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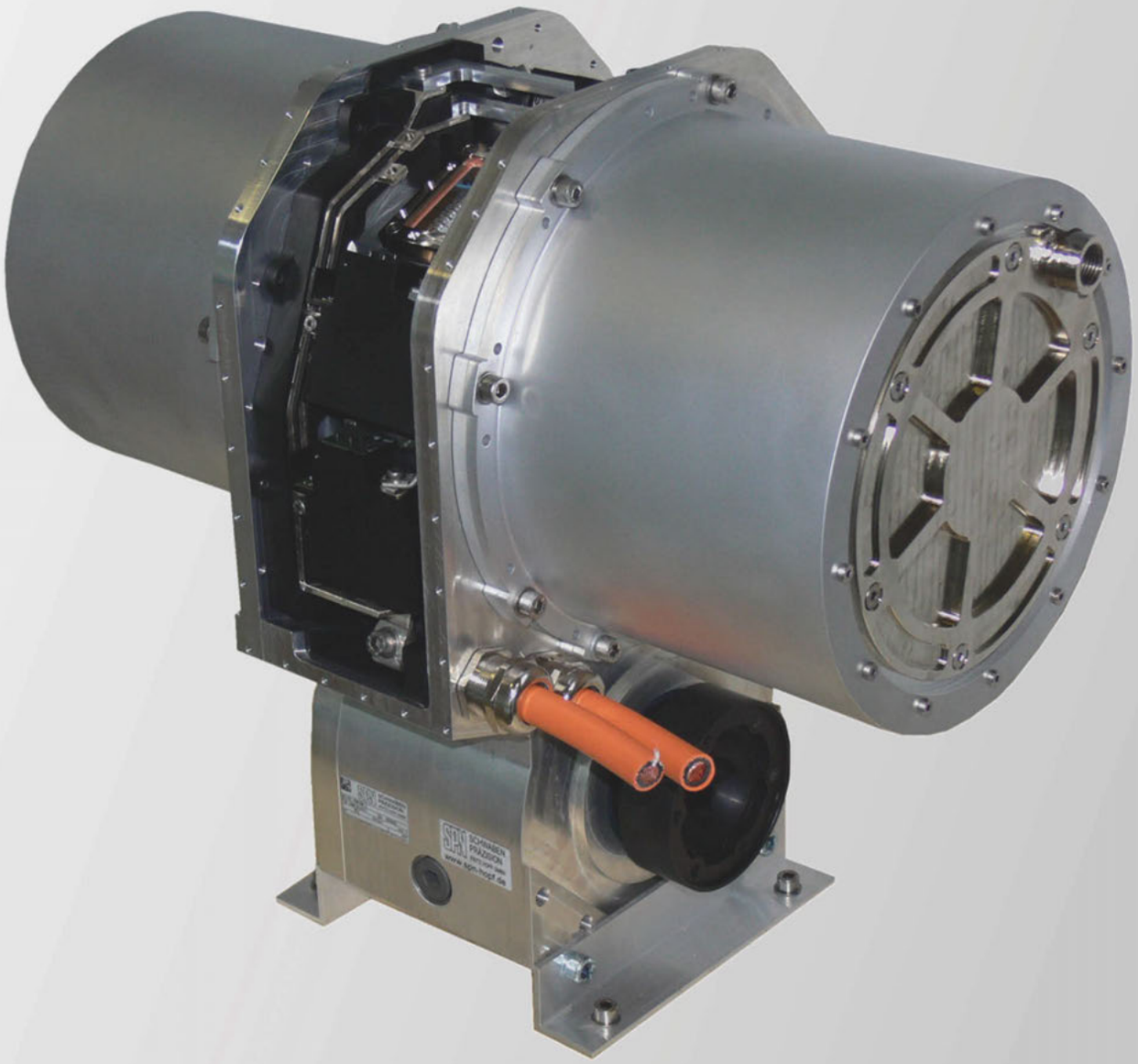
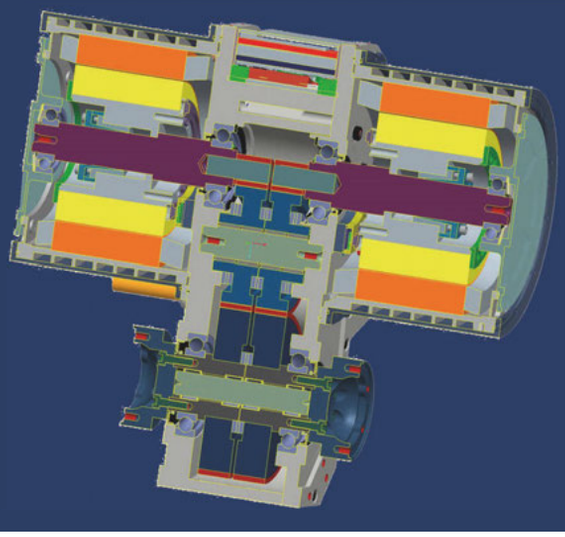
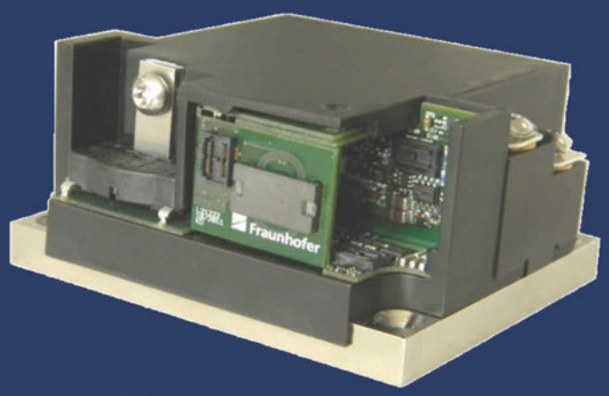
High Performance Traction-Drive (2x 80 kW) with Integrated Inverter







Inverter Building Block
(600 V IGBT power module with integrated DC link capacitor)

High Performance Traction-Drive

The highly efficient axle-drive unit includes two mechanically independent 80 kW permanent magnet synchronous motors (PMSM) and an integrated IGBT double-inverter.

The chosen "off-axis" concept leads to highest flexibility for the use in different vehicle platforms. The applicability of the drive in small commercial vans, busses or sports-cars is proven.

Technical Data

Nominal power	2x 30 kW
Maximum power (60 s)	2x 80 kW
Nominal torque (@wheel)	2x 800 Nm
Maximum torque (@wheel, 60 s)	2x 1.600 Nm
Nominal DC-link voltage	400 V
Max. motor speed	10.000 rpm
Gear ratio	7:1

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Integrated Double-Inverter

The double-inverter for an independent operation of both motors is directly integrated into the housing of the drive. This set-up provides significant advantages in comparison to systems with separate inverter:

- Internal connection of the motor windings (no bulky and costly AC-connectors)
- One cooling circuit for the electric machines, inverters, and the gear-system
- Improved EMC behavior (no AC cables within the vehicle)
- Highest overall power density

Six 'Inverter Building Blocks' are used to realize the double-inverter of the drive-unit with a nominal phase current of 350 A_{rms}. The innovative design of this power-modules eliminates many of the weak-points of today's solutions regarding interfaces, constraints for the overall system design, the assembly effort and reliability.

Two independent field-oriented control algorithms are implemented on a central control-board with TriCore™-processor. This allows an independent torque control for each motor.

Highly Efficient

High driving cycle efficiencies for typical BEV-scenarios were focus of the system development. Optimized components lead to maximum driving ranges of the eclectic vehicle even for part-load operation.

Driving cycle	System efficiency
Jam	86,4 %
Urban	90,0 %
Road	93,7 %
Highway	94,0 %

Contact Us!

The Fraunhofer IISB is your research and development partner for innovative electric drives.

We develop and realize complete drive-units for any output-power, voltage class and machine type (e.g. PMSM, IM, SSM) according to your specifications!