Created for the Quantum Leap

AVL SPECTRA™ Universal Inverter

Versatile testing device for future-proof e-motor and inverter development

THE CHALLENGE

The global demand for electric propulsion systems is rapidly increasing. To meet this growing need, the development of electrified powertrains must be accelerated, which makes the need for highly flexible and versatile testing equipment more important than ever, especially in early stages of development, even when inverters are not available. Electric powertrain developers and manufacturers must ensure test coverage for different units under test while increasing development efficiency and facing cost pressures.

THE AVL SOLUTION

The AVL SPECTRA™ Universal Inverter is a testing device that utilizes state-of-the-art power electronics based on Silicon Carbide Metal-Oxide Semiconductor Field-Effect Transistor technology (SiC MosFET). This ensures a wide range of switching frequencies and the ability to emulate an extensive spectrum of common traction inverters. An integrated control unit using Field Programmable Gate Array (FPGA) technology, manages all control tasks and the emulation of any type of inverter. Depending on the existing infrastructure, the Universal Inverter is offered as a mobile or cabinet version.

THE ADDED VALUE

- Universal device for any motor – can control all common types of e-motors
- High performance: up to 1,260 Arms continuous current without derating over switching frequency
- Future-proof: voltage range of up to 1,000 Vdc
- Maximum flexibility: the unique mobile solution, enables realtesting conditions, due to small distance to unit-under-test
- Rapid prototyping: Open control software platform facilitates the generation of custom control algorithms via MATLAB®/Simulink®
- Easy integration: Various interfaces provide high- speed connection to common automation systems

AVL SPECTRA™ Universal Inverter Mobile

AVL SPECTRA™ Universal Inverter Mobile

AVL SPECTRA™ Universal Inverter Cabinet

Universal Inverter portfolio: mobile or cabinet versions for maximum flexibility and future-proof prototyping with the control board

Control Board

APPLICATIONS OF THE AVL SPECTRA™ UNIVERSAL INVERTER

The Universal Inverter can be used across a variety of application areas, from efficiency analysis, peak and continuous performance tests, to endurance tests, and controller adjustments. As a final step, driving cycles can be used to verify the tests performed. These are just a few examples from a wide range of applications.

TECHNICAL DETAILS

UNIVERSAL INVERTER TYPES	220	440	750	880
Electric machine types	IM/PMSM/EESM	IM/PMSM/EESM	IM/PMSM/EESM	IM/PMSM/EESM
Power (nominal)	220 kVA	440 kVA	750 kVA	880 kVA
Current (nominal)	315 Arms	630 Arms*	1000 Arms*	1260 Arms*
Rotor current	315 Adc	315 Adc	315 Adc	315 Adc
Technology	Full SiC converter			
Switching frequency	2 – 96 kHz (2 and 3 level operation)			
Control frequency	1 MHz cycle time			
Output frequency	max. 4 kHz			
DC voltage range	40 – 1,000 Vdc**			
Dimensions LxWxH	Mobile: 1,250 x 700 x 1,300 mm Cabinet: 800 x 500 x 2,200 mm			
Cooling Method	Water + Glycol			

IM = Induction machine
PMSM = Permanent-magnet synchronous machine
EESM = Externally-excited synchronous machine

* for EESM reduced current
**1,200 Vdc at reduced current

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FIND OUT MORE

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