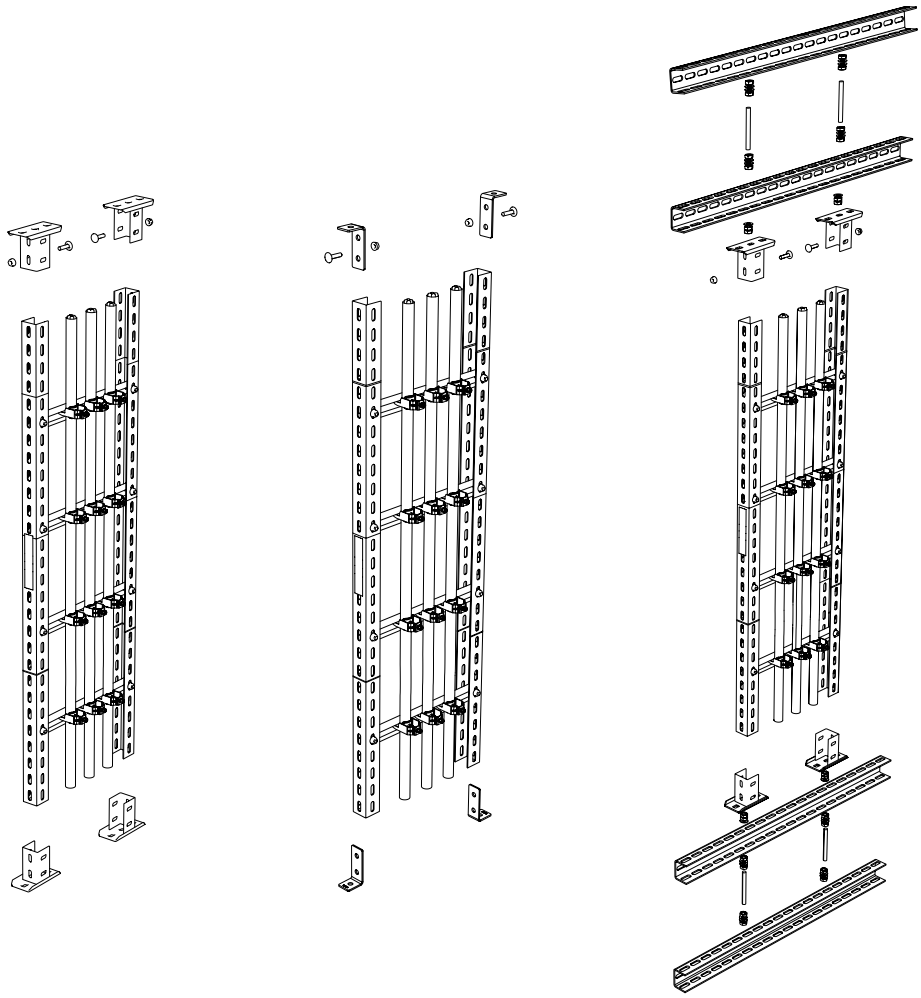


# Mounting instructions

SLM50 suspended rising sections for the maintenance of electrical function to DIN 4102 Part 12

OBO BETTERMANN

**SLM50 suspended rising sections for the maintenance of electrical function**
*Mounting instructions*

# Table of contents

# 1 About these instructions

## 1.1 Target group


These instructions are intended for specialists and/or instructed technical personnel (e.g. engineers, architects, heads of construction, and mounting and installation engineers) who have had fire protection training and are charged with the planning or installation of suspended vertical ladders for the maintenance of electrical function.

## 1.2 Relevance of these instructions

These instructions are based on the standards valid at the time of compilation (02/2021).

Follow these instructions to ensure correct and safe use.

Any images are intended merely as examples. Mounting results may look different.

In these instructions, cables and lines are referred to simply as cables.

Add the mounting instructions for construction acceptance after mounting to the construction file.

## 1.3 Types of warning information

**WARNING**

**Type of risk!**
Shows a risky situation. If the safety instruction is not observed, then serious or fatal injuries may occur.

**CAUTION**

**Type of risk!**
Shows a risky situation. If the safety instruction is not observed, then medium or minor injuries may occur.

**Note!** *Indicates important information or assistance.*

## 1.4 Basic standards and regulations

– Standard support structure to DIN 4102 Part 12

## 1.5 Applicable documents

– Surveyor's report no. GS 3.2/17-436-4-r1 (MFPA Leipzig) for standard support structure according to DIN 4102 Part 12 for cable routing on suspended rising sections

– Surveyor's report no. GA-2020/044 (IBB) for standard support structure according to DIN 4102 Part 12 for cable routing on suspended rising sections

– General construction test certificates of the cable manufacturers

# 2 Correct use

The rising section standard support structure, type SLM50C40F, is suitable for suspended mounting under the ceiling and is used for vertical support and routing of cables for the maintenance of electrical function (E30–E90). The following mounting parameters must be maintained:

- Suspension height max. 3.5 or 7 m
- Width of the vertical cable ladder max. 600 mm
- Cable load per vertical ladder max. 20 kg/m
- Cable bundling, heavy current cables, max. quantity 3, max. diameter 25 mm
- Cable bundling, installation cables, quantity not limited, total cable weight max. 3.0 kg/m

# 3 Safety

## 3.1 General safety information

Observe the following general safety information:

- All the appropriate regulations and technical regulations of other units, in particular those for electrical engineering, must be complied with.
- Risk of cutting from plate edges.
- The rising section should be included in the protection measures and/or the equipotential bonding.
- The inclusion in the equipotential bonding of the overall system must be performed by specialist personnel.

## 3.2 Personal protective equipment

List of personal protective equipment to be used:


Use hand protection


Wear safety shoes


Wear eye protection


Wear head protection

# 4 Necessary tools

List of required tools:
– Angle grinder
– Drill
– Linear laser; spirit level
– Wrench set
– Ladder
– Roller scaffolding or work platform

# 5 System description

The SML50C40F.. vertical ladders, with a max. width of 600 mm, can be used as standard support structures in the mounting variants, according to the surveyors' reports, as suspended rising sections for the maintenance of electrical function (E30–E90).

The suspended mounting of the vertical ladder can be performed regardless of the structure or type and of the distance to the wall. For this, the vertical ladders are mounted flush to solid ceiling structures. Depending on the mounting version, the maximum storey height may not exceed 3.5 m or 7.0 m.

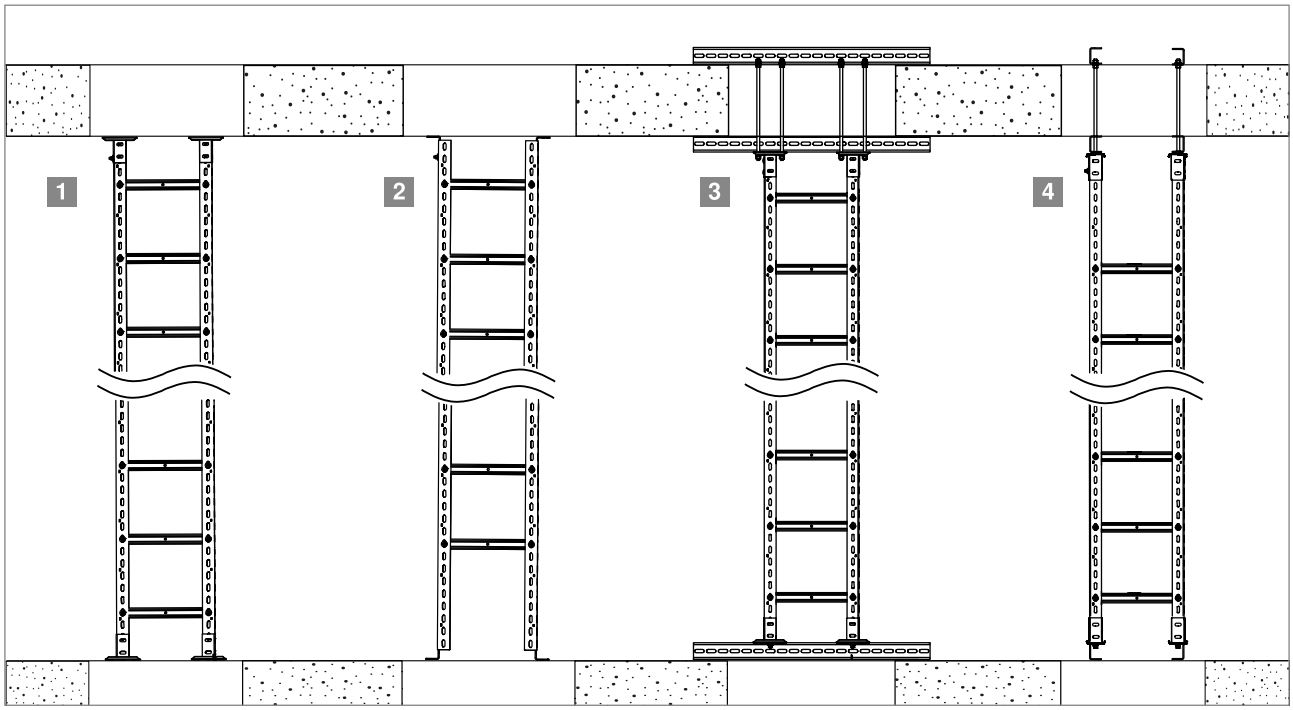



**Fig. 1:** Overview, mounting variants

| No. | Mounting variant | Suitable for storey heights | |
|---|---|---|---|
| | | ≤ 3.5 m | > 3.5 m – ≤ 7.0 m |
| 1 | Direct ceiling mounting with head plates | ✓ | ✓ |
| 2 | Direct ceiling mounting with mounting angles | ✓ | — |
| 3 | Mounting in a direct run below the ceiling opening with transverse profiles | ✓ | ✓ |
| 4 | Mounting in a direct run below the ceiling opening with lengthwise profiles | ✓ | ✓ |

**Tab. 1:** Overview, mounting variants

## 5.1 System overview

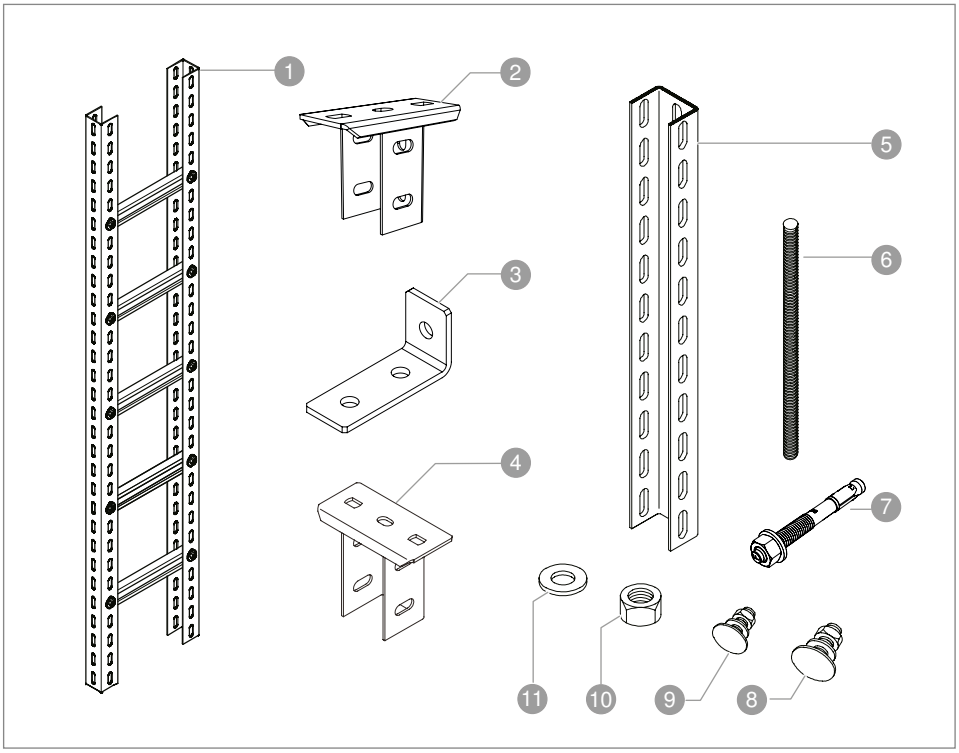



**Fig. 2:** Overview of system components

1. SLM50 C... F vertical ladder
2. KUS 5 NOK head plate
3. GMS 3 VW 90 mounting bracket
4. KUS 5 head plate
5. US7 U support
6. M12 threaded rod
7. M12 anchor, fire protection-tested (e.g. bolt tie BZ12-15-35/110)
8. M12 truss-head bolt (with washer and nut)
9. M10 truss-head bolt (with washer and nut)
10. M12 hexagonal nut
11. M12 washer

**Note!** *The SML50 C... F vertical ladder 1 is required for all mounting variants and is 3 m long. The quantity of vertical ladders required per storey is dependent on the appropriate storey height. For storey heights > 3 m, 2 VUS 5 U support connectors are required for each additional vertical ladder.*

### 5.1.1 Mounting variant 1: Direct mounting with head plate

| No. | Designation | Quantity/storey at ≤ 3.5 m | Quantity/storey at > 3.5 m – ≤ 7.0 m |
|---|---|---|---|
| 2 | KUS 5 NOK head plate | 4 | 4 |
| 9 | M10 truss-head bolt | 2 | 4 |
| 7 | M12 anchor | 4 | 4 |

**Tab. 2:** System components, variant 1

### 5.1.2 Mounting variant 2: Direct mounting with bracket

| No. | Designation | Quantity/storey at ≤ 3.5 m | Quantity/storey at — |
|---|---|---|---|
| 3 | GMS 3 VW 90 mounting bracket | 4 | — |
| 9 | M10 truss-head bolt | 2 | — |
| 7 | M12 anchor | 4 | — |

**Tab. 3:** System components, variant 2

### 5.1.3 Mounting variant 3: Mounting on transverse profile with head plate

| No. | Designation | Quantity/storey at ≤ 3.5 m | Quantity/storey at > 3.5 m – ≤ 7.0 m |
|---|---|---|---|
| 2 | KUS 5 NOK head plate | 6 | 6 |
| 5 | US7 U support | 3 / 2* | 3 / 2* |
| 9 | M10 truss-head bolt | 2 | 4 |
| 7 | M12 anchor | 6 | 6 |
| 8 | M12 truss-head bolt | 4 | 4 |
| 6 | M12 threaded rod | 2 | 4 |
| 10 | M12 hexagonal nut | 8 | 16 |
| 11 | M12 washer | 6 | 12 |

**Tab. 4:** System components, variant 3

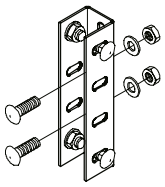
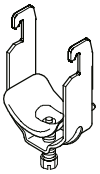
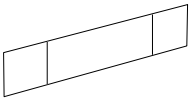
### 5.1.4 Mounting variant 4: Mounting on lengthwise profile with head plate

| No. | Designation | Quantity/storey at ≤ 3.5 m | Quantity/storey at > 3.5 m – ≤ 7.0 m |
|---|---|---|---|
| 2 | KUS 5 NOK head plate | — | 6 |
| 4 | Head plate KUS 5 | 6 | — |
| 5 | US7 U support | 6 / 4* | 12 / 8* |
| 9 | M10 truss-head bolt | 2 | 4 |
| 7 | M12 anchor | 12 | 24 |
| 8 | M12 truss-head bolt | 4 | 8 |
| 6 | M12 threaded rod | 2 | 4 |
| 10 | M12 hexagonal nut | 8 | 16 |
| 11 | M12 washer | 6 | 12 |

**Tab. 5:** System components, variant 4

* If suspended vertical ladders are installed across multiple storeys, then fewer U supports are required for the installation from the 2nd storey.

## 5.2 Accessories

| Designation | Figure | Function |
|---|---|---|
| U support connector VUS 5 |  | Connect 2 vertical ladders at a storey height > 3 m. |
| Clamp clip 2056U M |  | Cable fastening on the suspended vertical ladder. |
| KS-E identification plate |  | Identification of the cable system according to DIN 4102-12 |

**Tab. 6:** Accessories

# 6 Mounting

The SLM50 vertical ladder is supplied unmounted. With all mounting variants, the ladder rails are first mounted to the ceiling fastening and then the ladder rungs for cable fastening inserted.

**WARNING**

**Risk of injury!**
The size and weight of the components can cause injuries. Do not mount suspended vertical ladders on your own and use roller scaffolding or a raised platform or mounting lift. Wear personal protective equipment.

## 6.1 Preparations for mounting

Before mounting, the ladder rails must be cut according to the storey height.

**Note!** *At a storey height of 3–6 m, 2 U support connectors are required. At a storey height of 6–7 m, 4 U support connectors are required. Along the length of the ladder rails, reckon with a gap of 13 mm per pair of connectors.*

**CAUTION**

**Risk of cutting**
During cutting work, metal chips or sharp cut edges can cause injuries to eyes and hands!
– Wear protective glasses and gloves.
– Deburr cut edges.

1. Cut vertical ladders to the desired length, e.g. using an angle grinder.
2. Deburr cut edges.

## 6.2 Mounting vertical ladders up to a max. storey height of 3.5 m

**WARNING**

**Function loss in the event of fire!**
At a storey height > 3.5 m, perfect functioning of the vertical ladder cannot be guaranteed in the event of fire. Only use mounting variants at a storey height of maximum 3.5 m.

### 6.2.1 Mounting the ladder rails with head plates

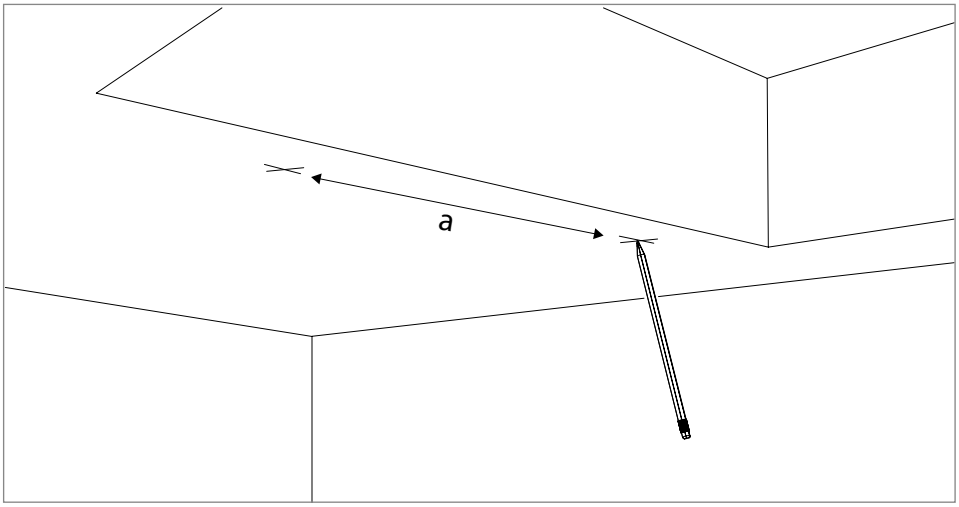



**Fig. 3:** Drawing on the drill holes

**Note!** *Distance “a” is dependent on the width of the vertical ladder used. a = vertical ladder width – 50 mm.*

1. Draw on two drill holes at spacing “a” behind the ceiling opening. Maintain the minimum edge spacing according to the approval of the anchor used.
2. Using a linear laser, transfer the position of the drill holes to the floor.
3. Pre-drill the drill holes. Ø according to anchor type and approval.

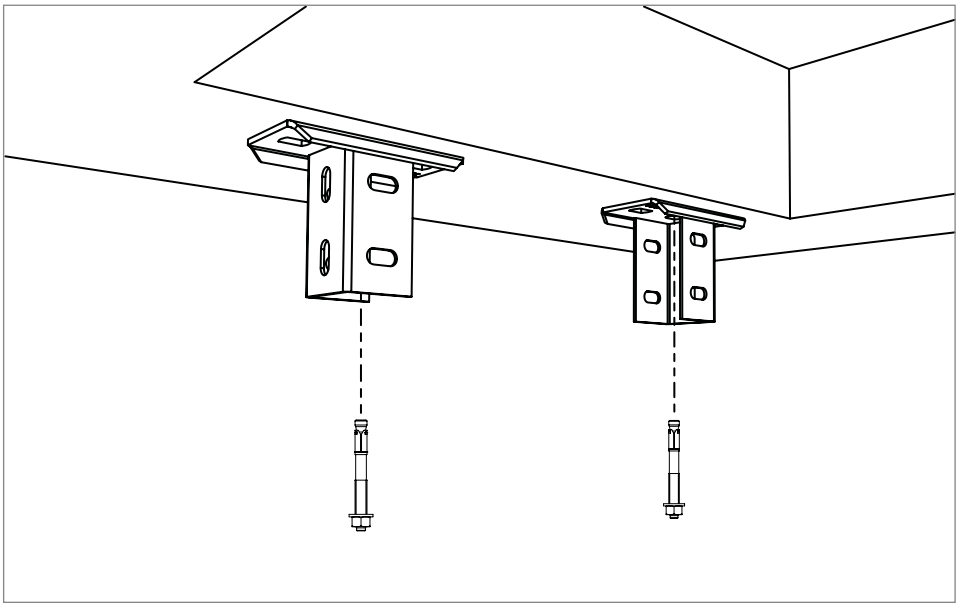


**Fig. 4:** Mounting head plates

4. Mount head plates with the open sides facing each other, using one M12 anchor for the ceiling and one for the floor.

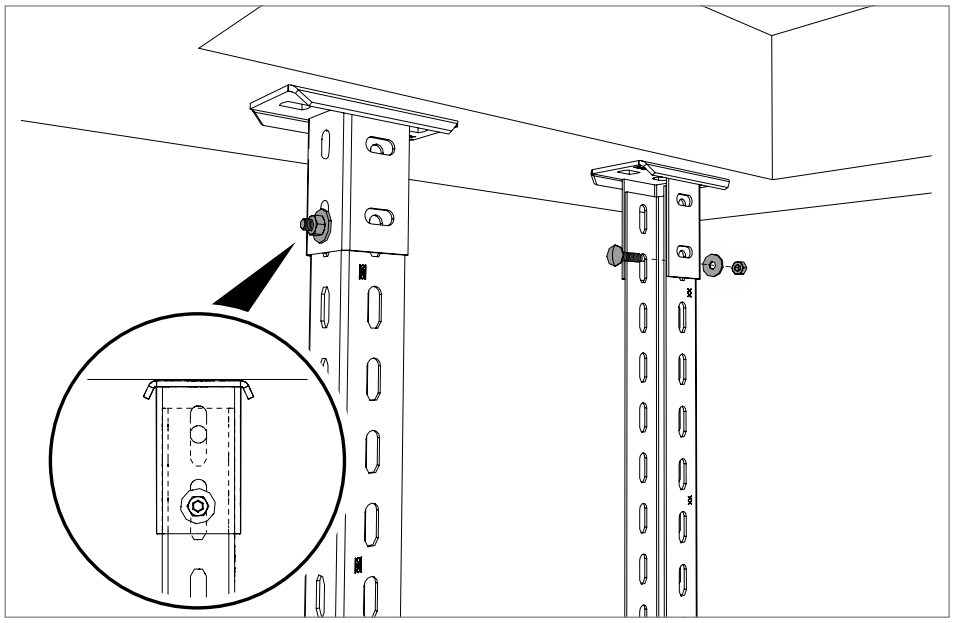


**Fig. 5:** Mounting ladder rails under the ceiling

5. Mount ladder rails under the ceiling with 1 M10 truss-head bolt each on the head plates.
   - Mount the rails with the open sides facing each other.
   - Place the bolts up to the limit in the slot, in order to prevent a vertical movement of the vertical ladders.

**Note!** *At a storey height > 3 m, additional ladder rails must be connected with the mounted ladder rails. See also “6.5 Mounting U support connectors” on page 30.*

**WARNING**

**Function loss through length expansion in the event of fire!**
If there is a fire, the material of the vertical ladders expands.
Do not bolt the vertical ladder to the floor. Maintain a minimum distance of 40 mm between the end of the ladder rail and the floor.

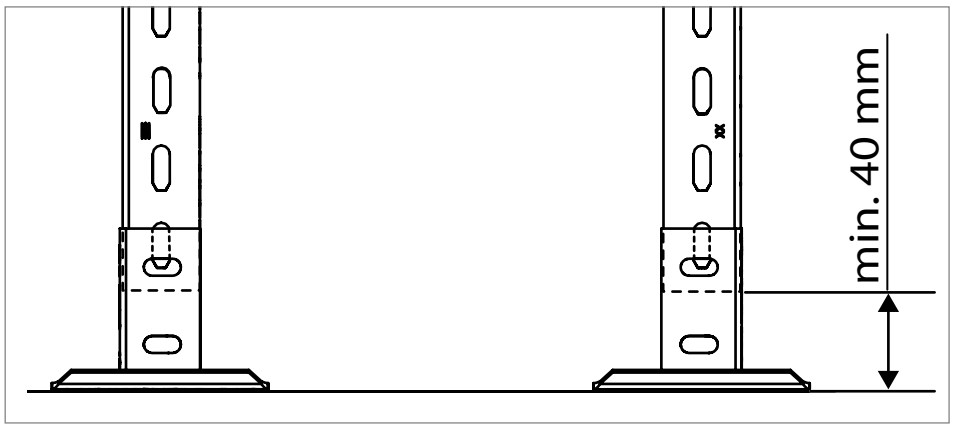



**Fig. 6:** Moveable bearing on the floor

### 6.2.2 Mounting the ladder rails with a mounting bracket

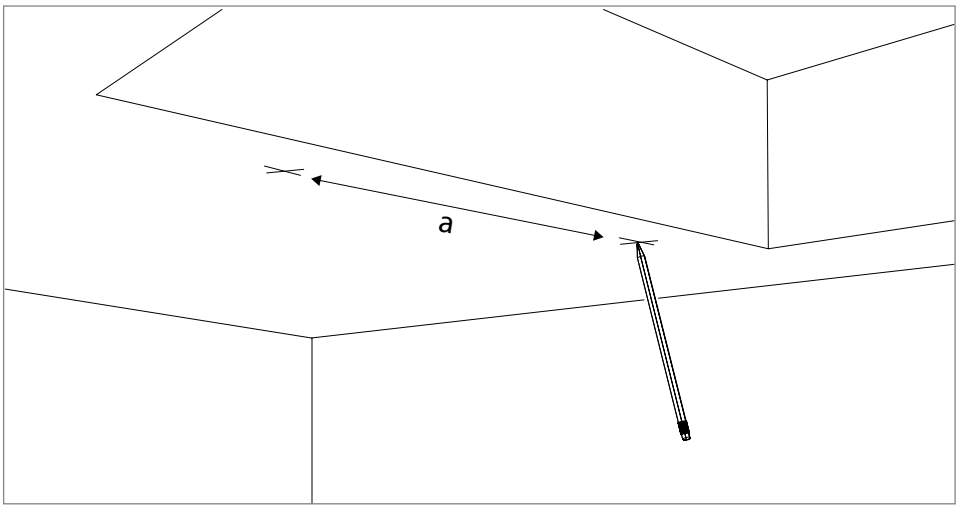



**Fig. 7:** Drawing on the drill holes

**Note!** *Distance “a” is dependent on the width of the vertical ladder used.*
*a = vertical ladder width + 42 mm.*

1. Draw on two drill holes at spacing “a” behind the ceiling opening. Maintain the minimum edge spacing according to the approval of the anchor used.
2. Using a linear laser, transfer the position of the drill holes to the floor.
3. Pre-drill the drill holes. Ø according to anchor type and approval.

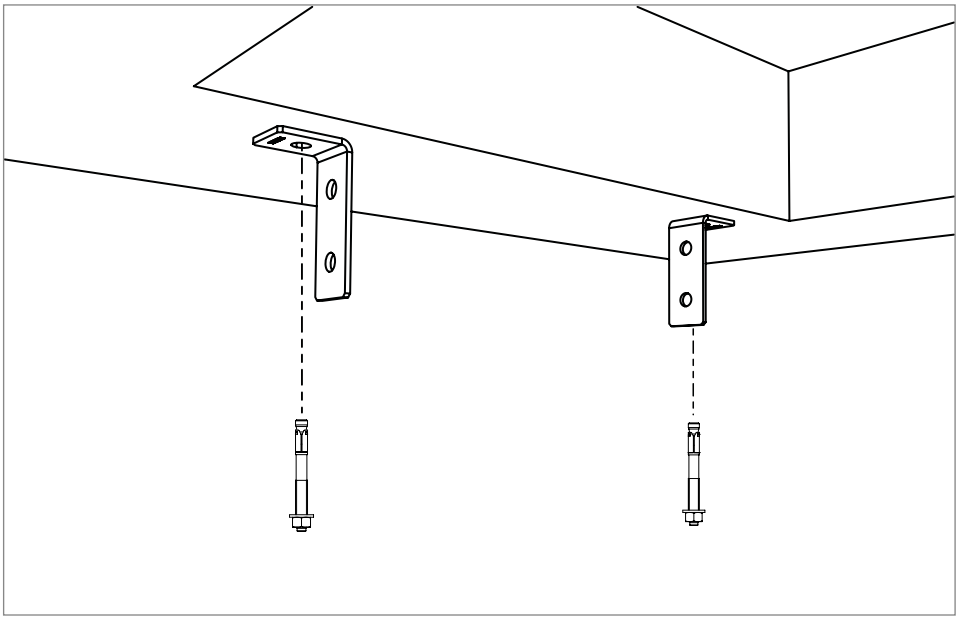


**Fig. 8:** Mounting installation profiles

4. Mount the installation profiles with 1 M12 anchor on the ceiling and floor.
   – Mount the installation profiles with the short side on the ceiling and floor.
   – Mount the installation profiles with the long side inward.

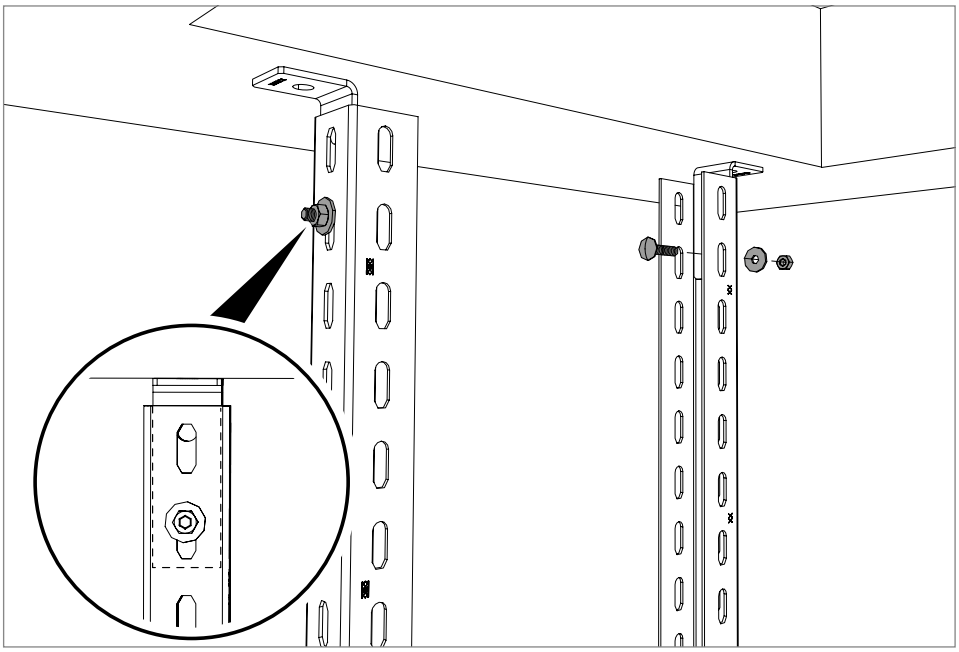


**Fig. 9:** Mounting ladder rails under the ceiling

5. Mount ladder rails under the ceiling with 1 M10 truss-head bolt each on the installation profiles.
   - Mount the rails with the open sides facing each other.
   - Place the bolts up to the limit in the slot, in order to prevent a vertical movement of the vertical ladders.

**Note!**

*At a storey height > 3 m, additional ladder rails must be connected with the mounted ladder rails. See also “6.5 Mounting U support connectors” on page 30.*

**WARNING**

**Function loss through length expansion in the event of fire!**
If there is a fire, the material of the vertical ladders expands.
Do not bolt the vertical ladder to the floor. Maintain a minimum distance of 40 mm between the end of the ladder rail and the floor.

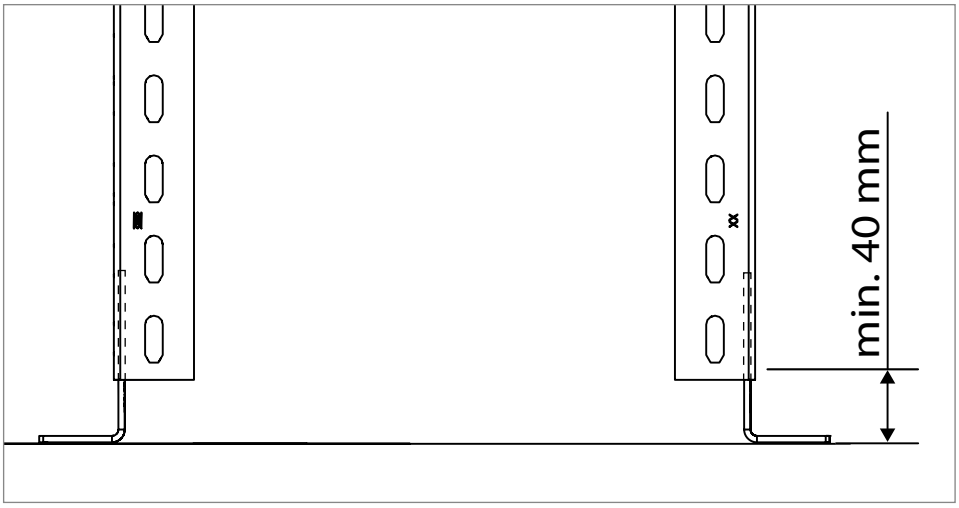



**Fig. 10:** Moveable bearing on the floor

### 6.2.3 Mounting the ladder rails with transverse profiles

1. Draw the drill holes on next to the ceiling openings. Maintain the minimum edge spacing according to the approval of the anchor used.
2. Using a linear laser, transfer the position of the drill holes to the floor.
3. Pre-drill the drill holes. Ø according to anchor type and approval.

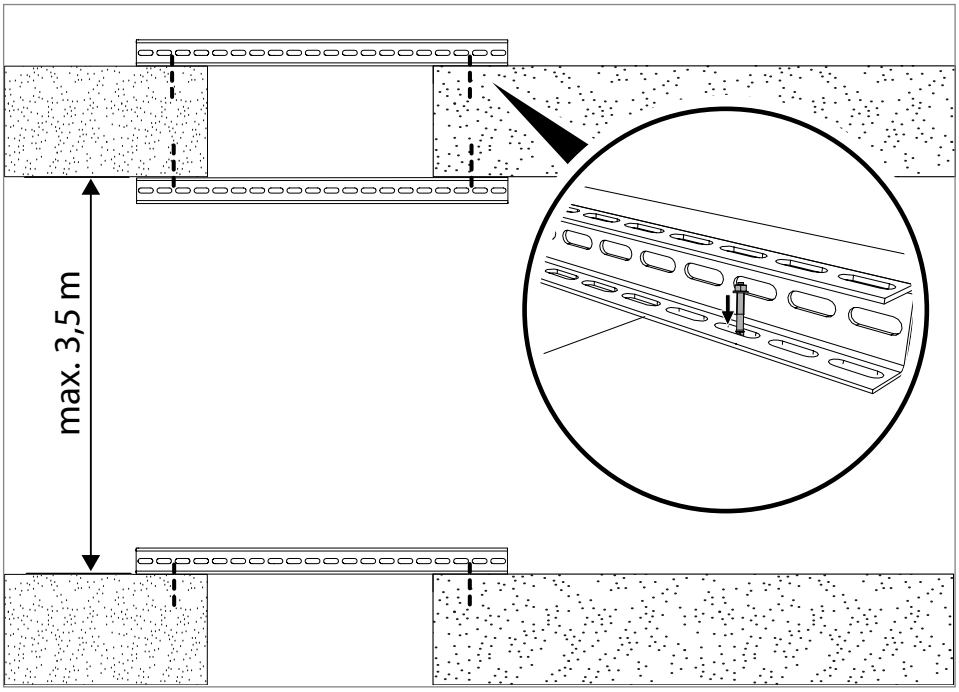



**Fig. 11:** Mounting transverse profiles

4. Mount the U supports in parallel to the vertical ladder, each with 2 M12 anchors.

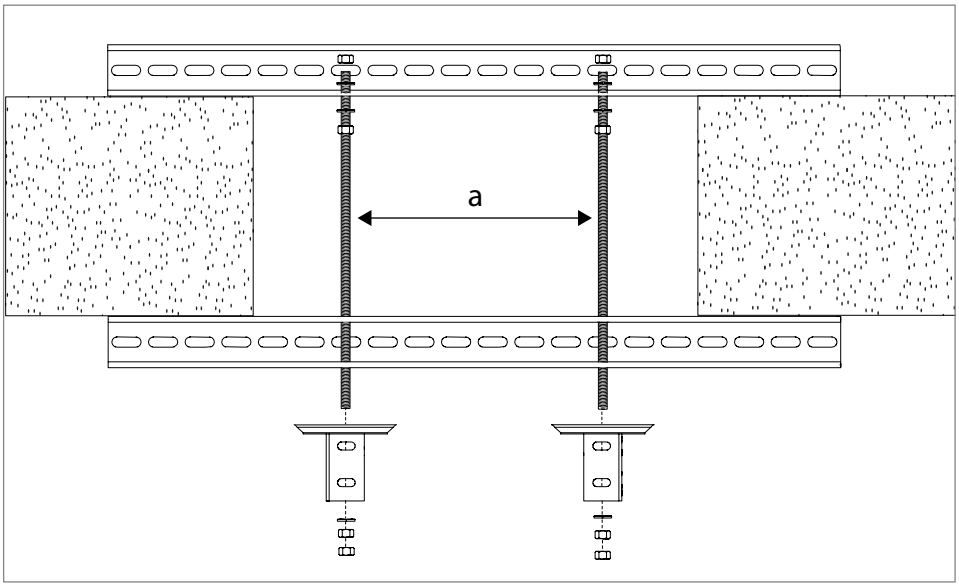



**Fig. 12:** Mount head plates under the ceiling.

**Note!** *The threaded rods must be mounted at a spacing of "a" to each other. a = vertical ladder width – 50 mm.*

5. Run the first threaded rod through the lower U support and up to the ceiling opening and screw on the M12 nut and M12 washer.
6. Run the threaded rod through the lower side of the upper U support and screw tight from above using an M12 washer and M12 nut.
7. Lock from below with the previously screwed-on nut and washer.
8. Repeat steps 5–7 with the second threaded rod.
9. With the open sides facing each other, mount the head plates on the threaded rods, using 1 M12 washer and 2 M12 nuts.

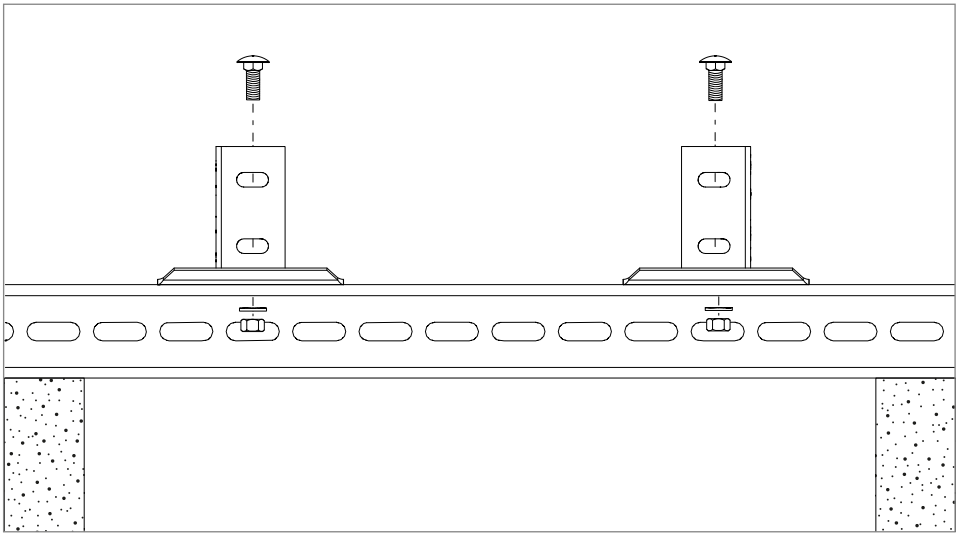


**Fig. 13:** Mounting head plates on the floor

**Note!** *The head plates must be mounted vertically under the head plates under the ceiling.*

10. With the open sides facing each other, mount the head plates on the floor, using 1 M12 truss-head bolt each on the U support.

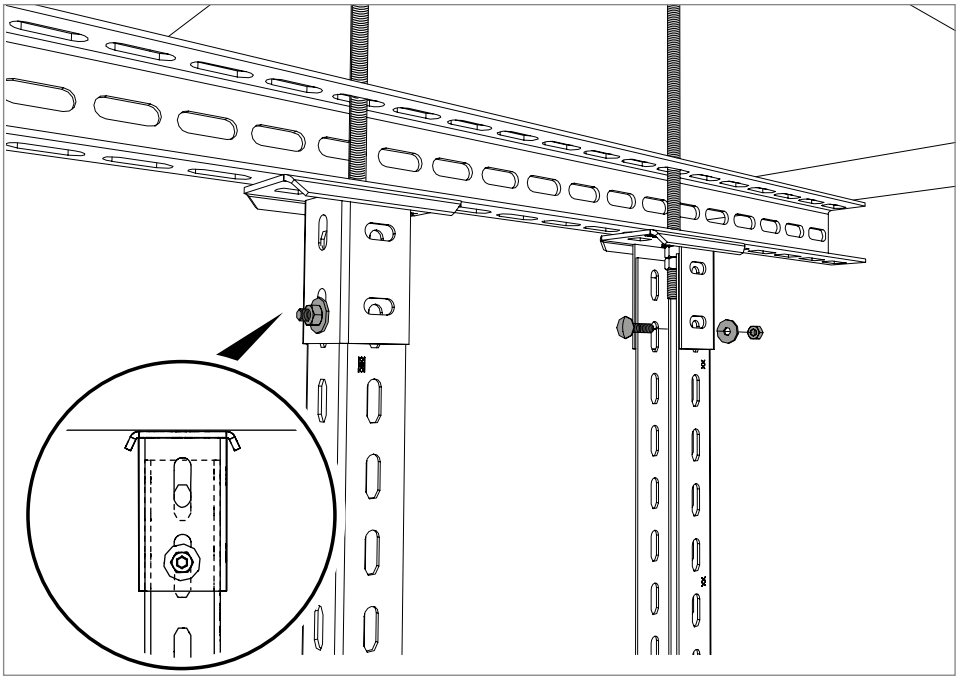


**Fig. 14:** Mounting ladder rails under the ceiling

11. Mount ladder rails under the ceiling with 1 M10 truss-head bolt each on the head plates.
    - Mount the rails with the open sides facing each other.
    - Place the bolts up to the limit in the slot, in order to prevent a vertical movement of the vertical ladders.

**Note!** *At a storey height > 3 m, additional ladder rails must be mounted with the mounted ladder rails. See also “6.5 Mounting U support connectors” on page 30.*

**WARNING**

**Function loss through length expansion in the event of fire!**
If there is a fire, the material of the vertical ladders expands. Do not bolt the vertical ladder to the floor. Maintain a minimum distance of 40 mm between the end of the ladder rail and the top side of the transverse profile.

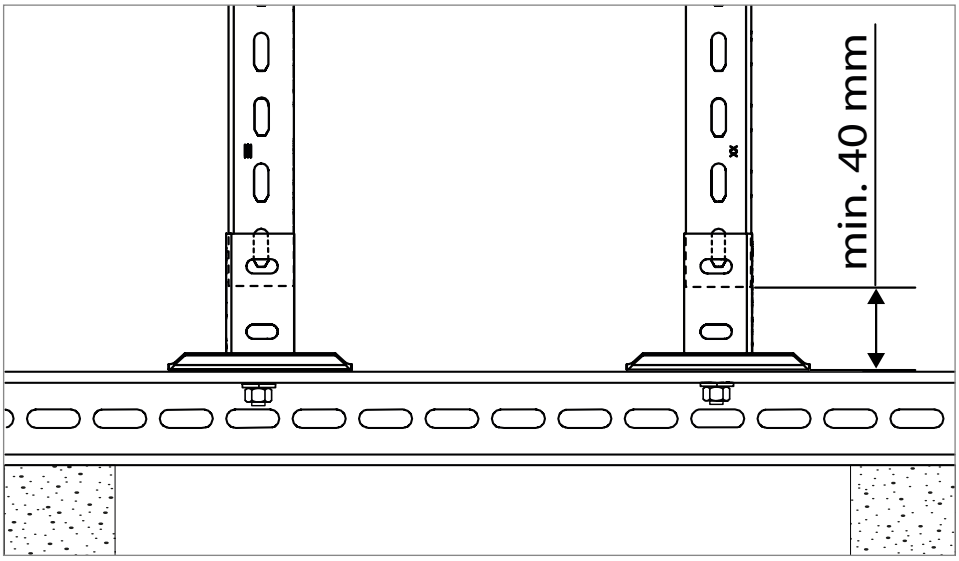



**Fig. 15:** Moveable bearing on the floor

### 6.2.4 Mounting the ladder rails with lengthwise profiles

1. Draw the drill holes on at spacing “a”, in front of and behind the ceiling openings. Maintain the minimum edge spacing according to the approval of the anchor used. *a = vertical ladder width – 50 mm.*
2. Using a linear laser, transfer the position of the drill holes to the floor.
3. Pre-drill the drill holes. Ø according to anchor type and approval.

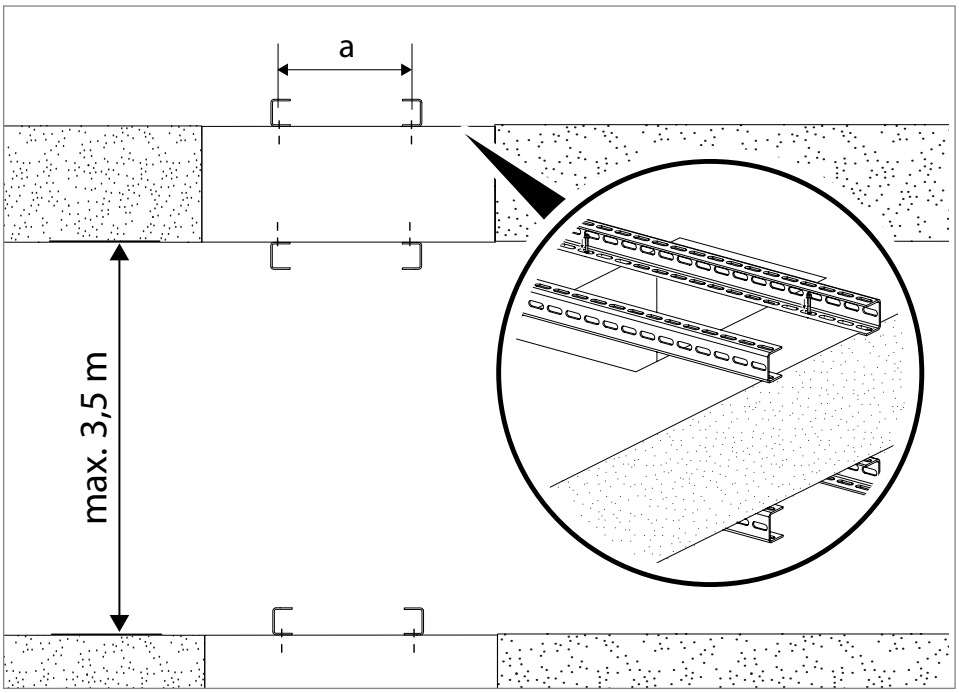



**Fig. 16:** Mounting lengthwise profiles

4. Mount the U supports at a 90° angle to the vertical ladder, each with 2 M12 anchors.

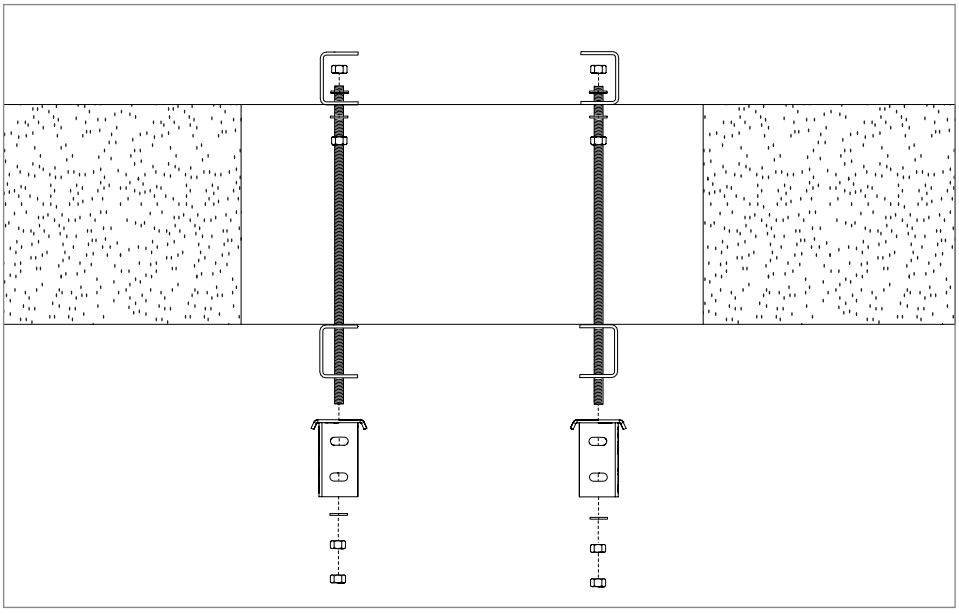


**Fig. 17:** Mounting head plates

5. Run the first threaded rod through the lower U support and up to the ceiling opening and screw on the M12 nut and M12 washer.

6. Run the threaded rod through the lower side of the upper U support and screw tight from above using an M12 washer and M12 nut.
7. Lock from below with the previously screwed-on nut and washer.
8. Repeat steps 5–7 with the second threaded rod.
9. With the open sides facing each other, mount the head plates on the threaded rods, using 1 M12 washer and 2 M12 nuts each.

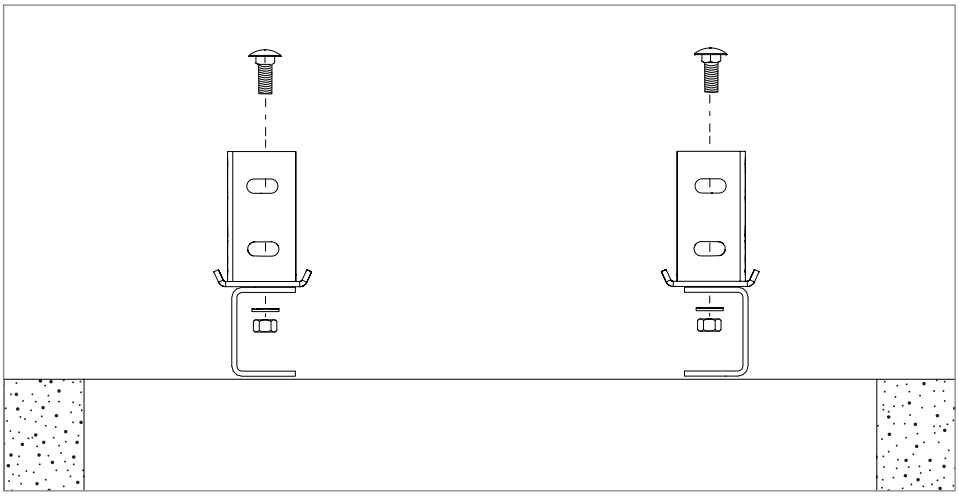


**Fig. 18:** Mounting head plates on the floor

**Note!** *The head plates must be mounted vertically under the head plates under the ceiling.*

10. With the open sides facing each other, mount the head plates on the floor, using 1 M12 truss-head bolt each on the U supports.

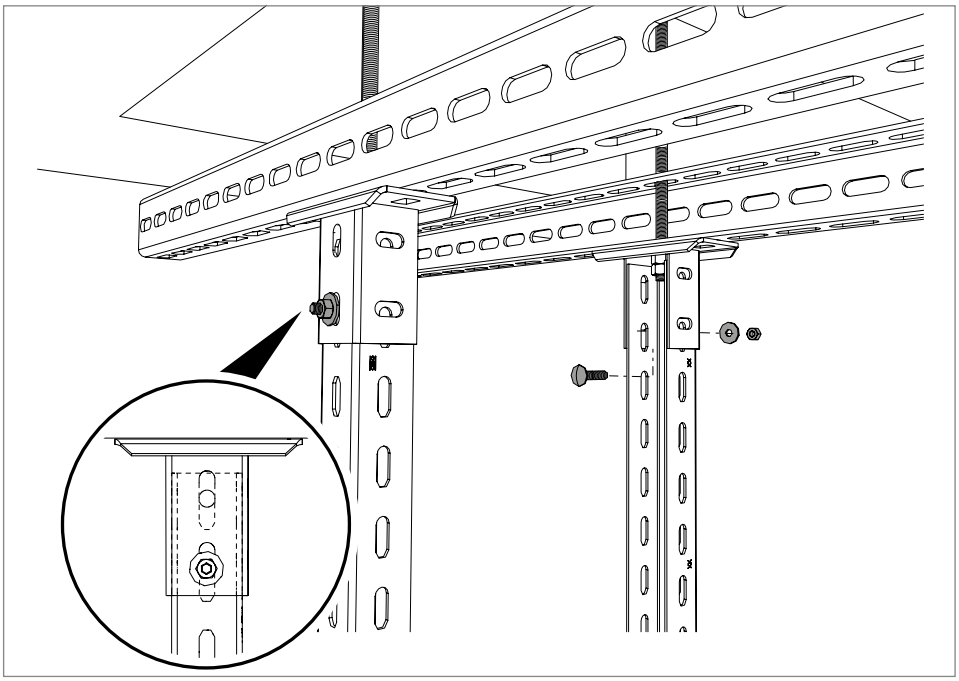


**Fig. 19:** Mounting ladder rails under the ceiling

11. Mount ladder rails under the ceiling with 1 M10 truss-head bolt each on the head plates.
    - Mount the rails with the open sides facing each other.
    - Place the bolts up to the limit in the slot, in order to prevent a vertical movement of the vertical ladders.

**Note!** *At a storey height > 3 m, additional ladder rails must be connected with the mounted ladder rails. See also “6.5 Mounting U support connectors” on page 30.*

**WARNING**

**Function loss through length expansion in the event of fire!**
If there is a fire, the material of the vertical ladders expands.
Do not bolt the vertical ladder to the floor. Maintain a minimum distance of 40 mm between the end of the ladder rail and the top side of the lengthwise profile.

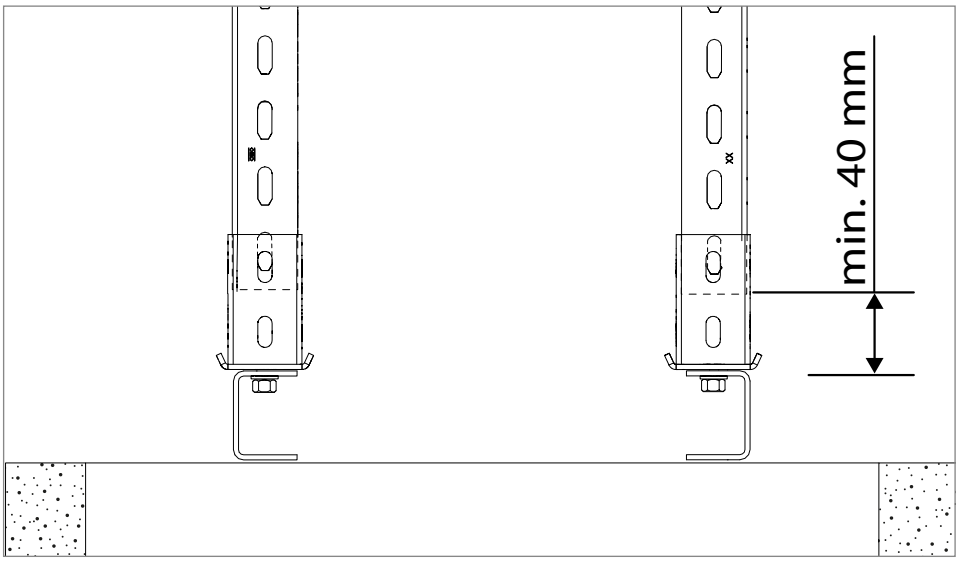



**Fig. 20:** Moveable bearing on the floor

## 6.3 Mounting vertical ladders up to a max. storey height of 7.0 m

**WARNING**

**Function loss in the event of fire!**
At a storey height > 7.0 m, perfect functioning of the vertical ladder cannot be guaranteed in the event of fire. Only use mounting variants at a storey height of maximum 7.0 m.

**Note!** *At a storey height > 3.5 m, after mounting of the vertical ladder, the ZSE90...LH strain relief must also be mounted. See also “7.2 Mounting the strain relief” on page 33.*

### 6.3.1 Mounting the ladder rails with head plates

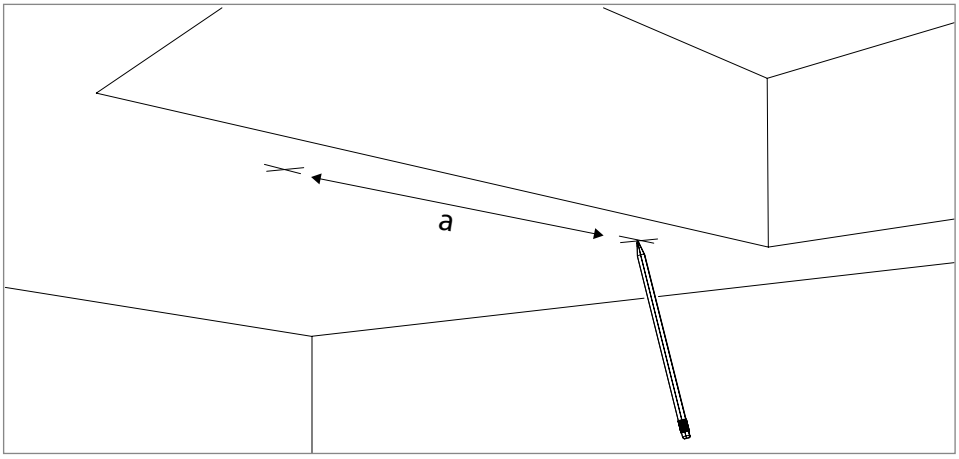



**Fig. 21:** Drawing on the drill holes

**Note!** *Distance “a” is dependent on the width of the vertical ladder used. a = vertical ladder width – 50 mm.*

1. Draw on two drill holes at spacing “a” behind the ceiling opening. Maintain the minimum edge spacing according to the approval of the anchor used.
2. Using a linear laser, transfer the position of the drill holes to the floor.
3. Pre-drill the drill holes. Ø according to anchor type and approval.

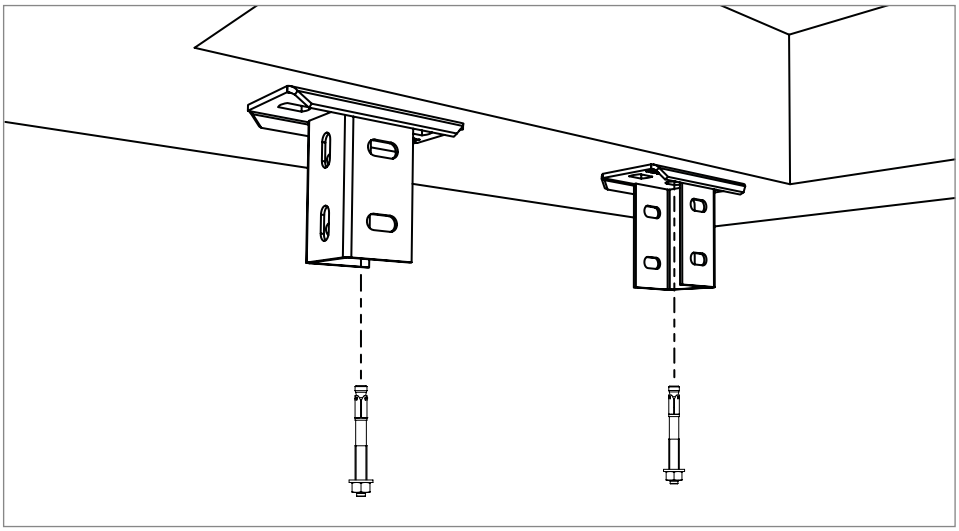


**Fig. 22:** Mounting head plates

4. Mount head plates with the open sides facing each other, using 1 M12 anchor for the ceiling and 1 for the floor.

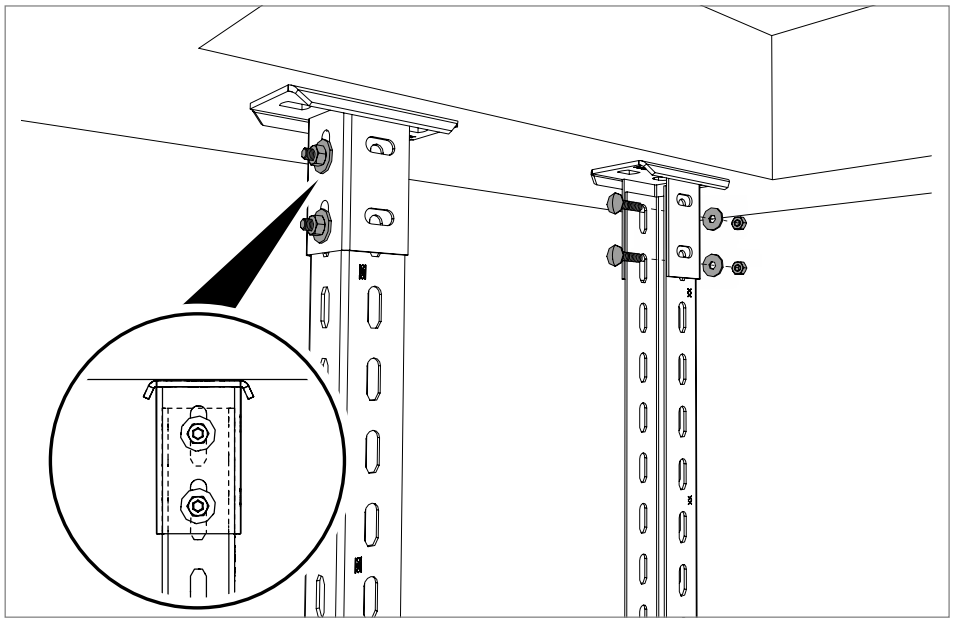


**Fig. 23:** Mounting ladder rails under the ceiling

5. Mount ladder rails under the ceiling with 2 M10 truss-head bolts each on the head plates.
   - Mount the rails with the open sides facing each other.
   - Place the bolts up to the limit in the slot, in order to prevent a vertical movement of the vertical ladders.

**Note!** *To connect additional ladder rails to the mounted ladder rails, see “6.5 Mounting U support connectors” on page 30.*

**WARNING**

**Function loss through length expansion in the event of fire!**
If there is a fire, the material of the vertical ladders expands.
Do not bolt the vertical ladder to the floor. Maintain a minimum distance of 70 mm between the end of the ladder rail and the floor.

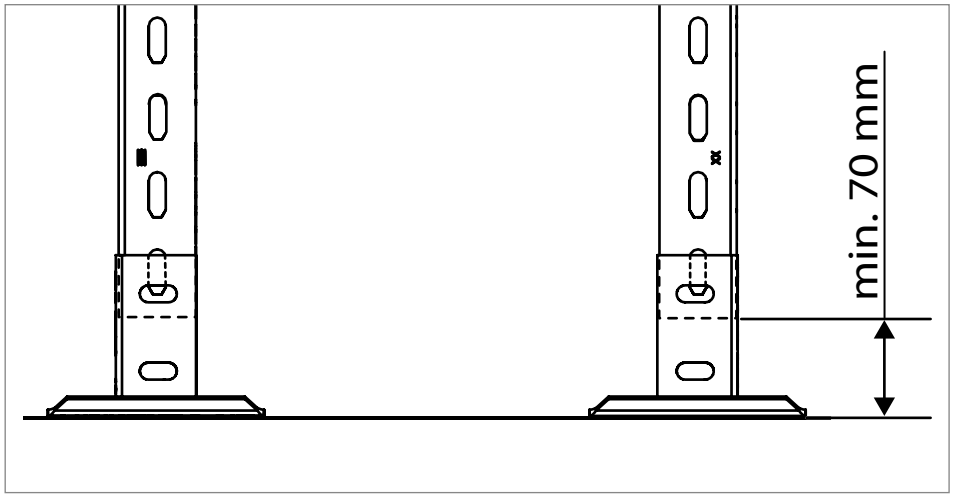



**Fig. 24:** Moveable bearing on the floor

### 6.3.2 Mounting the ladder rails with transverse profiles

1. Draw the drill holes on next to the ceiling openings. Maintain the minimum edge spacing according to the approval of the anchor used.
2. Using a linear laser, transfer the position of the drill holes to the floor.
3. Pre-drill the drill holes. Ø according to anchor type and approval.

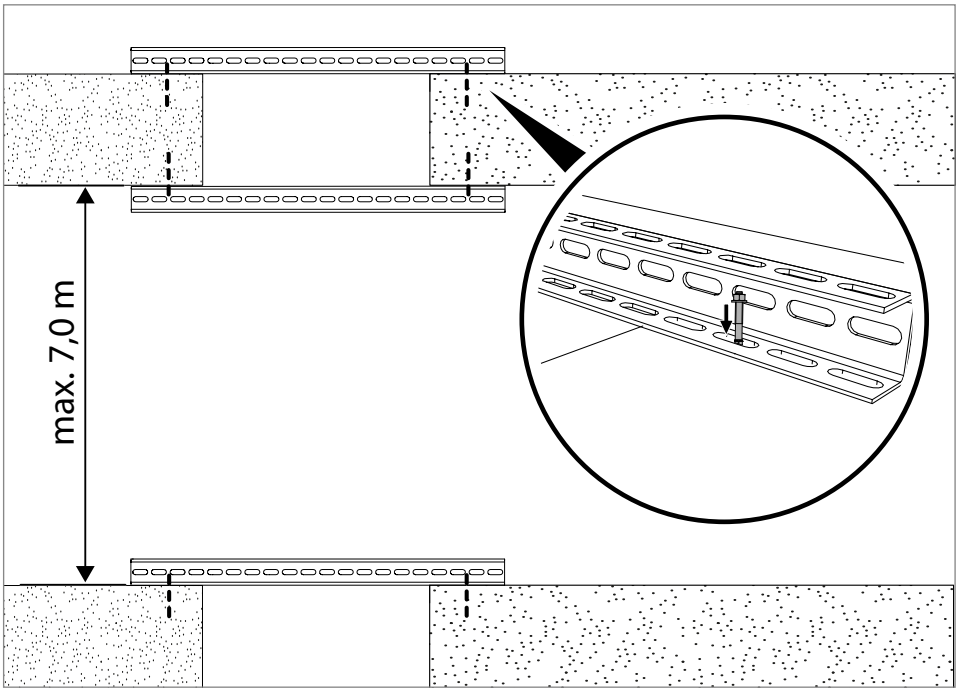



**Fig. 25:** Mounting transverse profiles

4. Mount the U supports in parallel to the vertical ladder, each with 2 M12 anchors.

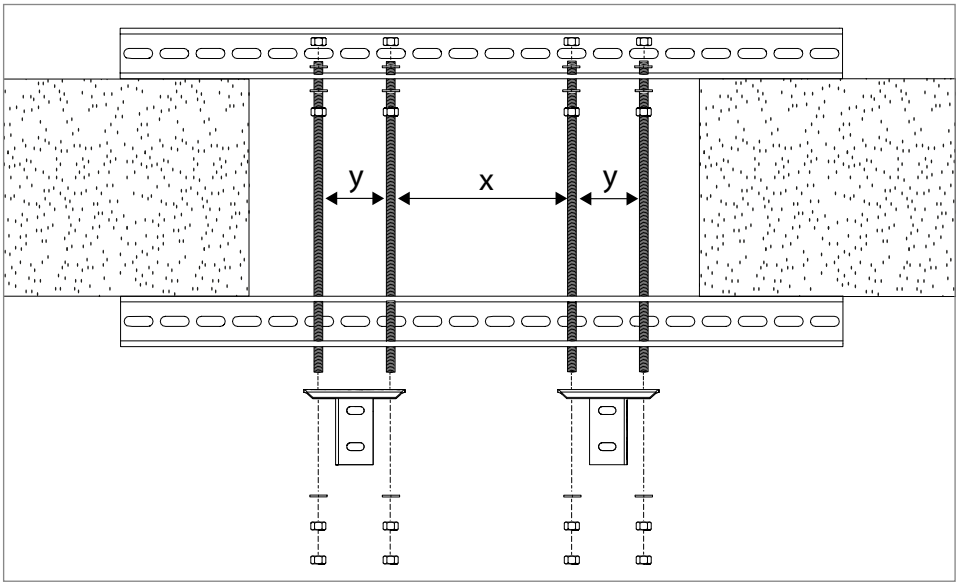



**Fig. 26:** Mounting head plates

**Note!** *The threaded rods must be mounted at a spacing of y – x – y to each other. x = vertical ladder width – 150 mm; y = 100 mm.*

5. Run the first threaded rod through the lower U support and up to the ceiling opening and screw on the M12 nut and M12 washer.
6. Run the threaded rod through the lower side of the upper U support and screw tight from above using an M12 washer and M12 nut.
7. Lock from below with the previously screwed-on nut and washer.
8. Repeat steps 5–7 with 3 further threaded rods.
9. With the open sides facing each other, mount the head plates on the threaded rods, using 1 M12 washer and 2 M12 nuts.

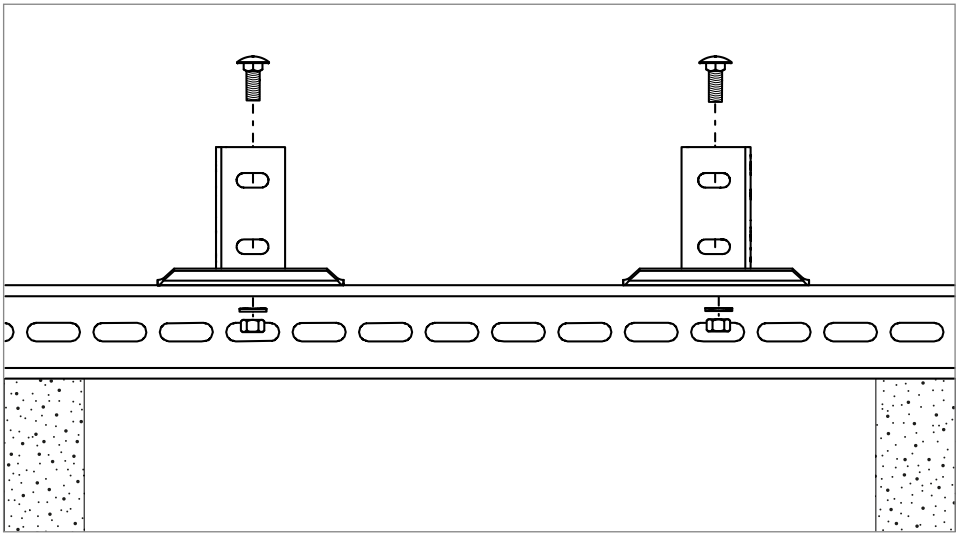


**Fig. 27:** Mounting head plates on the floor

**Note!** *The head plates must be mounted vertically under the head plates under the ceiling.*

10. With the open sides facing each other, mount the head plates on the floor using 1 M12 truss-head bolt each on the U support.

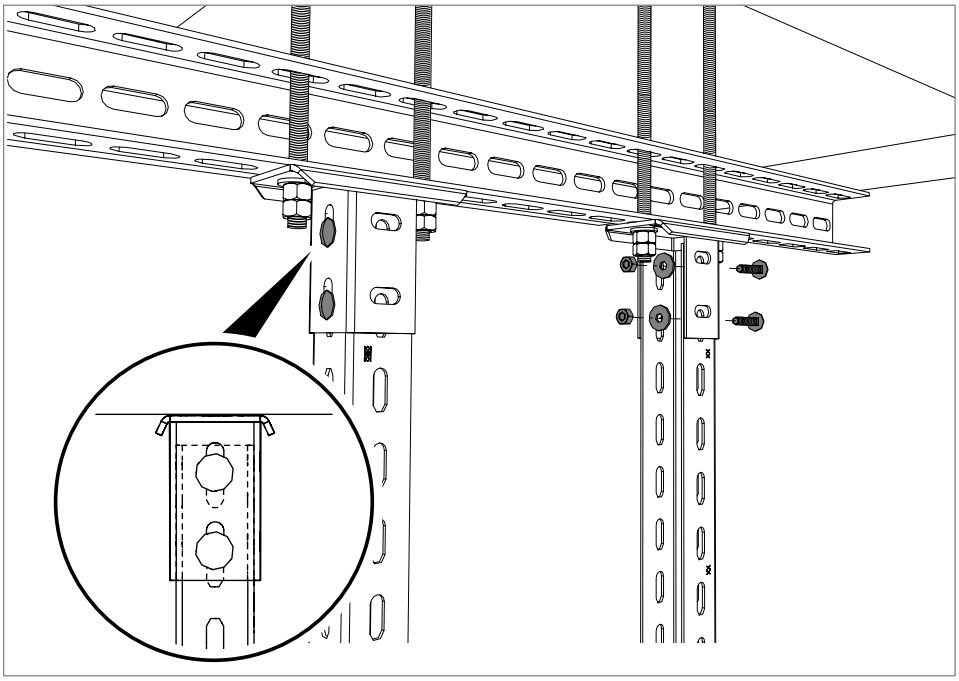


**Fig. 28:** Mounting ladder rails under the ceiling

11. Mount the ladder rails under the ceiling with 2 M10 truss-head bolts each on the head plates.
    - Mount the rails with the open sides facing each other.
    - Place the bolts up to the limit in the slot, in order to prevent a vertical movement of the vertical ladders.

**Note!** *To connect additional ladder rails to the mounted ladder rails, see “6.5 Mounting U support connectors” on page 30.*

**WARNING**

**Function loss through length expansion in the event of fire!**
If there is a fire, the material of the vertical ladders expands.
Do not bolt the vertical ladder to the floor. Maintain a minimum distance of 70 mm between the end of the ladder rail and the top side of the transverse profile.

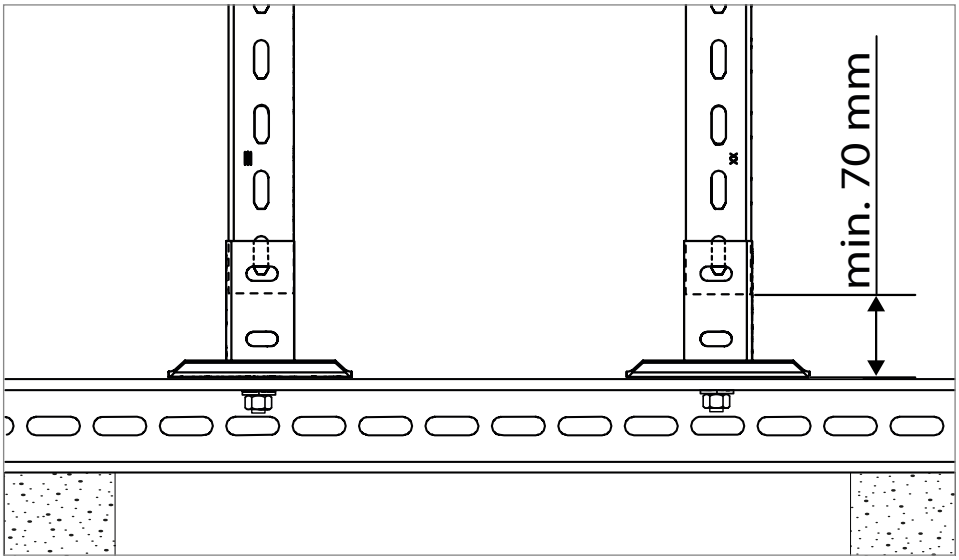



**Fig. 29:** Moveable bearing on the floor

### 6.3.3 Mounting the ladder rails with lengthwise profiles

1. Draw the drill holes on at spacing y – x – y, in front of and behind the ceiling openings. *x = vertical ladder width – 150 mm, y = 100 mm.*
2. Using a linear laser, transfer the position of the drill holes to the floor.
3. Pre-drill the drill holes. Ø according to anchor type and approval.

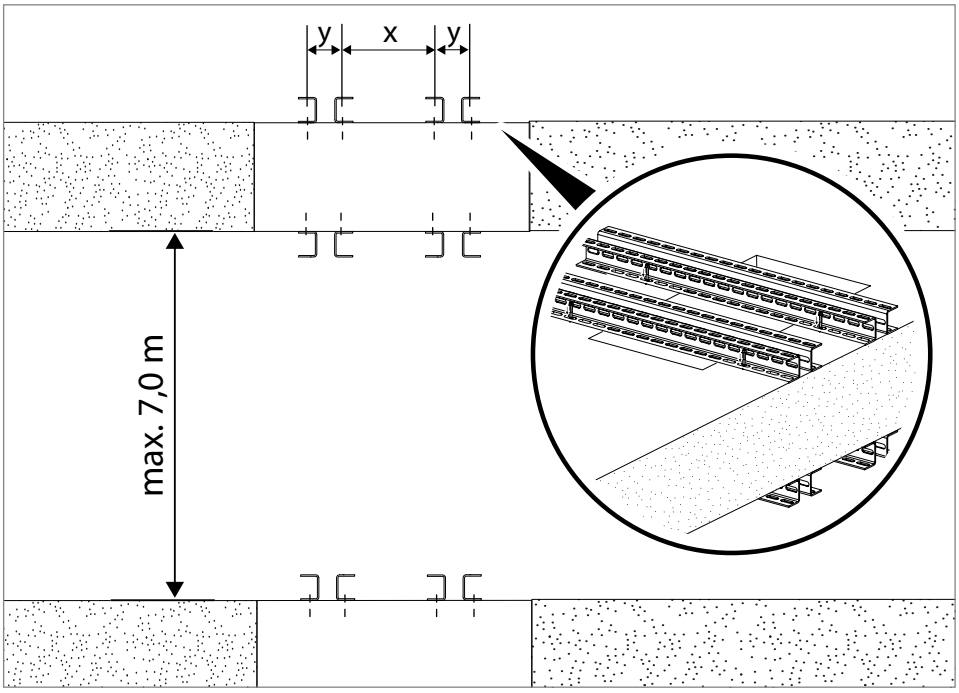



**Fig. 30:** Mounting lengthwise profiles

4. Mount the U support at a 90° angle to the vertical ladder, each with 2 M12 anchors.

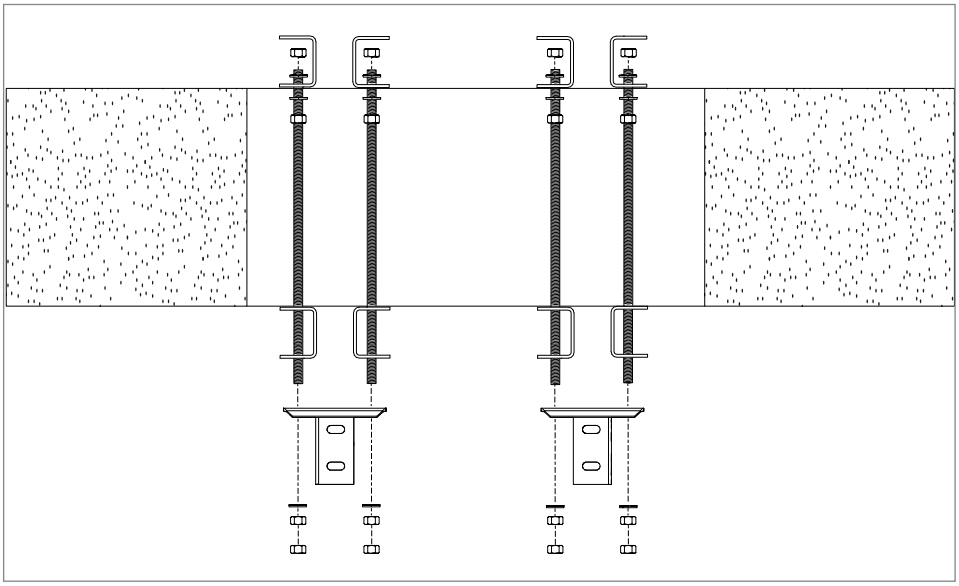


**Fig. 31:** Mounting head plates

5. Run the first threaded rod through the lower U support and screw on the M12 nut and M12 washer.
6. Run the threaded rod through the lower side of the upper U support and screw tight from above using an M12 washer and M12 nut.

7. Lock from below with the previously screwed-on nut and washer.
8. Repeat steps 5–7 with 3 further threaded rods.
9. With the opening facing inward, mount the head plates on the threaded rods, using 1 M12 washer and 2 M12 nuts each.

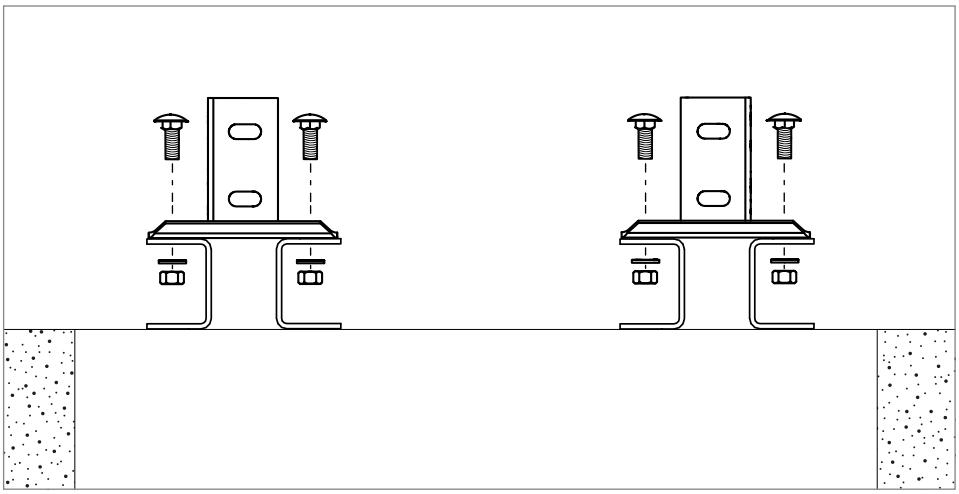


**Fig. 32:** Mounting head plates on the floor

**Note!** *The head plates must be mounted vertically under the head plates under the ceiling.*

10. With the open sides facing each other, mount the head plates on the floor, using 1 M12 truss-head bolt each on the U supports.

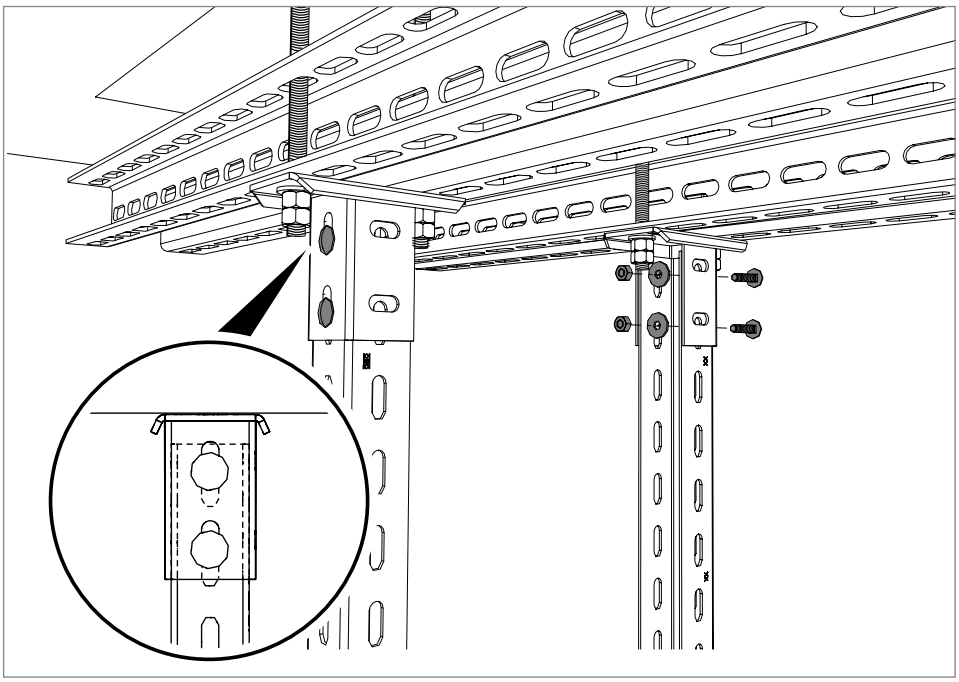


**Fig. 33:** Mounting ladder rails under the ceiling

11. Mount ladder rails under the ceiling with 2 M10 truss-head bolts each on the head plates.
    - Mount the rails with the open sides facing each other.
    - Place the bolts up to the limit in the slot, in order to prevent a vertical movement of the vertical ladders.

**Note!** *To connect additional ladder rails to the mounted ladder rails, see “6.5 Mounting U support connectors” on page 30.*

**WARNING**

**Function loss through length expansion in the event of fire!**
If there is a fire, the material of the vertical ladders expands.
Do not bolt the vertical ladder to the floor. Maintain a minimum distance of 70 mm between the end of the ladder rail and the top side of the lengthwise profile.

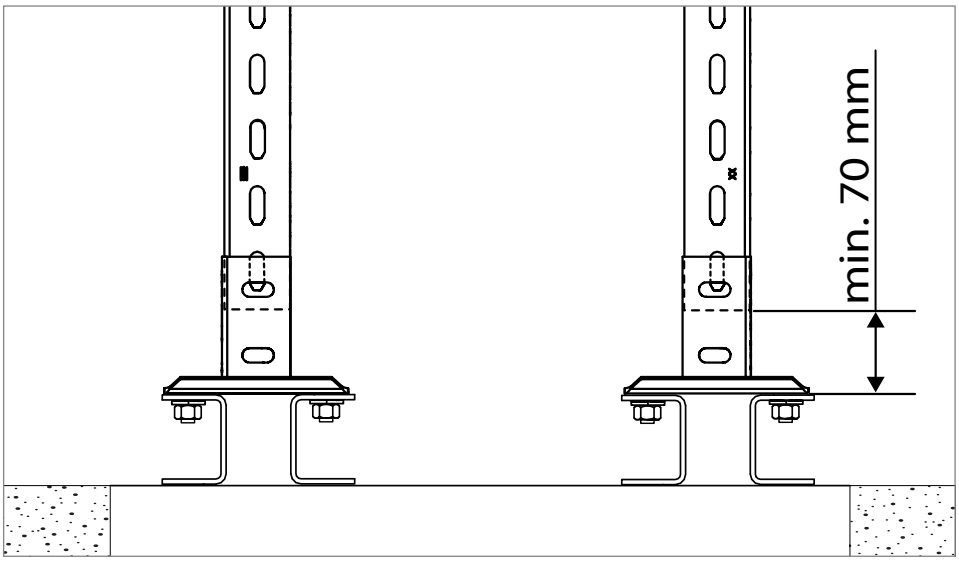



**Fig. 34:** Moveable bearing on the floor

## 6.4 Mounting ladder rungs

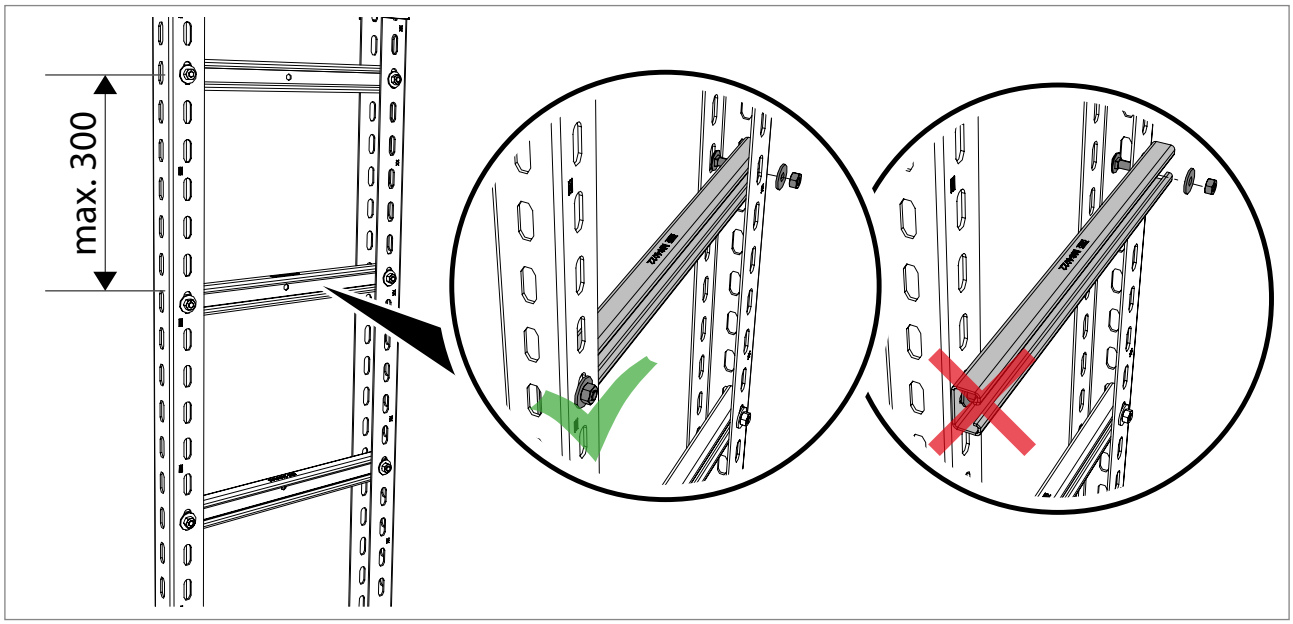



**Fig. 35:** Mounting ladder rungs

1. Insert the ladder rungs into the ladder rails at a distance of 300 mm from the interior.
2. Mount with 2 truss-head bolts each.

## 6.5 Mounting U support connectors

The U support connector can connect two vertical ladder rails, in order to connect storey heights > 3.0 m.

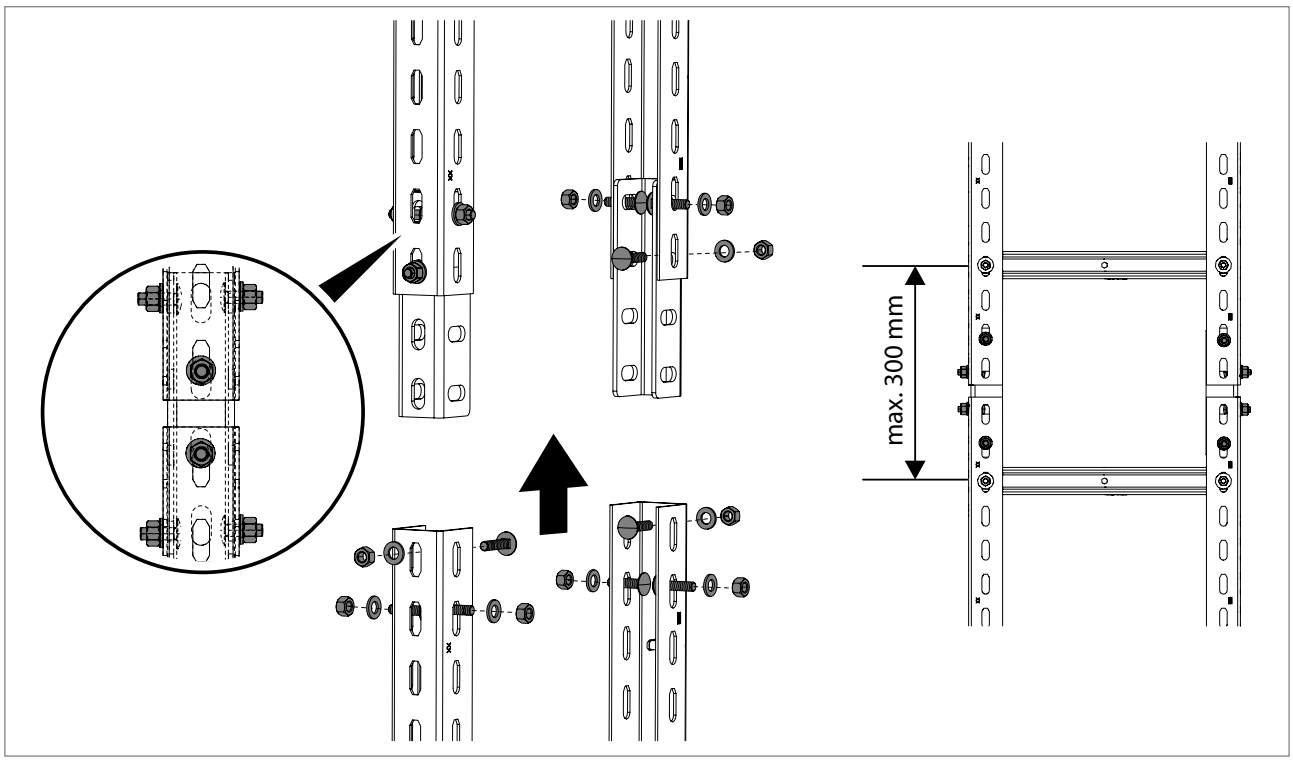



**Fig. 36:** Mounting U support connectors

1. Mount each of the U support connectors with 3 M10 truss-head bolts to the ladder rails already mounted under the ceiling.
   - Mount the connectors with the opening pointing inwards.
   - Place the bolts up to the limit in the slot, in order to prevent a vertical movement of the connector.
2. Mount each additional ladder rail to the U support connectors with 3 truss-head bolts.
   - Mount the rails with the opening pointing inwards.
   - Place the bolts up to the limit in the slot, in order to prevent a vertical movement of the vertical ladders.

**Note!** *The maximum distance between the ladder rungs above and below the U support connector is 300 mm.*

## 6.6 Fastening cables

**WARNING**

**Function loss through excessive cable load!**
At an excessive cable load, the perfect functioning of the vertical ladder cannot be guaranteed in the event of fire. Observe the maximum cable load and specifications for the cable assignment.

– Cable load per vertical ladder max. 20 kg/m
– Cable bundling, heavy current cables, max. quantity 3, max. diameter 25 mm
– Cable bundling, installation cables, quantity not limited, total cable weight max. 3.0 kg/m

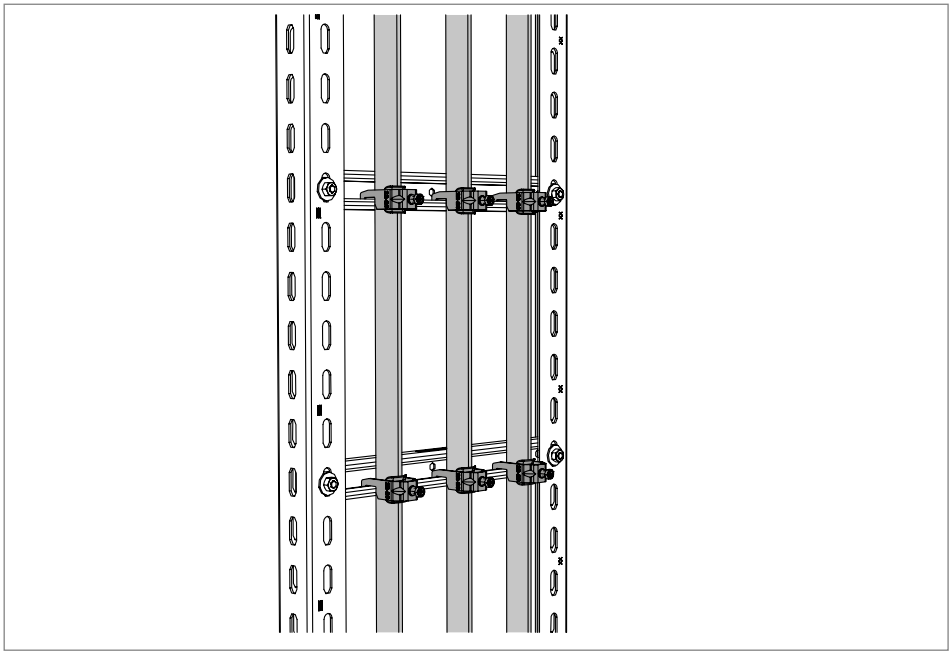


**Fig. 37:** Fastening cables

1. Fasten cables to the ladder rungs with clamp clips, type 2056U M.

## 6.7 Attaching the identification plate

The cable system must be given an identification plate, in accordance with DIN 4102 Part 12.

1. Clearly fill out the KS-E identification plate with a permanent marker.
2. Stick the KS-E identification plate to the ladder rail of the suspended vertical ladder.

# 7 Additional required measures

## 7.1 Closing ceiling openings with insulation

After mounting, the ceiling opening must be closed off with appropriate fire insulation.

**Note!** *For more information on mounting the fire insulation, see the mounting instructions of the appropriate insulation system.*

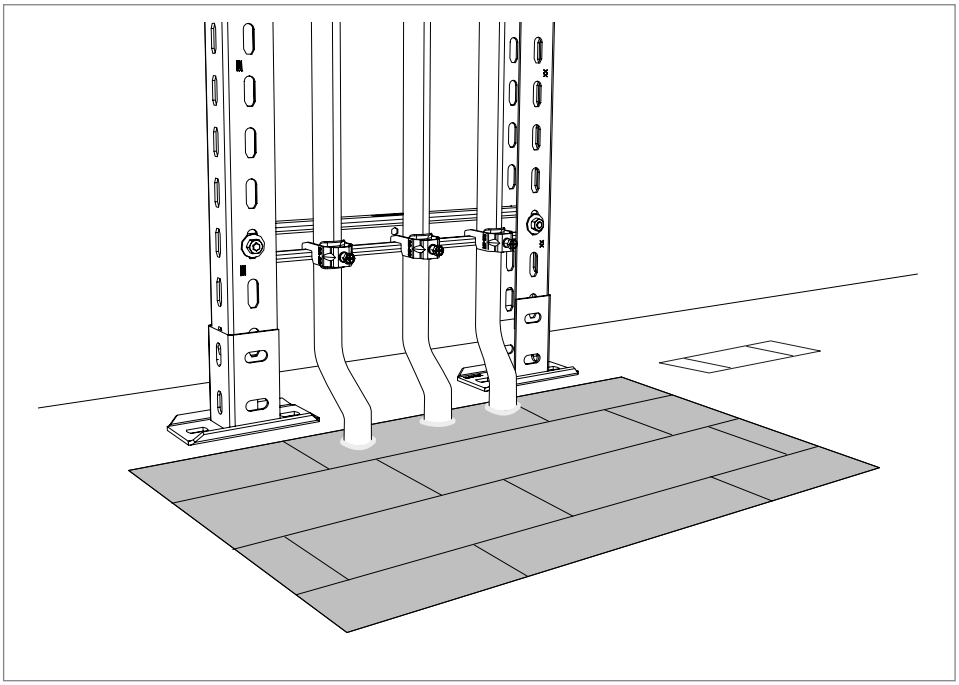


**Fig. 38:** Fully mounted strain relief on suspended vertical ladder

## 7.2 Mounting the strain relief

From storey heights of 3.5 m, the ZSE90... LH strain relief must be mounted as an effective support measure for suspended rising sections.

**Note!** *For more information on the mounting of the ZSE90...LH strain relief, see the ZSE90 mounting instructions.*

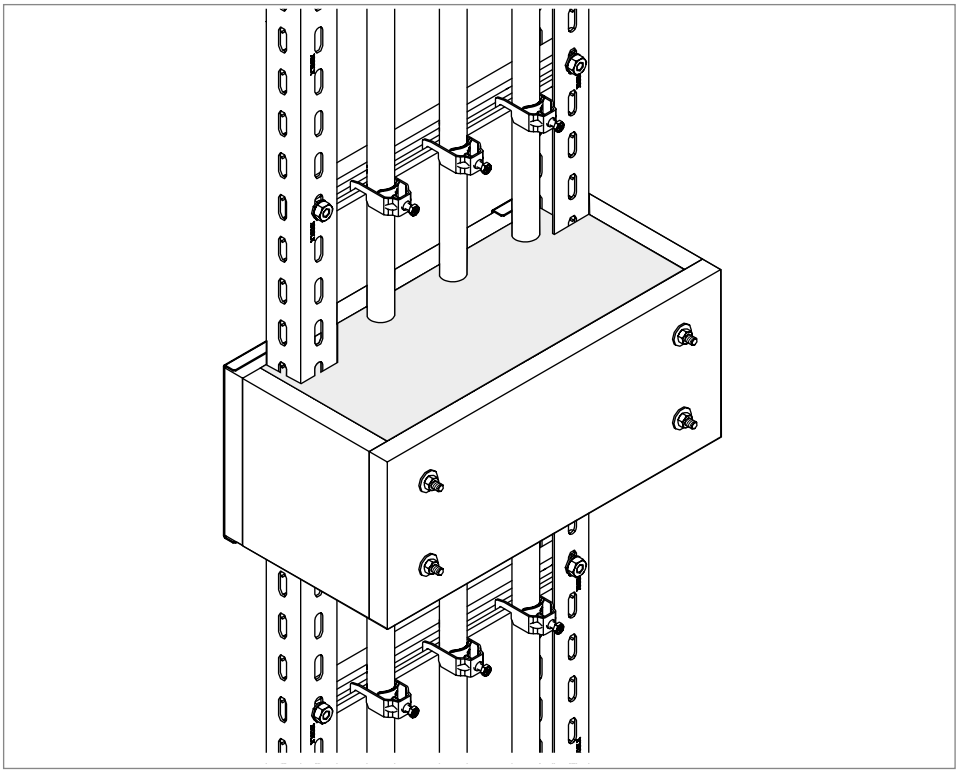


**Fig. 39:** Fully mounted strain relief on suspended rising section

# 8 Retrofitting

Retrofitting of the suspended rising section is always possible at any time. During retrofitting, observe the following:

– Do not exceed the maximum cable load of the vertical ladder, see also “6.6 Fastening cables” on page 31.

– Observe the conditions for retrofitting the inserted insulation in the ceiling opening.

– Observe the conditions for retrofitting any possibly mounted ZSE90 strain relief.

# 9 Checking and maintaining the system

The suspended vertical ladder is maintenance-free.

Carry out a visual inspection of the suspended vertical ladder as part of the inspection of the electrical systems.

# 10 Dismantling the system

Dismantling of all the elements of the suspended rising section takes place in the reverse order to mounting.

# 11 Disposing of the system

Comply with the local waste disposal regulations.

– Product/system: As scrap metal

– Packaging: As household waste

**Disposal after a fire**

**CAUTION**

**Irritant effect!**
If there is a fire, burning cable insulation can create corrosive gases, which have an irritant and corrosive effect. When disposing of system components which have been subjected to a fire, wear breathing protection and protective clothing.

If the system was subjected to fire damage, then the complete system must be removed and disposed of. We recommend obtaining the advice of the local fire damage restorer during disposal.

# 12 Technical data

| Type | Item no. | Designation | Dimensions in mm (L x W) |
|---|---|---|---|
| Vertical ladders | | | |
| SLM50C40F 20 FT | 6010004 | SLM 50 vertical ladder | 3,000 x 200 |
| SLM50C40F 30 FT | 6010006 | SLM 50 vertical ladder | 3,000 x 300 |
| SLM50C40F 40 FT | 6010008 | SLM 50 vertical ladder | 3,000 x 400 |
| SLM50C40F 50 FT | 6010016 | SLM 50 vertical ladder | 3,000 x 500 |
| SLM50C40F 60 FT | 6010024 | SLM 50 vertical ladder | 3,000 x 600 |
| Fastenings | | | |
| KUS 5 NOK | 6348939 | Head plate | – |
| KUS 5 FT | 6348904 | Head plate | – |
| GMS 3 VW 90 FT | 1124661 | Mounting bracket | – |
| US 7 40 FT | 6340059 | US 7 support | – |
| US 7 50 FT | 6340075 | US 7 support | – |
| US 7 60 FT | 6340091 | US 7 support | – |
| US 7 70 FT | 6340113 | US 7 support | – |
| US 7 80 FT | 6340148 | US 7 support | – |
| US 7 90 FT | 6340164 | US 7 support | – |
| US 7 100 FT | 6340180 | US 7 support | – |
| US 7 110 FT | 6340199 | US 7 support | – |
| US 7 120 FT | 6340202 | US 7 support | – |
| US 7 130 FT | 6340210 | US 7 support | – |
| US 7 140 FT | 6340229 | US 7 support | – |
| US 7 150 FT | 6340237 | US 7 support | – |
| VUS 5 FT | 6018506 | U support connector | – |
| FRS 10x25 F 8.8 | 6407560 | Truss-head bolt | – |
| FRS 12x25 F | 6406254 | Truss-head bolt | – |
| TR M12 1M G | 3141306 | Threaded rod | – |
| HN M12 G | 3400123 | Hexagonal nut | – |
| WS M12 D24 G | 3402096 | Washer | – |
| Accessories | | | |
| KS-E EN | 7205432 | Identification plate | – |
| 2056U M 12 FT | 1158007 | Clamp clip | – |
| 2056U M 16 FT | 1158015 | Clamp clip | – |
| 2056U M 22 FT | 1158023 | Clamp clip | – |
| 2056U M 28 FT | 1152031 | Clamp clip | – |
| 2056U M 34 FT | 1158058 | Clamp clip | – |
| 2056U M 40 FT | 1158066 | Clamp clip | – |
| 2056U M 46 FT | 1158074 | Clamp clip | – |
| 2056U M 52 FT | 1158082 | Clamp clip | – |
| 2056U M 58 FT | 1158090 | Clamp clip | – |
| 2056U M 64 FT | 1158104 | Clamp clip | – |
| 2056U M 70 FT | 1158112 | Clamp clip | – |
| 2056U M 76 FT | 1158120 | Clamp clip | – |

**Tab. 7:** Technical data

**OBO Bettermann Holding GmbH & Co. KG**
P.O. Box 1120
58694 Menden
GERMANY

**Customer Service Germany**
Tel.: +49 (0)2373 89-1700
Fax: +49 (0)2373 89-1238
E-mail: info@obo.de

www.obo-bettermann.com

OBORD 200296 Date 02/2021

**Building Connections**