EVBOX

EVBox Liviqo

Cable

Installation and user manual

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1. Introduction

This Installation and user manual describes how to install the charging station and make it ready to use. You must carefully read the safety information before you start.

1.1. Scope of the manual

The installation and configuration instructions in this manual are intended for qualified installers who can assess the work and identify potential danger.

The user instructions are intended for users of the charging station.

Retain all documentation delivered with the charging station in a safe place for the entire life cycle of the product. Forward all documentation to any subsequent owners or users of the product.

All EVBox manuals can be downloaded from evbox.com/manuals.

Disclaimer

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1.2. Symbols used in this manual

Symbols used in this manual

DANGER
Indicates an imminently hazardous situation with a high risk level which, if the danger is not avoided, will cause death or serious injury.

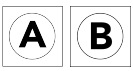
WARNING
Indicates a potentially hazardous situation with moderate risk level which, if the warning is not obeyed, can cause death or serious injury.

CAUTION
Indicates a potentially hazardous situation with a medium risk level which, if the caution is not obeyed, may cause minor or moderate injury or damage to the equipment.

Note
Notes contain helpful suggestions, or references to information not contained in this manual.

1., a. or i. Action to be followed in the stated order.

1.3. Icons used in this manual



Choose one feature


Installer


User


Visually check


Only for use in a dry location


Do not use a power screwdriver


AC power supply

1.4. Certification and compliance

	The charging station has been CE-certified by the manufacturer and bears the CE logo. The relevant declaration of conformity may be obtained from the manufacturer.
	Electrical and electronic appliances, including accessories, must be disposed of separately from the general municipal solid waste.
	Recycling of materials saves raw materials and energy and makes a major contribution to conserving the environment.



Note
See EU Declaration of Conformity on page 44 for the Declaration of Conformity for this product.

2. Safety

2.1. Safety precautions

DANGER
Not following the installation and user instructions given in this manual will result in the risk of electric shock, which will cause severe injury or death.

- Read this manual before installing or using the charging station.

DANGER
Installation, servicing, repair and relocation of this charging station by a non-qualified person will result in the risk of electric shock, which will cause severe injury or death.

- Only a qualified electrician is permitted to install, service, repair, and relocate the charging station.
- The user must not attempt to service or repair the charging station as it does not contain user-serviceable parts.
- Local regulations may be applicable and may vary depending on your region or country of use. The qualified electrician must always ensure that the charging station is installed according to local regulations.

DANGER
Working on electric installations without proper precautions will result in the risk of electric shock, which will cause severe injury or death.

- Switch off the input power before installing the charging station.
- Do not switch on the charging station if it is not fully installed or not secure.
- Do not install a charging station that is faulty or has a noticeable issue.

DANGER
Extensive exposure of the charging station to water will result in the risk of electric shock, which will cause severe injury or death.

- Do not direct powerful jets of water toward or onto the charging station.
- Do not put the charging plug into any liquid.

⚠ DANGER

Operating the charging station when it is damaged or worn will result in the risk of electric shock, which will cause severe injury or death.

- Do not operate the charging station if the power supply, the enclosure or an EV connector is broken, cracked, open, or shows any other indication of damage.
- Do not operate the charging station if a charging cable is frayed, has broken insulation, or shows any other indication of damage.
- In the event of danger and/or an accident, have the electrical supply to the charging station disconnected immediately.
- Contact your installer if you suspect that the charging station is damaged.

⚠ WARNING

Installing the charging station during wet environmental conditions (for example, rain or fog) can result in the risk of electric shock and damage to the product, which can cause severe injuries or death.

- Do not install or open the charging station during wet environmental conditions (for example, rain or fog).

⚠ WARNING

Incorrect use of the charging station will result in the risk of electric shock, which can cause injury or death.

- Make sure that the contact area of the charging plug is free from dirt and moisture before starting a charging session.
- Make sure that the charging cable is positioned so that it will not be stepped on, tripped over, driven over, or otherwise subjected to excessive force or damage. Where applicable, make sure that the charging cable is correctly stowed when it is not in use, making sure that the charging plug does not touch the ground.
- Only pull on the charging plug hand grip and never on the charging cable itself.
- Keep the charging station, charging cable and charging plug away from heat sources, dirt, and water.
- Do not use explosive or readily flammable substances near the charging station.

⚠ WARNING

Using adapters, conversion adapters, or cord extensions with the charging station can result in technical incompatibilities and can result in damage to the charging station, which can cause injury or death.

- Use this charging station to charge compatible electric vehicles only. Refer to the charging station specifications in the charging station installation manual for details.
- Refer to your vehicle user manual to check if your vehicle is compatible.

⚠ WARNING

Exposure of the charging station or the charging cable to heat or flammable substances can result in damage to the charging station, which can cause injury or death.

- Make sure that the charging station and the charging cable never come into contact with heat.
- Do not use explosive or readily flammable substances near the charging station.

⚠ WARNING

Using the charging station under conditions not specified in this manual can result in damage to the charging station, which can cause injury or death.

- Use the charging station only under the operating conditions specified in this manual.

⚠ WARNING

Working on electrical installations without using personal protective equipment can result in the risk of injury.

- Use personal protective equipment such as eye protection, cut-resistant gloves, and non-slip safety shoes to prevent personal injuries.

⚠ WARNING
In the event of a fire, not following the fire fighting instructions can result in increased danger, which can cause injury or death.

- When safe to do so, have the electrical supply to the equipment that is burning or endangered by fire disconnected.
- Do not use water to extinguish electrical installations and equipment that have a live power supply.
- To extinguish a charging station, use an extinguisher that is specified for use on electrical equipment with a rating of up to 1 kV.

⚠ CAUTION
Charging a vehicle with the charging cable not completely extended can result in overheating of the cable, which can damage the charging station.

- Before you connect the charging cable to the vehicle, fully unwind the charging cable so it has no overlapping loops.

⚠ CAUTION
Putting fingers into or leaving other objects inside the plug port (for example, during cleaning) can cause injury or can damage the charging station.

- Do not put your fingers into the plug port.
- Do not leave objects inside the plug port.

⚠ CAUTION
Not taking precautions against ESD (Electrostatic discharge) can damage electronic components in the charging station.

- Take the necessary precautions against ESD before touching electronic components.

⚠ CAUTION
Not enabling firmware updates for this charging station, or disabling, opting out of, or otherwise failing to install available firmware updates, can cause the charging station to encounter problems, function with errors, and be more prone to safety or security risks.

2.2. Moving and storage precautions

Obey the following guidelines when moving and storing the charging station:

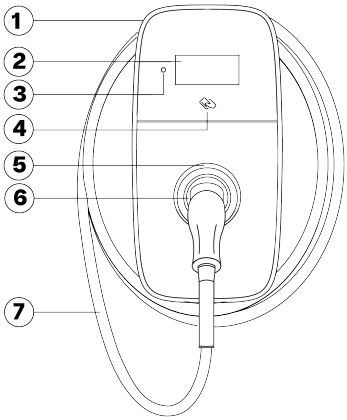
- Never lift the charging station using its charging cable.
- Disconnect the input power before removing the charging station for storage or relocation.
- Transport and store the charging station only in its original packaging. No liability can be accepted for damage incurred when the product is transported in non-standard packaging.
- Store the charging station in a dry environment in the temperature and humidity ranges given in the Technical specifications (see Technical specifications on page 7).

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3. Product features

3.1. Description

1. **Charging station**
   The charging station safely supplies electrical power from the grid to the electric vehicle (EV).
2. **Display**
   The display guides the user through the actions required, and shows information about the charging session.
3. **Light sensor and proximity sensor**
   The light sensor measures the light intensity to automatically adjust the brightness of the display and the LED ring. The proximity sensor switches on the display when a person is close to the charging station.
4. **RFID reader**
   This is the area where you scan your charge card or key fob to start or stop a charging session.
5. **LED ring**
   The LED ring indicates the status of the charging station.
6. **Dock**
   The dock holds the charging cable plug when the charging cable is not in use.
7. **Charging cable**
   The charging cable connects the charging station to the EV. The charging cable is stowed around the station when the cable is not in use.



3.2. Technical specifications

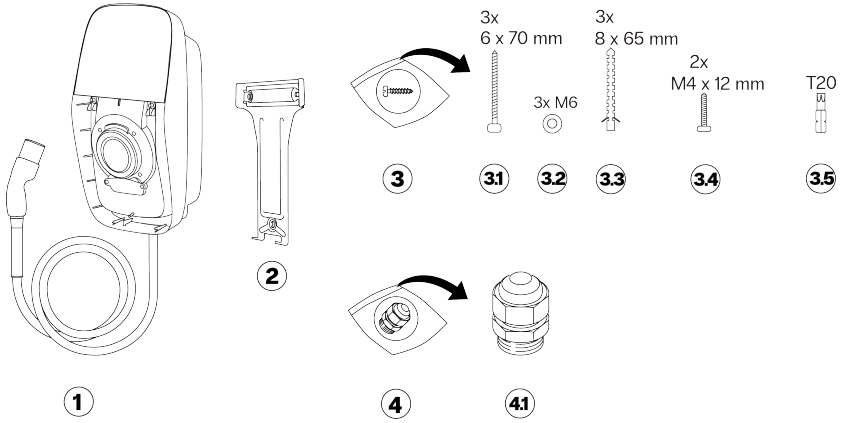
Feature	Description
Electrical properties	
Maximum charge rate	Up to 22 kW (3-phase, 32 A) **Note** Derating may occur. The charge rate depends on factors such as the demand from the EV, the available power supply, and the ambient temperature.
Charging mode	Mode 3 (IEC 61851-1)
Fixed charging cable	Type 2 plug (IEC 62196-1, IEC 62196-2)
Charging cable length	6 m
kWh meter	MID-approved with class B accuracy (EN-50470) Eichrecht compliant meter(1)
Input capacity	6 – 32 A configurable 1-phase, 230 V ±10%, maximum 32 A ±6%, 50/60 Hz 3-phase, 400 V ±10%, maximum 32 A ±6%, 50/60 Hz
Power cable sheath diameter	12 to 25 mm

Feature	Description
Power cable wire gage	Solid wire: maximum 16 mm² Stranded wire with ferrule (without plastic sleeve): maximum 10 mm²
Rated impulse withstand voltage (*U*imp)	4000 V
Rated insulation voltage (*U*i)	250 V AC (phase to ground) 450 V AC (phase to phase)
Leakage current detection	Tripping times and limits are compliant with IEC 61851-1:2017 Cl. 8.5. (in accordance with IEC 62955:2018 Table 2). See Power supply requirements on page 11. RCBO: Type A or Type B
Environment and safety class	
Operating temperature range	-30 °C to +50 °C
Storage temperature range	-40 °C to +80 °C
Humidity (non-condensing)	5% to 95%
Maximum installation altitude	2000 m above sea level
Enclosure codes	IP55 (IEC 60529), IK10 (IEC 62262)
Safety class	Safety Class I and overvoltage Category III
Pollution degree of the macro-environment	Pollution degree 3
Electromagnetic compatibility (EMC) classification	Environment A and Environment B (in accordance with IEC 61439-1)
Mechanical resistance for stationary assembly	High resistance
Connectivity	
Authorization	RFID reader or using an app
Wi-Fi	2.4/5 GHz
Local area network	Ethernet
Cellular communication	4G LTE-M (2G fallback supported)
Communication protocol	OCPP 2.0.1
Smart charging features	Dynamic Load Balancing, Cluster Load Balancing, EEBus compliant, ISO 15118 (hardware ready)
Physical properties	
Dimensions (W x H x D)	256 x 508 x 211 mm
Weight	Approximately 8.4 kg
Housing material	Low-carbon Makrolon RE®
HMI	5" 800 x 480 WVGA IPS LCD, LED ring, Buzzer, Authorization
Certification and compliance	
Power supply input	EV supply equipment permanently connected to AC supply network
Power supply output	AC EV supply equipment
Normal environmental conditions	Indoor and outdoor use
Access	Equipment for locations with non-restricted access
Equipment type	Stationary equipment that is wall-mounted or pole-mounted

(1)Optional.

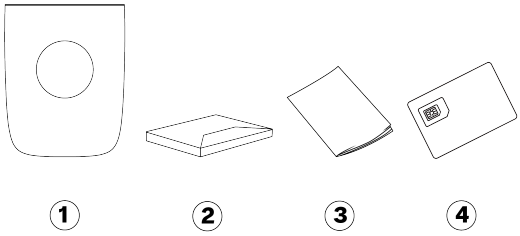
3.3. Delivered components

Components in the charging station box



1 Charging station with charging cable
2 Wall bracket
3 Installation kit
3.1 Panel screws, 6x70 mm, T20, 3x
3.2 Washers, M6, 3x
3.3 Wall-plugs, 8x65 mm, 3x
3.4 Screws, M4x12 mm, T20, 2x
3.5 Torx bit, T20 security
4 Cable gland kit
4.1 Cable gland, 12-20 mm, with seal and blanking plug

Components in the cover box



1 Front cover
2 Welcome pack (optional)
3 Installation and user manual
4 SIM card (optional)

4. Installation instructions

4.1. Prepare for installation

4.1.1. Plan for installation

The following recommendations help you to plan the installation of the charging station.

Choose location

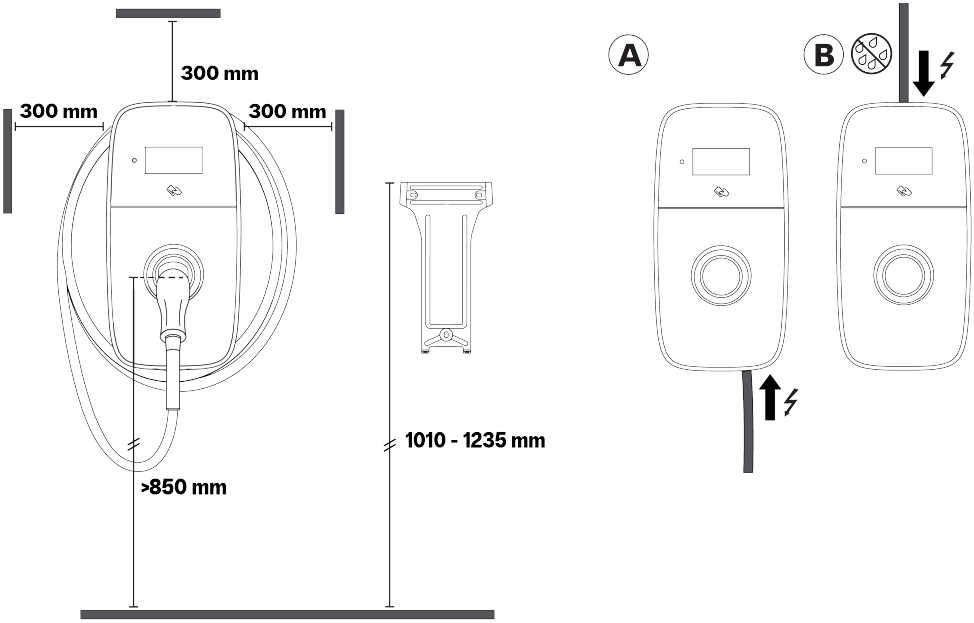
- Position the charging station, where possible, in a location where it is not exposed to direct sunlight or vulnerable to external damage.
- The wall must have a flat structure and must be able to hold a load of at least 100 kg.
- The minimum free space around the charging station is 300 mm.
- The location must not cause the charging cable to have sharp bends.
- The power cable can enter the charging station from the top or the bottom. The bottom cable entry A can be used in any location. The top cable entry B must only be used in a location where there is no risk of exposure

to rain or moisture.

⚠ CAUTION
Risk of water ingress when the top cable entry B is used outdoors. Over a long period of time, rain and moisture can enter the charging station along the power cable, which can damage the charging station.

- Communication cable entry is only through the bottom of the charging station.

Note
The following illustration shows the minimum recommended installation height. Observe and comply with the local accessibility regulations.

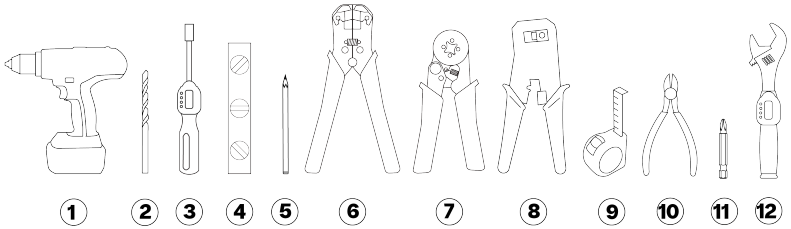


Pre-installation checklist

Before starting the installation of the charging station, check the following:

- The installation will be in accordance with IEC 60364 and any applicable local regulations.
- All necessary permits have been obtained from the local authority that has jurisdiction.
- The existing electrical load has been calculated to find the maximum operating current for the charging station installation.
- For a charging station without an RCBO, a miniature circuit breaker (MCB) and residual current device (RCD) are installed upstream and have the recommended ratings. See Power supply requirements on page 11.
- The power supply cable with the correct specification has been routed to the installation area, and there is sufficient cable length to strip and connect the wires.
- The power supply cable will remain within its bending tolerance during and after installation.
- The recommended tools are available on site. See Tools required on page 11.
- The plugs, screws, and drill bit used for installing the charging station are suitable for the wall structure.
- If using a cluster set up, the correct phase order is planned and the requirements are met. See Optional: Cluster load balancing on page 14.

4.1.2. Tools required



1. Drill
2. Drill bit for masonry, 8 mm (5/16 in)
3. Torque screwdriver with bit holder, 0.5 – 3 Nm
4. Spirit level
5. Pencil
6. Wire stripper (power cable)
7. Ferrule crimp tool
8. Wire stripper and crimp tool (RJ45)
9. Tape measure
10. Wire cutters
11. Screwdriver bit, PH2
12. Torque wrench, 3 – 6 Nm

4.1.3. Power supply requirements

DANGER

Connecting the charging station to the power supply other than as specified in this section will result in incompatibility of the installation and risk of electric shock, which will cause damage to the charging station and injury or death.

- Connect the charging station only in a configuration that is specified in this section.

Earthing system	TN-S and TNC-S systems	PE-cable.
	TT-system IT-system	Earth electrode installed separately (self-installed).
Power input (phase)	1-phase	230 V ±10%, up to 32 A ±6%, 50/60 Hz.
	3-phase	400 V ±10%, up to 32 A ±6%, 50/60 Hz.
MCB (Miniature Circuit Breaker)	• Tripping characteristic: Type C. • The tripping current of the MCB can decrease if the ambient temperature in the power supply cabinet becomes high. Consider potential higher ambient temperatures when choosing the MCB specifications. • Not required for stations with a built-in RCBO. **Note** • The installation, including the MCB, must be in accordance with IEC 60364 and any applicable local regulations. • The MCB must match the amperage settings of the charging station and the maximum current available for the charging station, in accordance with the MCB manufacturer specifications. • The maximum I^2t value of the MCB must not exceed 75000 A^2s.	

RCD (Residual Current Device)	• RCD amperage rating: The rating must match the amperage of the charging station.
	• Standard installations:
	  ◦ For France, the RCD must be a Type B with a rated current of 20 A or 40 A and have maximum 30 mA AC leakage current detection.
	  ◦ For other countries, the RCD must be a Type A, F, or B with a rated current of 20 A, 32 A or 40 A and have maximum 30 mA AC leakage current detection.
	• EV Ready installations: The RCD must be a Type A+, high immunity (for example: HPI, SI, HI, KV, etc., depending on the RCD manufacturer).
	• Not required for stations with a built-in RCBO.
	Note
	• The installation, including the RCD, must be in accordance with IEC 60364 and any applicable local regulations.
	• The charging station has internal DC leakage detection with tripping times and limits compliant with IEC 61851-1:2017 Cl. 8.5. (in accordance with IEC 62955:2018 Table 2).

Power supply wiring

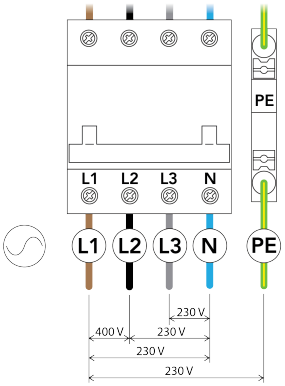
The tables below describe how to connect the power supply to the charging station, depending on the type of the power supply and the configuration of the station.

WARNING
Connecting an IT power supply (without neutral) to a built-in Type A RCBO can result in damage to the charging station, which can cause injury or death.

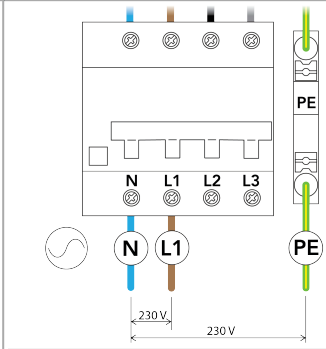
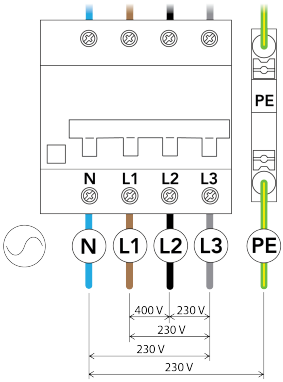
- Only connect a TN or TT 3-phase power supply (with neutral) to a built-in Type A RCBO.

TN and TT power supply to RCBO

Note
This section is only applicable to stations with an built-in RCBO.

Station configuration	1-phase with neutral	3-phase with neutral
RCBO Type A Station article number: Q********8*-***	**CAUTION** Not supported. Do not connect a single phase supply to a station with a 3-phase plus neutral RCBO.	

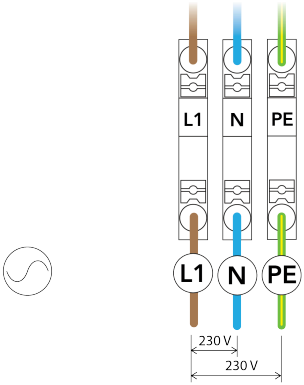
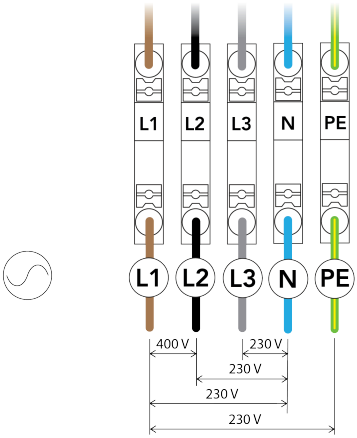
EN

Station configuration	1-phase with neutral	3-phase with neutral
RCBO Type B Station article number: Q********1*-***		

⚠ CAUTION
Do not use terminals L2 and L3.

TN and TT power supply

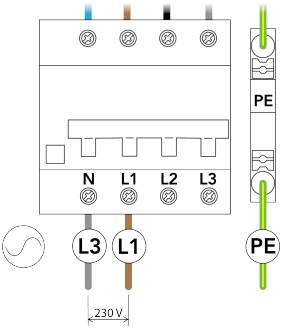
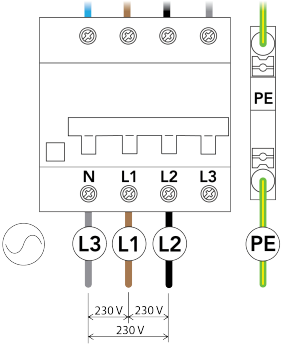
ⓘ Note
This section is only applicable to stations without an built-in RCBO.

1-phase with neutral	3-phase with neutral
	

IT power supply (without neutral) to RCBO

⚠ CAUTION
Make sure that local regulations permit the installation of this charging station on an IT-grid without neutral. Make sure that the EV is compatible with this type of installation.

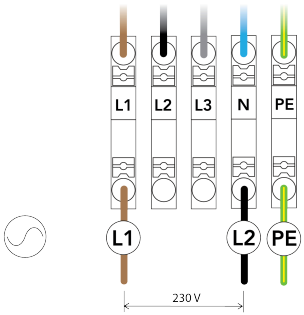
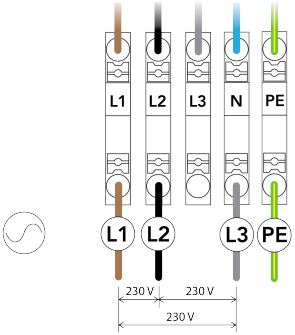
ⓘ Note
This section is only applicable to stations with an built-in RCBO.

Station configuration	2-phase without neutral	3-phase without neutral
Type B RCBO Station article number: Q********1*-***	 ⚠ CAUTION Do not use terminals L2 and L3.	 ⚠ CAUTION Do not use terminal L3.

IT power supply (without neutral)

⚠ CAUTION
Make sure that local regulations permit the installation of this charging station on an IT-grid without neutral. Make sure that the EV is compatible with this type of installation.

ⓘ Note
This section is only applicable to stations without an built-in RCBO.

2-phase without neutral	3-phase without neutral
 ⚠ CAUTION Do not use terminals L2 and L3.	 ⚠ CAUTION Do not use terminal L3.

4.1.4. Optional: Dynamic load balancing

Dynamic load balancing monitors the power consumption of all electrical appliances using the same power source. The EVBox Dynamic Load Balancing Kit supplies a control signal to the charging station to regulate the power that the station supplies to the EV, which keeps the total power consumption from the power source within preset limits. In a cluster installation, the connected charging station regulates the other charging stations connected in the cluster.

Dynamic load balancing requires a wired input from a load balancing detection system (see Charging station communication on page 26).

4.1.5. Optional: Cluster load balancing

A cluster load balancing installation consists of multiple charging stations connected in a cluster. A cluster enables a smart grid to be established across the whole cluster to optimize power usage. Any station can be used as the connected station in the cluster. The cluster is set-up using EVBox Install App. For correct load balancing, a cluster must be connected to a single power supply circuit.

Cluster load balancing requires each station in the cluster to be connected to the same local area network (LAN) using the Ethernet connection (see Charging station communication on page 26).

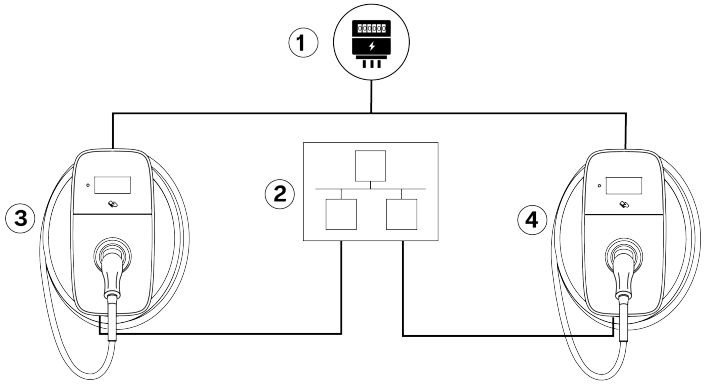
Cluster load balancing requirements

Ethernet Switch	• IPv6 support • Not managed • Number of ports: The number of port must be equal or greater than the number of chargers connected to the cluster. • RJ45 port • 100 Mbps or higher • Static Multicasting: Disabled • Dynamic Multicasting (MLD snooping): Disabled **Note** ◦ For large clusters, two or more switches can be combined in the same network. ◦ An additional port is required if the switch is used for internet connection.
Cables	• CAT5 • Length: 100 m maximum length for each cluster node

Connection Diagram

The following diagram describes how multiple charging stations are connected in a cluster.

Note
The diagram does not include the internet connection of the charging station. The internet connection of the charging station may be set up using cellular, Wi-Fi, or Ethernet.



1. Power supply
2. Ethernet switch
3. AC charger 1
4. AC charger N

Phase rotation

To avoid overloading the first phase with single-phase electric vehicles, the phase order for each charging station that connects to a 3-phase supply in a Power-Sharing installation must be configured using the EVBox Install App.

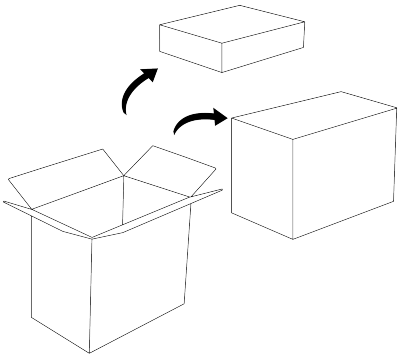
4.1.6. Only for applicable countries: Remote power control by DSO

According to Technical Connection Rules VDE-AR-N-4100:2019-04 Cl. 10.6.4, a charging station with a total rated power of more than 12 kVA must have a remote power control interface to allow remote shutdown of the station by the Distribution System Operator (DSO). This charging station can be connected by cable to an upstream DSO device equipped with a Normally Open (NO) relay. When the relay closes, the station enters a suspended state and charging is paused. Charging resumes when the relay opens. See Only for applicable countries: Connect remote power control cable on page 30 for cable connection instructions.

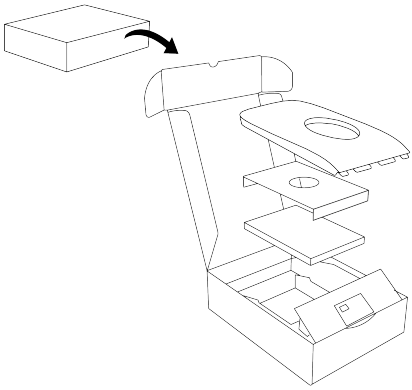
Registration with the DSO is required.

4.2. Unpacking

1. Open the shipping box. Remove the cover box and the charging station box.

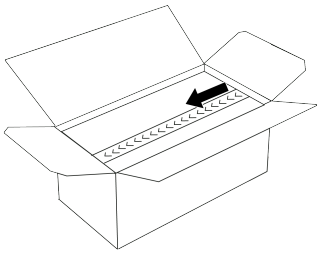


2. Open the cover box. Find the front cover, the Welcome Pack (optional), the charging station documentation, and the SIM card (optional).



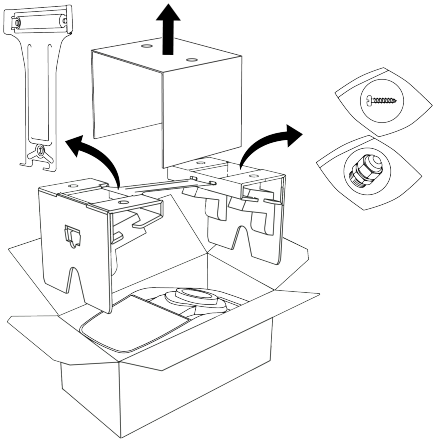
Note
To prevent damage, leave the front cover in the packaging until installation.

3. Open the station box.

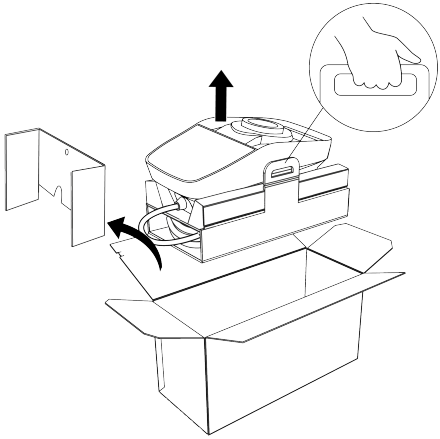


4. Remove the three cardboard fillers, the wall bracket, and the installation kits.

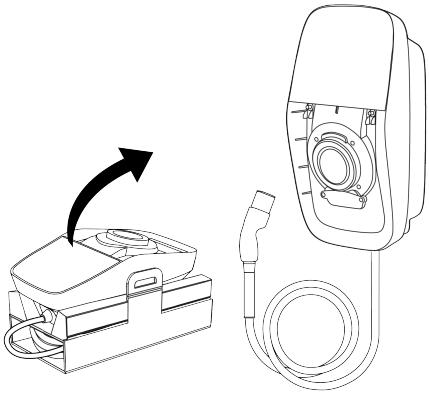
Note
To prevent damage, leave the charging station and the cable in the packaging until installation.



5. When the station can be installed on the wall bracket, remove the charging station from the packaging as follows:
   a. Remove the cardboard insert, then lift the cardboard packaging with the charging station and cable from the station box.



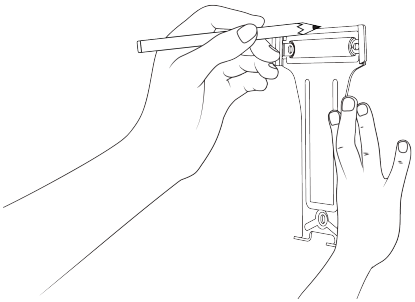
b. Remove the charging station and the charging cable from the packaging.



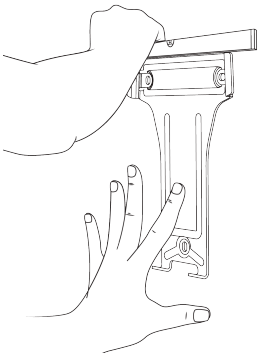
4.3. Install the wall bracket and charging station

⚠ CAUTION
Follow the recommendations in Plan for installation on page 9 when selecting a location and an installation height for the charging station, and when choosing a power cable entry.

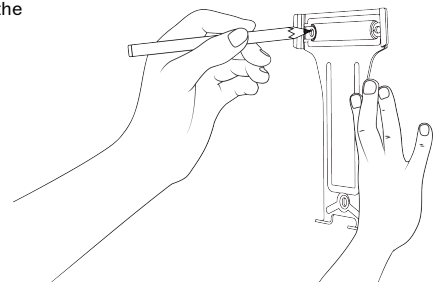
1. Install the wall bracket as follows:
   a. Mark the height of the top of the wall bracket.



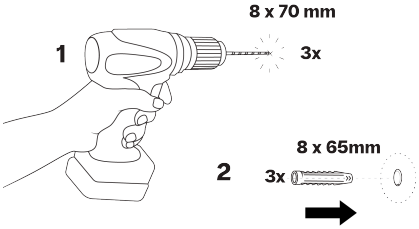
   b. Hold the wall bracket on the wall and level it using a spirit level.



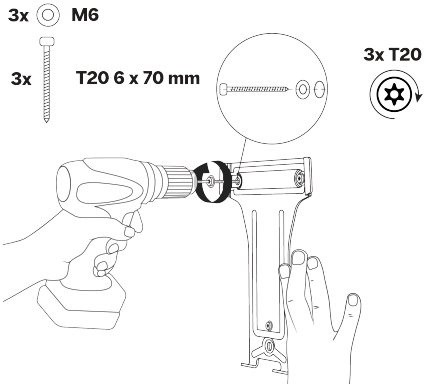
c. Mark the three screw points on the wall. Remove the wall bracket.



d. Drill an 8 mm hole to a depth of 70 mm at each screw point. Install an 8 x 65 mm wall plug in each hole.

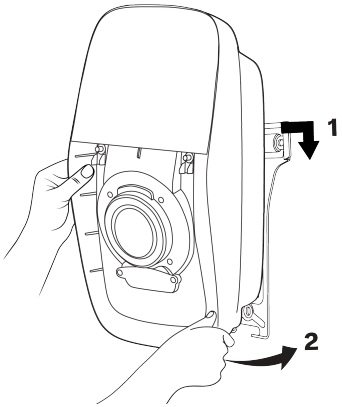


e. Install the wall bracket using three T20 6 x 70 mm screws and M6 washers.



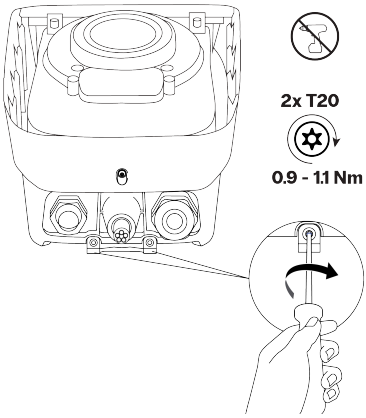
2. Install the charging station as follows:

a. Engage the charging station with the top of the wall bracket, then rotate the charging station down to align the two lower screw holes.

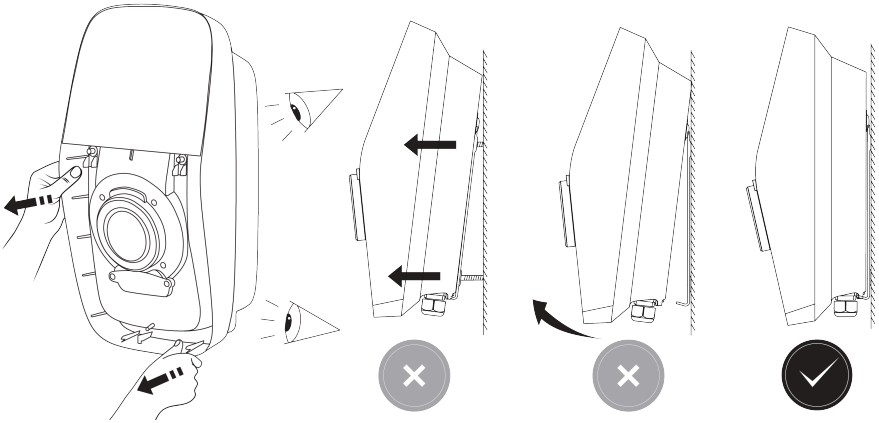


b. Install two security Torx T20 screws to attach the charging station to the wall bracket.

> ⚠ **CAUTION**
> Using a power screwdriver with a high torque can damage the screws and components.
> - Use only a low-torque screwdriver with the correct torque setting.



c. Gently pull on the charging station to make sure it is securely attached to the wall bracket and to the wall.



4.4. Connect the power cable

The charging station has two interchangeable cable glands:

- The installed cable gland is for a power cable with a sheath diameter of 13 to 25 mm.
- The cable gland kit is for a power cable with a sheath diameter of 12 to 20 mm.

The terminals accept a wire gage in the following range:

- Solid wire: maximum 16 mm^2.
- Stranded wire with ferrule (without plastic sleeve): maximum 10 mm^2.

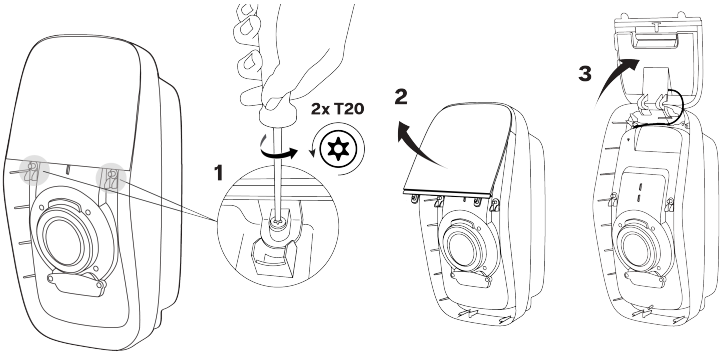
The power cable can enter the charging station from the top or the bottom. The bottom cable entry A can be used in any location. The top cable entry B must only be used in a location where there is no risk of exposure to rain or moisture.

⚠ CAUTION
Follow the recommendations in Plan for installation on page 9 when selecting the power cable entry point for the charging station.

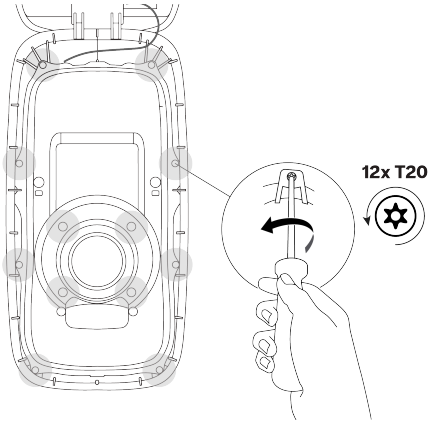
Note
Communication cable entry is only through the bottom of the charging station.

Note
All security Torx T20 screws are captive. Do not fully remove the captive screws from the charging station.

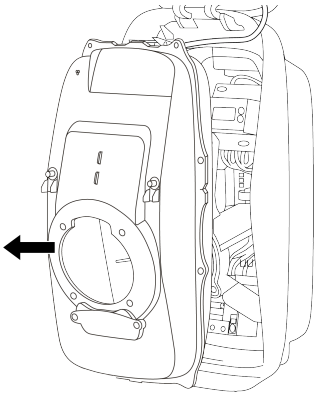
1. Remove the inner cover as follows:
   a. Loosen the two Torx security T20 captive screws that secure the display cover. Fully open the display cover so it locks in the open position.



   b. Loosen the 12 Torx security T20 captive screws that attach the inner cover.



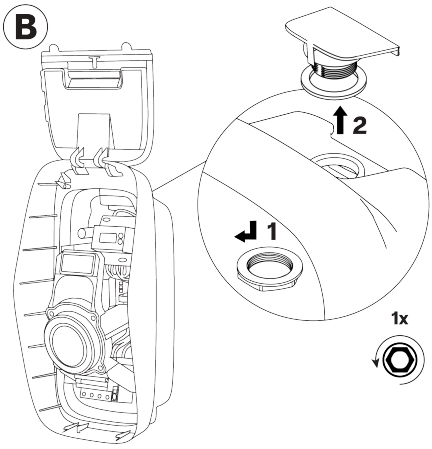
c. Remove the inner cover.



2. **For top cable entry B**: Prepare the top entry for the power cable as follows:

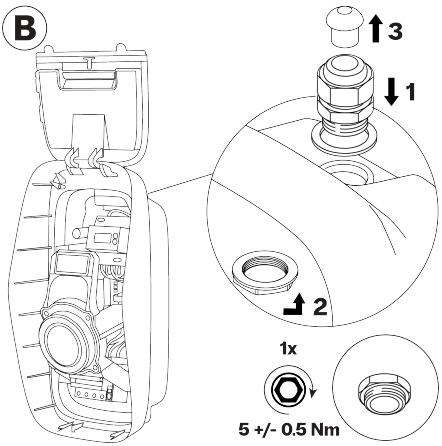
a. Remove the nut that secures the cover on the top entry. Remove the cover.

Keep the nut to use on the cable gland. Store the cover in the packaging.



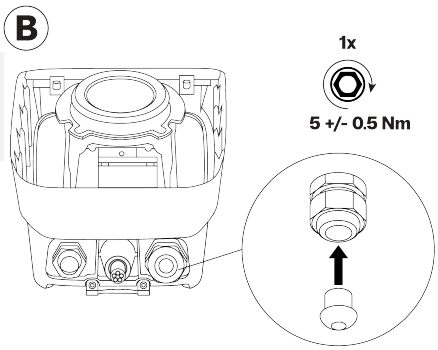
b. Install the cable gland and seal in the top entry. Install and tighten the nut.

Remove the blanking plug from the cable gland and keep it for later use.



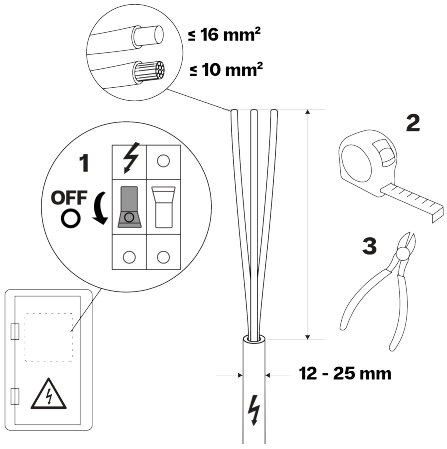
c. Install the blanking plug in the unused gland in the bottom of the charging station.

⚠ CAUTION
Make sure that the blanking plug is installed in the cable gland to maintain the IP code of the charging station.

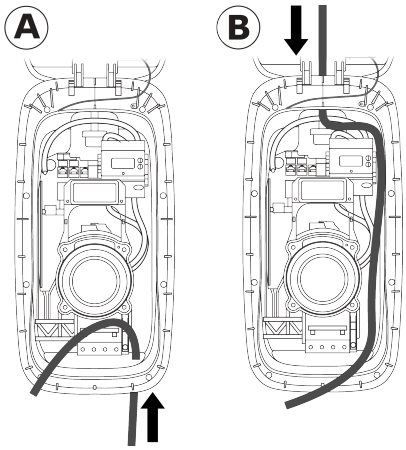


3. Cut the power cable and strip the outer sheath so the cable and its wires will have sufficient length to connect to the RCBO and PE terminal terminal block in the charging station. If required, install extra insulation on the individual wires.

⚠ CAUTION
To protect Separated Extra Low Voltage (SELV) circuits, the stripped single-insulated wires must not touch the components on the main board. When required, install double insulation on the individual wires, for example using heat-shrink tubing or insulation sleeves.

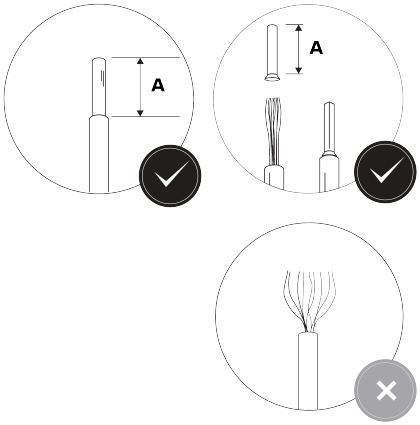


4. Feed the power cable into the charging station using bottom cable entry A or top cable entry B. Route the power cable to the connection points. Leave sufficient length to strip and connect the wires.



5. Strip the wire ends of the power cable:
   - For an RCBO, A = 12 mm
   - For a terminal block, A = 18 mm

   When stranded wires are used, install wire end sleeves and apply a square crimp for optimal fit into the RCBO and the PE terminal block.



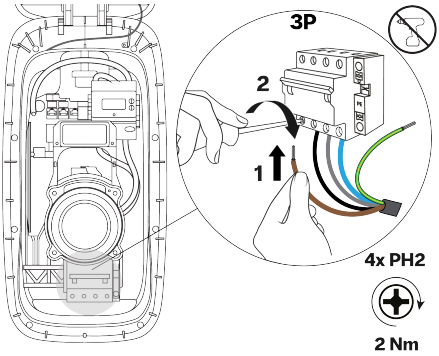
6. **For a station with a built-in RCBO**: Connect the power cable as follows:

WARNING
Incorrect connection of the power wires can result in the risk of electric shock, and thus cause damage to the charging station, and injury or death.
- Make sure that the power wires are securely connected.

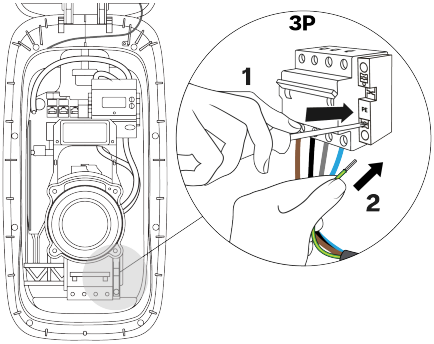
Note
Connect the wires in accordance with the power supply wiring schematics in Power supply requirements on page 11.

Note
Type B RCBOs are installed upside down in the charging stations.

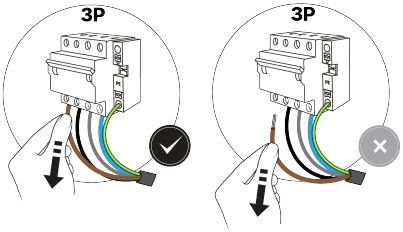
a. Connect the wires of the power cable to the RCBO. Tighten the screws to secure the wires.



b. Connect the PE wire of the power cable to the PE terminal block.



c. Pull each wire to check that each wire is securely connected.



7. **For a station with terminal blocks**: Connect the power cable as follows:

WARNING

Incorrect connection of the power wires can result in the risk of electric shock, and thus cause damage to the charging station, and injury or death.

- Make sure that the power wires are securely connected.

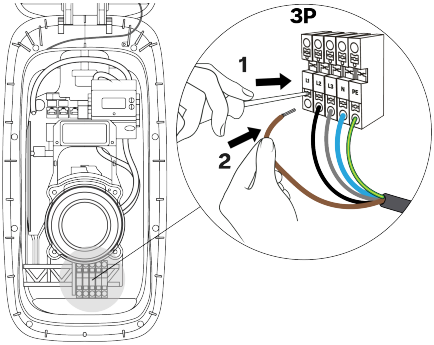
Note

Connect the wires in accordance with the power supply wiring schematics in Power supply requirements on page 11.

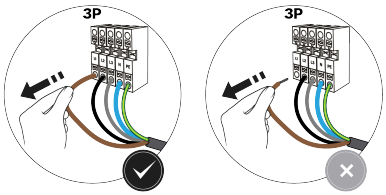
Note

The illustrations show a 3-phase with neutral connection.

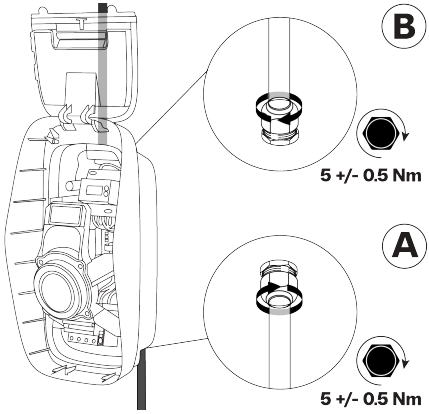
a. Connect the wires of the power cable to the terminal blocks.



b. Pull each wire to check that each wire is securely connected.



8. Tighten the cable gland to secure the power cable and to maintain the IP code for the charging station.



4.5. Charging station communication

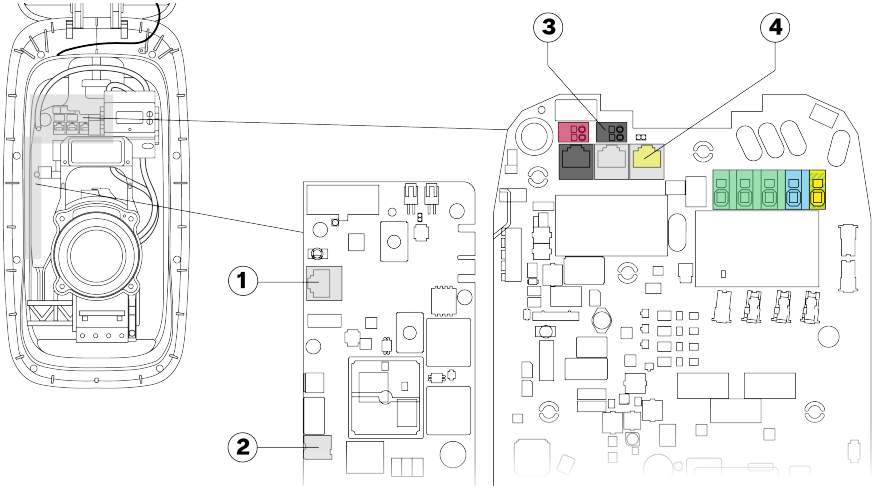
Communication cable entry is only through the left cable gland in the bottom of the charging station. A maximum of four communication cables can enter the charging station through the gland.

There are three options to connect the charging station to the Internet:

- Ethernet (recommended option)
- Wi-Fi (see Configuration on page 36)
- Cellular (SIM card)

Communication connections and components

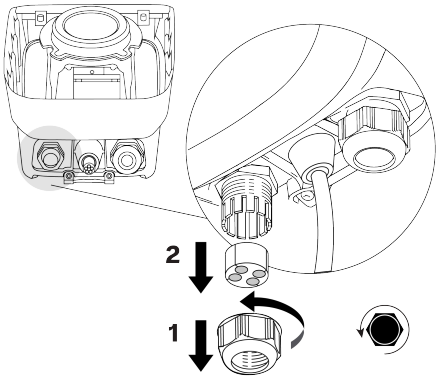
Note
The communication connections and components used depend on the model of the charging station and the required functionality.



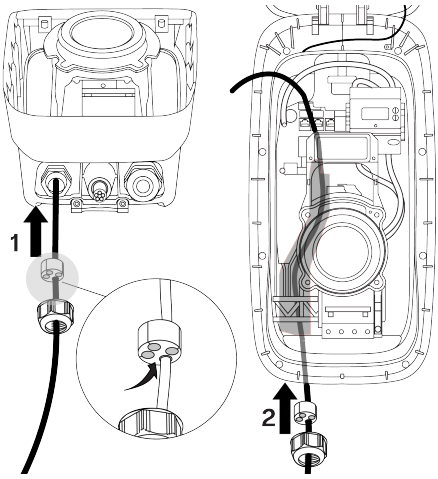
1. Ethernet socket for wired internet connection
2. Nano-SIM card slot for cellular internet connection
3. Terminals for active power control (only for Germany)
4. CT IN socket for dynamic load balancing

4.5.1. Route communication cables

1. Remove the cable gland nut and seal from the left cable gland.



2. Feed the required communication cables through the cable gland nut and seal, then through the left cable gland in the bottom of the charging station. Feed the cables through the cable channel to the top of the charging station.



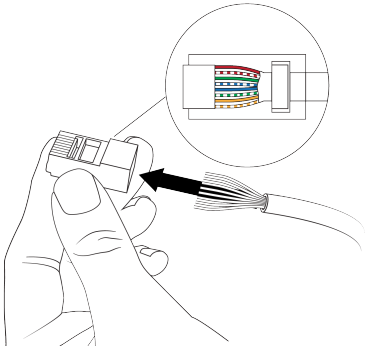
4.5.2. Optional: Connect Ethernet cable for Internet

Note

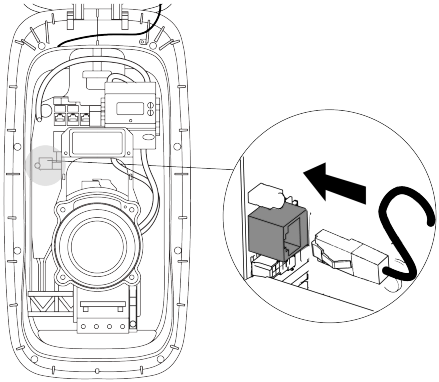
Use any network cable of Cat5 and above (Cat5, Cat5e, Cat6), with twisted pair wires.

- The use of shielded network cable is recommended but not mandatory.
- If a shielded cable is used, do not ground the shield.
- For outdoor installations, use a UV-stabilized network cable.
- Network cables can have a pre-installed RJ45 plug, or the RJ45 plug can be installed before or after routing the network cable into the charging station.

1. If an RJ45 plug is not pre-installed, install an RJ45 plug on the network cable.



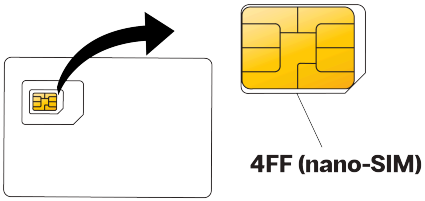
2. Connect the network cable RJ45 plug to the Ethernet socket on the communication board.



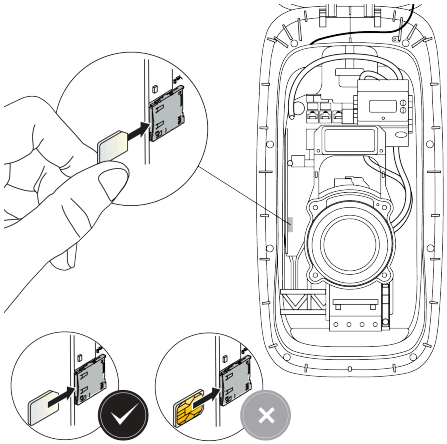
4.5.3. Optional: Install SIM card for Internet

Note
Only certain SIM cards are supported.

1. Remove the 4FF (nano-SIM) SIM card from its card.



2. Push in and lock the 4FF (nano-SIM) SIM card in the slot in the communication board. The SIM card contacts must face the communication board.



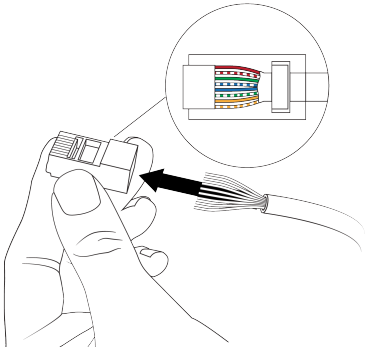
4.5.4. Optional: Connect dynamic load balancing cable

Note

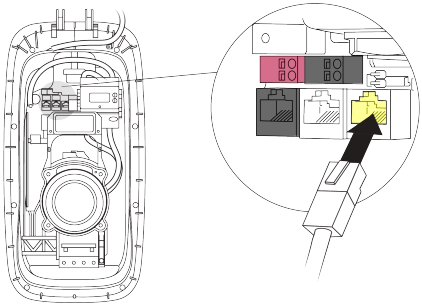
Use any network cable of Cat5 and above (Cat5, Cat5e, Cat6), with twisted pair wires.

- The use of shielded network cable is recommended but not mandatory.
- If a shielded cable is used, do not ground the shield.
- For outdoor installations, use a UV-stabilized network cable.
- Network cables can have a pre-installed RJ45 plug, or the RJ45 plug can be installed before or after routing the network cable into the charging station.

1. If an RJ45 plug is not pre-installed, install an RJ45 plug on the network cable.



2. Connect the network cable RJ45 plug to the CT IN socket.



4.5.5. Only for applicable countries: Connect remote power control cable

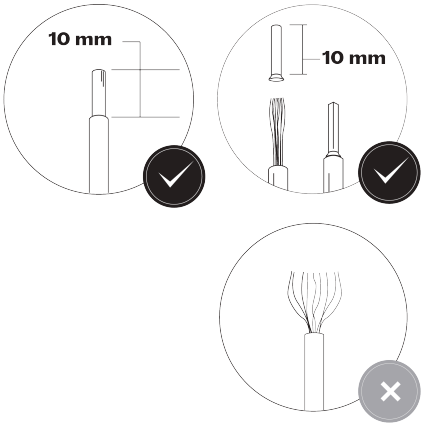
The terminal blocks accept a wire gauge in the following range:

- Solid wire: maximum 1.5 mm².
- Stranded wire with ferrule (without plastic sleeve): maximum 1.5 mm².

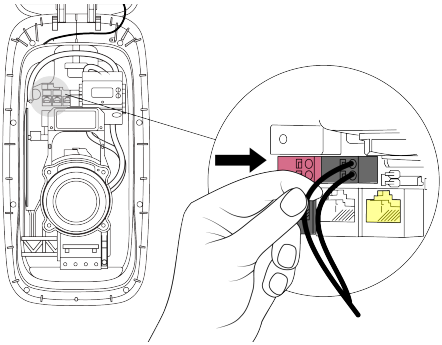
Use double-insulated cable that is resistant to temperatures of up to 90 °C.

1. Strip the wire ends of the active power control cable.

   When stranded wires are used, install ferrules (without plastic sleeves) and apply a square crimp for optimal fit into the terminal blocks.



2. Connect the active power control wires to the black terminal block (digital input 1).

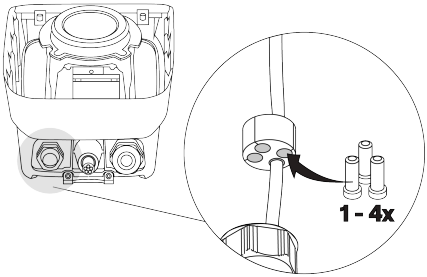


3. Connect the other end of the active power control cable to a DSO control device with normally-open (NO) contacts.

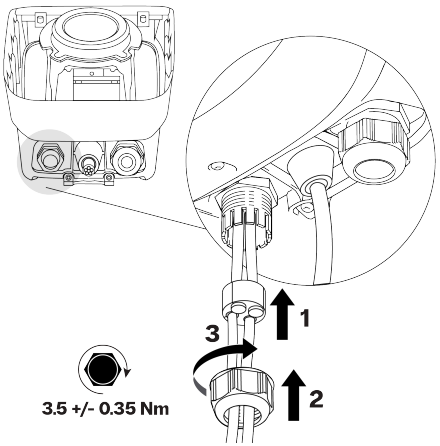
4.5.6. Tighten the cable gland

1. Install blanking plugs in the unused entries in the cable gland seal.

   ⚠ CAUTION
   Make sure that blanking plugs are in place in the unused entry points in the cable gland to maintain the IP code of the charging station.



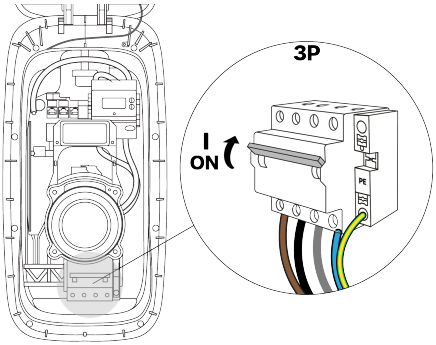
2. Move the cable gland seal up into the cable gland, then tighten the cable gland to secure the network cables and blanking plugs.



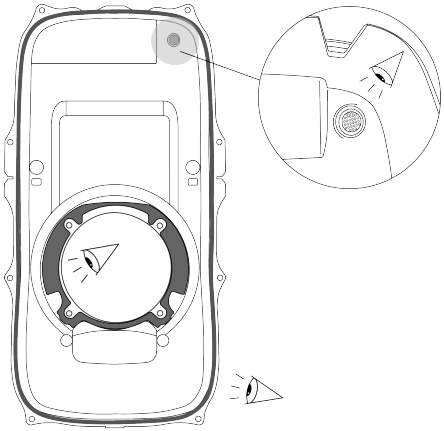
4.6. Install the charging station covers

1. **For a station with a built-in RCBO**: In the charging station, make sure that the RCBO is switched on.

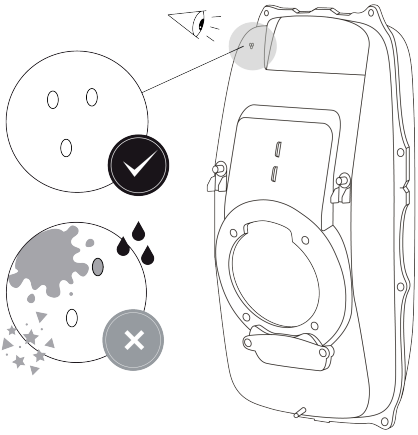
   Note
   Type B RCBOs are installed upside down in the charging stations. If the charging station has a Type B RCBO, the on and off directions are reversed.



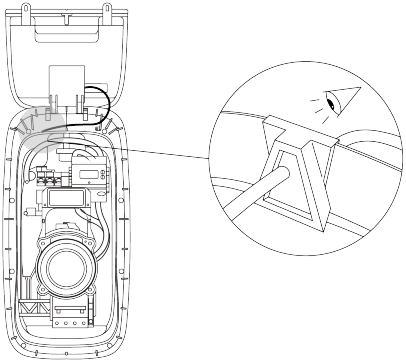
2. Before installation, check the inner cover as follows:
   a. On the inside, check that the inner cover seal and the center seal are clean and free of damage. Check that the venting membrane is secure and free of damage.



b. On the outside, check that the three venting holes are not blocked by water, dust, or debris.

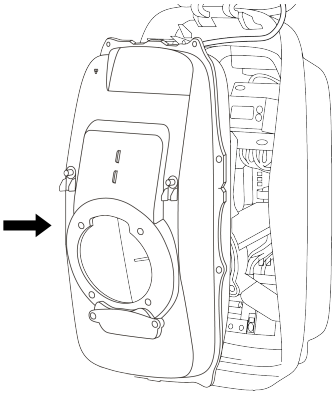


3. On the charging station, check that the feed-through seal for the display cable is correctly installed.



4. Install the inner cover as follows:

a. Engage the bottom of the cover below the center hole, then push the top of the cover into position.

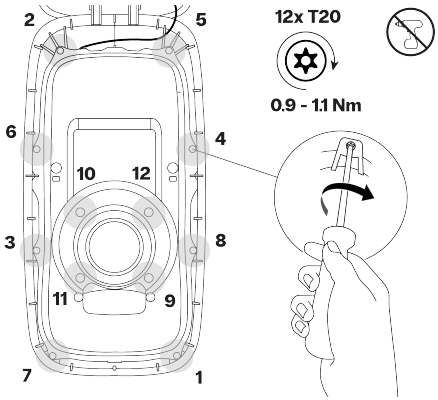


b. Tighten 12 security Torx T20 captive screws in the order shown to secure the inner cover.

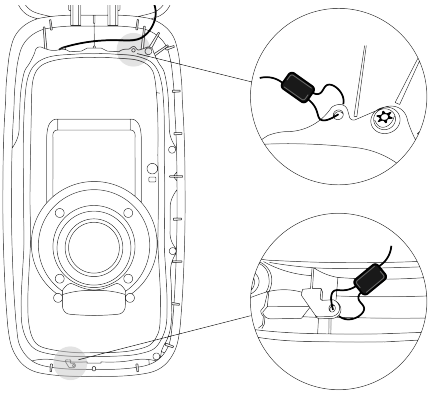
⚠ CAUTION
Risk of water ingress. Rain and moisture can enter the charging station if the screws are not tightened in the correct order.

⚠ CAUTION
Using a power screwdriver with a high torque can damage the screws and components.

- Use only a low-torque screwdriver with the correct torque setting.

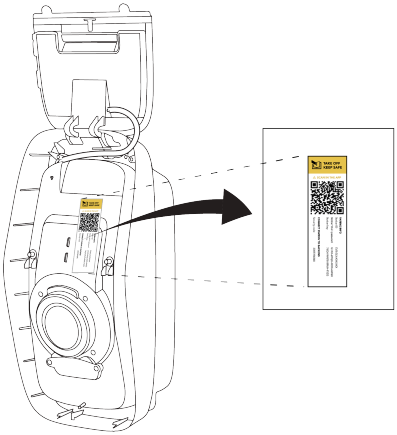


c. Optional: Install two tamper-evident seals on the top right and bottom left corners of the inner cover.



5. Remove the sticker containing the charging station-specific information from the inner cover. Store the sticker with the charging station documentation. The information on the sticker is required during configuration.

⚠ CAUTION
To prevent unauthorized access to the charging station settings, do not leave the sticker with the charging station.



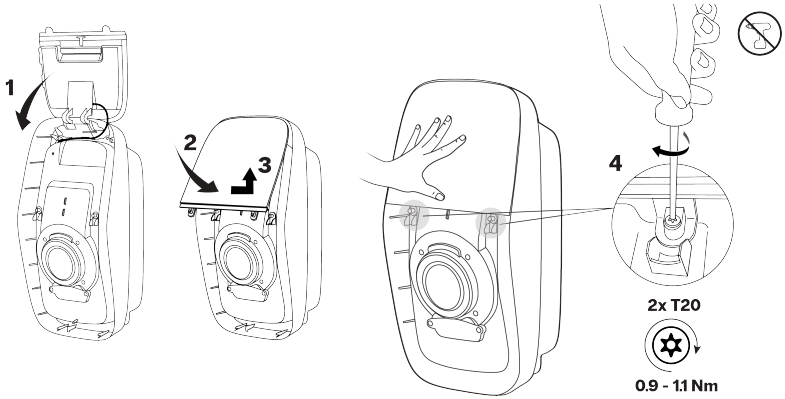
6. Install the display cover and the front cover as follows:

a. Close the display cover and hold it closed. Secure the display cover using two security Torx T20 captive screws.

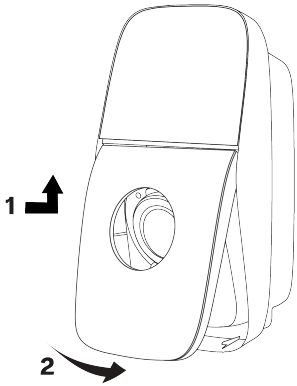
⚠ CAUTION

Using a power screwdriver with a high torque can damage the screws and components.

- Use only a low-torque screwdriver with the correct torque setting.



b. Engage the top edge of the front cover under the bottom edge of the display cover, then rotate the cover down to align the lower screw hole.

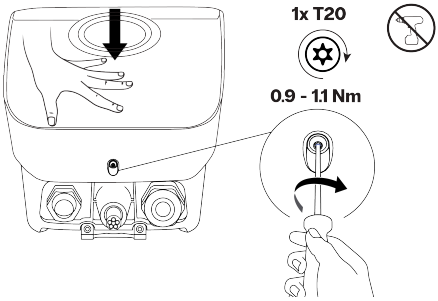


c. Push the front cover against the spring. Tighten the security Torx T20 captive screw to secure the front cover on the charging station.

⚠ CAUTION

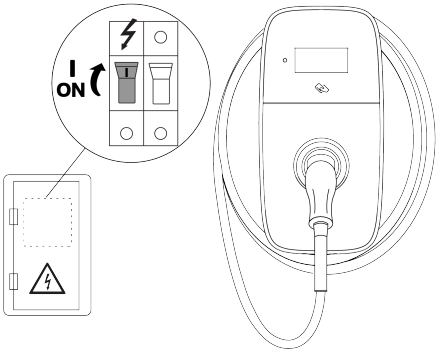
Using a power screwdriver with a high torque can damage the screws and components.

- Use only a low-torque screwdriver with the correct torque setting.



7. Loosely wind the charging cable around the charging station for storage, and place the charging plug in the plug holder.

   Switch on power to the charging station. The LED ring shows spinning white to indicate that the charging station is booting.



The charging station is now fully installed. The LED ring shows white, blinking on and off two times, to indicate that configuration can be started.

4.7. Configuration

For the charging station to function, it must be connected to the Internet. Once connected, it is recommended to activate the charging station on a Charging Management Platform (CMP) to fully benefit from all the charging station features and online support.

Configuration must be completed before the charging station can be used.

4.7.1. Configure the charging station

⚠ WARNING
Risk of electric shock, which can cause severe injuries or death. Only a qualified electrician is permitted to use the EVBox Install app to configure the charging station.

1. Download and install EVBox Install App on your smartphone or tablet.





GET IT ON Google Play

Download on the App Store

2. Open EVBox Install App and follow the instructions in the app.

   The charging station-specific information required for station configuration is on the sticker that was removed during installation.





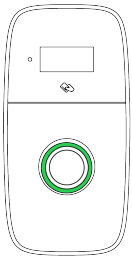
3. Using EVBox Install App, set the following key settings to ensure that the charging station operates safely:
   - Maximum charging current.
   - Internet connectivity.
   - Other configuration settings.

4.7.2. Optional: Activate the charging station with CMP

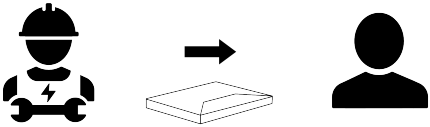
For an online charging station, the user must activate the charging station with the Charging Management Platform (CMP) on the CMP website or by using the CMP-specific app. Contact the Charging Point Operator (CPO) for details about the charging station activation procedure.

4.7.3. Ready for use

The charging station is ready to charge an EV when the covers are installed on the charging station, the commissioning is completed, and the LED ring shows steady green



Hand over all documentation to the owner. The owner must retain all documentation delivered with the charging station in a safe place for the entire life cycle of the product.



5. User instructions

DANGER

Not following the user instructions given in this manual will result in the risk of electric shock, which will cause severe injury or death.

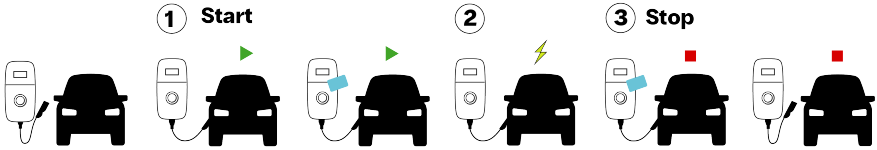
- Read the safety precautions and the user instructions in this manual before using the charging station.
- If you are unsure about how to use the charging station, contact your reseller for more information.

5.1. Start and stop a charging session

Note

Charging session instructions are also shown on the display.

1. Start charging:
   - Take the plug from the charging station dock, then fully unwind the charging cable from around the charging station.
   - Connect the charging cable to your vehicle.
   - If you use a charge card or key fob, hold it in front of the reader on the charging station to start charging.*
2. Your vehicle is charging.
3. Stop charging:
   - If you use a charge card or key fob**, hold it in front of the reader on the charging station to stop charging.*
   - Disconnect the charging cable from your vehicle.
   - Wind the charging cable around the charging station, then place the plug into the dock.



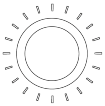
* When the charging station is configured to only accept charge cards or key fobs.

** You must use the same charge card or key fob that you used to start the charging session.

5.2. Status indication

Note
The status of the charging station is also shown on the display.

Note
Some features and status indications are not available on all models.

LED ring	Color	State description
	White (spinning)	Charging station is starting, or software is updating.
	White (blinking)	Charging station is waiting for configuration using EVBox Install App.
	Green (constant)	Idle. Charging station is ready to charge.
	Red (constant)	Authentication not accepted. Indication changes to Green after 5 seconds.
	Blue (constant)	· Charging station is waiting for vehicle. · Charging is paused.
	Blue (filling from bottom)	The vehicle is charging.
	Green (blinking)	The charging session is complete. The vehicle can be disconnected from the charging station.
	Orange (constant)	Charging is slow or paused because of high temperature. Charging will resume automatically.

LED ring	Color	State description
	Orange (blinking)	Charging session has failed. Disconnect the vehicle and try again.

5.3. Maintenance by user

The user of the charging station is responsible for the condition of the charging station, whereby both the law regarding the safety of persons, animals, and property must be observed, as well as the installation regulations in force in the country of use. Have the charging station and its installation inspected by a qualified electrician on a regular basis and in compliance with installation regulations applicable in your country.

⚠ DANGER

Extensive exposure of the charging station to water will result in the risk of electric shock, which will cause severe injury or death.

- Do not direct powerful jets of water toward or onto the charging station.
- Do not put the charging plug into any liquid.

⚠ CAUTION

Do not use aggressive chemical cleaners or solvents to clean the charging station.

1. Remove dirt and natural organic matter from the outside of the charging station using a damp soft cloth. Make sure that the display, the LED ring and the light sensor are clean.
2. Visually check the charging station, the charging cable and the charging plug. If you suspect that the charging station, cable or plug are damaged or dirty, contact a qualified electrician to repair or replace the damaged components.
3. Gently pull on the charging station to make sure it is still securely installed. Make sure that the station outer cover is secure. If the charging station or the cover is loose, contact a qualified electrician to correctly re-install the station.

5.4. Log in to the charging station

Using a Wi-Fi enabled smartphone, tablet, or laptop, the user can log in to the charging station to change settings such as Wi-Fi, and view the software licenses. For instructions, see help.evbox.com.

6. Troubleshooting

⚠ DANGER

Servicing and repair of this charging station by a non-qualified person will result in the risk of electric shock, which will cause severe injury or death.

- Only a qualified electrician is permitted to service or repair the charging station.
- The user must not attempt to service or repair the charging station as it does not contain user-serviceable parts.

6.1. Error indication

LED ring	Color	State description	Action
	Red (constant)	An error has occurred.	Follow the instructions shown on the display.

LED ring	Color	State description	Action
	Off	The power supply has failed.	Check the power supply to the station. Reset the MCB or RCD in the power supply cabinet. For a station with a built-in RCBO, check if the RCBO is open (see Access the RCBO on page 40).

Note

Some error states are solved by switching the power off and on again.

- For stations without a built-in RCBO, switch the power off and on again at the power supply cabinet.
- For stations with a built-in RCBO, switch the power off and on again using the RCBO (see Access the RCBO on page 40).

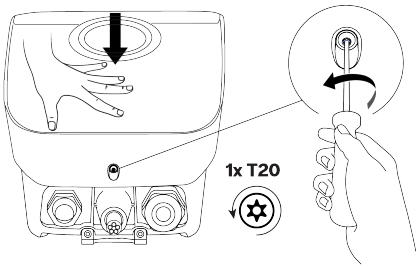
6.2. Access the RCBO

This procedure is only applicable for charging stations that have an built-in RCBO. The RCBO is accessible through an access cover located on the inner cover. Before starting this procedure, make sure that power is being supplied to the charging station.

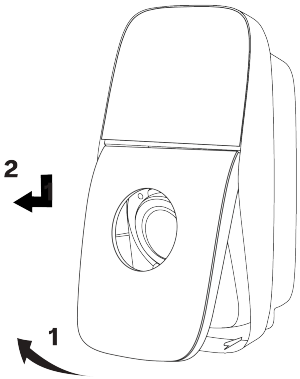
Note

All security Torx T20 screws are captive. Do not fully remove the captive screws from the charging station.

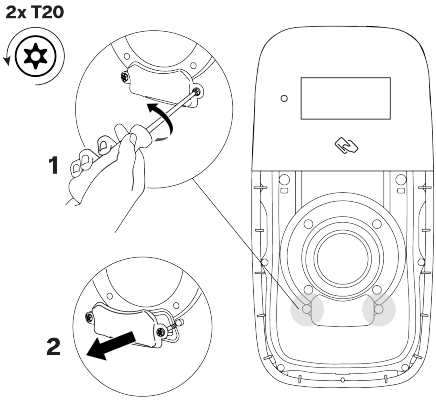
1. If an EV is connected to the charging station, disconnect the EV.
2. Push the front cover against the spring, then loosen one security Torx T20 captive screw that secures the front cover on the charging station.



3. Rotate the front cover up, then disengage the top edge of the front cover from under the bottom edge of the display cover.



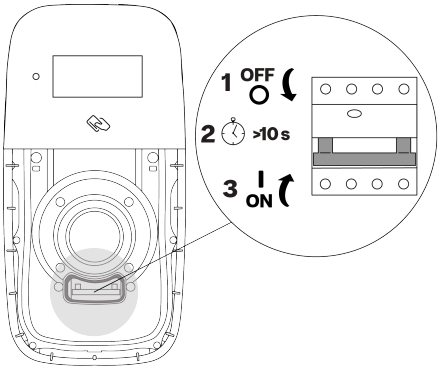
4. Loosen two security Torx T20 captive screws. Remove the RCBO cover from the inner cover.



5. To switch the charging station off and then on again, switch off the RCBO, wait 10 seconds, then switch on the RCBO.

   The LED ring shows spinning white to indicate that the charging station is booting. The charging station is ready to charge an EV when the LED ring shows steady green.

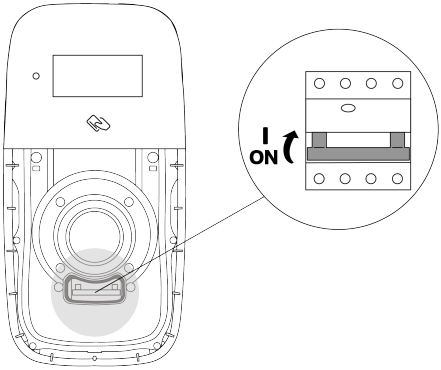
   Note
   Type B RCBOs are installed upside down in the charging stations. If the charging station has a Type B RCBO, the on and off directions are reversed.



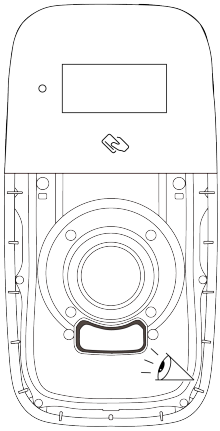
6. For an open RCBO, move the RCBO switch down.

   The LED ring shows spinning white to indicate that the charging station is booting. The charging station is ready to charge an EV when the LED ring shows constant green.

   Note
   Type B RCBOs are installed upside down in the charging stations. If the charging station has a Type B RCBO, the on and off directions are reversed.



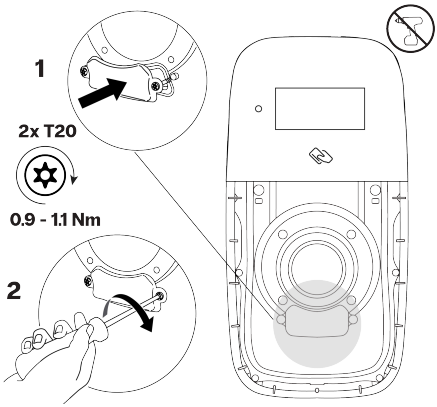
7. Check that the seal on the inner cover is clean and free of damage.



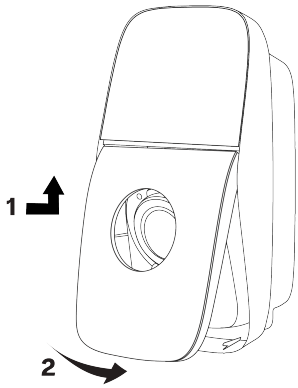
8. Install the RCBO cover on the inner cover. Tighten two security Torx T20 captive screws.

⚠ CAUTION
Using a power screwdriver with a high torque can damage the screws and components.

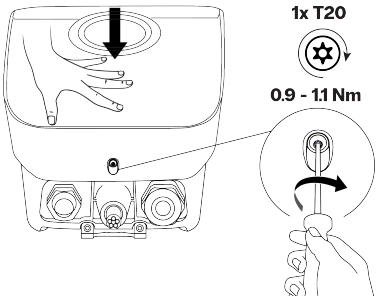
- Use only a low-torque screwdriver with the correct torque setting.



9. Install the front cover as follows:
   a. Engage the top edge of the front cover under the bottom edge of the display cover, then rotate the cover down to align the lower screw hole.



b. Push the front cover against the spring. Tighten the security Torx T20 captive screw to secure the front cover on the charging station.



⚠ CAUTION

Using a power screwdriver with a high torque can damage the screws and components.

- Use only a low-torque screwdriver with the correct torque setting.

7. Decommissioning

Decommission and recycle the charging station in accordance with the applicable local disposal regulations.

	Do not dispose of this charging station in household waste. Instead, dispose of this charging station at a local collection point for electric/electronic devices in order to enable recycling and thus avoid negative and hazardous impacts on the environment. Ask your city or local authorities for respective addresses.
	Recycling of materials saves raw materials and energy and makes a major contribution to conserving the environment.



8. Appendix

8.1. Glossary

Abbreviation	Meaning
1P	1-phase power supply (input and output). The station rating is shown on the bottom of the station.
3P	3-phase power supply (input and output). The station rating is shown on the bottom of the station.
AC	Alternating Current.
CMP	Charging Management Platform. The backend platform that links a charging station to the CPO.
CPO	Charging Point Operator. The owner and/or operator of the charging station installation.
DSO	Distribution System Operator. The operator responsible for the electrical power supply network.
ESD	Electrostatic discharge.
EV	Electric vehicle.
IK	Impact protection.
IP	Ingress Protection.
RF	Radio Frequency communication.
LAN	Local Area Network.
LED	Light Emitting Diode.
MCB	Miniature Circuit Breaker.
OCPP	Open Charge Point Protocol.
PE	Protective earth or ground.

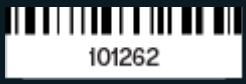
Abbreviation	Meaning
RCBO	Residual Current Breaker with Over-Current.
RCD	Residual Current Device.

8.2. EU Declaration of Conformity

EVBox B.V. declares that the radio equipment type EVBox Liviqo is in compliance with Directive 2014/53/EU. The full text of the EU Declaration of Conformity is available at help.evbox.com.

Regulatory Information

Technology	Frequency bands	Max. output power
GSM 900	890 MHz – 915 MHz	27.77 dBm
GSM 1800	1710 MHz – 1785 MHz	24.77 dBm
LTE Band 3	1710 MHz – 1785 MHz	28.48 dBm
LTE Band 8	880 MHz – 915 MHz	28.48 dBm
LTE Band 20	832 MHz – 862 MHz	28.48 dBm
LTE Band 28	703 MHz – 748 MHz	28.48 dBm
WLAN (802.11b/g/n)	2412 MHz – 2484 MHz	16.79 dBm
WLAN (802.11a/n/ac)	5150 MHz – 5250 MHz	16.63 dBm
WLAN (802.11a/n/ac)	5725 MHz – 5850 MHz	11.46 dBm
RFID	13.56 MHz	19.00 dBm



Article number: 101262
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