

Technology ready for use

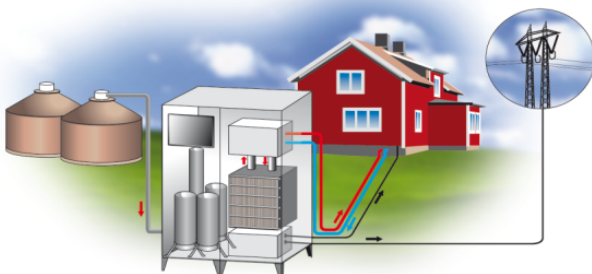
## Multi-Fuel home energy 5+7 kW fuel cell system

- Biogas, natural gas or LPG operation
- Efficient reformer for fuel conversion
- long-life fuel cell for heat and power
- AC power output for grid connection
- DC power with inverter for off-grid use
- Silent and zero pollution technology

**The Prometheus 5 Multi-Fuel home energy fuel cell represents the future generation of efficient and quiet Combined Heat and Power systems (CHP) for independence**

### Power production for the grid or for local consumption

The Prometheus 5 is equipped with inverter for supply of AC power to the grid, according to national regulations. A dedicated and intelligent DC/DC power converter enables the fuel cell output to be automatically directed to supply all power to the grid, through the inverter, or to provide independent power to the home energy distribution system in the absence of grid power.



**The Prometheus 5 is designed for flexible integration with other specific electricity and heating power systems, for maximum comfort and economy.**

The system can be integrated with other home energy systems such as solar power, battery back-up and DC LED lighting systems. The heat energy can be used for heating of sanitary hot water, for floor heating and/or for conventional water based radiator heating of the house. Battery, boiler and hot water tanks are not included in the delivery, but can be offered as options.

Annual energy production of the Prometheus 5 system is 41 500 kWh of electrical energy and 58 000 kWh of heat energy, in the form of hot water at about + 65 °C.

# Converting energy gas into hydrogen, heat and power

## Flameless hydrogen generation from fuel gas and water

A clean stream of gas is mixed with water and fed to the reforming reactor to produce hydrogen. A large portion of the hydrogen comes from water, which acts as a fuel in the process. The heat required by the process is produced by catalytic combustion of a fraction of the fuel, eliminating disadvantages of open flame and increasing process safety. Additional hydrogen is produced by a Water-Gas- Shift reaction which also eliminates the CO produced in the reforming process.

## Converting hydrogen into clean electricity and heat

The hydrogen from the reformer is purified and fed to a PEM fuel cell, where electricity and heat are produced through an electro-chemical process. The fuel cell is liquid cooled and operates at + 70-80 °C, and the output hot water can be used for heating of buildings and for sanitary hot water through a heat exchanger. The only waste product is clean water.

## Converting the fuel cell power to grid power and home energy

The Prometheus 5 Multi Fuel System is supplied with inverter for feeding the electricity to the grid. In the case of grid power failure, the Metacon 5 can supply electricity to the house, after disconnecting the grid. A battery is continuously charged for back-up, peak power use and for start-up of the reformer/fuel cell system. DC/DC converter for conditioning of the electrical power output of the fuel cell to an inverter is also included.

## Control system for safe, autonomous operation

The Prometheus 5 is highly automated with PCB based state of the art control systems for safe process control, start-up and shut-down. The system can operate completely autonomously and unattended.

## Certified design for easy installation

The design and construction complies with all relevant international standards and E.C. directives (97/23 EC, 94/9 EC, 2004/108 EC, EN13445), including CE marking. The system is designed for indoor or outdoor placement. Most of the connections and peripherals are included in the main cabinet to assure easy and quick installation. Inverter for grid connection is separate for wall mounting. Battery, boiler and hot water tanks are not included, but can be offered as options.

## Local or remote monitoring and control

The Metacon 5 is designed with the latest technology Wi-Fi and internet communication and control. A dedicated APP provides full control and detailed information on the system status, performance and statistics for history of power production, availability and failure reports. The communication can be made from smart phone, tablet or computer.

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## ABOUT METACON

Metacon produces and markets energy systems for electrochemical conversion of biogas, natural gas or LPG to hydrogen, electricity and heat. Our systems for local energy production are delivered turn- key, for local consumption of energy or for commercial energy supply through external connection. The products are based on proprietary, patented reactor/catalyst configurations, processes and designs, developed by Helbio S.A., a daughter company of Metacon AB.

## SPECIFICATIONS for Metacon 5 Multi-Fuel:

Hydrogen production:	5,0 Nm <sup>3</sup> /h
Electric power output:	5 kW
Thermal power output:	7 kW
Output voltage:	100 V /230V or 3 x 400 V AC
Output frequency:	50Hz or 60 Hz

## Fuel consumption (± 5 %) at rated power

LPG:	1,2 kg/h
Natural Gas:	1,6 Nm <sup>3</sup> /h
Biogas:	2,1 Nm <sup>3</sup> /h

## Other main data

Water consumption:	6,0 l/h
Heating water temp:	+65-70°C
Operation:	Continuous
Dimensions (WxDxH):	0,7x 0,7 x 1.8 m
Weight:	200 kg
Noise Level:	<38 dB(A) @ 1m
Operating Temperature (ambient):	-20 to +40°C
(External heating required to avoid freezing)	

## TECHNOLOGY:

Reformer:	Flameless steam reforming
CO minimization:	Single stage water gas shift
Fuel cell:	PEM

## CONNECTIONS:

Fuel gas feed:	1/2" flexible stainless steel tube
Water:	8mm OD plastic hose
Exhaust:	1" OD 304 SS tube

## INFORMATION AND CONTROL:

Wi-Fi and/or internet by smart phone or tablet



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