

Regional and
Commuter Trains



Source: Bombardier

KNORR-BREMSE





Why do more and more regional and commuter train manufacturers and operators put their trust in Knorr-Bremse systems





Because we simply find the right answers to complex challenges

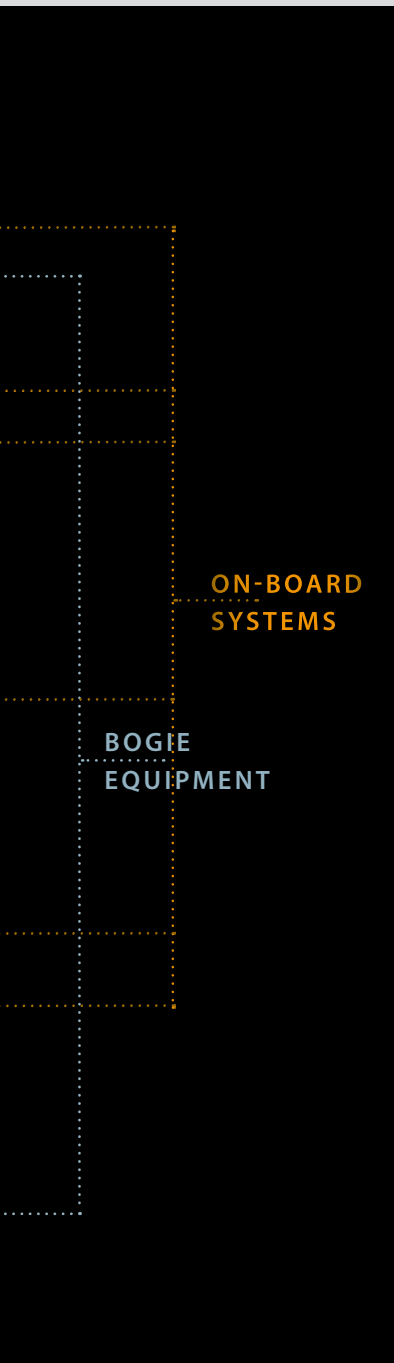
Multiple rail units that connect urban areas and link them with their suburbs face tough challenges – and the requirements made on the vehicles' systems are similarly demanding. What is needed are lightweight, compact systems that will operate anywhere in the world but are also precisely adapted to local conditions. This is where Knorr-Bremse's flexible systems come in. On the basis of tried-and-tested technologies, we develop innovative solutions offering top levels of safety, reliability, and economy. The systems we have developed are so efficient that they also score top marks in terms of environmental friendliness. Customers enjoy full support from a single source – from the initial planning stage and commissioning right down to aftermarket services. Worldwide operator and customer audits regularly single out the consistent quality of our products and services for praise – and this is confirmed by our EN 50126 (RAMS and LCC) certification.

Systems Solutions For Every Market



What is Knorr-Bremse's
complete "one-stop
solution" for regional
and commuter
trains





Air Supply

Combined compressor and air treatment system

Knorr-Bremse's ready-to-install air supply equipment has been adapted in line with the trend towards increasingly compact, lightweight systems. The use of compressor management means the compressor only operates until the required quantity of air has been produced. Maintenance work is rarely required and can be carried out rapidly.

Bogie Equipment

Innovative design minimizes assembly and maintenance requirements

Knorr-Bremse offers a wide range of compact, lightweight bogie equipment including low-wear brake discs, low-maintenance compact brake calipers, and innovatively designed brake pads that wear evenly and therefore remain in operation for longer than conventional pads. Customers' precise needs are taken into account with the help of realistic simulations of actual operating conditions, for example.

Brake Control

Ensuring the intelligent interaction of all brake functions

With brake control systems, Knorr-Bremse ensures optimum functioning of all systems involved in the braking process and enables reliable stopping of the train in all operating conditions. The highly flexible and configurable brake control system EP Compact, together with the modular electronic platform ESRA, manages the pressure control, anti-skid, wheel-slide monitoring, and diagnostics, as well as further highly complex brake control functions.

On-Board Systems

Doors, air-conditioning units, windscreen wiper and wash systems, and more

It is not just Knorr-Bremse braking systems that ensure greater safety and comfort in rail vehicles. Our on-board product portfolio covers a wide range of innovative products and solutions including vehicle and platform doors and air-conditioning units. We also produce state-of-the-art electronic diagnostic systems and windscreen wiper and wash systems.

Rail-Services

A partner for all requirements throughout the entire product life-cycle

Knorr-Bremse offers a wide range of rail-services ranging from individual consultancy and collaborative product development to homologation, commissioning, training, maintenance, repair, upgrading, and overhaul of all components – as well as a reliable supply of OEM parts. Whether you opt for individual services or the full package, everything is provided locally, either on-site or in one of our global service centers.

Testing

Test benches for all products – worldwide

Knorr-Bremse supplies test benches for all products and systems, customized and tailored to the customer's requirements, to supplement long-term overhaul services with tools and products for daily maintenance. Several hundreds of test benches and test installations are in operational service with our customers worldwide – for example, as train brake tests, test benches for brake control products, compressors, air dryers, tread brakes, brake calipers, and more.

A perfect balance of high-quality systems and services

Knorr-Bremse's expertise in the field has gone into every single component and system. Top-quality components operate smoothly together to guarantee optimum functionality, high reliability, and maximum safety. Complex electronic control systems such as blending and brake management reduce wear to a minimum by ensuring the balanced operation of all systems. The system can be configured either to use the vehicle bus system or a separate bus exclusive to the braking system. For each project, customers are closely involved in the design stage. It goes without saying that Knorr-Bremse offers support during the homologation process as well as all the necessary on-site services across the entire product life-cycle.

Cutting-Edge Technologies

Air Supply

More compact, lightweight, and economical compressors

Knorr-Bremse offers a wide range of compressors including screw compressors that operate with minimum vibration and noise, and also the first-ever oil-free compressor for rail vehicles. Removing the need to use oil for lubrication and cooling not only benefits the environment – it also avoids expenses for oil changes, oil separation, and condensate disposal. Furthermore, energy consumption, weight, and installation space are significantly reduced and life-cycle costs cut by up to 50%.



Bogie Equipment

Maintenance-free brake calipers, low-wear pads

The compact brake caliper unit has a completely redesigned operating mechanism. Requiring only a standard interface, it is easy to install and sealed joints make it low-maintenance. Its weight has also been reduced by up to 100 kg per bogie. It can also be equipped with lightweight aluminum brake discs. Patented ISOBAR pads ensure even wear and therefore require less frequent replacement.



Magnetic track brake

The magnetic track brake builds up a friction force between the rail and brake. It delivers additional brake force independent from the vehicle weight and the adhesion between wheel and rail. Due to the track-cleaning effect of the magnets, the adhesion of the wheel and rail is also increased. The Knorr-Bremse magnetic track brake is optimized in weight and dimensions. Our sinter pads require less maintenance than conventional brake pads. This increases operational availability and safety. All Knorr-Bremse electrical coils are vacuum-casted, which gives them an outstanding lifetime.



Innovations that pay their way

Reducing wear and tear and maintenance costs is a good way of saving money. More than any other manufacturer, Knorr-Bremse has succeeded in finely coordinating the complex interplay of different braking systems. Brake components that are prone to wear are only used when the wear-free electro-dynamic braking cannot cope on its own. Even then, patented ISOBAR brake pads have proven longevity against conventional materials. Brake pads and discs require replacement less frequently, and their design allows rapid service. The brake calipers themselves are low maintenance. These examples demonstrate that if all the relevant factors are included in the calculation, the bottom line is savings for the customer.

railservices

Customized service packages ensure that all Knorr-Bremse systems function smoothly for up to 30 years – anywhere in the world. The secret is our combination of OEM expertise and a highly efficient service infrastructure.

Brake Control

EP Compact – flexible and powerful

With EP Compact and EP Compact lite, Knorr-Bremse has developed a flexible and powerful brake control system with central and distributed control coming from one product family. Both core functions can be expanded by the addition of a wide range of optional functions selected from different modules of the EP Compact product family. EP Compact offers continuous pneumatic load correction, EP Compact lite electronic load correction, and pneumatic load limitation. Both can be installed beneath the floor, optionally including the electronics. Numerous additional functions are available depending on the requirements.



Christoph Strohmer
*Team Leader,
System Engineering
Regional and Commuter Trains*

"Increasingly complex technologies, less time for planning and implementation and a squeeze on prices - we can only cope with these pressures by making our processes more efficient. But even so, safety and reliability remain top priorities."



Is it true that
Knorr-Bremse's regional
and commuter train
solutions are also the
best in the world in
terms of economy



Satisfied Customers ...



Wherever top quality is crucial for competitiveness

Knorr-Bremse's rail vehicle systems are not only cutting-edge technology – they are also market leaders. All over the world, when manufacturers and operators make purchasing decisions, they take a wide range of factors relating to safety and economics into consideration. They find that the best results are offered by Knorr-Bremse's unique combination of experience and innovation. Many customers opt for the full range of Knorr-Bremse systems and components for their regional and commuter trains.

Examples for equipped regional and commuter trains worldwide:

- 1 AGC 2 Flirt 3 Spacium 4 Desiro 5 ATR 220 6 Talent

... Supplied With Excellent Products

Air Supply

Oil-free compressor

- Oil-free air (environmentally friendly, no downstream contamination)
- Less complex system / fewer interfaces (no oil filter, no condensate collector)
- Almost maintenance-free, very low LCC



Screw compressor

- Special design, related to the tough railway operation conditions
- Low compressor noise level
- Virtually pulsation-free, delivery of compressed air



Brake Control

EP Compact

- Flexible brake control platform
- Central and distributed control
- Compact design
- Continuous pneumatic load correction
- Full set of auxiliary functions
- CENELEC- and TSI-compliant



Distributor valve KKL

- Distributor valve with simplified function
- Especially suited as pneumatic backup solution for light trains
- Often used in combination with EP Compact



Bogie Equipment

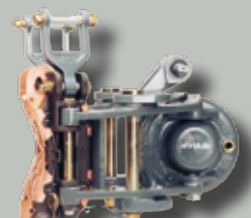
Wheel- and axle-mounted brake disc

- Standardized interface and fixation on wheel
- Resistant against thermal cracks due to movable friction disc
- Robust design with high safety against external shock and vibration



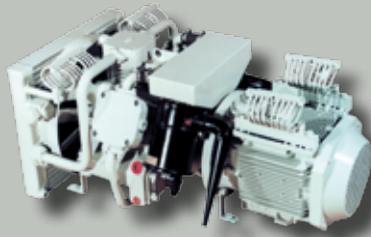
Conventional brake caliper

- Endurance limit and vibrations tested
- Low wear
- Modular standard solutions
- Lightweight and robust design



Piston compressor

- Great reliability, long life and extraordinary ruggedness
- Self-supporting flange-mounted motor compressor set



Air dryer

- Dual chamber regeneration dryer
- Lightweight aluminum design
- Integrated pre filtration



BP Compact

- Precise and very powerful
- Compact design
- Integrated precontrol and relay graduation
- Isolation function
- Width adaption



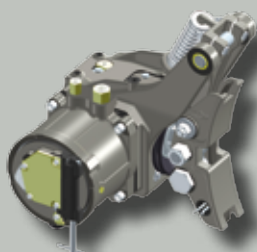
Modular motion controller kit

- Brake, traction, and master controller
- Compatible with UIC standard
- Small, flexible installation space
- Robust design, application proven



Tread-brake unit

- Modular design
- Flexible mounting
- High output forces



Magnetic track brake

- Modular standard solutions
- Robust and proven design
- Wear-optimized pole shoes available





Where have Knorr-Bremse solutions already been tried and tested



The Future



What prospects for the future can Knorr-Bremse offer in the regional and commuter train segment



Secure Operation | Secure Investment | Secure Future



Tomorrow's technologies

The extreme stresses to which regional and commuter trains are subjected call for unusually high-performance, top-quality, and safe braking technologies. We offer to adapt every system to the specific operating conditions, thereby minimizing wear and tear and achieving top levels of economy and vehicle availability. As a manufacturer of braking systems with more than 100 years of experience, Knorr-Bremse has the necessary expertise to achieve this. High levels of R & D investment ensure that our systems remain cutting-edge around the world. With railservices, Knorr-Bremse offers a high-quality portfolio of maintenance and aftermarket services ranging from original spare parts and maintenance agreements right down to responsibility for complete systems during the entire life-cycle. Customers also benefit from a comprehensive network of service centers for all braking and on-board systems.

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