EnerSys®

Power/Full Solutions

HYDROGEN FUEL CELL ENGINE

The EnerSys® Extended Run Time Solution™ utilizes the Altergy Freedom Power™ System (FPS) hydrogen fuel cell engine. The FPS prides itself on its high efficiency power generation capabilities that deliver the power quality, reliability and on demand ride-through capabilities required for mission critical applications. The FPS system meets the rigid certification standards of ANSI/CSA America FC1-2004, has also been certified by the FCC for telecommunications applications. The FPS has also been certified by the California Air Resources Board as a zero emission power generator. The FPS combined with EnerSys EON Technology™ provides a seamless extended run time solution.

FREEDOM FUEL CELL ENGINE

The Freedom Fuel Cell Engine utilized in the EnerSys system is a 5 kW standby power system that is offered in either 24VDC or 48VDC configuration. The 50 cells that make up a fuel cell stack are constructed from durable stainless steel with injection molded plastic fuel management frames. The fuel cell stack is integrated with the balance of plant including thermal, fuel, power and voltage management, creating a complete Fuel Cell Engine System (FCES). These systems are designed with a plug-n-play feature that allows them to operate in a stand-alone mode or to be combined with additional FPSs to produce a range of power outputs up to 30 kW. The plug–n-play design created by Altergy® also allows optional peripherals to interface seamlessly into the overall standby power system.

The overall Fuel Cell Engine contains an integrated supervisory control system that consists of a 32-bit digital signal controller with on-board diagnostics. This control system manages the function of the fuel cell, including real-time system monitoring and control, as well as thermal management. Sensors monitor fuel pressure, leak detection, ambient temperature, stack and electronics temperature and humidity, mass air flow, fan and filter conditions, stack and output currents and voltages, as well as tampering detection and reporting. It communicates via a Graphic User Interface (GUI) to provide system and site status and allows user input of operating parameters. External communications and/or monitoring are facilitated by USB, RS-232 and/or Ethernet connections, as well as 4 user defined digital Input/Outputs. Power conditioning/regulation is performed by a fully digital, multiphase, interleaved DC/DC converter that delivers precisely regulated DC power output.

In addition to a industry leading rugged, modular design, the Freedom Fuel Cell Engine was chosen by EnerSys because it has the smallest, most compact footprint in industry. The Altergy FPS-5 (5kW module) is only 21" wide, 30 inches deep and 24.5 inches tall.

altergy

Freedom Power®

Preliminary Publication No: US-HFCE-FL-001 - January 2009

HYDROGEN FUEL CELL ENGINE SPECIFICATIONS

ALTERGY FREEDOM POWER™ SYSTEM - FPS		FPS-5		FPS-10		FPS-15	
Power Output	Kilowatts (kW) Net	5		10		15	
	kW Max (30 seconds)	User Definable		User Definable		User Definable	
	Rated Net Current	210 A	105 A	420 A	210 A	630 A	315 A
Voltage	Nominal Voltage (VDC)	24	48	24	48	24	48
Physical (Engine Only)	Voltage Adjustable (VDC)	21 to 29	42 to 58	21 to 29	42 to 58	21 to 29	42 to 58
	Dimensions (w x d x h)	21″ x 30″ x 24.5″ 53 x 76 x 65 cm		21″ x 30″ x 24.5″ 53 x 76 x 65 cm		21″ x 30″ x 24.5″ 53 x 76 x 65 cm	
	Weight (lbs)	187 lbs / 86 kg		FPS-5 x 2		FPS-5 x 3	
Fuel	Consumption (SLPM)	70		140		210	

ALTERGY FREEDOM POWER™ SYSTEM - FPS		FPS-20		FPS-25		FPS-30	
Power Output	Kilowatts (kW) Net	20		25		30	
	kW Max (30 seconds)	User Definable		User Definable		User Definable	
	Rated Net Current	840 A	420 A	1050 A	525 A	1260 A	630 A
Voltage	Nominal Voltage (VDC)	24	48	24	48	24	48
Physical (Engine Only)	Voltage Adjustable (VDC)	21 to 29	42 to 58	21 to 29	42 to 58	21 to 29	42 to 58
	Dimensions (w x d x h)	21″ x 30″ x 24.5″ 53 x 76 x 65 cm		21″ x 30″ x 24.5″ 53 x 76 x 65 cm		21″ x 30″ x 24.5″ 53 x 76 x 65 cm	
	Weight (lbs)	FPS-5 x 4		FPS-5 x 5		FPS-5 x 6	
Fuel	Consumption (SLPM)	280		350		420	

ALTERGY FREEDOM POWER™ SYSTEM - FPS		COMMON SPECIFICATIONS
Physical	Mounting	Standard 23″ rack, shelf mount or cabinet mount
Operational	Ambient Temperature	-40° C (-40° F) to 45° C (113° F)
	Relative Humidity	5% to 100%
	Location	Indoors with suitable air management ducting or outdoors with suitable cabinet
	Altitude	10,000 ft
Environmental	Clean	California Air Resources Board (CARB) Certified as Zero Emission Electric Power Generator. By-product is water
	Green	Recycles residual heat to increase energy/system efficiency. “Green” hydrogen fuel (generated from biomass, hydroelectric, solar or wind powered electrolysis)
	Noise	<60dBA @ 1 meter
Control System	Supervisory Control	32-Bit Digital Signal Controller with on-board, real-time diagnostics, communications, thermal & systems management. Sensorless Brushless Direct Current motor control
	Power Conditioning	Fully digital, multi-phase, interleaved DC/DC converter
	Software	Real-time control communicates with GUI to provide system and site status and allow user input of operating parameters. Field upgrades through Comm. or USB port
	Communications/Monitoring	USB, RS-232, RS-485 and Ethernet supported. Four (4) user defined dry contacts (8 optional). Wireless optional
	Sensors	Fuel pressure, leak detection, ambient temperature & humidity, stack & electronics temperatures, fan & filter conditions, stack & output currents and voltages, tampering
Safety/Certification/Compliance		CSA/ANSI Fuel Cell 1 (FC1), FCC 47CFR Part 15. Subpart B. Class A. NEBS Level 3
Fuel	Type and Grade	Gaseous hydrogen, industrial grade, 99.95% pure
	Supply Pressure	40 to 100 psig

EnerSys
Power/Full Solutions

www.enersys.com

EnerSys
P.O. Box 14145
Reading, PA 19612-4145
USA
Tel: +1-610-208-1991
+1-800-538-3627
Fax: +1-610-372-8613

EnerSys EMEA
Brussels, Belgium
Tel: +32 (0)2 247 94 47

EnerSys Asia
Guangdong, China
Tel: +86-755-2689 3639

Distributed by:

Printed in USA

Preliminary Publication No. US-HFCE-FL-001 - January 2009 - Subject to revisions without prior notice. E.&O.E.