

The product provides the following key features:

- Designed to integrate into application such as mobile, stations and transportation power generation; function as UPS or APU
- Carbon emission free and environmentally friendly
- Designed to meet CSA Fuel Cell Safety (FC 1-2012) and European Conformity (CE) EN 62282-3-100 and EMC directive (EN 61000-6-1 & EN 62040-2)



| Product Specification / Model No. | | LPH-3622 | LPH-5622 | LPH-8022 |
|-----------------------------------|----------------------------------|--|--|--|
| Basic | Product Description | Fuel Cell Power Module | Fuel Cell Power Module | Fuel Cell Power Module |
| | Max Stack Output Power | 1.3kW | 2.2kW | 3.2kW |
| Output | Voltage | 19~36V | 30~56V | 42~80V |
| | Current | 65A | 65A | 65A |
| Input | Input Voltage | 24V | 24V | 24V |
| | Hydrogen Purity Requirement | >99.95% | >99.95% | >99.95% |
| Fuel Requirement | Operating Fuel Pressure | 100 psi(6.8bar) | 100 psi(6.8bar) | 100 psi(6.8bar) |
| | Hydrogen Working Pressure | 44~120 psi(3~8.2 bar) | 44~120 psi(3~8.2 bar) | 44~120 psi(3~8.2 bar) |
| | Oxidant Composition | Air | Air | Air |
| | Oxidant Humidity | 0~100 %RH | 0~100 %RH | 0~100 %RH |
| Mechanical Info | Outer Dimensions | L54 x W42 x H36 cm (21.2 x 16.5 x 14.2 in.) | L65 x W42 x H36 cm (25.6 x 16.5 x 14.2 in.) | L80 x W42 x H36 cm (31.5 x 16.5 x 14.2 in.) |
| | Weight | 27 kg | 31 kg | 35 kg |
| | Cooling Type | Air Cooling | Air Cooling | Air Cooling |
| Environment Requirement | Ambient Temperature Storage | -20~50°C | -20~50°C | -20~50°C |
| | Normal Working Temperature | -5~35°C | -5~35°C | -5~35°C |
| | Humidity | 0~100 %RH | 0~100 %RH | 0~100 %RH |
| Operation Efficiency | Hydrogen Consumption | 752 Liter / kW-hr | 752 Liter / kW-hr | 752 Liter / kW-hr |
| | Fuel Cell Stack Efficiency (LHV) | >50% | >50% | >50% |
| | Noise | <65dB | <65dB | <65dB |
| Others | LCD Data Display | Yes | Yes | Yes |
| | System Start-up Time | 10 sec. | 10 sec. | 10 sec. |

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The product provides the following key features:

- Ideal module designed to integrate for transportation, stationary and decentralized generator application
- Water-cooling platform with higher stack efficiency, useful head recovery and longer lifetime
- Capable to be integrated in parallel/series fuel cell system
- Carbon emission free and environmentally friendly power generator
- Safety design following CSA Fuel Cell Safety (FC 1-2012) and European Conformity (CE) EN 62282-3-100 and EMC directive

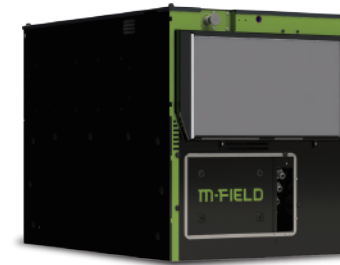
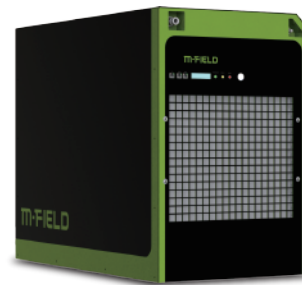


| Product Specification / Model No. | | WGH-5010 | WGH-7510 | WGH-9510 | WGH-12010 |
|-----------------------------------|----------------------------------|--|--|--|--|
| Basic | Product Description | Fuel Cell Power Module | Fuel Cell Power Module | Fuel Cell Power Module | Fuel Cell Power Module |
| | Max Stack Output Power | 4kW | 6kW | 8kW | 10kW |
| Output | Voltage | 30~50V | 45~75V | 57~95V | 72.5~120V |
| | Current | 135A | 135A | 135A | 135A |
| Input | Input Voltage | 48V | 48V | 48V | 48V |
| | Hydrogen Purity Requirement | >99.95% | >99.95% | >99.95% | >99.95% |
| Fuel Requirement | Operating Fuel Pressure | 100 psi(6.8bar) | 100 psi(6.8bar) | 100 psi(6.8bar) | 100 psi(6.8bar) |
| | Hydrogen Working Pressure | 44~120 psi(3~8.2 bar) | 44~120 psi(3~8.2 bar) | 44~120 psi(3~8.2 bar) | 44~120 psi(3~8.2 bar) |
| | Oxidant Composition | Air | Air | Air | Air |
| | Oxidant Humidity | 0~100 %RH | 0~100 %RH | 0~100 %RH | 0~100 %RH |
| Mechanical Info | Outer Dimensions | L70 x W50 x H40 cm (27.5 x 19.6 x 15.7 in.) | L70 x W50 x H40 cm (27.5 x 19.6 x 15.7 in.) | L70 x W50 x H40 cm (27.5 x 19.6 x 15.7 in.) | L70.5 x W42 x H60 cm (27.7 x 16.5 x 23.6 in.) |
| | Weight | 40 kg | 50 kg | 50 kg | 60 kg |
| | Cooling Type | Water Cooling | Water Cooling | Water Cooling | Water Cooling |
| Environment Requirement | Ambient Temperature Storage | 0~50°C | 0~50°C | 0~50°C | 0~50°C |
| | Normal Working Temperature | 5~40°C | 5~40°C | 5~40°C | 5~40°C |
| | Humidity | 0~100 %RH | 0~100 %RH | 0~100 %RH | 0~100 %RH |
| Operation Efficiency | Hydrogen Consumption | 752 Liter / kW-hr | 752 Liter / kW-hr | 752 Liter / kW-hr | 752 Liter / kW-hr |
| | Fuel Cell Stack Efficiency (LHV) | >50% | >50% | >50% | >50% |
| | Noise | <65dB | <65dB | <65dB | <65dB |
| Others | LCD Data Display | Yes | Yes | Yes | Yes |
| | System Start-up Time | 10 sec. | 10 sec. | 10 sec. | 10 sec. |

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The product provides the following key features:

- Designed as an alternative power solution for forklifts and trucks
- Perform to fulfill 8-hour shift operation
- Shorter refueling time comparing to traditional battery
- Remote monitoring platform
- Carbon emission free and environmental friendly power generator
- Designed to follow UL Fuel Cell Safety (UL 2267) and European Conformity (CE) EN 62282-4-101 and EMC directive



| Product Specification / Model No. | | TPH-0324 | TGH-1036 | TVH-1280 |
|-----------------------------------|-------------------------------|--|--|---|
| Basic | Product Description | Fuel Cell Power Pack for Electric Forklift | Fuel Cell Power Pack for Electric Forklift | Fuel Cell Power Pack for Electric Forklift |
| | Max Output Power | 5kW for 10 sec. | 24kW for 10 sec. | 35kW for 15 sec. |
| Output | Rated Output Power | 3kW | 10kW | 12.5kW |
| | Output Voltage | 24Vdc | 36Vdc | 80Vdc |
| | Input Voltage | 24Vdc | 36Vdc | 80Vdc |
| Input | Energy Bridging | Battery | Battery | Battery |
| | Regenerative Energy Storage | Available | Available | Available |
| | Hydrogen Purity Requirement | >99.95% | >99.95% | >99.95% |
| Fuel Requirement | Hydrogen Storage Pressure | 350 bar | 350 bar | 350 bar |
| | Hydrogen Mass in Cylinder | ~0.6kg @350bar | ~1.0kg @350bar | ~1.5kg @350bar |
| | Oxidant Composition | Air | Air | Air |
| | Oxidant Humidity | 0~100 %RH | 0~100 %RH | 0~100 %RH |
| | Outer Dimensions | L78 x W32 x H78 cm (30.7 x 12.5 x 30.7 in.) | L97.5 x W52 x H79 cm (38.3 x 20.4 x 31.1 in.) | L102.8 x W71.1 x H73.8 cm (40.4 x 27.9 x 29 in.) |
| Mechanical Info | Weight | 150~250 kg | 1100 kg | 850 kg |
| | Cooling Type | Air Cooling | Water Cooling | Water Cooling |
| Environment Requirement | Ambient Temperature Operation | -20~40°C | -20~40°C | -20~40°C |
| | Storage Temperature | 0~50°C | 0~50°C | 0~50°C |
| | Operation Environment | Indoor | Indoor | Indoor / Outdoor |
| | Humidity | 0~100 %RH | 0~100 %RH | 0~100 %RH |

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The product provides the following key features:

- Designed for sites requiring high quality electricity supply and power stability
- Optional dual AC & DC outputs are available
- Remote monitoring platform with user friendly interface
- Carbon emission free and environmentally friendly power generator
- Designed to meet CSA Fuel Cell Safety (FC 1-2012) and European Conformity (CE) EN 62282-3-100 and EMC directive (EN 61000-6-1 & EN 62040-2)



| Product Specification / Model No. | | UTH-0321 | UTH-0620 | UTH-0621 | UTH-1020 |
|-----------------------------------|--|--|--|--|--|
| | Product Description | Fuel Cell Power Generator | Fuel Cell Power Generator | Fuel Cell Power Generator | Fuel Cell Power Generator |
| Basic | Max Output Power | 3kW | 6kW | 6kW | 10kW |
| | Continuous Operation ¹ | 2.8kW | 5.6kW | 5.6kW | 9.4kW |
| Output | Output Current and Voltage | 60A@48Vdc | 120A@48Vdc | 120A@48Vdc | 200A@48Vdc |
| | Input Voltage | 48Vdc | 48Vdc | 48Vdc | 220~240Vac |
| Input | Frequency | - | - | - | 50/60Hz |
| | Rated Input Current | < 2A | < 2A | < 2A | 2A |
| | Hydrogen Purity Requirement | >99.95% | >99.95% | >99.95% | >99.95% |
| Fuel Requirement | Operating Fuel Pressure | 100 psi (6.8 bar) | 100 psi (6.8 bar) | 100 psi (6.8 bar) | 100 psi (6.8 bar) |
| | Fuel Working Pressure | 80~120 psi(5.4~8.2 bar) | 80~120 psi(5.4~8.2 bar) | 80~120 psi(5.4~8.2 bar) | 80~120 psi(5.4~8.2 bar) |
| | Oxidant Composition | Air | Air | Air | Air |
| | Oxidant Humidity | 0~100 %RH | 0~100 %RH | 0~100 %RH | 0~100 %RH |
| Mechanical Info | Outer Dimensions | L110 x W70 x H180 cm (43.3 x 27.5 x 70.8 in.) | L177 x W60.6 x H165.4 cm (69.6 x 23.8 x 65.1 in.) | L110 x W70 x H180 cm (43.3 x 27.5 x 70.8 in.) | L120 x W60.6 x H194.7 cm (47.2 x 23.8 x 76.6 in.) |
| | Weight ² | 250 kg | 650 kg | 300 kg | 360 kg |
| | Cooling Type | Air Cooling | Air Cooling | Air Cooling | Air Cooling |
| Environment Requirement | Ambient Temperature Storage ³ | -20~50°C | 0~50°C | -20~50°C | 0~50°C |
| | Normal Working Temperature | -10~40°C | 0~40°C | -10~40°C | 0~40°C |
| | Humidity | 0~95 %RH | 0~95 %RH | 0~95 %RH | 0~95 %RH |
| Operation Efficiency | Hydrogen Consumption | 752 Liter / kW-hr | 752 Liter / kW-hr | 752 Liter / kW-hr | 752 Liter / kW-hr |
| | Fuel Cell Efficiency (LHV) | >40% | >40% | >40% | >40% |
| | Noise | <65dB | <65dB | <65dB | <65dB |
| Others | Remote Monitor | 3G Network | 3G Network | 3G Network | 3G Network |
| | System Start-up Time | 20 sec. | 20 sec. | 20 sec. | 20 sec. |

¹ Continuous operation is a guide for assisting fuel cell system selection

² No battery inside, weight does not include battery

³ Performance derating when temperature is below -5°C and above 35°C (30%)

*UTH-0620 and UTH-1020 are for indoor installation

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The product provides the following key features:

- Ideal system for residential backup, especially suitable for remote industrial application
- All-in-one total solution as alternative energy storage system (Photovoltaic, wind or grid power)
- Optional dual AC & DC outputs are available
- Remote monitoring platform with user friendly interface
- Customization of specification available
- Carbon emission free and environmentally friendly power generator
- Designed to meet European Conformity (CE) EN 62282-3-100 and EMC directive



| Product Specification / Model No. | | UEH-0111 | | UEH-0311 |
|-----------------------------------|--|--|-------|--|
| | Product Description | Energy Storage & Fuel Cell Power Generator | | Energy Storage & Fuel Cell Power Generator |
| Basic | Max Output Power | 1kW | | 3kW |
| | Continuous Operation ¹ | 850W | | 2.8kW |
| Output | Output Current and Voltage | 20A@48Vdc | | 60A@48Vdc |
| Input | Hydrogen Production Voltage | 220~240Vac | 48Vdc | 220~240Vac |
| | Frequency | 50/60Hz | - | 50/60Hz |
| | Rated Input Current | 3A | 16A | 13A |
| Fuel Requirement | System Standby Voltage | 48V | | 48V |
| | System Standby Current | <2A | | <2A |
| | Hydrogen Input Pressure | 44~120 psi(3~8.2 bar) | | 44~120 psi(3~8.2 bar) |
| | Oxidant Composition | Air | | Air |
| | Oxidant Humidity | 0~100 %RH | | 0~100 %RH |
| Mechanical Info | Outer Dimensions | L110 x W70 x H180 cm (43.3 x 27.5 x 70.8 in.) | | L110 x W70 x H180 cm (43.3 x 27.5 x 70.8 in.) |
| | Weight | 250 kg | | 380 kg |
| | Cooling Type | Air Cooling | | Air Cooling |
| Environment Requirement | Ambient Temperature Storage ² | -20~50°C | | -20~50°C |
| | Normal Working Temperature ³ | -10~40°C | | -10~40°C |
| | Humidity | 0~95 %RH | | 0~95 %RH |
| Operation Efficiency | Hydrogen Consumption | 752 Liter / kW-hr | | 752 Liter / kW-hr |
| | Fuel Cell Efficiency (LHV) | >40% | | >40% |
| | Noise | <65dB | | <65dB |
| Others | Remote Monitor | 3G Network | | 3G Network |
| | System Start-up Time | 20 sec. | | 20 sec. |

¹ Continuous operation is a guide for assisting fuel cell system selection

² Cold standby (-20~0°C) requires 9A@220Vac for internal heating

³ Performance derating when temperature is below -5°C and above 35°C (30%)

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The product provides the following key features:

- Designed as a hydrogen storage/extension system and capable to perform in outdoor environment
- Remote monitoring platform
- Designed and tested to meet 1.5 times the maximum operating pressure for safety



| Product Specification / Model No. | H - 250 | H - 1000 | H - Cabin | H - Cube |
|-----------------------------------|--|--|--|---|
| Backup Energy | 8 kWh | 37.5 kWh | 120 kWh | 24 kWh |
| Storage Pressure | 30 bar | 30 bar | 150 bar | 3~8 bar |
| Tank Volume | 250L | 1000L | 600L | - |
| Cylinder Quantity | 6 EA (included) | 12 EA (included) | 15 EA (excluded) | - |
| Physical Interface | RS-485 | RS-485 | RS-485 | - |
| Protocol | M-Field Mod Bus | M-Field Mod Bus | M-Field Mod Bus | - |
| Control Box | | | | |
| Alarm Message | Available | Available | Available | - |
| Pressure Dection | Available | Available | Available | - |
| Backup Switch | Available | Available | Available | - |
| LCD Display | Available | Available | Available | - |
| Dimension | L100 x W75 x H126 cm (39.3 x 29.5 x 49.6 in.) | L130 x W97 x H230 cm (51.1 x 38.1 x 90.5 in.) | L130 x W97 x H200 cm (51.1 x 38.1 x 78.7 in.) | L70 x W30 x H160 cm (27.5 x 11.8 x 62.9 in.) |

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The product provides the following key features:

- Designed as a high efficiency fuel cell converter to achieve overall system electrical and operation efficiency
- Convert efficiency over 92% to achieve less requirements of hydrogen but more power output
- Designed to meet UL 60950-1 and European Conformity (CE) EN 62282-3-100 and EMC directive (EN 61000-6-2 & EN 61000-6-4)



| Product Specification / Model No. | | CP-1003-48 | CP-2504-48 | CP-3004-24 / CP-3004-48 | CP-5000-48 | CP-10000-36 / CP-10000-48 |
|-----------------------------------|---------------------------|--|--|--|--|--|
| Output | DC Voltage | 52V (Set Point) | 52V (Set Point) | 24V / 52V (Set Point) | 52V (Set Point) | 43V / 52V (Set Point) |
| | DC Voltage Range | 46~56V | 46~56V | 24~28V / 46~56V | 42~56V | 36~44V / 46~56V |
| | Rated Current | 22A | 48A | 120A / 58A | 100A | 233A / 193A |
| | Current Range | 0~27A | 0~57A | 0~144A / 0~70A | 0~120A | 0~278A / 0~228A |
| | Rated Power | 1.1kW | 2.5kW | 3kW | 5kW | 10kW |
| Input | Voltage Precision | ±1% | ±1% | ±1% | ±1% | ±1% |
| | Voltage Range | 14~44Vdc | 15~27Vdc | 30~80Vdc / 40~85Vdc | 30~80Vdc | 65~130Vdc |
| | Efficiency (Typ.) | 90% | 90% | 90% | 93% | 94% |
| | Current (Typ.) | 70A | 160A | 70A | 135A | 140A |
| | Current (Max.) | 75A | 180A | 75A | 150A | 160A |
| Auxiliary Power | DC Voltage | 24V | 24V | 24V | - | - |
| | Rated Power | 300W | 400W | 400W | - | - |
| Protection | Over Current Protection | 27A (@52V) | 60A (@52V) | 144A (@24V) / 70A (@48V) | 120A (@48V) | 330A (@36V) / 274A (@48V) |
| | Over Voltage Protection | 58V | 58V | 28V / 58V | 58V | 46V / 58V |
| | Input Low Voltage Limiter | 14V | 15V | 30V / 40V | 30V | 65V |
| Communication | Physical Interface | RS-485/CAN Bus | RS-485/CAN Bus | RS-485/CAN Bus | RS-485/CAN Bus | RS-485/CAN Bus |
| | Protocol | M-Field Mod Bus | M-Field Mod Bus | M-Field Mod Bus | M-Field Mod Bus | M-Field Mod Bus |
| | Alarm Message | Available | Available | Available | Available | Available |
| | DC Voltage Adjustment | Available | Available | Available | Available | Available |
| Environment | Operating Temp | -20~60°C | -20~60°C | -20~60°C | -20~60°C | -20~60°C |
| | Relative Humidity | 10~95% | 10~95% | 10~95% | 10~95% | 10~95% |
| | Storage Temp | -40~85°C | -40~85°C | -40~85°C | -40~85°C | -40~85°C |
| | Protection Level | IP 20 | IP 20 | IP 20 | IP 20 | IP 20 |
| Construction | Weight | 6kg | 8kg | 10kg / 13kg | 12kg | 15kg |
| | Dimension | L45.1 x W42.3 x H8.6 cm (17.7 x 16.6 x 3.3 in.) | L45.1 x W42.3 x H8.6 cm (17.7 x 16.6 x 3.3 in.) | L45.1 x W42.3 x H8.6 cm (17.7 x 16.6 x 3.3 in.) | L45.1 x W42.3 x H8.6 cm (17.7 x 16.6 x 3.3 in.) | L45.1 x W42.3 x H8.6 cm (17.7 x 16.6 x 3.3 in.) |
| | Mounting | Standard 19" Rack, 2U | Standard 19" Rack, 2U | Standard 19" Rack, 2U | Standard 19" Rack, 2U | Standard 19" Rack, 2U |

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