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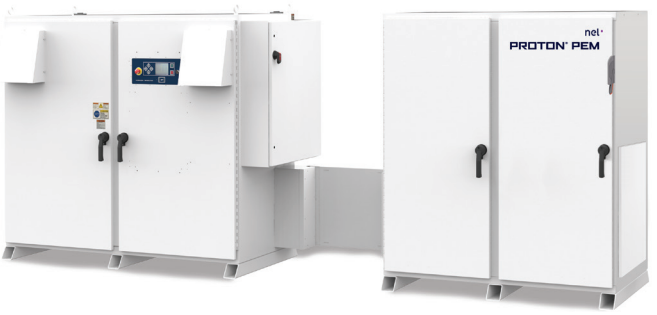
PROTON® PEM

C Series

Hydrogen Generation Systems



MODEL	C10	C20	C30
Description	On-site hydrogen generator in two integrated, automated, site-ready enclosures Dual-mode Operation (Selectable): • 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			
Nominal Production Rate Nm^3/h @ 0°C, 1 bar SCF/h @ 70°F, 1 atm SLPM @ 70°F, 1 atm kg/24 h	10 Nm^3/h 380 SCF/h 179 SLPM 21.6 kg/24 h	20 Nm^3/h 760 SCF/h 359 SLPM 43.3 kg/24 h	30 Nm^3/h 1,140 SCF/h 538 SLPM 65.0 kg/24 h
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_2O < 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/h (1,140 SCF/h)		N/A
DI WATER REQUIREMENT			
Consumption Rate at Maximum Production	9 L/h (2.4 gal/h)	17.9 L/h (4.7 gal/h)	26.9 L/h (7.1 gal/h)
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/h) (9.1 tons refrigeration)	64 kW (218,377 BTU/h) (18.2 tons refrigeration)	96 kW (327,566 BTU/h) (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)		

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INTERFACE CONNECTIONS – CONSULT MECHNICAL 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		• Fully automated, push button start/stop • Automatic fault detection and system depressurization • E-stop		• Remote start/stop • On-board H_2 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)	3,076 kg (6,781 lbs) 3,241 kg (7,145 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				
• Factory matched RO/DI water system • Factory matched cooler/chiller		• Low ambient temperature package (-10°C to 40°C)	• High ambient temperature package (5°C to 50°C)	• Dew point monitoring • Equipment orientation

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

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

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MADE IN USA

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