

E-Motor Test Bench

CAPABILITY SHEET - 4-QUADRANT - 350 kW CLASS - ENGINEERED TO ORDER

THE BENCH

WHAT	A four-quadrant back-to-back powertrain bench for traction motors, e-axes, gearboxes and the inverters that drive them - to the 350 kW class and the twenty-thousand-rpm order EV machines actually turn.
THE CORE IDEA	Two machines, one shaft, one bus: the DUT drives, the load machine absorbs and feeds the power straight back. The grid supplies only the losses - a 350 kW test draws tens of kW.
STATUS	Engineered to order. Reference configuration, not yet built - engineered against India's current EV-laboratory build-out, including a live national-lab requirement pairing a 350 kW bench with gearbox and climatic chamber; no order followed.

ENVELOPE

TORQUE METROLOGY	Flange-based: repeatability +/-0.03 % class (DIN 1319), temperature-compensated, IP54, encoder speed and angle. Mechanical power measured, not inferred from current.
EFFICIENCY MAPPING	Automated sweeps over the speed-torque grid; motor, inverter and driveline losses separated via simultaneous mechanical and electrical measurement; maps re-run at temperature with chamber coupling.
EMULATION	Battery emulator 0-1,000 V class with programmable sag and full regen acceptance - the pack the inverter believes in. Motor emulator variant proves controllers without rotating hardware.

LAB TO LINE

GEARBOX / E-AXLE	Input-output configurations characterise transmission efficiency and complete e-axes under drive cycles, with losses attributed per stage.
EOL TESTERS	No-load and load, back-EMF and Hall verification, stator surge (>10 uH), hipot/IR, Ke and phase resistance - seconds per motor, catching the marginal machine, not just the dead one.
DAQ	EtherCAT / CAN-class networks at 10 kHz class sampling; automated sequences, limit supervision, reporting, resume-after-interruption.

SAFETY, STANDARDS & ENGAGEMENT

SAFETY	Guarded couplings, interlocked enclosures, overspeed and vibration trips, torque-limit supervision, defined E-stop philosophy - a cell around a shaft at EV speeds.
STANDARDS	IEC 60034-1 duty and temperature rise; IEC 60034-2-1 efficiency methods; DIN 1319 metrology class for the flange; ISO/IEC 17025-traceable calibration in scope.
ENGAGEMENT	Send the machines, the duty cycle and the standards to sales@neometrixgroup.com - compliance matrix within two working days.

PROJECTS DESK

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