Mounting Instructions

Multipole Conductor Rail System

Program 0831

Order Number

0831xx-…

Contents

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Program 0831

1 System description

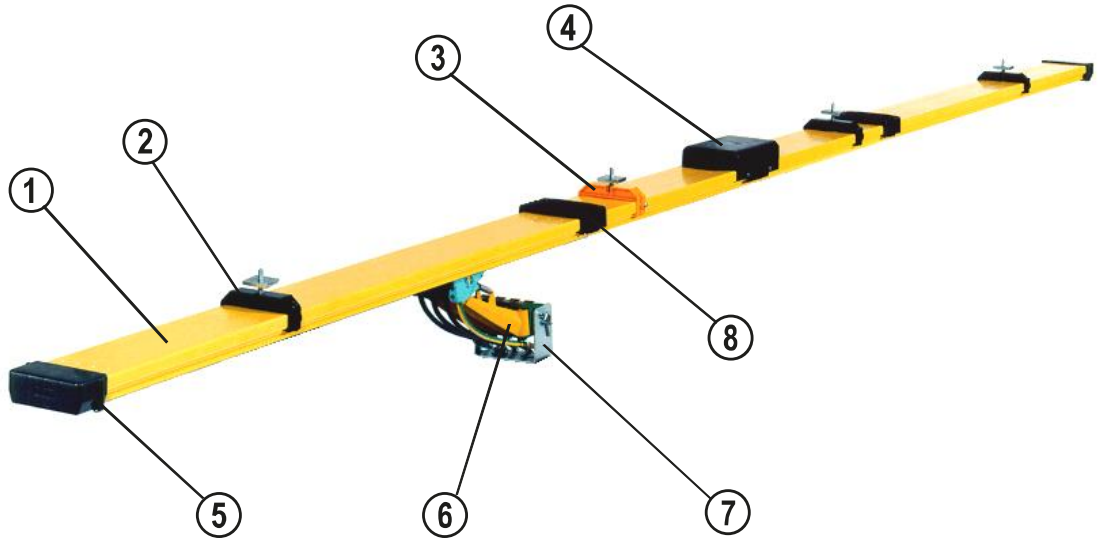


Fig. 1: Components of the multipole conductor rail system program 0831

Item	Designation
1	Conductor rail
2	Hanger clamp
3	Fixed point
4	Centre feed
5	End cap
6	Current collector
7	Towing unit
8	Connector

See chapter 8 for other components of the multipole conductor rail system.

2 Intended use

The multipole conductor rail system serves for the energy and data transmission on indoor systems and weatherproof outdoor systems on straight travel paths.

Possible fields of application:

- Storage and retrieval equipment
- Cranes
- Transport vehicles and special machines.

The following conditions are applicable for the use of the multipole conductor rail systems:

Designation	Value, unit	Additional information
Range of application		The multipole conductor rail system 0831 is an electrical energy supply for track-guided, mobile consumers indoors, in storage areas not accessible for the public.
Installation height	Max. 3000 mm	For the installation beyond 3000 mm installation height or on systems with a strong risk potential we have provided safety catching devices that can be supplied as an option. See chapter 4.2.3 for further information.
Installation position		Horizontal installation position with vertical engagement, optional current collector engagement from underneath. Vertical engagement e.g. at the pole is possible, please contact us for advice and provide a safety catching device.
Max. Support distance (distance between the hanger clamps)	1000 mm	If suspension distances of more than 1000 mm are required, you can combine the multipole conductor rail system with the support profile ProShell (see „KAT0800-0003“).
Max. operating voltage		See type plate The type plate is located on the end and center feed
Nominal current		

3 Control components

Prior to mounting check the goods (consisting of several packages) for completeness and damage by means of the delivery note:

→ Ensure that all required packages are on site.

The conductor rails are available with various nominal values and of various conductor materials:

Strength of the conductor materials

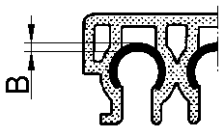


Fig. 2: Strength of the conductors

Conductor material	Ampere I	Catalog number	B [mm]
Steel (galvanized)	32 A	083112-...	1
copper	60 A	083115-...	0.6
copper	100 A	083116-...	1
copper	125 A	083117-...	1.4
Data-Metal	10 A	083118-...	1

4 Assembly

The system sketch shows the mounting distances to the connectors and end and center feed:

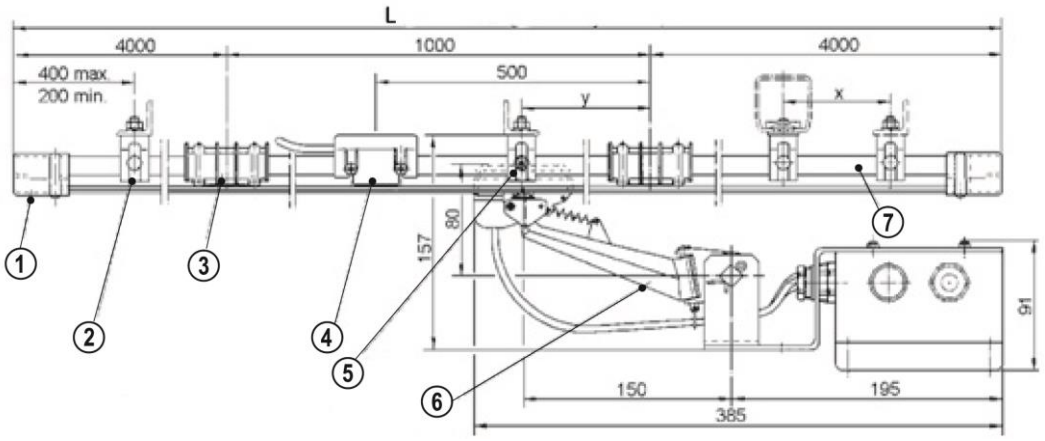


Fig. 3: System sketch

→ See Fig 5 for suspension distance (x) and center distance (y)

Item	Designation
1	End cap or end feed (not illustrated)
2	Hanger clamp
3	Connector
4	Centre feed
5	Fixed point
6	Current collector (vertical engagement)
7	Conductor rail
L	Total length of the system

Use the QR code („click“ or „scan“), to watch our animation **MultiLine 0831 Overview**

Use the QR code („click“ or „scan“), to watch our animation **Console Assembly**

Use the QR code („click“ or „scan“), to watch our animation **Console Aligning**

4.1 Adjusting the lengths

The multipole conductor rail systems are supplied by standard in lengths of 4000 mm, 3000 mm, 2000 mm and 1000 mm. All kinds of system lengths can thus be realized.

→ Always make the length adjustment at the finally mounted conductor rail!

Shorten conductor rail <u>at the end</u>:

→ Saw off the conductor rail to the requested length.

→ Saw the slots according to the sketch (see Fig. 4).

→ Deburr the terminations of the conductor rail and the slots with a not too rough file.

→ Remove dirt and shavings.

→ Put on the end cap and bore out the insulating profile (through the borings ∅ 4 mm in the end cap).

→ See chapter 4.4 for the installation of the end cap.

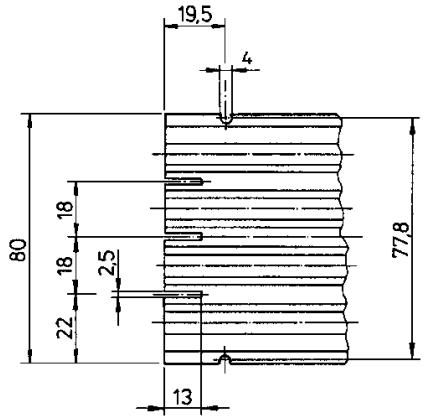


Fig. 4: Dimensions for slots at the end of the conductor rail

Shorten conductor rail track <u>in the course</u>:

→ Pull connector clips (item 6) out of the socket side (see Fig. 14). On the pin side, in addition to the connector clips (item 6), remove connector pins (item 8) and connector cap (item 2).

→ Cut the conductor rail to the desired length.

→ Cut slots according to sketch (see Fig. 4).

→ Deburr the ends of the conductor rail and deburr the slots with a file that is not too coarse.

→ Remove dirt and chips.

→ Move the connector clips (item 6) back to their position (see Fig. 14).

→ Place the connector cap (item 2) on the pin side and drill out the insulating profile (item 1) (through the holes ∅ 4 mm into the connector cap (item 2).

→ Screw connector cap (item 2) with Phillips screwdriver (item 3) if necessary.

→ Reassemble connector pins (item 8) if necessary.

CAUTION!

Bring the connecting point into its original state!

→ Bring the connecting point into its original state (see Fig. 14), if a conductor rail must be shortened along the track.

Conductor rails that have not been deburred will cause increased abrasion of the collector heads:

→ Ensure that the conductor rails (conductors) are properly deburred at their terminations (see Fig. 14)

4.2 Installation of the fixed point and the hanger clamp

4.2.1 Fixed point

The fixed point secures the multipole conductor rail system against displacement. The fixed point consists of an orange hanger clamp and a self-tapping screw.

Working steps:

→ Put the fixed point preferably in the center of the multipole conductor rail system. Particularly on long systems this will guarantee a consistent expansion of the multipole conductor rail system in both directions.

→ When using a center feed install the fixed point next to it, if possible. See chapter 7 for the screw tightening torques.

→ Fix the fixed point with the enclosed self-tapping screw at the conductor rail.

Use the QR code („click“ or „scan“), to watch our animation **Tightening the Anchor Point Screw**

4.2.2 Hanger clamps

The hanger clamps are designed as sliding suspensions (see Fig. 3):

Suspension distance x	Center distance y	
	System length ≤ 50.000 mm	System length > 50.000 mm
≤ 1000 mm	190 ±10 mm	320 ±10 mm

Fig 5: Dimensions of the suspension distance and the center distance

CAUTION!

Ensure a correct alignment of the hanger clamps!

Height offset or angle error during the assembly may result in jamming of the conductor rail on thermal expansion. This will result in wavy conductor rails!

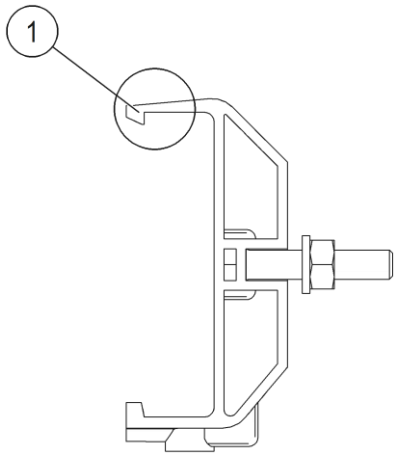
→ Pay attention to a correct alignment of the hanger clamps, in order to ensure gliding of the rail in the hanger clamp on thermal expansion.

Working steps:

→ Observe the minimum distances to the connector points and feeds for the position of the hanger clamps, in order to avoid collisions and inhibitions in case of linear extensions. See Fig 5 for suspension and center distance.

→ Install the hanger clamp. See chapter 7 for the screw tightening torques.

→ If the multipole conductor rail system is in a vertical arrangement, the clip (see Fig. 6) must point upward.



Item	Designation
1	Clip

Fig. 6: In vertical position the clip points upward

In case of collisions/overlapping along the track, there must be an assembly fault at the hanger clamps:

→ Replace the respective hanger clamp. See Fig 5 for suspension and center distance.

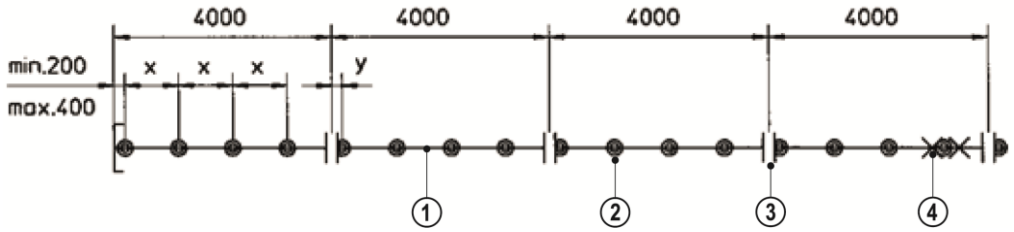


Fig. 7: Distribution of hanger clamps, rail connectors and fixed points

Item	Designation
1	Conductor rail
2	Hanger clamp
3	Connector
4	Fixed point

Max. length of track (without expansion units):

	Length	Temperature
Without expansion units	On systems with lengths L ≤ 200.000 mm	Systems in a normal temperature range and a max. temperature change of 30 K
With expansion units	On systems with lengths L ≤ 200.000 mm	Changed range of temperature (see chapter 5)

The multipole conductor rail system can be combined with the support profile ProShell!

If suspension distances (distance between the hanger clamps) of more than 1000 mm are required, you can combine the multipole conductor rail system with the support profile ProShell.

ProShell is a modular supporting structure for the Conductix-Wampfler conductor rail systems 0812 and 0831. With ProShell you can choose a suspension distance of up to 3200 mm. See „KAT0800-0003“ for further information.

Use the QR code („click“ or „scan“), to watch our animation **Hanger Clamp and Anchor Point Assembly (horizontal operation)**

Use the QR code („click“ or „scan“), to watch our animation **Hanger Clamp and Anchor Point Assembly (vertical operation)**

4.2.3 Optional fall arrest device

If the possibility of mechanical failure of the conductor rail suspension has been identified in the system operator's risk assessment, a fall arrest device should be installed.

Danger due to electric shock or fire!

DANGER!

Conductor rail components and current collector components can break open due to material fatigue, external forces, incorrect design or installation, etc., and live parts can be exposed and/or hang down.

→ To achieve a sufficiently low risk, especially for installations at greater heights, Conductix-Wampfler recommends the use of safety gear or other measures that prevent parts from falling.

Danger from failing parts!

DANGER!

Schleifleitungskomponenten und Komponenten des Stromabnehmers können durch Materialermüdung, externe Kräfte, fehlerhafte Auslegung oder Montage etc. herabfallen und zu Personenschäden und/oder Sachschäden führen.

→ To achieve a sufficiently low risk, especially for installations at greater heights, Conductix-Wampfler recommends the use of safety gears or other measures that prevent parts from falling.

Working steps:

→ Lay both clamp halves to the back of the rail and screw the two components together by means of the enclosed screw/bolt.

→ Attach the catch-rope to the on-site structure and connect it with the clamp.

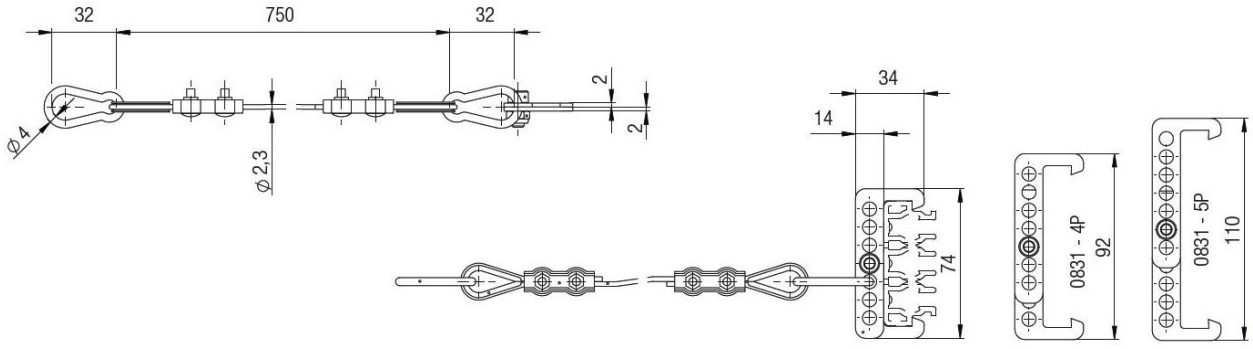


Fig. 8: Optional fall arrest device

For more information, please see mounting instructions MV0831-0009-DE-EN

Use the QR code („click“ or „scan“), to watch our animation **Fall Arrest Device (vertical operation)**

4.3 Click the conductor rail into its place

→ Observe the alignment of the conductor rail.

→ Click the conductor rail into the hanger clamp.

CAUTION!

In a vertical arrangement the clip must point upward (see Fig. 6)!

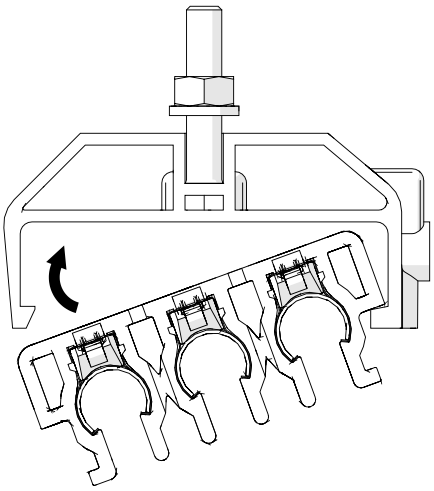


Fig. 9: Click the conductor rail into the hanger clamp.

Use the QR code („click“ or „scan“), to watch our animation **Conductor Rail Clipping and Connecting**

4.4 Position of the end and center feeds

The position of the end and center feeds is specified by the connecting points on site. The alignment of the end and center feed, among others, determines the position of the protective earth conductor.

The connecting cables must not exert any tensile strength onto the end or center feed. A tensile force may, e.g., be generated by thermal expansion of the multipole conductor rail system. Therefore, the cables must be installed flexibly at the end or center feed (e.g., by sufficiently large cable loops). See Fig. 3 for the arrangement of the mounting distances to the connectors and end and center feed.

Use the QR code („click“ or „scan“), to watch our animation **Center Feed Mounting**

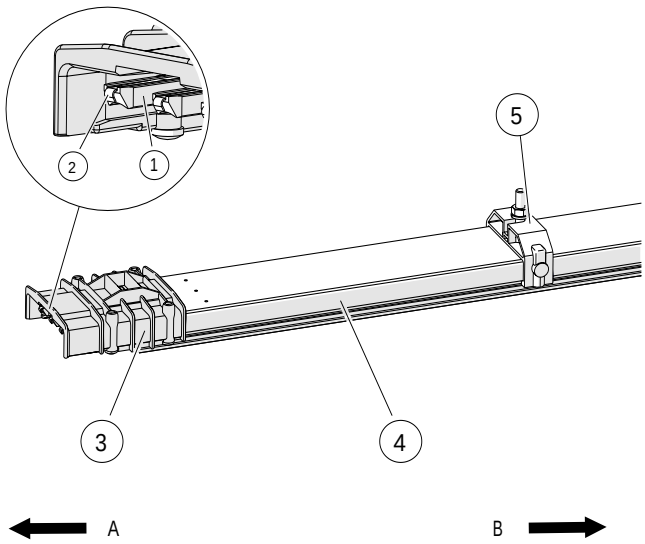
Use the QR code („click“ or „scan“), to watch our animation **End Feed Assembly**

4.5 Connect the conductor rail

Prerequisites:

- The hanger clamps are mounted as in chapter 4.
- The conductor rails that are to be connected must be completely clicked into the hanger clamps.
- The connector pins with spring elements must be straight and undamaged.

Each conductor rail is equipped with sockets on both sides. On one side connecting pins with spring elements have been introduced into the sockets and a connector cap has been pre-assembled. The connecting pins must be pushed into the sockets as far as they will go until they touch the PVC profile.



Item	Designation
1	Connecting pin
2	Spring element
3	Connector cap
4	Insulating profile
5	Hanger clamp
A	Pin side
B	Socket side

Fig. 10: Pin side in detail

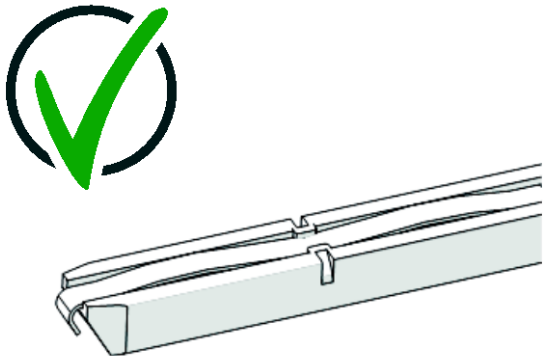


Fig. 11: Correct position of the clamp

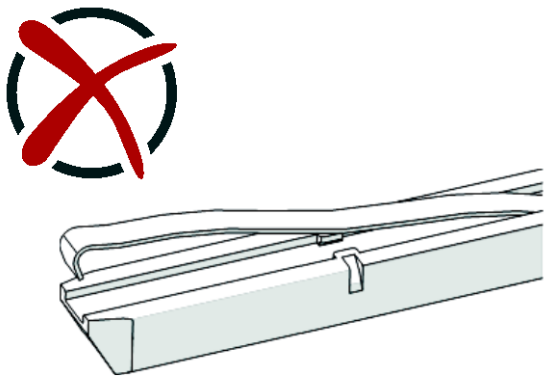


Fig. 12: Wrong position of the clamp

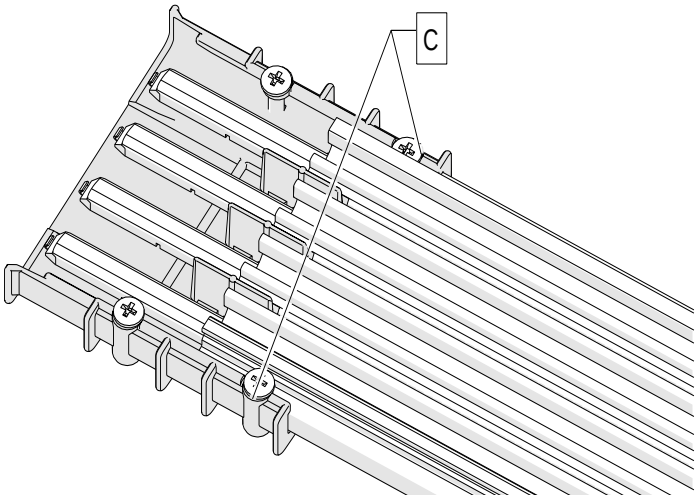


Fig. 13: Marking rings (C) under the screws

Conductor Rail for…	Color/Marking Rings (C)	Temperature Range
Standard application	no ring	+6 ° C to + 55 ° C
Cool application	blue ring	+ 1 ° C to + 5 ° C
Frozen application	white ring	-30° C to < + 1 ° C

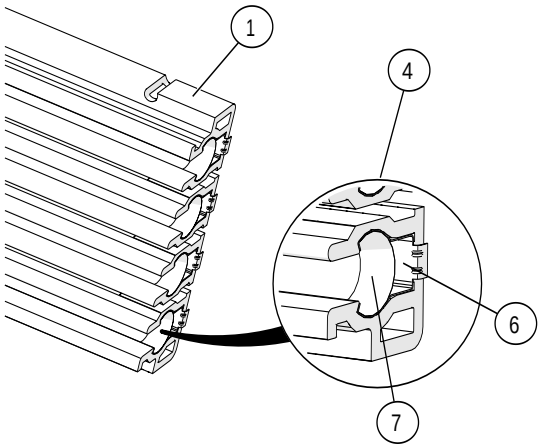


Fig. 14: Detailed view socket side

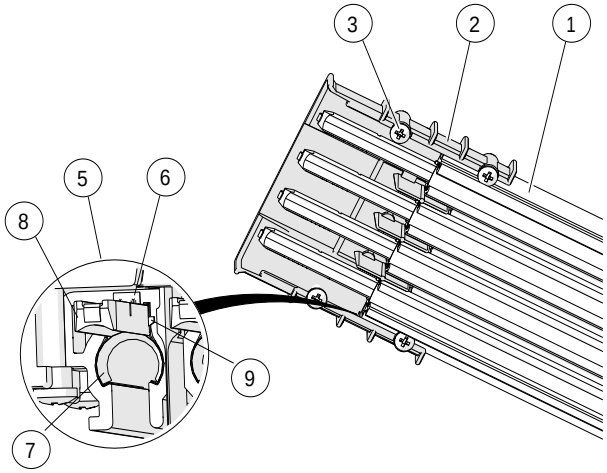


Fig. 15: Detailed view pin side

Item	Designation
1	Insulating profile
2	Connector cap
3	Cross-head screw
4	Socket
5	Pin side
6	Connecting clamp
7	Conductor rail (conductor): Finely deburred and slightly chamfered ends
8	Connecting pin with spring element
9	Stop position of the connecting pin

CAUTION!

Prior to making a rail connection, check if connecting pin and socket are in perfect condition!

On the pin side it must be checked if:

- Connecting pins and connecting clamps are existing and in the same position (see Fig. 10, item 1 and Fig. 15, item 6),
- Connecting pins with spring are fitting and not deformed (see Fig. 10, item 1).

On the pin side it must be checked if:

- Connecting clamp in the reception area for the connecting pin (socket side) is available and in a correct position (see Fig. 14, item 6).

ACHTUNG!

Always use the mounting block (08-V015-0492-00x) and a rubber hammer when assembling (see Fig. 16, Fig. 17 and Fig. 18)!

→ Never force the connector pins or the rail end.

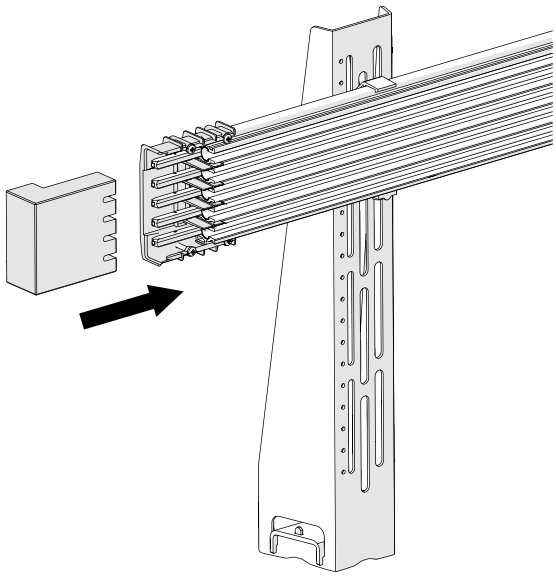


Fig. 16: Slide the mounting block onto the connector pins

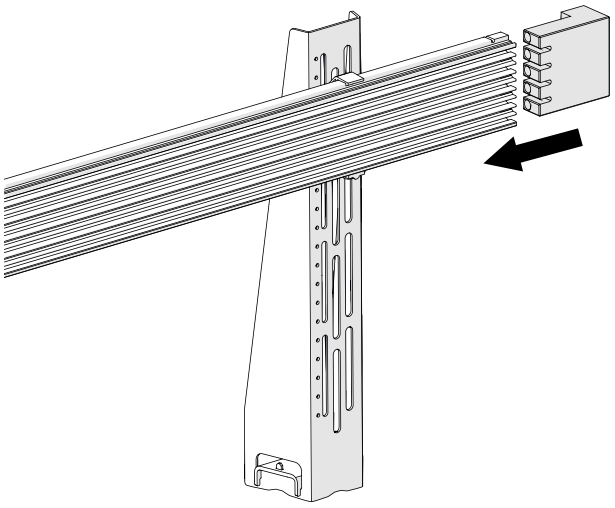


Fig. 17: Use mounting block at the other rail end

→ When inserting the connecting pins, ensure a precise alignment on the sockets.

Working steps:

The assembly always starts **at one end** of the multipole conductor rail systems and **not** in the center:

→ Click the first conductor rail into the hanger clamp in such a way that the pin end is the end (or the beginning) of the multipole conductor rail system. The socket end points in the direction where the installation is made.

→ Pull the connecting pins out of the pin end of the first conductor rail and put them aside (can be used as spare parts).

→ Dismount connector cap and put it aside (can be used as spare part).

→ Install the mounting block (Order Number: 08-V015-0492-00x) in front of the conductor rail with a screw clamp (see Fig. 18). The mounting block variant depends on the number of poles of the conductor rail. It might be necessary to mount a temporary console to fasten the mounting block.

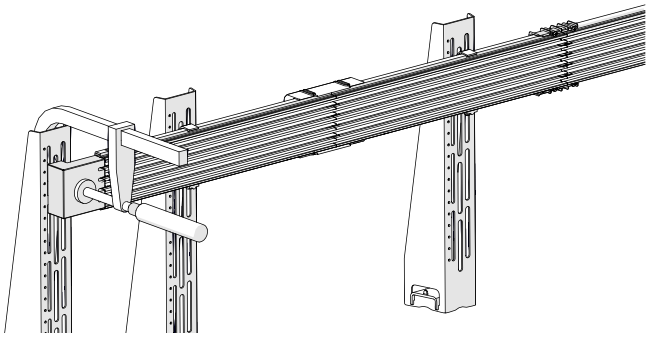


Fig. 18: Mounting block (Order Number: 08-V015-0492-00x) fasten with a screw clamp

→ Click the next conductor rail into the hanger clamp.

→ Establish the plug and socket connection:

→ Align the pin side in straight line at a distance of approx. 50 mm with the fixed conductor rail.

→ Fix the connecting pins in straight line and regularly at the sockets.

→ Push the pin side manually onto the fixed conductor rail, so that all chamfered connecting pins are introduced into the sockets of the fixed conductor rail.

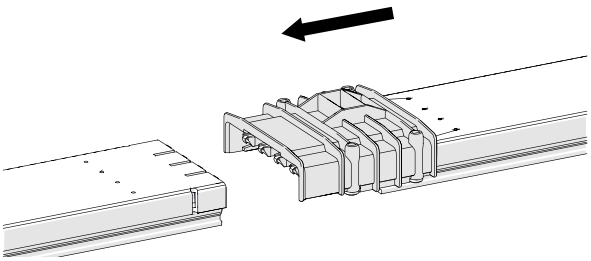


Fig. 19: Align conductor rail

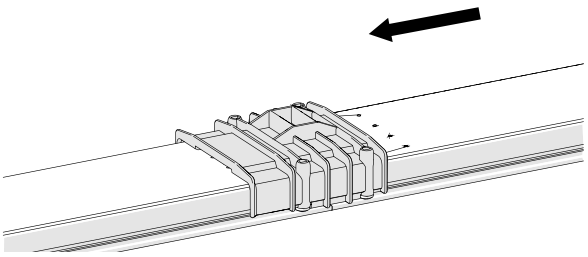


Fig. 20: Insert the connecting pins into the sockets of the fixed conductor rail

→ There are 2 different possibilities to make a plug and socket connection:

1. Push the connector side manually over the open rail end until it stops (see Fig. 16).

2. Place the mounting block next to the socket side of the conductor rail to be mounted. Then force the conductor rail carefully into the opposite conductor rail by means of slight taps with a soft-head hammer (see Fig. 21).

→ Control the correct position:

If the lateral cut-outs in the insulating profile match with the screw holes in the connecting cap, you have found the correct position (see Fig. 22).

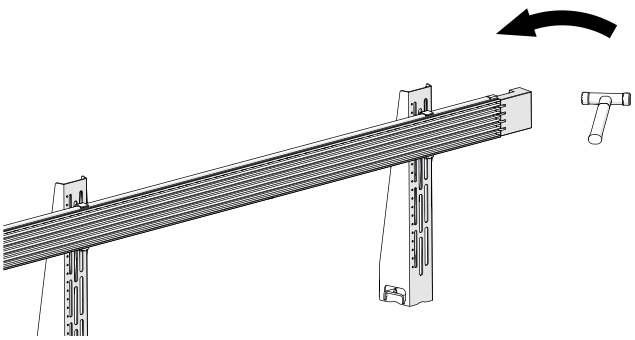


Fig. 21: Force the conductor rail into its place by means of a soft-head hammer

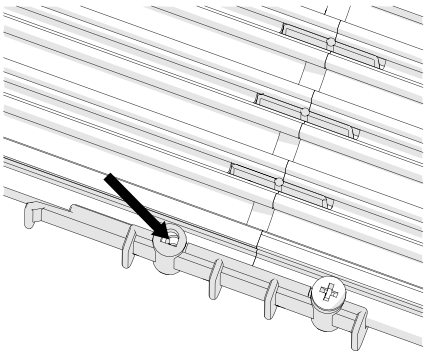


Fig. 22: Correct position

→ Fix the connector cap and the insulating profile with the 2 cross-head screws, as soon as the conductor rail has been pushed on completely (see Fig. 23).

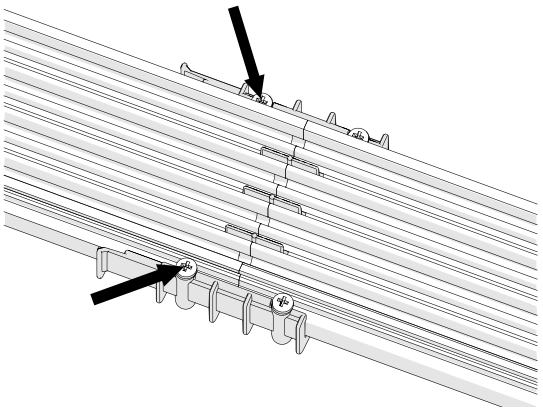


Fig. 23: Fix the connector cap on both sides with cross-head screws.

CAUTION!

A gap between the conductors is non-critical!

Conductor material and plastic profile have different coefficients of expansion. By pre-assembly the conductor material is 2 mm shorter than the insulating profile (temperature 20°C), to compensate for the expansion. Depending on the installation and operating temperature the gap can be up to 8 mm. This gap is for physical reasons and does not have any influence on the multipole conductor rail system.

→ Do not close the gap by a correction of the conductor position!

→ Mount all the other conductor rails, power feeds and expansion units in the same way.

Use the QR code („click“ or „scan“), to watch our animation **Power Feed Mounting**

→ Check if the mounted length corresponds to the order-related length. If the installation was made too short, make it longer und shorten the last conductor rail. See chapter 4.1 for further information.

→ Remove mounting block (see Fig. 18).

→ Depending on the position of the end and center feed, mount a power feed or end caps as a termination at the end of the system.

WARNING!

Danger to life by electric shock and risk of injury at sharp edges!

→ In any case the terminations of the conductor rail must be protected against accidental contact by an end or center feed or end caps!

Use the QR code („click“ or „scan“), to watch our animation **Conductor Rail Clipping and Connecting**

→ Secure the end caps with the enclosed screws (2 pc.) (see Fig. 24).

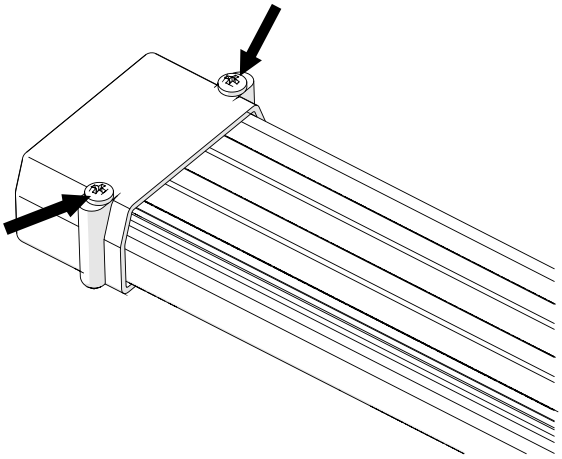


Fig. 24: Secure end cap

→ Carry out the installation of the complete multipole conductor rail system in this way.

Use the QR code („click“ or „scan“), to watch our animation **End Caps Assembly**

4.6 Remedy in case of damaged connecting pins

The connecting pin has a stop device and is inserted up to the middle on pre-assembly.

→ If 1 connecting pin has been pushed in further during transport, it must be pulled back to its middle position.

→ Replace the connecting pin, if the stop device is damaged (replacement by a remaining connecting pin from the system end/beginning)

Procedure for the control if a damaged connecting pin fits properly:

→ The connecting pin must be in the middle position.

→ The stop device rests against the conduct.

→ Mark the position of the connector pin directly at the transition from the conductor surface with a felt pen.

→ Join the conductor rails as described in chapter 4.3 and check the marking during the joining.

→ If the marking is still visible between the two conductors after the joining, the connecting pin is in its correct position.

→ If the connecting pin has slipped out of its position, detach the connection and replace the defective connecting pin.

5 Installation of expansion elements

On multipole conductor rail systems with a length > 200.000 mm and if the fluctuation of the ambient temperature (ΔT) during operation is more than 20 °C, expansion elements will be arranged.

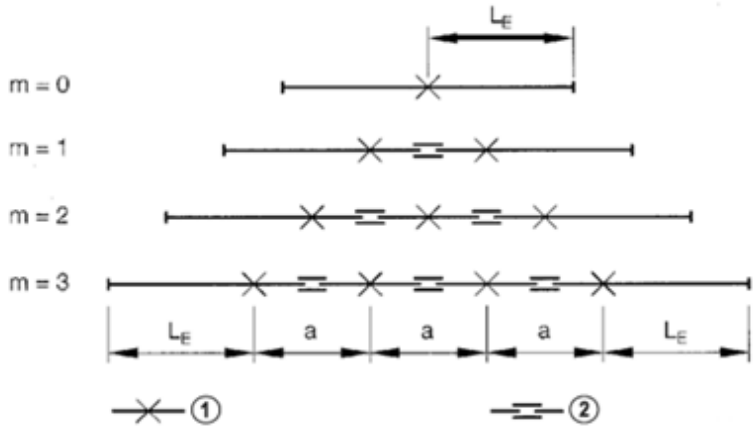
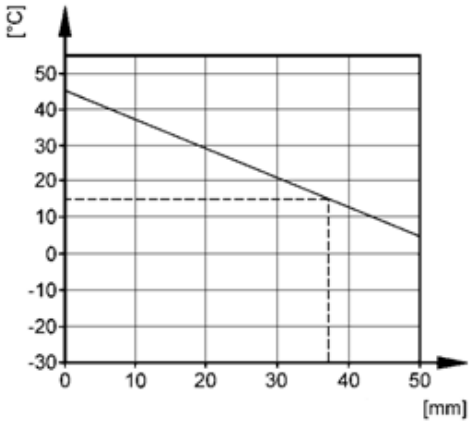


Fig. 25: Arrangement of fixed points and expansion elements on multipole conductor rail systems with a length over 200.00 mm

ΔT [°C]	a [mm]
65	11.000
60	12.000
55	14.000
50	15.000
45	17.000
40	20.000
35	24.000
30	31.000
25	40.000
20	60.000

Item	Designation
1	Fixed point
2	Expansion element

Diagram for the determination of the air gap setting



[°C] = Ambient temperature

[mm] = Air gap

Fig. 26: Determination of the air gap setting:

Example:

Min. ambient temperature during system operation:	5°C
Temperature during installation:	15°C
Max. ambient temperature during system operation:	45°C
ΔT	Max. ambient temperature - min. ambient temperature = 40 °C
ΔT_1	Max. ambient temperature - temperature during installation = 30°C
Air gap calculated:	$s = 50 \cdot \frac{\Delta T_1}{\Delta T}$ = 37.5 mm
Air gap read off:	≈ 38 mm

6 Assembly of the current collectors

→ Mount the current collector according to the sketch.

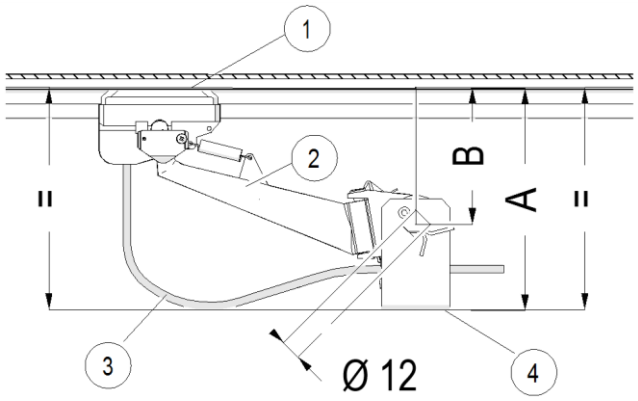


Fig. 27: Current collector 083102- ... / 083103- ... in (vertical engagement)

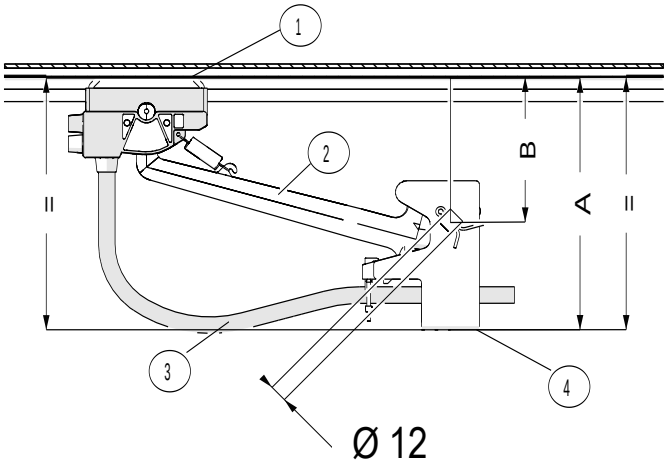


Fig. 28: Current collector 083106- ... / 083107- ... in (vertical engagement)

Item	Name
1	Conductor-rail running surface
2	Current collector
3	Connector cables
4	Mounting surface (customer side)

Order No.	A [mm]	B [mm]
083102-…	130	80
083103-…	130	80
083104-…	133	80
083106-…	175	100
083107-…	175	100

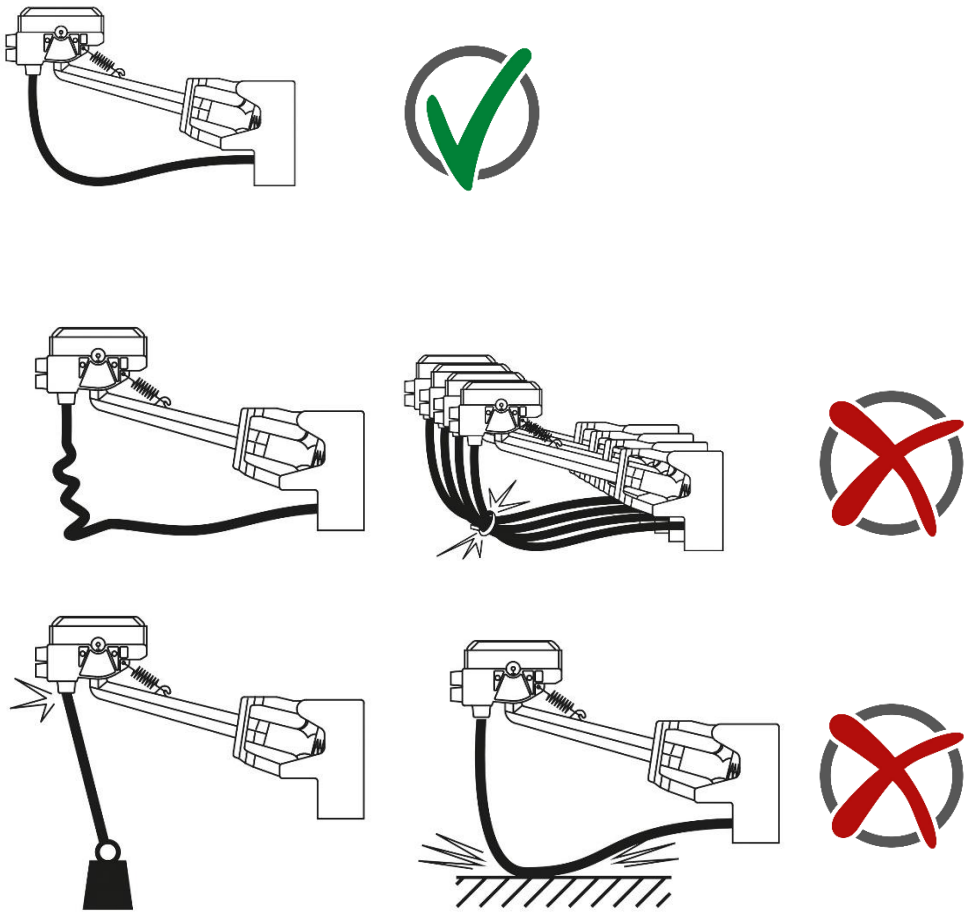
A and B are functional installation dimensions (distance to the conductor-rail running surface)

CAUTION!

Only use highly flexible connecting cables according to the manufacturer's specifications!

→ Do not bundle connecting cables and do not mark them with cable characteristics

→ Connecting cables must be laid free of tensile or levelling forces



Arrangement/engagement	Features
Horizontal arrangement/vertical engagement	→ Mount the central axis of the central current collector exactly onto the central axis of the appropriate conductor rail.
Vertical arrangement/horizontal engagement	→ Install the lowest current collector in parallel to the corresponding conductor rail. All other current collectors are then installed above this one, by the corresponding pole distance offset dimension.

→ The stated mounting distance A or rather B (see Fig. 27 and Fig. 28) must absolutely be observed.

The connecting cables must be highly flexible, in order to ensure full functionality of the current collectors:

→ Fix the connecting cables at the current collector with a cable tie by means of the mounting ring, so that no tensile or torsional forces can be transferred to the current collectors.

CAUTION!

Check for assembly errors!

→ After having completed the installation of the multipole conductor rail system check the electricity and ensure that the assembly has been made without any errors!

Use the QR code („click“ or „scan“), to watch our animation **Current Collector Tolerances**

7 Screw tightening torques

Relevant components	Screws		
	M6 [Nm]	**M8** [Nm]	**Additional information**
End and center feed	max. 10	max. 25	-
Hanger clamps	4.5	-	-
Fixed point	4.5	-	screw in (flush) until it stops
Connector	-	-	
End cap/end cap for passages	-	-	

See „KAT0831-0001“ for additional information.

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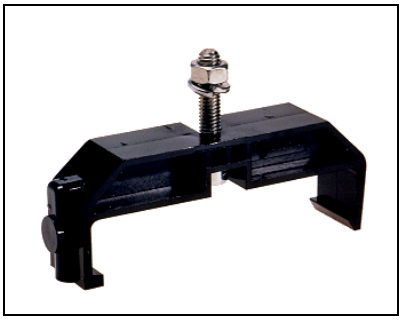
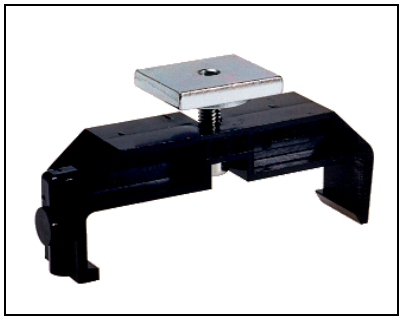
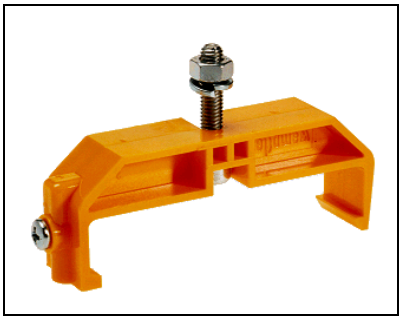


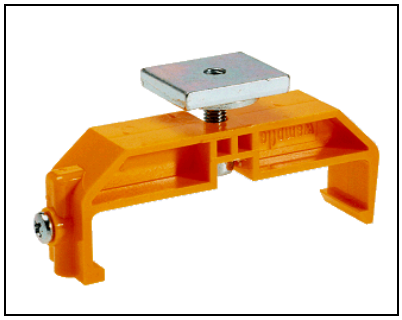
083143-...; hanger clamp
with steel nut



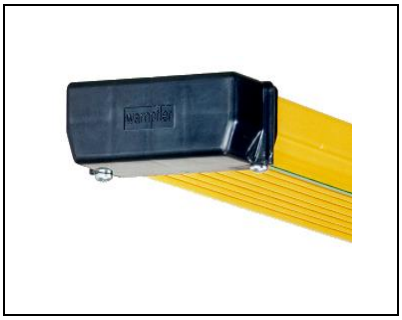
083145-...; hanger clamp
for C-rail assembly



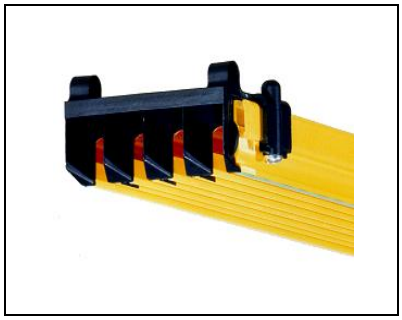
083133-...; anchor clamp with steel nut



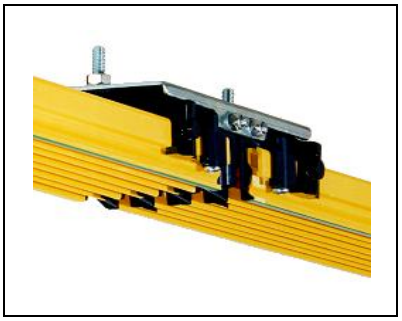
083135-...; anchor clamp for
C-rail assembly



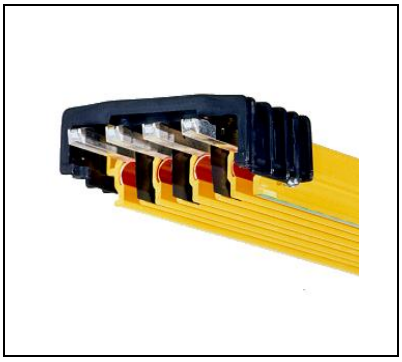
083171-...;
end cap



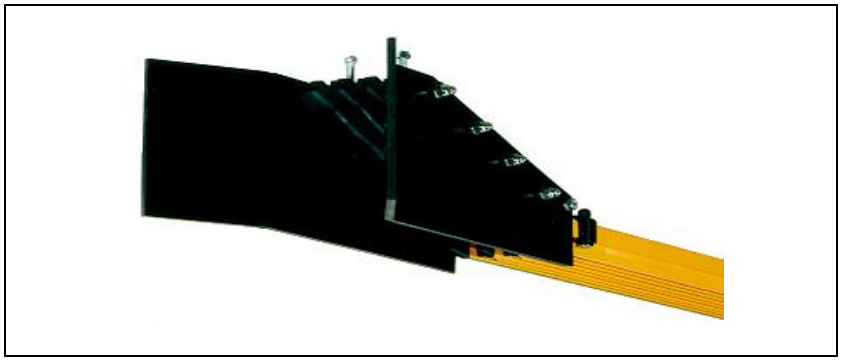
083172-...;
end cap for passages



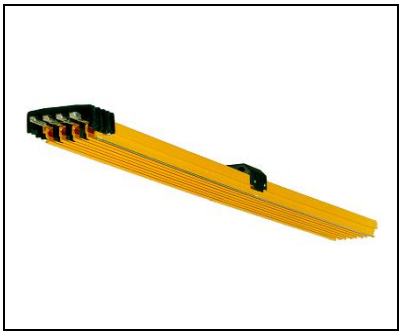
083195-...;
air gap insulation section



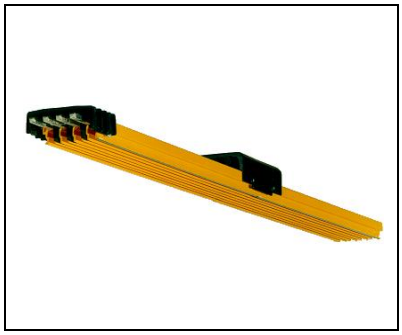
0831XX-...; conductor rails (pin side)



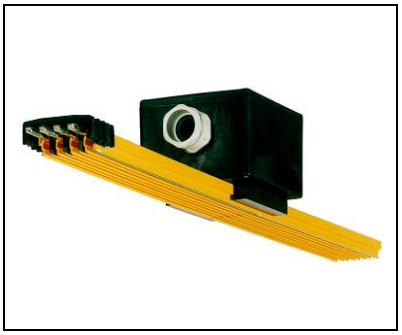
083181-...;
pick-up guide for passages



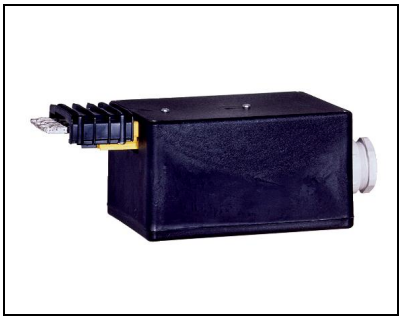
083151-...;
center feed (max. 10 mm²)



083154-...;
center feed (max. 35 mm²)

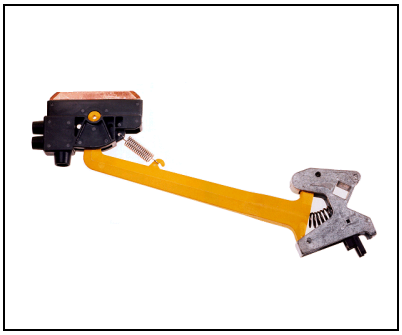


083152-...;
center feed (max. 35 mm²)

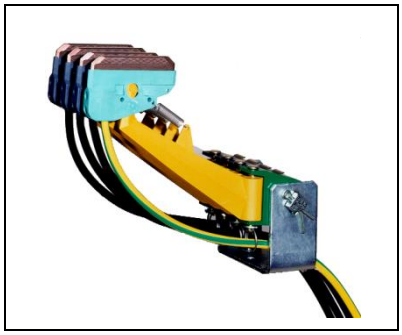


083153-...;
center feed (max. 35 mm²)

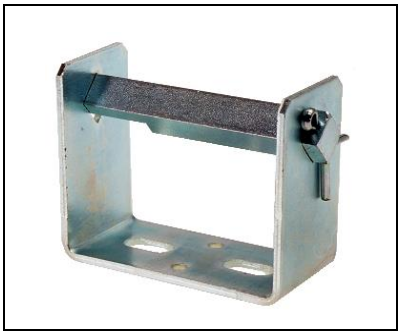
083161-...;
expansion element



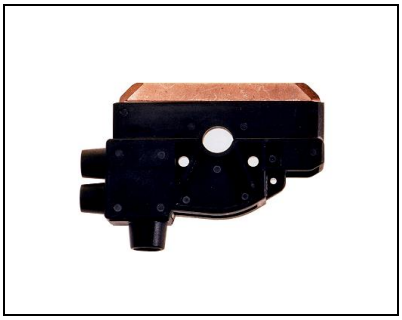
083106-...;
current collector for 80 A



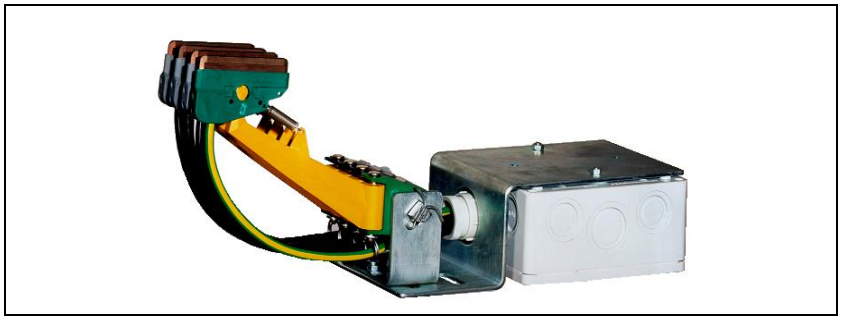
083103-...; current collector unit
for 55 A per pole



081050-...;
towing bracket

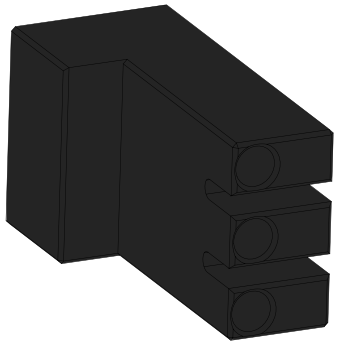
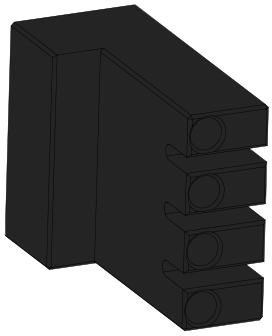
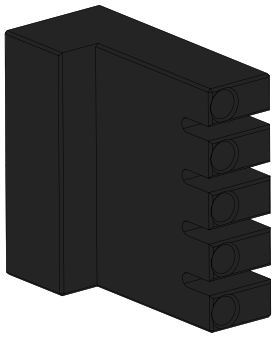


081001-...;
collector brush for 80 A (spare part)



083103-...;
current collector unit for 55 A per pole with terminal box

08-S280-0613
Fall arrest device for horizontal assembly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