Exchange Membrane (PEM) Hydrogen Generation Systems



MODEL	H2	H4	H6
Description	On-site hydrogen generator in an integrated, automated, site-ready enclosure Load following operation automatically adjusts output to match demand Full differential pressure, H ₂ over O ₂		
Electrolyte	Proton Exchange Membrane (PEM) – caustic-free		
HYDROGEN PRODUCTION			
Nominal Production Rate Nm ³ /h (m ³ /h @ 0°C, 1 bar) SCF/h (ft ³ /h @ 70°F, 1 atm) kg/24 h	2 Nm ³ /h 76 SCF/h 4.31 kg/24 h	4 Nm ³ /h 152 SCF/h 8.63 kg/24 h	6 Nm ³ /h 228 SCF/h 12.94 kg/24 h
Delivery Pressure – Nominal	15 barg (218 psig); Optional 30 barg (435 psig)		
Power Consumption by System per Unit of H ₂ Gas Produced ¹	7.3 kWh/Nm ³ (19.2 kWh/100 SCF)	7.0 kWh/Nm ³ (18.5 kWh/100 SCF)	6.8 kWh/Nm ³ (17.8 kWh/100 SCF)
Purity (Concentration of Impurities)	99.999+% [H ₂ O < 5 ppm, -65°C (-85°F) Dew Point, 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 6 Nm ³ /h (228 SCF/h)		N/A
DI WATER REQUIREMENTS			
Minimum DI Water Flow Rate	15 l/h (4 gal/h)		
Consumption Rate at Maximum Production	2 l/h (0.53 gal/h)	4 l/h (1.06 gal/h)	6 l/h (1.59 gal/h)
Temperature	5 to 50°C (41 to 122°F)		
Pressure	1.5 to 4 barg (21.8 to 58 psig)		
Input Water Quality	Required: ASTM Type II Deionized Water, < 1 µS/cm (> 1 MΩ-cm) Preferred: ASTM Type I Deionized Water, < 0.1 µS/cm (> 10 MΩ-cm)		
HEAT LOAD AND COOLANT REQUIREMENTS			
Coolant ²	Liquid-cooled; non-freezing, non-fouling; 15 to 35°C (59 to 95°F); 25°C cooling water maximum for ambient temperatures above 40°C		
Maximum Heat Load (Cooling Requirement)	8.1 kW (27,368 BTU/h) (2.3 tons refrigeration)	16.1 kW (54,936 BTU/h) (4.6 tons refrigeration)	23.7 kW (80,868 BTU/h) (6.8 tons refrigeration)
Coolant Flow Rate	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)
Maximum Pressure	6.9 barg (100 psig)		
ELECTRICAL SPECIFICATIONS			
Maximum Power Required within Expected System Life	22 kVA	38 kVA	55 kVA
Electrical Requirements	380, 400, 415 VAC, three phase, 50 Hz (+/- 10% from nominal voltage) 480 VAC, three phase, 60 Hz (+/- 10% from nominal voltage)		

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INTERFACE CONNECTIONS – CONSULT MECHANICAL INTERFACE DIAGRAM DRAWING PD-9900-0034 FOR DETAILS				
H ₂ Product Port	1/4" compression tube fitting, SS			
H ₂ Vent Port	1/2" FNPT, SS			
DI Water Port	1/4" FNPT, SS			
Calibration–Gas Port	1/8" FNPT, brass			
Coolant Supply and Return Ports	1" FNPT, brass			
Drain Port	3/8" FNPT, brass			
Electrical	Electrical terminals at fused disconnect inside electrical compartment			
Communications	Modbus TCP/IP, 24 VDC dry contacts			
CONTROL SYSTEMS				
Standard Features	<ul style="list-style-type: none"> Fully automated, push button start/stop Automatic fault detection and system depressurization 		<ul style="list-style-type: none"> E-stop Remote start/stop Remote communications Optional: current command 	
Remote Shutdown	Hardwire input to safety PLC			
PHYSICAL CHARACTERISTICS				
Dimensions W x D x H	Product	180 cm x 81 cm x 191 cm (71" x 32" x 75")		
	Est. Shipping	206 cm x 104 cm x 216 cm (81" x 41" x 85") Note: Add 8 cm (3") to height for installed lifting brackets.		
Weight	Product	682 kg (1,500 lbs)	727 kg (1,600 lbs)	773 kg (1,700 lbs)
	Est. Shipping	807 kg (1,776 lbs)	858 kg (1,887 lbs)	908 kg (1,998 lbs)
IP Rating	IP66 for electrical compartment. IP43 for fluids compartment; Upgradeable to IP56.			
ENVIRONMENTAL CONSIDERATIONS – DO NOT FREEZE				
Standard Siting Location	Indoor, level ± 1°, 0 to 90% RH non-condensing, non-hazardous/non-classified environment			
Storage/Transport Temperature	5 to 60°C (41 to 140°F)			
Ambient Temperature Range	5 to 50°C (41 to 122°F)			
Altitude Range	Seal level to 2,000 m (6,562 ft)			
Room Ventilation	Proper ventilation must be provided from a non-hazardous area at a rate prescribed by the installation manual			
SAFETY AND REGULATORY CONFORMITY				
Maximum On-board H ₂ Inventory at Full Production	0.040 Nm ³ @ 15 barg; 0.08 Nm ³ @ 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, chapter 8 and EN 1127-1, clause 6.2 Vent fan draws fresh air up to 28 m ³ /min (1,000 ft ³ /min)			
Noise dB(A) at 1 Meter	< 83			
Conformity	cTUVus (UL and CSA equivalent), CE (PED, Mach. Dir., EMC), ISO 22734-1			



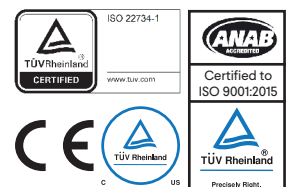
Specifications are subject to change. Please contact Nel Hydrogen for solutions to best fit your needs.

- Beginning of life and dependent on configuration and operating conditions.
- Consult Nel Hydrogen Applications Engineering Department for proper installation guidelines.

www.nelhydrogen.com | +1.203.949.8697 | sales@nelhydrogen.com

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