

E-motor and e-drive high-speed testbed

PERFORMANCE TESTING WITH OPTIONAL CLIMATIC CONDITIONS

EXPLORE OUR E-MOTOR AND E-DRIVE TESTBED

for performance testing under real load conditions. The unit under test can be tested according to regional, national and international standards. You are welcome to submit your self-defined test cases or we jointly define the most appropriate Design Verification Plan (DVP) with you.

One of the most important standard tests is the verification of the efficiency maps to validate the e-motor design. Thermal and mechanical properties of the test object are evaluated in a customer-specific test cycle.

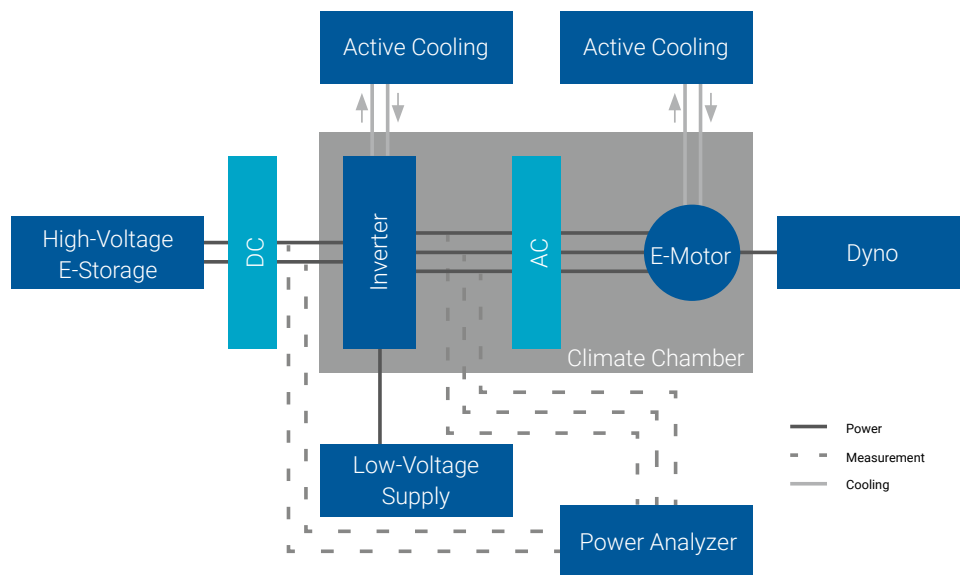
Any other performance and functional tests of your unit under test can be easily done thanks to direct mechanical connection to dynamometer and advanced real-time control and measurement capabilities.

ADVANTAGES

- High-performance flexible automation system AVL PUMA 2™ E-Motor
- Reduction of test field complexity with AVL multisynch technology
- E-drive/inverter calibration and e-motor parameter identification
- High-precision power analysis (AVL X-ion™) and efficiency calculation
- Recuperation of energy to the mains power supply
- Advanced test optimization and e-drive calibration with AVL CAMEO 5™
- In-house design experts available for a comprehensive correlation between test results and simulation

MAIN FEATURES

- Active dynamometer AVL DynoULTRA™ PMM: up to 20,000 rpm (and higher with transmission)
- Nominal: 545 Nm, 400 kW | Peak: 800 Nm, 500 kW
- Real-time power measurement: 2 MS/s, multi-phase motors, 1,500 V peak, 1,000 A peak
- Unit under test conditioning: 2 water/glycol channels and 2 oil channels, separately controlled
- Climatic chamber: - 40 °C to + 95 °C, 10 % to 95 % relative humidity
- Battery emulation: 1,200 V_{DC}, 800 A_{DC}



The high-speed 400 kW dynamometer enables testing of e-motors and e-drives under various climatic conditions. You can choose between an AVL universal inverter or may apply your own inverter to drive the e-motor.

Prior to the test, calibration of the inverter is supported by AVL e-drive system experts to determine typical machine parameters (Ld, Lq, efficiency) and the power of the e-motor. The testbed allows real-time measurement of torque, speed, current and voltage, including additional parameters such as torque ripple and harmonics.

Dedicated AVL test engineers continuously analyze test results and mitigate potential issues with the AVL e-motor development team. This minimizes project delays and reduces testing costs.

Thanks to AVL's engineering expertise in e-motors and e-drives, customers can be offered interpretations of test results and recommendations for design improvements in addition to pure testing activities.

TECHNICAL DATA

Features	Values
Unit Under Test (UUT)	E-motor or e-drive units
UUT conditioning	2 coolant water channels
	2 oil channels
	- 40 °C to + 140 °C for every channel
Real-time power measurement	Sampling rate 2 MS/s
	DC power: 1,500 V peak, 1,000 A peak
	AC power: multi-phase motors, 1,500 V peak, 1,000 A peak Up to 8 NVH channels
	Mechanical specs: 1 kNm, 20,000 rpm
Climatic test chamber	- 40 °C to + 95 °C, 10 % to 95 % relative humidity
Battery emulator	Maximal output: ± 800 A, 1,200 V
Dyno	Nominal: 545 Nm, 400 kW
	Peak: 800 Nm 10s in 600s; 681 Nm (10s in 100s)
	Rotational speed: ≤ 20,000 rpm
	25 % overload for 30 s
Testbed automation	AVL PUMA 2™ E-Motor AVL CAMEO 5™

