



ON TRACK *// FOR GROWTH*

Shaping the transportation technology of the future –
with new standards in convenience, safety and efficiency.



//CONTENTS

Door systems for trains	6
Door systems for buses	7
Platform screen doors	8
Sanitary systems	9
Interiors	10
Communications	11
Air conditioning	12
Service for rolling stock	13
Driver's desk and cab	16
Master controllers	17
Lighting systems	18
Power supply	19
High-voltage components	20
Control and monitoring systems	21
Level crossing systems	24
Railway signal technology	25
Point heating systems	26
Shunting equipment	27
Industrial braking systems	30
Components for industrial trucks	31
Sliding doors	32
Components for wind and solar power ...	33



3

We transport people with maximum comfort and reliability.

In partnership with train, bus and automobile manufacturers, we play a key role in designing the mobility of tomorrow.

We guide trains safely to their destinations

Schaltbau products for railway vehicles are making train travel safer than ever.

We point the way in railway signal technology.

Our pronounced expertise in signal technology makes Schaltbau one of the most successful manufacturers of safety-related technical products in the field of rail infrastructure.

We keep global goods traffic rolling smoothly.

Our systems and components are helping boost supply chain efficiency.

DOOR SYSTEMS FOR TRAINS

Safety every step of the way

Door systems manufactured by the Schaltbau subsidiaries Bode and RAWAG are used in trams and underground trains as well as in regional and high-speed trains worldwide. As suppliers of complete systems, we develop customized door systems based on well-proven assemblies that are characterised by their high availability and long-term reliability in daily use.



▲ The BIDS drive unit can easily be adapted to suit a wide range of sliding door systems and dimensions.

◄ The modular concept is suitable for both single- and double-panel sliding plug doors.

PRODUCT RANGE

BIDS single- and double-panel sliding plug doors

BMS Bode metro sliding door system

HARDI diagnosis software

BISS sliding step systems

DOOR SYSTEMS FOR BUSES

In use throughout the world

Practically all state-of-the-art coach doors are based on a Bode patent – all around the world. The Schaltbau subsidiary manufactures tailor-made door systems with innovative safety technology and well-conceived boarding systems, both as original equipment and for retrofitting. As systems suppliers, we have united a highly capable team of specialists under one roof to provide the entire range of services required in the life cycle of a bus door. Our innovative Compact Allround Drive System (CADS) meets even the most stringent requirements in terms of energy efficiency, durability and availability.



▲ The Bode Electric Easy Door is an inswinging plug door with a proven track record of long-lasting efficiency in the tough daily routine of city buses.

PRODUCT RANGE

Outswinging plug doors

Inswinging plug doors

Sliding plug doors

Folding doors

Swivel doors

Boarding systems

PLATFORM SCREEN DOORS

Perfect timing

Platform screen doors are widely used on metropolitan underground train lines, where large numbers of passengers need to be guided with maximum safety in a minimum of time. They make for shorter cycle times and smooth, reliable metro movements with greater convenience and safety than ever. The platform screen doors (PSD) produced by Schaltbau's subsidiary PINTSCH BAMAG are certified in accordance with international Safety Integrity Level (SIL) 3 standards. In order to maximise passenger safety, the platform screen doors can be wirelessly synchronised with the train door system.



▼ PINTSCH BAMAG platform screen doors in action in Shenyang, China.

PSD COMPONENTS

Interruption-free power supply

Control units and monitoring terminals

Universal, autodidactic door controls

SANITARY SYSTEMS

A clean solution

Convenient on-board toilets are an important factor in the passenger experience. The Schaltbau subsidiary ALTE Technologies develops and manufactures integrated toilet modules especially designed for trains. Special-purpose solutions can also be supplied, such as for passengers with mobility restrictions. The complete modules comprise the patented permanent vacuum system, tanks for fresh water and wastewater and also cabins with modern conveniences and automatic door systems, specially designed to meet customer requirements.



▲ ALTE Technologies supplies complete toilet systems – including the cabin.

PRODUCT RANGE

Toilet modules (standard)

Universal Accessible Toilet modules

(UAT) Vacuum systems

INTERIORS

Everything in the right spot

Everything safely stowed away? Not a problem with the luggage and hat racks designed and manufactured by Bode subsidiary RAWAG. The Poland-based company also manufactures sidewalls, cabinets, stairs and railings as well as windows and doors for driver's cabs and railway carriages. The company focuses on producing well-tailored, durable solutions using ecologically friendly materials.



▲ RAWAG specialises in low-cost interior furnishings and metal fittings.

PRODUCT RANGE

Interior door systems, windows, stairs and railings

Luggage racks

Interior walls, panels, cabinets

COMMUNICATIONS

Always well informed

Its cooperation with the Spanish company Albatros has enabled the Schaltbau Group to broaden its product range to include acoustic and visual on-board communication and information systems for both passengers and train crew. These systems make everything from timetable information to operating data for maintenance purposes available throughout the entire train.



▲ The communications and information systems are all centrally controlled

PRODUCT RANGE

Passenger information systems (PIS)

TFT video systems

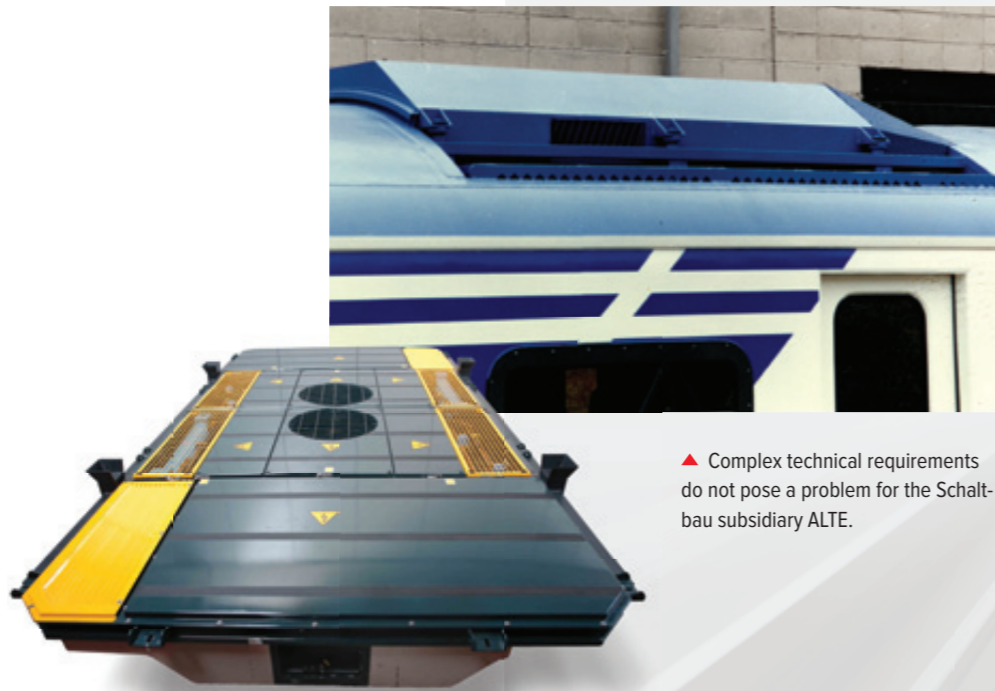
Multifunctional cabin terminals

CCTV systems

AIR CONDITIONING

Ideal temperatures

Air conditioning systems made by ALTE make sure that temperatures on board are always pleasant, both on cold winter days and in the middle of summer. As a niche provider, ALTE focuses on custom-designed products for technologically complex projects. The air conditioning solutions can be adapted for all types of trains and are suitable for both roof and chassis installation. Trains can also be retrofitted – a highly practical option for emerging markets, where only a small percentage of fleets are currently air-conditioned.



▲ Complex technical requirements do not pose a problem for the Schaltbau subsidiary ALTE.

PRODUCT RANGE

Roof-mounted HVAC unit

Underframe HVAC unit

Split or compact design

SERVICE FOR ROLLING STOCK

High added value for outstanding customer benefit

Rolling stock is usually developed for a service life of 30 years. However, during their life cycles, vehicles need to be continuously adapted to meet changing customer needs and increasingly strict safety requirements. The Schaltbau subsidiary PINTSCH BAMAG provides vehicle-specific solutions and adaptations, individually tailored to suit the refurbishment requirements of each vehicle type.

In addition, our UK-based company RDS provides its own teams of specialists for maintenance, servicing and modernisation for the entire service life of each vehicle, minimising the operator's total cost of ownership across the life cycle.



▲ The RDS maintenance experts ensure that the train doors always function reliably.

RANGE OF SERVICES

Overhauls and modernisation

Installation and commissioning

Seminars and training

CONTROL TECHNOLOGY MOVING TRAINS

Schaltbau makes sure trains arrive safely and reliably at their destinations. We guarantee the correct operating voltage, an ideal view of the track ahead and reliable control instruments. Our collaboration with Albatros has allowed us to expand our range of services in this field quite considerably. Our partnerships with systems suppliers enable us to ideally combine products and services and provide them from one single source.



MASTER CONTROLLERS
Always safely under control



DRIVER'S DESK AND CAB
Fully integrated



LIGHTING SYSTEMS
Innovative track illumination developed in our high-tech laboratory



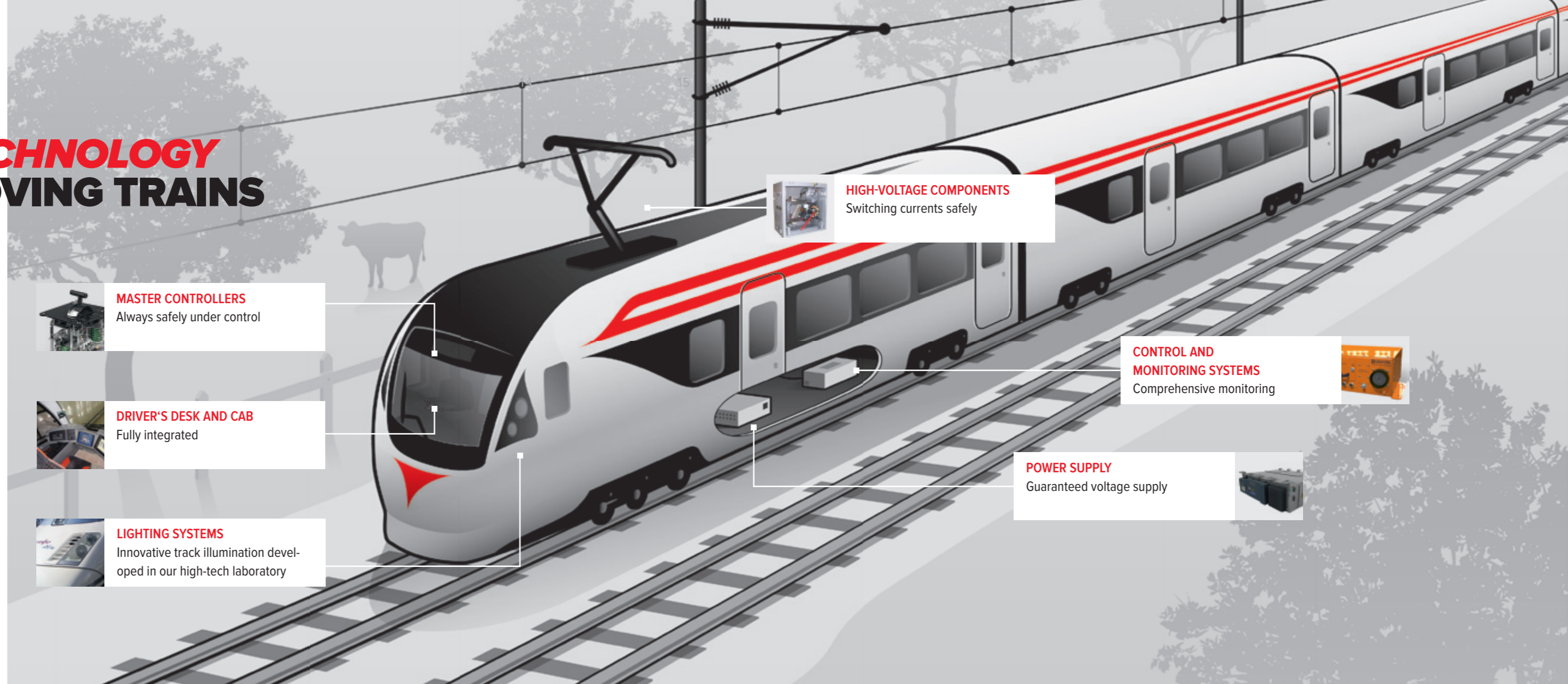
HIGH-VOLTAGE COMPONENTS
Switching currents safely



CONTROL AND MONITORING SYSTEMS
Comprehensive monitoring



POWER SUPPLY
Guaranteed voltage supply



DRIVER'S DESK AND CAB

Fully integrated

A growing number of control and monitoring systems are being operated directly from the driver's cab. SPII integrates all of these subsystems in its driver's cabs via a bus network that provides CAN and MVB interfaces for all subsystems and enables bidirectional data exchange. SPII supplies its driver's desks fully pre-wired, including all electromechanical and electronic components, making them particularly quick and simple to install. The SPII integrated solution is available for all train types.



▼ SPII integrated systems significantly reduce assembly time.



PRODUCT RANGE

Preparatory ergonomic studies

Complete driver's desks

Master controllers

Subsystems with field bus connection and/or vehicle portal

MASTER CONTROLLERS

▼ Schaltbau master controllers are of outstanding quality when it comes to safety, reliability and durability.

Always safely under control

Rail vehicles around the world are reliably controlled using outstanding technology made by Schaltbau: trams and underground trains, shunting engines and diesel trains, heavy goods locomotives and high-speed trains. The master controllers can be assembled according to the modular design principle – using a combination of proven and new functional groups, keeping design times to a minimum and allowing for individual adaptations.



PRODUCT RANGE

Master controllers and toggle switches

Key-operated and dead man's switches

Emergency brake handles

Acoustic signal transmitters

LIGHTING SYSTEMS

Innovative track illumination developed in our high-tech laboratory

PINTSCH BAMAG lighting systems are fitted in trains throughout the world – and perfectly adapted to the respective type of vehicle as well as the applicable standards. The products are tested in the company's own lighting laboratory, one of the few accredited testing facilities in Germany. Most recently the key focus has been placed on developing compact light modules with a defined cut-off line, which will greatly improve track illumination for German Railways' new ICx fleet.



▲ LED headlights guarantee high availability for the operator and make it possible to incorporate unusual designs.

PRODUCT RANGE

Signal lights

Taillights

Special-purpose lights

POWER SUPPLY

Guaranteed voltage supply

Single- and multi-voltage systems with their core element, the high-voltage converter, guarantee a safe, reliable on-board power supply. They supply electrical consumers, such as air conditioning systems, and make sure the vehicle's batteries are charged as well as meeting all requirements of cross-border rail traffic. The units can be installed either in the roof or in the chassis.



▲ High-voltage power converters supply all of the electrical consumers on board with energy.

PRODUCT RANGE

Power converters

Battery chargers

HIGH-VOLTAGE COMPONENTS

Switching currents safely

Schaltbau and SPII develop and manufacture high-quality switches and contactors specifically designed to meet the exacting standards of the rail sector and are capable of safely controlling the high currents and different voltages used in cross-border rail traffic. The products can all be individually configured and are suitable for any type of vehicle.



PRODUCT RANGE

Contactors

Earthing switches

Switch disconnectors

▼ Schaltbau switch disconnectors, contactors and earthing switches (f.l.t.r.) exhibit outstanding quality and performance.

CONTROL AND MONITORING SYSTEMS

Comprehensive monitoring

Our Spanish partner Albatros supplements our product portfolio with train control and management systems (TCMS), brake assistance and control, event recording, vehicle-to-ground communication and power measurement systems. These systems operate in the background, ensuring the smooth flow of data between the various subsystems as well as between the vehicle and the electronic systems in the tracks.



▲ Long-term video recorders in HD quality and crash-proof event recording

PRODUCT RANGE

TCMS and brake assistance

Vehicle-to-ground communication

CCTV and event recording

//RAIL INFRASTRUCTURE POINTING THE WAY

Rail infrastructure technology made by Schaltbau plays a key role in making sure that trains arrive both safely and on time. We secure railway crossings, coordinate rail traffic with our signal systems and axle counters and make sure that points stay free of ice in winter. Our wealth of experience and high safety standards make us the partner of choice not only for German Railways, but also on foreign markets, where our products are enjoying growing demand.

SHUNTING EQUIPMENT
Greater efficiency on the track



POINT HEATING SYSTEMS
Always effective, despite snow and ice



RAILWAY SIGNAL TECHNOLOGY
Perfect coordination



LEVEL CROSSING SYSTEMS
Crossing railway lines with safety



LEVEL CROSSING SYSTEMS

Crossing railway lines with safety

Securing the intersections of railway lines and roads requires an outstanding level of reliability and availability. In addition, a level crossing needs to be easy to operate and maintain. PINTSCH BAMAG level crossing systems guarantee all of these things. We develop, produce, install and maintain complete level crossing systems, including transformer houses or electric switchboards, power supply, battery charging equipment and exterior components.



▼ PINTSCH BAMAG level crossing systems guarantee the utmost reliability with low investment and maintenance costs.

PRODUCT RANGE

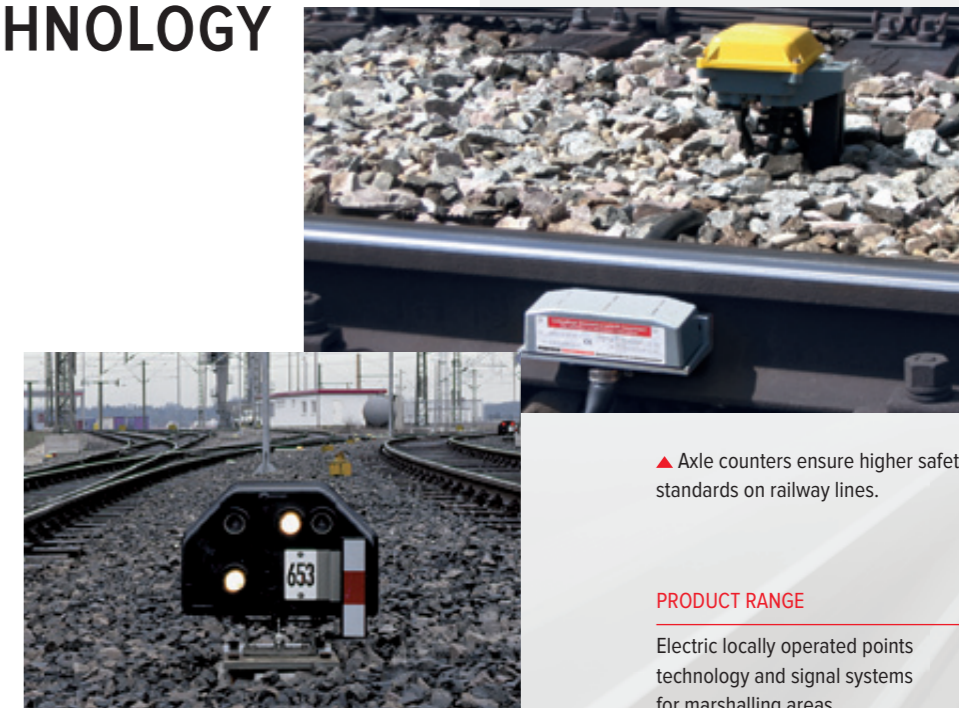
Computer-controlled level crossing technology (RBUEP/RBUET)

Level crossing components
Signal technology components

RAILWAY SIGNAL TECHNOLOGY

Perfect coordination

With PINTSCH TIEFENBACH signal technology systems, points and signal systems can be controlled and monitored automatically, both centralised and decentralised. Axle counter systems are used to determine whether sections of a railway line are occupied or clear, considerably reducing the workload of the locomotive and shunting staff on the ground. Moreover, the technically supported train control system significantly reduces the risk arising from human error.



▲ Axle counters ensure higher safety standards on railway lines.

PRODUCT RANGE

Electric locally operated points technology and signal systems for marshalling areas

Remote control systems for relay signal boxes

Technically supported train control operations

Axle counter systems

POINT HEATING SYSTEMS

Always effective,
despite snow and ice

PINTSCH ABEN point heating systems ensure that trains always run smoothly, even at below-zero temperatures in winter. Weather stations equipped with temperature sensors measure the weather conditions and temperatures and automatically turn the power supply on or off. Operating and monitoring are carried out either locally, via remote control or from higher-level control systems. Moreover, PINTSCH ABEN supplies all commonly used industrial standard protocols, enabling perfect cooperation between the various systems and precise remote diagnoses.



▼ Point heating systems prevent track bifurcations and crossings from freezing.

PRODUCT RANGE

Electric point heating systems

Gas-infrared point heating systems

Geothermal point heating systems

SHUNTING EQUIPMENT

Greater efficiency
on the track

PINTSCH TIEFENBACH hauling and shunting equipment serves to automate train marshalling, handling and loading processes. Rope traction-operated shunting cars are used, which are attached to the wheelsets of the various railcars to transport, decelerate and position them as required. The rope traction units are driven by base stations that are controlled by state-of-the-art frequency converter technology



▼ Shunting cars move carriages into the required position with speed and efficiency.

APPLICATIONS

Train formation systems

Wash lines

Loading and unloading stations

LOGISTICS AND INDUSTRY MOVING HEAVY LOADS



INDUSTRIAL BRAKES

High performance for large-scale drive systems



SLIDING DOORS

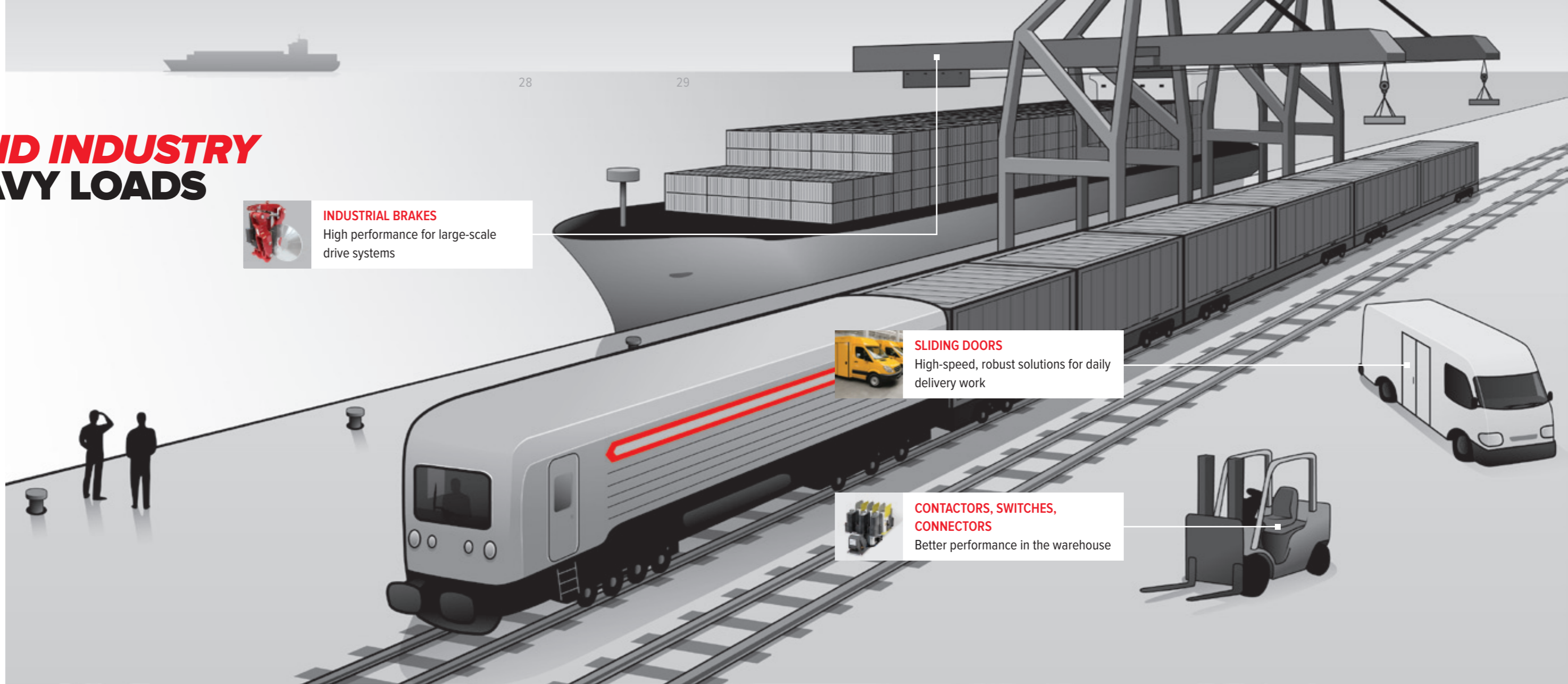
High-speed, robust solutions for daily delivery work



CONTACTORS, SWITCHES, CONNECTORS

Better performance in the warehouse

From the ship onto the goods train, via forklift to the warehouse and from there directly to the final destination via delivery van. Global supply chains need to run like clockwork. Schaltbau systems and components play an important role in making sure they always do – in ports, on rails, in warehouses and on the final short trip to the customer.



INDUSTRIAL BRAKES

High performance for large-scale drive systems

PINTSCH BUBENZER high-strength quality brake systems are used in both stationary and mobile applications, wherever large-scale drive systems need to be controlled with outstanding safety and precision. As market leader in the field of goods handling, PINTSCH BUBENZER has cooperated closely with container terminal operators, crane manufacturers and equipment suppliers for many years. Furthermore, PINTSCH

BUBENZER is one of the technologically leading suppliers of brake systems for rail loading stations, shipbuilding and offshore technology, mining, the steel industry, wind power, mechanical engineering and special-purpose vehicle manufacturers. The after-sales services that PINTSCH BUBENZER provides worldwide increase availability through preventive maintenance, quick spare parts delivery, and installation – around the clock.



▼ PINTSCH BUBENZER brakes are made to meet the most stringent quality standards.



PRODUCT RANGE

Service brakes, emergency brakes, storm brakes

Motor-integrated brakes

Couplings, buffers, anti-slag systems

Monitoring systems and brake control devices

Accessories

COMPONENTS FOR INDUSTRIAL TRUCKS

Better performance in the warehouse

Forklifts are becoming increasingly intelligent and need to perform better than ever. Schaltbau helps both manufacturers and operators to develop sustainable products capable of outstanding performance with a minimum of energy. Our modular charging connectors, which transport both current and data, are helping to make fleet management more economical. Contactors and combination contactors made by Schaltbau can be perfectly integrated in the modular concept of state-of-the-art industrial trucks and our snap-action switches meet the highest safety standards.



▼ The right contactors for every forklift – also available as combination contactors.

PRODUCT RANGE

Charging connectors

DC and combination contactors

Snap-action switches

SLIDING DOORS

High-speed, robust solutions for daily delivery work

Decades of experience, excellent quality awareness and the use of leading-edge technology all go towards making Bode a leading supplier of electric and mechanical sliding doors for a range of vans and delivery vehicles. In the course of development we benefit greatly from ideas that originated in our bus and rail business fields, enabling us to produce door systems that meet the highest standards in terms of economy,

durability and safety. Automotive manufacturers appreciate us both as series suppliers and as strategic development partners. We create custom-designed solutions to suit the varying requirements of delivery van fleets and special-purpose vehicles. We assist our customers in forming an initial concept, developing the specific product, manufacturing it and then providing after-sales service. die Produktion bis zum Aftersales.



▼ Metro drives in delivery vehicles open doors at high speed.

PRODUCT RANGE

Sliding doors and guide systems for box bodies

Guide systems for the sliding side doors of delivery vans and cars

Sliding doors for special-purpose vehicles

COMPONENTS FOR WIND AND SOLAR POWER

Innovative technology for generating clean energy

Drawing on its comprehensive technological expertise, Schaltbau has entered new markets in the field of renewable energy, as both wind turbines and photovoltaic plants rely on robust, reliable components and systems: contactors that safely and reliably control high currents, snap-action switches with double contacts and positive opening that comply with the highest safety standards and rotor brake systems that guarantee reliable operation with a minimum of maintenance.



▼ Contactors used in railway technology are also key components in photovoltaic systems.

PRODUCT RANGE

Contactors for solar installations

Snap-action switches for photovoltaic tracking systems and wind turbines

Charging connectors for battery storage systems

Brakes, rotor locking systems and monitoring systems for wind turbines

SCHALTBAU HOLDING AG

Hollerithstr. 5
D-81829 München
www.schaltbau.de

GEBR. BODE GMBH & CO. KG

Ochshäuser Str. 14
D-34123 Kassel
www.bode-kassel.com

PINTSCH BAMAG

Antriebs- und Verkehrstechnik GmbH
Hünxer Str. 149
D-46537 Dinslaken
www.pintschbamag.de

SCHALTBAU GMBH

Hollerithstraße 5
81829 München
www.schaltbau-gmbh.com

PUBLISHER

Schaltbau Holding AG
Hollerithstr. 5
D-81829 München
Tel.: +49 (0) 89/930 05-0
Fax: +49 (0) 89/930 05-350
www.schaltbau.de

CONCEPTION AND DESIGN

ergo Kommunikation

PRINTING

schmitz druck & medien GmbH & Co. KG

PHOTOS AND ILLUSTRATIONS

INTO Branding, gettyimages, Shutterstock