M Series M18
Hydrogen Generator

The Methanol to Hydrogen fuel delivery solution for marine vessels

- *Clean, safe, efficient & economical*
- *AiP with Lloyds and ABS*
- *Reduces carbon emissions*

Fuel cell grade Hydrogen generation without electrolysis

e1 Marine's Hydrogen generation technology generates Hydrogen from Methanol without electrolysis – on land, on board, and on demand. This proven solution is robust and efficient, enabling you to reduce your vessel's carbon emissions, while safely and economically re-powering your fleet for greater range and operational flexibility.

e1® Marine
Getting hydrogen to work

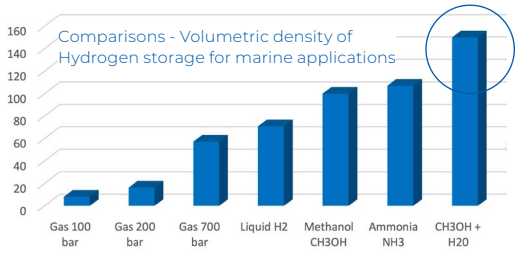
M Series M18 **Hydrogen Generator**

Hydrogen on demand - when you need it, where you need it!

The e1 Marine M Series M18 is scalable, compact and can easily integrate with PEMFCs and a variety of vessel fuel cell power applications.

Applications:

- Marine Power - primary propulsion and secondary auxiliary
- Cold Ironing & Bunkering - shore to ship
- Electric Vessel (EV) Charging Stations



50% more Hydrogen is available when water is added to methanol

Advantages:

- On-board, on-demand fuel cell grade Hydrogen production
- Eliminates the need for high pressure hydrogen tanks
- Modular, scalable power output supporting MW power solutions
- High energy efficiency: > 80%
- Uses low-cost, low-volatility Methanol/DI water feedstock
- Zero NOx, SOx, and particulate matter emissions
- Net zero CO_2 emission with renewable Methanol feedstock
- Low noise - low vibration
- Designed for cyclic & variable operations

SYSTEM ARCHITECTURE	
H_2 Generator System	Includes fuel pump, air blower, fuel reformer, H_2 purifier, controls
H_2 Purifier	Proprietary bi-metallic membrane purifier
H_2 PRODUCT	
Output	1,800 slm | 10 kg/hr (max output)
Purity	≥99.97% (dry basis) with <0.2 ppm CO_2 (meets ISO 14687 purity standard)
H_2 Buffer Tank Delivery Pressure	0.7-2.0 barg | 10-30 psig
EFFICIENCY	
Methanol/Water Consumption	132 L/hr | 34.8 gal/hr average at 1,800 slm hydrogen production
Efficiency at Steady State Optimal	>80%
CONTROL OPTIONS	
Controls	Woodward LECM control package
Communication Protocol	CAN - SAE j1939
Operating Modes	Automated or Manual
Remote Access	Optional: Access to Wi-Fi required for remote access
ELECTRICAL POWER REQUIREMENTS	
Cold Startup Mode	≤7 kW at 200 VDC/VAC (Constant), <0.1 kW at 24 VDC
Hot Standby	≤1 kW at 24 VDC
H_2 Production Mode	≤2 kW at 200 VDC/VAC (avg. energy consumption), <0.1kW at 24 VDC
Minimum Power to H_2 Generator	~35 A at 200 VAC, 35A at 24 VDC
STARTUP TIME	
From Ambient Temperature	Typically <24 hrs. depending on system power conditions & ambient temp.
From Hot Standby	< 5 min to H_2 production; < 30 min to rated H_2 production
ENVIRONMENT	
Temperature Range	+5°C to 45°C | 41°F to 113°F
Maximum Altitude	2,500 m | 8,200 ft
DIMENSIONS	
Size (L x W x H) / Volume	3.13 M^3 (2019mm x 997mm x 1554mm (3.2m^3) | 110.5 ft3 (79.5" x 39.25" x 61.2"ft)
Weight	1,550 kg (~3,400 lbs.)
FEEDSTOCK REQUIREMENTS	
Methanol/Water DI Blend Ratio	Premixed | Methanol 62.5+/- 0.5 wt% with balance DI water
Methanol Specifications	Methanol must meet IMPCA purity standard
De-Ionized Water Specifications	DI water must ≥ 14MΩ-cm

Place QR Code here

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* Specifications subject to change