

# **ACOPOStrak**

## **User's manual**

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# 1 General information

## 1.1 Manual history

### Information:

**B&R makes every effort to keep user's manuals as current as possible.**

**From a safety point of view, however, the current version must be downloaded from the B&R website ([www.br-automation.com](http://www.br-automation.com)).**

Version	Date	Comment
1.2.2	2022-10-03	Changes / New features <ul style="list-style-type: none"> <li>Chapter "Technical data":               <ul style="list-style-type: none"> <li>Segments: Added blind plug caps.</li> <li>Straight segment: Added installation diagram revision B5.</li> <li>Added magnet units.</li> <li>Shuttles: Added order numbers for 10 pieces.</li> <li>Shuttles: Added magnet cover plates.</li> </ul> </li> <li>Chapter "Servicing and maintenance":               <ul style="list-style-type: none"> <li>"Replacing a shuttle cover": Added "Installing a shuttle shim".</li> </ul> </li> <li>Chapter "Installation":               <ul style="list-style-type: none"> <li>Added "Lifting guide elements of an ACOPOStrak transport system".</li> <li>Added "Vertical track system".</li> <li>"Assembling the segments": Added "Lubricating the mounting screws".</li> <li>"Assembly of the segments": Added note.</li> <li>"Adjusting the segment position": Changed order of instructions.</li> </ul> </li> <li>Chapter "Standards and certifications":               <ul style="list-style-type: none"> <li>Added link to declaration of incorporation for shuttles.</li> </ul> </li> <li>Appendix:               <ul style="list-style-type: none"> <li>Installation diagrams: Added straight segment revision B5.</li> </ul> </li> </ul>
1.2.1	2022-03-08	Changes / New features <ul style="list-style-type: none"> <li>Chapter "Assembly instructions":               <ul style="list-style-type: none"> <li>"B&amp;R standard guide system": Increased tightening torque of mounting screws segments.</li> </ul> </li> </ul>
1.2	2021-11-22	Changes / New features <ul style="list-style-type: none"> <li>Chapter "General information":               <ul style="list-style-type: none"> <li>Updated "Safety guidelines / Intended use".</li> <li>Updated "Safety guidelines / Reasonably foreseeable misuse".</li> <li>Updated "Safety guidelines / Hazardous energy".</li> </ul> </li> <li>Chapter "Technical data":               <ul style="list-style-type: none"> <li>General information: Removed "System-relevant data".</li> <li>Segments: Updated technical data.</li> <li>Magnet units: Updated technical data.</li> <li>Power supply: Updated technical data.</li> <li>Cables: Updated technical data.</li> <li>Guide systems: Removed "B&amp;R legacy guide system".</li> <li>Guide systems / B&amp;R standard guide system: Updated technical data.</li> <li>Guide systems / Shuttles: Updated technical data.</li> <li>Guide systems: Updated "Replacement parts list".</li> <li>Guide systems: Added "Additional loads on the guide system".</li> <li>Tools: Updated technical data.</li> </ul> </li> <li>Chapter "Maintenance":               <ul style="list-style-type: none"> <li>Added "Replacing a segment".</li> <li>Added "Replacing shuttle gliders".</li> <li>Added "Replacing a shuttle cover".</li> </ul> </li> <li>Chapter "Installation":               <ul style="list-style-type: none"> <li>Removed "B&amp;R legacy guide system".</li> <li>Updated "B&amp;R standard guide system".</li> </ul> </li> <li>Chapter "Wiring":               <ul style="list-style-type: none"> <li>Power supply connection: Updated "Wiring from power supply module 80PS to segment 8F1101".</li> </ul> </li> <li>Appendix:               <ul style="list-style-type: none"> <li>Removed "Circular track of the B&amp;R legacy guide system".</li> <li>Updated "Straight segment".</li> <li>Updated "Magnetic fields on the ACOPOStrak shuttle".</li> </ul> </li> </ul>

Table 1: Manual history



Version	Date	Comment
1.1.2	2021-04-16	Changes / New features <ul style="list-style-type: none"> <li>Chapter "Wiring":               <ul style="list-style-type: none"> <li>General information / EMC-compatible installation / Installation notes: Removed cable information.</li> </ul> </li> </ul>
1.1.1	2021-03-03	Changes / New features <ul style="list-style-type: none"> <li>Chapter "Technical data":               <ul style="list-style-type: none"> <li>B&amp;R standard guide system: Updated names.</li> <li>Updated installation diagrams for guide stands.</li> <li>Magnet units: Removed 8F1M1.04030.00x-1.</li> <li>Shuttles: Removed 8F1SA.207.10000x-1, 8F1SA.205.10000x-1.</li> </ul> </li> </ul>
1.1	2021-02-04	Changes / New features <ul style="list-style-type: none"> <li>Chapter "Technical data":               <ul style="list-style-type: none"> <li>Cables: Updated technical data.</li> <li>B&amp;R standard guide system: Added end interface.</li> </ul> </li> <li>Chapter "Installation":               <ul style="list-style-type: none"> <li>B&amp;R standard guide system: Added diverter setting.</li> <li>Added removal of crossbar.</li> <li>Added installation of a guide stand with end interface.</li> <li>Installing an end stop</li> <li>Tightening torque of mounting screws segments reduced to their original values.</li> </ul> </li> <li>Chapter "Servicing and maintenance":               <ul style="list-style-type: none"> <li>Updated shuttle maintenance.</li> <li>Updated lubrication of the lubrication felt.</li> </ul> </li> <li>Chapter "Dimensioning":               <ul style="list-style-type: none"> <li>Mechanical dimensioning: Added examples of the load on the shuttle.</li> </ul> </li> <li>Chapter "Wiring":               <ul style="list-style-type: none"> <li>Updated system topology.</li> </ul> </li> <li>Chapter "International and national certifications": Updated.</li> <li>Appendix: Updated magnetic fields on the ACOPOStrak shuttle.</li> </ul>
1.0.3	2020-10-28	Preliminary changes / New features <ul style="list-style-type: none"> <li>Chapter "Assembly instructions":               <ul style="list-style-type: none"> <li>B&amp;R standard guide system (without diverter): Increased tightening torque of mounting screws segments.</li> </ul> </li> </ul>
1.0.2	2020-09-10	Preliminary changes / New features <ul style="list-style-type: none"> <li>Chapter "General information / Safety guidelines":               <ul style="list-style-type: none"> <li>Added reasonably foreseeable misuse.</li> <li>Dangerous energy: Added radiation.</li> <li>Added notes on disassembly.</li> </ul> </li> <li>Chapter "Technical data":               <ul style="list-style-type: none"> <li>Added power supply 8B0C0320Hx00.B00-1.</li> <li>Added magnet units 8F1M1.03010.00X-1, 8F1M1.04030.00X-1.</li> <li>Added B&amp;R illuminated ring keys.</li> <li>Added shuttles 8F1SA.104.10000I-1, 8F1SA.106.10000I-1, 8F1SA.205.10000I-1, 8F1SA.207.10000I-1.</li> <li>Added tools.</li> </ul> </li> <li>Chapter "Assembly instructions":               <ul style="list-style-type: none"> <li>Added B&amp;R standard guide system (without diverter).</li> <li>Updated assembly/disassembly of a shuttle.</li> </ul> </li> <li>Chapter "Maintenance":               <ul style="list-style-type: none"> <li>Restructured and updated.</li> </ul> </li> <li>Chapter "Dimensioning":               <ul style="list-style-type: none"> <li>Added power supply with ACOPOSmulti drive system.</li> <li>Updated layout rules.</li> </ul> </li> <li>Chapter "Wiring":               <ul style="list-style-type: none"> <li>Added power supply with ACOPOSmulti drive system.</li> </ul> </li> </ul>
1.0.1	2020-04-14	Changes / New features <ul style="list-style-type: none"> <li>Chapter "Technical data":               <ul style="list-style-type: none"> <li>Segments: Added UL certification; updated input current value.</li> <li>Overvoltage protection: General information: Updated note.</li> <li>Technical data: Added CE/UL certifications.</li> <li>Updated input/output circuit diagram.</li> </ul> </li> <li>Chapter "Assembly instructions":               <ul style="list-style-type: none"> <li>Restructured according to assembly sequence.</li> <li>Assembling straight segment / curved segment: Updated size of the shoulder screw.</li> </ul> </li> <li>Chapter "Wiring":               <ul style="list-style-type: none"> <li>Basic rules for POWERLINK connections: Updated POWERLINK connections, hub port DNA assignments</li> </ul> </li> <li>Chapter "Safety technology":               <ul style="list-style-type: none"> <li>General information: Added fuse protection of the power supply cable</li> </ul> </li> <li>Appendix:               <ul style="list-style-type: none"> <li>Added UL marks.</li> </ul> </li> </ul>
1.0	2020-01-31	Start of revision history publication

Table 1: Manual history

## 1.2 Safety notices

### 1.2.1 Organization of notices

#### Safety notices

Contain **only** information that warns of dangerous functions or situations.

Signal word	Description
<b>Danger!</b>	Failure to observe these safety guidelines and notices will result in death, severe injury or substantial damage to property.
<b>Warning!</b>	Failure to observe these safety guidelines and notices can result in death, severe injury or substantial damage to property.
<b>Caution!</b>	Failure to observe these safety guidelines and notices can result in minor injury or damage to property.
<b>Notice!</b>	Failure to observe these safety guidelines and notices can result in damage to property.

#### General notices

Contain **useful** information for users and instructions for avoiding malfunctions.

Signal word	Description
<b>Information:</b>	Useful information, application tips and instructions for avoiding malfunctions.

### 1.2.2 Intended use

In all cases, applicable national and international standards, regulations and safety measures must be taken into account and observed!

The B&R products described in this manual are intended for use in industry and industrial applications. The intended use includes control, operation, monitoring, drive and HMI tasks as part of automation processes in machines and systems.

ACOPOStrak was not specifically designed and manufactured for hygienic applications and related industry-specific guidelines and standards.

B&R products are only permitted to be used in their original condition. Modifications and extensions are only permitted if they are described in this manual.

B&R excludes liability for damage of any kind resulting from the use of B&R products in any intended way.

The components of transport systems are intended for use in machine manufacturing as well as process manufacturing. This intended use is prohibited until it has been determined that the machine complies with the regulations of EC directives 2006/42/EC (Machinery Directive) and 2014/30/EU (EMC Directive).

B&R products have not been designed, developed and manufactured for use that involves fatal risks or hazards that could result in death, injury, serious physical harm or other loss without the assurance of exceptionally stringent safety precautions.

B&R products are explicitly not intended for use in the following applications:

- Monitoring and control of thermonuclear processes
- Weapon systems control
- Flight and traffic control systems for passenger and freight transport
- Mass transport control
- Passenger transport
- Health monitoring and life support systems
- Painting and coating systems

The components of B&R transport systems are only permitted to be operated with the following B&R power supply modules:

- 80PS080X3.10-01
- 8B0C0320Hx00.B00-1

For technical data as well as specifications for connection and ambient conditions, see the nameplate of the components and user documentation. The connection and ambient conditions must be observed!

### **Danger!**

**Electronic devices are generally not failsafe. If the transport system fails, the user is responsible for ensuring that any moving shuttles are brought to a secure state.**

### 1.2.3 Reasonably foreseeable misuse

The following reasonably foreseeable misuse must be avoided:

- Loading above the maximum permissible payload
- Exceeding the maximum permissible speed
- Transport of hazardous fluids (fluids in group 1) per the Pressure Equipment Directive 2014/68/EU
- Transport of flammable and reactive fluids/substances
- Use of different shuttle types (in terms of width, skewed magnet units)
- Processing of ferromagnetic materials/chips

### 1.2.4 Qualified personnel

The use of safety-related products is restricted to the following persons:

- Qualified personnel who are familiar with relevant safety concepts for automation technology as well as applicable standards and regulations.
- Qualified personnel who plan, develop, install and commission safety equipment in machines and systems.

Qualified personnel in the context of this manual's safety guidelines are those who, due to their training, experience and instruction combined with their knowledge of relevant standards, regulations, accident prevention guidelines and operating conditions, are qualified to carry out essential tasks and to recognize and avoid potentially dangerous situations.

In this regard, sufficient language skills are also required in order to be able to properly understand this manual.

### 1.2.5 Handling and installation

#### **Warning!**

**Components of the ACOPOStrak transport system may be very heavy.**

**When handling and installing heavy components of the ACOPOStrak transport system, there is therefore the risk of personal injury or damage to property caused by shearing, impacts, cutting or crushing. If required, use suitable protective equipment (e.g. safety glasses, protective gloves, safety shoes)!**

Installation must be performed according to this documentation using suitable equipment and tools.

Components are only permitted to be installed in a voltage-free state and by qualified personnel. The ACOPOStrak transport system must first be disconnected from the power supply and secured against being switched on again.

General safety guidelines and national accident prevention regulations for working with high voltage systems must be observed.

#### **Warning!**

**Danger due to improper assembly.**

- **Assembly is only permitted to be carried out by qualified personnel.**
- **For assembly, only hoisting devices and load-handling equipment that comply with legal regulations are permitted to be used.**
- **Hoisting devices, load-handling equipment and means of transport must have sufficient load-bearing capacity and safety.**
- **Risk of crushing when lifting loads!**
- **Do not step under suspended loads! Staying under a suspended load can result in death!**
- **Use mechanical lifting equipment (e.g. crane, forklift) to lift loads over 25 kg.**
- **Secure loads to the designated attachment points.**
- **Do not place the load-handling equipment on sharp edges and corners, knot or twist it.**
- **When transporting individual components, the designated attachment points for chains, ropes or forklift forks must be used.**
- **Trip hazard!**

### 1.2.6 Hazardous energy

Any energy source that presents a risk of injury to a person working on the system must be regarded as a hazardous energy source. The following hazardous energy sources are present on the ACOPOStrak transport system:

- Electrical
- Mechanical
- Thermal
- Radiation

## Danger!

Unintended and hazardous shuttle movements can be triggered by the faulty behavior of the ACOPOStrak transport system! Possible causes:

- Incorrect installation or faults when handling components
- Incorrect or incomplete wiring of the ACOPOStrak transport system
- Defective components (segments, shuttles, position encoders, cables, etc.)
- Improper control

## Danger!

Shuttles can become detached from the guide system at high speed during the movement and cause substantial damage to property and personal injury! Possible causes:

- Poor weight distribution of the product / product carrier on the shuttle
- Adverse ratio of distances from centers of gravity to magnetic forces
- Poor geometry of the product / product carrier
- Excessive weight of the transported product / product carrier
- Excessive speed and/or acceleration of the shuttle
- Product moving on the shuttle (sloshing, rolling, slipping)
- Nonobservance of limitations regarding the mounting orientation of the ACOPOStrak transport system
- Incorrect configuration

### 1.2.6.1 Electrical

## Warning!

Maintenance work on an ACOPOStrak transport system that is still connected to the power source may result in injury or death. Before performing any work on the ACOPOStrak transport system, it must be disconnected from the mains and secured against being switched on again. Only qualified electrical personnel are permitted to carry out maintenance work on an ACOPOStrak transport system.

### 1.2.6.2 Mechanical

## Warning!

Maintenance work on mechanical components or parts of the system while the voltage source is still connected can result in injuries. For access or maintenance of the mechanical components, the main power supply must be switched off, locked and marked accordingly. Only qualified personnel are permitted to access mechanical components and parts of the system.

Be mindful of stored energy sources (e.g. potential and kinetic energy or strong magnetic fields) that exist after the ACOPOStrak transport system is shut down.

## Warning!



**Danger of crushing between shuttle and guide rail!  
Hand injury!**

- Grip the shuttle on its side.

The ACOPOStrak transport system is subject to mechanical hazards due to moving tool components or parts of the system. System components driven by potential or kinetic energy in the form of rotational force, linear force or gravity can cause crushing, jamming and impact injuries.

In the event of mechanical danger, switch off the main power supply. Do not switch on the main power supply of the ACOPOStrak transport system until qualified personnel has corrected the situation.

### 1.2.6.3 Thermal

#### Danger!



Allow sufficient time for hot surfaces to cool before starting work. When working on or near the thermal hazard, wear appropriate personal protective equipment (PPE). Use a non-contact thermometer to check the temperature.

Thermal hazards include any point of contact that is too hot or too cold. Thermal hazards can cause contact damage to exposed skin or constitute a fire hazard. Use a shield to prevent contact burns. Discharge the heat to ensure that the contact point is at a moderate temperature before working near it.

### 1.2.6.4 Radiation

#### Danger!



- The magnetic field generated by the shuttles (magnet units) can be harmful to pacemaker wearers. Maintain a minimum distance of 31 cm (12 in.) between the shuttle and the implant location.
- The permanent magnets in the shuttles have a strong magnetic field.
- When a shuttle is removed from the ACOPOStrak transport system, slide a magnet cover plate over the magnet unit on the shuttle to reduce the effect of the magnetic field to a safe level.
- Magnetic fields that occur can set ferromagnetic and magnetic materials into motion, creating potential projectiles or pinch points. Various electronic equipment or magnetic data storage media can also be affected by these magnetic fields.

#### Warning!



Danger of crushing between shuttle and guide rail!  
Hand injury!

- Grip the shuttle on its side.

Observe the following points to avoid and protect against magnetic and electromagnetic fields:

- Observe relevant national health and safety regulations.
- Post warning notices as needed.
- Place barriers around danger zones.
- Ensure that magnetic and electromagnetic fields are reduced at their source (using shields, for example).

## 1.3 Environmentally friendly disposal

B&R transport systems are designed to have as little impact on the environment as possible.

### 1.3.1 Separation of materials

To ensure that devices can be recycled in an environmentally friendly manner, it is necessary to separate out the different materials.

Component	Disposal
Transport systems, cables	Electronic recycling
Cardboard/Paper packaging	Paper/Cardboard recycling
Guide systems	Metal recycling

Table 2: Environmentally friendly separation of materials

Disposal must be carried out in accordance with applicable legal regulations.

### 1.3.2 Notes about disassembly

Preparation

- Keep the machine voltage-free.
- Safely disconnect all power supply cables from the machine.
- The machine must be at a standstill and, if necessary, cooled down.

## Warning!

### Stored energy sources can result in injury!

- **Before disassembly, all power supply cables must be disconnected from the machine.**
- **Be mindful of stored energy sources (e.g. stored electrical energy or strong magnetic fields) that exist after the ACOPOStrak transport system is shut down.**
- **Disassembly is only permitted to be carried out by qualified and authorized personnel.**

In the event the machine is being decommissioned, the following must be taken into account for subsequent disposal:

### Machine parts

- Disassemble the machine parts according to the different materials.
- Dispose of the materials in accordance with applicable laws regarding waste disposal.
- Provide evidence of the properties and disposal route of the different materials in accordance with applicable ordinances regarding waste recovery and disposal records (e.g. declaration and entry in the register).

### Substances

- Detergents, etc. must also be disposed of in accordance with local regulations and the respective manufacturer's guidelines.

### Addition material groups to be separated out:

- Surface-treated steel sheet such as powder-coated or wet-painted covers, etc.
- Surface-treated structural steel such as turned parts, perforated grids, screws, etc.
- Copper (electro-copper or silver-plated electro-copper) such as busbars, connecting lugs, fittings, etc.
- Cables and lines
- Built-in devices, electrical components

## Warning!

### Danger due to improper disassembly.

- **Disassembly is only permitted to be carried out by qualified personnel.**
- **For disassembly, only hoisting devices and load-handling equipment that comply with legal regulations are permitted to be used.**
- **Hoisting devices, load-handling equipment and means of transport must have sufficient load-bearing capacity and safety.**
- **Risk of crushing when lifting loads!**
- **Do not step under suspended loads! Staying under a suspended load can result in death!**
- **Use mechanical lifting equipment (e.g. crane, forklift) to lift loads over 25 kg.**
- **Secure loads to the designated attachment points.**
- **Do not place the load-handling equipment on sharp edges and corners, knot or twist it.**
- **When transporting individual components, the designated attachment points for chains, ropes or forklift forks must be used.**
- **Observe local fire protection regulations. When cutting materials, do not work with welding equipment or devices that produce sparks!**
- **Fire hazard due to plastic parts**
- **If necessary, fasteners such as dowels and screw anchors must be removed.**
- **Trip hazard!**

## 2 Components of the ACOPOStrak transport system

ACOPOStrak is a multifunctional, flexible transport system based on long-stator linear motor technology. Free-moving elements (shuttles) are controlled using both forward force and normal force on segments that are installed in a guide system and that form open or closed paths based on a grid system. This allows shuttles to be individually positioned as needed.

The individual control of the normal force of each shuttle makes it possible to implement branches such as diverters purely electrically.

Products and product components are transported quickly and flexibly on individual shuttles through a machine or system from processing station to processing station.

Additional characteristics:

- Simple programming of the application
- Shuttle change possible during operation
- Possible to combine conventional transport systems

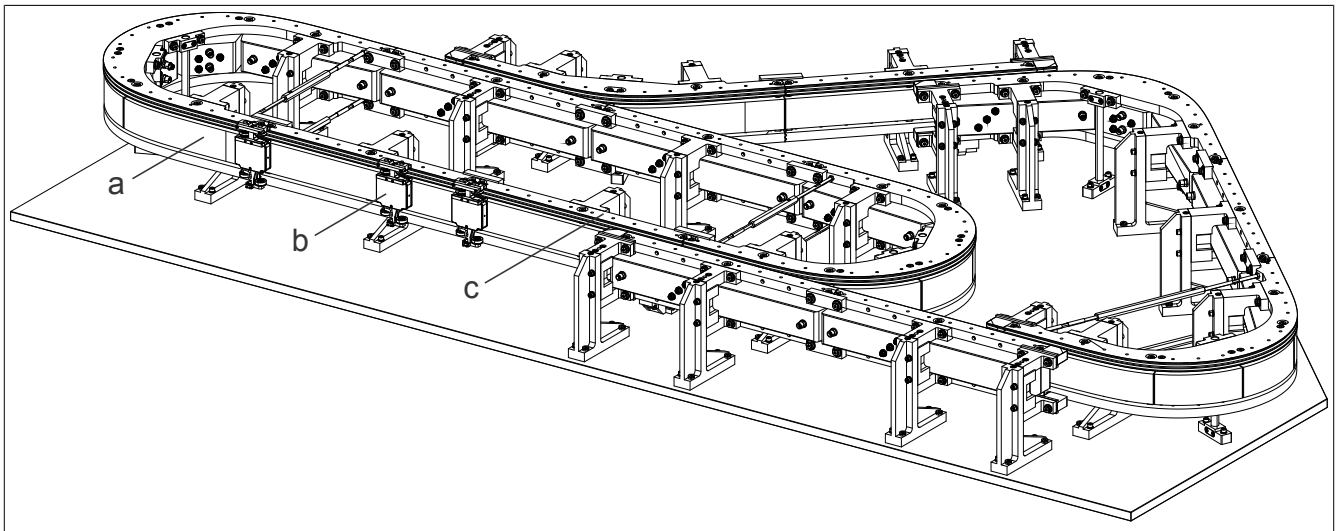


Figure 1: Components of the ACOPOStrak transport system

Components of the ACOPOStrak transport system:

- [Segments](#) (a)
- [Guide elements with guide rails](#) (c)
- [Shuttles](#) (b)



## 3 Technical data

### 3.1 General information

Note the "Safety notices" on page 12!

Permissible mounting orientations:

- Horizontal
- Vertical
- Angle between horizontal-vertical (0 - 90°)

Impermissible mounting orientations:

- Overhead mounting

### 3.2 Segments

Segments represent the stator of the ACOPOStrak system and are the actual stator units with integrated drives.

#### Caution!

##### Damage due to improper wiring

Segments are only permitted to be connected when the power is switched off!

Wiring under voltage will irreparably damage the segments.

#### Caution!

**Damage to property when connecting the display (8EAD0000.000-1) - Observe the connection sequence<sup>1)</sup>**

The following procedure must be followed:

- 1) Connect display cable 8F1CU000x.313U0-0 to the ACOPOStrak segment (X2). Display module 8EAD0000.000-1 **is not permitted to be connected** to display cable 8F1CU000x.313U0-0!
- 2) Connect display module 8EAD0000.000-1 to display cable 8F1CU000x.313U0-0.

If this sequence is not observed, the segments will be irreparably damaged.

Order number	Short description	Page
8EAD0000.000-1	Display module, LCD, 128 x 64, black/white, 1x USB 3.0	30
8F1I01.AA66.0000-1	ACOPOStrak straight segment	20
8F1I01.AB2B.0000-1	ACOPOStrak curved segment A, suitable for diverters	24
8F1I01.BA2B.0000-1	ACOPOStrak curved segment B, suitable for diverters	26
8F1I01.BB4B.0000-1	ACOPOStrak circular arc segment	22

<sup>1)</sup> Applies exclusively to revisions B0 to B2.

### 3.2.1 8F1I01.AA66.0000-1 Straight segment

#### 3.2.1.1 Order data


Order number	Short description	Figure
	<b>Segments</b>	
8F1I01.AA66.0000-1	ACOPOStrak straight segment	
	<b>Optional accessories</b>	
	<b>Cables</b>	
8F1CB0001.31110-0	ACOPOStrak ISC+PLK cable, length 1 m, 2x 8-pin male X-coded straight M12 connector	
8F1CB0002.31110-0	ACOPOStrak ISC+PLK cable, length 2 m, 2x 8-pin male X-coded straight M12 connector	
8F1CB00X5.31110-0	ACOPOStrak ISC+PLK cable, length 0.5 m, 2x 8-pin male X-coded straight M12 connector	
8F1CB00X8.31110-0	ACOPOStrak ISC+PLK cable, length 0.8 m, 2x 8-pin male X-coded straight M12 connector	
8F1CD0005.11390-0	ACOPOStrak PLK cable, length 5 m, 1x 12-pin male A-coded straight M12 connector, 1x 8-pin straight RJ45 connector, can be used in cable drag chains	
8F1CD0010.11390-0	ACOPOStrak PLK cable, length 10 m, 1x 12-pin male A-coded straight M12 connector, 1x 8-pin straight RJ45 connector, can be used in cable drag chains	
8F1CI00X5.31110-0	ACOPOStrak ISC cable, length 0.5 m, 2x 8-pin male X-coded straight M12 connector	
8F1CI00X8.31110-0	ACOPOStrak ISC cable, length 0.8 m, 2x 8-pin male X-coded straight M12 connector	
8F1CP0002.11110-0	ACOPOStrak power cable, length 2 m, 1x 8-pin female series 915 straight hybrid connector, 1x 8-pin male series 915 straight hybrid connector, can be used in cable drag chains	
8F1CP0005.1112A-0	ACOPOStrak power supply cable, length 5 m, 2x 6 mm <sup>2</sup> + 1x (2x 0.34 mm <sup>2</sup> ), 1x 8-pin female series 915 straight hybrid connector, can be used in cable drag chains	
8F1CP0010.1112A-0	ACOPOStrak power supply cable, length 10 m, 2x 6 mm <sup>2</sup> + 1x (2x 0.34 mm <sup>2</sup> ), 1x 8-pin female series 915 straight hybrid connector, can be used in cable drag chains	
8F1CP0015.1112A-0	ACOPOStrak power supply cable, length 15 m, 2x 6 mm <sup>2</sup> + 1x (2x 0.34 mm <sup>2</sup> ), 1x 8-pin female series 915 straight hybrid connector, can be used in cable drag chains	
8F1CP0X38.11110-0	ACOPOStrak power cable, length 0.38 m, 1x 8-pin female series 915 straight hybrid connector, 1x 8-pin male series 915 straight hybrid connector, can be used in cable drag chains	
8F1CU0001.313U0-0	ACOPOStrak display cable, length 1 m, 1x male USB connector, 1x 12-pin straight male M12 A-coded connector	
8F1CU0002.313U0-0	ACOPOStrak display cable, length 2 m, 1x male USB connector, 1x 12-pin straight male M12 A-coded connector	
	<b>Closure caps</b>	
8F1X0A.00001000K-1	30x blind plug for connections X1A/X1B on ACOPOStrak 8F1I segments	
	<b>Display modules</b>	
8EAD0000.000-1	Display module, LCD, 128 x 64, black/white, 1x USB 3.0	

Table 3: 8F1I01.AA66.0000-1 - Order data

#### 3.2.1.2 Technical data

Order number	8F1I01.AA66.0000-1
<b>General information</b>	
Workspace length for shuttle movement <sup>1)</sup>	0.660000000 m
Certifications	
CE	Yes
UL	cULus E225616
	Power conversion equipment
<b>Power connection</b>	
Power supply	Power supply only in conjunction with 80PS080X3.10-01 and 8F1OA.01B.0000-1 or 8B0C0320Hx00.B00-1
Input voltage	Max. 58 VDC
Input current	Max. 31 A
Power dissipation	Max. 40 W
Derating depending on installation elevation	In preparation
Switching frequency	40 kHz
DC bus capacitance	1.48 mF ±20%
Max. line length <sup>2)</sup>	30 m

Table 4: 8F1I01.AA66.0000-1 - Technical data

Order number	8F1I01.AA66.0000-1
<b>DC bus connection</b>	
Protective measures	
Overload protection	No
Short-circuit and ground fault protection	No
<b>Fieldbus</b>	
Type	POWERLINK V2 controlled node (CN)
Variant	2x M12 x-cod shielded, 1x M12 a-cod shielded, 3-port hub
Line length	<30 m between 2 stations
Transfer rate	100 Mbit/s
<b>Enable inputs</b>	
Quantity	1
Circuit	Sink
Electrical isolation	
Input - ACOPOStrak	Yes
Input voltage	
Nominal	24 VDC
Maximum	30 VDC
Input current at nominal voltage	Approx. 5 mA
Switching threshold	
Low	<5 V
High	Typ. 15 V Max. 19 V
Switching delay at nominal input voltage	
Enable 1 → 0, PWM off	42 ms
Enable 0 → 1, ready for PWM	3 ms typ.
Modulation compared to ground potential	Max. ±38 V
OSSD signal connections	0.5 ms
Max. line length <sup>2)</sup>	30 m
<b>Support</b>	
Motion system	
mapp Motion	V5.12.3 or higher
<b>Operating conditions</b>	
Mounting orientation	
Any	Yes
Installation elevation above sea level	
Nominal	0 to 500 m
Maximum	4000 m
Degree of protection per EN 60529 <sup>3)</sup>	IP65
Degree of protection per UL 50	Type 12
<b>Ambient conditions</b>	
Temperature	
Operation	
Nominal	5 to 40°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%, non-condensing
Storage	5 to 95%, non-condensing
Transport	Max. 95% at 40°C
<b>Mechanical properties</b>	
Dimensions	
Width	658 mm
Height	85.5 mm
Depth	114 mm
Weight	11.8 kg

Table 4: 8F1I01.AA66.0000-1 - Technical data

- 1) Value required for configuration in Automation Studio.
- 2) Use of cables 8F1CP0xxx.xxxxx-0.
- 3) The specified degree of protection is only met if all connectors on the segment that are not being used are closed with suitable threaded caps or slot covers! All screw connections must be closed with the appropriate screws.

### 3.2.1.3 Dimension diagram and installation dimensions

See A.2 "Straight segment" on page 317.

### 3.2.2 8F1I01.BB4B.0000-1 Circular arc segment

#### 3.2.2.1 Order data


Order number	Short description	Figure
	<b>Segments</b>	
8F1I01.BB4B.0000-1	ACOPOStrak circular arc segment	
	<b>Optional accessories</b>	
	<b>Cables</b>	
8F1CB0001.31110-0	ACOPOStrak ISC+PLK cable, length 1 m, 2x 8-pin male X-coded straight M12 connector	
8F1CB0002.31110-0	ACOPOStrak ISC+PLK cable, length 2 m, 2x 8-pin male X-coded straight M12 connector	
8F1CB00X5.31110-0	ACOPOStrak ISC+PLK cable, length 0.5 m, 2x 8-pin male X-coded straight M12 connector	
8F1CB00X8.31110-0	ACOPOStrak ISC+PLK cable, length 0.8 m, 2x 8-pin male X-coded straight M12 connector	
8F1CD0005.11390-0	ACOPOStrak PLK cable, length 5 m, 1x 12-pin male A-coded straight M12 connector, 1x 8-pin straight RJ45 connector, can be used in cable drag chains	
8F1CD0010.11390-0	ACOPOStrak PLK cable, length 10 m, 1x 12-pin male A-coded straight M12 connector, 1x 8-pin straight RJ45 connector, can be used in cable drag chains	
8F1CI00X5.31110-0	ACOPOStrak ISC cable, length 0.5 m, 2x 8-pin male X-coded straight M12 connector	
8F1CI00X8.31110-0	ACOPOStrak ISC cable, length 0.8 m, 2x 8-pin male X-coded straight M12 connector	
8F1CP0002.11110-0	ACOPOStrak power cable, length 2 m, 1x 8-pin female series 915 straight hybrid connector, 1x 8-pin male series 915 straight hybrid connector, can be used in cable drag chains	
8F1CP0005.1112A-0	ACOPOStrak power supply cable, length 5 m, 2x 6 mm <sup>2</sup> + 1x (2x 0.34 mm <sup>2</sup> ), 1x 8-pin female series 915 straight hybrid connector, can be used in cable drag chains	
8F1CP0010.1112A-0	ACOPOStrak power supply cable, length 10 m, 2x 6 mm <sup>2</sup> + 1x (2x 0.34 mm <sup>2</sup> ), 1x 8-pin female series 915 straight hybrid connector, can be used in cable drag chains	
8F1CP0015.1112A-0	ACOPOStrak power supply cable, length 15 m, 2x 6 mm <sup>2</sup> + 1x (2x 0.34 mm <sup>2</sup> ), 1x 8-pin female series 915 straight hybrid connector, can be used in cable drag chains	
8F1CP0X38.11110-0	ACOPOStrak power cable, length 0.38 m, 1x 8-pin female series 915 straight hybrid connector, 1x 8-pin male series 915 straight hybrid connector, can be used in cable drag chains	
8F1CU0001.313U0-0	ACOPOStrak display cable, length 1 m, 1x male USB connector, 1x 12-pin straight male M12 A-coded connector	
8F1CU0002.313U0-0	ACOPOStrak display cable, length 2 m, 1x male USB connector, 1x 12-pin straight male M12 A-coded connector	
	<b>Closure caps</b>	
8F1X0A.00001000K-1	30x blind plug for connections X1A/X1B on ACOPOStrak 8F1I segments	
	<b>Display modules</b>	
8EAD0000.000-1	Display module, LCD, 128 x 64, black/white, 1x USB 3.0	

Table 5: 8F1I01.BB4B.0000-1 - Order data

#### 3.2.2.2 Technical data

Order number	8F1I01.BB4B.0000-1
<b>General information</b>	
Workspace length for shuttle movement <sup>1)</sup>	0.240000000 m
Certifications	
CE	Yes
UL	cULus E225616
	Power conversion equipment
<b>Power connection</b>	
Power supply	Power supply only in conjunction with 80PS080X3.10-01 and 8F1OA.01B.0000-1 or 8B0C0320Hx00.B00-1
Input voltage	Max. 58 VDC
Input current	Max. 31 A
Power dissipation	Max. 17 W
Derating depending on installation elevation	In preparation
Switching frequency	40 kHz
DC bus capacitance	0.54 mF ±20%
Max. line length <sup>2)</sup>	30 m

Table 6: 8F1I01.BB4B.0000-1 - Technical data

Order number	8F1I01.BB4B.0000-1
<b>DC bus connection</b>	
Protective measures	
Overload protection	No
Short-circuit and ground fault protection	No
<b>Fieldbus</b>	
Type	POWERLINK V2 controlled node (CN)
Variant	2x M12 x-cod shielded, 1x M12 a-cod shielded, 3-port hub
Line length	<30 m between 2 stations
Transfer rate	100 Mbit/s
<b>Enable inputs</b>	
Quantity	1
Circuit	Sink
Electrical isolation	
Input - ACOPOStrak	Yes
Input voltage	
Nominal	24 VDC
Maximum	30 VDC
Input current at nominal voltage	Approx. 5 mA
Switching threshold	
Low	<5 V
High	Typ. 15 V Max. 19 V
Switching delay at nominal input voltage	
Enable 1 → 0, PWM off	42 ms
Enable 0 → 1, ready for PWM	3 ms typ.
Modulation compared to ground potential	Max. ±38 V
OSSD signal connections	0.5 ms
Max. line length <sup>2)</sup>	30 m
<b>Support</b>	
Motion system	
mapp Motion	V5.12.3 or higher
<b>Operating conditions</b>	
Mounting orientation	
Any	Yes
Installation elevation above sea level	
Nominal	0 to 500 m
Maximum	4000 m
Degree of protection per EN 60529 <sup>3)</sup>	IP65
Degree of protection per UL 50	Type 12
<b>Ambient conditions</b>	
Temperature	
Operation	
Nominal	5 to 40°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%, non-condensing
Storage	5 to 95%, non-condensing
Transport	Max. 95% at 40°C
<b>Mechanical properties</b>	
Dimensions	
Width	232 mm
Height	85.5 mm
Depth	141 mm
Weight	5.1 kg

Table 6: 8F1I01.BB4B.0000-1 - Technical data

- 1) Value required for configuration in Automation Studio.
- 2) Use of cables 8F1CP0xxx.xxxxx-0.
- 3) The specified degree of protection is only met if all connectors on the segment that are not being used are closed with suitable threaded caps or slot covers! All screw connections must be closed with the appropriate screws.

### 3.2.2.3 Dimension diagram and installation dimensions

See A.3 "Circular arc segment" on page 319.

### 3.2.3 8F1I01.AB2B.0000-1 Curved segment A

#### 3.2.3.1 Order data


Order number	Short description	Figure
	<b>Segments</b>	
8F1I01.AB2B.0000-1	ACOPOStrak curved segment A, suitable for diverters	
	<b>Optional accessories</b>	
	<b>Cables</b>	
8F1CB0001.31110-0	ACOPOStrak ISC+PLK cable, length 1 m, 2x 8-pin male X-coded straight M12 connector	
8F1CB0002.31110-0	ACOPOStrak ISC+PLK cable, length 2 m, 2x 8-pin male X-coded straight M12 connector	
8F1CB00X5.31110-0	ACOPOStrak ISC+PLK cable, length 0.5 m, 2x 8-pin male X-coded straight M12 connector	
8F1CB00X8.31110-0	ACOPOStrak ISC+PLK cable, length 0.8 m, 2x 8-pin male X-coded straight M12 connector	
8F1CD0005.11390-0	ACOPOStrak PLK cable, length 5 m, 1x 12-pin male A-coded straight M12 connector, 1x 8-pin straight RJ45 connector, can be used in cable drag chains	
8F1CD0010.11390-0	ACOPOStrak PLK cable, length 10 m, 1x 12-pin male A-coded straight M12 connector, 1x 8-pin straight RJ45 connector, can be used in cable drag chains	
8F1CI00X5.31110-0	ACOPOStrak ISC cable, length 0.5 m, 2x 8-pin male X-coded straight M12 connector	
8F1CI00X8.31110-0	ACOPOStrak ISC cable, length 0.8 m, 2x 8-pin male X-coded straight M12 connector	
8F1CP0002.11110-0	ACOPOStrak power cable, length 2 m, 1x 8-pin female series 915 straight hybrid connector, 1x 8-pin male series 915 straight hybrid connector, can be used in cable drag chains	
8F1CP0005.1112A-0	ACOPOStrak power supply cable, length 5 m, 2x 6 mm <sup>2</sup> + 1x (2x 0.34 mm <sup>2</sup> ), 1x 8-pin female series 915 straight hybrid connector, can be used in cable drag chains	
8F1CP0010.1112A-0	ACOPOStrak power supply cable, length 10 m, 2x 6 mm <sup>2</sup> + 1x (2x 0.34 mm <sup>2</sup> ), 1x 8-pin female series 915 straight hybrid connector, can be used in cable drag chains	
8F1CP0015.1112A-0	ACOPOStrak power supply cable, length 15 m, 2x 6 mm <sup>2</sup> + 1x (2x 0.34 mm <sup>2</sup> ), 1x 8-pin female series 915 straight hybrid connector, can be used in cable drag chains	
8F1CP0X38.11110-0	ACOPOStrak power cable, length 0.38 m, 1x 8-pin female series 915 straight hybrid connector, 1x 8-pin male series 915 straight hybrid connector, can be used in cable drag chains	
8F1CU0001.313U0-0	ACOPOStrak display cable, length 1 m, 1x male USB connector, 1x 12-pin straight male M12 A-coded connector	
8F1CU0002.313U0-0	ACOPOStrak display cable, length 2 m, 1x male USB connector, 1x 12-pin straight male M12 A-coded connector	
	<b>Closure caps</b>	
8F1X0A.00001000K-1	30x blind plug for connections X1A/X1B on ACOPOStrak 8F1I segments	
	<b>Display modules</b>	
8EAD0000.000-1	Display module, LCD, 128 x 64, black/white, 1x USB 3.0	

Table 7: 8F1I01.AB2B.0000-1 - Order data

#### 3.2.3.2 Technical data

Order number	8F1I01.AB2B.0000-1
<b>General information</b>	
Workspace length for shuttle movement <sup>1)</sup>	0.450642056 m
Certifications	
CE	Yes
UL	cULus E225616
	Power conversion equipment
<b>Power connection</b>	
Power supply	Power supply only in conjunction with 80PS080X3.10-01 and 8F1OA.01B.0000-1 or 8B0C0320Hx00.B00-1
Input voltage	Max. 58 VDC
Input current	Max. 31 A
Power dissipation	Max. 30 W
Derating depending on installation elevation	In preparation
Switching frequency	40 kHz
DC bus capacitance	0.95 mF ±20%
Max. line length <sup>2)</sup>	30 m

Table 8: 8F1I01.AB2B.0000-1 - Technical data

Order number	8F1I01.AB2B.0000-1
<b>DC bus connection</b>	
Protective measures	
Overload protection	No
Short-circuit and ground fault protection	No
<b>Fieldbus</b>	
Type	POWERLINK V2 controlled node (CN)
Variant	2x M12 x-cod shielded, 1x M12 a-cod shielded, 3-port hub
Line length	<30 m between 2 stations
Transfer rate	100 Mbit/s
<b>Enable inputs</b>	
Quantity	1
Circuit	Sink
Electrical isolation	
Input - ACOPOStrak	Yes
Input voltage	
Nominal	24 VDC
Maximum	30 VDC
Input current at nominal voltage	Approx. 5 mA
Switching threshold	
Low	<5 V
High	Typ. 15 V Max. 19 V
Switching delay at nominal input voltage	
Enable 1 → 0, PWM off	42 ms
Enable 0 → 1, ready for PWM	3 ms typ.
Modulation compared to ground potential	Max. ±38 V
OSSD signal connections	0.5 ms
Max. line length <sup>2)</sup>	30 m
<b>Support</b>	
Motion system	
mapp Motion	V5.12.3 or higher
<b>Operating conditions</b>	
Mounting orientation	
Any	Yes
Installation elevation above sea level	
Nominal	0 to 500 m
Maximum	4000 m
Degree of protection per EN 60529 <sup>3)</sup>	IP65
Degree of protection per UL 50	Type 12
<b>Ambient conditions</b>	
Temperature	
Operation	
Nominal	5 to 40°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%, non-condensing
Storage	5 to 95%, non-condensing
Transport	Max. 95% at 40°C
<b>Mechanical properties</b>	
Dimensions	
Width	446 mm
Height	85.5 mm
Depth	132 mm
Weight	9.6 kg

Table 8: 8F1I01.AB2B.0000-1 - Technical data

- 1) Value required for configuration in Automation Studio.
- 2) Use of cables 8F1CP0xxx.xxxxx-0.
- 3) The specified degree of protection is only met if all connectors on the segment that are not being used are closed with suitable threaded caps or slot covers! All screw connections must be closed with the appropriate screws.

### 3.2.3.3 Dimension diagram and installation dimensions

See A.4 "Curved segment A" on page 320.

### 3.2.4 8F1I01.BA2B.0000-1 Curved segment B

#### 3.2.4.1 Order data


Order number	Short description	Figure
	<b>Segments</b>	
8F1I01.BA2B.0000-1	ACOPOStrak curved segment B, suitable for diverters	
	<b>Optional accessories</b>	
	<b>Cables</b>	
8F1CB0001.31110-0	ACOPOStrak ISC+PLK cable, length 1 m, 2x 8-pin male X-coded straight M12 connector	
8F1CB0002.31110-0	ACOPOStrak ISC+PLK cable, length 2 m, 2x 8-pin male X-coded straight M12 connector	
8F1CB00X5.31110-0	ACOPOStrak ISC+PLK cable, length 0.5 m, 2x 8-pin male X-coded straight M12 connector	
8F1CB00X8.31110-0	ACOPOStrak ISC+PLK cable, length 0.8 m, 2x 8-pin male X-coded straight M12 connector	
8F1CD0005.11390-0	ACOPOStrak PLK cable, length 5 m, 1x 12-pin male A-coded straight M12 connector, 1x 8-pin straight RJ45 connector, can be used in cable drag chains	
8F1CD0010.11390-0	ACOPOStrak PLK cable, length 10 m, 1x 12-pin male A-coded straight M12 connector, 1x 8-pin straight RJ45 connector, can be used in cable drag chains	
8F1CI00X5.31110-0	ACOPOStrak ISC cable, length 0.5 m, 2x 8-pin male X-coded straight M12 connector	
8F1CI00X8.31110-0	ACOPOStrak ISC cable, length 0.8 m, 2x 8-pin male X-coded straight M12 connector	
8F1CP0002.11110-0	ACOPOStrak power cable, length 2 m, 1x 8-pin female series 915 straight hybrid connector, 1x 8-pin male series 915 straight hybrid connector, can be used in cable drag chains	
8F1CP0005.1112A-0	ACOPOStrak power supply cable, length 5 m, 2x 6 mm <sup>2</sup> + 1x (2x 0.34 mm <sup>2</sup> ), 1x 8-pin female series 915 straight hybrid connector, can be used in cable drag chains	
8F1CP0010.1112A-0	ACOPOStrak power supply cable, length 10 m, 2x 6 mm <sup>2</sup> + 1x (2x 0.34 mm <sup>2</sup> ), 1x 8-pin female series 915 straight hybrid connector, can be used in cable drag chains	
8F1CP0015.1112A-0	ACOPOStrak power supply cable, length 15 m, 2x 6 mm <sup>2</sup> + 1x (2x 0.34 mm <sup>2</sup> ), 1x 8-pin female series 915 straight hybrid connector, can be used in cable drag chains	
8F1CP0X38.11110-0	ACOPOStrak power cable, length 0.38 m, 1x 8-pin female series 915 straight hybrid connector, 1x 8-pin male series 915 straight hybrid connector, can be used in cable drag chains	
8F1CU0001.313U0-0	ACOPOStrak display cable, length 1 m, 1x male USB connector, 1x 12-pin straight male M12 A-coded connector	
8F1CU0002.313U0-0	ACOPOStrak display cable, length 2 m, 1x male USB connector, 1x 12-pin straight male M12 A-coded connector	
	<b>Closure caps</b>	
8F1X0A.00001000K-1	30x blind plug for connections X1A/X1B on ACOPOStrak 8F1I segments	
	<b>Display modules</b>	
8EAD0000.000-1	Display module, LCD, 128 x 64, black/white, 1x USB 3.0	

Table 9: 8F1I01.BA2B.0000-1 - Order data

#### 3.2.4.2 Technical data

Order number	8F1I01.BA2B.0000-1
<b>General information</b>	
Workspace length for shuttle movement <sup>1)</sup>	0.450642056 m
Certifications	
CE	Yes
UL	cULus E225616
	Power conversion equipment
<b>Power connection</b>	
Power supply	Power supply only in conjunction with 80PS080X3.10-01 and 8F1OA.01B.0000-1 or 8B0C0320Hx00.B00-1
Input voltage	Max. 58 VDC
Input current	Max. 31 A
Power dissipation	Max. 30 W
Derating depending on installation elevation	In preparation
Switching frequency	40 kHz
DC bus capacitance	0.95 mF ±20%
Max. line length <sup>2)</sup>	30 m

Table 10: 8F1I01.BA2B.0000-1 - Technical data



Order number	8F1I01.BA2B.0000-1
<b>DC bus connection</b>	
Protective measures	
Overload protection	No
Short-circuit and ground fault protection	No
<b>Fieldbus</b>	
Type	POWERLINK V2 controlled node (CN)
Variant	2x M12 x-cod shielded, 1x M12 a-cod shielded, 3-port hub
Line length	<30 m between 2 stations
Transfer rate	100 Mbit/s
<b>Enable inputs</b>	
Quantity	1
Circuit	Sink
Electrical isolation	
Input - ACOPOStrak	Yes
Input voltage	
Nominal	24 VDC
Maximum	30 VDC
Input current at nominal voltage	Approx. 5 mA
Switching threshold	
Low	<5 V
High	Typ. 15 V Max. 19 V
Switching delay at nominal input voltage	
Enable 1 → 0, PWM off	42 ms
Enable 0 → 1, ready for PWM	3 ms typ.
Modulation compared to ground potential	Max. ±38 V
OSSD signal connections	0.5 ms
Max. line length <sup>2)</sup>	30 m
<b>Support</b>	
Motion system	
mapp Motion	V5.12.3 or higher
<b>Operating conditions</b>	
Mounting orientation	
Any	Yes
Installation elevation above sea level	
Nominal	0 to 500 m
Maximum	4000 m
Degree of protection per EN 60529 <sup>3)</sup>	IP65
Degree of protection per UL 50	Type 12
<b>Ambient conditions</b>	
Temperature	
Operation	
Nominal	5 to 40°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%, non-condensing
Storage	5 to 95%, non-condensing
Transport	Max. 95% at 40°C
<b>Mechanical properties</b>	
Dimensions	
Width	446 mm
Height	85.5 mm
Depth	132 mm
Weight	9.6 kg

Table 10: 8F1I01.BA2B.0000-1 - Technical data

- 1) Value required for configuration in Automation Studio.  
2) Use of cables 8F1CP0xxx.xxxxx-0.  
3) The specified degree of protection is only met if all connectors on the segment that are not being used are closed with suitable threaded caps or slot covers!  
All screw connections must be closed with the appropriate screws.

### 3.2.4.3 Dimension diagram and installation dimensions

See [A.5 "Curved segment B" on page 321](#).

### 3.2.5 Pinouts

#### 3.2.5.1 X1A (power connection)

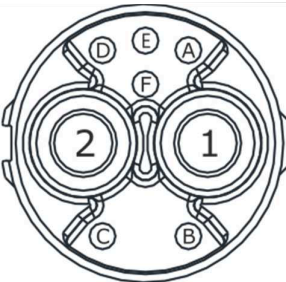
8-pin male series 915 circular connector (with male contact)	Pin	Description	Function
	1	DC+	DC bus +
	2	DC-	DC bus -
	A	STO+	Enable signal A +
	B	nc	nc
	C	nc	nc
	D	nc	nc
	E	STO-	Enable signal A -
	F	nc	nc

Table 11: X1A - Pinout

##### 3.2.5.1.1 Power supply connection

### Caution!

#### Damage due to improper wiring

Connector X1A/X1B is only permitted to be connected in a voltage-free state!

Wiring under voltage will irreparably damage connected devices.

#### 80PS power supply module with 8F10A overvoltage protection

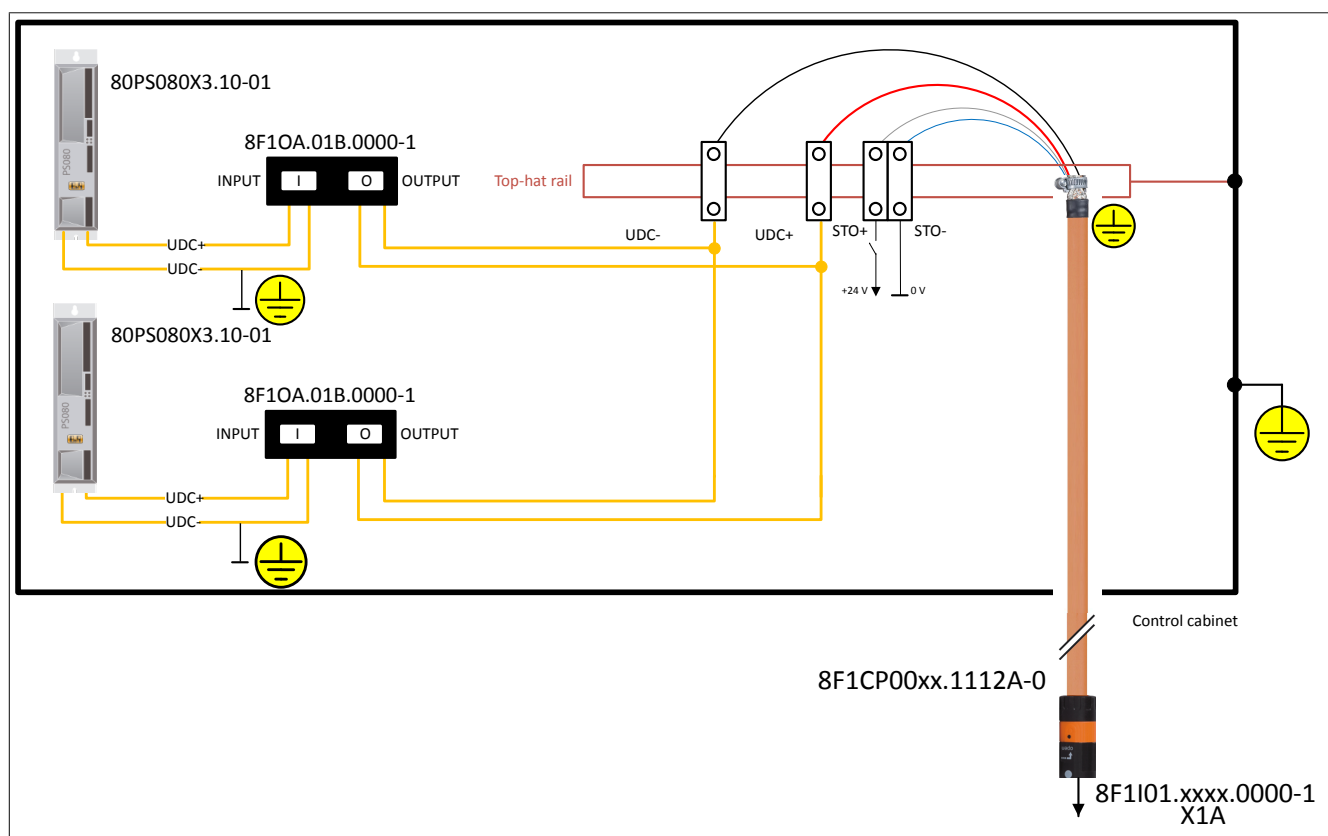


Figure 2: Wiring from power supply module 80PS to segment 8F1I01

### Information:

A minimum cross section of 6 mm<sup>2</sup> is recommended for the cable to wire the 80PS power supply module to the terminal via the 8F10A overvoltage protection.

## Information:

For STO wiring, see [8.3.1 "STO, category 3 / SIL 2 / PL d \(variant A\)" on page 300](#).

### Power supply module 8B0C0320Hx00.B00-1

## Information:

Segment 8F1I01 is connected directly to power supply module 8B0C0320Hx00.B00-1, see data sheet [3.4.1 "8B0C0320Hx00.B00-1" on page 43](#).

### 3.2.5.2 X1B (power connection)

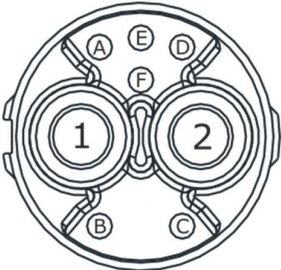
8-pin female series 915 circular connector (with female contact)	Pin	Description	Function
	1	DC+	DC bus +
	2	DC-	DC bus -
	A	STO+	Enable signal A +
		nc	nc
		nc	nc
		nc	nc
	E	STO-	Enable signal A -
	F	nc	nc

Table 12: X1B - Pinout

### 3.2.5.3 X2 (POWERLINK, display)

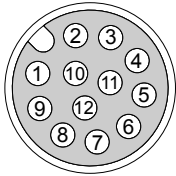
M12	Pin	Description	Function
	1	Tx+	Transmit signal
	2	NC	NC
	3	NC	NC
	4	GND	Ground
	5	NC	NC
	6	NC	NC
	7	Rx-	Receive signal inverted
	8	24 V	Power supply
	9	Tx-	Transmit signal inverted
	10	UART Tx	UART transmit signal
	11	UART Rx	UART receive signal
	12	Rx+	Receive signal

Table 13: X2 - Pinout

## Caution!

Only 8EAD0000.000-1 display modules with revision C0 and later are permitted to be connected to ACOPOStrak segments 8F1I01!

### 3.2.5.4 X3A, X3B (POWERLINK, intersegment communication)

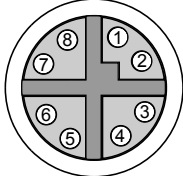
M12 X-keyed	Pin	Description	Function
	1	Rx\	Receive signal inverted
	2	Rx	Receive signal
	3	Tx\	Transmit signal inverted
	4	Tx	Transmit signal
	5	ISC_Rx\	Receive signal inverted
	6	ISC_Rx	Receive signal
	7	ISC_Tx\	Transmit signal inverted
	8	ISC_Tx	Transmit signal

Table 14: X3A, X3B - Pinout

3.2.6 Accessories

3.2.6.1 Display module 8EAD0000.000-1

Caution!

Only 8EAD0000.000-1 display modules with revision C0 and later are permitted to be connected to ACOPOStrak segments 8F1I01!

3.2.6.1.1 General information

Display module 8EAD is equipped with four keys that carry out different commands depending on the information displayed. The respective commands are shown at the bottom of the screen being shown on the display module. The 8EAD display module is connected to slot X2 of any segment using [adapter cable 8F1CU000x.313U0-0](#).

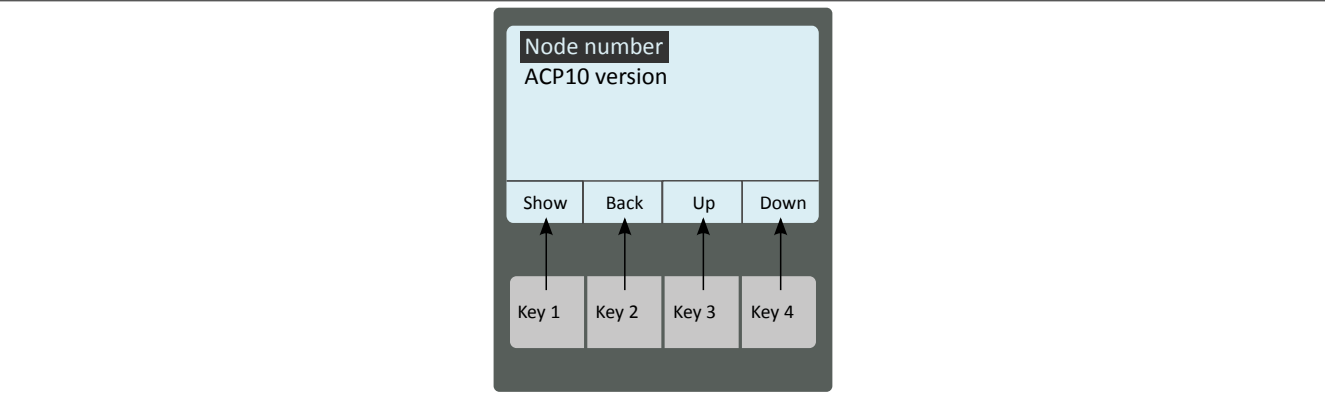


Figure 3: Display module 8EAD0000.000-1: Key/Command assignments

Command	Function
Show	Selects the highlighted menu option and either shows respective information or opens the corresponding sub-menu.
Back	Switches to the higher-level menu.
Up	Moves the entry one position up.
Down	Moves the entry one position down.

Table 15: Command functions

For the data sheet, see [www.br-automation.com](http://www.br-automation.com).

3.2.6.1.2 Order data

Order number	Short description	Figure
Display modules		
8EAD0000.000-1	Display module, LCD, 128 x 64, black/white, 1x USB 3.0	

Table 16: 8EAD0000.000-1 - Order data

### 3.2.6.1.3 Technical data

<b>Order number</b>	<b>8EAD0000.000-1</b>
<b>General information</b>	
Power consumption	Max. 2.5 W
Certifications	
CE	Yes
UL	cULus E225616 Power conversion equipment
<b>Display</b>	
Type	LCD
Colors	Black/White
Resolution	128 x 64
<b>Keys</b>	
Type	Short stroke keys
Quantity	4
<b>Electrical properties</b>	
Nominal voltage	5 to 26 VDC
<b>Operating conditions</b>	
Degree of protection per EN 60529	IP20
<b>Ambient conditions</b>	
Temperature	
Operation	
Nominal	5 to 40°C
Maximum	55°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Storage	5 to 95%
Transport	95% at 40°C
<b>Mechanical properties</b>	
Dimensions	
Width	59 mm
Height	75 mm <sup>1)</sup>
Depth	20 mm
Weight	54 g

Table 17: 8EAD0000.000-1 - Technical data

1) When connected: 66 mm.

### 3.2.6.1.4 Accessories

Model number	Short description
8F1CU0001.313U0-0	Display cable 1 m
8F1CU0002.313U0-0	Display cable 2 m

Table 18: 8EAD0000.000-1 - Overview of accessories

### 3.3 Magnet units

Order number	Short description	Page
8F1M0.01010.00X-1	ACOPOStrak magnet unit 0 STD, 45 mm, 10 pcs., 8F1M0.01010.000-1	33
8F1M0.02020.00X-1	ACOPOStrak magnet unit 0 SPH, 45 mm, 10 pcs. 8F1M0.02020.000-1	35
8F1M0.07010.00X-1	ACOPOStrak magnet unit 0 STD, 45 mm, generation 2, 10 pcs. 8F1M0.07010.000-1	39
8F1M0.08020.00X-1	ACOPOStrak magnet unit 0 SPH, 45 mm, generation 2, 10 pcs. 8F1M0.08020.000-1	41
8F1M1.03010.00X-1	ACOPOStrak magnet unit 1, skewed, 45 mm, 10 pcs. 8F1M1.03010.000-1	37

#### 3.3.1 General information

Magnet units consist of magnets that exert a strong attractive force upon one another. Magnet units that have attracted one another can only be separated again by applying substantial force. It is therefore important to make sure that magnet units are not stored or handled too close to one another after unpacking. A minimum distance of approximately 15 cm is the recommended guide value.

Note the ["Safety notices"](#) on page 12!

### 3.3.2 8F1M0.01010.00X-1

#### 3.3.2.1 Order data

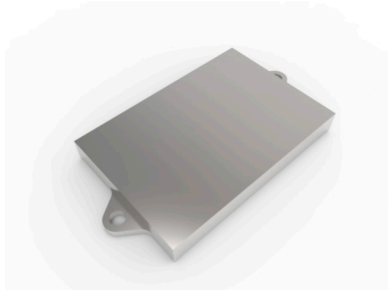
Order number	Short description	Figure
	<b>Magnet units</b>	
8F1M0.01010.00X-1	ACOPOStrak magnet unit 0 STD, 45 mm, 10 pcs., 8F1M0.01010.000-1	

Table 19: 8F1M0.01010.00X-1 - Order data

#### 3.3.2.2 Technical data

Order number	8F1M0.01010.000-1
<b>Operating conditions</b>	
Max. magnet temperature	60°C
<b>Ambient conditions</b>	
Temperature	
Operation	
Nominal	5°C to 40°C
Storage	-25°C to 55°C
Transport	-25°C to 60°C
Relative humidity	
Operation	5 to 85%, non-condensing
Storage	5 to 95%, non-condensing
Transport	Max. 95% at 40°C
<b>Mechanical properties</b>	
Dimensions	
Width	45 mm
Height	82 mm
Depth	8 mm
Weight	Approx. 175 g

Table 20: 8F1M0.01010.000-1 - Technical data

### 3.3.2.3 Dimension diagram and installation dimensions

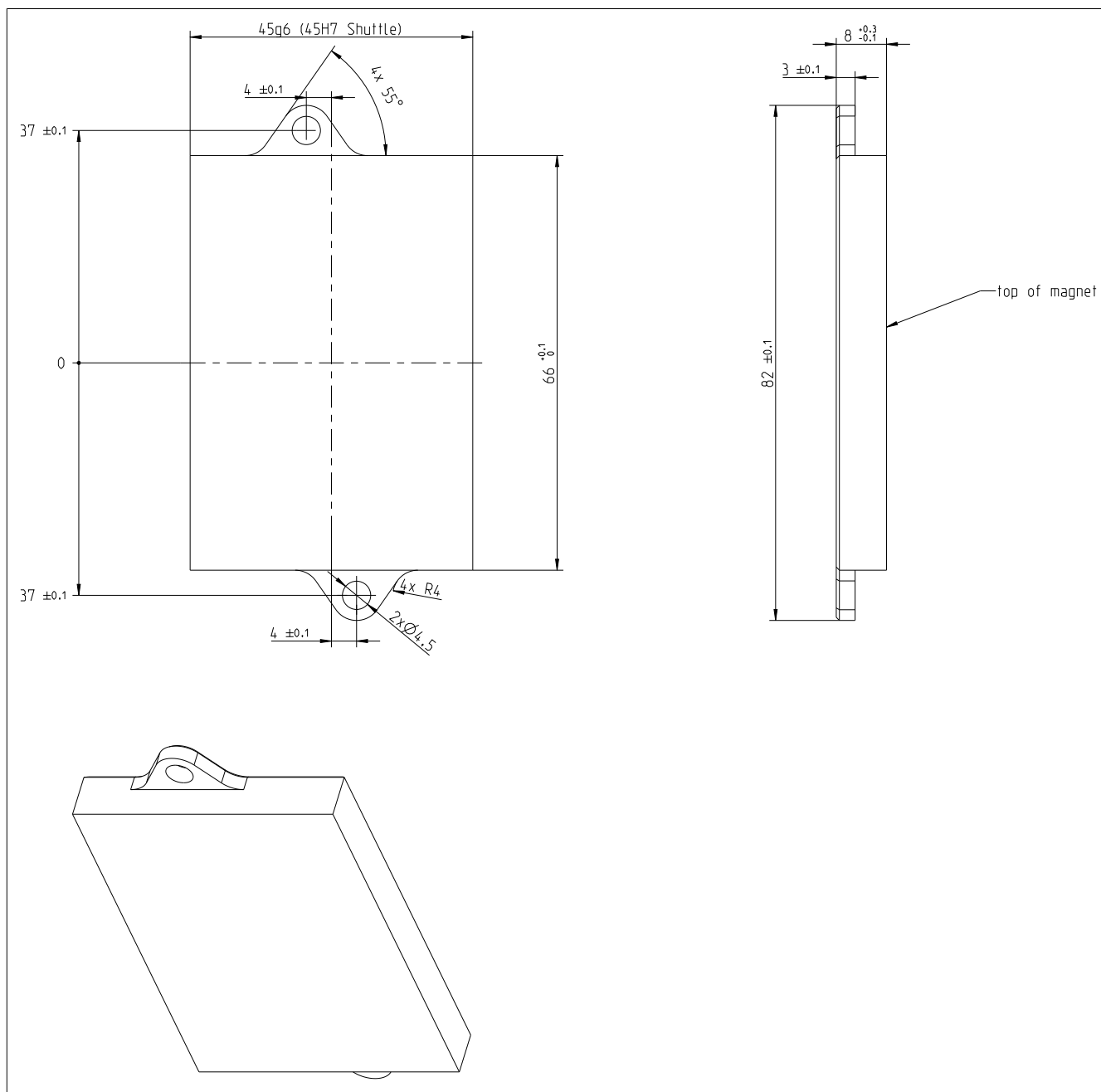


Figure 4: 8F1M0.01010.000-1 - Dimension diagram



### 3.3.3 8F1M0.02020.00X-1

#### 3.3.3.1 Order data

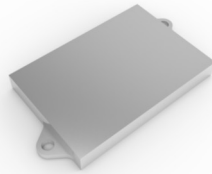
Order number	Short description	Figure
	<b>Magnet units</b>	
8F1M0.02020.00X-1	ACOPOStrak magnet unit 0 SPH, 45 mm, 10 pcs. 8F1M0.02020.000-1	

Table 21: 8F1M0.02020.00X-1 - Order data

#### 3.3.3.2 Technical data

Order number	8F1M0.02020.000-1
<b>Operating conditions</b>	
Max. magnet temperature	60°C
<b>Ambient conditions</b>	
Temperature	
Operation	
Nominal	5°C to 40°C
Storage	-25°C to 55°C
Transport	-25°C to 60°C
Relative humidity	
Operation	5 to 85%, non-condensing
Storage	5 to 95%, non-condensing
Transport	Max. 95% at 40°C
<b>Mechanical properties</b>	
Dimensions	
Width	45 mm
Height	82 mm
Depth	8 mm
Weight	Approx. 175 g

Table 22: 8F1M0.02020.000-1 - Technical data

### 3.3.3.3 Dimension diagram and installation dimensions

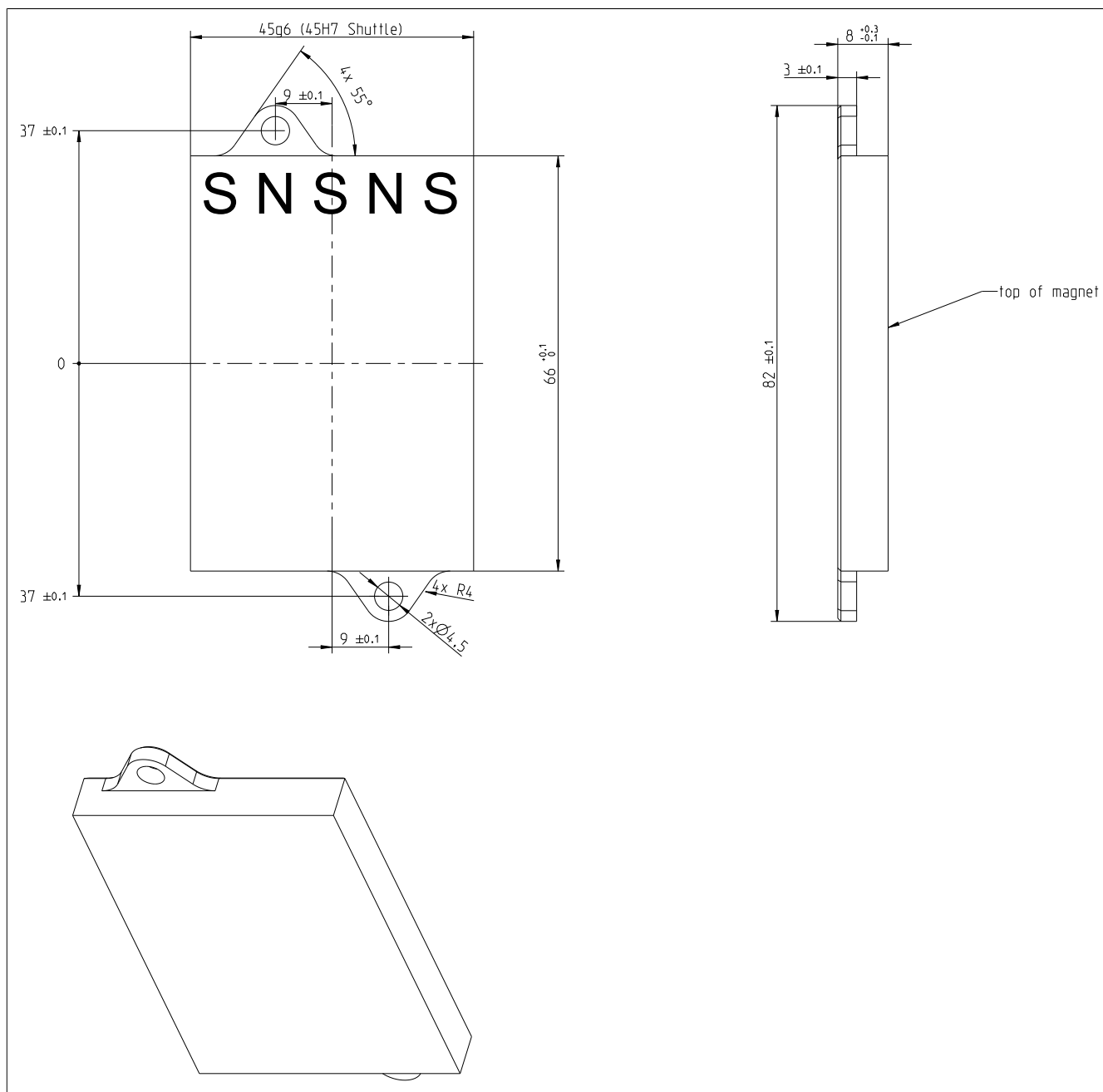


Figure 5: 8F1M0.02020.000-1 - Dimension diagram

### 3.3.4 8F1M1.03010.00X-1

#### 3.3.4.1 Order data

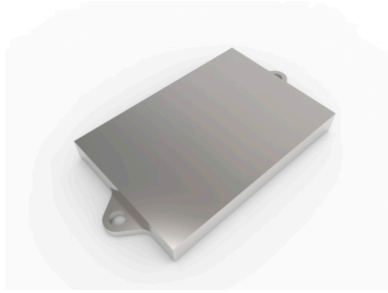
Order number	Short description	Figure
	<b>Magnet units</b>	
8F1M1.03010.00X-1	ACOPOStrak magnet unit 1, skewed, 45 mm, 10 pcs. 8F1M1.03010.000-1	

Table 23: 8F1M1.03010.00X-1 - Order data

#### 3.3.4.2 Technical data

Order number	8F1M1.03010.000-1
<b>Operating conditions</b>	
Max. magnet temperature	60°C
<b>Ambient conditions</b>	
Temperature	
Operation	
Nominal	5°C to 40°C
Storage	-25°C to 55°C
Transport	-25°C to 60°C
Relative humidity	
Operation	5 to 85%, non-condensing
Storage	5 to 95%, non-condensing
Transport	Max. 95% at 40°C
<b>Mechanical properties</b>	
Dimensions	
Width	45 mm
Height	82 mm
Depth	8 mm
Weight	Approx. 175 g

Table 24: 8F1M1.03010.000-1 - Technical data

### 3.3.4.3 Dimension diagram and installation dimensions

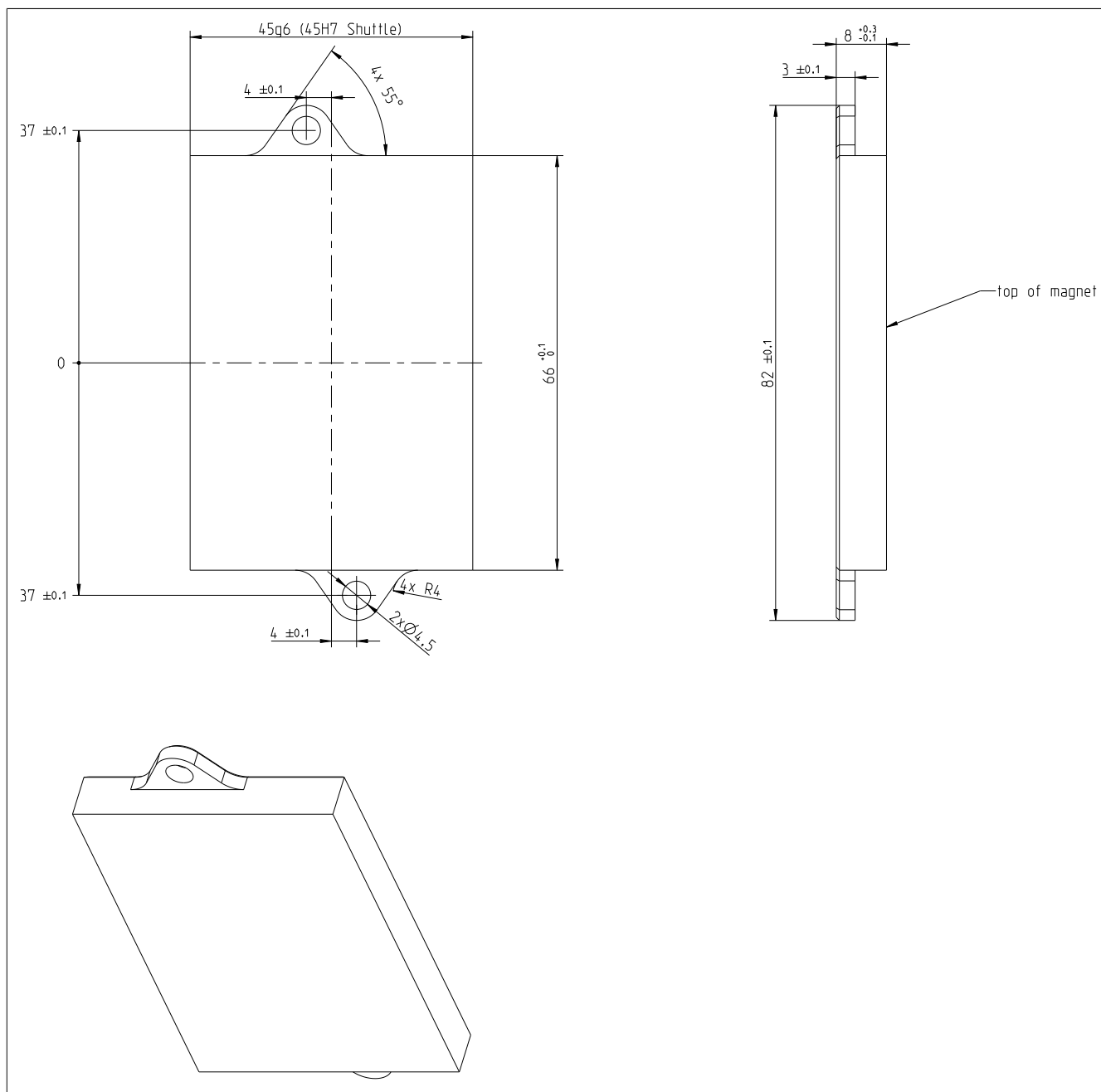


Figure 6: 8F1M0.01010.000-1 - Dimension diagram

### 3.3.5 8F1M0.07010.000-1

#### 3.3.5.1 Order data

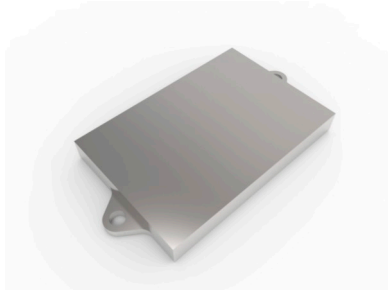
Order number	Short description	Figure
	<b>Magnet units</b>	
8F1M0.07010.00X-1	ACOPOStrak magnet unit 0 STD, 45 mm, generation 2, 10 pcs. 8F1M0.07010.000-1	

Table 25: 8F1M0.07010.00X-1 - Order data

#### 3.3.5.2 Technical data

Order number	8F1M0.07010.000-1
<b>Operating conditions</b>	
Max. magnet temperature	60°C
<b>Ambient conditions</b>	
Temperature	
Operation	
Nominal	5°C to 40°C
Storage	-25°C to 55°C
Transport	-25°C to 60°C
Relative humidity	
Operation	5 to 85%, non-condensing
Storage	5 to 95%, non-condensing
Transport	Max. 95% at 40°C
<b>Mechanical properties</b>	
Dimensions	
Width	45 mm
Height	82 mm
Depth	8 mm
Weight	Approx. 175 g

Table 26: 8F1M0.07010.000-1 - Technical data

### 3.3.5.3 Dimension diagram and installation dimensions

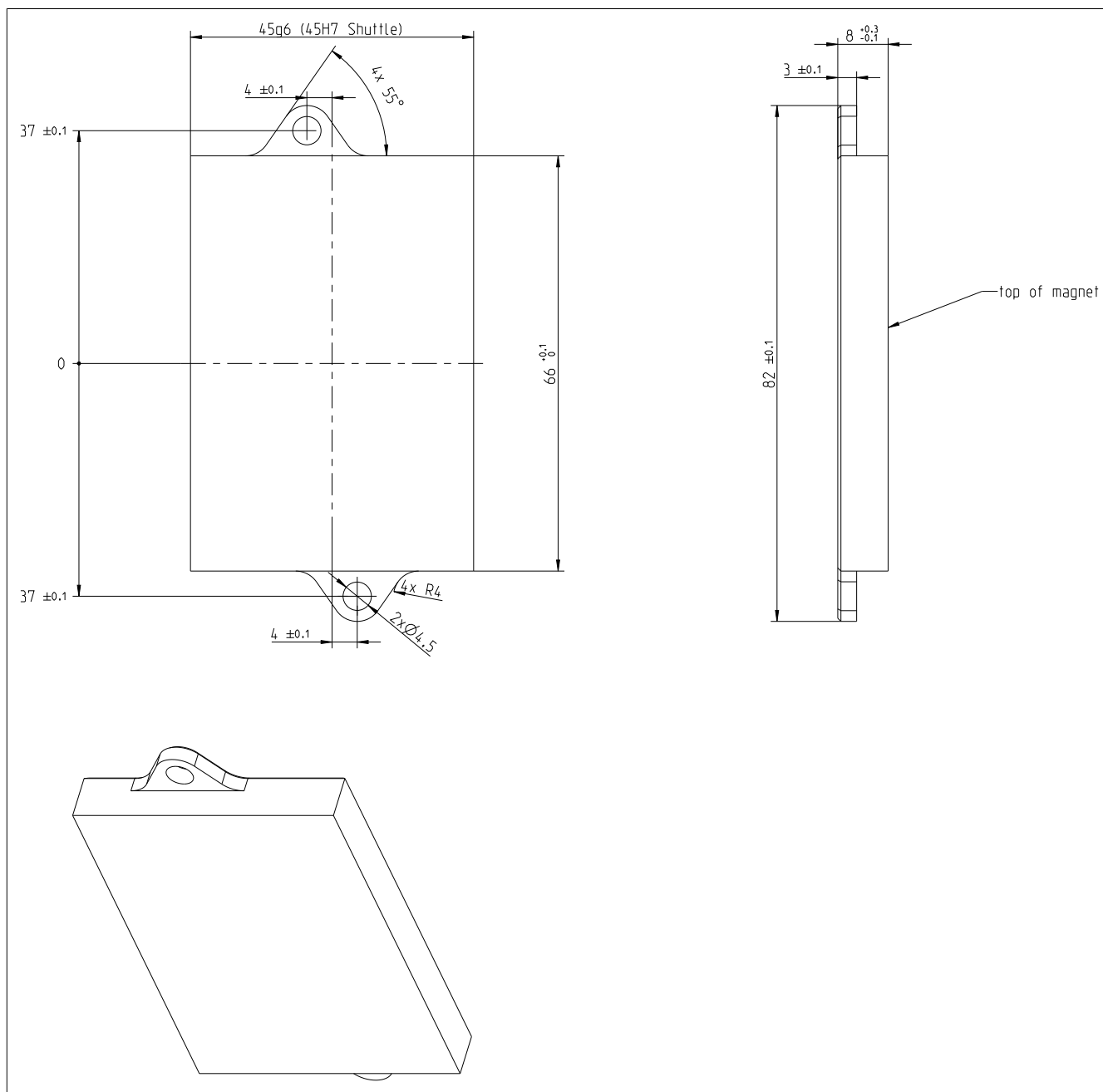


Figure 7: Dimension diagram for 8F1M0.07010.000-1

### 3.3.6 8F1M0.08020.000-1

#### 3.3.6.1 Order data

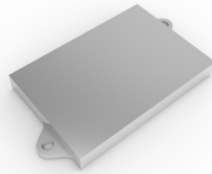
Order number	Short description	Figure
	<b>Magnet units</b>	
8F1M0.08020.00X-1	ACOPOStrak magnet unit 0 SPH, 45 mm, generation 2, 10 pcs. 8F1M0.08020.000-1	

Table 27: 8F1M0.08020.00X-1 - Order data

#### 3.3.6.2 Technical data

Order number	8F1M0.08020.000-1
<b>Operating conditions</b>	
Max. magnet temperature	60°C
<b>Ambient conditions</b>	
Temperature	
Operation	
Nominal	5°C to 40°C
Storage	-25°C to 55°C
Transport	-25°C to 60°C
Relative humidity	
Operation	5 to 85%, non-condensing
Storage	5 to 95%, non-condensing
Transport	Max. 95% at 40°C
<b>Mechanical properties</b>	
Dimensions	
Width	45 mm
Height	82 mm
Depth	8 mm
Weight	Approx. 175 g

Table 28: 8F1M0.08020.000-1 - Technical data

### 3.3.6.3 Dimension diagram and installation dimensions

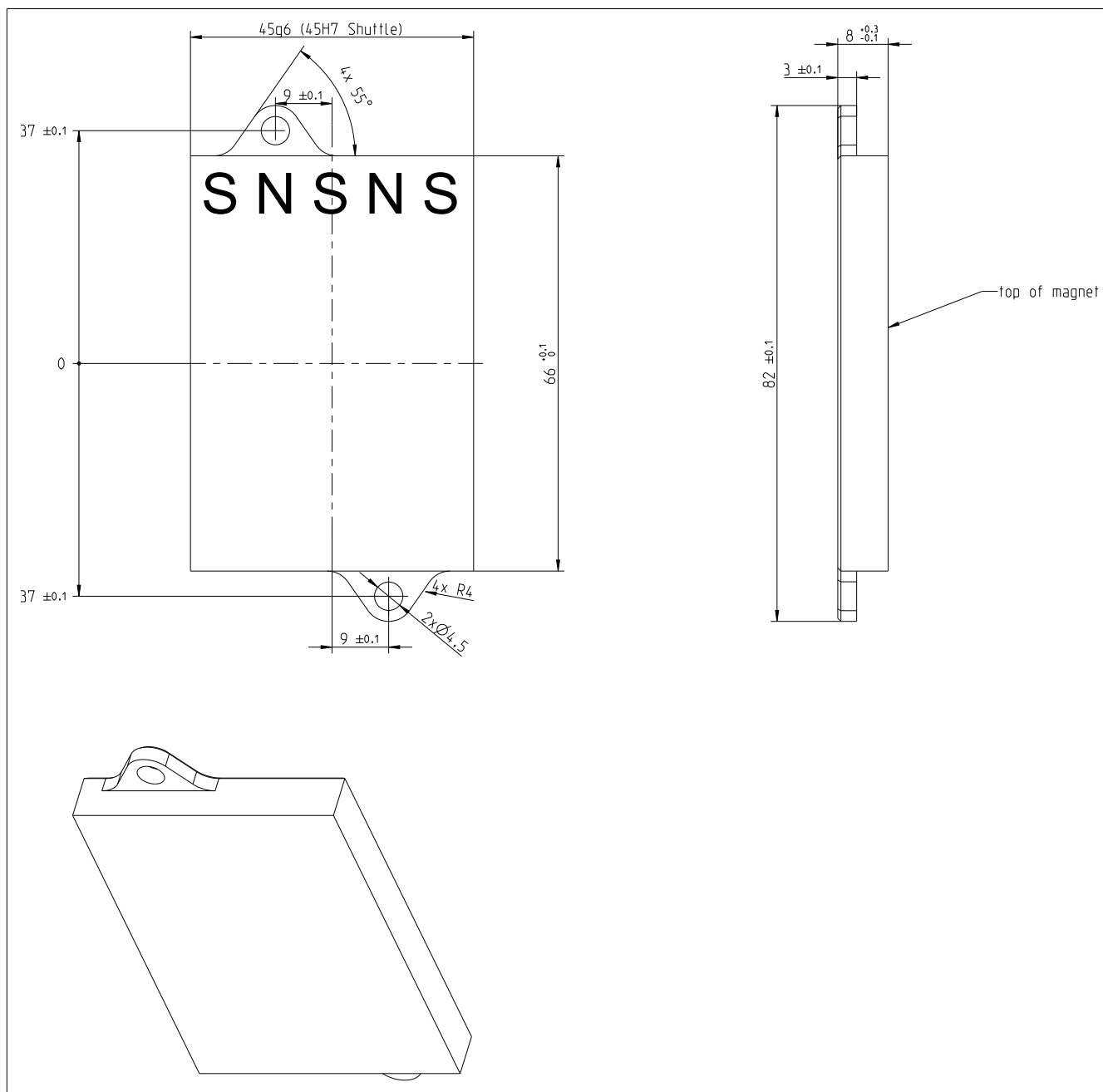


Figure 8: Dimension diagram for 8F1M0.02020.000-1



## 3.4 Power supply

### 3.4.1 8B0C0320Hx00.B00-1

#### 3.4.1.1 General information

Regenerative auxiliary supply module 8B0C0320Hx00.B00-1 is used for the power supply of external DC consumers. It is equipped with a DC output with two connections, whose output voltage can be continuously configured between 42 VDC and 58 VDC, and a POWERLINK connection. It is ideally suited as a power supply for ACOPOStrak transport systems.

Using 8B0C0320Hx00.B00-1 for the power supply of ACOPOStrak transport systems is only permitted starting with revision B0 of 8F1I01 ACOPOStrak segments.

The module offers the following additional functions:

- Voltage measurement on a battery
- Configurable cutoff limit for output current monitoring

#### 3.4.1.2 Order data


Order number	Short description	Figure
	<b>Wall mounting</b>	
8B0C0320HW00.B00-1	ACOPOSmulti auxiliary supply module , 35 A, AS, wall mounting, 42...58 VOut	
	<b>Cold-plate or feed-through mounting</b>	
8B0C0320HC00.B00-1	ACOPOSmulti auxiliary supply module, 35 A, AS, cold plate or pass-through mounting, 42...58 VOut	
	<b>Required accessories</b>	
	<b>Terminal block sets</b>	
8BZ0C032000.0B0-1A	Screw clamp terminal block set for 8B0C0320Hx00.B00-1 ACOPOSmulti modules: 1x 8TB4104.208P-10, 1x 8TB2112.2010-00, 1x 8TB2104.2010-00, 1x 8TBB104.201A-00	
8BZ0C032000.0B0-1C	Push-in terminal block set for 8B0C0320Hx00.B00-1 ACOPOSmulti modules: 1x 8TB4104.228P-10, 1x 8TB2112.2210-00, 1x 8TB2104.2210-00, 1x 8TBB104.221A-00	
	<b>Optional accessories</b>	
	<b>Fan modules</b>	
8BXF001.0000-00	ACOPOSmulti fan module, replacement fan for ACOPOSmulti modules (8BxP/8B0C/8BVI/8BVE/8B0K)	
	<b>POWERLINK/Ethernet cables</b>	
X20CA0E61.00020	POWERLINK/Ethernet connection cable, RJ45 to RJ45, 0.2 m	
X20CA0E61.00050	POWERLINK/Ethernet connection cable, RJ45 to RJ45, 0.5 m	
X20CA0E61.00100	POWERLINK/Ethernet connection cable, RJ45 to RJ45, 1 m	
X20CA0E61.00500	POWERLINK/Ethernet connection cable, RJ45 to RJ45, 5 m	
X20CA0E61.01000	POWERLINK/Ethernet connection cable, RJ45 to RJ45, 10 m	
X20CA0E61.1000	POWERLINK/Ethernet connection cable, RJ45 to RJ45, 100 m	
	<b>Shield component sets</b>	
8SCS000.0000-00	ACOPOSmulti shield component set: 1x shield plate 1x type 0, 1x hose clamp, B 9 mm, D 12-22 mm	
8SCS002.0000-00	ACOPOSmulti shield component set: 1x clamping plate, 2x clamp D 4-13.5 mm, 2x screws	
8SCS009.0000-00	ACOPOSmulti shield component set: 1x ACOPOSmulti holding plate SK8-14, 1x shield connection clamp SK14	
8SCS010.0000-00	ACOPOSmulti shield component set: 1x ACOPOSmulti holding plate SK14-20, 1x shield connection clamp SK20	
	<b>Terminal blocks</b>	
8TB2104.2010-00	4-pin screw clamp terminal block, 1-row, pitch: 5.08 mm, label 1: Numbered consecutively	
8TB2104.2210-00	4-pin push-in terminal block, 1-row, pitch: 5.08 mm, label 1: Numbered consecutively	
8TB2112.2010-00	12-pin screw clamp terminal block, 1-row, pitch: 5.08 mm, label 1: Numbered consecutively	
8TB2112.2210-00	12-pin push-in terminal block, 1-row, pitch: 5.08 mm, label 1: Numbered consecutively	
8TB4104.208P-10	4-pin screw clamp terminal block, 1-row, pitch: 10.16 mm, label 8: GND, OUT, GND, OUT coding G: 1011	
8TB4104.228P-10	4-pin push-in terminal block, 1-row, pitch: 10.16 mm, label 8: GND, OUT, GND, OUT coding G: 1011	
8TBB104.201A-00	4-pin screw clamp terminal block, 1-row, pitch: 3.81 mm, label 1: Numbered consecutively	
8TBB104.221A-00	4-pin push-in terminal block, 1-row, pitch: 3.81 mm, label 1: Numbered consecutively	

Table 29: 8B0C0320HW00.B00-1, 8B0C0320HC00.B00-1 - Order data

### 3.4.1.3 Technical data

Order number	8B0C0320HW00.B00-1	8B0C0320HC00.B00-1
General information		
Cooling and mounting type	Wall mounting	Cold plate
Certifications		
CE	Yes	
UL	cULus E225616 Power conversion equipment	
DC bus connection		
Voltage		
Nominal	750 VDC	
Operating range in continuous operation	260 to 800 VDC	
Full continuous power	550 to 800 VDC	
Continuous power consumption	Max. 2120 W	
Power dissipation with continuous power <sup>1)</sup>	15 W (0% continuous power) 30 W (50% continuous power) 90 W (100% continuous power)	
DC bus capacitance	1.2 µF	
Variant	ACOPOSmulti backplane	
24 VDC output		
Quantity	1	
Output voltage		
DC bus voltage (U <sub>DC</sub> ): 260 to 315 VDC	25 VDC * (U <sub>DC</sub> /315)	
DC bus voltage (U <sub>DC</sub> ): 315 to 800 VDC	24 VDC ±6%	
Fuse protection	250 mA (slow-blow) electronic, automatic reset	
Variant		
24 VDC, COM	Connector	
24 VDC internal system power supply		
Input voltage	25 VDC ±1.6%	
Input capacitance	47 µF	
Max. power consumption	7 W + P 24 VDC Out	
Variant	ACOPOSmulti backplane	
58 VDC output		
Quantity	1 <sup>2)</sup>	
Output voltage		
Nominal	58 VDC	
Workspace	42 to 58 VDC	
Residual ripple	Typ. 200 mV <sub>SS</sub>	
Input stability <sup>3)</sup>	Typ. <50 mV (dynamic)	
Load stability <sup>4)</sup>	250 mV <sub>SS</sub> (dynamic)	
Continuous power <sup>5)</sup>	(Output voltage / 58 VDC) * 2030 W	
Continuous current	±35 A	
Peak current	±60 A (max. 2 s)	
Reduction of continuous current		
Depending on ambient temperature	0.2 A/K (starting at 40°C)	
Depending on installation elevation	3.5 A per 1000 m (starting at 500 m above sea level)	
Depending on input voltage	0.0732 A/V * (550 V - Input voltage)	
Depending on cooling type	No reduction	
Reduction of peak current		
Depending on input voltage	0,136 A/V * (600 V - Input voltage)	
Startup delay	Max. 8 s	
Startup time	Typ. 300 ms	
Residual ripple		-
Protective measures		
No-load proof	Yes	
Overload-proof	Yes	
Short-circuit proof	Yes	
Feedback protection	Yes <63 V	
Overtemperature protection	Yes	
Output/Input isolation	PELV	
Variant	Connector	
Shield connection	Yes	
Connection	Parallel connection on output: Not permitted Serial connection on output: Not permitted	
Max. cable length	30 m	
Fieldbus		
Type	POWERLINK V2 controlled node (CN)	
Variant	2x RJ45, shielded, 2-port hub	
Line length	Max. 100 m between 2 stations (segment length)	

Table 30: 8B0C0320HW00.B00-1, 8B0C0320HC00.B00-1 - Technical data

Order number	8B0C0320HW00.B00-1	8B0C0320HC00.B00-1
Transfer rate	100 Mbit/s	
Digital inputs		
Quantity	1	
Modulation compared to ground potential	±38 VDC	
Circuit	Sink	
Input current at nominal voltage	Typ. 10 mA	
Switching threshold	LOW: <5 VDC HIGH: >15 VDC	
Input voltage		
Nominal	24 VDC	
Maximum	30 VDC	
Electrical isolation	Yes	
Switching delay		
Rising edge	52 ±0.5 µs (digitally filtered)	
Falling edge	53 ±0.5 µs (digitally filtered)	
Shielding	No	
Max. cable length	30 m	
Signal loop through		
Quantity	2 pairs	
Voltage	Max. 30 VDC	
Current	Max. 100 mA <sup>6)</sup>	
Electrical isolation	Yes	
Loop through for STO	Yes	
Shielding	No	
Variant	Pair1_1, Pair1_2, Pair2_1, Pair2_2	
Max. cable length	30 m	
Battery voltage measurement <sup>7)</sup>		
Quantity	1	
Electrical isolation	Yes	
Input voltage		
Maximum	10 V	
Measurement		
Load pulse	3 mA	
Pulse duration	Max. 500 ms	
Threshold value for undervoltage warning	5.2 V <sup>8)</sup>	
Idle current	Max. 10 µA	
Variant	Connector	
Shielding	No	
Max. cable length	30 m	
Support		
Motion system		
mapp Motion	5.13.1 and higher	
ACP10/ARNC0	All versions <sup>9)</sup>	
Operating conditions		
Permissible mounting orientations		
Hanging vertically	Yes	
Horizontal, face up	Yes	
Standing horizontally	No	
Installation elevation above sea level		
Nominal	0 to 500 m	
Maximum	4000 m	
Pollution degree per EN 61800-5-1	2 (non-conductive pollution)	
Overvoltage category per EN 61800-5-1	III	
Degree of protection per EN 60529 <sup>10)</sup>	IP20	
Ambient conditions		
Temperature		
Operation		
Nominal	5 to 40°C	
Maximum	55°C	
Storage	-25 to 55°C	
Transport	-25 to 70°C	
Relative humidity		
Operation	5 to 85%	
Storage	5 to 95%	
Transport	Max. 95% at 40°C	

Table 30: 8B0C0320HW00.B00-1, 8B0C0320HC00.B00-1 - Technical data

## Technical data

Order number	8B0C0320HW00.B00-1	8B0C0320HC00.B00-1
<b>Mechanical properties</b>		
Dimensions <sup>11)</sup>		
Width	53.5 mm	
Height	317 mm	
Depth		
Wall mounting	263 mm	-
Cold plate	-	212 mm
Weight	3.2 kg	2.6 kg
Module width	1	

Table 30: 8B0C0320HW00.B00-1, 8B0C0320HC00.B00-1 - Technical data

- 1) Output 58 V
- 2) 2 separate connections.
- 3)  $U_{DC}$ : 250 to 800 V
- 4) Output current slope: 500 A/ms
- 5) Applies to supply and regenerative operation.
- 6) External fusing recommended.
- 7) Battery voltage measurement must be explicitly triggered by the user.
- 8) The value is designed to measure the voltage of two 3.6 V Li-ion batteries connected in series.
- 9) 8B0C0320Hx00.B00-1 auxiliary supply modules are only permitted to be used in ACOPOSmulti drive systems with 8B0P0110Hx00.000-1 power supply modules if the power supply modules have operating system version ACP10 V5.10.0 or higher.
- 10) The specified degree of protection is only provided if suitable terminals are connected to all connectors on the module and all fans are installed.
- 11) These dimensions refer to the actual device dimensions including the respective mounting plate. Additional spacing above and below the devices must be taken into account for mounting, connections and air circulation.

### 3.4.1.4 Status indicators

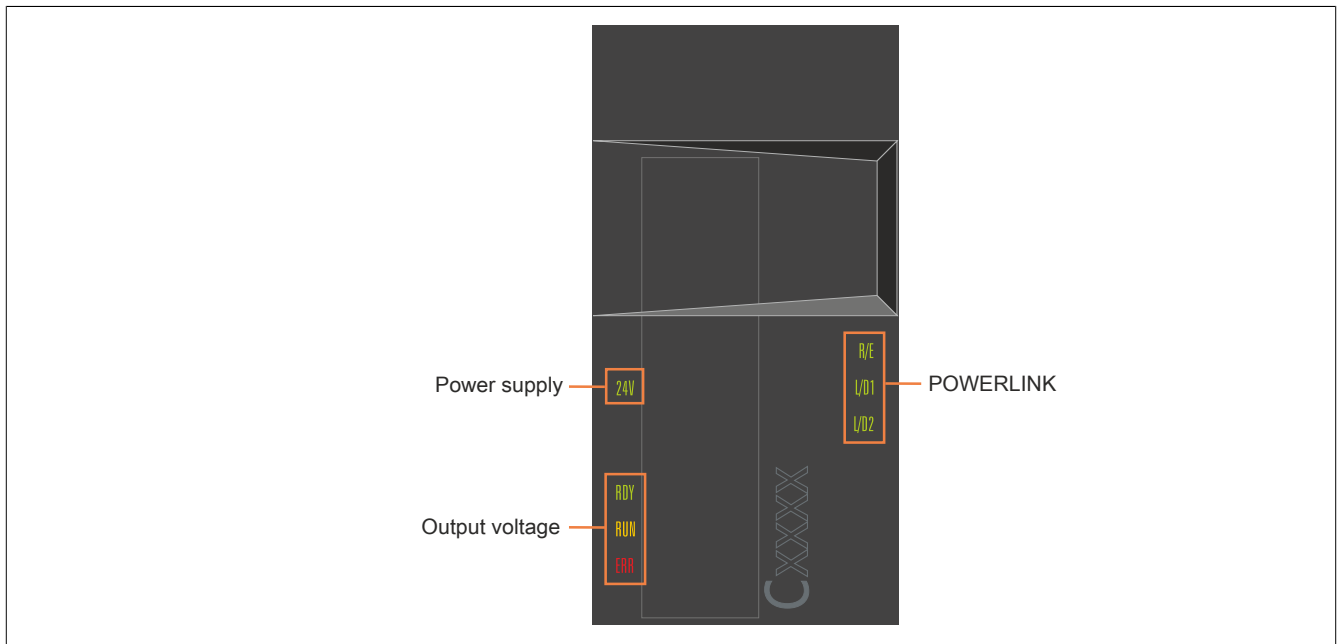


Figure 9: Auxiliary supply modules with power output (8B0C0320Hx00.B00-1) - Status indicator groups

#### 3.4.1.4.1 LED status indicator ERROR

##### Module not configured in Automation Studio

The following intervals are used for the LED status indicators:

Width of box: 500 ms

Repeats after: 3,000 ms

Status	LED	Display
Module overtemperature	RDY	
	RUN	
	ERR	

#### 3.4.1.4.2 POWERLINK - LED status indicators

Label	Color	Function	Description
R/E	Green/Red	Ready/Error	LED off
			The module is not supplied with power or network interface initialization has failed.
			Solid red
			The POWERLINK node number of the module is 0.
			Blinking red/green
			The client is in an error state (drops out of cyclic operation).
			Blinking green (1x)
			The client detects a valid POWERLINK frame on the network.
			Blinking green (2x)
			Cyclic operation on the network, but the client itself is not yet in cyclic operation.
			Blinking green (3x)
			Cyclic operation of the client is in preparation.
			Solid green
			The client is in cyclic operation.
			Flickering green
			The client is not in cyclic operation and also does not detect any other stations on the network in cyclic operation.
L/D1	Green	Link/Data activity Port 1	Solid green
			A physical connection has been established to another station on the network.
			Blinking green
			Activity on port 1
L/D2	Green	Link/Data activity Port 2	Solid green
			A physical connection has been established to another station on the network.
			Blinking green
			Activity on port 2

Table 31: POWERLINK - LED status indicators

## 3.4.1.4.3 RDY, RUN, ERR - LED status indicators

Label	Color	Function	Description	
RDY	Green	Ready	Solid green	The module is ready for operation and the power stage can be enabled (operating system present and booted, no pending permanent or temporary errors).
			Blinking green	The module is not ready for operation. <b>Examples:</b> <ul style="list-style-type: none"> <li>• No signal on CR_OK</li> <li>• DC bus voltage outside the tolerance range</li> <li>• Overtemperature of power section</li> <li>• Overtemperature of air flow</li> <li>• Output voltage outside the tolerance range</li> <li>• Disturbance on network</li> </ul>
RUN	Orange	Run	Solid orange	The module's power stage is enabled.
ERR	Red	Error	Solid red	There is a permanent error on the module. <b>Example:</b> <ul style="list-style-type: none"> <li>• Data in EPROM not valid</li> </ul>

Table 32: RDY, RUN, ERR - LED status indicators

**Information:**

The ACOPOSmulti drive system has no way of detecting whether the fans in the fan modules of the mounting plate or the module-internal fans are actually rotating.

### 3.4.1.5 Dimension diagram and installation dimensions

#### 8B0C0320HW00.B00-1

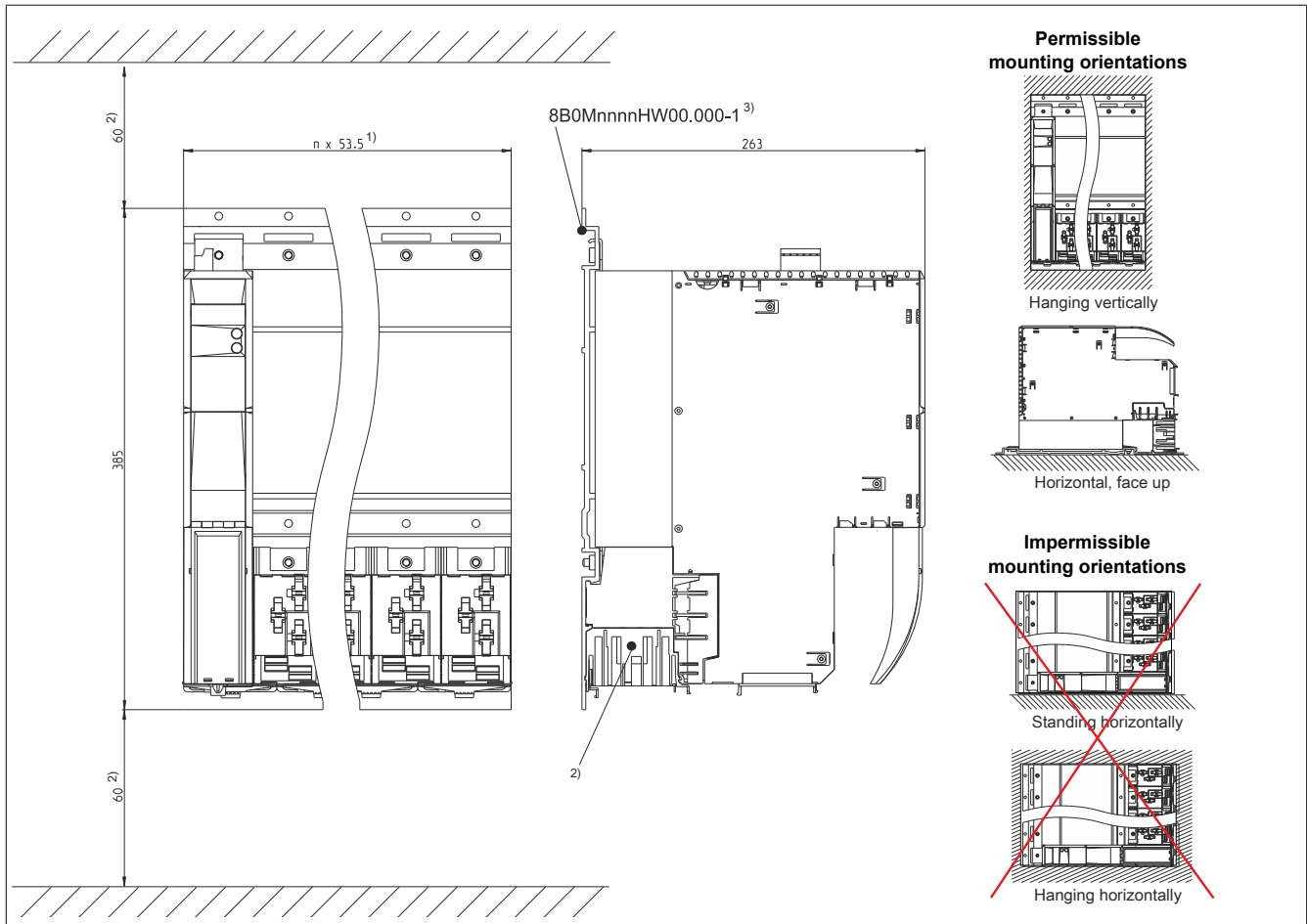
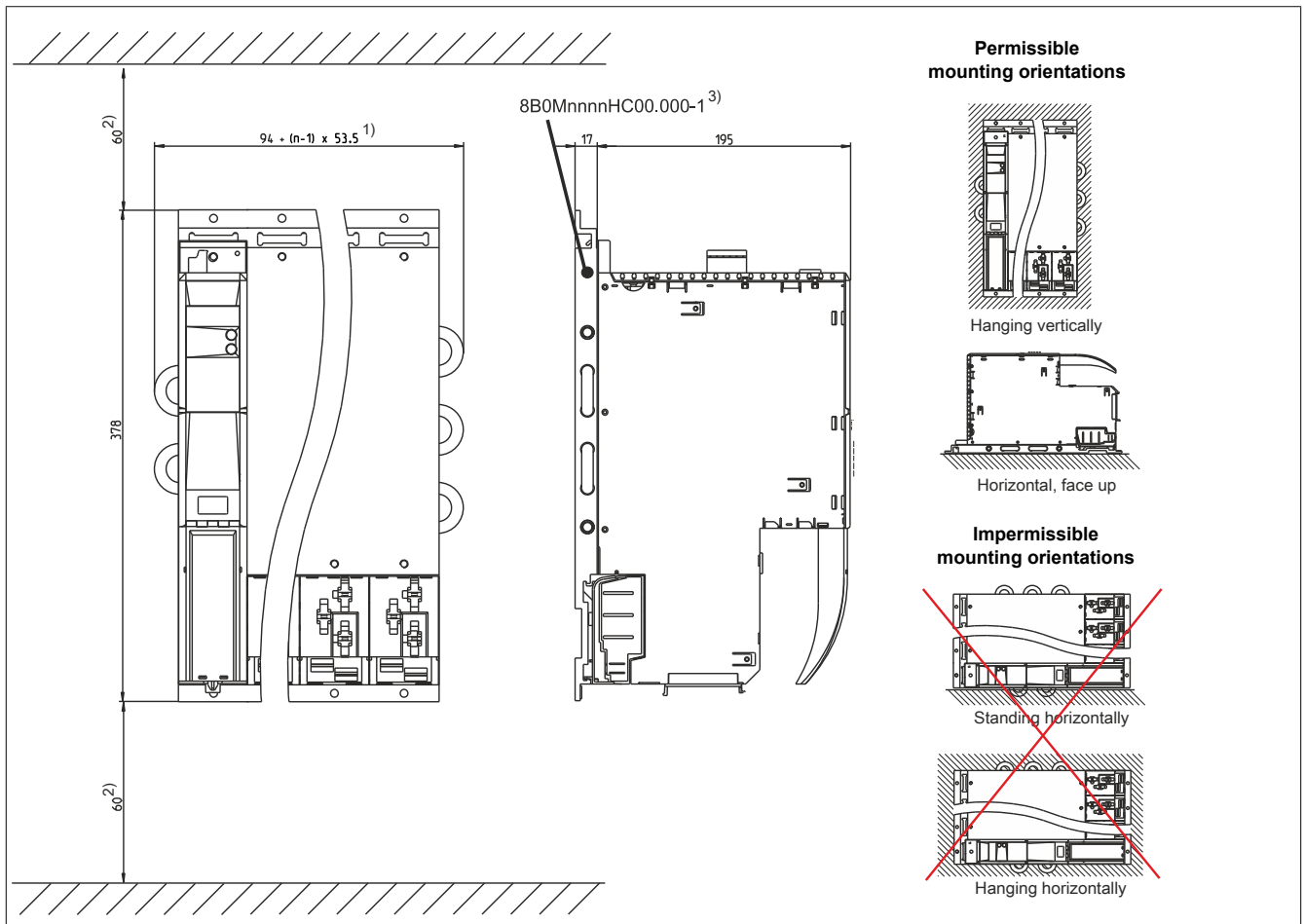


Figure 10: 8B0C0320HW00.B00-1 - Dimension diagram and installation dimensions

- 1) n... Number of width units on the mounting plate
- 2) For sufficient air circulation, a clearance of at least 60 mm must be provided above the mounting plate and below the module.  
**To ensure that the fan modules in the mounting plate can be replaced easily, at least 250 mm clearance must be available below the module.**
- 3) nnnn indicates the number of slots (e.g. 0160 refers to 16 slots).

# 8B0C0320HC00.B00-1



- 1) n... Number of width units on the mounting plate
- 2) For sufficient air circulation, a clearance of at least 60 mm must be provided above the mounting plate and below the module.
- 3) nnnn indicates the number of slots (e.g. 0160 refers to 16 slots).



### 3.4.1.6 Wiring

#### 3.4.1.6.1 Pinout overview

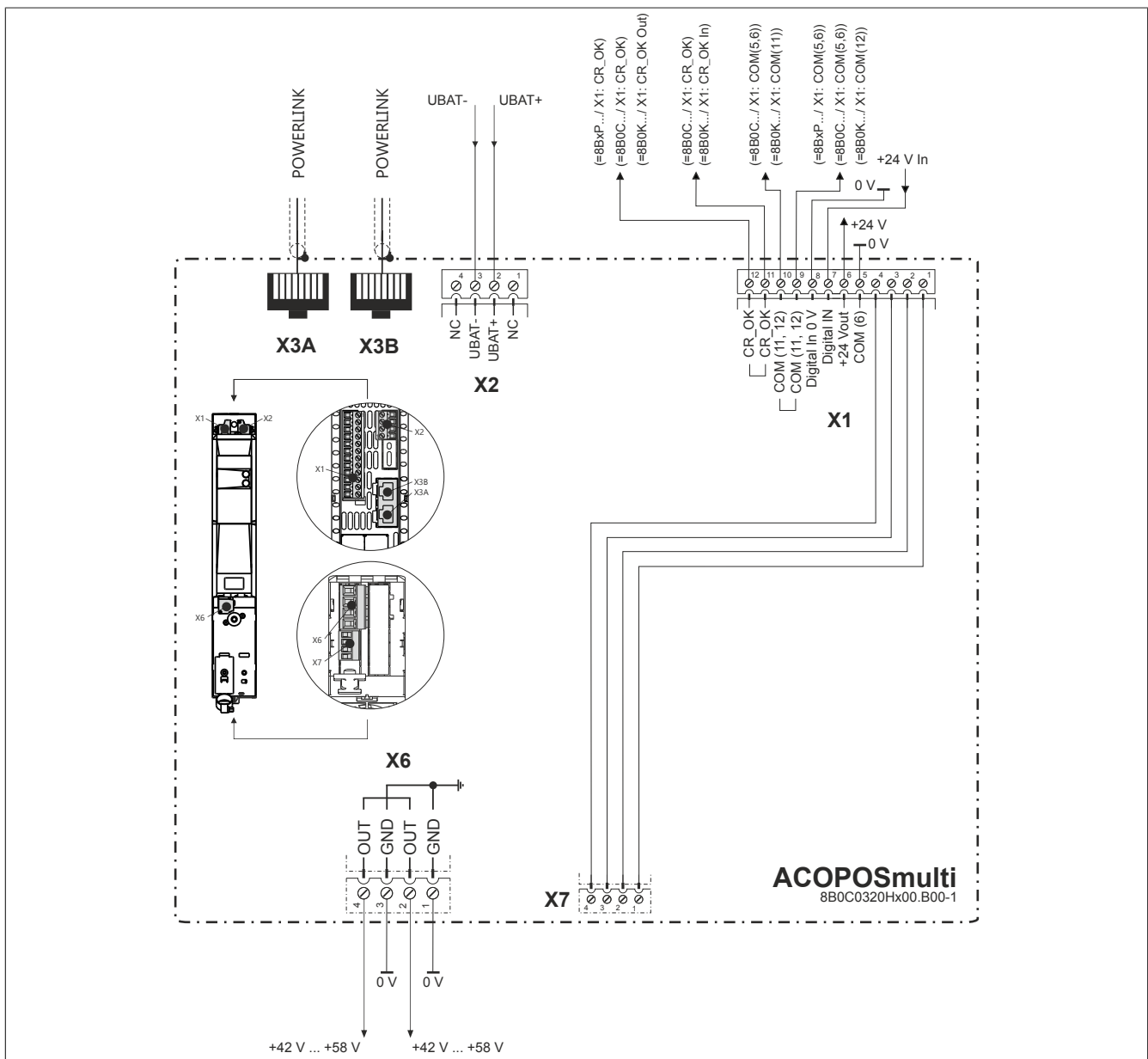


Figure 12: 8B0C0320Hx00.B00-1 - Pinout overview

#### Information:

For the POWERLINK connection to X3A/X3B, see [POWERLINK wiring](#).

### 3.4.1.6.2 Connector X1 - Pinout

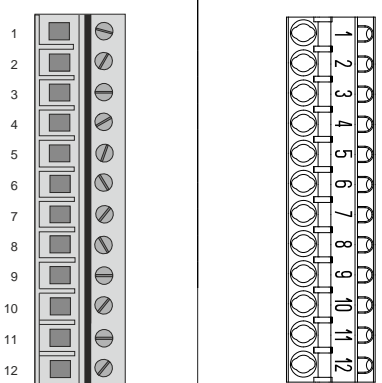
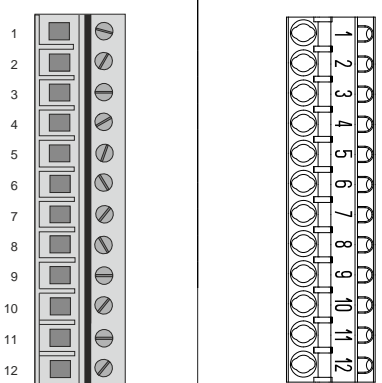
X1		Pin	Name	Function
		1	Pair1_1	Pair 1, pin 1
		2	Pair1_2	Pair 1, pin 2
		3	Pair2_1	Pair 2, pin 1
		4	Pair2_2	Pair 2, pin 2
		5	COM (6)	+24 V output 0 V
		6	+24 V Out	+24 V output
		7	Digital IN	Digital input +24 V
		8	Digital IN 0 V	Digital input 0 V
		9	COM (12)	0 V
		10	COM (11)	0 V
		11	CR_OK Out	DC bus ready out
		12	CR_OK In	DC bus ready in

Table 33: Connector X1 - Pinout

Terminal cross section	[mm²]	[AWG]
Solid core / Multiple-conductor lines	0.2 to 2.5	24 to 12
Flexible, multiple wire line		
Without wire end sleeves	0.2 to 2.5	24 to 12
With wire end sleeves	0.25 to 2.5	24 to 12
Approbation data		
UL/C-UL-US (push-in/screw connection)		24 to 12 / 24 to 12
CSA (push-in/screw connection)		24 to 12 / 24 to 12
Tightening torque for the terminal screws [Nm]	0.5 to 0.6	

### 3.4.1.6.3 Connector X2 - Pinout

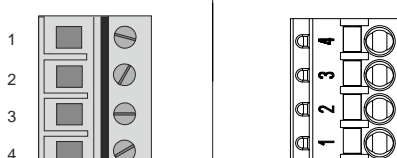
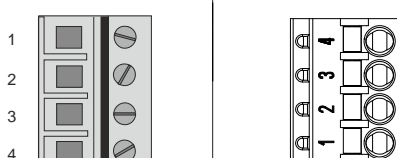
X2		Pin	Name	Function
		1	NC	NC
		2	UBAT+	Battery voltage +
		3	UBAT-	Battery voltage -
		4	NC	NC

Table 34: Connector X2 - Pinout

Terminal cross section	[mm²]	[AWG]
Solid core / Multiple-conductor lines	0.2 to 2.5	24 to 12
Flexible, multiple wire line		
Without wire end sleeves	0.2 to 2.5	24 to 12
With wire end sleeves	0.25 to 2.5	24 to 12
Approbation data		
UL/C-UL-US (push-in/screw connection)		24 to 12 / 24 to 12
CSA (push-in/screw connection)		24 to 12 / 24 to 12
Tightening torque for the terminal screws [Nm]	0.5 to 0.6	

### 3.4.1.6.4 Connectors X3A, X3B - Pinout

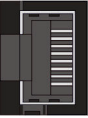
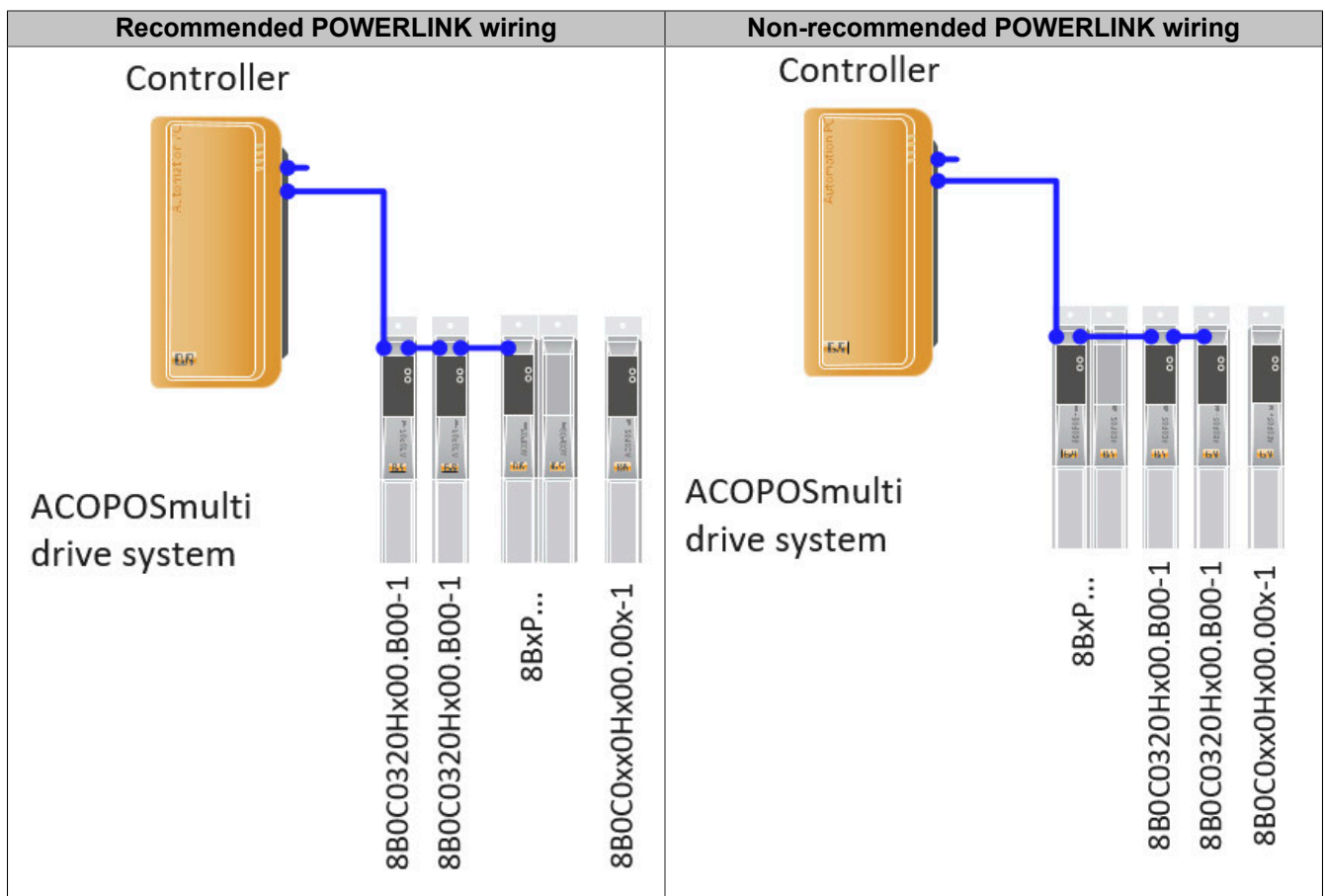
X3A, X3B	Pin	Name	Function
	1	RXD	Receive signal
	2	RXD\	Receive signal inverted
	3	TXD	Transmit signal
	4	Shield	Shield
	5	Shield	Shield
	6	TXD\	Transmit signal inverted
	7	Shield	Shield
	8	Shield	Shield

Table 35: X3A, X3B connectors - Pinout

#### 3.4.1.6.4.1 POWERLINK wiring

If DNA is enabled on at least one station in the POWERLINK network, the hub port of drives and power supply modules is briefly disabled after a warm restart of the CPU, even if they have a permanent node number. This can result in network communication failure for the following bus stations.

In this case, placing power supply module 8B0C320Hx00.B00-1 in the first position after the controller is recommended.



### 3.4.1.6.5 Connector X6 - Pinout

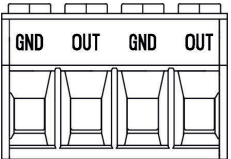
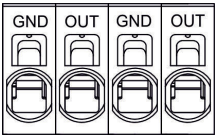
X6	Name	Function
 8TB4104.208P-10	GND	0 V
	OUT	+42 ... 58 Vout
	GND	0 V
	OUT	+42 ... 58 Vout
 8TB4104.228P-10		

Table 36: Connector X6 - Pinout

## Technical data

Terminal cross section	[mm²]	[AWG]
Solid core / Multiple-conductor lines	0.75 to 16	18 to 6
Flexible, multiple wire line		
Without wire end sleeves	0.75 to 16	18 to 6
With wire end sleeves	0.75 to 16	18 to 6
Approval data		
UL/C-UL-US		18 to 6
CSA		18 to 6
Tightening torque for the terminal screws [Nm]	1.7 to 1.8	

### 3.4.1.6.6 Connector X7 - Pinout

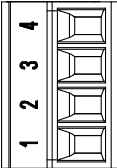
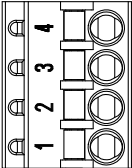
X7		Pin	Name	Function
 8TBB104.201A-00	 8TBB104.221A-00	1	Pair1_1	First pair, pin 1
		2	Pair1_2	First pair, pin 2
		3	Pair2_1	Second pair, pin 1
		4	Pair2_2	Second pair, pin 2

Table 37: Connector X7 - Pinout

Terminal cross section	[mm²]	[AWG]
Solid core / Multiple-conductor lines	0.14 to 1.5	26 to 16
Flexible, multiple wire line		
Without wire end sleeves	0.14 to 1.5	26 to 16
With wire end sleeves	0.25 to 1.5	26 to 16
Approval data		
UL/C-UL-US (push-in/screw connection)		26 to 16 / 28 to 16
CSA (push-in/screw connection)		26 to 16 / 28 to 16
Tightening torque for the terminal screws [Nm]	0.22 to 0.25	

### 3.4.1.7 POWERLINK node number setting

The POWERLINK node number can be set using the two hexadecimal coded rotary switches located behind the module's black cover:



Figure		Coded rotary switches	POWERLINK node number
		1	16s position (high)
		2	1s position (low)
Cover closed		A change to the POWERLINK node number only takes effect the next time the ACOPOSmulti drive system is switched on.	
Cover open		<div><div></div><h2>Information:</h2><p>In principle, node numbers between \$01 and \$FD are permitted.</p><p>However, node numbers between \$F0 and \$FD are intended for future system expansions. To ensure compatibility, these node numbers should be avoided.</p><p>Node numbers \$00, \$FE and \$FF are reserved and are therefore not permitted to be set.</p></div>	

Table 38: Setting the POWERLINK node number

### 3.4.1.8 Configuration in Automation Studio

#### 3.4.1.8.1 Configuration with mapp Motion (function model "Motion configuration")

When using mapp Motion, the module is configured with "Motion configuration".

Name	Value	Unit	Description
8B0C0320HW00.B00-1			
Function model	Motion configuration		Module operating mode
General			
Module supervised	off		Service mode if there is no hardware module
POWERLINK configuration			
POWERLINK parameters			
Power section			
Axis reference			Name of the power supply module component
Output parameters	User defined		Output parameters selection
Voltage	58.0	V	Output voltage
Current limitation	Not used		Current limitation
Output voltage on	Yes		Output voltage is on after start-up and error reset

Figure 13: Selecting function model "Motion configuration"

For details, see Automation Help.

#### 3.4.1.8.2 Configuration without mapp Motion (function model "Direct control")

Without using mapp Motion, the module is configured with "Direct control".

##### Output voltage

Name	Value	Unit	Description
8B0C0320HW00.B00-1			
Function model	Direct control		Module operating mode
General			
Module supervised	on		Service mode if there is no hardware module
POWERLINK configuration			
POWERLINK parameters			
Power section			
Output parameters			
Voltage	58	V	Output voltage
Current limitation	Not used		Current limitation
Output voltage on	off		Default output state

Figure 14: Configuration of the output voltage in function model "Direct control"

The output voltage of the module can be configured between 42 V and 58 V.

##### Overload shutdown ("Current limitation")

Name	Value	Unit	Description
8B0C0320HW00.B00-1			
Function model	Direct control		Module operating mode
General			
POWERLINK configuration			
Power section			
Output parameters			
Voltage	58	V	Output voltage
Current limitation	Used		Current limitation
Current limit	31	A	Maximum allowed output current
Current limit time	20	s	Monitoring time for output current limit
Output voltage on	off		Status of the output after successful POWERLINK connection establishment

Figure 15: Configuration of output current monitoring and switch-on behavior in function model "Direct control"

Overload shutdown monitors the maximum permissible output current [ $I_{rms}$ ] of the module. Overload shutdown is disabled by default and only becomes active by selecting "Used".

##### Configuration parameters

- Current limit OUTPUT\_CURRENT\_LIMIT\_I\_OUT\_MAX ( $I_{LIM}$ ): Max. permissible output current [ $I_{rms}$ ]
- Current limit time OUTPUT\_CURRENT\_LIMIT\_FILTER\_TIME ( $T_{LIM}$ ): Filter time for the output current

Monitoring takes place using the time-filtered root mean square (RMS) value of the output current. This is calculated from a PT1 characteristic, where time constant  $\tau$  is selected as follows:

$$T_{LIM} = 5 \cdot \tau$$

If the output current rises sharply from 0 to  $I_{peak}$ , tripping time  $T_A$  is calculated as follows:

$$T_A = \frac{1}{5} T_{LIM} \cdot \ln \left( \frac{I_{peak}}{I_{peak} - I_{LIM}} \right)$$

- No overload shutdown occurs with output currents  $< I_{LIM}$ .
- With an output current of approx.  $1.07 \cdot I_{LIM}$ , the overload shutdown occurs after monitoring time  $T_{LIM}$ .
- With output currents  $> 1.07 \cdot I_{LIM}$ , overload shutdown takes place correspondingly faster (see also the tripping characteristic for overload shutdown).

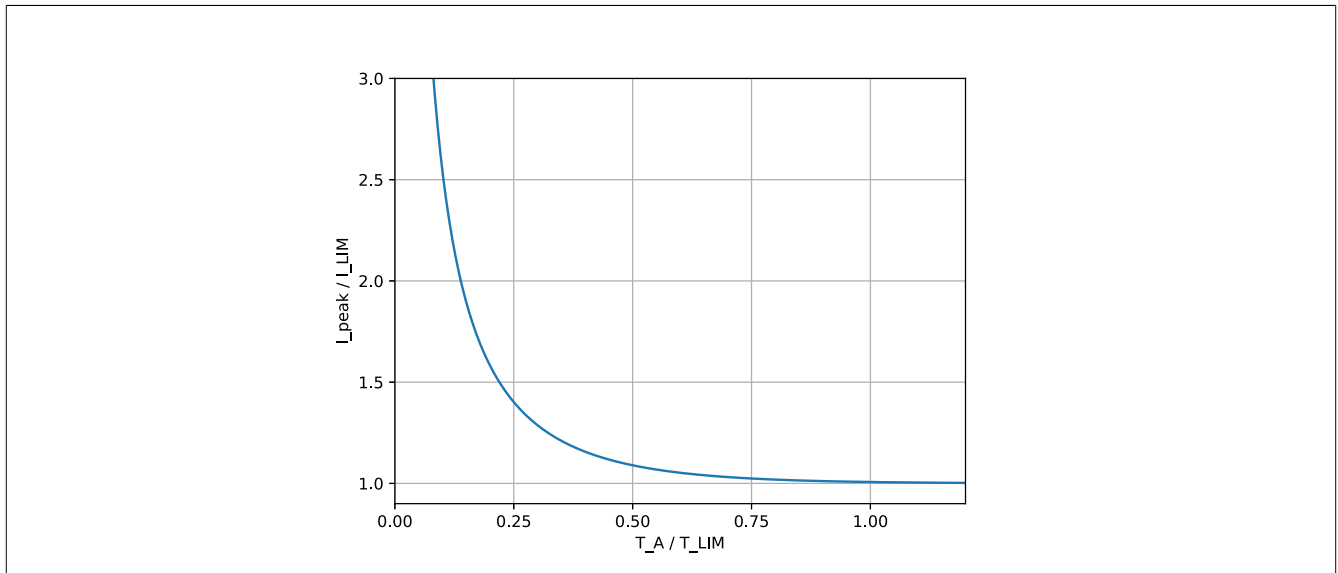


Figure 16: Tripping characteristic for overload shutdown

The behavior of overload shutdown is similar to that of conventional melting fuses. Monitoring time  $T_{LIM}$  thus specifies whether the overload shutdown is "fast-acting" or "slow-blow".

### 3.4.1.9 Register description

Object Index	Su-index	Name	Data type	Read		Write	
				Cyclic (PDO)	Acyclic (SDO)	Cyclic (PDO)	Acyclic (SDO)
0x2000	1	CTRL_REG	UINT16	•		•	
0x2001	0	STATUS_REG	UINT8				
	1	STATUS_REG_SUB_GENERAL	UINT16	•			
	2	STATUS_REG_SUB_RUNMODE	UINT8	•			
0x2002	1	ErrorsPacked	UINT32	•			
0x2003	1	WarningsPacked	UINT32	•			
0x2005	0	ACT_MEAS	UINT8		•		
	1	ACT_MEAS_U_OUT	REAL		•		
	2	ACT_MEAS_I_OUT	REAL		•		
	3	ACT_MEAS_P_OUT	REAL		•		
	4	ACT_MEAS_U_IN	REAL		•		
0x2006	0	SETTINGS	UINT8		•		
	1	SETTINGS_U_OUT [mV]	UINT32		•		•
	2	SETTINGS_CONFIG_OUTPUT_STATE	UINT8		•		•
0x2008	0	TEMPS	UINT8		•		
	1	TEMPS_T_HEATSINK	INT16		•		
	2	TEMPS_T_AIR_IN	INT16		•		
	3	TEMPS_T_AIR_OUT	INT16		•		
	4	TEMPS_T_TRAFO	INT16		•		
	5	TEMPS_T_COIL	INT16		•		
0x2009	0	BAT_MEAS	UINT8		•		
	1	BAT_MEAS_CMD	UINT8				•
	2	BAT_MEAS_STATE	UINT8		•		
0x200A	0	OUTPUT_CURRENT_LIMIT	UINT8		•		
	1	OUTPUT_CURRENT_LIMIT_I_OUT_MAX	UINT32		•		•
	2	OUTPUT_CURRENT_LIMIT_FILTER_TIME	UINT16		•		•
	3	OUTPUT_CURRENT_LIMIT_ACTIVE	UINT8		•		•

#### 3.4.1.9.1 Control register CTRL\_REG (0x2000/1)

The control register can be used to switch the output of the module on and off and to acknowledge errors and warnings.

Bit	Name		Description
0	ENABLE_OUTPUT	1	The output is switched on with a rising edge.
1	ACK_ALL_ERRORS	1	All pending errors are acknowledged with a rising edge.
2	ACK_ALL_WARNINGS	1	All pending warnings are acknowledged with a rising edge.
3	DISABLE_OUTPUT	1	The output is switched off with a rising edge.

#### 3.4.1.9.2 Status register STATUS\_REG

##### Status bits STATUS\_REG\_SUB\_GENERAL (0x2001/1)

Bit	Name	Description
0	CR_OK	DC bus ready Signal from the power supply module (PSM)
1	DIGITAL_IN	Digital input for general use (general purpose input)
2	OUTPUT_ENABLED	Power output stage switched on
3	---	Reserve
4	---	Reserve
5	OUTPUT_STABLE	Output voltage stable when the power output stage is switched on
6 to 15	---	Reserve

##### Run mode status STATUS\_REG\_SUB\_RUNMODE (0x2001/2)

Value	Name	Description
0	INIT	Module initialization procedure in progress
1	READY	Module ready for switching on
2	ACTIVE	Power output stage switched on
3	ERROR	Error pending

##### Error register ErrorsPacked (0x2002/1)

Bit	Name	Description
0	U_OUT_OV	Overvoltage: Output side
1	U_OUT_UV	Undervoltage: Output side
2	U_IN_OV	Overvoltage: Input side
3	U_IN_UV	Undervoltage: Input side
4	I_IN_OC	Overcurrent: Input side
5	I_OUT_OC	Overcurrent: Output side (short circuit)
6	AUX_UV	Overvoltage/Undervoltage: 24 V auxiliary supply
7	TEMP_AIR_IN	Overtemperature: Input air flow (sensor)



Bit	Name	Description
8	TEMP_AIR_OUT	Overtemperature: Output air flow (sensor)
9	TEMP_TRAFO	Overtemperature: Transformer (sensor)
10	TEMP_HEATSINK	Overtemperature: Heat sink (sensor)
11	PEAK_OVERLOAD	Overload: Peak (60 A, 2 s)
12	CONT_OVERLOAD	Overload: Duration (35 A rms)
13	---	Reserve
14	---	Reserve
15	CR_OK_LOW	CR OK signal from power supply module interrupted
16	---	Reserve
17	---	Reserve
18	---	Reserve
19	SELFTEST	Device defective
20	I_OUT_CUSTOM_LIMIT	Overload: Configured limit
21	TEMP_COIL	Overtemperature: Choke (model)
22 to 31	---	Reserve

Each of the listed errors causes the module to change to state ERROR. In state ERROR, the output voltage (power output stage) is switched off and cannot be switched on again.

All pending errors are acknowledged by setting bit ACK\_ALL\_ERRORS (edge-sensitive). After acknowledging the errors, it is possible to switch on the output again.

### Information:

Error SELF\_TEST\_ERROR cannot be acknowledged by the user since in this case the module has detected a serious and permanent system error.

#### 2.3.4 Warning register WarningsPacked (0x2003/1)

Bit	Name	Description
0	TEMP_AIR_IN	Overtemperature: Input air flow (sensor)
1	TEMP_AIR_OUT	Overtemperature: Output air flow (sensor)
2	TEMP_TRAFO	Overtemperature: Transformer (sensor)
3	TEMP_HEATSINK	Overtemperature: Heat sink (sensor)
4	CONT_OVERLOAD	Overload: Duration (90% of the error limit)
5	U_IN_OV	Overvoltage: Input side
6	PEAK_OVERLOAD	Overload: Peak (90% of the error limit)
7	I_OUT_CUSTOM_LIMIT	Overload: Configured limit (90% of the error limit)
8	TEMP_COIL	Overtemperature: Choke (model)
9 to 31	---	Reserve

Warnings have no direct influence on the operation of the module but indicate that a specific value has exceeded a warning limit. If no intervention takes place, this can subsequently result in an error and to the module being shut down.

All pending warnings are acknowledged by setting bit ACK\_ALL\_WARNINGS (edge-sensitive).

#### 3.4.1.9.3 Gate sizes ACT\_MEAS (0x2005)

##### Output voltage ACT\_MEAS\_U\_OUT (0x2005/1)

Current output voltage (instantaneous value) in V

##### Output current ACT\_MEAS\_I\_OUT (0x2005/2)

Current output current (instantaneous value) in A

##### Output power ACT\_MEAS\_P\_OUT (0x2005/3)

Current output power (arithmetic 5 ms average) in W

##### Input voltage ACT\_MEAS\_U\_IN (0x2005/4)

Current input voltage (instantaneous value) in V

#### 3.4.1.9.4 Configuration parameter SETTINGS (0x2006)

##### Output voltage SETTINGS\_U\_OUT (0x2006/1)

Default value for output voltage in mV

This register is not normally needed since the output voltage is set via the module configuration in Automation Studio (see "Output voltage" on page 56) and written automatically during startup.

**Automatic switch-on SETTINGS\_CONFIG\_OUTPUT\_STATE (0x2006/2)**

When value 1 is written to this register (bit 0 is set), the power output stage is automatically switched on by the controller after complete configuration. See [Configuration in Automation Studio](#).

**3.4.1.9.5 Temperatures TEMPS (0x2008)****Temperature of the heat sink TEMPS\_T\_HEATSINK (0x2008/1)**

Measured temperature at the heat sink in °C

**Temperature of the input air flow TEMPS\_T\_AIR\_IN (0x2008/2)**

Measured temperature of the input air in °C

**Temperature of the output air flow TEMPS\_T\_AIR\_OUT (0x2008/3)**

Measured temperature of the output air in °C

**Temperature of the transformer TEMPS\_T\_TRAFO (0x2008/4)**

Measured temperature at the transformer in °C

**Temperature of the choke TEMPS\_T\_COIL (0x2008/5)**

Model-based temperature of the choke core in °C

**Battery measurement BAT\_MEAS (0x2009)**

Writing value 1 to subindex 1 BAT\_MEAS\_CMD (**USINT**) performs the battery measurement once. The state of the battery measurement can be read out via subindex 2 BAT\_MEAS\_STATE (**USINT**). This is interpreted as follows:

Value	State	Description
0	UNKNOWN	Battery measurement never performed
1	BUSY	Battery measurement active
2	BAT_OK	Battery voltage OK (battery voltage >5.2 V)
3	BAT_NOT_OK	Battery voltage not OK (battery voltage ≤5.2 V)

For the duration of the measuring procedure, the battery is loaded with a low current. Since the measurement is physically implemented as gate measurement, the measurement duration varies. The maximum value is about 500 ms.

**Configurable overload shutdown OUTPUT\_CURRENT\_LIMIT (0x200A)**

In addition to the module-specific overload shutdowns for continuous and peak load, the module has a configurable overload shutdown that is designed to protect connected components. The configurable overload shutdown thus has the function of an electronic fuse. See also [Overload shutdown \("Current limitation"\)](#).

Subindex 1 OUTPUT_CURRENT_LIMIT_I_OUT_MAX ( <b>UDINT</b> ):	Monitoring limit in A ( <b>I_LIM</b> )
Subindex 2 OUTPUT_CURRENT_LIMIT_FILTER_TIME ( <b>UINT</b> ):	Monitoring time window in s ( <b>T_LIM</b> )
Subindex 3 OUTPUT_CURRENT_LIMIT_ACTIVE ( <b>USINT</b> ):	Enable (0...Inactive, 1...Active)

**Cyclic data points**

A selected part of the objects described in [Register description](#) is transferred in the cyclic POWERLINK frame. These cyclic objects (process data objects, PDOs) are listed in the module's I/O mapping and represented in AS as follows:

Channel Name	Data Type	Description [1]
➤ ModuleOk	BOOL	Module status (1 = module present)
➤ SerialNumber	UDINT	Serial number
➤ ModuleID	UDINT	Module ID
➤ HardwareVariant	UDINT	Hardware variant
➤ FirmwareVersion	UINT	Firmware version
➤ EnableOutput	BOOL	Switch powersupply on (edge sensitive)
➤ AcknowledgeAllErrors	BOOL	Acknowledge all pending errors (edge sensitive)
➤ AcknowledgeAllWarnings	BOOL	Acknowledge all pending warnings (edge sensitive)
➤ DisableOutput	BOOL	Switch powersupply off (edge sensitive)
➤ Iout	REAL	Actual Output current (A)
➤ Uout	REAL	Actual Output voltage (V)
➤ CrOk	BOOL	State Charging relay
➤ DigitalIn	BOOL	State 24VDC Input
➤ OutputEnabled	BOOL	State Output voltage (active / not active)
➤ OutputVoltageStable	BOOL	State Output voltage (within / outside tolerance range)
➤ StatusRunMode	USINT	Operating mode (0 = INIT, 1 = READY, 2 = ACTIVE, 3 = ERROR)
➤ ErrorsPacked	UDINT	ErrorsPacked
➤ ErrorOversvoltageUout	BOOL	Error: Output voltage too high
➤ ErrorUndervoltageUout	BOOL	Error: Output voltage too low
➤ ErrorOversvoltageUin	BOOL	Error: Input voltage too high
➤ ErrorUndervoltageUin	BOOL	Error: Input voltage too low
➤ ErrorOvercurrentIn	BOOL	Error: Input current too high
➤ ErrorOvercurrentIout	BOOL	Error: Output current too high
➤ ErrorAuxVoltage	BOOL	Error: Auxiliary logic supply faulty
➤ ErrorTempAirIn	BOOL	Error: Overtemperature @ Sensor Air-In
➤ ErrorTempAirOut	BOOL	Error: Overtemperature @ Sensor Air-Out
➤ ErrorTempTrafo	BOOL	Error: Overtemperature @ transformer
➤ ErrorTempHeatsink	BOOL	Error: Overtemperature @ heatsink
➤ ErrorPeakOverload	BOOL	Error: Peak load too high
➤ ErrorContinuousOverload	BOOL	Error: Continuous load too high
➤ ErrorCrOk	BOOL	Error: CR_OK
➤ ErrorSelftest	BOOL	Error: Selftest-Error
➤ ErrorOutputCurrentLimit	BOOL	Error: Configured output current limit exceeded
➤ ErrorTempCoil	BOOL	Error: Overtemperature @ coil
➤ WarningsPacked	UDINT	WarningsPacked
➤ WarningTempAirIn	BOOL	Warning: Overtemperature @ Air-In
➤ WarningTempAirOut	BOOL	Warning: Overtemperature @ Air-Out
➤ WarningTempTrafo	BOOL	Warning: Overtemperature @ transformer
➤ WarningTempHeatsink	BOOL	Warning: Overtemperature @ heatsink
➤ WarningContinuousLoad	BOOL	Warning: Continuous load high
➤ WarningHighUin	BOOL	Warning: Input voltage high
➤ WarningPeakLoad	BOOL	Warning: Peak load high
➤ WarningCurrentLimit	BOOL	Warning: Warning-Limit for configured output current limit exceeded
➤ WarningTempCoil	BOOL	Warning: Overtemperature @ coil

Figure 17: I/O mapping with all cyclically available data points

**Information:**

"Iout - Actual output current (A)" is displayed in the I/O mapping as 5 ms arithmetic average value.

**3.4.2 Power supply module 80PS080X3.10-01****3.4.2.1 General information**

The output voltage and current limiting for power supply module 80PS080X3.10-01 can be configured via the fieldbus (X2X Link). In order to be used as a power supply for an ACOPOStrak system, the output voltage of the module must first be configured for 58 V. With integrated diagnostics and a chopper output for connecting an external braking resistor, this module is well-suited for an ACOPOStrak system.

- Input: 3x 380 to 480 VAC  $\pm 10\%$
- Output voltage adjustable via X2X Link
- Status information readable via X2X Link
- Chopper output for connecting an external braking resistor
- 3-phase wide range input
- Closed metal housing

## 3.4.2.2 Order data


Order number	Short description	Figure
	<b>Power supply modules</b>	
80PS080X3.10-01	Power supply module, Input 3x 380-480 VAC $\pm 10\%$ , Power output 24-80 VDC 16.6 A (max. 1000 W), Output 24 VDC 2 A, X2X Link interface, integrated brake chopper, wall mounting. Order terminal blocks separately!	
	<b>Required accessories</b>	
	<b>Terminal block sets</b>	
80XPS080X3.10-01A	Screw clamp terminal block set for 80PS080X3.10-01: 1x 0TB3104-7021, 1x 0TB3104-7022, 1x 0TB3102-7010, 1x 0TB1110.8010, 1x 0TB103.3	
	<b>Optional accessories</b>	
	<b>Braking resistor</b>	
80XBR0025.010-11	Braking resistor for power supply module 80PS080X3.10-01 2.5 $\Omega$ 100 W	

Table 39: 80PS080X3.10-01 - Order data

For the data sheet, see [www.br-automation.com](http://www.br-automation.com).

## 3.4.2.3 Configuration

Bit	Channel name	Description
0	ParallelMode <sup>1)</sup>	0 ... Parallel operation off 1 ... Parallel operation on
1	ChopperEnable	0 ... Chopper off 1 ... Chopper on
2	VoltageRamp <sup>2)</sup>	0 ... Normal (default value) 1 ... Steep (only permitted to be used in conjunction with ACOPOStrak segments with revisions <B4)
3 - 15	Reserved	

1) The technical description of parallel operation is documented in section "Parallel operation" in the ACOPOSmicro user's manual.

2) Determines the steepness of the voltage rise on the output.

**Information:**

To achieve the desired steepness of the voltage rise when operating the power supply modules in parallel, the same voltage rise must be configured for all power supplies.

### 3.4.3 8F10A.01B.0000-1 overvoltage protection

#### 3.4.3.1 General information

This overvoltage protection module monitors the output voltage of the 80PS power supply module. If the output voltage exceeds 59.25 V, a protection circuit becomes active (OVP) and separates the current path to the load-side output. The load side is therefore separated from the input side, and the output is voltage-free. When the input voltage drops below 58.6 V again, the current path is restored.

#### Information:

**8F10A.01B.0000-1 is only permitted to be used in combination with B&R power supply 80PS080X3.10-01 and ACOPOStrak.**

**Only max. 1 B&R 80PS080X3.10-01 power supply is permitted to be used per 8F10A.01B.0000-1.**

**B&R power supply 80PS080X3.10-01 must be reset after an overvoltage occurs.**

#### 3.4.3.2 Order data


Order number	Short description	Figure
	<b>Accessories</b>	
8F10A.01B.0000-1	Overvoltage protection, input 24-80 VDC, output 24-59.25 VDC (switched on) or 0 V (switched off), order terminal blocks separately.	
	<b>Required accessories</b>	
	<b>Terminal blocks</b>	
0TB3104-7021	Accessory terminal block, 4-pin, screw clamp terminal block 6 mm <sup>2</sup> , Labeled + + - -	

Table 40: 8F10A.01B.0000-1 - Order data

#### 3.4.3.3 Technical data

Order number	8F10A.01B.0000-1
<b>General information</b>	
Module type	Overvoltage protection
Electrical isolation	
Input - Output	No
Certifications	
CE	Yes
UL	cULus E225616
	Power conversion equipment
<b>Input</b>	
Power supply	Power supply only in conjunction with 80PS080X3.10-01
Nominal input voltage	24 to 80 VDC <sup>1)</sup>
Input current	16.6 A nominal
Internal fuse	Fuse 25 A, class gR, UL rated 800 VDC
Variant	Connector
Shield connection	No
Max. cable length	3 m
<b>Output</b>	
Output voltage	0 to 59.25 V
Output current	0 to 16.6 A
Max. power dissipation	4.5 W
Reduction of continuous current depending on installation elevation	
Starting at 500 m above sea level	1.66 A <sub>eff</sub> per 1000 m
Power back immunity	Yes
Variant	Connector
Shield connection	No

Table 41: 8F10A.01B.0000-1 - Technical data

## Technical data

<b>Order number</b>	<b>8F10A.01B.0000-1</b>
Max. cable length	15 m
<b>Protective measures</b>	
Overvoltage	Separation of input and output potentials
Cutoff threshold	59.25 V
Restart threshold	58.59 V
<b>Operating conditions</b>	
Mounting orientation	
Face-up	No
Vertical	Yes
Installation elevation above sea level	
Nominal	0 to 500 m
Maximum	4000 m
Pollution degree per EN 61800-5-1	2
Degree of protection per EN 60529	IP20
<b>Ambient conditions</b>	
Temperature	
Operation	
Nominal	5 to 55°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%, non-condensing
Storage	5 to 95%
Transport	Max. 95% at 40°C
<b>Mechanical properties</b>	
Dimensions	
Width	28.8 mm
Height	114.35 mm
Depth	127.3 mm
Weight	0.16 kg

Table 41: 8F10A.01B.0000-1 - Technical data

1) Nominal input voltage 58 VDC

### 3.4.3.4 Pinout


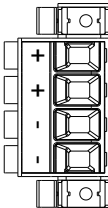
Figure	X1A, X1B	Pin	Description	Function
		+	UDC+	DC bus +
		+	UDC+	DC bus +
		-	UDC-	DC bus -
		-	UDC-	DC bus -
Terminal cross section		[mm²]		[AWG]
Solid core / Multiple-conductor lines		0.2 - 6		24 - 10
Flexible, multiple wire line				
Without wire end sleeves		0.25 - 6		24 - 10
With wire end sleeves		0.25 - 6		24 - 10
Approbation data				
UL/C-UL-US		---		24 - 10
CSA		---		24 - 10
Tightening torque for the terminal screws [Nm]		0.5 to 0.6		

Table 42: 8F10A.01B.0000-1 - Pinout

### 3.4.3.5 Input/Output circuit diagram

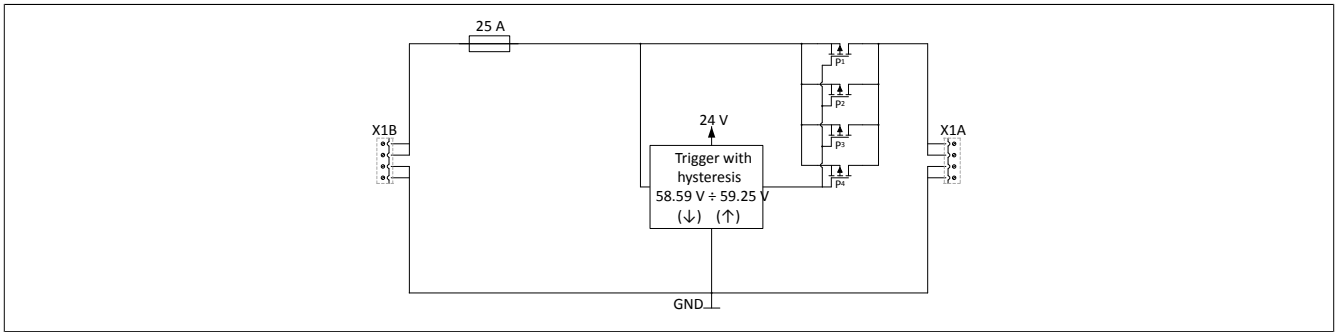


Figure 18: 8F10A.01B.0000-1 - Overvoltage protection input/output circuit diagram

### 3.4.3.6 Dimension diagram and installation dimensions

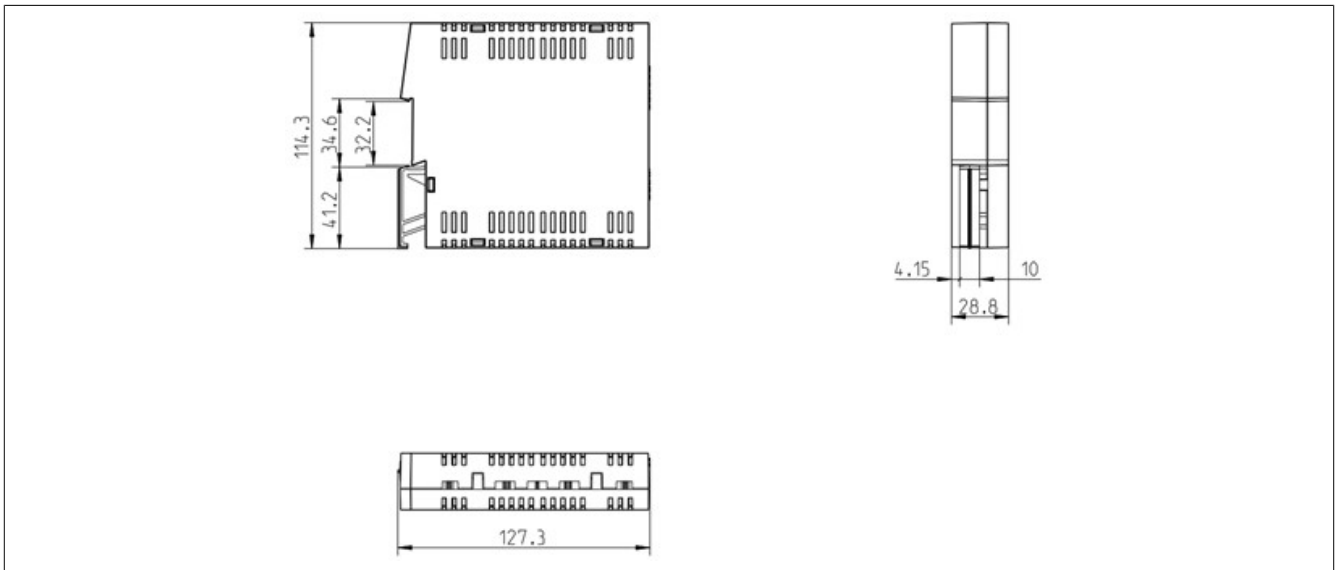


Figure 19: 8F10A.01B.0000-1 - Dimension diagram

### 3.5 8F1C cables

Order number	Short description	Page
8F1CB0001.31110-0	ACOPOStrak ISC+PLK cable, length 1 m, 2x 8-pin male X-coded straight M12 connector	72
8F1CB0002.31110-0	ACOPOStrak ISC+PLK cable, length 2 m, 2x 8-pin male X-coded straight M12 connector	72
8F1CB00X5.31110-0	ACOPOStrak ISC+PLK cable, length 0.5 m, 2x 8-pin male X-coded straight M12 connector	72
8F1CB00X8.31110-0	ACOPOStrak ISC+PLK cable, length 0.8 m, 2x 8-pin male X-coded straight M12 connector	72
8F1CD0005.11390-0	ACOPOStrak PLK cable, length 5 m, 1x 12-pin male A-coded straight M12 connector, 1x 8-pin straight RJ45 connector, can be used in cable drag chains	76
8F1CD0010.11390-0	ACOPOStrak PLK cable, length 10 m, 1x 12-pin male A-coded straight M12 connector, 1x 8-pin straight RJ45 connector, can be used in cable drag chains	76
8F1CI00X5.31110-0	ACOPOStrak ISC cable, length 0.5 m, 2x 8-pin male X-coded straight M12 connector	74
8F1CI00X8.31110-0	ACOPOStrak ISC cable, length 0.8 m, 2x 8-pin male X-coded straight M12 connector	74
8F1CP0002.11110-0	ACOPOStrak power cable, length 2 m, 1x 8-pin female series 915 straight hybrid connector, 1x 8-pin male series 915 straight hybrid connector, can be used in cable drag chains	67
8F1CP0005.1112A-0	ACOPOStrak power supply cable, length 5 m, 2x 6 mm <sup>2</sup> + 1x (2x 0.34 mm <sup>2</sup> ), 1x 8-pin female series 915 straight hybrid connector, can be used in cable drag chains	69
8F1CP0010.1112A-0	ACOPOStrak power supply cable, length 10 m, 2x 6 mm <sup>2</sup> + 1x (2x 0.34 mm <sup>2</sup> ), 1x 8-pin female series 915 straight hybrid connector, can be used in cable drag chains	69
8F1CP0015.1112A-0	ACOPOStrak power supply cable, length 15 m, 2x 6 mm <sup>2</sup> + 1x (2x 0.34 mm <sup>2</sup> ), 1x 8-pin female series 915 straight hybrid connector, can be used in cable drag chains	69
8F1CP0X38.11110-0	ACOPOStrak power cable, length 0.38 m, 1x 8-pin female series 915 straight hybrid connector, 1x 8-pin male series 915 straight hybrid connector, can be used in cable drag chains	67
8F1CU0001.313U0-0	ACOPOStrak display cable, length 1 m, 1x male USB connector, 1x 12-pin straight male M12 A-coded connector	78
8F1CU0002.313U0-0	ACOPOStrak display cable, length 2 m, 1x male USB connector, 1x 12-pin straight male M12 A-coded connector	78



### 3.5.1 8F1CP0xxx.11110-0 power cables

#### 3.5.1.1 Order data


Order number	Short description	Figure
	<b>Cables</b>	
8F1CP0X38.11110-0	ACOPOStrak power cable, length 0.38 m, 1x 8-pin female series 915 straight hybrid connector, 1x 8-pin male series 915 straight hybrid connector, can be used in cable drag chains	
8F1CP0002.11110-0	ACOPOStrak power cable, length 2 m, 1x 8-pin female series 915 straight hybrid connector, 1x 8-pin male series 915 straight hybrid connector, can be used in cable drag chains	

Table 43: 8F1CP0X38.11110-0, 8F1CP0002.11110-0 - Order data

#### Information:

This cable assembly may be available in other lengths.

For a current overview, see the B&R website.

#### 3.5.1.2 Technical data

Order number	8F1CP0X38.11110-0	8F1CP0002.11110-0
General information <sup>1)</sup>		
Cable cross section	2x 6 mm² + 1x (2x 0.34 mm²)	
Durability	Oil resistance per EN 60811-4040 Flame-retardant per EN 60332-1-2 Halogen-free per EN 60754 Hydrolysis resistance per EN 50396 Microbial resistance per EN 50396 Silicone-free / PWIS per VW PV 3.10.7	
Certification	E170315 cRUus AWM STYLE 20233 AWM I/II A/B 80°C 300 V FT1	
Certifications		
UL	cULus E225616 Power conversion equipment	
Cable construction		
Outer jacket		
Material	TPU, flame-retardant, halogen-free	
Color	Orange (similar to RAL 2003)	
Connector		
Type	8-pin male/female series 915 circular connector	
Mating cycles	>500	
Contacts	4	
Degree of protection per EN 60529	IP65 when connected	
Electrical properties		
Nominal voltage	80 VDC (power) 60 VDC (signal)	
Nominal current	31 A (power) 2 A (signal)	
Ambient conditions		
Temperature		
Moving	-20 to 80°C	
Mechanical properties		
Dimensions		
Length	0.38 m	2 m
Diameter	11.7 ±0.3 mm	
Bend radius		
Single bend	≥3x cable diameter	
Moving	≥12.5x cable diameter	
Drag chain data		
Acceleration	Max. 50 m/s² (depends on the length of the travel path)	
Flex cycles <sup>2)</sup>	≥3000000	
Velocity	Max. 300 m/min	
Torsional strength	±30°/m	
Weight	0.12 kg	0.63 kg

Table 44: 8F1CP0X38.11110-0, 8F1CP0002.11110-0 - Technical data

1) Values refer to the raw cable being used.

2) At an ambient temperature from -20 to 60°C.

<b>Connector material</b>	
Housing	Zinc casting, nickel-plated,
Clamping ring	Zinc casting, nickel-plated
Insulator	PBT, PA, UL94 / V0
Gaskets	FKM

3.5.1.3 Cable construction

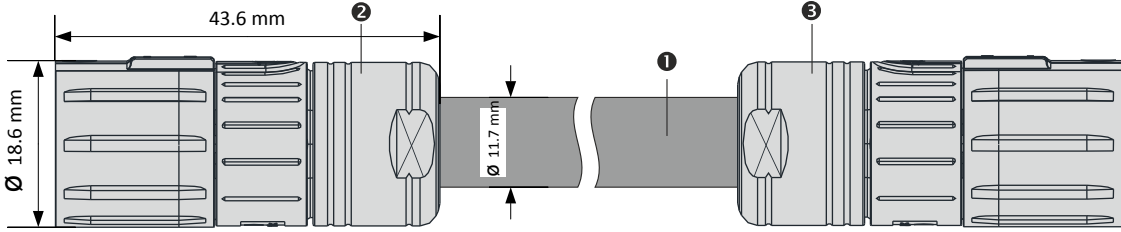
			
Pos.	Pieces	Description	Note
1	1	Hybrid cable	2x 6.0 + 1x (2x 0.34 mm²)
2	1	8-pin series 915 circular connector, female	Diameter 18.6 mm, length 43.6 mm
3	1	8-pin series 915 circular connector, male	Diameter 18.6 mm, length 43.6 mm

Table 45: 8F1CP0xxx.11110-0 power cables - Cable construction

3.5.1.4 Pinout

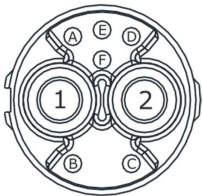
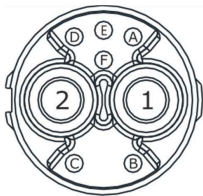
8-pin female series 915 circular connector (with female contact)	Pin	Description	Function	Pin	8-pin male series 915 circular connector (with male contact)
	1	DC+	DC bus +	1	
	2	DC-	DC bus -	2	
	A	STO1+	Enable signal A +	A	
	B	NC	NC	B	
	C	NC	NC	C	
	D	NC	NC	D	
	E	STO-	Enable signal A -	E	
	F	NC	NC	F	

Table 46: 8F1CP0xxx.11110-0 - Pinout

3.5.1.5 Cable diagram

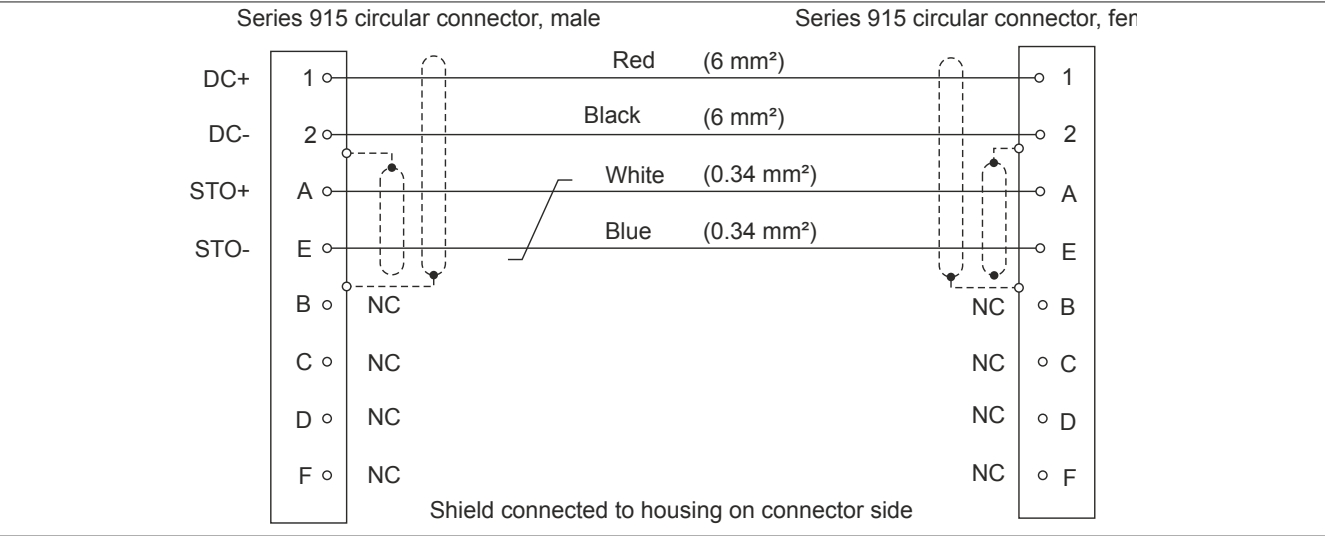


Figure 20: 8F1CP0xxx.1111 - Cable diagram

### 3.5.2 8F1CP00xx.1112A-0 power supply cables

#### 3.5.2.1 Order data

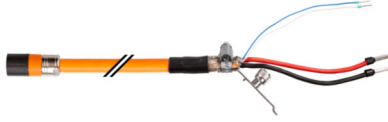
Order number	Short description	Figure
	<b>Cables</b>	
8F1CP0005.1112A-0	ACOPOStrak power supply cable, length 5 m, 2x 6 mm <sup>2</sup> + 1x (2x 0.34 mm <sup>2</sup> ), 1x 8-pin female series 915 straight hybrid connector, can be used in cable drag chains	
8F1CP0010.1112A-0	ACOPOStrak power supply cable, length 10 m, 2x 6 mm <sup>2</sup> + 1x (2x 0.34 mm <sup>2</sup> ), 1x 8-pin female series 915 straight hybrid connector, can be used in cable drag chains	
8F1CP0015.1112A-0	ACOPOStrak power supply cable, length 15 m, 2x 6 mm <sup>2</sup> + 1x (2x 0.34 mm <sup>2</sup> ), 1x 8-pin female series 915 straight hybrid connector, can be used in cable drag chains	

Table 47: 8F1CP0005.1112A-0, 8F1CP0010.1112A-0, 8F1CP0015.1112A-0 - Order data

#### Information:

This cable assembly may be available in other lengths.

For a current overview, see the B&R website.

#### 3.5.2.2 Technical data

Order number	8F1CP0005.1112A-0		8F1CP0010.1112A-0	8F1CP0015.1112A-0
General information <sup>1)</sup>				
Cable cross section	2x 6 mm² + 1x (2x 0.34 mm²)			
Durability	Oil resistance per EN 60811-4040 Flame-retardant per EN 60332-1-2 Halogen-free per EN 60754 Hydrolysis resistance per EN 50396 Microbial resistance per EN 50396 Silicone-free / PWIS per VW PV 3.10.7			
Certification	E170315 cRUus AWM STYLE 20233 AWM I/II A/B 80°C 300 V FT1			
Certifications				
UL	cULus E225616 Power conversion equipment			
Cable construction				
Outer jacket				
Material	TPU, flame-retardant, halogen-free			
Color	Orange (similar to RAL 2003)			
Connector				
Type	8-pin female series 915 circular connector			
Mating cycles	>500			
Contacts	4			
Degree of protection per EN 60529	IP65 when connected			
Electrical properties				
Nominal voltage	80 VDC (power) 60 VDC (signal)			
Nominal current	31 A (power) 2 A (signal)			
Ambient conditions				
Temperature				
Moving	-20 to 80°C			
Mechanical properties				
Dimensions				
Length	5 m	10 m	15 m	
Diameter	11.7 ±0.3 mm			
Bend radius				
Single bend	≥3x cable diameter			
Moving	≥12.5x cable diameter			
Drag chain data				
Acceleration	Max. 50 m/s² (depends on the length of the travel path)			
Flex cycles <sup>2)</sup>	≥3000000			
Velocity	Max. 300 m/min			
Torsional strength	±30°/m			
Weight	0.85 kg	1.66 kg	2.48 kg	

Table 48: 8F1CP0005.1112A-0, 8F1CP0010.1112A-0, 8F1CP0015.1112A-0 - Technical data

1) Values refer to the raw cable being used.

2) At an ambient temperature from -20 to 60°C.

Connector material	
Housing	Zinc casting, nickel-plated,
Clamping ring	Zinc casting, nickel-plated
Insulator	PBT, PA, UL94 / V0
Gaskets	FKM

3.5.2.3 Cable construction

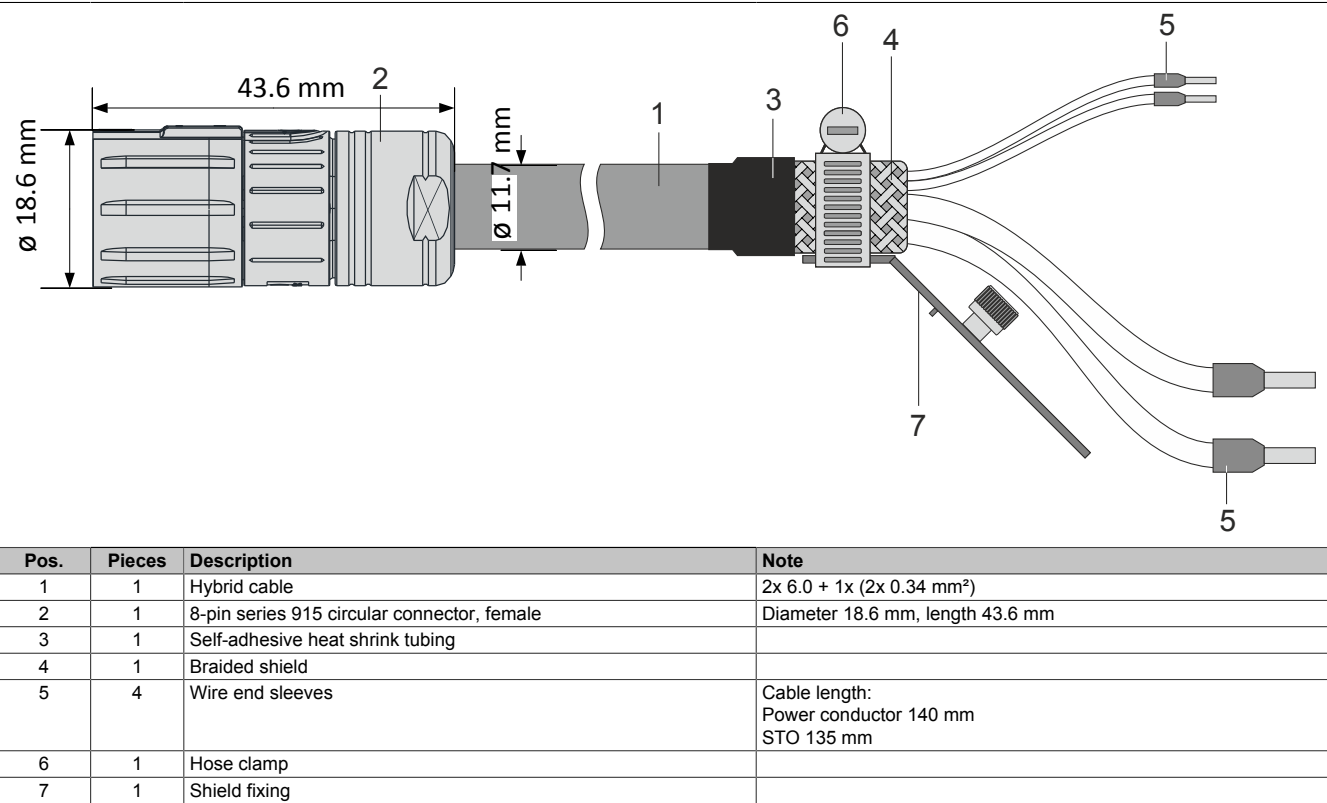


Table 49: 8F1CP00xx.1112A-0 power supply cables - Cable construction

3.5.2.4 Pinout

8-pin female series 915 circular connector (with female contact)	Pin	Description	Function
	1	DC+	DC bus +
	2	DC-	DC bus -
	3	STO+	Enable signal A +
	4	NC	NC
	5	NC	NC
	6	NC	NC
	7	STO-	Enable signal A -
	8	NC	NC

Table 50: 8F1CP00xx.1112A-0 - Pinout

### 3.5.2.5 Cable diagram

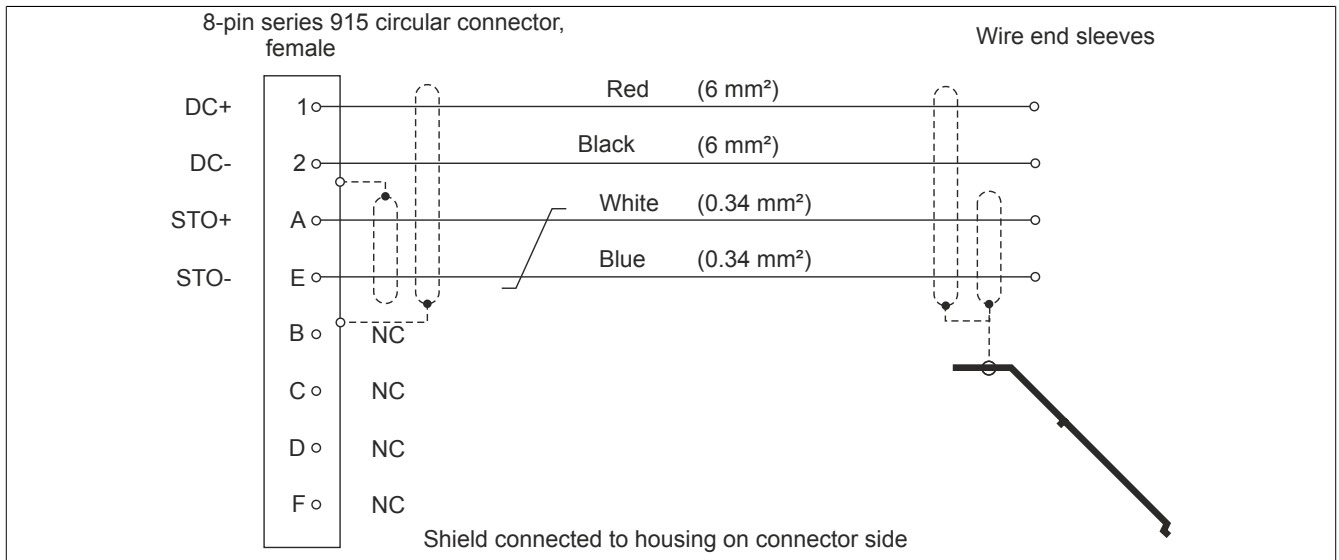


Figure 21: 8F1CP00xx.1112A-0 - Cable diagram

### 3.5.3 ISC - PLK 8F1CB00xx.31110-0

#### 3.5.3.1 Order data


Order number	Short description	Figure
	<b>Cables</b>	
8F1CB00X5.31110-0	ACOPOStrak ISC+PLK cable, length 0.5 m, 2x 8-pin male X-coded straight M12 connector	
8F1CB00X8.31110-0	ACOPOStrak ISC+PLK cable, length 0.8 m, 2x 8-pin male X-coded straight M12 connector	
8F1CB0001.31110-0	ACOPOStrak ISC+PLK cable, length 1 m, 2x 8-pin male X-coded straight M12 connector	
8F1CB0002.31110-0	ACOPOStrak ISC+PLK cable, length 2 m, 2x 8-pin male X-coded straight M12 connector	

Table 51: 8F1CB00X5.31110-0, 8F1CB00X8.31110-0, 8F1CB0001.31110-0, 8F1CB0002.31110-0 - Order data

#### 3.5.3.2 Technical data

Order number	8F1CB00X5.31110-0	8F1CB00X8.31110-0	8F1CB0001.31110-0	8F1CB0002.31110-0
General information <sup>1)</sup>				
Cable cross section	4x (2x 0.14 mm²)			
Durability	Hydrolysis resistance per EN 50396 Halogen-free per EN 60754 Silicone-free / PWIS per VW PV 3.10.7 Oil resistance per EN 60811-404 Flame propagation per EN 60332-1-2 Microbial resistance per EN 50396			
Certification	UL style 20963			
Certifications				
UL	cULus E491528			
Cable construction				
Outer jacket				
Material	PUR			
Color	Violet			
Connector				
Type	8-pin male/female M12 circular connector, X-coded			
Mating cycles	>100			
Contacts	8			
Degree of protection per EN 60529	IP65 when connected			
Electrical properties				
Nominal voltage	30 VAC			
Nominal current	0.5 A			
Ambient conditions				
Temperature				
Operation	-30 to 80°C			
Moving	-20 to 60°C			
Mechanical properties				
Dimensions				
Length	0.5 m	0.8 m	1 m	2 m
Diameter	6.4 ±0.3 mm			
Bend radius				
Single bend	≥5x cable diameter			
Moving	≥10x cable diameter			
Torsional strength	±30°/m			
Weight	0.03 kg	0.05 kg	0.06 kg	0.1 kg

Table 52: 8F1CB00X5.31110-0, 8F1CB00X8.31110-0, 8F1CB0001.31110-0, 8F1CB0002.31110-0 - Technical data

1) Values refer to the raw cable being used.

#### 3.5.3.3 Cable construction

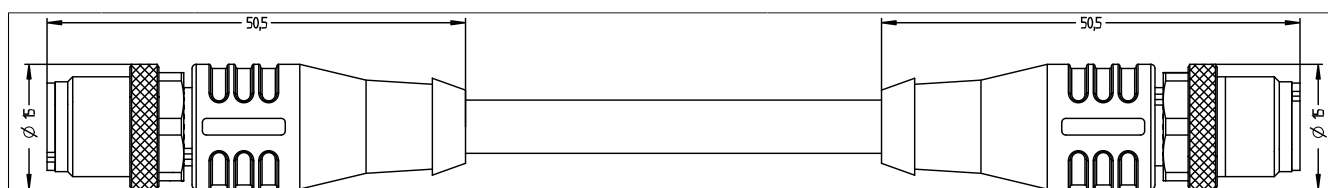


Table 53: ISC-PLK 8F1CB00xx.31110-0 - Cable construction

### 3.5.3.4 Pinout

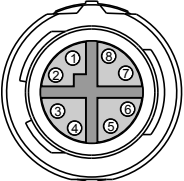
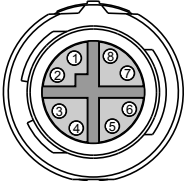
M12 X-keyed	Pin	Description	Function	Pin	M12 X-keyed
	1	Rx\	Receive signal inverted	1	
	2	Rx	Receive signal	2	
	3	Tx\	Receive signal inverted	3	
	4	Tx	Receive signal	4	
	5	ISC_Rx\	Receive signal inverted	5	
	6	ISC_Rx	Receive signal	6	
	7	ISC_Tx\	Transmit signal inverted	7	
	8	ISC_Tx	Transmit signal	8	

Table 54: 8F1CB00xx.31110-0 - Pinout

### 3.5.3.5 Cable diagram

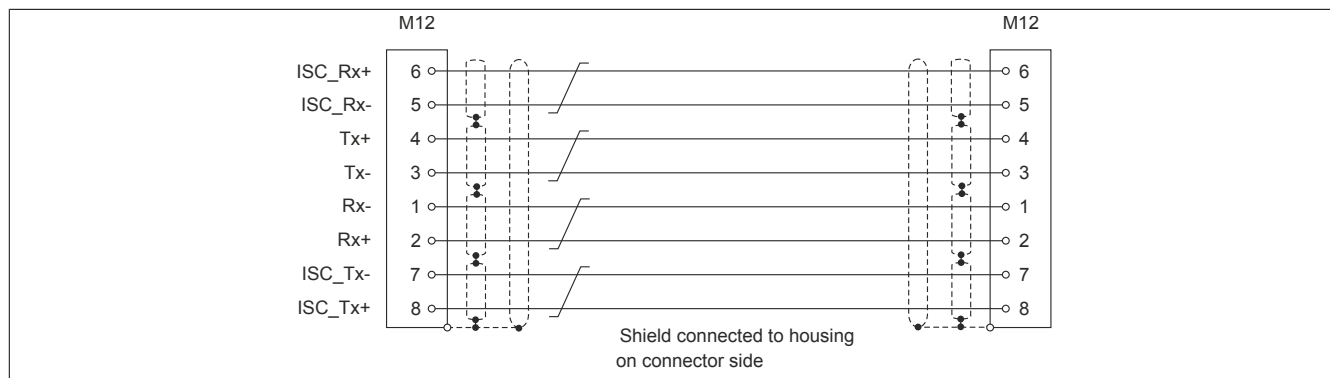


Figure 22: 8F1CB00xx.31110-0 - Cable diagram (using a 4x twisted pair design)

### 3.5.4 ISC - ISC 8F1CI00xx.31110-0

#### 3.5.4.1 Order data


Order number	Short description	Figure
	<b>Cables</b>	
8F1CI00X5.31110-0	ACOPOStrak ISC cable, length 0.5 m, 2x 8-pin male X-coded straight M12 connector	
8F1CI00X8.31110-0	ACOPOStrak ISC cable, length 0.8 m, 2x 8-pin male X-coded straight M12 connector	

Table 55: 8F1CI00X5.31110-0, 8F1CI00X8.31110-0 - Order data

#### 3.5.4.2 Technical data

Order number	8F1CI00X5.31110-0	8F1CI00X8.31110-0
General information <sup>1)</sup>		
Cable cross section	4x (2x 0.14 mm²)	
Durability	Hydrolysis resistance per EN 50396 Halogen-free per EN 60754 Silicone-free / PWIS per VW PV 3.10.7 Oil resistance per EN 60811-404 Flame propagation per EN 60332-1-2 Microbial resistance per EN 50396	
Certification	UL style 20963	
Certifications		
UL	cULus E491528	
Cable construction		
Outer jacket		
Material	PUR	
Color	Green	
Connector		
Type	8-pin male/female M12 circular connector, X-coded	
Mating cycles	>100	
Contacts	8	
Degree of protection per EN 60529	IP65 when connected	
Electrical properties		
Nominal voltage	30 VAC	
Nominal current	0.5 A	
Ambient conditions		
Temperature		
Operation	-30 to 80°C	
Moving	-20 to 60°C	
Mechanical properties		
Dimensions		
Length	0.5 m	0.8 m
Diameter	6.4 ±0.3 mm	
Bend radius		
Single bend	≥5x cable diameter	
Moving	≥10x cable diameter	
Torsional strength	±30°/m	
Weight	0.2 kg	0.3 kg

Table 56: 8F1CI00X5.31110-0, 8F1CI00X8.31110-0 - Technical data

1) Values refer to the raw cable being used.

#### 3.5.4.3 Cable construction

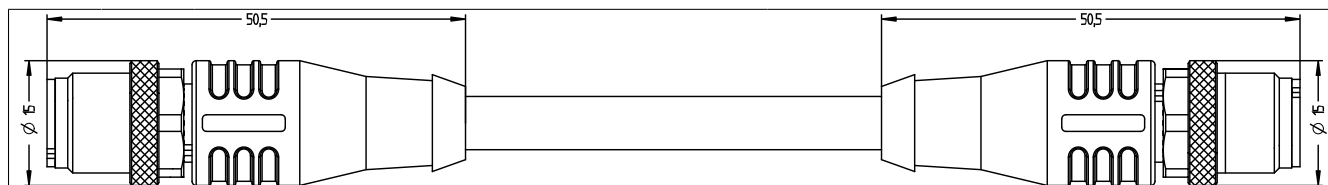


Table 57: ISC-ISC 8F1CI00xx.31110-0 - Cable construction



### 3.5.4.4 Pinout

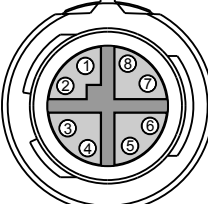
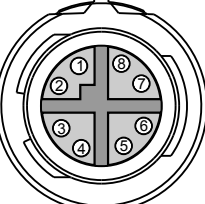
M12 X-keyed	Pin	Description	Function	Pin	M12 X-keyed
	1	NC	NC	1	
	2	NC	NC	2	
	3	NC	NC	3	
	4	NC	NC	4	
	5	ISC_Rx\	Receive signal inverted	5	
	6	ISC_Rx+	Receive signal	6	
	7	ISC_Tx\	Transmit signal inverted	7	
	8	ISC_Tx+	Transmit signal	8	

Table 58: 8F1CI00xx.31110-0 - Pinout

### 3.5.4.5 Cable diagram

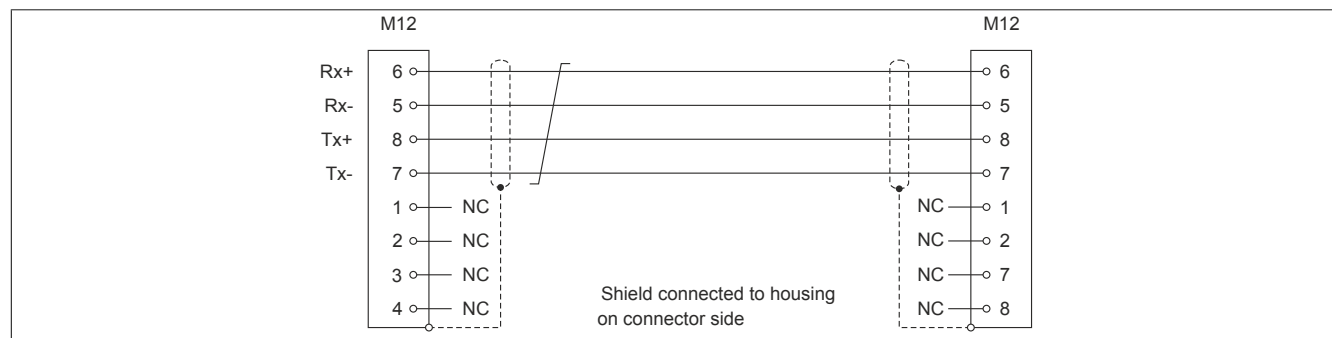


Figure 23: 8F1CI00xx.31110-0 - Cable diagram

### 3.5.5 PLK - RJ45 8F1CD00xx.11390-0

#### 3.5.5.1 Order data


Order number	Short description	Figure
	<b>Cables</b>	
8F1CD0005.11390-0	ACOPOStrak PLK cable, length 5 m, 1x 12-pin male A-coded straight M12 connector, 1x 8-pin straight RJ45 connector, can be used in cable drag chains	
8F1CD0010.11390-0	ACOPOStrak PLK cable, length 10 m, 1x 12-pin male A-coded straight M12 connector, 1x 8-pin straight RJ45 connector, can be used in cable drag chains	

Table 59: 8F1CD0005.11390-0, 8F1CD0010.11390-0 - Order data

#### 3.5.5.2 Technical data

Order number	8F1CD0005.11390-0	8F1CD0010.11390-0
General information <sup>1)</sup>		
Cable cross section	4x 0.34 mm²	
Durability	Hydrolysis resistance per EN 50396 Halogen-free per EN 60754 Silicone-free / PWIS per VW PV 3.10.7 Oil resistance per EN 60811-404 Flame propagation per EN 60322-1-2 Microbial resistance per EN 50396	
Certification	UL file E119100 vol. 1 s. 13 page 1, UL file E352715 vol. 1 s. 1 page 3 verified Cat 5e	
Cable construction		
Outer jacket		
Material	PUR	
Color	Violet	
Connector		
Type	8-pin male M12 circular connector, A-coded	
Mating cycles	>100	
Contacts	4	
Additional connectors	RJ45 (IP20)	
Degree of protection per EN 60529	IP65 when connected	
Electrical properties		
Nominal voltage	30 VAC	
Nominal current	1.5 A	
Ambient conditions		
Temperature		
Operation	-30 to 70°C	
Moving	-20 to 60°C	
Mechanical properties		
Dimensions		
Length	5 m	10 m
Diameter	6.5 ±0.2 mm	
Bend radius		
Single bend	≥4x cable diameter	
Moving	≥8x cable diameter	
Drag chain data		
Acceleration	4 m/s² (depends on the length of the travel path)	
Flex cycles <sup>2)</sup>	>3,000,000	
Velocity	Max. 4 m/s	
Torsional strength	±30°/m	
Weight	0.3 kg	0.6 kg

Table 60: 8F1CD0005.11390-0, 8F1CD0010.11390-0 - Technical data

1) Values refer to the raw cable being used.

2) At an ambient temperature of 20°C.

#### 3.5.5.3 Cable construction

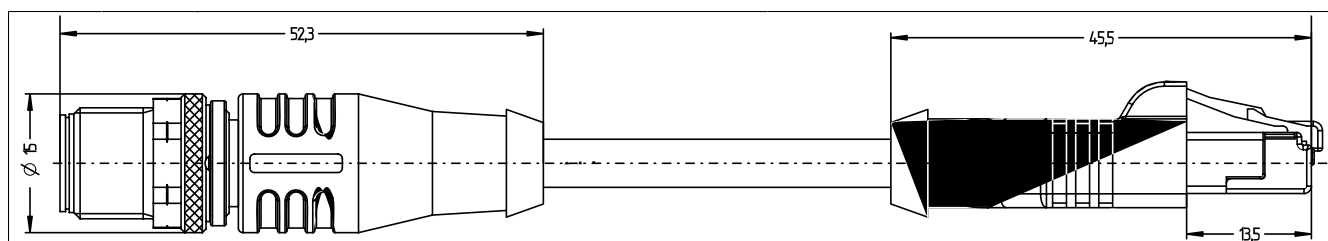


Table 61: PLK - RJ45 8F1CD00xx.11390-0 - Cable construction

### 3.5.5.4 Pinout

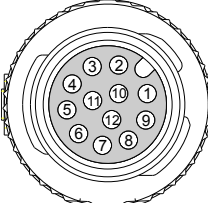
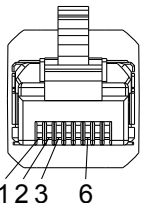
M12, A-coded	Pin	Description	Function	Pin	RJ45
	1	Tx+	Transmit signal	1	
	7	Rx-	Receive signal inverted	6	
	9	Tx-	Transmit signal inverted	2	
	12	Rx+	Receive signal	3	

Table 62: 8F1CD00xx.11390-0 - Pinout

### 3.5.5.5 Cable diagram

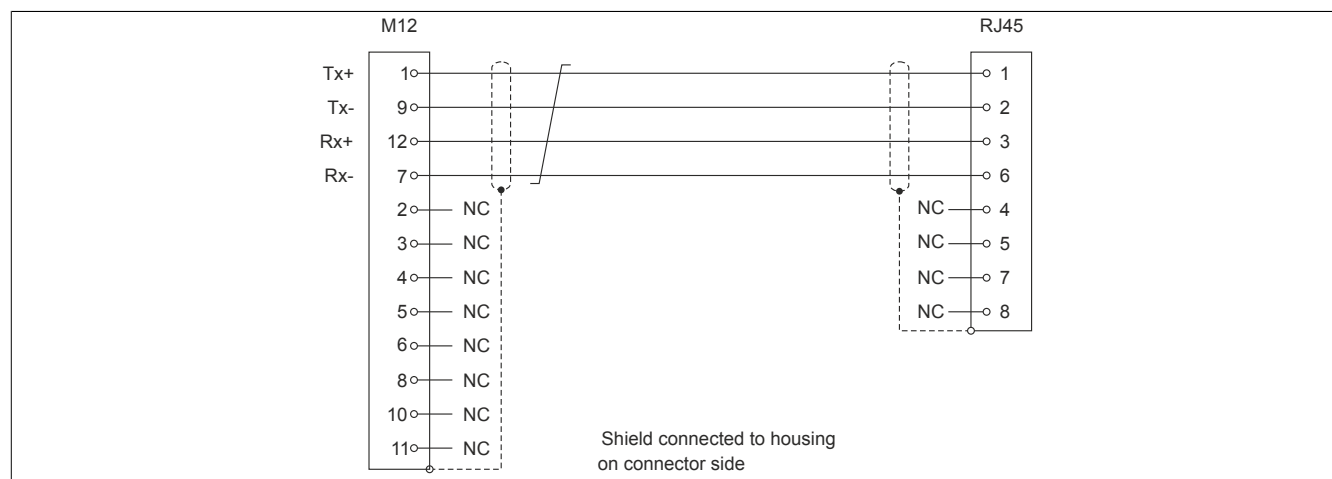


Figure 24: 8F1CD00xx.11390-0 - Cable diagram

### 3.5.6 M12 8F1CU000x.313U0-0 - Display cables

#### 3.5.6.1 Order data


Order number	Short description	Figure
	<b>Cables</b>	
8F1CU0001.313U0-0	ACOPOStrak display cable, length 1 m, 1x male USB connector, 1x 12-pin straight male M12 A-coded connector	
8F1CU0002.313U0-0	ACOPOStrak display cable, length 2 m, 1x male USB connector, 1x 12-pin straight male M12 A-coded connector	

Table 63: 8F1CU0001.313U0-0, 8F1CU0002.313U0-0 - Order data

#### 3.5.6.2 Technical data

Order number	8F1CU0001.313U0-0		8F1CU0002.313U0-0	
General information <sup>1)</sup>				
Certification		E139315-F5 AWM2725 30V VW-1		
Cable construction				
Outer jacket				
Material		PVC		
Color		Black		
Connector				
Type		USB 3.0		
Ambient conditions				
Temperature				
Static		Up to 80°C		
Mechanical properties				
Dimensions				
Length		1 m		2 m
Diameter		5.7 ±0.2 mm		
Bend radius				
Single bend		4x cable diameter		

Table 64: 8F1CU0001.313U0-0, 8F1CU0002.313U0-0 - Technical data

1) Values refer to the raw cable being used.

#### 3.5.6.3 Cable construction

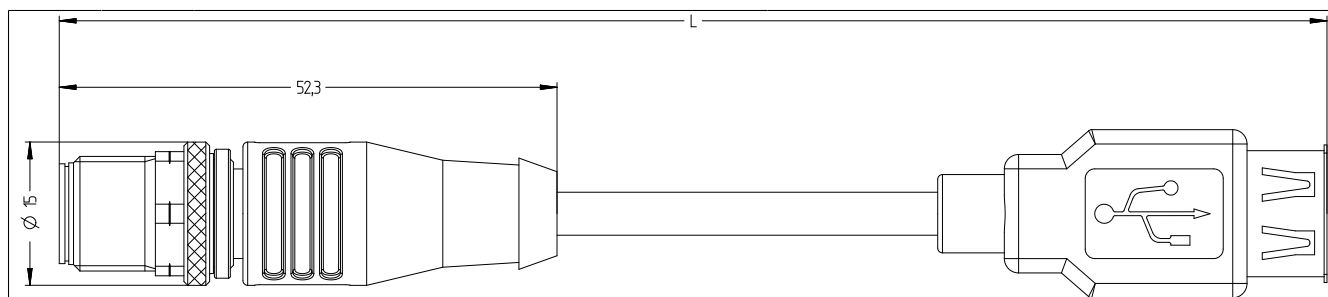


Table 65: M12 8F1CU000x.313U0-0 display cables - Cable construction

#### 3.5.6.4 Pinout

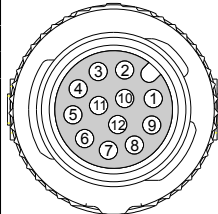
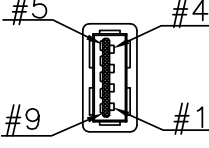
M12, A-coded	Pin	Description	Function	Pin	USB 3.0
	4	GND	Ground	4	
	8	24 V	Power supply	1	
	10	UART Tx	UART transmit signal	5	
	11	UART Rx	UART receive signal	8	

Table 66: 8F1CU000x.313U0-0 - Pinout

## 3.5.6.5 Cable diagram

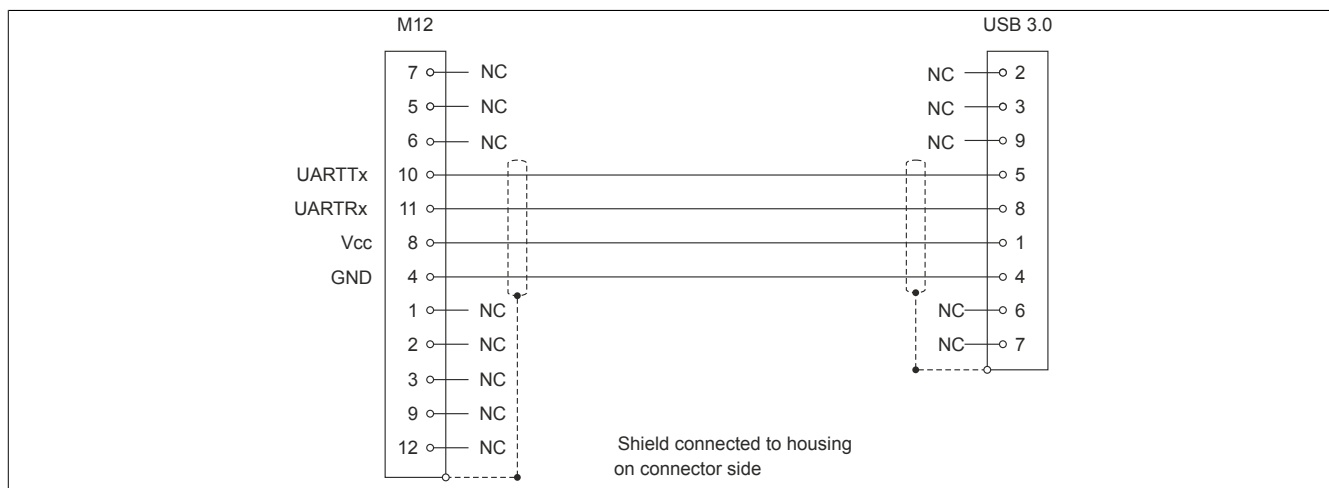


Figure 25: 8F1CU000x.313U0-0 - Cable diagram

### 3.6 B&R standard guide system

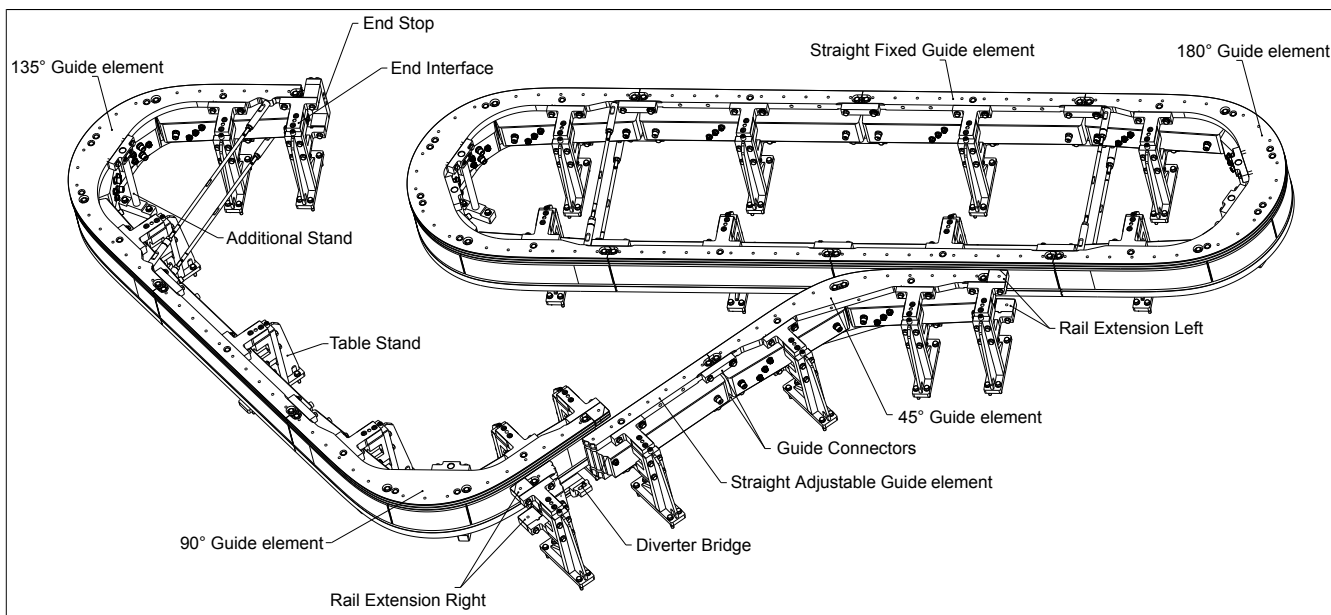


Figure 26: Accessories overview

Order number	Short description	Page
8F1GC.A066.AA000-1	ACOPOStrak guide element CA, straight	81
8F1GC.A066.AB000-1	ACOPOStrak guide element CA, straight, adjustable	82
8F1GC.AA66.AA000-1	ACOPOStrak guide element CA, 45°	84
8F1GC.AB66.AA000-1	ACOPOStrak guide element CA, 90°	86
8F1GC.AC66.AA000-1	ACOPOStrak guide element CA, 135°	88
8F1GC.AD66.AA000-1	ACOPOStrak guide element CA, 180°	90
8F1GCA.AS027A00I-1	ACOPOStrak accessory stand CA, 275 mm	97
8F1GCA.DB000A00I-1	ACOPOStrak diverter bridge CA	98
8F1GCA.EI000A00I-1	ACOPOStrak end interface CA	107
8F1GCA.ES000A00I-1	ACOPOStrak end stop CA	105
8F1GCA.JC000A00I-1	ACOPOStrak guide connector CA	100
8F1GCA.REL00A00I-1	ACOPOStrak CA guide extensions, left	101
8F1GCA.RER00A00I-1	ACOPOStrak CA guide extensions, right	103
8F1GCA.ST027100I-1	ACOPOStrak guide stand C1, 275 mm	93
8F1GCA.ST027A00I-1	ACOPOStrak guide stand CA	95

### 3.6.1 Guide elements

Guide elements are connected in series to create a path for the shuttle to travel on.

#### 3.6.1.1 8F1GC.A066.AA000-1, straight

##### 3.6.1.1.1 General information

This guide element can accommodate a straight segment. The position of the segment cannot be adjusted.

The double-v guide rail and the flat guide rail are not adjustable in the air gap direction.

##### 3.6.1.1.2 Order data

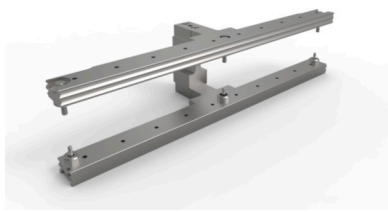
Order number	Short description	Figure
	<b>B&amp;R standard guide system</b>	
8F1GC.A066.AA000-1	ACOPOStrak guide element CA, straight	
	<b>Optional accessories</b>	
	<b>Installation accessories</b>	
8F1GCP.MF000A00I-1	ACOPOStrak installation material for flat guide rail, straight guide element 8F1GC.A066.xx000-1	
8F1GCP.MV000A00I-1	ACOPOStrak installation material for double-v guide rail, straight guide element 8F1GC.A066.xx000-1	

Table 67: 8F1GC.A066.AA000-1 - Order data

Material number 8F1GC.A066.BA000-1 corresponds to material number 8F1GC.A066.AA000-1. This distinction is purely logistical; the component is technically absolutely identical.

The following installation material is included in delivery:

Segment installation material	Amount
<b>For v-rail</b>	
M8x43 shoulder screw	3
Disc spring 25 x 13.5 x 2.2	2
Flat washer for load transfer 18 x 10.2 x 3.5	2
Precision flat washer 27 x 18.5 x 1.8	2
<b>For flat rails</b>	
Shoulder screw M6x41	3
Disc spring 25 x 13.5 x 2.2	2
Flat washer for load transfer 18 x 10.2 x 3.5	2
Precision flat washer 27 x 18.5 x 1.8	2

### Optional accessories

When using B&R guide stands, the following stands are necessary:

Order number	Stand	Quantity
8F1GCA.ST027A00I-1 8F1GCA.ST027100I-1	Guide stands	1

#### 3.6.1.1.3 Technical data

Order number	8F1GC.A066.AA000-1
<b>Ambient conditions</b>	
Temperature	
Operation	5 to 40°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%, non-condensing
Storage	5 to 95%, non-condensing
Transport	Max. 95% at 40°C
<b>Mechanical properties</b>	
Dimensions	
Length	663.2 mm
Height	155 mm
Depth	177 mm
Weight	16.7 kg

Table 68: 8F1GC.A066.AA000-1 - Technical data

### 3.6.1.1.4 Dimension diagram and installation dimensions

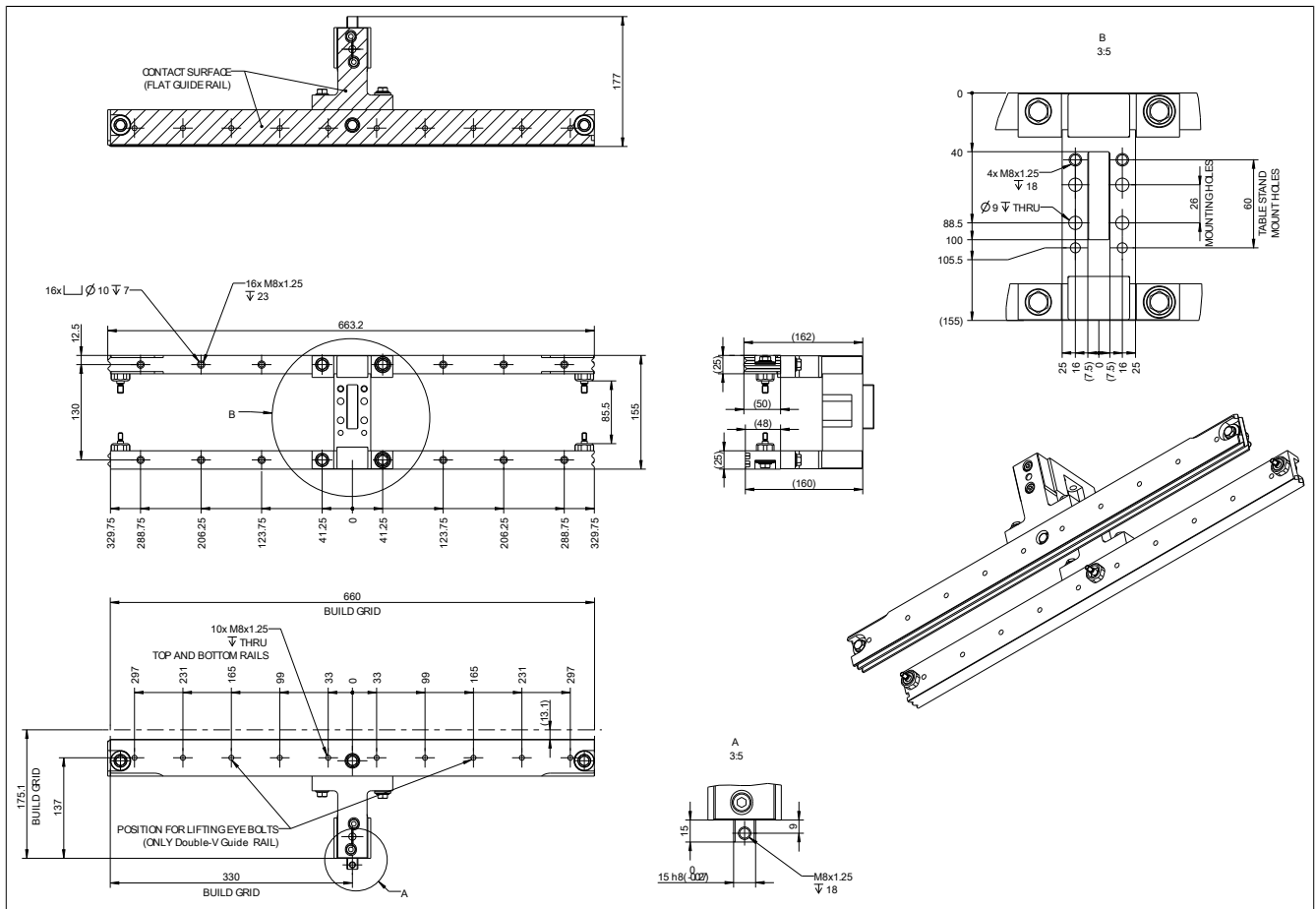


Figure 27: Dimension diagram for 8F1GC.A066.AA000-1

Material: 1.4404

### 3.6.1.2 8F1GC.A066.AB000-1, straight, adjustable

#### 3.6.1.2.1 General information

This guide element can accommodate a straight segment. The position of the segment is adjustable in the direction of the air gap.

The double-v guide rail and the flat guide rail are adjustable in the air gap direction.

#### 3.6.1.2.2 Order data

Order number	Short description	Figure
	<b>B&amp;R standard guide system</b>	
8F1GC.A066.AB000-1	ACOPOStrak guide element CA, straight, adjustable	
	<b>Optional accessories</b>	
	<b>Installation accessories</b>	
8F1GCP.MF000A00I-1	ACOPOStrak installation material for flat guide rail, straight guide element 8F1GC.A066.xx000-1	
8F1GCP.MV000A00I-1	ACOPOStrak installation material for double-v guide rail, straight guide element 8F1GC.A066.xx000-1	

Table 69: 8F1GC.A066.AB000-1 - Order data

Material number 8F1GC.A066.BB000-1 corresponds to material number 8F1GC.A066.AB000-1. This distinction is purely logistical; the component is technically absolutely identical.



The following installation material is included in delivery:

Segment installation material	Amount
<b>For v-rail</b>	
M8x43 shoulder screw	3
Disc spring 25 x 13.5 x 2.2	2
Flat washer for load transfer 18 x 10.2 x 3.5	2
Precision flat washer 27 x 18.5 x 1.8	2
<b>For flat rails</b>	
Shoulder screw M6x41	3
Disc spring 25 x 13.5 x 2.2	2
Flat washer for load transfer 18 x 10.2 x 3.5	2
Precision flat washer 27 x 18.5 x 1.8	2

### Optional accessories

When using B&R guide stands, the following stands are necessary:

Order number	Stand	Quantity
8F1GCA.ST027A00I-1	Guide stands	1
8F1GCA.ST027100I-1		

### 3.6.1.2.3 Technical data

Order number	8F1GC.A066.AB000-1
<b>Ambient conditions</b>	
Temperature	
Operation	5 to 40°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%, non-condensing
Storage	5 to 95%, non-condensing
Transport	Max. 95% at 40°C
<b>Mechanical properties</b>	
Dimensions	
Length	663.2 mm
Height	155 mm
Depth	177 mm
Weight	16.7 kg

Table 70: 8F1GC.A066.AB000-1 - Technical data

#### 3.6.1.2.4 Dimension diagram and installation dimensions

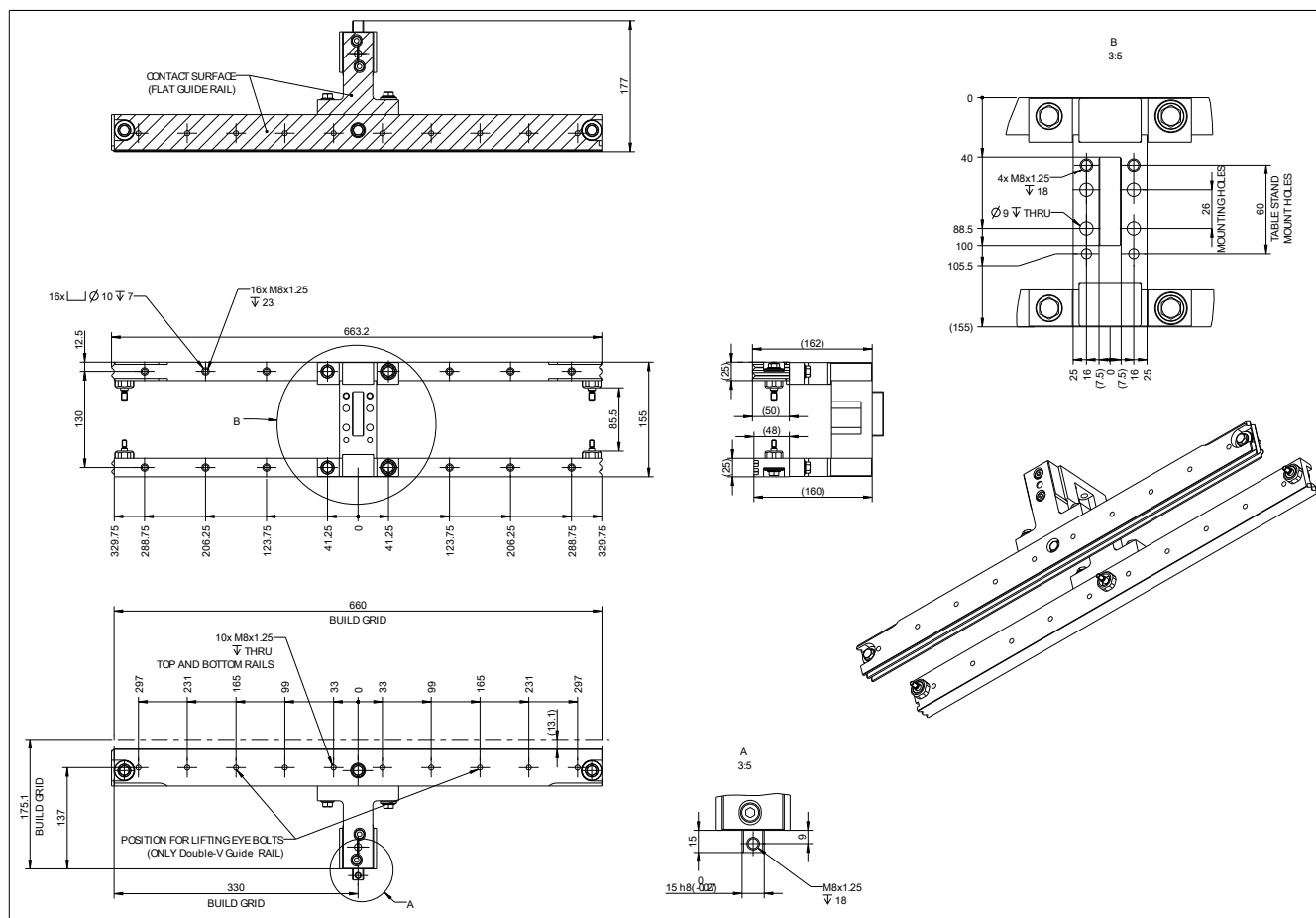


Figure 28: Dimension diagram for 8F1GC.A066.AB000-1

Material: 1.4404

### 3.6.1.3 8F1GC.AA66.AA000-1, 45°

### 3.6.1.3.1 General information

This guide element is used to construct a 45° curve on the transport system using two curved segments (curve A + curve B).

### 3.6.1.3.2 Order data


Order number	Short description	Figure
	<b>B&amp;R standard guide system</b>	
8F1GC.AA66.AA000-1	ACOPOStrak guide element CA, 45°	
	<b>Optional accessories</b>	
	<b>Installation accessories</b>	
8F1GCP.MF045A00I-1	ACOPOStrak installation material for flat guide rails, 45° guide element 8F1GC.AA66.xx000-1	
8F1GCP.MV045A00I-1	ACOPOStrak installation material for double-v guide rails, 45° guide element 8F1GC.AA66.xx000-1	

Table 71: 8F1GC.AA66.AA000-1 - Order data

Material number 8F1GC.AA66.BA000-1 corresponds to material number 8F1GC.AA66.AA000-1. This distinction is purely logistical; the component is technically absolutely identical.

The following installation material is included in delivery:

Segment installation material	Amount
<b>For v-rail</b>	
M8x43 shoulder screw	6
Disc spring 25 x 13.5 x 2.2	4
Flat washer for load transfer 18 x 10.2 x 3.5	4
Precision flat washer 27 x 18.5 x 1.8	4
<b>For flat rails</b>	
Shoulder screw M6x41	6
Disc spring 25 x 13.5 x 2.2	4
Flat washer for load transfer 18 x 10.2 x 3.5	4
Precision flat washer 27 x 18.5 x 1.8	4

### Optional accessories

When using B&R guide stands, the following stands are necessary:

Order number	Stand	Quantity
8F1GCA.ST027A00I-1	Guide stands	2
8F1GCA.ST027100I-1		

### 3.6.1.3.3 Technical data

Order number	8F1GC.AA66.AA000-1
<b>Ambient conditions</b>	
Temperature	
Operation	5 to 40°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%, non-condensing
Storage	5 to 95%, non-condensing
Transport	Max. 95% at 40°C
<b>Mechanical properties</b>	
Dimensions	
Length	790.7 mm
Height	155 mm
Depth	361.3 mm
Weight	31.9 kg

Table 72: 8F1GC.AA66.AA000-1 - Technical data

### 3.6.1.3.4 Dimension diagram and installation dimensions

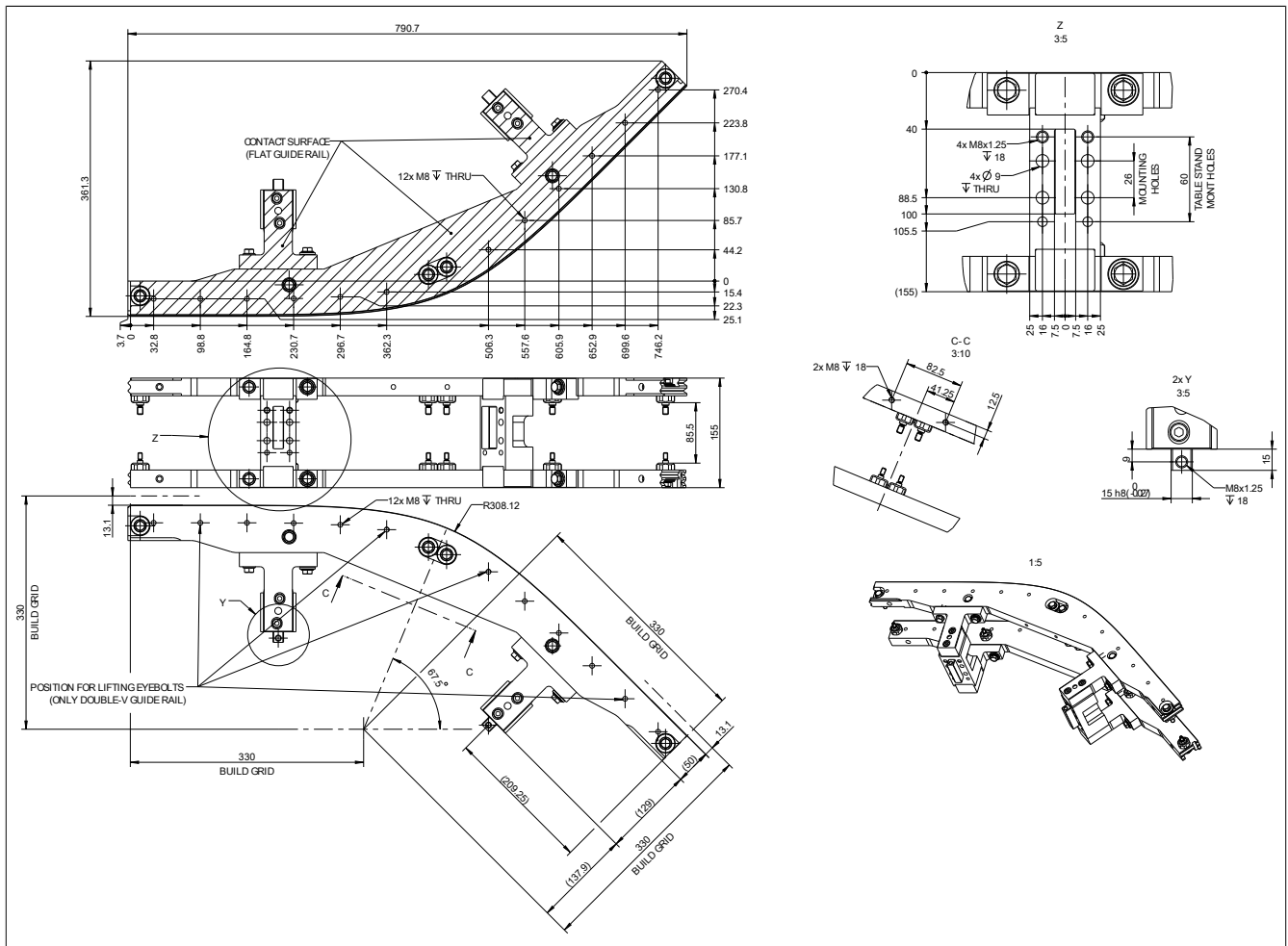


Figure 29: Dimension diagram for 8F1GC.AA66.AA000-1

Material: 1.4404

### 3.6.1.4 8F1GC.AB66.AA000-1, 90°

#### 3.6.1.4.1 General information

This guide element is used to construct a 90° curve on the transport system using two curved segments (curve A + curve B) and a circular arc segment.

#### 3.6.1.4.2 Order data

Order number	Short description	Figure
	<b>B&amp;R standard guide system</b>	
8F1GC.AB66.AA000-1	ACOPOStrak guide element CA, 90°	
	<b>Optional accessories</b>	
	<b>Installation accessories</b>	
8F1GCP.MF090A00I-1	ACOPOStrak installation material for flat guide rails, 90° guide element 8F1GC.AB66.xx000-1	
8F1GCP.MV090A00I-1	ACOPOStrak installation material for double-v guide rails, 90° guide element 8F1GC.AB66.xx000-1	

Table 73: 8F1GC.AB66.AA000-1 - Order data

Material number 8F1GC.AB66.BA000-1 corresponds to material number 8F1GC.AB66.AA000-1. This distinction is purely logistical; the component is technically absolutely identical.

The following installation material is included in delivery:

Segment installation material	Amount
<b>For v-rail</b>	
M8x43 shoulder screw	8
Disc spring 25 x 13.5 x 2.2	4
Flat washer for load transfer 18 x 10.2 x 3.5	4
Precision flat washer 27 x 18.5 x 1.8	4
<b>For flat rails</b>	
Shoulder screw M6x41	6
Shoulder screw, M6x8x41	2
Disc spring 25 x 13.5 x 2.2	4
Flat washer for load transfer 18 x 10.2 x 3.5	4
Precision flat washer 27 x 18.5 x 1.8	4
Lower spacer 20 x 8.15 x 26.5	2

### Optional accessories

When using B&R guide stands, the following stands are necessary:

Order number	Stand	Quantity
8F1GCA.ST027A00I-1 8F1GCA.ST027100I-1	Guide stands	2
8F1GCA.AS027x00I-1	Accessory stands	1

### 3.6.1.4.3 Technical data

Order number	8F1GC.AB66.AA000-1
<b>Ambient conditions</b>	
Temperature	
Operation	5 to 40°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%, non-condensing
Storage	5 to 95%, non-condensing
Transport	Max. 95% at 40°C
<b>Mechanical properties</b>	
Dimensions	
Length	650.4 mm
Height	155 mm
Depth	646.7 mm
Weight	41.1 kg

Table 74: 8F1GC.AB66.AA000-1 - Technical data

### 3.6.1.4.4 Dimension diagram and installation dimensions

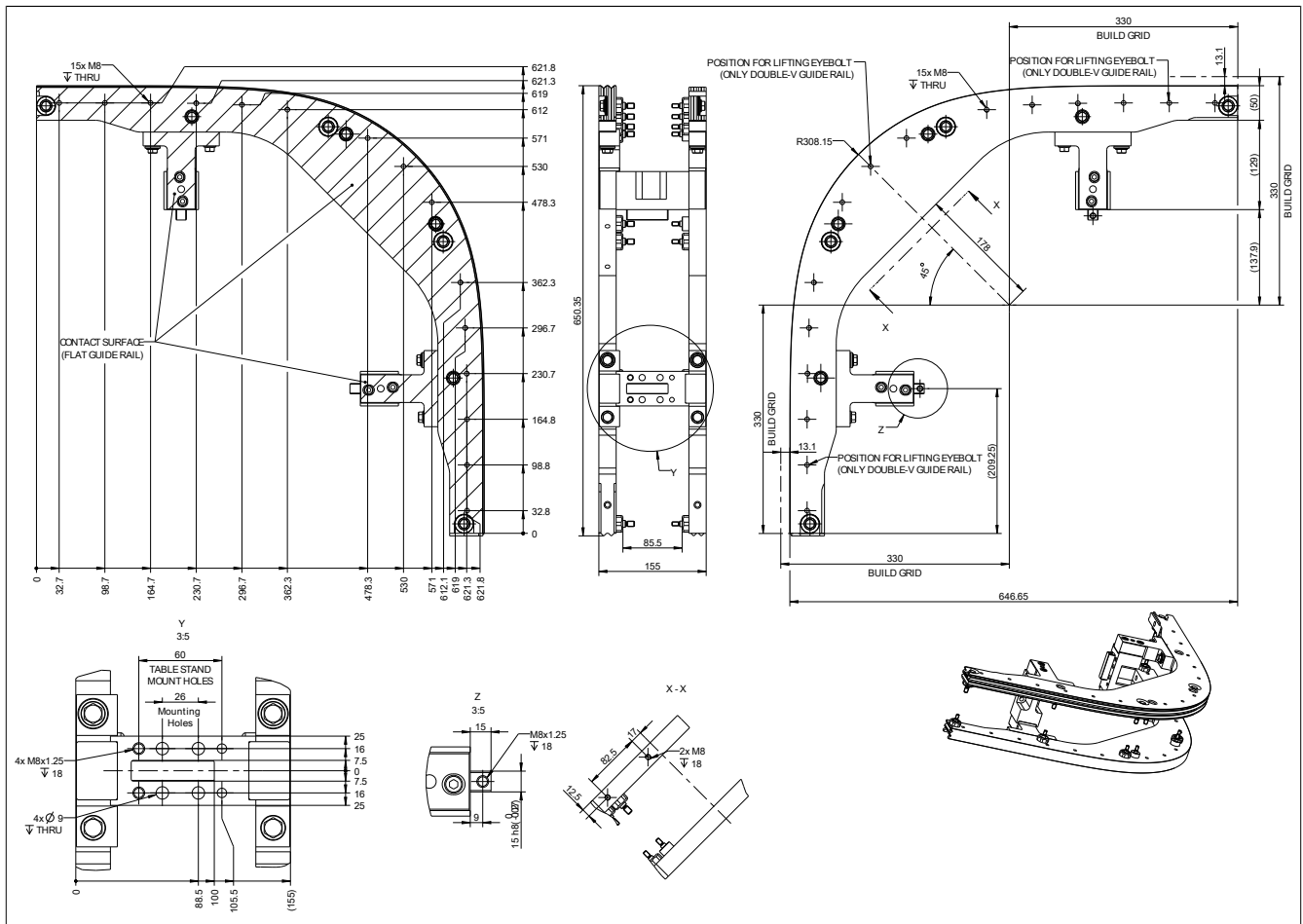


Figure 30: Dimension diagram for 8F1GC.AB66.AA000-1

Material: 1.4404

### 3.6.1.5 8F1GC.AC66.AA000-1, 135°

#### 3.6.1.5.1 General information

This guide element is used to construct a 135° curve on the transport system using two curved segments (curve A + curve B) and two circular arc segments.

#### 3.6.1.5.2 Order data

Order number	Short description	Figure
	<b>B&amp;R standard guide system</b>	
8F1GC.AC66.AA000-1	ACOPOStrak guide element CA, 135°	
	<b>Optional accessories</b>	
	<b>Installation accessories</b>	
8F1GCP.MF135A00I-1	ACOPOStrak installation material for flat guide rails, 135° guide element 8F1GC.AC66.xx000-1	
8F1GCP.MV135A00I-1	ACOPOStrak installation material for double-v guide rails, 135° guide element 8F1GC.AC66.xx000-1	

Table 75: 8F1GC.AC66.AA000-1 - Order data

Material number 8F1GC.AC66.BA000-1 corresponds to material number 8F1GC.AC66.AA000-1. This distinction is purely logistical; the component is technically absolutely identical.

The following installation material is included in delivery:

Segment installation material	Amount
<b>For v-rail</b>	
M8x43 shoulder screw	10
Disc spring 25 x 13.5 x 2.2	4
Flat washer for load transfer 18 x 10.2 x 3.5	4
Precision flat washer 27 x 18.5 x 1.8	4
<b>For flat rails</b>	
Shoulder screw M6x41	6
Shoulder screw, M6x8x41	4
Disc spring 25 x 13.5 x 2.2	4
Flat washer for load transfer 18 x 10.2 x 3.5	4
Precision flat washer 27 x 18.5 x 1.8	4
Lower spacer 20 x 8.15 x 26.5	4

### Optional accessories

When using B&R guide stands, the following stands are necessary:

Order number	Stand	Quantity
8F1GCA.ST027A00I-1 8F1GCA.ST027100I-1	Guide stands	2
8F1GCA.AS027x00I-1	Accessory stands	1

### 3.6.1.5.3 Technical data

Order number	8F1GC.AC66.AA000-1
<b>Ambient conditions</b>	
Temperature	
Operation	5 to 40°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%, non-condensing
Storage	5 to 95%, non-condensing
Transport	Max. 95% at 40°C
<b>Mechanical properties</b>	
Dimensions	
Length	837.5 mm
Height	155 mm
Depth	641.6 mm
Weight	47.4 kg

Table 76: 8F1GC.AC66.AA000-1 - Technical data

3.6.1.5.4 Dimension diagram and installation dimensions

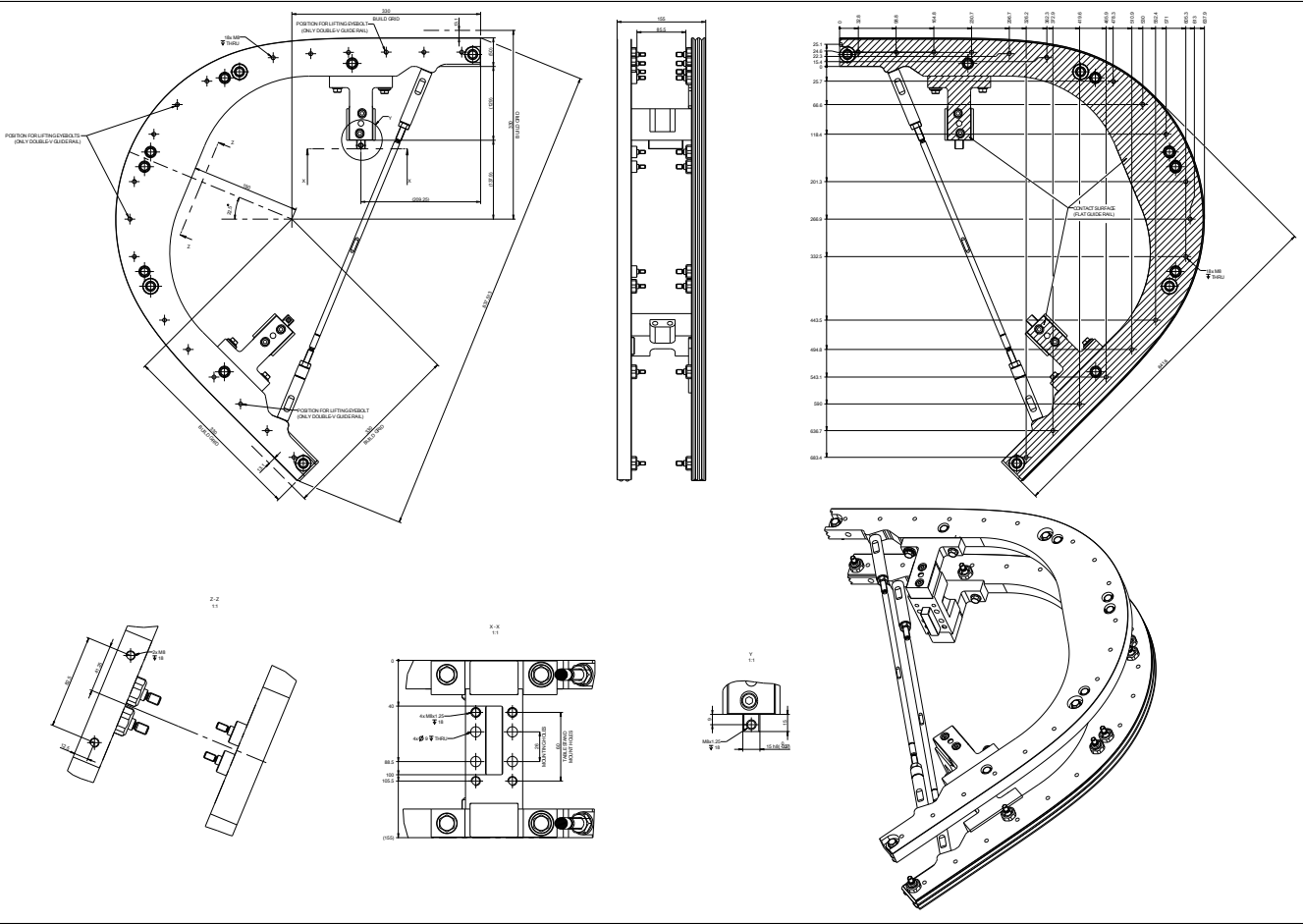


Figure 31: Dimension diagram for 8F1GC.AC66.AA000-1

Material: 1.4404

3.6.1.6 8F1GC.AD66.AA000-1, 180°

3.6.1.6.1 General information

This guide element is used to construct a 180° curve on the transport system using two curved segments (curve A + curve B) and three circular arc segments.

3.6.1.6.2 Order data

Order number	Short description	Figure
	<b>B&amp;R standard guide system</b>	
8F1GC.AD66.AA000-1	ACOPOStrak guide element CA, 180°	
	<b>Optional accessories</b>	
	<b>Installation accessories</b>	
8F1GCP.MF180A00I-1	ACOPOStrak installation material for flat guide rails, 180° guide element 8F1GC.AD66.xx000-1	
8F1GCP.MV180A00I-1	ACOPOStrak installation material for double-v guide rails, 180° guide element 8F1GC.AD66.xx000-1	

Table 77: 8F1GC.AD66.AA000-1 - Order data

Material number 8F1GC.AD66.BA000-1 corresponds to material number 8F1GC.AD66.AA000-1. This distinction is purely logistical; the component is technically absolutely identical.



The following installation material is included in delivery:

Segment installation material	Amount
<b>For v-rail</b>	
M8x43 shoulder screw	12
Disc spring 25 x 13.5 x 2.2	4
Flat washer for load transfer 18 x 10.2 x 3.5	4
Precision flat washer 27 x 18.5 x 1.8	4
<b>For flat rails</b>	
Shoulder screw M6x41	6
Shoulder screw, M6x8x41	6
Disc spring 25 x 13.5 x 2.2	4
Flat washer for load transfer 18 x 10.2 x 3.5	4
Precision flat washer 27 x 18.5 x 1.8	4
Lower spacer 20 x 8.15 x 26.5	6

### Optional accessories

When using B&R guide stands, the following stands are necessary:

Order number	Stand	Quantity
8F1GCA.ST027A00I-1	Guide stands	2
8F1GCA.ST027100I-1		
8F1GCA.AS027x00I-1	Accessory stands	2

### 3.6.1.6.3 Technical data

Order number	8F1GC.AD66.AA000-1
<b>Ambient conditions</b>	
Temperature	
Operation	5 to 40°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%, non-condensing
Storage	5 to 95%, non-condensing
Transport	Max. 95% at 40°C
<b>Mechanical properties</b>	
Dimensions	
Length	633.8 mm
Height	155 mm
Depth	641.6 mm
Weight	56 kg

Table 78: 8F1GC.AD66.AA000-1 - Technical data

#### 3.6.1.6.4 Dimension diagram and installation dimensions

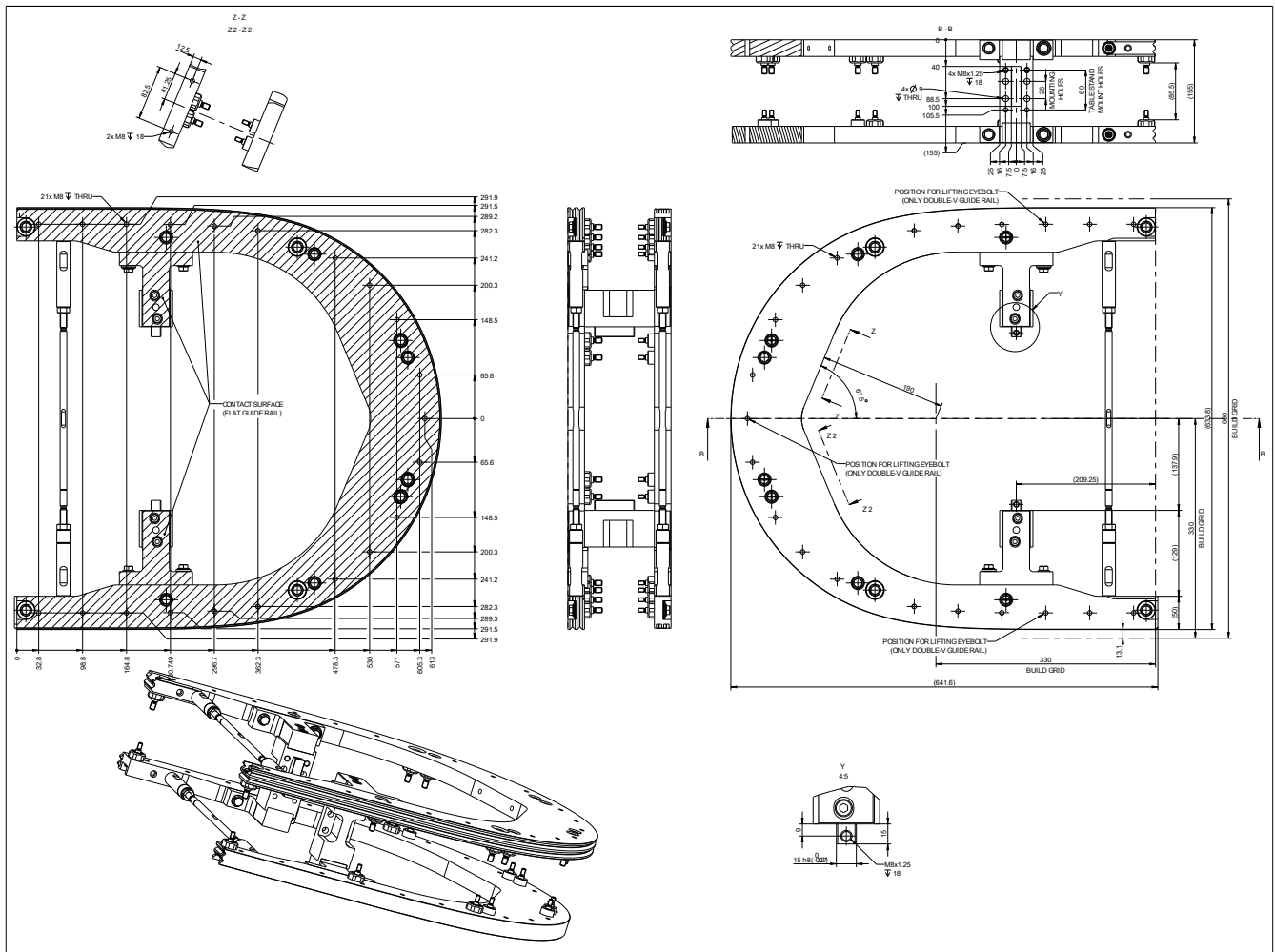


Figure 32: Dimension diagram for 8F1GC.AD66.AA000-1

Material: 1.4404

### 3.6.1.7 Accessories

Order number	Short description	Page
8F1GCA.AS027A00I-1	ACOPOStrak accessory stand CA, 275 mm	97
8F1GCA.DB000A00I-1	ACOPOStrak diverter bridge CA	98
8F1GCA.EI000A00I-1	ACOPOStrak end interface CA	107
8F1GCA.ES000A00I-1	ACOPOStrak end stop CA	105
8F1GCA.JC000A00I-1	ACOPOStrak guide connector CA	100
8F1GCA.REL00A00I-1	ACOPOStrak CA guide extensions, left	101
8F1GCA.RER00A00I-1	ACOPOStrak CA guide extensions, right	103
8F1GCA.ST027100I-1	ACOPOStrak guide stand C1, 275 mm	93
8F1GCA.ST027A00I-1	ACOPOStrak guide stand CA	95

#### 3.6.1.7.1 8F1GCA.ST027100I-1

##### 3.6.1.7.1.1 General information

When using B&R guide stands, they establish the mechanical connection between individual guide elements and the substructure of the entire guide system.

##### 3.6.1.7.1.2 Order data


Order number	Short description	Figure
	<b>B&amp;R standard guide system</b>	
8F1GCA.ST027100I-1	ACOPOStrak guide stand C1, 275 mm	
	<b>Optional accessories</b>	
	<b>Installation accessories</b>	
8F1GCP.ST027A00I-1	ACOPOStrak installation material for guide stand 8F1G-CA.ST027100I-1	

Table 79: 8F1GCA.ST027100I-1 - Order data

The following installation material is included in delivery:

Installation material	Amount
M8x43 shoulder screw	2
M8x40 hex head screw	2
M8x35 hex head screw	4
Push-Pull screw	1

##### 3.6.1.7.1.3 Technical data

Order number	8F1GCA.ST027100I-1
<b>Ambient conditions</b>	
Temperature	
Operation	5 to 40°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%, non-condensing
Storage	5 to 95%, non-condensing
Transport	Max. 95% at 40°C
<b>Mechanical properties</b>	
Dimensions	
Length	50 mm
Height	275 mm
Depth	205 mm
Weight	2.2 kg

Table 80: 8F1GCA.ST027100I-1 - Technical data

#### 3.6.1.7.1.4 Dimension diagram and installation dimensions

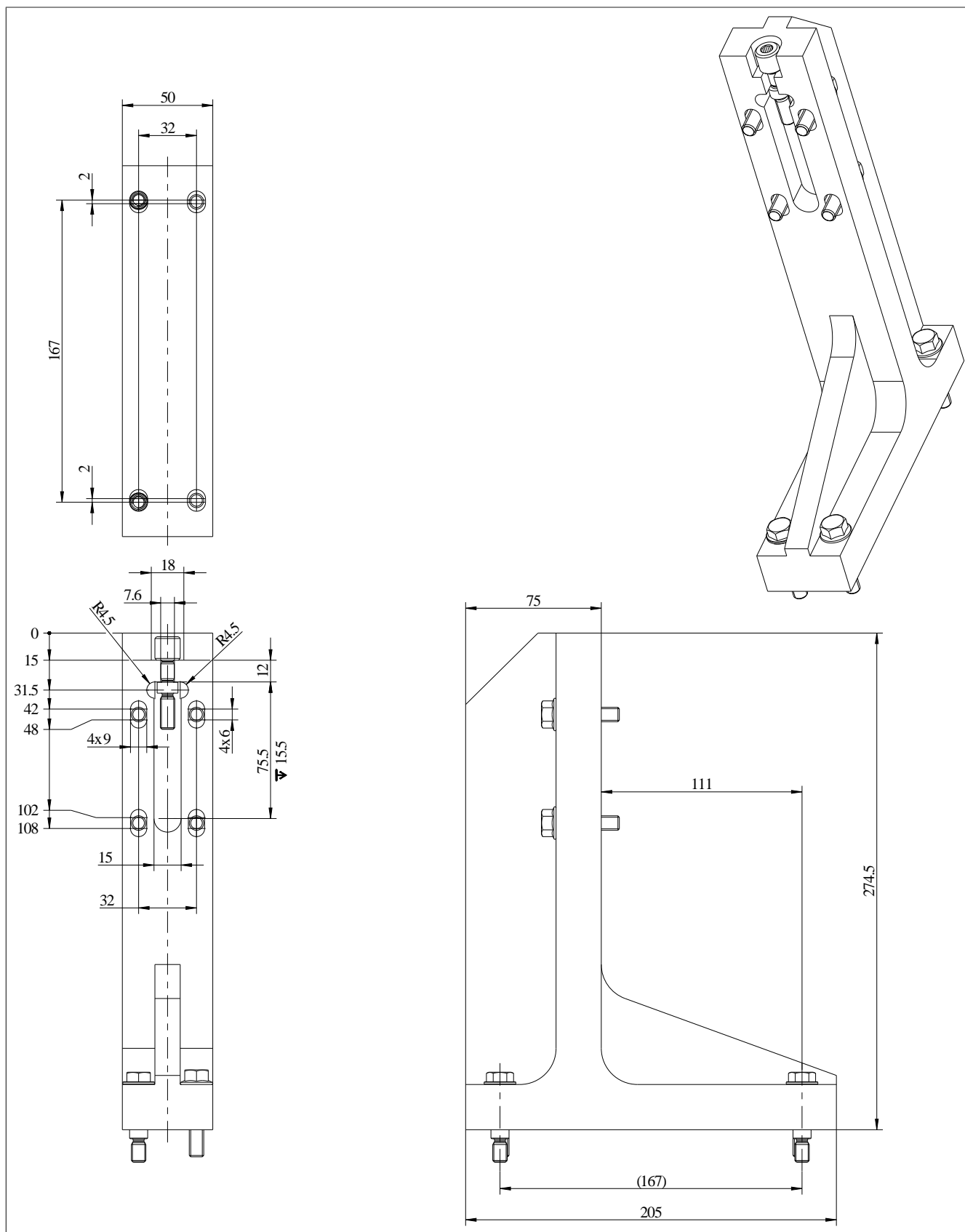


Figure 33: Dimension diagram for 8F1GCA.ST027100I-1

Material: Anodized aluminum

### 3.6.1.7.2 8F1GCA.ST027A00I-1

#### 3.6.1.7.2.1 General information

When using B&R guide stands, they establish the mechanical connection between individual guide elements and the substructure of the entire guide system.

#### 3.6.1.7.2.2 Order data


Order number	Short description	Figure
	<b>B&amp;R standard guide system</b>	
8F1GCA.ST027A00I-1	ACOPOStrak guide stand CA	
	<b>Optional accessories</b>	
	<b>Installation accessories</b>	
8F1GCP.ST027V00I-1	ACOPOStrak installation material for guide stand 8F1G-CA.ST027A00I-1	

Table 81: 8F1GCA.ST027A00I-1 - Order data

The following installation material is included in delivery:

Installation material	Amount
M8x32 shoulder screw	2
M8x30 hex head screw	6
Push-Pull screw	1

#### 3.6.1.7.2.3 Technical data

Order number	8F1GCA.ST027A00I-1
<b>Ambient conditions</b>	
Temperature	
Operation	5 to 40°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%, non-condensing
Storage	5 to 95%, non-condensing
Transport	Max. 95% at 40°C
<b>Mechanical properties</b>	
Dimensions	
Length	50 mm
Height	260 mm
Depth	205 mm
Weight	2.2 kg

Table 82: 8F1GCA.ST027A00I-1 - Technical data

#### 3.6.1.7.2.4 Dimension diagram and installation dimensions

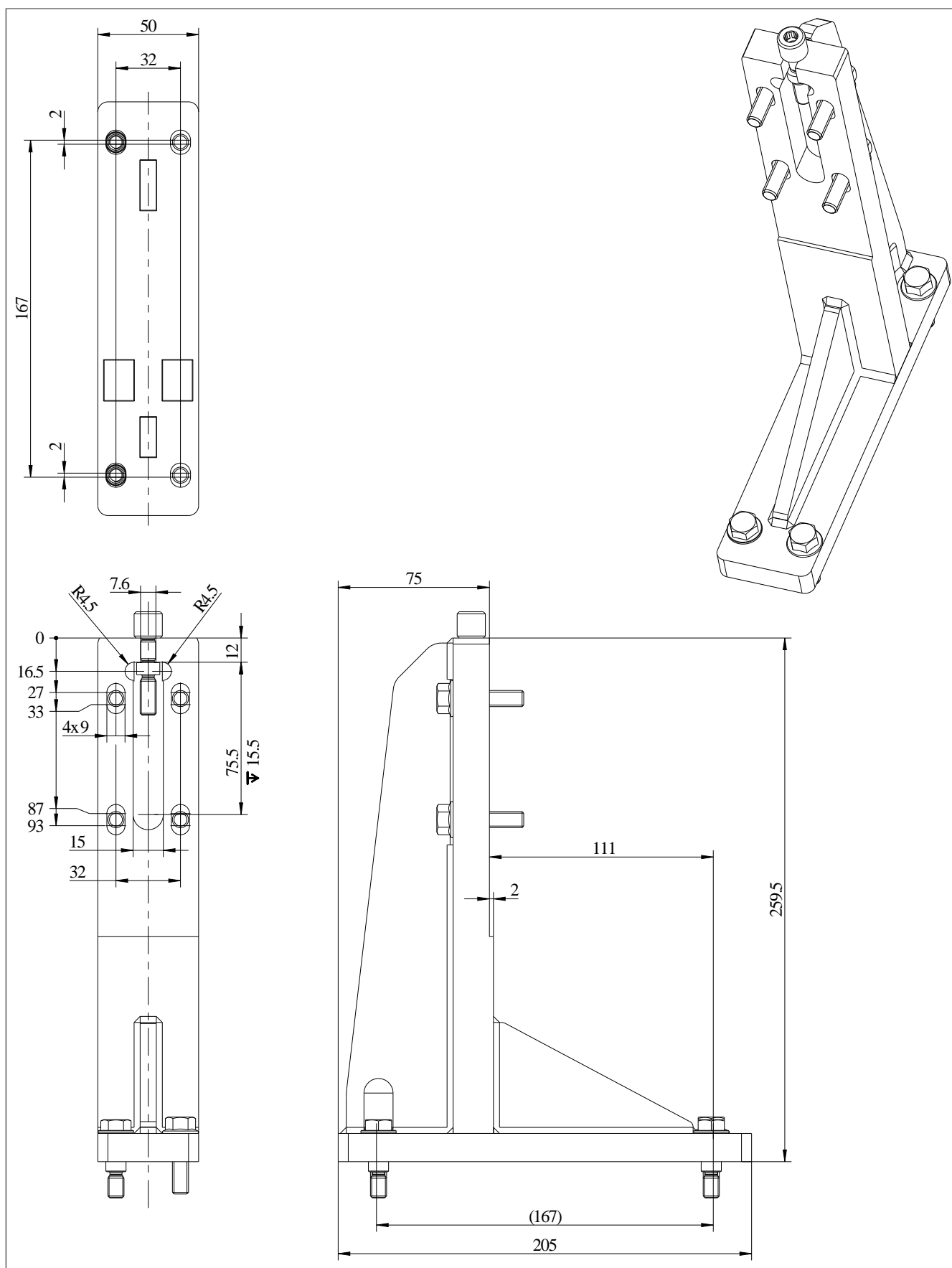


Figure 34: Dimension diagram for 8F1GCA.ST027A00I-1

Material: 1.4404

### 3.6.1.7.3 8F1GCA.AS027A00I-1

#### 3.6.1.7.3.1 General information

Accessory stands provide additional mechanical support for individual guide elements.

#### 3.6.1.7.3.2 Order data


Order number	Short description	Figure
	<b>B&amp;R standard guide system</b>	
8F1GCA.AS027A00I-1	ACOPOStrak accessory stand CA, 275 mm	
	<b>Optional accessories</b>	
	<b>Installation accessories</b>	
8F1GCP.AS027A00I-1	ACOPOStrak installation material for accessory stand 8F1GCA.AS027x00I	

Table 83: 8F1GCA.AS027A00I-1 - Order data

Material number 8F1GCA.AS027B00I-1 corresponds to material number 8F1GCA.AS027A00I-1. This distinction is purely logistical; the component is technically absolutely identical.

The following installation material is included in delivery:

Installation material	Amount
M6x16 hex head screw	4
M8x35 hex head screw	4

#### 3.6.1.7.3.3 Technical data

Order number	8F1GCA.AS027A00I-1
<b>Ambient conditions</b>	
Temperature	
Operation	5 to 40°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%, non-condensing
Storage	5 to 95%, non-condensing
Transport	Max. 95% at 40°C
<b>Mechanical properties</b>	
Dimensions	
Length	110 mm
Height	274.5 mm
Depth	110 mm
Weight	2 kg

Table 84: 8F1GCA.AS027A00I-1 - Technical data

### 3.6.1.7.3.4 Dimension diagram and installation dimensions

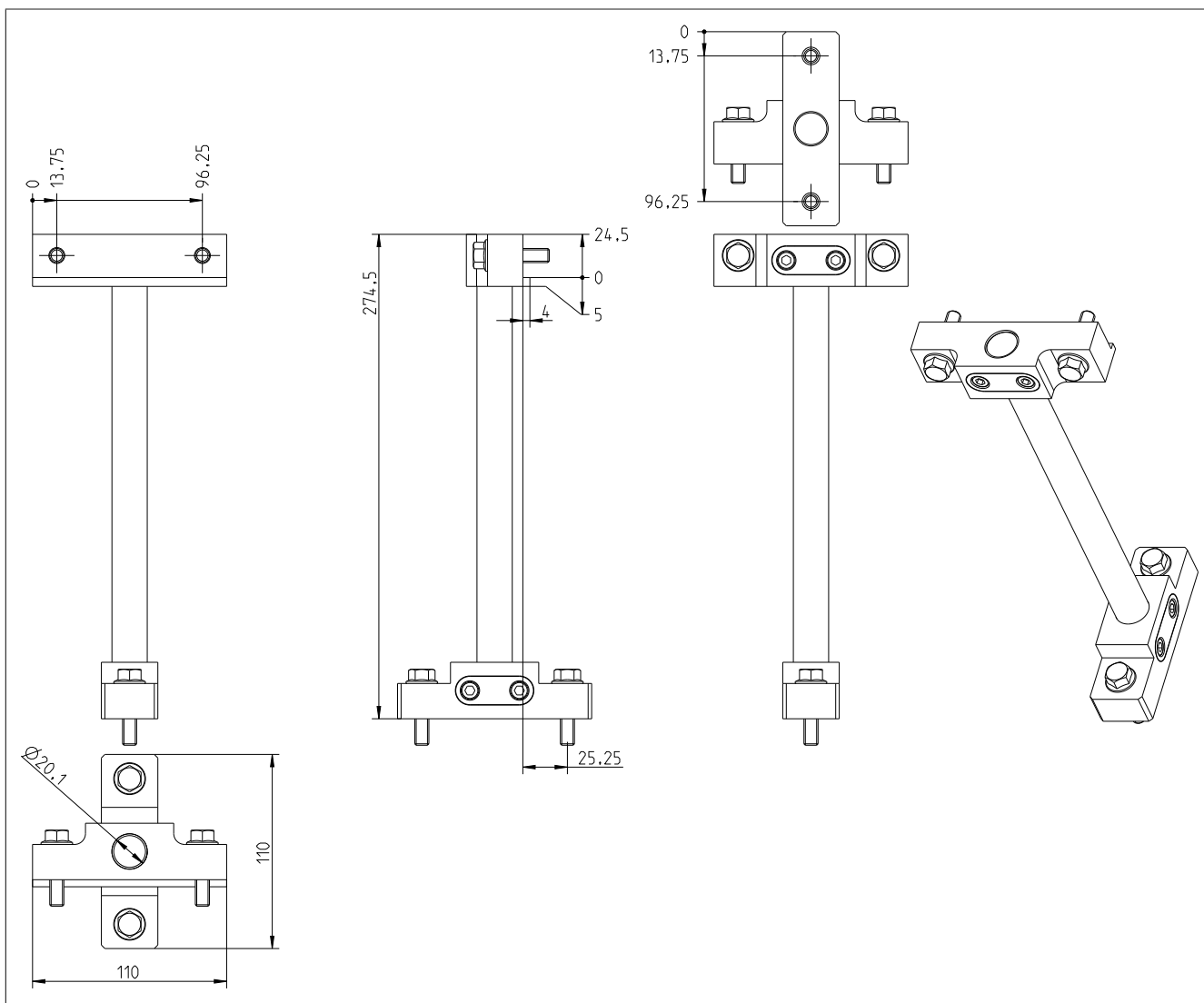


Figure 35: Dimension diagram for 8F1GCA.AS027A00I-1

Material: 1.4404

### 3.6.1.7.4 8F1GCA.DB000A00I-1

#### 3.6.1.7.4.1 General information

The diverter bridge establishes a mechanical connection between two opposing guide elements of a diverter and keeps the distance between these guide elements constant.

#### 3.6.1.7.4.2 Order data

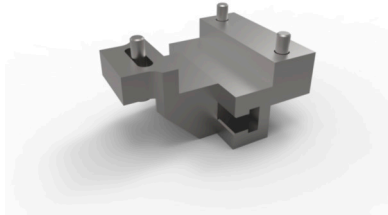
Order number	Short description	Figure
	<b>B&amp;R standard guide system</b>	
8F1GCA.DB000A00I-1	ACOPOStrak diverter bridge CA	
	<b>Optional accessories</b>	
	<b>Installation accessories</b>	
8F1GCP.DB000A00I-1	ACOPOStrak installation material for diverter bridge 8F1GCA.D-B000x00I-1	

Table 85: 8F1GCA.DB000A00I-1 - Order data



Material number 8F1GCA.DB000B00I-1 corresponds to material number 8F1GCA.DB000A00I-1. This distinction is purely logistical; the component is technically absolutely identical.

The following installation material is included in delivery:

Installation material	Amount
M8x30 hex head screw	3
M8 flat washer	1

### 3.6.1.7.4.3 Technical data

Order number	8F1GCA.DB000A00I-1
Ambient conditions	
Temperature	
Operation	5 to 40°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%, non-condensing
Storage	5 to 95%, non-condensing
Transport	Max. 95% at 40°C
Mechanical properties	
Dimensions	
Length	86 mm
Height	50 mm
Depth	110 mm
Weight	1.6 kg

Table 86: 8F1GCA.DB000A00I-1 - Technical data

### 3.6.1.7.4.4 Dimension diagram and installation dimensions

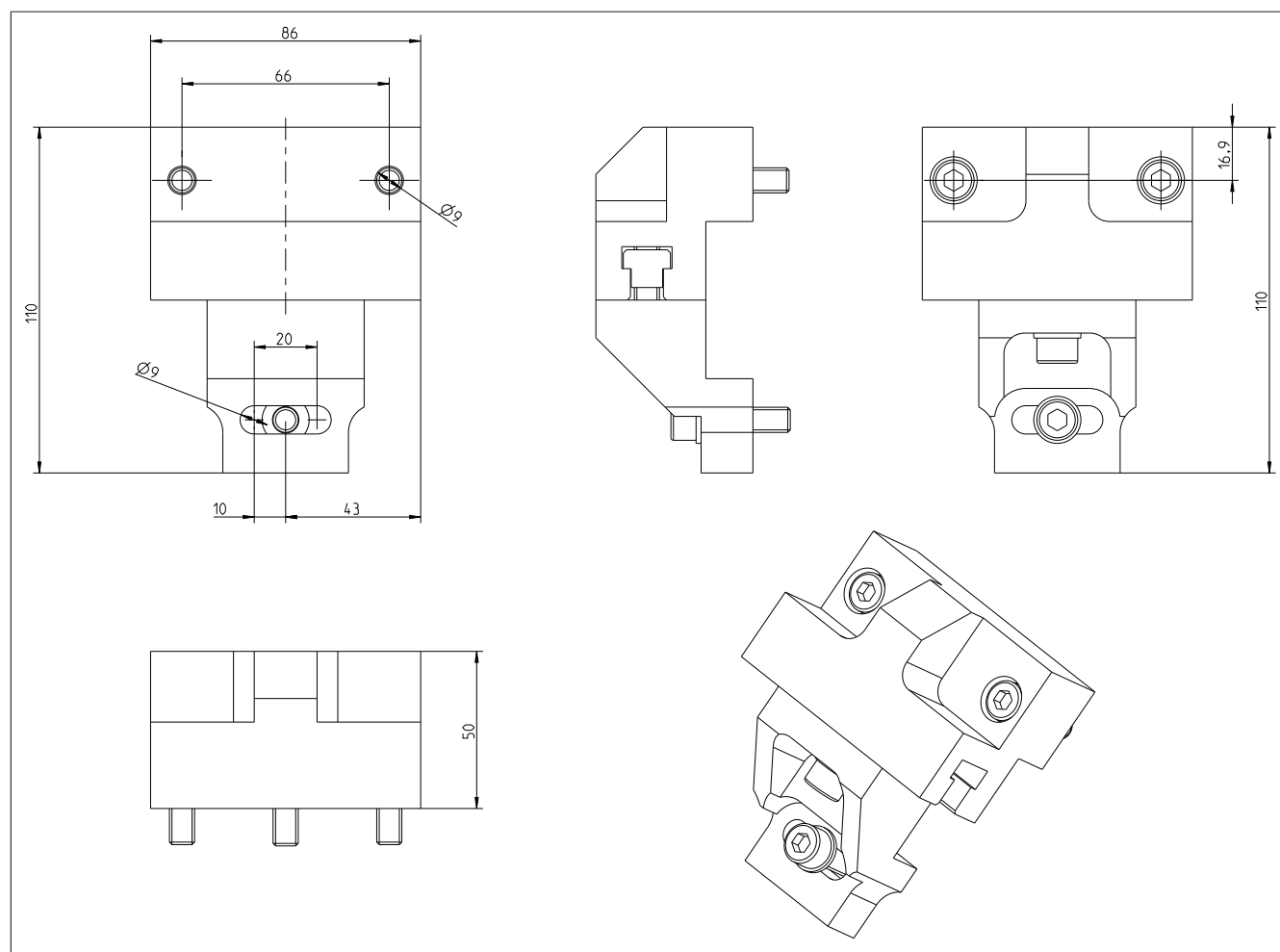


Figure 36: Dimension diagram for 8F1GCA.DB000A00I-1

Material: 1.4404

### 3.6.1.7.5 8F1GCA.JC000A00I-1

#### 3.6.1.7.5.1 General information

Guide connectors establish the mechanical connection of guide elements arranged in rows. Integrated disc springs compensate for thermal expansion of the guide rails.

#### 3.6.1.7.5.2 Order data


Order number	Short description	Figure
	<b>B&amp;R standard guide system</b>	
8F1GCA.JC000A00I-1	ACOPOStrak guide connector CA	
	<b>Optional accessories</b>	
	<b>Installation accessories</b>	
8F1GCP.JC000A00I-1	ACOPOStrak installation material for guide connector 8F1G-CA.JC000X00I-1	

Table 87: 8F1GCA.JC000A00I-1 - Order data

Material number 8F1GCA.JC000B00I-1 corresponds to material number 8F1GCA.JC000A00I-1. This distinction is purely logistical; the component is technically absolutely identical.

The following installation material is included in delivery:

Installation material	Amount
M8x43 shoulder screw	2
M8x35 hex head screw	2
Disc spring	2
Washer	2

#### 3.6.1.7.5.3 Technical data

Order number	8F1GCA.JC000A00I-1
<b>Ambient conditions</b>	
Temperature	
Operation	5 to 40°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%, non-condensing
Storage	5 to 95%, non-condensing
Transport	Max. 95% at 40°C
<b>Mechanical properties</b>	
Dimensions	
Length	110 mm
Height	154 mm
Depth	39 mm
Weight	1 kg

Table 88: 8F1GCA.JC000A00I-1 - Technical data

### 3.6.1.7.5.4 Dimension diagram and installation dimensions

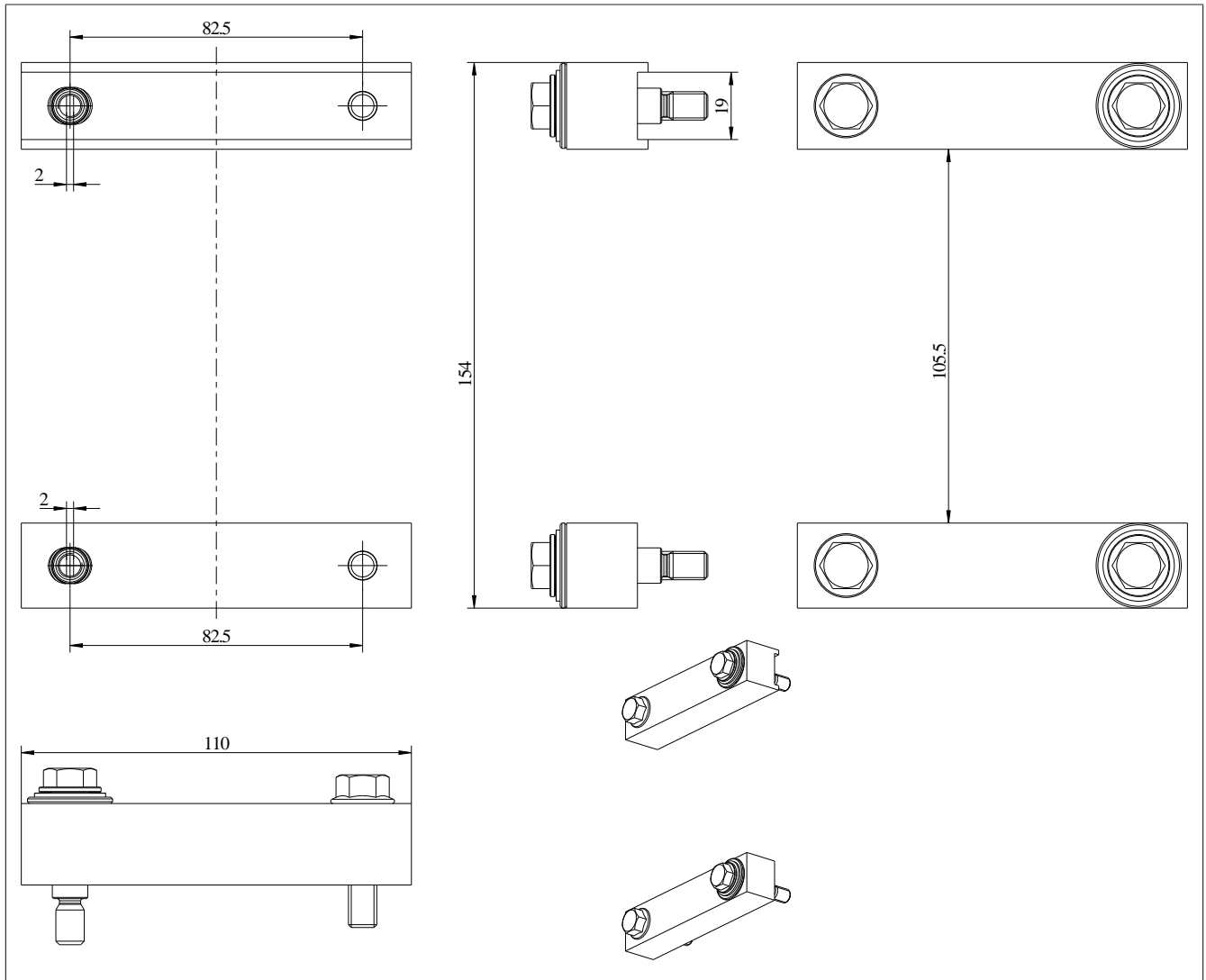


Figure 37: Dimension diagram for 8F1GCA.JC000A00I-1

Material: 1.4404

### 3.6.1.7.6 8F1GCA.REL00A00I-1

#### 3.6.1.7.6.1 General information

The guide extensions allow shock-free entry of shuttles into a diverter or dual-track area and are assembled on the left side of the guide element's guide rails.

#### 3.6.1.7.6.2 Order data

Order number	Short description	Figure
	<b>B&amp;R standard guide system</b>	
8F1GCA.REL00A00I-1	ACOPOStrak CA guide extensions, left	
	<b>Optional accessories</b>	
	<b>Installation accessories</b>	
8F1GCP.REL00A00I-1	ACOPOStrak installation material for left guide extensions 8F1GCA.REL00X00I-1	

Table 89: 8F1GCA.REL00A00I-1 - Order data

Material number 8F1GCA.REL00B00I-1 corresponds to material number 8F1GCA.REL00A00I-1. This distinction is purely logistical; the component is technically absolutely identical.

### 3.6.1.7.6.3 Technical data

Order number	8F1GCA.REL00A00I-1
Ambient conditions	
Temperature	
Operation	5 to 40°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%, non-condensing
Storage	5 to 95%, non-condensing
Transport	Max. 95% at 40°C
Mechanical properties	
Dimensions	
Length	59 mm
Height	155 mm
Depth	50 mm
Weight	1 kg

Table 90: 8F1GCA.REL00A00I-1 - Technical data

### 3.6.1.7.6.4 Dimension diagram and installation dimensions

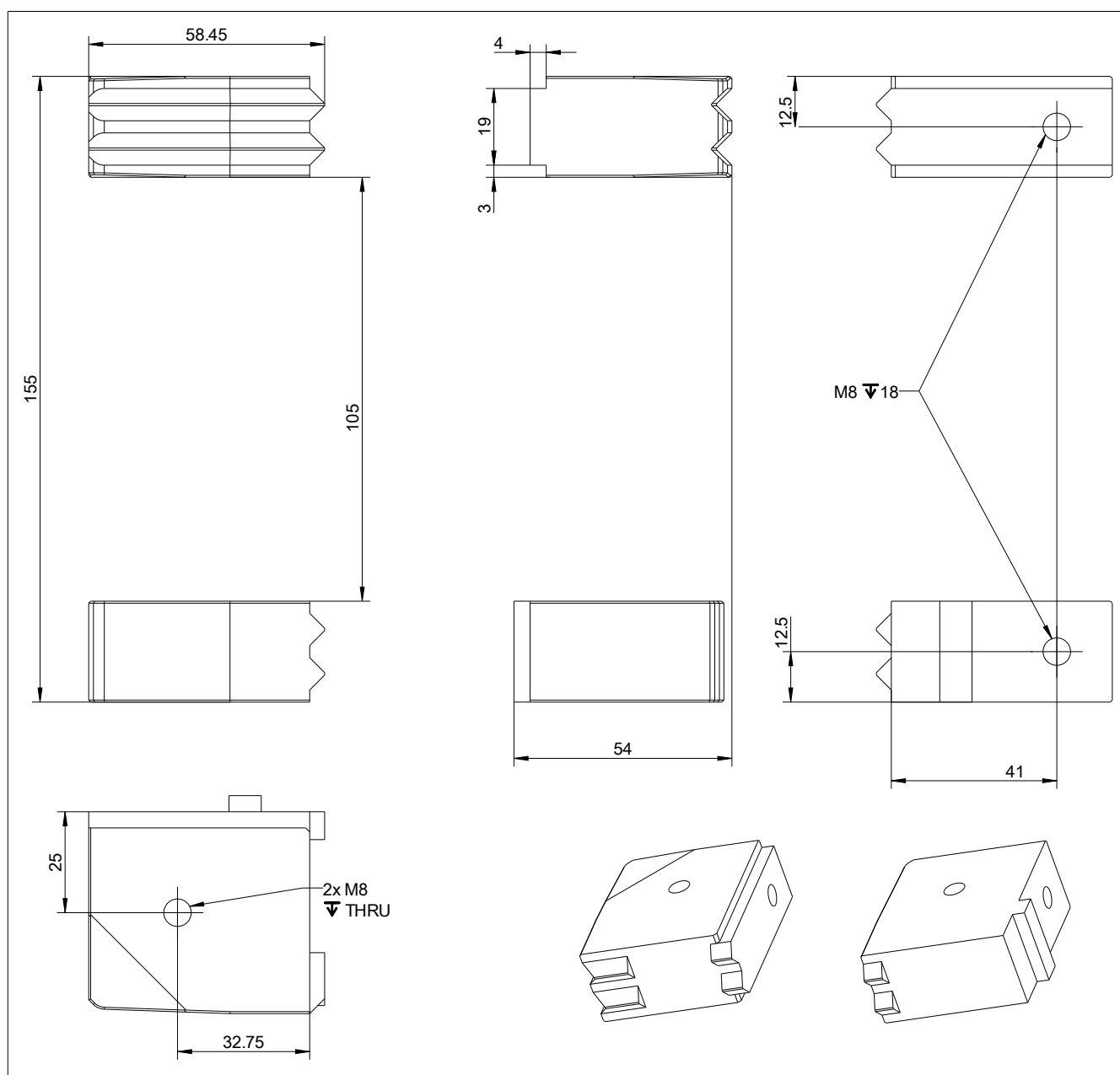


Figure 38: Dimension diagram for 8F1GCA.REL00A00I-1

Material: 1.4404

### 3.6.1.7.7 8F1GCA.RER00A00I-1

#### 3.6.1.7.7.1 General information

The guide extensions allow shock-free entry of shuttles into a diverter or dual-track area and are assembled on the right side of the guide element's guide rails.

#### 3.6.1.7.7.2 Order data

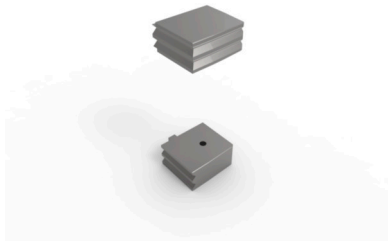
Order number	Short description	Figure
	<b>B&amp;R standard guide system</b>	
8F1GCA.RER00A00I-1	ACOPOStrak CA guide extensions, right	
	<b>Optional accessories</b>	
	<b>Installation accessories</b>	
8F1GCP.RER00A00I-1	ACOPOStrak installation material for right guide extensions 8F1GCA.RER00X00I-1	

Table 91: 8F1GCA.RER00A00I-1 - Order data

Material number 8F1GCA.RER00B00I-1 corresponds to material number 8F1GCA.RER00A00I-1. This distinction is purely logistical; the component is technically absolutely identical.

#### 3.6.1.7.7.3 Technical data

Order number	8F1GCA.RER00A00I-1
<b>Ambient conditions</b>	
Temperature	
Operation	5 to 40°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%, non-condensing
Storage	5 to 95%, non-condensing
Transport	Max. 95% at 40°C
<b>Mechanical properties</b>	
Dimensions	
Length	50 mm
Height	155 mm
Depth	55 mm
Weight	1 kg

Table 92: 8F1GCA.RER00A00I-1 - Technical data

### 3.6.1.7.7.4 Dimension diagram and installation dimensions

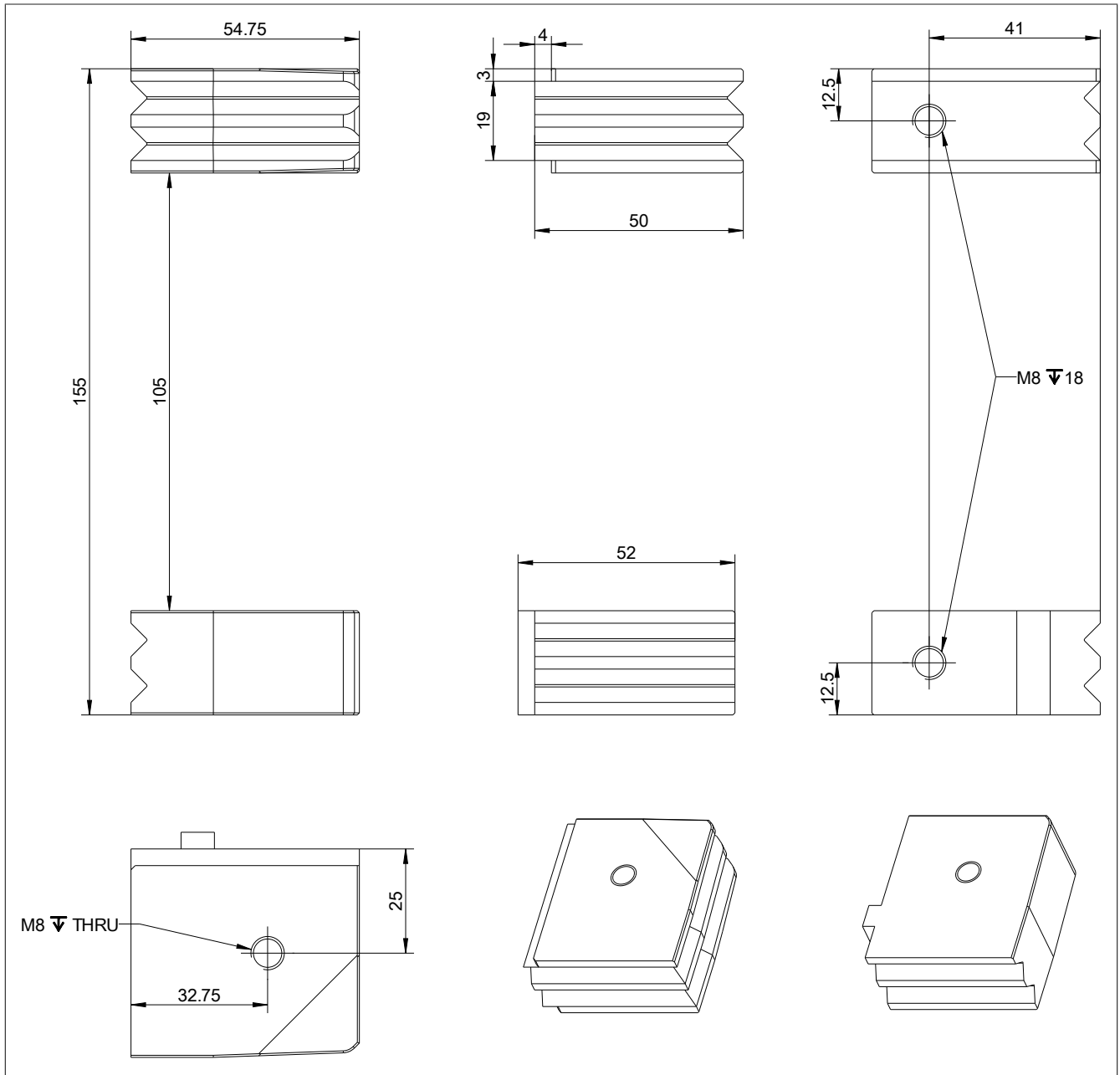


Figure 39: Dimension diagram for 8F1GCA.RER00A00I-1

Material: 1.4404

### 3.6.1.7.8 8F1GCA.ES000A00I-1

#### 3.6.1.7.8.1 General information

The end stop prevents the shuttles from moving beyond the open end of a transport system. B&R recommends installing end stops on all open ends of the transport system. End stops are not permitted to be installed in the area of diverters.

### 3.6.1.7.8.2 Order data


Order number	Short description	Figure
	<b>B&amp;R standard guide system</b>	
8F1GCA.ES000A00I-1	ACOPOStrak end stop CA	
	<b>Optional accessories</b>	
	<b>Installation accessories</b>	
8F1GCP.ES000A00I-1	ACOPOStrak installation material for end stop 8F1G-CA.ES000x00I-1	

Table 93: 8F1GCA.ES000A00I-1 - Order data

Material number 8F1GCA.ES000B00I-1 corresponds to material number 8F1GCA.ES000A00I-1. This distinction is purely logistical; the component is technically absolutely identical.

The following installation material is included in delivery:

Installation material	Amount
M6x16 hex head screw	2
M8x35 hex head screw	4
Rubber buffer	2

### 3.6.1.7.8.3 Technical data

Order number	8F1GCA.ES000A00I-1
<b>Ambient conditions</b>	
Temperature	
Operation	5 to 40°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%, non-condensing
Storage	5 to 95%, non-condensing
Transport	Max. 95% at 40°C
<b>Mechanical properties</b>	
Dimensions	
Length	68 mm
Height	155 mm
Depth	74.5 mm
Weight	2.2 kg

Table 94: 8F1GCA.ES000A00I-1 - Technical data

### 3.6.1.7.8.4 Dimension diagram and installation dimensions

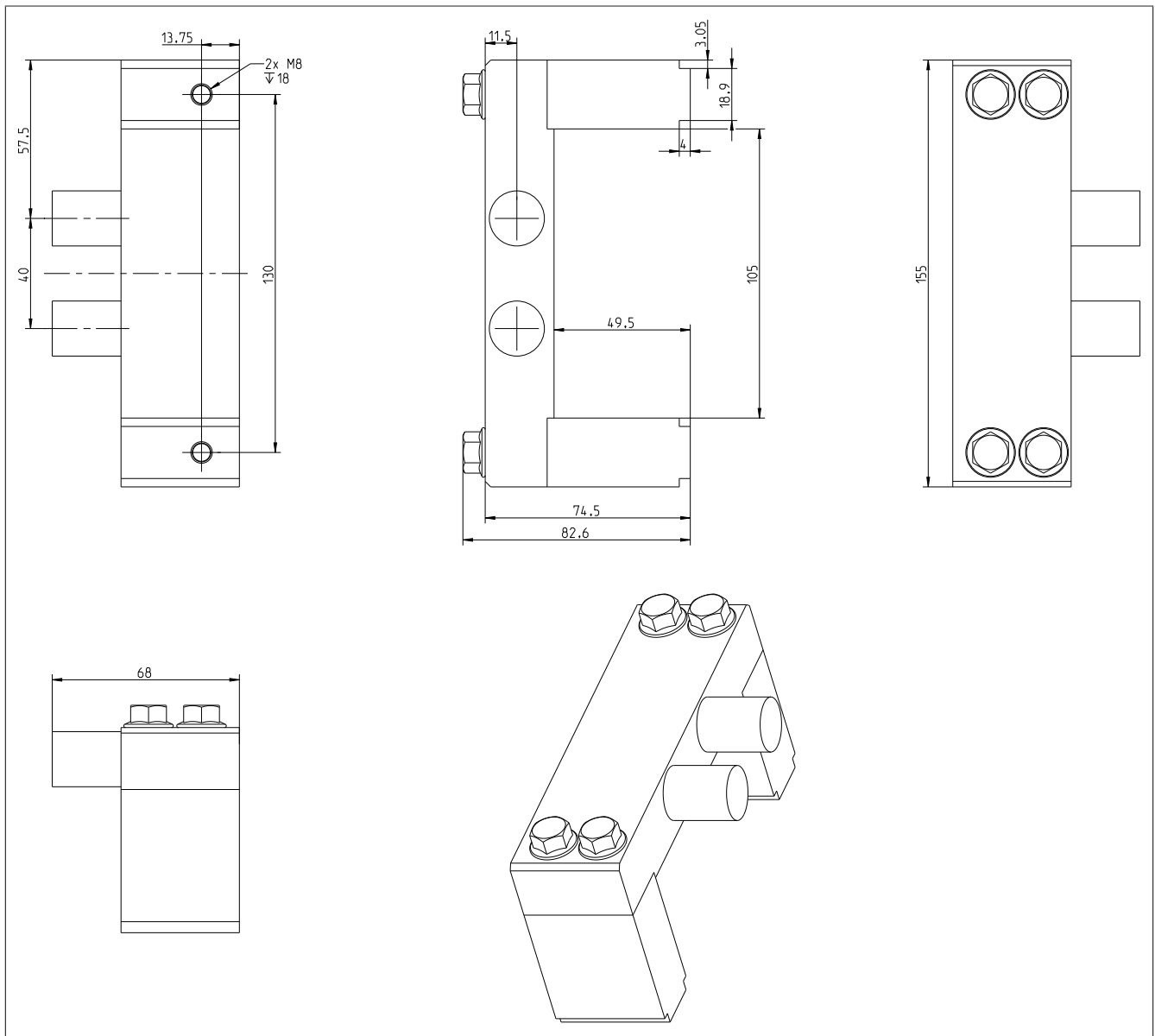


Figure 40: Dimension diagram for 8F1GCA.ES000A00I-1

Material: 1.4404

### 3.6.1.7.9 8F1GCA.EI000A00I-1

#### 3.6.1.7.9.1 General information

The end interface allows accessories (end stop and guide extension) to be mounted on the open end of an ACOPOStrak transport system.

1x end interface is required when using a B&R guide stand.



## 3.6.1.7.9.2 Order data

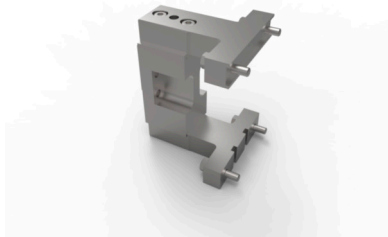
Order number	Short description	Figure
	<b>B&amp;R standard guide system</b>	
8F1GCA.EI000A00I-1	ACOPOStrak end interface CA	
	<b>Optional accessories</b>	
	<b>Installation accessories</b>	
8F1GCP.EI000A00I-1	ACOPOStrak installation material for end interface 8F1G-CA.EI000x00I-1	

Table 95: 8F1GCA.EI000A00I-1 - Order data

Material number 8F1GCA.EI000B00I-1 corresponds to material number 8F1GCA.EI000A00I-1. This distinction is purely logistical; the component is technically absolutely identical.

The following installation material is included in delivery:

Installation material	Amount
M8x35 hex head screw	4

## 3.6.1.7.9.3 Technical data

Order number	8F1GCA.EI000A00I-1
<b>Ambient conditions</b>	
Temperature	
Operation	5 to 40°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Relative humidity	
Operation	5 to 85%, non-condensing
Storage	5 to 95%, non-condensing
Transport	Max. 95% at 40°C
<b>Mechanical properties</b>	
Dimensions	
Length	110 mm
Height	154 mm
Depth	130 mm
Weight	1.8 kg

Table 96: 8F1GCA.EI000A00I-1 - Technical data

### 3.6.1.7.9.4 Dimension diagram and installation dimensions

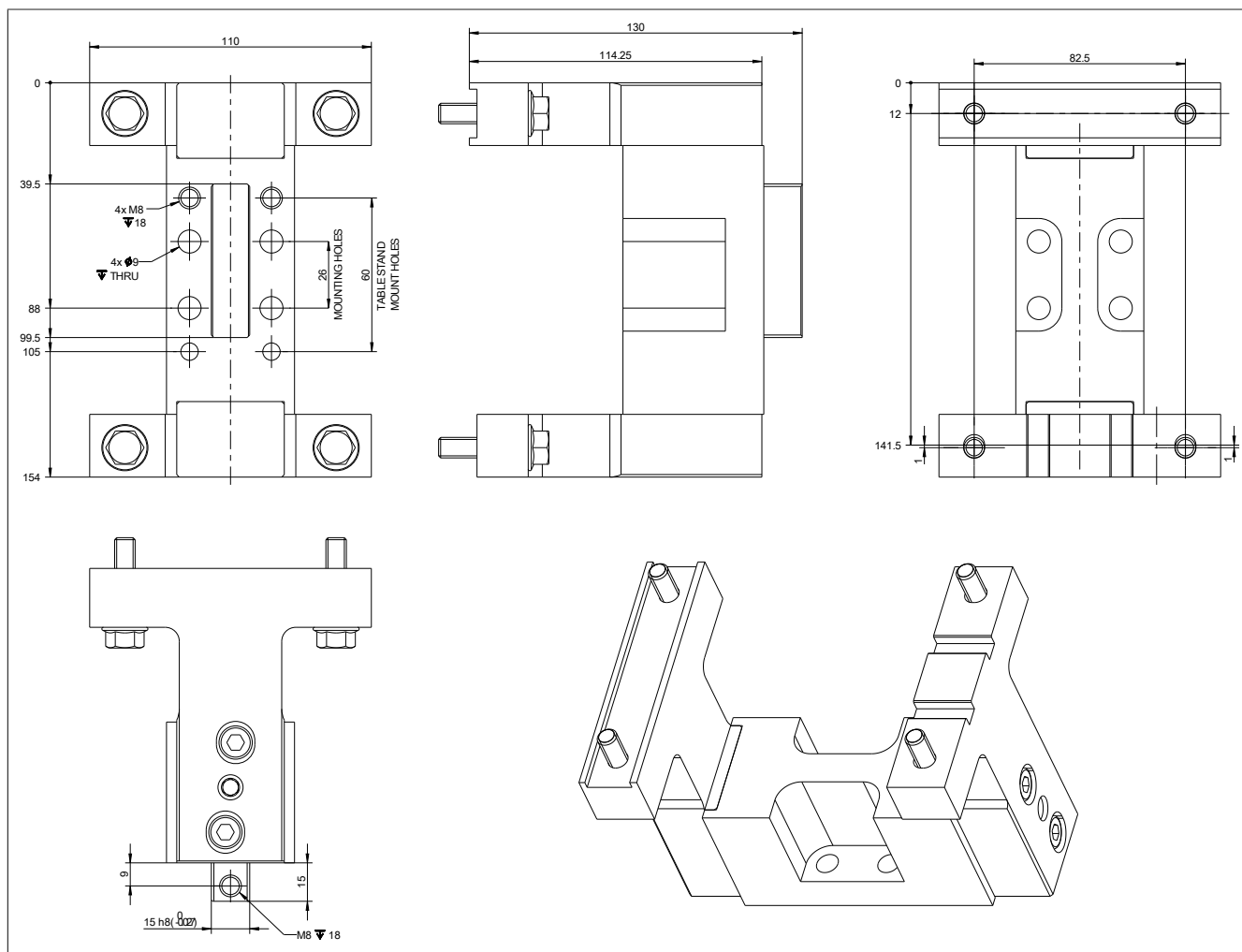


Figure 41: Dimension diagram for 8F1GCA.EI000A00I-1

Material: 1.4404

## 3.7 Shuttles

A shuttle is used to transport payloads on the ACOPOStrak transport system. Options for attaching payloads to which a product or shuttle shelf<sup>2)</sup> can be attached are shuttle-specific. For additional information, see the [A.1 "interface diagrams" on page 315](#) or 3D model.

### Information:

- Only non-hazardous materials are permitted to be transported with the shuttle.
- The responsibility for the product carrier lies with the machine designer.
- The product carrier must be designed so that the following conditions are met:
  - The product is held securely in all areas and transport cycles.
  - The transported product is not permitted to present any danger.
  - The product carrier must hold the product securely and secure it against slipping.
  - Sharp edges, rough surfaces or acute angles that could cause injury are not permitted.
  - The product and product carrier are not permitted to come into contact with the guide system (guide elements with segments).
  - The product carrier must be able to withstand the maximum loads and forces that occur.

Order number	Short description	Page
8F1SA.100.10000I-1	ACOPOStrak shuttle A , 50 mm wide, suitable for diverters, 1 pc.	109
8F1SA.100.10000X-1	ACOPOStrak shuttle A, 50 mm wide, suitable for diverters, 10 pcs. 8F1SA.100.10000I-1	109
8F1SA.102.10000I-1	ACOPOStrak shuttle A, 50 mm wide, not suitable for diverters, 1 pc.	114
8F1SA.102.10000X-1	ACOPOStrak shuttle A, 50 mm wide, not suitable for diverters, 10 pcs. 8F1SA.102.10000I-1	114
8F1SA.104.10000I-1	ACOPOStrak shuttle A , 50 mm wide, suitable for diverters, skewed, 1 pc.	119
8F1SA.104.10000X-1	ACOPOStrak shuttle A, 50 mm wide, suitable for diverters, skewed, 10 pcs. 8F1SA.104.10000I-1	119
8F1SA.106.10000I-1	ACOPOStrak shuttle A, 50 mm wide, not suitable for diverters, skewed, 1 pc.	123
8F1SA.106.10000X-1	ACOPOStrak shuttle A, 50 mm wide, not suitable for diverters, skewed, 10 pcs. 8F1SA.106.10000I-1	123
8F1SA.201.10000I-1	ACOPOStrak shuttle A, 100 mm wide, suitable for diverters, 1 pc.	128
8F1SA.201.10000X-1	ACOPOStrak shuttle A, 100 mm wide, suitable for diverters, 10 pcs. 8F1SA.201.10000I-1	128
8F1SA.203.10000I-1	ACOPOStrak shuttle A, 100 mm wide, not suitable for diverters, 1 pc.	133
8F1SA.203.10000X-1	ACOPOStrak shuttle A, 100 mm wide, not suitable for diverters, 10 pcs. 8F1SA.203.10000I-1	133

### 3.7.1 8F1SA.100.10000I-1

#### 3.7.1.1 General information

This shuttle is suitable for diverters. Mounting options for payloads are provided on the top and bottom.

#### 3.7.1.2 Order data


Order number	Short description	Figure
	<b>Standard shuttles</b>	
8F1SA.100.10000I-1	ACOPOStrak shuttle A , 50 mm wide, suitable for diverters, 1 pc.	
8F1SA.100.10000X-1	ACOPOStrak shuttle A, 50 mm wide, suitable for diverters, 10 pcs. 8F1SA.100.10000I-1	
	<b>Optional accessories</b>	
	<b>Shuttles</b>	
8F1SAP.ASB001002-1	ACOPOStrak shuttle A, 10 anti-static brushes	
8F1SAP.FW0001002-1	ACOPOStrak shuttle A, 2 flat wheels with bearing	
8F1SAP.GD050P00I-1	ACOPOStrak shuttle glider, 50 mm, suitable for diverters, 2 pieces	
8F1SAP.GD050P00X-1	ACOPOStrak shuttle glider, 50 mm, suitable for diverters, 10 pieces	
8F1SAP.LF0001002-1	ACOPOStrak shuttle A, 10 replacement lubrication felts	
8F1SAP.PC000000X-1	ACOPOStrak shuttle replacement magnetic cover plates, 10 pcs.	
8F1SAP.SC050C00X-1	ACOPOStrak shuttle cover, 50 mm, 10 pieces	
8F1SAP.VW0001002-1	ACOPOStrak shuttle A, 2 v-wheels with bearing	

Table 97: 8F1SA.100.10000I-1, 8F1SA.100.10000X-1 - Order data

<sup>2)</sup> Securely mounted unit on the shuttle for holding the product to be transported.

### 3.7.1.3 Technical data

<b>Order number</b>	<b>8F1SA.100.10000I-1</b>
<b>Motor characteristics</b> <sup>1)2)3)</sup>	
Maximum propulsion force	85 N
Maximum speed <sup>4)</sup>	5 m/s
<b>Accuracy in direction of movement</b> <sup>5)6)7)8)</sup>	
Repeat accuracy of single shuttle <sup>9)</sup>	
Interface on top	±310 µm
Interface on bottom	±310 µm
Repeat accuracy of multiple shuttles	
Interface on top	±922 µm
Interface on bottom	±947 µm
<b>Operating conditions</b>	
Max. magnet temperature	60°C
Payload	
Typical <sup>10)11)</sup>	1 kg
Maximum <sup>10)11)12)</sup>	1 kg
<b>Ambient conditions</b>	
Temperature	
Operation	
Nominal	5°C to 40°C
Storage	-25°C to 55°C
Transport	-25°C to 60°C
Relative humidity	
Operation	5 to 85%, non-condensing
Storage	5 to 95%, non-condensing
Transport	5 to 95%, non-condensing
<b>Mechanical properties</b>	
Dimensions	
Length	83 mm
Height	179 mm
Depth	47.3 mm
Weight	0.7 kg

Table 98: 8F1SA.100.10000I-1 - Technical data

- 1) Magnetic air gap  $\delta_n$  of 2 mm
- 2) At 25°C ambient temperature.
- 3) Due to tolerances or other influencing factors, the values may be reduced by up to 10%.
- 4) The achievable speed depends on the center of gravity of the load and required shuttle acceleration and is determined by a detailed configuration of the system.
- 5) Limitations: The accuracy specification applies within a segment (30 mm from the segment edge) and no other shuttle (50 mm between shuttle bodies).
- 6) The reference on the segment is the center hole of the segment (mechanical fixed bearing).
- 7) Thermal compensation possible starting with mapp Motion V5.15 (release 2021-09-01).
- 8) Potentially ±300 µm depending on the thermal load of the segment and the position on the segment (distance to the mechanical fixed bearing)
- 9) For one side of the shuttle at a time. If a shuttle is rotated, it must be assessed as another shuttle.
- 10) The payload applies to a horizontal track layout.
- 11) The achievable payload depends on the center of gravity of the load and the required shuttle dynamics (speed and acceleration) and is determined by a detailed design of the system.
- 12) For higher payload requirements, contact your B&R representative.

### 3.7.1.4 Dimension diagram and installation dimensions

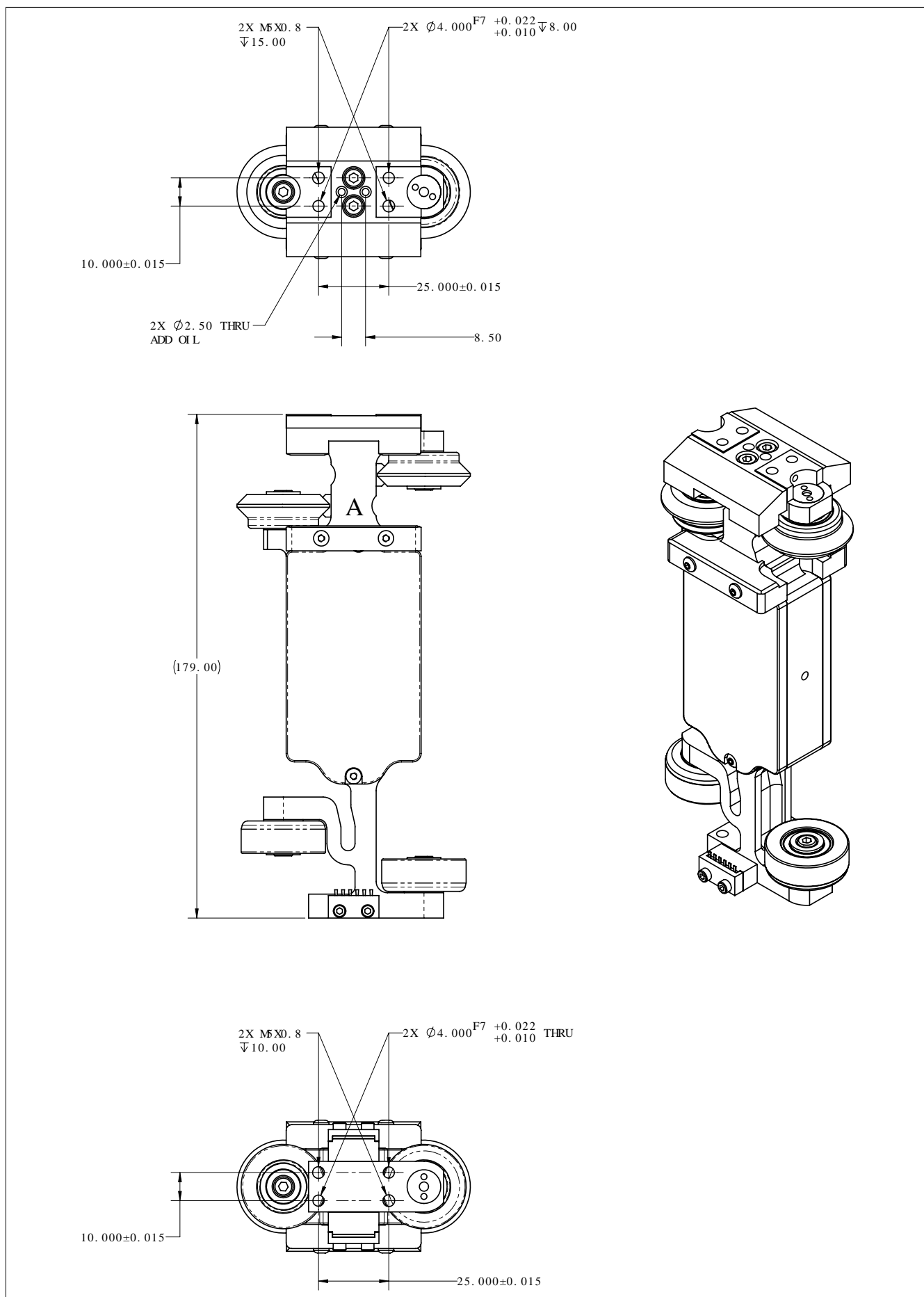


Figure 42: 8F1SA.100.10000I-1 - Dimension diagram

### 3.7.1.5 Force-velocity diagram

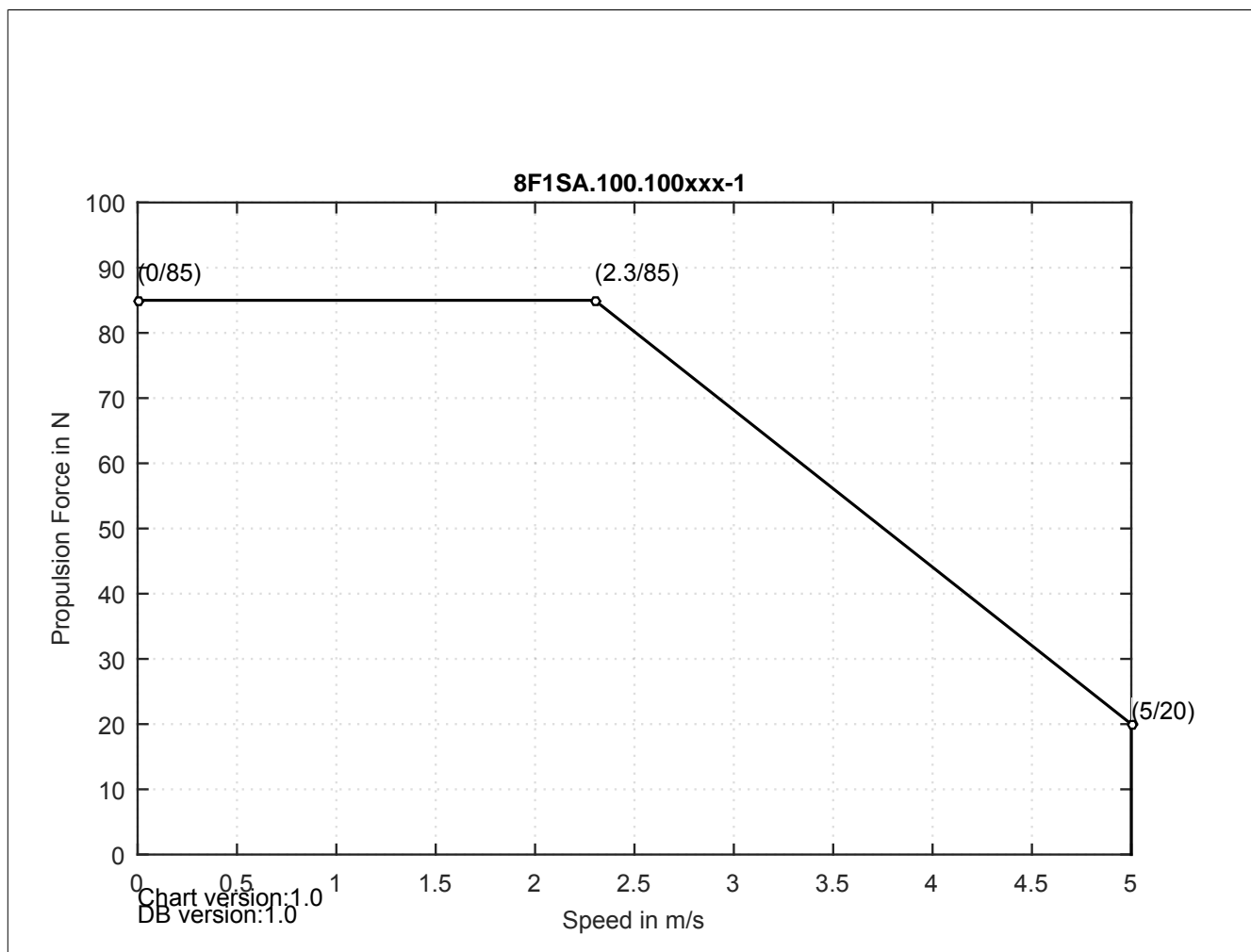


Figure 43: Force-velocity diagram for 8F1SA.100.xxxxxx-1

Propulsion force<sup>3)</sup> = Maximum propulsion force

<sup>3)</sup> Due to tolerances or other influencing factors, the values may be reduced by up to 10%.

### 3.7.1.6 Accuracy in relation to the guide system

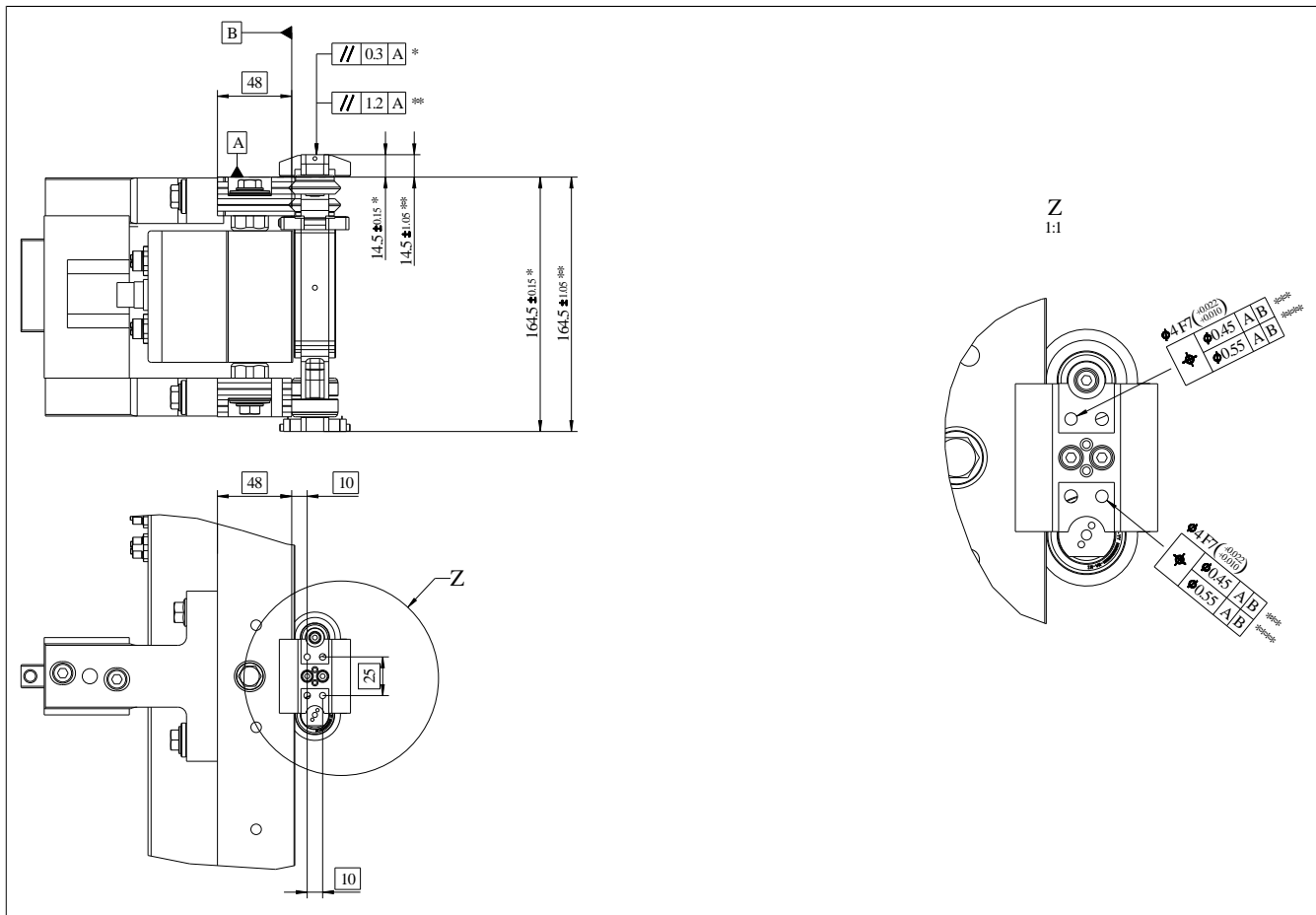


Figure 44: Positioning precision - 50 mm shuttle, suitable for diverters

- \* Local shuttle guide rail reference (related to the position of the guide rail in the current position)
- \*\* Total shuttle guide rail reference (related to the total position of the guide rail in the section of a straight guide unit)
- \*\*\* At recommended wheel wear limit: 0.15 mm in diameter
- \*\*\*\* At absolute lower wear limit: 0.25 mm in diameter

Detail Z: All values also apply to both shuttle interfaces.

Reference B: Running surface of the flat guide rail and neutral plane of the double-v guide rail

## 3.7.2 8F1SA.102.10000I-1

### 3.7.2.1 General information

This shuttle is not suitable for diverters. Mounting options for payloads are provided on the top, front and bottom side.

### 3.7.2.2 Order data


Order number	Short description	Figure
	<b>Standard shuttles</b>	
8F1SA.102.10000I-1	ACOPOStrak shuttle A, 50 mm wide, not suitable for diverters, 1 pc.	
8F1SA.102.10000X-1	ACOPOStrak shuttle A, 50 mm wide, not suitable for diverters, 10 pcs. 8F1SA.102.10000I-1	
	<b>Optional accessories</b>	
	<b>Shuttles</b>	
8F1SAP.ASB001002-1	ACOPOStrak shuttle A, 10 anti-static brushes	
8F1SAP.FW0001002-1	ACOPOStrak shuttle A, 2 flat wheels with bearing	
8F1SAP.G0050P00I-1	ACOPOStrak shuttle glider, 50 mm, not suitable for diverters, 2 pieces	
8F1SAP.G0050P00X-1	ACOPOStrak shuttle glider, 50 mm, not suitable for diverters, 10 pieces	
8F1SAP.LF0001002-1	ACOPOStrak shuttle A, 10 replacement lubrication felts	
8F1SAP.PC000000X-1	ACOPOStrak shuttle replacement magnetic cover plates, 10 pcs.	
8F1SAP.SC050C00X-1	ACOPOStrak shuttle cover, 50 mm, 10 pieces	
8F1SAP.VW0001002-1	ACOPOStrak shuttle A, 2 v-wheels with bearing	

Table 99: 8F1SA.102.10000I-1, 8F1SA.102.10000X-1 - Order data

### 3.7.2.3 Technical data

Order number	8F1SA.102.10000I-1
<b>Motor characteristics</b> <sup>1)2)3)</sup>	
Maximum propulsion force	85 N
Maximum speed <sup>4)</sup>	5 m/s
<b>Accuracy in direction of movement</b> <sup>5)6)7)8)</sup>	
Repeat accuracy of single shuttle <sup>9)</sup>	
Interface on top	±310 µm
Interface on bottom	±310 µm
Interface on side	±310 µm
Repeat accuracy of multiple shuttles	
Interface on top	±922 µm
Interface on bottom	±947 µm
Interface on side	±922 µm
<b>Operating conditions</b>	
Max. magnet temperature	60°C
Payload	
Typical <sup>10)11)</sup>	1 kg
Maximum <sup>10)11)12)</sup>	1 kg
<b>Ambient conditions</b>	
Temperature	
Operation	
Nominal	5°C to 40°C
Storage	-25°C to 55°C
Transport	-25°C to 60°C
Relative humidity	
Operation	5 to 85%, non-condensing
Storage	5 to 95%, non-condensing
Transport	5 to 95%, non-condensing
<b>Mechanical properties</b>	
Dimensions	
Length	83 mm
Height	179 mm
Depth	40.2 mm
Weight	0.5 kg

Table 100: 8F1SA.102.10000I-1 - Technical data

- 1) Magnetic air gap  $\delta_n$  of 2 mm
- 2) At 25°C ambient temperature.
- 3) Due to tolerances or other influencing factors, the values may be reduced by up to 10%.
- 4) The achievable speed depends on the center of gravity of the load and required shuttle acceleration and is determined by a detailed configuration of the system.
- 5) Limitations: The accuracy specification applies within a segment (30 mm from the segment edge) and no other shuttle (50 mm between shuttle bodies).
- 6) The reference on the segment is the center hole of the segment (mechanical fixed bearing).
- 7) Thermal compensation possible starting with mapp Motion V5.15 (release 2021-09-01).
- 8) Potentially ±300 µm depending on the thermal load of the segment and the position on the segment (distance to the mechanical fixed bearing)
- 9) For one side of the shuttle at a time. If a shuttle is rotated, it must be assessed as another shuttle.
- 10) The payload applies to a horizontal track layout.



- 11) The achievable payload depends on the center of gravity of the load and the required shuttle dynamics (speed and acceleration) and is determined by a detailed design of the system.
- 12) For higher payload requirements, contact your B&R representative.

### 3.7.2.4 Dimension diagram and installation dimensions

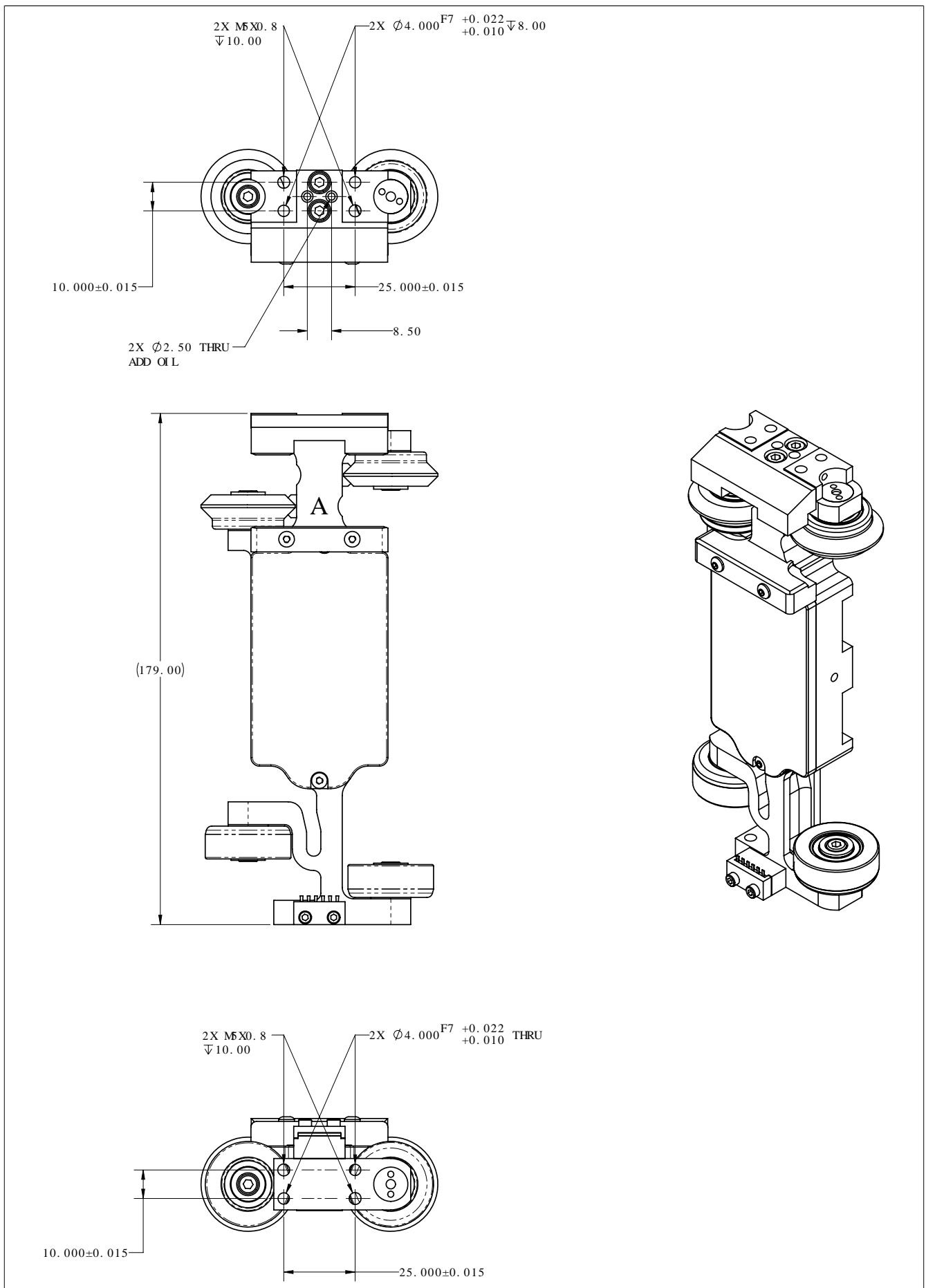


Figure 45: 8F1SA.102.10000I-1 - Dimension diagram

### 3.7.2.5 Force-velocity diagram

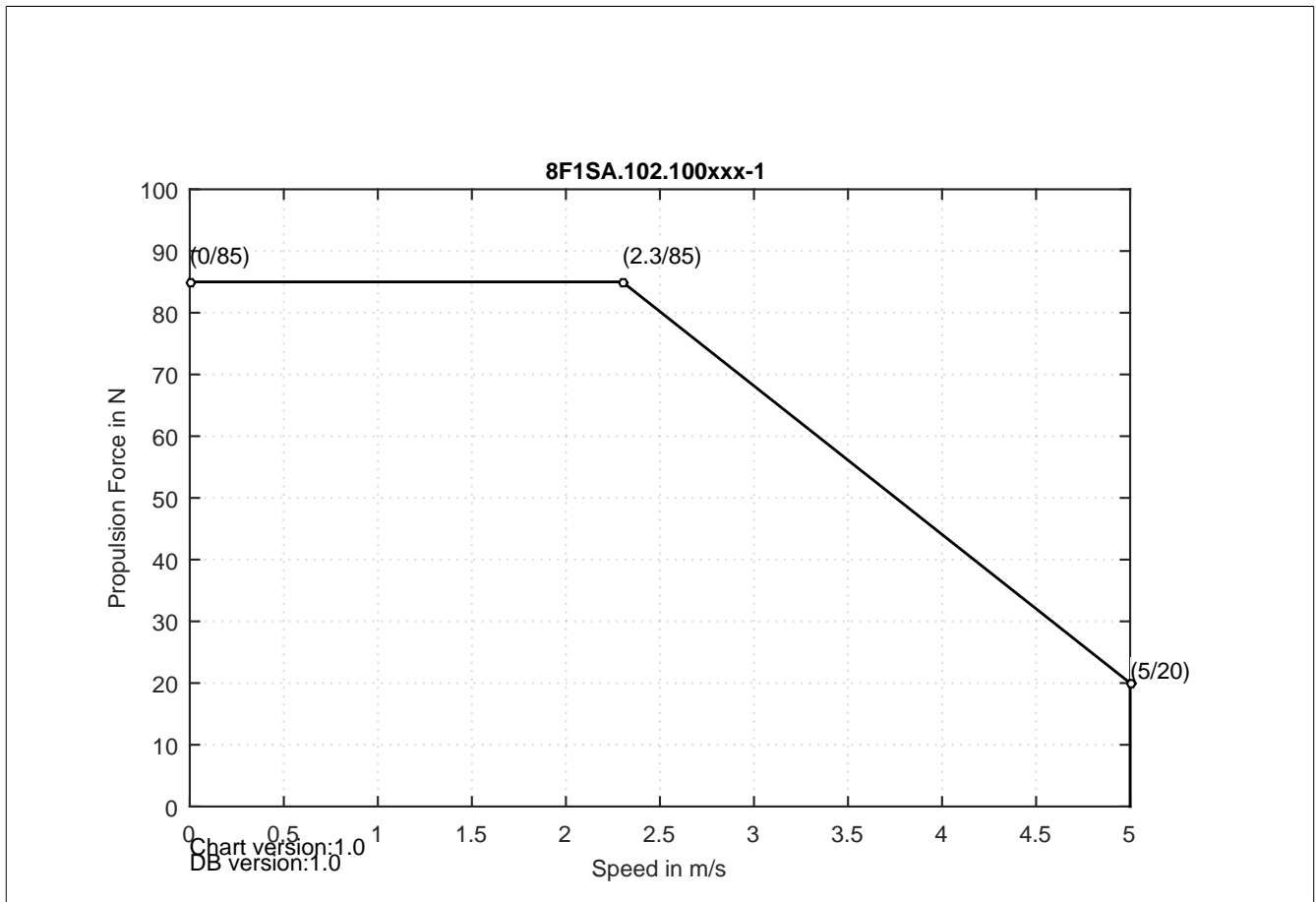


Figure 46: Force-velocity diagram for 8F1SA.102.xxxxxx-1

Propulsion force<sup>4)</sup> = Maximum propulsion force

<sup>4)</sup> Due to tolerances or other influencing factors, the values may be reduced by up to 10%.

### 3.7.2.6 Accuracy in relation to the guide system

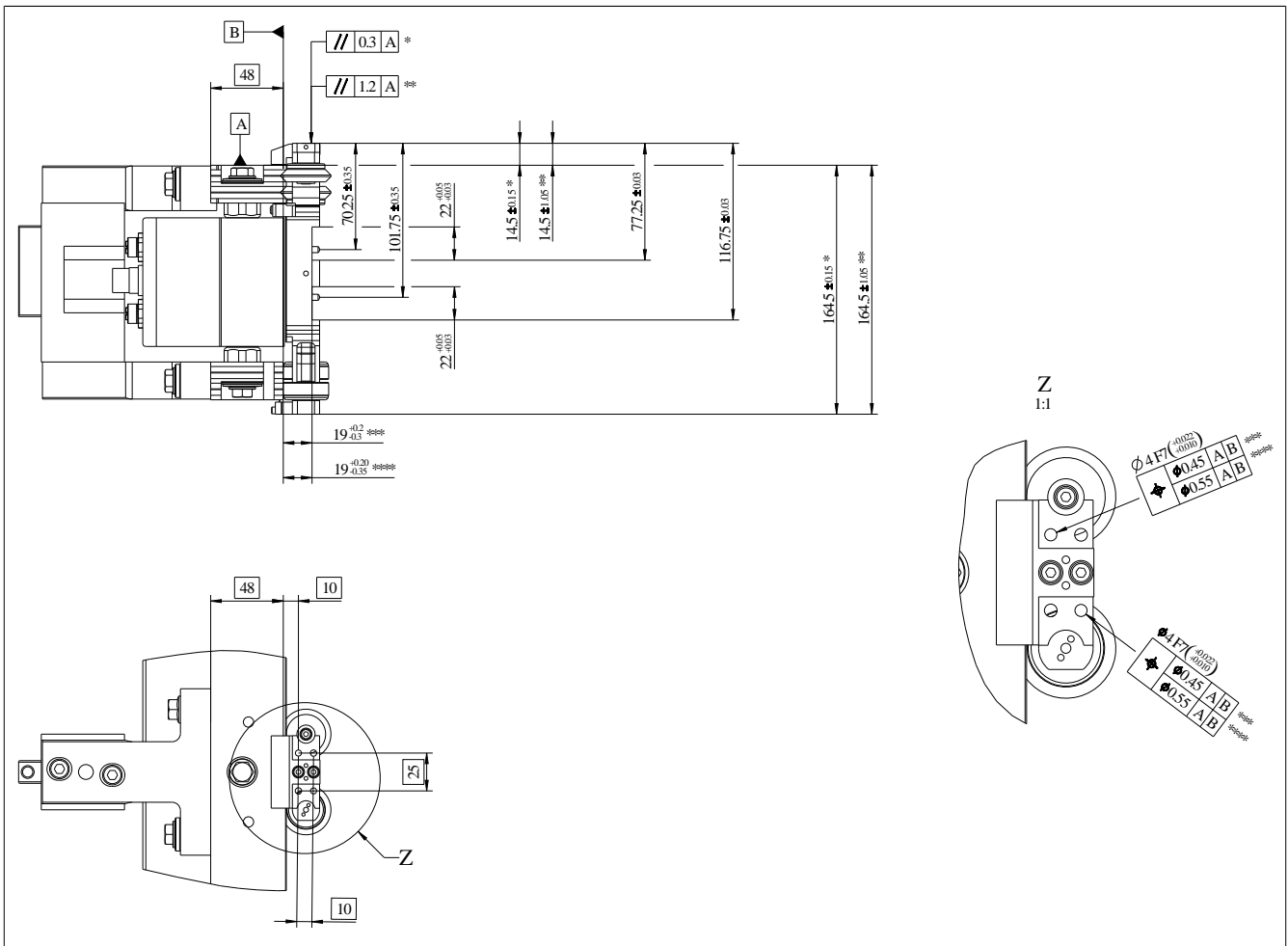


Figure 47: Positioning precision - 50 mm shuttle, not suitable for diverters

- \* Local shuttle guide rail reference (related to the position of the guide rail in the current position)
- \*\* Total shuttle guide rail reference (related to the total position of the guide rail in the section of a straight guide unit)
- \*\*\* At recommended wheel wear limit: 0.15 mm in diameter
- \*\*\*\* At absolute lower wear limit: 0.25 mm in diameter

Detail Z: All values also apply to both shuttle interfaces.

Reference B: Running surface of the flat guide rail and neutral plane of the double-v guide rail

### 3.7.3 8F1SA.104.10000I-1

#### 3.7.3.1 General information

This shuttle is suitable for diverters. Options for attaching payloads are provided on the top and bottom.

Magnetic units have skewed magnetic geometry.

### 3.7.3.2 Order data


Order number	Short description	Figure
	<b>Standard shuttles</b>	
8F1SA.104.10000I-1	ACOPOStrak shuttle A , 50 mm wide, suitable for diverters, skewed, 1 pc.	
8F1SA.104.10000X-1	ACOPOStrak shuttle A, 50 mm wide, suitable for diverters, skewed, 10 pcs. 8F1SA.104.10000I-1	
	<b>Optional accessories</b>	
	<b>Shuttles</b>	
8F1SAP.ASB001002-1	ACOPOStrak shuttle A, 10 anti-static brushes	
8F1SAP.FW0001002-1	ACOPOStrak shuttle A, 2 flat wheels with bearing	
8F1SAP.GD050P00I-1	ACOPOStrak shuttle glider, 50 mm, suitable for diverters, 2 pieces	
8F1SAP.GD050P00X-1	ACOPOStrak shuttle glider, 50 mm, suitable for diverters, 10 pieces	
8F1SAP.LF0001002-1	ACOPOStrak shuttle A, 10 replacement lubrication felts	
8F1SAP.PC000000X-1	ACOPOStrak shuttle replacement magnetic cover plates, 10 pcs.	
8F1SAP.SC050C00X-1	ACOPOStrak shuttle cover, 50 mm, 10 pieces	
8F1SAP.VW0001002-1	ACOPOStrak shuttle A, 2 v-wheels with bearing	

Table 101: 8F1SA.104.10000I-1, 8F1SA.104.10000X-1 - Order data

### 3.7.3.3 Technical data

Order number	8F1SA.104.10000I-1
<b>Motor characteristics</b> <sup>1)2)3)</sup>	
Maximum propulsion force	45 N
Maximum speed <sup>4)</sup>	5 m/s
<b>Accuracy in direction of movement</b> <sup>5)6)7)8)</sup>	
Repeat accuracy of single shuttle <sup>9)</sup>	
Interface on top	±310 µm
Interface on bottom	±310 µm
Repeat accuracy of multiple shuttles	
Interface on top	±922 µm
Interface on bottom	±947 µm
<b>Operating conditions</b>	
Max. magnet temperature	60°C
Payload	
Typical <sup>10)11)</sup>	In preparation
Maximum <sup>10)11)12)</sup>	In preparation
<b>Ambient conditions</b>	
Temperature	
Operation	
Nominal	5°C to 40°C
Storage	-25°C to 55°C
Transport	-25°C to 60°C
Relative humidity	
Operation	5 to 85%, non-condensing
Storage	5 to 95%, non-condensing
Transport	5 to 95%, non-condensing
<b>Mechanical properties</b>	
Dimensions	
Length	83 mm
Height	179 mm
Depth	47.3 mm
Weight	0.7 kg

Table 102: 8F1SA.104.10000I-1 - Technical data

- 1) Magnetic air gap  $\delta_n$  of 2 mm
- 2) At 25°C ambient temperature.
- 3) Due to tolerances or other influencing factors, the values may be reduced by up to 10%.
- 4) The achievable speed depends on the center of gravity of the load and required shuttle acceleration and is determined by a detailed configuration of the system.
- 5) Limitations: The accuracy specification applies within a segment (30 mm from the segment edge) and no other shuttle (50 mm between shuttle bodies).
- 6) The reference on the segment is the center hole of the segment (mechanical fixed bearing).
- 7) Thermal compensation possible starting with mapp Motion V5.15 (release 2021-09-01).
- 8) Potentially ±300 µm depending on the thermal load of the segment and the position on the segment (distance to the mechanical fixed bearing)
- 9) For one side of the shuttle at a time. If a shuttle is rotated, it must be assessed as another shuttle.
- 10) The payload applies to a horizontal track layout.
- 11) The achievable payload depends on the center of gravity of the load and the required shuttle dynamics (speed and acceleration) and is determined by a detailed design of the system.
- 12) For higher payload requirements, contact your B&R representative.

### 3.7.3.4 Dimension diagram and installation dimensions

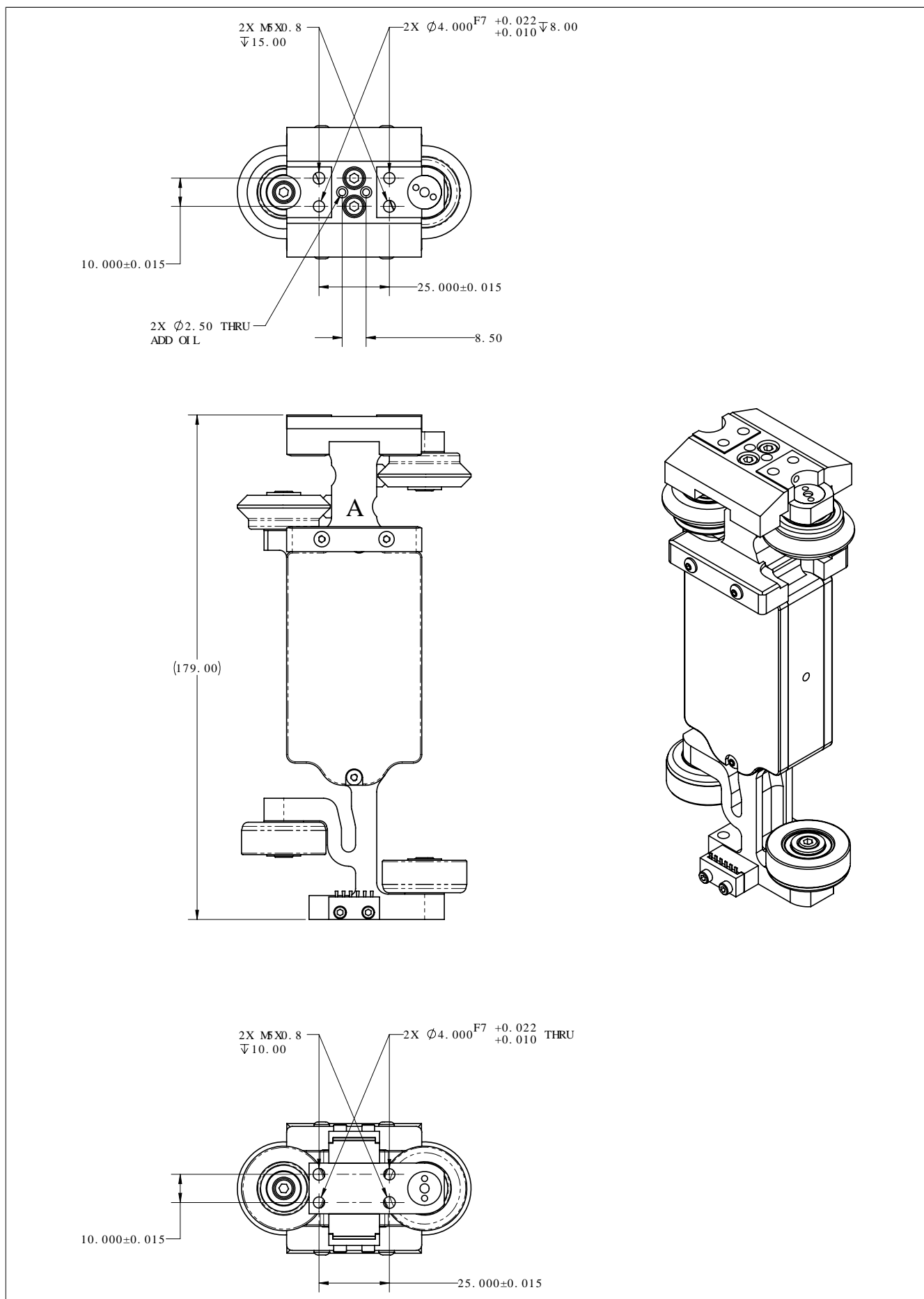


Figure 48: 8F1SA.104.10000I-1 - Dimension diagram

### 3.7.3.5 Force-velocity diagram

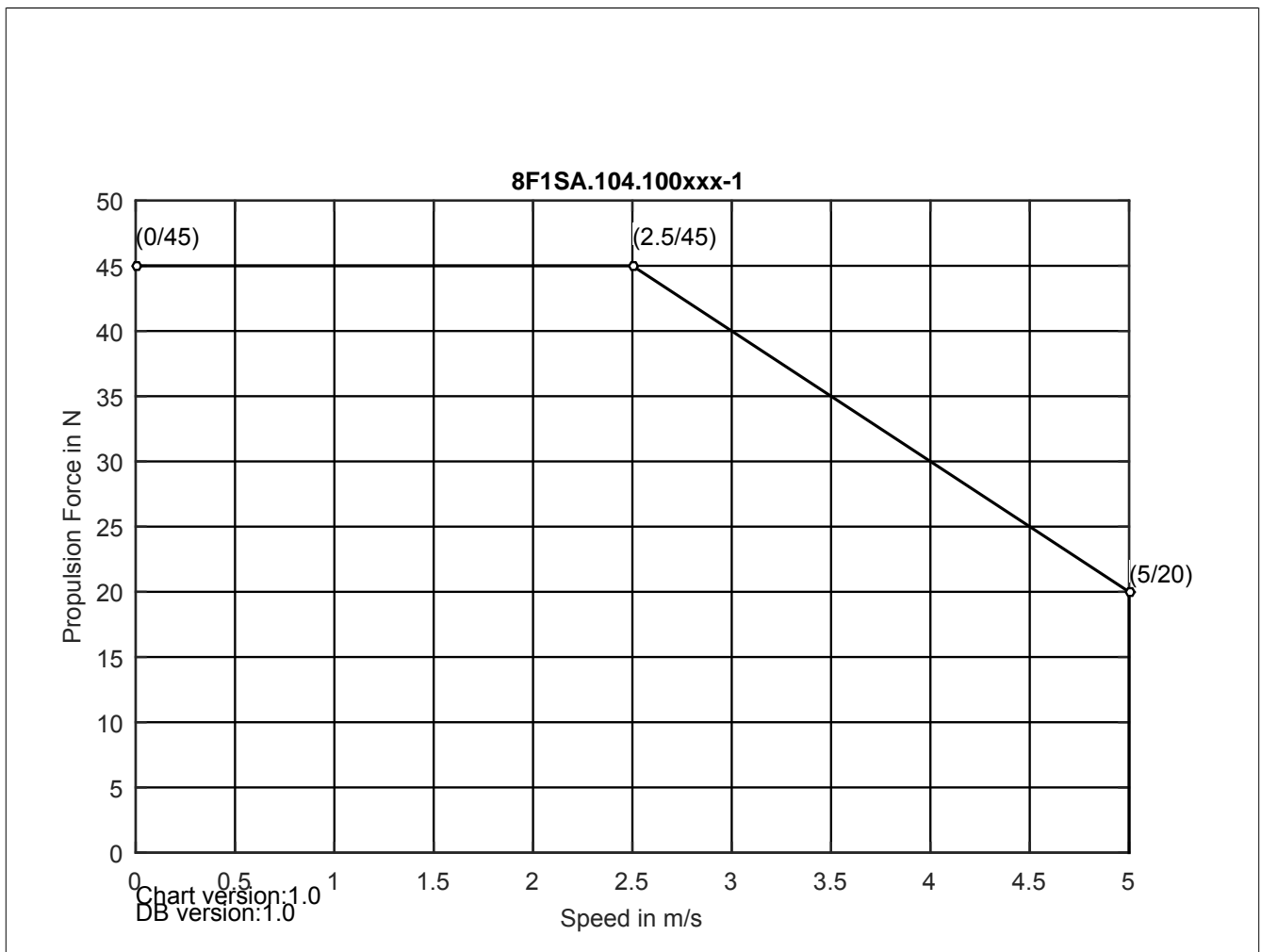


Figure 49: Force-velocity diagram for 8F1SA.104.xxxxxx-1

Propulsion force<sup>5)</sup> = Maximum propulsion force

<sup>5)</sup> Due to tolerances or other influencing factors, the values may be reduced by up to 10%.

### 3.7.3.6 Accuracy in relation to the guide system

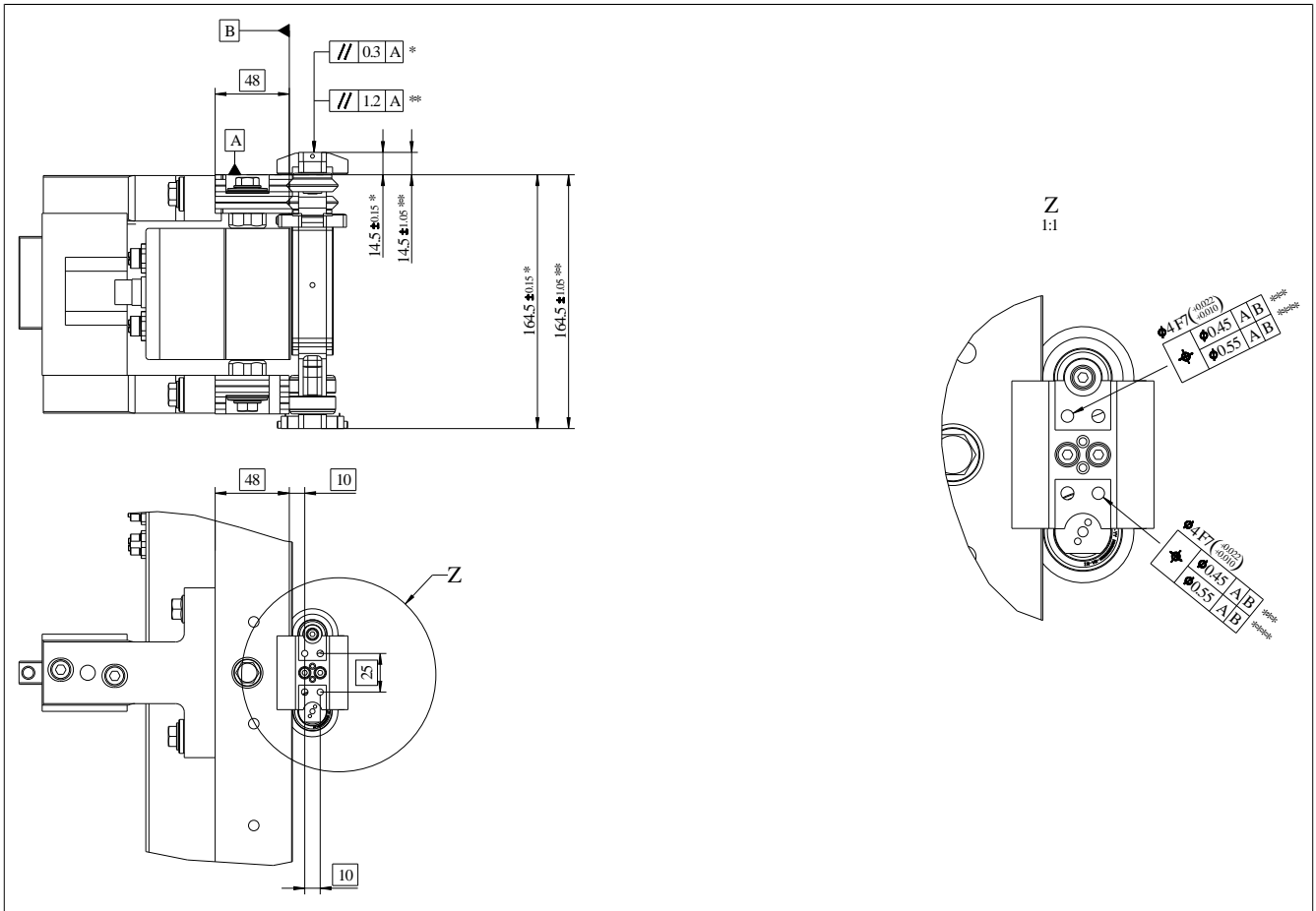


Figure 50: Positioning precision - 50 mm shuttle, suitable for diverters

- \* Local shuttle guide rail reference (related to the position of the guide rail in the current position)
- \*\* Total shuttle guide rail reference (related to the total position of the guide rail in the section of a straight guide unit)
- \*\*\* At recommended wheel wear limit: 0.15 mm in diameter
- \*\*\*\* At absolute lower wear limit: 0.25 mm in diameter

Detail Z: All values also apply to both shuttle interfaces.

Reference B: Running surface of the flat guide rail and neutral plane of the double-v guide rail

### 3.7.4 8F1SA.106.10000I-1

#### 3.7.4.1 General information

This shuttle is not suitable for diverters. Options for attaching payloads are provided on the top, front and bottom. Magnetic units have skewed magnetic geometry.



### 3.7.4.2 Order data


Order number	Short description	Figure
	<b>Standard shuttles</b>	
8F1SA.106.10000I-1	ACOPOStrak shuttle A, 50 mm wide, not suitable for diverters, skewed, 1 pc.	
8F1SA.106.10000X-1	ACOPOStrak shuttle A, 50 mm wide, not suitable for diverters, skewed, 10 pcs. 8F1SA.106.10000I-1	
	<b>Optional accessories</b>	
	<b>Shuttles</b>	
8F1SAP.ASB001002-1	ACOPOStrak shuttle A, 10 anti-static brushes	
8F1SAP.FW0001002-1	ACOPOStrak shuttle A, 2 flat wheels with bearing	
8F1SAP.G0050P00I-1	ACOPOStrak shuttle glider, 50 mm, not suitable for diverters, 2 pieces	
8F1SAP.G0050P00X-1	ACOPOStrak shuttle glider, 50 mm, not suitable for diverters, 10 pieces	
8F1SAP.LF0001002-1	ACOPOStrak shuttle A, 10 replacement lubrication felts	
8F1SAP.PC000000X-1	ACOPOStrak shuttle replacement magnetic cover plates, 10 pcs.	
8F1SAP.SC050C00X-1	ACOPOStrak shuttle cover, 50 mm, 10 pieces	
8F1SAP.VW0001002-1	ACOPOStrak shuttle A, 2 v-wheels with bearing	

Table 103: 8F1SA.106.10000I-1, 8F1SA.106.10000X-1 - Order data

### 3.7.4.3 Technical data

Order number	8F1SA.106.10000I-1
<b>Motor characteristics</b> <sup>1)2)3)</sup>	
Maximum propulsion force	45 N
Maximum speed <sup>4)</sup>	5 m/s
<b>Accuracy in direction of movement</b> <sup>5)6)7)8)</sup>	
Repeat accuracy of single shuttle <sup>9)</sup>	
Interface on top	±310 µm
Interface on bottom	±310 µm
Interface on side	±310 µm
Repeat accuracy of multiple shuttles	
Interface on top	±922 µm
Interface on bottom	±947 µm
Interface on side	±922 µm
<b>Operating conditions</b>	
Max. magnet temperature	60°C
Payload	
Typical <sup>10)11)</sup>	In preparation
Maximum <sup>10)11)12)</sup>	In preparation
<b>Ambient conditions</b>	
Temperature	
Operation	
Nominal	5°C to 40°C
Storage	-25°C to 55°C
Transport	-25°C to 60°C
Relative humidity	
Operation	5 to 85%, non-condensing
Storage	5 to 95%, non-condensing
Transport	5 to 95%, non-condensing
<b>Mechanical properties</b>	
Dimensions	
Length	83 mm
Height	179 mm
Depth	40.2 mm
Weight	0.5 kg

Table 104: 8F1SA.106.10000I-1 - Technical data

- 1) Magnetic air gap  $\delta_n$  of 2 mm
- 2) At 25°C ambient temperature.
- 3) Due to tolerances or other influencing factors, the values may be reduced by up to 10%.
- 4) The achievable speed depends on the center of gravity of the load and required shuttle acceleration and is determined by a detailed configuration of the system.
- 5) Limitations: The accuracy specification applies within a segment (30 mm from the segment edge) and no other shuttle (50 mm between shuttle bodies).
- 6) The reference on the segment is the center hole of the segment (mechanical fixed bearing).
- 7) Thermal compensation possible starting with mapp Motion V5.15 (release 2021-09-01).
- 8) Potentially ±300 µm depending on the thermal load of the segment and the position on the segment (distance to the mechanical fixed bearing)
- 9) For one side of the shuttle at a time. If a shuttle is rotated, it must be assessed as another shuttle.
- 10) The payload applies to a horizontal track layout.

## Technical data

- 11) The achievable payload depends on the center of gravity of the load and the required shuttle dynamics (speed and acceleration) and is determined by a detailed design of the system.
- 12) For higher payload requirements, contact your B&R representative.

### 3.7.4.4 Dimension diagram and installation dimensions

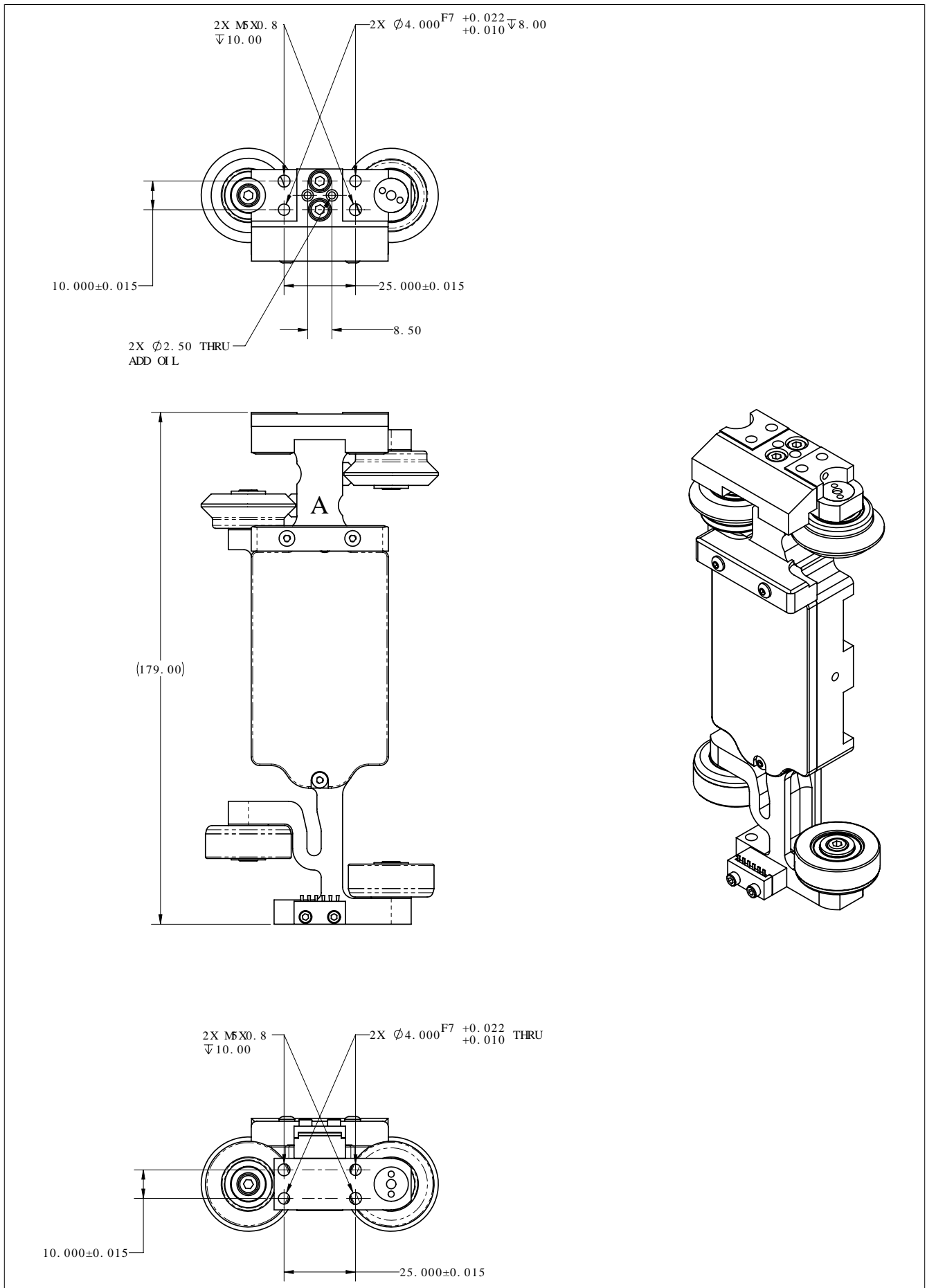


Figure 51: 8F1SA.106.10000I-1 - Dimension diagram

### 3.7.4.5 Force-velocity diagram

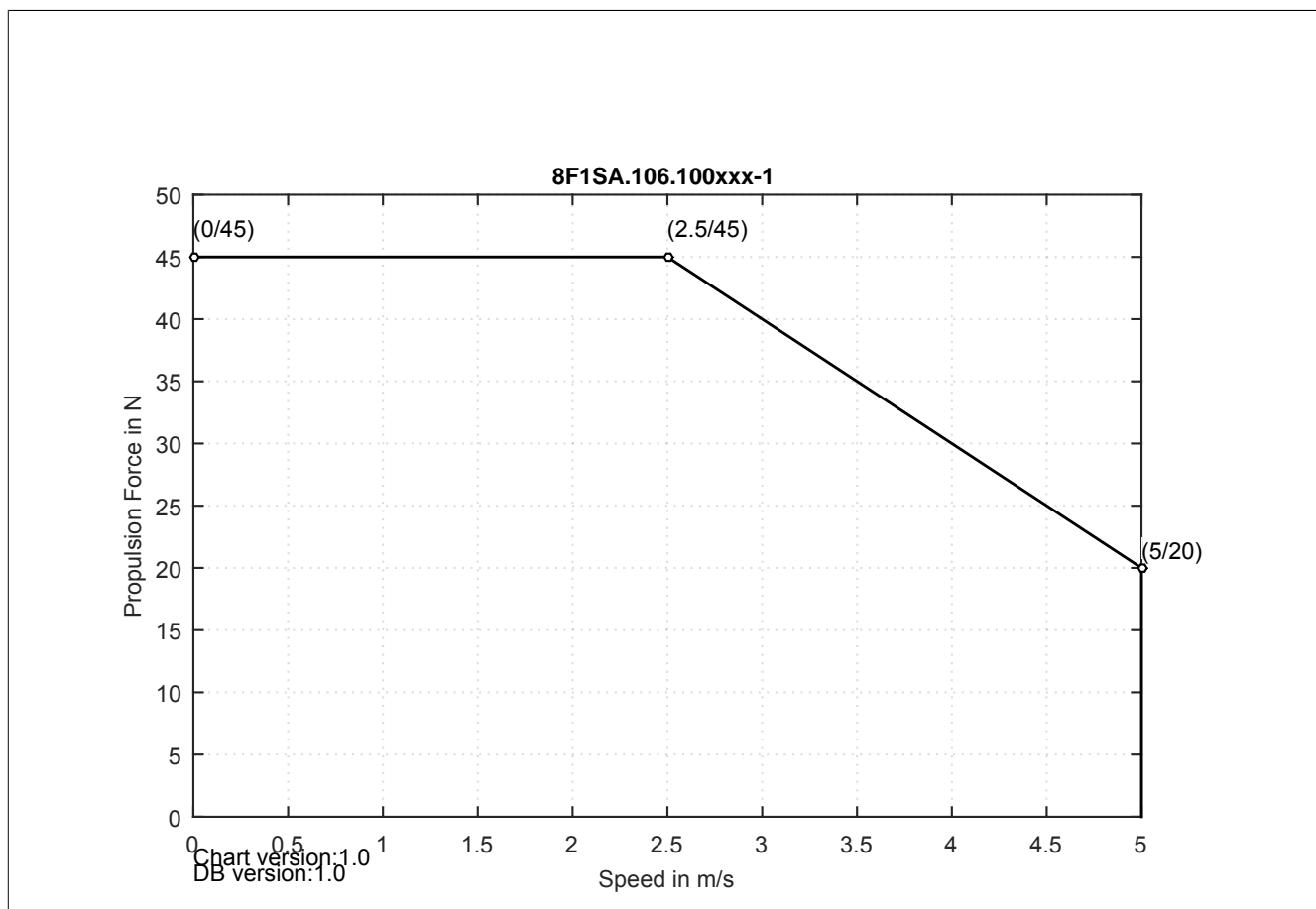


Figure 52: Force-velocity diagram for 8F1SA.106.xxxxxx-1

Propulsion force<sup>6)</sup> = Maximum propulsion force

<sup>6)</sup> Due to tolerances or other influencing factors, the values may be reduced by up to 10%.

### 3.7.4.6 Accuracy in relation to the guide system

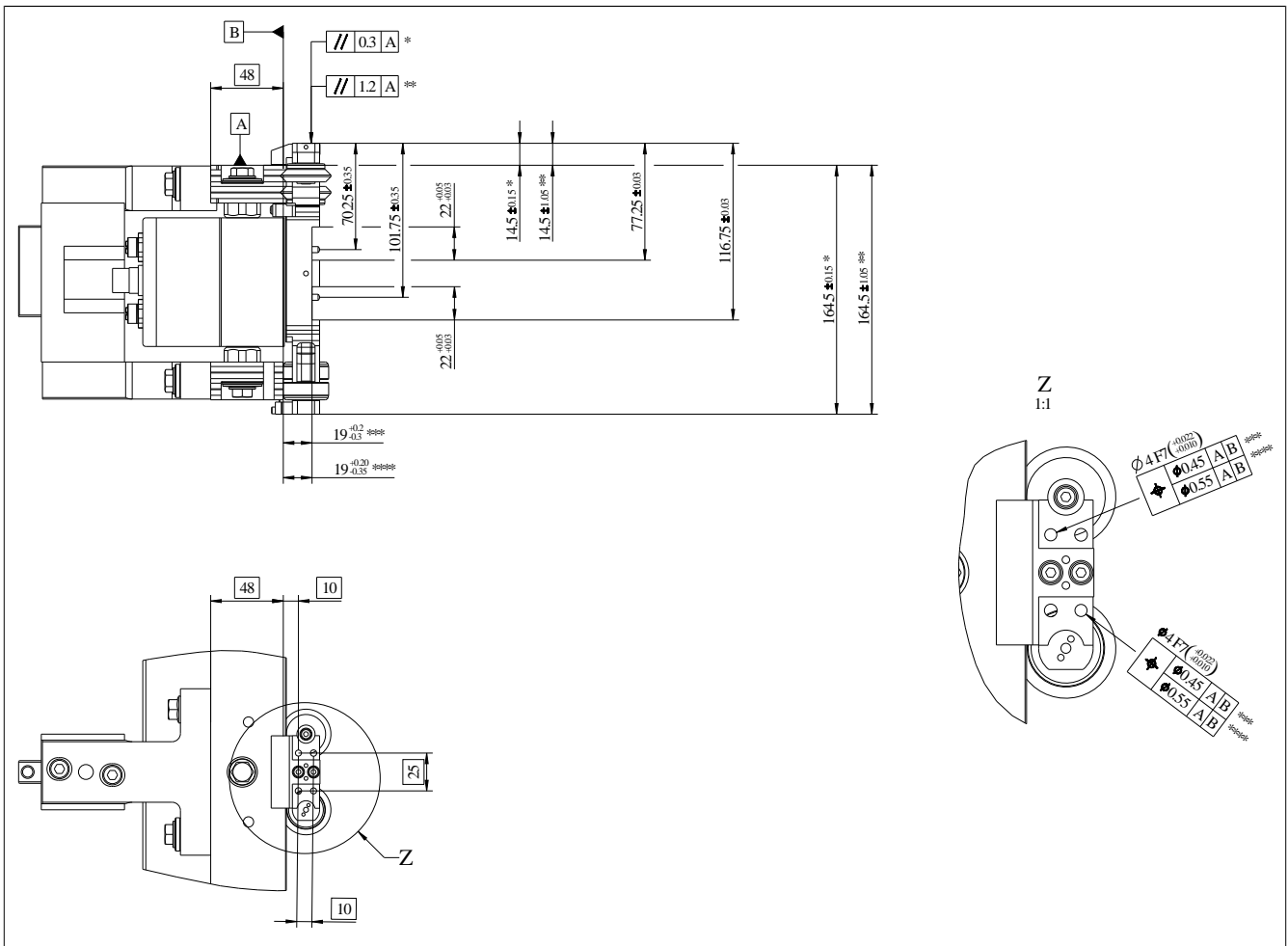


Figure 53: Positioning precision - 50 mm shuttle, not suitable for diverters

- \* Local shuttle guide rail reference (related to the position of the guide rail in the current position)
- \*\* Total shuttle guide rail reference (related to the total position of the guide rail in the section of a straight guide unit)
- \*\*\* At recommended wheel wear limit: 0.15 mm in diameter
- \*\*\*\* At absolute lower wear limit: 0.25 mm in diameter

Detail Z: All values also apply to both shuttle interfaces.

Reference B: Running surface of the flat guide rail and neutral plane of the double-v guide rail

## 3.7.5 8F1SA.201.10000I-1

### 3.7.5.1 General information

This shuttle is suitable for diverters. Mounting options for payloads are provided on the top and bottom. The 100 mm shuttle has a higher typical payload than the 50 mm shuttle.

### 3.7.5.2 Order data

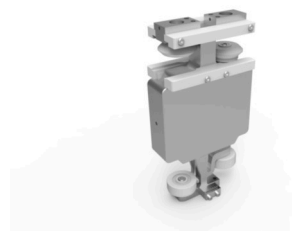
Order number	Short description	Figure
	<b>Standard shuttles</b>	
8F1SA.201.10000I-1	ACOPOStrak shuttle A, 100 mm wide, suitable for diverters, 1 pc.	
8F1SA.201.10000X-1	ACOPOStrak shuttle A, 100 mm wide, suitable for diverters, 10 pcs. 8F1SA.201.10000I-1	
	<b>Optional accessories</b>	
	<b>Shuttles</b>	
8F1SAP.ASB001002-1	ACOPOStrak shuttle A, 10 anti-static brushes	
8F1SAP.FW0001002-1	ACOPOStrak shuttle A, 2 flat wheels with bearing	
8F1SAP.GD100P00I-1	ACOPOStrak shuttle glider, 100 mm, 2 pieces	
8F1SAP.GD100P00X-1	ACOPOStrak shuttle glider, 100 mm, 10 pieces	
8F1SAP.LF0001002-1	ACOPOStrak shuttle A, 10 replacement lubrication felts	
8F1SAP.PC000000X-1	ACOPOStrak shuttle replacement magnetic cover plates, 10 pcs.	
8F1SAP.SC100C00X-1	ACPtrak shuttle cover, 100 mm, 10 pieces	
8F1SAP.VW0001002-1	ACOPOStrak shuttle A, 2 v-wheels with bearing	

Table 105: 8F1SA.201.10000I-1, 8F1SA.201.10000X-1 - Order data

## Information:

**ACOPOStrak shuttle cover, 100 mm (8F1SAP.SC100C00X-1) is only compatible with revisions A0 and A1.**

### 3.7.5.3 Technical data

Order number	8F1SA.201.10000I-1
<b>Motor characteristics</b> <sup>1)2)3)</sup>	
Maximum propulsion force	170 N
Maximum speed <sup>4)</sup>	5 m/s
<b>Accuracy in direction of movement</b> <sup>5)6)7)8)</sup>	
Repeat accuracy of single shuttle <sup>9)</sup>	
Interface on top	±310 µm
Interface on bottom	±310 µm
Repeat accuracy of multiple shuttles	
Interface on top	±922 µm
Interface on bottom	±947 µm
<b>Operating conditions</b>	
Max. magnet temperature	60°C
Payload	
Typical <sup>10)11)</sup>	2 kg
Maximum <sup>10)11)12)</sup>	2 kg
<b>Ambient conditions</b>	
Temperature	
Operation	
Nominal	5°C to 40°C
Storage	-25°C to 55°C
Transport	-25°C to 60°C
Relative humidity	
Operation	5 to 85%, non-condensing
Storage	5 to 95%, non-condensing
Transport	5 to 95%, non-condensing
<b>Mechanical properties</b>	
Dimensions	
Length	98 mm
Height	179 mm
Depth	47.3 mm
Weight	1.2 kg

Table 106: 8F1SA.201.10000I-1 - Technical data

- 1) Magnetic air gap  $\delta_n$  of 2 mm
- 2) At 25°C ambient temperature.
- 3) Due to tolerances or other influencing factors, the values may be reduced by up to 10%.
- 4) The achievable speed depends on the center of gravity of the load and required shuttle acceleration and is determined by a detailed configuration of the system.
- 5) Limitations: The accuracy specification applies within a segment (30 mm from the segment edge) and no other shuttle (50 mm between shuttle bodies).
- 6) The reference on the segment is the center hole of the segment (mechanical fixed bearing).
- 7) Thermal compensation possible starting with mapp Motion V5.15 (release 2021-09-01).
- 8) Potentially ±300 µm depending on the thermal load of the segment and the position on the segment (distance to the mechanical fixed bearing)
- 9) For one side of the shuttle at a time. If a shuttle is rotated, it must be assessed as another shuttle.
- 10) The payload applies to a horizontal track layout.

- 11) The achievable payload depends on the center of gravity of the load and the required shuttle dynamics (speed and acceleration) and is determined by a detailed design of the system.
- 12) For higher payload requirements, contact your B&R representative.

### 3.7.5.4 Dimension diagram and installation dimensions

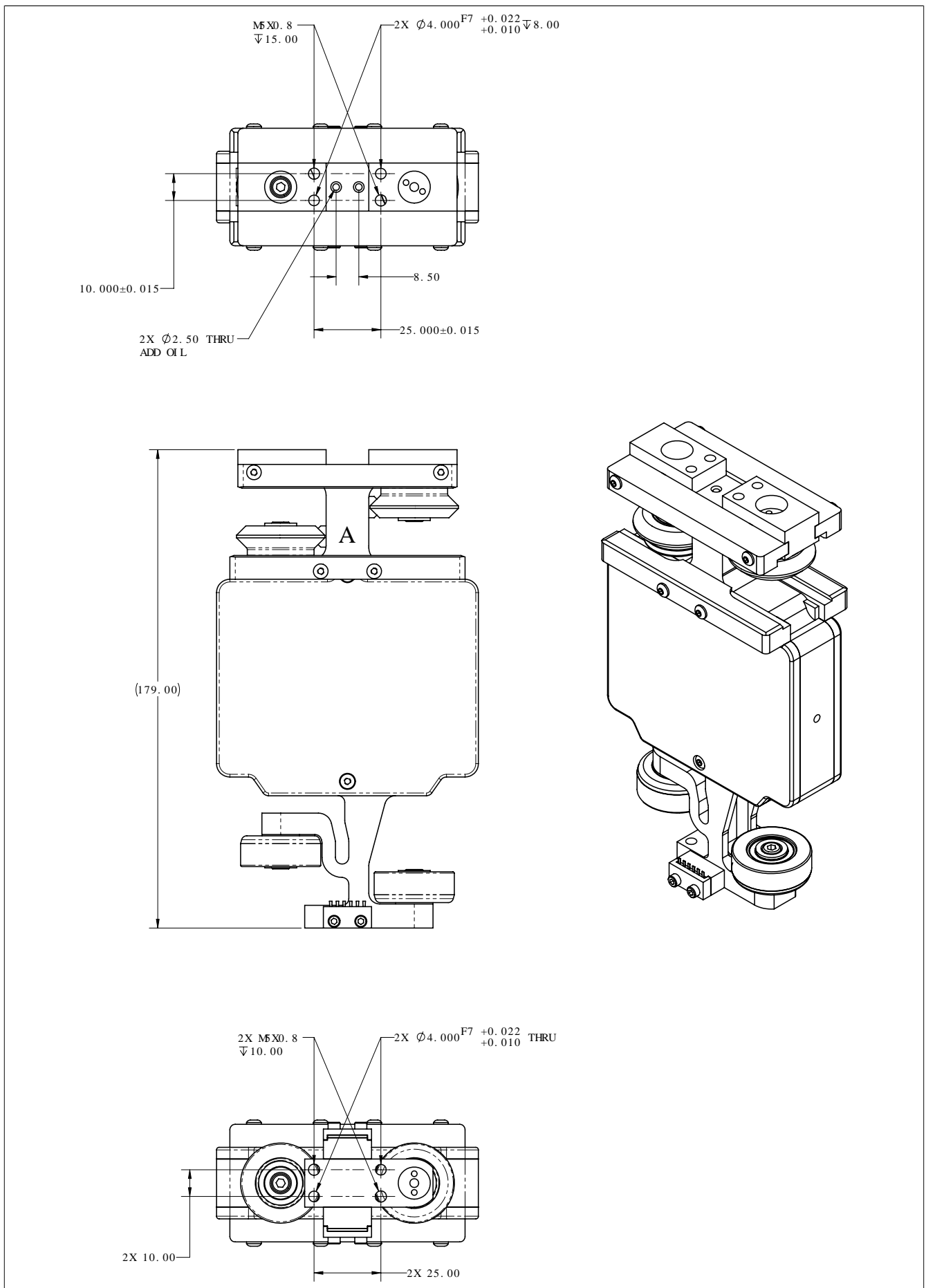


Figure 54: 8F1SA.201.10000I-1 - Dimension diagram



### 3.7.5.5 Force-velocity diagram

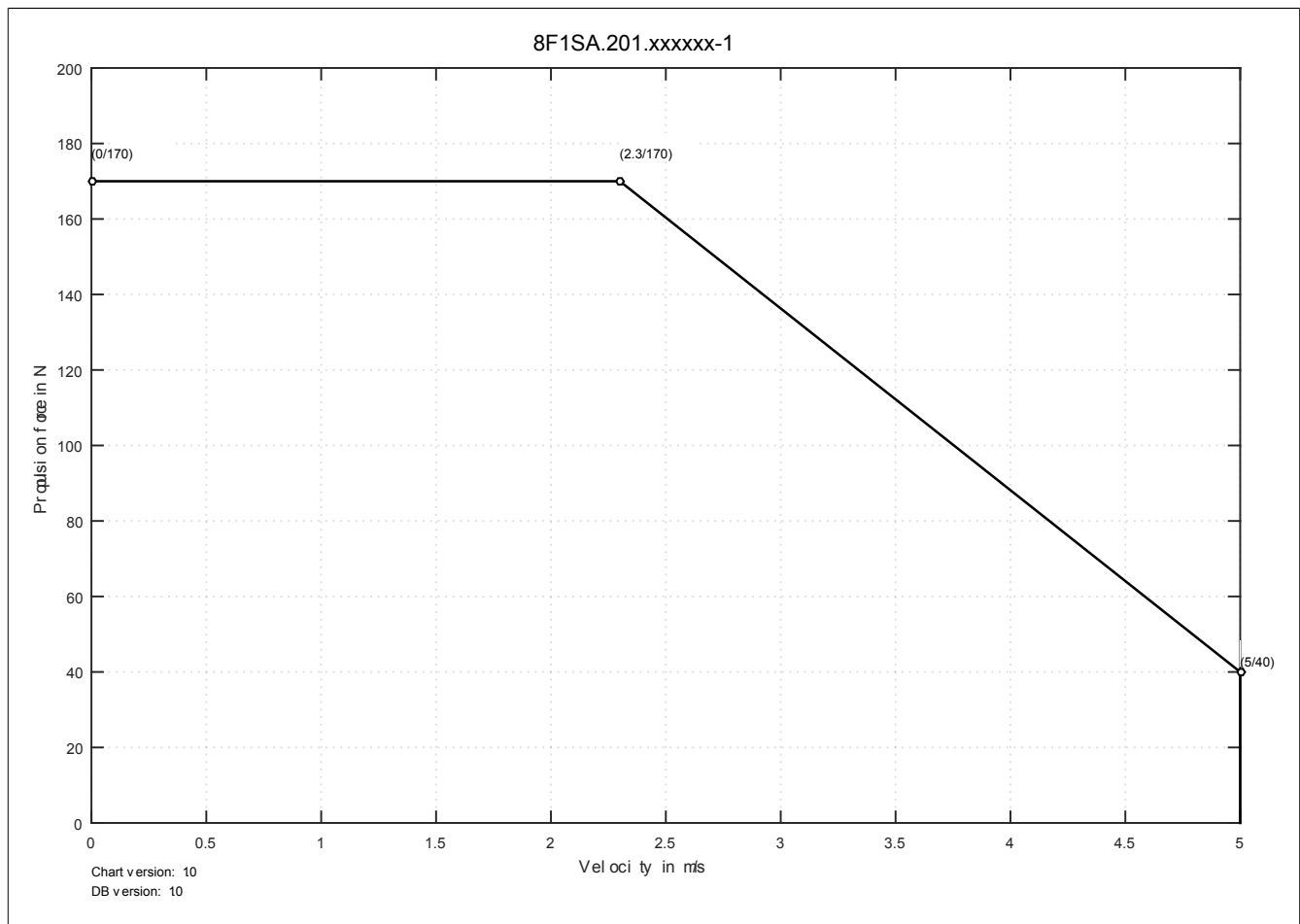


Figure 55: Force-velocity diagram for 8F1SA.201.xxxxxx-1

Propulsion force<sup>7)</sup> = Maximum propulsion force

<sup>7)</sup> Due to tolerances or other influencing factors, the values may be reduced by up to 10%.

### 3.7.5.6 Accuracy in relation to the guide system

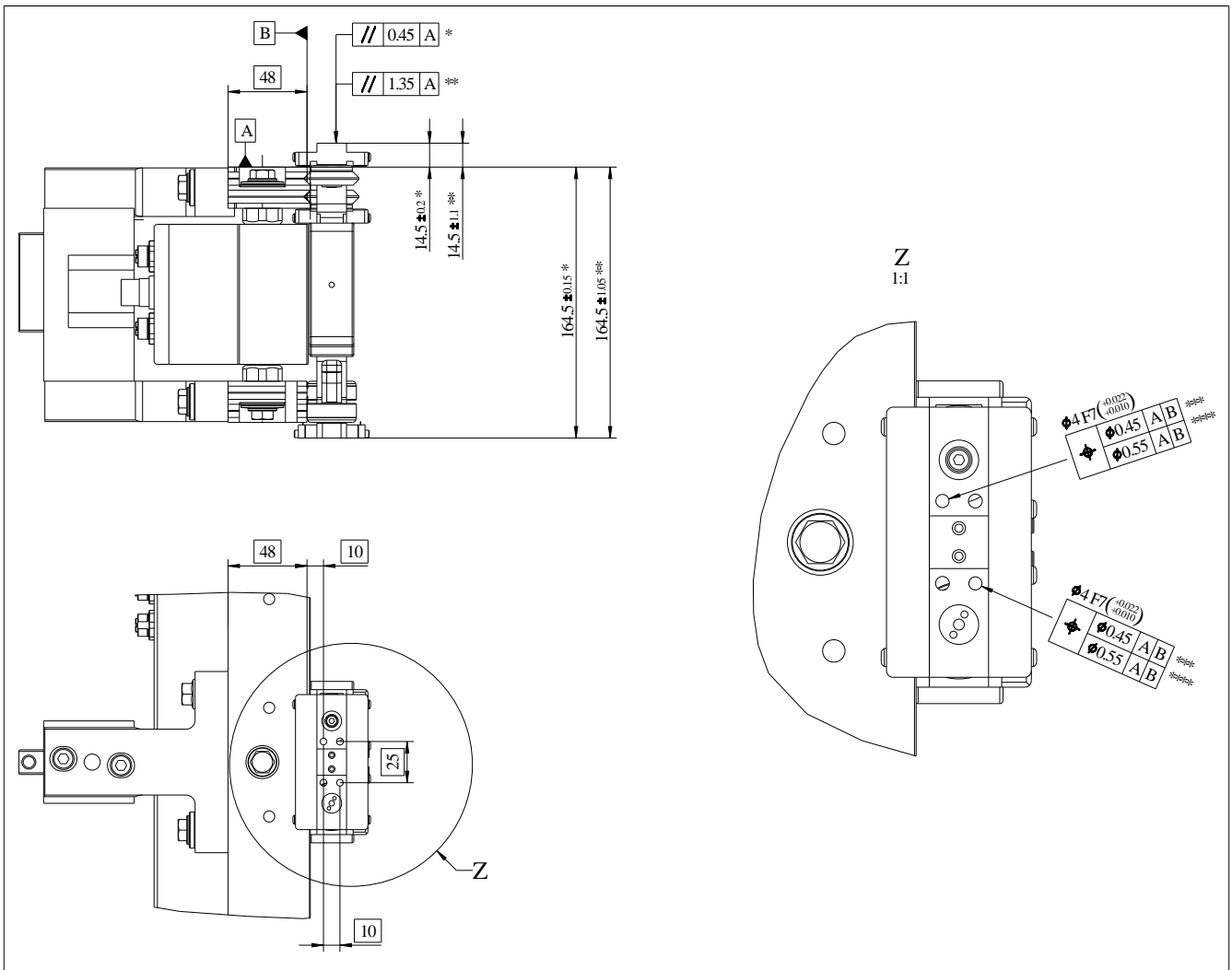


Figure 56: Positioning precision - 100 mm shuttle, suitable for diverters

- \* Local shuttle guide rail reference (related to the position of the guide rail in the current position)
- \*\* Total shuttle guide rail reference (related to the total position of the guide rail in the section of a straight guide unit)
- \*\*\* At recommended wheel wear limit: 0.15 mm in diameter
- \*\*\*\* At absolute lower wear limit: 0.25 mm in diameter

Detail Z: All values also apply to both shuttle interfaces.

Reference B: Running surface of the flat guide rail and neutral plane of the double-v guide rail

### 3.7.6 8F1SA.203.10000I-1

#### 3.7.6.1 General information

This shuttle is not suitable for diverters. Mounting options for payloads are provided on the top, front and bottom side. The 100 mm shuttle has a higher typical payload than the 50 mm shuttle.

### 3.7.6.2 Order data

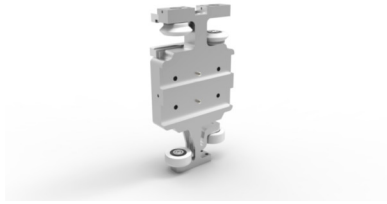
Order number	Short description	Figure
	Standard shuttles	
8F1SA.203.10000I-1	ACOPOStrak shuttle A, 100 mm wide, not suitable for diverters, 1 pc.	
8F1SA.203.10000X-1	ACOPOStrak shuttle A, 100 mm wide, not suitable for diverters, 10 pcs. 8F1SA.203.10000I-1	
	Optional accessories	
	Shuttles	
8F1SAP.ASB001002-1	ACOPOStrak shuttle A, 10 anti-static brushes	
8F1SAP.FW0001002-1	ACOPOStrak shuttle A, 2 flat wheels with bearing	
8F1SAP.GD100P00I-1	ACOPOStrak shuttle glider, 100 mm, 2 pieces	
8F1SAP.GD100P00X-1	ACOPOStrak shuttle glider, 100 mm, 10 pieces	
8F1SAP.LF0001002-1	ACOPOStrak shuttle A, 10 replacement lubrication felts	
8F1SAP.PC000000X-1	ACOPOStrak shuttle replacement magnetic cover plates, 10 pcs.	
8F1SAP.SC100C00X-1	ACPtrak shuttle cover, 100 mm, 10 pieces	
8F1SAP.VW0001002-1	ACOPOStrak shuttle A, 2 v-wheels with bearing	

Table 107: 8F1SA.203.10000I-1, 8F1SA.203.10000X-1 - Order data

## Information:

**ACOPOStrak shuttle cover, 100 mm (8F1SAP.SC100C00X-1) is only compatible with revisions A0 and A1.**

### 3.7.6.3 Technical data

Order number	8F1SA.203.10000I-1
Motor characteristics <sup>1)2)3)</sup>	
Maximum propulsion force	170 N
Maximum speed <sup>4)</sup>	5 m/s
Accuracy in direction of movement <sup>5)6)7)8)</sup>	
Repeat accuracy of single shuttle <sup>9)</sup>	
Interface on top	±310 µm
Interface on bottom	±310 µm
Interface on side	±310 µm
Repeat accuracy of multiple shuttles	
Interface on top	±922 µm
Interface on bottom	±947 µm
Interface on side	±922 µm
Operating conditions	
Max. magnet temperature	60°C
Payload	
Typical <sup>10)11)</sup>	2 kg
Maximum <sup>10)11)12)</sup>	2 kg
Ambient conditions	
Temperature	
Operation	
Nominal	5°C to 40°C
Storage	-25°C to 55°C
Transport	-25°C to 60°C
Relative humidity	
Operation	5 to 85%, non-condensing
Storage	5 to 95%, non-condensing
Transport	5 to 95%, non-condensing
Mechanical properties	
Dimensions	
Length	98 mm
Height	179 mm
Depth	40.2 mm
Weight	0.8 kg

Table 108: 8F1SA.203.10000I-1 - Technical data

- 1) Magnetic air gap  $\delta_n$  of 2 mm
- 2) At 25°C ambient temperature.
- 3) Due to tolerances or other influencing factors, the values may be reduced by up to 10%.
- 4) The achievable speed depends on the center of gravity of the load and required shuttle acceleration and is determined by a detailed configuration of the system.
- 5) Limitations: The accuracy specification applies within a segment (30 mm from the segment edge) and no other shuttle (50 mm between shuttle bodies).
- 6) The reference on the segment is the center hole of the segment (mechanical fixed bearing).
- 7) Thermal compensation possible starting with mapp Motion V5.15 (release 2021-09-01).
- 8) Potentially ±300 µm depending on the thermal load of the segment and the position on the segment (distance to the mechanical fixed bearing)
- 9) For one side of the shuttle at a time. If a shuttle is rotated, it must be assessed as another shuttle.

## Technical data

- 10) The payload applies to a horizontal track layout.
- 11) The achievable payload depends on the center of gravity of the load and the required shuttle dynamics (speed and acceleration) and is determined by a detailed design of the system.
- 12) For higher payload requirements, contact your B&R representative.

### 3.7.6.4 Dimension diagram and installation dimensions

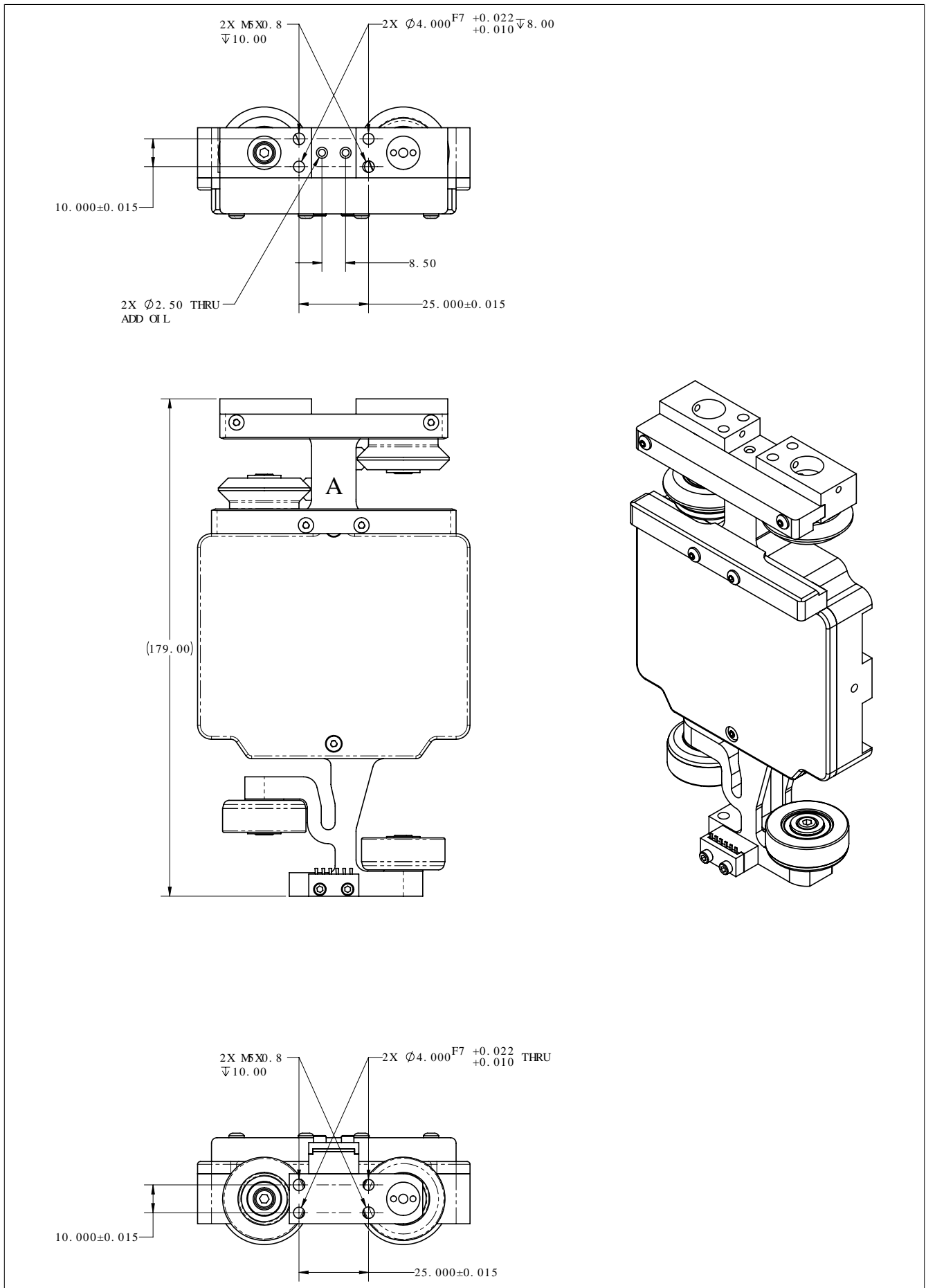


Figure 57: 8F1SA.203.10000I-1 - Dimension diagram

### 3.7.6.5 Force-velocity diagram

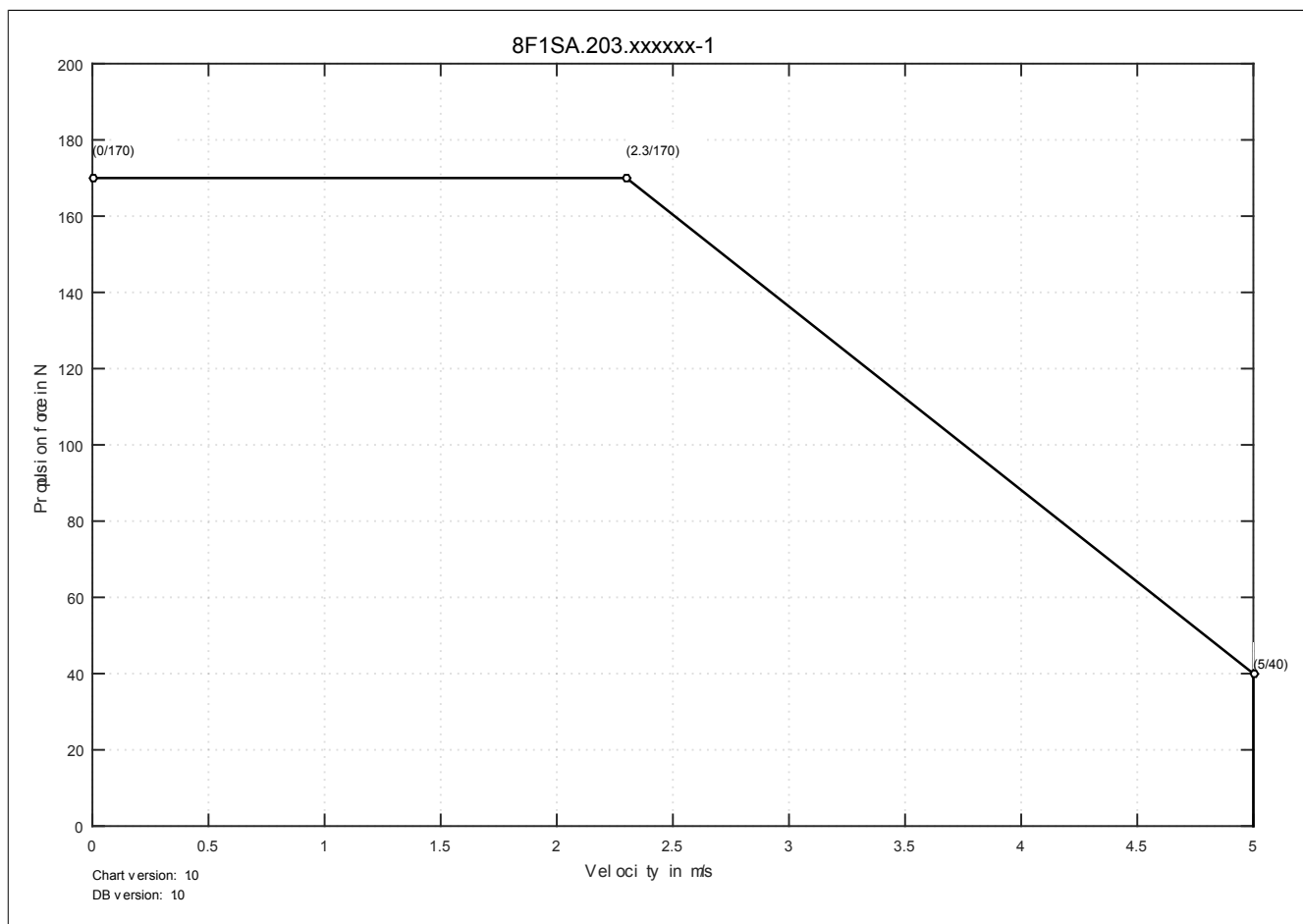


Figure 58: Force-velocity diagram for 8F1SA.203.xxxxxx-1

Propulsion force<sup>8)</sup> = Maximum propulsion force

<sup>8)</sup> Due to tolerances or other influencing factors, the values may be reduced by up to 10%.

### 3.7.6.6 Accuracy in relation to the guide system

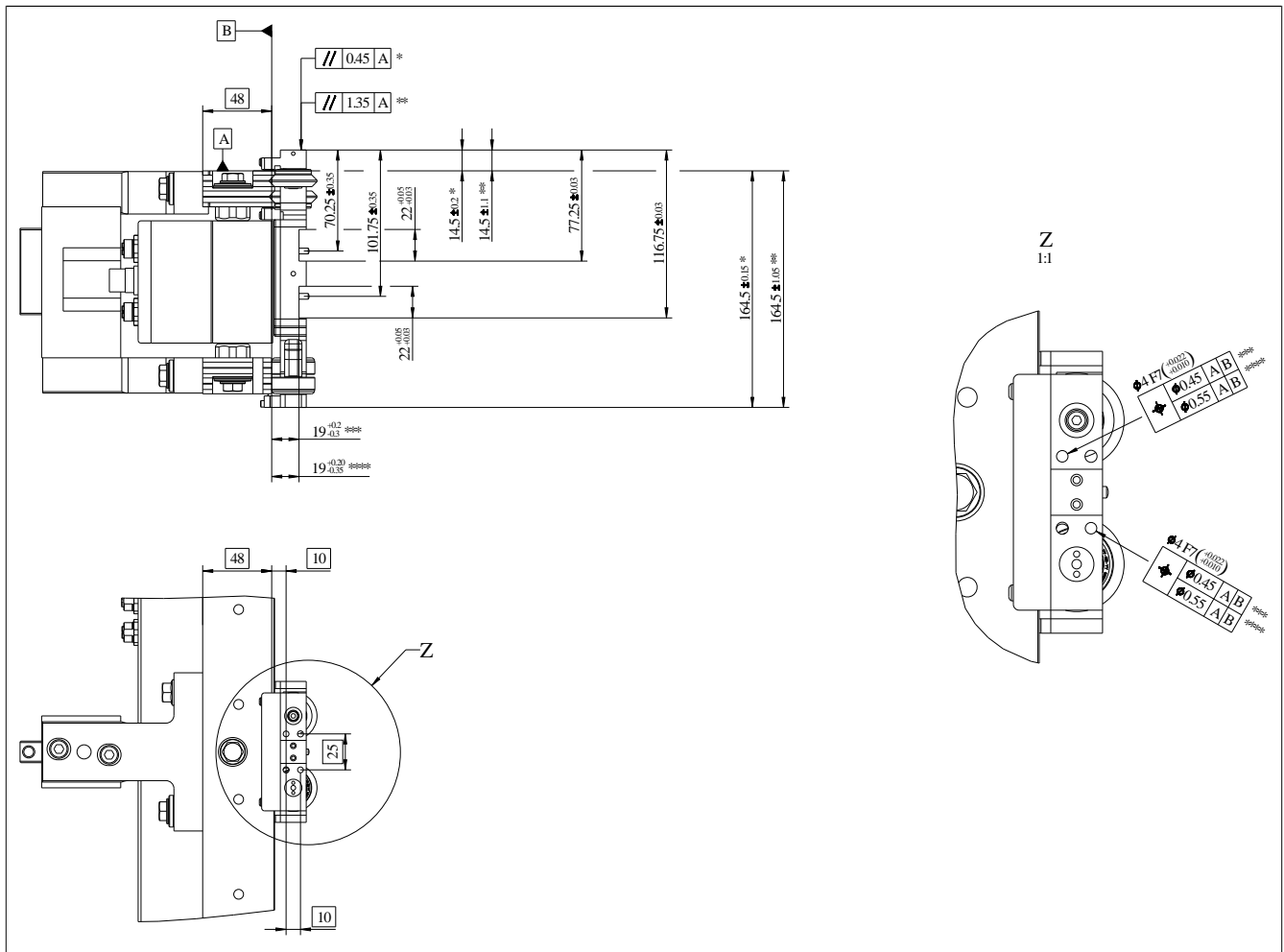


Figure 59: Positioning precision - 100 mm shuttle, not suitable for diverters

- \* Local shuttle guide rail reference (related to the position of the guide rail in the current position)
- \*\* Total shuttle guide rail reference (related to the total position of the guide rail in the section of a straight guide unit)
- \*\*\* At recommended wheel wear limit: 0.15 mm in diameter
- \*\*\*\* At absolute lower wear limit: 0.25 mm in diameter

Detail Z: All values also apply to both shuttle interfaces.

Reference B: Running surface of the flat guide rail and neutral plane of the double-v guide rail

## 3.8 Replacement parts list

### Shuttle replacement parts

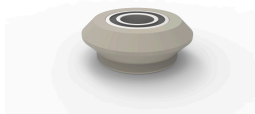
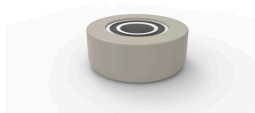




Material number	Component	Quantity per shuttle	Description
8F1SAP.VW0001002-1	V-wheel 	2x	2 v-wheel with 2 bearings and precision flat washer
8F1SAP.FW0001002-1	Flat wheel 	2x	2 flat wheel with 2 bearings and precision flat washer
8F1SAP.ASB001002-1	Antistatic brush 	Not suitable for diverters: 1x Suitable for diverters: 2x	10 pcs. The antistatic brush establishes electrical contact between the shuttle body and the guide rails of the track in order to dissipate the electrical charge that occurs.
8F1SAP.LF0001002-1	Lubrication felt 	2x	10 pcs. The lubrication felt absorbs the lubricant and serves to lubricate the guide rail and the V-wheels.
8F1SAP.SC050C00X-1	Shuttle cover 	Not suitable for diverters: 1x Suitable for diverters: 2x	10 pcs. Set for 10 shuttles that are not suitable for diverters or 5 shuttles that are suitable for diverters  The shuttle cover lies over the magnet unit.
8F1SAP.SC100C00X-1	Shuttle cover 	Not suitable for diverters: 1x Suitable for diverters: 2x	10 pcs. Set for 10 shuttles that are not suitable for diverters or 5 shuttles that are suitable for diverters  The shuttle cover lies over the magnet unit.

Table 109: Shuttle replacement parts






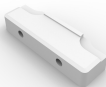
Material number	Component	Quantity per shuttle	Description
8F1SAP.GD050P00I-1	Shuttle glider for 50 mm shuttle, suitable for diverters Upper shuttle glider:	Upper shuttle glider: 1x Lower shuttle glider: 2x	4 pcs. lower glider, 2 pcs. upper glider Set for 2 shuttles  Shuttle gliders are used to support shuttle guidance. Screws are included in delivery.
	  Lower shuttle glider: 		
8F1SAP.GD050P00X-1			20 pcs. lower glider, 10 pcs. upper glider Set for 10 shuttles
8F1SAP.G0050P00I-1	Shuttle glider for 50 mm shuttle, not suitable for diverters Upper shuttle glider:	Upper shuttle glider: 1x Lower shuttle glider: 1x	2 pcs. lower glider, 2 pcs. upper glider Set for 2 shuttles  Shuttle gliders are used to support shuttle guidance. Screws are included in delivery.
	  Lower shuttle glider: 		
8F1SAP.G0050P00X-1			10 pcs. lower glider, 10 pcs. upper glider Set for 10 shuttles

Table 109: Shuttle replacement parts

Material number	Component	Quantity per shuttle	Description
8F1SAP.GD100P00I-1	Shuttle glider for 100 mm shuttle Upper shuttle glider:	Suitable for diverters: Upper glider 2x Lower glider 2x	2 pcs. lower glider, 2 pcs. upper glider Set for 2 shuttles that are not suitable for diverters or 1 shuttle that is suitable for diverters
	Lower shuttle glider:	Not suitable for diverters: Upper glider 1x Lower glider 1x	Shuttle gliders are used to support shuttle guidance. Screws are included in delivery.
8F1SAP.GD100P00X-1			10 pcs. lower glider, 10 pcs. upper glider Set for 10 shuttles that are not suitable for diverters or 5 shuttles that are suitable for diverters

Table 109: Shuttle replacement parts

### Information:

Only the replacement parts listed here are permitted to be replaced by the user, see 4 "Servicing and maintenance" on page 169.

In all other cases, the ACOPOStrak component must be sent to B&R for repair.

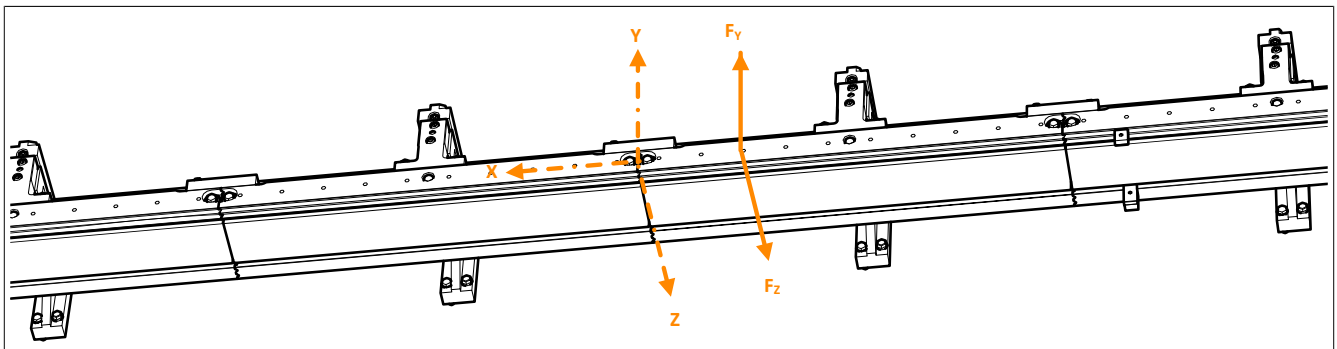
## 3.9 Additional loads on the guide system<sup>9)</sup>.

Maximum additional loads can be applied to the double-v guide rail or flat guide rail according to table "Max. force depending on contact point and contact direction" on page 140. The values are valid for a complete guide system with installed segments and guide connectors.

The guide units and guide stands must be installed to the left and right of the design area (no free end).

- ⇒ Design area from guide stand to guide stand: 660 mm
- ⇒ Valid per design area with load on double-v guide rail or flat guide rail.
- ⇒ Only static loads are permitted.

### 3.9.1 Forces


Figure 60: Forces  $F_z$ ,  $F_y$  on the guide system

Forces $F_z$ , $F_y$	X-offset of contact point	Contact direction	Max. force
Single load	-330 mm to +330 mm	Y or Z	±100 N
Double load	-330 mm to +330 mm, min. 198 mm force distance	Y or Z	2x ±100 N
Single load	-330 mm and 330 mm guide stands	Z (on the hole)	±100 N and ±100 N

Table 110: Max. force depending on contact point and contact direction

<sup>9)</sup> Applies only to horizontal track layout

### 3.9.2 Torques

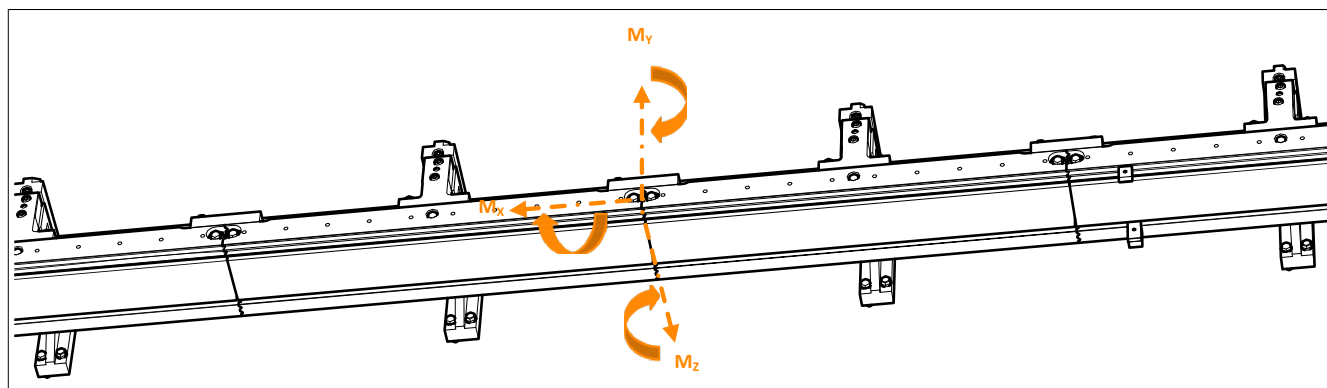


Figure 61: Torques  $M_x$ ,  $M_y$ ,  $M_z$  on the guide system

Torques $M_x$ , $M_y$ , $M_z$	X-offset of contact point	Contact direction	Max. torque
$M_x$	-330 mm to +330 mm	Around x-axis	$\pm 10$ Nm
$M_y$	-330 mm to +330 mm	Around y-axis	$\pm 10$ Nm
$M_z$	-330 mm to +330 mm	Around z-axis	$\pm 10$ Nm

Table 111: Max. torque depending on contact point and contact direction

### 3.9.3 Equal loads

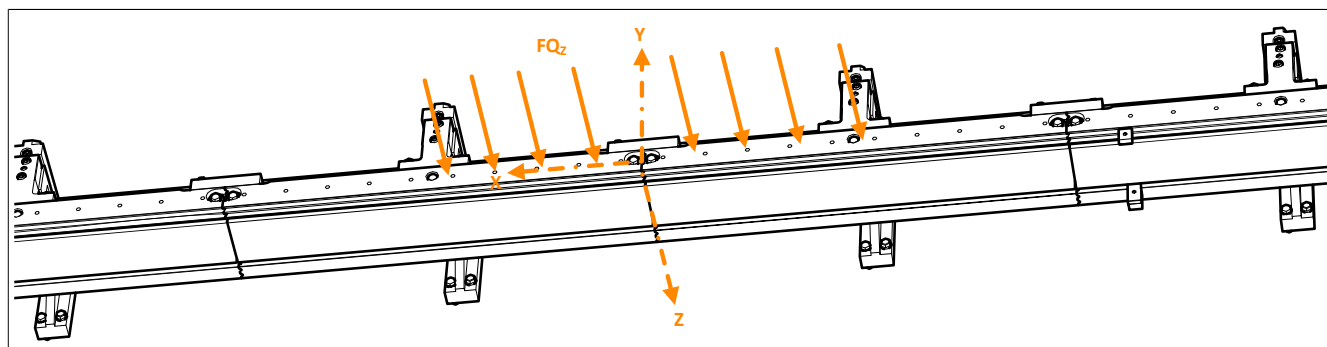


Figure 62: Equal loads  $FQ_z$  on the guide system

Equal loads	X-offset of load contact point	Contact direction	Max. load
$FQ_y$	-330 mm to +330 mm	Y	$\pm 0.24$ N/mm
$FQ_z$	-330 mm to +330 mm	Z	$\pm 0.24$ N/mm

Table 112: Max. equal load depending on load contact area and contact direction

### 3.10 Process forces on the shuttle

Process forces	Horizontal		Dynamic	
Shuttle, 50 mm	Max. 400 N (to the segment) (positive y-direction only)	In the permissible force contact area (A) of the shuttle (as per sketch)	Max. 200 N	In the permissible force contact area (A) of the shuttle (as per sketch)
Shuttle, 100 mm	Max. 200 N		Max. 100 N	

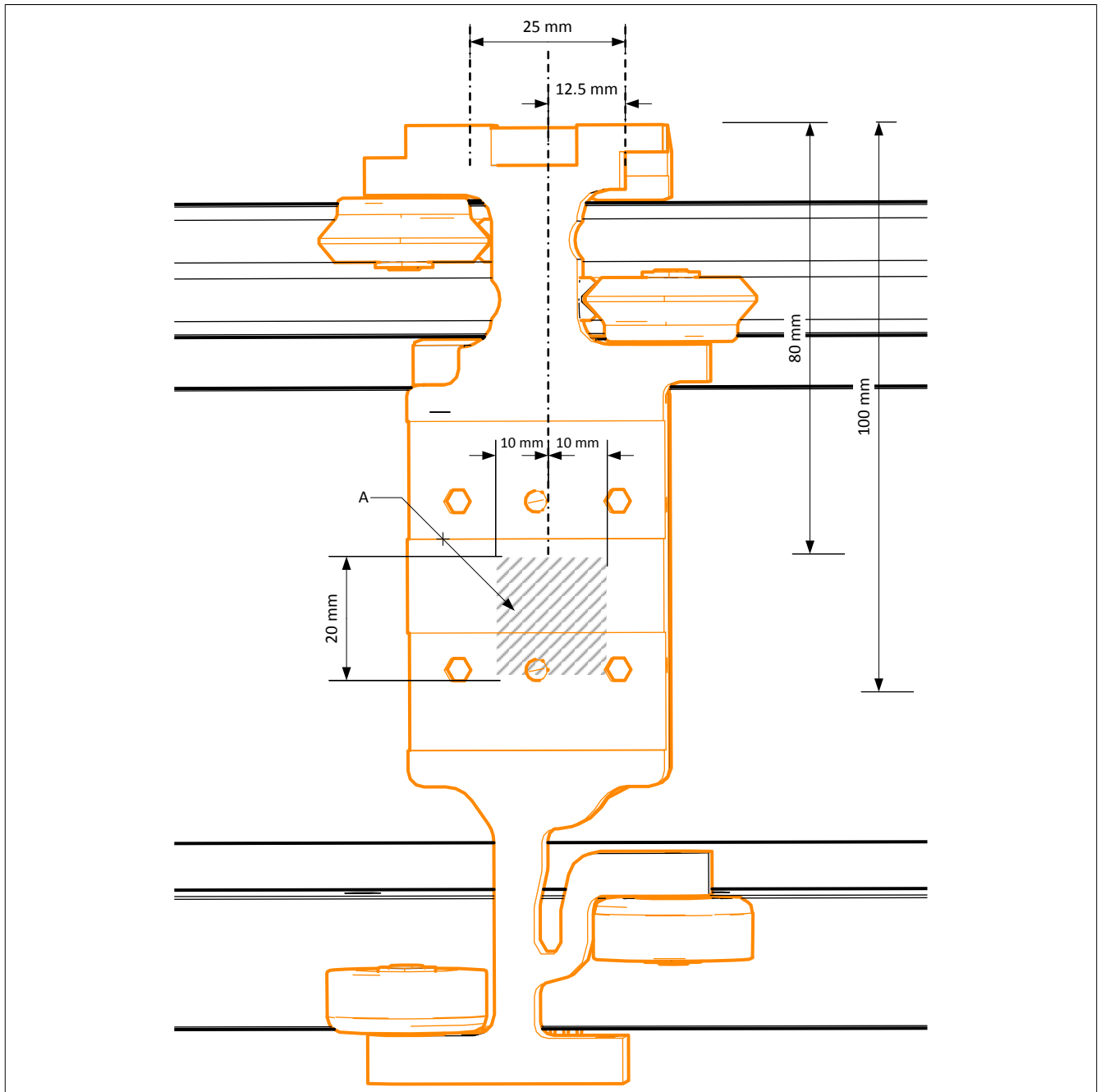


Figure 63: Permissible force contact area (A) of the process force on the shuttle (50 mm, 100 mm)

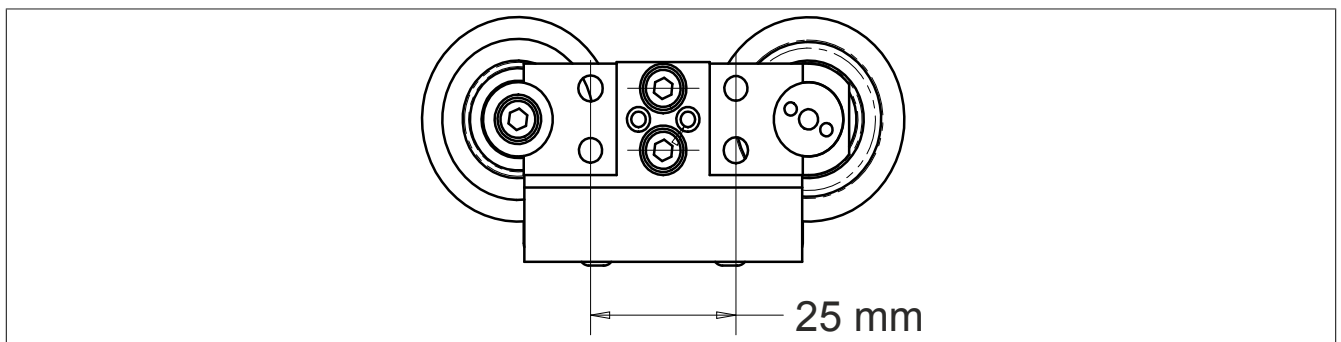


Figure 64: Shuttle - Top view

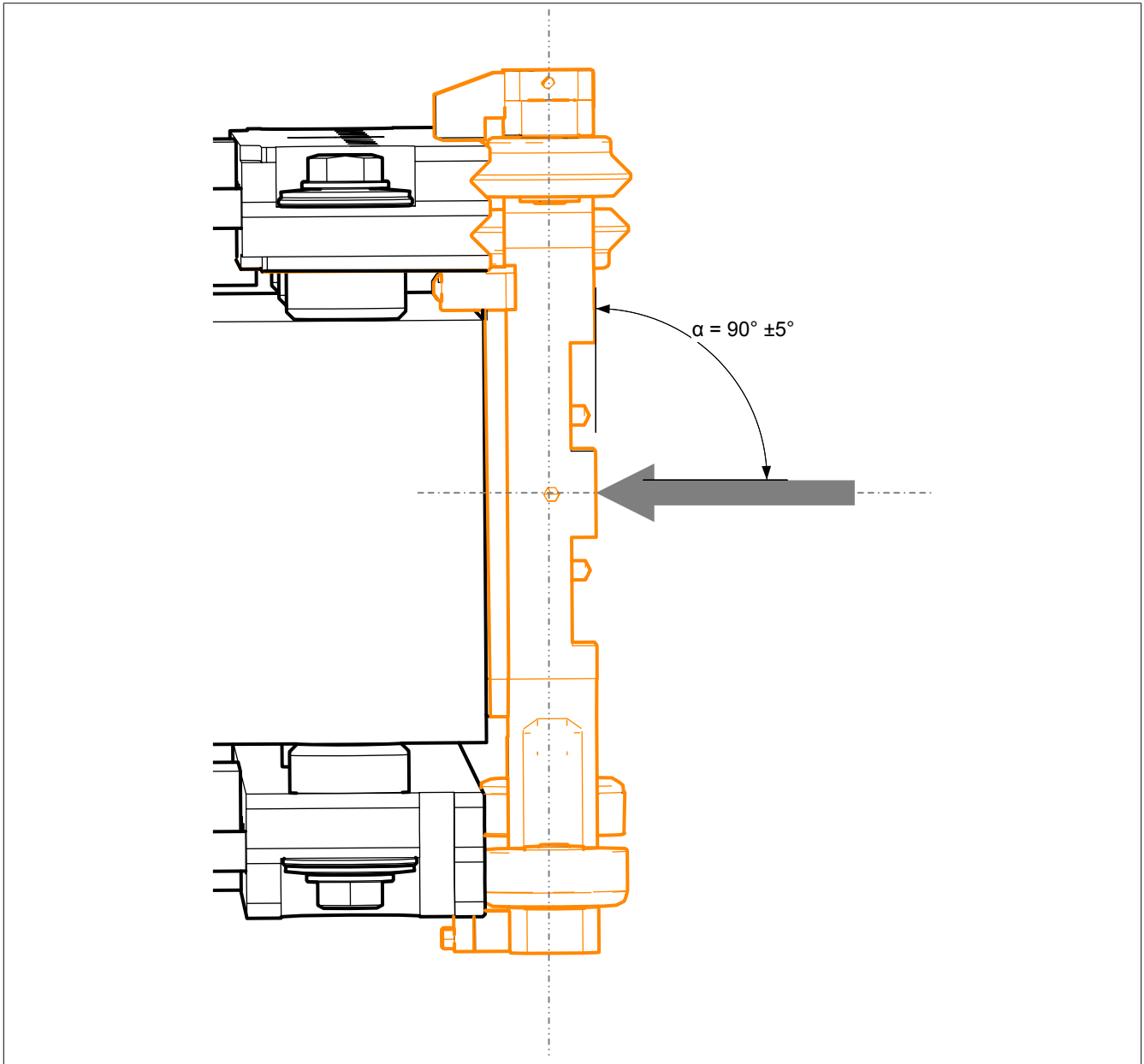
**Permissible force contact direction of the process force on the shuttle**

Figure 65: Permissible force contact direction of the process force on the shuttle (50 mm, 100 mm)

### 3.11 Tools

The following ACOPOStrak tools are available to support the assembly and alignment of the ACOPOStrak guide system.

Order number	Short description	Page
8F1TCA.DCB00000I-1	ACOPOStrak 2x 3 adjustment and control blocks for the diverter gap	161
8F1TCA.DCBT0000I-1	ACOPOStrak calibration block for height offset / calibration for diverter gap calipers	163
8F1TCA.DCDG0000I-1	ACOPOStrak calipers for diverter gap	165
8F1TCA.DHOMD000I-1	ACOPOStrak measuring device for determining the height offset of opposing double-v guide rails in the diverter area	156
8F1TCA.DSAT0000I-1	ACOPOStrak adjustment tool for precisely positioning segments horizontally in guide elements	154
8F1TCA.GAS00000I-1	ACOPOStrak assembly support, adjustable	153
8F1TCA.GAT01000I-1	ACOPOStrak alignment tool for guide element, 180° / guide element, 135°	148
8F1TCA.GAT02000I-1	ACOPOStrak alignment tool for guide element, 90° / guide element, 45° / guide element, straight	150
8F1TCA.GATST000I-1	ACOPOStrak alignment tool for guide stands	167
8F1TCA.GHAT0000I-1	ACOPOStrak height adjustment tool for accessory stands	152
8F1TCA.GMS00000I-1	ACOPOStrak measuring shuttle for guide rail transition	145
8F1TCA.SPTB0000I-1	ACOPOStrak pin-type bit for assembling/disassembling shuttle wheels	158
8F1TCA.SWGS0000I-1	ACOPOStrak wear gauge set: 1x v-wheel wear gauge, 1x flat wheel wear gauge	159

### 3.11.1 8F1TCA.GMS00000I-1

#### 3.11.1.1 General information

The measuring shuttle is used to check and measure the offset at the guide rail transition of the double-v guide rail and flat guide rail. Two steel v-wheels and one steel flat wheel are assembled on the measuring shuttle.

Three options for fastening digital dial gauges are located on the side of the measuring shuttle. An additional spacer clamp is used for each dial gauge to hold back the probe tip of the dial gauge probe when assembled on the track system.

The dial gauges require a measuring span of 12.5 mm and an accuracy of 0.01 mm. The clamping diameter must be 8 mm.

#### 3.11.1.2 Order data


Order number	Short description	Figure
	<b>Tools</b>	
8F1TCA.GMS00000I-1	ACOPOStrak measuring shuttle for guide rail transition	
	<b>Included in delivery</b>	
	<b>Accessorie</b>	
8F1TCA.DI300000I-1	Mitutoyo dial gauge 12.7 mm, readout 0.01, 3 pcs.	

Table 113: 8F1TCA.GMS00000I-1 - Order data

3x dial gauge (8F1TCA.DI100000I-1) optionally included in delivery.

(observe the notes in the information sheet)

Delivery state: Handle not assembled and magnet cover plate on magnet unit

When using the ACOPOStrak measuring shuttle, the supplied handle must be used.

#### 3.11.1.3 Technical data

Order number	8F1TCA.GMS00000I-1
<b>Ambient conditions</b>	
Temperature	
Operation	5 to 40°C
Storage	-10 to 55°C
Transport	-10 to 60°C
<b>Mechanical properties</b>	
Dimensions	
Width	127.3 mm
Height	181.8 mm
Depth	165.3 mm
Weight	1.2 kg

Table 114: 8F1TCA.GMS00000I-1 - Technical data

### 3.11.1.4 Dimension diagram and installation dimensions

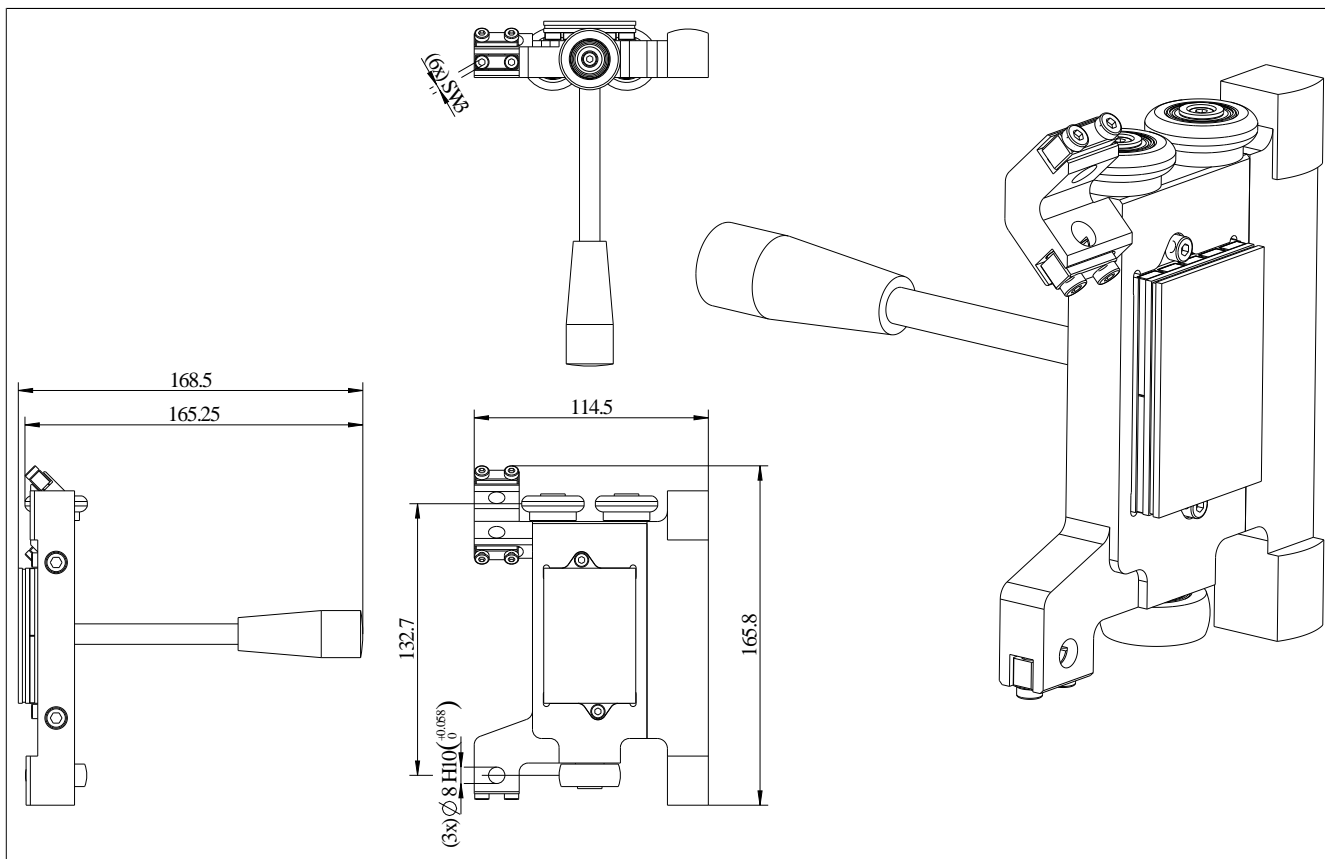
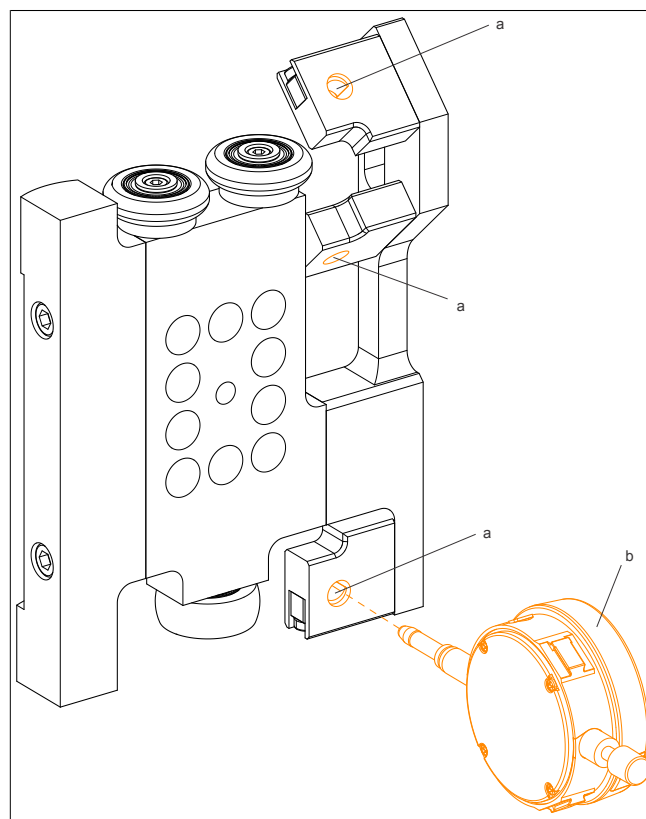


Figure 66: 8F1TCA.GMS00000I-1 - Dimension diagram

### 3.11.1.5 Installing the dial gauges

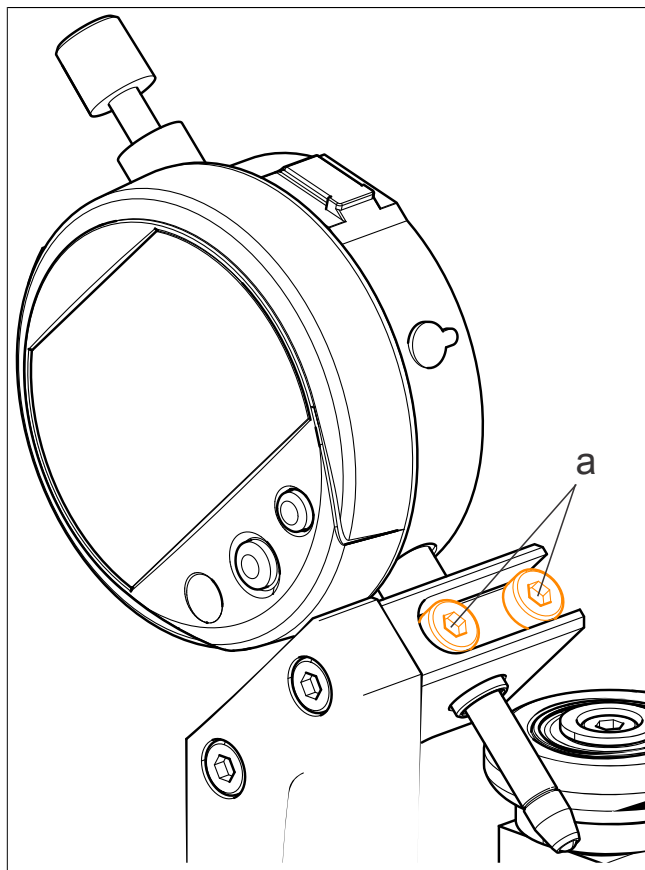
Observe the operating instructions of the dial gauge!

1. Install the dial gauges ((b), with attached spacer clamps) in the designated mounting holes (a) of the measuring shuttle. Turn the dial gauge (b) so it can be read comfortably.





2. Clamp the dial gauge with the hex socket screws (a) of the clamping device.



### 3.11.2 8F1TCA.GAT01000I-1

#### 3.11.2.1 General information

The 180°/135° alignment tool enables precise alignment of the 180° and 135° guide elements (with segments). Simultaneous alignment in several directions is possible with the option of placing two spirit levels.

2x horizontal spirit level (DIN 877) with an accuracy of 0.04 mm/m, length of 200 mm and width of 40 mm is required.

The alignment tool is only permitted to be used for the horizontal mounting orientation of a track.

The alignment tool must be stored and transported in such a way that no external mechanical influences can act on it.

#### Notice!

**The tool is calibrated. Screws are not permitted to be loosened.**

#### 3.11.2.2 Order data


Order number	Short description	Figure
	<b>Tools</b>	
8F1TCA.GAT01000I-1	ACOPOStrak alignment tool for guide element, 180° / guide element, 135°	
	<b>Included in delivery</b>	
	<b>Accessorie</b>	
8F1TCA.SL200000I-1	Spirit level, 0.04 mm/m. 200 mm, 2 pcs.	

Table 115: 8F1TCA.GAT01000I-1 - Order data

2x horizontal precision spirit level (8F1TCA.SL100000I-1) per DIN 877 optionally included in delivery.

(observe the notes in the information sheet)

#### 3.11.2.3 Technical data

Order number	8F1TCA.GAT01000I-1
<b>Ambient conditions</b>	
Temperature	
Operation	15 to 25°C
Storage	-25 to 55°C
Transport	-25 to 70°C
<b>Mechanical properties</b>	
Dimensions	
Width	660 mm
Length	561 mm
Height	85 mm
Weight	6 kg

Table 116: 8F1TCA.GAT01000I-1 - Technical data

### 3.11.2.4 Dimension diagram and installation dimensions

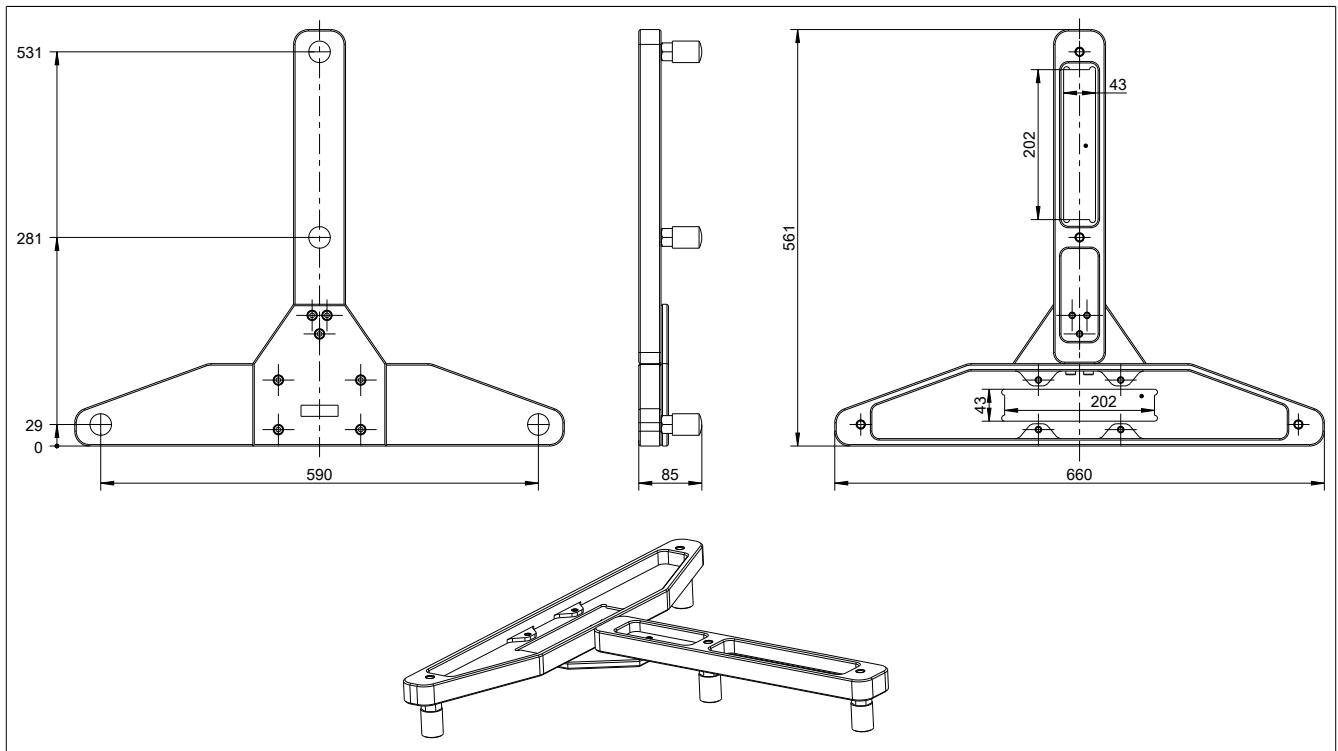


Figure 67: 8F1TCA.GAT01000I-1 - Dimension diagram

### 3.11.3 8F1TCA.GAT02000I-1

#### 3.11.3.1 General information

Guide elements (with segments) can be aligned 90°/45°/straight using the 90°/45°/straight alignment tool.

1x horizontal spirit level (DIN 877) with an accuracy of 0.04 mm/m, length of 200 mm and width of 40 mm is required.

The alignment tool is only permitted to be used for the horizontal mounting orientation of a track.

The alignment tool must be stored and transported in such a way that no external mechanical influences can act on it.

#### Notice!

**The tool is calibrated. Screws are not permitted to be loosened.**

#### 3.11.3.2 Order data

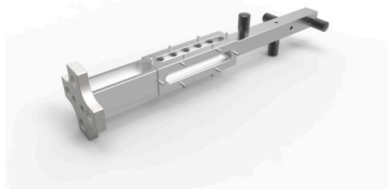
Order number	Short description	Figure
	<b>Tools</b>	
8F1TCA.GAT02000I-1	ACOPOStrak alignment tool for guide element, 90° / guide element, 45° / guide element, straight	
	<b>Included in delivery</b>	
	<b>Accessorie</b>	
8F1TCA.SL100000I-1	Spirit level, 0.04 mm/m. 200 mm, 1 pc.	

Table 117: 8F1TCA.GAT02000I-1 - Order data

1x horizontal precision spirit level (8F1TCA.SL100000I-1) per DIN 877 optionally included in delivery.

(observe the notes in the information sheet)

#### 3.11.3.3 Technical data

Order number	8F1TCA.GAT02000I-1
<b>Ambient conditions</b>	
Temperature	
Operation	15 to 25°C
Storage	-25 to 55°C
Transport	-25 to 70°C
<b>Mechanical properties</b>	
Dimensions	
Width	152 mm
Length	700 mm
Height	152 mm
Weight	6.8 kg

Table 118: 8F1TCA.GAT02000I-1 - Technical data

### 3.11.3.4 Dimension diagram and installation dimensions

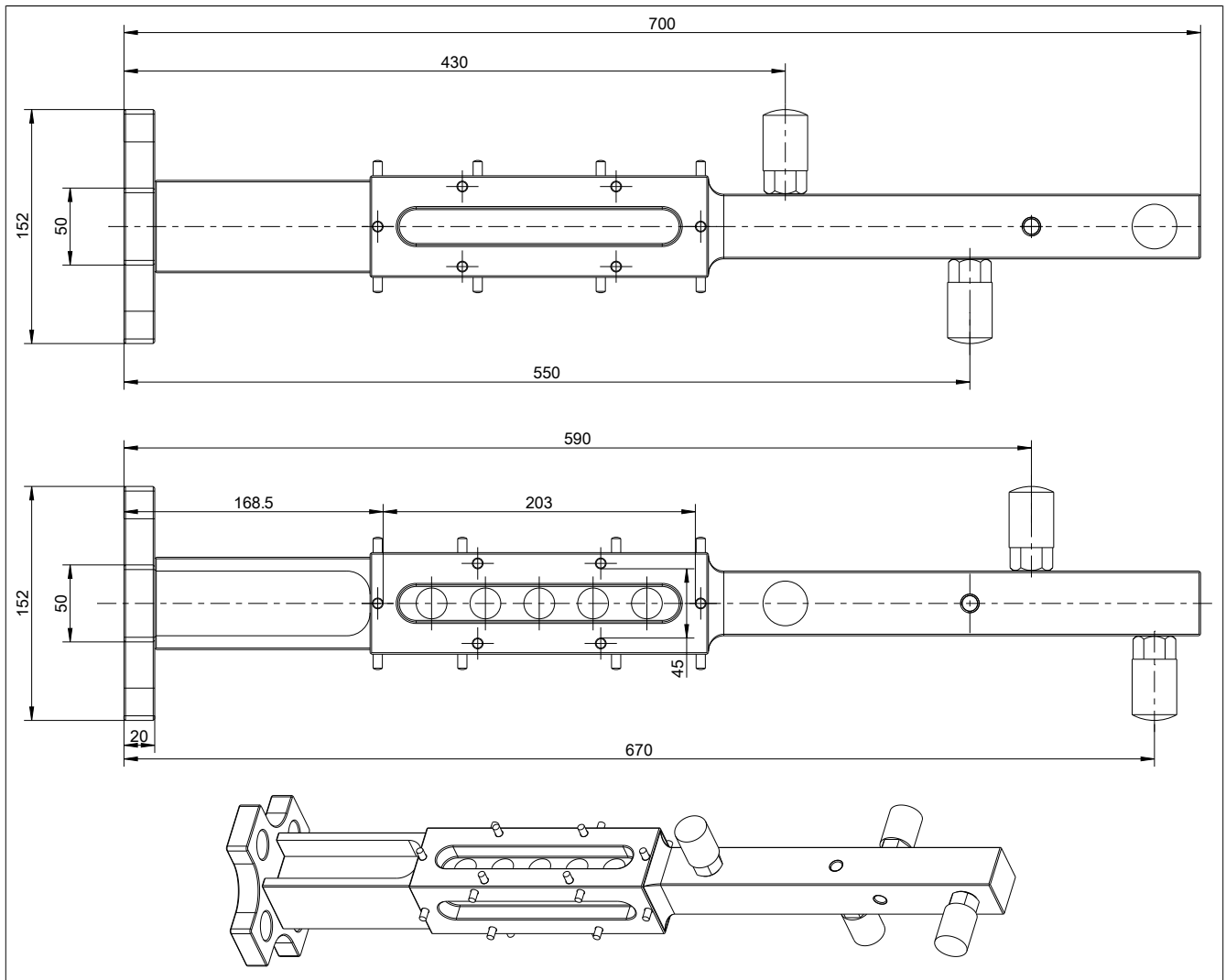


Figure 68: 8F1TCA.GAT02000I-1 - Dimension diagram

### 3.11.4 8F1TCA.GHAT0000I-1

#### 3.11.4.1 General information

This tool supports the height adjustment of the accessory stand.

#### 3.11.4.2 Order data

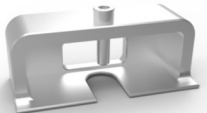
Order number	Short description	Figure
8F1TCA.GHAT0000I-1	ACOPOStrak height adjustment tool for accessory stands	

Table 119: 8F1TCA.GHAT0000I-1 - Order data

#### 3.11.4.3 Technical data

Order number	8F1TCA.GHAT0000I-1
<b>Ambient conditions</b>	
Temperature	
Operation	5 to 40°C
Storage	-25 to 55°C
Transport	-25 to 70°C
<b>Mechanical properties</b>	
Dimensions	
Width	142 mm
Height	53 mm
Depth	59 mm
Weight	Approx. 1.4 kg

Table 120: 8F1TCA.GHAT0000I-1 - Technical data

#### 3.11.4.4 Dimension diagram and installation dimensions

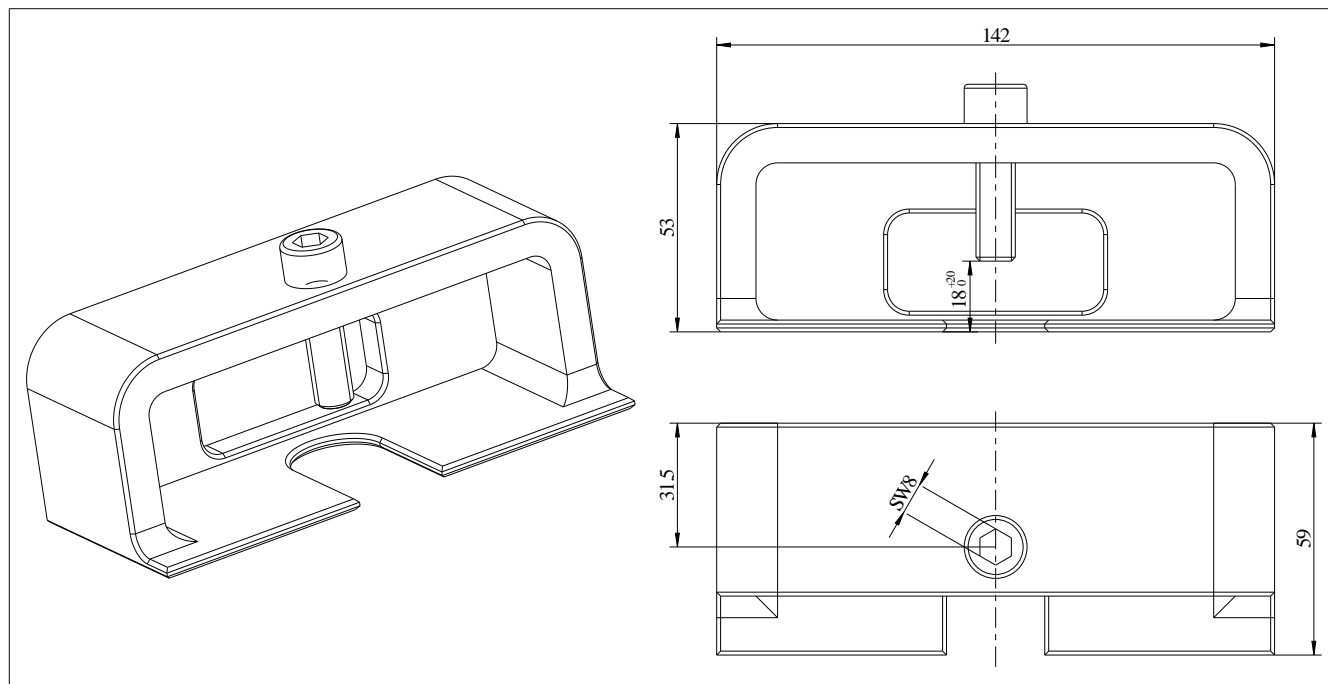


Figure 69: 8F1TCA.GHAT0000I-1 - Dimension diagram

### 3.11.5 8F1TCA.GAS00000I-1

#### 3.11.5.1 General information

The assembly support supports the flat guide rail when assembling the segments. The tool consists of two plastic parts and is height-adjustable (110 to 140 mm).

The assembly support is only permitted to be used for the horizontal mounting orientation of a track.

#### 3.11.5.2 Order data


Order number	Short description	Figure
	<b>Tools</b>	
8F1TCA.GAS00000I-1	ACOPOStrak assembly support, adjustable	

Table 121: 8F1TCA.GAS00000I-1 - Order data

#### 3.11.5.3 Technical data

Order number	8F1TCA.GAS00000I-1
<b>Ambient conditions</b>	
Temperature	
Operation	5 to 40°C
Storage	-25 to 55°C
Transport	-25 to 70°C
<b>Mechanical properties <sup>1)</sup></b>	
Dimensions	
Height	120 mm
Diameter	40 mm
Weight	0.2 kg

Table 122: 8F1TCA.GAS00000I-1 - Technical data

1) Max. load: 100 kg

#### 3.11.5.4 Dimension diagram and installation dimensions

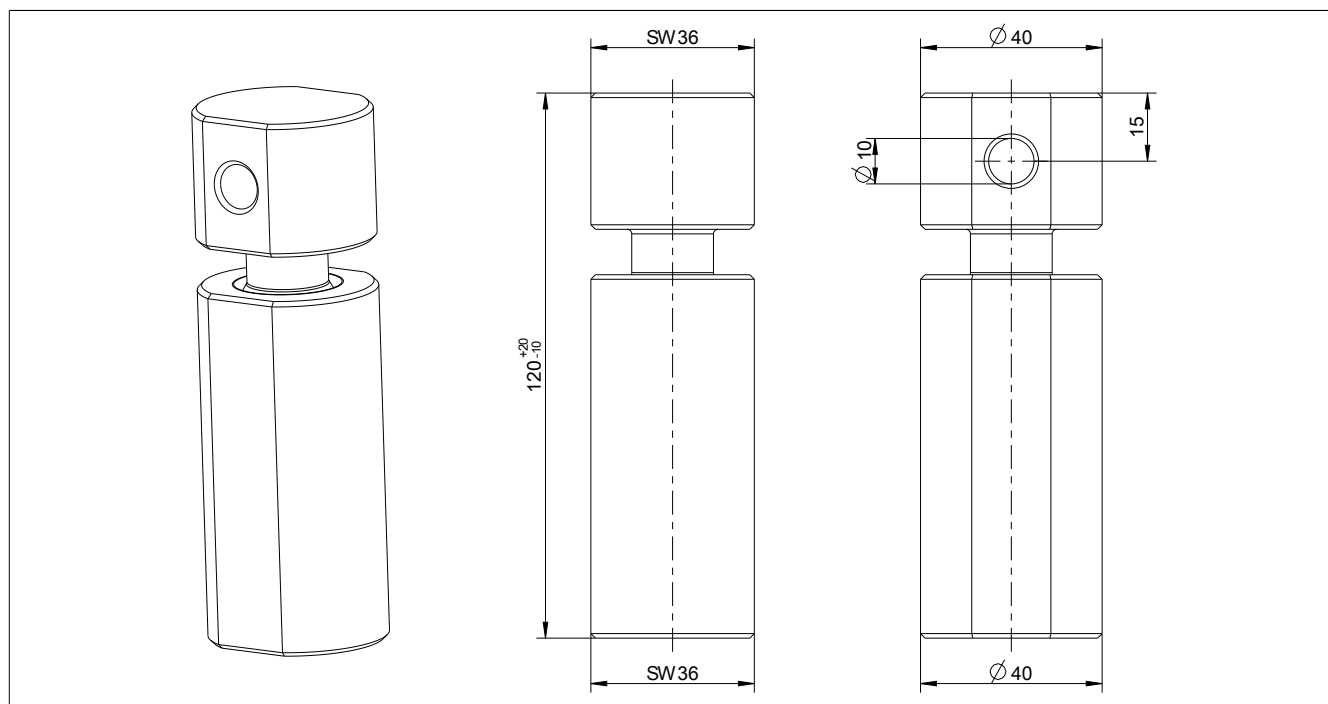


Figure 70: 8F1TCA.GAS00000I-1 - Dimension diagram

### 3.11.6 8F1TCA.DSAT0000I-1

#### 3.11.6.1 General information

This adjustment tool is used to precisely position segments horizontally in guide elements.

Two of these tools are required for the exact positioning of straight segments.

Adjustment range:  $\pm 1.5$  mm

#### 3.11.6.2 Order data


Order number	Short description	Figure
	<b>Tools</b>	
8F1TCA.DSAT0000I-1	ACOPOStrak adjustment tool for precisely positioning segments horizontally in guide elements	

Table 123: 8F1TCA.DSAT0000I-1 - Order data

#### 3.11.6.3 Technical data

Order number	8F1TCA.DSAT0000I-1
<b>Ambient conditions</b>	
Temperature	
Operation	5 to 40°C
Storage	-25 to 55°C
Transport	-25 to 70°C
<b>Mechanical properties</b>	
Dimensions	
Width	85 mm
Height	238.5 mm
Depth	152.6 mm
Weight	1 kg

Table 124: 8F1TCA.DSAT0000I-1 - Technical data



### 3.11.6.4 Dimension diagram and installation dimensions

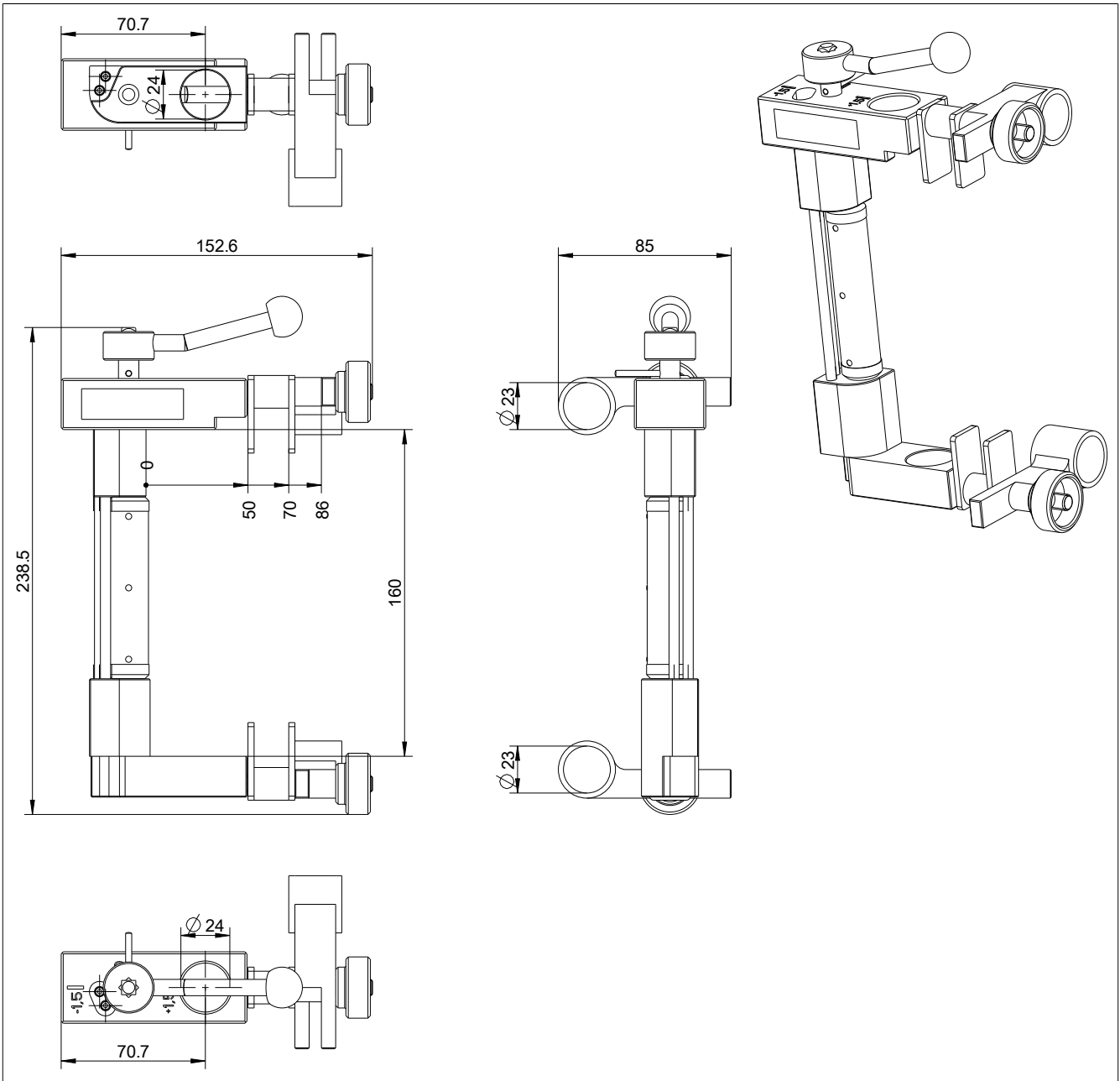


Figure 71: 8F1TCA.DSAT0000I-1 - Dimension diagram

### 3.11.7 8F1TCA.DHOMD000I-1

#### 3.11.7.1 General information

The height offset measuring device measures the height offset of opposing double-v guide rails in the diverter area. 8F1TCA.DCBT0000I-1 (calibration block for tools) is required to zero the tool.

The dial gauges require a measuring span of 12.5 mm and an accuracy of 0.01 mm. The clamping diameter must be 8 mm.

#### 3.11.7.2 Order data


Order number	Short description	Figure
	<b>Tools</b>	
8F1TCA.DHOMD000I-1	ACOPOStrak measuring device for determining the height offset of opposing double-v guide rails in the diverter area	
	<b>Included in delivery</b>	
	<b>Accessorie</b>	
8F1TCA.DI100000I-1	Mitutoyo dial gauge 12.7 mm, readout 0.01, 1 pc.	

Table 125: 8F1TCA.DHOMD000I-1 - Order data

1x dial gauge (8F1TCA.DI100000I-1) optionally included in delivery.

(observe the notes in the information sheet)

#### 3.11.7.3 Technical data

Order number	8F1TCA.DHOMD000I-1
<b>Ambient conditions</b>	
Temperature	
Operation	5 to 40°C
Storage	-10 to 55°C
Transport	-10 to 60°C
<b>Mechanical properties</b>	
Dimensions	
Width	30.8 mm
Height	67 mm
Depth	60 mm
Weight	0.6 kg

Table 126: 8F1TCA.DHOMD000I-1 - Technical data

### 3.11.7.4 Dimension diagram and installation dimensions

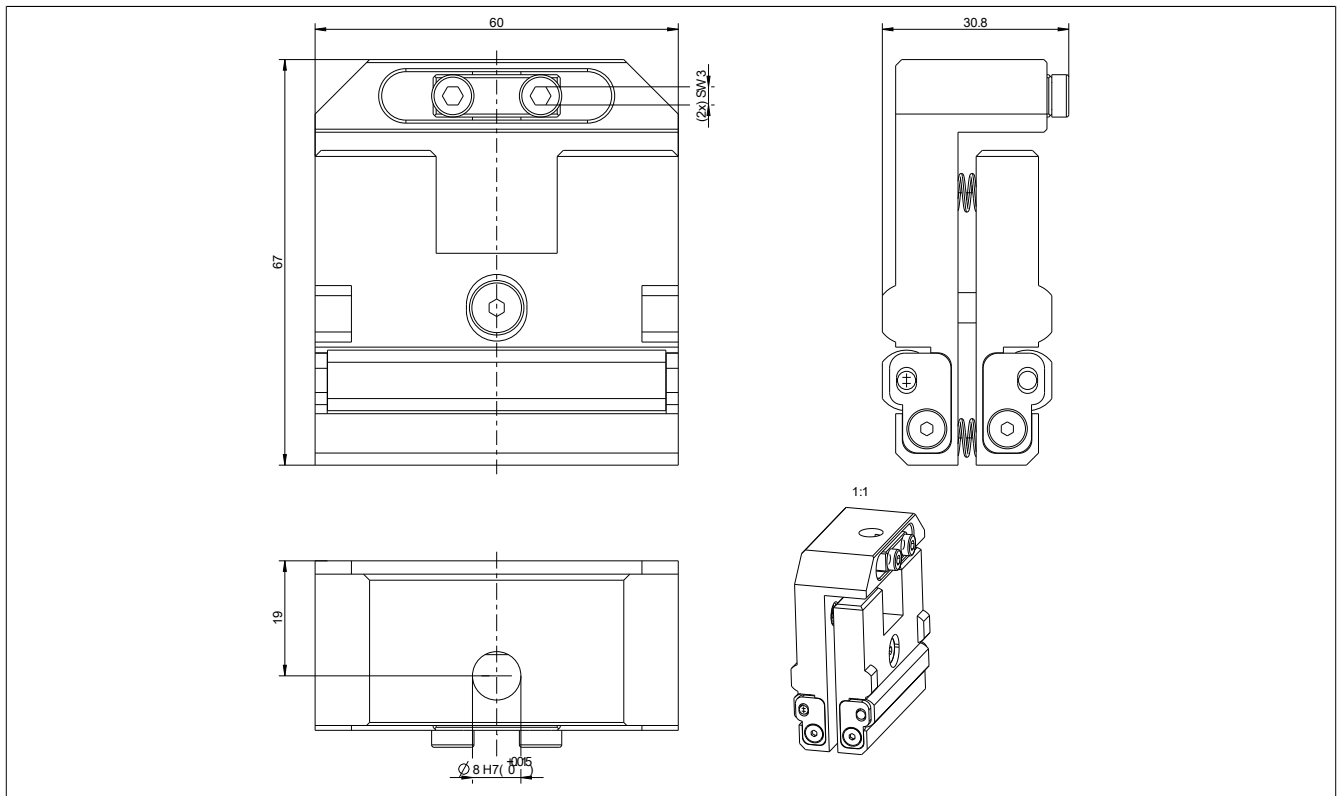
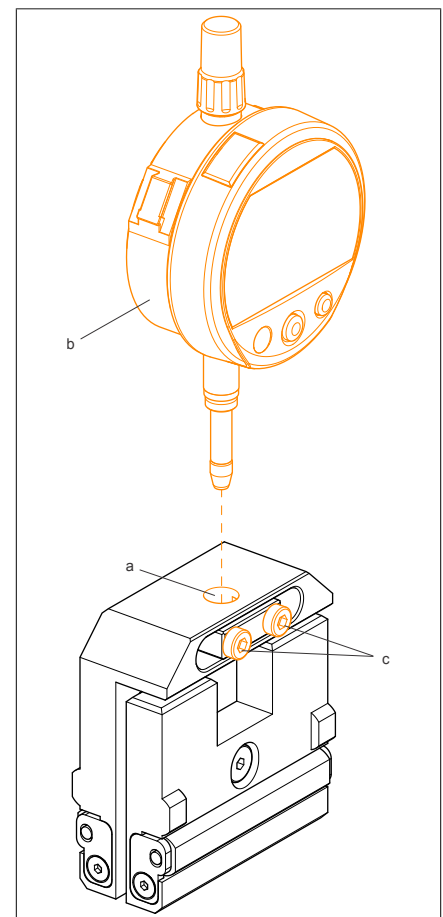


Figure 72: Dimension diagram for 8F1TCA.DHOMD000I-1

### 3.11.7.5 Installing the dial gauge

Observe the operating instructions of the dial gauge!

1. Install the dial gauge (b) in the designated mounting hole (a) of the height offset measuring device. Turn the dial gauge (b) so it can be read comfortably.
2. Clamp the dial gauge with the hex socket screws (c) of the clamping device.



### 3.11.8 8F1TCA.SPTB0000I-1

#### 3.11.8.1 General information

The ACOPOStrak pin-type bit is required for assembling/disassembling the shuttle wheels.

#### 3.11.8.2 Order data


Order number	Short description	Figure
8F1TCA.SPTB0000I-1	<b>Tools</b> ACOPOStrak pin-type bit for assembling/disassembling shuttle wheels	

Table 127: 8F1TCA.SPTB0000I-1 - Order data

#### 3.11.8.3 Technical data

Order number	8F1TCA.SPTB0000I-1
<b>Ambient conditions</b>	
Temperature	
Operation	5 to 40°C
Storage	-25 to 55°C
Transport	-25 to 70°C
<b>Mechanical properties</b>	
Dimensions	
Length	27.8 mm
Diameter	14 mm
Weight	0.02 kg

Table 128: 8F1TCA.SPTB0000I-1 - Technical data

#### 3.11.8.4 Dimension diagram and installation dimensions

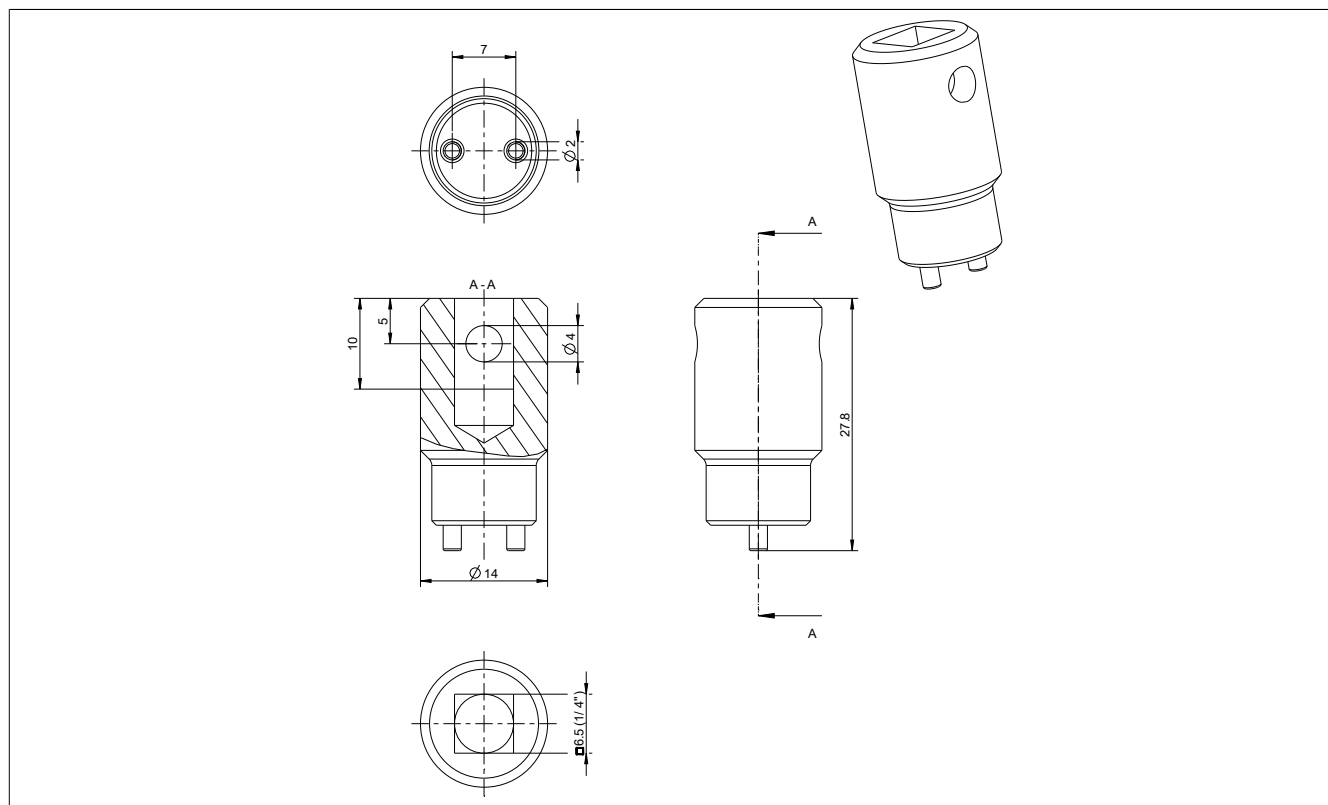


Figure 73: 8F1TCA.SPTB0000I-1 - Dimension diagram

### 3.11.9 8F1TCA.SWGS0000I-1

#### 3.11.9.1 General information

One wear gauge each serves to check the abrasion of the v-wheels and flat wheels.

Measurement range: 0 to 0.25 mm

#### 3.11.9.2 Order data

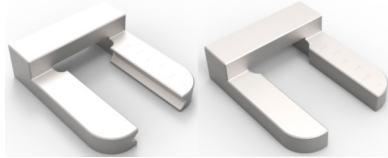
Order number	Short description	Figure
<b>Tools</b>		
8F1TCA.SWGS0000I-1	ACOPOStrak wear gauge set: 1x v-wheel wear gauge, 1x flat wheel wear gauge	

Table 129: 8F1TCA.SWGS0000I-1 - Order data

#### 3.11.9.3 Technical data

Order number	8F1TCA.SWGS0000I-1
<b>Ambient conditions</b>	
Temperature	
Operation	5 to 40°C
Storage	-25 to 55°C
Transport	-25 to 70°C
<b>Mechanical properties</b>	
Dimensions	
Width	60 mm
Length	71.5 mm
Height	10 mm
Weight	Approx. 0.5 kg

Table 130: 8F1TCA.SWGS0000I-1 - Technical data

#### 3.11.9.4 Dimension diagram and installation dimensions

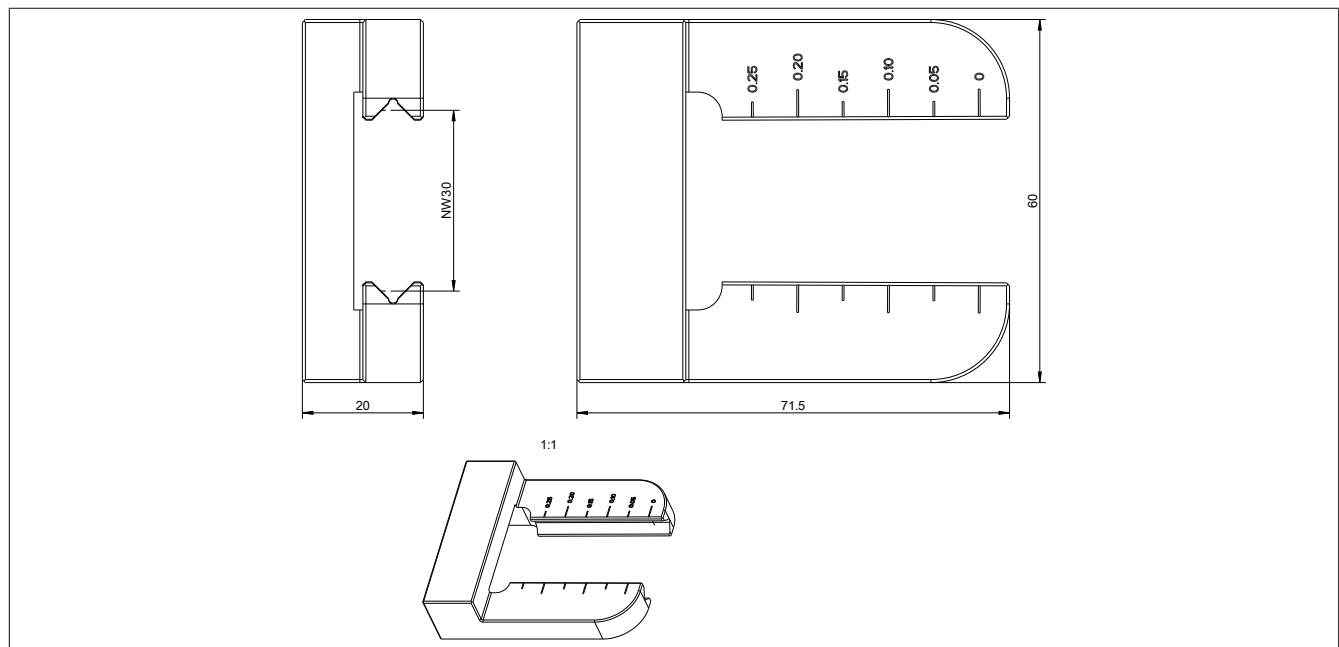


Figure 74: Dimension diagram for v-wheel 8F1TCA.SWGS0000I-1

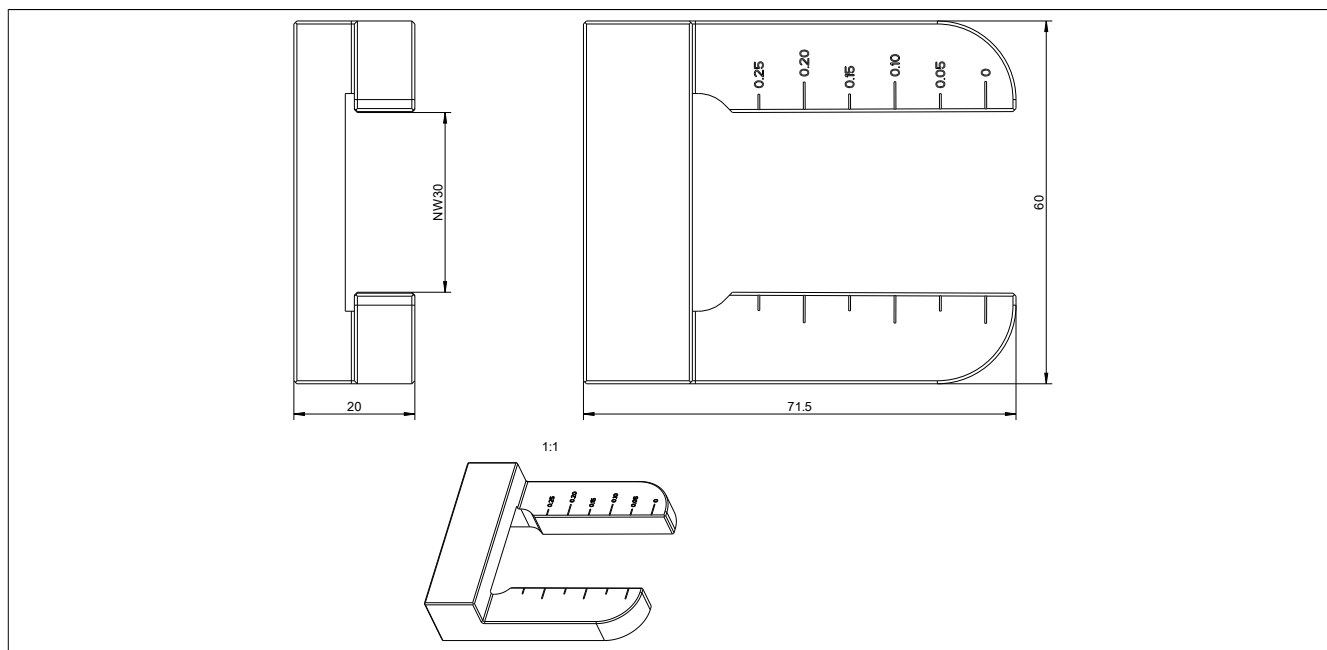


Figure 75: Dimension diagram for flat wheel 8F1TCA.SWGS0000I-1

### 3.11.10 8F1TCA.DCB00000I-1

#### 3.11.10.1 General information

The adjustment and control blocks are used to correctly adjust the diverter gap in the diverter area.

3x each for the double-v guide rail and 3x each for the flat guide rail in sizes 30.1 mm / 30.2 mm / 30.3 mm.

#### 3.11.10.2 Order data

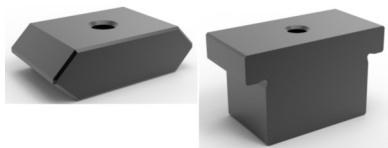
Order number	Short description	Figure
	<b>Tools</b>	
8F1TCA.DCB00000I-1	ACOPOStrak 2x 3 adjustment and control blocks for the diverter gap	

Table 131: 8F1TCA.DCB00000I-1 - Order data

#### 3.11.10.3 Technical data

Order number	8F1TCA.DCB00000I-1
<b>Ambient conditions</b>	
Temperature	
Operation	5 to 40°C
Storage	-25 to 55°C
Transport	-25 to 70°C
<b>Mechanical properties</b>	
Dimensions	
Width	30.1 mm 30.2 mm 30.3 mm
Height	25.5 mm 10 mm
Depth	20 mm
Weight	0.5 kg

Table 132: 8F1TCA.DCB00000I-1 - Technical data

### 3.11.10.4 Dimension diagram and installation dimensions

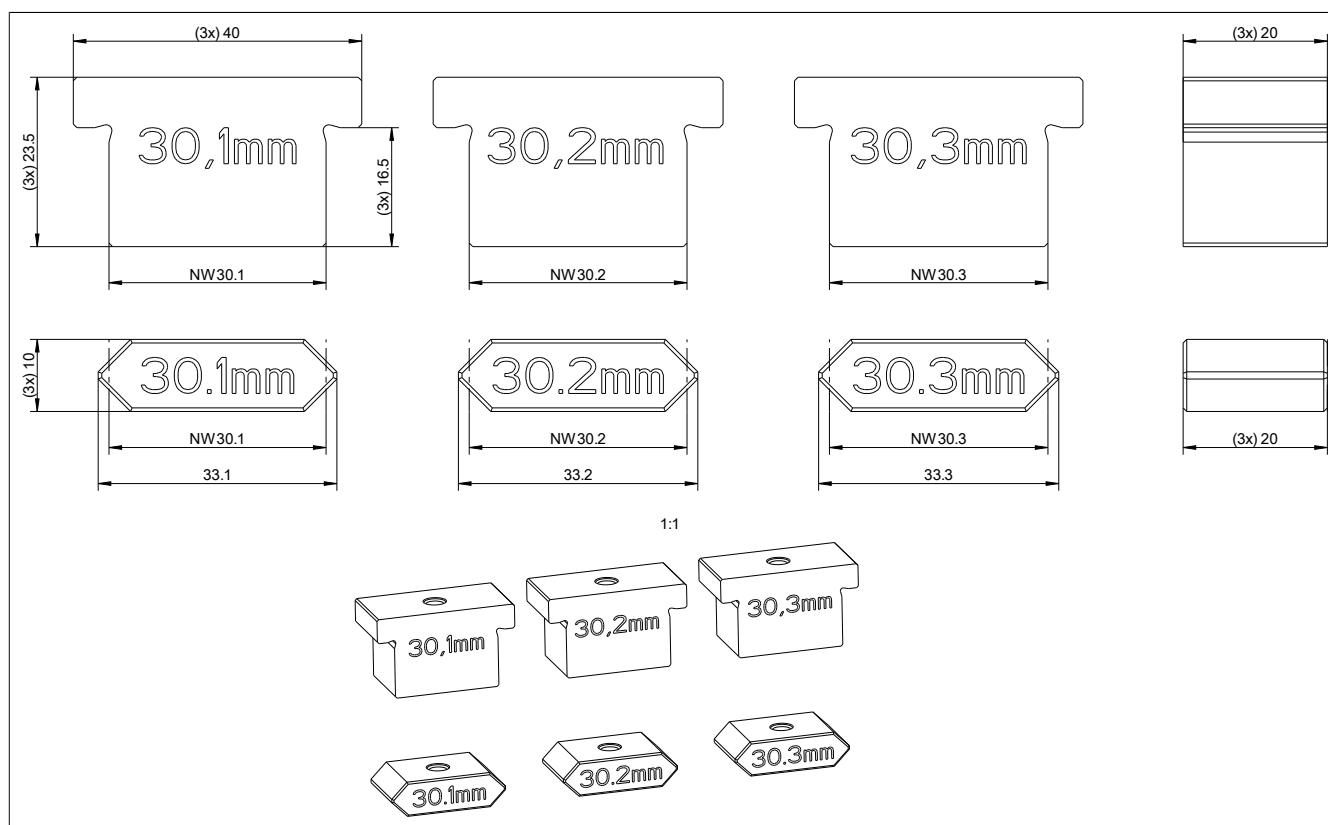


Figure 76: 8F1TCA.DCB00000I-1 - Dimension diagram



### 3.11.11 8F1TCA.DCBT0000I-1

#### 3.11.11.1 General information

The calibration block is required to calibrate (zero setting) the calipers for the diverter gap (8F1TCA.DCDG0000I-1) and the height offset measuring device (8F1TCA.DHOMD000I-1).

#### 3.11.11.2 Order data


Order number	Short description	Figure
	<b>Tools</b>	
8F1TCA.DCBT0000I-1	ACOPOStrak calibration block for height offset / calibration for diverter gap calipers	

Table 133: 8F1TCA.DCBT0000I-1 - Order data

#### 3.11.11.3 Technical data

Order number	8F1TCA.DCBT0000I-1
<b>Ambient conditions</b>	
Temperature	
Operation	5 to 40°C
Storage	-25 to 55°C
Transport	-25 to 70°C
<b>Mechanical properties</b>	
Dimensions	
Width	60 mm
Height	50 mm
Depth	60 mm
Weight	Approx. 0.4 kg

Table 134: 8F1TCA.DCBT0000I-1 - Technical data

### 3.11.11.4 Dimension diagram and installation dimensions

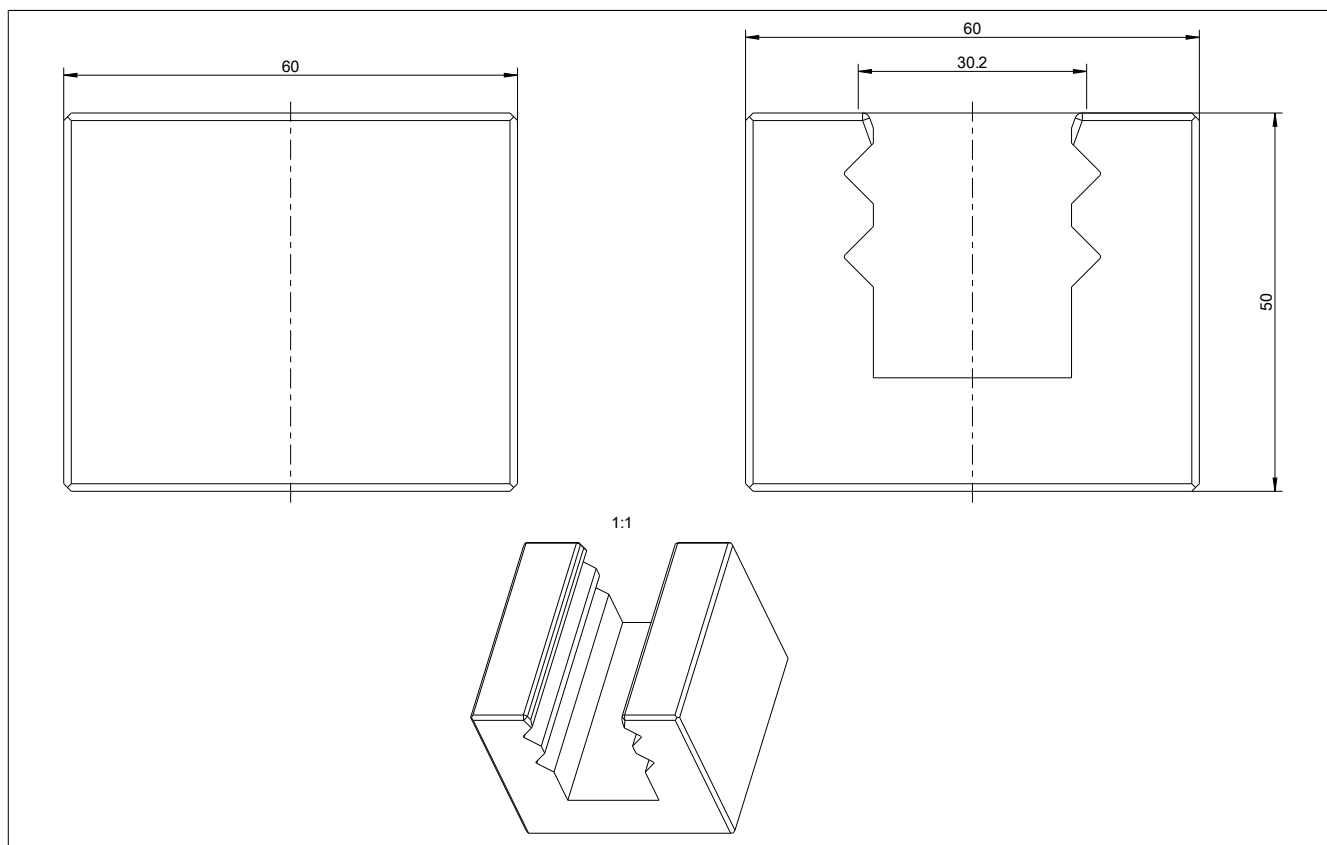


Figure 77: 8F1TCA.DCBT0000I-1 - Dimension diagram

### 3.11.12 8F1TCA.DCDG0000I-1

#### 3.11.12.1 General information

A slightly modified Kroeplin calipers is used to measure the diverter distance to the double-v guide rails (not suitable for the flat guide rail).

8F1TCA.DCBT0000I-1 (calibration block for tools) is required to zero the tool to 31.71 mm.

Measurement range: 25 to 45 mm

#### 3.11.12.2 Order data

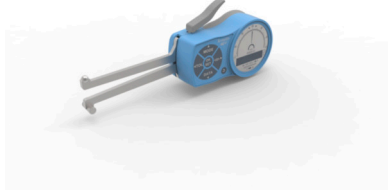
Order number	Short description	Figure
	<b>Tools</b>	
8F1TCA.DCDG0000I-1	ACOPOStrak calipers for diverter gap	

Table 135: 8F1TCA.DCDG0000I-1 - Order data

#### 3.11.12.3 Technical data

Order number	8F1TCA.DCDG0000I-1
<b>Ambient conditions</b>	
Temperature	
Operation	10 to 30°C
Storage	-10 to 50°C
Transport	-10 to 50°C
<b>Mechanical properties</b>	
Dimensions	
Length	200.3 mm
Height	80.8 mm
Depth	38.5 mm
Weight	0.27 kg

Table 136: 8F1TCA.DCDG0000I-1 - Technical data

### 3.11.12.4 Dimension diagram and installation dimensions

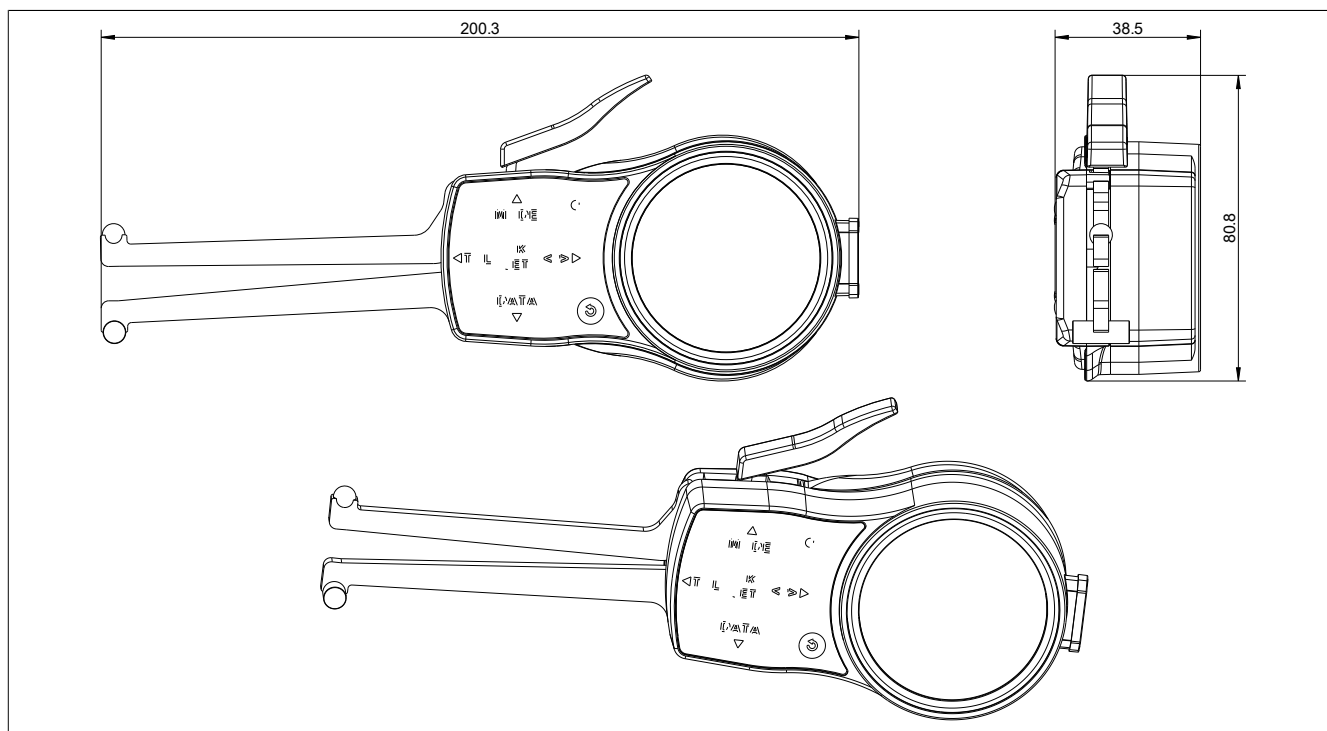


Figure 78: 8F1TCA.DCDG0000I-1 - Dimension diagram

### 3.11.13 8F1TCA.GATST000I-1

#### 3.11.13.1 General information

The ACOPOStrak alignment tool is used to check the alignment of the mounting surfaces for track systems without a stand or for track systems with a stand when the guide stand is removed.

#### 3.11.13.2 Order data


Order number	Short description	Figure
<b>Tools</b>		
8F1TCA.GATST000I-1	ACOPOStrak alignment tool for guide stands	

Table 137: 8F1TCA.GATST000I-1 - Order data

#### 3.11.13.3 Technical data

Order number	8F1TCA.GATST000I-1
Ambient conditions	
Temperature	
Operation	15 to 25°C
Storage	-25 to 55°C
Transport	-25 to 70°C
Mechanical properties	
Dimensions	
Width	110 mm
Height	130 mm
Depth	140 mm
Weight	0.6 kg

Table 138: 8F1TCA.GATST000I-1 - Technical data

### 3.11.13.4 Dimension diagram and installation dimensions

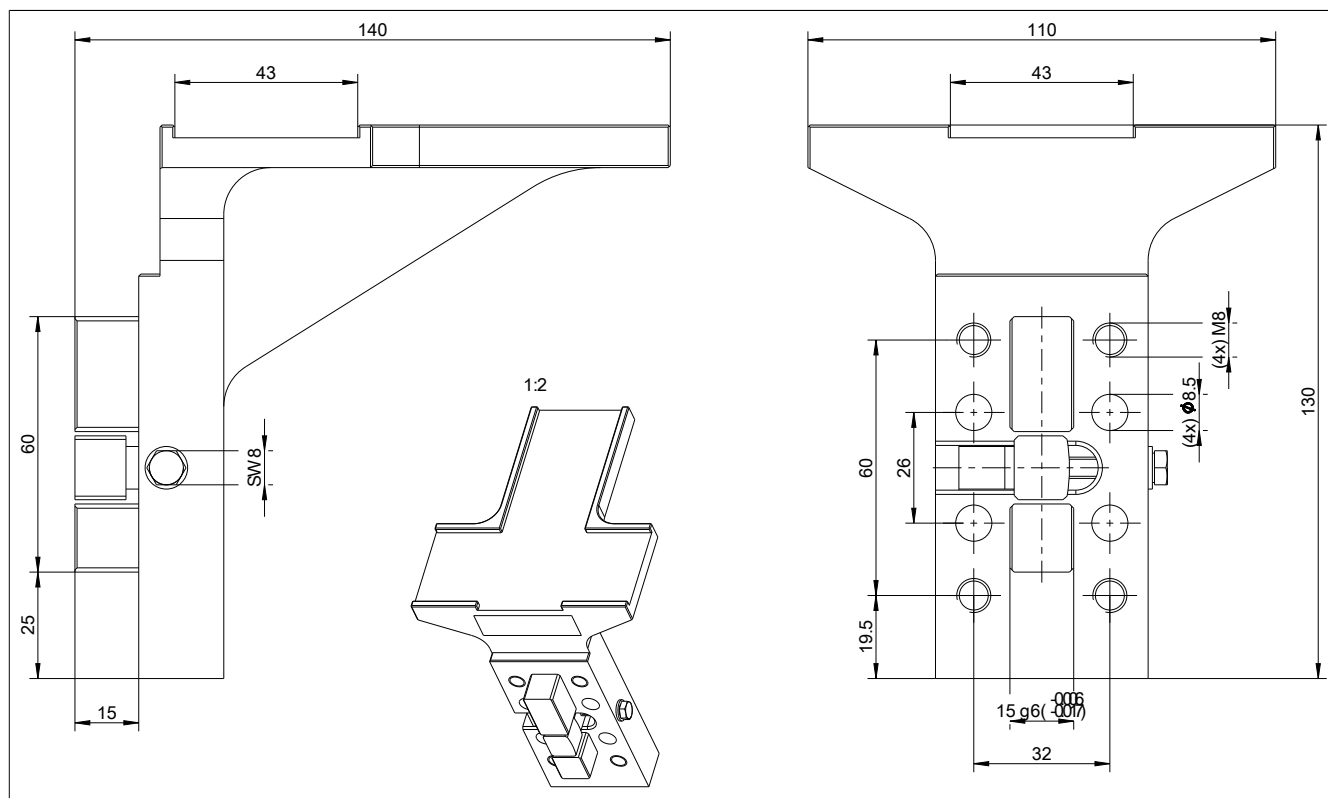


Figure 79: 8F1TCA.GATST000I-1 - Dimension diagram

## 4 Servicing and maintenance

For video tutorials on various topics, see [ACOPOStrak installation and servicing](#).



<https://www.br-automation.com/learn-track>

### 4.1 Shuttle maintenance

#### Information:

Check each shuttle for [4.1.1 "Wear" on page 171](#).

Visually inspect the wheels for wear or damage.

Visually inspect the shuttles. If necessary, clean or replace them.

#### Typical service life

ACOPOStrak transport system design with diverter

Component	Service life	Activity <sup>1)</sup>
All wheels	30000 km at up to 2 m/s and typical payload	<a href="#">4.5 "Replacing the wheels on the shuttle" on page 175</a>

Table 139: Shuttle maintenance: Design with diverter

1) For replacement, see [3.8 "Replacement parts list" on page 138](#).

ACOPOStrak transport system design without diverter

Component	Service life	Activity <sup>1)</sup>
All wheels	40000 km at up to 2 m/s and typical payload	<a href="#">4.5 "Replacing the wheels on the shuttle" on page 175</a>
All wheels	30000 km at up to 4 m/s and typical payload	<a href="#">4.5 "Replacing the wheels on the shuttle" on page 175</a>

Table 140: Shuttle maintenance: Design without diverter

1) For replacement, see [3.8 "Replacement parts list" on page 138](#).

**The typical service life applies when using a typical payload and 2 m/s or 4 m/s. The service life may be reduced depending on the following factors:**

- Velocity
- Load
- Travel profile
- Ambient conditions
- Number of diverter jumps
- Alignment of the guide system (of the guide elements to each other)

The values for service life are determined with continuous movement at constant speed, with low center of gravity (COG) of the total payload and under clean and well lubricated conditions. Applications with intermittent motion or in environments that are not clean have shorter wheel service life.

## Maintenance intervals

### ACOPOStrak transport system construction

Component	Interval	Activity <sup>1)</sup>
All wheels	4000 km	<a href="#">4.1.1 "Checking wheels for wear" on page 171</a>
Lubrication felt	2000 km	<a href="#">4.4 "Lubricating the lubrication felt" on page 174</a>
Anti-static brushes	8000 km	Visual inspection (Replace if the anti-static brushes are not in contact with the guide rail, are kinked or heavily soiled.)

Table 141: Shuttle maintenance

1) For replacement, see [3.8 "Replacement parts list" on page 138](#).

## Notice!

The shuttle speed must be less than 2.5 m/s in the area of diverters and dual tracks in order to avoid additional wear of the wheels due to the side change.

At speeds above 2.5 m/s in the area of diverters and dual tracks, the service life of the wheels (and thus of the shuttle) is considerably reduced.



### 4.1.1 Checking wheels for wear

In addition to visually inspecting the wheels for wear or damage, ACOPOStrak v-wheel and flat wheel wear gauges can be used to measure the wear of the wheels.

Wear limit value: 0.15 mm in diameter

⇒ 4.5 "Replacing the wheels" on page 175 is recommended starting at this wear level value.

Absolute lower wear limit: 0.25 mm in diameter

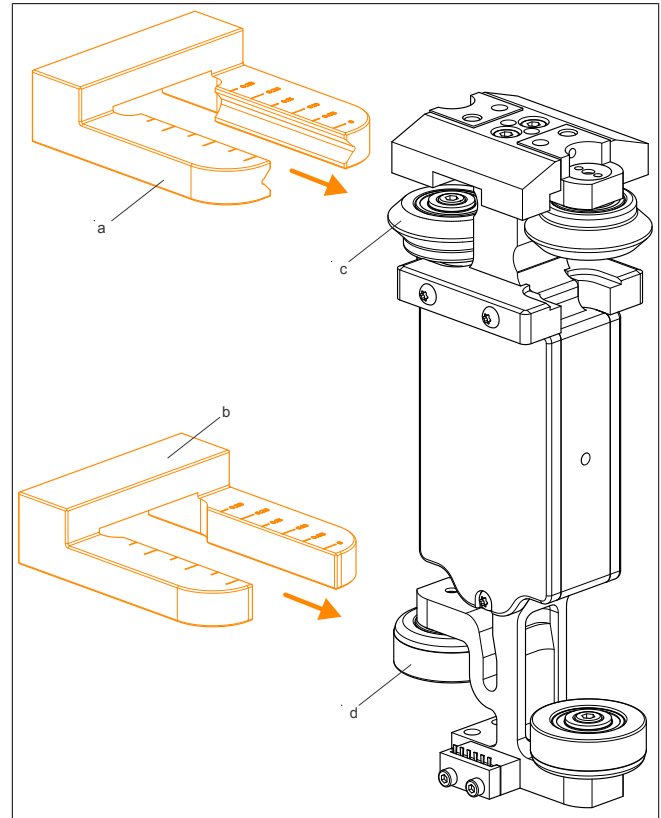
⇒ 4.5 "Replacing the wheels" on page 175 must take place starting at this wear limit value.

**ACOPOStrak wear gauge set for v-wheels and flat wheels**

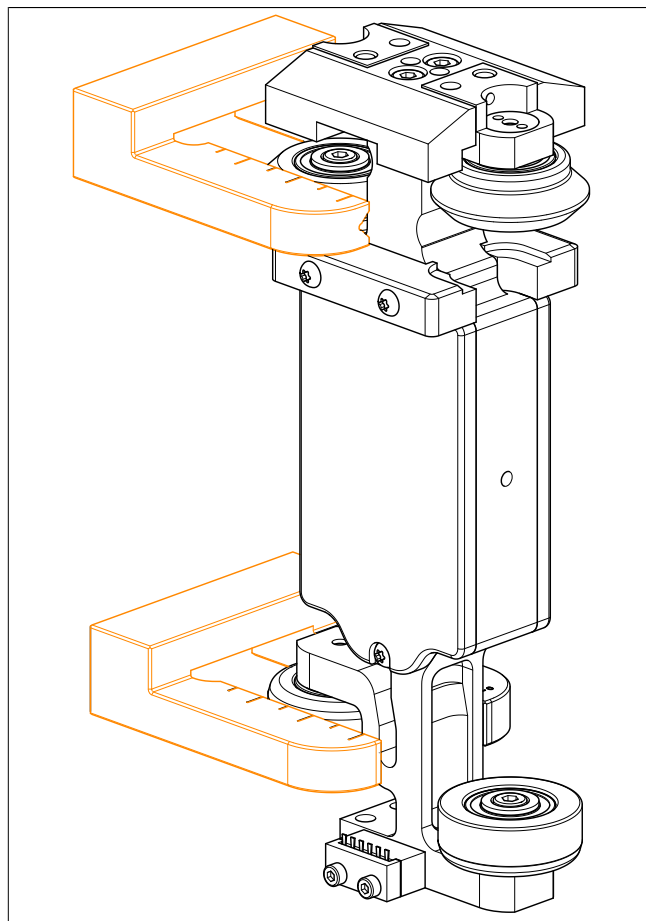
8F1TCA.SWGS0000I-1

1. Carefully guide the v-wheel wear gauge / flat wheel over the v-wheel or flat wheel so that it does not get stuck.

- a V-wheel wear gauge
- b Flat wheel wear gauge
- c V-wheel
- d Flat wheel



2. Read the value of the tangent contact point of the scale.  
The scale value corresponds to the reduction of the diameter from the nominal dimension = 30 mm.
- Measured value scale: 0 to 0.25 mm



## 4.2 Cleaning the ACOPOStrak transport system

### Caution!

Wipe up any spilled or excess water immediately after cleaning the ACOPOStrak transport system. Wet floors cause danger of slipping.

### Information:

The ACOPOStrak transport system and shuttles must be kept free of dust and dirt.

### Information:

Never use razor blades, scrapers, spatulas, brushes or other coarse tools to clean the ACOPOStrak transport system. The use of such tools can cause damage.

### Removing of dust and dirt

1. Wipe off dust and dirt with a soft, damp cloth.
2. Wipe with a mild detergent on a soft cloth.
3. Use a soft, damp cloth to wipe off the cleaning agent.
4. Dry with a clean, soft cloth or chamois leather.

### Removing wet paint or grease

1. Wipe with a clean soft cloth moistened with isopropanol or equivalent.
2. Dry with a clean, soft cloth or chamois leather.

## 4.3 Cleaning the guide rails

Guide rails must be cleaned at regular intervals.

Component	Interval	Cleaning
Guide rails	Cleaning after every 6000 km or every six months (whichever comes first)	Clean the guide rails with a clean soft cloth (moistened with isopropanol or equivalent). Remove dirt deposits completely.

Relubricate the lubrication felts after cleaning!

Depending on the ambient conditions, lubrication/cleaning may be required at shorter intervals.

## 4.4 Lubricating the lubrication felt

The lubrication felt on the shuttle lubricates the double-v guide rail and the v-wheels on the shuttle.

### Information:

Only the following lubricants are permitted to be used to lubricate the lubricating felt:

ISO grade 46 (recommended: No-Tox HD Food Grade Oil 46 from Bel-Ray Company, Inc.) or SAE grade 20

#### 1. Commissioning

Lubrication felts are sufficiently pre-lubricated when delivered to produce basic system lubrication. Excess oil on guide rails must be removed during commissioning.

#### 2. Servicing

After 2000 km, add 1 drop (40 µl) of ISO grade 46 or SAE grade 20 oil to each lubrication hole on each shuttle.

#### 3. Maintenance

See 4.7 "Replacing the lubrication felt" on page 182.

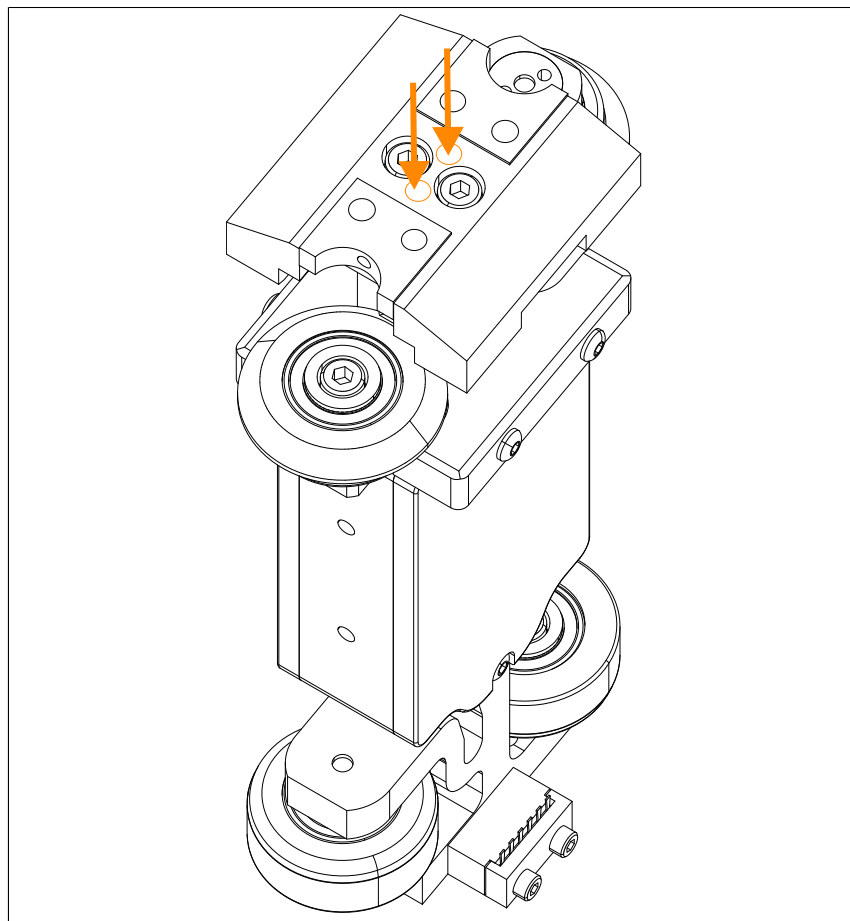


Figure 80: Lubrication holes on the shuttle

Check the state of the lubrication felt each time you lubricate. The lubrication felt must have contact with the wheel. If the lubrication felt is dirty or has no contact with the wheel, ["replace the lubrication felt" on page 182](#).

## 4.5 Replacing the wheels on the shuttle

### V-wheel and flat wheel - Overview of accessories

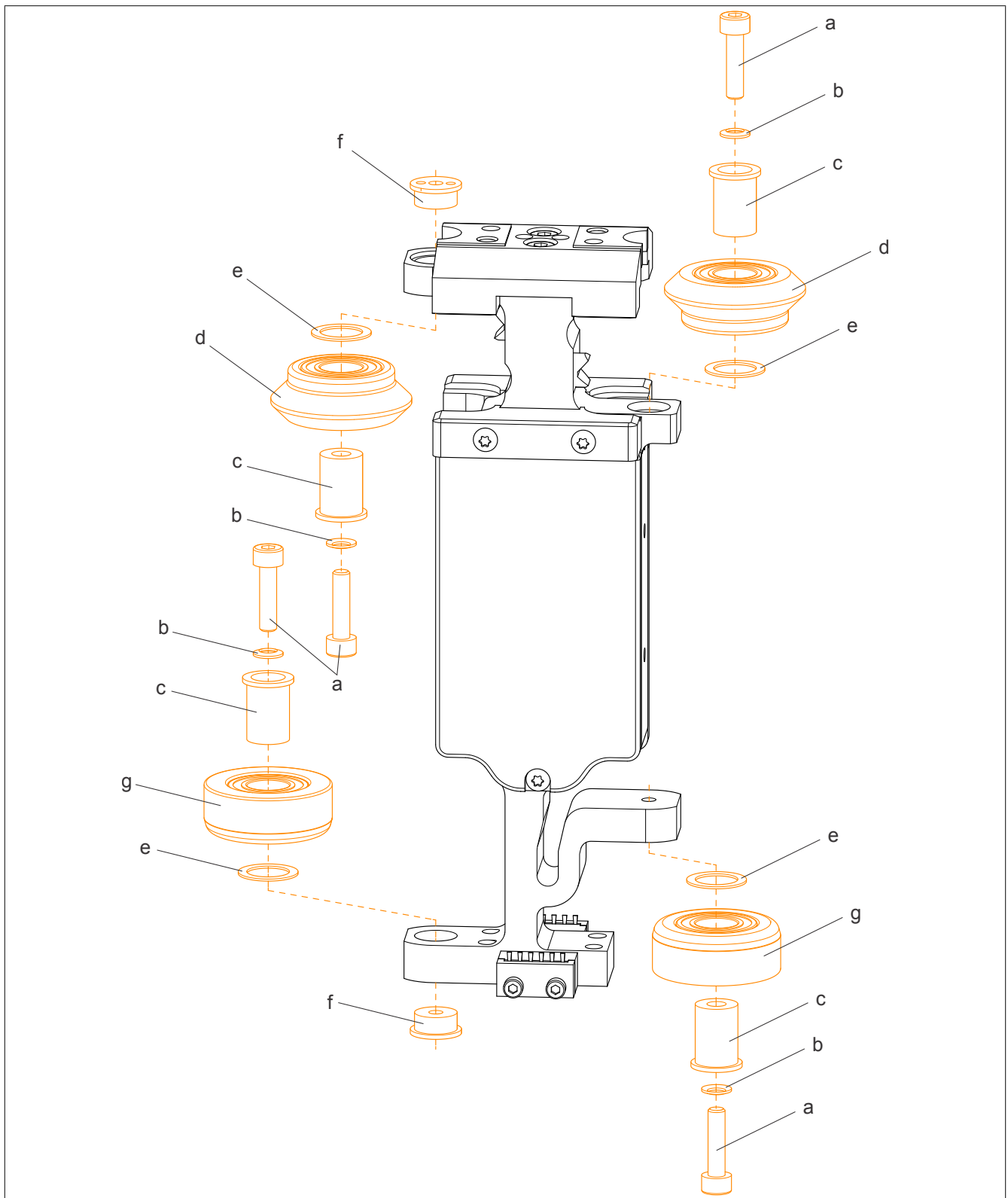


Figure 81: V-wheel and flat wheel - Overview of accessories

a	Hex socket screw M4x16
b	Lock washer
c	Shaft
d	V-wheel
e	Shim washer
f	Flange nut
g	Flat wheel

It is important to ensure that the orientation of the wheels after replacement corresponds to the diagram:

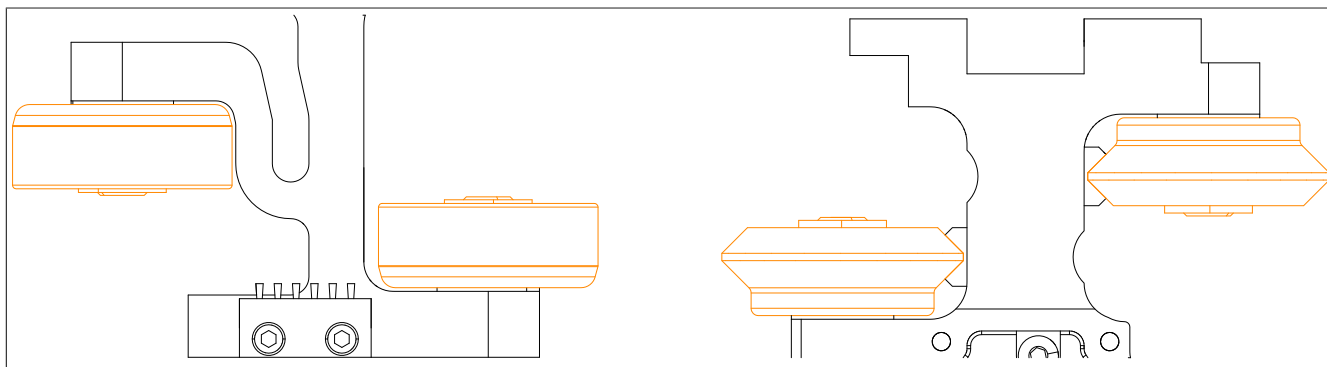


Figure 82: Arrangement of flat wheels and v-wheels

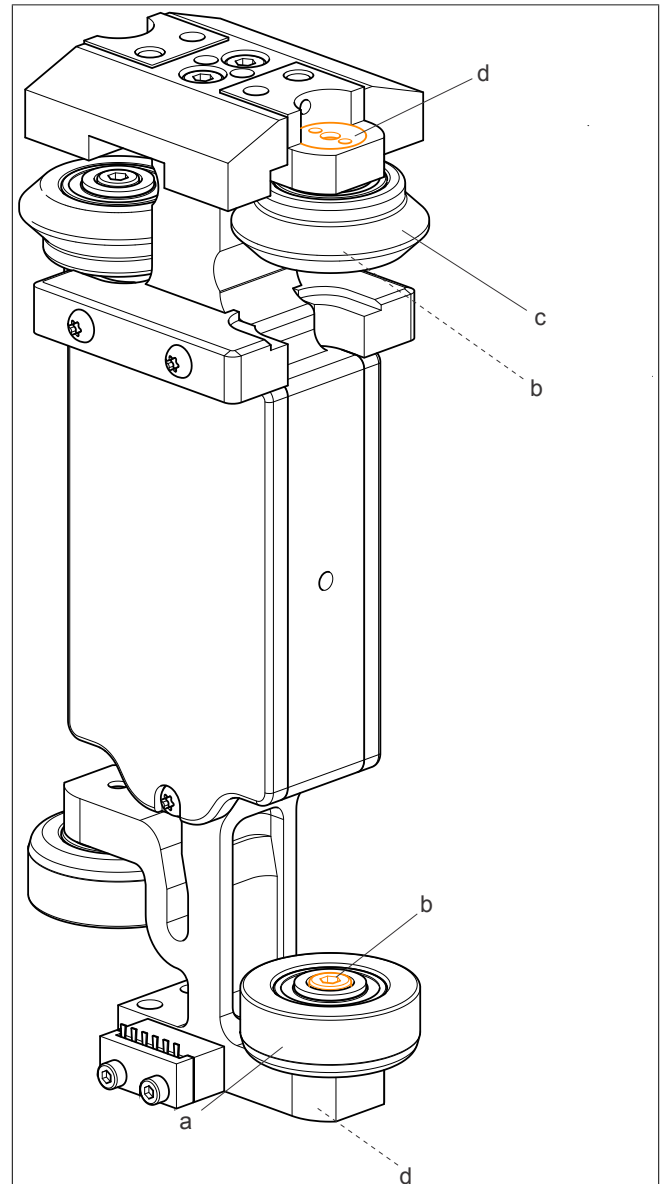
Check the condition of the lubrication felt each time the wheels are replaced. The lubrication felt must have contact with the wheel. If the lubrication felt is dirty or has no contact with the wheel, ["replace the lubrication felt" on page 182](#).

### 4.5.1 Replacing v-wheel and flat wheel with flange nut

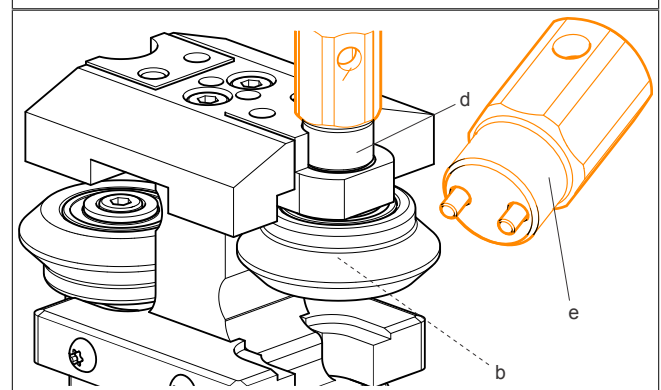
One v-wheel and one flat wheel are secured to the shuttle body with a flange nut.

#### Procedure

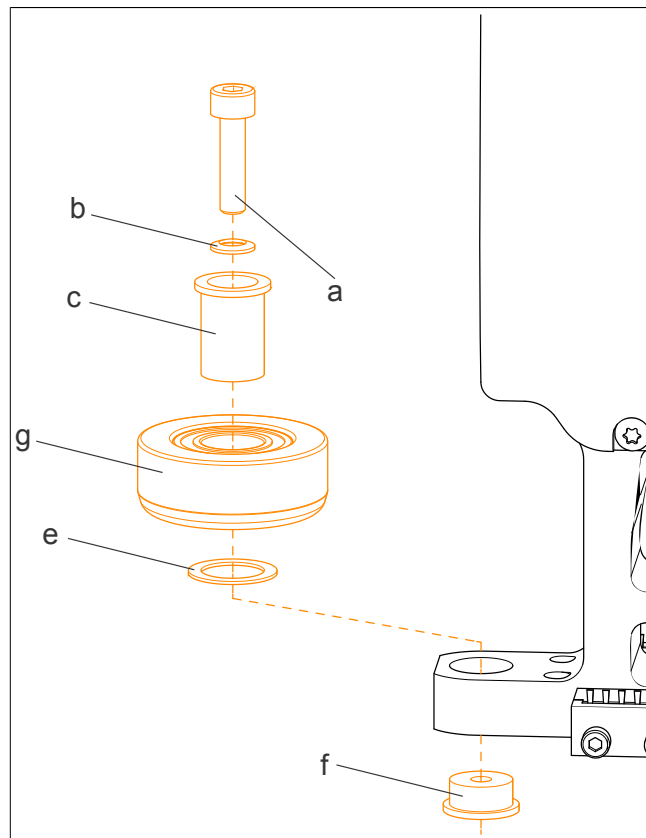
1. Loosen the M4x16 hex socket screw (b) with a hex key to remove the v-wheel (c) or flat wheel (a) from the shuttle body.



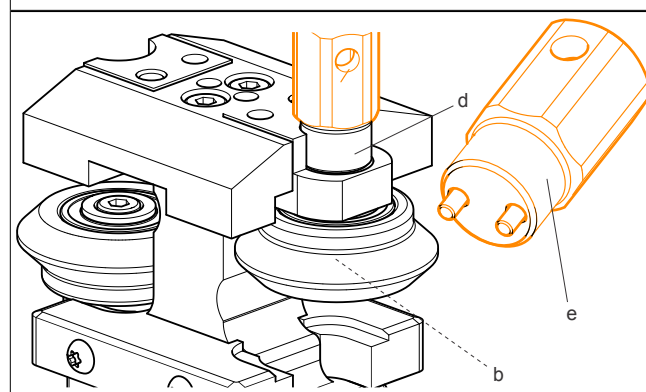
2. To do this, hold the flange nut (d) with the pin-type bit (e) (8F1TCA.SPTB0000I-1).
3. Disassemble the components of the v-wheel or flat wheel, see ["Replacing the wheels on the shuttle" on page 175](#).



4. Insert the shaft (c) into the bearing of the new v-wheel or flat wheel (g).
5. Insert the M4x16 hex socket screw (a) with the lock washer (b) through the bearing of the v-wheel or flat wheel (g). The cone of the lock washer (b) must point in the direction of the bolt head.
6. Place the shim washer (e) on the shaft.
7. Insert the v-wheel or flat wheel assembly on the shuttle body with the shaft into the countersink and screw on the flange nut (f).



8. Screw in the M4x16 hex socket screw (b).
9. Hold the M4x16 hex socket screw (b) with the hex key (size 3 mm) and tighten the flange nut (d) with the pin-type bit (b) ([8F1TCA.SPTB0000I-1](#)) (tightening torque 4 Nm).



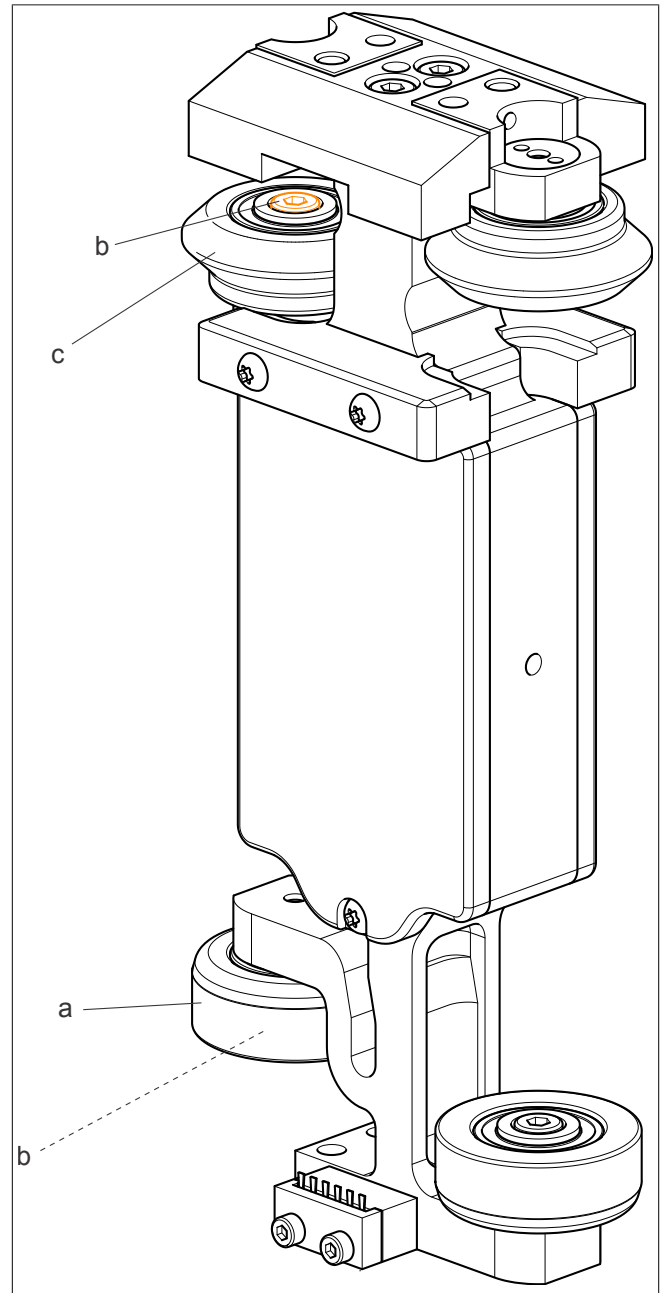


### 4.5.2 Replacing v-wheels and flat wheel without flange nut

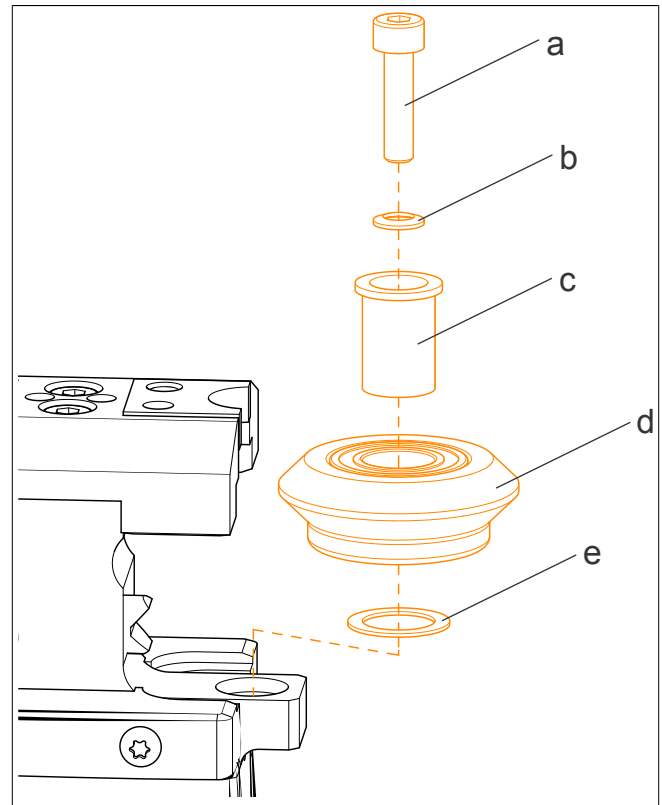
One v-wheel and one flat wheel are secured directly to the shuttle body.

#### Procedure

1. Loosen the M4x16 hex socket screw (b) with a hex key to remove the v-wheel (c) or flat wheel (a) from the shuttle body.
2. Disassemble the components of the v-wheel or flat wheel, see ["Replacing the wheels on the shuttle" on page 175](#).

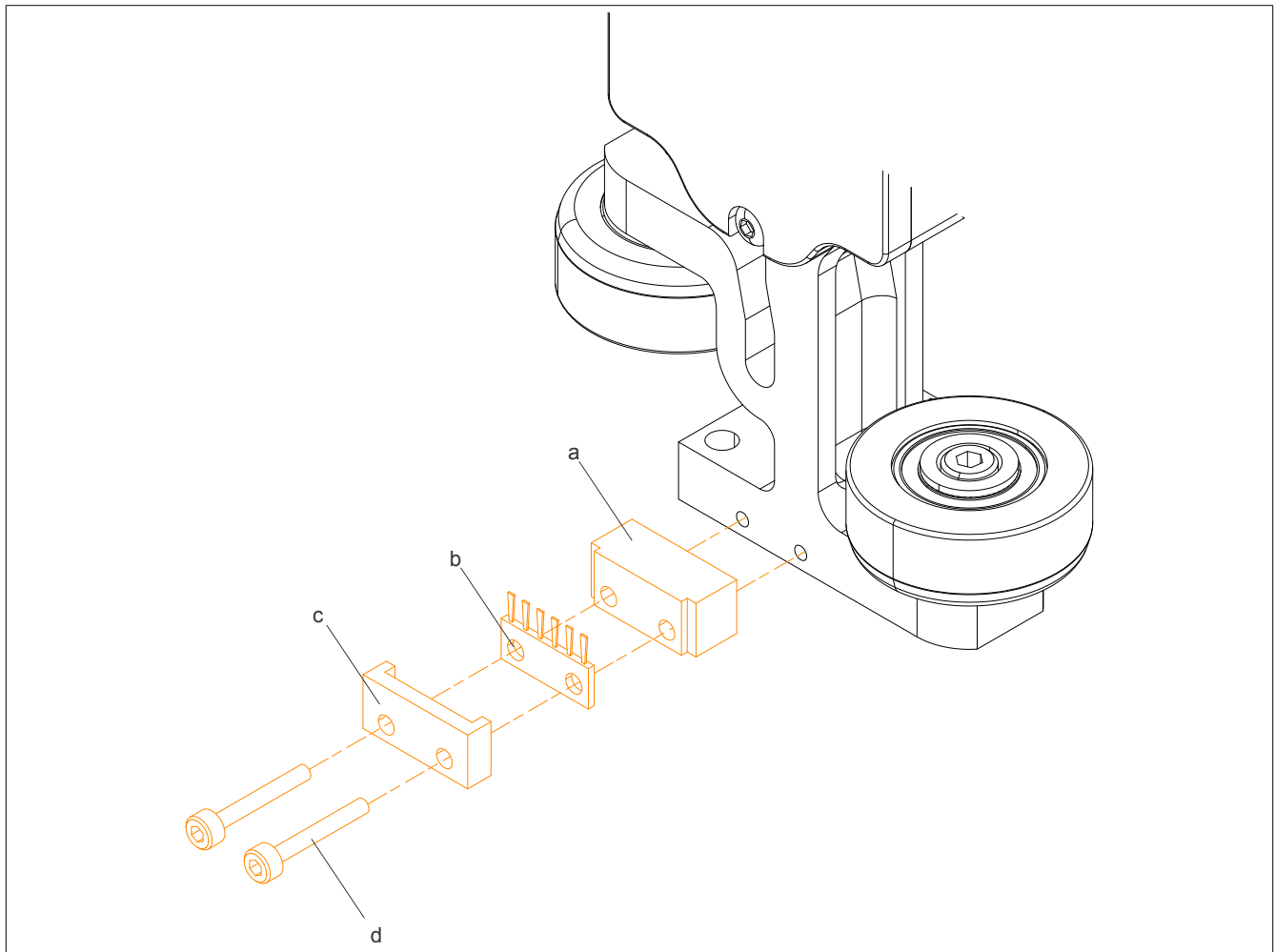


3. Insert the shaft (c) into the bearing of the new v-wheel (d) or flat wheel.
4. Insert the M4x16 hex socket screw (a) with the lock washer (b) through the bearing of the v-wheel (d) or flat wheel (for the orientation of the wheels, see [Fig. 82 "Arrangement of flat wheels and v-wheels" on page 176](#)). The cone of the lock washer (b) must point in the direction of the bolt head.
5. Place the shim washer (e) on the shaft.
6. Insert the v-wheel or flat wheel assembly on the shuttle body with the shaft into the countersink and screw in the M4x16 hex socket screw (b).
7. Tighten the M4x16 hex socket screw (b) (tightening torque 4 Nm).



## 4.6 Replacing the anti-static brush

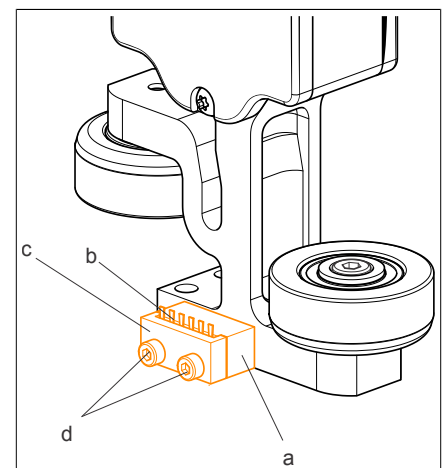
### Anti-static brush - Overview of accessories



<b>a</b>	Brush spacer
<b>b</b>	Anti-static brush
<b>c</b>	Brush cover
<b>d</b>	Hex socket screw M2.5x16 (2x)

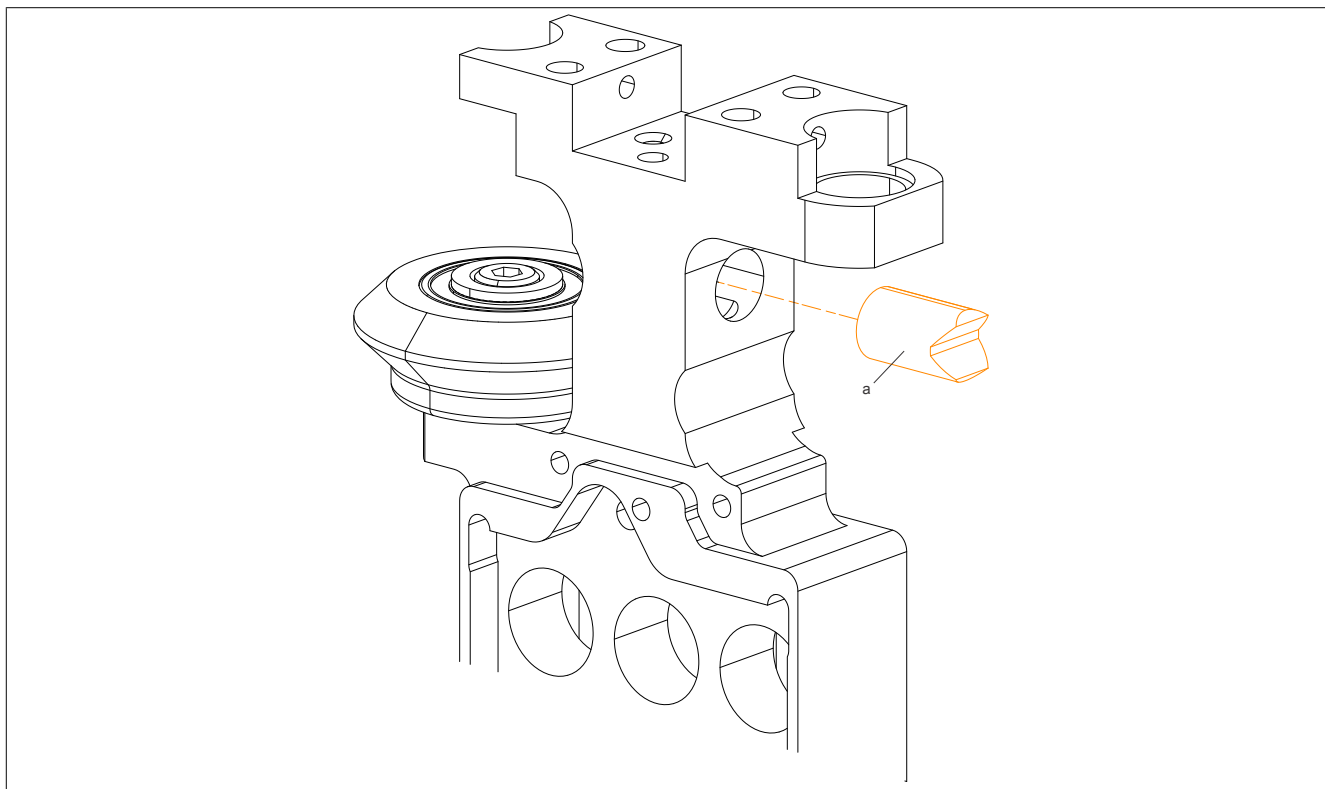
### Procedure

1. Loosen the hex socket screws (d) with a hex key (size 2 mm) to remove the components of the anti-static brush (b) from the shuttle body.
2. Place a new anti-static brush (b) between the brush spacer (a) and brush cover (c).
3. Tighten the hex socket screws (d) with the torque wrench (tightening torque 0.9 Nm).



## 4.7 Replacing the lubrication felt

### Lubrication felt - Overview



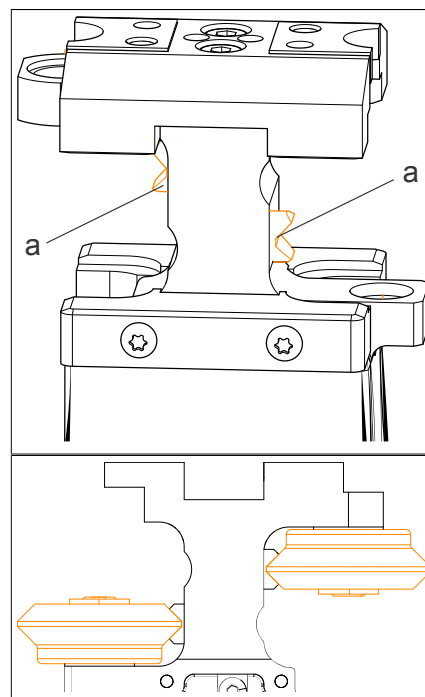
**a** Lubrication felt

### Procedure

The v-wheel must be removed.

1. Pull the lubrication felt (a) out of the hole in the shuttle body.
2. Insert dry replacement lubrication felt (a) into the hole on the shuttle body in the direction shown.

3. After installing the v-wheel assembly, the lubrication felt should be slightly compressed to ensure contact with both v-surfaces of the double-v guide rail. The v-wheel must be able to rotate.
4. Fill each lubrication hole with 350  $\mu$ l of ISO grade 46 (recommended: No-Tox HD Food Grade Oil 46 from Bel-Ray Company, Inc.) or SAE grade 20 oil. Excess oil on guide rails must be removed during recommissioning.



## 4.8 Replacing a segment

Segments are only permitted to be replaced in a voltage-free state and by qualified personnel. The ACOPOStrak transport system must first be disconnected from the power supply and secured against being switched on again.

### Preparation

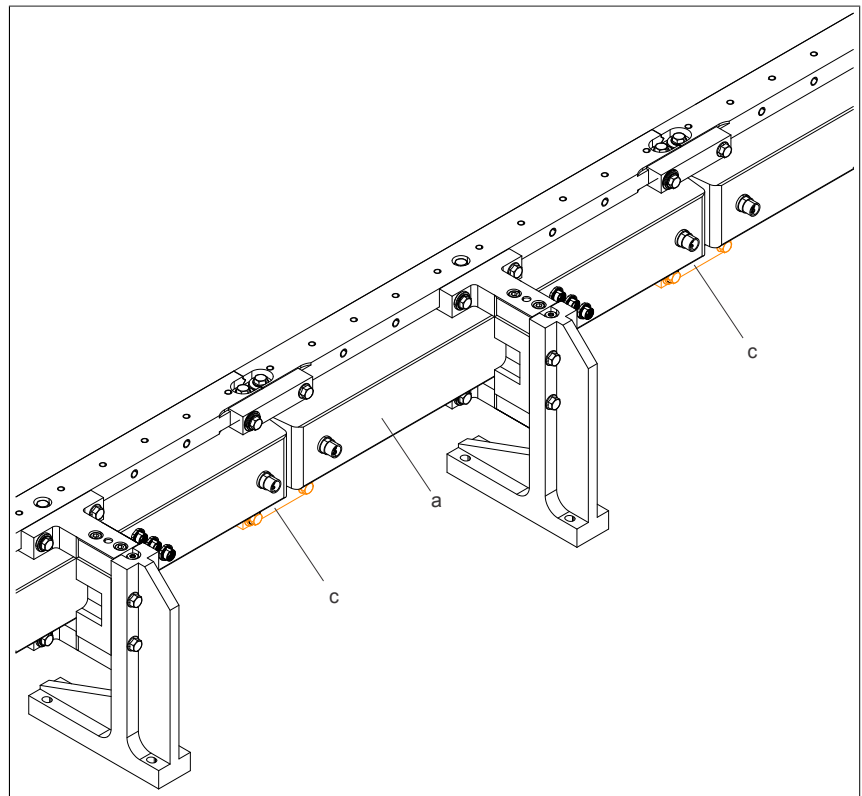
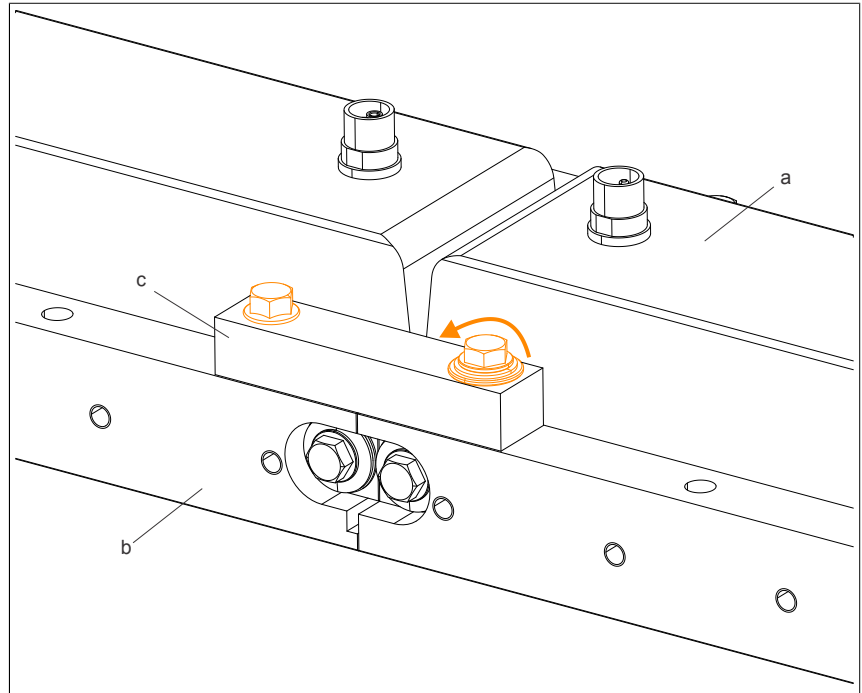
1. Terminate all cables on the segment.
2. If there are shuttles on the guides in the replacement area, they must be removed or moved.

### Expanding the segment

#### Loosening the flat guide rail

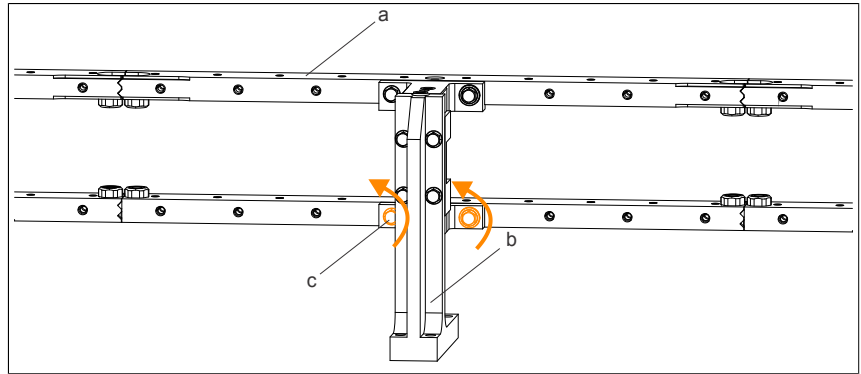
1. Loosen the hex head screw and shoulder screw on the guide connector to the adjacent segments on the flat guide rail.

- a Segment to be replaced
- b Flat guide rail
- c Guide connector (with screws to be loosened)



2. Loosen the hex head screws (c) of the guide stand (b) used to fasten the flat guide rail.

a Guide element (applies to all)  
b Guide stands  
c M8x40 hex head screw (2x)



## Notice!

**To prevent the flat guide rail from falling down, the screws are only permitted to be loosened and not removed!**

3. Loosen the screws of the segment to be replaced on the double-v guide rail.

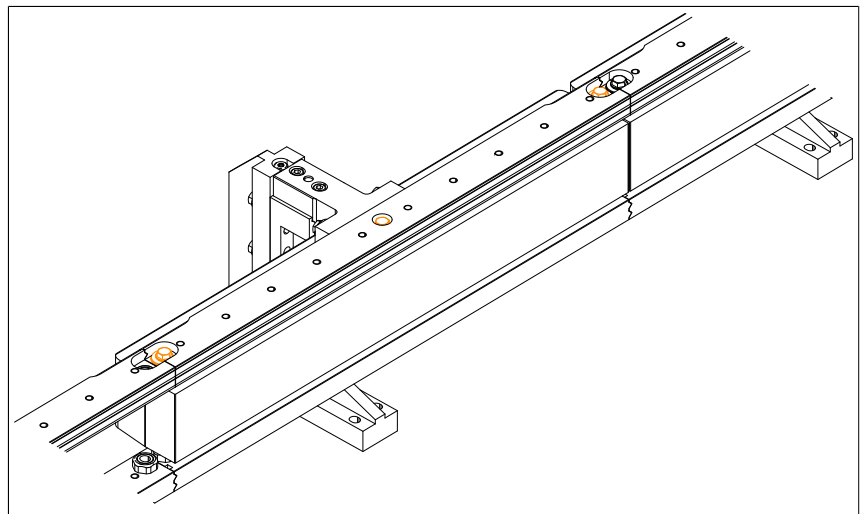


Figure: Example of straight segment disassembly

In addition, the screws on the double-v guide rail must be loosened on all segments installed in the affected guide element:

Guide element, straight	1x straight segment
45° guide element	2x curved segment
90° guide element	2x curved segment, 1x circular arc segment
135° guide element	2x curved segment, 2x circular arc segment
180° guide element	2x curved segment, 3x circular arc segment

► The flat guide rail is unstressed.

4. Remove the shoulder screws (c) including the flat washers (e, f) and disc springs (d) of the segment to be replaced (b) on the double-v guide rail.

a Guide element (applies to all)  
b Curved segments (8F1I01.AB2B.0000-1, 8F1I01.BA2B.0000-1)  
c 3x M8x43 shoulder screw  
d 2x disc spring 26 x 13.8 x 2.2  
e 2x precision flat washer 27 x 18.5 x 1.8  
f 2x flat washer for load transfer 18 x 10.2 x 3.5

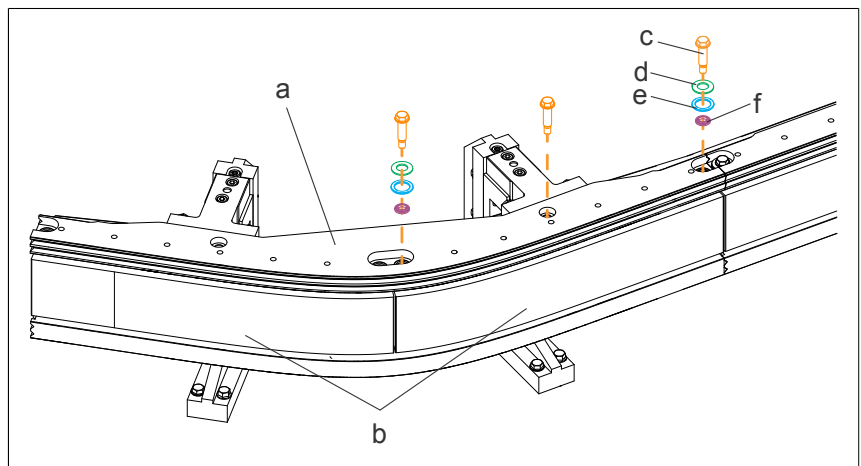
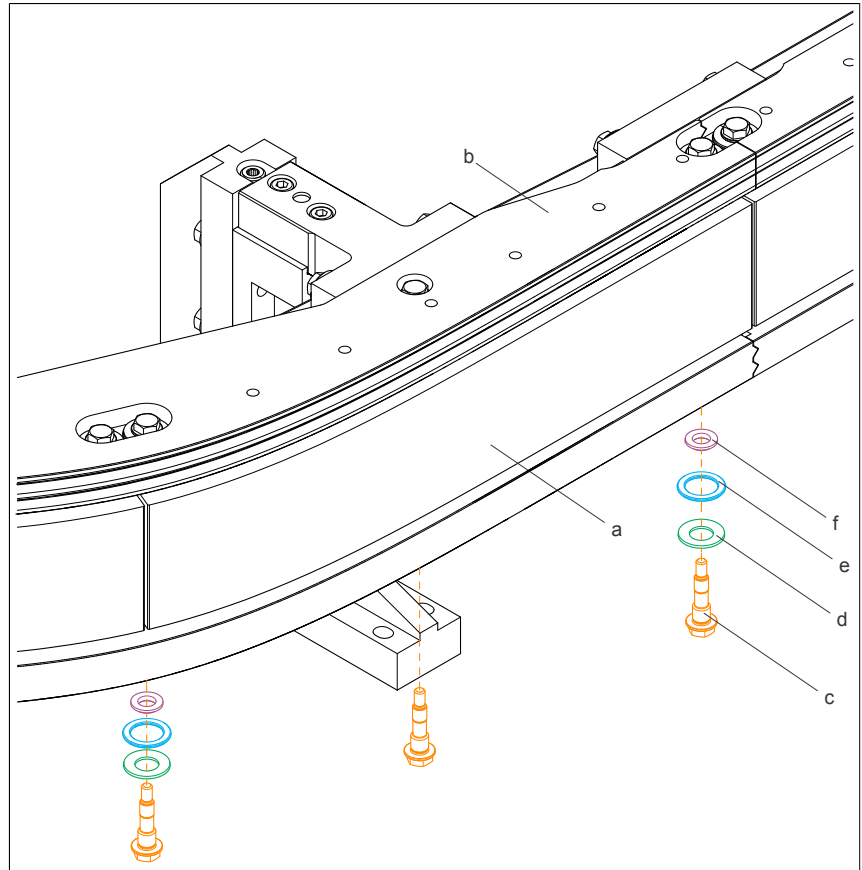


Figure: Example of curved segment disassembly

5. Remove the shoulder screws (c) including the flat washers (e, f) and disc springs (d) of the segment to be replaced (b) on the flat guide rail.

- a Curved segment (8F1101.AB2B.0000-1)
- b Guide element (applies to all)
- c Shoulder screw M6x41
- d Disc spring 26 x 13.8 x 2.2
- e Precision flat washer 27 x 18.5 x 1.8
- f Flat washer for load transfer 18 x 10.2 x 3.5



6. Remove the segment.

### Information:

In the diverter area, it may be necessary to disassemble and remove the adjacent segments beforehand in order to replace a segment; for this sequence, see [5.3.4.4 "Assembling the segments" on page 231](#).

### Installing the new segment

The new segment is installed in reverse order, see [5.3.4.4 "Assembling the segments" on page 231](#), [5.3.4.5 "Assembling the flat guide rail" on page 239](#) and [5.3.4.6 "Assembling the guide connectors" on page 244](#).

### Checking the guide rail transitions

The guide rail transitions must be checked after assembling the segment, see [5.3.5.3 "Measuring the guide rail transition" on page 254](#).

### Segments in the diverter area

The magnetic attraction force must be checked after replacing segments in the diverter area, see [5.3.5.8.3 "Adjusting the symmetrical magnetic force in the diverter area" on page 273](#).

### Putting into service

After all cables have been reconnected, the new segment can be put into service.

## 4.9 Replacing shuttle gliders (50 mm shuttle)

Replace shuttle gliders (upper and lower gliders) as needed.

### Tool

Screwdriver, TORX T10

Thread cutter M3 6H tolerance

Torque wrench

### Preparation

1. Clean the shuttle.
2. Place or clamp the shuttle on a suitable, non-magnetic surface.
3. Keep the workplace away from magnetic and ferromagnetic parts.

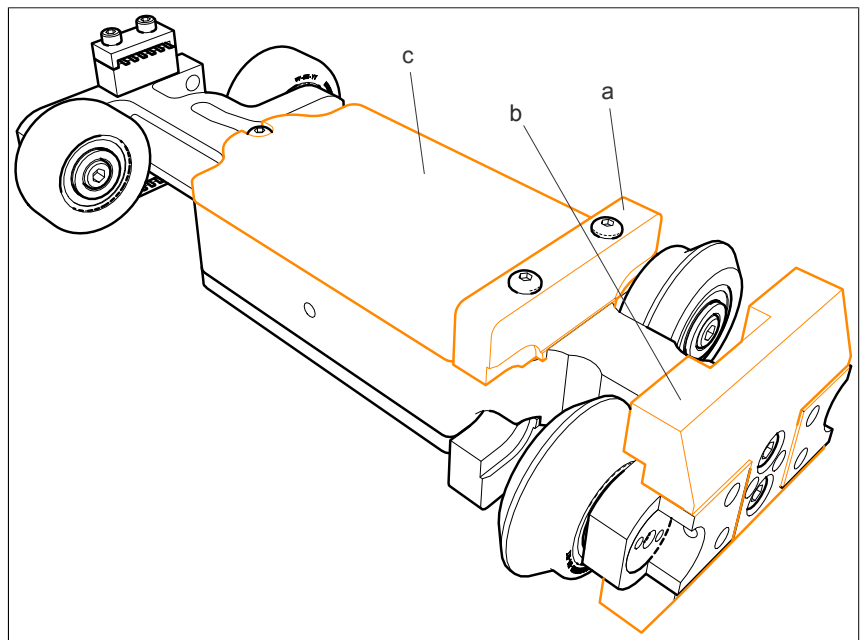
### Procedure

1. [4.9.1 "Disassembling shuttle gliders \(50 mm shuttle\)" on page 187](#)
2. [4.9.2 "Assembling shuttle gliders \(50 mm shuttle\)" on page 190](#)

### ACOPOStrak shuttle

#### ► Components to be replaced

- a Lower glider
- b Upper glider
- c Shuttle cover





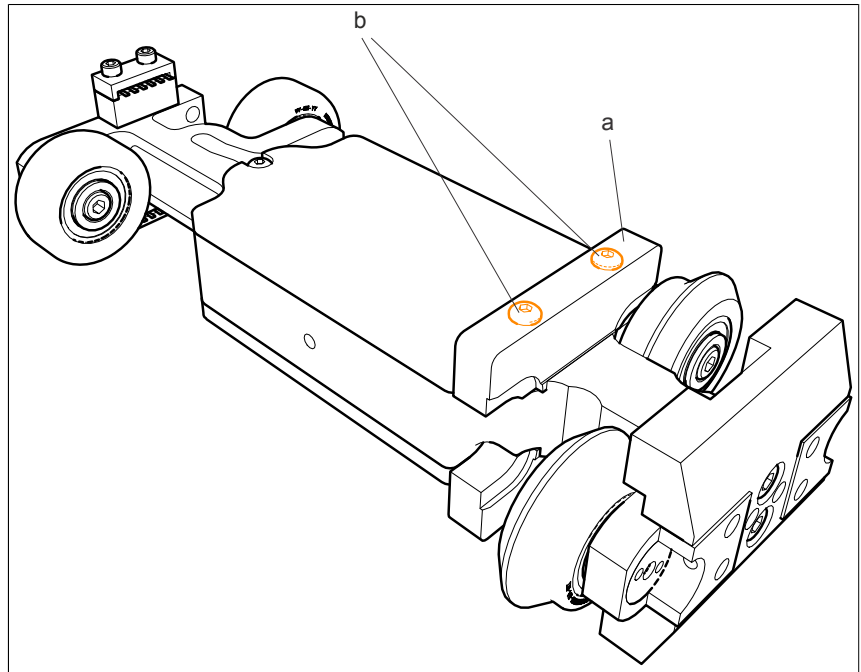
#### 4.9.1 Disassembling shuttle gliders (50 mm shuttle)

Disassembling the lower shuttle glider

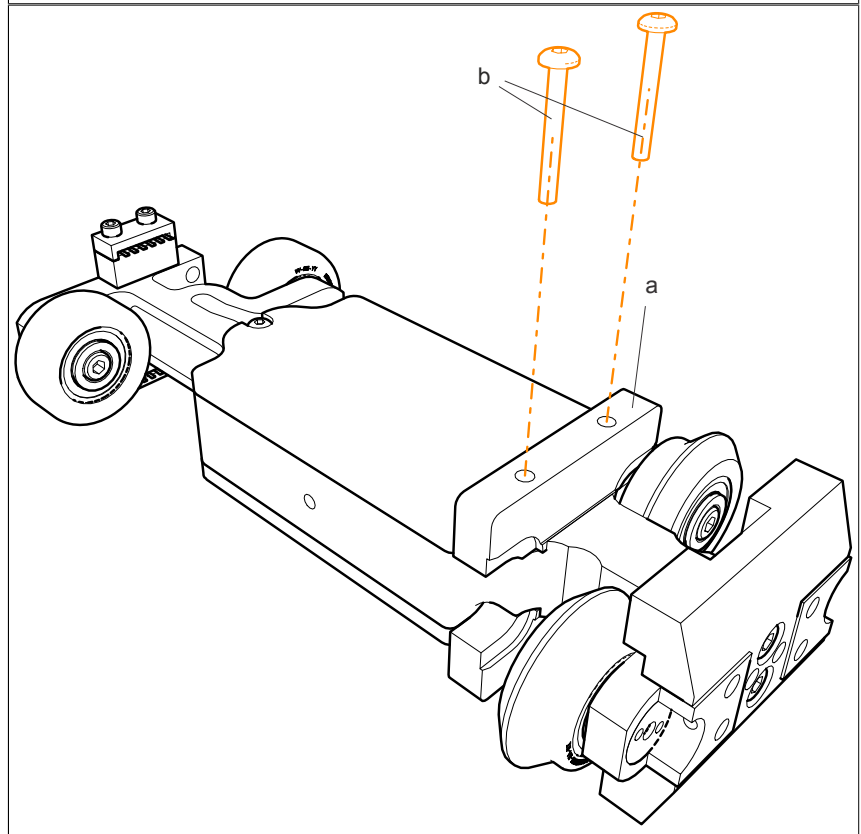
1. Loosen the screws (b) on the lower glider (a).

a Lower glider

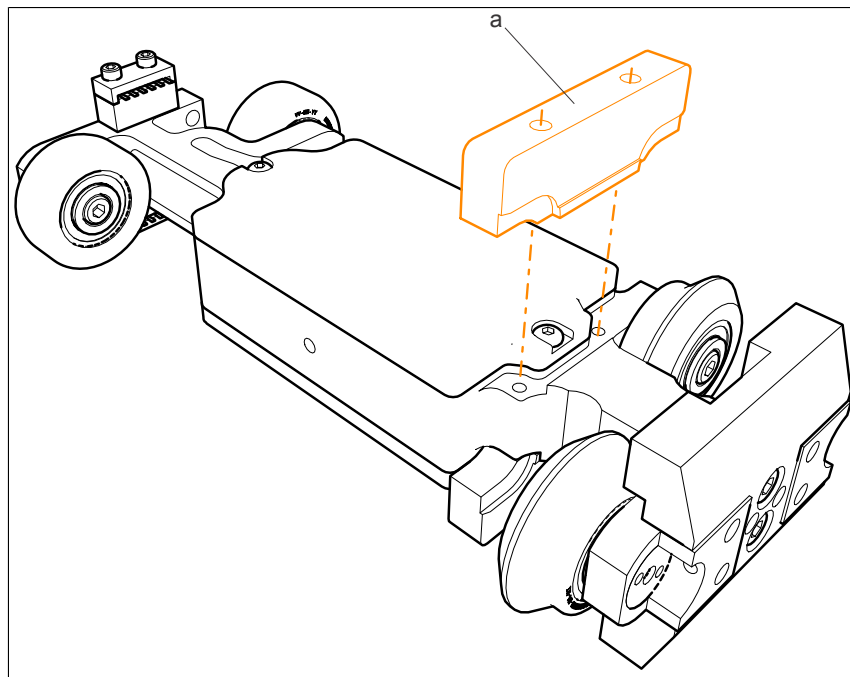
b Screws ISO 7380-1 M3x20 (2x)



2. Remove the screws (b) on the lower glider (a).



3. Remove the glider (a) (discard when replacing the shuttle cover).

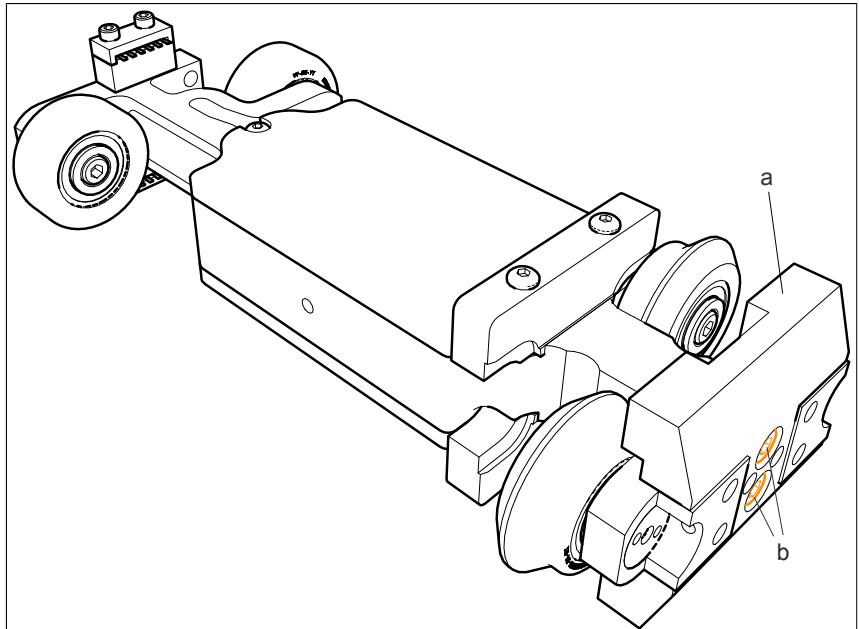


## Disassembling the upper shuttle glider

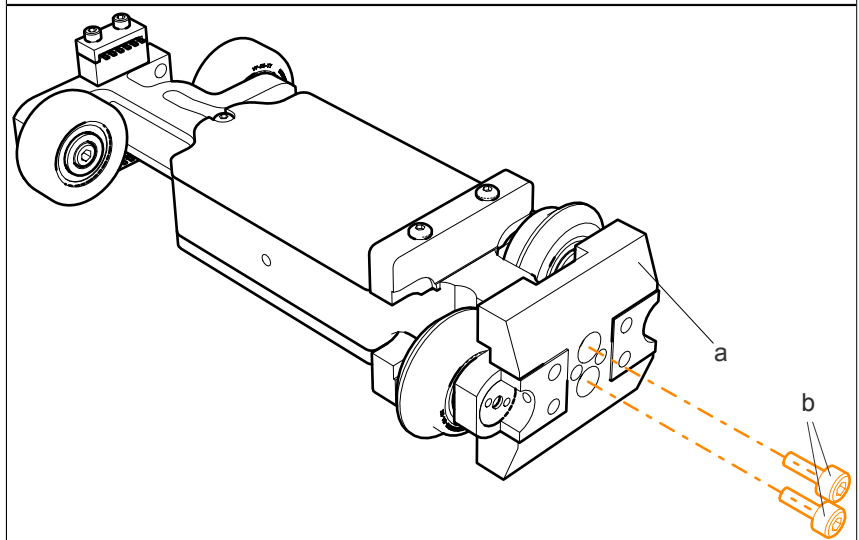
1. Loosen the screws (b) on the upper glider (a).

a Upper glider

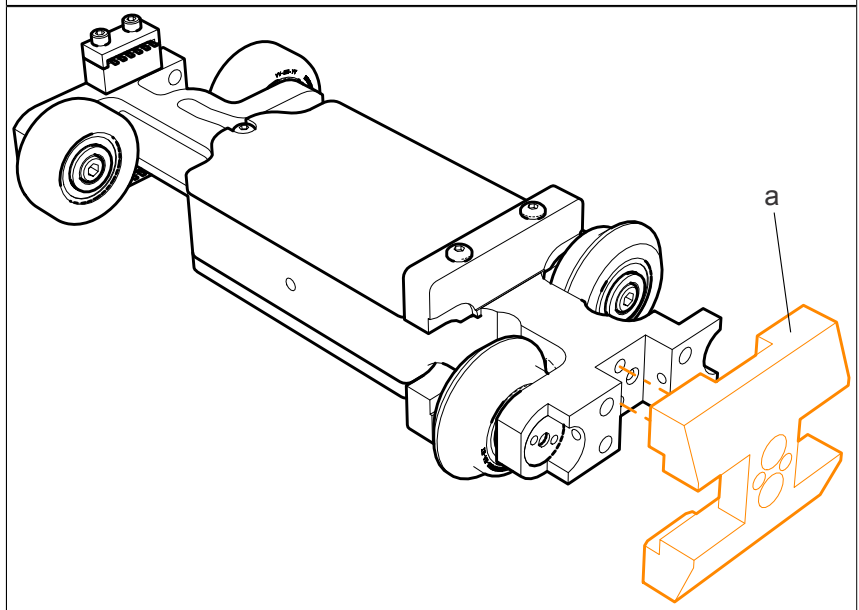
b Screws ISO 7380-1 M3x20 (2x)



2. Remove the screws (b) on the upper glider (a).



3. Remove the glider (a) (discard when replacing the shuttle cover).



## 4.9.2 Assembling shuttle gliders (50 mm shuttle)

Re-cut the threads for the shuttle glider mounting screws (M3x20) with a thread cutter with M3 6H tolerance and clean using commercially available brake cleaner. The screw thread and countersink must be free of adhesive residues.

### Information:

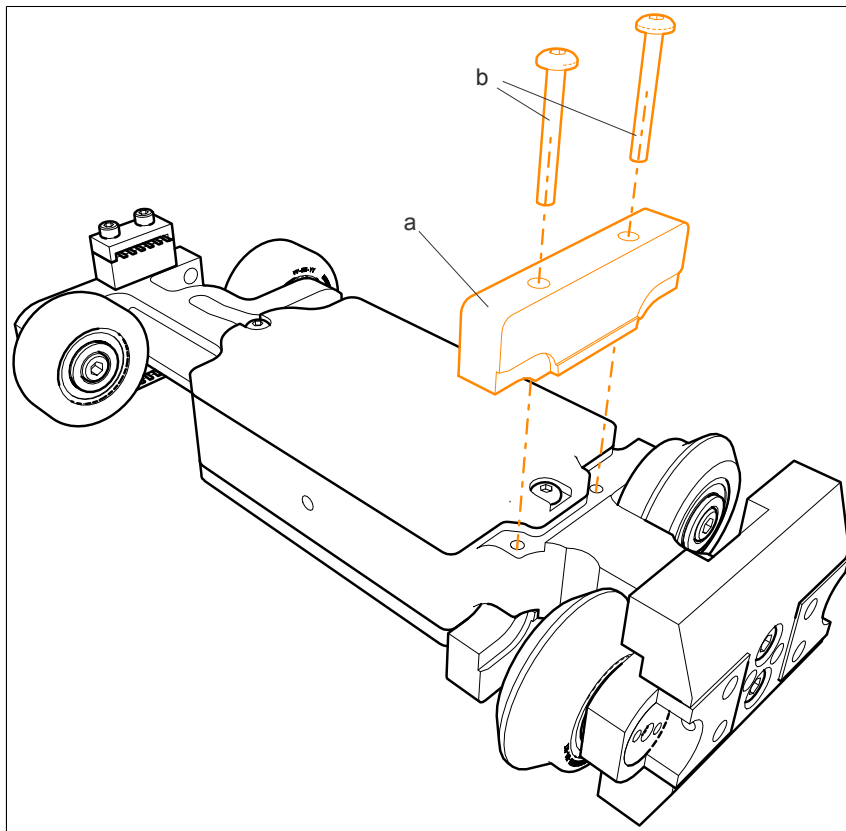
**After cleaning and re-cutting the threads, a newly coated screw must be used for assembly.**

**Check the screw thread for damage by disassembly or re-cutting the screw thread; this must be in perfect condition.**

Assembling the lower shuttle glider

1. Assemble the lower glider (a) with the newly coated screws (b) (tightening torque 0.4 Nm).

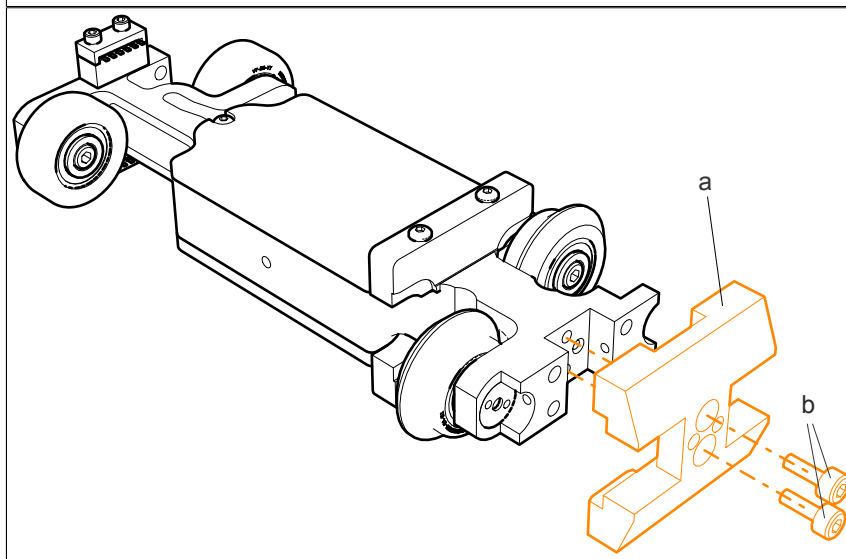
a Lower glider  
b Screws ISO 7380-1 M3x20 (2x)



Assembling the upper shuttle glider

1. Assemble the upper glider (a) with the newly coated screws (b) (tightening torque 1 Nm).

a Upper glider  
b Screws ISO 7380-1 M3x20 (2x)



## 4.10 Replacing shuttle gliders (100 mm shuttle)

Replace shuttle gliders (upper and lower gliders) as needed.

### Tool

Screwdriver, TORX T10

Thread cutter M3 6H tolerance

Torque wrench

### Preparation

1. Clean the shuttle.
2. Place or clamp the shuttle on a suitable, non-magnetic surface.
3. Keep the workplace away from magnetic and ferromagnetic parts.

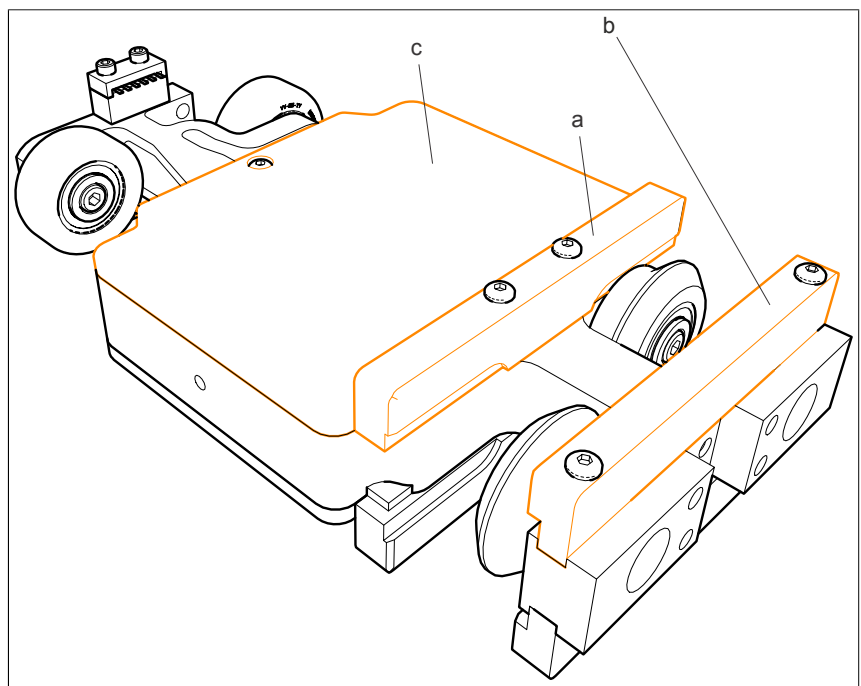
### Procedure

1. [4.10.1 "Disassembling shuttle gliders \(100 mm shuttle\)" on page 192](#)
2. [4.10.2 "Assembling shuttle gliders \(100 mm shuttle\)" on page 196](#)

### ACOPOStrak shuttle

#### ► Components to be replaced

- a Lower glider
- b Upper glider
- c Shuttle cover



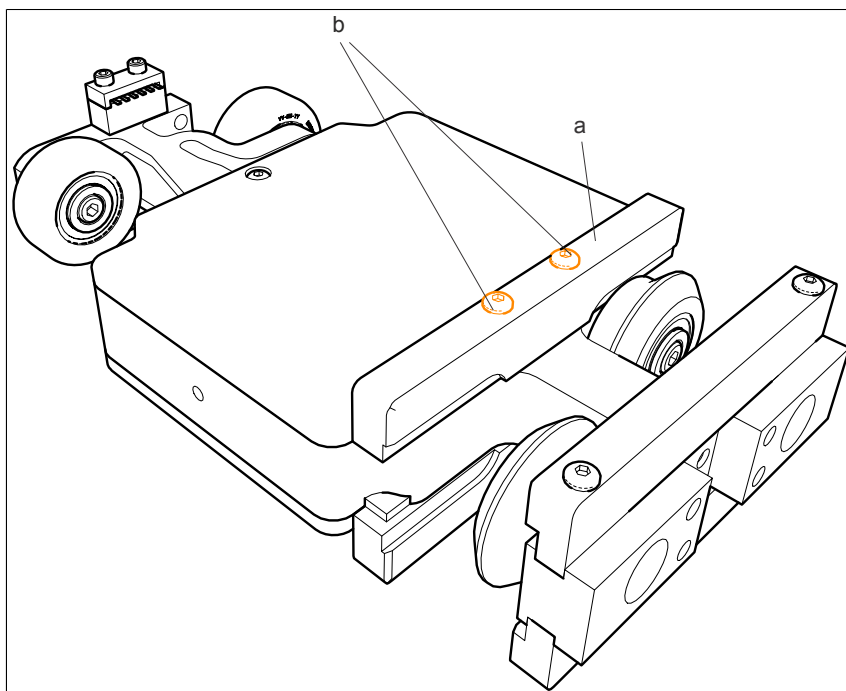
### 4.10.1 Disassembling shuttle gliders (100 mm shuttle)

Disassembling the lower shuttle glider

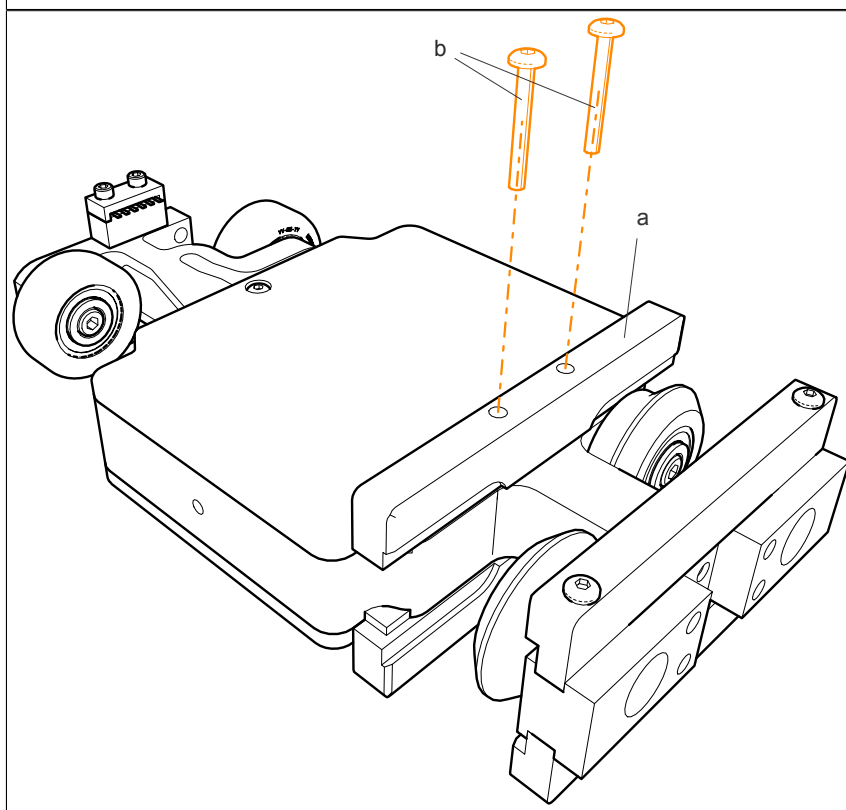
1. Loosen the screws (b) on the lower glider (a).

a Lower glider

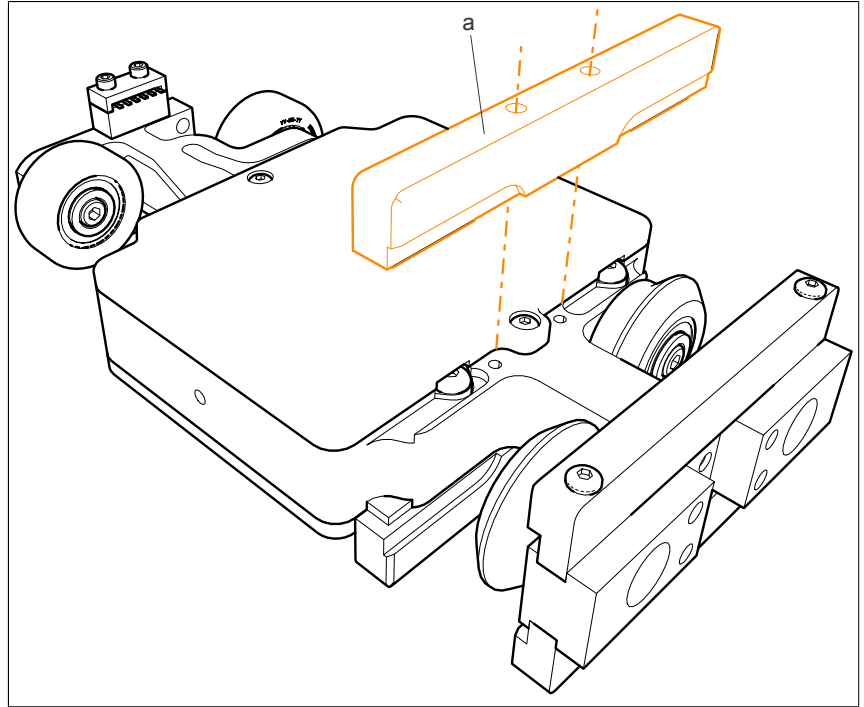
b Screws ISO 7380-1 M3x20 (2x)



2. Remove the screws (b) on the lower glider (a).



3. Remove the glider (a) (discard when replacing the shuttle cover).

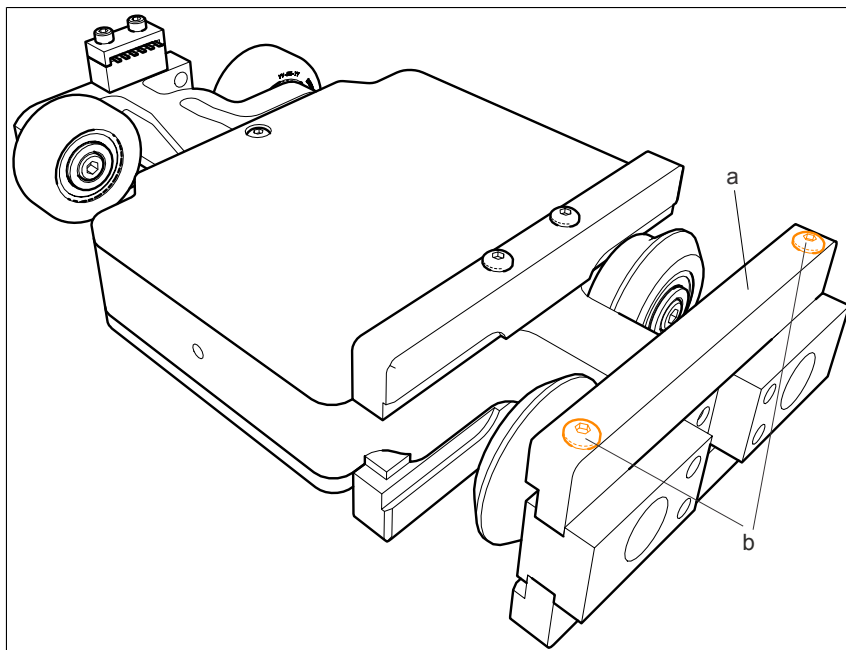


## Disassembling the upper shuttle glider

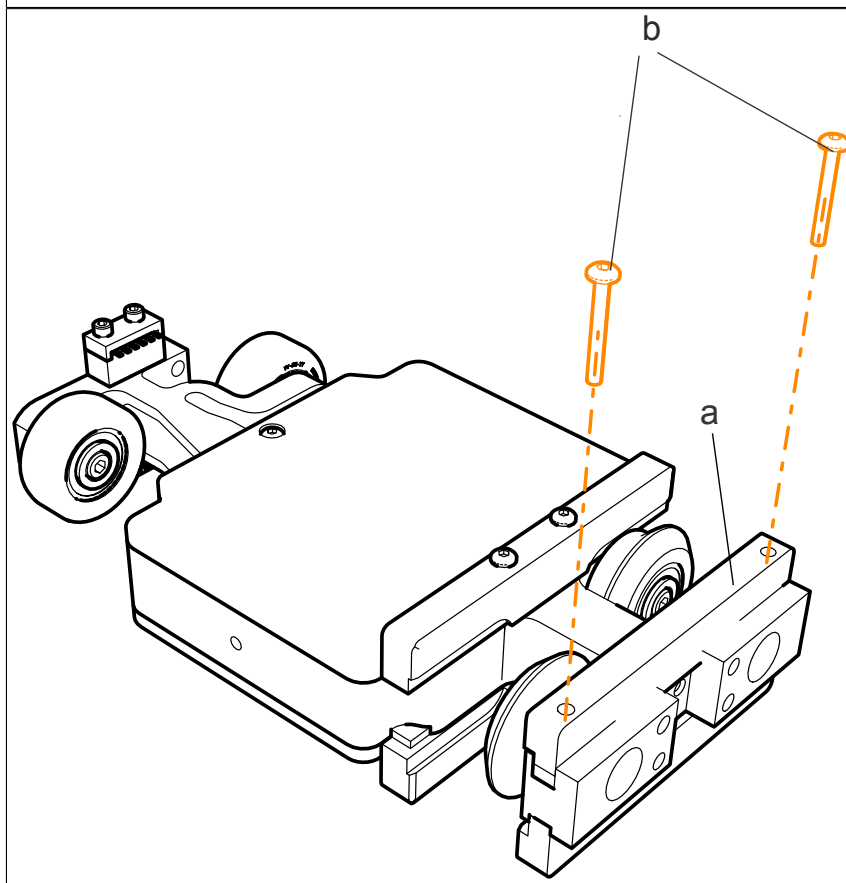
1. Loosen the screws (b) on the upper glider (a).

a Upper glider

b Screws ISO 7380-1 M3x20 (2x)

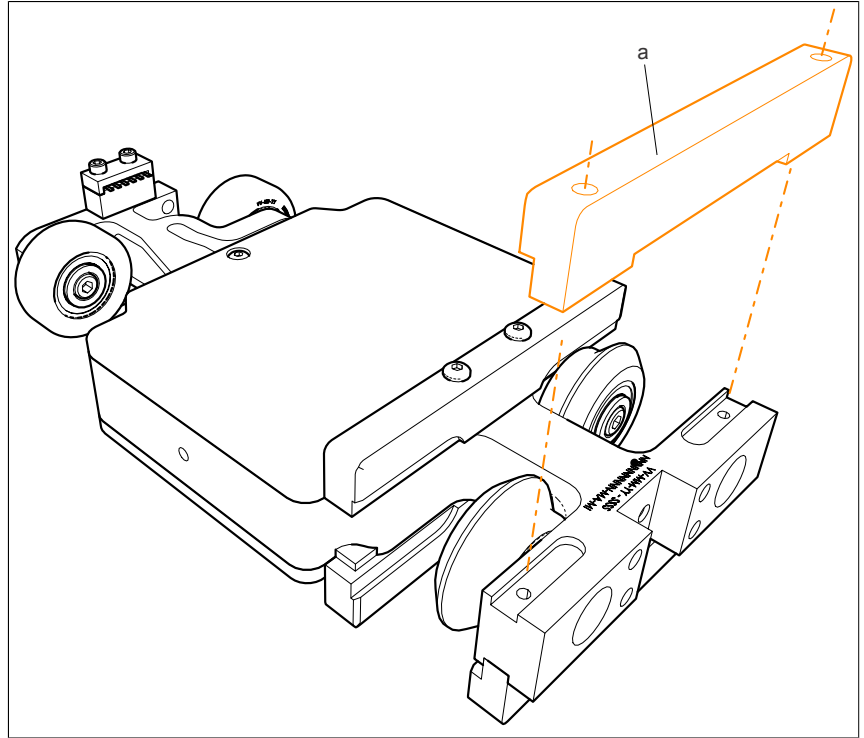


2. Remove the screws (b) on the upper glider (a).





3. Remove the glider (a) (discard when replacing the shuttle cover).



### 4.10.2 Assembling shuttle gliders (100 mm shuttle)

Re-cut the threads for the shuttle glider mounting screws (M3x20) with a thread cutter with M3 6H tolerance and clean using commercially available brake cleaner. The screw thread and countersink must be free of adhesive residues.

#### Information:

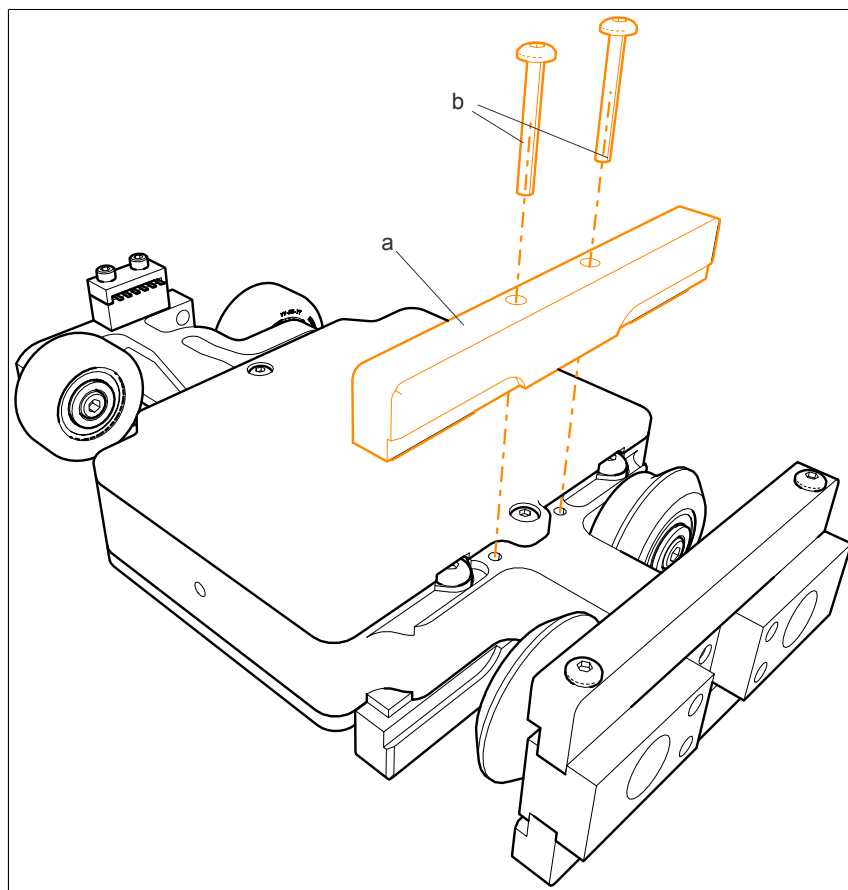
**After cleaning and re-cutting the threads, a newly coated screw must be used for assembly.**

**Check the screw thread for damage by disassembly or re-cutting the screw thread; this must be in perfect condition.**

Assembling the lower shuttle glider

1. Assemble the lower glider (a) with the newly coated screws (b) (tightening torque 0.4 Nm).

a Lower glider  
b Screws ISO 7380-1 M3x20 (2x)

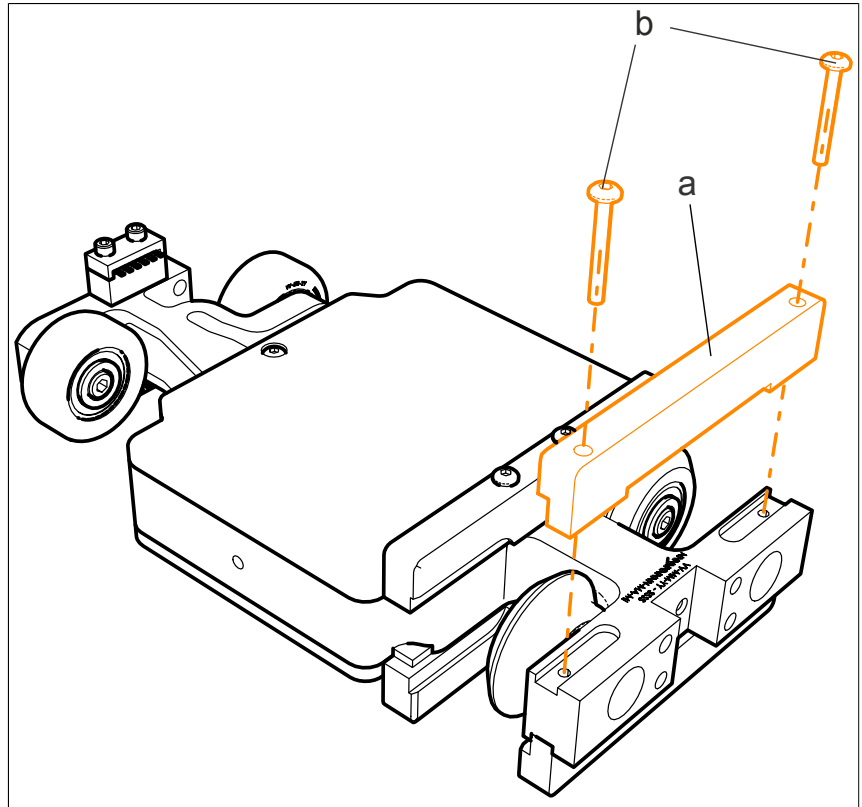


## Assembling the upper shuttle glider

1. Assemble the upper glider (a) with the newly coated screws (b) (tightening torque 1 Nm).

a Upper glider

b Screws ISO 7380-1 M3x20 (2x)



## 4.11 Replacing a shuttle cover (50 mm shuttle)

### Tool

Screwdriver, TORX T10

Thread cutter M3 6H tolerance

Torque wrench

### Preparation

1. Clean the shuttle.
2. Place or clamp the shuttle on a suitable, non-magnetic surface.
3. Keep the workplace away from magnetic and ferromagnetic parts.

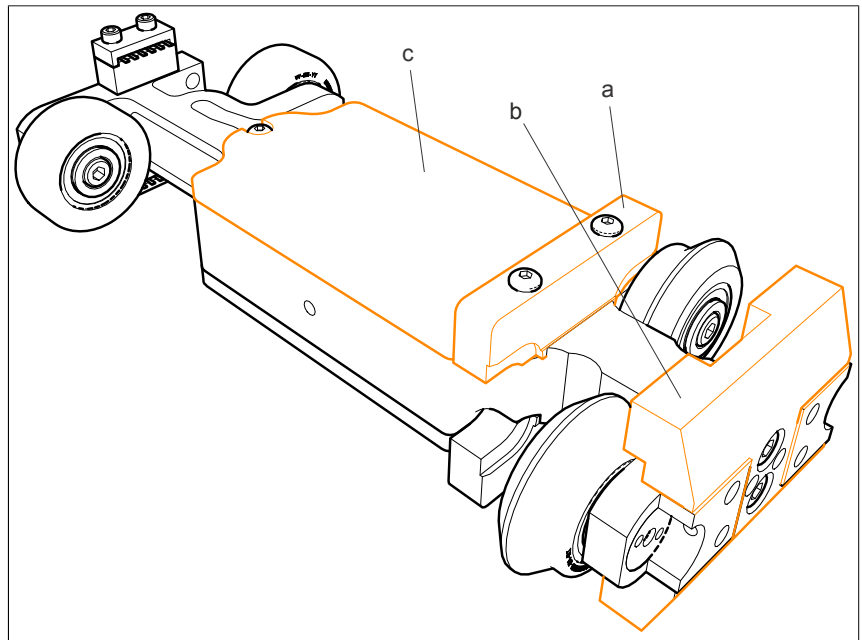
### Procedure

1. [4.9.1 "Disassembling the lower shuttle glider" on page 187](#)
2. ["Disassembling the shuttle cover" on page 199](#)
3. ["Assembling the shuttle cover " on page 201](#)
4. [4.9.2 "Assembling the lower shuttle glider" on page 190](#)

### ACOPOStrak shuttle

#### ► Components to be replaced

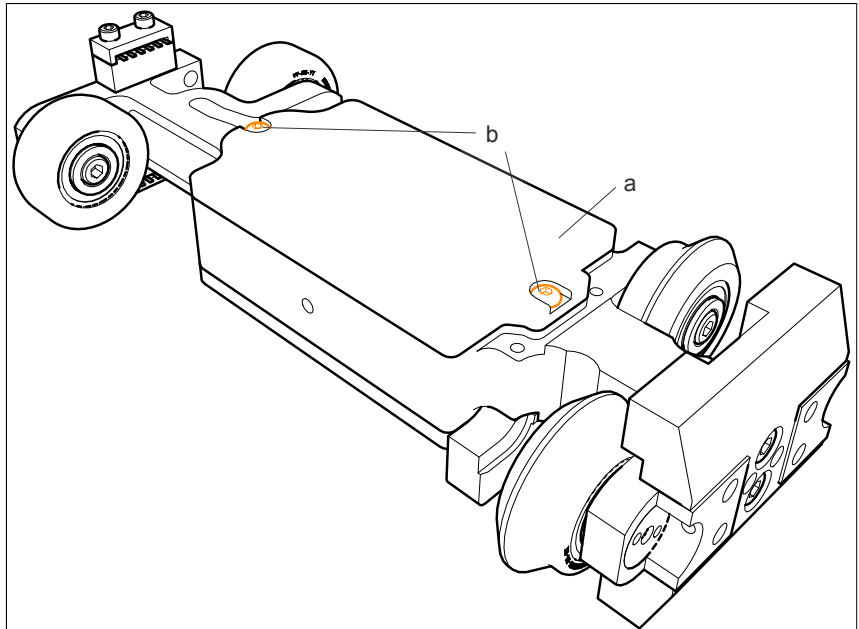
- a Lower glider
- b Upper glider
- c Shuttle cover



### Disassembling the shuttle cover

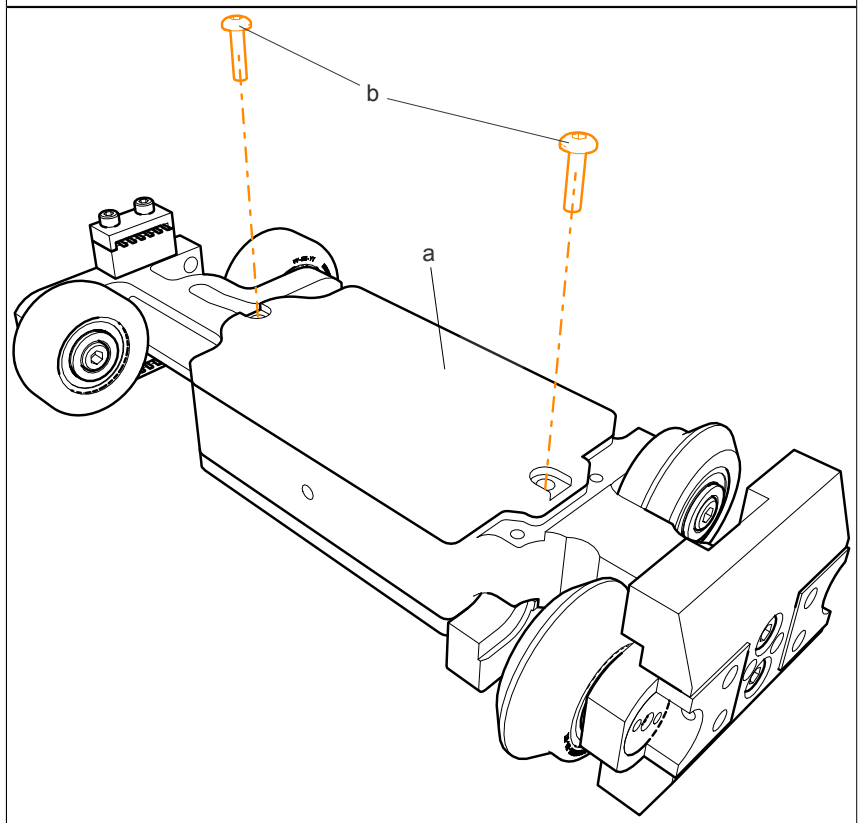
1. Loosen the screws (b) on the shuttle cover (a).

a Shuttle cover  
b Screws ISO 7380-1 M3x8 (2x)

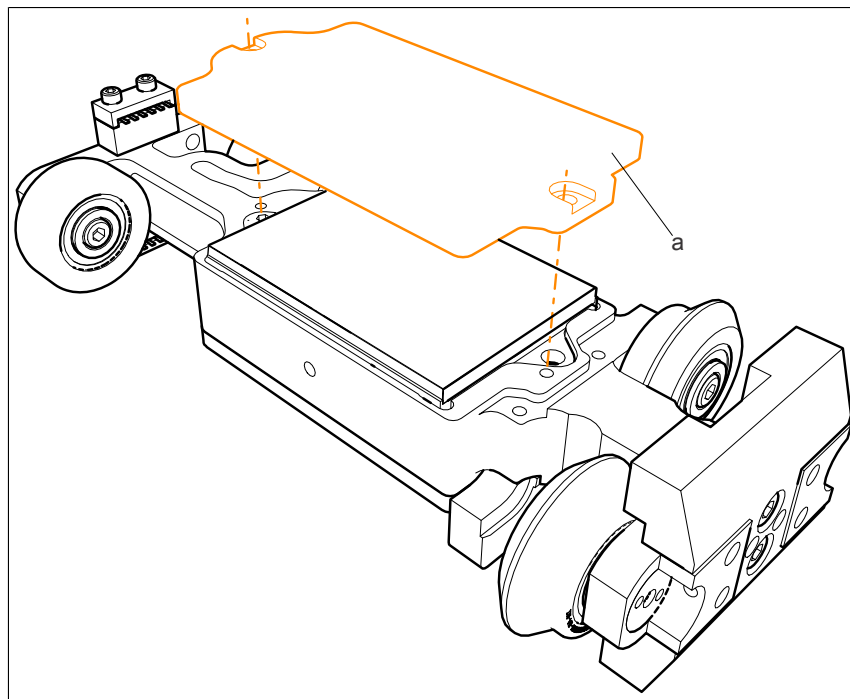


2. Remove the screws (b) on the shuttle cover (a).

a Shuttle cover  
b Screws ISO 7380-1 M3x8 (2x)



3. Remove the shuttle cover (a).



## Assembling the shuttle cover

Re-cut the threads for the shuttle cover mounting screws (M3x8) with a thread cutter with M3 6H tolerance and clean using commercially available brake cleaner. The screw thread and countersink must be free of adhesive residues.

### Information:

After cleaning and re-cutting the threads, a newly coated screw must be used for assembly.

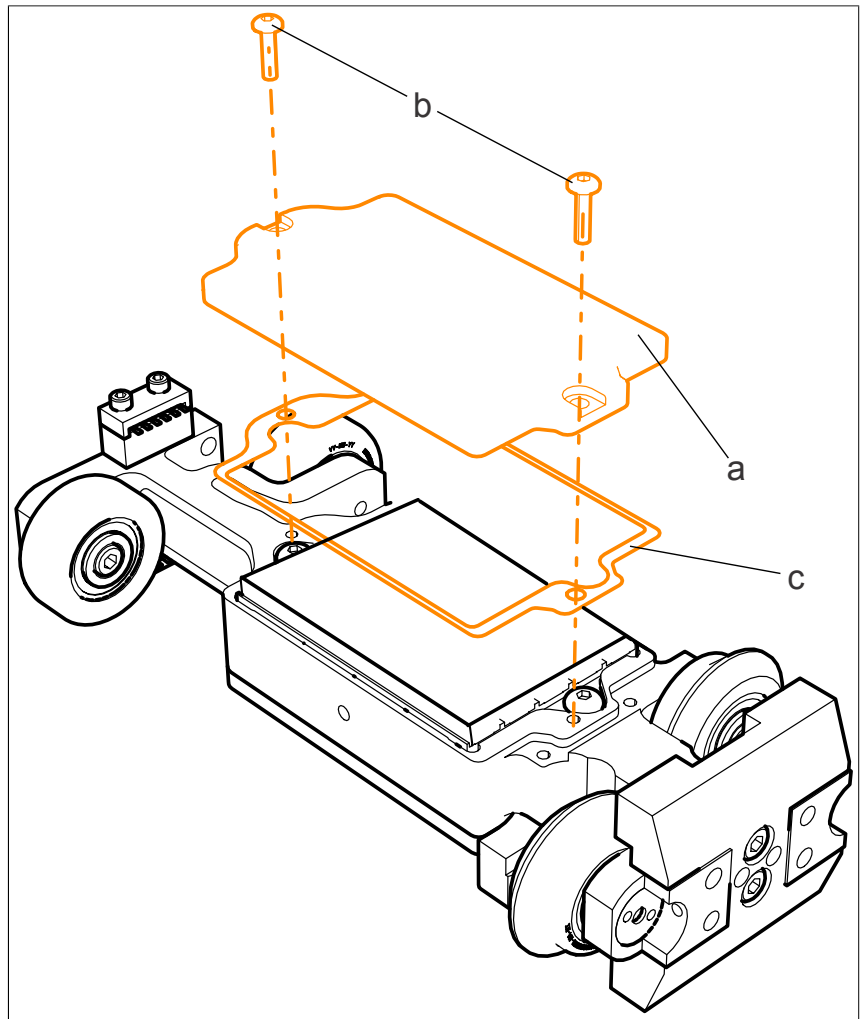
Check the screw thread for damage by disassembly or re-cutting the screw thread; this must be in perfect condition.

### Notice!

Check the magnet unit for any adhering parts and remove them if necessary.

1. Assemble the shuttle cover (a) with the newly coated screws (b) (tightening torque 1 Nm).
2. In addition, install the shuttle shim (c) for shuttles up to revision A1.

- a Shuttle cover
- b Screws ISO 7380-1 M3x20 (2x)
- c Shuttle shim



The procedure for disassembling/assembling the shuttle cover is identical for all standard shuttle variants.

## 4.12 Replacing a shuttle cover (100 mm shuttle)

### Tool

Screwdriver, TORX T10

Thread cutter M3 6H tolerance

Torque wrench

### Preparation

1. Clean the shuttle.
2. Place or clamp the shuttle on a suitable, non-magnetic surface.
3. Keep the workplace away from magnetic and ferromagnetic parts.

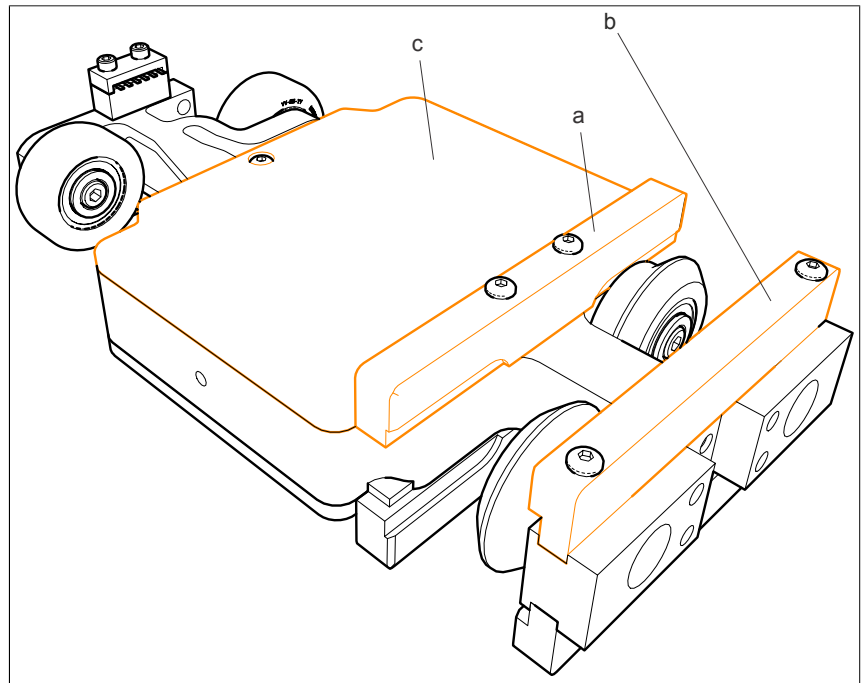
### Procedure

1. [4.10.1 "Disassembling the lower shuttle glider" on page 192](#)
2. ["Disassembling the shuttle cover" on page 203](#)
3. ["Assembling the shuttle cover " on page 204](#)
4. [4.10.2 "Assembling the lower shuttle glider" on page 196](#)

### ACOPOStrak shuttle

#### ► Components to be replaced

- a Lower glider
- b Upper glider
- c Shuttle cover

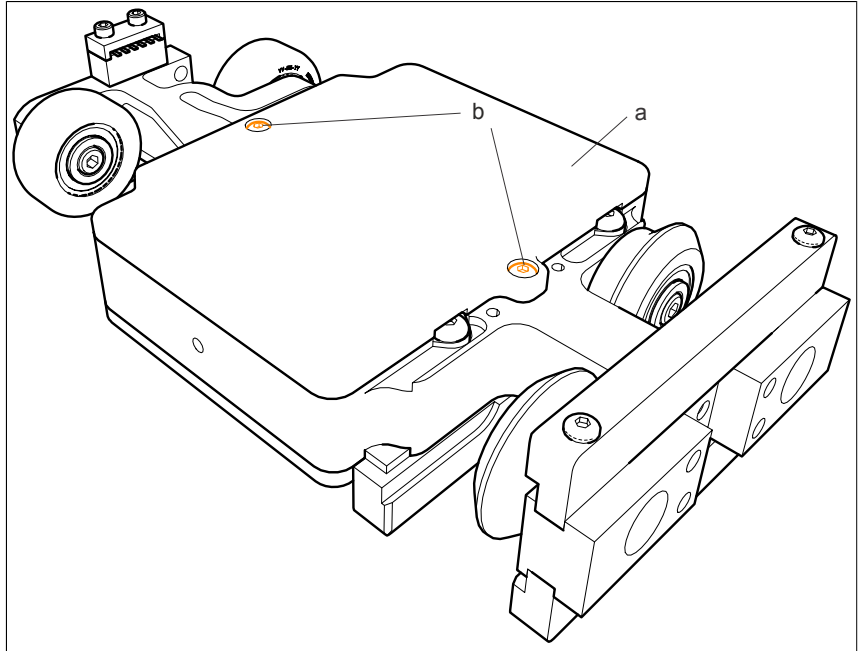




**Disassembling the shuttle cover**

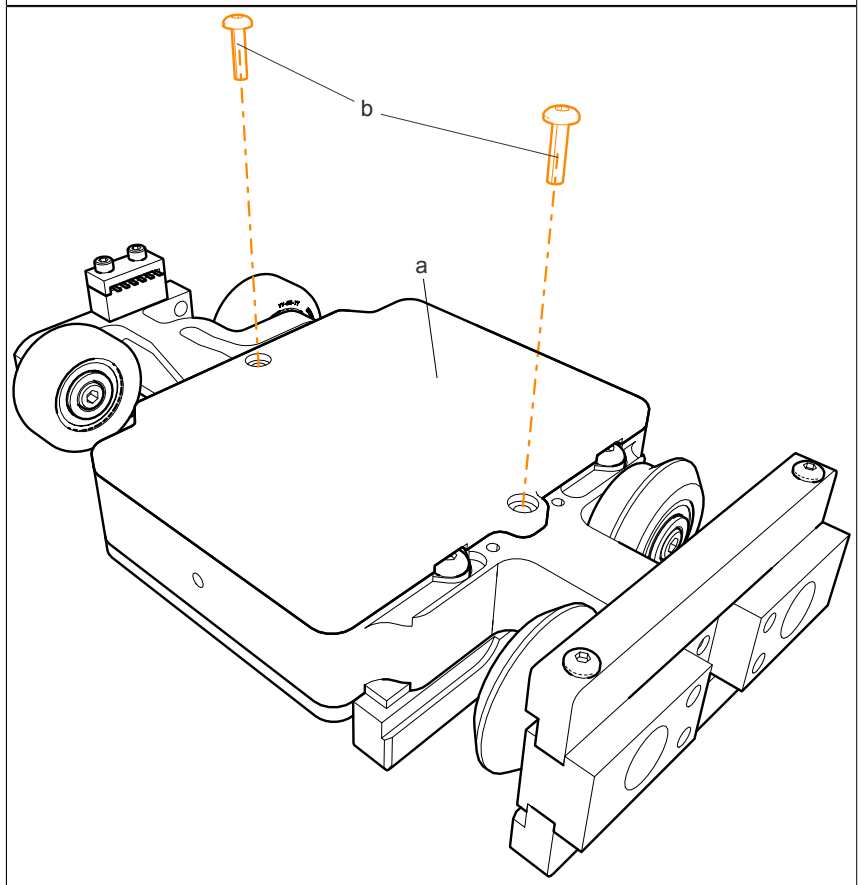
1. Loosen the screws (b) on the shuttle cover (a).

a Shuttle cover  
b Screws ISO 7380-1 M3x8 (2x)

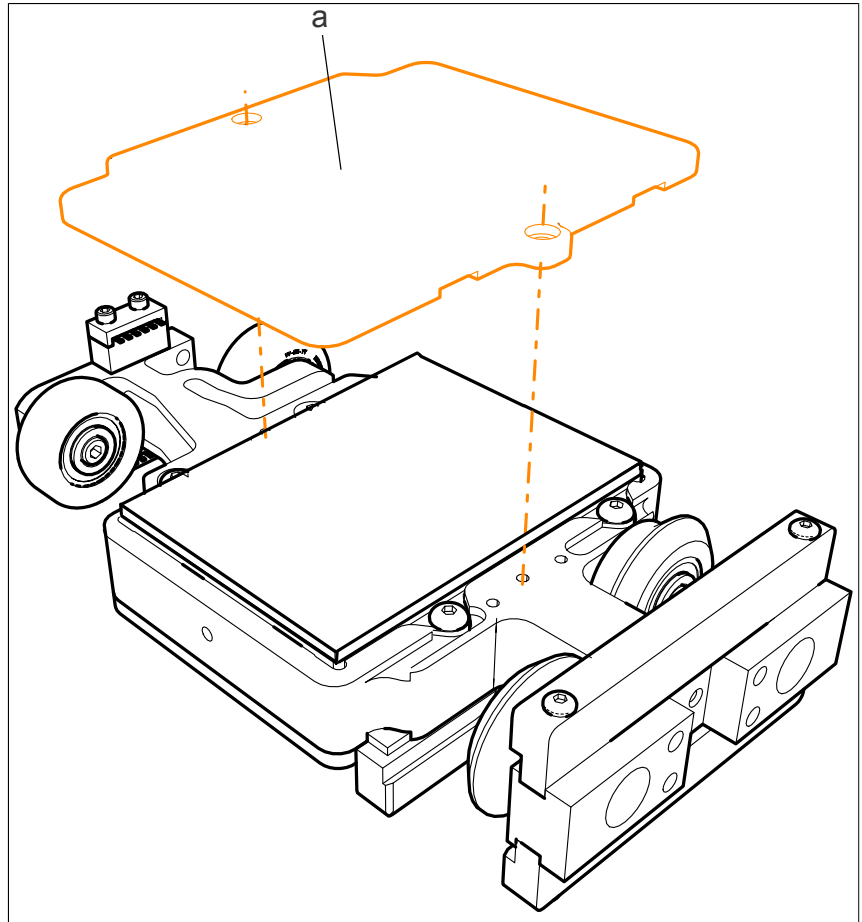


2. Remove the screws (b) on the shuttle cover (a).

a Shuttle cover  
b Screws ISO 7380-1 M3x8 (2x)



3. Remove the shuttle cover (a).



#### Assembling the shuttle cover

Re-cut the threads for the shuttle cover mounting screws (M3x8) with a thread cutter with M3 6H tolerance and clean using commercially available brake cleaner. The screw thread and countersink must be free of adhesive residues.

#### Information:

After cleaning and re-cutting the threads, a newly coated screw must be used for assembly.

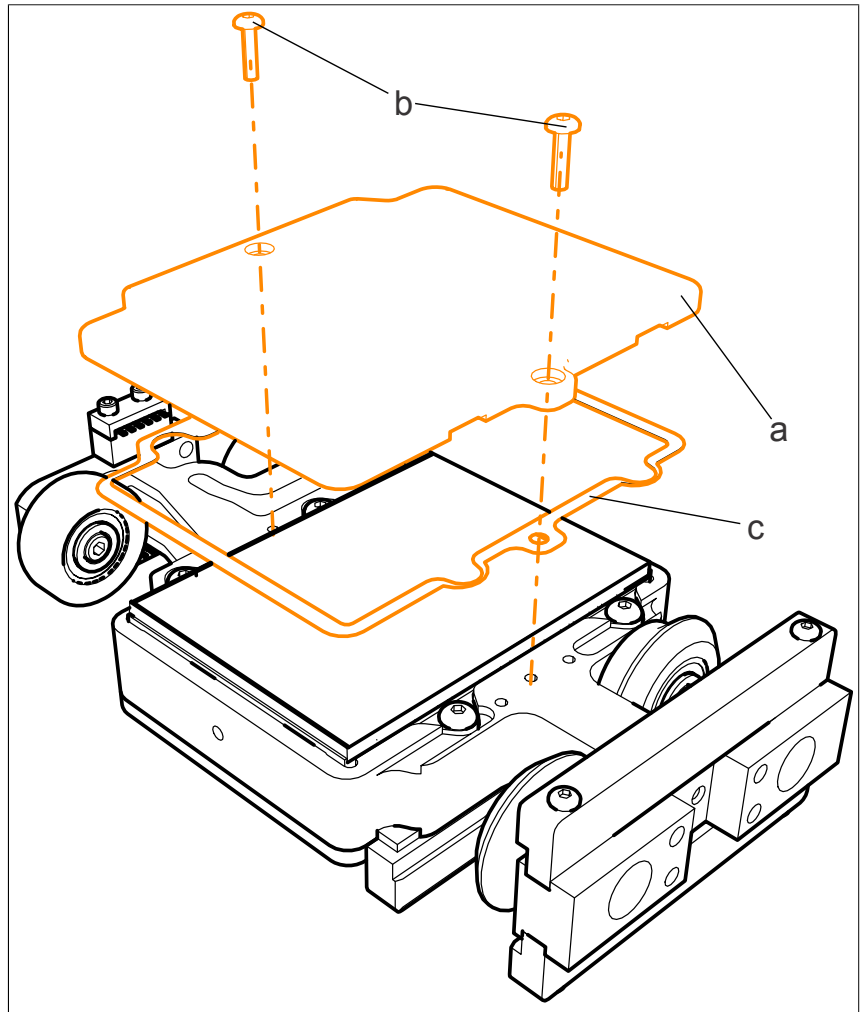
Check the screw thread for damage by disassembly or re-cutting the screw thread; this must be in perfect condition.

## Notice!

**Check the magnet unit for any adhering parts and remove them if necessary.**

1. Assemble the shuttle cover (a) with the newly coated screws (b) (tightening torque 1 Nm).
2. In addition, install the shuttle shim (c) for shuttles up to revision A1.

a Shuttle cover  
b Screws ISO 7380-1 M3x20 (2x)  
c Shuttle shim



The procedure for disassembling/assembling the shuttle cover is identical for all standard shuttle variants.

## 5 Installation

For video tutorials on various topics, see [ACOPOStrak installation and servicing](https://www.br-automation.com/learn-track).



<https://www.br-automation.com/learn-track>

### 5.1 Installation diagrams

#### 5.1.1 Cable bending radius

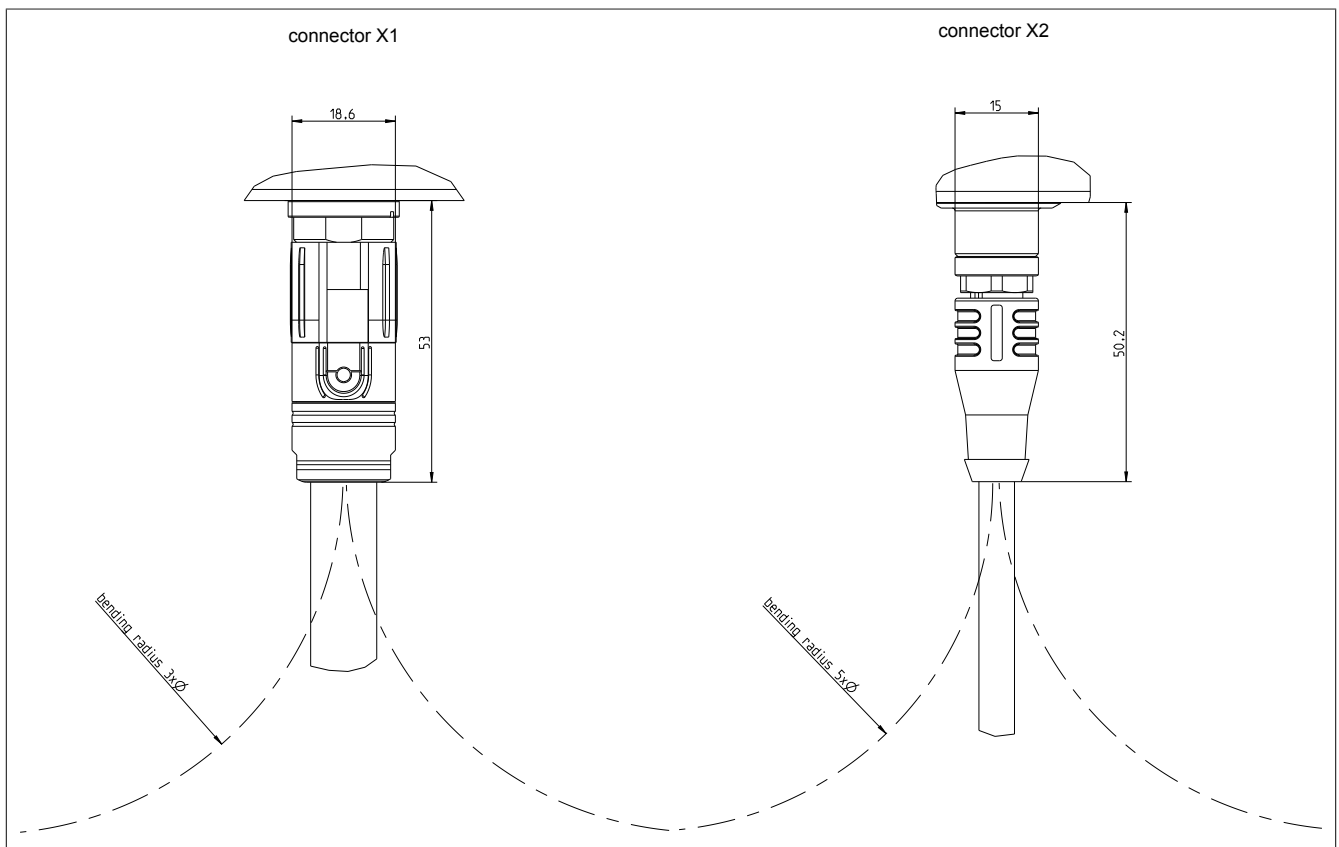


Figure 83: Dimension diagram for cable radii (connector X1, X2)

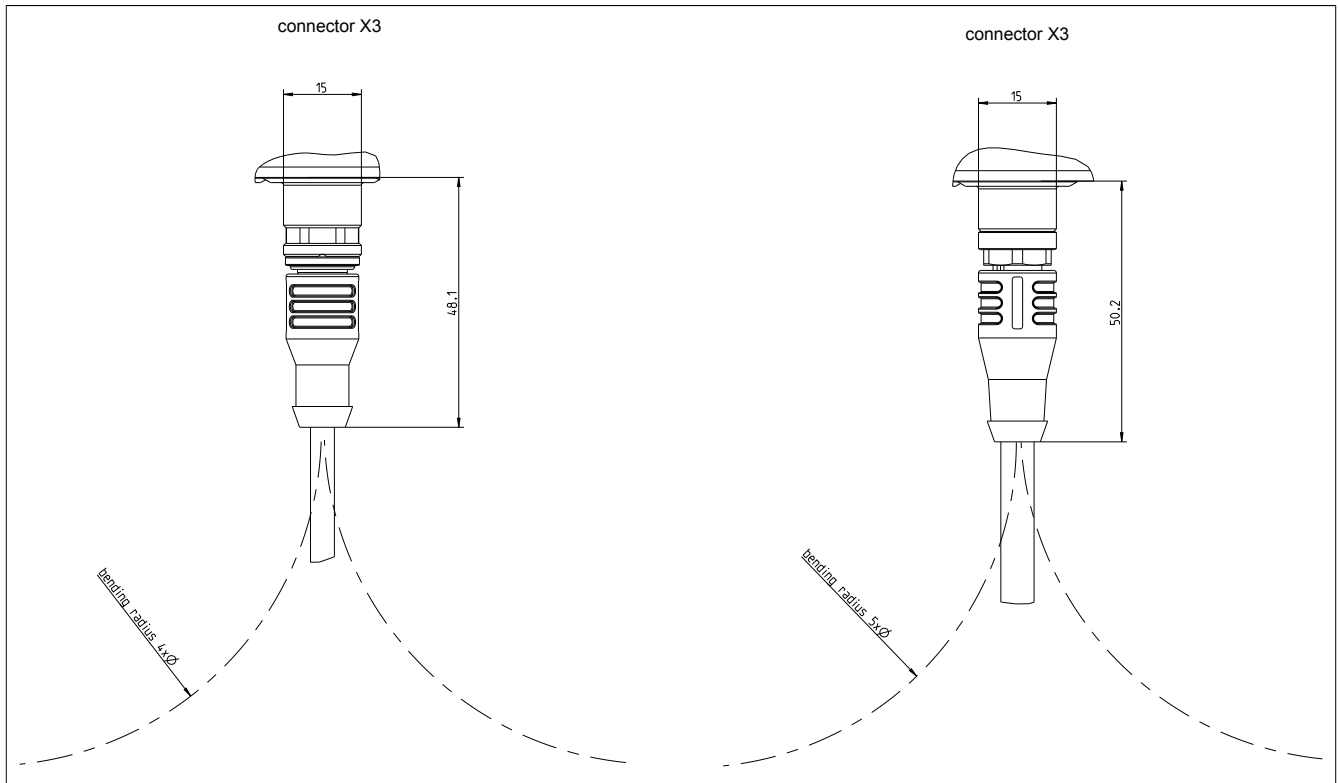


Figure 84: Dimension diagram for cable radii (connector X3)

## 5.2 Lifting guide elements of an ACOPOStrak transport system

### **Danger!**

Dangerous situations are avoided by using lifting equipment (e.g. forklift or crane) and applying safe lifting methods and procedures to lift a guide element.

B&R recommends obtaining appropriate information from the respective national health and safety authorities.

Use appropriate lifting equipment and apply safe lifting methods to lift a guide element.

The following tools are required for this procedure:

- 4 swivel lifting rings (material number)



- Chain sling with adjustable length for horizontal lifting of the guide elements with a minimum load capacity of 100 kg

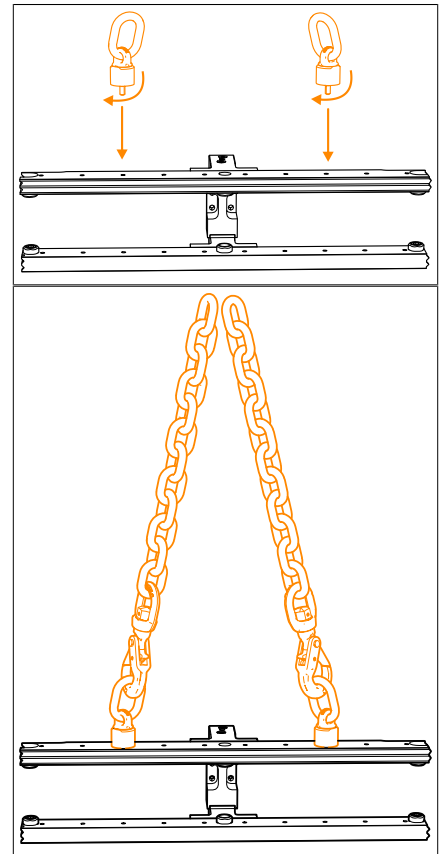


- Appropriate lifting equipment (e.g. forklift or crane)

### 5.2.1 Lifting ACOPOStrak guide element CA, straight

#### Lifting ACOPOStrak guide element CA, straight, adjustable (2 attachment points)

1. Screw in the swivel lifting rings to the end stop at the specified position according to the [3.6.1.2.4 "dimension diagram \("Position for lifting eyebolt"\)"](#) on page 84.
2. Fasten the chain sling to the swivel lifting rings.
3. Use appropriate lifting equipment (forklift or crane) to lift the guide element.
4. When the guide element is in the desired position, remove the chain sling and swivel lifting rings.

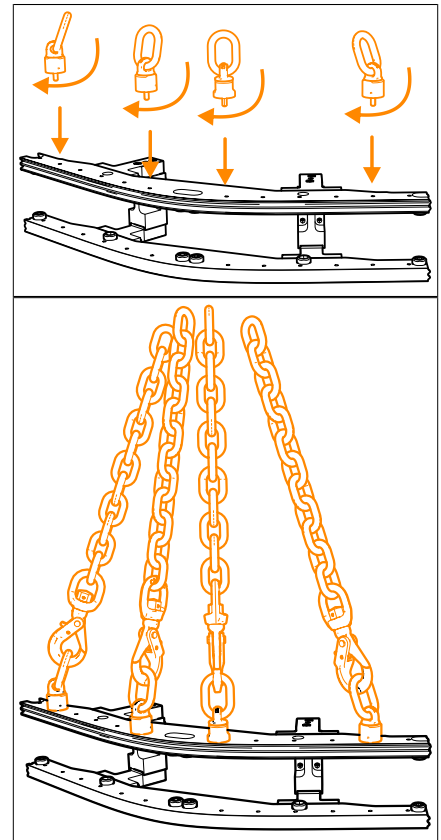


### 5.2.2 Lifting ACOPOStrak guide element CA, 45°

#### Lifting ACOPOStrak guide element CA, 45°

(4 attachment points)

1. Screw in the swivel lifting rings to the end stop at the specified position according to the 3.6.1.3.4 "dimension diagram ("Position for lifting eyebolt")" on page 86.
2. Fasten the chain sling to the swivel lifting rings.
3. Use appropriate lifting equipment (forklift or crane) to lift the guide element.
4. When the guide element is in the desired position, remove the chain sling and swivel lifting rings.



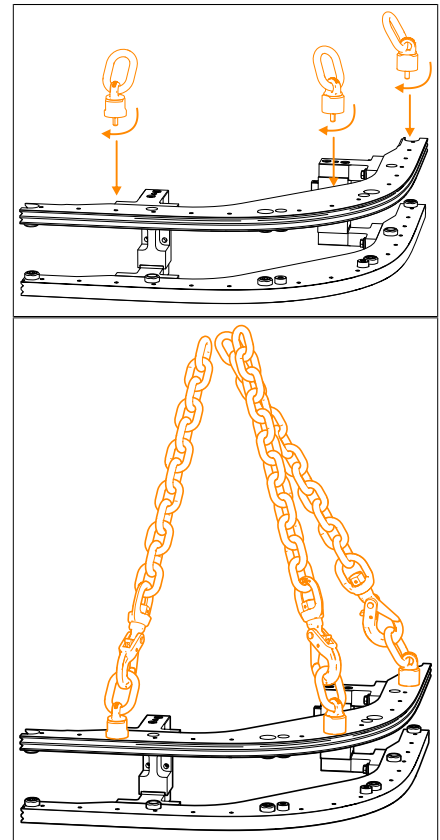


### 5.2.3 Lifting ACOPOStrak guide element CA, 90°

#### Lifting ACOPOStrak guide element CA, 90°

(3 attachment points)

1. Screw in the swivel lifting rings to the end stop at the specified position according to the 3.6.1.4.4 "dimension diagram ("Position for lifting eyebolt")" on page 88.
2. Fasten the chain sling to the swivel lifting rings.
3. Use appropriate lifting equipment (forklift or crane) to lift the guide element.
4. When the guide element is in the desired position, remove the chain sling and swivel lifting rings.

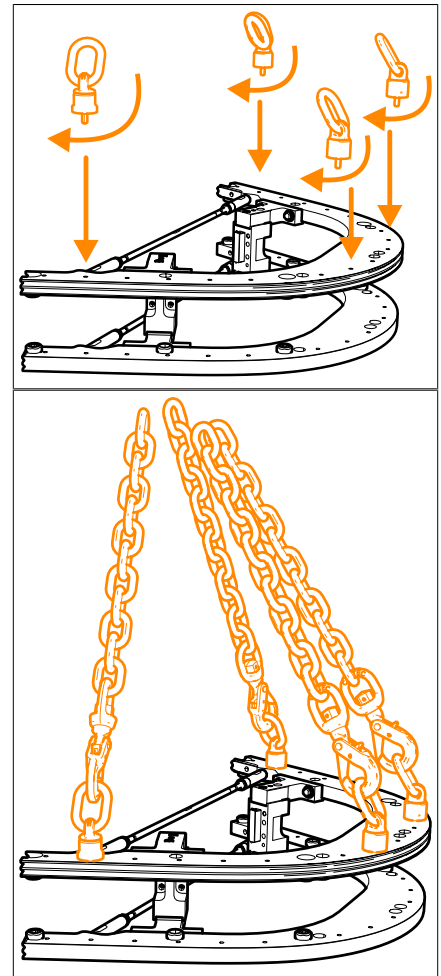


### 5.2.4 Lifting ACOPOStrak guide element CA, 135°

#### Lifting ACOPOStrak guide element CA, 135°

(4 attachment points)

1. Screw in the swivel lifting rings to the end stop at the specified position according to the 3.6.1.5.4 "dimension diagram ("Position for lifting eyebolt")" on page 90.
2. Fasten the chain sling to the swivel lifting rings.
3. Use appropriate lifting equipment (forklift or crane) to lift the guide element.
4. When the guide element is in the desired position, remove the chain sling and swivel lifting rings.

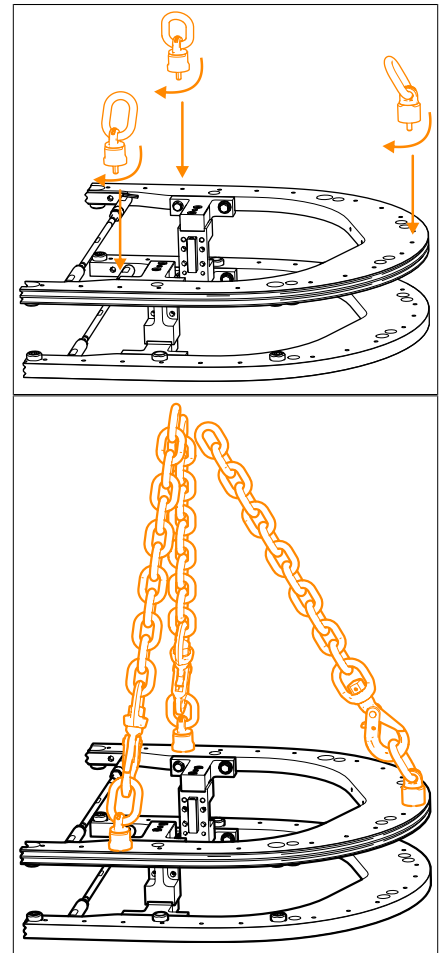


### 5.2.5 Lifting ACOPOStrak guide element CA, 180°

#### Lifting ACOPOStrak guide element CA, 180°

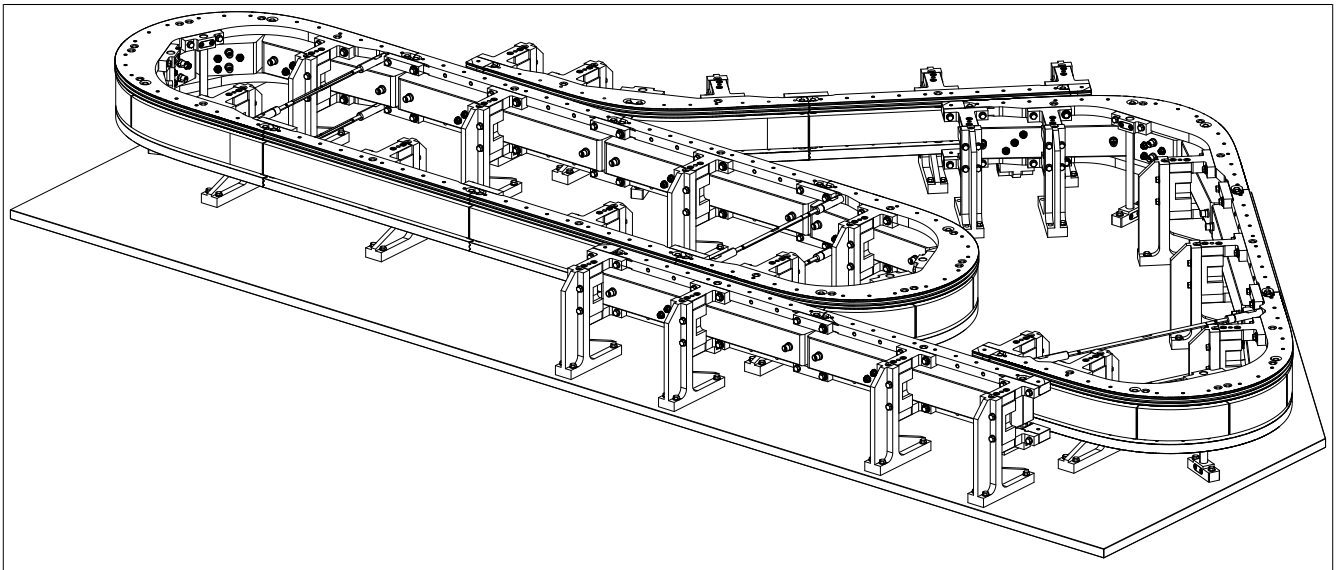
(3 attachment points)

1. Screw in the swivel lifting rings to the end stop at the specified position according to the 3.6.1.6.4 "dimension diagram ("Position for lifting eyebolt")" on page 92.
2. Fasten the chain sling to the swivel lifting rings.
3. Use appropriate lifting equipment (forklift or crane) to lift the guide element.
4. When the guide element is in the desired position, remove the chain sling and swivel lifting rings.



## 5.3 B&R standard guide system

### 5.3.1 Sample setup



Sample setup with the following components:

- Generic base plate
- Guide stands
- Accessory stands
- Non-adjustable guide elements
- Adjustable guide elements (in the diverter area)
- Adjustable units (e.g. 45° guide element)
- Guide connector
- Guide extensions
- Segments

### 5.3.2 Requirements

The following components are required to install an ACOPOStrak transport system:

#### Tools

- Torque wrench 5 to 25 Nm
- Deep socket 13 mm
- Hex key 5 mm, 6 mm
- Open-ended wrench 8 mm, 13 mm, 16 mm, 17 mm

#### Measuring device

- 2x horizontal spirit level (DIN 877), accuracy: 0.04 mm/m
- Feeler gauge
- Height measuring device (300 mm)
- ACOPOStrak alignment tool for guide element, 180° / guide element, 135 (8F1TCA.GAT01000I-1)
- ACOPOStrak alignment tool for guide element, 90° / guide element, 45° / guide element, straight (8F1TCA.GAT02000I-1 )
- ACOPOStrak measuring shuttle for guide rail transition (8F1TCA.GMS00000I-1 )

#### Measuring device for diverter adjustment

- Diverter setup tool
- ACOPOStrak calipers for diverter gap (8F1TCA.DCDG0000I-1)
- ACOPOStrak adjustment tool for precisely positioning segments horizontally in guide elements (8F1TCA.DSAT0000I-1)
- ACOPOStrak measuring device for determining the height offset of opposing double-v guide rails in the diverter area (8F1TCA.DHOMD000I-1)
- ACOPOStrak 2x 3 adjustment and control blocks for the diverter gap (8F1TCA.DCB00000I-1)

#### Installation accessories

- ACOPOStrak assembly support, adjustable (8F1TCA.GAS00000I-1 )
- ACOPOStrak height adjustment tool for accessory stands (8F1TCA.GHAT0000I-1)

#### Additional

- Assembly diagram of the complete system
- Installation diagrams

#### Information:

Note the [1.2 "Safety notices" on page 12!](#)

#### Information:

**None of the screws are permitted to be glued or coated with thread-locking fluid!**

#### Information:

The base surface and all contact surfaces on tools, measuring devices and components used to construct an ACOPOStrak transport system must be clean, see [4.2 "Cleaning the ACOPOStrak transport system" on page 173.](#)

#### Information:

Check tools and measuring devices for damage before use.

### **Checking the base surface**

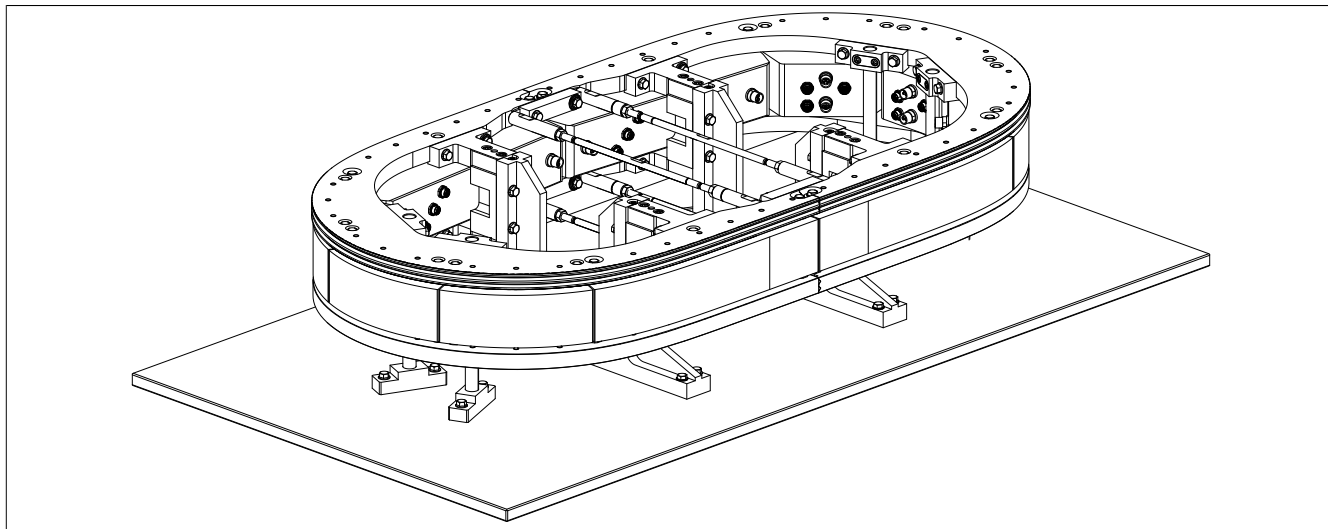
If necessary, the base surfaces or plate(s) must be checked for horizontality and flatness according to the installation diagrams before starting assembly.

Exact alignment of the base surfaces or plate(s) is a prerequisite for constructing the ACOPOStrak transport system.

### 5.3.3 Procedure for assembly and adjustment depending on the track layout

#### 5.3.3.1 Track system with 2x 180° guide units

Constructing a track system with two 180° guide units (guide elements with ACOPOStrak segments).



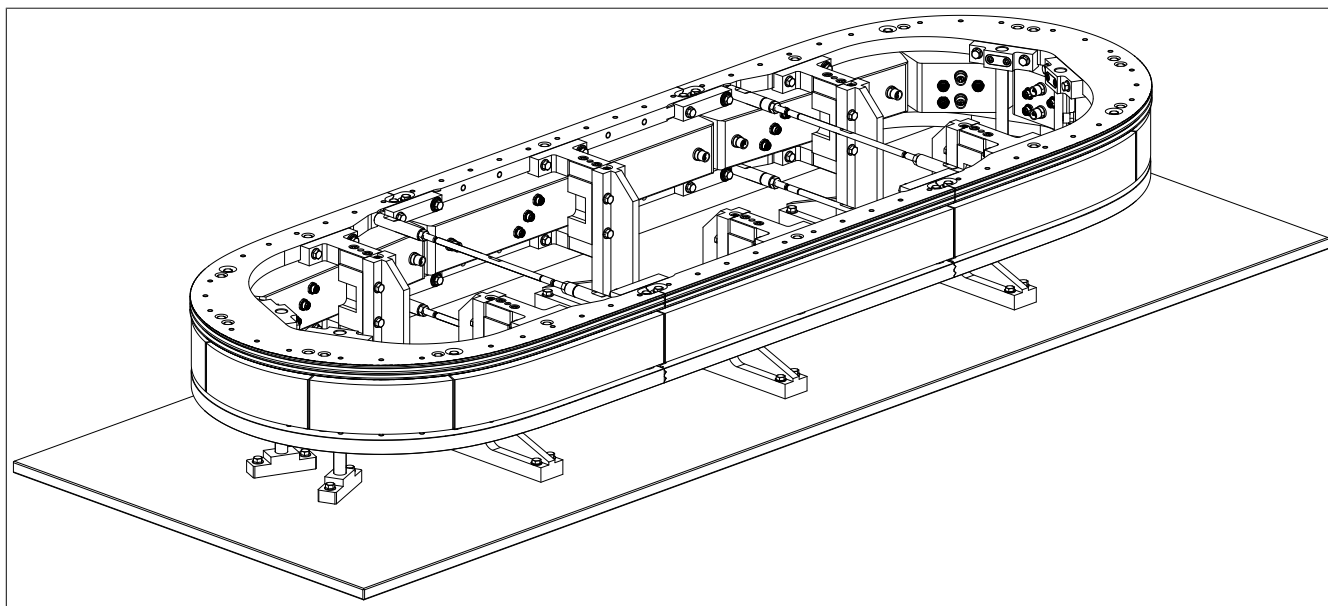
#### Procedure

1. ["Pre-assembly of individual components" on page 221](#)
2. Set up both pre-assembled 180° guide elements.
3. Position both 180° guide elements with an ["precise drilling pattern" on page 228](#) and tighten the screws.
4. ["Removing the crossbar on the 180° guide element" on page 227](#)
5. ["Assembling the segments" on page 231](#)
6. ["Assembling the flat guide rail" on page 239](#)
7. ["Alignment a 180° guide unit" on page 258](#)
8. ["Assembling the guide connectors" on page 244](#)
9. ["Measuring the guide rail transition" on page 254](#)

#### 5.3.3.2 Track system with 2x 180° and n straight guide units

Constructing a track system with two 180° and n straight guide units (guide elements with ACOPOStrak segments).

n = Number of straight guide units

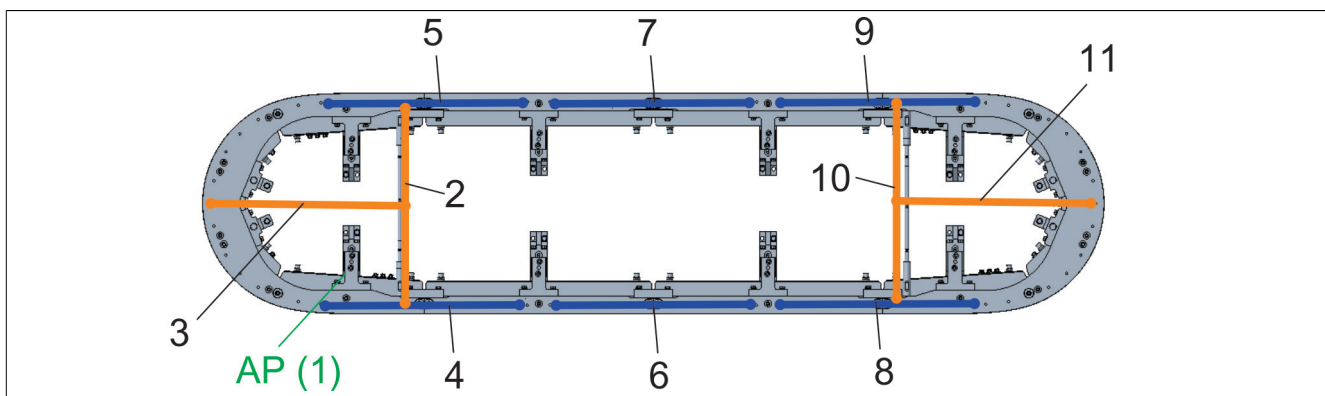


## Procedure

1. "Pre-assembly of individual components" on page 221
2. Set up all guide elements.
3. "Arranging the components and pre-assembly" on page 228 of all guide elements with a "precise drilling pattern" on page 228.
4. "Assembling the segments" on page 231
5. "Assembling the flat guide rail" on page 239

Align the assembled components.

6. Define the anchor point (AP), see "Adjustment" on page 258.
7. "Align the first 180° guide unit" on page 258.
8. Align the straight guide units connected to the 180° guide unit and the second 180° guide unit (sequence of measuring points 4 to 11).



9. "Assembling the guide connectors" on page 244
10. "Measuring the guide rail transition" on page 254



### 5.3.3.3 Track system with diverter

In preparation

### 5.3.3.4 Vertical track system

#### Design of ACOPOStrak transport systems in a mounting orientation with an angle $>0^\circ$ to $<90^\circ$ as well as vertically ( $90^\circ$ )

The track system is set up in a horizontal position on a stable machine base frame with subsequent swivel and alignment movement.

#### Requirements

- The machine base frame must be designed for a swivel and/or alignment movement with the ACOPOStrak system installed.
- Attachment points for a swivel and/or alignment movement are not permitted on the ACOPOStrak system.
- No shuttles are permitted to be on the ACOPOStrak system during the swivel and/or alignment movement.

#### Notice!

**Shuttles must be removed from the ACOPOStrak system before the swivel and/or alignment movement.**

#### Procedure

1. The ACOPOStrak system is set up on the base frame in the same way as a horizontal track system, see [5.3.4 "Assembly steps" on page 221](#).
2. After customized vertical alignment, the guide rail transitions, magnetic forces and diverter areas must be checked as follows:
  - [5.3.5.3 "Measuring the guide rail transition" on page 254](#)
  - [5.3.5.8.2.2 "Adjusting the height offset of the double-v guide rail" on page 268](#)
  - [5.3.5.8.3 "Adjusting the symmetrical magnetic force in the diverter area" on page 273](#)

#### Shuttles

#### Notice!

**Shuttle maintenance is only permitted in the horizontal position or according to the [5.4.3 "disassembly of the shuttles" on page 282](#).**

#### Alignment tools

#### Notice!

**[5.3.5.4 "B&R alignment tools" on page 258](#) are not suitable for alignment/installation in the vertical range.**

### 5.3.4 Assembly steps

Description of the individual assembly steps. For the assembly sequence, see [5.3.3 "Procedure for assembly and adjustment depending on the track layout"](#) on page 217.

#### 5.3.4.1 Pre-assembly of individual components

##### 5.3.4.1.1 Assembling the guide stands and accessory stands on the guide elements

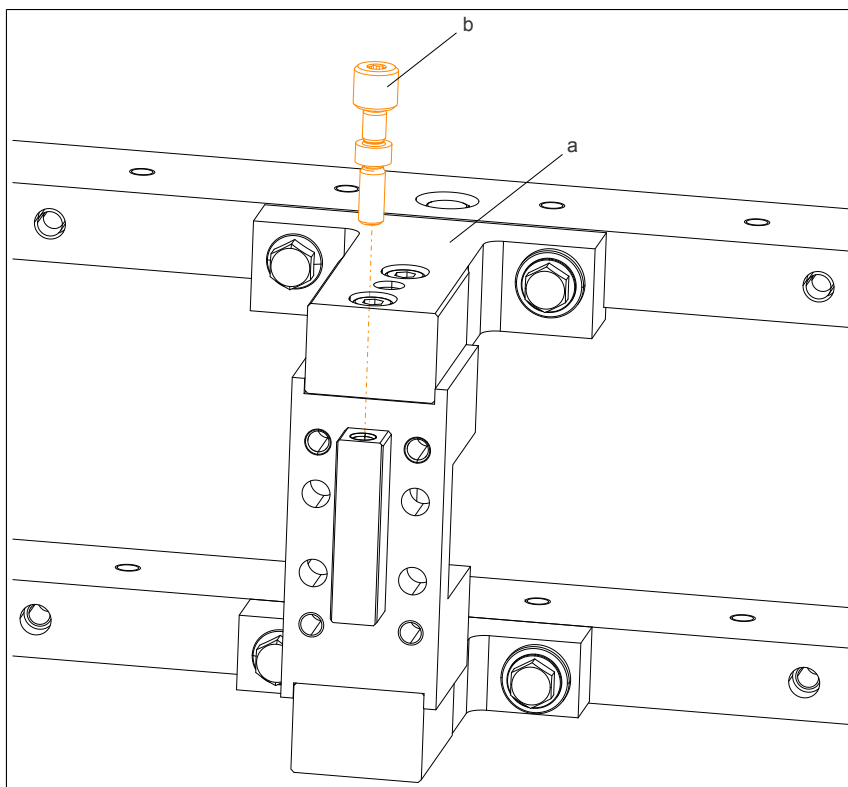
The required guide stands and accessory stands are assembled on the guide elements used so that the guide elements can be assembled on the mounting surface.

<b>Guide stands</b>	8F1GCA.ST027100I-1 , 8F1GCA.ST027A00I-1
<b>Accessory stands</b>	8F1GCA.AS027A00I-1
<b>Guide elements</b>	8F1GC.A066.AA000-1, straight 8F1GC.A066.AB000-1, straight, adjustable 8F1GC.AA66.AA000-1, 45° 8F1GC.AB66.AA000-1, 90° 8F1GC.AC66.AA000-1, 135° 8F1GC.AD66.AA000-1, 180°

#### Assembling the guide stands

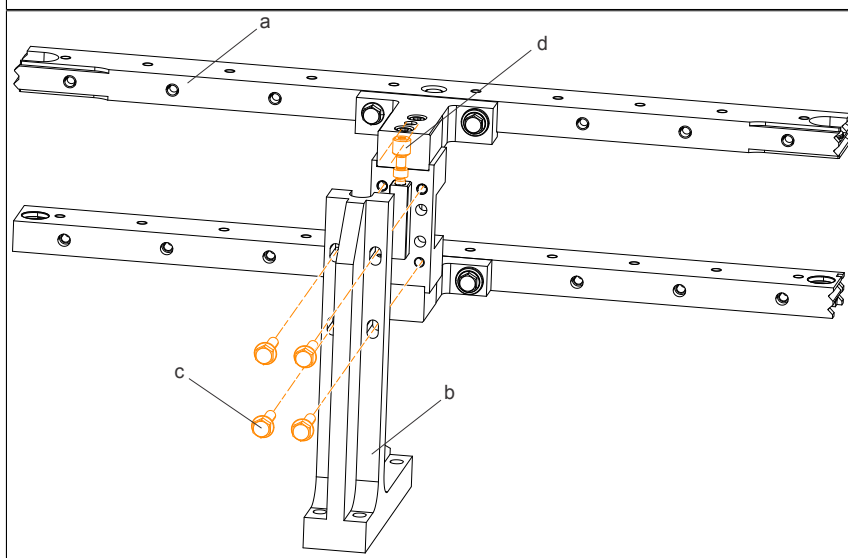
1. Install the push-pull screw (b) on the guide element (a) and screw it in until the screw head of the push-pull screw (b) is flush with the upper edge of the guide element (a).

a Guide element  
b M8x45 push-pull screw (1x)



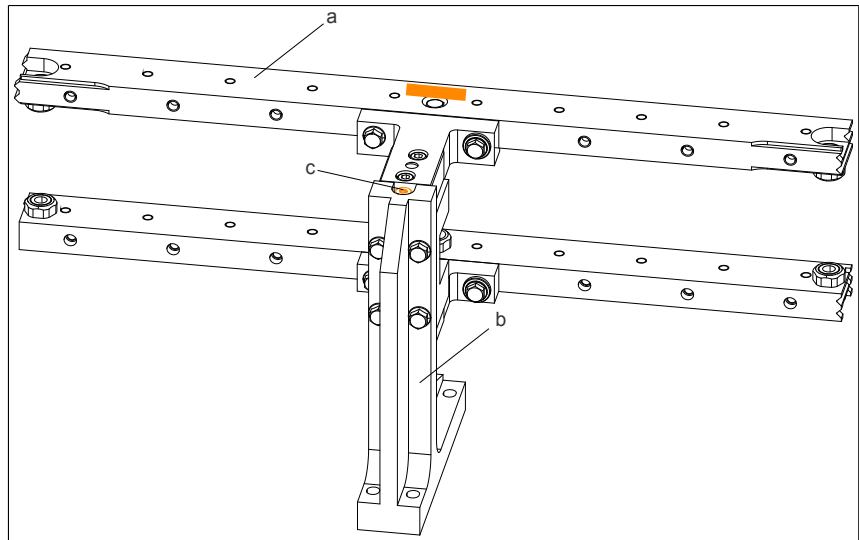
2. Assemble the guide stand (b) on the guide element (a) with 4 hex head screws (c) each and tighten them loosely.

a Guide element  
b Guide stand  
c M8x40 hex head screw (4x)  
d M8x45 push-pull screw (1x)



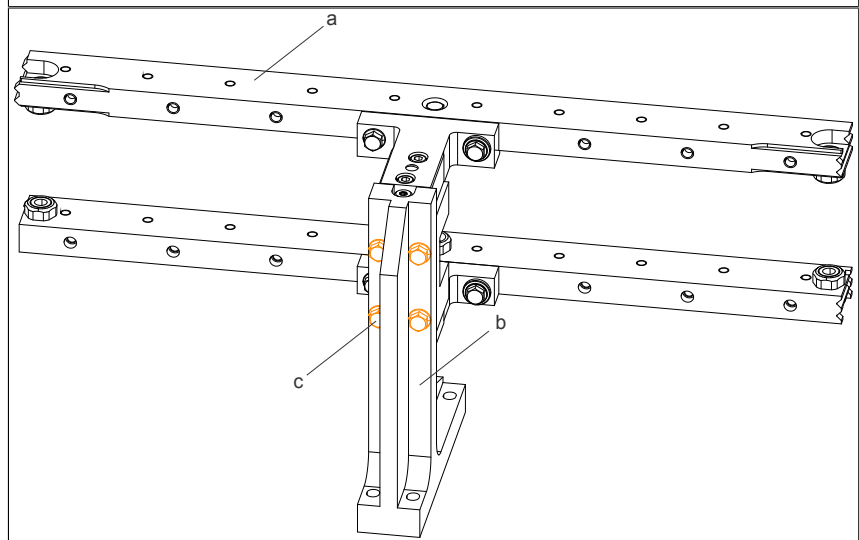
3. Adjust the height using the push-pull screw (c) to the specified dimension ( $275 \pm 0.1$  mm, Fig. 85 "Height adjustment dimension" on page 224, measure at the marked area).

a Guide element  
b Guide stand  
c M8x45 push-pull screw (1x)



4. Tighten the 4 hex head screws (c) (tightening torque 20 Nm).

a Guide element  
b Guide stand  
c M8x40 hex head screw (4x)

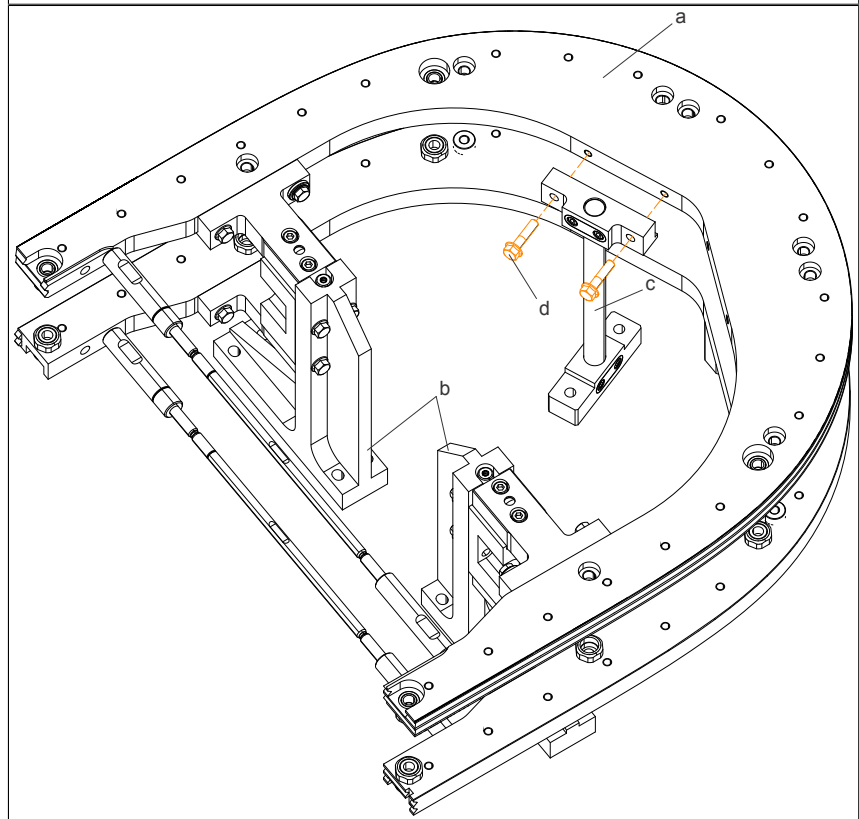


### Assembling the accessory stands

1. Assemble the accessory stand (c) with the hex head screws (d) and tighten them (tightening torque 20 Nm).

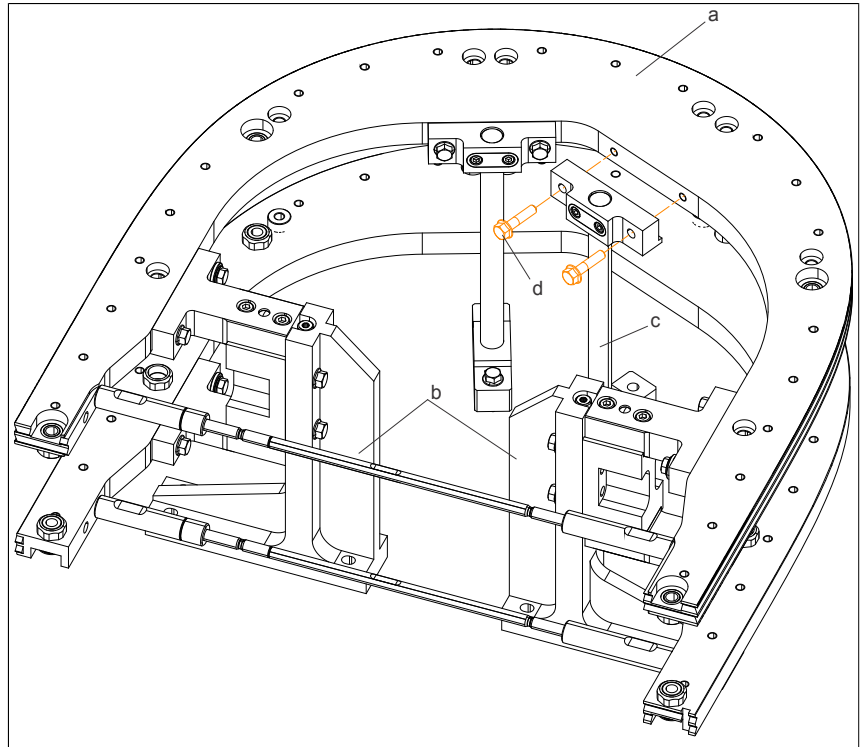
The edge on the bottom of the fastener of the accessory stand must be in contact with the double-v guide rail.

a Guide element  
b Guide stands  
c Accessory stands  
d M8x30 hex head screw (2x)

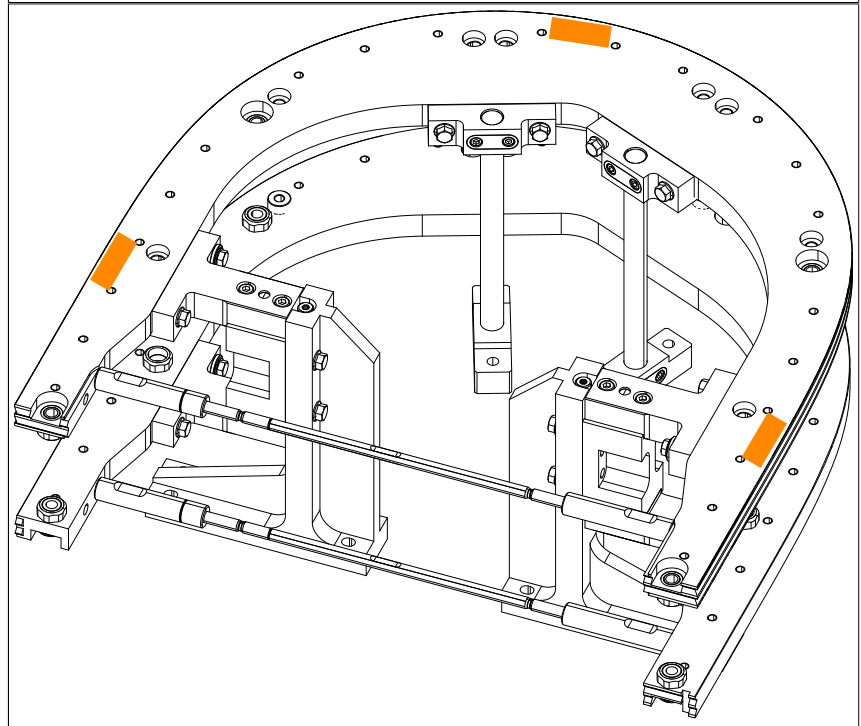


2. Assemble the second accessory stand (c) with the hex head screws (d) and tighten them (tightening torque 20 Nm). The edge on the bottom of the fastener of the accessory stand must be in contact with the double-v guide rail.

a Guide element  
b Guide stands  
c Accessory stands  
d M8x30 hex head screw (2x)



3. Adjust the "height" on page 253 of the accessory stand. Measure the height at the marked areas.



2 accessory stands are assembled for the 180° guide elements; 1 accessory stand is assembled for the 90°/135° guide elements.

**Height adjustment dimension**

Adjust the height to  $275 \pm 0.1$  mm:

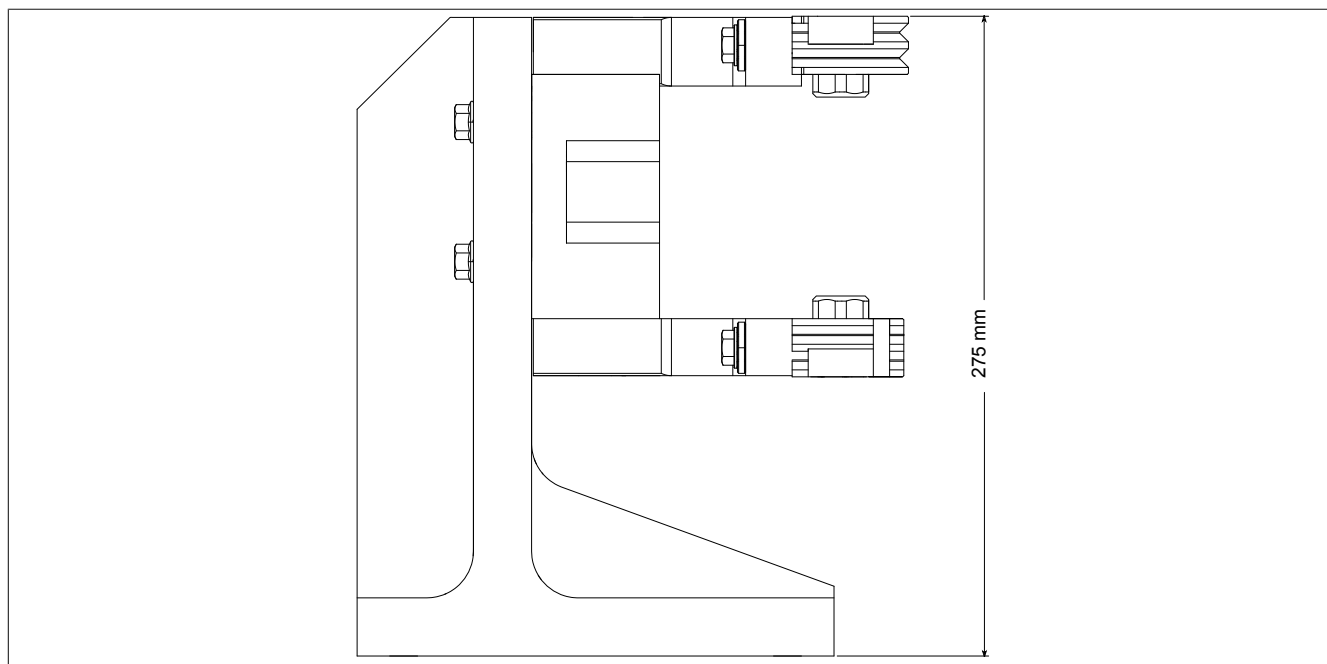


Figure 85: Height adjustment dimension

### 5.3.4.1.2 Assembling the end interface on the guide stand

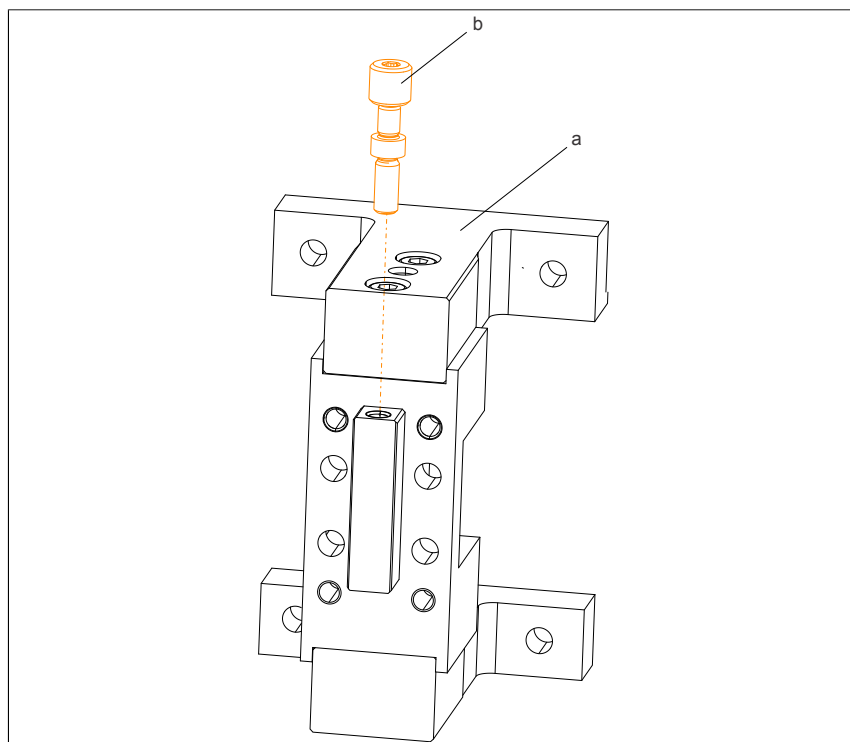
The end interface is assembled on the guide stand.

Guide stands	8F1GCA.ST027100I-1
End interface	8F1GCA.EI000A00I-1

1. Install the push-pull screw (b) on the end interface (a) and screw it in until the screw head of the push-pull screw (b) is flush with the upper edge of the guide element (a).

a End interface

b M8x45 push-pull screw (1x)



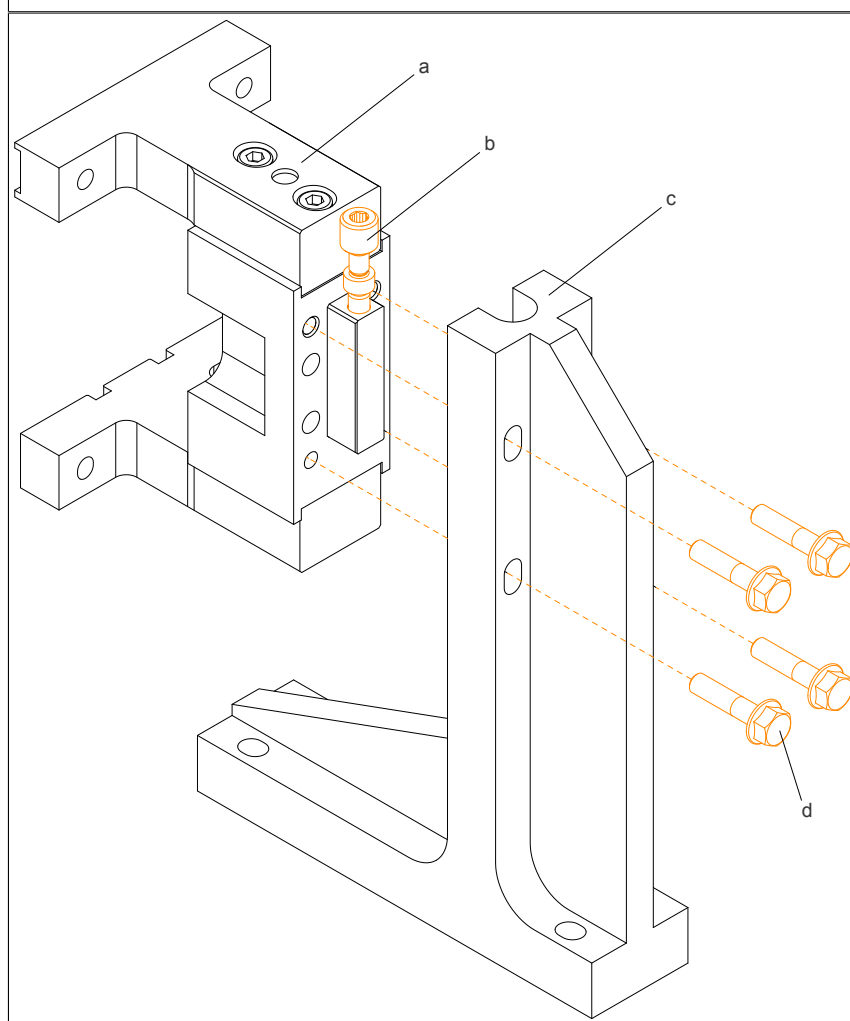
2. Assemble the guide stand (c) on the end interface (a) with 4 hex head screws (d) each and tighten them loosely.

a End interface

b M8x45 push-pull screw (1x)

c Guide stand

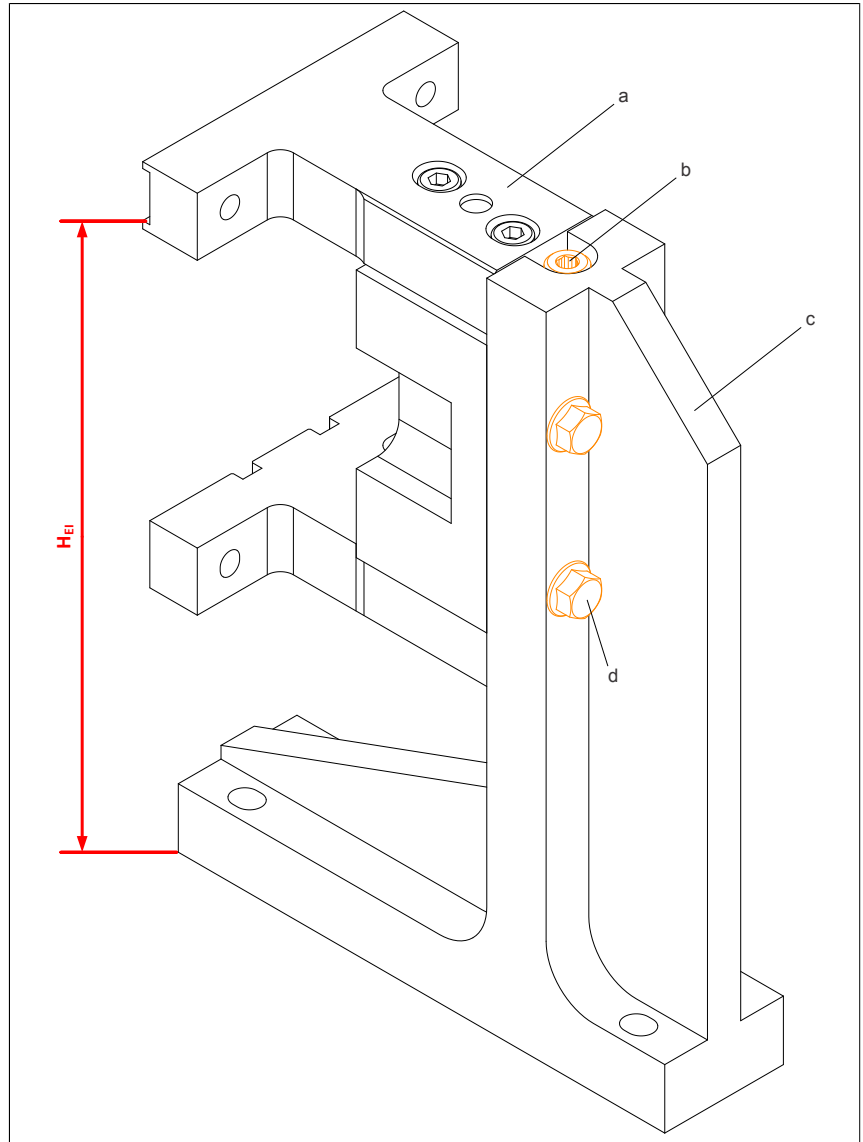
d M8x40 hex head screw (4x)



3. Adjust the height using the push-pull screw (b) to specified measurement  $H_{EI}$  (253  $\pm$ 0.1 mm, height adjustment dimension of the end interface).

4. Tighten the 4 hex head screws (d) (tightening torque 20 Nm).

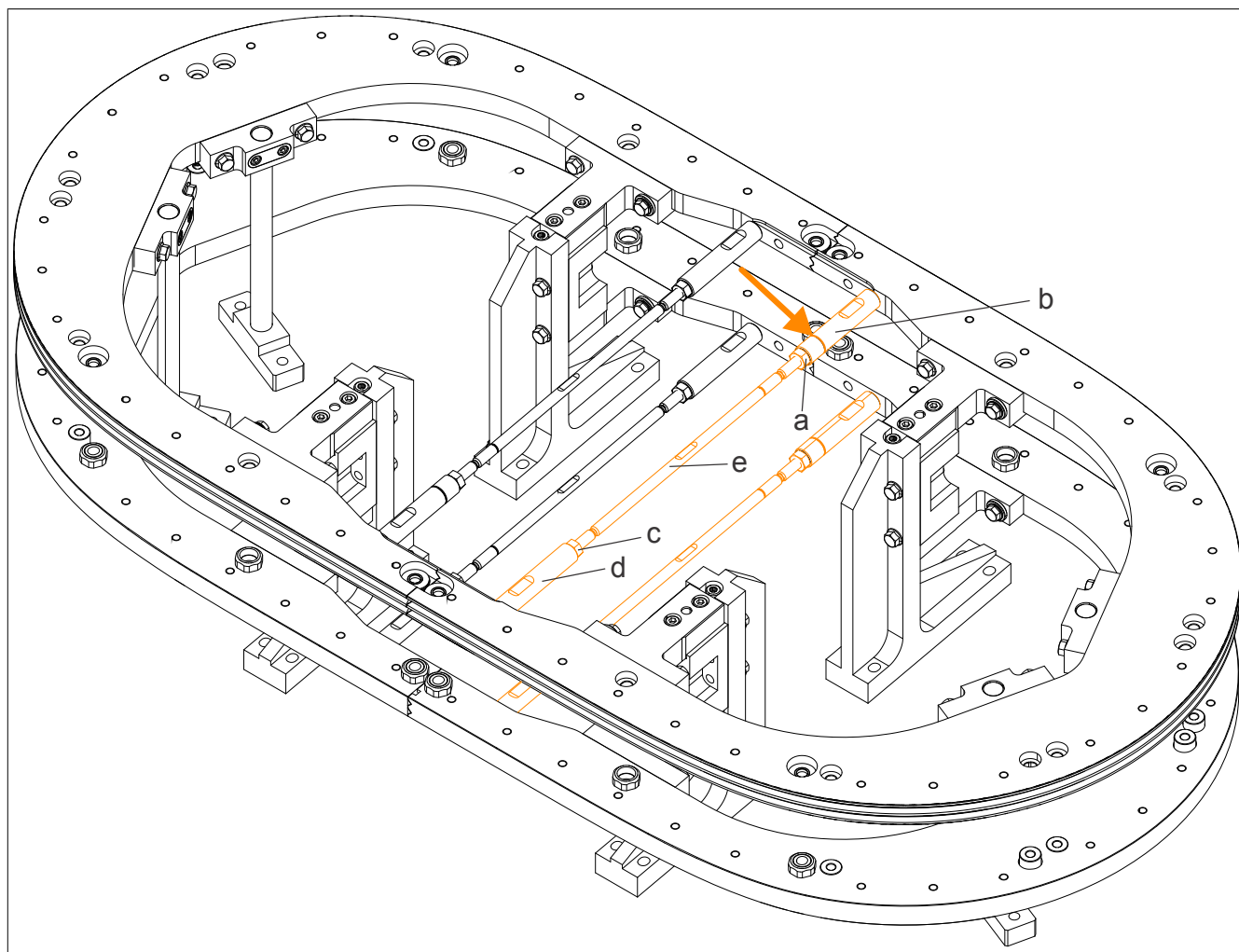
- a End interface
- b M8x45 push-pull screw (1x)
- c Guide stand
- d M8x40 hex head screw (4x)





### 5.3.4.2 Removing the crossbar on the 180° guide element

To avoid stress on track systems with directly adjacent 2x 180° guide elements, both crossbars must be disassembled in one of the two 180° guide elements.



- a Lock nut 17 mm, left-hand thread
- b Bushing 17 mm, left-hand thread
- c Lock nut 16 mm, right-hand thread
- d Bushing 17 mm, right-hand thread
- e Threaded rod, 8 mm

Pay attention to the pitch directions of the threads! The bushing with left-hand thread is marked with a groove (see arrow).

#### Disassembling the crossbar (double-v guide rail)

1. Loosen the lock nut (c) 16 mm, right-hand thread.
2. Loosen the bushing (b) 17 mm, left-hand thread with simultaneous screwing of the threaded rod (e) into the bushing (d).
3. Loosen the nut (a) 17 mm, left-hand thread to the end of the thread.
4. Screw the bushing (b) further into the threaded rod until the end stop.
5. Loosen the bushing (d) 17 mm, right-hand thread
6. Remove the crossbar.

#### Disassembling the crossbar (flat guide rail)

7. Repeat steps 1 to 6 for the second crossbar.

### 5.3.4.3 Arranging the components and pre-assembly

Position the track's guide elements with the stands on the base plate or corresponding base surfaces according to the assembly diagram.

#### 5.3.4.3.1 Drilling pattern for exact and adjustable assembly

Drilling distances are provided in the base surfaces or the base plate that allow **exact** or **adjustable positioning** of the guide stands by means of two different arrangements of the screws.

##### Exact positioning

- a M8 shoulder screw
- b M8 hex head screw

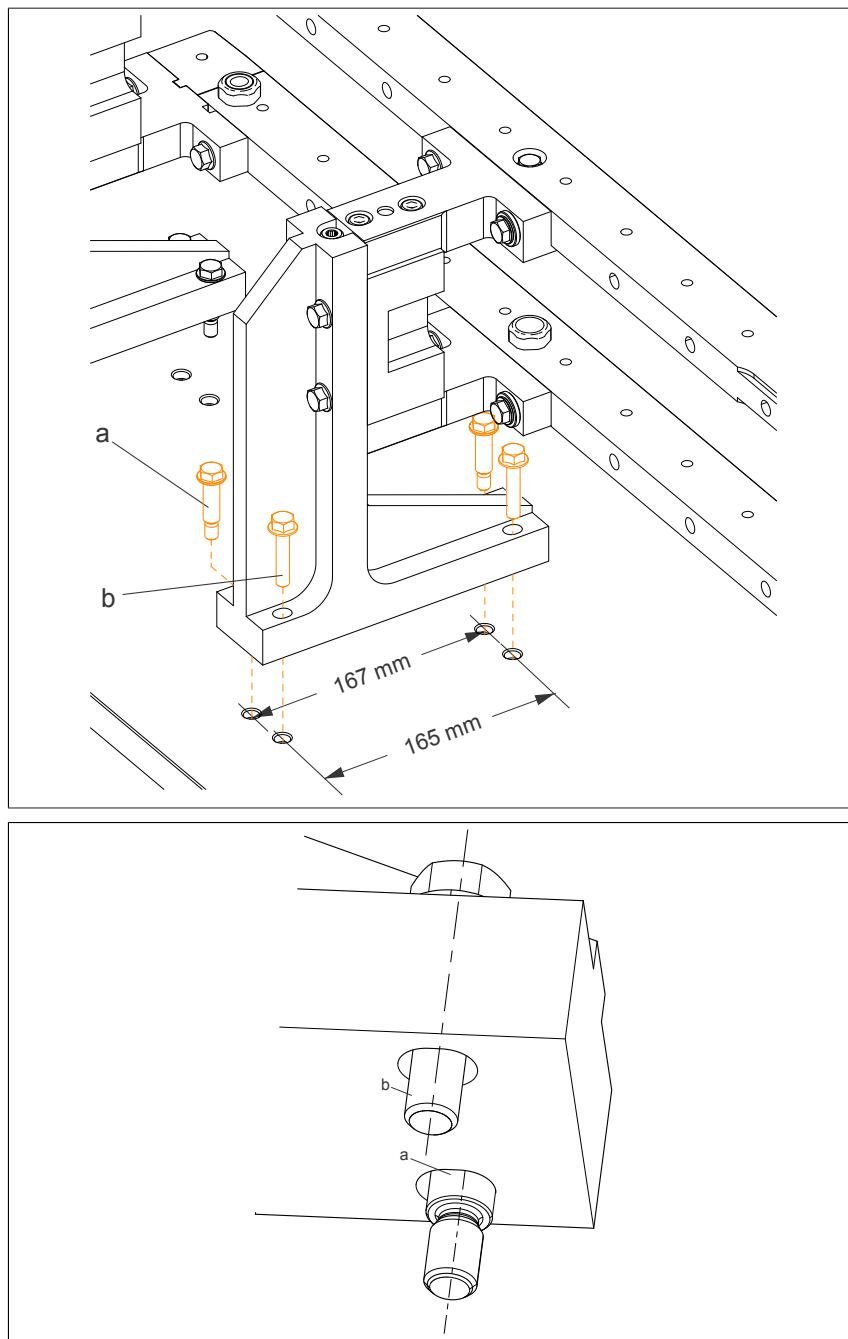


Figure 86: Arrangement of the screws

**Adjustable positioning**

- a M8 hex head screw
- b M8 shoulder screw

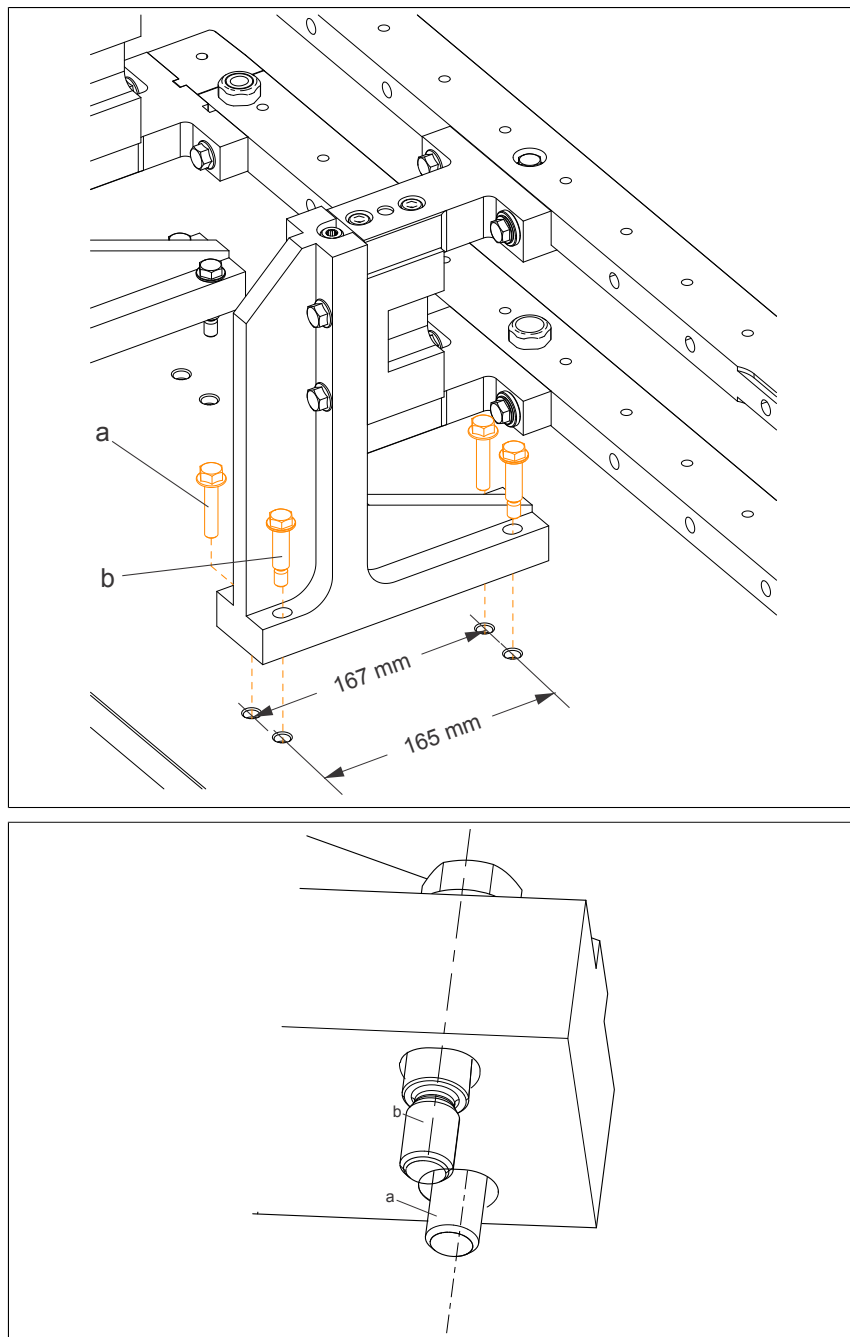


Figure 87: Arrangement of the screws

Take the corresponding position of the holes from the installation diagram or measure (and mark) them directly on the manufactured plate.

**5.3.4.3.2 Guide elements with accessory stand**

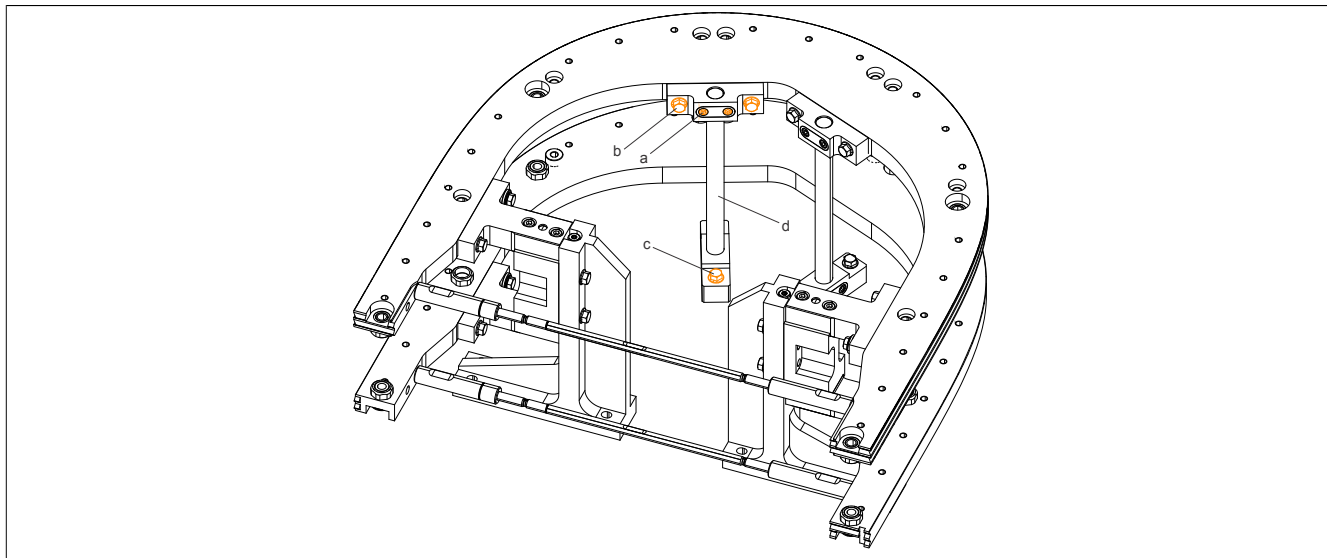
Assemble the guide stands and accessory stands of the curved guide elements (45°, 135° and 180° curve ) in the holes for **adjustable positioning** using 2 shoulder screws (M8x30). Install the hex head screws (M8x40) in the other two drill holes. This allows a small amount of adjustment in the positioning of the curved guide elements.

Open the clamping screws (a) of an accessory stand. Turn the rod (d) of the additional stand until the mounting holes (c) of the accessory stand are located above the corresponding mounting holes of the base plate. If necessary, additionally loosen the hex head screws (b) to move the accessory stand slightly and thus adjust its position.

Mount the accessory stand on the base plate with 2 hex head screws (c) and tighten them.

Tighten the clamping screws (a) and hex head screws (b) again.

Repeat the procedure for the second accessory stand.



- a Clamping screw for accessory stand (2x)
- b M8x30 hex head screw (2x)
- c Mounting hole with hex head screw M8x30 (2x)
- d Accessory stand rod

### 5.3.4.4 Assembling the segments

#### Information:

For applications with one or more diverters, assembly of segments must be started in the diverter area. The segments can be inserted on the side.

Otherwise, assembling the segments in the diverter area can be considerably more difficult (removal of segments or guide elements that are already installed).

Recommended sequence for assembling the segments in the diverter area:

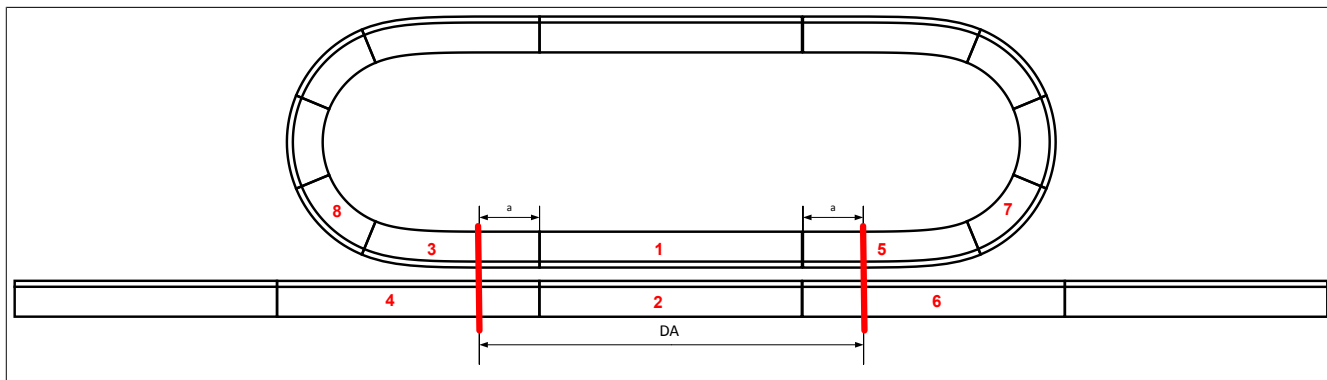


Figure 88: Sequence for segment assembly

DA = Diverter area

a = 150 mm

#### 5.3.4.4.1 Preparations for assembling the segments

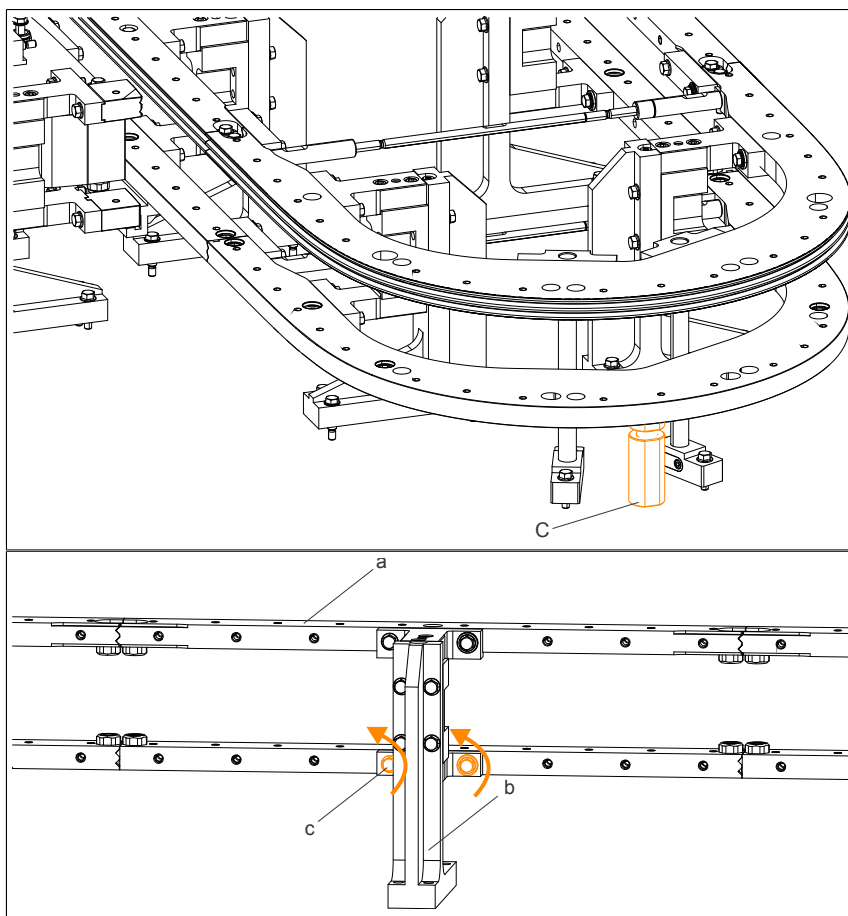
1. To prepare the segments for assembly, place an ACOPOStrak assembly support (C = 119 mm) under the apex of the curves. This supports the flat guide rail after it is loosened.

C ACOPOStrak assembly support  
(8F1TCA.GAS000001-1)

- Important! Contact surfaces must be stable, clean and non-slip. The assembly support is only permitted to be used for support and is not suitable for lifting!

2. Loosen the hex head screws (c) of the guide stand (b) used to fasten the flat guide rail. The number of guide stands varies depending on the guide element.

a Guide element (applies to all)  
b Guide stands  
c M8x40 hex head screw (4x)



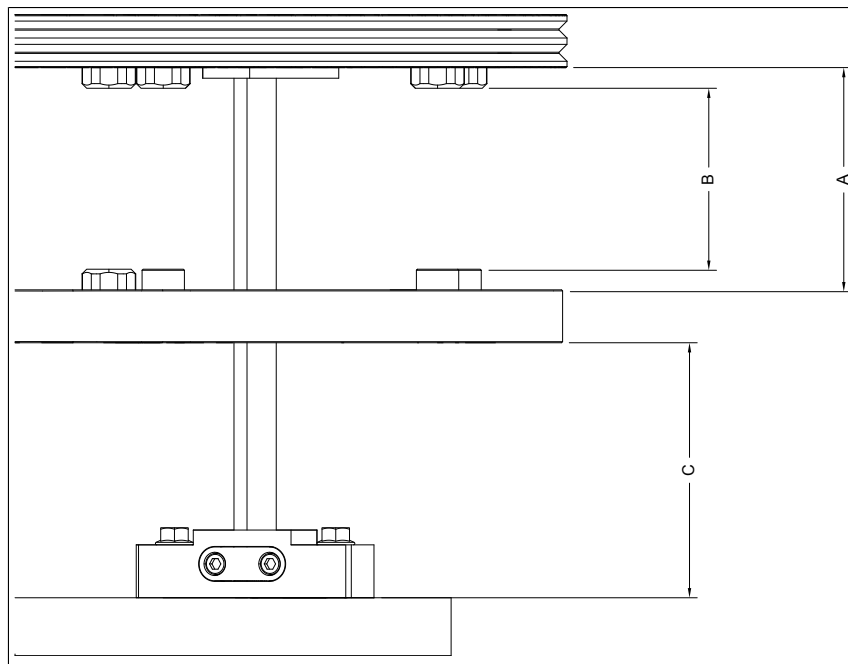
### 3. Spacing dimensions

Spacing of the guide rails for easy insertion of the segments:

$B = 86.5 \text{ mm}$

$A = 106 \text{ mm}$

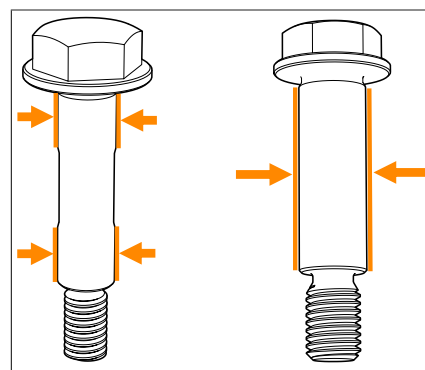
$C = 119 \text{ mm}$  (ACOPOStrak assembly support)



#### 5.3.4.4.2 Lubricating the mounting screws

- Before assembly, brush the shoulder screws for segment assembly on the fitting surfaces (see figure for marked surfaces) with suitable assembly paste / lubricating grease<sup>10)</sup>.

This reduces rubbing of the fitting surfaces of the screws. The thread and the head rests of the shoulder screws are not permitted to be lubricated.

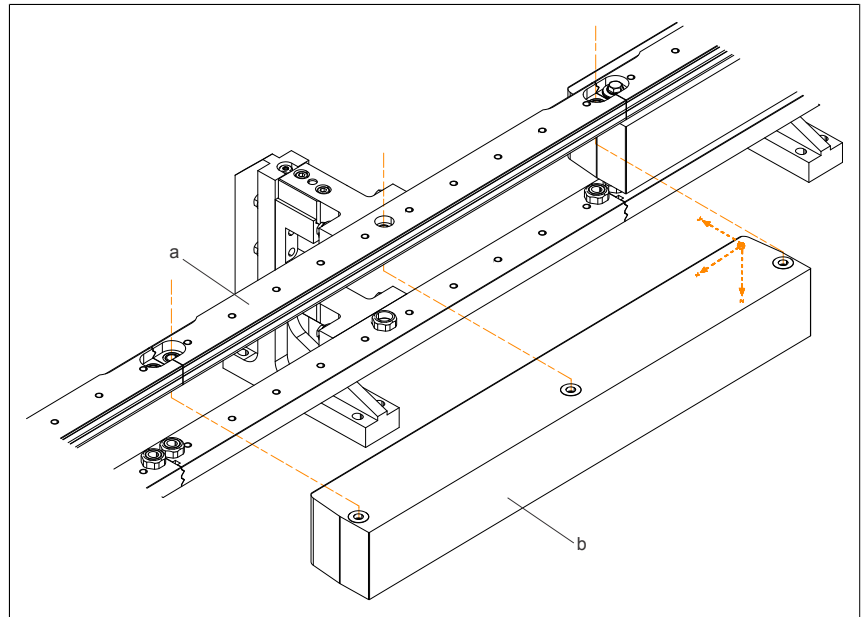


<sup>10)</sup> CASSIDA PASTE AP synthetic assembly paste for the food industry

### 5.3.4.4.3 Straight segment

1. Slide the segment (b) between the two guide rails of the respective guide element (a).

a Guide element (applies to all)  
b Straight segment (8F1101.AA66.0000-1)

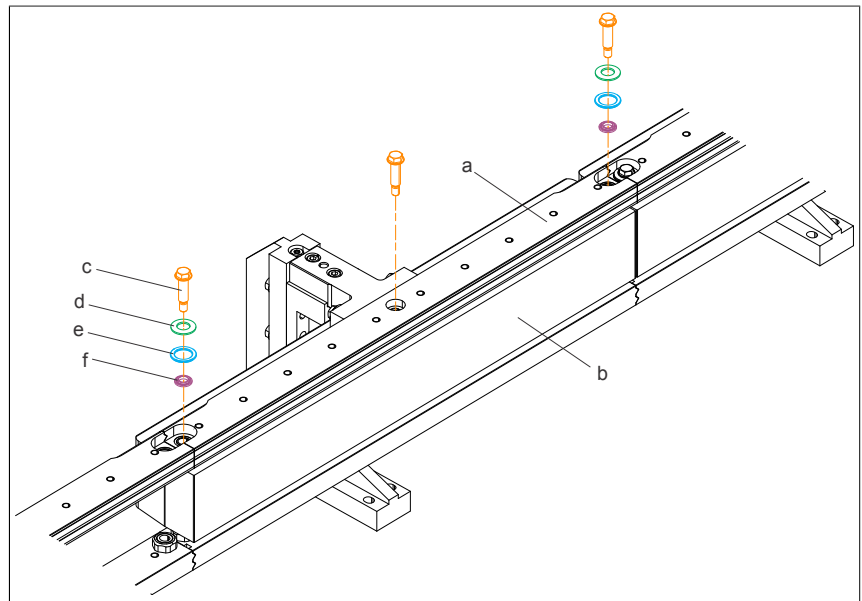


- Note the orientation of the segment according to the specified coordinate system on the segment. The z-direction points to the flat guide rail.



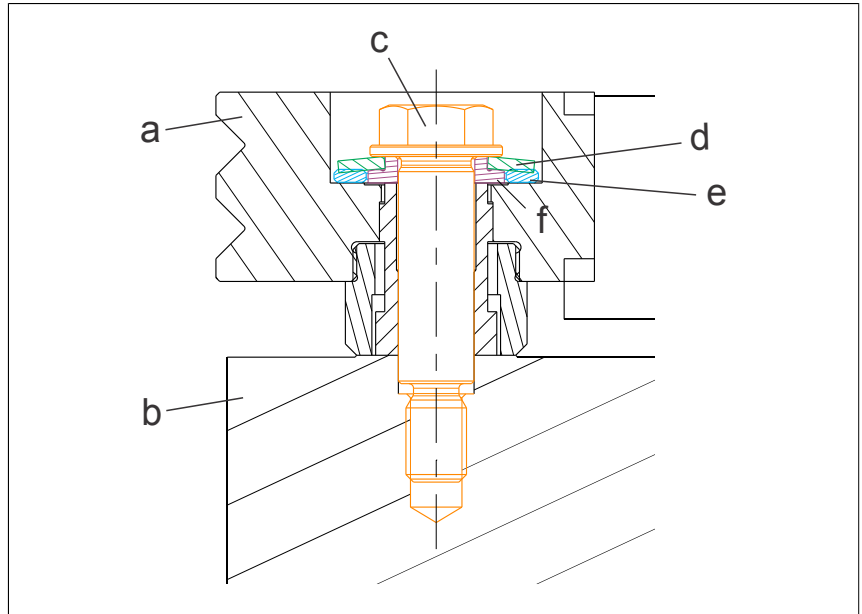
2. First, fasten the segment (b) to the double-v guide rails (here: suspended) using the shoulder screws (c) inserted from above. Raise the segment to do this.

a Guide element (applies to all)  
b Straight segment (8F1101.AA66.0000-1)  
c 3x M8x43 shoulder screw  
d 2x disc spring 26 x 13.8 x 2.2  
e 2x precision flat washer 27 x 18.5 x 1.8  
f 2x flat washer for load transfer 18 x 10.2 x 3.5



- Note the arrangement of components and orientation of the disc spring (d)!

- a Guide element (applies to all)
- b Straight segment (8F1101.AA66.0000-1)
- c Shoulder screw M8x43
- d Disc spring 26 x 13.8 x 2.2
- e Precision flat washer 27 x 18.5 x 1.8
- f Flat washer for load transfer 18 x 10.2 x 3.5



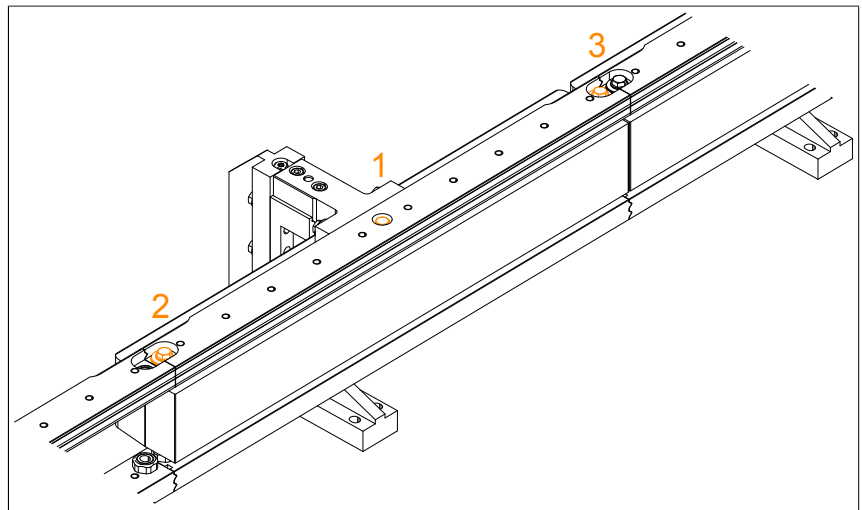
### Information:

During assembly, position the flat guide rail parallel to the motor segment or directly on its underside.

Thread in all mounting screws and screw in 4 to 5 thread turns.

It is important to ensure that the mounting screws do not become skewed during threading and can be installed easily.

3. Tighten the screws of the segment starting from the middle screw in the order shown (1, 2, 3) (tightening torque 16 Nm).



### Information:

If the mounting screws are not tightened (according to the torque specification!), no shuttles are permitted to be on the affected segment.

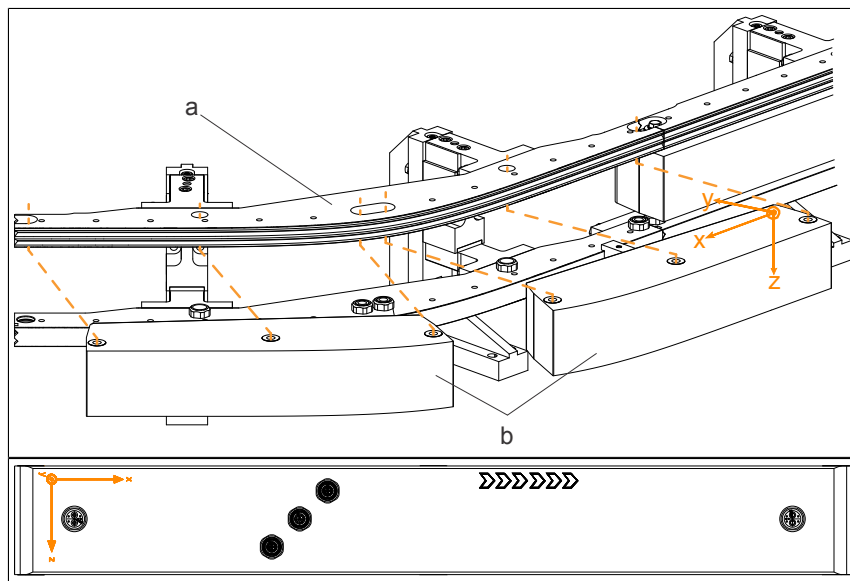
In this case, the magnetic attraction force can cause the segments to shift due to a slight tilting of the loose screws.



#### 5.3.4.4.4 Straight segment, curved segment A

1. Slide the segment (b) between the two guide rails of the respective guide element (a).

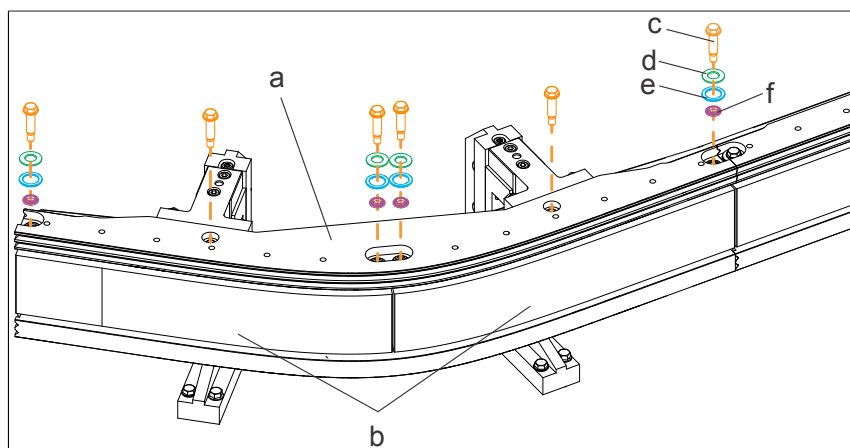
a Guide element (applies to all)  
 b Curved segments (8F1I01.AB2B.0000-1,  
 8F1I01.BA2B.0000-1)



- Note the orientation of the segment according to the specified coordinate system on the segment. The z-direction points to the flat guide rail.

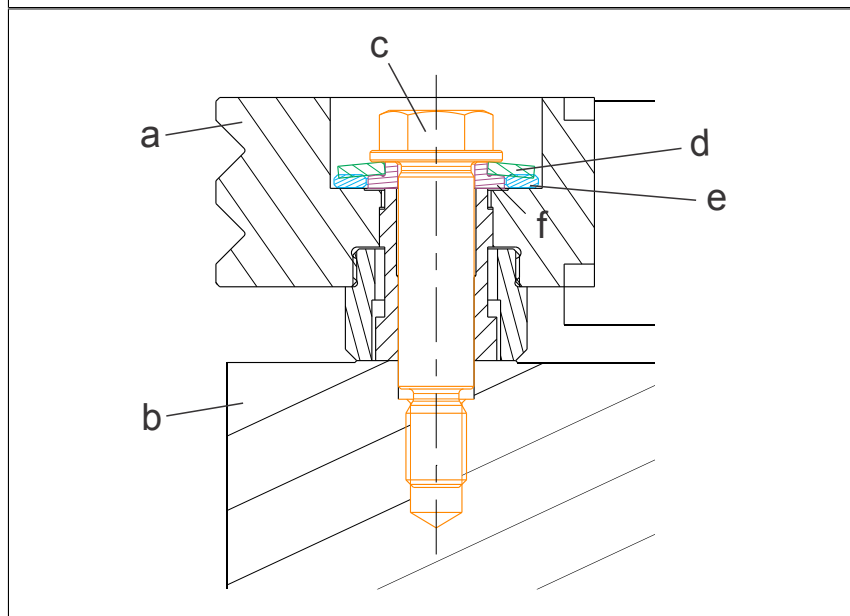
2. First, fasten the segment (b) to the double-v guide rails (here: suspended) using the shoulder screws (c) inserted from above. Raise the segment to do this.

a Guide element (applies to all)  
 b Curved segments (8F1I01.AB2B.0000-1,  
 8F1I01.BA2B.0000-1)  
 c 3x M8x43 shoulder screw  
 d 2x disc spring 26 x 13.8 x 2.2  
 e 2x precision flat washer 27 x 18.5 x 1.8  
 f 2x flat washer for load transfer 18 x 10.2 x 3.5



- Note the arrangement of components and orientation of the disc spring (d)!

a Guide element (applies to all)  
 b Straight segment (8F1I01.AA6B.0000-1)  
 c Shoulder screw M8x43  
 d Disc spring 26 x 13.8 x 2.2  
 e Precision flat washer 27 x 18.5 x 1.8  
 f Flat washer for load transfer 18 x 10.2 x 3.5



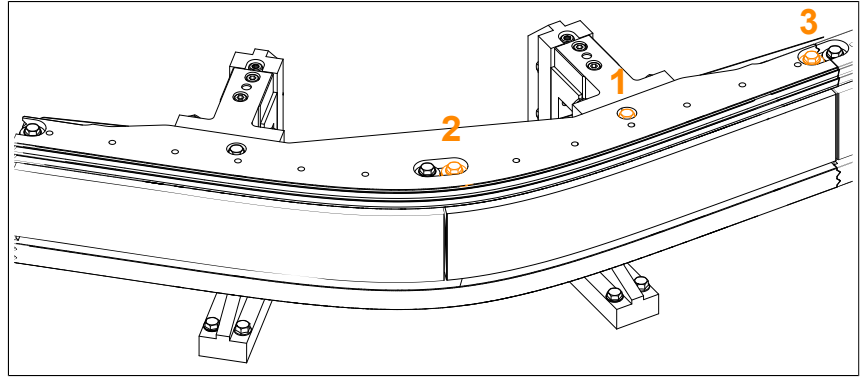
### Information:

During assembly, position the flat guide rail parallel to the motor segment or directly on its underside.

Thread in all mounting screws and screw in 4 to 5 thread turns.

It is important to ensure that the mounting screws do not become skewed during threading and can be installed easily.

3. Tighten the screws of the segment starting from the middle screw in the order shown (1, 2, 3) (tightening torque 16 Nm).



### Information:

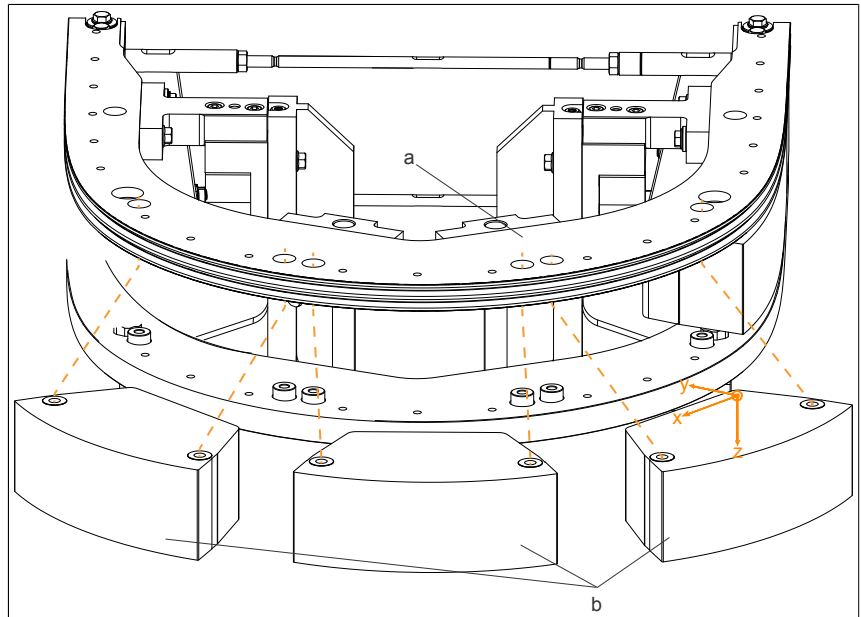
If the mounting screws are not tightened (according to the torque specification!), no shuttles are permitted to be on the affected segment.

In this case, the magnetic attraction force can cause the segments to shift due to a slight tilting of the loose screws.

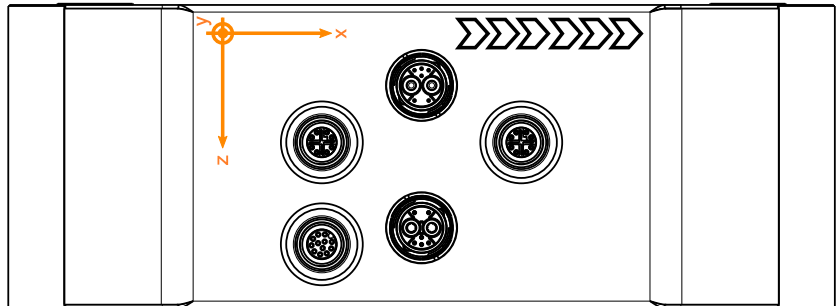
### 5.3.4.4.5 Circular arc segment

1. Slide the segment (b) between the two guide rails of the respective guide element (a).

a Guide element (applies to all)  
 b Circular arc segment  
 (8F1101.BB4B.0000-1)

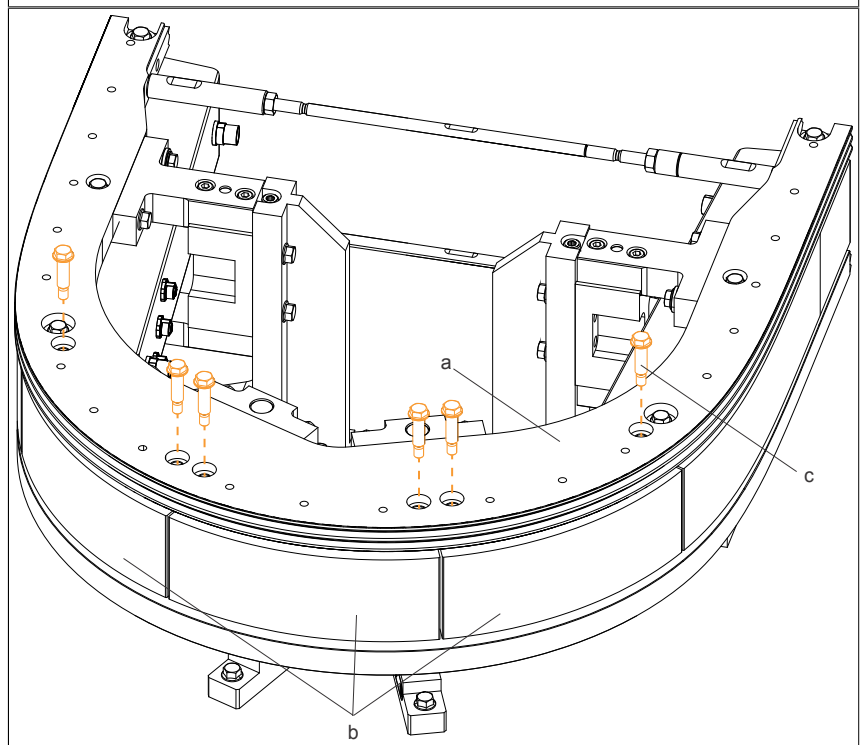


- Note the orientation of the segment according to the specified coordinate system on the segment. The z-direction points to the flat guide rail.



2. First, fasten the segment (b) to the double-v guide rails (here: suspended) using the shoulder screws (c) inserted from above. Raise the segment to do this.

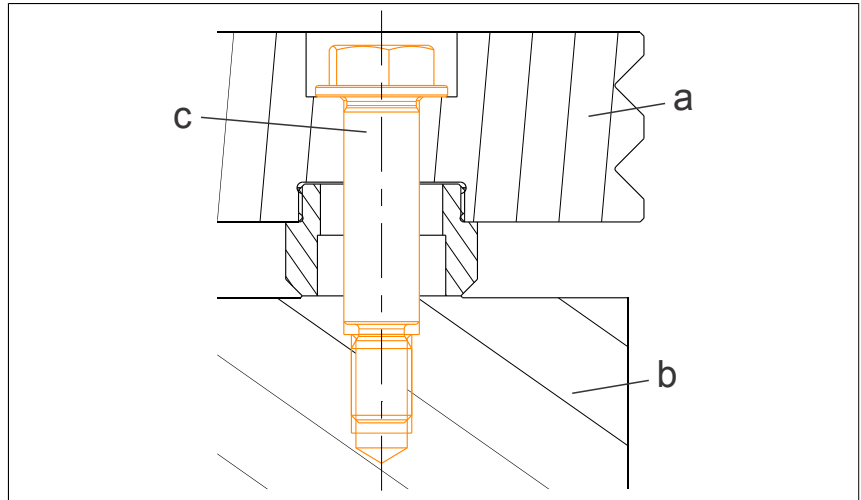
a Guide element (applies to all)  
 b Circular arc segment  
 (8F1101.BB4B.0000-1)  
 c 2x M8x43 shoulder screw



3. Tighten the screws of the segment in any order (tightening torque 16 Nm).

- Fasten the circular arc segment (b) with shoulder screws (c).

- a Guide element (applies to all)
- b Circular arc segment  
(8F1101.BB4B.0000-1)
- c Shoulder screw M8x43



## Information:

During assembly, position the flat guide rail parallel to the motor segment or directly on its underside.

Thread in all mounting screws and screw in 4 to 5 thread turns.

It is important to ensure that the mounting screws do not become skewed during threading and can be installed easily.

## Information:

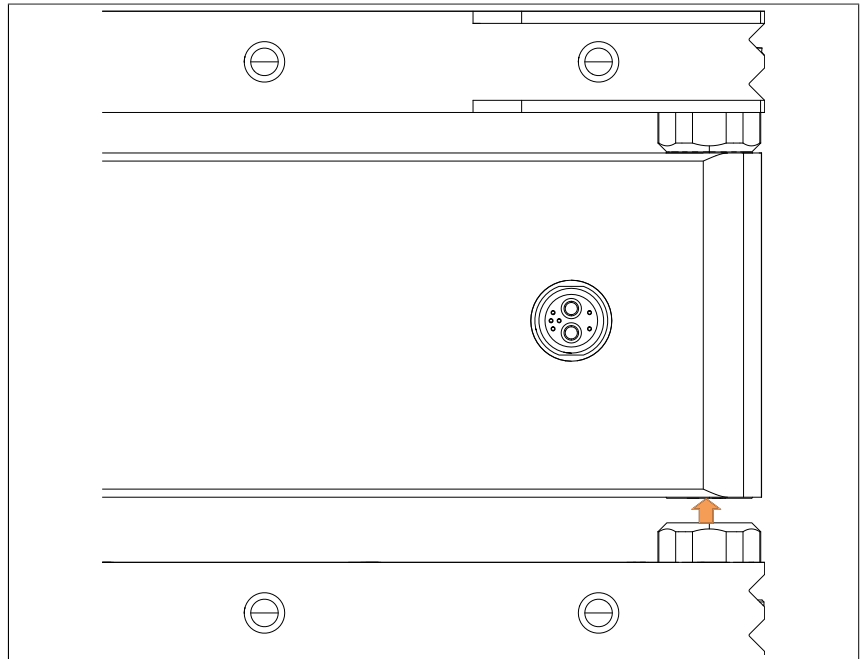
If the mounting screws are not tightened (according to the torque specification!), no shuttles are permitted to be on the affected segment.

In this case, the magnetic attraction force can cause the segments to shift due to a slight tilting of the loose screws.

### 5.3.4.5 Assembling the flat guide rail

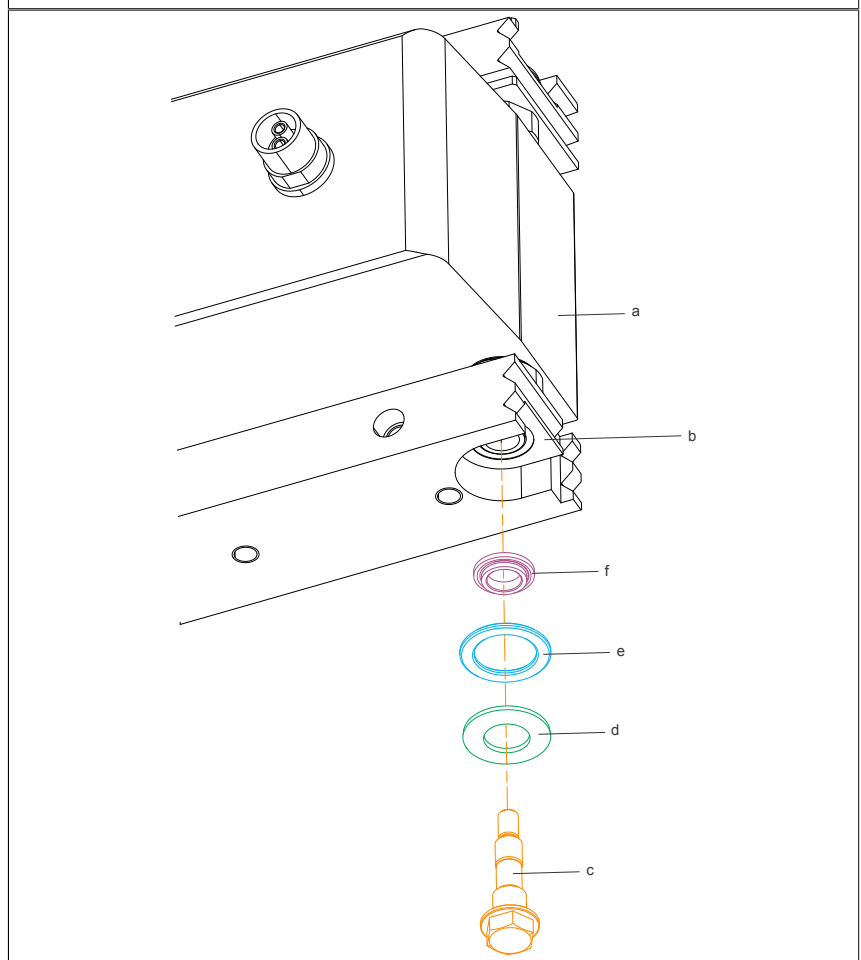
#### 5.3.4.5.1 Straight segment, curved segment A, curved segment B

1. Lift the loosened flat guide rail until it is in contact with the motor segment.



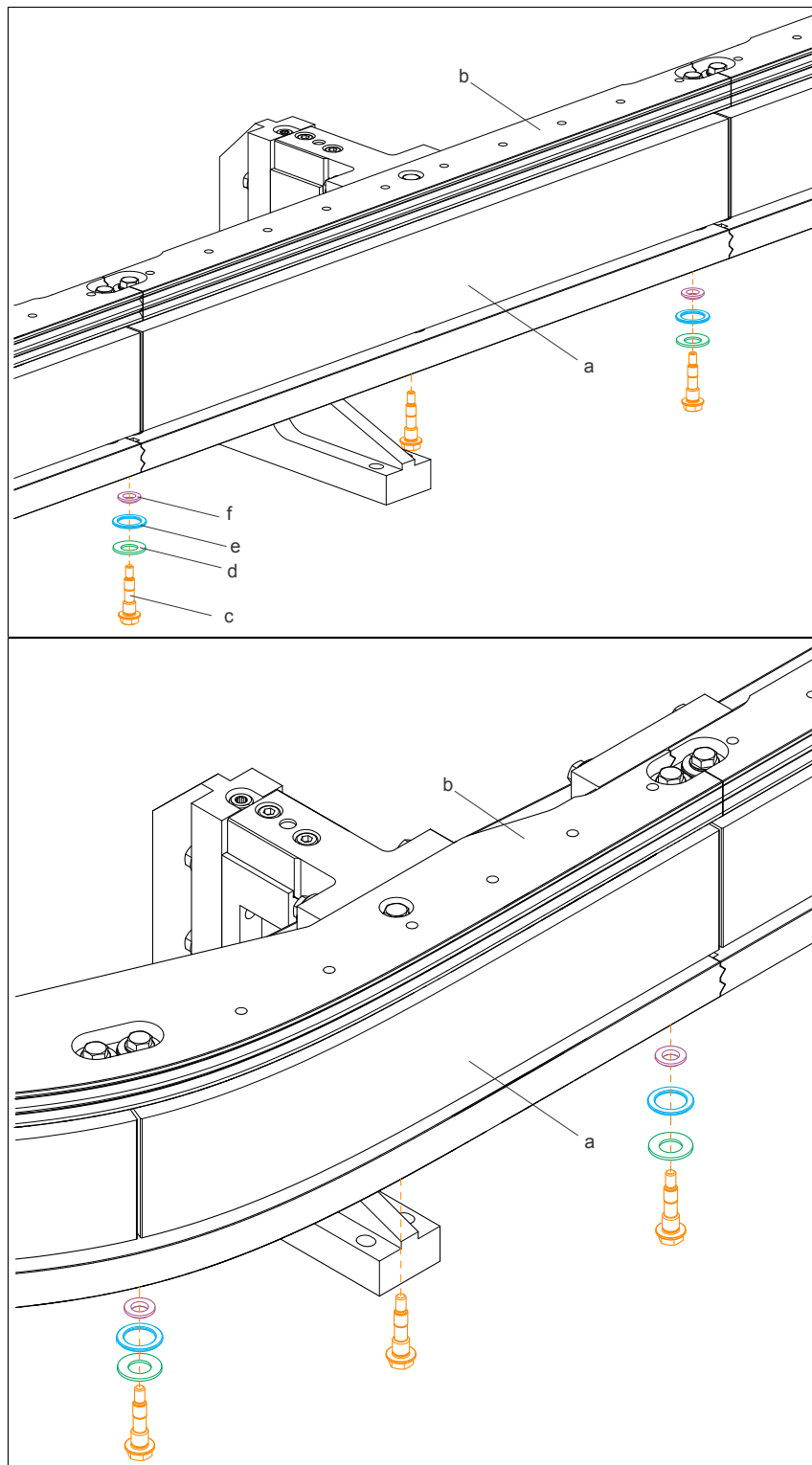
2. Fasten the segment (a) to the flat guide rail using the inserted shoulder screws (c).

- a Straight segment (8F1I01.AA66.0000-1)
- b Guide element (applies to all)
- c Shoulder screw M6x41
- d Disc spring 26 x 13.8 x 2.2
- e Precision flat washer 27 x 18.5 x 1.8
- f Flat washer for load transfer 18 x 10.2 x 3.5



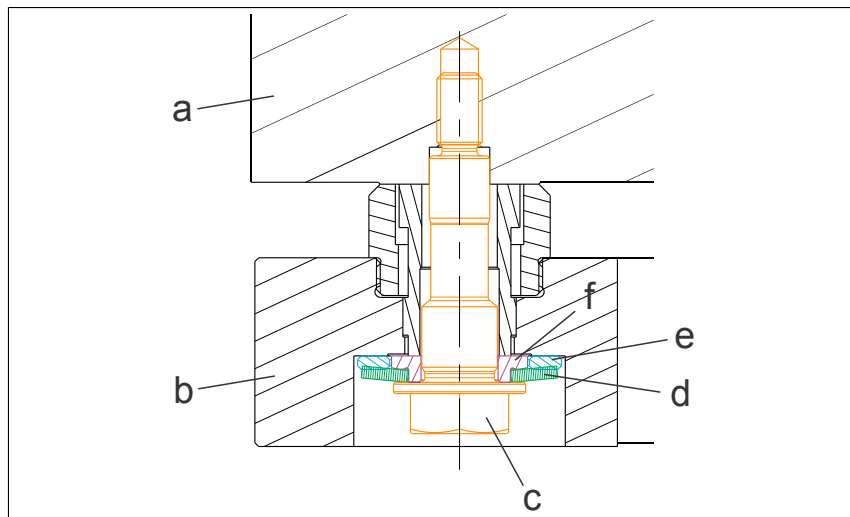
3. Fasten the segment (a) to the flat guide rail using the inserted shoulder screws (c).

- a Curved segment (8F1101.AB2B.0000-1)
- b Guide element (applies to all)
- c Shoulder screw M6x41
- d Disc spring 26 x 13.8 x 2.2
- e Precision flat washer 27 x 18.5 x 1.8
- f Flat washer for load transfer 18 x 10.2 x 3.5



- Note the arrangement of components and orientation of the disc spring (d)!

- a Guide element (applies to all)
- b Straight segment (8F1I01.AA66.0000-1)
- c Shoulder screw M6x41
- d Disc spring 26 x 13.8 x 2.2
- e Precision flat washer 27 x 18.5 x 1.8
- f Flat washer for load transfer 18 x 10.2 x 3.5



## Information:

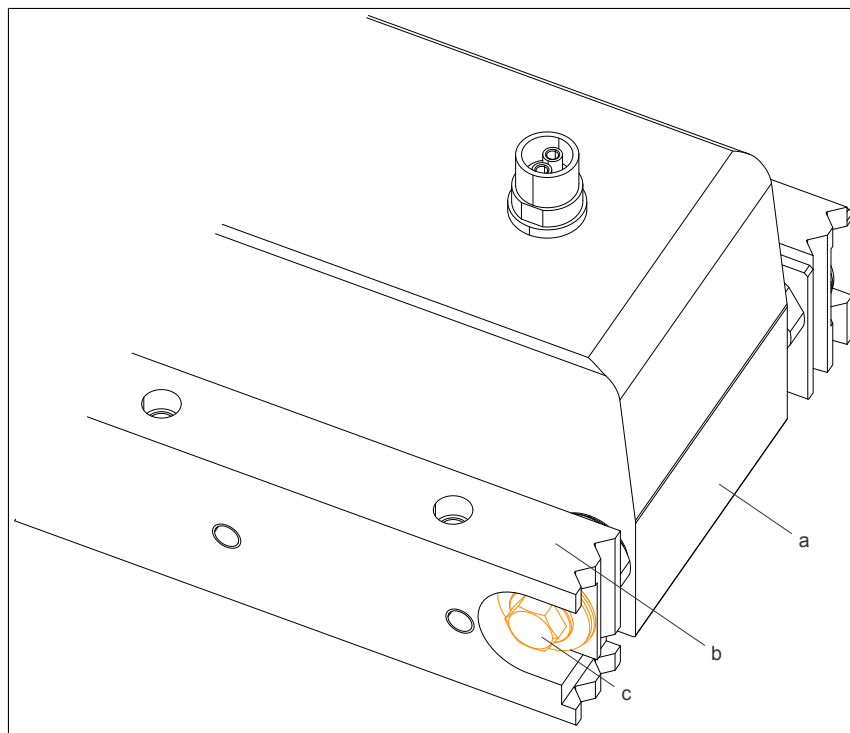
During assembly, position the flat guide rail parallel to the motor segment or directly on its underside.

Thread in all mounting screws and screw in 4 to 5 thread turns.

It is important to ensure that the mounting screws do not become skewed during threading and can be installed easily.

4. Tighten the shoulder screws of the segment (a) (tightening torque 12 Nm).

- a Straight segment (8F1I01.AA66.0000-1)
- b Guide element (applies to all)



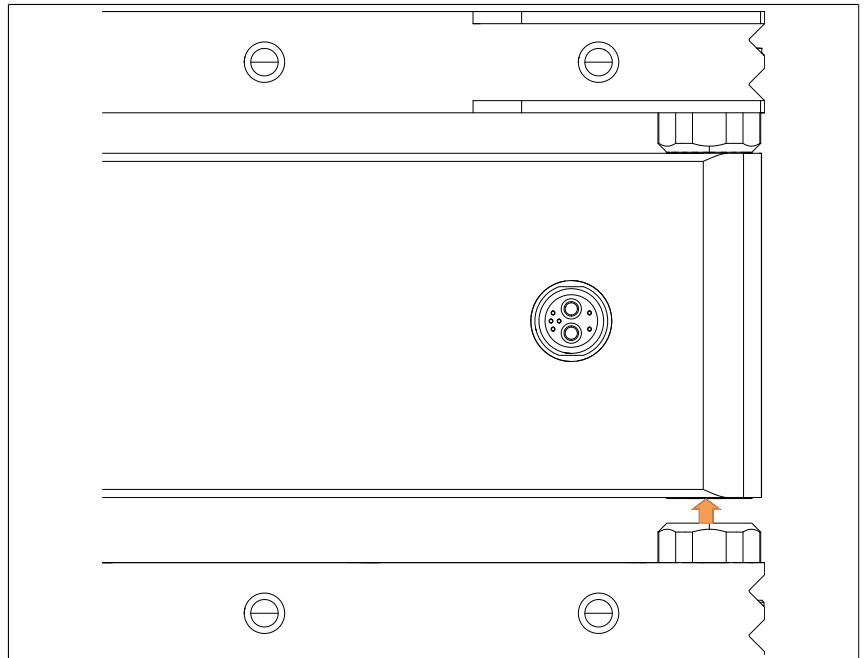
## Information:

If the mounting screws are not tightened (according to the torque specification!), no shuttles are permitted to be on the affected segment.

In this case, the magnetic attraction force can cause the segments to shift due to a slight tilting of the loose screws.

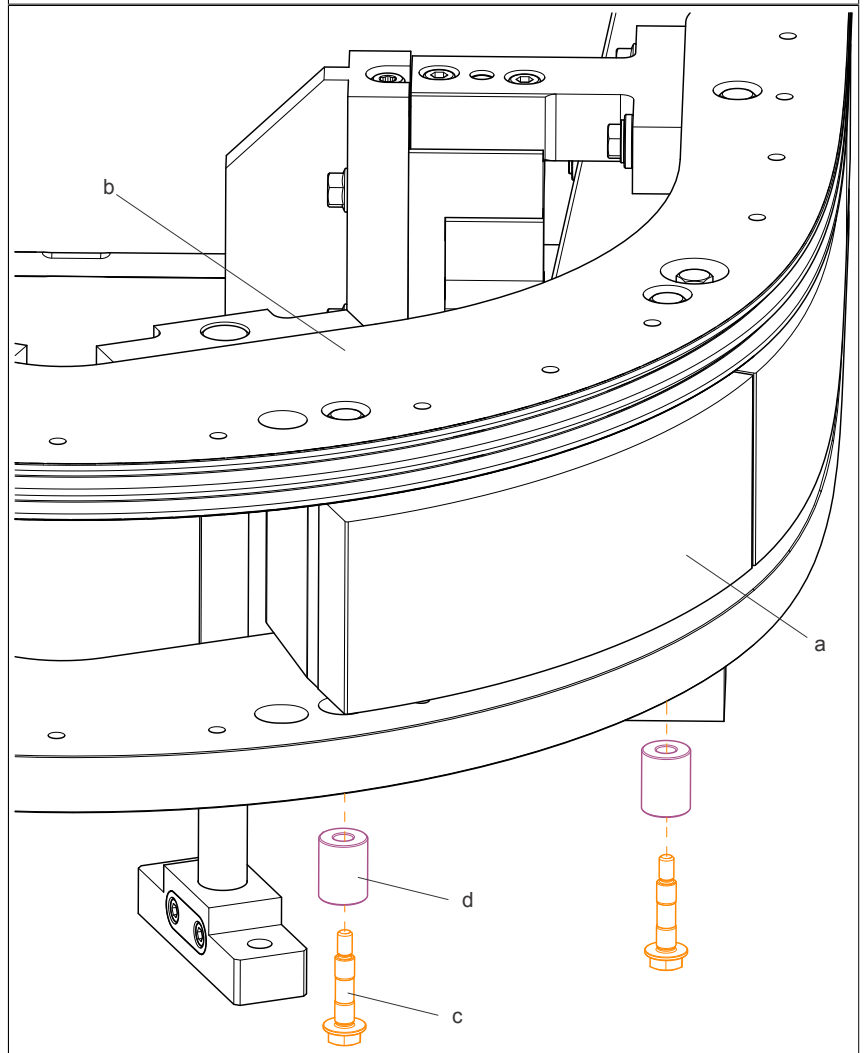
### 5.3.4.5.2 Circular arc segment

1. Lift the loosened flat guide rail until it is in contact with the motor segment.



2. Fasten the segment (a) to the flat guide rail using the inserted shoulder screws (c).

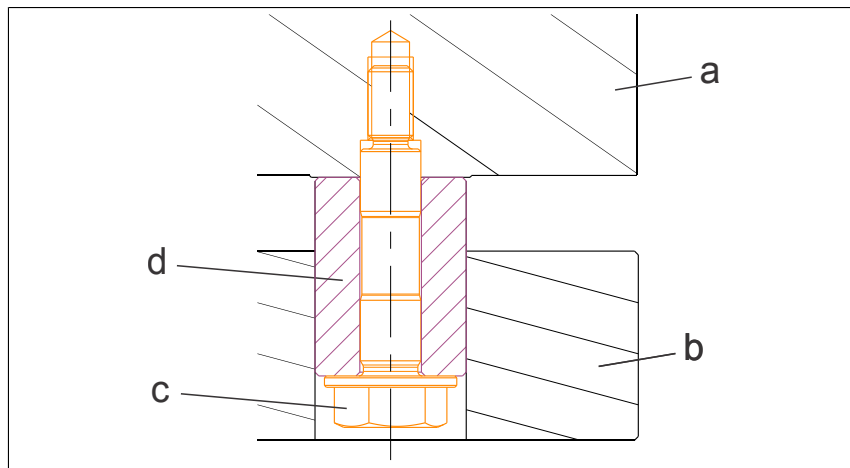
- a Circular arc segment (8F1101.BB4B.0000-1)
- b Guide element (applies to all)
- c Shoulder screw M6x41
- d Sleeve 20 x 8 x 26.5





- Fasten the circular arc segment (b) in a sleeve (d) with shoulder screws (c).

- a Circular arc segment  
(8F1101.BB4B.0000-1)  
b Guide element (applies to all)  
c Shoulder screw M6x41  
d Sleeve 20 x 8 x 26.5



3. Tighten the shoulder screws (c) of the segment (a) (tightening torque 12 Nm).

### Information:

During assembly, position the flat guide rail parallel to the motor segment or directly on its underside.

Thread in all mounting screws and screw in 4 to 5 thread turns.

It is important to ensure that the mounting screws do not become skewed during threading and can be installed easily.

### Information:

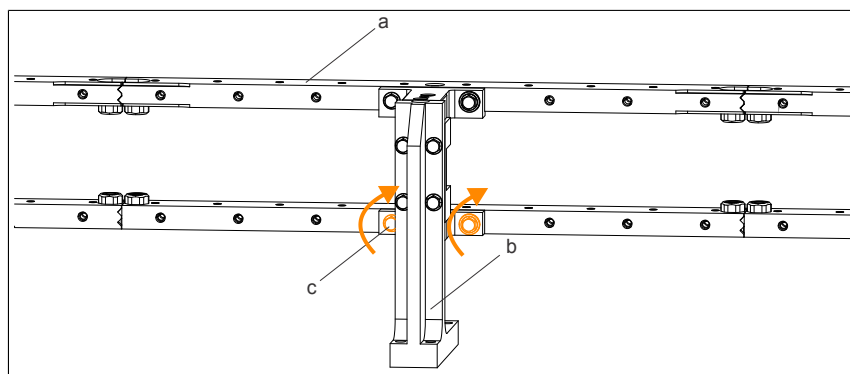
If the mounting screws are not tightened (according to the torque specification!), no shuttles are permitted to be on the affected segment.

In this case, the magnetic attraction force can cause the segments to shift due to a slight tilting of the loose screws.

#### 5.3.4.5.3 Fastening the flat guide rail

1. Tighten the hex head screws (c) of the guide stand (b) used to fasten the flat guide rail (tightening torque 20 Nm). The number of guide stands varies depending on the guide element.

- a Guide element (applies to all)  
b Guide stand  
c M8x40 hex head screw (4x)



2. Remove the ACOPOStrak assembly support(s) (C = 119 mm) after ensuring that the segments are fastened.

### 5.3.4.6 Assembling the guide connectors

#### Guide connector

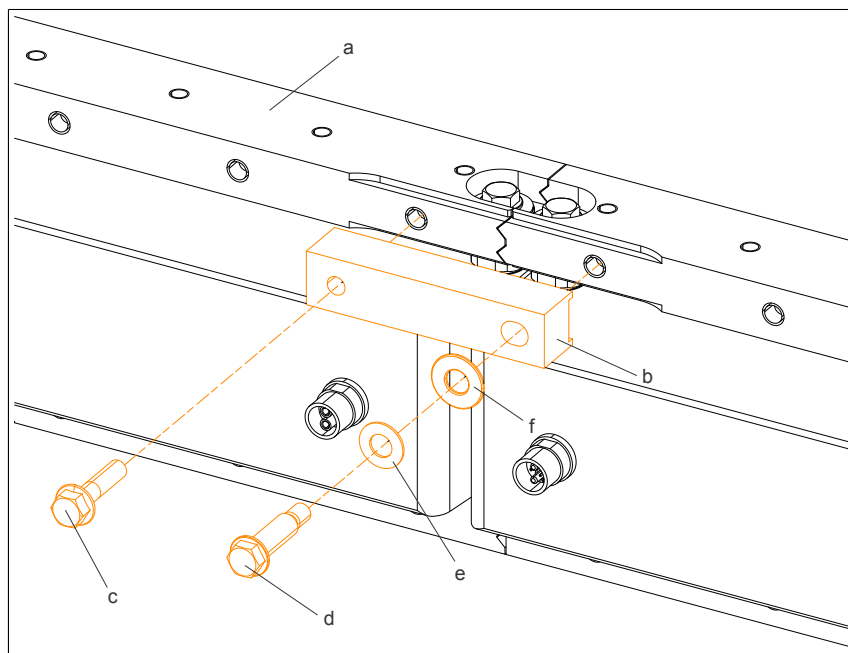
8F1GCA.JC000A00I-1

The orientation of the guide connectors is not relevant, but the oblong holes of the guide connectors on the double-v guide rail and the flat guide rail must have the same orientation.

1. Attach the guide connector (b) to the double-v guide rail (a) and tighten the guide connector (b) to the double-v guide rail (a) with the screws (c, d) (tightening torque 20 Nm).

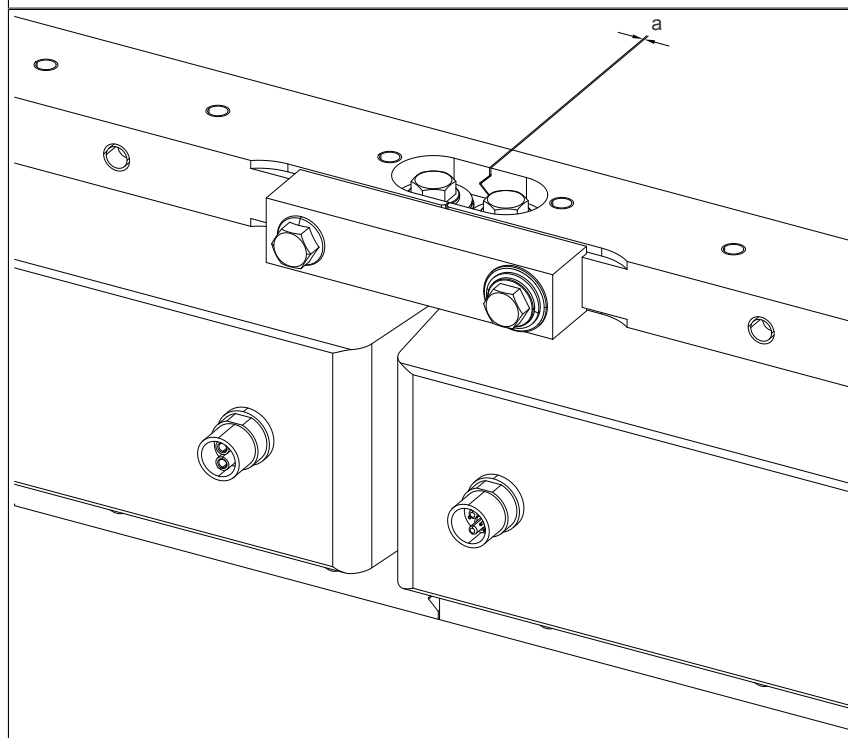
Install the shoulder screw (d) with flat washer (f) and disc spring (e) on the side of the oblong hole on the guide connector!

- a Double-v guide rail
- b Guide connector
- c M8x30 hex head screw
- d Shoulder screw M8x30
- e Disc spring 23 x 10.5 x 2
- f Flat washer 27 x 10 x 1.8



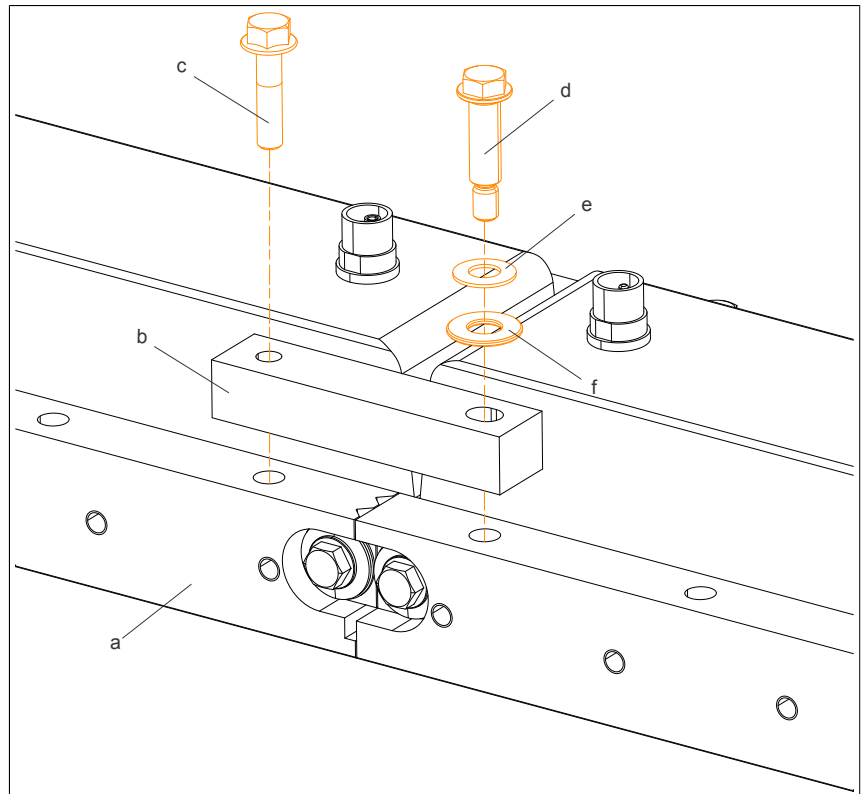
2. Check the gap (a) between the double-v guide rails using a feeler gauge ( $0.5 \pm 0.2$  mm).

- a Gap between double-v guide rails



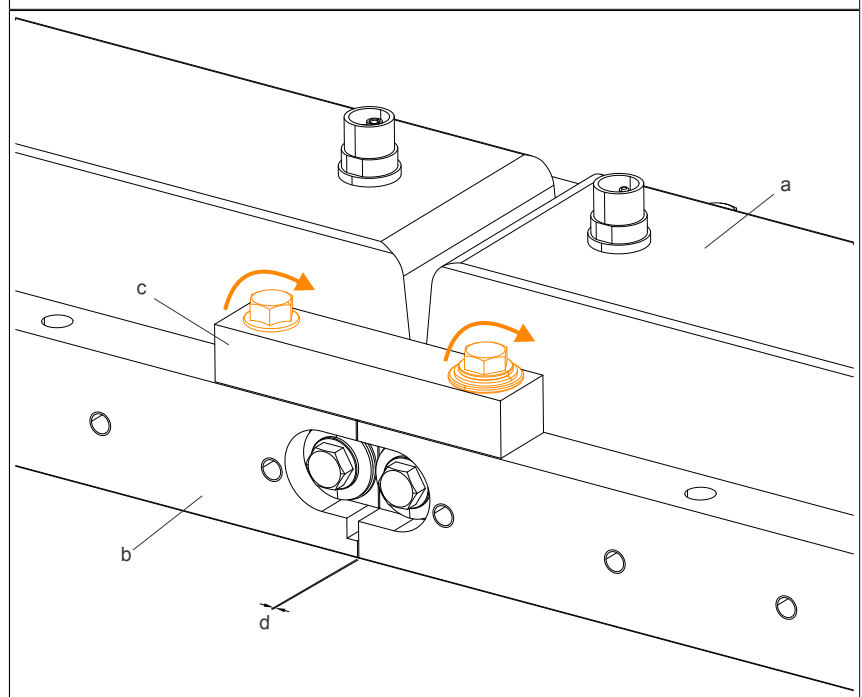
3. Assemble the guide connectors (b) on the flat guide rail (a). Install the shoulder screw (d) with flat washer (f) and disc spring (e) on the side of the oblong hole on the guide connector!

a Flat guide rail  
b Guide connector  
c M8x30 hex head screw  
d Shoulder screw M8x30  
e Disc spring 23 x 10.5 x 2  
f Flat washer 27 x 10 x 1.8



4. Tighten the hex head screw and shoulder screw on the guide connector (tightening torque 20 Nm).

a Segment  
b Flat guide rail  
c Guide connector  
d Spacing between the guide rails



- Check the gap (d) ( $0.5 \pm 0.2$  mm) between the flat guide rails using a feeler gauge. If the gap is outside the tolerance, loosen the hex head screws for [5.3.4.5.3 "fastening the guide stand"](#) on page 243 to the adjacent guide element and adjust the gap (d). Tighten the hex head screws again.

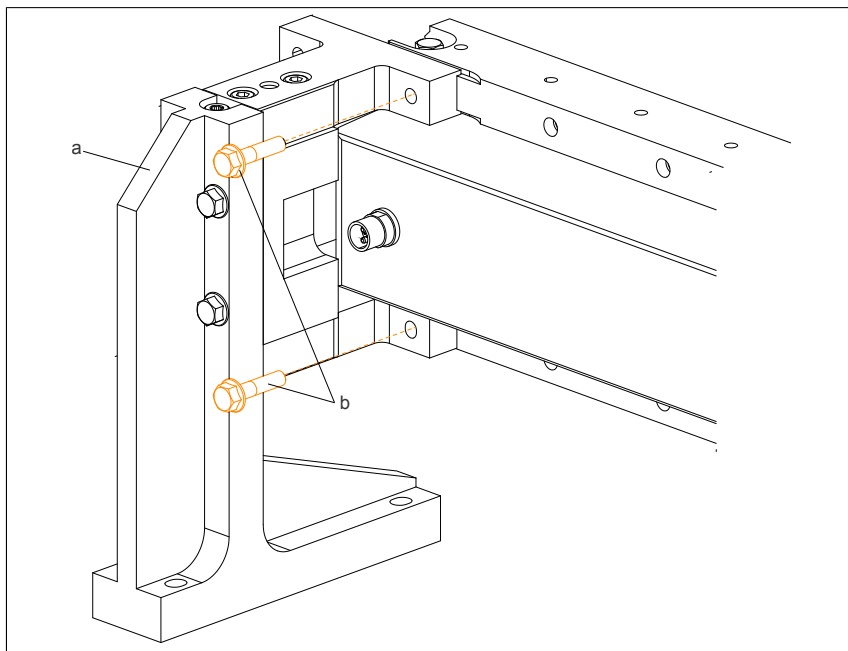


### 5.3.4.7 Assembling the guide stand with end interface

The guide stand with end interface is assembled; for pre-assembly, see [5.3.4.1.2 "Assembling the end interface on the guide stand "](#) on page 225.

1. Assemble the guide stand with end interface (a) with 2 hex head screws (b) and tighten (tightening torque 20 Nm).

a Guide stand with end interface  
b M8x40 hex head screw



2. Fasten the guide stand (a) with the mounting screws in the holes on the base surface using the [5.3.4.3.1 "drilling pattern for adjustable position"](#) on page 228 (tightening torque 20 Nm).

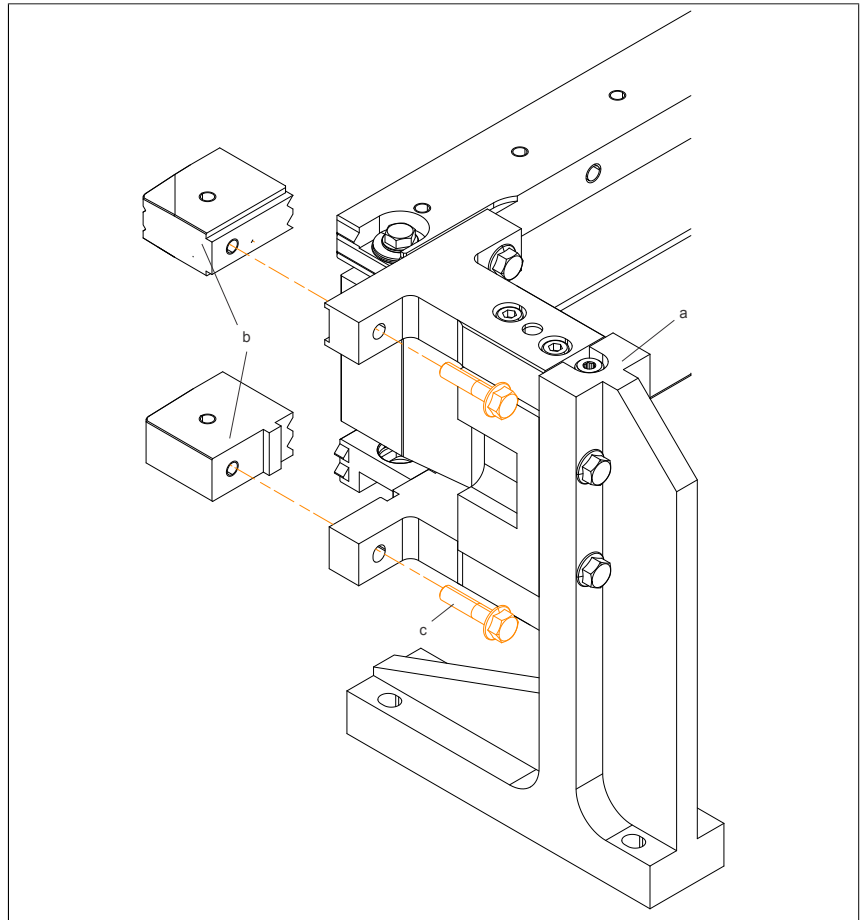
### 5.3.4.8 Assembling the guide extensions, right and left

Before assembling the guide extensions, a 5.3.4.7 "Guide stand with assembled end interface" on page 246 must first be mounted on the guide rails.

Guide extensions, right	8F1GCA.RER00A00I-1
Guide extensions, left	8F1GCA.REL00A00I-1

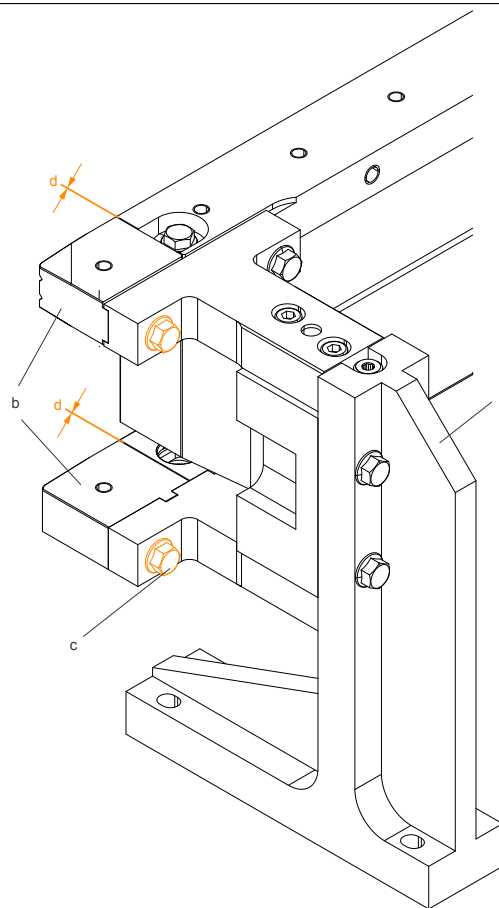
1. Assemble the guide extensions (b) in the diverter area on the double-v guide rail and the flat guide rail according to the assembly diagram.  
Ensure that the guide rails are flush with each other!

- a Guide stand with end interface
- b Guide extensions
- c M8x30 hex head screw (2x)



2. Check that the guide extensions (b) are aligned and in flush contact with the guide rails of the guide elements. Tighten the hex head screws (c) (tightening torque 20 Nm).

a Guide stand  
b Guide extensions  
c M8x30 hex head screw (2x)



- Check the guide gap: Check distance d ( $0.5 \pm 0.2$  mm) between the guide extension and guide rails using a feeler gauge.



### 5.3.4.9 Installing the end stop

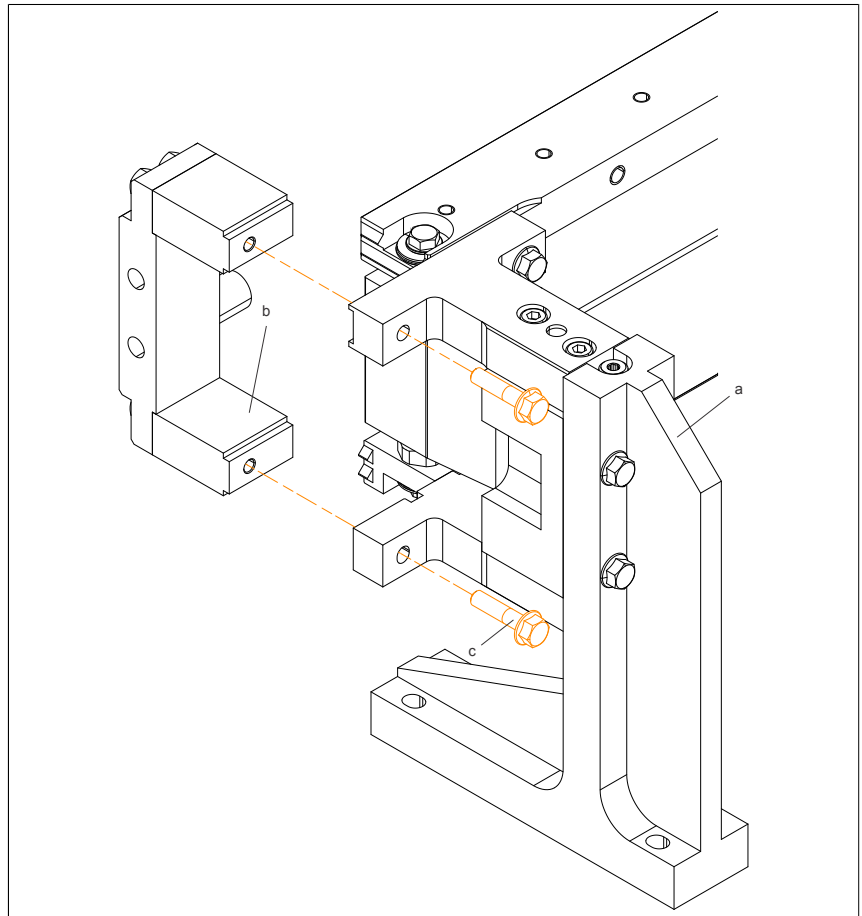
Before assembling the end stop, a [5.3.4.7 "Guide stand with assembled end interface"](#) on page 246 must first be mounted on the guide rails.

#### End stop

8F1GCA.ES000A00I-1

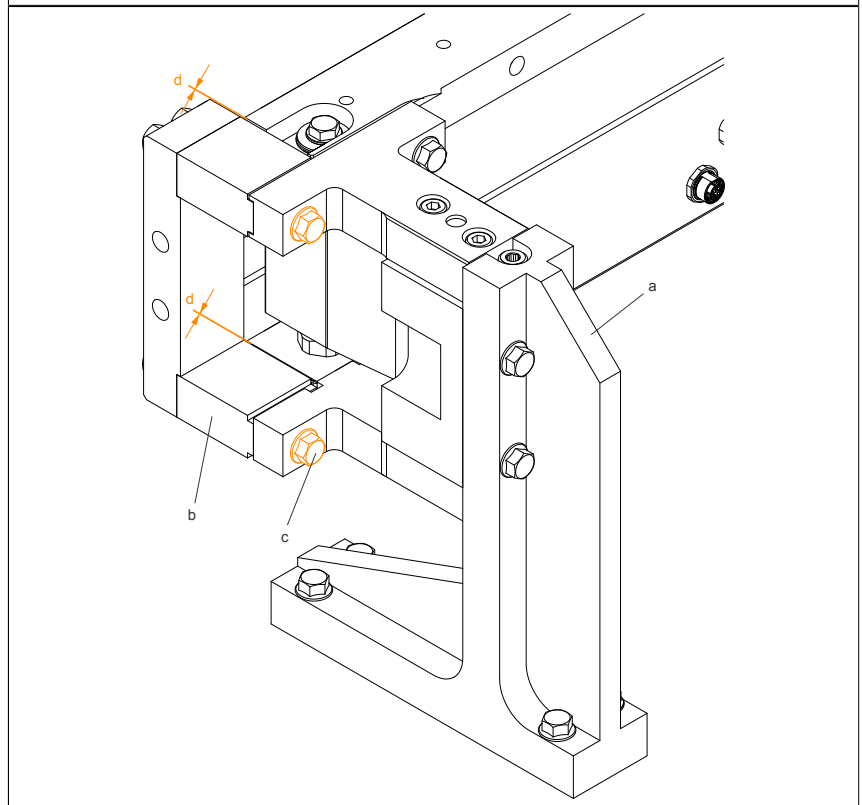
1. Install an end stop (b) according to the assembly diagram. Ensure that the guide rails are flush with each other!

a Guide stand with end interface  
b End stop  
c M8x30 hex head screw (2x)



2. Tighten the hex head screws (c) (tightening torque 20 Nm).

a Guide stand  
b End stop  
c M8x30 hex head screw (2x)



- Check the guide gap: Check distance  $d$  ( $0.5 \pm 0.2$  mm) between the end stop and guide rails using a feeler gauge.





### 5.3.4.10 Installing the diverter bridge

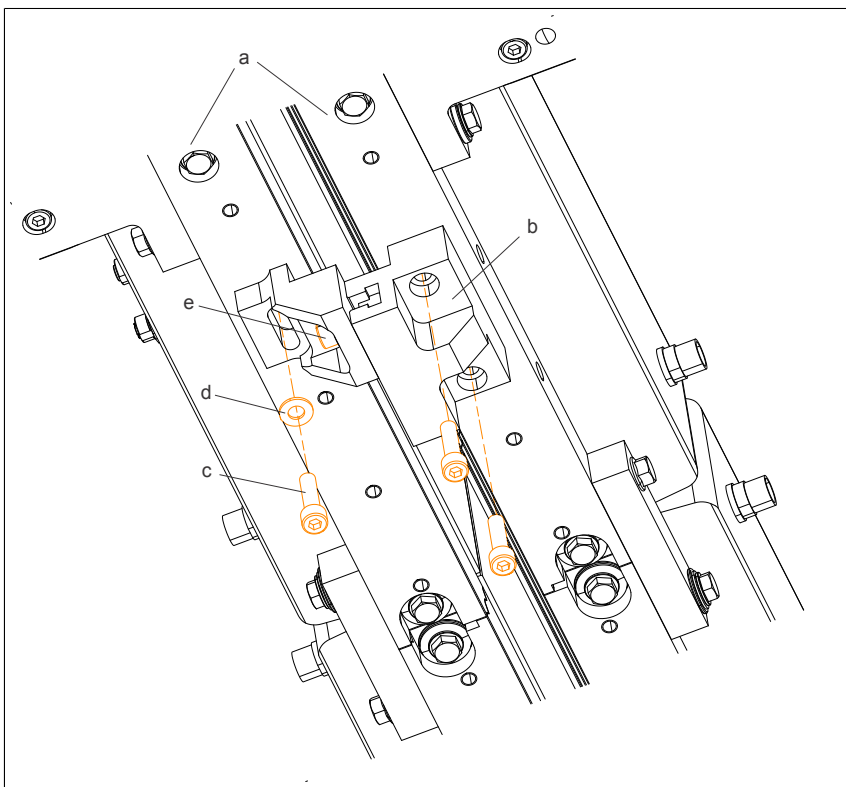
5.3.5.8 "Diverter setting" on page 263 must be performed before the diverter bridge is installed.

#### Diverter bridge

8F1GCA.DB000A00I-1

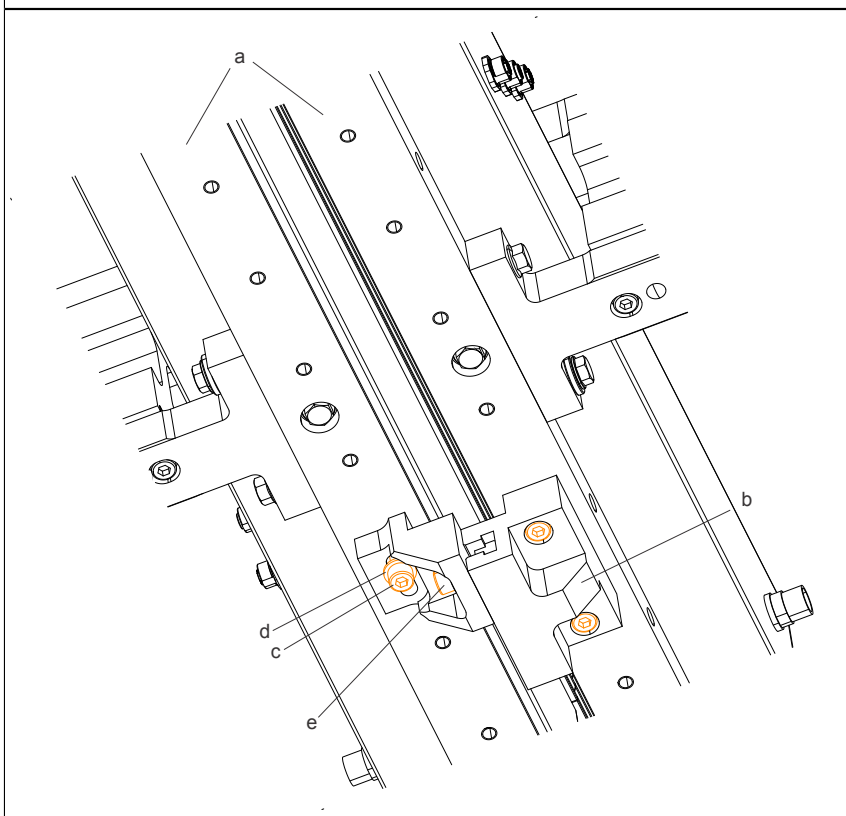
1. Loosen the hex socket screw (e).
2. Install the diverter bridge on the threaded drill holes on the underside of the flat guide rail in the diverter area. Position of the diverter according to the assembly diagram.

- a Flat guide rail
- b Diverter bridge
- c Hex socket screw M8x30 (3x)
- d Flat washer 22 x 10 x 3.5 (1x)
- e Hex socket screw M8x30



3. Slightly tighten the hex socket screws (c).
4. Tighten the hex socket screw (e) (tightening torque 20 Nm).
5. Tighten the hex socket screws (c) (tightening torque 20 Nm).

- a Guide rails
- b Diverter bridge
- c Hex socket screw M8x30 (3x)
- d Flat washer 22 x 10 x 3.5 (1x)
- e Hex socket screw M8x30



### 5.3.5 Alignment

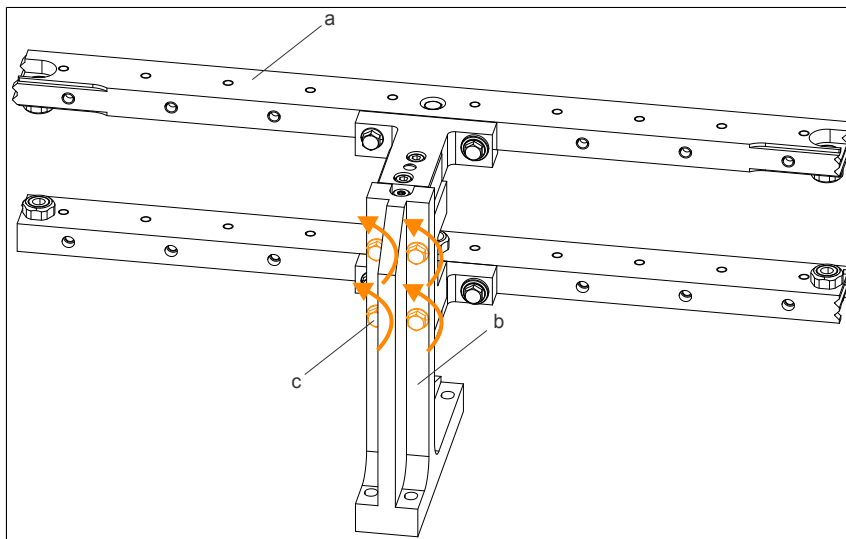
#### 5.3.5.1 Adjusting the height of the double-v guide rail

##### Height adjustment on the guide stand

The guide stand can be adjusted vertically to adjust the height.

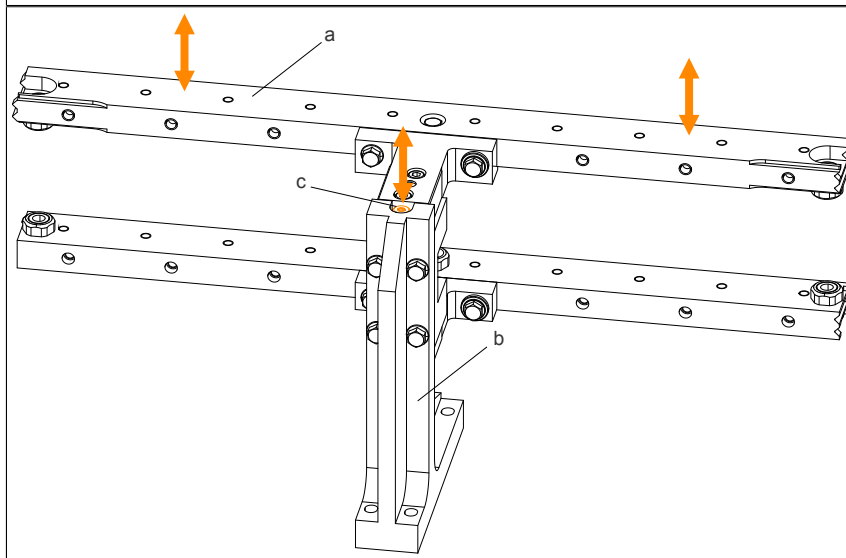
1. Loosen the 4 hex head screws (c) by approx. 1/4 turn.

a Guide element 8F1GC.A066.AA000-1  
b Guide stand 8F1GCA.ST027100I-1  
c M8x40 hex head screw (4x)



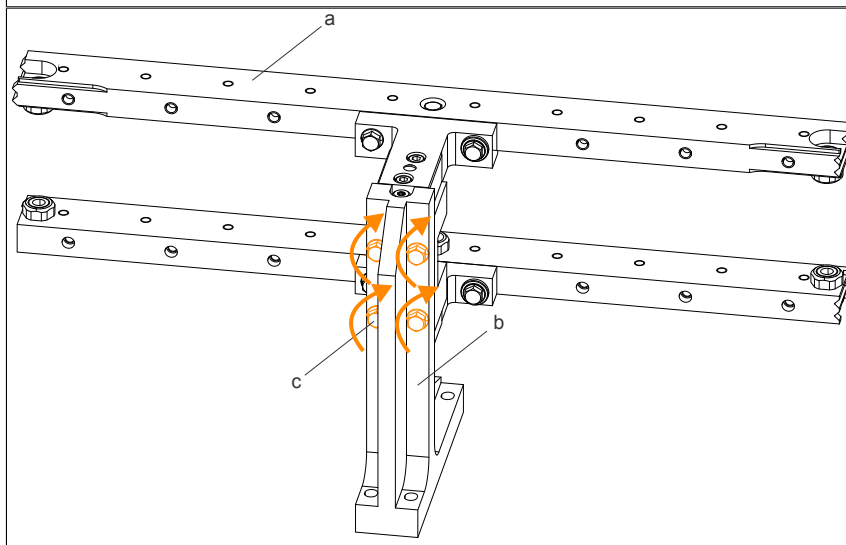
2. Adjust the height to the required position using the push-pull screw (c).

a Guide element 8F1GA.A066.AA000-1  
b Guide stand 8F1GCA.ST027100I-1  
c M8x45 push-pull screw



3. Tighten the 4 hex head screws ((c), tightening torque 20 Nm) again.

a Guide element 8F1GA.A066.AA000-1  
b Guide stand 8F1GCA.ST027100I-1  
c M8x40 hex head screw (4x)



### 5.3.5.2 Height adjustment on the accessory stand

#### Attaching the height adjustment tool for the accessory stand

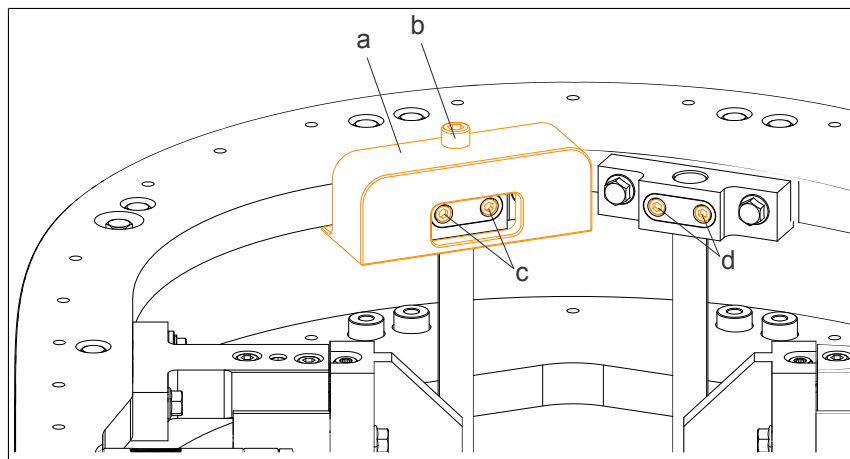
1. Attach the height adjustment tool (a) above the accessory stand at the rear of the double-v guide rail. (Unscrew adjusting screw (b) until the height adjustment tool (a) can be attached.)
2. Screw in the adjusting screw (b) to contact and tighten it with approx. 5 Nm.

a Height adjustment tool (8F1T-CA.GHAT0000I-1)

b Adjusting screw

c M6x30 hex socket screw (2x) on the accessory stand

d M6x30 hex socket screw (2x) on the accessory stand



3. Loosen the hex socket screws (c) and adjust the height of the double-v guide rail with the adjusting screw (b). If there is a second accessory stand (with 180° guide element), also loosen the screws (d) of the second accessory stand before adjustment.
4. Adjust the height to the required position by turning the adjusting screw (b).
5. Tighten the hex socket screws ((c) and (d) if present)) with a tightening torque of 10 Nm.
6. Loosen the adjusting screw (b) of the height adjustment tool (a) and remove the height adjustment tool (a).

### 5.3.5.3 Measuring the guide rail transition

The ACOPOStrak measuring shuttle ([8F1TCA.GMS00000I-1](#)) measures the guide rail transition.

The ACOPOStrak measuring shuttle is only permitted to be moved by hand. The ACOPOStrak transport system must be disconnected from the power supply.

When using the ACOPOStrak measuring shuttle, the supplied handle must be used.

#### Danger!



- The magnetic field generated by the shuttles (magnet units) can be harmful to pacemaker wearers. Maintain a minimum distance of 31 cm (12 in.) between the shuttle and the implant location.
- The permanent magnets in the shuttles have a strong magnetic field.
- When a shuttle is removed from the ACOPOStrak transport system, slide a magnet cover plate over the magnet unit on the shuttle to reduce the effect of the magnetic field to a safe level.
- Magnetic fields that occur can set ferromagnetic and magnetic materials into motion, creating potential projectiles or pinch points. Various electronic equipment or magnetic data storage media can also be affected by these magnetic fields.

#### Warning!



**Danger of crushing between shuttle and guide rail!  
Hand injury!**

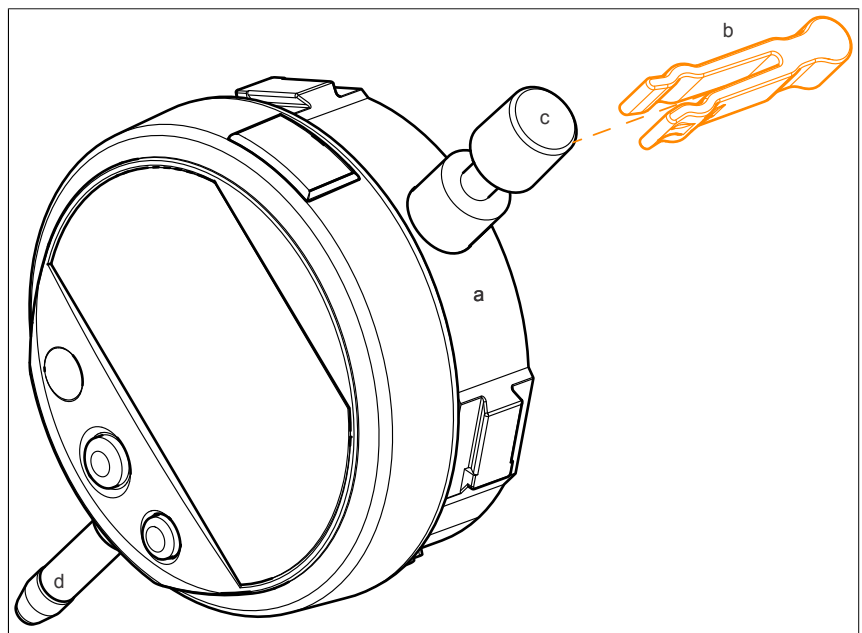
- Grip the shuttle on its side.

#### Danger!

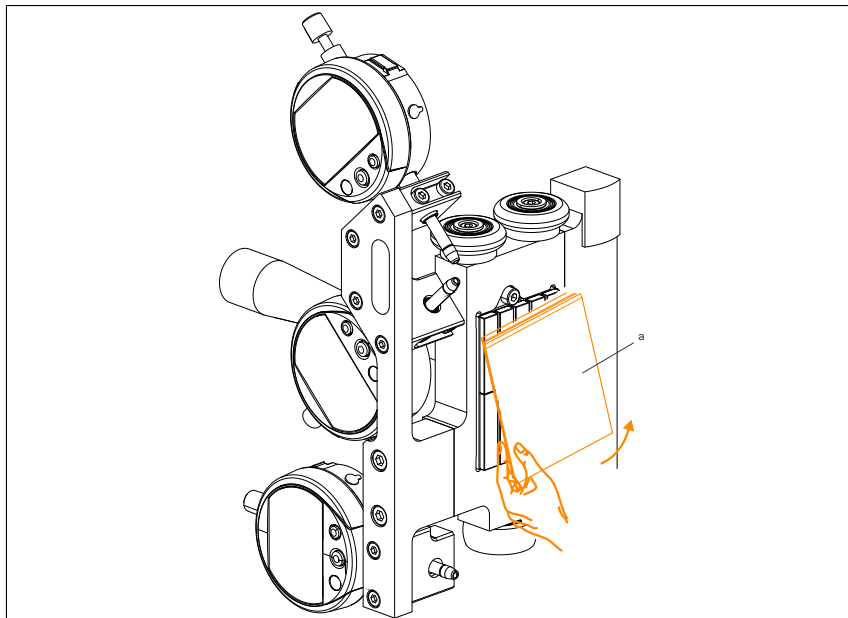
There is a risk of splintering in the event of strong mechanical influence, for example due to the attraction of magnetic objects to the magnets.

### Preparing and attaching the measuring shuttle to the ACOPOStrak transport system

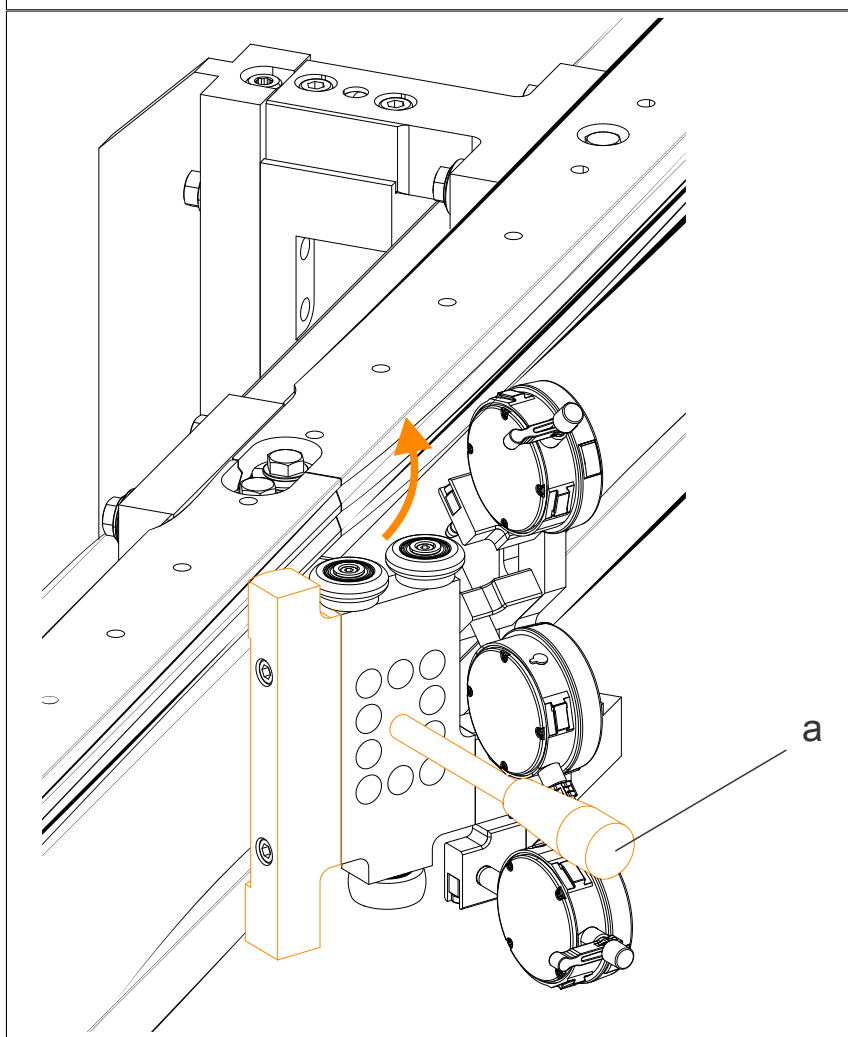
1. Clean the v-wheel and flat wheels of the measuring shuttle and guide rails.
2. Unscrew the cap (c) of the dial gauges (a), lift the probes (d) and attach the spacer clamps (b). This serves to protect the probes (d) against impacts when attaching the measuring shuttle.



3. Remove the keeper plate assembly (a) from the magnet unit.

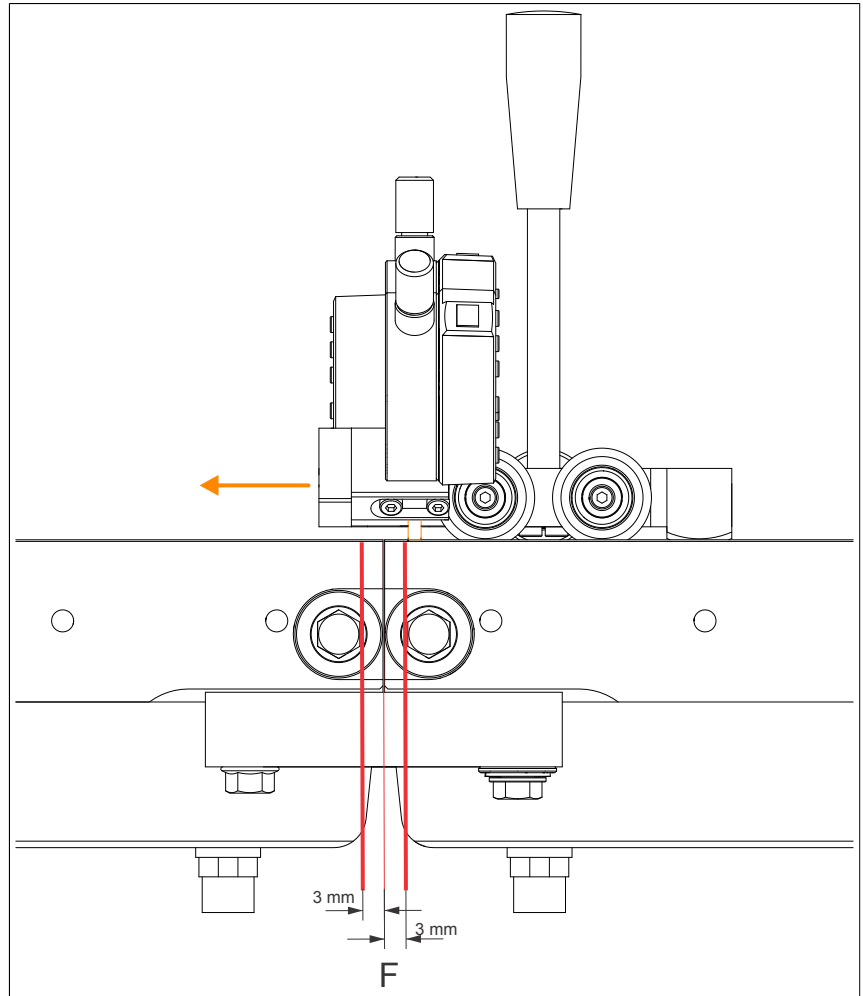


4. Take the measuring shuttle by the handle (a) and move it slowly in the direction of the double-v guide rail (the two v-wheels of the measuring shuttle must be inserted into the upper v-groove of the double-v guide rail). The measuring shuttle is pulled into the guide rails by magnetic force. The probes on the dial gauges are not permitted to be loaded obliquely during this procedure.



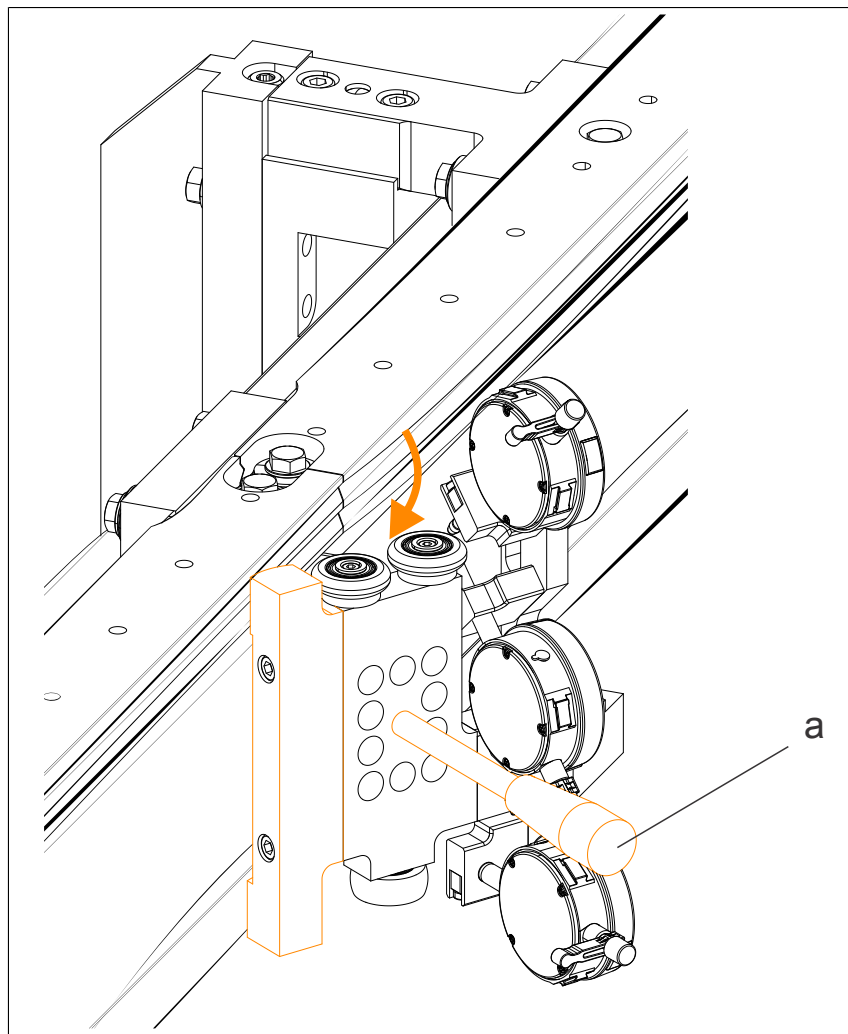
**Measuring procedure**

1. Remove the spacer clamps of the probes so that the probe tips of the dial gauges are in contact with the guide rails.
2. Position the measuring shuttle on one side of guide rail transition F with a distance between the probe tips of the dial gauges of approx. 3 mm before the transition.
3. Set the dial gauges to zero (see the operating instructions for the dial gauges).
4. Move the measuring shuttle manually over guide rail transition F until approx. 3 mm after the transition.
5. Read the measured value ( $<|0.05 \text{ mm}|$ ).



### Removing the measuring shuttle from the ACOPOStrak transport system

1. Reattach the spacer clamps on the dial gauge probes, see ["Attaching the spacer clamps" on page 254](#).
2. Remove the measuring shuttle from the ACOPOStrak transport system by turning the handle (a).
3. Attach the keeper plate assembly to the magnet unit again.



### 5.3.5.4 Alignment a 180° guide unit

An already assembled 180° guide element with assembled ACOPOStrak segments is aligned with the ACOPOStrak alignment tool for the 180° guide element / 135° guide element ([8F1TCA.GAT01000I-1](#)).

#### Handling the ACOPOStrak alignment tools

- The support points of the feet must rest on a clean and level surface.
- The alignment tool is only permitted to rest with the feet.
- When changing the position of the alignment tool, it must be lifted and is not permitted to slide (wear on the feet!).
- Check the contact surfaces of the spirit levels for cleanliness before placing them in the pockets provided.

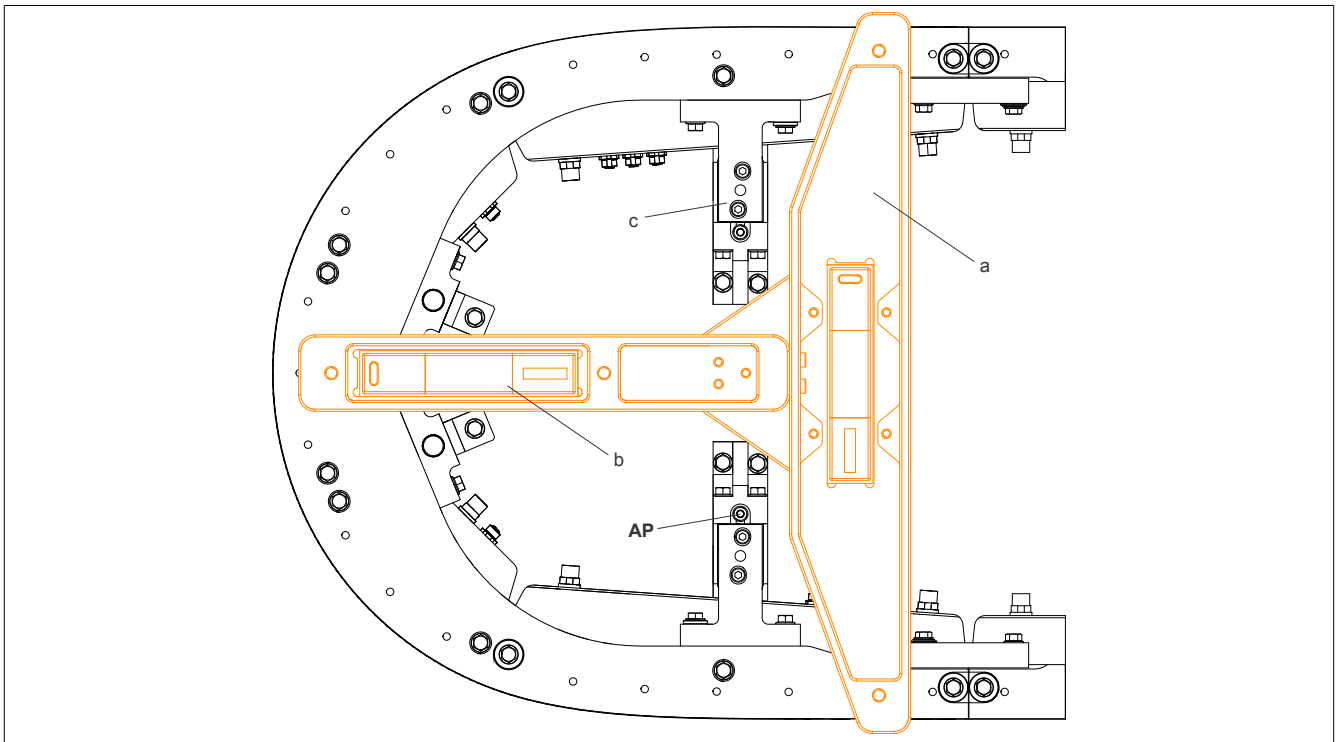
#### Preparation

1. "Attach the height adjustment tool to the accessory stand" on page 253.
2. Place the 180°/135° alignment tool on the double-v guide rail as shown in the figure.
3. Place two horizontal spirit levels in the designated pockets of the 180°/135° alignment tool.
4. Define anchor point AP: Select a guide stand of the 180° guide unit.

#### Adjusting

5. First guide stand to be adjusted (here: (c), not the anchor point!) with which to begin the adjustment.
6. Adjust the transverse axis (a): "Adjust the height of the guide stand (c)" on page 252.
7. Check the horizontality\* of the transverse axis (a) with a spirit level.
8. Adjust the longitudinal axis (b): "Adjust the height of the accessory stand" on page 253.
9. Check the horizontality\* of the longitudinal axis (b) with a spirit level.
10. Check the horizontality\* of both axes and repeat the adjustment of the corresponding axis if necessary.

\* Maximum value =  $\pm 0.08$  mm/m (0.04 mm corresponds to one graduation mark on the scale of the spirit level)





### 5.3.5.5 Alignment a 135° guide unit

An already assembled 135° guide element with assembled ACOPOStrak segments is aligned with the ACOPOStrak alignment tool for the 180° guide element / 135° guide element ([8F1TCA.GAT01000I-1](#)).

#### Handling the ACOPOStrak alignment tools

- The support points of the feet must rest on a clean and level surface.
- The alignment tool is only permitted to rest with the feet.
- When changing the position of the alignment tool, it must be lifted and is not permitted to slide (wear on the feet!).
- Check the contact surfaces of the spirit levels for cleanliness before placing them in the pockets provided.

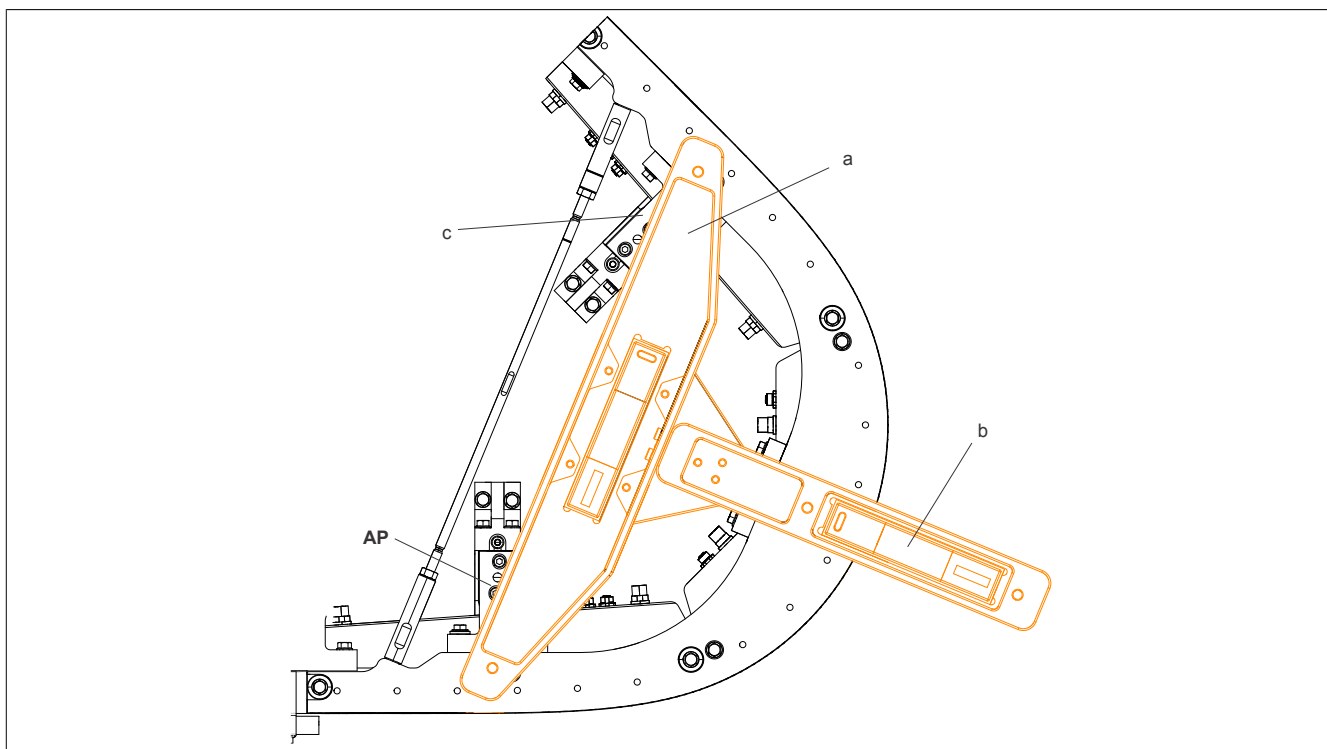
#### Preparation

1. ["Attach the height adjustment tool to the accessory stand" on page 253.](#)
2. Place the 180°/135° alignment tool on the double-v guide rail as shown in the figure.
3. Place two horizontal spirit levels in the designated pockets of the 180°/135° alignment tool.
4. Define anchor point AP: Select a guide stand of the 135° guide unit.

#### Adjusting

5. First guide stand to be adjusted (here: (c), not the anchor point!) with which to begin the adjustment.
6. Adjust the transverse axis (a): ["Adjust the height of the guide stand" on page 252.](#)
7. Adjust the longitudinal axis (b): ["Adjust the height of the accessory stand" on page 253.](#)
8. Check the horizontality\* of both axes and repeat the adjustment of the corresponding axis if necessary.

\* Maximum value =  $\pm 0.08$  mm/m (0.04 mm corresponds to one graduation mark on the scale of the spirit level)



### 5.3.5.6 Aligning a 90°/45°/straight guide unit

An already assembled 90°/45°/straight guide element with assembled ACOPOStrak segments is aligned with the ACOPOStrak alignment tool for the 90°/45°/straight guide element ([8F1TCA.GAT02000I-1](#)).

#### Handling the ACOPOStrak alignment tools

- The support points of the feet must rest on a clean and level surface.
- The alignment tool is only permitted to rest with the feet.
- When changing the position of the alignment tool, it must be lifted and is not permitted to slide (wear on the feet!).
- Check the contact surfaces of the spirit levels for cleanliness before placing them in the pockets provided.

#### Preparation

1. Place the 90°/45°/straight alignment tool on the double-v guide rail as shown in the figure. The support points must rest on a clean and level surface.
2. Place horizontal spirit levels in the designated pockets of the 90°/45°/straight alignment tool.

#### Adjusting

3. Adjust the guide stand that has not yet been adjusted.
4. Adjust: "[Adjusting the height of the guide stand](#)" on page 252.
5. Check the horizontality\* and repeat the adjustment if necessary.

\* Maximum value =  $\pm 0.08$  mm/m (0.04 mm corresponds to one graduation mark on the scale of the spirit level)

#### Correctly placing the alignment tool

Depending on the use case, the appropriate foot of the alignment tool must be used for support on the guide.

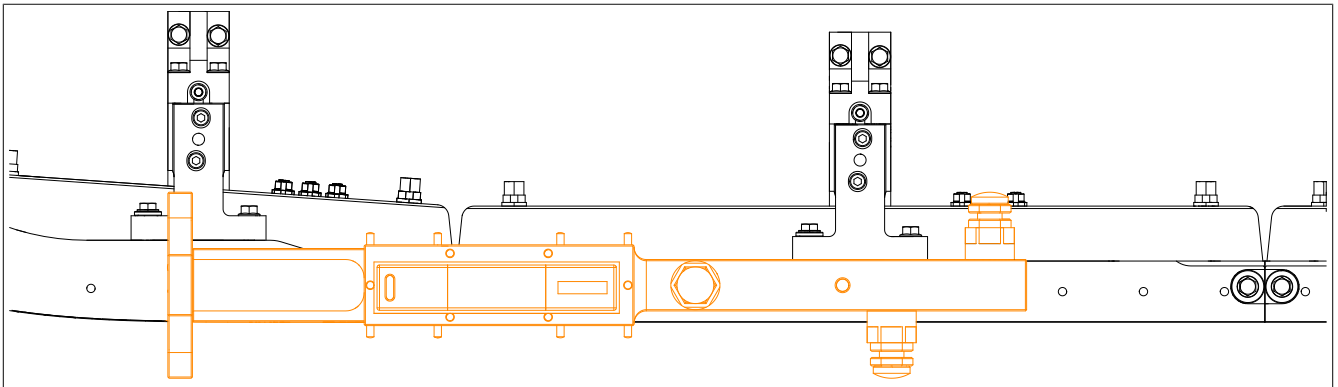


Figure 89: Aligning a straight guide element

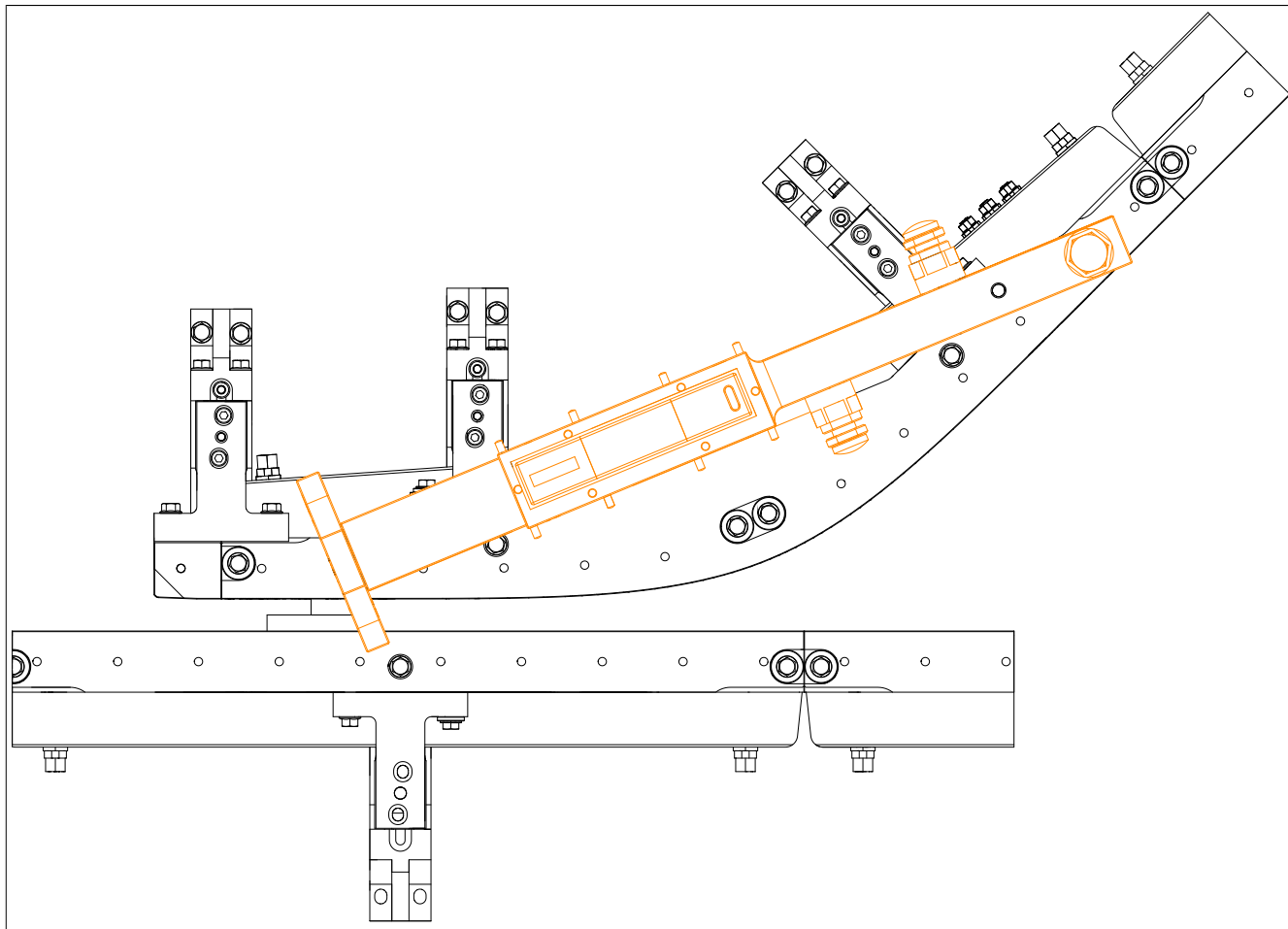


Figure 90: Aligning a 45° guide element

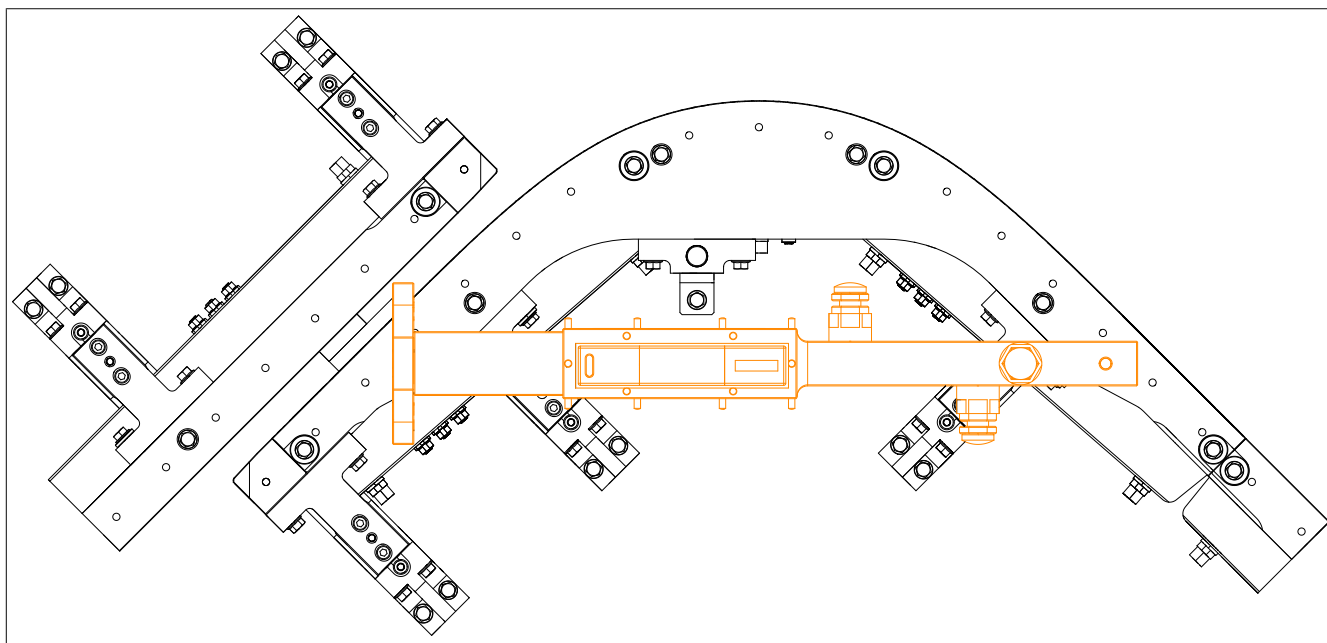


Figure 91: Aligning a 90° guide element

### 5.3.5.7 Aligning a straight guide unit on a 180° guide unit

An already assembled straight guide element on a 180° guide element with assembled ACOPOStrak segments is aligned with the ACOPOStrak alignment tool for the 90°/45°/straight guide element (8F1TCA.GAT02000I-1).

#### Preparing

1. Place the 90°/45°/straight alignment tool on the double-v guide rail.  
The support points must rest on a clean and level surface.
2. Place horizontal spirit levels in the designated pocket of the 90°/45°/straight alignment tool.

#### Adjusting

3. Adjust the guide stand of the straight guide element that has not yet been adjusted, see "[Adjusting the height of the double-v guide rail](#)" on page 252.
4. Check the horizontality\* and repeat the adjustment if necessary.

\* Maximum value =  $\pm 0.08 \text{ mm/m}$  (0.04 mm corresponds to one graduation mark on the scale of the spirit level)

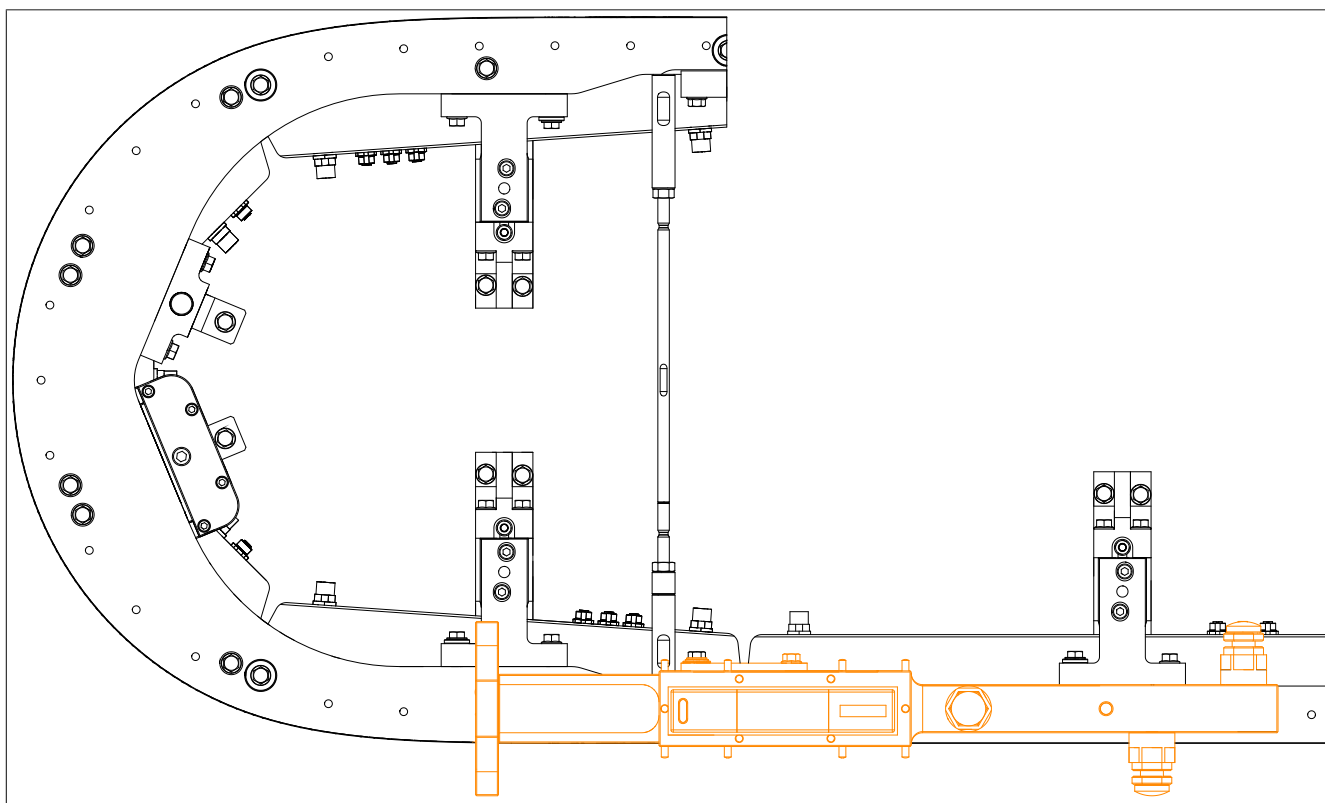


Figure 92: Aligning a straight guide element on a 180° guide element

### 5.3.5.8 Diverter setting

For constructions with a diverter, the mechanical adjustment of diverter gap A (nominal diameter of the v-wheels / flat wheels + 0.2 mm) must be carried out for the double-v guide rails and flat guide rails. The height of the double-v guide rails must also be adjusted. This is followed by magnetic balancing, in which the attractive force of the shuttle is balanced on both sides of the diverter by adjusting the position of the segments.

#### Diverter gap A

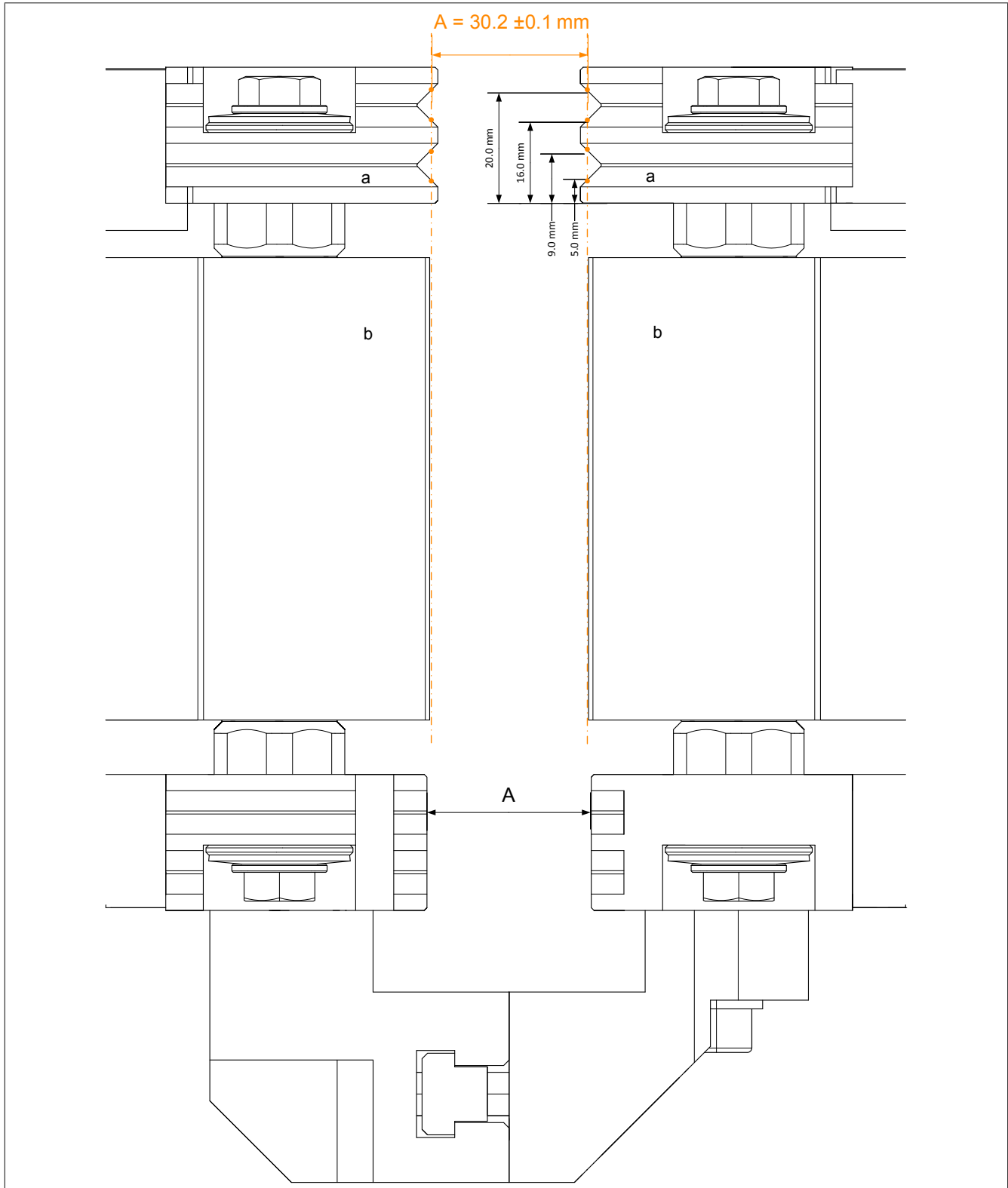


Figure 93: Diverter gap A

- a Double-v guide rails
- b Segments

### 5.3.5.8.1 Defining the diverter area

An exact adjustment of the guide rails and segments to each other is required in the diverter area. The specified adjustment values apply in this diverter area.

In the diverter area, the opposite guide rails run parallel. For the curved guide rail, the length of straight section "a" is 150 mm. Diverter area DA results from the sum of the parallel-running areas of the guide rails.

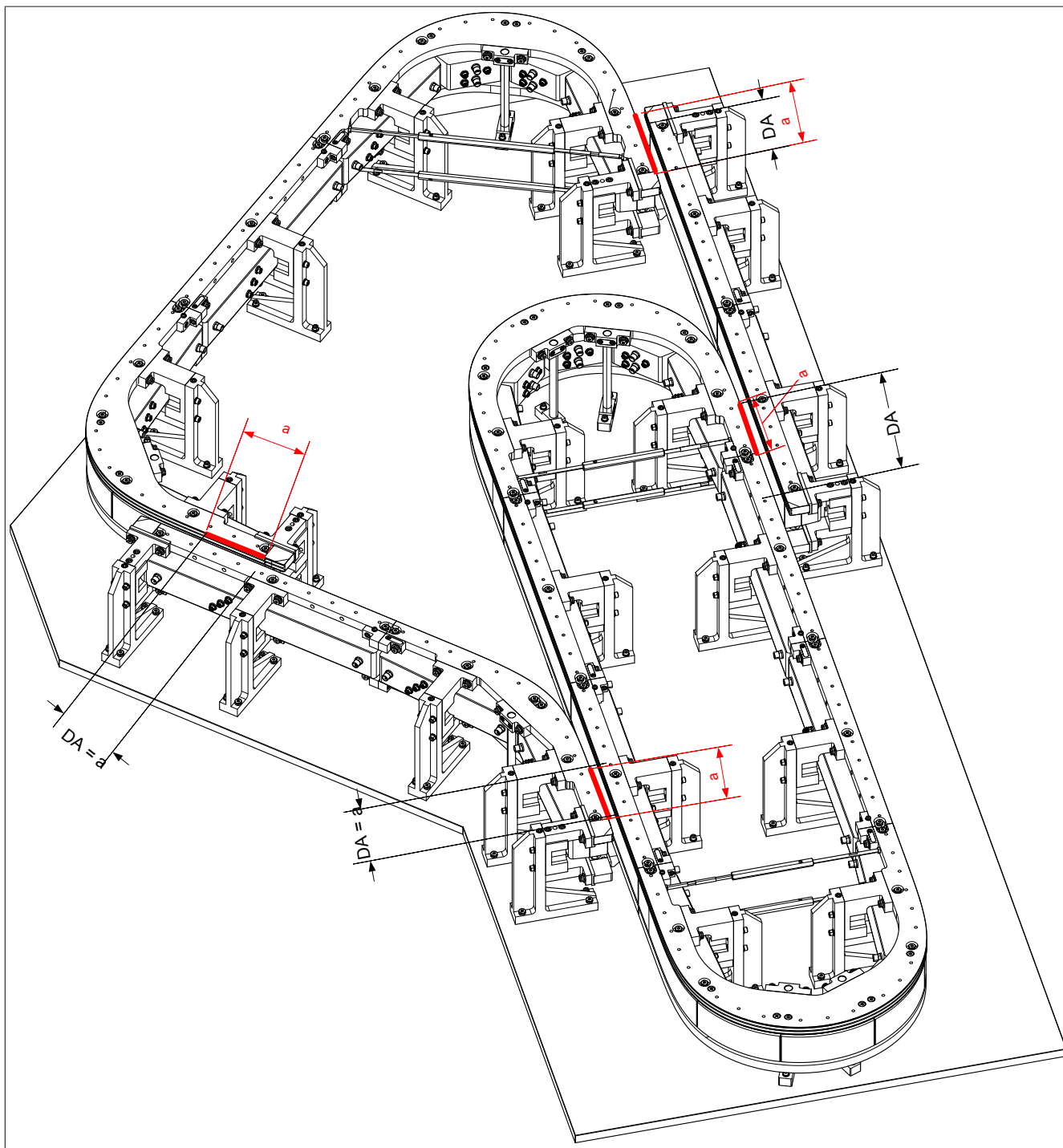


Figure 94: Sample setup with specified diverter areas

DA = Diverter area

a = 150 mm, adjustment range for straight section

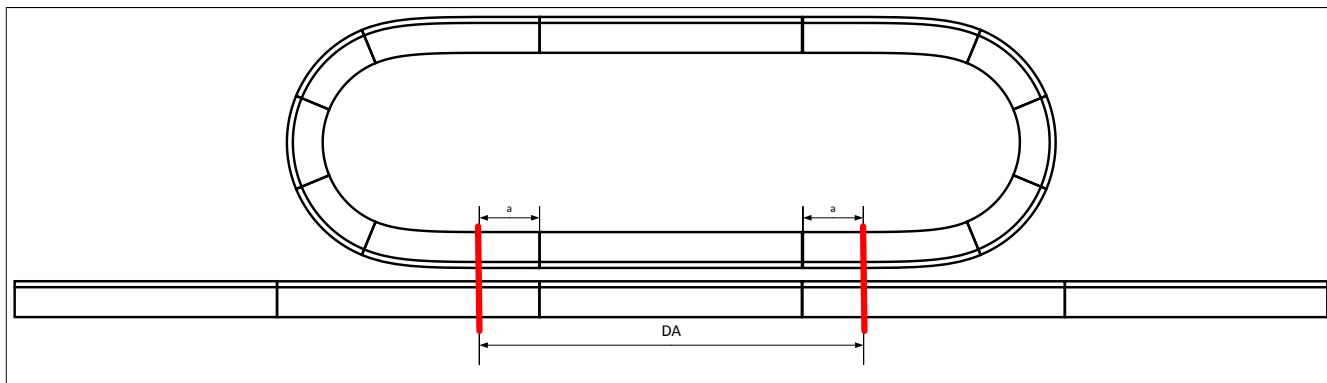


Figure 95: Diverter area with opposing straight segments

#### 5.3.5.8.2 Adjusting the diverter spacing

##### Requirement

Starting from a base side, the opposite side is adjusted in the diverter area.

##### Preparation

- Remove or loosen the diverter bridge.
- The adjustment and control blocks must be cleaned and checked for damage before use.

##### Notice!

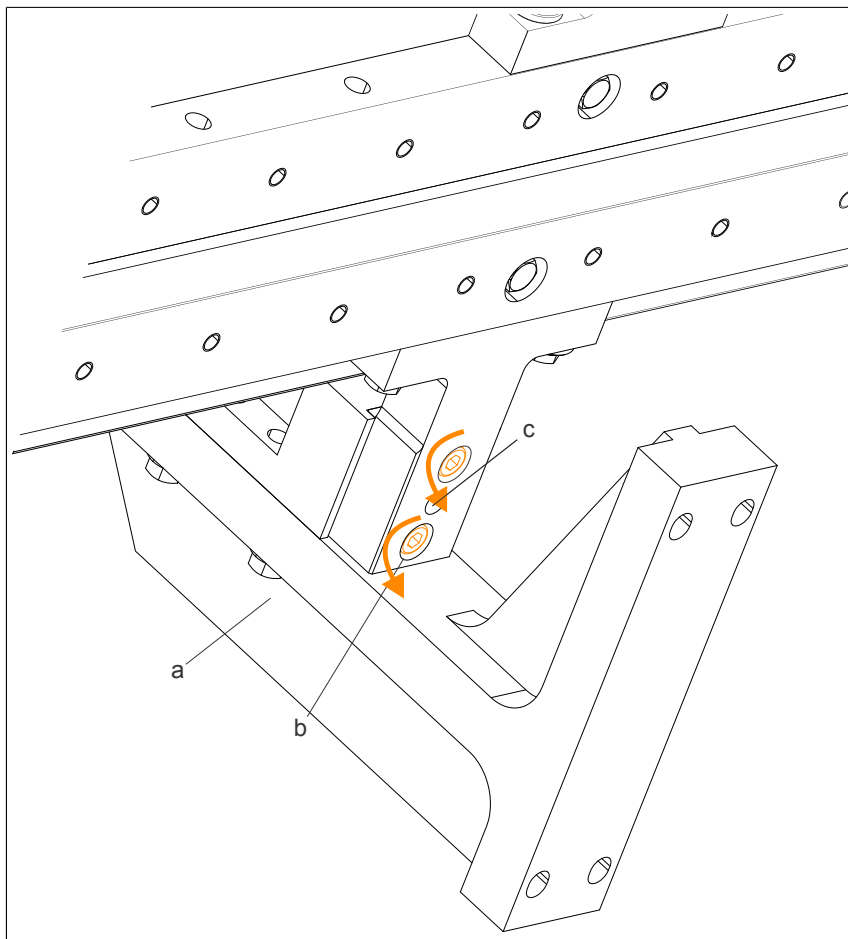
The adjustment and control blocks are only permitted to be moved by hand so that they cannot get stuck and the guide rails are not damaged.

##### 5.3.5.8.2.1 Adjusting the exact diverter gap of the flat guide rail in the diverter area

The flat guide rail is adjusted via an eccentric in the adjustable guide stand of the guide elements.

1. Loosen the hex socket screws (b).

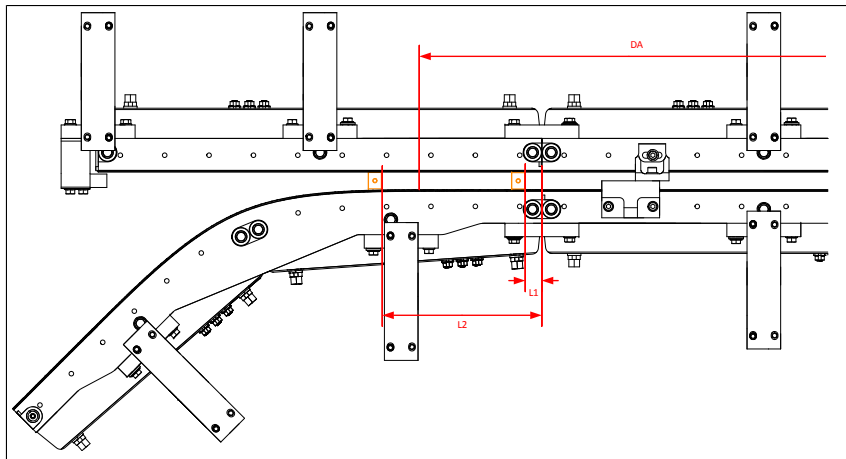
- a Guide stand, adjustable (applies to all)
- b Hex socket screws M6
- c Eccentric, internal



2. Insert the adjustment blocks (8F1TCA.DCB00000I-1) for the flat guide rail between the flat guide rails in the diverter area.

L1 10 mm (adjustment block measurement = 30.2 mm)

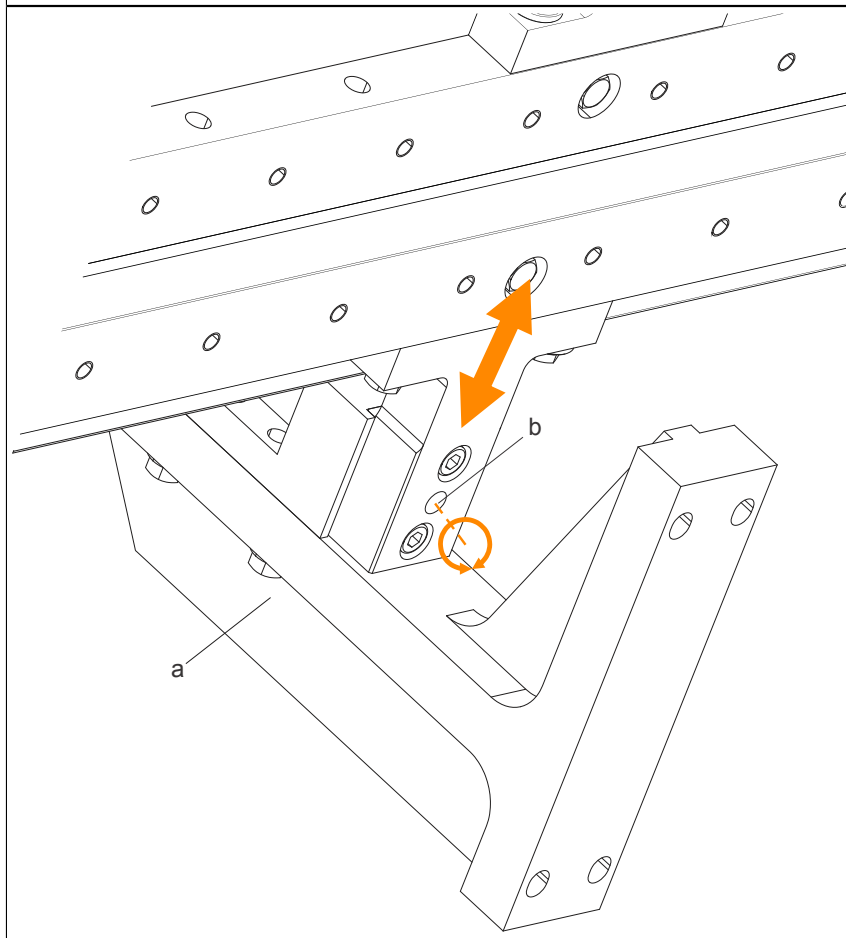
L2 195 mm (adjustment block measurement = 30.3 mm)



3. By turning the eccentric (b), the holding bracket on the guide stand (a) can be moved back and forth via the flat guide rail. Position the flat guide rail so that the two adjustment blocks can be easily moved in their positions.

4. In addition, check the ability of the 30.2 mm adjustment block to be moved within diverter area DA.

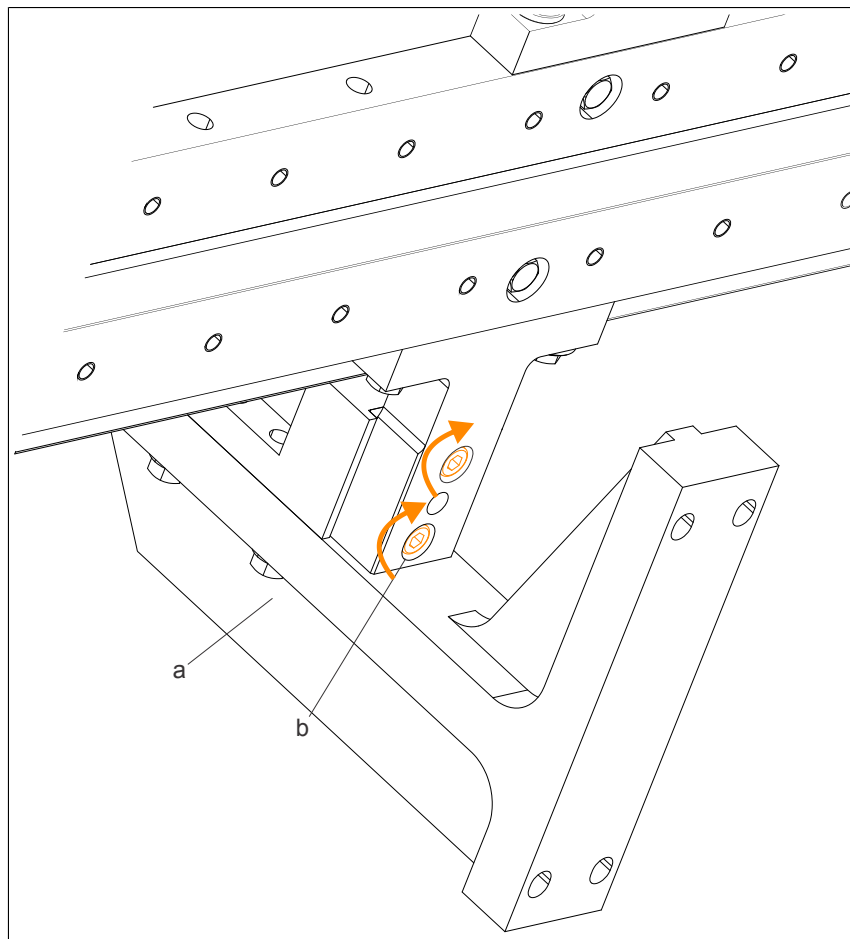
a Guide stand, adjustable  
b Eccentric, internal





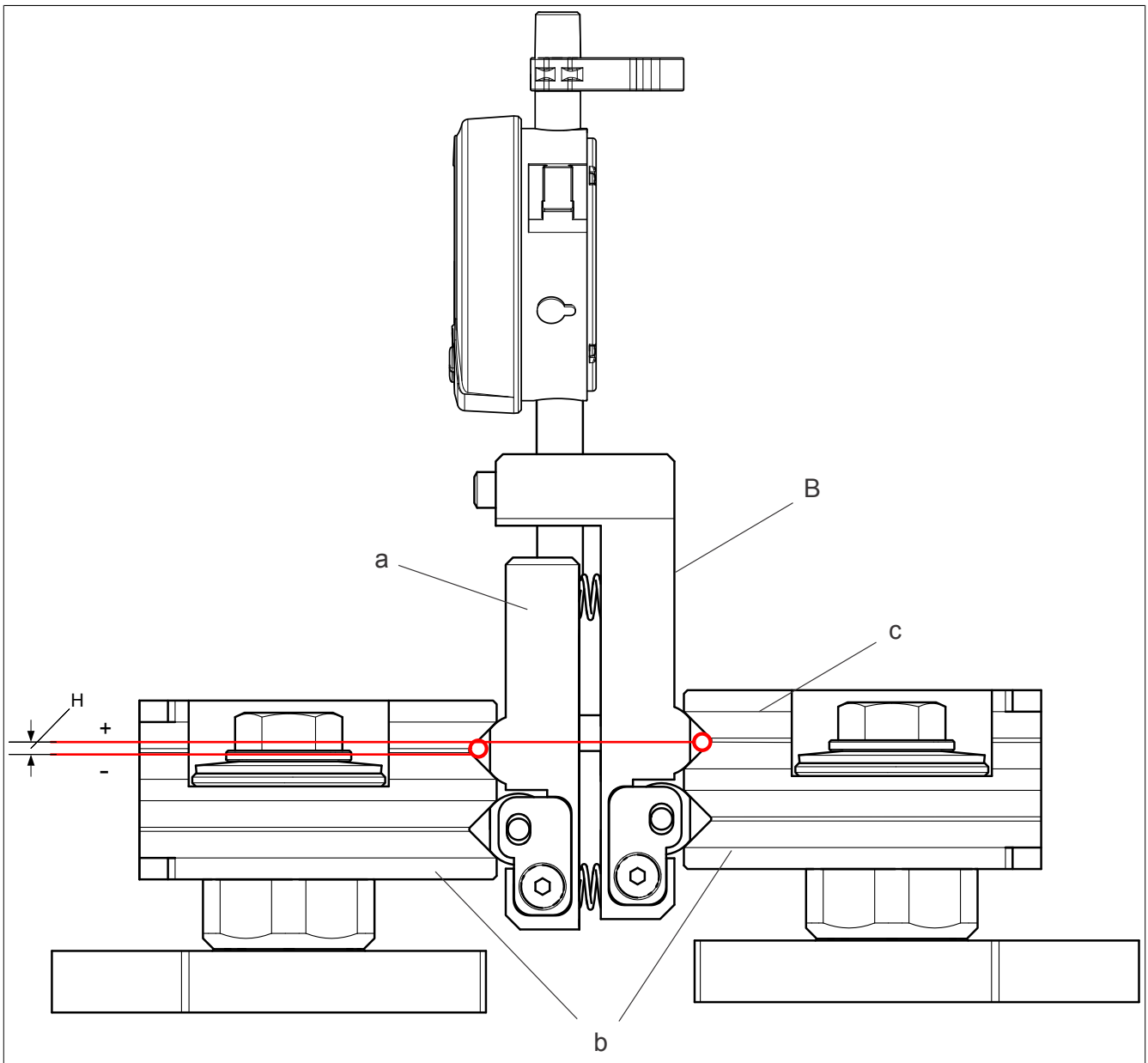
5. Tighten the hex socket screws (b) again (tightening torque 20 Nm).

a Guide stand, adjustable  
b Hex socket screws M6



### 5.3.5.8.2.2 Adjusting the height offset of the double-v guide rail

The ACOPOStrak height offset measuring device (8F1TCA.DHOMD000I-1) is used to measure the height offset (H) of the double-v guide rails opposite each other in the diverter area.



- a** ACOPOStrak height offset measuring device
- b** Double-v guide rails in the diverter area
- c** Already aligned base track in the diverter area
- B** Base side of the height offset measuring device
- H** Height offset

#### Requirement

ACOPOStrak guide elements with segments of the base track are positioned according to the assembly diagram and aligned with the ACOPOStrak alignment tools.

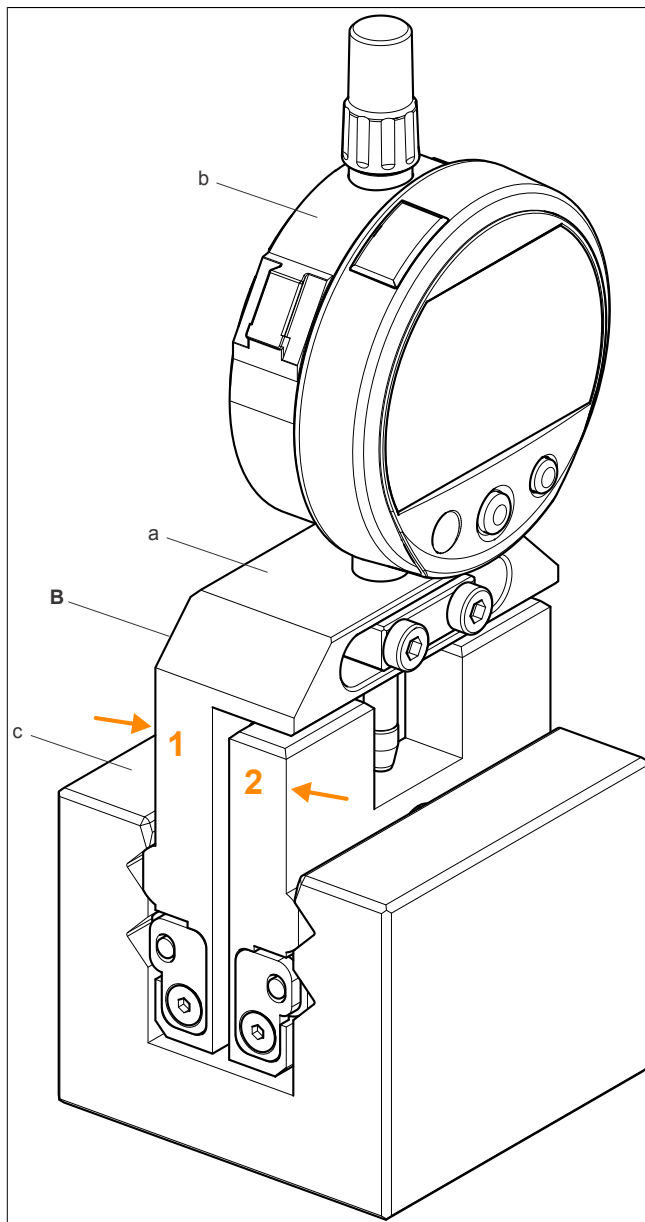
All hex head screws (installation and mounting screws) of the guide stands are tightened.

Check the contact surfaces of the measuring device and the calibration block for cleanliness before use.

## Zero adjustment of the measuring device for the height offset of the double-v guide rail

1. Press the jaws (1, 2) of the height offset measuring device together and insert into the calibration block (c).  
The v-contours of the measuring device must be in contact with the calibration block. The built-in spring presses the jaws (1, 2) against the contact surfaces of the calibration block.
2. In addition, press the jaws of the measuring device lightly in the order (1, 2) and position shown so that the v-contours of the measuring device are in contact.
3. Set the dial gauge to zero (follow the dial gauge operating instructions).

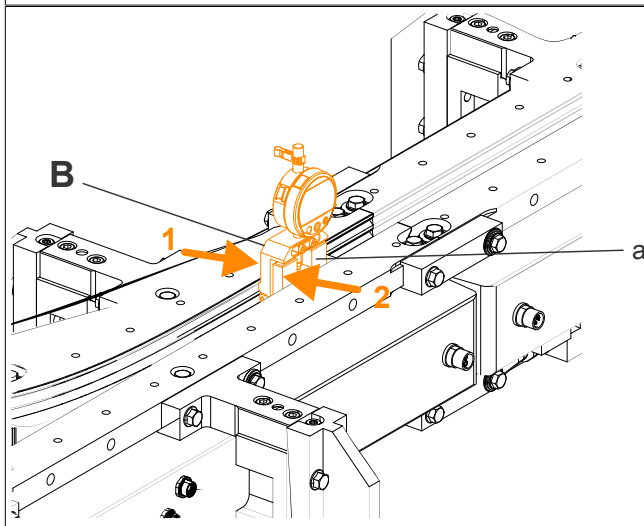
- a Height offset measuring device (8F1TCA.DHOMD000I-1)  
b Dial gauge  
c Calibration block (8F1TCA.DCBT0000I-1)  
B Base side of the height offset measuring device



## Height offset measurement in the diverter area

1. Base side (B) of the measuring device points to the already adjusted base track in the diverter area.
2. Press the jaws (1, 2) of the measuring device (a) together and insert the measuring device into the diverter area (measurement range) (from above or the side).
3. Press the jaws of the measuring device (a) lightly in the order (1, 2) and position shown so that the v-contours of the measuring device are in contact.
- ✓ The measured value shows height offset H from the double-v guide rail on the base side (B). Read the measured value from the dial gauge. Carry out additional measurements by moving to different positions within the diverter area.

- a Height offset measuring device with dial gauge  
B Base side of the height offset measuring device



4. Correct the height offset ( $H = 0 \text{ mm} \pm 0.03$ ) on the non-adjusted side of the track in the diverter area according to 5.3.5.1 "Adjusting the height of the double-v guide rail" on page 252.

### 5.3.5.8.2.3 Adjusting the exact diverter gap of the double-v guide rails in the diverter area

#### Requirement

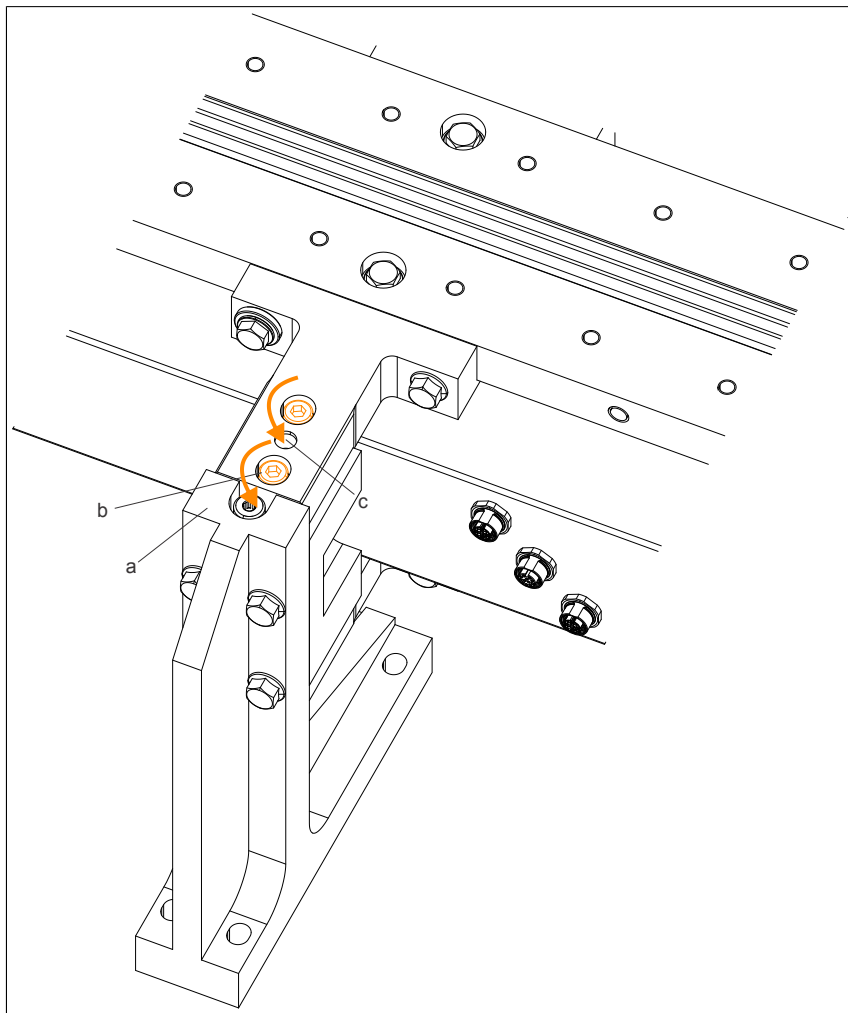
- The height offset is adjusted.
- The diverter bridge is removed.

#### Adjusting the exact diverter gap

The double-v guide rail is adjusted via the eccentric in the adjustable guide stand of the guide elements.

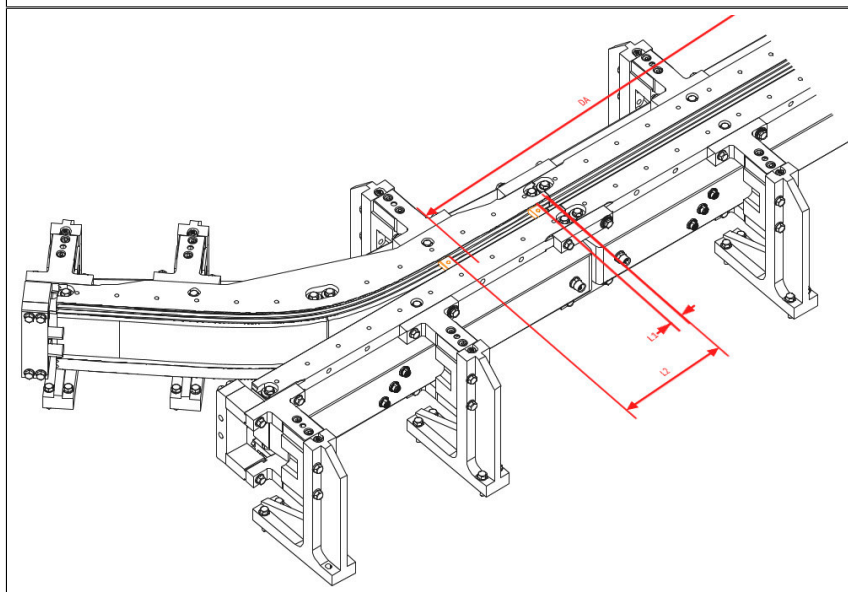
1. Loosen the hex socket screws (b).

- a Guide stand, adjustable  
b Hex socket screws M6  
c Eccentric, internal



2. Insert the adjustment blocks (8F1TCA.DCB00000I-1) between the double-v guide rails into the diverter area.

- L1 10 mm (adjustment block measurement = 30.2 mm)  
L2 195 mm (adjustment block measurement = 30.3 mm)

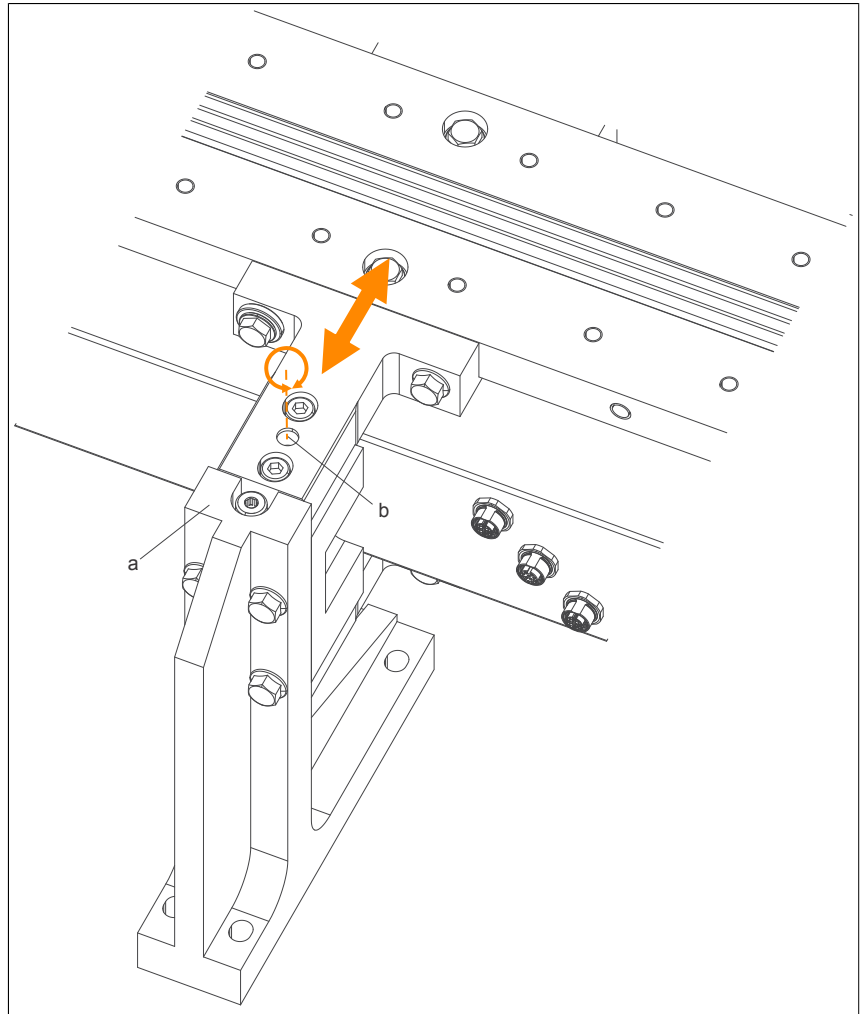


3. By turning the eccentric (b), the holding bracket on the guide stand (a) can be moved back and forth using the double-v guide rail.

Position the double-v guide rail so that the two adjustment blocks can be easily moved in their positions.

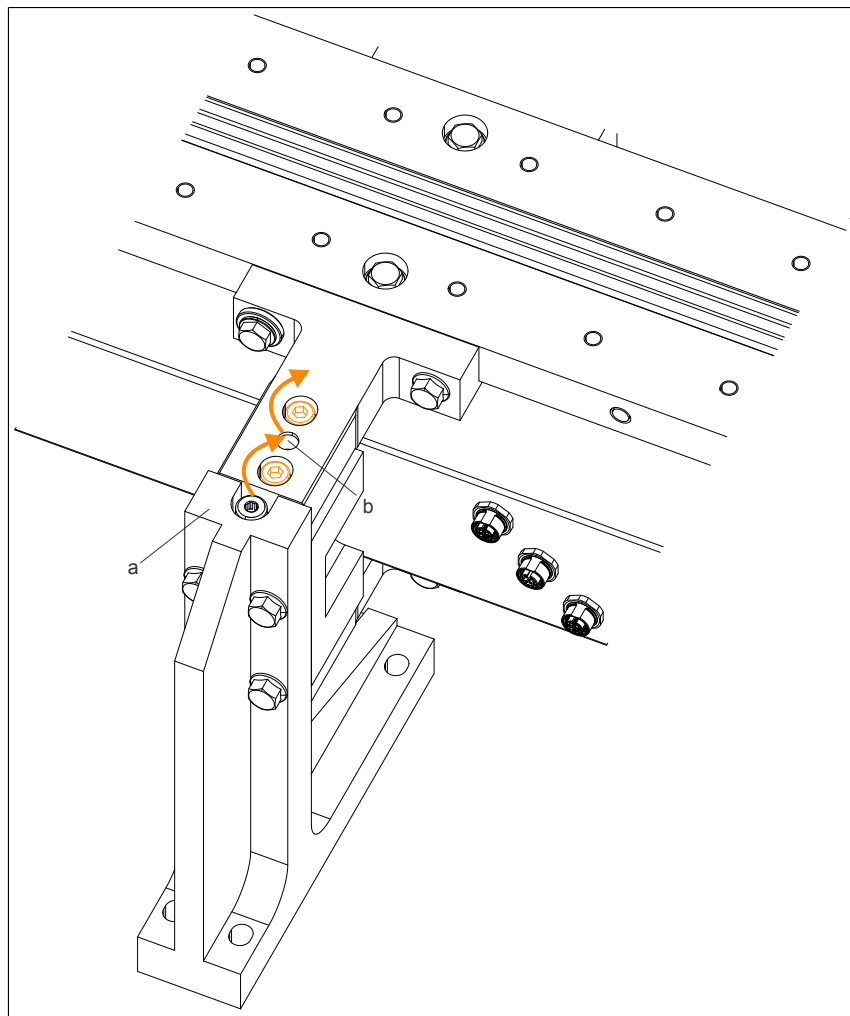
4. In addition, check the ability of the 30.2 mm adjustment block to be moved within diverter area DA.

a Guide stand, adjustable  
b Eccentric, internal



5. Tighten the hex socket screws (b) again (tightening torque 20 Nm).

a Guide stand, adjustable  
b Hex socket screws M6



6. Install and tighten the diverter bridge again.
7. Then check the diverter gap and height offset again.
8. Remove the adjustment blocks.

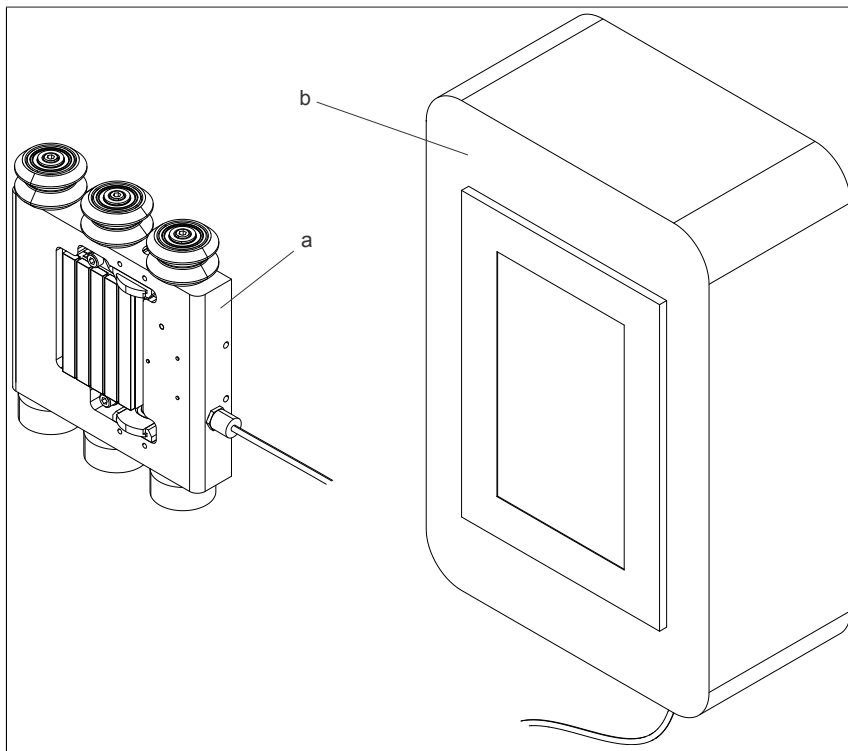
### 5.3.5.8.3 Adjusting the symmetrical magnetic force in the diverter area

The diverter setup tool is used to adjust the magnetic force in the diverter area.

Requirement is 5.3.5.8.2 "the setting of the diverter distance" on page 265.

1. Connect the diverter setup tool (a) to the display unit (b).

a Diverter setup tool  
b Display unit



2. Position the diverter setup tool so that the magnets point to the side of the non-adjustable guide element in the diverter area. Insert the diverter setup tool into the system from outside the diverter area (DA).

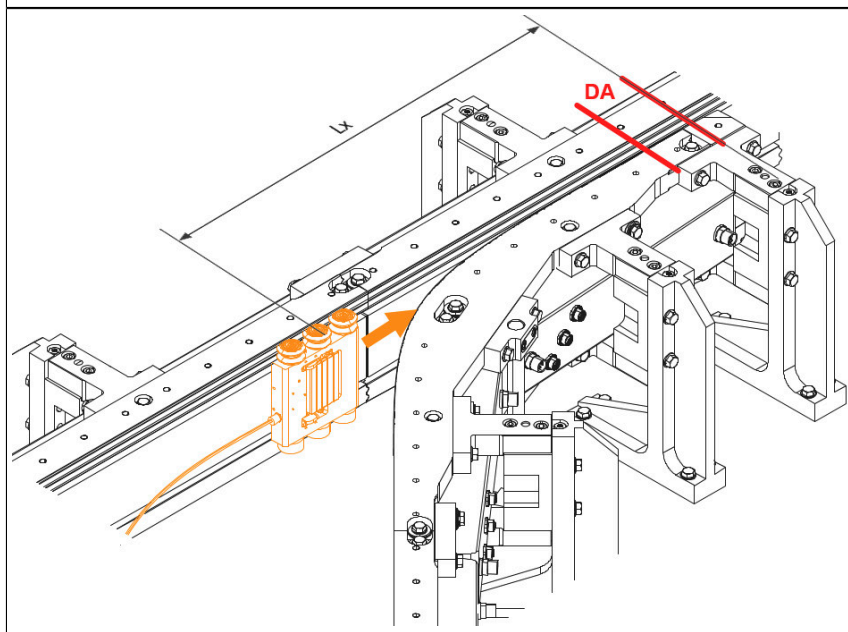
DA Diverter area

3. Position the diverter setup tool at spacing L1, L2 and L3 in the diverter area and note the measured value of the magnetic force from the display unit.

L1 = 60 mm  
L2 = 120 mm  
L3 = 150 mm

For straight guide elements on both sides:

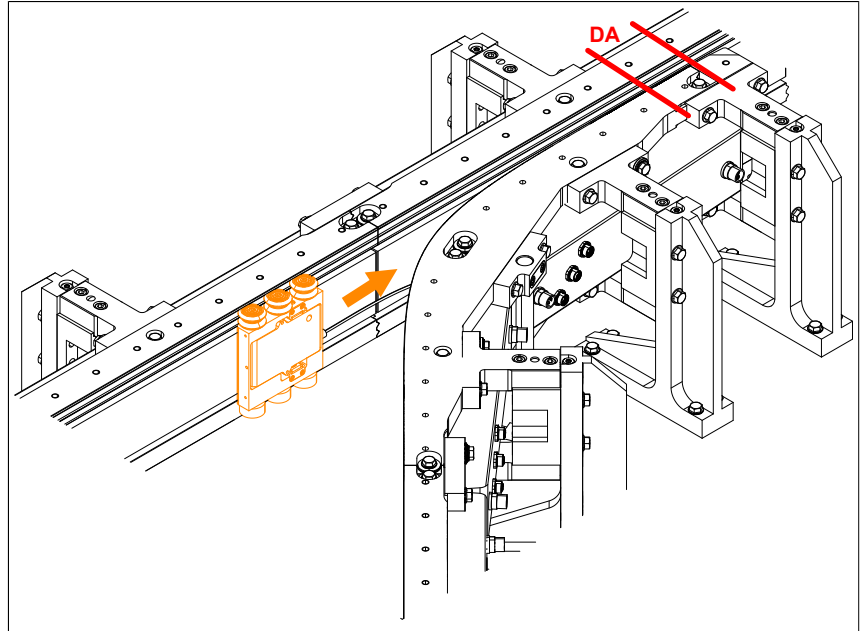
L1 = 60 mm  
L2 = 330 mm  
L3 = 600 mm



4. Extend the diverter setup tool and position it so that the magnets point to the side of the adjustable guide element in the diverter area. Insert the diverter setup tool into the system from outside the diverter area.

DA Diverter area

5. Position the diverter setup tool at spacing L1, L2 and L3 in the diverter area and note the measured value of the magnetic force from the display unit.



6. Check the measured values of the magnetic force on the display unit.  
If this is higher than the measured value from step 3 at the same position, the segment of the adjustable guide element is too close and must be adjusted with the ACOPOStrak adjustment tool.  
If this is lower than the measured value from step 3 at the same position, the segment of the adjustable guide element is too far away and must be adjusted with the ACOPOStrak adjustment tool.  
The segment position can be adjusted with the ACOPOStrak segment adjustment tool (8F1T-CA.DSAT0000I-1), see 5.3.5.8.3.1 "Adjusting the segment position" on page 274.

#### 5.3.5.8.3.1 Adjusting the segment position

With the adjustable guide elements, the segment can be moved horizontally.

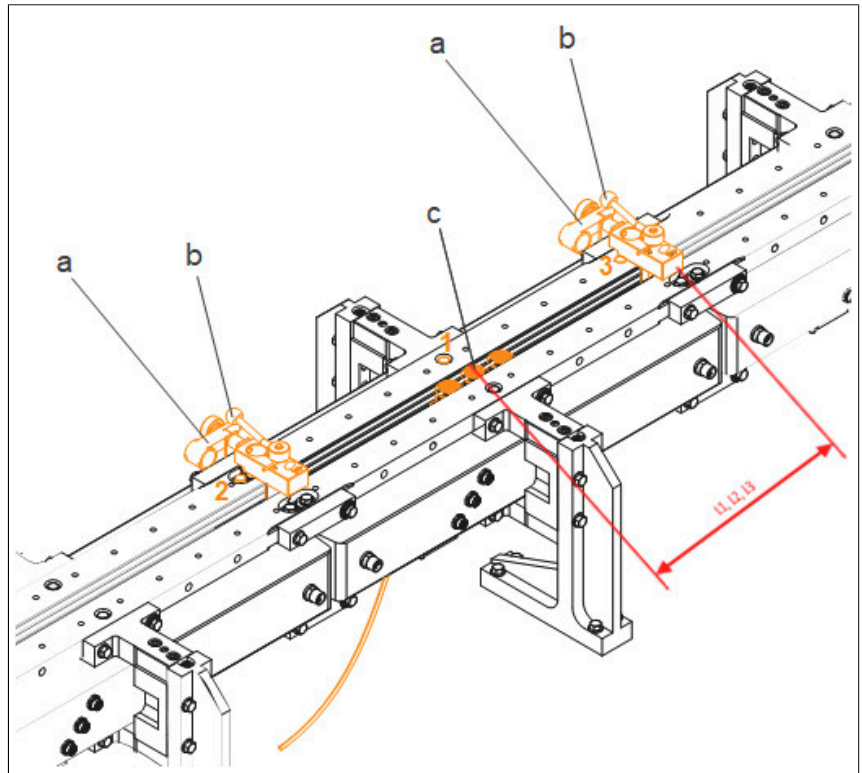
For this, push the diverter setup tool into the diverter area (magnet unit points at the adjustable guide element).

1. Attach the ACOPOStrak adjustment tools (a) in the position shown.
2. Remove the shoulder screws for fastening the segments (1, 2, 3 top and bottom), see 5.3.4.4.3 "Straight segment" on page 233, 5.3.4.4.4 "Straight segment, curved segment A" on page 235.
3. Position the segments horizontally with the adjusting lever (b) of the adjustment tool (a) until the magnetic force corresponds to the opposite values.  
To do this, position the diverter setup tool in the lengths L1, L2, L3.

L1 = 60 mm  
L2 = 330 mm  
L3 = 600 mm

For curved guide elements:

L1 = 60 mm  
L2 = 120 mm  
L3 = 150 mm





- a ACOPOStrak segment adjustment tool (8F1TCA.DSAT0000I-1)
  - b Adjusting lever
  - c Diverter setup tool
- 1, 2, 3 Shoulder screws M8x30

4. "Tighten the segment screws." on page 234
5. Remove the ACOPOStrak adjustment tools and diverter setup tool.
6. Manually check that the shuttles can pass freely through the diverter.

## 5.3.A Appendix

### Tightening torques

		Tightening torque [Nm]	Position
Guide system			
	Shoulder screw		
	M8	16	Double-v guide rail to segment
	M6	12	Flat guide rail to segment
	Hex head screw		
	M8	20	All (guide stands)
	Hex socket screw		
	M6	10	All (accessory stands)

## 5.4 Assembling a shuttle

The plant operator is responsible for taking appropriate measures (labels and hazard warnings) to adequately protect operating personnel against possible harm.

- Observe relevant national health and safety regulations.
- Post warning notices as needed.
- Place barriers around danger zones.
- Ensure that magnetic and electromagnetic radiation is reduced at its source (using shields, for example).

### Danger!



- The magnetic field generated by the shuttles (magnet units) can be harmful to pacemaker wearers. Maintain a minimum distance of 31 cm (12 in.) between the shuttle and the implant location.
- The permanent magnets in the shuttles have a strong magnetic field.
- When a shuttle is removed from the ACOPOStrak transport system, slide a magnet cover plate over the magnet unit on the shuttle to reduce the effect of the magnetic field to a safe level.
- Magnetic fields that occur can set ferromagnetic and magnetic materials into motion, creating potential projectiles or pinch points. Various electronic equipment or magnetic data storage media can also be affected by these magnetic fields.

### Warning!



**Danger of crushing between shuttle and guide rail!  
Hand injury!**

- Grip the shuttle on its side.

### Preparing the shuttles before installing on the guide system:

- Check the mobility of the wheels
- Check the state of the anti-static brushes, see [4.1 "Shuttle maintenance" on page 169](#).

### 5.4.1 Installing the load on the shuttle<sup>11)</sup>

#### Threaded holes for assembly

Attach the load to the shuttle at the tapped holes / mounting surfaces provided for this purpose according to the installation diagrams and assembly diagram.

If necessary, note the orientation of the load to the shuttle.

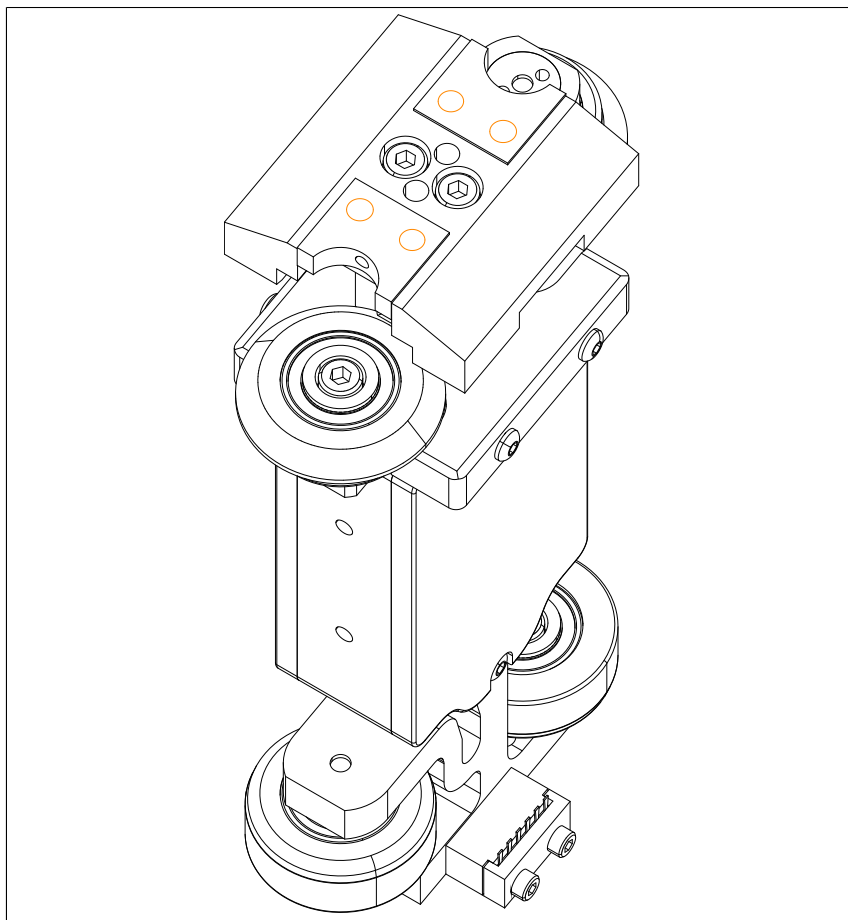


Figure 96: Mounting holes - Shuttle

Leave the lubrication holes open!

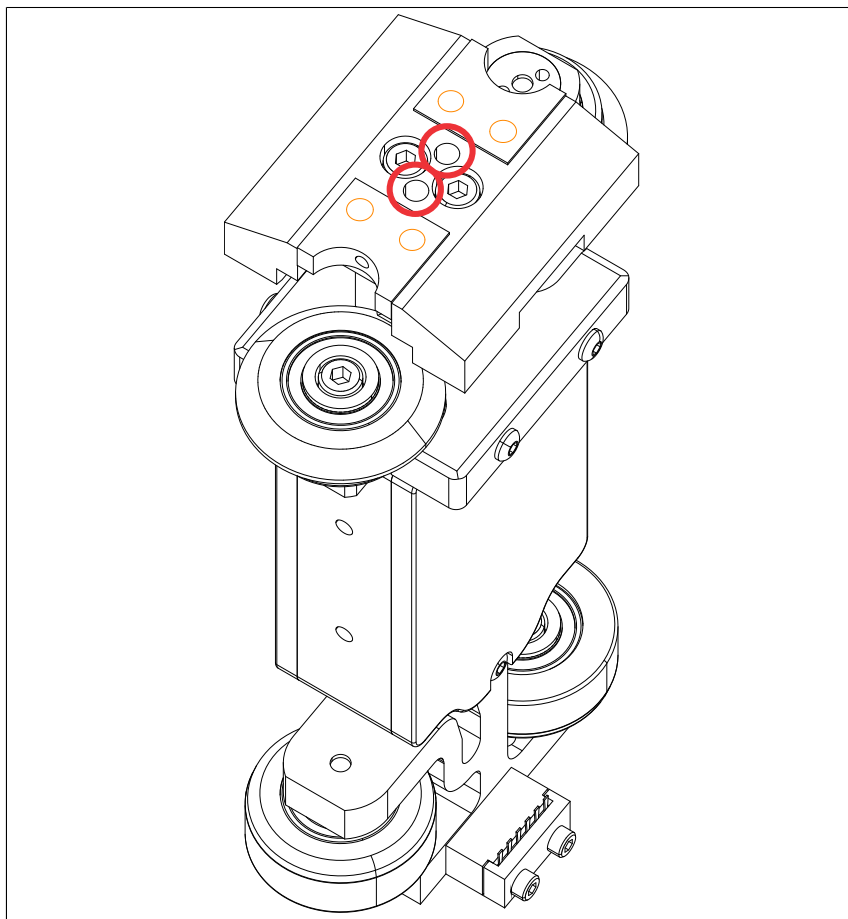
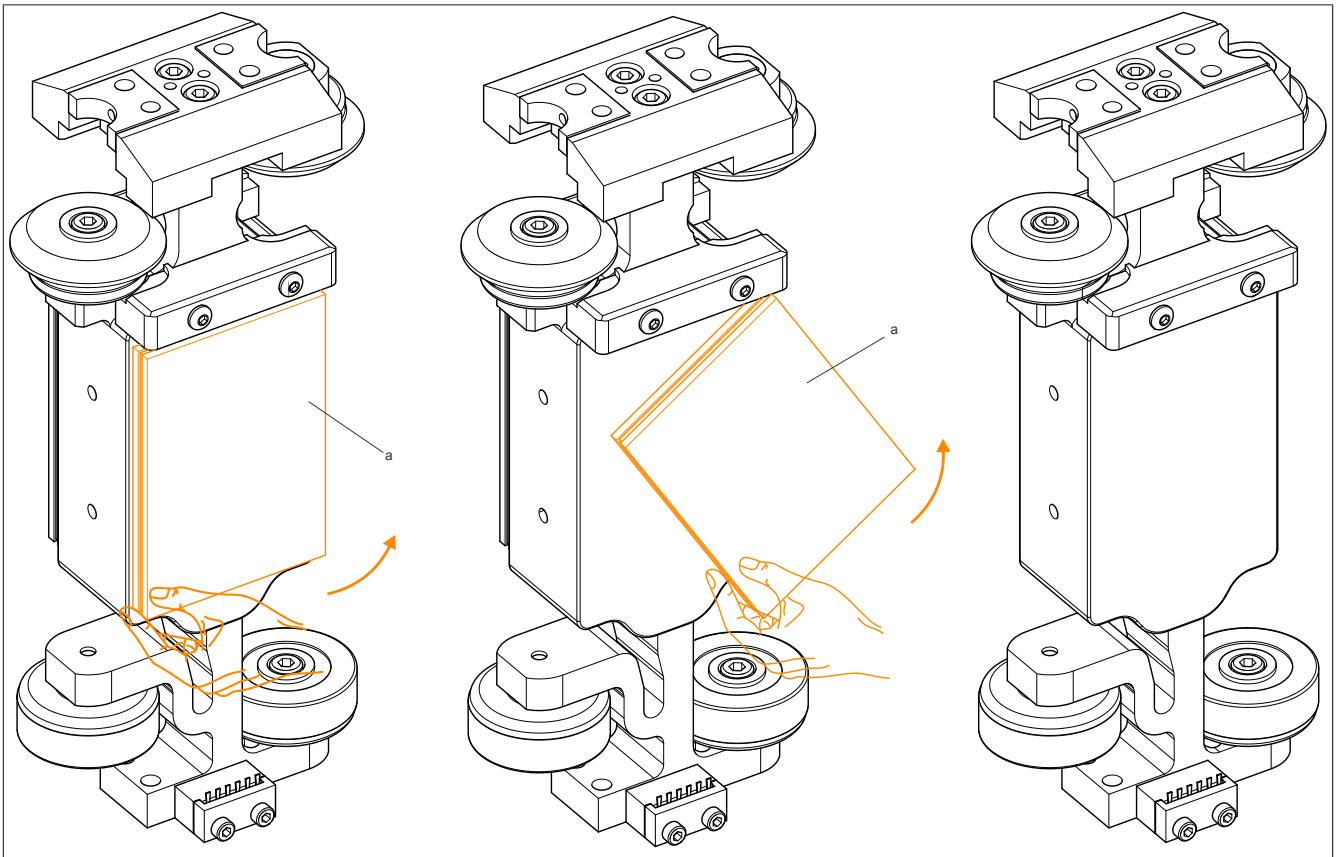


Figure 97: Lubrication holes - Shuttle

<sup>11)</sup> The following notes and explanations are provided as examples for the 50 mm shuttle. They are valid for all shuttle types.

### 5.4.2 Assembling a shuttle<sup>12)</sup> on the ACOPOStrak transport system.

1. Remove the magnet cover plate (a) from the side.



2. Observe the alignment of the shuttles according to the assembly plan. The alignment of all shuttles should be the same (exception: special cases).

<sup>12)</sup> The following notes and explanations are provided as examples for the 50 mm shuttle. They are valid for all shuttle types.

3. Grip the shuttle on its side.
4. Position the shuttle with the v-wheels at approx. 45° to the segment on the double-v guide rail.

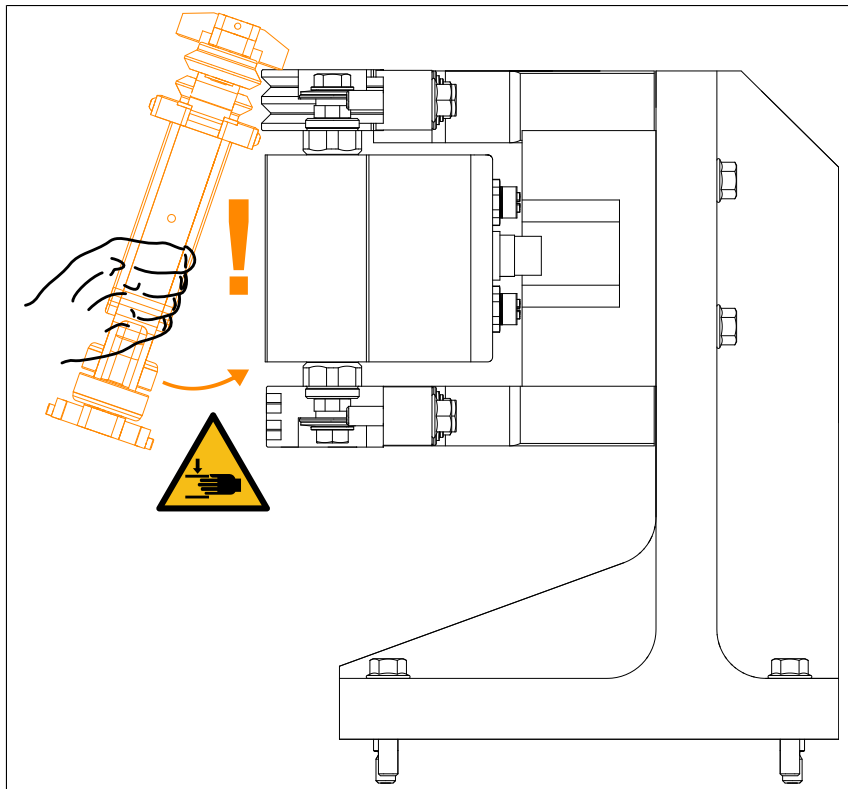


Figure 98: Manual assembly of a shuttle

## Notice!

Always start mounting the shuttle (especially 100 mm shuttles) by placing the v-wheels; otherwise, the segment may be damaged if positioned incorrectly.

## Warning!



**Danger of crushing between shuttle and guide rail!  
Hand injury!**

- Grip the shuttle on its side.

5. Slowly swivel the shuttle over this pivot point towards the segment; the shuttle will engage in the double-v guide rail.
6. Check the correct position of the shuttle in the double-v guide rail.

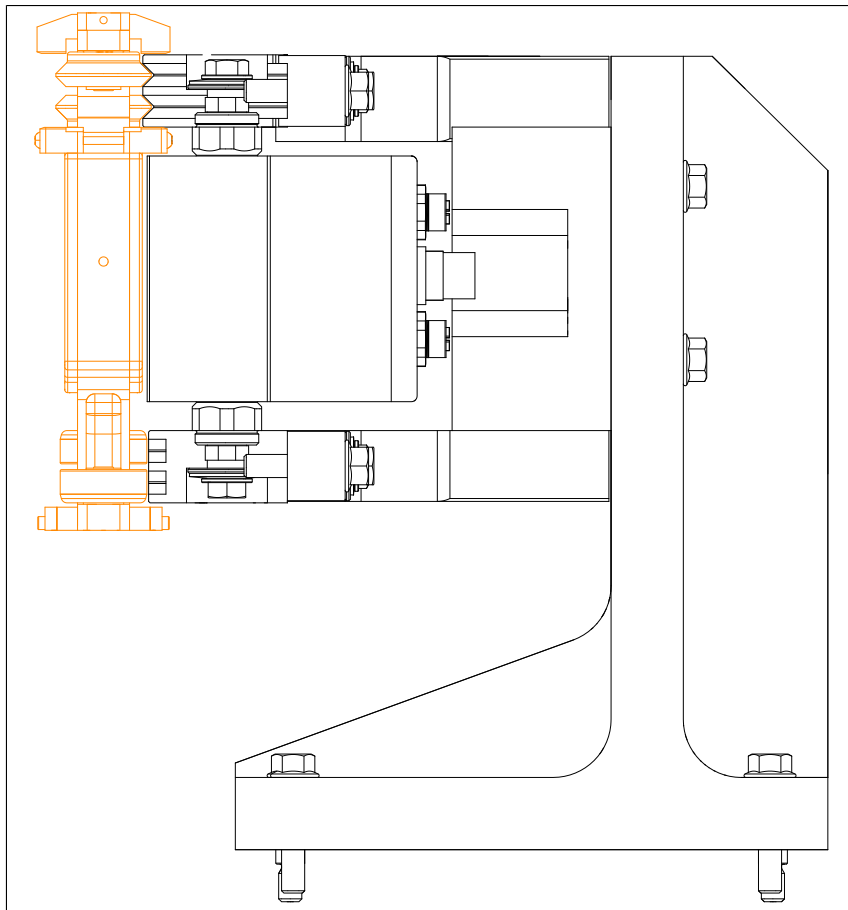
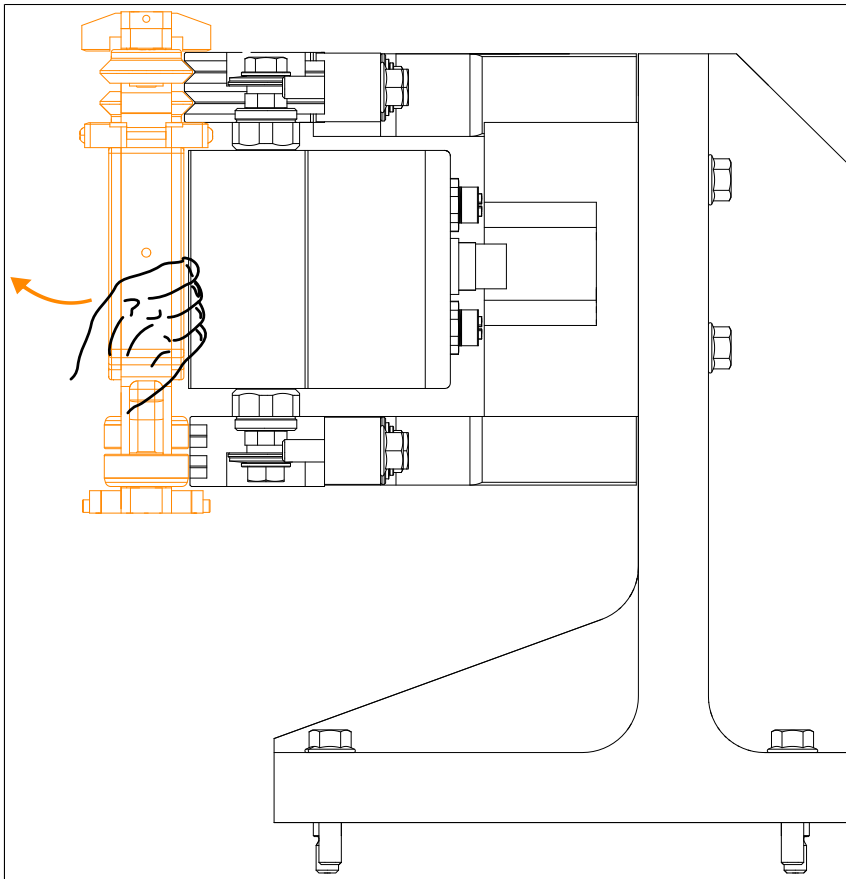


Figure 99: Manual assembly of a shuttle

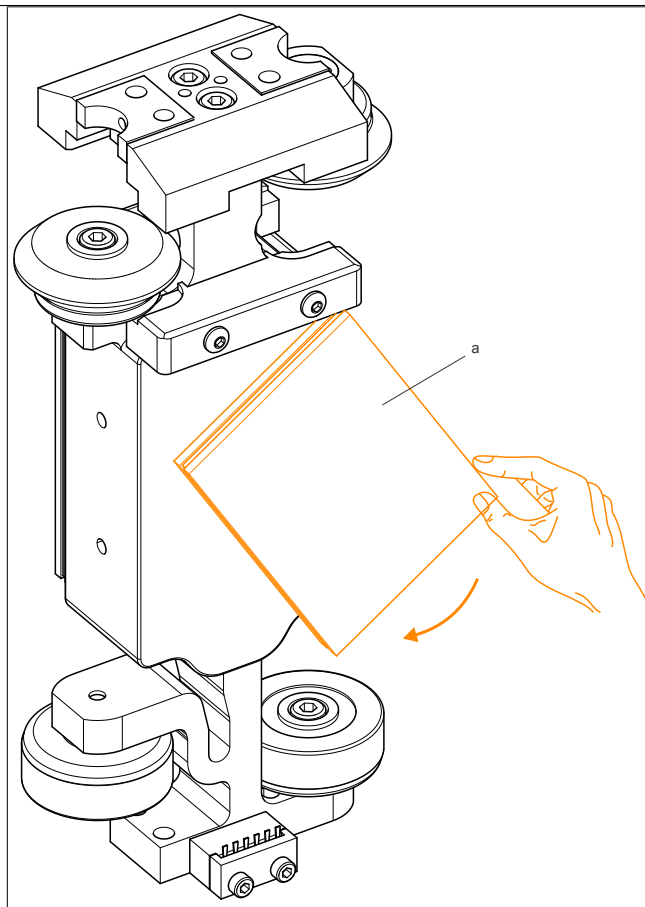
7. Move the shuttle by hand; check the rolling of the wheels in the double-v guide rail and on the flat guide rail.

### 5.4.3 Disassembling a shuttle<sup>13)</sup> on the ACOPOStrak transport system.

1. Grip the shuttle on its side and remove it from the ACOPOStrak transport system.



2. Reattach the magnet cover plate (a).



<sup>13)</sup> The following notes and explanations are provided as examples for the 50 mm shuttle.  
They are valid for all shuttle types.



## 6 Dimensioning

### 6.1 Layout rules

The following layout recommendations apply to the B&R standard guide system.

#### Minimum length of the overlap at a changeover

In the area of a transition between opposing segments, 2 straight segments must overlap at least 90 mm and 2 curved segments must overlap exactly 90 mm to 105 mm. The reference points for these distances are the center holes of the respective segments.

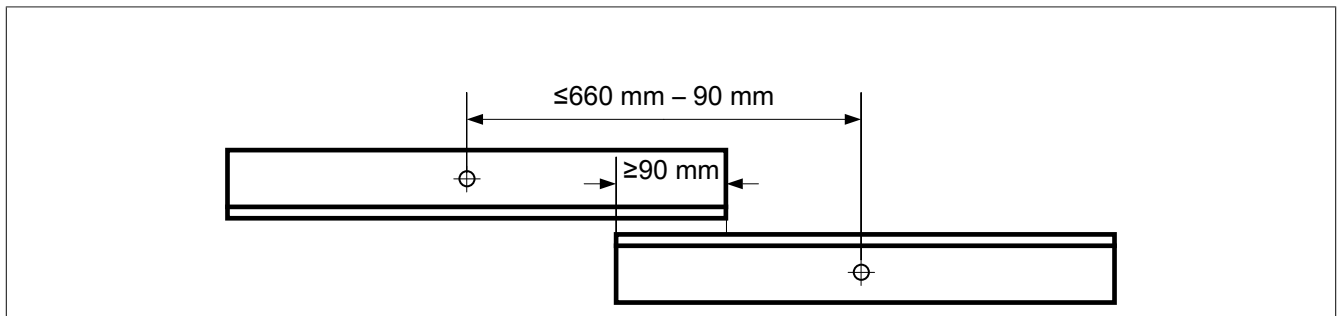


Figure 100: Straight - Straight

An overlap of 90 or 105 mm is recommended.

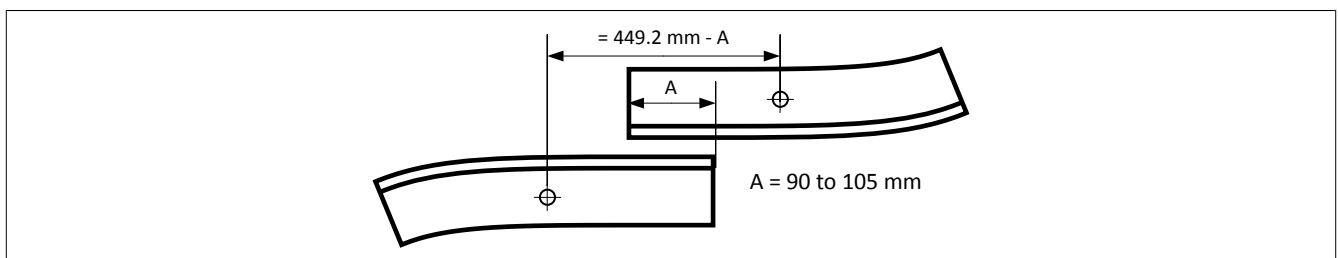


Figure 101: Curve - Curve

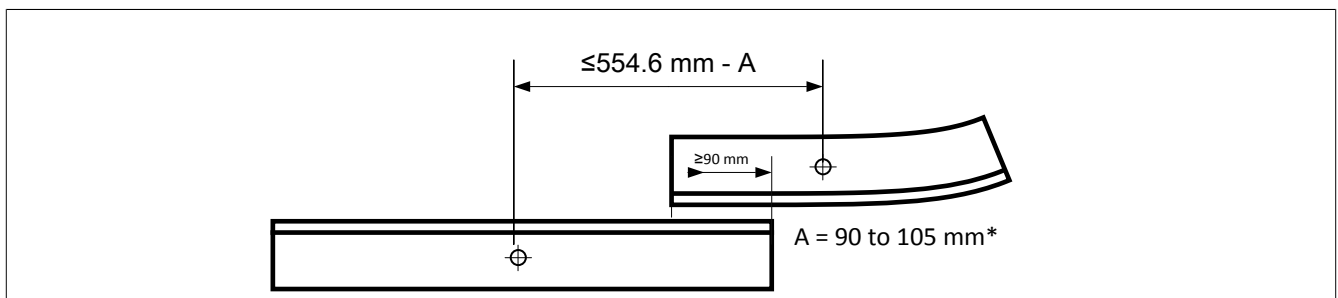


Figure 102: Straight - Curve

**\*With an overlap greater than 105 mm, this area becomes a diverter, which has a thermal influence in this area.**

### Overlap at the diverter

In the area of the diverter, an opposing segment gap should be located max. A or min. B from the beginning of the diverter or directly opposing if no additional segment follows.

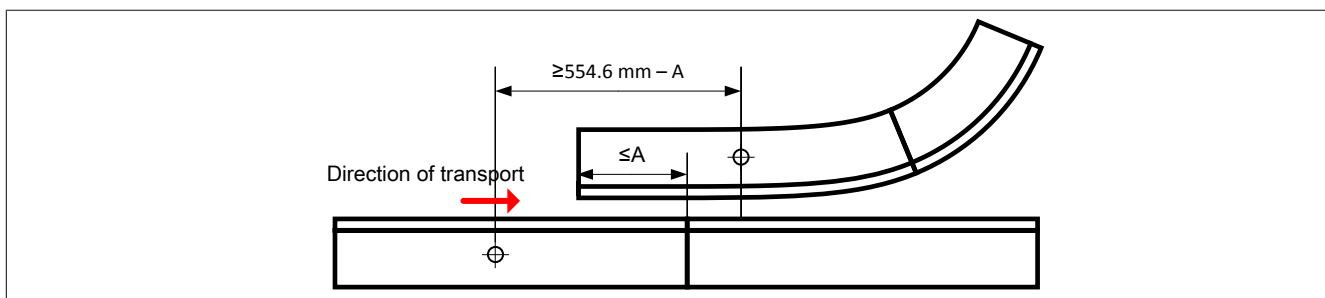


Figure 103: Overlap at the diverter with segment gap

Shuttle, 50 mm: A = 135 mm

Shuttle, 100 mm: A = 105 mm

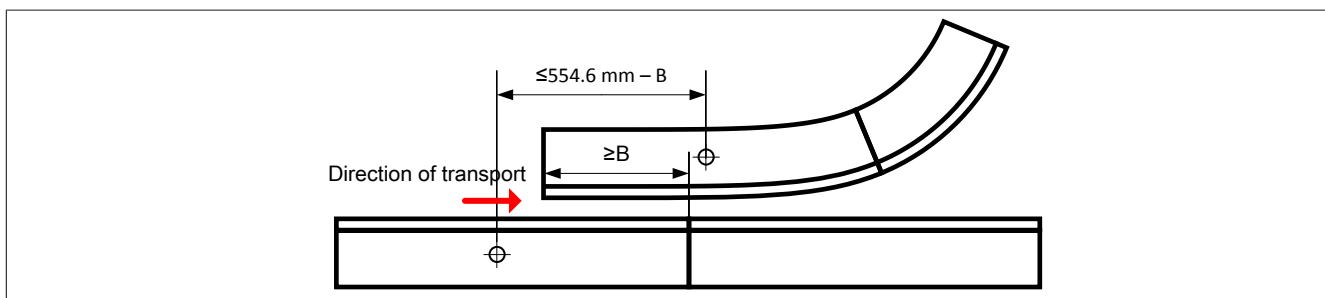


Figure 104: Overlap at the diverter with segment gap

Shuttle, 50 mm: B = 270 mm

Shuttle, 100 mm: B = 300 mm

**The value of A or B should be a multiple of  $15 \pm 0.25$  mm.**

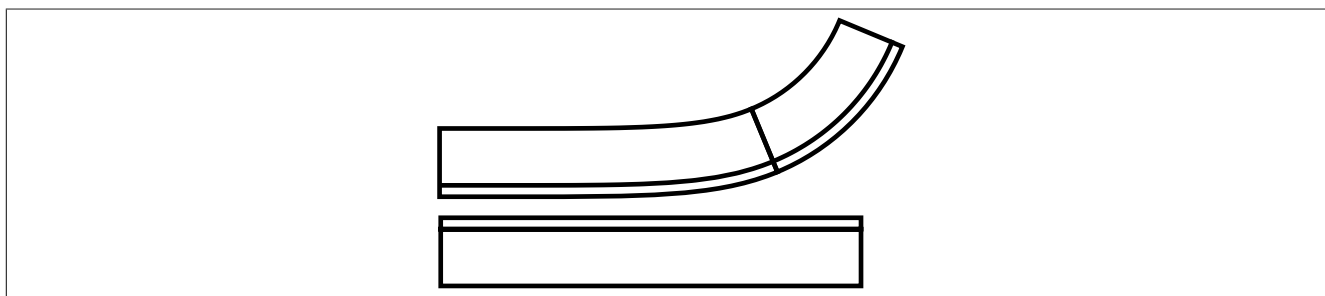
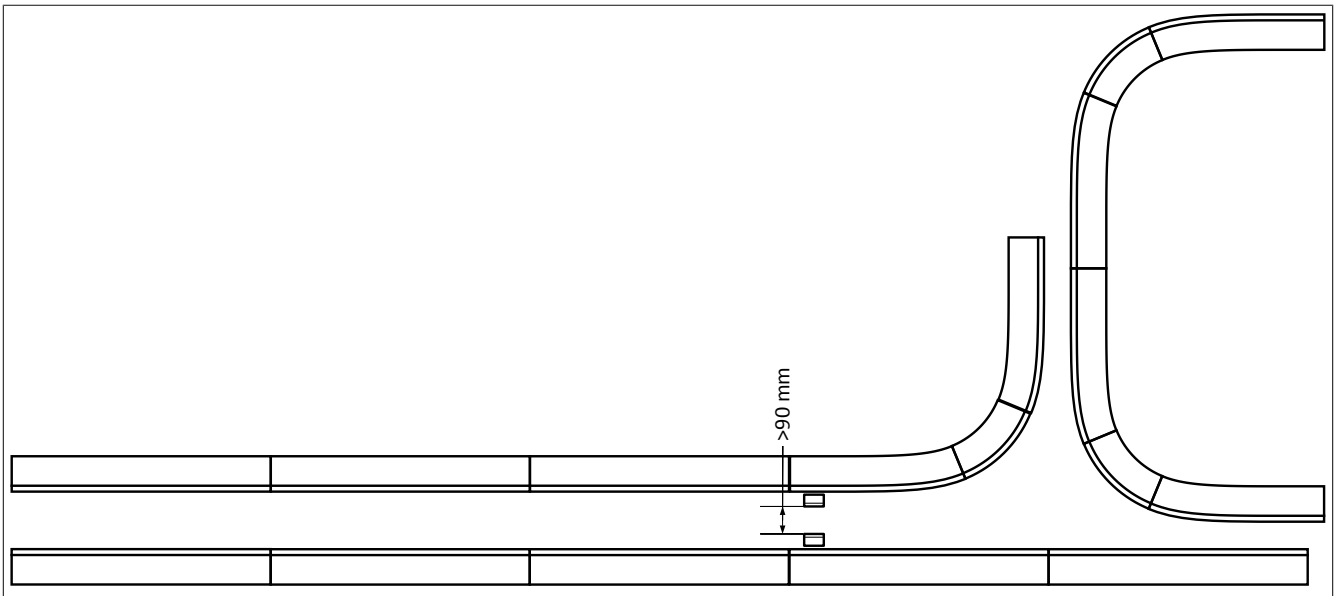


Figure 105: Overlap at the diverter without segment gap

### Minimum distance of track arrangements

When arranging multiple track structures, a minimum distance of 90 mm (shuttle magnet to shuttle magnet) must be maintained so that passing shuttles suitable for diverters do not affect each other.



### Impermissible arrangements

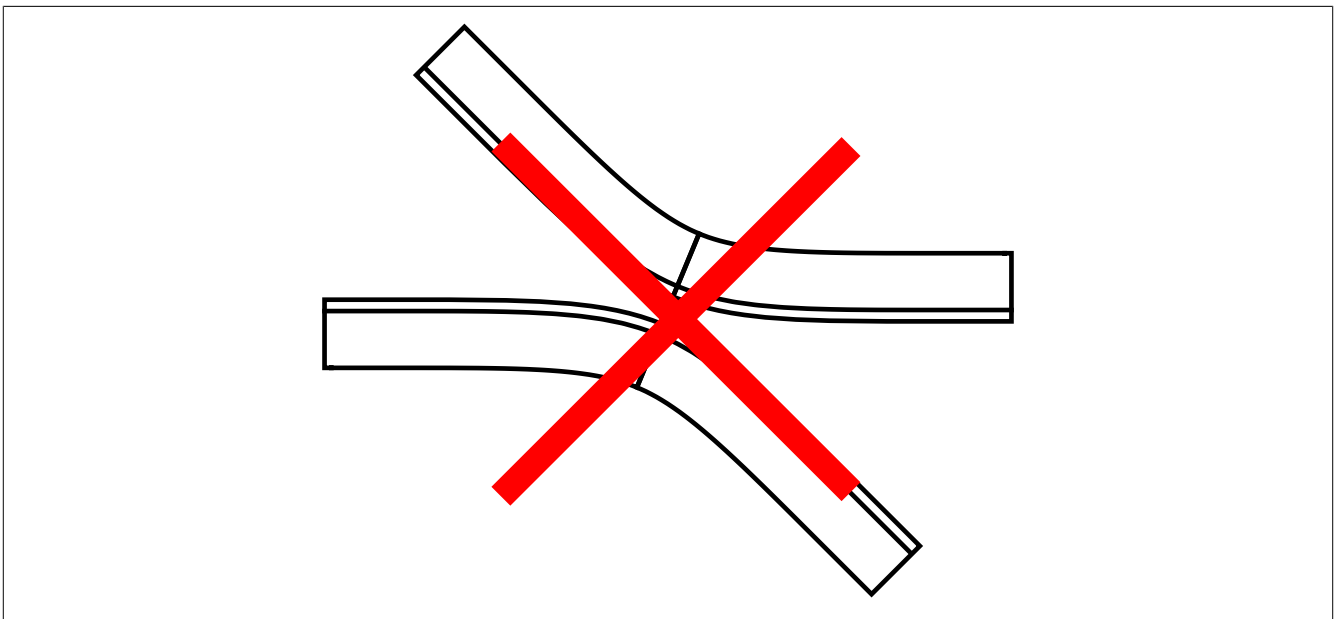


Figure 106: Impermissible arrangement of curve

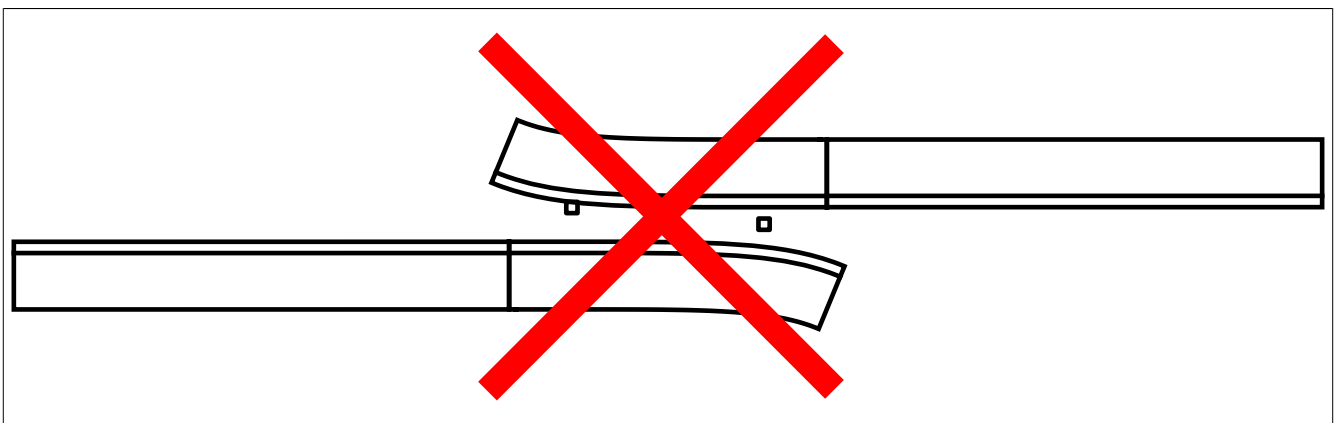


Figure 107: Impermissible arrangement of curve

## Recommended arrangements

The segment gap for opposing segments should line up one above the other:

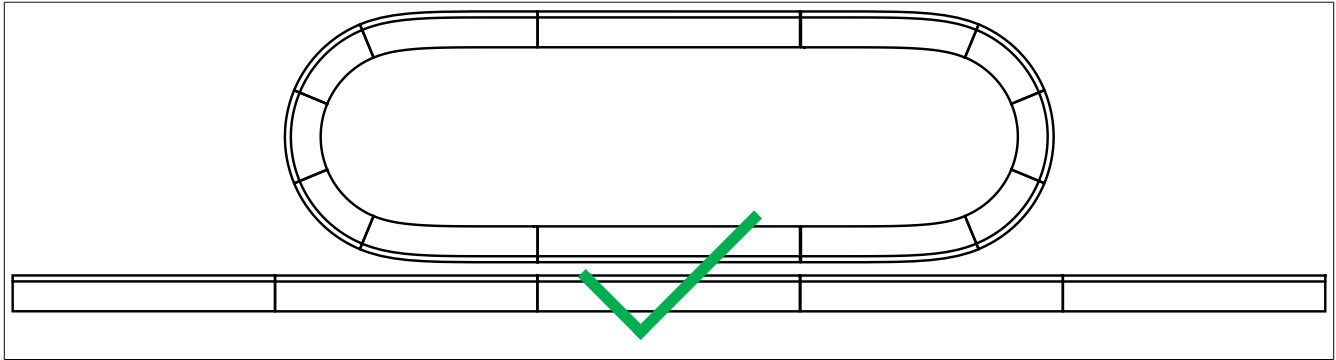


Figure 108: Recommended arrangement

## 6.2 Design of custom guide systems

### 6.2.1 Track separation

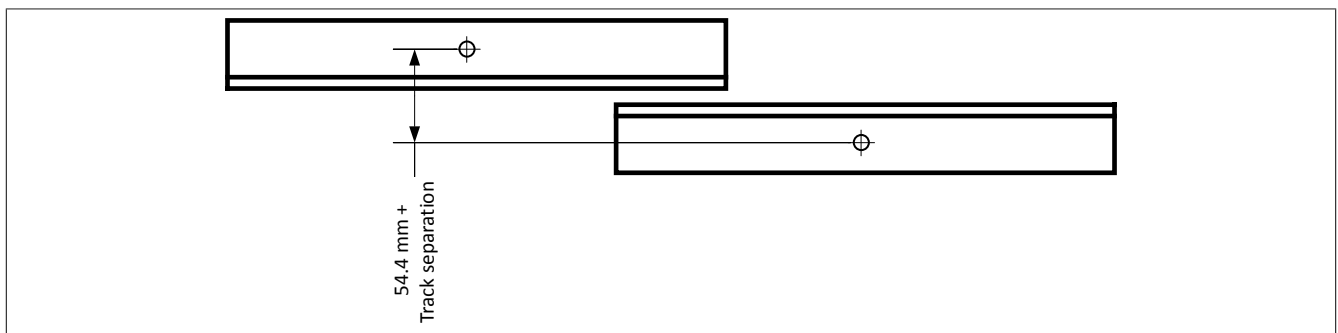


Figure 109: Track separation

Spacing between segment mounting screws = 54.4 mm + Track separation

The value for "Track separation" can be set in the assembly configuration in Automation Studio. This value is 30 mm by default.

## 6.3 Power supply

Fuse protection for the devices must be implemented in accordance with national regulations.

For a basic design of the ACOPOStrak transport system, contact B&R.

### 6.3.1 8B0C0320Hx00.B00-1

Power supply module 8B0C0320Hx00.B00-1 is suitable for ACOPOStrak transport systems.

The following rules must be observed when dimensioning 8B0C0320Hx00.B00-1 power supply modules:

- Multiple supply is recommended (depending on the application).
- Parallel connection of the X6 outputs of power supply modules is not permitted!
- Power supply module 8B0C0320Hx00.B00-1 already has an integrated OVP circuit. Using OVP module 8F10A.01B.000-1 is not required and also not permitted.
- The power supply module is normally configured using function model "Motion configuration" when using mapp Motion. "Output parameters" must be parameterized with "ACOPOStrak" to avoid overloading the current-carrying capacity of the ACOPOStrak power supply cable. If function model "Direct control" is used during configuration, function "Current limitation" (see [Configuration of output current monitoring and switch-on behavior in function model "Direct control"](#)) must be used with a "Current limit" of 31 A to avoid overloading the current-carrying capacity of the ACOPOStrak power supply cable.

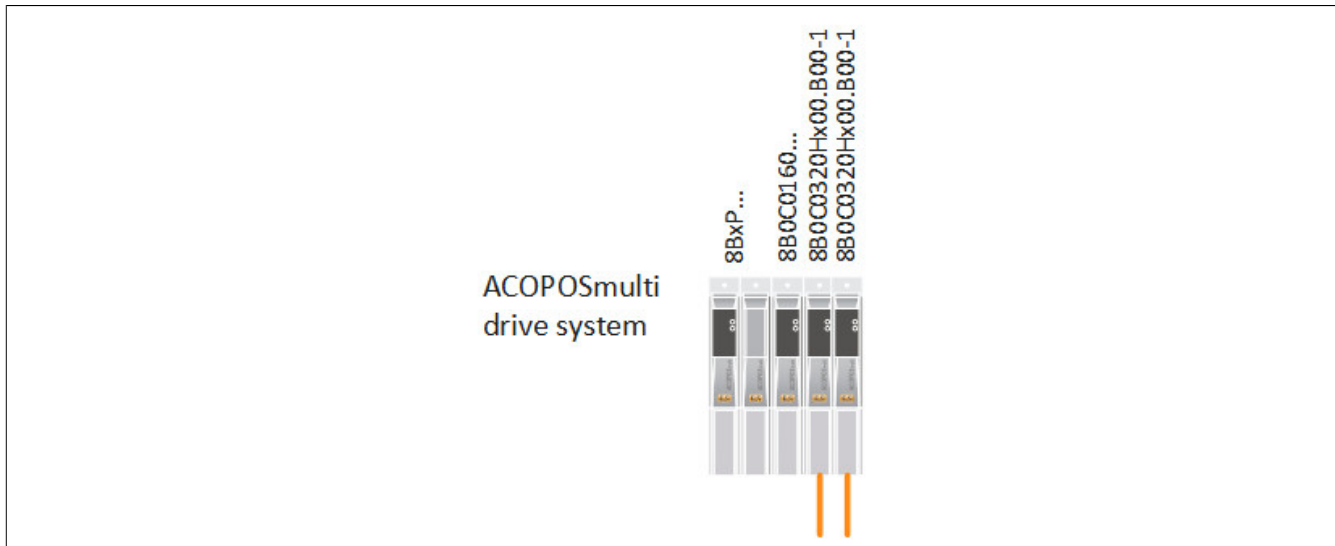


Figure 110: Power supply for ACOPOStrak transport systems - Example

### 6.3.2 80PS080X3.10-01

The [Power supply module 80PS080X3.10-01](#) is suitable for ACOPOStrak transport systems.

The following rules must be observed when dimensioning 80PS080X3.10-01 power supply modules:

- Max. 2 80PS080X3.10-01 power supply modules are permitted to be connected in parallel.
- 80PS080X3.10-01 power supply modules must be connected in parallel after the OVP modules [8F10A.01B.0000-1](#).
- Parallel connection of 80PS080X3.10-01 power supply modules must be configured.
- 80PS080X3.10-01 power supply modules must be configured to 58 V.
- Braking resistors (80XBR0025.010-11) of 80PS080X3.10-01 power supply modules must be installed and configured.
- Multiple supply is recommended (depending on the application).



Figure 111: Power supply for ACOPOStrak transport systems - Example

## 6.4 POWERLINK dimensioning

### Calculating the cycle time

The POWERLINK cycle time is a configuration parameter for the managing node. A certain amount of processing time is required depending on the number and type of segments as well as the amount of data exchanged. The cycle time is not permitted to be less than this value. The minimum permissible cycle time is 400 µs. Multiples of 400 µs can be set. The ideal cycle time is 400 µs up to 1.2 ms; the maximum cycle time is 2 ms.

Using the poll-response chaining setting is recommended. The possible cycle time can be calculated for a concrete layout in System Designer.

## 6.5 Mechanical dimensioning

For a basic design of the ACOPOStrak transport system, contact B&R.

### 6.5.1 Examples of the load on the shuttle

Below are some examples of track performance depending on the load on the shuttle.

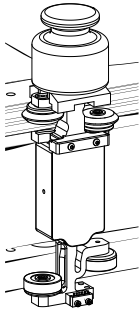
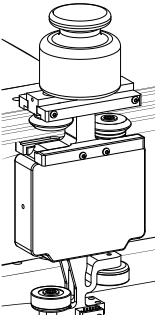
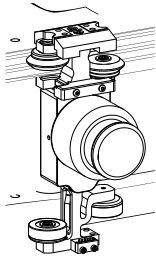
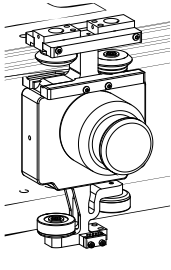
<b>Shuttle type (width)</b>	50 mm	100 mm	50 mm	100 mm
<b>Load weight</b>	1 kg	2 kg	1 kg	2 kg
<b>Track alignment</b>	Horizontal	Horizontal	Horizontal	Horizontal
<b>Maximum acceleration on the straight line</b>	16 m/s <sup>2</sup>	18 m/s <sup>2</sup>	50 m/s <sup>2</sup>	50 m/s <sup>2</sup>
<b>Maximum speed in the curve</b>	3.5 m/s	3 m/s	4 m/s	4 m/s
<b>Load center of gravity</b>	25 mm above upper support 	25 mm above upper support 	25 mm to the side of the shuttle 	25 mm to the side of the shuttle 

Table 142: Track orientation examples: Horizontal

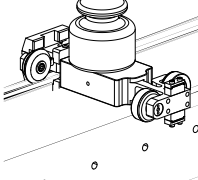
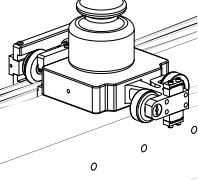
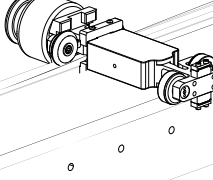
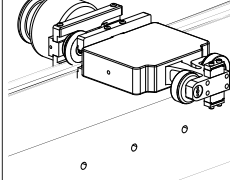
<b>Shuttle type (width)</b>	50 mm	100 mm	50 mm	100 mm
<b>Load weight</b>	1 kg	2 kg	1 kg	2 kg
<b>Track alignment</b>	Vertical	Vertical	Vertical	Vertical
<b>Maximum acceleration on the straight line</b>	50 m/s <sup>2</sup>	50 m/s <sup>2</sup>	Shuttle moves up: 20 m/s <sup>2</sup> Shuttle moves down: 13 m/s <sup>2</sup>	Shuttle moves up: 22 m/s <sup>2</sup> Shuttle moves down: 16 m/s <sup>2</sup>
<b>Maximum speed in the curve</b>	4 m/s	4 m/s	2.8 m/s	2 m/s
<b>Load center of gravity</b>	25 mm above upper support 	25 mm above upper support 	25 mm to the side of the shuttle 	25 mm to the side of the shuttle 

Table 143: Track orientation examples: Vertical

## 7 Wiring

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### 7.1 General information

#### 7.1.1 EMC-compatible installation

##### 7.1.1.1 Installation notes

1. The transport system must be set up in a functional and appropriate manner.
2. To prevent the effects of disturbances, the following lines must be properly shielded:
  - Motor cables
  - Encoder cables
  - Control cables
  - Data cables
  - Braking resistor cables
3. Inductive switching elements such as contactors or relays must be equipped with corresponding interference suppressors such as varistors, RC elements or damping diodes.
4. All electrical connections must be kept as short as possible.
5. Cable shields must always be attached over a wide area and as close as possible to the designated shield connection clamps and connector housings. Twisting the braided shield or extending it with single conductors (pigtail) is not permitted!
6. Shielded cables with copper or tinned copper braiding must be used (coverage >75%).
7. Unused cable conductors must be grounded on both sides whenever possible.

#### 7.1.2 Connecting connectors properly

##### **Caution!**

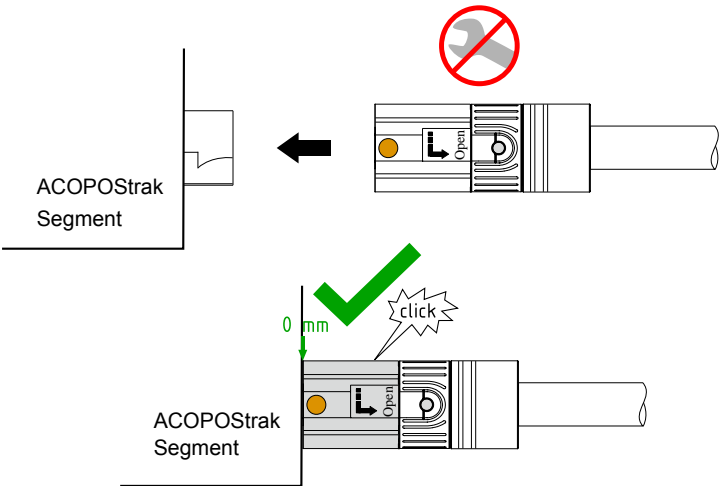
**Damage due to improper connector installation!**

**Incorrectly attached connectors can result in disturbances and damage to the components of the ACOPOStrak transport system!**

- **Always attach the connectors without excessive force, without the use of tools or with the use of special tools.**
- **Make sure that the connectors are fully attached and locked if necessary.**

Series 915 circular connector

The self-locking series 915 system twists the first ring when attached and returns it to the middle position after it has been locked.



Installation tool (M12 connector)

The connectors of pre-assembled ACOPOStrak cables have additional width across flats on the knurled-head screw that can be used for an installation tool. A torque wrench set with M12 (tightening torque 0.6 Nm) insert is available as an accessory for optimal assembly. It can be used to ensure the absolute safety of the connection to the ACOPOStrak segment.

Model number	Short description	Figure
X67ACTQMX	Installation tool Torque wrench set, M12 connector, for hexagonal connectors	

Table 144: X67ACTQMX - Order data

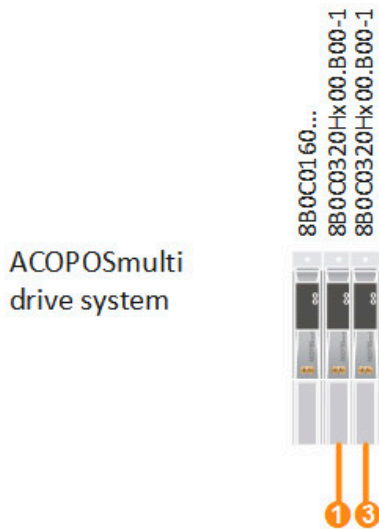


## 7.2 System topology

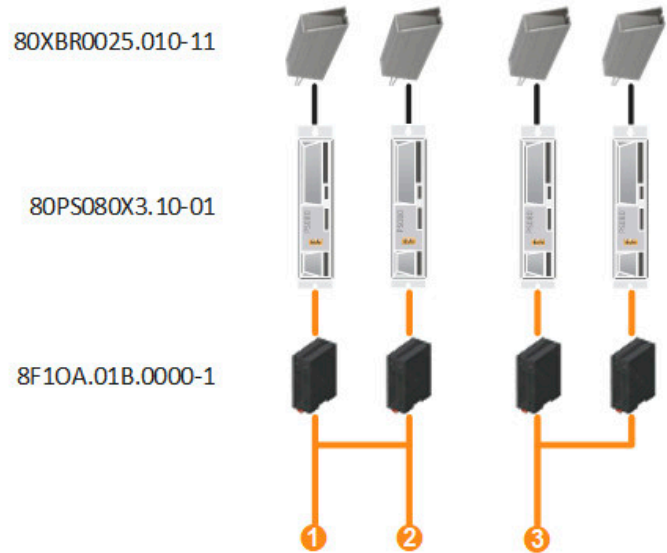
The general wiring of the power supply primarily depends on the application and moving loads as well as the speeds and accelerations. Detailed sizing is mandatory.

### Power supply

Power supply with ACOPOSmulti drive system and 8B0C0320Hx00.B00-1



Power supply with 8F10A.01B.0000-1 overvoltage protection



This representation of the power supply (**PS** = power supply) applies to the listed system topologies in relation to the supply points 1 to 3.

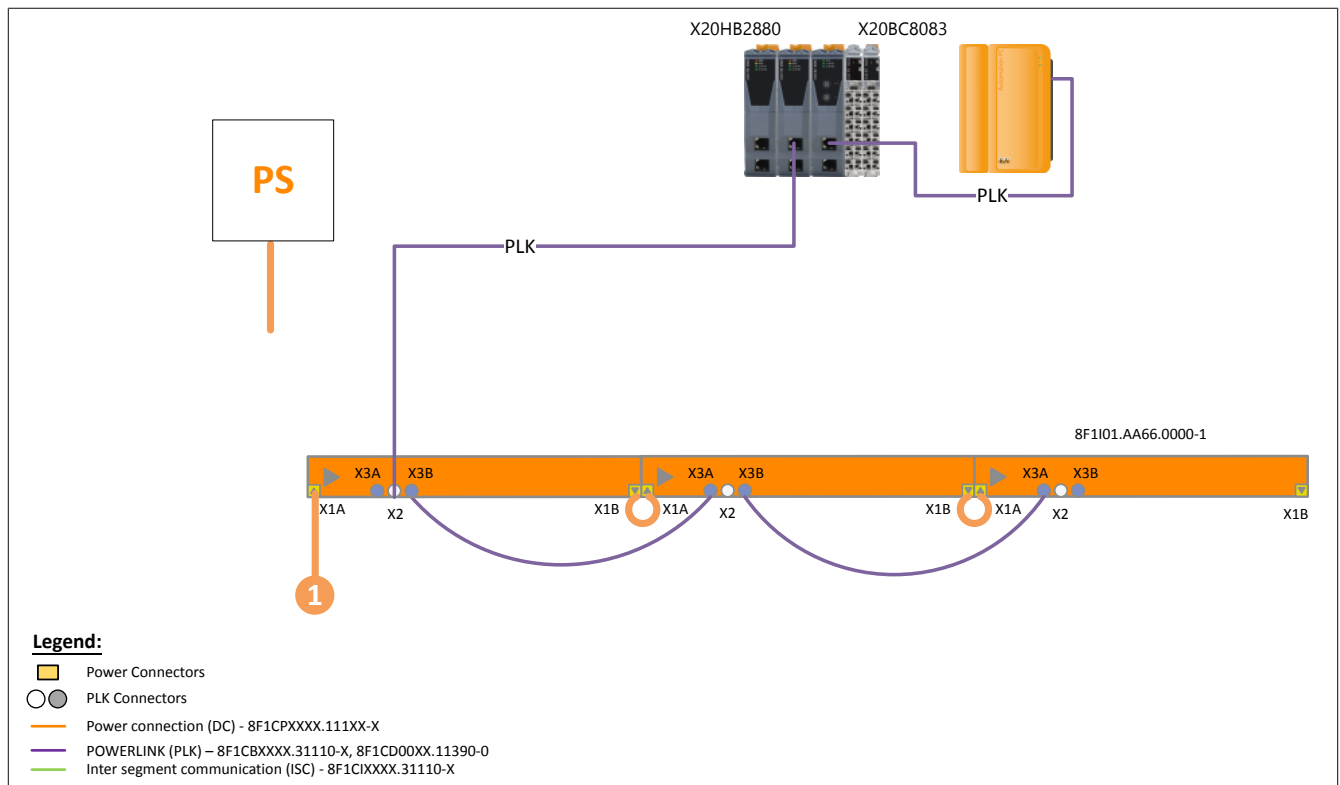


Figure 112: ACOPOStrak system topology - Straight segments

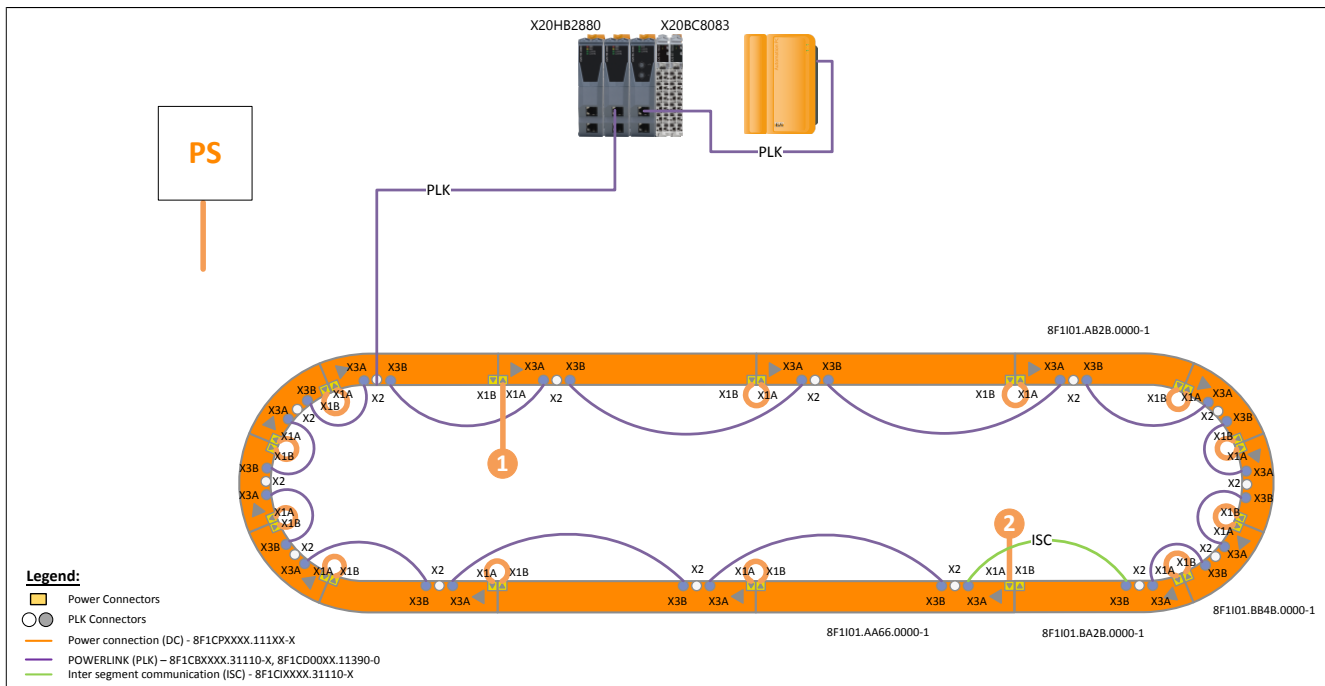


Figure 113: ACOPOStrak system topology - Circular track

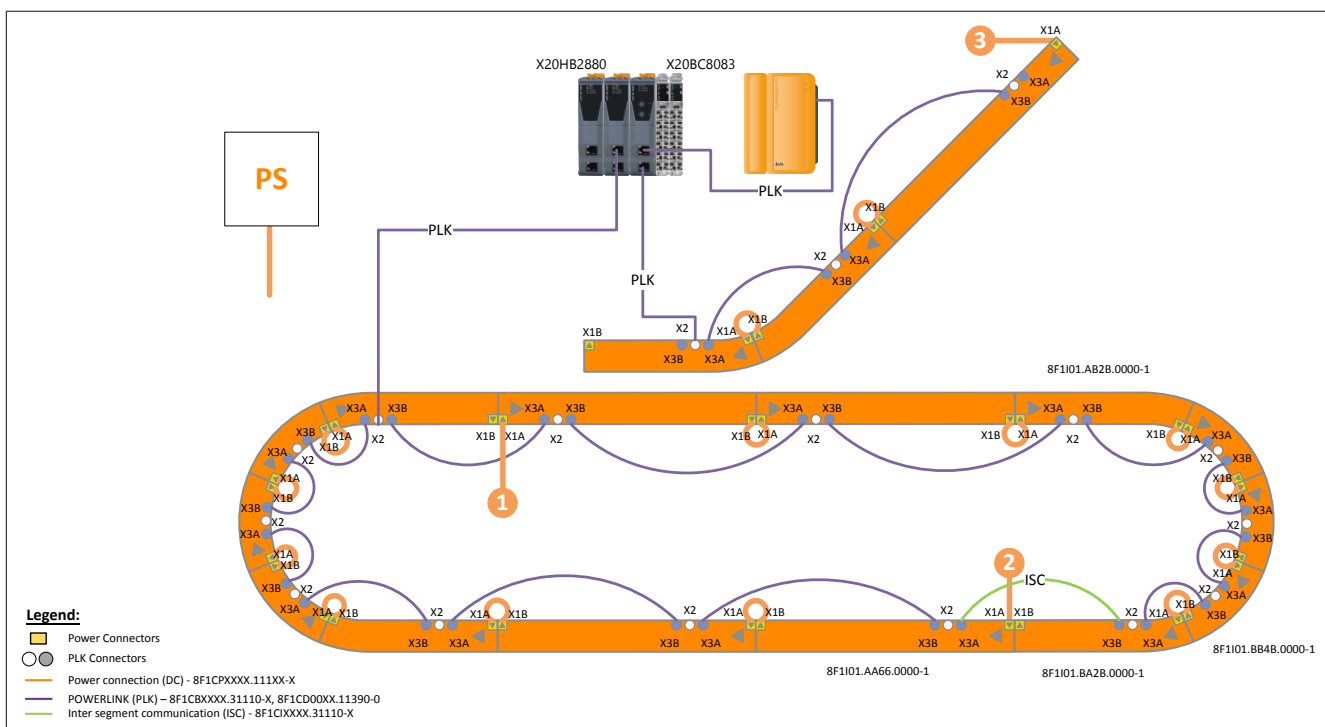


Figure 114: ACOPOStrak system topology - Circular track with diverter

### Information:

The POWERLINK connection is established from segment  $n$  / X3A to segment  $n+1$  / X3B (i.e. from segment 1 / X3A to segment 2 / X3B, from segment 2 / X3A to segment 3 / X3B, etc.).

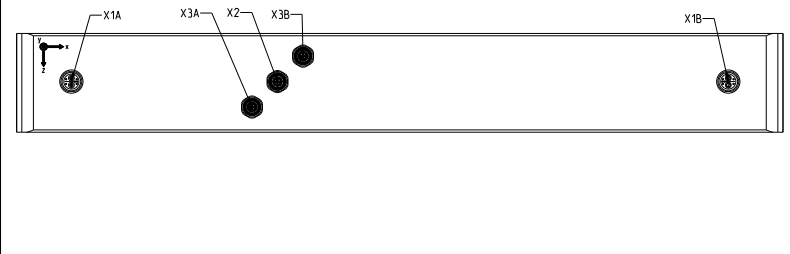
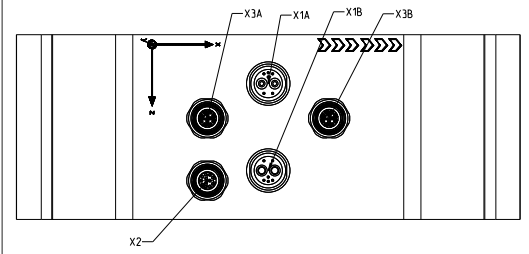
### Information:

Faulty communication wiring can result in subsequent errors (e.g. lag error) in the area of segment transitions.

### 7.3 Basic rules for POWERLINK connections

ACOPOStrak segments support automatic assignment of node numbers via **Dynamic Node Allocation (DNA)**. See Automation Help for a detailed description of the function and configuration of DNA.

#### POWERLINK connections, DNA hub port assignments

Straight segment, curved segment	Circular arc segment
X3A = PLK 1 / ISC 1 / Hub port 1 X3B = PLK 2 / ISC 2 / Hub port 2 X2 = PLK 3 / Display / Hub port 3	X3A = PLK 1 / ISC 1 / Hub port 1 X3B = PLK 2 / ISC 2 / Hub port 2 X2 = PLK 3 / Display / Hub port 3
	

- The first segment is connected to hub port 3 (X2), the adjacent segments to hub ports 1 (X3A) and 2 (X3B).
- The maximum number of hub levels is 10.
- In the network structure, the maximum difference in hub levels between adjacent and opposing segments is not permitted to exceed  $\pm 2$ .
- POWERLINK connections are not permitted to have a ring topology. Intersegment communication (ISC) cable 8F1CIXXX.31110-X must therefore be used at the appropriate locations.

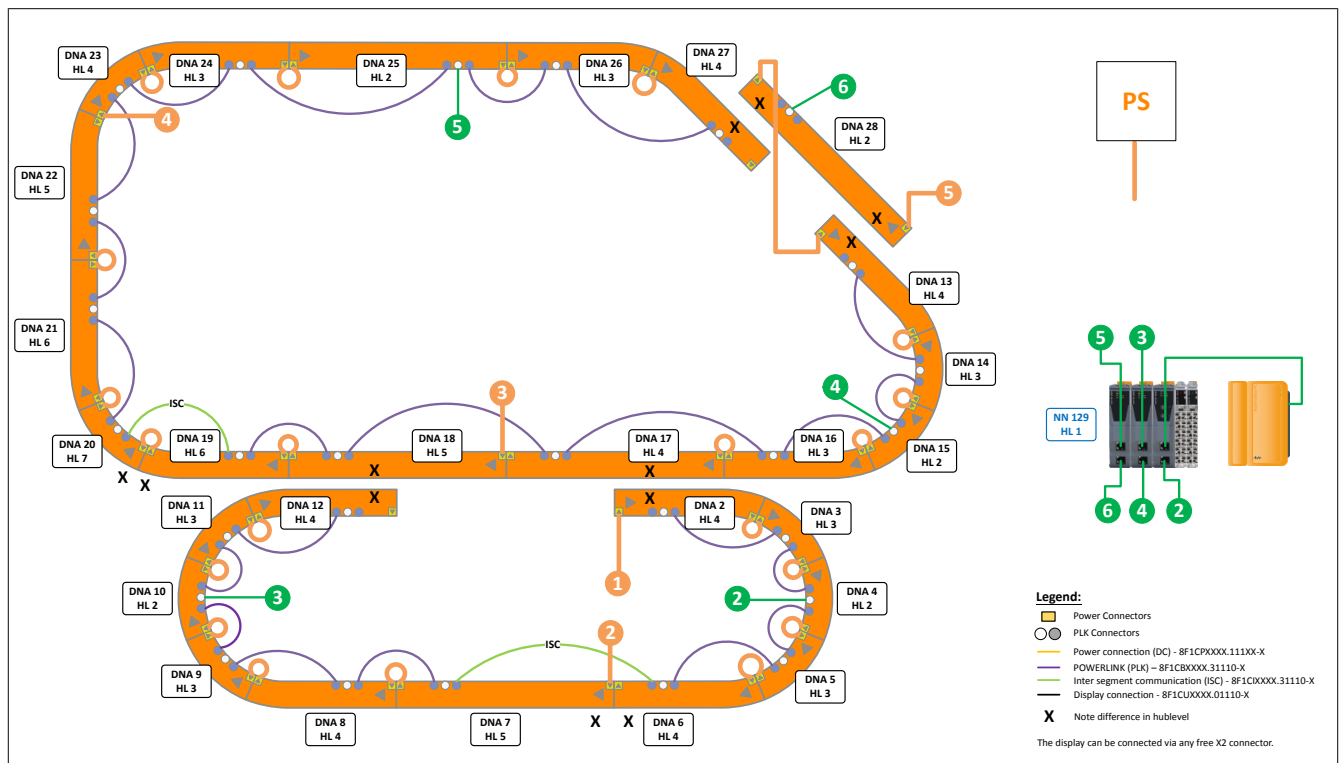


Figure 115: Overview of POWERLINK connections

For the power supply (PS), see "Power supply " on page 291.

## 7.4 Power supply connection

### 7.4.1 Wiring from power supply module 80PS to segment 8F1I01

#### 80PS power supply module with 8F1OA overvoltage protection

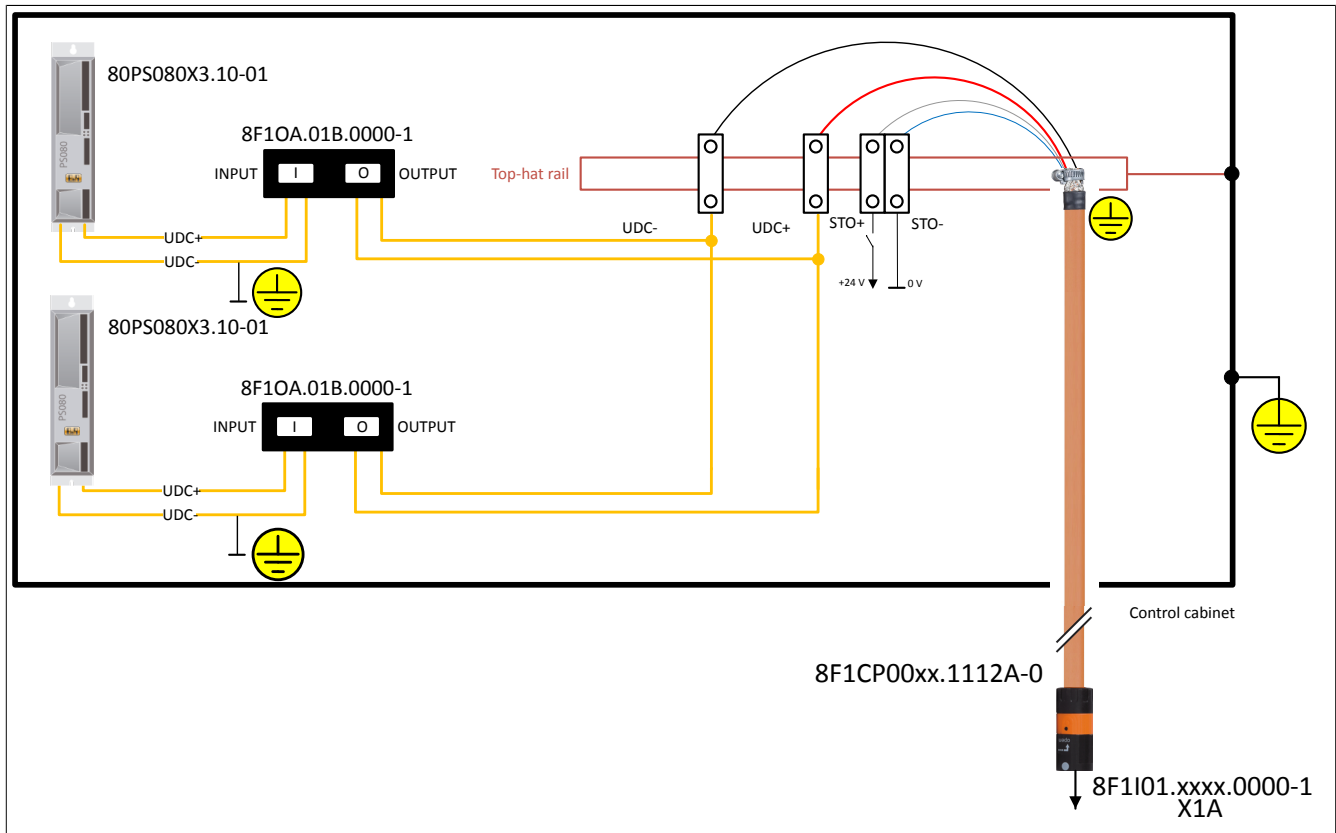


Figure 116: Wiring from power supply module 80PS to segment 8F1I01

#### Information:

A minimum cross section of 6 mm<sup>2</sup> is recommended for the cable to wire the 80PS power supply module to the terminal via the 8F1OA overvoltage protection.

#### Information:

For STO wiring, see [8.3.1 "STO, category 3 / SIL 2 / PL d \(variant A\)" on page 300](#).

#### Power supply module 8B0C0320Hx00.B00-1

#### Information:

Segment 8F1I01 is connected directly to power supply module 8B0C0320Hx00.B00-1, see data sheet [3.4.1 "8B0C0320Hx00.B00-1" on page 43](#).

## 8 Standard safety technology ("hardwired safety technology")

The B&R ACOPOStrak transport system with standard safety technology implements safety function Safe Torque Off (STO) per EN 61800-5-2. The cutoff corresponds to stop category 0 per EN 60204-1.

### Caution!

**Safety function STO does not protect against faults that occur in non safety-related functions of the B&R ACOPOStrak transport system with standard safety technology!**

### Danger!

**Especially in the area of safety technology, always consult the latest version of this document on the B&R website for valid specifications ([www.br-automation.com](http://www.br-automation.com))! The specifications in this version of the document are not necessarily current. The user must verify the correctness of specifications before implementing safety functions!**

### 8.1 General information

ACOPOStrak systems use integrated safe pulse disabling for secure shutdowns and to prevent unexpected startup. This is designed to satisfy the following safety classifications depending on the external circuit: <sup>14)</sup>

Criteria	Characteristic value
Maximum safety category per EN ISO 13849	Cat. 3
Maximum performance level per EN ISO 13849	PL d
Maximum safety integrity level per IEC 61800-5-2	SIL 2
Maximum safety integrity level per IEC 62061	SIL 2
Maximum safety integrity level per IEC 61508	SIL 2
PFH (probability of dangerous failure per hour)	$<5 \cdot 10^{-8}$
PFD (probability of dangerous failure on demand) depends on the proof test interval (PT) with a PT of 20 years	$<2 \cdot 10^{-3}$
PTI (proof test interval) <sup>1)</sup>	Max. 20 years
SFF (safe failure fraction)	$>60\%$
DC_avg (diagnostic coverage)	$>80\%$
MTTFd (mean time to dangerous failure)	$>80$ years
Maximum switching delay	See technical data for the ACOPOStrak transport system

Table 145: Safety classifications, criteria and characteristics for safe pulse disabling

1) Corresponds to the service life of the ACOPOStrak segments.

The following table provides an overview of the individual safety functions that can be implemented:

Name according to standard	Short description
<b>EN 61800-5-2</b>	<b>EN 60204-1</b>
STO (Safe Torque Off)	Stop category 0 Cuts off the power supply

Table 146: Overview of safety functions per standard

Safe pulse disabling interrupts the energy supply and thus the possibility of an active force effect on the shuttle by single-channel suppression of the pulses to the power output stage.

The terminology of EN 61800-5-2 (STO) will be used in the following.

### Danger!

**If the safety functions integrated in the drive system are used in an application, then they must be fully validated before the drive system is switched on for the first time. There is a risk of death, serious injury or damage to property.**

<sup>14)</sup> For detailed information about the listed standards and safety functions, see "International and national certifications" on page 302.

**Information:**

If module-internal hardware errors in the safety circuit occur, pulse disabling switches to the safe state and interrupts the supply of power to the drive (failsafe principle). If a hardware defect occurs, then the entire module must be replaced.

**Information:**

It should be noted that an error in the control of the coil can result in a permanent holding force or forward movement. This forward movement depends on the shuttle length and accelerates the shuttle at a maximum over a shuttle length.

**Danger!**

If the enable input voltage rises above 32 V, the safety function can no longer be guaranteed.

**Danger!**

If the DC bus supply (DC+, DC-) drops below 40 V for longer than 5 s in the event of an overload or short circuit, the voltage must be switched off. This can be ensured by configuring power supply module 80PS080X3.10-01 accordingly<sup>15)</sup>.

**Fuse protection of the power supply cable**

Due to the daisy-chain connection, there is a risk that upstream segments may be damaged in the event of a fault at the end of the connection (e.g. short circuit, defective wiring). For the power connection (DC+ and DC-), this is prevented by an overload and short-circuit shutdown of the supplying module.

**Information:**

It is recommended that the STO circuit be protected accordingly.

In order to provide adequate protection, the fuse must ensure that the current profile in [Fig. 117 "Current profile specification for fuse protection"](#) is not exceeded. If the supplying voltage source ensures that these values are not exceeded, no additional fuse protection is necessary.

- A max. operating current of 10 mA is expected per connected segment.
- The fuse component used must be suitable for DC and have a breaking capacity corresponding to the voltage source.

<sup>15)</sup> See "Configuration" on page 62.

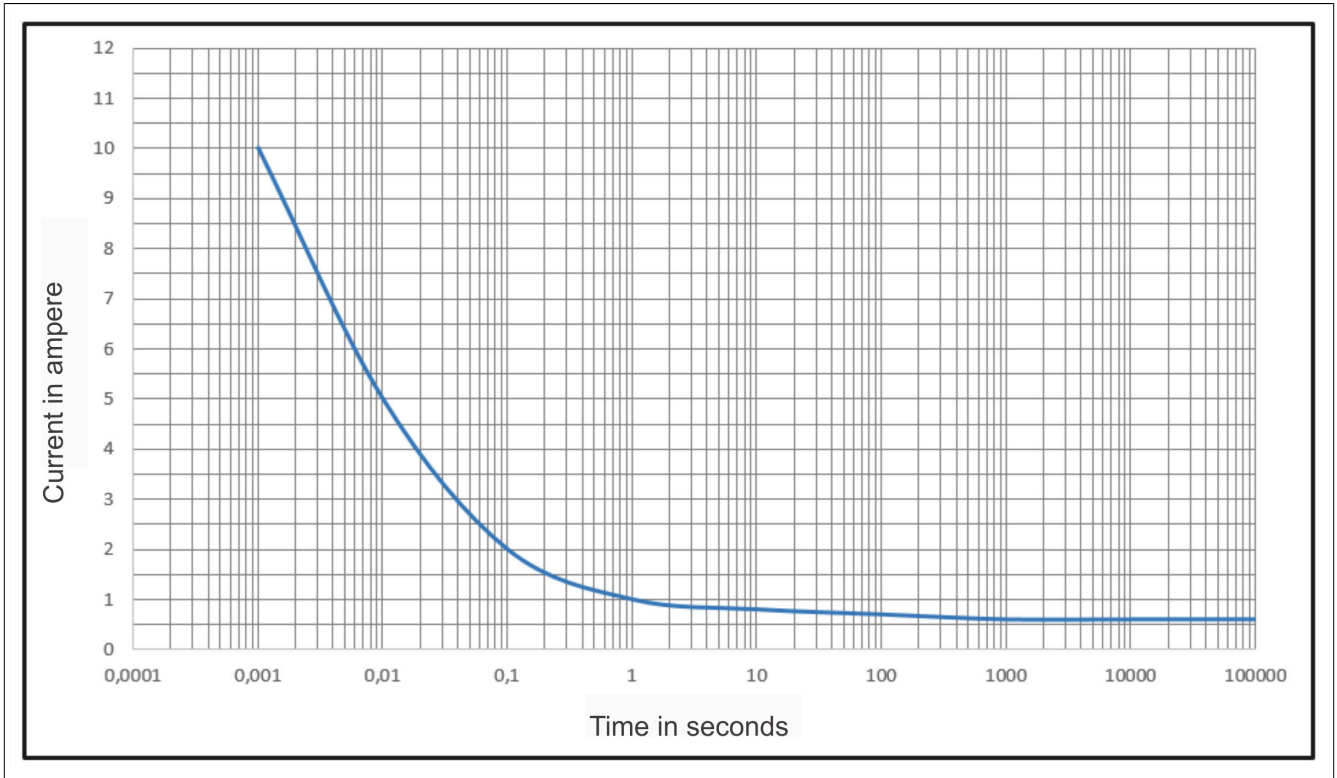


Figure 117: Current profile specification for fuse protection

## 8.2 Principle - Implementing the safety function

Safe pulse disabling is achieved by interrupting the pulse patterns to the power output stage in the ACOPOStrak. The internal power supply for the drivers (VCC) is safely switched via the terminals STO+ and STO- so that the pulse patterns can be transferred to the power output stage.

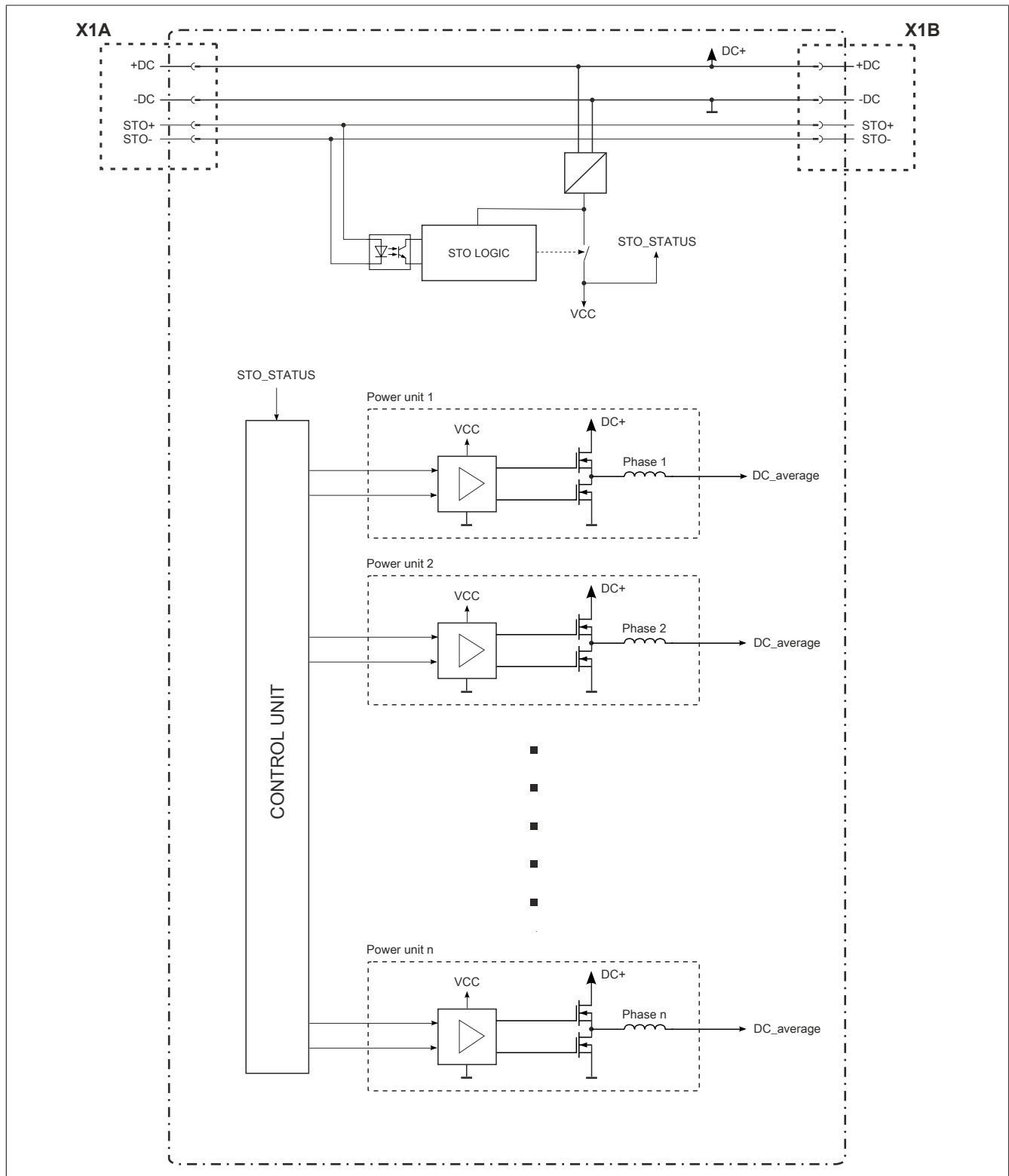


Figure 118: Block diagram for safe pulse disabling

If control at the STO+ and STO- terminals drops out, the driver supply is reliably interrupted and the pulse patterns are no longer transferred. It is then no longer possible to transfer the necessary pulse patterns to the power output stage. This prevents the power supply to the motor.



### 8.2.1 Additional functions

The presence of the driver voltage (STO\_Status) is queried by the control system. If no voltage is applied, generation of the pulse patterns by the control system is also suppressed.

#### **Danger!**

After activation of safe pulse disabling via terminals STO+ and STO-, the drive is de-energized and thus without power. If a shuttle was moved before safe pulse disabling is activated, it is only stopped by the friction of the complete system. The drive is therefore no longer able to hold a shuttle in a vertical position. The machine must be designed accordingly.

#### **Danger!**

The switch-off time for the enable input must be taken into account since it has a substantial effect on the response time of the safety functions and therefore the remaining distances and times to be considered. In order to calculate the total safety response time, the user must validate the rundown time of the complete system!

The switch-off time for the enable inputs is listed in the technical data for the respective ACOPOStrak segment.

#### **Danger!**

Activating safe pulse disabling via the terminals STO+ and STO- is not sufficient for switching off voltage to the motor and therefore does not provide sufficient protection against electrical shock!

#### **Danger!**

Depending on the application, it is possible for the drive to restart after safe pulse disabling is deactivated.

#### **Danger!**

The C standards relevant to applications must be observed!

### 8.3 Wiring the enable inputs to the required safety category / SIL / PL

This section uses the example of safety function STO to illustrate the different circuit variations of the enable inputs on ACOPOStrak linear motors to achieve the required safety category / SIL / PL.

## **Danger!**

**All faults (e.g. cross-faults) that are not detected can lead to failure of the safety function.**

**Appropriate measures must be taken to justify the exclusion of faults. For instance, faults caused by a short circuit between any two wires can be excluded per EN ISO 13849-2, appendix D.5, if one of the following conditions is met:**

- The wires are permanently installed and protected against external damage (e.g. using a cable duct or armored conduit).**
- The wires are installed in different plastic-sheathed cables or within an area for electrical equipment.<sup>16)</sup>**
- The wires are each individually protected by a ground connection.**

**For more fault exclusions, see EN ISO 13849-2, appendix D.5.**

## **Danger!**

**All faults (e.g. cross-faults) that are not detected can lead to failure of the safety function.**

**Appropriate measures must be taken to justify the exclusion of faults. For instance, faults caused by a short circuit between any two wires can be excluded per EN ISO 13849-2, appendix D.5, if one of the following conditions is met:**

- The wires are permanently installed and protected against external damage (e.g. using a cable duct or armored conduit).**
- The wires are installed in different plastic-sheathed cables or within an area for electrical equipment.<sup>16)</sup>**
- The wires are each individually protected by a ground connection.**

**For more fault exclusions, see EN ISO 13849-2, appendix D.5.**

## **Danger!**

**All faults (e.g. cross-faults) that are not detected can lead to failure of the safety function.**

**Appropriate measures must be taken to justify the exclusion of faults. For instance, faults caused by a short circuit between any two wires can be excluded per EN ISO 13849-2, appendix D.5, if one of the following conditions is met:**

- The wires are permanently installed and protected against external damage (e.g. using a cable duct or armored conduit).**
- The wires are installed in different plastic-sheathed cables or within an area for electrical equipment.<sup>16)</sup>**
- The wires are each individually protected by a ground connection.**

**For more fault exclusions, see EN ISO 13849-2, appendix D.5.**

- ## **Danger!**
- All faults (e.g. cross-faults) that are not detected can lead to failure of the safety function.**
- Appropriate measures must be taken to justify the exclusion of faults. For instance, faults caused by a short circuit between any two wires can be excluded per EN ISO 13849-2, appendix D.5, if one of the following conditions is met:**
- The wires are permanently installed and protected against external damage (e.g. using a cable duct or armored conduit).**
  - The wires are installed in different plastic-sheathed cables or within an area for electrical equipment.<sup>16)</sup>**
  - The wires are each individually protected by a ground connection.**
- For more fault exclusions, see EN ISO 13849-2, appendix D.5.**

## **Danger!**

**All faults (e.g. cross-faults) that are not detected can lead to failure of the safety function.**

**Appropriate measures must be taken to justify the exclusion of faults. For instance, faults caused by a short circuit between any two wires can be excluded per EN ISO 13849-2, appendix D.5, if one of the following conditions is met:**

- The wires are permanently installed and protected against external damage (e.g. using a cable duct or armored conduit).**
- The wires are installed in different plastic-sheathed cables or within an area for electrical equipment.<sup>16)</sup>**
- The wires are each individually protected by a ground connection.**

**For more fault exclusions, see EN ISO 13849-2, appendix D.5.**

**Danger!**

In order to achieve safety category 3 / SIL 2 / PL d, it must be ensured that a single fault does not lead to failure of the safety function.

**Danger!**

In order to achieve safety category 3 / SIL 2 / PL d, it must be ensured that a single fault does not lead to failure of the safety function.

### 8.3.1 STO, category 3 / SIL 2 / PL d (variant A)

Actuating an emergency switching-off device disconnects the enable input of the ACOPOStrak from the +24 V power supply via a switch, thereby cutting off the supply of power to the motor.

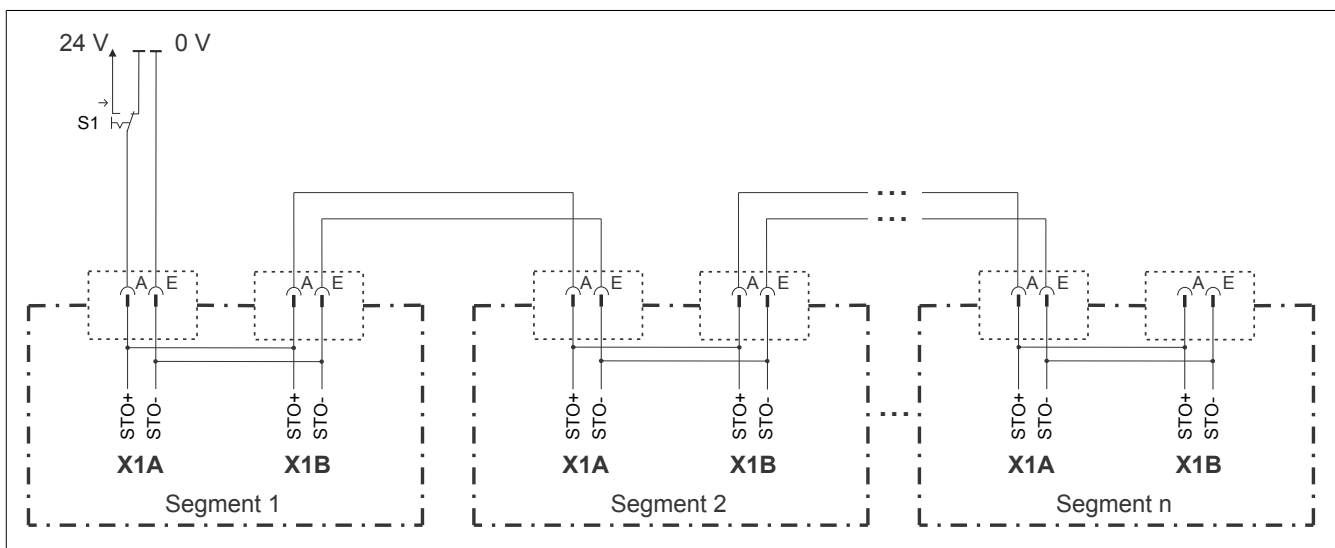


Figure 119: STO, category 3 / SIL 2 / PL d (variant A)

**Danger!**

A 1-pole category 3 / SIL 2 / PL d switching device with a positively driven normally closed contact must be used for the shown S1 switch per EN 60947-5-1.

The information in the user documentation for the switching device must be observed!

**Danger!**

A 1-pole category 3 / SIL 2 / PL d switching device with a positively driven normally closed contact must be used for the shown S1 switch per EN 60947-5-1.

The information in the user documentation for the switching device must be observed!

**Danger!**

A 1-pole category 3 / SIL 2 / PL d switching device with a positively driven normally closed contact must be used for the shown S1 switch per EN 60947-5-1.

The information in the user documentation for the switching device must be observed!

### 8.3.2 STO, category 3 / SIL 2 / PL d (variant B)

The enable input of the ACOPOStrak is supplied via a safe digital output (Out1+, Out1-). If the safety function is requested, then the safe digital output cuts off the enable input.

<sup>16)</sup> Prerequisite: Both the wires and the area for electrical equipment must meet applicable requirements (see IEC 60204-1).

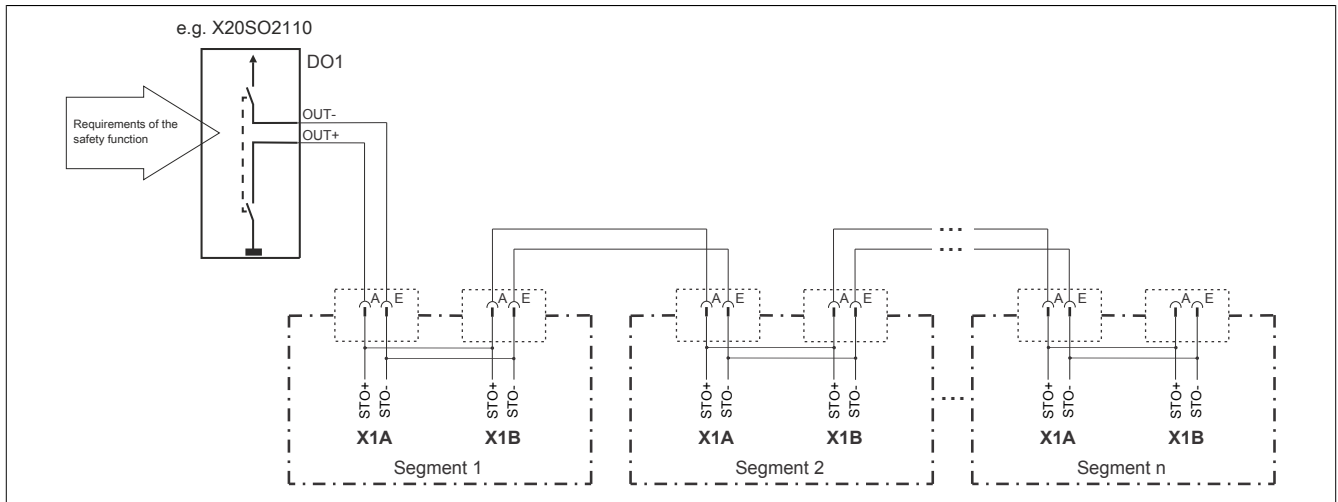


Figure 120: STO, category 3 / SIL 2 / PL d (variant B)

The consideration of fault events in the external wiring for fault exclusion purposes is not necessary since faults are detected by the safe digital output.

## **Danger!**

**A safe digital output module with Category 3 / SIL 2 / PL d must be used for the DO1 digital output shown.**

**The information in the user documentation for the safe digital output module must be observed!**

## 9 International and national certifications

Products and services from B&R comply with applicable regulations, directives and standards. These are national, European and international regulations, mainly from organizations such as ISO, IEC and CENELEC. We are committed to ensuring the reliability of our products in industrial environments.

### Information:

For the certifications valid for the respective component of the ACOPOStrak transport system, see the following locations:

- The data sheet's technical data under "General information → Certifications"
- At [www.br-automation.com](http://www.br-automation.com) under "Products" in the "General information → Certifications" area of the technical data

### 9.1 Mark on the module housing

Mark	Explanation	Region
	CE marking	Europe (EU)
	Underwriters Laboratories Inc. (UL)	Canada USA

## 9.2 EU directives and standards (CE)

### CE marking



Europe (EU)

The respective product complies with all applicable EU directives and relevant harmonized standards.

Certification of these products is performed in cooperation with accredited testing laboratories.

### EMC Directive 2014/30/EU

All devices meet the protection requirements of the "Electromagnetic Compatibility" directive and are designed for typical industrial use.

Applicable standards from this directive:

EN 61800-3                      Adjustable speed electrical power drive systems  
                                      - Part 3: EMC requirements and specific test methods

### Low Voltage Directive 2014/35/EU

The low voltage directive applies to electrical equipment with a nominal voltage from 50 to 1000 VAC and from 75 to 1500 VDC.

All devices within the area of application of this directive satisfy the its protection requirements.

Applicable standard from this directive:

EN 61800-5-1                      Adjustable speed electrical power drive systems  
                                      - Part 5-1: Safety requirements - Electrical, thermal and energy

The corresponding declaration of conformity is available for download from the B&R website. For information about the versions of applicable standards, see the declaration of conformity.



#### Declaration of conformity

[Website > Downloads > Certificates > Declarations of conformity > Declaration of conformity ACOPOStrak](#)

**Machinery Directive 2006/42/EC****Standard  
safety technology**

No mark

In accordance with the Machinery Directive, safety technology products are designed, developed, tested and labeled for special applications providing protection to machinery and personnel.

Certification of these products is performed exclusively in co-operation with EU-authorized bodies (notified bodies).

**Europe (EU)****Applicable standards from this directive:**

IEC 61508-1	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 1: General requirements
IEC 61508-2	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 2: Requirements for electrical/electronic/programmable electronic safety-related systems
IEC 61508-4	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 4: Definitions and abbreviations
EN 61800-5-2	Adjustable speed electrical power drive systems - Part 5-2: Safety requirements - Functional
EN 62061	Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems
EN ISO 13849-1	Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design

The declaration of conformity, certificates and additional safety-related information are available for download on the B&R website. For information about the versions of applicable standards, see the declaration of conformity.

**Declaration of conformity**

[Website > Downloads > Certificates > Declarations of conformity > Declaration of conformity ACOPOStrak](#)

**Certificates**

[Website > Downloads > Certificates > Safety technology > ACOPOStrak > TÜV certificate - Function "Safe Pulse Disabling" for ACOPOStrak](#)

ACOPOStrak shuttles are placed on the market as partly completed machinery according to the Machinery Directive 2006/42/EC. These comply with the fundamental health and safety requirements listed in the annex of the declaration of incorporation in accordance with Annex I of this directive.

**Declaration of incorporation**

[Website > Downloads > Certificates > Declarations of incorporation > Declaration of incorporation ACOPOStrak transport system](#)

### 9.2.1 Overview of standards

The following overview contains standards that are partially or completely taken into account for product certification.

Standard	Description
EN 61800-3	Adjustable speed electrical power drive systems - Part 3: EMC requirements and specific test methods
EN 61800-5-1	Adjustable speed electrical power drive systems - Part 5-1: Safety requirements - Electrical, thermal and energy
EN 60034-1	Rotating electrical machines - Part 1: Rating and performance
UL 61800-5-1	Adjustable speed electrical power drive systems - Part 5-1: Safety requirements - Electrical, thermal and energy
UL 1004-1	Rotating electrical machines - General requirements
CSA C22.2 No. 100	Motors and generators - Industrial products
CSA C22.2 No. 274	Industrial control equipment
EN 61508-1	Functional safety of electrical / electronic / programmable electronic safety-related systems - Part 1: General requirements
EN ISO 13849-1	Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design
EN 61800-5-2	Adjustable speed electrical power drive systems - Part 5-2: Safety requirements - Functional safety
EN 62061	Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems

## 9.2.2 Immunity requirements for 8F1I01 segments

- EN 61800-3 requirements apply.
- For all modules that have certified safety functions, stricter requirements apply for section "High-frequency disturbances" per EN 61800-5-2.

Immunity	Testing performed per	Requirements per
Electrostatic discharge (ESD)	EN 61000-4-2	EN 61800-3: Product standard - Adjustable speed electrical power drive systems EN 61800-5-2: Product standard - Adjustable speed electrical power drive systems
High-frequency electromagnetic fields	EN 61000-4-3	EN 61800-3: Product standard - Adjustable speed electrical power drive systems EN 61800-5-2: Product standard - Adjustable speed electrical power drive systems
High-speed transient electrical disturbances (Burst)	EN 61000-4-4	EN 61800-3: Product standard - Adjustable speed electrical power drive systems EN 61800-5-2: Product standard - Adjustable speed electrical power drive systems
Surge voltages (Surge)	EN 61000-4-5	EN 61800-3: Product standard - Adjustable speed electrical power drive systems EN 61800-5-2: Product standard - Adjustable speed electrical power drive systems
Conducted disturbances	EN 61000-4-6	EN 61800-3: Product standard - Adjustable speed electrical power drive systems EN 61800-5-2: Product standard - Adjustable speed electrical power drive systems

### Evaluation criteria for performance

Criteria (PC)	During test	After test
<b>A</b>	The system shall continue to operate as intended. No loss of function or performance.	The system shall continue to operate as intended.
<b>B</b>	Degradation of performance accepted. The operating mode is not permitted to change. Irreversible loss of stored data is not permitted.	The system shall continue to operate as intended. Temporary degradation of performance must be self-recoverable.
<b>C</b>	Loss of functions accepted, but no destruction of hardware or software (program or data).	The system shall continue to operate as intended automatically, after manual restart or power off / power on.
<b>FS</b>	Functional safety - Behavior of test object per EN 61800-5-2, item 6.2.5.3	



### 9.2.2.1 High-frequency interference for 8F1I01 segments

These immunity tests are applicable for industrial environments (category C3).

#### Electrostatic discharge (ESD)

Testing performed per EN 61000-4-2	Requirements per EN 61800-3	PC	Requirements per EN 61800-5-2 <sup>1)</sup> Increased immunity to interference	PC
Contact discharge (CD) on conductive accessible parts	±4 kV	B	±6 kV	FS
Air discharge (AD) on insulating accessible parts	±8 kV		±15 kV	

1) The total number of discharges depends on the required safety integrity level (SIL) and listed in EN 61800-5-2.

#### High-frequency electromagnetic fields

Testing performed per EN 61000-4-3	Requirements per EN 61800-3	PC	Requirements per EN 61800-5-2 <sup>1)</sup> Increased immunity to interference	PC
Housing, completely wired	80 MHz to 1 GHz 10 V/m 80% amplitude modulation (1 kHz)	A	80 MHz to 1 GHz 20 V/m 80% amplitude modulation (1 kHz)	FS
	1.4 GHz to 2 GHz 3 V/m 80% amplitude modulation (1 kHz)		1.4 GHz to 2 GHz 10 V/m 80% amplitude modulation (1 kHz)	
	2 GHz to 2.7 GHz 1 V/m 80% amplitude modulation (1 kHz)		2 GHz to 6 GHz 3 V/m 80% amplitude modulation (1 kHz)	

#### High-speed transient electrical disturbances (Burst)

Testing performed per EN 61000-4-4	Requirements per EN 61800-3	PC	Requirements per EN 61800-5-2 <sup>1)</sup> Increased immunity to interference	PC
Power supply connections	±2 kV 1 min Direct coupling	B	±4 kV Direct coupling	FS
Connections for process measurement, open-loop and closed-loop process control	±2 kV 1 min		±4 kV	
Signal interfaces	±1 kV 1 min		±2 kV	

1) The duration of the effect depends on the required safety integrity level (SIL) and listed in EN 61800-5-2.

#### Surge voltages (Surge)

Testing performed per EN 61000-4-5	Requirements per EN 61800-3	PC	Requirements per EN 61800-5-2 <sup>1)</sup> Increased immunity to interference	PC
Power supply connections	±1 kV DM Symmetrical	B	±2 kV DM Symmetrical	FS
	±2 kV CM Asymmetrical		±4 kV CM Asymmetrical	
Connections for process measurement, open-loop and closed-loop process control	±1 kV CM Asymmetrical		±2 kV CM Asymmetrical	
Signal interfaces	---		±0.5 kV CM Asymmetrical	

1) The number of pulses depends on the required safety integrity level (SIL) and listed in EN 61800-5-2.

#### Conducted disturbances

Testing performed per EN 61000-4-6	Requirements per EN 61800-3	PC	Requirements per EN 61800-5-2 Increased immunity to interference	PC
Power supply connections	150 kHz to 80 MHz	A	150 kHz to 80 MHz	FS
Connections for process measurement, open-loop and closed-loop process control	10 V 80% amplitude modulation (1 kHz)		20 V 80% amplitude modulation (1 kHz)	
Signal interfaces				

### 9.2.3 Interference emission requirements for 8F1I01 segments

Phenomenon	Testing performed per	Limit values per
Radiated emissions	EN 55011	EN 61800-3: Product standard - Adjustable speed electrical power drive systems

The following limit values are applicable for industrial environments (category C3).

#### Radiated emissions

Testing performed per EN 55011	Limit values per EN 61800-3	
	Frequency band	Quasi-peak value
Electric field / Measured from 10 m 30 MHz to 1 GHz	30 MHz to 230 MHz	50 dB (µV/m)
	230 MHz to 1 GHz	60 dB (µV/m)

## 9.2.4 Mechanical conditions for 8F1I01 segments

Testing	Testing performed per	Requirements per
Vibration (sinusoidal) / Operation	EN 60068-2-6	EN 61800-2: Product standard - Adjustable speed electrical power drive systems EN 60721-3-3 / class 3M6
Shock / Operation	EN 60068-2-27	EN 61800-2: Product standard - Adjustable speed electrical power drive systems EN 60721-3-3 / class 3M4
Vibration (sinusoidal) / Transport (packaged)	EN 60068-2-6	EN 61800-2: Product standard - Adjustable speed electrical power drive systems EN 60721-3-2 / Class 2M1
Free fall / Transport (packaged)	EN 60068-2-31 <sup>1)</sup>	EN 61800-2: Product standard - Adjustable speed electrical power drive systems EN ISO 4180

1) Replacement for EN 60068-2-32

### Vibration (sinusoidal) / Operation

Testing performed per EN 60068-2-6	Requirements per EN 61800-2 and EN 60721-3-3 / class 3M6	
	Frequency band	Amplitude
Vibration (sinusoidal) / Operation	2 to 9 Hz	7.5 mm
	9 to 200 Hz	Acceleration 2 g <sup>1)</sup>

1) 1 g = 10 m/s<sup>2</sup>

### Shock / Operation

Testing performed per EN 60068-2-27	Requirements per EN 61800-2 and EN 60721-3-3 / class 3M4
Shock / Operation	Acceleration 10 g <sup>1)</sup>

1) 1 g = 10 m/s<sup>2</sup>

### Vibration (sinusoidal) / Transport (packaged)

Testing performed per EN 60068-2-6	Requirements per EN 61800-2 and EN 60721-3-2 / class 2M1	
	Frequency	Amplitude
Vibration (sinusoidal) / Transport (packaged) <sup>1)</sup>	2 to 9 Hz	3.5 mm
	9 to 200 Hz	Acceleration 1 g <sup>2)</sup>
	200 to 500 Hz	Acceleration 1.5 g <sup>2)</sup>

1) The values in [Vibration \(sinusoidal\) / Operation](#) apply to modules that are not in their original packaging.

2) 1 g = 10 m/s<sup>2</sup>

### Free fall / Transport (packaged)

Testing performed per EN 60068-2-31	Requirements per EN 60721-3-2 / class 2M1	
	Weight	Height <sup>1)</sup>
Free fall / Transport (packaged)	>10 kg	0.3 m

1) Height per EN 61131-2.

## 9.2.5 Climate conditions for 8F1I01 segments

Testing	Testing performed per	Requirements per
Operation	---	EN 61800-2: Product standard - Adjustable speed electrical power drive systems EN 60721-3-3 / class 3K3
Storage	---	EN 61800-2: Product standard - Adjustable speed electrical power drive systems EN 60721-3-1 / class 1K4 / class 1K3
Transport	---	EN 61800-2: Product standard - Adjustable speed electrical power drive systems EN 60721-3-2 / class 2K3

### Operation

	Requirements per EN 60721-3-3 / class 3K3
Ambient temperature during operation	5 to 40°C
Relative humidity during operation	5 - 85%, non-condensing

### Storage

	Requirements per EN 60721-3-1 / class 1K4	Requirements per EN 60721-3-1 / class 1K3
Storage temperature	-25 to 55°C	---
Relative humidity during storage	---	5 to 95%, non-condensing

### Transport

	Requirements per EN 60721-3-2 / class 2K3
Transport temperature	-25 to 70°C
Relative humidity during transport	Max. 95% at 40°C

## 9.2.6 Electrical safety for 8F1I01 segments

### Pollution degree

Requirement per EN 61800-2	Explanation
Pollution degree 2	Normally only non-conductive pollution occurs. Occasionally, however, a temporary conductivity caused by condensation is to be expected, when the module is out of operation.

### Protection rating provided by enclosure (IP code)

Requirement	Explanation of code numbers per EN 60529	Explanation for the protection of equipment	Explanation for the protection of personnel
IP 65	First number IP6x	Dust-proof	Complete protection against contact
	Second number IP x5	Protection against water jets (nozzle) from any angle	---

### 9.3 UL / CSA



#### Underwriters Laboratories (UL)

Products with this mark are tested by Underwriters Laboratories and listed as "power conversion equipment" in category NMMS (power conversion equipment) with file number E225616.

The mark is valid for the USA and Canada and facilitates the certification of your machines and systems in this economic area.

#### Standards applied:

UL 61800-5-1  
CSA-C22.2 No. 274

Standard for adjustable speed electrical power drive systems  
Adjustable speed drives



#### Certificate

[Website > Downloads > Certificates > UL > ACOPOStrak > E225616 UL certificate of compliance ACOPOStrak](#)

## 9.4 Standards and definitions for safety technology

### Stop functions per EN 60204-1 (Electrical equipment of machines, Part 1: General requirements)

There are three categories of stop functions:

Category	Description
0	Stopping by immediate removal of power to the machine actuators (i.e. an uncontrolled stop).
1	A controlled stop with power left available to the machine actuators to allow for stopping. Power is only interrupted when standstill is achieved.
2	A controlled stop with power left available to the machine actuators.

Table 147: Overview of stop function categories

The necessary stop functions must be determined based on a risk assessment of the machine. Category 0 and category 1 stop functions must be functional regardless of operating mode. A category 0 stop must have priority. Stop functions must have priority over assigned start functions. Resetting the stop function is not permitted to trigger a dangerous state.

### Emergency stops per IEC 60204-1:2006 (Electrical equipment of machines, Part 1: General requirements)

In addition to the requirements for stop functions, the emergency stop function has the following requirements:

- It shall override all other functions and operations in all operating modes.
- Power to the machine actuators that can cause a hazardous situation shall be removed as quickly as possible without creating other hazards.
- A reset is not permitted to initiate a restart.

Emergency stops must be category 0 or category 1 stop functions. The necessary stop function must be determined based on a risk assessment of the machine.

### Performance levels (PL) per EN ISO 13849-1 (Safety of machinery - Safety-related parts of control systems, Part 1: General principles for design)

The safety-related parts of control systems must meet one or more of the requirements for five defined performance levels. These performance levels define the required behavior of safety-related controller parts with regard to their resistance to errors.

Performance level (per EN ISO 13849-1)	Safety integrity level - SIL (per IEC 61508-2)	Short description	System behavior
a	---	Safety-related components must be designed and built in such a way that they can meet the expected operational requirements (no specific safety measures are implemented).	<b>Caution!</b> The occurrence of a fault can result in the loss of the safety function.
b	1	Safety-related components must be designed and built in such a way that only reliable components and safety principles are used (e.g. preventing short circuits by using sufficient distances, reducing the probability of errors by using oversized components, defining the failure route, idle current principle).	<b>Caution!</b> The occurrence of a fault can result in the loss of the safety function.
c	1	Safety-related components must be designed so that their safety functions are checked at suitable intervals by the machine control system (e.g. automatic or manual check during startup).	<b>Caution!</b> An error between checks can result in the loss of the safety function. The loss of the safety function is detected during the check.
d	2	Safety-related parts shall be designed so that a single fault does not result in the loss of the safety function. Individual errors should – if possible – be detected the next time (or before) the safety function is required.	<b>Caution!</b> The safety function is always retained when a fault occurs. Some but not all errors are detected. An accumulation of undetected errors can result in loss of the safety function.
e	3	Safety-related parts shall be designed so that a single fault does not result in the loss of the safety function. Individual errors must be detected the next time (or before) the safety function is required. If this type of detection is not possible, an accumulation of faults is not permitted to result in the loss of the safety function.	<b>Information:</b> The safety function is always retained when a fault occurs. The faults are detected in time to prevent loss of the safety function.

Table 148: Overview of performance levels (PL)

A suitable performance level must be selected separately for each drive system (or for each axis) based on a risk assessment. This risk assessment is a part of the total risk assessment for the machine.

The following risk graph (per EN ISO 13849-1, appendix A) provides a simplified procedure for risk assessment:

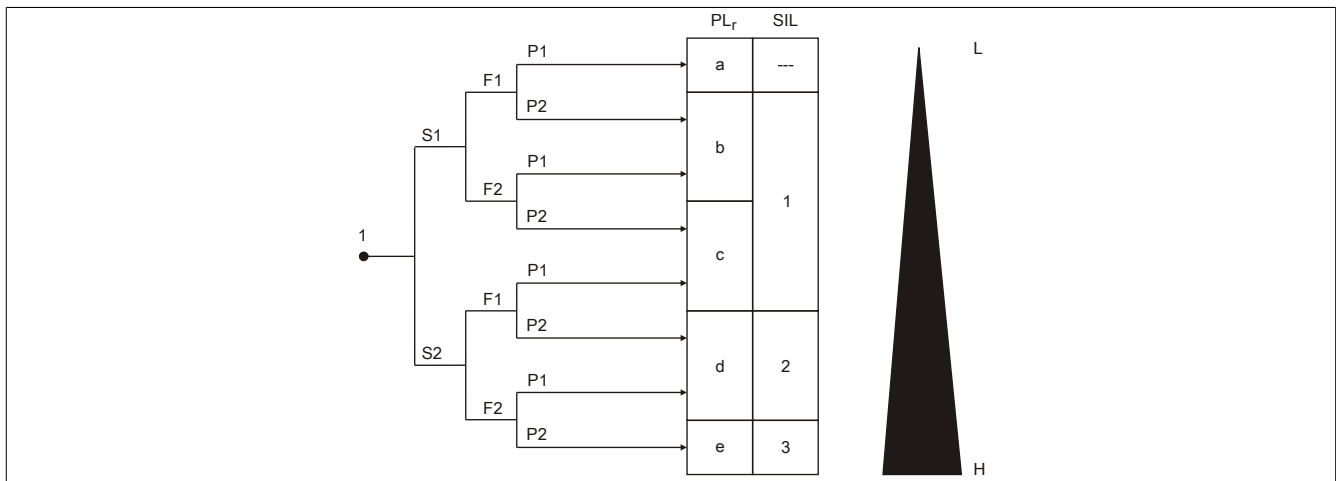


Figure 121: Risk diagram for determining the PL<sub>r</sub> for each safety function per EN ISO 13849-1, appendix A

### Legend

- 1 Starting point for assessing the impact on risk reduction
- L Low contribution to risk reduction
- H High contribution to risk reduction
- PL<sub>r</sub> Required performance level
- SIL Safety Integrity Level per IEC 61508-2

### Risk parameters

- S Severity of injury
- S1 Slight (normally reversible injury)
- S2 Serious (normally irreversible injury or death)
- F Frequency and/or duration of the exposure to the hazard
- F1 Seldom to less often and/or exposure time is short.
- F2 Frequent to continuous and/or exposure time is long.
- P Possibility of avoiding hazard or limiting harm
- P1 Possible under specific conditions
- P2 Scarcely possible

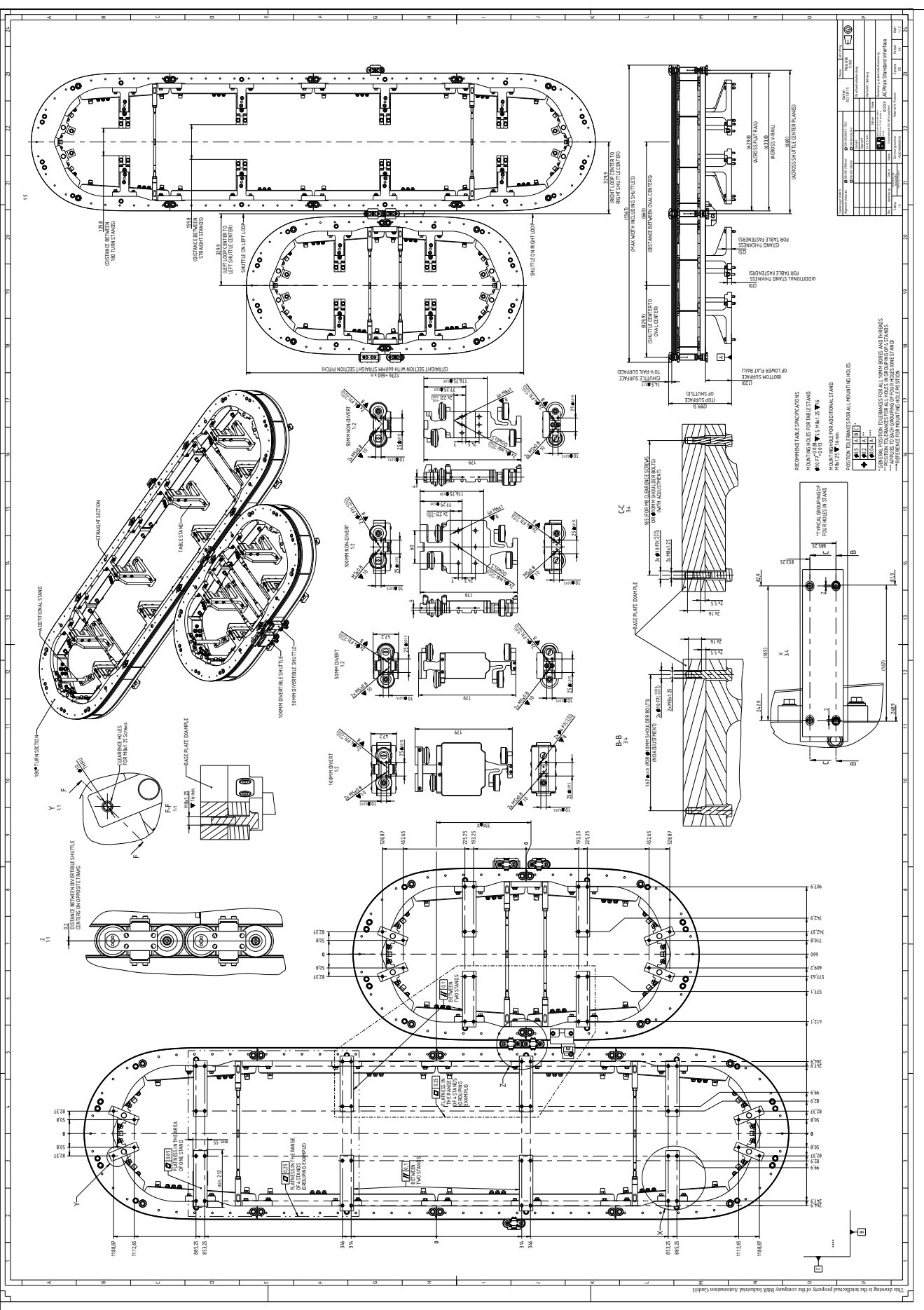
The performance level to be used is determined by starting at the specified starting point and taking the risk parameters S, F and P into account.

## Appendix A Installation diagrams

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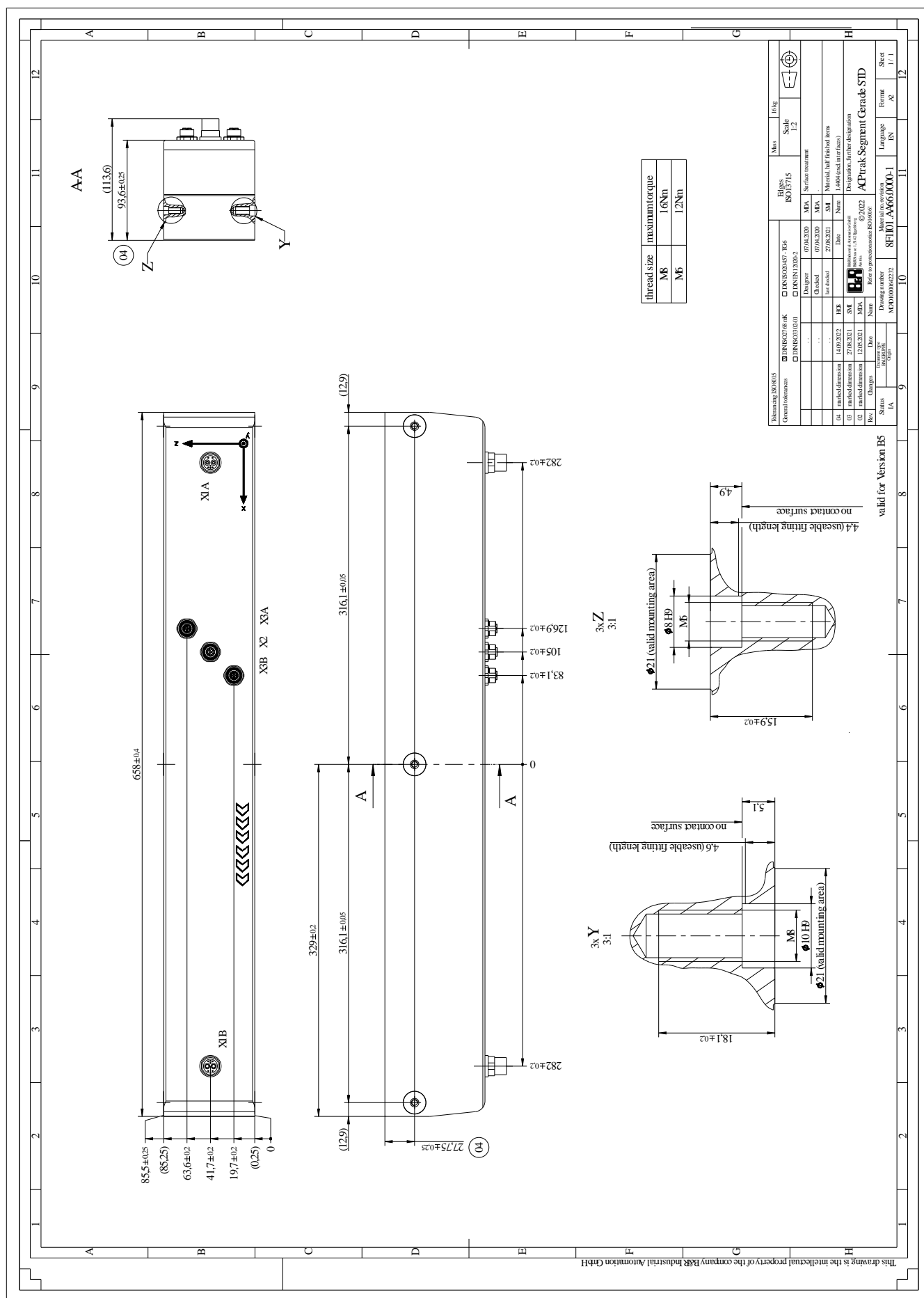


### A.1 Circular track of the B&R standard guide system



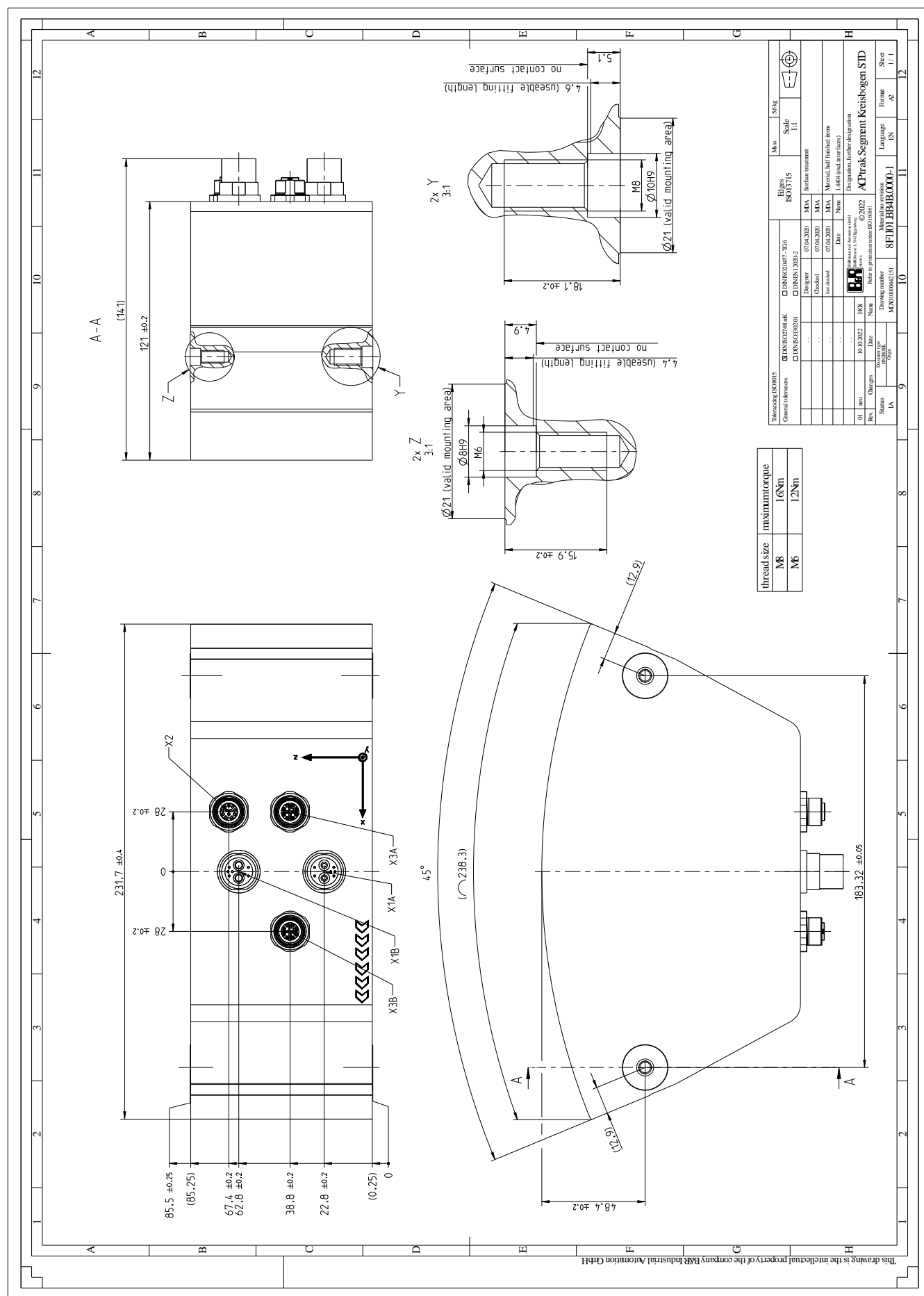


## A.2 Straight segment

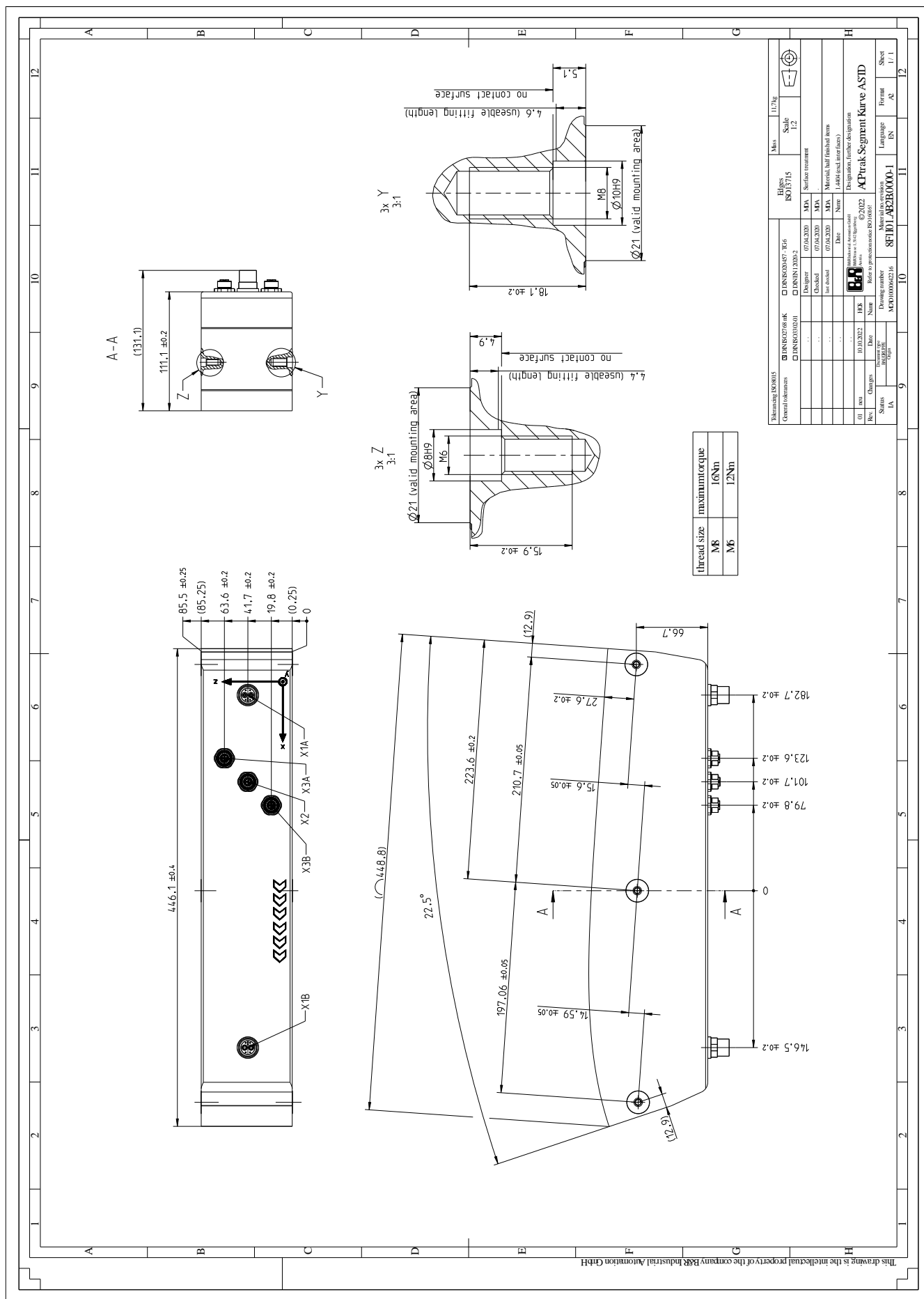




### A.3 Circular arc segment

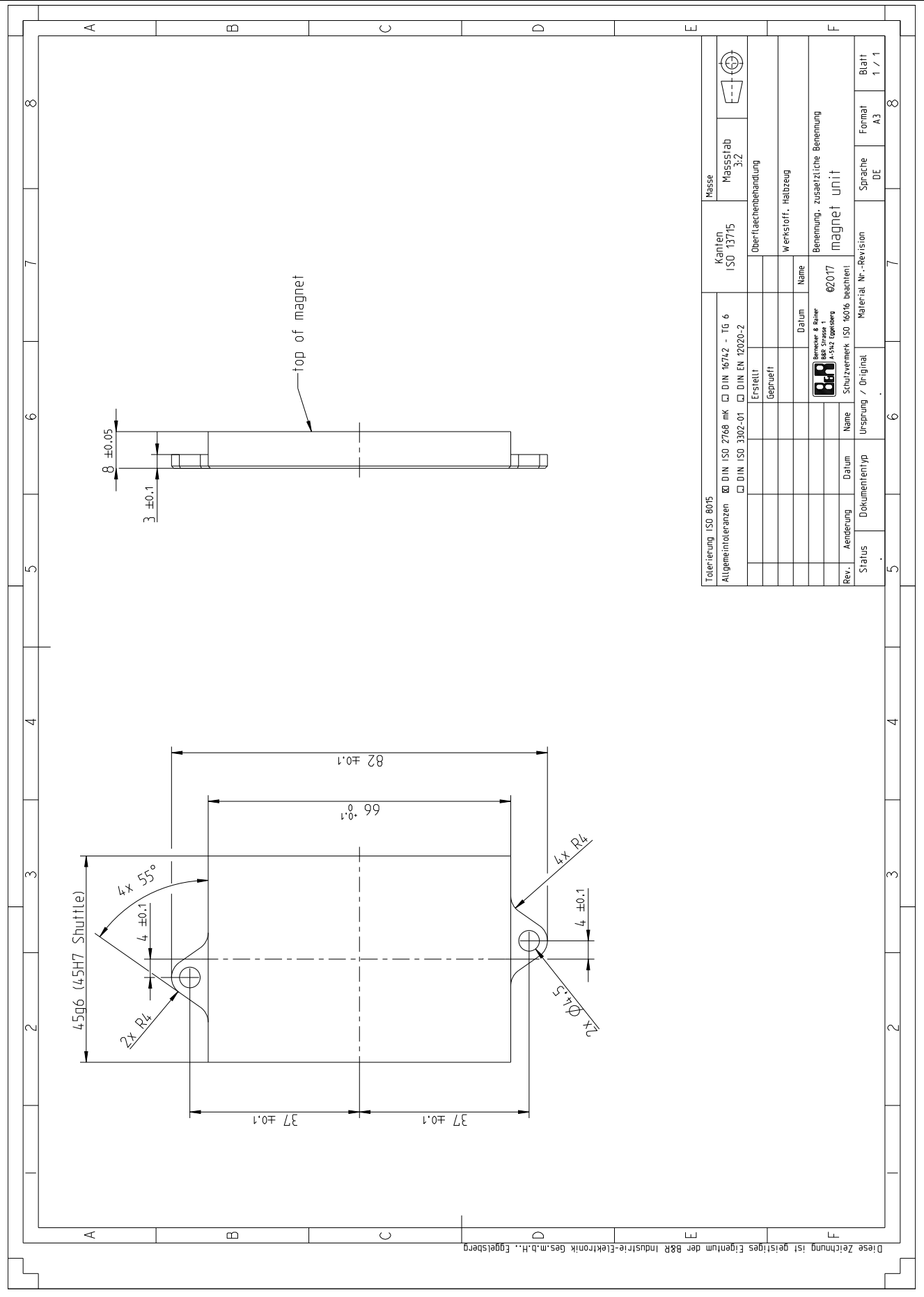


#### A.4 Curved segment A

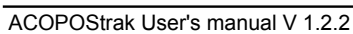


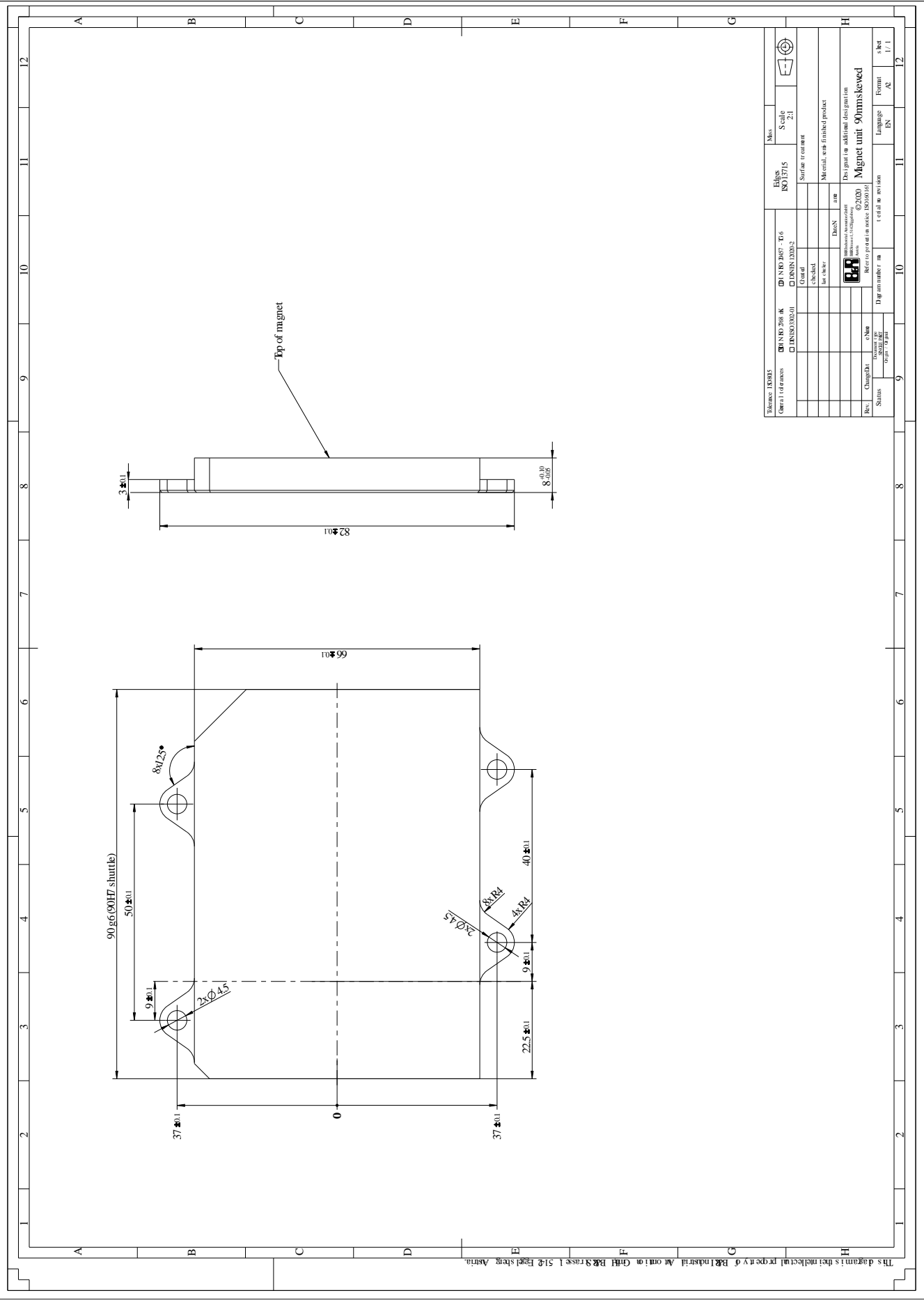


A.6 Magnet unit









# Appendix B Magnetic fields on the ACOPOStrak shuttle

## Magnetic field limit for occupational safety

EU Directive 2013/35/EU applies to safety in the workplace. It defines the following limit values for the trigger thresholds of the magnetic flux density of static magnetic fields:

Trigger thresholds for the magnetic flux density of static magnetic fields	
Hazard source	Trigger threshold
Interference with active implanted devices, e.g. cardiac pacemakers	0.5 mT
Attraction and projectile risk in the fringe field of high field strength sources (>100 mT)	3 mT

Table 149: Trigger thresholds of static magnetic fields per EU Directive 2013/35/EU

The magnetic flux density is displayed in 10 equivalent gradations from 5 mT to 0 mT. The outer line inside the circle represents the limit of 0.5 mT for occupational safety.

## 50 mm shuttle, not suitable for diverters (8F1SA.102.10000I-1)

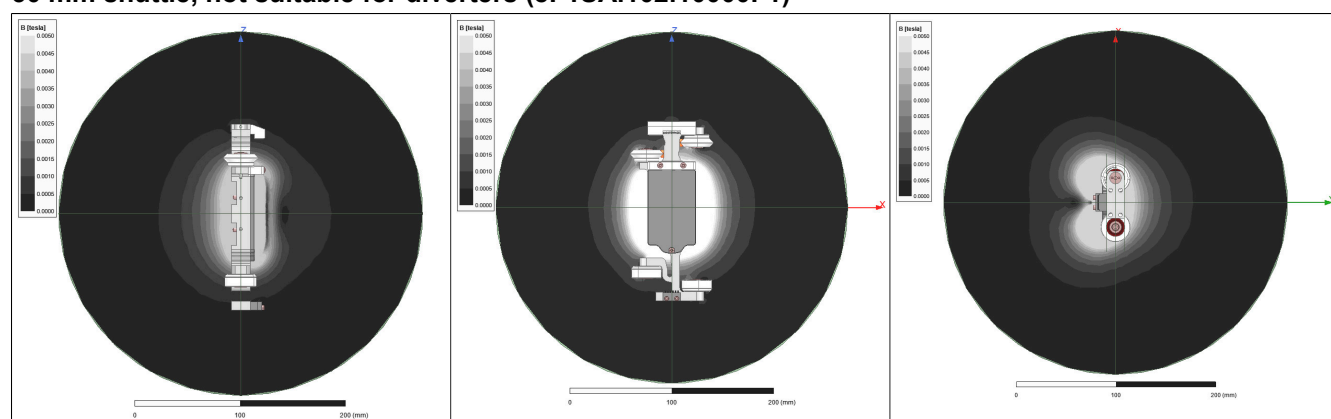


Table 150: Equipotential lines - 50 mm shuttle, not suitable for diverters

Radius of the outer circle: 175 mm

## 50 mm shuttle, suitable for diverters (8F1SA.100.10000I-1)

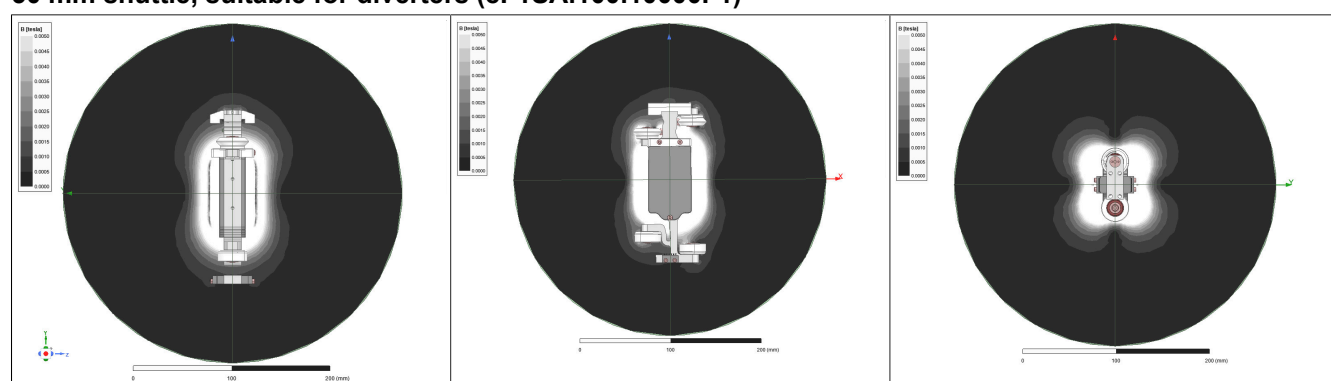


Table 151: Equipotential lines - 50 mm shuttle, suitable for diverters

Radius of the outer circle: 175 mm

100 mm shuttle, not suitable for diverters (8F1SA.203.10000I-1)

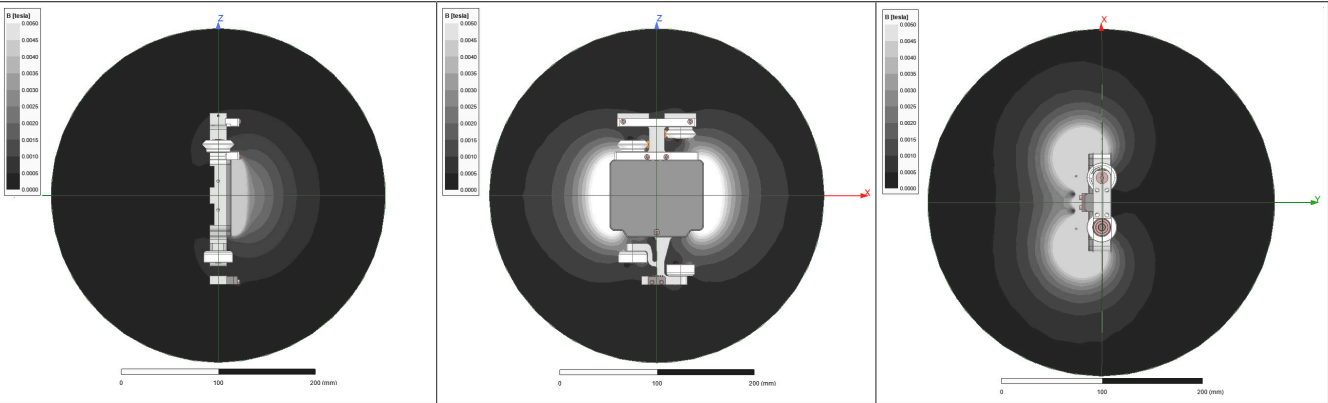


Table 152: Equipotential lines - 100 mm shuttle, not suitable for diverters

Radius of the outer circle: 175 mm

100 mm shuttle, suitable for diverters (8F1SA.201.10000I-1)

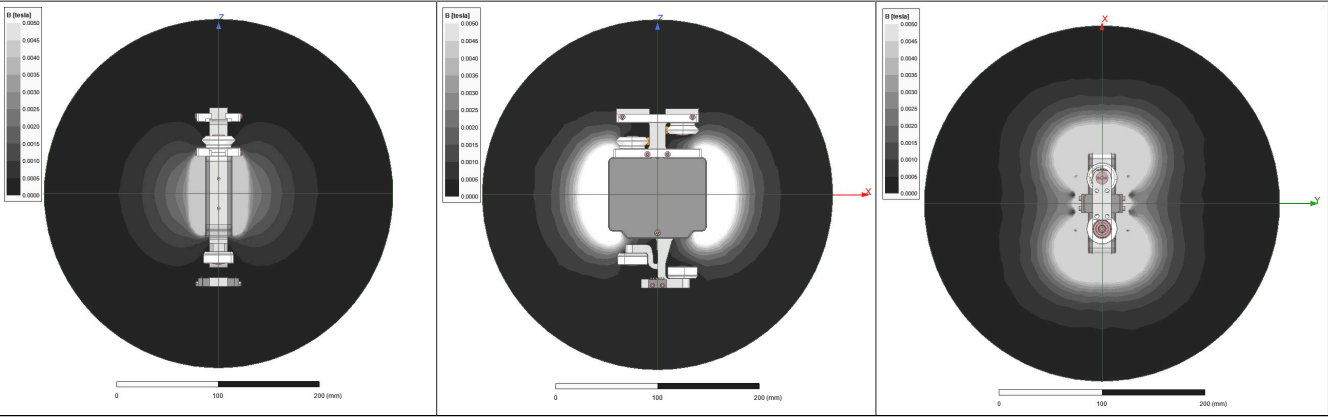


Table 153: Equipotential lines - 100 mm shuttle, suitable for diverters

Radius of the outer circle: 175 mm

## Appendix C Safety instructions for magnets

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[C0024662 Safety instructions for magnets \(CMYK\)](#)

## Appendix D UL Markings

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- 8F10A.01B.0000-1 only:  
Max. surrounding air temperature is 60°C.
- Only use 8F1CP cables for supplying ACOPOStrak.
- Suitable for Use on a Circuit Capable of Delivering Not More Than 5000 rms Symmetrical Amperes, 60 Volts DC Maximum, When Protected by Fuses Class J rated maximum 60A.
- For use in NFPA79 applications only.