

Press release

Sustainability: Knorr-Bremse makes a major contribution to protecting the environment and decarbonizing commercial vehicles

- **Knorr-Bremse technologies and solutions help to decarbonize the commercial vehicle industry**
- **Braking systems and innovative system developments from Knorr-Bremse enable customers to implement sustainable, resource-efficient business models**
- **Ecological product design (EcoDesign) will reduce the environmental impact of products over their full life cycle**
- **Examples here include electric compressors, the Active Caliper Release (ACR) system and the EconX[®] remanufacturing portfolio**

Munich, September 13, 2022 – As the global market leader for braking systems and a leading supplier of other systems for rail and commercial vehicles, Knorr-Bremse is a driving force behind sustainable mobility. This is reflected not least in the company's sustainability ratings. In 2022, Knorr-Bremse was once again awarded Gold status by EcoVadis. And in the automotive and supplier industry's self-assessment questionnaire (SAQ), the sustainability management at 17 Knorr-Bremse plants was given a score of between 80 and 93%. Visitors to the IAA TRANSPORTATION 2022 trade fair in Hanover, Germany, on September 20-25, will discover all they want to know about Knorr-Bremse's strategies, technologies and solutions for supporting decarbonization and the circular economy within the commercial vehicle sector. Knorr-Bremse will be exhibiting at Booth C21 in Hall 12.

In Knorr-Bremse's ongoing efforts to boost sustainability, climate action is a key strategic focus. In 2021, as part of the Group's Climate Strategy 2030, Knorr-Bremse attained the target of carbon neutrality across all Group sites worldwide. Green power agreements and certificates ensured that 98% of the electricity supplied to Knorr-Bremse globally was generated from renewables. Knorr-Bremse is also firmly on track to reach its second key climate goal: to halve carbon emissions by 2030. By 2021, the company had already achieved a 73% reduction in carbon emissions compared with 2018.

As Bernd Spies, Member of the Executive Board of Knorr-Bremse AG and responsible for the Commercial Vehicle Systems division affirms, aligning Knorr-Bremse's product strategy with sustainability goals opens up great opportunities: "Sustainability is good for the commercial vehicle industry and safeguards the future of our company by facilitating new business models. Here I'm thinking in particular of innovative products that improve traffic safety and contribute to e-mobility and automated driving. In this respect, both our customers and our own strategic objectives are focused on building a circular economy, reducing emissions and cutting energy consumption."

At the same time, with an eye to global technology trends, Knorr-Bremse has aligned its latest new product developments with sustainable goals which it aims to meet by applying the principles of EcoDesign – ecological product design. This process, now mandatory within the company, stipulates new product development requirements relating to, for example, the selection of materials, weight reduction, energy efficiency, and higher levels of recyclability. In commercial vehicles, this results in safe, reliable systems with minimized carbon, noise and brake-dust emissions that comply with the vehicle manufacturers' development roadmaps. Reducing the weight of systems and components, for example, also cuts fuel consumption. E-mobility requirements in particular are driving forward the development of

sustainable products, not least in the fields of steering and braking systems and electric compressors. And then there is the tried and tested practice of remanufacturing – the industrial reconditioning of used parts.

- **EPS – Electric Power Steering:** With its all-electric EPS, Knorr-Bremse offers a steering system that is both fully redundant and fail-safe, and as such a key enabler of Advanced Driver Assistance Systems (ADAS), Highly Automated Driving (HAD) and e-mobility. Because EPS systems are based on a modular approach, they are easy to integrate into applications for all commercial vehicle categories. The power-on-demand principle behind these systems also enables customers to significantly reduce both energy consumption and carbon emissions
- **Electric compressors:** The **Electrical Vane Module (EVM)** comprises a rotary vane compressor and a compact electric motor. The quietest, most energy-efficient compressor in the marketplace, this rotary vane compressor is scalable for electric vehicles with medium to low compressed-air requirements and will be launched in 2023. The compressor owes its quiet operation to a smooth, pulse-free air supply and low vibrations. With a compact, robust design for operating in temperatures from -40°C to +80°C, the compressor features a thermal management system that keeps it running very efficiently over its entire speed range. Another factor contributing to its efficiency is a permanent magnet electric motor with integrated inverter. The extremely efficient **Electric Screw Module** (a screw-type compressor in conjunction with an electric motor) delivers impressively quiet performance in commercial vehicles with high compressed-air requirements, such as buses. The volumetric flow rate ranges from 230 up to 475 NL/min (rotary vane compressor: 180 to 300 NL/min; 330 NL/min up to 11 bar). The product characteristics are similar to those of the rotary vane compressor.
- **SYNACT® with Active Caliper Release (ACR):** Compared to the previous generation, the SYNACT® family is characterized by higher braking torque combined with reduced-weight brake calipers and backing plates. A new brake pad concept improves pad guidance and travel. Equipped with optional **Active Caliper Release (ACR)**, SYNACT® is designed – among other things – to save fuel. ACR uses a spring-loaded system to disengage the pads from the disc and re-center the caliper. As a result, when the braking maneuver ends, the brake disc is released faster. This reduces fuel consumption by up to one percent, as well as brake pad wear.
- **Remanufacturing:** Knorr-Bremse is committed to the concept of the circular economy. Remanufacturing represents a substantial part of that commitment. This involves reconditioning brake components, which are then reassembled and reused. The process saves precious raw materials and energy. The range of remanufactured products for commercial vehicles available under the EconX® brand includes some 1,000 different items. This kind of professional product reconditioning can only be carried out by an original equipment supplier like Knorr-Bremse. In 2021, industrial reconditioning allowed Knorr-Bremse in Europe to save 1,885 metric tons of CO₂, 641 metric tons of material, and 7,486 MWh of energy. And the company is constantly improving the remanufacturing process. By way of example, a new production-ready cleaning system for electronic components has come on stream at Knorr-Bremse's remanufacturing plant in Liberec in the Czech Republic. The eco-compatible cleaning process has enabled the plant to reduce the reject rate in the industrial reconditioning of control units, as well as carbon emissions and material consumption levels.

Where to find Knorr-Bremse: Hall 12, Booth C21

Product innovations, efficient systems solutions, and sustainable business models that help commercial vehicle manufacturers to effectively manage their transformation within the

transportation sector – these are what Knorr-Bremse has in store for trade visitors to IAA TRANSPORTATION 2022. In Hanover, Knorr-Bremse will present transparent, clearly explained demonstrations of the technologies behind automated driving, e-mobility, sustainability, connectivity and traffic safety. You will find Knorr-Bremse at IAA TRANSPORTATION in Hanover, Germany (Hall 12, Booth C21) on September 20-25, 2022.

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.

Media contact:

Simon Basler
Press Office Commercial Vehicle Systems
T +49 (0)89 3547 1498
E simon.basler@knorr-bremse.com

Knorr-Bremse AG
Moosacher Straße 80
80809 Munich, Germany