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FROM START
TO FUTURE.

Cable trays

Assembly Instructions



Table of contents

Introduction

Index 3

General information 4

Assembly steps

Fastening elements 5

Connector assembly 6

Horizontal change in direction 7

Vertical change in direction 10

Reduction 11

Accessories assembly 12

Cover installation 14

Index

Cable trays

R 35/60/85/110	Cable tray unperforated, height=35/60/85/110 mm
RG 35/60/85/110	Cable tray perforated, height=35/60/85/110 mm
RS 60/110	Cable tray heavy, unperforated, height=60/110 mm
RGS 60/85/110	Cable tray heavy, perforated, height=60/85/110 mm
RGL 60	Cable tray perforated, permeable to extinguishing water, height=60 mm
RI 60	Installation tray, height=60 mm
RIS 60	Installation tray heavy, height=60 mm

Formed parts

RB 35/60/85/110	Tray curve 90 °, height=35/60/85/110 mm
RB45 35/60/85/110	Tray curve 45 °, height=35/60/85/110 mm
RIB 60	Installation tray curve, height=60 mm
RBV 35/60/85/110	Tray curve, variable, height=35/60/85/110 mm
RAE 35/60/85/110	Tray extension angle, height=35/60/85/110 mm
RAA 35/60/85/110	Tray extension joint, height=35/60/85/110 mm
RA 35/60/85/110	Tray joint, height=35/60/85/110 mm
RIA 60	Installation tray joint, height=60 mm
RK 35/60/85/110	Tray junction, height=35/60/85/110 mm
RVB 35/60/85/110	Tray vertical curve, height=35/60/85/110 m
RR 35/60/85/110	Tray reducer, height=35/60/85/110 mm

Cover

RD	Tray cover
RDR	Tray cover with turning bolts
RID	Installation tray cover
RIDR	Installation tray cover with turning bolts
RDS	Tray cover, heavy
RDSR	Tray cover with turning bolts, heavy
RBD	Tray curve cover
RBDR	Tray curve cover with turning bolts
RIBDS	Installation tray curve cover, heavy
RBD45	Tray curve cover
RBDR45	Tray curve cover with turning bolts
RBVD	Tray curve cover, variable
RBVD	Tray curve cover, variable with turning bolts
RAED	Tray extension angle cover
RAAD	Tray extension joint cover
RBDR	Tray extension joint cover with turning bolts
RAAD	Tray joint cover
RADR	Tray joint cover with turning bolts
RIADS	Installation tray joint cover, heavy
RKD	Tray junction cover
RADR	Tray junction cover with turning bolts
RRD	Tray reducer cover
RADR	Tray reducer cover with turning bolts
RD-SW	Storm safety angle - tray
RDKL 60/110	Tray cover bracket

Accessories

KLF	Spring clamping assembly
RGV	Tray side connector, height=20/45/70/95 mm
RIV 60	Installation tray connector, height=45 mm
RGVS 60	Tray side snap-lock connector, height=60 mm
RGVST	RGVS assembly tool
VB	Connecting plate
RTR 35/60/85/110	Tray barrier strip, height=33/50/80/100 mm
RITR 60	Installation tray barrier strip, height=58 mm
RTRV 35/60/85/110	Tray barrier strip, variable, height=33/50/80/100 mm
REB	Tray end plate
RAB 35/60/85/110	Tray closing plate, height=20/45/70/95 mm
RKAB	Drop-out plate
KSR 35	Cable protection ring 35 for cable tray permeable to extinguishing water
KSR 50	Cable protection ring for installation tray
KSR 94	Cable protection ring 94 for cable tray permeable to extinguishing water
SRI 60	Protective cap for installation tray
SRI-EO	Protective cap extension top for installation tray
SRI-EU	Protective cap extension bottom for installation tray
KSB	Edge protective strip
MP-RG	Assembly plate
AHB	Suspension bow
MKB	Adhesive metal strip
KZF	Cold zinc paint
KZS	Cold zinc spray

Fastenings

KLR	Clamp fastening set (2x SEMS M6 + 2x FRSV 6x12)
FRSV 6x12	Truss-head screw with short square neck, DIN 603
US 6x12	Washer, DIN 125
SEM M6	Hexagon nut, DIN 934
SEMS M6	Hexagon flange nut, DIN EN 1661
SEMSS M6	Hexagon nut, self-locking, DIN 985

Formed parts, covers, accessories and fastenings are not included with the cable trays and must be ordered separately.

General information

Cable trays and installation trays are used to bridge medium fastening distances. The support structures are to be planned by qualified engineers. All assembly instructions shown also apply to installation trays RI and RIS.

The following general instructions must be observed before beginning assembly work:

1. The permissible torque must be observed for all screw connections. (see table: „Selection of screw tightening torques")
2. The following applies to all formed parts, changes in direction or open ends: The maximum distance of 300 mm in relation to the end of the formed part and the support must be observed. (see Fig. 1)
3. Carry out cutting and sectioning work with the utmost care and in compliance with occupational safety. (see fig. 2)
4. All cutting and sectioning points are to be galvanised on site after deburring. Cold zinc paint (CZP) / cold zinc spray (CZS) can be used to repair cut edges or defects for strip galvanised / pre-galvanised material (version S). Only CZP may be used for the finally galvanised / batch galvanised version (version F).
5. Connecting points must be adequately screwed together. Trays with a side rail height of up to 60 mm must be screwed together in one place and trays with a side rail height of 85 mm or more must be screwed together in two places per connector end.
6. In the case of high temperature fluctuations, a fixed and a floating bearing in the butt joint must be considered. (see Fig. 3)

Selection of screw tightening torques

Nominal thread diameter	Strength class Screw GV/F (DIN EN ISO 898-1)	Tightening torque GV/F, Friction coefficient μ=0.14; acc. to VDI 2230	Strength class Screw E/E4 (DIN EN ISO 3506-1)	Tightening torque E/E4, Friction coefficient μ=0.20; acc. to VDI 2230
M6	4.6	4.1 Nm	50	4.6 Nm
M8	4.6	10.1 Nm	50	11.2 Nm
M10	4.6	20.3 Nm	50	22.2 Nm
M12	4.6	34.0 Nm	50	38.0 Nm
M6	8.8	11.3 Nm	70	10.0 Nm
M8	8.8	27.3 Nm	70	24.1 Nm
M10	8.8	54.0 Nm	70	47.7 Nm
M12	8.8	93.0 Nm	70	82.0 Nm

Legend



Wear safety goggles



Wear hearing protection



Observe tightening torque for fastening elements

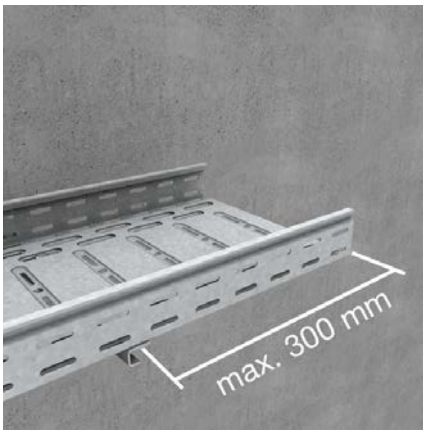


Fig. 1: Support distance to the end of the formed part (max. 300 mm)



Fig. 2: Observe occupational safety measures during cutting and sectioning work.

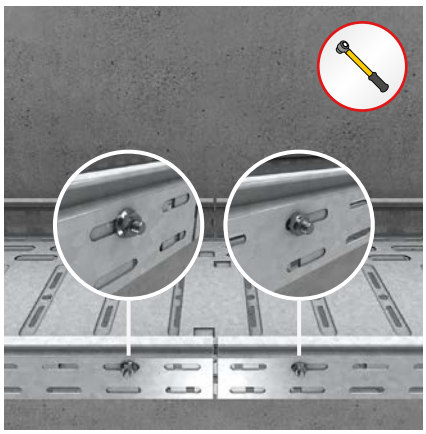


Fig. 3: left: Fixed bearing (KLR); right: floating bearing (FRSV, SEMSS); Gap dimension 4 mm, tightening torque hand-tight (max. 4 Nm)

Fastening elements

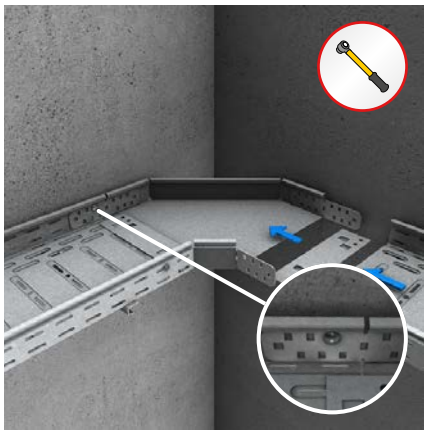
Connection of brackets, barrier strips and formed parts



The classic connection is made by means of a clamp fastening set (KLR). KLR consists of two truss-head screws

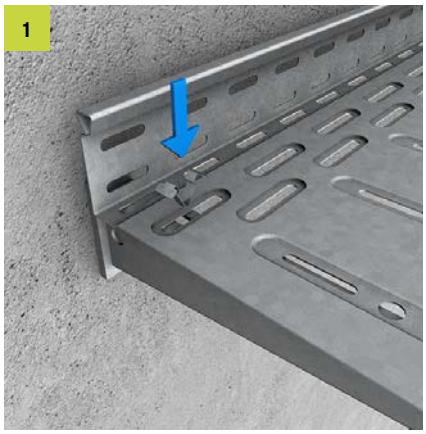


(FRSV 6x12) and two hexagonal flange nuts (SEMS 6). The FRSV is pushed through from the inside to the outside



and screwed to the SEMS from the outside. The “General information” apply.

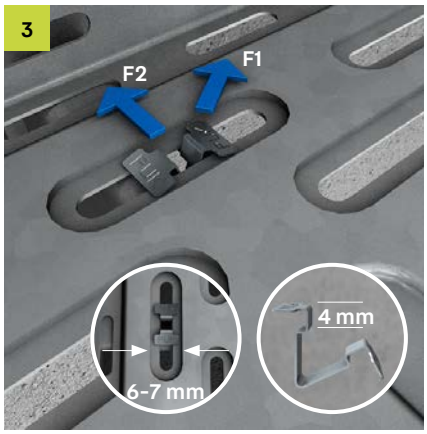
Alternative connection of brackets, barrier strips and formed parts as well as REB and RAB



Spring connector (KLF)
Align KLF with the slotted hole on the opposite side, press it in and check the fit. The tip of the KLF must always point away from the cables. **The KLF must not be used if it becomes a load-bearing component.**



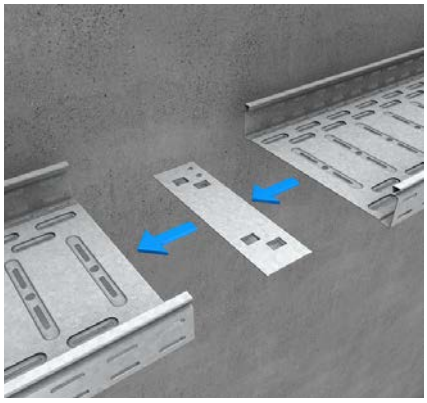
To dismantle, press the tip of the KLF together with pliers and push it out.



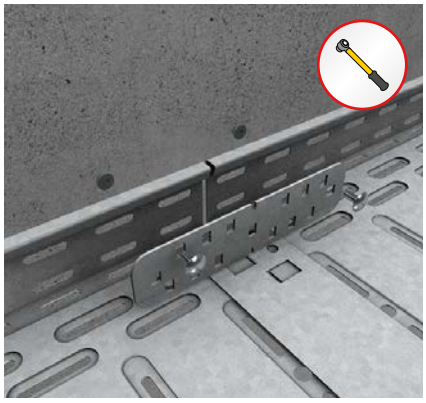
Technical data on the KLF:
against tear-out (F1): 280 N
against shifting (F2): 10 N
max. clamping range: 4 mm
Slot width: 6 to 7 mm

Connector assembly

For a connection you need: 2x tray connector RGV / 2x tray snap-lock connector RGVS 60 and 1x connecting plate VB.

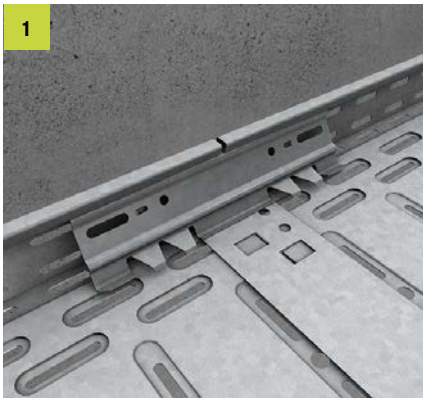


Connection of the cable tray floor by means of floor connector (VB)
For nominal widths of 100 mm and more, attach VB to the bottom of the cable tray.



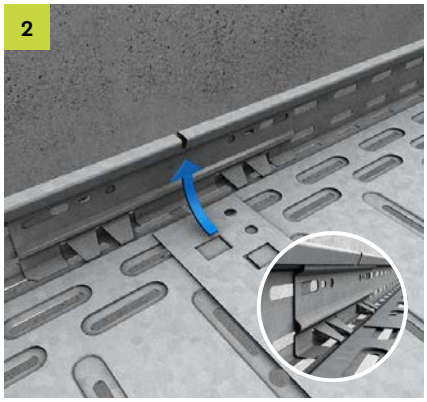
Connection of the cable tray sides by means of side connectors (RGV/RIV)
Push RGV/RIV into the side rail of the cable tray and screw with the clamping screw (KLR) to each side rail, then push in the connecting tray and screw to the RGV/RIV. Number of screw connections depends on side bar height.

1



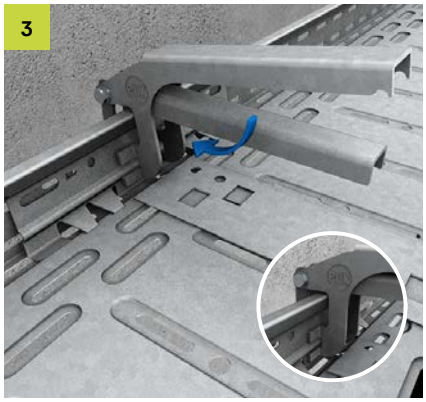
Connection of the cable tray sides by means of snap-lock connector (RGVS 60)
Fit the floor connector (VB) centrally. Align the trays with each other. Position the RGVS 60 alternately in the centre by means of the notch at the connection point.

2



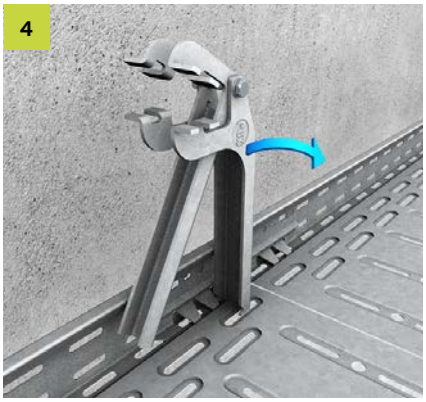
Latch the cable tray, height 60, using the RGVS 60 on the inside on both sides below the side rail head. The RGVS 60 is pressed against the tray bottom until it locks into the tray bottom.

3



With the supporting RGVS assembly tool (RGVST), the RGVS 60 can be mounted more ergonomically and with less fatigue.

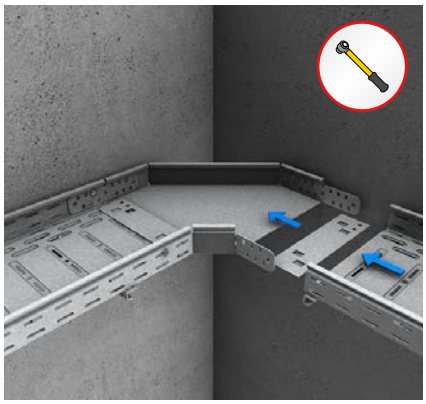
4



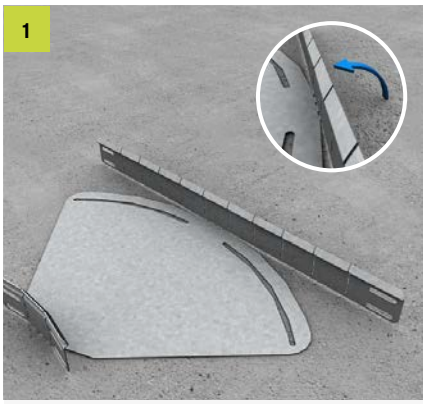
To dismantle, loosen the individual lugs of the RGVS 60 with the hooks on the RGVST.

Horizontal change in direction

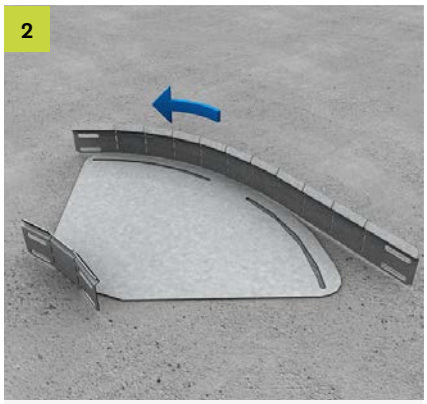
With standard formed parts



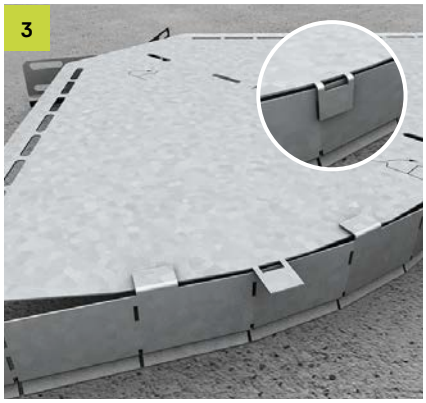
Tray curve (RB/RIB)
Push incoming and outgoing cable trays with floor connector (VB) into RB/RIB and screw together in one place per side rail, alternatively KLF.



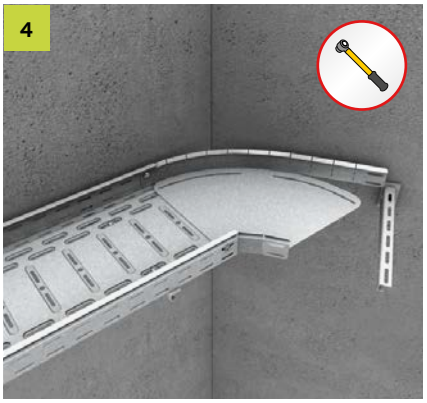
Tray bottom, variable (RBV)
RBV is delivered flat. Bend up the side lugs of the RBV, changing it from its transport state, for assembly.



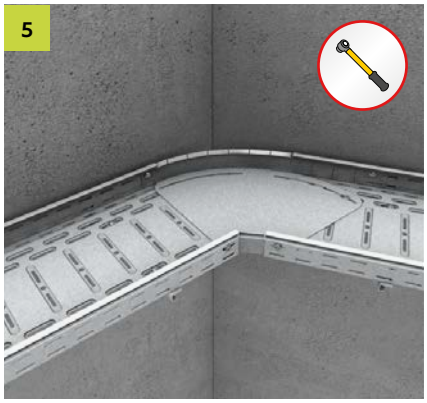
Roughly align the desired angle (between 0° and 90°) with the side rails of the RBV.



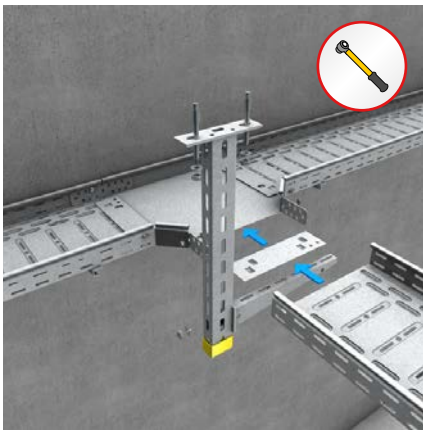
If necessary, bend additional lugs on the bottom for better stability.



Push the RBV into the first cable tray. Screw the side rail tight with KLR, as well as the bottoms.



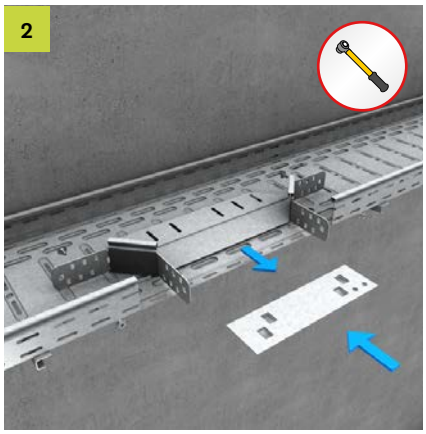
Then screw tight the continuing cable tray in the same way as the first tray. RBVs with B ≥ 400 mm must be supported centrally by an additional supporting structure under the RBV.



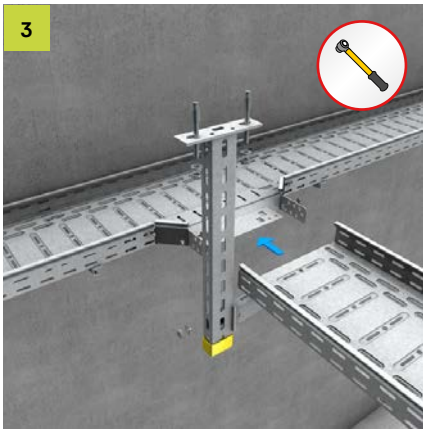
Tray joint (RA/RIA)
Insert RA/RIA and floor connector (VB) into cable tray and screw together like tray side connector (RGV), alternatively KLF.



Tray extension joint (RAA)
Cut out the side rail of the cable tray flush with the bottom in width B = connecting cable tray width + 120 mm, deburr and cold-galvanise.



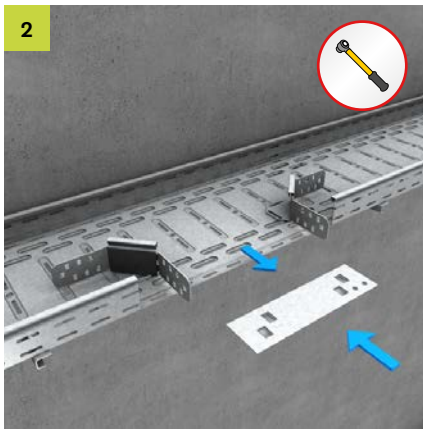
Attach RAA and screw in one place in one place per side rail.



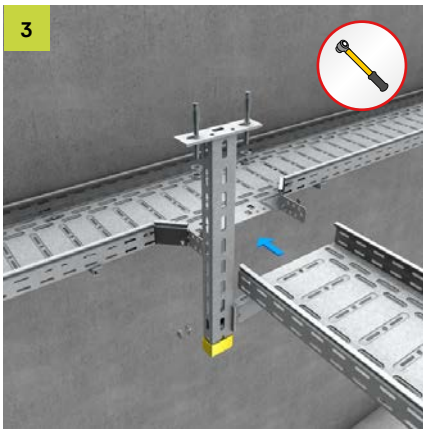
Push the connecting cable tray and floor connector (VB) into the RAA and screw together like the tray side connector (RGV).



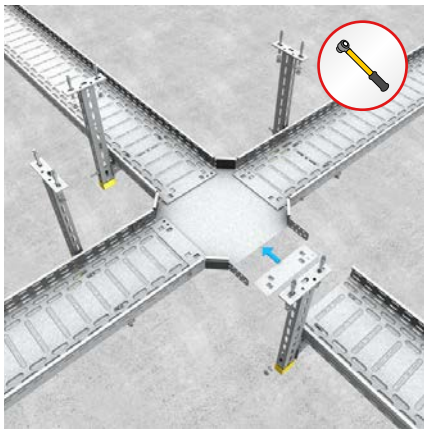
Tray extension angle (RAE)
Cut out the side rail of the cable tray flush with the bottom in width B = connecting cable tray width + 120 mm, deburr and cold-galvanise.



Insert RAE into the cable tray and screw it to the bottom in one place per side rail. Attach floor connector (VB).



Trim the connection cable tray by 60 mm per side rail, push it onto the extension angles and screw together in one place per side rail.



Tray junction (RK)
Insert RK and floor connector (VB) into cable tray and screw together in one place per side rail, alternatively KLF.

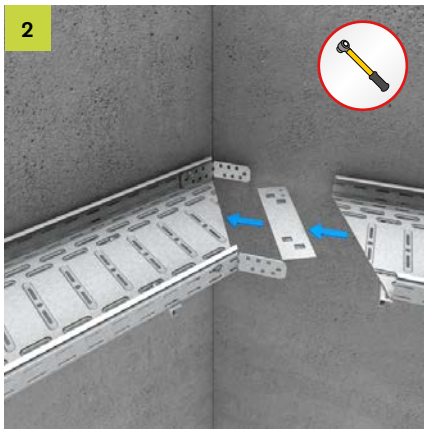
Without standard formed parts

1



By means of tray side connectors (RGVs)
Cut the cable tray to the required mitre, deburr and cold-galvanise.

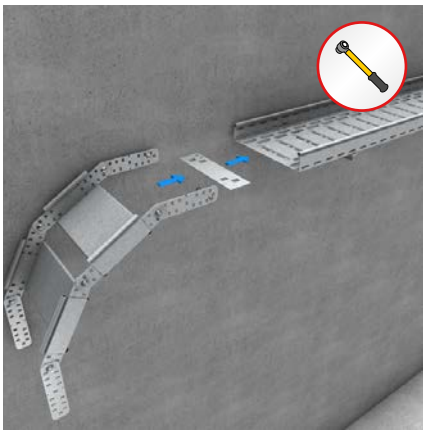
2



Bend both RGVs to the required angle on site, push them into the side rails of the cable tray and screw together. Fit floor connector (VB) of the appropriate length in the bottom of the cable tray, push the connecting cable tray into the RGVs and screw together.

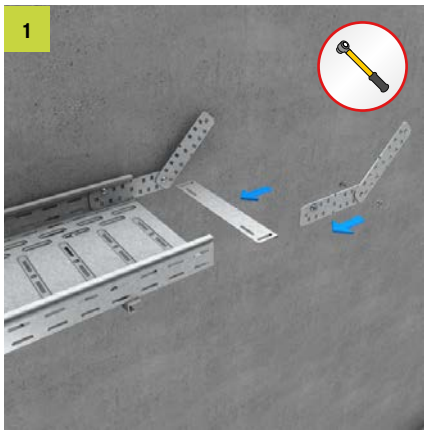
Vertical change in direction

With standard formed parts

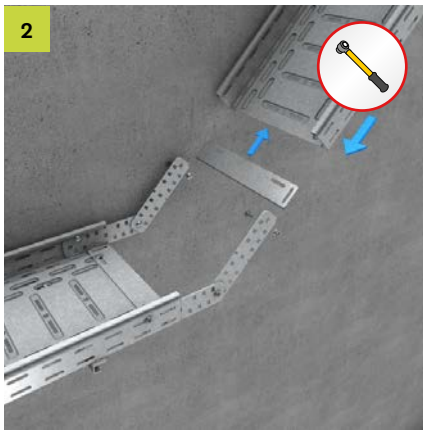


Tray vertical curve, variable (RBV)
At the cable tray end, push the tray end plate (REB) into the bottom of the cable tray and screw together like RGV. Then insert RBV into the cable tray and screw together like RGV. Can be implemented as a rising or a falling piece.

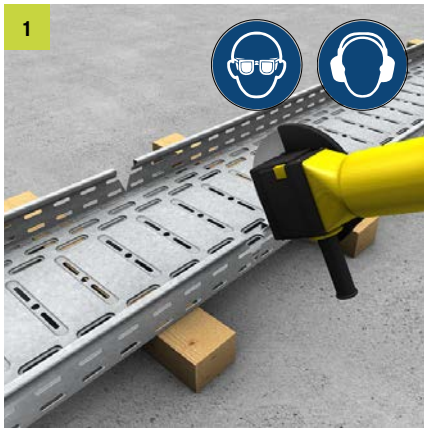
Without standard formed parts



By means of tray side connectors (RGV) and tray end plate (REB)
For a vertical change in direction, push REB into the bottom of the cable tray and screw together like RGV. Screw an RGV with a projection to each side rail. The hinge point is implemented with M8 or M6 for RGV 35 and another RGV.



Push REB into the bottom of the connecting cable tray and screw together like RGV. Then push it into the RGVs and screw together. Can be implemented as a rising or a falling piece.



By means of V-cut and tray side connectors (RGV)
For the vertical change in direction with V-cut, cut out both side rails in a V-shape at the desired position and deburr.



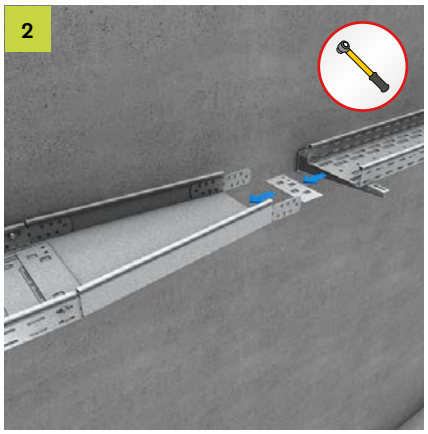
Then insert 2x RGV per side rail into the V-cut and carefully bend to the desired angle. Screw the RGVs tight centrally at the ends. The hinge point is implemented with M8 or M6 for RGV 35.

Reduction

With standard formed parts



Tray reducer (RR)
Push cable tray reducer (RR) and floor connector (VB) into cable tray and screw together in one place per side rail.

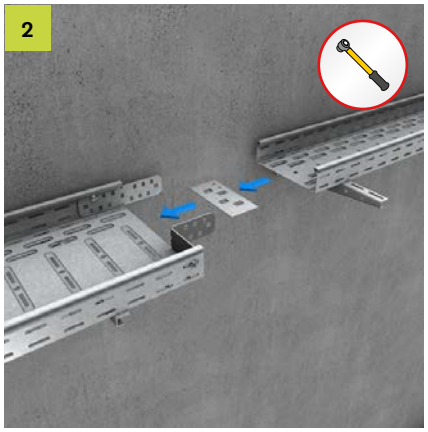


Push connecting cable tray and floor connector (VB) into the cable tray reducer (RR) and screw together like RGV.

Without standard formed parts

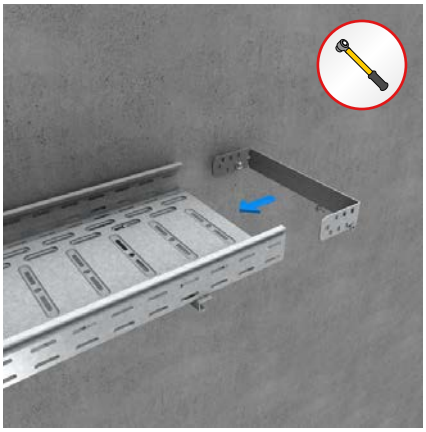


By means of tray closing plate (RAB)
Cable tray reduction by means of RAB and tray side connectors (RGV). Bend RAB in a Z-shape and screw RGV and RAB tight like RGV.

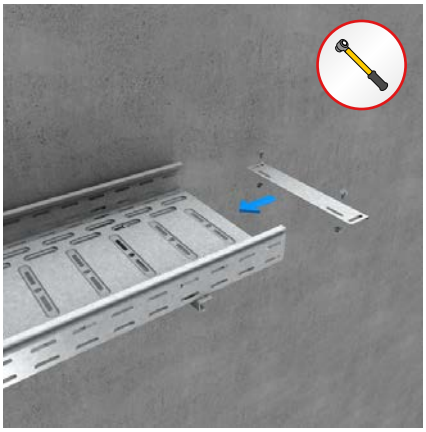


Insert connecting cable tray and floor connector (VB) into the cable tray reducer (RAB) and screw together like RGV.

Accessories assembly



Tray closing plate (RAB)
Sealing the cable tray by means of RAB. Bend tray closing plate into a U-shape and push into the cable trays and screw together like tray side connector (RGV), alternatively KLF.



Tray end plate (REB)
Mounting of the REB for the protection of the inbound or outbound cables. Insert REB into the bottom of the cable tray and screw to the bottom in two places with clamping screw (KLR), alternatively KLF.



Tray drop-out plate (RKAB)
Place the RKAB on the end of the cable tray and screw together in two places with flange nut (SEMS 6) and truss-head screw (FRSV 6x12).



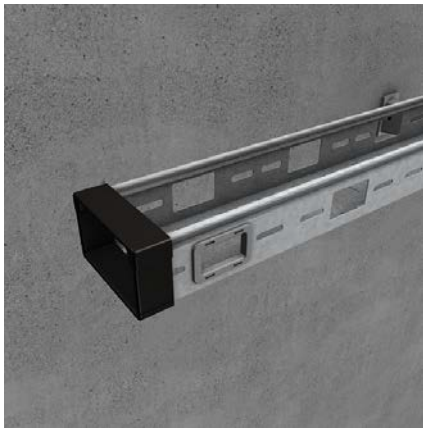
Barrier strip (RTR/RITR)
Screw RTR/RITR in three places (approx. 100 mm from both barrier strip ends as well as in the middle), alternatively KLF.



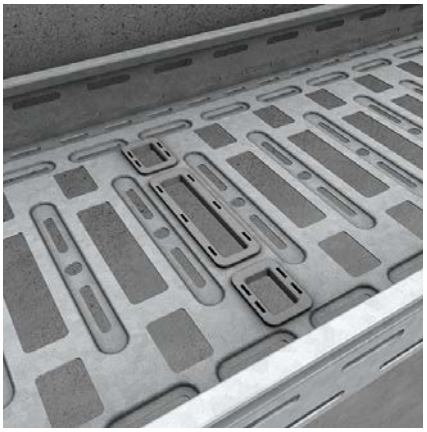
Barrier strip, variable (RTRV)
RTRV for flexible installation in formed parts, joints or reducers. Bending radius from 35 mm to 600 mm. Screw connection occurs with KLR in min. 3 places, alternatively KLF.



Assembly plate (MP-RG)
Screw MP-RG for electrical component to the side rail of the cable tray in two places.



Cable protection installation trays (RI)
For the protected threading out of cables from a covered RI, the ends are to be provided with protective caps (SRI) and the sides with cable protection rings (KSR 50). For different tray widths, the protective caps SRI are provided with separating points and corresponding sets are available.



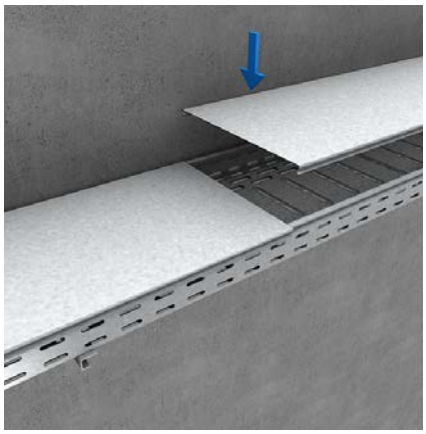
Cable protection cable trays (RGL)
For the protected threading out of cables from an RGL, the openings in the bottom or sides must be provided with KSR 35 or KSR 94.



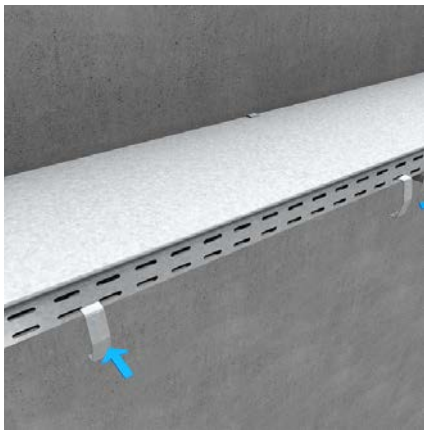
Edge protective strip (KSB)
Exposed edges (e.g. of cable trays, covers, barrier strips etc.) can cause damage to the cables. The edge protective strip (KSB) should be used as protection. It should be cut to size and pushed onto the edge to be protected.

Cover installation

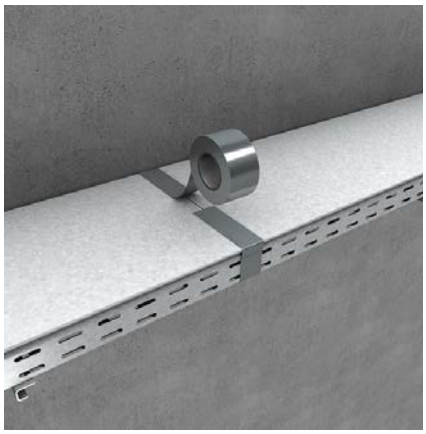
Cover fixation indoors



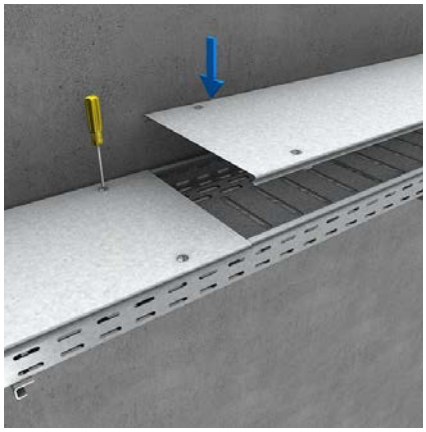
Tray cover (RD/RID/RDS)
Place the RD/RID/RDS onto the cable tray and push against the side rail until it engages positively in the side rail.



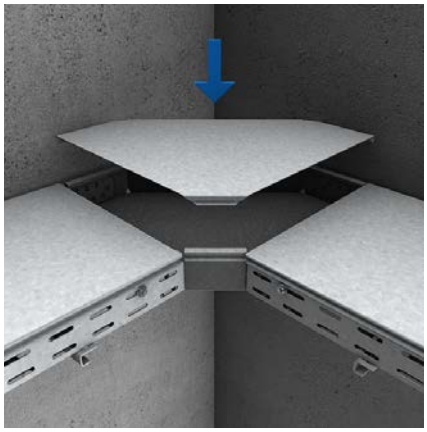
Tray cover brackets (RDKL)
Place the RDKLs sideways onto the tray cover (RD) and push against the RDKLs until they engage positively with the cable tray bottom. 6 pieces every 3 metres.



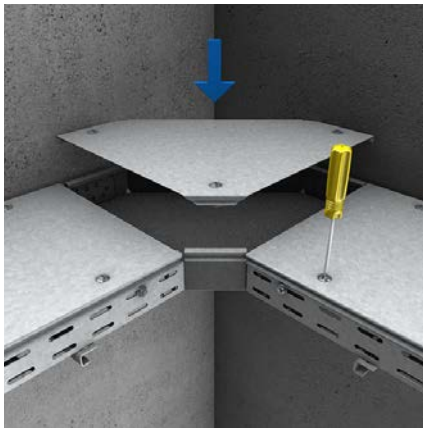
Adhesive metal strip (MKB)
Remove the separating foil of the adhesive metal strip (MKB) and wrap the MKB around the cover and the cable tray.



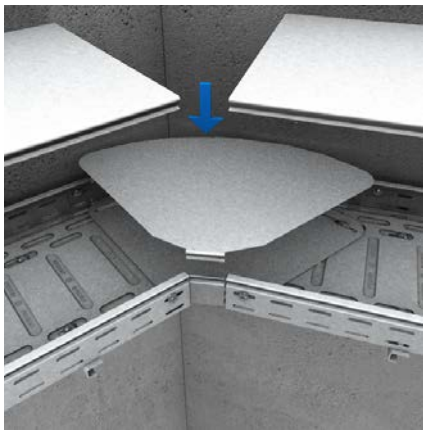
Tray cover with turning bolts (RDR/RIDR)
RDR/RIDR is mounted in the same way as the tray cover (RD). In addition, tighten the turning bolt with a screwdriver until the screw head slot points lengthwise to the cable tray.



Formed part cover, e.g. curve cover (RBD)
Formed part covers, e.g. RBD, are fitted in the same way as the tray cover (RD).

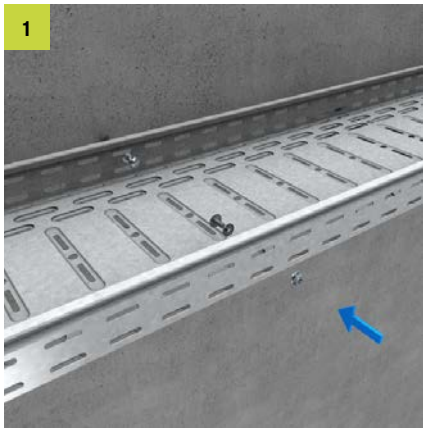


Formed part cover with turning bolts, e.g. curve cover with turning bolts (RBDR)
Formed part covers with turning bolts, e.g. RBDR, are installed with turning bolts (RDR) in the same way as the tray cover.

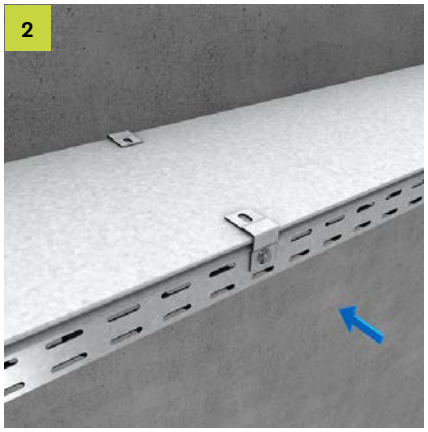


Tray curve cover, variable (RBVD)
Mount the RBVD on the variable curve. Then place the tray covers (RD) onto the cable trays.

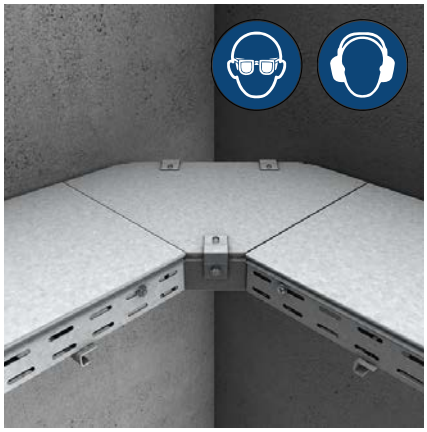
Cover fixation outdoors



Tray cover (RD) with storm safety angle (RD-SW)
Lead the truss-head screw (FRSV 6x12) of the RD-SW on the inside through the cable tray. Push the anti-loss washer (UVS M6) onto the FRSV 6x12.



Place the RD on the cable tray and then place the RD-SW onto the cover from the outside and screw tight with the flange nut (SEMS 6). 6 pieces every 3 metres. Position of the storm safety angles: 100-150 mm in front of the ends and in the middle of the cable tray.



Formed part cover with storm safety angle (RD-SW), e.g. curve cover (RBD)
RD-SW for formed part covers are installed in the same way as the curve cover (RBD). The through-holes (Ø 7 mm) must also be drilled using the RD-SW as a drilling template. For RAA 2 pieces, for RB 3 pieces and for RA and RK 4 pieces.

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PohlCon GmbH
Nobelstr. 51
12057 Berlin
Germany

T +49 30 68283-04

www.pohlcon.com