KeContact P20

Installation manual

(for the specialist)

KEBA

Automation by innovation.

Comments to this manual

In this manual you will find warnings against possible dangerous situations. The used symbols apply to the following meanings:

WARNING!

- **Indicates a potentially hazardous situation which, if not avoided could result in death or serious injury.**

CAUTION!

- **Indicates a potentially hazardous situation which, if not avoided may result in minor or moderate injury.**

CAUTION

- **Indicates a situation which, if not avoided could result in property damage.**

- **This symbol reminds you of the possible consequences of touching electrostatically sensitive components.**

Notice
Notes on use of equipment and useful practical tips are identified by "Notice". Notices do not contain any information that draws attention to potentially dangerous or harmful functions.

► Step of a sequence of operations.

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The device is designed in accordance with CE-rules.
The declaration of conformity is being held by KEBA AG.

The device meets the ROHS directive (RL 2011/65/EU).
The declaration of conformity is being held by KEBA AG.

Information on disposal
The symbol with the crossed-out garbage can points out that electrical and electronic devices including their accessories should not be disposed of in the household garbage. Information on correct disposal can be found on the product itself, in the instructions for use or on the packaging.
Depending on their coding, the raw materials are recyclable. By disposing of such used devices correctly, you can ensure that they can be reused, their raw materials recycled or put to another use, and you will be making an important contribution to the protection of our environment.

Disposal of batteries
Batteries or rechargeable batteries are hazardous waste and must be disposed of in the correct manner.
Although batteries have a low voltage, in the event of a short-circuit, they can still emit a charge sufficient to ignite flammable materials. Batteries should therefore not be disposed of together with conductive materials (such as iron filings, wire wool contaminated with oil etc.).

The latest **KeContact P20 firmware** can be downloaded from the Internet at www.kecontact.com (download area).
A new firmware can eg. consider modified standards or improve the compatibility with new electric vehicles.

Contents

1 Important information

1.1 Safety instructions

WARNING!

Not observing the safety instructions can result in risk of death, injuries and damage to the device! KEBA AG assumes no liability for claims resulting from this!

- **Electrical hazard!**
  The installation, commissioning and maintenance of the charging station may only be performed by correctly trained, qualified and authorized electricians who are fully responsible for the compliance with existing standards and installation regulations.

  Please observe that an additional overvoltage protection of vehicles or national regulations can be required.

  Also observe that some countries or vehicle manufacturers may require a different triggering characteristic of the fault-current circuit breaker (Type B).

- **Only connect voltages and circuits in the right-hand connection area (Ethernet, terminals for control lines) that have a secure separation to dangerous voltages (e.g. sufficient isolation).**

  Only supply the terminals (X2) from voltage sources which feature safety extra-low voltage!

- **Before commissioning, check all screw and terminal connections for firm seating!**

- **The connector panel cover may never be left open unattended. Mount the connector panel cover if you leave the charging station.**

- **Do not carry out any unauthorized conversion work or modifications to the charging station!**

- **Repair work to the charging station is not permitted and may only be performed by the manufacturer (replacement of the charging station)!**

- **Do not remove any notices on the device, such as safety symbols, warning notices, rating plates, nameplates or cable markings!**

- **The charging station does not have its own power switch! The RCD circuit breaker and the line circuit breaker of the building installation serve as mains disconnector.**

- **Observe the instructions given for selecting the location and the constructional requirements!**
  If the specifications for the location are not observed, this can result in death, serious physical injury or equipment damage if the corresponding precautionary measures are not met!

WARNING!

- **Pull the charging cable only at the plug and not at the cable out of the connector.**

- **Ensure that the charging cable is not mechanically damaged (bent, pinched or run over) and the connection area does not come into contact with heat sources, dirt or water.**

5 safety rules:

- Shut down all poles and all sides!
- Secure against reactivation!
- Check that the equipment is voltage-free!
- Ground and short-circuit!
- Cover adjacent live parts and restrict access to hazardous areas!

ATTENTION

- **Risk of damage!**
  Make sure that the charging station is not damaged by improper handling (anchoring, housing cover, socket, inner parts etc.).

- **Do not open the connector panel cover in the rain!**

- **Risk of breaking the plastic housing!**
  - Countersunk screws may not be used for the mounting!
  - The included washers must be used.
  - Do not tighten the mounting screws with force.
  - The mounting surface must be completely level (max. 1 mm difference between the support points or mounting points). Warpage of the housing must be prevented.

Information for technicians who are permitted to open the device:

- **Risk of damage!**
  Electronic components can be destroyed if touched!

  Before handling components, make sure you perform an electrical discharge by touching a metallic, grounded object!

1.2 Intended use

KeContact P20 is a "charging station" for the indoor and outdoor area at which electrically operated vehicles can be charged (e.g. electric automobiles).

The charging station is designed for installation on a wall or in a floor-mounted column.

The respective national regulations must be observed with regard to the installation and connection of the charging station.

The intended use of the device always includes the compliance with the environmental conditions for which this device was developed.

The device was developed, manufactured, inspected and documented in compliance with the relevant safety standards. Therefore, the products do not pose any danger to the health of persons or a risk of damage to other property or equipment under normal circumstances, provided that the instructions and safety precautions relating to the intended use are properly observed.

The instructions contained in this manual must be followed precisely in all circumstances. Failure to do so could result in the creation of potential sources of danger or the disabling of safety devices. Apart from the safety instructions given in this manual, the safety precautions and accident prevention measures appropriate to the situation in question must also be observed.

Only electrical vehicles or their chargers may be connected. A connection of other loads (e.g. electric tools) is not permitted!

Due to technical or legal restrictions, not all variants / options are available in all countries.

1.3 About this manual

This manual is valid for devices of the type

- KeContact P20

Use of this manual

This installation manual is intended for qualified personnel only[1].

The figures and explanations contained in this manual refer to a typical device design. The design of the device may deviate from it.

Please refer to the "KeContact P20 User manual" for information and instructions about operating the device.

[1] Persons who, due to their special training, expertise, and experience, as well as knowledge of current standards, are able to assess the work performed and the possible hazards.

1.4 Product description

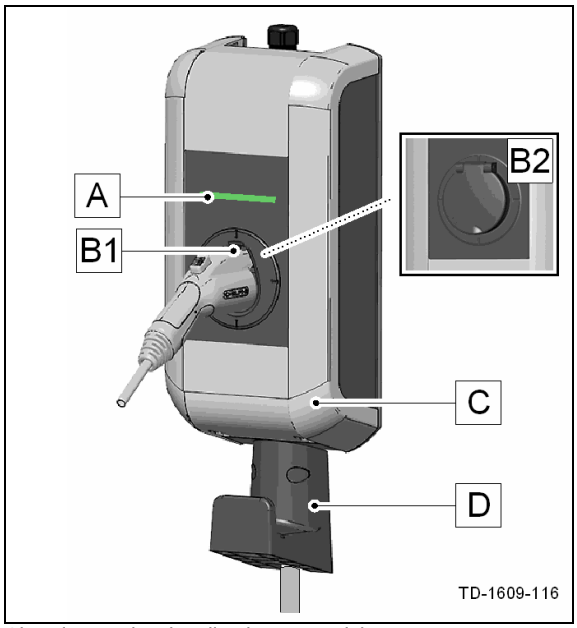
Example KC-P20-ES240030-000-xxxx

Type plate	Product family	-	Product type	Type / Version	-
see top of the device	KC	-	P	20	-
	KeContact		ChargePoint	Type	

Design versions							
Basic versions	Cable / Socket					Electronics	Electrics
E	S	2	4	0	0	3	0
E…Europe	***S…Socket*** C…Cable	1…Type 1 ***2…Type 2***	1…13A 2…16A 3…20A ***4…32A***	***00…no cable*** 01…4m straight 04…6m straight 99…4m spiraled		0…e-series 1…b-series 2…c-series ***3…c-series + PLC***	***0…Contactor*** 1…Contactor 1-phase

-	Options			-	Optional Customer code 2-digit
	Buttons		Authentication		
	Left	Right			
-	0	0	0	-	xx
	0…not populated		***0…not populated*** R…RFID K…Key switch		

2 Overview



Charging station (application example)

Typical version with charging cable

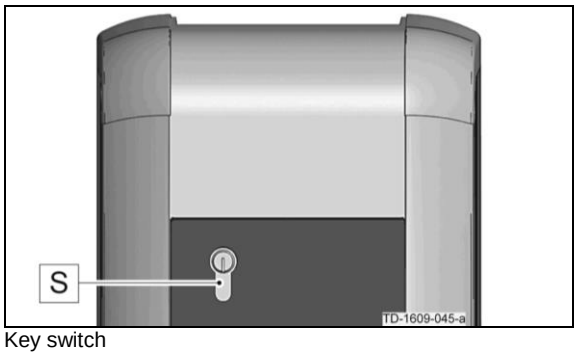
[A]… Status LED
[B1]… Parking bay for charging plug
[B2]… Standard socket (variants possible)
[C]… Housing cover
[D]… Hanger for charging cable

Note
Depending on the design of the charging station, the parking bay may deviate from the form shown.

2.1 Optional equipment (except e-series)

RFID sensor

RFID sensor
The RFID sensor **[R]** is used for touchless authorization of a user with MIFARE cards or tags according to ISO14443.



Key switch

Key switch
The key switch **[S]** is used for authorizing a user.

2.1.1 Additional optional equipment

- Network capability
- Switch contact (for control of external additional equipment)
- Enable input for e.g. ripple control receivers, time switches,…
  This permits a scheduled (time-controlled) charging of the vehicle to be realized.
- PLC (Power Line Communication) according to GreenPhy standard
- Mounting column
- 3-phases
- ZER 1.2 conform
- Energy meter

3 Installation guidelines

3.1 General criteria for the site selection

The charging station was constructed for the indoor and outdoor area. Accordingly, it is necessary to ensure the installation conditions and the protection of the device at the installation site.

- Take into account the local electrical installation regulations, fire prevention measures and accident prevention regulations as well as emergency routes at this site.
- The charging station must not be installed in potentially explosive zones (EX environment).
- Mount the charging station so that it is not located in the direct flow of passersby and so that no one can trip over connected charging cables and so that the charging cables do not cover or cross passing pedestrian and motorized traffic.
- Do not install the charging station at locations where ammonia or ammonia gas is exposed (e.g. in or at stables).
- The mounting surface must be sufficiently constructed in order to withstand the mechanical forces.
- Do not mount the charging station at locations where falling objects (e.g. hung ladders or automobile tires) could damage the device.
- According to the product standard, the charging station must be located at a height between 0.4 m and 1.5 m.
  We recommend mounting the charging station (height of the socket or parking bay) at a height of 1.2 m. Observe that national regulations can limit this height.
- The device may not be exposed to direct spray water (by e.g. neighboring manual carwash facility, high-pressure cleaner, garden hose).
- If possible, the device should be mounted protected from direct rainfall, in order to avoid e.g. icing, damage because of hail or similar.
- If possible, the charging station should be mounted protected from direct sunlight, in order to avoid the reduction of the charging current or the interruption of the charging procedure due too high temperatures of the components inside the charging station.
- For not weatherproof mounting (e.g. in a parking lot outside), the charging current setting is changed to 16A, if the temperature is inadmissible exceeded. Subsequently, the charging process can also be switched off.

For information about environmental conditions, please refer to the "Technical Data" chapter.

Observe the internationally relevant installation standards (e.g. IEC 60364-1 and IEC 60364-5-52) and follow the applicable national installation standards and regulations.

3.2 Specifications for the electrical connection

3.2.1 General

The charging station is set to 10 amps in the delivery state. Set the maximum EVSE current capacity by setting the DIP-switches in coordination with your installed line circuit breaker (see chapter “DIP-switch settings”).

The mains supply line must be hardwired to an existing house installation and correspond to the nationally applicable legal conditions.

Selection of the RCD circuit breaker:

- Each charging station must be connected to a separate RCD circuit breaker. No other circuits may be connected to this RCD circuit breaker.
- RCD circuit breaker of at least type A
  If the vehicles to be charged are not known (e.g. semi-public area), measures must be met for protection where direct fault currents (>6mA) occur. This can be realized, for example, through the use of an RCD type specifically intended for electric vehicles or with a RCD type B. The vehicle manufacturer specifications must also be observed.
- The nominal current I_N must be selected to match the line circuit breaker and the fuse.

Dimensioning the Line circuit breaker:
When dimensioning the line circuit breaker also observe the increased environmental temperatures in the switching cabinet! Under certain circumstances, this may require a reduction of the preadjusted charging current setting to increase the system availability.

- Maximum value according to the type plate data matching to the DIP-switch settings of the preadjusted charging current value.
- Determine the nominal current in accordance with the specifications on the type plate, in coordination with the desired charging current (DIP switch settings for the pre-adjusted maximum EVSE current capacity) and the mains supply line.

Dimensioning of the mains supply line:
When dimensioning the mains supply line also observe possible reduction factors and the increased environmental temperatures in the interior connection area of the charging station (see „Mains supply terminals temperature rating”)! Under certain circumstances, this can lead to an increase of the cable cross-section and to the adaptation of the temperature resistance of the mains supply line.

Mains disconnector:
The charging station does not have its own power switch. The RCD circuit breaker and the line circuit breaker of the mains supply line serve as mains disconnector.

3.2.2 Differing requirements for the fulfillment of „Z.E.-Ready®“ (Renault)

- For the case where the internal switching element (contactor) is no longer able to open, an additional switch-off capability must be realized. This can be realized with the switch contact output X2 (for details, see chapter "Switch contact output [X2]").
- No 13A charging cables may be used.
- For 3-phase connection of the KeContact P20, at least a fault-current circuit breaker RCD type A with DC fault current detection (>6mA) or a fault-current circuit breaker RCD type B must be used.

- Renault recommends the selection of the line circuit breaker according to the following table:

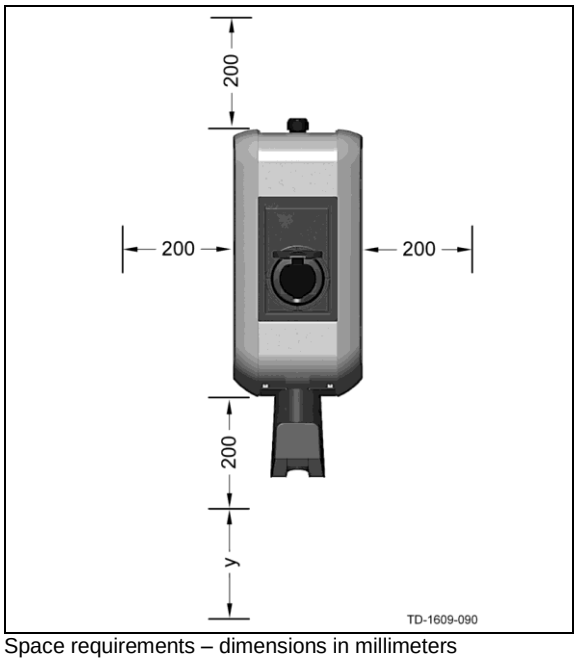
Preadjusted charging current value (DIP-switch setting)	Line circuit breaker	Characteristics	
		1-phase	3-phases
10A	**not allowed!**		
13A	**not allowed!**		
16A	**20A**	**C**	**D**
20A	**25A**	**C**	**D**
25A	**32A**	**C**	**D**
32A	**32A**	**B**	**C**

The nominal current of the selected line circuit breaker must not exceed the value on the type plate. If the preadjusted charging current setting and the nominal current are equal, in particular the temperature in the switching cabinet must be considered (thermal derating of the line circuit breaker).

Electricity supply earthing system requirements:

- In TT and TN systems, the ground resistance of the installation must be lower than 150 ohms.
- In IT or TT systems with ground resistance greater than 150 ohms, an isolating transformer has to be placed in the EVSE (Electric Vehicle Supply Equipment) upstream installation. This transformer must then be fed into a TN earthing system for which the above mentioned criteria apply.
- Electricity supplies with IT earthing systems are prohibited.

3.3 Space requirements



Space requirements – dimensions in millimeters

Space requirements

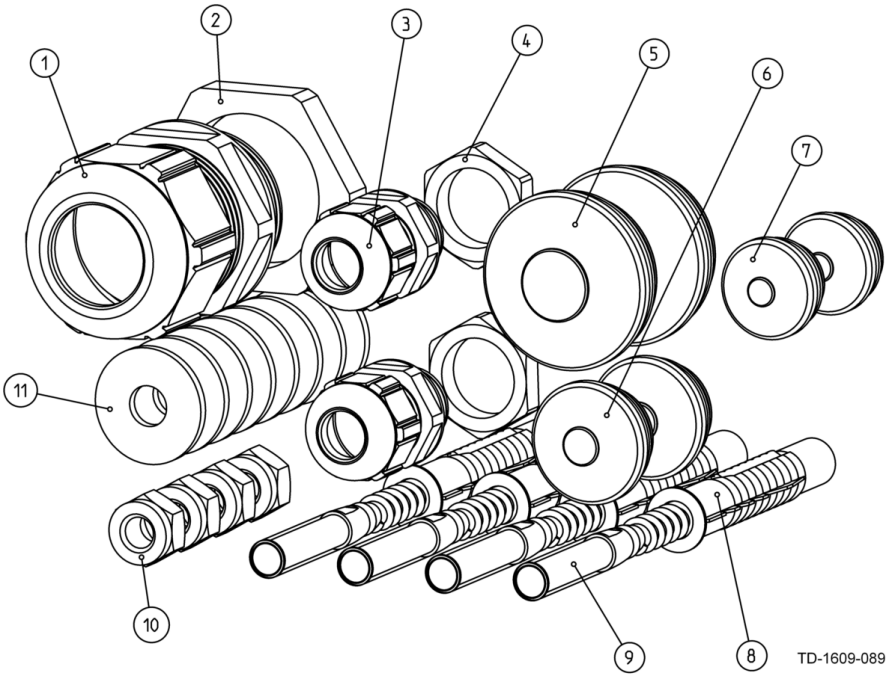
For device versions with optional cable hanger, additional and sufficient free area (**y**) for the charging cable to be used is to be accounted for.

If several charging stations are installed adjacent to each other, a distance of at least 200 mm between charging stations must be complied with.

4 Installation

Scope of supply		e-series	others
Charging station		1 piece	1 piece
Cable hanger (for versions with charging cable)		1 piece	1 piece
Installation manual (for the specialist)		1 piece	1 piece
User manual (for the end customer)		1 piece	1 piece
Drilling template		1 piece	1 piece
Keys for cylinder lock (optional)		-	3 pieces
RFID card (optional)		-	1 piece
	Terminal range (permitted cable diameter)		
[1] Cable gland M32x1.5	10 – 21 mm	1 piece	1 piece
[2] Lock nut M32x1.5		1 piece	1 piece
[3] Cable gland M16x1.5	4 – 10 mm	-	2 pieces
[4] Lock nut M16x1.5		-	2 pieces
[5] Double-membrane seals M32	14 – 21 mm	1 piece	2 pieces
[6] Double-membrane seals M20	7 – 12 mm	-	2 pieces
[7] Double-membrane seals M16	5 – 9 mm	-	2 pieces
Mounting set for wall insulation:			
[8] Anchor bolt for M8; Fischer UXR-8		-	4 pieces
[9] Hanger bolts M8x100		-	4 pieces
[10] Nut ISO 10511 - M8		-	4 pieces
[11] Washer ISO 7089 - 8.4		-	8 pieces

Supplied installation materials



Installation requirements

- Before beginning the installation, the installation guidelines must be observed.
- Contact person on-site (for access to the mains disconnector in the electrical distribution panel board).
- The electrical connection (mains supply line) must be prepared.
- Acclimation:
  With a temperature difference of more than 15°C between transport and installation site, the charging station should be acclimatized for at least two hours unopened.

  The immediate opening of the charging station can lead to a formation of water in the inside and can cause damages when switching on the device. A possible damage could also occur at a later time after installation.

  Ideally, the charging station should be stored at the installation site for a few hours. If this is not possible, the charging station should not be stored outside overnight or in a vehicle at cold temperatures (<5°C).

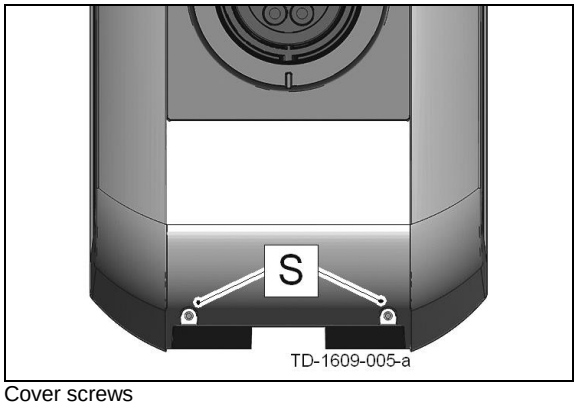
Tool list to handle KC-P20

The following tools are required for the installation:

- Flathead screwdriver for mains supply terminals (blade width 5.5 mm)
- Flathead screwdriver for terminals X1/X2 (blade width 3.0 mm)
- Phillips head screwdriver PH2
- Mounting tools for cable glands M16 (width across flats 20mm) and M32 (width across flats 36mm)
- LSA+ insertion tool (optional)

4.1 Preparing the housing

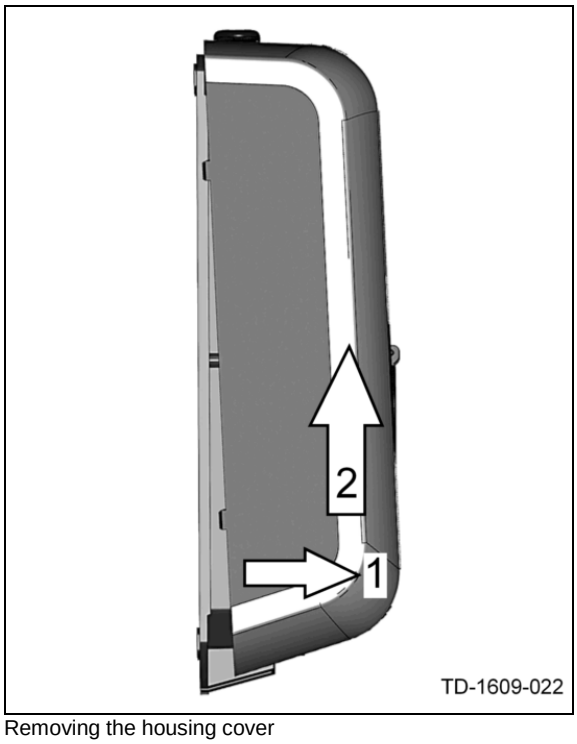
4.1.1 Removing the housing cover



Cover screws

Cover screws

- Unscrew the two cover screws **[S]** on the bottom side of the housing cover.

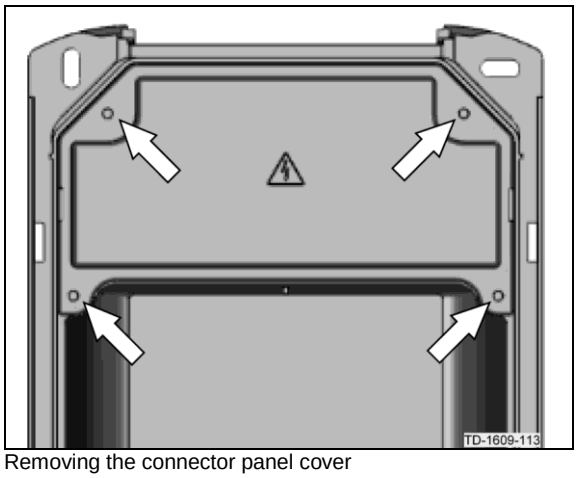


Removing the housing cover

Removing the housing cover

- **(1)** Pull the housing cover out slightly.
- **(2)** Slide the housing cover up slightly to unhinge it.

4.1.2 Removing/mounting the connector panel cover



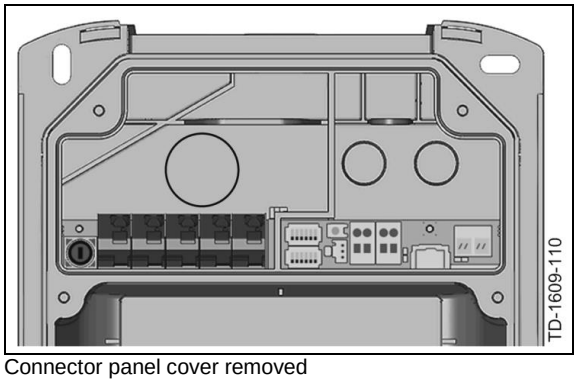
Removing the connector panel cover

Removing the connector panel cover

- ► Unscrew the four screws with which the connector panel cover is mounted and remove the connector panel cover.

Notice
Remove the dry bag from the connector panel and dispose it of properly.

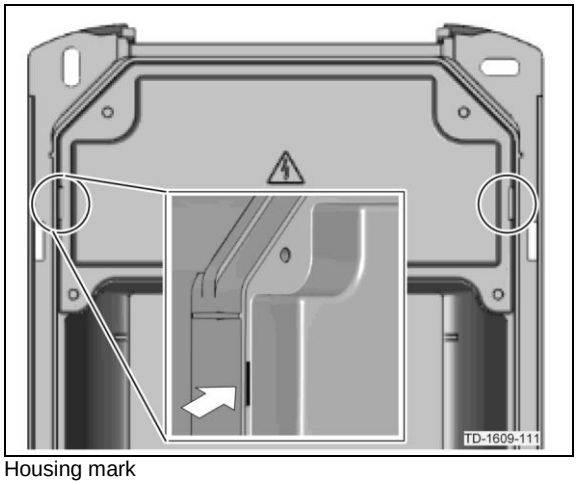
Information for reassembly



Connector panel cover removed

Mounting the connector panel cover

- ► Insert the connector panel cover again.
- ► Mount the connector panel cover again using the four screws.



Housing mark

Housing mark

- ► Tighten the four screws until the mark on the connector panel cover is even with the housing surface.

  The connector panel cover must seal the housing properly.

  Self-tapping screws require more force (min. 2.5 Nm to max. 5 Nm).

4.2 Preparing the cable insertion

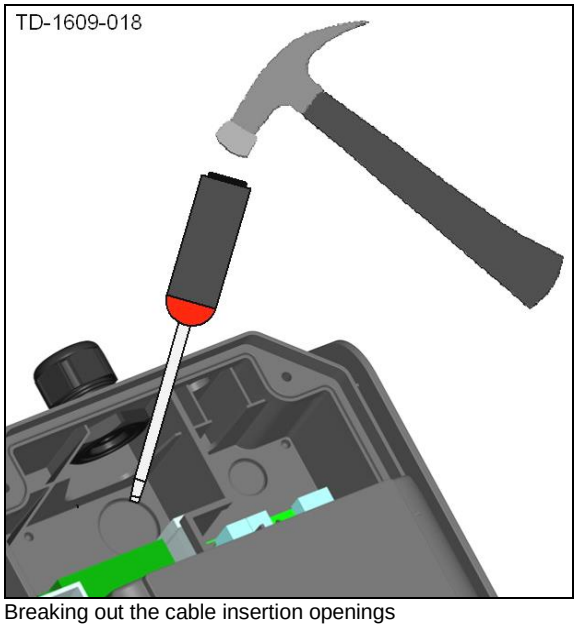
There are two possibilities available for the cable insertion:

- Cable insertion from above (surface cable routing)
- Cable insertion from behind (flush-type cable routing)

Preparations

► Remove the connector panel cover (see Chapter "Removing/mounting the cable panel cover").

► **Populate the charging station with the required cable glands or seals (if an open cable insertion opening is not used any more).**



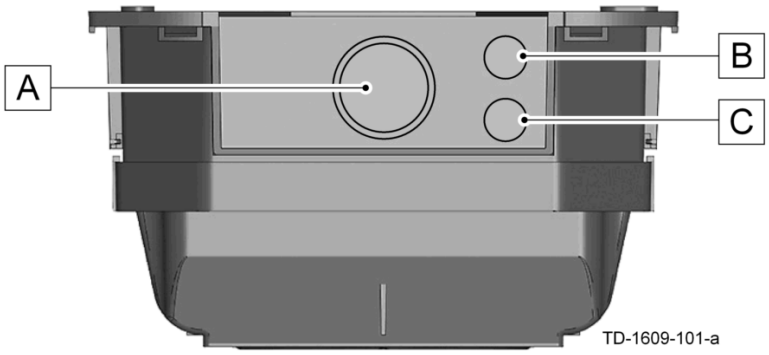
Breaking out the cable insertion openings

Breaking out the cable insertion openings

► Place the housing on on a stable support pad and use a hammer and flathead screwdriver to carefully break out the required cable insertion openings.

► Then insert the corresponding feedthroughs (cable glands or double-membrane seals)

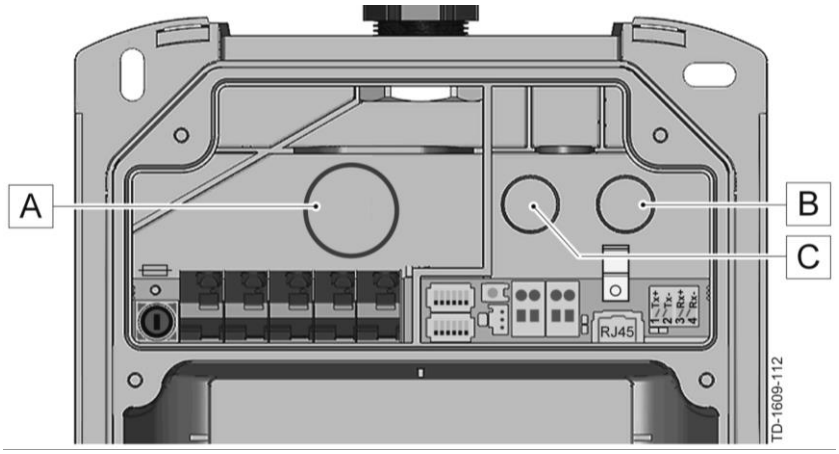
4.2.1 Cable insertion from above - surface cable routing



Cable insertion openings - top view

[A]…Cable gland M32 (mains supply line)	**[B]**…Cable gland M16 (for control line/Ethernet)
[C]…Cable gland M16 (for control line/Ethernet)	

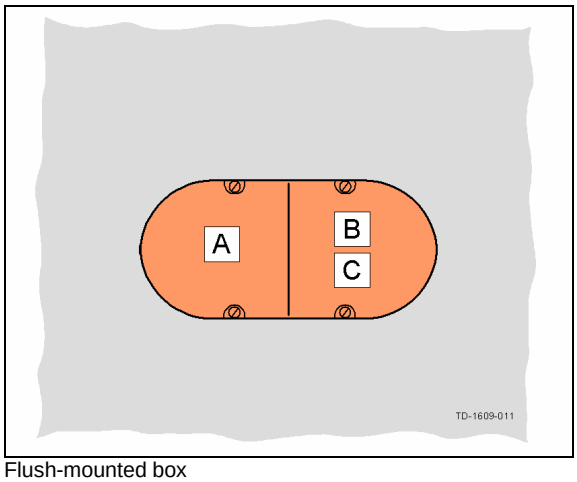
4.2.2 Cable insertion from behind - flush-type cable routing



Cable insertion openings - front view

[A]… Feedthrough / double-membrane seals M32 (mains supply line)	**[B]**… Feedthrough / double-membrane seals M20 (for control line/Ethernet)
[C]… Feedthrough / double-membrane seals M20 (for control line/Ethernet)	

It is important to ensure that the connection cable is inserted through the center of the double membrane seals to ensure the correct sealing of the device.



Flush-mounted box

Cable outlet
A double flush-mounted box with separating divider for secure separation can be provided for the cable insertion.

[A]… mains supply line
[B]… control line
[C]… Ethernet

4.3 Mounting the charging station

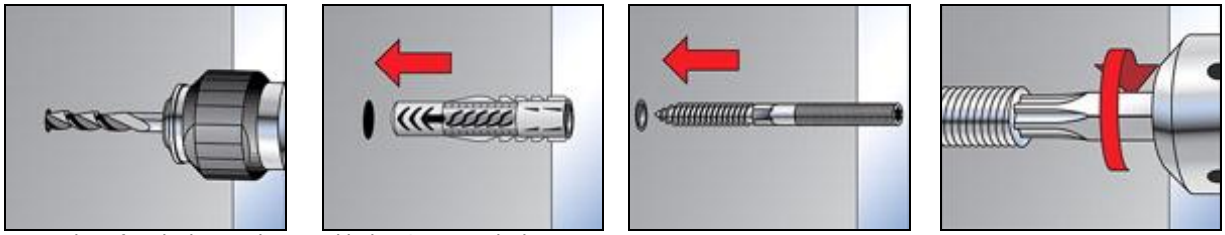
Installation materials

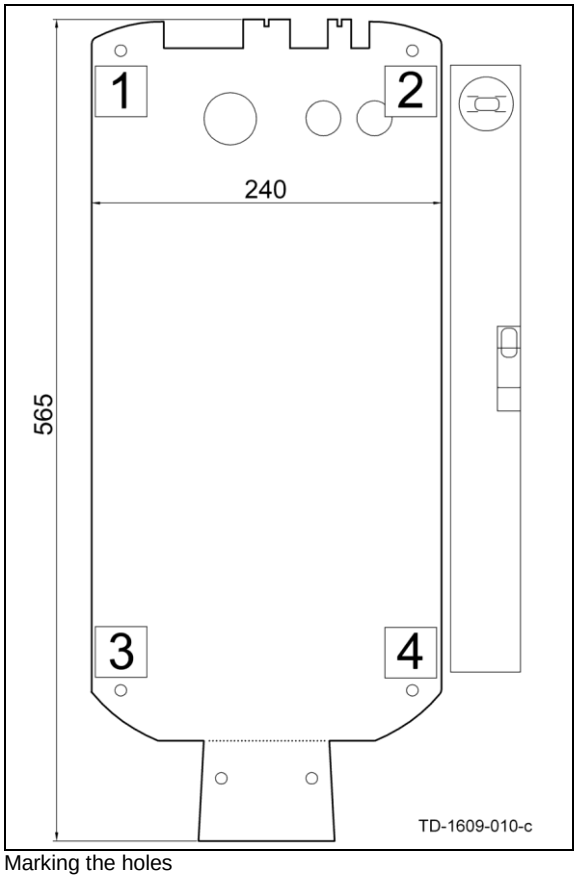
The included installation material is suitable for cement, brick and wood (without anchors).
For other surfaces, a suitable method of installation must be selected.

Depending on the device model or in case of special materials, the mounting materials must be made available on site.

A proper mounting is absolutely necessary and lies outside of the scope of responsibility of KEBA AG.

Please also observe the following manufacturer instructions:


Instructions for placing anchors and bolts. Source: Fischer



Marking the holes

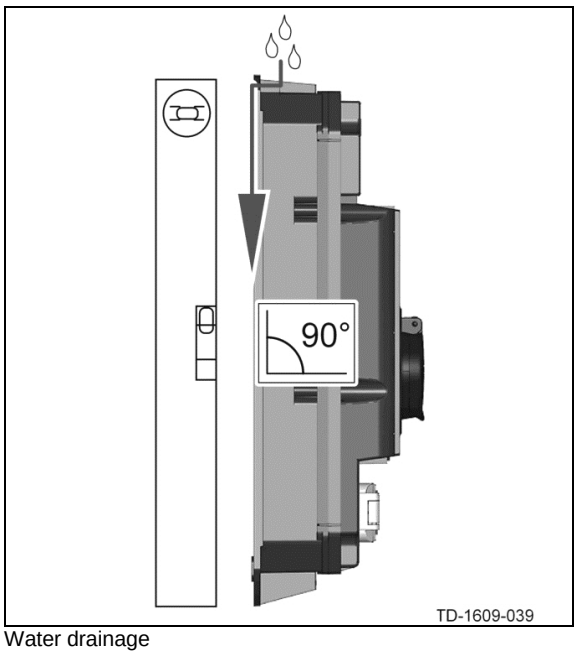
Marking the holes

► Mark the four holes **[1]** to **[4]** using the supplied drilling template and a spirit level.

► Drill the four mounting holes.

Information about the drilling template:

- The drilling template shows the outer contour of the charging station.
- The four main mounting holes are aligned centered to the slotted holes on the device.
- The three holes in the upper right show the area for the cable insertions and help to be able to align the mounting position of the device to the cables.
- The two notches on the top side are used for aligning the device to the connection lines.
- In the lower part, the holes for the optional cable hanger can be drilled appropriate to the device. This part can be separated if the cable hanger is not mounted or is to be mounted at a different location.

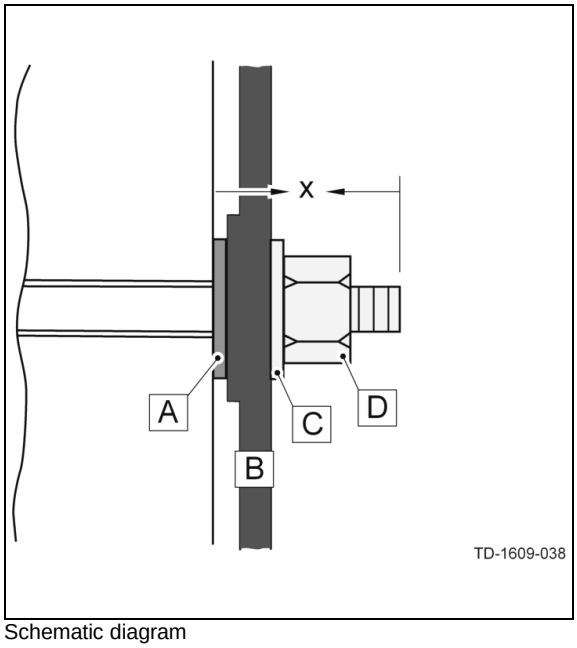


Water drainage

Water drainage

The water drainage from the top side to the rear side of the charging station must be ensured. Therefore, observe the following:

- Only a vertical installation of the charging station is permitted.
- The charging station must be mounted at an angle of 90° (no inclination is permitted!).

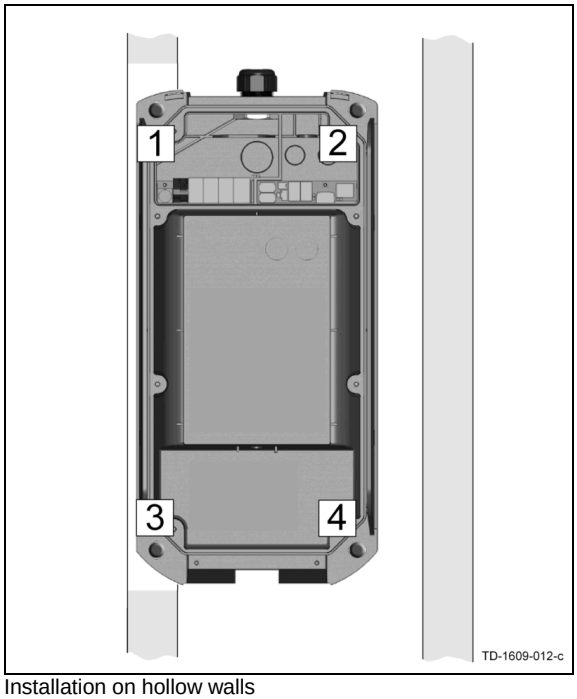


Schematic diagram

Mounting the charging station

- ► Turn the hanger bolts into the anchors until the thread still protrudes approx. 2 cm (**'x'**).
- ► Use the shims **[A]** to compensate for any unevenness and to ensure a water drainage behind the device.
- ► Position and mount the charging station using the supplied washers and nuts.

[A]…shim
[B]…charging station housing
[C]…washer
[D]…nut



Installation on hollow walls

Installation on hollow walls

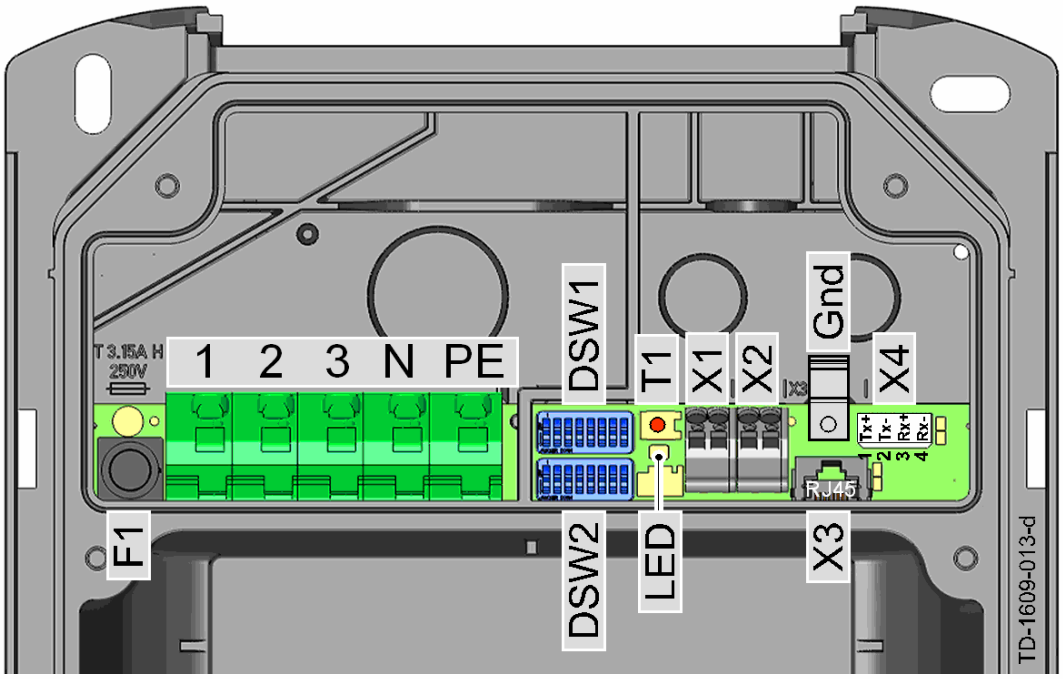
For installation on hollow walls, at least two mounting screws must be secured to a support element of the wall (see figure).

Special hollow-wall anchors must be used for the other mounting screws.

When installing on hollow walls you must ensure that the bearing strength of the construction is sufficient.

4.4 Electrical connection

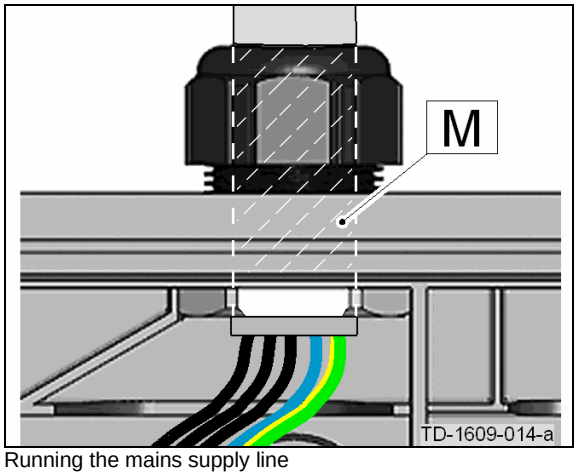
4.4.1 Connection overview with opened connector panel cover



Connection overview

[1]…	Mains supply terminal - Phase conductor 1	**[T1]**…	Service button
[2]…	Mains supply terminal - Phase conductor 2	**[LED]**…	Status LED (internal)
[3]…	Mains supply terminal - Phase conductor 3	**[X1]**…	Enable input
[N]…	Mains supply terminal - N conductor	**[X2]**…	Switch contact output
[PE]…	Mains supply terminal - PE conductor	**[X3]**…	Ethernet2 connection (debug)
[F1]…	Fuse holder	**[X4]**…	Ethernet1 connection (LSA+ terminals)
[DSW1]…	DIP-switch configuration	**[Gnd]**…	Ground for Ethernet1 connection terminals
[DSW2]…	DIP-switch addressing		

4.4.2 Connecting the mains supply line

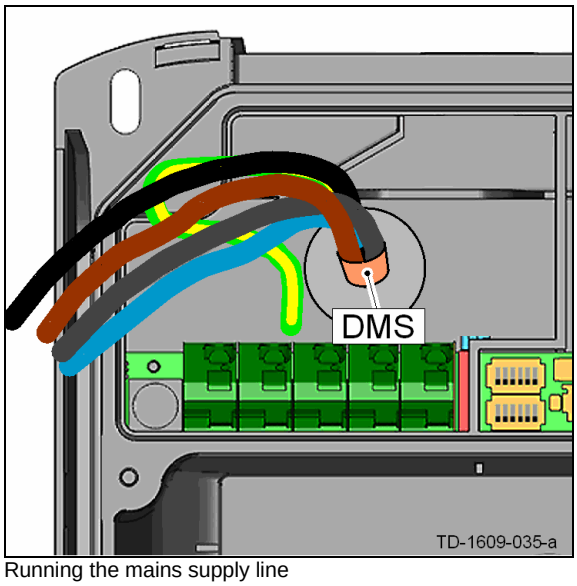


Running the mains supply line

Running the mains supply line (surface cable routing)

► Run the mains supply line from **ABOVE** as shown in the figure.

[M]… cable sheathing



Running the mains supply line

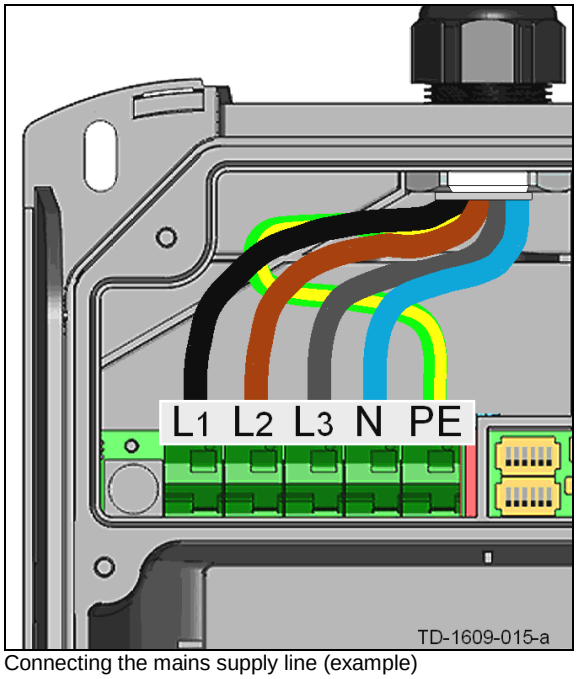
Running the mains supply line (flush-type cable routing)

► The power supply cable must be run as shown through the feedthrough/double-membrane seal **[DMS]**.

Make sure that the double-membrane seal fits cleanly against the cable sheathing.

Please observe:

- Use of a suitable cable sheathing diameter of the supply line or increase of the cable sheathing diameter by means of suitable seal adapter (see list "Scope of supply" for details about the terminal range).
- Feed the supply line (feed line from above) resp. double-membrane seals (feed line from behind) sufficiently into the cable fitting. The cable sheathing must be visible in the connection area.
- The installation pipe or cable conduit with the feed line may not be screwed together in the cable fitting (feed line from above) or run through the double-membrane seals (feed line from behind).
- The feed line must be run straight through the cable fitting (feed line from above) resp. the double-membrane seals (feed line from behind), in compliance with the bending radii (approx. cable diameter times 10).
- The cable fitting resp. double-membrane seals must be installed properly and screwed together sufficiently.



Connecting the mains supply line (example)

Connecting the mains supply line

- ► Shorten the connection wires to the appropriate length; these should be kept as short as possible.

  The PE conductor must be longer than the remaining conductors!

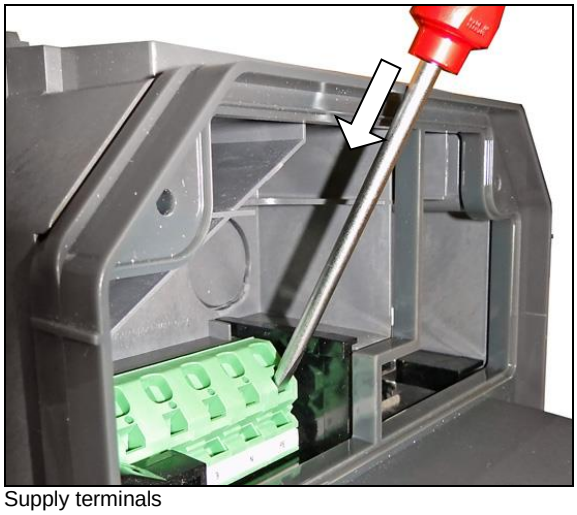
- ► Strip approx.12 mm from the connection wires.
  Wire end sleeves are recommended for finely stranded wires.

- ► Perform the connection of the mains supply line **[L1]**, **[L2]**, **[L3], [N]** and **[PE]**.

  Observe which phase conductor you connect to terminal [L1] if several charging stations are installed in a network (DIP-switch settings for load management).

1-phase connection

It is also possible to perform a 1-phase connection of the charging station. Use the terminals [L1],[N] and [PE].


Supply terminals

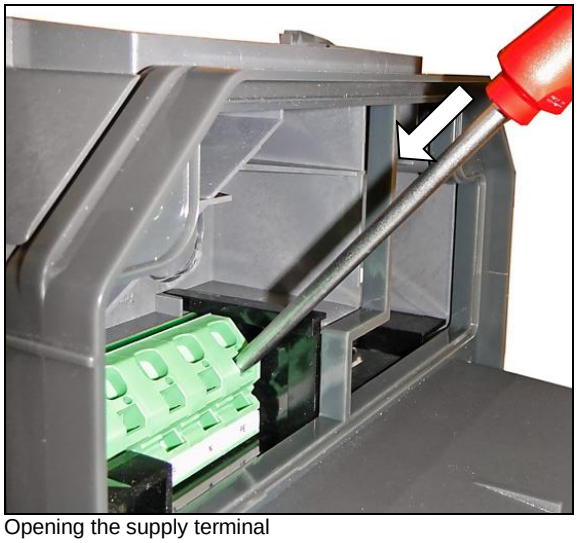
Supply terminals

The supply terminals are designed as spring-type terminals.

- ► Insert the flathead screwdriver (blade with 5.5 mm) into the supply terminal as shown on the picture.

Terminal data:

- inflexible (min.-max): 0.2 – 16 mm²
- flexible (min.-max): 0.2 – 16 mm²
- AWG (min.-max): 24 – 6
- flexible (min.-max) with wire end sleeve: Without/with plastic sleeve 0.25 – 10 / 0.25 – 10 mm²
- Stripping length: 12 mm
- Flathead screwdriver: 5.5 mm


Opening the supply terminal

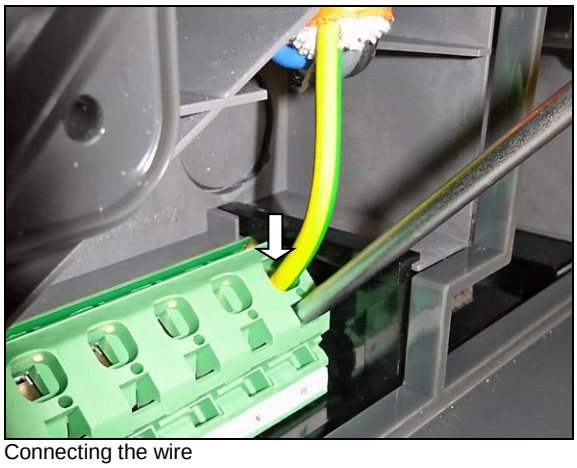
Opening the supply terminal

► Push the screwdriver with moderate force straight into the terminal until the wire connector is completely open.

During pushing into the supply terminal, the angle of the screwdriver is changing.

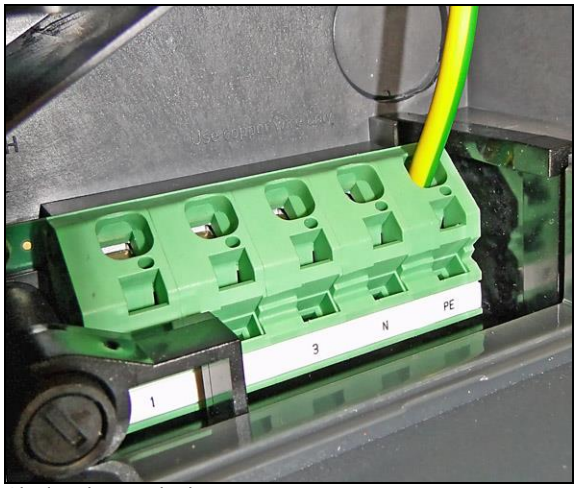
ATTENTION

- **Risk of breaking the terminal! Do not pry the screwdriver up, down or to the side!**


Connecting the wire

Connecting the wire

► Push the stripped connection wire into the supply terminal as shown on the picture.



Closing the terminal

Closing the terminal

► Pull the screwdriver completely out of the supply terminal to close it.

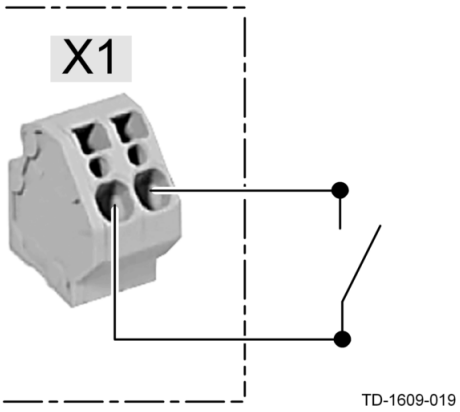
► Check the firm seating of the wire.

► Connect the other wires in the same way.

4.4.3 Enable input [X1] (except e-series)

The enable input is equipped for the use with a potential-free contact. Using the enable input, it is possible to control the charging station using external components (e.g. external key switches, ripple control receiver of the energy supplier, house control, time switches, combination lock, photovoltaic system etc.).

Circuit diagram:



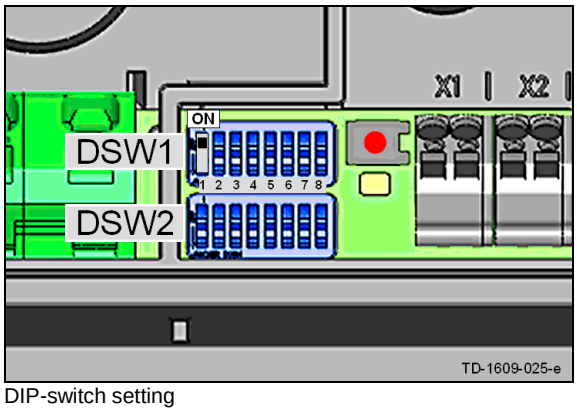
Electrical requirements:
Ensure a safe separation from dangerous voltages for this control cable outside of the device.

Logical function:

Enable contact	State of the charging station
Open	LOCKED
Closed	READY FOR OPERATION

Connection:

► Connect the wires to the enable input (please refer to the "Terminals [X1/X2]" chapter for details about the terminal).



DIP-switch setting

DIP-switch setting
The use of the enable input must be activated by a DIP-switch setting.

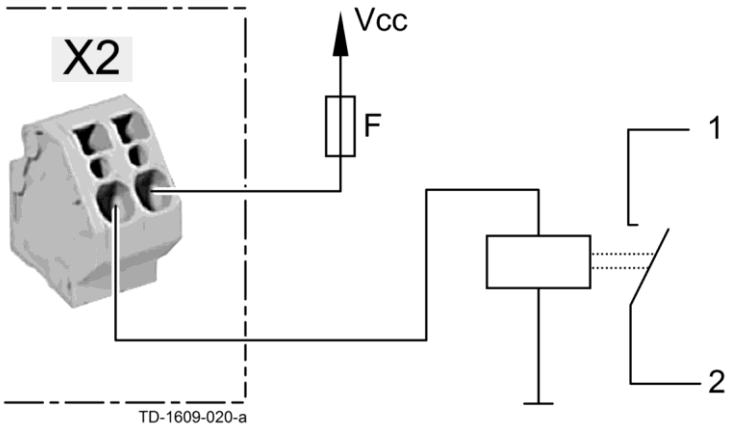
Using the enable input:

- "Yes": **DSW1.1 = ON**
- "No": DSW1.1 = OFF (Default)

4.4.4 Switch contact output [X2] (except e-series)

The switch contact output (signal contact) is a potential-free relay contact and signals a fault for the internal contactor. If the output is used, the corresponding DIP switch setting must be selected.

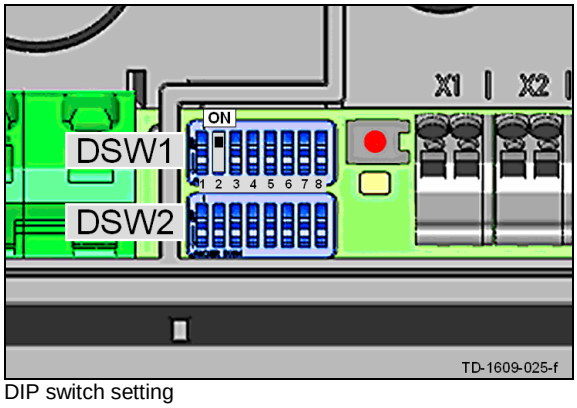
Circuit diagram:



Electrical requirements:
- Safety extra-low voltage Vcc < $50V_{AC}$
- F ≤ 0.5A current-limiting protective devices

Connection:

► Connect the wires to the switch contact output (please refer to the chapter "Terminals [X1/X2]" for details about the terminals).



DIP switch setting

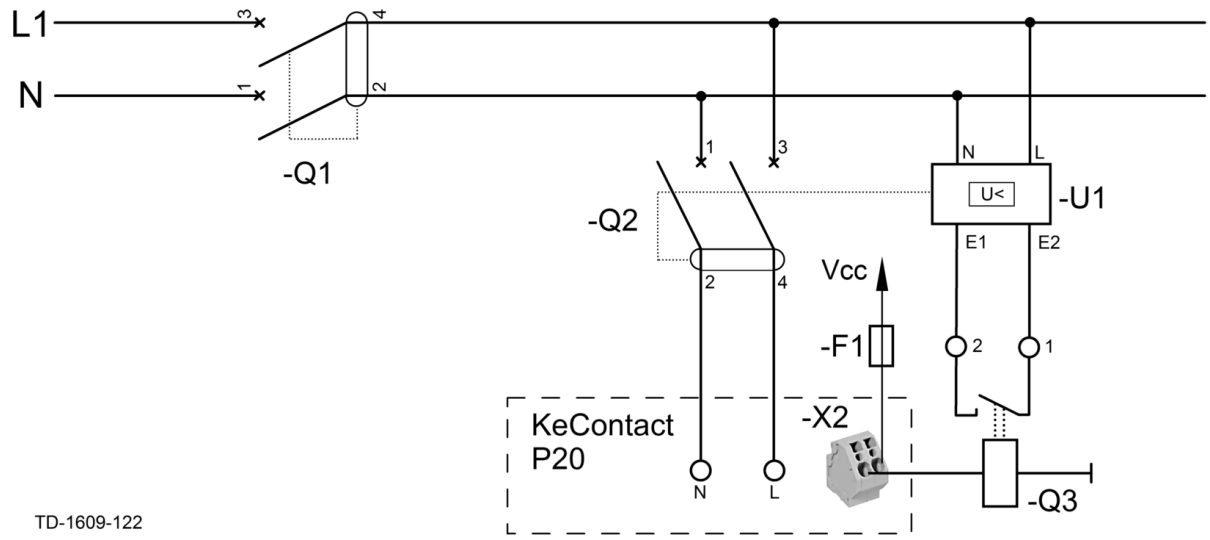
DIP switch setting

The use of the switch contact output must be activated by a DIP switch setting.

Use switch contact output:

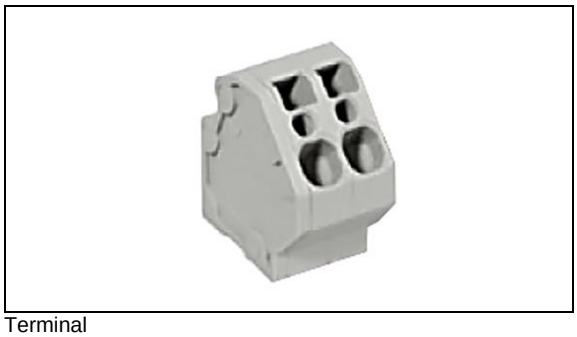
- "Yes": **DSW1.2 = ON**
- "No": DSW1.2 = OFF (Default)

Example (supplement to the circuit diagram):
The switch contact can be used to switch off the KeContact P20 (disconnect the current) by means of an overriding disconnect solution.



-Q1… Main circuit breaker
-Q2… Line circuit breaker + RCD circuit breaker
-Q3… Contactor/Relay
-F1… Current-limiting protective device
-U1… Undervoltage release
-X2… Switch contact output

4.4.5 Terminals [X1/X2] (except e-series)



Terminal

Terminals

The terminals for the enable input [X1] and the switch contact output [X2] are designed as spring-type terminals.

Terminal data:

- Cross-section (min.-max): 0.08 – 4 mm²
- AWG (min.-max): 28 – 12
- Stripping length: 8 mm
- Flathead screwdriver: 3,0 mm

4.4.6 Ethernet1 connection [ETH] (optional)

WARNING!

- **Danger from compensation currents on shielding!**

  Compensation currents flowing through shielding in extended systems can lead to damage to the interfaces and hazards when working on the data lines.

  Any measures (such as connecting to a shared distribution board, expanding a TN-S network, etc.) should be discussed with the person responsible for building services.

The Ethernet1 is designed as terminal block in LSA+® technology. A hardwired communication can be realized using the Ethernet1 connection (e.g. for smart home integration or fleet solutions).

Color coding:

According to the used wiring standard in the building, the contacts are wired according to **TIA-568A/B** for 100BaseT:

Pin	-568A Pair	-568B Pair	-568A Color	-568B Color
1 (Tx+)	3	2	 white/green stripe	 white/orange stripe
2 (Tx−)	3	2	 green/white stripe or green	 orange/white stripe or orange
3 (Rx+)	2	3	 white/orange stripe	 white/green stripe
4 (Rx−)	2	3	 orange/white stripe or orange	 green/white stripe or green

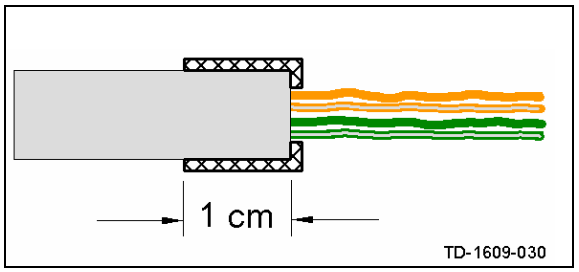
Terminal data:

Category	Wire diameter	Insulation diameter
Inflexible cable Cat 5e / Cat6 STP	0.36 mm (AWG 27)	0.7 – 0.75 mm
	0.4 – 0,64 mm (AWG 26 – AWG 22)	0.7 – 1,4 mm
Cat 6 STP	0.51 – 0,81 mm (AWG 24 – AWG 20)	1.0 – 1,4 mm
Flexible cable Cat 5e / Cat 6 STP	7 x 0.2 mm (AWG 24)	1.1 – 1,4 mm

LSA+® insertion tool

LSA+® insertion tool

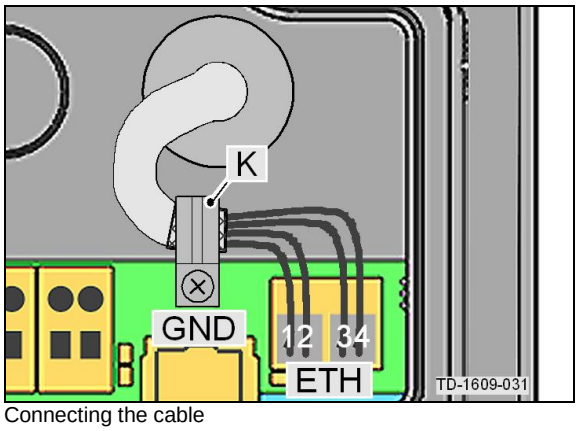
Original KRONE insertion tool with solder-free and stripping-free connection of the wires and simultaneous trimming of the residual lengths.



Preparing the connection cable

Preparing the connection cable

- ► Strip the connection cable approximately 6 cm.
- ► Fold back approx. 1 cm of shielded braiding completely and wrap it with conductive adhesive textile tape.



Connecting the cable

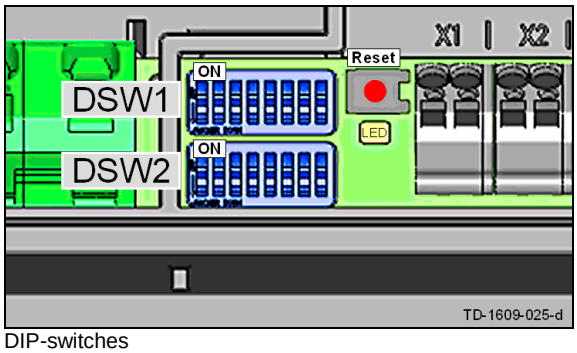
Connecting the cable

- ► Secure the connection cable at the point of the wrapped shielded braiding in the cable clamp **[K]**.

  The cable clamp must be screwed onto the ground point **[GND]** of the circuit board.
- ► Clamp the wires to the terminal block **[ETH]** using the insertion tool.

4.5 DIP-switch settings

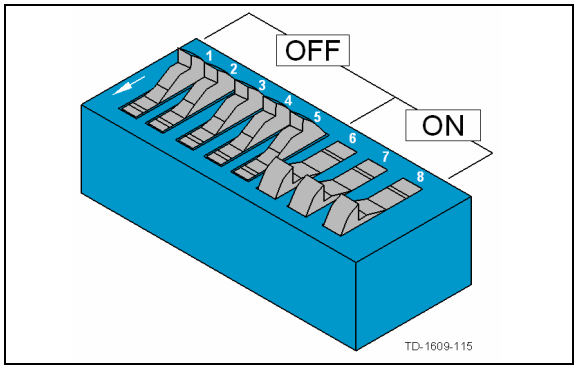
Changes in the DIP-switch settings will take effect once the charging station has been restarted!
To do this press the **[Service button]** for **1 second** or switch the power supply voltage off/on.



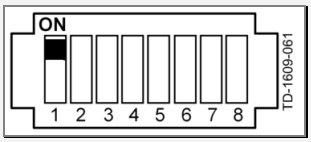
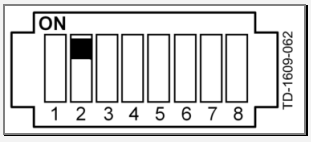
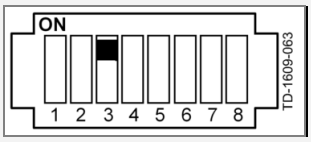
DIP-switches

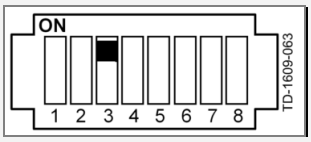
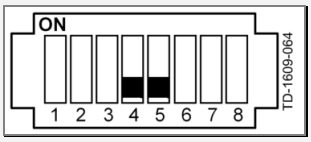
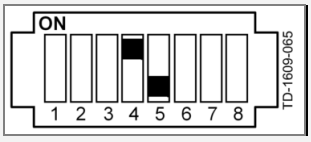
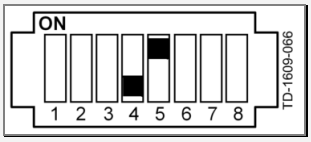
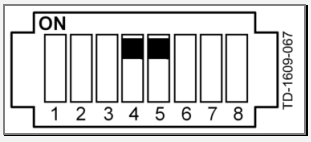
DIP-switches
The DIP-switches are used for the addressing and configuring the charging station and are located under the connector panel cover.

[DSW1]…configuration (upper DIP-switch)
[DSW2]…addressing (lower DIP-switch)



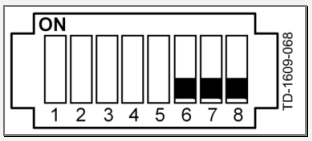
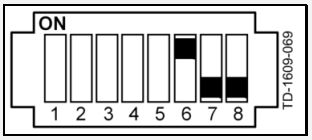
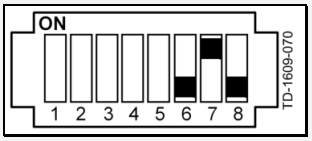
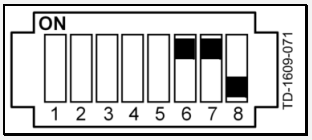
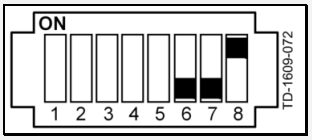
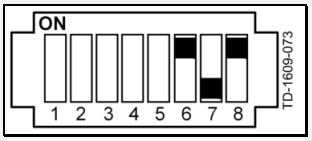
DIP-switch example
The figure shows for a better explanation, the position of the DIP-switches for the ON and OFF state.

INPUT/OUTPUT (DSW1) / ONLY FOR STANDARD MODE			
Function	**DIP-switch**		**Figure**
External enable input [X1] is used	**D1.1**	**ON=yes**	
Switch contact output [X2] is used	**D1.2**	**ON=yes**	
SmartHome interface via UDP (details see “UDP Programmers Guide”)	**D1.3**	**ON= enabled**	

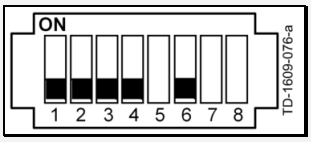
PHASES / ONLY FOR LOAD MANAGEMENT MODE DSW1.3 to DSW1.5			
Function	**DIP-switch**		**Figure**
Supply (phases)	**D1.3**	**ON= only 1 phase** **OFF= all 3 Phases**	
Phase assignment (*)	**D1.4**	**D1.5**	**Figure**
Phase **L1** at terminal 1 connected	**OFF**	**OFF**	
	ON	**OFF**	
Phase **L2** at terminal 1 connected	**OFF**	**ON**	
Phase **L3** at terminal 1 connected	**ON**	**ON**	

(*) Comments:
For load distribution, with 1-phase operating mode, any phase (L1, L2 or L3) of the mains supply line can be connected to the connection terminal 1.
The determination of which phase of the mains supply line was connected serves for informing the (optional) load management software in order to facilitate an efficient and proper load distribution.

Only one maximum value can be set with the following DIP switches which is smaller or equal to the operating current according to the type plate:

SETTING THE AMPERAGE (DSW1) (*1)				
Current	**D1.6**	**D1.7**	**D1.8**	**Figure**
10A	**OFF**	**OFF**	**OFF**	
13A	**ON**	**OFF**	**OFF**	
16A	**OFF**	**ON**	**OFF**	
20A	**ON**	**ON**	**OFF**	
25A	**OFF**	**OFF**	**ON**	
32A	**ON**	**OFF**	**ON**	

(*1) Preadjusted maximum current value for the EV charger (control pilot duty cycle).

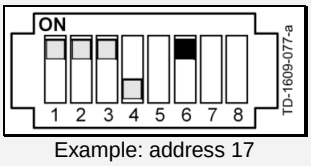
STANDARD MODE + DHCP (NO ADDRESSING) DSW2.1 to DSW2.4=OFF / DSW2.6=OFF	
The charging procedure in **STANDARD** mode is carried out automatically by the charging station without higher-ranking control system. The charging station attempts to obtain an IP address via **DHCP** server, if needed. This also corresponds to the basic settings for charging stations without network connection.	

STANDARD MODE + ADDRESSING
DSW2.6=ON

The charging procedure in **STANDARD** mode is carried out automatically by the charging station without higher-ranking control system.

The charging station has the static IP address: **[192.168.25.xx]**

Set the desired IP address with the DIP-switches **DSW2.1** to **DSW2.4** (see “Addressing”).



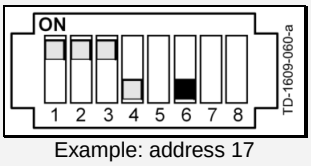
Example: address 17

LOAD MANAGEMENT MODE + ADDRESSING
DSW2.6=OFF

The charging procedure in **LOAD MANAGEMENT** mode is controlled by a higher-ranking load management system.

Since multiple charging stations are located in a network; an addressing of the charging stations is necessary.

Set the desired IP address with the DIP-switches **DSW2.1** to **DSW2.4** (see “Addressing”).



Example: address 17

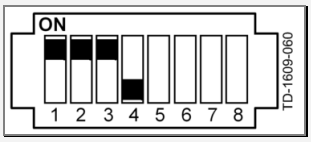
ADDRESSING (for all modes without DHCP)
DSW2.1 to DSW2.4

If multiple charging stations are located in a network, an addressing of the charging stations is necessary.

The addressing is done via the DIP-switches **DSW2.1** to **DSW2.4**. The settable Ethernet addresses start at **10 + DIP-switch setting**.

With the 4-bit addressing, the addresses 11 to 26 are usable **[192.168.25.xx]**.

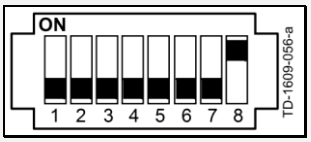
DSW2.1 = Address Bit 2^0 (Value=1)
DSW2.2 = Address Bit 2^1 (Value=2)
DSW2.3 = Address Bit 2^2 (Value=4)
DSW2.4 = Address Bit 2^3 (Value=8)



Example for address "17":

DSW2.1 = ON (value=1)
DSW2.2 = ON (value=2)
DSW2.3 = ON (value=4)
DSW2.4 = OFF (value=0)

Address= ***10*** + 1 + 2 + 4 + 0 = **17**

COMMISSIONING MODE (DSW2.8)			
Function	**DIP-switch**		**Figure**
Commissioning mode activate	**D2.8**	**ON=yes**	 **Set D2.1 to D2.7 to OFF!**

4.6 Commissioning

General commissioning process

1. Remove all residual installation and connection materials from the connection area.

2. Before commissioning, check all screw and terminal connections for firm seating!

3. Check whether all unused cable glands are properly sealed with blind plugs or dummy screw fittings.

4. Ensure that the voltage of the mains supply line is switched on.
After 15 to 20 seconds, the status LED must flash green slowly.

The device performs a self test every time it is switched on.

5. Perform the specified initial tests according to the locally applicable regulations and laws (see the "Commissioning mode/self test" chapter).

6. Close the connector panel cover to the charging station.

7. Mount the housing cover (see the " Mounting the housing cover" chapter).

4.6.1 Commissioning mode/self test

General

The charging station can be placed into a commissioning mode for supporting the initial system test. During this, a self test of the device is performed (interlocking, contactor activation, current measurement, etc.) and the result is displayed.

After successful test without connected vehicle, the contactor is switched for limited time in order to facilitate the initial tests. A normal charging procedure is not possible in commissioning mode. The interlocking of the connector socket is activated to prevent a cable from being plugged in.

Switching on the charging station in commissioning mode via the supply voltage leads for security reasons in an error state (white-red-red-red) to prevent an unattended activation.

Activating the commissioning mode

- ► Set the DIP-switch **DSW2.8** to **ON** (see "DIP-switch settings").
- ► Perform a reset of the charging station. To do this press the **[Service button]** for **1 second**.

  The commissioning mode is now activated and is indicated by the orange status LED (lights continuously).
- ► You now have the option for approximately 5 min. to contact with standard test probes using the measuring device (e.g. Astaco® test probes from BEHA) and to perform the necessary tests (see chapter "Safety checks").

  After 5 min. have elapsed, the contactor is deactivated in the charging station is shut down.

Deactivating commissioning mode

- ► Set the DIP-switch **DSW2.8** to **OFF** again.
- ► Perform a reset of the charging station. To do this, press the **[Service button]** for **1 second** or switch the power supply voltage off/on.

  The charging station starts up again in normal mode and is ready for operation.

4.6.2 Safety checks

Before the initial use, check the effectiveness of the safety measure(s) of the system according to the nationally applicable regulations (e.g.:ÖVE/ÖNORM E8001-6-61, DIN VDE 0100-600:2008-06 "Checks,...")!

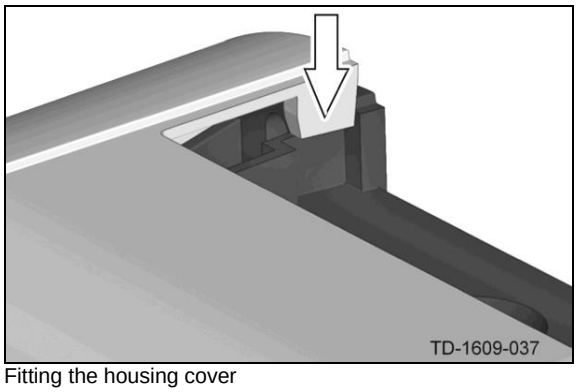
Electrical systems or devices must be checked by the installer of the system or device before their initial operation. This also applies for the expansion or modification of existing systems or electrical devices.

However, it is essential that all conditions for the safety measures are observed.

Moreover, the following points are to be taken into account:

- The checks (continuity of the connections of the protective conductor, insulation resistance, RCD (FI) triggering current, triggering time,…) are to be performed for the expanded or modified part.
- The measurement devices must comply with the national regulations!
  (e.g.: DIN EN 60557 (VDE 0413) "Electrical safety in low-voltage distribution systems up to AC 1000V and DC 1500V").
- The measurement results are to be documented. A test report is to be created and saved before the check.

4.6.3 Mounting the housing cover

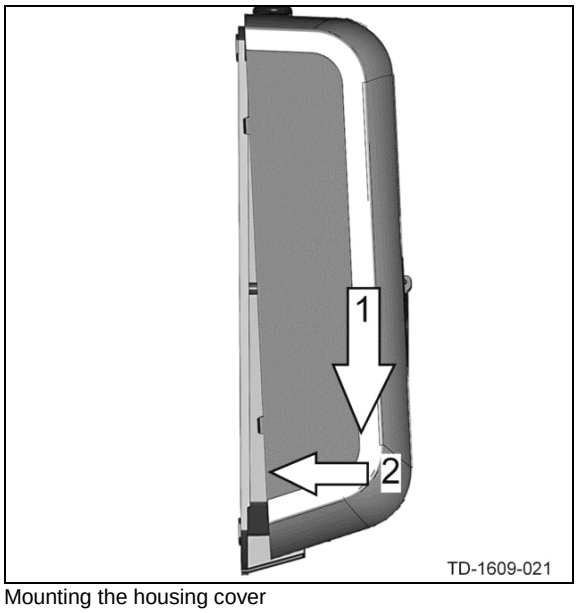


Fitting the housing cover

Fitting the housing cover

- ► Fit the housing cover at the top and push the cover downwards slightly.

  Make sure that the housing cover is seated correctly at the top in the housing guides.



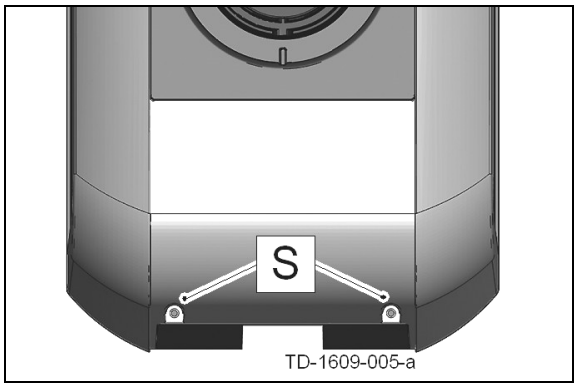
Mounting the housing cover

Mounting the housing cover

- ► Then fold the housing cover to the rear.

  The housing cover must glide into the guides without considerable resistance.
- ► Make sure that the housing cover is seated correctly on all sides in the housing guide.

  Only a minimum, even gap may be present.



Cover screws

Cover screws

- ► Secure the housing cover at the bottom using the two cover screws **[S]**.

5 Further technical instructions

5.1 Programming RFID cards (optional)

Programming the RFID master card

The authorization by an RFID master card is necessary for the programming. The programming mode can be activated and deactivated using the RFID master card.

The first RFID card that is detected by the charging station will automatically be stored as the master card.

► Hold the RFID master card to be programmed in front of the RFID sensor and wait for the signal tone.

The RFID master card is now programmed. Keep this card in a safe place.

Programming RFID user cards

► Hold the RFID master card in front of the RFID sensor and wait for the signal tone.

► Hold the new RFID user card in front of the RFID sensor within 5 seconds and wait for the signal tone.

► To confirm, hold the RFID master card in front of the RFID sensor again within 5 seconds and wait for the signal tone.

The RFID user card is now programmed.

Deleting all RFID cards from memory

► Remove the housing cover and open the connector panel cover of the charging station.

► Press the **[Service button]** for **5 seconds**.

All saved RFID cards (including the RFID master card) are now deleted.

► Now start again with the programming of the RFID master card.

5.2 Configure the communication with the EV PLC->Ethernet (optional)

To allow the access of the vehicle to the home network or internet, the power line communication between vehicle and charging station must be configured on both sides with the same password (NMK „Network Membership Key“).

The default password is „*emobility*“. It is recommended to change this password.

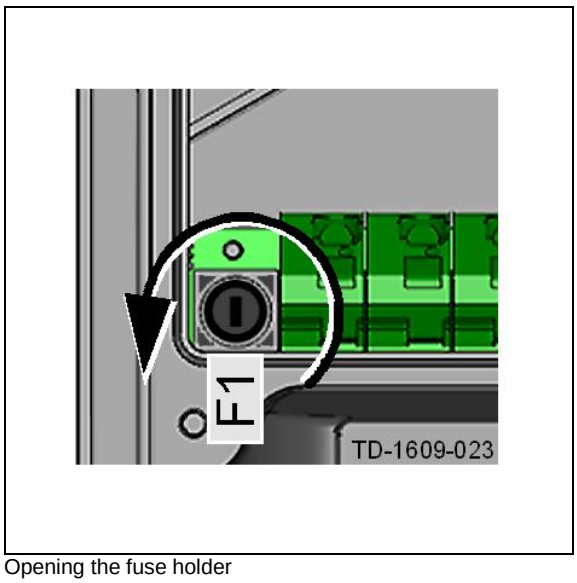
The required software ("EV Communication Assistant“) including the instructions how to configure the charging station, you can find in the download area under www.kecontact.com.

Further details how to configure your vehicle, please see the manufacturer’s manual of your vehicle.

5.3 Replacing the fuse

The following fuse must be used:

Description	Current / Voltage	Type	Dimensions
F1	3.15 A / 250 V	Slow-blow with high breaking capacity (>1500A) (T) (H)	5 x 20 mm fuse



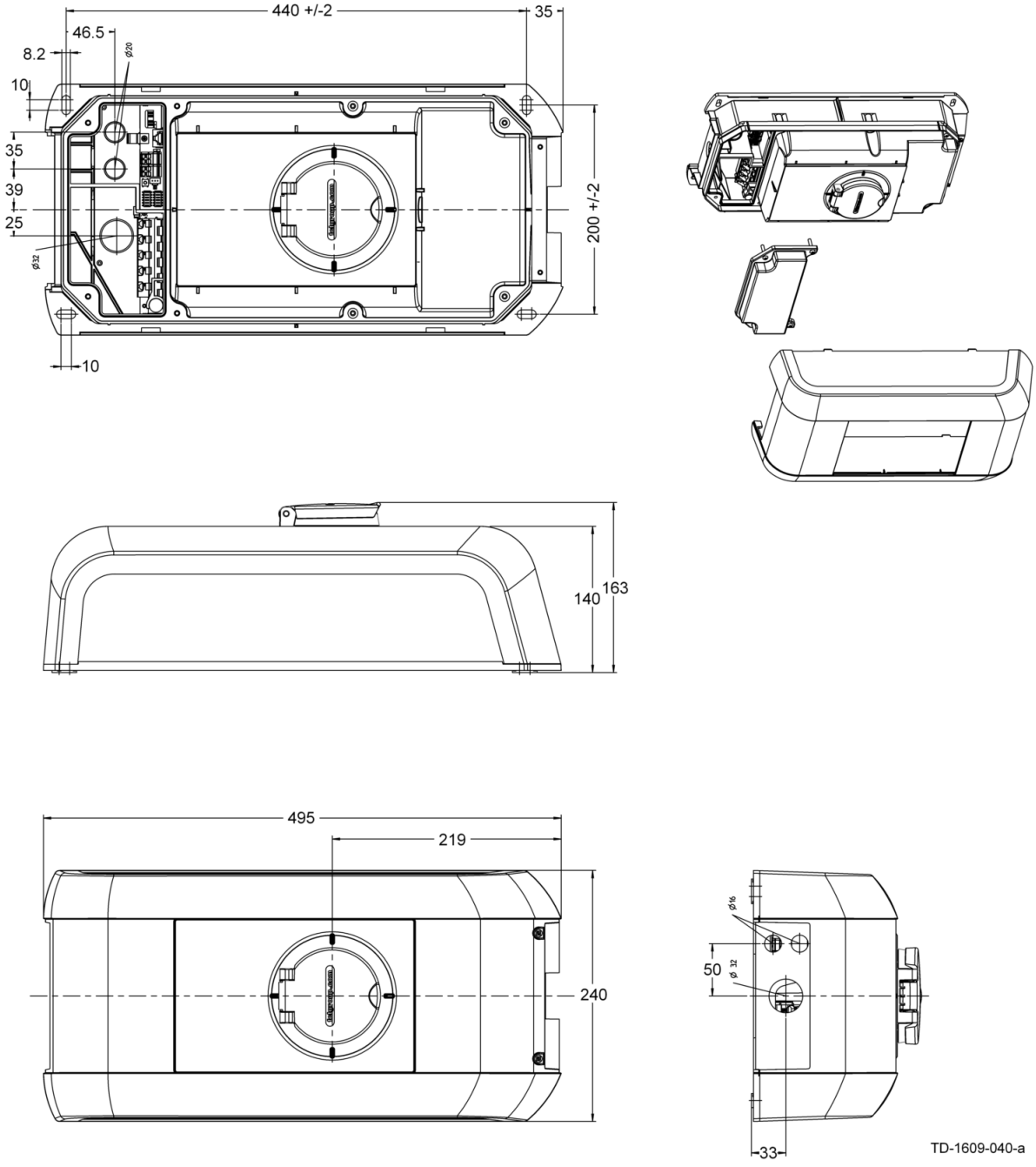
Opening the fuse holder

Replacing the fuse

- ► Switch off the mains supply line of the charging station completely.
- ► Remove the connector panel cover.
- ► Press a flathead screwdriver into the opening of the fuse holder.
- ► Turn the fuse holder counterclockwise until the spring pushes out automatically.
- ► Replace the fuse.
- ► Push the fuse holder in and retighten in the clockwise direction.

5.4 Dimensions

Version with standard socket (Type 2)



Dimensions in millimeters

5.5 Technical data

Electrical data	
Cable feed:	Surface cable routing or flush-type cable routing
Mains connection cross-section:	Minimum cross-section (depending on the cable and the line length): - 5 x 2.5 mm² (16A nominal current) - 5 x 6.0 mm² (32A nominal current)
Mains supply terminals:	Connection line: - inflexible (min.-max): 0.2 – 16 mm² - flexible (min.-max): 0.2 – 16 mm² - AWG (min.-max): 24 – 6 - flexible (min.-max) with wire end sleeve without/with plastic sleeve: 0.25 – 10 / 0.25 – 10 mm²
Mains supply terminals temperature rating:	105°C
Nominal current (configurable connection values):	10A, 13A, 16A, 20A, 25A or 32A 3-phase or 1-phase
Mains voltage (Europe):	230V 230/400V 3N~ (except e-series)
Line frequency:	50Hz / 60Hz
Overvoltage category:	III according to EN 60664
Rated short-time withstand current:	< 10kA effective value according to EN 61439-1
Fuse protection (in the house installation):	The fuse protection must occur according to the locally valid regulations, dependent on the socket versions / cable versions (see type plate).
Residual current circuit breaker (in the house installation):	RCD $I_{\Delta N}$=30mA Type A, sensitive to pulse current Dimension I_N according to the fuse protection
Socket versions:	Type 2 standard socket: 32A / 400 V_{AC} according to EN 62196-1 and VDE-AR-E 2623-2-2
Cable versions: (rating see type plate)	Type 1 cable: up to 32A / 230 V_{AC} according to EN 62196-1 and SAE-J1772 Type 2 cable: up to 32A / 400 V_{AC} according to EN 62196-1 and VDE-AR-E 2623-2-2
Equipment class:	I
IP protection rating for device:	IP54
Degree of protection against mechanical impact:	IK08 (except cylinder lock)

Connectors	
Enable input [X1]:	Enable input for external authorization: Connection line: - Cross-section (min.-max): 0.08 – 4 mm² - AWG (min.-max): 28 – 12
Potential-free switch contact output [X2]:	Safety extra-low voltage <50V_{AC} 50/60Hz External current limiting to 0.5A required Connection line: - Cross-section (min.-max): 0.08 – 4 mm² - AWG (min.-max): 28 – 12
Ethernet2 connection (debug) [X3]:	RJ45
Ethernet1 connection [X4]:	LSA+ terminals
RFID (optional):	MIFARE cards or tags according to ISO14443
Cylinder lock (optional):	Profile half cylinder according to EN 1303 or DIN 18252; Length A=30mm (31mm)

Mechanical data	
Dimensions (W x H x D):	240 x 495 x 163 mm (e.g. Type 2 standard socket)
Weight:	approx. 4.8 kg (depending on device version)

Environmental conditions	
Operating temperature at 16A:	-25°C to +50°C without direct sunlight
Operating temperature at 32A:	-25°C to +40°C without direct sunlight
Temperature behaviour:	In each case of the specified operating temperature ranges, the device supplies the charging current continuously available. To increase the charging availability, the charging current setting is changed to 16A, if the temperature is inadmissible exceeded. Subsequently, the charging process can also be switched off. After cooling, the charging current setting is increased again.
Storage temperature range:	-25°C to +80°C
Speed of temperature change:	max. 0.5°C /min
Permitted relative air humidity:	5% to 95% non-condensing
Altitude:	max. 2000 m above sea level

5.6 Standards and regulations

EC regulations	
2004/108/EC	Electromagnetic Compatibility Directive
2006/95/EC	Low-Voltage Directive

Check of the conformity with the low-voltage directives / electromagnetic compatibility directive	
EN 61851-1	Conductive charging system for electrical vehicles
EN 61851-22	Conductive charging system for electrical vehicles – Part 22: Alternating current charging station for electrical vehicles
EN 61439-1	Low-voltage switch component combinations - Part 1: General determinations
FprEN 61439-7	Low-voltage switch component combinations - Part 7: Switch component combinations for commercial premises, special installations or locations such as marinas, campsites, marketplaces and similar applications as well as charging stations for electrical vehicles

6 INDEX

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