

MODERN, INTELLIGENT BACKUP POWER TECHNOLOGY TO KEEP RAILROADS SAFE

Fully integrated fuel cell solution designed for railroad backup power

The dangers of crossing a railroad track on foot, bicycle, or in a vehicle are well known. To mitigate these dangers and assure public safety, railroad operators install crossing gates, crossing bells, crossing lights, approaching train lights and bells, and other safety measures. These safety measures operate on electricity supplied by the grid.

When power outages occur, these safety measures are inoperable, increasing the safety risk. Power outages occur frequently and are increasing in both number and duration. These outages are caused by equipment failures, weather, accidents, age and deterioration of the grid itself, and the ever-increasing load on the grid. Some railroad infrastructure is backed up by batteries and or generators. Batteries generally cannot carry the load for long durations, while generators emit harmful air and noise emissions, do not start reliably, and require high maintenance.

Altery has developed a better solution, using its breakthrough hydrogen fuel cell power systems to deliver clean, reliable power, cost effectively, when the grid fails. This system can be standalone or operate with an optional, integrated multi-volt, multi-stage, multi-battery type charger to extend the battery runtime and assure public safety.



Altery's Freedom Power System for Railroads

- Provides power when grid fails
- Modular solution – 1kW, 2.5kW & 5kW
- Eliminates performance and replacement issues with batteries and generators
- Unlimited runtime with hydrogen refueling
- Simple, low-cost maintenance
- Zero-emissions certifications supports sustainability initiatives
- Compact footprint
- Made in USA

Altery's Freedom Power fuel cells provide freedom from:



Alteryg Freedom Power System – Nacelle

Alteryg Freedom Power System – Nacelle							
Output¹	Rated Standby Power (kW) ¹	1 kW		2.5 kW		5 kW	
	Nominal Current (A)	40	21	100	52	200	105
Voltage	Rated (VDC)	24	48	24	48	24	48
Physical	Dimensions (W x D x H in.)	28" x 14" x 34"		24" x 26" x 59"		24" x 26" x 59"	
	Weight (lbs)	210 lbs		310 lbs		330 lbs	
Fuel	Type and Grade	Gaseous hydrogen, industrial grade 99.95% pure (CGA-G-5.3 Type 1, Grade B)					
	Supply Pressure	40 to 100 psig / 2.75 to 6.89 bar					
	Runtime	Various, Unlimited with Alteryg Freedom Fuel service					
Operational	Ambient Temperatures ²	-40°C to +50°C					
	Relative Humidity	5% to 95% non-condensing					
	Location	Indoors with suitable air management or outdoors with suitable enclosure					
	Altitude	10,000 ft					
Control Electronics	Supervisory Control	32-Bit Digital Signal Controller w/on-board, real time diagnostics, communications, thermal & systems management. Sensor less brushless direct current motor control					
	Power Conditioning	Fully digital, multi-phase, interleaved DC/DC converter					
	Monitoring Software	Real time control communicates with GUI to provide system and site status and allow user input of operating parameters. Field upgrades through communication port					
	I/O Interfaces ³	Ethernet supported. Four user-defined dry contacts. Optional wireless monitoring. Optional RS-232, RS-485 and additional user defined contacts					
	Sensors	Fuel pressure, leak detection, ambient temperature & humidity, stack & electronics temperatures, fan & filter conditions, stack & output currents and voltages, tampering					
Environmental	Clean	California Air Resources Board (CARB) certified as a zero-emission electrical power generator. By-product is water					
	Green	Recycles residual heat to increase fuel and system efficiency. Can use "Green" hydrogen fuel (generated from biomass, hydroelectric, solar or wind powered electrolysis)					
	Noise	Meets FC-1 Standards					
Safety/Certification/Compliance⁴		Designed and tested to NEBS Level 3 criteria and certified under CSA FC-1, 2014 and GR1293					

1. FPS Engines can be combined to achieve up to 100 kW of output.

2. 10 °C (50 °F) and below requires low temperature configuration, 40 °C (104 °F) or higher requires high temperature configuration.

3. I/O Options vary by model number

4. Some certifications pending.

Specifications subject to change without notice

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