



## MC Series Modular Plants

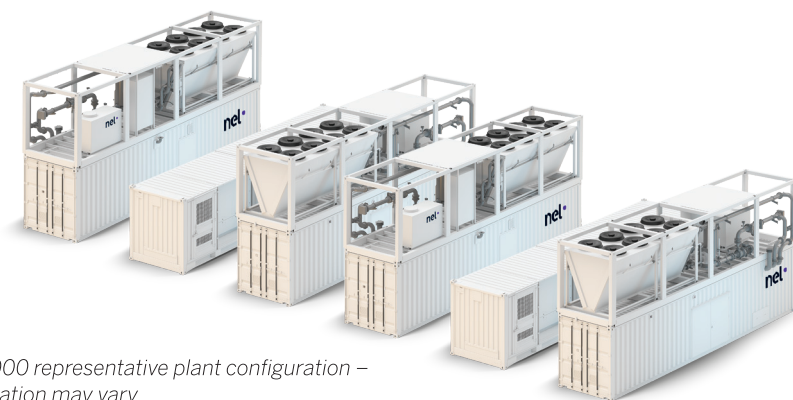
### Proton Exchange Membrane (PEM) Electrolyser Systems



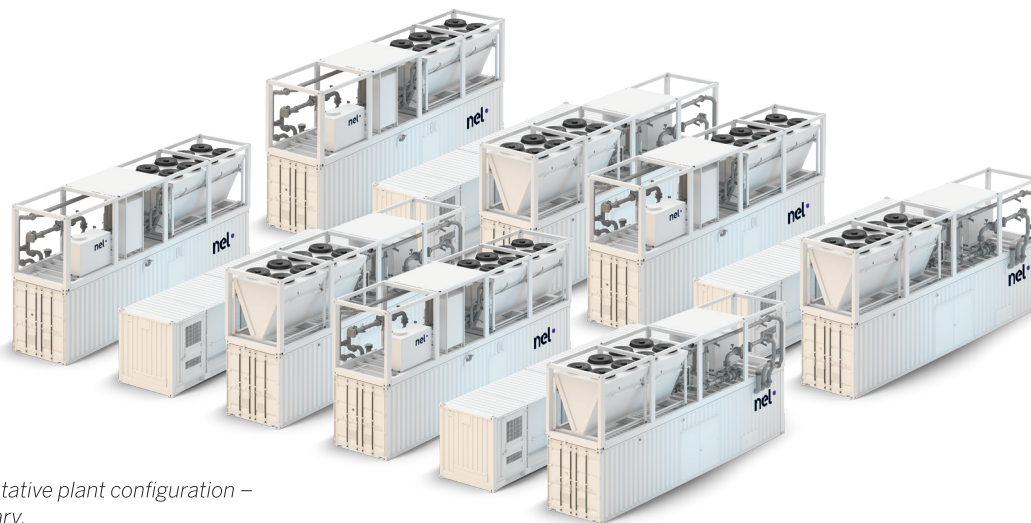
MC1000 representative plant configuration – installation may vary.

MODEL	MC1000	MC2000	MC4000
Class	5 MW	10 MW	20 MW
Description	Fully-automated MW-class on-site hydrogen generator utilizing a modular containerized design for ease of installation and integration		
Technology	Proton Exchange Membrane (PEM)		
HYDROGEN PRODUCTION			
Nominal Production Rate Nm³/h (m³/h @ 0°C, 1 bar) kg/24 h	984 Nm³/h 2,124 kg/24 h	1,968 Nm³/h 4,248 kg/24 h	3,936 Nm³/h 8,496 kg/24 h
Delivery Pressure – Nominal	30 barg (435 psig); full differential pressure H <sub>2</sub> over O <sub>2</sub>		
Power Consumption at Stack per Unit of H <sub>2</sub> Gas Produced at 100% Capacity¹	4.7 kWh/Nm³ 53.2 kWh/kg		
Power Consumption by System per Unit of H <sub>2</sub> Gas Produced at 100% Capacity¹	5.04 kWh/Nm³ 56.77 kWh/kg		
Purity (concentration of impurities)	99.95% [H <sub>2</sub> O < 500 ppm, N <sub>2</sub> < 2 ppm, O <sub>2</sub> < 1 ppm, all others undetectable]		
Purity (concentration of impurities with optional high purity dryer)	ISO 14687:2019(E) Type I, Type II Grade D and SAE J-2719 Type I Grade L 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 others undetectable]		
Start-up Time (from standby)	< 8 min		
Ramp-up Time (minimum to full load)	< 15 sec		
Ramp Rate (% of full-range)	≤ 7.4% per sec		
Turndown Range	20 to 100% (automatic)²		
POTABLE WATER REQUIREMENTS			
Consumption³	1.5 l/Nm³ of H <sub>2</sub> (0.4 gal/Nm³ of H <sub>2</sub> ) 15.9 l/kg of H <sub>2</sub> (4.2 gal/kg of H <sub>2</sub> )		
Temperature	5 to 35°C (41 to 95°F)		
Pressure	2.7 to 4.8 barg		
Input Water Quality³	Potable, subject to site water quality analysis		
Water Purification System (included)	Reverse Osmosis/Electrodeionization (RO/EDI)		

MODEL	MC1000	MC2000	MC4000
ELECTRICAL SPECIFICATIONS			
Electrical Requirements	Medium voltage: 4.16 to 35 kV, three phase 50/60 Hz Low voltage, three phase required for balance of plant and ancillary equipment Backup, low voltage, three phase required for emergency heating for freeze protection		
Power Quality (medium voltage)	Total harmonic distortion: < 5%, power factor: > 0.9		
PHYSICAL CHARACTERISTICS			
Footprint <sup>4</sup>	315 m <sup>2</sup> (3,400 ft <sup>2</sup> )	561 m <sup>2</sup> (6,050 ft <sup>2</sup> )	1,053 m <sup>2</sup> (11,400 ft <sup>2</sup> )
ENVIRONMENTAL CONSIDERATIONS – DO NOT FREEZE			
Standard Siting Location	Outdoor, pad mounted Flatness/levelness 35/25 per AC 117-10 Bottom access for AC and DC electrical connections, water and drains		
Storage/Transport Temperature	5 to 60°C (41 to 140°F)		
Ambient Temperature	-30 to 40°C (-22 to 104°F) <sup>5</sup>		
Altitude Range	Sea level to 2,000 m (6,562 ft)		



MC2000 representative plant configuration – installation may vary.



MC4000 representative plant configuration – installation may vary.

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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.
- <sup>2</sup> If lower than 20% plant turndown is required, consult Nel Engineering.
- <sup>3</sup> Potable water quality can affect usage, see SFM1087.
- <sup>4</sup> Site conditions may cause the design to vary. <sup>5</sup> High ambient temperature package available.

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