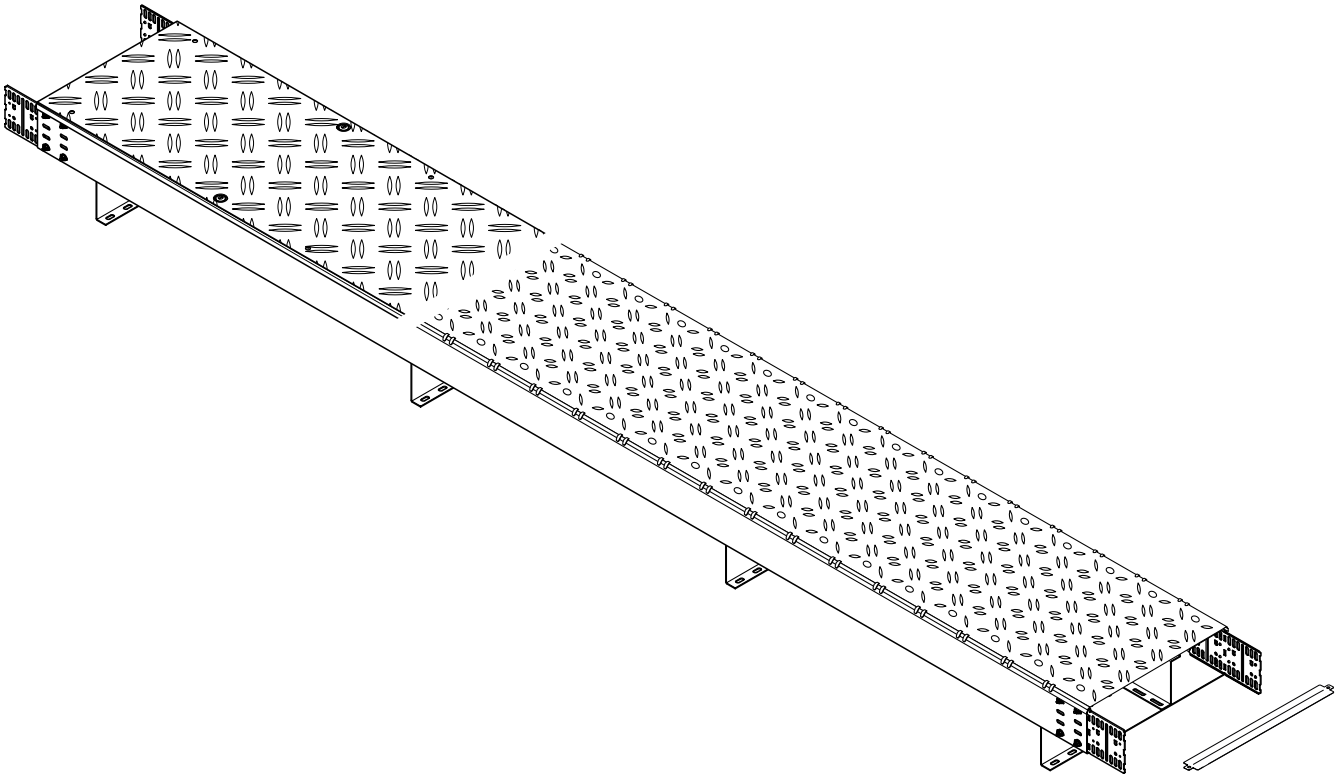
BKRS walkable cable tray systems

Mounting instructions for VW AG



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1 General information

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) charged with the installation of the BKRS walkable cable tray system.

1.2 Using these instructions

- These instructions are based on the standards valid at the time of compilation April 2019.
- Before commencing work, read these instructions through once completely. In particular, please observe the safety instructions.
- Keep all the documents supplied with the BKRS walkable cable tray system safe, so that the information is available should you need it.
- We will not accept any warranty claims for damage caused through non-observance of these instructions.
- Any images are intended merely as examples. Mounting results may look different.

1.3 Types of safety information

Type of risk!
Shows a possibly risky situation. If the situation is not avoided, then death or serious injury may result.

Note! *Indicates important information or assistance!*

1.4 Correct use

The BKRS cable tray systems are walkable cable tray systems for direct floor mounting or raised mounting on support profiles. They are used to install and protect power and data cables in industrial areas.

The BKRS cable tray systems are suitable for use at ambient temperatures of –20 °C to +120 °C. At temperatures below –20 °C, the metal will become brittle and may not be processed further.

1.5 Basic standards

The walkable BKRS cable tray systems correspond to the standards:

- IEC 61537 – Cable management – Cable tray systems and cable ladder systems
- Based on DIN EN 50085-2-2 – Cable trunking systems and cable ducting systems for electrical installations
- DIN EN 50174 – Information technology – Installation of communication cabling
- DIN 51130 – Testing of floor coverings – Determination of the anti-slip property – Workrooms and fields of activities with slip danger – Walking method – Ramp test

2 General safety information

Observe the following general safety information on handling the BKRS walkable cable tray systems:

- Protective gloves must be worn during all mechanical mounting work.
- The BKRS walkable cable tray systems must 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 Product description

3.1 Product features

The BKRS walkable cable tray systems are characterised by the following product features:

- Two installation options: Direct floor mounting or raised mounting on support brackets
- Walkable thanks to solid cover
- 2 cover types with different fastening options to the cable tray:
  - Cover type DF BKR made of strip galvanised sheet steel and chequered sheet aluminium: Fastening with pre-mounted turn buckles
  - Cover type DBKR made of strip galvanised chequered sheet steel with increased anti-slip protection: Fastening with flexibly mounted turn buckles in pre-marked break-out openings or fastening with cover clamps
- Walkable and non-slip thanks to chequering
- With bottom perforation for ventilation, as water drainage and for more flexible mounting
- Resistant to dirt and dust through dust protection elements
- EMC-compatible separation of power and data cables through barrier strips
- Side heights 100 mm and 110 mm
- Self-supporting, no screwing with machines required

3.2 Product overview

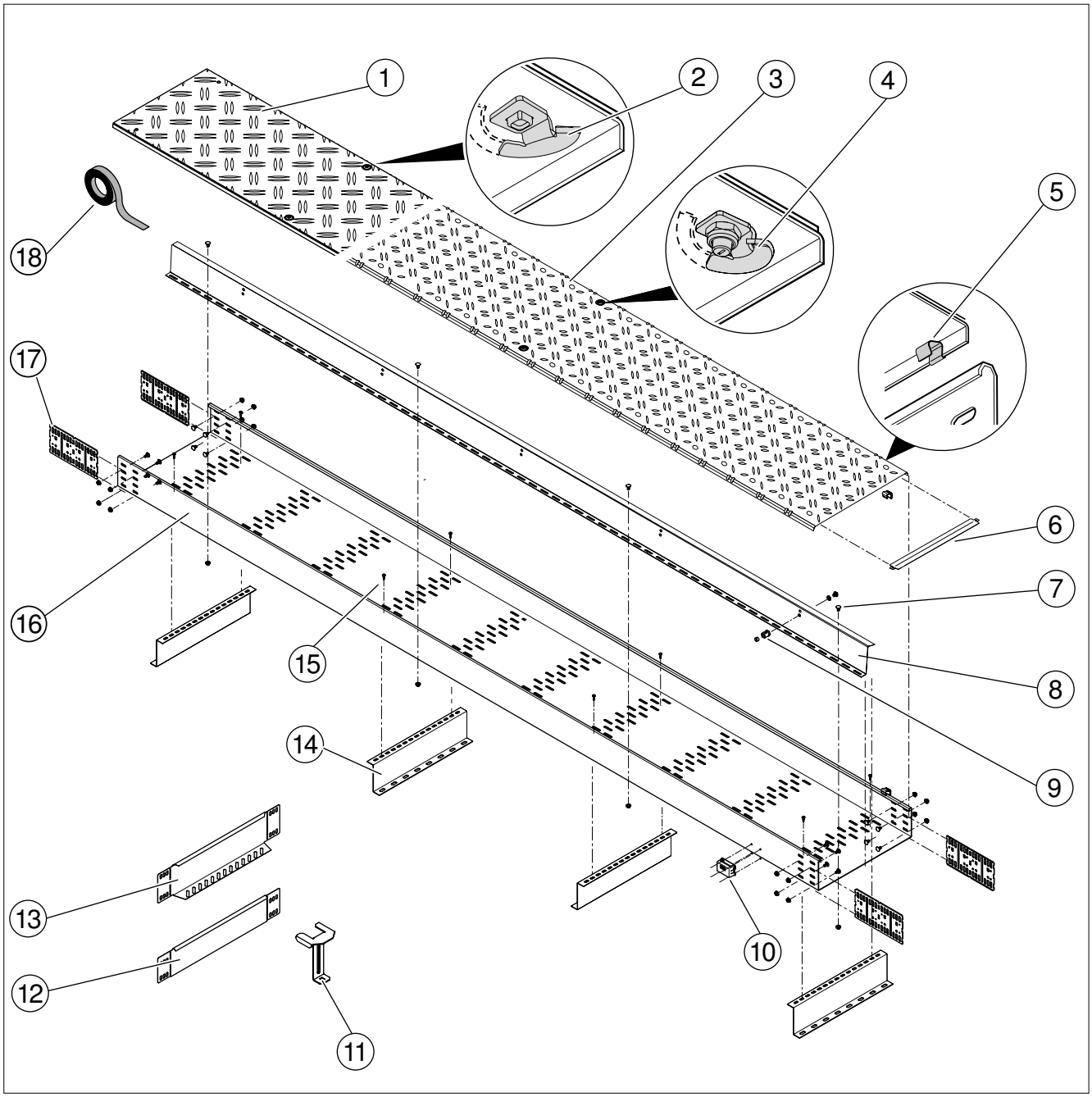

Figure 1: System components

Item	Designation	Function
①	Cover type DF BKR (strip galvanised sheet steel with chequered sheet aluminium)	Walkable cover of the cable tray
②	Pre-mounted turn buckle, type DRL H FT	Fastening of the cover DF BKR to the cable tray
③	Cover, type DBKR, with increased slip protection (strip galvanised, chequered sheet steel)	Walkable cover of the cable tray
④	Turn buckle Type DRL H S A2 for break-out openings (optionally also type DRL H FT)	Fastening of the cover DBKR to the cable tray
⑤	Cover clamp DK DBKR G	Fastening of the cover DBKR to the cable tray
⑥	Dust protection element	Protection against dust and chips at the cover joints
⑦	Truss-head screw with hexagonal nut	Mounting of barrier strips
⑧	Z-shaped barrier strip	Cover support for cable tray widths of > 200 mm with perforation for the installation of earthing terminals
⑨	Earthing terminal	Connection of the cable tray system with the equipotential bonding of the overall system
⑩	Equipotential busbar	
⑪	Cover support	Support of covers and fitting covers in cross-over areas
⑫	Reducer/end closure 100 mm	Closure of open points, if cable trays of different widths are connected, as well as closure of cable tray ends
⑬	Reducer/end closure 110 mm	
⑭	Support profile	Raised mounting of the cable tray
⑮	Truss-head bolt with hexagonal nut with flange	Connection of the cable tray with support profiles, straight and angle connectors, reducers/end closures
⑯	Cable tray	Acceptance of the power and data cables
⑰	Straight and angle connector	Connection of cable trays
⑱	Anti-slip strip	Securing against shifting of the cover in the straight direction

4 Mounting

The cable trays are suitable for mounting on the floor or on support profiles.

The maximum spacing of the support profiles must be 1.2 m, if the stated load limits are to be achieved (approved loads under “BKRS cable tray” at www.obo.de).

Note! *Depending on the circumstances on the construction site, the sequence of mounting steps for the BKRS walkable tray systems may change!*

4.1 Mounting the support profiles

Note! *The support profiles (Z profiles) must be installed in an alternating manner under the cable tray.*

Note! *When mounting the support profiles, it is helpful to use the bottom perforation of the cable tray.*

The support profiles are screwed to the floor with the M8 bolt ties and nuts or with Ø 7.5 mm bolt ties.

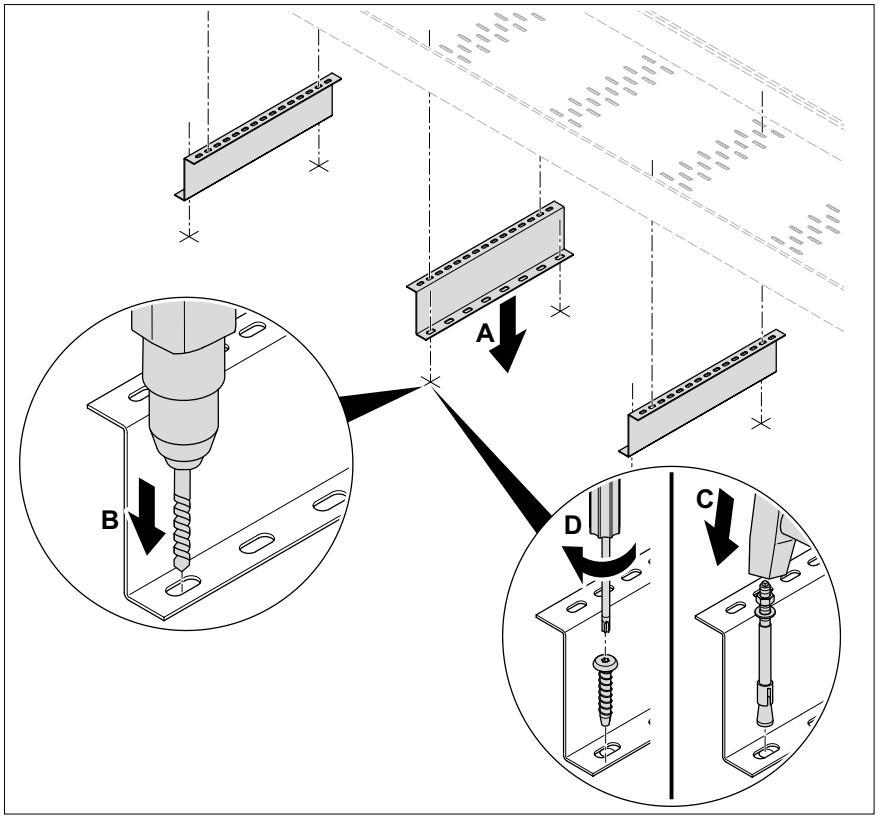

Figure 2: Mounting of support profiles

1. Align the support profiles so that they are suitable for floor mounting (A).
2. Drill a hole for the bolt tie through the slot on the support profile (B).
3. Knock the bolt tie in with a hammer (C) and screw the support profile tight with a nut.
4. Alternatively: Turn in the bolt tie (D) and screw the support profile tight.

4.2 Mounting the cable trays

The cable trays can be shortened or extended to any length. If, after shortening the cable trays, slots for further installation are missing, then suitable fastening holes must be drilled in the cable trays.

4.2.1 Mounting the cable trays directly on the floor

The cable trays are mounted on the floor with knock-in anchors Ø 6 mm or bolt ties Ø 6 mm.

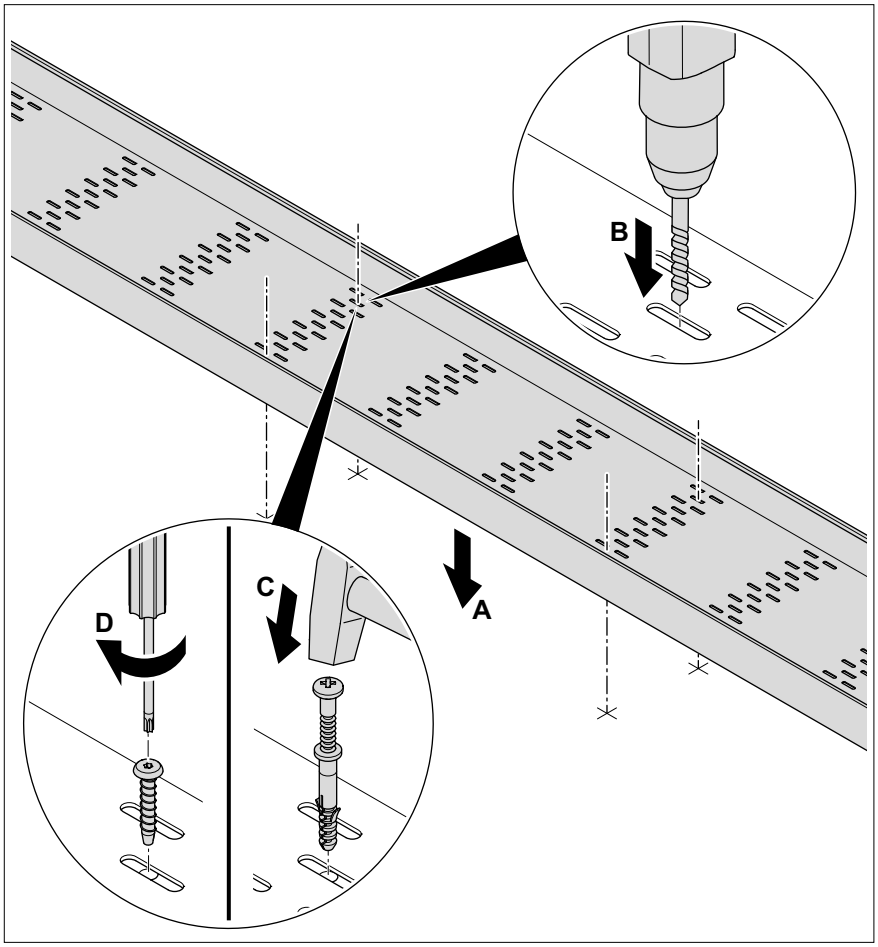

Figure 3: Mounting directly on the ground

1. Align the cable tray so that it is suitable for floor mounting (A).
2. Drill a hole for the knock-in anchor or bolt tie through the slot in the cable tray (B).
3. Knock the knock-in anchor in using a hammer (C) and screw the cable tray tight
4. Alternatively: Turn in the bolt tie (D) and screw the cable tray tight.

4.2.2 Mounting the cable trays on support profiles

The cable trays are mounted on the support profiles through the slots in the base of the cable trays with truss-head bolts and hexagonal nuts with a flange (M6).

Note! *Corner connections or cross-overs of cable trays must also be supported with support profiles.*

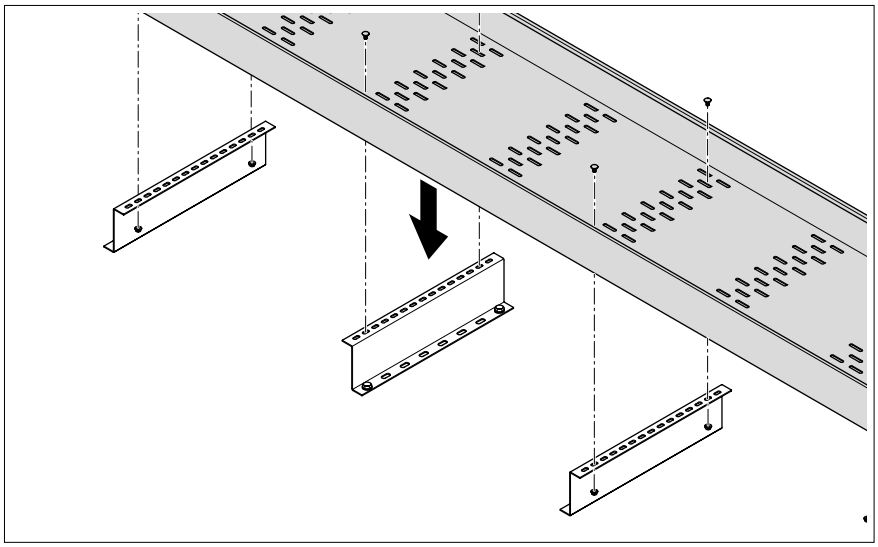

Figure 4: Mounting on support profiles

1. Mount the cable trays.

4.3 Connecting cable trays

Cable trays are connected using straight and angle connectors.

The straight and angle connectors are screwed to the sides of the cable trays using the supplied fastening material.

Connect the cable trays so that they abut.

Note! *The straight and angle connectors are mounted on the inside. The nuts are screwed on to the outside.*

4.3.1 Connecting cable trays in lengthwise direction

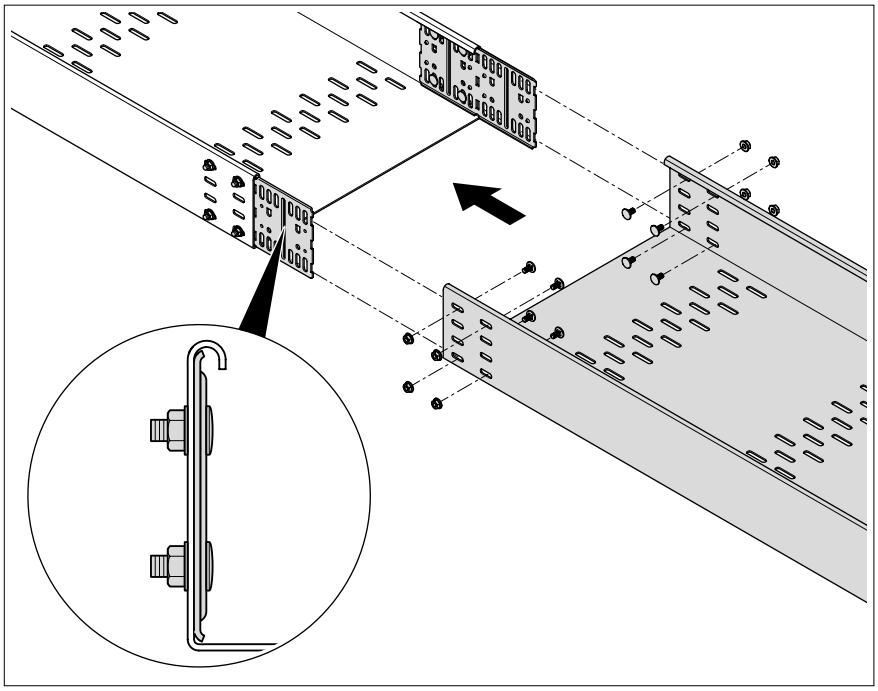

Figure 5: Straight connection

1. If necessary, create fastening holes (4x ø8 mm) for the connectors on the side sections of the cable trays.
2. Screw two straight and angle connectors to the first cable tray.
3. Push the second cable tray over the straight and angle connectors of the first cable tray.
4. Screw the second cable tray to the straight and angle connectors.

4.3.2 Connecting cable trays as a corner

Note! *With corner connections, the cable trays are mounted so that they overlap.*

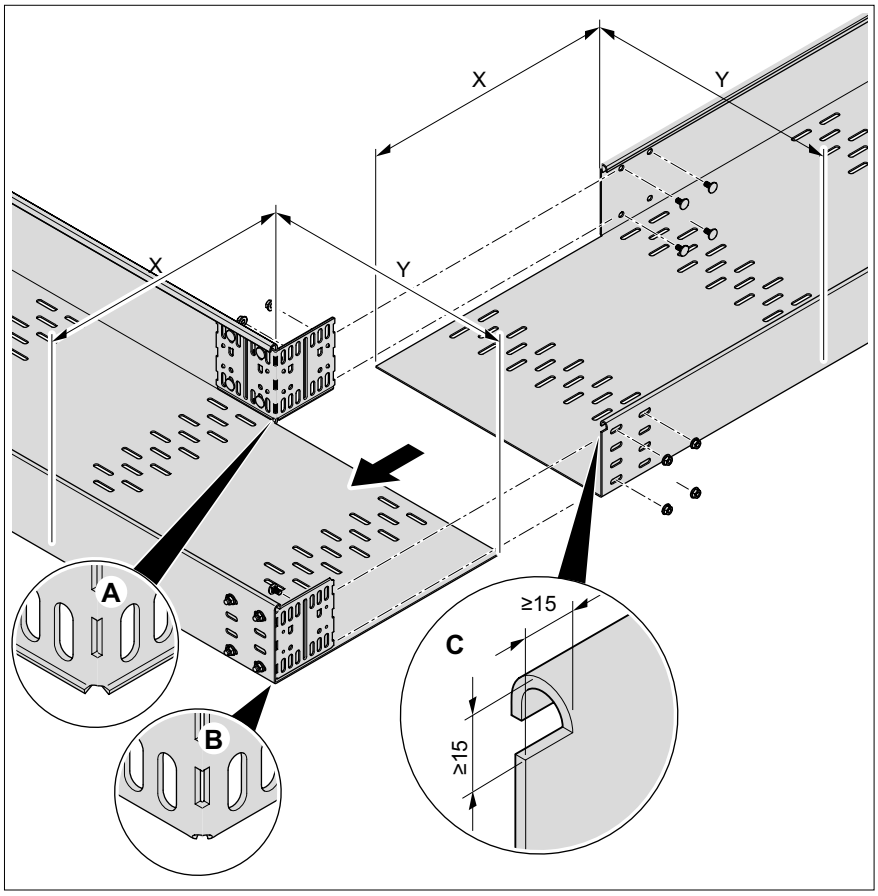

Figure 6: Corner connection

1. Cut out the side parts of the cable trays by the dimensions x and y.
2. Notch out the corner (C).
3. Deburr cut edges to avoid cable damage.
4. If necessary, create fastening holes (4x ø8 mm) for the connectors on the side sections of the cable trays.
5. Bend the straight and angle connector through a 90° angle.

Note! *Straight and angle connector*
1x bent edge on the inside (B),
1x bent edge on the outside (A).

6. Screw the angle connector to the first cable tray.
7. Push the second cable tray over the straight and angle connectors of the first cable tray.
8. Screw the straight and angle connector to the second cable tray.

4.3.3 Connecting cable trays as a cross-over

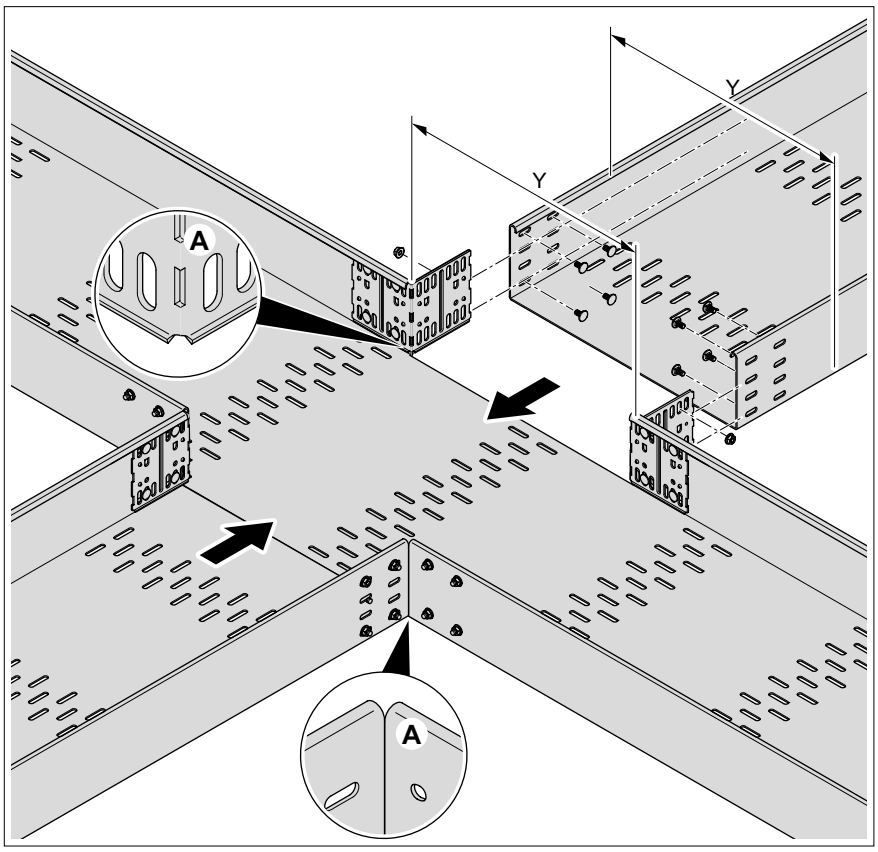

Figure 7: Cross-connection

1. Cut out the side parts of the cable trays.
2. Deburr cut edges to avoid cable damage.
3. If necessary, create fastening holes (4x ø8 mm) for the connectors.
4. Bend the straight and angle connector through a 90° angle.

Note! *Straight and angle connector:*
Bent edge on the outside (A).

5. Screw the angle connector to the first cable tray.
6. Push the second cable tray over the straight and angle connectors of the first cable tray.
7. Screw the straight and angle connector to the second cable tray.

4.3.4 Changing the cable tray width

If two cable trays with different widths are connected, then a straight and angle connector is replaced by a reducer/end closure.

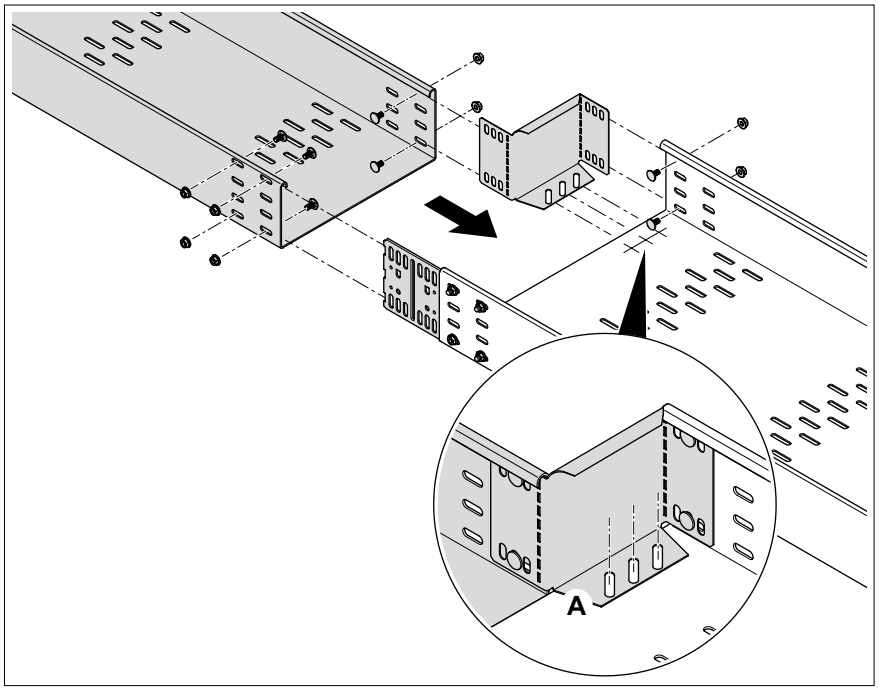

Figure 8: Changing the cable tray width

1. Screw the first cable tray to the straight and angle connector on one side.
2. Bend the straps of the reducer/end closure through a 90° angle.

Note! *The lower flange (A) points into the cable tray during mounting.*

Note! *At widths above 150 mm, reducers/end closures for 110 mm cable trays have perforation in the lower flange, which can be used for screwing to the cable tray.*

3. Screw the reducer/end closure to the first cable tray.
4. Push the second cable tray over the straight and angle connector and the reducer/end closure of the first cable tray and screw it tight.
5. If necessary, screw the base of the cable tray to the lower flange of the reducer/end closure.

4.3.5 Closing the open ends of the cable trays

The open ends of the cable trays are closed with a reducer/end closure.

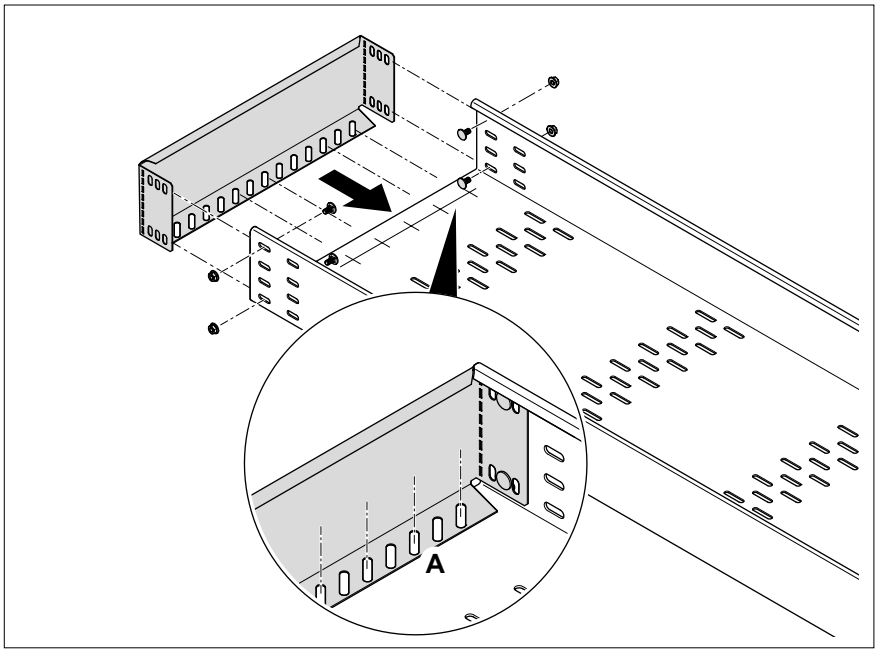

Figure 9: Closure of open ends

1. If necessary, create fastening holes (2 x ø8 mm on each side) for the connectors on the side sections of the cable trays.
2. Bend the straps of the reducer/end closure through a 90° angle.

Note! *The lower flange (A) points into the cable tray during mounting.*

3. Push the reducer/end closure into the cable tray.
4. Screw the reducer/end closure to the cable tray.
5. If necessary, screw the base of the cable tray to the lower flange of the reducer/end closure.

4.4 Mounting Z-shaped barrier strips

In order to achieve the maximum permitted load, Z-shaped barrier strips must be placed in cable trays with a width > 200 mm. The distance between the barrier strips and the side wall or the next barrier strip may not exceed 220 mm.

The barrier strips can be shortened to any length.

Note! *The cable tray is divided asymmetrically by the barrier strips.*

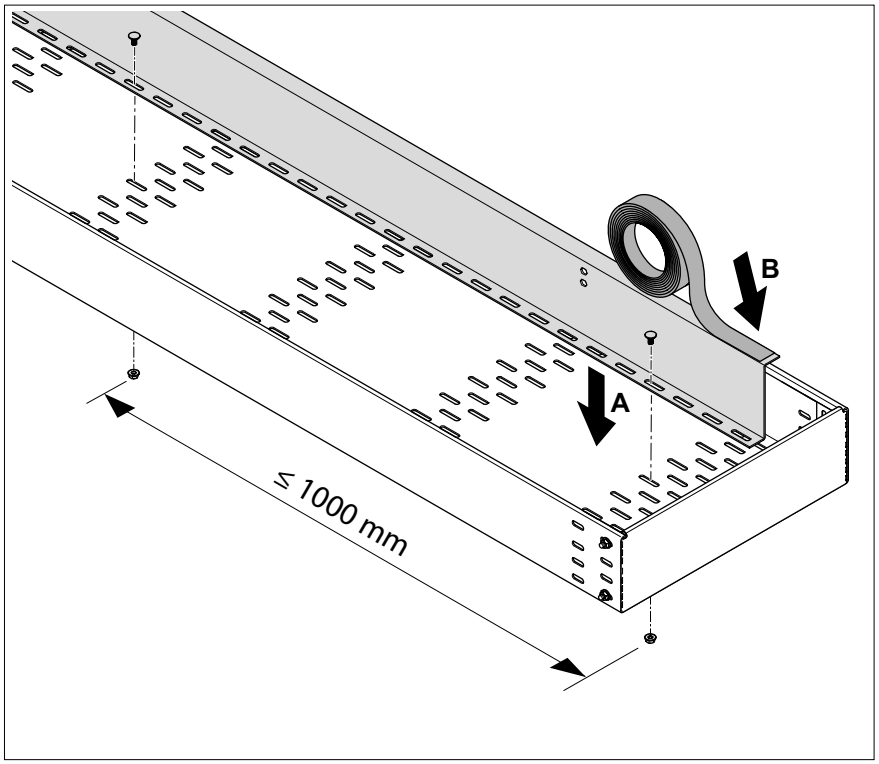

Figure 10: Barrier strip mounting

1. If necessary, cut the barrier strips to size.
2. Screw on the barrier strips through the bottom perforation at the start of the cable tray (A) using truss-head bolts and hexagonal nuts.
3. Screw on an additional truss-head bolt with hexagonal nut at least every 1,000 mm (at least 3 per cable tray length).
4. Optionally, anti-slip strips can be stuck to the barrier strips (B), in order to secure applied covers which have not yet been screwed on.

4.5 Creating equipotential bonding

WARNING

Risk of electric shock!
Contact with electrical current can lead to an electric shock. Fatal or serious injuries are possible.
Work on the electrical system may only be performed by electrical specialists.

Note! *When mounting the system components, the screw connections automatically create continuous equipotential bonding of the entire walkable cable tray system. The system must be connected to the equipotential bonding of the overall system at least once.*

Method 1: Equipotential bonding on the equipotential busbar

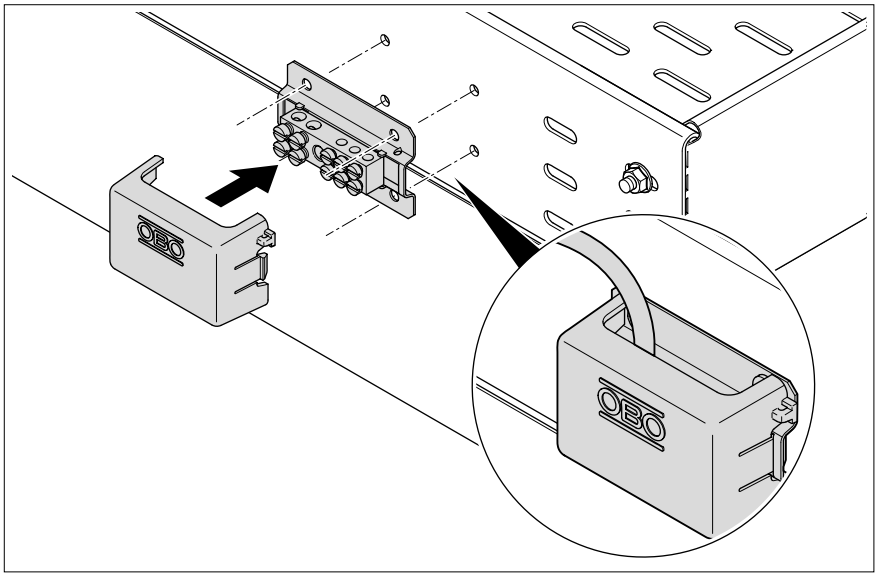

Figure 11: Mounting of the equipotential busbar

1. Drill holes in the side section of the cable tray.
2. Fasten the equipotential busbar to the cable tray with suitable fastening material.
3. Electrically connect the equipotential busbar to the overall equipotential bonding.
4. Attach the end cap.

Method 2: Equipotential bonding with earthing terminal on cable tray rail

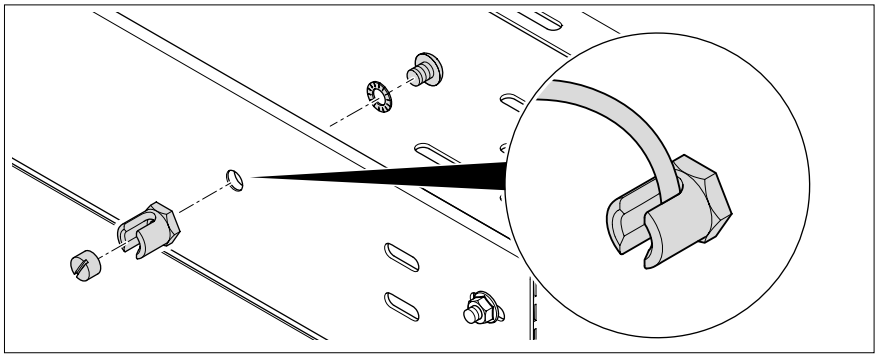

Figure 12: Mounting of the earthing terminal on the cable tray rail

1. Drill a hole in the side section of the cable tray.
2. Screw the earthing terminal into the side section of the cable tray.
3. Electrically connect the earthing terminal to the overall equipotential bonding.

Method 3: Equipotential bonding with earthing terminal on Z barrier strip

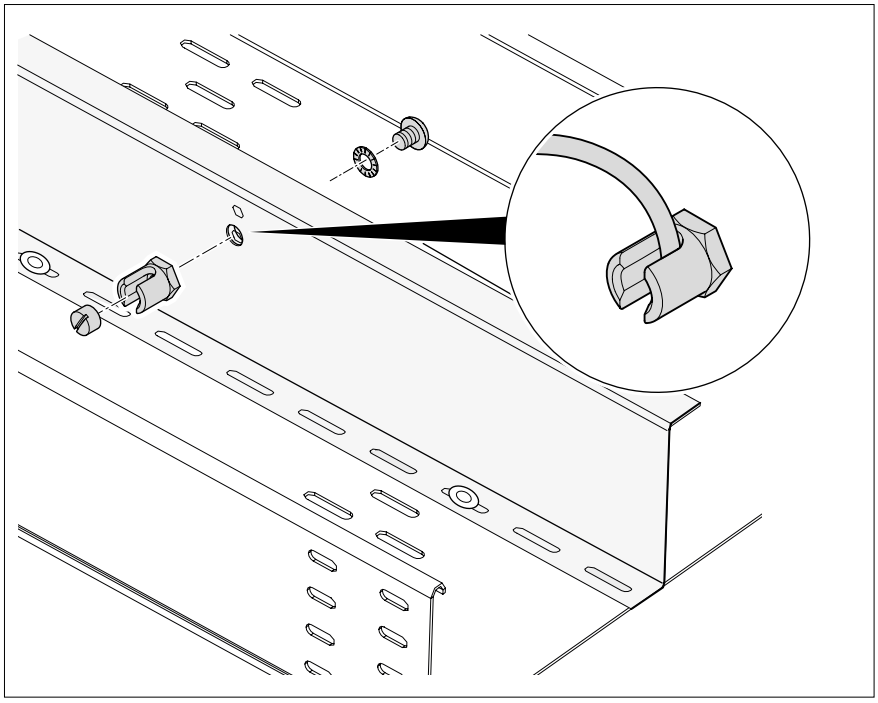

Figure 13: Mounting of the earthing terminal on the Z barrier strip

1. Screw the earthing terminal into the perforation of the Z barrier strip.
2. Electrically connect the earthing terminal to the overall equipotential bonding.

4.6 Mounting the cover

The covers can be shortened to any length.

The covers are always cut straight and not with a mitre.

The cover, type DF BKR, is mounted on the cable tray with the pre-mounted turn buckles.

The cover, type DBKR, is either mounted to the cable tray with cover clamps or turn buckles, which are inserted in the cover at a later time.

4.6.1 Mounting the cover support

In cross-over and corner areas, a cover support must be mounted instead of the missing barrier strip. This is always mounted in the centre of the cross-over or corner area.

There are two different fastening types for raised mounting on support profiles or for direct floor mounting.

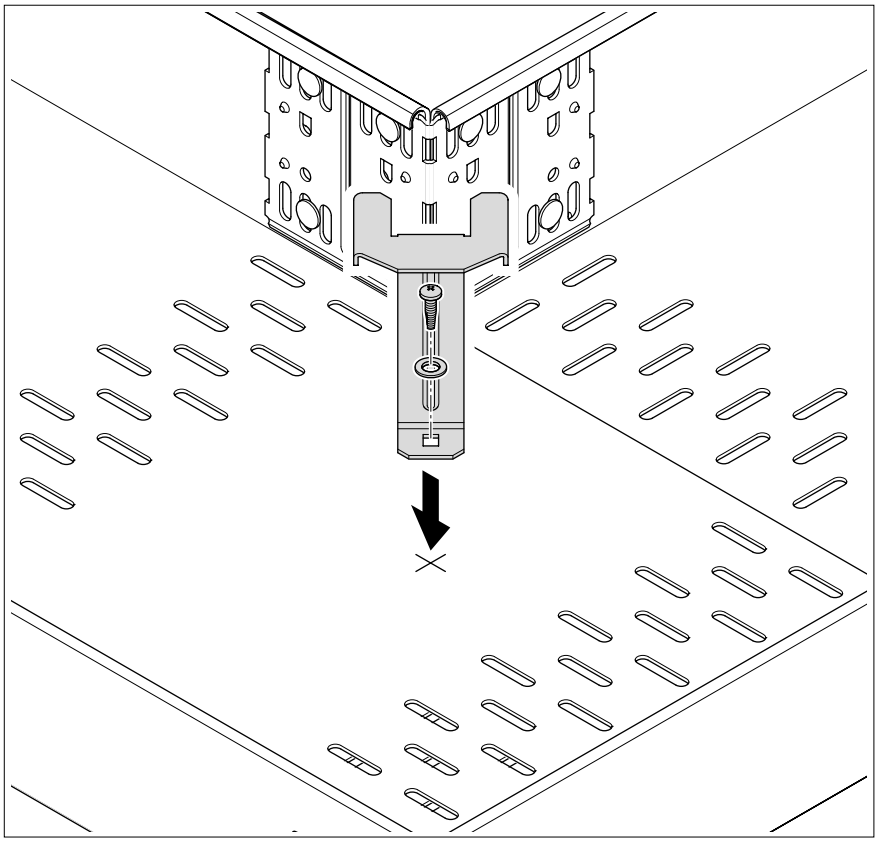

Figure 14: Installation of cover support

For raised mounting:

1. Screw the cover support to the base of the cable tray with a drilling screw and washer.

Note! *If a bottom perforation is located in the cross-over area, then the cover support can alternatively be screwed on with a truss-head bolt and hexagonal nut through the bottom perforation of the cable tray.*

For direct floor mounting:

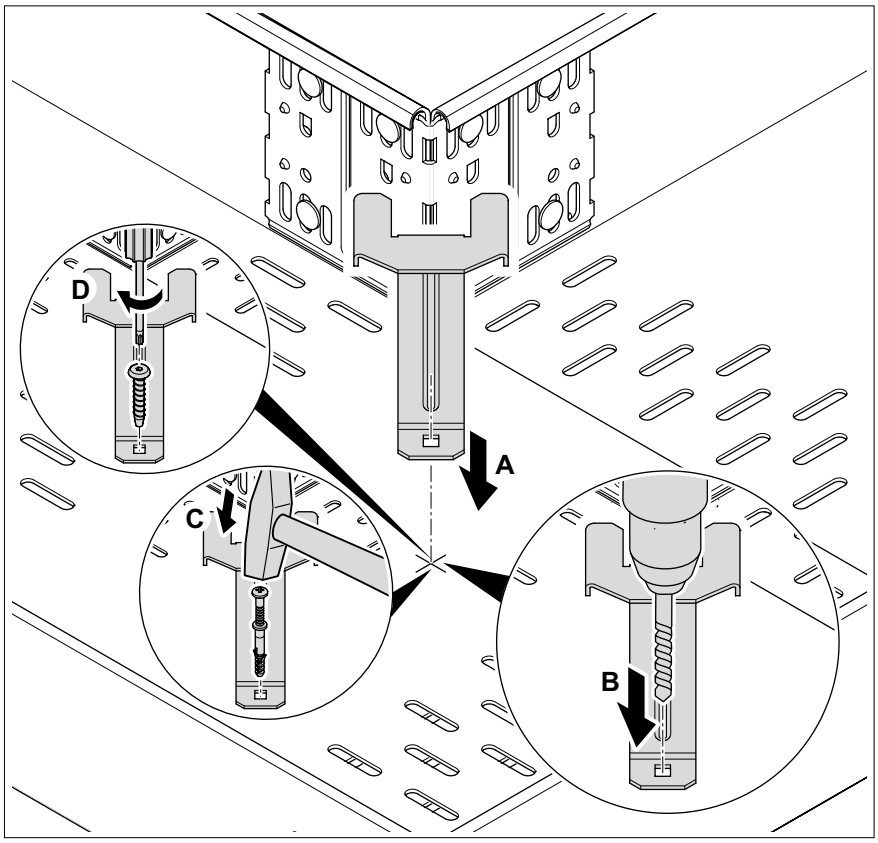

Figure 15: Direct floor mounting of the cover support

1. Attach the cover support at a suitable position (A).
2. Drill a hole for the knock-in anchor Ø 6 mm or bolt tie Ø 6 mm through the cable tray (B).
3. Knock the knock-in anchor in using a hammer (C) and screw the cover support tight through the base of the cable tray.
4. Alternatively: Turn in the bolt tie (D) and screw the cover support tight through the base of the cable tray.

4.6.2 Mounting the cover with cover clamps

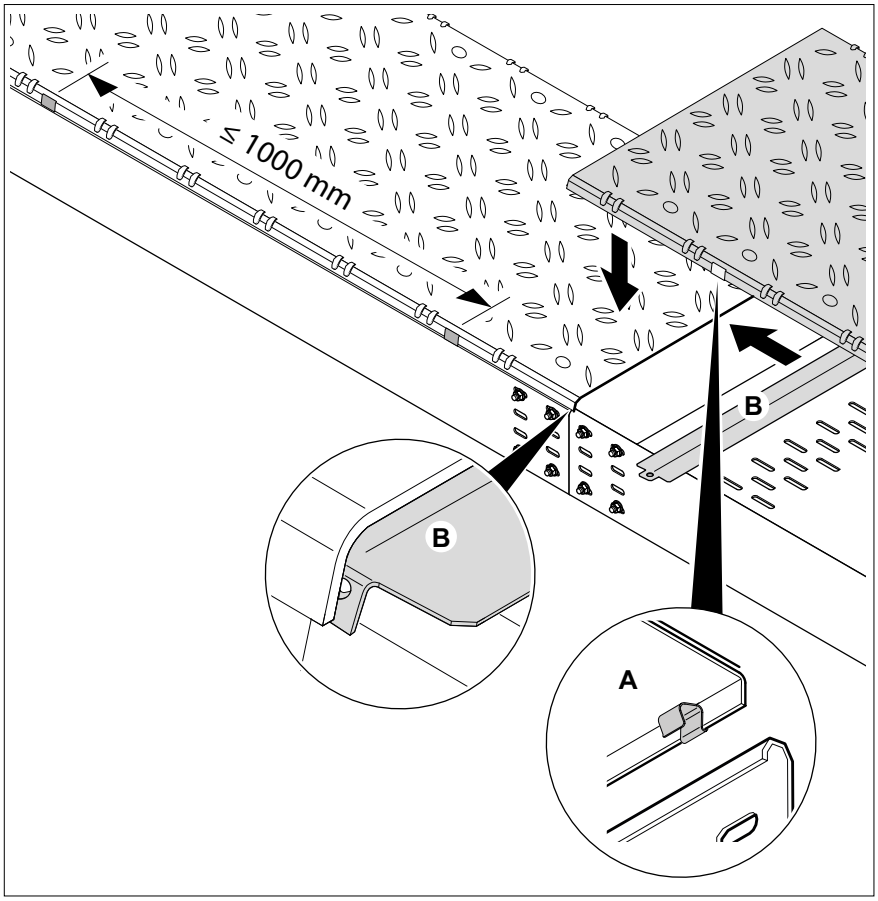

Figure 16: Mounting the cover, type DBKR, with cover clamps

1. Fasten the cover clamp at the start of the cover (A).
2. Fasten an additional cover clamp at least every 1,000 mm (at least 3 supports per cover side).
3. Fasten the cover to the cable tray with cover clamps.
4. Push the dust protection element up to halfway under the cover butt (B).
5. Fasten the next cover to the cable tray with cover clamps.

4.6.3 Mounting the cover with turn buckles

Mounting the turn buckle, type DRL H S A2

The turn buckle, type DRL H S A2, is screwed to the cover of type DBKR.

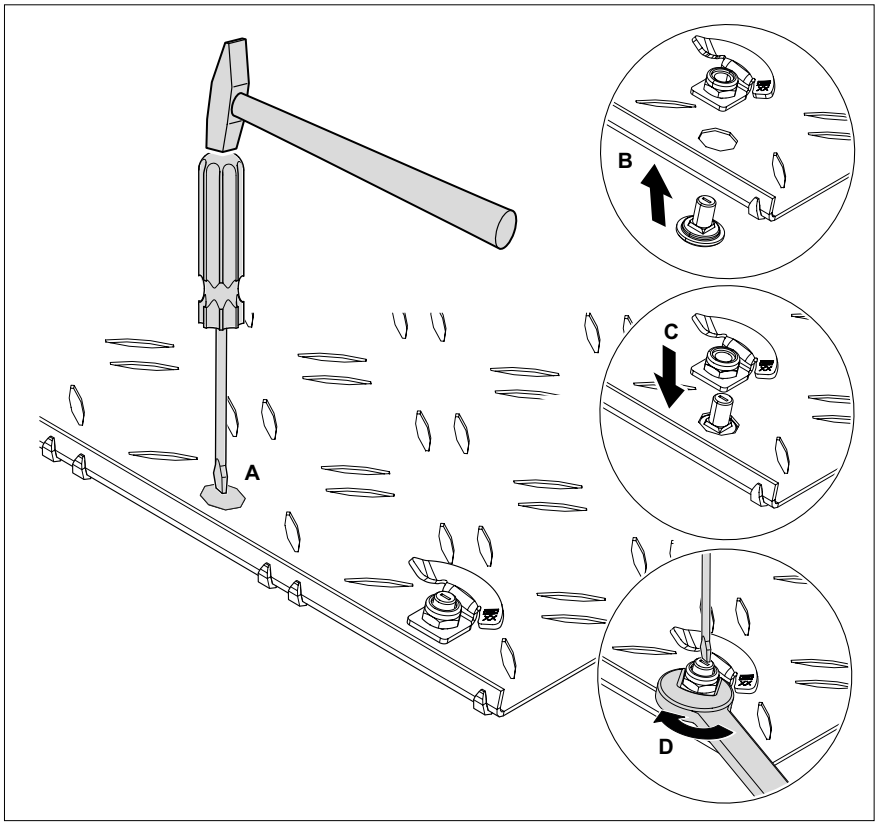

Figure 17: Mounting the turn buckle, type DRL H A2

1. Knock out the break-out opening on the cover (A).
2. Insert the turn buckle button to the top side of the cover (B).
3. From below, place the helical shape against the turn buckle button (C).
4. Lock the nut on the helical shape (D).
5. Mount an additional turn buckle at least every 900 – 1,000 mm (at least 3 supports per tray side).

Mounting the turn buckle, type DRL H FT

The turn buckle, type DRL H FT, is caulked to the cover of type DBKR.

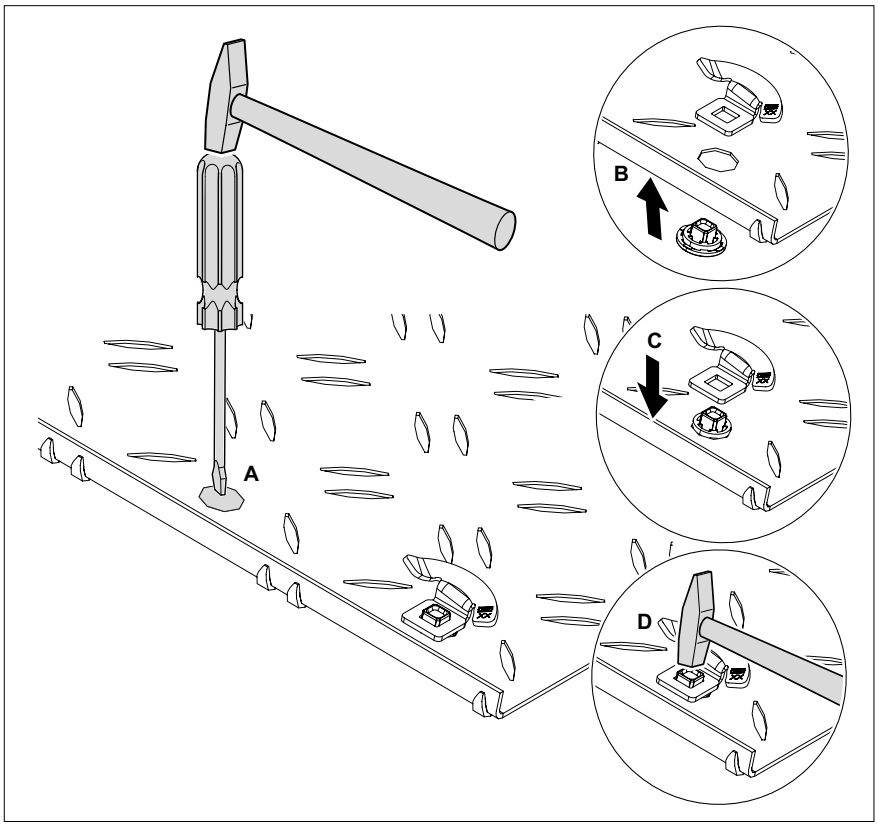

Figure 18: Mounting the turn buckle, type DRL H FT

1. Knock out the break-out opening on the cover (A).
2. Insert the turn buckle button to the top side of the cover (B).
3. From below, place the helical shape against the turn buckle button (C).
4. Caulk the helical shape with the turn buckle button (D).
5. Mount an additional turn buckle at least every 900 – 1,000 mm (at least 3 supports per tray side).

Mounting the cover with turn buckle

Note! *Both cover types are fastened with turn buckles (pre-mounted or optionally mounted at a later date) to the cable tray in the same manner. The following chapter shows the cover of type DBKR.*

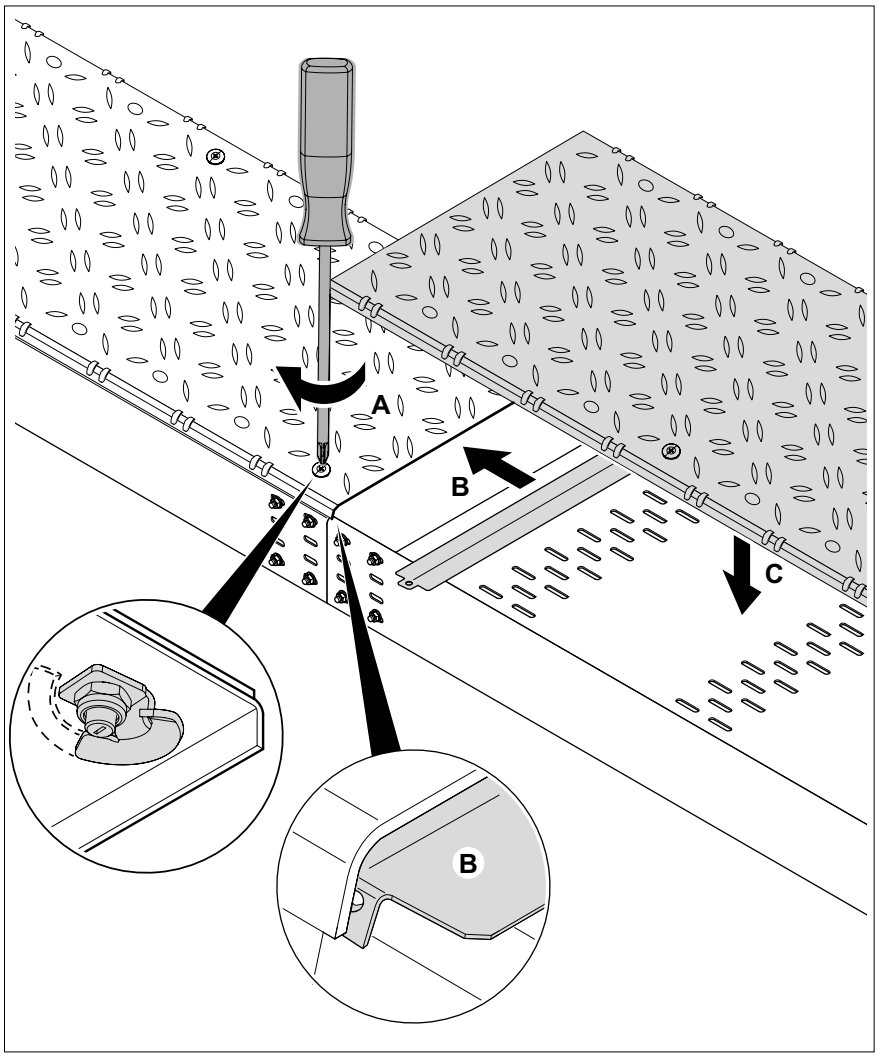

Figure 19: Mounting of cover with turn buckle

1. Attach the first cover.
2. Fasten the turn buckle of the cover to the cable tray (A).
3. Push the dust protection element up to halfway under the cover butt (B).
4. Fasten the next cover to the cable tray with turn buckles (C).

4.6.4 Mounting the cover on a corner connection

Note! *Both cover types are fastened with turn buckles (pre-mounted or optionally mounted at a later date) to the cable tray in the same manner. The following chapter shows the cover of type DBKR.*
The type DBKR cover can also be mounted with cover clamps for corner connections.

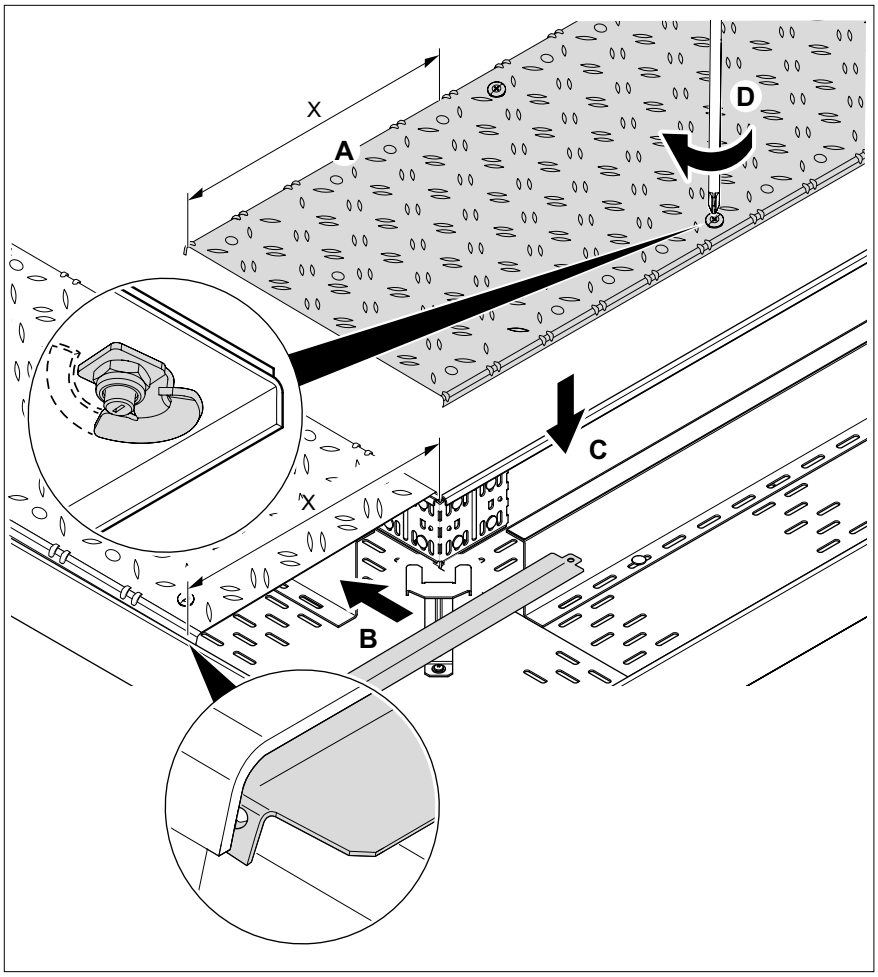

Figure 20: Mounting the cover on a corner connection

1. If necessary, cut the cover to size.
2. Notch out the joint edge of the cover along length x (A).
3. Push the dust protection element up to halfway under the cover butt (B).
4. Attach the cover (C).
5. Fasten the cover to the cable tray with turn buckles or cover clamps (D).

4.6.5 Mounting the cover on a cross-over connection

Note! *Both cover types are fastened with turn buckles (pre-mounted or optionally mounted at a later date) to the cable tray in the same manner. The following chapter shows the cover of type DBKR.*
The type DBKR cover can also be mounted with cover clamps for cross-connections.

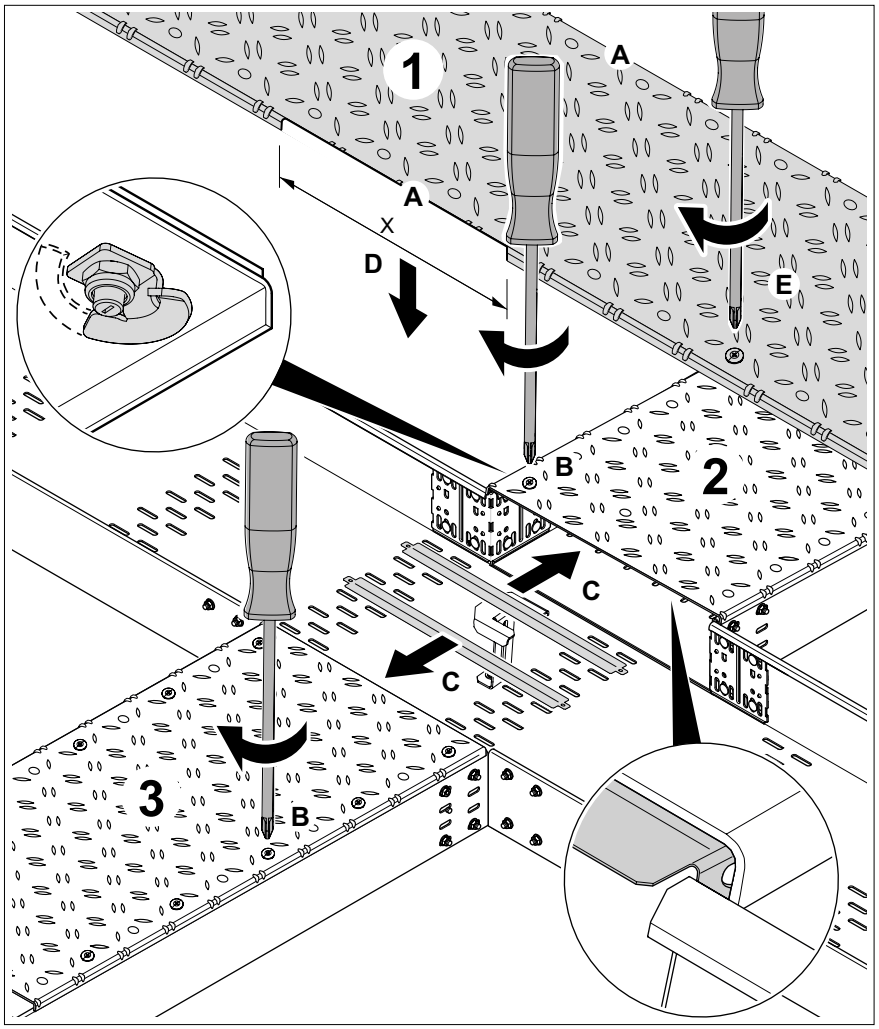

Figure 21: Mounting the cover on a cross-connection

1. If necessary, cut the cover to size.
2. Notch out the joint edge of cover 1 on both sides along length x (A).
3. Deburr cut edges to avoid cable damage.
4. Fasten covers 2 and 3 to the cable tray with turn buckles (B) or cover clamps.
5. Push each dust protection element up to halfway under the cover butt (C).
6. Attach cover 1 (D).
7. Fasten cover 1 to the cable tray with turn buckles (E) or cover clamps.

5 Maintenance

The stability and function of the BKRS walkable cable tray systems can be impaired by external influences, such as damage or machine vibrations.

Loose connection elements must be retightened and damaged parts replaced. In addition, we recommend regular checks to see if the connection to the overall equipotential bonding is still intact.

6 Dismantling

The BKRS walkable cable tray system is dismantled in the reverse order to mounting.

7 Disposal

1. Residual metal: As scrap metal
2. Packaging: As household waste

Comply with the local waste disposal regulations.

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Building Connections