

MITIS MICROTURBINE

The micro-FC 100 UPS is an Uninterruptible Power Supply system which uses hydrogen as base fuel to provide smooth and high-quality electric power to microgrids.

The system comprises a PEM (Proton Exchange Membrane) fuel cell module supplied by EKPO Fuel Cell Technologies, a turbocharger, a DC/DC converter, a Hybrid Ultra Capacitor (HUC) and a low voltage battery. Output of the DC/DC converter is supplied through an inverter of 100kVA to the load. An energy management system (EMS) monitors and controls the operation of the fuel cell depending on the load requirements.

Powered by:

EKPO FUEL CELL TECHNOLOGIES



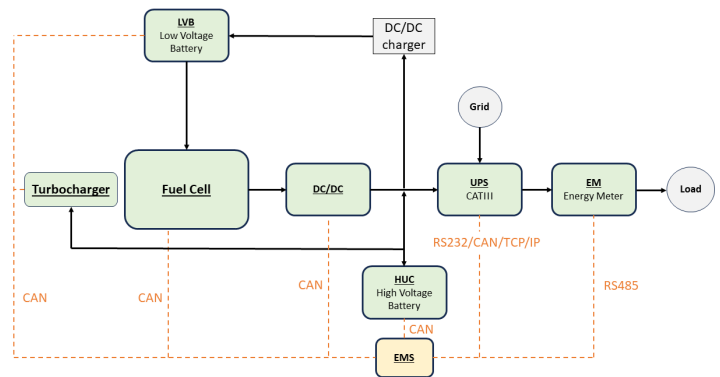
NM12 from EKPO Fuel Cell Technologies

TECHNICAL DATA

Electrical Efficiency at 100 KW	51.5%
Rated Power	100 kVA
Hydrogen quality	Type I, grade D (ISO 14687:2019)
H2 consumption at rated current at 2.5 BAR	7.7 kg/h
Equipment protection class	IP20
Performance classes	G3
Installation configuration	Fixed
Installation environment	Indoor
Altitude	<2,000 m above sea level
Atmosphere	Tropicalized
Environmental temperature	-15 ... 45 °C
Output frequency (Utilisation)	50Hz + / - 0,05%
Impact of load or progressive power rise on power up or on mains voltage return	0s
Harmonic distortion rate	< = 5% between phases < = 33% between Phase and Neutral
Usage profile Generator (According to ISO 8528-1 : 2005 and ISO 3046-1 : 2002)	PRP = 100kW and Ppp= 70kW

SCHEMATIC

- Fuel cell: supply the electrical power.
- Turbocharger: supply the fuel cell with compressed air and retrieve waste energy from the fuel cell exhaust gas.
- DC/DC: convert the operating voltage of the fuel cell to the operating voltage of the battery and UPS.
- HUC: provide power during the starting time of the fuel cell and absorb the load variations.
- UPS: convert DC power supply to AC power supply, detect a power failure, correct the electrical constants thanks to a double conversion.
- LVB: supply the auxiliaries during the machine operation.



OPERATIONAL MODES

The operational modes of the system are presented in Figure 2. In case of power failure, the fuel cell is started while the high voltage batteries cover the power demand. At the end of this starting phase, the system functions in UPS mode and provides power to the grid. The batteries absorb the power fluctuations not handled by the fuel cell and play the role of buffer. Finally, once the power from the electrical network is recovered, the charging phase starts up and the fuel cell recharges the battery in order to support another power failure.

