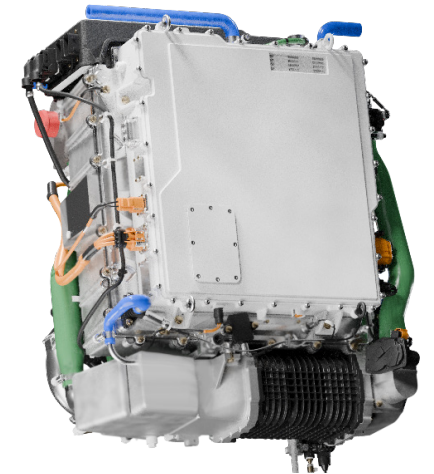
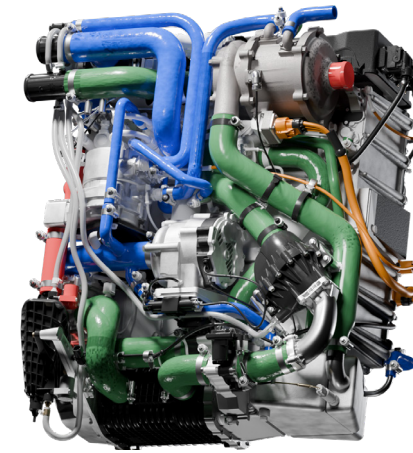




# Fuel Cell Power for Heavy Duty Applications

The FCmove<sup>®</sup>-XD is the latest development in Ballard's proven FCmove platform of high-performance fuel cell engines for zero-emission heavy-duty vehicles.

With a compact, powerful modular design, the FCmove<sup>®</sup>-XD modules are scalable from 120kW to 360kW as one engine and feature a single interface offering an easy integration solution for vehicle OEMs and integrators, backed by Ballard's proven experience, product performance and service quality promise.



## Features

### Low Total Cost of Ownership

High efficiency engine enabling long driving range.

### Scalable By Design

Easily incorporates up to 3 parallel connections for power output of 240kW or 360kW utilizing all the original connections.

### Proven Reliability & Durability

Demonstrated exceptional fuel cell stack lifetime, with >20,000 hours of operation and 98% in service module power availability.

### High Performance Stack

FCgen<sup>®</sup>-HPS stack is a high power density, high performance stack designed to meet stringent automotive standards.

### Freeze-Start Capability

Rapid freeze start from -30°C eliminates vehicle plug in or special start procedures.

### Compact Design

Integrated with a DC/DC converter and BOP components, this module easily connects to the architecture of the integrator with a 17% reduction in volume from previous models.

### Humidification

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

### High Temperature and Altitude Operation

Operation up to 90°C system outlet temperature and up to 1,500m with no power derate at beginning of life (BOL).

### Climate Protection

IP6K9K-rated enclosure guards against and protects key module components in extreme climates.

### High Pressure System

Offers better performance, fuel efficiency and durability by preventing degradation.

### Remote Diagnostics

Monitors performance data remotely to anticipate preventative maintenance.

### Safety Features

Fuel shut off, fuel pressure relief, touchsafe high voltage rated connectors, optional high voltage interlock configuration, H2 leak and fire detection, and an integrated redundant hardware safety system.

## Product Specifications<sup>1</sup>

### Performance with integrated DC/DC convertor

Net system power	BOL 120kW EOL 100kW
Operating system current <sup>2</sup>	10 - 230 A
Operating system voltage	520 - 750 V
Idle power	5kW

### Physical

Dimensions (L x W x H) mm	737 x 565 x 902
Weight	238 kg
Environmental protection	IP6K9K
Environmental operating temperature	-30°C - +40°C
Minimum start-up temperature	-30°C
Short-term storage temp	-40°C - +80°C

### Reactants and Coolant

Fuel type	Gaseous hydrogen
Composition	H <sub>2</sub> quality as per SAE J2719...201511, ISO 14687:2019 grade D
Fuel supply pressure	5 - 8 barg nominal
Peak fuel efficiency	60%
Oxidant	Air
Coolant	Ethylene glycol concentrate 0% to 50% by volume, balance DI water
Nominal radiator coolant outlet temperature	70°C

### Safety Compliance

Certifications	ISO23273:2013, ISO6469-2:2018, ISO6469-2:2018, SAE J2578:2014, UN ECE Reg 10, ECE/TRANS/180/Add.13, REACH, ISO/IATF 16949:2016, SAE J1939:2013, ISO 6469-4:2015
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### Monitoring

Control interface	CANbus
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### Emissions

Exhaust	Zero-emissions (no PM, NO <sub>x</sub> , SO <sub>x</sub> , CO or CO <sub>2</sub> )
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<sup>1</sup> Specifications are subject to change without notice

<sup>2</sup> Current range is calculated for a DC/DC high side system voltage of 520V

