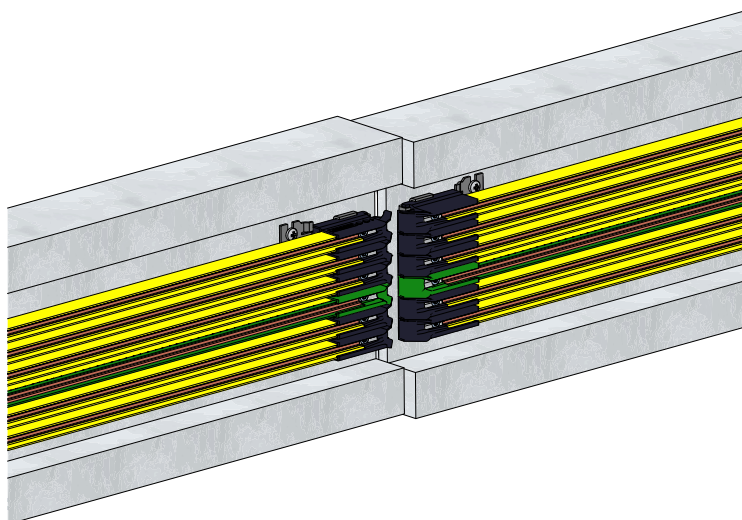


Use of a drilling jig for transitions

SingleFlexLine 0815

Order number:

0815xx-...



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Use of a drilling jig for transitions

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1 About this Document

This document makes possible the safe and efficient installation of the installation plate and end caps for SingleFlexLine section transitions.

This document is a part of the device, and must be kept accessible to personnel at all times in its immediate vicinity. Personnel must read this document carefully and understand it before starting any work. The basic prerequisite for safe work is compliance with all safety and operating guidelines in this document.

Local accident protection regulations and general safety guidelines for the area of use of the device also apply.

Illustrations in this document are provided for basic understanding and may deviate from the actual implementation of the system.

In addition to these installation instructions, the instructions listed in the appendix for the installed components also apply.



ATTENTION!

The drilling jig is designed for the installation of overhead monorails (EMS) (SingleFlexLine Program 0815 with 14 mm phase spacing).

The tool may only be used to a limited extent when it comes to electrified monorail systems close to the ground (other installation situations and interfering contours can limit its use here).



The drilling jig can also be used to drill the holes for the screw-on hanger clamp. This is described, among other things, in BAL0815-0002!

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2 Safety Note

2.1 Explanation of Symbols

Safety and hazard information is identified in this installation manual by symbols. Safety instructions are introduced by signal words that indicate the extent of the hazard. Always observe safety and hazard instructions, and work carefully to avoid accidents, bodily injury and damage to property!



DANGER!

... indicates an immediately hazardous situation that will result in death or serious injury if not avoided.



DANGER!

... indicates an immediately hazardous situation due to electricity that may result in death or serious injury if not avoided.



WARNING!

... indicates a potentially hazardous situation that may result in death or serious injury if not avoided.



WARNING!

... indicates a potentially hazardous situation due to electricity that may result in death or serious injury if not avoided.



CAUTION!

... indicates a potentially hazardous situation that may result in minor or moderate injury if not avoided.



Tips and recommendations:

... highlights useful tips and recommendations as well as information for efficient and trouble-free operation.



NOTE!

... indicates actions that will help you prevent material damage.

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2.2 Personal Protective Equipment

Always to be used For all work



Safety helmet

For protection against falling or flying parts and materials.



Protective gloves

For the protection of hands against friction, scrapes, puncture or deeper wounds, as well as against contact with hot surfaces.



Protective work clothing

Primarily for protection against entrapment by moving machine parts. Work clothing must be close fitting with a low resistance to tearing; it must have close-fitting sleeves and no protruding parts.



Protective footwear

For protection against heavy falling parts and slipping on slippery floors.

To be worn for special tasks

Specific protective equipment is required when performing certain tasks. Separate reference to this is made in the individual sections.



Safety eyewear

For eye protection against harmful influences such as strong light, chemicals, dust, splinters or weather effects.



Hearing protection

For protection against loud noises and to prevent acoustic trauma.



Breathing mask (FFP-3 – according to country-specific requirements)

For protection against materials, particles, and organisms. In this case: protection against dust arising from the abrasion of carbon brushes and the PVC insulation of the conductor rail.

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2.3 Special Hazards

The following section lists residual risks determined on the basis of a risk assessment.

→ Follow the safety instructions and warnings in these installation instructions to reduce health hazards and to avoid dangerous situations.

2.3.1 Electrical Hazards and Sources of Danger



Risk of death by electrocution!

Contact with energized components can lead to death by electrocution or severe injury. There is also a risk of injury from shock reactions, falling or being thrown across the room as a result of an electrical shock.



Work on the following components is dangerous:

- Main power supply
- Electrically live components: Power feed, cables, connections, conductor rail, connectors, current collectors, devices and connections within switching cabinets, control systems, etc.
- Parts that have become live due to a fault

Before working on the parts listed above:

→ Disconnect the conductor-rail system from the power supply in accordance with the 5 safety rules and **secure it against being switched back on**

During work:

→ Use insulated tools

Before switching on:

→ Every time before the device or system is started, test the insulation resistance according to locally applicable technical standards, directives and legal regulations.

→ Carry out locally required electrical tests

Maintain electrical safety!

→ Regularly test and maintain electrical equipment.

→ If dangerous deficiencies are identified, take measures to correct the deficiencies without delay. Inform the system operator immediately

→ If it is not possible to correct a dangerous deficiency, block off the area in question or turn off the equipment and secure it against being switched back on. Inform the system operator immediately.

→ Immediately secure loose cables and replace damaged cables.

→ Always replace blown fuses with fuses of the same rating

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DANGER!

Fire hazard due to overload or sparking!

Fire hazards occur due to overloaded cables, electrical arcs, short circuits, or sparking. Sparking can occur in poorly serviced, contaminated conductor rails or if installation does not comply with the required tolerances.

- Permissible current values must be observed.
- Comply with tolerances during installation
- Install electrical fuses according to specifications
- Do not store easily ignited materials in the vicinity of conductor rails
- Check, service, and clean conductor rails regularly and as prescribed

2.3.2 Mechanical Hazards and Sources of Danger



DANGER!

Risk of injury due to grasping or impact!

Grasping and/or impact with moving conductor rails (slip ring) or current collectors connected to the machine and other components must be prevented.

- Cordon off the work area
- Caution when working in the vicinity of the danger zone, in particular if protective devices (covers, enclosures, control devices) have been removed or disabled
- Caution when working in the vicinity of the danger zone, in particular below the conductor rail
- Use personal protective equipment!



WARNING!

Secure conductor rails against falling

→ In application areas with personnel traffic and at installation height of 3 m or more, conductor rails must be secured against falling.



CAUTION!

Risk of puncture wounds and cuts!

The packaging material can contain sharp objects such as nails and wood splinters that can cause injury to limbs.

- Use personal protective equipment!
- Cordon off the work area!
- Caution when working in the vicinity, in particular below the conductor rail

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2.3.3 Danger due to Dust and Vapors



Danger of sensitization, irritation of the mucous membranes, and respiratory diseases due to dust!

Dust from the contact brushes collects in the conductor rails and the guide profile. This dust is very fine and is categorized as a health risk. Frequent handling can result in sensitization. People who frequently spend longer periods of time in a heavily used plant without protective equipment must expect the following **consequences**:

- Irritations of the mucous membranes
- Respiratory diseases
- Cancer

These consequences must also be reckoned with if there is a lack of caution in handling accumulated dust (by blowing out the dust with compressed air, for example).

- In workplaces with long-term exposure and frequently visited systems, take effective measures to protect employees from the dust
- During all work on the conductor rail system in which collected dust can be stirred up, wear personal protective equipment. Personal protective equipment must be worn especially during cleaning operations.
 - Safety eyewear
 - Class-FFP3 dust mask
 - Gloves
 - Disposable coverall

- Before starting work, clean the conductor rail in accordance with regulations. There is a specific maintenance instruction for this (VV0800-0001)
- Protect the surroundings during cleaning works, for instance by covering or removing warehouse goods and blocking access to those areas, in which dust could fall down on persons.
- **Do not blow out dust with compressed air.** Instead, vacuum it up. The vacuum cleaner must be equipped with a Class H fine filter.
- Do not eat, drink or smoke during work!



DANGER!

Poisonous gases in case of fire!

In case of fire in the facility, the plastic parts (PVC) of the conductor-rail system emit poisonous gases (HCL).

- The building must be evacuated immediately.
- The fire brigade must be informed.

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2.3.4 Hazards related to the Operating Environment

The following conductor-rail properties can give rise to hazards when the conductor rail is installed in its operating environment:

- Electrical power
- Sparking
- Dust due to abrasion
- Material composition of the insulating profiles, which releases toxic vapors on combustion

The **most important action** for protection from these dangers is only to install the conductor-rail system in locations where **suitable operating conditions** prevail.



Do not energize the surroundings of the conductor rail!

The conductor rail must not be energized under the following conditions:

- If the conductor rail gets severely contaminated or wet
- If live components are exposed (insulating profile or the insulation of the connecting cable are damaged)
- If hanger clamps or the insulating profile fail, or if the electric rail falls down and touches a conductive material

→ Secure the electric system in accordance with regulations

→ Install the conductor rail according to the manual; take environmental conditions into account; regularly inspect it and maintain and clean it according to regulations.

→ The conductor rail must be regularly inspected and, if necessary, repaired.



Danger of sensitization, irritation of the mucous membranes, and respiratory diseases due to dust!

Dust from the contact brushes collects in the conductor rails and the guide profile. This dust is very fine and is categorized as a health risk. Possible consequences:

- Irritations of the mucous membranes
- Respiratory diseases
- Cancer

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3 Installation

The conductor-rail system has to be interrupted at switches and lifting stations. These places are called transitions. The ends of the conductor rail at transitions are fitted with insulated end caps (3). The opposing end caps allow the current-collector head to pass over transitions.

The end caps must be precisely aligned to ensure a low-wear crossing.

The end caps are fixed to the EMS profile (guideway profile) (1).

They are not attached to the EMS profile (1) individually, but via an installation plate (4), or an end cap bar in older systems.

The installation plate or end cap bar is fastened to the EMS profile (1) with two screws (5). The end caps are then only hung or snapped into place.

These installation instructions are only valid for standard bar widths of 7-8 mm and 90° degree as well as 45° degree cuts.



ATTENTION!

To allow the mounting of the end caps, a clearance of 110 mm from the beginning of the guideway profile must be maintained at the full height! (see Fig. 1)

The holes for the installation plate must be precisely positioned and machined to ensure the accurate alignment of the end caps!

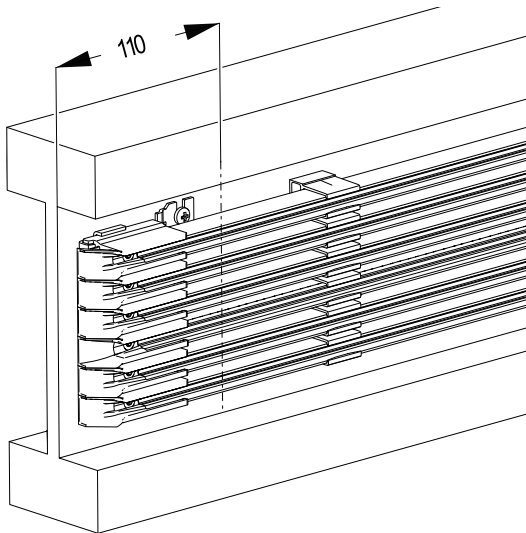


Fig. 1: Clearance for mounting the end caps

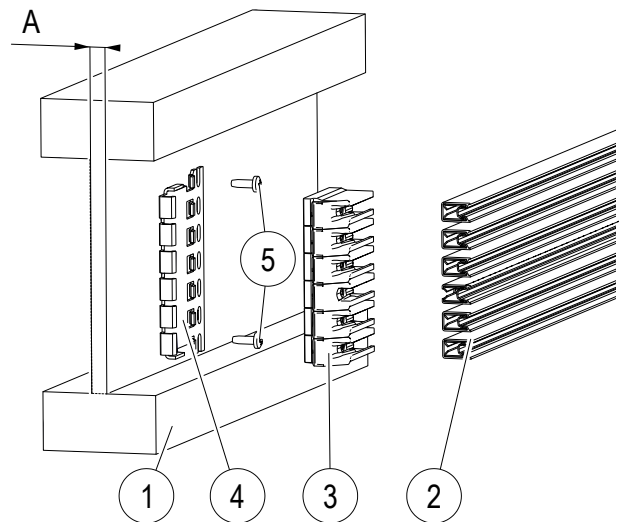


Fig. 2: Individual components for new systems

Pos.	Benennung
1	EMS profile (guideway profile)
2	Conductor rail
3	End cap

Pos.	Benennung
4	Installation plate
5	Self-tapping screws DIN 7500-1 M4, Length \triangleq A (see Fig. 1)
A	Profile bar width (see A in Fig. 1)

There are suitable drilling jigs (drilling diameter \varnothing 3.6) to position the holes quickly and easily.

Installation Instructions



Use of a drilling jig for transitions

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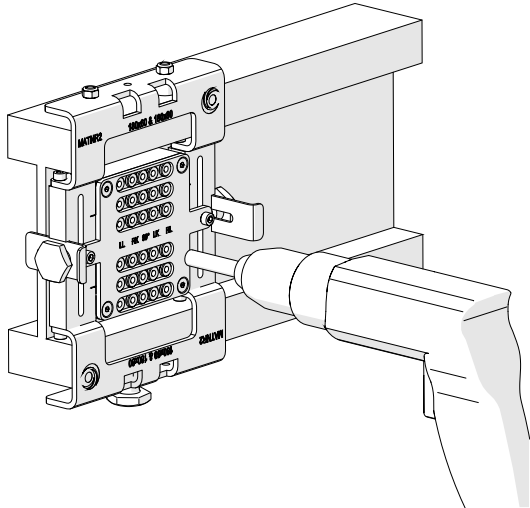


Fig. 3: Drilling an EMS guideway profile using a drilling jig

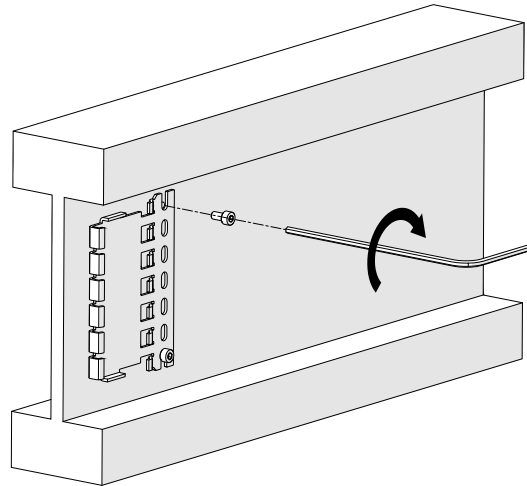


Fig. 4: Screwing the installation plate on



ATTENTION!

The drilling jig is only designed for bar widths from 7 mm up to 8 mm. If the bar width differs, the stop must be adjusted, e.g., using a spacer plate as a supplement (see tables in Section 3.1.2). If necessary, please contact Conductix-Wampfler.

There are 2 versions:

Guideway Profile	Dimensions	Order No.
EMS Profile	180x60 180x80	08-V015-0474-001
Heavy-duty Profile	240x80	08-V015-0474-002



Use the QR code ("click" or "scan"), to watch our animation **Mounting Installation Plate.**

Use of a drilling jig for transitions

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3.1 Installing the Installation Plate

The installation plate is available in 4-pole, 6-pole, and 8-pole versions:

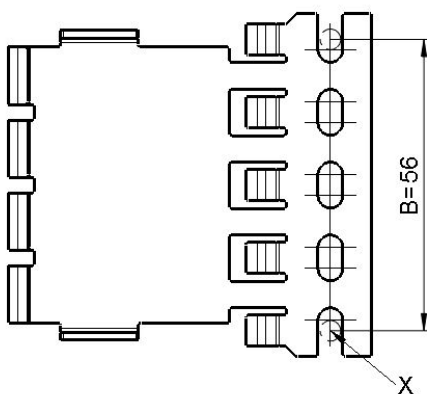


Fig. 5: Installation plate, 4 pole

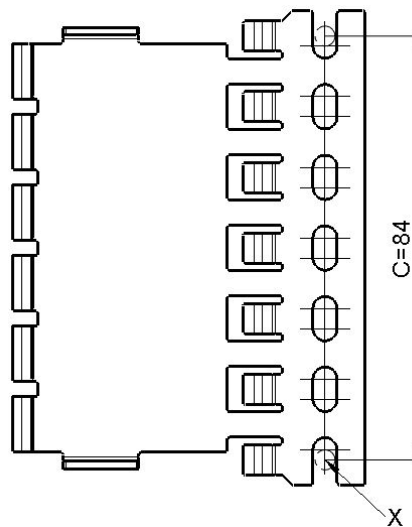


Fig. 6: Installation plate, 6 pole

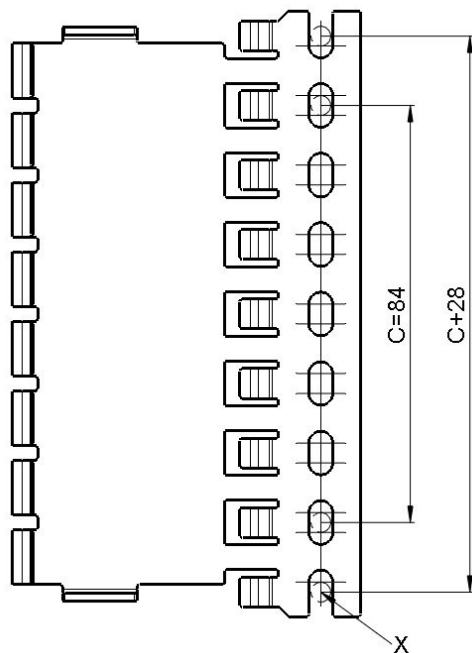


Fig. 7: Installation plate, 8 pole



ATTENTION!

Always try to use the outer holes (x) so that the fixing screws are always accessible!



ATTENTION!

With the 8-pole version, the height of the drill bushing block must be readjusted for changing from the upper and lower hole. Alternatively, the fastening can be carried out with 84 mm. A disadvantage is that fine adjustment is then not possible without dismantling the conductor rail.

Use of a drilling jig for transitions

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3.1.1 Description of the Drilling Jig

The drilling jig simplifies the setting of the holes for the end cap bar. After setting the drilling jig to the installation height of the conductor rail, the drilling jig can be used at all end cap positions, regardless of whether it is a straight or angled cut at the left or right end of the guideway profile.

The drilling jig is designed for a minimum profile bar width of 7 mm - 8 mm. If the bar width differs, the stop dimensions must be adjusted (see tables in Section 3.1.2). If necessary, please contact Conductix-Wampfler.

The drill diameter is 3.6 mm (M4 core drilling).

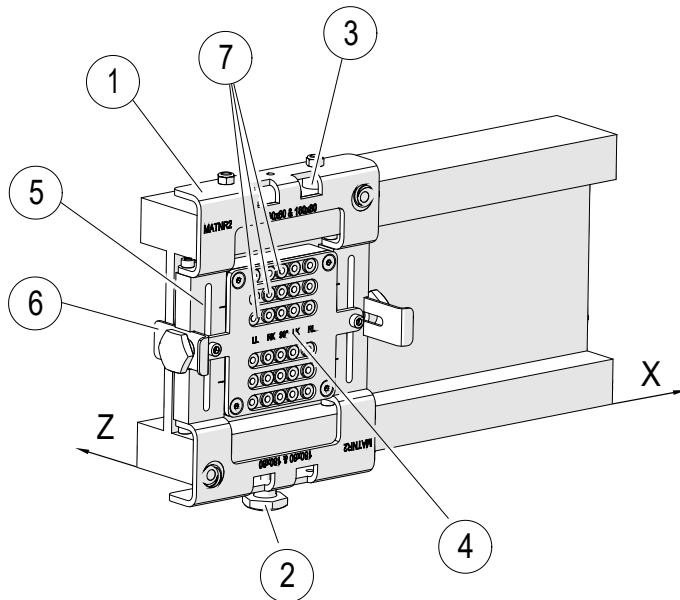


Fig. 8: Drilling jig for installation plate

Item	Name
1	Support
2	Locking screw
3	Support buffer
4	Drill bushing block
5	Square profiles
6	Stop
7	Row of bushings for core drill 3.6 mm

Use of a drilling jig for transitions

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The drilling jig is placed over the support buffers (3) on the EMS support profile from above and pressed against the support profile. The drilling jig is fixed to the support profile by turning the locking screw (2) at the lower angle.

The drilling jig is positioned at the end of the rail using the right or left stop (6).

The stop (6) can be withdrawn via the elongated hole and allows for a quick change to the other end of the rail (from left to right or from right to left).

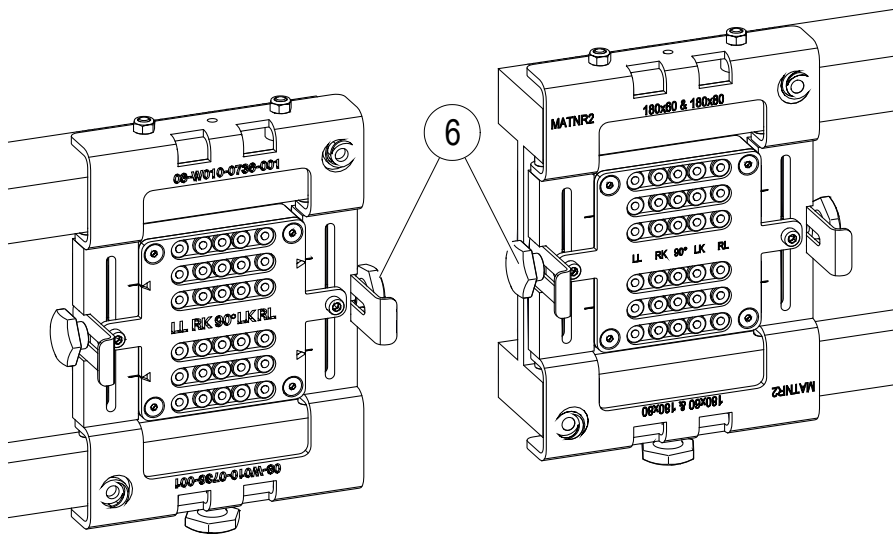


Fig. 9: Left stop and right stop

The drill bushing block (4) is set using the two elongated holes on the left and right of the drill bushings. After releasing the clamp, the height of the drill bushing block can be adjusted. This setting defines the position for the mounting holes in the installation plate.

The correct setting dimensions result from the hanger clamps used (position of the conductor rail) and are taken over from the hanger clamp.

Use of a drilling jig for transitions

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Height adjustment of the drilling jig:

- a) Determine the spacing (h) between the upper edge of the guideway profile and the center of the conductor rail poles (e.g., with 4-pole conductor rails, the center between pole 2 and pole 3 is used)

Note: The pole spacing for Conductor Rail System 0815 is 14 mm.

- b) Apply the hole spacing of the mounting points on the installation plate for the end caps used (see Fig. 5 to Fig. 7):

Number of Poles	Spacing
4	56 mm
6	84 mm
8	84 mm + 2x14 mm

- c) Set the drilling jig to the required rail position. To do this, loosen both clamping screws on the left and right and position the drill bushing block in the elongated hole at the required height. Fix the block again with the clamping screws and check the setting.

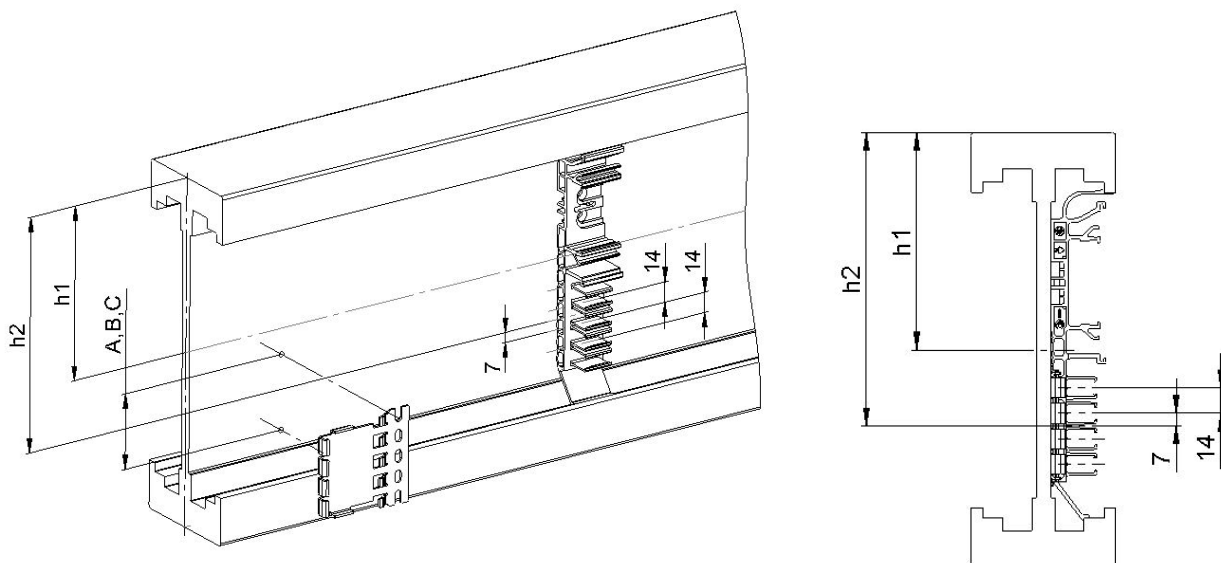


Fig. 10: Installation plate on a guideway profile

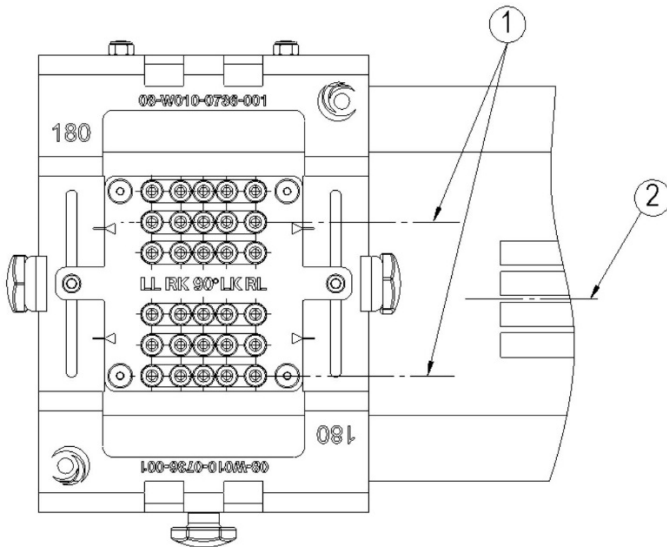
Item	Name
A, B, C	Hole spacing of the installation plate
h1	Center of the guideway profile
h2	Center of the conductor rail poles to the upper edge of the guideway profile

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Item	Name
1	Hole level distance A, B, or C
2	Center of the conductor rail

Fig. 11: Determine the hole spacing

The bushing rows in the drill bushing block are intended for the different profile cuts (straight cut/ 45° left and 45° right). The spacing and assignment are shown in the following illustrations.

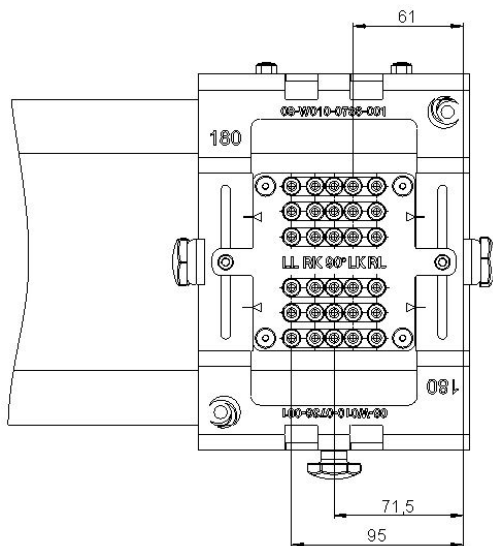


Fig. 12: Distance between the rows and the stop plates (left)

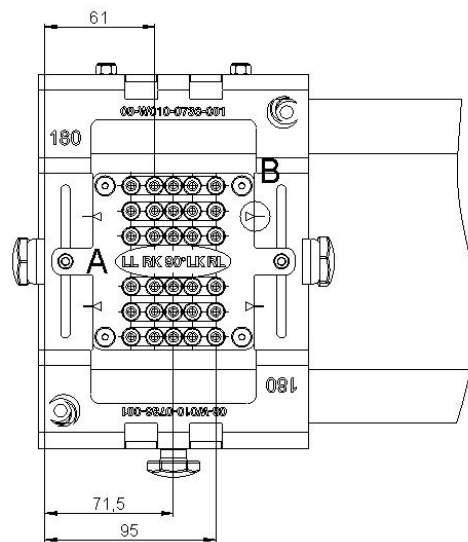


Fig. 13: Distance between the rows and the stop plates (right)

Use of a drilling jig for transitions

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Using the drill bushing block

Depending on the respective guideway profile cut and the guideway profile side, the following bushing rows are used to achieve the correct spacing between the holes and the guideway edge. If the bar width of the guideway profile differs, please note the tables in Section 3.1.2.

a) 90° rail stop (straight cut)

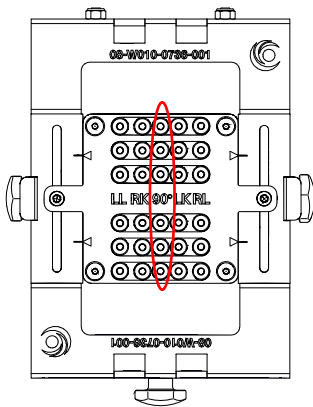


Fig. 14: Drill row 90 °“

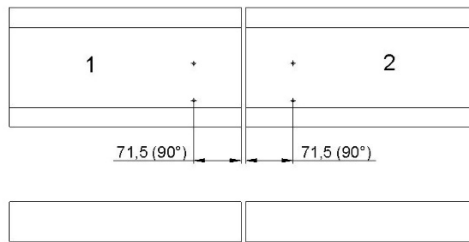


Fig. 15: 90° Rail stop

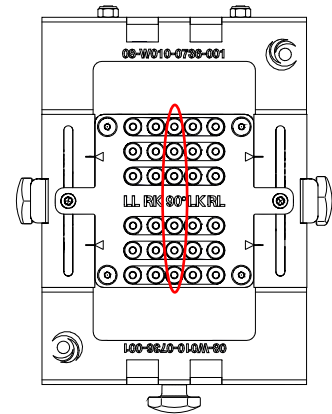


Fig. 16: Drill row 90 °“

b) With a 45° cut tapering to the right

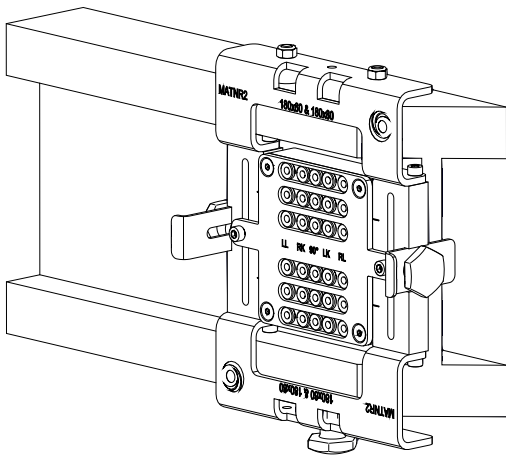


Fig. 17: Left side/Left profile 45°

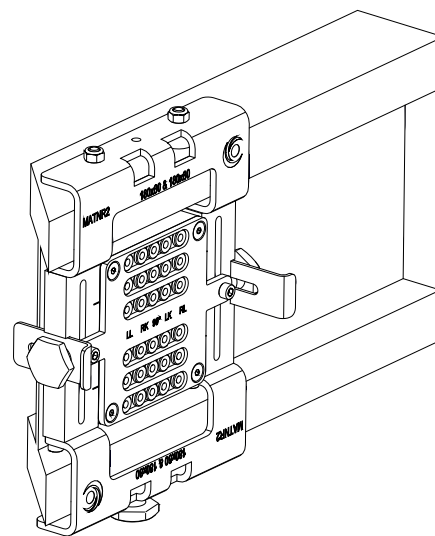


Fig. 18: Right side/Right profile 45°

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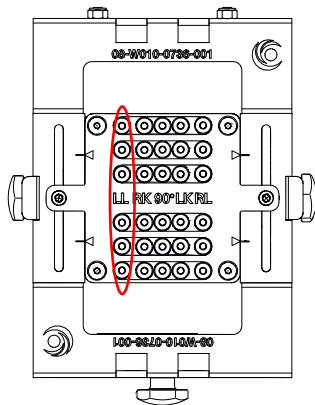


Fig. 19: Drill row LL

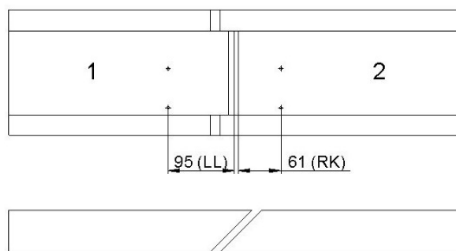


Fig. 20: 45° rail stop tapering to the right

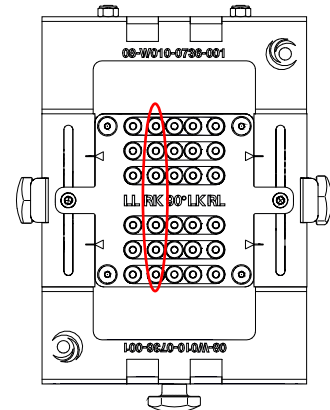


Abb. 21: Drill row RK

c) With a 45° cut tapering to the left

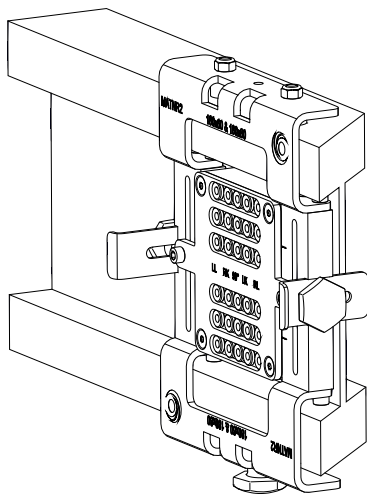


Abb. 22: Linke Seite/Linkes Profil 45°

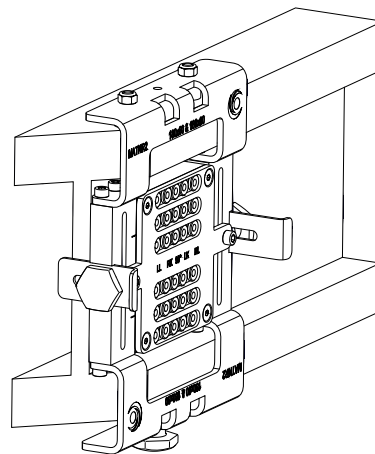


Abb. 23: Rechte Seite/Rechtes Profil 45°

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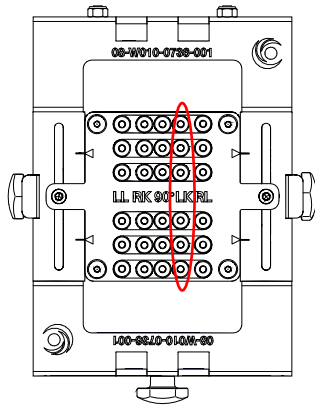


Fig. 24: Drill row LK“

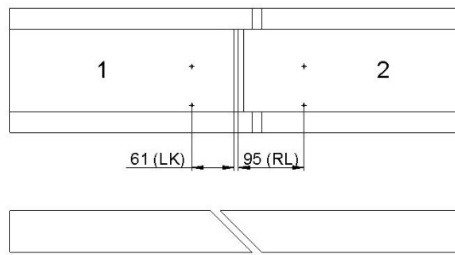


Fig. 25: 45° rail stop tapering to the left

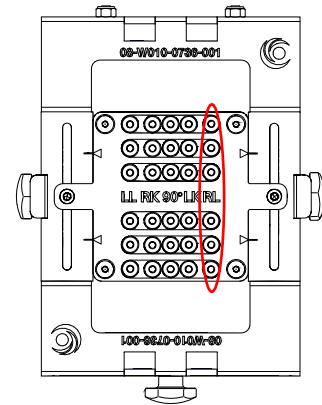


Fig. 26: Drill row RL“

3.1.2 Spacing dimensions for different guideway profile bar widths

With a 45° cut tapering to the right, the following dimensions apply to different bar widths:

Bar Width [mm]	Dimension (LL)	Dimension (RK)	Standard bar width 7-8 mm
4	93.5	62.5	
6	94.5	61.5	
7	95	61	
8	95	61	
10	96.5	59.5	
12	97.5	58.5	
14	98.5	57.5	

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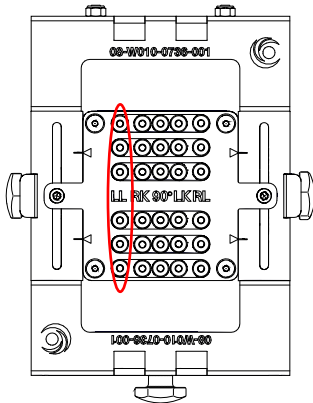


Fig. 27: Drill row LL“

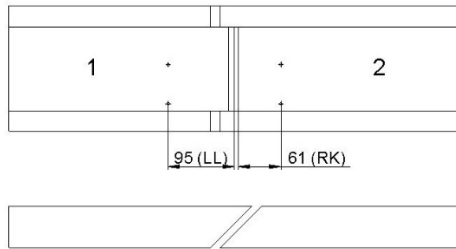


Fig. 28: 45° rail stop tapering to the right

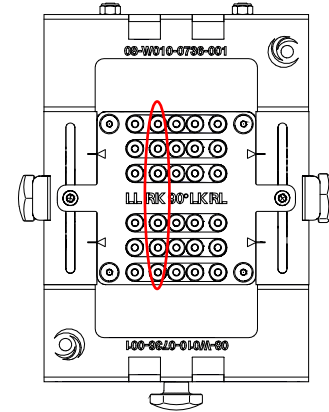


Fig. 29: Drill row RK“

With a 45° cut tapering to the left, the following dimensions apply to different bar widths:

Bar Width [mm]	Dimension (LK)	Dimension (RL)
4	62.5	93.5
6	61.5	94.5
7	61	95
8	61	95
10	59.5	96.5
12	58.5	97.5
14	57.5	98.5

Standard bar width 7-8 mm

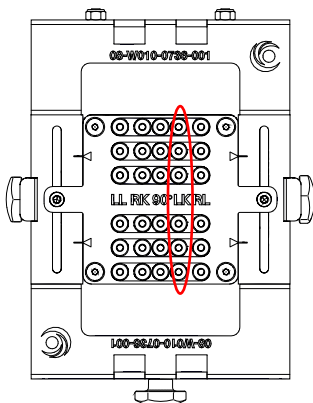


Fig. 30: Drill row LK“

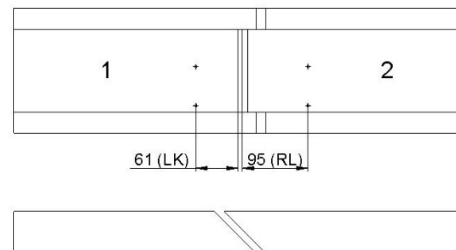


Fig. 31: 45° rail stop tapering to the left

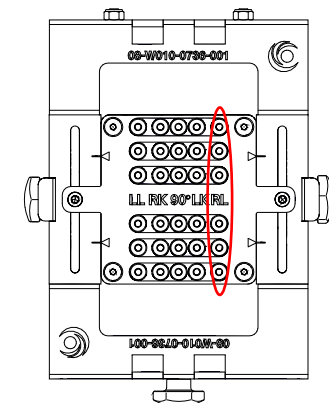


Fig. 32: Drill row RL“

Use of a drilling jig for transitions

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3.1.3 Dependence on the number of poles

For installation, it is not necessary to drill the entire row (90°, LL, LK, RL, RK). There are always only two holes set, and these depend on the number of poles:

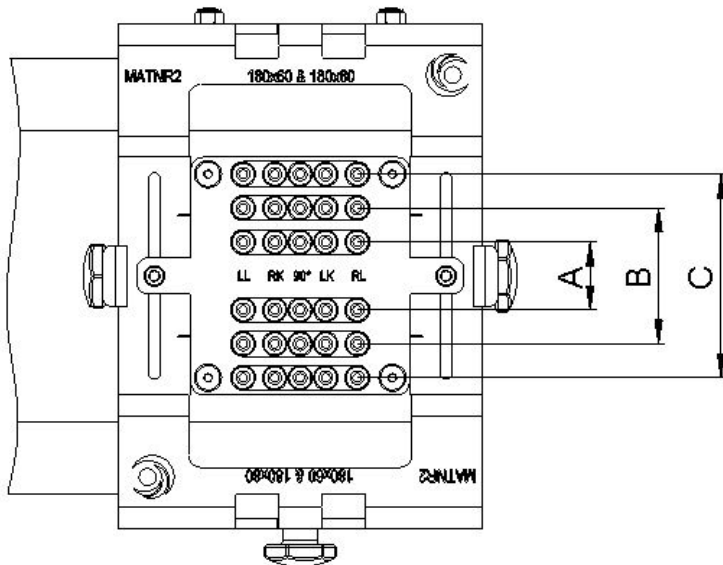


Fig. 33: Holes depend on the number of poles

A	B	C
2 poles: Only position the 2 inner holes	3 poles: Only position the 2 middle holes	6 poles (or more): Only position the 2 outermost holes

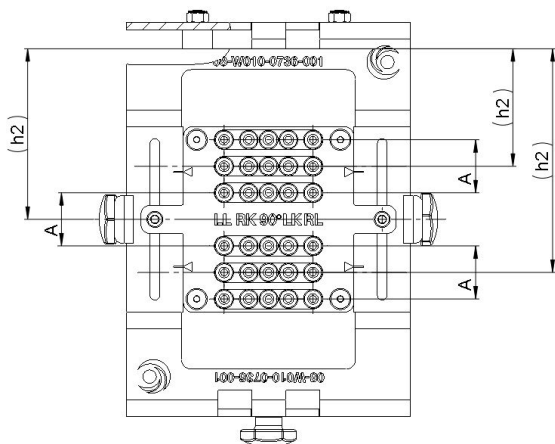


Fig. 34: Drilling jig spacing "A"

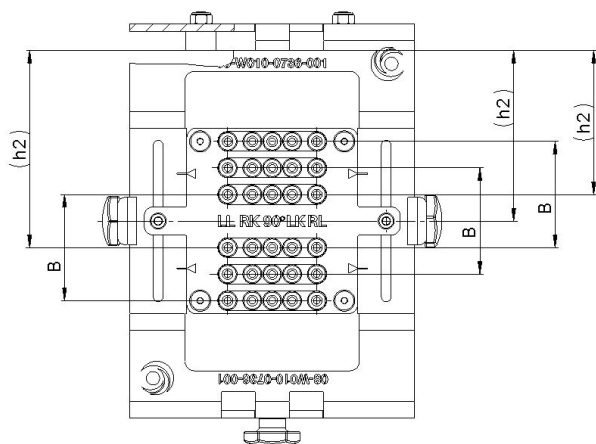


Fig. 35: Drilling jig spacing "B"

Use of a drilling jig for transitions

SingleFlexLine 0815

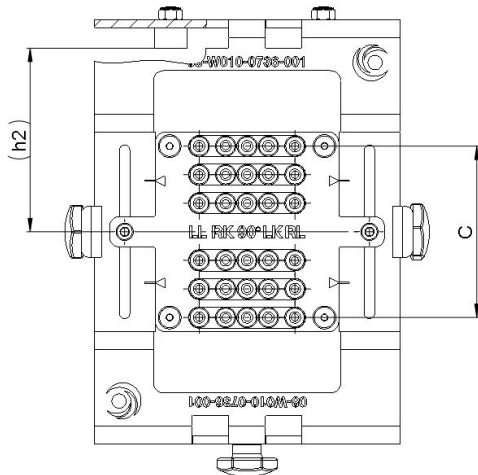


Fig. 36: Drilling jig spacing "C"

Item	Name
A, B, C	Hole spacing of the installation plate
h2	Adjustable height. Dimensions depend on the respective customer application

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With 8-pole systems, the drill bushing block must be moved up and down (also see notes in Section 3.1 and Fig. 7). The reference line here is the center of the conductor rail:

- Loosen the two outer cylinder screws DIN912 M5x16 (Item 1) with an Allen wrench (2.5) (see Fig. 37).

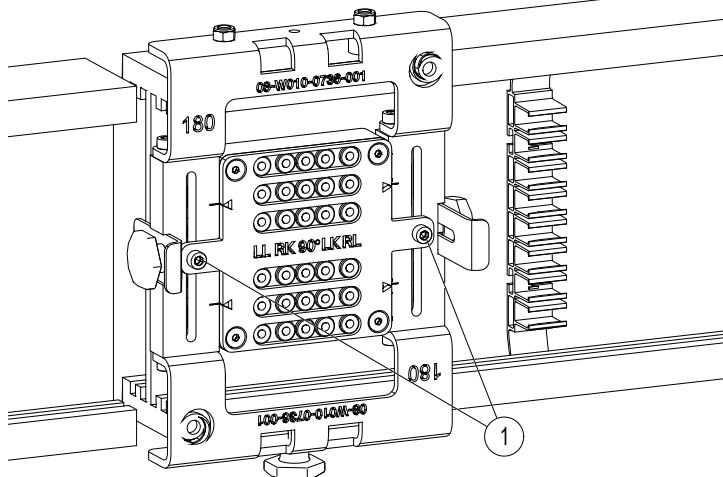


Fig. 37: Loosen the outer holes on the drill bushing block

- Push the drill bushing block upwards so that the upper row of drill bushings on the lower bushings is centered on the center line of the conductor rail. This results in a dimension of 56 mm (see Fig. 38)

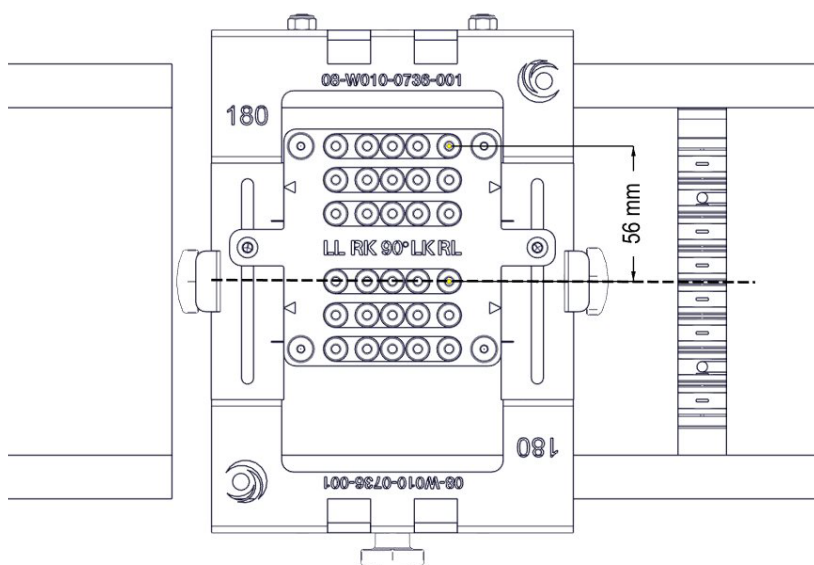


Fig. 38: Align the drill bushing block

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→ Tighten the outer cylinder screws and drill the first hole (see Fig. 39).

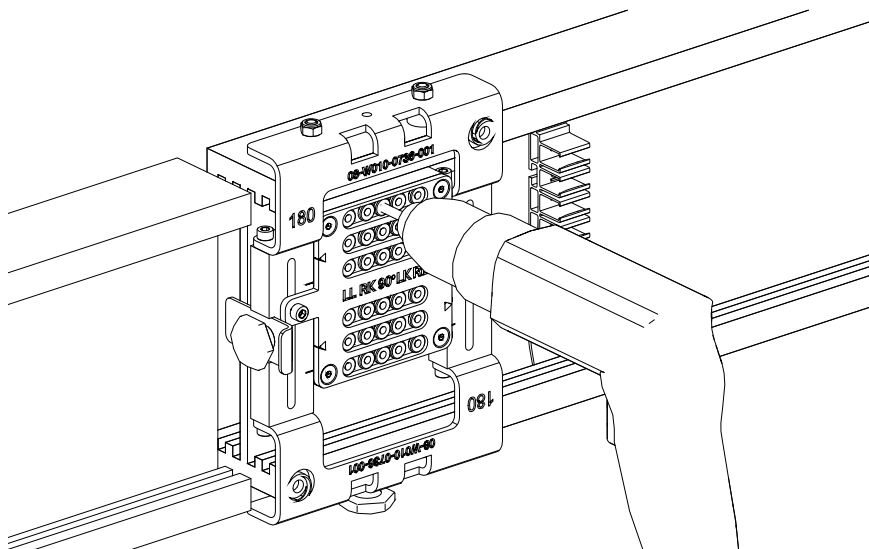


Fig. 39: Drill the first hole

→ Loosen the outer cylinder screws again.

→ Push the drill bushing block down so that the lower row of the upper bushings is centered on the center line of the conductor rail. This results in a dimension of 56 mm (see Fig. 40)

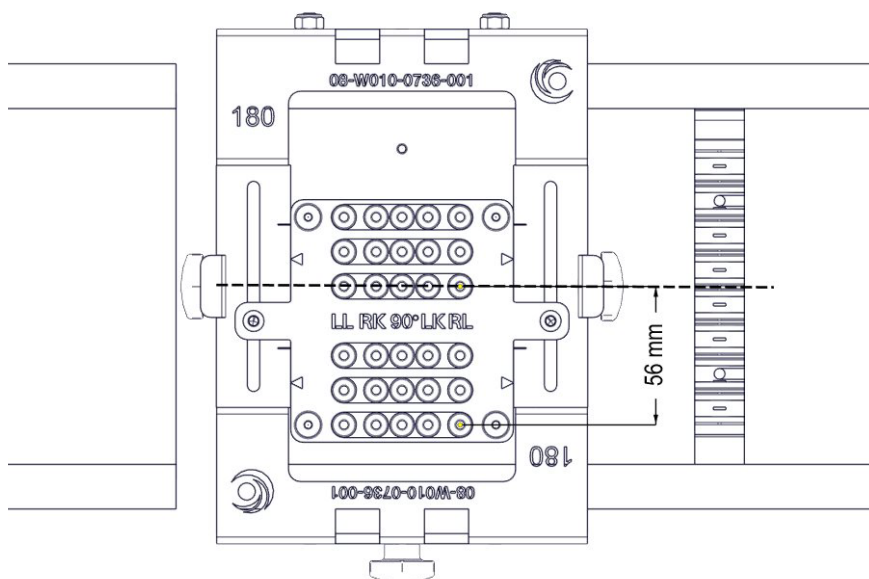


Fig. 40: Align the drill bushing block

→ Tighten the outer cylinder screws and drill the second hole (see Fig. 41).

Installation Instructions



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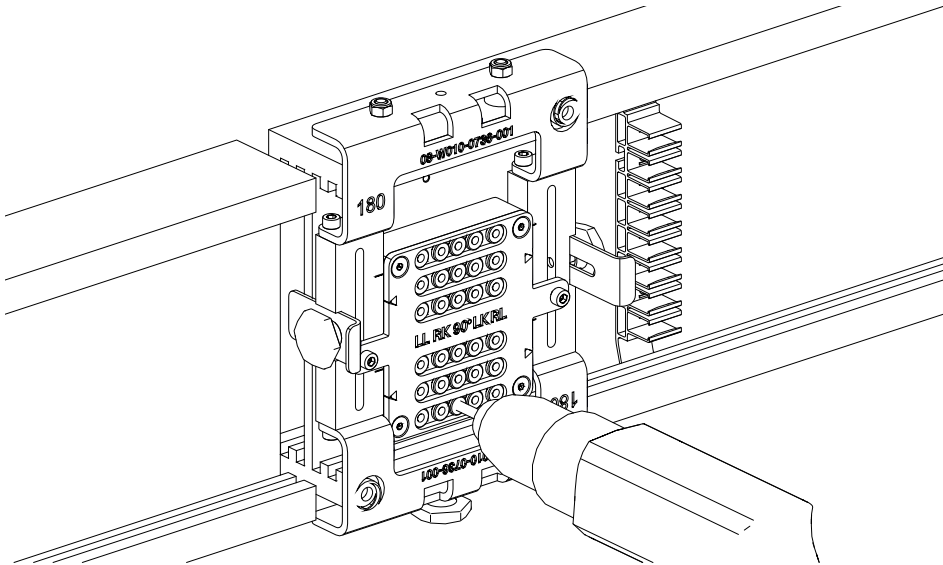


Fig. 41: Drill the second hole

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3.2 Installing ProEMS End Caps for Transitions

End caps for transitions are used for mechanical and electrical breaks at switches and lifting stations. They are available with or without infeed, whereby the crimping cable lug is designed for max. 6 mm².

After installation of the installation plate for the transition caps, the end caps (with or without infeed) are installed.

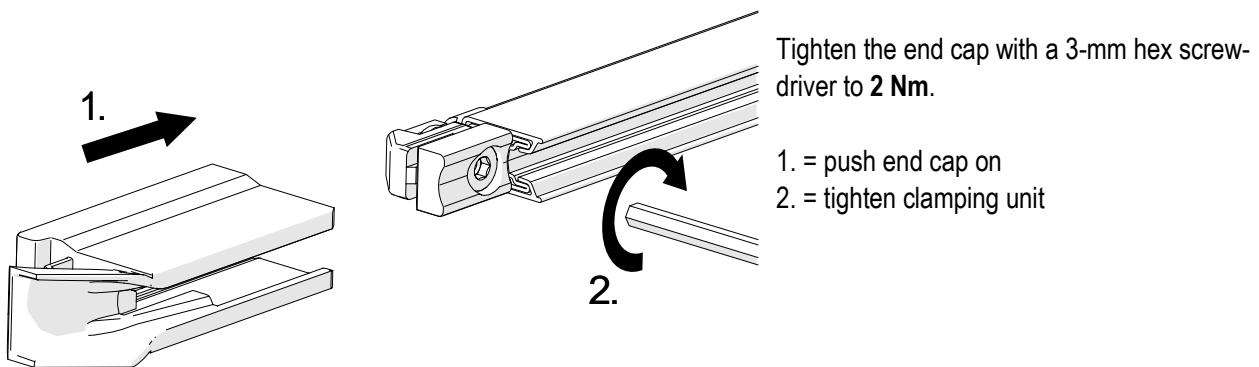


Fig. 42: Installing the end cap

→ Put the clamping unit onto the end of the rail. Possibly loosen the clamping screw somewhat, push the end cap onto the clamping part, push the conductor rail up to the stop and tighten to 2 Nm.



Ensure the correct positioning of the clamping unit!

Push the clamping unit of the end cap into the conductor rail such the contact part sits in the interior of the conductor rail and the clamping part engages between the conductor rail and the rear insulation (see Fig. 43 and Fig. 44).

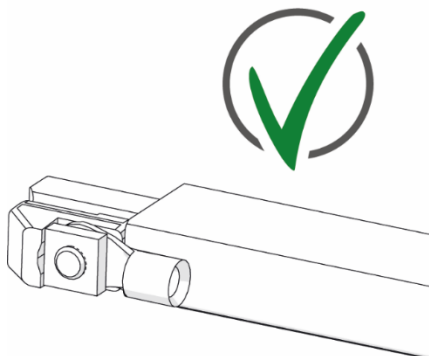


Fig. 43: Correct position of the clamping unit

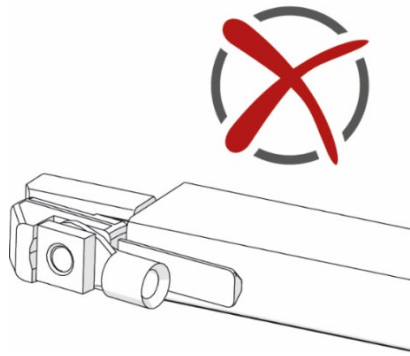


Fig. 44: Incorrect position of the clamping unit

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- Hook the end cap into the installation plate and repeat the procedure for the other poles. It is recommended that the conductor rail not yet be mounted in the adjacent hanger clamp.

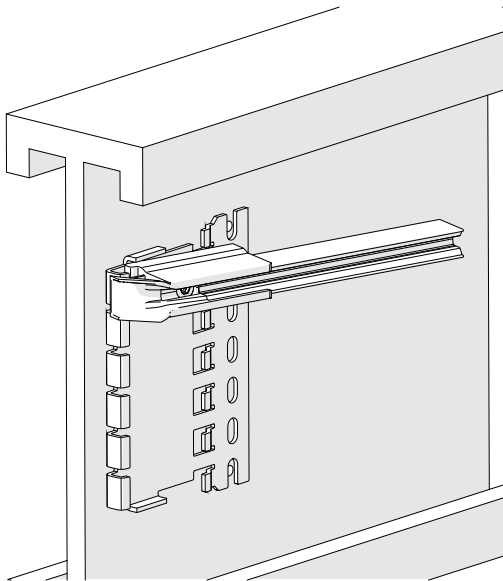


Fig. 45: Hooking the conductor rail in place

- After fitting both sides of the transition, check the functioning of the transition in all end positions of the switches or lifters.
- When checking switches and lifters, the end caps must not collide and the specified gap dimensions must not be exceeded. Manually pass a current collector through the end cap and conductor rail of each pole. The current collector must slide through the end caps into the conductor rails without jamming.



WARNING!

Make sure that switches and lifters are correctly adjusted!

Make sure that switches and lifters are correctly adjusted (end position and no vertical or lateral offset between guide profiles). If the guideway profile is offset, have the switch/lifter adjusted by the system engineer and repeat the test.

During commissioning, this test must be repeated under load (hanger with payload) to rule out the settling of switches under load.



NOTE!

For the inner arcs of switches, the installation plate must first be snapped onto the end caps and then bolted to the guideway profile!

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To ensure proper functioning of the energy transmission in the area of a switch or a jack, it must be ensured that the distance (A) between the opposing end caps is set so that no contact can occur between the two sides when the switch or the jack is moved. Contact between the opposing end caps will impair energy transfer. Conductix-Wampfler tolerates a maximum end cap gap of 5 mm. In the case of angled cuts, the gap dimension of 5 mm can be increased to up to 10 mm. In order not to impair the function of the energy transmission system, the tolerance dimension B must be set to max. 0 to -1 mm and the tolerance dimension C to ± 1 mm (see Fig. 46).

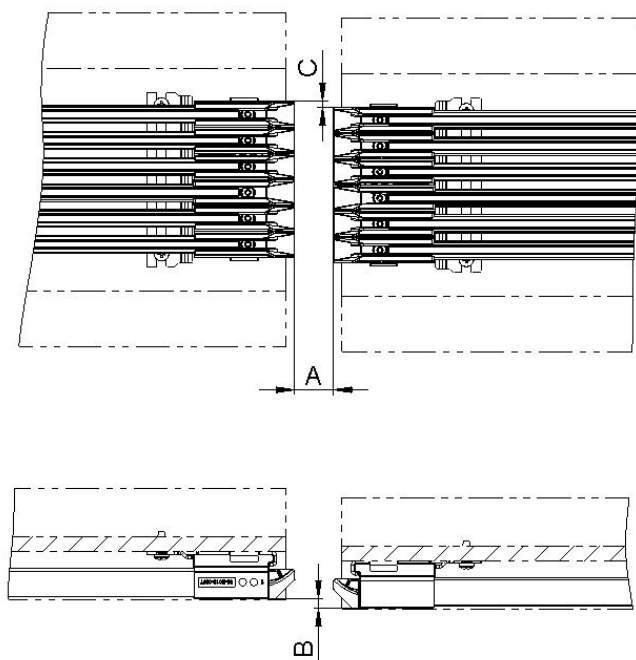


Fig. 46: Maximum offset for a transition

A	max. 10 mm
B	± 5 mm
C	± 3 mm

Use of a drilling jig for transitions

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4 Further Documents

Serial No.	Document number	Document name
01	WV0800-0001	Cleaning of conductor rails
02	WV0800-0002	Conductor rail maintenance plan
03	MV0815-0005	Expansion module and expansion element
04	MV0815-0012	Brief instructions for Conductor Rail System SingleFlexLine 0815
05	BAL0815-0001	Carbon-brush sensor unit
06	BAL0815-0002	SingleFlexLine
07	BAL0800-0004	Bending device for product ranges 0811 and 0815

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