

Open-cathode PEM fuel cells



- BETTER FUEL EFFICIENCY
- HIGHER RELIABILITY
- VERY EASY TO SET UP
- EVEN SMALLER AND LIGHTER THAN BEFORE!

H-Series Fuel Cell Stacks

H-12 12W

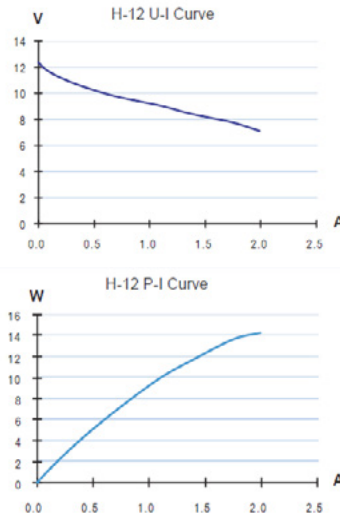
FCS-B12



Semi-integrated 12W fuel cell system

- Integrated fan and casing
- 12W stack with blower

INCLUDES



| | |
|------------------------------------|------------------------------|
| Type of fuel cell | PEM |
| Number of cells | 13 |
| Rated power | 12W |
| Rated performance | 7.8V at 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 and casing) | 275g (±30g) |
| Stack size | 75x47x70mm |
| 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 |

H-20 20W

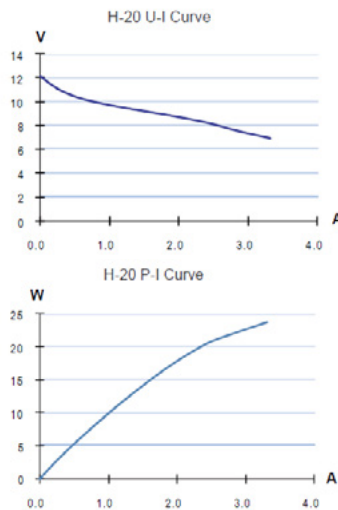
FCS-B20



Semi-integrated 20W fuel cell system

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

INCLUDES



| | |
|------------------------------------|------------------------------|
| Type of fuel cell | PEM |
| Number of cells | 13 |
| Rated power | 20W |
| Rated performance | 7.8V at 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 and casing) | 275g (±30g) |
| Controller weight | 90g (±10g) |
| Stack size | 75x47x70mm |
| 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 |

H-30 30W

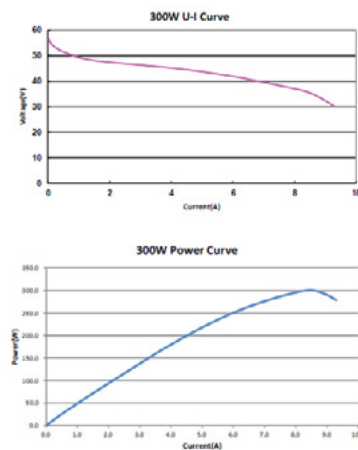
FCS-B30



Semi-integrated 30W fuel cell system

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

INCLUDES

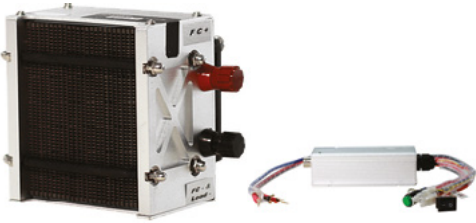


| | |
|------------------------------------|------------------------------|
| Type of fuel cell | PEM |
| Number of cells | 14 |
| Rated power | 30W |
| Rated performance | 8.4V at 3.6A |
| Purging valve voltage | 6V |
| Blower voltage | 5V |
| Reactants | Hydrogen and Air |
| Ambient temperature | 5-30°C (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 and casing) | 280g (±30g) |
| Controller weight | 90g (±10g) |
| Stack size | 80x47x75mm |
| 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 |

H-Series Fuel Cell Stacks

H-100 100W

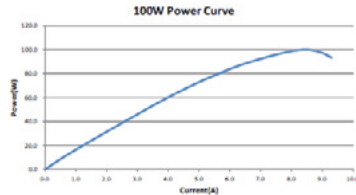
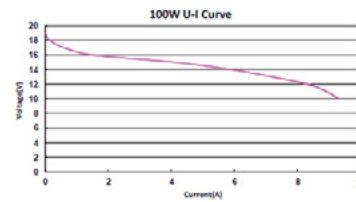
FCS-C100



Semi-integrated 100W fuel cell system

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

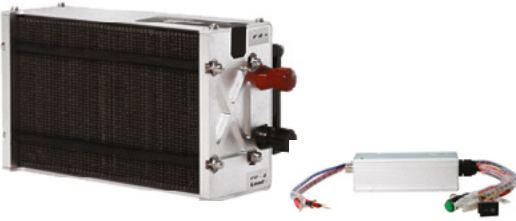
INCLUDES



| | |
|------------------------------------|------------------------------|
| Type of fuel cell | PEM |
| Number of cells | 20 |
| Rated power | 100W |
| Rated performance | 12V at 8.3A |
| Hydrogen supply valve voltage | 12V |
| Purging supply 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 and casing) | 1460g (±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 |

H-200 200W

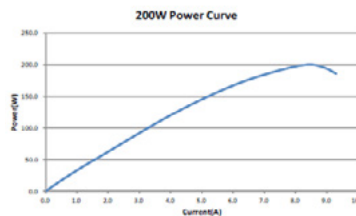
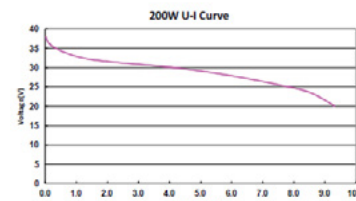
FCS-C200



Semi-integrated 200W fuel cell system

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

INCLUDES



| | |
|------------------------------------|------------------------------|
| Type of fuel cell | PEM |
| Number of cells | 40 |
| Rated power | 200W |
| Rated performance | 24V at 8.3A |
| Hydrogen supply valve voltage | 12V |
| Purging supply 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 and 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% at 24V |
| Low voltage protection | 20V |
| Over current protection | 12A |
| Over temperature protection | 65°C |
| External power supply | 13V(±1V), 5A |

H-300 300W

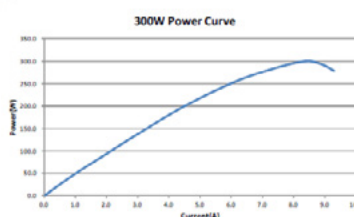
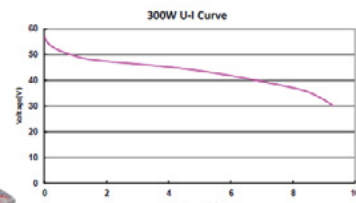
FCS-C300



Semi-integrated 300W fuel cell system

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

INCLUDES



| | |
|------------------------------------|------------------------------|
| Type of fuel cell | PEM |
| Number of cells | 60 |
| Rated power | 300W |
| Rated performance | 36V at 8.3A |
| Hydrogen supply valve voltage | 12V |
| Purging supply 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 and casing) | 3000g (±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% at 36V |
| Low voltage protection | 30V |
| Over current protection | 12A |
| Over temperature protection | 65°C |
| External power supply | 13V(±1V), 5A |

H-Series Fuel Cell Stacks



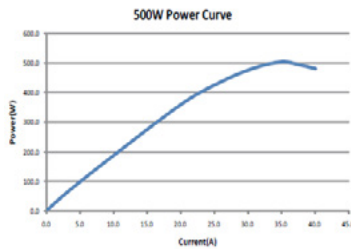
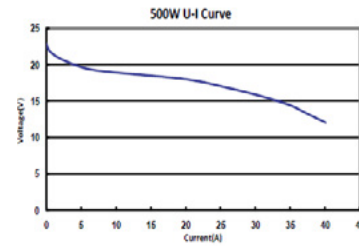
H-500 500W

FCS-C500



Semi-integrated 500W fuel cell system

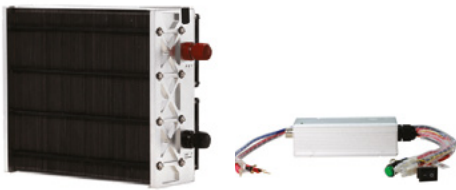
- Connections/Tubing
 - Electronic valves
 - Electronic control box
 - 500W stack with blower
 - Fuel cell ON/OFF switch
 - SCU ON/OFF switch
- INCLUDES**



| | |
|------------------------------------|------------------------------|
| Type of fuel cell | PEM |
| Number of cells | 24 |
| Rated power | 500W |
| Rated performance | 14.4V at 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 | 0.45-0.55 Bar |
| Humidification | Self-humidified |
| Cooling | Air (integrated cooling fan) |
| Stack weight (with fan and casing) | 3370g (±50g) |
| Controller weight | 627g (±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% at 14.4V |
| Low voltage protection | 12V |
| Over current protection | 42A |
| Over temperature protection | 65°C |
| External power supply | 13V(±1V),5A |

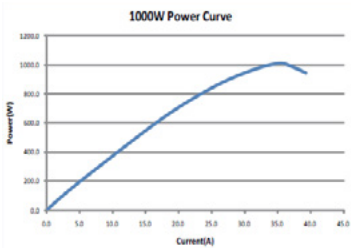
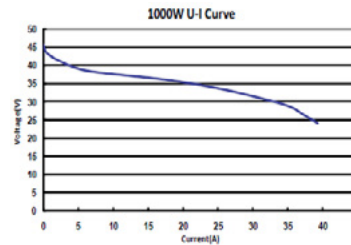
H-1000 1000W

FCS-C1000



Semi-integrated 1000W fuel cell system

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



| | |
|------------------------------------|------------------------------|
| Type of fuel cell | PEM |
| Number of cells | 48 |
| Rated power | 1000W |
| Rated performance | 28.8V at 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) 65° |
| Max stack temperature | C (149°F) |
| Hydrogen pressure | 0.45-0.55 Bar |
| Humidification | Self-humidified |
| Cooling | Air (integrated cooling fan) |
| Stack weight (with fan and casing) | 5760g (±100g) |
| Controller weight | 627g (±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% at 28.8V |
| Low voltage protection | 24V |
| Over current protection | 42A |
| Over temperature protection | 65°C |
| External power supply | 13V(±1V),5A-8A |



Semi-integrated fuel cell system

- | INCLUDES | OPTIONALS |
|---|--|
| <ul style="list-style-type: none"> ○ Connections/Tubing ○ Electronic valves ○ Electronic control box ○ Ambient temperature sensor ○ 1000W stack with blowers ○ ON/OFF switch ○ SCU unit ○ Blower controller ○ Start up battery connector ○ LCD display ○ RS232 connector | <ul style="list-style-type: none"> ○ Ultra capacitor bank ○ Hydrogen sensor ○ DC-DC converter ○ Software |

H-500XP 500W

| | |
|------------------------------------|------------------------------|
| Type of fuel cell | PEM |
| Number of cells | 30 |
| Rated power | 500W |
| Rated performance | Hydrogen 18V at 27.8A |
| supply valve voltage | Purging 12V |
| supply valve voltage | Blower 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 | 0.45-0.55 Bar |
| Humidification | Self-humidified |
| Cooling | Air (integrated cooling fan) |
| Stack weight (with fan and casing) | Approx. 3.9kg |
| Controller weight | Approx.1.9kg |
| Stack size | 264x130x104mm |
| Flow rate at max output | 5.86L/min |
| Hydrogen purity | ≥99.995% dry H2 |
| Start up time | ≤30s (ambient temperature) |
| Efficiency of system | 48% at 18V LHV (net) |
| Low voltage protection | 15V |
| Over current protection | 50A |
| Over temperature protection | 68°C |
| External power supply | 12V |

H-1000XP 1000W

| | |
|------------------------------------|------------------------------|
| Type of fuel cell | PEM |
| Number of cells | 50 |
| Rated power | 1000W |
| Rated performance | 30V at 33.5A |
| Hydrogen supply valve voltage | 12V |
| Purging supply 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 | 0.45-0.55 Bar |
| Humidification | Self-humidified |
| Cooling | Air (integrated cooling fan) |
| Stack weight (with fan and casing) | Approx. 5kg |
| Controller weight | Approx.1.9kg |
| Stack size | 264x203x104mm |
| Flow rate at max output | 12.5L/min |
| Hydrogen purity | ≥99.995% dry H2 |
| Start up time | ≤30s (ambient temperature) |
| Efficiency of system | 48% at 30V LHV (net) |
| Low voltage protection | 25V |
| Over current protection | 50A |
| Over temperature protection | 68°C |
| External power supply | 12V |

H-Series Fuel Cell Stacks

H-2000 2000W

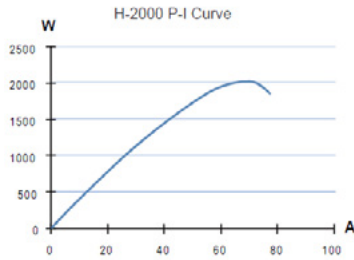
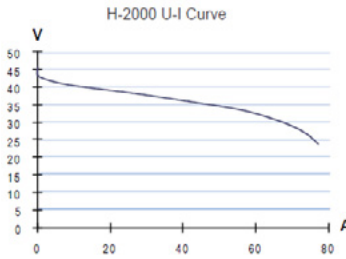
FCS-C2000



Semi-integrated 2000W fuel cell system

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

INCLUDES



| | |
|------------------------------------|------------------------------|
| Type of fuel cell | PEM |
| Number of cells | 48 |
| Rated power | 2000W |
| Rated performance | 28.8V at 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 | 0.45-0.55 Bar |
| Humidification | Self-humidified |
| Cooling | Air (integrated cooling fan) |
| Stack weight (with fan and casing) | 14.1kg (±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% at 28.8V |
| Low voltage protection | 24V |
| Over current protection | 90A |
| Over temperature protection | 65°C |
| External power supply | 13V(±1V),5A-8A |

H-3000 3000W

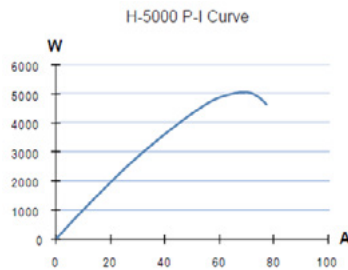
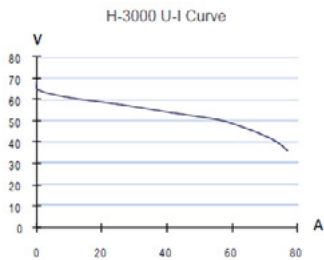
FCS-C3000



Semi-integrated 3000W fuel cell system

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

INCLUDES



| | |
|------------------------------------|------------------------------|
| Type of fuel cell | PEM |
| Number of cells | 72 |
| Rated power | 3000W |
| Rated performance | 43.2V at 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 | 0.45-0.55 Bar |
| Humidification | Self-humidified |
| Cooling | Air (integrated cooling fan) |
| Stack weight (with fan and 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% at 43.2V |
| Low voltage protection | 36V |
| Over current protection | 90A |
| Over temperature protection | 65°C |
| External power supply | 13V(±1V),5A-8A |

H-5000 5000W

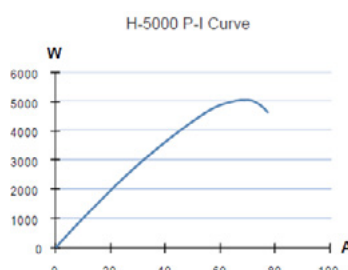
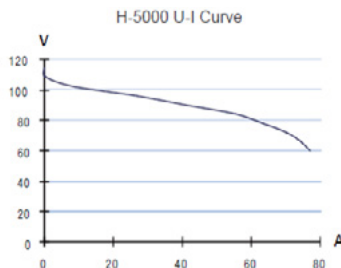
FCS-C5000



Semi-integrated 5000W fuel cell system

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

INCLUDES



| | |
|------------------------------------|------------------------------|
| Type of fuel cell | PEM |
| Number of cells | 120 |
| Rated power | 5000W |
| Rated performance | 72V at 70A |
| Hydrogen supply valve voltage | 12V |
| Purging supply 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 | 0.45-0.55 Bar |
| Humidification | Self-humidified |
| Cooling | Air (integrated cooling fan) |
| Stack weight (with fan and 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% at 72V |
| Low voltage protection | 60V |
| Over current protection | 90A |
| Over temperature protection | 65°C |
| External power supply | 24V(±1V),8A-12A |