



## S Series

# Proton Exchange Membrane (PEM) Hydrogen Generation Systems



MODEL	S10	S20	S40
Description	On-site hydrogen generator in an integrated, automated, site-ready enclosure Tank filling mode Load following operation automatically adjusts output to match demand Full differential pressure, H <sub>2</sub> over O <sub>2</sub>		
Electrolyte	Proton Exchange Membrane (PEM) – caustic-free		
<b>HYDROGEN PRODUCTION</b>			
Nominal Production Rate Nm <sup>3</sup> /h (m <sup>3</sup> /h @ 0°C, 1 bar) SCF/h (ft <sup>3</sup> /h @ 70°F, 1 atm) kg/24 h	0.27 Nm <sup>3</sup> /h 10 SCF/h 0.58 kg/24 h	0.53 Nm <sup>3</sup> /h 20 SCF/h 1.14 kg/24 h	1.05 Nm <sup>3</sup> /h 40 SCF/h 2.27 kg/24 h
Delivery Pressure – Nominal	13.8 barg (200 psig)		
Power Consumption by System per Unit of H <sub>2</sub> Gas Produced <sup>1</sup>	6.1 kWh/Nm <sup>3</sup> (16.3 kWh/100 SCF)		
Purity (Concentration of Impurities)	99.999+% [H <sub>2</sub> O < 5 ppm, -65°C (-85°F) Dew Point, N <sub>2</sub> < 2 ppm, O <sub>2</sub> < 1 ppm, all other undetectable]		
Turndown Range	0 to 100% net product delivery (automatic)		
Upgradeability	N/A		
<b>DI WATER REQUIREMENTS</b>			
Consumption Rate at Maximum Production	0.26 l/h (0.07 gal/h)	0.47 l/h (0.13 gal/h)	0.94 l/h (0.25 gal/h)
Temperature	5 to 35°C (41 to 95°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)		
<b>HEAT LOAD AND COOLANT REQUIREMENTS</b>			
Coolant	Air-cooled; ambient air		
Maximum Heat Load	1.1 kW (3,754 BTU/h)	2.2 kW (7,507 BTU/h)	4.3 kW (14,673 BTU/h)
<b>ELECTRICAL SPECIFICATIONS</b>			
Maximum Power Required within Expected System Life	3 kVA	4.5 kVA	8.5 kVA
Electrical Requirements	220, 230, 240 VAC, single phase, 50/60 Hz (+/- 10% from nominal voltage)		

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<b>INTERFACE CONNECTIONS – CONSULT MECHANICAL INTERFACE DIAGRAM DRAWING PD-9900-0040 FOR DETAILS</b>			
H <sub>2</sub> Product Port	1/4" compression tube fitting, SS		
H <sub>2</sub> /H <sub>2</sub> O Vent Port	1/2" compression tube fitting, SS		
O <sub>2</sub> Vent Port	3/8" FNPT		
DI Water Port	1/4" tube push-to-lock, polypropylene		
Drain Port	1/4" tube push-to-lock polypropylene		
Electrical	Connect to on-board circuit breaker		
Communications	Modbus TCP/IP, 24 VDC dry contacts		
<b>CONTROL SYSTEMS</b>			
Standard Features	<ul style="list-style-type: none"> <li>Fully automated, push button start/stop</li> <li>Automatic fault detection and system depressurization</li> </ul>		<ul style="list-style-type: none"> <li>E-stop</li> <li>Remote start/stop</li> <li>Remote communications</li> <li>Optional: current command</li> </ul>
Remote Shutdown	Hardwire input to safety PLC		
<b>PHYSICAL CHARACTERISTICS</b>			
Dimensions W x D x H	Product	79 cm x 97 cm x 112 cm (31" x 38" x 45")	
	Est. Shipping	97 cm x 114 cm x 137 cm (38" x 45" x 55")	
Weight	Product	209 kg (460 lbs)	
	Est. Shipping	289 kg (635 lbs)	
IP Rating	IP 22		
<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 to 60°C (41 to 140°F)		
Ambient Temperature Range	5 to 40°C (41 to 104°F); Optional: 5 to 50°C (41 to 122°F)	5 to 40°C (41 to 104°F)	
Altitude Range	Seal level to 1,520 m (5,000 ft)		
Room Ventilation	Proper ventilation must be provided from a non-hazardous area at a rate prescribed by the installation manual		
<b>SAFETY AND REGULATORY CONFORMITY</b>			
Maximum On-board H <sub>2</sub> Inventory at Full Production	0.016 Nm <sup>3</sup> 0.56 SCF 0.001 kg		
Cabinet Ventilation with Environment	NFPA 69, chapter 8 and EN 1127-1, clause 6.2 Vent fan draws fresh air up to 28 m <sup>3</sup> /min (1,000 ft <sup>3</sup> /min)		
Noise dB(A) at 1 Meter	< 70		
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.

<sup>1</sup> Beginning of life and dependent on configuration and operating conditions.

