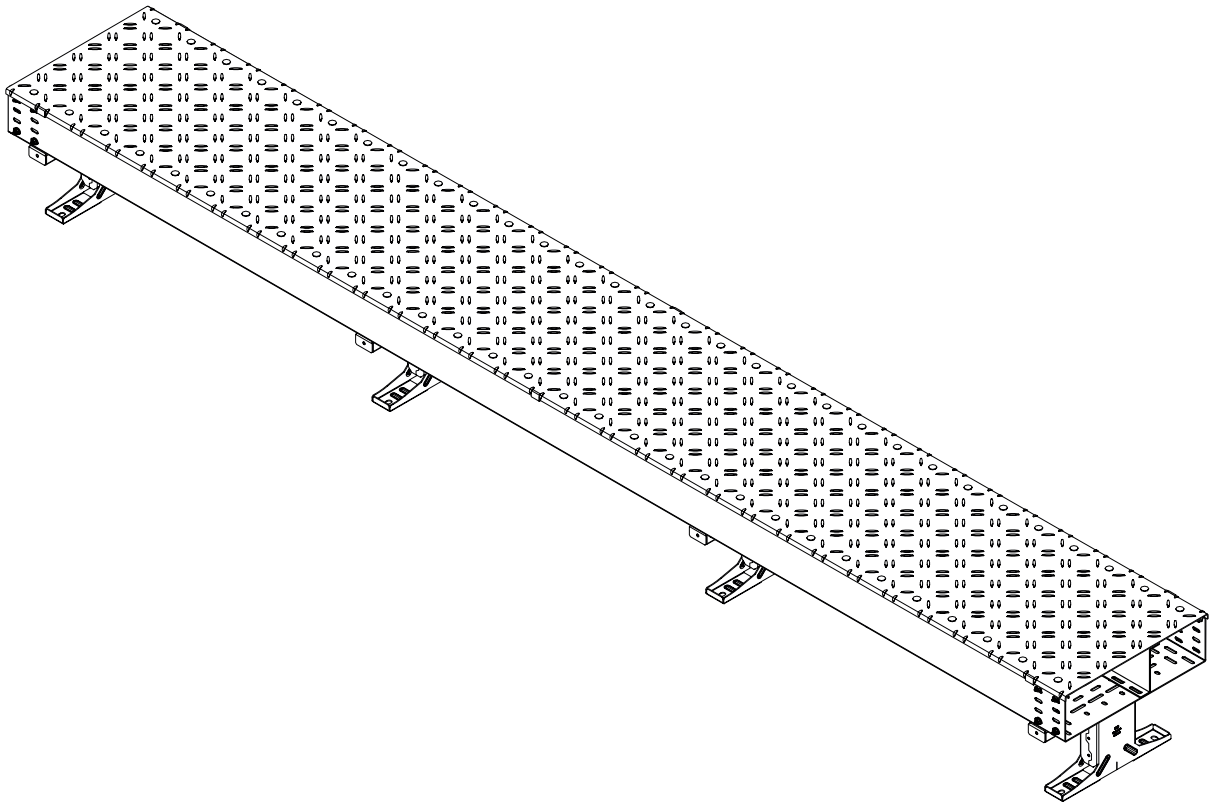

Mounting instructions

BKRS walkable cable tray systems, Mercedes Benz

OBO BETTERMANN

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BKRS walkable cable tray systems, Mercedes Benz
Mounting instructions

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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 (March 2023).

– 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 warning information

⚠ WARNING

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 Intended use

The BKRS cable tray systems are used as walkable cable trays. They are used to install and protect power and data cables in industrial areas. The BKRS systems are mounted on symmetrical floor supports.

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

– Based on DIN EN 50085-2-2 – Cable trunking systems and cable ducting systems for electrical installations

– DIN EN 50174 – Information technology – Cabling installation (EMC)

– 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:

– Mounting on symmetrical floor supports for additional installation space

– Walkable thanks to solid cover

– Cover with different fastening options on the cable tray:

  – Flexible fastening of turn buckles in pre-stamped break-out openings,

  – 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 protection plates and dust protection elements

– EMC-compatible separation of power and data cables through barrier

strips

– Side height 100 mm

– Self-supporting, no screwing with machines required

3.2 BKRS product overview

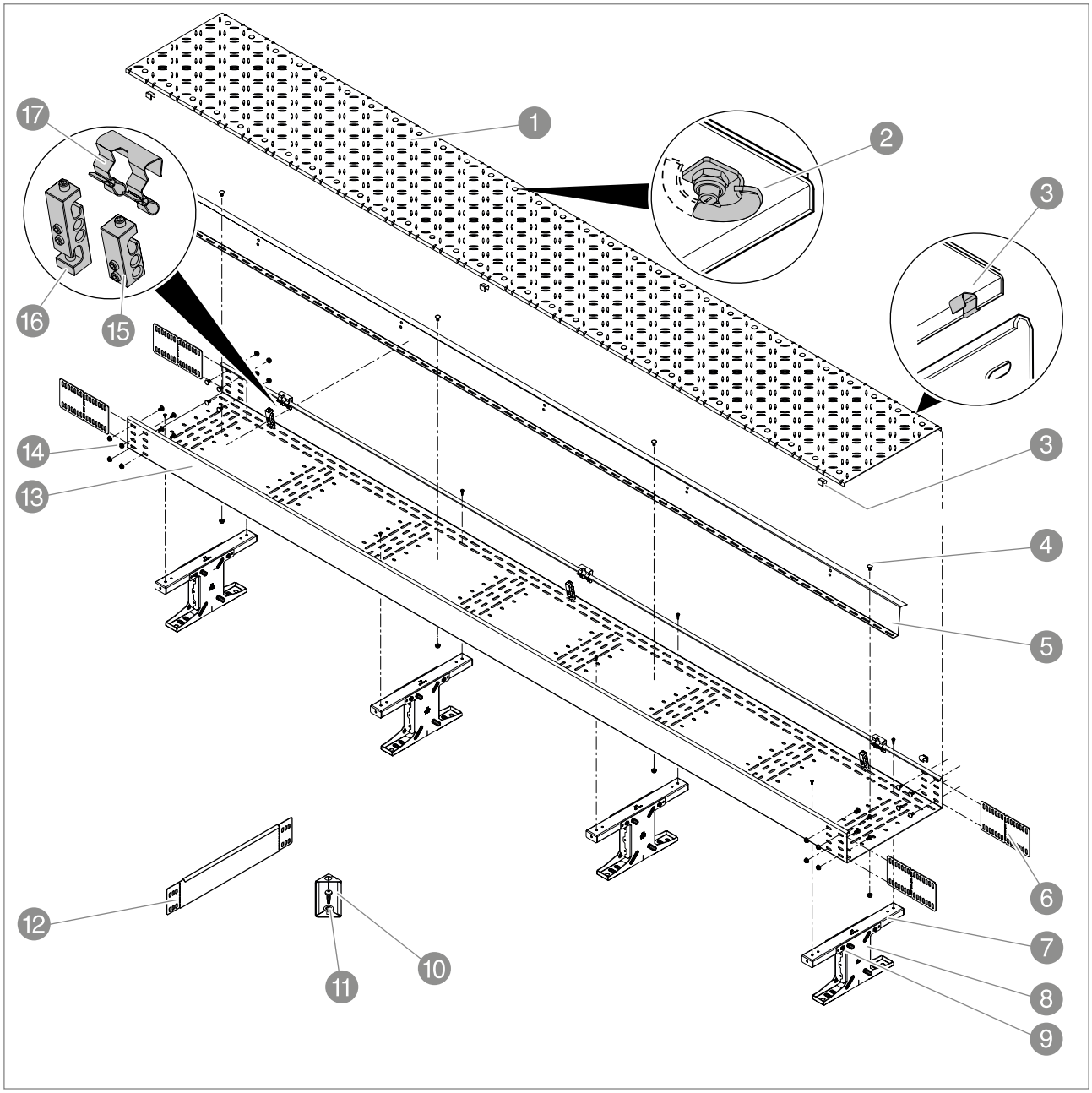

Abb. 1: BKRS system components

No.	Designation/type	Function
❶	Cover, type DBKR, made of strip galvanised, chequered sheet steel with increased slip protection	Walkable cover of the cable tray
❷	Turn buckle type DRL H for break-out openings	Fastening of the DBKR cover to the cable tray
❸	Cover clamp DK DBKR G	Fastening of the DBKR cover to the cable tray
❹	Truss-head bolt with hexagonal nut	Mounting of barrier strips
❺	Z-shaped barrier strip	Cover support for cable tray widths of > 200 mm
❻	RUVK universal connector	Connection of cable trays lengthwise and angularly
❼	Symmetrical floor support, crossbeam	Raised cable tray mounting (enabling mounting of pipe clamps and routing of additional media under the cable tray)
❽	Symmetrical floor support, base, height 190 mm	
❾	Flat-head screw FKS, with hexalobular internal M6	Connection of crossbeam and base of the symmetrical floor support
❿	Cover support	Support of covers and fitting covers in cross-over areas
⓫	BS BKS KP drilling screw	Fastening of cover support to cable tray
⓬	Reducing bracket/end closure 100 mm	Closure of open points, if cable trays of different widths are connected, as well as closure of cable tray ends
⓭	Cable tray	Acceptance of the power and data cables
⓮	FRS truss-head bolts with combined nuts	Connection of the cable trays with straight and angle connectors, reducers, mounting of barrier strips
⓯	Connection terminal, double, for conductor cable	Connection of the cable tray system with the protective equipotential bonding of the overall system
⓰	Connection terminal, single, for conductor cable	
⓱	Clamp spring for conductor rope	

4 Mounting

The duct is suitable for mounting on symmetrical floor supports.

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 cable tray

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.

4.1.1 Mounting symmetrical floor supports on the floor

Note! *The BSS BS drilling template can be used to precisely mark the holes for the floor supports.*

The floor supports in the 190 mm height consist of a base and cross-beam, and are mounted to the floor with 2 wedge anchors.

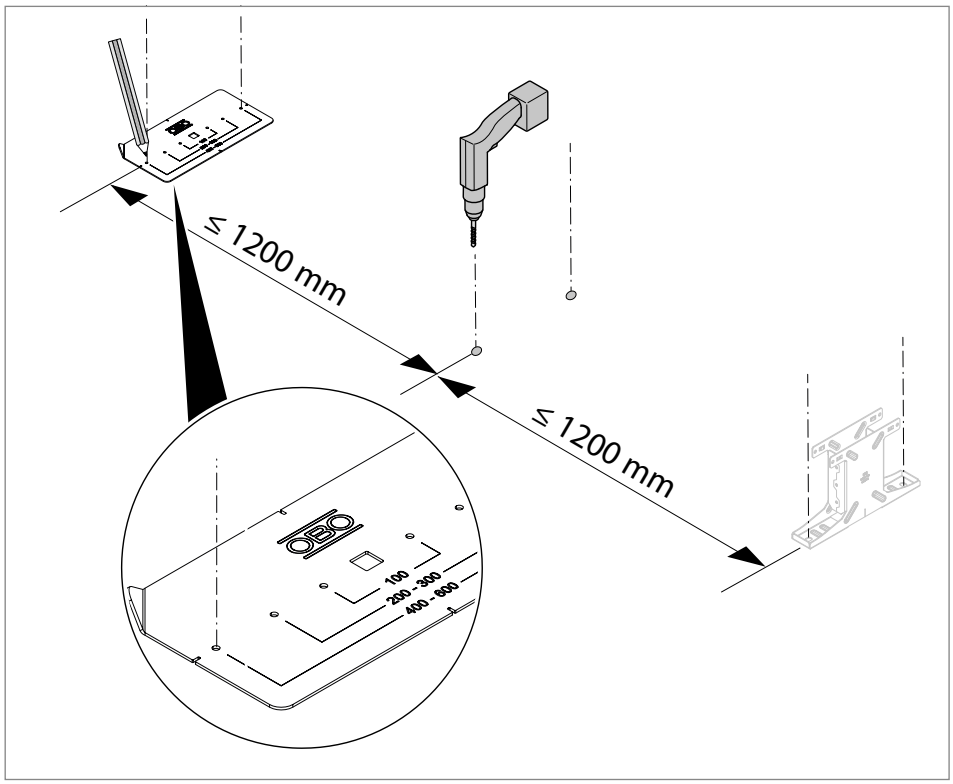

Fig. 2: Drill hole for anchor holes for symmetrical floor supports

1. Mark holes every 1,200 mm for at least 3 floor supports.
2. Drill the holes for the wedge anchors.

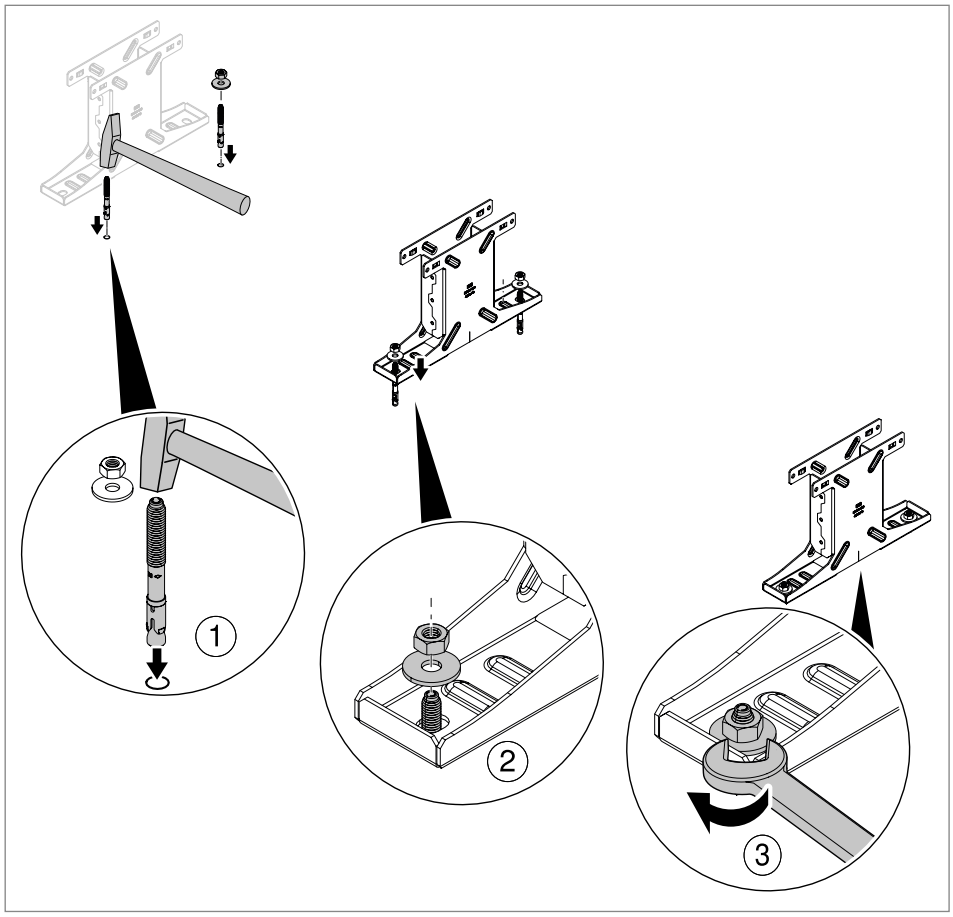

Fig. 3: Mounting base with wedge anchors

3. Knock the wedge anchor into the drill hole ①.
4. Place the base on the wedge anchor ②.
5. Screw on the base with washer and nut on both sides ③.

Note! *Depending on the properties of the substrate, bolt ties can also be used.*

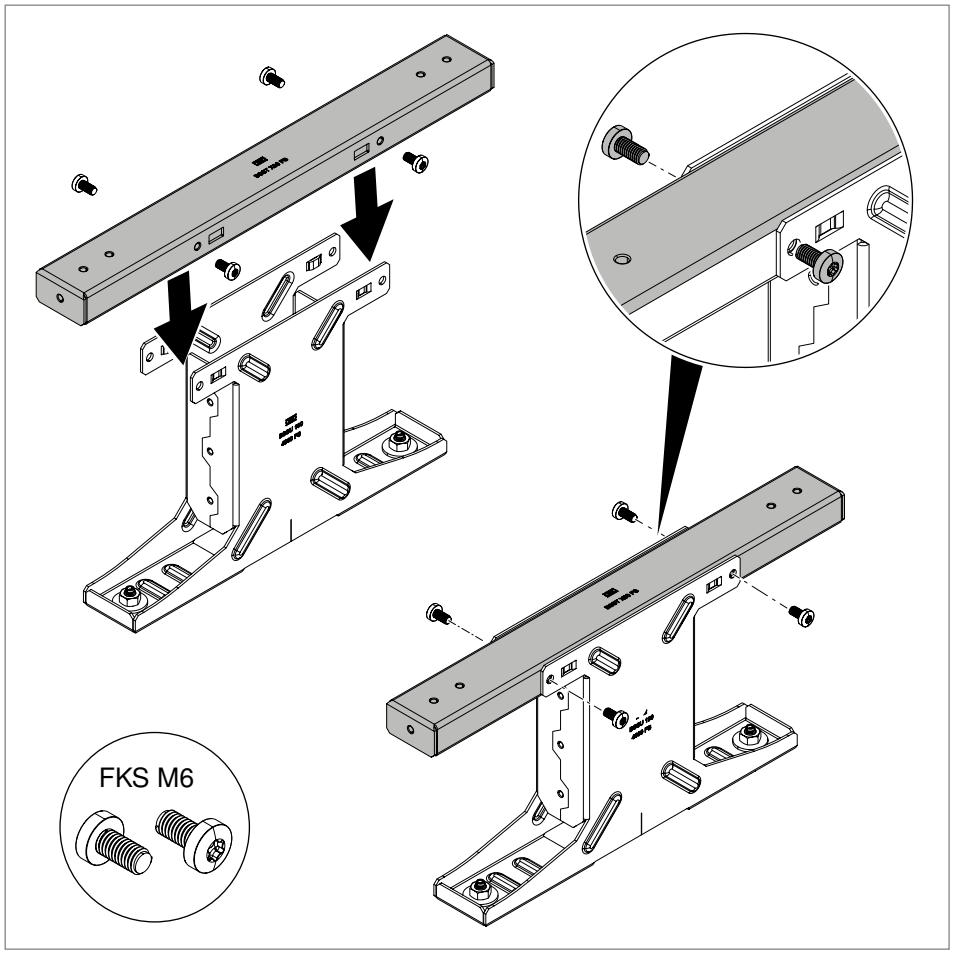

Fig. 4: Mounting crossbeam on base

6. Place the crossbeam on the base.
7. Screw the crossbeam to the base with flat-head screws.

4.1.2 Mounting the cable tray on floor supports

The cable tray is mounted to the crossbeams of the floor supports through the slots in the base of the cable tray with flat-head screw FKS.

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

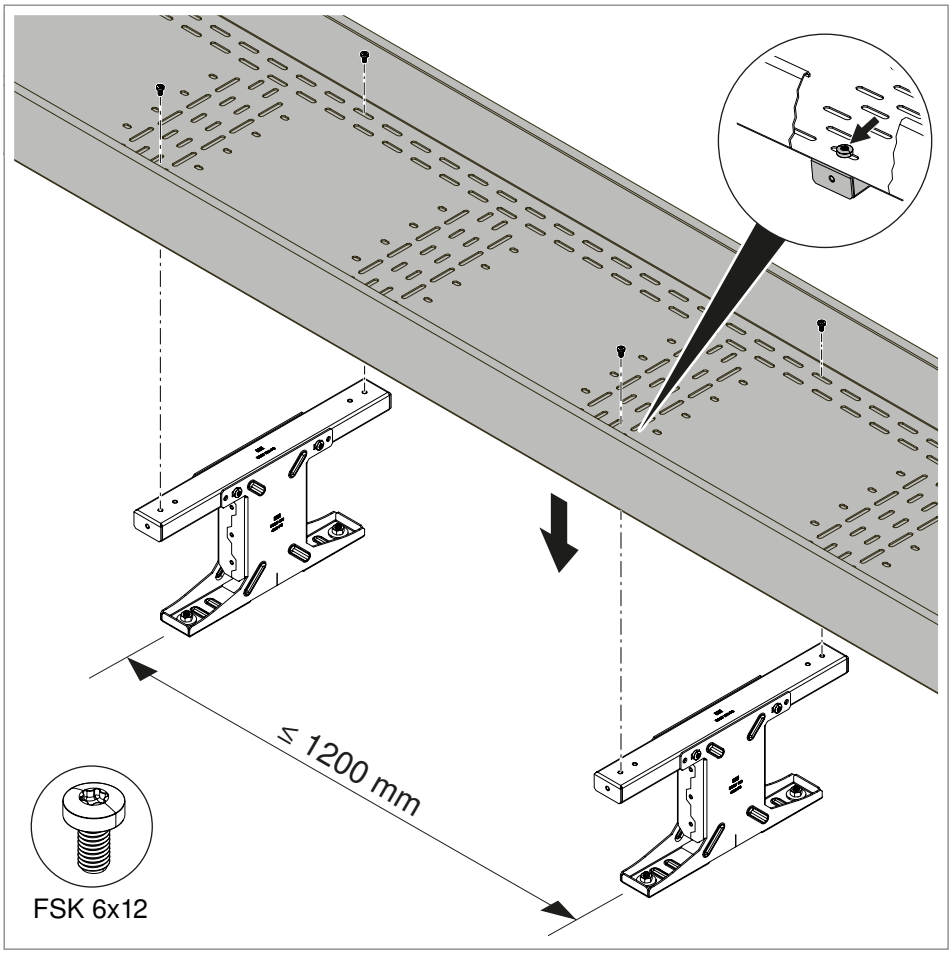

Fig. 5: Mounting the cable tray on floor supports

1. Place the cable tray on floor supports.
2. Screw the cable tray to the floor supports with flat-head screws.

4.2 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.*

4.2.1 Connecting cable trays in lengthwise direction

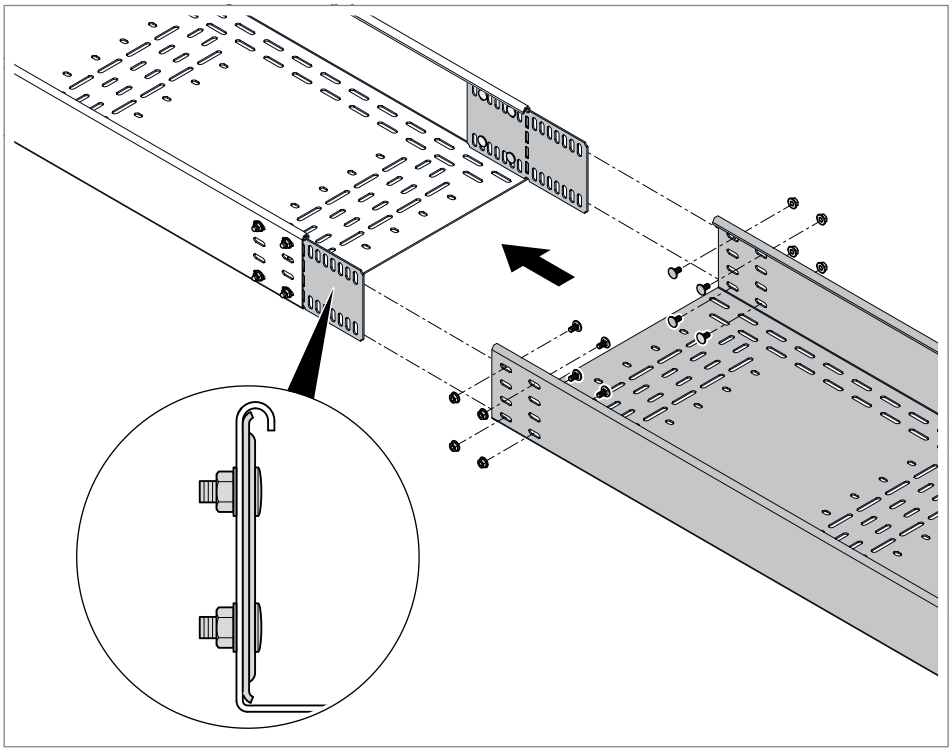

Fig. 6: Straight connection

1. If necessary, create fastening holes (4x ø8 mm) for the connectors on the side sections of the cable trays.

Note! *The DH DBKR cover lifter with integrated drill template can be used to create the connector holes.*

2. Screw two straight and two 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.

4.2.2 Connecting cable trays as a corner

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

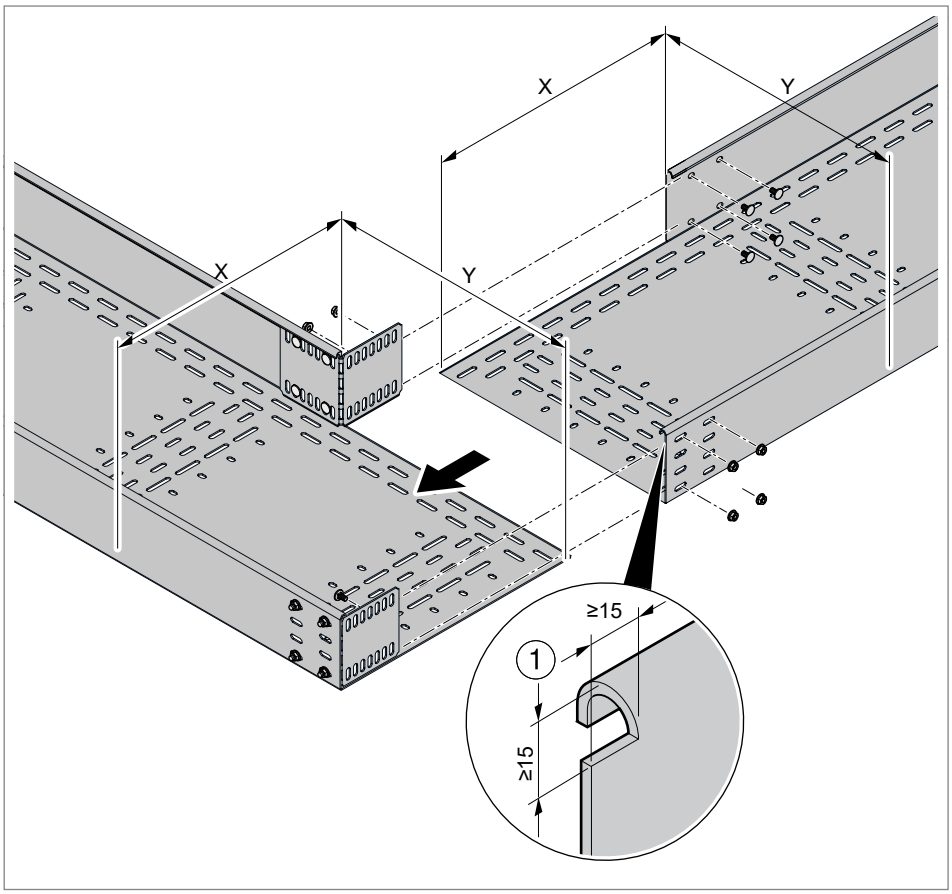

Fig. 7: Corner connection

1. Cut out the side parts of the cable trays by the dimensions x and y.
2. Notch out the corner (①).
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 in a 90° angle.
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 connectors to the second cable tray.

4.2.3 Connecting cable trays as a cross-over

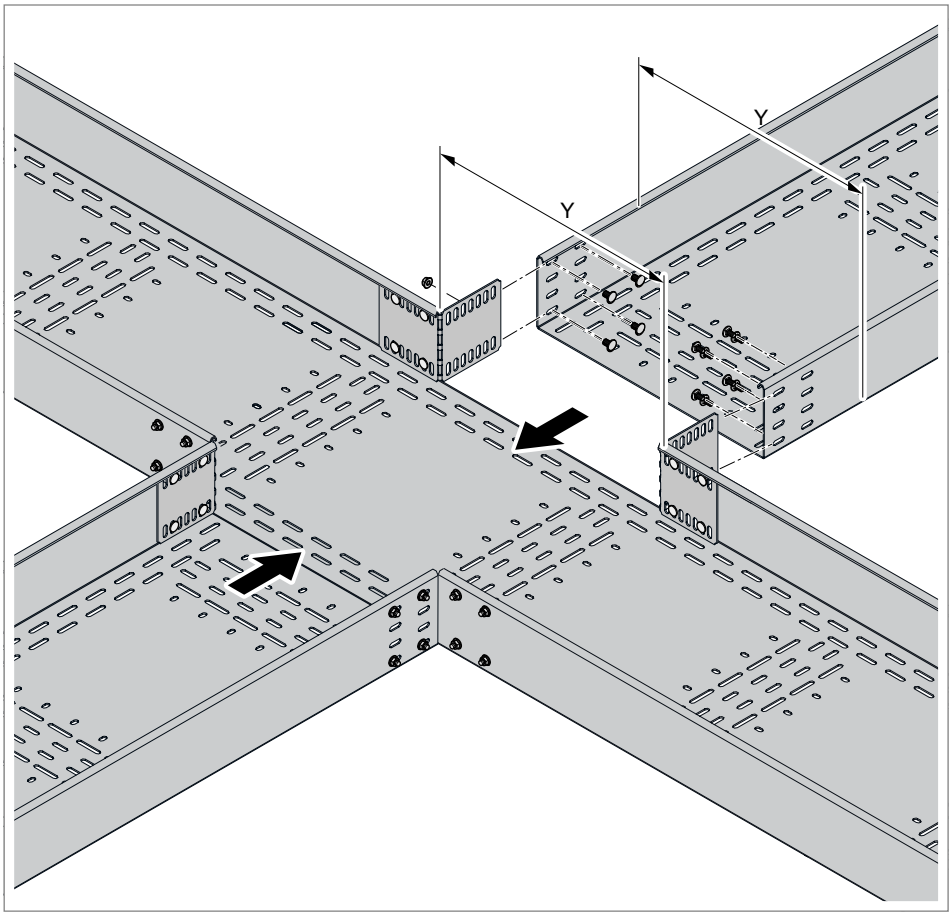

Fig. 8: Cross-connection

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 in a 90° angle.
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 connectors to the second cable tray.

4.2.4 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.

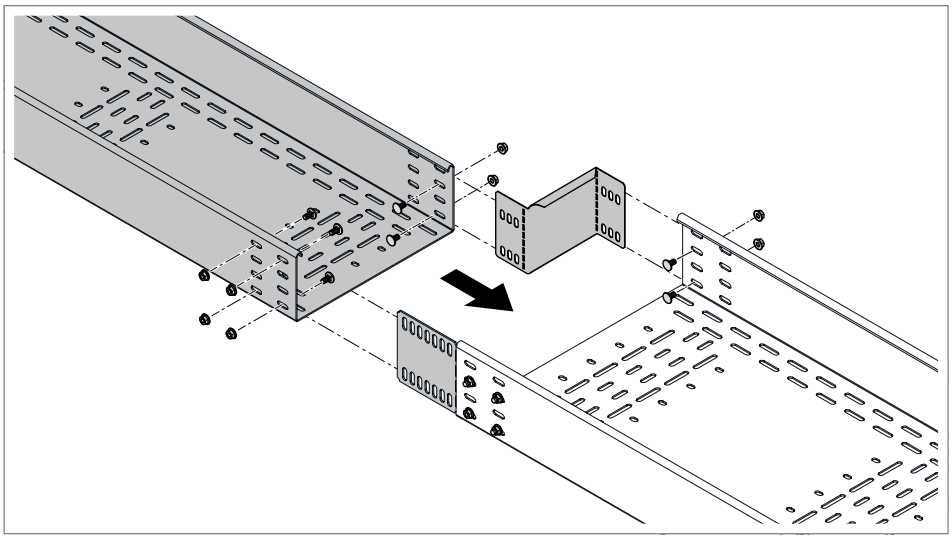

Fig. 9: Changing the cable tray width

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.
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.

4.2.5 Closing the open ends of the cable trays

The open ends of the cable trays are closed with a reducer/end closure, in order to avoid the ingress of dirt and prevent the cover from slipping.

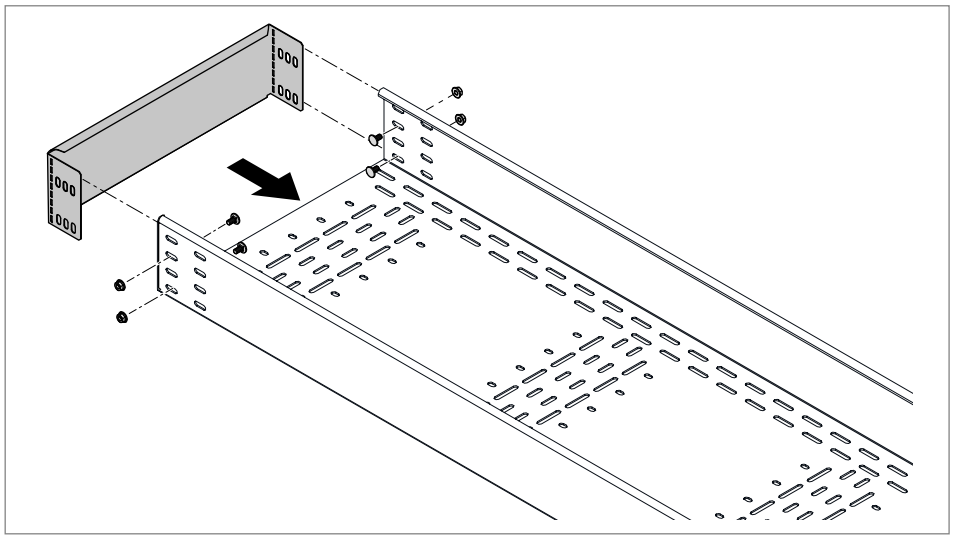

Fig. 10: Closure of open ends

1. If necessary, create fastening holes (2x 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.

4.3 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.*

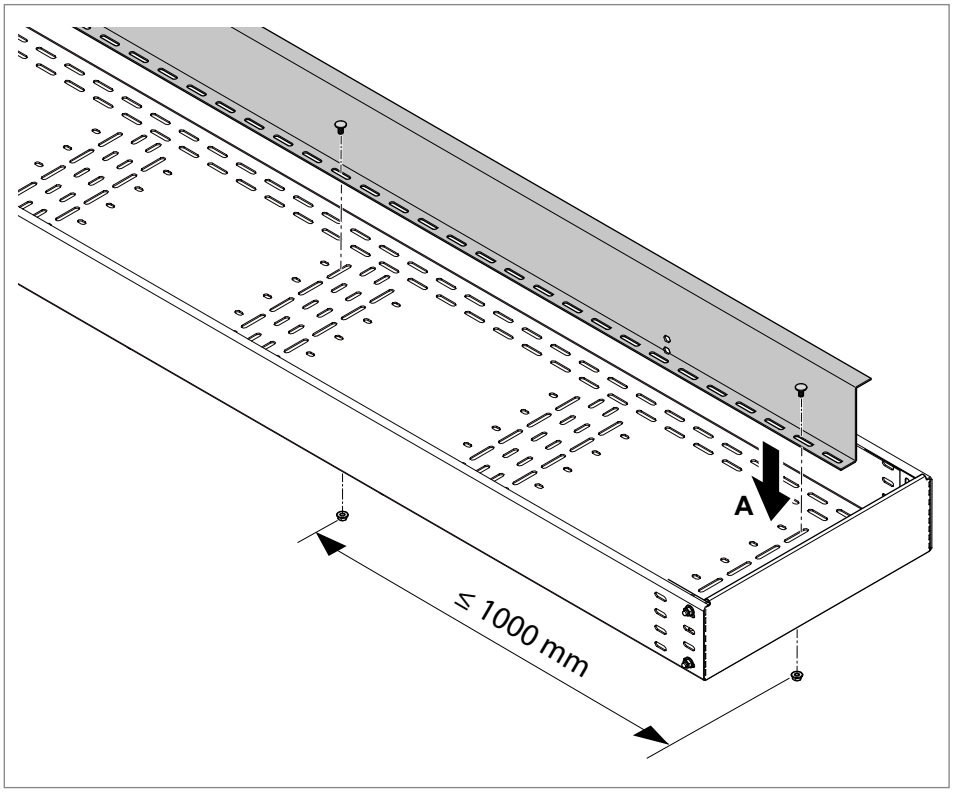

Fig. 11: Barrier strip mounting

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).

4.4 Creating protective equipotential bonding

Protective equipotential bonding is created with conductor cable and clamp springs. A connection terminal (single or double version) can be mounted to branch off the conductor cable. The clamp spring is clamped onto the edge of the cable tray and then the conductor cable is clamped into the support of the clamp spring. The connection terminal is screwed to the conductor cable if required, so that contact with the entire system is established via the clamp spring.

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 clamping and screw connections automatically create continuous protective equipotential bonding of the entire walkable cable tray system. The system must be connected to the protective equipotential bonding of the overall system at least once. The clamp spring must be mounted to the cable tray at least every 1,500 mm.

Note!

A separate test report of the electrical conduction properties of earthing connections is available for the earthing components.

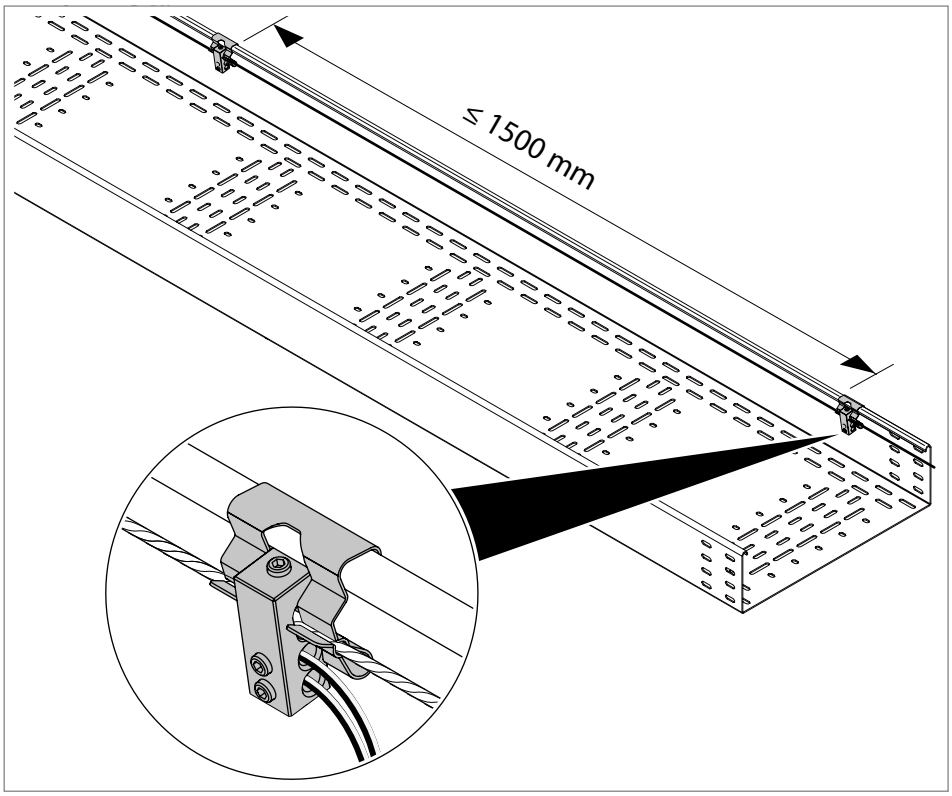

Fig. 12: Spacing of clamp springs with connection terminal

Protective equipotential bonding with connection terminal, single

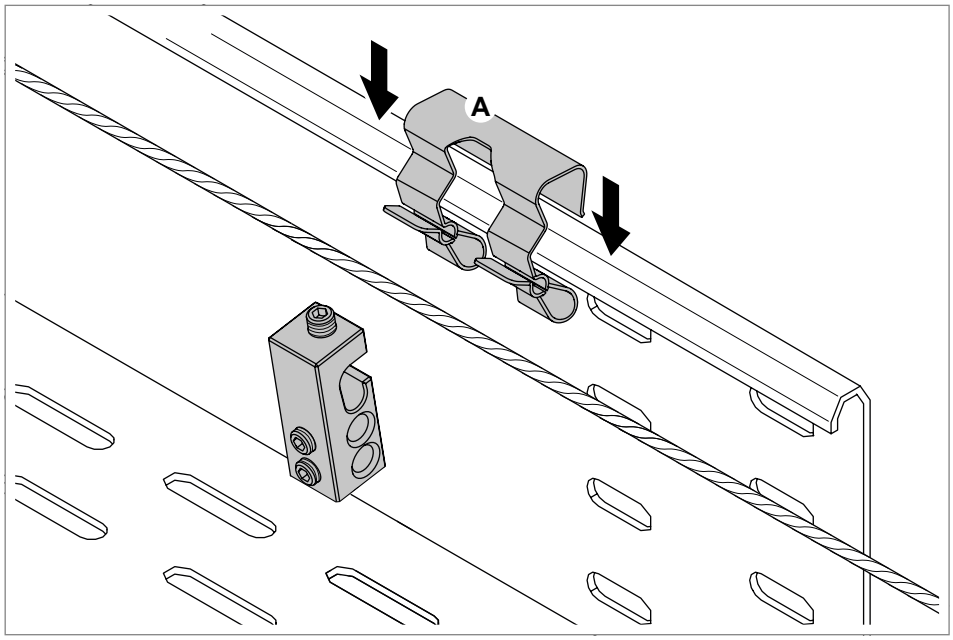

Fig. 13: Mounting the clamp spring

1. Clamp the clamp spring (A) to the edge of the cable tray.

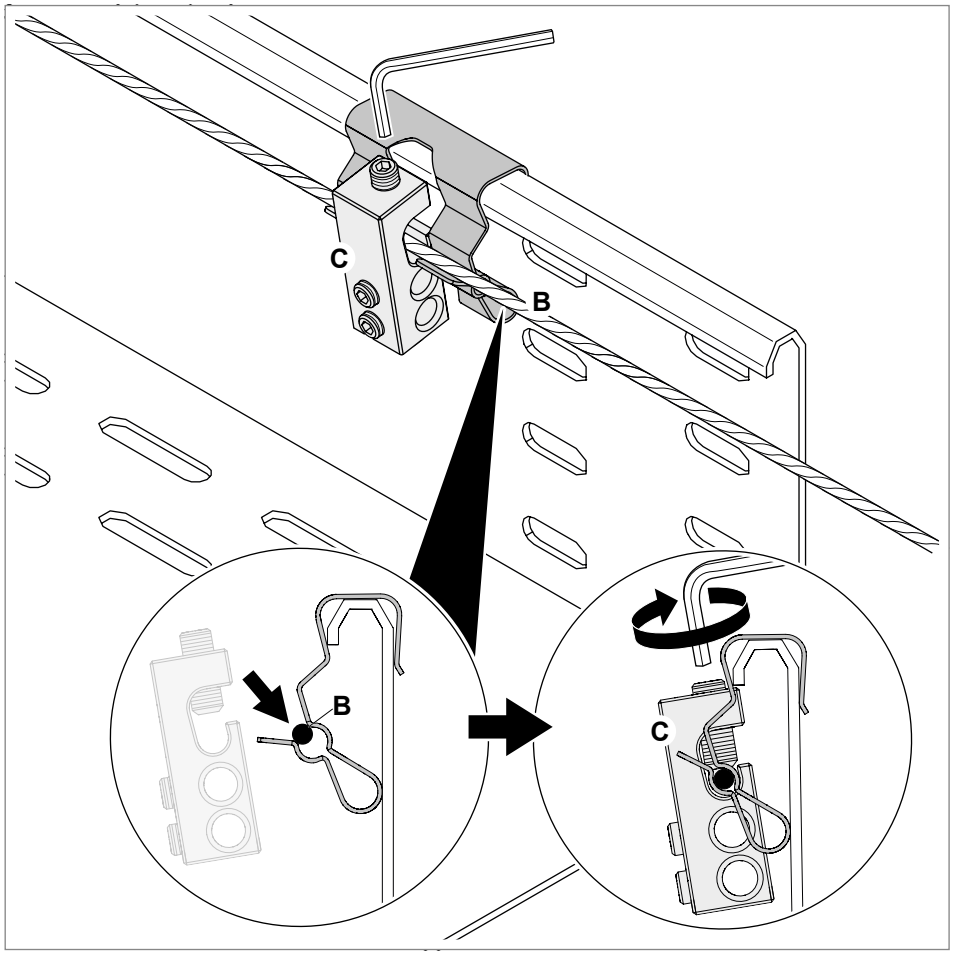

Fig. 14: Connection of clamp spring, conductor cable and connection terminal

2. Clamp the conductor cable (B) in the clamp spring.

3. If necessary, attach a connection terminal (C) to the conductor cable.

4. Screw in the connection terminal screw to make conductive contact.

Conductor cable branch with connection terminal, double

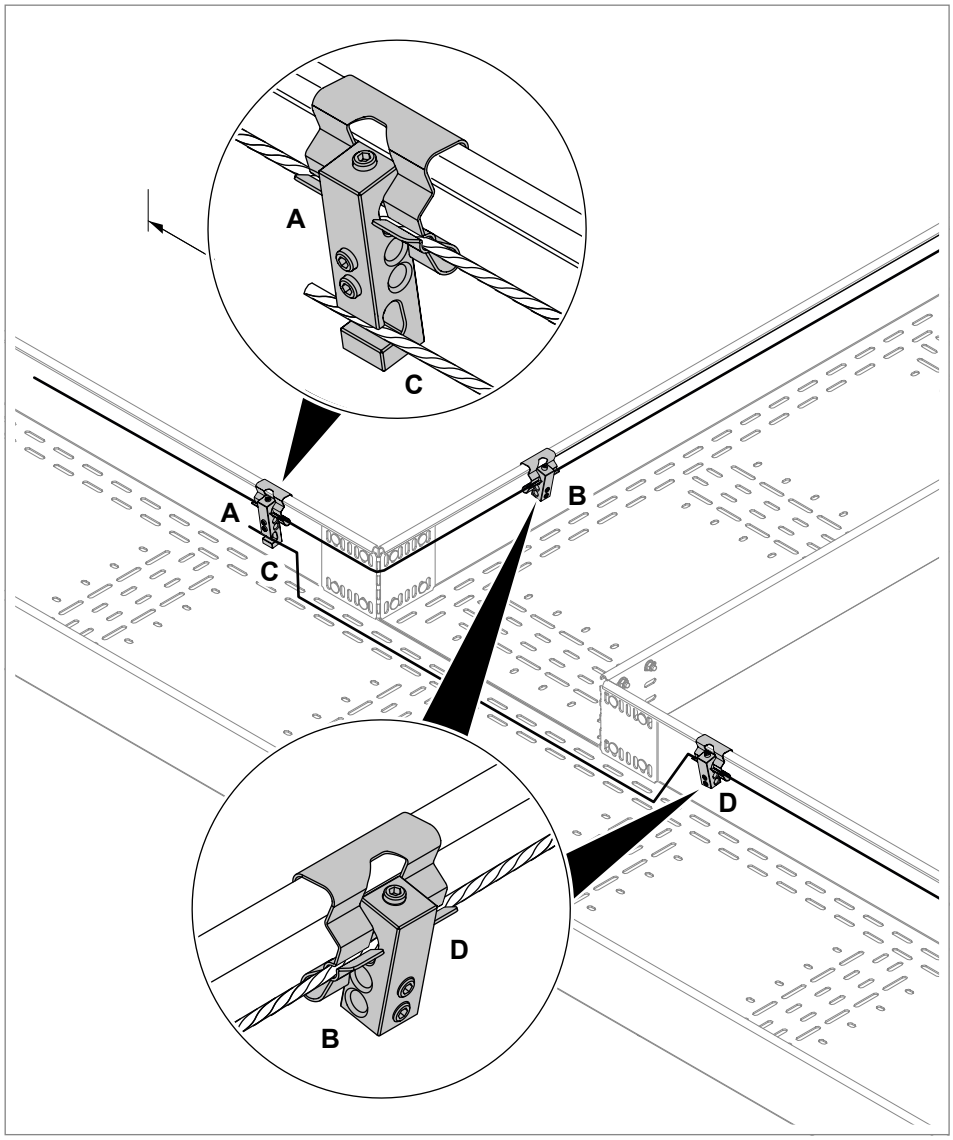

Fig. 15: Mounting of conductor cable branch, double connection terminal

1. Attach the double connection terminal to the conductor cable (A).

2. Screw in the upper screw of the connection terminal to make conductive contact.

3. Branch off the conductor cable and mount with clamp spring and single connection terminal (B).

4. Mount the second conductor cable in the lower contact of the double connection terminal (C).

5. Mount the second conductor cable in another clamp spring and single connection terminal (D).

Cross-over of conductor cable with connection terminal, double

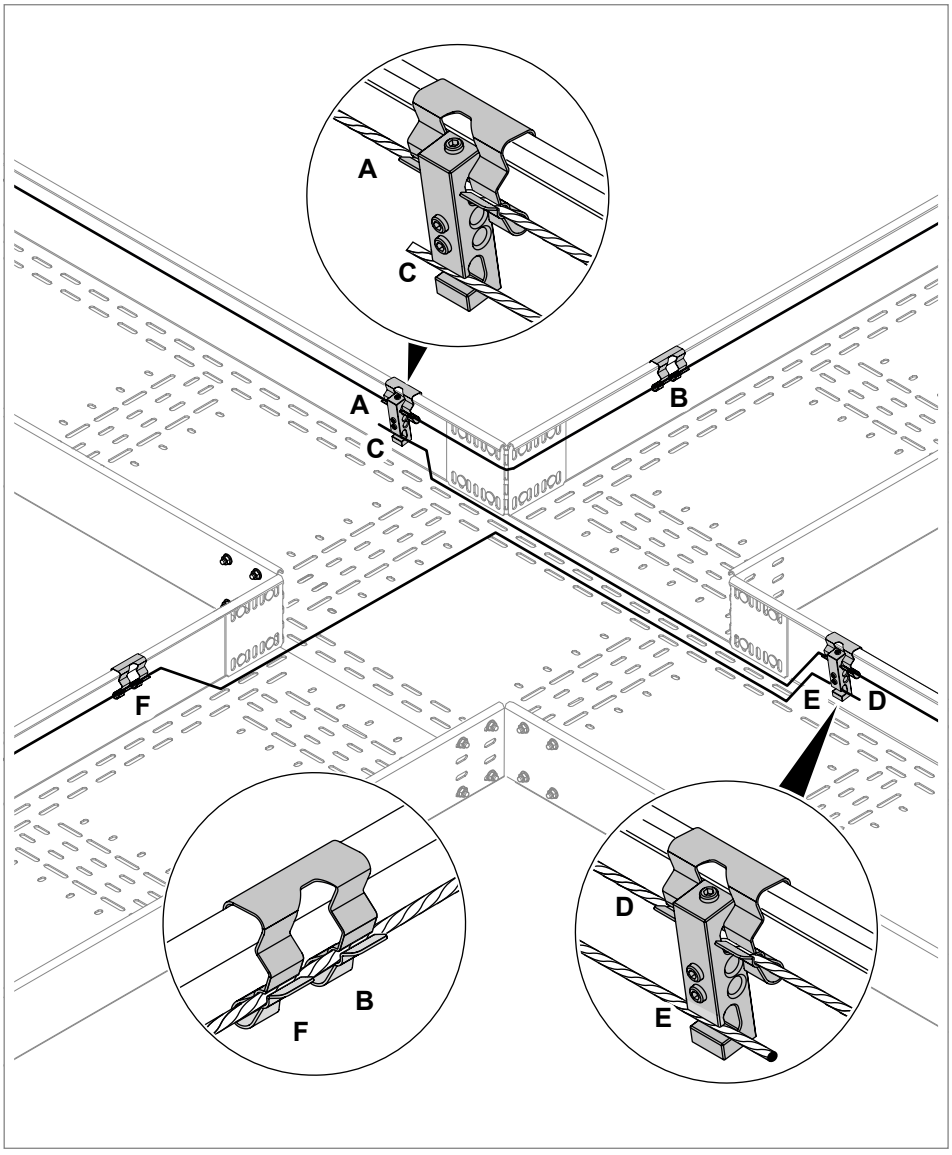

Fig. 16: Mounting of conductor cross-over, double connection terminal

1. Attach the double connection terminal to the conductor cable (A).
2. Screw in the upper screw of the connection terminal to make conductive contact.
3. Branch off the conductor cable and mount with clamp spring (B).
4. Mount the second conductor cable in the lower contact of the double connection terminal (C).
5. Mount the second conductor cable in another clamp spring and double connection terminal (D).
6. Mount the third conductor cable in the lower contact of the double connection terminal (E).
7. Branch off the third conductor cable cross-wise and mount with clamp spring (F).

4.5 Mounting covers

The covers can be shortened to any length.

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

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

4.5.1 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.

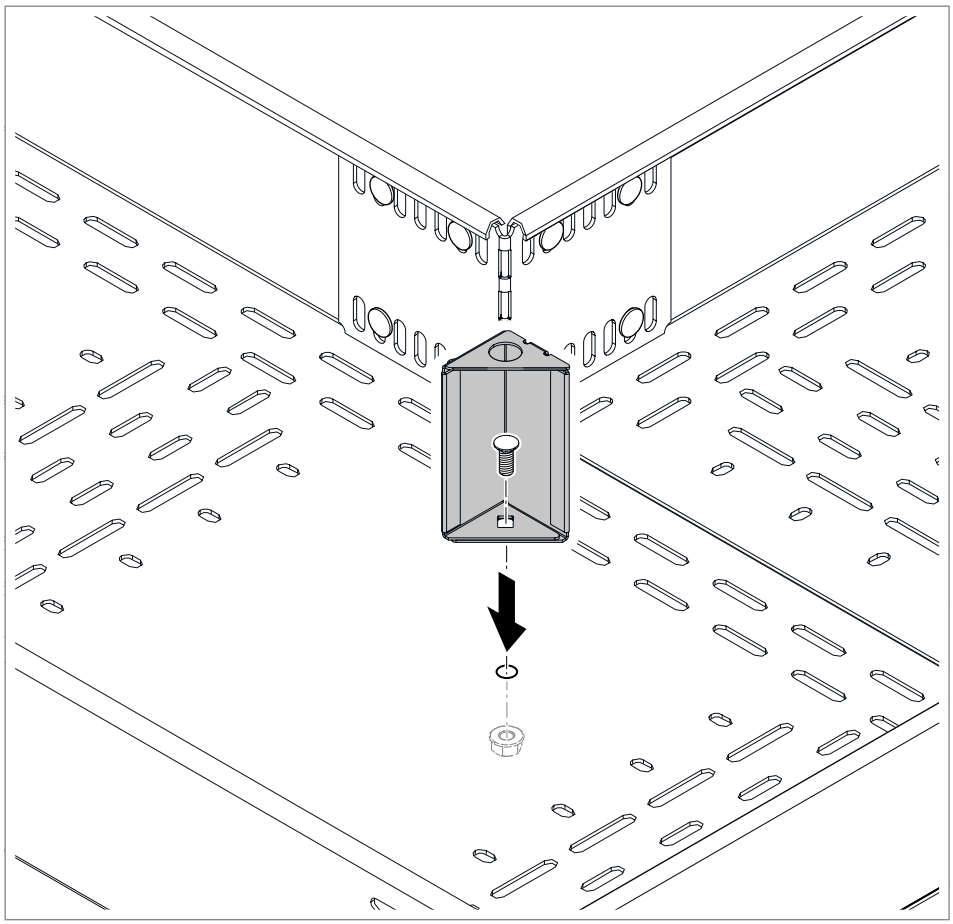

Fig. 17: Installation of cover support

1. Drill hole in the base of the cable tray for FRSB M6x16 truss-head bolt.

2. Screw the cover support to the base of the cable tray with a truss-head bolt and flange nut.

Note! *Alternatively, the cover support can be mounted with a drilling screw and washer.*

Note! *The metal plate of the cover support is double-folded at the edges, to protect the cables from damage when being pulled through or laid.*

4.5.2 Mounting the cover with cover clamps

The cover clamps are mounted at the edge of the cover between 2 ribs of a pair of corrugations.

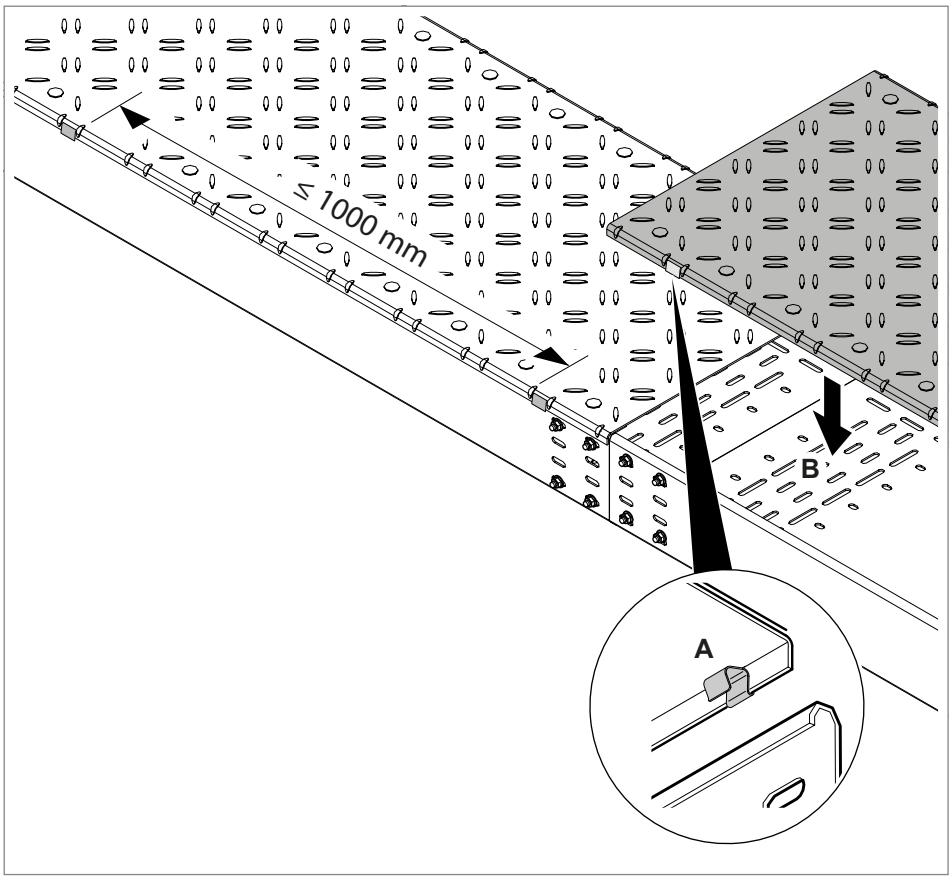

Fig. 18: Mounting the cover, type DBKR, with cover clamps

1. Fasten the cover clamp at the start of the cover (A).
2. Mount 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 (B).
4. Fasten the next cover to the cable tray with cover clamps.

Note! *The last cover at end of each system must also be fixed to the cover clamps, e.g. with a turn buckle, to prevent it from slipping when walked on.*

4.5.3 Mounting the cover with turn buckles

Mounting the turn buckle, type DRL H S FT

The turn buckle, type DRL H S FT, is screwed to the cover.

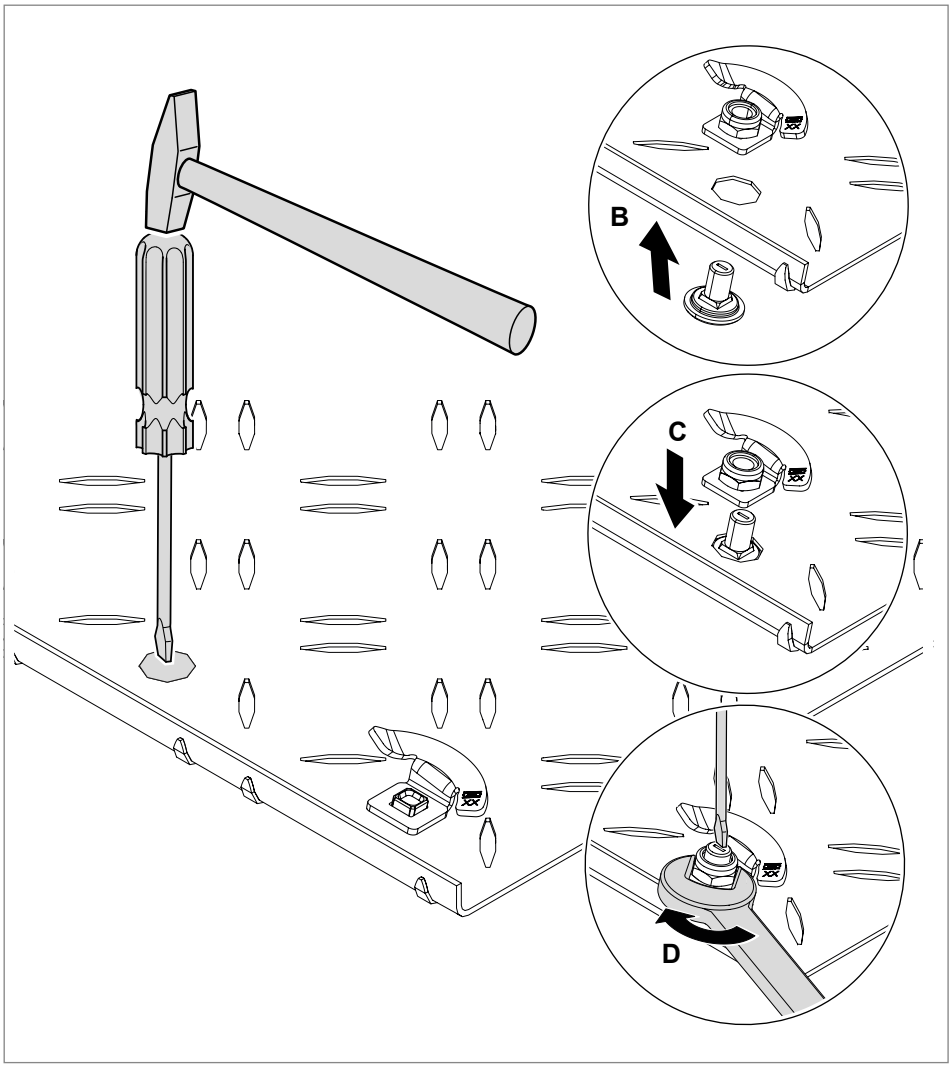

Fig. 19: Mounting the turn buckle, type DRL H S FT

1. Knock out the break-out opening on the cover using a flattener (16–20 mm) or screwdriver (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 cover with turn buckle

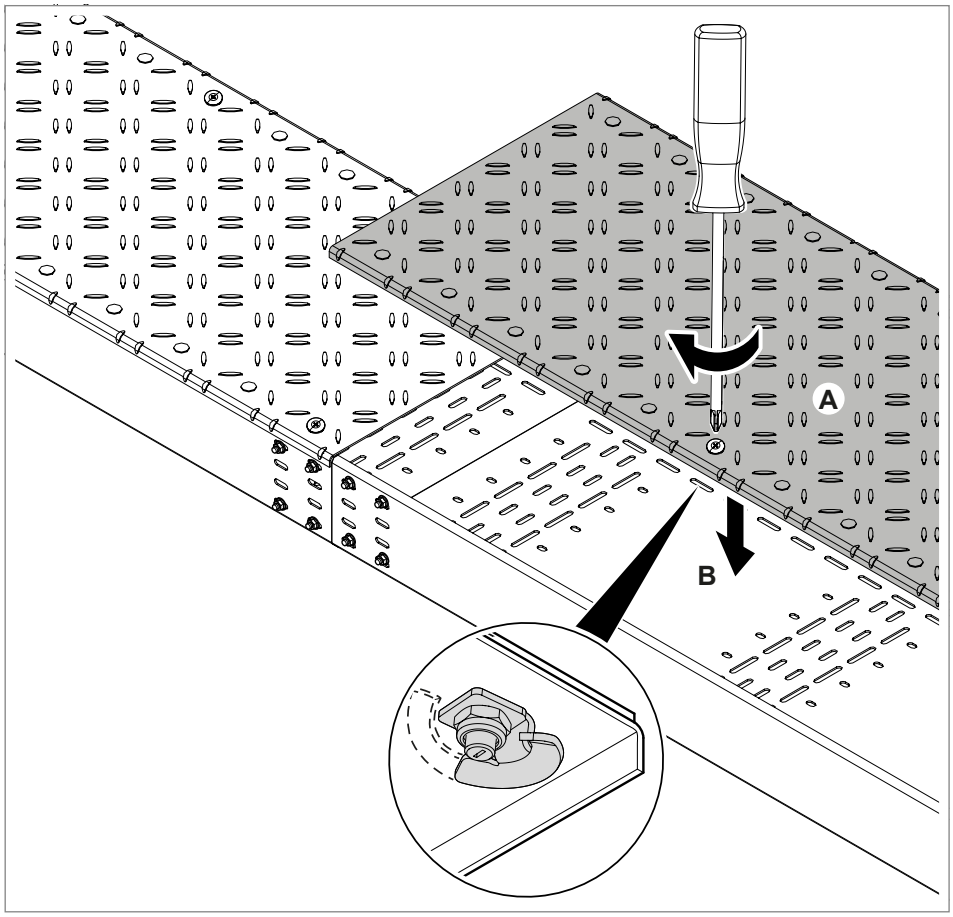

Fig. 20: Mounting of cover type DBKR with turn buckle

1. Attach the first cover.
2. Fasten the turn buckle of the cover to the cable tray (A).
3. Fasten the next cover to the cable tray with turn buckles (B).

4.5.4 Mounting the cover on a corner connection

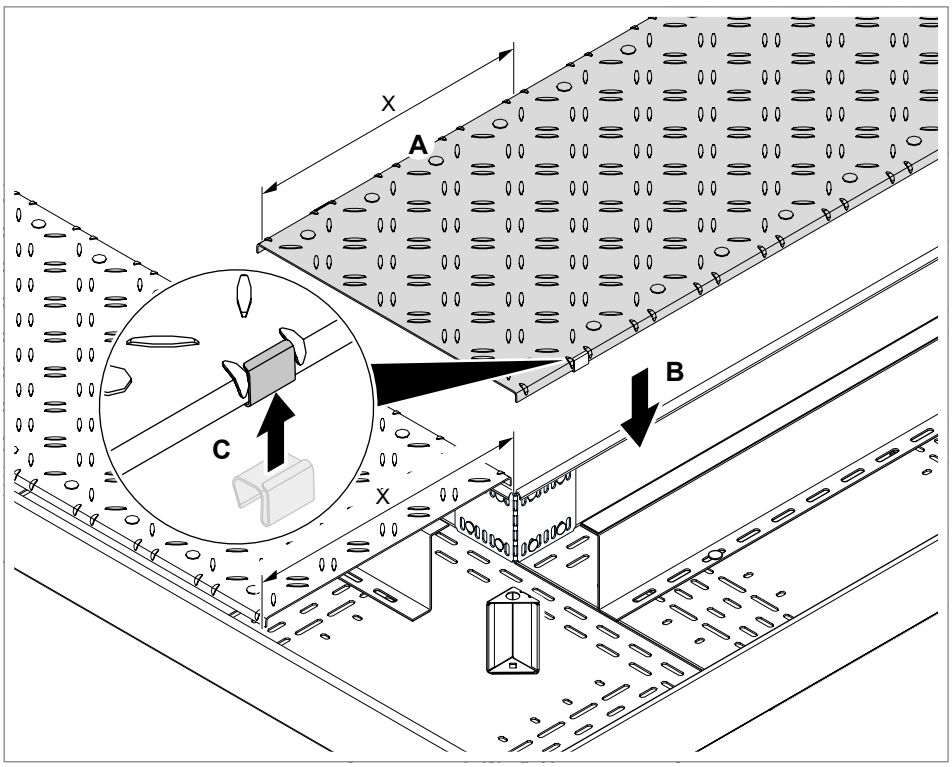

Fig. 21: Mounting the cover on a corner connection

1. If necessary, cut the cover to size.
2. Notch out the joint edge of the cover along length x (A).
3. Attach the cover (B).
4. Fasten the cover to the cable tray with cover clamps (C) or turn buckles.

4.5.5 Mounting the cover on a cross-connection

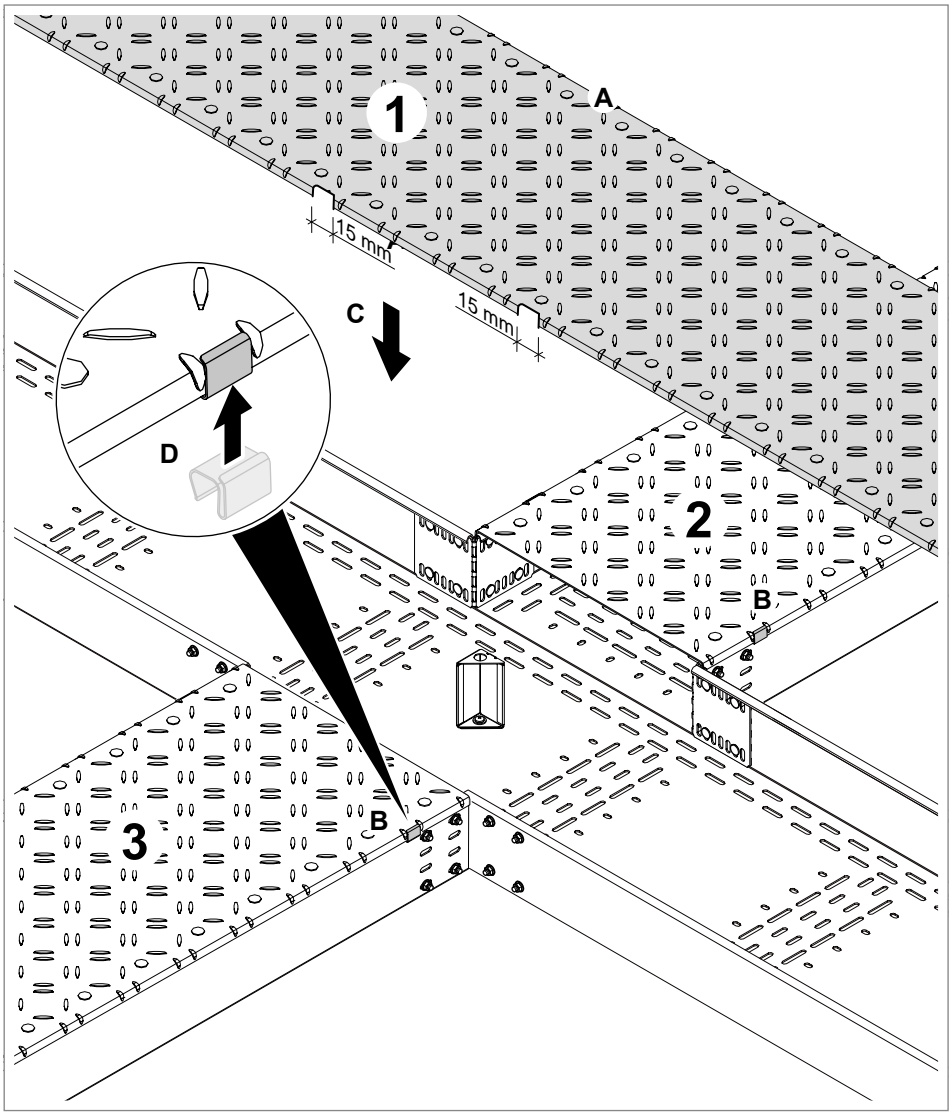

Fig. 22: Mounting the cover on a cross-connection

1. If necessary, cut the cover to size.

2. In order to be able to position cover 1 on the upper edges of the cable tray that are at right angles to each other, cut out 15 mm from both sides of cover 1 in the joint area (A).

3. Deburr cut edges to avoid cable damage.

4. Fasten covers 2 and 3 to the cable tray with cover clamps (B) or turn buckles.

5. Attach the cover 1 (C).

6. Fasten cover 1 to the cable tray with cover clamps (D) or turn buckles.

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.

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

Customer Service Germany
Tel.: +49 (0)2373 89-1300

toi@obo.de

www.obo-bettermann.com

230048.01 Date 05/2023

Building Connections

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