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Wide-span Cable Ladders WPL

Assembly Instructions



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General information

Wide-span cable ladders can span support distances of up to eight metres thanks to their high transverse rigidity. Sufficient air circulation is maintained around the welded rungs, even when power cables are installed, preventing heat build-up. Supporting structures must be designed by a qualified engineer.

The following general instructions must be observed before starting installation:

1. The permissible tightening torques for all bolted connections must be observed (see table Recommended Tightening Torques).
2. For all fittings, changes of direction and open ends, a maximum distance of 300 mm from the end of the fitting or the support must be maintained (see Fig. 1).
3. Cutting and separation work must be carried out with the utmost care and in compliance with occupational health and safety requirements (see Fig. 2).
4. After deburring, all cut and separated areas must be galvanised on site. For repairing cut edges and damaged areas on plain or pre-galvanised material (finish S), cold zinc paint KZF or cold zinc spray KZS may be used. For batch or hot-dip galvanised material (finish F), only cold zinc paint KZF may be used.
5. Connection points must be adequately bolted. Wide-span cable ladders must be secured with four bolted connections on each side of the connector, using flange nuts, self-locking nuts and washers.
6. In applications with large temperature fluctuations, one fixed bearing and one sliding bearing must be provided at each joint connection (see Fig. 3).
7. Locking devices must be used where vibration is present.
8. Threaded ends must be avoided within the cable routing area (see Fig. 3). **Risk of cable damage!**

Recommended tightening torques

Nominal thread diameter	Property class Screw GV/F (DIN EN ISO 898-1)	Tightening torque acc. to VDI 2230 Nm	Property class Screw E/E4 (DIN EN ISO 3506-1)	Tightening torque acc. to VDI 2230 Nm
M6	4.6	**3.7**	50	**4.6**
M8	4.6	**9.1**	50	**11.2**
M10	4.6	**18.3**	50	**22.2**
M12	4.6	**31.0**	50	**38.0**
M6	8.8	**10.1**	70	**10.0**
M8	8.8	**24.6**	70	**24.1**
M10	8.8	**48.0**	70	**47.7**
M12	8.8	**84.0**	70	**82.0**

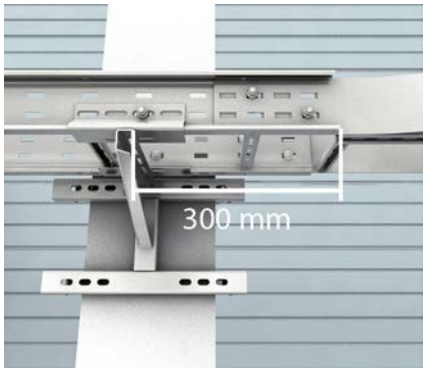


Fig. 1: Support spacing
Distance to an open end, the end of a fitting or a change of direction: max. 300 mm.



Fig. 2: Cutting and separation work
Carry out cutting and separation work in accordance with occupational health and safety requirements.

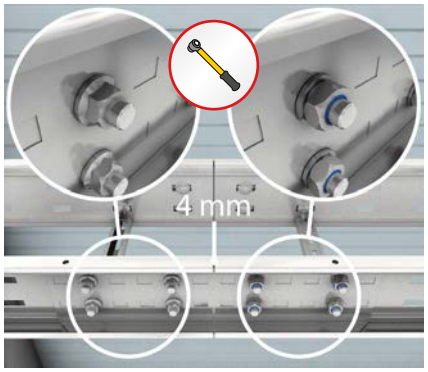


Fig. 3: Bolted connections
Left: fixed bearing (flange nut). Right: sliding bearing (loose washer).
Maintain a clearance of 4 mm. Bolt heads must be positioned on the inside.

Safety instructions



Wear safety goggles



Wear ear protection



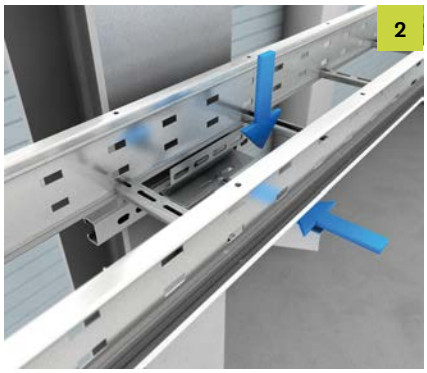
Observe the tightening torque for fasteners

Fastening of elements

Fastening of brackets, fittings and accessories



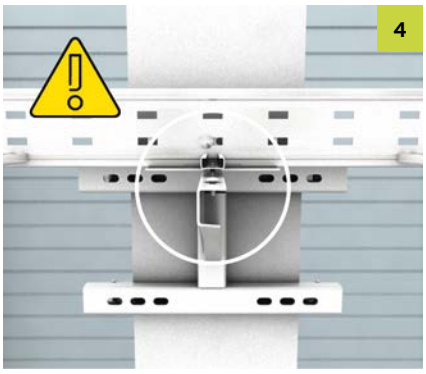
Wide-span cable tray rail support WPHS
Fasten or clamp the rear WPHS to the supporting structure. The type of rail support used depends on the supporting structure:
For brackets: WPHS-K
For profile rails: WPHS-A
For profiles: WPHS-P



Place the wide-span cable ladder onto the support and push it against the mounted WPHS.



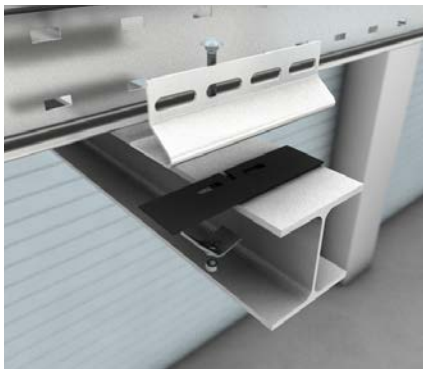
Ensure that the supporting structure is correctly positioned between the rungs of the wide-span cable ladder.



The WPHS must be fastened to the supporting structure even if a rung is positioned directly above it.



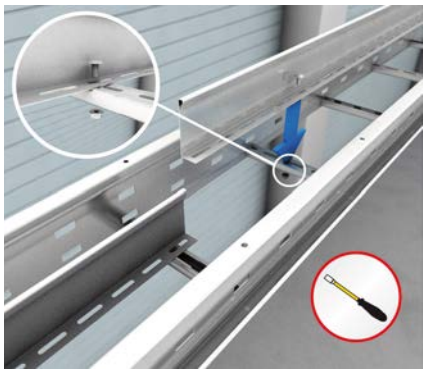
Slide the front WPHS onto the supporting structure and fasten it together with the wide-span cable ladder and the supporting structure.



Insulation strip WPHS-IS
The WPHS-IS insulation strip prevents contact corrosion between the WPHS rail support and the supporting structure and protects the surfaces.

Only one WPHS-P may be fastened to each side rail on a steel beam. The fastenings must be positioned offset and opposite one another.

WPHS is essential for achieving the maximum load capacities.

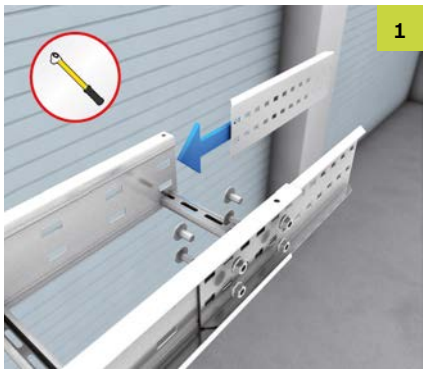


Accessories on rungs
Accessories are generally fastened to the rung using the clamp fastening set KLR.

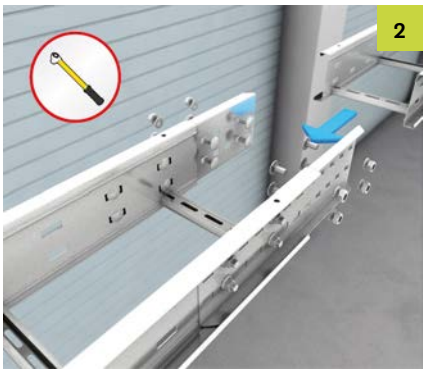


Fittings and accessories on side rails
Fittings are generally fastened to each side rail using four clamp fastening sets KLS 10×20. Accessories are fastened in accordance with the instructions supplied with the product.

Connector installation



Side rail connector WPV
Insert the WPV into the side rail of the wide-span cable ladder and fasten it to each side rail using four clamp fastening sets KLS 10×20.



Slide the connecting ladder section into the WPV and fasten it to the WPV using self-locking hexagon nuts SEMSS 10 or self-locking hexagon nuts SEMB 10. Permissible tightening torque: 3 Nm.

Horizontal change of direction

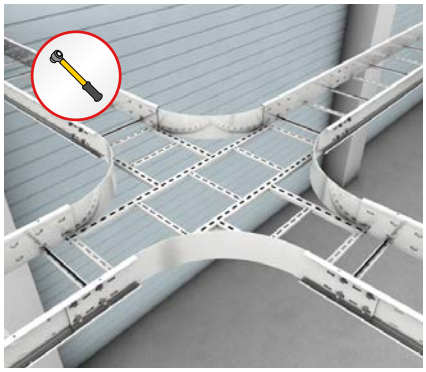
With standard fittings



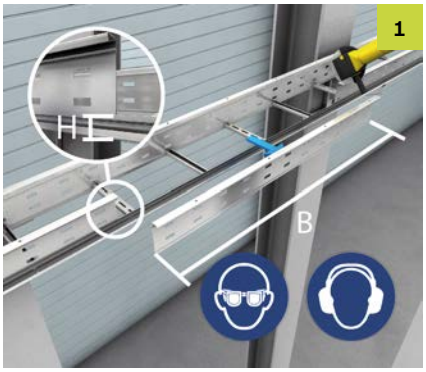
Wide-span cable ladder bend WPLB
Insert the WPLB into the wide-span cable ladder and fasten it to each side rail using four bolted connections. Then slide on the connecting ladder section and fasten it to each side rail using four bolted connections.



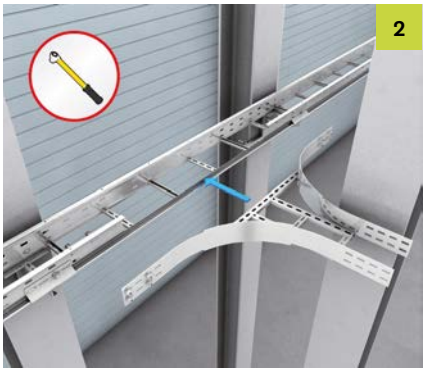
Wide-span cable ladder branch WPLA
Insert the WPLA into the wide-span cable ladder and fasten it to each side rail using four bolted connections. Then slide on the connecting ladder sections and fasten them to each side rail using four bolted connections.



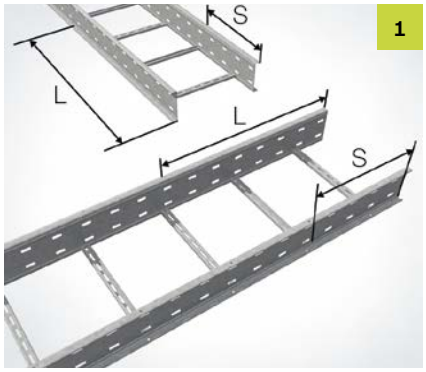
Wide-span cable ladder crossing WPLK
Insert the WPLK into the wide-span cable ladder and fasten it to each side rail using four bolted connections. Then slide on the connecting ladder sections and fasten them to each side rail using four bolted connections.



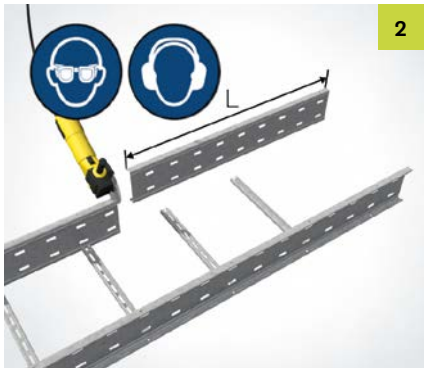
Wide-span cable ladder add-on branch WPLAA
Cut a flush opening in the side rail of the wide-span cable ladder to the specified width. Width of opening = width of the connecting ladder section + 900 mm (H = 23 mm)



Fasten the WPLAA in position and secure it to each side rail using four bolted connections. Then slide on the connecting ladder section and fasten it to each side rail using four bolted connections.



Wide-span cable ladder add-on corner WPLEAB
Identify the inner side rails of the change of direction and mark the cutting lines. The side rails will later be removed within section L.



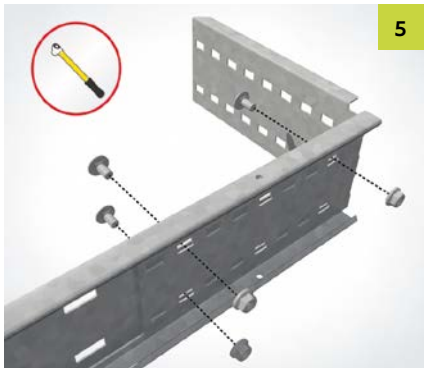
Cut the side rails of both wide-span cable ladders free from the rungs within the defined section L, then remove the side rails completely.
L = tray width + 520 mm.



Remove the rungs of both wide-span cable ladders within the defined section S. S = tray width + 150 mm.



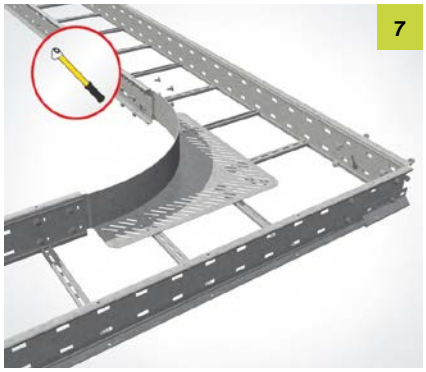
Fasten the connector of the wide-span add-on corner WPEA to the outside of the side rail using four clamp fastening sets KLS 10×20.



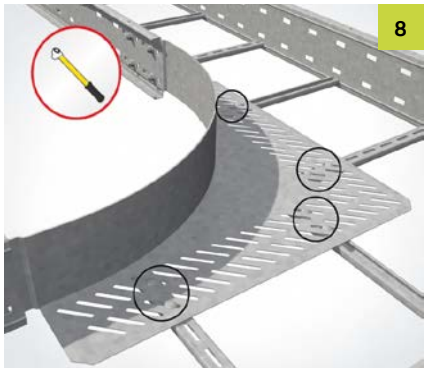
Bend the horizontal wide-span cable tray connector WPVH to 90° at the centre and fasten it to the outside of the side rail using three bolted connections.



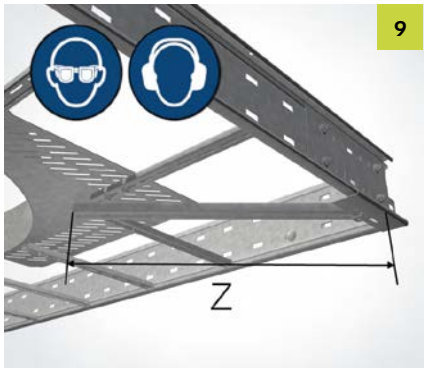
Position the wide-span cable tray rail support WPHS close to the corner and fasten it to the side rail together with the connector using one bolted connection.



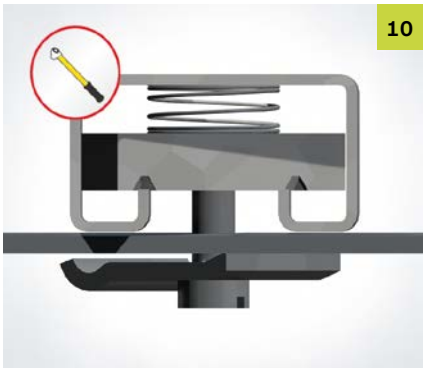
Fasten the connecting ladder section to the wide-span add-on corner WPEA and the horizontal wide-span cable tray connector WPVH using four clamp fastening sets KLS 10×20 on each side rail.



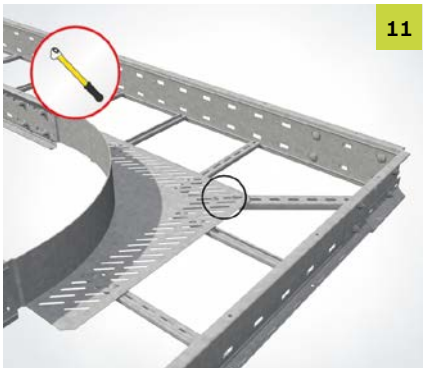
Fasten each of the four free rungs to the wide-span add-on corner WPEA using four round-head bolts with square neck FRS 6×25.



Cut the profile rail KHA to the specified length Z. Z = tray width + 200 mm.

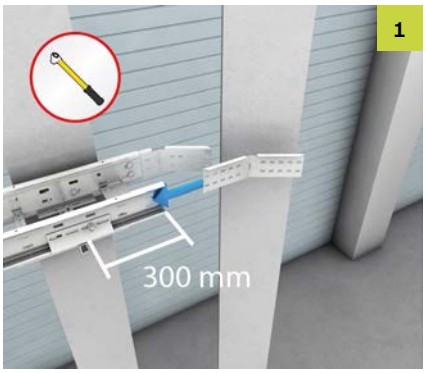


Place the channel nut with spring AMF18 M6 in one end of profile rail KHA. Position KHA on WPHS with the open side facing down. Fasten through WPHS using slotted cheese head screw FKS 6×20 and clamp fastening set KLU.

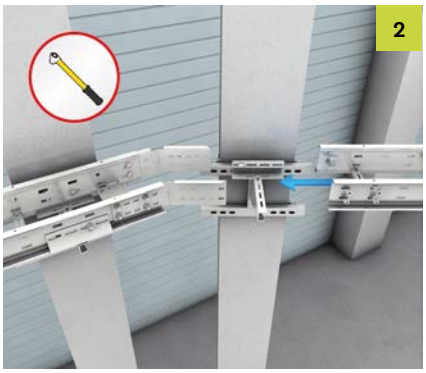


Fasten the profile rail KHA to the bottom plate of the wide-span add-on corner WPEA using two slotted cheese head screws FKS 6×20 and channel nuts AMA18 M6.

Without standard fittings



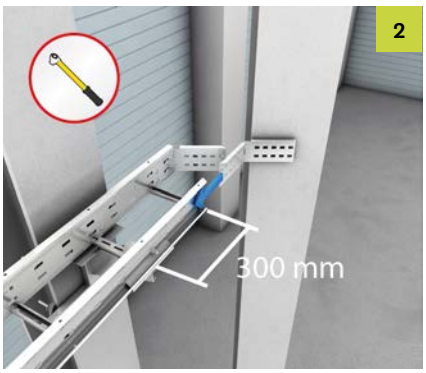
Wide-span cable tray connector, horizontal, less than 30° WPVH
Bend both WPVH connectors to the required angle. Insert them into the side rails of the wide-span cable ladder and fasten each side rail using four bolted connections.



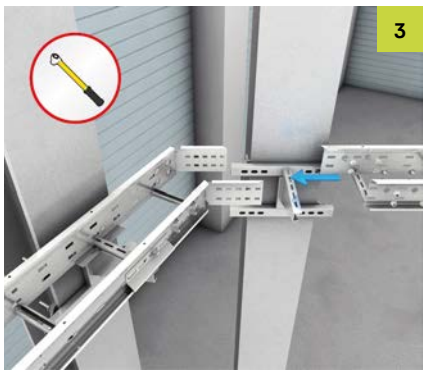
Slide the connecting ladder sections into the WPVH connectors and fasten them to each side rail using four bolted connections.



Wide-span cable tray connector, horizontal, greater than 30° WPVH
Cut the wide-span cable ladder to a mitre angle as required. If necessary, remove the rung completely.



Bend both WPVH connectors to the required angle. Insert the WPVH connectors into the side rails of the wide-span cable ladder and fasten them to each side rail using four bolted connections.



Slide the connecting ladder sections into the WPVH connectors and fasten them to each side rail using four bolted connections.



Wide-span cable tray connector, horizontal, branch WPVH
Bend both WPVH connectors to an angle of 90°. Then insert the WPVH connectors into the side rails of the branching wide-span cable ladders.



Fasten the WPVH connectors to each side rail using four bolted connections.



T-joint connector plate KATB
(Optional) Attach the T-joint connector plate KATB to the side rail of the continuous wide-span cable ladder and fasten it in place.



T-joint connector plate, side KATBS
(Optional) To increase the cable bending radius, attach the T-joint connector plate, side KATBS to the side rails of both the branching and the continuous wide-span cable ladders and fasten it in place.



Wide-span cable tray connector, tee joint WPVTO
Attach the WPVTO to the side rail of the continuous cable route. Position the connecting cable route and fasten it using the fastening bolt and beam clamp.

Vertical change of direction

With standard fittings

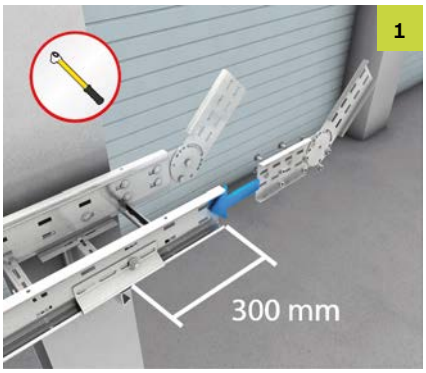


Wide-span cable ladder drop section WPLF
Insert the WPLF into the wide-span cable ladder and fasten each side rail using four bolted connections. Slide on the connecting ladder section and fasten each side rail using four bolted connections.

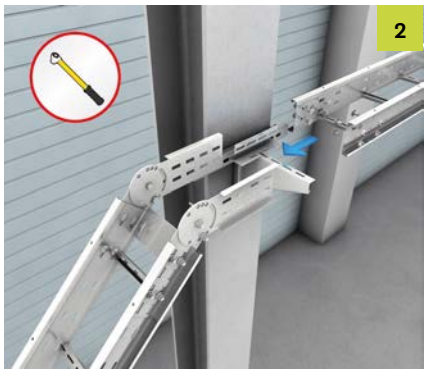


Wide-span cable ladder riser section WPLS
Insert the WPLS into the wide-span cable ladder and fasten each side rail using four bolted connections. Slide on the connecting ladder section and fasten each side rail using four bolted connections.

Without standard fittings



Wide-span cable tray connector, vertical WPVV
Adjust both WPVV connectors to the required angle and fasten them together. Insert them into the side rails of the wide-span cable ladder and fasten each side rail using four bolted connections.

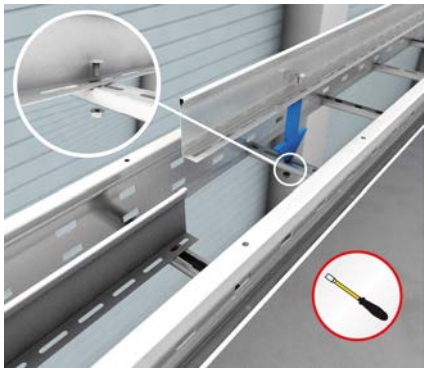


Slide the connecting ladder sections into the WPVV connectors and fasten each side rail using four bolted connections.

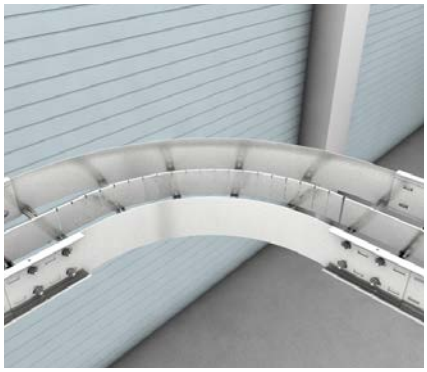
Accessory installation



Wide-span cable ladder drop-out plate WPLKAB
Place the WPLKAB on the required rung and fasten it to the rung using two channel nuts AM 16.



Wide-span cable tray divider WPTR
Fasten the WPTR to the rungs at three points using the clamp fastening set KLR (in the centre of the divider and approximately 100 mm from each end of the divider).



Wide-span cable tray divider, flexible WPTRV
Fasten the WPTRV to the rungs at three points using the clamp fastening set KLR (in the centre of the divider and approximately 100 mm from each end of the divider).



Cable clamp for fastening to C profile rails H
Slide the clamp over the cable. Hook the tee-head bolt into every second rung of the wide-span cable ladder. Optionally position the counter trough GW and tighten the bolted connection.



Cable clamp for fastening to round and flat profiles RU
Slide the clamp over the cable. Slide the clamp head over the rung of the wide-span cable ladder. Optionally position the counter trough GW and tighten the bolted connection.



Mounting plate MP-W
Fasten the MP-W for electrical components to the side rail of the wide-span cable ladder using two bolted connections.



Protection cap SWP
Fit the protection cap SWP made of polyethylene to the respective ends of the side rails of the wide-span cable ladder.



Edge protection strip KSB
Cut the KSB to the required length and slide it onto exposed edges (e.g. side rails, covers, dividers, etc.) to protect cables from damage.

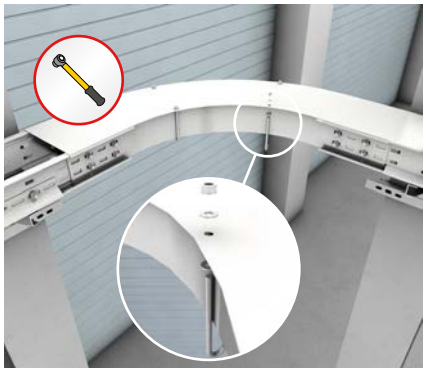
Cover installation



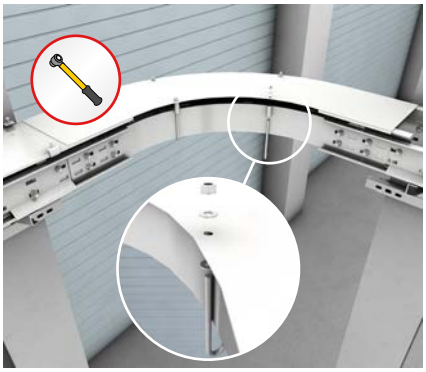
Wide-span cover WPD with cover clamp WPDUK
Secure the WPD on both sides using WPDUK at three positions (in the centre of the cover and 100 mm from each end of the cover; 6 pcs./3 m).
In areas exposed to wind, the number of WPDUK must be increased (minimum 10 pcs./3 m).



Wide-span cover WPD with cover riser WPD-A
Fasten the WPD-A to the inside of the side rail and place the WPD on top. Then secure the WPD using cover clamps WPDUK (6 pcs./3 m; in areas exposed to wind: minimum 10 pcs./3 m).



Wide-span fitting covers (WPBD, WPAD, WPKD) with fitting cover clamp WPFDK
Hook the WPFDK onto the underside of the side rail from the outside and fasten it at all fixing holes of the cover.



Wide-span cable ladder fitting covers (WPBD, WPAD, WPKD) with cover riser WPD-A and fitting cover clamp WPFDKA
Hook the WPFDKA onto the underside of the side rail from the outside, place the spacer sleeve onto the side rail from above, and fasten the WPFDKA at all fixing holes of the cover.

	WPFDK and WPFDKA
WPAD 20 - WPAD 60	6x
WPBD 20 - WPBD 40	4x
WPBD 50 - WPBD 60	5x
WPFD 20 - WPFD 60	4x
WPKD 20 - WPKD 60	8x
WPSD 20 - WPSD 60	4x

Number of fitting cover clamps (WPFDK and WPFDKA)
Required number of fitting cover clamps.

Index

Wide-span Cable Ladders

WPL 100/120/150 ..... Wide-span cable ladder, height = 100/120/150 mm

Fastening Accessories

AM22 M10 ..... Channel nut
AMA18 M6 ..... Channel nut
AMF18 M6 ..... Channel nut with spring
FKS 6x20 ..... Slotted cheese head screw, DIN EN ISO 1580
FRS 8x50 ..... Round-head bolt with square neck, DIN 603
FRSV 10x20 ..... Round-head bolt with short square neck, DIN 603
FRSV 6x16 ..... Round-head bolt with short square neck, DIN 603
KHA 7 ..... profile rail 39.5×22 mm, perforated
KHA 8 ..... profile rail 40×22 mm, perforated
KLR ..... Clamp fastening set (2x SEMS 6 + 2x FRSV 6x12)
KLS 10x20 ..... Clamp fastening set (1x SEM 10 + 1x FRSV 10x20 + 1x US 10x21)
KLU ..... Clamp fastening set (1x KLU-L + 1x SEMS 6 + 1x FRSV 6x12)
KLU-L ..... Clamp fastening
SEM 6/8/10 ..... Hexagon nut, DIN 934
SEMB 10 ..... Hexagon nut, self-locking, DIN 934
SEMS 6/8/10 ..... Flanged hexagon nut, DIN EN 1661
SEMSS 6/8/10 ..... Hexagon nut, self-locking, DIN 985
SKLL ..... Light-duty clamping claw
US 10x21 ..... Washer, DIN 125
US 6x12 ..... Washer, DIN 125
US 8x17 ..... Washer, DIN 125
WPV 100/120/150 ..... Wide-span cable tray connector, height = 95/115/145 mm
WPVH 100/120/150 ..... Wide-span cable tray connector, horizontal, height = 85/105/135 mm
WPVV 100/120/150 ..... Wide-span cable tray connector, vertical, height = 95/115/145 mm

Fittings

WPEA 100/120/150 ..... Wide-span add-on corner
WPLAA 100/120/150 ..... Wide-span cable ladder add-on branch, height = 100/120/150 mm
WPLA 100/120/150 ..... Wide-span cable ladder branch, height = 100/120/150 mm
WPLB 100/120/150 ..... Wide-span cable ladder bend, height = 100/120/150 mm
WPLEAB 100/120/150 ..... Wide-span cable ladder add-on corner
WPLF 100/120/150 ..... Wide-span cable ladder drop section, height = 100/120/150 mm
WPLK 100/120/150 ..... Wide-span cable ladder crossing, height = 100/120/150 mm
WPLS 100/120/150 ..... Wide-span cable ladder riser section, height = 100/120/150 mm

Cable Clamps

GW ..... Counter trough
H ..... Cable clamp for fastening to C profile rails
RU ..... Cable clamp for fastening to round and flat profiles

Covers

WPAD ..... Wide-span branch cover
WPBD ..... Wide-span bend cover
WPD ..... Wide-span cover
WPD-A ..... Cover riser
WPDUK ..... Cover clamp
WPFD ..... Wide-span drop section cover
WPFDK 100/120/150 ..... Fitting cover clamp
WPFDKA 100/120/150 ..... Raised fitting cover clamp
WPKD ..... Wide-span crossing cover
WPSD ..... Wide-span riser section cover

Rail Supports and Fastenings

WPHS ..... Wide-span cable tray rail support
WPHS-A ..... Wide-span cable tray rail support (profile rail)
WPHS-IS ..... Insulation strip
WPHS-K ..... Wide-span cable tray rail support (bracket)
WPHS-P ..... Wide-span cable tray rail support (profile)

Accessories

KATB ..... T-joint connector plate
KATBS ..... T-joint connector plate, side
KSB ..... Edge protection strip
KZF ..... Cold zinc paint
KZS ..... Cold zinc spray
MP-W ..... Mounting plate
SWP 100/120/150 ..... Protection cap, height = 100/120/150 mm
WPLKAB ..... Wide-span cable ladder drop-out plate
WPTR 100/120/150 ..... Wide-span cable tray divider, height = 50/80/100 mm
WPTRV 100/120/150 ..... Wide-span cable tray divider, flexible, height = 50/80/100 mm
WPVTO ..... Wide-span cable tray connector, tee-joint, top

Fittings, covers, accessories and fastening accessories are not supplied with the wide-span cable ladders and must be ordered separately.

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PohlCon GmbH
Nobelstr. 51
12057 Berlin
Germany

T +49 30 68283-04

www.pohlcon.com