KEMPOWER

Charging equipment for electric vehicles

OWNER'S MANUAL

Power Unit, Station Charger and Satellites

PUBLIC REV 2.20 en 05-2024

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1. INTRODUCTION

1.1. Disclaimer on products and services

Kempower electric vehicle (EV) charging equipment deliveries typically consist of charging power unit(s), charging points, and connectivity tools. Charging hardware and software, together with the power grid, data communication network, various electric vehicles, charging operators, and users, form a complex entity.

1.1.1. Liability

Kempower is not liable for incidental or consequential damages arising from the use of any software or hardware.

1.1.2. Product specifications

Kempower reserves the right to change the specification of the product described at any time without prior notice.

1.1.3. Software development

Kempower constantly develops the software in terms of vehicle support, new features, and improvement of user interface experience. Kempower offers software updates upon request or periodically as part of a service contract.

Kempower provides software support for all active and valid ChargEye licenses.

1.2. Information about the warranty

1.2.1. Part replacement

NOTICE
When you replace parts under warranty, keep the faulty part until you have made sure that Kempower does not need to inspect it.

NOTE
Kempower guarantees spare parts available for a minimum of 10 years after production ramp down for the product.

1.2.2. Certification training

NOTICE
You must complete the Kempower certification training before you do installation, commissioning, service or maintenance tasks. Installation, commissioning, service or maintenance tasks done by an unapproved partner will void the warranty.

1.2.3. Warranty period

The warranty period is defined in your warranty policy. If you have purchased extended warranty, the warranty period is defined in your purchase agreement. For detailed information about the terms and conditions, see your warranty policy or purchase agreement. You can view the general warranty terms at kempower.com/kempower-terms-and-conditions.

1.2.4. Coverage

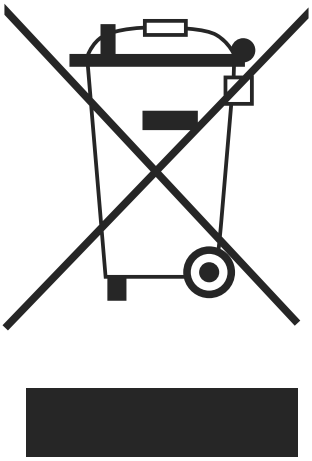
The warranty only covers the product and its parts delivered by Kempower. The warranty does not cover consumable parts such as cables and connectors, any other materials, labor, accommodation, or travel costs.

1.3. Information about the manufacturer

Manufacturer	Kempower Oyj
Address	Ala-Okeroistentie 29, 15700 Lahti, Finland
Phone	+358 29 0021900
Contact	kempower.com/support
Website	kempower.com

1.4. Recycling

- The product labeled with this symbol reminds that the product contains electrical and electronic parts and batteries which must be recycled in compliance with the **2012/19/EU on waste electrical and electronic equipment (WEEE) directive**.
- Comply with local laws. Always return packaging materials to dedicated collection points in accordance with the symbols on the packaging. After end of the product's working life, the product must be delivered to the local waste management company, which handles the recycling of the product in accordance with the law and regulations.
- When you make sure that the product is correctly reused and recycled, you protect the environment.
- When waste treatment operations are carried out on a professional level, the product is almost fully recyclable.



2. SAFETY

2.1. Symbols used in the instructions

DANGER
Indicates a hazardous situation which, if not avoided, will cause death or serious injury.

WARNING
Indicates a potentially hazardous situation which, if not avoided, may cause death or serious injury.

CAUTION
Indicates a potentially hazardous situation which, if not avoided, may cause moderate or minor injury.

NOTICE
Indicates a situation which, if not avoided, may cause property damage or an undesirable result or state.

NOTE
Indicates advice and recommendations for the safe and efficient use of the product or highlights unusual points.

2.2. Common risks

DANGER
Electric vehicle charging equipment must be located at a safe distance from potentially explosive atmospheres. Know and obey local laws and regulations.

WARNING
You must complete the Kempower certification training before you do installation, commissioning, service or maintenance tasks. Installation, commissioning, service or maintenance tasks done by an unapproved partner will void the warranty.

WARNING
Do not use the charging unit if the unit, its cables or vehicle connectors are damaged. Risk of electrical shock or fire.

CAUTION
Before you use the electric vehicle charging system, make sure that it is fully commissioned and approved for use.

CAUTION
Do not use running water or pressure washing equipment to clean the charging unit. Use a pH neutral detergent if necessary.

NOTICE
Changes or modifications to the charging equipment, unless specifically agreed upon with Kempower, are prohibited and will void the warranty.

NOTICE
Only use spare parts approved by Kempower.

NOTICE
During charging do not wrap the cables around the charging unit. Straighten tight loops in the cables.

NOTICE
Do not put the vehicle connector on the ground. Put the connector in its holder after charging.

NOTICE
The vehicle connector pins do not have voltage when the device is not charging.

2.3. Defective or damaged equipment

WARNING
Do not use the charging unit if the unit, its cables or vehicle connectors are damaged. Risk of electrical shock or fire.

If you find that a charging unit is visibly damaged:

- Do not connect the vehicle connector to your vehicle or start a new charging session.
- Stop any ongoing charging sessions immediately and remove the vehicle connector from your vehicle.
- Contact your local service or maintenance provider.

2.4. Fire safety

WARNING
Do not use the charging unit if the unit, its cables or vehicle connectors are damaged. Risk of electrical shock or fire.

If there is a fire:

- If possible, stop the charging session, remove the vehicle connector from the vehicle, and move the vehicle away from the charging equipment.
- Only use fire extinguishers suitable for electric equipment (CO^2 fire extinguishers).

- Alert the local authorities and obey their instructions.
- If possible, turn the charging equipment off:
  - Press the equipment stop button (if available).
  - Disconnect the main power supply.

> **NOTE**
> The AC Satellite is not connected to a charging power unit. It is connected directly to the main power supply.

- After extinguishing the fire, always contact Kempower before you start any maintenance work. Kempower will perform a critical failure analysis before maintenance work can be done.

2.5. Insulation monitoring circuit

The Satellite includes an insulation monitoring circuit, which fulfills the requirements of IEC 61851-23:2014.

The internal measurement circuit measures leakage from DC+ and DC-. When no leakage is detected, operation continues normally. If leakage current is detected, the output is controlled to shut down and an alarm is displayed on the charging unit. The current detection limit is 6 mA.

2.6. Environment

> **DANGER**
> Electric vehicle charging equipment must be located at a safe distance from potentially explosive atmospheres. Know and obey local laws and regulations.

> **NOTE**
> See the product datasheets for specifications. Product datasheets are available at mediabank.kempower.com.

- The environment of the charging unit must conform with its IP classification.
- The airflow to and from the charging unit must be unrestricted.
- The preventive maintenance intervals depend on the environmental conditions. For additional information, see 11: Preventive maintenance.

2.7. Derating of the system in high temperatures

NOTE
See the product datasheets for specifications. Product datasheets are available at mediabank.kempower.com.

In higher temperatures, derating is used to prevent damage to the electrical components. Derating automatically decreases the charging power provided by the charging unit. Kempower charging units provide maximum charging power at the start of the charging session, and derate as necessary during the session if temperatures inside the charging unit rise too high. Note that electric vehicles also derate as necessary in higher temperatures.

3. OVERVIEW

3.1. Planning the electric vehicle charging site

DANGER
Electric vehicle charging equipment must be located at a safe distance from potentially explosive atmospheres. Know and obey local laws and regulations.

NOTICE
The site plan is the customer's responsibility. Kempower does not provide plans for individual installations.

NOTICE
Branding according to Kempower Branding Guidelines. Applying additional painting or stickers to the unit by the customer voids the warranty.

NOTE
See the product datasheets for the dimensions and weights of the units. Product datasheets are available at mediabank.kempower.com.

As the requirements of individual installations vary significantly, it is not possible to give detailed instructions that are valid for all sites. Take into account at least the following general issues when you plan the layout of the electric vehicle charging site:

- The local rules and requirements on civil works, electrical installations, cable routing, and cable dimensioning. Cable dimensioning is the electrical designer's responsibility. For assistance, contact Kempower Sales Support.
- When you determine cable lengths:
    - Leave an additional 1000 mm of supply power cable length above the installation surface.

    - For Satellites, leave an additional 1700 mm of control cable and communication cable length above the installation surface.
- How the units are moved to and within the installation site. The maximum allowed tilting for the charging power units is 6 degrees.
- The installation surfaces of the site:
    - The units can be installed directly on a flat, level, and solid surface that can withstand the weight of the unit, or on concrete foundations that are prefabricated or made on site.
    - The cables can be routed above or below the ground. If the cables are installed in cable channels, make sure that the cable channels are wide enough for all required cables.
- The specific requirements and ambient conditions of the site:
    - If you plan to install the charging power unit in a closed space, contact Kempower Sales Support to approve the location before installation. If the unit is installed indoors, make sure that the air flow to the unit is sufficient.
    - If the temperature stays above 30 °C for long periods of time, we recommend placing the charging power unit in a well-ventilated shelter with the display screen facing away from direct sunlight. For assistance, contact Kempower Sales Support.
    - The location of the main supply point: supply grid main distribution board or one of the secondary substations.
    - The configuration of your communication system. Connectivity to the Kempower ChargEye and possible OCPP backend system requires an Internet connection, either with a SIM card or Ethernet (SuperCat 6/7 shielded) cabling to your wide area network (WAN) router.
    - The charging power unit must be easily accessible for maintenance without disturbing traffic or other movement in the charging area.
    - The charging points must be easily accessible to the end users.
    - The maximum distance between the charging power unit and a connected charging point is approximately 80 m.

The Kempower delivery includes the charging equipment and cabling inside the units. Cabling from the AC main power supply to the unit(s), cabling between the units, and any other components are the customer's responsibility.

3.1.1. Backend integration requirements

NOTE
Plan for any backend integrations as early on in the process as possible.

3.1.1.1. Backend systems

If you plan to use a third-party backend system to manage the charging equipment, make sure to:

- Read the Open Charge Point Protocol (OCPP) and application programming interface (API) documentation provided by Kempower.
- Contact Kempower Sales Support for support in the integration process.

3.1.1.2. Payment service providers

If you plan to use a third-party payment service provider, make sure to:

- Ask Kempower if the selected payment service provider is already supported by the system. If not, plan the integration work together with Kempower and adjust the project schedule accordingly.
- Note that Kempower provides the payment terminal hardware but does not provide payment services or participate in the implementation of the payment service.
- Contact the gateway/processing bank as soon as possible to start the registration process to reduce delays. Usually this stage takes at least 4 weeks.

3.1.2. Installation requirements

The installation phase includes both the mechanical and electrical installation of the charging equipment. For additional information, see the installation manual.

3.1.2.1. Qualifications

- You must be authorized to do electrical work and know the applicable electrical safety requirements.
- You must complete the Kempower certification training before you do installation, commissioning, service or maintenance tasks.

3.1.2.2. General requirements

- Obey local rules and requirements on civil works, electrical installations, cable routing, cable dimensioning, and health and safety, such as local regulations regarding personal protective equipment (PPE).
- Obey Kempower installation instructions. For additional information, see the installation manual.
- We recommend that site plans for sites with more than 250 kW of charging capacity and five or more charging outputs are submitted to be reviewed and approved by Kempower Sales Support before you start the installation.
- Use suitable tools and equipment for the installation. For additional information, see the Kempower certification training materials and the installation manual.
- Before you start the installation, make sure that all delivered parts are correct and not damaged.

3.1.2.3. Testing

NOTE
Note that this is an indicative list, not a comprehensive checklist for testing your charging site.

- Test the installation for electrical safety (usually done by an external electrical inspector). Obey local rules and requirements.
- Examine and correctly set the AC main supply circuit breaker current for each Power Unit.
- Do the following electrical tests:
    - Ethernet cables tests (such as correct cable type, correct wiring, attenuation).
    - Continuity tests for power and control cables and the protective circuit.
    - Trip test for the power supply residual current device of the AC Satellite.
    - Phase direction test for the AC Satellite.
    - Other tests required by local rules and regulations.

3.1.2.4. Inspection

Inspect the installation according to the Kempower installation checklist. Submit the completed document to Kempower ChargEye. For additional information, contact Kempower Technical Support.

3.1.3. Commissioning requirements

The commissioning phase includes taking the charging equipment into use, such as powering, configuring and testing the equipment. For additional information, see the installation manual.

3.1.3.1. Qualifications

- You must complete the Kempower certification training before you do installation, commissioning, service or maintenance tasks.
- We recommend that you have an authorized electrician on site during commissioning to repair possible electrical installation errors.

3.1.3.2. General requirements

- Obey local rules and requirements, such as regarding the use of personal protective equipment (PPE).
- Obey Kempower commissioning instructions. For additional information, see the installation manual.
- Use the Kempower Commissioning Tool software (or Kempower Maintenance Tool for offline cases) to configure the charging equipment.

3.1.3.3. Testing

NOTE
Note that this is an indicative list, not a comprehensive checklist for testing your charging site.

- Test the cloud connection to the third-party backend system (option). Also test the second SIM card and wireless connection, if applicable.
- Test the connection to the third-party payment provider (option). For additional information, contact Kempower Technical Support.
- Test each charging output using either a suitable electric vehicle or a Comemso EV simulator/charger tester (min. 1 minute/vehicle connector).
- Test the equipment stop function (option).

3.1.3.4. Inspection

Complete the commissioning according to the Kempower commissioning checklist. Submit the completed document to Kempower ChargEye. For additional information, contact Kempower Technical Support.

3.1.4. Maintenance requirements

Maintenance includes both preventive and corrective maintenance tasks, such as on-site repairs, installing replacements, retrofits, upgrades and warranty work. For additional information, see the maintenance manual.

3.1.4.1. Qualifications

- You must be authorized to do electrical work and know the applicable electrical safety requirements.
- You must complete the Kempower certification training before you do installation, commissioning, service or maintenance tasks.
- You must be a Kempower Authorized Partner or other Kempower approved third party to perform warranty work.

3.1.4.2. General requirements

- Obey local rules and requirements, such as regarding the use of personal protective equipment (PPE).
- Obey Kempower maintenance instructions. For additional information, see the maintenance manual.
- Use suitable tools and equipment for the maintenance tasks.
  For additional information, see the Kempower certification training materials and the maintenance manual.
- Preventive and corrective maintenance tasks are invoiced according to fixed labor times per tasks as defined by Kempower.

3.1.4.3. Testing

NOTE
Note that this is an indicative list, not a comprehensive checklist for testing your charging site.

- If electrical circuits are affected by the maintenance work, test the installation for electrical safety (usually done by an external electrical inspector). Obey local rules and requirements.
- Do the following electrical tests:

    - Continuity tests for power and control cables and the protective circuit.
    - Trip test for the power supply residual current device, in accordance with local standards and regulation, or at minimum the relevant IEC standards. For additional information, contact Kempower Technical Support.
    - Other tests required by local rules and regulations.
- Test each charging output using either a suitable electric vehicle or a Comemso EV simulator/charger tester (min. 1 minute/vehicle connector).

3.1.4.4. Inspection

Complete the Kempower field visit report. Submit the completed document to Kempower ChargEye. For additional information, contact Kempower Technical Support.

3.2. Kempower charging equipment for electric vehicles

As the design of Kempower electric vehicle charging equipment is modular, the charging site can be expanded when necessary. The charging equipment is connected to the Internet and the Kempower ChargEye system via a cellular or Wi-Fi network or hardwired Ethernet connection.

- Kempower Power Unit is a charging power unit that receives power from the electric power distribution network and distributes it to 1–8 DC charging points. The Power Unit can be a single, double, or triple cabinet unit. Each cabinet can be equipped with 1–4 s (C500/500 V and C800/800 V). Charging power management can be dynamic or static, see 3.2.1: Charging power management.
- Kempower Station Charger consists of a charging power unit, 1–2 DC vehicle connectors per cabinet, and a user interface. The Station Charger can be a single or double cabinet unit.
- Kempower Satellite is the charging point connected to the charging power unit.
- Kempower Liquid Cooled Satellite is a high-power charging point connected to the charging power unit.
- Kempower Control Unit is a charging point connected to the charging power unit.
- Kempower AC Satellite is a standalone AC charging point that is not connected to a charging power unit but directly to the main power supply.

3.2.1. Charging power management

The charging power management method of the charging power unit can be dynamic or static. Dynamic charging power management is one of the key elements in optimizing the charging of electric vehicles. While it is possible to later expand the modular configuration, the type of charging power management cannot be changed from static to dynamic after installation unless you order a dynamic-ready configuration.

The charging power unit can have 1–12 power modules (1–4 per cabinet) that each have two independent power channels (2 x 25 kW). The power distribution module can distribute charging power to 1–8 charging points. The available charging power depends on the maximum charging power level that the electric vehicle can accept, the output capacity of the charging points, and the power capacity of the charging site.

In dynamic charging power management, the power distribution module routes and re-routes the power channels to the charging points during the charging session.

In static (S2, S4, S8) charging power management, a fixed amount of charging power is routed to the charging point(s).

Table 1. Example of dynamic and static charging power management

Charging power unit with 4 x 50 kW power modules (200 kW)	**Output to 4 charging points**
Dynamic output (Ds4) @ 400 V	25–200 kW
Dynamic output (Ds4, adaptive voltage) @ 800 V	50–200 kW
Dynamic output (Ds4) @ 667 V	25–200 kW
Static output (S4) @ 500 V/800 V	50 kW

Dynamic charging can operate in two modes:

- Democratic mode where the charging power is distributed evenly to all charging points in use. See Figure 1.
- Priority mode where charging power is distributed in order of priority. The priority type is set in Kempower ChargEye and can be customized to your needs. For example, arrival priority (FIFO, first in first out) is where the first arrival gets the most charging power (as requested by the vehicle). When the first vehicle leaves, the freed capacity is shared in arrival priority with the remaining vehicles. See Figure 2.

Figure 1. Example of dynamic charging in democratic mode

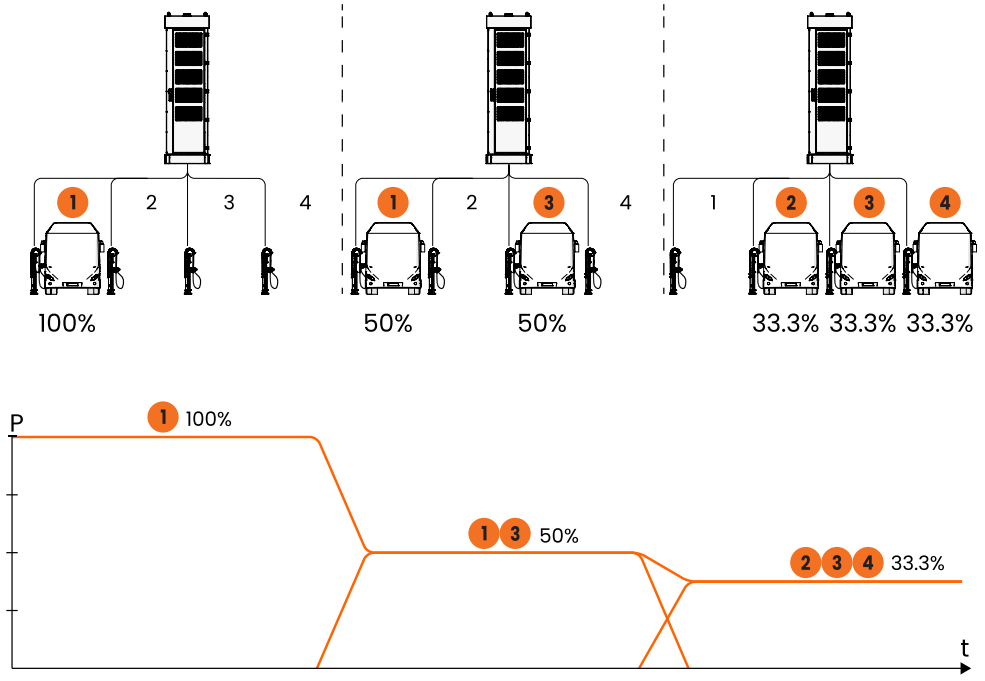
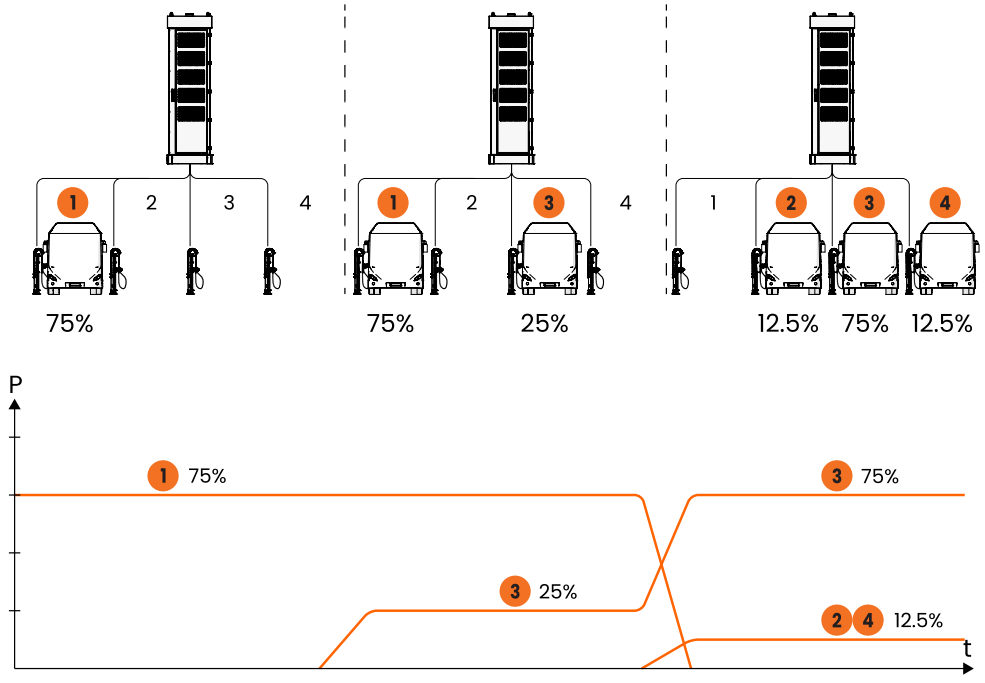


Figure 2. Example of dynamic charging in arrival priority mode (in this example the first vehicle requests only 75% of the available power)



3.3. Identifiers

Serial number

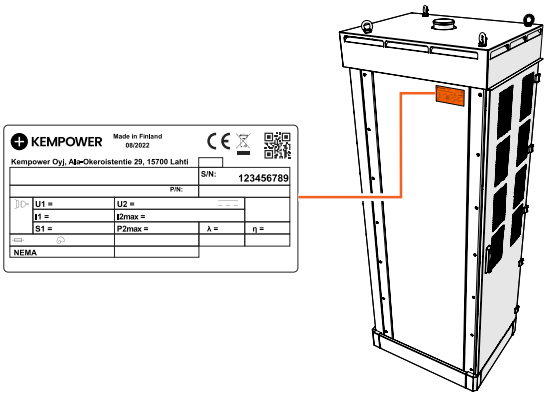
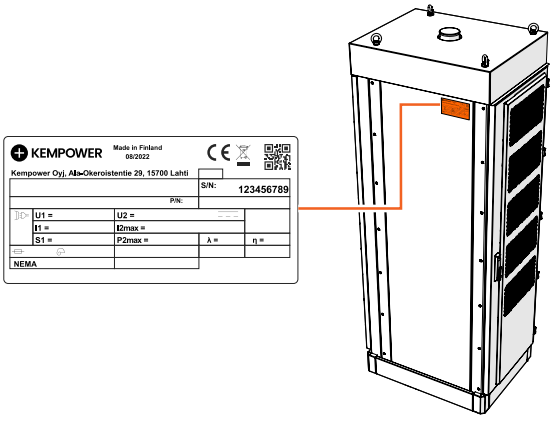
The serial number of the unit is given on the rating plate. The correct serial number is important when you order spare parts or repair the unit.

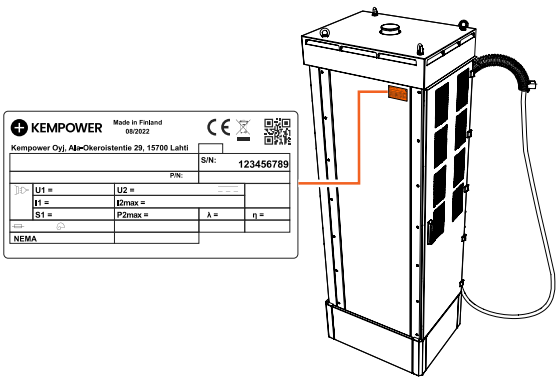
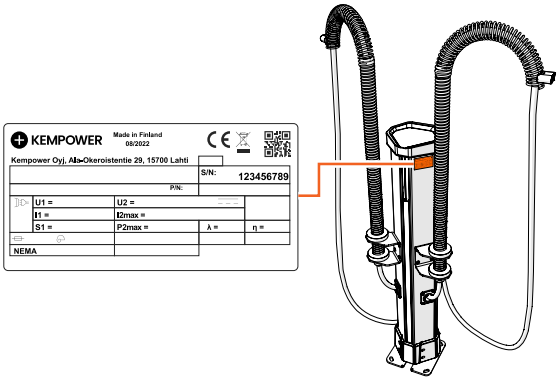
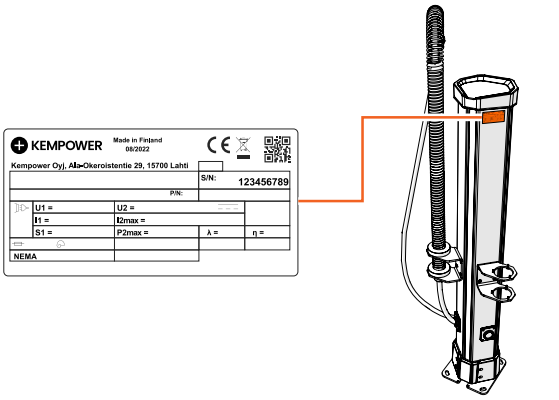
Quick response (QR) code or barcode

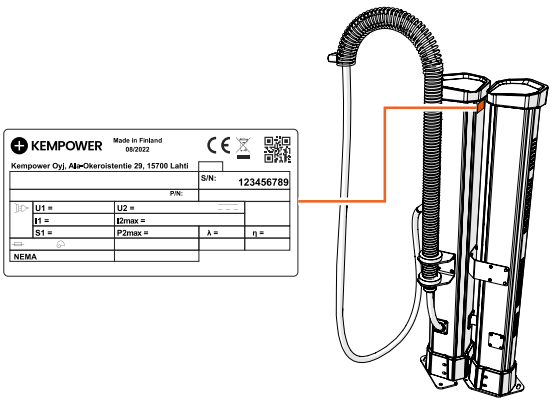
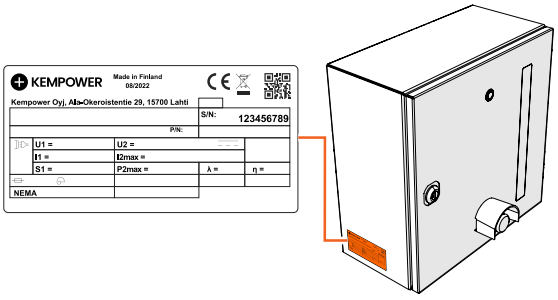
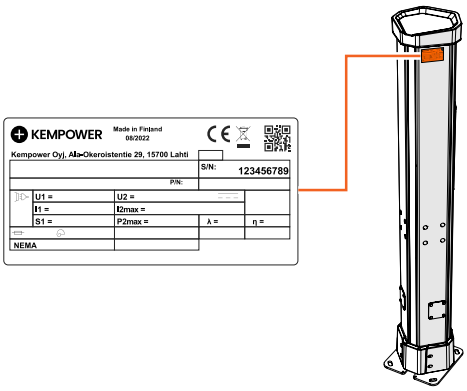
The serial number and other information about the unit can also be given as a QR code or barcode on the unit's rating plate. Use a mobile phone with a QR application or a code reader to access the information.

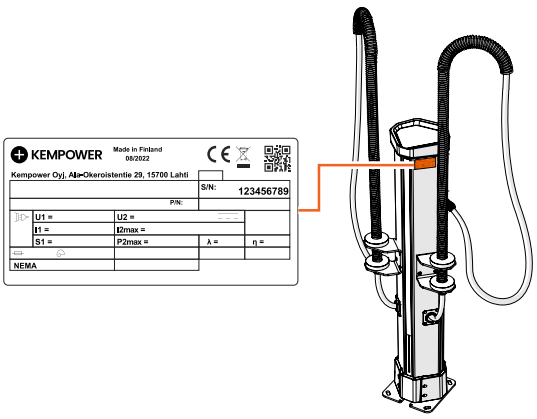
Rating plate

Information about the unit is marked on the rating plate. If the unit is upgraded, Kempower adds a retrofit sticker to the unit. The location of the rating plate on the units:

Product	Description	Image
Power Unit	On the left side of the cabinet, in the top right corner.	
Power Unit Version 3	On the left side of the cabinet, in the top right corner.	

Product	Description	Image
Station Charger	On the left side of the cabinet, in the top right corner.	
Satellite	On the rear side of the unit, in the top right corner.	
Satellite Version 2	On the rear side of the unit, in the top right corner.	

Product	Description	Image
Liquid Cooled Satellite	On the rear side of the unit, in the top right corner.	
Control Unit	On the left side of the unit, in the bottom left corner.	
AC Satellite	On the rear side of the unit, in the top right corner.	

Product	Description	Image
AC Satellite with charging cables	On the rear side of the unit, in the top right corner.	

3.4. Kempower charging power units

3.4.1. Power Unit

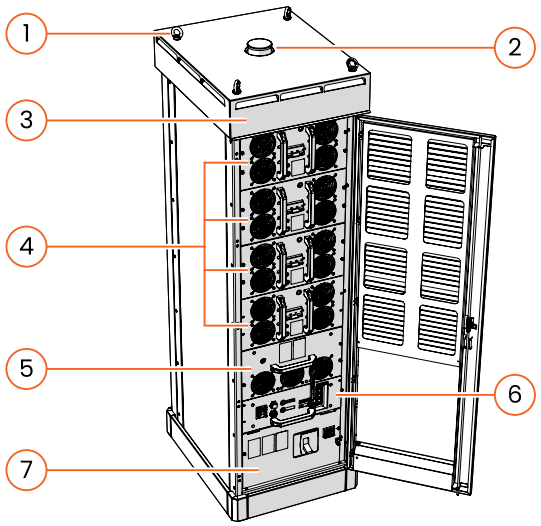
NOTE
See the product datasheets for the dimensions and weights of the units. Product datasheets are available at mediabank.kempower.com.

Kempower Power Unit is a charging power unit that receives power from the electric power distribution network and distributes it to 1–8 DC charging points. Power Unit can be a single, double, or triple cabinet unit.

Each cabinet can be equipped with 1–4 power modules (C500/500 V and C800/800 V). One power module provides a maximum of 50 kW charging power through two independent 25 kW channels.

Charging power management can be dynamic or static.

Figure 3. Kempower Power Unit overview (single cabinet, dynamic)



1	Lifting lugs	5	Power distribution module
2	Cellular/Wi-Fi antenna	6	Control module
3	Unit roof with cooling outlets	7	Mains module
4	s (1–4 per cabinet)		

3.4.2. Power Unit Version 3

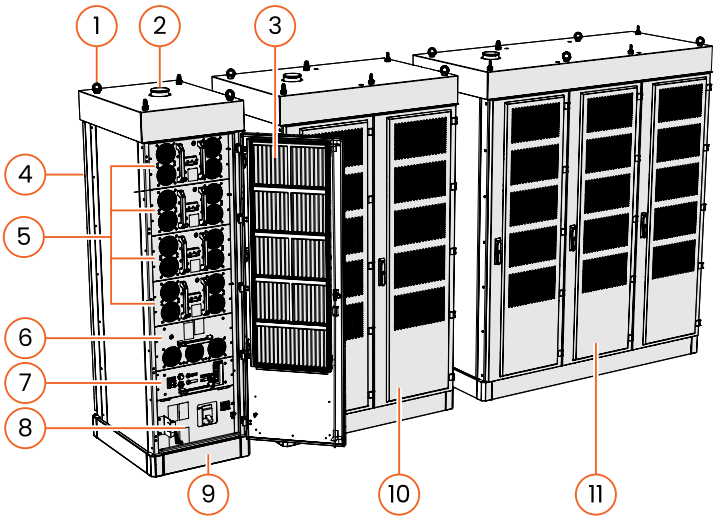
NOTE
See the product datasheets for the dimensions and weights of the units. Product datasheets are available at mediabank.kempower.com.

Kempower Power Unit Version 3 is a charging power unit that receives power from the electric power distribution network and distributes it to 1–8 DC charging points. Power Unit Version 3 can be a single, double, or triple cabinet unit.

Each cabinet can be equipped with 1–4 power modules (C500/500 V and C800/800 V). One power module provides a maximum of 50 kW charging power through two independent 25 kW channels.

Charging power management can be dynamic or static.

Figure 4. Kempower Power Unit Version 3 overview



1	Lifting lugs	7	Control module
2	Cellular/Wi-Fi antenna	8	Mains module
3	Air inlet	9	Single cabinet
4	Air outlet (behind cabinet)	10	Double cabinet
5	s (1–4 per cabinet)	11	Triple cabinet
6	Power distribution module		

3.4.3. Station Charger

NOTE
See the product datasheets for the dimensions and weights of the units. Product datasheets are available at mediabank.kempower.com.

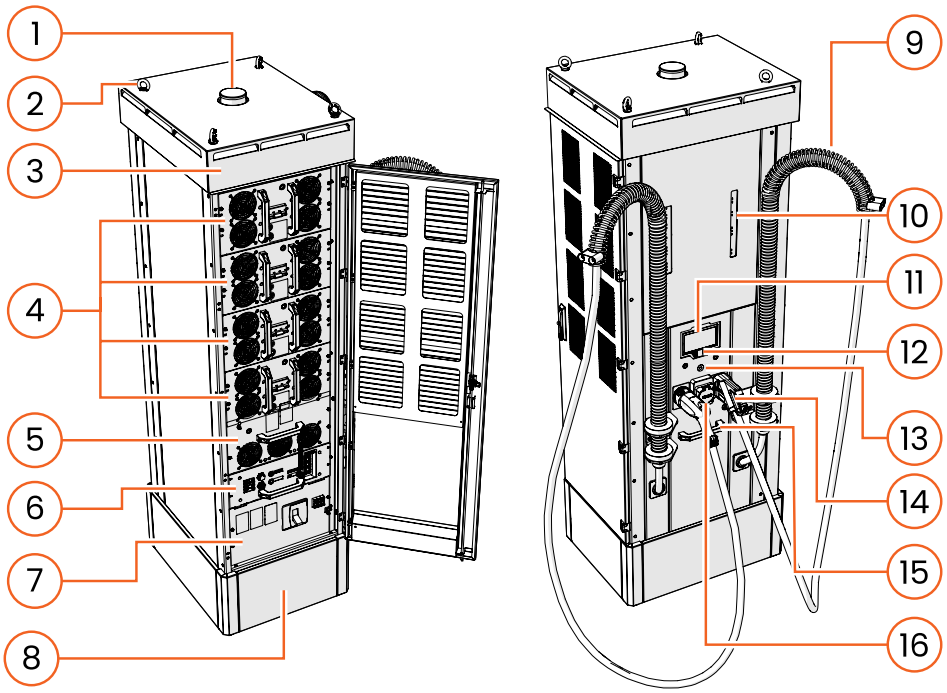
Kempower Station Charger consists of a charging power unit, 1–2 DC vehicle connectors per cabinet, and a user interface. Station Charger can have an additional AC charging socket (option). See the product datasheet for the available charging cable and vehicle connector types. Station Charger can be a single or double cabinet unit. Depending on the configuration, Station Charger can also be connected to 1–2 Kempower Satellites.

Each cabinet can be equipped with 1–4 power modules (C500/500 V and C800/800 V). One power module provides a maximum of 50 kW charging power through two independent 25 kW channels.

Charging power management can be dynamic or static.

See also 3.7: Vehicle connector types.

Figure 5. Kempower Station Charger overview (single cabinet, two DC vehicle connectors and optional AC charging socket)



1	Cellular/Wi-Fi antenna	9	Charging cable support springs
2	Lifting lugs	10	Charging status indicators
3	Unit roof with cooling outlets	11	Touch screen
4	s (1–4 per cabinet)	12	RFID reader
5	Power distribution module	13	Function buttons
6	Control module	14	Vehicle connectors and holders
7	Mains module	15	Front panel
8	Steel base	16	AC charging socket (option)

3.5. Kempower DC Satellites

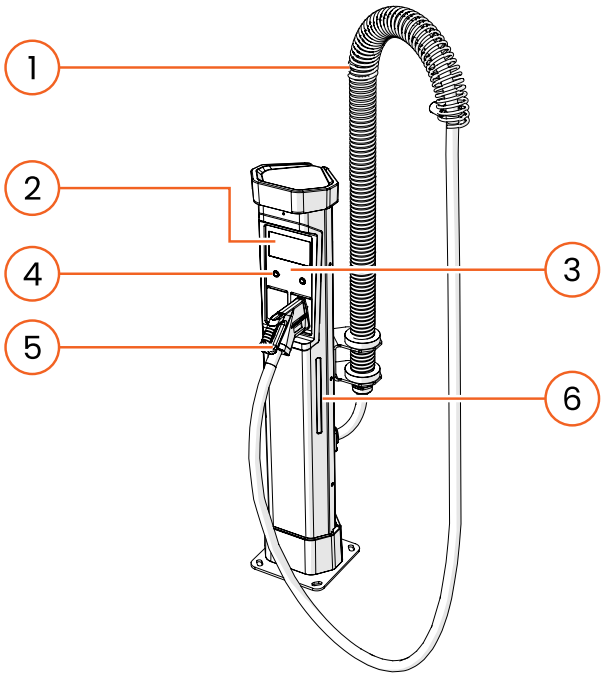
3.5.1. Satellite Version 1

NOTE
See the product datasheets for the dimensions and weights of the units. Product datasheets are available at mediabank.kempower.com.

Kempower Satellite Version 1 is the charging point connected to the charging power unit. The single Satellite has one vehicle connector and the double has two. See the product datasheet for the available charging cable and vehicle connector types.

See also 3.7: Vehicle connector types.

Figure 6. Kempower Satellite Version 1 overview (single)



1	Charging cable support spring	4	Function buttons
2	Touch screen	5	Vehicle connector and holder
3	RFID reader	6	Charging status indicator[a]

[a] *Green: OK, ready to charge. Blue: charging. Red: error.*
The height of the charging status indicator light-emitting diode (LED) bar indicates the state of charge (SoC) of the vehicle being charged.

3.5.2. Satellite Version 2

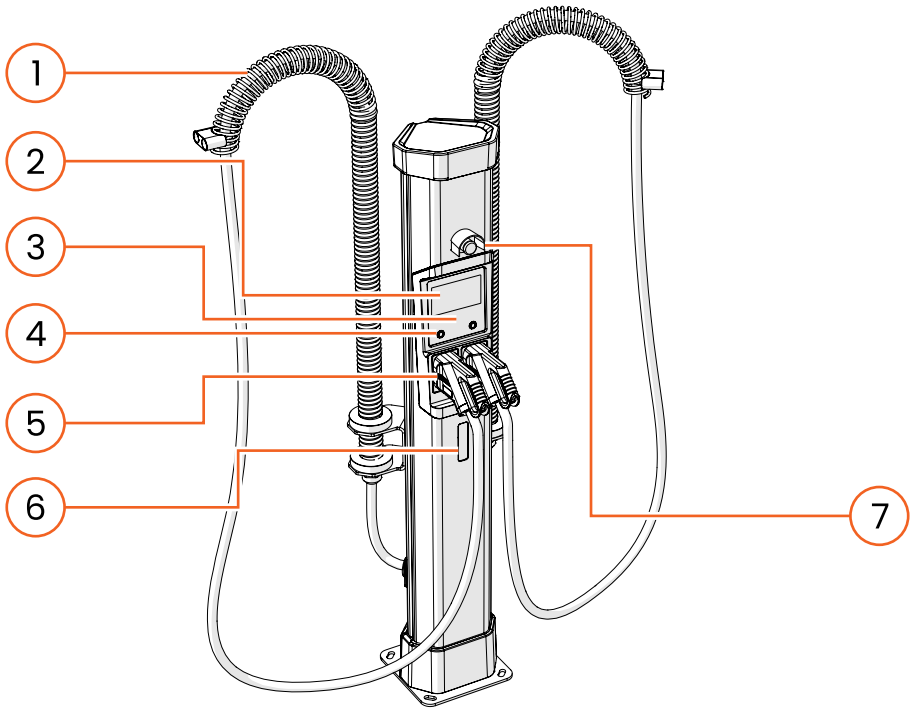
NOTE
See the product datasheets for the dimensions and weights of the units. Product datasheets are available at mediabank.kempower.com.

NOTE
The Satellite Version 2 does not have charging status indicator LEDs.

Kempower Satellite Version 2 is the charging point connected to the charging power unit. The single Satellite has one vehicle connector and the double has two. See the product datasheet for the available charging cable and vehicle connector types.

See also 3.7: Vehicle connector types.

Figure 7. Kempower Satellite Version 2 overview



1	Charging cable support spring	5	Vehicle connector and holder
2	Touch screen	6	Window for integrated energy meter
3	RFID reader	7	Equipment stop button (option)
4	Function buttons		

3.5.3. Liquid Cooled Satellite

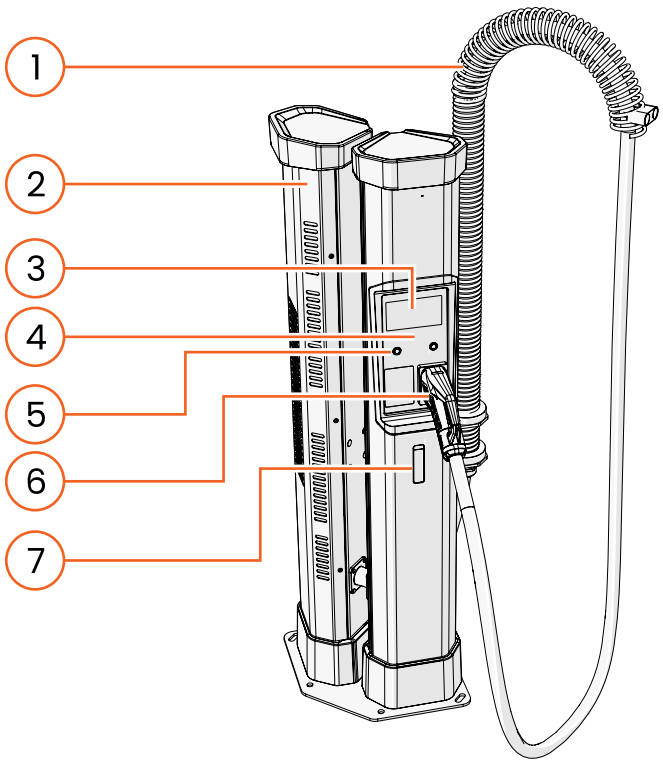
NOTE
See the product datasheets for the dimensions and weights of the units. Product datasheets are available at mediabank.kempower.com.

NOTE
Liquid Cooled Satellite does not have charging status indicator LEDs.

Kempower Liquid Cooled Satellite is the high-power charging point connected to the charging power unit. See the product datasheet for the available charging cable and vehicle connector types.

See also 3.7: Vehicle connector types.

Figure 8. Kempower Liquid Cooled Satellite overview (single)



1	Charging cable support spring	5	Function buttons
2	Liquid cooling unit	6	Vehicle connector and holder
3	Touch screen	7	Window for integrated energy meter
4	RFID reader		

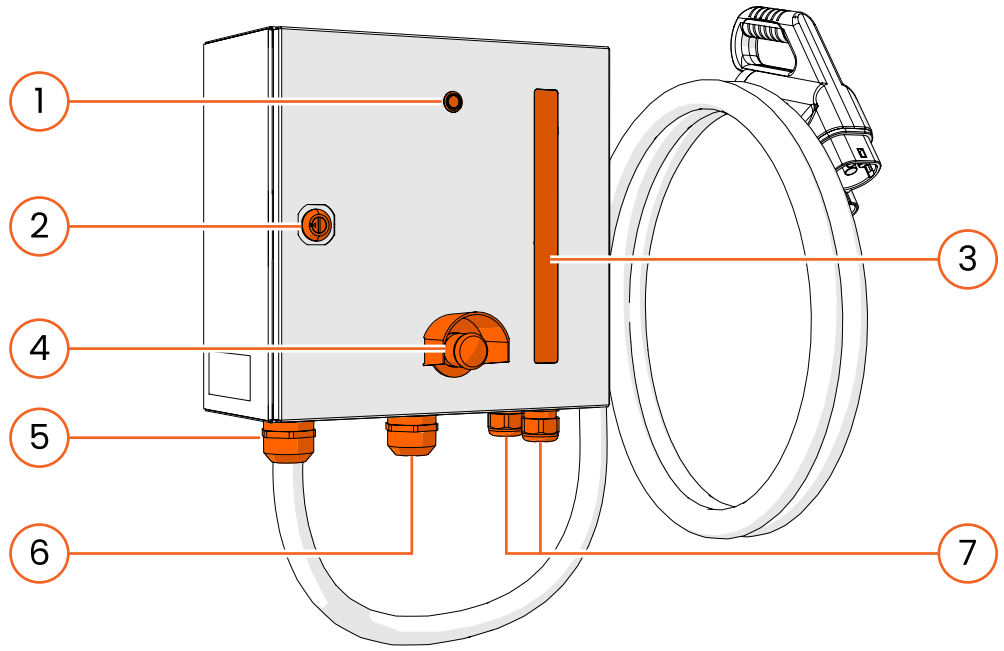
3.5.4. Control Unit

NOTE
See the product datasheets for the dimensions and weights of the units. Product datasheets are available at mediabank.kempower.com.

Kempower Control Unit is the charging point connected to the charging power unit. Control Unit has one vehicle connector. See the product datasheet for the available charging cable and vehicle connector types.

See also 3.7: Vehicle connector types.

Figure 9. Kempower Control Unit overview



1	Control button with LED indicator	5	Charging cable
2	Front panel lock	6	Supply DC power cable
3	Charging status indicator[a]	7	Cable strain reliefs for control cable, control bus, and additional equipment stop cable
4	Equipment stop button		

[a]*Green: OK, ready to charge. Blue: charging. Red: error.*

3.6. Kempower AC Satellites

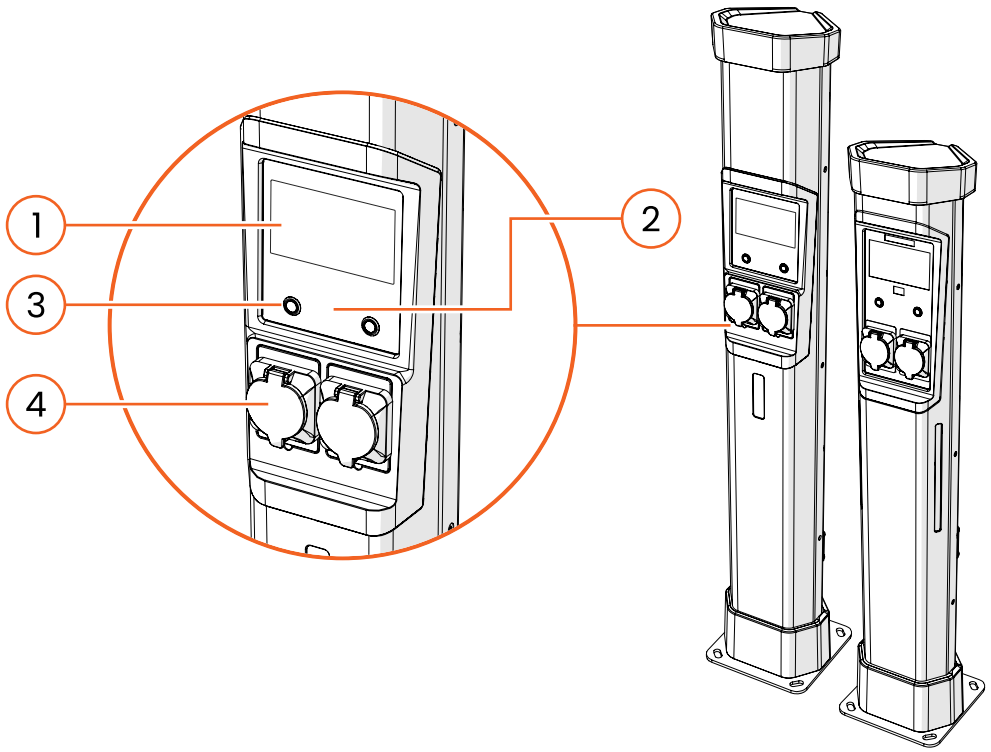
3.6.1. AC Satellite

NOTE
AC Satellite Version 2 does not have charging status indicatior LEDs.

Kempower AC Satellite is a standalone AC charging point that is not connected to the charging power unit but directly to the main power supply. The single AC Satellite has one AC charging socket and the double has two.

See also 3.7: Vehicle connector types.

Figure 10. AC Satellite overview



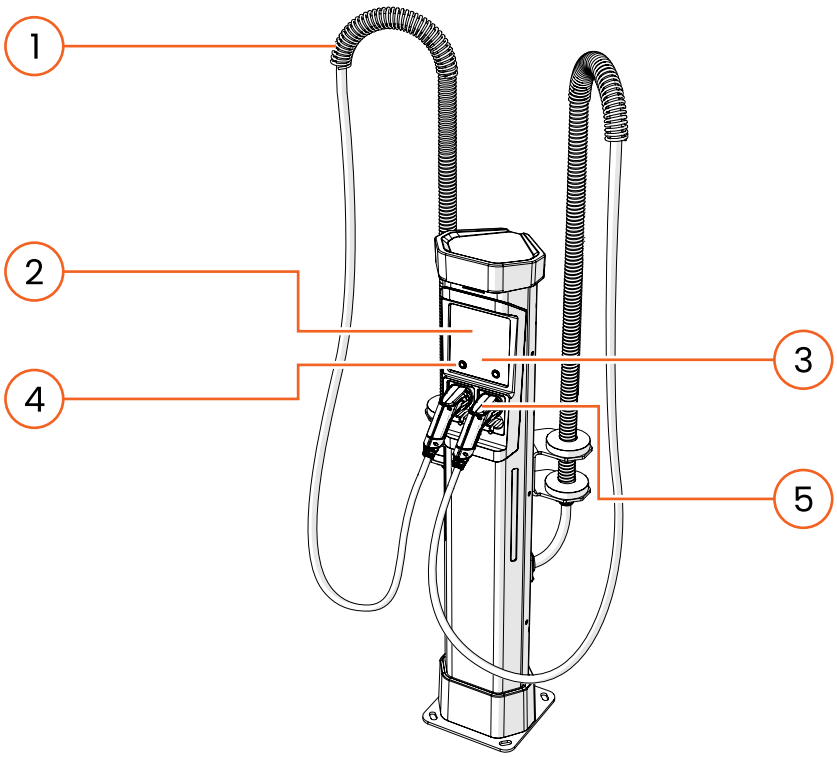
1 Touch screen
2 RFID reader
3 Function buttons
4 Charging connectors

3.6.2. AC Satellite with charging cables

The Kempower AC Satellite with cables is a standalone AC charging point that is not connected to a charging power unit but directly to the main power supply. The single AC Satellite has one AC vehicle connector and the double has two.

See also 3.7: Vehicle connector types.

Figure 11. Kempower AC Satellite with charging cables overview



1 Charging cable support spring
2 Touch screen
3 RFID reader
4 Function buttons
5 Vehicle connectors and holders

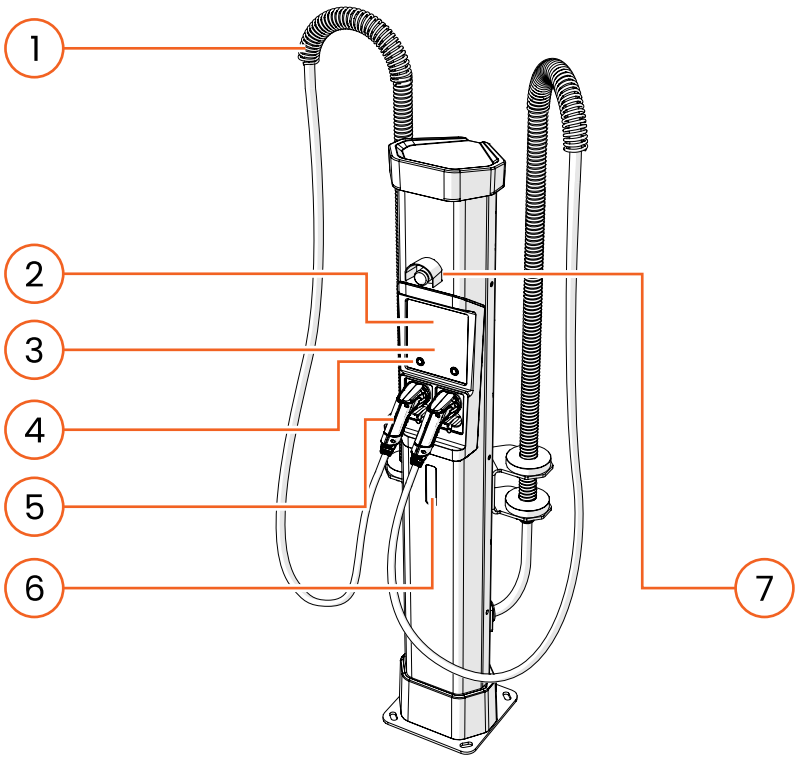
3.6.3. AC Satellite Version 2 with charging cables

NOTE
AC Satellite Version 2 does not have charging status indicator LEDs.

Kempower AC Satellite with cables is a standalone AC charging point that is not connected to a charging power unit but directly to the main power supply. The single AC Satellite has one AC vehicle connectors and the double has two.

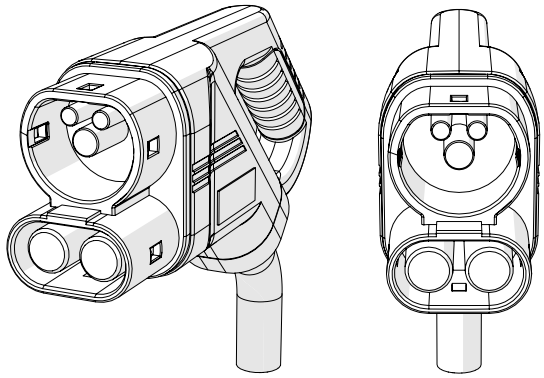
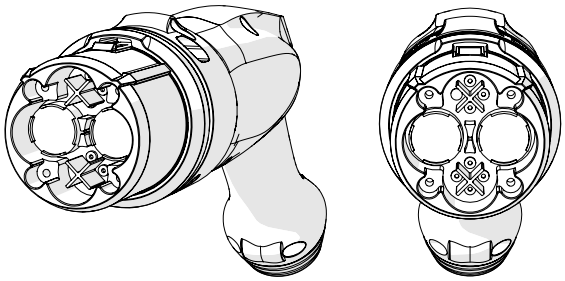
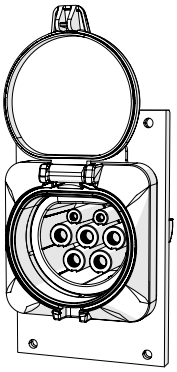
See also 3.7: Vehicle connector types.

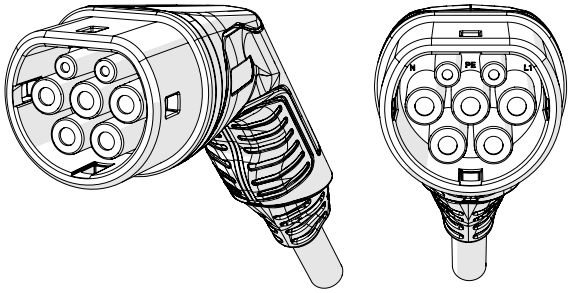
Figure 12. Kempower AC Satellite with charging cables overview



1	Charging cable support spring	5	Vehicle connectors and holders
2	Touch screen	6	Energy meter window
3	RFID reader	7	Emergency stop button (option)
4	Function buttons		

3.7. Vehicle connector types

	Combined Charging System (CCS2) Only option available for Liquid Cooled Satellite and Control Unit.
	CHAdeMO
	Type 2 AC socket

	Type 2 AC vehicle connector

4. PACKAGING OF THE CHARGING UNIT

NOTICE
Do not stack the product packages during shipping.

NOTICE
The maximum tilting angle of the charging power unit is 6 degrees.

NOTICE
The maximum tilting angle of the Liquid Cooled Satellite is approximately 45 degrees.

Product	Image	Shipping
Power Unit (single)		• **Size:** 1200 x 800 x 2350 mm • **Weight:** 305–440 kg
Power Unit (double)		• **Size:** 1450 x 1050 x 2400 mm • **Weight:** 665–890 kg

Product	Image	Shipping
Power Unit (triple)		• **Size:** 2050 x 1050 x 2350 mm • **Weight:** 1130–1400 kg
Power Unit Version 3 (single)		• **Size:** 1200 x 800 x 2350 mm • Power modules delivered separately for Power Unit Version 3
Power Unit Version 3 (double)		• **Size:** 1450 x 1100 x 2400 mm • Power modules delivered separately for Power Unit Version 3
Power Unit Version 3 (triple)		• **Size:** 2050 x 1100 x 2400 mm • Power modules delivered separately for Power Unit Version 3
Power module (1 pc)		• **Size:** 800 x 600 x 550 mm
Power module (2 pcs)		• **Size:** 800 x 600 x 740 mm
Power module (4 pcs)		• **Size:** 1200 x 800 x 740 mm • **Weight:** 245 kg

Product	Image	Shipping
Station Charger (single)		• **Size:** 1450 x 1050 x 2350 mm • **Weight:** 460–595 kg
Station Charger (double)		• **Size:** 2050 x 1050 x 2350 mm • **Weight:** 765–990 kg
Satellite (single)		• **Size:** 2180 x 620 x 740 mm • **Weight:** 182 kg
Satellite (double)		• **Size:** 2180 x 620 x 1480 mm • **Weight:** 364 kg

Product	Image	Shipping
Liquid Cooled Satellite		• **Size:** 1200 x 1000 x 2430 mm • **Weight:** 220 kg
Control Unit		• **Size:** 710 x 500 x 290 mm • **Weight:** 14 kg
Control Unit charging cables		• **Size:** 710 x 500 x 290 mm • **Weight:** 22 kg

5. STORING THE CHARGING EQUIPMENT

Product	Instructions	Temperature
Power Unit	• Store in a clean and dry indoor area • Do not stack • Make sure that the unit is the correct way up. For details, see the sticker on the packaging.	-40...+60 °C
Power Unit Version 3	• Store in a clean and dry indoor area • Do not stack • Make sure that the unit is the correct way up. For details, see the sticker on the packaging.	-40...+60 °C

Product	Instructions	Temperature
Power modules	• Store in a clean and dry indoor area • Do not stack • Make sure that the unit is the correct way up. For details, see the sticker on the packaging.	-40...+60 °C
Station Charger	• Store in a clean and dry indoor area • Do not stack • Make sure that the unit is the correct way up. For details, see the sticker on the packaging.	-40...+60 °C
Satellite Version 1	• Store in a clean and dry indoor area • Stackable, max. 3 crates on top of each other • Make sure that the unit is the correct way up. For details, see the sticker on the packaging.	-40...+60 °C
Satellite Version 2	• Store in a clean and dry indoor area • Stackable, max. 3 crates on top of each other • Make sure that the unit is the correct way up. For details, see the sticker on the packaging.	-40...+60 °C
Liquid Cooled Satellite	• Store in a clean and dry indoor area • Do not stack • Store the unit upright. For details, see the sticker on the packaging. • If stored for more than five years, change the cooling fluid before using the charging unit.	-40...+60 °C
AC Satellite	• Store in a clean and dry indoor area • Stackable, max. 3 crates on top of each other • Make sure that the unit is the correct way up. For details, see the sticker on the packaging.	-40...+60 °C

Product	Instructions	Temperature
AC Satellite with charging cables	• Store in a clean and dry indoor area • Stackable, max. 3 crates on top of each other • Make sure that the unit is the correct way up. For details, see the sticker on the packaging.	-40...+60 °C
Control Unit	• Store in a clean and dry indoor area • Stackable, max. 3 boxes on top of each other • Make sure that the unit is the correct way up. For details, see the sticker on the packaging.	-40...+60 °C

6. UNPACKING THE CHARGING EQUIPMENT

CAUTION
High center of gravity. Make sure that the cabinet does not fall over.

NOTICE
One cabinet with four power modules weighs approximately 400 kg. Use appropriate lifting equipment operated by qualified professionals.

NOTICE
The maximum tilting angle of the charging power unit is 6 degrees.

NOTICE
The Liquid Cooled Satellite is shipped in a crate that weighs approximately 150 kg. Use appropriate lifting equipment operated by qualified professionals.

- Inspect the delivery as soon as possible. Make sure to remove the fixing brackets. If the equipment is damaged, do not start the installation. For assistance, contact Kempower Technical Support.
    - Power Unit is shipped upright on a pallet and wrapped in plastic. The top of the unit is covered with a plywood board.
    - The charging cables and support springs of the Station Charger are installed on the unit at the factory. The unit is shipped upright on a pallet and wrapped in plastic. The top of the unit is covered with a plywood board.

  - The charging cable and support spring of the Liquid Cooled Satellite are installed on the unit at the factory. The coolant is prefilled inside the unit. The unit is shipped upright in a crate.
  - The charging cables and support springs of the Satellite are not installed on the unit at the factory. The unit and its charging cables and support springs are shipped in a horizontal position in a crate.
  - The charging cable of Control Unit is not installed on the unit at the factory. The unit and the charging cable are shipped in two separate boxes.
  - Do not remove the protective packaging from the vehicle connectors before you have installed the charging cables.
- Power Unit and Station Charger shipments have a tilt indicator. Shipments of other products may also have a tilt indicator. If the tilt indicator indicates mishandling, do not start the installation. For assistance, contact Kempower Technical Support.

7. MOVING AND LIFTING THE CHARGING EQUIPMENT

7.1. Moving and lifting Power Unit

WARNING
Do not go under the unit when it is lifted.

CAUTION
Use all lifting lugs of the unit when you lift it. Minimum angle of slings 60 degrees.

CAUTION
High center of gravity. Make sure that the cabinet does not fall over.

CAUTION
The module rails inside the cabinet have sharp edges. Be careful when removing and installing modules.

NOTICE
The maximum tilting angle of the charging power unit is 6 degrees.

NOTICE
One cabinet with four power modules weighs approximately 400 kg. Use appropriate lifting equipment operated by qualified professionals.

NOTICE
Carefully remove the control module, the power distribution module, the bottom power module, and the front panel of the mains module from each cabinet before you lift the unit. This is done to reduce the weight and make space for installing the cables. Keep the modules clean and dry.

NOTICE
Make sure that you replace the same serial number card to the same cabinet when you install or replace control modules. Each cabinet is identified with its unique serial number in ChargEye.

NOTICE
Do not lift the power module from its guide pins.

NOTE
The power module weighs approximately 43 kg.

NOTE
The power distribution module weighs approximately 32 kg.

Figure 13. Remove the bottom modules before you lift the unit

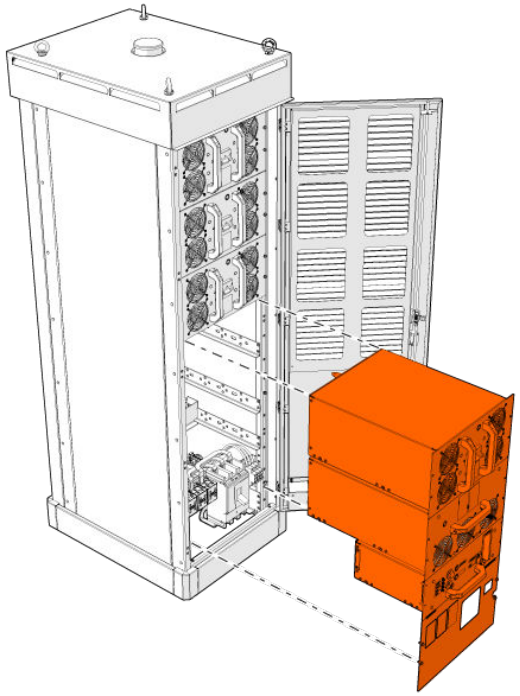


Figure 14. Left : lifting the unit to be installed without the steel base. Right: lifting the unit to be installed on the steel base.

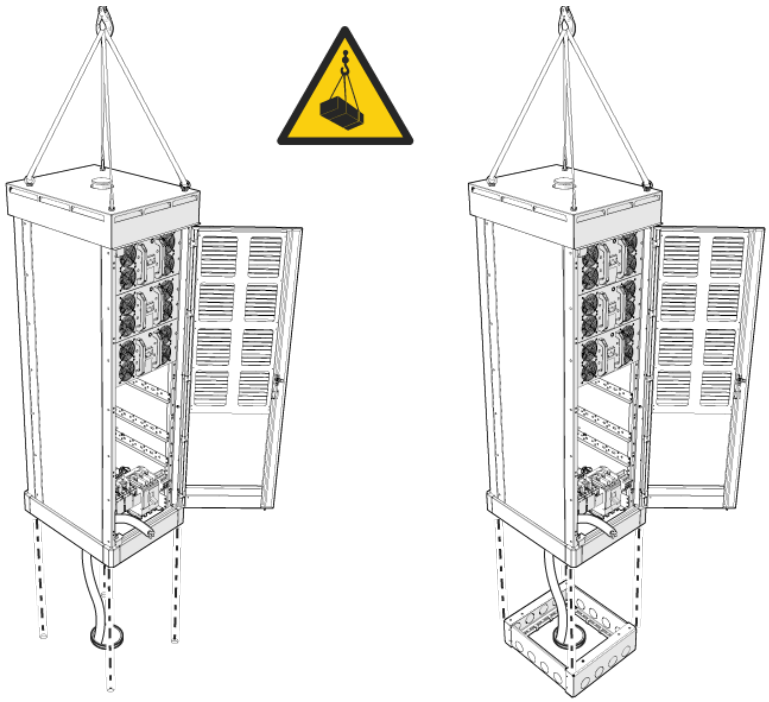


Figure 15. Lifting lugs on a single, double, and triple cabinet

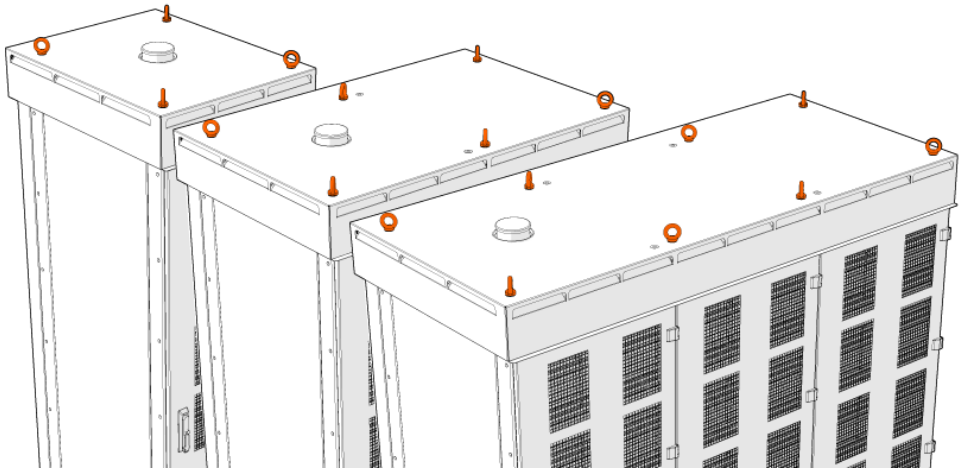
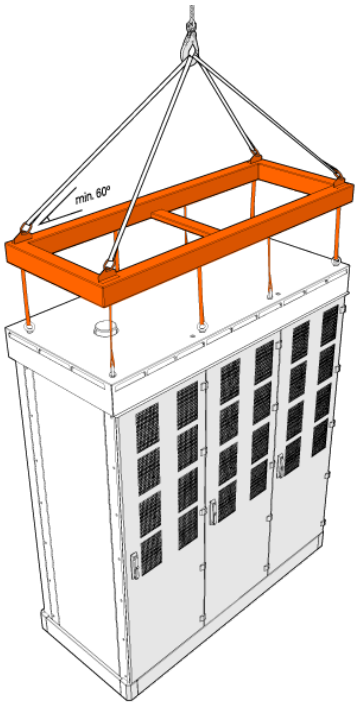


Figure 16. Use all fastening points if you use lifting beams



7.2. Moving and lifting Power Unit Version 3

WARNING
Do not go under the unit when it is lifted.

CAUTION
Use all lifting lugs of the unit when you lift it. Minimum angle of slings 60 degrees.

CAUTION
High center of gravity. Make sure that the cabinet does not fall over.

NOTICE
The maximum tilting angle of the charging power unit is 6 degrees.

NOTICE
One cabinet with four power modules weighs approximately 400 kg. Use appropriate lifting equipment operated by qualified professionals.

NOTICE
Carefully remove the control module, the power distribution module, and the front panel of the mains module from each cabinet before you lift the unit. This is done to reduce the weight and make space for installing the cables. Keep the modules clean and dry.

NOTICE
Make sure that you replace the same serial number card to the same cabinet when you install or replace control modules. Each cabinet is identified with its unique serial number in ChargEye.

Figure 17. Remove the control module, the power distribution module and the front panel of the mains module before you lift the unit

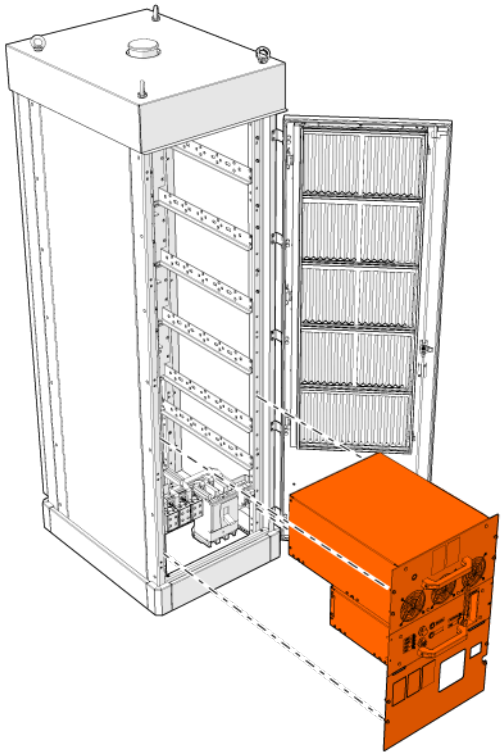


Figure 18. Left : lifting the unit to be installed without the steel base. Right: lifting the unit to be installed on the steel base.

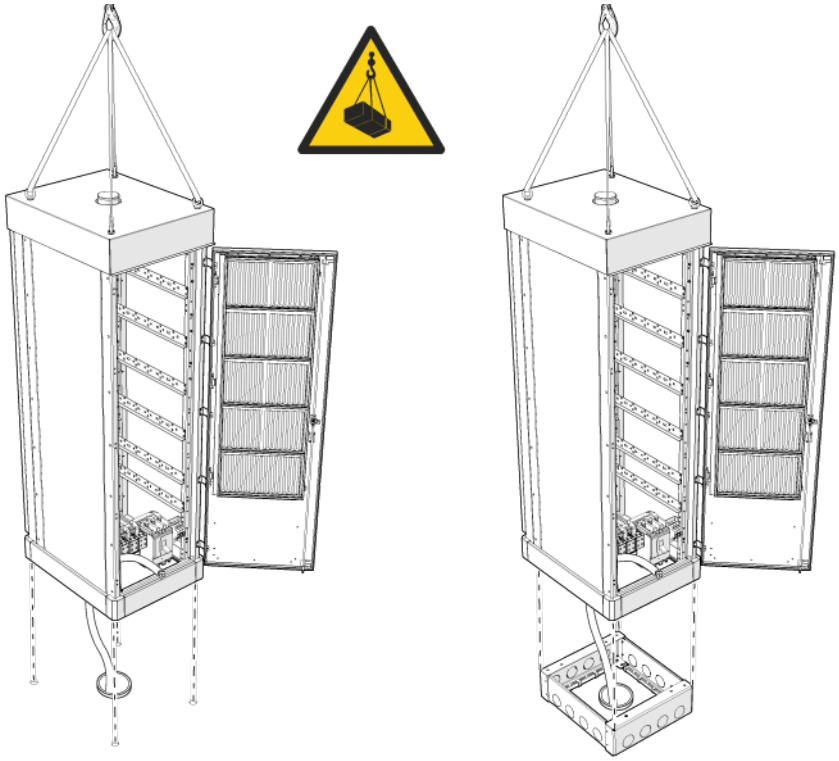


Figure 19. Lifting lugs on a single, double, and triple cabinet

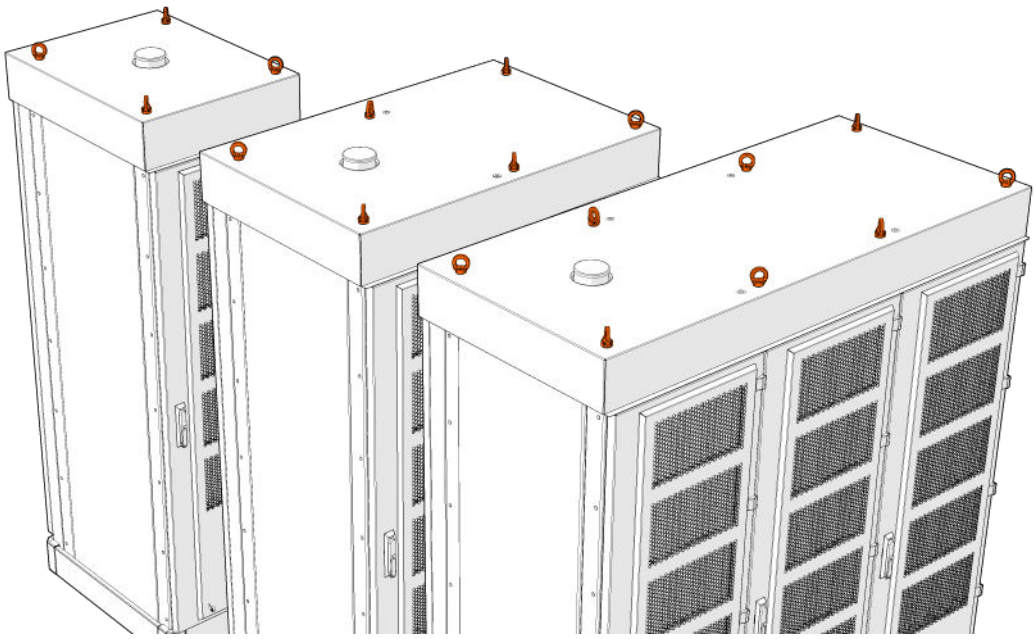
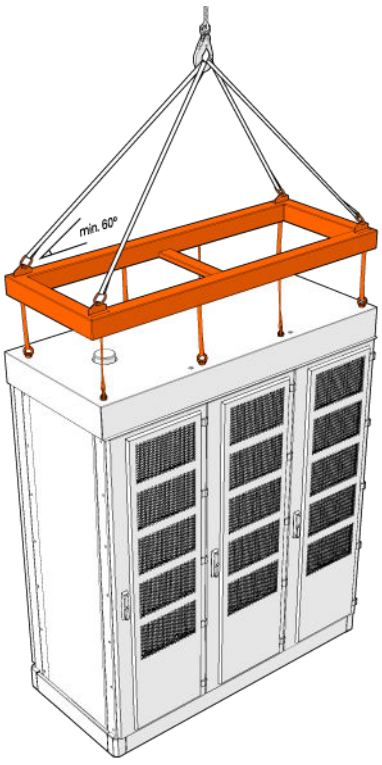


Figure 20. Use all fastening points if you use lifting beams



7.3. Moving and lifting Station Charger

WARNING
Do not go under the unit when it is lifted.

CAUTION
Use all lifting lugs of the unit when you lift it. Minimum angle of slings 60 degrees.

CAUTION
High center of gravity. Make sure that the cabinet does not fall over.

NOTICE
The maximum tilting angle of the charging power unit is 6 degrees.

NOTICE
One cabinet with four power modules weighs approximately 400 kg. Use appropriate lifting equipment operated by qualified professionals.

NOTICE
Carefully remove the control module, the power distribution module, the bottom power module, and the front panel of the mains module from each cabinet before you lift the unit. This is done to reduce the weight and make space for installing the cables. Keep the modules clean and dry.

NOTICE
Make sure that you replace the same serial number card to the same cabinet when you install or replace control modules. Each cabinet is identified with its unique serial number in ChargEye.

NOTICE
Do not lift the power module from its guide pins.

NOTE
The power module weighs approximately 43 kg.

NOTE
The power distribution module weighs approximately 32 kg.

Figure 21. Remove the bottom modules before you lift the unit

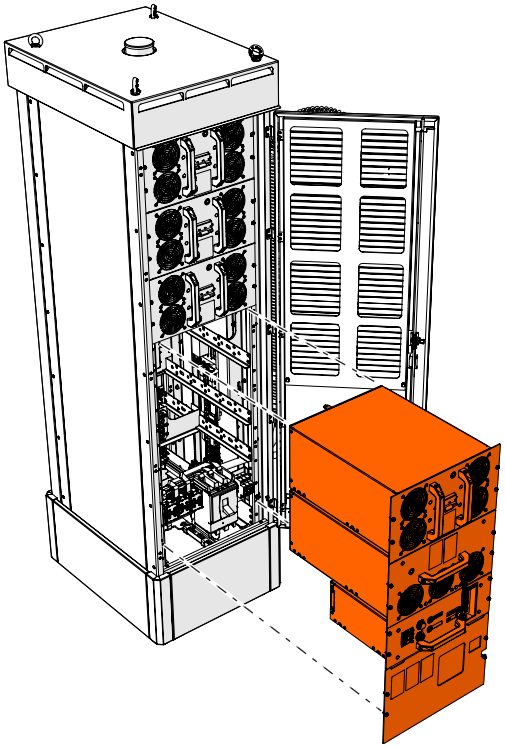


Figure 22. Lifting the unit to be installed on the steel base.

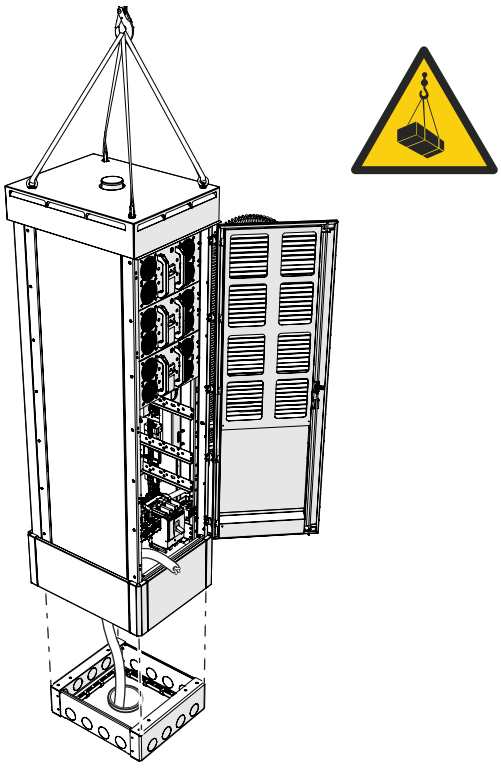


Figure 23. Lifting lugs on a single, double, and triple cabinet

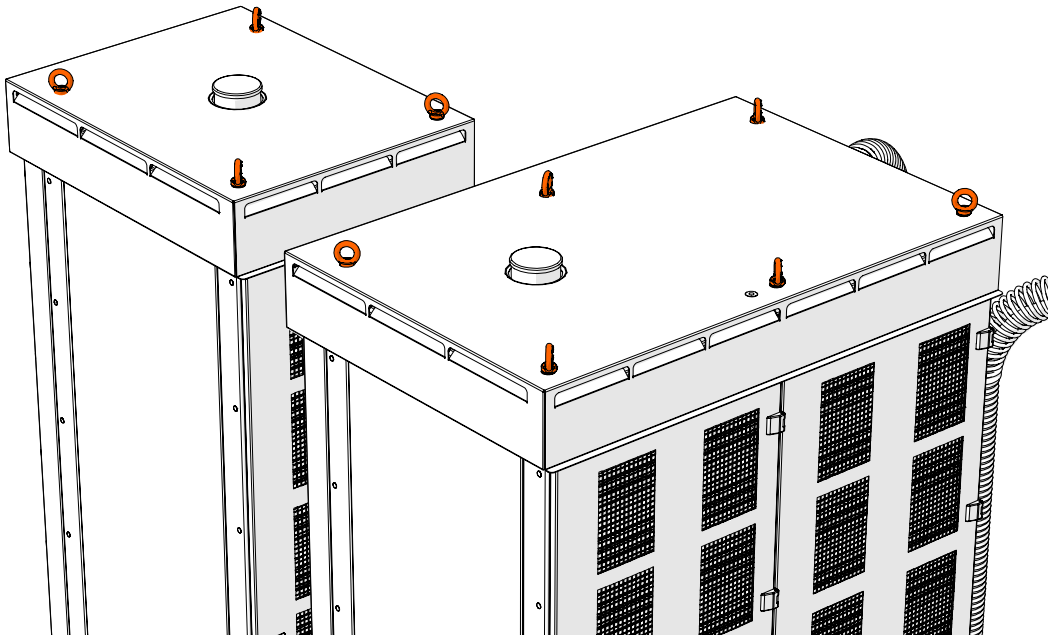
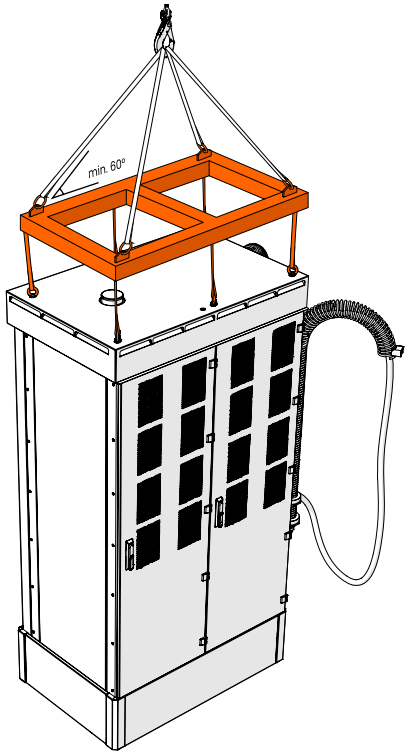


Figure 24. Use all fastening points if you use lifting beams



7.4. Moving and lifting Satellite

NOTICE
Depending on the Satellite model, one shipping crate weighs on average 150 kg (with charging cables and support springs). Stack at maximum two crates on top of each other. Use appropriate lifting equipment operated by qualified professionals.

NOTICE
Two persons are needed for this task.

NOTICE
The Satellite frame weighs approximately 50 kg without the charging cables and support springs.

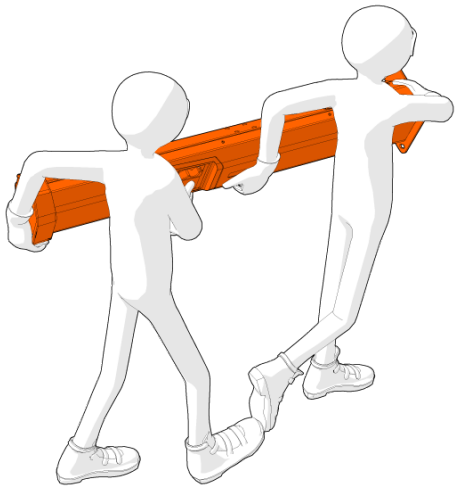
NOTICE
The AC Satellite frame weighs approximately 36 kg without the charging cables and support springs.

NOTICE
If the Satellite has two charging cables, you can use both support spring holders to lift the Satellite. Do not lift the Satellite from one holder.

The Satellite is shipped with its charging cables and support springs in a crate. The charging cables and support springs are not installed on the unit at the factory

The AC Satellite is shipped in a crate. If the AC Satellite has charging cables, they are packed in the same crate with the support springs. The charging cables and support springs are not installed on the unit at the factory.

Figure 25. Moving the Satellite



7.5. Moving and lifting Liquid Cooled Satellite

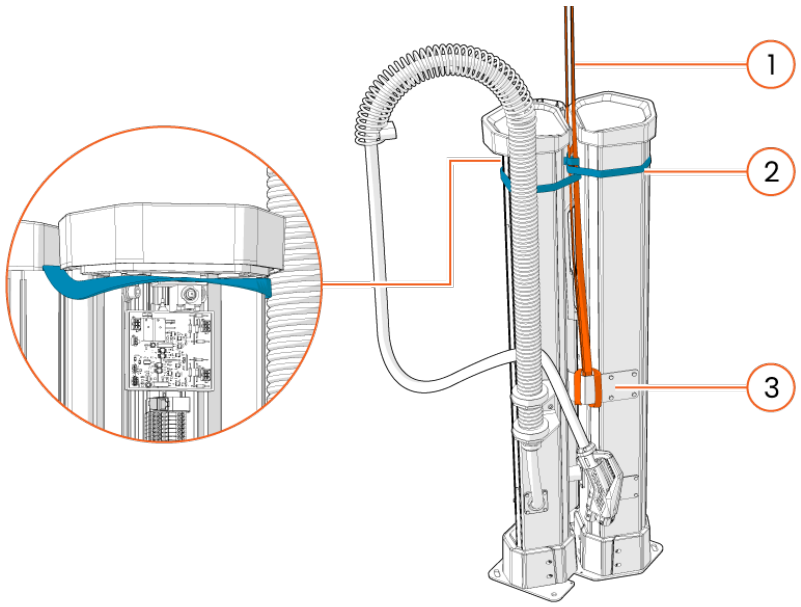
NOTICE
The Liquid Cooled Satellite is shipped upright in a crate. The total weight is approximately 150 kg. Use appropriate lifting equipment operated by qualified professionals.

The charging cables and support springs are installed on the unit at the factory.

The Liquid Cooled Satellite is delivered with the cooling liquid (Glysofor N) prefilled inside the unit. The maximum tilting angle of the Liquid Cooled Satellite is approximately 45 degrees. If liquid comes out of the Liquid Cooled Satellite during transportation, make sure that the expansion tank in the liquid cooling unit is approximately 1/3 full before you start operation. The coolant/water mix ratio is 50/50 when delivered. Use clean water when refilling.

The Liquid Cooled Satellite weighs approximately 150 kg and must be lifted to its installation position with lifting equipment and straps. See Figure 26.

Figure 26. Lifting points of the Liquid Cooled Satellite



1	Lifting strap	3	Fastener between frames
2	Fastening strap		

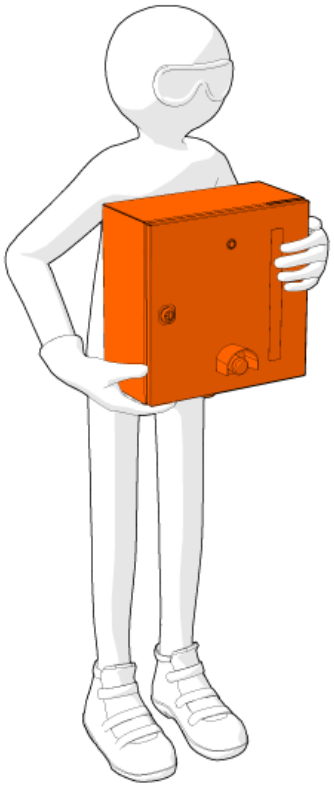
7.6. Moving and lifting Control Unit

NOTICE
The Control Unit frame weighs approximately 12.5 kg without the charging cable.

The Control Unit is shipped in two boxes, one for the unit and another for the charging cables. The charging cables are not installed on the unit at the factory.

The weight of the Control Unit box is less than 15 kg and the weight of the charging cable box is less than 22 kg so they can be lifted without lifting equipment.

Figure 27. Lifting the Control Unit



8. INSTALLING THE CHARGING EQUIPMENT

WARNING
You must complete the Kempower certification training before you do installation, commissioning, service or maintenance tasks. Installation, commissioning, service or maintenance tasks done by an unapproved partner will void the warranty.

You must be an authorized electrician to install and commission the charging equipment. For additional information, see the installation manual.

9. TURNING THE CHARGING EQUIPMENT OFF

NOTE
Stop any ongoing charging sessions before you turn the equipment off.

Turn the charging equipment off if:

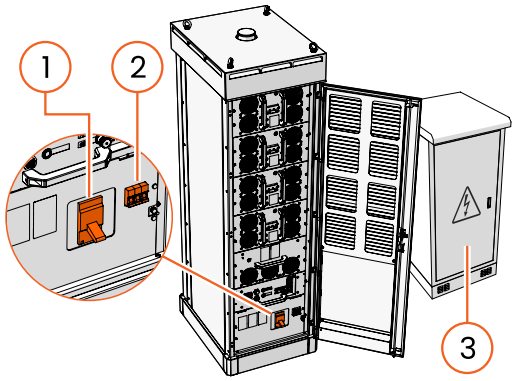
- It causes an immediate safety risk.
- Kempower or your local service or maintenance provider instructs you to do so.
- Maintenance tasks require you to do so. For maintenance instructions, see the maintenance manual.

1. Unlock and open the door(s) of the charging power unit.

   In each cabinet, set the miniature circuit breaker (MCB) for control voltage (2) and main switch (1) to OFF position.

   Disconnect the AC power supply to the unit from the main supply point (3).

   Complete the lockout-tagout (LOTO) procedure.



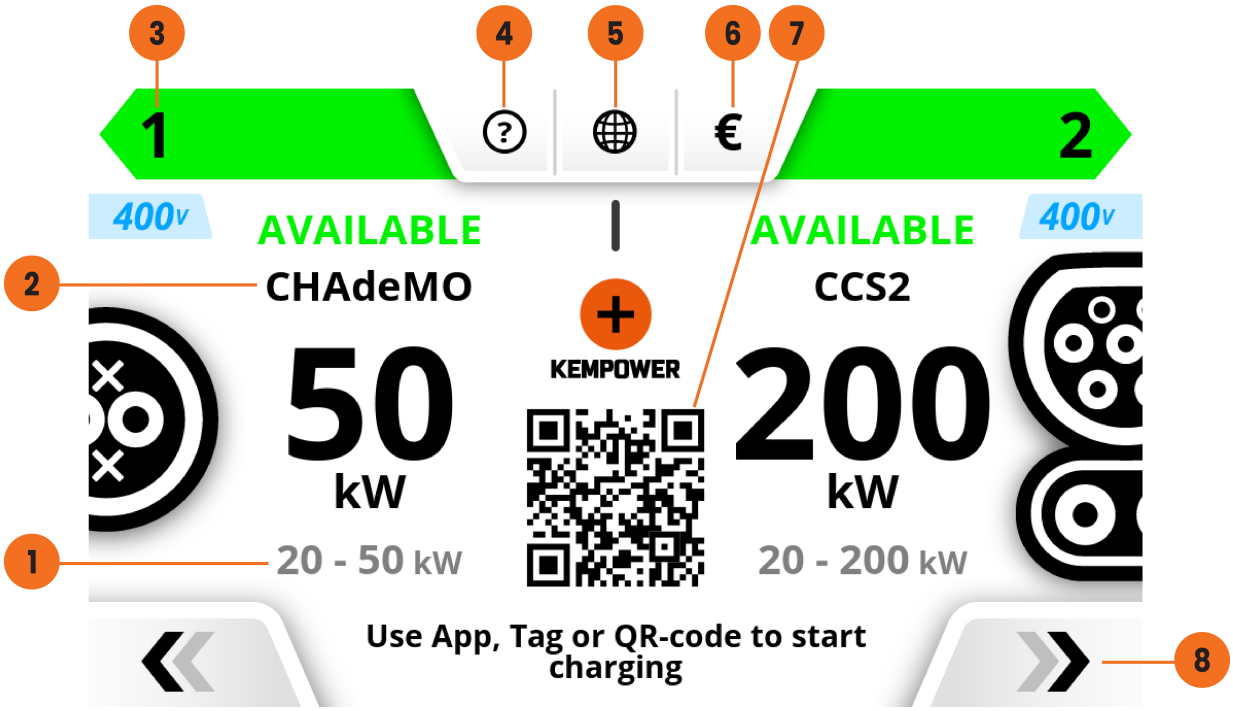
WARNING
After you disconnect the power supply, wait a minimum of two minutes for the capacitors of the power modules to discharge before you continue. Before you start work, measure the voltage of the electrical circuits to make sure that no dangerous voltage remains.

10. USING THE CHARGING UNIT

10.1. User interface

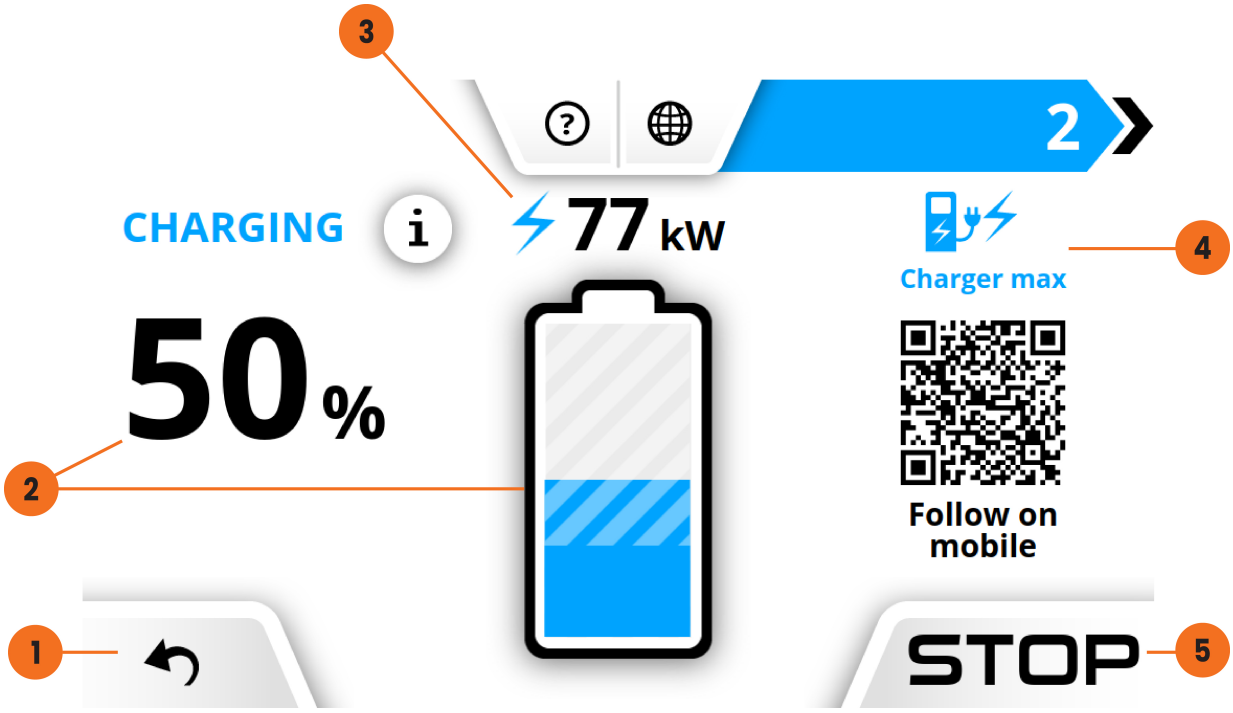
NOTE
The user interface can be customized in Kempower ChargEye.

Figure 28. User interface



1	**Power range:** available power range for the vehicle connector	5	**Language:** press to select another user interface language
2	**Vehicle connector type:** CCS2 or CHAdeMO	6	**Pricing:** press for more information about pricing
3	**Vehicle connector number identifier**	7	**QR code:** scan to access charging session information via your mobile device
4	**Help:** press for more information	8	**Change view:** press for more information about the charging session

Figure 29. User interface - charging session information

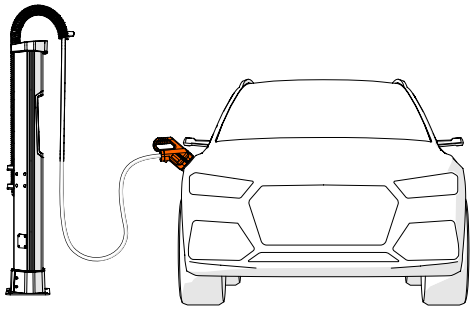


1	**Change view:** press to return to the previous view	4	**Charging rate limit:** shows what is limiting the charging rate, for example the charging unit, the vehicle or the network
2	**State of Charge (SoC):** press the battery icon for the charging curve.	5	**Stop:** press to end the charging session
3	**Charging power:** shows the current charging rate for the active charging session		

10.2. Charging process (Satellites)

1. Make sure that you have read and understood the instructions of the vehicle to be charged.

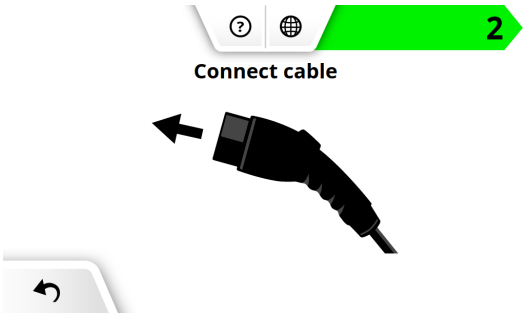
   The charging process starts when the vehicle connector is correctly connected to the vehicle and, if in use, when identification is done.



2. Follow the on-screen instructions of the charging unit.

   Select the correct type of vehicle connector. See 3.7: Vehicle connector types.

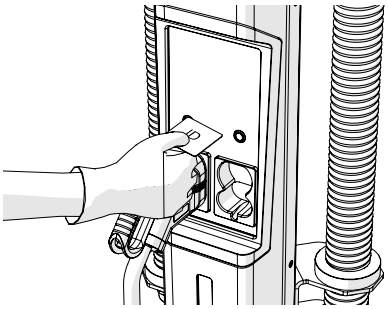
   Attach the vehicle connector to the vehicle. Make sure that the vehicle connector is correctly connected. Listen for the vehicle's lock-in sound.



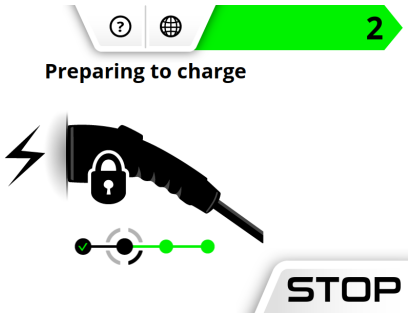
3. If identification is necessary, the charging unit asks for it when the vehicle connector is connected to the vehicle.

   Use the identification method suggested by the charging unit.

   The charging unit can use for example radio-frequency identification (RFID), a card reader or a mobile application for the identification.

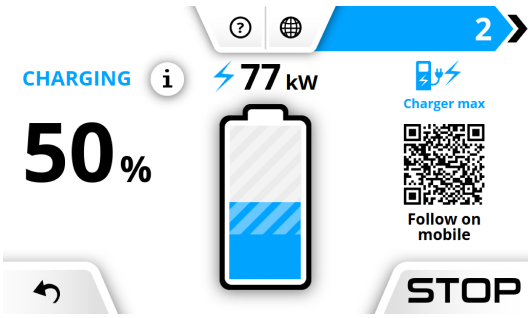


4. Communication between the charging unit and the vehicle starts. Follow the progress on the display screen.

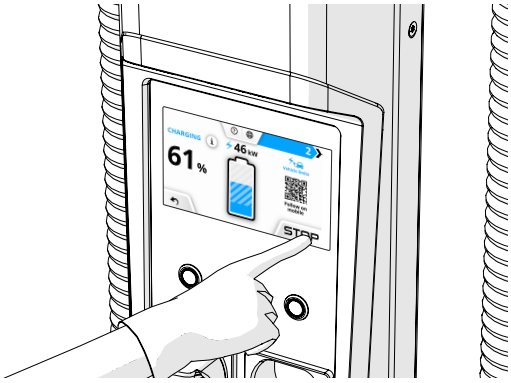


5. When charging starts, the charging status is shown on the display screen.

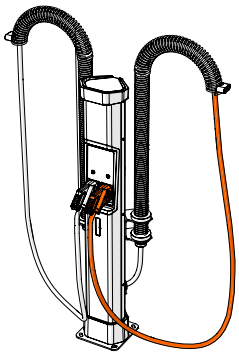
   To see the charging process remotely, scan the quick response (QR) code with your mobile phone. A secure web page opens on your mobile phone and shows the charging status screen.



6. Press Stop on the display screen or use the mobile application to end the charging session.



7. Remove the vehicle connector from your vehicle and put it back in the vehicle connector holder.

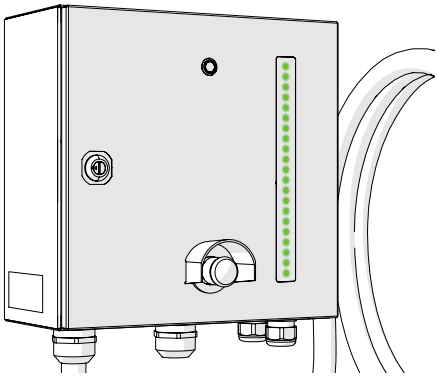


10.3. Charging process (Control Unit with CCS cable)

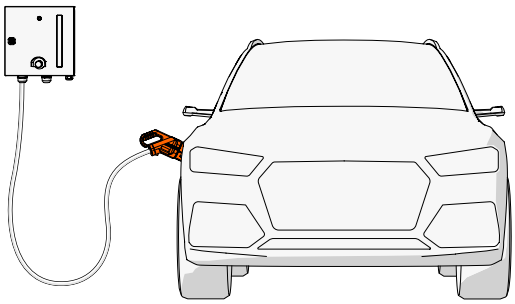
1. Make sure that you have read and understood the instructions of the vehicle to be charged.

   The Control Unit is ready to charge when the charging status indicator is green.

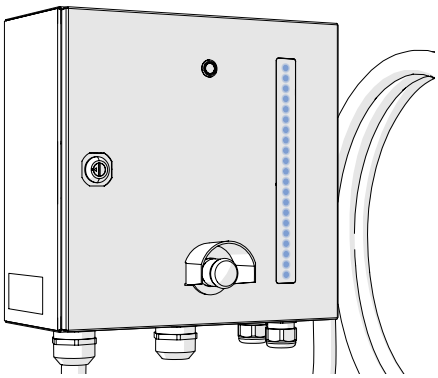
   The charging process starts when the vehicle connector is correctly connected to the vehicle and, if in use, when identification is done.



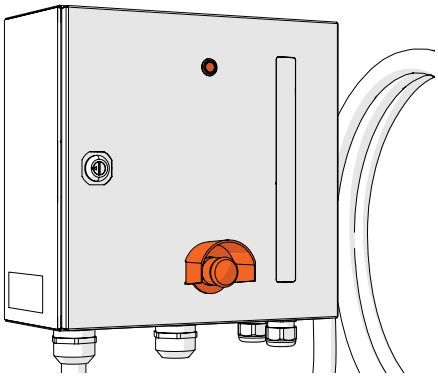
2. Attach the vehicle connector to the vehicle. Make sure that the vehicle connector is correctly connected. Listen for the vehicle's lock-in sound.



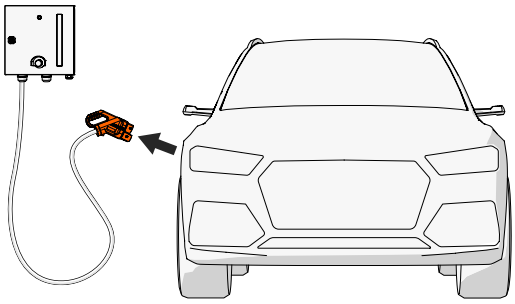
3. Communication between the charging unit and the vehicle starts. When charging starts, the charging status indicator color changes to blue.



4. Press the control button (with LED indicator) or the equipment stop button to end the charging session.



5. Remove the vehicle connector from your vehicle (use your vehicle's release button as necessary).



11. PREVENTIVE MAINTENANCE

WARNING
You must complete the Kempower certification training before you do installation, commissioning, service or maintenance tasks. Installation, commissioning, service or maintenance tasks done by an unapproved partner will void the warranty.

CAUTION
Do not use running water or pressure washing equipment to clean the charging unit. Use a pH neutral detergent if necessary.

NOTICE
Obey the preventive maintenance plan to ensure the optimal performance of the electric vehicle charging system. Failure to obey the preventive maintenance plan and report the completed tasks to ChargEye is cause to void the warranty.

NOTICE
The preventive maintenance schedule for cleaning and replacing components and consumable parts gives the indicative minimum intervals. Monitor the condition of the electric vehicle charging system and its wearing parts regularly. Adjust the intervals as necessary.

For maintenance instructions, see the maintenance manual.

To find your local service or maintenance partner, contact Kempower Technical Support.

11.1. Periodic maintenance

	Quarterly	Annually	As necessary
Power Unit maintenance		•	
Station Charger maintenance		•	
Satellite maintenance		•	
Liquid Cooled Satellite maintenance		•	
Control Unit maintenance		•	
Charging cable and vehicle connector maintenance			•

The maintenance interval always depends on environmental and site-specific conditions.

- Charging unit maintenance:
  - Do according to the maintenance intervals, more often in demanding conditions. Maintenance tasks include a visual inspection and cleaning.
- Charging cable and vehicle connector maintenance:
  - Replace if any damage is found. Inspect regularly.

11.2. General maintenance

- Visually inspect the charging unit from all sides regularly. Make sure that:
  - There are no dents or other damage
  - The charging cables and vehicle connectors are not damaged
  - The user interface is not damaged
- Clean the outside of the charging unit regularly. Use a damp cloth and pH neutral detergent.
- Update the charging unit software as needed. Software updates are performed remotely by approved service or maintenance partners orKempower upon request. You can also update the software directly from ChargEye.
- If the vehicle connectors are frozen to the vehicle connector holders or sockets, we recommend using a cordless heat gun (with a maximum temperature setting of 200 °C) and a plastic scraper to carefully remove the ice. Make sure that the temperature does not rise above 60 °C. Keep moving the heat gun around to prevent heat damage to the cables or vehicle connectors.

If you find any damage, do not use the charging unit. Contact Kempower Technical support or your local approved service partner.

NOTE
You can disable the charging units from the ChargEye system to prevent use of the damaged device. We also recommend that you visibly notify users that the charging unit is not in use.

12. MAINTENANCE OF THE CHARGING EQUIPMENT

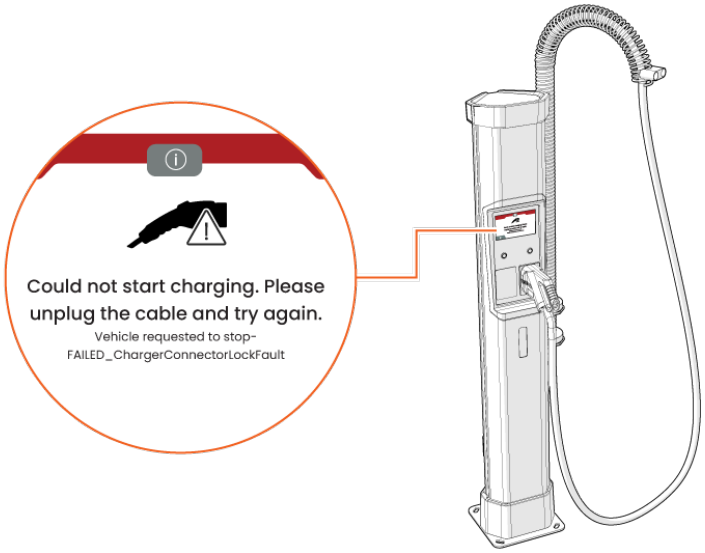
WARNING
You must complete the Kempower certification training before you do installation, commissioning, service or maintenance tasks. Installation, commissioning, service or maintenance tasks done by an unapproved partner will void the warranty.

You must be an authorized electrician to do service or maintenance tasks. For additional information, see the maintenance manual.

13. TROUBLESHOOTING

NOTE
You can also see the error codes in the ChargEye system.

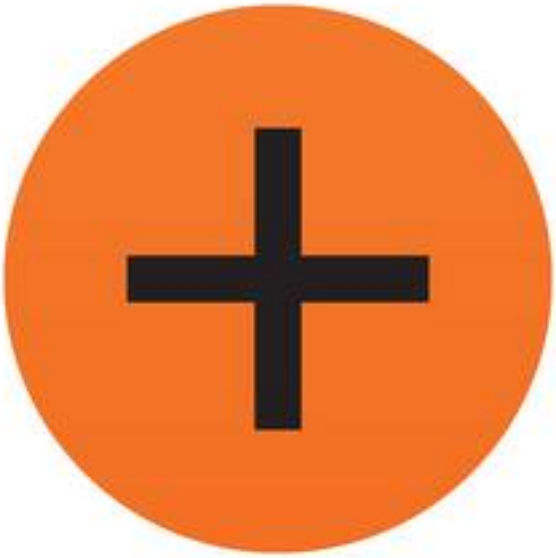
Instructions for problem situations are given on the device's display. The error codes help your service or maintenance partner to fix the problem. For assistance, contact Kempower Technical Support.



14. CHANGE LOG

Charging equipment for electric vehicles Owner's manual **REV 2.20 05-2024**	**Changes**
1.1: Disclaimer on products and services	Added information about software support Added subheadings
1.2: Information about the warranty	Added note about spare parts availability Added subheadings
1.4: Recycling	Updated recycling logo Added information about packaging materials
3: Overview	Updated charging power management illustrations Updated overview images for all products Added images for rating plate placements Added information about Control Unit, Power Unit Version 3 and AC Satellite Indentificators changed to Identifiers Added hardwired Ethernet connection option Added that power module has two independent 25 kW channels Added links from product overviews to 3.7: Vehicle connector types Updated illustration for vehicle connector types
4: Packaging of the charging unit	Added information about Control Unit, Power Unit Version 3 and AC Satellite Added notices about tilting angles
5: Storing the charging equipment	Added information about Control Unit, Power Unit Version 3 and AC Satellite

Charging equipment for electric vehicles Owner's manual **REV 2.20 05-2024**	**Changes**
6: Unpacking the charging equipment	Added information about Control Unit
7: Moving and lifting the charging equipment	Updated moving and lifting images for all products Added information about Station Charger, Control Unit and Power Unit Version 3.
9: Turning the charging equipment off	Updated image and added note about using lockout-tagout (LOTO) procedure when turning the equipment off
10: Using the charging unit	Added information about Control Unit
11: Preventive maintenance	Added information about Control Unit Added instructions for thawing frozen vehicle connectors
13: Troubleshooting	Updated troubleshooting image



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