



GARO Entity Pro installation and operation

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1 INTRODUCTION

1.1 DOCUMENT DESCRIPTION

This document describes installation and use of the Entity Pro product, which is a member of the Entity family. Also, the Entity Balance Load Interface installation is described.

1.2 PRODUCT DESCRIPTION

This product is a GARO charging station for electrical vehicles.

1.2.1 FEATURE DESCRIPTION

Entity is a series of charging stations and load interfaces that can operate together. They are based on the versatile open protocol OCPP, that also makes it possible to integrate them in other systems as well as to include third party OCPP based charging stations in the same systems. Entity Pro is a wallbox that is easy to use, install, and enables advanced functionality.

Configuration and operation are supported by the GARO Connect app, available for android and Apple devices.

1.2.2 DEFINITIONS

In the installation, setup and operation of the Entity Pro charging stations, there are several terms and expressions that is important to understand. Read about the most common terms and expressions below.

Charger groups: A charger group contains several charging stations at the same location. The charger group manages the access rights to the charging stations within the charger group.

Charging station: A charging station is used for charging EVs. The charging station is connected to a location and an owner. The charging station can be installed and monitored through the GARO Connect app and be part of a charger group.

Connection group: A group of charging station(s) and other devices that shares the same resource, such as a fuse. The connection group is set up to protect fuses from overload and is controlled by one device (either a charging station or a load interface) to act as a master device. Normally, the Connection group also defines how the internet is connected to the units, through a master. For more information about connection groups, refer to [4.14.1 Dynamic Load Management \(DLM\) functionality, page 62](#).

DLM system: DLM stands for Dynamic Load Management and is a software-based solution that is meant to manage the loads of the system of several charging stations in an installation. DLM can be defined as the current limiting logic applied to a connection group.

EV: Electrical vehicle.

EV driver: An EV driver is a person that has access to the charging station(s). The EV driver can be part of an EV driver group and gain access to the charging station(s) with an RFID tag or an app. The EV driver can use the GARO Connect app to monitor charging of an EV.

EV driver group: An EV driver group is a group of EV drivers with the same access rights within the organization. The access rights are managed on an organizational level, which means that the EV driver group can be used at several locations within the organization.

GARO Connect app: The application from which it is possible to install, manage and operate Entity charging stations. For more information about the GARO Connect application, refer to [4.13 GARO Connect, page 39](#).

Installer: An installer is a certified installer or acts on behalf of a certified installer. The installer is hired by the owner to do the electrical steps of the installation of the charging station(s) and/or a load interface. The installer can see and change settings of the units in the location. The installer provided access to a location with the installation code, just like a key.. The installer can during the first setup act as a temporary owner to assist with the installation.

Load interface: The load interface connects a current metering device to the system. This is needed when a fuse is feeding not only charging stations and needs monitored/dynamic overload protection (DLM)

For more information about load interface, refer to [4.14.1 Dynamic Load Management \(DLM\) functionality, page 62](#).

Location: A location is a physical address of where one or several charging station(s) are installed. The location is connected to an owner and can tell EV drivers where it is possible to charge EVs. The location can contain several charging groups. All charging stations within a location normally uses the same grid connection point. A location can be transferred to another owner.

Organization: An organization contains one or several locations. The organization share the same owner(s) and it is possible to create groups of EV drivers to manage access to the charging stations.

Owner: An owner is a person who owns one or several charging stations. This person owns the location(s) and invites the installer to do the installation of the charging station(s). The owner can add other owners, manage access for EV drivers and EV driver groups, manage charger groups and create locations, organizations and EV driver groups. The owner can monitor and control status of the owned charging station(s).

PME: Protective Multiple Earthing. A mandatory safety function only applicable for the United Kingdom (UK).

Unit: A charging station or a load interface.

1.3 INTENDED USE

The product is intended for electrical vehicle charging. Do not use the product for any other tasks.

NOTE

Follow local rules and restrictions regarding the product and installation.

1.4 CONTACT

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2 SAFETY

2.1 SAFETY DEFINITIONS

WARNING



Risk of personal injury or death.

CAUTION

Risk of damage to the product or the adjacent area.

NOTE

Information that is necessary in a given situation.

2.2 SAFETY INSTRUCTIONS FOR INSTALLATION

WARNING

Read and understand the safety warnings below before installation of the product.

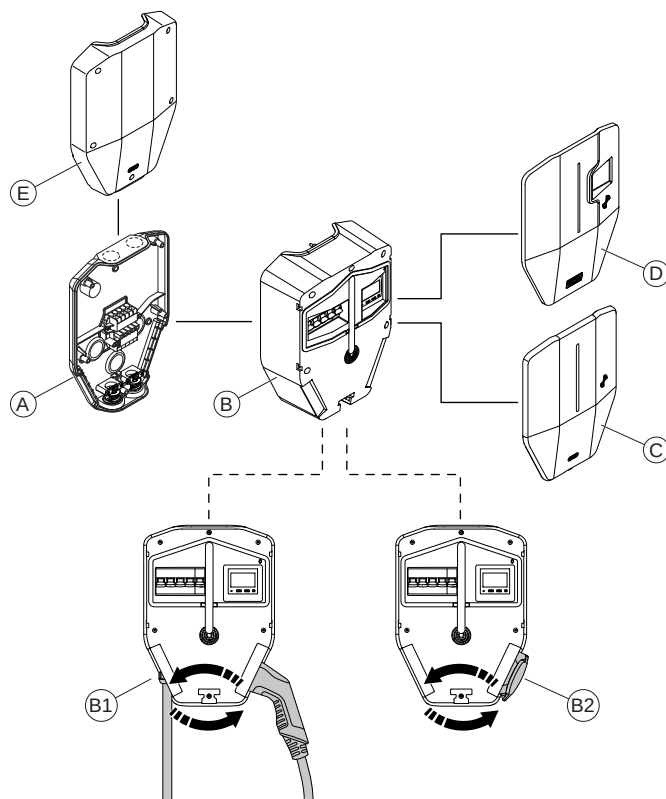
WARNING

Do not use a damaged charging station or a charging station that has a red blinking (slow 0,5 Hz) indication light. If a defect is found, speak to the owner of the charging station. The owner can be found in the GARO Connect app. Only use charging cables with no visible defects and intended for charging the relevant EV. Follow all instructions for your EV.

- Ventilation signal from EV is not supported. This means that test of "State D" is not possible.
- Adapters for charging connectors are not allowed to be used.
- Cord extension sets for charging cable is not allowed to be used.
- Do not use private power generators as a power source for charging.
- Incorrect installation and testing of the charging station could potentially damage either the EV and/or the charging station itself.
- Do not operate the charging station in temperatures outside its operating range. Refer to [8 Technical data, page 85](#).
- Avoid high voltage insulation testing on connected charging stations. If insulation testing is necessary, first remove the charging unit from the installation bracket.
- If the charging station is set up without any internet connectivity, it will allow charging up to the maximum current defined for the charging unit. The maximum current can be up to 32 A. Default at delivery, the maximum setting is 16 A. This means that an unconfigured charging station will function without any internet connection, up to 16 A.
- Do not use the product if any parts are damaged.
- Do not connect an EV if the indication light is blinking a slow red light (0,5 Hz).
- Do not remove the screws from the sealed assembly points on the rear side of the charging unit. Removed screws or broken sealing will void the warranty.
- All installation must be carried out by an authorized installer and comply with local country installation regulations. If any questions, please contact your local electrical authority.
- Refer to local standards and regulations not to exceed charging current limitations.

3 PRODUCT OVERVIEW

3.1 CHARGING STATION SYSTEM OVERVIEW

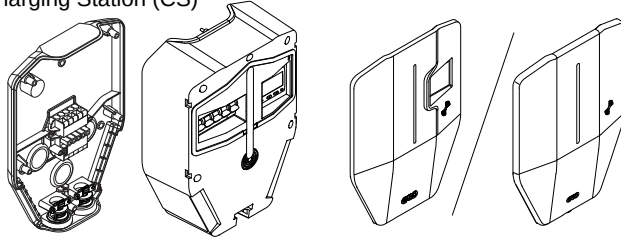


- A. Installation bracket. The installation bracket is available as single and double (side by side).
- B. Charging unit. The charging unit is available in several versions. Refer to [3.3 Product variants, page 13](#). The fixed cable (B1) or Type 2 outlet (B2) can be positioned on either side of the charging unit.
- C. Front cover for charging units without an MID certified, visible energy meter. The front cover is available in several colors.
- D. Front cover for charging units with an MID certified, visible energy meter. The front cover is available in several colors.
- E. Protection cover. The protection cover is an accessory that is used for a prepared installation without an attached charging unit.

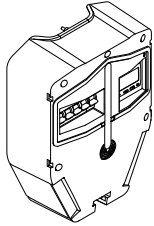
It is possible to purchase different installation packages from GARO. Both as a complete charging station or as individual system components.

3.2 CHARGING STATION PACKAGING OVERVIEW

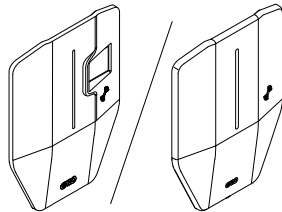
Charging Station (CS)



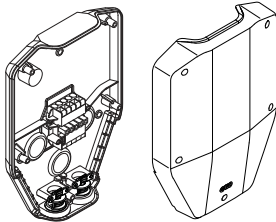
Charging Unit (CU)



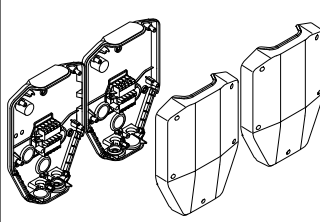
Front cover



Installation bracket - single (IB)



Installation bracket - double (IB)



Charging station (CS)

A charging station is a complete kit, packed in a box. It contains all parts required for EV charging. The product is available in several versions, that all consists of : an installation bracket (single or double), charging unit and front cover.

Charging unit (CU)

The charging unit is the active part of the charging station. To be plugged into the installation bracket. The charging unit is available in several versions. Refer to [3.3 Product variants, page 13](#). The fixed cable (B1) or Type 2 outlet (B2) can be positioned on either side of the charging unit.

Front cover

Front cover for charging units with or without an MID certified, visible energy meter. The front cover is available in several colors.

Installation bracket — single (IB)

The installation bracket is where the physical installation is done. It contains a permanent RFID tag with the

identity of the physical charging station. The installation bracket is available as single and double.

The protection cover covers the installation in the installation bracket. The protection cover is an accessory that us used for a prepared installation without an attached charging unit.

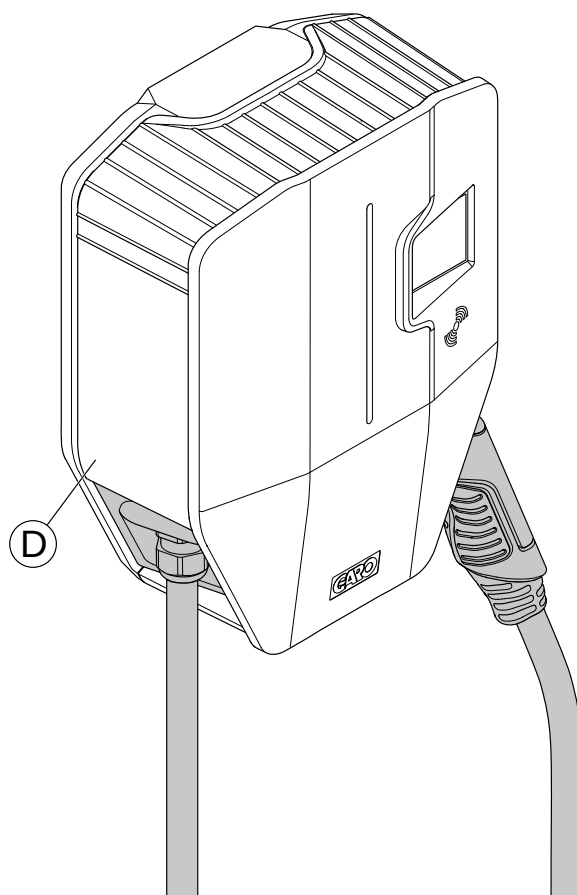
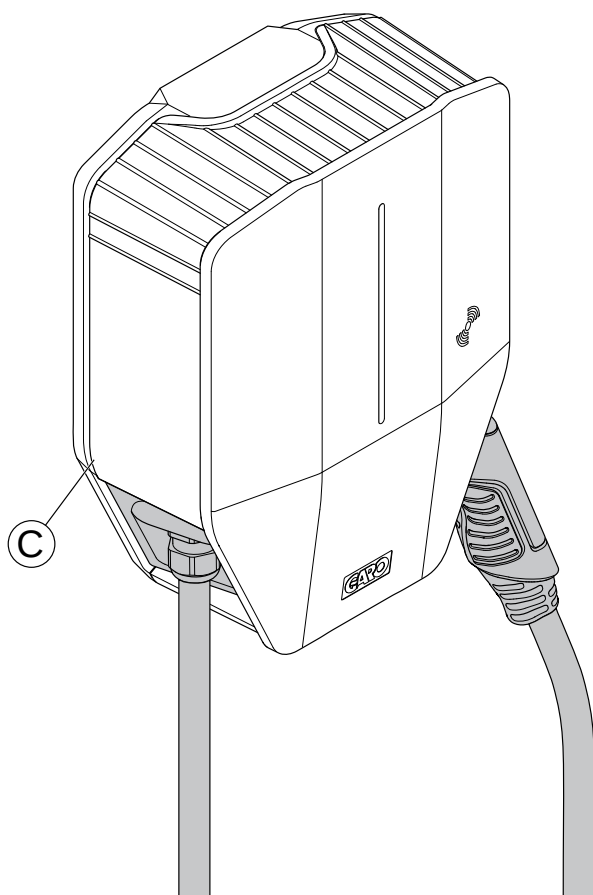
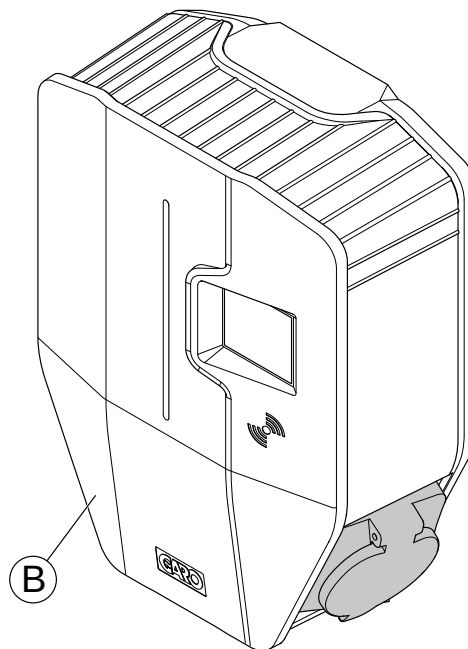
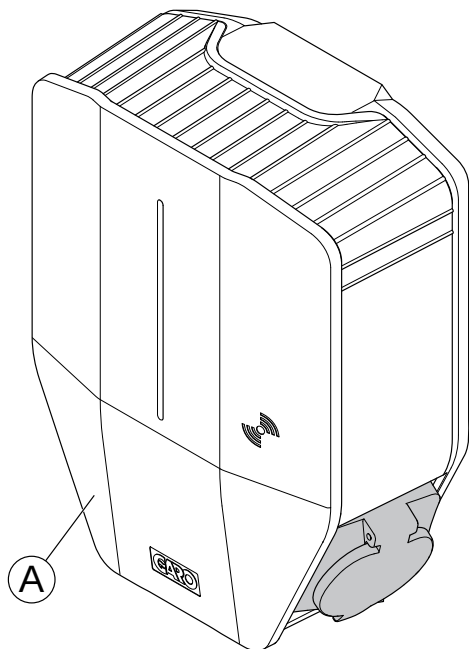
Installation bracket — double (IB)

The installation bracket is also available as double, two side-by side located installation brackets with prepared interconnection for easy installation. The installation bracket is available as single and double.

Each position of the installation bracket can be protected by a protection cover, if not used for attached charging unit.

3.3 PRODUCT VARIANTS

The Entity Pro charging station (and separate charging unit) is available in several product variants.

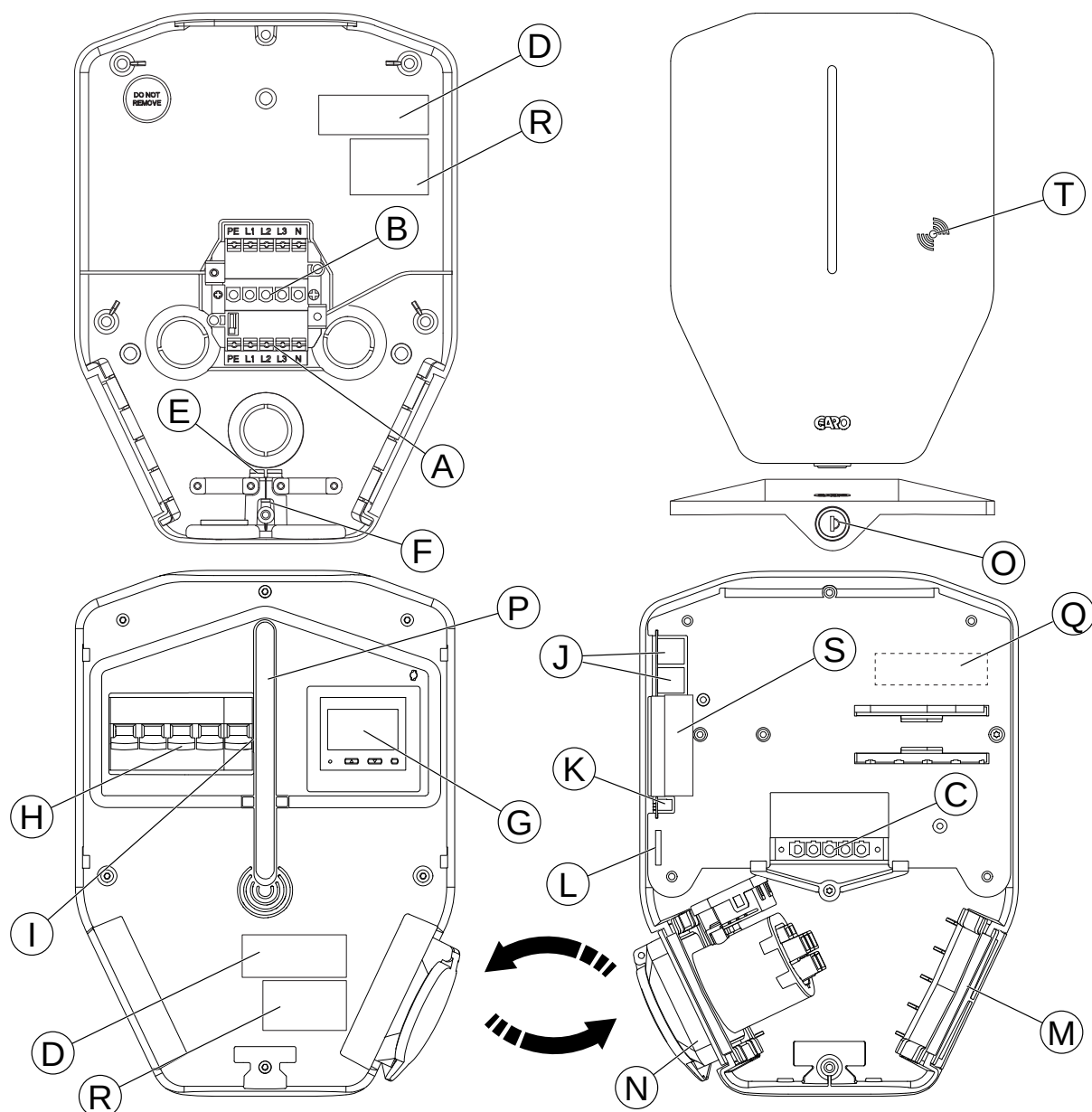


- A. With Type 2 outlet, with internal energy meter (not visible on the front cover).
- B. With Type 2 outlet, with MID certified, visible energy meter.
- C. With Type 2 cable, with internal energy meter (not visible on the front cover).
- D. With Type 2 cable, with MID certified, visible energy meter.

The product concept can for special high volume orders be customized to with or without the features listed below:

- Type 2 outlet or fixed cable.
- Long fixed cable (8 m) or normal fixed cable (5 m).
- 32 A or 20 A fixed cable.
- Three-phase or one-phase.
- With or without phase balancing.
- With or without 4 G (LTE) modem.
- With or without ISO 15118 HW support.
- With or without SIM, supplied from GARO.
- With or without PME protection (UK only).

3.4 CHARGING STATION OVERVIEW



A. Power connection terminal (in and out).

B. Bracket terminal connector.

C. Charging unit connector.

D. Installation bracket QR label.

E. Ethernet cable inlet.

F. Control cable inlet.

G. Visible MID energy meter (optional).

H. All-pole circuit breaker, manual reset.

I. PE disconnection relay (PME protection variant only) (for UK only).

J. 2 port Ethernet switch RJ45.

K. Control cable port and connector.

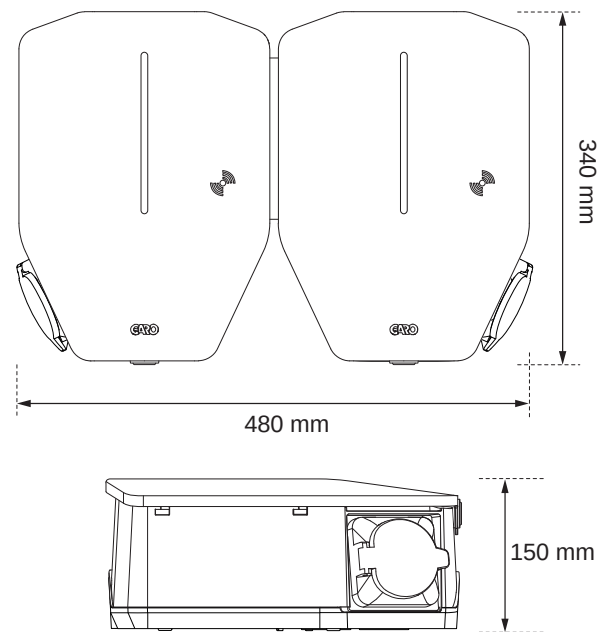
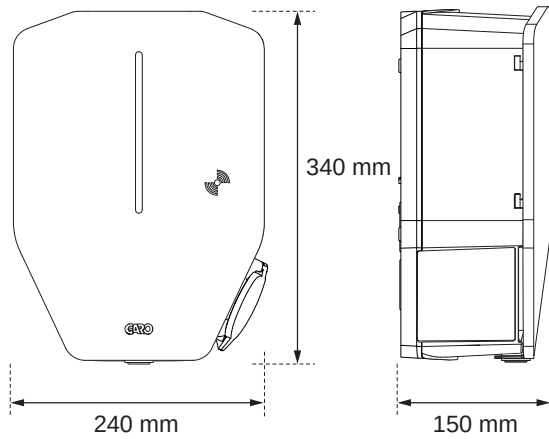
L. SIM card slot (size 3 FF/Micro).

M. Flat adapter cover.¹

1. The fixed cable variant of the charging unit has the fixed cable placed here.

- N. Type 2 outlet.²
- O. Front cover lock.
- P. Indication light.
- Q. Optional ID-label placement after installation.
- R. Label, load interface type.
- S. Sealing label.
- T. RFID reader area.

3.5 DIMENSIONS



2. The fixed cable variant of the charging unit has the cable parking placed here.

4 INSTALLATION

4.1 TO DO BEFORE INSTALLATION

- Make sure that the correct training is provided to do the installation. Refer to [4.2 Personnel requirements](#), page 17.

4.2 PERSONNEL REQUIREMENTS

- To safely and correctly install the charging station, only a certified installer or somebody who acts on behalf of a certified installer may perform the installation. Comply with local requirements.
- Only a technically skilled person with the necessary knowledge of the GARO Entity charging station may replace the charging unit.

4.3 PERSONAL PROTECTIVE EQUIPMENT

WARNING

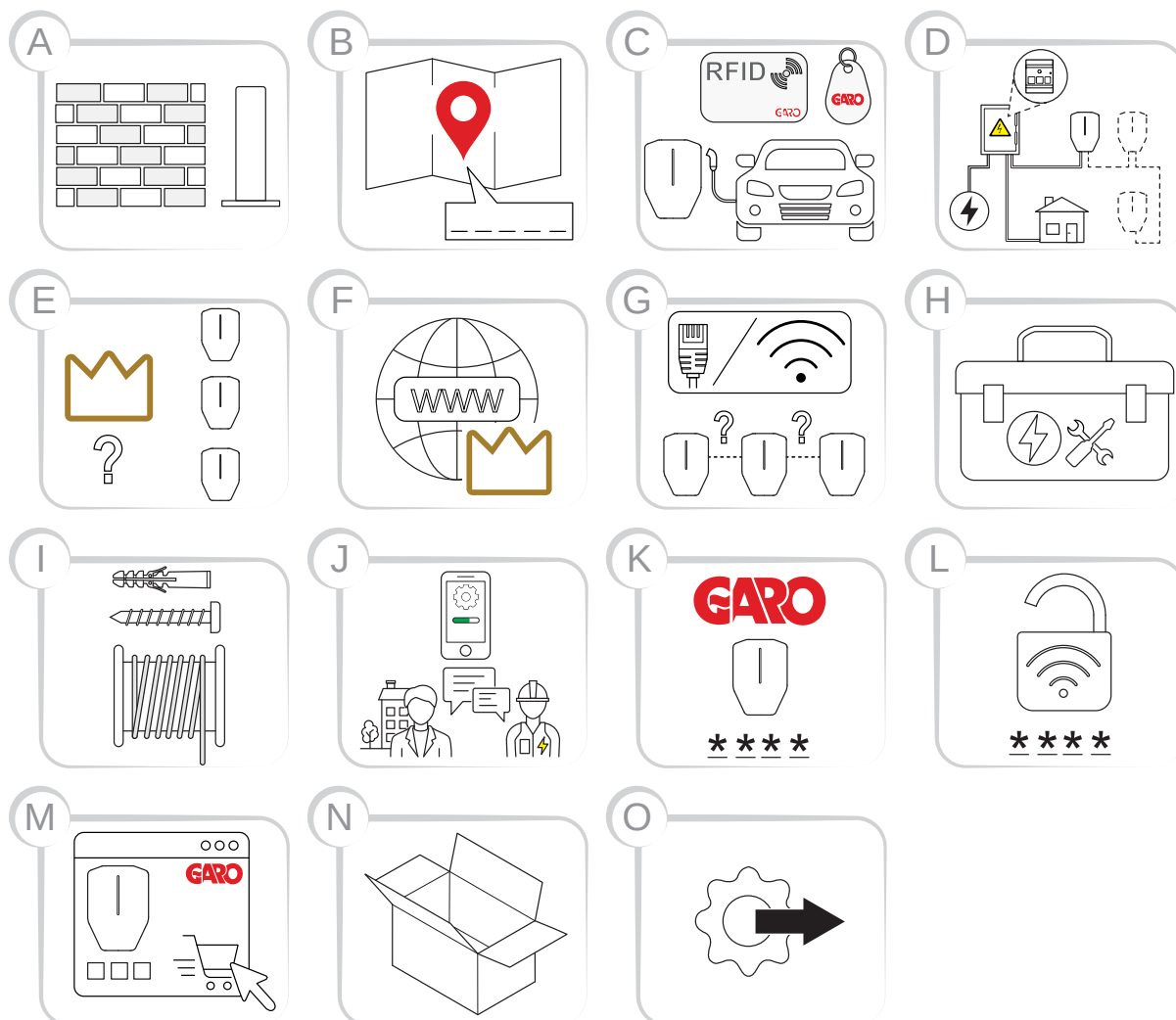
Make sure that the correct personal protective equipment for the installation is available. Adapt the personal protective equipment to suit the installation location. Comply with local requirements. Note that more personal protective equipment can be necessary.



- Protective shoes for electricians.
- Protective gloves.
- Protective goggles.
- Protective helmet.
- Hearing protection.
- High visibility clothing.

4.4 TO DO A PLAN FOR THE INSTALLATION

- Prepare the installation location according to the steps that are shown in the illustration.



- A. Decide where to put the charging station(s). Make sure that a suitable location due to weather conditions and preparation for future expansion.

NOTE

Charging station(s) can be attached to a wall, a stand or a pole. Installation accessories are available at GARO.

- B. Decide on how to define the location and naming of the charging station(s).
- C. Decide on access control for EV drivers. It is possible to control access with the GARO Connect app or RFID tags where controlled

authorization is necessary. Those can also be combined in a schedule.

NOTE

RFID tags are available as accessories at GARO.

- D. Plan the power supply and current availability on all levels of the installation. Plan for the DLM (dynamic load management) system setup. Refer to [4.14.1 Dynamic Load Management \(DLM\) functionality, page 62](#).
- E. If several charging stations are used, decide which charging station that should act as master charging station. This can be affected by a DLM setup.

- F. Decide the internet connection type for the master unit in the connection group (the charging station and/or the load interface unit).
- G. Decide the connection type between all charging stations, if applicable.
- H. Make sure that the necessary tools and testing instruments for installation is available.
- I. Make sure that the correct installation material is available.
- J. Decide if the installer or owner should prepare the installation in the GARO Connect app. Refer to [4.13 GARO Connect, page 39](#).
- K. Use the GARO Connect app to generate the installation code. The owner normally provides the installation code to the installer. However, the first installation can be made by the installer and handed over to the owner.
- L. Prepare the Wi-Fi credentials (SSID and password), if Wi-Fi is used for internet connection to the connection group master. The owner of the local Wi-Fi must provide the Wi-Fi credentials to the installer.
- M. Order the required products, accessories and other material.
- N. Unpack the packages from GARO. Inspect the product(s) and accessories while unpacking to make sure that no damage has happened during transport. Also, make sure that all the necessary product(s) and accessories are available, before the installation is started.
- O. Start the physical installation.

4.5 TO GENERATE THE INSTALLATION CODE

An installation code is used as a key to the location. It is created and used in the GARO Connect app. An installation code must be provided to the installer for correct installation of the charging station. The installation code is owned and generated by the owner. An installation code provides access to a location.

NOTE

A new installation can also be started by the installer that acts as an intermediate owner, which means that the installer generates the installation code and hands over the ownership after installation is completed.

NOTE

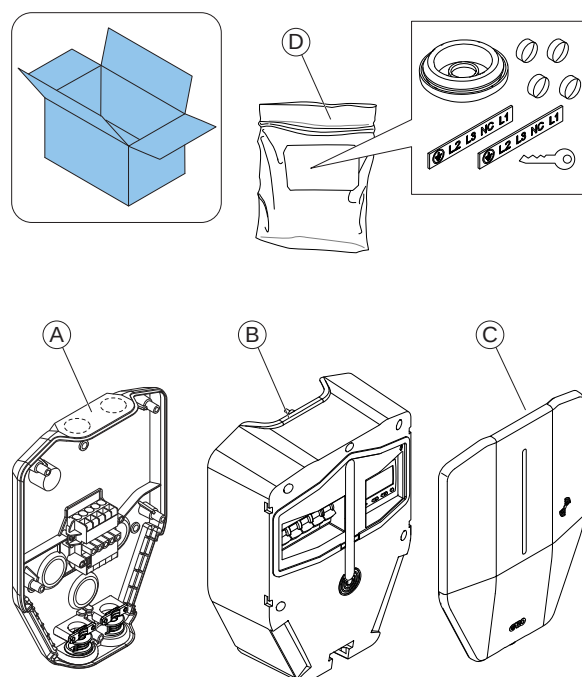
If the installer should no longer have access to the location, generate a new installation code.

NOTE

There can only be one installation code for each location. However, an installation code can be used by several installers. However, Only one installer shall be formal responsible for the installation work. Refer to [To prepare the installation \(owner\), page 44](#).

4.6 TO DO A CHECK OF THE DELIVERY

- Make sure that the delivery is complete and correct.

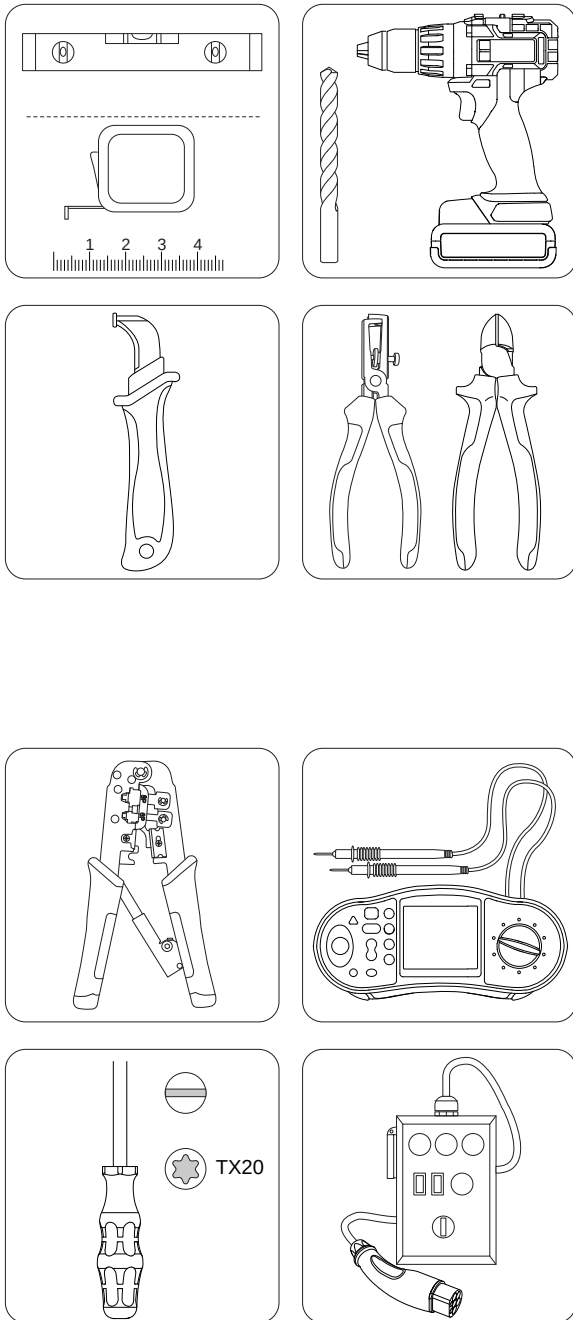


- A. Installation bracket
- B. Bag with 2 keys, 1 cable grommet, 4 screw covers and 2 stickers (for the IT 230 V system)
- C. Charging unit
- D. Protection cover

E. Front cover

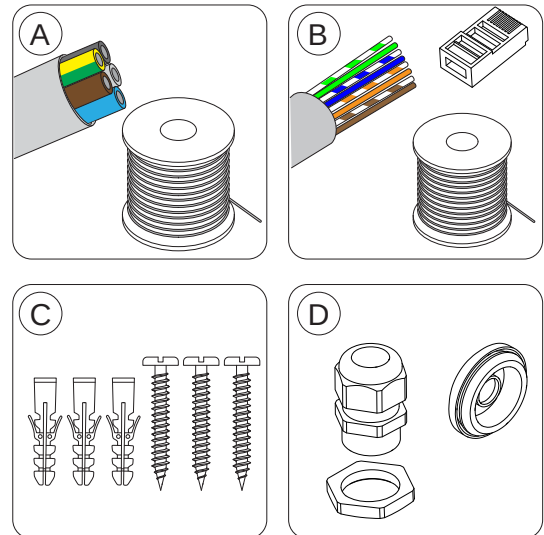
4.7 TO ENSURE THE NECESSARY TOOLS

- Make sure that the necessary tools for the installation are available.



4.8 TO ENSURE THE NECESSARY INSTALLATION MATERIAL

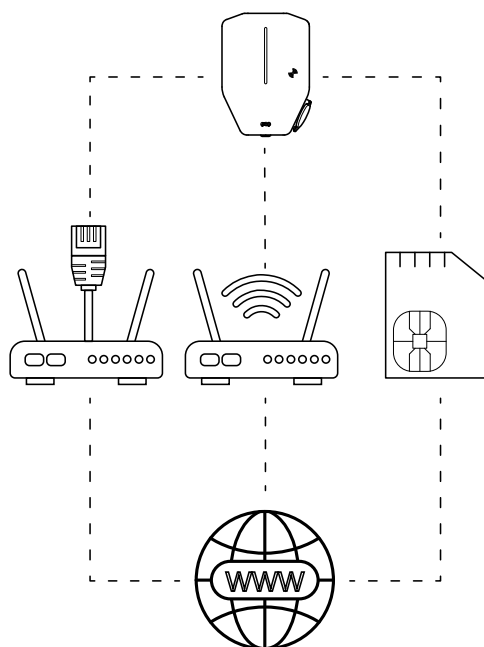
- Make sure that the necessary installation materials are available.



- A. Power cable.
- B. Ethernet cable with suitable RJ45 plug, if ethernet is used.
- C. Screws and plugs that are suitable for the wall material, at a maximum diameter of 6 mm and a maximum screw head diameter of 14 mm.
- D. Cable grommets (M32) that is suitable for the entry point of the power cable. For cables that enter from the top of the charging station, use a IP54 cable grommet with integrated cable strain relief function as a minimum requirement.

4.9 TO DECIDE INTERNET CONNECTION TYPE

- Decide what internet connection should be used for the installation. There are 3 types of internet connection that is possible to use for installation.



- Ethernet cable from the router/switch.
- Local Wi-Fi connection from the building where the installation is set up.
- Built-in 4 G/LTE with SIM card.

NOTE

The listed order is also the automatic priority order for connection types.

- If several charging stations are interconnected to form a connection group, internet should be connected to the master charging station.

4.10 TO CONNECT SEVERAL CHARGING STATIONS

NOTE

If DLM is used, all charging stations must be on the same network.

Before choosing the connection type between several charging stations, first chose the internet connection

type for the master charging station (must!). Refer to [4.9 To decide internet connection type, page 21](#).

The system is equipped with a built-in meshed Wi-Fi system that contributes to an easy installation. However, large distances or obstacles may require physical ethernet cable connections.

NOTE

A connection group is limited to max. 32 units. If more units needs to be used in the system, then subgroups needs to be introduced.

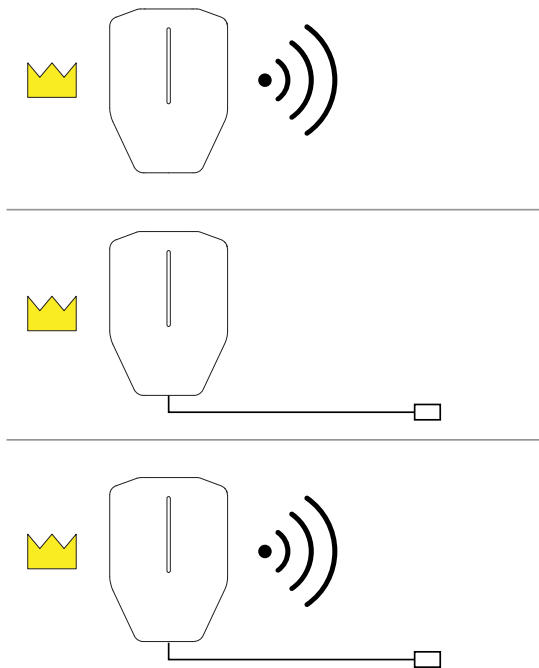
NOTE

The master unit is the bridge between a mesh Wi-Fi and ethernet. It is not possible to switch between mesh Wi-Fi and ethernet without introducing a master/new connection group where media needs to be changed (from ethernet to mesh Wi-Fi and vice versa). Each internet connection type must be set up through the master unit.

4.10.1 BEFORE SETUP

Before deciding the connection type between several charging stations (CS), decide the internet connection type for the master CS. Refer to [4.9 To decide internet connection type, page 21](#).

The system is equipped with a built-in meshed Wi-Fi system that contributes to an easy installation. However, large distances or radio obstacles may require physical ethernet cable connections. Cable connection is a good recommendation, but comes with pros and cons. The first charging station unit must be setup as a master unit. Other charging station units can be connected to the master unit using mesh Wi-Fi, ethernet cable or both.



The master charging station unit is the bridge between the mesh Wi-Fi and the ethernet cable. It is not possible to switch between Wi-Fi and ethernet without assigning a charging station as a master unit. Each internet connection type must be set up through a master unit.

NOTE

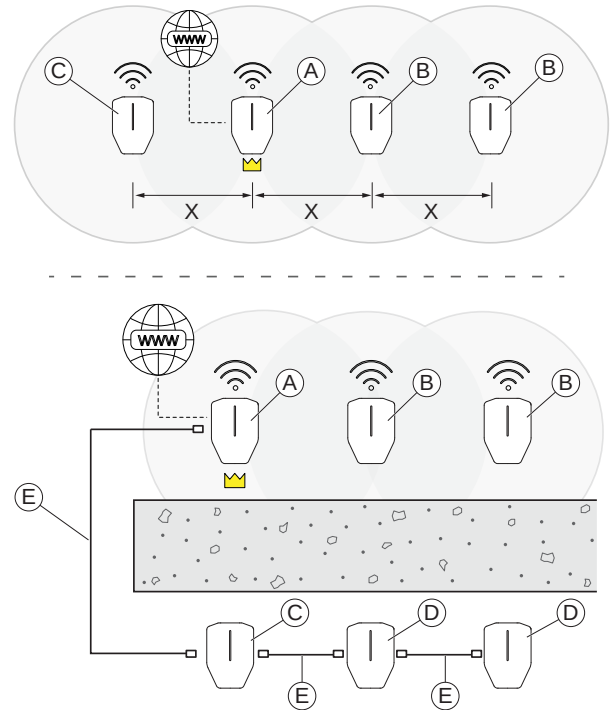
If DLM is used, all charging stations must be on the same network.

NOTE

Number of units in a connection group is limited to 32. If more units are needed, then subgroups needs to be used.

4.10.2 SIMPLE SETUP SCENARIOS

The connection type between the master charging station (A) and the other CS (B, C, D) in the same installation depends on distance and radio obstacles. The following scenarios are some common setups when you have several charging stations.



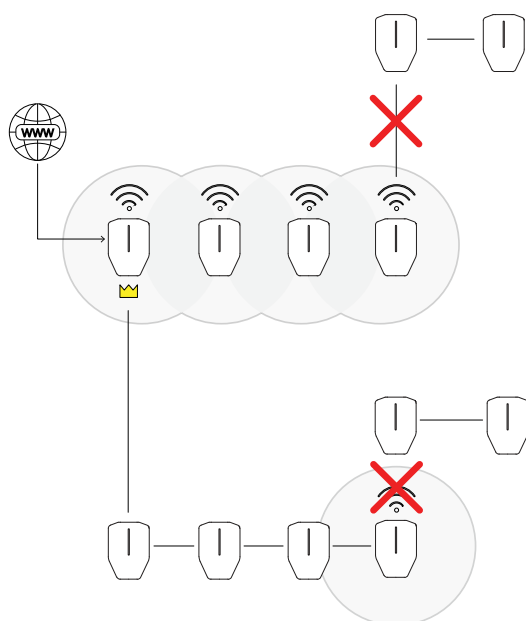
Scenario 1: If the distance (X) between the charging stations is short and there are no radio obstacles, it is possible to use a mesh Wi-Fi connection between the master charging station (A), and the other charging stations (B and C). (However, it is always preferable to use an ethernet cable, if suitable.)

Scenario 2: If the distance between the master charging station (A) and the charging stations (C) are long or there are thick walls or other radio obstacles, an ethernet cable (E) must be used. If there are several charging stations (D) behind the obstacle, they should all be connected to charging stations (C) with an ethernet cable regardless of the distance.

4.10.3 ADVANCED SETUP SCENARIOS

In the following scenario the installer wants to switch from mesh Wi-Fi to ethernet cable, and switch from ethernet cable to mesh Wi-Fi. This requires assigning additional master units and grouping the charging stations.

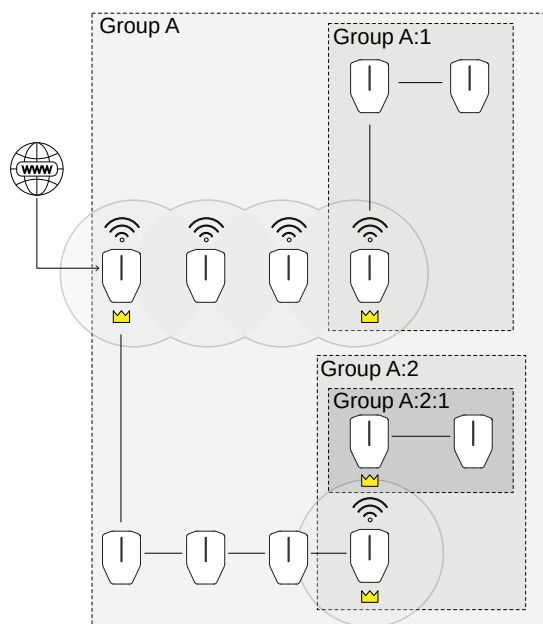
NOT POSSIBLE



To solve the scenario the installer must do the following:

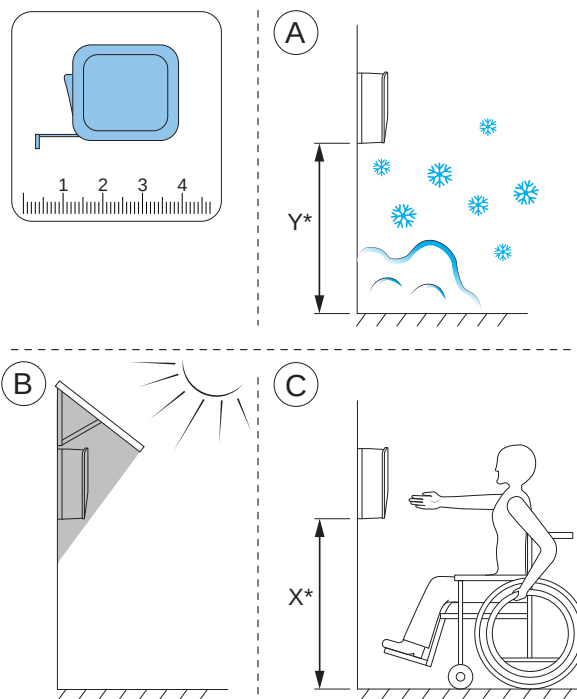
- Assign new master units according to the illustration.
- Group the charging station units according to the illustration.

SOLUTION



4.11 TO DECIDE THE POSITION OF THE CHARGING STATION

1. Avoid installing the charging station where snow (A) can block access to the charging station.



2. Avoid installation in direct sunlight (B) and do not install the charging station on a hot surface.
3. Make sure that the position of the charging station is approved from an accessibility (C) perspective. Comply with local requirements.

4.12 CABLE INSTALLATION

The GARO Entity is designed to work with both 400 V TN-S (default) and 230 V IT.

If a 230 V IT system is to be used, the marking of the installation bracket should be updated, using the supplied marking stickers.

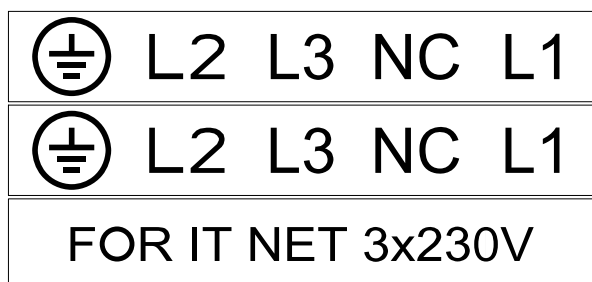
Once connected, the charging station will detect what voltage system it uses. The only setting required is phase connections. Refer to [4.12.5 To connect the power cable to the terminal](#), page 28.

4.12.1 TO INSTALL THE STICKERS FOR IT 230 V

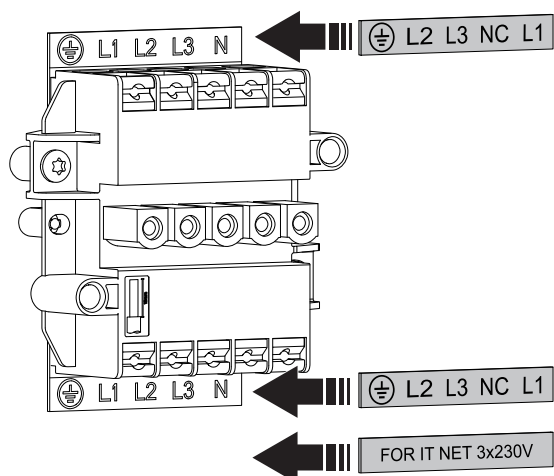
NOTE

This instruction is only valid for IT 230 V systems.

1. Locate the stickers on the installation bracket.

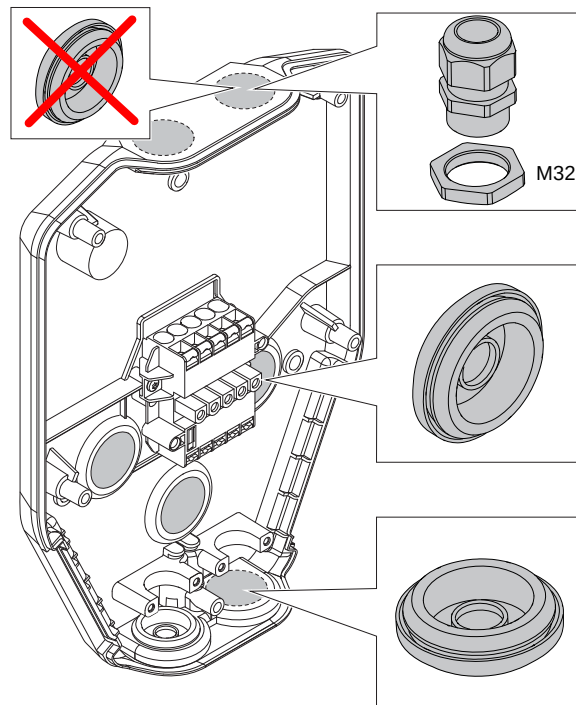


2. Install the new stickers supplied with the installation bracket. Install the new stickers onto the old stickers.



4.12.2 TO PREPARE THE INSTALLATION BRACKET FOR THE CABLE INSTALLATION

1. Decide the inlet points for the power cable.

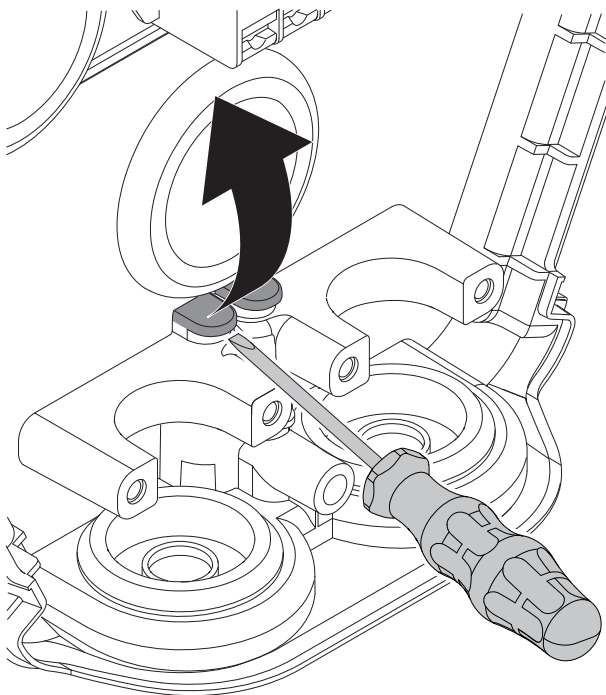


- a. Remove the knock-out from the inlet hole of the power cable.
- b. If there are several charging stations to be daisy-chained with the same feeding cable, also remove the knock-out for the outlet hole of the second power cable.
- c. Insert a suitable grommet in the knock-out hole.

2. If the connection to internet, or other charging station, is decided to be via an ethernet cable, prepare the inlet of the ethernet cable(s).

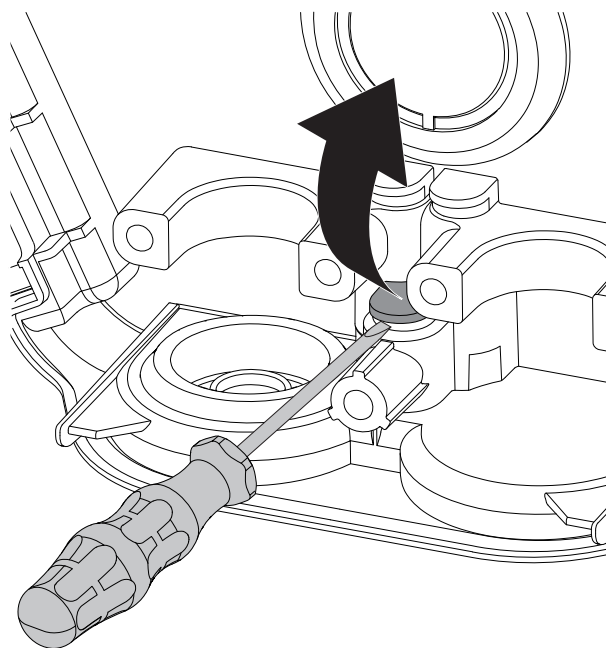
NOTE

It is possible to install the ethernet cable in several ways, but there are dedicated break-outs for the ethernet cable in the installation bracket. Maximum cable diameter for the break-out is 8 mm.

**NOTE**

If the top cable entry positions are used, they must be firmly sealed with approved IP54 cable grommets. The cable grommets must also secure cable force strain relief. The lower and rear positions are preferably sealed using "skin type" cable grommets.

- a. Remove the break-out for the ethernet cable with a flat screwdriver.
- b. If there are several charging stations to be installed, also remove the break-out for the outlet hole of the second ethernet cable.
3. If a control cable is to be used, one option is to use the lower entrypoint. To remove the break-out, use a flat screwdriver.

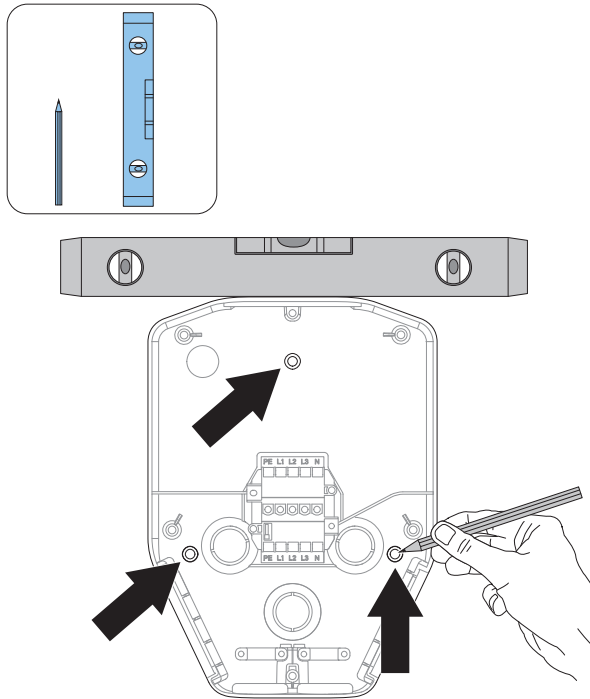
**NOTE**

Maximum cable diameter for the break-out is 8 mm.

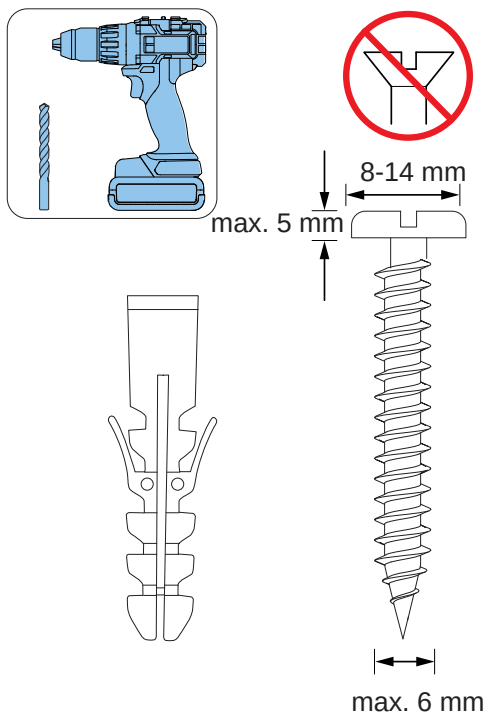
Recommendation: Many good fast connection RJ-45 connectors are available. Select a connector that works well with the ethernet cable.

4.12.3 TO INSTALL THE INSTALLATION BRACKET TO A WALL

1. Decide the position of the charging station. Refer to [4.4 To do a plan for the installation, page 18](#).
2. Hold the installation bracket as a template against the wall.

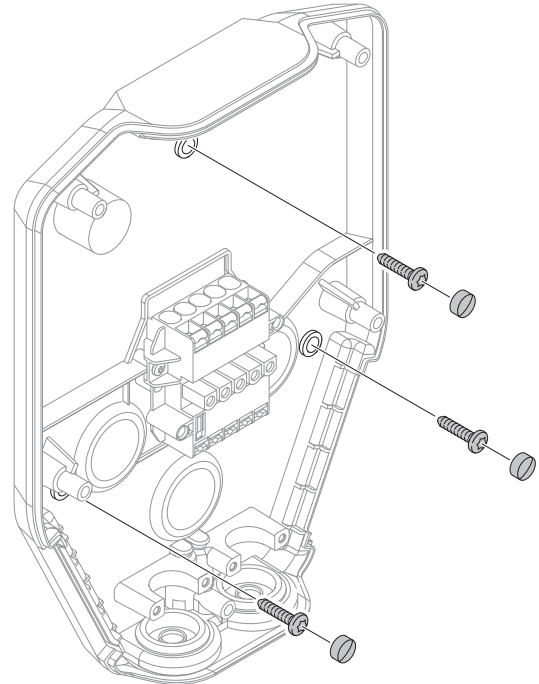


3. Use a spirit level to make sure that the installation bracket is straight.
4. Use a pen to mark the drill holes on the wall, if needed.
5. Choose appropriate screws for the wall material. If it is necessary, also choose appropriate plugs and drill for the wall material.



6. Drill the holes and attach the plugs if it is necessary.

7. Attach the installation bracket to the wall with the screws.



8. Attach the screw covers to the screws.

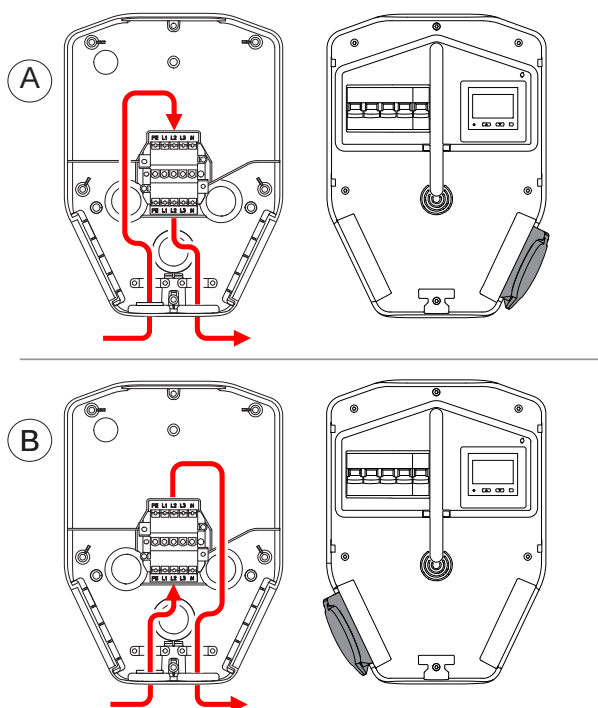
NOTE

Ground stands and polemount fixtures are available as accessories. The workflow is similar. See separate manuals for those accessories.

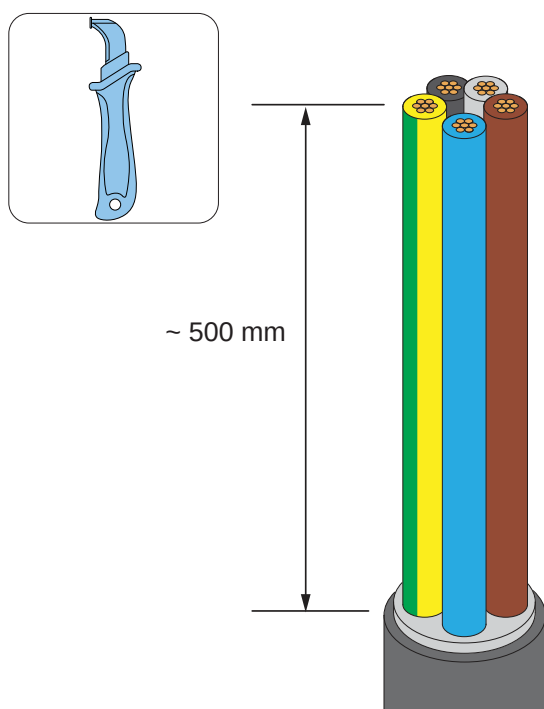
4.12.4 TO PREPARE THE POWER CABLE FOR INSTALLATION

CAUTION

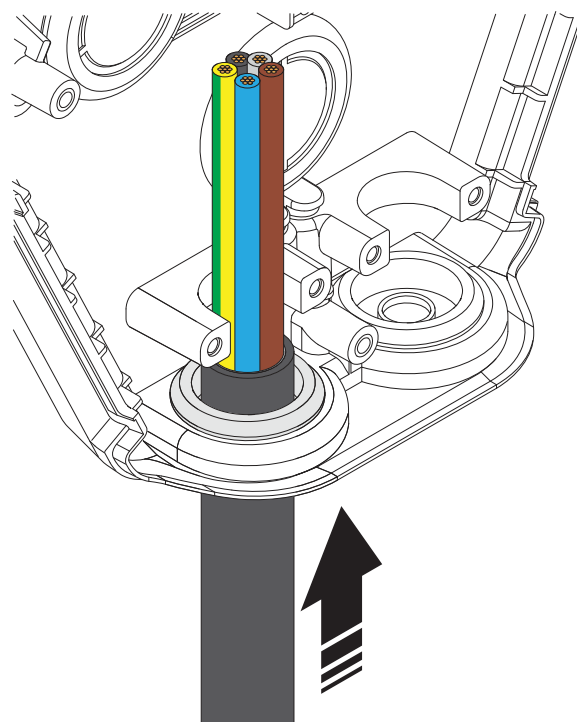
If it is necessary to pass the connection terminal with connection of the power cable due to dual power cables in the same direction, route the wires on the opposite side from the connection terminal, compared to where the Type 2 outlet is to be placed (right or left). For example, if the Type 2 outlet is located on the right side of the charging unit (default), lead the wire the wires on the left (A) side of the connection terminal. If the Type 2 outlet is located on the left side of the charging unit, lead the wire along the right (B) side of the connection terminal. Refer to [3.4 Charging station overview, page 15](#) to see where the Type 2 outlet is.



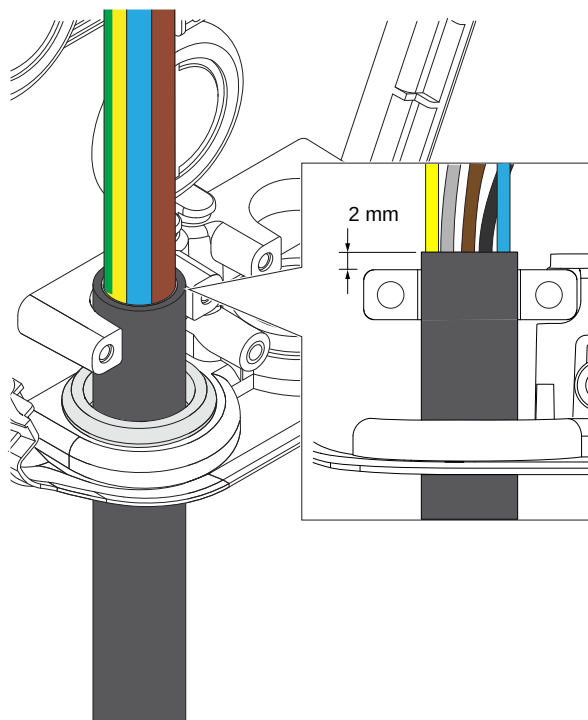
1. Dismantle approximately 500 mm of the power cable.



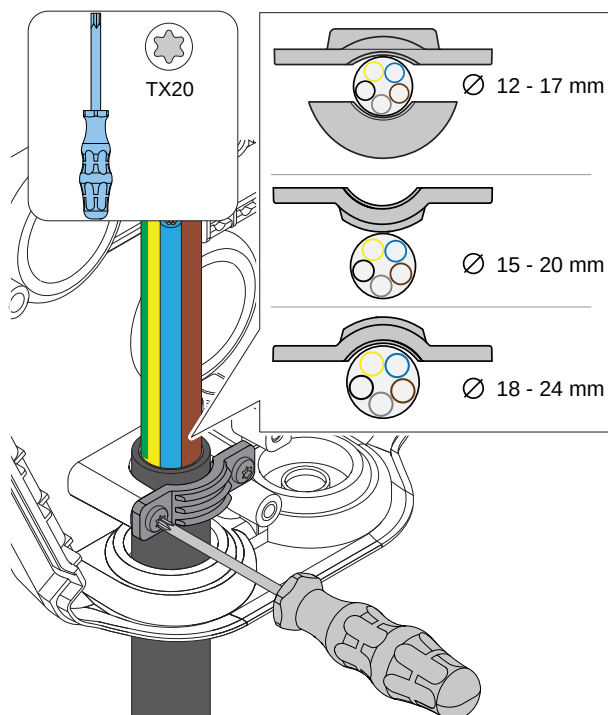
2. Thread the power cable through the grommet in the power cable inlet hole.



3. Make sure that the cable sheet reaches 2 mm above the bracket for the cable strain relief.



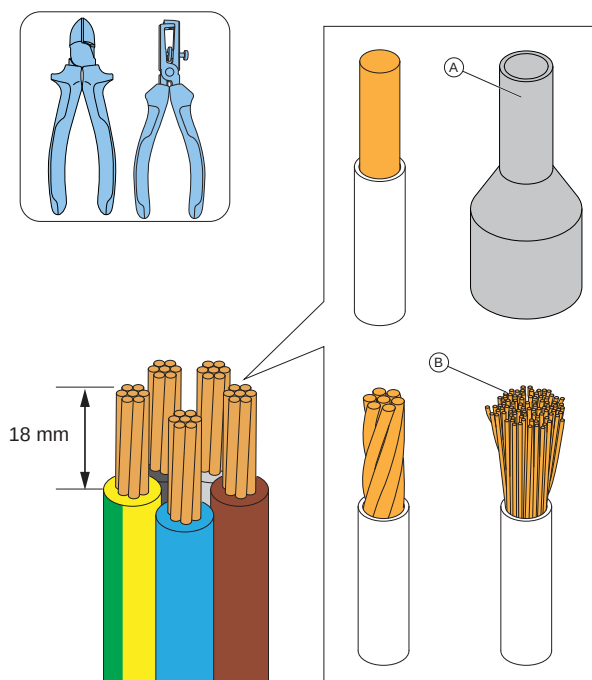
4. Install the cable strain relief to fixate the power cable.



NOTE

The cable strain relief can be configured in 3 different ways. Choose the configuration that is suitable for the diameter of the power cable.

5. Cut the wires to the exact length for the installation.
6. Cut and dismantle the wires. Use a wire ferrule (A) for strained power wire conductors (B).



CAUTION

Make sure that the protective earth cable is a little bit longer than the other cables.

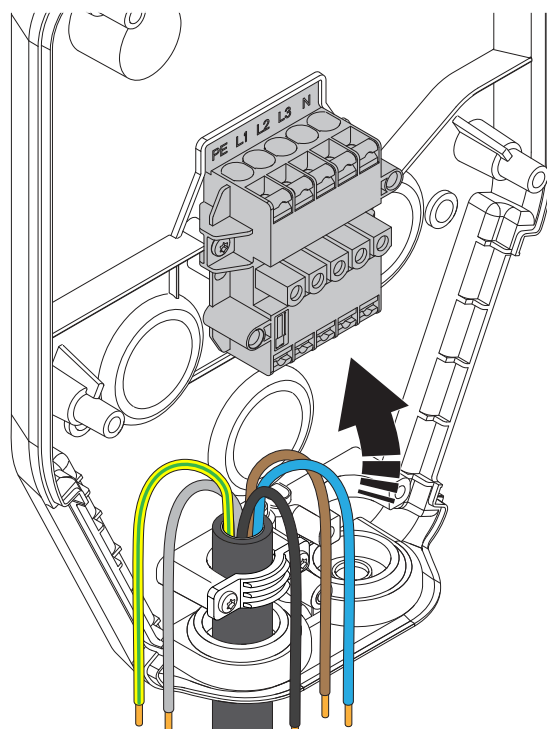
4.12.5 TO CONNECT THE POWER CABLE TO THE TERMINAL

Electric vehicles charge on one, (two) or three phases. Phase loads must be addressed, especially when installing several charging stations in one location. GARO Entity PRO is available with a built-in phase management system, that when using DLM, automatically selects the phase(s) that can be used. This means, that the charging stations involved can be installed as L1 to L1, L2 to L2 and L3 to L3.

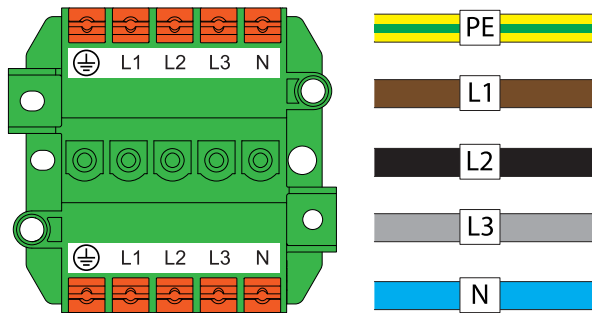
If charging units without this function are used, it is highly recommended to rotate phases one step for each charging station. The rotation must also be configured in the GARO connect app to reflect exactly how each charging station is connected to the grid.

Install the power lines as follows:

1. Install the wires of the power cable according to installation type.



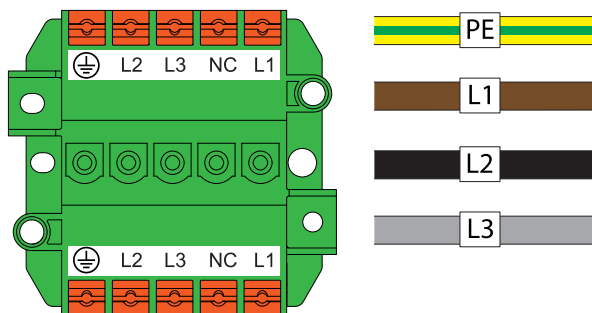
a. TN system.



TN400 V

PE	L1	L2	L3	N	Description
PE	L1			N	TN 1x230V L1
PE	L2			N	TN 1x230V L2
PE	L3			N	TN 1x230V L3
PE	L1	L2		N	TN 2x230V L1 - L2
PE	L2	L3		N	TN 2x230V L2 - L3
PE	L3	L1		N	TN 2x230V L3 - L1
PE	L1	L2	L3	N	TN 3x400V
PE	L2	L3	L1	N	TN 3x400V rotated + 120 deg
PE	L3	L1	L2	N	TN 3x400V rotated + 240 deg

b. IT system.



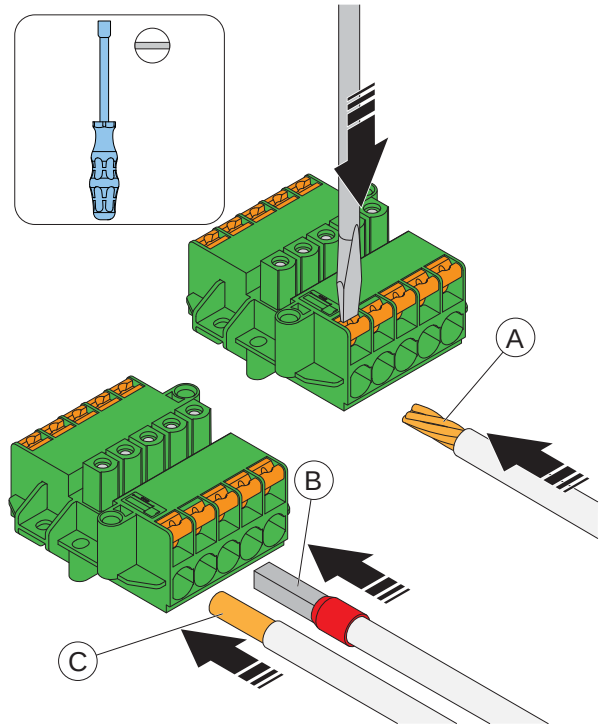
IT230 V

PE	L2	L3	NC	L1	Description
PE	L2			L1	IT 2x230V L1-L2
PE	L3			L2	IT 2x230V L2-L3
PE	L1			L3	IT 2x230V L3-L1
PE	L2	L3		L1	IT 3x230V
PE	L3	L1		L2	IT 3x230V rotated +120 deg
PE	L1	L2		L3	IT 3x230V rotated +240 deg

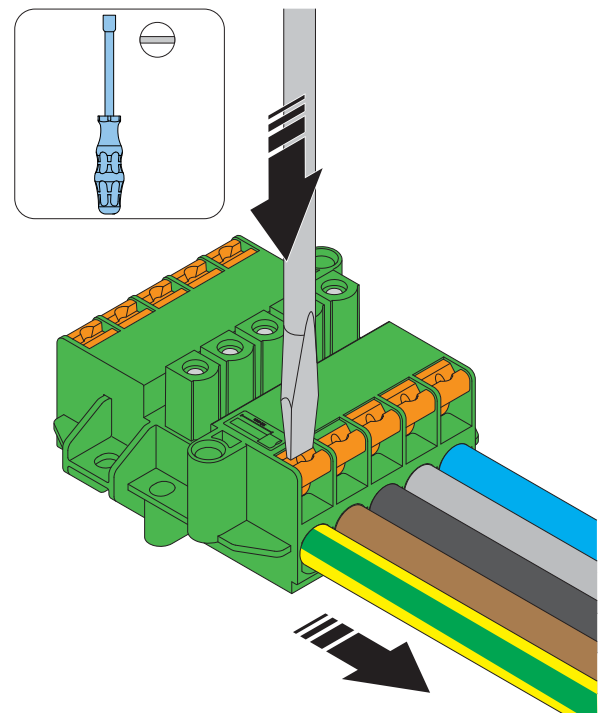
2. Install the wires to the terminal block.

- a. If the wires have strained conductors (A), use a flat screwdriver and push the orange button to open the terminal.

- b. If the wires have cable ferrules (B) or solid conductors (C), push the wires into the terminal.



3. To remove any wire, push a flat screwdriver on the terminal and pull the wire out.



4.12.6 TO INSTALL A SECOND POWER CABLE (DAISY-CHAINING METHOD)

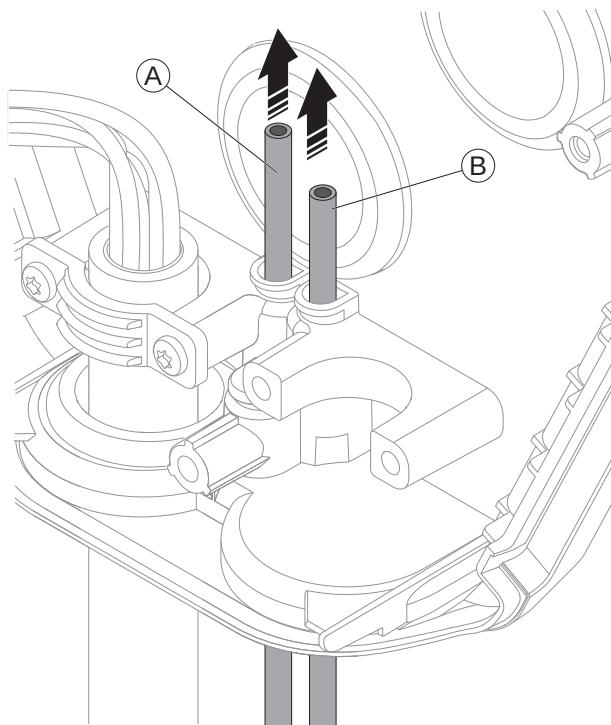
If several charging stations are fed by the same power cable in a daisy chain, a second power cable can also be connected to the terminal.

1. Dismantle the second power cable for installation. Refer to [4.12.4 To prepare the power cable for installation, page 26](#).
2. Install the wires of the second power cable to the terminal. For more information about installation types, refer to [4.12.5 To connect the power cable to the terminal, page 28](#).

4.12.7 TO PREPARE THE INSTALLATION BRACKET WITH ETHERNET CABLE(S)

If ethernet should be used, the installation bracket must be prepared with the ethernet cable(s).

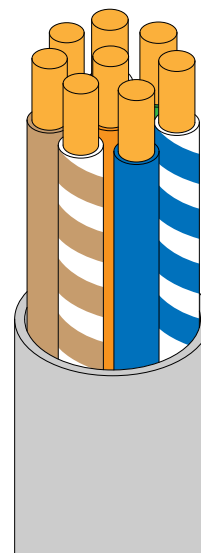
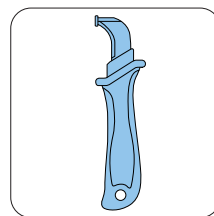
1. Thread the ethernet cable (A), and (B) if applicable, through the installation bracket.



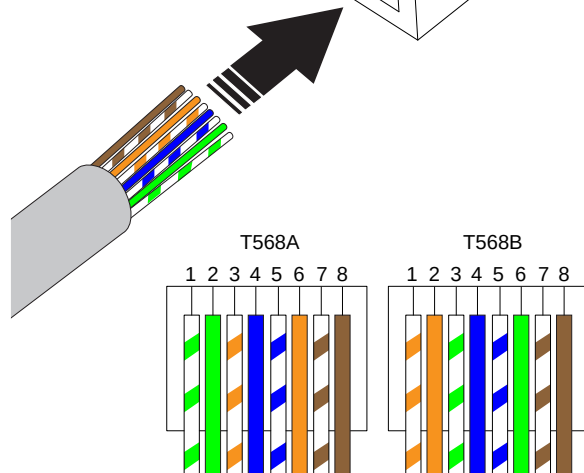
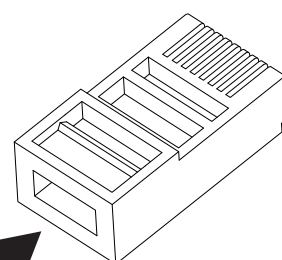
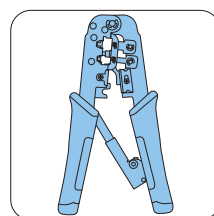
NOTE

The recommended length for the ethernet cable inside the installation bracket is 500 mm.

2. Secure the ethernet cable(s) from pull-out forces, for example with a cable strap.
3. Dismantle the ethernet cable(s).



4. Install the ethernet cable to a RJ45 plug.



NOTE

Both shielded or unshielded ethernet cables are possible to use, depending on installation conditions.

4.12.8 TO PREPARE THE INSTALLATION BRACKET WITH A SECOND ETHERNET CABLE

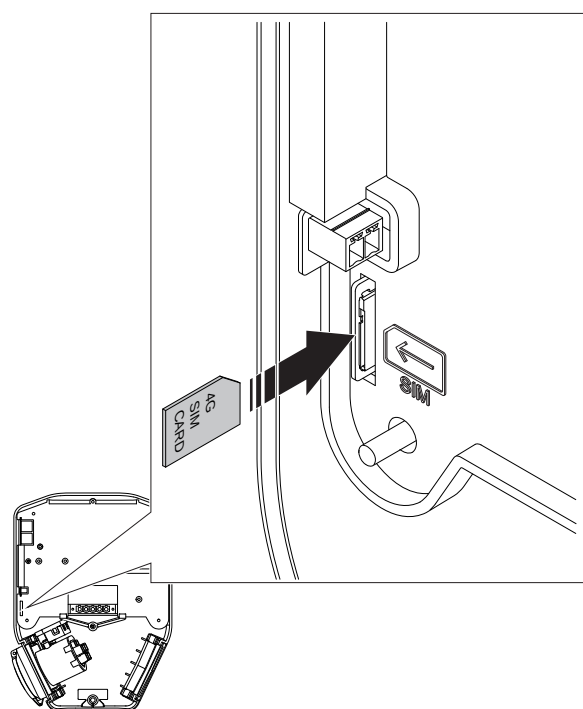
If ethernet should be used as internet connection for several units (i.e. either charging stations or load interfaces), the installation bracket must be prepared with a second ethernet cable. Refer to [4.12.7 To prepare the installation bracket with ethernet cable\(s\)](#), page 30.

- Install a second ethernet cable through the outlet hole in the installation bracket. Refer to [4.12.7 To prepare the installation bracket with ethernet cable\(s\)](#), page 30.

4.12.9 TO CONNECT THE CHARGING STATION TO THE INTERNET WITH 4 G/LTE

Connection to the internet with 4 G requires a SIM card (SIM card size: 3 FF = Micro = 15x25 mm).

1. Turn the charging unit rear side up.
2. Install the SIM card to the dedicated slot in the charging station.



NOTE

Some charging units are supplied with a SIM card (standard) attached.

4.12.10 TO INSTALL THE CONTROL CABLE TO THE INSTALLATION BRACKET

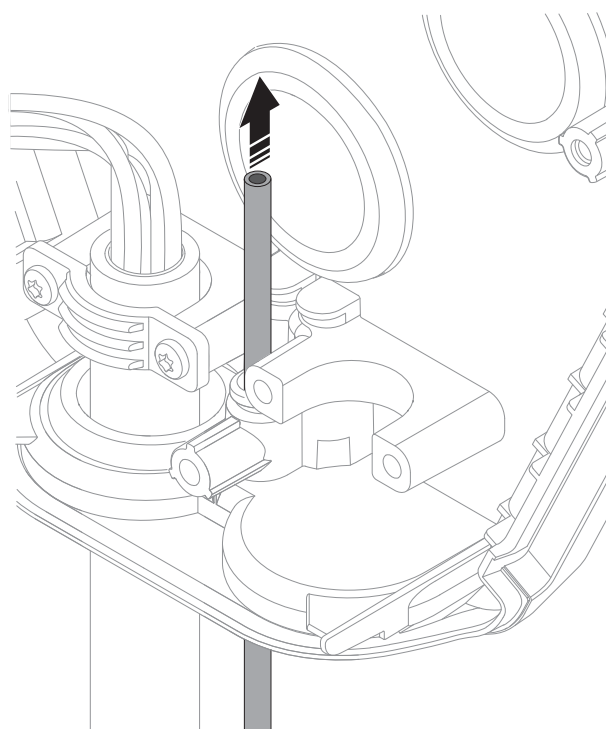
NOTE

The charging station has a control input that can be used to enable and disable charging. This digital input signal limits the charging current to a fixed value 0-32 A (configurable). Physical connection is done by an external, insulated/potential free contact. The control logic is configured in the GARO Connect app. By default, charging is disabled if the contact is closed. The control logic can be toggled: Closed contact = limitation, or Open contact = limitation. The current limitation level is configurable.

1. Thread the control cable through the inlet hole in the bottom of the installation bracket.

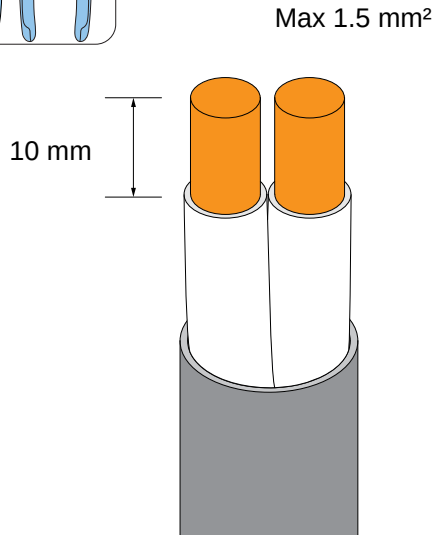
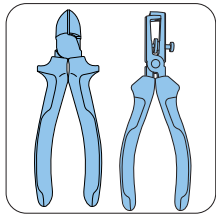
NOTE

The recommended length of the control cable inside the installation bracket is 500 mm. The maximum cable area for the control cable is 1.5 mm² and maximum voltage is 12 VDC and maximum current is 0.1 A. It is recommended to use a flexible and smaller cable area for convenient installation.



2. Secure the control cable from pull out forces, for example with a cable strap.

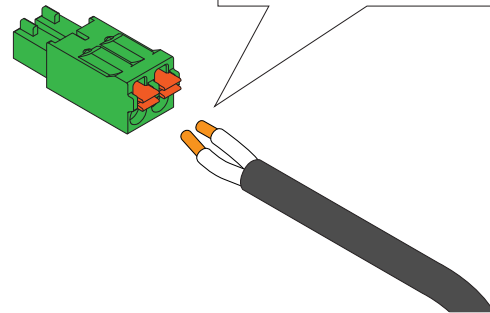
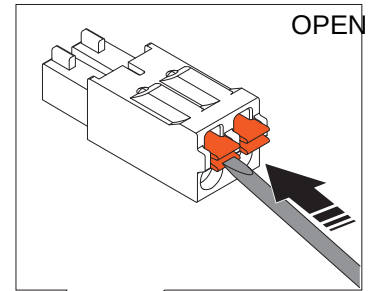
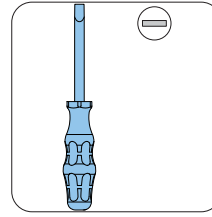
3. Dismantle the control cable and the wires inside the control cable.



NOTE

The recommended conductor strip length is 10 mm.

4. If the cable has strained conductors, use cable ferrules to the conductors.
5. Install the cables to the connector.
 - a. If the cables have solid conductors or ferrules, push them into the connector.
 - b. If the cables have soft conductors, use a flat screwdriver to open the spring mechanism in the connector before you push the cable in.



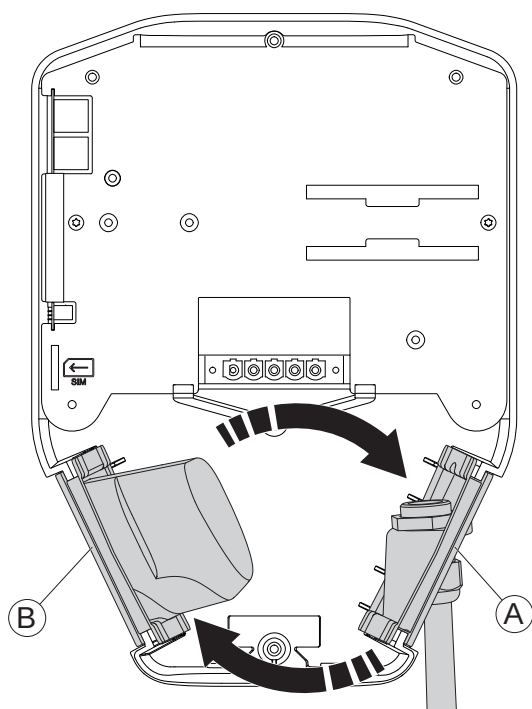
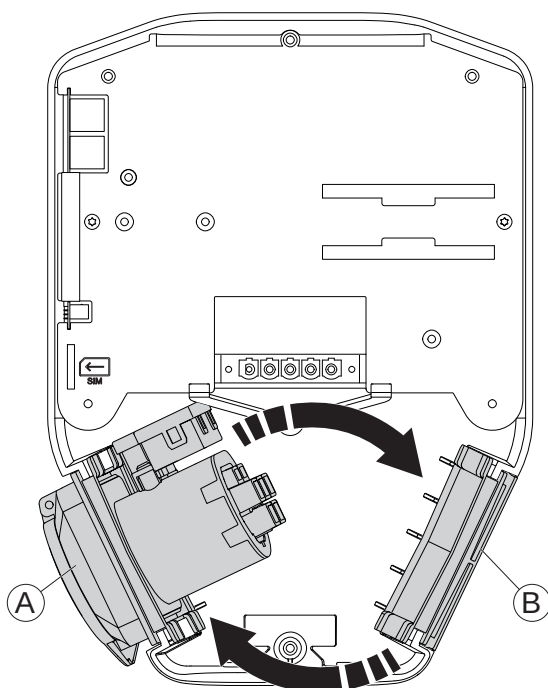
NOTE

If wires need to be disconnected, use a flat screwdriver to push the orange button to open the terminal.

4.12.11 TO CHANGE THE POSITION OF THE TYPE 2 OUTLET OR FIXED CABLE

As default, the Type 2 outlet or the fixed cable is located on the right side of the charging unit. The position of the Type 2 outlet or fixed cable can be changed.

1. Turn the charging unit to the rear side.
2. Slide the Type 2 outlet or fixed cable (A) and the protective cover/cable holder (B) out of the charging unit.



3. Install the protective cover/cable holder in the opposite slots.

CAUTION

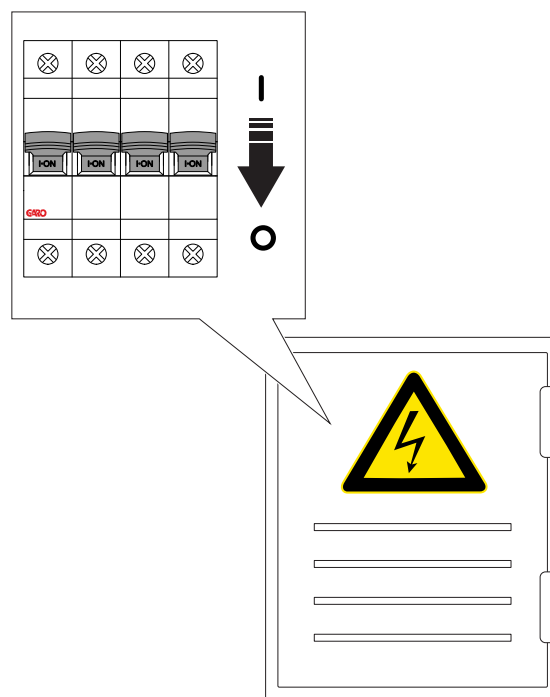
Be aware of the wiring and make sure that the wires do not get pinched or stretched.

4.12.12 TO DO A TEST OF THE POWER CONNECTION

WARNING

Electrical power can cause serious personal injury or death.

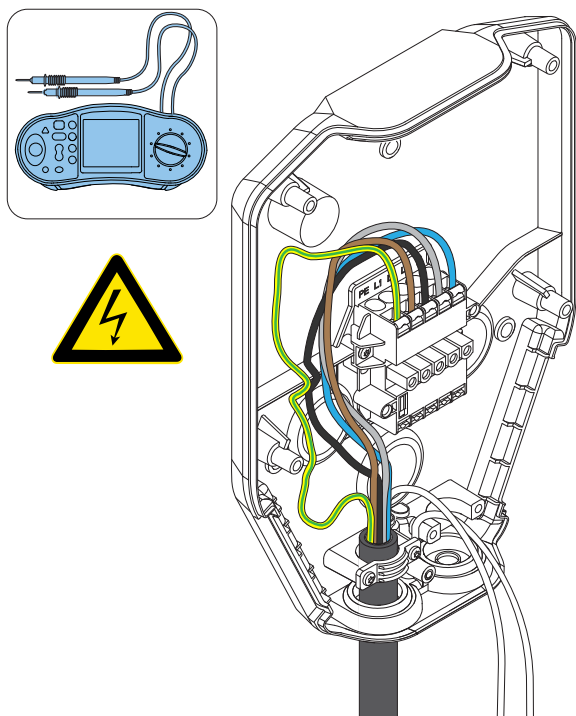
1. Make sure that the power/voltage is off.



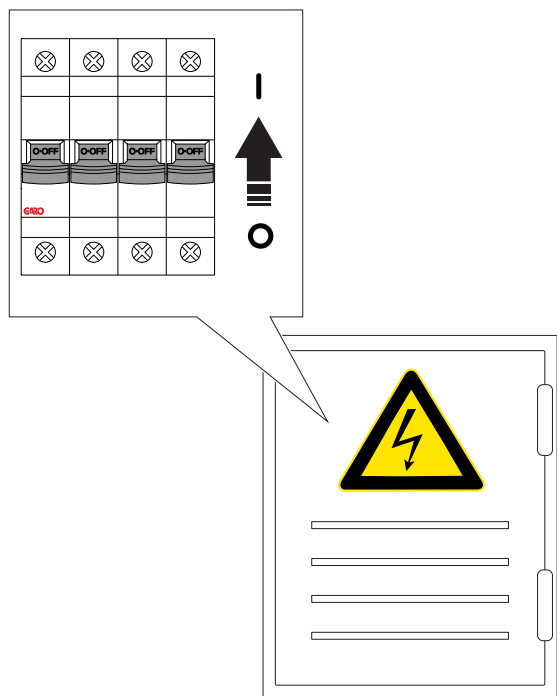
2. Do a visual inspection and make sure that nobody accidentally can access the installation bracket(s). Make sure that it is safe to apply power/voltage to all parts of the installation.
3. Do a test of the PE continuity.

CAUTION

Do not do a test of the insulation with any charging unit attached, as that can cause damages to the charging unit(s).

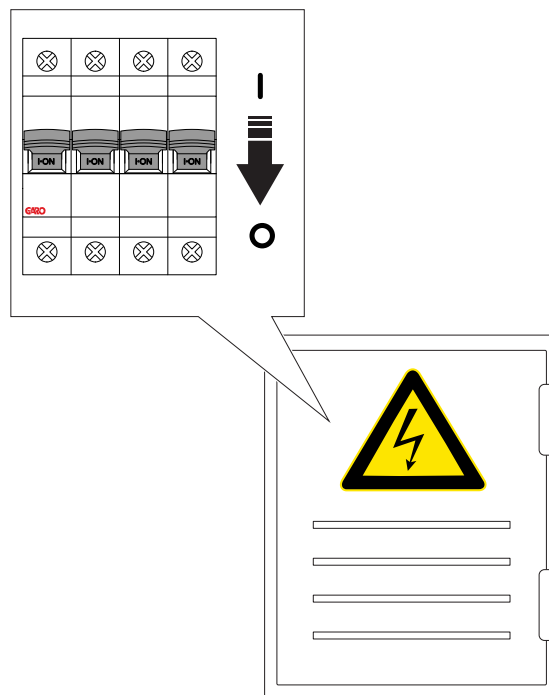


4. Switch the power/voltage to on.

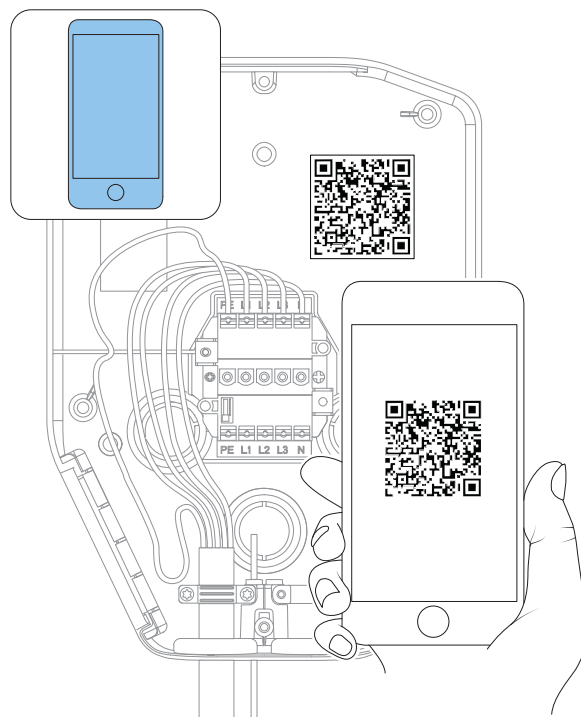


5. Do a check of the voltage and phase sequence in the installation bracket terminal. Make sure that the voltage and phase sequence matches the planned setup. Refer to [4.12.5 To connect the power cable to the terminal](#), page 28.

6. Switch the power/voltage to off.



7. Read the QR code on the installation bracket using the Gar Connect App. At this step, it is time to connect the charging station, created in the GARO Connect App to the physical installation bracket. Refer to [4.13 GARO Connect](#), page 39 for more information about the procedure and functions of the GARO Connect app.



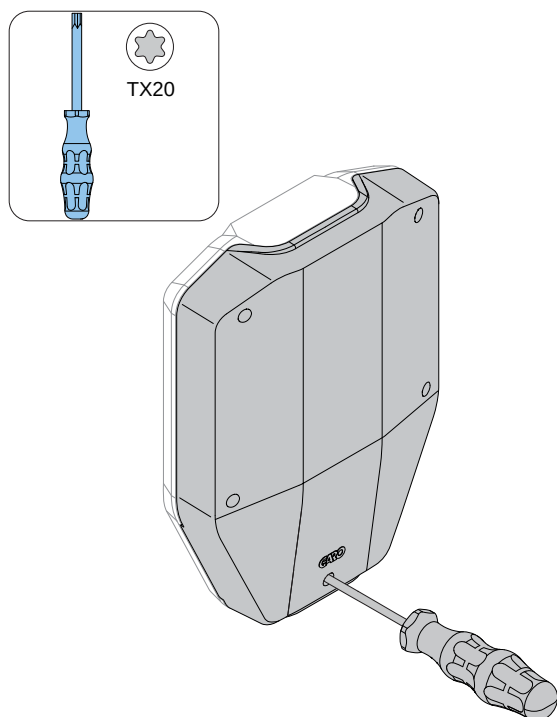
CAUTION

If the charging station is set up without any internet connectivity, it will allow charging at maximum current defined by the attached charging unit. The default setting is 16 A. Can be adjusted as parameter.

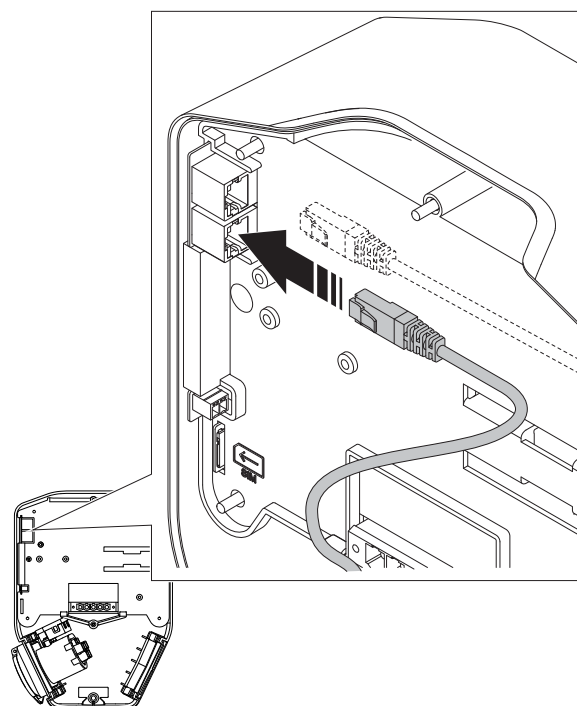
4.12.13 TO INSTALL A PROTECTION COVER

The protection cover is used to protect the installation bracket if a charging unit should not be attached from the start or temporary removed. When the protection cover is installed, the charging station is protected from damage before installation of the charging unit.

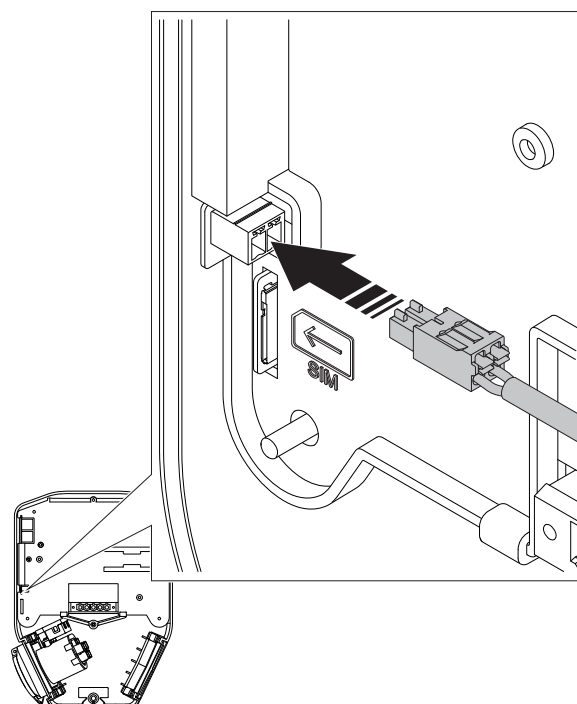
1. Attach the protection cover to the installation bracket.
2. Tighten the screws with a Torx TX20 until the protection cover is tight against the installation bracket (max. 2,9 Nm).

**4.12.14 TO ATTACH THE CHARGING UNIT TO THE INSTALLATION BRACKET**

1. If applicable, install the ethernet cable(s) in the ethernet ports on the charging unit.



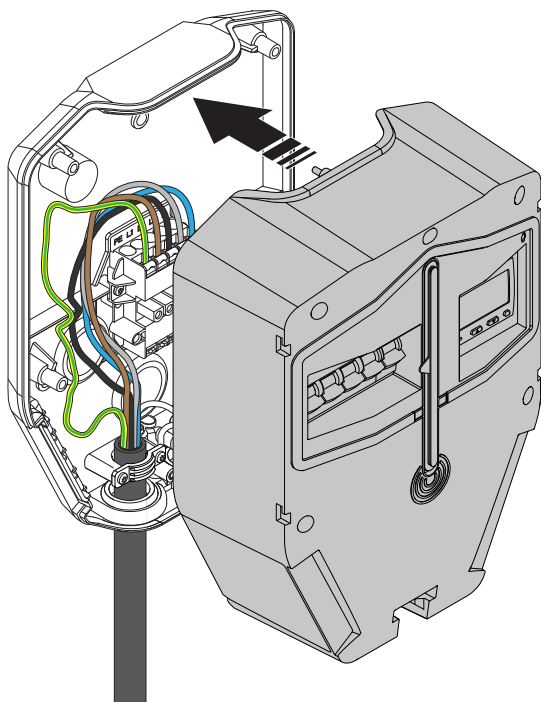
2. Install the control cable to the control cable port on the charging unit.



3. Attach the charging unit to the installation bracket. Press equally on the charging unit with both hands.

CAUTION

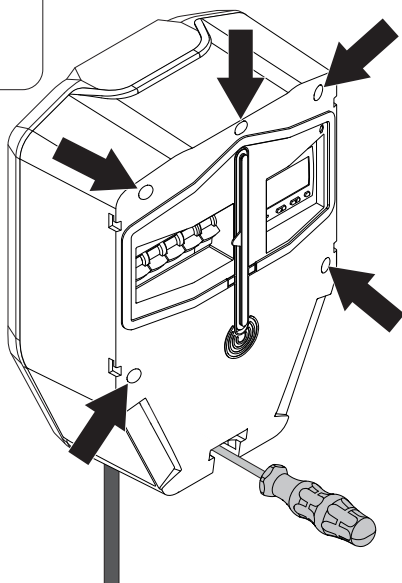
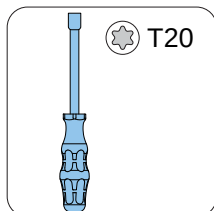
Make sure that no cables get pinched and that the charging unit can meet the edges of the installation bracket.



4. Use a Torx TX20 and tighten the 6 screws until the charging unit is tight against the installation bracket (max. 2,9 Nm).

CAUTION

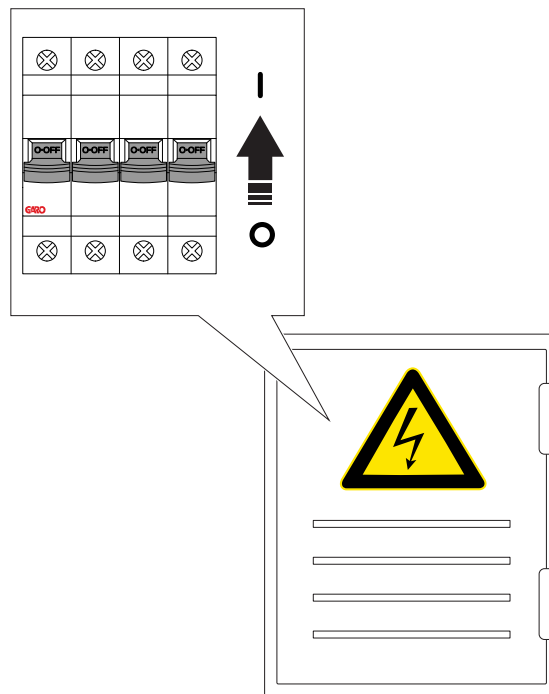
Do not overtighten the screws.



5. Set the power to on.

WARNING

Electrical power can cause serious personal injury or death.



NOTE

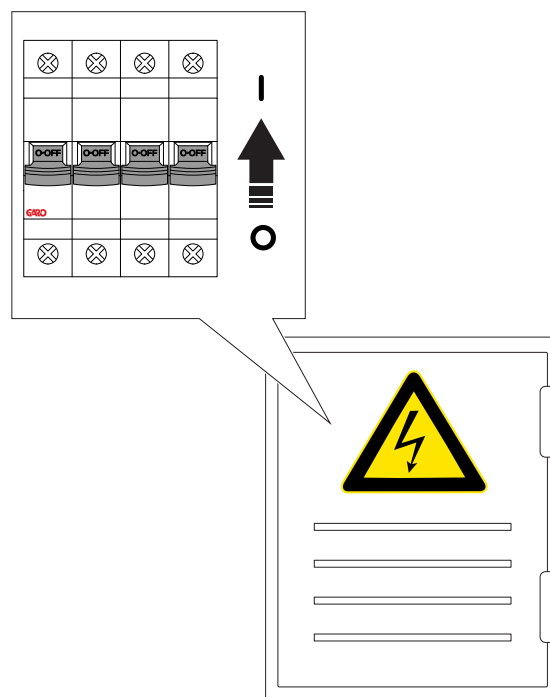
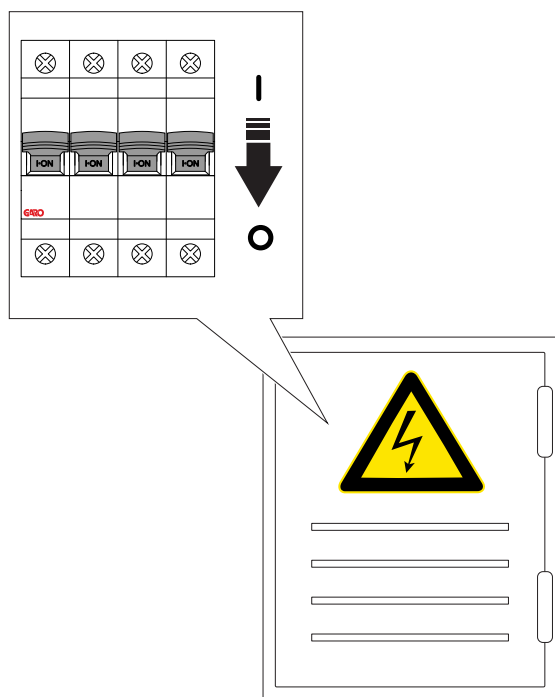
If the charging station needs manual internet settings, e. g. if it shall act as master with a local Wi-Fi as the internet connection, then at this time the internet connectivity settings in the GARO Connect app should be made. Refer to [Create and setup a load interface, page 59](#).

4.12.15 TO DO A FINAL FUNCTIONALITY TEST OF THE PRODUCT

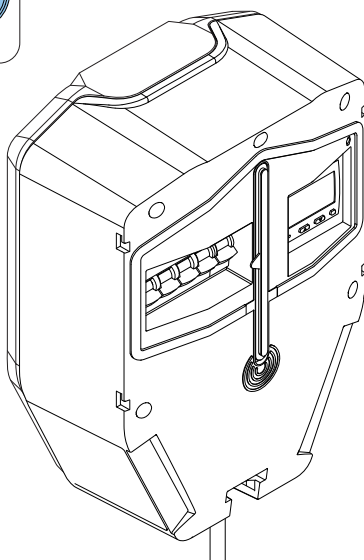
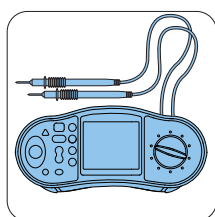
CAUTION

If the charging unit needs reduced installed current settings, make sure this setting done before testing with high power, such as EV charging.

1. Switch the power/voltage to off.



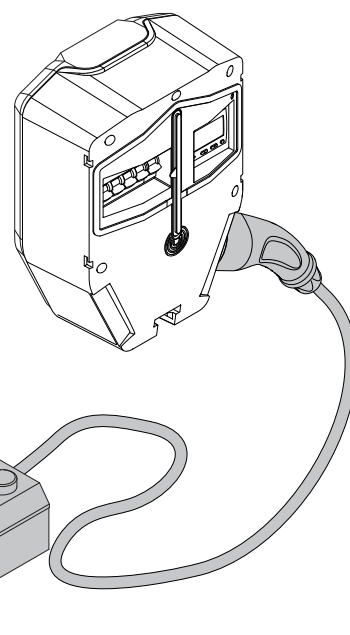
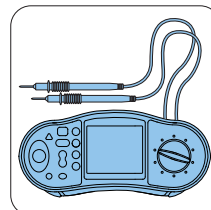
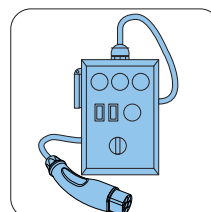
2. Do a test of the PE continuity to the Type 2 outlet.



3. Switch the power/voltage to on.

4. Wait for the charging unit to start. This takes approximately 2 minutes and is shown with a green light indication.

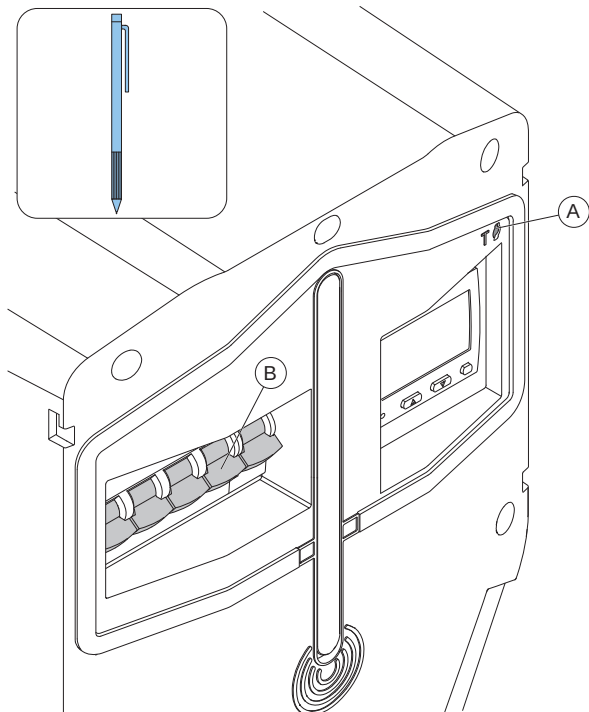
5. Set the charging station to state B. Shown with a blue solid light indication.



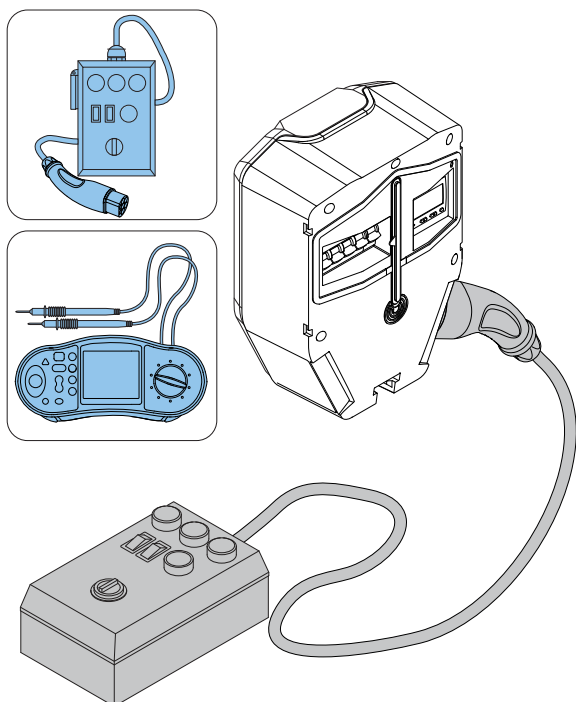
6. Set the charging station to state C. Shown with a blue pulsating light indication.

7. Do a check of the voltage in the Type 2 outlet.

8. Press the test button (A) on the charging unit for approximately 1 sec, but not more than 5 sec.! Make sure that the all-pole circuit breaker is triggered.



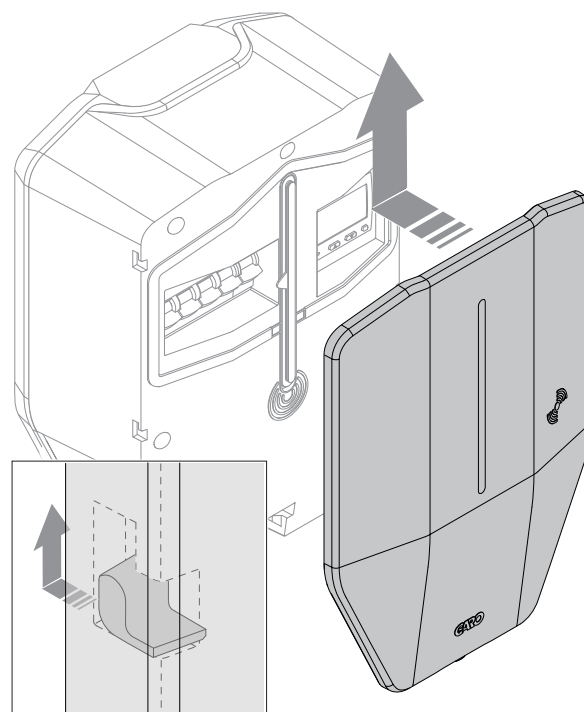
9. Reset the all-pole circuit breaker. Refer to [6.5 To do a reset after a minor ground fault, page 80](#).
10. Do a test of the earth faults (AC and DC) with a test instrument.



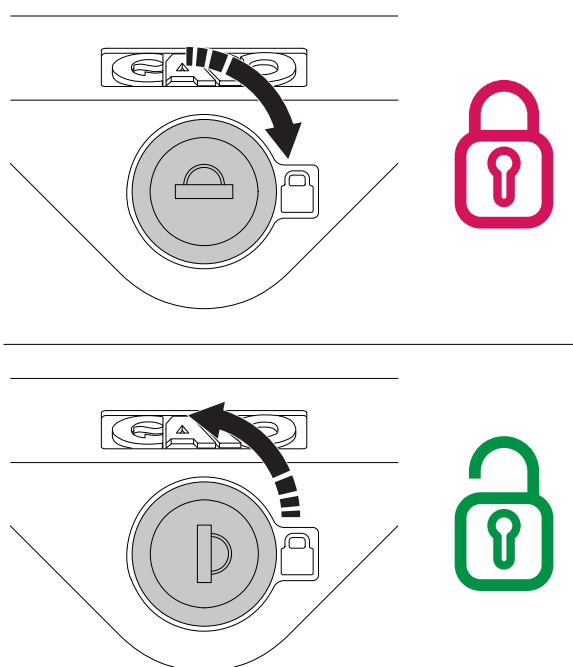
11. If necessary, reset the all-pole circuit breaker. Refer to [6.5 To do a reset after a minor ground fault, page 80](#).
12. Set the charging station to state A.
13. Disconnect the test equipment.
14. Test charging an EV.

4.12.16 TO MOUNT THE FRONT COVER OF THE CHARGING UNIT

1. Mount the front cover of the charging unit.



2. Lock the front cover at the bottom of the charging unit. Key can only be removed in locked position.



as a new user in the GARO Connect app. Use an e-mail address as username.

NOTE

The front cover is supplied with two keys. Both keys should be handed over to the owner of the charging station.

3. After the final testing, the installation of the charging unit can be declared ready in the app, The charging unit becomes available to use and visible to EV drivers with access rights.

NOTE

If the charging station is part of a connection group for DLM, then it is recommended to complete the whole installation of the connection group and to test it, before the installation is handed over to owner for operation.

4.13 GARO CONNECT

4.13.1 THE GARO CONNECT APP

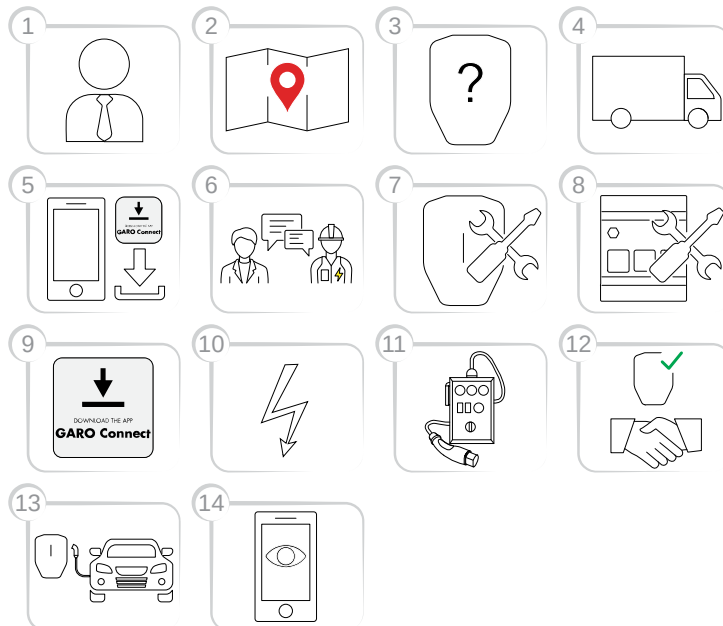
The function of the GARO Connect app is the installation, management and operation of the GARO NextGen charging station. The instructions in this manual are intended as an overview of the setup and functions of the GARO Connect app.

The GARO Connect app can be downloaded from Google Play or App store on a digital device. Register

4.13.2 GARO CONNECT APP PROCESS OVERVIEW

The GARO Connect app is based on a standard/ startup process for both the owner of the charging

station, and the installer of the charging station. The illustration shows the process from both perspectives.



1. Owner (or Installer): Consult a GARO representative for correct choice of product variant.
2. Owner: Prepare the installation and choose location.
3. Owner (or Installer): Choose product(s) and accessories.
4. Owner (or Installer): Receive delivery of product(s) and accessories.
5. Owner and Installer: Download the GARO Connect app.
6. Owner (or Installer on behalf of the Owner): Prepare the installation and invite the Installer.
7. Installer: Install the charging stations(s) (CS(s)).
8. Installer: Install the load interface(s) (LI).
9. Installer: Follow the installation guide in the administrative tool - the GARO Connect app.
10. Installer: Apply power to the charging station.
11. Installer: Perform a test of the installation.
12. Installer and Owner: Declare installation as complete in the GARO Connect app. Do the handover to the Owner.
13. Owner and/or EV Driver: Charge an EV.
14. Owner: Manage access control for EV drivers, monitor the system, refer to [To prepare the installation \(owner\)](#), page 44.

4.13.3 GARO CONNECT APP SYMBOLS OVERVIEW

Icon	Icon name	Icon information
	Location	Click the icon to access the list of available locations.
	Chosen location	The icon is shown beside the selected location.
	Edit	Click the icon to make changes to the settings.
	Charging station	The icon is the symbol for charging station.
	Settings	Click the icon to adjust the settings of the product.
	Add	Click the icon to add a location, group, charging station, etcetera.
	Master	The icon is shown beside the master charging station or load interface. The master unit can act as a gateway to Internet. If a connection group is set up without load interface, the master charging station is also acting as the DLM master.
	No internet	The icon informs that there is no internet. The master charging station must have internet access via 4 G, Wi-Fi, or an ethernet.
	Internet connection	The icon informs that internet connection is available. The master charging station must have internet access via 4 G, Wi-Fi, or an ethernet.

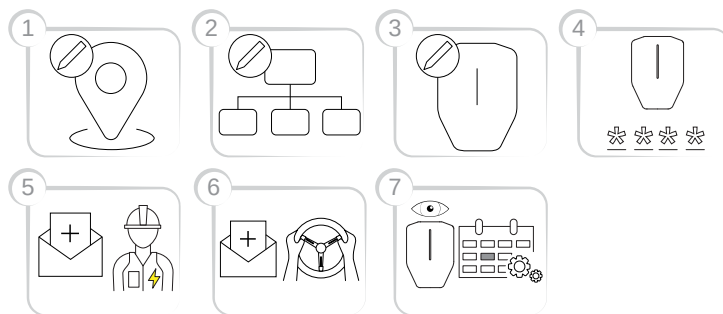
	Complete	The icon shows that the installation is complete.
	Continue	Click the icon to continue the installation process.
	User manual	Click the icon to access the operator and installation manual of the product.
	Main menu	Click the icon to choose action in the main menu; load and use, manage charging stations and users, or install charging stations.
	Personal settings	Manage name and e-mail address. Click the settings icon next to your name to manage personal settings, such as name and e-mail address.
	RFID tags	Click the icon to add or remove RFID tags.
	User rights	Click the icon to manage settings for user rights.
	Password	Click the icon to change password.
	Favorite	Click the icon to mark the location as a favorite.

	Charging cable type 2	The icon is for the charging cable Type 2 that is connected to the charging station. This means that the charging station has a fixed cable. Only possible for Garo Entity CS.
	Type 2 outlet	The icon is for the Type 2 outlet, which can be used to charge the EV.

4.13.4 OWNER

The owner is the person who owns one or several charging stations and the location, refer to [1.2.2 Definitions, page 5](#). The owner invites the installer to do all or part of the installation of the charging station(s). For more information about the installation process of the installer, refer to [4.13.5 Installer, page 50](#).

The installation process of the owner is described in the illustration below. For a full instruction, refer to [To prepare the installation \(owner\), page 44](#).



1. Create or choose a location. The “home” location is the default location.
2. Create an organization if it is needed. This is not mandatory for every installation. Add more persons as owners.
3. Create the logical charging station(s) (CS) in the GARO Connect app. The logical charging station(s) (CS) is later tied to a physical charging station (CS) by the Installer by scanning the installation bracket.
4. Generate an installation code.
5. Invite an installer to install the product(s).
6. Invite EV drivers and manage EV driver access control if needed. This is not mandatory for every installation.
7. Monitor the system of charging station(s) (CS). Ensure maintenance routines are followed. Refer to [6 Maintenance, page 79](#).

NOTE

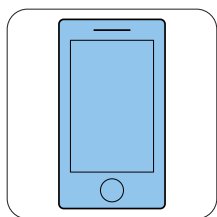
A new installation (a location with charging station(s)) can also be set up by the installer, who can act as a temporary owner. After installation, the installer can transfer the complete control of the product(s) to the owner.

To prepare the installation (owner)

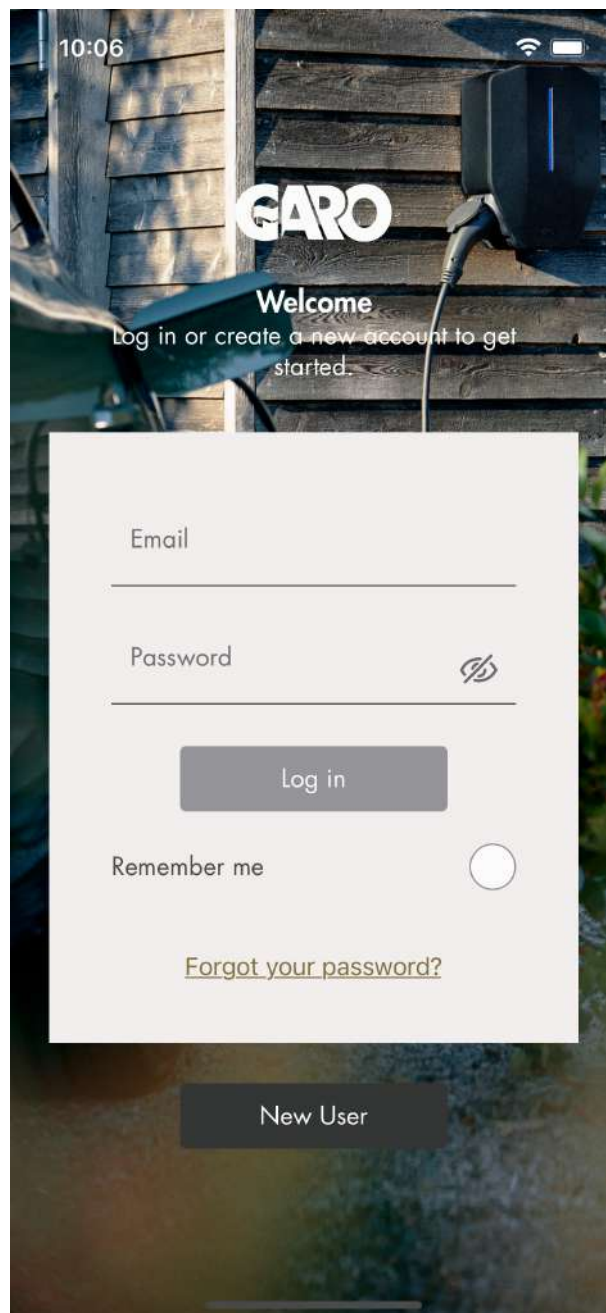
NOTE

These instructions are for the owner. To see the whole process overview of the GARO Connect app, refer to [4.13.2 GARO Connect app process overview, page 40](#). To see the overview of the symbols and buttons in the GARO Connect app, refer to [4.13.3 GARO Connect app symbols overview, page 41](#).

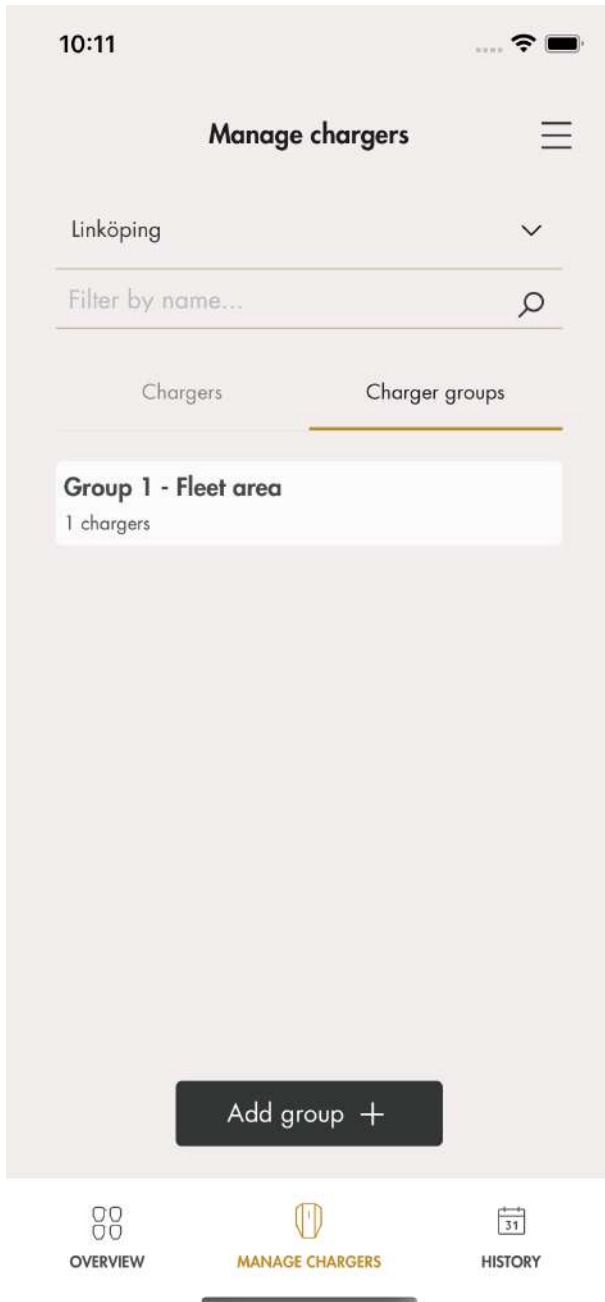
1. Download the GARO Connect app.



2. Create a new account in the app. Follow the instructions on the screen.
3. Log on to the app with the provided credentials.



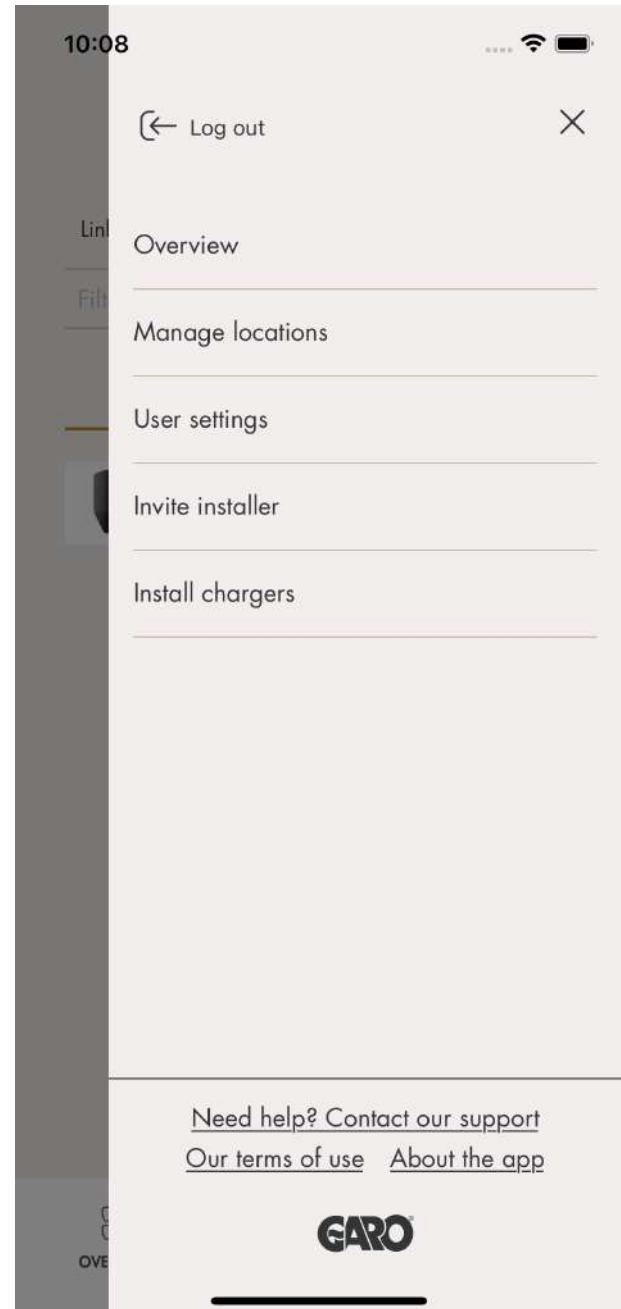
4. Select *Manage chargers*.
5. Create the charging station or charging stations for the location (default location = "Home").



NOTE

The installer can also create charging stations once invited with the installation code from the owner.

6. Go to *Location settings* and choose *Invite installer*.



7. Generate an installation code. An e-mail address can to the installer (not mandatory).

10:08

← Invite installer

Location

Linköping

With installer code the electrician can gain access to this location as location admin. To redeem the access, electrician needs to download the app, create an account and redeem the installation code.

XONODWV0N11D

Generate new code

Invite installer by email

Additional installation information

e.g. Wifi password or other information that may be useful to the installer

Update message

10:09

← Charger settings

Alpha

Users

Charger settings

Status

Transactions

History

Charger settings (owner)

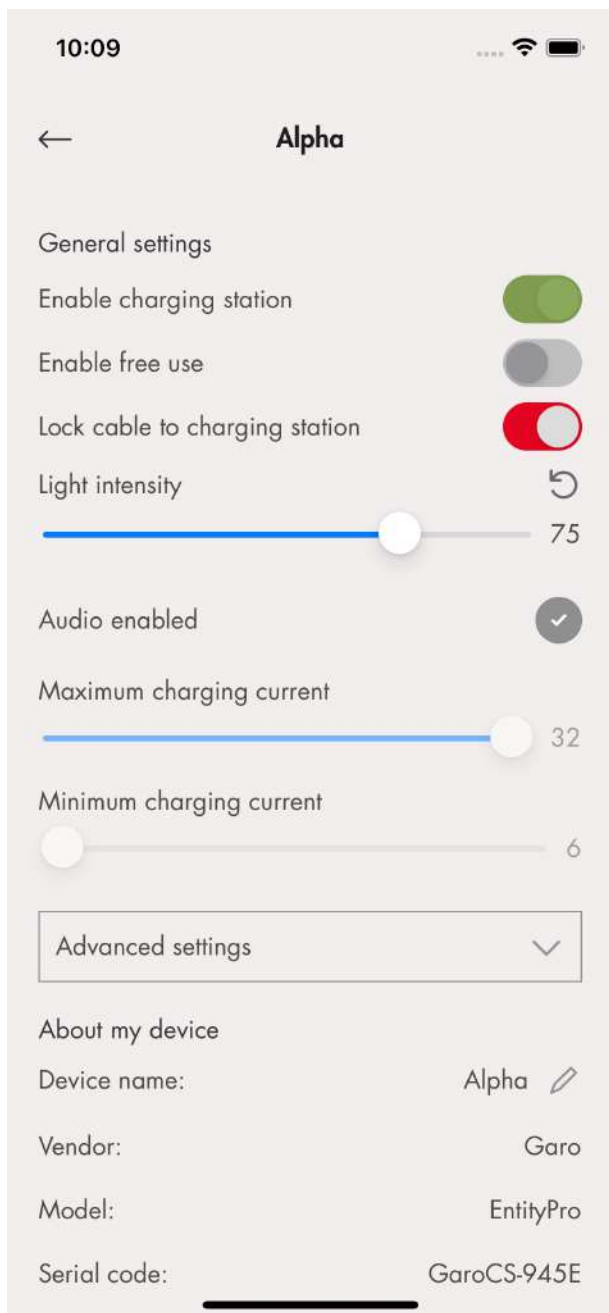
The features available under Charger settings (owner) are not mandatory.

- Charging settings

The settings for each charging station can be changed. Click on applicable charging station, then *Charger Settings* and follow the instructions in the app.

- Enable charging station

Under *Manage chargers and users*, each charging station can be enabled/disabled by the owner. If the disabled, the charger cannot be used.



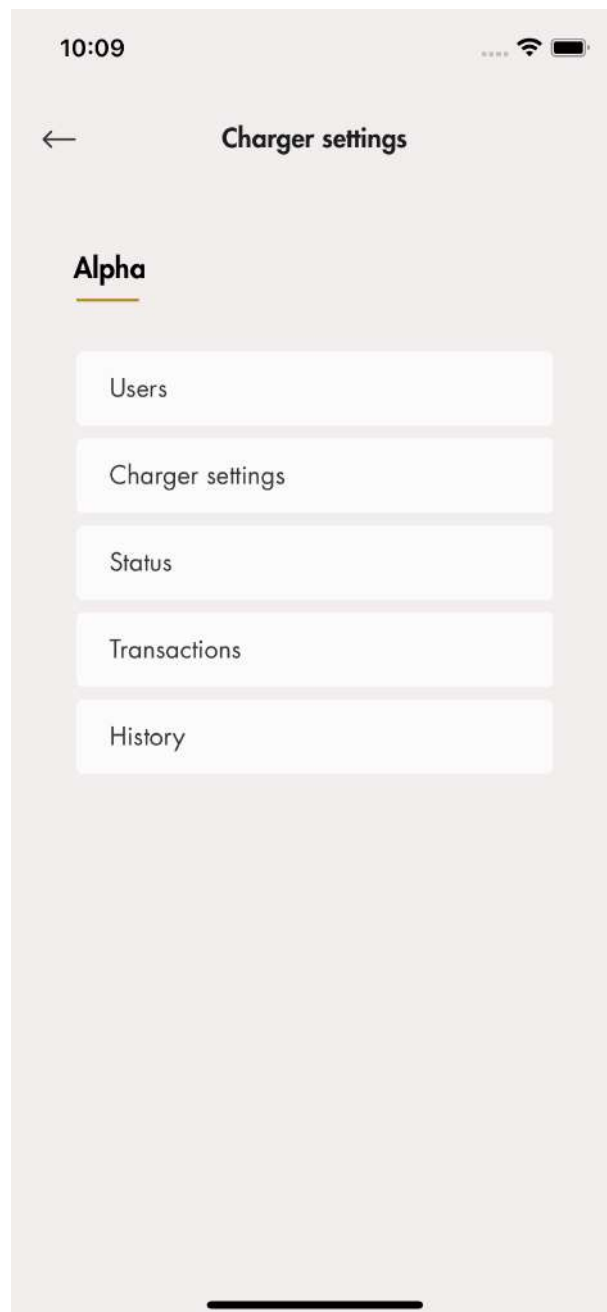
- Charging station access

Each charging station can be set to "free use" (default). This enables access for everybody. If the EV driver identifies before connecting to the EV, the charging transaction is registered to the EV driver.

At delivery the "free use" is enabled by default. The charging station is at that time not set up for access control. Free use can be used, even if the CS has defined EV drivers, Those rights can be seen as "overridden" by the free use.

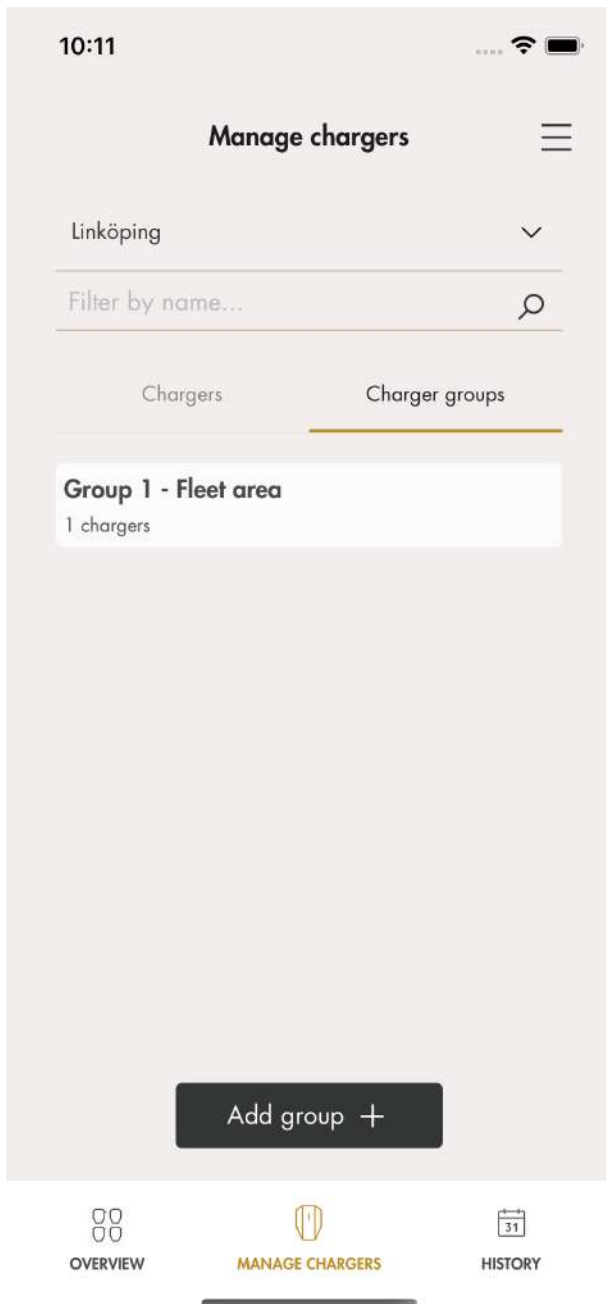
- Invite drivers

The owner can invite EV drivers from the app. Click *Charger Settings*, select *Users* and follow the instructions in the app. EV drivers can be added individually or trough an EV driver group.



- Create a charging group for the charging stations

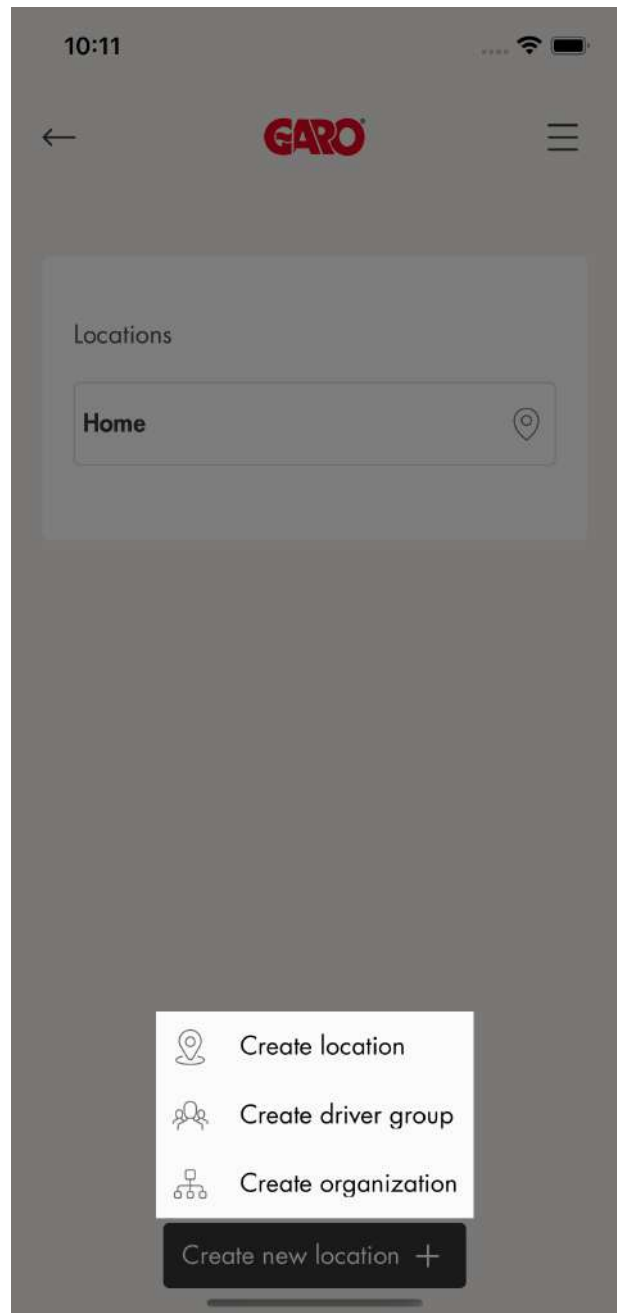
A charging group is used to manage access control of several charging stations, for example "Visitor parking area". Access control can be done both on individual and on group level. It is not mandatory to create charging groups during the installation process. It is possible to create charging groups at a later time.



- Cluster EV drivers

EV drivers can be managed in clusters called EV driver groups, which makes access management easier. EV driver groups are related to the organization, which means they can be used in several locations within an organization.

The organization is a good tool when administrating several locations.



- Advanced owner tools

Additional owners can be added and removed to a location and organization. However, an organization and location must always have at least 1 owner.

A location can also be handed over to another owner (example "sold to").

The owner is normally given default access to use the charging stations of the location.

4.13.5 INSTALLER

The installer is a certified installer or acts on behalf of a certified installer. The installer is hired by the owner to perform the electrical steps of the installation of the charging station(s) that is connected to a location.

To access a location for installation, the owner of the location creates/generates an installation code. The installation code is a 12-letter code that works like a key to the location. The code can be handed over to an installer by mail, paper or any other media. Installer must have the code to start an installation.

If a new installation code is generated by the owner, the old one is invalid, like a key.

The installation process of the installer is described in the illustration below. For a full instruction, refer to [To prepare the installation \(installer\), page 50](#).

NOTE

When a new installation is started, the installer can act as a temporary owner and generate an installation code. Use the code for installation and then hand over ownership of the product(s) to the owner.



1. Enter the installation code in the GARO Connect app. The installation code is related to a location.
2. Select the location that the owner has set up.
3. Create or choose charging station.
4. Perform the physical installation. Refer to [4 Installation, page 17](#).
5. Connect the selected, logical CS to a physical installation bracket, by scanning the IB QR code.
6. Set up the internet connection for the charging station(s).

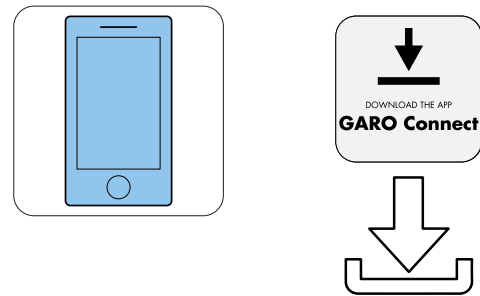
7. Perform necessary firmware updates.
8. Perform the configuration settings.
9. Create connection groups and install load interfaces (if needed).
10. Perform test charging to make sure that the charging station(s) operate correctly.
11. Declare the installation as complete in the GARO Connect app and hand over the installation to the owner. If the installer created the location, it should be transferred to the real owner.

To prepare the installation (installer)

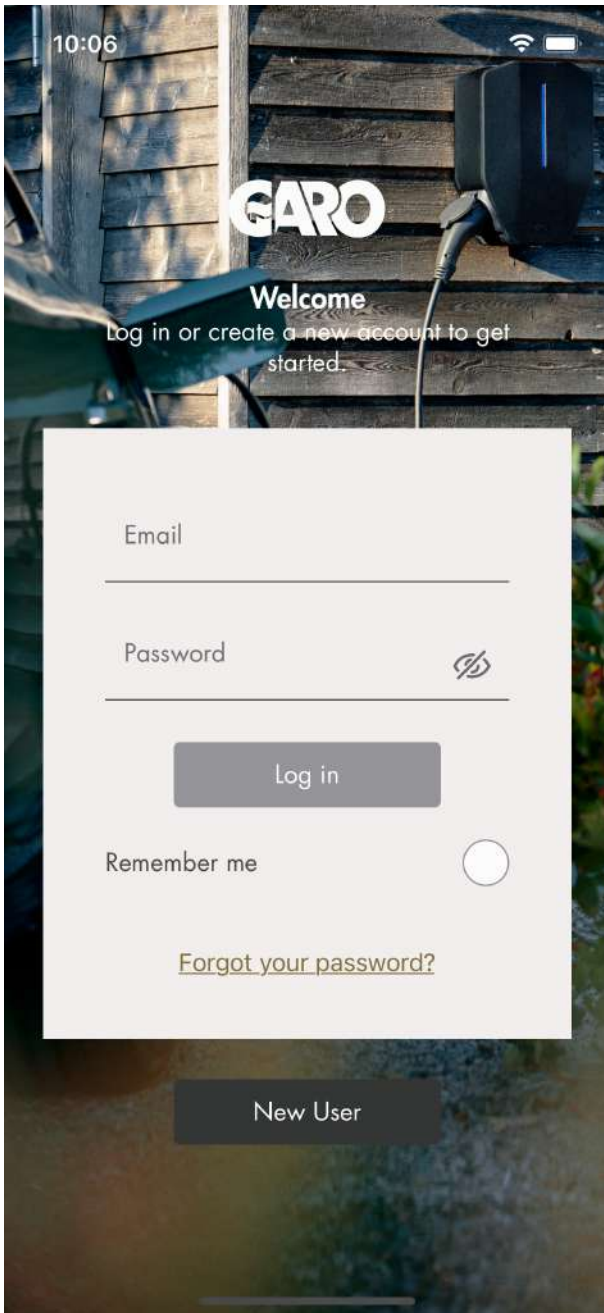
NOTE

These instructions are for the installer. To see the whole process overview of the GARO Connect app, refer to [4.13.2 GARO Connect app process overview, page 40](#). To see the overview of the symbols and buttons in the GARO Connect app, refer to [4.13.3 GARO Connect app symbols overview, page 41](#).

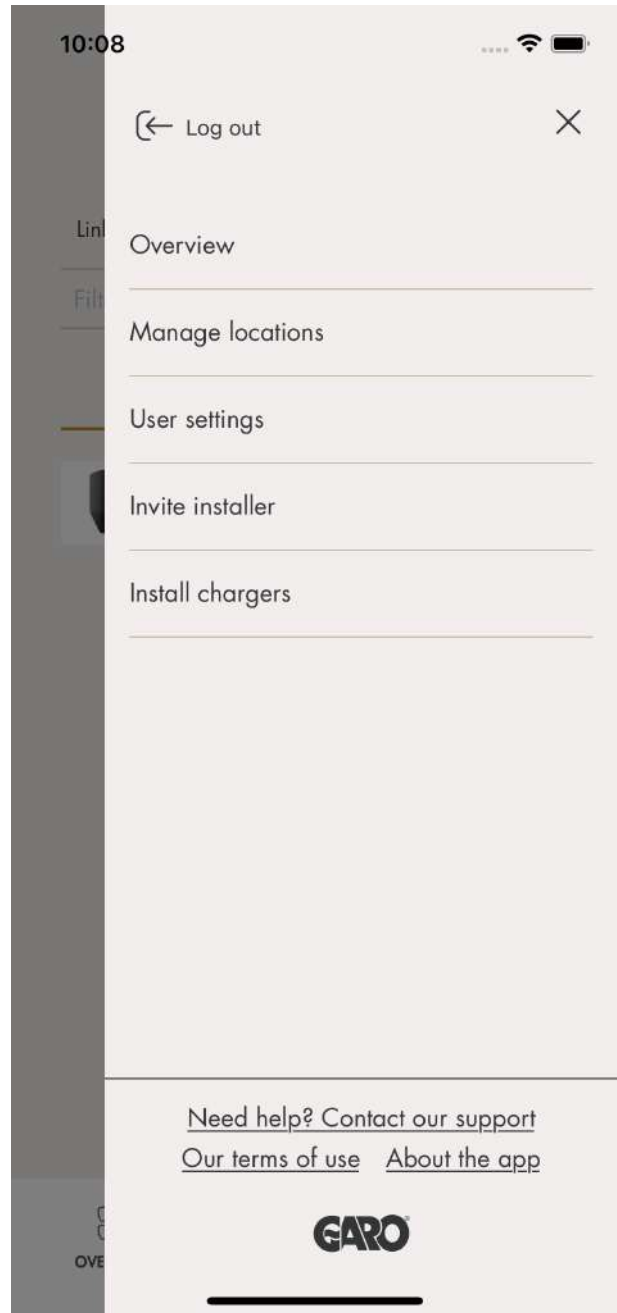
1. Download the GARO Connect app.



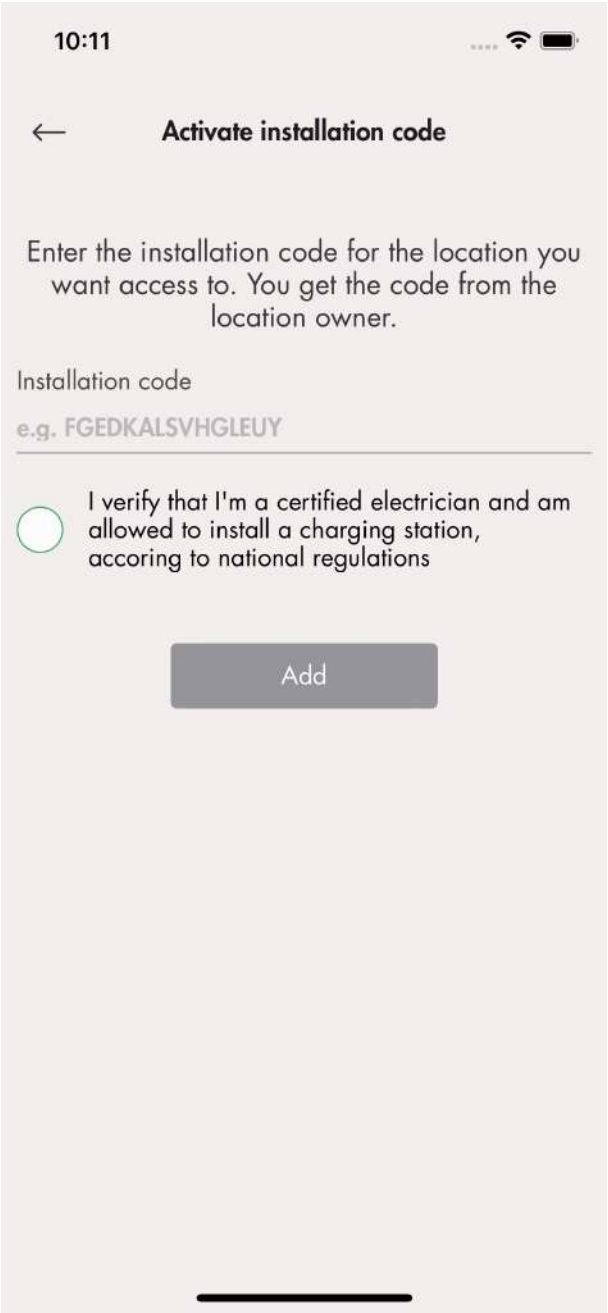
2. Log on to the app with the provided credentials. If it is the first time logging in, edit personal settings.



3. Choose *Install chargers*.
If the owner has sent an invitation, the invitation screen will automatically show. Go to Step 4.



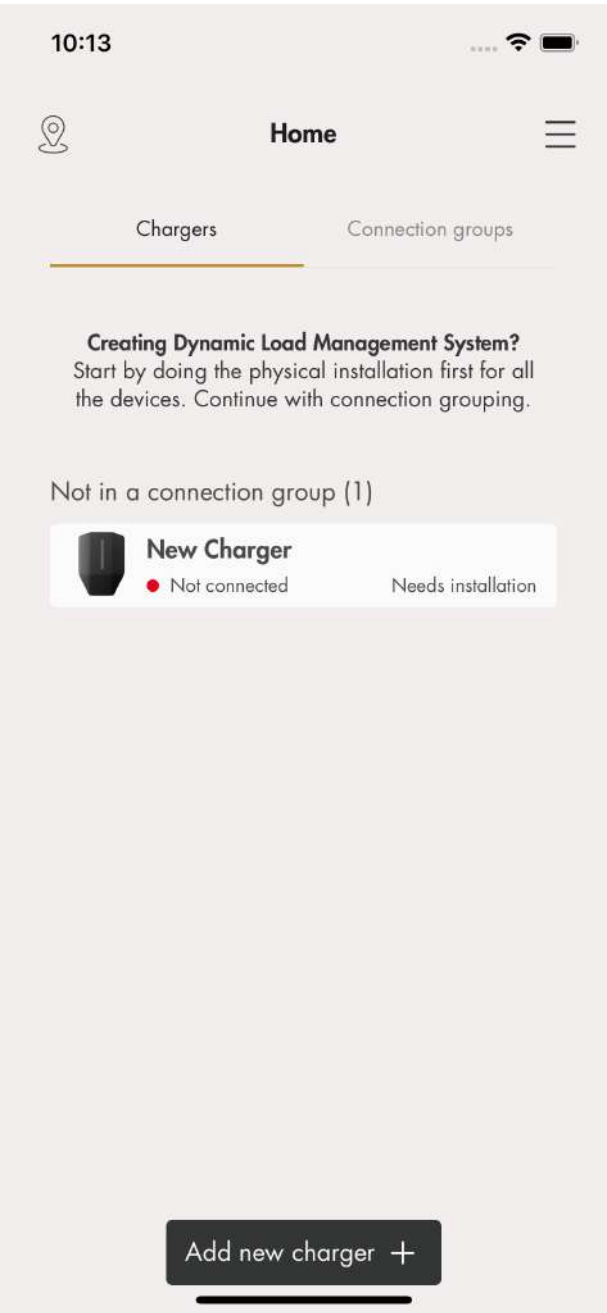
4. Enter the installation code provided by the owner.



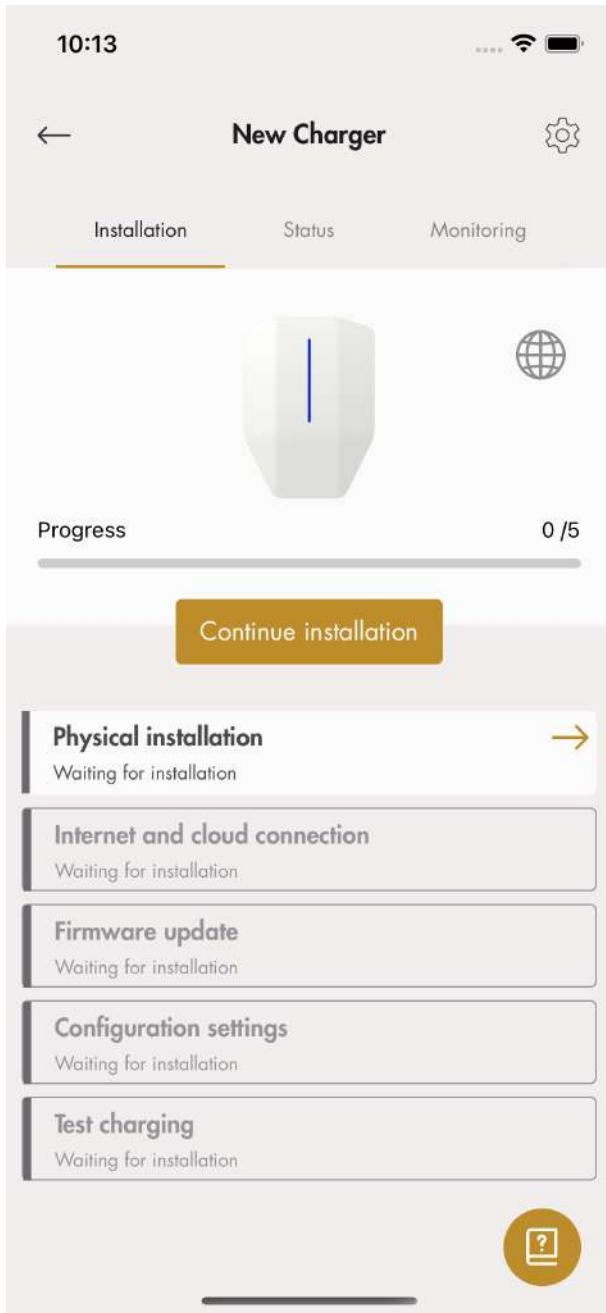
NOTE

To access a location for installation, the owner of the location creates/generates a 12-letter installation code that works like a key to the location. The code can be handed over to an installer by mail, paper or any other media. The installer must have the code to start an installation. If a new installation code is generated by the owner, the old code becomes invalid and cannot be used. A location is normally equal to an electrical mains system of a building/site/area.

5. Click the charging station to be installed and perform the installation, following the guided steps. Start with the master charging station.



6. The installation guide displays. Each step must be completed in order to finalize the installation.



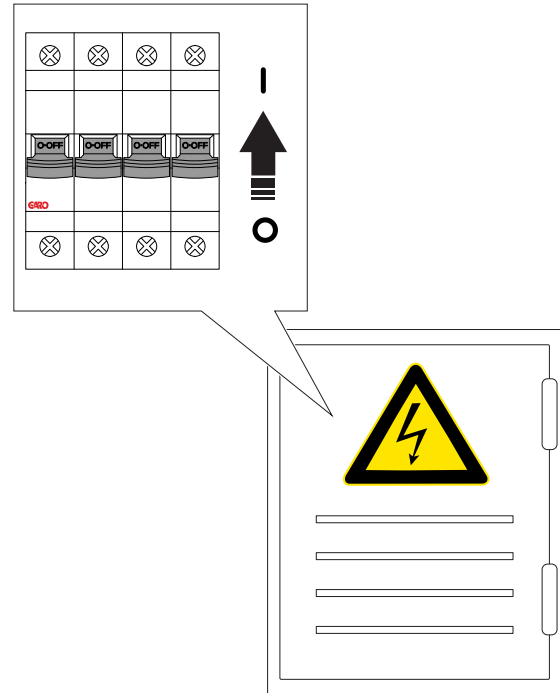
7. Physical installation

- a. Install the charging station(s). Refer to [4 Installation, page 17](#).

- b. Set the power to on.

WARNING

Electrical power can cause serious personal injury or death.



- c. Wait for the charging unit to start. This takes approximately 2 minutes and is shown with a green light indication.

8. Internet and cloud connection

Internet to a CS is connected in this priority:

1. Ethernet cable
2. Mesh Wi-Fi (if the charging station is part of a connection group)
3. Local Wi-Fi (requires manual setting)
4. 4 G/LTE

The internet should connect automatically. If it does not, or if a local Wi-Fi is used, then a local connection between the device (mobile with app) and the charging station will be established. Once this connection is established, internet connectivity can be managed manually.

10:13

← Internet connection setup

1 2 3



Establish direct Wi-Fi connection to charging station

Connect your mobile device to the charging station so that you can configure your charging station internet connection and connect it to GARO Connect. Start by connecting your mobile device to Wi-Fi hotspot provided by your charging station.

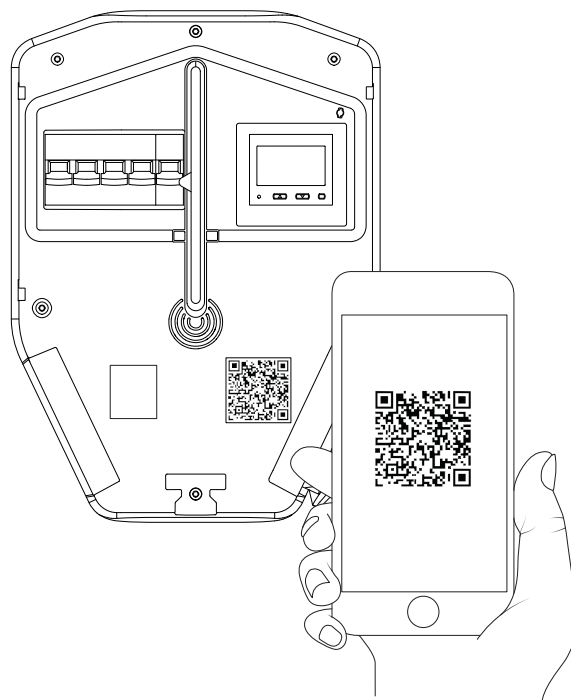
Garocu

Password

Read QR code 

NEXT

- a. If a charging station is configured to use a local Wi-Fi for internet access, a direct connection must be set up between the device (mobile with app) and the charging station. To set up a direct connection, use the charging unit ID label to enter the credentials to the GARO Connect app. The QR code is scanned via the GARO Connect app.



NOTE

It is also possible to enter the Wi-Fi credentials as plain text in the GARO Connect app, if the QR code can not be used.

10:13

← Physical installation

To do before installation

- Make sure that you have the correct training to do the installation. Refer to [Personnel requirements](#).

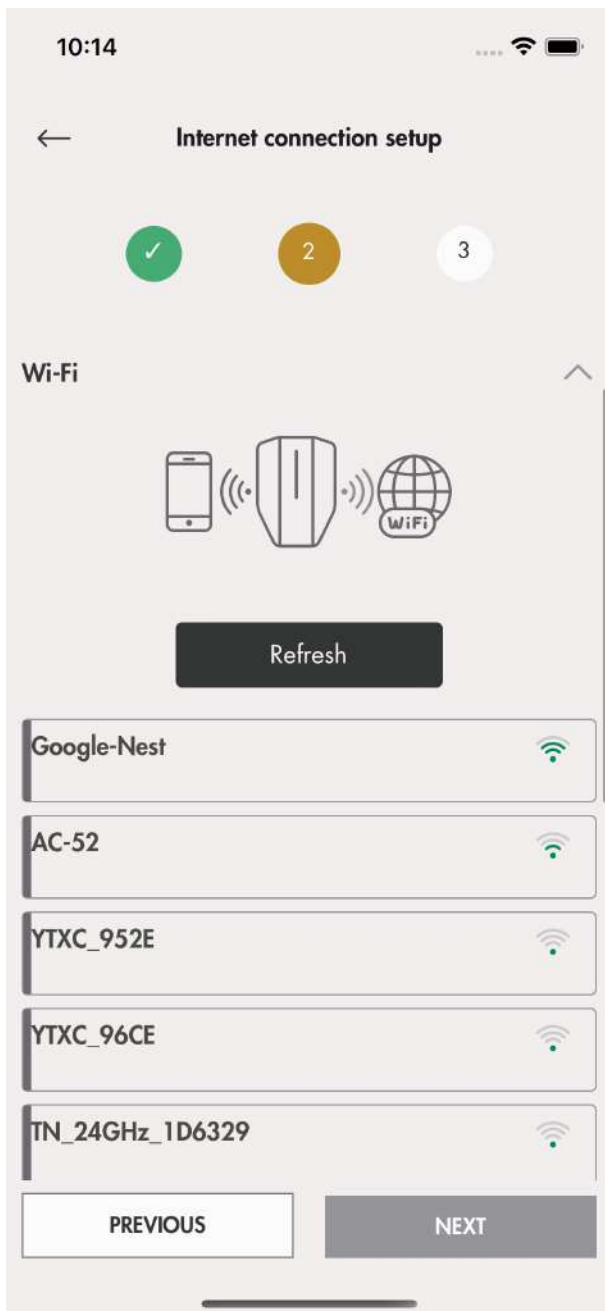
Identify the device by entering the serial code on the bracket

GarocuS-

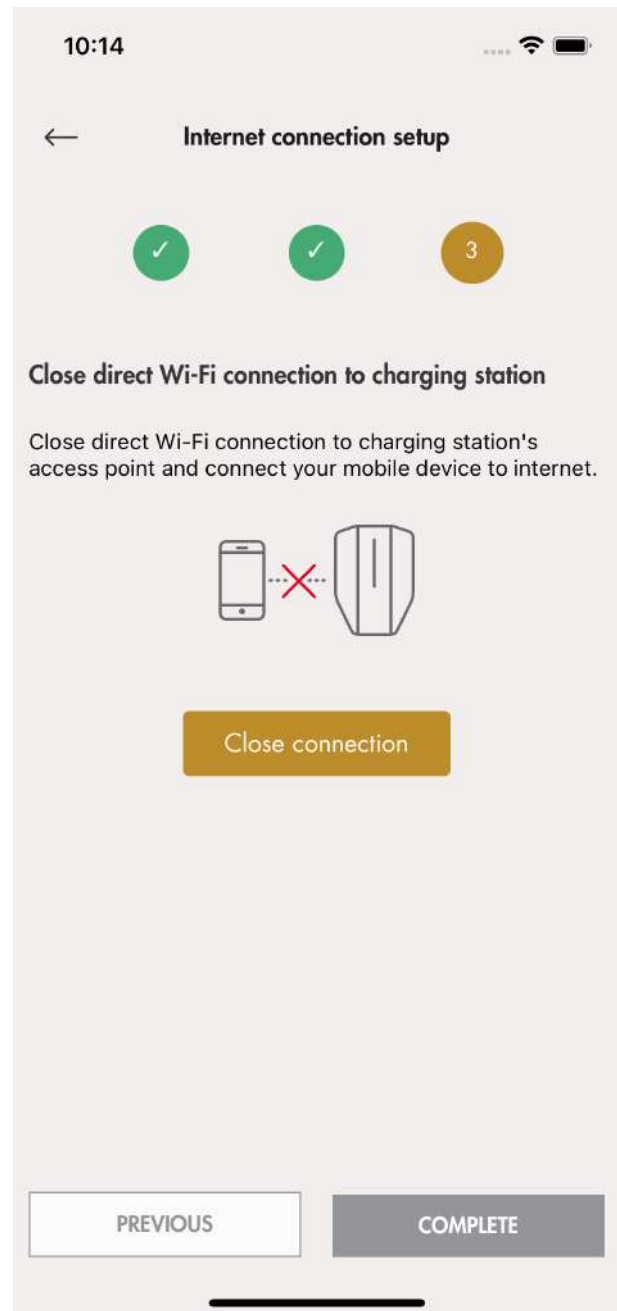
Accept

- b. Choose preferred internet connection and click *Next*.

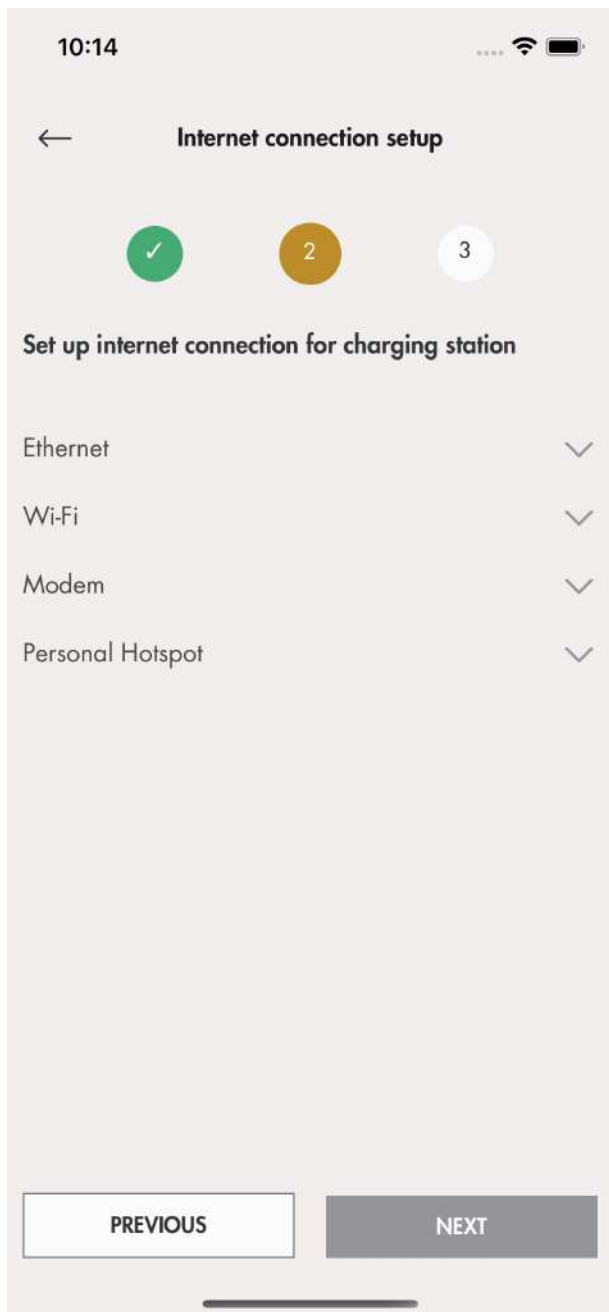
If the ethernet cable is connected to the internet, the charging unit will automatically connect through the cable. If neither ethernet nor Wi-Fi is available the charging unit will automatically connect through 4 G/LTE. If the charging station is configured as part of a connection group through a mesh Wi-Fi then the charging station will automatically be connected via this mesh Wi-Fi group.



- c. The Internet icon will turn green connected to the internet.

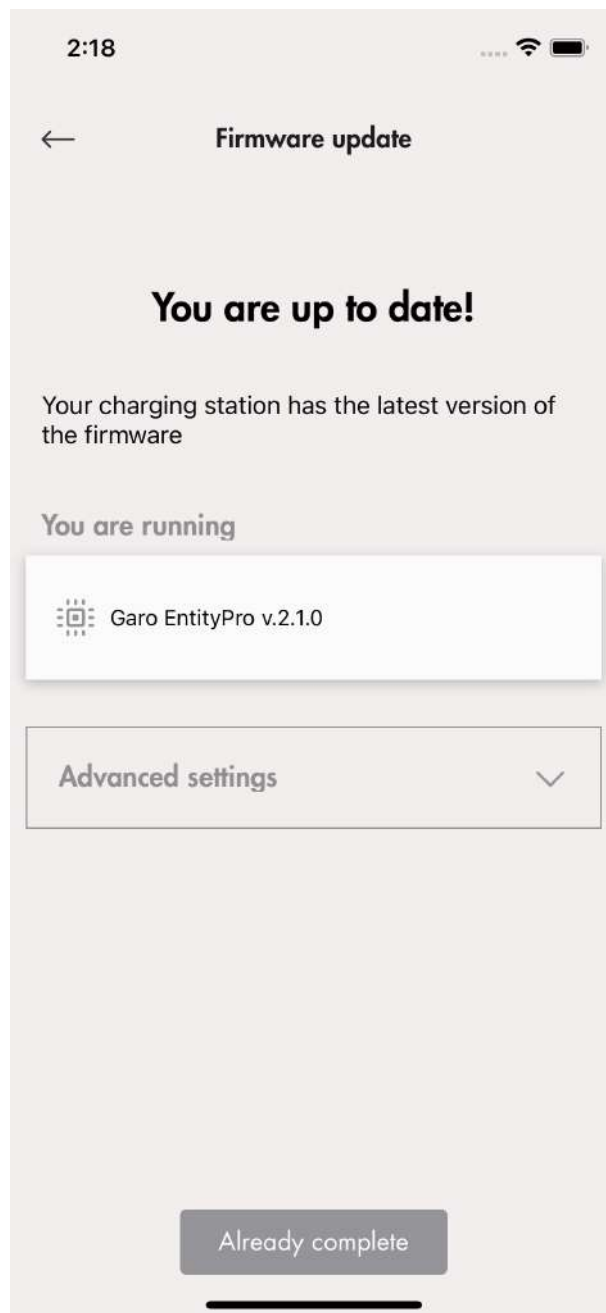


- d. Close the connection to the charging station.
Once the internet is connected to the charging station, the device (mobile with app) will communicate with the charging station over the internet, so the direct connection shall be closed.



9. Firmware update

Firmware can always be updated, but never downgraded as this is not allowed due to cyber security. It is highly recommended to enable automatic update of firmware (default setting).



10. Configuration settings

There are several configuration settings that are possible to adjust with the GARO Connect app. In the GARO Connect app, information is available as support for each available setting. If it is necessary, speak to the GARO support organization for further assistance.

10:15

← Configuration settings

Installation

GaroBracketMaxCurrent ⓘ

16

Number of enabled phases for bracket

1-phase 2-phase **3-phase**

Phase rotation for bracket

0.RST

TN 400 V

Bracket				
PE	L1	L2	L3	N
PE	L1	L2	L3	N
PE	L2	L3	L1	N
PE	L3	L1	L2	N

Restore default

Complete

NOTE

For information on the different parameters, click the “?” icon.

11. Test charging and finalize installation

Finalize the installation by testing the charging station with an EV tester or an EV.

2:20

← Charlie ⓘ

Installation Status Monitoring

Progress 5 / 5

Complete installation

Physical installation Completed ✓

Internet and cloud connection Completed ✓

Firmware update Completed ✓

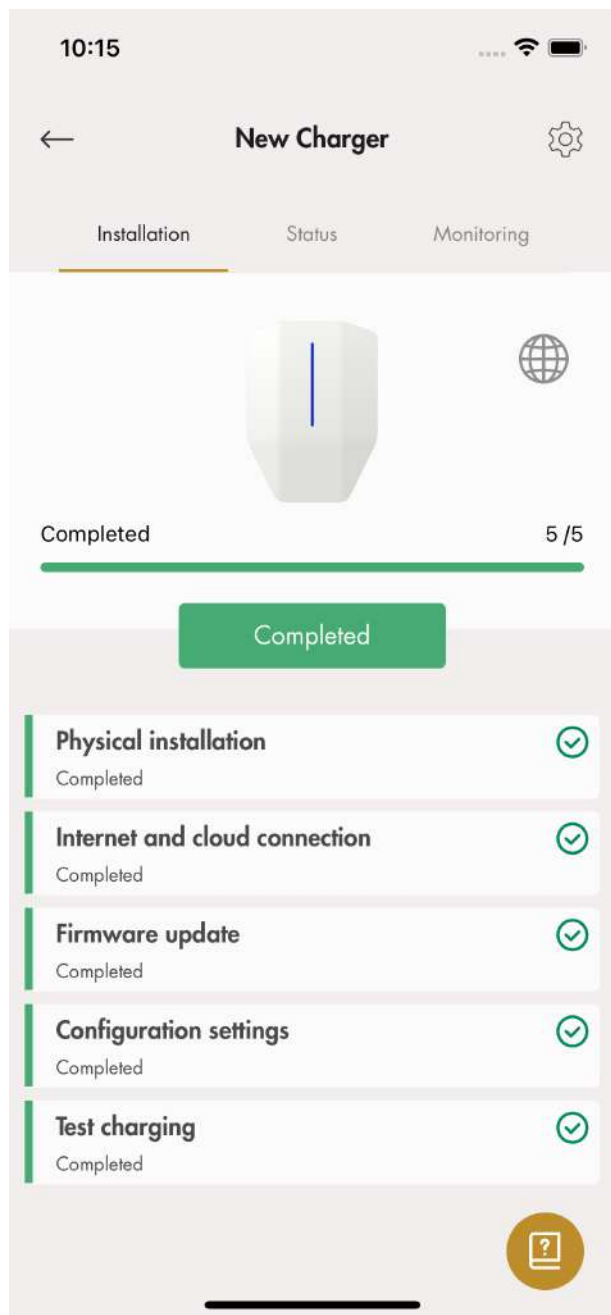
Configuration settings Completed ✓

Test charging Completed ✓

?

12. Declare installation as completed

After final testing, the installation of the charging unit can be declared ready in the app by clicking on Completed. It then becomes available to use and visible to the owner.

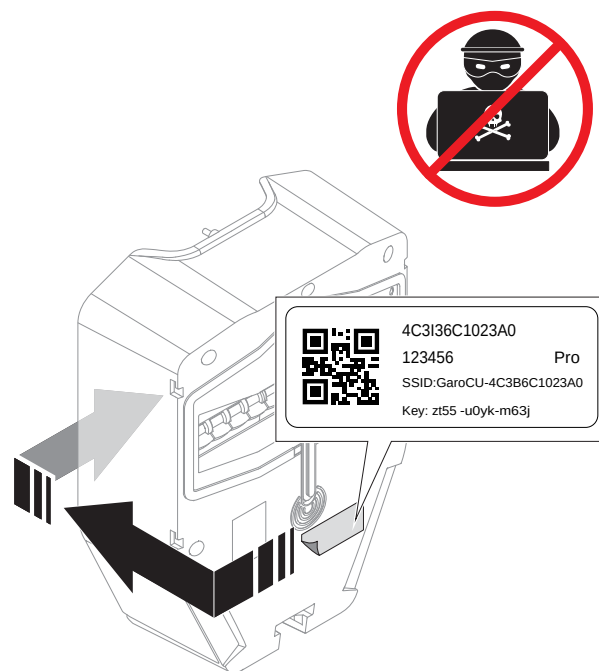


NOTE

After the installation is complete each charging station can be activated and deactivated. An inactivated charging station is indicated as red.

13. Remove the ID label from the charging unit.

The Wi-Fi credentials on this label can be used to gain unauthorized access to the charging station. For this reason, the information should be considered as sensitive. Place it on a safe space location, for example on the rear side of the charging unit.



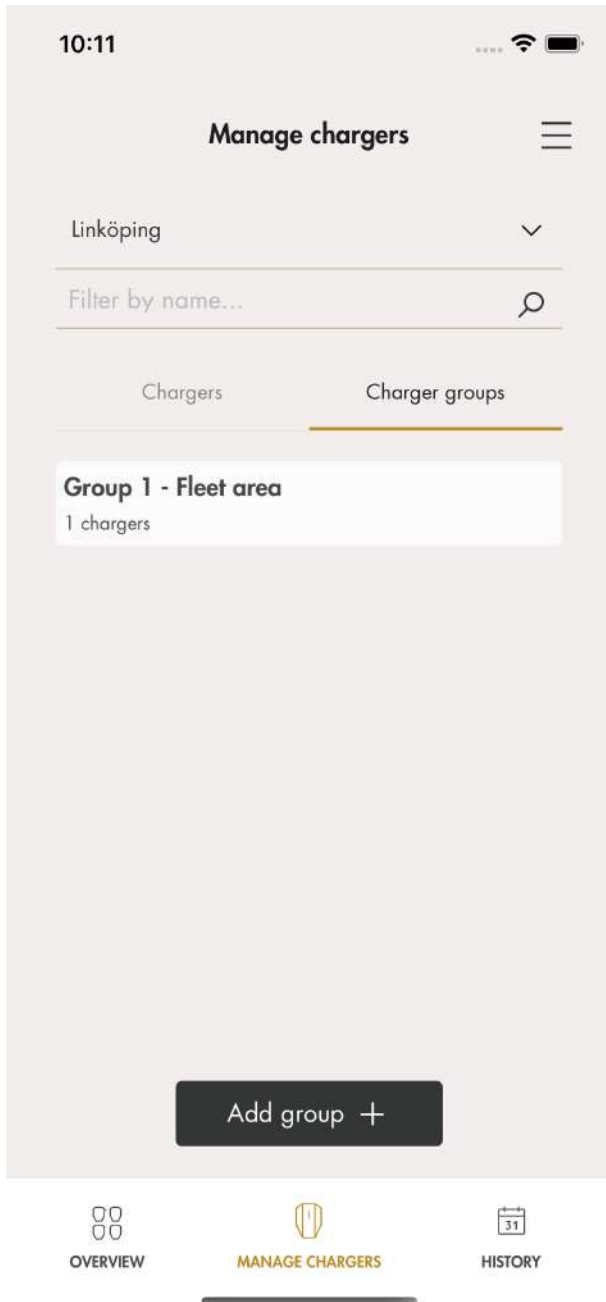
DLM settings (installer)

The DLM settings are common, but not mandatory.

- Create a connection group for the charging stations.

Connection group(s) can be created to control maximal current consumption by the charging stations, in order to protect fuses or other electrical system components from overload. The connection group concept is also used as default structure for internet connectivity. It is possible to include a connection group with another connection group as a subgroup. Up to 4 group levels can be set up.

A connection group is always defined by a maximal current.

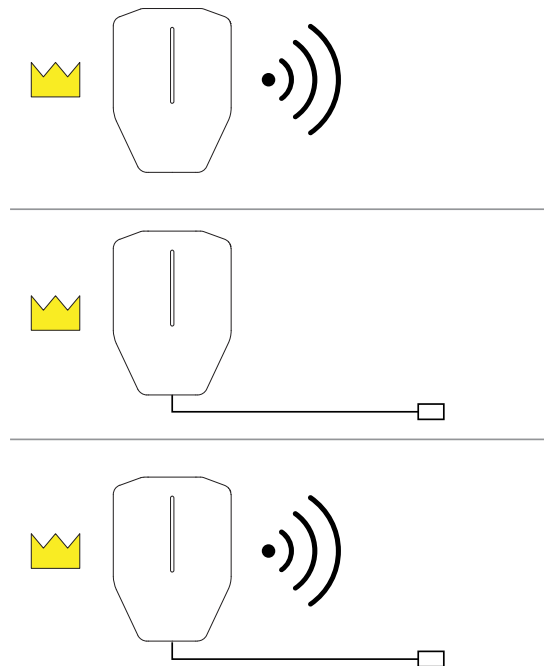


Before setup

Before deciding the connection type between several charging stations (CS), decide the internet connection type for the master CS. Refer to [4.9 To decide internet connection type, page 21](#).

The system is equipped with a built-in meshed Wi-Fi system that contributes to an easy installation. However, large distances or radio obstacles may require physical ethernet cable connections. Cable connection is a good recommendation, but comes with pros and cons. The first charging station unit must be setup as a master unit.

Other charging station units can be connected to the master unit using mesh Wi-Fi, ethernet cable or both.



The master charging station unit is the bridge between the mesh Wi-Fi and the ethernet cable. It is not possible to switch between Wi-Fi and ethernet without assigning a charging station as a master unit. Each internet connection type must be set up through a master unit.

NOTE

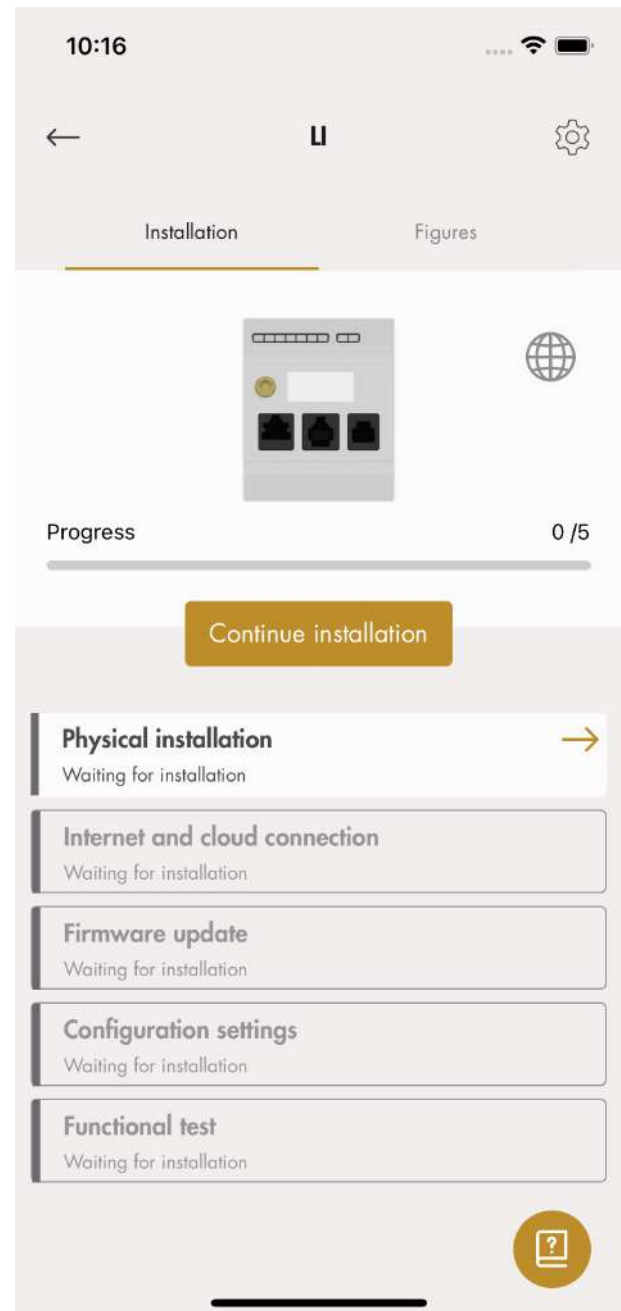
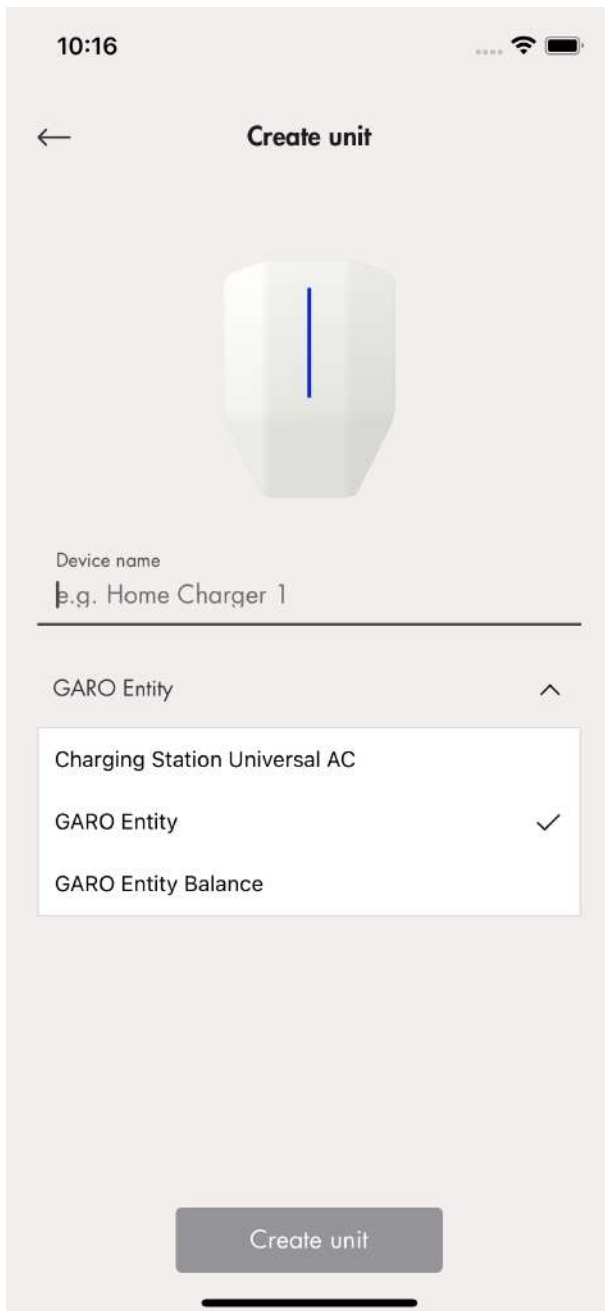
If DLM is used, all charging stations must be on the same network.

NOTE

Number of units in a connection group is limited to 32. If more units are needed, then subgroups need to be used.

Create and setup a load interface

1. Create a unit, add a name for it and select GARO Entity Balance.



2. Select the created unit to update the settings.
3. The installation guide displays. Each step must be completed in order to finalize the installation.
4. Physical installation. Refer to [4.14.3 To install the load interface in an electrical cabinet, page 68](#).
5. Connect the created load interface in the app to a physical load interface by scanning the QR code on the load interface or enter the serial code to confirm the unit and click complete. At this point, the physical DLM is connected to the unit, created in the GARO Connect App.



6. Internet connectivity

If the ethernet cable is connected to the internet, the DLM unit will automatically connect through the cable. If the DLM unit is configured as part of a connection group through a mesh Wi-Fi then the DLM unit will automatically be connected via this mesh Wi-Fi group. The connection status is visible in the GARO connect app. If a local Wi-Fi is to be used for internet access, do the following steps:

- a. Establish a direct link between the mobile device, where the app is used, and the load interface (its built-in access point).
- b. To enter the Wi-Fi credentials, scan the QR code OR enter the SSID and key manually.
- c. The app should indicate that a connection between the app device (mobile phone) and the load interface is established.
- d. Select what type of internet connectivity is chosen (in this case, local Wi-Fi).
- e. Enter the credentials of the local Wi-Fi to use as internet connectivity, (SSID and password).
- f. When Internet is accessed, this is visualized in the app (the internet icon will turn green).

- g. Close the direct connection (to the load interface access point) to the DLM unit. Once the internet icon is connected to the charging station, the app-device (mobile phone) will communicate with the DLM unit over the internet, so the direct connection shall be closed.

NOTE

The load interface ID label contains login credentials for the load interface and should be considered as sensitive information from a cyber security perspective.

7. Firmware update

Firmware can always be updated, but never downgraded as this is not allowed due to cyber security risks. It is highly recommended to enable automatic update of firmware (default setting).

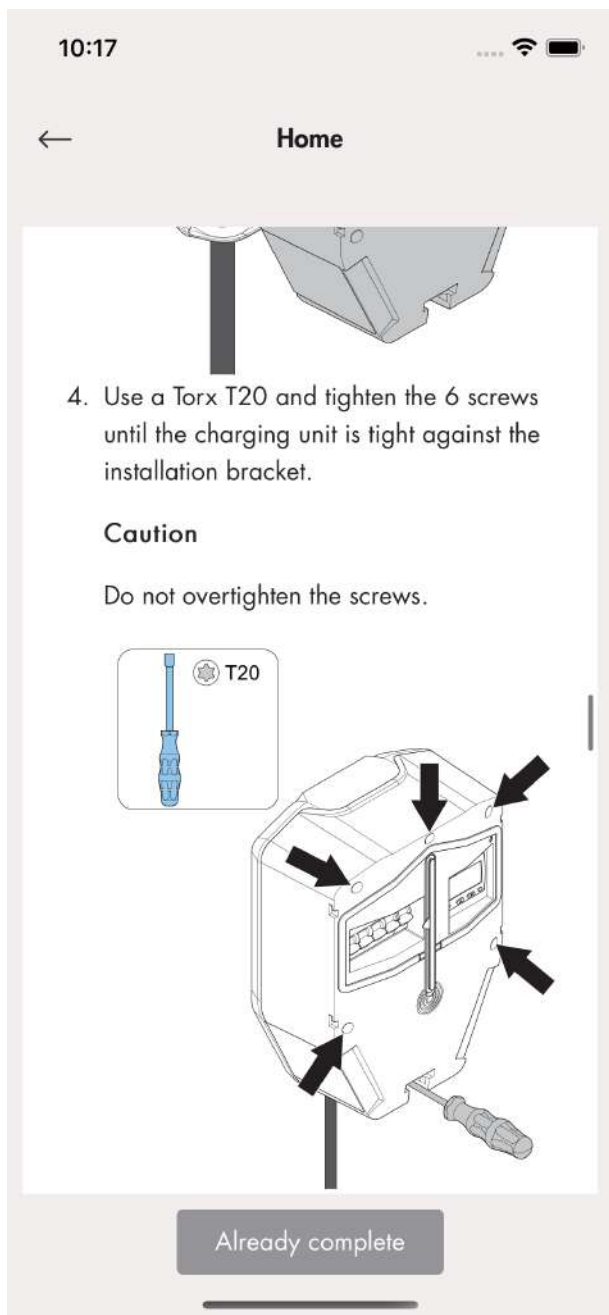
8. Configuration settings

As the main function of the load interface is to monitor current, the main setting is to select what type of input to use. The input type is dependent of the variant of load interface. i.e. Balance basic or Balance advanced. Use the guided settings to define the input to be used. There are several additional advanced configuration settings that are possible to adjust with the GARO Connect app. For information on the different parameters, click the "I" icon.

9. Functional test

Perform the necessary functionality tests such as testing the load management setup to ensure the current is limited at high load conditions.

10. Complete the installation.



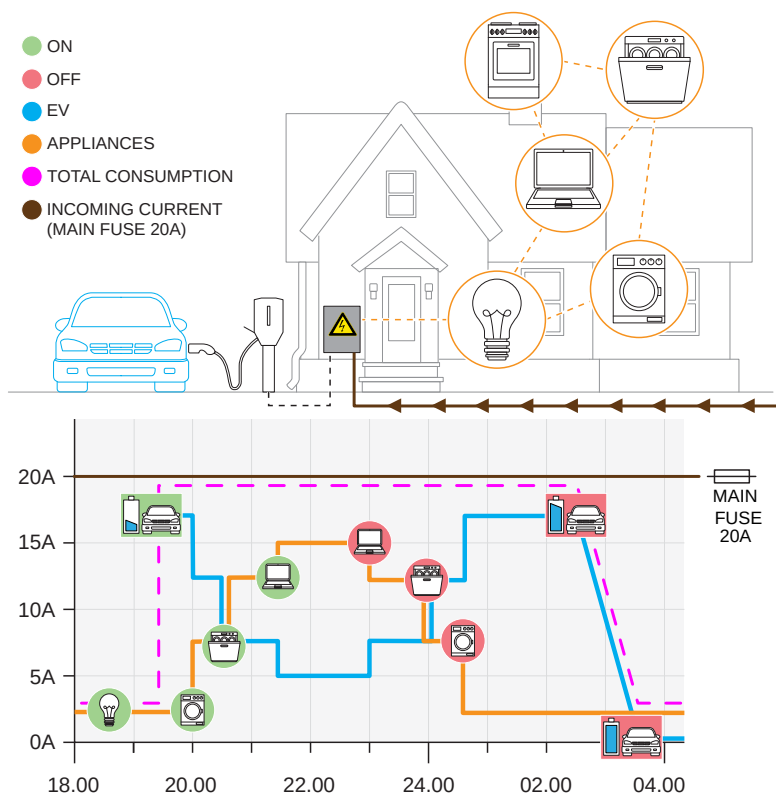
11. Once the installation is complete you can add it to a connection group.

4.14 DYNAMIC LOAD MANAGEMENT (DLM)

4.14.1 DYNAMIC LOAD MANAGEMENT (DLM) FUNCTIONALITY

Dynamic Load Management (DLM) is based on a grouping of loads that share a specific critical equipment, such as a fuse. Each connection group is based on one master device (charging station or load interface) in the connection group. The master device should preferably be the connection point for internet, but this is not a must. Any device can be defined internet gateway master. The connection group is also defined by a maximum current, which is typically the same size as the fuse that is to be protected from overload.

The connection group either consists of (A) one or several charging station(s), where the real current is calculated as the sum of all charging station currents, or (B) several charging stations together with other loads. If the connection group consists of other loads as well, then the real current needs to be monitored, using a load interface. The load interface also acts as DLM master of this connection group. The charging stations (and possible subgroups) will share the remaining current (unused fuse capacity) to prevent overload.



The real current is measured by current transformers or energy meter, and transferred into the system with a load interface. It is possible to define several connection groups as a hierarchy of maximum four levels.

NOTE

Internet connection is necessary for configuration but not for operation.

The load interface transfers current information to the DLM system by reading a current transformer or an energy meter, and act as master unit for DLM in the connection group. In that case, internet connection for access control is recommended to be done through the master load interface. The load interface can be connected to internet via Wi-Fi or ethernet. Refer to [4.1.4.3 To install the load interface in an electrical cabinet, page 68](#). It can also participate in a Wi-Fi Mesh network.

The load interface is necessary in most installations and all settings are done in the GARO Connect app. The communication platform is in the same network as the charging station(s) and the communication uses the same structure as meshed Wi-Fi or ethernet cables.

NOTE

The Load Interface is available in two versions, GARO Entity Balance Basic and GARO Entity Balance Advanced. Their difference lies in connectivity. GARO Entity Balance Basic should fit most installations, refer to [8.2 Load interface technical data, page 87](#).

Multi-Level Load Management

The Garo Entity system is prepared to work with the Load Interface, to support multi-level load management. This means that current limitations can be managed on several (up to 4) levels of the installation.

The first level could be a fuse, feeding a group of charging stations. If a connection group contains only charging stations, then no LI is required, total current is calculated by adding the charging station currents.

The second level could be the fuse feeding the building where the charging stations are connected.

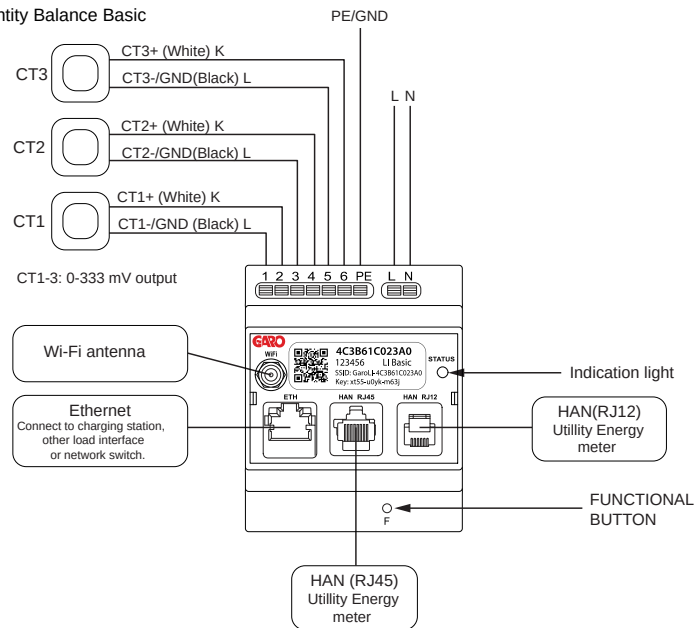
A third level could be the main fuses to the location.

Up to 4 levels are possible to configure with the app-based user interface. These settings are made by the installer.

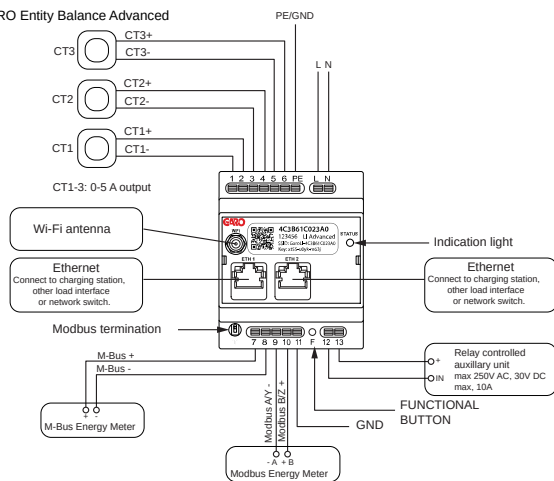
By using the GARO Connect-app, any limitation that occurs can be analyzed to see what causes the limitation.

4.14.2 DYNAMIC LOAD MANAGEMENT (DLM) INSTALLATION OVERVIEW

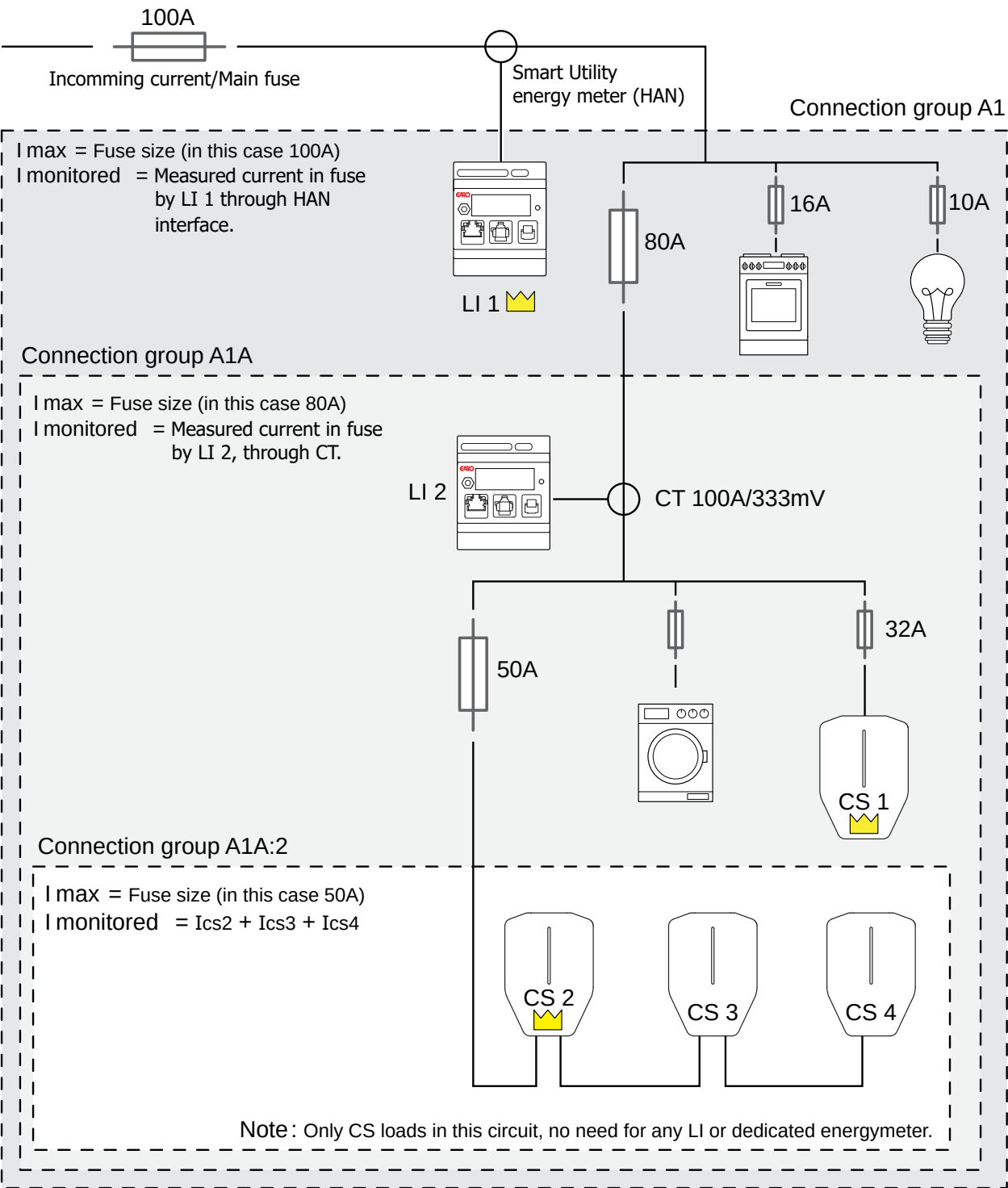
GARO Entity Balance Basic

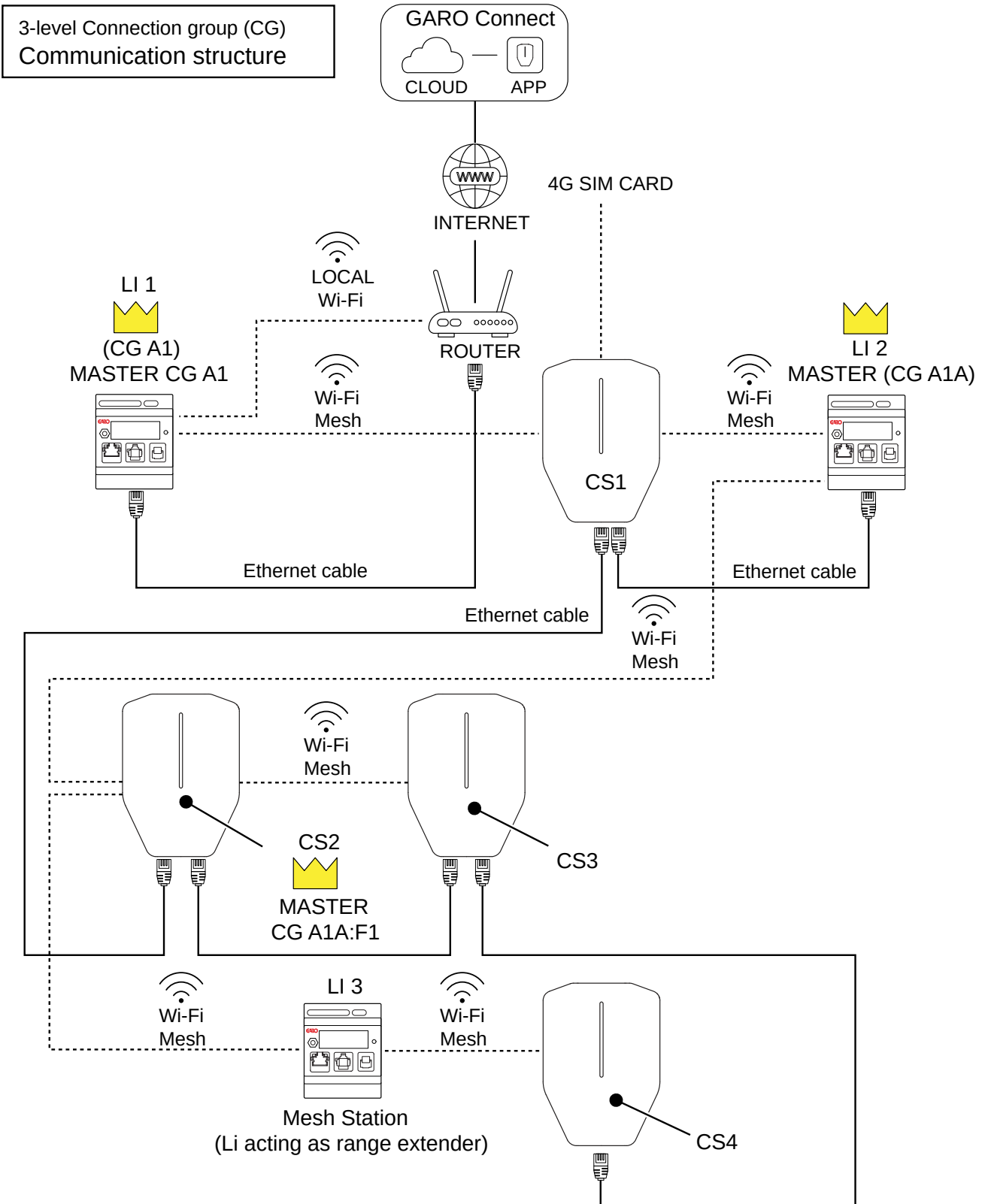


GARO Entity Balance Advanced



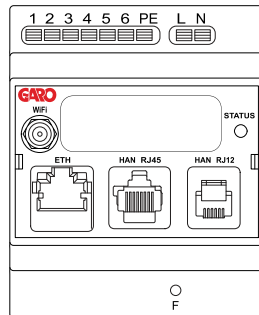
3-level Connection group (CG)
Power monitoring structure



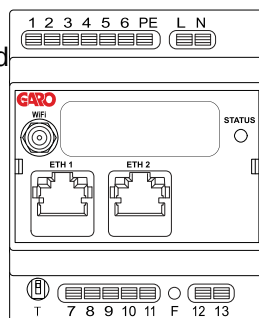


4.14.3 TO INSTALL THE LOAD INTERFACE IN AN ELECTRICAL CABINET

GARO Entity
Balance Basic



GARO Entity
Balance Advanced

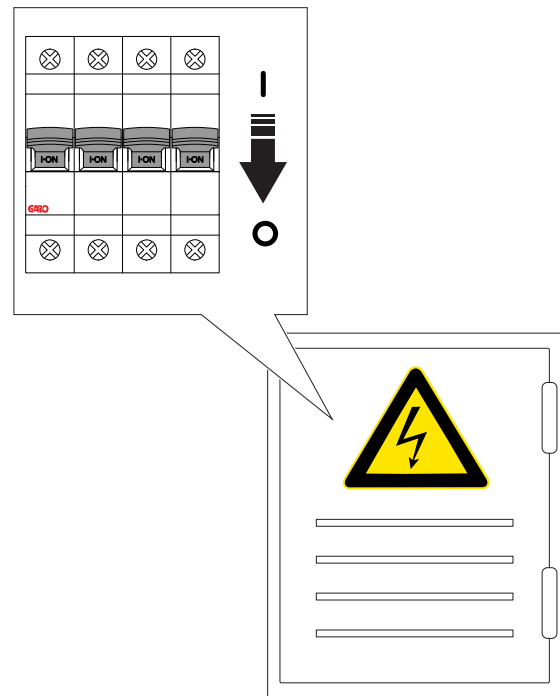


This is a general instruction of the load interface installation. The load interface is intended to act as an interface to the power and current meters as input to the DLM system of GARO Entity Charging stations. The procedure differs between different installations and can also differ due to national regulations. The load interface unit is designed for DIN rail mounting. Two different load interface units are available at GARO: GARO Entity Balance BASIC and GARO Entity Balance ADVANCED.

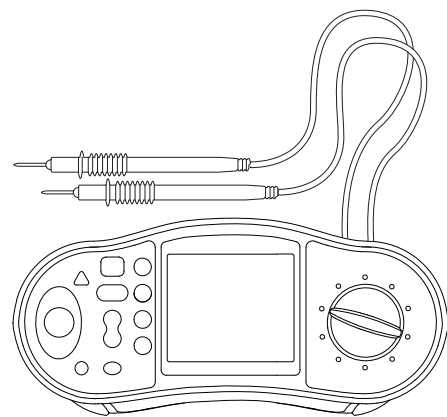
NOTE

This chapter shows the installation of the GARO Entity Balance BASIC model. The process for the GARO Entity Balance ADVANCED is similar.

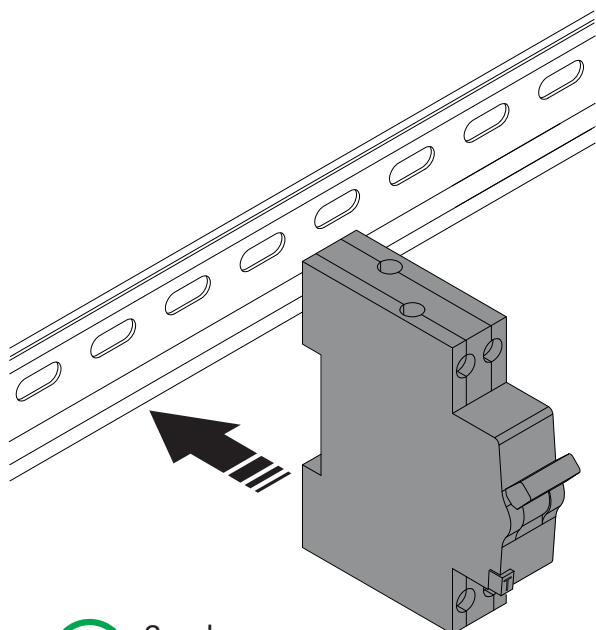
1. Turn the power/voltage off by an appropriate insulating main switch.



2. Make sure that the power (voltage) is off.

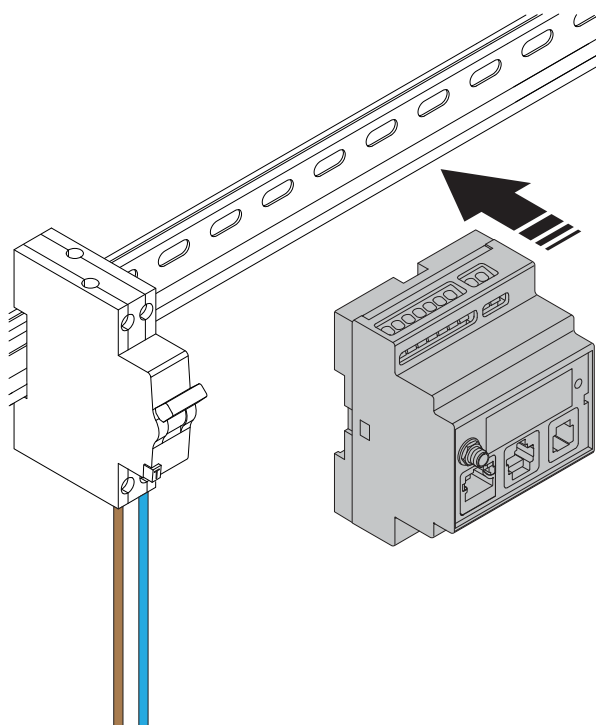


3. Install an insulating and protection device (RCBO or MCB) on a DIN rail (A). The load interface normally requires an individual insulating and protection device for 230 V. For this purpose it is recommended to use a 2-pole 2–10 A RCBO.

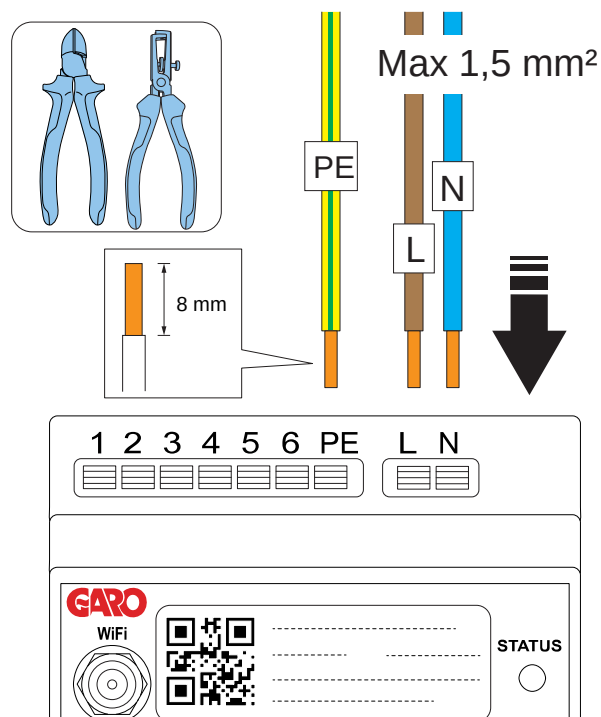


✓ 2-pole
2-10 A

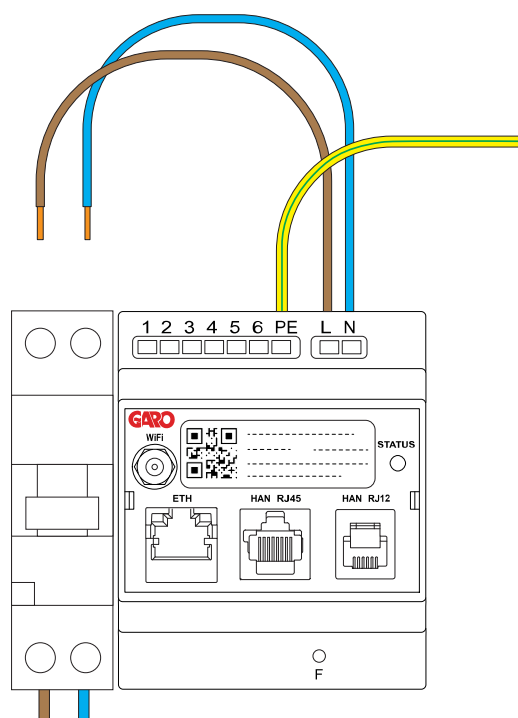
4. Install the load interface unit (C) on the DIN rail.



5. Dismantle the wires and connect the Load interface to the 230V AC. (Refer to the electrical schedule for all electrical connections.)



6. Connect the Load interface to the protection device.



7. If current is measured using current transformer, choose the correct current transformer (CT) for the installation.

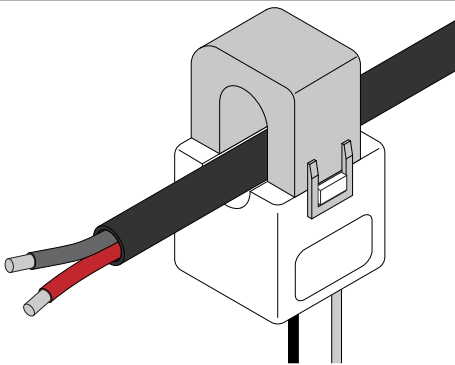
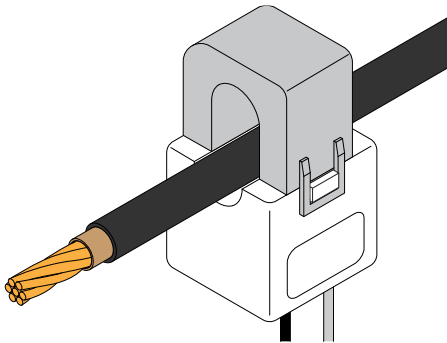
WARNING

Make sure that you choose a CT that is suitable for your installation. CT's of two output types can be used. 0-333 mV or 0 – 5 A output range. For easy installation, GARO recommends the 0-333 mV type when possible.

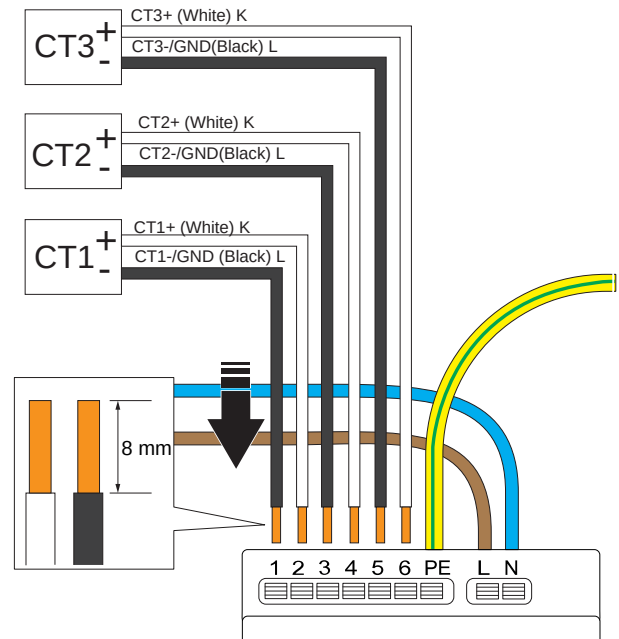
0–333 mV is only valid for GARO Entity Balance BASIC and 0–5 A is only valid for GARO Entity Balance ADVANCED. (Take notice: 0-5 A output types of CT clamps must never be exposed to open circuit conditions.)

NOTE

This chapter shows the installation of the GARO Entity Balance BASIC and the GARO 0-333 mV CT clamps that are available as accessory. The process for the GARO Entity Balance ADVANCED is similar.



8. Dismantle the CT wires and connect the CT clamps to the load interface.

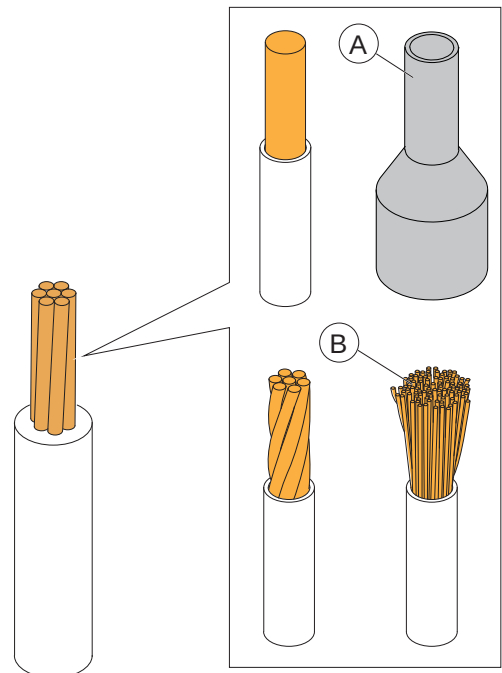


CT1-3: 0-333 mV (Basic)
CT1-3: 0-5 A (Advanced)

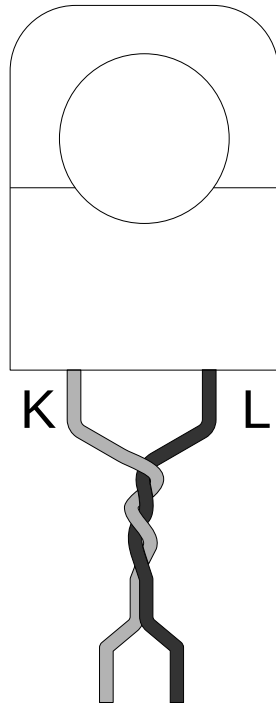
Use a wire ferrule (A) for strained wires (B).

NOTE

The PE conductor is internally connected to one of each CT pole (no. 1, 3, 5). This in order to provide a defined voltage potential.

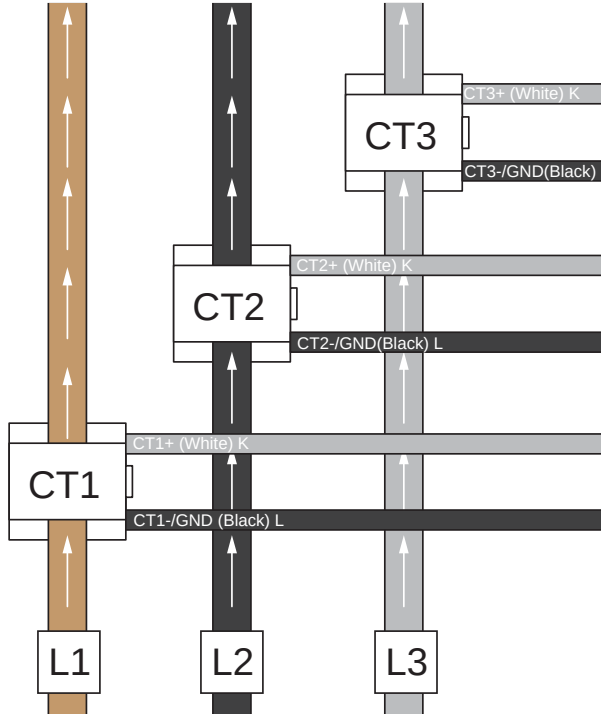


The input terminals 1, 3 and 5 are internally connected to PE in the load Interface.

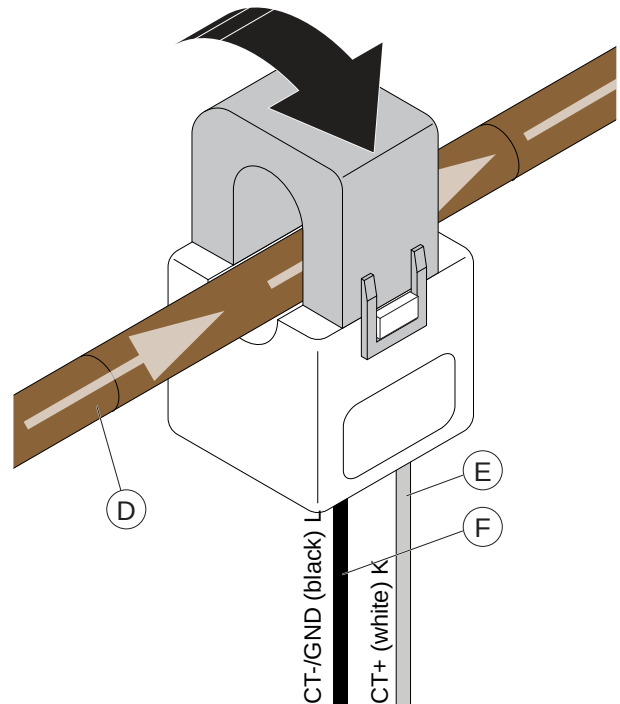


Wires -L are recommended to be light twisted as pairs, to reduce induced disturbances.

9. Attach the CT clamps to the measured current.



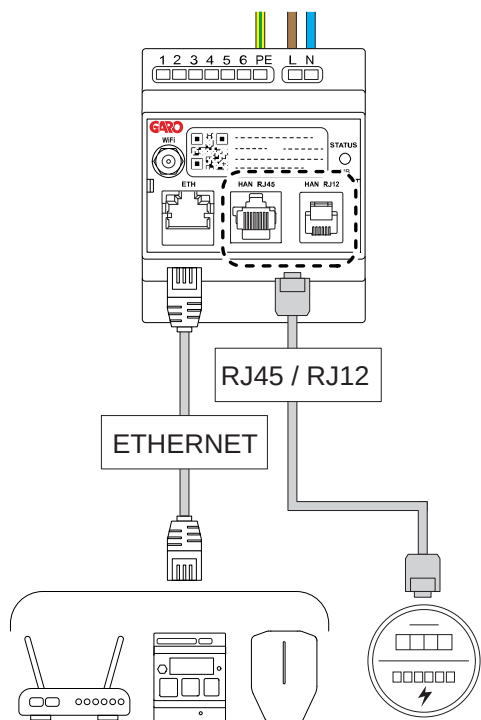
10. Make sure that the metal contact surfaces are really clean before closing the CT clamps. Close the CT clamp. A click is heard when it locks.



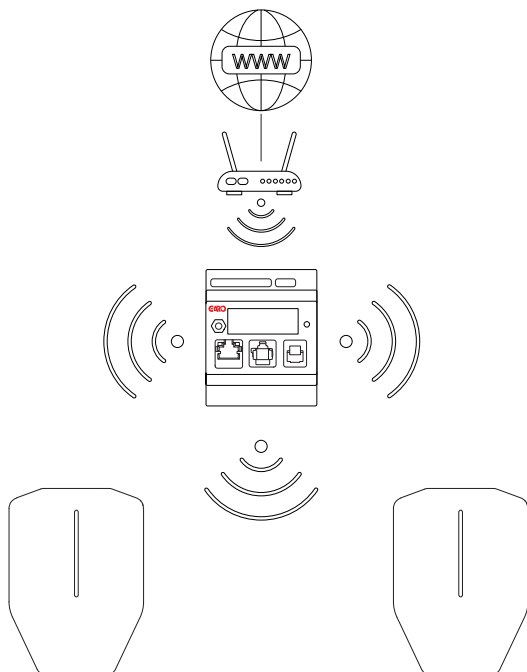
CAUTION

Note the current direction of the cable (D) and the position of the positive (K) and negative (L) cable of the CT clamp.

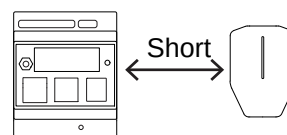
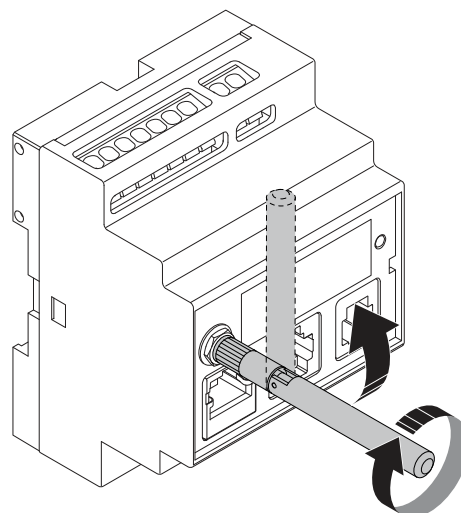
11. The GARO Entity Balance BASIC is prepared for HAN communications to the modern Main utility meters, based on RJ12 or RJ45 connections. (HAN is only available on GARO Entity Balance BASIC.)
12. The load Interface is a part of the total GARO Entity Charging Station communication network, that could be based on either Ethernet cable or Wi-Fi. The GARO Entity Balance BASIC has one(1) RJ-45 Ethernet port. The GARO Entity Balance ADVANCED has two(2) RJ-45 Ethernet ports. In most installations, external internet connection is done via the load interface unit.



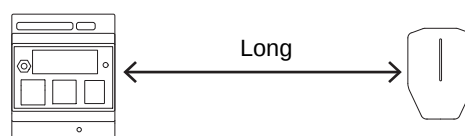
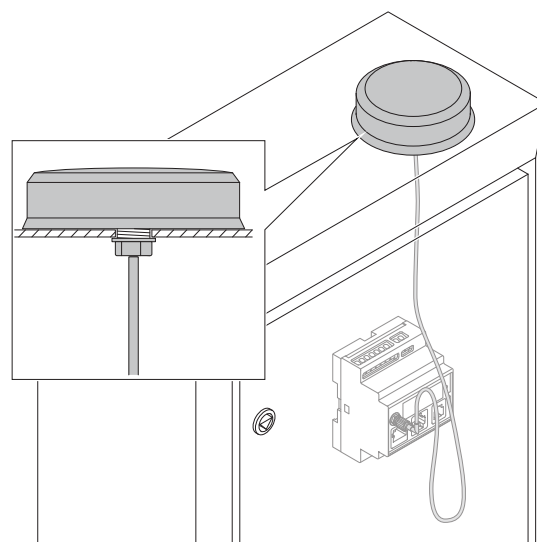
13. It is always recommended to connect an antenna even if Wi-Fi or mesh Wi-Fi is not used.



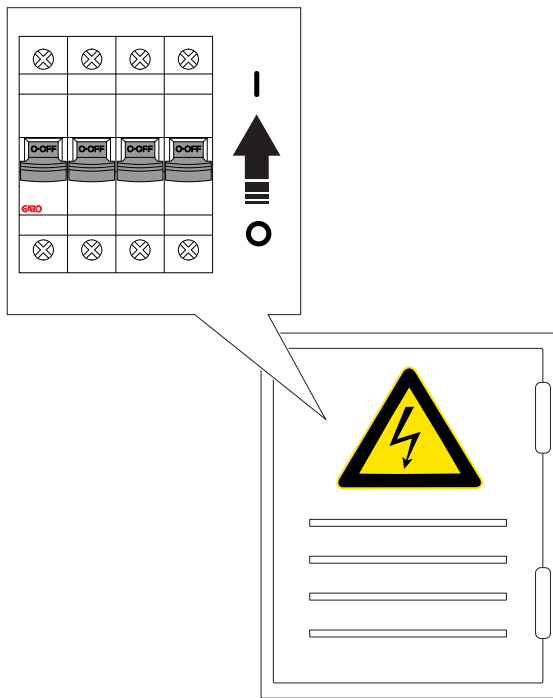
14. The short external antenna is supplied with the product. Use this antenna if the distance to the CS is short. There are several factors that can lower the range of the antenna (i.e. obstacles, metal cabinet, other radio equipment, etc.).



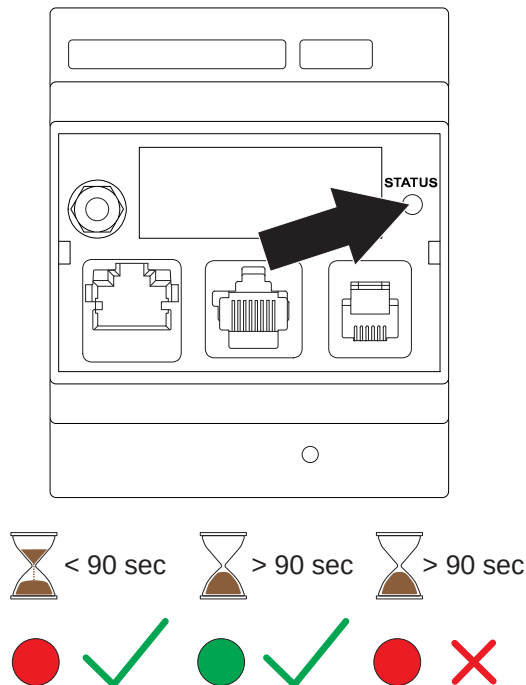
15. The long range, panel-mounted, circular disc Wi-Fi antenna is available as accessory at GARO. It is used when the distance to the Wi-Fi or mesh Wi-Fi node (=other entity unit) is long or obstacles can occur. Assembly instructions are supplied with the external antenna. If the load interface is mounted inside a metal cabinet, it is highly recommended to use the external disc antenna.



16. Turn the power/voltage on.



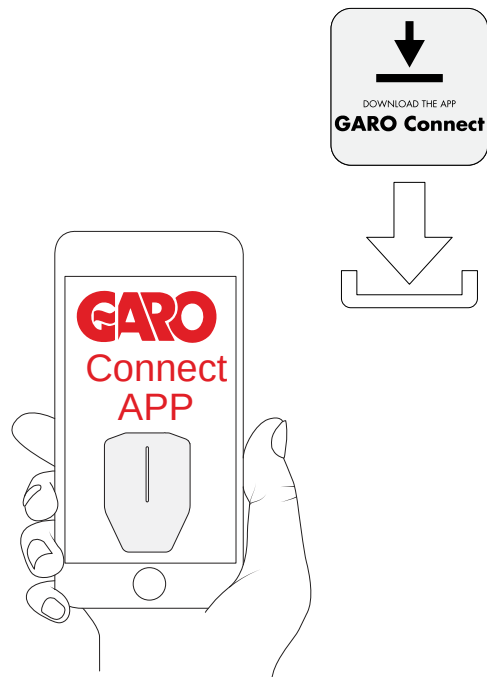
17. The light indicator on the front panel turns red at power up. Make sure that the indicator light on the load interface turns green. This can take 60–90 seconds.



NOTE

If the LED on the load interface does not turn green within 90 sec. of power.

18. Download the GARO app on AppStore or Google Play store.



19. Test the load management setup to ensure that the current is limited at high load conditions.
20. Scan the QR code on the Load interface. Configure the settings in the GARO app.



5 OPERATION

WARNING

Read and understand the safety chapter before operation of the product. Refer to [2 Safety, page 9](#).

5.1 TO CHARGE AN ELECTRICAL VEHICLE

1. If the charging station has a Type 2 outlet, connect a charging cable to the Type 2 outlet.

NOTE

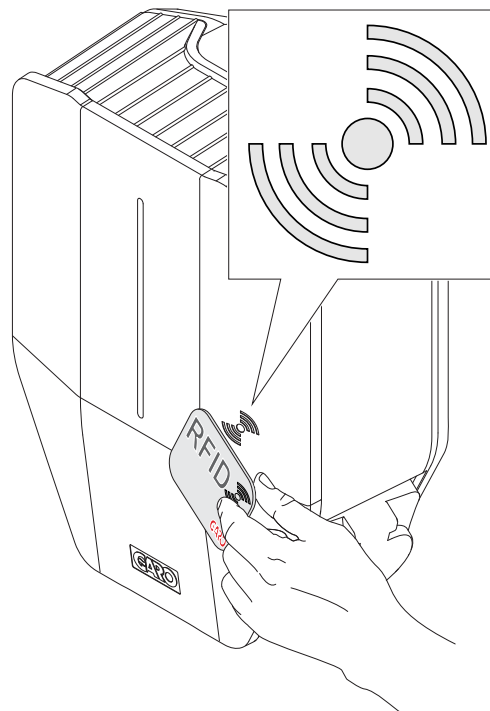
It is possible to lock the charging cable to a Type 2 outlet using the Garo Connect app. It is only the EV driver that has locked the charging cable, that can unlock the charging cable or by the owner of the charging station.

2. Connect the charging cable to the EV.
3. If the charging stations gives a yellow blinking light indication, authorization is necessary. Do one of the steps that follow:

NOTE

If the charging station is set to free charge mode (default), no authorization will be necessary and the charging starts immediately.

- a. Either hold your RFID tag against the RFID reader on the charging station



- b. OR log on to the GARO Connect app and choose *Charge and use* (A). Choose location (B) and charging station (C).

The charging starts after authorization.

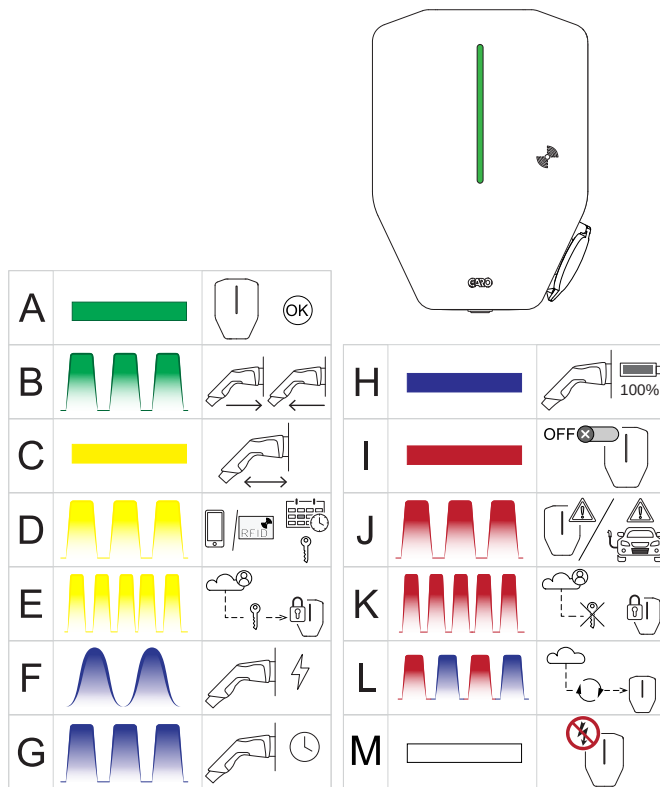
NOTE

The following settings are also available in the GARO Connect app.

- Schedule the charging.
- Manage personal settings and the personal RFID tags.
- Monitor the charging process.
- Do a check of the status and location of charging stations that are accessible to the user.

Also, ongoing sessions can be monitored and the charging history analyzed.

5.1.1 INDICATION LIGHT



	When	Meaning
A	Green solid light.	The charging station is available for charging.
B	Green slow blinking light, 1 Hz.	The charging station waits for either a connection to or a disconnection of an EV.
C	Yellow solid light.	The Type 2 contact is not in correct position. Try to reconnect.
D	Yellow slow blinking light, 1 Hz.	The charging station is reserved or awaits authorization by the EV Driver.
E	Yellow fast blinking light, 10 Hz.	The authorization of the EV driver is checked.
F	Blue pulsating light, 1 Hz.	The EV charges.
G	Blue slow blinking light.	The charging awaits the time schedule to start the charging process.
H	Blue solid light.	The charging process is finished by the EV.

I	Red solid light.	The charging station is deactivated by GARO Connect app or the external enable signal.
J	Red slow blinking light, 0.5 Hz.	Error in the charging station or the EV. Disconnect the EV and retry. If the breaker has tripped, a manual reset is required. It can also participate in a Wi-Fi Mesh network.
K	Red fast blinking light for 3 seconds, 10 Hz.	The charging station cannot find authorization for the EV driver.
L	Red and blue slow blinking light, 1 Hz.	Software update in progress.
M	No light.	The charging station has no power or the intensity of the indication light is reduced.

5.2 TO SCHEDULE CHARGING

1. Open the GARO application on a mobile device.
2. Navigate to *Charge and use*.
3. In the view *My chargers* click the charging station to set a schedule for.
4. Click *Schedule Charging* in the view that opens.
5. Follow the instructions in the app to set the time for charging.

5.3 TO MONITOR THE CHARGING PROCESS

1. Open the GARO Connect app on a mobile device.
2. Navigate to *Charge and use*.
3. In this view it is possible to navigate to each charging station that is in use by an EV Driver account/identity up to the same access level. The charging process can be started, stopped and charging scheduled, see the status of the charging station and the charging capacity.

5.4 TO STOP THE CHARGING OF THE ELECTRICAL VEHICLE

1. Do one of the procedures that follow to stop the charging.
 - a. Follow the instructions for the electrical vehicle, i.e. the EV will initiate a charging stop.
 - b. Use a RFID that is connected to same EV D driver that started the charging. Only the EV driver that started the charging can stop it.
 - c. Use the GARO Connect app and log in as the EV driver that started the charging.
2. Disconnect the Type 2 connector from the electrical vehicle.

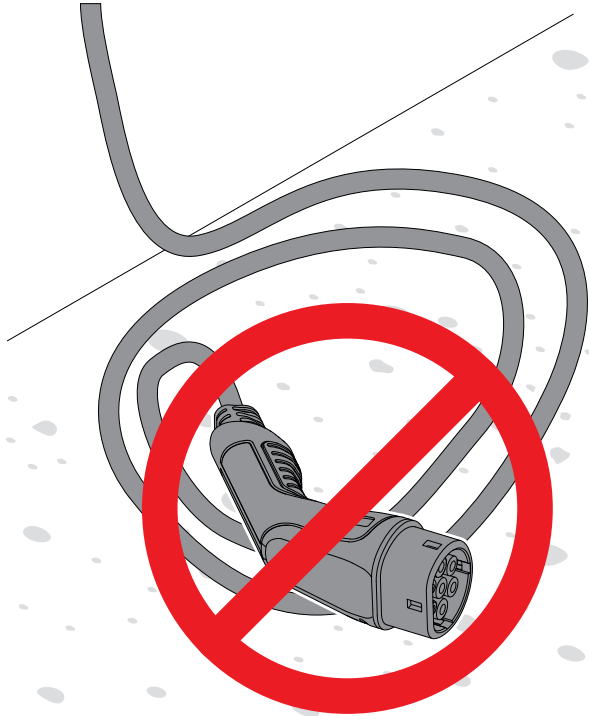
CAUTION

The Type 2 connector is locked during charging in the charging station and the electrical vehicle inlet. Do not force the Type 2 connector or charging cable as this can cause damage to the product or the electrical vehicle.

3. If there is a Type 2 outlet in the charging station, disconnect the Type 2 connector from the Type 2 outlet in the charging station.
4. If there is a fixed cable on the charging station, put the Type 2 connector in the dedicated parking position on the charging station.

CAUTION

Do not leave the Type 2 contact on the ground. Always hang it up or store it in a dry location.



6 MAINTENANCE

6.1 TO CLEAN THE CHARGING STATION

- Use a damp cloth to clean the exterior of the charging station.

CAUTION

Do not use running water or a hard brush to clean the charging station, it can cause damage.

6.2 TO DO A VISUAL CHECK OF THE CHARGING STATION

1. Make sure that the charging station is clean. Refer to [6.1 To clean the charging station, page 79](#).
2. Do a visual check of the charging station, Type 2 connector and the power cables. Do a check for damages such as cracks or deformation.

WARNING

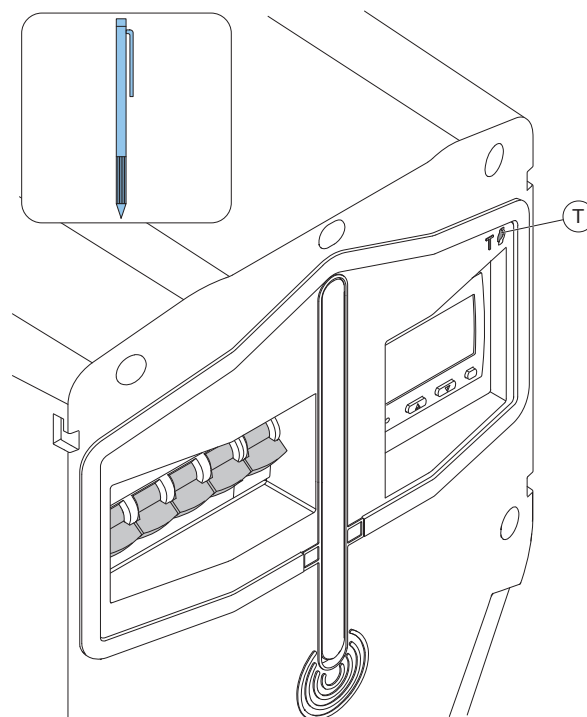
Do not use a damaged charging station. Turn off the electric power and disable the charging station in the GARO Connect app. Contact an authorized service center.

6.3 TO DO A FACTORY RESET

CAUTION

The GARO support organization should approve a factory reset. The factory reset should only be done as a last resort in case of errors, such as lost contact to the network or the GARO Connect app.

1. Stop charging and disconnect any EV.
2. Remove the front cover of the charging unit.
3. Do a long press, approximately 20 seconds, on the test button (T) with the designation "T". Use a pen or similar. When pressing the button, the circuit breaker will trip. The indication turns a blinking red.



4. After the light goes off, release the button and the circuit breaker can be re closed. Refer to [6.5 To do a reset after a minor ground fault, page 80](#).
5. Wait for the device to restart and the light to turn green.

6.4 TO DO AN EARTH FAULT TEST

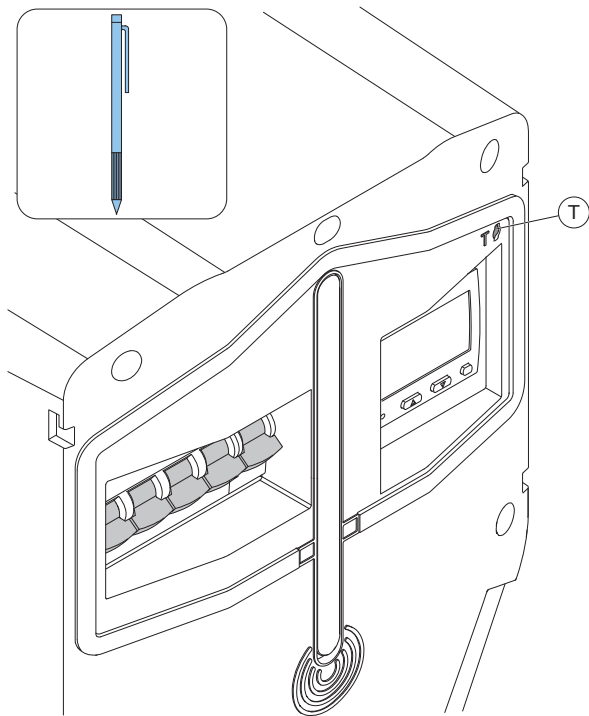
NOTE

Do an earth fault test one time each month.

1. Remove the front cover of the charging station.
2. Do a short press (max. 1 second) on the test button (T) with the designation "T". Use a pen or similar.

NOTE

When the test button is pressed, the indication light becomes blinking red and the circuit breaker trips.



3. Unplug the electric vehicle (EV).
4. If the charging station still indicates red, the circuit breaker needs to be reset. Open the front cover of the charging station.
5. Lift the switch arm up to reset the circuit breaker.

NOTE

The circuit breaker can have 4 or 2 poles (three- or one-phase versions).

6.5 TO DO A RESET AFTER A MINOR GROUND FAULT

The Entity Charging station can be configured to enable early detection of a ground fault or overload by an EV. This is a setting made by the installer. This is indicated by a slow blinking (0.5 Hz) red indication light.

As charging is stopped, disconnect the EV. The charging station will reset after a few seconds. A green light indicates if all is OK.

If no green light lights up, contact the owner of the charging station to perform a reset of the circuit breaker.

6.6 TO DO A RESET OF A CIRCUIT BREAKER

If the circuit breaker trips, the light status indication on the charging unit becomes a slow blinking (0.5 Hz) red. If it is configured, a notification is sent to the owner and the EV driver that uses the charging station, in the GARO Connect app. The circuit breaker can trip either due to a earth fault, short circuit or overload a short circuit.

1. If there is an EV connected to the charging station, unplug the Type 2 charging connector.
2. Unlock and remove the front cover of the charging unit.
3. Do a visual check of all cables and connectors.
4. Lift the switch arm up to reset the circuit breaker.
5. Do an earth fault test. This should trip the circuit breaker. Reset the circuit breaker.
6. Connect and charge the electrical vehicle again.
 - a. If the circuit breaker trips immediately, disconnect the electrical vehicle from the charging unit and speak to an authorized service center to examine for the EV and the charging station.

CAUTION

Do not perform repeated tests on a faulty EV or charging station. This may result in damages to the EV or charging station.

If the circuit breaker does not trip again, reinstall the front cover of the charging unit.

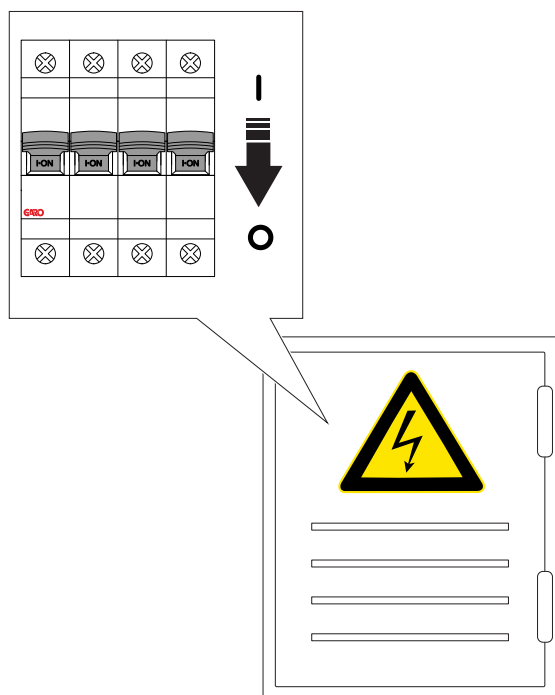
6.7 TO REPLACE A CHARGING UNIT

WARNING

Necessary knowledge to replace a charging unit is required. If unsure, speak to an installer.

If the charging unit is damaged, it is necessary to replace it. To replace a single charging station or a master charging station that is connected to a local Wi-Fi requires a smartphone and the GARO Connect app. Refer to [4.13 GARO Connect, page 39](#).

1. Turn the power/voltage off.



2. Unlock and remove the front cover of the charging unit.
3. Remove the 6 screws (TX20) that hold the charging unit to the installation bracket, and pull the charging unit out of the installation bracket.
4. Never leave an installation bracket empty. If the installation bracket is not used, it should be protected by a cover. The cover is available as a separate part.
5. Disconnect the ethernet cable(s) and control cable, if used, from the charging unit.
6. Examine the installation bracket for damages.
 - a. If the installation bracket is damaged, an installer must remove it from the wall or pole and install a new installation bracket. This requires that the charging station must be re-installed, connecting it to the new identity of the installation bracket.

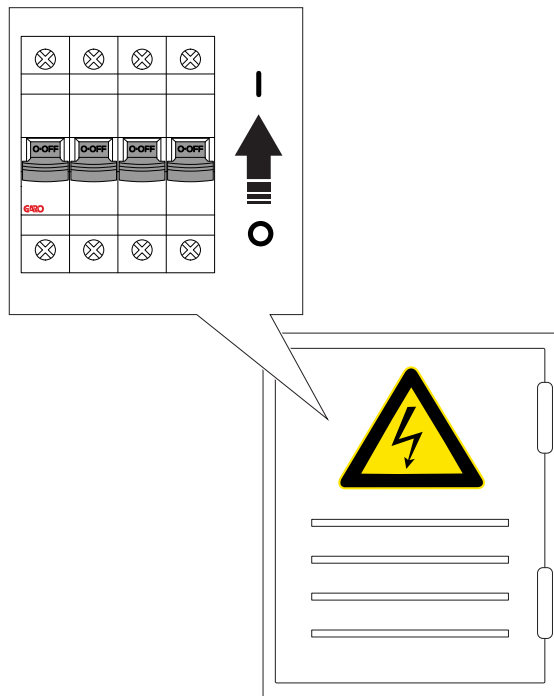
WARNING

Only an authorized installer, or a person acting on behalf of an authorized installer, may replace the installation bracket.

NOTE

Only 1 installation bracket can be installed, connected to 1 charging station in the app. If an installation bracket is to be re-used in another location, it must first be deleted from the first location.

7. Unpack and inspect the new charging unit.
8. Connect the ethernet cable(s) if used, and the control cable to the new charging unit. Refer to [4.12.10 To install the control cable to the installation bracket, page 31](#).
9. Attach the new charging unit to the installation bracket. Refer to [4.12.14 To attach the charging unit to the installation bracket, page 35](#).
10. If the charging station uses a local Wi-Fi for internet access, do the internet adjustments through the GARO Connect app. This also applies to single/standalone charging stations. Refer to [Create and setup a load interface, page 59](#).
11. Attach and lock the front cover of the charging unit.
12. Turn the power on.



13. Allow the charging unit to download software settings.
14. Do a functional test of the charging unit. Refer to [4.12.15 To do a final functionality test of the product, page 36](#).

6.8 PME - PROTECTIVE MULTIPLE EATHING (UK VERSIONS ONLY)

Some variants of CU is equipped with Protective Multiple Earthing (PME) protection. By monitoring the phase voltage, a fault in the grid-connected earth connection (PEN conductor) can be detected. Detection level is phase voltage $<207\text{ V}$ OR $>253\text{ V}$. In case of detected fault, any charging is stopped, the EV is isolated (Live, Neutral and PE). The charging station indicates blinking red. The function is activated by default on CU with this function. An installer can disable the function.

Action when triggered:

(A red, slow blinking (0.5 Hz) indication on the charging station LED, an error message can be read in the GARO Connect app). A notification is sent to the user and the owner if configured.

1. Disconnect the EV.

2. Contact the installer to investigate the root cause of the problem. Reset the circuit breaker.

3. Press the test button marked "T" to conduct a ground fault test. The circuit breaker should then trip. Refer to [6.4 To do an earth fault test, page 79](#).

If the test is OK and no further uncertainty exists, then the charging station can be used in normal operation. The voltage level can be monitored in the GARO Connect app.

CAUTION

Never use the charging station if any uncertainty exists regarding PEN status or voltage levels.

6.9 SERVICE

The owner of a location is responsible for keeping the installation in a safe condition. One recommended way to fulfil this is to set up a service agreement with a service provider.

CAUTION

Service must only be performed by approved personnel.

Contact GARO to set up a service agreement.

6.10 REPAIR

CAUTION

All repair work must be done by GARO approved service centers.

NOTE

If the charging unit is opened, breaking the sealing label, warranty is void.

7 TROUBLESHOOTING

7.1 TROUBLESHOOTING

Problem	Solution
No light on the indication light on the charging station.	Do a check of the power supply to the charging station. Startup takes approximately up to 2 minutes. Do a check of the light intensity setting. If the light intensity is set near 0, it results in no visible light.
The indication light shows a blinking red light (0.5 Hz).	Disconnect the EV. Let the owner do a reset of the circuit breaker. Refer to 6.5 To do a reset after a minor ground fault, page 80. If the above measures do not help, do not use the charging station. Contact the installer or GARO support.
The indication light shows a fixed red light.	The CS is deactivated by the owner using the Garo Connect app or a Pro CS is deactivated by an external enable signal.
The indication light shows a slow blinking yellow light.	Before starting the charging process, do a check of the Type 2 connectors. If the charging process is stopped, remove the charging cable from the Type 2 outlet. Once authentication is received, connect the EV.
The charging power is too low.	Let the owner do a check of the power and current status in the GARO Connect app. The signalled current, that is what the charging station allows the EV to use, can be reduced due to load balance and thermal derating. This information is also available in the GARO Connect app.
There is no charging power but the indication light shows a blue blinking light.	Let the owner do a check of the power and current status in the GARO Connect app. The signalled current, that is what the charging station allows the EV to use, can be reduced due to load balance and thermal derating. This information is also available in the GARO Connect app.

8 TECHNICAL DATA

8.1 CHARGING STATION TECHNICAL DATA

Product type	GARO Entity Pro
Standards/directives	IEC 61851-1 IEC 62955 IEC 61439-7 IEC 60898-1 IEC 61008-1
EMC classification	2014/30/EU TBC
Installation method	Wall in a single and/or double installation bracket. (Stand and pole mount fixtures are available as accessories)
Installation environment	Indoor/outdoor
Location type	Non-restricted access
Rated voltage	TN/TT 2-3 phase 400 VAC 50 Hz TN/TT 1 phase 230 VAC 50 Hz IT 2-3 phase 230 VAC 50 Hz
Rated current	32 A or 20 A depending on fixed cable version. The default setting is always 16 A. The maximum installed current for the charging station (CS) is set by the Installer.
Installation systems	TN, IT and TT systems
Charging type	Mode 3
Charging method	AC charging
Protection class	IP54
Mechanical impact resistance	IK10
Temperature range	-40 °C - +40 °C. Charging current is reduced at higher temperatures.

Weight	3-3.7 kg without cable (depending on product variant)
Cable length (fixed cable version)	4.5 m/8 m
Size single version charging station, height*width*depth	340*240*150 mm
Size double version charging station, height*width*depth	340*495*145 mm
Rated current withstand	10 kA
Rated short-time withstand current	10 kA
Rated conditional short-circuit current of an assembly	10 kA
Short-circuit protective device type	C
Rated impulse withstand voltage	4 kV TBC
Rated insulation voltage	230 V/400 V
Rated diversity factor (RDF)	1
Pollution degree	3
EMC environmental condition	A and B
RFID Frequency Band	13.56 MHz TBC
RFID output power	250 mW TBC
SIM	3 FF = Micro = 15x25 mm
Modem	Lte Cat M1/Cat Nb2/Egprs
Wi-Fi	802.11 g 2.5 GHz
Maximum pre-fuse to terminal	80 A
Installation power cable limitations	Maximum 16 mm ² , outer diameter: maximum 24 mm ²
Power connection terminals	16 mm ² , spring type

Warranty	2 years
Design product life cycle	10 years installation/30 000 hours charging at 20 °C

8.2 LOAD INTERFACE TECHNICAL DATA

Standards/directives	IEC 12345
EMC Classification	2014/30/EU
Installation method	DIN rail.
Installation environment	Indoor/outdoor electrical cabinet.
Location type	Restricted access.
Rated voltage	TN/IT/TT 1-phase 230 VAC 50 Hz
Rated current	13 mA
Installation systems	TT, IT and TN system.
Power	<3W
Protection class	IP20
Temperature range	-20 °C to +50 °C
Weight	0.2 kg
Dimensions (heightxwidthxdepth)	86x72x49 + antenna mm (4 DIN modules).
Color	Grey
Recommended protective pre-fuse	max. C 10 A
Overvoltage category	III (OVC 3)
Rated impulse withstand voltage	4 kV
Rated insulation voltage	230 V/400 V
Antenna connection	SMA male.

Type	Load interface, basic	Load interface, advanced
Interface to GARO Entity Pro	1 x Ethernet RJ45, Wi-Fi 2.4 GHz, mesh	2x Ethernet RJ45, Wi-Fi 2.4 GHz, mesh
HAN RJ-45 input EN 13757-2	1	N/A
HAN RJ-12 input	1	N/A
Current transformer input 333 mV.	x3	N/A
Current transformer input 0-5 A.	N/A	x3
M-Bus input	N/A	1
Modbus input RS-485	N/A	1
Relay output 12-230 V, 1 A	N/A	1

8.3 ACCESSORIES

For available accessories, refer to the GARO website at www.garo.com.

SOURCE CODE

The software included in this product contains copyrighted software that is licensed under LGPL-2.1, GPL-2.0, and GPL-3.0 and other open source licenses. A copy of the licenses are available in a separate document. Source code can be obtained from GARO for a period of 3 years after the final shipment of the product, which may be no earlier than 2025-01-01 for a fee. For order and payment of the source code document, please contact:

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EC DECLARATION OF CONFORMITY