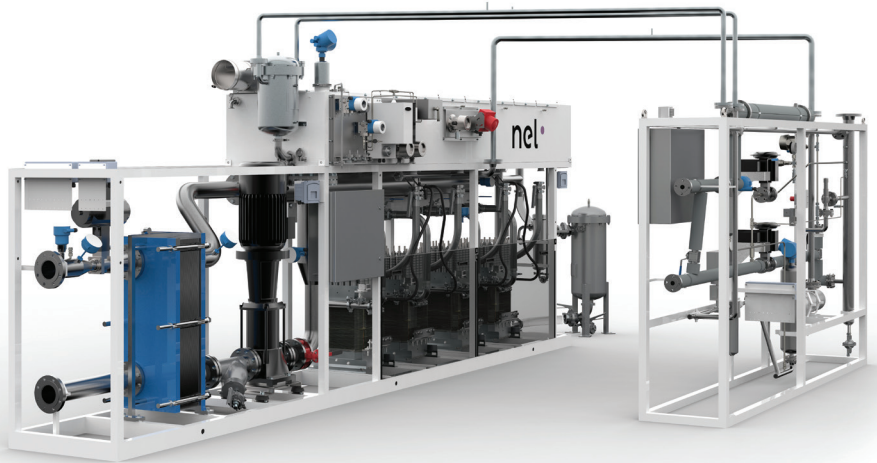




M Series

Hydrogen Generation Systems



MODEL	M100	M200	M400
	Fully-automated MW-class on-site hydrogen generator utilizing a modular skid-based design Tri-mode operation (selectable): <ul style="list-style-type: none"> <li>• Command-following mode allows operation based on available input power</li> <li>• Load following mode automatically adjusts output 0-100% to match demand</li> <li>• Tank filling mode operates with power-conservation mode during standby</li> </ul>		
ELECTROLYTE	Proton Exchange Membrane (PEM) – Caustic-Free		
HYDROGEN PRODUCTION			
Nominal Production Rate Nm <sup>3</sup> /hr @ 0°C, 1 bar SCF/hr @ 70°F, 1 atm SLPM @ 70°F, 1 atm kg per 24 hours	100 Nm <sup>3</sup> /hr 3,804 SCF/hr 1,795 SLPM 216 kg/24 hr	200 Nm <sup>3</sup> /hr 7,608 SCF/hr 3,590 SLPM 431 kg/24 hr	400 Nm <sup>3</sup> /hr 15,217 SCF/hr 7,180 SLPM 864 kg/24 hr
Delivery Pressure – Nominal	30 barg (435 psig); full differential pressure H <sub>2</sub> over O <sub>2</sub>		
Power Consumed at Stack by System	0.51 MW 0.55 MW	1.0 MW 1.1 MW	2.1 MW 2.2 MW
Power Consumption at Stack per Volume of H <sub>2</sub> Gas Produced <sup>1</sup>	4.95 kWh/Nm <sup>3</sup>		
Power Consumed at Stack per Mass of H <sub>2</sub> Gas <sup>1</sup>	55 kWh/kg		
Purity (Concentration of Impurities)	99.9% 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 14687-1:1999 Type 1 Grade C / ISO 14687-2:2012 Type 1 Grade D 99.9995% H <sub>2</sub> O < 2 ppm, N <sub>2</sub> < 2 ppm, O <sub>2</sub> < 1 ppm, all others undetectable		
Start-Up Time (from Off State)	<5 min		
Ramp-Up Time (Minimum to Full Load)	<10 Sec		
Ramp Rate (% of Full-Scale)	≥ 15% per sec (Power Input Mode)		
Turndown Range	10-100% (Input Power Mode); 0-100% (H <sub>2</sub> Demand Mode)		
Upgradeability	Field upgradeable in 250 kW (52 Nm <sup>3</sup> /hr) increments		
DI WATER REQUIREMENT			
Consumption Rate at Maximum Production	93 L/hr (25 gal/hr)	187 L/hr (49 gal/hr)	373 L/hr (99 gal/hr)
Temperature	5°C to 40°C (41°F to 104°F)		
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)		

MODEL		M100	M200	M400
<b>ELECTRICAL SPECIFICATIONS</b>				
Electrical Requirements	Typical installation: 10 kV and 20 kV, three phase + Neutral, 50Hz/60Hz; for lower voltage connection, consult Nel Hydrogen Applications Engineering Department for specific requirements and options Ancillary equipment powered by customer or optionally powered by Nel Hydrogen			
Power Quality	Designed to German TAB specification			
<b>PHYSICAL CHARACTERISTICS</b>				
Power Conversion Assembly – Includes Rectifiers, Transformer and AC Distribution	Quantity	1	2	4
Classified Area Dimensions W x D x H	Water Circulation Skid	720 cm x 82 cm x 256 cm (283" x 32" x 101")	720 cm x 82 cm x 256 cm (283" x 32" x 101")	992 cm x 82 cm x 214 cm (390" x 32" x 843")
	H <sub>2</sub> Gas Management Skid	332 cm x 58 cm x 208 cm (131" x 23" x 82")	332 cm x 58 cm x 208 cm (131" x 23" x 82")	332 cm x 58 cm x 208 mm (131" x 23" x 82")
Unclassified Area Dimensions W x D x H	Power Conversion Assembly (each)	620 cm x 120 cm x 285 cm (244" x 47" x 112")		
	MCC	203 cm x 55 cm x 221 cm (80" x 22" x 87")		
	Controls	155 cm x 38 cm x 219 cm (61" x 15" x 86")		
Classified Area Weight	Water Circulation Skid (Operating)	5,163 kg (11,382 lbs)	5,481 kg (12,084 lbs)	10,403 kg (22,935 lbs)
	H <sub>2</sub> Gas Management Skid	909 kg (2,004 lbs)	909 kg (2,004 lbs)	909 kg (2,004 lbs)
Unclassified Area Weight	Power Conversion Assembly (each)	6,500 kg (14,330 lbs)	6,500 kg (14,330 lbs)	6,500 kg (14,330 lbs)
	MCC	909 kg (2,004 lbs)	909 kg (2,004 lbs)	909 kg (2,004 lbs)
	Controls	300 kg (661 lbs)	300 kg (661 lbs)	300 kg (661 lbs)
<b>ENVIRONMENTAL CONSIDERATIONS - DO NOT FREEZE</b>				
Standard Siting Location	Indoor, 10-90% RH non-condensing for Classified and Unclassified Equipment Outdoor siting options available			
Storage/Transport Temperature	5°C to 60°C (41°F to 140°F)			
Ambient Temperature Range	10°C to 40°C (50°F to 104°F)			
Altitude Range-Sea Level	1,000 m (3,281 ft)			
<b>OPTIONS</b>				
<ul style="list-style-type: none"> <li>• Factory matched RO/DI water system</li> <li>• Factory matched thermal control unit</li> <li>• Dew point monitoring</li> </ul>		<ul style="list-style-type: none"> <li>• High purity hydrogen dryer</li> <li>• Air compressor</li> <li>• Containerization</li> </ul>		



Specifications are subject to change based on siting and configuration. Please contact Nel Hydrogen for solutions to best fit your needs.

<sup>1</sup>. Dependent on configuration and operating conditions.

