



C Series

Proton Exchange Membrane (PEM) Hydrogen Generation Systems



MODEL	C10	C20	C30
Description	On-site hydrogen generator in two integrated, automated, site-ready enclosures Load following operation automatically adjusts output 0 to 100% 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 @ 0°C, 1 bar SCF/h @ 70°F, 1 atm kg/24 h	10 Nm ³ /h 380 SCF/h 21.6 kg/24 h	20 Nm ³ /h 760 SCF/h 43.3 kg/24 h	30 Nm ³ /h 1,140 SCF/h 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 ₂ O < 2 ppm, -72°C (-98°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 30 Nm ³ /h (1,140 SCF/h)		N/A
DI WATER REQUIREMENTS			
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 to 40°C (41 to 104°F)		
Pressure	1.0 to 4.1 barg (10 to 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 REQUIREMENTS			
Coolant ²	Liquid cooled; non-freezing, non-fouling; 5 to 35°C (41 to 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 Flow Rate	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)		
Maximum Pressure	4.1 barg (60 psig) continuous		
ELECTRICAL SPECIFICATIONS			
Maximum 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 MECHANICAL INTERFACE DIAGRAM DRAWING PD-9900-0039 FOR DETAILS				
H ₂ Product Port	3/8" compression tube fitting, SS			
H ₂ Vent Port	1" compression tube fitting, SS			
O ₂ Vent Port	1" 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	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 E-stop 		<ul style="list-style-type: none"> Remote start/stop On-board H₂ leak detection Remote communications 	
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	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")		
	Est. Shipping	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	2,734 kg (6,026 lbs)	2,924 kg (6,446 lbs)	3,076 kg (6,781 lbs)
	Est. Shipping	2,876 kg (6,340 lbs)	3,089 kg (6,810 lbs)	3,241 kg (7,145 lbs)
IP Rating	Overall unit rating of IP44			
ENVIRONMENTAL CONSIDERATIONS – DO NOT FREEZE				
Standard Siting Location	Indoor/sheltered; level ±1°, 0 to 100% 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)			
Altitude Range – Sea Level	2,000 m (6,562 ft)			
Room Ventilation	Proper ventilation must be provided from a non-hazardous area, at a rate consistent with the cabinet ventilation rate listed below			
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 Dew point monitoring 	<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"> Equipment orientation Current command 	



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.

