

1 kWe HT-PEMFC ▶ Combined Heat & Power System

DESCRIPTION

The HySA™ Systems Integration & Technology Validation Competence Centre, HySA™ Systems, hosted by the University of the Western Cape (UWC) and located at the South African Institute for Advanced Materials Chemistry (SAIAMC) is one of three national Competence Centres that were initiated by the Department of Science and Technology's National Hydrogen and Fuel Cell Technologies (HFCT) Flagship Project, also known as Hydrogen South Africa or HySA™.

The main objective with HySA™ Systems is to perform technology validation and system integration in application oriented programme Combined Heat and Power (CHP). In the frame of the programme the 1 kW HT-PEMFC CHP System for stationary application is being developed. The system delivers electrical power and thermal energy for household. The project is realized in collaboration with South African SME company.

SPECIFICATION

HT-PEMFC technology

Externally oil-cooled FC stack

Electrical power 1000 W_{el}

Heat recovery up to 1500 W_{th}

Total efficiency up to 90 %

BENEFITS

- Combined heat and power (CHP) generation
- Methane or city gas supply
- High total efficiency of fuel conversion



FEATURES

- Noiseless operation
- Usage of anode-off-gas
- Usage of cathode-off-gas-heat
- Safe and easy maintenance and operation



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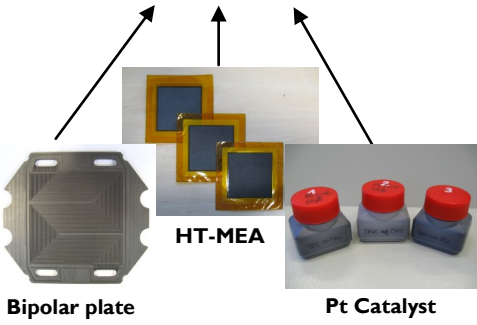
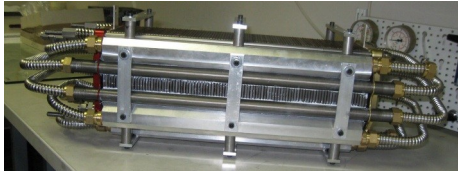
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▶ GENERAL DATA



Specification	
Electrical / thermal power	1000 W _{el} / 1500 W _{th}
Type of fuel	Methane, City gas
Energy storage module (ESM)	6 kWh 6 kVA for 1 hour or 1 kVA for 6 hours without methane gas consumption
Thermal storage module (TSM)	150 litres @ 55-65°C
Electrical efficiency Thermal efficiency Total efficiency	up to 40 % up to 55 % up to 90 %
Dimensions (LxWxH)	PM&ESM 1152x320x2100 mm RFCM 1280x750x1290 mm TSM 620x1635 mm (ØxH)

▶ FUEL CELL STACK



Fuel Cell Stack	
Fuel cell type	Externally oil-cooled HT-PEMFC
Number of cells	50
Electrode active area	100 cm ²
Nominal / peak power	1000 W / 1200 W
Stack nominal / peak current	33 A / 50 A
Stack nominal DC voltage	30 V
Anode / cathode reactant	dry hydrogen or reformat / dry air
Anode / cathode utilization	40 - 90 % / 25 - 60 %
Operating temperature / pressure	90 - 180 °C / ambient to 0.6 bar _g

▶ LAYOUT AND CONTROL

