

**BALLARD™**

**FCmove™-HD+**

# Fuel Cell Power for Medium Duty Applications



Ballard's FCmove™-HD+ is the next-generation medium heavy duty fuel cell power module for use in zero-emission motive applications. The FCmove™-HD+, offers a durable, compact, and easy installation solution for system integrators and vehicle OEMs—backed by Ballard's proven experience, unmatched product performance, and service quality promise.

## Features

### Lower Life Cycle Cost

With better fuel economy and fewer maintenance requirements, total cost of ownership is 40% 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

Available either in a low-profile or small footprint form factor to enable greater flexibility in commercial truck and bus vehicle designs.

### 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 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 >25,000 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

IP6K9K-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 (WiFi or cellular) 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	Engine Bay	Rooftop
Net system power	100 kW	100 kW
Operating system current	21 - 360 A	21 - 360 A
Operating system voltage	280 - 560 V	280 - 560 V 9kW
Idle power	9kW	
<b>Physical</b>		
Dimensions (L x w x h) mm, excluding air filter	1081 x 693 x 650	1709 x 771 x 359
Dimensions (L x w x h) mm, including air filter	N/A	2015 x 802 x 444
Weight	256 kg	280 kg
Environmental protection		IP6K9K
Operating temperature		-30°C - +50°C
Minimum start-up temperature		-25°C
Short-term storage temp		-40°C - +80°C
<b>Reactants and Coolant</b>		
Fuel type		Gaseous hydrogen
Fuel purity		As per SAE J2719 or ISO 14687:2019 grade D
Fuel supply pressure		8 barg nominal
Peak fuel efficiency		57%
Oxidant		Air
Coolant		Ethylene glycol min 0% to a max 60% by volume, balance DI water
Radiator coolant outlet temperature		60°C nominal
<b>Safety Compliance</b>		
Certifications <sup>1</sup>		ISO 6469-2:2009, ISO 6469-3:2011, ISO 23273:2013, SAE J2578, UN ECE Reg 10, ECE/Trans/180/Add.13, REACH
<b>Monitoring</b>		
Control Interface		CANbus
<b>Emissions</b>		
Exhaust		Zero-emissions (no PM, NOx, SOx, CO or CO <sub>2</sub> )

<sup>1</sup> Specific clauses within each standard \* Specifications are subject to change without notice