

# Open-Cathode PEM Fuel Cells

Better fuel efficiency, higher reliability, very easy to set up  
...And even smaller, lighter than before!





Semi-integrated 12W fuel cell system

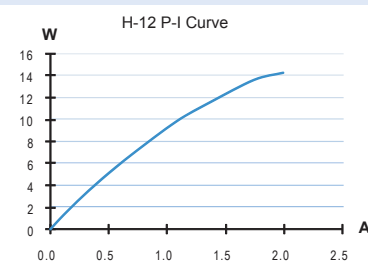
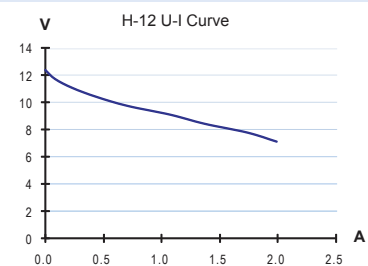
- Includes:**
- Integrated fan and casing
  - 12W stack with blower

# H-12

## FCS-B12

### 12W

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
Flow rate at max output.....	0.18L/min
Hydrogen purity.....	≥99.995% dry H <sub>2</sub>
Start up time.....	≤30s (ambient temperature)
Efficiency of system.....	40% at full power



Controller



Semi-integrated 20W fuel cell system

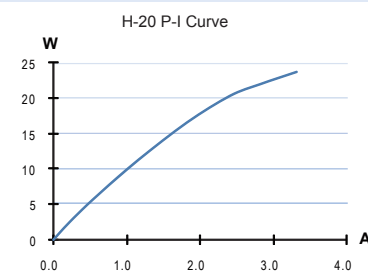
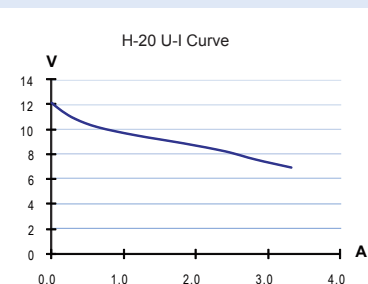
- Includes:**
- Miniature electronic valve
  - Control electronics
  - Integrated fan and casing
  - Low voltage protection
  - 20W stack with blower

# H-20

## FCS-B20

### 20W

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
Flow rate at max output.....	0.28L/min
Hydrogen purity.....	≥99.995% dry H <sub>2</sub>
Start up time.....	≤30s (ambient temperature)
Efficiency of system.....	40% at full power



Controller



Semi-integrated 30W fuel cell system

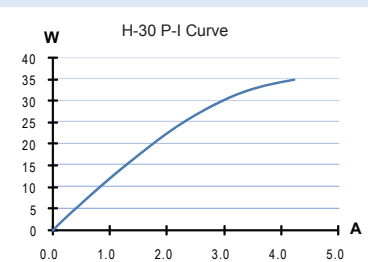
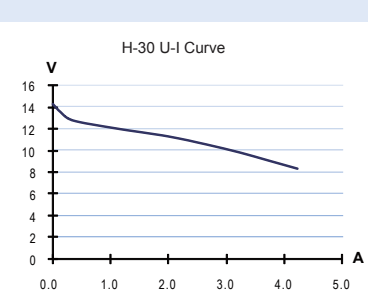
- Includes:**
- Miniature electronic valve
  - Control electronics
  - Integrated fan and casing
  - Low voltage protection
  - 30W stack with blower

# H-30

## FCS-B30

### 30W

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
Flow rate at max output.....	0.42L/min
Hydrogen purity.....	≥99.995% dry H <sub>2</sub>
Start up time.....	≤30s (ambient temperature)
Efficiency of system.....	40% at full power





Controller

Semi-integrated 100W fuel cell system

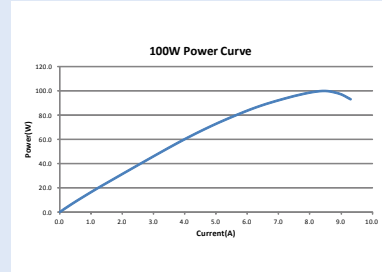
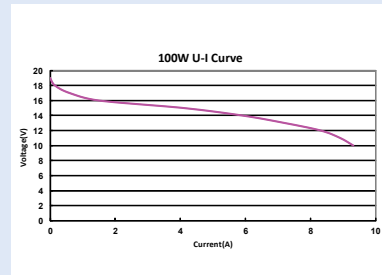
- Includes:**
- Connections/Tubing
  - Electronic valves
  - Electronic control box
  - 100W stack with blower
  - Fuel cell ON/OFF switch
  - SCU ON/OFF switch

# H-100

## FCS-C100

### 100W

Type of fuel cell	PEM
Number of cells	20
Rated power	100W
Rated Performance	12V@8.3A
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)	1290g(±50g)
Controller weight	400g(±30g)
Stack size	118x104x94mm
Flow rate at max output	1.3L/min
Hydrogen purity	≥ 99.995% dry H2
Start up time	≤30s (ambient temperature)
Efficiency of system	40% @12V
Low voltage protection	10V
Over current protection	12A
Over temperature protection	65°C
External power supply	13V(±1V), 5A



Controller

Semi-integrated 200W fuel cell system

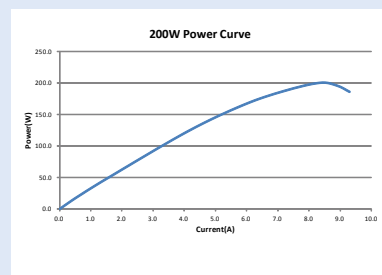
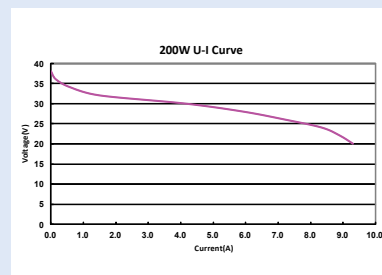
- Includes:**
- Connections/Tubing
  - Electronic valves
  - Electronic control box
  - 200W stack with blower
  - Fuel cell ON/OFF switch
  - SCU ON/OFF switch

# H-200

## FCS-C200

### 200W

Type of fuel cell	PEM
Number of cells	40
Rated power	200W
Rated Performance	24V@8.3A
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)	2230g(±50g)
Controller weight	400g(±30g)
Stack size	118x183x94mm
Flow rate at max output	2.6L/min
Hydrogen purity	≥99.995% dry H2
Start up time	≤30s (ambient temperature)
Efficiency of system	40% @24V
Low voltage protection	20V
Over current protection	12A
Over temperature protection	65°C
External power supply	13V(±1V), 5A



Controller

Semi-integrated 300W fuel cell system

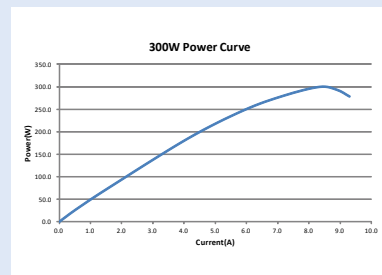
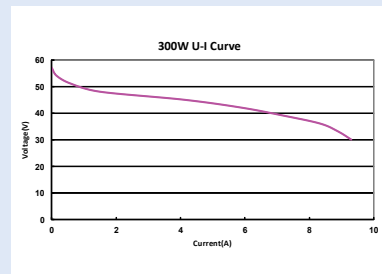
- Includes:**
- Connections/Tubing
  - Electronic valves
  - Electronic control box
  - 300W stack with blower
  - Fuel cell ON/OFF switch
  - SCU ON/OFF switch

# H-300

## FCS-C300

### 300W

Type of fuel cell	PEM
Number of cells	60
Rated power	300W
Rated Performance	36V@8.3A
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)	2790g(±50g)
Controller weight	400g(±30g)
Stack size	118x262x94mm
Flow rate at max output	3.9L/min
Hydrogen purity	≥99.995% dry H2
Start up time	≤30s (ambient temperature)
Efficiency of system	40% @36V
Low voltage protection	30V
Over current protection	12A
Over temperature protection	65°C
External power supply	13V(±1V), 5A





Semi-integrated 500W fuel cell system

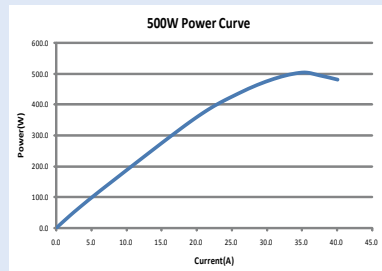
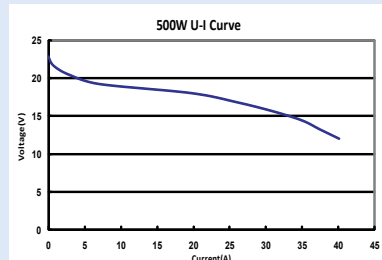
- Includes:**
- Connections/Tubing
  - Electronic valves
  - Electronic control box
  - 500W stack with blower
  - Fuel cell ON/OFF switch
  - SCU ON/OFF switch

## H-500

### FCS-C500

# 500W

Type of fuel cell .....	PEM
Number of cells.....	24
Rated power.....	500W
Rated Performance.....	14.4V@35A
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)...	2520g(±50g)
Controller weight.....	400g(±30g)
Stack size.....	130x268x123mm
Flow rate at max output.....	6.5L/min
Hydrogen purity.....	≥99.995% dry H2
Start up time.....	≤30s (ambient temperature)
Efficiency of system.....	40% @14.4V
Low voltage protection.....	12V
Over current protection.....	42A
Over temperature protection.....	65°C
External power supply.....	13V(±1V), 5A



Semi-integrated 1000W fuel cell system

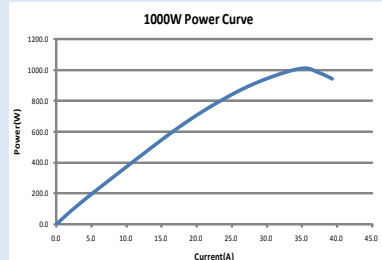
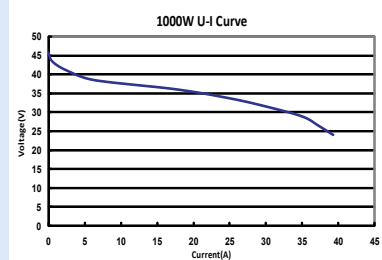
- Includes:**
- Connections/Tubing
  - Electronic valves
  - Electronic control box
  - 1000W stack with blower
  - Fuel cell ON/OFF switch
  - SCU ON/OFF switch

## H-1000

### FCS-C1000

# 1000W

Type of fuel cell .....	PEM
Number of cells.....	48
Rated power.....	1000W
Rated Performance.....	28.8V@35A
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).....	4kg(±100g)
Controller weight.....	400g(±30g)
Stack size.....	219x268x123mm
Flow rate at max output.....	13L/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.....	42A
Over temperature protection.....	65°C
External power supply.....	13V(±1V), 5A-8A



Semi-integrated 1kW fuel cell system

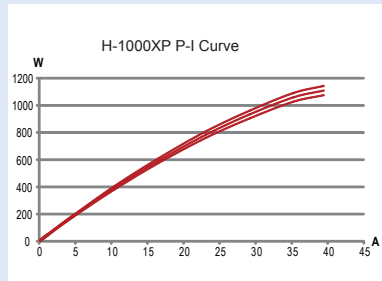
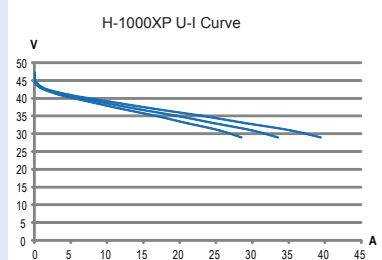
- Includes:**
- LCD display
  - Hydrogen sensor(optional)
  - Ambient temperature sensor
  - DC-DC converter
  - Ultra capacitor bank
  - Electronic control box
  - Electronic valves
  - RS232 connector
  - Blower controller
  - Start up battery connector
  - Software(optional)
  - ON/OFF switch
  - Emergency stop switch
  - PU tubing

## H-1000XP

### 1000W

Extra Performance

Type of fuel cell .....	PEM
Number of cells.....	50
Rated power.....	1000W
Rated Performance.....	30V@33.5A
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.5kg
Controller weight.....	Approx. 1.9kg
Stack size.....	264x203x104mm
Flow rate at max output.....	12.5L/min
Hydrogen purity.....	≥99.99% 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





Controller

Semi-integrated 2000W fuel cell system

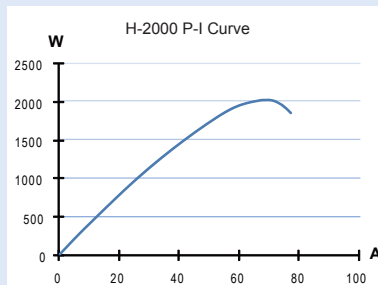
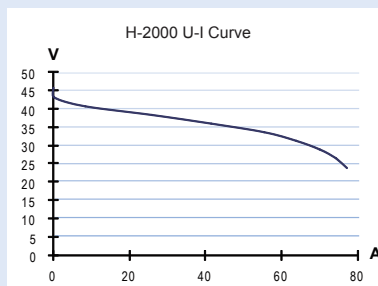
- Includes:**
- Connections/Tubing
  - Electronic valves
  - Electronic control box
  - 2000W stack with blower
  - Fuel cell ON/OFF switch
  - SCU ON/OFF switch
  - LCD display

# H-2000

## FCS-C2000

### 2000W

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.....	303x350x183mm
Flow rate at max output.....	26L/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



Controller

Semi-integrated 3000W fuel cell system

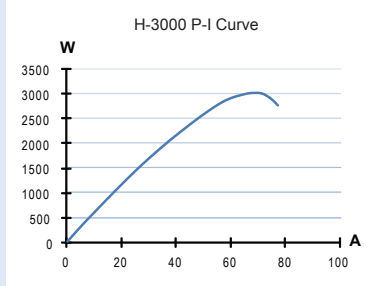
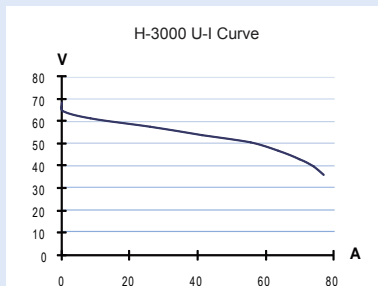
- Includes:**
- Connections/Tubing
  - Electronic valves
  - Electronic control box
  - 3000W stack with blower
  - Fuel cell ON/OFF switch
  - SCU ON/OFF switch
  - LCD display

# H-3000

## FCS-C3000

### 3000W

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.....	418x350x183mm
Flow rate at max output.....	39L/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



Controller

Semi-integrated 5000W fuel cell system

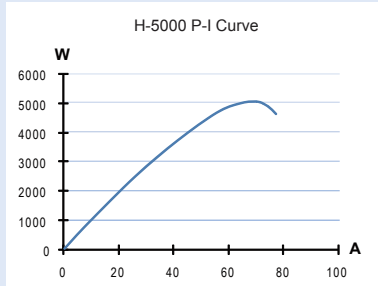
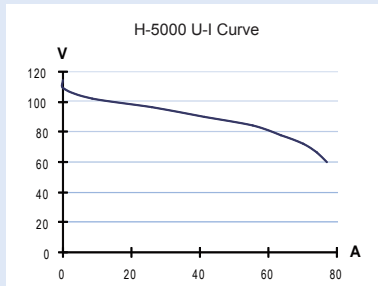
- Includes:**
- Connections/Tubing
  - Electronic valves
  - Electronic control box
  - 5000W stack with blower
  - Fuel cell ON/OFF switch
  - SCU ON/OFF switch
  - LCD display

# H-5000

## FCS-C5000

### 5000W

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.....	650x350x212mm
Flow rate at max output.....	65L/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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