

Commercially Available Fuel Cell & Related Products

Manufacturer	Product Name	Application	Product Description and System Availability
Bloom Energy	ES-5700 Energy Server	Power Generation	All electric solid oxide fuel cell system
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	UPM-570 Uninterruptible Power Module	Power Generation	All electric solid oxide fuel cell system
Hydrogenics	HyPM XR	Back-up Power Generation	Compact, fully integrated rack mountable PEM fuel cell power module available in three power outputs - 4.5 kW, 8.5 kW and 12.5 kW
	HyPM HD Series Fuel Cell	Power Generation	Fuel cell power module for mobile and stationary applications
	HyPM Rack Series Fuel Cell	Power Generation	fuel cell power for Alternating Current electric back up for data centers
	HyPX Fuel Cell Power Pack	Power Generation	Hybrid fuel cell/ultracapacitor lead acid battery replacement for Class 1 and Class 2 (electric) forklift trucks. Includes integrated hydrogen storage tank, thermal management subsystem and power controls. (Specifications given apply to Class 1 product)
Ballard Power Systems	FCgen-1020ACS	Power Generation	Ballard Power Systems offers an air-cooled, scalable proton exchange membrane fuel cell stack suitable for a wide range of light duty applications where durability, reliability and a simplified balance of plant are key requirements.
	FCgen-1300	Power Generation	Ballard's Fcgen-1300 fuel cell is a low-cost liquid-cooled PEM fuel cell product line specifically designed for stationary applications. Available with fuel cell stack integration capability, it is especially suited to backup power and distributed generation systems.
	FCvelocity-9SSL	Power Generation	Ballard Power Systems offers a PEM fuel cell stack based on our proven, fourth generation transportation stack technology. Available now to customers with fuel cell stack integration capabilities, it is designed to perform in rugged environments and is scalable depending on customer requirements from 4 to 21 kW
	FCvelocity-HD6	Power Generation	FCvelocity-HD6 offers a design ideal for integration into bus applications. The heavy duty module can interface with a system controller, making it a plug and play product for any fuel cell or hybrid bus platform
	ElectraGen-H2	Power Generation	Ballard Power Systems offers complete direct hydrogen backup power solutions designed for telecom and related networks applications. ElectraGen™- H2 systems are clean, reliable, quiet, economical and have been deployed worldwide for critical backup power applications.
	ElectraGen-ME	Power Generation	Ballard Power Systems' fuel cell solutions are clean, reliable, quiet, economical and have been deployed worldwide for critical backup power applications. The ElectraGen™- ME system provides power on an extended runtime basis for telecommunications and related network applications.
	ClearGen	Power Generation	ClearGen is a complete turnkey solution, providing zero-emission power. The system can operate continuously for baseload power generation or providing peak power during high demand. The self contained modules run on hydrogen fuel, scalable in increments of 500KW
Nuvera	Orion (industrial)	Power Generation	Nuvera works closely with OEMs and Tier-1 automotive suppliers to customize the Orion fuel cell stack for specific models of fuel cell electric vehicles (FCEVs) and fuel cell buses. Orion-powered solutions vary from 30 kW range extenders for electric vehicles to 110+ kW engines for larger fuel cell vehicles.
	Orion (Automotive)	Power Generation	Nuvera is partnering with a major airframe manufacturer and system integrator to develop onboard electrical power generators for a new generation of commercial airliners. Fuel cells can be used to power the avionics, the hydraulics, and the system used to keep fuel tanks safe by maintaining artificially low oxygen levels. Currently, an aircraft's main engines produce electrical power for these systems during a flight while a separate auxiliary power unit—a small turbine often contained within the tail—powers them on the ground.
	Orion (Aerospace)	Power Generation	
Plug Power	GenDrive Series 1000	Power Generation	In today's evolving material handling industry, operational performance enhancements are key to growing a thriving business. And, the predictability of your productivity can be the main differentiator separating you from your competition. Plug Power's GenDrive® hydrogen fuel cell systems elevate lift truck performance to exceed the demanding requirements of high-volume manufacturing, warehousing and distribution operations. Your sit-down counterbalanced trucks will move more pallets faster, as time spent dealing with depleted batteries is now eliminated.

GenDrive Series 2000	Power Generation	<p>In today's evolving material handling industry, operational performance enhancements are key to growing a thriving business. And, the predictability of your productivity can be the main differentiator separating you from your competition. Plug Power's GenDrive® hydrogen fuel cell systems elevate your lift truck performance to exceed the demanding requirements of high-volume manufacturing, warehousing and distribution operations. Your reach trucks will lift heavy loads with accelerated speed, and maintain momentum during an entire shift. Time spent dealing with depleted batteries is now eliminated.</p>
GenDrive Series 3000	Power Generation	<p>In today's evolving material handling industry, operational performance enhancements are key to growing a thriving business. And, the predictability of your productivity can be the main differentiator separating you from your competition. Plug Power's GenDrive® hydrogen fuel cell systems elevate lift truck performance to exceed the demanding requirements of high-throughput warehousing, distribution and manufacturing operations. Your rider pallet jacks will move more pallets, faster, maintaining rapid momentum during an entire shift. Time spent dealing with depleted batteries is now eliminated.</p>
E-200	Back-up Power Generation	<p>The E-200™ fuel cell system is designed specifically for small-scale backup power applications within the railroad, telecommunications, transportation, security and government sectors. The E-200™ provides DC power for equipment needing up to 200W in a 2U rack-mountable chassis. Fueled by hydrogen, it can affordably provide hundreds of hours of highly reliable runtime for critical equipment.</p>
E-1000x	Back-up Power Generation	<p>The E-1000x™ hydrogen fuel cell is designed for grid support and high duty cycle customer applications. It offers robust reliability and comes with an industry-leading warranty, providing extended runtime for critical equipment. The E-1000x™ fuel cell system produces DC power for equipment needing up to 1,000 Watts in a compact 4U rack-mount chassis. Multiple systems may be combined for higher power applications and N+1 redundancy. Because the only emissions are warm air and a small amount of water, the E-1000x™ is exempt from the most stringent air quality standards and is a valuable asset for use in CO2 reduction efforts.</p>
E-1100	Back-up Power Generation	<p>The E-1100™ fuel cell system offers the latest innovation in high-reliability power solutions. Designed around ReliOn's patented modular, fault-tolerant architecture, the E-1100™ fuel cell system provides 1,100W of power in a compact, 4U (7" tall) rack-mountable package. This system has 2.5 times greater power density than ReliOn's T-1000® fuel cell, allowing for higher power configurations in the same environmentally-hardened outdoor enclosure footprint. Like all of ReliOn's fuel cell products, emissions are limited to warm air and a small amount of water, and the E-1100™ fuel cell is exempt from the most stringent air quality standards. The E-1100™ system can affordably provide hundreds of hours of runtime between refuelings and many years of service for critical equipment.</p>
E-1100v	Back-up Power Generation	<p>The E-1100v fuel cell is a fully integrated system producing up to 1,100 Watts of power in an industry first vertical-mount chassis. The product was developed for use with customers for whom total footprint at small power levels is most important. The E-1100v fuel cell system is available in both 24V or 48V DC and has a variety of indoor and outdoor mounting options including rack, wall and cabinet. Like all of ReliOn's fuel cell products, the E-1100v is a clean energy solution; emissions are limited to warm air and a small amount of water.</p> <p>The E-1100v system is exempt from the most stringent air quality standards, such as those set by the California Air Resources Board, because it produces no harmful emissions. The E-1100v system can affordably provide hundreds of hours of runtime between refuelings and many years of service for critical equipment.</p>
E-2200x	Back-up Power Generation	<p>The E-2200x™ fuel cell system is designed for grid-support and high duty cycle customer applications. It offers robust reliability and comes with an industry-leading warranty, providing extended runtime for critical equipment. The E-2200x™ fuel cell system provides DC power for equipment needing up to 2,200 Watts in an 8U rack-mount chassis. Multiple systems may be combined for higher power applications and N+1 redundancy. Because the only emissions are warm air and a small amount of water, the E-2200x™ is exempt from the most stringent air quality standards and is a valuable asset for use in CO2 reduction efforts.</p>

	E-2500	Back-up Power Generation	The E-2500™ fuel cell system offers the latest innovation in high-reliability power solutions. Designed around patented modular, fault-tolerant architecture, the E-2500™ fuel cell system provides 2,500W of power in a compact, 8U (14" tall) rack-mountable package. This system has 1.6 times greater power density than ReliOn's T-2000® fuel cell, allowing for higher power configurations in the same environmentally-hardened outdoor enclosure footprint. Like all of ReliOn's fuel cell products, emissions are limited to warm air and a small amount of water, and the E-2500™ fuel cell is exempt from the most stringent air quality standards. The E-2500™ system can affordably provide hundreds of hours of runtime between refuelings and many years of service for critical equipment.
	T-2000	Back-up Power Generation	The T-2000® fuel cell system is designed specifically for larger communications backup power loads within the wireless and wireline telecommunications, utility and government sectors. The T-2000® fuel cell uses ReliOn's patented Modular Cartridge Technology® for hot-swappable high reliability, ease of maintenance and simplicity of design. Modular electronics cards enable scalability by providing flexible configuration from 600 Watts to a full 2,000 Watt capacity in one chassis. Or combine multiple T-2000® fuel cells to provide higher outputs for a variety of site requirements up to 12kW.
FuelCell Energy	DFC3000	Power Generation	FuelCell Energy's DFC3000™ system is the largest of the Direct FuelCell® (DFC®) power plant fleet, capable of providing high-quality baseload power with 47% electric power generation efficiency around-the-clock. Scalable for Multi-Megawatt Fuel Cell Parks, the system is especially suitable for applications with larger load requirements such as universities, manufacturing facilities, wastewater treatment plants, and utility/grid support.
	DFC1500	Power Generation	The DFC1500™ stationary fuel cell power plant from FuelCell Energy provides high-quality, Ultra-Clean electrical power with 47% efficiency around-the-clock. Designed for commercial and industrial applications, the system offers easy transport, quiet and reliable operation, and simple site planning and regulatory approval. The DFC1500 is ideal for wastewater treatment plants, manufacturing, food and beverage processing, universities and office campuses.
	DFC300	Power Generation	The DFC®300™ stationary fuel cell power plant from FuelCell Energy provides high-quality, Ultra-Clean electrical power with 47% efficiency in a compact footprint. Designed for commercial and industrial applications, the system offers operation around-the-clock, easy transport, quiet and reliable operation, and simple site planning and regulatory approval.
Johnson Matthey Fuel Cells	Membrane Electrode Assemblies	Fuel Cell component	Johnson Matthey specialises in manufacturing membrane electrode assembly (MEA) components for developers and manufacturers of polymer electrolyte fuel cell (PEMFC) systems for hydrogen, reformat and direct methanol operation.
	HISPEC Catalyst	Fuel Cell Catalyst	A wide range of HISPEC® Catalysts for different fuel types and operating conditions are produced at our US manufacturing plant. The HISPEC® Catalysts product range includes single component, alloy, supported and unsupported catalysts. All are manufactured to a consistently high standard in our quality approved, high volume facility.
Delphi	SOFC APU	Power Generation	The Delphi Solid Oxide Fuel Cell (SOFC) Auxiliary Power Unit (APU) is a high-efficiency electrochemical generator designed to provide up to 5 kW of environmentally friendly electrical power for a wide range of transportation and stationary applications.
TruLite	KH4™	Power Generation	The highly portable Trulite KH4 hydrogen fuel cell power system provides you with safe, quiet and environmentally friendly power for a wide range of reliable power solutions. Trulite is the only fuel cell company that offers both fuel cell and fuel source in one compact fully integrated system.
Dupont	MP-100	Power Generation	Need more power? The FCS-300 generator offers 300W of continuous power and 400W peak power.
	Nafion Membrane	Fuel Cell component	
Delphi	Delphi SOFC	Power Generation	Delphi's Solid Oxide Fuel Cell (SOFC) technology is commercially ready for a wide range of high volume stationary power generation and transportation industry applications. Delphi's innovative fuel cell is robust, fuel flexible and highly efficient. A single Delphi Gen 4 SOFC Stack can provide 9 kW of electrical power and it features a modular design, ideal for integration into large power plants.
Intelligent Energy	Upp	USB Charger	Upp™ provides instant energy at your fingertips allowing you to discover the freedom of personal energy generation. Upp conveniently powers and charges all your compatible hand-held electronic devices via USB. Just connect the Upp fuel cell to a replaceable Upp fuel cartridge and experience instant energy gratification. Stay connected with your favourite device on the move. Liberate yourself from the wall socket forever.

	Air Cooled Fuel Cell Solution	Fuel Cell	Intelligent Energy Air Cooled fuel cell systems utilise low power fans to provide cooling and the oxidant supply for operation. In the Air Cooled fuel cell system, heat from the fuel cell stack is conducted to cooling plates and removed through airflow channels, resulting in a simplified and cost effective power solution. These systems are typically used in a wide range of power-critical consumer electronic, stationary power applications, two-wheel and small car range extenders.
Treadstone Technologies	Evaporatively Cooled Fuel Cell LiteCell	Fuel Cell Surface Treatment	Intelligent Energy's proprietary and patented high performance, Evaporatively Cooled (EC) fuel cell system provides reliable power generation up to 100kW. The EC system has been refined and proven in automotive and aerospace applications worldwide. Thermal management of the EC fuel cell stack utilises the benefits of the heat of vaporisation in contrast to circulating coolant through the cells, reducing systems complexity, mass and cost. Surface treatment for metallic substrates

			Automotive and other transportation applications represent some of the most challenging operating environments for a fuel cell, as well as some of the most cost-restrictive market environments. Gore has made tremendous progress toward meeting these challenges. Current Gore technologies include greater power density membrane electrode assemblies (MEA), which can operate in hotter and dryer operating conditions, in addition to other advances that will allow for smaller, more powerful fuel-cell stacks with greater system simplification. Cost reductions are also being realized through Gore's efficient, high-volume production process.
Gore	GORE PRIMEA MEA for Transportation	fuel cell component	GORE® PRIMEA® Membrane Electrode Assemblies (MEA) are designed to operate in the most extreme portable fuel cell environments. Gore's patented thin and extremely durable membrane and high activity electrodes allow smaller, more powerful portable fuel cell devices without the need for external humidification. These components allow superior fuel-cell operation with dry reactant gasses and a durable power density to meet the most challenging application requirements
	ORE® PRIMEA® MEAs for Portable & Backup Power	fuel cell component	

			Gore's thorough understanding of degradation mechanisms has led to the development of a new series of membrane electrode assemblies (MEA) with a unique combination of durability and power density. Available in high volume, GORE® PRIMEA® MEAs deliver the greatest power density over the longest lifetime of any MEA currently produced. Gore has demonstrated more than 10,000 hours of continuous use and continues to engineer improvements that will contribute to the commercial success of the stationary PEM fuel cell industry.
LG Fuel Cell Systems	GORE® PRIMEA® MEAs for Stationary Power LGFC5 1 MW Fuel Cell System	fuel cell component Power Generation	n/a

Clariant	HyProGen Catalyst	Fuel Cell Catalyst	Clariant offers high-performance HyProGen catalysts for all major fuel cell technologies and applications that are based on hydrocarbon fuels. Key fuel cell markets include: Large Stationary Fuel Cell Applications Small Stationary Fuel Cell Applications Mobile Fuel Cell Applications Portable-Power Fuel Cell Applications Distributed Hydrogen Production
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