

# Nexa<sup>®</sup> 1200

Fuel Cell System

The Nexa<sup>®</sup> 1200 is the successor to the popular Nexa<sup>®</sup> Power Module. Based on the modern FCgen<sup>™</sup> 1020 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 facilitated integration into applications.



# System Overview

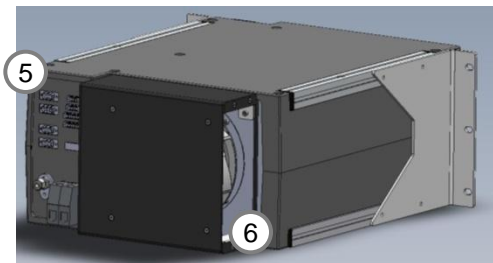
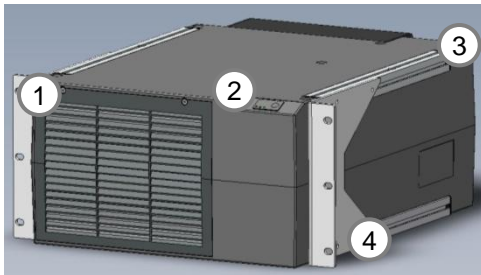
Nexa® 1200

The Nexa® 1200 is a fully integrated fuel cell power module based on the FCgen™ 1020 ACS stack from Ballard, offering superior fuel efficiency and longer service life.

Its enclosed, robust housing and especially flat design combined with integrated profile rails allows for comfortable integration while protecting the inner life of the system.

Both the system's orientation in the application and the air ducts are variably adjustable. An easy to reach interface unit housing all system interfaces further facilitates integration.

A comprehensive safety concept and improved serviceability make the product interesting for integrators.



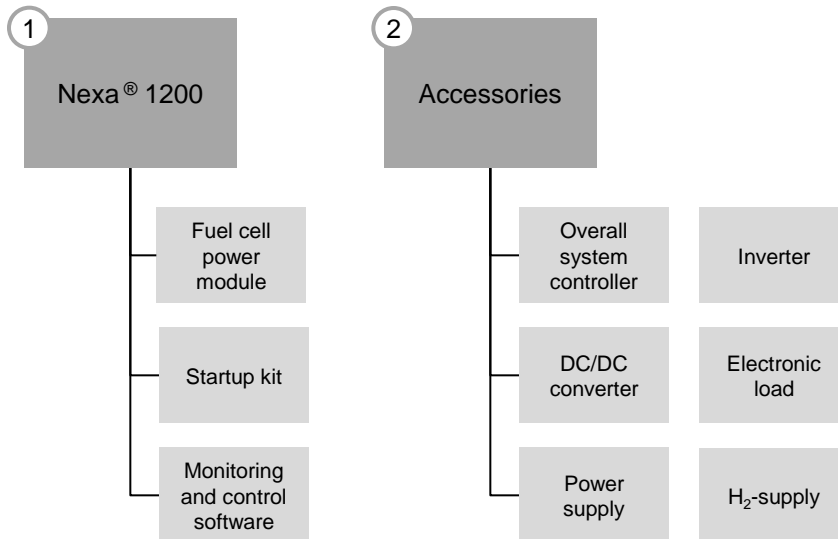
1. Air inlet with intake filter
2. Start/Stop button and status LED
3. Profile rail for mounting
4. Brackets for 19" rack (optional)
5. Interface unit
6. Exhaust

# System Overview

Nexa® 1200

The Nexa® 1200 comes with a startup kit including all components required to easily set up and run the system in laboratory environments.

For integration projects and more complex laboratory setups a range of accessories is available.



1. Nexa® 1200 fuel cell power module for operation in laboratory environments.
2. Accessory program for integration projects and complex laboratory setups.

# System Features

Nexa® 1200



## 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 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 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.

## No draining of water required

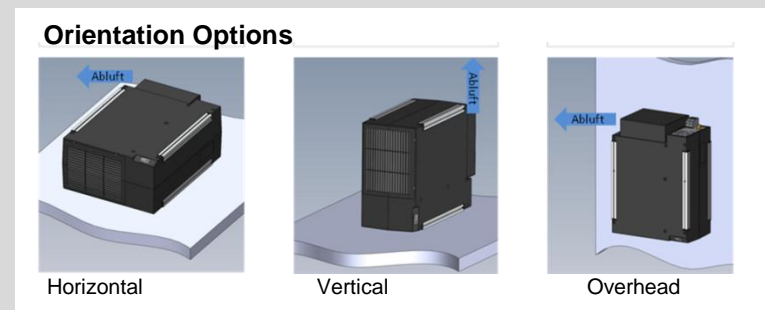
The open cathode stack facilitates drainage of the water accumulated during the reaction. It is evaporated with the cooling air and is blown out through the air duct at the back of the system. The air outlet is designed for easy attachment of an exhaust air duct.

## Central interface unit and mounting rails

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

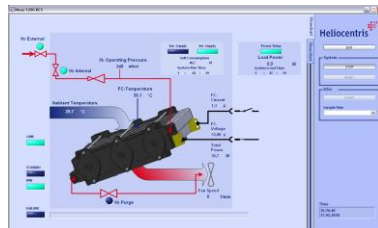
## Flexible orientation options

The Nexa® 1200 can be installed horizontally, vertically and over head, in upright or suspended position.



# Product Package

Nexa® 1200



## Nexa® 1200 Fuel Cell Power Module

Fully integrated 1.2 kW fuel cell power module comprising the FCgen™ 1020 ACS stack from Ballard. Integrated profile rails allow for flexible mounting of the system. All interfaces are located in one place on the system's backside facilitating the connection of cables and hydrogen supply.

## Monitoring Software

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.

## Startup Kit

The startup kit facilitates operation of the system in the lab. It comprises a load cable, a power relays, a diode with cooling element, a bundle of connectors and all necessary electric lines.

All items: Item No. 1911

# Accessories

Nexa® 1200



## Nexa® OSC

The Overall System Controller for Nexa® 1200 comprises a Panel-PC with visualization and control software. It enables the central visualization, operation and setting of parameters of all system components via touch screen monitor. For further system analysis data logging is possible.

Item No. 1710



## Nexa® DC 1200

The DC/DC converter stabilizes the unregulated fuel cell voltage of the Nexa® 1200 fuel cell module to 24 Volt direct current. It also protects the system against reverse currents. The Nexa® DC 1200 is required to hybridize the Nexa® 1200 with the battery set.

Item No. 1610



## Battery Set

The Battery set includes two Lead-Gel-Batteries as well as a cable connection set and a short circuit protection for the connection to the Nexa® DC 1200. It also enables the startup of the Nexa® 1200 without a power supply.

Item No. 1650

# Accessories

Nexa® 1200



## EL 1500 Electronic Load

The electronic load enables the controllable loading of the Nexa® 1200 fuel cell system and features the operating modes: constant current, constant power or constant resistance. The load settings can be made manually or via software.

Item No. 1600



## Hydrogen Detector

A portable hydrogen warning device for monitoring the workplace together with a leak test fluid ensure safety during use of the system.

Item No. 731

# Hydrogen Supply

Nexa® 1200

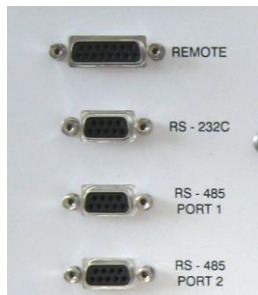


## HG 60 Hydrogen Generator

The HG 60 produces 60 standard liters of hydrogen per hour through the electrolysis of deionized water. No free acids or alkalines are used. An innovative and maintenance-free gas dehydration system achieves a hydrogen purity of 6.0 (99.9999 %).

It is suitable for refilling of low-pressure metal hydride canisters and for direct supply to fuel cell systems.

Item No. 1302



## I/O Board

The I/O Board enables remote control of the hydrogen generator via RS232 interface. It allows to check the status of the generator and to control the production of hydrogen with a PC. If equipped with an I/O board up to ten generators can be cascaded via RS485 interfaces.

The included software allows for monitoring of all relevant parameters, e. g. H<sub>2</sub> production, pressure, cell voltage and operation time.

Item No. 1801



# Hydrogen Supply

Nexa® 1200



## Metal Hydride Canister

The low-pressure metal hydride canister allows for safe and easy intermediate storage of 760 sl of hydrogen in compact form. An integrated quick coupling ensures safe connecting and disconnecting.

Item No. 647

## Flow Meter

The hydrogen flow meter enables the exact measurement of the current hydrogen consumption. The measured values can be displayed via the included software.

Item No. 1730

## H<sub>2</sub> Connection Kit for Compressed Gas Cylinders

For direct refilling of metal hydride canisters from compressed gas cylinders. The pressure reducer ensures that the cylinder pressure is reduced to the suitable inlet pressure of the system.

Item No. 631

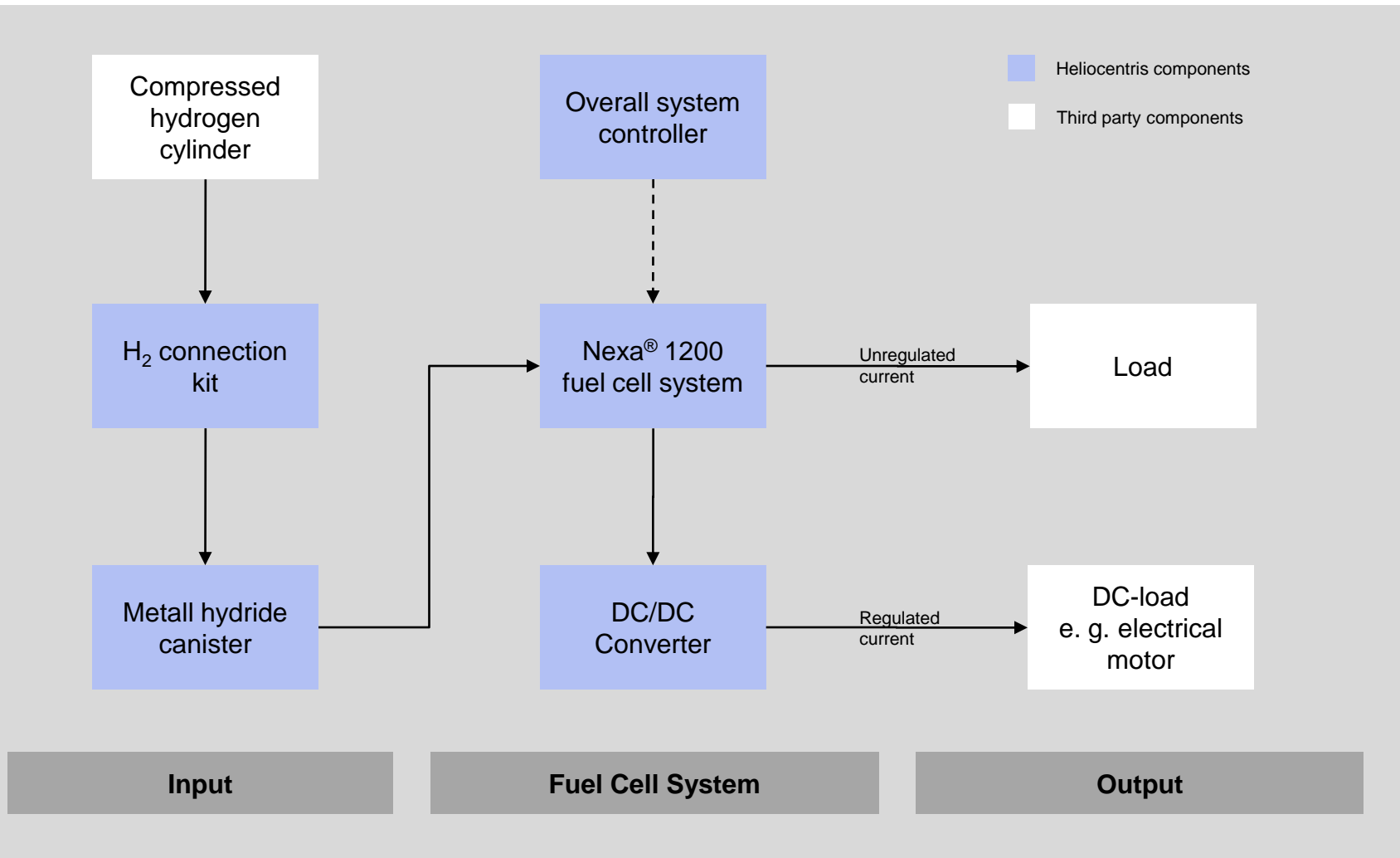
## H<sub>2</sub> Connection Kit for Metal Hydride Canisters

For connecting three metal hydride canisters to the Nexa® 1200 fuel cell system. The canister pressure, which is dependent on the state of charge and temperature, is reduced to system's required input pressure.

Item No. 1502

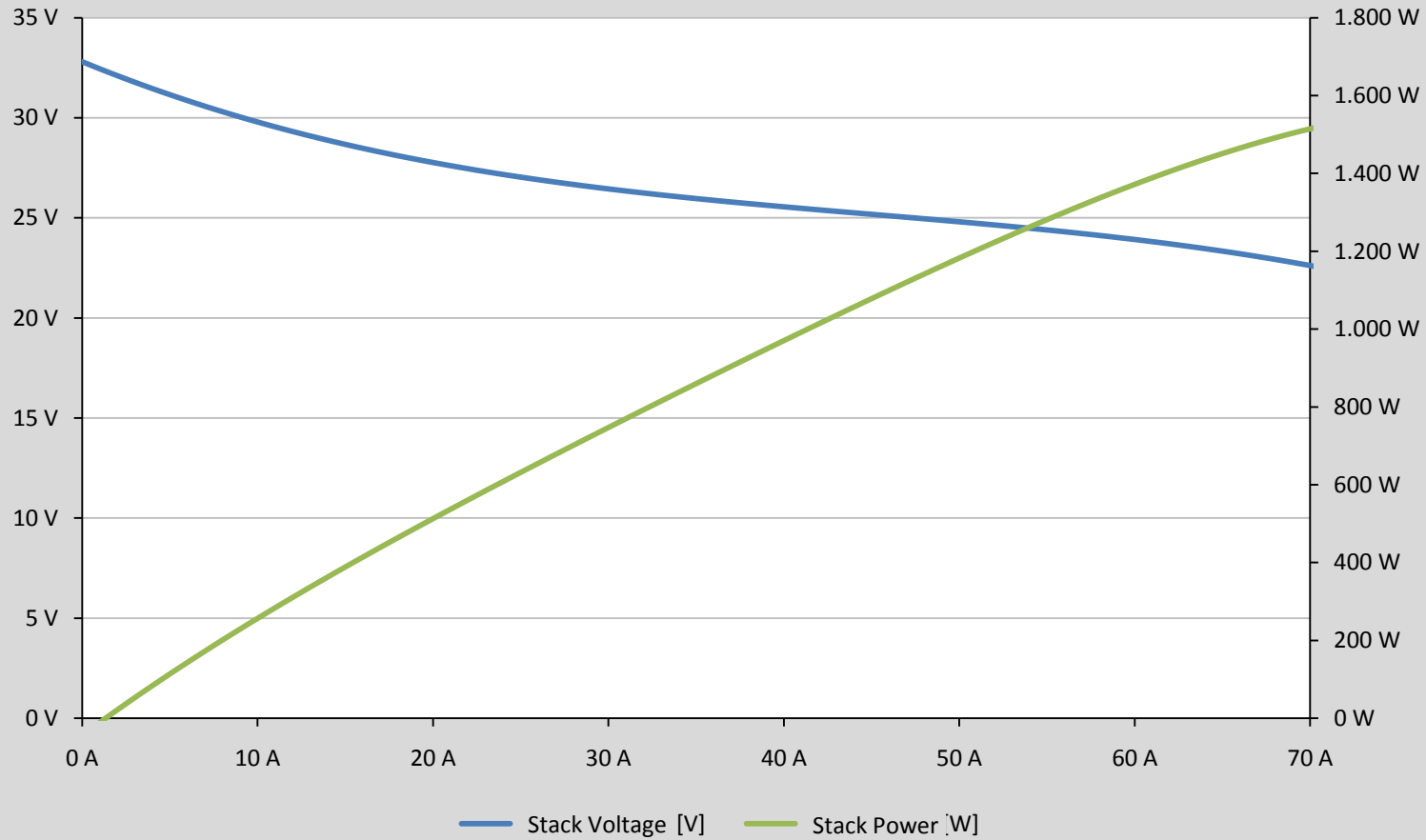
# System Scheme

Nexa<sup>®</sup> 1200



# Power Curve

Nexa® 1200



# Parts List

## Nexa® 1200

Item No.	Name	Description
1911	Nexa® 1200 Fuel Cell System	Product package including Heliocentris Nexa® 1200 1.2 kW fuel cell power module with FCgen™ 1020 ACS stack, monitoring and control software and startup kit allowing to run the system in the lab.
<b>Accessories</b>		
1610	Nexa® DC 1200	DC/DC converter stabilizing the unregulated fuel cell voltage of the Nexa® 1200 fuel cell module to 24 Volt direct current.
1710	Nexa® OSC	Overall System Controller for Nexa 1200 power module and other system components comprising of a Panel-PC incl. visualization and control software.
1870	Nexa® Win OSC	Software package for overall system control with a MS-Windows based office PC.
1660	Startup Power Supply	AC-Adaptor for powering Nexa® 1200 fuel cell system during start-up.
1620	DC/AC Inverter	Inverter to operate loads requiring DC/AC input.
1600	EL1500 Electronic Load	Electronic load for controllable loading of the Nexa® 1200. Operating modes: constant current, constant power, constant resistance
1650	Battery Set	Two Lead-Gel-Batteries incl. cable connection set, short circuit protection for connection to the NEXA 1200 DC/DC converter
731	Hydrogen Detector	Hydrogen leak detection set including a hydrogen sensor with a display and various acoustic and visual alarm levels as well as leak test liquid
<b>Hydrogen Supply Options</b>		
647	HS 760 Metal Hydride Canister	Low-pressure hydrogen storage solution with a capacity of 760 NI
1302	HG 60 Hydrogen Generator	Hydrogen production rate 60 standard liters/hour, connection to metal hydride canisters.
1801	I/O Board for HG Series	I/O Board for remote controlling of the Hydrogen Generator and enabling the interconnection of up to 10 units. Monitoring and control software included.
1730	H2 Flow Meter	Hydrogen flow meter for measurement of hydrogen consumption.
1502	H2 Connection Kit	Connection kit for connecting 3 metal hydride canisters to the Nexa® 1200.
631	H2 Connection Kit	Connection kit for refilling of metal hydride canisters from compressed gas cylinders.

# Technical Data

Nexa® 1200

Fuel Cell Power Module	
Dimensions	
Width x depth x height	400 x 550 x 220 mm
Weight	Approx. 22 kg
Stack	
Make	FCgen™ 1020 ACS
Type	PEM
Design	Air cooled, open cathode
Electrical	
Rated power	1,200 W
Rated current	52 A
Rated voltage	24 V
Output voltage (unregulated)	20 ... 36 V
Operational temperature	5 ... 40 °C

Media	
Hydrogen quality	4.0 (99.99 % or better)
Hydrogen consumption	15 slpm (at rated output)
Air consumption	3,000 slpm (at rated output, 30 °C ambient temperature)
Connectors	
Electrical connector	Screw terminal, 25 mm recommended
Hydrogen connector	Stainless steel clamping ring screw connection, 6 mm
Periphery connector	Plug-in connector, Phoenix FCM
Communication connector	Plug-in connector, Sub-D

# Technical Data

Nexa® 1200

Accessories	
<b>OSC (Overall System Controller)</b>	
Width x depth x height	226 x 41 x 140 mm
Weight	0.6 kg
Make	Panel PC
Display	TFT LCD touch screen, 7"
Interfaces	2 x RS232, 2 x USB, 2 x RJ45 Ethernet, WLAN 802.11b/g
Operational temperature	0 ... 50 C
<b>DC/DC Converter</b>	
Output power	max. 1,200 W
Nominal voltage	24 V
Output voltage	0 ... 32 V
Input voltage	12 ... 45 V
Output current	max. 55 A
Operational temperature	-10 ... 55 C
Efficiency	> 96 %

Battery Set	
Width x depth x height	181 x 76 x 167 mm
Weight	approx. 6.3 kg
Rated voltage	12 V
Capacity	18 Ah
<b>Leak Detection Set</b>	
Sensor type	Hydrogen 4 %
Measuring principle	3-electrode sensor
Standard range	0.00 ... 4.00 %

# Technical Data

## Nexa® 1200 – Hydrogen Supply

Hydrogen Supply	
Hydrogen Generator with I/O Board	
Hydrogen flow rate	60 sl/h
Hydrogen purity	> 6.0 (99.9999 %)
Hydrogen delivery pressure	1.4 ... 10.7 bar adjustable
Pressure accuracy	0.1 bar ( 0.5 %)
Water quality	Deionized or distilled
Operating temperature	15 °C to 40 °C
Relative humidity	0 – 80 %, non-condensing
Input voltage	120 or 240 V AC / 50-60 Hz selectable
Power consumption	480 VA max.
Operation panel	LC Display 128 x 64 pixels
	Set points, status, alarm
I/O board with PC software (option)	1 port RS232
	2 ports RS485
	Potential free relay contacts
	Set points, system status, user parameter
Dimensions (W x D x H)	230 x 355 x 410 mm
Weight (unfilled)	20 kg

Metal Hydride Canister	
Storage capacity (at charge pressure of 17 bar)	760 sl
Output	6 slpm
Weight	6.5 kg
Size (ø x L)	89 x 420 mm
Charge pressure	10 ... 17 bar

The power delivered by the fuel cell depends on various parameters and decreases throughout the product life. All technical data correspond to the stack power at time of delivery.

The system works with hydrogen, a highly inflammable gas. Therefore, the respective local norms and safety regulations for transport, storage and operation have to be observed. Before setting up and operating the system, carefully read the instruction manual.

Subject to changes without notice.  
© Heliocentris Energiesysteme GmbH 2010



**Heliocentris Energiesysteme GmbH**

Rudower Chaussee 29  
12489 Berlin  
Germany

Tel: +49 (0) 30 63 92 63 26  
Fax: +49 (0) 30 63 92 63 29  
sales@heliocentris.com

[www.heliocentris.com](http://www.heliocentris.com)

**Heliocentris Energy Systems Inc.**

902-610 Granville St.  
Vancouver, BC  
V6C 3T3 Canada

Tel: +1 604 684 3546  
Fax: +1 604 648 9406  
sales@heliocentris.com