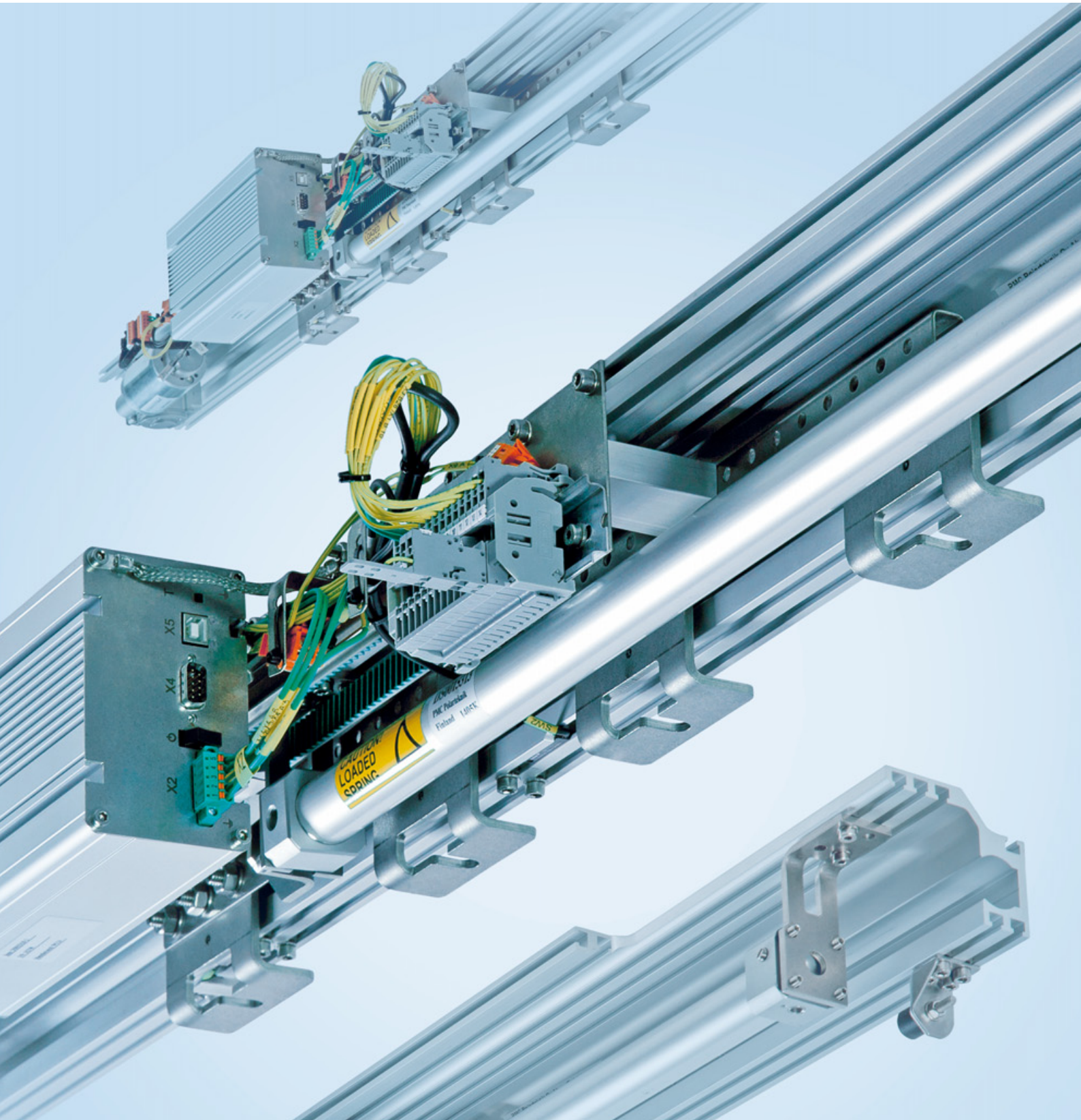
Polarteknik
Door Systems

Polarteknik



Tomorrow´s solutions today

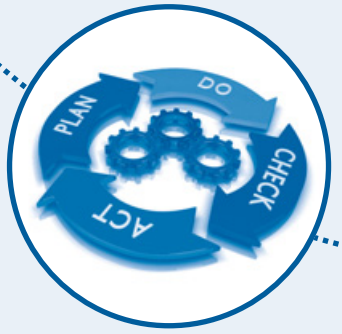
Reliability
Specific needs met with proven technology

Safety
Fire performance and reliable electronics with safe control software

Polart
Door S

TCO
Calculation, analysis and REX driven design

Service
Support services that meet the highest requirements



teknik
ystems

Training
Repairs
Spare parts

First mounting
Commissioning

Modernization
Continuous improvement

Fleet checks
Preventive maintenance

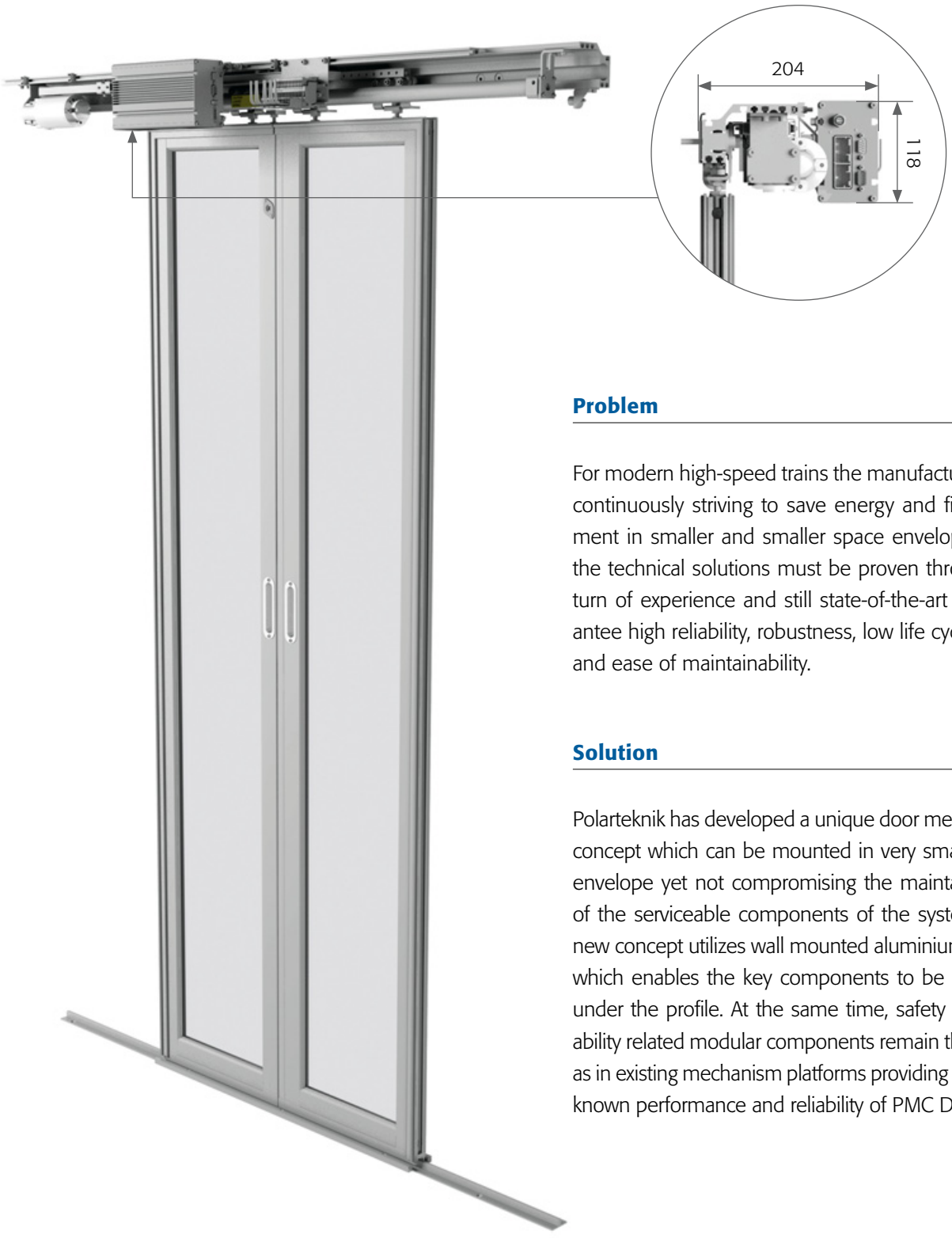
Polarteknik Door Systems

Polarteknik is Leading European company to supply and design fire barrier Gangway door systems for rail vehicles. We are supplier in most of the new European high speed, very high speed and intercity trains. Our product range also includes complete fire barrier walls, Automatic single, double leaf sliding doors, telescopic and curved doors. Product can be used in modern as well as refurbished passenger coaches to increase the passenger comfort and safety.

Our knowledge of customer requirements, combined with unparalleled expertise in compact door systems for rail vehicles from the world´s leading manufacturers, places us in the best possible position to provide our customers with first rate service. Polarteknik has a great deal of experience in producing fire barrier doors in compliance with prevailing national and international norms in the target countries.

Polarteknik Door Systems

Double leaf sliding doors in low space envelope



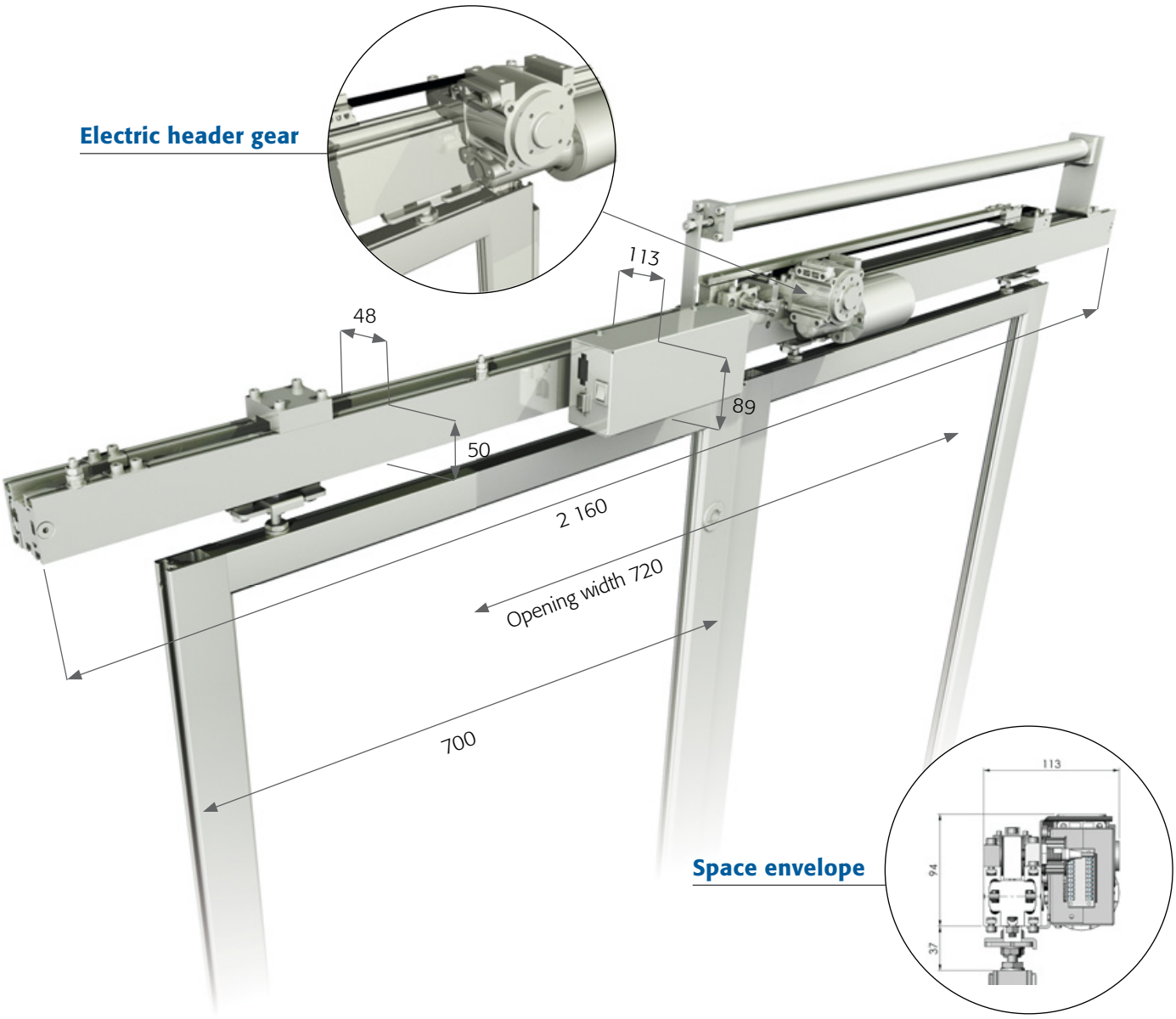
Problem

For modern high-speed trains the manufacturers are continuously striving to save energy and fit equipment in smaller and smaller space envelopes. Yet, the technical solutions must be proven through return of experience and still state-of-the-art to guarantee high reliability, robustness, low life cycle costs and ease of maintainability.

Solution

Polarteknik has developed a unique door mechanism concept which can be mounted in very small space envelope yet not compromising the maintainability of the serviceable components of the system. The new concept utilizes wall mounted aluminium profile which enables the key components to be place all under the profile. At the same time, safety and reliability related modular components remain the same as in existing mechanism platforms providing the well-known performance and reliability of PMC Doors.

Single and Double leaf sliding doors



Note: This drawing is given only as information of a standard solution. We are able to modify the layout of the door mechanism in order to suit the customers doorway header space envelope. Please contact us if You require more details.

POLARTEKNIK
FIRE DOORS

PMC Polarteknik, having designed and supplied thousands of door components and systems for almost twenty years, continues with top level integrated compact door systems. Co-operation with our customers has been a key to develop the modular doors of lowest LCC-values in the market. Our experience and reliable construction gives customer the best choice during the whole project in modern as well as refurbished passenger coaches to increase the passenger comfort.

Technical specifications

• Mechanism weight	10 to 12,5 kg
• Opening time, adjustable	2,5 to 6 sec
• Closing time, adjustable	3,5 to 8 sec
• Nominal reversing force	80 N
• Manual opening force	max. 70 to 150 N
• Operating temperature	-25 to +50°C
• Operating power	24/36/72/110 V DC
• Control unit according to	EN 50155
• Control unit	See page 18
• Power consumption idle-state	4 W
• Power consumption nominal	7 - 14 W

Advantages

- Compact modular design – easy to install and maintain
- Manual, electrically or pneumatically driven
- Microprocessor-controlled with integrated safety functions
- Lightweight with low space requirements
- Adjustable for varying spaces and different environments
- Designed to last 30 years of operation
- Minimal need for maintenance
- Smooth and silent operation
- All components and materials are of high quality and thoroughly tested
- Fire doors are tested against 20 minutes integrity
- No scheduled part exchanges first 10 years of operation

Characteristics

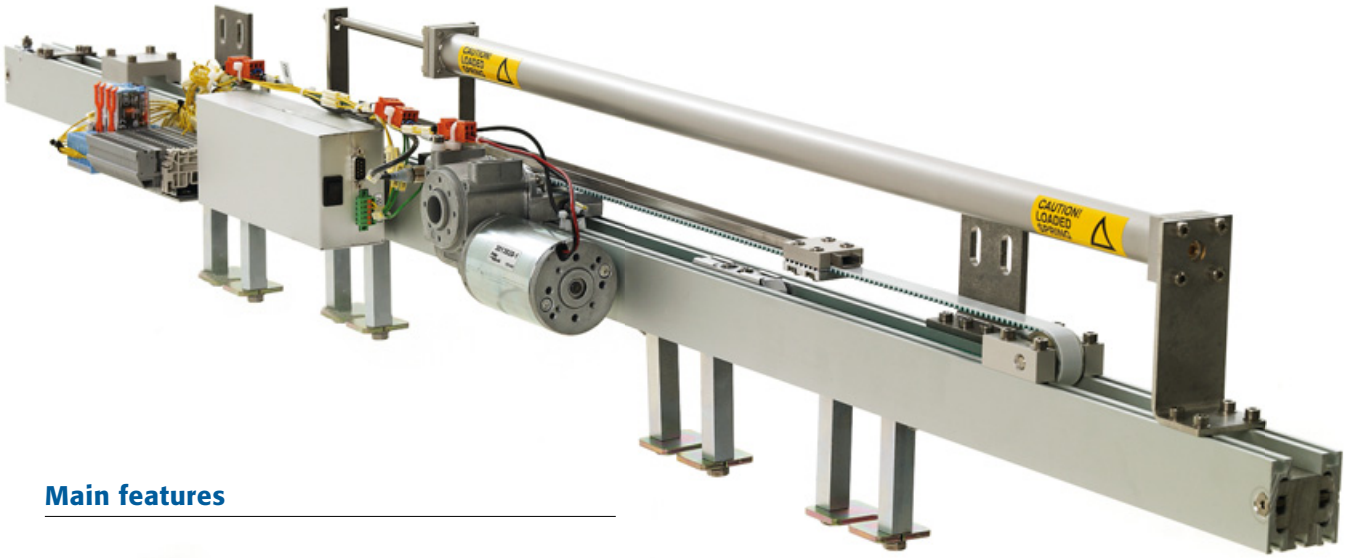
- Passenger operated pushbuttons or photocell detection
- Obstacle detection
- Release function
- Recovery timer
- Centralized opening option
- Monitoring and diagnostics through RS485 network
- Fault diagnosis display
- Emergency off-switch
- Operational parameter setting through RS232 interface
- Available with forced closing function
- Available with different openings
- Available with customized or standard door leaves
- Large operating temperature range

Norms

Our door products are used in projects all over Europe. Our sliding doors can be made to fulfil the international and national norms such as:

- BS norms (United Kingdom)
- DIN norms (Germany)
- EN norms (Europe)
- GOST norms (Russia)
- ISO norms (International)
- NF norms (France, Belgium, Italy)
- PNK norms (Poland)
- UNI norms (Italy)

Single and Double leaf sliding doors – DSYS2



Main features

- Compact modular design – easy to install and maintain
- Electrically or pneumatically powered
- Microprocessor-controlled with integrated safety functions
- Lightweight with low space requirements
- Adjustable for varying spaces and different environments
- Designed to last 30 years of operation
- Minimal need for maintenance
- Smooth and silent operation
- All components and materials are of high quality and thoroughly tested
- Fire doors are tested against 20 minutes integrity
- Available both automatic and manual versions
- EW/EI 15 – 30 available

Technical specifications

• Mechanism weight	10 to 12,5 kg
• Max. door leaf weight	60 kg or 2 x 40 kg
• Opening time, adjustable	2,5 to 6 sec.
• Closing time, adjustable	3,5 to 8 sec.
• Nominal reversing force	80 N
• Manual opening force (force closing device)	70 – 150 N
• Operating temperature	-25 to +50°C
• Storage temperature	-40 to +70°C
• Operating voltage	24/36/72/110 VDC
• Control unit according to	EN 50155
• Open and close and lock available	

Opening the doors for innovation

Engineering and Teamwork

PMC Polarteknik's teamwork approach empowers individuals and gives them responsibility, while encouraging easy sharing of information. The free flow of information through the organisation allows decisions to be made where the knowledge is. Our customers benefit from our flexibility and decisiveness.
PMC Polarteknik is firmly committed to its quality control system, which is under constant development. Our design and control make good use of state-of-the-art technology. We are in close cooperation with universities and independent testing laboratories to ensure that our project development process has the latest and best scientific knowledge available.

Single and Double leaf sliding doors – DSYS4

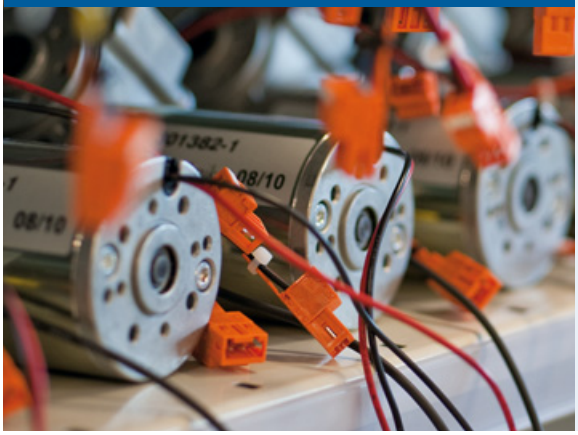
Main features

- Shares modular components with the DSYS2 standard door
- Lightweight and economical solution
- Minimal space envelope e.g. height 130 mm
- Suitable for doorleaf weights up to 45 kg
- Optimized for low maintenance cost

Technical specifications

• Mechanism weight	10 kg
• Max. door leaf weight	45 kg
• Opening time, adjustable	2,5 to 6 sec.
• Closing time, adjustable	3,5 to 8 sec.
• Nominal reversing force	80 N
• Manual opening force (force closing device)	70 – 150 N
• Operating temperature	-25 to +50°C
• Storage temperature	-40 to +70°C
• Operating voltage	24/36/72/110 VDC
• Control unit according to	EN 50155
• Open and close and lock available	

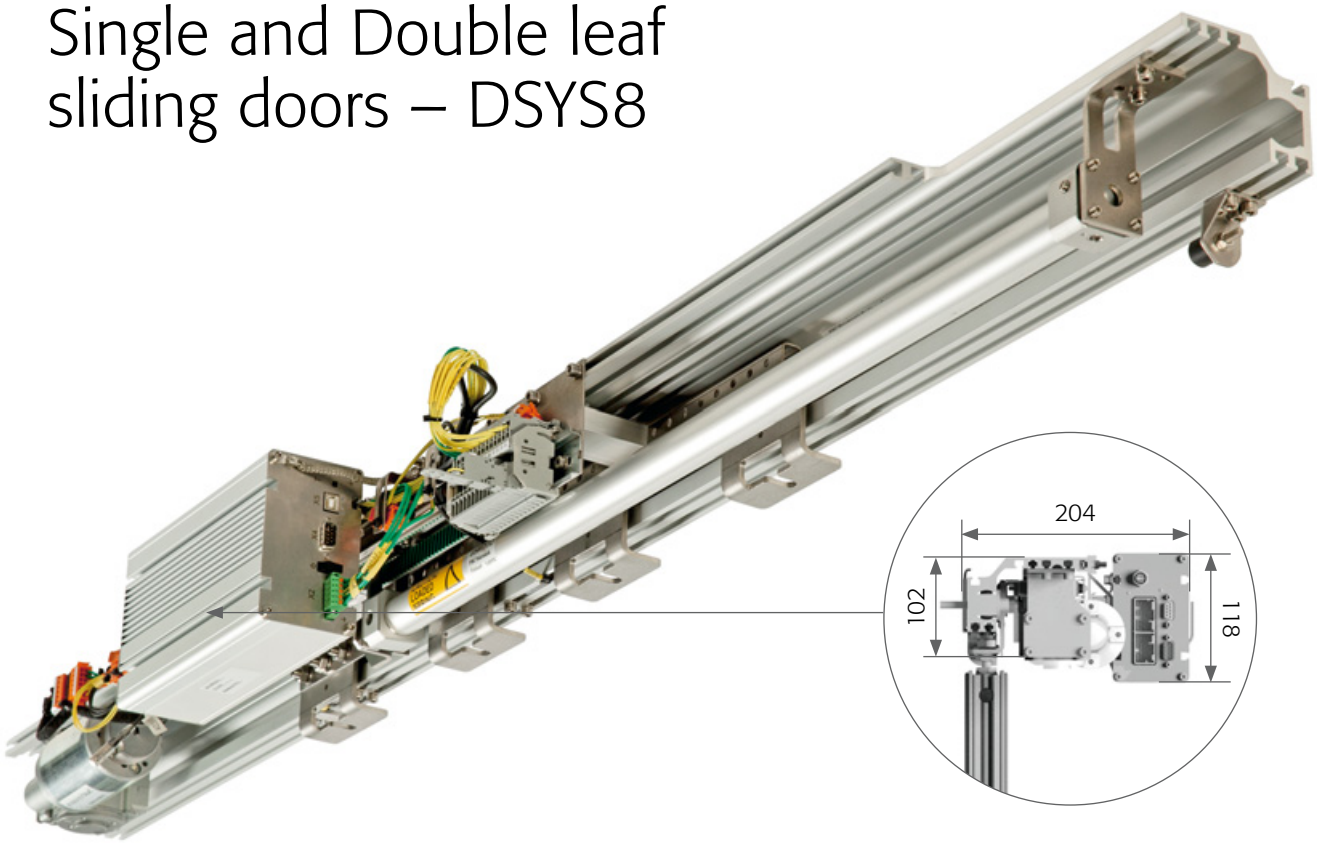
Reliability – doors that open when they need to



Production

PMC Polarteknik's area of expertise is the final assembly and testing of door units. Flexibility and high quality are our bywords, and the quality requirements of our customers always come first. Each door assembled by us undergoes a rigorous testing procedure. We have built our network of subcontractors carefully and hold them to the same exacting demands as our own operations.

Single and Double leaf sliding doors – DSYS8



Main features

- Shares modular components with the DSYS2 standard doors
- Very low space envelope e.g. height 120mm
- Good accessibility for maintenance
- Doorleaves also available

Technical specifications

• Mechanism weight	13 kg
• Max. door leaf weight	50 kg
• Opening time, adjustable	2,5 to 5 sec.
• Closing time, adjustable	3,5 to 8 sec.
• Nominal reversing force	80 N
• Manual opening force max.	70 N
• Operating temperature	- 25 to + 50°C
• Storage temperature	- 40 to + 70°C
• Operating voltage	24/36/72/110 VDC
• Control unit according to	EN 50155

Quality assurance – 100% serial testing

Testing and validation

All of the products are serial tested to assure compliance with the standards and customer requirements. Testing includes electrical testing, functional testing, dimensional and visual checks.
Quality systems include IRIS, ISO9001, ISO 14001 and we have certificates for DIN6701 A3-bonding and EN15085-2 CL4-welding.

Double leaf sliding telescopic doors

Note: This drawing is given only as information of a standard solution. We are able to modify the layout of the door mechanism in order to suit the customers doorway header space envelope. Please contact us if You require more details.

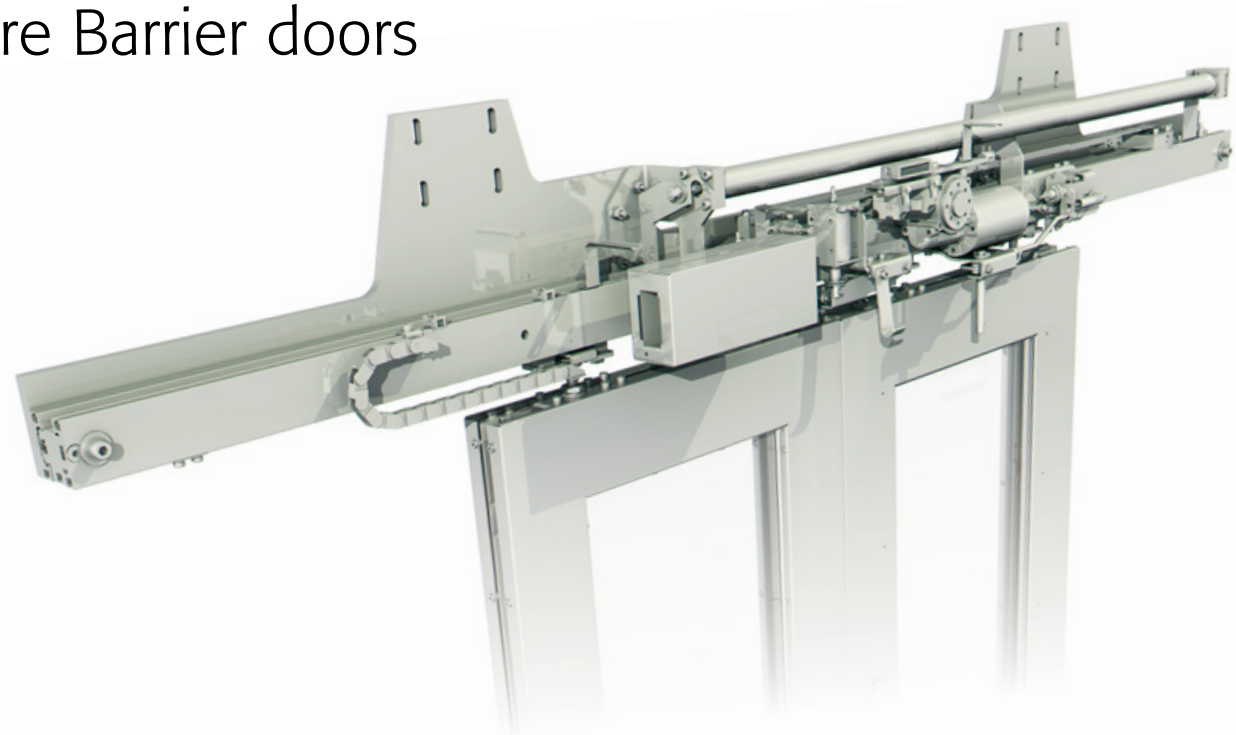
Main features

- Shares modular components with the DSYS2 standard door
- Lightweight and economical solution
- Minimal space envelope e.g. 1235mm length for 790mm opening
- Optimized for low maintenance cost

Technical specifications

• Mechanism weight	11 kg
• Max. door leaf weight	45 kg
• Opening time, adjustable	2,5 to 6 sec.
• Closing time, adjustable	3,5 to 8 sec.
• Nominal reversing force	80 N
• Manual opening force (force closing device)	70 – 150 N
• Operating temperature	-25 to +50°C
• Storage temperature	-40 to +70°C
• Operating voltage	24/36/72/110 VDC
• Control unit according to	EN 50155
• Open and close and lock available	

Fire Barrier doors



Fire tests done for PMC Doors in connection with customer project, EI class

Door type	Standard	Requirement / passed	Year	Report	Remarks
Double-leaf 750 mm	EN 1634-1	Integrity EI-30	2009	Interver	Glass 16 mm
Double-leaf 600 mm	BS 476	Integrity EI-30	2009	VTT-S-6301-09	Glass 19 mm
Double-leaf 700 mm	EN 1634-1	Integrity EI-15	2012	Customer	Glass 16 mm
Single-leaf 580 mm	EN 1634-1 / VNPB-03	Integrity E30I15	2012	Customer	Glass 10 mm
Single-leaf 1000 mm	EN 1634-1	Integrity E15I15	2012	Customer	Glass 10 mm
Double leaf 1100 mm	EN 1634-1	Integrity EI-30	2012	No. 2012-B-5706	Glass 18 mm
Double leaf 1050 mm	EN 1634-1	Integrity EI-15	2012	No. 2012-B-2900	Glass 10 mm
Double leaf 800 mm	EN 1634-1/ VNPB-03	Integrity EI-15	2013	Customer	Glass 10 mm
Double-leaf 600 mm	EN1634-1	Integrity EI-20	2016	Customer	Glass 14 mm

Performance and details

- Fire integrity and insulation from 15 to 30 minutes (EI15-EI30)
- Glass thickness 10 to 20 mm
- Effective sound insulation
- Pocket mounting

POLARTEKNIK FIRE DOORS [30 min.]

POLARTEKNIK FIRE DOORS [15 min.]

Fire tests done for PMC Doors in connection with customer project, E-EW class

Door type	Standard	Requirement / passed	Year	Report	Remarks
Double-leaf 603 mm	BS 476	Integrity 20 minutes	2001	VTT/RTE4256/01	Glass 6 mm, silicone rubber
Double-leaf 755 mm	BS 476	Integrity 20 minutes	2004	Chilt/RF04028	Glass 6 mm, 3 part sealing
Single-leaf 920 mm	EN 1634-1	Integrity 15 minutes	2006	VTT-S-3140-06	Glass 6 mm, silicone rubber
Single-leaf 820 mm	EN 1634-1	Integrity E15 / EW15	2006	VTT-S-9714-06	Glass 8 mm, silicone rubber
Double-leaf 755 mm	BS 476	Integrity 20 minutes	2006	Warrington 159968	Glass 6 mm, silicone rubber
Double-leaf 1100 mm	EN 1634-1	Integrity 15 minutes	2007	VTT-S-4887-07	Glass 8 mm, silicone rubber
Single-leaf 715 mm	EN 1634-1	Integrity E15 / EW15	2007	VTT-S-7793-07	Glass 8 mm, silicone rubber
Double-leaf 715 mm	EN 1634-1	Integrity E15 / EW15	2007	Licof-Afiti	Glass 6 mm, silicone rubber
Single-leaf 715 mm	EN 1634-1	Integrity E15 / EW15	2007	VTT-S-10380-07	Glass 8 mm, silicone rubber
Single-leaf 715 mm	EN 1634-1	Integrity E15 / EW15	2007	Licof-Afiti	Glass 8 mm, silicone rubber
Double-leaf 840 mm	BS 476	Integrity 20 minutes	2010	VTT-S-5274-10	Glass 6 mm, silicone rubber
Hinge door 732 mm	EN 1634-1 / VNPB-03	Integrity EW30-I15	2012	0668408	Glass 10 mm
Double leaf 1100 mm	EN 1634-1	Integrity E20	2013	No. 2013-B-5855	Glass 6 mm
Double leaf 650 mm	EN 1634-1	Integrity E20	2014	Customer	Glass 7 mm
Single-leaf 800 mm	EN 1634-1	Integrity EW20	2016	20160334	Glass 8 mm

Performance and details

- Fire integrity EW-15 to 20
- Glass thickness 6 to 16 mm
- Effective sound insulation
- Pocket or surface mounting

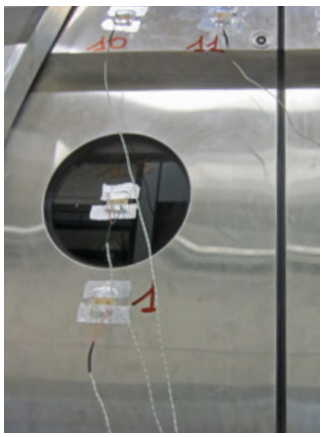
POLARTEKNIK FIRE DOORS [30 min.]

POLARTEKNIK FIRE DOORS [20 min.]

POLARTEKNIK FIRE DOORS [15 min.]

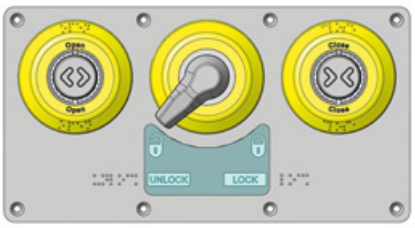
Materials according to

- BS 6853
- DIN 5510
- EN 45545-2
- NF F 16-101/2
- UNI CEI 11170-3



Curved doors

Operation panel



Main features

- Customizable to different module space envelope
- Shares modular components with the DSYS2 standard doors
- Doorleaves also available
- Variants are 1-leaf and 2-leaf bi-parting
- Available both automatic and manual versions

Technical specifications

Mechanism weight	5 to 7 kg
Max. door leaf weight	40 kg
Opening time, adjustable	2,5 to 5 sec.
Closing time, adjustable	3,5 to 6 sec.
Nominal reversing force	80 N
Manual opening force max.	70 N
Operating temperature	-25 to +50°C
Storage temperature	-40 to +70°C
Operating voltage	24/36/72/110 VDC
Control unit according to	EN 50155

- Different open and close and locks available
- See page 21 for some optional accessories

Partition wall concept

This principle serves primarily the following objectives:

- To reduce the number of managed items
- To divide physically large assemblies into more manageable units
- To reduce the number of components to be installed
- To minimize the number of electrical connections to be made
- To minimize the required adjustment steps during installation
- To speed up the required routine tests
- To help the commissioning process by providing pre-tested units

Acting by networking

- sourcing components, sub-supplies and services

Manufacturing the product

- procure, produce, assemble, test, dispatch

Carrying system responsibility

- one-stop-shop service to customer

Our doors to your door – reliably and fast

Packing and delivery

All our doors are carefully packaged in sturdy and easily unloaded cardboard crates designed to ensure safe delivery anywhere in the world. All required documents for shipping and quality control are naturally included with each shipment. In Europe, we can deliver our doors to customers within one week. Tilting sensors and shock sensors are included to trace possible mis-handling during freight.

Partition walls without fire integrity

Main features

- All components and materials are of high quality and throughly tested
- Sliding door mechanism pre-assembled and tested
- Minimized amount of assembly modules
- Easy service access for internal components
- Easy integration to train systems
- Optimized for low maintenance cost
- Flexible scope of supply

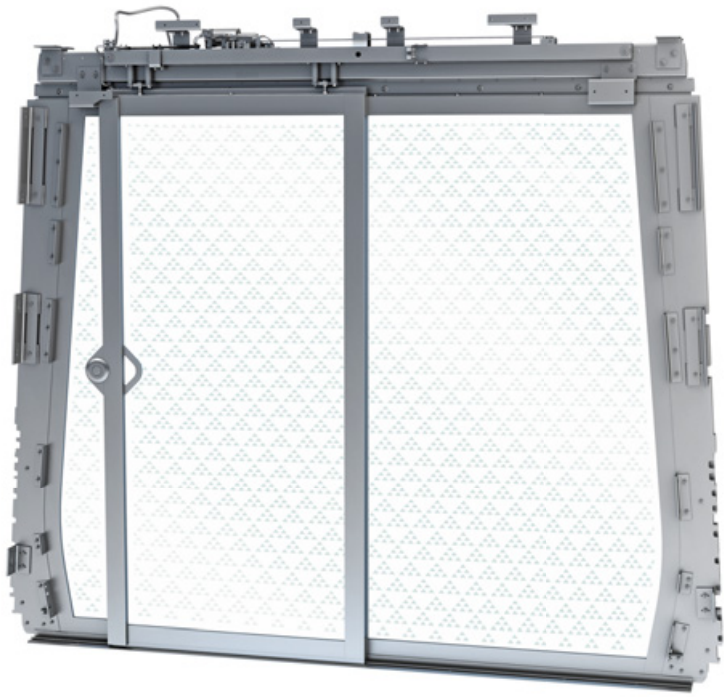
Technical specifications

- 30 minutes insulating fire barrier EW 20, EI 15 – 30
- Surface coats: Anodization, wet paint, powder coat, chrome, anti-graffiti
- Pocket or surface mounted doorleaves
- Open and close locks available
- Force closing device optional
- Nominal weight from 100 kg
- Remote open function

Fire barrier body-end and partition walls

Gangway partition cassette

- Full partition wall with fire resistance of EW15
- Aluminium body and surface plates
- Manual with force closing spring (can be offered as automatic)

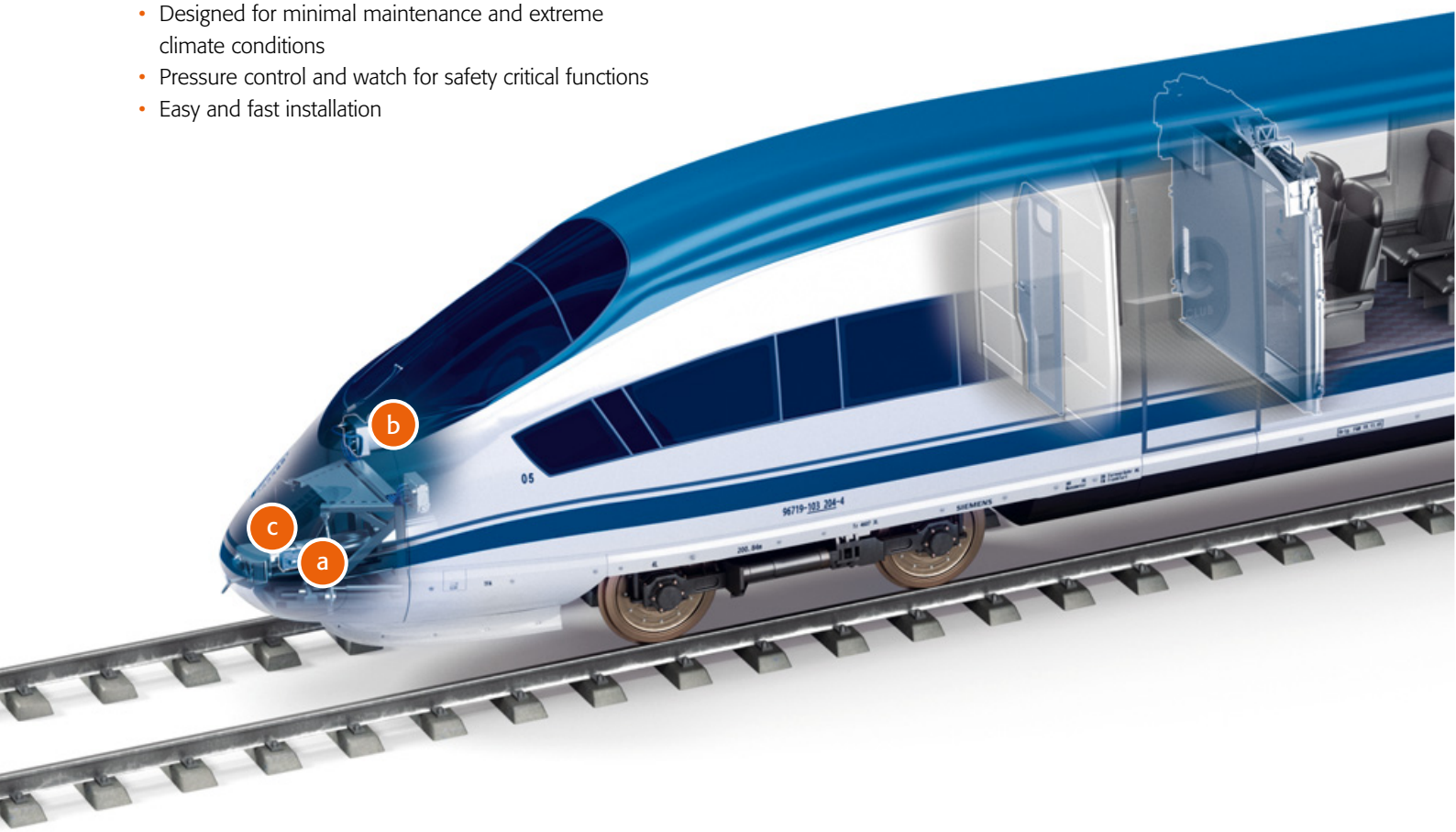


Full glass partition

- Automatic version; push button or IR-sensor operated door system
- Fire protection EW20- design according to EW30 requirements (new profile system)
- Fire interfaces are included in the system scope of supply => total responsibility
- High-quality finish – chromating,powder painting or anodized natural color available
- Free control unit positioning for optimal accessibility during maintenance
- Optional features: TCMS bus connectivity (MVB, RS485, Ethernet coming soon) in automatic version.
- Glass 8mm E15..E30 available with sandblasting effect to provide unique visual outlook

Control Blocks for Couplers and Hatches

- Designed for minimal maintenance and extreme climate conditions
- Pressure control and watch for safety critical functions
- Easy and fast installation



a

Control Blocks for couplers

- Easy and fast installation:
  To release the block for service: open 4 hex screws and replace with new
- Designed for minimal maintenance and extreme climate conditions
- Multi-function block without external intermediate connections
- Integrated ON/OFF device
- Intergrated valves and filters in one block/baseplate

b

Control Blocks for hatches

- Intergrated valves with filters and adjustment in one block
- Designed for minimal maintenance and extreme climate conditions
- Pressure control and watch for safety critical functions
- All the connections in the baseplate
- Easy and fast installation:
  Replacing the valve block requires disconnecting only 4 bolts and the electrical plug

c

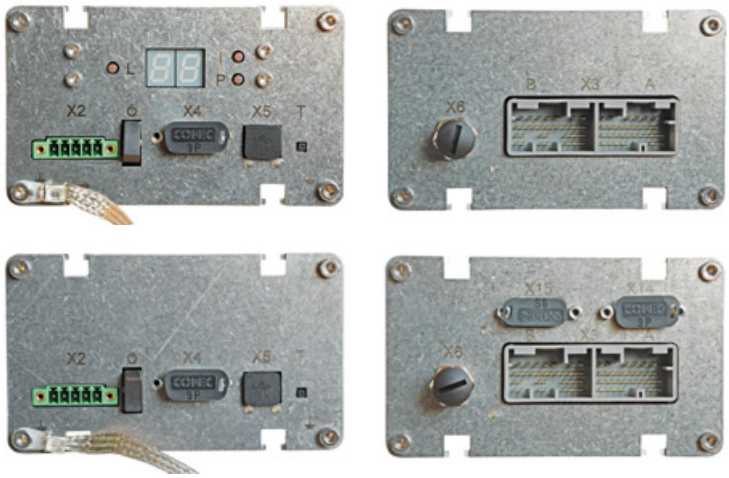
Locking cylinders for train carriage couplers

- Small durable and easy to install locking cylinder
- Designed for minimal maintenance and extreme climate conditions

D55 Door Control unit

Norm compliance		
Function	EN14752:2015	
Vibration	EN 50155:2007 M25 GOST 17516.1-90	IEC 61373:1999 Category 1, Class A GOST 16962.2-90 and 20.57.406-81 Methods 102-1, 103-1.1 and 160-1
EMC	EN 50155:2007	EN 50121-3-2:2006
Temperature	EN 50155:2007	Table 1, Class TX, -40 to +85 °C Cooling EN 60068-2-1, Dry heat EN 60068-2-2, Damp heat EN 60068-2-30
IP	EN 60529:1999	IP20
Dimensions	1375g, 226 x 118 x 70 mm (L x W x H)	
Software	EN 50128:2001	SIL 0 or SIL 1
MTBF The fit is equivalent to one failure per billion device hours	MIL-217F-2 UTE C 80-810	FIT = 114079 FIT = 215502

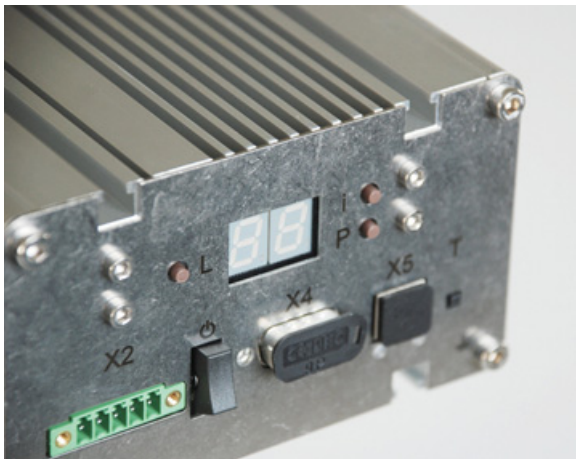
D55 Main features

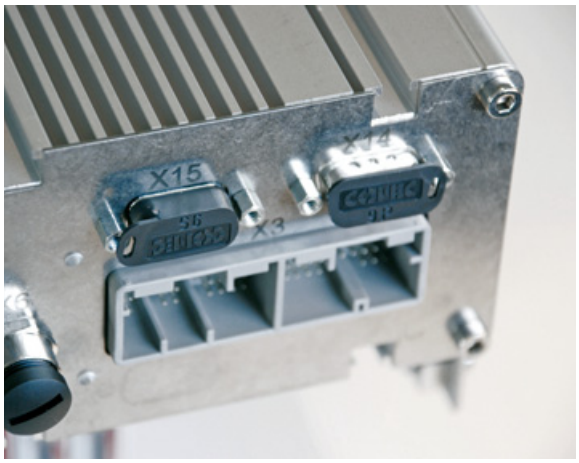


General input and outputs	D55	D55F
Digital inputs	8 pcs	One optional analog input
Isolated inputs	D55 model 8 pcs	D55F model 4 pcs
Digital outputs	D55 model 16 pcs	D55F model 12 pcs
	6 outputs PWM capable	
Connectors	**D55**	**D55F**
Power supply	Phoenix Contact MC 1,5/5-GF-3,81	Souriau SMS6GE63
Main I/O	Jae Connectors MX31070NFC	Harting 09 23 148 222
Ethernet	Standard M12 female, D-coded	Standard M12 female, D-coded
USB 2.0	Standard type A female	Standard type A female
RS484 and RS232	D9 female	D9 female
MVB and CAN	D9 male+female	D9 male+female
Communication interfaces	**Standard**	**Optional (select only 1)**
	USB interface	CAN bus IEC 61375-3-3
	RS232 interface	RS485 bus ANSI
	Ethernet 10/100BASE-TX	MVB bus cl.1/2 IEC 61375-3-1
		DD1 diagnostic display can be combined with RS485

Secondary features	
Motor controller	Full H-bridge motor controller
Power supply: isolated push-pull DC-DC converter	There are two input voltage versions, 24/36 V and 72/110 V
	Output voltage +24,5 V
	Typical output power 100 W, 3A continuous current
	Maximum output power 150 W (6A) for 5 s time
Clock	Real time clock with capacitor backup

D55 Door Control unit





An ideal product for large variety of projects

PMC Group's 30 years of excellence in power, motion and control products is continued with the launch of another innovative product, that meets customer requirements and the ever more demanding market needs in an unparalleled way.

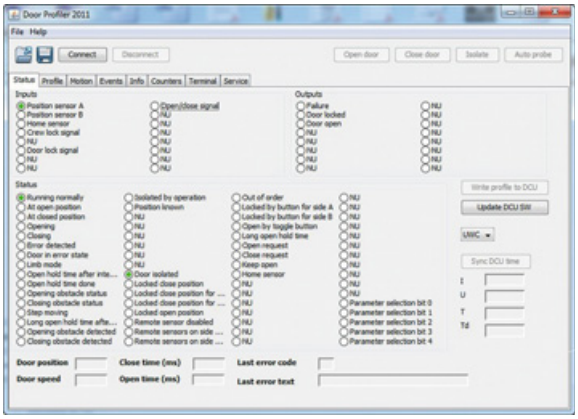
The D55 Door Control Unit features a wealth of Return On Experience gathered in deliveries to the rolling stock and transport industry – all of it designed and put into action in a most impressive way. Carefully implemented comprehensive pre-studies, design FMEA, and strong obsolescence management make D55 the ultimate product in terms of life cycle management and reliability of operation.

Best-in-class reliability coupled with compliance with most norms against hardware and software norms, diagnostics tools, and parametric adjustability make this product one of the best ones ever. It meets all door control requirements of new-build and refurbishment projects now and in the years to come.

Main features

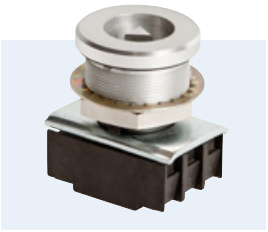
- Internal power source with galvanic isolation
- Capacitor backup for internal real-time clock
- ARM Cortex-M3 32bit processor
- Bus extensions RS232, USB, Ethernet 10/100Mbps, RS485, CAN, MVB, ModBus
- Diagnostics via laptop or diagnostic display
- 200 adjustable settings for increased flexibility

Maintenance software



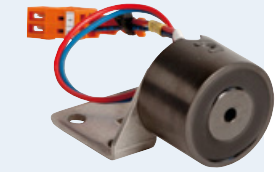
Accessories

Rotary switches, press switches, magnets and solenoids

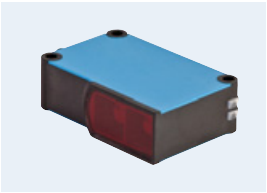
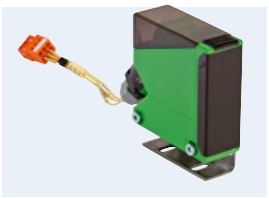


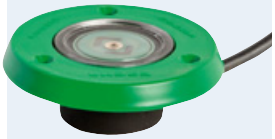


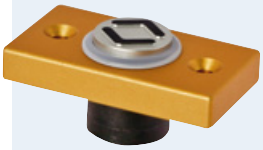


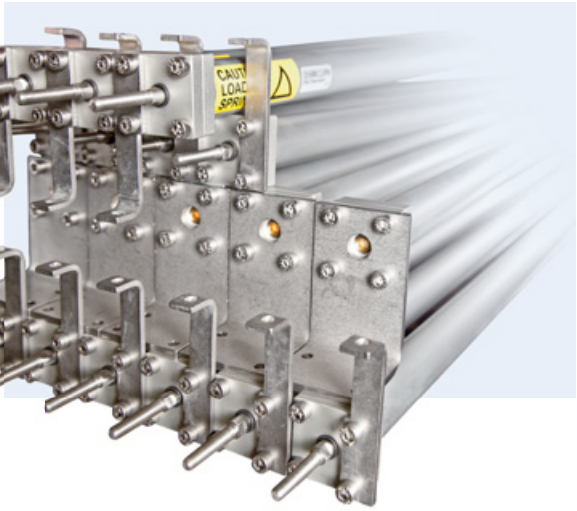
Photocells, opening switches and energy transfer chain




Force closing device



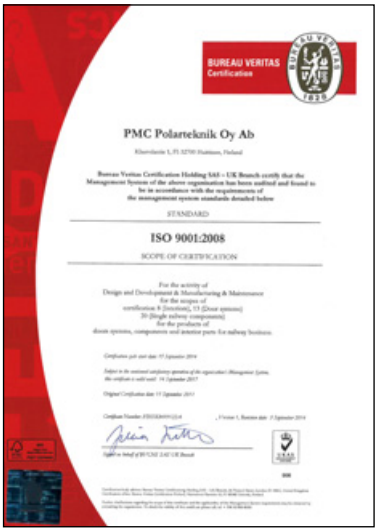
Accessories and customer specific devices

Polarteknik can provide off-the-shelf components and customer tailored accessories and assemblies as per request. Different activation, safety, power and filtration devices are a common addition to the tailor made door systems and partitions. Mechanical accessories can include e.g. handles, counter frame profiles, partition panels, covers and brackets.

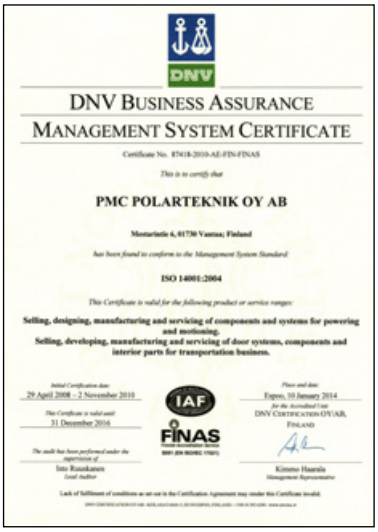
All of the proposed solutions share the value of return of experience from previous projects supplied and compliance and longevity testing where applicable.

Quality and Certifications

IRIS rev 02 certified

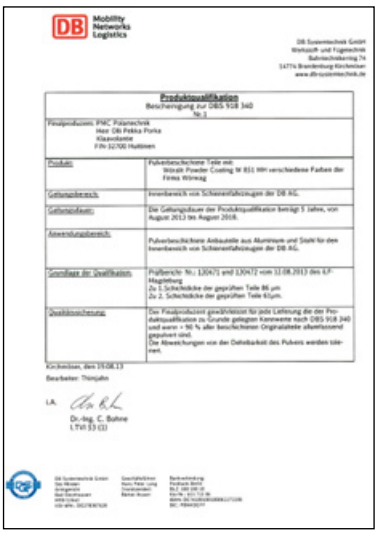


ISO9001 certified



ISO14001 certified

DIN 6701-2 (gluing)



DB approved supplier

DIN15085-2 (welding)

IRIS Certification

Polarteknik Oy
Klaavolantie 1, 32700 Huittinen, Finland
Tel. +358 (0)20 770 9500
Fax +358 (0)20 770 9505
info@polarteknik.fi
www.polarteknik.fi

2016

Polarteknik