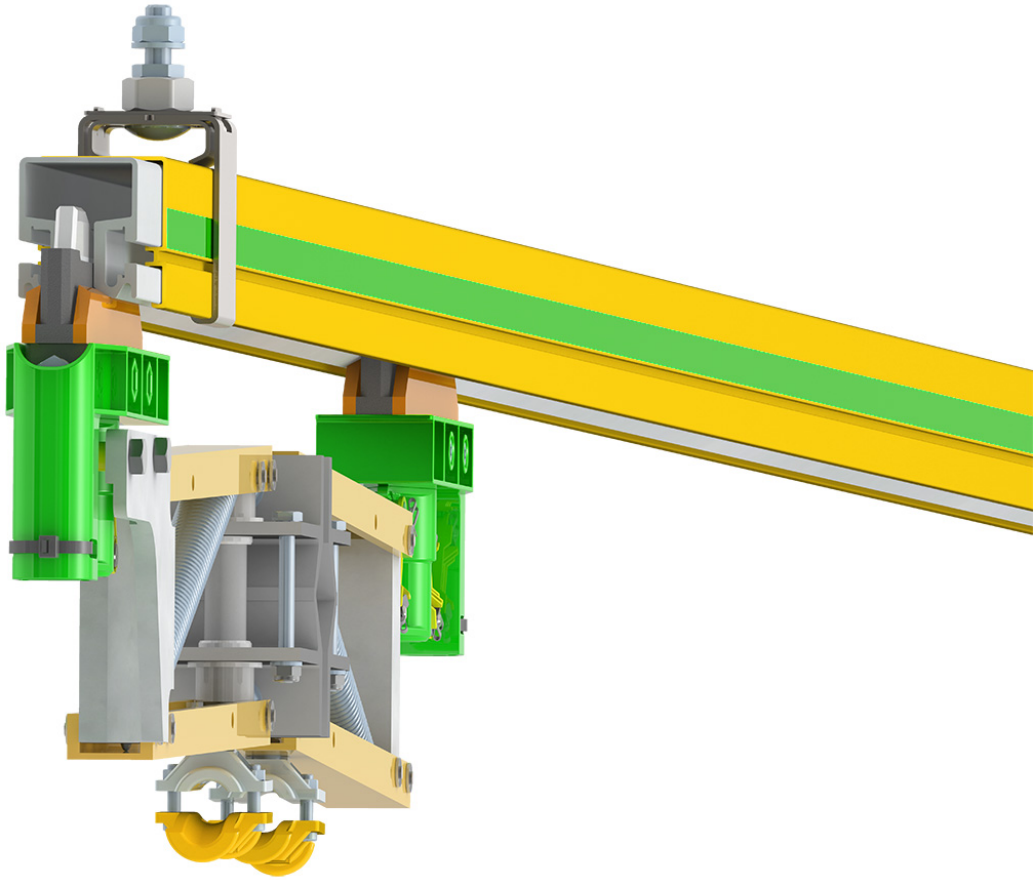
Mounting Instructions

ProfiDAT® Data Transmission System

Programm 0514



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1 General Notes

1.1 About this Document

This document facilitates safe and efficient working with the Conductix-Wampfler ProfiDAT® data-transmission system. The data-transmission system consists of components integrated into a conductor rail system by the system engineer for the transmission of data between a base unit and a mobile system component.

This document is a part of the data transmission system, and must be kept in its immediate vicinity and accessible to personnel at all times. Personnel must read this document carefully and understand it before starting any work. Compliance with all safety and handling instructions given in this document is a basic prerequisite for safe working.

Local accident-protection regulations and general safety guidelines for the area of use of the data-transmission system also apply.

Illustrations in this document are provided for basic understanding and may deviate from the actual versions of individual components.

In addition to these instructions, the instructions in the appendices for the individual installed components also apply.

1.2 Limitation of Liability

All data and information in this mounting instructions have been compiled in compliance with the applicable standards and regulations, best practice and our many years of experience and knowledge.

The manufacturer accepts no liability for damages resulting from:

- Failure to comply with this document
- Improper use
- Use by untrained personnel
- Unauthorized modifications
- Technical changes
- Use of unauthorized replacement parts and accessories
- The actual scope of delivery may differ from the explanations and descriptions provided here if the model in question is a special one, if additional equipped has been ordered or due to recent technical changes.

The obligations agreed upon in the delivery agreement and our General Terms and Conditions of business apply, as do the delivery conditions of the manufacturer and the legal regulations applicable at the time the contract was concluded.

All products are subject to technical modifications in the context of improvement of function and further development.

1.3 Copyright

1.4 Spare Parts

WARNING!

Incorrect spare parts are a safety hazard!

Incorrect or faulty spare parts can impair safety as well as resulting in damage, malfunctions or complete failure.

→ Always use original spare parts from the manufacturer!

Order spare parts from your contracted dealer or directly from the manufacturer.
Contact details: See the last page of this document.
Spare parts: see section 11.2

1.5 Material defects

The regulations about material defects are listed in the general terms and conditions of business.

1.6 Technical support

For technical support please contact our staff from the Customer Support Department.
Contact details: See the last page of this document.

Our employees are also always interested in new information and experience from the field that can be valuable for the improvement of our products.

2 Safety Instructions

2.1 Explanation of Symbols

Safety and hazard information is identified by symbols in this mounting instruction. Safety instructions are introduced by signal words that signal the scale of the hazard. Always observe safety and hazard instructions, and work carefully to avoid accidents, bodily injury and damage to property!

DANGER!

… indicates an immediately hazardous situation that will result in death or serious injury if not avoided.

DANGER!

… indicates an immediately hazardous situation due to electricity that will result in death or serious injury if not avoided.

WARNING!

… indicates a potentially hazardous situation that can result in death or serious injury if not avoided.

WARNING!

… indicates a potentially hazardous situation due to electricity that can result in death or serious injury if not avoided.

CAUTION!

… indicates a potentially hazardous situation that can result in moderate or minor injury if not avoided.

Tips and recommendations:

… highlights useful tips and information for efficient, problem-free operation.

CAUTION!

… indicates measures that will help you avoid material damage.

2.2 Personnel Requirements

2.2.1 Qualifications

WARNING!

Inadequately trained persons are at risk of injury!

Improper use can result in serious personal injury or material damage.

→ All activities must only be performed by qualified personnel.

- Only persons who can be expected to perform their work reliably are acceptable personnel. People whose reactions are impaired by drugs, alcohol or medications, for example, are not authorized.

- When selecting personnel, follow all age- and occupation-specific guidelines applicable at the location of use.

The following qualifications are specified in the operating instructions for certain fields of activity.

- **Trained personnel and operators**
  have participated in a training session, given by the owner, on the tasks assigned to them and the potential hazards in case of improper conduct.
  The owner of the machine or system must document that the appropriate training has taken place.

- **Specialist personnel**
  consists of persons capable of performing assigned tasks and independently identifying and avoiding potential hazards based on their specialist training, knowledge and experience as well as their knowledge of the applicable regulations.
  Persons are deemed to be technically qualified if they have successfully completed training as a master electrician, apprentice electrician, electrical engineer or electrical technician. Persons are also considered technically qualified if they have been employed in an appropriate capacity for several years, receiving theoretical and practical training in that time, and their knowledge and skills have been tested by a specialist in the appropriate field of training.
  The machine or system owner must document that the appropriate certificates or other proofs of qualification have been or are being provided.

2.2.2 Unauthorized Personnel

WARNING!

Danger due to unauthorized personnel!

Unauthorized persons who do not meet the requirements described here are not acquainted with the dangers in the working area.

→ Keep unauthorized personnel away from the working area.

→ In case of doubt, address the person and direct them away from the working area.

→ Stop working, as long as unauthorized persons are in the working area.

2.2.3 Training

Before commissioning the equipment, personnel must be trained by the owner. Log the implementation of training for better traceability.

Example of a training log:

Date	Name	Type of training	Training given by	Signature
11/5/2009	John Doe	First safety training for personnel	Dave Miller	

2.3 Personal Protective Equipment

Always use: **For all tasks:**

Safety helmet
For protection against falling or flying parts and materials.

Protective gloves
For the protection of hands against friction, scrapes, puncture or deeper wounds, as well as against contact with hot surfaces.

Protective work clothing
Primarily for protection against entrapment by moving machine parts. Work clothing must be close fitting with a low resistance to tearing; it must have close-fitting sleeves and no protruding parts.

Protective footwear
For protection against heavy falling parts and slipping on slippery floors.

Used for special tasks: Specific protective equipment is required when executing particular tasks. Separate reference to this is made in the individual sections.

Safety eyewear
For eye protection against harmful influences such as strong light, chemicals, dust, splinters or weather effects.

Hearing protection
For protection against loud noises and to prevent acoustic trauma.

Breathing mask (FFP-3 — according to country-specific requirements)
For protection against materials, particles, and organisms. In this case, for protection against the dust produced by the abrasion of carbon brushes and the PVC insulation of the conductor rail.

2.4 Intended Use

The data-transmission system is designed and built exclusively for the usage described here (intended use).

WARNING!

Hazard due to improper use!

Any application that deviates from or goes beyond the intended use of the devices can result in hazardous situations.

→ Strict compliance with the specifications of this installation manual is required.

→ Refrain from improper use of the system.

→ Respect the instructions on improper use in chapter 2.4.1.

Intended use

The ProfiDAT® data-transmission system is used for data communication between a base unit and a mobile system component.
In addition to the capacity to transmit data, the ProfiDAT® profile can also be used as a ground conductor rail together with conductor rails in product ranges 0813/0812 (max. 1000 V/max. 1000 A).

Transmission of electrical power is not permitted.
The system comprises at least one access point and one client transceiver, together with the corresponding infeed and consumer antennas.

Compliance with these technical conditions is mandatory for the installation:

- The maximum permitted traversing speed of the mobile transceiver is 5 m/s.
- The profile may only be installed horizontally with the access aperture facing down.
  Side access is also feasible after prior technical testing and approval by the manufacturer.

Electrical-engineering operating conditions:

- The electrical system must be protected in accordance with local regulations and guidelines.
- The system may only be installed on the PE profile (protective conductor, green/yellow).

2.4.1 Improper use

Claims of any kind due to damage incurred during use that deviates from the intended use described above ("use other than the intended use") are excluded.
The owner bears sole liability for any damage resulting from improper use.

Improper use in particular includes the following forms of use:

- Operation that does not comply with the specified operating conditions (see chapter 3.5)
- Use of the ProfiDAT® profile for the transmission of power
- Use where there is a risk of explosion (“Ex”-classified zones)
- Use of the transceiver without the profile
- Use of transceivers not supplied by Conductix-Wampfler
- Use of the system parallel to a conductor rail system of a brand/type not approved by Conductix-Wampfler
- Use of the system with accessories that are not approved and not authorized by the manufacturer
- Use of the system by untrained personnel

Environmental conditions

The ProfiDAT® data transmission system may **only** be used under the ambient conditions described in chapter 3.

The ProfiDAT® data transmission system must **not** be used under the following ambient conditions:

- Temperatures below -25°C or above +50°C
- Wind speeds above 25 m/s (10 Bft) or 32.7 m/s (12 Bft) if the system is inactive.
- Solar irradiance levels greater than 1120 W/m² (for components directly exposed to sunlight)

2.5 Protective Measures to be taken by the Owner/Operator

The data transmission system is used in an industrial setting. The owner of the data transmission system is therefore subject to the legal obligations concerning workplace safety. In addition to the safety instructions in this document, all safety, accident-prevention and environmental regulations that apply where the data transmission system is used must also be observed. In particular, pay attention to the following:

- Work on electrical components of the system may only be carried out **when disconnected from the power supply.**
- The owner must become acquainted with the applicable occupational-safety regulations and perform a risk analysis to identify additional hazards arising from the specific working conditions where the system is used. This knowledge must be implemented in the form of operating instructions for the data transmission system.
- For the entire time that the data transmission system is in use, the owner must check whether the operating instructions it has produced correspond to the current regulatory situation and adjust them if necessary.
- The owner must clearly regulate and define responsibilities for installation, operation, troubleshooting and maintenance.
- The owner must ensure that all employees involved with the system have read and understood this installation manual. The owner must also train the personnel at regular intervals and inform them of hazards.
- The owner must provide personnel with the necessary protective equipment.
- The owner must keep the keys for switching cabinets in a safe place. "Safe" means that only explicitly authorized personnel may have access to the keys. The keys may only be issued to specialist personnel as described in chapter 2.2.1.
- The owner must verify that the operating frequency of the data transmission system is permitted in the place of use.

- The owner must observe the following standards, regulations and directives when operating the system:

EMC Directive 2014/30/EU, including	**EMC Directive**
EN 6100-6-2	Interference immunity in industrial areas
EN 61000-6-4	Interference emissions for industrial areas
EN 61000-3-2	Limit values for harmonic currents
EN 61000-3-3	Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage power supply networks for devices with a nominal current of 16 A per conductor that are not subject to special connection requirements
EN 62311	Assessment of electrical and electronic equipment with respect to limiting exposure of persons to electromagnetic fields (0 Hz – 300 GHz)
Radio Equipment Directive 2014/53/EC, including	**Radio equipment**
EN 301 489-1 V1.8.1 EN 301 489-17 V2.2.1	Protection requirements with regard to EMC
EN 300 328 V1.8.1 EN 301 893 V1.7.1	Use of the radio frequency spectrum
EN 300 440-1 V1.6.1	Air interface for radio equipment 2,4 – 2,4835 GHz; 5,15 – 6,35 GHz; 5,47 – 5,725 GHz
Low Voltage Directive 2014/35/EU, including:	**Low Voltage Directive**
EN 60950-22	Information-technology equipment: Equipment to be installed outdoors
EN 60529	Protection classes due to housings (IP code)

The owner is also responsible for ensuring that the data transmission system is always in perfect working order. The following thus applies:

- The operator must ensure that the service intervals described in this document are observed.
- The owner must have all safety systems inspected for functionality and completeness on a regular basis (once yearly if possible, but at least as often as required by applicable national regulations).
- If components or the system have been modified, the safety systems must be re-inspected and adapted to the changed circumstances such that the system is safe again.

2.6 Special Hazards

The following chapter lists residual risks determined on the basis of a risk assessment.

→ Follow the safety instructions and warnings in this installation manual to reduce health hazards and to avoid dangerous situations.

2.6.1 5 Protective Safety Rules when working on Electrical Systems

- Work on electrical systems only when they are disconnected from the power supply. Follow the **5 safety rules** (see DIN VDE 0150-100:2009-10/EN 50110-1:2004-11) before starting work:

1. disconnect the system from the power supply at the main switch,
2. secure the main switch against being switched on again,
3. verify disconnection from the power supply by measurements,
4. ground and short-circuit parts of the system to be worked on,
5. cover or block off adjacent energized parts.

- Only electricians or personnel trained in electrical work may disconnect power or approve reconnection of power after work carried out in the disconnected state!

2.6.2 Electrical Hazards and Sources of Danger

Risk of death by electrical shock!

Risk of injury from falling or being thrown across the room after an electrical shock!

Burns due to arcing caused by short circuit!

Contact with energized components can lead to death or severe injury by electrical shock. There is also a risk of injury from shock reactions, falling or being thrown across the room as a result of an electrical shock.

DANGER!

Work on the following components is dangerous:

- Main power supply
- Electrically live components: Power feed, cables, connections, conductor rail, connectors, current collectors, devices and connections within switching cabinets, control systems, etc.
- Parts that have become live due to a fault

Before working on the parts listed above:

→ **Switch off the powers supply** of the conductor rail system according to the 5 safety rules and **secure it against being switched on again**. For the 5 safety rules, see section 2.6.1.

During work:

→ Use insulated tools

Before switching on:

→ Every time before the system is started, test the insulation resistance according to locally applicable technical standards, directives and legal regulations.

→ Carry out locally required electrical tests.

Maintain electrical safety:

→ Regularly test and maintain electrical equipment.

→ If dangerous deficiencies are identified, take measures to correct the deficiencies without delay. Inform the system operator immediately.

→ If it is not possible to correct the dangerous deficiency, block off the area involved or turn the equipment off and secure it against being switched on again. Inform the system operator immediately.

→ Immediately secure loose cables and replace damaged cables.

Always replace blown fuses with fuses of the same rating.

Fire hazard due to overload or sparking!

Fire hazards occur due to overloaded cables, electrical arcs, short circuits or sparking. Sparking can occur in poorly serviced, contaminated conductor rails or if installation does not comply with the required tolerances.

→ Compliance with permissible current ratings is mandatory.

→ Tolerances must be observed during installation.

→ Install electrical protection as prescribed.

→ Check, service, and clean conductor rails regularly and as prescribed. See the information in the documents for conductor rail range 0812/0813.

2.6.3 Mechanical Hazards and Sources of Danger

Risk of crushing injury!

Risk of impact injury!

There is a risk of crushing of skin and limbs due to:

- Current collectors (spring force) during installation, dismantling and maintenance
- Falling parts of the data transmission system in case of improper installation or unsuitable operating conditions (in solvent-containing environments, for example)
- Moving parts (current collectors, mobile equipment) when the system is in operation

→ Do not enter the hazardous area of the system when in operation, except for repair and maintenance tasks.

→ Have installation done only by trained technicians.

→ Wear safety footwear, protective gloves and a safety helmet when working on the data transmission system.

→ When replacing the carbon brushes, follow the instructions in chapter 8.2.4.

→ Only install the system where suitable operating conditions prevail. See chapter 3.5

Risk of injury when cutting and trimming!

The ends of profiles and connectors can have sharp edges, especially if they have been trimmed at the construction site and have not been deburred.

→ Use protective gloves and safety footwear.

→ During installation: Deburr insulating profiles and power rails after sawing.

→ When dismantling: Handle cut, removed profiles with care and store them properly (transport or other container).

→ Be on the lookout for sharp edges near the installation area and avoid contact.

Danger of injury by falling objects!

ProfiDAT® profiles, current collectors and other components (e.g., antennas) can fall off during operation or during any other work on the system. This can cause severe injuries or fatalities if they fall from great heights.

→ Wear a safety helmet.

→ During installation, commissioning, troubleshooting, maintenance: Block off the entire danger zone.

→ During decommissioning, dismantling, disposal: Block off the entire danger zone. Handle cut, removed profiles with care and store them properly (transport or other container).

Danger of injury by catching and entanglement!

There is a danger of being entangled in moving parts when the system is in operation during installation, commissioning, or service. Moving parts include, for instance, the crane and the current collectors attached to it.

- → Do not enter the hazardous area of the system when in operation, except for repair and maintenance tasks.
- → Traverse at reduced speed!
- → Before working on the system, **switch off the power supply** of the system according to the 5 safety rules **and secure it against being switched on again.** For the 5 safety rules, see chapter 2.6.1.
- → Wear closely fitting work clothing.

2.6.4 Danger due to Dust and Vapors

Danger of sensitization, irritation of the mucous membranes, and respiratory diseases due to dust!

Abrasion debris from the carbon brushes collects in the ProfiDAT® profiles and the guide profile. This dust is very fine and is classified as harmful to health. Frequent exposure can lead to sensitization. Persons who frequently spend longer periods in a heavily used system without protective equipment must reckon with the following **consequences**:

- Irritations of the mucous membranes
- Respiratory diseases
- Cancer

These consequences must also be reckoned with if there is a lack of caution in handling accumulated dust (by blowing out the dust with compressed air, for example).

→ In workplaces with long-term exposure and heavily use systems, take effective measures to protect employees from the dust.

→ Use personal protective equipment during all work performed on the data transmission system where accumulated dust can be stirred up. Use personal protective equipment particularly when cleaning the system.

- Safety eyewear
- Dust mask, class FFP3
- Gloves
- Disposable coverall

→ Clean the profiles as prescribed before starting work. There are special instructions for this task; see chapter 11.

→ During cleaning operations, protect the surrounding area, for example by covering or removing stored materials and blocking off areas in which dust could fall onto people.

→ **Do not blow out dust with compressed air**. Instead, vacuum it up. The vacuum cleaner must be equipped with a Class H fine filter.

→ Do not eat, do not drink, do not smoke during the work!

Poisonous gases in case of fire!

In the case of a fire in the system, the plastic parts of the conductor rail system (PVC) will emit toxic gases (HCl).

→ Leave the system immediately.

→ Notify the fire brigade.

2.6.5 Danger related to the Place of Use

Danger by slipping and falling!

When entering the system, there is a danger of slipping and falling due to environmental conditions such as moisture, snow, water, contamination and wind.

→ Wear personal protective equipment when entering the system and during all work on the ProfiDAT® system.

→ Suspend work on the ProfiDAT® system in strong wind: Risk of falling!

→ Clean severely contaminated system parts before entering.

The following characteristics of the ProfiDAT® system can cause hazards when the ProfiDAT® system is installed in its operational environment:

- Electrical energy
- Sparking
- Dust caused by abrasion (of the carbon brushes)
- Material composition of the insulating profiles, which releases toxic vapors if burned

The **most important measure** to provide protection from these dangers is to install the ProfiDAT® system only in locations where **suitable operating conditions** prevail. See chapter 3.5

2.6.6 Unexpected Startup, unexpected Movement

Failure/fault of the control system, software error!

Failure of the data transmission system or a software error can result in unexpected system movements.

→ A plausibility check of signals must be carried out by the customer's higher-level control system. We recommend the use of PROFIsafe controllers.

→ Complete the start-up checklist, see chapter 6.6

Restore the energy feed after failure of the power feed!

Failure of the power feed can lead to uncontrolled movements of the system.

→ Initialization of the RAM memory (carried out automatically).

External influences on electrical equipment due to external sources of interference!

External sources of interference, such as radio or radar, can cause malfunctions of the components and the WiFi network.

→ Use only shielded aluminum profiles made by the manufacturer.

→ A plausibility check of signals must be carried out by the customer's higher-level control system.

2.6.7 Emergency Stop

The ProfiDAT® data transmission system is used for transparent transmission of safety-relevant signals. These signals must be generated by a higher-level component. Suitable safety components must be used to guarantee the emergency-stop function. The emergency stop must be implemented using safety equipment provided by the customer and depends on the nature of the power supply.

We recommend the use of a PROFIsafe system.

2.6.8 Hazard Areas

WARNING!

Risk of injury due to moving components!

When the system is operating, severe injuries can result if persons or objects are within the movement range (hazard area!).

- → Do not start the system if there are persons or objects within the movement range (hazard area!).
  Exception: Repair and maintenance work. Traversing is only permitted at reduced speed.
- → Make sure that the system cannot start up in an uncontrolled manner.
- → Do not reach into moving parts.
- → Block off the hazard area around the entire system.

WARNING!

Risk of injury due to moving components!

Serious injuries may occur if the system is moved in an uncontrolled manner.

- → Block off working and hazard areas.
- → Do not reach into moving parts. The interfaces between current collectors and rail-fastening equipment are particularly dangerous.

CAUTION!

Crushing hazard due to stored energy!

When working on the current collector, there is the risk of crushing extremities due to uncontrolled movements as a result of the energy stored in the spring.

- → The spring force must be taken into consideration, during all works on the current collector. Do not reach between profiles and current collectors (see Fig. 1).
- → During installation, maintenance and repair works: Check the spring force with caution.

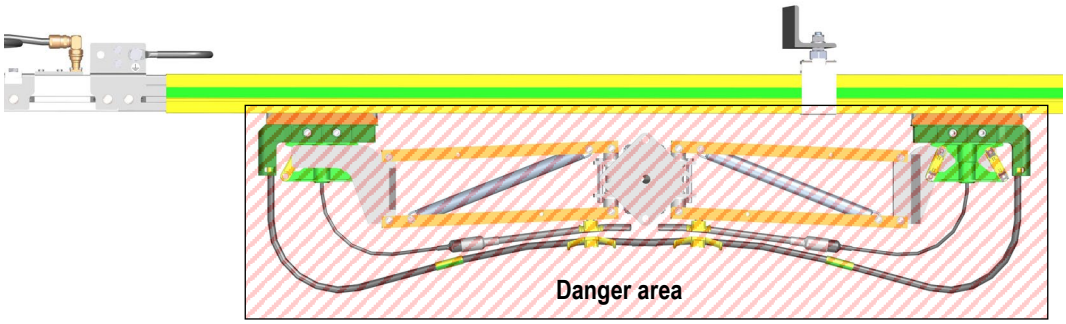

Fig. 1: Sketch of the hazard area at the current collector

2.7 Safety Devices

The data transmission system has **no** safety devices. The system is always operated in conjunction with the plant in which the data transmission system is installed. Therefore pay attention to the safety equipment of the plant!

WARNING!

Risk of death due to inoperative safety devices!

Safety is only guaranteed if the safety devices are intact.

→ Before starting work, check that the safety systems are serviceable and properly installed.

→ Never disable or deactivate safety systems.

2.8 Conduct in the Event of Accidents and Malfunctions

Measures to take in the event of accidents:

- Shut down the system and secure it against unauthorized, unintentional and/or erroneous activation.
- Secure the danger zone
- Remove persons from the danger zone.
- Initiate first-aid measures
- Alert the rescue services
- Inform responsible parties at the operating site
- Clear access routes for emergency vehicles

Measures to take in the event of malfunction:

- Shut down the system and secure it against unauthorized, unintentional and/or erroneous reactivation.
- Secure the work area against entry
- Consult qualified personnel when analyzing the fault
- Involve authorized personnel for maintenance and repair
- Check for disconnection from power
- Remove the component and replace with a new component
- Determine the cause of the fault and repair the component
- Conductix-Wampfler must be informed immediately if personal injury or material damage can occur during breakdowns.

Conductix-Wampfler GmbH
Rheinstrasse 27 + 33
79576 Weil am Rhein – Märkt
Germany

Phone: +49 (0) 7621 662-0
Fax: +49 (0) 7621 662-144
info.de@conductix.com
www.conductix.com

3 Technical Specifications

3.1 General Information

Designation	Value, unit
System length (without segmentation)	500 m
Profile length	5000 mm
External profile dimensions (width x height)	50 mm x 56 mm
Power supply: ProfiDAT® transceiver ProfiDAT® infeed cabinet	 24 V DC* 120–500 V AC / 50–60 Hz
Maximum data transmission rate	100 Mbit/s
Maximum travel speed of the mobile transceiver (connection trolley)	5 m/s
Interface	Ethernet (RJ45 as standard)
System service life (except wear parts and electrical components)	10 years

* Deviations may occur, see the manufacturer's documentation (chapter 11.2 "Other applicable Documents")

3.2 Interfaces

3.2.1 Electrical

The interfaces to the customer system are:

- Data interface
- Power supply/control voltage
- PE

Data interface: ProfiDAT Ethernet, RJ45 connection.
The customer has to connect the ProfiDAT® system with its own system at both ends of the ProfiDAT® system with a RJ45 connector or an optional LC (fiber-optic) connector. The interface is located on both the mobile and the stationary transceivers.

The customer system must provide the data using the Ethernet protocol. If the customer control system is not Ethernet capable, the appropriate conversions must be made.

PE interface:
The interface for the customer's grounding cable is located at the PE rail connector (see chapter 4.3.1). At the flap (M10 drilled hole), the PE cable must be connected according to the applicable standards.

Power supply/control voltage:
The controller of the ProfiDAT® data transmission system requires the following power supply:

Description	Voltage/frequency
AC power supply	
Infeed switching cabinet	120–500 V, 50/60 Hz
DC control voltage	
Transceiver	24 V DC*

* Deviations may occur, see the manufacturer's documentation (chapter 11.2 "Other applicable Documents")

WARNING!

Danger of injury by current collector!

Failure to comply with the prescribed supply voltages for the controller can cause a controller failure and electrical components may be destroyed. As a result, the current collector may run jerkily and hit persons or objects.

→ Observe and comply with the prescribed supply voltages.

→ Keep persons and objects out of the hazard area (see chapter 2.6.6).

On commissioning of the transceiver devices, please observe that the cycle periods for the ProfiDAT® communication distances must be adapted.

The cycle period must be at least 32 ms (but can differ depending on the application) and must be adjusted accordingly in the superior control assembly group.

3.2.2 Mechanical

The interface between the data transmission system and the system is:

- Current collector

The current collector on the ProfiDAT® profile performs a dual function. Two divided carbon brushes guide the current collector on the ProfiDAT® profile. The carbon brushes secure the connection to the ground conductor rail (ProfiDAT® profile) while data transmission occurs via the two built-in antennas. The antennas are inserted into the slot in the ProfiDAT® profile and are electrically isolated from the carbon brushes.

3.3 Technical Data for the Transceiver

Designation	Value, unit
Ethernet	1 x 100 Mbit/s RJ45*
Supply voltage:	24 V DC*
Data rate	up to 100 Mbit/sec
Operating frequency	4.9–5.8 GHz**
Energy consumption	See the data sheet for the transceiver
Temperature range	See the data sheet for the transceiver
Dimensions (width x height x depth)	See the data sheet for the transceiver
Weight	See the data sheet for the transceiver

* Deviations may occur, see the manufacturer's documentation (chapter 11.2 "Other applicable Documents")

** Country-specific deviations may occur

Please note the information in the documentation of the transceiver, see chapter 11.2. "Other applicable documents".

3.4 Technical Data for HF Cables

The following values must not be exceeded:

Designation	Value, unit
Temperature range	-25°C to +50°C
Min. bending radius	40 mm
Tension force	50 N
Recommended coupling torques:	
N connector	4–6 Nm
SMA/R-SMA	79–113 Ncm

CAUTION!

The HF cables may not be squeezed (for instance through firm pulling at the cable binder).

→ Observe the bending radius of the HF cables.

→ Maintain the recommended coupling torque.

3.5 Operating Conditions

Designation	Value			Notes
	Minimum	Maximum	Conditions	
Ambient temperature	-25°C	+50 °C	At a relative humidity of [100% at +20°C]	
Wind speed in operation		25 m/sec (10 Bft)		
Wind speed when not in operation		32.7 m/sec (12 Bft)		

CAUTION!

Faults due to incorrect operating conditions!

Operating conditions outside the specified range can lead to malfunctions due to short circuits, premature aging, and damage to electrical and mechanical components.

Important parameters are:

- Dust and deposits
- Humidity/condensation
- Cold/hot temperatures
- Corrosion

4 Product Description and Mode of Operation

4.1 Overview

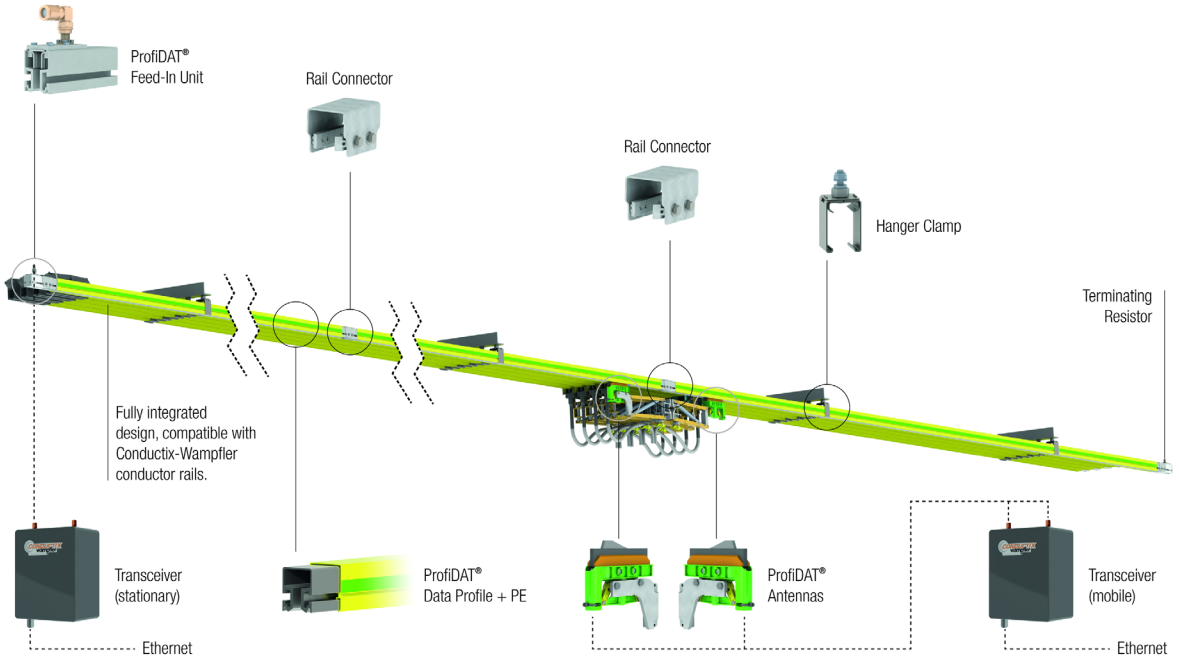

Fig. 2: Overview

4.2 Brief Description

The ProfiDAT® data transmission system provides a means of communication between the base station and the mobile system component. The ProfiDAT® system is installed parallel to the electrification system.

In addition to data transmission, the ProfiDAT® profile can simultaneously be used as a ground conductor rail. The system has a variable length. It consists of at least one fixed and one mobile transceiver, the infeed antenna and the consumer antenna. Hanger clamps are used to fasten the profiles to the steel construction, which is provided by the customer. The profiles are mechanically attached using connectors that ensure the stability and secure connection of the profiles. Data is fed into and received from the profile by means of an infeed antenna attached at the end of the system (end infeed) or within the system (central infeed/section infeed). The mobile consumer antenna can continuously receive and transmit data.

Examples of applications are:

- High-performance crane systems
- Rope-drawn STS crane-trolley systems
- People movers/passenger transportation systems
- Portable electrical consumers

4.3 Description of Assemblies

4.3.1 ProfiDAT® System

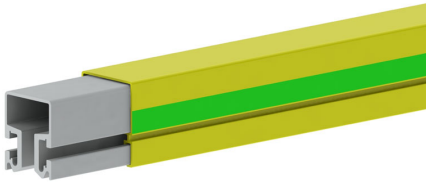

Fig. 3: Profile

- **Profile (slotted wave guide)**
  The profiles are used as a data channel. They are electrically conductive and are simultaneously used as a protective conductor (PE).
  The standard length of a profile is 5000 mm. The outer dimensions are 50 x 56 mm (width x height). The conductor cross-section is at least 585 mm².

Fig. 4: Hanger clamp

- **Hanger clamp**
  The rail clamps are attached to the supporting construction with nuts and bolts, which are provided by the customer.
  The hanger clamps are pushed onto the profiles. Two hanger clamps are installed for each profile. The spacing between hanger clamps is 2500 mm.

Fig. 5: Hanger clamp for installation on a C-rail

Hanger clamp for installation on a 40 x 40-mm C-rail

Fig. 6: Anchor point

- **Anchor point**
  The anchor point is fixed to the hanger clamp and the PE rail connector and is used to create a fixed point.

Fig. 7: Rail connector

- **Rail connector**
  The rail connector connects two profiles together and is screwed onto the profile.

  There are two types of connectors:
  - Connector, simple
  - PE connector, with connection for a grounding cable

Fig. 8: PE rail connector

The ground cable is attached to the lug (PE rail connector).
There must be a PE connector every five profiles (every 25 m) and at each expansion element.

Fig. 9: Infeed antenna

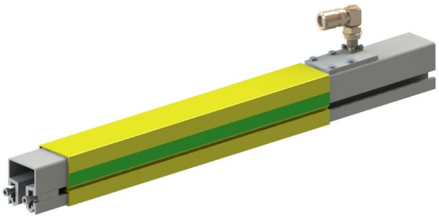

Fig. 10: Infeed antenna for funnel

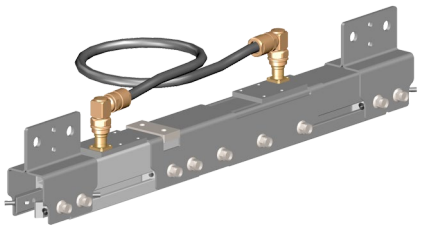

Fig. 11: Expansion element

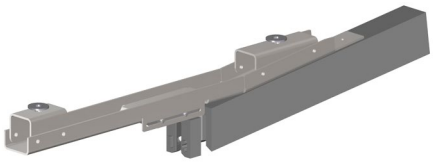

Fig. 12: Entry funnel

- **Infeed antenna (infeed unit) with cable**

  The feed-in antenna is installed at the end of the system (end infeed). It is used to feed data signals in and out.
  System lengths up to 250 m are possible with end infeed.

  There are two types of antennas:
  - Antenna screwed to the profile
  - Antenna for funnels, attached to the profile with a connector

  At the end of the ProfiDAT® section, there is a terminating element with a terminating resistance that attenuates the signal to the point that no interference emissions are produced for other equipment in the vicinity of the data transmission system.

- **Expansion element**

  The expansion element connects two ProfiDAT® profiles together, compensating for changes in the length of profiles due to temperature fluctuations.

  The expansion element is fastened to the ProfiDAT® profile using PE rail connectors as well as by screws to the load-bearing profile. A flexible cable transmits the data signal between the two antennas.

  The expansion element can also be used as a section infeed. This allows system lengths of 500 m to be achieved. Segmentation makes the system expandable (see chapter 6.4.8.2).

- **Entry funnel**

  The entry funnel is installed at the drive-in zone. The entry funnel guides the current collector onto the conductor rail.

  The entry funnel can only be used in systems with the slot facing down.

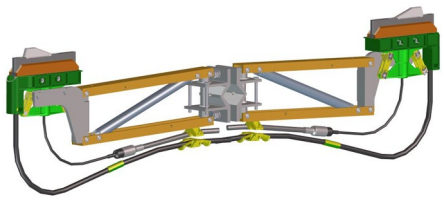

Fig. 13: Current collector (dual collector)

- **Current collector**
  Two divided carbon brushes guide the current collector on the ProfiDAT® profile. The antennas are inserted into the slot in the ProfiDAT® profile and are electrically isolated from the carbon brushes.

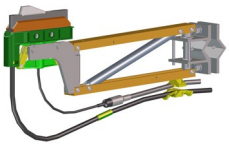

Fig. 14: Current collector (single collector)

Use of the single collector:
- If there are no transitions in the traversing range
- If there are no expansion joints in the system
- With end infeed

4.3.2 Electrical Components

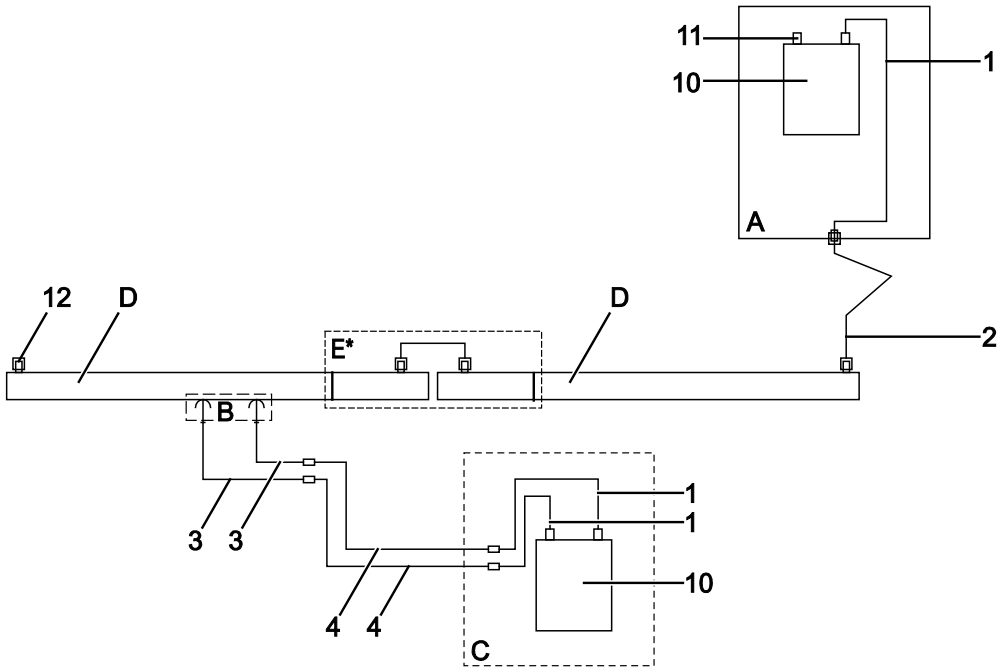

Fig. 15: Overview and arrangement of the electrical components

1	ProfiDAT® adapter cable	10	ProfiDAT® transceiver with 24 V power supply line
2	Infeed connection	11	R-SMA plug, terminating resistor 50 Ohm / 6 GHz / 1 W
3	Antenna adapter cable	12	N-connector terminating resistor, 50 Ohm / 6 GHz / 1 W
4	Antenna connection		
A	Infeed switching cabinet		
B	Current collector		
C	Moving system part		
D	ProfiDAT® profile		
E	Expansion element (optional, depending on system type)		

Transceiver

Fig. 16: Transceiver (sample photo)

The transceiver is a PROFINET/PROFIsafe-compatible communication device based on the IEEE 802.11n standard. Communication with PROFINET-IO uses a Layer 2 Tunneling Protocol (L2TP).

Installation can be on a wall, profile, or DIN rail.

The figure shows an example, because various transceiver types are available. See the manufacturer's documentation for a detailed description of the transceiver (chapter 11.2 "Other applicable Documents").

ProfiDAT® power feed cabinet

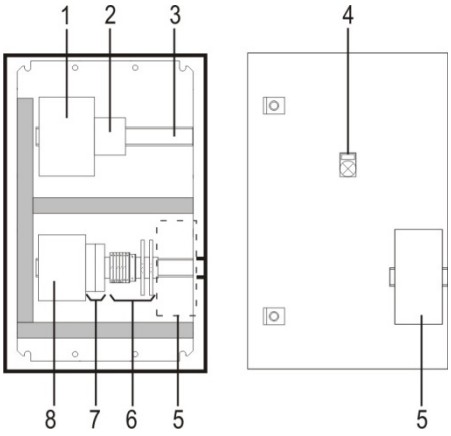

Fig. 17: Infeed switching cabinet

The power feed cabinet contains the component needed to mount a ProfiDAT® transceiver on the system. From the switching cabinet, the antenna connection of the ProfiDAT® transceiver is connected to the infeed antenna on the ProfiDAT® profile.
The ProfiDAT® transceiver is mounted on the DIN rail.

The infeed cabinet contains:

1) Transceiver (access point)
2) Thermostat/hygrostat
3) DIN rail (35 x 15 mm)
4) LED display/indicator light (optional)
5) Heating element (mounted in the side wall)
6) Connector terminals
7) Line circuit breaker
8) Power supply

Dimensions: 380 x 600 x 210 mm (width x height x depth)

Connectors:

- Power supply (screw connection): 120–500 V AC / 50–60 Hz
- Ethernet cable (screw connection):
- N connector
- Ground cable

Display:

"24V OK" indicator lamp (in the door):	Lit: ProfiDAT® transceiver power supply is active.

HF cables

HF cables are used for connector cables and adapter cables for the transmission of data between the transceiver and antennas (see Fig. 15).

4.4 Modes of Operation

The ProfiDAT® data transmission system is used in the "normal operation" mode.

4.4.1 Normal Operation

During normal operation, the operator controls the system. No person may be present in the working area during normal operation to monitor the working process. Traversing commands are given exclusively by the operator.

5 Transport, Packaging and Storage

5.1 Shipment

5.1.1 Safety Instructions for Transport

WARNING!

Risk of death due to suspended loads!

When lifting loads, there is a risk of death from falling parts or parts swinging out of control.

- → Never walk under suspended loads.
- → Follow the specifications provided for the attachment points.
- → Do not lash to protruding machine parts or eyelets on attached components. Be sure the lashing elements are firmly seated.
- → Use only authorized lifting gear and lashing components with sufficient load capacity.
- → Do not use torn or worn ropes or straps.
- → Do not attach ropes or straps at sharp corners and edges, and do not knot or twist them.

Damage due to improper transport!

Damage due to improper transport!

Improper transport can result in substantial property damage.

- → Unload packaged parts upon delivery and during internal transport with care, and observe the symbols and the hazard information on the packaging.
- → Use only the provided lashing points.
- → Wait until just before installation, for removing packaging material.

5.1.2 Transporting packaged Parts

Transport packed parts under the following conditions:

- Dry and free of dust.
- Do not expose to aggressive media.
- Protect from direct sunlight.
- Avoid mechanical vibrations.
- Transport temperature: -25 to +50 °C.
- Relative humidity max. 60 %

5.1.3 Transport Inspection

Check the delivery for completeness and transport damage immediately upon receipt.
If transport damage is externally visible, proceed as follows:

- Do not accept delivery, or accept it only with reservations.
- Note the scope of damage on the transport documents or on the transporter's delivery note.
- Submit a complaint.

CAUTION!

File a complaint on every defect, as soon as it is detected. Damage compensation claims may only be made within the applicable claim periods.

5.2 Packaging

The individually packaged parts are packed in accordance with the anticipated transport conditions. Only environmentally friendly materials have been used for packaging.
The packaging is designed to protect the individual components from transport damage, corrosion and other damage until installation. As a result, do not destroy the packaging and remove it only shortly before installation.

Handling packaging materials:

Dispose of packaging material according to valid legal regulations and local guidelines.

WARNING!

Environmental damage due to improper disposal!

Packaging materials are valuable resources and can often be reused or usefully processed or recycled.

→ Dispose of packaging materials in an environmentally appropriate manner.

→ Comply with locally applicable disposal guidelines; if necessary, engage a specialist company to handle the disposal.

5.3 Storage of packaged Parts

Store packaged parts under the following conditions:

- Do not store outdoors.
- Store in a dry, dust-free place.
- Do not expose to aggressive media.
- Protect from direct sunlight.
- Avoid mechanical vibrations.
- Storage temperature: 15 to 35 °C
- Relative humidity: max. 60%
- When storing for more than 3 months, check the general condition of all parts and the packaging at regular intervals. If necessary, refresh or replace the preservative

CAUTION!

In some cases, there may be instructions for storage on the packed parts that go beyond the requirements listed here. Comply with them accordingly.

6 Installation and Commissioning

6.1 Safety

Personnel:

- Installation and commissioning may only be carried out by specially trained technicians!

Use the following personal protective equipment for all installation and commissioning work:

- Protective work clothing
- Safety helmet
- Protective footwear
- Protective gloves

WARNING!

Risk of death due to suspended loads!

Falling loads can cause serious injuries or even death.

→ Never walk under suspended loads.

→ Only move loads under supervision.

→ Set down the load before leaving the workplace

Injury due to improper installation and initial commissioning!

Improper installation and commissioning can result in serious personal injury and/or material damage.

→ Before starting work, ensure sufficient space for assembly.

→ Handle open, sharp-edged components with care.

→ Make sure the installation area is tidy and clean! Loosely stacked or scattered components and tools are sources of hazards.

→ Install components properly. Comply with specified screw tightening torques.

6.2 Preparations

Required tools:

- Open-ended spanner, SW10
- Open-ended spanner, SW17
- Open-ended spanner, SW24
- Set of Allen keys, SW3
- Allen key, SW5
- Phillips screwdriver
- Torque wrench
- Lubricant
- Hot air blower
- Chop saw

Required material:

- Cable ties
- Shrink sleeve
- Conductive paste 080021
- Lubricant for stainless-steel screws, recommended: Klüber 46 MR 401 paste
  Klüber Lubrication München KG
  Geisenhausenerstr. 7
  D-81379 Munich

Screw tightening torques:

- M6 threaded pin (SW3 Allen wrench): 8 Nm
- M6 screw (SW10 open-ended spanner): 10 Nm, **Only for flange screws on the connector!**
- M10 screw (SW17 open-ended spanner): 40 Nm

6.3 Grounding

The system operator must ensure sufficient grounding of the steel structure, especially the painted components. Safety regulations and country-specific directives for the grounding of electrical equipment (e.g. VDE/UVV/VBG4) must be followed.

The grounding of the steel structure must be taken into consideration for different application cases:

- Protection against electrical shock
- Lightning protection

DANGER!

Risk of death by electrical shock!

The steel structure may be at high voltage if it is **not properly grounded**.

Contact with the steel structure can lead to death or severe injury. There is also a high risk of injury from overreaction caused by electrical shock.

→ Read and follow the locally applicable and international guidelines for proper ground installation and lightning protection.

→ Provide the grounding installation that is appropriate to the architecture of the power grid at the place of installation of the system (TT network or TN network).

→ Connect the steel structure to the grounding installation.

→ Install a conductive connection between all parts of the steel structure. Use toothed washers for screw connections or other suitable components to establish a conductive connection between coated components

→ Regularly check the proper grounding of the steel structure.

6.3.1 TN Network

→ In a TN network, the ProfiDAT® profile (ground conductor rail) is connected by a cable directly to the grounded star point of the power supply transformer.

→ The total impedance between phase conductor and PE conductor must not exceed 0.16 Ω.

6.3.2 Grounding Implementation Instructions

→ The ProfiDAT® profile (ground conductor rail) must be connected to the load-bearing profile at the start and end, as well as at every fifth conductor rail joint. The cross-section of the connector cable must be at least 16 mm².

→ Locally applicable standards or regulations may require different (lower) grounding impedance values. The system operator must check the locally applicable standards or regulations and implement the grounding system accordingly.

→ The grounding impedance must be measured during installation and a test report prepared with the following content:

- Condition of the grounding unit,
- Extent of corrosion and corrosion protection,
- Fastenings of the cables and components,
- Measurement of grounding impedance,
- Documentation of modifications and extensions.

6.4 Mechanical Installation

Personnel:

- Installation by technical personnel only
- At least two people

The following describes the installation of the data transmission system step by step in a logical sequence. Some steps may be carried out in parallel on site.

6.4.1 Installation of the Expansion Element

Depending on the system type, the installation of one or more expansion elements is necessary. The air gap in the expansion element must be adjusted depending on the ambient temperature during installation. Both expansion joints of the expansion element must have the same air gap.

The hanger clamps are designed as sliding suspension devices so that profiles can expand or contract as the temperature changes. To this end, it is necessary to install defined anchor points and expansion points. The expansion element performs the functions of both the anchor point and the expansion point.

Starting from the left-hand end of the system, the first expansion element for the ProfiDAT® profile is installed. All other expansion elements are mounted at intervals of at most 50 m. The exact positions of the expansion elements can be found in the system layout.

The anchor point of the expansion element points toward the left-hand end of the system.

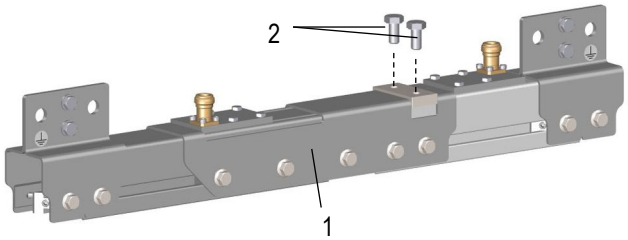

Fig. 18: Installation of the ProfiDAT® expansion element (shown without connecting cable)

Work steps:

→ Fix the expansion element (1) to the support structure using two fastening screws (2).

→ Read the air gap "s" from the table in Fig. 19 and adjust it.

Determining the Air Gap:

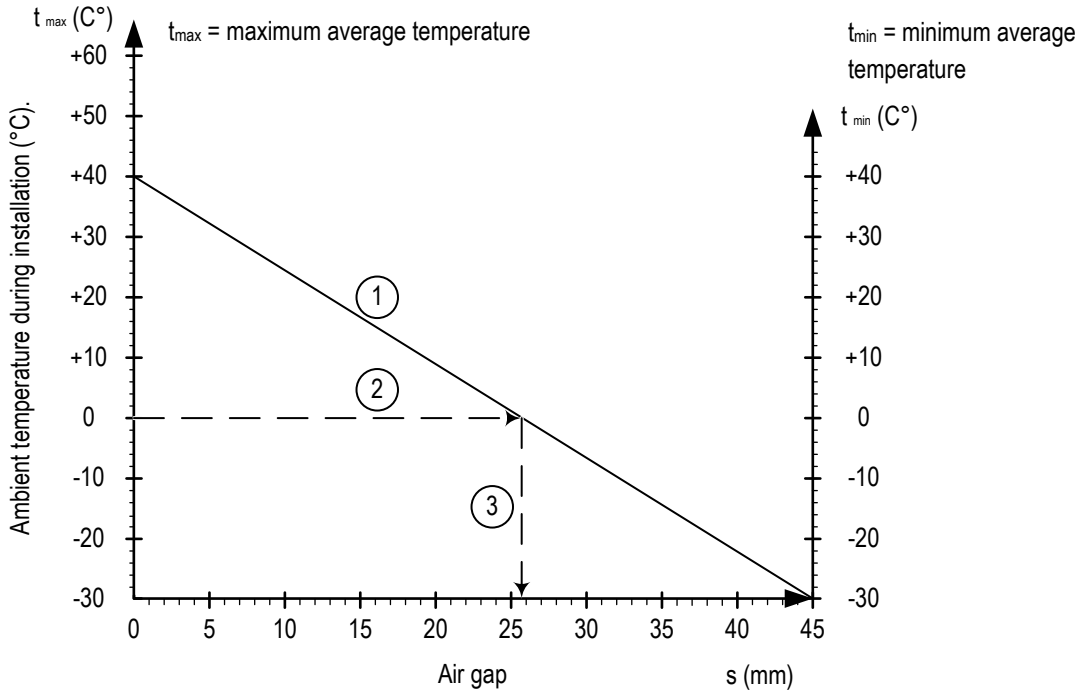

Fig. 19: Determining the air gap for the expansion element

Procedure:

(1) Determine t_{max} and t_{min} and enter them on the axes, then draw a connecting line (1) from t_{max} to t_{min}.
(2) Measure the ambient temperature during installation and mark it horizontally.
(3) Drop a line down from the intersection of the two lines, and read off the air gap to adjust.

Example (as entered):

(1) t_{max} = 40 °C; t_{min} = -30 °C;
(2) Ambient temperature during installation = 0 °C
(3) Air gap = about 26 mm

Ensure that the air gaps on the expansion elements are not displaced during the further installation of the profiles!

6.4.2 Mounting the ProfiDAT® Profile

Work steps:

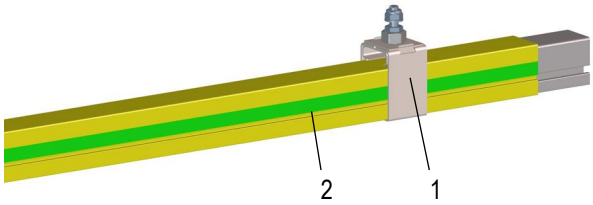

Fig. 20: Hanger-clamp installation

→ Push 2 hanger clamps (1) onto the ProfiDAT® profile (2).

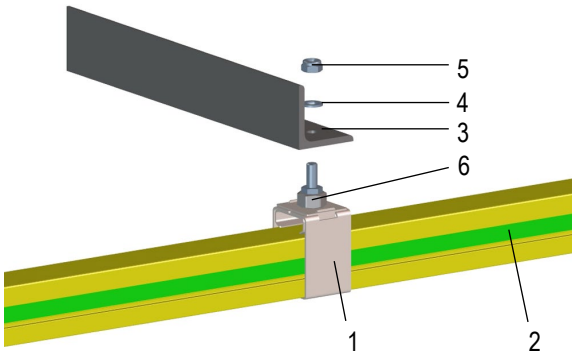

Fig. 21: Installation of the ProfiDAT® profile on the support structure.

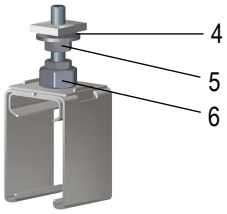

Fig. 22: Hanger clamp for installation on a C-rail

→ Insert the ProfiDAT® profile (2) with hanger clamps (1) into the support structure (3) from below, or push it into the C-rail, and secure the hanger clamps with the nut (5) and washer (4).

Pay attention to the alignment of the ProfiDAT® profiles!

One side is marked with two longitudinal grooves (L). Install the profiles so that the longitudinal grooves are always on the same side.

→ Hold the aluminum spacer (6) with an SW24 open-ended spanner and then firmly tighten the nut (5).

After installation, it must still be possible to freely rotate the rail clamp.

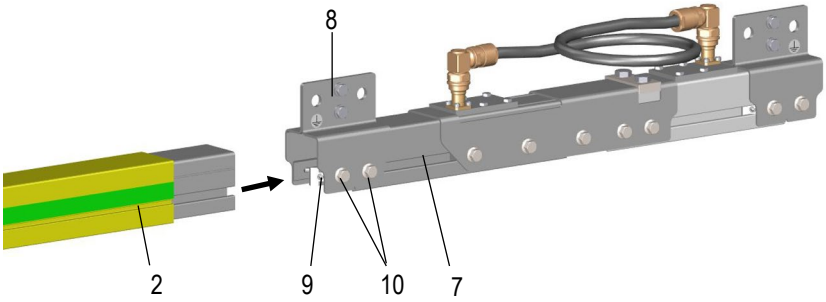

Fig. 23: Mounting the ProfiDAT® profile on an expansion element

→ Push the ProfiDAT® profile (2) toward the expansion element (7) and insert it into the PE rail connector (8) on the expansion element until it reaches the center.

CAUTION!

Both profiles must be directly next to one another. The gap must be no more than 0.5 mm wide! The sliding surfaces for the carbon brushes must be level with one another and deburred.

→ Secure the PE rail connector (8) to the ProfiDAT® profile (2) with the two threaded pins (9) M6 (8 Nm).

→ Tighten the four lateral flange screws (10) M6 (10 Nm) on the connector.

6.4.3 Installing the rail connector (without PE)

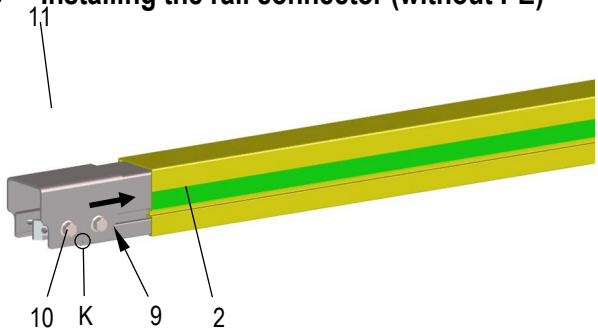

Fig. 24: Mounting the rail connectors on the ProfiDAT® profile

→ Push a rail connector (11) onto the mounted ProfiDAT® profile (2) until it reaches the center of the connector.

The center of the rail connector is marked with a notch (K).

→ Fix the rail connector (11) with the two threaded pins (9) M6 (8 Nm).

→ Push the next ProfiDAT® profile into the installed connector (11) insert and secure it with the two threaded pins M6 (8 Nm).

→ Tighten the four lateral flange screws (10) M6 (10 Nm) on the connector.

→ Install all further ProfiDAT® profiles in the same way.

6.4.4 Installing the PE rail connector

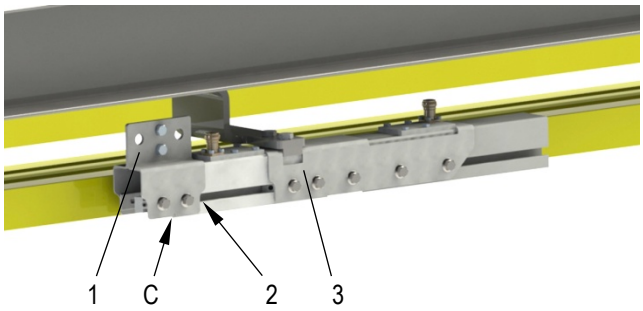

Fig. 25: PE rail connector mounted on the expansion element

Steps:

→ Push a PE rail connector (1) onto the left profile of the expansion element (3) or in the ProfiDAT®-Profil as described in chapter 6.4.3

The center of the rail connector is marked with a notch (K).
Always use a PE connector on both sides of the expansion element!

→ Fasten the PE rail connector (1) with the two threaded pins (2) M6 (8 Nm).

→ Push the next ProfiDAT® profile (4) into the rail holder and push it into the rail connector (1) until it reaches the center.

ATTENTION!

Both profiles must be directly next to one another. The gap must be no more than 0.5 mm wide!
The sliding surfaces for the carbon brushes must be aligned level with one another and be free of burrs.

→ Fasten the ProfiDAT® profile (4) to the the rail connector (1) with the two threaded pins (2) M6 (8 Nm).

→ Tighten the four lateral flange screws (5) M6 (10 Nm) with locking edge washer (6) on the connector (see chapter 6.4.3).

Observe the tightening torques for flange screws (5) and threaded pins (2):
Flange screw (5): 10 Nm
Threaded pin (2): 8 Nm

6.4.5 Installing the Anchor Point

The hanger clamps are designed as sliding suspension devices so that profiles can expand or contract as the temperature changes. To this end, it is necessary to install defined anchor points and expansion elements (see chapter 6.4.1). The positions of the anchor points are indicated in the system layout.

The anchor point must be installed before the hanger clamp is fastened to the support structure.

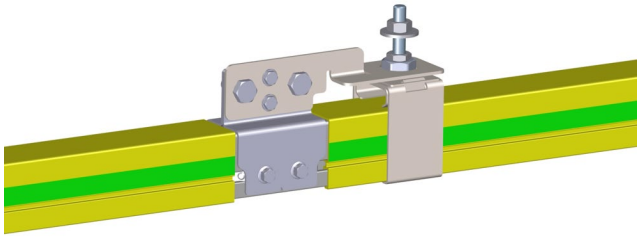

Fig. 26: Installed anchor point

Work steps:

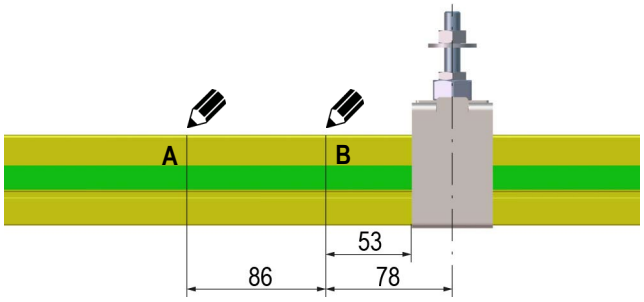

Fig. 27: Marking the gap on the insulating profile

→ Mark the distance from the hanger clamp and interfaces on the insulating profile.

Mark the two sections A and B so that they are not confused during installation.

→ The gap must be at least 86 mm.

→ Remove the insulating profile from the aluminum profile.

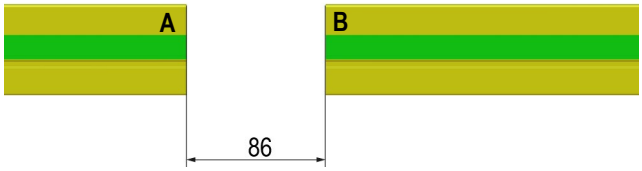

Fig. 28: Trimming the insulating profile

→ Cut the marked gap out of the insulating profile. When doing this, insert a surplus piece of ProfiDAT® profile (an offcut, for example) into the insulating profile so that it does not break during the cutting process. See also chapter 6.4.7.

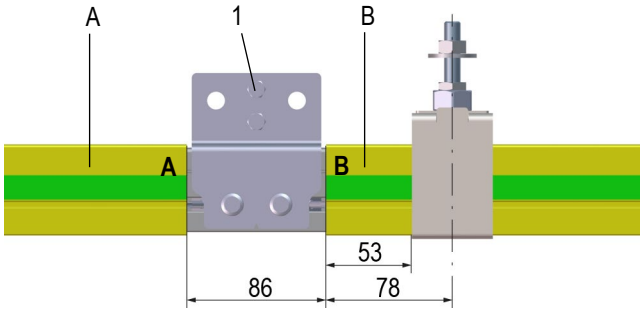

Fig. 29: Installing the PE rail connector PE and insulating profiles

→ Push section A, a PE rail connector (1) and section B onto the aluminum profile and align them. Comply with the distances specified in Fig. 29.

→ Fasten the PE rail connector with the two threaded pins M6 (8 Nm).

→ Tighten the four lateral flange screws M6 (10 Nm) on the connector.

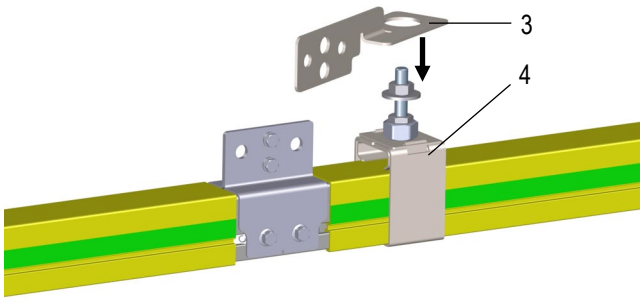

Fig. 30: Pushing on the anchor point

→ Push the anchor point (3) onto the hanger clamp (4) from above.

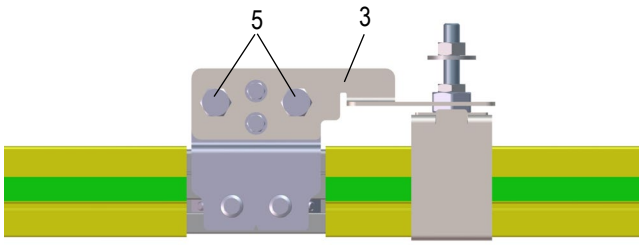

Fig. 31: Installing the anchor point

→ Install the anchor point (3) on the PE rail connector with two screws (5).

→ Install the hanger clamp with profile on the support structure (see chapter 6.4.2, Fig. 21).

6.4.6 Installing the Entry Funnel

Systems with drive-in/out zones require the installation of an entry funnel so that the current collector can be driven in and out of the profile.

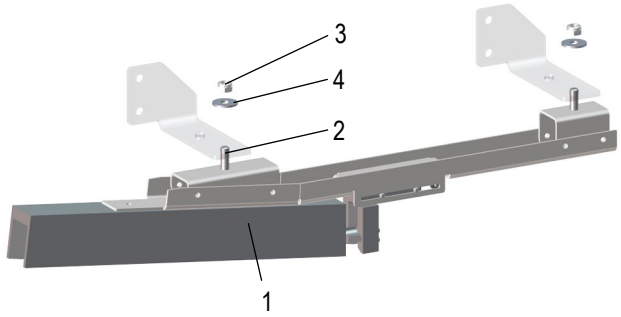

Fig. 32: Installing the entry funnel

Work steps:

→ Push the entry funnel (1) onto the drive-in zone from underneath and fasten with two screws (2) with nuts (3) and washers (4).

CAUTION!

Note that there are left- and right-handed versions of the entry funnel!

→ Install the second entry funnel in the same way.

6.4.7 Adjusting the length of the ProfiDAT® Profile

The ProfiDAT® profiles at the ends of the section can be adjusted in length.

The insulating profile of the ProfiDAT® profile must always be 138 mm shorter than the aluminum profile.

Work steps:

→ Determine the length of ProfiDAT® profile required.

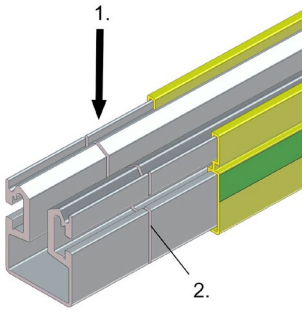

Fig. 33: Trimming the ProfiDAT® profile

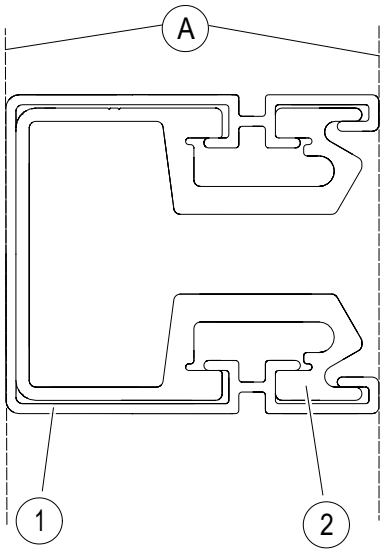

Fig. 34: Insulation profile (1), aluminum rail (2) and clamping surface (A)

→ The cutting direction (1) must be from the open profile side, so from top to bottom (see Fig. 33).

→ Saw insulation profile and aluminum rail separately and at right angles with a chop saw. Use the clamping surface A (see *Fig. 34*) so that the inside of the aluminum rail is not deformed.

→ After cutting the aluminum rail, make a chamfer of max. 0.3 mm x 45° on the aluminum rail with a key file (see Fig. 35). This is important to prevent wear of the sliding contact! Remove burrs from all other sharp edges with a key file!

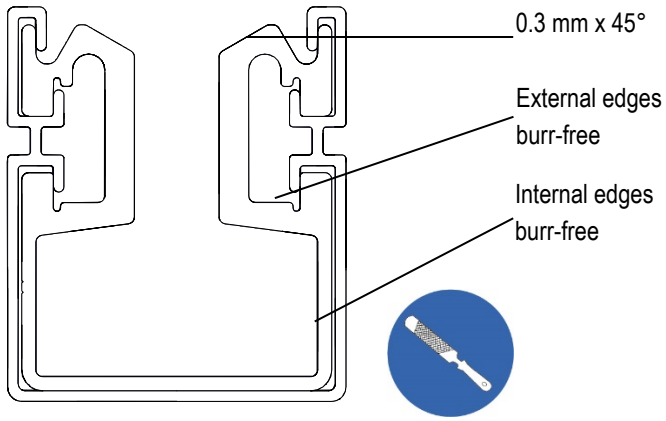

Fig. 35: ProfiDAT® profile burr-free

6.4.8 Installing the Infeed

The infeed is installed either at the beginning/end of the system (end infeed) or within the system (section infeed). Depending on the system, the end infeed is via an infeed antenna directly on the profile or in conjunction with an entry funnel.

6.4.8.1 Installing an End Infeed

Infeed antenna on entry funnel:

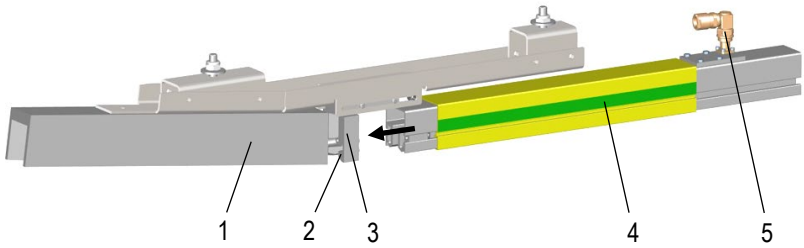

Fig. 36: Installation of an infeed antenna on an entry funnel

→ Push the infeed antenna (4) onto the end cap (3) on the drive funnel (1).

→ Fix the infeed antenna (4) with the frontal hexagonal-socket-headed screws (2) of the end cap (3).

Infeed antenna on the profile:

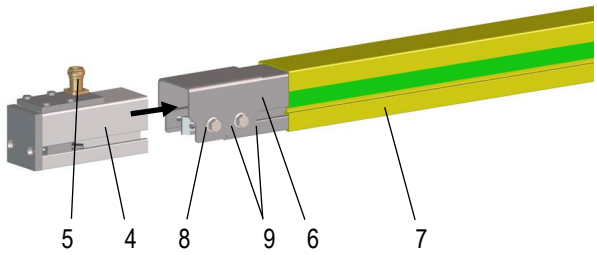

Fig. 37: Install the infeed antenna on the profile

→ Push a connector (6) onto the last ProfiDAT® profile (7) and secure it with the two threaded pins M6 (8 Nm).

→ Insert the infeed antenna (4) up to the stop in the connector (6) of the last ProfiDAT® profile (7).

CAUTION!

Both profiles must be directly next to one another. The gap must be no more than 0.5 mm wide!

The sliding surfaces for the carbon brushes must be level with one another and deburred.

→ Secure the infeed antenna (4) on the connector with the two threaded pins (8) M6 (8 Nm).

→ Tighten the four lateral flange screws (9) M6 (10 Nm) on the connector (6).

Attaching the connecting cable:

→ Push the heat-shrink sleeve onto one end of the connecting cable.

→ Fasten/screw the connecting cable to the socket (5) of the infeed antenna (4).

Depending on the version, the angled plug of the connecting cable lies parallel or perpendicular to the ProfiDAT® profile.

→ Lay the cable to the infeed switching cabinet/transceiver.

→ Secure the cable run to the support structure with cable ties (drive-in zone, steel structure, etc.).

CAUTION!

The cable must not be crushed!

Respect the bending radius of the cable (at least 40 mm).

→ Push the heat-shrink sleeve over the angled plug and socket (5) on the infeed antenna (4) and shrink it with a heat gun.

6.4.8.2 Installing a Section Infeed

The section infeed is installed at the expansion element. Two infeed antennas are already integrated here.

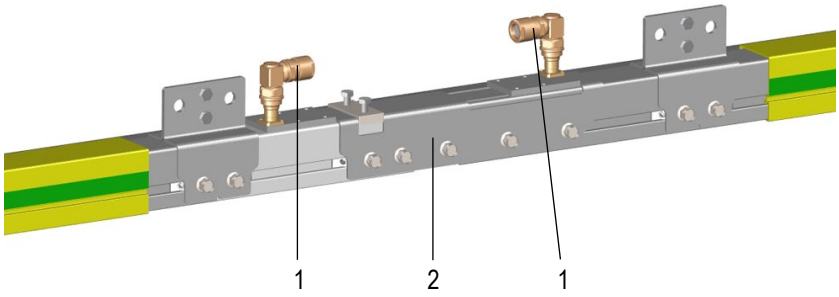

Fig. 38: ProfiDAT® section infeed

Attaching the connecting cable to the expansion element:

→ Fasten/screw the connecting cable to the socket (1) of the expansion element (2).

The angled plug of the connecting cable lies parallel to the ProfiDAT® profile.

→ Lay the cable to the infeed switching cabinet/transceiver.

→ Fasten the cable run to the support structure with cable ties.

→ Attach the second connection cable in the same manner.

6.4.9 Connecting the ProfiDAT® Profile to the Entry Funnel

After the ProfiDAT® profile has been installed on the entire line, recheck the air gaps on the expansion elements for the correct measurement. The connection of the ProfiDAT® to the entry funnel is then installed. To do this, the ProfiDAT® profile must be cut to length in situ (see chapter 6.4.4). The entry funnel also has an expansion function. Set the air gap at the entry funnel to half the value used for the air gap at the expansion element.

If a temperature sensor is to be used (see chapter 6.4.15) the bracket for it must be installed during this step!

The insulation profile of the ProfiDAT® must always be 138 mm shorter than the aluminum profile.

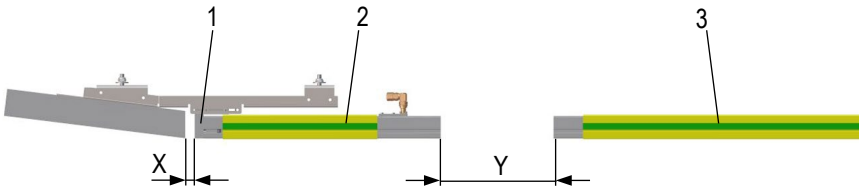

Fig. 39: Adjusting the ProfiDAT® profile to the entry funnel

Work steps:

→ Displace the end cap (1) with infeed antenna (2) and adjust the air gap to size “X” (half the size of the air gap of the expansion joint).

→ Measure the dimension “Y” (from the start of the ProfiDAT® profile infeed antenna (2) to the next ProfiDAT® profile (3)).

→ Trim a ProfiDAT® profile to dimension “Y”; see chapter 6.4.4.

→ Insert and connect the trimmed ProfiDAT® profile.

6.4.10 Installing the Terminating Unit

The terminating unit differs from the infeed unit by having a terminating resistor (pre-installed). No cable is attached here.

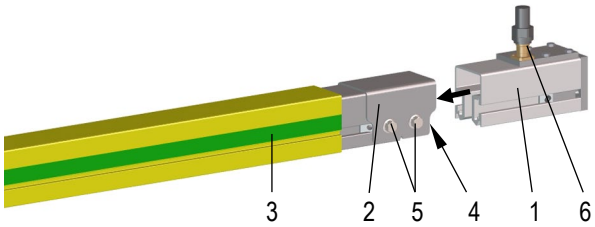

Fig. 40: Installing the terminating unit

Work steps:

→ Insert the terminating unit (1) up to the stop in the connector (2) of the last ProfiDAT® profile (3).

CAUTION!

Both profiles must be directly next to one another. The gap must be no more than 0.5 mm wide! The sliding surfaces for the carbon brushes must be level with one another and deburred.

→ Secure the terminating unit on the connector with the two threaded pins (4) M6 (8 Nm).

→ Tighten the four lateral flange screws (5) M6 (10 Nm) on the connector.

→ Push the heat-shrink sleeve over the terminating resistor (6) and the socket on the terminating unit, and shrink with a heat gun.

6.4.11 Installing the Current Collector

There are two versions of the current collector: single and dual current collectors.

6.4.11.1 Installing dual Current Collectors

The dual current collector consists of two identical current-collecting arms. There is a difference between short arm current collector and long arm current collector (see Fig. 43 and Fig. 44). These are connected with the screws supplied and attached to the towing arm. Minimum conductor spacing 50 mm.

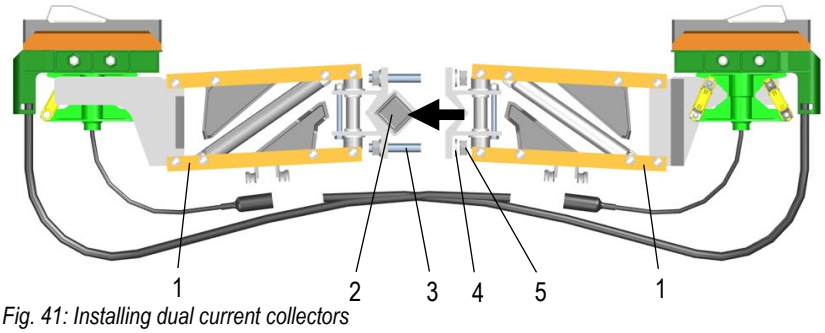

Fig. 41: Installing dual current collectors

Work steps:

→ Position both current collector arms (1) on the towing arm (2).

→ Fix the current collector arms (1) with two screws (3), washers (4) and nuts (5).

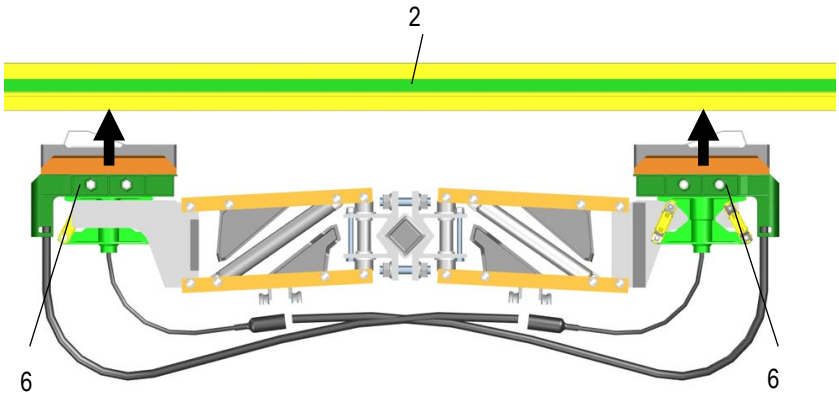

Fig. 42: Inserting the dual current collector into the profile from below

→ For systems without entry funnels: Insert the current-collecting heads (6) into the ProfiDAT® profile (2) from below.

→ Align the current collector to the profile.

CAUTION!

Make sure that the current collector is installed with its central axis exactly on the central axis of the ProfiDAT® profile, and that the specified installation distance between the towing arm and the lower edge is observed (see Fig. 43 and Fig. 44).
In order to ensure the full functional freedom of the current collectors, the connecting cables must be highly flexible and, with the help of the cable clamps located on the current collector, fixed in such a way that no tensile or torsional forces are transferred to the current-collecting head.

Check the dimensions of the long arm current collector (the setting dimension is measured from the lower edge of the ProfiDAT® profile):

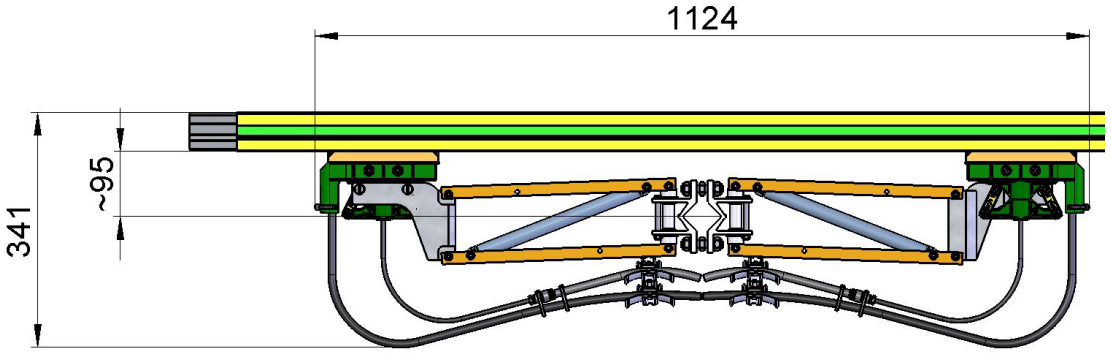

Fig. 43: Long arm current collector

Check the dimensions of the short arm current collector (the setting dimension is measured from the lower edge of the ProfiDAT® profile):

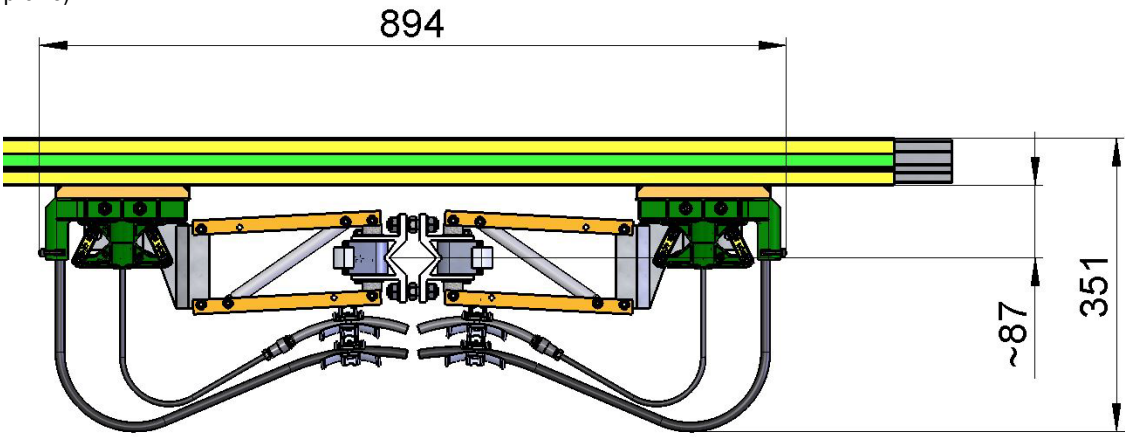

Fig. 44: Short arm current collector

6.4.11.2 Installing a single Current Collector

The single current collector has only one current-collecting arm. This is fastened to the counterpart on the towing arm with the screws supplied.

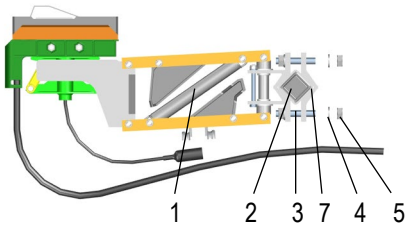

Fig. 45: Installing a single current collector

Work steps:

→ Position the current-collecting arm (1) and the counterpart (7) on the towing arm (2).

→ Secure the current-collecting arm (1) with the two screws (3), washers (4) and nuts (5).

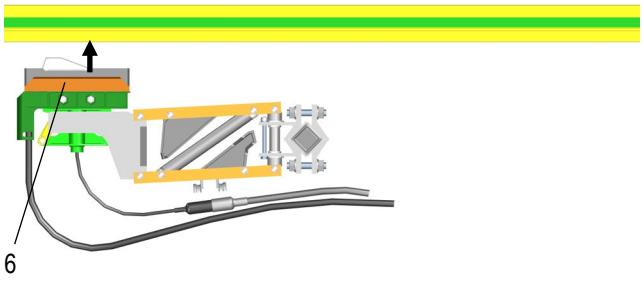

Fig. 46: Inserting the single current collector into the profile from below

→ For systems without entry funnels: Insert the current-collecting head (6) into the ProfiDAT® profile from below.

→ Align the current collector to the profile.

CAUTION!

Make sure that the current collector is installed with its central axis exactly on the central axis of the ProfiDAT® profile, and that the specified installation distance between the towing arm and the sliding surface is observed (see system layout).
In order to ensure the full functional freedom of the current collector, the connecting cable must be highly flexible and, with the help of the cable clamps located on the current collector, fixed in such a way that no tensile or torsional forces are transferred to the current-collecting head.

6.4.12 Installing the PE Cable on the ProfiDAT® Profile

The ProfiDAT® profile must be connected to the customer's PE cable at the start of the system. This cable must be a PE cable and thus marked green-yellow (see Fig. 47). The cable cross-section can be determined by the customer; it must be designed at least equal to half the phase current.

Steps:

→ Fasten screw DIN 933 (2), locking washer DIN 6798 (6), PE pipe (3) with cable lug (4), locking washer (7) and nut DIN 934 (8) to connector PE (1).

→ Attach the grounding symbol below the cable lug to the connector (1).

At each 5th rail connection point, a PE connector and a grounding wire connected to the steel construction must be installed. For this purpose, an expansion element can be used.
The conductor cross section of the grounding cable may be specified by the customer, but must be at least 16 mm². PE rail connectors are used to connect the grounding cable to the ProfiDAT® profiles.

Steps:

→ Mark the grounding cable (3) with the cable lug (4) (for M10 screw) at both ends green-yellow (5).

→ Fasten screw DIN 933 (2), locking washer DIN 6798 (6), PE pipe (3) with cable lug (4), locking washer (7) and nut DIN 934 (8) to connector PE (1).

→ Attach the grounding symbol below the cable lug to connector PE (1).

→ Connect the unconnected end to the steel structure on site and mark the connection point with the grounding symbol.

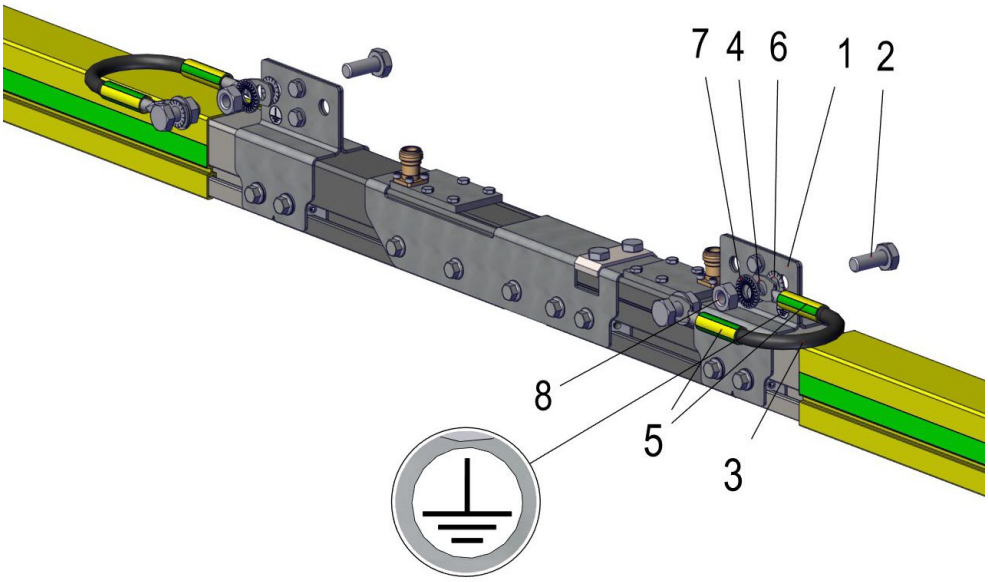

Fig. 47: PE line is connected to the ProfiDAT® profile

6.4.13 Use of the ProfiDAT® profile without PE function

If the ProfiDAT® profile is used without the PE function, it must nevertheless be connected to the grounded crane/steel structure.

The following steps must be performed when the PE function is not used:

→ Connect both ends to the crane construction which has been grounded by the customer.

→ Use a green-yellow grounding cable (minimum cross section 25 mm²) (see Fig. 47).

→ Label PE connection points with grounding marks.

6.4.14 Installing Trace Heating (optional)

The trace heater is intended to prevent the running surface of the profiles from icing. The trace heater is an additional conductor that has to be introduced **during the installation of the ProfiDAT® profile**. It is led out of the groove in the side and wired in the infeed terminal box (see chapter 6.6)

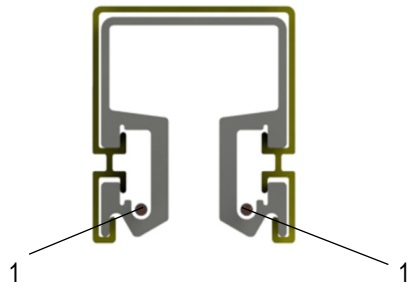

Fig. 48: Positions of trace-heating conductors in the profile

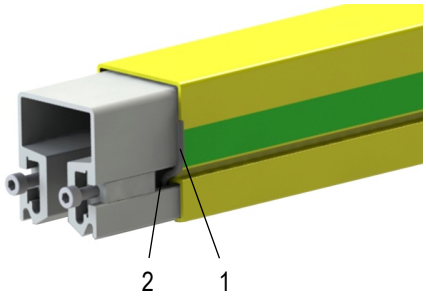

Fig. 49: Trace-heating conductor emerging at the infeed antenna

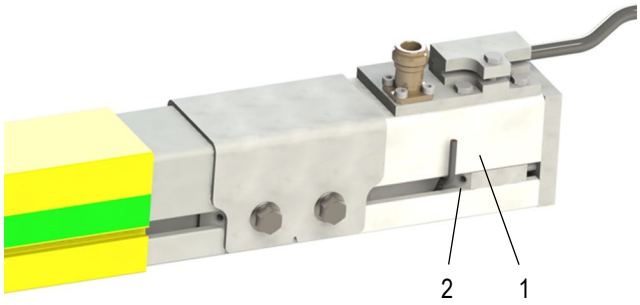

Fig. 50: Trace-heating conductor emerging at the infeed/terminating unit

Work steps:

→ Start the installation of the trace-heating cable (1) at the infeed.

→ Pull the aluminum profile out of the insulation.

→ Remove burrs and sharp edges with a file.

→ Lay the trace-heating cable in the aluminum profile.

→ Slide the insulating profile over the aluminum profile.

→ Install the ProfiDAT® profile (see chapter 6.4.2).

→ Pull the heating cable taut by hand and check whether the heating cable can move freely.

→ Install trace heating in all ProfiDAT® profiles in the same way.

→ Lead the trace-heating cables out of the groove to the terminal box for the infeed.

CAUTION!

When connecting the ProfiDAT® profiles, make sure that the trace-heating cable is not damaged. Before taking into operation, use an insulation tester (test voltage at least 500 V, maximum 2000 fold, minimum insulation resistance 500 Ohm/V) to check that the insulation of the heating cable is undamaged.

6.4.15 Mounting a Temperature Sensor (optional)

The temperature sensor is connected directly to the ProfiDAT® profile.

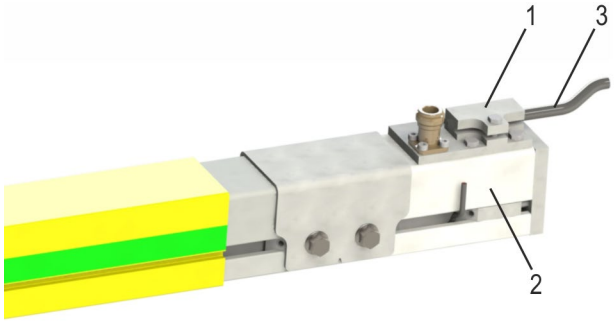

Fig. 51: Temperature sensor at the infeed antenna

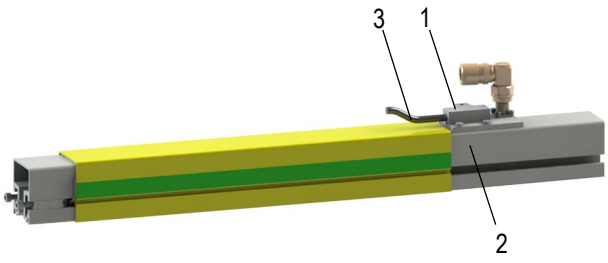

Fig. 52: Temperature sensor at the infeed antenna for funnel

Work steps:

→ The temperature sensor (1) is pre-installed on the infeed unit (2).

→ Run the temperature-sensor cable (3) to the profile-heating controller switching cabinet and connect it.

6.4.16 Retrofitting of a PE Rail Connector (Ground)

If the existing grounding of the profile is insufficient, a PE rail connector has to be retrofitted to the ProfiDAT® profile. The exact position must be determined based on the system layout.

It is not possible to retrofit a PE rail connector in a system with C-rails!

Work steps:

→ Center the insulating profile on the aluminum profile so that both ends of the insulating profile are at the same distance from the ends of the aluminum profile.

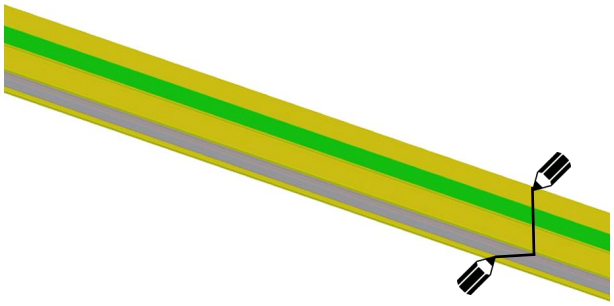

Fig. 53: Marking the profile

→ Measure the required distance to the cable penetrations in the support structure and mark the position on the ProfiDAT® profile. Make markings on the insulating profile and the aluminum profile!

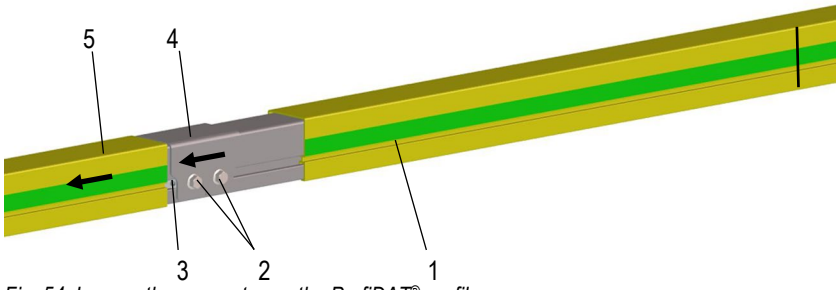

Fig. 54: Loosen the connector on the ProfiDAT® profile

→ Remove the marked profile (1). To do this, loosen the four lateral flange screws (2) M6 (10 Nm) and the threaded pins (3) M6 (8 Nm) of the two rail connectors (4) on the left and right of the profile.

→ Move the rail connectors (4) so that the marked profile (1) can be removed. The insulating profiles (5) of the two adjacent profiles to the left and right may also need to be moved.

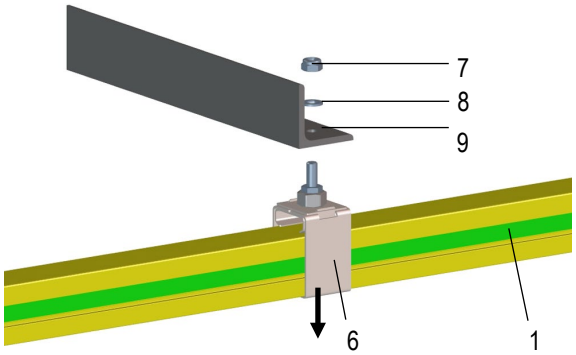

Fig. 55: Dismantling the ProfiDAT® profile

→ Remove the hanger clamps (6) with the marked profile (1). To do this, loosen the nut (7) and disc (8) and remove the hanger clamp from the support structure (9).

→ Pull the ProfiDAT® profile (1) out of the hanger clamps (6).

→ Remove the insulating profile from the aluminum profile.

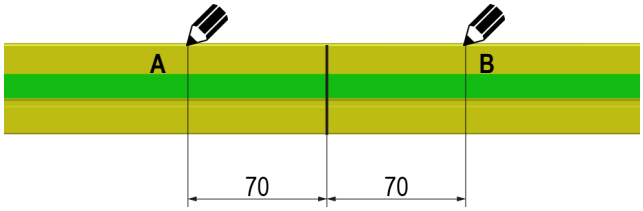

Fig. 56: Marking the cutting points on the insulating profile

→ Starting from the marked position, make one marking to the left and another to the right at 70 mm each.

Mark the two sections A and B so that they are not confused during installation.

→ Cut the marked gap out of the insulating profile. When doing this, insert a surplus piece of ProfiDAT® profile (a profile offcut, for example) into the insulating profile so that it does not break during the cutting process. See also chapter 6.4.7.

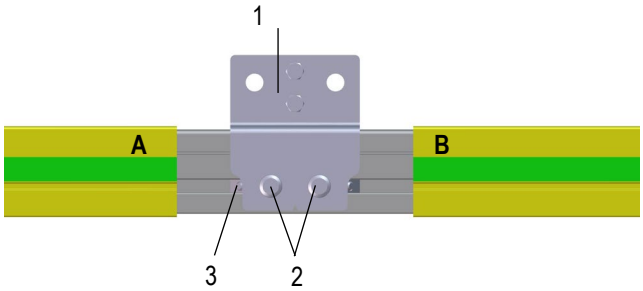

Fig. 57: Installing the PE rail connector

→ Push section A onto the aluminum profile.

→ Push a PE rail connector (10) onto the aluminum profile and align it with the marking.

→ Secure the PE rail connector (10) with the threaded pins (3) M6 (8 Nm).

→ Tighten the four lateral flange screws (2) M6 (10 Nm) on the connector.

→ Push section B onto the aluminum profile.

→ Push the hanger clamps (6) back onto the ProfiDAT® profile (1).

→ Insert the ProfiDAT® profile (1) with hanger clamps (6) into the support structure (9) from below and secure the hanger clamps with the nut (7) and the washer (8) (see Fig. 55).

→ Reconnect the profile with the adjacent profiles on the right and the left. To do this, push the rail connectors onto the profile as far as the center of the connector, secure with the threaded pins M6 (8 Nm) and tighten the four lateral flange screws M6 (10 Nm) on the connector. See chapter 6.4.2.

→ Connect the PE cable, see chapter 6.4.12.

6.5 Electrical Installation

DANGER!

Risk of death by electrical shock!

Contact with energized components can lead to death or severe injury by electrical shock. There is also a risk of injury from shock reactions, falling or being thrown across the room as a result of an electrical shock.

- → Disconnect the system from the power at the main switch.
- → If there is no main switch, disconnect the energy source from the system according to the instructions of the system manufacturer.
- → Secure the system against being switched on again.
- → Confirm that the power has been disconnected.
- → Ground and short-circuit parts of the system disconnected from power.
- → Cover or block off adjacent energized components,
- → Before each start-up, test the insulation resistance according to locally applicable technical standards, directives and laws.

6.5.1 Installing the ProfiDAT® Infeed Switching Cabinet

DANGER!

Danger of death due to incorrect installation!

The incorrect or improper installation of electrical components can lead to death or severe injury by electrical shock. There is also a risk of injury from shock reactions, falling or being thrown across the room as a result of an electrical shock.

→ Have the power supply in the infeed switching cabinet installed only by professional electricians.

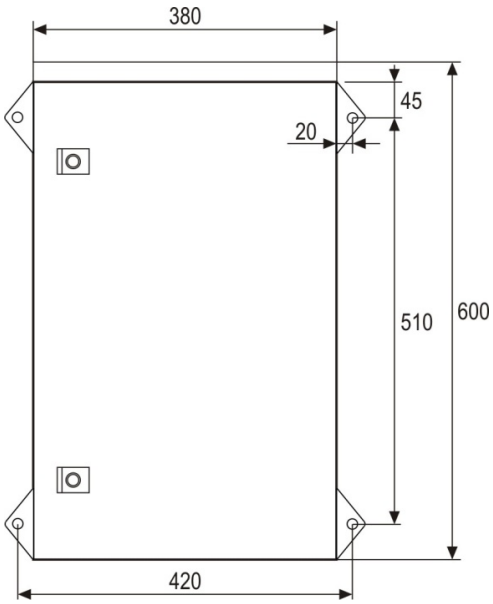

Fig. 58: Dimensions and holes for the power feed cabinet

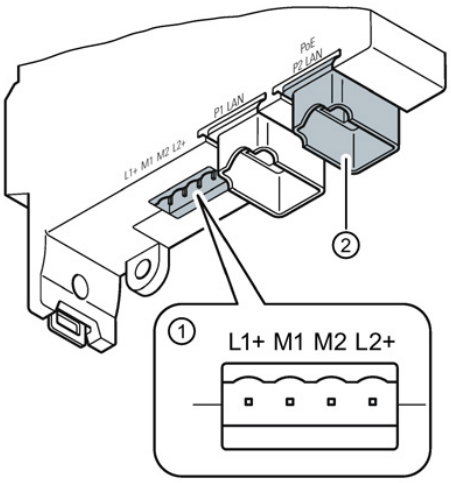

Fig. 59: Transceiver Ethernet connection

Work steps:

→ Fasten the switching cabinet to the angle bracket with four screws.

→ Connecting the Ethernet plug at the transceiver:

1. Insert the bare cable through the screw connection.
2. Install the Ethernet plug (RJ45) on the cable.
3. Tighten the screw connection.
4. Insert the Ethernet connector (RJ45) into socket P1 or P2 (2) on the transceiver (see Fig. 59).
   Observe the information and safety instructions in the manufacturer's documentation!

→ Connect the power supply (AC) for the power supply switching cabinet.

→ Connect the grounding cable of the power supply switching cabinet.

→ Connect the connecting cable (HF cable) (see chapter 6.5.3).

6.5.2 Installing a ProfiDAT® Transceiver on a Mobile System Component

Also observe the information and safety instructions in the manufacturer's documentation when installing the transceiver!

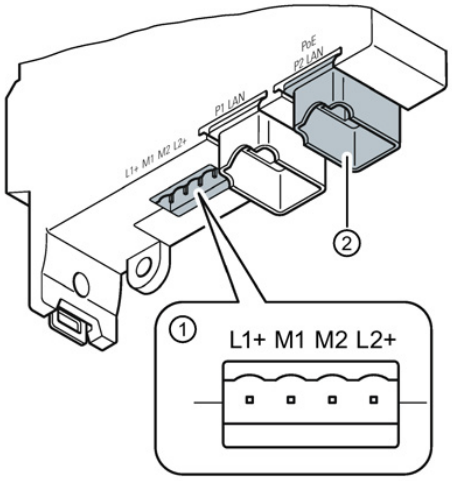

Fig. 60: Connections on the transceiver

Work steps:

→ Fasten the ProfiDAT® transceiver to the DIN rail (35 mm) in the switching cabinet of the mobile system component.

→ Connecting the cable to the power supply (24 V) on the transceiver:

- Direct infeed via the 4-pole socket: Connection pinout (see Fig. 60):
  L1+: 24 V DC
  M1: Chassis ground
  M2: Chassis ground
  L2+: 24 V DC

CAUTION!

Do not reverse the polarity of the connections!

- Power over Ethernet via the RJ45 Ethernet interface P2 (2).

→ Connect the Ethernet plug (RJ45) to the transceiver (P1 or P2).

→ Connect the connecting cable (HF cable) (see chapter 6.5.3).

6.5.3 Installing the Connecting Cable (HF cable) on the Infeed Antenna

The connecting cable to the infeed antenna on the ProfiDAT® profile is installed between the transceiver in the infeed switching cabinet and the connection on the infeed antenna.

Work steps:

→ Push a heat-shrink sleeve onto one end of the connector cable.

→ Fasten/Screw the straight N plug on the connector cable onto the socket at the power feed cabinet.

→ Run the connecting cable to the socket of the infeed antenna.

→ Push a heat-shrink sleeve onto the other end of the connector cable.

→ Fasten/Screw the angled N plug on the socket of the infeed antenna.

→ Fasten the cable run to the support structure with cable ties, etc. Stow the excess cable neatly.

CAUTION!

Do not crush the cable!

Comply with the bending radius of the cable.

→ Push both heat-shrink sleeves over the plugs and socket and shrink them with a heat gun.

6.5.4 Installing the Connection Cable (HS Cable) on the Transceiver

The connecting cables of the antenna on the current collector are installed on the transceiver in the switching cabinet of the mobile system component.
Also observe the information and safety instructions in the manufacturer's documentation when installing the connecting cables!

Work steps:

→ Installing the ProfiDAT® adapter cable on the transceiver.

→ Run the connecting cable to the adapter cable.

→ Connect the connection cable to the ProfiDAT® adapter cable.

→ Secure the cable run with cable ties, etc.

CAUTION!

Do not crush the cable!

Comply with the bending radii of the cables.

→ Secure the connection point between the connection cable and the ProfiDAT® adapter cable (strain relief).

CAUTION!

Avoid tensile stress on the ProfiDAT® adapter cable.

→ Install the second connection cable in the same manner.

6.6 Profile-heating (optional)

Condensation on the contact surface of the ProfiDAT® profile can lead to insulation faults, as well as increasing oxidation of the rail and wear of the carbon brushes. The conductor rail heating is designed to prevent condensation, hoarfrost or ice from forming around the contact surface.

To this end, the ProfiDAT® profile is temperature controlled using an optional heating cable starting at a temperature near the dew point or the point of formation of frost and ice. The trace-heating cable is laid in the cavity of the profile and is supplied as a conductive loop with external auxiliary power.

The heating power required depends on a number of parameters. It must be taken into consideration that whether ice forms on a profile or not depends on the installation situation of the profile and its environment,
Where a profile is exposed to wind, wind-chill effects can cause ice to form even when the temperature is still above 0°C.

The profile-heating controller has temperature and dew-point sensors. The profile heating is switched on if the temperature falls below a certain value and reaches the dew point.

Electrical hazards and sources of danger

DANGER!

Risk of death by electrical shock!

When working on these components, death or injury may result from electrical shock, burns, or electrical arcs, because they are electrically live:

Conductor rails and current collectors, cables and connections, servomotors, switching cabinets and control systems.

Before entering the danger zone and working on these components:

- → Disconnect the system from the power at the main switch.
- → If there is no main switch, disconnect the energy source from the system according to the instructions of the system manufacturer.
- → Secure the system against being switched on again.
- → Confirm that the power has been disconnected.
- → Ground and short-circuit parts of the system disconnected from power.
- → Cover or block off adjacent energized components,
- → Before each start-up, test the insulation resistance according to locally applicable technical standards, directives and laws.

WARNING!

Risk of fire!

Overloaded cables are a fire risk!

- → Before commissioning, test the product in accordance with the manufacturer's checklist.
- → Only have testing carried out by qualified technicians who are familiar with both the product and the regulations concerning workplace safety and accident prevention.

6.6.1 Profile-heating Controller

The figure below shows the switching cabinet for the profile heating with the three indicators on the front side.

The green lamp (1) indicates the operational readiness of the controller.
The white lamp (2) indicates whether the heating is switched on or off.
The red warning lamp (3) indicates faults. Faults include, for example, the failure of the circuit breaker or other fuse elements.

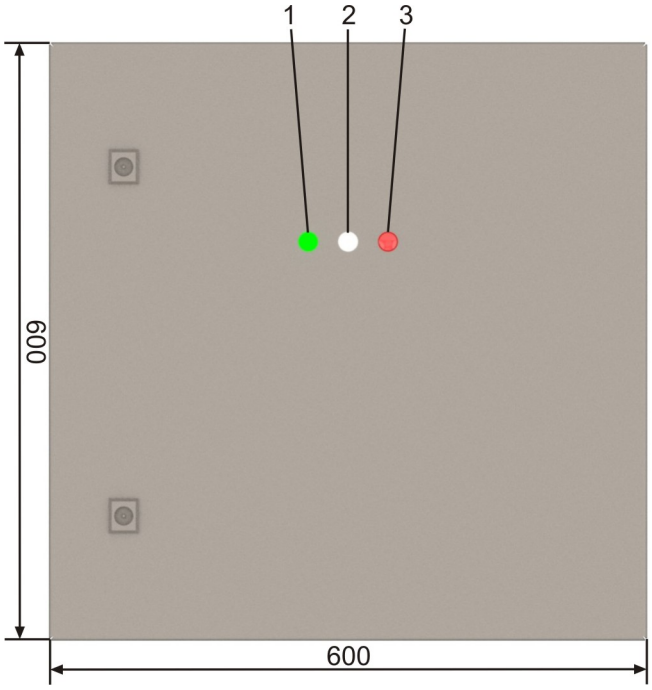

Fig. 61: Profile-heating switching cabinet

6.6.2 Profile-heating Components

The profile heating consists of the trace-heating cable, the wiring components and the temperature-dependent power supply.

Trace-heating cable

The trace-heating cable is a resistive heating cable used in different nominal sizes. It is drawn into the cavity between the profile rail and the profile insulation (see chapter 6.4.14). The external dimensions are designed such that the trace-heating cable passes through the lateral groove on the infeed antenna or expansion element as well as through the bottlenecks at the connector. Trace-heating cables with larger diameters or self-regulating heat tapes with feed and return lines cannot be used.

During installation, ensure that the trace-heating cable insulation is not damaged and that the heating cable is not jammed in the profile connections. If the trace-heating cable or its insulation is damaged, the heating can fail, a short circuit can occur, or a connection to the conductor rail can occur (stray voltage).

6.7 Checklist and Initial Commissioning

WARNING!	**This checklist serves as a guide to ensure the safe operation of the electrification system.** The checklist is intended for qualified professionals who install and commission electrification systems and are familiar with the regulations on safety at work and accident prevention. **The report on the next few pages must be filled out during initial commissioning.**

Final customer		**Customer no.**	
		Order no.	
Place of commissioning			
Address			
Country			

Site no.		**System no.**	
Serial number ProfiDAT® transceiver			
Start of commissioning		**Commissioning Engineer**	
End of commissioning		**Name**	
		Date	
		Signature	

No.	Description	Remark: OK/not OK
1.	**Installation**	
1.1.	The number of profile hanger clamps is correct (with a maximum spacing of 2500 mm).	
1.2.	The expansion elements are correctly installed.	
1.3.	The ProfiDAT® profiles are correctly aligned.	
1.4.	The current collector is correctly installed. The force between the carbon brushes and the Profi-DAT® profile is 28 N.	
1.5.	The current collector is correctly aligned to the ProfiDAT® profile.	
1.6.	There are no objects blocking the movement range of the current collector.	
1.7.	The ProfiDAT® connectors are correctly installed (maximum gap of 0.5 mm between profiles; no vertical or horizontal offset).	
1.8.	The infeed modules/infeed unit are/is correctly installed.	
1.9.	The terminating unit is correctly installed.	
1.10.	The protective conductor cable at the start of the ProfiDAT® profiles is correctly installed.	
1.11.	The protective conductor cables are correctly installed on the PE connectors.	
1.12.	The carbon brushes are free of grease.	
1.13.	The trace-heating system has been correctly installed (if an optional heating system has been installed).	
1.14.	All screws have been tightened according to the specification.	
1.15.	The ProfiDAT® transceivers have been correctly installed.	
1.16.	The ProfiDAT® infeed cabinet has been correctly installed.	
1.17.	All electrical connections have been correctly completed by specialist personnel.	
1.18.	All RF cables have been correctly installed.	
1.19.	The operating personnel have been trained.	
2.	**ProfiDAT® connection**	
2.1.	**The stationary ProfiDAT® Transceiver is turned on and the LAN is connected** Turn on the 24 V power supply to the ProfiDAT® Transceiver and allow at least 1 minute for the ProfiDAT® Transceiver to load. Requirement: LED “L1” or “L2” or “PoE” lights up green LED “R1” lights up green or flashes green orange. LEDs "P1" and / or "P2" light up green or flash green orange LED "F" does not light up	

No.	Description	Remark: OK/not OK
2.2.	**The ProfiDAT® Transceiver on the vehicle is turned on and the LAN is connected** Turn on the 24 V power supply to the ProfiDAT® Transceiver and allow at least 1 minute for the ProfiDAT® Transceiver to load. Requirement: LED “L1” or “L2” or “PoE” lights up green LED “R1” lights up green or flashes green orange. LEDs "P1" and / or "P2" light up green or flash green orange LED "F" does not light up	
2.3.	**The ProfiDAT® Connection is established** Requirement: LED “R1” lights up green or flashes green orange	

*The initial commissioning of the transceiver must occur **simultaneously** with the commissioning of the system into which the data transmission system is integrated. The establishment of the connection and transfer of data can only occur once the system has been switched on and a connection has been established between the antenna on the current collector and the infeed antenna via the ProfiDAT® profile.*

No.	Description	Remark: OK/not OK
3.	**Commissioning**	
3.1.	**Current-collector check – low speed** Test: traverse the entire guideway at 10 % of the maximum speed. Monitor the activity of the current collector on the ProfiDAT® profile watch, especially at joints and the expansion element. Required result: The connections and transitions over the whole length of the ProfiDAT® profile are smooth and the activity of the current collector is problem free at all times.	
3.2.	**Current-collector test – increased speed** Test: Increase the speed to 30 %, 50 %, 80 %, and finally 100 % of the full speed. Required result: The activity of the current collector is problem free at all times.	
3.3.	**Additional functional tests** Required result: All other functions are carried out in accordance with customer requirements.	

7 Operation

7.1 Safety

WARNING!

Risk of death due to suspended loads!

Falling loads can lead to severe injuries or even death.

→ Never walk under suspended loads.

→ Only move loads under supervision.

→ Set down the load before leaving the workplace

Danger of injury due to improper operation!

Improper operations can result in serious personal injury and material damage!

→ Carry out all operating steps according to the specifications of these mounting instructions.

→ Before starting work, ensure that all covers and safety devices are installed and working property.

→ Never disable the safety systems during operation.

→ Maintain order and cleanliness in the working area! Loosely stacked or scattered components and tools are sources of hazards.

Danger for unauthorized personnel!

Unauthorized persons who do not meet the requirements described here are not acquainted with the dangers in the working area!

→ Keep unauthorized personnel away from the working area.

→ In case of doubt, address the person and direct them away from the working area.

→ Stop working as long as unauthorized persons are in the working area.

Electrical

Do not exceed the rated voltage specified in chapter 3. The data transmission system can be overloaded by excessive current or voltage. Danger of fire, destruction of the data transmission system!

Personnel:

- The system may only be operated by trained personnel!

Personal protective clothing (this must be worn for all work):

- Protective work clothing
- Protective footwear

8 Maintenance and Servicing

8.1 Safety

WARNING!

Danger of injury due to improperly executed maintenance tasks!

Improper maintenance can result in serious injury to person and property.

- → Before starting work, ensure sufficient space for assembly.
- → Make sure the installation area is tidy and clean! Loosely stacked or scattered components and tools are sources of hazards.
- → If components have been removed, check for proper installation, replace all fastening elements and comply with screw-tightening torques.
- → Turn off power switches and secure them against unauthorized switching on.
- → Use the provided climbing aids and working platforms, whenever installation tasks are carried out above eye level.
- → Do not use machine components as climbing aids.
- → Ensure that process and auxiliary materials are drained, collected and disposed of in a safe and environmentally friendly manner.
- → Safety devices that have been removed for installation, service or repair work must be installed and inspected immediately after the work is complete.
- → Observe the inspection and maintenance intervals described in the maintenance instructions.
- → Ensure that sufficient space for maintenance work is available.
- → Ensure that powered components are not inadvertently activated during maintenance work.
- → Ensure that detached parts do not fall.
- → Screw joints that were loosened during maintenance work must be retightened and secured according to instructions.
- → Fasteners and seals that cannot be reused must be replaced (e.g. self-locking nuts, disks, splints, O-rings, glued or microencapsulated screws).
- → Lubrication/Greasing points that are cleaned or wiped during maintenance and repair work must be relubricated as instructed.
- → After finishing work, collect all tools and materials and check that all are present.
- → Disassembled parts and components that were exchanged are to be collected, stored in a safe place, recycled or returned.
- → Before entering systems, they must be disconnected from power at the main switch and secured against unauthorized, unintentional and/or erroneous switching on.

8.2 Maintenance Plan

The following chapters describe the maintenance tasks required for optimal, trouble-free operation. The tasks specified and performed as per the maintenance plan must be logged.
If regular checks reveal increased wear, the required maintenance intervals should be shortened in accordance with the actual signs of wear.
Contact the manufacturer in case of any questions regarding maintenance tasks and intervals - see the service address on the last page.

Interval	Maintenance work	To be carried out by
14 days: 3- and 4-shift operation **30 days: 2-shift operation after no more than 300 hours**	Visual inspection of ProfiDAT® system components ■ Proper condition ■ Proper function ■ Firm seating of screws and nuts ■ Deformation ■ Wear ■ Damage ■ Pollution Degree ■ Corrosion	Operator
Every 4 weeks	Visual and functional inspection ■ Wear of carbon brushes	Technician
Every 6 months	Visual and functional inspection ■ Check for ease of motion ■ All electrical connections and cables Visual inspection of the components of the ProfiDAT® system for: ■ Proper condition ■ Proper function ■ Deformation ■ Wear ■ Damage ■ Pollution Degree ■ Corrosion	Technician
	Check of screw connections ■ Check for firm seating of screws ■ If necessary tighten to torque (see chapter 6).	Technician
Every 6 months	Inspection of the current collectors ■ Installation dimensions ■ Contact force of the carbon brushes ■ Connector cables ■ Oil joints and/or bolts	

8.2.1 Documentation

→ The results of inspections and the measures taken are to be documented in written reports.

→ Conductix-Wampfler must be informed immediately of any defects or malfunctions that occur during the test phase and within the warranty period.

8.2.2 Replacement of the ProfiDAT® Antenna

Required tools:

- Allen key, SW5

Work steps:

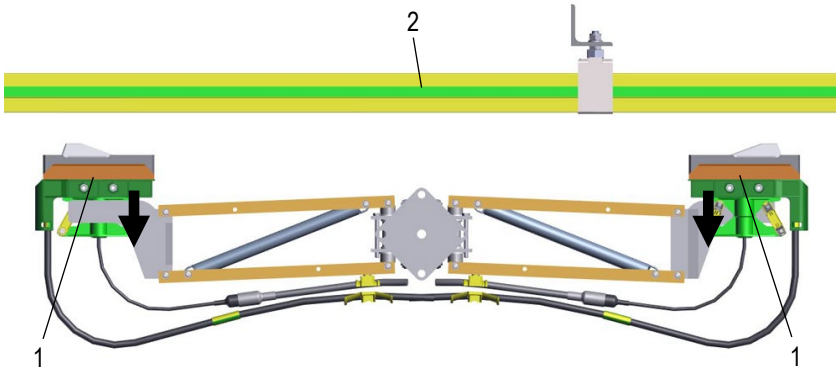

Fig. 62: Remove the current-collecting head from the ProfiDAT® profile

→ Pull the current-collecting head (1) down and out of the ProfiDAT® profile (2).

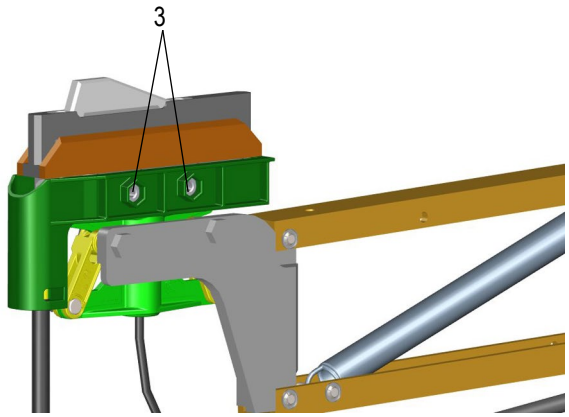

Fig. 63: Loosening screws

→ Loosen the 2 hexagonal-socket-headed screws (3) (without removing them).

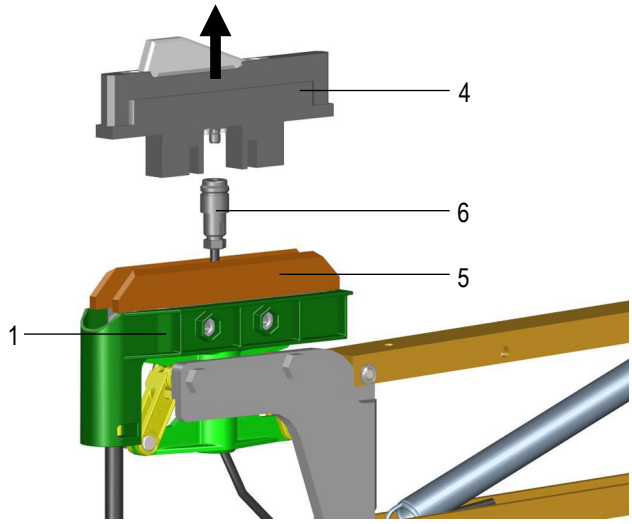

Fig. 64: Pulling out the antenna

→ Pull out the antenna (4) in an upwards direction.

CAUTION!

Make sure that the carbon brushes (5) do not fall out.

→ Loosen the coupling ring of the cable (6) and disconnect the cable from the antenna (4).

→ Clean the head of the current collector (1) with a clean cloth.

→ Connect the cable (6) with the coupling ring to the new antenna.

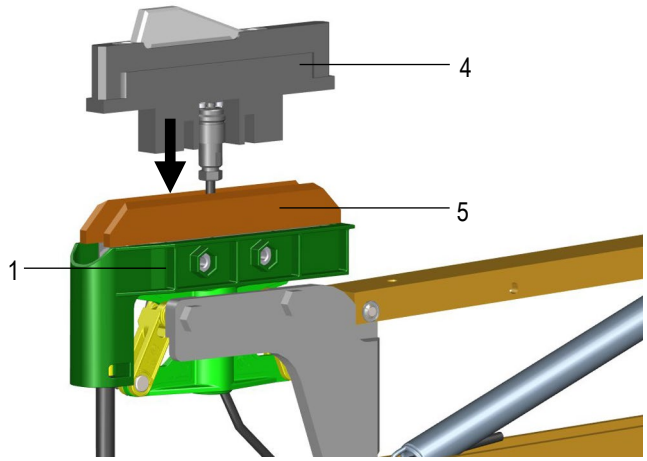

Fig. 65: Inserting the antenna in the head of the current collector

→ Insert the antenna (4) between the 2 carbon brushes (5) from above.

CAUTION!

Make sure that the antenna (4) and at the carbon brushes (5) make contact with the current-collecting head (1).

→ Tighten the 2 hexagonal-socket-headed screws (3; see Fig. 63).

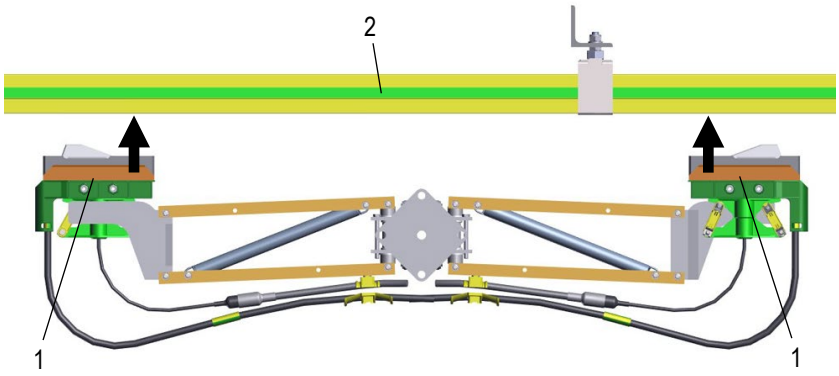

Fig. 66: Inserting the current-collecting head into the ProfiDAT® profile

→ Insert the current-collecting head (1) into the ProfiDAT® profile (2) from below.

8.2.3 Maximum Wear of the Carbon Brushes

WARNING!

Destruction of the system due to lack of grounding!

Carbon brushes that have been worn down beyond the permitted limit can no longer make good contact with the ProfiDAT® profile. Poor contact between carbon brush and profile leads to the loss of the PE connection (ground)! In case of a short circuit, the system is not grounded.

→ Regularly check the degree of wear of the carbon brushes.

→ Under no circumstances continue to use defective or worn out carbon brushes. Worn out carbon brushes must be exchanged immediately.

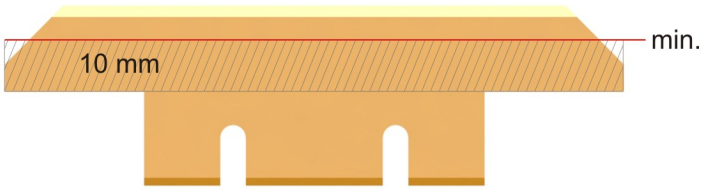

Fig. 67: Wear limit of the carbon brush on the ProfiDAT® current collector

8.2.4 Replacement of Carbon Brushes on the ProfiDAT® Current Collector

Required tools:

- Allen key, SW5

Work steps:

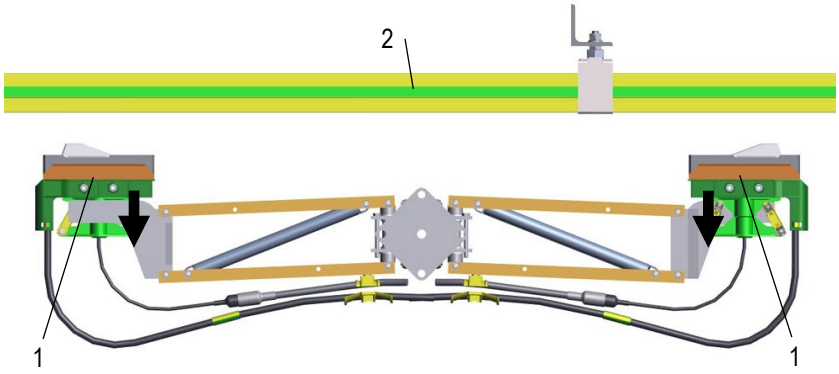

Fig. 68: Remove the current-collecting head from the ProfiDAT® profile

→ Pull the current-collecting head (1) down and out of the ProfiDAT® profile (2).

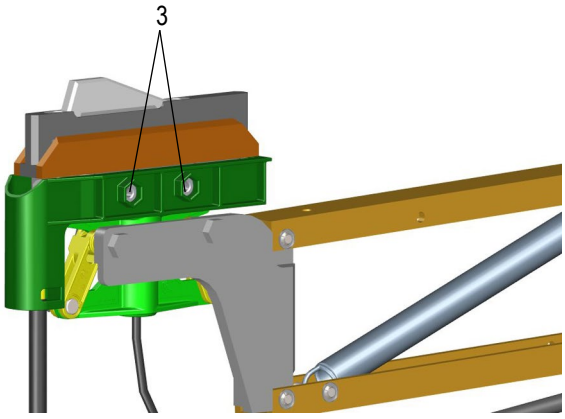

Fig. 69: Loosening screws

→ Loosen the 2 hexagonal-socket-headed screws (3) (without removing them).

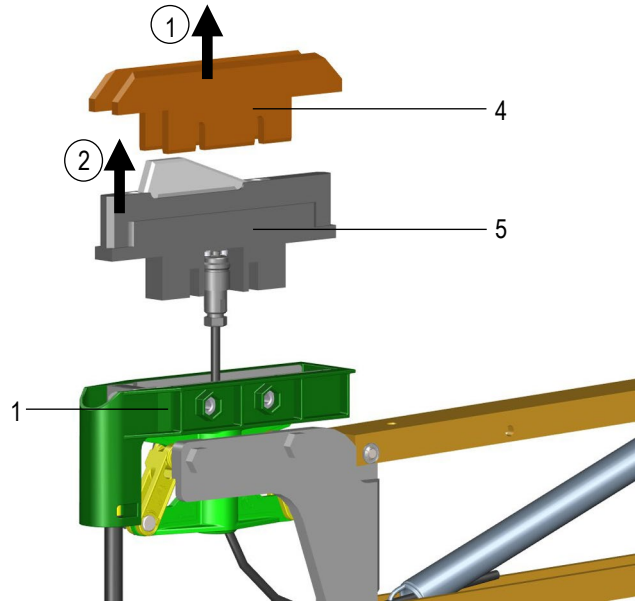

Fig. 70: Pull out the carbon brushes

→ Pull out the carbon brushes (4) in an upward direction.

→ Pull out the antenna (5) in an upwards direction.

The cable on the antenna does not have to be disconnected.

→ Clean the head of the current collector (1) with a clean cloth.

→ Insert both carbon brushes (4) into the current-collecting head (1) from above.

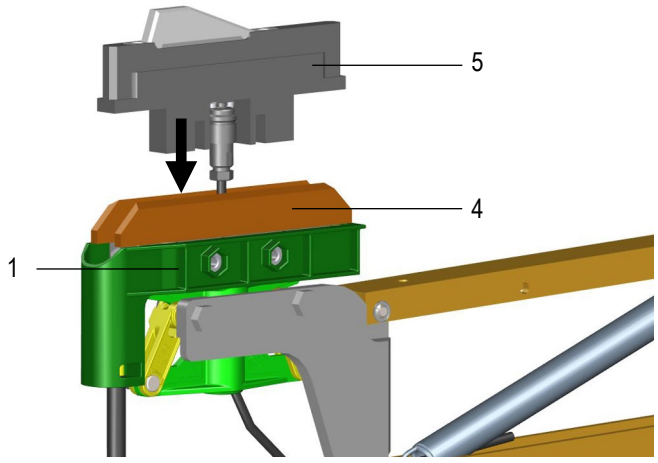

Fig. 71: Inserting the antenna between the carbon brushes

→ Insert the antenna (5) between the 2 carbon brushes (4) from above.

CAUTION!

Make sure that the antenna (5) and at the carbon brushes (4) make contact with the current-collecting head (1).

→ Tighten both hexagonal-socket-headed screws (3; see Fig. 69).

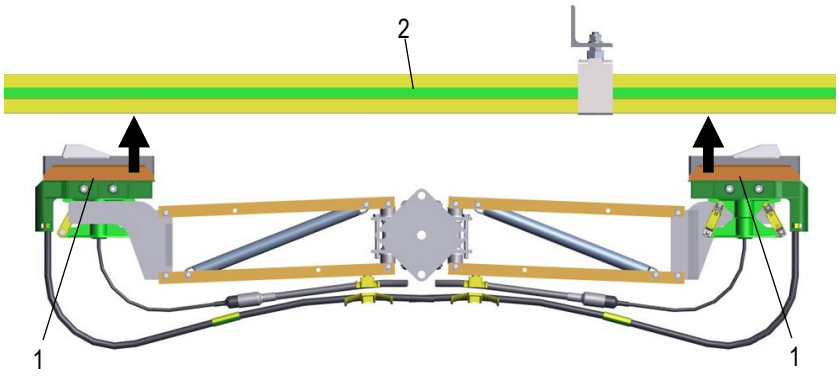

Fig. 72: Inserting the current-collecting head into the ProfiDAT® profile

→ Insert the current-collecting head (1) into the ProfiDAT® profile (2) from below.

9 Troubleshooting

WARNING!

Danger of injury due to improper troubleshooting!

Improper troubleshooting can result in serious injury to person and property.

→ Contact the manufacturer in case of malfunction.

→ Allow troubleshooting to be carried out only by personnel from or authorized by the manufacturer.

CAUTION!

In case of a frequently occurring PROFINET errors:

→ Inspect the mechanical system.

Ensure that the data load on the ProfiDAT® system does not exceed the limits specified on page 23.

10 Dismantling and Disposal

10.1 Safety

WARNING!

Danger of injury due to improper dismantling!

Stored residual energy, sharp components, and points and edges on and in the data transmission system or the required tools can cause injuries.

- → Before starting work, ensure sufficient space.
- → Handle open, sharp-edged components with care.
- → Make sure the workplace is tidy and clean! Loosely stacked or scattered components and tools are sources of hazards.
- → Dismount components properly. Be aware of the high dead weight of some components. If necessary, use lifting gear.
- → Secure components so that they cannot fall or fall over.
- → Involve the manufacturer in case of any unclear points.

10.2 Dismantling

After the end of its service life, the data transmission system must be disassembled and disposed of in an environmentally friendly manner.

→ Remove operating and auxiliary materials, as well as residual processing materials, and dispose of them in an environmentally appropriate manner.

WARNING!

Note the dangers due to electrical shock, harmful dusts, sharp edges and moving parts!

→ Clean the subassemblies and components properly, and dismantle and dispose of them in compliance with locally applicable occupational-safety and environmental-protection regulations.

10.2.1 Dismantling the Assembly

DANGER!

Danger of parts falling from above!

Falling parts can lead to severe injuries or even death.

A hazard exists that components fall down, during the disassembly of the data transmission system. These can lead to extremely severe injuries and even death.

- → Secure all components against falling during dismantling work.
- → Never walk underneath the disassembly location.
- → Barricade the disassembly location.

Personnel

- May only be carried out by trained technicians
- At least two people

Required tools

- Open-ended spanner, SW10
- Open-ended spanner, SW17
- Open-ended spanner, SW24
- Allen wrench SW3
- Allen key, SW5
- Phillips screwdriver
- Tools for ensuring safety

10.3 Disposal

In the absence of a return or disposal agreement, dismantled components must be recycled as follows:

- All metal parts must be scrapped
- Plastic components must be sent for recycling
- The other components are to be disposed of according to their material composition.

CAUTION!

Environmental damage due to improper disposal!

Electrical waste, electronic components, lubricants, and other auxiliary materials are subject to hazardous-waste disposal regulations and may only be disposed of by authorized specialists!

Local authorities or specialist disposal companies can provide information about environmentally appropriate disposal.

11 Additional Documents

11.1 Conformity Declaration

The conformity declaration for this product can be obtained from Conductix-Wampfler on request.

11.2 Other applicable Documents

Seq. no.	Document No.	Document name
01	C79000-G8900-C322-03	Industrial Wireless LAN, SCALANCE W760/W720 Operating Instructions
02	C79000-G8900-C325-04	Industrial Wireless LAN, SCALANCE W770/W730 Operating Instructions
03	A5E03678337-09	Industrial Wireless LAN SCALANCE W786-x Operating Instructions
04	WV0800-0001-D	Cleaning conductor rails

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Conductix-Wampfler GmbH
Rheinstrasse 27 + 33
79576 Weil am Rhein – Märkt
Germany

Phone: +49 (0) 7621 662-0
Fax: +49 (0) 7621 662-144
info.de@conductix.com
www.conductix.com