Installation Instructions

Energy Supply System with C-rails
Program 0230, 0240, 0250, 0255 and 0260

Contents

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1 Required Tools

1.1 Standard tools

Common (metric) tools are required for the assembly of the energy supply systems.

1.2 Special tools

To tighten the nuts on flat cable trolleys with split nuts, we recommend using the special Conductix-Wampfler socket wrench order no.: 020104

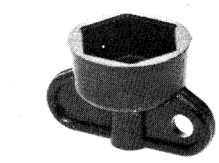

Fig. 1: Socket wrench 020104

2 Sequence of Assembly Operations

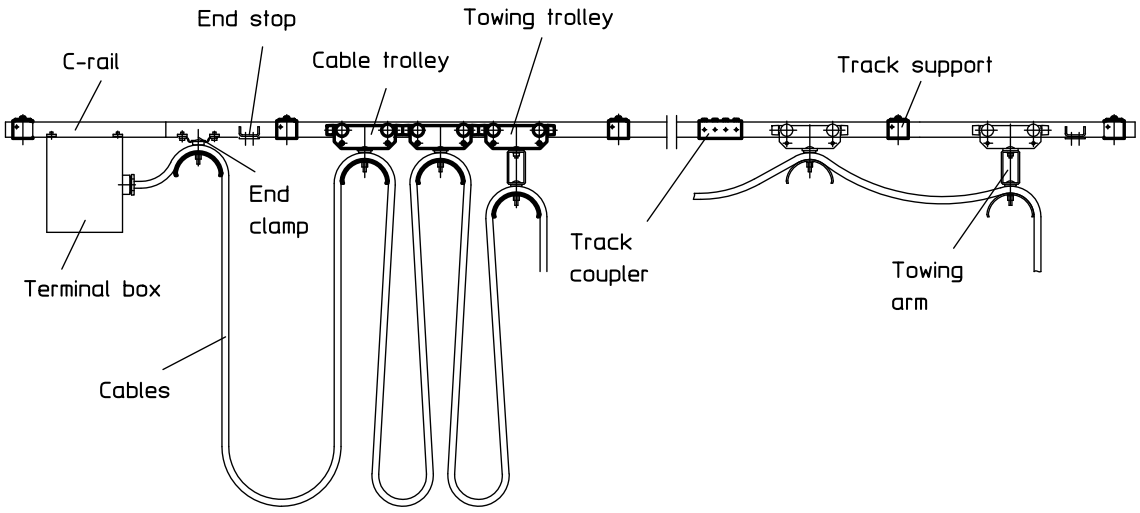

Fig. 2: Completely mounted energy supply system

2.1 Assembly preparations

Prior to installing the C-rails, the rail segments and, if applicable, the rail curves are cut to size in accordance with the course of the track.

During the manufacturing process of C-rails according to DIN EN 10162, the adhesion of lubricant residues is unavoidable. This can cause metal chips to stick to the lubricant. Conductix-Wampfler can therefore not guarantee that chips are not present. If necessary, the rails have to be cleaned before mounting.

A rail connector must be provided at each rail joint.
The suspension distance must be observed for each installation in accordance with the regulations in the product catalogs. In curves, the distance is reduced to 2/3 of the distance for straight rails. For the recommended suspension distance, please refer to the system documentation.

2.2 Assembly of the energy supply system

2.2.1 Rail mounting on ceiling and wall structures

Conductix-Wampfler offers a wide range of different track support bracket designs for the assembly of the C-rails by means of track support brackets on existing ceiling and wall structures.
Special instructions for the assembly of the track support brackets are given in chapter 3.1.
Direct fastening of C-rails without track support bracket by drilling and screwing the C-rail should be avoided in any case. The restriction of the clearance profile of the C-rails by screw heads, etc. would mean that the operability of the cable trolleys is no longer guaranteed.

2.2.2 Rail mounting on track beams

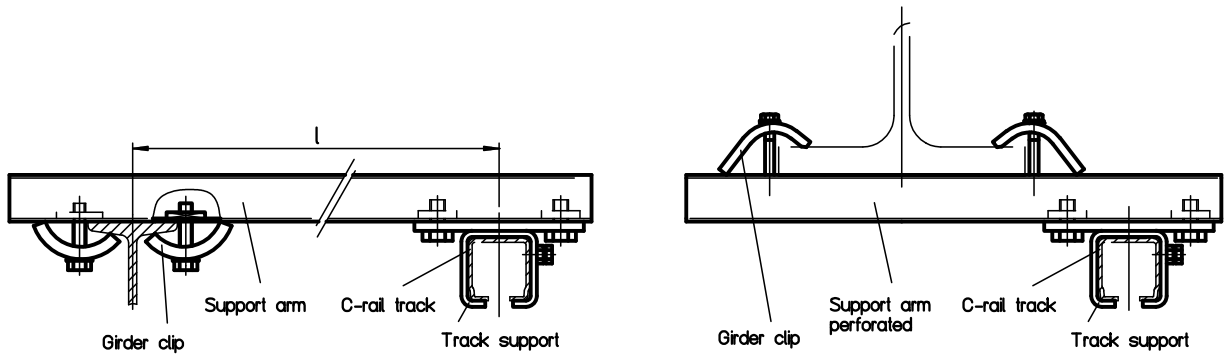

Fig. 3: Rail installation by means of support arms on the upper or lower flange

If the situation allows, we recommend this type of assembly.
Advantage: there is no need to set weld seams or drill holes in existing steel structures.
The alignment of the track system is achieved by moving the support arms in the direction of the track and the track support brackets transverse to the track.

2.2.3 Assembly of the components in the C-rail

At the feed point of the energy supply system, the end clamp and the end stop, and possibly the terminal box, are attached to the rail. After that, the cable trolleys are lined up in the rail, and finally the towing or control unit trolley. The trolleys are secured with an end stop at the end to prevent unintentional driving out. Subsequently the open rail ends are closed with sealing caps.

2.2.4 Assembly of the cables

Markings for the fixed installation length and subsequently for the loop lengths lschl (see project documentation) are applied to the cable(s) (e.g. by means of chalk). The cables are then inserted into the cable clips starting from the end clamp. For the alignment of the cables, make sure that the markings on the cables are in the middle of the supports. This procedure is repeated for all the cables. Finally, the cables are clamped by tightening the nuts.

Please note that for curved tracks, the cable loop must not exceed 35% of the smallest radius traversed. Those loops that do not pass through this radius can be made larger accordingly.

If several flat cables are laid on each cable trolley, make sure that the flat cable with the greatest thickness (usually the main power cable) is laid on top. In case of round cables, the main power cables are placed at the edge of the support, and the cables with the largest diameters in the middle.

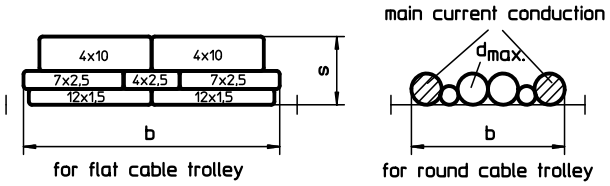

Fig. 4: Examples for the arrangement of cable packages

The electrical connection of the system must be carried out by a qualified electrician.

2.2.5 Application of cable clamps

In the case of large cable packages and long cable loops (from 2 m loop depth) as well as high travel speeds, it is advantageous to install cable clamps in the lower area of the loop. This ensures that the cable package is held together in an orderly manner and prevents individual cables and loops from becoming entangled. Conductix-Wampfler offers special cable clamps for both flat and round cables.

2.2.6 Interface to mobile consumers – towing device

To take along the energy supply system a towing arm is mounted to the mobile consumer. This engages with the towing trolley inserted at the end of the energy supply system. When using a control unit trolley, the towing trolley is not required.

2.2.7 Pre-assembly as an alternative

The energy supply system can also be ordered completely pre-assembled. The pre-assembled festoon system is thus just inserted into the running rail mounted on site and connected. For this, please contact our pre-assembly service.

2.2.8 Example of an energy supply system with flat cable supports (Flat and round cables, hoses lying side by side)

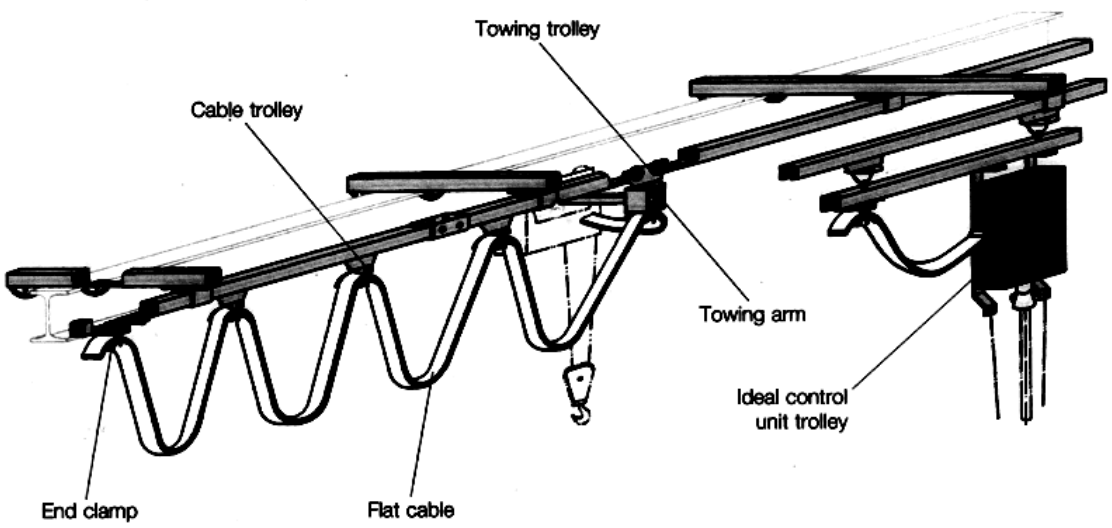

Fig. 5: Mounted energy supply system with flat cables

2.2.9 Example of an energy supply system with round cable, hoses spirally (in separate cable clips)

In case of round cables, also ensure that the cables are inserted into the cable clips free of twists.

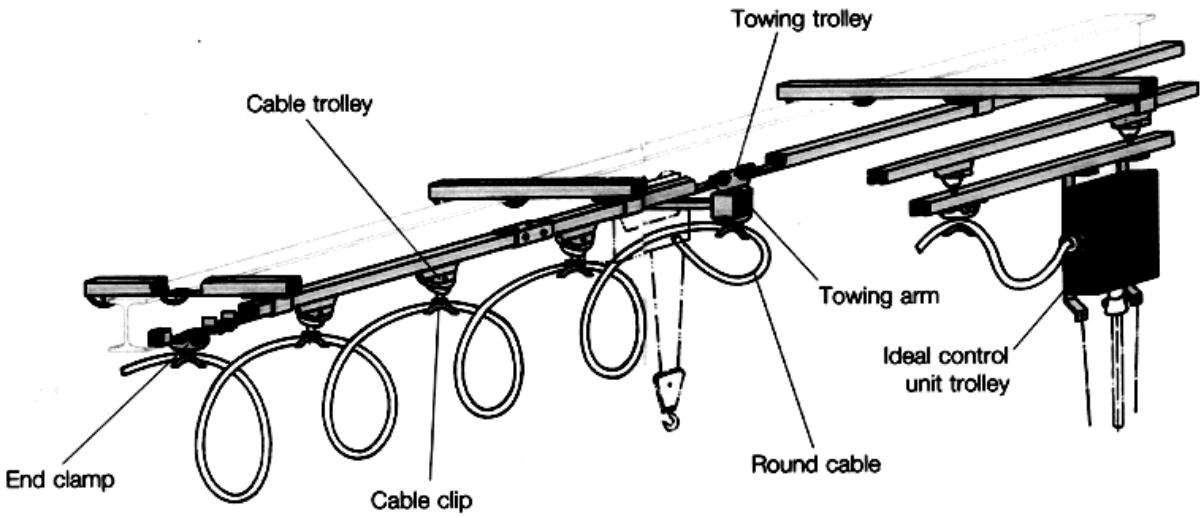

Fig. 6: Mounted energy supply system with round cables

3 Special Operational Steps during the Assembly

3.1 Track support bracket

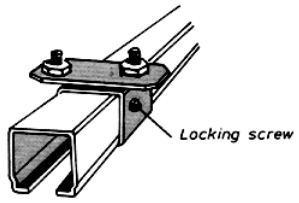

Fig. 7: Track support bracket with locking screw

The track support brackets are pushed onto the C-rails and fastened to the suspension structure together with the rail. The C-rail is fixed to the track support bracket with the locking screw.

Alternatively, the track support brackets can first be fastened to the suspension structure. The C-rail sections are then inserted and fixed with the locking screws.

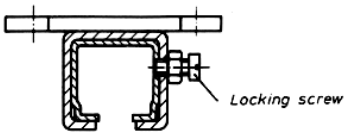

Fig. 8: Securing rail against slipping out

In the first and last track support bracket, the C-rail must be secured against shifting lengthwise. To do this, holes with a diameter of 6.2 mm are drilled into the web of the C-rail where the locking screws can be screwed in.
Ensure that the screw ends do not protrude on the inside of the rail, otherwise the rollers of the cable trolleys will be damaged.

3.2 Rail connector

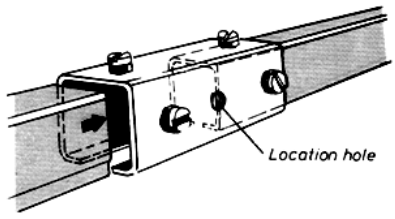

Fig. 9: Rail connector

The rail connector is pushed halfway onto the first C-rail piece at the joint and clamped tight. The correct position can be determined by the visual borehole. The second C-rail segment is then inserted and clamped without a gap. For this, the C-rails must be cut at an angle and deburred. Ensure that the locking screw are tightened uniformly so that no rail offset will occur.

3.3 End stop

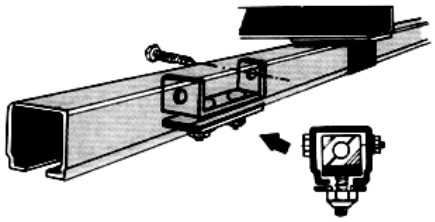

Fig. 10: End stop

The end stop is inserted into the C-rail for travel limitation and clamped tight. Leave free space at the end of the rail for the end clamp. At the recommendation of the Berufsgenossenschaft, the end stop must be additionally secured with a M6x40 screw transverse to the rail.

3.4 End clamp

The end clamp is inserted behind the end stop and clamped tight.

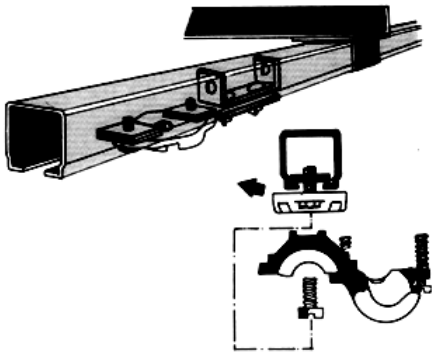

Fig. 11: End clamp for round cables

3.5 Strain relief devices

For higher travel speeds, large loop h and for rail systems with curves, we recommend the use of strain relief devices.

3.5.1 Strain relief devices for steel trolleys

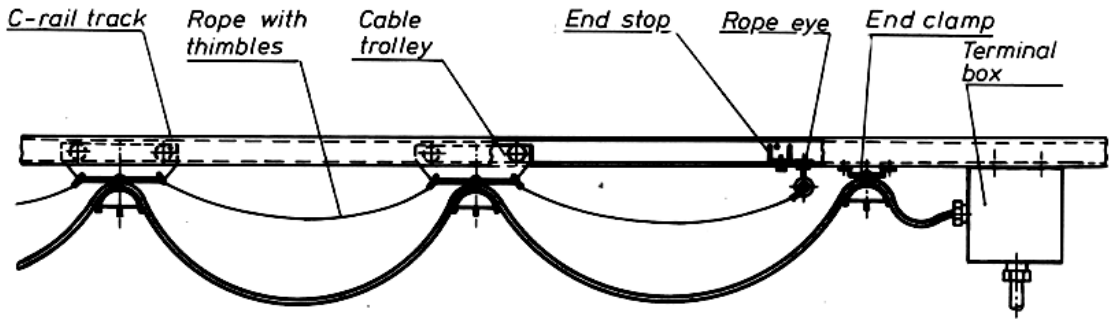

Fig. 12: Strain relief devices for steel trolleys

The individual cable trolleys are connected with strain relief cables. Here the ropes are fastened in the holes provided for the strain relief devices. The first strain relief is fastened between the end clamp and the end stop by means of a towing eye.

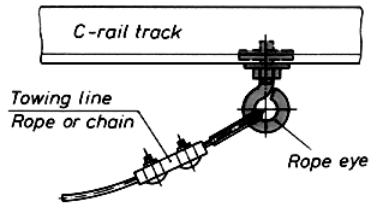

Fig. 13: Towing eye

3.5.2 Strain relief devices for plastic trolleys

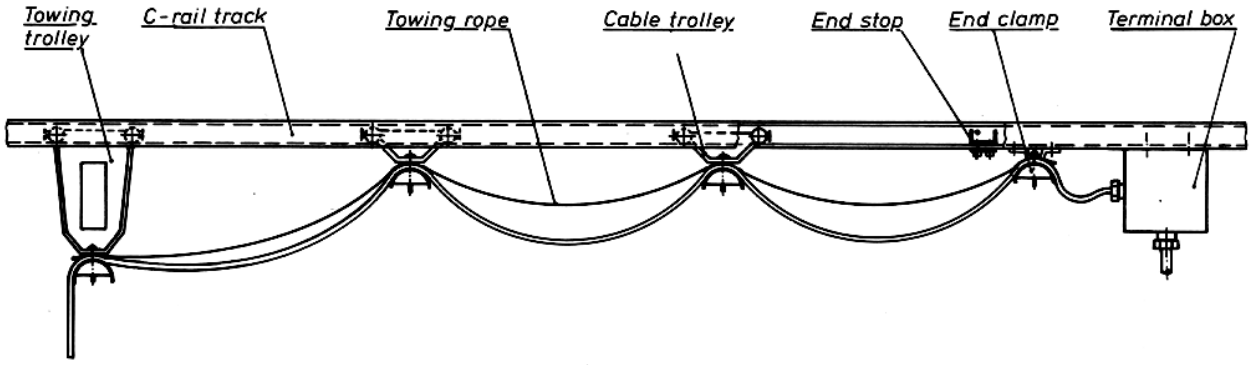

Fig. 14: Strain relief device for plastic trolleys

The installation of the strain relief device in one piece - from the end clamp via the cable trolleys to the towing trolley - has the advantage that the time-consuming individual installation of the individual strain relief sections between the trolleys is no longer necessary. Plastic ropes (Polyamide) are used for this type of strain relief. After the cables have been laid and aligned, the strain relief cable is pressed into the cross groove provided with pins on the trolley or end clamp. Then the nuts below the cable support are tightened until the cables and the strain relief device are tight against the crosshead of the cable trolleys.

4 Special examinations during the assembly

During the assembly of the rail track, it is recommended to check the proper procedure inside the rails with one of the supplied cable trolleys. Especially when using a trolley with horizontal guide rollers, even a slight misalignment of the rail ends at the joint or a deformation of the rail can cause the trolley to tilt or even get jammed.

5 Mounting of the Protective Grounding for Systems under EX Conditions

For the operation of a festoon system in an EX-environment it is mandatory to ensure the grounding of the rail system. For this purpose, the earth connection clamp is pushed onto the C-rail at the end and fixed with the locking screw. The connection piece is then welded to the steel structure (e.g. crane track). Now the protective conductor is attached to the earth connecting clamp of the C-rail and connected to the connecting piece on the steel structure.

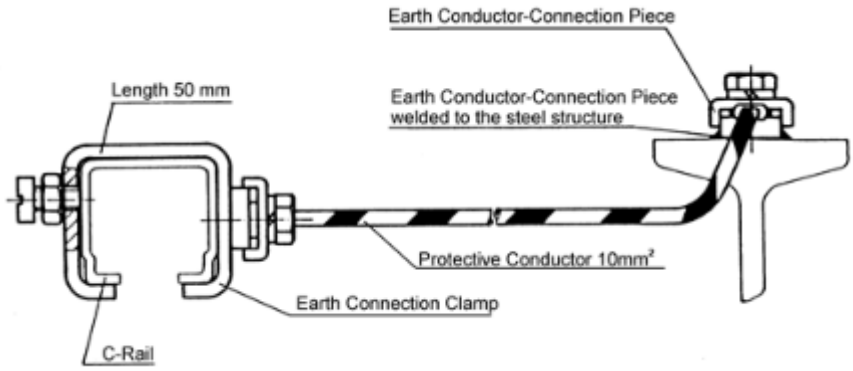

Fig. 15: Connection of the earthing of the C-rail

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