

BALLARD™

FC^{veloCity}-MD

Fuel Cell Power Module for Heavy Duty Motive Applications



Ballard's 30kW FC^{veloCity}-MD module was developed for use in zero-emission, battery dominant hybrid, heavy duty motive applications. The hydrogen fuelled power module is sized for smaller transit vehicles, and offers a low risk, versatile and easy installation solution for system integrators, with a design based on many years of transit experience, and backed by Ballard's unmatched expertise and experience.

Features

High Performance

Robust PEM fuel cells deliver the route flexibility, range, gradeability and top speeds demanded by transit operators.

Flexible Integration

Modular design with separate air subsystem enables flexible integration of components into the vehicle drive train and easy access for enhanced serviceability. The coolant pump is also included in the scope of supply.

High Temperature Operation

Permits a smaller cooling package for integration flexibility and generates HVAC heating, significantly improving overall vehicle fuel economy.

High Pressure System

Offers better performance, fuel efficiency and durability by preventing degradation of the fuel cell power module.

Fuel Efficiency

two to three times more efficient than CNG/ diesel engines, fuel cell buses reduce overall fuel consumption.

Remote Diagnostics

Wireless or direct connection provides access to performance data anytime on the road as well as in the service bay, enabling anticipation of required maintenance.

Proven Reliability & Durability

Demonstrated through exceptional bus availability and fuel cell module lifetime, with >30,000 hours of operation of a fuel cell power module in the field without failure.

Safety Features

Integrated safety system with ventilation fans, H₂ sensors, and smoke detectors built into the module to ensure highest safety and ease of installation.

System Integration Flexibility

Collaborating closely with the system integrator, Ballard supports the integration of a variety of drive systems to optimize the transit application.

Zero-Emission

PEM fuel cell power module to meet the mandates set by policy makers to reduce transportation emissions.

Humidification

Integrated humidification system is maintenance free and provides maximum system performance and durability through a wide range of environmental conditions.

Options

Freeze protection
Ground fault monitor

Sub-system

The FC^{veloCity}-MD includes a separate air-sub systems for simplified and flexible integration into the electric drive system. The air sub-system delivers air at a prescribed flow rate to the fuel cell stack to support the electrochemical reaction. Sub-system includes motor, controller, air compressor and a mass flow sensor.

Preliminary Product Specifications

Technology	Fuel cell	Proton exchange membrane
Performance	Rated net power	30kW
	Operating DC voltage range	85 – 180V
	Current	0–300 A
Physical	Dimensions (L x w x h)	900 x 480 x 375 mm ¹
	Weight	125 kg (fuel cell module)
Fuel	Type	Gaseous hydrogen
	Composition	As per SAE specification J2719
Operation	Oxidant	Air
	Stack coolant	50/50 pure ethylene glycol and deionized water WEG 600 to 700C
	Fuel supply pressure	8 barg nominal
	Fuel flow rate	0.7 g/s maximum
Safety Compliance	Design Standards	ISO 6469–2:2009 ² , ISO 6469–3:2009 ² and ISO 23273:2013 ²
	Enclosure	IP55
Monitoring	Control interface	CANbus
Emissions	Exhaust	Zero-emissions (no PM, NO _x , SO _x , CO or CO ₂)
	Sound level	Less than 75 dBA

¹ Freeze protection option adds 60mm in all dimensions

² Specific clauses within each standards