



# *EP / BP* *Compact Product Family*



## **APPLICATIONS**

High-Speed Trains | Locomotives | Metros |  
Regional and Commuter Trains

**KNORR-BREMSE**





## EP / BP COMPACT PRODUCT FAMILY IS A FLEXIBLE AND POWERFUL BRAKE CONTROL SYSTEM

providing not only brake cylinder pressure control for central and decentralized systems but also for brake pipe pressure control. Its modular design of electronic and pneumatic modules makes it configurable for all types of high-speed trains, multiple units and metros.

With its variety of modules, EP / BP Compact can be used for a wide range of different applications of all car builders across different markets. Every electropneumatic module controls either brake pipe applications, single bogies separately or several bogies with identical braking requirements. Different electronic modules allow the use of different communication interfaces: wheel slide protection, pressure regulation and diagnosis functions. Anti-skid valves as well as different auxiliary control functions can be integrated into the module as an option.

### CUSTOMER BENEFITS

- Lightweight and compact
- Flexible system layout
- Maximum economy thanks to standardized modules
- Discrete, highly integrable components
- Straightforward service and maintenance concept
- For central or decentralized control
- Multifunctional for numerous system configurations
- Innovative use of proven technology
- Integrated electronics for underfloor or separate electronics for interior installation

### DIVERSIFICATION

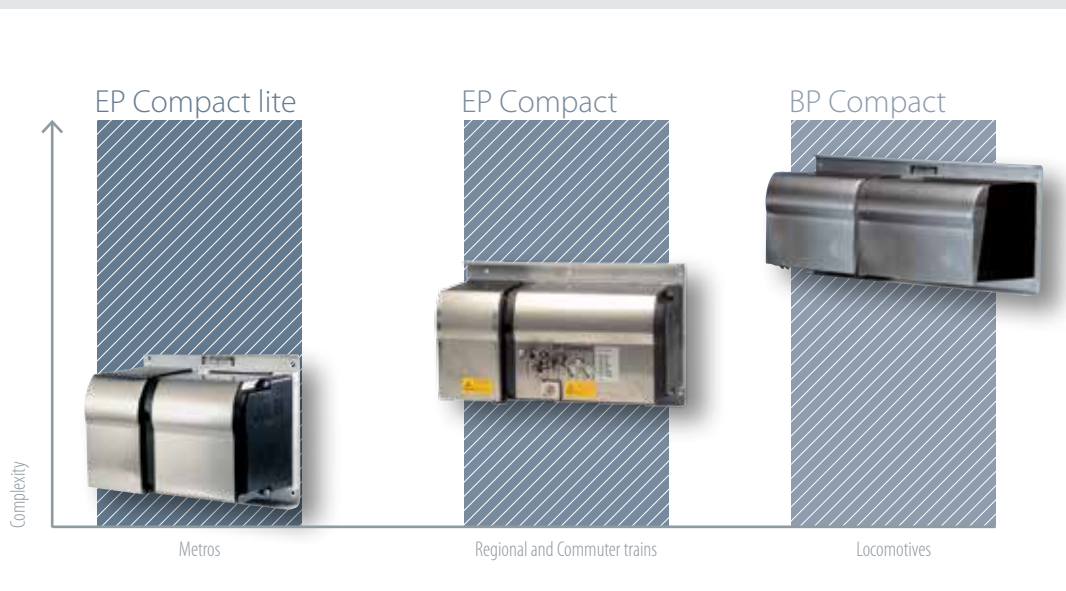
EP Compact offers control of various functions of the braking systems:

- Service brake (direct and indirect)
- Emergency brake (direct and indirect)
- Magnetic track brake
- Parking brake
- Wheel slide control
- Continuous load correction and load limitation

Electronic control functions:

- Blending / brake management
- Diagnostics and monitoring
- Sanding and other auxiliary systems
- TSI functions: detection of non-rotating axles, bogie monitoring
- Brake pipe control

## EP/BP COMPACT PRODUCT FAMILY



Standardized brake pipe control and brake cylinder pressure control for different applications from metros to locomotives

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## DESIGN/FUNCTION


















The brake management system can control the following sub-systems:

- Electro-pneumatic brake for brake cylinder pressure control and brake pipe control
- Electro-dynamic brake (optional)
- Parking brake (optional)
- Magnetic track brake (optional)
- Other dynamic brakes (e.g. retarder, eddy current brake, etc.)
- Air suspension
- Sanding
- Pantograph

There are three core functions of the EP / BP Compact family that can be expanded adding further functionalities:

- EP Compact: central or decentralized brake control with continuous pneumatic load correction
- EP Compact lite: central or decentralized brake control with electronic load correction and pneumatic load limitation, especially for metros and multiple units
- BP Compact: electronic brake pipe control and pneumatic back-up including optional assimilation function and isolating module
- All core functions can be expanded by the addition of a wide range of optional functions offered by the various different modules of the EP / BP Compact product family

MAIN PNEUMATIC CONTROL MODULES Compact control modules which are optionally expandable

















<p>ADDITIONAL CONTROL MODULES →</p> <p>↓ BASE CONTROL MODULES</p>	<p>CU01 – electronic control unit (3-channel WSP)</p> 	<p>CU02 – Central electronic control unit (4-channel WSP)</p> 	<p>GCU02 – Expanded gateway unit for distributed and central systems</p> 	<p>ESRA – Standard 19" indoor electronic system unit</p> 
<p>EP Compact lite</p> <p>Brake cylinder pressure control with pneumatic load limitation</p> 				
<p>EP Compact</p> <p>Brake cylinder pressure control with continuous pneumatic load correction</p> 	<p>(without PLUS)</p> 			
<p>BP Compact</p> <p>Brake pipe control</p> 				

## EP COMPACT IN HIGH-SPEED TRAINS, MULTIPLE UNITS AND METROS

The modules of EP Compact offer a wide range of functionality, such as the integration of distributor valves for the fully load weighed indirect brake, wheel slide protection, parking brake and magnetic track brake actuation. Each function is an add-on to the core module, which forms the brake control sub-system for a single car or an individual bogie. These sub-systems provide the basic modules for the full brake control system. Full electronic information exchange is ensured between the EPC units via the option of a dedicated Brake-bus. Connection to a wide range of state of the art train information networks like MVB, Ethernet and CANopen is also available.

### THE EP / BP COMPACT MODULES – THE BASIC UNITS

The EP Compact unit comprises two main elements: a modular pneumatic control unit PU and an optional electronic control unit CU / GCU. The two elements PU and CU are compatible, although they remain physically separate in order to provide the flexibility for incorporating them into the vehicle and for maintenance purposes. For extended interfaces to the vehicle control system an optional gateway unit GCU instead of the CU can be provided to facilitate additional high functionality with CAN-bus systems and discrete control lines.

Parking brake	Magnetic track brake	Distributor valve	Wheelslide protection	Assimilation module	Isolating module
 <i>monostable</i>  <i>bistable</i>	 <i>with/without pressure reducing valve</i>	 <i>STV200</i>  <i>KKL-A</i>	 <i>GV12</i>		
					
					
					

### THE PNEUMATIC UNIT PU

The pneumatic unit PU of EP Compact incorporates the entire pneumatic actuation and sensor-components. It provides a modular system of pneumatic functions such as BCP control (PU-C, Lite), WSP (PU-W), parking brake control (PU-P), magnetic track brake actuation control (PU-M) and as a feature the integration of a distributor valve (KKL / STV) for the indirect brake.

### THE CONTROL UNIT CU

EP Compact can optionally include a Control Unit (CU), which provides the electronic control and monitoring of the PU, especially the pressure control, WSP and diagnostics. Apart from these control functions, the CU can acquire and process all related external data such as the handle position of isolating cocks or external pressure switch signals. In addition, a variety of inputs are available for train line signals.

### THE GATEWAY UNIT GCU

The Gateway Unit (GCU) optionally provides an extended interface between the brake control system and the train control system. Consequently, the brake management is accomplished in the GCU, which contains the interface to the train management system and additionally carries out coordination of the brake functions. By means of extension boards which allow almost unlimited scaling of the IOs, the GCU can be adapted to the control system of the vehicle. The GCU performs the centralized and train system functions such as brake management and diagnostics.



## THE BP COMPACT MODULE

BP Compact can deliver electronic brake pipe control in accordance to UIC541-03 and STM-F301. It includes a rapid charge function as well as assimilation according to UIC. It can be used for different applications because of its features including different back-up modes and the cut-off function.

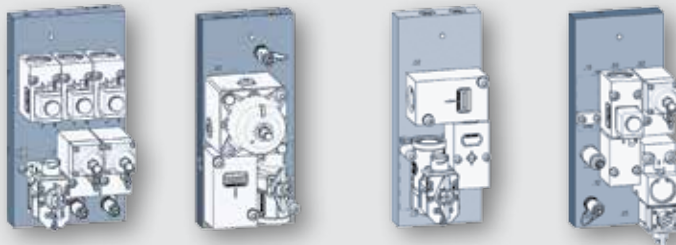
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## ADDITIONAL FUNCTIONS

Standardized pneumatic add-on modules to EP Compact, EP Compact lite and BP Compact realizing different auxiliary control functions

- » Sanding
- Air suspension
- Filter
- Parking brake
- Pantograph
- Isolation functions
- Wheelslide protection
- Magnetic track brake
- Others



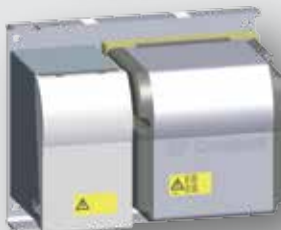


### CONFIGURATION EXAMPLES

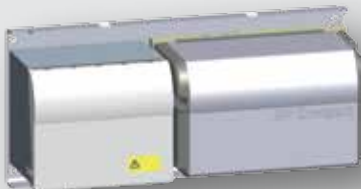
EP Compact for brake cylinder pressure control (continuous pneumatic load correction) including underfloor electronic CU01 for up to 3-channel wheelslide protection.



EP Compact lite for brake cylinder pressure control (pneumatic load limitation) including underfloor electronic CU02 for up to 4-channel wheelslide protection.



BP Compact for brake pipe pressure control plus assimilating and isolation module and underfloor electronic GCU02.



EP Compact for brake cylinder pressure control including parking brake control, magnetic track brake control, distributor valve KKL and several auxiliary controls (sanding, air suspension).



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