

Powering your process. Protecting your business.

The First Element Advantage

- **Save costs** over battery installations
Cheaper than diesels for baseload use
- Superior systems communications, high power density & wide environmental operating range
- Baseload power capable, multi year life
- **Fuel flexibility!** Hydrogen or Methanol

LIQUID COOLED FUEL CELL SYSTEMS FOR BACKUP AND BASELOAD / OFF-GRID POWER APPLICATIONS

Scalable from 3-25 kW in a single OSP cabinet

DC and AC power

Hybrid solar systems available

Applications

Communications: Cell & Microwave Towers, Wire-line cabinets, Central Office Switch & POP sites

Business and Building Backup

Utility substation backup. Railroad communications, signaling & switch protection.

Government & Military Communications

Fuel Cell Advantages

Environmentally Friendly, Minimal Maintenance

High Reliability & Longer Life

Equipment Integration, smaller site footprint

NEW, Fast-Deploy cabinet option, NO concrete pad needed!



Total Station Power Cabinet

Integrated: 12 kW Fuel Cell, AC Rectifiers & UPS batteries

www.FirstElementEnergy.com

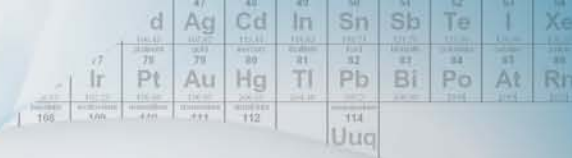
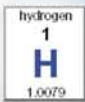
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Product Specifications for Liquid-Cooled Fuel Cell Systems							Std. units
Systems are modular							
Model	3 kW	5 kW	6 kW	12 kW	20 kW	25 kW	
Nominal Voltage (typical DC)	24 or +/- 48 V, custom voltage available on request Adjustable voltage output, +/- 15% of nominal						
Run Time per Fuel Cabinet* (hours)	30.8	16.0	15.0	7.5	4.2	3.1	
Cylinders Required for 8 hours**	2.1	5.0	4.7	9.4	15.7	19.6	
Physical							
System & Cabinet Weight (lbs.)	817	882	903	970	1,367	1,420	
Cabinet Materials	Aluminum, Stainless Steel or Steel. Power Coating finish available						
Cabinet Dimensions (W x D x H)	32" x 36 x Low profile 50" or Standard 84" height				90" height		
<i>Batteries may be added to the 84" standard 3-12 kW cabinet</i>							
Operation							
Total Station Cabinet Option	Integrated 2 RU High-Efficiency AC/DC rectifier & UPS batteries						
Power Conditioning	DC AC	DC/DC converter, load following, remote-real time controllable output Optional DC/AC inverter, load following, 50 or 60 Hz, 120 / 2xx VAC selectable Battery "smart charging" system available					
Fuel	Standard Industrial grade hydrogen (99.95%)						
Fuel Storage Cabinet	(8) Standard "T" cylinder capacity, includes auto-change over exercise cylinder						
Ambient Temperature, (deg. F)	Rated power maintained from: -20° to 105° (High temp kit available)						
Relative Humidity, (% RH)	5 - 100						
Std. Altitude Capability, (feet)	< 12,000	< 10,000	< 10,000	< 7,000	< 7,000	< 7,000	
Altitude compensating kit available for elevation above standard							
Shipping Freeze Exposure, (deg F)	Fuel cell stack non-operating / shipping exposure limit, -4°						
Controls							
Software	Industrial PLC						
Safety	Full system and hydrogen alarms						
Certifications	Components UL/CSA, Stack: CSA, Cabinet NEBS exposure on request						
GUI (Graphical User Interface)	Standard 3" LCD/keypad or Optional 6" color industrial screen Laptop or desktop computer, optional						
Remote System Communications	3 - 5 Dry contact alarms standard Fiber, LAN or Wireless Network Cellular / Phone modem						
Data / Software	FULL remote command & monitoring via internet Run-time data collection storage, local or remote & software upgrades						
Emissions							
Water	~0.1 gal / kWh, dependent on local conditions, condenser kit available						
Noise	TBD						
CO, CO ₂ , NO _x , SO _x	Emissions free, < 1 ppm, fuel cell system using hydrogen gas as fuel						
Fuel Options <i>Liquid Fuel Processing Systems. Information on separate spec sheet.</i>							
Methanol	Power in 3 and 5 kW modules, ultra low emissions						
* Based on 8 "T" cylinders per bottle cabinet							
** Fuel usage based on 250 ft ³ usable volume per cylinder at: 2,400, 4,800, 9,600, 16,000 & 20,000 W							
*** Certifications Pending							
Product Specifications are subject to change at any time.							