

**BALLARD™**

**FCmove™-HD**

# Fuel Cell Power Module for Heavy Duty Motive Applications



Ballard's FCmove™-HD is the next-generation heavy duty fuel cell power module for use in zero-emission motive applications. The hydrogen fuelled power module offers a durable, compact and easy installation solution for system integrators and vehicle OEMs, backed by Ballard's unmatched fuel cell expertise and experience.

## Features

### Lower Life Cycle Cost

With better fuel economy and fewer maintenance requirements, total cost of ownership is 35% lower than previous product generations.

### Simplified Integration

This complete package, with all subsystems fully integrated, has interfaces located on one panel to provide easier access for connections as well as maintenance.

### Robust Components

Designed with a new generation of more robust balance of plant components to improve reliability.

### System Integration Flexibility

Reducing the volume by 40% and weight by 35% has produced a low-profile power module that enables greater flexibility in commercial vehicle design.

### Freeze-Start Capability

Freeze start from -25°C, with no need to plug in the vehicle or use special start procedures.

### Humidification

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

### High Performance

Robust PEM fuel cells deliver the power, range, and efficiency demanded by fleet operators.

### Proven Reliability & Durability

Demonstrated through exceptional fuel cell stack lifetime, with >30,000 hours of operation and 97% module availability in service.

### High Temperature Operation

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

### Climate Protection

IP67-rated enclosure system guards against premature deterioration of key module components in extreme climates.

### 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

Direct or wireless connection allows customer to monitor performance data remotely, and anticipate preventative maintenance.

### Safety Features

integrated safety system with ventilation fans, and hydrogen sensor built into the module to ensure highest safety and ease of installation.

## Product Specifications\*

### Performance

Net system power	70kW
Operating system current	20 – 240 A
Operating system voltage	250 – 500 V
Idle power	8kW

### Physical

Dimensions (L x w x h) mm, excluding air filter	1525 x 812 x 367
Dimensions (L x w x h) mm, including air filter	1812 x 816 x 415
Weight	250 kg
Environmental protection	IP67
Operating temperature	-30°C – +50°C
Minimum start-up temperature	-25°C
Short-term storage temp	-40°C – +80°C

### Reactants and Coolant

Fuel Type	Caseous hydrogen
Fuel purity	As per SAE specification J2719
Fuel supply pressure	8 barg nominal
Peak fuel efficiency	57%
Oxidant	Air
Coolant	Ethylene glycol or propylene glycol min 20% to a max 60% by volume, balance DI water
Radiator coolant outlet temperature	60°C nominal

### Safety Compliance

Certifications	ISO 6469-2:2009 <sup>1</sup> ISO 6469-3:2011 <sup>1</sup> ISO 23273:2013 <sup>1</sup>
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### Monitoring

Control Interface	CANbus
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### Emissions

Exhaust	Zero-emissions (no PM, NOx, SOx, CO or CO <sub>2</sub> )
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<sup>1</sup> Specific clauses within each standard \* Specifications are subject to change without notice