

# Installation Instruction



## Single Pole Insulated Conductor Rail Program 0812

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### Order Number

0812xx-...

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## Contents

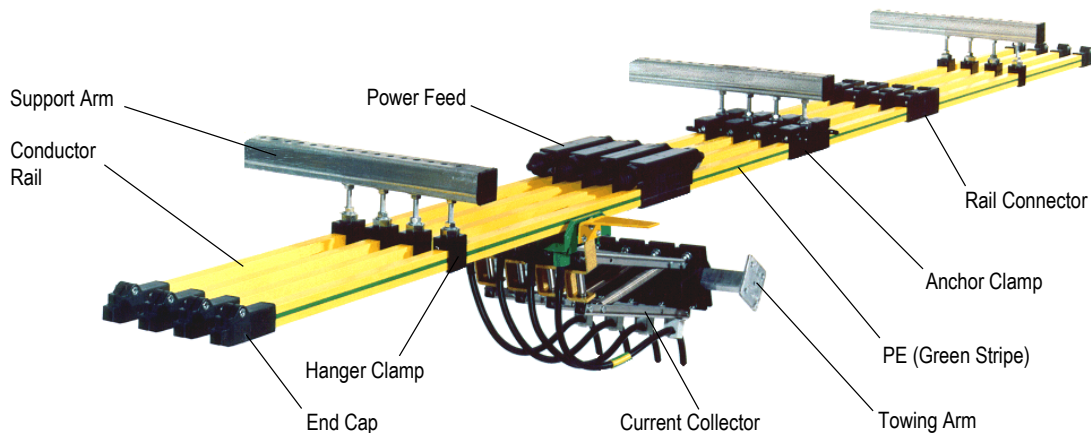
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## Single Pole Insulated Conductor Rail Program 0812

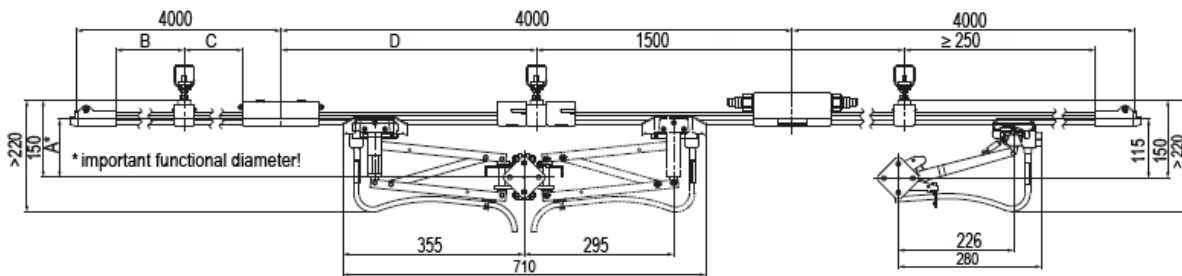
### 1 Product Description

Please check first, if the individual parts are completely delivered (see chapter 8), if they comply with the shipping papers and if they are undamaged.

#### System Arrangement:



### 2 System Layout



	Description	Measurement
A	Distance rail running surface and towing arm	115 mm
B	Distance between end cap and last hanger	$300 \pm 50$ mm
C	Distance between connector cap and next hanger	$\geq 250$ mm
D	Maximum of the hanger distance	1500 mm

## Single Pole Insulated Conductor Rail Program 0812

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### 3 Safety Instructions

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The insulated conductor rail system will be installed onto the existing support structure. The mechanical correct installation of the support arm has to be checked before starting the installation of conductor rail. The maximal horizontal and vertical tolerance between the crane rail and rail holder support arm is  $\pm 5$  mm. Ensure that the support construction is rectangular to the crane rail.

The conductor rail components for the different conductor rail systems are arranged as shown in the

- Conductor rail layout drawing
- Connection diagrams
- Part lists

### 4 Intended Use

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Power supply of mobile consumers in the non-public area. Protection class IP21 (current collector entry from the side) and IP23 (current collector from below) for indoor and outdoor use outside the hand area.

### 5 Installation

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#### 5.1 Hanger Clamp

The **hanger clamps** are first attached to the clamping arms.



**CAUTION!**

**The hanger clamp mount must be adapted to the respective application!**

The mounting elements are designed for standard mounting applications. The mount must be adapted to the respective application (e.g. by means of additional screw locking with Loctite 242) for safety-critical mounts, special on-site interfaces (e.g. deviating through-hole geometry or other restrictions affecting the fastening) and/or increased requirements (e.g. vibration). The system manufacturer is responsible for the evaluation.



**WARNING!**

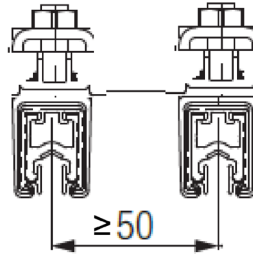
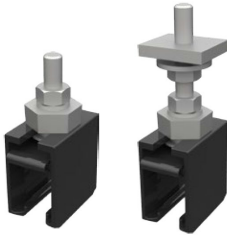
**The maximum tightening torques must not be exceeded (7 Nm for standard hanger clamp with steel nut). Tightening torques that exceed this may lead to damage to the hanger clamp.**

Position and height of the hanger clamps must be adjusted and aligned. Clip the conductor rails and expansion units into the hanger clamps (see pictures below).

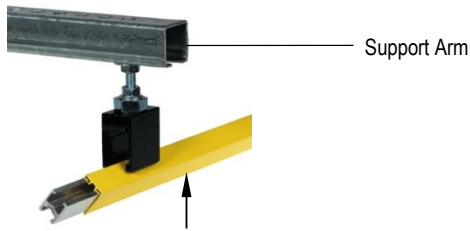
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- Phase distance 50 mm
- Center distance between hanger clamp and rail connector:  $\geq 250$  mm!
- Max. Hanger distance is 1500 mm (see layout system in chapter 2)



Insert conductor rail from below approx. 45° into track hanger clamp.



Rail clipped into the track hanger clamp.

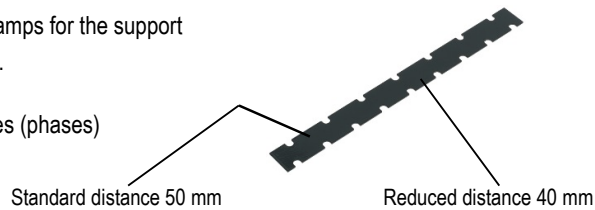


**CAUTION!**

**Check that both sides of the hanger clamp are snapped in!**

To determine the distances between the hanger clamps for the support arm assembly. It is required to use a **mounting jig**.

- The standard distance between the center lines (phases) and the conductor rails is  $\geq 50$  mm.



**CAUTION!**

**Distances between the center lines of 40 mm require a staggered position of the rail connectors power feeds and expansion units!**

## 5.2 Cutting of Conductor Rail

Insulation profile and conductor rail have to be cut separately. The cut direction is only top down (avoid stainless steel strip to be disconnected from rail!). Use fine saw or angle grinder with fine cutting plate (no rough saw). File a chamfer 1-2 mm 45° at the stainless steel strip at the end of the aluminum rail after cutting. This is important to avoid sliding contact wear! Remove burrs from all other sharp edges of the rail by using a file!

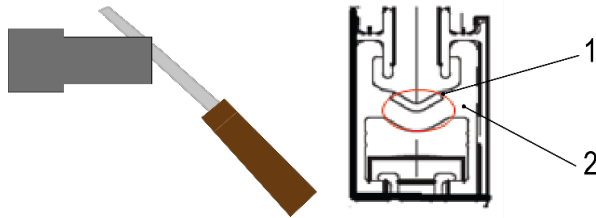
# Installation Instruction



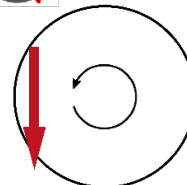
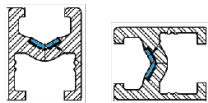
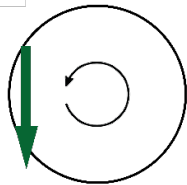
## Single Pole Insulated Conductor Rail Program 0812



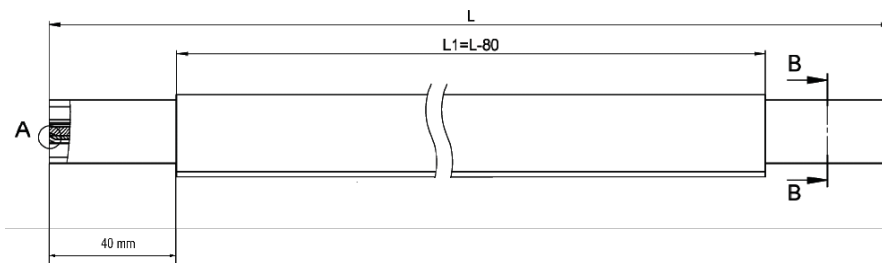
Copper and steel rails must also be prepared at the ends after cutting! A chamfer 1-2 mm 45° is also required at the sliding surface for the current collector!  
Sharp edges must be burred!



Pos.	Designation
1	Stainless steel strip
2	Aluminum rail body



Damage Risk!  
Stainless steel strip can be disconnected



A = Chamfer at stainless steel strip

Insulation is 2x40 mm shorter than the conductor rail!

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### 5.3 Rail Connector

Conductor rails are joined by rail connectors. To ensure proper current transfer at the rail joints, all contact surfaces between the conductor rail ends and the rail connector should be cleaned and coated with a thin layer of Conductix-Wampfler conductive grease 080021.

Insert the conductor rails into the rail connectors until the notch in the middle of the rail connector so that a gap of approx. 2-3 mm must remain between the conductor rails.



#### Risk of stainless steel strip riding up or overlapping if forced together!

In extreme cases, the stainless steel strip can ride up or overlap if driven together with force.

→ Do not install the conductor rails with force against a block. A gap of approx. 2-3 mm must remain!



#### Risk of damage to rail connectors due to excessive torque!

The use of excessive torque can damage rail connectors (loss of contact, arcing).

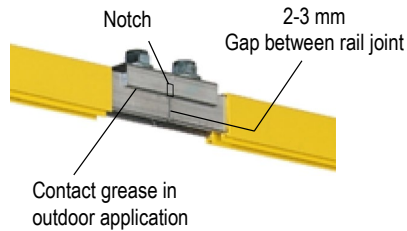
→ Use a torque wrench < 20 Nm while installing the rail connector



Depending on the rail connector type, a hole or notch is existing inside the connector to identify the center. Some rail connectors have an integrated stop to ensure the gap is maintained. With this design, the conductor rail can only be inserted until the stop.

→ Do not use a hammer! Manage the joining manually!

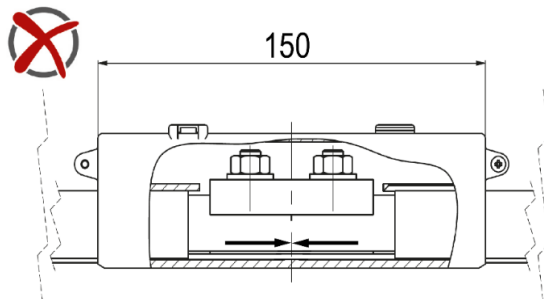
By tightening the nuts (12 Nm with galvanized rail connectors and 10 Nm with stainless steel connectors) the rails will be mechanically fixed. **Always use a torque wrench!**



Conductor rail with screwed rail connector.

Tighten the nuts 12 Nm (galvanized)

Tighten the nuts 10 Nm (stainless)

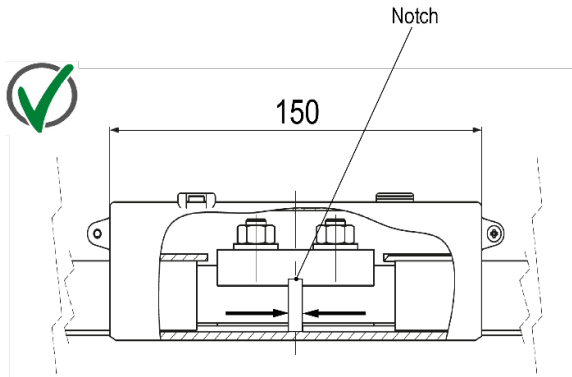


No gap

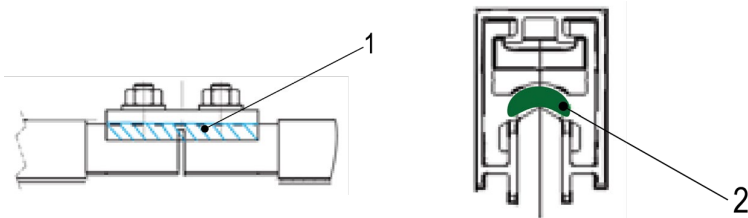
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Minimum gap between rails equals 2-3 mm



1 = Contact area  
2 = Thin grease layer on rail end

### Recommendation to avoid contact corrosion

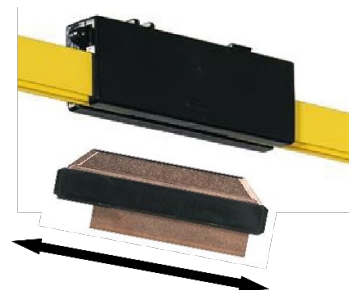
To ensure proper current transfer, all contact surfaces of the conductor rails should be coated with a thin layer of Conductix-Wampfler conductive grease 080021.



Placing the shells of connector caps onto the conductor rails.



The rail connector is mounted completely.



Check smooth transfer!

Both shells of the connector cap are hooked below the rail and closed up above the rail joint. The connector cap has to be screwed at the lateral plastic stripe with enclosed self-tapping screws. These screws prevent tool-free access to live parts and are important for safety. The connector caps do not need to be screwed on when installed in the ProShell support profile.

## 5.4 Anchor Clamps

An anchor point consists of two anchor clamps and a hanger clamp.

The **anchor clamps** must be slid on the conductor rail as indicated (usually in the middle of the system) prior to connecting the rail with the rail connector. For each anchor point, one anchor clamp must be positioned on either side of a hanger clamp, as shown. The anchor clamp screws are only tightened (tightening torque: 5.5 Nm-6 Nm) after final system adjustment and the adjustment of the expansion units.

# Installation Instruction



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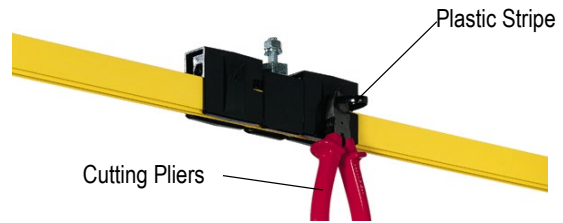


On systems with  $L \leq 200$  m expansion units are not required. Therefore, only one anchor point is required!

For systems with  $L > 200$  m an anchor point is required for each rail segment between expansion units (see chapter 5.6).



Anchor point: Anchor clamps positioned right and left, next to the hanger clamps.



Completely mounted anchor point: The plastic stripes can be removed (after the assembly) if required.



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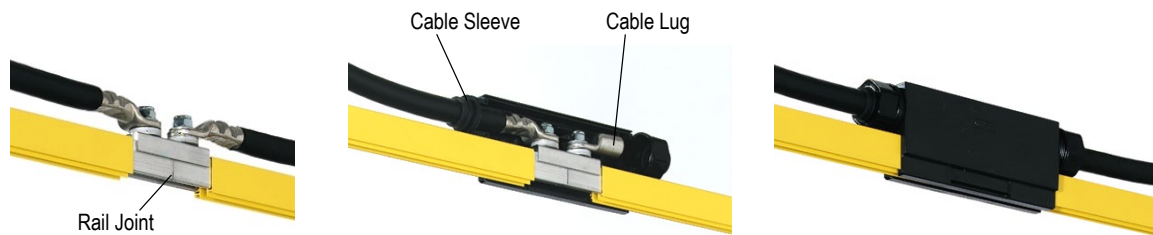
### 5.5 Power Feed

The power feed should be installed and checked by an electrician.

The current from the supply is connected to the rail by the **power feed**. The power feed can be installed within a conductor rail section or at every rail joint instead of the rail connector (see chapter 5.3). The power feed should be installed as near as possible to the source of the incoming power. If the power feed is required within a conductor rail section, the power feed cap must be separated and 40 mm must be cut off on either side. Please note that a space (center distance  $\geq 250$  mm) must be available between power feed and hanger clamp for the expansion of the conductor rail due to the temperature variation. In addition, a cable loop has to be provided (about 300 mm), so that a system expansion cannot pull off the cable.

To ensure proper current transfer, all contact surfaces of the conductor rails should be coated with a thin layer of Conductix-Wampfler conductive grease 080021.

The power feed clamp is pushed onto the conductor rail. The power feed cables are fastened to the power feed clamps and by tightening the screws (12 Nm with galvanized power feed clamps and 10 Nm with stainless power feed clamps) an electrical connection of the power feed clamp with the conductor rail is achieved.



Feeding:  
Completely mounted connections

The central axis of the cable must be in alignment with the cable sleeve.

Feeding is equipped with power feed caps.

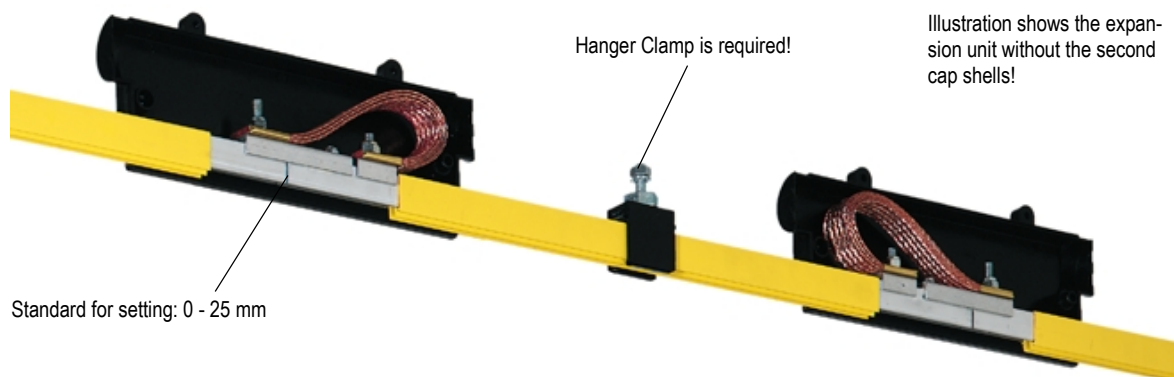
Both shells of the power feed cap are hooked under the rail and the inner snap fastener of the power feed cap must be placed between the two clamps. Both shells of the power feed cap are clipped together enclosing the power feed clamps and screwed together with the already fitted cable sleeves and nuts.

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### 5.6 Expansion Unit

The **expansion units** are supplied pre-assembled. A rail holder must be positioned on the center of the section.



Expansion units compensate for changes in length due to temperature changes. The expansion gap has to be adjusted during the installation. The rail segment between the both expansion units has to be supported by a support hanger.

The expansion units are mounted like conductor rails and connected with rail connectors (see chapter 5.3).



**Risk of damage to the complete conductor rail system!**

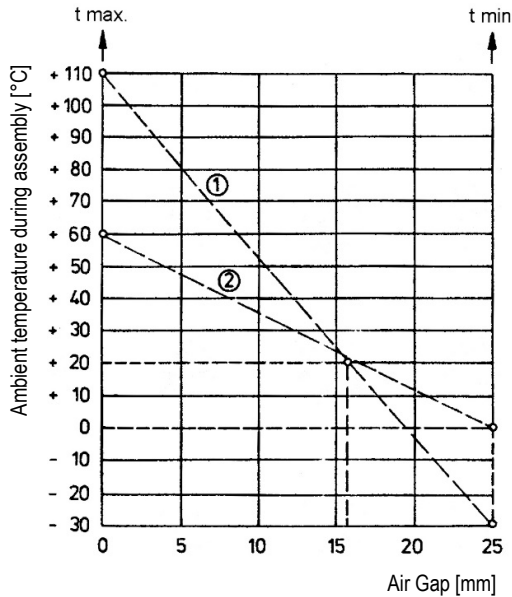
Do not open the expansion units and do not modify the expansion joints. Do not change the torque of the nuts inside the expansion unit! Modification can lead to blocking of the expansion unit.

After completion of a complete rail segment until the next anchor point, both air gaps of the expansion units must be set according to the ambient temperature during assembly (refer to the diagrams below).

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### Air gap allowance on expansion units

Both air gaps in an expansion unit must be identical!



#### Instructions

$t_{min}$  = lowest temperature that occurs in the respective area of application.

$t_{max}$  = highest operational temperature that occurs in the respective area of application.

- Draw a connection line from  $t_{min}$  to  $t_{max}$ .
- Mark the ambient temperature during operation horizontally.
- Draw a line from the intersection vertically down and read the air gap to be set.

#### Examples

① = Temperature range from - 30 °C up to + 110 °C (ambient temperature during installation: + 20 °C)

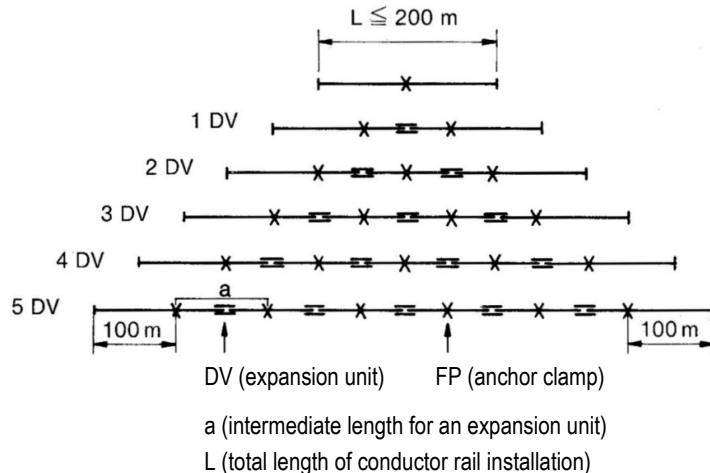
Air gap (read): 16 mm

② = Temperature range from - 0°C up to + 60 °C (ambient temperature during installation: 0°C).

Air gap (read): 25 mm

On conductor rail systems > 200 m it is required to install expansion units at certain intervals:

	Number of Expansion Units	Intermediate Length a		
		St	Al	Cu
$\Delta t_{ges.}$	10	200	200	200
	20	200	104	147
	30	140	70	98
	40	104	52	74
	50	83	42	58
	60	70	35	49
	70	60	28	42
	80	52	26	36
	90	46	23	32
	100	42	22	29



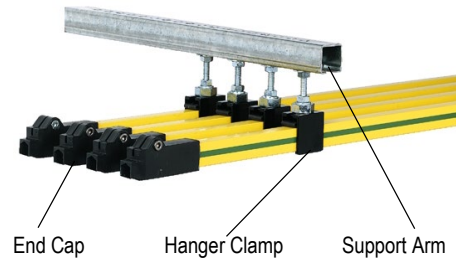
Then the anchor clamps are moved close to the rail holder and positioned with the locking screws (refer to chapter 5.4). Thereafter the expansion unit is checked to have the correct air gap and smooth transfer of the sliding contact passing through the expansion unit.

**Single Pole Insulated Conductor Rail**  
**Program 0812**

**5.7 End Cap**

Each rail end is protected by an **end cap**, which is pushed onto the end of the conductor rail with gentle blows of a hammer and tightening by the clamping screw. The end has to be burred in case the rail end was cut to length.

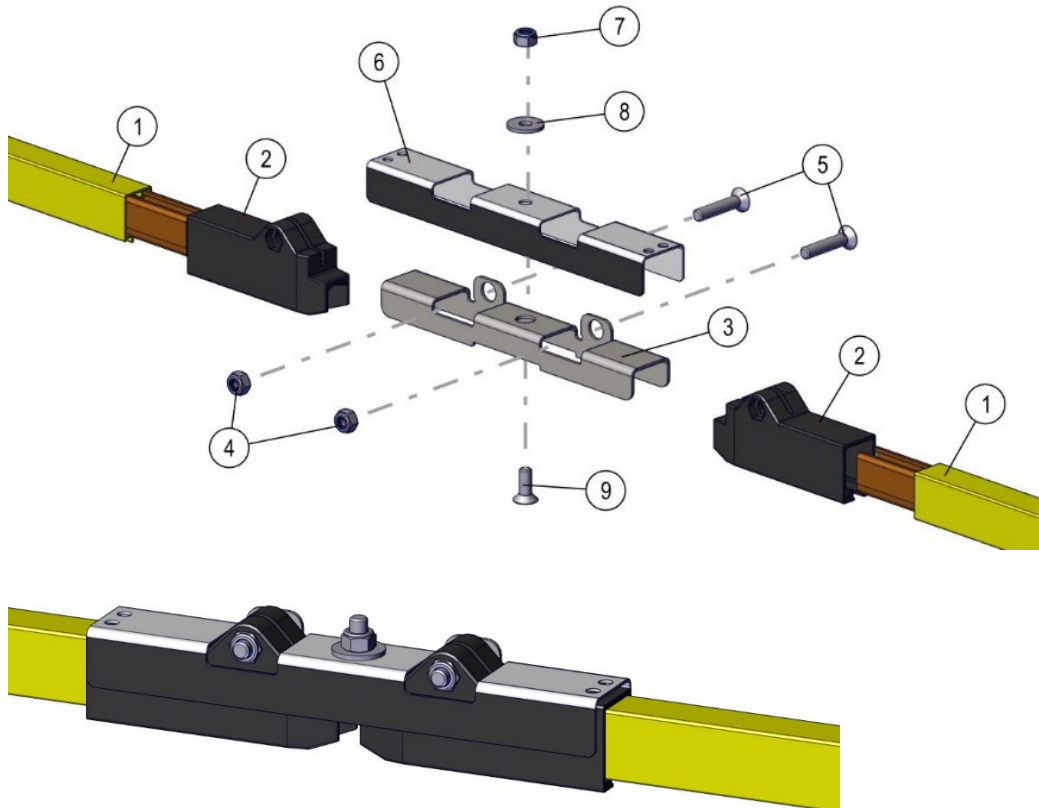
- The distance measured from the end of the end cap to the center of the hanger clamp is max. 250 mm.



**5.8 Air Gap Insulation Section**

Air gap insulation sections are used for the galvanic isolation of sections, such as maintenance segments that can be supplied with power and turned off separately. For each section, two air gap insulation sections must be mounted at a suitable distance to avoid power carryover through the current collectors.

Slide the end caps (1) onto both rail ends. Then place the sheet metal for air gap insulation section (3) on the end caps (2) and mount it using the countersunk screws DIN 7991 M6x30-A2 (5) and lock nuts DIN 985-M6-A4 (4) to clamp the end caps. Then mount the cover (6) using the countersunk screw DIN 7991 M6x16-A2 (9), washer DIN 9021-A6.4-A2 (8) and lock nut DIN 985-M6-A4 (7).

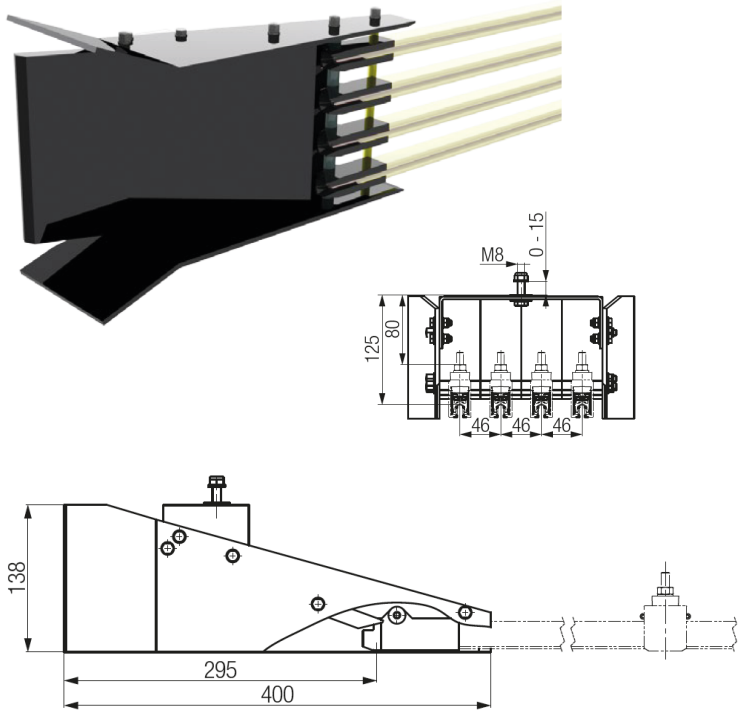


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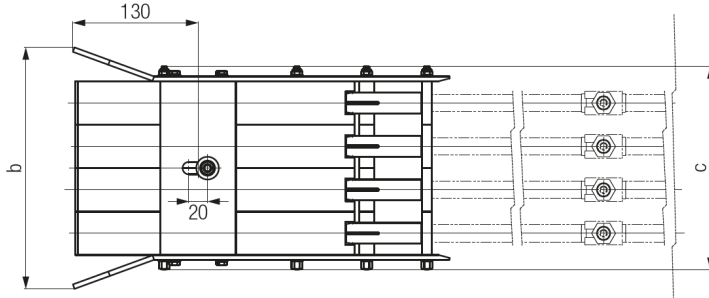
### 5.9 Pickup Guides

For areas in which the collector must be driven in or out of the conductor rail system, pickup guides are used in combination with current collectors provided for this purpose. The speed for pickup guide entry must not exceed 60 m/min and pickup guides must be considered as wearing parts.

Installation tolerances must be taken into consideration. Simultaneous alignment gaps with maximum tolerances in the X and Y directions are not permitted.



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Dimensions	Number of Poles					
	1	2	3	4	5	6
b	120	166	212	258	304	350
c	78	124	170	216	262	308

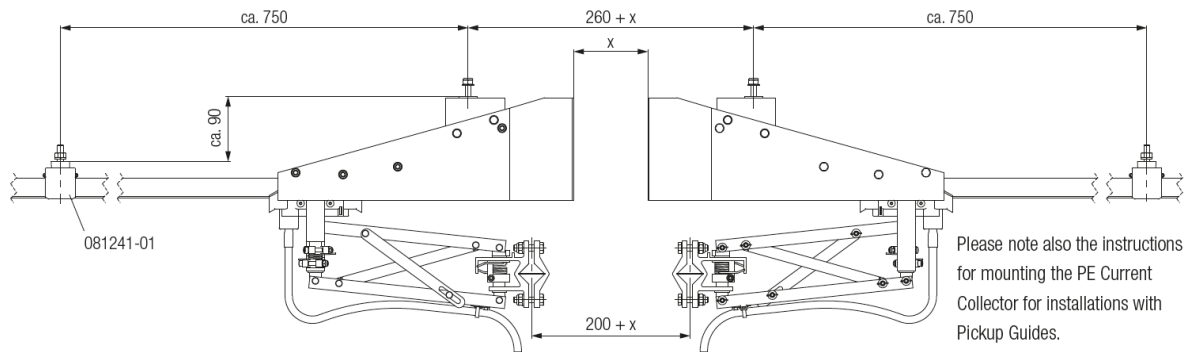
- The pickup guide centers the current collector with a maximum lateral and vertical alignment tolerance of  $\pm 25$  mm
- Settings of less than  $\pm 10$  mm are recommended.
- In installations with pickup guides, a corresponding number of current collectors must be available, and mounted in intervals that ensure that just the necessary number of current collectors needed for momentary power requirements are in use.



**DANGER!**

The user must ensure that the current collector between the pickup guides are disconnected from power or are protected against accidental contact!

### Hanger clamp spacing for installations with pickup guides



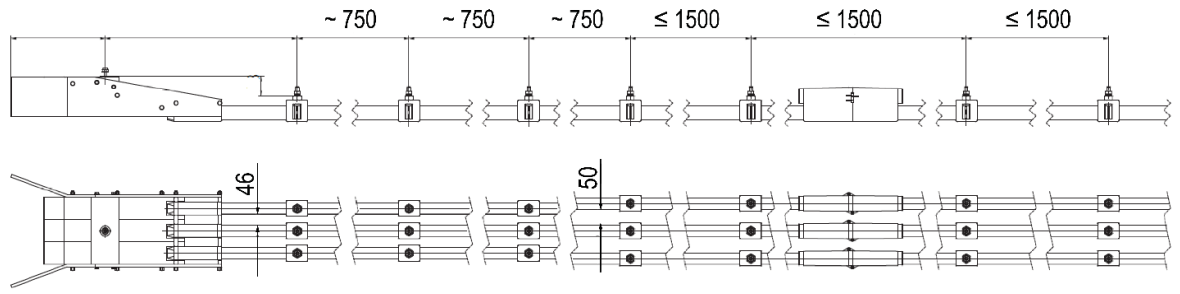
**CAUTION!**

### Installation note!

The middle distance (phase distance) between two conductors is 50 mm. This is reduced to 46 mm using the last hanger clamps before the pickup guide in order to ensure that the current collector enters the pickup guide precisely. The pickup guide is delivered complete with end caps. The end caps are pushed onto the rails with a soft-head hammer until they hit the end stops. The clamping screws are then tightened firmly. Keep a distance of 750 mm between the pickup guide and the first hanger clamp.

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### Hanger clamp spacing for installations with pickup guides



## 6 Commissioning

After completion of the installation, the system must be mechanically and electrically tested before the power is switched on.

- The correct position of the current collector and operation must be checked by driving the crane in “slow speed” over the complete system.

## 7 Maintenance

Please carry out following checks half-yearly after commissioning:

### Hanger Clamp 081241-...

- Correct tightening of the nuts.
- Correct position of the rail within the hanger clamps.
- Free movement of conductor rail within the hanger clamps. Free movement for expansion.

### Rail Connector 081221-... and Power Feed 081251-...

- The correct position of the rail in the rail joint has to be checked, max. distance between rail ends 2 mm. If the distance is, more than 2 mm reconnect the rail joint or power feed.
- Check that the rail ends are smooth and do not protrude beyond the contact surface.
- Check the correct tightening of the cable connection.

### Expansion Unit 081261-...

On the expansion unit, the correct tightening of the cable connection must be checked. The distance of the 2 air gaps must be checked according to the setting instructions described in chapter 5.6. If there is a difference of more than 5 mm to the actual setting, the expansion section has to be reset to the correct air gap distance.

### Anchor Clamp 081231-...

The anchor clamp must be checked of the correct and rigid position. If the anchor clamp is not close to the rail holder it must be repositioned but in accordance with the correct adjustment to the expansion unit.

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### Conductor Rail 0812XX-...

- a) The rail insulation must be checked for visual damage, cuts or deformations due to external interferences like mechanical damage or extensive ambient temperature. If required insulation profile to be replaced.
- b) Further, it must be checked that the insulation lips located left and right of the rail opening are not subject to excessive wear. Normally there is no wear on this lips but should there be wear detected the current collectors must be re-adjusted. If the damage is excessive, the insulation profile must be replaced.

### Current Collector 081205-... to 081209-...

- a) Check the installation dimensions according to catalogue KAT0812-0002 and re-adjust them if necessary.
- b) Check the contact pressure of the sliding contact with a spring scale. The contact pressure must be 20 N (10 N for 081209). The spring is to be replaced if the contact pressure is less than 20 N (10 N).
- c) Check the position and the fastening of the connecting cable. If you use the current collector type 081209-... strip the cable 15 mm on one side, enter it into the rail connector up to the end position and fix it with the screw. The connecting cable may not handicap the current collector head.
- d) The sliding contacts have to be replaced if the carbon is worn down to 2 mm up to the insulation of the sliding contact.
- e) Hinges resp. bolts have to be oiled slightly (except 081209).

### Heating System

- a) Check all the safety fuses. Replace them if necessary.
- b) Check all the heating wires on electrical continuity.



**CAUTION!**

On cleaning the runway, the mobile equipment and the conductor rail etc. take care that only solvent free cleaning agents are used, which do not react aggressive and destructive to plastic material such as PVC, PC and PBTP (see WV0800-0001)!



For additional information, see our catalogue KAT0812-0002!



Single Pole Insulated Conductor Rail  
Program 0812

**8 Relevant System Parts**



081241-...;  
Hanger Clamp with Steel Nut



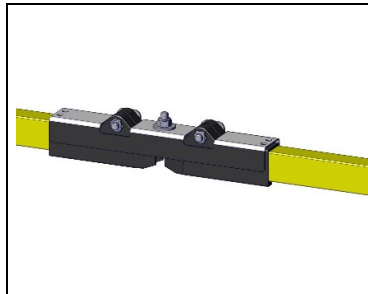
081243-...;  
Hanger Clamp for C-Rail Support Arm



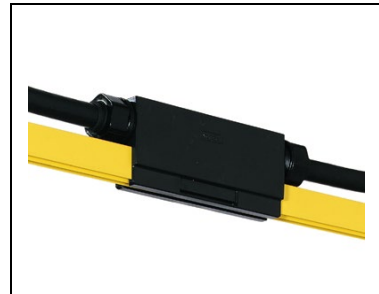
081231-...;  
Anchor Clamp



081221-...;  
Rail Connector



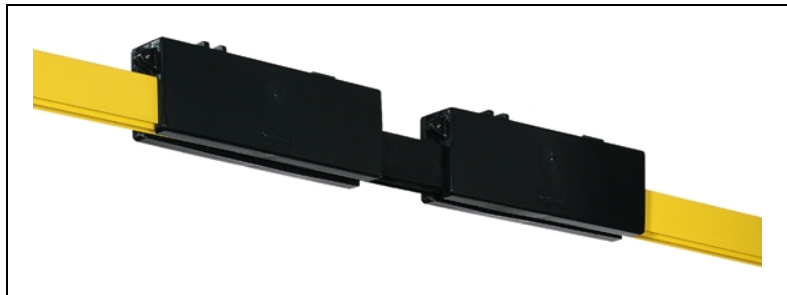
081294-...;  
Air Gap Insulation Section



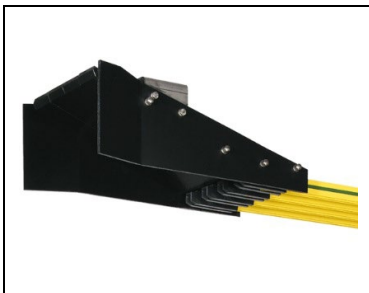
081251-...;  
Power Feed



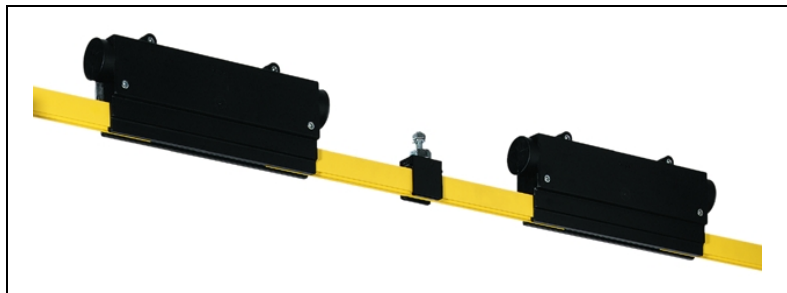
081271-...;  
End Cap



081296-...;  
Insulating Section



081281-...;  
Pickup Guide (4 poles)



081261-...;  
Expansion Unit

Single Pole Insulated Conductor Rail  
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020185-... / 020186-...;  
Support Arm



020285-... / 020286-...;  
Weld on Bracket for Support Arm



020180-...;  
Girder Clip



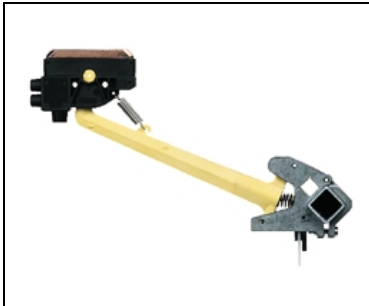
020195-...;  
Towing Arm



080051-...;  
Cable Lug for Power Feed Cable



080401-... / 02- / 03-...;  
Insulator



081209-...;  
Current Collector



081209-...;  
Double Current Collector



081001-...;  
Collector Head (Spare Part)



081205-... / 06- / 07- / 08-...;  
Current Collector



081205-... / 06- / 07- / 08-...;  
Double Current Collector



081001-...;  
Sliding Contact (Spare Part)

# Installation Instruction



## Single Pole Insulated Conductor Rail Program 0812

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### USA / Latin America

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