Heliocentris

Systems

Fuel Cell Systems

Product Overview

Heliocentris provides professional users with standardized fuel cell system solutions for the cost-effective and fast implementation of lab setups, demonstration systems and prototypes.

The easy way to get started with fuel cell technology

Fuel Cell Systems

Constantly gaining in importance – the fuel cell

The efficient storage of regenerative energy is the key to expanding its share in the energy mix of the future. Hydrogen and fuel cells will make a decisive contribution here.

Get started easily

For universities, institutes and industrial applications it is important to be able to integrate fuel cell technology in development today already. This is the only way to meet the demands of tomorrow. Standardized system solutions from Heliocentris make it easy for professional users to get started with the technology.

Get fast results

All components of the fuel cell systems from Heliocentris are prequalified and optimized for system integration. This makes it possible to implement lab and practical setups in a very short time. Industrial users can easily and efficiently integrate the technology in the development of new products, to produce commercially viable fuel cell solutions more quickly.

Quality from Heliocentris

- More than 10 years of experience in the integration and series production of fuel cell systems
- Components from leading providers of the industry
- Matching power electronics and energy management
- One-stop shopping for H_2-solutions and fuel cell systems

Overview of the Systems

Heliocentris provides fuel cell system solutions for diverse applications.
Find out which product best suits your requirements.

Constructor System

The fuel cell system for small-scale power supply

Power range: 20 – 40 W [1]

Examples of applications:

» Small-scale power supply
» Battery chargers
» Model making

100 W | 300 W | 600 W

Average power demand of the application

FC-42 System

The modular stack solution with extensive application possibilities

Power range: 300 – 1200 W [1]

Examples of applications:

» Stationary power supply with co-generation
» On-board power supply for motor vehicles and boats
» Small electric drive systems

Heliocentris offers solutions for hydrogen generation and storage individually tailored to each fuel cell system solution.

Nexa® 1200 System

Fully integrated fuel cell system for implementation of prototypes and lab setups

Power range: 600 – 1200 W [1]

Examples of applications:

» Backup and UPS systems
» On-board power supply for motor vehicles and boats
» Small electric drive systems

900 W — 1200 W | 2 kW — 8 kW — 16 kW

HyPM® System

The powerhouse for heavy-duty applications

Power range: 3 – 16 kW [1]

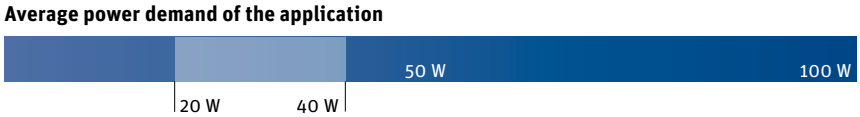
Examples of applications:

» Electric drive systems (buses, floor conveyors, boats)
» Large UPS and emergency power systems
» On-board power supply

[1] Average power demand of the application

Constructor System

The Constructor is a 50 W fuel cell system for applications with low power consumption. The modular design and the optional battery hybridization enable flexible adaptation to the application.



Very easy integration

All components can be connected by means of a small number of transparent interfaces. The modular design allows flexible adaptation of the system to the available space.

The extensive documentation leaves no questions about the integration of the system.

Flexible due to hybridization option

The power output of the Constructor system is suitable for diverse applications. The power range can easily be expanded with battery hybridization, for flexible adaptation to the requirements of the application.

Time-tested system featuring top quality

Hundreds of these system solutions are already in use around the world. The solid operating behavior of its fuel cell and the integrated microcontroller ensure safe and reliable operation.

Technical data for basic module	
Rated output	40 W
Rated current	8 A
Output voltage	5 ... 10 V DC
Hydrogen consumption	0.7 slpm
Design	open cathode, air cooled

The Constructor System – components

In addition to the 50 W PEM fuel cell, the system includes the following components:

Hybridization set

Enables design of a fuel cell hybrid system. The DC converter contains an integrated charge controller for 12 V lead batteries. Therefore, it is also possible to operate 12 V consumers independent of the output of the fuel cell.

Hydrogen flow meter

The hydrogen flow meter enables the exact measurement of the current hydrogen consumption.

Pressure reducer for metal hydride canisters

The pressure reducer reduces the charge pressure of a metal hydride canister to the input pressure required for the fuel cell system.

Monitoring software keeps track of all system parameters

The PC software included enables visualization and processing of the important system operating parameters.

Facts

Constructor System

- 50 W PEM fuel cell with open cathode
- Can be used in labs and application projects
- For applications with low power consumption
- Optional battery hybridization
- RS232 interface and monitoring software

Nexa® 1200 System

The Heliocentris Nexa® 1200 is the successor to the popular Nexa® Power Module. Based on the modern FCgen™ 1020 ACS stack from Ballard, the system provides an output of 1200 W.

The fully integrated power module offers performance data that is top in its class and a form factor that allows for easier integration into applications.

Average power demand of the application

Improved overall system efficiency

Whilst the old Nexa® Power Module required a compressor and a fan for the supply of reaction and cooling air, the Heliocentris Nexa® 1200 uses a single fan on the back of the system, drawing in ambient air for even distribution through the entire system.

The parasitic power consumption could be reduced by up to 50 %, thus significantly increasing the overall system efficiency.

Improved service life

Heliocentris guarantees a stack service life of 1500 hours, three times the service life of the old Nexa system, if the system is used according to specifications.

Technical data	
Rated output	1200 W
Rated current	52 A
Output voltage	22 ... 36 V DC
Hydrogen consumption	15 slpm (at rated output)
Design	Air cooled, open cathode

No draining of water required

The open cathode stack facilitates drainage of the water accumulated during the reaction. It is evaporated with the cooling air and is blown out through the air duct at the back of the system. The air outlet is designed for easy attachment of an exhaust air duct.

Central interface unit and mounting rails

The Heliocentris Nexa® 1200 has a central interface unit on its back, housing peripheral, electrical and hydrogen connectors. Integrated mounting rails further facilitate integration.

Flexible orientation options

The Heliocentris Nexa® 1200 can be installed horizontally, vertically and overhead — in upright or suspended position.

Software package

The Heliocentris Nexa® 1200 software is used for communication between the system control and a computer. The software allows to monitor all relevant operating parameters, e. g. stack voltage, stack current, coolant temperature and load state. All data can be saved for further editing.

Facts

Nexa® 1200 system

- Fully integrated 1.2 kW PEM fuel cell module
- Based on FCgen™ 1020 ACS stack from Ballard
- Superior efficiency
- Comfortable and easy integration
- Robust housing and flat design

FC-42 System

The compact fuel cell stacks of the FC-42 series are available in four power classes. Heliocentris provides a modular evaluation system for stacks up to 720 W, which makes it easy to start using the FC-42.

Average power demand of the application

Modular stack series FC-42

All FC-42 stacks are based on a standardize PEM basic module with a rated output of 360 W. The stacks are very compact and are available in four power classes: 360/720/1080 and 1440 W.

Innovative liquid cooling

Liquid cooling of the FC-42 series enables flexibility in designing the cooling system and easy extraction of available heat. The innovative cooling jacket makes it possible to use conventional coolants. With a maximum permissible operating temperature of 70 °C, the stacks can also be operated at higher ambient temperatures.

Industrial series production

The FC-42 stacks are based on industrially manufactured and tested standard modules. This reduces production and maintenance costs. Innovative materials and a special production technology are suitable for large-scale production, but also allow cost advantages even for small series.

Technical data for basic module	
Rated output	360 W
Rated current	15 A
Output voltage	22 ... 42
Hydrogen consumption	4.4 slpm
Design	closed cathode, liquid cooled

Easy start with the FC-42 Evaluation Package

The FC-42 evaluation package is a modular system that was specially developed for easy and safe operation and testing of FC-42 stacks up to 720 W. The evaluation package makes it easy to start using the FC-42 stack and therefore speeds up your development processes and the design of prototypes.

Applications

» Stationary power supply with co-generation
» Emergency power and UPS systems
» On-board power supply for motor vehicles and boats
» Small electric drive system

Extensive applications

In addition to simplified set-up and operation, the system also enables analysis of the operating behavior of FC-42 stacks in normal operation. With its compact dimensions, the system is also suitable for the design of application-oriented prototypes. The ability to start using the system right away saves valuable development time.

From the lab to series production?

Are you planning to use this technology platform for series production? We will be glad to help you develop a custom system for your series product.

Convenient integration of additional measuring technology

The separate stack and media module makes it easy to change the stack. Additional measuring instruments or process-related components can easily be integrated in the lines between the media module and the stack.

Facts

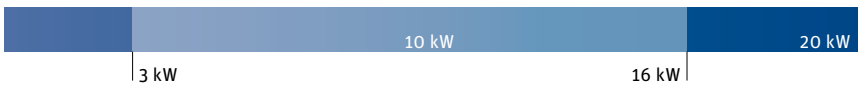
FC-42 Evaluation Package

» For FC-42 PEM stacks from Schunk up to 720 W
» Facilitates startup and safe operation of stacks
» Additional measuring instruments can easily be integrated
» Also suitable for application-oriented prototypes
» Reduces development time

HyPM® System

The HyPM® System from Heliocentris provides fully integrated plug & play fuel cell solutions from 4 to 16 kW. The modular system can flexibly be adapted to the requirements of mobile and stationary applications.

Average power demand of the application



Industrially manufactured powerhouse

The HyPM® fuel cell systems from Hydrogenics are manufactured in series and are already being used in industrial applications such as emergency power supplies or small buses. They feature a completely integrated, compact design, high efficiency and good dynamics.

For higher outputs, the modules can be interconnected electrically.

Suitable for many applications

The HyPM® systems are available in two versions.

HyPM® XR modules are optimized for stationary applications and are available with outputs of 4, 8 and 12 kW. They feature cost-effective technology and many start-stop cycles.

HyPM® HD modules are optimized for mobile applications and are available with outputs of 4, 8, 12 and 16 kW. They have a robust design and achieve a service life of more than 10,000 hours.

Technical data	HyPM® HD 4	HyPM® HD 8	HyPM® HD 12	HyPM® HD 16	HyPM® XR 4	HyPM® XR 8	HyPM® XR 12
Rated output	4 kW	8 kW	12 kW	16 kW	4 kW	8 kW	12 kW
Rated current	175 A	350 A	350 A	350 A	175 A	350 A	350 A
Output voltage	22 … 40 V DC	22 … 40 V DC	30 … 60 V DC	40 … 80 V DC	22 … 40 V DC	22 … 40 V DC	30 … 60 V DC
Hydrogen consumption	56 slpm	120 slpm	170 slpm	230 slpm	56 slpm	120 slpm	170 slpm
Design	closed cathode, liquid cooled						

Easy integration – with the integration components from Heliocentris

Additional components are needed for the application-specific integration of HyPM® modules. For this purpose, Heliocentris provides an extensive line of pre-qualified system components.

» Start energy supply
» Cooling system
» Load relay and reverse power cut-out
» Hydrogen supply
» CAN interface
» Safety technology

On request, we will also be glad to integrate all mechanical and electric components of the HyPM® module in your application or provide support with this task.

Power electronics

Power electronics adapted to the consumers are needed for the electrical connection of HyPM® fuel cell systems to the specific application. For this purpose, Heliocentris provides DC converters for voltages starting at 12 V DC and inverters for 115 and 230 V AC, which can also be integrated in your application, if desired.

Master system controller with visualization

An overall system controller is generally needed for the application-specific integration of HyPM® modules. Operating parameters are configured and read via a CAN interface. Operation and visualization can be implemented via a PC or an integrated control panel. The overall system controller can be adapted to your individual requirements.

Facts

HyPM® System

» 4-16 kW PEM fuel cell module from Hydrogenics
» Compact design and high efficiency
» HyPM® XR modules for stationary backup applications
» HyPM® HD modules for mobile applications
» Heliocentris provides qualified accessories and will carry out all integration tasks, if desired

Customized Solutions

A standard system is not suitable for your project? You need a custom solution? Heliocentris will adapt the fuel cell system to your requirements – for any lab, stationary or mobile system.

For more information on our project services, please see brochure *Projects with Fuel Cell Technology.*

Implement projects with Heliocentris

Not every project in the field of fuel cell and hydrogen technology can be implemented with a standardized system. The design of the system depends largely on the specific application and utilization. Heliocentris will take care of the necessary adaptations – with project services.

Systems to suit your requirements

No matter what you are planning – Heliocentris will help you to identify your requirements and develop a fuel cell solution to suit your needs – custom designed and ready to operate. The integration of additional technologies such as small-scale wind power or photovoltaic technology is also no problem.

A broad spectrum of solutions

From the adaptation of one of our standard products to complete development of a new system, Heliocentris offers a broad spectrum of solutions. Our portfolio includes:

» Lab systems
» Prototypes for feasibility studies
» Pilot run and small batch studies for industrial use
» Presentation models

Fuel Cell Systems

Hydrogen Generation & Storage

For the operation of the fuel cell system, Heliocentris provides optimized solutions for hydrogen supply: from connection sets for compressed gas cylinders to storage solutions and hydrogen generators.

Connection sets

For direct connection of 200 bar compressed gas cylinders, Heliocentris provides connection sets with pressure reducers and connecting hoses according to DIN, CGA or BS standards.

Low-pressure metal hydride canisters

For intermediate storage of hydrogen, Heliocentris provides low-pressure metal hydride canisters – the ideal supply solution especially for systems with limited installation space.

Hydrogen generation

For the flexible generation of hydrogen in labs, Heliocentris provides a series of hydrogen generators. We also develop custom solutions for large-scale projects on request. Ask us about the possibilities.

Heliocentris supports instructors, developers and industrial partners worldwide in establishing hydrogen-based fuel cell technology as an integral part of modern energy systems. To do this, we provide them with solutions specifically tailored to their needs.

With a subsidiary in Vancouver, Canada, and customers in more than 60 countries, Heliocentris is a truly global player in the fuel cell industry.

Heliocentris

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