

Press release

Munich/Düsseldorf, July 05, 2022

Efficient urban mobility: Knorr-Bremse equips 40 more trams for Gothenburg with system technologies

- **Västtrafik picks up contract option to order another 40 Flexity low-floor trams for Gothenburg from consortium partners Alstom and Kiepe Electric**
- **Knorr-Bremse supplies key technologies for enabling customer-specified vehicle performance, reliability, sustainability and passenger comfort**
- **Close, methodical collaboration between Knorr-Bremse Group business units and global brands results in full in-vehicle systems integration**
- **Subsystems supplied by Knorr-Bremse include traction and onboard power supply systems, Train Control and Management Systems (TCMS), hydraulic braking systems as well as entrance and climate control systems**

Munich/Düsseldorf, July 05, 2022 – Kiepe Electric and consortium partner Alstom have received an order from Swedish tram operator Göteborgs Spårvägar and county transit agency Västtrafik to supply an additional 40 longer trams. Kiepe Electric is a brand of Knorr-Bremse, the global market leader for braking systems and other systems for rail and commercial vehicles. The first Flexity trams from the previous 40-vehicle order entered service in September 2020. Equipped with vehicle systems technology from Kiepe Electric and numerous subsystems from Knorr-Bremse Group, the new vehicles operate to the highest safety standards, offer high levels of passenger comfort, and further strengthen the city of Gothenburg's eco-friendly local mass transit services.

Dr. Peter Radina, as Member of the Management Board of Knorr-Bremse Rail Vehicle Systems responsible for Kiepe Electric, observes that: "Göteborgs Spårvägar is making exemplary use of our broad-based systems expertise for this tram project. Working with our project partner Alstom, this means we can fully satisfy our customer's stringent criteria for passenger comfort, road safety and sustainable mobility." For Kiepe Electric, the total value of the Västtrafik order for 40 new M34 light rail vehicles is in the mid double-digit million euro range. The order was awarded in the first quarter of 2022. Deliveries of the new vehicles will take place from the beginning of 2024 and continue through to 2026.

"The new trams will be a major plus for the residents of Gothenburg. With 40 new vehicles, finally Gothenburg has a fully accessible LRV fleet capable of transporting many more people," explains Peter Hermansson, Chairman of the Board of Västtrafik.

After completing 20,000 kilometers of rigorous testing, the first batch of partly bidirectional M33 low-floor trams has proved that they can satisfy the customer's need for highly reliable operation; they are now in regular service. At 45 meters each, the newly ordered unidirectional M34 trams are significantly longer; each vehicle has enough space for 319

passengers – a 50 percent increase in capacity. The key criteria remain the same, however: accessibility, comfort, safety, and sustainability. To help increase their overall sustainability, the traction system supplied by Kiepe Electric was developed with particular emphasis on energy efficiency and ultra-low maintenance costs.

The all-electric design of the trams works really well thanks to space-saving hardware, smoothly operating integrated systems from a single source, and Kiepe fleet management for facilitating maintenance. Alexander Ketterl, Managing Director of Kiepe Electric, emphasizes, that “the operator, public transit agency and passengers are all very happy with the new trams already in service. Kiepe Electric's long experience in system design and integration and the methodical collaboration between Knorr-Bremse Group departments and subsidiaries has resulted in and a full in-vehicle systems integration. The resulting high level of passenger comfort and attractive maintenance costs constitute real added value.”

One outcome of the close collaboration between the engineers at Kiepe Electric, Knorr-Bremse Rail Vehicle Systems and Alstom is the outstanding overall performance of the various braking systems – both operator and passengers have commented on the comfortable ride. The entrance system, supplied by Knorr-Bremse's brand IFE, the global market leader for door systems for trains, was harmonized with the Alstom engineering and Kiepe Electric vehicle control technology at an early stage, making it exceptionally reliable in operation. Innovative climate control technology from Merak, Knorr-Bremse's global brand for HVAC systems, has helped fulfil the customer's stringent specifications for energy-efficient vehicle systems integration. The use of waste heat from the motors to heat the passenger compartment is an excellent example, among others, reducing energy consumption and consequently cutting the vehicle's life-cycle costs.

Caption: Alstom is building another 40 low-floor trams, pictured the M33 tram, for Göteborgs Spårvägar and Västtrafik in Gothenburg, Sweden. The vehicles are equipped with electric traction and systems technology from Kiepe Electric, plus multiple subsystems from other Knorr-Bremse brands. | © Västtrafik

Knorr-Bremse (ISIN: DE000KBX1006, ticker symbol: KBX) is the global market leader for braking systems and 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. About 30,500 employees at over 100 sites in more than 30 countries use their competence and motivation to satisfy customers worldwide with products and services. In 2021, Knorr-Bremse's two divisions together generated revenues of EUR 6.7 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 leading rail vehicle and bus manufacturers. The company offers efficient solutions and ecologically sustainable concepts for low-emission public transportation in the form of eco-friendly electrical equipment for light rail vehicles, metros and regional rail networks, as well as electric buses and trolleybuses fitted with In Motion Charging (IMC) and High Power Charging (HPC).

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