



### Powering the hydrogen future<sup>™</sup> with our outstanding fuel cells and service.

# **IE-POWER 1T/1U**

#### IE-POWER fuel cell systems for power generation, telecoms, micro-grids and material handling equipment.

IE-POWER 1T/1U compact fuel cell modules match the needs of portable power, stationary power and materials handling equipment (MHE) with battery tanks down to 210mm wide.

Ease of use and installation is aided with horizontal and vertical installation flexibility together with variants that allow cooling air to flow either through-the-unit or in-and-out-on-a-single-face.

1kW of regulated DC power is generated, typically at 24, 36 or 48VDC using 99.9% gaseous hydrogen from cylinders, electrolysers and reformers.

Just water vapour and heat are emitted by the quiet electrochemical reaction that makes this all possible.  $CO_2$ ,  $NO_x$  or  $SO_x$  are not produced.

#### IE-POWER 1T/1U fuel cell module benefits include:

- High power density, small and compact
- Zero Emissions no Greenhouse Gases, CO<sub>2</sub>, NO<sub>x</sub> or SO<sub>x</sub>
- Lightweight for ease of handling and maintenance

#### **Applications:**

- Telecommunications
- Disaster recovery
- Portable power generation
- Backup power
- Emergency power
- Off-grid power
- Microgrids
- Auxiliary power units

- Low maintenance with no servicing
- Quiet operation
- Simple integration
- Industrial trucks
- 24, 36 or 48V electric trucks
- Tow tractors and tugs
- Warehouse trucks
- Airport auxillary & service vehicles



## **IE-POWER 1 specification**

#### Preliminary

		,
Performance	Rated net power	1.0kW 1, 2
	Output voltage and regulation	1.2KW MdX >24V ~
	Output voltage and regulation	Typically for use with 24, 36 or 48V battery.
		User configurable for -ve, +ve or floating earth
		Voltage regulation to ETS I 300-132-2 @ 48V
	Rated current	50A max @ ≤ 24V, 25A @ 48V
	Emissions	Water vapour in warm exhaust air <sup>4</sup>
Fuel	Fuel type	Hydrogen gas
	Fuel pressure	0.5 - 0.7 bar gauge <sup>5</sup>
	- Fuel consumption	Less than 70g per kWh $^{ m 6}$
	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	99.9% gaseous hydrogen or better <sup>7</sup>
Operations and maintenance	Manual start/stop	Customer interface connections provided for 'enable/reset' and 'run' switch or signal. Accessory switches available <sup>8</sup>
	Automatic start/stop	Operation governed by factory configurable time, voltage and current levels in 'run' state. Level set to suit application battery and load <sup>2</sup> , 8
	Status display	7 state LED status indication
		Status info (CAN/Serial) on Customer Port
	Start up time	Accessory Port allows use of accessory display o
		Less than 20 seconds <sup>9</sup>
Safety & certification		CE & FCC for industrial fruck (MHE), Outdoor Portable Power and Stationary use
Physical	Mass	
	Max dimensions	~10.4Kg 196mm (W) × 294mm (H) × 294mm
	Connections as	(D) <sup>11</sup> 5/16" SAE 12044 MALE SPIGOT 12
	Connections, gas	Amphapal Suri ak Plus 5 7mm (120A) recentacles
	connections, electrical power	Positive red with SR2 key
		Negative black with SB0 key
	Connection, chassis/earth	M6 stud
	Connections, Customer	26-way high density female D-sub connector
	Comms/Signal	Enable/Reset; Run; Status; CAN/Serial; Index
	Connections, Accessory Comms/Signal	15-way high density female D-sub connector
	commissional	Proprietary connections for accessories
	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
	Non-repetitive shock (to IEC/EN 60068-2-27)	50G, 10 times, for each of 2 directions, 3 axis
	Audible Noise	A-weighted emission sound pressure level does not exceed 70 dB(A) $^{17}$
Normal operating conditions	Altitude	0m to 1500m <sup>8, 13</sup>
	Operating temperature range	+5°C to +35°C 14, 15, 16
	Operating humidity range	10% to 90% 8, 16
	Storage temperature	-40°C to +70°C
% duty cycle.		8 Please contact us to discuss your requirements.
ically hybridised with external battery allowing higher combined peak power. ilable load power reduced during battery charge. Multiple units may be operated in parallel to		9 Up to 5 minutes when below 5°C. 10 Options available for continuous health monitoring and predictive maintenance scheduling for
ease power. ed power available when above 24V. production of CO, CO <sub>2</sub> or NO <sub>x</sub> Contains safety permitted trace levels of hydrogen. 100mbar pressure transients on purge permitted.		<ul> <li>high system availability.</li> <li>11 Dimensions excludes protruding fasteners, mating connectors and accessories. Unit designed to used with either the H-axis vertical or rotated so the W-axis is vertical. Any single axis may be +/-</li> <li>12, 13, 14, 15 Future capability improvement planned.</li> </ul>
hieved at 25°C, beginning of life. cording to quality characteristics of Type 1, Grade E and Category 3 hydrogen fuel specified in BS 14687-3:2014(E).		16 De-rated power when RH is less than 30%. 17 Conditions: Distance 1m; Height of 1.6m; Power 1.2kW; Temperature 20 <sup>o</sup> C; Humidity 50% RH; Sea level elevation.
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