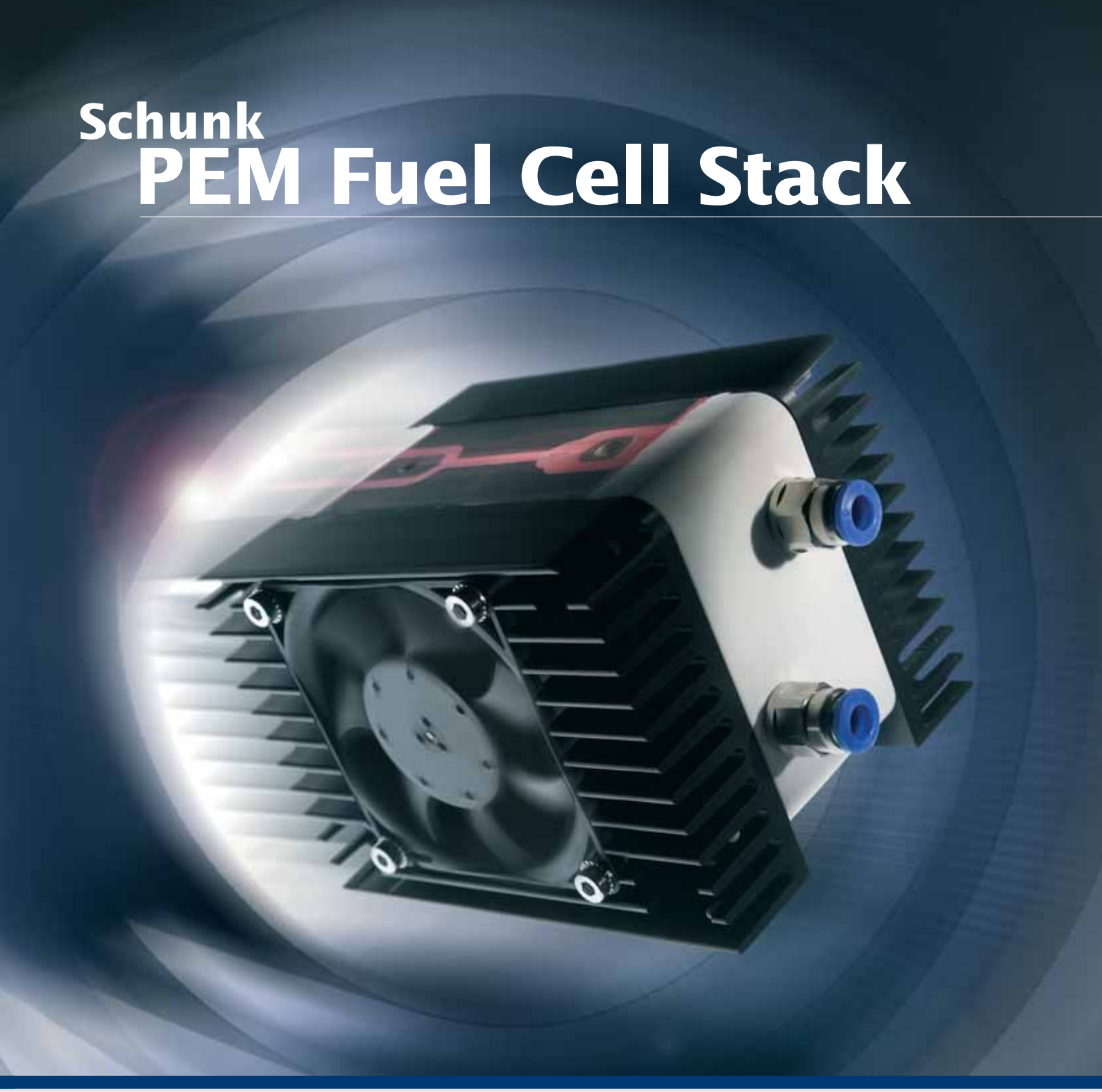
Schunk

PEM Fuel Cell Stack



The Universal
PEM Fuel Cell Stack

schunk Group

Schunk Bahn- und Industrietechnik GmbH

Your Benefits of our Basic Concept

Basic Concept: The electrical power requirements of fuel cell systems are obtained by modular assembly of identical 360 W stacks.

Flexibility: Power, voltage and current can be set independently by the corresponding number and the electrical connection of single stacks.

Stack Design: Design, materials and manufacturing technologies of the individual components and stacks are suitable for high-volume production.

Sealing Technology: The joining and sealing of the stack components is achieved by a special casting technology.

Space Issues: The flat geometry of the single stacks permits installation even in crowded or compact areas.

Alternative Fuels: All stacks are also available in configurations for reformate gas operation mode.

Cooling System: Regarding FC-42 HLC and FC-08 HLC an external cooling jacket allows the use of typical coolants instead of deionized water. The air cooling system of FC-08 HAC allows an easy system integration.

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Properties of FC-42 HLC (Single Stack)/FC-08 HLC/HAC

General	FC-42 HLC (Single Stack)	FC-08 HLC	FC-08 HAC
Type	PEM fuel cell stack	PEM fuel cell stack	PEM fuel cell stack
Cooling	water/glycol (or other conventional coolant)	water/glycol (or other conventional coolant)	air (active cooling)
Media	air/hydrogen	air/hydrogen	air/hydrogen
Design	bipolar	bipolar	bipolar
Electrical			
Nominal output	360 W	80 W	60 W
Nominal voltage	24 V	5.4 V	5.4 V
Nominal current	15 A	15 A	12 A
Minimum voltage	15 V	3 V	3 V
Maximum voltage (open circuit)	36 to 42 V	7.5 to 9 V	7.5 to 9 V
Maximum current	30 A	30 A	30 A
Thermal			
Operating temperature	5 to 55 °C (self humidified) <75 °C (external humidified)	5 to 55 °C (self humidified) <75 °C (external humidified)	5 to 55 °C (self humidified) <75 °C (external humidified)
Ambient temperature	5 to 70 °C	5 to 70 °C	5 to 50 °C
Storage temperature	-10 to 50 °C (dry unit)	-10 to 50 °C (dry unit)	-10 to 50 °C (dry unit)
Humidity management	self humidified (5 to 55 °C) external humidifier (> 55 °C)	self humidified (5 to 55 °C) external humidifier (> 55 °C)	self humidified (5 to 55 °C) external humidifier (> 55 °C)
Dimensions			
Number of cells	42/43[1)]	8/9[1)]	8/9[1)]
Width x depth x height	approx. 130 x 61 x 190 mm	approx. 75 x 118 x 53 mm	approx. 83 x 118 x 98 mm
Weight	approx. 2,000 g	approx. 520 g	approx. 1,300 g
Media			
Hydrogen quality	99.99 % (no traces of CO)	99.99 % (no traces of CO)	99.99 % (no traces of CO)
Hydrogen consumption	approx. 5 l/min at nominal load	approx.1.1 l/min at nominal load	approx. 0.8 l/min at nominal load
Maximum anode pressure drop	15 mbar	15 mbar	15 mbar
Air	approx. 25 l/min at nominal load and $\lambda = 2$	approx. 5 l/min at nominal load and $\lambda = 2$	approx. 4 l/min at nominal load and $\lambda = 2$
Maximum cathode pressure drop	35 mbar	30 mbar	30 mbar
Coolant (water/glycol)	approx. 3 l/min at nominal load	approx. 0.5 l/min at nominal load	-
Maximum water pressure drop	150 mbar	150 mbar	-

The data shown above are not guaranteed, but typical values based on our experience from test results.
It should be understood that a spread of results can occur due to variations in materials, components, production and test conditions.
Schunk reserves the right to change specifications at any time.

[1)] *tolerance possible*

Schunk is setting Standards

Examples of Applications:

- ***Technical Safety Systems***
  e. g. uninterruptible power supply (UPS), control enclosures, replacement of batteries
- ***Small Traction Applications***
  e. g. industrial trucks, electric scooters, apron vehicles
- ***Off-Mains Power Supply***
  e. g. measurement systems, mobile communication systems, renewable energy systems
- ***Portable Generators***
  e. g. camping, leisure time, military applications
- ***Special On Board Supply Systems***
  e. g. yachts, motorhomes, special vehicles

Schunk is setting Standards

Simple modular assembly up to four fuel cell stacks

Overview of our Product Range

The Standard Stack in Modular Concept for all System Integrators

FC-08 HLC
Power: 80 W
Mass: approx. 0.52 kg
Dimensions: 118 x 74.5 x 61 mm

FC-08 HAC
Power: 60 W
Mass: approx. 1.3 kg
Dimensions: 118 x 83 x 98 mm

FC-42 HLC
Power: 360 W
Mass: approx. 2 kg
Dimensions: 130 x 61 x 190 mm

FC-42 HLC
Power: 720 W
Mass: approx. 4 kg
Dimensions: 130 x 108 x 190 mm

FC-42 HLC
Power: 1,080 W
Mass: approx. 6 kg
Dimensions: 130 x 155 x 190 mm

FC-42 HLC
Power: 1.4 kW
Mass: approx. 8 kg
Dimensions: 130 x 202 x 190 mm

Schunk Competence-Center

Schunk Bahn- und Industrietechnik GmbH is your design and development partner in all questions of power transmission in the industrial and railway sector.
We are your one-stop source for customized solutions such as design and development, production, assembly, sales and applications engineering.
We are close to all important key industries all over the world thanks to our own test facilities, service and maintenance: From the automobil and electrical industry to the medical engineering and renewable energies.

In our Competence-Center we inform you about Schunk fuel cell stacks, their advantages and design as well as their application in practice.

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