



EN/MLI/AAI/12-11-2020



## Introduction

#### Dear customer!

You have chosen a product from **KS Tools**. We thank you for placing your trust in **efuturo** and our products. In this manual, you will find all the information you need for safe and proper use. Therefore, read the manual completely before use and always follow the instructions contained in the manual.

## General

These instructions will help you to take the device into operation and to operate it without malfunction or risk.



Read the manual before you take the device into operation.

This manual will help you to:

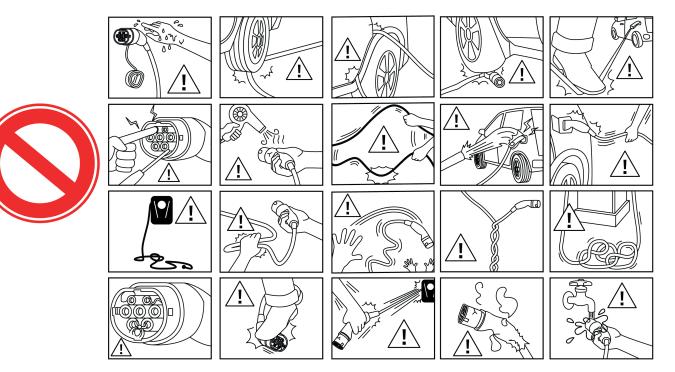
- avert dangers
- familiarise yourself with the device
- achieve optimum function
- · identify and remedy defects in good time
- avoid malfunctions due to improper installation
- prevent repair costs and downtimes
- · increase the reliability and lifetime of the device
- prevent risks to the environment

The manual is an important part of the product and must be kept for future reference.

KS Tools GmbH does not accept liability for damage caused by failure to observe the instructions in this manual.



## **Basic safety instructions**



- ▲ Do not drive over the plug
- $\triangle$  Do not drive over the charging cable
- $\triangle$  Do not squash the charging cable
- △ Only pull the charging cable out of the charging socket directly at the plug
- $\triangle$  Do not heat the plug and cable
- $\triangle$  Do not kink the cable
- ▲ Do not twist the cable
- ▲ Keep children away from the charging cable
- ▲ Keep animals away from the charging cable
- ▲ Do not use adapter plugs or extension cables
- ▲ Connect the charging cable to a suitable charging infrastructure that does not have any defects
- A Protect plug connections and plug-and-socket devices against moisture and liquids
- △ Do not use the charging cable in potentially explosive environments containing flammable liquids, gases or dust
- A Protect charging infrastructure against direct environmental influences such as water jets, snow, sand, hail





## Safety instructions

The following signal words and symbols are used:

#### 🛕 Danger

This symbol in conjunction with the signal word "Danger" indicates an immediate danger. Non-observance of the safety instructions will result in serious or fatal injury.

## **Marning**

This symbol in conjunction with the signal word "Warning" indicates a possibly dangerous situation. Non-observance of the safety instructions can result in extremely serious or fatal injuries.

#### ▲ Caution

This symbol in conjunction with the signal word "Caution" indicates a possibly dangerous situation. Non-observance can result in slight or minor injuries.

#### **Attention**

This instruction indicates a potentially harmful situation. Non-observance of the safety instruction can result in damage or destruction of the product and/or other components.

#### General information on safety

The product is built according to the current state of the art and is safe to operate.

Nevertheless, under the following circumstances, residual risks may still arise from the product:

- The product is not used as intended
- It is improperly maintained
- Non-observance of the safety instructions
- Improper changes

#### **A** Danger

#### Danger to life through non-observance of the documentation!

Everyone charged with working on the system must have read and understood these instructions and especially the "Safety" chapter.

The electrical installation, start-up and maintenance of the device are only allowed to be carried out by qualified electricians. The following rules and regulations must be observed in addition to the safety instructions in this manual:

- Accident prevention regulations (UVV)
- · Occupational health regulations
- · Generally recognised safety rules
- Country-specific provisions
- Intended use

In addition, these rules and regulations can be further supplemented by internal plant or internal company regulations.





## Intended use

The device is intended exclusively intended for use as described in the "Product description" chapter with the supplied and approved components.

Any use beyond this is considered not in accordance with the intended use. **KS Tools GmbH** is not liable for any damage resulting from this. The risk for this is borne solely by the owner/user.

The following points also form part of the intended use:

- Observance of all instructions in this manual
- Compliance with the maintenance work

The device can be dangerous if it is not employed in accordance with its intended use.

## **Qualification of personnel**

The electrical installation, start-up and maintenance of the device are only allowed to be carried out by a qualified electrician. The specialist must have read and understood this installation manual.

Requirements for a qualified electrician:

- · Observance of the general and special safety and accident prevention regulations
- Observance (e.g. DIN VDE 0100 part 600, DIN VDE 0100-722) as well as the applicable national regulations
- · Ability to identify and assess risks and hazards in order to prevent hazards

#### Instructions for persons with a pacemaker or implanted defibrillator

Charging systems from **KS Tools** that are operated as intended comply with the European Directive on Electromagnetic Compatibility with regard to interference radiation.

If persons with a pacemaker or defibrillator wish to carry out activities on charging systems and their equipment in normal operation, **KS Tools** cannot make any statement regarding the suitability of such medical devices. **KS Tools GmbH** is not in a position to assess the corresponding pacemakers or defibrillators with regard to their susceptibility to electromagnetic radiation. Only the manufacturer of the pacemaker or defibrillator can do this. **KS Tools GmbH** therefore recommends that affected persons should not work on our charging systems until they have consulted the manufacturer of the pacemaker or defibrillator radiation. The pacemaker or defibrillator systems until they have consulted the manufacturer of the pacemaker or defibrillator systems until they have consulted the manufacturer of the pacemaker or defibrillator systems until they have consulted the manufacturer of the pacemaker or defibrillator systems until they have consulted the manufacturer of the pacemaker or defibrillator systems until they have consulted the manufacturer of the pacemaker or defibrillator and the responsible insurer. In any case, make sure in advance that there are never any health or safety risks.

Persons with a pacemaker or defibrillator must not work on or be present at charging systems and their equipment, e.g. for maintenance purposes or for troubleshooting.

## Sending back devices

If you send the device back to **KS Tools GmbH** for repair, use the original packaging or a suitable secure transport container.

## Warranty

If you have any complaints about the device, contact KS Tools GmbH immediately, stating:

- Type designation AND serial number
- Reason for the complaint
- Time in service
- Ambient conditions (temperature, humidity, installation location)





## General

The **efuturo** Wallbox is a charging station for use in private and semi-public areas, e.g. company car parks, transport depots or private properties. The charging station is used exclusively for charging electric vehicles:

- Charging according to Mode 3 according to IEC 61851, SAE J1772
- Plug-and-socket devices according to IEC 62196

The charging station is operated as a single-site solution. The charging station is intended exclusively for fixed installation.

## **Equipment features**

- Status information via LED info field
- Integrated means for hanging up the charging cable
- Wired ready for connection

## **Optional equipment**

The following optional features are available depending on the variant of the charging station:





Fig. 1

Fig. 2

Depending on the version, the charging station is equipped with one of the following plug systems:

- 1. Fig. 1: Type 2 charging socket for use of separate charging cables
- 2. Fig. 2: Permanently connected charging cable with Type 2 charging coupling
- 3. RFID module to activate and control the Wallbox
- 4. MID electricity meter for determining consumption

## Type plate

	efuturo G	imbH
	Modell: 1 XXX	
	Тур: <mark>2</mark> ХХХ	
	SN: 3 XXX	
	Volt: 4 XXX max	. Input: 6 XXX
	Schutzart: 5XXX G	ewicht: 🚺 XXX
1	Model designation	6 Protection type
2	Model name	6 Output in kW
3	Serial number	<b>7</b> Weight in kg
4	Operational voltage	





## Contents

The scope of delivery includes

- Wallbox
- Instruction manual
- Drilling template
- Mounting material
- CE declaration
- VDE application form

(j) The RFID card can be reordered from the following address, stating the serial number of the Wallbox:

## KS Tools Werkzeuge - Maschinen GmbH

Seligenstädter Grund 10-12

63150 Heusenstamm - Germany Phone: 0049 6104 / 49 74 0 Fax: 0049 6104 / 49 74 11 E-Mail: info@efuturo.com

## Composition Exterior view



The charging station housing consists of 3 parts: the housing itself, the front cover and the outer ring. To access the internal components, the screws on the front cover must be removed. To do this, first remove the outer ring. This is simply clicked into place.







#### **Interior view**



The charging station contains all the components required for controlling the charging process and for communication with the vehicle.





## **Front panel**



The front cover contains the LED display, the contact field for RFID access control (optional) and the Type 2 charging socket (for devices with Type 2 charging socket) or the Type 2 holder (for devices with permanently connected Type 2 charging cable).

#### **Technical data**

Version with socket	3,7 kW
Nominal voltage	230 V
Nominal frequency	50 Hz
Rated current	16 A
Mode 3 charging capacity	3,7 kW
Protection type	IP 55
Protection class	1
Dimensions (H x W x D)	326 x 199 x 132 mm
Weight	2,65 kg

Version with cable	3,7 kW
Nominal voltage	230 V
Nominal frequency	50 Hz
Rated current	16 A
Mode 3 charging capacity	3,7 kW
Protection type	IP 55
Protection class	1
Dimensions (H x W x D)	326 x 199 x 132 mm
Weight	4,4 kg







Version with socket	7,4 kW
Nominal voltage	230 V
Nominal frequency	50 Hz
Rated current	32 A
Mode 3 charging capacity	7,4 kW
Protection type	IP 55
Protection class	1
Dimensions (H x W x D)	326 x 199 x 132 mm
Weight	2,65 kg

Version with cable	7,4 kW
Nominal voltage	230 V
Nominal frequency	50 Hz
Rated current	32 A
Mode 3 charging capacity	7,4 kW
Protection type	IP 55
Protection class	1
Dimensions (H x W x D)	326 x 199 x 132 mm
Weight	4,4 kg

Version with socket	11 kW
Nominal voltage	400 V
Nominal frequency	50 Hz
Rated current	16 A
Mode 3 charging capacity	11 kW
Protection type	IP 55
Protection class	1
Dimensions (H x W x D)	326 x 199 x 132 mm
Weight	2,8 kg

Version with cable	11 kW
Nominal voltage	400 V
Nominal frequency	50 Hz
Rated current	16 A
Mode 3 charging capacity	11 kW
Protection type	IP 55
Protection class	1
Dimensions (H x W x D)	326 x 199 x 132 mm
Weight	5,6 kg



Version with socket	22 kW
Nominal voltage	400 V
Nominal frequency	50 Hz
Rated current	32 A
Mode 3 charging capacity	22 kW
Protection type	IP 55
Protection class	1
Dimensions (H x W x D)	326 x 199 x 132 mm
Weight	2,8 kg

Version with cable	22 kW
Nominal voltage	400 V
Nominal frequency	50 Hz
Rated current	32 A
Mode 3 charging capacity	22 kW
Protection type	IP 55
Protection class	1
Dimensions (H x W x D)	326 x 199 x 132 mm
Weight	5,6 kg

## **Ambient conditions**

Ambient temperature	-40°C +45°C
Storage temperature	-40°C +45°C
Altitude	max. 2000 metres above sea level
Relative humidity	< 85%

# Installation

## **Danger**

## Danger of fatal injury due to improper installation!

There is a danger of fatal injury to persons carrying out work for which they have neither been qualified nor instructed.

- The device is only allowed to be installed by persons who are familiar with it, have been informed about the dangers and possess the necessary qualifications.
- All safety conditions must be fulfilled before installation.





## **Choice of location**

#### **Marning**

#### Danger due to unsuitable ambient conditions/installation locations.

Unsuitable ambient conditions and installation locations can lead to dangerous situations when handling electrical current. Please note the following points when setting up the Wallbox.

- Do not set up in potentially explosive atmospheres (Ex zones) (e.g. service stations)
- · Do not set up in areas subject to flooding
- Observe the local technical connection conditions and safety rules
- Observe ambient conditions
- Protection of the charging system against direct water jets
- The mounting surface must have sufficient strength to withstand the mechanical loads. When mounting on gypsum plasterboard walls, these must be at least double-layered

## Unpacking

#### **Attention**

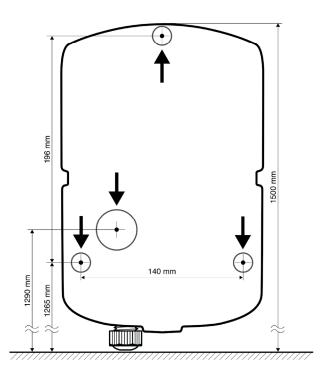
#### Damage to the charging station due to improper handling.

Collisions and shocks can damage the charging station

- Always move the Wallbox with great care
- Use a soft underlay on which to place the Wallbox
- · Avoid opening the packaging with sharp and pointed objects

#### Unpacking the charging station

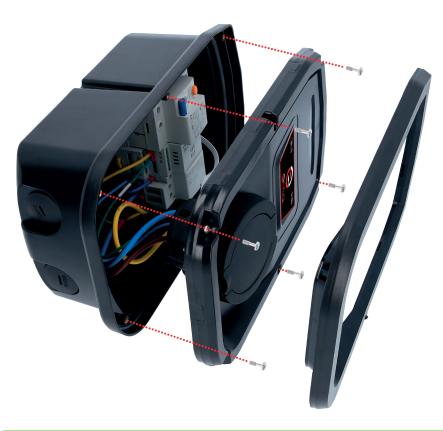
- 1. Remove the Wallbox and the drilling template from the box
- 2. Place the Wallbox on a soft surface. The foam inlay on top of the Wallbox is suitable for this purpose



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## **Opening the charging station**



#### ▲ Attention

#### Damage to the device.

Damage to the device due to improper handling.

- 1. Remove the outer ring on the Wallbox.
- 2. Remove the screws on the front cover. Make sure that the screws do not get lost.
- 3. Lift the front cover and make sure that you do not damage any cables or cable connections on the inside.

## Installation

## Surface-mounted installation of the feeder cable

If the feeder cable or cable duct comes from below, the feeder cable to the Wallbox is introduced via the cable gland.

## Flush-mounted installation of the feeder cable

When flush-mounted installation of the feeder cable, the positions must be set according to the drilling template.

## Installation of the charging station on the wall

1 For installation on concrete, brick and wooden walls, use the enclosed mounting material.

If the substrate is different, a suitable type of mounting must be selected on-site. **KS Tools GmbH** recommends mounting the charging station at a height of approx. 1.50 m above the finished floor (measured up to the top edge of the housing).



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- 1. Mark the mounting holes using the supplied drilling template and a spirit level.
- 2. Drill the holes in the wall with the diameter provided for the selected mounting material.
- 3. Route the feeder cable to the position indicated on the drilling template.
- 4. For the electrical connection, approx. 20 cm of cable are required inside the charging station.
- 5. Open the charging station see "Opening the charging station".
- 6. Insert the feeder cable into the charging station through the cable entry points.
- 7. Screw the charging station to the wall using suitable mounting materials. Check again with the spirit level and if necessary finely adjust the Wallbox with the screws.
- 8. Check the charging station for firm and secure fastening.

## **Electrical connection**

#### **Danger**

## Fatal shock hazard!

Components are live. Touching live parts will result in electric shock, burns or death. Observe the following points before working on the electrical system.

- Disconnect the device from the power supply
- Secure against switching back on
- Check freedom from voltage
- · Grounding and short circuiting
- Cover adjacent live parts and secure the danger zone

During installation, also observe the following points:

- This device is only allowed to be installed, started up and serviced by qualified electricians in compliance with the applicable national regulations, see the "Qualification of personnel" chapter
- Before connecting the device, ensure that it is not live, or take suitable protective measures

Observe the following points when connecting to the power supply:

- For installation in Germany, observe DIN VDE 0100 part 530
- When installing in other countries, observe the applicable national/local regulations
- For three-phase current connection, make sure there is a clockwise rotating field

## Security and personal protection

#### ▲ Danger

#### Fatal shock hazard!

• All current sensitive residual current circuit breakers (type B) must not be mounted behind pulse current sensitive residual current circuit breakers (type A).

The charging stations are equipped with a **type B** residual current circuit breaker <u>regardless of the equipment variant</u>. Observe the following points when connecting the charging station:

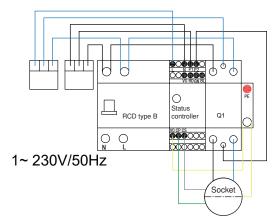
- Each charging station must be connected via a separate circuit breaker.
- No other circuits are allowed to be connected to this circuit breaker

#### Design of the on-site circuit breaker

The rating of the on-site circuit breaker is selected by a suitable qualified electrician.



## **Connection terminals**



Connect the feeder cable:

- 1. Remove the cable insulation from the feeder cable over a length of 150 mm. Remove the wire insulation and press on suitable wire end sleeves.
- 2. Connect the wires of the feeder cable according to the circuit diagram. The protective conductor (PE) must be longer than the remaining conductors!
- 3. Check that the individual wires are connected correctly and that the screws are tightened properly.

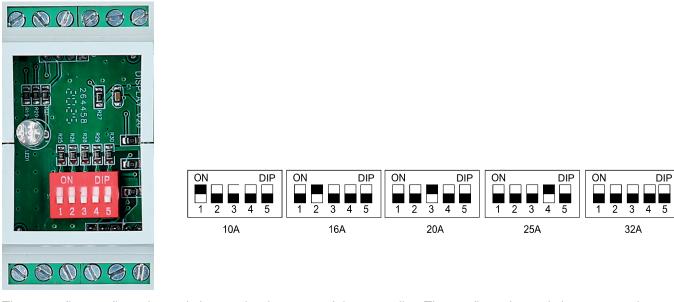
# Start-up

## Marning

#### Danger due to faulty start-up!

There is an increased risk of injury to persons carrying out work for which they have neither been qualified nor instructed.

- The device is only allowed to be installed by persons who are familiar with it, have been informed about the dangers and possess the necessary qualifications
- All safety conditions must be fulfilled before installation



There are five configuration switches under the cover of the controller. The configuration switches are used to set the charging current limit.





## Setting the charging current limit

The charging current provided can be limited by the configuration switches numbered one to five. In this way, the charging current can be adapted to the power available in the building installation, for example. The maximum charging current provided depends on the device version (see type plate) and cannot be exceeded.

The setting is made by combining the individual configuration switches.

#### Switching on the device

Proceed as follows to switch on the charging station:

- 1. Make sure that the protective device in the charging station is switched on.
- 2. Switch on the supply voltage.
- 3. Check the supply voltage at the charging station for clockwise rotating field.

 $\checkmark$  The LED info field indicates that the charging station is ready for operation

#### Test of the charging station

#### **Marning**

#### Danger of injury!

Risk of injury due to damage to the charging station. If it can be assumed that safe operation of the charging station is not possible:

- · Take the charging station out of operation
- Determine what is the fault and rectify it

#### Test according to DIN VDE 0100 or national regulations

During the initial start-up and at the specified maintenance intervals, carry out an inspection of the charging station in accordance with DIN VDE 0100 or the corresponding valid national regulations.

#### System test

A test box is required for a system test. The test box simulates communication with the vehicle.

Perform a system test with a test box before authorising the charging station.

Perform the system test according to the documentation of the test box.

#### **Closing the charging station**

#### **Attention**

#### Damage to the device.

Damage to the device due to improper handling.

#### **Closing the charging station**

- 1. Place the front cover on the housing and make sure that you do not damage any cables or cable connections on the inside.
- 2. Screw the front cover back on with the screws.
- 3. Click the outer ring back in.

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## Operation

## **Marning**

#### Danger of injury!

Risk of injury due to damage to the charging station. If it can be assumed that safe operation of the charging station is not possible:

- Take the charging station out of operation
- · Determine what is the fault and rectify it

## Hanging up the charging cable



The housing of the charging station is designed in such a way that it can be used for hanging up the charging cable. Optionally, you can also use our wall brackets.

## **LED display**

The LED display provides information about the operating status of the charging station..

#### **Cabled version:**

	LED display	Active function
No electrical power supply	Switched off	Wallbox switched off, no function
Blue	Light flashes	Establish connection
Blue	Light shines	Connection OK, after the charging process the LED changes back to a blue light
Green	Light shines	Charging active
Red	Light shines	Overheating, charging interrupted
Red	Light flashes	Fault, no charging process

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## Socket version:

	LED display	Active function
No electrical power supply	Switched off	Wallbox switched off, no function
Blue	Light shines	Establish connection
Blue	Light flashes	Connection OK
Green	Light shines	Charging active
Green	Light flashes	Charging process completed
Red	Light shines	Overheating, charging interrupted
Red	Light flashes	Fault, no charging process

## **RFID version:**

	LED display	Active function	
No electrical power supply	Switched off	Wallbox switched off, no function	
Blue	Light shines	Establish connection	
Blue	Light flashes	Connection OK	
Green	Light flashes	Charging active	
Green	Light shines	Charging process completed	
Red	Light shines	Overheating, charging interrupted	
Red	Light flashes	Fault, no charging process	

## Charging the vehicle

## **Marning**

## Risk of injury due to incorrect handling!

Using an extension cable or a second charging cable represents a risk of electric shock or cable fire. Using extension cables is not permitted.

- Always use only one charging cable to connect electric or hybrid vehicles and the charging station
- · Only use undamaged charging cables

## Starting the charging process

It is possible to use the charging station without access control.

For charging stations with RFID access control, prior authorisation via the RFID transponder card at the charging station is required.

Make sure that the vehicle and charging cable are suitable for Mode 3 charging.

- 1. Connect the charging cable to the vehicle.
- 2. Check that the charging cable is correctly positioned in the vehicle and on the Wallbox (for the socket version).
- 3. (RFID version) Start the charging process by RFID card\*.

The charging station now automatically carries out the following steps:

- Detection of current capacity
- · Check of the conditions for proper charging
- · Communication with the vehicle via the CP contact. The protective earth connection is checked at the same time
- The charging station locks the plug mechanically (for charging stations with integrated charging socket Type 2 and the optional magnetic lock). The vehicle signals to the charging station that it is ready for charging. The charging process starts.





## \*For 3.

Mode	Hold RFID card against sensor	Action	LED display	Status
ON	Once	Start	Green flashing	Charging
Period within two minutes after the start	Start + once extra	Setting for 1 h charging	Blue once + Green once	Charging for 1 h
Period within two minutes after the start	Start + twice extra	Setting for 2 h charging	Blue once + Green twice	Charging for 2 h
Period within two minutes after the start	Start + three times extra	Setting for 3 h charging	Blue once + Green three times	Charging for 3 h
OFF	repeated	Stop	Blue light	Standby

The maximum available charging current depends on the following points:

- · Connected load of the charging station
- · Equipment/version of the charging station
- · Current capacity of the charging cable
- Configuration of the DIP switches in the charging station

## Ending the charging process

#### **Attention**

#### Damage to the charging cable.

Pulling on the cable can lead to cable breakage and other damage.

Only pull the charging cable out of the charging socket directly at the plug.

The charging process can be terminated prematurely on the vehicle. If you have the RFID version of the Wallbox, you can also use the RFID card to stop the charging process.

If the cable is pulled out without first terminating the charging process, the Wallbox immediately switches off the charging process.

#### Maintenance

#### **Danger**

Fatal injury hazard due to improper maintenance/repair.

There is a danger of fatal injury to persons carrying out work for which they have neither been qualified nor instructed.

- The device is only allowed to be maintained/repaired by persons who are familiar with it, have been informed about the dangers and possess the necessary qualifications.
- Before maintenance/repair work is carried out, all safety conditions must be fulfilled.

#### ▲ Danger

#### Fatal shock hazard!

Components are live. Touching live parts will result in electric shock, burns or death. Observe the following points before working on the electrical system:

- Disconnect the device from the power supply
- Secure against switching back on
- Check freedom from voltage
- Grounding and short circuiting
- · Cover adjacent live parts and secure the danger zone

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## Maintenance plan

Carry out the following maintenance work at the specified intervals.

## Maintenance interval every 6 months (half-yearly)

Part/component	Maintenance work	
Housing	Visual inspection for defects or damage	
	Check device for secure mounting	
	Clean the housing from the outside with a damp cloth	
Front cover	Visual inspection for defects or damage	
Switching and safety devices	Visual inspection for defects or damage. Check the test button on the RCD	

## Maintenance interval every 4 years

In addition, carry out all maintenance work listed under "Maintenance interval every 6 months (half-yearly)".

Part/component	Maintenance work	
Cable connections and Plug-in	Check for firm attachment	
connectors	Visual inspection for defects or damage	
Charging station	Visual inspection for defects or damage	
	Check for function	
System test	Perform system test	
	See "System test" chapter	

## Troubleshooting

#### **Danger**

#### Fatal injury hazard due to improper maintenance/repair.

There is a danger of fatal injury to persons carrying out work for which they have neither been qualified nor instructed.

- The device is only allowed to be maintained/repaired by persons who are familiar with it, have been informed about the dangers and possess the necessary qualifications
- Before maintenance/repair work is carried out, all safety conditions must be fulfilled

#### **A** Danger

#### Fatal shock hazard!

Components are live. Touching live parts will result in electric shock, burns or death. Observe the following points before working on the electrical system.

- Disconnect the device from the power supply
- Secure against switching back on
- Check freedom from voltage
- Grounding and short circuiting
- Cover adjacent live parts and secure the danger zone





## Troubleshooting by a qualified electrician

Fault	Cause	Note on troubleshooting	
LED flashes red	Self-test of the charging station faulty	Switch off the charging station, after switching it on again the fault should be eliminated	
	Internal fault	Switch off the charging station, after switching it on again the fault should be eliminated.	
		Contact your service partner if the fault cannot be eliminated	
LED lights up red	Overheating, charging interrupted	Wait until the charging station has cooled down again	
LED display does not light up	No electrical power supply at the charging station	Check electrical power supply	
	Safety device in the charging station has tripped	Switch on the safety device again	

## Disassembly, storage and disposal

#### Disassembly

#### ▲ Danger

#### Fatal shock hazard!

Components are live. Touching live parts will result in electric shock, burns or death. Observe the following points before working on the electrical system.

- Disconnect the device from the power supply
- Secure against switching back on
- Check freedom from voltage
- Grounding and short circuiting
- Cover adjacent live parts and secure the danger zone

Carry out the disassembly as follows: (in compliance with the five safety rules)

1. Make sure that the electrical power supply is switched off.

- 2. Disconnect the feeder cable.
- 3. Disassemble the charging station.

## Storage

Storage must be in a clean, dry place.

## Disposal

The device must not be disposed of with household waste.

- Please send the defective device back to us. We will handle the professional disposal on your behalf
- If you have any questions, contact your dealer or disposal company
- Dispose of the packaging material in the waste containers for cardboard, paper and plastic