



New Karsan Midibus Features TM4® Electric Motor and Inverter from Dana Incorporated

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HANOVER, Germany, Sept. 19, 2018 /PRNewswire/ -- Today at the 67th IAA Commercial Vehicles, Dana Incorporated (NYSE: DAN) and vehicle manufacturer Karsan announced the availability of the Karsan ATAK electrified midibus featuring Dana's TM4® SUMO™ MD electric motor and inverter.



Karsan, a manufacturer of light commercial vehicles, shuttle buses, and city buses, is focused on providing contemporary product and service solutions for mass transportation. The company has been developing sustainable electric-driven vehicles since 2015 and introduced its first prototype electric minibus, the Karsan JEST, in 2016.

"Globalization, increased environmental concerns, and the need to reduce operating costs continue to drive our innovative thinking," said Christophe Dominiak, chief technology officer for Dana. "As Dana expands its capabilities and the scope of product offerings for electric vehicles, we are pleased to be working with industry leaders like Karsan, which has extensive vehicle development and manufacturing expertise."

The electrified bus is based on the Karsan ATAK eight-meter low-entry bus platform and is equipped with a TM4 SUMO MD electric motor and inverter. The TM4 SUMO MD is composed of a high-torque, permanent magnet variable reluctance (PMVR) direct drive motor and automotive-grade power electronics. The new motors with the PMVR technology for external rotors can deliver 45 percent more torque and operating speed than previous motors in the same compact package while reducing cost.

PMVR works by adding specially-designed soft magnetic composites (SMCs) next to the magnets. SMCs are produced through a new forming process and fabrication method by TM4. The SMCs also allows the use of simpler and smaller magnets that are easier to manufacture and that uses less rare-earth in the fabrication process to account for 25 percent savings in magnetic material.

This new bus platform is able to operate with a range of up to 300 kilometers on a single charge. Dana is also a key contributor in the development of the vehicle control software, through the supply of hardware and services related to its TM4® NEURO™ 200 vehicle control unit platform and SynApps development tool.

Dana will exhibit the TM4 SUMO MD, along with other Spicer® Electrified™ with TM4 solutions for the commercial-vehicle market, in Hall 17, Stand A24 at IAA. Visit the stand for a private demonstration of Dana's e-Propulsion technologies.

About Karsan

Founded in 1966, Karsan Otomotiv Sanayii ve Ticaret A.Ş. operated under the Koç Group between 1979 and 1998, and following Inan Kırac's purchase of the majority shares in 1998, the Company started to carry out its operations within the body of Kıraca Holding. Since 1981, Karsan has been a commercial vehicle manufacturer with 100 percent local capital. In line with its "Limitless Transportation Solution" vision set in 2009, Karsan has aimed to develop and manufacture a wide variety of products ranging from passenger cars to buses, and minivans to heavy trucks. Today, in its state-of-the-art, flexible facilities, the company produces Hyundai Motor Company's H350 model panel vans, minibuses, and chassis for pick-up trucks and Menarinibus branded buses under license, as well as Karsan JEST, Karsan ATAK, and Karsan STAR vehicles manufactured under its own brand. Marketing, sales, and aftersales services of such products are performed via Karsan Marketing.

About Dana Incorporated

Dana is a world leader in highly engineered solutions for improving the efficiency, performance, and sustainability of powered vehicles and machinery. Dana supports the passenger vehicle, commercial truck, and off-highway markets, as well as industrial and stationary equipment applications. Founded in 1904, Dana employs approximately 30,000 people in 33 countries on six continents who are committed to delivering long-term value to customers. The company reported sales of more than \$7.2 billion in 2017. Based in Maumee, Ohio, USA, the company is ranked among the Drucker Institute's listing of the 250 most effectively managed companies. For more information, please visit www.dana.com.

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