

Press release

Düsseldorf, October 05, 2023

Kiepe Electric at Busworld Europe 2023: Solutions that lead public transportation directly into the e-mobility lane

- **“Sustainable solutions for generations” – Kiepe Electric supports its customers in their transformation toward e-mobility**
- **World premiere for mobile High-Power Charging (mHPC) with the K-Charger, which charges electric buses with up to 800 kW in mere minutes**
- **E-mobility solutions such as In Motion Charging (IMC®) technology, Smart Fleet Management (SFM) and the Kiepe Traction Inverter (KTI)**

Düsseldorf, October 05, 2023 - Kiepe Electric supports vehicle manufacturers and transit authorities with sophisticated solutions that help to implement and accelerate decarbonization strategies. In addition to emission-free, electric drive solutions for buses and commercial vehicles, innovative charging concepts for electric bus fleets are also available for the first time. Kiepe Electric welcomes discussions with customers and the industry about “sustainable solutions for generations” at Busworld Europe 2023 in Brussels (October 7-12, 2023). Kiepe Electric's booth No. 1169 is located in hall 11.

Kiepe Electric uses its experience and enormous know-how in traction and charging systems for streetcars, LRVs and electric buses with In Motion Charging (IMC) and is very well positioned to service and support the market of battery electric buses. The managing director of Kiepe Electric, Alexander Ketterl, explains: “As a partner in the design of electric buses, we can offer the successful IMC system platform as well as our new High-Power Charging platform. Visitors to Busworld should not miss our world premiere, the K-Charger, with which we have entered the market for high-end charging stations.” There is also an additional highlight waiting at Busworld, says Ketterl: “A unique electric bus will celebrate its world premiere, Kiepe Electric is a consortium partner, supplying the entire electric system. We make full use of our system integration expertise, from traction and battery systems to software solutions and smart fleet management.” An additional product focus of Kiepe Electric as a contribution to climate-friendly public transit is the ISO26262-ready Kiepe Traction Inverter (KTI).

Mobile High-Power Charging (mHPC) - the K-Charger opens up a completely new charging strategy for transit authorities by quickly charging battery electric buses. Charging takes place with up to 800 kW of power in mere minutes. The K-Charger can make use of an existing power supply such as the catenary of regional and long-distance rail or the urban LRV or subway networks. Either complementing or as an alternative to overnight charging, mHPC from Kiepe Electric uses existing electric power infrastructure for charging. On the one hand, this significantly reduces investments in new infrastructure, and on the other hand, electric bus operation becomes more flexible, more stable and 24/7 operation becomes possible. The mHPC charging concept, housed in a portable, turnkey container, and is ideal for electric buses that serve sub-urban areas: Buses can be supplied with energy at train stations or near train tracks via the K-Charger. The first K-Charger works at a depot in St. Gallen, Switzerland. In addition, Kiepe Electric also offers the entire charging solution as a mobile unit that uses batteries to provide charging energy.

In Motion Charging (IMC®) technology as a system platform for electric trolley buses enables reliable, emission-free 24/7 operation. IMC buses charge their batteries via an overhead line while in motion and can travel 20 kilometers or more off wire. Kiepe Electric

supports and advises the operator using extensive route simulations and thus ensures an optimized system of vehicle and infrastructure. The result can be a significantly simplified infrastructure and overhead line sections reduced by up to 80%. This means that suburbs can be reached without overhead lines and existing routes can be easily expanded.

In order to make switching between routes with and without overhead lines as easy, safe and quick as possible, Kiepe has developed the new **Intelligent Current Collector (ICC)**. This new generation of current collector system can rewire both vertically and laterally, which allows the current collector poles to be rewired at any point in the overhead line network. This saves time-consuming manual rewiring. The ICC is a compact design with optimized geometry. This creates space for additional components such as traction batteries, cooling units or heat pumps on the vehicle's roof. Thanks to the simple interfaces and the plug-and-play approach, the new ICC is easy to integrate, both in new and existing vehicles. Vehicle manufacturers and transit agencies can count on Kiepe Electric's system expertise throughout the entire life cycle of the electric buses: services and modernizations such as technology updates ensure efficient and reliable performance over the entire vehicle life. This is shown, for example, by the first major replacement programs for batteries after eight years of operation. Here, Kiepe Electric underlines its high level of expertise and – in addition to simply replacing batteries – offers the customer real added value by using batteries with significantly higher capacities.

Smart Fleet Management (SFM) is an AI-supported energy management software for electric bus fleets. The SFM automatically learns the route information for bus routes and therefore knows or covers the necessary electricity charging requirements at the recharging stations or on the overhead line. This effectively reduces "range anxiety". At the same time, SFM prioritizes charging processes in order to make the best possible use of the network capacity. The primary goal of predictive charging management is to keep the battery in the optimal state of charge (SOC), which has a positive effect on battery life. At the same time, the SFM transmits all recorded information to a cloud based application. All buses can benefit from this charging information, even on routes that they have never operated on previously. In addition, providing the information in a customized dashboard enables transit agencies to generate automated energy balances.

The **Kiepe Traction Inverter (KTI)** is an innovative converter for battery buses and electric commercial vehicles and, in the function of the traction inverter, a central drive component. Included are the power electronics and the most modern drive control. The Kiepe Traction Control provides powerful torque dynamics, low energy consumption and strong hill climbing ability. With cyber security and ISO 26262 readiness, the KTI meets the standard for safety-relevant electrical systems in motor vehicles. With its compact design it can be installed anywhere on the vehicle. The KTI in DOUBLE version can use the two motor outputs to control a motor in a double star configuration. The intelligent control can drive both asynchronous and PSM motors (synchronous). As a contribution to preventive maintenance, the KTI and the entire new generation of Kiepe Electric traction devices for electric vehicles can be integrated into Kiepe Fleet Management (KFM).

Captions:

(Image K-Charger) With Kiepe Electric's mobile HPC technology, electric buses can be quickly charged with up to 800 kW. The K-Charger can be positioned quickly and flexibly according to the local conditions. | © Kiepe Electric

(Image trolley bus) San Francisco to prototype a major battery upgrade for enhanced in motion charging capability on electric trolley buses | © Klaus P. Canavan

Knorr-Bremse (ISIN: DE000KBX1006, ticker symbol: KBX) is the global market leader for braking systems and a leading provider of other systems for rail and commercial vehicles. Knorr-Bremse's products make a decisive contribution to greater safety and energy efficiency on rail tracks and roads around the world. Some 32,600 employees at over 100 sites in more than 30 countries use their competence and motivation to satisfy customers worldwide with products and services. In 2022, Knorr-Bremse's two divisions together generated global revenues of EUR 7.1 billion. For more than 115 years, the company has been the industry innovator, driving developments in mobility and transportation technologies with an edge in connected system solutions. Knorr-Bremse is one of Germany's most successful industrial companies and profits from the key global megatrends: Urbanization, Sustainability, Digitalization and Mobility.

Knorr-Bremse subsidiary **Kiepe Electric**, based in Düsseldorf, Germany, is a globally active supplier of electrical systems to the world's leading rail vehicle and bus manufacturers. The company offers efficient solutions and ecologically sustainable concepts for low-emission public transportation, including eco-friendly electrical equipment for light rail vehicles, metros, regional rail networks and electric buses fitted with In Motion Charging (IMC) and High-Power Charging (HPC) systems.

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