Regional and Commuter Trains

REALIZING SYSTEM SYNERGIES

KNORR-BREMSE
Because we simply find the right answers to complex challenges
MULTIPLE RAIL UNITS THAT CONNECT URBAN AREAS 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 flexible systems come in. From a base of proven 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 highly in terms of environmental friendliness. Customers can enjoy full support from a single source – from the initial planning stage and commissioning right through the life cycle with support from our RailServices team. Operator and customer audits worldwide regularly single out the consistent quality of our products and services for praise and this is confirmed by our International Railway Industry Standard (IRIS) certification.
Knorr-Bremse expertise in its field has gone into every single component and system. Top-quality components operate in harmony 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 balanced operation. The system can be configured either to use the vehicle CAN-bus system or a separate CAN-bus exclusive to the braking system. For each project, customers are closely consulted at the design stage. Knorr-Bremse offers support during the homologation process as well as all the necessary on-site services through the entire product life cycle.
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 entrance systems and platform screen systems and air conditioning units. We also produce state-of-the-art electronic diagnostic systems and windscreen wiper and wash systems.

»RAILSERVICES | 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, upgrades and overhaul of all components – as well as a reliable supply of genuine parts. Whether you opt for individual services or the full package, everything is provided locally, either on-site or in one of our service centers.

»TESTING | TEST BENCHES FOR ALL PRODUCTS – WORLDWIDE
Knorr-Bremse can supply test benches for all of the company’s products and systems. The test equipment can be customized and the necessary tools can be provided to exactly suit the customer’s specific test requirements. Hundreds of Knorr-Bremse test benches and test installations are in successful operational service with customers worldwide. Examples of the type of testing covered include: train brake systems, brake control products, compressors, air dryers, tread brakes, brake calipers and there are many more available.
CUTTING-EDGE TECHNOLOGIES

AIR SUPPLY | COMPACT, LIGHTWEIGHT AND ECONOMICAL COMPRESSORS
Knorr-Bremse was the first company in the rail vehicle industry to develop a compressor that operates without any oil. Lubricating oil is negated by a special coating and the unit is cooled by air taken in via the crankcase. This innovative product is a winner in both environmental and economic terms. The expense of oil changes, oil separation and condensate disposal are avoided and energy consumption, weight and installation space are significantly reduced.

BOGIE EQUIPMENT | LOW-MAINTENANCE 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.

BOGIE EQUIPMENT | MAGNETIC TRACK BRAKE SYSTEMS
The magnetic track brake builds up a friction force between the rail and brake. It delivers an additional brake force independent of the vehicle weight and the adhesion levels between wheel and rail. Due to the track-cleaning effect of the magnets, the adhesion levels of the wheel and rail is also increased. Our sinter pole shoes require less maintenance than conventional brake pads. This increases operational availability and safety. All Knorr-Bremse electrical coils are vacuum-cast, which gives them an outstanding lifetime.

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, whilst EP Compact lite offers electronic load correction and pneumatic load limitation. Both can be installed beneath the floor, with an option to include the electronics. Numerous additional functions are available depending on the customer.

SANDING | NEW SDP-1 UNIT - ACCURATE PNEUMATIC DOSING
This sanding unit is able to offer the entire range of functionalities even for very difficult routings of the sand delivery hose. The separation of dosing and conveying function is the main advantage of this system, without any mechanically driven parts. The output sand quantity is independent of the sand flow rate and can be set very exactly. An integrated sand drying is available as optional feature. The system offers the best accuracy of all pneumatic dosing systems.
INNOVATIONS THAT REDUCE LIFE-CYCLE COSTS

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Reducing unnecessary wear and maintenance is a good way of reducing life-cycle costs. 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 electrodynamic braking cannot cope on its own. Even then, patented brake pads have proven longevity against conventional materials. Brake pads and discs require replacement less frequently and their design enables them to be serviced rapidly. 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.

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.
PRODUCT RANGE

AIR SUPPLY UNIT INCCLUDING OIL-FREE COMPRESSOR
- Oil-free air (environmentally friendly, no downstream contamination)
- Air dryer integrated in frame
- Less complex system / fewer interfaces (no oil filter, no condensate collector)
- Almost maintenance-free, very low life-cycle costs

SCREW COMPRESSOR
- Special design, to cope with tough rail operational conditions
- Low compressor noise level
- Low vibration

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

EP2002®
- Intelligent braking system optimizes brake effort across the whole train
- Per bogie or car distributed braking
- Smaller, lighter and faster to commission than conventional brake control

WHEEL- AND AXLE-MOUNTED BRAKE DISC
- Standardized interface and mounting on wheel
- Resistant against thermal cracks due to movable friction disc
- Robust design with high safety against external shock and vibration

COMPACT BRAKE CALIPER
- Only one interface to bogie
- Highly modular design
- Optimized design regarding weight, assembly and costs
- Reduced maintenance

SANDING SYSTEMS
- Pure pneumatic sand dosing principle, no abrasion
- Separation of sand dosing and sand conveying function
- Highest accuracy
- Integrated heating and drying function optionally

WINDSCREEN WIPER AND WASH SYSTEMS
- Maximum lifetime of the driving units
- Optimized availability via optional emergency unit
- Maximum flexibility of functionalities (e.g., middle parking position, etc.)
PISTON COMPRESSOR
- Rugged construction and long life performance
- Self-supporting flange-mounted motor compressor set

AIR DRYER
- Dual-chamber regeneration dryer
- Lightweight aluminum design
- Integrated pre-filtration elements
- Low exhaust noise

BP COMPACT
- High power delivery
- Compact design
- Integrated pre-control 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, proven application

TREAD-BRAKE UNIT
- Modular design
- Flexible mounting
- High output forces

MAGNETIC TRACK BRAKE
- Modular standardized solutions
- Robust and proven design
- Pole shoes with increased braking performance available

LEADER
- Saves traction energy
- Increases punctuality
- Reduces wear of the brake system
- Improves driver skills
- Increases customer satisfaction

MODULAR MAGNETIC TRACK BRAKE CONTROL SYSTEM
- Reduced life cycle costs
- Monitoring of track brake during testing
- Automatic one-man brake test - no additional personnel required
- Simultaneous checking of all track brakes
- Self-diagnostics enable corrective maintenance
- No wearing parts in brake control system
WHEREVER TOP QUALITY IS CRUCIAL FOR COMPETITIVENESS, KNORR-BREMSE RAIL VEHICLE SYSTEMS OFFER CUTTING-EDGE TECHNOLOGY
TOMORROW’S TECHNOLOGIES. THE EXTREME STRESSSES TO WHICH REGIONAL AND COMMUTER TRAINS ARE SUBJECTED call for technologically advanced, reliable, and safe braking systems. Knorr-Bremse designs every system to address the specific operating conditions, thereby minimizing wear and achieving high 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 research and development investment ensure that our systems remain cutting-edge. 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.