

**Press Release**

Munich, December 10, 2019

## **Improving traffic safety: Kiepe Electric to equip trams in Hanover with collision avoidance systems**

- **Kiepe Electric to retrofit collision avoidance systems with components from Bosch Engineering to 50 light rail vehicles (LRVs) run by Hanover mass transit operator**
- **Radar and camera sensors scan the area in front of the vehicle**
- **Driver assistance system warns the driver and activates the brakes if a collision is imminent**

**Munich/Hanover, December 10, 2019 – Kiepe Electric, a subsidiary of Knorr-Bremse, the global market leader for braking systems and a leading supplier of other rail and commercial vehicle subsystems, has won an order from Hanover mass transit operator ÜSTRA to equip 50 light rail vehicles with collision avoidance systems. Following a successful field trial of a vehicle fitted with the system, further TW3000 vehicles are due to be retrofitted in 2020.**

“Our collision avoidance systems for LRVs provide genuine traffic safety benefits in our ever more densely populated cities,” says Dr. Jürgen Wilder, Member of the Executive Board of Knorr-Bremse AG and responsible for the Rail Vehicle Systems division. “As well as delivering significant cost savings for operators by keeping the network running more smoothly, every accident that is prevented also means fewer staff having to take time off work, less vehicle downtime and lower repair costs.”

Particularly in downtown areas, LRVs have to share the limited available space with many other road users including pedestrians, cyclists, cars, buses and delivery vehicles. Collision avoidance systems provide drivers with valuable support, especially in chaotic and unpredictable traffic situations.

Kiepe Electric has refined its collision avoidance technology in conjunction with its customer ÜSTRA and its partners at Bosch Engineering GmbH. The system warns the LRV driver if a collision is imminent. If the driver fails to intervene or reacts too slowly, the system minimizes the likelihood of an accident by independently activating the brakes until the vehicle has been brought to a halt.

“The system uses a combination of radar and camera sensors to continuously measure both the distance between the LRV and any objects ahead of it and the speed at which they are traveling. This allows it to identify dangerous situations and predict potential collisions,” explains Kiepe Electric Managing Director Dr. Heiko Asum.

The deceleration and jerk settings ensure that autonomous braking poses no danger to the LRV’s passengers. Moreover, the driver can override the autonomous braking function at all times, choosing either to brake harder or to release the brakes completely if the braking system has been activated in error.

As well as preventing or reducing physical injury and damage, collision avoidance systems also help to keep the light rail network running as smoothly as possible. While cars involved

in an accident can usually be cleared from the road relatively quickly, the same cannot be said of LRVs, which sometimes hold up the vehicles behind them for several hours.

**Caption:** An LRV from Hanover's TW3000 fleet, equipped with a collision avoidance system comprising radar and camera sensors and a control unit. | © Knorr-Bremse

**Knorr-Bremse (ISIN: DE000KBX1006, Ticker symbol: KBX)** is the global market leader for braking systems and a leading supplier of other safety-critical rail and commercial vehicle systems. Knorr-Bremse's products make a decisive contribution to greater safety and energy efficiency on rail tracks and roads around the world. About 28,500 employees at over 100 sites in more than 30 countries use their competence and motivation to satisfy customers worldwide with products and services. In 2018, Knorr-Bremse's two divisions together generated revenues of EUR 6.6 billion. For more than 114 years the company has been the industry innovator, driving innovation 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, eco-efficiency, digitization and automated driving.

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 with eco-friendly electrical equipment for light rail vehicles, metros and regional rail networks as well as for battery, trolley and In Motion Charging (IMC) buses.

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