ARADEX

DCDC200

DCDC200-HL

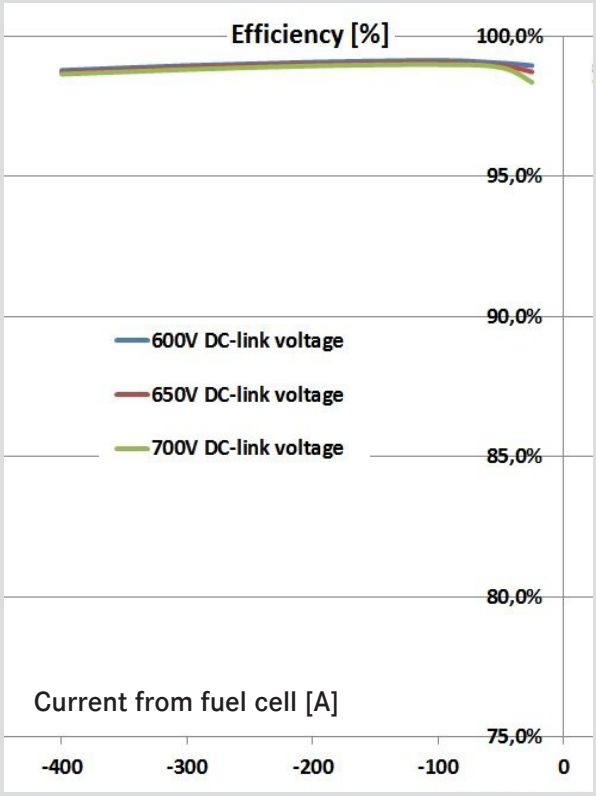
DC/DC converter VECTOPOWER for fuel cells

For more efficiency and safety in the power train

- Input voltage from 48 to 750 V DC, up to 400 A.
- Output voltage up to 770 V DC, freely adjustable
- Efficiency of up to 99%
- Raising and stabilizing the voltage level at the DC link
- PowerBalancing possible without parent control (SmartDC)
- Protection of the fuel cell against voltage ripples
- Operation of the fuel cell always at the optimal operating point
- Optional brake chopper controler available with the DCDC200-HL

Efficiency curves

500 VDC @ Low-Side



400 VDC @ Low-Side

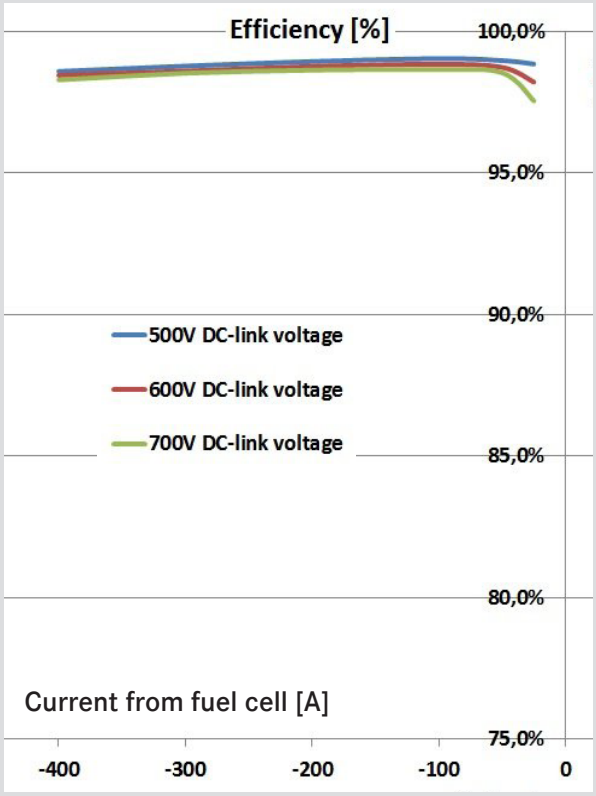


Fig .: Efficiency curves are valid for DCDC200 and DCDC200-HL. Current flows into DC Link

Efficiency

The excellent efficiency of the VECTOPOWER DC/DC converters with up to 99% illustrate the great benefits for the system in terms of overall efficiency. The higher voltage in the DC link reduces the necessary currents and thus improves the efficiency of the overall system. In combination with hydrogen fuel cells, efficiency is doubly important. Just consider 1% less hydrogen consumption every day.

Voltage stability

With the µs-fast regulation of the voltage of the DC link, not only the voltage level of the fuel cell can be raised, but also extremely fast reaction to load changes in the drive system. Energy management is correspondingly stable and secure.

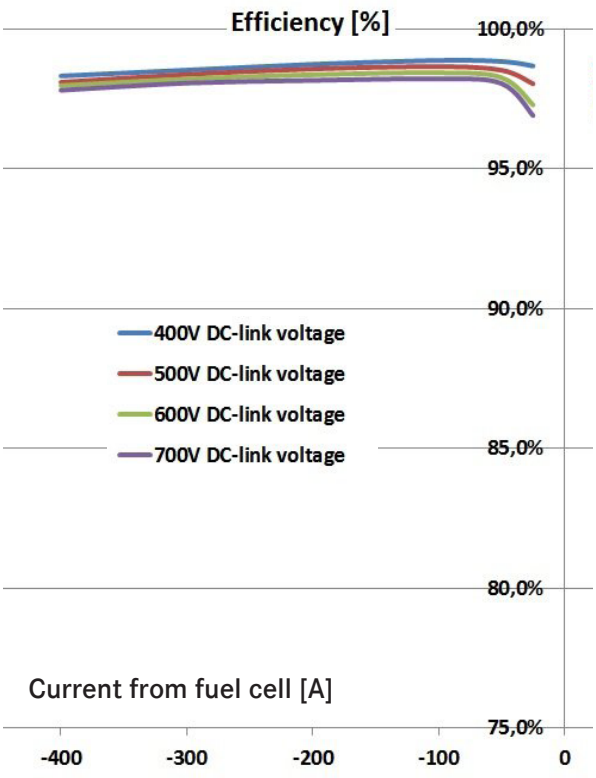
Optimized operation of the Fuel cell

The fuel cell is operated freely adjustable at the predefined operating point. This can be carried out under current or voltage. This enables both optimum efficiency and the optimal service life of the fuel cell to be achieved. At every operating point. This operating point can be adjusted on-the-fly during operation and without interruption, e.g. when the operating conditions of the fuel cell change.

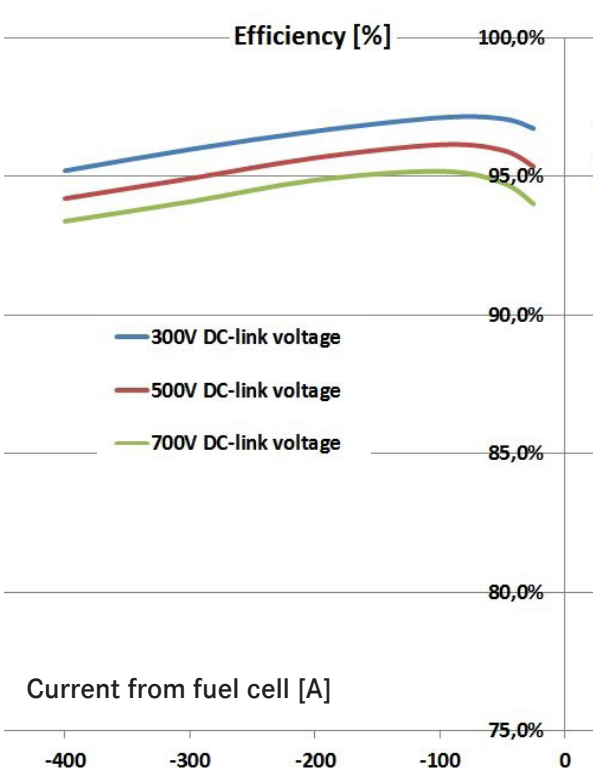
Power balancing

If several fuel cells are connected to the DC-link via the VECTOPOWER DC/DC converter, the optional SmartDC software module from ARADEX can be used to control the power balancing between the fuel cells. This means that there is no need for additional control for energy management.

300 VDC @ Low-Side



100 VDC @ Low-Side



Brake chopper +

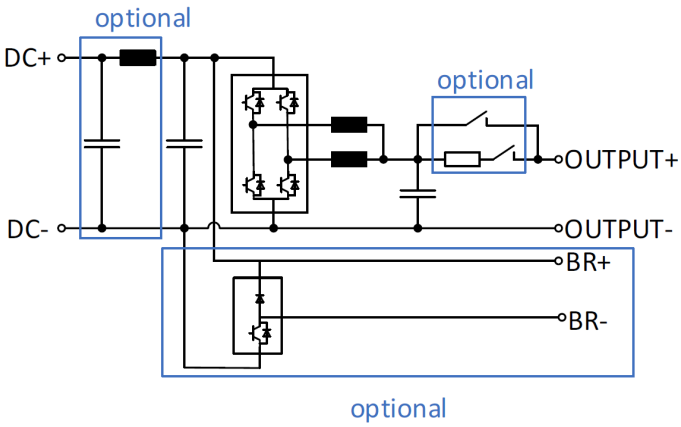
The following additional components have been integrated with the DCDC200-HL, which can facilitate the integration of fuel cells in drive systems without a backup battery:

+ Brake chopper connection
+ Charging circuit (relay, resistor)

In addition, the DC link is stabilized with

+ a HF choke for the DC link
+ and a larger capacitance of 3700 µF

integrated in the DCDC200-HL. Short power peaks can be stored in the capacity and a connected brake chopper can reduce excess energy.



Characteristics for DC200 /-HL

	VP5000-DCDC200	VP5000-DCDC200-HL
Field of application	fully integrated DC/DC converter for mobile applications	integrated in addition to DCDC200: - Brake chopper connection - HF choke for DC link - charging circuit (relay, resistor) - 3700 µF
Item number	VP5000-DC18W140-68.1.22.01.80.0	VP5000-DC18W140-68.1.22.01.81.0
Voltage range for DC-link	48 - 800 V | switch off threshold: 820 V	
Recom. voltage range for DC-link	350 - 770 V | nominal: 650 V	
Therm. nominal current*	400 A DC | 350 A DC (with Derating)	
Voltage ripple	< +/- 1 Vpp	
Communications	CAN	
Dimensions	H: 271 mm | W: 529 mm | D: 414 mm	
Weight	about 75 kg	about 85 kg
Cooling	Water / Glycol (30 l/min)	
Max. cooling water temp.	up to 35°C | 35 - 65°C with derating	
Degree of protection	IP65	

* Values depend on cooling, voltage and PWM frequency. Measured at 30 liters of cooling water flow at 35°C | 65°C cooling water temperature and 45°C outside temperature, unless otherwise stated

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