

EFFICIENT. TECHNOLOGY. WORLDWIDE.

# ***Knorr-Bremse Rail Vehicle Systems***



**KNORR-BREMSE**









# Knorr-Bremse. Rail Vehicle Systems.

Every day, more than one billion people put their trust in products from Knorr-Bremse Rail Vehicle Systems. We are the world's leading designers, manufacturers and maintainers of brake systems and many other on-board systems for all types of rail vehicle.

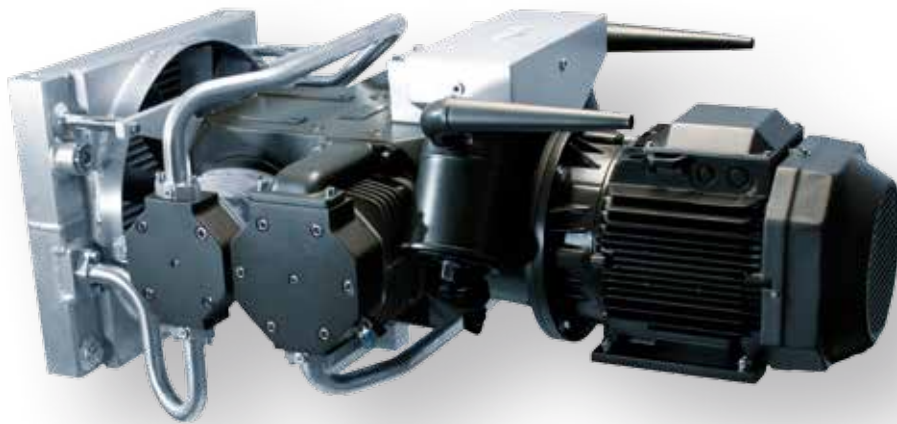
For well over a century, through pioneering technology we have played a major role in driving forward the development, production, distribution and maintenance of these systems, which have become essential solutions for rail vehicles and for satisfied passengers.

All around the world we create customized systems, combining technical expertise, long-term experience and rail systems know-how in safety-critical environments. Only when these competencies are harmonized and matched to the specific vehicle requirements by an expert can operational safety and functional reliability be delivered to a high degree of economic efficiency.

We offer a one-stop source for complete systems and create solid partnerships with vehicle manufacturers and operators. This yields reliable safety, proven support regarding the aspects of homologation and efficient solutions in all fields of sustainability.

To capture all of the above in three words: Efficient. Technology. Worldwide.

# Efficient. Safety systems from a single source.



## Sustainability

The family-owned company Knorr-Bremse assigns very high priority to sustainability. This is reflected not only in our corporate culture but also throughout the company's products and systems range.

## Products/Systems

Energy efficiency has become the motto of a whole generation of development engineers and is one of the core competencies of Knorr-Bremse. Innovation is also at the very heart of what we do. This approach has resulted in, for example, the development of modular brake control systems such as MBS® which, along with the KAB60 distributor valve, are designed for extreme temperatures down to as low as -60 °C and up to a maximum of +80 °C and are extremely durable and highly reliable in all climatic conditions. Our innovative approach has also delivered oil-free compressors which offer low vibration and noise levels, helping the environment and making rail travel more comfortable for passengers. Knorr-Bremse also offers further solutions to reduce noise emissions for people living near rail tracks with special friction material like the Flexpad Silent and the wheel flat protection system.

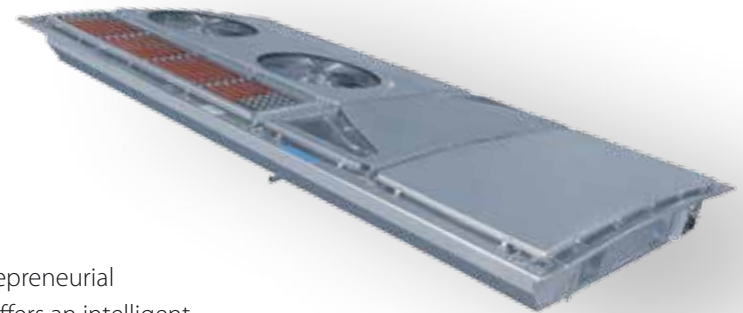
Knorr-Bremse has developed new energy-saving systems such as LEADER®. This driver assistant system helps a driver to better adhere to operational schedules whilst at the same time delivering significant energy savings. In fact, fuel savings of up to 15 percent have proven achievable in operational service.

## Climate protection

Rail vehicles are one of the most environment-friendly segments in the transport sector, and Knorr-Bremse is helping to drive this development even further. The Knorr-Bremse brands Merak and Sigma, the leaders in the development and production of HVAC systems for rail vehicles, make a valuable contribution to protecting the climate in this segment. Both companies aim at reducing substantially the energy consumption of its systems through the use of heat pump technology. The product portfolio includes innovative HVAC systems that run on the most eco-friendly refrigerants available.

## Processes

At Knorr-Bremse we combine in-depth engineering expertise with innovative entrepreneurial thinking. Thanks to its decades of experience as a systems supplier, Knorr-Bremse offers an intelligent blend of skills. This combination makes Knorr-Bremse processes as fast, efficient and cost-effective as possible. Through working in close partnership with car builders and operators we keep our processes efficient – from the integration and homologation stage our processes are designed to support the customer right through the life cycle of the product or system.



# Technology. From idea to market.

## Safety

In a world of ever-increasing levels of both rail passenger and freight traffic, maintaining safety levels has become ever more crucial. Increasingly rigorous legislation relating to safety-critical systems can be addressed by Knorr-Bremse experience and expertise. Systems from Knorr-Bremse train door specialists IFE include all-electric, safe and reliable door solutions proven around the world in daily operation. Knorr-Bremse platform screen specialists Westinghouse Platform Screen Doors provide systems which create a barrier between track and train and the platform. These systems, used around the world, enhance platform safety and the platform environment, can facilitate economical use of air conditioning on the platform and also support operational headways.

## Quality

As a designer and manufacturer of extremely safety-critical products, Knorr-Bremse makes no compromises when it comes to quality. The uniform, global Knorr-Bremse Production System (KPS) provides the foundation for best-in-class production operations and actively embraces a zero-defect approach.





## Innovation

Globalization, urbanization, energy efficiency and safety are the challenges to which Knorr-Bremse provides the answers. System solutions are delivered by products such as highly integrated intelligent control systems, high-performance brakes, innovative compressors and systems designed for operation in extreme climatic conditions. The company's innovative products are at the leading edge in terms of technology and reliability in the market.

## Customers

The Knorr-Bremse approach to innovation follows customer needs. Our systems are designed to meet customer requirements – worldwide.





KNORR-BREMSE WORLDWIDE







# Worldwide. Products for the rail world.

## Global presence

With more than 11,000 employees located in over 25 countries across the globe, the Knorr-Bremse production, research and development and sales and service network ensures local support wherever customers are located in the world. This local service supported by the global Knorr-Bremse network means that we can fully support our products and systems through the entire life cycle.



## Global applications

Be it in mile-long freight trains operating in the Australian outback, in new metro cars in the Middle East or in high-speed trains in Europe, China or Japan, Knorr-Bremse products are compliant with relevant standards worldwide across all applications, and are designed to deal with challenging environmental conditions such as an earthquake. We even have products that are certified for use in the harshest winter conditions including temperatures as low as -60 °C.

In short, Knorr-Bremse products can be technically adapted to operate on almost any rail system in the world.



LIGHT RAIL VEHICLES



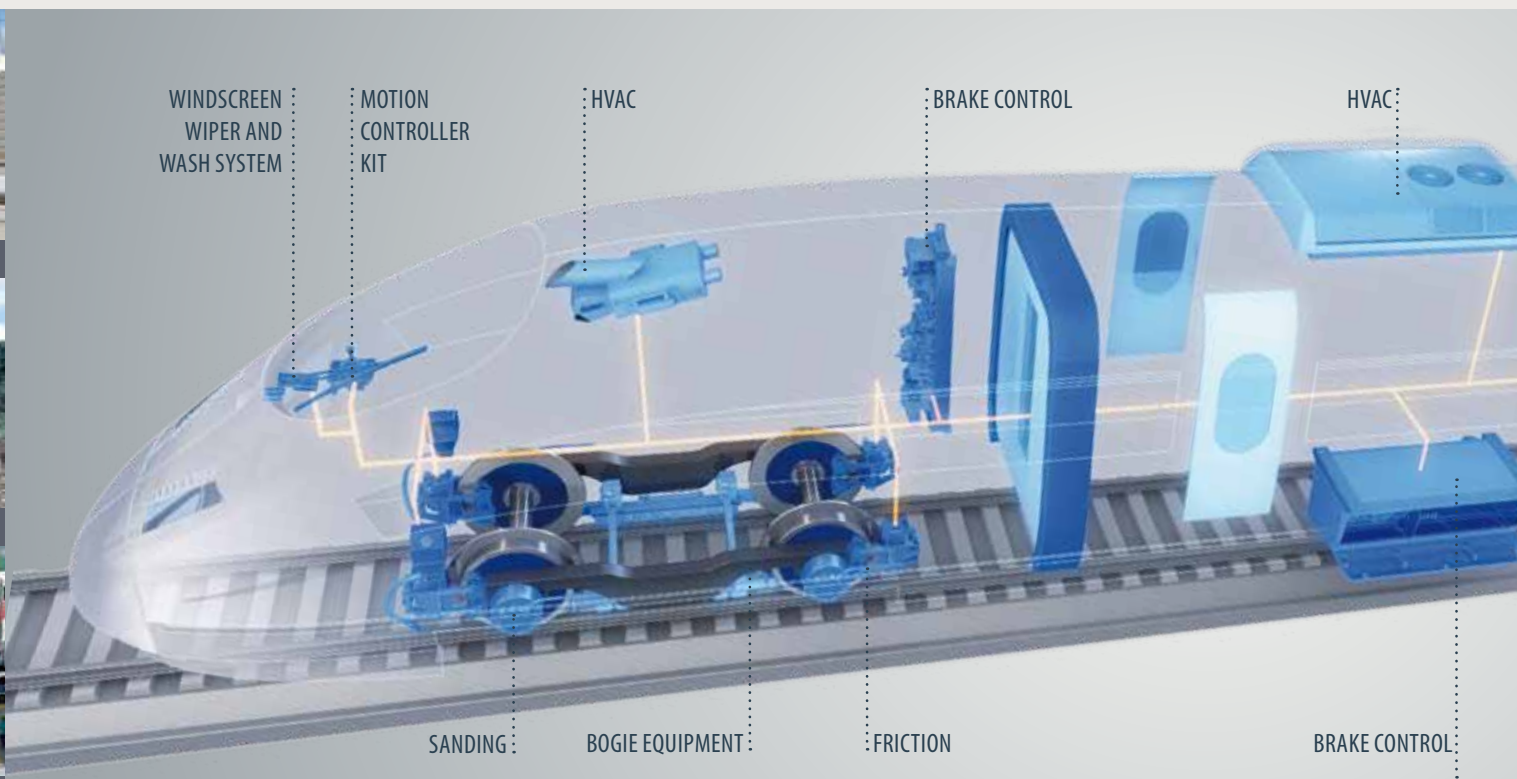
FREIGHT CARS



MONORAILS



PASSENGER COACHES



LOCOMOTIVES



REGIONAL & COMMUTER TRAINS



METROS



Brake and on-board systems  
for rail vehicles



Automatic door systems  
for rail vehicles



Heating, ventilation and  
air conditioning (HVAC) equipment



Heating, ventilation and  
air conditioning (HVAC) equipment



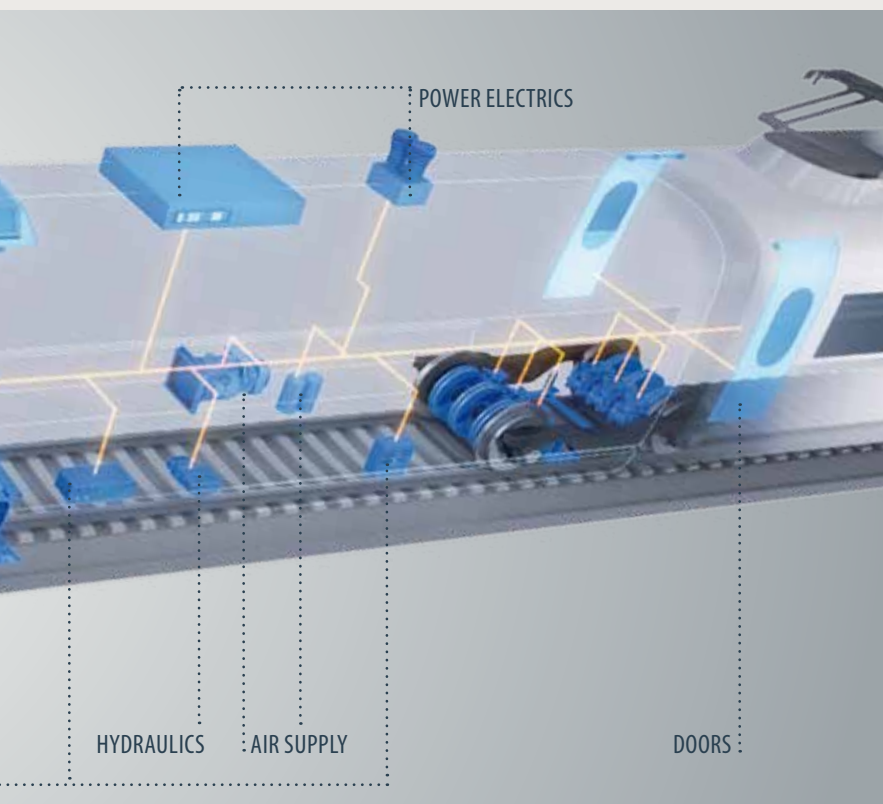
Electromechanical and electronic  
components for rail vehicles

EFFICIENT. TECHNOLOGY. WORLDWIDE.

# Product portfolio. One-stop solutions.

Brake systems, automatic door systems, HVAC systems, control components and several other safety-related products – rail vehicle builders and operators can obtain all of these from Knorr-Bremse as a one-stop supplier.

This efficient approach makes Knorr-Bremse a competent partner in all of the world's markets and in every rail vehicle application.



HIGH-SPEED TRAINS


**WESTINGHOUSE**  
platform screen doors

Manufacture, installation and maintenance of platform screen systems


**NEW YORK AIR BRAKE**

Systems for heavy-haul rail vehicles



Traffic management systems



Simulation and engineering modeling technology


**RAILSERVICES**  
always on track

Services for the maintenance, overhaul and repair of brake and on-board systems





**RAILSERVICES**  
always on track

# Railservices. Your partner of choice through the entire life cycle – worldwide.

Knorr-Bremse has the ability to support its products and systems, not just when they are initially delivered to the customer but over the full vehicle life cycle. The primary focus is on maintaining the original performance and safety levels of the Knorr-Bremse systems which, around the world, every day, more than one billion people put their trust in.

Experience shows that a basis for safe and efficient train operation combined with minimal system life-cycle costs lies in strong partnerships. Knorr-Bremse approaches relationships with vehicle manufacturers and operators as a reliable, long-term system partner. Good, open and fair collaboration is indispensable in any mutually successful partnership. Knorr-Bremse recognizes that as all vehicle operators and manufacturers have their own distinctive profile, their needs in terms of maintenance, overhaul, repair services and modernization will invariably be unique. Our objective is that our systems continue to be able to provide faultless service even decades into their life cycle.

With its flexible **railservices** portfolio, Knorr-Bremse supports each customer with a tailor-made service package geared precisely to their needs. This way, Knorr-Bremse plays a decisive role in ensuring that all types of rail vehicle continue to run as cost-effectively as possible during the whole vehicle life. Our **railservices** experts are ready to support you, from our global facilities or at your own location.

Knorr-Bremse helps shape the future of the rail vehicle market – a future that has already begun.

# Knorr-Bremse Corporate Values.



***Entrepreneurship***

## Enduring values for a promising future

For us, growth is more than just a buzzword, a rising revenue curve or a new factory. It's also about the personal development of each and every one of us, the way we do business each and every day and the way we interact with colleagues, partners and our clients. Taking this wider view helps us to live up to our responsibilities within our company and toward society as a whole, the environment and ourselves.

We call this 'Growing with Values' and these values are an integral part of our identity. They have made us what we are today – a world leader in our sector. Our commitment to road and rail safety stretches back over generations, from the development of a new control valve for air brakes to the very latest innovations aimed at reducing emissions and fuel consumption.

Entrepreneurship, technological excellence, reliability, passion and responsibility – these values describe who we are. They guide the way we do business each and every day. They help us make the right decisions and find answers to challenging questions. Only by living and breathing the values of our organization can we grow and master the challenges of the future.



***Technological Excellence***



***Reliability***



***Passion***



***Responsibility***



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 **KNORR-BREMSE**

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Innovations  
For  
Entrance Systems

 **merak**

 **SIGMA**

 **Microelettrica Scientifica**

 **WESTINGHOUSE**  
platform screen doors

 **NEW YORK AIR BRAKE**

**ZELISKO**

**S Y D A C**

 **RAILSERVICES**  
Always on Track

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