

Anchor Point, Hanger Clamp and Fall Arrest Device for Vertical Application

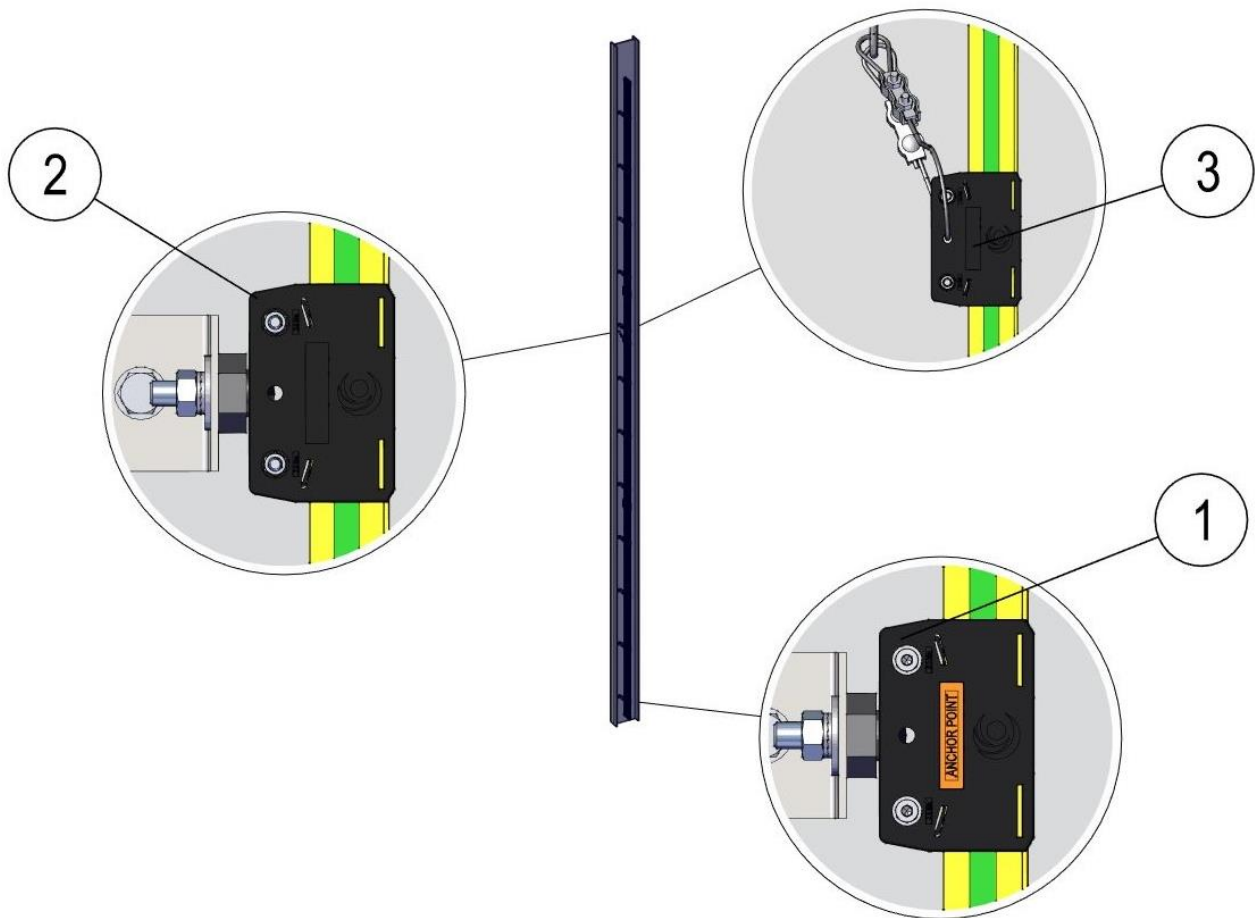
Program 0812

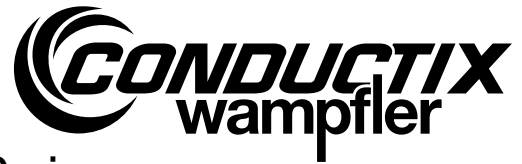
Order Number:

Anchor Point (Pos. 1): 081232-2

Hanger Clamp (Pos. 2): 081247-02

Fall Arrest Device (Pos. 3): 0812-FALL-X





**Anchor Point, Hanger Clamp and Fall Arrest Device
for Vertical Application**

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Contents

1	Introduction	3
2	Safety	5
3	Product Description.....	7
3.1	System arrangement	7
3.2	Description of components	8
4	Installation	11
4.1	Required tools	11
4.2	Mounting the hanger clamp and anchor point	12
4.3	Mounting the fall arrest device.....	24
5	Segmentation and System Limits	27
6	Checklist	29

Anchor Point, Hanger Clamp and Fall Arrest Device for Vertical Application

Program 0812

1 Introduction

This document describes the installation of the anchor points, hanger clamps and fall arrest device for the Conductor Rail Program 0812 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, in (temporary) load elevators on construction sites, in (temporary) cranes, for example, in bridge construction or also in mountain cableways/cable cars.



DANGER!

Danger due to electric shock or fire!

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

- To achieve a sufficiently low risk, especially for installations at greater heights, Conductix-Wampfler recommends the use of safety gear or other measures that prevent parts from falling.



DANGER!

Danger from failing parts!

Schleifleitungskomponenten und Komponenten des Stromabnehmers können durch Materialermüdung, externe Kräfte, fehlerhafte Auslegung oder Montage etc. herabfallen und zu Personenschäden und/oder Sachschäden führen.

- To achieve a sufficiently low risk, especially for installations at greater heights, Conductix-Wampfler recommends the use of safety gears or other measures that prevent parts from falling.

**Anchor Point, Hanger Clamp and Fall Arrest Device
for Vertical Application**

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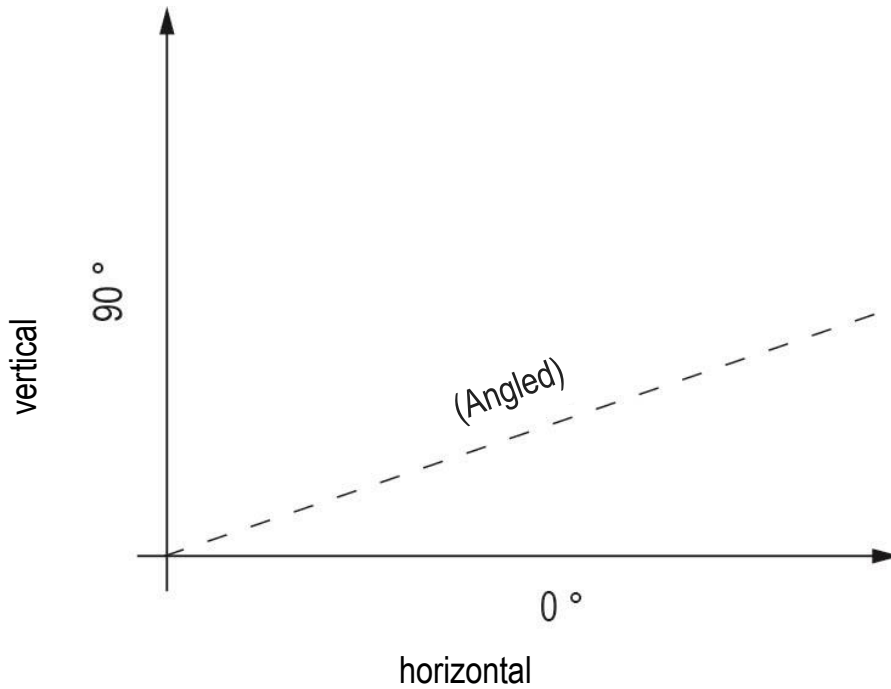


Fig. 1: Vertical, horizontal and angled alignment of the system

Anchor Point, Hanger Clamp and Fall Arrest Device for Vertical Application

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2 Safety

Please read and observe the General Safety Instructions in the Operating Instructions for the Conductor Rail System 0812 (BAL0812-0001) 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 a shock reaction, falling or being thrown across a space as a result of an electrical shock.



Risk of injury due to ensnarement or impact!

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



DANGER!

- Cordon off the work area.
- Use caution when working in the vicinity of the danger zone, particularly if protective devices (covers, housings, control devices) have been removed or disabled.
- Use caution when working in the vicinity of the danger zone, particularly 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.

Anchor Point, Hanger Clamp and Fall Arrest Device for Vertical Application

Program 0812

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

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

- Check the influencing factors of temperature, exposure time, concentration and interactions.
- 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.



DANGER!

The resistance 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 fall down.

The system must be designed and operated in accordance with the prevailing ambient conditions as part of the 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.

Anchor Point, Hanger Clamp and Fall Arrest Device for Vertical Application

Program 0812

3 Product Description

3.1 System arrangement

When the Conductor Rail Program 0812 is used vertically or at an angle, the complete route of the conductor rail is divided into segments. Each segment is supported by an anchor point (Pos. 2) (see Fig. 2).

The hanger clamp (Pos. 3) must be positioned at shorter distances ($\leq 1,000$ mm) than with a horizontal application (1,500 mm) (see Fig. 3 and Fig. 4). The phase offset ("a") is equal to the horizontal application (see Fig. 5).

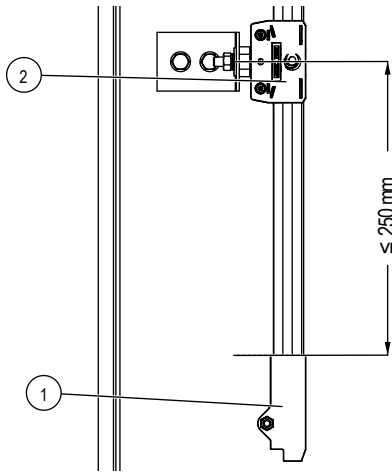


Fig. 2: Measurement from end cap to anchor point

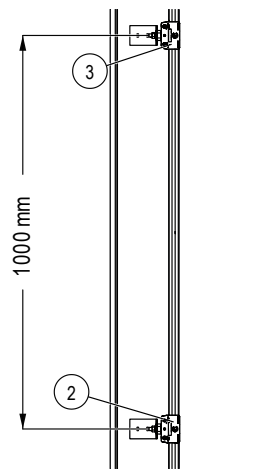


Fig. 3: Measurement from anchor point to hanger clamp

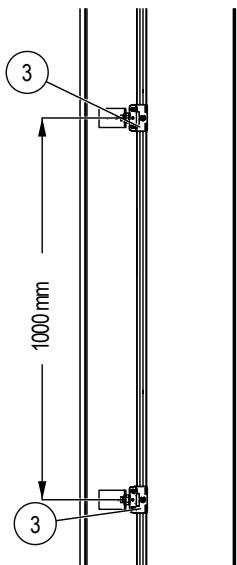


Fig. 4: Measurement from hanger clamp to hanger clamp

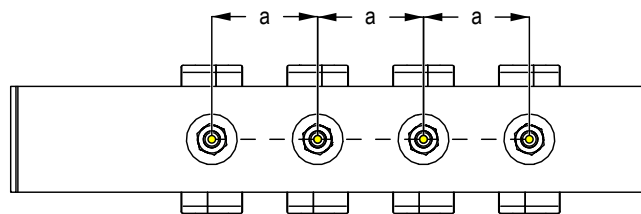


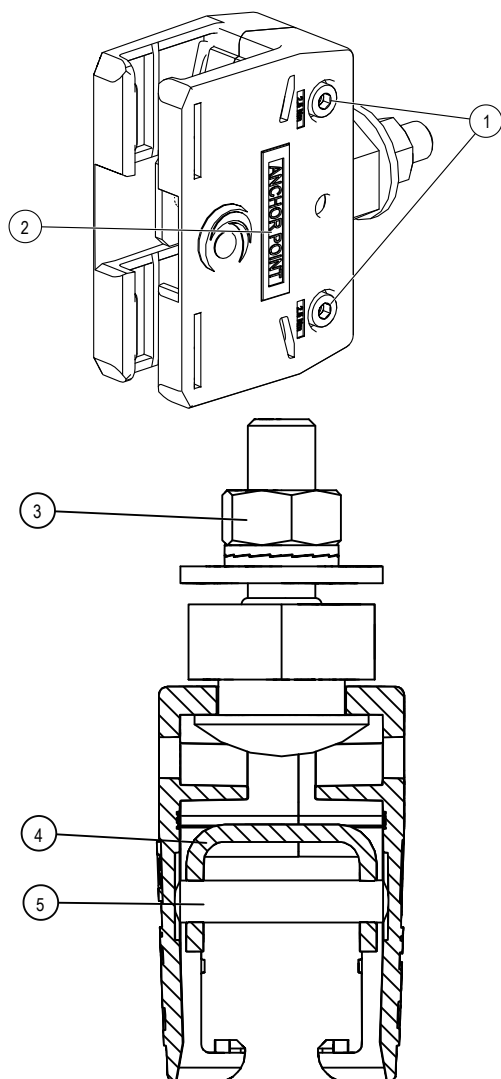
Fig. 5: Phase offset hanger clamp/anchor point

Pos.	Name
1	End cap
2	Anchor point
3	Hanger clamp
a	50 mm (with offset arrangement of the current collector, 40 mm)

Anchor Point, Hanger Clamp and Fall Arrest Device for Vertical Application

Program 0812

3.2 Description of components



■ Anchor point 0812 for vertical use (Order No.: 081232-2)

The anchor point for vertical use typically fastens the conductor rail at the beginning of the segment from below so that the conductor rail can freely expand upward from this point.

The fastening is realized by means of a bolt (Pos. 5) that is inserted through the U-plate (Pos. 4) and the conductor rail. The U-plate (Pos. 4) serves as a drilling template for the required through-hole in the conductor rail.

The anchor point 0812 for vertical use consists of two housing halves that are screwed together with cylinder screws M4 (Pos. 1). The torque specification (2.5 Nm) is also located on the housing halves.

To avoid confusion with the vertical hanger clamp, the component is labeled with two "Anchor Point" stickers (Pos. 2) on both housing halves (Pos. 2).

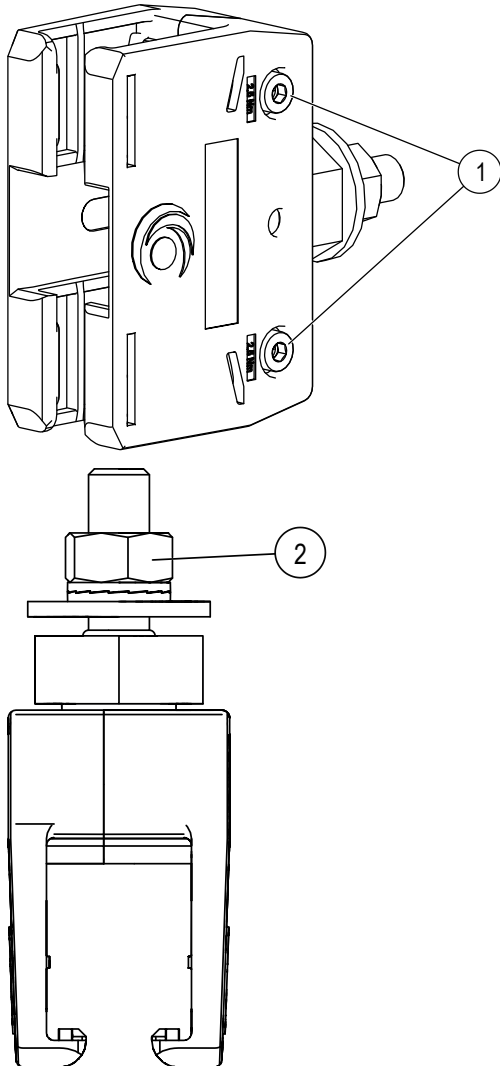
The vertical anchor point is screwed to the holder (e.g. an angle plate as an outrigger) of the customer's support structure using a hexagon nut M8 (Pos. 3) (see Fig. 6).

A combination of hanger clamp and anchor clamps as in the horizontal application is therefore not necessary.

Fig. 6: Anchor point 0812 for vertical applications

Anchor Point, Hanger Clamp and Fall Arrest Device for Vertical Application

Program 0812



■ **Hanger clamp 0812 for vertical use (Order No.: 081247-02)**

The hanger clamp for vertical use serves to support and guide the conductor rails of the 0812 program. It consists of two housing halves that are screwed together with cylinder screws M4 (Pos. 1) The torque specification (2.5 Nm) is also located on the housing halves.

Using a hexagon nut M8 (Pos. 2), the hanger clamp is attached to the customer's support structure (e.g. an angle plate as an outrigger) (see Fig. 7).

Fig. 7: Hanger clamp 0812 for vertical applications

Anchor Point, Hanger Clamp and Fall Arrest Device for Vertical Application

Program 0812

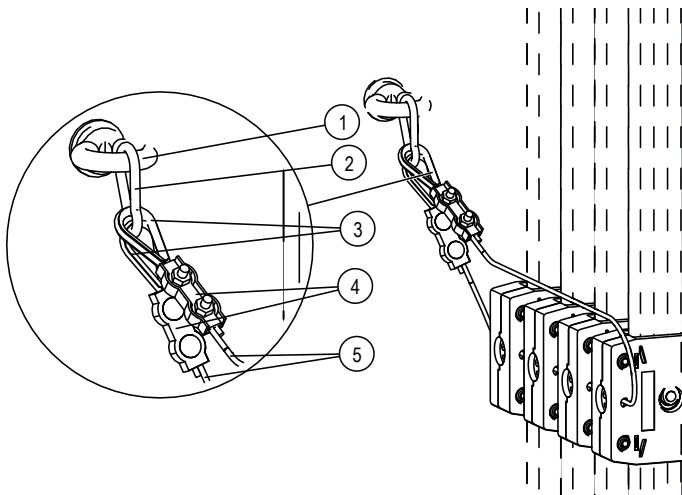


Fig. 8: Fall arrest device 0812

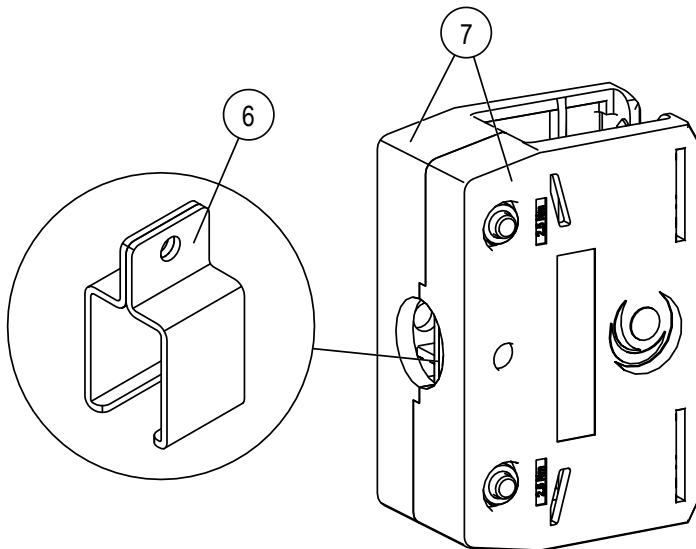


Fig. 9: Safety catch retaining plate

■ Fall arrest device for vertical use (Order No.: 0812- FALL-X)

The fall arrest device 0812 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 0812 consists of two retaining plate halves (Pos. 6) and two housing halves. A torque of 2.5 Nm is to be used with the cylinder screws M4 for the housing halves.

Through the side hole in the housing half (Pos. 7), the supplied securing rope (Pos. 5) is threaded through the housing halves and the safety plates (Pos. 6). The securing rope (Pos. 5) is fastened via rope clamps (Pos. 4) to a thimble (Pos. 3) that are secured in a snap-hook (Pos. 2).

The snap-hook (Pos. 2) is then hooked into a suitable secure fastening option for the securing rope (e.g. eye bolt) (Pos. 1) on the customer's support structure (see Fig. 8).

At one end of the securing rope, the rope clamp (Pos. 4) and thimble (Pos. 3) are already pre-assembled on the securing rope (Pos. 5) (see Fig. 8 and Fig. 9).

Anchor Point, Hanger Clamp and Fall Arrest Device for Vertical Application

Program 0812

4 Installation

4.1 Required tools

- Rubber mallet
- Open-end wrench SW 13
- Open-end wrench SW 22
- Hexagon screwdriver SW 4
- Torque wrench in a measurement range 2.5 Nm – 7 Nm (bit SW 4, socket 13)
- Pen (e.g. red or white)
- Drill Ø 5.1 mm
- Wire brush or similar
- Ratchet

Anchor Point, Hanger Clamp and Fall Arrest Device for Vertical Application

Program 0812

4.2 Mounting the hanger clamp and anchor point



NOTE!

The maximum tightening torques of 7 Nm for the hexagon nut M8 and 2.5 Nm for the screw connection of the hanger clamp housing halves must not be exceeded.



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 since whether the bolts and the U-plate have been mounted cannot be checked in the completely installed state.



An anchor point is always located at the beginning of the segment.



Since the anchor point and conductor rail are mounted while on the ground, at least 2 specialists for the subsequent hanging of the conductor rail in the hanger clamps are to be planned.

Anchor Point, Hanger Clamp and Fall Arrest Device for Vertical Application

Program 0812

Requirement:

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

Required tools:

- Rubber mallet
- Open-end wrench SW 13
- Open-end wrench SW 22
- Hexagon screwdriver SW 4
- Torque wrench in a measurement range 2.5 Nm – 7 Nm (bit SW 4, socket 13)
- Pen (red or white) for marking
- Drill Ø 5.1 mm
- Wire brush or similar for deburring

Anchor Point, Hanger Clamp and Fall Arrest Device for Vertical Application

Program 0812

Work steps:

Mounting the hanger clamp:

- Loosen the upper screw connection of the hanger clamp (Pos. 1), consisting of washer (Pos. 2), wedge lock washer (Pos. 3) and hexagon nut M8 (Pos. 4) with an open-end wrench SW 13 (see Fig. 10).
- Insert the hanger clamp (Pos. 1) into the corresponding hole in the customer's support structure and tighten the screw connection (Pos. 2, Pos. 3 and Pos. 4 in Fig. 12 and Fig. 13) with the specified torque (SW 13, torque wrench: **7 Nm**). Use the open-end wrench SW 22 to counter-lock the plastic nut (Pos. 5). Ensure that the screw heads of the loosely mounted cylinder screws face outward (Pos. 6), i.e. they are turned away from the customer's support structure.

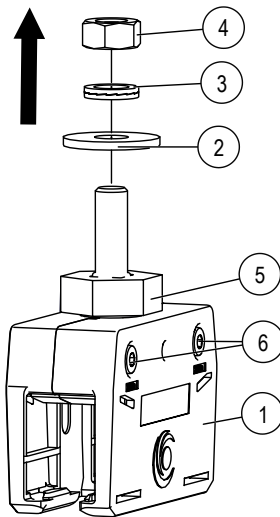


Fig. 10: Loosen upper screw connection of hanger clamp

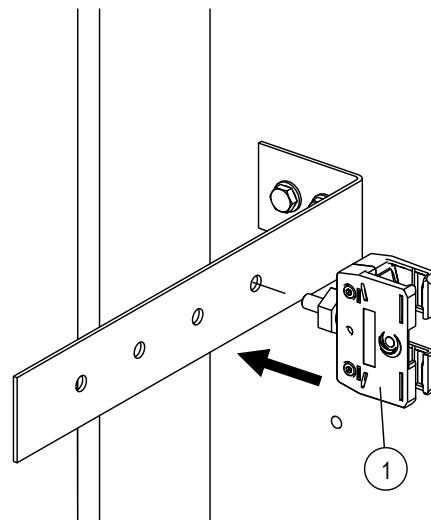


Fig. 11: Insert hanger clamp into angle plate

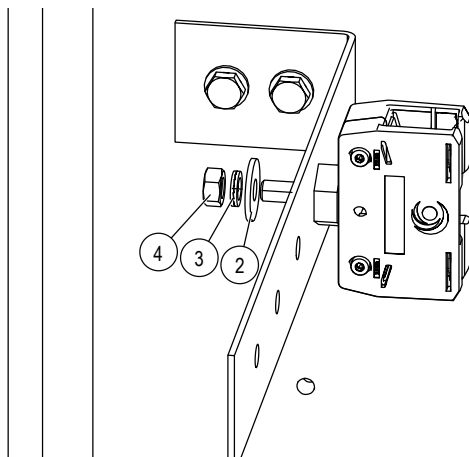


Fig. 12: Screw hanger clamp on

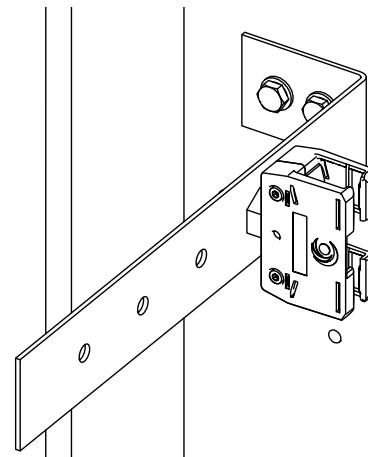


Fig. 13: Hanger clamp is mounted

Anchor Point, Hanger Clamp and Fall Arrest Device for Vertical Application

Program 0812

Mounting the anchor point:

→ Lightly tap the end cap (Pos. 5) onto the conductor rail with a rubber mallet. Ensure that the insulating profile (Pos. 6) in the end cap (Pos. 5) is correctly seated (see Fig. 16 and Fig. 17), but do not fully tighten the end cap cylinder screw yet (Pos. 7) (see Fig. 14 to Fig. 15).

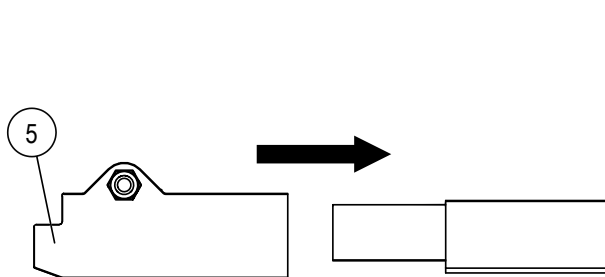


Fig. 14: Tap end cap (Pos. 5) onto conductor rail

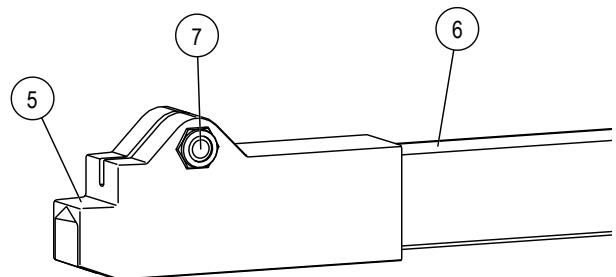


Fig. 15: End cap correctly mounted

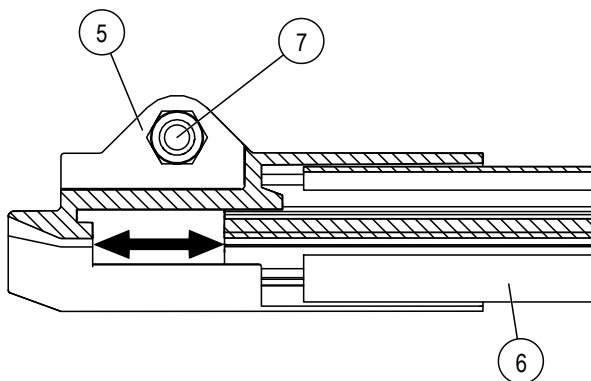


Fig. 16: End cap incorrectly mounted

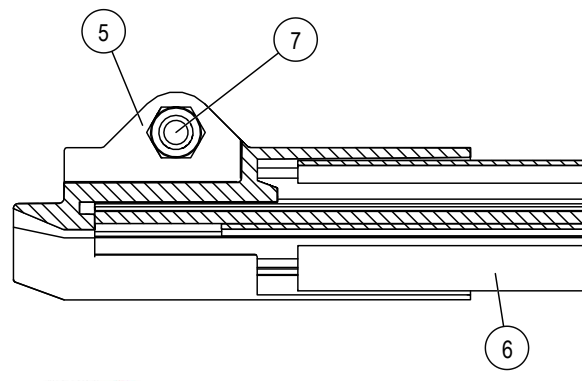


Fig. 17: End cap correctly mounted



Anchor Point, Hanger Clamp and Fall Arrest Device for Vertical Application

Program 0812

- From the rear edge of the end cap (Pos. 5), measure 250 mm on the insulating profile and mark the distance with a pen (e.g. red or white) (see Fig. 18).

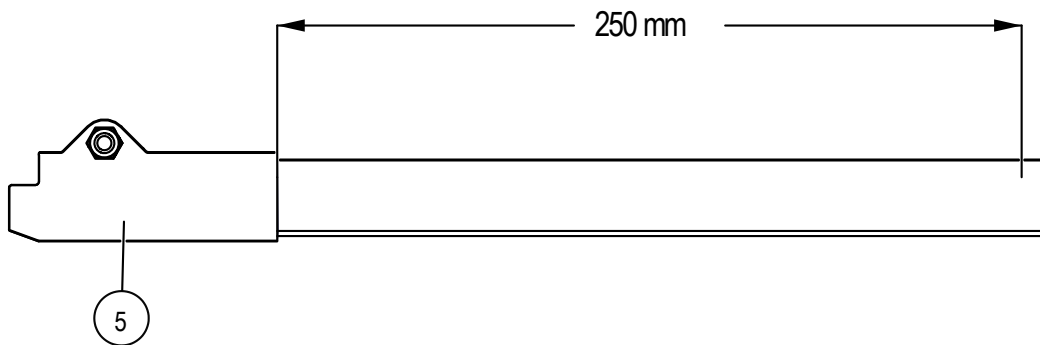


Fig. 18: Measure distance for anchor point hole

- The U-plate hole (Pos. 7) must be centrally aligned with the marked point on the conductor rail (see Fig. 19).

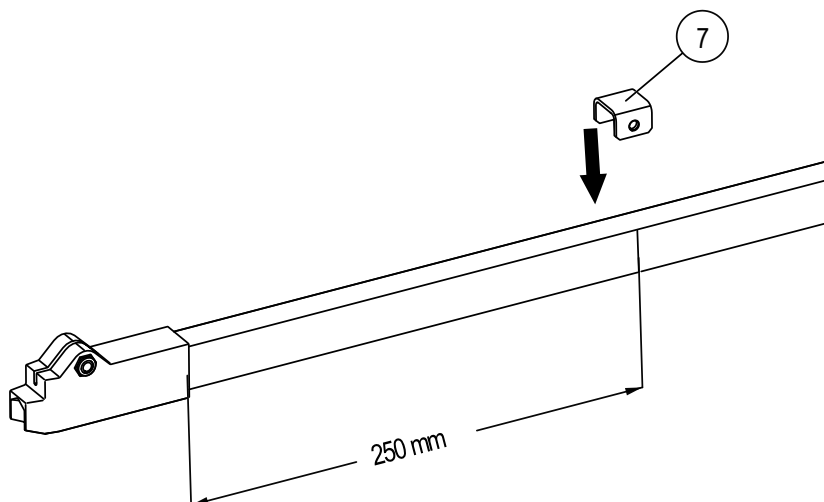


Fig. 19: Slide U-plate (Pos. 7) onto conductor rail

Anchor Point, Hanger Clamp and Fall Arrest Device for Vertical Application

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→ Using a drill $\varnothing 5.1$ mm, drill the through-hole for the bolt of the anchor point from both sides (see Fig. 20 and Fig. 21).

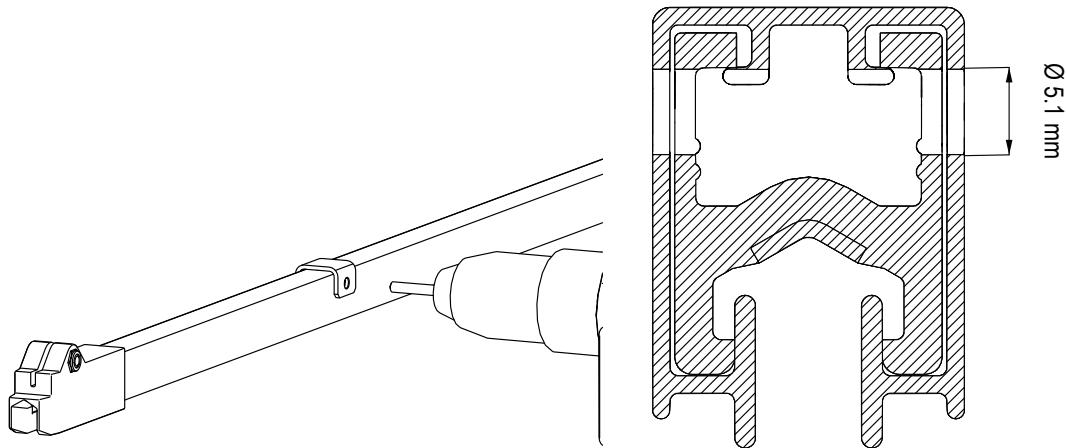


Fig. 20: Drill through-hole

Fig. 21: Through-hole for anchor point bolt

→ Pull the insulating profile (Pos. 8) from the end cap (Pos. 5) (see Fig. 22) until the holes in the conductor bar are exposed (see Fig. 23).

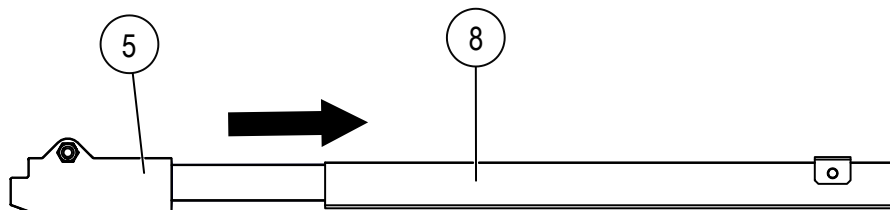


Fig. 22: Pull insulating profile (Pos. 8) from end cap (Pos. 5)

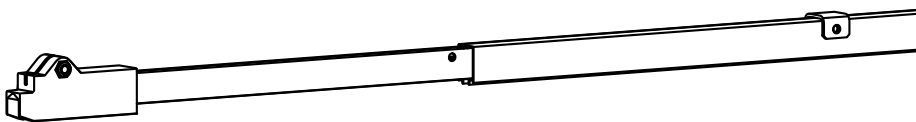


Fig. 23: Conductor bar holes are exposed

- Deburr the conductor rail holes from the inside with a wire brush or similar and remove the remaining chips from the conductor rail.
- Slide the insulating profile back in and up to the end cap stopper (Pos. 5) (see Fig. 24 and Fig. 15) and tighten the end cap cylinder screw (Pos. 9) with a hexagon screwdriver SW 5 (see Fig. 25).

Attention: The positions of the holes (insulating profile and conductor bar) must be aligned with each other.

Anchor Point, Hanger Clamp and Fall Arrest Device for Vertical Application

Program 0812

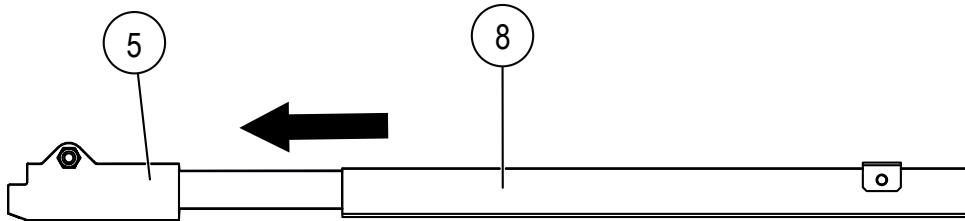


Fig. 24: Slide insulating profile (Pos. 8) back into end cap (Pos. 5)

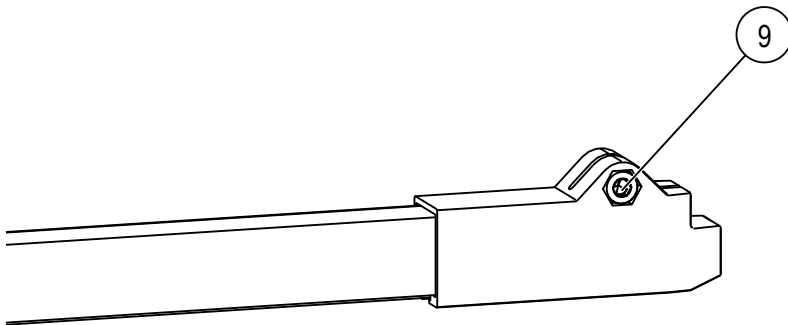


Fig. 25: Tighten end cap cylinder screw (Pos. 9)



Refer to BAL0812-0001 for further information on how to mount the end cap.

→ Insert the anchor point bolt (Pos. 10) into the through-hole (see Fig. 26).

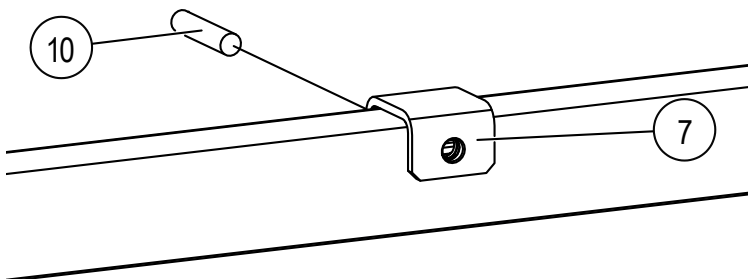


Fig. 26: Insert bolt (Pos. 10) into through-hole

Anchor Point, Hanger Clamp and Fall Arrest Device for Vertical Application

Program 0812

→ Hang the two loosely mounted housing halves over the conductor rail via the mounted U-plate with bolts (see Fig. 27). Ensure that the anchor point completely encases the insulating profile (see Fig. 28).

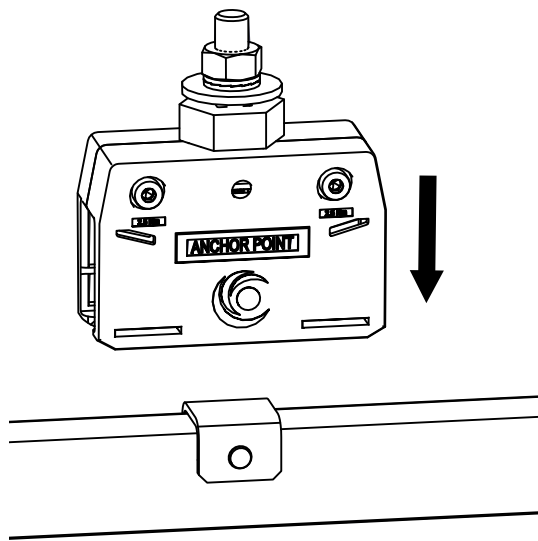


Fig. 27: Hang anchor point on conductor rail from above

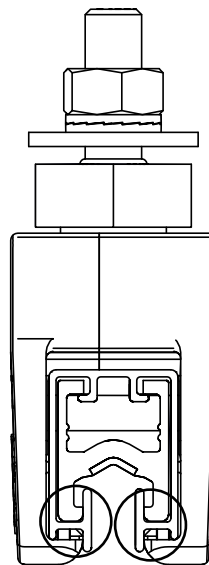


Fig. 28: Anchor point completely encases insulating profile

Anchor Point, Hanger Clamp and Fall Arrest Device for Vertical Application

Program 0812

→ Tighten the pre-assembled cylinder screws M4 x 22 (Pos. 11) with the specified torque (SW 4, torque: **2.5 Nm**) (see Fig. 29).

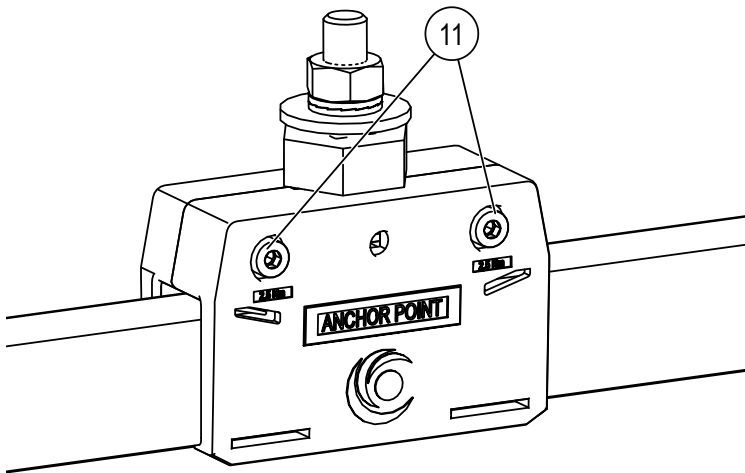


Fig. 29: Tighten anchor point cylinder screws

→ Loosen the screw connection of the anchor point hexagon nut (M8) (Pos. 12) (see Fig. 30).

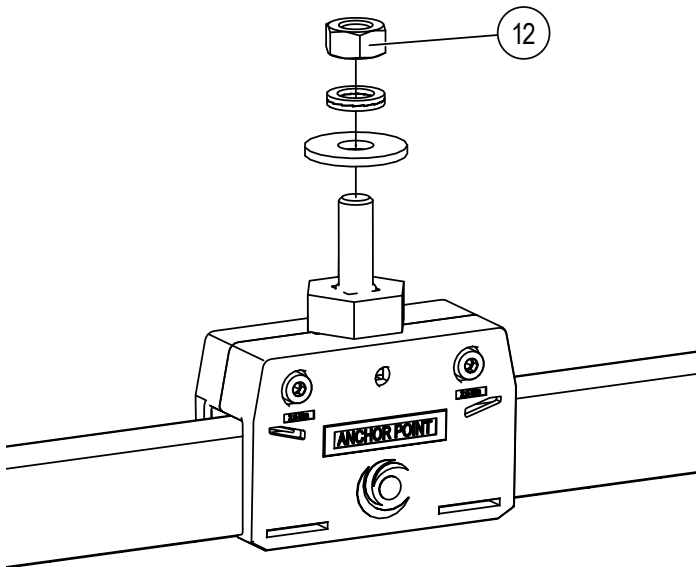


Fig. 30: Loosen anchor point hexagon nut (M8)

Anchor Point, Hanger Clamp and Fall Arrest Device for Vertical Application

Program 0812

- 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). For this, tighten the M8 hexagon nut (Pos. 12) with the specified torque (SW 13, torque: **7 Nm**) (see Fig. 32 and Fig. 33). Use the open-end wrench SW 22 to counter-lock the plastic nut. Ensure that the screw heads of the cylinder screws face outward, i.e. they are turned away from the customer's support structure.

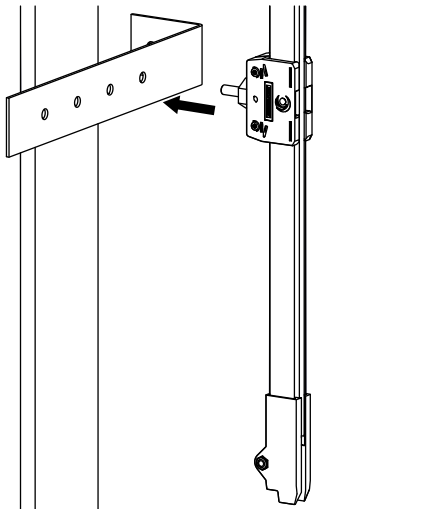


Fig. 31: Mount anchor point including conductor rail

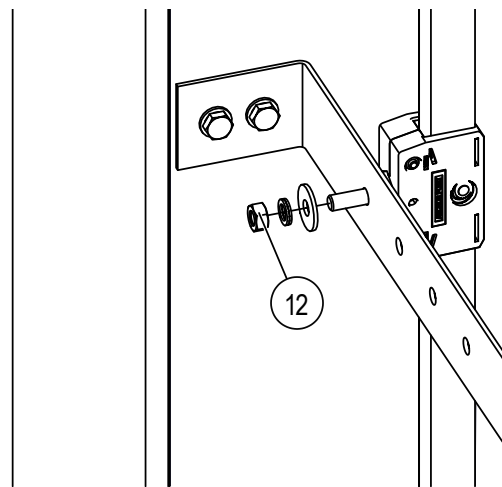


Fig. 32: Tighten hexagon nut M8 (Pos. 12)

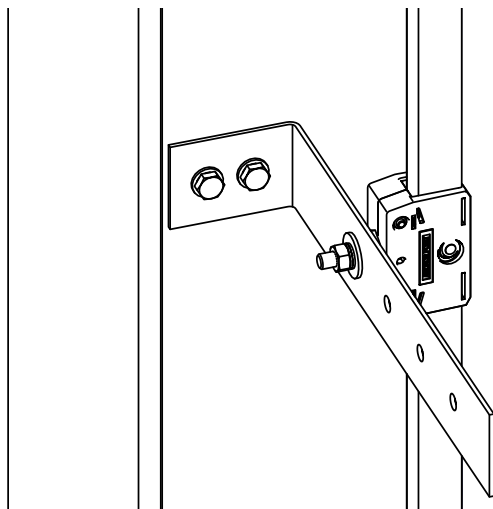


Fig. 33: Mounted anchor point

Anchor Point, Hanger Clamp and Fall Arrest Device for Vertical Application

Program 0812

- Click the conductor rail into the already mounted hanger clamps (see Fig. 34) and tighten the loosely mounted cylinder screws M4 x 22 (Pos. 13) of the two hanger clamp housing halves with the specified 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).

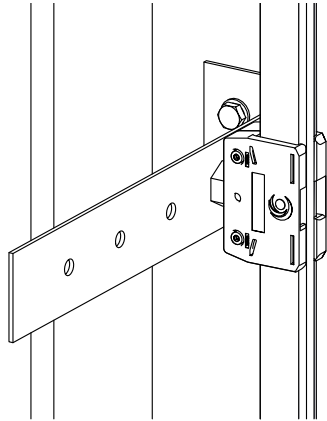


Fig. 34: Hang conductor rail in hanger clamp

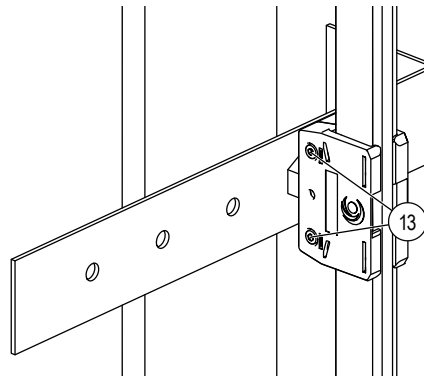


Fig. 35: Tighten hanger clamp cylinder screws (Pos. 13)

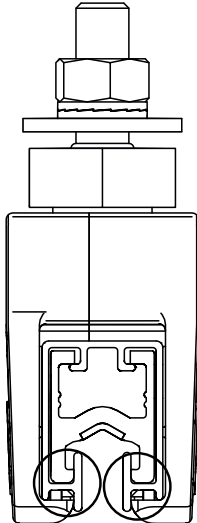


Fig. 36: Hanger clamp completely encases insulating profile

Anchor Point, Hanger Clamp and Fall Arrest Device for Vertical Application

Program 0812

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



Since the cylinder screws M4 x 22 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.



Use the QR code ("click" or "scan") to see our Animation **Mount Hanger Clamp/Anchor Point** .

Anchor Point, Hanger Clamp and Fall Arrest Device for Vertical Application

Program 0812

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. 44 and Fig. 45 in Section 5).

The fall arrest device must not be placed between the hanger clamp and the end cap.

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:

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

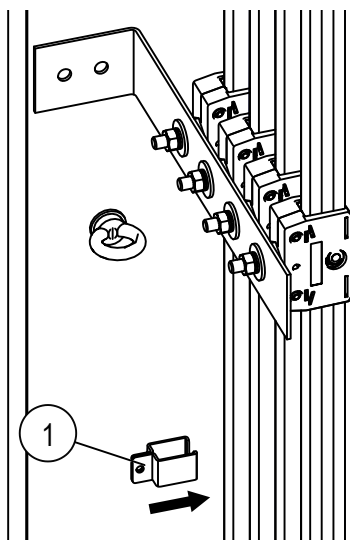


Fig. 37: Clip fall arrest device retaining plate (Pos. 1) into rail

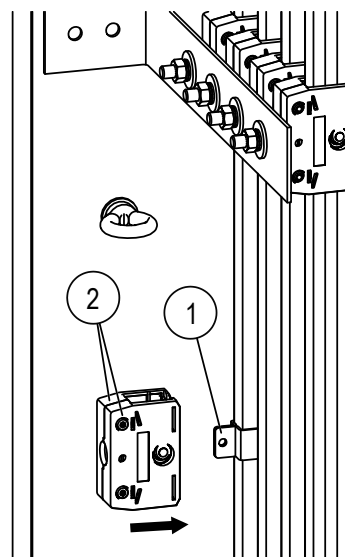


Fig. 38: Hang housing halves (Pos. 2)

- Tighten the loosely mounted cylinder screws M4 x 22 (Pos. 3) of the housing halves to the specified torque (SW 4, torque: **2.5 Nm**) (see Fig. 39).

Anchor Point, Hanger Clamp and Fall Arrest Device for Vertical Application

Program 0812

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

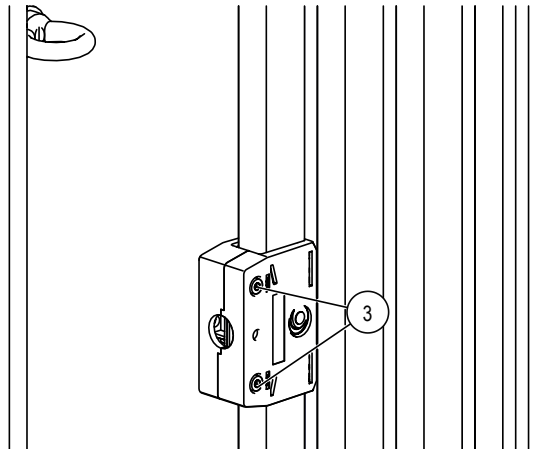


Fig. 39: Tighten cylinder screws M4 x 22 (Pos. 3)

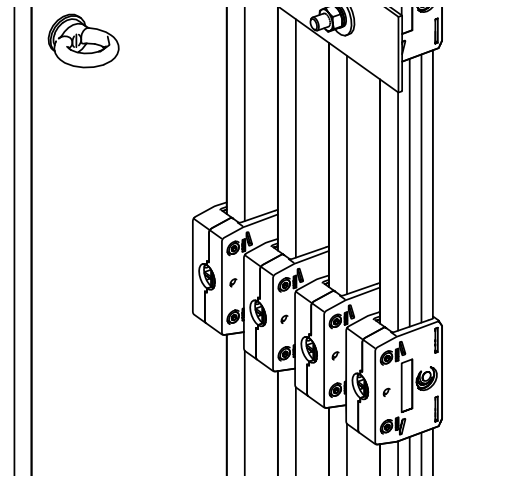


Fig. 40: Fall arrest device housing halves mounted on all poles

→ Thread the securing rope (Pos. 4) through the side holes of the housing halves and the retaining plates (see Fig. 41). The rope clamp (Pos. 5) and thimble (Pos. 6) are already preassembled at one end of the rope.

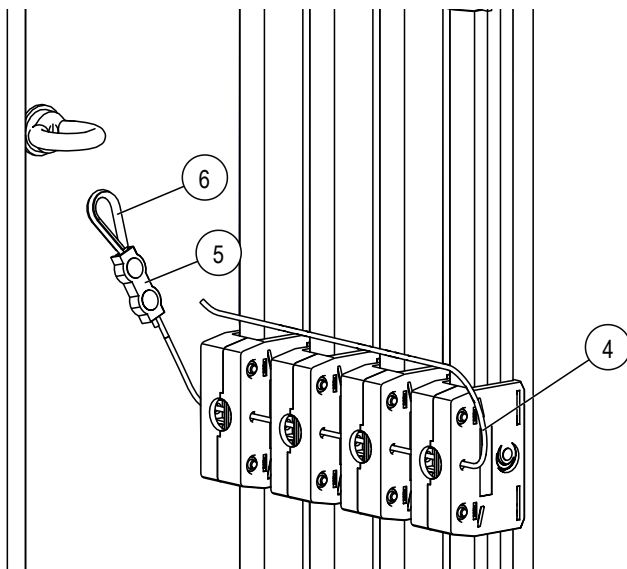


Fig. 41: Thread securing rope (Pos. 4) through fall arrest device

Anchor Point, Hanger Clamp and Fall Arrest Device for Vertical Application Program 0812

- Mount the rope clamp (Pos. 5) using a ratchet (tighten the hexagon nuts of the rope clamps) and pull the thimbles (Pos. 6) into the loops (see Fig. 42).
- Hook the thimbles into the snap-hooks (Pos. 7) (see Fig. 43).
- Hang the snap-hook (Pos. 7) in the suitable secure fastening options (e.g. eyebolt) for the securing rope (Pos. 4) (see Fig. 43).

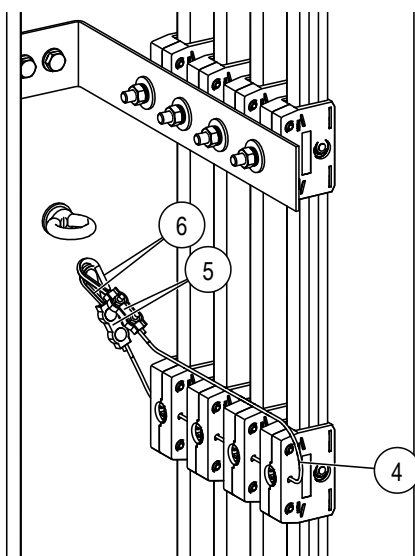


Fig. 42: Fasten thimble (Pos. 6)

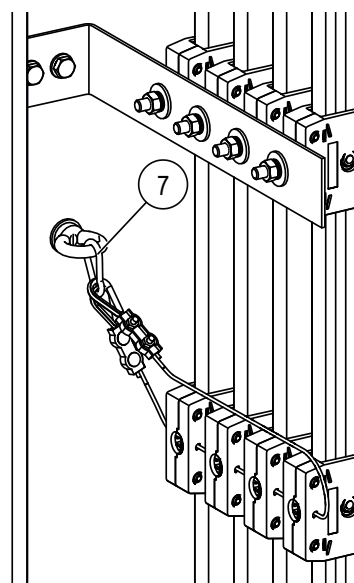


Fig. 43: Hook thimble in snap-hook (Pos. 7)



The fall arrest device can still be moved on the conductor rail after assembly!

This is useful so that the safety catch 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).

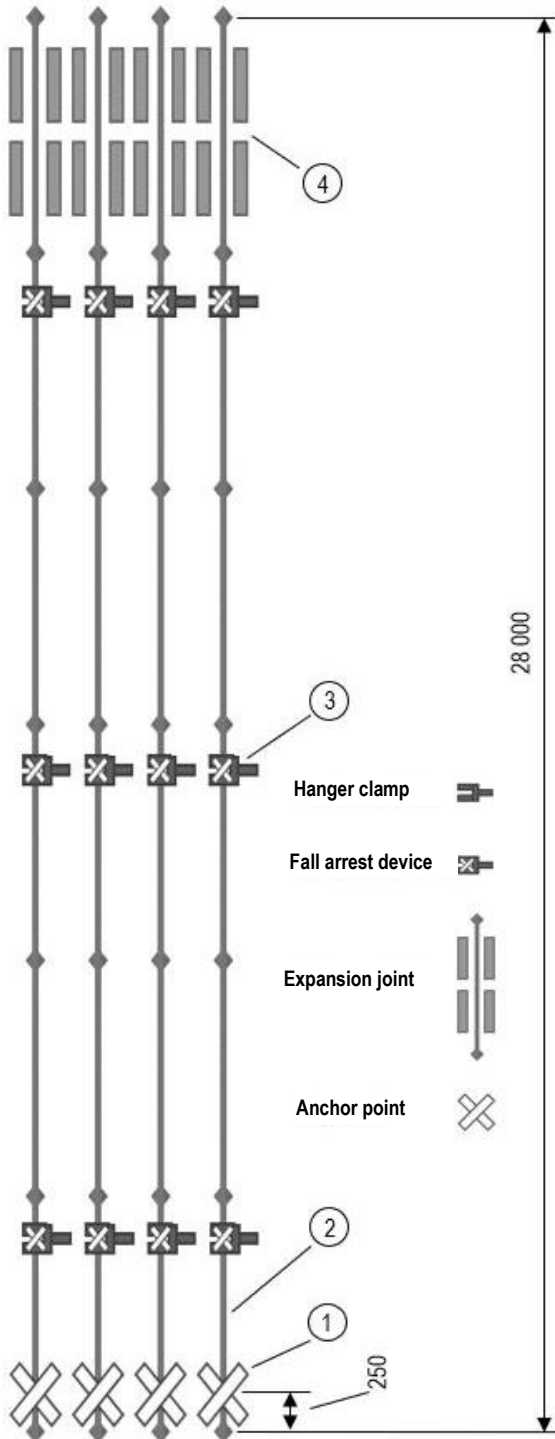


Use the QR code ("click" or "scan") to see our Animation **Mount Fall Arrest Device**.

Anchor Point, Hanger Clamp and Fall Arrest Device for Vertical Application

Program 0812

5 Segmentation and System Limits



Segmentation

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

- Segment length: 28 m (7 conductor bars at 4 m each)
- One anchor point (Pos. 1) per segment at the lower end
- Number of hanger clamps per conductor rail: 4 pieces
- Hanger clamp suspension distance: 1 m
- Fall arrest device (Pos. 3) at every other conductor rail
- An expansion joint (Pos. 4) at the upper end of the segment
- Conductor bar used: Aluminum rail 320 A, 4 m

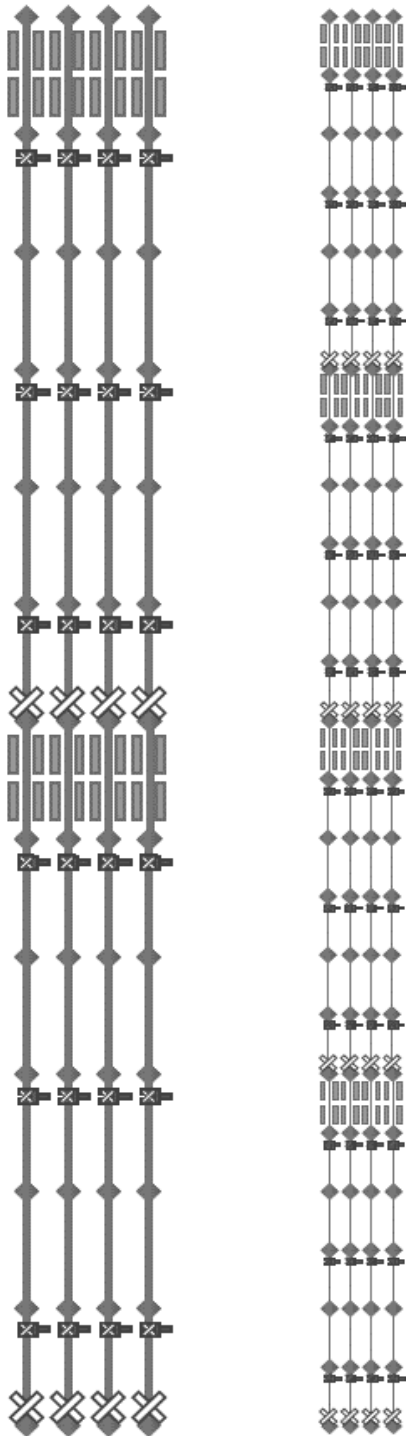
Fig. 44 schematically shows a segment (number of conductor bars not representative).

Only 320 A aluminium conductor bars with a length of 4 m are used in the vertical application of conductor rail systems.

Fig. 44: Vertical conductor rail system segmentation

Anchor Point, Hanger Clamp and Fall Arrest Device for Vertical Application

Program 0812



System limits:

Individual segments for vertical use can be stacked on top of one another several times (see Fig. 45). Information about stacking segments:

- 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 upward.
- 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 with an anchor point
- An anchor point supports a segment.
- Segments can be stacked up to a total system height of 300 m.

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

Anchor Point, Hanger Clamp and Fall Arrest Device for Vertical Application

Program 0812

6 Checklist



Please read and observe or check the separate Commissioning Checklist for Conductor Rail System 0812 (see IBC0812-0001) in addition to the points specified here!

Check	Checked
Were 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 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)?	
Were 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)?	
Was 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)?	

**Anchor Point, Hanger Clamp and Fall Arrest Device
for Vertical Application**

Program 0812

Conductix-Wampfler GmbH
Rheinstraße 27 + 33
79576 Weil am Rhein - Markt
Germany

Phone: +49 (0) 7621 662-0
Fax: +49 (0) 7621 662-144
info.de@conductix.com
www.conductix.com

**UK
CA**

Importer for the United Kingdom:
Conductix-Wampfler Ltd.
1, Michigan Avenue
Salford
M50 2GY
United Kingdom

Phone: +44 161 8480161
Fax: +44 161 8737017
info.uk@conductix.com
www.conductix.com