

# H-Series

## PEM Fuel Cell Systems

[www.horizonfuelcell.com](http://www.horizonfuelcell.com)



## The smallest and the lightest.

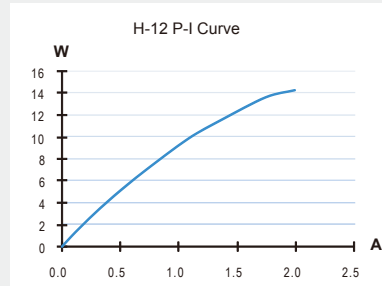
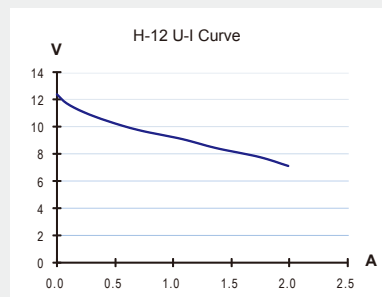
The H-series Polymer Electrolyte Membrane (PEM) fuel cells designed by Horizon are semi-integrated, efficient, reliable systems that minimize the use of peripherals. As such, they are the most compact and lightweight air-cooled, self-humidified fuel cells available on the market, bringing new product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

# H-SERIES PEM Fuel Cell Systems



## H-12 FCS-B12

Type of fuel cell .....	PEM
Number of cells.....	13
Rated power.....	12W
Rated Performance.....	7.8V@1.5A
Purging valve voltage.....	6V
Blower voltage.....	5V
Reactants.....	Hydrogen and Air
Ambient temperature.....	5-30°C(41-86°F)
Max stack temperature.....	55°C(131°F)
Hydrogen pressure.....	0.45-0.55Bar
Humidification.....	Self-humidified
Cooling.....	Air (integrated cooling fan)
Stack weight (with fan & casing).....	275g(±30g)
Stack size.....	75x47x70mm(3x1.8x2.8in)
Flow rate at max output.....	0.18L/min
Hydrogen purity.....	≥99.995% dry H2
Start up time.....	≤30s (ambient temperature)
Efficiency of system.....	40% at full power

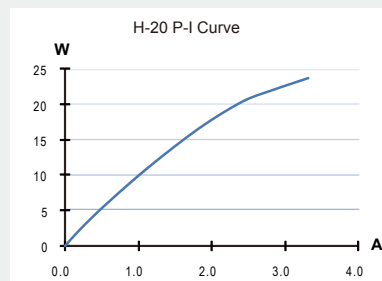
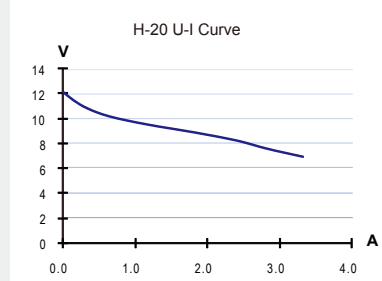


Semi-integrated 12W fuel cell system  
Including: • Integrated fan and casing  
• 12W stack with blower



## H-20 FCS-B20

Type of fuel cell .....	PEM
Number of cells.....	13
Rated power.....	20W
Rated Performance.....	7.8V@2.6A
Purging valve voltage.....	6V
Blower voltage.....	5V
Reactants.....	Hydrogen and Air
Ambient temperature.....	5-30°C(41-86°F)
Max stack temperature.....	55°C(131°F)
Hydrogen pressure.....	0.45-0.55Bar
Humidification.....	Self-humidified
Cooling.....	Air (integrated cooling fan)
Stack weight (with fan & casing).....	275g(±30g)
Controller weight.....	90g(±10g)
Stack size.....	75x47x70mm(3x1.8x2.8in)
Flow rate at max output.....	0.28L/min
Hydrogen purity.....	≥99.995% dry H2
Start up time.....	≤30s (ambient temperature)
Efficiency of system.....	40% at full power

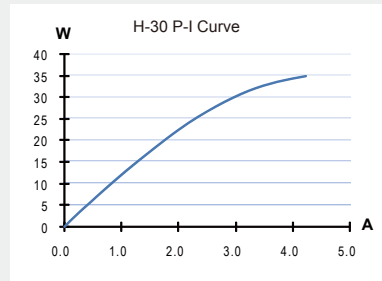
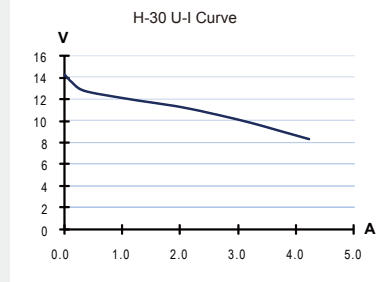


Semi-integrated 20W fuel cell system  
Including: • Miniature electronic valve  
• Control electronics  
• Integrated fan and casing  
• Low pressure protection  
• 20W stack with blower



## H-30 FCS-B30

Type of fuel cell .....	PEM
Number of cells.....	14
Rated power.....	30W
Rated Performance.....	8.4V@3.6A
Purging valve voltage.....	6V
Blower voltage.....	5V
Reactants.....	Hydrogen and Air
Ambient temperature.....	5-30°C(41-86°F)
Max stack temperature.....	55°C(131°F)
Hydrogen pressure.....	0.45-0.55Bar
Humidification.....	Self-humidified
Cooling.....	Air (integrated cooling fan)
Stack weight (with fan & casing).....	280g(±30g)
Controller weight.....	90g(±10g)
Stack size.....	80x47x75mm(3.1x1.8x3in)
Flow rate at max output.....	0.42L/min
Hydrogen purity.....	≥99.995% dry H2
Start up time.....	≤30s (ambient temperature)
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

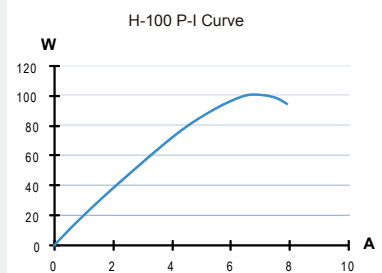
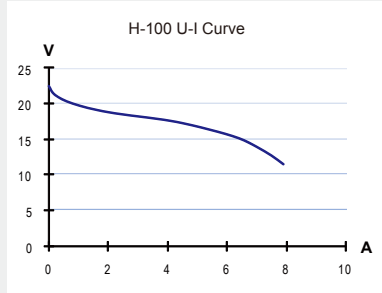
## H-100 FCS-B100



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

Type of fuel cell	PEM
Number of cells	24
Rated power	100W
Rated Performance	14.4V@7.2A
Hydrogen supply valve voltage	12V
Purging valve voltage	12V
Blower voltage	12V
Reactants	Hydrogen and Air
Ambient temperature	5-30°C(41-86°F)
Max stack temperature	65°C(149°F)
Hydrogen pressure	0.45-0.55Bar
Humidification	Self-humidified
Cooling	Air (integrated cooling fan)
Stack weight (with fan & casing)	960g(±50g)
Controller weight	400g(±30g)
Stack size	130x112x95mm(5.1x4.4x3.7in)
Flow rate at max output	1.4L/min
Hydrogen purity	≥99.995% dry H <sub>2</sub>
Start up time	≤30s (ambient temperature)
Efficiency of system	40% @14.4V
Low voltage protection	12V
Over current protection	12A
Over temperature protection	65°C
External power supply	13V(±1V), <5A



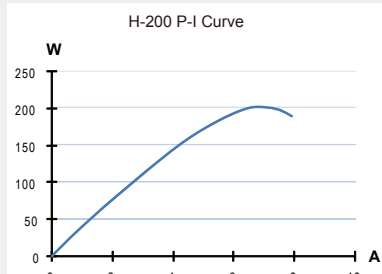
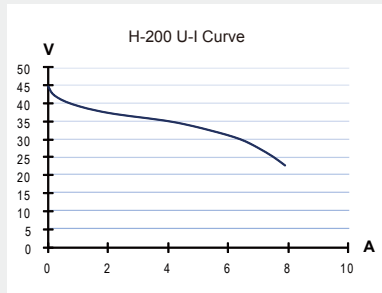
## H-200 FCS-B200



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

Type of fuel cell	PEM
Number of cells	48
Rated power	200W
Rated Performance	28.8V@7.2A
Hydrogen supply valve voltage	12V
Purging valve voltage	12V
Blower voltage	12V
Reactants	Hydrogen and Air
Ambient temperature	5-30°C(41-86°F)
Max stack temperature	65°C(149°F)
Hydrogen pressure	0.45-0.55Bar
Humidification	Self-humidified
Cooling	Air (integrated cooling fan)
Stack weight (with fan & casing)	1550g(±50g)
Controller weight	400g(±30g)
Stack size	215x112x95mm(8.5x4.4x3.7in)
Flow rate at max output	2.8L/min
Hydrogen purity	≥99.995% dry H <sub>2</sub>
Start up time	≤30s (ambient temperature)
Efficiency of system	40% @28.8V
Low voltage protection	24V
Over current protection	12A
Over temperature protection	65°C
External power supply	13V(±1V), <5A



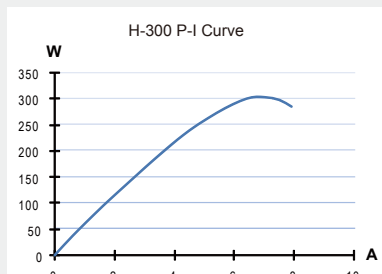
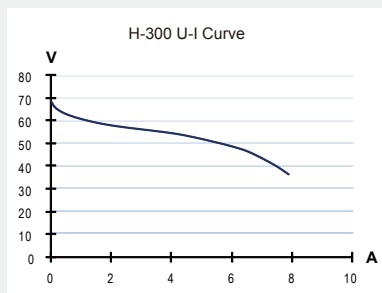
## H-300 FCS-B300



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

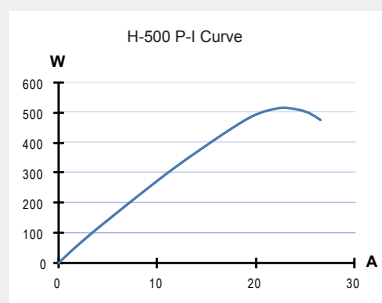
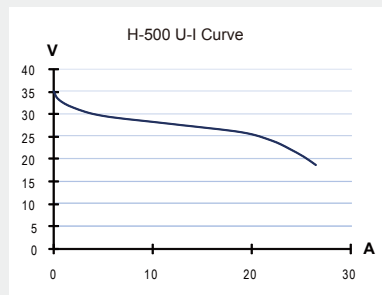
Type of fuel cell	PEM
Number of cells	72
Rated power	300W
Rated Performance	43.2V@7A
Hydrogen supply valve voltage	12V
Purging valve voltage	12V
Blower voltage	12V
Reactants	Hydrogen and Air
Ambient temperature	5-30°C(41-86°F)
Max stack temperature	65°C(149°F)
Hydrogen pressure	0.45-0.55Bar
Humidification	Self-humidified
Cooling	Air (integrated cooling fan)
Stack weight (with fan & casing)	2050g(±50g)
Controller weight	400g(±30g)
Stack size	280x112x95mm(11x4.4x3.7in)
Flow rate at max output	4.2L/min
Hydrogen purity	≥99.995% dry H <sub>2</sub>
Start up time	≤30s (ambient temperature)
Efficiency of system	40% @43.2V
Low voltage protection	36V
Over current protection	12A
Over temperature protection	65°C
External power supply	13V(±1V), <5A



# H-SERIES PEM Fuel Cell Systems

## H-500 FCS-B500

Type of fuel cell ..... PEM  
 Number of cells..... 36  
 Rated power..... 500W  
 Rated Performance..... 21.6V@24A  
 Hydrogen supply valve voltage..... 12V  
 Purging valve voltage..... 12V  
 Blower voltage..... 12V  
 Reactants..... Hydrogen and Air  
 Ambient temperature..... 5-30°C(41-86°F)  
 Max stack temperature..... 65°C(149°F)  
 Hydrogen pressure..... 0.45-0.55Bar  
 Humidification..... Self-humidified  
 Cooling..... Air (integrated cooling fan)  
 Stack weight (with fan & casing)... 2800g(±50g)  
 Controller weight..... 400g(±30g)  
 Stack size..... 215x125x180mm(8.5x4.9x7.1in)  
 Flow rate at max output..... 7L/min  
 Hydrogen purity..... ≥99.995% dry H2  
 Start up time..... ≤30s (ambient temperature)  
 Efficiency of system..... 40% @21.6V  
 Low voltage protection..... 18V  
 Over current protection..... 30A  
 Over temperature protection..... 65°C  
 External power supply..... 13V(±1V), <5A

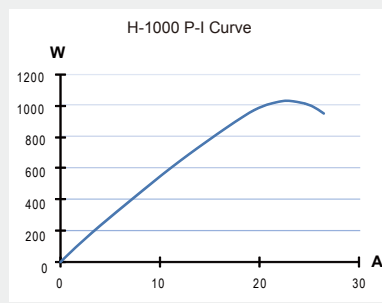
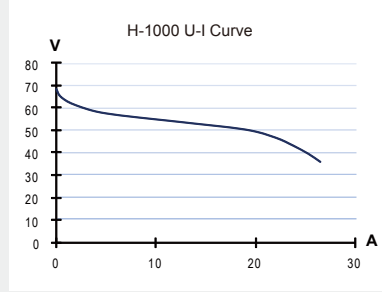


Semi-integrated 500W fuel cell system

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

## H-1000 FCS-B1000

Type of fuel cell ..... PEM  
 Number of cells..... 72  
 Rated power..... 1000W  
 Rated Performance..... 43.2V@24A  
 Hydrogen supply valve voltage..... 12V  
 Purging valve voltage..... 12V  
 Blower voltage..... 12V  
 Reactants..... Hydrogen and Air  
 Ambient temperature..... 5-30°C(41-86°F)  
 Max stack temperature..... 65°C(149°F)  
 Hydrogen pressure..... 0.45-0.55Bar  
 Humidification..... Self-humidified  
 Cooling..... Air (integrated cooling fan)  
 Stack weight (with fan & casing)... 4.5kg(±100g)  
 Controller weight..... 400g(±30g)  
 Stack size..... 215x125x300mm(8.5x4.9x11.8in)  
 Flow rate at max output..... 14L/min  
 Hydrogen purity..... ≥99.995% dry H2  
 Start up time..... ≤30s (ambient temperature)  
 Efficiency of system..... 40% @43.2V  
 Low voltage protection..... 36V  
 Over current protection..... 30A  
 Over temperature protection..... 65°C  
 External power supply..... 13V(±1V), 5A-8A

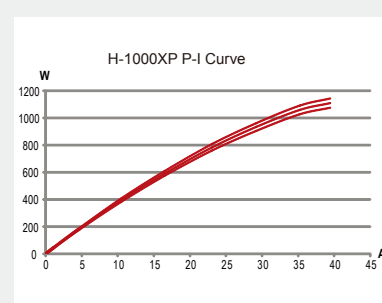
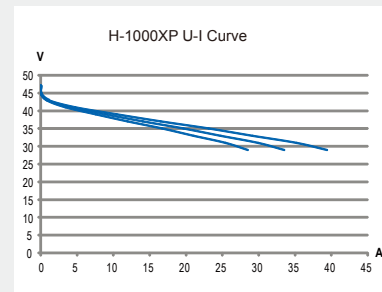


Semi-integrated 1000W fuel cell system

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

## H-1000XP

Type of fuel cell ..... PEM  
 Number of cells..... 50  
 Rated power..... 1000W  
 Rated Performance..... 30V@33.3A  
 Hydrogen supply valve voltage..... 12V  
 Purging valve voltage..... 12V  
 Blower voltage..... 12V  
 Reactants..... Hydrogen and Air  
 Ambient temperature..... 5-35°C(41-95°F)  
 Max stack temperature..... 65°C(149°F)  
 Hydrogen pressure..... 0.45-0.55Bar  
 Humidification..... Self-humidified  
 Cooling..... Air (integrated cooling fan)  
 Stack weight (with fan & casing).. Approx.3.6kg  
 Controller weight..... Approx.1.9kg  
 Stack size..... 264x197x117mm(10.4x7.8x4.6in)  
 Flow rate at max output..... 13.5L/min  
 Hydrogen purity..... ≥99.995% dry H2  
 Start up time..... ≤30s  
 Efficiency of system..... 48%@ 30V LHV (net)  
 Low voltage protection..... 25V  
 Over current protection..... 50A  
 Over temperature protection..... 68°C  
 Start up battery..... 12V



Semi-integrated 1kW fuel cell system

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

# H-SERIES PEM Fuel Cell Systems

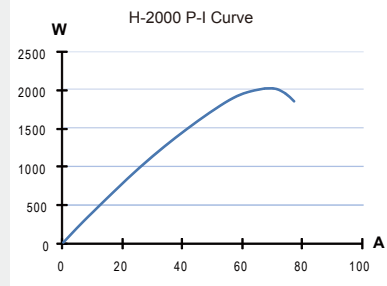
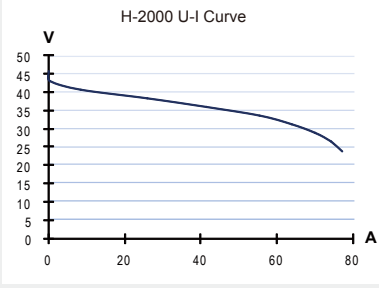


Semi-integrated 2000W fuel cell system

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

## H-2000 FCS-B2000

Type of fuel cell	PEM
Number of cells	48
Rated power	2000W
Rated Performance	28.8V@70A
Hydrogen supply valve voltage	12V
Purging valve voltage	12V
Blower voltage	12V
Reactants	Hydrogen and Air
Ambient temperature	5-30°C(41-86°F)
Max stack temperature	65°C(149°F)
Hydrogen pressure	0.45-0.55Bar
Humidification	Self-humidified
Cooling	Air (integrated cooling fan)
Stack weight (with fan & casing)	10kg(±200g)
Controller weight	2500g(±100g)
Stack size	404x183x327mm(16x7.2x12.9in)
Flow rate at max output	29L/min
Hydrogen purity	≥99.995% dry H2
Start up time	≤30s (ambient temperature)
Efficiency of system	40% @28.8V
Low voltage protection	24V
Over current protection	90A
Over temperature protection	65°C
External power supply	13V(±1V), 5A-8A

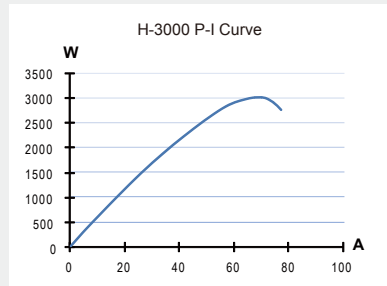
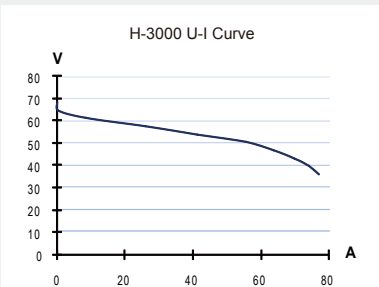


Semi-integrated 3000W fuel cell system

- 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
Hydrogen supply valve voltage	12V
Purging valve voltage	12V
Blower voltage	12V
Reactants	Hydrogen and Air
Ambient temperature	5-30°C(41-86°F)
Max stack temperature	65°C(149°F)
Hydrogen pressure	0.45-0.55Bar
Humidification	Self-humidified
Cooling	Air (integrated cooling fan)
Stack weight (with fan & casing)	15kg(±200g)
Controller weight	2500g(±100g)
Stack size	404x183x449mm(16x7.2x17.7in)
Flow rate at max output	42L/min
Hydrogen purity	≥99.995% dry H2
Start up time	≤30s (ambient temperature)
Efficiency of system	40% @43.2V
Low voltage protection	36V
Over current protection	90A
Over temperature protection	65°C
External power supply	13V(±1V), 5A-8A

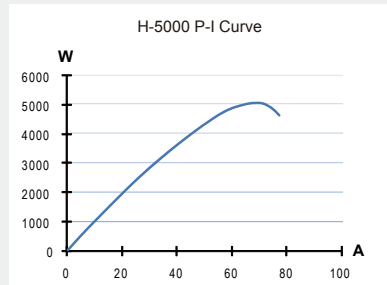
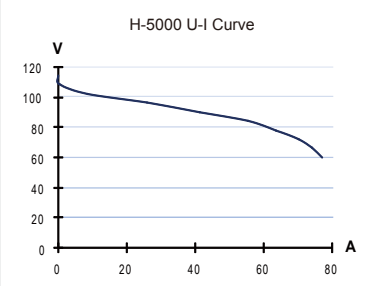


Semi-integrated 5000W fuel cell system

- 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
Hydrogen supply valve voltage	12V
Purging valve voltage	12V
Blower voltage	24V
Reactants	Hydrogen and Air
Ambient temperature	5-30°C(41-86°F)
Max stack temperature	65°C(149°F)
Hydrogen pressure	0.45-0.55Bar
Humidification	Self-humidified
Cooling	Air (integrated cooling fan)
Stack weight (with fan & casing)	30kg(±200g)
Controller weight	2500g(±100g)
Stack size	404x212x692mm(16x8.3x27in)
Flow rate at max output	70L/min
Hydrogen purity	≥99.995% dry H2
Start up time	≤30s (ambient temperature)
Efficiency of system	40% @72V
Low voltage protection	60V
Over current protection	90A
Over temperature protection	65°C
External power supply	24V(±1V), 8A-12A





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