

KeContact P20 / P30
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.

ATTENTION

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



ESD

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 "i". Notices do not contain any information that draws attention to potentially dangerous or harmful functions.



Additional important information.

▶ This icon marks **steps** of a sequence of operations.

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KEBA AG, Postfach 111, Gewerbepark Urfahr, A-4041 Linz, Austria www.keba.com/emobility



Disposal information

The symbol with the crossed-out waste container means that electrical and electronic devices including their accessories must not be disposed of in the household garbage. You can find more information about this directly on the product, in the operating manual or on the packaging.

The materials are recyclable in accordance with their labeling. You can make an important contribution to protecting our environment by reusing, renewing and recycling materials and old appliances.



Disposal of batteries

Batteries and accumulators are classed as hazardous waste and must be properly disposed of. Although batteries have a low voltage, they can provide enough current when short-circuited to ignite flammable material. They should not be disposed of together with conductive material (e.g. iron filings, wire wool contaminated with oil, etc.)



You can download the **Installation manual** at www.keba.com/emobility.



You can download the latest **firmware** at www.keba.com/emobility (download area). A new firmware can take into account modified standards or improve the compatibility with new electric vehicles, for example.

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1 Important information

1.1 Safety information



WARNING!

- **Electrical hazard!**
Installation, commissioning and maintenance of the charging station must be performed by correctly trained, qualified and authorized electricians⁽¹⁾ who are fully responsible for the compliance with existing standards and installation regulations.

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

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 have safety extra-low voltage!

- Before commissioning, check all screw and terminal connections for tightness.
 - 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 disconnecter.
 - Pull the charging cable out of the plug connection by the plug only and not by the cable.
 - Make sure that the charging cable is not damaged mechanically (kinked, pinched or driven over) and do not allow the contact area to come into contact with sources of heat, dirt or water.
 - It is not permitted to connect any cable extension to the charging cable on the charging station.
-

⁽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.

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 or when mounting outdoors.
 - Risk of breaking the plastic housing!
 - Countersunk screws may not be used for the mounting!
 - The washers supplied 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.
-



ESD

Information for technicians who are permitted to open the device:

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

- Before handling the modules, touch a grounded metal object in order to discharge any static electricity from your body.
-



CAUTION!

5 safety rules:

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



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!

1.2 Intended use

The device is a "charging station" for the indoor and outdoor area which can be used to charge electrically operated vehicles (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 precisely followed 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. The connection of other devices (e.g. electric tools) is not allowed!

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

1.3 About this manual

This manual and the functions described apply to devices of the type:

- KeContact P20 / firmware version: v2.x (and above)
- KeContact P30 / firmware version: v3.x (and above)

Use of this manual

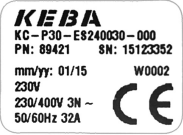
This manual is intended for *qualified personal* only. This means persons who, due to their special training, expertise and experience as well as knowledge of current standards, are able to assess the work performed and the possible hazards.

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 "User manual" for information and instructions about operating the device.

1.4 Product description

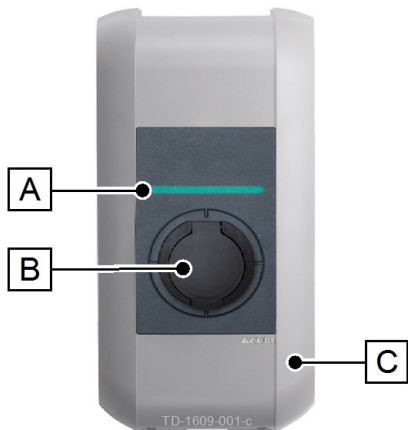
Example KC-P30-ES240030-000-xx

Product description		
Type plate See top of device		
Product family	KC	KeContact
Product type / Version	P20 / P30	Charge Point

Design versions		
Basic versions	E	E...Europe
Cable / Socket	S	S...Socket C...Cable
	2	1...Type 1 2...Type 2 S...Shutter
	4	1...13A 2...16A 3...20A 4...32A
	00	00...no cable 01...4m straight 04...6m straight
Electronics	3	0...e-series 1...b-series 2...c-series 3...c-series+PLC (P20 only) A...c-series+WLAN B...x-series C...x-series+GSM D...x-series+GSM+PLC
Electrics	0	0...Contactor 1...Contactor 1-phase 2...3-phase with DC residual current detection (RDCMB)

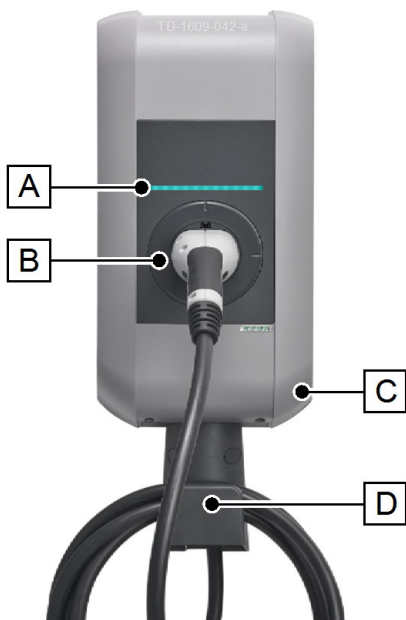
Options		
P30 energy meter (P20: not used)	0	0...not populated E...Energy meter (not calibrated)
Not used	0	-
Authentication	0	0...not populated R...RFID K...Key switch
Optional customer code	xx	-

2 Variant overview



Base model with socket (Type 2)...

- [A]...Status LED
- [B]...Standard socket (variants possible)
- [C]...Housing cover



Base model with charging cable Type 1, Type 2)...

- [A]...Status LED
- [B]...Parking bay for charging connector
- [C]...Housing cover
- [D]...Bracket for charging cable

Storing the charging connector/charging cable...

If no charging procedure is being performed, the charging connector can be plugged into the parking bay [B] for safe storage.

The charging cable can be coiled up and placed on the hanger [D].

2.1 Optional equipment

Display (P30 option)



The optional dot matrix display (1) can display various information depending on the operating state (e.g. software version, energy meter status).

During periods of inactivity, the display brightness is dimmed/switched off after a few minutes.

The dot matrix display shines through the housing and is not visible when the display is deactivated!

Variant overview

RFID sensor



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

Key switch



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

Additional optional equipment

- Network capability
- Switch contact (for control of external additional equipment)
- Enable input for ripple control receivers, time switches, etc. (this allows time-controlled charging of the vehicle.)
- PLC (Power Line Communication) according to GreenPhy standard
- Mounting column

Only relevant for P30:

- DC residual-current monitoring (RDCMB)
- XPU communication module
 - WLAN module
 - GSM module (optional)

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 it is exposed to ammonia or ammonia gas (e.g. in or at stables).
- The mounting surface must be sufficiently stable in order to withstand the mechanical forces.
- Do not install the charging station at locations where falling objects could damage the device (e.g. hung up ladders or automobile tires).
- 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 must not be exposed to direct spray water (e.g. neighboring manual car wash facility, high-pressure cleaner, garden hose).
- The device should be protected against direct rain as far as possible to prevent icing, hail damage or similar.
- The device should be mounted so that it is protected from direct sunlight as far as possible to prevent reduction of the charging current or interruption of the charging due to excessive temperatures of the charging station components.
- When set up unprotected against the weather (e.g. outside at a parking space), the charging current specification is reduced to 16 A if the maximum permitted temperature is exceeded. The charging procedure can also subsequently be switched off.
- For information about environmental conditions, please refer to the Chapter "[5.5 Technical data \[42\]](#)".

Observe the internationally valid installation standards (e.g. IEC 60364-1 and IEC 60364-5-52) and comply with the nationally applicable 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 current using the DIP switches to match the installed line circuit breaker (see Chapter "4.6 DIP switch settings [32]").

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

Selection of the residual-current device (RCD):

- Every charging station must be connected via its own RCD. No other circuits may be connected to this RCD.
- Residual-current device of at least type A (30 mA triggering current).
If the vehicles to be charged are not known (e.g. semi-public area), measures must be taken for protection where DC residual currents (>6 mA) occur. This can be realized, for example, through device version KC-P30-xxxxxxx2, 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.
- If a charging station is protected with a type B residual-current device, every upstream residual-current device, even those not assigned to the charging station, must either be type B or equipped with a DC residual-current detection device.
- The nominal current I_N must be selected to match the circuit breaker and back-up fuse.

Dimensioning of the line circuit breaker:

When dimensioning the line circuit breaker also observe the increased environmental temperatures inside the switch cabinet. Under certain circumstances, this can make a reduction of the charging current specification necessary in order to increase the system availability.

- Determine the nominal current according to the type plate specification in coordination with the desired charging capacity (DIP switch settings for charging current specification) and the power supply line.

Dimensioning of the power supply line:

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

Mains disconnecter:

The charging station does not have its own power switch. The residual current device (RCD) and the line circuit breaker of the power supply line serve as mains disconnecter.

3.2.2 Differing requirements for Z.E.-/ E.V. Ready

Z.E.-Ready is a voluntary certification process from Renault. For a charging point to be designated Z.E.-Ready, charging station must be certified Z.E.-Ready and the system installed in accordance with the E.V. Ready requirements (see table).

E.V. Ready is a voluntary certification process founded by Renault-Nissan. For a charging point to be designated E.V. Ready, the installation engineer and the charging station must be certified as E.V. Ready. The system must be installed in accordance with the E.V. Ready requirements (see table).

The following requirements must be met for certification:

- In the event that 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 "4.5.4 Switch contact output [X2] (excluding e-series) [28]").
- No 13A charging cables may be used.
- For 3-phase connection of the charging station, the device version KC-P30-xxxxxxx2-xxx (**P30 b-,c-, x-series**) or at least a residual-current device (RCD) type A with DC residual-current detection (>6 mA) or a residual-current device (RCD) type B must be used.

Requirements for the selection of the line circuit breaker:

Charging current specification	Line circuit breaker	Characteristic	
		1-phase	3-phase
(DIP switch)			
10 A		Not allowed	
13 A		Not allowed	
16 A	20 A	Not allowed	C
20 A	25 A	B / C	C
25 A	32 A	B / C	C
32 A	40A	B / C	C



*Fuse protection of **40A** is permissible if required due to a thermal derating of the line circuit breaker. Otherwise nominal current fuse protection according to the nameplate. The same climatic environmental conditions for the line circuit breaker and the charging station.*

Mains supply and grounding requirements (Z.E.-Ready/E.V. Ready)

- **TT and TN networks:** The grounding resistance of the system must be less than **100 Ohm**, or lower if required by national regulations.
- **TT networks:** With a grounding resistance greater than **100 Ohm**, an isolating transformer must be installed before the EVSE (Electric Vehicle Supply Equipment) installation. The isolating transformer must then be integrated into a TN grounding system, for which the criteria above applies.
- **IT networks:** Power supplies with IT grounding systems are forbidden.
- In TT and TN networks, the voltage at the N conductor to PE must not be higher than 10 V.

Installation guidelines

- If several charging stations are connected to the same power supply, local ground connections must also be established (at least every 10 outputs).
The maximum grounding resistance for each additional ground connection (measured independently) must be less than **100 Ohm**. All ground connections must be connected to ensure a single potential.
- An excessive proportion of harmonic waves can terminate the charging procedure. The public mains power supply should fulfill the standards IEC 61000-2-1, IEC 61000-2-2, EN 50160 § 4.2.4 and § 4.2.5 to prevent this problem. The maximum permitted limit of harmonic waves can vary in dependence on the mains network impedance.

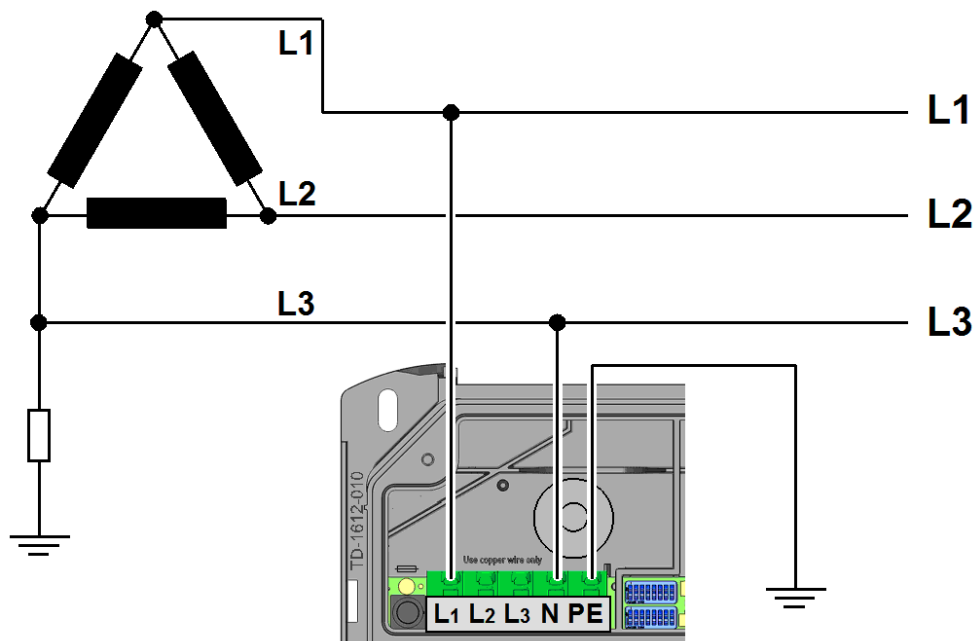
3.2.3 Electrical connection to IT networks (P30 only)



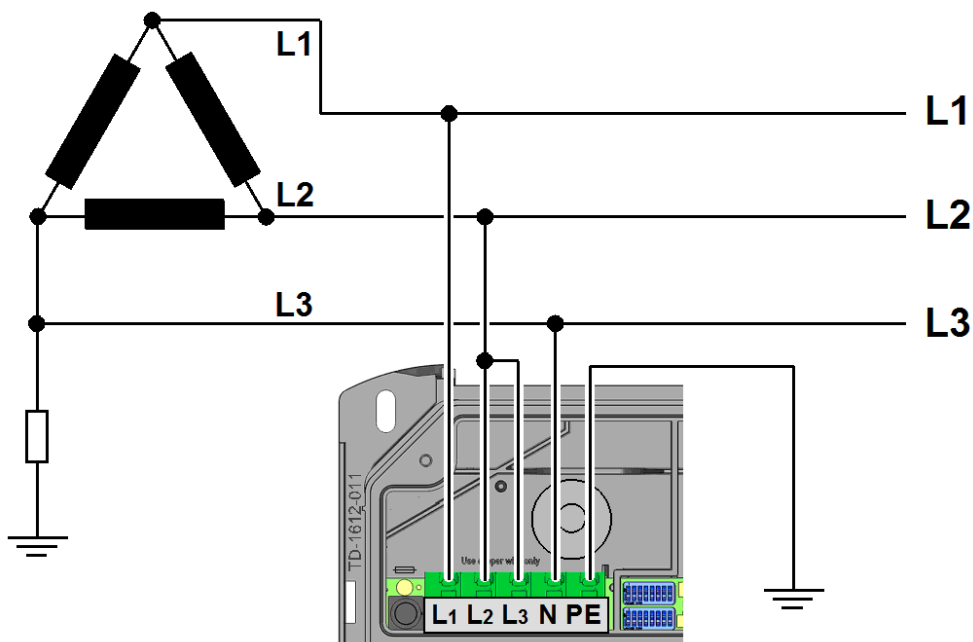
Note that not all vehicle types are approved for connection to IT networks. The vehicles must be approved by the vehicle manufacturer for the IT network type.

In principle the charging station can to TN, TT and IT networks.

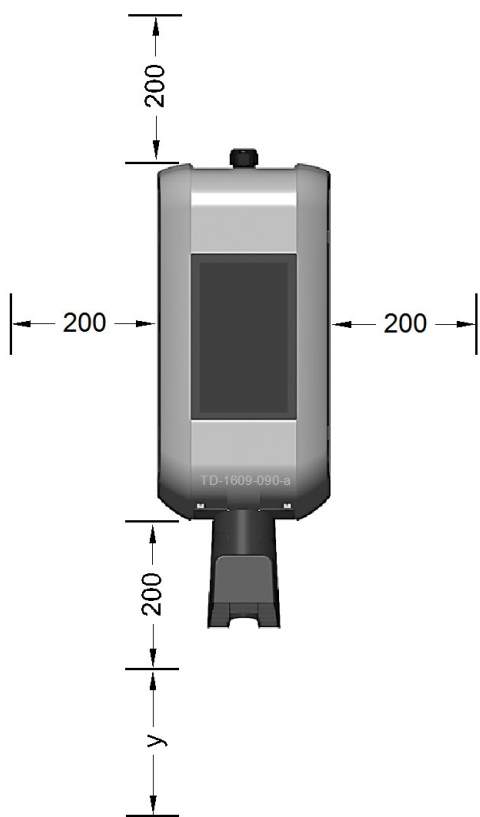
Example: 1-phase connection to a triangular shaped supply network with 230V



Example: 3-phase connection to a triangular shaped supply network with 230V



3.3 Space requirements



Dimensions in millimeters

Space requirement...

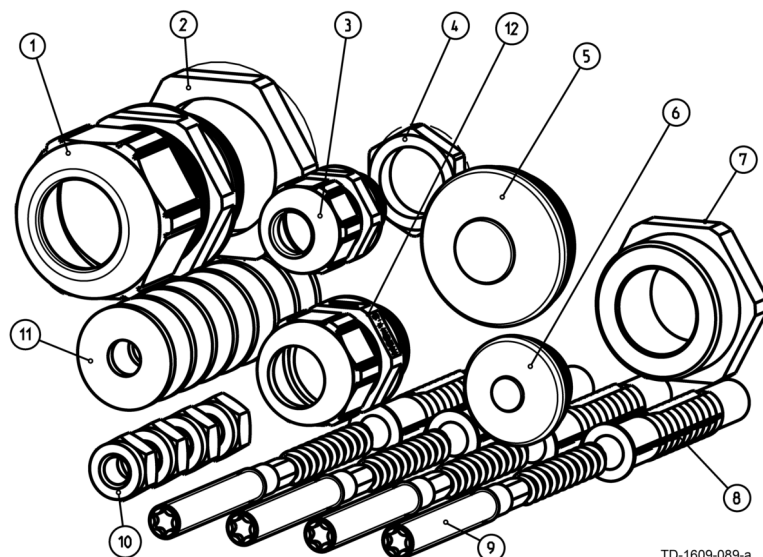
For device versions with optional cable hanger, **additional** free area **y** for the charging cable to be used is to be accounted for.

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 delivery	e-series	Others
Charging station	1 pieces	1 pieces
Cable hanger (for versions with charging cable)	1 pieces	1 pieces
Installation manual (for the specialist)	1 pieces	1 pieces
User manual (for the end customer)	1 pieces	1 pieces
Drilling template	1 pieces	1 pieces
Keys for cylinder lock (optional)	-	3 ST
RFID card (optional)	-	1 pieces
[1] Cable gland M32x1.5, black (clamping area 10–21mm)		
	1 pieces	1 pieces
[2] Locknut M32x1.5 black		
	1 pieces	1 pieces
[3] Cable gland M16x1.5 black (clamping area 4–10mm)		
	-	1 pieces
[4] Locknut M16x1.5 black		
	-	1 pieces
[5] Double-membrane seals M32 black (clamping area 14–21mm)		
	1 pieces	1 pieces
[6] Double-membrane seals M20 black (clamping area 7–12mm)		
	-	1 pieces
[7] Reduction insert M32/M20 grey		
	-	1 pieces
[12] Cable gland M20 grey		
		1 pieces
Mounting set for wall insulation:		
[8] Anchors for M8; Fischer UXR-8		
	-	4 pieces
[9] Hangar bolts M8x100		
	-	4 pieces
[10] Nut ISO 10511 - M8		
	-	4 pieces
[11] Washer ISO 7089 - 8.4		
	-	8 pieces

Supplied installation materials



TD-1609-089-a

4.1 Installation requirements

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

Opening the charging station immediately can cause water to form inside and lead to damage when the device is switched on. Under certain circumstances, this damage may not occur until a later point after the installation.

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

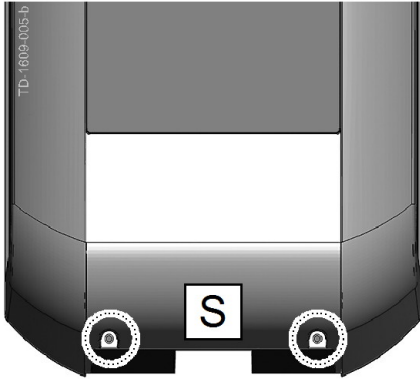
Tool list

The following tools are required for the installation:

- Flathead screwdriver for 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 screw connections M16 (width across flats 20 mm) and M32 (width across flats 36 mm)
- LSA+ insertion tool (optional)

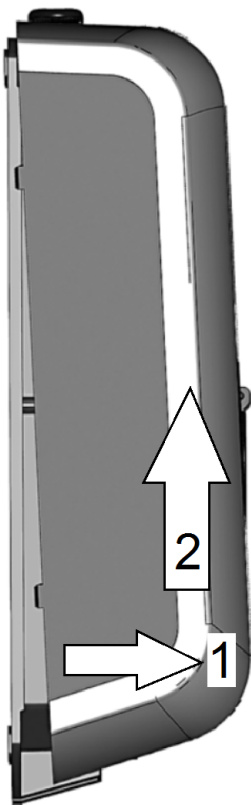
4.2 Preparing the housing

4.2.1 Removing the housing cover



Cover screws...

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

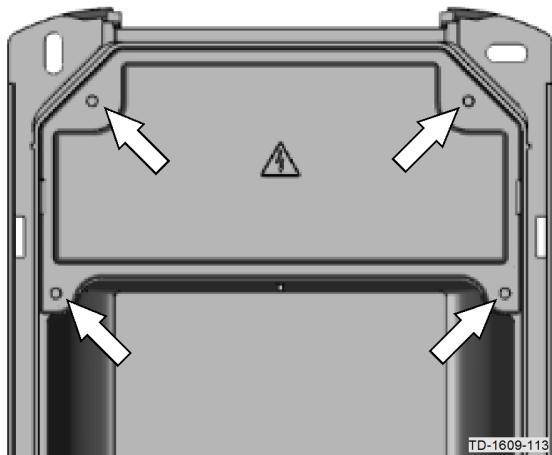


Removing the housing cover...

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

TD-1609-022

4.2.2 Removing the connector panel cover



Removing the connector panel cover

- ▶ Unscrew the four screws that mount the connector panel cover and remove the connector panel cover.
- ▶ Take the silica bag out of the terminal panel and dispose of it properly.

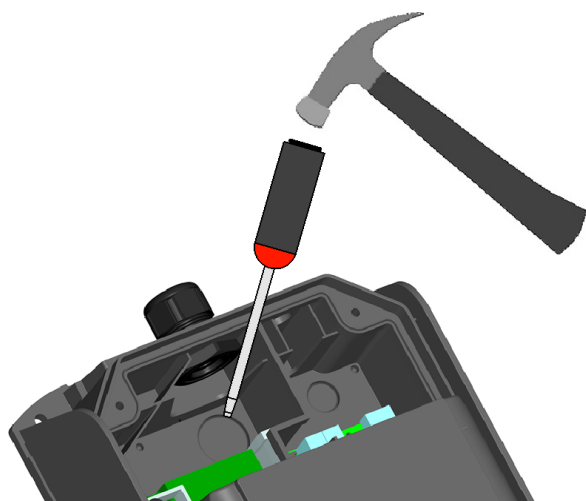
4.3 Preparing the cable insertion

There are two options available for the cable insertion:

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

Preparations

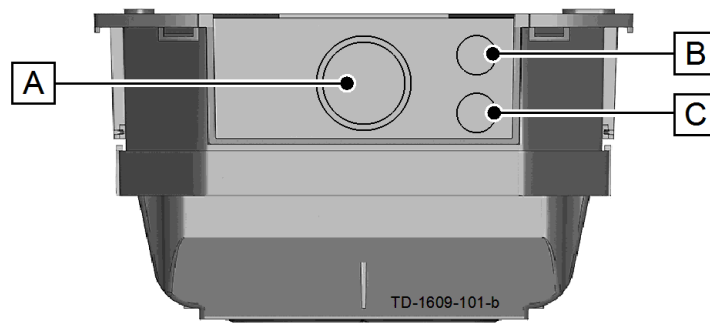
- ▶ Remove the connector panel cover (see Chapter "[4.2.2 Removing the connector panel cover \[19\]](#)").
- ▶ **Fit the charging station with the supplied cable glands or dummy screw fittings (if an open cable insertion opening is no longer used).**



Breaking out the cable insertion openings

- ▶ Place the housing 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 gland or double-membrane seals).

4.3.1 Cable insertion from above - surface cable routing

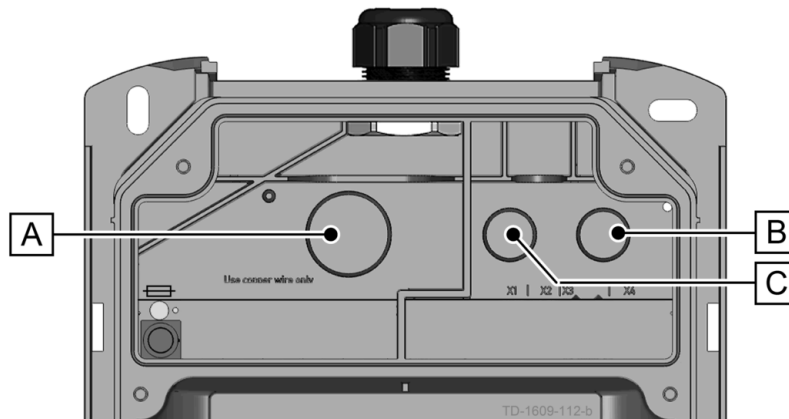


A ... Cable gland M32 (power supply line)

B ... Cable gland M16 (for control line/Ethernet)

C ... Cable gland M16 (for control line/Ethernet)

4.3.2 Cable insertion from behind - flush-mounted cable routing



A ... Feedthrough/double-membrane seals M32 (power supply line)

B ... Feedthrough/double-membrane seals M20 (for control line/Ethernet)

C ... Feedthrough/double-membrane seals M20 (for control line/Ethernet)

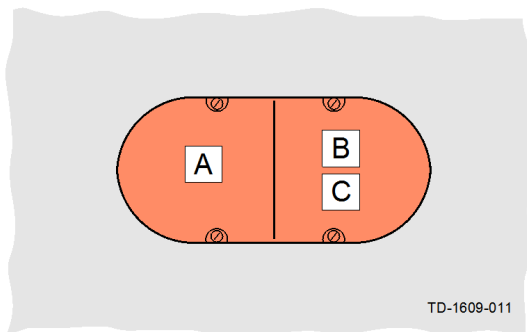
Cable outlet - flush-mounted box...

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

[A]... Power supply line

[B]... Control line

[C]... Ethernet



TD-1609-011

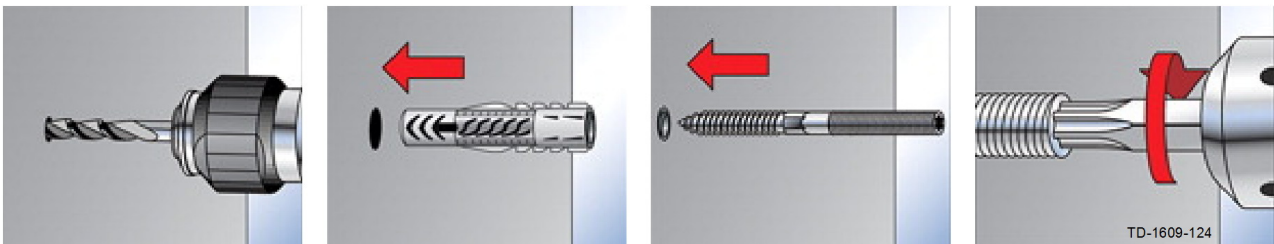
4.4 Mounting the charging station

Installation materials

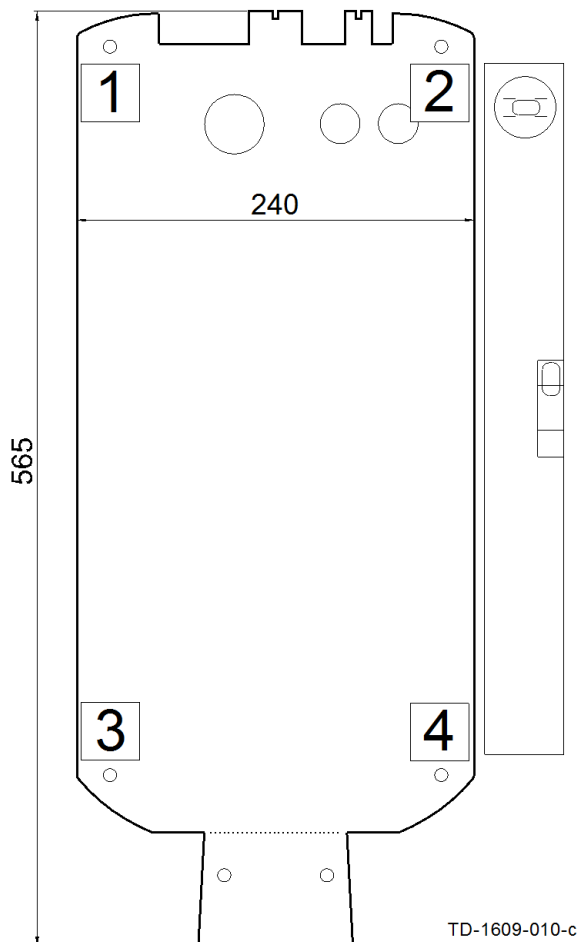
The included installation material (excluding e-series) is suitable for cement, brick and wood (without anchors). For other surfaces, a suitable method of installation must be selected.

Depending on the device model or for special materials, the installation materials must be provided by the customer. A proper installation is absolutely necessary and lies outside of the scope of responsibility of the KEBA AG.

Please also observe the following manufacturer instructions:



Instructions for placing anchors and bolts. Source: Fischer



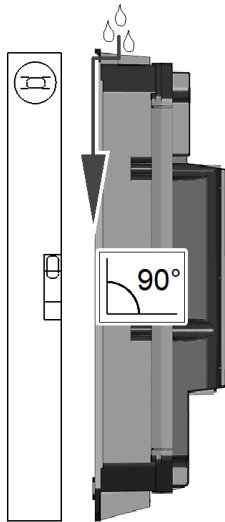
Marking the holes...

- ▶ 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.

Installation

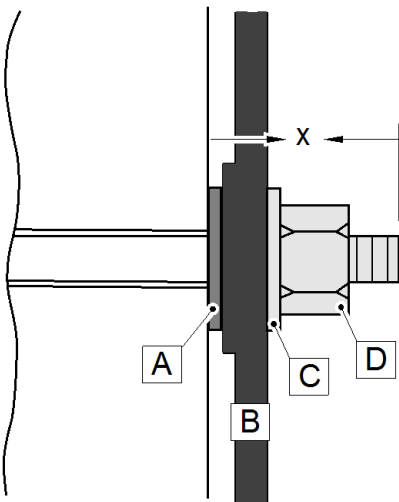


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Water drainage

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!).



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Mounting the charging station...

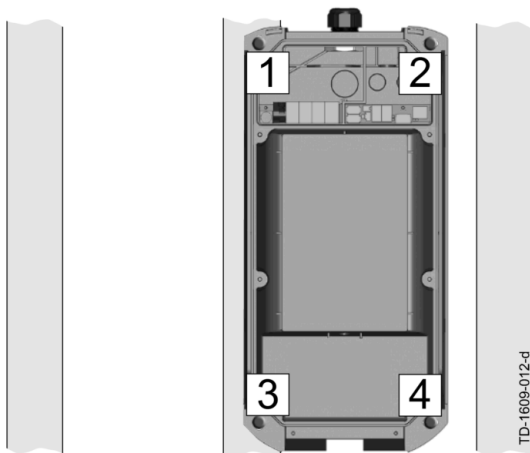
- ▶ Turn the hanger bolts into the anchors until the thread still protrudes approx. 2 cm ('x').
- ▶ Use the shims [A] to compensate for any unevenness and to ensure a water drainage behind the device.
- ▶ Position and mount the charging station using the supplied washers and nuts.

[A]...Shim

[B]...Charging station housing

[C]...Washer

[D]...Nut



TD-1609-012-d

Installation on cavity walls

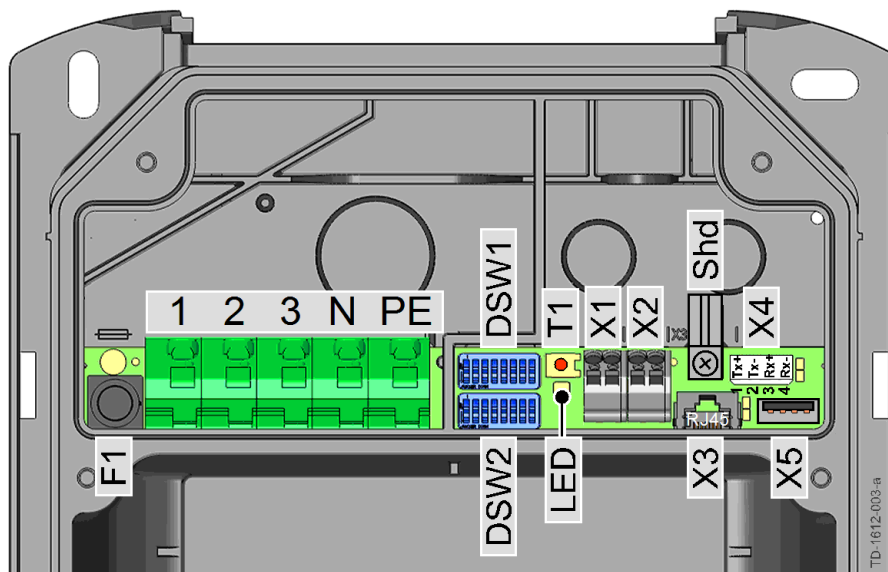
For installation on cavity walls, **at least 2** mounting screws must be secured to a support element of the wall (see figure).

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

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

4.5 Electrical connection

4.5.1 Connection overview with opened connector panel cover



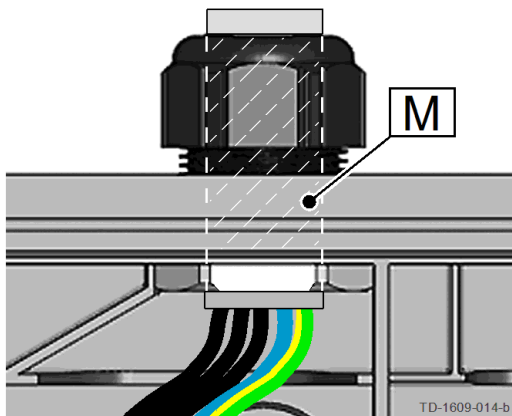
1 ... Mains connection phase conductor 1	T1 ... Service button
2 ... Mains connection phase conductor 2	LED ... Status LED (internal)
3 ... Mains connection phase conductor 3	X1 ... Enable input
N ... Mains connection N conductor	X2 ... Switch contact output
PE ... Mains connection PE conductor	X3 ... Ethernet2 connection (RJ45)
F1 ... Fuse holder	X4 ... Ethernet1 connection (LSA+ terminals)
DSW1 ... DIP switch configuration	X5 ... USB connection (P30 only)
DSW2 ... DIP switch addressing	Shd ... Ground for Ethernet1 connection terminals



Information for Ethernet connection

The Ethernet1 connection [X4] and Ethernet2 connection [X3] are connected in parallel on the circuit board and cannot be used at the same time. The connection that is not used must be unplugged.

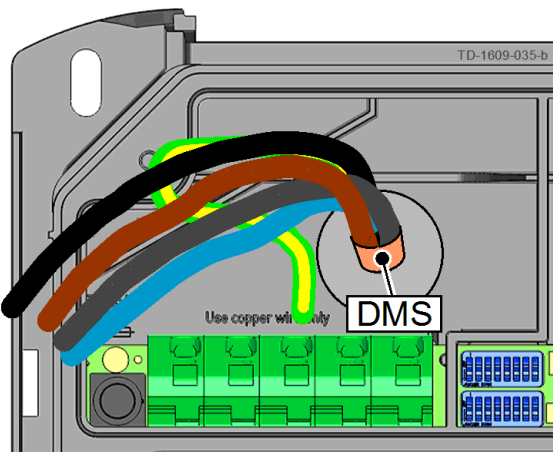
4.5.2 Connecting the power supply line



Running the power supply line (surface cable routing)

- ▶ Run the supply line from **ABOVE** as shown in the figure.

[M]... Cable sheathing



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

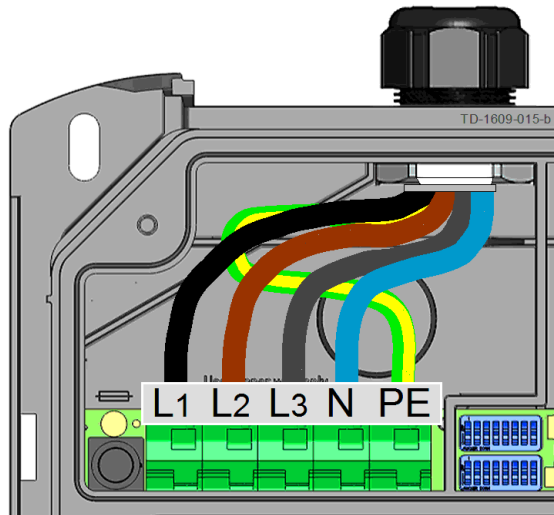
- ▶ The power supply cable must be run as shown through the feedthrough/double-membrane seal [DMS].

- Make sure that the double-membrane seal fits cleanly against the cable sheathing.
- Make sure that the connection cable is inserted through the center of the double-membrane seal and free of pressure to ensure seal tightness.

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 (above) resp. double-membrane seals (behind) sufficiently into the cable gland. 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 gland (above) or run through the double-membrane seals (behind).
- The feed line must be run straight through the cable gland (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 gland resp. double-membrane seals must be installed properly and screwed together sufficiently.

Installation



Connecting the power 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. Core-end sleeves are recommended for fine stranded wires.
- ▶ Carry out the connection of the power 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).

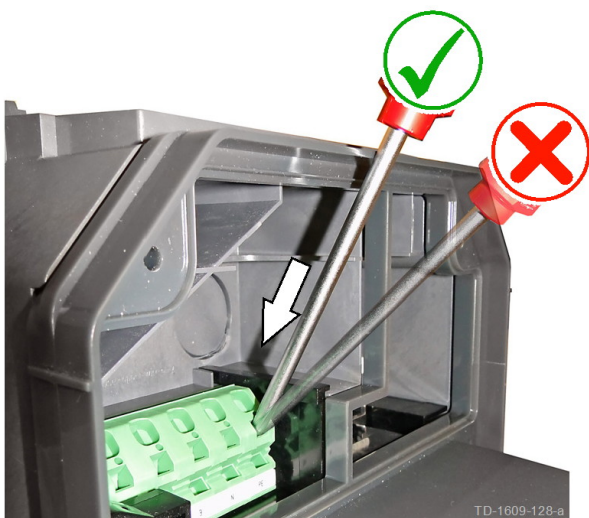
1-phase connection

It is also possible to connect the charging station with only 1-phase; the terminals [L1], [N] and [PE] are to be used for this.

Supply terminals...

The supply terminals are designed as spring-type terminals.

- ▶ Insert the flathead screwdriver (5.5 mm) into the power supply terminal as shown in the figure.



Terminal data:

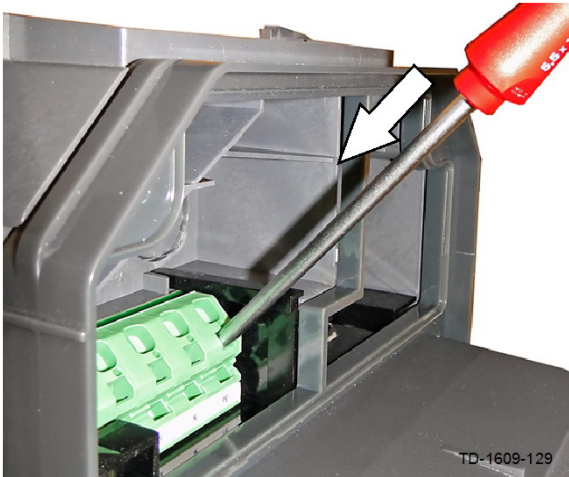
- Fixed (min.-max): 0.2 – 16 mm²
- Flexible (min.-max): 0.2 – 16 mm²
- AWG (min.-max): 24 – 6
- Flexible (min.-max) with wire end sleeve:
Without/with plastic sleeve
0.25 – 10 / 0.25 – 10 mm²
- Insulation stripping length: 12 mm
- Flathead screwdriver 5.5 mm

ATTENTION

Risk of breaking the terminal!

- Do not press the screwdriver up, down or to the side!

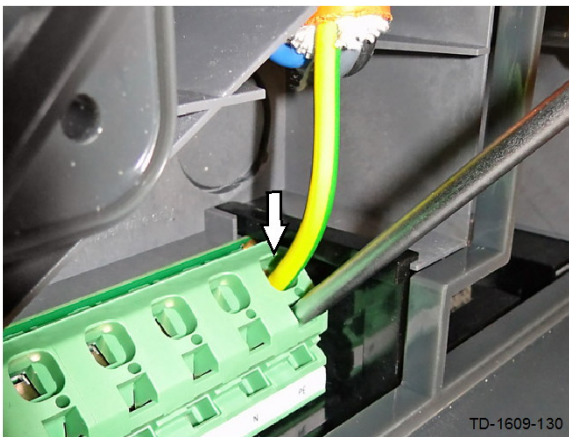
Installation



Opening the power supply terminal...

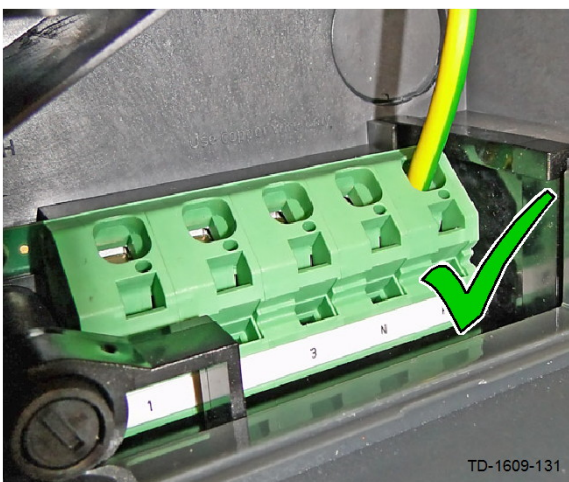
- ▶ Using moderate force, press the screwdriver straightly into the terminal until the contact opens completely.

The angle of the screwdriver changes while pressing in the terminal.



Connecting wires...

- ▶ Insert the stripped connection wire into the power supply terminal.



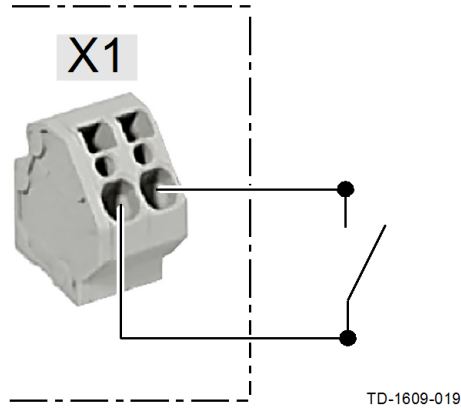
Closing the power supply terminal...

- ▶ Pull the screwdriver out of the terminal completely in order to close the contact.
- ▶ Check that the connection wire is tight.
- ▶ Connect the other connection wires in the same way.

4.5.3 Enable input [X1] (excluding e-series)

The enable input is equipped for 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:

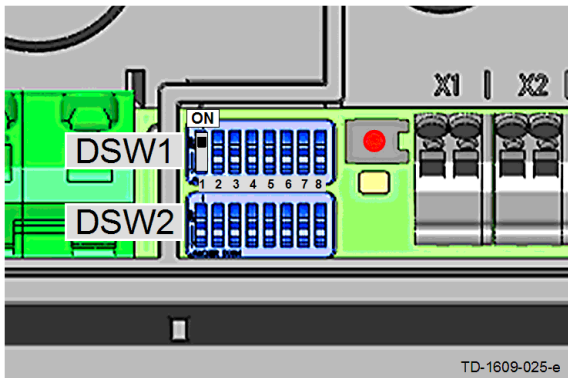
Outside of the device, a secure isolation to dangerous voltages must be ensured for this control line.

Logical function:

Enable contact	State of the charging station
open	BLOCKED
closed	READY FOR OPERATION

Connection:

- ▶ Connect the wires to the enable input (please refer to the "[4.5.5 Terminals \[X1/X2\] \(excluding e-series\) \[29\]](#)" chapter for details about the terminal).



DIP switch setting...

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

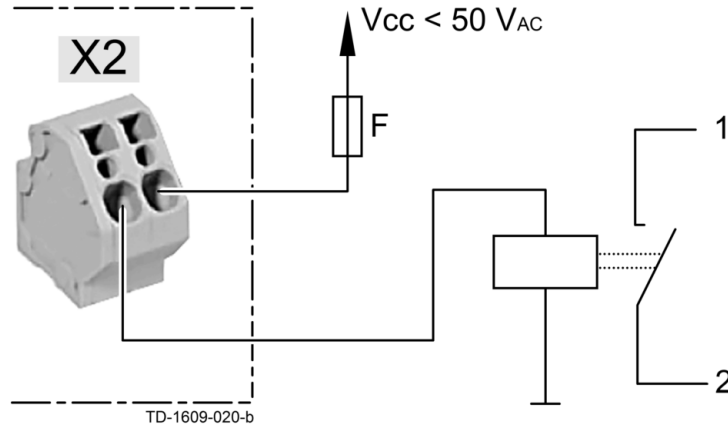
Use enable input:

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

4.5.4 Switch contact output [X2] (excluding e-series)

The switch contact output (signal contact) is a potential-free relay contact and can be used as a charging status display (default) or contactor monitoring.

Circuit diagram:

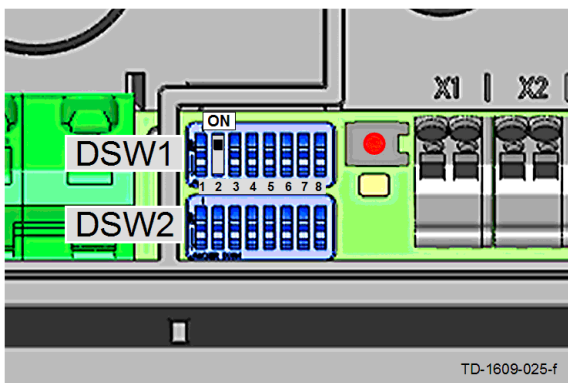


- Safety extra-low voltage $V_{CC} < 50 V_{AC}$
- $F \leq 0.5A$ current-limiting protective equipment

Logical function:

Charging status display / DSW1.2 = OFF (default)	
X2 = closed	Charging station is ready for operation and no vehicle is connected.
X2 = open	Vehicle is connected, charging station not in operation or error.

Contactor monitoring / DSW1.2 = ON	
X2 = closed	A switch contact of the contactor is stuck.
X2 = open	No error.



DIP switch setting

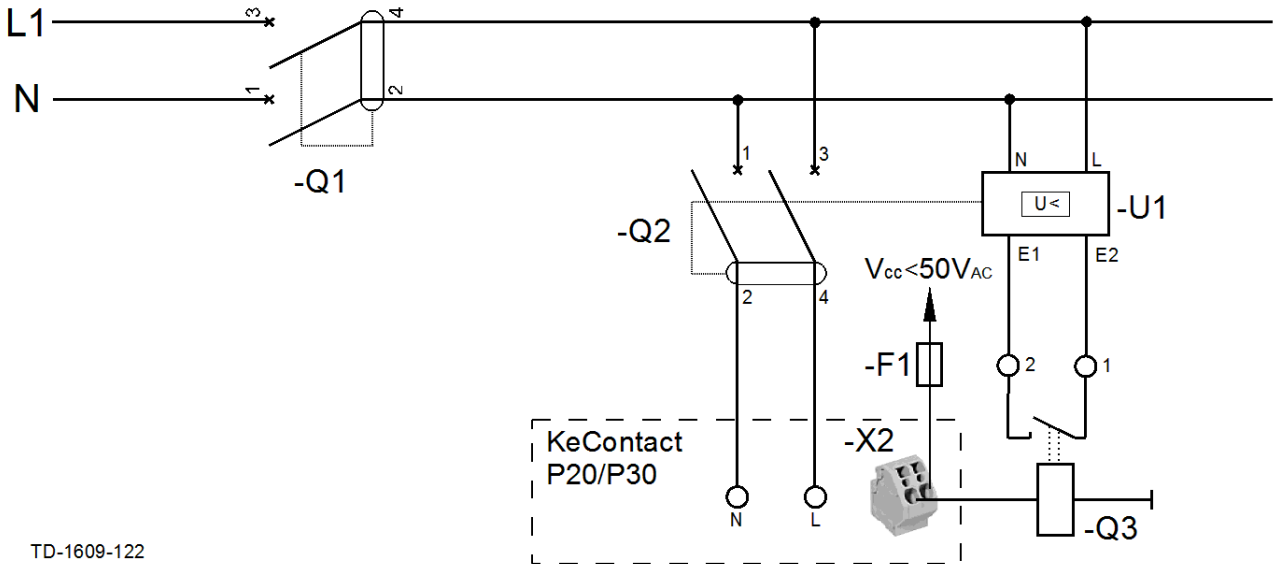
The use of the switch contact output can be selected with a DIP switch setting.

- Charging status display: DSW1.2 = **OFF** (default)
- Contactor monitoring: DSW1.2 = **ON**

▶ Connect the wires to the switch contact output (please refer to the Chapter "4.5.5 Terminals [X1/ X2] (excluding e-series) [29]").

Example (supplement to the circuit diagram):

The switch contact output can be used to switch off the charging station (disconnect the current) by means of an overriding disconnect solution.



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-Q1 ... Main switch	-Q2 ... Line circuit breaker + RCD circuit breaker
-Q3 ... Contactor/relay	-F1 ... Current-limiting equipment
-U1 ... Undervoltage trigger	-X2 ... Switch contact output

4.5.5 Terminals [X1/X2] (excluding e-series)



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
- Insulation stripping length: 8 mm
- Flathead screwdriver 3.0 mm

4.5.6 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.











Information for Ethernet connection

The Ethernet1 connection [X4] and Ethernet2 connection [X3] are connected in parallel on the circuit board and cannot be used at the same time. The connection that is not used must be unplugged.

The Ethernet1 connection 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 cabling standards used in the building, the contacts are wired according to **TIA-568A/B** for 100BaseT as follows:

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

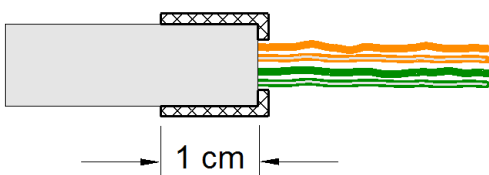
Installation

Category	Wire diameter	Insulation diameter
Flexible cable Cat 5e / Cat 6 STP	7 x 0.2 mm (AWG 24)	1.1 – 1.4 mm



LSA+® insertion tool

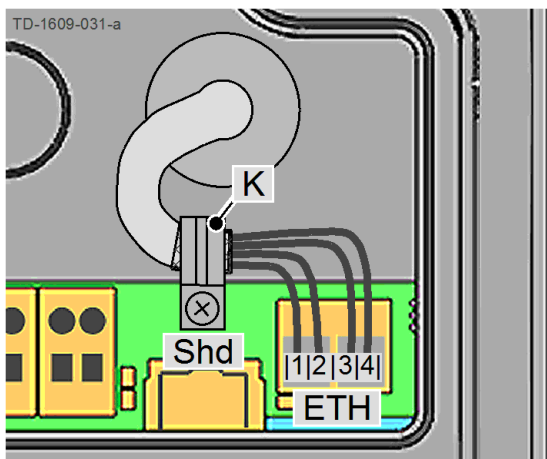
Original KRONE insertion tool with solder-free and stripping-free connection of the wires and simultaneous trimming of the residual lengths.



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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

- ▶ Fix the connecting cable at the point of the wrap-around shielding braid in the cable clamp [K].

The cable clamp must be screwed onto the ground point [Shd] of the circuit board.

- ▶ Clamp the wires to the terminal block [ETH] using the insertion tool.

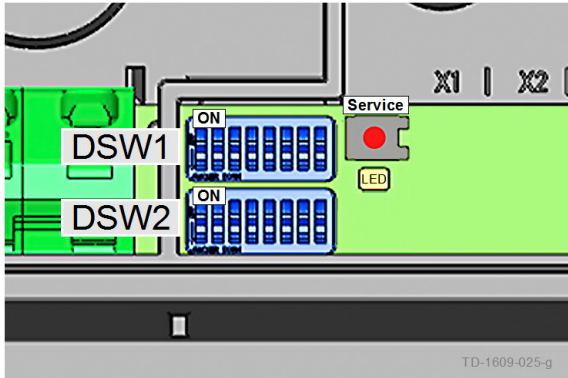
ATTENTION

Risk of damage!

- Ensure that the connection area remains clean, so that no contaminants (pieces of wire, etc.) get inside the charging station.
- If there is protective film present, do not remove it before the connection of the cables!

4.6 DIP switch settings

Changes to the DIP switch settings only become effective after a restart of the charging station! To do this, press the **[service button]** for 1 second or switch the power supply voltage off/on.

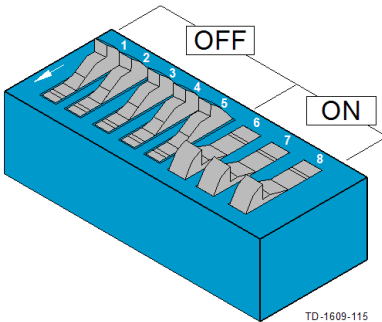


DIP switches...

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

[DSW1]...Configuration (DIP switch up)

[DSW2]...Addressing (DIP switch down)



DIP switch example setting...

For better explanation, the figure shows the position of the DIP switches for the states ON and OFF.

CONTROL FUNCTIONS OF THE CHARGING STATION

Function	DIP switch		Figure
External enable input [X1] is used (for details, see Chapter "4.5.3 Enable input [X1] (excluding e-series) [27]").	D1.1	ON= yes	
Switch contact output [X2] is used (for details, see Chapter "4.5.4 Switch contact output [X2] (excluding e-series) [28]").	D1.2	ON= yes	
Activate SmartHome Interface via UDP (for details see "UDP Programmers Guide"). Only available for c-series and x-series charging stations.	D1.3	ON= yes	

Installation



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

SETTING THE AMPERAGE (DSW1) (*1)				
Current	DIP-Switch			Figure
	D1.6	D1.7	D1.8	
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) Preset maximum charging current value for the vehicle (Control Pilot Duty Cycle).

OBTAIN IP ADDRESS VIA DHCP (NO ADDRESSING) (*2) DSW2.1 to DSW2.4=OFF / DSW2.5=OFF / DSW2.6=OFF	
<p>The charging procedure in STANDARD mode is carried out automatically by the charging station without higher-ranking control system.</p> <p>The charging station attempts to obtain an IP address via DHCP server, if needed.</p> <p>This also corresponds to the basic settings for charging stations without network connection.</p>	

(*2) Not valid for P30 x-series

Installation

USE FIXED IP ADDRESS (*2) DSW2.1 to DSW2.4 / DSW2.5=OFF / DSW2.6=ON

Since multiple charging stations are located in a network; the charging stations must be addressed.

Addressing is done using the DIP switches **DSW2.1 to DSW2.4**.

The settable Ethernet addresses start at **10 + DIP switch setting**.

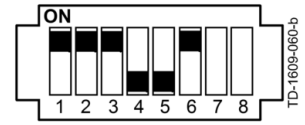
With 4-bit addressing, the addresses 11 to 26 can be used **[192.168.25.xx]**.

DSW2.1 = Address bit 2⁰ (value=1)

DSW2.2 = Address bit 2¹ (value=2)

DSW2.3 = Address bit 2² (value=4)

DSW2.4 = Address bit 2³ (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

(*2) Not valid for P30 x-series

CONNECTION TO HIGHER-RANKING COMMUNICATION MODULE DSW2.1 to DSW2.4=OFF / DSW2.5=ON / DSW2.6=OFF

Activate communication hub mode.

Required for OCPP connection of a KeContact P30 x-series or a KeContact C10 communication hub.

D2.5

ON= yes

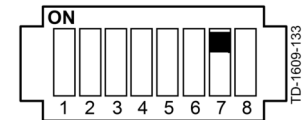


PLC MODEM (DSW2.7)

Deactivate PLC modem

D2.7

ON= yes

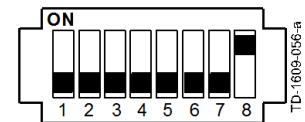


COMMISSIONING MODE (DSW2.8)

Activating the commissioning mode
(for details, see Chapter "[4.7.1 Commissioning mode/self test \[35\]](#)").

D2.8

ON= yes



Set D2.1 to D2.7 to OFF!

4.7 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 tightness.
- 3) Check whether all unused cable screw connections are properly sealed with blind plugs or dummy screw fittings.
- 4) Ensure that the voltage of the power supply line is switched on. The status LED (LED bar) should start to slowly flash green after 15-20 seconds.
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 Chapter "4.7.1 Commissioning mode/self test [35]").
- 6) Close the connector panel cover to the charging station.
- 7) Mount the housing cover (see Chapter "4.7.5 Mounting the housing cover [38]").

4.7.1 Commissioning mode/self test

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.

A switching on of the charging station in commissioning mode via the power supply line leads to a fault for safety reasons (white-red-red-red) in order to prevent an unintended activation.

Activating the commissioning mode

- ▶ Set the DIP switch **DSW2.8** to **ON** (see "4.6 DIP switch settings [32]").
- ▶ Perform a reset of the charging station. To do this, press the **[service button]** for **1 second**. The commissioning mode is now activated and signaled by the orange status LED.
- ▶ 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 "4.7.2 Safety checks [36]").
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 off/on.
The charging station starts up again in normal mode and is ready for operation.

4.7.2 Safety checks

Before the initial use, check the effectiveness of the safety measure(s) of the system according to the nationally applicable regulations!

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 triggering current, triggering time,...) are to be performed for the expanded or modified part.
- ▶ The measurement devices must comply with the national regulations!
- ▶ The measurement results are to be documented. A test report is to be created and saved before the check.

4.7.3 Firmware update

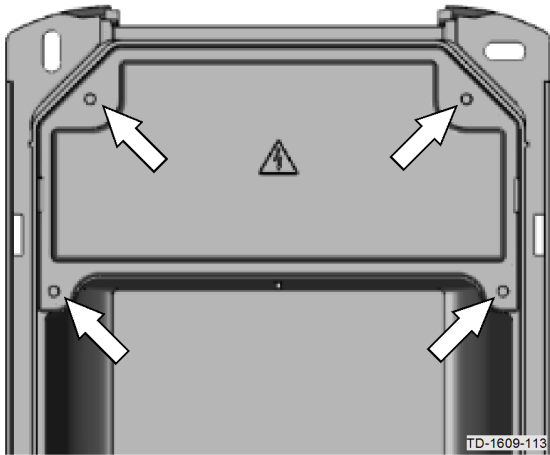
The firmware of the charging station can be updated via the network connection or via the USB connection [X5] (P30 only).

- ▶ Follow the documentation with the firmware package to update the charging station.



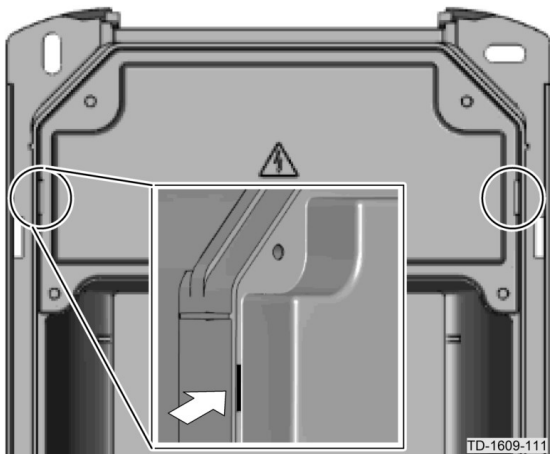
You can download the latest **firmware** at www.keba.com/emobility (download area). A new firmware can take into account modified standards or improve the compatibility with new electric vehicles, for example.

4.7.4 Mounting the connector panel cover



Mounting the connector panel cover

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

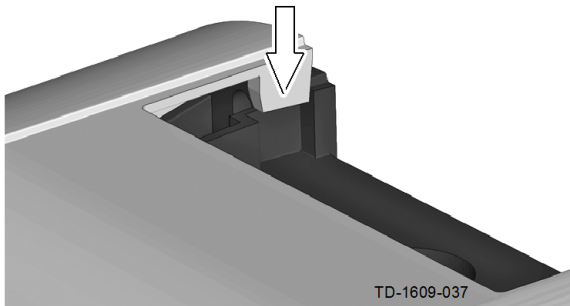


Enclosure marking

- ▶ Tighten the 4 screws until the enclosure marking on the connector panel cover is flush with the enclosure.
- ▶ The connector panel cover must seal the enclosure properly.

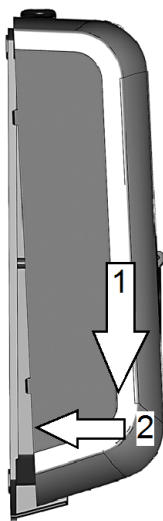
Self-tapping screws require more force (min. 2.5 Nm to max. 5 Nm).

4.7.5 Mounting the housing cover



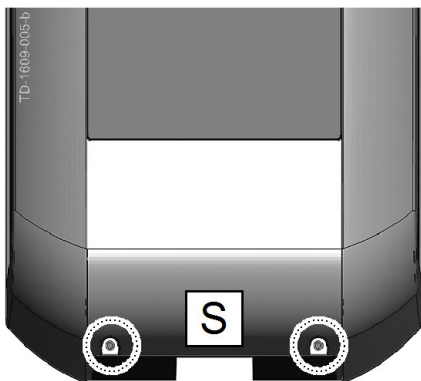
Fitting the housing cover...

- ▶ 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...

- ▶ 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...

- ▶ Secure the housing cover at the bottom using the two mounting screws[S].

5 Additional technical instructions

5.1 Programming RFID cards (optional)



Note

If you have a device version with RFID function, then please follow the programming instructions in the "Authorization functions" manual.

5.2 Communication with the electric vehicle PLC->Ethernet (optional; P20 only)

To grant the vehicle access to the home network or the Internet, the powerline communication between vehicle and charging station must be configured on both sides using the same password (NMK "Network Membership Key").

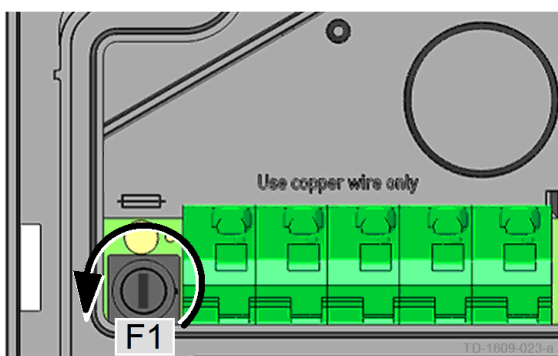
The standard password is "emobility". We recommend changing this password.

The required software ("EV Communication Assistant") incl. instructions for the configuration of the charging station can be found in the download area at www.keba.com/emobility.

For details on setting up the vehicle, please refer the manufacturer's instructions for your vehicle.

5.3 Replacing the fuse

Fuse	Current / Voltage	Type	Dimensions
F1	6.3 A / 250 V	Slow-blow with high breaking capacity (>1500 A) (T) (H)	5 x 20 mm fuse



Replacing the safety fuse

- ▶ Switch off the power supply line of the charging station completely.
- ▶ Remove the connection field cover.
- ▶ Press a flathead screwdriver into the opening of the fuse holder.
- ▶ Turn the fuse holder counterclockwise until it is pushed out automatically by the spring.
- ▶ Replace the fuse.
- ▶ Push the fuse holder in and retighten in the clockwise direction.

5.4 Dimensions

Version with standard socket (Type 2)

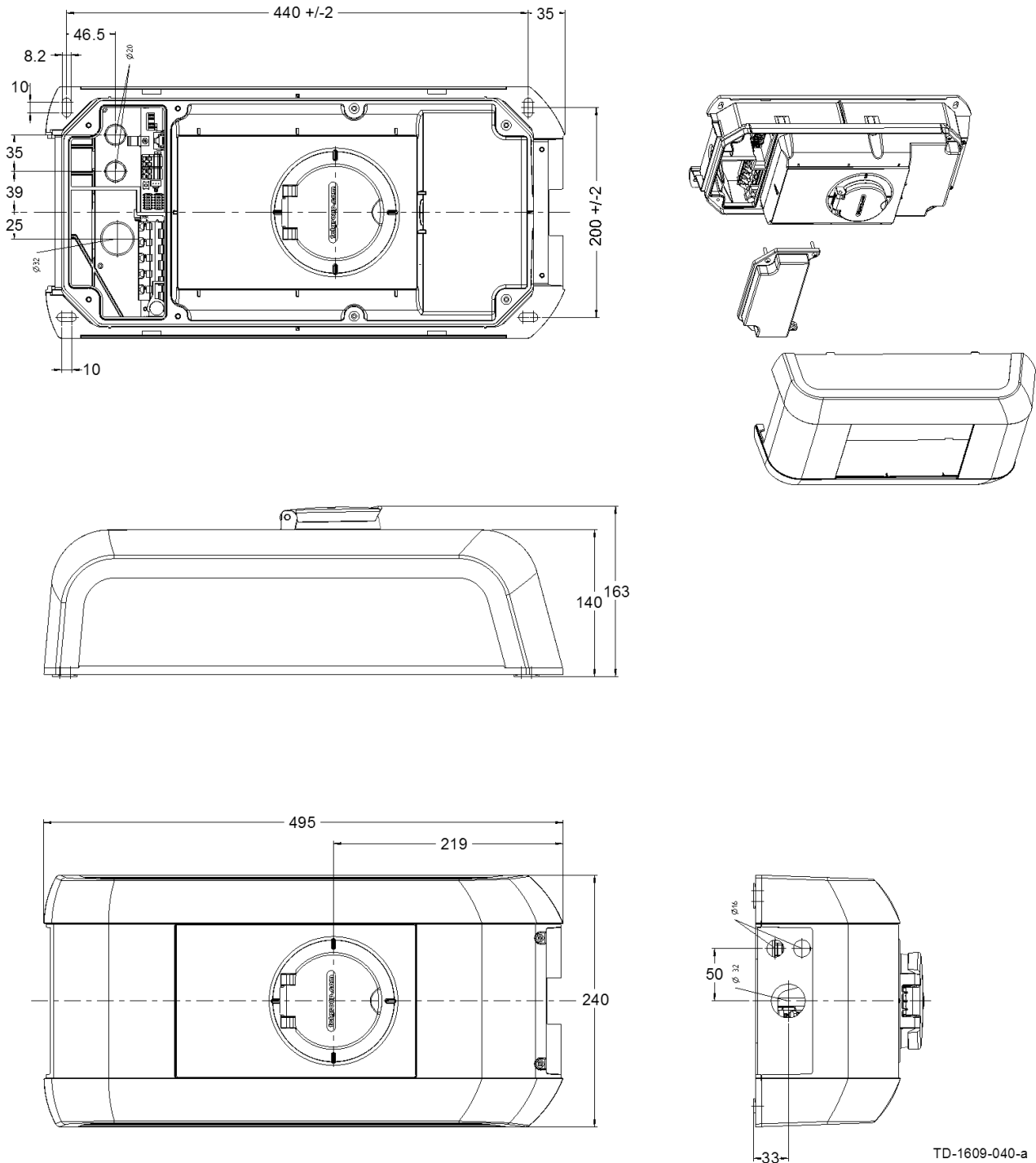


Figure 5-1: Dimensions in millimeters

Version with charging cable and hanger

TD-1612-103

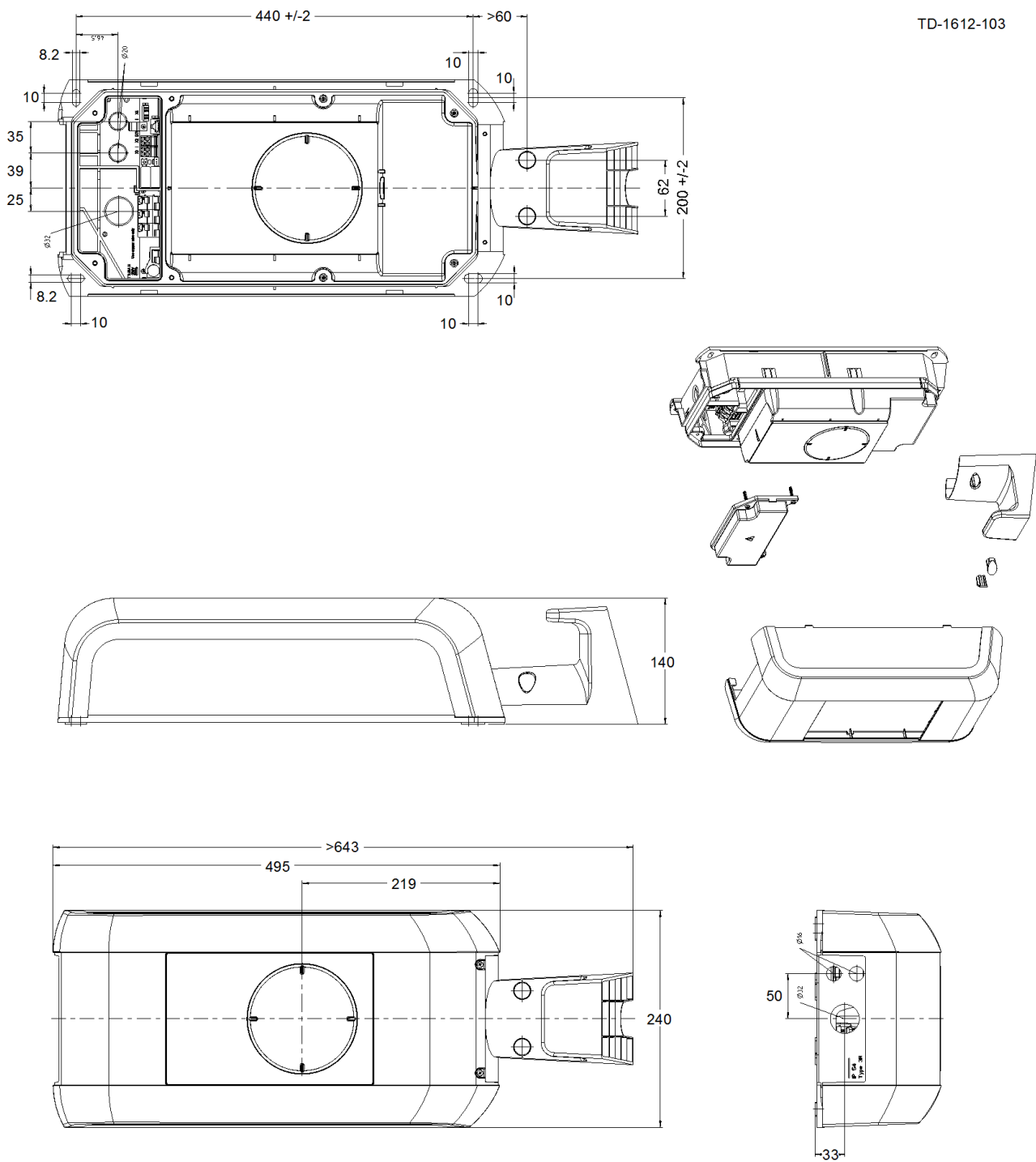


Figure 5-2: Dimensions in millimeters

5.5 Technical data

Electrical data	
Cable feed:	Surface cable routing or flush-type cable routing
Connection cross-section:	Minimum cross-section (depending on the cable and the laying system): - 5 x 2.5 mm ² (16 A nominal current) - 5 x 6.0 mm ² (32 A nominal current)
Supply terminals:	Connection line: - Solid (min.-max): 0.2 – 16 mm ² - Flexible (min.-max): 0.2 – 16 mm ² - AWG (min.-max): 24 – 6 - Flexible (min.-max) with wire end sleeve without/with plastic sleeve: 0.25 – 10 / 0.25 – 10 mm ²
Supply terminals temperature rating:	105°C
Nominal current (configurable connection values):	10 A, 13 A, 16 A, 20 A, 25 A or 32 A 3-phase or 1-phase
Mains voltage (Europe):	230 V 230/400 V 3N~ (excluding e-series)
Mains frequency:	50 Hz / 60 Hz
Network configuration:	TT / TN / IT (P30 only)
Overvoltage category:	III according to EN 60664
Rated short-time withstand current:	< 10 kA effective value according to EN 61439-1
Fuse protection (in domestic installation):	The fuse protection must be implemented according to the locally valid regulations, according to the socket versions / cable versions (see type plate).
DC residual-current monitoring (P30 only):	FI / RDCMB ≤ 6mA DC (integrated with corresponding P30 device version)
Socket versions:	Type 2 standard socket: 32 A / 400 V _{AC} according to EN 62196-1 and VDE-AR-E 2623-2-2
Cable versions: (for rating see type plate)	Type 1 cable: up to 32 A / 230 V _{AC} according to EN 62196-1 and SAE-J1772 Type 2 cable: up to 32 A / 400 V _{AC} according to EN 62196-1 and VDE-AR-E 2623-2-2
Protection class:	I
IP protection rating for device:	IP54
Protection against mechanical impact:	IK08 (except for cylinder lock)

Additional technical instructions

Interfaces	
Enable input [X1]:	Enable input for external authorization: Connection line: - Cross section (min.-max): 0.08 – 4 mm ² - AWG (min.-max): 28 – 12
Potential-free switch contact output [X2]:	Safety extra-low voltage <50 V _{AC} 50/60 Hz External current limiting max. 0.5 A Connection line: - Cross section (min.-max): 0.08 – 4 mm ² - AWG (min.-max): 28 – 12
Ethernet2 connection (debug) [X3]:	RJ45
Ethernet1 connection [X4]:	LSA+ terminals
USB connection [X5] (P30 only):	USB socket type A (max. 500 mA)
RFID (optional):	MIFARE cards or tags according to ISO14443
Cylinder lock (optional):	Profile half cylinder according to EN 1303 or DIN 18252 Length A=30 mm (31 mm)

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)

Ambient conditions	
Operating temperature at 16 A:	-25°C to +50°C without direct sunlight
Operating temperature at 32 A:	-25°C to +40°C without direct sunlight
Temperature behavior:	In each case, for the specified operating temperature ranges, the device provides charging current continuously. To increase the charging availability, the charging current specification is reduced to 16 A if the temperature is exceeded. The charging procedure can also subsequently be switched off. After cooling down, the charging current specification is increased again.
Storage temperature range:	-25°C to +80°C
Speed of temperature change:	max. 0.5°C/min
Permitted relative humidity:	5 % to 95 % (non condensing)
Altitude:	max. 2000 m above sea level

5.6 CE Declaration of Conformity

KEBA hereby declares that the product complies with the following Directives:

2014/35/EU	Low-voltage Directive
2014/30/EU	Electromagnetic Compatibility Directive
2014/53/EU	Radio Equipment Directive (RED)
2011/65/EU	Directive on the restriction of the use of certain hazardous substances (RoHS)
2012/19/EU	Directive for waste electrical and electronic equipment (WEEE)



The complete text of the CE Declaration of Conformity is available in the download area of the following website:

www.keba.com/emobility

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