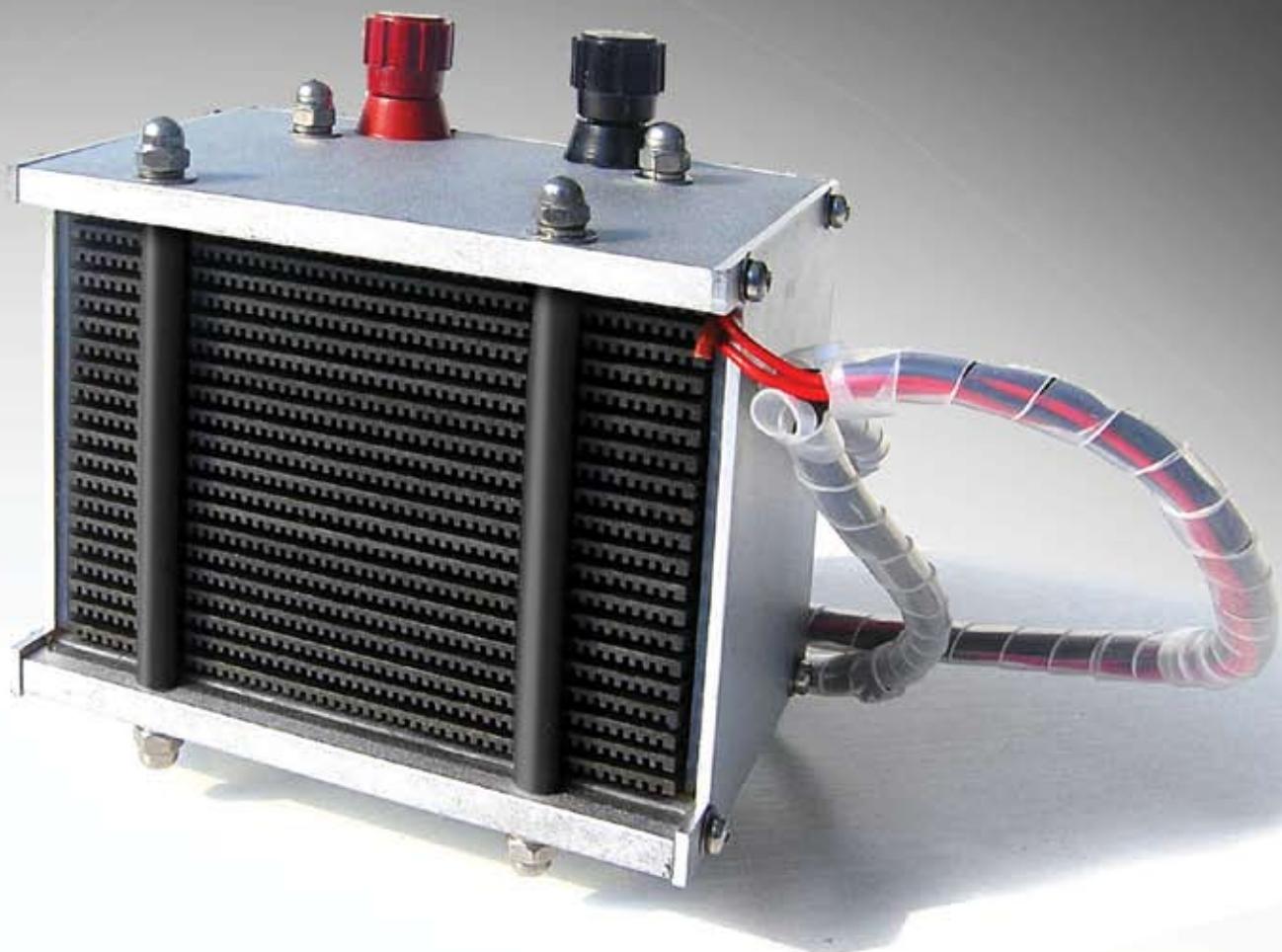


H-Series

PEM Fuel Cell Systems

www.horizonfuelcell.com



The smallest and the lightest.

The H-series Polymer Electrolyte Membrane (PEM) fuel cells designed by Horizon are semi-integrated, efficient, reliable systems that minimize the use of peripherals. As such, they are the most compact and lightweight air-cooled, self-humidified fuel cells available on the market, bringing new product innovation possibilities to engineers around the world.

H-SERIES PEM Fuel Cell Systems



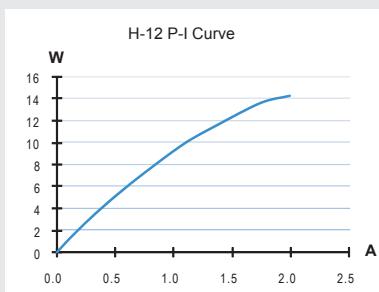
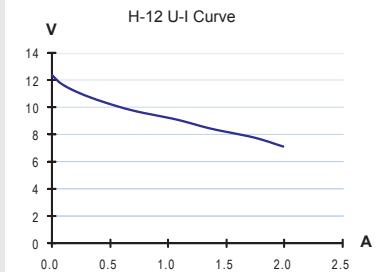
Semi-integrated 12W fuel cell system

Including:

- Integrated fan and casing
- 12W stack with blower

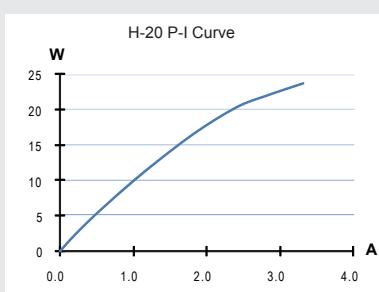
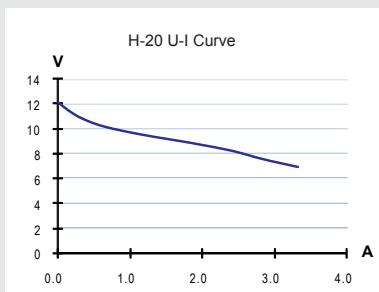
H-12 FCS-B12

Type of fuel cell	PEM
Number of cells.....	13
Rated power.....	12W
Rated Performance.....	7.8V@1.6A
Output voltage range.....	6V-12V
Weight (with fan & casing).....	225g(0.496lbs)
Size.....	76x64x47mm(3x2.5x1.85in)
Reactants.....	Hydrogen and Air
Rated H ₂ consumption.....	180ml/min(11in ³ /min)
Hydrogen pressure.....	0.3-0.4Bar(4.3-5.8PSI)
Purging valve voltage.....	6V
Blower voltage.....	.5V
Ambient temperature.....	5-35°C(41-95°F)
Max stack temperature.....	55°C(131°F)
Hydrogen purity.....	99.999% dry H ₂
Humidification.....	Self-humidified
Cooling.....	Air (integrated cooling fan)
Start up time.....	Immediate
Efficiency of system.....	40% at full power



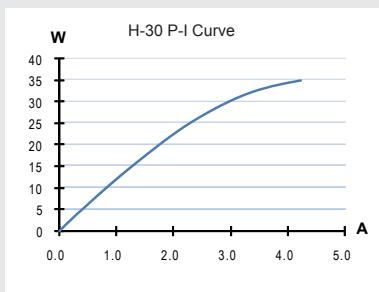
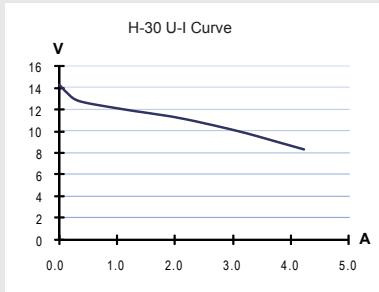
H-20 FCS-B20

Type of fuel cell	PEM
Number of cells.....	13
Rated power.....	20W
Rated performance.....	7.8V@2.6A
Output voltage range.....	6V-12V
Weight (with fan & casing).....	0.23kg(0.5lbs)
Size.....	76x64x47mm(3x2.5x1.85in)
Reactants.....	Hydrogen and Air
Rated H ₂ consumption.....	280ml/min(17in ³ /min)
Hydrogen pressure.....	0.3-0.4Bar(4.3-5.8PSI)
Purging valve voltage.....	6V
Blower voltage.....	.5V
Ambient temperature.....	5-35°C(41-95°F)
Max stack temperature.....	55°C(131°F)
Hydrogen purity.....	99.999% dry H ₂
Humidification.....	Self-humidified
Cooling.....	Air (integrated cooling fan)
Start up time.....	Immediate
Efficiency of system.....	40% at full power



H-30 FCS-B30

Type of fuel cell	PEM
Number of cells.....	12
Rated power.....	30W
Rated Performance.....	9V@3.4A
Output voltage range.....	7V-14V
Weight (with fan & casing).....	0.235kg(0.52lbs)
Size.....	80x64x46mm(3.1x2.5x1.8in)
Reactants.....	Hydrogen and Air
Rated H ₂ consumption.....	420ml/min(26in ³ /min)
Hydrogen pressure.....	0.3-0.4Bar(4.3-5.8PSI)
Purging valve voltage.....	6V
Blower voltage.....	.5V
Ambient temperature.....	5-35°C(41-95°F)
Max stack temperature.....	55°C(131°F)
Hydrogen purity.....	99.999% dry H ₂
Humidification.....	Self-humidified
Cooling.....	Air (integrated cooling fan)
Start up time.....	Immediate
Efficiency of system.....	40% at full power



Semi-integrated 30W fuel cell system

Including:

- Miniature electronic valve
- Control electronics
- Integrated fan and casing
- Low pressure protection
- 30W stack with blower



H-SERIES PEM Fuel Cell Systems

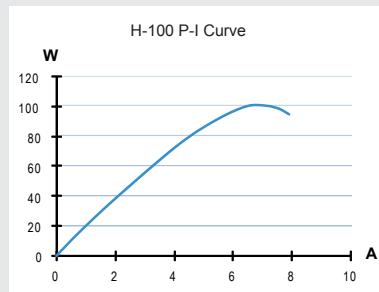
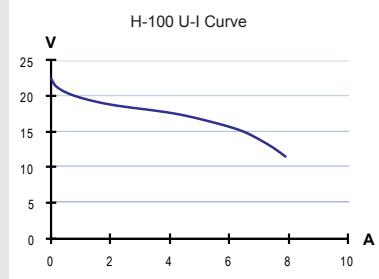


Semi-integrated 100W fuel cell system

- Including:
- Connections/Tubing
 - Electronic valves
 - Electronic control box
 - 100W stack with blower
 - Fuel cell ON/OFF switch
 - SCU ON/OFF switch

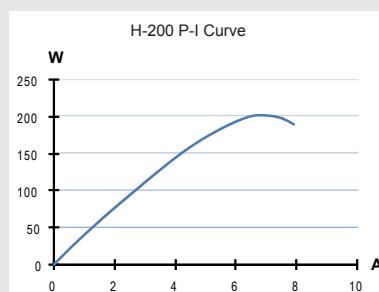
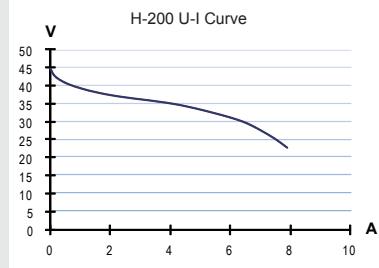
H-100 FCS-B100

Type of fuel cell	PEM
Number of cells.....	24
Rated power.....	100W
Rated performance.....	14V@7.2A
Output voltage range.....	13V-23 V
Weight (with fan & casing).....	0.95kg(2.1lbs)
Size.....	143x109x94mm(5.6x4.3x3.7in)
Reactants.....	Hydrogen and Air
Rated H ₂ consumption.....	1.4l/min(83in ³ /min)
Hydrogen pressure.....	0.4-0.45Bar(5.8-6.5PSI)
Controller weight.....	0.4kg(0.88lbs)
Hydrogen supply valve voltage.....	12V
Purging valve voltage.....	12V
Blower voltage.....	12V
Ambient temperature.....	5-35°C(41-95°F)
Max stack temperature.....	65°C(149°F)
Hydrogen purity.....	99.999% dry H ₂
Humidification.....	Self-humidified
Cooling.....	Air (integrated cooling fan)
Start up time.....	Immediate
Efficiency of system.....	40%@14V



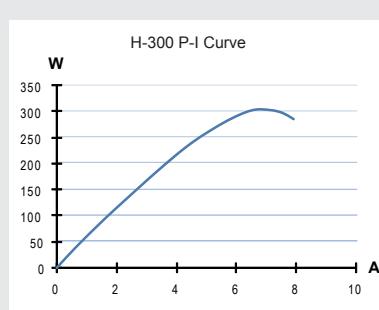
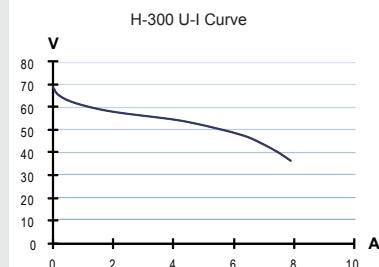
H-200 FCS-B200

Type of fuel cell	PEM
Number of cells.....	48
Rated power.....	200W
Rated performance.....	28V@7.2A
Output Voltage range.....	26V-46V
Weight (with fan & casing).....	1.5kg(3.3lbs)
Size.....	223x109x94mm(8.8x4.3x3.7in)
Reactants.....	Hydrogen and Air
Rated H ₂ consumption.....	2.8l/min(178in ³ /min)
Hydrogen pressure.....	0.4-0.45Bar(5.8-6.5PSI)
Controller weight.....	0.4kg/0.88lbs
Hydrogen supply valve voltage.....	12V
Purging valve voltage.....	12V
Blower voltage.....	12V
Ambient temperature.....	5-30°C(41-86°F)
Max stack temperature.....	65°C(149°F)
Hydrogen purity.....	99.999% dry H ₂
Humidification.....	Self-humidified
Cooling.....	Air (integrated cooling fan)
Start up time.....	Immediate
Efficiency of system.....	40%@28V



H-300 FCS-B300

Type of fuel cell	PEM
Number of cells.....	72
Rated power.....	300W
Rated performance.....	43V@7.2A
Output Voltage range.....	39V-69V
Weight (with fan & casing).....	2kg(4.4lbs)
Size.....	324x109x94mm(12.8x4.3x3.7in)
Reactants.....	Hydrogen and Air
Rated H ₂ consumption.....	4.2l/min(259in ³ /min)
Hydrogen pressure.....	0.4-0.45Bar(5.8-6.5PSI)
Controller weight.....	0.4kg(0.88lbs)
Hydrogen supply valve voltage.....	12V
Purging valve voltage.....	12V
Blower voltage.....	12V
Ambient temperature.....	5-30°C(41-86°F)
Max stack temperature.....	65°C(149°F)
Hydrogen purity.....	99.999% dry H ₂
Humidification.....	Self-humidified
Cooling.....	Air (integrated cooling fan)
Start up time.....	Immediate
Efficiency of system.....	40%@43V



Semi-integrated 200W fuel cell system

- Including:
- Connections/Tubing
 - Electronic valves
 - Electronic control box
 - 200W stack with blower
 - Fuel cell ON/OFF switch
 - SCU ON/OFF switch



Semi-integrated 300W fuel cell system

- Including:
- Connections/Tubing
 - Electronic valves
 - Electronic control box
 - 300W stack with blower
 - Fuel cell ON/OFF switch
 - SCU ON/OFF switch

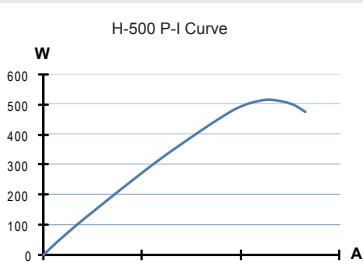
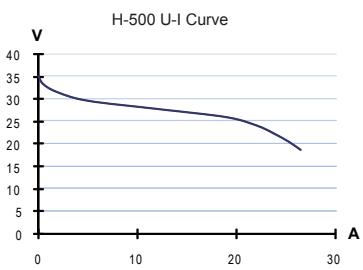


H-500 FCS-B500

Semi-integrated 500W fuel cell system

- Including:
- Connections/Tubing
 - Electronic valves
 - Electronic control box
 - 500W stack with blower
 - Fuel cell ON/OFF switch
 - SCU ON/OFF switch

Type of fuel cell	PEM
Number of cells.....	36
Rated power.....	500W
Rated performance.....	21V@24A
Output voltage range.....	19V-35V
Weight (with fan & casing).....	2.8kg(6.2lbs)
Size.....	250x190x75mm(9.8x7.5x3in)
Reactants.....	Hydrogen and Air
Rated H ₂ consumption.....	6.5l/min(398in ³ /min)
Hydrogen pressure.....	0.5-0.6Bar(7.2-9.4PSI)
Controller weight.....	0.45kg(0.99lbs)
Hydrogen supply valve voltage.....	12V
Purging valve voltage.....	12V
Blower voltage.....	12V
Ambient temperature.....	5-30°C(41-86°F)
Max stack temperature.....	65°C(149°F)
Hydrogen purity.....	99.999% dry H ₂
Humidification.....	Self-humidified
Cooling.....	Air (integrated cooling fan)
Start up time.....	Immediate
Efficiency of system.....	40%@21V

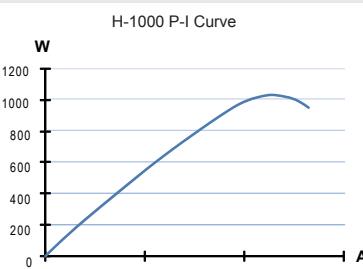
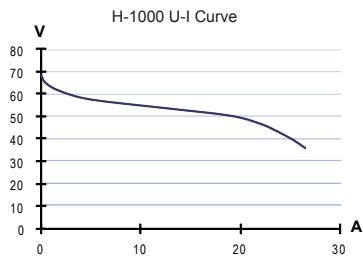


H-1000 FCS-B1000

Semi-integrated 1000W fuel cell system

- Including:
- Connections/Tubing
 - Electronic valves
 - Electronic control box
 - 1000W stack with blower
 - Fuel cell ON/OFF switch
 - SCU ON/OFF switch

Type of fuel cell	PEM
Number of cells.....	72
Rated power.....	1000W
Rated performance.....	43V@23.5A
Output voltage range.....	39V-69V
Weight (with fan & casing).....	4.2kg(9.3lbs)
Size.....	324x220x122mm(12.8x8.7x4.8in)
Reactants.....	Hydrogen and Air
Rated H ₂ consumption.....	14l/min(847in ³ /min)
Hydrogen pressure.....	0.5-0.6Bar(7.2-9.4PSI)
Controller weight.....	0.45kg(0.99lbs)
Hydrogen supply valve voltage.....	12V
Purging valve voltage.....	12V
Blower voltage.....	12V
Ambient temperature.....	5-30°C(41-86°F)
Max stack temperature.....	65°C(149°F)
Hydrogen purity.....	99.999% dry H ₂
Humidification.....	Self-humidified
Cooling.....	Air (integrated cooling fan)
Start up time.....	Immediate
Efficiency of system.....	40%@43V

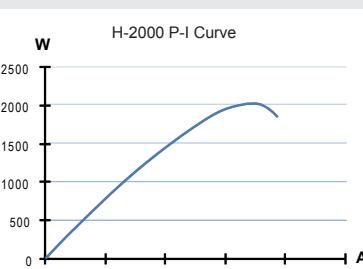
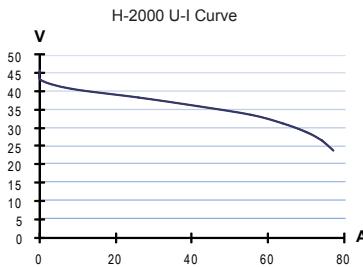


H-2000 FCS-B2000

Semi-integrated 2000W fuel cell system

- Including:
- Connections/Tubing
 - Electronic valves
 - Electronic control box
 - 2000W stack with blower
 - Fuel cell ON/OFF switch
 - SCU ON/OFF switch

Type of fuel cell	PEM
Number of cells.....	48
Rated power.....	2000W
Rated performance.....	28.8V@70A
Output voltage range.....	26V-46V
Weight (with fan & casing).....	7.7kg(16.9lbs)
Size.....	380x160x200mm(15x6.3x7.9in)
Reactants.....	Hydrogen and Air
Rated H ₂ consumption.....	28l/min(0.99ft ³ /min)
Hydrogen pressure.....	0.5-0.6Bar(7.2-9.4PSI)
Controller weight.....	1kg(2.2lbs)
Hydrogen supply valve voltage.....	12V
Purging valve voltage.....	12V
Blower voltage.....	12V
Ambient temperature.....	5-30°C(41-86°F)
Max stack temperature.....	65°C(149°F)
Hydrogen purity.....	99.999% dry H ₂
Humidification.....	Self-humidified
Cooling.....	Air (integrated cooling fan)
Start up time.....	Immediate
Efficiency of system.....	40%@28.8V



H-SERIES PEM Fuel Cell Systems

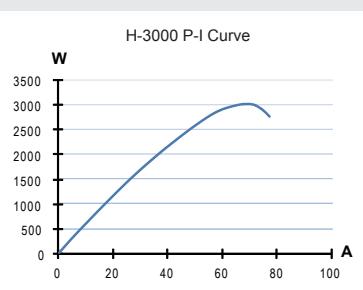
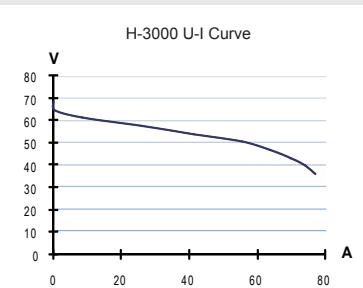


Semi-integrated 3000W fuel cell system

- Including:
- Connections/Tubing
 - Electronic valves
 - Electronic control box
 - 3000W stack with blower
 - Fuel cell ON/OFF switch
 - SCU ON/OFF switch

H-3000 FCS-B3000

Type of fuel cell PEM
 Number of cells..... 72
 Rated power..... 3000W
 Rated performance..... 43.2V@70A
 Output voltage range..... 39V-69V
 Weight (with fan & casing)..... 11kg(24.2lbs)
 Size..... 380x160x280mm(15x6.3x11in)
 Reactants..... Hydrogen and Air
 Rated H₂ consumption..... 42l/min(1.48ft³/min)
 Hydrogen pressure..... 0.5-0.6Bar(7.2-9.4PSI)
 Controller weight..... 1kg(2.2lbs)
 Hydrogen supply valve voltage..... 12V
 Purging valve voltage..... 12V
 Blower voltage..... 12V
 Ambient temperature..... 5-30°C(41-86°F)
 Max stack temperature..... 65°C(149°F)
 Hydrogen purity..... 99.999% dry H₂
 Humidification..... Self-humidified
 Cooling..... Air (integrated cooling fan)
 Start up time..... Immediate
 Efficiency of system..... 40%@43.2V

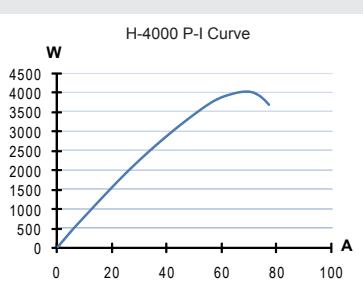
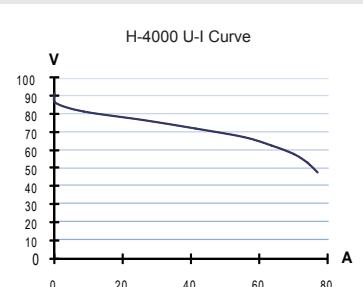


Semi-integrated 4000W fuel cell system

- Including:
- Connections/Tubing
 - Electronic valves
 - Electronic control box
 - 4000W stack with blower
 - Fuel cell ON/OFF switch
 - SCU ON/OFF switch

H-4000 FCS-B4000

Type of fuel cell PEM
 Number of cells..... 96
 Rated power..... 4000W
 Rated performance..... 57.6V@70A
 Output voltage range..... 52V-92V
 Weight (with fan & casing)..... 14kg(30.9lbs)
 Size..... 380x160x360mm(15x6.3x14in)
 Reactants..... Hydrogen and Air
 Rated H₂ consumption..... 56l/min(1.98ft³/min)
 Hydrogen pressure..... 0.5-0.6Bar(7.2-9.4PSI)
 Controller weight..... 1kg(2.2lbs)
 Hydrogen supply valve voltage..... 12V
 Purging valve voltage..... 12V
 Blower voltage..... 12V
 Ambient temperature..... 5-30°C(41-86°F)
 Max stack temperature..... 65°C(149°F)
 Hydrogen purity..... 99.999% dry H₂
 Humidification..... Self-humidified
 Cooling..... Air (integrated cooling fan)
 Start up time..... Immediate
 Efficiency of system..... 40%@57.6V

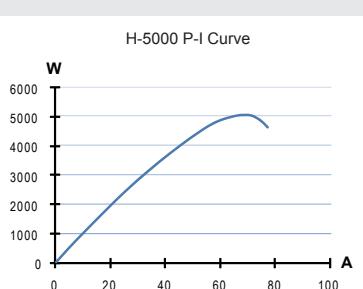
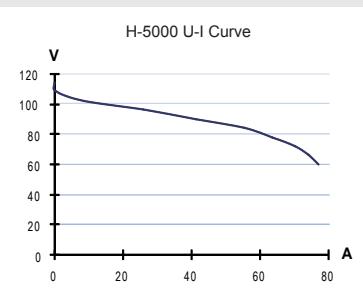


Semi-integrated 5000W fuel cell system

- Including:
- Connections/Tubing
 - Electronic valves
 - Electronic control box
 - 5000W stack with blower
 - Fuel cell ON/OFF switch
 - SCU ON/OFF switch

H-5000 FCS-B5000

Type of fuel cell PEM
 Number of cells..... 120
 Rated power..... 5000W
 Rated performance..... 72V@70A
 Output voltage range..... 64V-114V
 Weight (with fan & casing)..... 17kg(37.5lbs)
 Size..... 380x160x460mm(15x6.3x18in)
 Reactants..... Hydrogen and Air
 Rated H₂ consumption..... 70l/min(2.47ft³/min)
 Hydrogen pressure..... 0.5-0.6Bar(7.2-9.4PSI)
 Controller weight..... 1kg(2.2lbs)
 Hydrogen supply valve voltage..... 12V
 Purging valve voltage..... 12V
 Blower voltage..... 12V
 Ambient temperature..... 5-30°C(41-86°F)
 Max stack temperature..... 65°C(149°F)
 Hydrogen purity..... 99.999% dry H₂
 Humidification..... Self-humidified
 Cooling..... Air (integrated cooling fan)
 Start up time..... Immediate
 Efficiency of system..... 40%@72V





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