Bode. Die Tür.
System solutions for buses.
This much. is certain.

Industrial production – Made in Germany
– Excellent quality through advanced production methods (Lean Production)
– Semi and fully automated production processes
– Automated warehousing system

Standardised development, components & systems
– Standardised product development process (PDP)
– Modular door systems and components (electric, pneumatic and mechanical)
– Rigorous testing and review procedures to monitor product and quality convergence
– Comprehensive technical documentation, certificates and registrations

Software development & support
– Electronics and software development
– Diagnosis & control management systems
– Integrated sensor technology as the basis for smart door systems

Efficient & long-term cooperation
– Designated contact persons in project and customer teams
– Outcome-oriented development and project processes
– Comprehensive employee expertise from initial inquiry to series production

Economic efficiency
– Competitive pricing combined with low life-cycle costs on the basis of high quality, reliable performance and effective customer service
– Monitoring of product cost and identification of cost-reduction potentials

Knowledge at the interface to the customer
– Exchange with user groups and associations of public transport services
– Research & development in collaboration with institutions and universities
– Organisation of association meetings and workshops

Less weight, more stability, compact designs
– Use of aluminium & composites for increased stability and performance
– New, lightweight door systems for self-driving vehicle concepts
– Plug & Play solutions for easy, low-space, high-speed installations

Trend-setting development
– Solutions for new e-mobility customers (e.g. Street Scooter)
– Development expertise to meet new demands and mobility trends
– Application and utilisation of intelligent sensor systems

The Schaltbau Group – Taking door systems to the next level
– Products and intelligent sensor systems for innovative applications for (e)mobility and infrastructure
– Systems and services designed for minimal life-cycle costs
– Driving force for new trends and technologies

Schaltbau AG revenue (€ – millions)

Strength, availability and global presence
3,300 employees
35 worldwide locations in the Schaltbau Group

Fast response times and uncompromising commitment
– Worldwide delivery of services
– Direct contact and availability
– Fast-response problem solving

Easy maintenance
– Service-friendly designs
– Intelligent diagnostics
– Multilingual technical documentation

Seamless logistics
– Just-in-time – assembled to your specifications
– Reusable transport racks
– Fast and reliable spare parts logistics for long-term support

System solutions for buses
We are. intelligent.

Engineering expertise.

Industrial precision

Our door systems deliver dimensional accuracy and reliable functionality throughout the entire product life cycle. The high level of quality is driven by a policy of continual investment in our production, infrastructure and processes. At our production facility in Kassel, Germany, we use of lean production techniques that are standardised and semi- or fully automatic. In this way, we ensure that our products do exactly what is expected of them, even under the most demanding conditions of use.

Customer-focused strengths

In developing door systems we are not satisfied with anything but the very best solutions. Bode has numerous patents in kinematics, electrical drives and networked systems. This same technical expertise goes into the development of each new project. Reliability throughout the entire product life cycle comes from Bode’s comprehensive planning, design and testing processes. For each of our products we verify the safety of the design (FMEA) in hardware and software in accordance with all relevant legal requirements as well as individual standards.

Exclusive software solutions

Software has to work. Not sometimes – always. The best basis for this is when the developed software matches to the installed components and the mechanical requirements of the door system. This is the task of Bode’s software development department. Working closely with all functional departments, our software developers deliver dedicated applications which are used exclusively for our Bode systems.

Satisfied passengers

The door is the interface with the passenger. We have an essential obligation to always have the passengers’ needs in mind in everything we do. Safety and comfort come first on the list. We focus on new trends and passenger wishes. And we also incorporate our cross-industry know-how from the rail, bus and automotive sectors in realising our projects to develop door systems.
We are. cooperative.
Pursuing partnership.

Efficient collaboration
For us, working for optimal outcomes means running our projects with our customers with a focus on efficiency and quality. Our project management enables our teams to better converge towards serial release and sign-off. We assign dedicated contact persons to each customer, who are responsible to secure that all requirements are met. We develop customised solutions quickly, confidently and routinely around the world. Based on the standardized product development process (PDP) our programm management is the driving force for further successful business growth.

Flexible organisation
In our work with customers we aim to establish long-term partnerships. To this end, we pledge to provide maximum on-time delivery and consistently high quality, linked to clear and binding costs and budgets. We see our ability to respond flexibly and pragmatically to wishes and changes in the course of a project as an important competitive advantage.

Economic efficiency
Our customers value Bode products due to their proven reliability in long-term use. The Bode brand has built its reputation over many years. We pursue the goal of highest quality in everything we do – from development to world-wide sourcing of materials to serial production. Our goal: To achieve the highest possible reliability with the lowest possible life-cycle costs.

Reciprocal exchange
Regular meetings with representatives of associations and other institutions of public transport services enable us to anticipate trends and developments within the area of the mobility industry. Thinking together from the very beginning helps us and our customers to meet the demands and requirements of future vehicle applications and systems.
Innovative partnerships
In order to develop new systems and solutions, we start our pre-development even before we get an order from our customers. We have been searching for new and innovative solutions for 50 years and we are one of the drivers in the door system industry. This is visible in the numerous patents that we hold, which customers can make use of as necessary in the development of new systems for doors and boarding systems. We strive to be a step ahead of our competition through the input of the Schaltbau Group and the cross-industry collaboration. This expertise and experience in door systems for road and rail applications represents the basis for the successful realisation of projects. We are your reliable partner: From initial development to final production, with agile and reliable spare parts logistics and customer support services.

Forward-looking development
eMobility, digitisation and self-driving vehicles. These are topics that are shaping our common future. Today we are working on key aspects of these subjects which will be leading to decisive changes in how people and goods are transported in the coming years. It’s becoming a “smart” world. Previously unimaginated opportunities are opening up for innovative product solutions. At the same time, new challenges are arising in connection with safety, data protection, and the integration of vehicle components in public transport. In our research and development – across a range of industries and always with a close eye on the market – we are dealing with these issues and are involved in a dynamic process of knowledge transfer with our customers, service providers and with selected institutes and universities.

Reduced weight
Lightweight construction is of central importance in the areas of electrification and digitalisation. In our pre-development, we focus on reducing the weight of our door systems and thus to increases in the mileage of new electric vehicle systems. We see our lightweight construction expertise as a competitive advantage for our customers.

Integration and synergies
As part of the Schaltbau Group, we benefit from know-how transfer from our affiliated companies. Through close cooperation we have a in-depth understanding of vehicles and transport systems from drive systems to decoration accessories within the mobility industry. Our know-how and the intelligent use of synergies within the Schaltbau Group make it possible for us to grasp all of the requirements of new developments and trends in collaboration with our customers.
We are. prepared.
Delivering service.

Quick-response service
Our service team provides support throughout the entire life cycle of our systems – from the initial installation in new vehicles to the overhaul of entire vehicle fleets. We offer training programmes which put your personnel in the position to ensure long-term economical operation of Bode door systems. Our service team provides on-site support world-wide. We help our customers in case of any problems in a straightforward way.

Problem-free maintenance
Maintenance and service times should be reduced to a minimum. For this reason, we are already thinking about service-friendly planning and easy accessibility during the design phase of our products, and provide computer-aided maintenance options with our HARDI diagnostics tool. We also provide the technical documentation necessary for maintenance and service.

Seamless logistics
Efficiency is created when processes mesh perfectly. In cooperation with our customers, we pay special attention to develop services which function as smoothly as possible. Under the aspect of service, we also have a special focus on logistics. First and foremost this means cost-effective and secure transport of goods to the intended destinations. Together with our customers we define exactly what the requirements are and then implement them on time. Not only for door systems but also with the swift and sure supply of spare parts.
IST-E CADS® | IST-P.
Inward swinging doors.

Electric inward swing doors with CADS®, IST-CADS®

With IST-CADS® you have a system that provides all the advantages of CADS® – from easy installation to low-maintenance operation. In addition, you save approximately 8 kg in weight compared to an inward swinging door with conventional electric drive. CADS® IST "snap on" – saves weight, time and up to 0.33 litres of fuel every 100 km for each door system.

Clear width 750 ≥ 1,200 mm
Drive Electric
Maintenance frequency Maintenance-free
Use From -30°C to 80°C
Locking unit Locking secured via integrated brake in CADS® drive
Control unit / diagnostics WABCO or Bode Control Unit TA 12-24
Sensor system Pressure wave or sensitive edge in the primary closing edges / intelligent position sensor in CADS®

IST-P
Pneumatic inward swinging doors

You can rely on the IST-P system with its proven Bode quality in all components. Damping and speed can be set as required.

Clear width 750 ≥ 1,200 mm
Drive Pneumatic
Maintenance frequency Maintenance-free
Use From -25°C to 70°C
Control unit / diagnostics WABCO or Bode Control Unit TA 12-24
Sensor system Pressure wave or sensitive edge in the primary closing edges / position sensor on locking column

AST-P | AST-E.
Outward swing doors.

AST-P
Pneumatic outward swinging doors

The Bode AST-P door system has demonstrated its high quality over decades of use in vehicles around the world. Especially at speeds between 80 km/h and 120 km/h, this secure and reliable door system has been satisfying customers with its excellent sealing performance for more than 40 years.

Clear width 750 ≥ 1,200 mm
Drive Pneumatic
Maintenance frequency Maintenance-free
Use From -25°C to 70°C
Locking unit Locking secured via lifting movement in lifting wedges and / or operating pressure
Control unit / diagnostics WABCO or Bode Control Unit TA 12-24
Sensor system Pressure wave or sensitive edge on the primary closing edges / potentiometer on the locking column

AST-E
Electric outward swinging doors

The Bode AST-E door system has demonstrated its high quality over decades of use in vehicles around the world. Especially at speeds between 80 km/h and 120 km/h, this secure and reliable door system has been satisfying customers with its excellent sealing performance for more than 40 years.

Clear width 750 ≥ 1,200 mm
Drive Electric
Maintenance frequency Maintenance-free
Use From -30°C to 80°C
Control unit / diagnoses WABCO or Bode Control Unit TA 12-24
Sensor system Pressure wave or sensitive edge in the primary closing edges / potentiometer on the locking column

System solutions for buses

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Drives and locking units.
Robust. Lightweight. Secure.

Highly reliable drives
The CADS® drive made by Bode proves its worth in practice every day. Its installation is exceedingly simple. The curved ceiling area of the vehicle remains free with the CADS® drive, allowing you more design options. Thanks to the modular construction and the preset emergency release, outlays for installation and configuration are considerably reduced.

- Significant savings in operation thanks to low servicing and energy requirements
- One-click prior to the first use and CADS® configures itself automatically.
- CADS® adjusts itself and learns to position itself correctly with each run.

Secure locking unit
The locking unit of the drive and the additional locking system of the columns ensure a secured fixation of the door system under operation, even under the worst road conditions.

HKR Manual ramp
The quick and easy solution for city buses. The installation of the manual ramp requires minimum effort and can also be retrofitted with a properly prepared undercarriage. The corrosion-free housing made of stainless steel ensures that the manual ramp will be exceedingly durable. The ramp’s water outlet and slip-resistant tread plate provide problem-free operation in everyday use.

- Tread plate: 977 mm x 905 mm
- Total system weight: Approx. 19 kg
- Maintenance frequency: Maintenance-free
- Use: Maximum 350 kg load capacity
- Locking unit: Self-retaining and via motor short-circuit
- Control unit / diagnostics: Bode TA 12-24 Control Unit
- Sensor system: Integrated step and obstacle detection, electronically controlled retention system, optional additional safety diagnostics

HLR | ALR-IV.
Boarding aids.

HKR | ALR-IV.
Electric ramp
Maximum floor clearance for urban and inter-city bus routes. The electric ramp with Bode’s own control unit is a robust alternative to under-chassis ramps. It is based on standard Bode components; optimised materials make it highly corrosion resistant. The modular cartridge design ensures quick and easy installation directly in the vehicle floor.

- Tread plate: 850 mm x 690 mm
- Total system weight: Approx. 42 kg
- Maintenance frequency: Maintenance-free
- Use: Maximum 350 kg load capacity
- Control unit / diagnostics: Bode TA 12-24 Control Unit
- Sensor system: Integrated step and obstacle detection, electronically controlled retention system, optional additional safety diagnostics

Powerful drive motor with intelligent position detection
Smart CAN/CAN open-compatible Bode Control Unit or alternative WABCO unit
Modular drive carrier with integrated guide rail and service button
Standardised pneumatic drive with efficient functional elements
3-railer locking unit (SST)
Positive locking unit (SST)
**SST-E**

**The new generation.**

The new generation of sliding plug doors from Schaltbau Bode is especially designed for bus manufacturers and for manufacturers working on new self-driving vehicle concepts. The aim of the new SST-e generation is to radically simplify the complete door system and in particular to reduce the system's weight. Other important features of the new system are its improved reliability, a simple and robust method of door installation with excellent adjustability, combined with exceedingly simple maintenance of the door systems during vehicle operation. The result is a new generation of sliding plug doors.

**SST-E Electric sliding plug doors**

Key characteristics of this door system:

- No-loss, super smooth belted drive
- Dead centre regulated locking system
- Optimised movement for opening and closing (Soft Closing)
- Reduced noise during opening and closing
- Common and/or separate operation of door panels (optional)
- Diagonal positioning of one or both door panels (optional)

A convenient compact design featuring reduced weight for lower energy consumption rounds out the benefits of this new trend-setting door system from Schaltbau Bode. The prototype is presently patent pending. The concept is in final review prior to implementation in the first customer projects.
Next Stop: Future.
Smart Door Systems

Intelligent door systems for self-driving shuttle buses and other vehicle concepts

The potential for new, innovative city bus concepts is extraordinarily high in expanding urban areas with growing populations. The BRT (Bus Rapid Transit) routes enable cities to implement electric self-driving buses and vehicles at very low investments compared to underground network services.

Without a driver, operating costs can be cut by more than 50 percent depending on the fleet and type of operation. The investments for self-driving buses and their infrastructure are significantly lower than investments in underground networks. Autonomous city buses and vehicles will provide new functions and features that previously were not possible. They will reach new groups of passengers. Intelligent, self-driving and electrically powered. These vehicles detect situations while in use so that they can immediately adjust to traffic conditions.

Product and Process Development (PDP)

The product and process development plan defines the workflow from the initial idea for a new product through to the serial production. Our focus is to develop robust products for serial production which meet all customer requirements throughout the product life cycle.
Intelligent door systems for a new generation of city buses

The new Smart Door System from Schaltbau Bode has been designed to meet exactly these requirements. This system is intelligent, lightweight and electrically powered. It monitors passengers entering and leaving the vehicle, and when and where a ramp needs to be deployed for persons with wheel chairs or baby carriages.

The concept is modularly constructed so that it can be used for city buses of the present generation as well as for self-driving and electrically powered shuttle systems of the future. A key element of this door system is the BMUplus, or Boarding Management Unit plus. This unit is equipped with an interior and exterior sensor system that monitors the area inside and outside the vehicle for movements and persons.

Next Stop: Future. Smart Door Systems

**BMUplus Functions and characteristics**

- **BMU, interior / exterior**
  - Monitoring of boarding and deboarding for the primary closing edges
  - Optional: Monitoring and control of a button area

- **BMU, exterior**
  - Monitoring of the surrounding area and the exterior closing edges
  - Monitoring and control of the electric ramp
  - Monitoring of the surrounding area for pre-deployment of ramps

- **BMU, interior**
  - Monitoring of the vehicle interior in preparation for deboarding
By rail or by road – door systems from “Bode. Die Tür.” are in use around the world. These reliable, robust and increasingly intelligently networked systems are designed by Bode as the interface with the passenger.

For now more than 50 years we have been the interface to the passenger. By rail, by road – wherever our experience can help to provide safe and reliable door systems. Safety and reliability are key characteristics of all the door systems we deliver. On the one hand, safety for the passengers. On the other, reliability in failure-free operation. The door systems must be robust and lightweight at the same time to meet demanding requirements for energy-optimised performance.

From the initial idea through to industrial production in small and large series – many brands trust our knowledge and our quality. A selection of Bode references is shown on the following page.
With German engineering and efficient industrial production, Schaltbau Bode implements door systems for vehicles all over the world. Despite our high degree of product, software and process standardisation, we are pleased to actively maintain a corporate culture that has the positive features of a medium-sized, family-run company – built step by step over more than 50 years. Many of our staff belong to families that are in their second generation as Bode employees. You can feel this bond in our company through the commitment and enthusiasm of our workforce.

Our development department makes use of successful solutions from a wide range of areas which can be innovatively applied in new situations. From the tailgate door of an automobile to the fully networked door system in a high-speed train – we have knowledge acquired from multiple projects and markets around the world. Our aim is to provide failure-free door systems. Intelligent networked systems help to ensure that materials and energy are used sparingly and far-sightedly. One example of this is our Smart Door System which can be used in conventional city buses as well as with new, self-driving vehicle concepts. This system’s weight-saving design increases the mileage of electric vehicles, and its smart functionality brings a new level of safety for boarding and deboarding.

Worldwide, fast-response delivery service with just-in-time supply of complete systems, ready-assembled for quick and easy installation – all of this is business as usual at Bode.

From our headquarters in Kassel, Germany, we transport our high standards and our technical expertise to customers worldwide. As part of the Schaltbau Group, we understand vehicles through and through – a door is the first moment in which you experience the quality of a vehicle. Having a decisive role in this quality makes us proud.