

[www.schaltbau-bode.com](http://www.schaltbau-bode.com)



**Bode. Die Tür.**  
System solutions for buses.





# This much. is certain.

## Industrial production – Made in Germany

- excellent quality due to advanced production
- cost efficient lean-production
- high degree of automation

## Standardised components & systems

- entrance systems – electric, pneumatic & mechanical
- extensively validated components and systems
- comprehensive documentation, approvals and certifications

## In-house software development & support

- HARDI & MTB3 diagnostics & control management systems
- BMUplus, the Bode Boarding Management Unit
- high degree of system compatibility thanks to in-house development

## Efficient & long-term cooperation

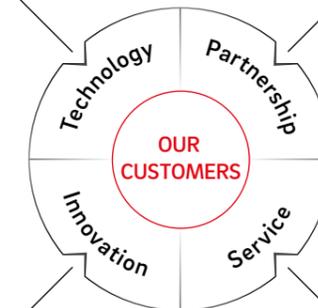
- designated partners in many countries
- customer and result orientated
- high level of know-how due to low employee fluctuation

## Life-cycle costs

- market-driven prices for a product life – thanks to high quality, long & reliable useful life and effective service
- compliant and flexible to your requirements

## Knowledge at the interface with the passenger

- exchange with user groups and associations
- research & development collaboration with institutions and universities



## Less weight, more stability, compact design

- use of aluminium & composites with simultaneous increase in stability and useful life
- "Plug & Play" – small installation spaces and short installation times

## Trend-setting development

- e-mobility pioneer
- development expertise for the highest requirements
- intelligent sensors and networked systems

## Schaltbau Group – taking the vehicle to the next level

- cross-system products and intelligent sensors
- long-term availability of systems and services
- leader of new technologies and initiator of trends

## Fast response and uncompromising commitment

- worldwide services
- direct contact and availability
- fast-response problem solving

## Easy maintenance

- service-friendly design
- intelligent diagnostics
- multi-lingual technical documentation

## Smooth logistics

- just-in-time – assembled to your specifications
- reusable transport racks
- long-term reliable and fast spare parts logistics



## We are. intelligent. Engineering.

### Industrial precision

Dimensional accuracy and reliable function during their entire life are elementary components of our door systems. We achieve these quality levels by consistently investing in our production. In our Kassel location we produce solely to lean criteria – partly standardised, partly fully automated, but always high precision. In this way we ensure that our products do precisely what is expected of them, even under long-term sustained loads.

### Customer-focussed strengths

When developing door systems we are never satisfied with anything less than the best solution. Bode has numerous patents in kinematics, electrical drives and networked systems. We dedicate the same technical expertise on which these developments are based to each further project too. Uncompromising reliability throughout the entire product life cycle is the result of Bode's comprehensive design and testing process. For each of our products we verify the safety of the concept (FMEA) in hardware and software on the basis of legal regulations and individual standards.

### Exclusive software solutions

Software must work. It does it best if the development is precisely matched to the installed components and the mechanical requirements in the door system. This is the task of Bode's software development department. Working in close consultation with all functional departments, we develop individual software applications, which are used exclusively for each system.

### Fulfilled user needs

The door is the interface with the passenger. For us it is obligatory that we bear in mind the needs of these stakeholders at all times. Safety and comfort always come first. In our projects we always have an eye on trends and wishes, as well as future measurement technology and sensors and we incorporate our cross-industry know-how from the rail, bus and automotive sectors into our realisation of the optimum solution.



## We are. cooperative. Partnership.

### Efficient collaboration

For us results-orientated working means completing projects quickly and cleanly in consultation with our customers. We bring together all the requirements for achieving this in our project management. We assign fixed contacts to each customer, who are then responsible for providing support, ensuring all workflows run smoothly and speak the same language as the customers – technically, interpersonally, but also in the true sense of the word: We develop fast and adapted solutions in many languages, experienced and confident on the national and international stage.

### Flexible organisation

In collaboration with our customers we strive to achieve a long-term partnership. To this end above all we pledge to achieve maximum on-time delivery, constant quality and binding cost structures. One of our other strengths is to respond flexibly and pragmatically to wishes and changes during the project. This is made possible by many years of experience, short decision-making channels and a performance-orientated corporate culture.

### Transparent costs structure

Our customers value Bode products due to their high, above-average reliability in use. Our brand stands for these strengths since many years. From the initial development to the worldwide sourcing of materials through to series production – our objective is to achieve the highest possible quality. Our goal is always: maximum reliability for minimum life-cycle costs.

### Mutual exchange

Regular meetings with representatives of passenger associations and other institutions give us insight, not only into current developments. This mutual exchange promotes understanding and helps us to safeguard and to take into account the interests of passengers and associations from the early product planning stage. Keeping this in mind from the outset gives us and our customers the certainty that ultimately nothing has been forgotten.



# We are. inspirational. Innovation.

## Innovative partnership

When it comes to developing new systems and solutions, we like to be on board from the outset. For 50 years, Bode has been an innovation driver in the industry. We hold numerous patents which substantiate our high degree of technical excellence. If necessary our customers can rely on these resources exclusively for the development of new systems for doors, sliding steps and software. Together with the Schaltbau Group and the cross-industry collaboration of our areas of business, we continuously raise our innovation potential to a new level. This makes us the first choice for many for new product development – as a reliable partner from the design through to the finished solution.

## Forward-looking development

eMobility, electric drives and networked systems, whether online or offline, are the topics to which the future belongs. We are already working intensively on the most important aspects, which in a few years will have a decisive influence on the transport of people and goods. The world is becoming “smart”. Previously unimagined opportunities are opening up for innovative product solutions. However, these are raising new challenges regarding security and data protection, which must also be solved. Research and development – cross-industry and with an ear to the market – is our approach to dealing with these issues, and at the same time to engage in close knowledge transfer with our customers.

## Reduced weight

Lightweight construction is a central innovation driver for us in many areas of development. We continuously find new possibilities for reducing the weight of our door systems through intelligent and innovative use and combination of materials. Lightweight construction expertise is a notion with which we identify ourselves.

## Integrated synergies

As part of the Schaltbau Group we actively transfer knowledge within the Group. Through our close cooperation we understand rolling stock and transport integrally, throughout the vehicle. This know-how enables us to use the available synergies intelligently to reliably include all requirements of a development and to continuously contribute new thought-provoking ideas for new developments and further development of existing systems in the partnership between us and our customers.



## We are. prepared. Service.

### Quick-response service

Our service team supports you throughout the entire life cycle of our systems – from the initial installation in new vehicles through to the overhaul of entire vehicle fleets. We offer training programmes, through which your personnel can ensure economical operation of Bode door systems for a long time. You can reach our team at any time and it can join you to provide on-site support worldwide within a short time. Direct help in all matters is a decisive criterion for us to achieve optimum partnership and reliability.

### Problem-free maintenance

Maintenance and service times should be reduced to a minimum. For this time we pay attention to service-friendly planning and easy accessibility during the design stage, and provide computer-aided maintenance options with our HARDI diagnostics tool. We provide our customers with the technical documentation necessary for maintenance and service with each order, on request this can also be supplied in the respective language of the country of use.

### Smooth logistics

Efficiency is created whether processes mesh seamlessly. In consultation with our customers, we purposefully ensure that our services are as smooth as possible. Under the aspect of service we also pay particular attention to logistics. Above all, this means cost-effective and secure transport of the goods to their intended destination. Together we clarify the requirements and implement them with a high degree of on-time delivery – not only for door systems but also for secured and quick-response supply of spare parts.

# IST-E CADS® | IST-P.

## Inward swinging doors.



### Electric inward swinging doors with CADS®, IST-CADS®

With IST-CADS® you have a system which has all the advantages of CADS®: From easy installation to low-maintenance operation. In addition, you save around 8 kg weight compared to an inward swinging door with conventional electric drive. CADS® IST "snap on". Saves weight, time and up to 0.33l fuel every 100km 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:	Bode Control Unit TA 12-24 or alternative control unit
Sensors:	Pressure wave or sensitive edge in the primary closing edges / intelligent position sensor in CADS®

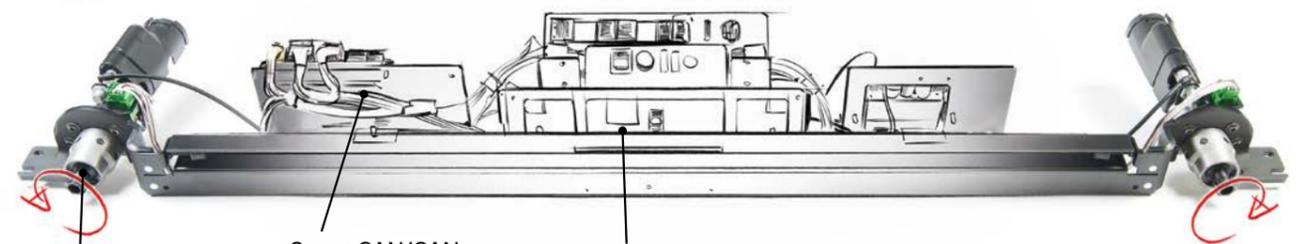
### IST-P Pneumatic inward swinging doors

You can rely on the IST-P system, because it guarantees you tried and tested Bode quality for 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
Locking unit:	Locking secured via system pressure
Control unit / diagnostics:	Bode Control Unit TA 12-24 or alternative control unit
Sensors:	Pressure wave or sensitive edge on the primary closing edge / position sensor on locking column

### Reliable drives

CADS® made by Bode proves its worth in practice excellently. Even the installation is very easy for you. The curved area of the roof remains free, allowing you more design options. Thanks to the modular design and preset emergency release the cost of installation and setting is reduced substantially.



Powerful drive motor with intelligent position detection

Smart CAN/CANopen-compatible Bode Control Unit or an alternative control unit

Modular drive carrier with integrated guide rail and service button

Significantly less expensive to run thanks to low servicing and energy requirements.

One click and CADS®. CADS® adjusts itself and learns to position itself correctly with each run.

### Secure locking unit

BSU locking unit with cylinder variants finger guard, sensing via pressure wave or electric sensitive edge.

Standardised pneumatic drive with efficient functional elements



Powerful pneumatic cylinder with high performance reserves

Smart CAN/CANopen-compatible Bode Control Unit or an alternative control unit

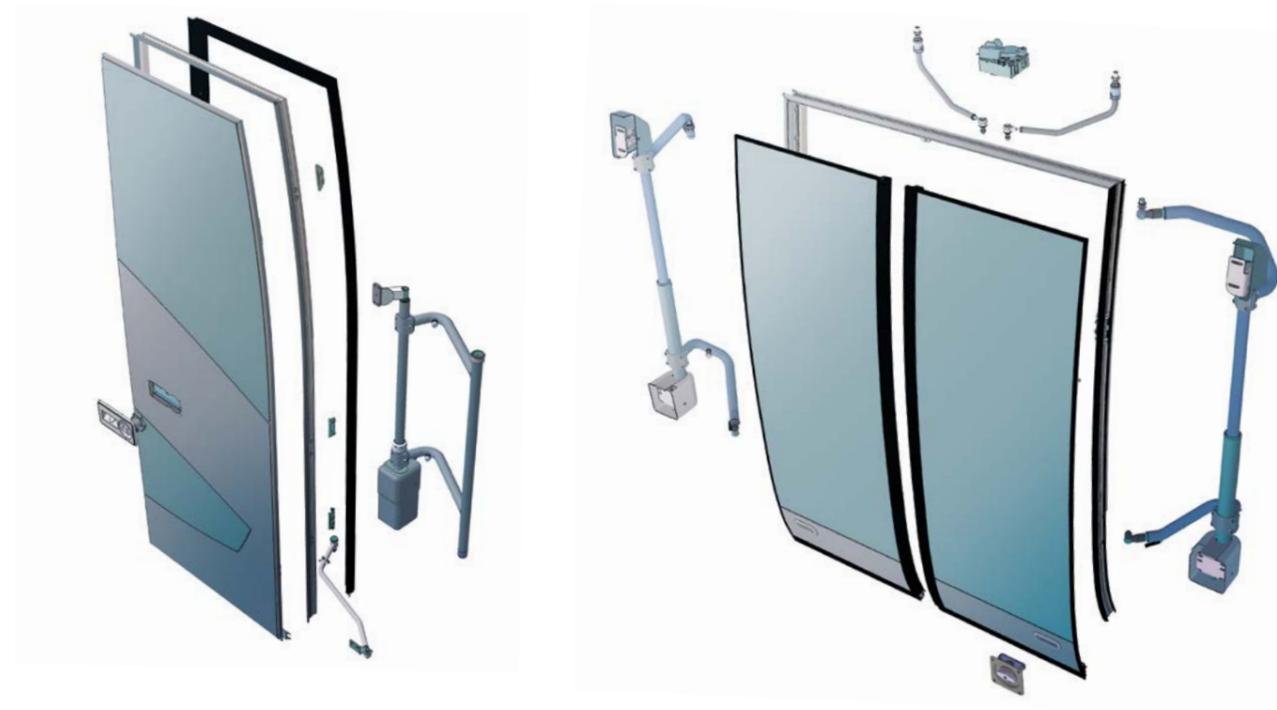
Robust pneumatic components to ensure a long lifetime



Door frame made of lightweight aluminium profiles incl. glazing, seal, edge sensing and locking unit

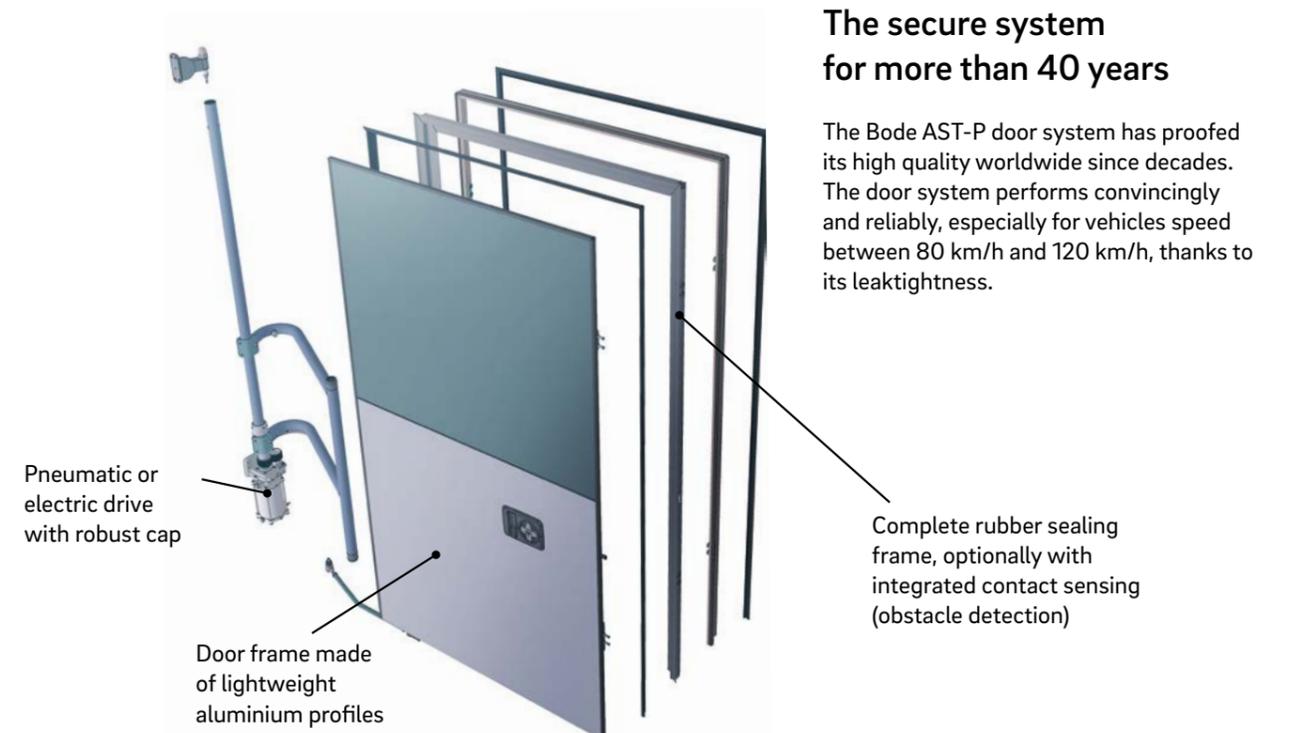
# AST-P | AST-E.

## Outward swinging doors.



### The secure system for more than 40 years

The Bode AST-P door system has proved its high quality worldwide since decades. The door system performs convincingly and reliably, especially for vehicles speed between 80 km/h and 120 km/h, thanks to its leaktightness.



### AST-P Pneumatic outward swinging doors

The Bode AST-P door system has proved its high quality worldwide since decades. For more than 40 years, the secure and reliable door system has performed convincingly, especially for vehicles speed between 80 km/h and 120 km/h, thanks to its leaktightness.

Clear width:	750 – 1,200 mm
Drive:	pneumatic
Maintenance frequency:	maintenance optimized system
Use:	von -25°C bis 70°C
Locking unit:	Locking secured via lifting movement in lifting wedges and / or operating pressure
Control unit / diagnostics:	Bode Control Unit TA 12-24 or alternative control unit
Sensors:	Pressure wave or sensitive edge in the primary closing edges / potentiometer on the locking column

### AST-E Electric outward swinging doors

The Bode AST-E door system has proved its high quality worldwide since decades. For more than 40 years, the secure and reliable door system has performed convincingly, especially for vehicles speed between 80 km/h and 120 km/h, thanks to its leaktightness.

Clear width:	750 – 1,200 mm
Drive:	electric
Maintenance frequency:	maintenance-free
Use:	from -30°C to 80°C
Locking unit:	Locking secured via lifting movement in lifting wedges and / or motor current
Control unit / diagnostics:	Bode Control Unit TA 12-24 or alternative control unit
Sensors:	Pressure wave or sensitive edge in the primary closing edges / potentiometer on the locking column

### Secure locking unit

Reliable locking unit with cylinder variants, finger guard, sensing via pressure wave or electric sensitive edge.



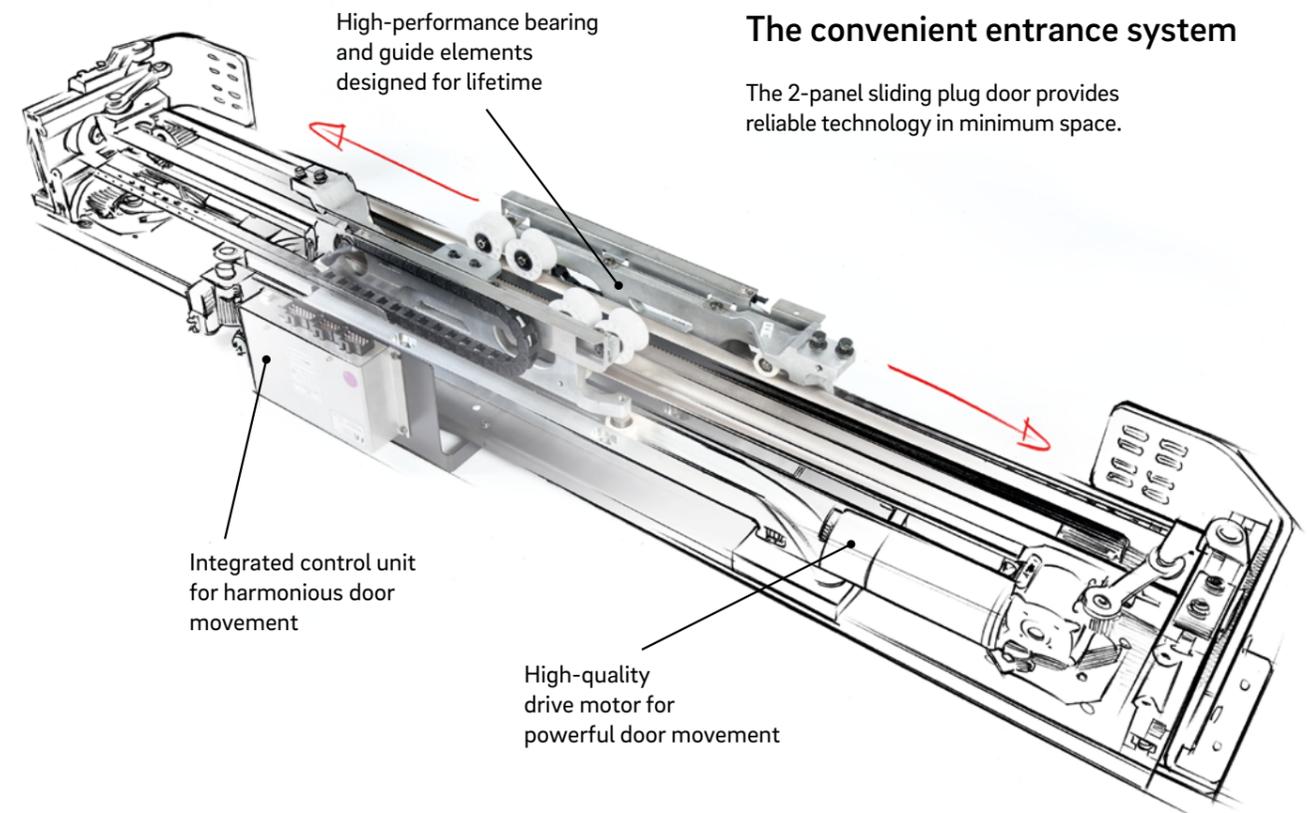
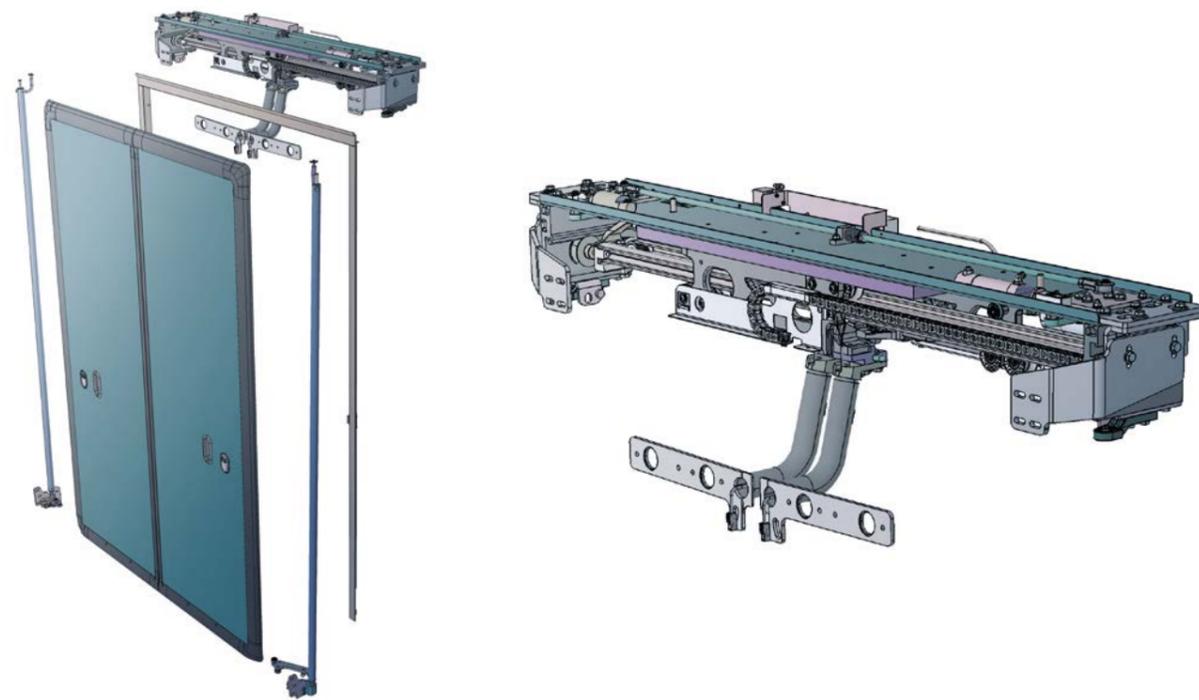
Compact drive unit with optional electric or pneumatic drive and optional lift locking unit



Door frame made of lightweight aluminium profiles incl. glazing, seal, edge sensing and locking unit

# SST.

## Sliding plug doors.



### The convenient entrance system

The 2-panel sliding plug door provides reliable technology in minimum space.

### SST

#### Electric sliding plug doors

The doors open conveniently close to the vehicle. The minimum installation space of this system is a pleasant surprise during installation. During operation the SST shows its other clear advantages: The little space during the opening cycle is highly appreciated by drivers and customers – nobody has to get out of the way, passengers aren't obstructed. The doors are kept securely closed without consuming any energy by the mechanism and / or its locking device.

The new SST uses the same connection points as AST and IST. As a single or double-panel variant, your electric drive provides reliable technology in minimum space, favourable preconditions for installation and operation and fulfills the requirements of the relevant standards.

Clear width:	750 – 1,200 mm
Drive:	electric / pneumatic
Maintenance frequency:	maintenance-free / low-maintenance
Use:	from -30°C to 80°C
Locking unit:	the doors are kept securely closed without energy consumption due to rotary latch lock
Control unit / diagnostics:	Bode TA12-24 control unit
Sensors:	Sensitive edge in the rear primary closing edge / motor current monitoring

#### 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 worst road conditions.

3-roller locking unit



Positive locking unit



# HKR | ALR-IV.

## Boarding aids.



### HKR Manual ramp

The fast and easy solution for city buses. Installation of the manual ramp requires minimum effort and – if the undercarriage is prepared – can also be retrofitted. Its corrosion free housing made of stainless steel makes the manual ramp extremely resistant. The water outlet and treadplate with slip-resistant surface ensure high reliability for everyday use.

Treadplate:	977 mm x 905 mm
Total weight of each system:	approx. 19 kg
Maintenance frequency:	maintenance-free
Use:	with maximum 350 kg load capacity



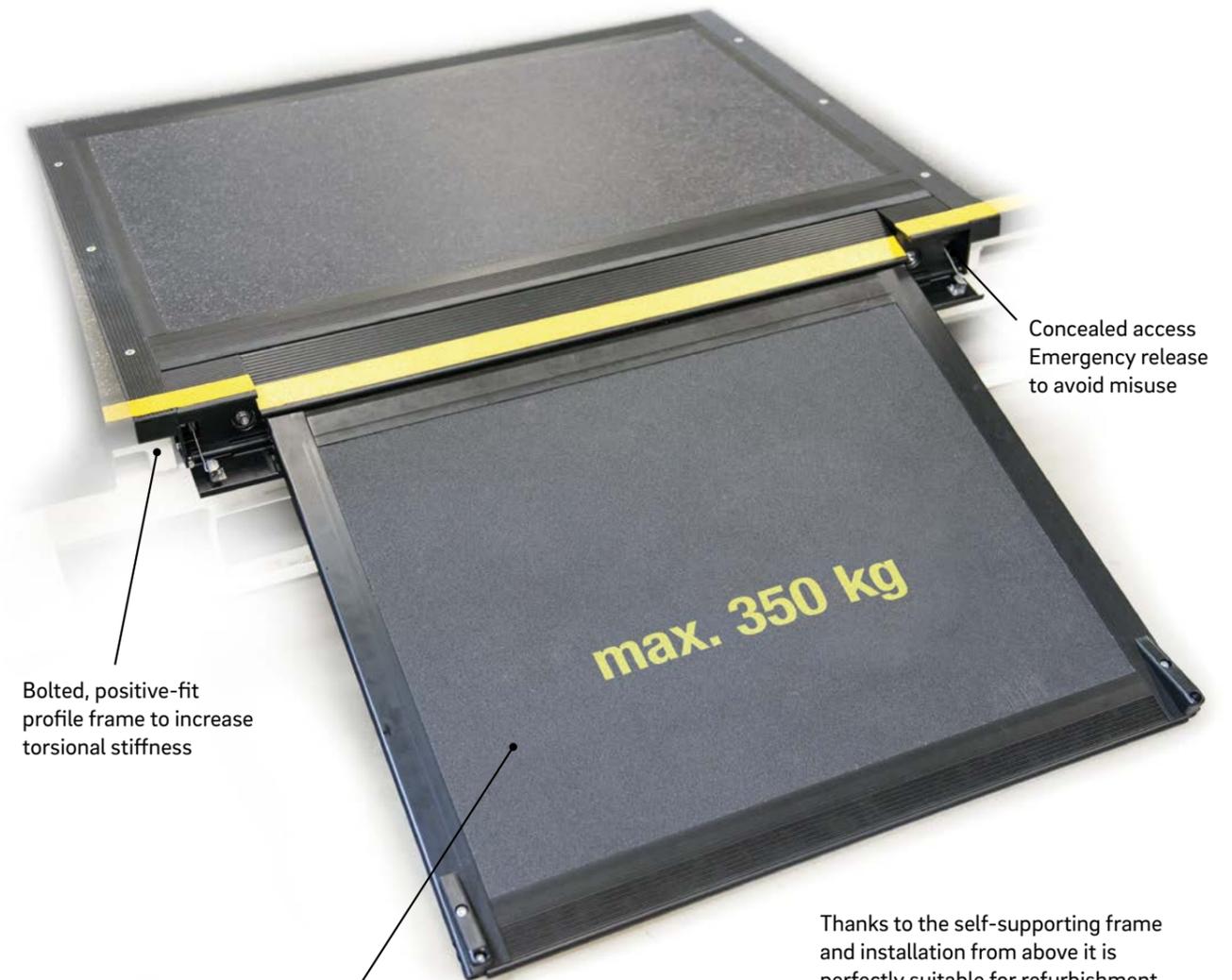
### ALR-IV Electric ramp

Maximum floor clearance for urban and suburban bus routes. The electric ramp with Bode's ramp control unit is the robust alternative to the under-chassis ramp. It is based on standard Bode components and thanks to its optimised materials it is corrosion resistant. The modular box-type design enables it to be installed in the floor, quickly and easily.

Treadplate:	850 mm x 690 mm
Total weight of each system:	approx. 42 kg
Maintenance frequency:	maintenance-free
Use:	with maximum 350 kg load capacity
Locking unit:	self-retaining and via motor short-circuit
Control unit / diagnostics:	Bode TA 12-24 control unit (external) or internal relay control
Sensors:	integrated step and edge sensing, electronically controlled retention system, optional additional safety diagnostics

### The convenient electric boarding aid

Optional with integrated or external control unit and extensive sensing. Can be adapted easily and directly to the vehicle bus system via the CAN/CAN-open bus.



**Emergency release**  
Manual extension or retraction with the help of a crank handle or ratchet, or a hexagon socket wrench

**Safety devices**

- electronic obstacle detection
- Locking unit device for „retracted“ position
- slip-resistant tread surface
- automatically lowering bottom strip

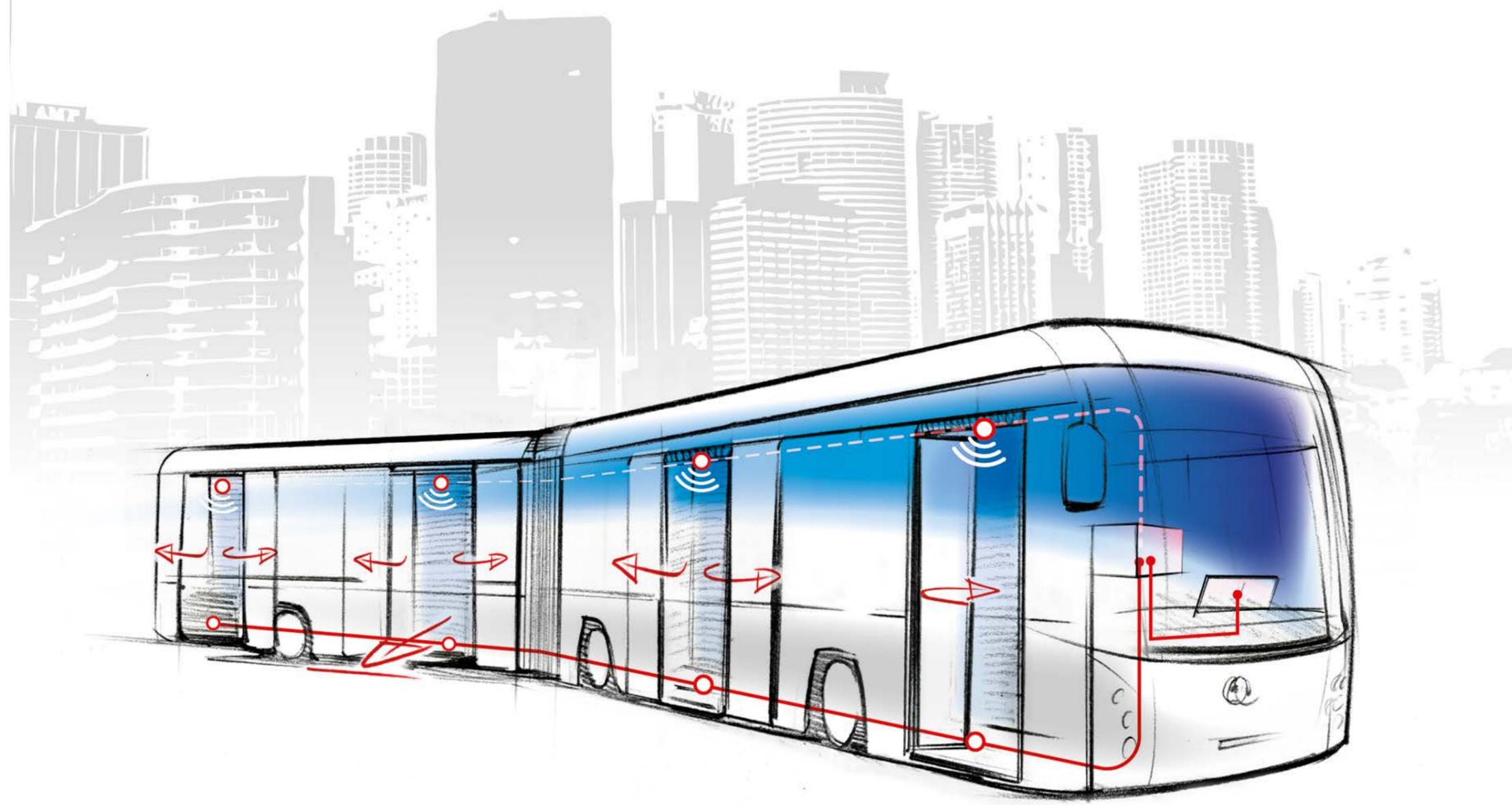
# Intelligent systems.

The purpose of well thought-through diagnostics is to avoid failures – and we are masters at this. Yet the future of the door is as an intelligent interface with the passenger and freight.

We recognised the relevance of IT in the door system many years ago and set up our own IT department. Our controls and diagnostic tools can be used under Windows and with standard hardware. The interfaces are therefore also simple and reliable: via USB and on request via an ethernet link. In addition, supplied with a simple, clear and intuitive user interface, our systems are available in more than 15 languages.

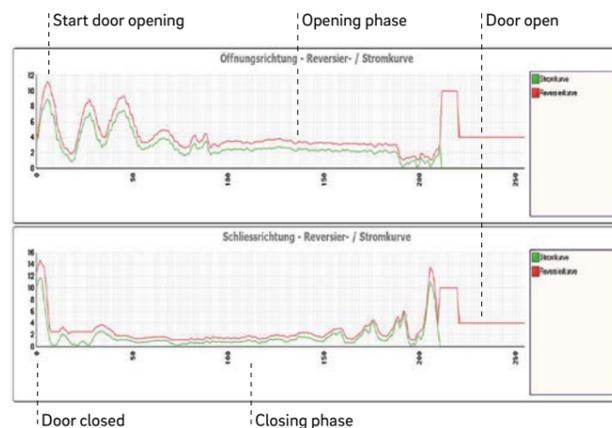
In future sensors on doors will not only carry out control functions. From ticketing through to space management, we are working on many features which will make the door system of tomorrow more intelligent.

Non-contact sensor technology for different functions in the door system is in principle already a standard feature and can be retrofitted. Whatever the future brings – Bode. Die Tür. This much is certain.



## HARDI diagnostics

Our HARDI diagnostics software analyses and documents operation of the door system simply and graphically. Key indicators are worked up visually. Over the years our programmers have optimised this tool to perfection.



## MTB-X control unit

The control unit is the heart of a door system. With our MTB-X we offer a high degree of operational reliability and operate all standard interfaces. With two hardware versions we can also fulfill all voltage requirements, from 24 to 110 volt.

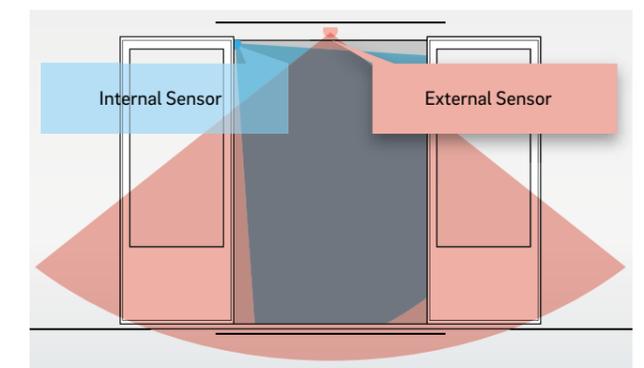


## BMU boarding management unit

As part of the Schaltbau Group we research and develop new applications for every aspect of the door system of the future. From guiding passengers to ticketing through to object detection, much is possible to make travel more pleasant, comfortable and safer – starting from the door system as the intelligent mediator between the passenger and vehicle. In cooperation with universities and institutions, we will expedite the development of intelligent networked systems. Our most important ideas and incentive come from our customers, our service department and, last but not least, passengers. We are therefore in discussion with passenger associations, to maintain a reliable feel for the wishes of the end users.

The objective of the Bode boarding management unit is to reduce the number of electric interfaces in a door system and to increase interaction between the vehicle and passenger. The new Bode sensor system, which can replace all controls and safety devices to date with only two sensors, is a prime example of this. The new Bode sensor system

secures the basic functions of the door system in the vicinity of the door, conveniently and wear-free, and provides additional safety through early detection of passenger motivations. With this system we meet the standard we have set ourselves of covering all relevant functions with few sensors and to be open to new tasks.





## Door systems. for mobile spaces.

This much is certain.

By rail or by road – door systems from “Bode. Die Tür.” are in use worldwide. Reliable, robust and increasingly intelligently networked, we design the interface with the passenger.

For a good 50 years we have defined the interface with the passenger. By rail, by road and wherever our experience can offer a safe system. Safety is a good cue. On the one hand for passenger safety and on the other for reliable operation. The systems must be robust and yet at the same time lightweight in order to be energy optimised and meet the high requirements set.

From the initial development through to industrial production in small and large series – many brands trust our knowledge and our quality. An excerpt from our reference list is given on the right.





# Made. by. Bode. Die Tür.

With German engineering and efficient industrial production, we implement door systems for vehicles all over the world. Despite the high degree of product, software and process standardisation, for us it is not a contradiction to actively maintain a culture which can be called mid-sized family – grown over a good 50 years. Many of our employees are second generation family members to work for Bode. You can feel this bond in our company through the commitment and enthusiasm of our workforce – 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.

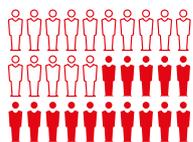
Our development department falls back on many solutions which, once reinterpreted, are suitable for different tasks. From the hatch door of a car through to the fully-networked door system in a high-speed train. We have the knowledge, acquired from many worldwide projects and markets.

Our goal is failure-free door systems. Intelligent networked systems help to use materials and energy sparingly and far-sightedly. Maintenance is signalled before wear can cause a failure. Sensors ensure greater safety and provide important feedback for personnel and transport operators.

This intelligence, combined with robust lightweight construction in increasingly compact versions, enables us to perform reliable life-cycle cost calculations. A fast-response worldwide service department is on hand. Just-in-time deliveries of complete systems – ready-assembled for fast and reliable installation – to us these are obvious requirements.

From our headquarters in Kassel we transport our standards and know-how to our branches on all continents.

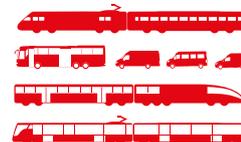
As part of the Schaltbau Group we understand vehicles integrally – one reason why we understand our customers so well.



Around 3,000 employees in the parent Group  
of which around 1,600 in the Bode Group



31 locations worldwide in total  
6 production facilities in the Bode Group



3 business units  
1,000 synergies

Gebr. Bode GmbH & Co. KG  
Ochshäuser Str. 14  
34123 Kassel  
Germany

Phone +49 561 5009-0

[www.schaltbau-bode.com](http://www.schaltbau-bode.com)

