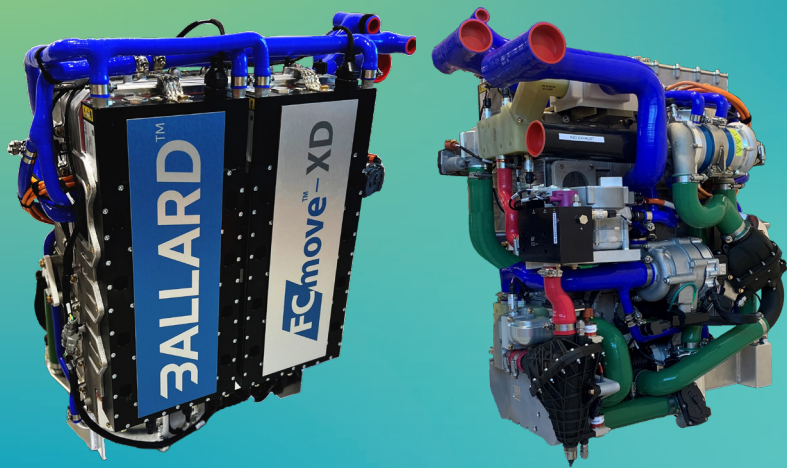


BALLARD™

FCmove™-XD

Fuel Cell Power for Heavy Duty Applications



Ballard's FCmove™-XD is the next-generation heavy duty fuel cell power module for use in zero-emission vehicles such as heavy duty trucks and bus coaches. This refined module offers a compact and easy installation solution for system integrators and vehicle OEMs that is always backed by Ballard's proven experience, unmatched product performance, and service quality promise.

Features

Low Total Cost of Ownership

High efficiency engine enabling long driving range of 600km under single fill.¹

Scalable By Design

Newly designed to easily incorporate parallel connection of modules for power output up to 360kW utilizing the original connection for fluid, communication, and control.

Proven Reliability & Durability

Demonstrated through exceptional fuel cell stack lifetime, with >25,000 hours of operation and 97% module power availability while in service

Compact Design to Enable Engine Bay Mounting

Highly integrated design with close-coupled DC/DC converter connects the fuel cell module to the high voltage architecture of the integrator.

Freeze-Start Capability

Rapid freeze start from -30°C eliminates vehicle plug in 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 Stack

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

High Temperature and High 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 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.

Remote Diagnostics

Monitor performance data remotely and anticipate preventative maintenance with direct or wireless connectivity.

Safety Features

Safety features include fuel shut off, fuel pressure relief, touch-safe high voltage rated connectors, optional high voltage interlock configuration, H2 leak and fire detection, and an integrated redundant hardware safety system.

Product Specifications with integrated DC/DC convertor¹

Performance with integrated DC/DC convertor

| | | |
|---------------------------------------|-------------|-----------|
| Net system power | 120kW | |
| Operating system current ² | 10 – 230 A | |
| Operating system voltage | 520 – 750 V | |
| Idle power | BOL 3 – 6kW | EOL 1 – 3 |

Physical

| | |
|---|-----------------|
| Dimensions (L x w x h) mm, excluding air filter | 596 x 745 x 985 |
| Weight | 250 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 | H2 quality as per SAE J2719_201511, ISO 14687:2019 grade D, GB/T 37244-2018 |
| Fuel supply pressure | 8 barg nominal |
| Peak fuel efficiency | 60% |
| Oxidant | Air |
| Coolant | Ethylene glycol concentrate 0% to 60% by volume, balance DI water |
| Nominal radiator coolant outlet temperature | 70°C |

Safety Compliance

| | |
|----------------|---|
| Certifications | ISO23273 2013, ISO6469-2 2009, ISO6469-3 2011, SAE J2578, UN ECE Reg 10, ECE/TRANS/180/Add.13 REACH |
|----------------|---|

Monitoring

| | |
|-------------------|--------|
| Control Interface | CANbus |
|-------------------|--------|

Emissions

| | |
|---------|--|
| Exhaust | Zero-emissions (no PM, NOx, SOx, CO or CO ₂) |
|---------|--|

¹ Specifications are subject to change without notice

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