Installation Instructions

Anchor point, Hanger Clamp and Fall Arrest Device for vertical Applications

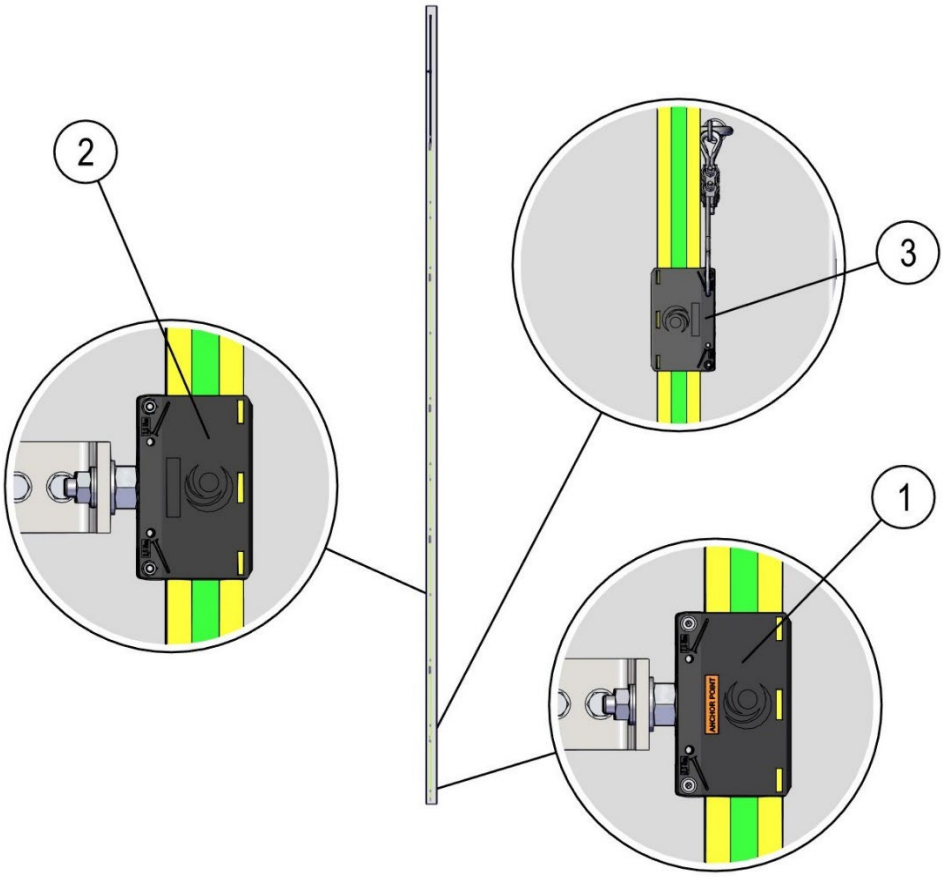
Program 0813

Order Number:

Anchor Point (Item 1): 081332-2

Hanger Clamp (Item 2): 081347-02

Fall Arrest Device (Item 3): 0813-FALL-X#



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1 Introduction

This document describes the installation of the anchor points, hanger clamps and fall arrest device for the Conductor Rail Program 0813 in vertical or angled applications. Vertical application means that the entire conductor rail system is vertically aligned, i.e., vertical design at 90°. Angled means an alignment between 0° and 90° (see Fig. 1).
Vertical applications are used, for example, in (temporary) load elevators on construction sites, in (temporary) cranes, for example, in bridge construction or also in mountain cableways/cable cars.

DANGER!

Danger of electric shock or fire!

Conductor rail components and current collector components can break open due to material fatigue, external forces, faulty design or assembly, etc. and live parts can be exposed and/or hang down.

→ To reduce risk, especially for installations at heights, Conductix-Wampfler recommends the use of fall arrest device or other measures that prevent parts from falling.

DANGER!

Danger of parts falling from above!

Conductor rail components and current collector components can fall due to material fatigue, external forces, faulty design or assembly, etc. and can cause personal injury and/or damage to property.

→ To reduce risk, especially for installations at heights, Conductix-Wampfler recommends the use of fall arrest device or other measures that prevent parts from falling.

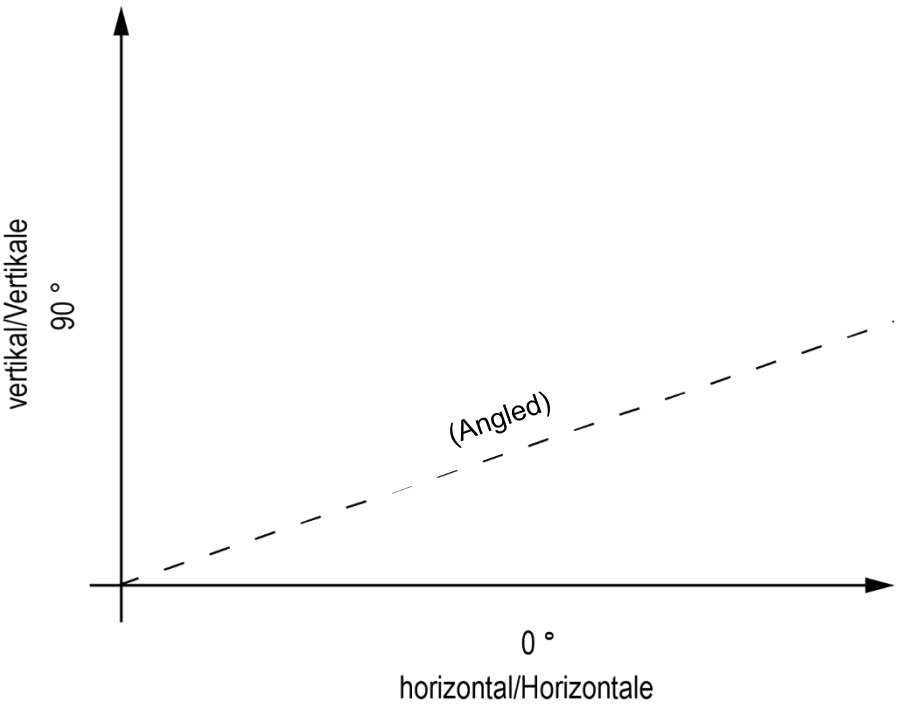

Fig. 1: Vertical, horizontal and angled alignment of the system

2 Safety

Please read and observe the General Safety Instructions in the Operating Instructions for the Conductor Rail System 0813 (BAL0812-0007) in addition to the instructions specified here!

DANGER!

Risk of death due to electrical shock!

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

DANGER!

Risk of injury due to ensnarement or impact!

Ensnarement and/or impact with moving conductor rails or current collectors connected to the machine and other components must be prevented.

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

WARNING!

Secure components against falling!

Possible falling components must be determined in the customer analysis as part of the operator's risk and hazard analysis.

- → The operator must take appropriate measures

Risk of components being damaged and losing functionality due to environmental influences!

Environmental influences (gases, substances, liquids, radiation, etc.) can damage components, particularly the plastic parts. E.g. hanger clamps can break and the conductor rail system can collapse.

→ Examine the influencing factors of temperature, exposure time, concentration and interactions

DANGER!

→ Use in chemical works, galvanizing plants, electroplating plants, composting plants or in warehouses or installations where chemical substances (e.g. aromatics, benzene) are stored or processed must be verified in advance by Conductix-Wampfler.

The durability of plastic parts is critical when in contact with oils, greases or various cleaning agents.

Major temperature variations can cause large expansions in the conductor rail system, particularly for long systems. E.g. hanger clamps can break and the conductor rail system can collapse.

The system must be designed and operated keeping in mind the ambient conditions and permissible operating conditions!

DANGER!

Fire hazard due to sparking!

Highly flammable dusts, substances or gases in the vicinity of the conductor rail can be ignited by sparks! These substances must not be present in the vicinity of the conductor rail.

DANGER!

Hazard due to energy storage!

If consumers with energy storage are supplied via the conductor rail, these must be disconnected from the conductor rail or the energy-storage system must be discharged according to the manufacturer's specifications before starting work and the system must be checked for the absence of voltage.

3 Product Description

3.1 System arrangement

When the Conductor Rail Program 0813 is used vertically or at an angle, the complete length of the conductor rail is divided into segments. Each segment is supported by an anchor point (Item 2). The anchor point is mounted at a distance of ≤ 250 mm from the end cap (see Fig. 2).
The hanger clamps (Item 3) are positioned at a distance of ≤ 2,500 mm (see Fig. 3 and Fig. 4). The phase offset (“a”) is equal to the horizontal application (see Fig. 5).

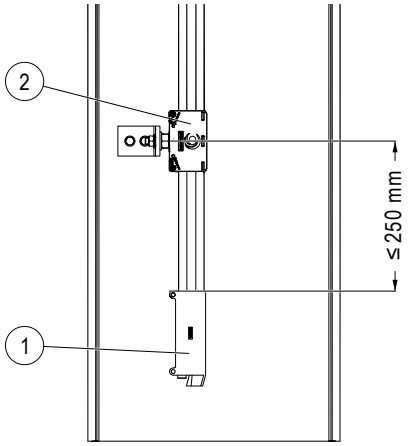

Fig. 2: Measurement from end cap to anchor point

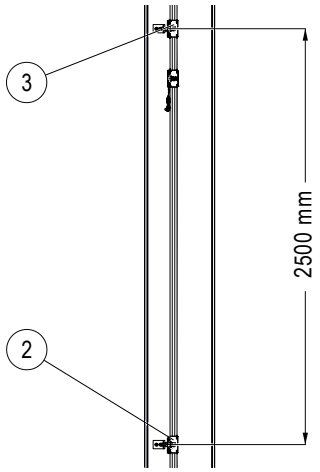

Fig. 3: Measurement from anchor point to hanger clamp

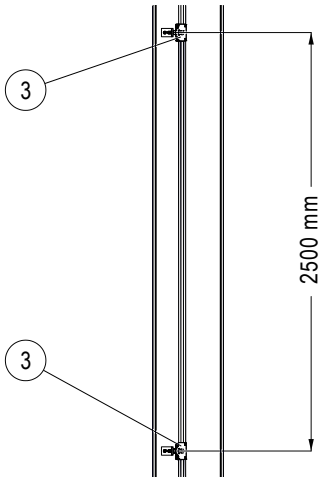

Fig. 4: Measurement from hanger clamp to hanger clamp

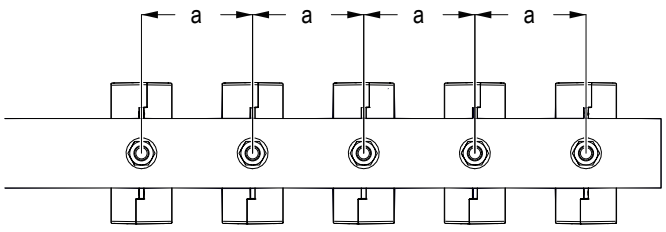

Fig. 5: Phase offset hanger clamp/anchor point

Item	Name
1	End Cap
2	Anchor point
3	Hanger clamp
a	80 mm (with offset arrangement of the current collector, 70 mm)

NOTE!

For vertical segment lengths ≥ 70 m, Conductix-Wampfler GmbH must be consulted due to the risk of system failure.

3.2 Description of components

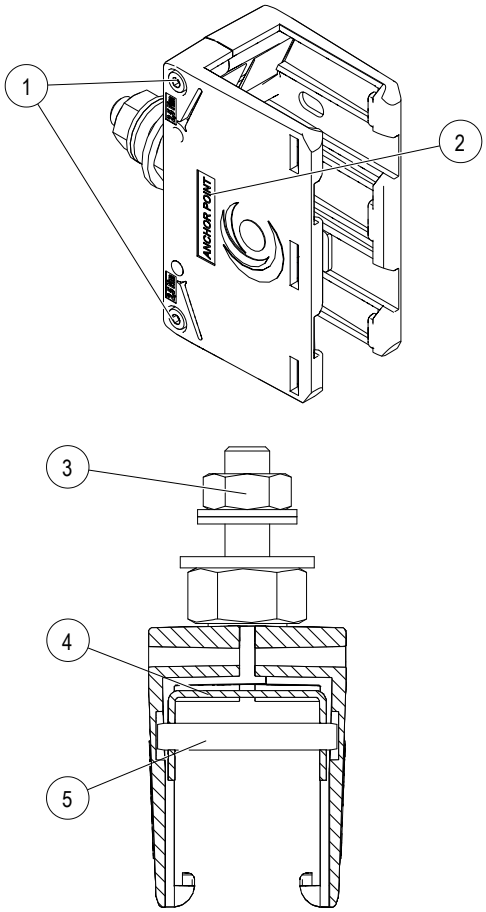

Fig. 6: Anchor point 0813 for vertical applications

- **Anchor point 0813 for vertical applications (Part no.: 081332-2)**

The anchor point for vertical use typically fastens the conductor rail at the beginning or end of the segment so that the conductor rail can freely expand from this point.
Affixing is done with a bolt (Item 5), which is inserted through the U-plate (Item 4) and the conductor rail.
The U-plate (Item 4) serves as a drilling template for the required through-hole in the conductor rail.
The anchor point 0813 for vertical application consists of two housing halves that are screwed together with M4 cylinder screws (Item 1) The torque specification (2.5 Nm) is also located on the housing halves.
To avoid confusion with the vertical hanger clamp, two “Anchor Point” stickers (Item 2) are placed on both halves of the housing (Item 2).
The vertical anchor point is bolted to the bracket (e.g. an angle plate as outrigger) of the customer’s supporting structure using the M10 hexagonal nut (Item 3) (see Fig. 6).

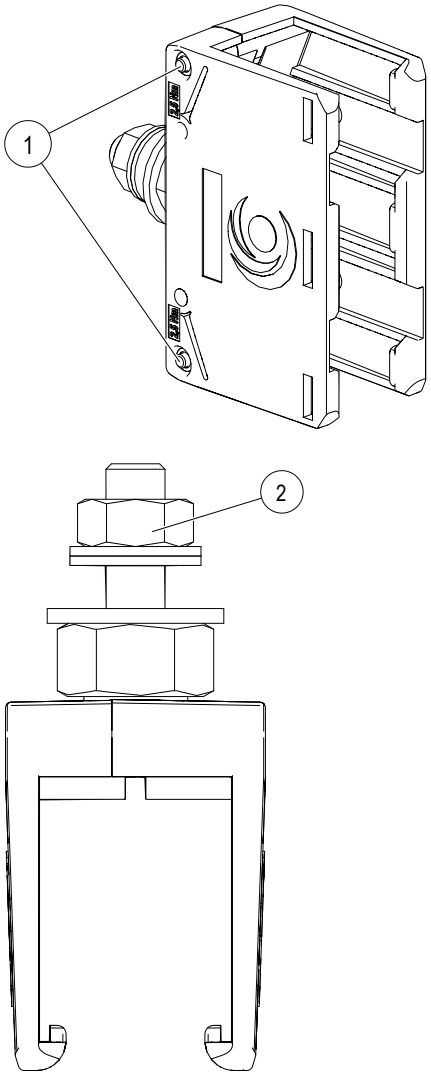

Fig. 7: Hanger clamp 0813 for vertical applications

- **Hanger clamp 0813 for vertical applications (Part no.: 081347-02)**

The hanger clamp for vertical applications serves to support and guide the conductor rails of the 0813 program.
It consists of two housing halves that are screwed together with M4 cylinder screws (Item 1). The torque specification (2.5 Nm) is also located on the housing halves.
The hanger clamp is fixed to the customer's supporting structure (for example an angle plate as an outrigger) with the help of the M10 hexagonal nut (Item 2) (see Fig. 7).

Anchor point, Hanger Clamp and Fall Arrest Device for vertical Applications

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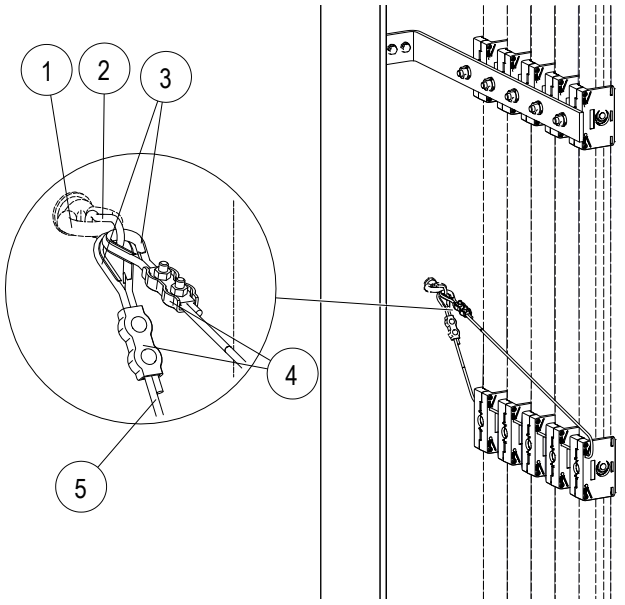

Fig. 8: Fall arrest device 0813

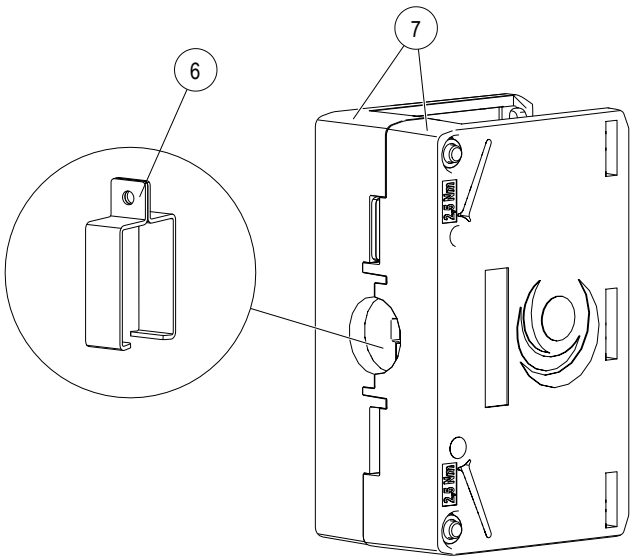

Fig. 9: Retaining plate of the fall arrest device

- **Fall arrest device 0813 for vertical applications (Part no.: 0813-FALL-X#)**

The fall arrest device 0813 for vertical arrangement is installed on every other rail. It has the task of securing the conductor rail against falling in the event of a failure in the fastening.

The Fall arrest device 0813 consists of two retaining plate halves (Item 6) and two housing halves. A torque of 2.5 Nm is to be used with the cylinder screws M4 for the housing halves.

The supplied safety rope (Item 5) is threaded through a hole in the side of the housing halves (Item 7) and the retaining plates (Item 6). The safety rope (Item 5) is attached to rope thimbles (Item 3) via rope clips (Item 4), which are hooked into a snap hook (Item 2).

The snap hook (Item 2) is then hooked into a suitable secure fastening point for the safety rope (e.g. eyebolt) (Item 1) on the customer's supporting structure (see Fig. 8).

The rope clamp (Item 4) and rope thimble (Item 3) are already pre-mounted at one end of the safety rope (Item 5) (see Fig. 8 and Fig. 9).

4 Installation

4.1 Required tools

- Rubber mallet
- Open-end wrench SW17
- Open-end wrench SW24
- Hexagonal screwdriver SW3
- Torque wrench in measurement range 2.5 Nm - 14 Nm (bit SW 3, socket 17)
- Pen (e.g. red or white)
- Drill Ø 6.1 mm
- Wire brush or similar
- Ratchet

4.2 Mounting the hanger clamp and anchor point

NOTE!

The maximum tightening torques of 14 Nm for the M10 hexagonal nut and 2.5 Nm for the screw connection of the housing halves must not be exceeded.
If the tightening torque is too high, it will damage the hanger clamp and anchor point.

NOTE!

The hanger clamp fastening must be adapted to the respective application!
The fastening elements are designed for standard fastening applications. For safety-critical fastenings, special on-site interfaces (e.g. deviating through-hole geometry or other restrictions affecting the fastening) and/or increased requirements (e.g. vibration), the fastening must be adapted to the respective application (e.g. by means of additional screw locking with Loctite 242). The operator is responsible for the evaluation.

NOTE!

The side bolt fundamentally contributes to the function of the anchor point!

→ So that the bolt cannot be lost during assembly, both the drilling of the conductor rail and the mounting must be carried out on the ground.

→ The bolts and plate must not be forgotten because it is not possible to check if the bolts and U-plate have been mounted once in the completely installed state.

An anchor point always sits at the beginning of the segment.

Since the anchor point and conductor rail are mounted on the floor, at least 2 specialists should be present to hang the conductor rail in the hanger clamps.

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Requirement:
The outrigger of the customer-specific support structure (e.g. angle plate) is mounted at the appropriate distance (note project-specific documentation).

Work steps:

Mounting the hanger clamp:

→ Loosen the upper screw connection of the hanger clamp, consisting of a washer (Item 2), wedge lock washer (Item 3) and M10 hexagonal nut (Item 1) with an open-end wrench SW 17 (see Fig. 10).

→ Guide the hanger clamp (Item 7) into the corresponding hole of the customer's supporting structure and tighten the screw connection (Item 1, Item 2 and Item 3 in Fig. 12 to Fig. 13) with the prescribed torque (SW 17, torque wrench: **14 Nm**). Use the open-end wrench SW 24 to counter-lock the spacer (Item 5). Ensure that the screw heads of the cylinder screws (Item 6) face outward, i.e., they are turned away from the customer's support structure.

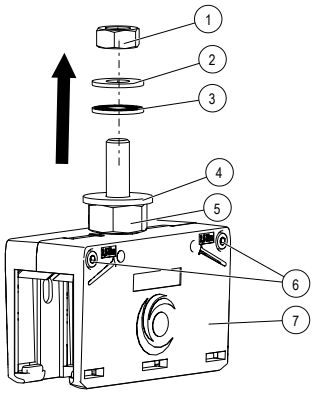

Fig. 10: Loosen upper screw connection of hanger clamp.

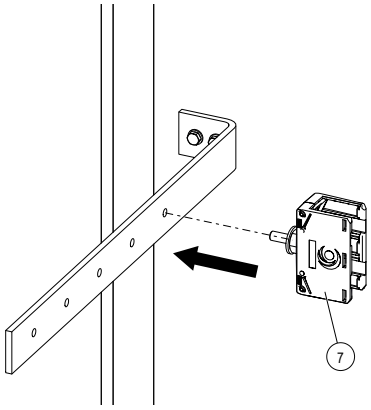

Fig. 11: Insert hanger clamp into angle plate.

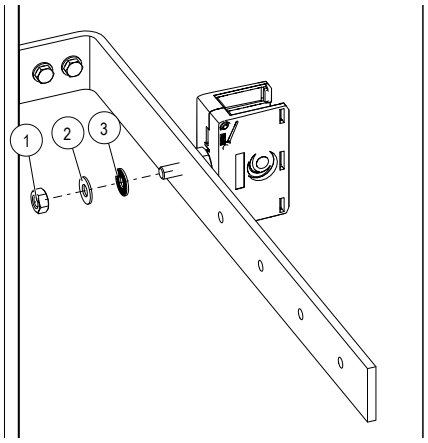

Fig. 12: Screw hanger clamp on.

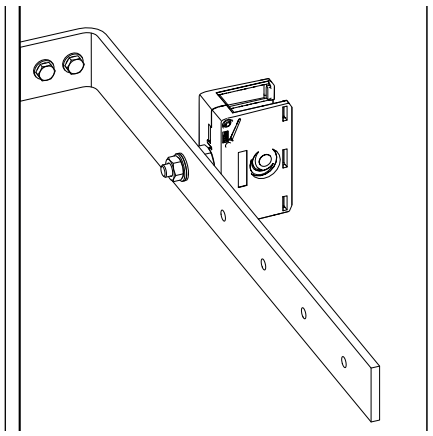

Fig. 13: The hanger clamp is mounted.

Anchor point, Hanger Clamp and Fall Arrest Device for vertical Applications

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Mounting the anchor point:

→ Drive the end cap (Item 1) onto the end of the conductor rail with careful, light hammer blows (see Fig. 14). Make sure that the busbar is correctly seated in the end cap (see Fig. 16).

→ Do not yet mount the cylinder screws DIN912-M6x35 (Item 2) and the ribbed inserts (Item 3).

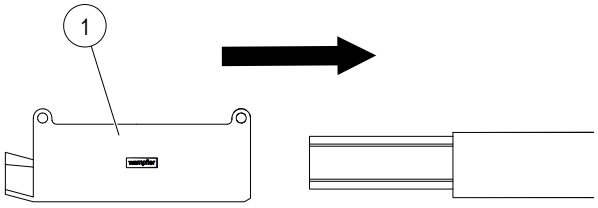


Fig. 14: Push end cap (Item 1) onto conductor rail.

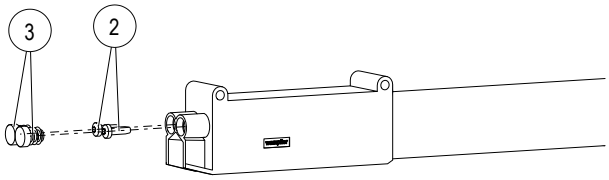


Fig. 15: Cylinder screw (Item 2) and ribbed insert (Item 3) of the end cap

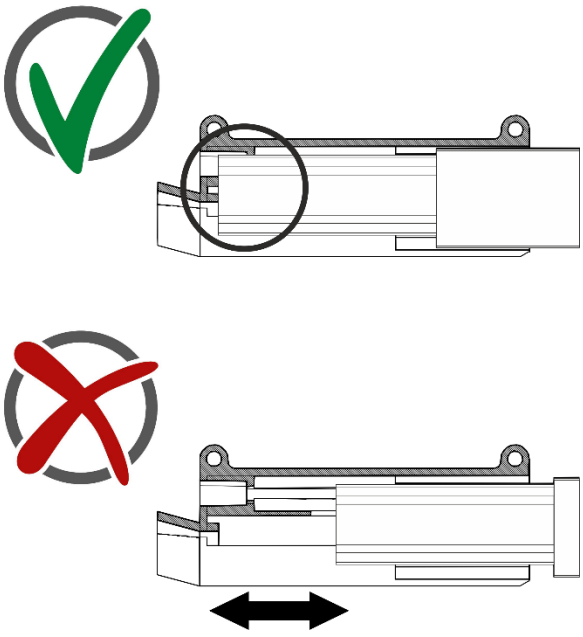


Fig. 16: End cap is mounted correctly (top). End cap is mounted incorrectly (bottom).

→ Measure 250 mm from the rear edge of the end cap (Item 1) on the insulating profile and mark the dimension with a pen (e.g. red or white) (see Fig. 17).

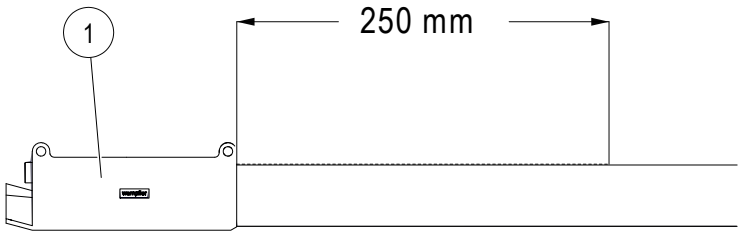


Fig. 17: Measure distance for anchor point hole.

→ Center the hole of the U-plate (Item 5) on the marked position of the conductor rail (see Fig. 18).

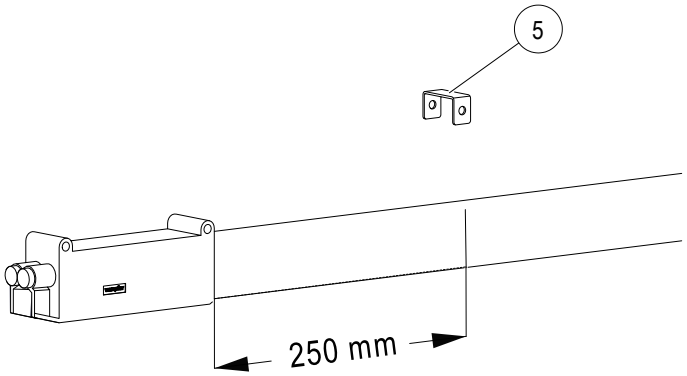


Fig. 18: Push U-plate (Item 5) onto conductor rail.

→ Using a drill Ø 6.1 mm, drill the through-hole for the bolt of the anchor point from both sides (see Fig. 19 and Fig. 20).

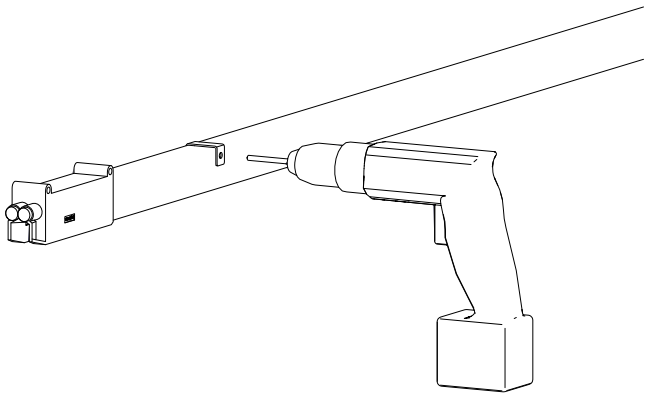


Fig. 19: Drill through-hole

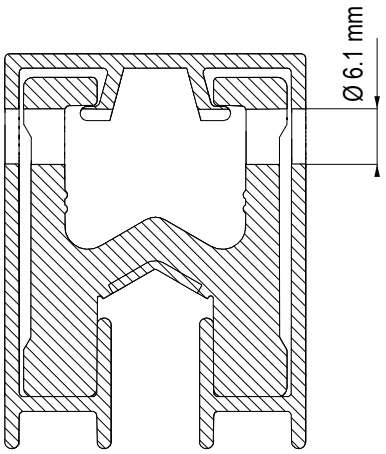


Fig. 20: Through-hole for anchor point bolt

→ Pull the insulating profile (Item 4) out of the end cap (Item 1) (see Fig. 21) until the hole in the conductor rail is exposed (see Fig. 22).

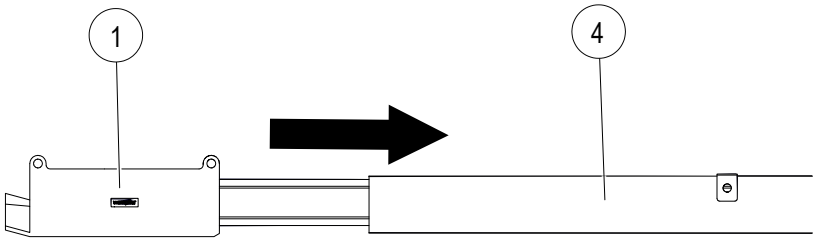


Fig. 21: Push the insulating profile (Item 4) out of the end cap (Item 1).

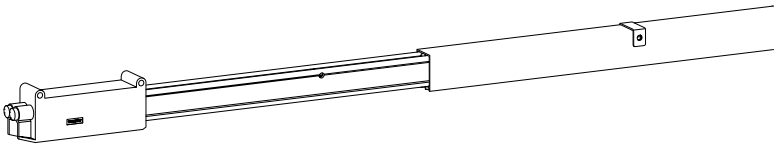


Fig. 22: The conductor rail hole is exposed.

→ Deburr the conductor rail holes from the inside with a wire brush or similar and remove the remaining chips from the conductor rail.

→ Push the insulating profile (Item 4) back in up to the stop of the end cap (Item 1) (see Fig. 23 and Fig. 15) and tighten the cylinder screw DIN912-M6x35 (Item 2) of the end cap with an Allen key SW 5 and put the ribbed insert over the cylinder screw (see Fig. 24).
Caution: The positions of the holes (insulating profile and conductor rail) must be aligned with each other.

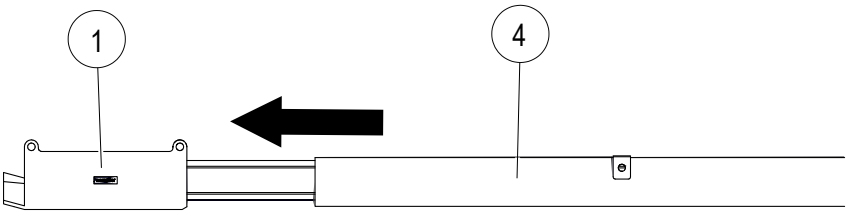


Fig. 23: Push the insulating profile (Item 4) in the end cap again (Item 1).

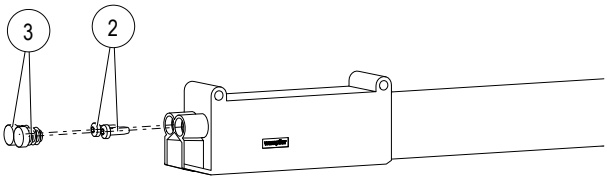


Fig. 24: Cylinder screw (Item 2) and ribbed insert (Item 3) in the end cap

Refer to BAL0813-0007 for further information on how to mount the end cap.

→ Push the anchor point bolt (Item 6) into the through hole and the U-plate (Item 5) (see Fig. 25).

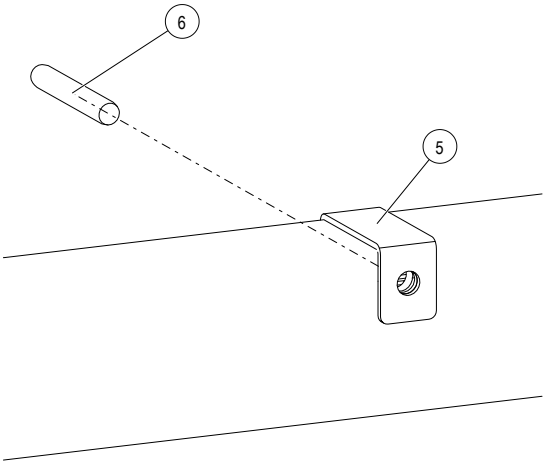


Fig. 25: Push the bolt (Item 6) into the through hole.

→ Hang the two loosely mounted housing halves over the conductor rail via the mounted U-plate with bolts (see Fig. 26). Ensure that the anchor point completely encases the insulating profile (see Fig. 28).

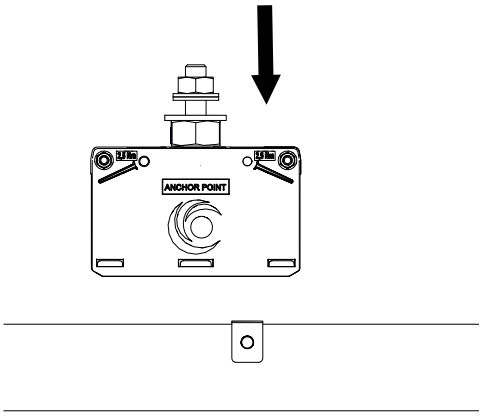


Fig. 26: The U-plate of the fixed point is off-center

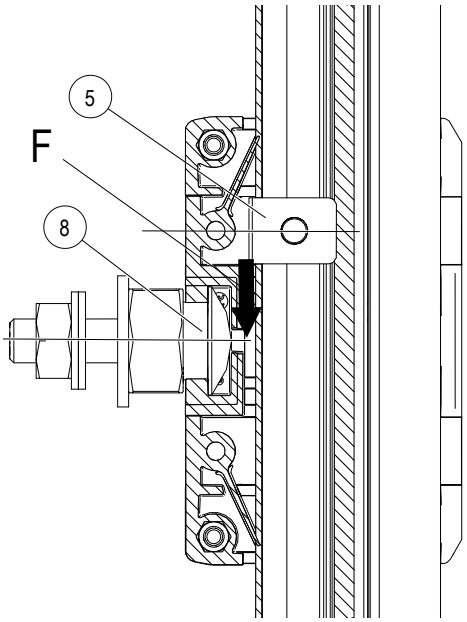


Fig. 27: The U-plate (pos. 5) is located above the carriage bolt (pos. 8); F = Force

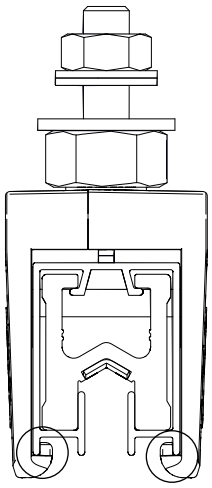


Fig. 28: Anchor point completely encases the insulating profile

→ Tighten the pre-mounted M4x40 cylinder screws (Item 7) to the prescribed torque (SW 3, torque: **2.5 Nm**) (see Fig. 29).

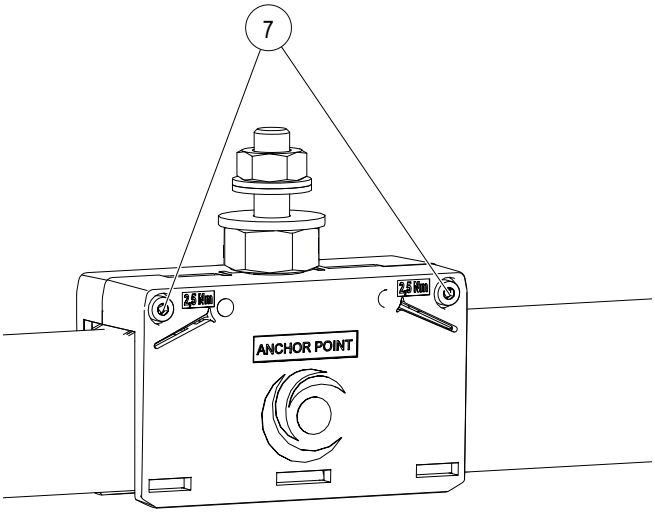


Fig. 29: Tighten the cylinder screws (Item 7) of the fixed point.

→ Loosen the screw connection of the anchor point with the M10 hexagonal nut (Item 10) (see Fig. 30).

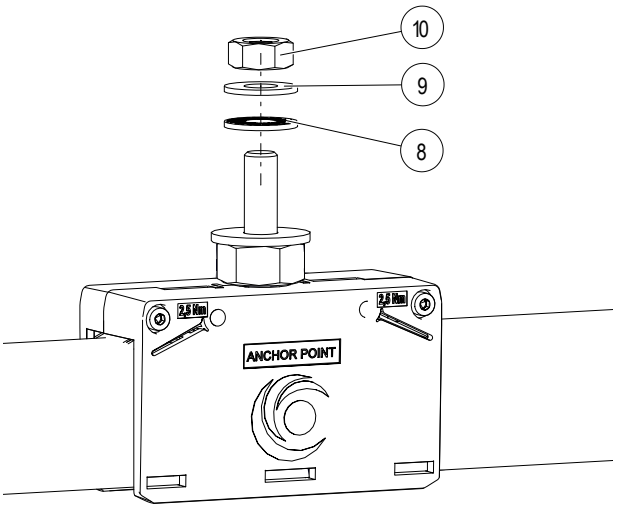


Fig. 30: Loosen the M10 hexagonal nut (item 10) of the anchor point.

→ Mount the anchor point, including the suspended conductor rail onto the outrigger of the customer's support structure (e.g. angle plate) (see Fig. 31). To do this, tighten the M10 hexagonal nut (Item 10) to the prescribed torque (SW 17, torque: **14 Nm**) (see Fig. 32 and Fig. 33). Use the open-end wrench SW 24 to counter-lock the spacer. Ensure that the screw heads of the cylinder screws (Item 7 in Fig. 29) face outward, i.e., they are turned away from the customer's support structure.

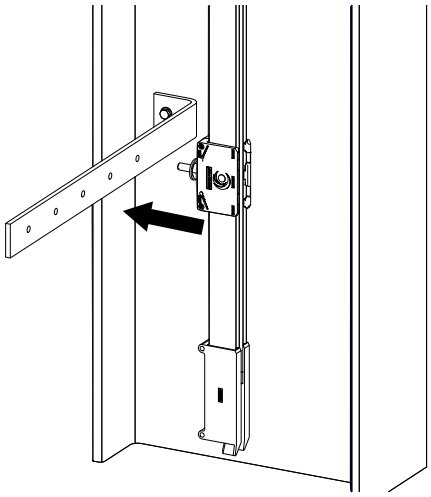


Fig. 31: Mount anchor point including conductor rail.

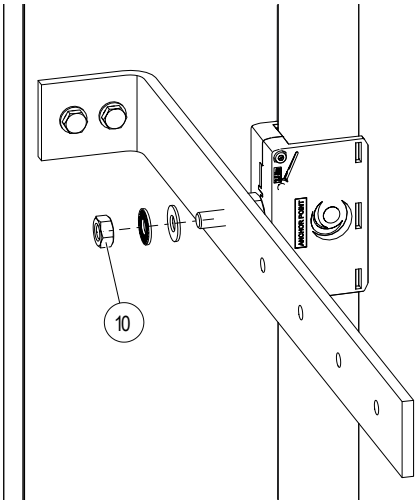


Fig. 32: Tighten the M10 hexagonal nut (Item 10).

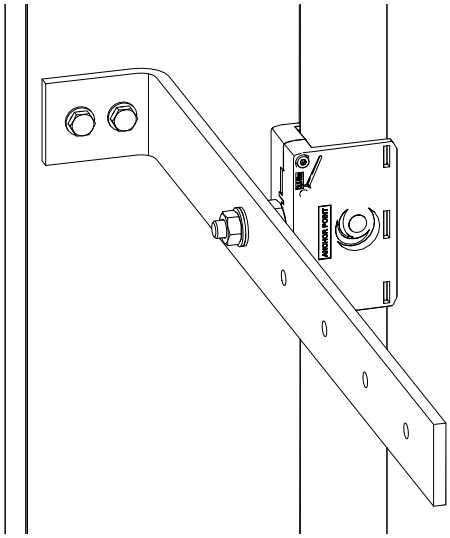


Fig. 33: Mounted anchor point

→ Hook the conductor rail (Item 4) into the already mounted hanger claps (see Fig. 34) and tighten the loosely mounted M4x40 cylinder screws (Item 13) of the two hanger clamp housing halves with the prescribed torque (SW 4, torque: **2.5 Nm**) (see Fig. 35). When hanging, ensure that the conductor rail is completely suspended in the hanger clamp (see Fig. 36).

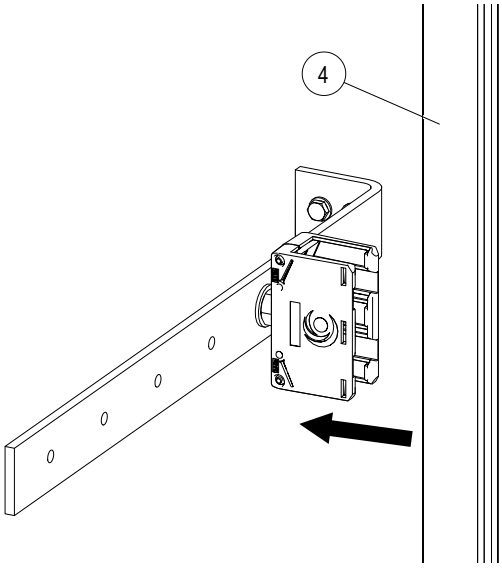


Fig. 34: Hang conductor rail in hanger clamp.

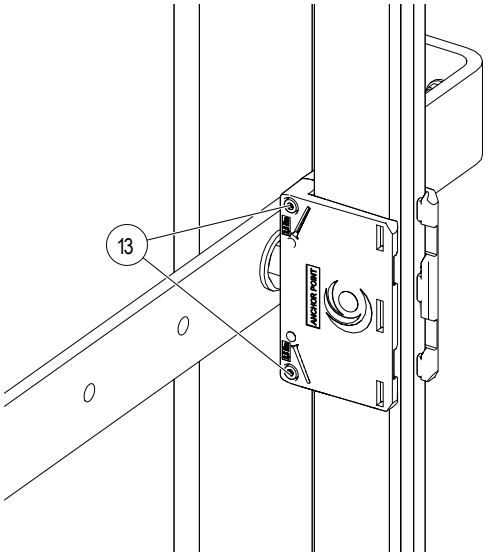


Fig. 35: Tighten the cylinder screws of the hanger clamp (Item 13).

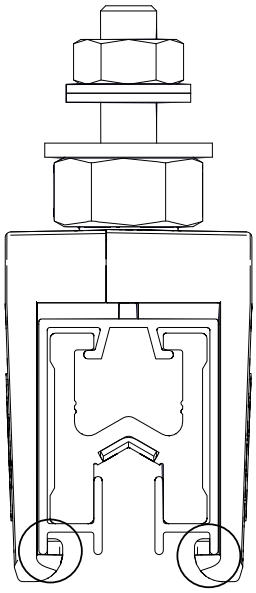


Fig. 36. The hanger clamp completely encases the insulating profile.

→ Mount all hanger clamps and anchor points on the other poles in the same way.

Since the M4x40 cylinder screws of the two hanger clamp housing halves can only be tightened when the conductor rail is suspended, the hanger clamps must first be completely mounted per pole. Otherwise, there is no or only more difficult access to the cylinder screws.
The fall arrest device must be mounted pole by pole, otherwise access to the M4x40 cylinder screws will be difficult (see chapter 4.3).

Use the QR code (“click” or “scan”) to see our animation:
Mount hanger clamp/anchor point.

4.3 Mounting the fall arrest device

The fall arrest device is mounted on every other rail. These are always between the last two hanger clamps of the second rail (see also Fig. 43 and Fig. 44 in section 5)
The fall arrest device must not be fitted between the rail holder and the end cap, as the fall arrest device can slide down the length of the rail here.
The safety cable of the fall arrest device must always be slightly pre-tensioned so that in the event of failure, no further acceleration forces are added to the system. The attachment option on the support profile of the fall arrest device must be located above the housing halves of the fall arrest device.

Requirement:
The conductor rails are suspended in the hanger clamps. Suitable secure fastening options for the securing rope (e.g. eyebolt) are mounted on every other rail in the customer's support structure (note project-specific documentation).

Required tools:

- Ratchet
- Torque wrench in a measurement range 2.5 Nm (bit SW 4)

Work steps:

→ Clamp the retaining plate halves (Item 1) of the fall arrest device over the insulating profile. Hold the retaining plate halves with one hand, and hang the housing halves in the direction of the arrow (Item 2) (see Fig. 37 and Fig. 38) with the other hand. Ensure that the screw heads of the cylinder screws face outward, i.e., they are turned away from the customer's support structure.

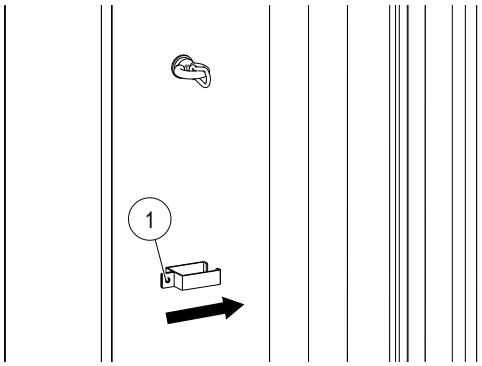


Fig. 37: Clip the retaining plate (Item 1) of the fall arrest device into the rail.

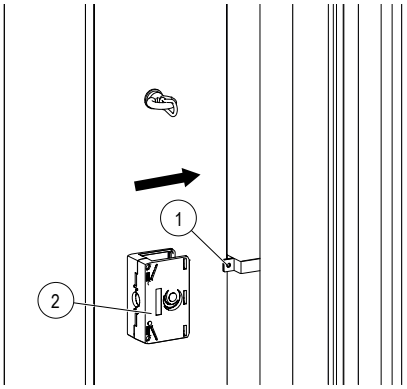


Fig. 38: Hang the housing halves (Item 2).

→ Tighten the pre-mounted M4x40 cylinder screws (Item 3) of the housing halves to the prescribed torque (SW 3, torque: **2.5 Nm**) (see Fig. 39). **IMPORTANT:** The fall arrest device must be mounted pole by pole, otherwise access to the M4x40 cylinder screws will be difficult.

→ Mount the housing halves on all other conductor rail poles (see Fig. 40).

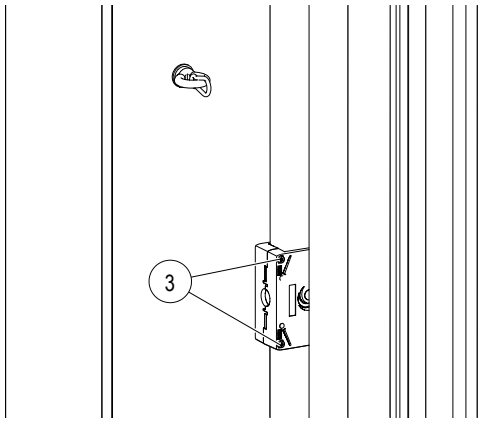


Fig. 39: Tighten the M4x40 cylinder nut (Item 3).

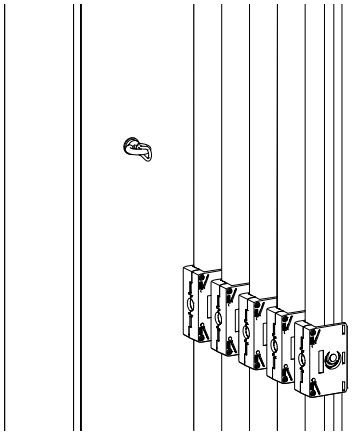


Fig. 40: The housing halves of the fall arrest device are mounted on all poles.

→ Thread the safety rope (Item 4) through the side holes in the housing halves and the retaining plates (see Fig. 41). Rope clamp (Item 5) and rope thimble (Item 6) are already pre-mounted at one end of the rope.

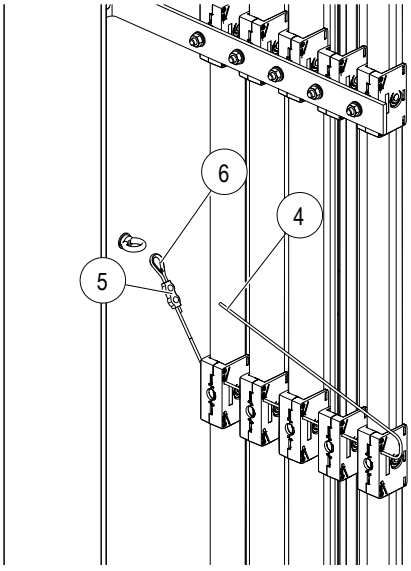


Fig. 41: Thread the safety rope (Item 4) through the fall arrest device.

→ Mount the rope clamp (Item 5) using a ratchet (tighten the hexagonal nuts of the rope clamps) and pull the rope thimbles (Item 6) into the loops (see Fig. 42).

→ Hook the rope thimbles into the snap hooks (Item 7) (see Fig. 43).

→ Hook the snap hook (Item 7) into the suitable secure fastening options (e.g. eyebolt) for the safety rope (Item 4) (see Fig. 43).

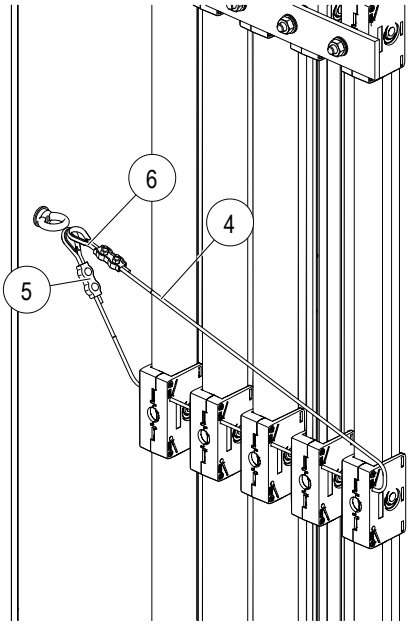


Fig. 42: Fasten the rope thimble (Item 6).

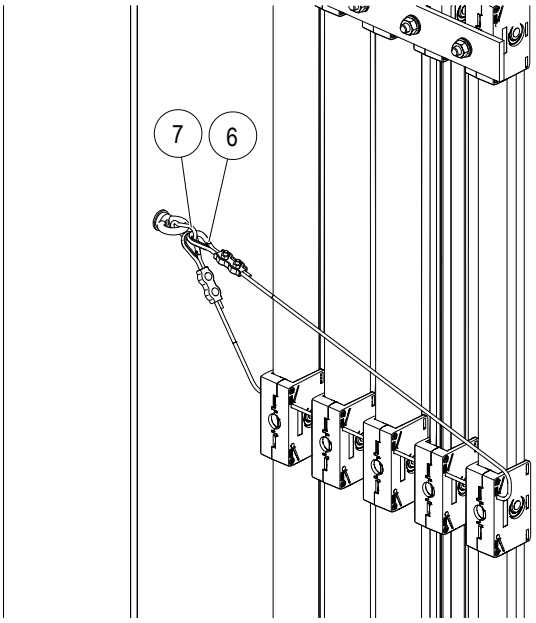


Fig. 43: Hook the rope thimble into the snap hook (Item 7).

The fall arrest device can still be moved on the conductor rail after mounting!
This is useful so that the fall arrest device can always be attached between two hanger clamps or between the hanger clamp and the connector (not between the hanger clamp and the end cap).

Use the QR code (“click” or “scan”) to see our animation:
Mount fall arrest device.

5 Segmentation and system limits

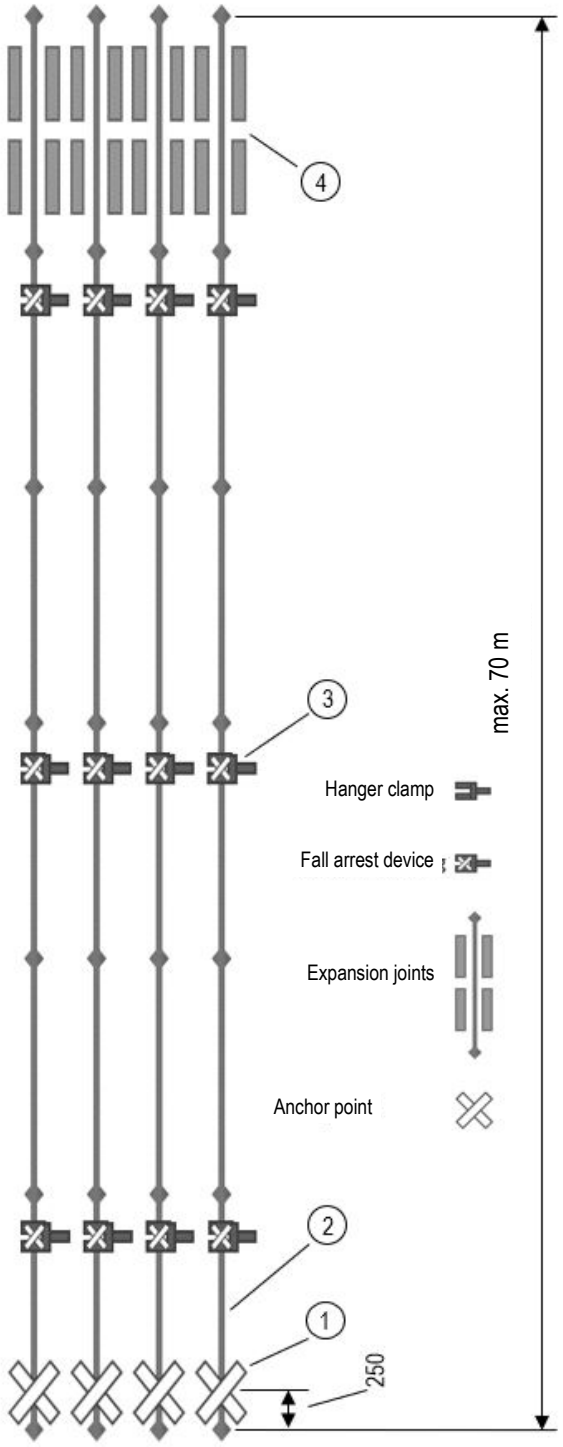


Fig. 44: Vertical conductor rail system segmentation

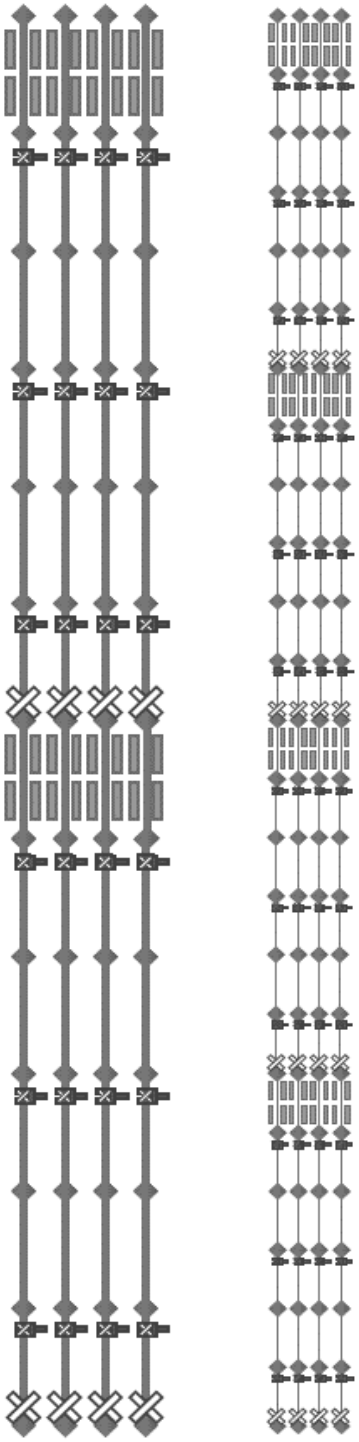
Segmentation

In cases of vertical application, the total length of the conductor rail system is divided into segments, among other factors, on the basis of thermal expansion and increased mechanical loading of the conductor rails (Item 2). A segment for vertical use includes:

- Segment length: 70 m (14 busbars, 5m each)
- One anchor point (Item 1) at the lower end.
- Number of hanger clamps per conductor rail: ≥ 2 pieces
- Hanger clamp suspension distance: 2.5 m (unless otherwise specified by Conductix-Wampfler)
- Safety devices (Item 3) on every 2nd conductor rail
- An expansion joint (Item 4) at the upper segment end

A segment is shown schematically (number of busbars not representative) in Fig. 43.

1000 A aluminum conductor rails are used in the vertical application of conductor rail systems.
Due to specific physical quantities, consult Conductix-Wampfler when using other busbars.



System limit:

Individual segments for vertical applications can be strung together several times (see Fig. 44). Information about stringing segments together:

- All segments are independent of each other.
- The segments do not influence each other (mechanically).
- The uppermost segment of a system does not require an expansion joint; this segment can freely expand downward.
- Expansion joints sit at the upper end of a segment since they are easier to mount and adjust in this position.
- Each new segment starts or ends with an anchor point.
- An anchor point supports a segment.
- Segments can be strung together up to a total system height of 300 m.

Fig. 45: System limits of the vertical conductor rail system

6 Checklist

Please read and observe or check the separate Commissioning Checklist for Conductor Rail System 0813 (see IBC0800-0001) in addition to the points specified here!

Testing	Checked
Are the anchor points fastened via the side bolts (see section 4.2)?	
Can the anchor points on the rail no longer be moved (see section 4.2)?	
Are all the side cylinder screw heads of the hanger clamp, anchor point and fall arrest device accessible from the outside, i.e., they are turned away from the customer's support structure?	
Are all installed components clean, dry and undamaged?	
Are all screw connections tightened to the specified torques (see section 4)?	
Are the distances to the individual components observed (end cap to anchor point, hanger clamp to anchor point, hanger clamp to hanger clamp) (see section 3.1)?	
Is the phase offset of the hanger clamp or anchor point maintained (see section 3.1)?	
Has the fall arrest device been mounted on every other conductor rail and between two hanger clamps (see section 5)?	
Are the lower clips of the hanger clamp, fall arrest device or anchor point engaged over the grooves of the insulating profile?	
Does the safety rope pass through the fall arrest device hole where the retaining plates are positioned?	

Anchor point, Hanger Clamp and Fall Arrest Device for vertical Applications

Program 0813

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