

## Press Release

Munich/Düsseldorf, February 17, 2017

# Esslingen's battery trolleybuses with IMC<sup>®</sup> from Vossloh Kiepe introduced to wide trade audience

**At a specialist event, Esslingen Municipal Transportation Authority (SVE) presented its new battery trolleybuses with In-Motion-Charging (IMC) from Vossloh Kiepe to an international trade audience and representatives of the media. The four electric hybrid buses ordered by SVE from consortium partners Vossloh Kiepe and Solaris Bus & Coach S.A. have been on regular line service since late 2016.**

A combination of expert presentations and a test ride left visitors to the event with a comprehensive impression of Esslingen's electric buses. These innovative IMC articulated buses are equipped with lithium titanate (LTO) traction batteries which, with 37 kWh of usable energy and an output of 240 kW, enable normal operation on sections of the route with no overhead contact lines.

Even in unfavorable conditions, the buses have an operating range of ten kilometers in battery mode. This was one of the main reasons why Esslingen opted for this technology: "On our 113 route the electric hybrid buses cover two-thirds of the distance on battery power. This enabled us to bring the Berkheim district into our zero-emission mass transit network with no additional infrastructure costs. Ever since they entered service these vehicles have been as reliable as diesel-engined buses," says a delighted Harald Boog, Head of Operations at SVE. "As the main challenges in IMC buses are not so much mechanical as in the electrics, electrical system specialist Vossloh Kiepe lead managed the consortium," he added.

Visitors showed strong interest in the vehicles' performance data. The battery trolleybuses have a top speed of 65 km/h in both operating modes. With their dual axle drive with 160 kW available at each powered axle, the buses offer outstanding performance even on gradients and in difficult weather conditions, and recuperate energy efficiently.

"The key to our success was the development of a new, powerful battery charging concept. This cleared the way to topping up the battery fast on the short stretches with overhead lines," explains Vossloh Kiepe project manager Joachim Berndt. If necessary the buses can draw on up to 600 kW while hooked up to the overhead lines. "The IMC concept means that it takes only short sections with overhead lines to reliably eliminate the risk of a recharging bottleneck," says Erik Lenz, Head of Sales, Buses and Electric Mobility.

When the presentations were over, the trade visitors were able to gain a first-hand impression of the vehicle's performance during a test run on regular routes in Esslingen. The bus's powerful acceleration in battery mode was demonstrated on an uphill stretch. The slight difference between battery power and the stretches under the overhead lines was generally not noticeable.

Against the backdrop of current demands for public transportation operators to make a substantial contribution to protecting the environment, with the IMC concept the electrical systems specialists at Vossloh Kiepe offer a practical and sustainable approach.

IMC permits fleet operators to run any number of electric buses reliably, leading to measurable improvements in air quality in urban environments around the world. In this reference project in Esslingen, an uncomplicated electric bus system has been implemented that enables the buses to be operated round the clock without a break, presenting a future-oriented approach that many public transportation authorities could adopt in many different places.

Now part of the Knorr-Bremse Group, Vossloh Kiepe has been supplying traction equipment for trolleybuses ever since 1950. Since 2005 the combination with a traction battery as an auxiliary drive system has been implemented in more than 600 electric buses, initially for Vancouver (262), then in articulated and double-articulated buses in Zurich (35), followed by Geneva (33) and Lucerne (30), then from 2014 in Seattle (174) and San Francisco (60). 12-meter versions of IMC battery buses with powerful LTO batteries are already in service on routes with sections with no overhead lines in Dayton (2) and Cagliari (4). The four IMC battery buses in Esslingen are the first dual mode articulated buses.

**Caption:** An IMC battery bus operated by Esslingen Municipal Transportation Authority (SVE)  
| © Vossloh Kiepe

Knorr-Bremse is a leading manufacturer of braking systems and supplier of additional sub-systems for rail and commercial vehicles, with sales totaling approximately EUR 5.5 billion in 2016. Some 25,000 employees develop, manufacture, and service braking, entrance, control, and energy supply systems, HVAC and driver assistance systems, as well as powertrain-related solutions. As a technology leader, through its products the company has been making a decisive contribution to greater safety by road and rail since 1905. Every day, more than one billion people around the world put their trust in systems made by Knorr-Bremse.

Knorr-Bremse subsidiary Vossloh Kiepe, based in Düsseldorf, Germany, is a globally active supplier of electrical traction equipment to the leading rail vehicle and bus manufacturers. The company offers efficient solutions and ecologically sustainable concepts for low-emission public transportation with eco-friendly drive technology for light rail vehicles, metros and regional rail networks, as well as for battery, hybrid, hydrogen, trolley and In-Motion-Charging (IMC) buses.

**Contact:**

Dr. Detlef Hug  
Head of Corporate Communications  
Tel: +49 (0)89 3547 1402  
E-Mail: [detlef.hug@knorr-bremse.com](mailto:detlef.hug@knorr-bremse.com)

Knorr-Bremse AG  
Moosacher Strasse 80  
D-80809 Munich  
[www.knorr-bremse.com](http://www.knorr-bremse.com)

Melanie Wiedenhöfer  
Tel: +49 (0)211 7497 352  
E-Mail: [m.wiedenhoef@vkd.vossloh.com](mailto:m.wiedenhoef@vkd.vossloh.com)