Fraunhofer IISB

Fraunhofer Institute for Integrated Systems and Device Technology IISB

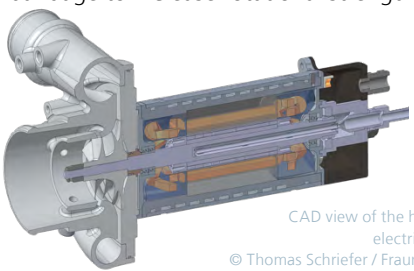
Fraunhofer IISB - Power Electronics

High-Speed Electric Machine for Compressor Application

High-Speed Electric Machine for Compressor Application

Highlights

- Application: air supply for fuel cell stack
- High power density: 30 kW/kg
- Direct fluid-cooled rotor (lance cooling)
- Rotor with surface magnets and CFRP bandage to increase rotational strength



CAD view of the high-speed electric machine
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Technical Data

- Peak power: **80 kW**
- Rated power: **48 kW**
- Peak speed: **150.000 rpm**
- Rated speed: **116.500 rpm**
- Nominal voltage: **800 V**
- Electrical frequency: **5 kHz**

- Cooling method: cooling jacket for stator, lance cooling for rotor
- Operation with 3-level inverter at 90 kHz switching frequency[1]

1) High Performance GaN Inverter for High-Speed Application; Jordan Sorge, Xinjun Liu, DOI: 10.30420/566091145

Let's connect!

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