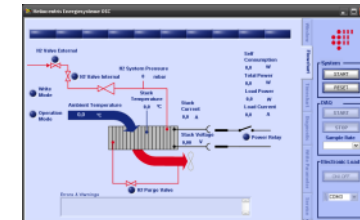


Nexa[®] Integration System

1.2 kW Fuel Cell System

The Nexa[®] Integration System is ideal for demanding application projects. With its 1.2 kW fuel cell module, matching DC/DC converter and a software facilitating overall system control, training and research projects can be implemented easily.

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

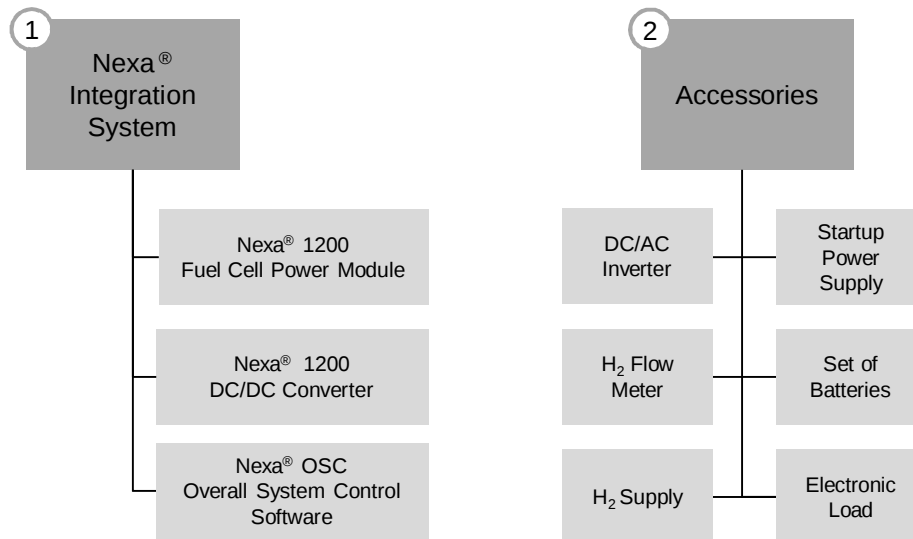


System Overview

Nexa® Integration System

The Nexa® Integration System includes the 1.2 kW Nexa® 1200 Fuel Cell Power Module including a startup kit, the Nexa® DC 1200 DC/DC Converter (24 V or 48 V) and the Nexa® OSC Overall System Control Software to easily set up and run the system in laboratory environments.

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



1. Nexa® Integration System for operation in laboratory environments.
2. Accessory program for more complex laboratory setups or integration projects and research projects.
The supplied software controls the full range of accessories: the DC/AC inverter, the H₂ generator, the flow meter, and the load. Every component is also accessible via OPC UA.

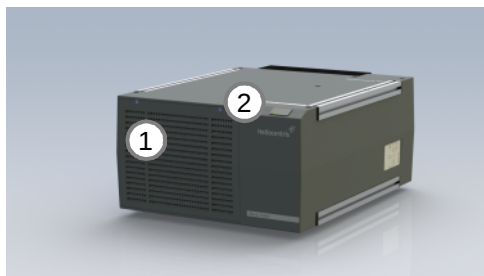
System Overview

Nexa® Integration System

The Nexa® 1200 Fuel Cell Module is the core of the Nexa® Integration System.

The fully integrated fuel cell power module is based on the FCgen™-1020ACS stack from Ballard, offering superior fuel efficiency and a long service life. Its enclosed, robust housing with integrated profile rails allows for comfortable integration of the module and protects the inner life of the system.

In combination with the Nexa® DC 1200 DC/DC Converter and the Nexa® OSC Software facilitating overall system control, the Nexa® Integration System is optimal for implementing stationary applications.



Nexa® 1200

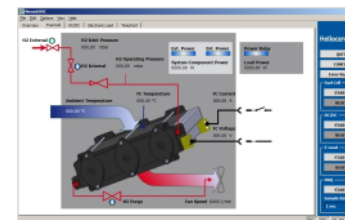
1. Air inlet with intake filter
2. Start/Stop button and status LED



3. Interface unit
4. Exhaust



Nexa® DC 1200



Nexa® OSC

System Features Nexa® 1200

Nexa® Integration System



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%.

Improved Service Life

Heliocentris guarantees a system warranty of 1500 hours, if the system is used according to specifications - three times the service life of the old Nexa® Power Module.

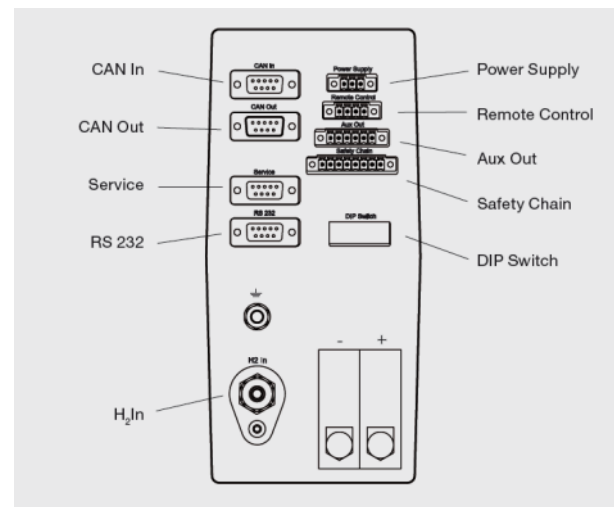
No Draining of Water Required

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

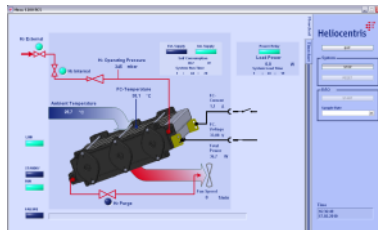
The Nexa® 1200 has a central, easy to reach interface unit on its back, housing peripheral, electrical and hydrogen connectors. Integrated mounting rails further facilitate the integration.

Interface Unit



Scope of Delivery

Nexa® 1200 - Item 1911



Nexa® 1200 Fuel Cell Power Module

Fully integrated 1.2 kW fuel cell power module comprising the FCgen™-1020ACS 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.

Remote Control Software

The included Remote Control Software allows to put the Nexa® 1200 into operation and 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 relay, a diode with cooling element, a bundle of connectors and all necessary electric lines.

All items: Item No. 1911

Scope of Delivery

Nexa® DC 1200 - Item 1610 / 1611



Nexa[®] DC 1200

The Nexa® DC 1200 DC/DC Converter stabilizes the unregulated fuel cell voltage of the Nexa® 1200 Fuel Cell Module to 24 / 48 Volt direct current. It also protects the system against reverse currents. The Nexa® DC 1200 is required to hybridize the Nexa® 1200 with the optionally available Battery Set.

Hybridization Kit

The included Hybridization Kit ensures that the DC/DC Converter, the Nexa® Fuel Cell Module and the Set of Batteries work together safely as a fuel cell/battery hybrid system. The device is responsible for load control, battery control, battery charging and deep charge protection.

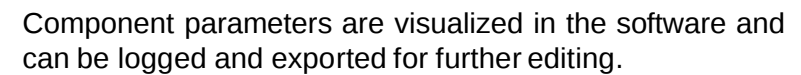
Software

The included software of the Nexa® DC 1200 enables the central parameterization of the device and the visualization of its operation parameters via a MS Windows PC. Data logging for further analysis is possible.

All items: Item No. 1610/1611



- » Nexa® 1200 Fuel Cell Module
- » Nexa® DC 1200
- » ELR 10080-60 Electronic Load



Item No. 1870



Accessories

Nexa® Integration System



For illustration purposes only



For illustration purposes only



Startup Power Supply

The Startup Power Supply provides the power required to start-up the Nexa® 1200 when used without Nexa® DC 1200 and Battery Set.

Item No. 1660

Set of Batteries

The Set of Batteries (24 / 48 V) includes two/four 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 / 1651

ELR 10080-60 with 1500 W

The Electronic Load enables the controllable loading of the Nexa® 1200 Fuel Cell System and features the operating modes: constant current, constant power, constant voltage or constant resistance. The load settings can be made manually or via the included software or the optionally available Nexa® OSC Software.

Item No. 1600

Accessories

Nexa® Integration System



Cotek SD-2500 DC/AC Inverter

The DC/AC Inverter converts the power from the Nexa® DC 1200 to 230V/110V. Only compatible with Nexa® DC 1200 24V Version.

Item No. 1620



H₂ Flow Meter

The Hydrogen Flow Meter enables the exact measurement of the current hydrogen consumption.

Item No. 1730



H₂ 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® Integration System



Metal Hydride Canister

The low-pressure metal hydride canister allows for safe and easy intermediate storage of 800 NI of hydrogen in a compact form. An integrated quick coupling ensures safe connecting and disconnecting of the canister.

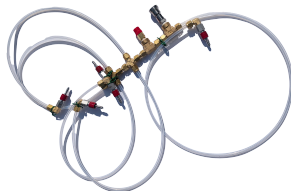
Item No. 650



H₂ Connection Kit 200 bar

For direct operation of the Nexa® 1200 Fuel Cell Module or 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 Nexa® 1200 or Metal Hydride Canister.

Item No. 631



H₂ Connection Kit 15 bar

For connecting three Metal Hydride Canisters to the Nexa® 1200 Fuel Cell System.

Item No. 1502

Hydrogen Supply

Nexa® Integration System



HG72 Hydrogen Generator

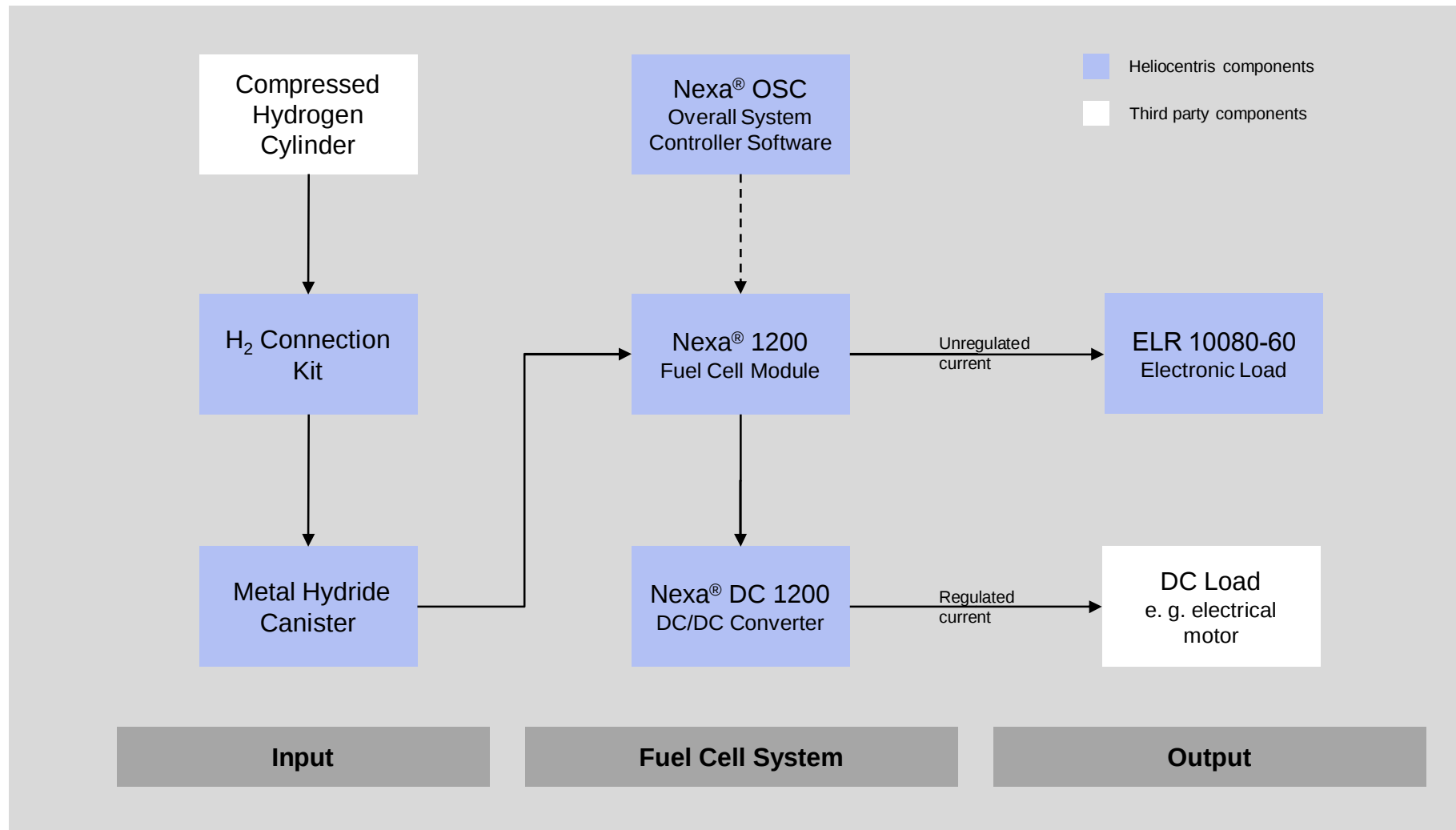
The HG72 produces up to 72 standard liters of hydrogen per hour through the electrolysis of de-ionized water. No free acids or alkalines are used.

Through an innovative and maintenance-free gas dehydration system the generator achieves a hydrogen purity of 6.0 (99.9999 %). It is suitable for the refilling of low-pressure metal hydride canisters.

Item No. 1303

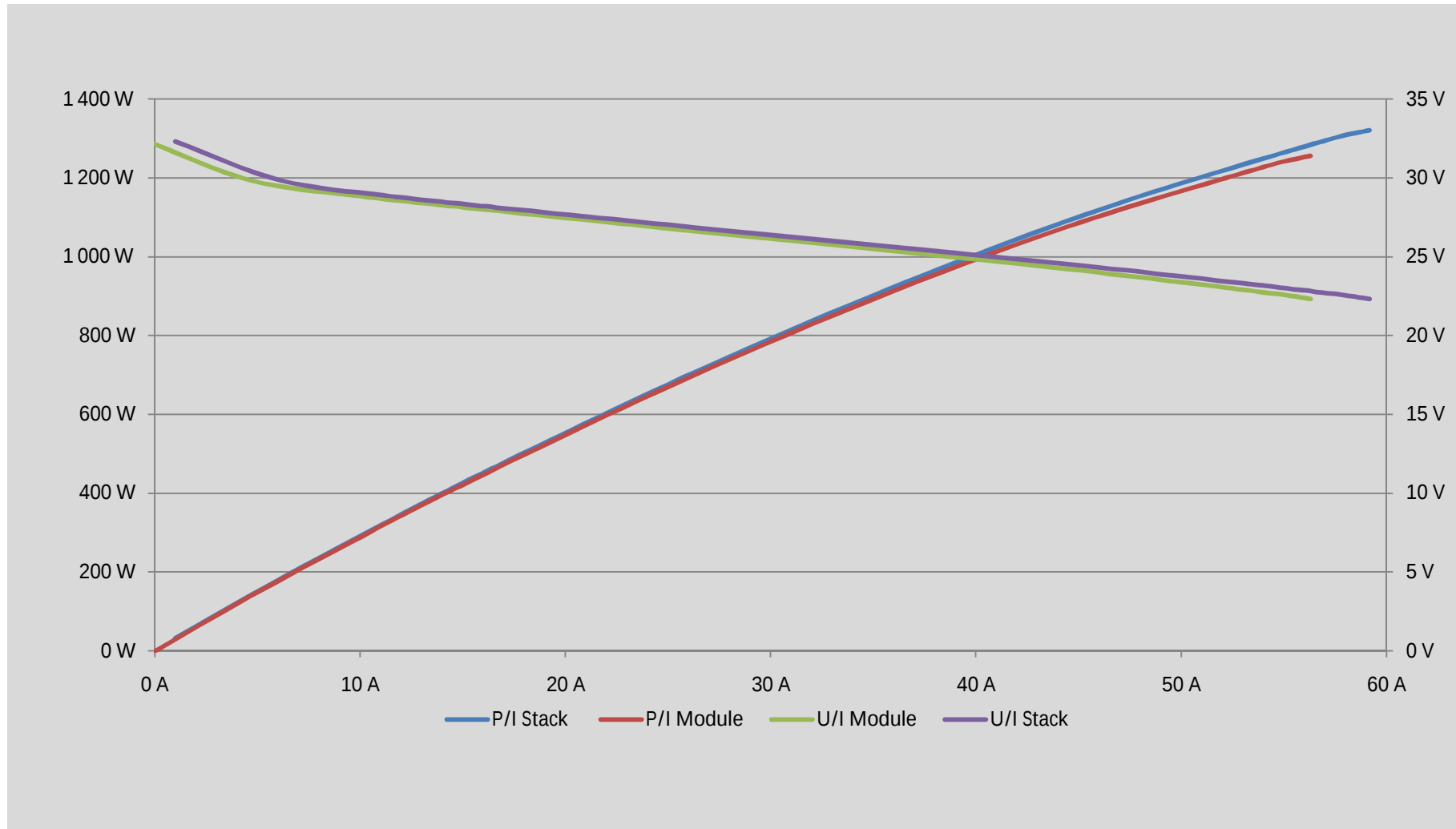
System Scheme

Nexa® Integration System



Power Curve – Nexa[®] 1200 Fuel Cell Module

Nexa[®] Integration System



Parts List

Nexa® Integration System

Item No.	Name	Description
1911	Nexa® 1200	1.2 kW Fuel Cell Power Module with FCgen™-1020ACS, Monitoring and Control Software and Startup Kit allowing to run the system in the lab
1610	Nexa® DC 1200-24	DC/DC Converter stabilizing the unregulated fuel cell voltage of the Nexa® 1200 Fuel Cell Module to 24 V DC, incl. Hybridization Kit and Cable Connection Set (battery set recommended for operation)
1611	Nexa® DC 1200-48	DC/DC Converter stabilizing the unregulated fuel cell voltage of the Nexa® 1200 Fuel Cell Module to 48 V DC, incl. Hybridization Kit and cable connection set (battery set recommended for operation)
1870	Nexa® OSC	Software package for overall system control with a MS Windows based PC
Hydrogen Supply		
631	H ₂ Connection Kit 200 bar	Connection Kit for refilling of Metal Hydride Canisters from compressed gas cylinders
1502	H ₂ Connection Kit 15 bar	Connection Kit for connecting 3 Metal Hydride Canisters to the Nexa® 1200 Fuel Cell Power Module
650	Metal Hydride Canister	The low-pressure metal hydride canister with 800 NI
1303	HG 72 Hydrogen Generator	HG 72 produces up to 72 standard liters of hydrogen per hour
Accessories		
1660	Startup Power Supply	AC-Adaptor for powering Nexa® 1200 Fuel Cell Module during startup
1650	Set of Batteries 24 V	Two Lead-Gel-Batteries 18Ah each
1651	Set of Batteries 48 V	Four Lead-Gel-Batteries 18Ah each
1600	ELR 10080-60 Electronic Load	Electronic Load for controllable loading of the Nexa® 1200 Fuel cell Module. Operating modes: constant current, constant power, constant resistance, constant voltage
1620	DC/AC Inverter	Inverter to operate loads requiring DC/AC input (only applicable with Nexa® DC 1200 and Battery Set)
1730	H ₂ Flow Meter	Hydrogen Flow Meter for measurement of hydrogen consumption
731	H ₂ Detector	Hydrogen Leak Detection Set including a hydrogen sensor with a display and various acoustic and visual alarm levels and a leak test liquid

Technical Data

Nexa® Integration System

Fuel Cell Power Module	
Dimensions	
Width x depth x height	400 x 550 x 220 mm
Weight	Approx. 22 kg
Stack	
Manufacturer	Ballard
Make	FCgen™-1020ACS
Type	PEM
Design	Air cooled, open cathode
Electrical	
Rated power	1200 W
Rated current	52 Adc
Output voltage (unregulated)	20 - 36 Vdc
Operational temperature	5 - 40°C

Media	
Hydrogen quality	4.0 (99.99 % or better)
Hydrogen consumption	15 slpm (at rated output)
Air consumption	335 m³/h (at rated output, 30 °C ambient temperature)
Connectors	
Electrical connector	Screw terminal, 16-50mm²
Hydrogen connector	Brass clamping ring screw connection, 6 mm
Periphery connector	Plug-in connector, Phoenix FCM
Communication connector	Plug-in connector, Sub-D

Technical Data

Nexa® Integration System

DC/DC Converter	
Specifications	
Output power	max. 1450 W
Nominal voltage	24 / 48 Vdc
Output voltage	0 ... 32 Vdc / 0...62 Vdc
Input voltage	16 ...45 Vdc
Output current	max. 55 / 27 Adc
Operational temperature	-10...55 °C
Efficiency	> 95 %
Weight	approx. 2.5 kg

Accessories	
H ₂ Flow Meter	
Measuring range	25 slpm
Accuracy	± 1.5% of full scale
Temperature	0-50 °C
H ₂ Detector	
Sensor type	Hydrogen 4 %
Measuring principle	3-electrode sensor
Standard range	0.00 - 4.00 %

Accessories	
Set of Batteries	
Rated voltage	24 Vdc / 48Vdc
Capacity	18Ah
Startup Power Supply	
Output voltage	24 Vdc
Output current	5.2 Adc
Output power	124.8 W
Input voltage	90 ... 264 V (60/50 Hz)
Electronic Load	
Load voltage	0 ... 80 Vdc
Load current	0 ... 60 Adc
Load power	max. 1500 W
Power supply	115 / 230 V (60/50 Hz)
DC/AC Inverter	
Output voltage	110 / 230 V (60/50 Hz)
Continuous output power	2500 W
Short time output power	3000 W
Input voltage	24 Vdc
Efficiency (full load)	91 / 93 % (110/230 V)

Technical Data

Nexa® Integration System

Hydrogen Supply	
Hydrogen Generator HG72	
Hydrogen flow rate	up to 72 sl/h
Hydrogen purity	> 6.0 (99.9999 %)
Hydrogen delivery pressure	12 - 16 bar adjustable
Pressure accuracy	0.1 bar (± 0.5 %)
Water quality	Deionized, ASTM II, <0.1uS
Operating temperature	5 °C - 35 °C
Relative humidity	0 - 80 %, non-condensing
Input voltage	120 or 240 V AC / 50 - 60 Hz selectable
Power consumption	560 VA max.
Operation panel	LC Display
	Set points, status, alarm
I/O board with optional PC software	1 port RS232
	2 ports RS485
	Potential free relay contacts
	Set points, system status, user parameter
Dimensions (W x D x H)	485 x 410 x 177 mm
Weight (unfilled)	25 kg

Metal Hydride Canister	
Storage capacity (at charge pressure of 17 bar)	800 NI
Output	max. 6 NI/min
Weight	7.3 kg
Size ($\varnothing$ x L)	102 x 470 mm
Charge pressure	1 - 17 bar
H ₂ Connection Kit 15 bar	
Inlet pressure	15 bar (217.5 psig)
Connections	3 x metal hydride canister to quick coupling
H ₂ Connection Kit 200 bar	
Inlet pressure	200 bar (2900 psig)
Outlet pressure	0 - 20 bar (0 – 290 psig)

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 Academia International GmbH



NEXA 1200 W
Article Nr.: 1911



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**Customized version – components of NEXA®
Integration System mounted on a plate:**

NEXA® 1200 W
Startup Power Supply
DC/DC Converter 24/48V
OSC Software



NEXA® 1200 + DC/DC Converter 24V
Article Nr.: 1913

NEXA® 1200 + DC/DC Converter 48V
Article Nr.: 1912