

Innovative solutions for the railway industry

Measuring instruments, sensors and encoders



Baumer

Passion for Sensors

Baumer experts
understand your needs.
High performance
from offer to after-sales
services.

Pioneering, precision and quality.

Baumer is a premier supplier of innovative and high-quality instruments, encoders and sensors for the railway industry. Our strong corporate history and leading market position through many decades is built on a strong customer focus and our innovative and comprehensive product portfolio.

Baumer is setting new benchmarks, whether in rugged designs or in sensor performance. We anticipate our customers' needs and continue to add new market-oriented products to our portfolio in order to bring even more value to our customers. We pool the expertise we have gained in various technologies and provide profound application expertise in railway industries.

We are relentlessly committed to quality. Our products master their application objectives with the utmost reliability and precision by virtue of the exceptionally high quality standards we place on development and manufacturing.

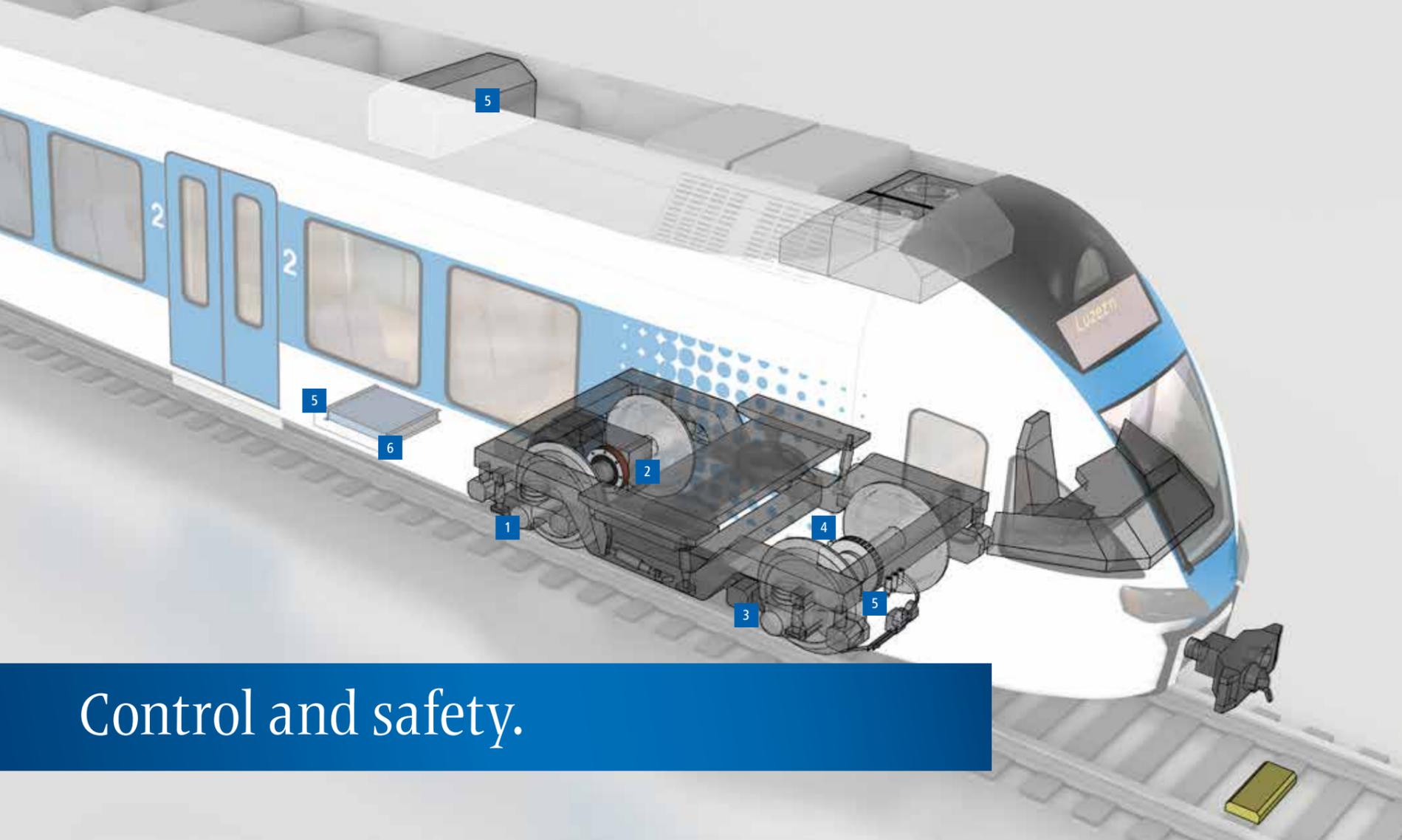


Learn more.

Downloadable data sheets and more information
about our products is available at:

www.baumer.com/railway





Control and safety.

Speed measurement.

Baumers portfolio provides perfectly fitting and reliable solutions for any speed measurement application on train bogies. The ultra-robust multi-channel axle encoders with their galvanically isolated signals solve the challenge of generating speed signals for multiple systems. Thanks to leading edge technologies, Baumer offers new sensing possibilities for acceleration and torsional vibration measurement.

Cold movement detection.

The Cold Movement Detector (CMD) monitors the position of a rail vehicle while the ERTMS EVC or CBTC system is in 'No Power' mode. In combination with the vehicle computer, the Baumer CMD sensor allows bringing vehicles fast to operation. Time consuming referencing procedures are no longer required and track capacity can be increased.

Pressure control.

In rail vehicles, an accurate and long-term stable pressure sensing across a wide temperature range is imperative. The EF6 series is an economical and reliable solution. PBMR sensors offer first class temperature stability, accuracy and long-term stability for test equipment and other high demanding applications.



1 3

Multi-channel axle encoder for speed measurement (BPIV, BMIV)

- Ultra-robust and proven design with reliable magnetic measuring principle
- Standard interface for fast and secure assembly
- Up to 4 independent, galvanically isolated A90°B signals
- One axle encoder for multiple sub-systems
- Conforms to EN 50128 / EN 50129, SIL2

1 2 3

High performance bearingless axle encoder (BPIK)

- Dynamic, precise speed measurement at all speeds
- Robust magnetic measuring principle
- Fast, reliable torsional vibration detection
- Up to 2 independent, galvanically isolated A90°B signals
- Minimum wear and LCC
- Integrated temperature sensor
- Conforms to EN 50128 / EN 50129, SIL2

1 2 3

Speed detection of gears (MTR, MTRM)

- Non-contact detection with up to 20,000 pulses/sec
- Wide temperature range -40 °C ... +120 °C
- Standard mechanical and electrical interface
- Superb EMC immunity thanks to patented screening concept
- Very high insulation resistance up to 2.5 kV
- Innovative cable outlet with IP69K and high strain relief

1 3

Sensor for cold movement detection (BCMD)

- Detects cold movement of a rail vehicle
- For use in CBTC and ERTMS/ETCS baseline 3
- Conforms to EN 50129, SIL4 in combination with EVC
- Avoids time consuming and costly position referencing procedures
- Allows increase of track capacity

4

Pressure control in hydraulic braking systems (CPX)

- Programmable switching points
- Two switching outputs
- High sensitivity over a wide temperature range
- Corrosion proof
- Compact design also fits into tight spaces
- Reliable switching properties
- Long-term stability
- Maintenance free

5

Pressure detection brake, slide regulation, retarder cooling and sanding system (EF6, PBMR)

- High accuracy over a wide temperature range (-50 °C ... +85 °C)
- Conforms to EN 50155
- Designed for harsh environments
- High EMC immunity
- Maintenance free

6

Monitoring of hydraulic parking brakes (MEX3)

- Accuracy class 1.6
- High pressure system
- Robust and anti-vandalism design
- Valve at rear side to facilitate refilling of hydraulic circuit

Level detection.

Each system should satisfy safety, reliability and simplicity demands to ensure a long service life for the train. Baumer designs its measuring instruments, sensors and encoders to fulfill these requirements, especially when it comes to passenger comfort. This is proven by the vast amount of equipment that is still in use even though it was installed in trains many years ago. Baumer control units and sensors monitor heating and ventilation systems and wastewater control systems.

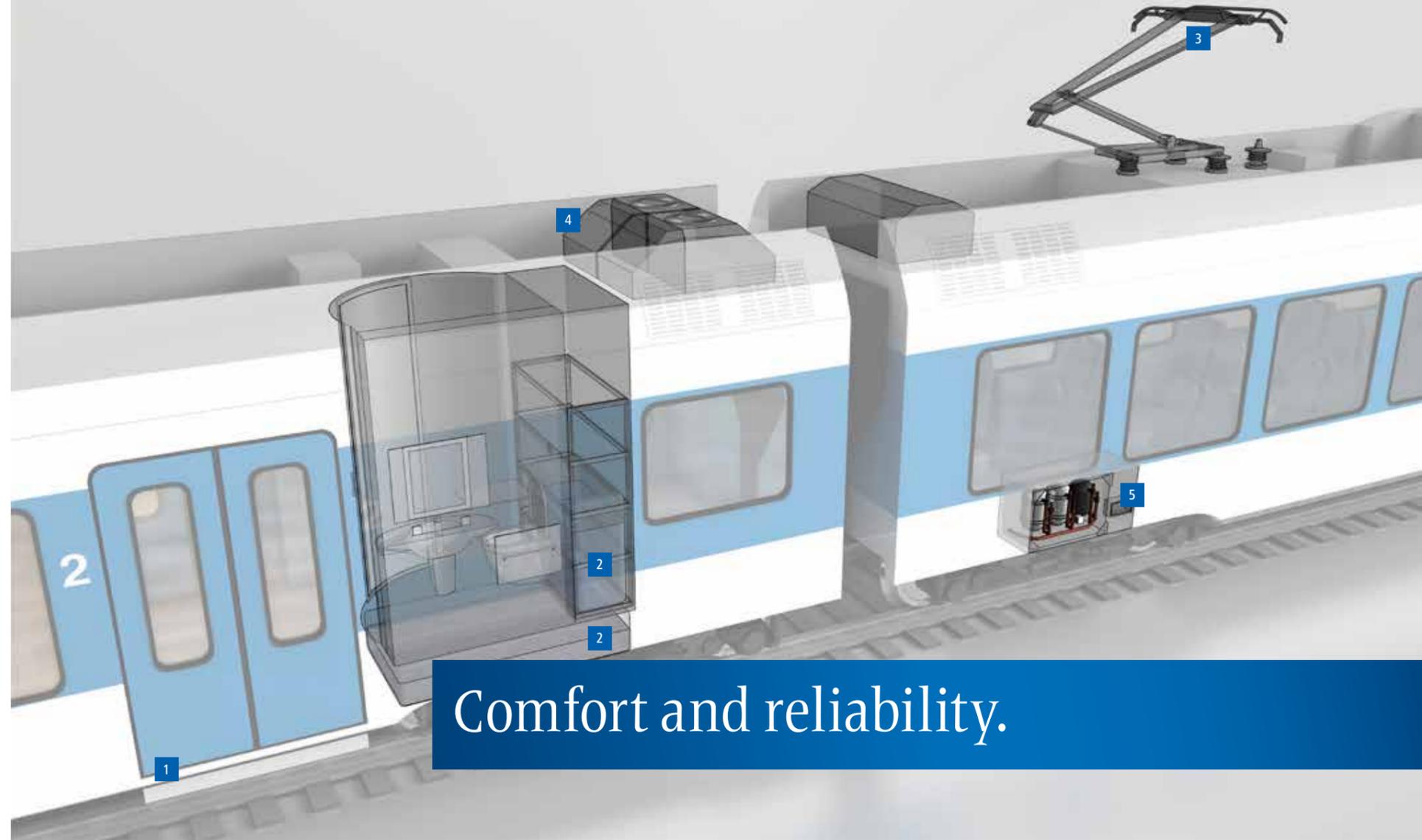
Our level switches *CleverLevel* LBFS that are based on the frequency sweep technology are suitable for high-viscosity fluids as well as for solid or liquid materials. Since they are unaffected by liquid turbulence, sedimentation or air bubbles, or even by foam or suspended particles, they are suitable for even highest demanding applications.

Presence detection.

With sensors from the IFRR and IWRR family, Baumer offers switching and highly precise measuring inductive sensors that comply with the high vibration and shock requirements of railroad standard EN 61373 category 3. Benefits of IFRR and IWRR sensors are their great resistance, even in a very adverse environment, a long service life and flexible installation options, thanks to numerous sensor versions.

The right sensor solutions for each of your railway applications.

- Train protection & control
- Motor current control
- Slip & slide regulation
- Roll-back prevention
- Speed control & evaluation
- Rolling distance measurement
- Sanding system
- HVAC
- Windshield wiper and wash systems
- Water & wastewater tanks
- Overflow protection in toilets
- Cooling circuits



- 1**
- Inductive sensors for position detection (IFRR, IWRR)**
- Meet vibration and shock requirements of EN 61373, category 3
 - Long life time thanks to unique sealing concept *ProTect+* (exceeds IP69K)
 - Large temperature range of $-40^{\circ}\text{C} \dots +85^{\circ}\text{C}$
 - Several sensor variants in M8, M12 and M18 housing
 - Up to 12 mm measuring range



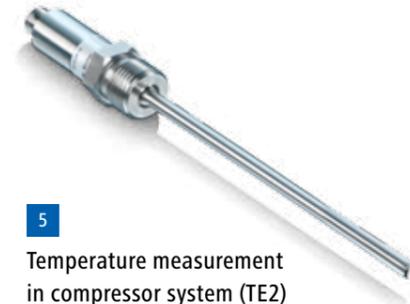
- 2**
- Level sensing in the climate-control system, level control on water and wastewater tanks (*CleverLevel* LBFS)**
- Frequency sweep technology
 - Masking of adhesion and incrustations
 - High sensitivity over a wide temperature range
 - Configurable with FlexProgrammer 9701
 - Conforms to EN 50155
 - Safe operation by high switching point repeatability
 - Maintenance free, robust



- 3**
- Pressure control for functional grip control pantograph (EF6, PBMR)**
- High accuracy over a wide temperature range ($-50^{\circ}\text{C} \dots +85^{\circ}\text{C}$)
 - Conforms to EN 50155
 - Designed for harsh environments
 - High EMC immunity
 - Maintenance free



- 4**
- Pressure control in the climate-control system (CPX)**
- Programmable switching points
 - Two switching outputs
 - High sensitivity over a wide temperature range
 - Corrosion proof
 - Compact design also fits in tight spaces
 - Reliable switching properties
 - Long-term stability
 - Maintenance free



- 5**
- Temperature measurement in compressor system (TE2)**
- Robust and compact
 - Stainless steel housing
 - Output 4 to 20 mA
 - High EMC immunity
 - Programmable
 - Maintenance free

Worldwide presence.

We strive to be close to our customers all around the world. We listen to them, and then after understanding their needs, we provide the best solution. Worldwide customer service for us starts with on-the-spot personal discussions and qualified consultation. Our application engineers speak your language and strive from the start, through an interactive problem analysis, to offer comprehensive and user-compatible solutions. The worldwide Baumer sales organizations guarantee a high level of readiness to deliver.



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India
Indonesia
Israel
Japan
Kuwait
Malaysia
Oman
Philippines
Qatar
Saudi Arabia
Singapore
South Korea
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