

REGIONAL / COMMUTER

lea[door]ship



**LEADING IN ENTRANCE SYSTEMS
FOR REGIONAL AND COMMUTER TRAINS**

TECHNOLOGY THAT INSPIRES: REGIONAL AND COMMUTER TRAINS



en[door]phins



RAIL
VEHICLE
SYSTEMS
**REGIONAL AND
COMMUTER TRAINS**

INCREASING PASSENGER VOLUMES AND A PROGRESSING USE OF PUBLIC TRANSPORT require highly reliable entrance systems.

Rolling stock manufacturers, systems suppliers and train operators are facing the technical challenge to meet the continuously rising requirements for safety, passenger comfort and barrier-free use for persons with reduced mobility.

As leading manufacturer of entrance systems for regional and commuter trains, we offer the whole range of suitable products: from double leaved sliding plug doors and sliding doors from 1200 to 2000 mm entrance width through to single leaf systems. The offer is complemented by a variety of door leaf types and access devices such as sliding or moveable step systems.

Further development is not only driven by a technical and functional excellence but also by long-term economic considerations. Our products are characterized by a particularly low-maintenance and easy-to-install design featuring the lowest life cycle costs.

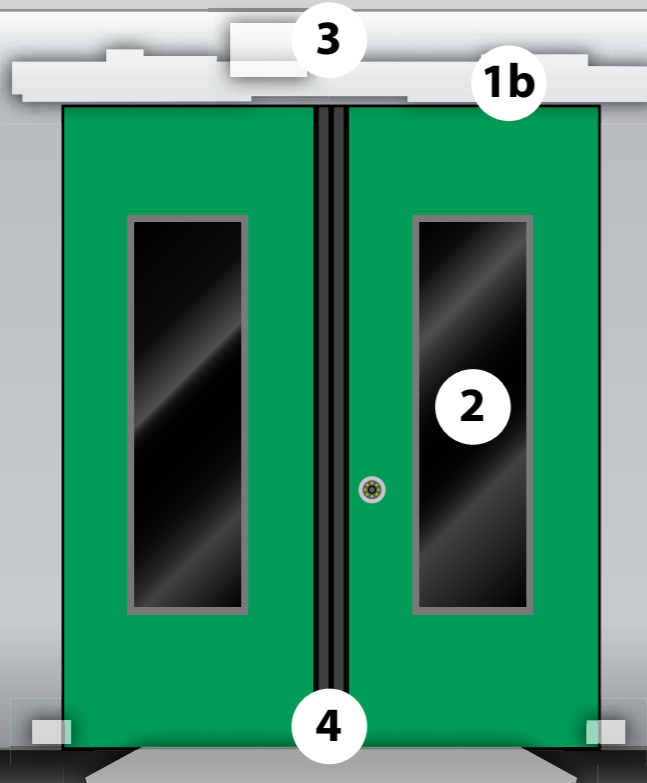
IFE is globally renowned as a reliable partner for the supply of entrance systems. The range of offered services, however, goes far beyond this area and furthermore includes installation, commissioning as well as maintenance over the whole product life of our door systems, including spare parts management.

IFE SLIDING PLUG DOOR DOUBLE LEAVED

WITHIN THE DOOR PORTAL

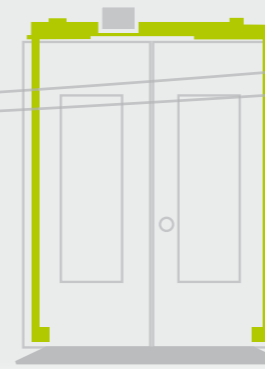


OUTSIDE THE DOOR PORTAL



DOOR DRIVE WITHIN THE DOOR PORTAL

1a



Lighter

20% less weight and 44% less parts

Smaller

Floor-level locking device and reduced installation height fitting in the installation space of a rotary column

Adjustment-free

Initial installation due to the adjustment-free design and maintenance operations do not require any adjustment work

DOOR DRIVE OUTSIDE THE DOOR PORTAL

1b



Flexible

Flexible integration in all types of vehicles with only a small protrusion outside of the portal

Robust

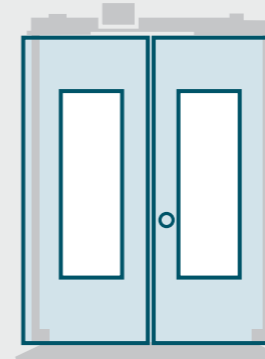
Durable ball bushing guide allowing for a high number of cycles

Low maintenance

Use of a maintenance-free spindle drive and encapsulated recirculating ball bushings

DOOR LEAVES

2



More insulated

Reduced heat transfer coefficient by up to 50%

More silent

Improved noise protection by a factor of 3 to 4 compared to similar products

More flexible

Sealing profiles with compensation of tolerances to adapt to vehicle movements

FLEX CONTROL

3



Reliable

Reduction of internal interfaces and electrical losses

Safe

SIL2 integrated in the standard solution

Integrable

Ethernet and CAN are in the standard solution, optional LED display and USB Independent of input voltage

SLIDING STEP X4

4



Smaller

Installation height reduced to 50 mm for widths of up to 1400 mm

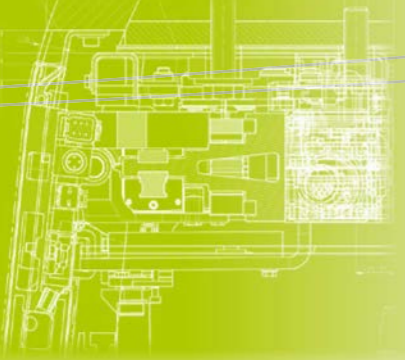
More robust

All load-carrying and functional parts are made from stainless steel

Easier to service

Central, maintenance-free spindle drive with a jamming-free guiding system

1a

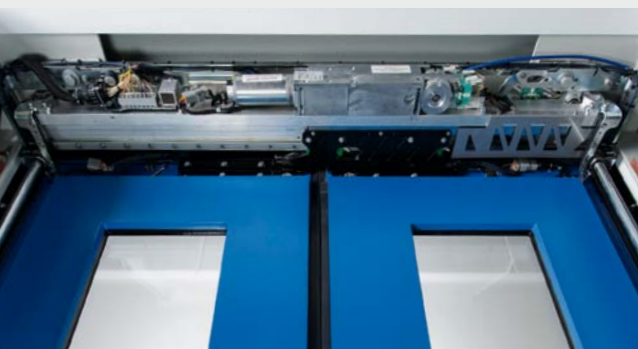


DOOR DRIVE WITHIN THE DOOR PORTAL

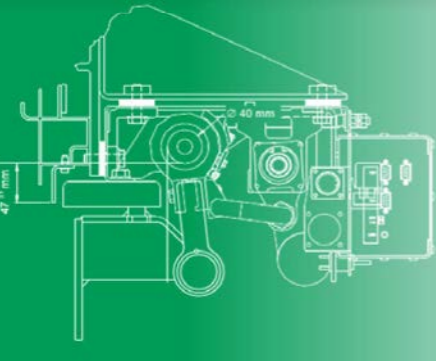
THE IFE E4 DOOR DRIVE is equipped with a particularly robust and deformation-tolerant linear guiding system which results in a lighter and more compact design and allows for an optimized adaptation to vehicle movements that appear during operations. The dirt-proof

design is furthermore equipped with maintenance-free bearings. The entrance system is kept closed at all four corners through over dead center locks. This enables it to be used even under high loads and with an entrance width of up to 2000 mm.

- Increased safety thanks to four over dead center locks
- Active floor-level locking device fitting in the installation space of a rotary column
- Adjustment-free design
- Rugged guiding system
- Maintenance-free door drive



1b

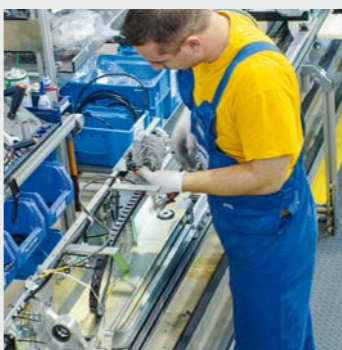


DOOR DRIVE OUTSIDE THE DOOR PORTAL

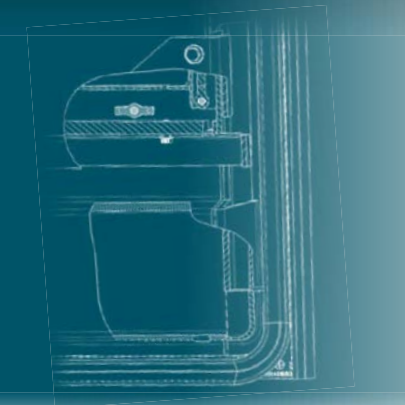
THE IFE RLS DOOR DRIVE design is straightforward and simple. It needs no more than one linear guiding system for the swiveling and sliding movements of both door leaves. This drive – which needs no rotary

columns – is mainly used for low train speeds and reduced loads but with frequent opening and closing cycles. Thanks to its compact and modular design, the RLS can be integrated into the vehicle in an optimized way.

- Linear and encapsulated guiding system for swiveling and sliding of both door leaves
- Maintenance-free spindle drive
- Modular design
- Suitable for frequent opening and closing cycles



2



DOOR LEAVES

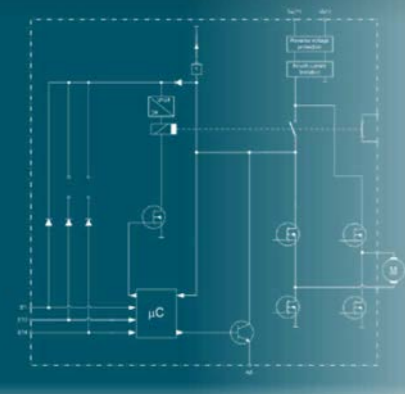
WITH THE INTRODUCTION of new insulation materials and improved profiles, our latest door leave generation has an optimized noise and heat insulation. The acoustic insulation value of the door leave type AN is improved by a factor of 3 to 4. Furthermore, the door leave

type AI reduces heat transmission by up to 50% compared to similar products. Nevertheless, the system weight could even be reduced. The lower edge of the fully adjustment-free door guide is equipped with an integrated safety device against lift-off.

- Increased passenger comfort
- 3- to 4-fold higher acoustic insulation values
- Reduction of heat transfer by up to 50%
- Sealing system with tolerance compensation
- Adjustment-free door guide with integrated lift-off safety device



3



CONTROL

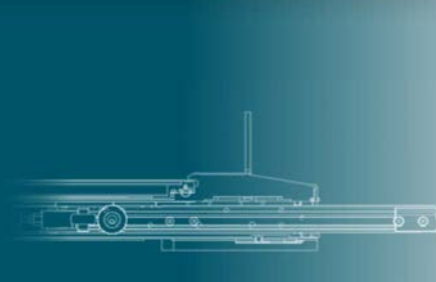
THE LATEST DOOR CONTROL GENERATION excels by a particularly high reliability. The integration of CAN and Ethernet interfaces in the standard solution respects market requirements. Further interfaces as well as a service module with an LED display of diagnosis codes and a USB

connector are also available as options. The intelligent energy supply adapts its operating modes to the operational situation of the moment and reduces the overall energy loss by a quarter. The universal door control works with all external voltages between 24 and 110 VDC.

- High reliability
- Increased safety – standard solution meets SIL2
- Input voltages may vary between 24 and 110VDC to reduce the number of different parts
- Energy consumption reduced by 25%
- Installation height reduced by 20%



4

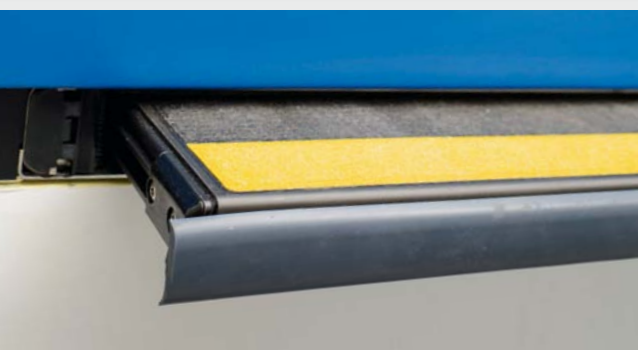
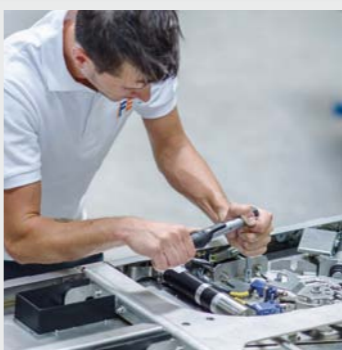


SLIDING STEP

THE X4 SLIDING STEP EXCELS by an extremely compact design and highest reliability. With an installation height of only 50 mm for standard widths of up to 1400 mm, the sliding step meets even the highest requirements. The integration of the weight

detection in the guiding system and a design which is corrosion-free and insensitive to dirt ensure a reliable functioning of the system. The statically determined 3-point guide of the sliding step is torsion-tolerant and prevents jamming.

- 50 mm installation height only
- Jamming-free 3-point guiding system
- Tolerant to torsion of the vehicle
- Maintenance- and adjustment-free locking module
- Rugged design, not affected by dirt, corrosion as well as ice and snow

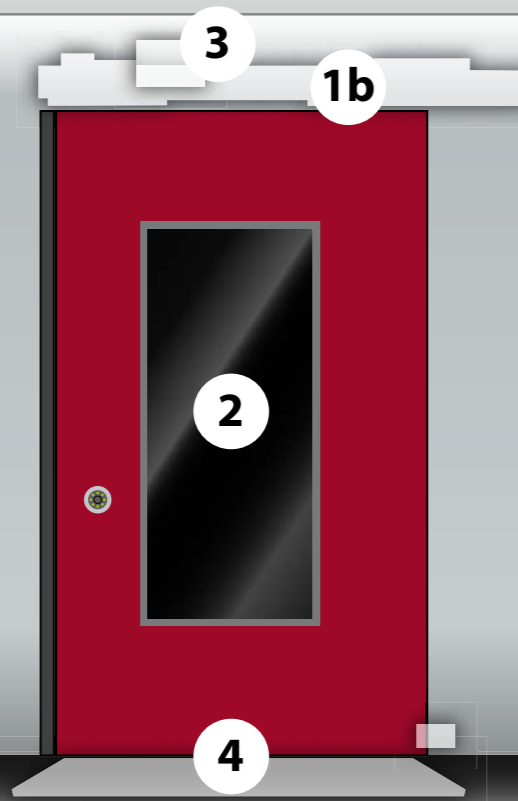


IFE SLIDING PLUG DOOR SINGLE-LEAVED

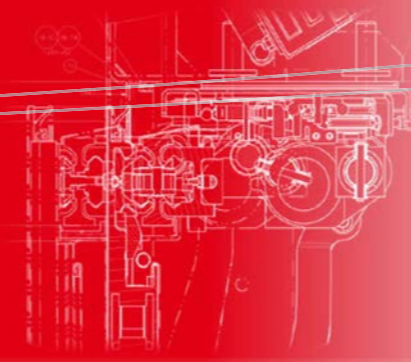
WITHIN THE DOOR PORTAL



OUTSIDE THE DOOR PORTAL



1a



DOOR DRIVE WITHIN THE DOOR PORTAL

THE E3H CONVINCES with its rugged design, which enables it to be combined even with wide and heavy door leaves. Its ability to be installed within the door frame opening and its compact dimensions allow for its use in all types of vehicle and available spaces. If requested, a pressure-sealed version of the E3H with opening width up to 1400 mm is also available.

- Door opening widths up to 1400 mm are possible
- Strong guiding system
- Maintenance-free spindle drive
- Pressure-tight version also available

1b

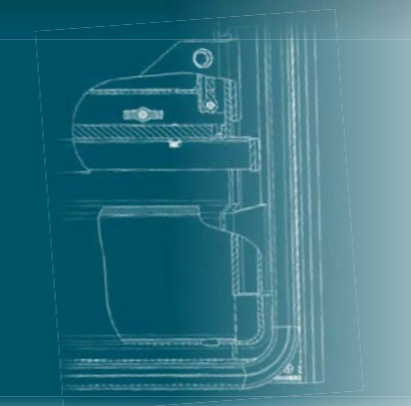


DOOR DRIVE OUTSIDE THE DOOR PORTAL

THE RLS DOOR DRIVE is used as a single-leaved door system besides its double-leaved version. This drive is mainly used for low train speeds and reduced loads but with frequent opening and closing cycles. Its integration in the vehicle is simplified thanks to its modular design.

- Linear and encapsulated guiding system for swiveling and sliding movements
- Maintenance-free spindle drive
- Modular design
- Suitable for frequent opening and closing cycles

2



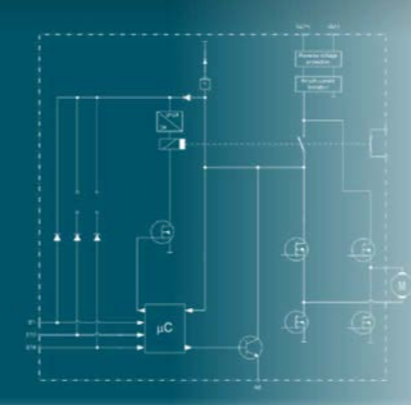
DOOR LEAVES

ALSO SINGLE-LEAVED DOOR entrance systems use aluminum door leaves in proven design. Door leaves for single-leaved doors are offered for standard widths between 800 and 1000 mm but also for very wide applications of up to 1400 mm.

- Proven light aluminum design
- Durable
- Door leaves up to 1400 mm opening width

9

3

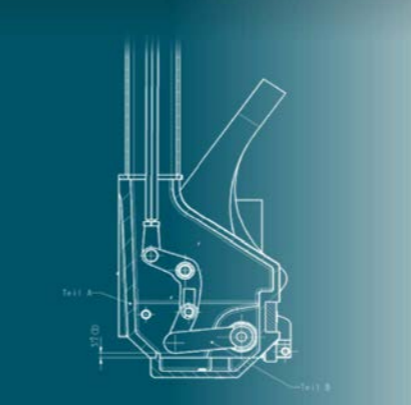


CONTROL

HIGH RELIABILITY, optimized integration in the vehicle as well as an enhanced safety requirement are the most important properties to be fulfilled by any door control. Furthermore, the universal door control processes any supply voltage between 24 and 110 VDC.

- High reliability
- Increased safety – standard solution meets SIL2
- Input voltages may vary between 24 and 110VDC to reduce the number of different parts
- Energy consumption reduced by 25%
- Installation height reduced by 20%

4



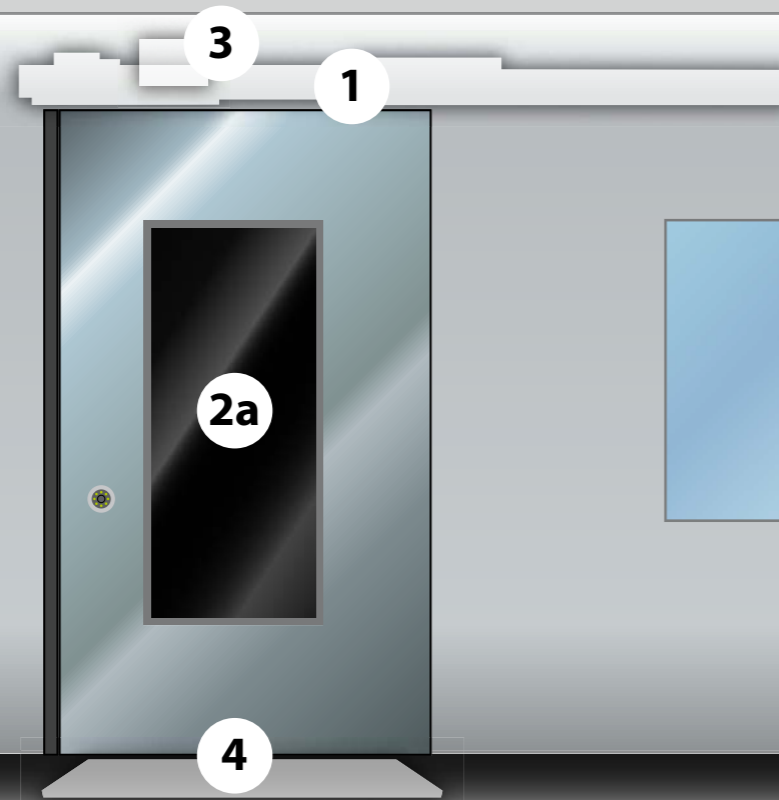
MOVEABLE STEP

BESIDES CLASSICAL sliding steps, single-leaved doors are also often equipped with moveable steps. In combination with the single-leaved door drive E3H, these systems need no own drive unit. They are mechanically linked to the door drive and are automatically controlled together.

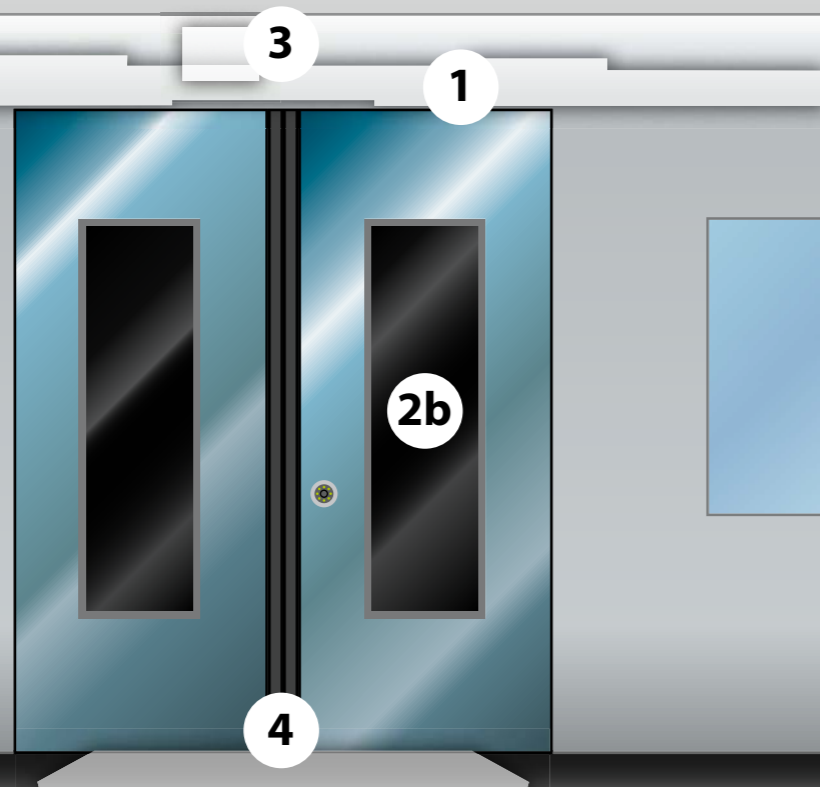
- Small installation dimensions
- Simple construction
- Robust design against dirt and corrosion
- Direct link to the door drive

IFE SLIDING DOOR SINGLE- AND DOUBLE-LEAVED

SINGLE-LEAVED

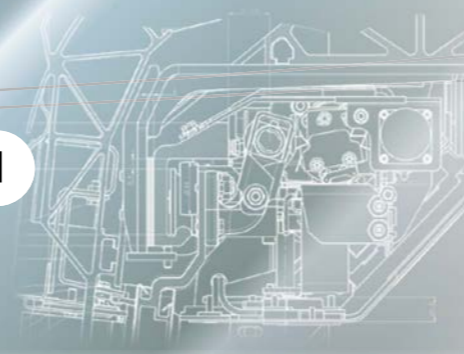


DOUBLE-LEAVED



DOOR DRIVE OUTSIDE THE DOOR PORTAL

1



THE IFE S3 DRIVE for sliding doors is employed in single- or double-leaved variants. With its compact design, the use of maintenance-free drive components and the optimized accessibility, the system is very easy to maintain. The IFE S3 can be used for sliding pocket doors or for external sliding doors.

- Central drive unit
- Robust and dirt-resistant guiding system
- Low system weight
- Adjustment-free design
- Maintenance-free spindle drive

DOOR LEAVES

2a



THE PROVEN door leave design in aluminum technology is also used for sliding doors. The proven design and manufacturing processes ensure a stable and durable product which will be adapted to the vehicle contour with circumferential sealing systems ensuring the tightness to the vehicle.

- Proven, light aluminum design
- Low weight
- Flexible insertion to the vehicle

DOOR LEAVES

2b

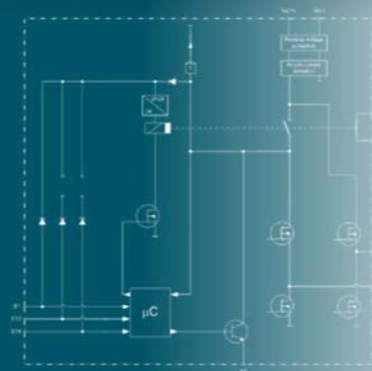


ESPECIALLY IN COMBINATION with sliding doors, door leaves entirely made from stainless steel are used. Rounding off the product portfolio, the door leaf structure is especially adapted to the material used. Stainless steel door leaves can be operated painted or unpainted.

- Simple structure
- Compatible with modern stainless steel rolling stock
- High resistance

CONTROL

3



HIGH RELIABILITY, optimized integration in the vehicle as well as an enhanced safety requirement are the most important properties to be fulfilled by any door control. Furthermore, the universal door control processes any supply voltage between 24 and 110 VDC.

- High reliability
- Increased safety – standard solution meets SIL2
- Input voltages may vary between 24 and 110 VDC to reduce the number of different parts
- Energy consumption reduced by 25%
- Installation height reduced by 20%

SLIDING STEP

4



COMPACT DESIGN combined with the highest reliability and safety. The 3-point guiding system is tolerant against torsion and prevents jamming. The used materials guarantee an optimal corrosion protection.

- 50 mm installation height only
- Jamming-free 3-point guiding system
- Tolerant against torsion of the vehicle
- Maintenance- and adjustment-free locking module
- Rugged design, not affected by dirt and corrosion

DECADES OF SERVICE
WITHOUT COMPROMISES

en[door]ance



RAIL
VEHICLE
SYSTEMS
REGIONAL AND
COMMUTER TRAINS

LIFE-CYCLE



Assembly & Commissioning

RailServices offer a professional support from the initial installation of a door system and the accompanying training of customers' local staff up to the installation of complete entrance system series for complete vehicles. Following customer wishes, specialists will be available at customer premises at firm conditions.



Repairs

Servicing of entrance systems is offered at fixed conditions and processing times and there is an additional possibility to plan them in regular intervals. A special advantage for the customer is the use of original IFE spare parts and modern testing tools which are being used for the generally defined standards and test procedures.



Maintenance

In order to permanently operate an entrance system efficiently, maintenance work must be carried out at regular intervals. In the framework of our services we also offer preventive maintenance contracts over the whole product life-cycle. The customer benefits from the experience of our service engineers, a high delivery availability and a solid quality of the original spare parts and the works carried out.



Modernization

In order to also keep existing vehicles at the leading edge of technology, RailServices offer consultancy, engineering and implementation of possibilities for modernization such as software updates, control system upgrades, retrofitting of new safety systems or the installation of completely new drives. This allows for entrance systems which have been in service for years to cope with the increased requirements.

SERVICE OVER THE WHOLE LIFE-CYCLE

Whether it is a single vehicle or a complete rolling stock fleet to equip – RailServices take over the installation and commissioning and deliver a reliable service from the first minute through the complete life of the vehicle.

Being part of the Knorr-Bremse Group, RailServices showcase the competence of the group on-site and ensure with its experienced

specialists that customers "remain on track".

Spare parts and service packages which are tailored to customer wishes go far beyond the usual scope and guarantee short reaction times and a straightforward on-site handling as well as a fast availability of the service engineers and the spare parts supplies.

The modernization of older vehicles as well as the retrofit of complete

rolling stock fleets with state-of-the-art safety equipment are as much part of the portfolio as an active obsolescence management and the measurement of wear to prevent critical safety levels.

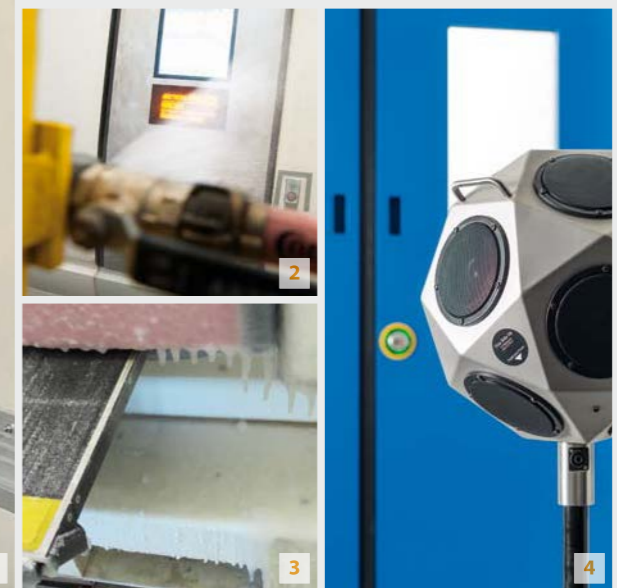
On the background of its competence and experience, RailServices take care of the rolling stock of our global customers to make sure that they meet the continuously rising requirements and the applicable safety standards.

SAFE IS SAFE:
ENDURANCE TESTS LEADING
TO MARKET MATURITY

[door]ability

REGIONAL AND
COMMUTER TRAINS

1 The in-house IFE hydro-pulse plant tests full-scale dynamic and static loads applied to a complete entrance system | 2 Tightness test of systems in the sprinkler plant | 3 The in-house differential climatic chamber is able to simultaneously produce different ambient temperatures between -50 and +80 degrees Celsius | 4 Full-scale verification of the acoustic insulation performance of an entrance system



WHEN IFE PRODUCTS SEE A TRAIN FOR THE FIRST TIME, they have already overcome the hardest experience. The IFE testing and validation phase equals an alpine tour with a snow storm and temperatures far below freezing as well as a thunderstorm in a tropical summer. Furthermore, during the validation phase our entrance systems already meet high speed trains which they may probably never encounter in real operations.

During the time our entrance systems spend on the IFE test site, the highest

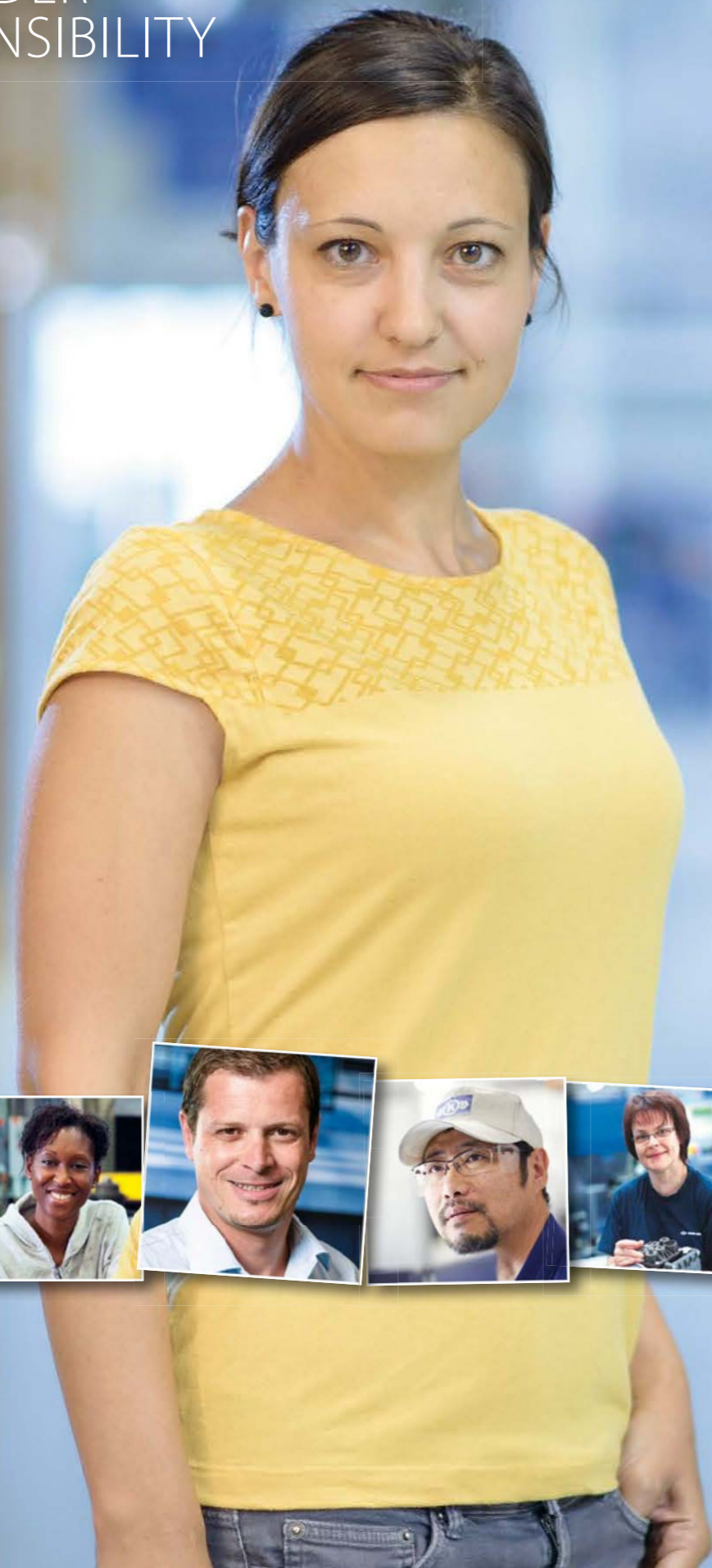
importance is given to the validation of all parameters related to technical standards. The set values are clearly exceeded during tests, in order to start into real life with a sufficient safety margin. To cover the whole spectrum efficiently and individually in an optimal way, all necessary equipment is available in-house.

This includes a two-chamber climatic plant which is able to produce different ambient temperatures between -50 and +80 degrees Celsius between the inner and outer side of a door system as

well as snow- and icemaking devices and an acoustic chamber. Our hydro-pulse machine applies real load levels of many tonnes as they occur in operation.

Furthermore, certain components and complete entrance systems undergo intensive endurance tests, simulating a multiple of the whole product life in just a few months. The results are directly and immediately integrated into our products.

THINK GLOBALLY, ACT LOCALLY:
MARKET LEADER
WITH RESPONSIBILITY



"Our team guarantees the highest quality along the complete production chain."

Olga Čechová
Quality engineer



RAIL
VEHICLE
SYSTEMS
**REGIONAL AND
COMMUTER TRAINS**



THERE IS MUCH MORE
IN EACH IFE PRODUCT than
the supply of a system component
for a rail vehicle. With IFE as a partner
you are welcomed in the worldwide
organization of the Knorr-Bremse
Group with its range of compre-
hensive advantages.

Rolling stock manufacturers often
face requirements for high import
duties, local content or local service

needs. In these cases we have access
to a multitude of well established
local manufacturing sites and service
centers and offer suitable solutions.

Both our manufacturing sites in the
Czech Republic (Brno) and in China
(Qingdao) are supplying the com-
plete product range and cover two
major market areas. With our estab-
lishments spread all over the world
we can offer our customers in Europe

and Africa, Asia, Australia and
America an optimal local support.

Close connections to our local sites
are offering our customers major
advantages in maintenance and
spare parts stockage. We are also
able to implement project specific
concepts regarding local added
value or series assembly.