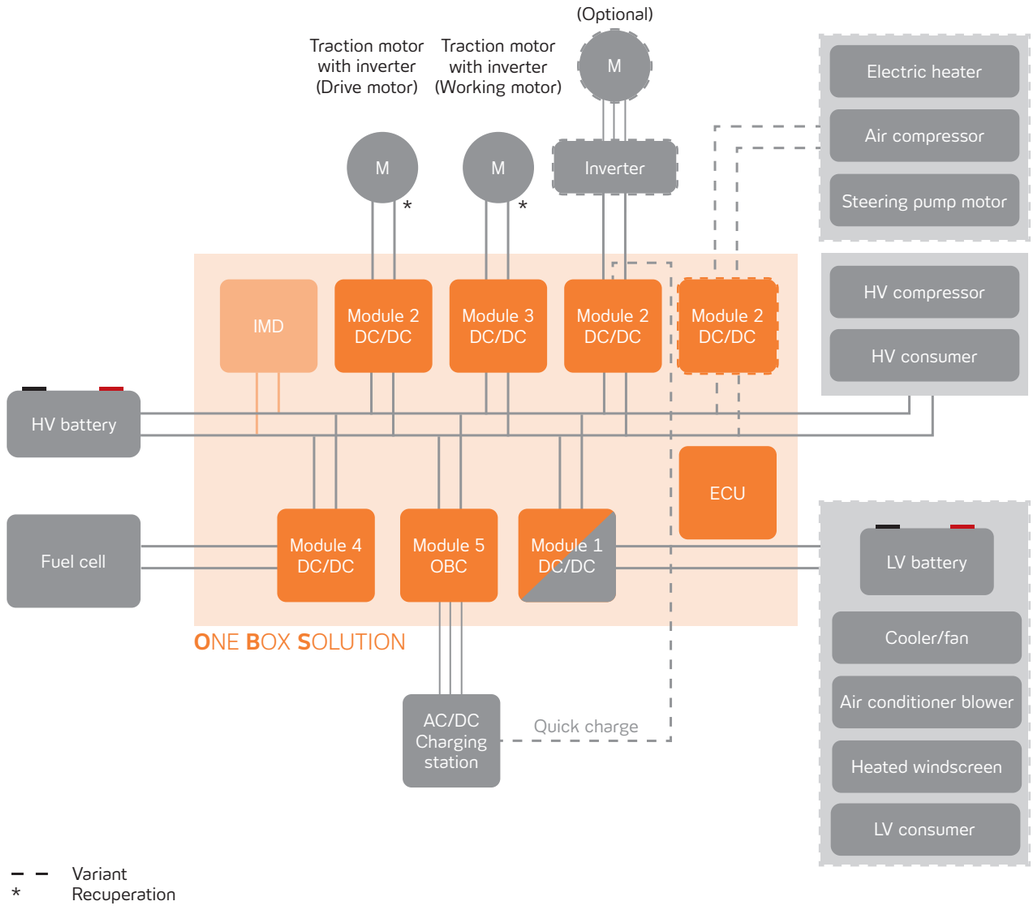
HV-PDU
ONE BOX SOLUTION

WÖLFLE INSIDE!

WÖLFLE
CLEVER. EFFICIENT. CREATIVE

E/E ARCHITECTURE

The following figure shows the central components of an electric vehicle. These components are usually supplied via decentralised DC/DC converters and connection boxes. The individual modules are distributed throughout the vehicle, must be connected to each other via complex high-voltage cable sets and cooled separately via cooling circuits.



STANDARD E/E ARCHITECTURE

AREAS OF APPLICATION OF THE OBS

With our modular One Box Solution (OBS), system components such as the HV PDU, DC/DC converter, LV power supply, on-board charger, etc. are combined into a self-contained unit. In comparison to a solution with individual components, the One Box Solution can save costly high-current connectors and power cables, requires less installation space and usually also delivers a weight reduction. Furthermore, this holistic solution takes care of heat dissipation and thermal management and offers easy "plug and play" system integration, which not only reduces costs but also the risk of errors.
A stable and safe power supply for all consumers with a solution tailored to your application under the harsh conditions in the vehicle.

ADVANTAGES OF THE INTEGRATED SOLUTION IN A BOX:

- Shorter development time
- Reduced complexity
- Reduction of plug connections and cables
- Reduced validation scope
- Integrated safe control

OBS WITH COMPONENTS

DC-DC CONVERTER

KEY VALUES – MODULE 1 (STEP-DOWN-CONVERTER)
- Power up to 10 kW
- Voltage input 300 – 900 VDC (HV battery)
- Voltage output 12, 24, 48 VDC
- Galvanic isolation

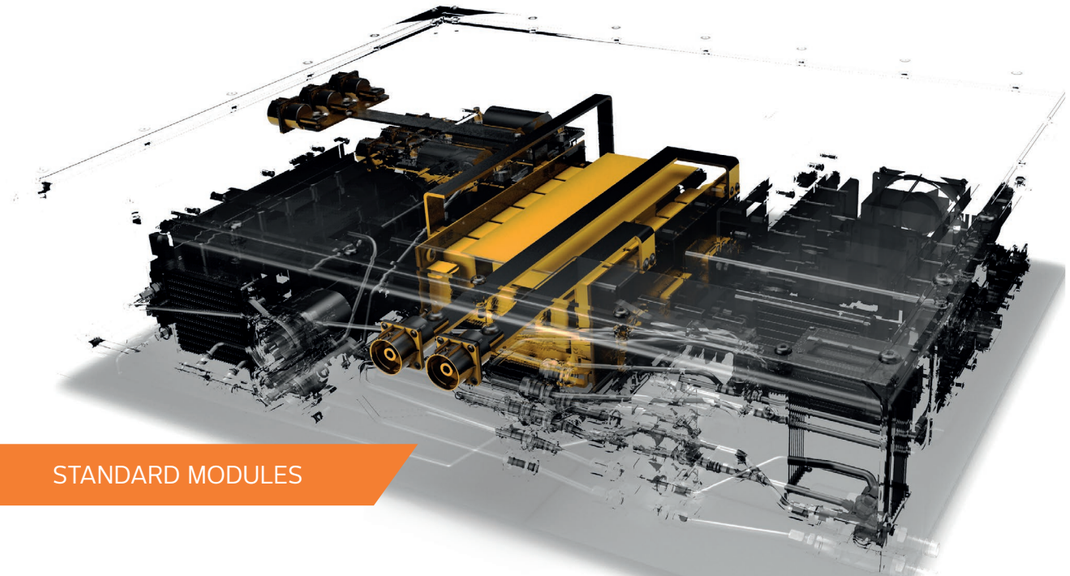
KEY VALUES – MODULE 2 (UP AND DOWN CONVERTER)
- Power up to 150 kW
- Voltage input 300 – 900 VDC (HV battery)
- Voltage output 300 – 900 VDC
- Bidirectional conversion (recuperation)

KEY VALUES – MODULE 3 (UP AND DOWN CONVERTER)
- Power up to 300 kW
- Voltage input 300 – 900 VDC (HV battery)
- Voltage output 300 – 900 VDC
- Bidirectional conversion (recuperation)

KEY VALUES – MODULE 4 (STEP-UP-CONVERTER)
- Power up to 40 kW
- Voltage input 80 – 250 VDC (fuel cell)
- Voltage output 300 – 900 VDC
- Galvanic isolation

PROPERTIES OF ALL MODULES
- SiC LCC converter
- Efficiency > 97%
- Short-circuit proof
- Active current and voltage measurement
- Active cooling

ADVANTAGES
- Easier to adapt to the machine thanks to standard modules
- Potential savings due to cascading (use of smaller DC-DC converters)
- Optimisation of time-to-market through standard solution



STANDARD MODULES

ON-BOARD CHARGER

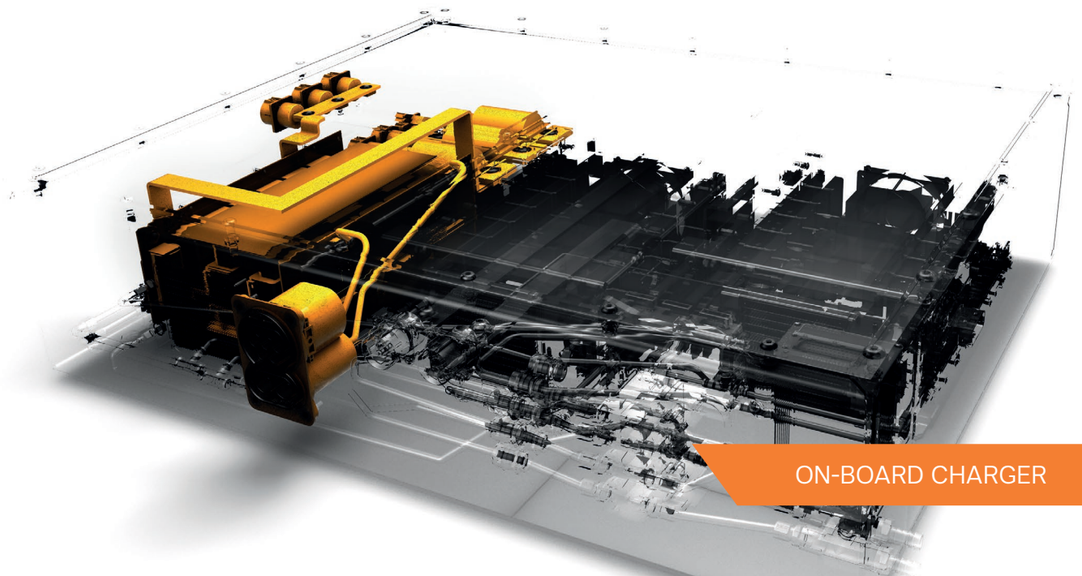
KEY VALUES – MODULE 5 (ON-BOARD CHARGER AC)
- Power up to 50 kW
- Voltage input 110 – 400 VAC 50/60 Hz (charging station)
- Voltage output 300 – 900 VDC (HV battery)
- Vehicle-to-Grid communication

KEY VALUES – MODULE 3 (ON-BOARD CHARGER DC / FAST CHARGING FUNCTION)
- Power up to 300 kW
- Voltage input 300 – 900 VDC (charging station)
- Voltage output 300 – 900 VDC (HV battery)
- Vehicle-to-Grid communication

KEY VALUES – MODULE 2 (ON-BOARD CHARGER DC / FAST CHARGING FUNCTION)
- Power up to 150 kW
- Voltage input 300 – 900 VDC (HV battery)
- Voltage output 300 – 900 VDC
- Vehicle-to-Grid communication

PROPERTIES OF ALL MODULES
- LLC/SiC LCC converter
- Efficiency > 97%
- Short-circuit proof
- Active current and voltage measurement
- Active cooling
- Optional protection and switching technology

ADVANTAGES
- Easier to adapt to the machine thanks to standard modules
- Potential savings due to multiple use (use of DC-DC converter as on-board charger DC)
- Optimisation of time-to-market through standard solution



ON-BOARD CHARGER

INTEGRATED CONTROL AND PROTECTION DEVICE

KEY VALUES – ECU
(INTEGRATED CONTROL)

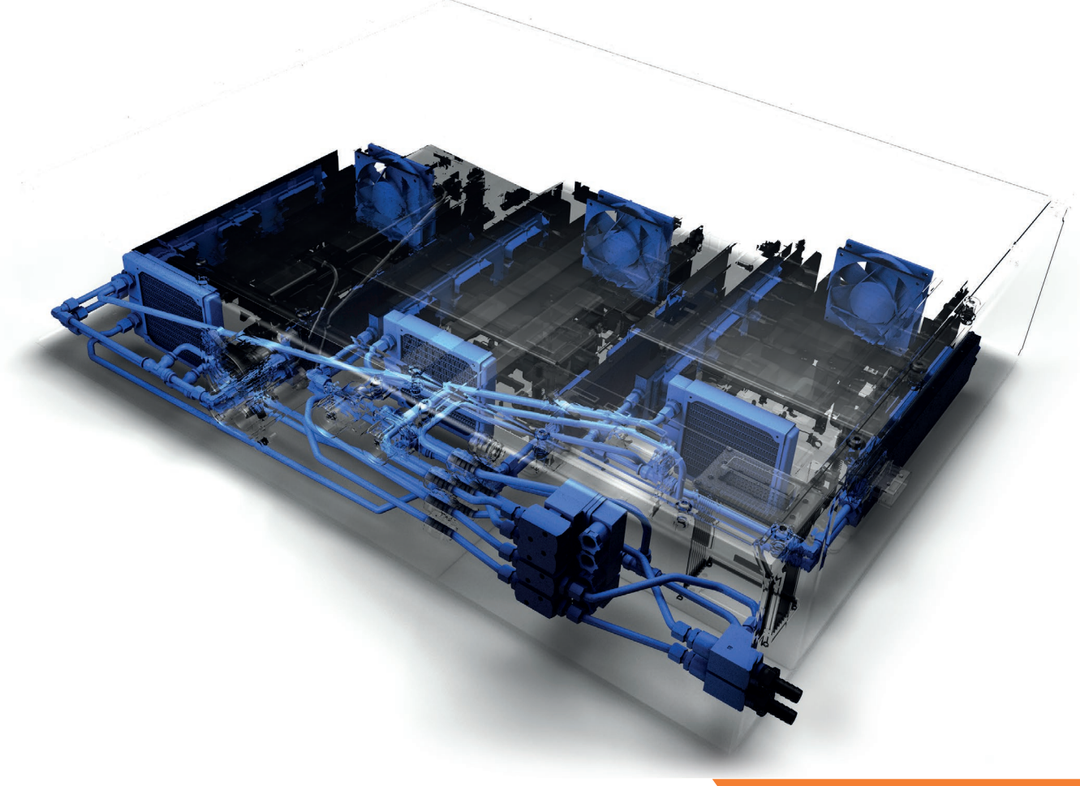
- OBS to Module (CAN-Bus)
- OBS to Grid (CAN-Bus, CP, PP)
- OBS to Vehicle (CAN-Bus, LIN-Bus, Ethernet)
- Thermal Management Control
- OBS diagnostics and safety monitoring
- High Voltage Interlock
- Functional safety
- Integration of existing insulation monitors (e.g. Bender)

ECU

THERMAL MANAGEMENT

KEY VALUES – THERMAL MANAGEMENT
(ACTIVE LIQUID COOLING)

- Self-regulating system via integrated ECU
- Compact and efficient cooling solution for the individual modules
- Integrated control of external cooling circuit
- Function- and service life-determining
- Cooling of the power semiconductors (max. 30 kW)
- Minimisation of power losses
- Intelligent waste heat utilisation



ACTIVE COOLING

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