

EV motor testing

The latest EVs present challenges at all levels of the development process, including dyno testing of new powertrains requiring state-of-the-art solutions

▶▶ For manufacturers who are developing electric cars, it's no longer simply a case of putting the powertrain on a testing rig – there are increasingly complex systems related to the current generation of EV powertrains that need to be accounted for when developing dynos that the manufacturers can use for testing.

D&V's latest electric powertrain tester (EPT) for the e-motor industry incorporates flexibility and expandability with a uniquely powered 250kW e-motor dyno. This purpose-built EPT rig is a motor development tester that has been designed specifically for the purpose of evaluating experimental traction motors used in electric vehicle and hybrid electric vehicle applications. The EPT platform includes highly configurable, state-of-the-art data measurement technology and dynamometer equipment designed for e-motor performance testing.

This EPT came about as a result of discussions with the client – they highlighted early on during those talks that, for them, system flexibility would be a critical aspect of the powertrain testing equipment. D&V's modular testing equipment was able to provide this flexibility. The modularized approach now enables the client to run one or both regenerative battery simulator modules for charge/discharge cycling, or as part of the e-motor dyno as a recuperative power supply. In recuperative mode, there will be substantial power savings, due to the use of D&V's coupled power system that captures and recirculates energy between the DUT motor and the dyno load motors' respective power circuits. These D&V battery simulator modules are each nominally rated at 150kW (450A maximum current,

while maintaining their 150kW rating), with voltage output ranging between 48V DC and 1,000V DC.

One key technology item in the electric powertrain tester setup is D&V's power measurement module, which feeds high-speed data into the company's user interface and measuring application software. This software allows for operation in both manual and automatic control modes and displays the real-time data at capture rates that are as high as 200kHz per channel. D&V's power measurement system, with its set of datalogging software and system control software, also has the ability to interface with third-party test cell control software packages.

D&V has developed a dual-load motor system that, in this configuration, is capable of 550Nm continuous torque from near 0rpm to 4,300rpm. Beyond 4,300rpm, the system is rated to 250kW continuously at speeds up to 18,000rpm. Peak torque is 750Nm from near 0rpm to 3,750rpm. This peak torque is available for up to two minutes. Again, due to modularity, the dyno driveline has the unique ability to be re-configured to deliver higher output torque at lower top speeds.

The tester includes a high-speed precision driveline that has the capability of performing an electrically locked rotor test, and mechanical lock rotor testing is also

available as an option. The locked rotor duration is limited only by the load motor drive capacity. D&V's development of modular, customer-specific test systems with state-of-the-art data measurement and analysis provides the best tools to clients worldwide who have particular production, endurance and performance testing needs. ©

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D&V's testing platform incorporates portable power supplies modules