

d	Ag	Cd	In	Sn	Sb	Te	I	Xe	
106.46	107.87	112.41	114.82	117.25	121.76	127.60	126.91	131.29	
Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
226.10	195.08	196.97	200.59	204.38	207.2	208.98	209	210	222
Tm	Yb	Lu	Hf	Ta	W	Re	Os	Ir	Pt
168.93	173.05	174.96	178.49	180.95	183.84	186.21	188.91	190.23	191.22
Uuo	Uuq								



*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](http://www.FirstElementEnergy.com)

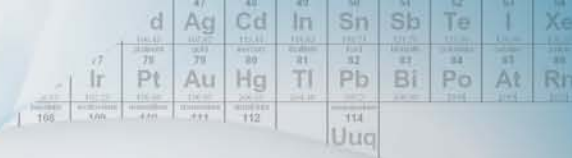
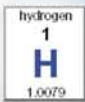
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Product Specifications for Liquid-Cooled Fuel Cell Systems							SI Units
Systems are modular							
Model	3 kW	5 kW	6 kW	12 kW	20 kW	25 kW	
Nominal Voltage (typical DC)	24 or +/- 48 V, custom voltage available on request						
	Adjustable voltage 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 (kg)	371	400	410	440	620	644	
	Weights are for fuel cell & aluminum cabinet, does not include batteries, fuel reformers or options						
Cabinet Materials	Aluminum, Stainless Steel or Steel. Power Coating finish available						
Cabinet Dimensions (W x D x H)	915 x 915 x Standard 2185 mm height				2286 mm height		
	<i>Batteries may be added to the 2185 mm, standard 3-12 kW cabinet</i>						
Operation							
<b>Total Station Cabinet Option</b>	<b>Integrated 2 RU High-Efficiency AC/DC rectifier &amp; UPS batteries</b>						
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. C)	Rated power maintained from: -29° to 41° (High temp kit available)						
Relative Humidity, (% RH)	5 - 100						
Std. Altitude Capability, (meters)	< 3657	< 3050	< 3050	< 2134	< 2134	< 2134	
	Altitude compensating kit available for elevation above standard						
Shipping Freeze Exposure, (deg. C)	Fuel cell stack non-operating / shipping exposure limit, -20°						
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 76 mm LCD & keypad or Optional 152 mm 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 upgrade option						
Emissions							
Water	Approximately 0.38 liter / kWh, dependent on local conditions, condenser kit available						
Noise	TBD						
CO, CO <sub>2</sub> , NO <sub>x</sub> , SO <sub>x</sub>	Emissions free, < 1 ppm, fuel cell system using hydrogen gas as fuel						
Fuel Options							
	<b>Liquid Fuel Processing Systems. Information on separate spec sheet.</b>						
Methanol	Power in 3 and 5 kW modules, ultra low emissions						
* Based on 8 "T" cylinders per bottle cabinet							
** Fuel usage based on 7 m <sup>3</sup> 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.							