

Fuel Cell Power Module for Heavy Duty Motive Applications

Description

Ballard's FCveloCity®-HD is the next-generation heavy duty fuel cell power module for use in zero-emission heavy duty motive applications. The hydrogen fuelled power module offers a low risk, versatile and easy installation solution for system integrators, 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 and coolant sub-systems enables flexible integration of components into the vehicle drive train and easy access for enhanced serviceability.

High Temperature Operation – permits a smaller cooling package for integration flexibility and generates HVAC heating, significantly improving overall vehicle fuel economy.

Climate Protection – IP-rated enclosure and freeze protection system to guard 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 – 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 >20,000 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.

PRODUCT SPECIFICATIONS

	HD60	HD85	HD100
Performance			
Net power	60 kW	85 kW	100 kW
Operating voltage range	220 - 350 VDC	280 - 420 V	400 - 580 V
Rated net current	288 A	288 A	288 A
Idle power	3.3 kW	4 kW	6 kW
Physical			
Fuel cell module			
• Dimensions (l x w x h) mm	1130 x 869 x 506	1130 x 869 x 506	1200 x 869 x 506
• Weight	244 kg	256 kg	285 kg
Coolant Subsystem			
• Dimensions (l x w x h) mm	← 737 x 529 x 379 →		
• Weight	← 44 kg →		
Air Subsystem			
• Dimensions (l x w x h) mm	← 676 x 418 x 352 →		
• Weight	← 61 kg →		
Reactants and Coolant			
Type	← Gaseous hydrogen →		
Composition	← As per SAE specification J2719 →		
Supply pressure	← 8 barg nominal →		
Oxidant	← Air →		
Coolant	← 50/50 pure ethylene glycol and deionized water WEG 60° to 70°C →		
Safety Compliance			
Certifications	ISO 6469-2:2009 ¹ ISO 6469-3:2011 ¹ ISO 23273:2013 ¹		
Enclosure	IP55		
Monitoring			
Control interface	← CANbus →		
Emissions			
Exhaust	← Zero-emissions (no PM, NOx, SOx, CO or CO2) →		

¹ Specific clauses within each standards

Sub-system

The FCveloCity®-HD includes separate air and coolant systems for simplified and flexible integration into the electric drive system. These two discrete modules have been designed, tested and validated for transit bus and light rail applications.



Coolant sub-system

Delivers a water/ethylene glycol (WEG) mixture at a prescribed flow rate to the fuel cell module. Sub-system includes coolant pump, piping, control valve and freeze protection.



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.