

# Scalable insulated DC/DC converters for safe and efficient coupling of fuel cells, electrolyzers and DC grids





10 kW submodule



Test bench: 1 MWh LOHC storage system

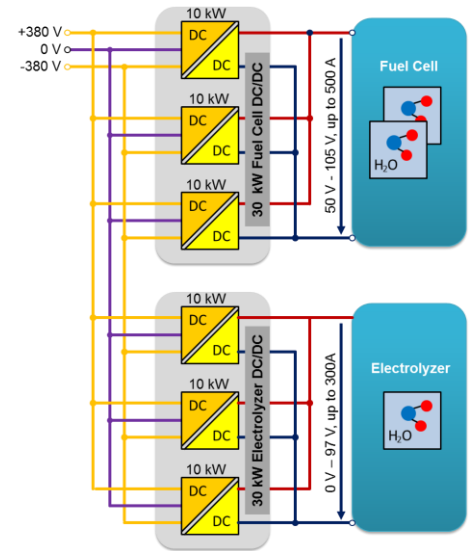
### DC/DC Converter

- **Universal building blocks**
  - Building set with a large variety
    - Voltage / Current / Power
    - Suitable topologies like Phase-Shift, Dual-Active-Bridge, Buck-Boost, ...
  - Fully isolated design approach enables serial or parallel connection on both sides
- 10 kW submodules
  - Realized by four universal building blocks
- 30 kW electrolyzer DC/DC and fuel cell DC/DC
  - Each realized by three submodules
  - Over 10 kW output power the minimum efficiency is higher than 94 % due to phase shedding ability

### Technical Data

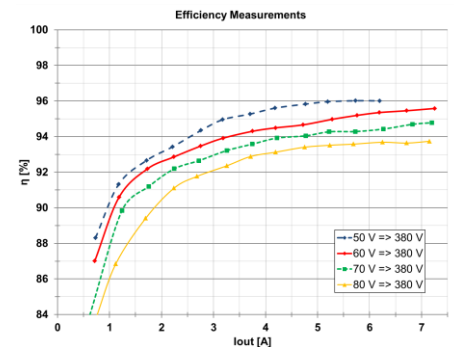
Converter	FC	EL
Low Side Voltage	50 V ... 105 V	0 V ... 97 V
High Side Voltage	380 V ± 10 %	
Max Output Current	500 A	300 A
Max Output Power	30 kW	30 kW
Max Efficiency	96.0 %	96.6 %
Max Coolant Temperature	65 °C	
Max Air Temperature	45 °C	
Switching Frequency	47 kHz	
Dimension Rack	19" x 6U (267 mm) x 650 mm	
Power Density Rack	1.15 kW / dm <sup>3</sup>	
Power Density Power Electronic	3 kW / dm <sup>3</sup>	

### Realized Application

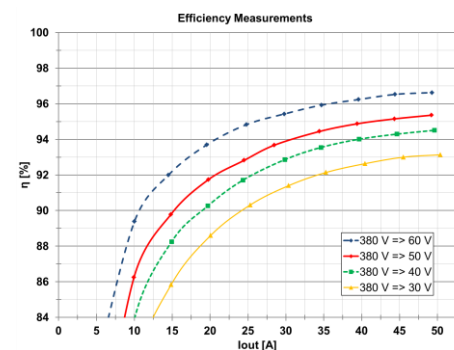


### Efficiency Measurements

#### Building block (phase) of the fuel cell DC/DC converter



#### Building block (phase) of the electrolyzer DC/DC converter



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