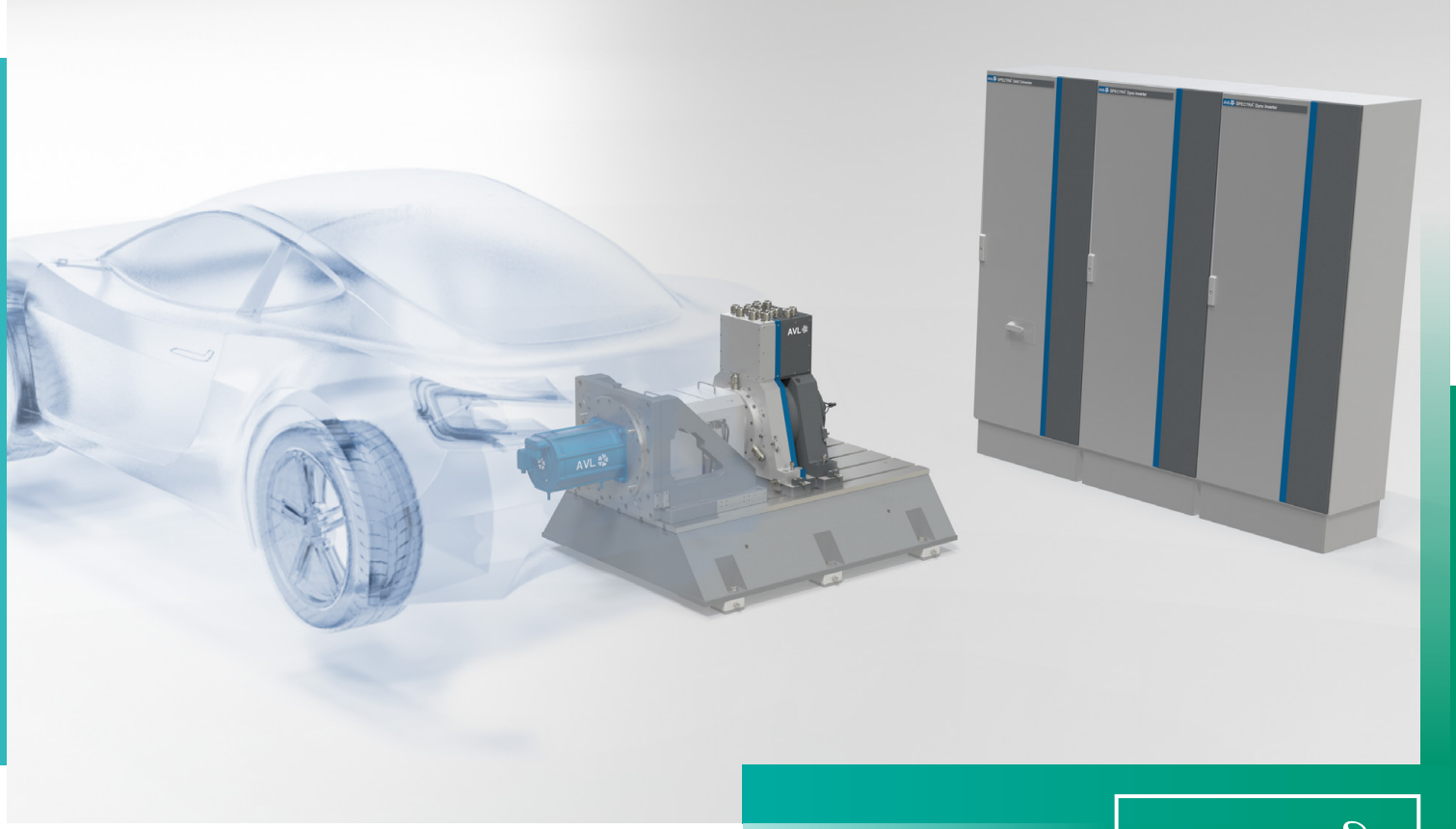


AVL SPECTRA™ E-Motor Dyno

Highest performance load system for the testing of today's and tomorrow's e-drives

THE CHALLENGE

The worldwide trend towards electrified vehicles is accelerating rapidly as global emissions legislation becomes more stringent. E-drive developers and manufacturers are seeing strong demand for high-performance and high-speed testing capability in order to cover all testing scenarios for modern traction e-motors. Increasing cost pressure is another trend resulting in today's test systems having to be scalable enough to handle tomorrow`s requirements.

THE AVL SOLUTION

The load unit converters in the AVL SPECTRA™ family utilize state-of-the-art power electronics based on SiC MosFET technology. This ensures the highest possible switching frequencies and therefore minimized current and torque ripple phenomena.

The use of this technology also allows the design to be optimized in terms of size and efficiency, which helps to minimize the system's physical and carbon footprint.

An integrated control unit using Field Programmable Gate Array (FPGA) technology carries out all control tasks with a cycle frequency of up to 1 MHz. Simulation functionality usually executed by higher-level automation systems can be implemented on the control unit and executed within short cycle times.

AVL's high-speed, synchronous, permanent magnet dynamometers are equipped with highly precise, oil-mist lubricated bearings to ensure optimized vibration behavior and lifetime. A highly efficient combination of oil- and water-cooling enables the highest levels of performance.

As an integral part of an AVL E-Motor Testbed, the AVL SPECTRA E-Motor Dyno in conjunction with high-speed testbed mechanics, forms a capable load unit solution for all kinds of applications. It covers testing requirements up to high rotational speeds as well as high torque and power. This not only gives you maximum flexibility and utilization rates, but also makes your testing capabilities future-proof.

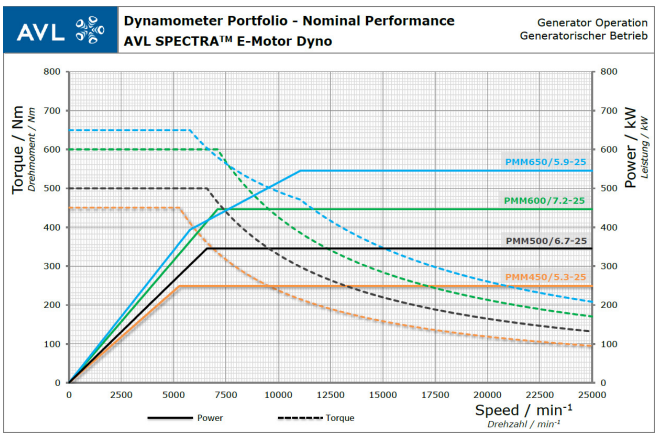
AVL SPECTRA™ E-Motor Dynamometer

AVL SPECTRA™ Dyno Converter

AVL SPECTRA™ Power Electronics

THE ADDED VALUE

As the global leader for automotive testing systems with our finger on the pulse of market developments, we designed the AVL SPECTRA family to be flexible enough to handle currently unforeseen requirements. The minimized footprint – both physical and carbon – helps you to save space and emissions. A modular and design-to-service approach was used in order to ensure maximum flexibility and availability.



State-of-the-art power and control electronics technology is utilized in order to reach highest levels of control dynamics, minimum downtime, and outstanding test quality:

- Extreme reduction in converter cabinet footprint by approx. 60% permits the upgrade of existing engine test cells
- High switching frequency up to 48 kHz reduces current and torque ripple to a minimum and prevents extensive heating of permanent magnets
- Minimized switching losses result in increased efficiency, reduced carbon footprint and decreased total cost of ownership
- Highly precise bearing technology ensures operability up to high rotating speeds with low levels of vibration
- Hybrid cooling technology enables maximum performance, matching today's and tomorrow's e-drive testing needs

AVL SPECTRA™ E-MOTOR DYNO	NOM. POWER (ABSORBING)	NOM. TORQUE (ABSORBING)	MAX. SPEED CONTINUOUS	OVERLAOD (SHORT-TIME)	ROTOR INERTIA
Type	kW	Nm	rpm	%	kgm²
PMM 450/5.3-25	250	450	25,000	50	0,110
PMM 500/6.7-25	350	500	25,000	25	0,110
PMM 600/7.2-25	450	600	25,000	20	0,130
PMM 650/5.9-25	550	650	25,000	20	0,130

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