

BALLARD™

FCwave™

Fuel Cell Power for Marine Applications

Ballard's 200 kW system, FCwave™, is designed to provide zero-emission power to vessels. The culmination of product development and field experience based on more than 150 million kilometers of heavy-duty vehicle operation, FCwave™ leverages Ballard's proven technology to deliver reliable performance, high power density and provide economical zero-emission solutions for marine use.

Ballard's FCwave™ is developed and tested for marine environments, and is the world's first DNV Type Approved Fuel Cell for marine applications. The system is scalable from 200kW to MWs which suits a broad range of vessels operating on short or longer and demanding routes.



Features

Modular, Scalable Power

Available in 200 kW increments, FCwave™ facilitates scalable power output and flexible integration to the vessel.

Low Lifecycle Cost

Low total-cost-of-ownership, achieved through product performance optimization, common components across product platforms and low maintenance requirements.

Long Lifetime

Powered by Ballard's FCgen®-LCS heavy duty liquid cooled stack and designed to deliver long term performance.

Ease of Integration

The system is integrated into a clean-lined cabinet with easy access doors and all interfaces accessible from the front for service and maintenance.

Safe Operation

Designed hand-in-hand with the industry to withstand the rigors of the marine environment, FCwave™ is developed, tested and prepared for installation with an uncompromising focus on safety.

Remote Diagnostics

Diagnostics connection allows the customer to monitor performance data remotely and plan for preventative maintenance.

Technology Leadership

The same Ballard fuel cell technology powering FCwave™ is already proving itself in more than 3,600 fuel cell electric trucks and buses deployed worldwide.

Product Specifications

Performance

Rated power	200kW
Minimum power	55kW
Peak fuel Efficiency	53.5%
Operating voltage	350 – 720 V DC
Rated current ¹	2 x 300 A 1 x 550 A
System cooling output	Max 65° C

Stack technology

Heat management	Liquid cooled
H2 Pressure	3.5 – 6.5 Barg

Physical

Dimensions (L x w x h) ²	1209 mm x 741 mm x 2195 mm
Weight (estimate) ³	1000 kg
Environmental protection	IP44
Engine room (DNV GL CG-0339)	+0°C – +45°C
Minimum start-up temperature	0°C
Short-term storage temp	-40°C – +60°C

Reactants and Coolant

Type	Gaseous hydrogen
Composition	As per SAE spec. J2719 and ISO 14687:2019 Type I, Type II – Grade D
Oxidant	Air
Composition	Particulate, Chemical and Salt filtered
Coolant ⁴	Water or 50/50 glycol

Safety Compliance

Certifications ⁵	DNV-Type Approval
Enclosure	Sealed secondary barrier for hydrogen

Monitoring

Control interface	Ethernet, Can
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Emissions

Exhaust	Zero-emission
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¹ System output (1 x 550A output pending tests). ² Target size. ³ Includes: framed skid base, fuel cell stacks, plumbing and wiring, H2 enclosure, cooling system, air system, electrical panel, and miscellaneous (sensors, cable tray, etc.). ⁴ Customer coolant type. ⁵ Specific clauses within each standard