

Advanced solutions for EV manufacturers

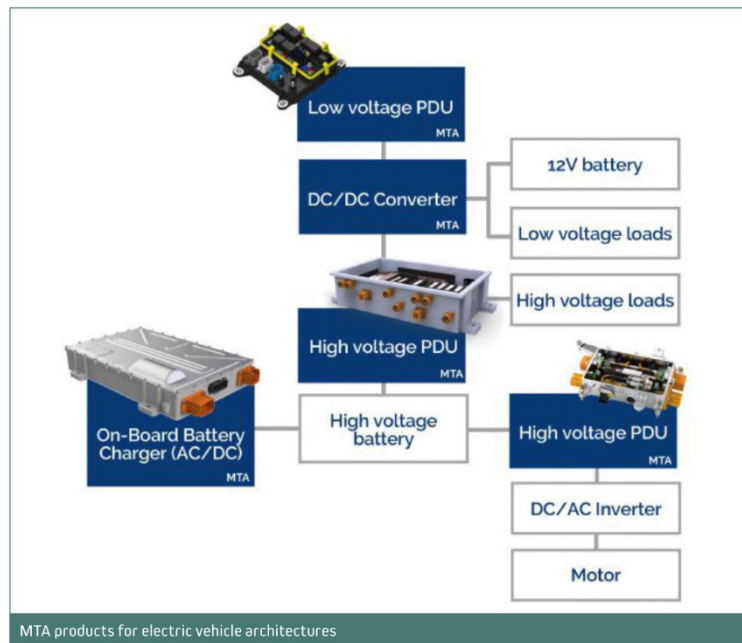
High voltage power distribution units and onboard battery chargers designed specifically for challenging electric vehicle environments

▶▶ The voltage of on-board systems has risen from the initial 24V to 48V in hybrid cars and from 400V to 800V in electric ones, but there is already talk of 1,200V schemes. Similar trends are also being seen in the truck and off-highway world, where there are now several electrified vehicle models on the market. The electrification of vehicles has required, and still requires, a major shift in R&D, purchasing and manufacturing. Since the powers and the voltages involved are now much higher than in the past, different materials, design systems and production technologies are needed. This involves a lot of testing, design validation and product validation.

MTA, which has been developing electrical components for OEMs for the past 70 years, has already taken up the challenge. The company is already producing power distribution units (PDUs) for major OEMs using a completely different technology to low-voltage products.

The high voltage (HV) PDUs developed by MTA have cast aluminum housings, which have replaced the plastic material that is typical of low voltage products. The aluminum that MTA uses has a high percentage of recycled raw material; it ensures robustness, insulation from external agents, optimal heat dissipation and correct EMC (electromagnetic compatibility) shielding. The company also plans to use aluminum for the busbars - the conduits for power distribution - since aluminum is lighter than copper, which is traditionally used.

The latest developments for heavy duty applications include modular PDUs with integrated



active cooling systems. The modularity and versatility of the PDUs allow the same product to be adapted to different platforms. An internal resin layer and a new technology for gaskets ensure waterproof features and electrical insulation without compromising optimal heating dissipation. The current trend, mainly for heavy duty applications, is PDUs with integrated electronics that can manage communication protocols and diagnose the status of the main internal components. The system can integrate a measurement port for service technicians to check high voltage that integrates safety circuits and additional internal covers to

guarantee safety in any condition during service operations.

MTA's electronic business unit has also developed a range of on-board battery chargers (OBCs), which are increasingly popular among OEMs. The OBCs produced by MTA cover voltages up to 1,000V. They are easy to integrate into vehicles and are built to resist harsh environments. They cover a wide range of commercial and industrial plug-in hybrid electric vehicles or pure electric vehicles, and they are suitable from small to large buses, trucks and vans, boats, underground vehicles and more.

The company's BHP range of OBCs with a power class of 19.2kW

for the US market and 22kW for the European market, offer both single and three-phase AC power. The product's conversion technology improves power density and specific power, and bidirectional charging allows energy to flow in two directions: to and from the battery. Bidirectionality also enables MTA's customers to take full advantage of the latest vehicle to grid (V2G), vehicle to load (V2V) and vehicle to home (V2H) applications.

The BHP range has IP67 and IP6K9K protection rating and a galvanic isolation ensuring a definitive safety separation between the vehicle and the grid. mta.it