EVBOX Dynamic Load Balancing Kit Installation Guide

EVBOX Dynamic Load Balancing Kit

Contents

Introduction

Thank you for choosing this EVBox Dynamic Load Balancing Kit. Refer to the installation manual of your charging station to check whether your charging station has a Dynamic Load Balancing (DLB) feature.
This Installation Manual describes how to install and use dynamic load balancing. You must carefully read the safety information before you start.

Scope of the manual

Keep this manual for the entire life cycle of the product.
The installation instructions in this manual are intended for qualified installers who can assess the work and identify potential danger.
All EVBox manuals can be downloaded from **www.evbox.com/manuals**.

Disclaimer

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Symbols used in this manual

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

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

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

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

1., a. or i Procedure that must be followed in the stated order.

Certification and compliance

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

Note
See EU Declaration of Conformity on page 22 for the Declaration of Conformity for this product.

Safety

Safety precautions

 **DANGER**

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

- Read this manual before installing or using the product.

 **DANGER**

Installing a damaged product, current sensors, or cables will result in the risk of electric shock, which will cause severe injury or death.

- Do not install the product if it is broken, cracked, or shows any indication of damage.
- Do not install damaged current sensors or cables.

 **DANGER**

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

- Only a qualified electrician is permitted to install, service, repair, and relocate the product.
- The user must not attempt to service or repair the product as it does not contain user-serviceable parts.
- Do not install the product in locations where children are likely to be present.

 **DANGER**

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

- Switch off power to the charging station before installing the product.
- Follow all safety precautions if the product has to be installed under voltage.
- Do not leave the charging station unattended with the covers open.
- Only supply electrical power to the charging station for the purpose of testing and adjusting the product or charging station.
- In the event of danger or an accident, have the electrical supply disconnected immediately

 **WARNING**

Exposure of the product to heat, flammable substances, and extreme environmental conditions can result in damage to the product and charging station, which will cause injury or death.

- Install the product in the power supply cabinet.

- Do not expose the product to heat, flammable substances, and extreme environmental conditions.
- Do not immerse the product in water or any other liquids.

WARNING

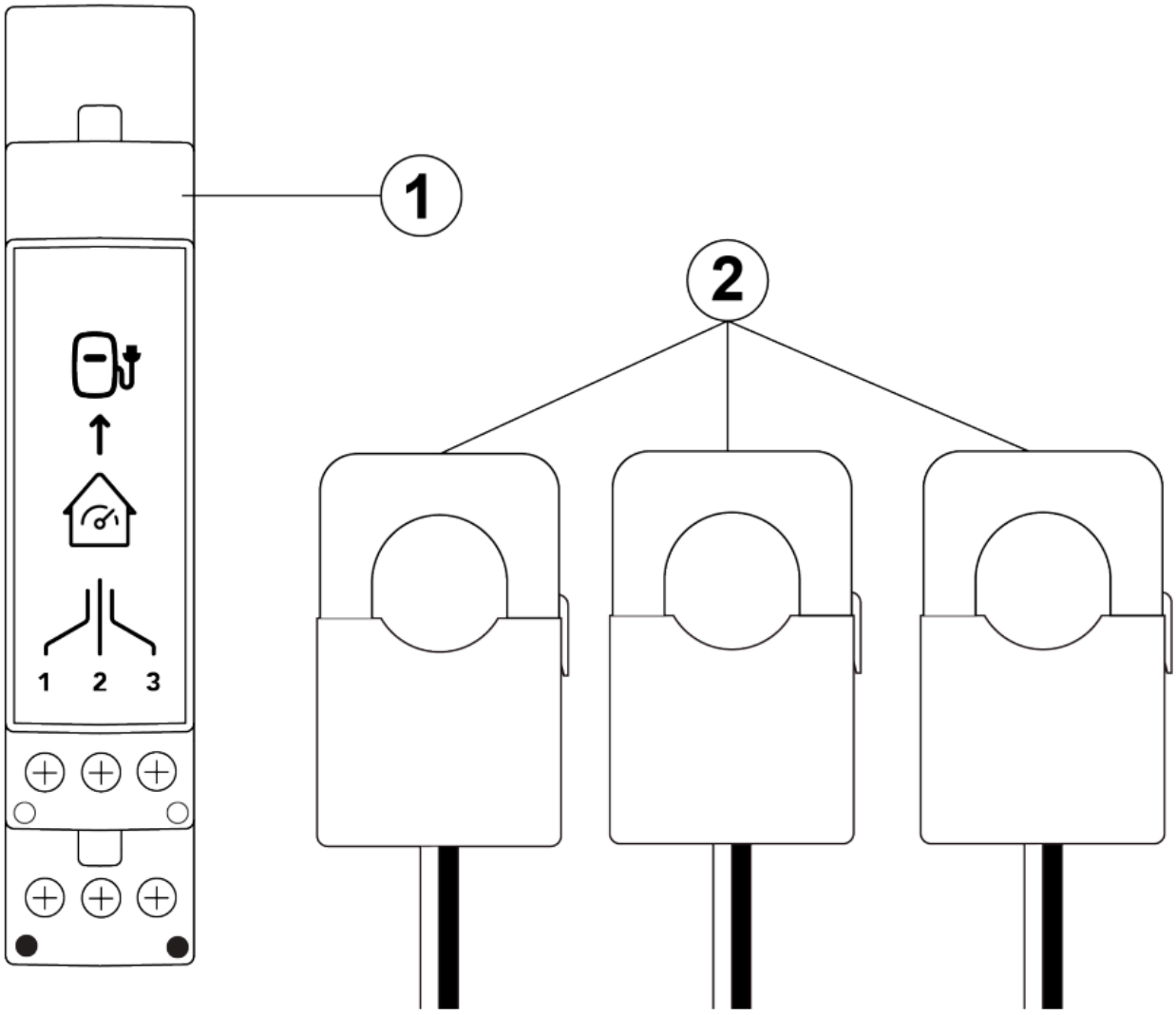
Using the product other than for its intended purpose may result in technical incompatibilities and can result in damage to the product or the charging station, which may cause injury or death.

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

Product features

The EVBox Dynamic Load Balancing Kit allows the charging station to monitor the power consumption of other electrical devices that use the same power source. When other electrical devices consume power, the charging station calculates the remaining capacity that is available for charging based on the inputs from the DLB Kit. The charging station reduces the charge rate to ensure that the total power consumption stays within the preset limits.

Description



1. **DLB adapter** The DLB adapter routes sensor signals to the charging station through a network cable.

2. **Current sensors** A current sensor measures the current flowing in a power supply phase wire.

Technical specifications

Feature	Description
Maximum circuit voltage	230 V ± 10% or 400 V ± 10%
Maximum output current	100 mA
Output voltage	300 mV peak
Primary current	up to 100 A *
Working frequency	50/60 Hz
Normal environmental conditions	Indoor use
Maximum installation altitude	3000 m above sea level
Operating temperature	-20 °C to +50 °C
Storage temperature	-40 °C to +80 °C
DLB adapter dimensions (D x W x H)	89.2 x 17.5 x 53 mm
Ethernet port	RJ45
Number of terminals	3 x 2
Maximum network cable length	30 m unshielded
	150 m shielded

* Check the packaging or the EV Box Install app for the current sensor rating.

Installation instructions

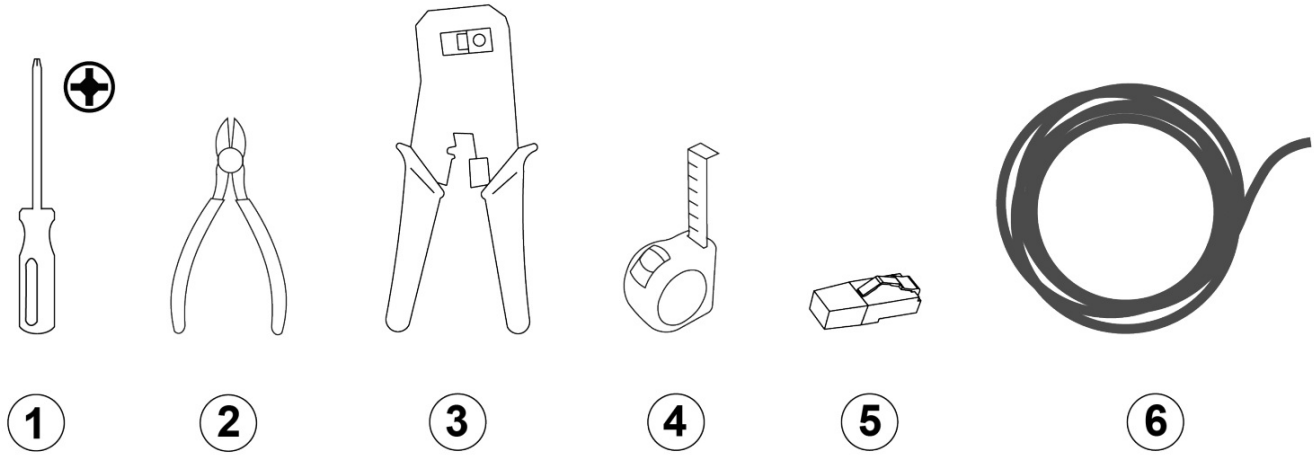
Prepare for installation

The following recommendations are a guide to help you plan the installation of the DLB Kit:

- Confirm the maximum current capacity per phase of the home or facility. This value defines the maximum configured capacity for dynamic load balancing.
- Ensure that the electric wires where the current sensors will be mounted have basic or reinforced insulation.
- Ensure that a suitable length of network cable can be routed from the charging station to the DLB installation.

  Note
- The network cable must have a maximum length of 30 m (unshielded) or 150 m (shielded).
- Ensure that there is one module space on a DIN rail in the power supply cabinet.

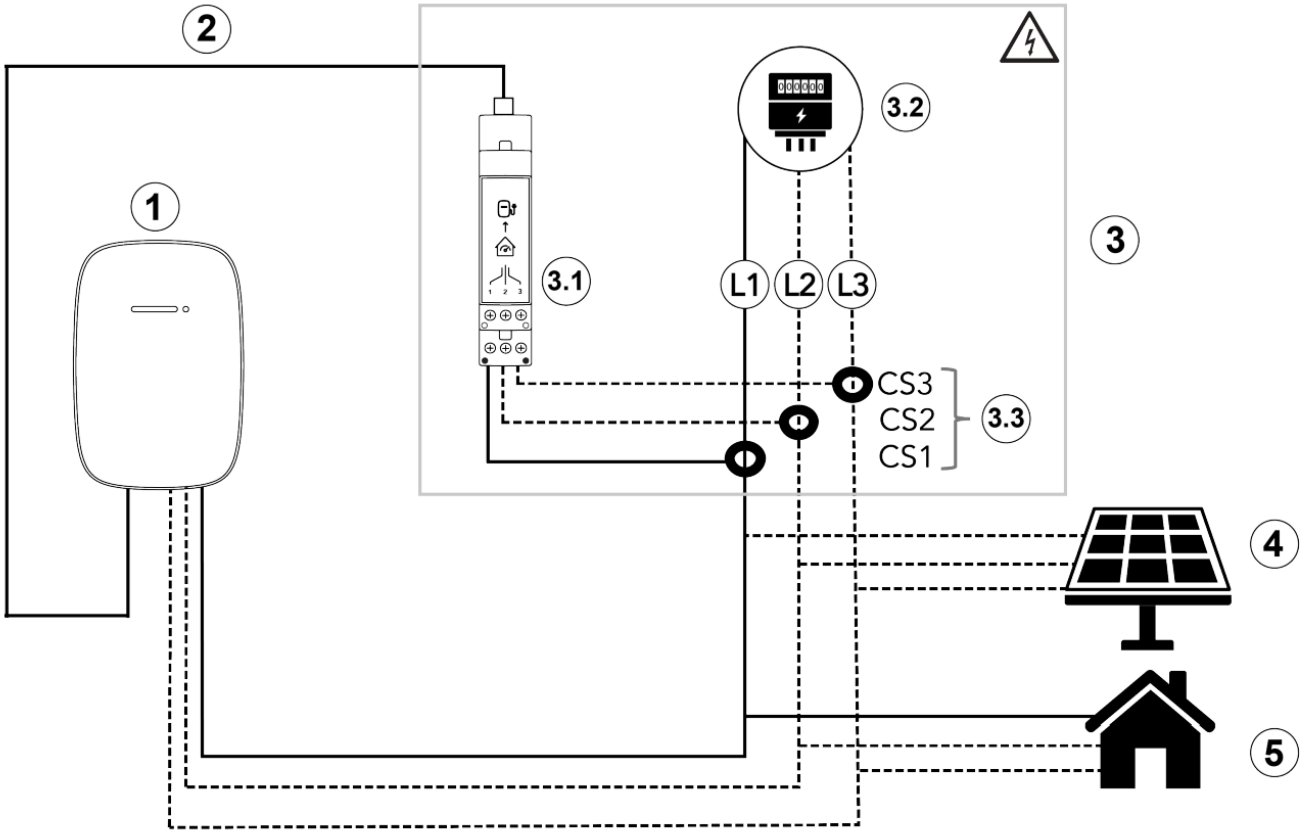
Tools and materials required



1. Torque Screwdriver, PH1
2. Wire cutter
3. RJ45 crimp tool
4. Tape measure
5. RJ45 plugs 2x (optional) *
6. Network cable (Cat5, Cat5e, Cat6), with twisted paired wires *

* Network cables can have a pre-installed RJ45 plug, or the RJ45 plug can be installed before or after routing the network cable into the charging station.

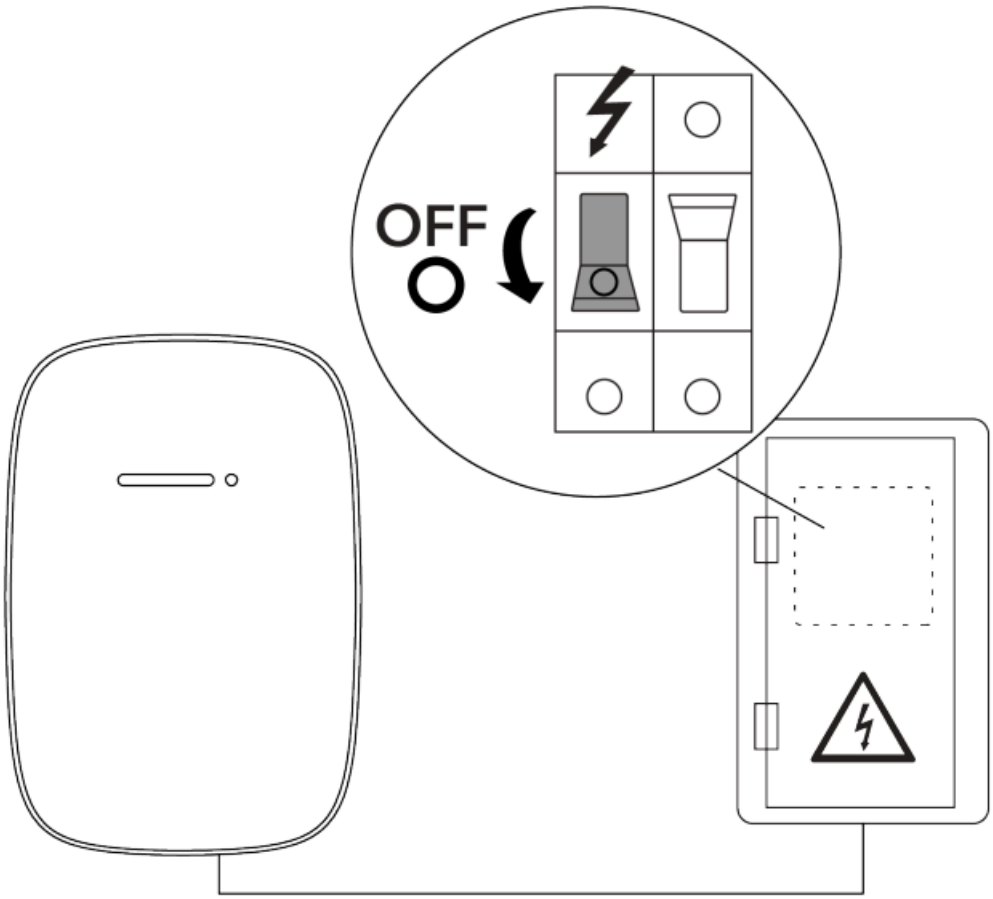
Connection diagram



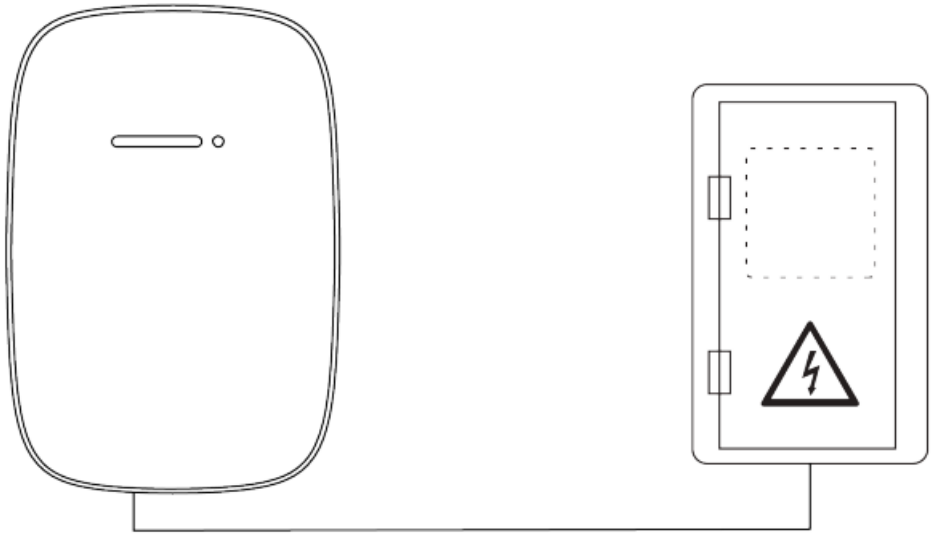
1. Charging station
2. Network cable
3. Power supply cabinet
   3.1 DLB adapter
   3.2 Electricity meter
   3.3 Current sensors
4. Home appliances

Installation

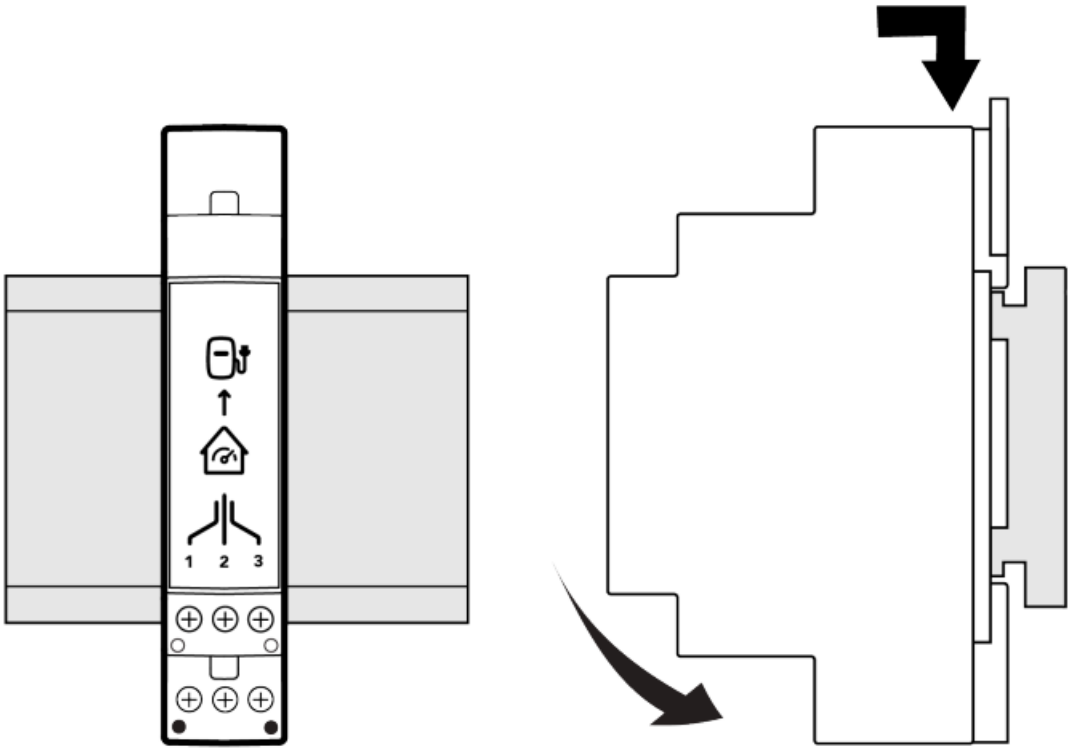
1. In the power supply cabinet, switch off the power to the charging station



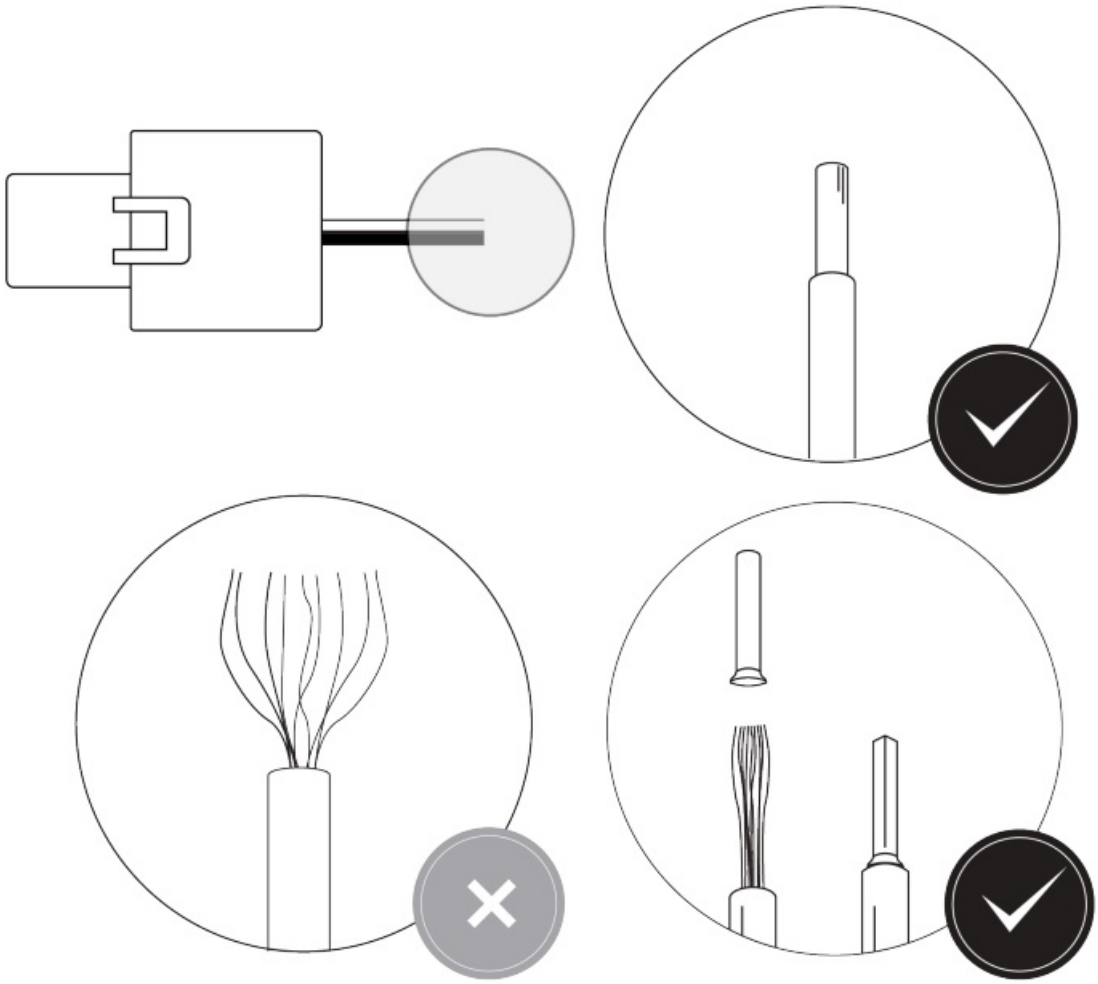
2. Put up warning signs to prevent accidental connection of power to the charging station.
3. Make sure that unauthorized persons cannot access the work area.
4. Route the network cable from the charging station to the DLB installation.



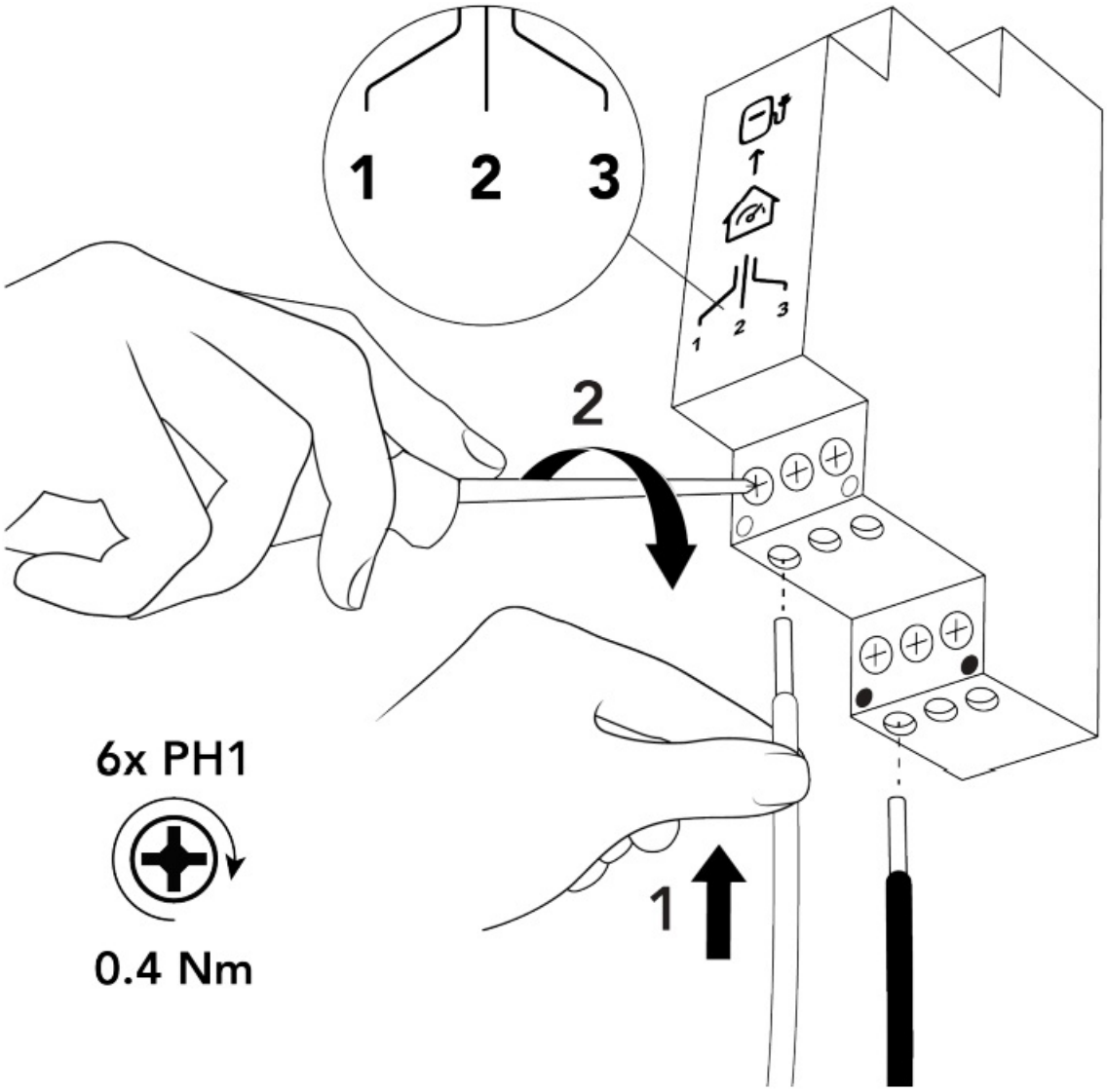
5. In the power supply cabinet, mount the DLB adapter on the DIN rail.

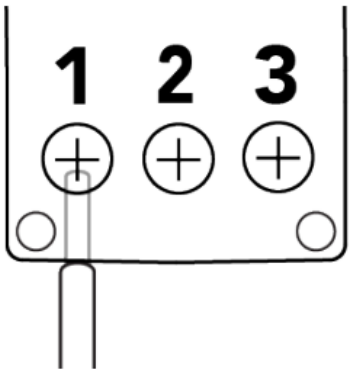


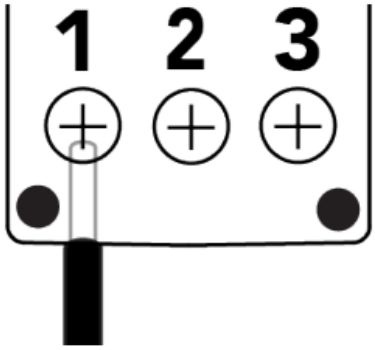
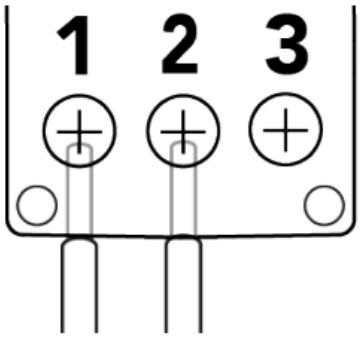
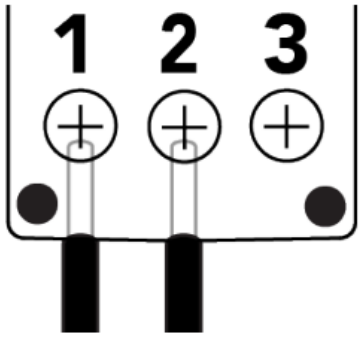
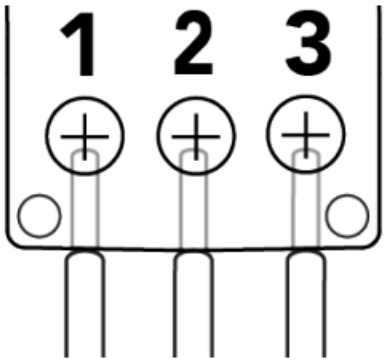
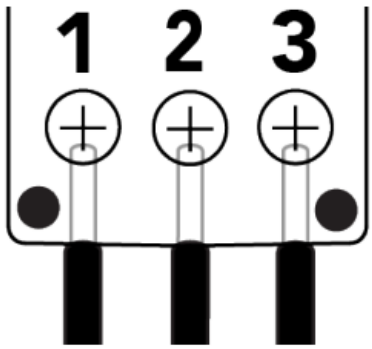
6. If the current sensors use stranded wires, install wire end sleeves (without plastic sleeves) and apply a square crimp for optimal fit into the DLB adapter.



7. For each current sensor, connect the white wires to the DLB adapter white terminals, and the black wires to the DLB adapter black terminals, as shown in the table. For each phase, connect current sensor wires to the same terminal numbers.

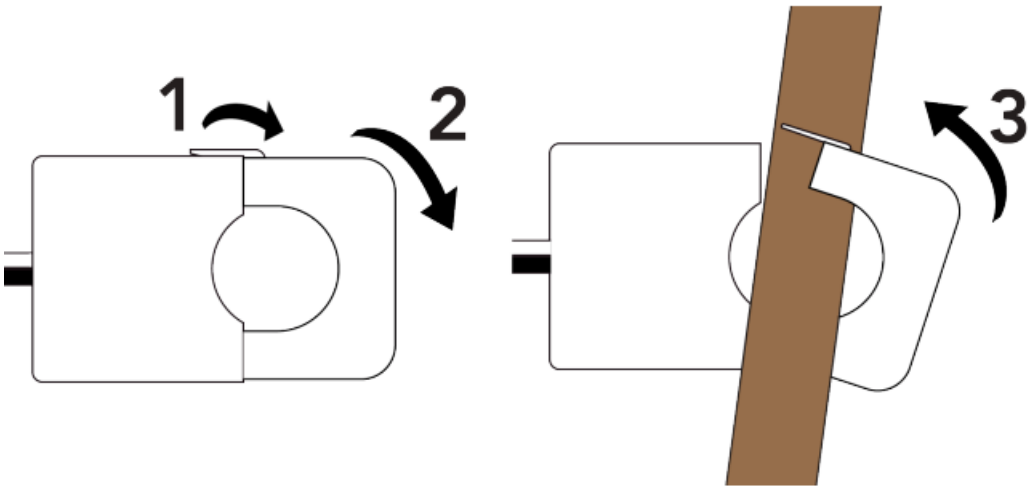


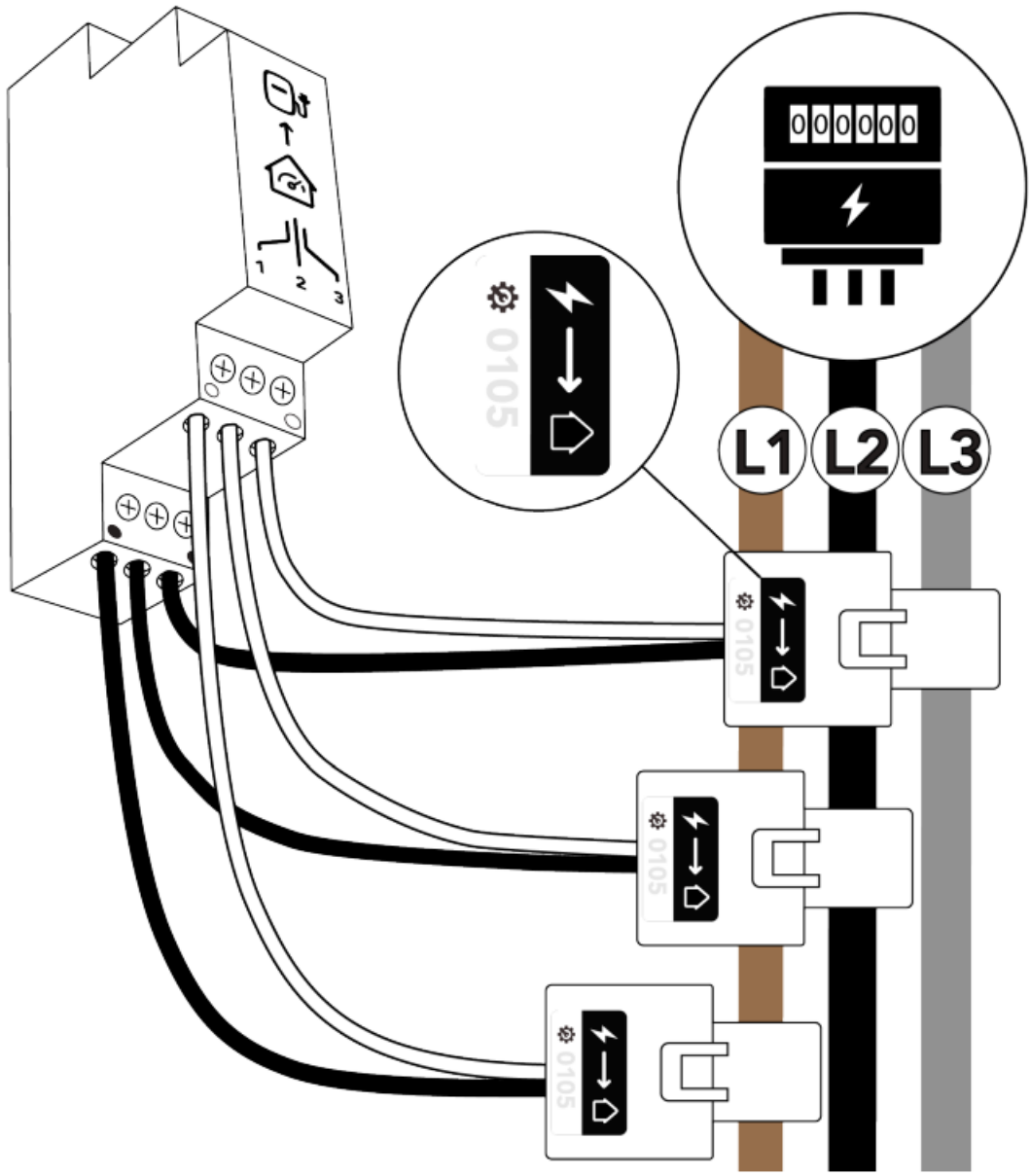
Power supply	Current sensor wire	DLB adapter terminal
1-phase	White	

	Black	
2-phase	White	
	Black	
3-phase	White	
	Black	

8. Mount the current sensors on the electric wires. The direction arrow on the current sensor must point from the electricity meter to the charging station.

DLB adapter terminal	Phase
1	L1
2	L2
3	L3





WARNING

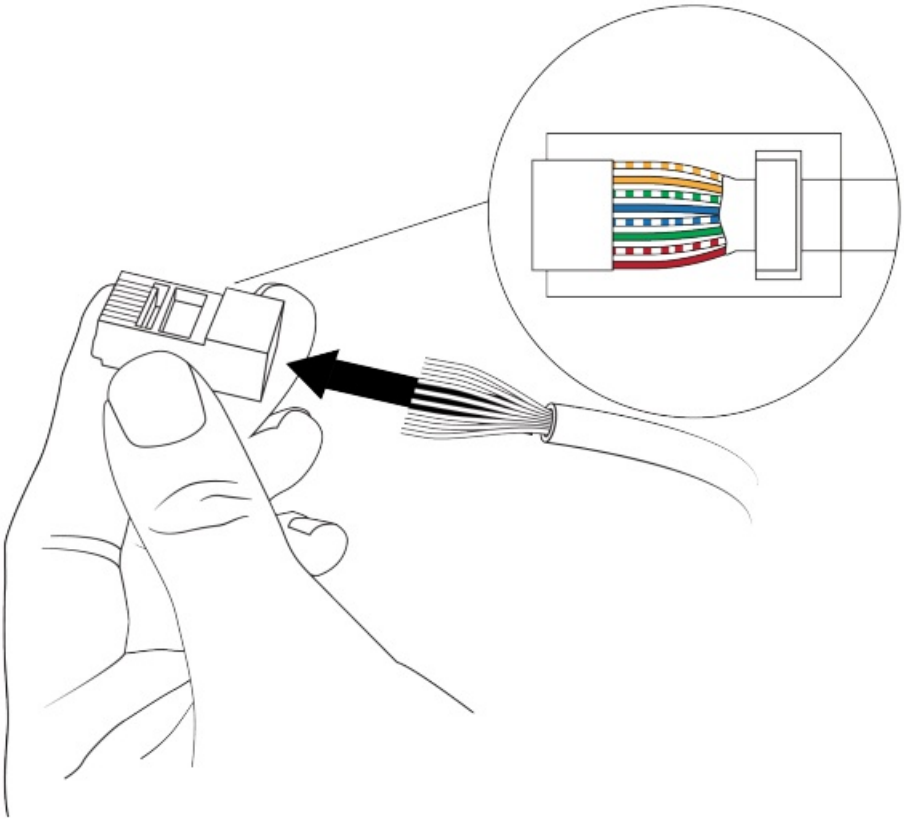
Mounting the current sensors on electric wires without insulation can result in damage to the product, which may cause injury or death.

- The current sensors must be mounted only on electric wires with basic or reinforced insulation.

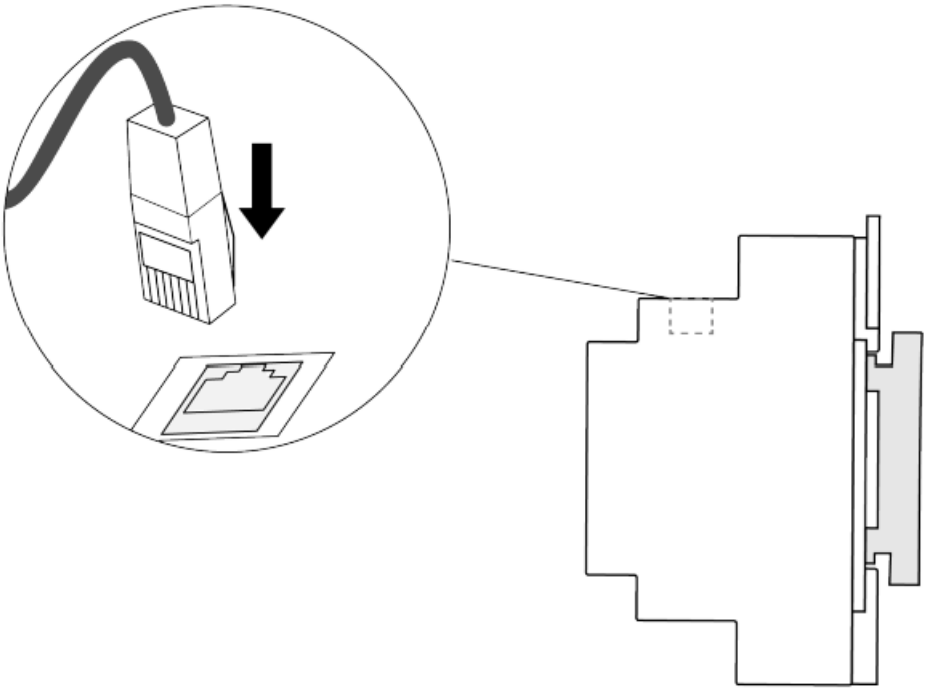
  CAUTION

  Mounting the current sensors on electric wires in the wrong order will cause the dynamic load balancing to not function properly.
- Make sure that the current sensors are mounted on electric wires in the correct order.
- If phase rotation is used for station installation, make sure that the current sensors match the phase rotation.

9. Use cable ties to route and secure the current sensor wires in the power supply cabinet.
10. If an RJ45 plug is not pre-installed, install an RJ45 plug on the DLB adapter end of the network cable.



11. Connect the network cable RJ45 plug to the DLB adapter.



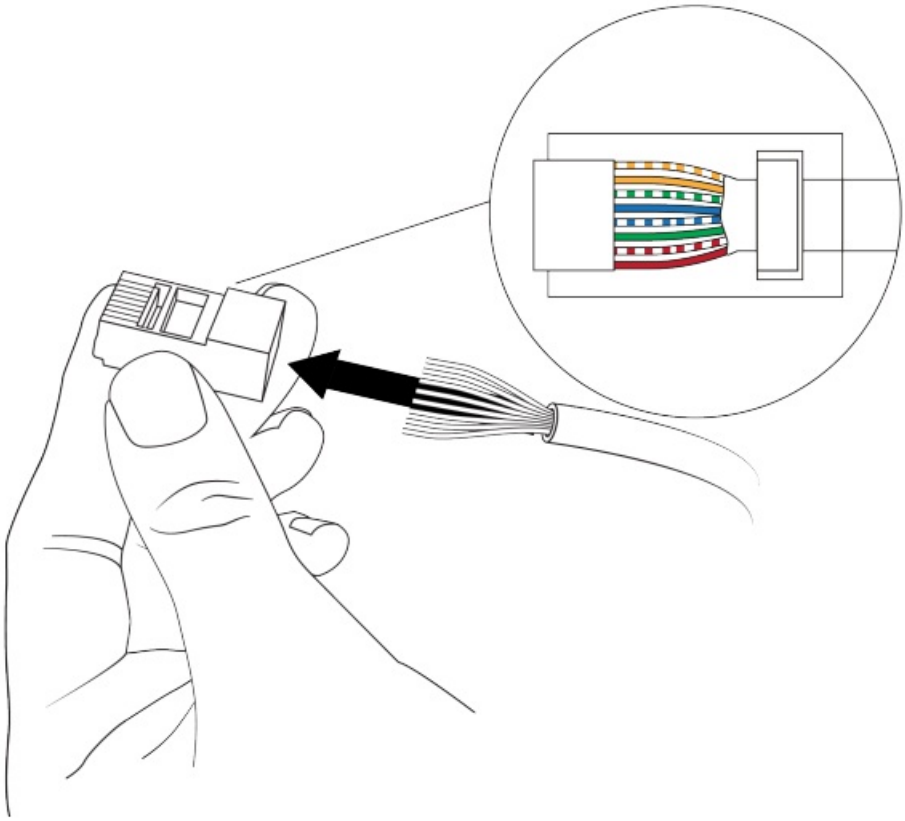
12. Remove the covers from the charging station.

Note

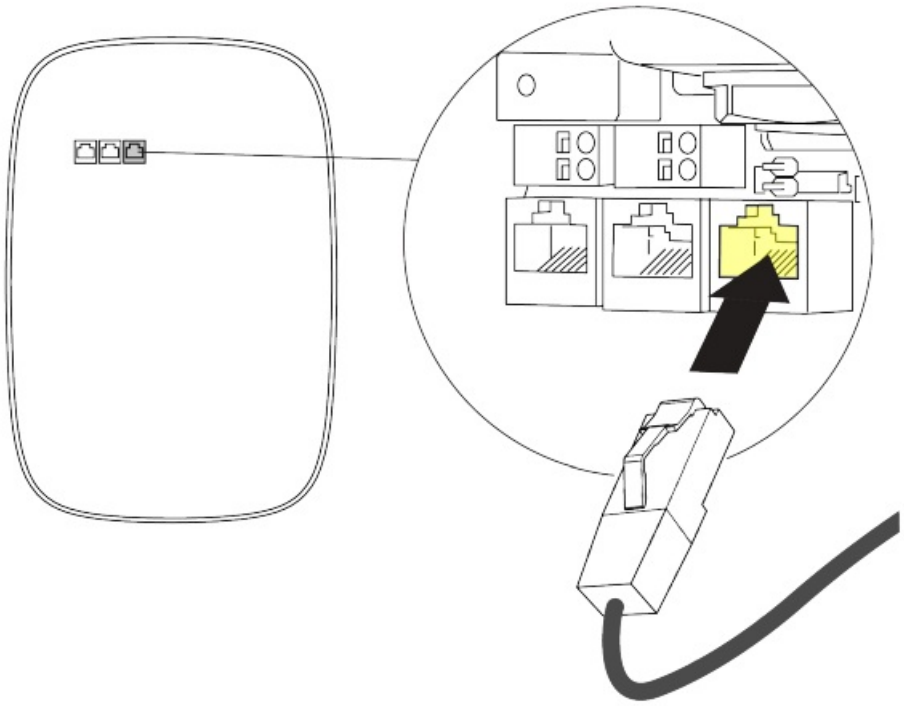
Refer to the installation manual of the charging station to learn about the following:

- Removing the covers from the charging station
- Finding the input connector for DLB
- Routing a network cable into the station

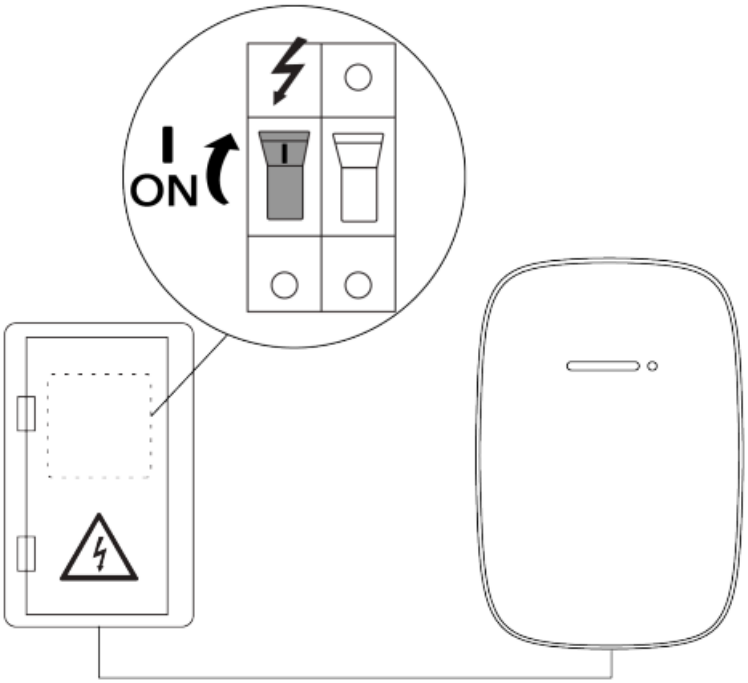
13. If an RJ45 plug is not pre-installed, install an RJ45 plug on the station end of the network cable.



14. Connect the network cable to the RJ45 socket for dynamic load balancing in the charging station.



15. Install the covers on the charging station.
16. Switch on the power to the charging station.



Configuration and testing

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

1. Download and install the EVBox Install app on your smartphone or tablet.
2.

3. Open the EVBox Install app on your smartphone or tablet and connect to the charging station. The charging station-specific information required for station configuration is on the sticker stored with the charging station documentation.

   Note Make sure that the EVBox Install app is up-to-date and that the charging station is running the latest firmware

4. . Follow the configuration instructions in the EVBox Install app
5. Follow the configuration instructions in the EVBox Install app.

   After the configuration, the EVBox Install app must show a reading from each current sensor. If a reading is not shown, see Troubleshooting on page 21.

Note

If the house or facility has a solar power system, excess power that cannot be used or stored is fed back to the grid (which results in a negative energy consumption). At present, the EVBox Install app indicates this as a positive value.

Troubleshooting

Problem	Possible cause	Solution
		Make sure that the
	The network cable is	network cable is
	not connected to the	connected to the
	charging station.	correct port in the
The EVBox Install app does not sh ow any values.		charging station.
	The network cable is not connected to the DLB adapter.	Make sure that the network cable is connected to the DLB adapter.
	The network cable is not crimped p roperly.	Make sure that the network cable is crimped properly.
		Make sure that the
Not all readings are received in the EVBox Install app. (2-phase and 3-phase configuration)	The related current sensor is not co nnected to the DLB adapter.	current sensor is connected to the DLB adapter. Increase the electrica l load to >1A, and check again.
	The network cable is not crimped p roperly.	Make sure that the network cable is crimped properly.

Appendix

EU Declaration of Conformity

EVBox B.V. declares that the equipment type EVBox Dynamic Load Balancing Kit is in compliance with Directive 2014/35/EU. The full text of the EU Declaration of Conformity is available at **help.evbox.com**.

Documents / Resources

	**EVBOX Dynamic Load Balancing Kit** [pdf] Installation Guide Dynamic Load Balancing Kit, Load Balancing Kit, Balancing Kit, Kit

References

- Help Center EVBox
- Help Center EVBox
- Smart EV charging stations and software | EVBox
- EVBox Branding