SIEMENS

OPERATING INSTRUCTIONS

SICHARGE

UC 150 UL Power Control Cabinet
usa.siemens.com/sichargeuc

March 2024

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Important Safety Instructions

SAVE THESE INSTRUCTIONS—This guide contains important instructions that must be followed during installation, operating and maintenance. When using electric products, basic precautions should always be followed.

Symbols indicating hazards

This manual contains notices you must observe to ensure your personal safety as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol. These notices are shown below:

The addition of either symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING

Indicates a potentially hazardous situation which, if not avoided, can result in death or serious injury.

⚠ CAUTION

Indicates a potentially hazardous situation which, if not avoided, can result in minor or moderate injury.

NOTICE

Used without the safety alert symbol, This indicates important information for optimal system operation. Follow instructions closely.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by personnel qualified for the specific task in accordance with the relevant documentation; in particular, its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

⚠ WARNING

Indicates a potentially hazardous situation which, if not avoided, can result in death or serious injury.

Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Consult the vehicle's OEM manual prior to use. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

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Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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SECTION 1

Introduction

1.1 FCC compliance

This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protections against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, this is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance may void the user's authority to operate the equipment and the warranty on the product.

1.2 About the operating instructions

These operating instructions contain the information required for safe operation and intended use of the SICHARGE UC charging station.

Safekeeping the operating instructions

The operating instructions are an integral part of the product and an indispensable part of the product safety concept. The following requirements therefore apply for safekeeping the operating instructions:

- Keep the operating instructions for the entire service life of the charging station.
- Make the operating instructions easily accessible at all times for all persons involved.
- If you transfer the charging station to third parties, also pass along the operating instructions.

Using the operating instructions

How to use the operating instructions correctly:

- Make the operating instructions available to all persons involved before and during work on the charging station.
- Read the operating instructions carefully before starting work.
- Follow the safety instructions and handling instructions.

See also

Technical specifications (Page 61).

1.3 Open-source software

Open-source software is used in the firmware of the product described. Open-source software is provided free of charge. We are liable for the product described, including the open-source software contained in it, pursuant to the conditions applicable to the product. Siemens accepts no liability for the use of the open-source software over and above the intended program sequence or for any faults caused by modifications to the software.

For legal reasons, we are obliged to publish the original text of the license conditions and copyright notices. Please also read the information that is supplied with the product or made available here (https://assets.new.siemens.com/siemens/assets/api/uuid:beda63de-e83a-4598-9863-7645d0c0dda8/sicharge-uc-open-source-software.pdf).

1.4 Security information

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions constitute one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Such systems, machines and components should only be connected to an enterprise network or the internet if and to the extent such a connection is necessary and only when appropriate security measures (such as firewalls and/or network segmentation) are in place.

For additional information on industrial security measures that may be implemented, please visit (https://www.siemens.com/industrialsecurity).

Siemens' products and solutions undergo continuous development to make them more secure.

Siemens strongly recommends that product updates are applied as soon as they are available and that the latest product versions are used. Use of product versions that are no longer supported and failure to apply the latest updates may increase customers' exposure to cyber threats.

Please note that the PLC used in this SICHARGE system has potential vulnerability associated only with physical access. Please ensure the cabinet is secure and located in a locked area to mitigate this risk.

To stay informed about product updates, subscribe to the Siemens Industrial Security RSS feed and by visiting (https://www.siemens.com/industrialsecurity).

1.5 Note regarding the general data protection regulation

Siemens observes the principles of data protection; in particular, the principle of data minimization (privacy by design). For this product this means:

The product does not process or store any personal data, only technical functional data (such as a time stamp). If the user links this data with other data (such as shift plans) or stores personal data on the same medium (such as a hard disk) and thus establishes a personal reference, the user must ensure compliance with data protection regulations.

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More information

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SECTION 2

Safety information

2.1 Basic safety instructions

The charging station complies with all prescribed technical safety standards and thereby offers the greatest possible product safety. To ensure the safety of all persons, systems and equipment at all times, adhere to the following basic safety instructions.

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS - This manual contains important instructions for SICHARGE UC that shall be followed during the installation, operation and maintenance of the unit.

Please note the ambient temperature ratings in Section 13.1.

Guidelines and regulations

In order to ensure comprehensive safety, adhere to the following guidelines and regulations:

- Guidelines for occupational safety
- Regulations for prevention of accidents
- Trade regulations
- Technical connection conditions of the power supply unit
- Building regulations
- Generally accepted rules of technology

Target group

These operating instructions are intended for the following persons:

- Planners
  - Planning the location of the charging station
- Carriers
  - Transporting the charging station to the place of use
- Installers
  - Mounting the charging station
- Qualified electricians
  - Connecting electrical cables to the charging station
  - Performing electrotechnical work on the charging station
- Users
  - Charging electric vehicles
- Service personnel
  - Performing maintenance and servicing

Intended use

The intended use of the charging station is exclusively to charge the vehicle battery of an electric vehicle. The electric vehicle must be equipped with a CCS Combo 1 charging socket. The charging station charges electric vehicles in accordance with the SAE J1772 standard.

To avoid the risk of overheating during high temperature conditions, user should consult the OEM manual regarding optimal battery temperature prior to connection to SICHARGE UC.

The charging station offers charging with a charging cable via a SICHARGE UC dispenser/distributed charge point. Up to four dispensers can be connected to one SICHARGE UC cabinet.

Any other or additional use is not in accordance with the intended use and constitutes misuse of the device. The charging station is suitable for indoor and outdoor use. The permissible ambient conditions at the place of use must be observed for intended use.

Qualified personnel

Non-electrical work, such as transport and assembly, may only be performed by qualified personnel. Qualified personnel are qualified by training and experience to recognize risks arising during the respective work and to avoid possible hazards.

Electrical engineering work may only be performed by qualified electricians themselves or under their direction and supervision. A qualified electrician is someone who is able to assess the work assigned to them and recognize potential dangers due to their professional training, knowledge and experience as well as awareness of the relevant standards.

Work on a live charging station can only be performed by qualified electricians that meet the following requirement: NFPA 70E.

Personal protective equipment (PPE)

Personal protective equipment protects you against hazards to your health and safety. Use your personal protective equipment in accordance with occupational safety guidelines and accident prevention regulations.

Fire and explosion protection

Do not store or use flammable liquids that produce flammable fumes, such as gasoline or ethanol, in the vicinity of the charging station. Electrostatic charge or heat generated during charging can ignite explosive and flammable liquids.

Protection against electromagnetic fields

The electromagnetic emission in the charging station meets the requirements of the UL 2202 standard:

⚠ WARNING

Danger to life from electromagnetic fields when door is open

When the door is open, the switched-on charging station emits electromagnetic fields (EMFs) to the outside. EMFs are particularly dangerous for people with pacemakers or other implants in the immediate vicinity of a system.

- Therefore, switch off the power supply before opening the door of the charging station.
- If you open the door forcibly, the charging station automatically switches off the power supply to the AC/DC converters.

Protection against ingress of liquid

The protection standard of the cabinet protects the charging station against the ingress of splash water from all directions. In particular, the protection standard prevents the penetration of precipitation and protects against all liquids applied to the surface of the cabinet without pressure.

Also, protect the charging station from liquids that exert pressure on the surface of the cabinet:

- Never use high-pressure cleaners or steam cleaners when cleaning the charging station.
- Place the charging station in a flood-proof location.

⚠ WARNING

Electric shock due to ingress of liquid

Strong jets of water or flooding can cause liquid to enter the charging station. Moisture or liquid inside the charging station can cause electric shock.

If liquid has entered the charging station, take the following safety precautions:

- Take the charging station out of service by switching off the main power supply at the power source.
- Qualified personnel must dry the charging station and check it for damage.

Protection against unauthorized opening

- A lock system protects the charging station from unauthorized opening of the device door.
- Only make the key available to authorized persons for work in the charging station.
- Do not leave the charging station unattended with the device door open.

Alterations to the device

The operating instructions describe all permissible changes to the charging station. Any other or additional changes are not permitted. Unauthorized modifications void the manufacturer's warranty and the approvals of the device become invalid.

⚠ WARNING

Danger due to missing or unrecognizable safety signs and warnings

Missing or unrecognizable safety signs or warnings do not indicate that danger is no longer present. Undetected dangers can result in accidents with serious physical injury or death.

- Check the presence of all safety signs and warnings using the operating instructions.
- Attach missing safety signs and warnings.
- Do not remove safety signs and warnings.
- Replace unrecognizable safety signs and warnings.

Only use undamaged equipment or parts

⚠ WARNING

Electric shock in case of damaged equipment

Improper handling can damage the equipment. Damaged devices may have dangerous voltages on the cabinet or exposed components, which can cause serious injury or death if touched.

- Comply with the technical specifications for transport, storage and operation.
- Check the charging cables and charging plugs for tampering, damage and foreign objects.
- Do not use a device if it is damaged.

2.2 The six safety rules for electrical work

The NFPA 70E "Standard for Electrical Safety in the Workplace" prescribes safety rules for working in and on electrical systems. To ensure the safety of persons and property in accordance with the standards, always comply with the following safety rules.

Securing an electrical system before starting work

Before starting work in and on electrical systems, apply the following six safety rules:

1. Disconnect the charging station from the voltage source
2. Secure against reclosing
3. Wait 10 minutes before resuming work
4. Ensure there is no voltage present
5. Ground and short circuit
6. Cover or shield adjacent live parts

Prepare to switch on again after work is finished

After finishing and checking the work, prepare the restart as follows:

- Inform persons no longer required that the work is completed and no further work is permitted
- Withdraw persons no longer required
- Remove all tools, equipment and aids used

Switch on the electrical system again

After finishing the work, remove the protective measures and switch the system on again:

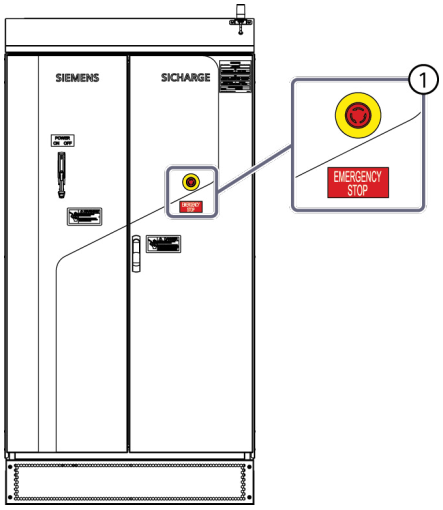
1. Remove the short circuit
2. Remove the grounding
3. Remove preventative restart equipment
4. Reinstall covers and barriers
5. Close and lock the cabinet
6. Power the system on by switching the external breaker handle to the "on" position

2.3 Emergency Stop button

In a hazardous situation, pressing the Emergency Stop button immediately puts the charging station into the safe Emergency Stop state.

Position of the button

The Emergency Stop button is positioned on the front of the charging station in the middle of the right-hand device door.



① Emergency Stop button

Figure 2-1 Position of the button

Function of the Emergency Stop button

Pressing the Emergency Stop button triggers an alarm and immediately puts the charging station into the safe Emergency Stop state. This state stops the charging process immediately and prevents charging from starting.
The Emergency Stop button does not interrupt the infeed to the charging station. Ensure the electrical isolation of the supply line to the charging station before opening the control cabinet door.
For safety reasons, the charging station is not operable in the Emergency Stop state. The charging station only returns to its normal operating state after the button has been reset.

Canceling the Emergency Stop state

Note

Eliminate the hazardous situation

First eliminate the hazardous situation. Only then can the Emergency Stop state be canceled.

The Emergency Stop button is equipped with a rotate-to-unlatch mechanism. An arrow on the top of the button indicates the direction of rotation for unlatching.

Unlatching the Emergency Stop button

To cancel the Emergency Stop state, proceed as follows:

- Turn the Emergency Stop button in the direction of the arrow until the button is released.

Optional External Emergency Stop button

Additional Emergency Stop buttons can be added to the system according to the External Emergency Stop Work Instruction document available on the SICHARGE UC marketing page.

2.4 Safety sign

To handle the charging station safely, safety signs are attached to the charging station and the packaging.

Safety signs on the packaging

The following safety signs are attached to the packaging of the charging station:

Safety sign	Meaning
	Marking of the center of gravity
	Warning of tipping hazard
	Identification of locations that cannot be used for pickup using a forklift
	Tilt indicator

Safety sign on the charging station cabinet

The following safety signs are attached to the charging station cabinet:

Safety sign	Meaning
	Warning of general danger
	Warning of dangerous voltage
	Warning of tipping hazard

2.5 Cybersecurity at Siemens

SIEMENS AG provides products and solutions with cybersecurity functions that support the secure operation of plants, systems, machines and networks.

Implement and maintain the cybersecurity concept

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art cybersecurity concept. Siemens' products and solutions constitute one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Systems, machines and components should only be connected to the enterprise network or the internet if and to the extent that it is necessary and with appropriate security measures in place (such as using firewalls and network segmentation).

In addition, the recommendations of Siemens regarding appropriate protective measures should be observed. For more information about cybersecurity, please visit:

Cybersecurity at Siemens (https://www.siemens.com/cybersecurity#ouraspiration)

Only use current product versions

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends that product updates are applied as soon as they are available and that the latest product versions are used. Using versions that are obsolete or are no longer supported can increase the risk of cyber threats.

2.6 Identification of the device

The nameplate clearly identifies the charging station. To this end, the nameplate contains the identification data of the device, the manufacturer and the UL marking.

Information on the nameplate

You can find the following information on the nameplate of the charging station:

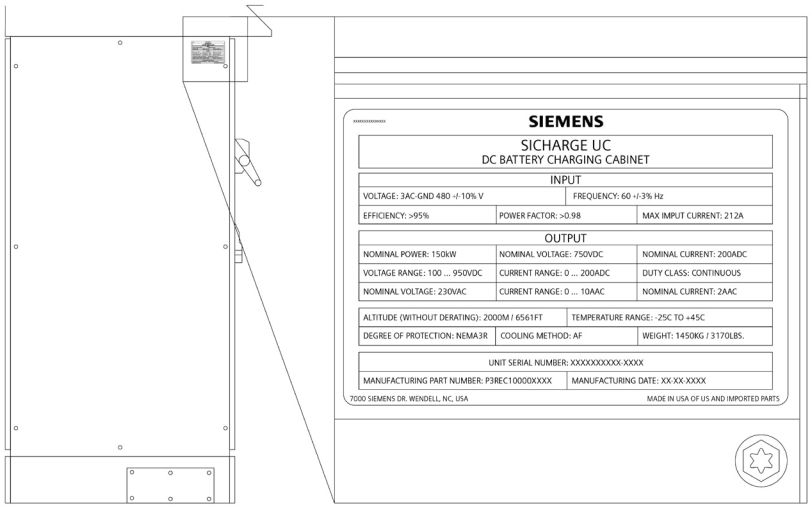


Figure 2-2 Example: SICHARGE UC 150 nameplate

Position of the nameplate on the device

The nameplate is positioned at the upper right corner on the right side panel of the cabinet.

SECTION 3

Description

3.1 Product overview

The SICHARGE UC 150 charging station enables high-performance charging of electric vehicles with the SICHARGE UC dispenser. Thanks to the support of the open universal charging standard CSS type 1, the station charges different vehicle models from different manufacturers both quickly and efficiently. One SICHARGE UC150 can connect up to four dispensers.

Performance features

The SICHARGE UC 150 charging station charges your electric vehicle quickly and safely. To start the charging process, simply connect the dispenser to your vehicle. The system then controls the entire charging process precisely and fully automatically.

The charging station features the following performance characteristics:

- Fully automatic control of the charging process
- Space-saving design
- High availability
- Easy maintenance and servicing

Application

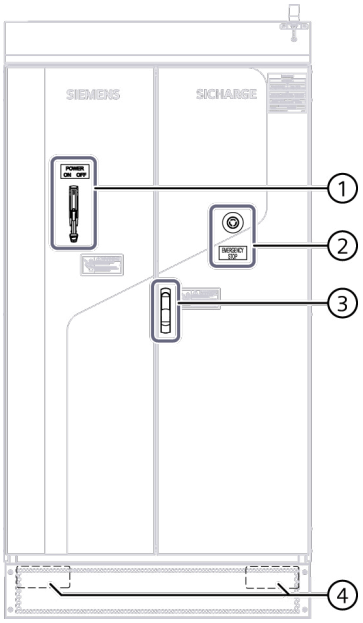
The charging station is designed for charging electric vehicles in semi-public commercial and industrial areas, for example:

- Terminals
- Vehicle depots
- Company parking lots

3.2 Properties and operator controls

Operator controls

The charging station has the following properties and operator controls:

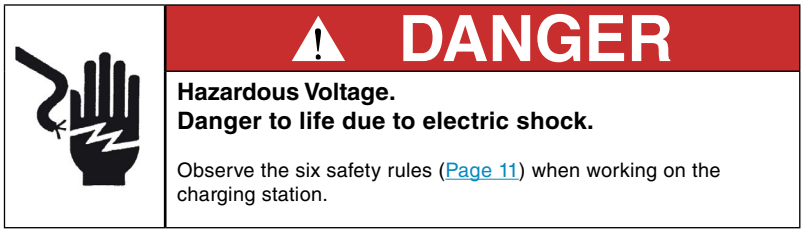


① Disconnect handle/main switch
② Emergency Stop button
③ Door handle
④ Forklift channels

Figure 3-1 Properties and operator controls of SICHARGE UC 150

Disconnect handle / main switch

The charging station is equipped with a disconnect handle on the door, with which the charging station can be de-energized. This de-energization does not include the removal of incoming supply power. Before working inside the charging station, switch off the supply line at the power source.



Emergency Stop button

The charging station is equipped with an Emergency Stop button ②. If you press the Emergency Stop button in a hazardous situation, the charging station immediately stops charging. The charging station switches to the safe Emergency Stop state. The HMI screen displays the “Emergency Stop” alarm message. For safety reasons, the charging station cannot be operated in the Emergency Stop state. The charging station only returns to its normal operating state after the button has been reset.

Lock system

To protect the charging station from unauthorized opening, the door of the charging station is equipped with a lock system. The door lock on the door handle ③ secures access to the interior of the charging station. You need a special door key to open the device door. The door key is included in the delivery.

Forklift channels

Channels for insertion of forklift forks are mounted behind the cover at positions ④. To remove the covers from the forklift channels, remove the four M6 hexagon bolts in the corners of the covers. The forklift forks can then be inserted into the forklift channels at the bottom of the cabinet and moved to the place of installation.

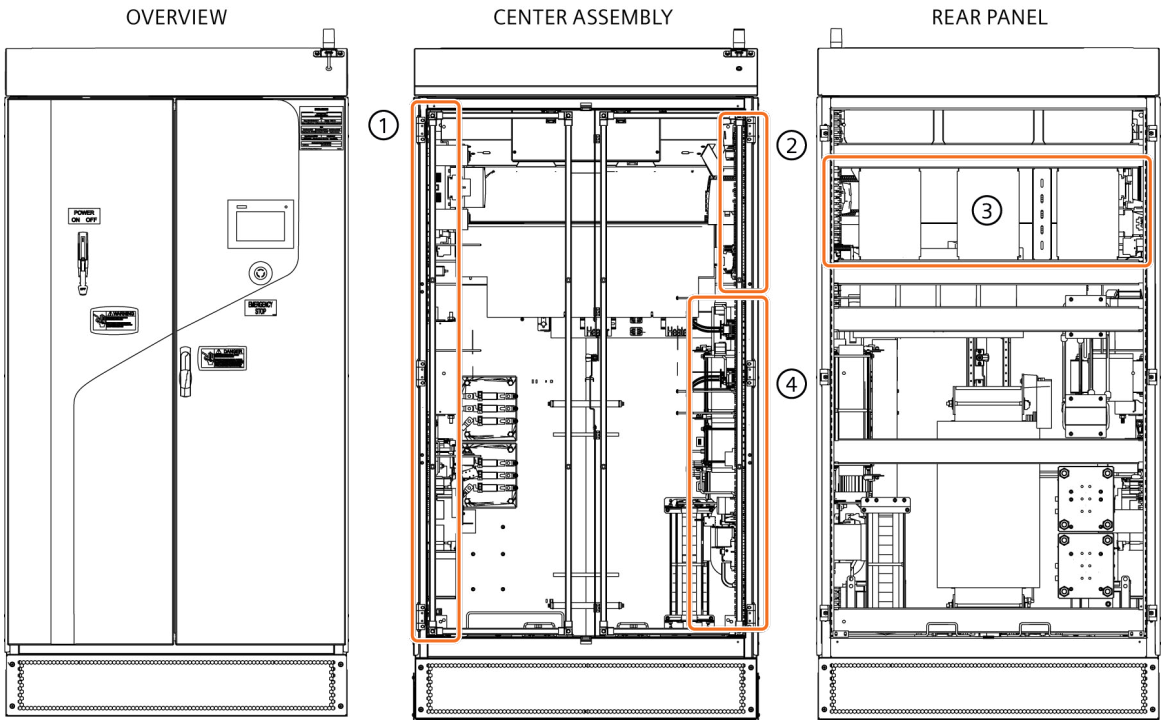
Note

Use caution while using forklift channels. Any damage to the paint within the forklift channels and base of unit can lead to an increased risk of corrosion and rust.

3.3 Design of the charging station

The control system with the communication modules, fuse elements and switching elements are located inside the charging station at the front. The following figure provides an overview of the positions of the various components.

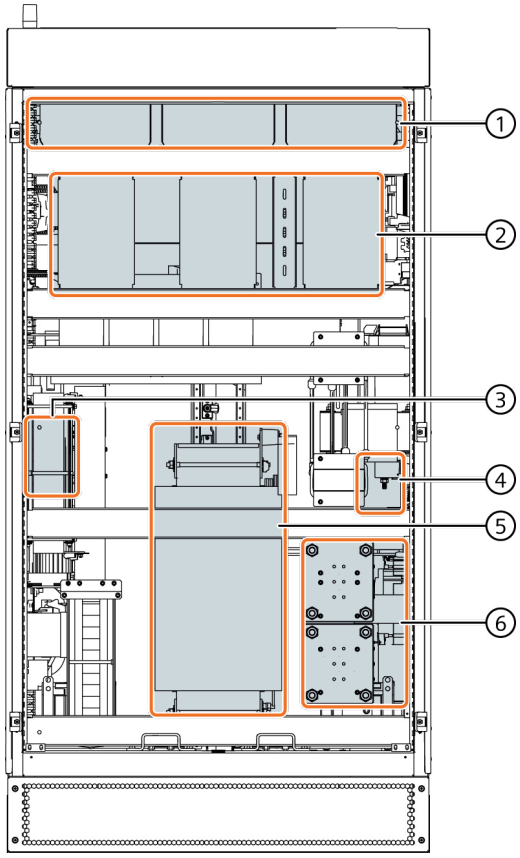
The right-hand graphic shows the version with another Siemens controller.



① Incoming power electronics
② Controllers
③ Rectifier bridge and IGBTs
④ Outgoing power electronics

Figure 3-2 Interior front

The fans, the electronic components of the DC output and several inductors are located at the rear. The transformer of the charging station is positioned in the middle of the cabinet behind the central switchboard.



① Fans
② Rectifier bridge and IGBTs
③ Outgoing filter
④ Incoming filter
⑤ Transformer
⑥ Secondary transformer fuses for inductors

Figure 3-3 Interior rear

3.4 Decentralized charge points

Depending on the equipment variant, the SICHARGE UC charging station is designed to supply various distributed charge points for electric vehicles with charging current via a fixed DC cable.

Charge points

You can operate one of the following charge points for electric vehicles at the SICHARGE UC charging station:

- SICHARGE UC Dispenser CCS 1 200 A floor mounting
- SICHARGE UC Dispenser CCS 1 200 A wall mounting

Routing cables between the charging station and the charge point

The DC charging cables from the charging station to the SICHARGE UC dispenser are installed by the end user. You can find details on connections, cable types and dimensioning in the project-specific instructions.

Additional information

You can find more information on connecting and operating charge points together with the SICHARGE UC charging station in the following documentation:

- SICHARGE UC dispenser operating instructions
- You can find the current documentation in the Siemens Industry Online Support (https://support.industry.siemens.com/cs/us/en/ps).

3.5 Electrical protection devices

The charging station is equipped with several electrical protection devices.

Overvoltage protection

The charging station has comprehensive protection against overvoltages from the distribution network. Voltage-dependent resistors with short response times protect each line conductor of the power cable against overvoltages. In addition, the control system of the charging station constantly monitors the nominal voltage. If the nominal voltage exceeds or falls below the permissible limits, the charging station interrupts a charging process in progress or does not start the charging process.

Overload protection

A separate system constantly monitors the input current and the output current in the charging station. The charging station supplies the system with power directly from the input voltage. This allows the system to monitor currents even when there is no output voltage.

The controller constantly monitors the input current and the output current. If a measured current value exceeds the preset limits, the control system opens the main contactor. The open main contactor electrically separates the charging module and the vehicle. No more charging current flows between the charging station and the vehicle. A breaker at the input protects the charging station against overcurrent. A fuse also protects the electric vehicle against overcurrent at the output.

Insulation monitoring

To ensure that an electric vehicle is safe, the vehicle's high-voltage electrical system must not be grounded via electrically conductive material. For this reason, an insulation monitoring device in the charging station constantly monitors the resistance between the DC+ and DC- contacts to ground. If this resistance falls below the permissible limit, the insulation monitoring device switches off the output current and disconnects the AC-DC converter from the AC input. In addition, the insulation monitoring device sends a message to the Siemens control system. For safety reasons, the charging station switches to the safe Emergency Stop state. In the Emergency Stop state, the charging station can no longer be operated. To reset the charging station, the user must confirm the alarm. When the alarm disappears, the charging station is ready for use again.

SECTION 4

Application planning

4.1 Incoming inspection of the device

4.1.1 Checking the delivery for completeness and correctness

When the carrier delivers the charging station, you should immediately perform an incoming inspection of the device.

Checking delivery

Begin the incoming inspection of the device with the following steps:

1. Check the completeness of the delivery

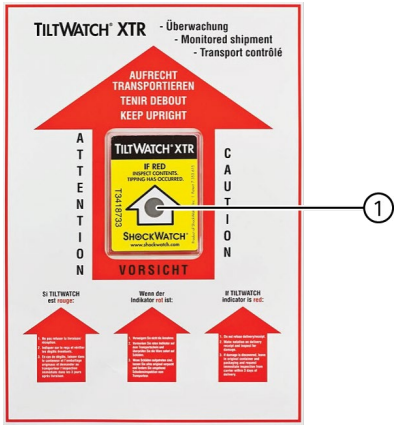
2. Check that the delivery documents correspond to the device delivered

4.1.2 Checking the transport packaging

Start the check of the transport packaging by visually inspecting the tilt indicator.

Checking tilt indicator

A tilt indicator is affixed to the transport packaging of the charging station. To check the tilt status of the transported package, follow the instructions on the label.



① Indicator

Figure 4-1 Schematic example: Tilt indicator

The tilt indicator monitors the container for tilting throughout its transport. The indicator tube indicates that the container has been tilted by more than 80° by turning red. A red indicator can be a sign of damage during transport.

Perform a visual inspection of the tilt indicator as follows:

1. Check for the presence of a tilt indicator on the transport packaging.

2. Check if the indicator has turned red.

3. Report a red indicator or damaged parts to the carrier immediately.

The carrier must confirm the red colored or missing indicator on the receipt.

Check the overall transport packaging

After you have checked the tilt indicator, continue the incoming inspection of the devices with the visual inspection of the entire transport packaging.

4.1.3 Unpackaging the charging station

Depending on the transport route, the forwarding agent delivers the charging station in different transport packaging.

Removing packaging for road transport

To remove the packaging, proceed as follows:

1. Remove the transport film
2. Remove the edge protection strips
3. Remove the spacers

Remove packaging for air transport

To remove the packaging, proceed as follows:

1. Remove the side walls of the packaging one-by-one as follows:
   - Unscrew the screws in the side panel
   - Remove the side panel
2. Remove the cover of the transport packaging

Remove the packaging for sea transport

To remove the packaging, proceed as follows:

1. Remove the aluminum compound foil
2. Remove the side walls of the packaging one-by-one as follows:
   - Unscrew the screws in the side panel
   - Remove the side panel
3. Remove the cover of the transport packaging

4.1.4 Report missing delivery components or transport damage

If you discover that the delivery is incomplete or that there is transport damage, document the damage first. Then submit a damage report.

Documenting damage

Take immediate action to determine the exact extent, cause and origin of the damage. Take immediate and appropriate measures to limit the damage.

In particular, document the damage as follows:

- Photograph the damage.
- Record all known information on the damaging event, such as the location, time and date.

Report incomplete delivery or damaged delivery items

If the delivery is incomplete or damaged, inform the following persons immediately:

- Contact of the supplier (see delivery note)
- Contact of the purchaser (see delivery note)
- Person responsible for the transport company

4.2 Location planning

To operate the charging station safely, you need a location that meets the following requirements.

⚠ WARNING

Damage to equipment

If the unit is operated outside of the recommended environmental parameters, damage or lack of function may occur. Refer to section 13.1 (Technical Specifications) for the required ambient conditions.

NOTICE

Our equipment has not undergone a seismic evaluation.

Selection criteria for a safe location

Select the location of the charging station so that all actions around charging are always safe. The user must be able to connect the vehicle without using extension cables. The charging station, therefore, must be located in the immediate vicinity of the charging areas but without itself posing a danger to persons or vehicles.

The SICHARGE unit must not be installed in a commercial garage (repair facility) or closer than 20 feet (610 cm) of an outdoor motor fuel dispensing device.

Properties of the base area

To ensure the stability of the charging station, the base area must meet the following requirements:

- Level
- Dry
- Sufficiently strong and able to support the weight of the charging station.

Minimum clearances

To ensure the operation and maintenance of the charging station, you must maintain the minimum physical back space clearance of 150 mm and the physical frontal clearance of 600 mm for all SICHARGE power cabinets:

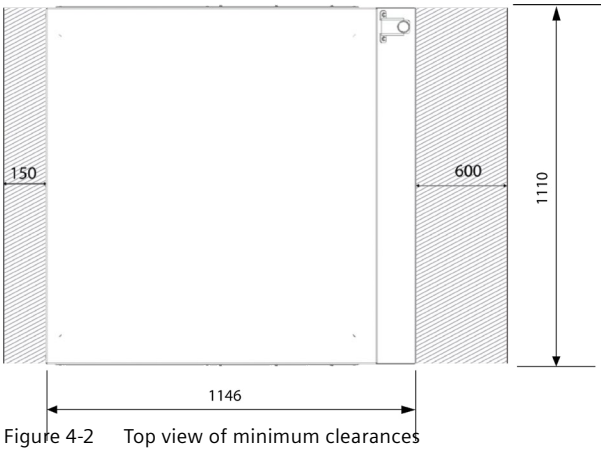
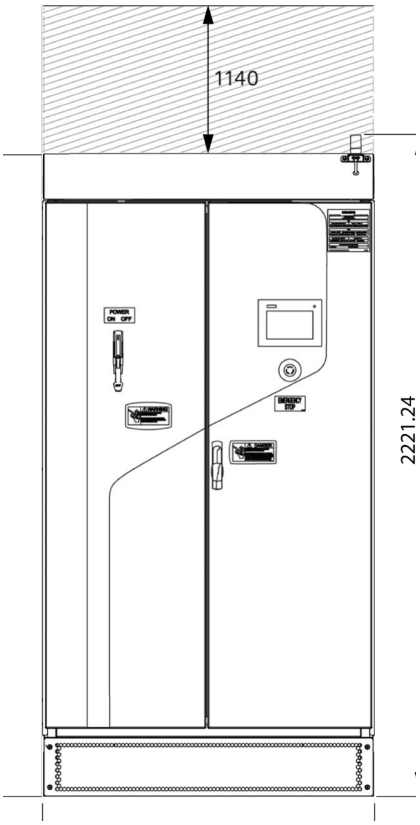


Figure 4-2 Top view of minimum clearances



A minimum overhead clearance of 1,140 mm is required at the intended installation location for filter maintenance.

Figure 4-3 Front view of minimum clearances

Maximum allowable temperature at air inlet

The maximum permissible temperature at the air inlet is 45 °C / 113 °F. When the temperature rises above 45 °C / 113 °F, the rated output is reduced. Do not operate the charging station above the maximum permissible ambient temperature.

You will find the graphical display of derating depending on the load voltage and ambient temperature in section 13.

Direction of air flow

The incoming air enters through the ventilation openings on the top of the charging station. The air is discharged through the outlets on the bottom of the charging station. To achieve sufficient cooling, avoid recirculating the air.

Electrical installation

The charging station is designed for connection to the low-voltage network (480 V or 600 V). Connect the charging station to the electrical distributor via a supply line dimensioned for the expected current load.
The following table provides a recommendation for the cable cross section under “Installation type in ground”.
The size of the automatic circuit breaker must be suitable for the selected cable and larger than the line-side automatic circuit breaker of the charging station. The minimum size for the distribution circuit breaker is 250 A for 480 V systems and 200 A for 600 V systems.

The charging station is equipped with a surge protection device (SPD) in accordance with UL2231 requirements. Site-specific conditions should be examined by a licensed professional. Outside of the parameters found in the following table, determine if supplemental protection is required for each installation:

Charger Nominal Input Voltage	Voltage Protection Rating (L-L)	Nominal Discharge Current Rating	Surge Capacity	Short-Circuit Current Rating (SCCR)
480 VAC	2,000 V	20 kA	75 kA	200 kA
600 VAC	2,500 V	10 kA	75 kA	200 kA

Observe the maximum overall length of 100m for the DC circuit.

Lay the cables carrying current separately and with a distance of at least 15 cm from the communication cables.

Note

The installer is responsible for calculation and design.
The installer is responsible for calculating and implementing the connection.
Connection of the charging station must comply with standards and regulations.

Table 4-1 Suggested cable cross sections

Area	Function		Cable size (minimum)	Cable type
Supply line	480 VAC	L1/L2/L3/PE	4/0 AWG 4 AWG PE	0.6/1kV PVC (THHW/THWN) Cu/PVC
Supply line	600 VAC	L1/L2/L3/PE	3/0 AWG 4 AWG PE	0.6/1kV PVC (THHW/THWN) Cu/PVC
Charging station - dispenser	100-1,000 VDC, 200 A	DC+/-	3/0 AWG	1kV/2kV PVC (RHW/RHH)
Charging station - dispenser	Grounding	PE	4 AWG	Cu/PVC (Y/G)
Charging station - dispenser	AC230V-AUX supply	L/N/PE	14 AWG	600 V, Cu/PVC
Charging station - dispenser	Communication (F.O. required for >100 m)		• RJ45 CAT 5 (TP) • F.O. 50/125, OM3, multi-mode 2 core	LIYCY (TP)
(Optional) Charging station - external E-stop	Emergency Stop	E21/E22	• 16 AWG	600V, Cu/PVC E41/E42

Supply line and dispenser cables to be rated 75 °C. (UL2202, Table 76.4)

Note: For comprehensive information on cable selection and sizes, please refer to the guide that can be located at the following link: Cable Selection and Sizing Guide

Dispenser cables for AC230V aux circuit to be rated 60 °C. (UL2202, Table 76.4)

Recommended cable lugs:

3/0 AWG - Panduit LCAX3/0-12-X (0.5 inch hole)
4/0 AWG - Panduit LCAX4/0-12-X (0.5 inch hole)
#4 AWG - Panduit LCA4-12-L (0.5 inch hole)

Recommended torque values:

230VAC cables - 0.5 to 0.6 Nm
480/600 VAC supply line - 25 Nm
Ground connections - 65 Nm
DC connections - 32 Nm

Note: Route DC cables, aux supply cables and communication cables in separate conduits.

Cable routing

- Auxiliary voltage:
  - The SICHARGE UC charging station is designed for connection to the low-voltage network (480 VAC or 600 VAC, 60 Hz, ±10%). Connect the SICHARGE UC charging station to the electrical distributor via a properly dimensioned supply line.
- Direct voltage:
  Connect the SICHARGE UC charging station with the SICHARGE UC dispenser via a properly dimensioned cable.

Note:

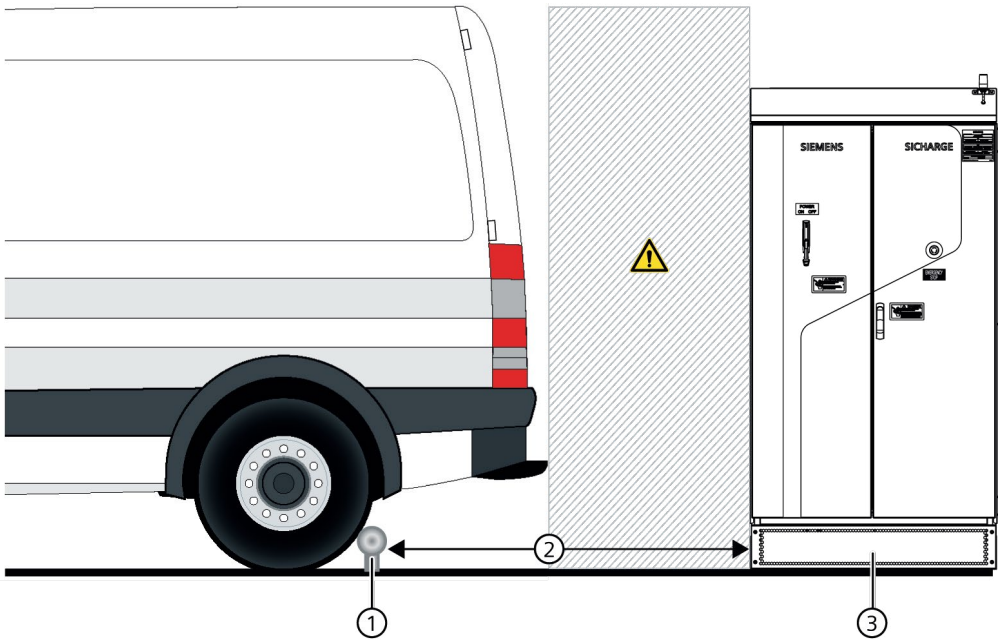
To prevent radio interference, ensure appropriate routing of DC cables.
Lay the DC charging cables from the SICHARGE UC charging station to the SICHARGE dispenser underground.

- Ethernet:
  Connect the SICHARGE UC charging station to the SICHARGE UC dispenser using an Ethernet cable.
  Specifications for laying of cables:
  - Low-voltage and direct-voltage cables must be installed shielded from the Ethernet cable.

    CAUTION - Separate cable routing to low-voltage and DC cables (minimum 20 cm).
  - Lay Ethernet cables close to grounded cabinet components.
  - Ethernet cables and low-voltage and direct-voltage cables may only cross each other at a 90° angle.

Bumper

To protect the charging station against contact by vehicles, install a bumper ①.



① Bumper
② Safety clearance
③ Charging station

Figure 4-4 Example: Correct position of the bumper and charging station

Plan for bumpers based on the dimensions of the vehicles used. The bumper must stop the vehicle before the vehicle overhang touches the charging station. The bumper must not interfere with the opening of the charging station's cabinet door.

See also

Derating (Page 63)

Grounding instructions

This unit is to be connected to a grounded, metal, permanent wiring system, or an equipment-grounding conductor is to be run with circuit conductors and connected to an equipment-grounding terminal or lead on a battery charger. Connections to the battery charger must comply with all local codes and ordinances.

4.3 Preparing the base area

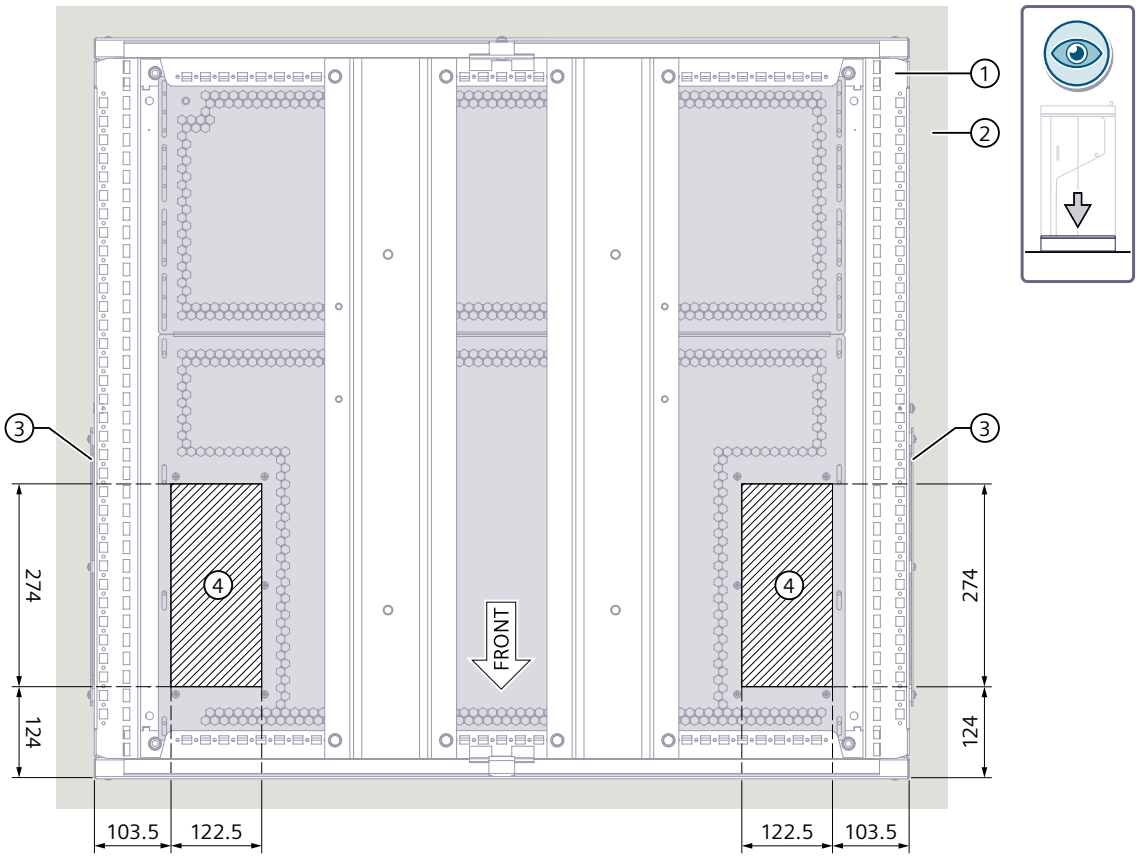
In order to secure the charging station securely on the intended base area, you need to prepare the base area.

Example of foundation

Make a static calculation for the base area to ensure stability. This calculation must include the following factors, among others:

- Ground survey
- Wind load
- Snow load
- Earthquakes

The dimensions and design of the foundation are determined by the static calculation. The figure below shows a schematic example of the design of the foundation made of reinforced concrete. The cable routing serves only as an example. Plan cable routing in accordance with the local conditions. The dimensions for the area of cable laying are specified in mm in the figure below, which displays the cut-out in the forklift channel for cable routing.



① Base area of charging station
② Reinforced concrete
③ Area for the cable routing
④ Cable inlet and cable outlet

Figure 4-5 Example of foundation

Drill holes for fastening points

The following figure shows the dimensions of the holes for fastening the charging unit. On each side, screw the charging station to the foundation in at least 4 holes.

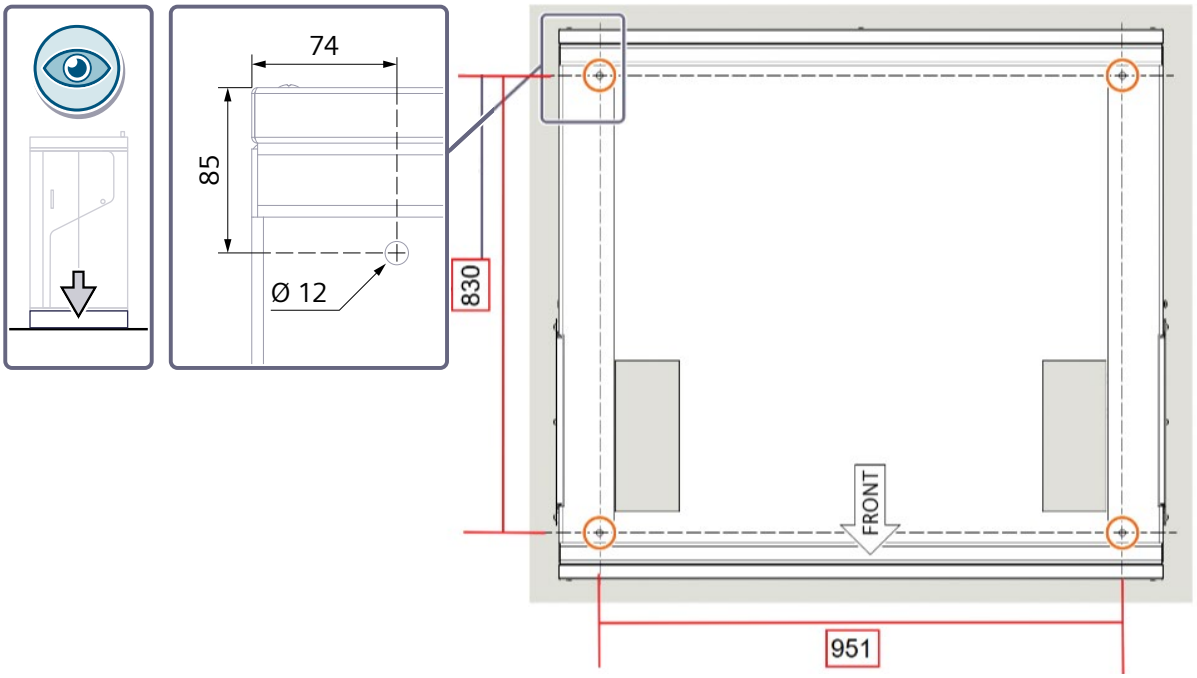


Figure 4-6 Fastening points

Screws for securing the charging station

To attach the base area to the reinforced concrete (Page 27), the following hardware is required:

- 4 M10 (3/8") bolts
- 4 M10 (3/8") washers
- 4 M10 (3/8") concrete

4.4 Storing the charging station

Safe operation of the device requires proper storage of the charging station.

NOTICE

Damage to property due to improper storage

Improper storage may result in damage to the charging station, such as corrosion damage.

- Observe the conditions for proper storage.

Storage conditions

Store the charging station indoors. The storage location must meet the following conditions:

- Horizontal surface
- Protection against mechanical stress (such as from shock vibration)
- Dust-free

- Low-pollutant atmosphere
- Room temperature as constant as possible
- Permissible room temperature range: -40 °C to 70 °C
- Permissible relative humidity: 30% to 70% (non-condensing)

Long-term storage

NOTICE

Material damage due to excessive storage time

If the electronic components of the charging station remain switched off for more than a year, storage damage to the components may occur.

- Only store the charging station for an extended time if necessary.
- Put the charging station back into operation after one year at the latest.

If you store the charging station for a longer period, also observe the following:

- Use the original transport packaging.
- Regularly check that the actual storage conditions do not allow condensation to form.
- Check the charging station at regular intervals for damage.

4.5 Transporting the charging station

⚠ DANGER

Danger to life due to improper transport

If you transport the charging station improperly, the device may tip over. Tipping of the charging station can cause death, serious injury and material damage.

- Only qualified persons may transport the charging station.
- Only use approved means of transport.
- Pay attention to the center of gravity of the charging station.
- Only transport the charging station in a vertical position.
- Note the weight of the charging station.
- Lift only as directed in the manual.

⚠ WARNING

Lift only as directed

The cabinet is intended to be transported from the base and/or pallet via a fork lift. Eye bolts under the hood are not designed to support the weight of the assembled cabinet. When lifting the gear for transportation, there is a danger to life when standing under lifting loads. If hoisting gear or load handling equipment fails, a lifted load can drop. If you are in a hazardous area under or next to the lifted load at the time of failure then death, serious injury and/or material damage may occur.

- Always use loading handling and transportation equipment properly.
- Do not stay in the hazardous area under or next to lifted loads.

Note

Transporting the charging station on the transport pallet:

The transport pallet protects the charging station from damage and facilitates transport.

- Therefore, always transport the charging station on the transport pallet.

Transporting the charging station

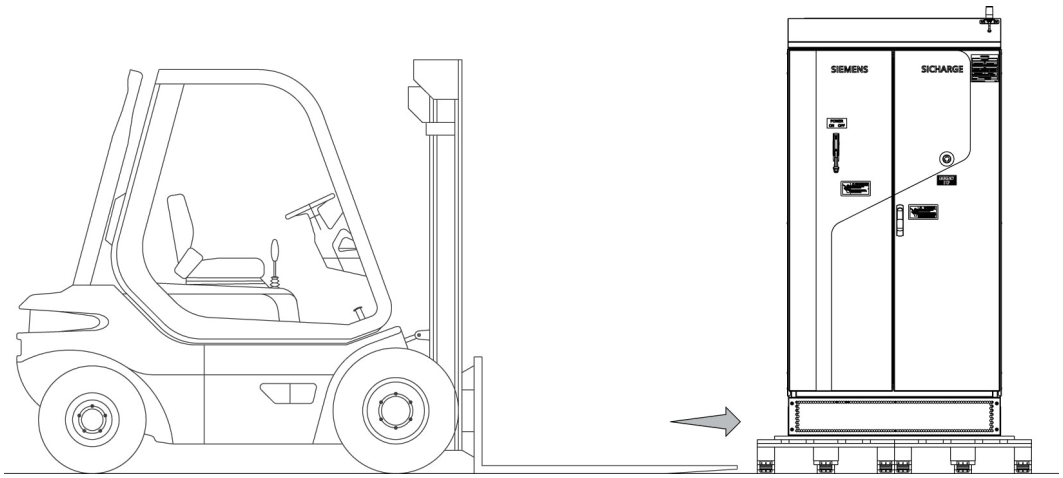


Figure 4-7 Forklift transport

To transport the charging station to the site with a forklift, proceed as follows:

1. Drive into the transport pallet with the forks on the transverse or longitudinal side.
2. Drive in until the forks protrude on the other side of the pallet.
3. Lift the charging station vertically.
4. Transport the charging station upright to the site.

SECTION 5

Installation

5.1 Safety instructions

In order to mount the charging station safely, observe the following safety instructions.

DANGER

Electrical shock from contact with exposed electrical connections or components.

Before starting the installation work, check that the supply cable has been disconnected from the power source and secured against unintentional restart.

If damage or tampering is visible (such as damage to the cabinet), do not install the charging station.

WARNING

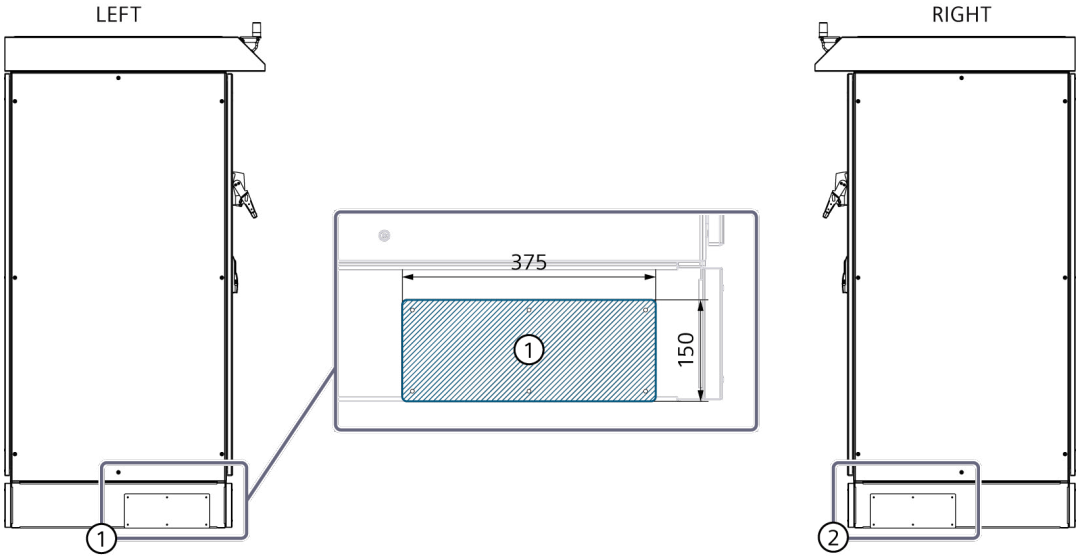
Danger to life when standing under lifted loads

If hoisting gear or load handling equipment fail, a lifted load can drop. If you are in the hazardous area under or next to the lifted load at this time, death, serious injury and material damage may result.

- Always use hoisting gear and load handling equipment properly.
- Do not stay in the hazardous area under or next to a lifted load

5.2 Cutouts for lateral cable entries

When cables are run through the sides of the charging unit, cable cutouts must be punched into the side panels.

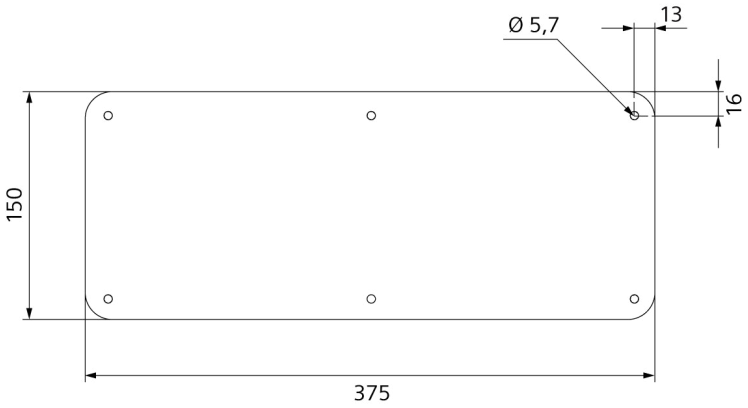


① Aluminum plate (left)

② Aluminum plate (right)

Figure 5-1 SICHARGE side view

To remove the aluminum plates, remove the M5 bolts (6 locations on each cover) that fasten the cover to the cabinet bottom. The plates should then be modified to punch the holes for incoming and outgoing cables to a suitable size. We recommend using compression connectors at the drilled holes to fasten the cables; however, the edges should have protection to prevent damaging the cables during installation.



① Aluminum plate

Figure 5-2 Removable aluminum cover

5.3 Positioning the charging station

To set up the charging station at the site, you need to lift the charging station from the transport pallet. Then, use a forklift to transport the charging station to the prepared base area.

Lifting the charging station

To lift the charging station from the transport pallet, proceed as follows:

1. Remove the forklift covers from the base of the cabinet.
2. Drive the forks from the front or from behind under the bottom of the cabinet.
3. Lift the charging station vertically upwards.
4. Transport the charging station in a vertical position in relation to the base area.
5. Reinstall the forklift covers on the bottom of the cabinet.

Positioning the charging station on the base area

To position the charging station on the base area, proceed as follows:

1. Position the charging station on the base area above the holes for the fastening screws.
2. Check that the mounting holes in the feet of the station are above the securing points on the base area.
3. Lower the charging station onto the base area.
4. Reinstall the forklift covers on the bottom of the cabinet.

5.4 Inserting the connecting cable into the cabinet

After positioning the charging station on the base for the first time, insert the power supply cable from below into the input side of the charging station.

⚠ WARNING

Danger to life when standing under lifted loads

If hoisting gear or load handling equipment fail, a lifted load can drop. If you are in the hazardous area under or next to the lifted load at this time, death, serious injury and material damage may result.

- Always use hoisting gear and load handling equipment properly.
- Do not stay in the hazardous area under or next to a lifted load

⚠ DANGER

Danger to life due to improper lifting

If you lift the charging station improperly, the device may tip over. Tipping of the charging station can cause death, serious injury and material damage.

- Only qualified personnel should lift the charging station.
- Only use approved hoisting gear.
- Pay attention to the center of gravity of the charging station.
- Note the weight of the charging station.
- Only lift the charging station in a vertical position.
- The forks of the forklift must protrude on the opposite side of the charging station.

Removing the pressure joint plates

First, remove the pressure gland plate at the bottom left on the inside of the charging station to insert the power supply cable:

1. Open the cabinet door.
2. Look for the pressure joint plate at the bottom left of the cabinet. This plate should have a 3" compression connection that is fastened in the center.
3. Remove the fixing screws that fasten the plate to the perforated bottom plate.
4. Remove the pressure joint plate.
5. Look for the pressure joint plate at the bottom right of the cabinet. This plate should have a 3" compression connection as well as two 1" compression connections that are attached to the plate.
6. Remove the fixing screws that fasten the plate to the perforated bottom plate.
7. Remove the pressure joint plate.
8. Use a wrench to loosen the nuts that fasten the clamping ring connections to the pressure flange plates.
9. Keep the clamping ring connection inserted in the pressure joint plate and guide the incoming cables through the 3" compression connection on the input side of the charging cabinet.
10. Fasten the nut of the clamping ring connection to tighten the screw connection at the pressure joint plate.
11. Install the pressure joint plate (with clamping ring connection and secured cables) back into the bottom left of the charging cabinet.
12. Keep the clamping ring connections inserted in the pressure joint plate and guide the outgoing cables through the 3" and 1" clamping ring connections on the output side of the charging cabinet.
13. Fasten the nut of the clamping ring connections to tighten the screw connections at the pressure joint plate.
14. Install the pressure joint plate (with the clamping ring connections and secured cables) back into the bottom right of the charging cabinet.

Removing protective covers

To make the cable entry accessible, first remove the protective covers in the interior of the charging station:

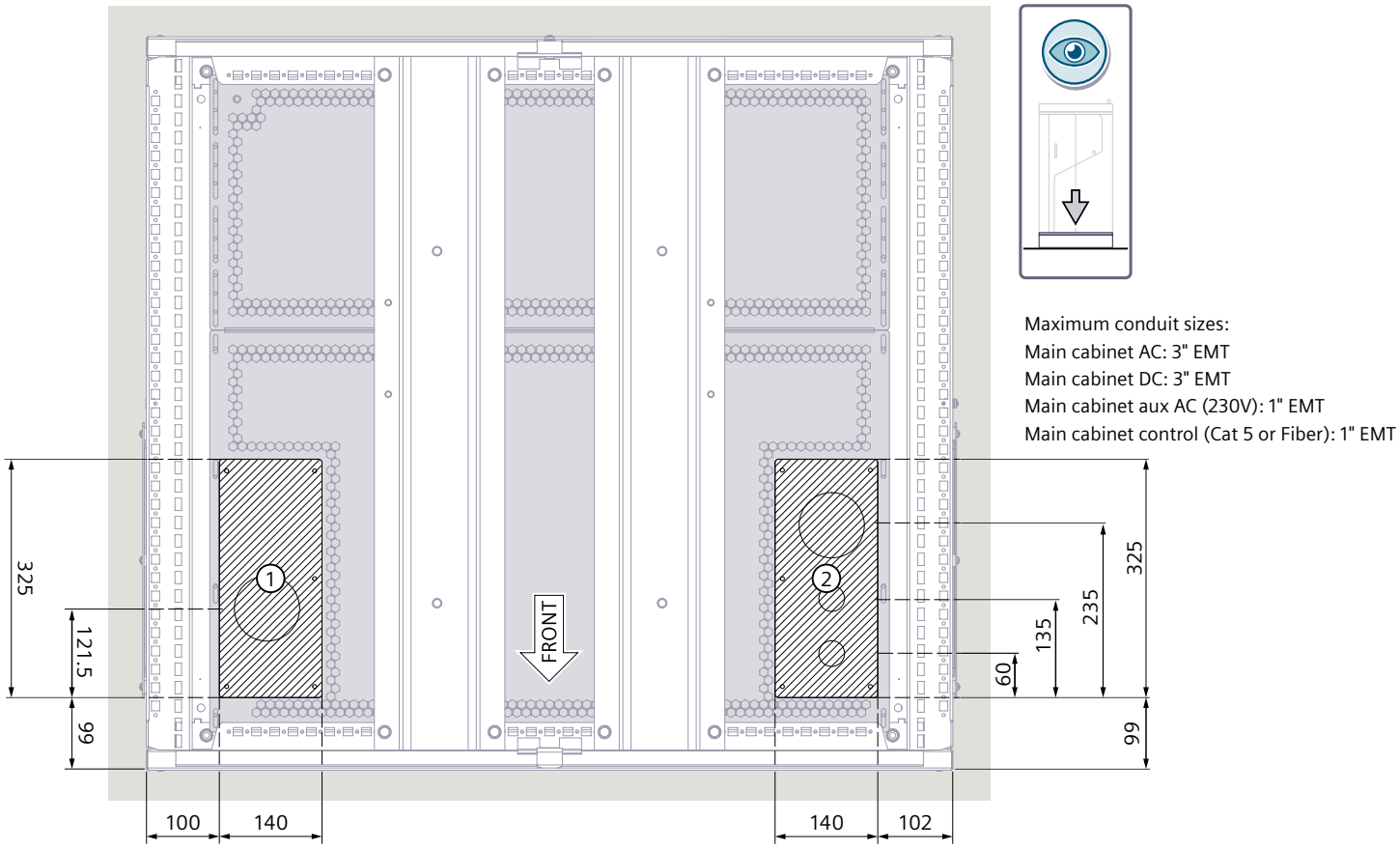
1. Open the cabinet door.
2. Find the protective cover on the lower left side of the cabinet. This cover protects the lower connections of the main cabinet switch.
3. Unscrew the fastening screws of the protective cover.
4. Remove the protective cover.
5. Find the two protective covers at the bottom right of the cabinet. These protect the DC fuse terminals.
6. Unlock and remove the transparent covers from the fuse bases.

Cable routing considerations

All circuits (incoming AC power wiring, DC wiring to dispensers and communications wiring) should be ran in separate conduit runs until reaching the cable gland plates.

Preparing the cable gland plate

The figure below shows the cable gland plate.



① Cable gland plate for power supply cord

② Cable gland plate for the connection of the DC cable

Figure 5-3 Cable gland plate UC 150

Loosen the four fastening screws of the cable gland plate and remove the cable gland plate from the cabinet.

Pull the power cables through the opening in the bottom of the cabinet

Pull the power cables from below through the opening in the cabinet floor.

Pull the DC cable through the opening in the bottom of the cabinet[1]

If you are installing a charging station for charging via decentralized charging points, pull the DC cable through the opening in the base of the charging station cabinet.

[1)] Only applies to equipment variants of the charging station that are set up for SICHARGE UC dispenser.

Pull the Ethernet cable through the opening in the bottom of the cabinet[1]

If you are installing a charging station for charging via distributed charging points, pull the Ethernet cable through the opening in the base of the charging station cabinet.

[1)] Only applies to equipment variants of the charging station that are set up for SICHARGE UC dispenser.

Pull the auxiliary power supply cable through the opening in the bottom of the cabinet[1]

If you are installing a charging station for charging via decentralized charging points, pull the auxiliary power supply cable through the opening in the base of the charging station cabinet.

[1)] Only applies to equipment variants of the charging station that are set up for SICHARGE UC dispenser.

Reposition the charging station on the base area

1. Close the cabinet door.
2. Drive the forks of the forklift from the front or from behind under the bottom of the cabinet.
3. Lift the charging station vertically upwards.
4. Lower the charging station onto the base area.

Guiding the cables through the cable glands

1. Guide all cables used through the cable glands of the cable gland plate.
2. Slide the cable gland plate to the cutout from which it was removed.
3. Screw the cable gland plate to the cabinet with the four fastening screws.
4. Tighten the cable glands on the cables.

5.5 Securing the charging station

After inserting the power cord into the cabinet, attach the charging station to the base area.

Required tools and fasteners

You will need the following tools to secure the charging station:

- Torque wrench
- Socket: Hexagon, SW18

You will also need the following fasteners:

- 10 M14 screws, property class 8.8
- 10 washers
- 10 cement sockets

Securing the charging station

Screw the charging station to the foundation at all four fastening points.

To secure the charging station, follow these steps:

1. Insert the fastening screws into the drill holes.
2. Tighten the screws.

   Tightening torque: 95 Nm

SECTION 6

Connecting

6.1 Safety instructions

The installer is responsible for the electrical connection of the charging station. The electrical connection of the charging station must be performed in accordance with the relevant regulations (such as the conductor cross section, fuses, ground connection, and so on).

During all work on the charging station, observe the basic safety instructions (Page 8), the requirements of DIN EN 501101 for safe working with and on electrical installations or equivalent applicable local guidelines. Also observe the following safety instructions:

⚠ WARNING

Electric shock due to lack of grounding

If the protective conductor connection is missing or incorrectly connected, high voltages may be present on exposed parts. Touching the parts can lead to serious injury or death. To ground the charging station, connect the protective conductor properly.

NOTICE

Danger to life and damage to property due to loose power connections

Insufficient tightening torques and vibrations lead to loose power connections. Loose power connections can result in high voltages on exposed parts. Touching the parts can lead to serious injury or death. Loose power connections can also cause fire damage, defects to the device or malfunctions.

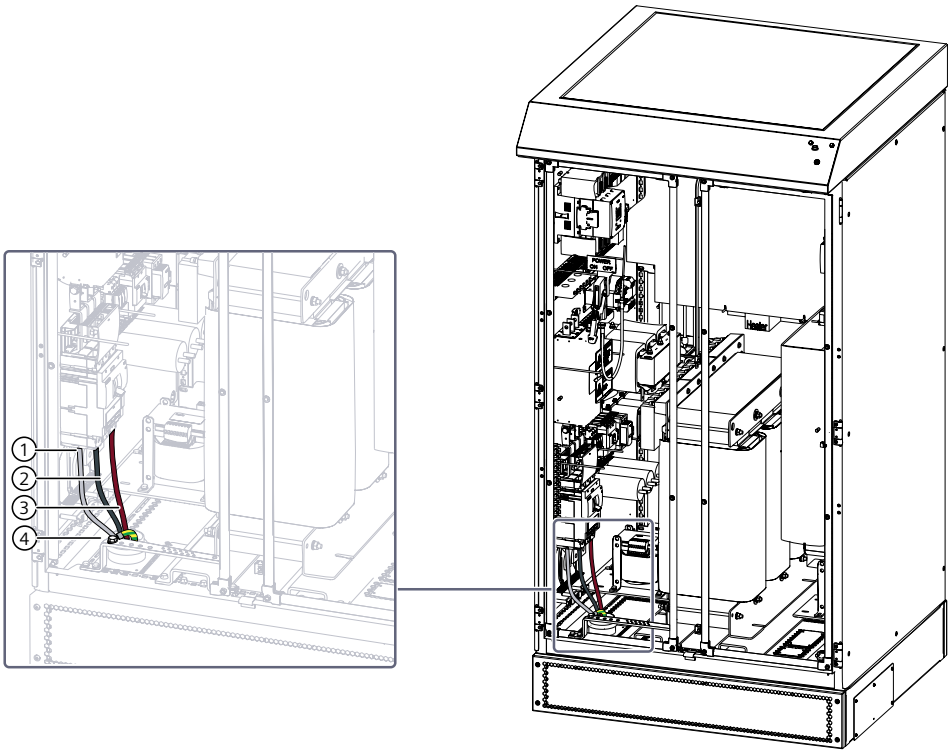
- Tighten all power connections to the specified tightening torque.
- Check all power connections at regular intervals, especially after transport

6.2 Connecting the power supply cable

To connect the charging station to the distribution network, connect the power cable to the main switch of the charging station.

Requirements

- You have removed the bottom protective cover.
- You have inserted the power cable into the cabinet.



Connections of the power supply cable

① Terminal L3 (-Q1:6)

② Terminal L2 (-Q1:4)

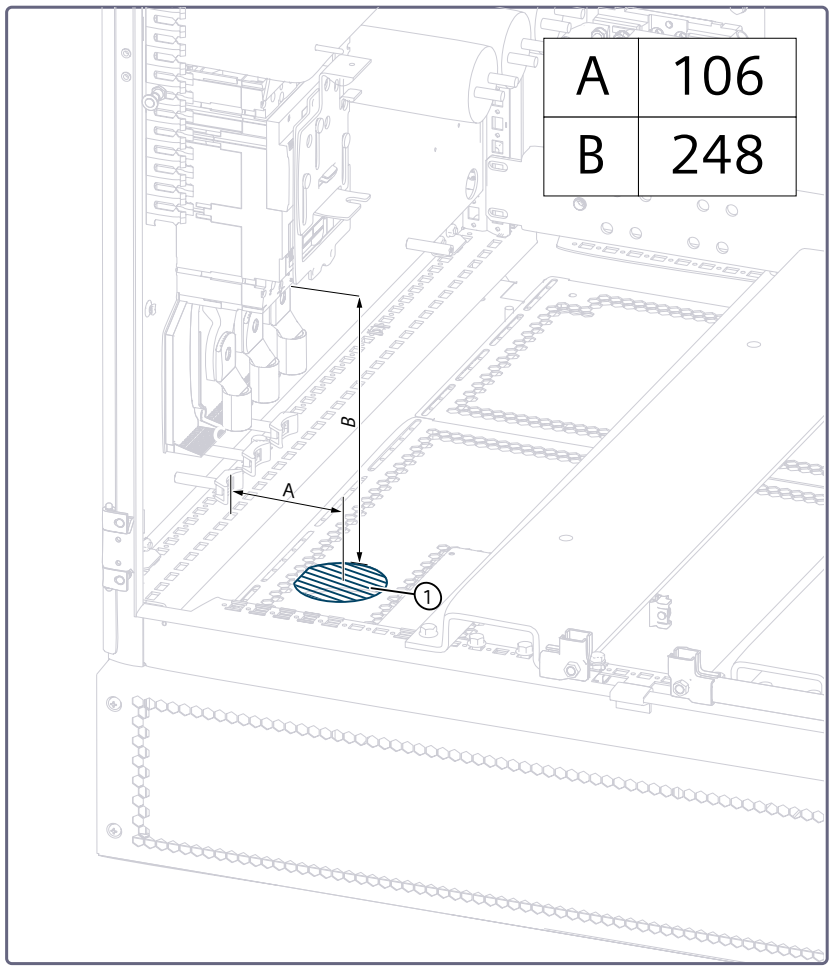
③ Terminal L1 (-Q1:2)

④ PE ground connection (PE cabinet)

Figure 6-1 Connections

Dimensions of terminals for the power supply cable

The following figure contains the dimensions in mm for connection of the power supply cable.



① Cable gland plate for incoming AC power
Figure 6-2 Power supply cable terminals

Connecting the PE conductor

First, connect the protective conductor of the power cable to the ground terminal:

1. Select an appropriate cable lug for the corresponding conductor cross section. Refer to Table 4.1.
2. Strip off the end of the conductor so that the remaining insulation reaches up to the cable lug.
3. Fasten the cable lug correctly to the end of the conductor.
4. Fasten the lug at an available opening along the ground bar on the lower front side of the cabinet.
5. Tighten the fastening nut with the required torque. Refer to Table 4.1.

Connect conductors L1, L2, L3

To connect a conductor, proceed as follows:

1. Select an an appropriate cable lug for the corresponding conductor cross section. Refer to Table 4.1.
2. Strip off the end of the conductor so that the remaining insulation reaches up to the cable lug.
3. Fasten the cable lug correctly to the end of the conductor.
4. Insert the cable lug into the terminal -XL2 of the main switch.
5. Insert the connection bolt through the screw holes of the cable lug and terminal.
6. Tighten the fastening nut with the required torque. Refer to Table 4.1.

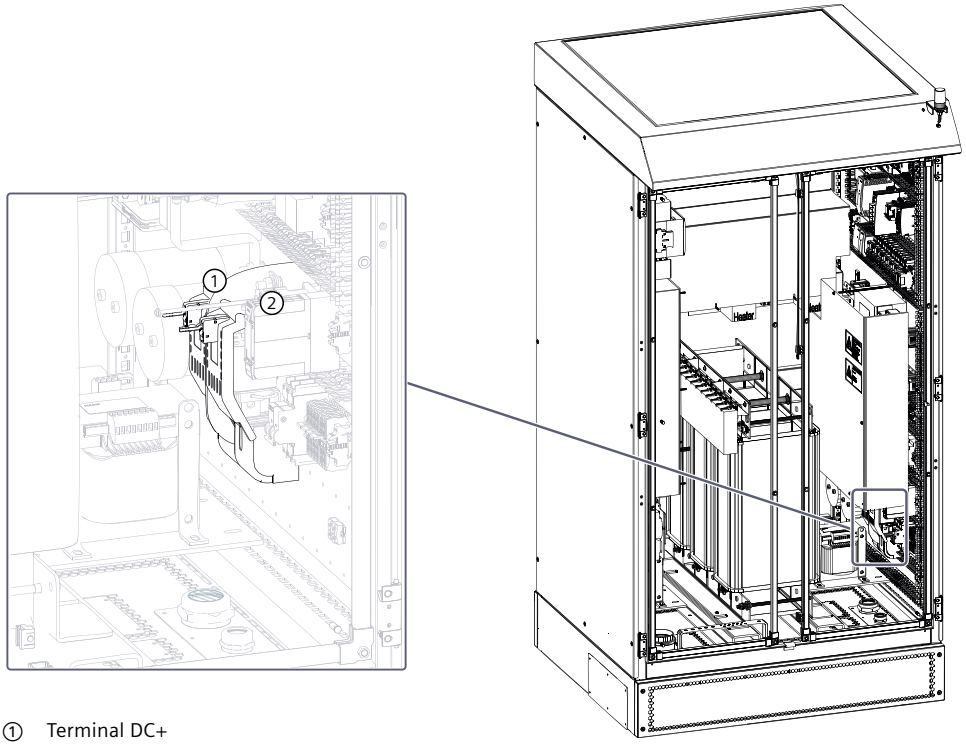
6.3 Connecting DC cables

To connect the charging station to the DC cable to supply the charge point with power, connect the DC cable to the DC+ and DC- connectors of the charging station.

Requirements

You have removed the bottom protective cover.

Connections for the DC cable



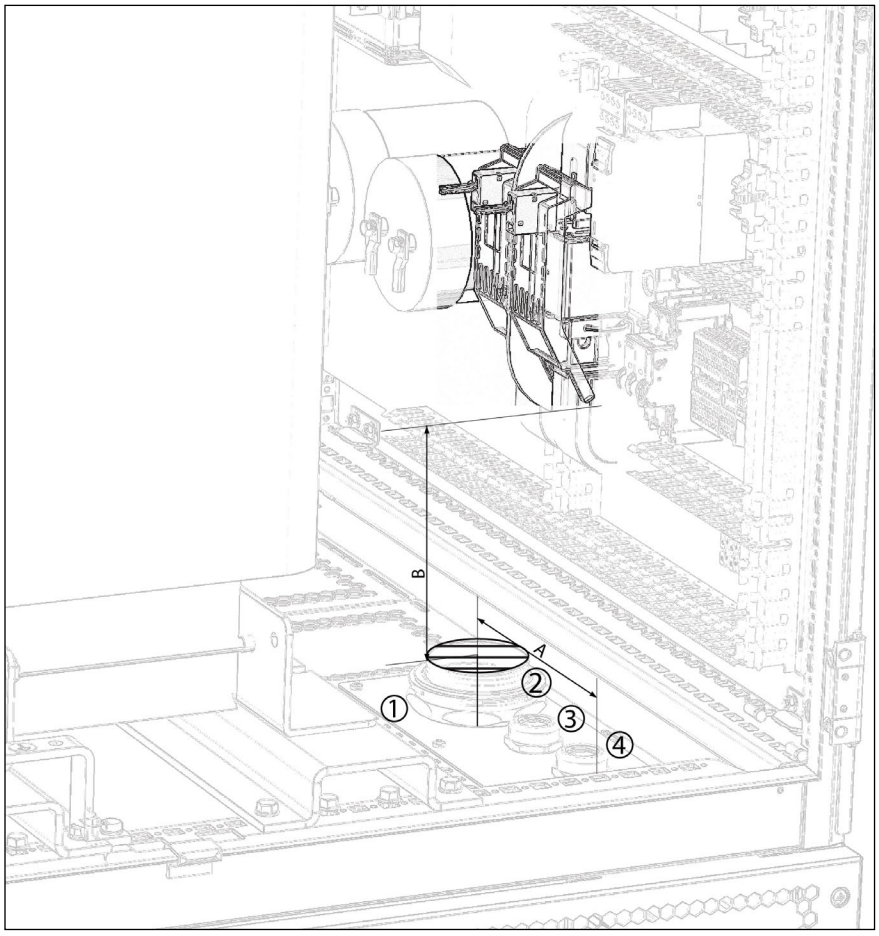
① Terminal DC+

② Terminal DC-

Figure 6-3 Connections for the DC cable

Dimensions of terminals for the DC cable

The following figure contains the dimensions in mm for connection of the DC cable.



A dimension: 269 mm
B dimension: 232 mm

① Cable gland plate (DC power and communications)
② DC cable gland
③ Ethernet cable gland
④ 230 VAC control voltage gland

Figure 6-4 DC cable terminals

Connecting the PE conductor

First, connect the PE conductor of the DC cable to the ground connection:

1. Remove the sheath of the power cable to a length of approximately 20 cm.
2. Select an an appropriate cable lug for the corresponding conductor cross section. Refer to Table 4.1.
3. Strip off the end of the conductor so that the remaining insulation reaches up to the cable lug.
4. Fasten the cable lug correctly to the end of the conductor.
5. Tighten the fastening nut with the required torque. Refer to Table 4.1.

Connecting DC+ and DC- conductors

Connect the DC+/DC- conductors of the DC cable.

To connect a DC conductor, follow these steps:

1. Select appropriate cable lugs for the corresponding conductor cross section. Refer to Table 4.1.
2. Strip off the end of the conductor so that the remaining insulation reaches up to the cable lugs.
3. Fasten the cable lug correctly to the end of the conductor.
4. Insert the cable lugs into the terminal DC- (-F12) or DC+ (-F11).
5. Insert the connection bolt through the screw holes of the cable lug and terminal.
6. Tighten the fastening nut with the required torque. Refer to Table 4.1.

6.4 Connecting the communication cable

When using the distributed charge points, connect the communication cable to the charging station.

Requirements

- You have removed the bottom protective cover.
- You have inserted the communication cable into the cabinet.

Ethernet switch connections

The following figure shows an example of an Ethernet switch for connecting an Ethernet cable.

CAUTION - separate the cable routing to communication (LV) and DC cables required (minimum 20 cm).

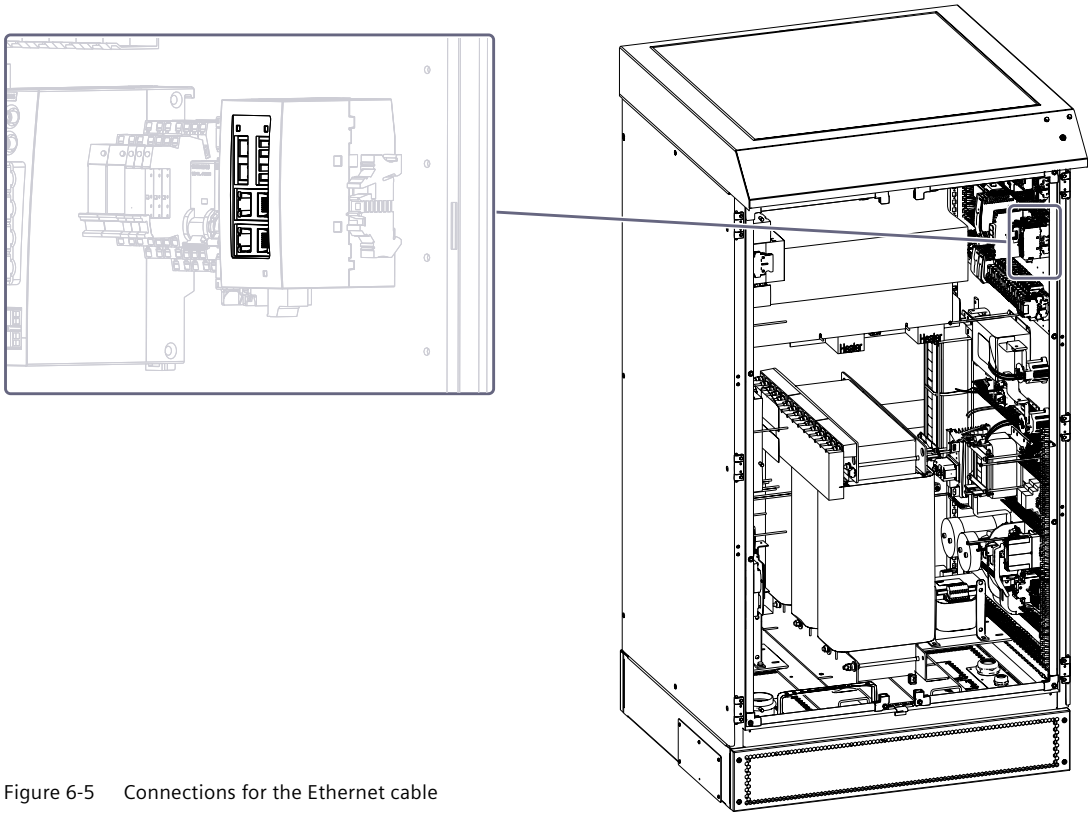


Figure 6-5 Connections for the Ethernet cable

Connecting the Ethernet cable

Insert the RJ45 connector of the Ethernet cable into a free connection of the SCALANCE Ethernet switch.

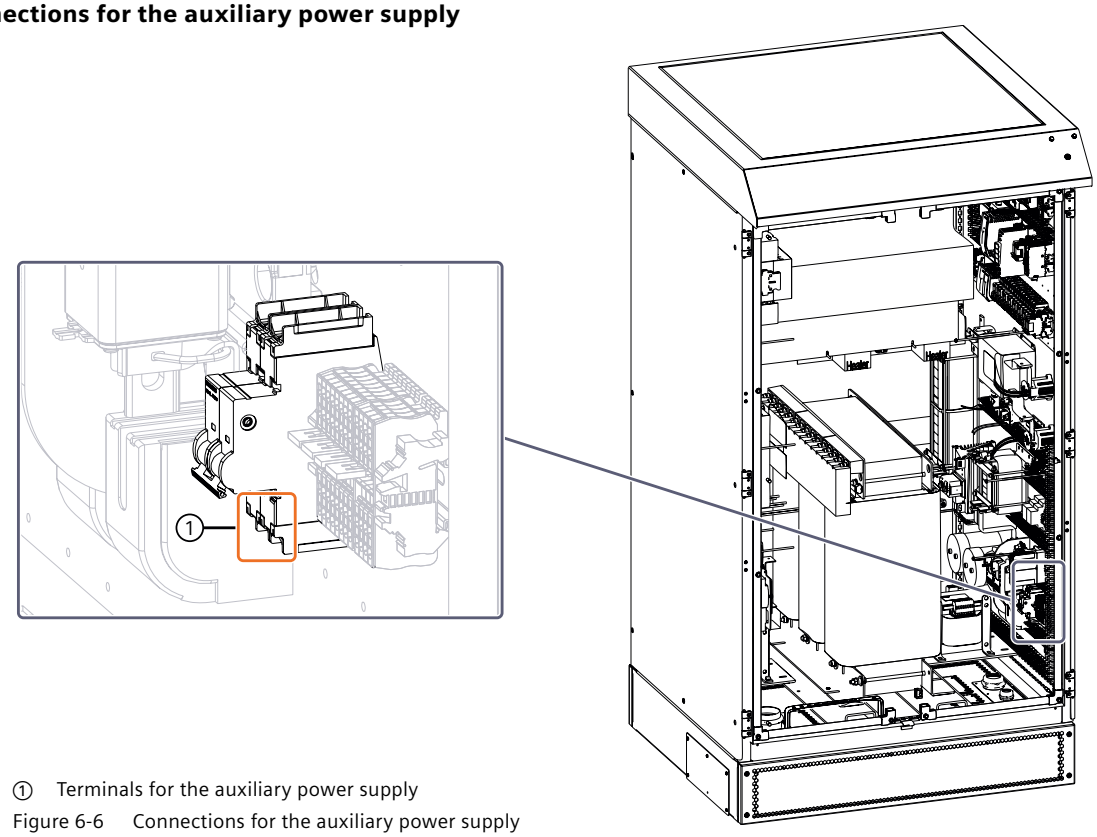
Connecting the fiber-optic cables

Connect the fiber-optic cables to the optical ports of the SCALANCE Ethernet switch.

6.5 Connecting the auxiliary power supply

The SICHARGE UC charging station supplies further charge points with operating current.

Connections for the auxiliary power supply



① Terminals for the auxiliary power supply

Figure 6-6 Connections for the auxiliary power supply

Cable cross sections up to a maximum of 4.0 mm^2 can be connected to the terminals for the auxiliary power supply.

Connecting the auxiliary power supply

To connect the L and N cables of the auxiliary power supply, follow these steps:

1. Strip the insulation from the end of the conductor so that the remaining insulation extends up to the ferrule.
2. Properly attach the wire end ferrule to the conductor end.
3. Connect the L conductor of the cable to the terminal “CB21-2”.
4. Connect the N conductor of the cable to the terminal “CB21-4”.
5. Make sure that the conductors are firmly connected to the terminal connections.

You can find the terminal designations and the connection plan in the circuit diagram.

See also

Technical specifications (Page 61)

6.6 External communication

The charging station can be equipped with a router.

The router can be installed for the wireless connection to the Siemens Configuration Backend and the OCPP backend. The required SIM card is provided by the operator. We recommend an M2M SIM card.

For installation in the routers, a standard SIM card or a corresponding adapter for this card format is needed.

Inserting the SIM card

1. The tray for the standard SIM card is located on the back of the device. A small button is located in the opening of the cabinet next to the SIM card tray. To open the drawer, press the button with a sharp object, such as a pencil.

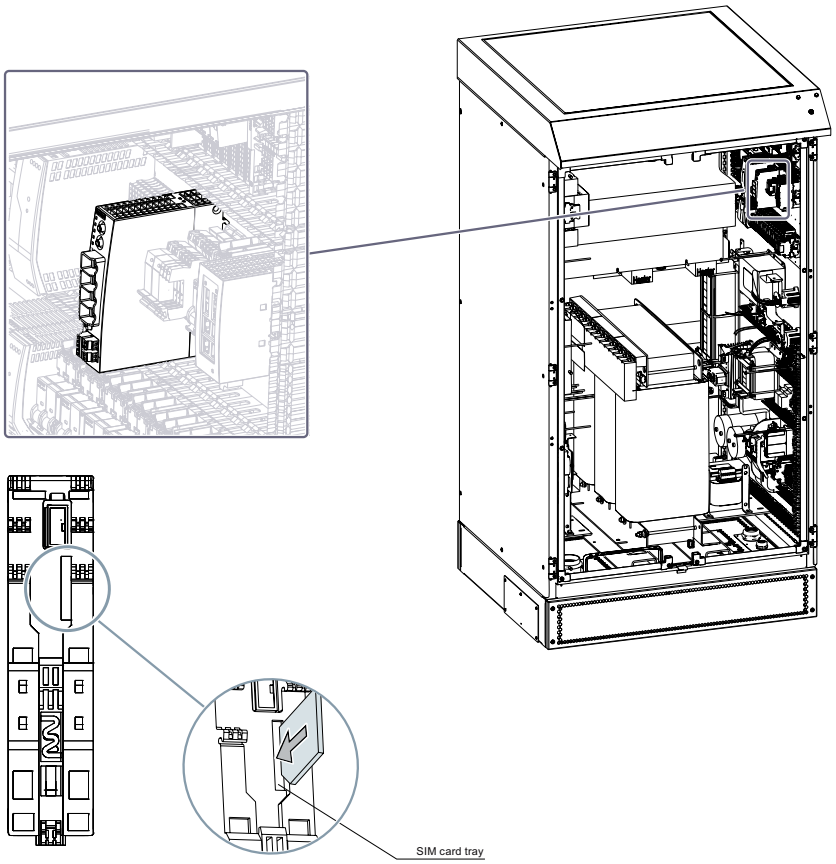


Figure 6-7 Position of the router and inserting the SIM card

2. Insert the SIM card into the tray so that it snaps audibly into place and the gold-plated contacts remain visible.
3. Push the tray with the SIM card all the way back into the cabinet.

6.7 Re-attaching protective cover

Once you have finished working on the connections of the charging station, you must reassemble the protective cover for the interior.

Mounting the protective cover

To fit the protective cover, proceed as follows:

1. Position the protective cover.
2. Tighten the fastening screws of the protective cover.
3. Replace the main switch handle on the handle extension.

SECTION 7

Commissioning

Only qualified personnel are permitted to perform the formal commissioning of the charging station and the associated distributed charge point (either SICHARGE UC dispenser). You can find additional information on commissioning the charging station in the SICHARGE UC Commissioning Guide. To start up the charging station, switch on the power supply to the charging station.

⚠ WARNING

Qualified personnel

Only a qualified and trained electrician may work on SICHARGE UC.

⚠ WARNING

Injury or damage to property

If the charging plug is not inserted in the plug holder before commissioning, the charging plug can cause injury or damage to property when switched on.

- Before switching on the charging station, make sure that the charging plug is in the plug holder.
- Leave the charging plug in the plug holder during the entire switch-on process.

⚠ DANGER

Risk of electric shock when moist due to condensed water

Before putting the charging station into operation, an authorized and qualified electrician must check whether there is any moisture in the charging station. Manually remove even small amounts of condensation before commissioning. Take appropriate measures for drying.

Do not switch off the power supply for an extended period of time after commissioning. This will prevent condensation in the charging station.

Note

Location of the charge points connected to the SICHARGE UC charging station

Switch on charging station

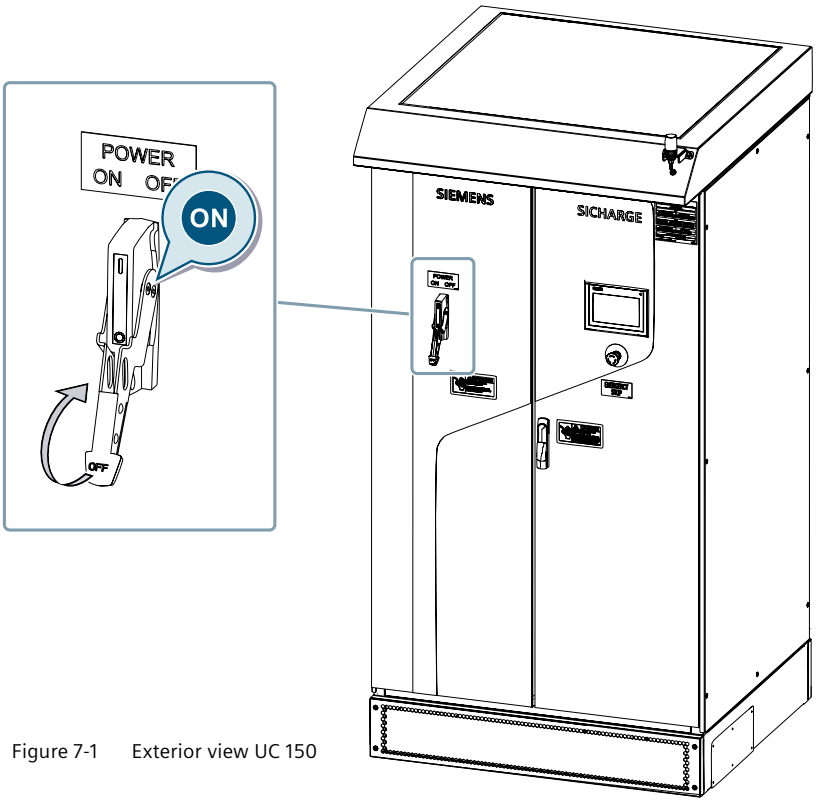


Figure 7-1 Exterior view UC 150

To switch on the charging station, proceed as follows:

1. Verify the cabinet door is closed and latched.
2. Energize the upstream electrical supply.
3. Set the main switch to the “ON” position (automatic starting of the charging station).

The charging station starts automatically. Wait until the charging station is fully started. When the display (located on the dispenser) shows the "Start" menu, the charging station is ready for use. Refer to the SICHARGE UC dispenser operating instructions for further information.

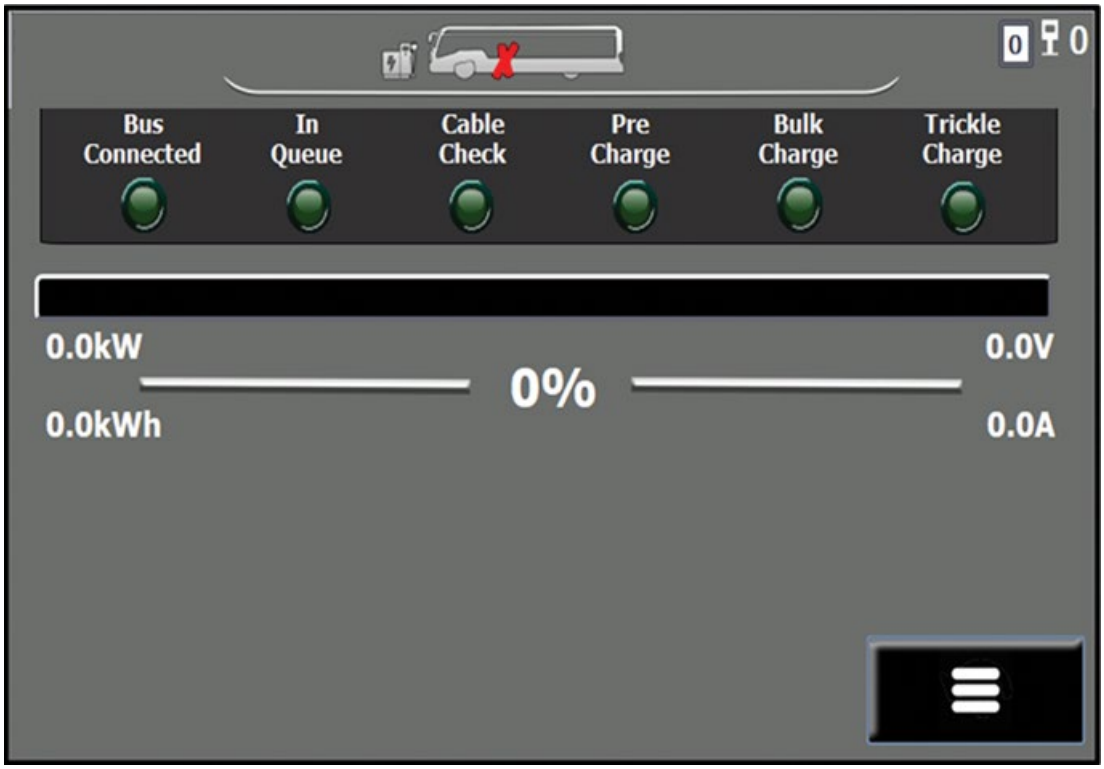


Figure 7-2 "Start" menu

SECTION 8

Operating

8.1 Operating equipment variants

The SICHARGE UC charging station is available in equipment variants with and without Human Machine Interface (HMI). The following section “Operation” describes operation using the HMI. Equipment variants without HMI can be operated via the HMI of the connected charge point (the SICHARGE UC dispenser).

8.2 Safety instructions

Observe the following safety instructions for safe operation of the charging station.

Use the charging cable safely

To safely use the charging cable, following the instructions in the operating instructions for the SICHARGE UC dispenser.

Safe HMI screen operation

The HMI screen is the central display and operator control of the charging station.

- Only use your fingers or a touch pen to operate the HMI screen.
- Follow the instructions for cleaning and care.

NOTICE

Damage due to unsuitable objects

If you touch the HMI screen with unsuitable objects, you will greatly reduce the service life of the display. If severe damage occurs, the HMI screen may even fail completely.

To avoid damaging the HMI screen, follow the instructions below:

- Never touch the HMI screen with pointed or sharp objects.
- Avoid shock or impact with hard objects.
- Use only your fingers or a touch pen to touch the HMI screen.

8.3 Initialization of the charging process

You can find additional information on proper operation of the distributed charge points in the following documentation:

- SICHARGE UC Dispenser Operating Instructions

8.4 Monitoring the charging process

After you have connected the electric vehicle to the charging station, the charging station display automatically shows the "Start" menu. Several display elements provide precise information about the progress of the charging process.

Note

The HMI is located on the remote dispenser.

You can find additional information in the following documentation:

- SICHARGE UC Dispenser Operating Instructions

LED display	Indication	Status	Description
Red	Permanent light	Active fault/shutdown state	Not ready to charge
	Rapid flashing	E-STOP	
Blue	Permanent light	Charging	Charging in progress
	Slow flashing	Vehicle connected but not charging (charging about to start or in queue)	
Green	Permanent light	Vehicle not connected, idle	
	Flashing	Charging completed	
White	Permament light	Charger is booting up, charger has malfunctioned	Not ready to charge

In the case of no color, please contact your Siemens representative for further assistance.

SECTION 9

Alarm, fault and system messages

In the event of an error, the charging station automatically performs error diagnostics. The HMI on the attached dispenser allows easy user interaction with the charging process, including alarms, faults and system messages. Reference the SICHARGE UC Dispenser Operating Instructions for additional information.

SECTION 10

Maintenance and service

10.1 Safety instructions

To ensure the safety of persons and property during maintenance and servicing of the charging station, observe the following safety instructions:

⚠ WARNING

Qualified personnel

Only qualified and trained persons may work on SICHARGE UC.

⚠ WARNING

Electric shock from live parts

Electrical systems have live parts during operation. If the system has not been disconnected from the power supply before maintenance work is performed inside the station, death, serious injury or damage to property may occur.

- Only perform maintenance and service work inside the station when the charging station is disconnected from the power supply.
- Observe the six safety rules for electrical work (Page 11).

⚠ WARNING

Electrical shock due to residual charges in capacitors

After switching off the power supply to the SICHARGE UC charging station , the capacitors begin to discharge. Live parts remain under dangerous electrical voltage for up to 10 minutes during discharging. Touching the live parts can lead to death or serious injury.

- Wait 10 minutes after switching off the power supply.
- Ensure that the charging station is not live.
- Only then should you start work on the charging station.

⚠ WARNING

Fall arrester

Use approved protective equipment to protect persons, components and tools against falling from a working height of 1 m.

⚠ WARNING

Falling parts

When working at an elevated height, watch out for falling parts, cables or plugs.

⚠ CAUTION

Risk of tripping or slipping

Keep the work area clean and tidy to prevent tripping and slipping.

⚠ CAUTION

Risk of crushing or cuts

During maintenance and service, pay attention to moving parts and protruding cables and bolts.

NOTICE

Safety area for maintenance and service

Create a safety area around the equipment with warning signs and barriers.

NOTICE

Use personal protective equipment (PPE)

Use the required personal protection equipment for the work according to NFPA 70E, such as:

- Protective shoes
- Helmet
- Safety vest
- Gloves
- Protective goggles

NOTICE

Damage to property due to foreign objects inside the station

During maintenance work, foreign bodies such as dirt, tools or loose components may remain in the charging station. This can result in a short circuit, reduced cooling capacity or increased running noise. The charging station may be damaged.

- Make sure that no foreign objects are left in and on the SICHARGE UC dispenser.
- Fasten loose components again after maintenance work.
- Carefully remove any dirt.

10.2 Maintenance plan

The following maintenance/service measures are required to maintain the functionality and operational safety of the SICHARGE UC charging cabinet. Maintenance of the charging cabinet should coincide with maintenance of the SICHARGE UC dispenser(s). Be aware that not heeding the maintenance plan may void equipment warranty.

Activities

Check the charging station regularly according to the intervals specified in the following table:

Location	Type of test	Test	Interval	Estimated completion time (in minutes)
External	Visual check for damage	• Check the exterior of the control cabinet for damage or rust/corrosion • Check the air inlets and exhausts for damage, obstructions or rust/corrosion • Check the HMI screen (if equipped) for damage	6 months	3
	Check for presence	• Ensure that all warning labels are legible	During every maintenance operation	1
	Visual check and cleaning	• Clean all dust and/or dirt accumulation from the charger cabinet's exterior and air inlets • Clean the HMI screen with a microfiber cloth (if equipped)	6 months①	5
	Emergency Stop button	Do not check during the charging process. • Check the charger Emergency Stop button • Check that an alarm message on HMI screen (if equipped) when the Emergency Stop button is pressed • Check that the alarm can be cleared after resetting the Emergency Stop button • Repeat tests on all remote Emergency Stop buttons (if equipped)	6 months	2
	Control cabinet doors	• Check that an alarm message is displayed on the dispenser HMI screen(s) when the control cabinet door is opened slightly • Check the disconnect handle/main switch functions as intended • Check the cabinet door locks and hinges for ease of movement	6 months	2
Internal	Visual check	Do not check with an energized charger. • Check that the air filter mats are properly positioned	Upon arrival	1
	Visual check and cleaning	• Clean all dust and/or dirt accumulation from the air inlets and exhausts • Clean all dust and/or dirt accumulation from fans	6 months①	5
	Visual check or replacement	• Replace the air filter mats	6 months①	3
	Check for presence	• Ensure all warning labels are legible	During every maintenance operation	1
	Visual check	• Check the cable glands	1 year	1
	Check of grounding straps	Do not check with an energized charger. • Check that the grounding straps are correctly tightened • Check the grounding straps for damage	1 year	4
	Visual check	Do not check with an energized charger. • Check line side switch (Q1) for external damage • Check to see whether the capacitors are leaking liquid	6 months	1
	Mechanical check	Do not check with an energized charger. • Check that the input connections are correctly torqued (L1, L2, L3, PE) • Check that the output connections are correctly torqued (DC+, DC-, PE)	1 year	10
	Visual check and cleaning	Do not check with an energized charger. • Visual check of all installed components for damage • With a dry cloth: – Clean the transformer – Clean the inductors of the back panel (LDC1, LDC2, LBK1, LBK2) – Clean the inductors of the input panel (LL, LH) – Clean the inductors on the output panel (LDC3) • Compressed air can be used to clear any debris between or within transformer or inductor coils	1 year	20
	Visual check, noise check	• Check for abnormal sounds from running fans and power supplies • Check for abnormal smells, damage/changes to installed components, corrosion②	6 months	5

① Adapt the maintenance interval in accord with local environmental conditions

② Over time, main fuse holders, chokes, and inductors may see discoloration due to oxidation. This will not affect the functionality or operation of the equipment

You can find instructions on replacing the filter and fan in section 10.5

10.3 Cleaning the HMI screen

The SICHARGE UC charging cabinet HMI screen (if equipped) is designed for low maintenance operation.
Clean the HMI screen regularly to keep it in optimal condition.

⚠ WARNING

Electric shock due to water ingress

Water entering the SICHARGE UC charging station can damage the SICHARGE UC charging station. If the unit is damaged, dangerous voltages may be present on the cabinet or exposed components, which can cause serious injury or death if touched.

- Always keep the cabinet doors closed during cleaning.
- Never use a pressure washer, steam jet or water jet when cleaning the SICHARGE UC charging station.

⚠ WARNING

Damage to property due to improper cleaning agents

Improper cleaning agents can damage the HMI screen of the SICHARGE UC charging station.

- Do not use solvents.
- Never use aggressive or abrasive cleaning agents.

Note

Only clean when the HMI screen is switched off.

If you clean the HMI screen when it is switched on, you may cause operating errors. This can unintentionally put the charging station into an undesirable operating state.

- Before cleaning the HMI screen, switch off the SICHARGE UC charging station.

Permitted cleaning agents and tools

- Use a mild, non-corrosive cleaning agent, even in the case of heavy soiling. Mild detergents include dishwashing liquids.
- Use only soft cleaning cloths.

Note

Read the information on chemical resistance.

To ensure that the HMI screen achieves the longest possible service life, observe the following information on the chemical resistance of SIMATIC HMI devices:

Information on resistance (https://support.industry.siemens.com/cs/ww/en/view/39718396)

Cleaning the HMI screen

Clean the HMI screen as follows:

1. Apply cleaning agent to the cleaning cloth.
2. Start cleaning at the edge of the screen.
3. Wipe with the cleaning cloth from the edge of the screen to the inside.

10.4 Cleaning the cabinet

⚠ WARNING

Electric shock due to water ingress

Water entering the SICHARGE UC charging station can damage the SICHARGE UC charging station. If the unit is damaged, dangerous voltages may be present on the cabinet or exposed components, which can cause serious injury or death if touched.

- Always keep the cabinet doors closed during cleaning.
- Never use a pressure washer, steam jet or water jet when cleaning the SICHARGE UC charging station.

⚠ WARNING

Damage to property due to improper cleaning agents

Improper cleaning agents can damage the exterior surfaces of the SICHARGE UC charging station. Therefore, do not use solvents. Also, never use aggressive or abrasive cleaning agents.

Permitted cleaning agents

- Use a mild, non-corrosive cleaning agent, even in the case of heavy soiling. Mild detergents include dishwashing liquid.
- Deionized water is particularly suitable for cleaning the unit.

Cleaning the exterior surfaces of the cabinet

- Wipe the exterior surfaces of the charging station with a damp cloth.
- Then rub the charging station dry.
- Do not scrape off stubborn dirt using hard objects.
- Do not use any sharp-edged tools.
- Soften paper stickers in advance for easy removal.

10.5 Replacing an air filter

The air filters of the SICHARGE UC charging station prevent dust particles from being pulled to the interior of the charging station. As operating time increases, the filtered dust particles reduce the air flow through the filters. Reduced airflow affects the cooling capabilities of the fans, which can cause the temperature inside the charging station to rise.

To keep the air inside the SICHARGE UC charging station within the permitted temperature range, replace filters regularly.

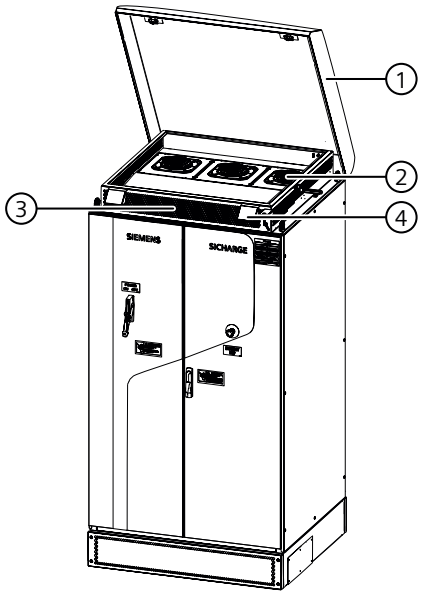
Required tools and spare parts

You will also need the following spare part (refer to the appropriate SICHARGE UC Spare Parts List for relevant part numbers):

- 3 fabric filters: Filter class G3 according to standard EN 779; dimensions: 950 mm x 150 mm

Position of the air filter

The following figure shows the air filter cover and the position of the air filters.



① Rain hood
② Fan (quantity: 3)
③ Air filter (quantity: 3)
④ Locking mechanism (quantity: 2)

Figure 10-1 Position of fans and air filters

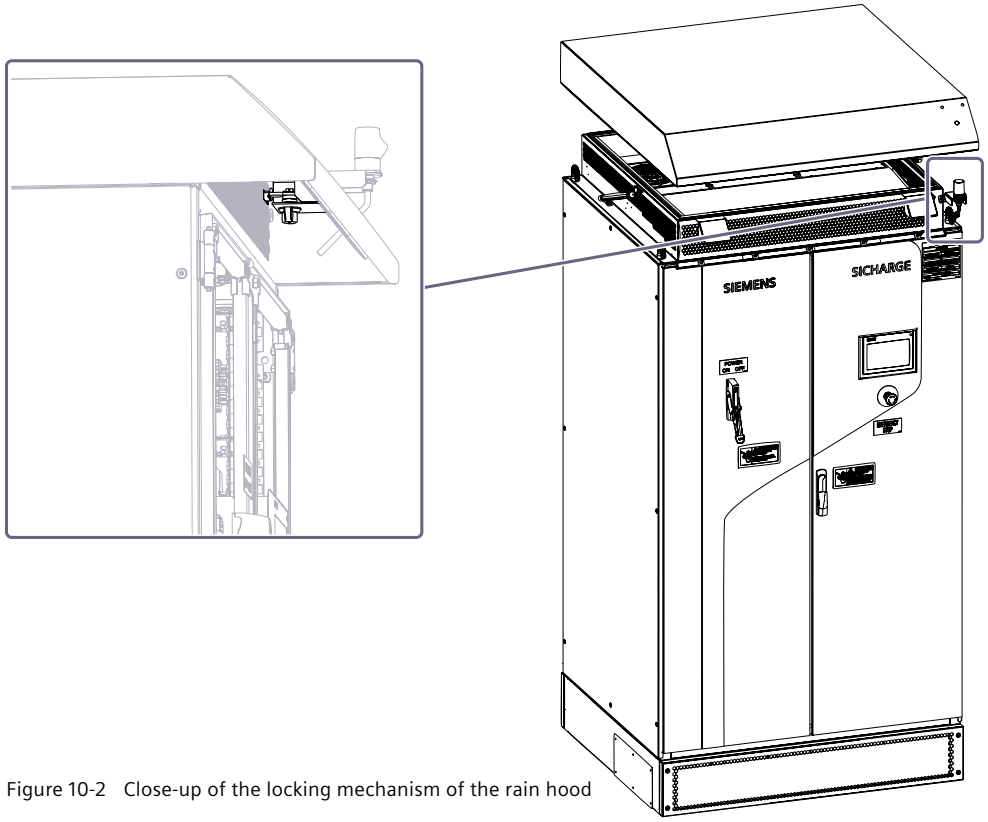


Figure 10-2 Close-up of the locking mechanism of the rain hood

Replacing an air filter

Follow the instructions to replace the air filters.

1. Disconnect the cell antenna on the rain hood.
2. Unlock the rain hood by inserting the keys one after the other into each locking mechanism and rotating and releasing the rain hood.
3. Lift the rain hood.
4. Remove the fabric filter from each air inlet.
5. Insert the new fabric filter by adhering it to the inside of each air inlet.
6. Close the rain hood.
7. Lock the rain hood into place by inserting the keys one after the other in each locking mechanism and rotating and locking the rain hood.

10.6 Replacing the cabinet fan

In the fan unit of the charging station, three cabinet fans air-condition the interior of the charging station.

⚠ WARNING

Electric shock from live parts

Electrical systems have live parts during operation. If the system has not been disconnected from the power supply before maintenance work is performed inside the station, death, serious injury or damage to property may occur.

- Only perform maintenance and service work inside the station when the charging station is disconnected from the power supply.
- Observe the six safety rules for electrical work (Page 11).

⚠ WARNING

Electrical shock due to residual charges in capacitors

After switching off the power supply to the charging station, the capacitors begin to discharge. Live parts remain under dangerous electrical voltage for up to 10 minutes during discharging. Touching the live parts can lead to death or serious injury.

- Wait approximately 10 minutes after switching off the power supply.
- Ensure that the charging station is not live.
- Only then should you start work on the charging station.

NOTICE

Damage to property due to foreign objects inside the station

During maintenance work, foreign bodies such as dirt, tools or loose components may remain in the charging station. This can result in a short circuit, reduced cooling capacity or increased running noise. The charging station may be damaged.

- During maintenance work, ensure that no foreign objects remain inand on the charging station.
- Fasten loose components again after maintenance work.
- Carefully remove any dirt.

Required tools and spare parts

You will need the following tools to replace the cabinet fan:

- Charging cabinet key
- Bit: Hexagon socket, 5 mm

You will also need the following spare part (refer to the appropriate SICHARGE UC Spare Parts List for relevant part numbers):

- Cabinet fan - centrifugal fan, 230VAC

Position of the cabinet fan

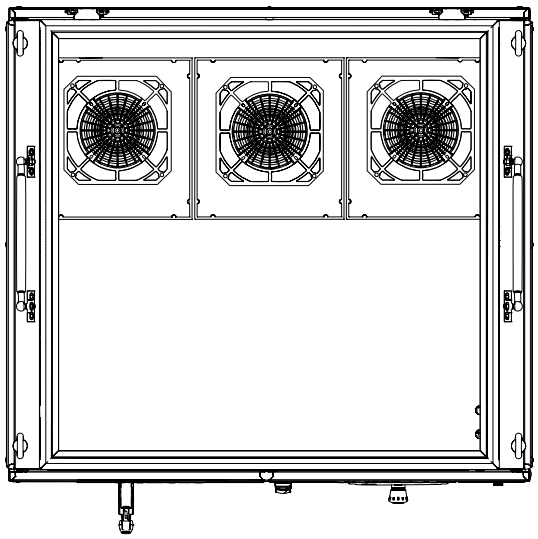


Figure 10-3 Top view of the charging unit with position of cabinet fans

Removing the cabinet fan

1. Unlock the rain hood by inserting the keys one after the other into each locking mechanism and rotating and releasing the rain hood.
2. Lift the rain hood.
3. Loosen the fastening screws of the cabinet fan(s).
4. Pull the cabinet fan out.
5. Disconnect the connecting cables of the fan.

Installing the new cabinet fan

1. Connect the connecting cables of the fan.
2. Insert the cabinet fan.
3. Tighten the fastening screws of the cabinet fan (specified torque: 6 Nm).
4. Close the rain hood.
5. Lock the rain hood into place by inserting the keys one after the other in each locking mechanism and rotating and locking the rain hood.

SECTION 11

Disposal

We consider environmental protection and the conservation of your resources as corporate goals of a high priority. A worldwide environmental management system in accordance with ISO 14001 ensures compliance with the law and sets high standards. Environmentally friendly design, technical safety and health protection are solid targets even during the development of our products. The following provides recommendations for environmentally friendly disposal of the charging station and its components.

Disposing of packaging material

- Dispose of packaging material in an environmentally friendly manner or recycle the material. Observe the disposal regulations and environmental protection regulations.
- If needed, contact a specialist disposal company.
- Wooden packaging consists of impregnated wood. Observe the local regulations.

Disposing of the charging station

For environmentally friendly recycling and disposal of the device, contact a certified electronic waste disposal company. Dispose of the device and specific material in accordance with the applicable regulations in your country.

Recycling considerations

SICHARGE UC is an environmentally friendly product with long lifetime and high recyclability. Key components should be treated per the following recommendations:

Parts	Recommended Treatment
Steel parts	Materials recovery
Plastic parts	Thermoplastic parts possible for materials recovery
	Thermosetting parts for incineration/recovery
Copper parts	Materials recovery
Main transformer	Materials recovery (steel and copper/aluminum)
Circuit boards	Landfill/discard
Capacitors	Discard/recovery/reuse

Note: Because of safety reasons, consider the safety instructions in this operating manual. The product should be dismantled by qualified personnel. Please get in contact with your local Siemens service office.

SECTION 12

Service & Support

Customer Support

Phone

For customer support, call us at +1 (855) 950-6339, option 9.

Business Hours: Monday – Friday, 6:00 a.m. to 8:00 p.m. Eastern Standard Time

Submit a ticket

Visit www.usa.siemens.com/createcase

1. Select **"Emobility/Vehicle Charging Products"** from the Create a Case dropdown menu.
2. Click "Next" and proceed to follow the instructions.
   Business Hours: Monday to Friday, 6:00 a.m. to 8:00 p.m. Eastern Standard Time.

Customer Support FAQs

Our Siemens eMobility staff is trained as a dedicated response team to all hardware and software products. Located here are a few commonly asked questions regarding our standard level of customer support.

Coming soon!

SECTION 13

Technical specifications

13.1 Technical specifications

Input nominal		**UC 150**	
Voltage		480 VAC 3 phase, +/- 10%, wye or delta	600 VAC 3 phase, +/- 10%, wye or delta
Rated current		200 A	160 A
Charger Input Breaker Settings (LSI)	L	240 A	200 A
	S	1s	1s
	I	2,000 A	2,000 A
Frequency		60 Hz	60 Hz
Power factor (cos phi)		> 0.98	> 0.98
Power consumption in standby mode (without fan/heater)		230 W	230 W

DC output	**UC 150**
Rated power at 750 V DC	150 kW
Current (maximum)	200 A
Voltage (range)	100 ... 950 V DC
Efficiency η without (at 100% load)	96 % ... 97 %
Efficiency η without running fan/heater	Fan off 96.5% Fan on 95.5%

Ambient conditions	**UC 150**
Operating temperature	-25 °C ... +45 °C
Humidity	5 ... 95% (no condensation)
Maximum operating altitude above sea level (ft / m)	6,562 ft / 2,000 m

Mechanical specifications	**UC 150**
Operating environment	Interior and exterior
Cabinet protection	NEMA 3R (HMI screen), NEMA 3R (housing)
Cabinet material	Steel, galvanized, powder-coated color
Color	Cabinet - Main section: RAL 9010 Cream White Roof and base: RAL 9005 - Jet Black
Floor area W x D (in / mm)	43.31 x 39.37 / 1,100 x 1,000
Overall dimensions W x D x H (in / mm)	43.30 x 43.30 x 85.43 / 1,100 x 1,100 x 2,170
Weight, approximate (lb / kg)	3,086.47 lb / 1,400 kg

General specifications	**UC 150**
Charge control system	Siemens controller
Local user interface	Siemens SIPLUS HMI TP700
Network connection	Ethernet interface or 3G and 4G
Communication protocol	OCPP 1.6 (JSON)
Maximum cable length between the charging station and the dispenser (ft / m)	320 ft / 100 m (RJ45 with Cat5 or higher) 640 ft / 200 m (Ethernet via fiber-optic cable SC type)
Charging standards	SAE J1772, ISO 15118
EMC standards	IEEE 519
Compliance	UL 2202, UL 2231

Connection plan

Type	Charging station	Dispenser	Outer cable diameter (in / mm)	Description
DC+	-F11	-F15	0.63 ... 1.10 in/ 16 ... 28 mm	DC single conductor
DC-	-F12	-F16	0.63 ... 1.10 in / 16 ... 28 mm	DC single conductor
PE	PE	PE	0.51 ... 0.82 in / 13 ... 21 mm	PE single conductor
L	CB21-2	X23-TB1_1	0.35 ... 0.67 in / 9 ... 17 mm	AC cable
N	CB21-4	X24-TB1_1		
Ethernet	A13	A2	0.27 ... 0.31 in / 7 ... 8 mm	Ethernet cable
Fiber-optic	A13_P4	A2_P3	0.12... 0.24 in /3...6 mm	Multimode glass fiber-optic with SC socket (Class A Profinet)

Table 13-1 Connection plan between charging station and dispenser

13.2 Charging current/power curve

Charging current

The following figure shows the progression of the charging current depending on the charging voltage.

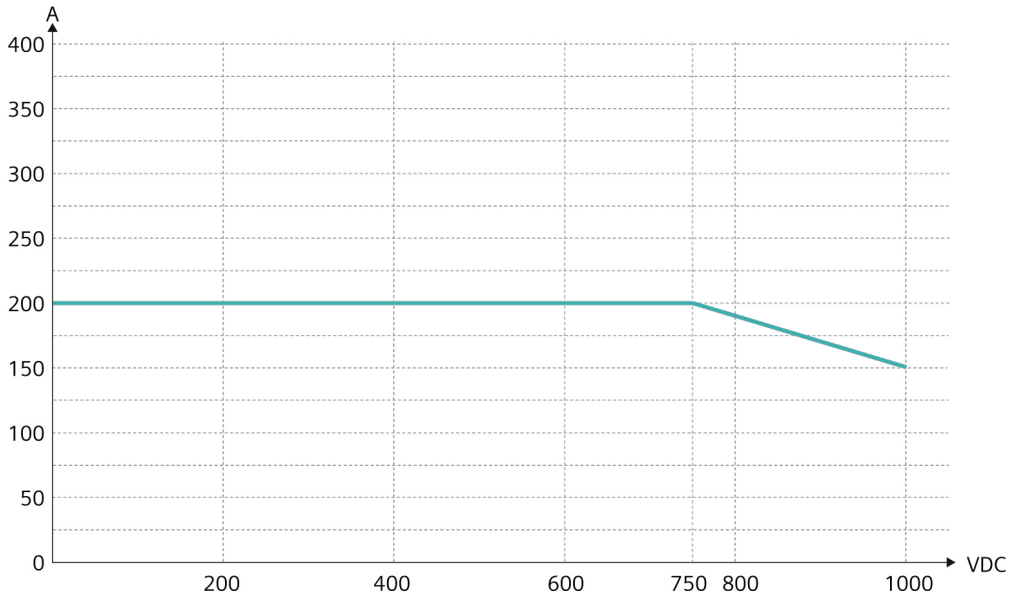


Figure 13-1 Charging current

Power curve

The following figure shows the power curve depending on the charging voltage.

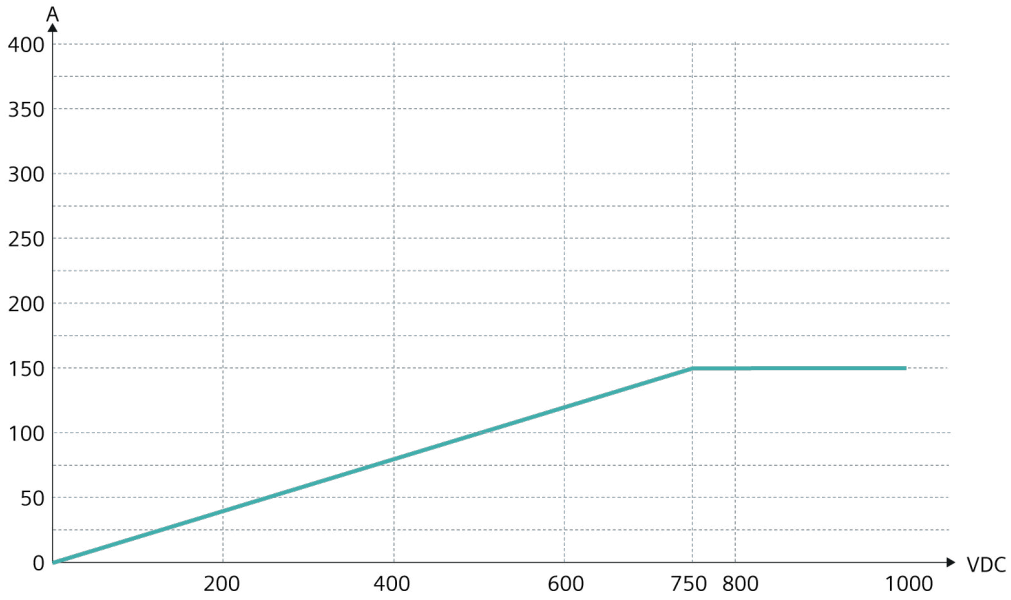


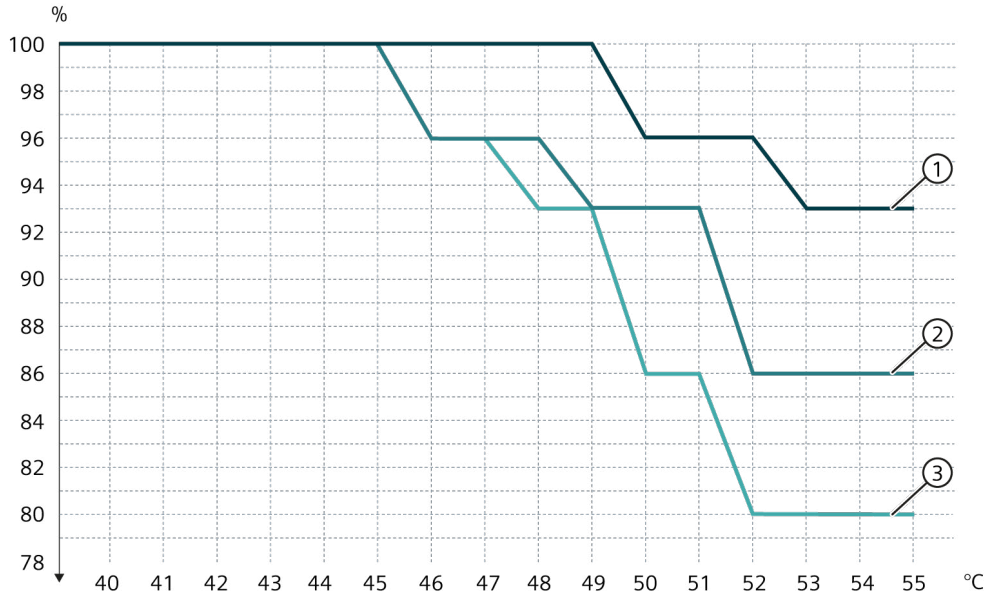
Figure 13-2 Power curve

13.3 Derating

Derating

The following table shows the derating depending on the ambient temperature from +45 °C with different charging voltages.

The power is specified in % of the user charging station.



① 600 V DC output voltage

② 800 V DC output voltage

③ 1,000 V DC output voltage

Figure 13-3 Ambient temperature derating

The SICHARGE UC DC charging station complies with the harmonized UL standards for charging stations.

SECTION 14

Declaration of Conformity

Declaration of conformity at a glance

The SICHARGE UC DC charging station complies with the requirements and protection goals of the following directives:

- UL2202 Standard for Electric Vehicle (EV) Charging System Equipment.
- UL2231 Personnel Protection Systems for Electric Vehicle (EV) Supply Circuits: Particular Requirements for Protection Devices for Use in Charging Systems

Safekeeping location of the declaration of conformity

SIEMENS AG keeps the EU Declaration of Conformity of the charging station available for the responsible authorities at the following location:

Legal Manufacturer
Siemens Industry, Inc.
3617 Parkway Ln.
Peachtree Corners, GA 30092
United States of America

APPENDIX A

Abbreviations

The following abbreviations are used in these instructions:

Abbreviation	Term
AC	Alternating Current
CAN	Controller Area Network
CCS	Combined Charging System
DC	Direct Current
OCPP	Open Charge Point Protocol
HMI	Human Machine Interface
IGBT	Insulated-Gate Bipolar Transistor
SOC	State of Charge
SW	Width Across Flats

APPENDIX B

Charger Maintenance Checklist

Date:		Equipment ID#:	
Customer:		Serial number:	
Location:		Date of manufacture:	

	Preventive maintenance action list		OK?		
No.	**Checklist Item**		**Yes**	**No**	**N/A**
1	Check the exterior of the control cabinet for damage or rust/corrosion		☐	☐	☐
2	Check the air inlets and exhausts for damage, obstructions or rust/corrosion		☐	☐	☐
3	Check the HMI screen (if equipped) for damage		☐	☐	☐
4	Check that the LED display is illuminated		☐	☐	☐
5	Ensure exterior warning labels are legible		☐	☐	☐
6	Clean accumulated dust and dirt from charger exterior and air inlets/exhausts		☐	☐	☐
7	Clean the HMI screen with a microfiber cloth (if equipped)		☐	☐	☐
8	**Do not check during a charging session.** Check the Emergency Stop button Check that an Emergency Stop Active alarm is displayed on the HMI screen(s) when the Emergency Stop button is pressed Check that the alarm can be cleared after resetting the Emergency Stop button		☐	☐	☐
9	Repeat the tests outlined in step 8 on all remote Emergency Stop buttons (if equipped)		☐	☐	☐
10	Check for abnormal sounds from running fans and power supplies		☐	☐	☐
11	Open the charger cabinet door slightly to verify a Door Open alarm is displayed on the dispenser HMI display (or charger HMI, if equipped)		☐	☐	☐
12	Check the disconnect handle/main switch functions as intended		☐	☐	☐
13	Disconnect the charger safely on its feeder MCCB according to the 6 safety rules. Pay attention to the follow note regarding the AC and DC capacitors.		☐	☐	☐
NOTE	**The AC and DC capacitors may not be fully discharged after switching off the power supply. DC live parts remain under dangerous electrical voltage for up to 10 minutes during discharging. AC live parts may remain under dangerous electrical voltage until they are manually discharged. Touching the live parts can lead to death or serious injury.** **Wait 10 minutes after switching off the power supply.** **Heed warnings about charged capacitors.** **Make sure that the charging station and its parts are de-energized.** **Only then should you start work on the charging station.**				
14	Replace air filter mats and ensure that they are properly positioned		☐	☐	☐
15	Check the cabinet door locks and hinges for ease of movement		☐	☐	☐
16	Check for abnormal smells, damage/changes to installed components, corrosion		☐	☐	☐
17	Check the cable glands		☐	☐	☐
18	Check that the AC input connections are correctly torqued (L1, L2, L3, PE) and use a paint pen to mark connections	**L1, L2, L3, PE (setpoint): 55Nm** L1 (measured): L2 (measured): L3 (measured): PE (measured):	☐	☐	☐
19	Check that the DC output connections are correctly torqued (DC+, DC-, PE) and use a paint pen to mark connections	**DC +, DC-, PE (setpoint): 30Nm** DC + (measured): DC (measured): PE (measured):	☐	☐	☐
20	Check that the grounding straps are correctly tightened		☐	☐	☐
21	Check the grounding straps for damage		☐	☐	☐
22	Ensure all interior warning labels are legible		☐	☐	☐
23	Check the line side switch (Q1) for external damage		☐	☐	☐

	Preventive maintenance action list	OK?		
No.	**Checklist Item**	**Yes**	**No**	**N/A**
24	Check to see whether the capacitors are leaking liquid	☐	☐	☐
25	• With a dry cloth: – Clean the transformer – Clean the inductors of the back panel (LDC1, LDC2, LBK1, LBK2) – Clean the inductors of the input panel (LL, LH) – Clean the inductors on the output panel (LDC3) • Compressed air can be used to clear any debris between or within transformer or inductor coils	☐	☐	☐
26	Re-energize the charger using its feeder/MCCB safely, according to the 6 safety rules	☐	☐	☐
27	Close and lock charger doors and roof	☐	☐	☐

Comments and findings:

	Name	Function	Signature
Responsible Person			
Customer (optional)			

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Notes:

Notes:

Notes:

Legal Manufacturer

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www.usa.siemens.com/createcase
for service.

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