CAN Newsletter Online

E-MOBILITY

Securing batteries for storage and transport

Micronova's Novacarts Charger supports automobile manufacturers and suppliers in monitoring, charging, and discharging vehicle traction batteries. Thus, batteries can be made secure for transport and quality losses can be prevented during storage.

The charger enables controlled charging and discharging of traction batteries for hybrid and electric vehicles (Source: Micronova)

With the increasing number of electric vehicles, the requirements for battery transport and storage are also growing both for manufacturers and suppliers. Hence, precautions must be taken to maintain the quality of the batteries for as long as possible and to transport them safely to their destinations. For example, for optimum service life, batteries should be regularly recharged to defined state-of-charge (SOC) levels if they are stored for an extended period. Otherwise, they must not be offered to the end consumer as new. Particular charging conditions must also be guaranteed for the transport of batteries depending on type and transport route.

Novacarts Charger (NC Charger) supports the charging/discharging system for both tasks: depending on requirements, the batteries can be recharged to the defined SOC levels or discharged for transport.

How they work

To make this possible, the product simulates the environment of the particular traction battery: the test system supplies the battery control unit both with voltage and with the necessary CAN messages. This is done by means of residual bus simulation, which must match the very traction battery.

All simulations and the CAN communication run under the charger's operating software on a Linux real-time computer. A component with a mains connection featuring a protective insulated input circuit is available to connect transportable units. It protects employees during operation as well as the system components from excessive contact voltage and overvoltage.

The charging/discharging system is a unit in rack format that can be used flexibly due to its wheels, explained the company. The test bench is operated on three-phase industrial mains supply and uses that energy to charge the batteries as well. Discharged power is fed back into the grid during the discharging process.

The product is controlled via a computer built directly into the rack on which the Real-Time Suite is installed. It includes operation during testing as well as the database for controlling the test bench. Alternatively, the system can be operated via a touch screen attached to the NC Charger on a swiveling bracket. The charging/discharging device was designed in such a way that it can be used by technical staff without requiring any special training.

Transport risks

In addition to the aspect of quality assurance, lithium batteries frequently used for energy storage in mobile devices and vehicles also present a transport risk: they are quite susceptible to deep discharge and overcharging, mechanical damage, and external temperature effects. For these reasons, lithium-based energy storage systems are classified as dangerous goods according to international transport law and are therefore subject to special transport regulations.

In order to comply with these specifications and minimize transport risks, vehicle batteries can be discharged to a required state-of-charge level using the NC Charger prior to transport, e.g. max. 30 percent for air freight; the charge status of the battery is documented in a protocol in PDF format, which is also automatically sent to a connected printer. It contains all data and information necessary for air freight transport.

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