



HYDRO FUEL CELL

1,2 kW-4 kW



Hydro Fuel Cell

The integration of the latest technical developments for the storage of renewable energies and their use in downstream applications is one of the most important topics for the future in shaping a sustainable, climate neutral future. The universal talent **hydrogen is one of the key elements**.

The use in downstream applications is realized with fuel cell modules. These use hydrogen gas, which is converted into direct electric power.

Our fuel cells can be integrated into our modular and individual configurable H2 Core systems, complementing the systems immensely, because the hydrogen produced can be **easily and reliably** converted back into electricity. The fuel cells are available in the following power levels: 1.2 kW, 2.4 kW and 4.0 kW.

SPECIFICATIONS (4 kW)

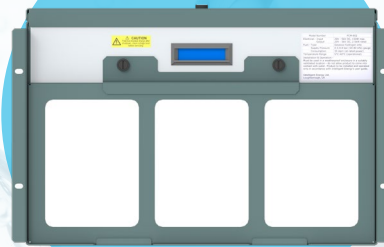
Please contact us for details regarding our other Fuel Cells

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|-------------|--------------------------------|--|
| PERFORMANCE | Rated net power ^{1,2} | 4.0kW @ 48V or 2.88kW @ 24V |
| | Output voltage and regulation | 20V – 56V via factory configuration parameters. Typically for use with 24 or 48V battery Supply -ve connected to chassis/earth Voltage regulation to ETSI 300-132-2 @ 48V |
| | Rated current | 83A@48V, 120A@24V |
| | Emissions ³ | Water vapour in warm exhaust air |
| FUEL | Fuel type | Hydrogen gas |
| | Fuel pressure ⁴ | 0.5 – 0.7 bar gauge |
| | Fuel consumption ⁵ | Less than 70g per kWh |
| | Fuel supply and storage | Designed for use with external fuel storage or production, (not included). Use of reformer and electrolyser gas subject to suitable pressure and purification. |
| | Fuel composition ⁶ | 99.9% gaseous hydrogen or better |



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|------------------------------------|---|--|
| OPERATIONS AND MAINTENANCE | Manual start/stop⁷ | Connections provided for 'enable/reset' and 'run' switch or signal. Accessory switches available |
| | Automatic start/stop^{2, 7} | Operation governed by factory configurable time, voltage and current levels in 'run' state. Level set to suit application battery and load |
| | Status display | In-built status display screen as standard |
| | Start-up time⁸ | Less than 20 seconds |
| | IP rating | IP20 |
| SAFETY AND CERTIFICATION | Certification | CE & FCC |
| | Health monitoring^{7, 9} | Options available |
| | Mass | ~20kg |
| PHYSICAL | Max dimensions¹⁰ | 450mm (W) × 300mm ('7U') (H) × 500mm (D) |
| | Connections, gas | G1/8 parallel BSP threaded port with face seal, female |
| | Connections, electrical power and comms/signal | Power terminals 2 x M8 bolts, chassis/earth 1 x M8 stud 1 x FCM run input, 1 x FCM enable input 1 x CAN hi/low/gnd, 4 x PFCs |
| | Mechanical mounting points | 4 mounting points on a 19" rack '7U' face |
| | Vibration (to IEC/EN 60068-2-6) | 5 to 30Hz, 10mm peak 5G 30 to 200Hz, 2.5G 10 minutes per sweep, 4 hours for each of 3 axis |
| | Repetitive shock (to IEC/EN 60068-2-27) | 10G, 1000 times, for each of 2 directions, 3 axis |
| | Non-repetitive shock (to IEC/EN 60068-2-27) | 30G, 3 times, for each of 2 directions, 3 axis |
| | Altitude^{8, 11} | 0 – 4000m |
| | Operating temperature range¹² | +5°C to +40°C |
| | Operating humidity range¹² | 10 to 90% |
| NORMAL OPERATING CONDITIONS | Storage temperature | -40°C to +70°C |

¹ >95% duty cycle.

² Typically hybridised with external battery allowing higher combined peak power. Available load power reduced during battery charge. Multiple units may be operated in parallel to increase power.

³ No production of CO, CO₂, or NO_x. Contains safety permitted trace levels of hydrogen.

⁴ +/- 100mbar pressure transients on purge permitted.

⁵ Achieved at 25°C, beginning of life.

⁶ According to quality characteristics of Type 1, Grade E and Category 3 hydrogen fuel specified in BS ISO 14687-3:2014(E).

⁷ Please contact us to discuss your requirements.

⁸ Start-up time based on optimal conditions and will vary

⁹ Options available for continuous health monitoring and predictive maintenance scheduling for high system availability.

¹⁰ Dimensions excludes protruding fasteners, mating connectors, 19" rack mount flanges/ears and accessories. Vertical height fits within '7U' 19" rack space.

¹¹ Power de-rate commences above 1500m.

¹² De-rated power when RH is less than 30%.

