



PROTON® PEM

C Series

Hydrogen Generation Systems



MODEL	C10	C20	C30
	On-site hydrogen generator in two integrated, automated, site-ready enclosures Dual-mode Operation (Selectable): <ul style="list-style-type: none"> • Load Following mode automatically adjusts output 0-100% to match demand • Tank Filling mode operates with power-conservation mode during standby Full differential pressure, H ₂ over O ₂		
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	10 Nm ³ /hr 380 SCF/hr 179 SLPM 21.6 kg/24 hr	20 Nm ³ /hr 760 SCF/hr 359 SLPM 43.3 kg/24 hr	30 Nm ³ /hr 1,140 SCF/hr 538 SLPM 65.0 kg/24 hr
Delivery Pressure – Nominal	30 barg (435 psig)		
Power Consumption by System per Volume of H ₂ Gas Produced ¹	6.2 kWh/Nm ³ (16.3 kWh/100 ft ³)	6.0 kWh/Nm ³ (15.8 kWh/100 ft ³)	5.8 kWh/Nm ³ (15.2 kWh/100 ft ³)
Power Consumed per Mass of H ₂ Gas Produced ¹	68.9 kWh/kg	66.7 kWh/kg	64.5 kWh/kg
Purity (Concentration of Impurities)	ISO 14687-1 Type 1 grade C ISO 14687-2 Type 1 grade D 99.9998% [H ₂ O < 2 ppm, -72°C (-98°F) Dew Point, N ₂ < 2 ppm, O ₂ < 1 ppm, all others undetectable]		
Turndown Range	0-100% net product delivery (automatic)		
Upgradeability	Field upgradeable to a maximum of 30 Nm ³ /hr (1,140 SCF/hr)		N/A
DI WATER REQUIREMENT			
Consumption Rate at Maximum Production	9 L/hr (2.4 gal/hr)	17.9 L/hr (4.7 gal/hr)	26.9 L/hr (7.1 gal/hr)
Temperature	5-40°C (41-104°F)		
Pressure	1.0-4.1 barg (10-60 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 REQUIREMENT			
Coolant ²	Liquid cooled; non-freezing, non-fouling; 5-35°C (41-95°F)		
Maximum Heat Load (Cooling Requirement)	32 kW 109,189- BTU/hr (9.1 tons refrigeration)	64 kW 218,377 BTU/hr (18.2 tons refrigeration)	96 kW 327,566 BTU/hr (27.3 tons refrigeration)
Coolant Flowrate	Up to 92 L/min (24.3 gal/min)	Up to 144 L/min (38 gal/min)	Up to 200 L/min (52.8 gal/min)
Pressure Drop (at Full Flow)	Up to ~1.1 barg (~14.5 psig)	Up to ~1.1 barg (~14.5 psig)	Up to ~1.1 barg (~14.5 psig)
ELECTRICAL SPECIFICATIONS			
Maxium Power Required within Expected System Life	85 kVA	160 kVA	236 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)		

MODEL	C10	C20	C30
INTERFACE CONNECTIONS – CONSULT MECHANICAL INTERFACE DIAGRAM DRAWING PD-9900-0039 FOR DETAILS			
H ₂ Product Port	3/8" Parker CPI™ compression tube fitting, SS		
H ₂ Vent Port	1" Parker CPI™ compression tube fitting, SS		
O ₂ Vent Port	1" Parker CPI™ compression tube fitting, SS		
DI Water Port	1/2" FNPT, SS		
Coolant Supply and Return Ports	Electrolyzer Enclosure: 1 1/2" MNPT, brass (Cell Stack); 1/2" FNPT, brass (Hydrogen Dryer) Power Supply Enclosure: 1 1/2" MNPT, brass (Power Supply Cooling)		
Drain Port	1/2" FNPT, brass		
Electrical	Electrical terminals at fused disconnect inside power supply enclosure		
Communications	Ethernet		
CONTROL SYSTEMS			
Standard Features	<ul style="list-style-type: none"> Fully automated, push button start/stop Automatic fault detection and system depressurization E-stop 		<ul style="list-style-type: none"> Remote start/stop On-board H₂ leak detection
Remote Alarm	Form C relay, 5 A, 250 V, 150 W Maximum rated switching		
Remote Shutdown	Safety circuit trip		
PHYSICAL CHARACTERISTICS			
Dimensions W x D x H	Product Est. Shipping	Electrolyzer Enclosure: 252 cm x 116 cm x 201 cm (99" x 46" x 79") Power Supply Enclosure: 169 cm x 103 cm x 201 cm (67" x 41" x 79") Electrolyzer Enclosure: 269 cm x 122 cm x 225 cm (106" x 48" x 89") Power Supply Enclosure: 269 cm x 122 cm x 225 cm (106" x 48" x 89")	
Weight	Product Est. Shipping	2,734 kg (6,026 lbs) 2,876 kg (6,340 lbs)	2,924 kg (6,446 lbs) 3,089 kg (6,810 lbs)
IP Rating	Overall unit rating of IP56		
ENVIRONMENTAL CONSIDERATIONS – DO NOT FREEZE			
Standard Siting Location	Indoor/sheltered; level ±1°, 0-100% RH non-condensing, non-hazardous/non-classified environment		
Storage/Transport Temperature	5-60°C (41-140°F)		
Ambient Temperature Range	5-40°C (41-104°F)		
Altitude Range – Sea Level	2,000 m (6,562 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	0.13 Nm ³ 4.9 SCF 0.011 kg	0.17 Nm ³ 6.4 SCF 0.015 kg	0.18 Nm ³ 7 SCF 0.016 kg
Cabinet Ventilation with Environment	Vent fan draws fresh air up to 8.5 Nm ³ /min (300 ft ³ /min)		
Noise dB(A) at 1 Meter	< 75		
Conformity	cTUVus (UL and CSA equivalent), CE (PED, Mach. Dir., EMC), ISO22734-1		
OPTIONS			
<ul style="list-style-type: none"> Factory matched RO/DI water system Factory matched cooler/chiller 	<ul style="list-style-type: none"> Low ambient temperature package (-10°C to 40°C) 	<ul style="list-style-type: none"> High ambient temperature package (5°C to 50°C) 	<ul style="list-style-type: none"> Dew point monitoring Equipment orientation



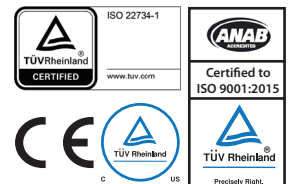
Specifications are subject to change. Please contact Nel Hydrogen for solutions to best fit your needs.

- Dependent on configuration and operating conditions.
- Consult Nel Hydrogen Applications Engineering Department for specific requirements and cooling water temperatures other than 35°C.

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

MADE IN USA

© 2019 Nel ASA. All Rights Reserved. Nel, number one by nature, Proton, and the Nel and Proton logos are trademarks of Nel ASA or its subsidiaries.



PD-0600-0068 Rev G