

CHARGEMAX 90-120-180

Installation manual



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1. About this document

1.1 Function of this document

The document is only applicable for this EVSE (ChargeMax series), including the variants and options listed in section 8.1.

The document gives the information that is necessary to install the EVSE.

1.2 Target group

The document is intended for qualified installation engineers.

For a description of the required qualifications, refer to section 3.3.

1.3 Revision history

Version	Date	Description
001		Initial version

1.4 Language

The original instructions of this document are in English (EN-US). All other language versions are translations of the original instructions.

1.5 Illustrations

It is not always possible to show the configuration of your EVSE. The illustrations in this document show a typical setup. They are for instruction and description only.

1.6 Units of measurement

SI units of measurement (metric system) are used. If necessary, the document shows other units between parentheses () or in separate columns in tables.

1.7 Typographical conventions

The lists and steps in procedures have numbers (123) or letters (abc) if the sequence is important.

1.8 How to use this document

1. Make sure that you know the structure and contents of this document.
2. Read the safety chapter and make sure that you know all the instructions.
3. Do the steps in the procedures fully and in the correct sequence.
4. Keep the document in a safe location that you can easily access. This document is a part of the EVSE.

1.9 General symbols and signal words

Signal word	Description	Symbol
Danger	If you do not obey the instruction, this can cause injury or death.	Refer to section 1.10.
Warning	If you do not obey the instruction, this can cause injury.	Refer to section 1.10.
Caution	If you do not obey the instruction, this can cause damage to the EVSE or to property.	
Note	A note gives more data, to make it easier to do the steps, for example.	
-	Information about the condition of the EVSE before you start the procedure.	
-	Requirements for personnel for a procedure.	
-	General safety instructions for a procedure.	
-	Information about spare parts that are necessary for a procedure.	
-	Information about support equipment that is necessary for a procedure.	
-	Information about supplies (consumables) that are necessary for a procedure.	
-	Make sure that the power supply to the EVSE is disconnected.	
-	Electrotechnical expertise is required, according to the local rules.	



Note: It is possible that not all symbols or signal words are present in this document.

1.10 Special symbols for warnings and dangers

Symbol	Risk type
	General risk
	Hazardous voltage that gives risk of electrocution
	Risk of pinching or crushing of body parts
	Rotating parts that can cause a risk of entrapment



Note: It is possible that not all symbols are present in this document.

1.11 Related documents

Document name	Target group
Product data sheet	All target groups
Installation manual	Qualified installation engineer
User manual	Owner
Service manual	Qualified service engineer
Declaration of conformity (CE)	All target groups

1.12 Manufacturer and contact data

Manufacturer

ABB EV Infrastructure
Heertjeslaan 6
2629 JG Delft
The Netherlands

Contact data

The local representative of the manufacturer can give you support on the EVSE. You can find the contact data here: <https://new.abb.com/>

1.13 Abbreviations

Abbreviation	Definition
AC	Alternating current
CAN	Controller area network
CPU	Central processing unit
DC	Direct current
EMC	Electromagnetic compatibility
EV	Electric vehicle
EVSE	Electric vehicle supply equipment
MiD	Measuring Instruments Directive
NFC	Near field communication
NoBo	Notified body
OCPP	Open charge point protocol
PE	Protective earth
PPE	Personal protective equipment
RFID	Radio-frequency identification



Note: It is possible that not all abbreviations are present in this document.

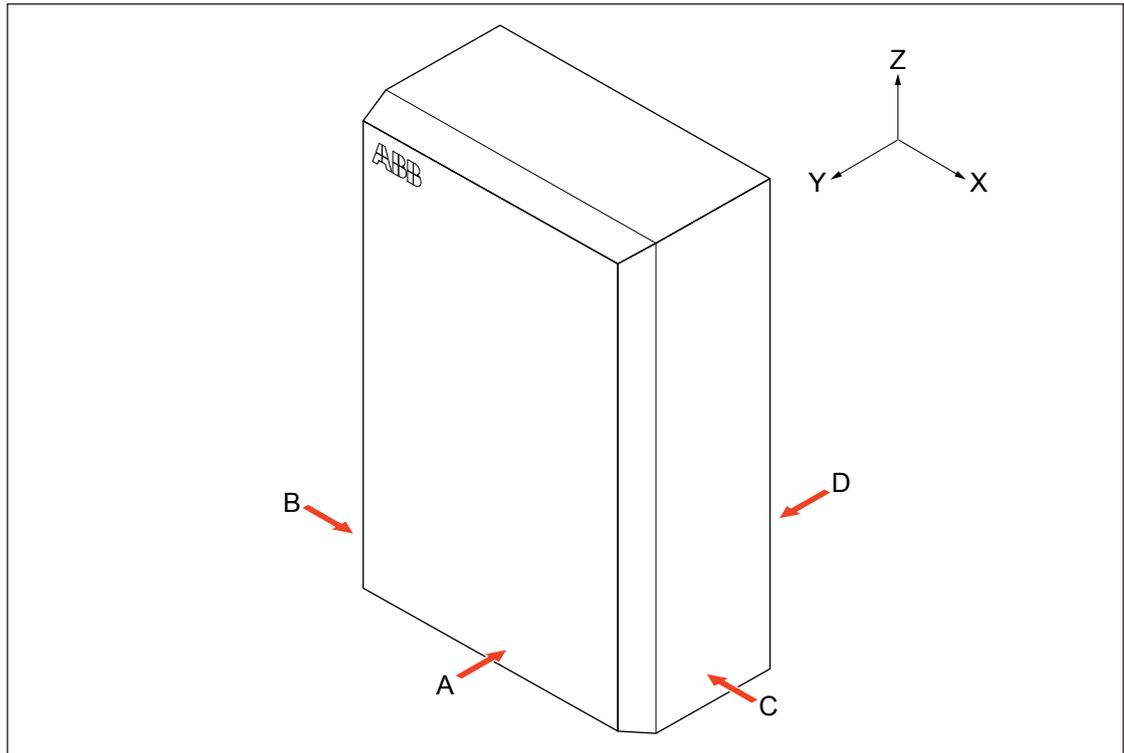
1.14 Terminology

Term	Definition
Network operating center of the manufacturer	Facility of the manufacturer to do a remote check on the correct operation of the EVSE
Cabinet	Enclosure of the EVSE, including the components on the inside
CHAdeMO	Japanese DC fast charging method for electric vehicles
Contractor	Third party that the owner or site operator hires to do engineering, civil and electrical installation work
Grid provider	Company that is responsible for the transport and distribution of electricity
Local rules	All rules that apply to the EVSE during the entire lifecycle of the EVSE. The local rules also include the national laws and regulations.
Open charge point protocol	Open standard for communication with charge stations
Owner	Legal owner of the EVSE
Site operator	Entity that is responsible for the day-to-day control of the EVSE. The site operator does not have to be the owner.
User	Owner of an EV, who uses the EVSE to charge the EV



Note: It is possible that not all terms are present in this document.

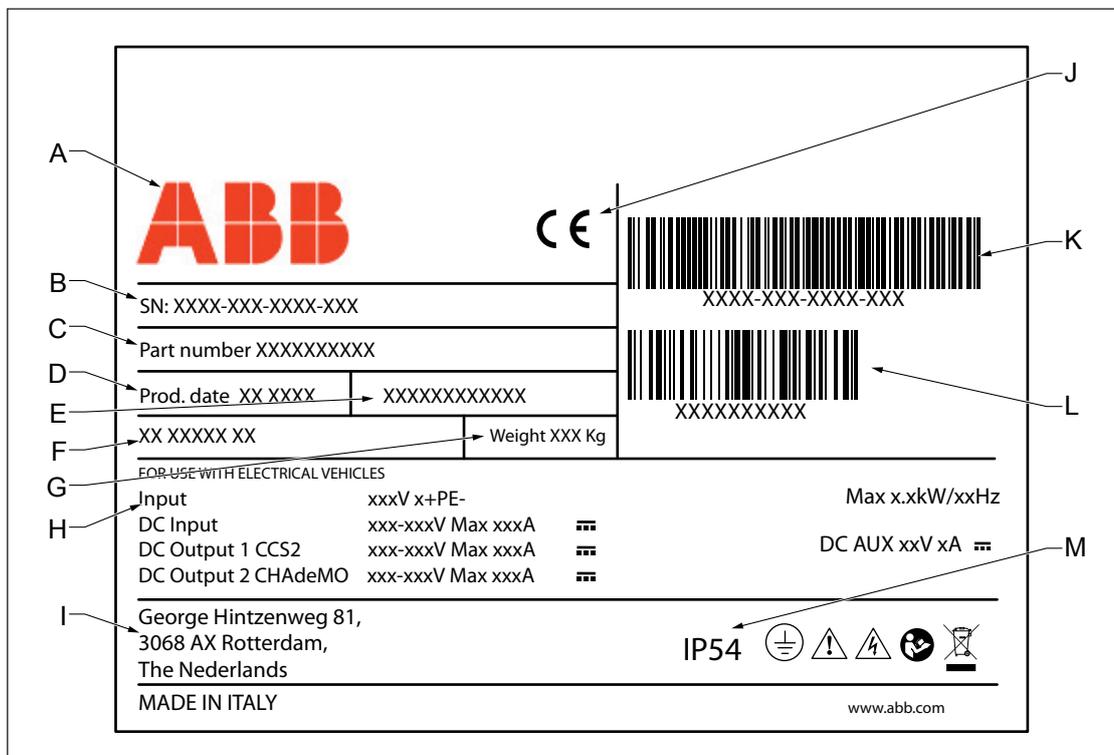
1.15 Orientation agreements



- | | | | |
|---|--|---|--|
| A | Front side: face forward to the EVSE during normal use | X | X-direction (positive is to the right) |
| B | Left side | Y | Y-direction (positive is rearward) |
| C | Right side | Z | Z-direction (positive is upward) |
| D | Rear side | | |

2. Description

2.1 Type plate



- | | | | |
|---|--|---|--|
| A | Manufacturer | H | EVSE rating |
| B | Serial number | I | Address of the manufacturer |
| C | Part number of the EVSE | J | CE mark |
| D | Production date | K | Barcode with the serial number of the EVSE |
| E | Internal product code (for the manufacturer) | L | Barcode with the part number of the EVSE |
| F | Full EVSE type | M | Additional EVSE rating data |
| G | EVSE mass | | |



Note: Find the type plate on your EVSE to see the applicable data. Refer to section 2.4.2.

2.2 Intended use

The EVSE is intended for the DC charging of EVs. The EVSE is intended for indoor or outdoor use. The properties of the electrical grid, the ambient conditions and the EV must comply with the technical data of the EVSE. Refer to chapter 8.

Only use the EVSE with accessories that the manufacturer provides and that obey the local rules.

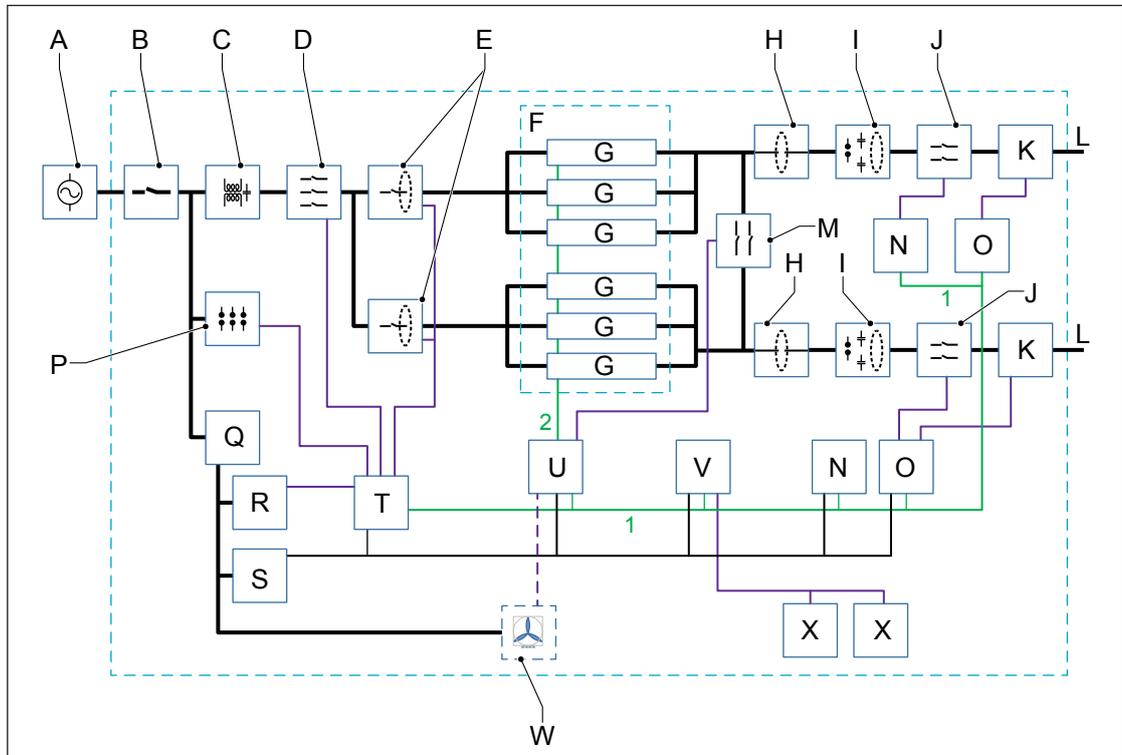


Danger:
General risk

- If you use the EVSE in any other way than described in the related documents, you can cause death, injury and damage.
- Use the EVSE only as intended.

2.3 Working principles

2.3.1 ChargeMax 90, 120 and 180 CC and CJ

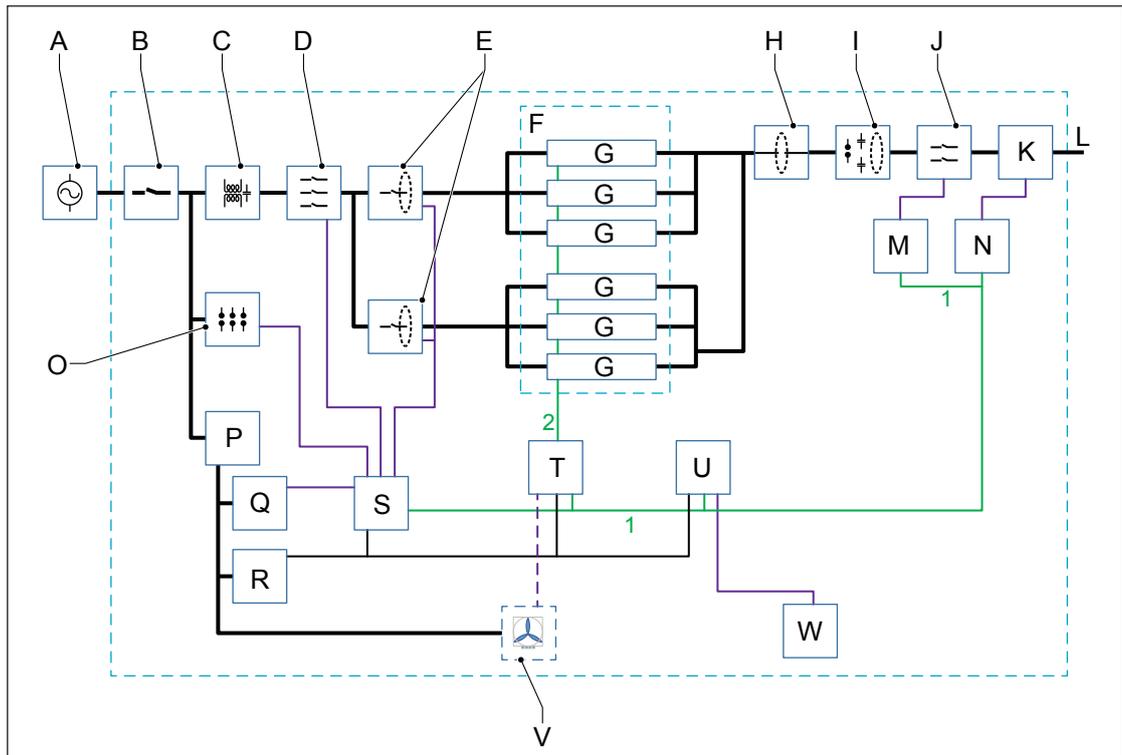


- | | |
|---------------------------------------|--|
| A AC input cable | N Insulation management interface |
| B Manual switch | O Charge protocol interface |
| C EMC filter | P Surge-protection device |
| D AC contactor | Q Residual-current device |
| E Residual-current device and breaker | R Heater |
| F Power module matrix | S Auxiliary power supply |
| G Power module | T Cabinet controller board |
| H DC filter | U Power bridge |
| I DC contactor | V Touchscreen |
| J DC fuse | W Cooling fan |
| K Overcurrent protection device | X LED for the illumination of the exterior of the EVSE |
| L Charge cable | 1 CAN bus signal 1 |
| M Interlink contactor | 2 CAN bus signal 2 |
- Black and bold lines: power connection
 - Black and thin lines: auxiliary power connection
 - Green lines: CAN bus
 - Purple lines: control signal or monitoring signal



Note: For ChargeMax 90, the second array of three power modules is empty.

2.3.2 ChargeMax 90, 120 and 180 C



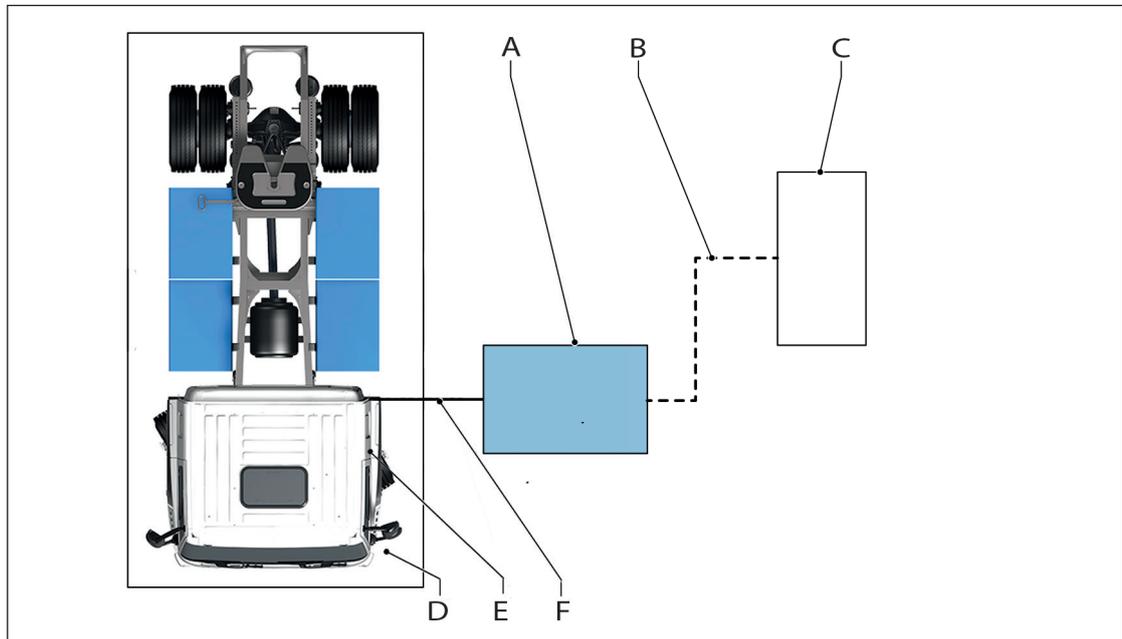
- | | |
|---------------------------------------|--|
| A AC input cable | N Charge protocol interface |
| B Manual switch | O Surge-protection device |
| C EMC filter | P Residual-current device |
| D AC contactor | Q Heater |
| E Residual-current device and breaker | R Auxiliary power supply |
| F Power module matrix | S Cabinet controller board |
| G Power module | T Power bridge |
| H DC filter | U Touchscreen |
| I DC contactor | V Cooling fan |
| J DC fuse | W LED for the illumination of the exterior of the EVSE |
| K Overcurrent protection device | 1 CAN bus signal 1 |
| L Charge cable | 2 CAN bus signal 2 |
| M Insulation management interface | |
- Black and bold lines: power connection
 - Black and thin lines: auxiliary power connection
 - Green lines: CAN bus
 - Purple lines: control signal or monitoring signal



Note: For ChargeMax 90, the second array of three power modules is empty.

2.4 Overview

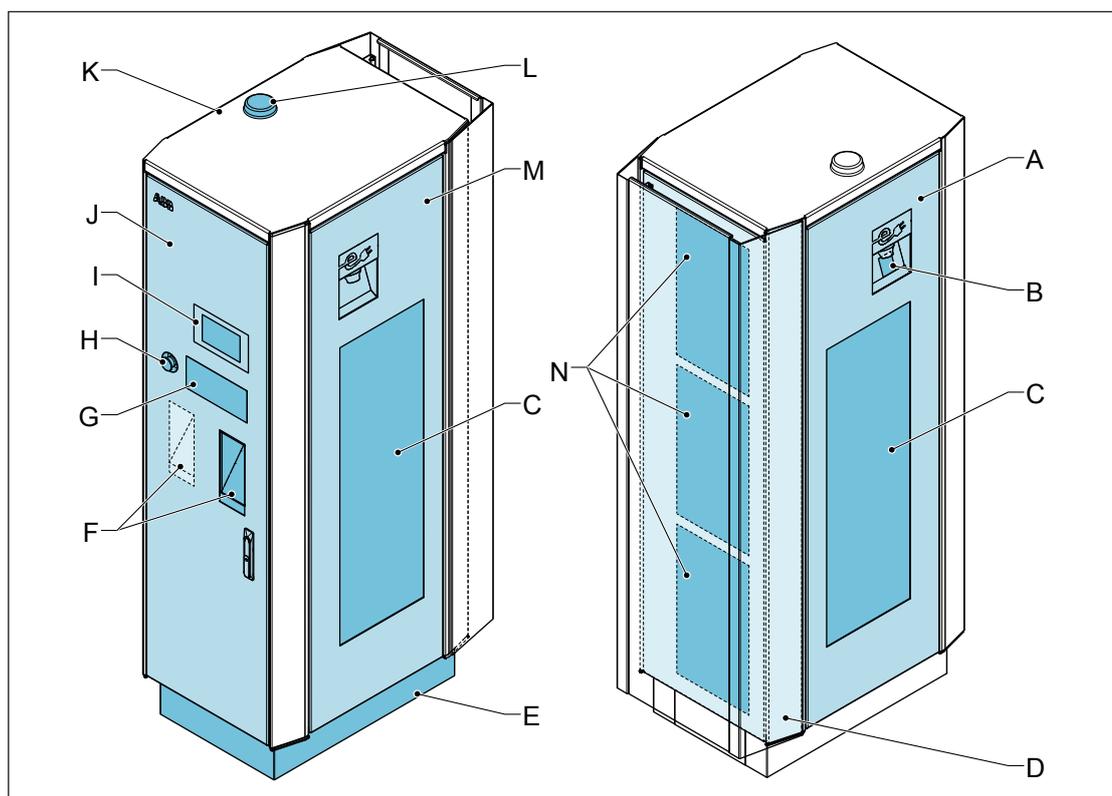
2.4.1 Overview of the system



- | | |
|----------------------------|-------------------|
| A EVSE | D Parking space |
| B AC input cable | E EV |
| C Power distribution board | F EV charge cable |

Part	Function
EV	The EV of which the batteries need to be charged
EVSE	Refer to section 2.4.2.
Parking space	Location for the EV during the charge session
AC input cable	To supply the electrical energy to the EVSE
Power distribution board	To connect the EVSE to the AC grid input
EV charge cable	To conduct the charge from the EVSE to the EV

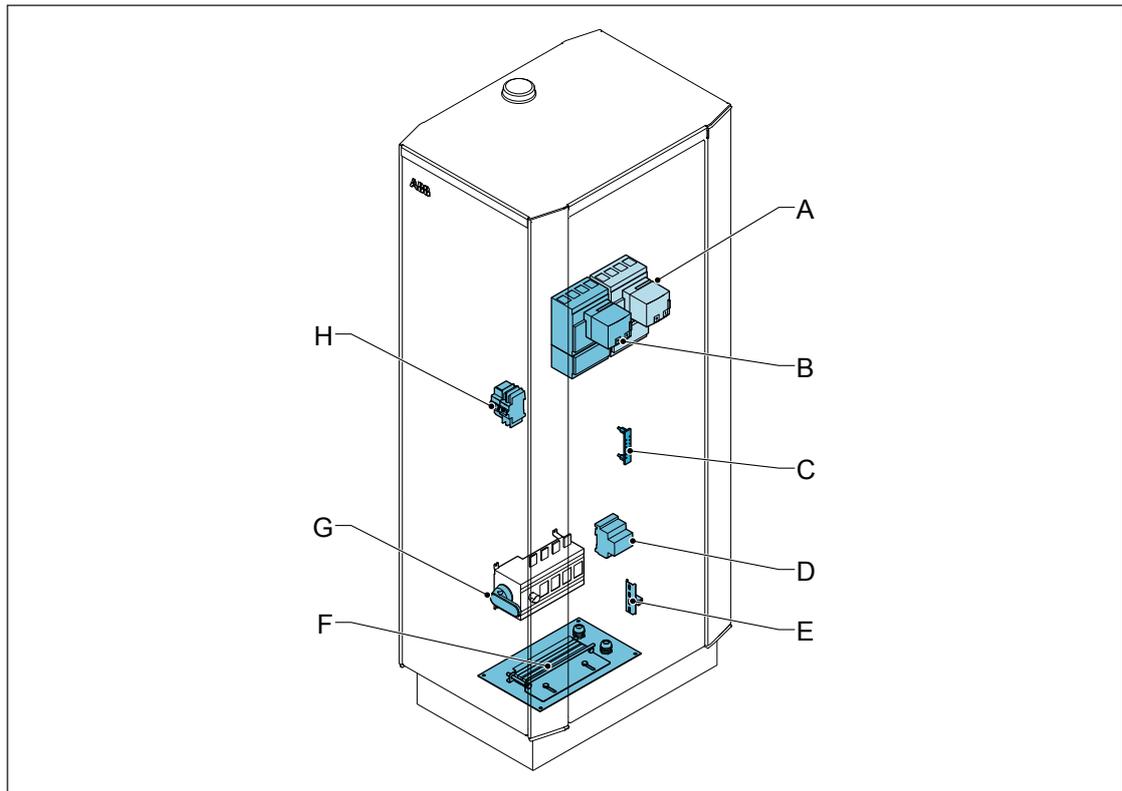
2.4.2 Overview of the EVSE, outside



- | | |
|--|-------------------------|
| A Left door | H Emergency stop button |
| B Type plate | I Touchscreen |
| C Air inlet | J Front door |
| D Cover on the air outlet | K Enclosure |
| E Border cover | L Antenna |
| F EV charge cable outlet and holder (1x or 2x) | M Right door |
| G Plate over the RFID reader and the integrated payment terminal | N Air outlet |

Part	Function
Front, left and right door	To give authorized personnel access to the inside of the EVSE
Type plate	To show the identification data of the EVSE. Refer to section 2.1.
Air inlet and outlet	To let cooling air in and out. The airflow makes sure that the parts on the inside of the EVSE do not become too hot.
Cover on the air outlet	To prevent a blockage of the air outlet
Border cover	To cover the lower part of the EVSE
EV charge cable outlet and holder	To connect and hold the EV charge cable. Refer to section 2.5.
RFID reader	To read the information from an RFID card
Payment terminal	To pay for the charge session
Emergency stop button	To stop the EVSE when there is an emergency
Touchscreen	To control and monitor the charge session
Enclosure	To reduce the accessibility of unqualified persons to the inside of the EVSE
Antenna	To send and receive wireless 2G, 3G and 4G signals

2.4.3 Overview of the EVSE, inside

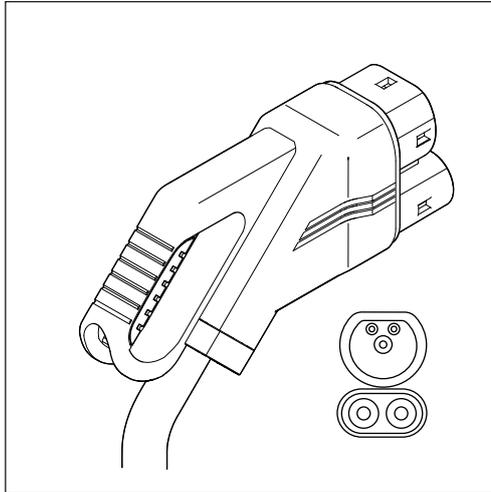


- | | |
|----------------------------------|----------------------------------|
| A Main breaker 2 | E Ethernet connection |
| B Main breaker 1 | F Cable guide plate |
| C PE busbar | G Manual switch |
| D Surge protection device switch | H Auxiliary power supply breaker |

Part	Function
Main breaker 2	To connect or disconnect the power modules group 2
Main breaker 1	To connect or disconnect the power modules group 1
PE busbar	To connect the PE cable
Surge protection device switch	Breaker to protect the surge protection device, always in the on position
Ethernet connection	Connection for the Ethernet cable
Cable guide plate	Plate with openings for the AC input cable and the Ethernet cable
Manual switch	To connect or disconnect the AC power input
Auxiliary power supply breaker	To connect or disconnect the AC power input to or from the auxiliary power for the control circuit

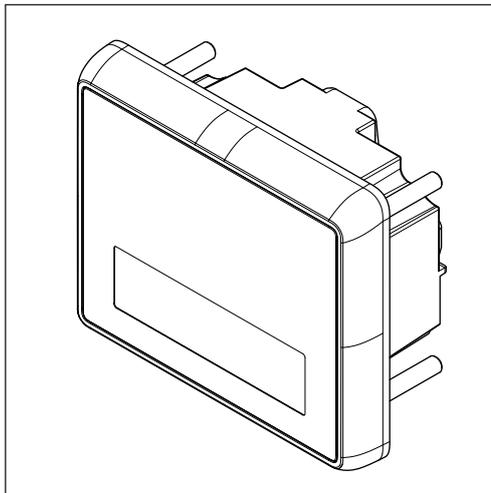
2.5 Options

2.5.1 EV charge cable, Combo 2



A EV charge cable

2.5.2 Integrated payment terminal - CCV



2.6 External residual-current device

The manufacturer does not supply an external residual-current device. If an external residual-current device is required because of local rules, this section helps you to select the correct device.

Situation: the local rules require an immunity for short current peaks over PE during the EV charging process.

At the start of the EV charge cycle, a relay switches and engages the AC input power to the power modules. Incidental current peaks can occur. For the specifications of the current peaks, refer to section 8.15.

A combination of these factors is the source of these current peaks:

- Asynchronous engagement of the phases in the relay
- The electrical capacity of the AC input power part of the EVSE

The amplitude of the current peaks can change. These factors are the source of the differences:

- The location of the EVSE
- The power grid
- The earth impedence

3. Safety

3.1 Liability

The manufacturer is not liable to the purchaser of the EVSE or to third parties for damages, losses, costs or expenses incurred by the purchaser or third parties if any target group mentioned in the related documents does not obey the rules below:

- Obey the instructions in the related documents. Refer to section 1.11.
- Do not misuse or abuse the EVSE.
- Only make changes to the EVSE, if the manufacturer approves in writing of the changes.

This EVSE is designed to be connected to and to communicate information and data via a network interface. It is the sole responsibility of the owner to provide and continuously ensure a secure connection between the EVSE and the network of the owner or any other network.

The owner shall establish and maintain any appropriate measures (such as - but not limited to - the installation of firewalls, application of authentication measures, encryption of data and installation of anti-virus programs) to protect the EVSE, the network, its system and the interface against any kind of security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information.

The manufacturer is not liable for damages and/or losses related to such security breaches, any unauthorized access, interference, intrusion, leakage and/or theft of data or information.

3.2 General safety instructions

- This document, the related documents and the warnings included do not replace your responsibility to use your common sense when you do work on the EVSE.
- Only do the procedures that the related documents show and that you are qualified for.
- Obey the local rules and the instructions in this manual. If the local rules contradict the instructions in this manual, the local rules will apply.

If and to the extent permitted by law, in case of inconsistency or contradiction, between any requirements or procedure contained in this document and any such local rules, obey the stricter between the requirements and procedures specified in this document and the local rules.

3.3 Required qualifications for the installation engineer



- The qualified installation engineer fully knows the EVSE and its safe installation.
- The installation engineer is qualified to work on high-voltage and high-current electrical installations.
- The qualified installation engineer obeys all local rules and the instructions in the installation manual.
- It is the responsibility of the owner of the EVSE to make sure that all qualified installation engineers obey the local rules, the installation instructions, and the specifications of the EVSE.

3.4 Personal protective equipment

Symbol	Description
	Protective clothing
	Safety gloves
	Safety shoes
	Safety glasses

3.5 Safety instructions during installation

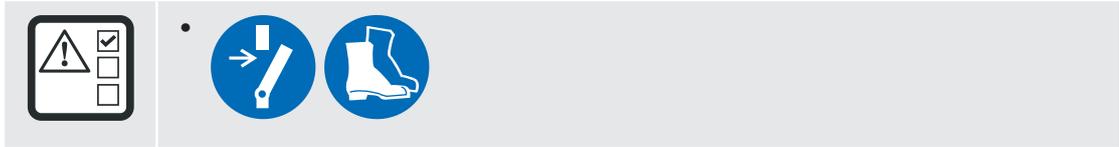
Preliminary requirements



- Do not use adaptors or conversion adapters.
- Do not use cord extension sets.
- Make sure that there is no voltage on the AC input cables during the complete installation procedure.
- Keep unqualified personnel at a safe distance during installation.
- Only use electrical wires of sufficient gauge and insulation to handle the rated current and voltage demand.
- Make sure that the load capacity of the grid is in accordance with the EVSE.
- Earth the EVSE correctly. Refer to section 3.7.
- Make sure that the wiring inside the EVSE is protected from damage and cannot get trapped when you open or close the cabinet.
- Make sure that water cannot enter the cabinet.
- Protect the EVSE with safety devices that the local rules specify.
- If it is necessary to remove safety devices, immediately install the safety devices after the work.
- Put on the correct personal protective equipment. Refer to section 3.4.

3.6 Safety instructions during transport

Preliminary requirements



- Make sure that the hoisting equipment or forklift truck can lift the EVSE safely. Take into account the mass and the center of gravity of the EVSE.
- Obey the safety instructions that apply to the hoisting equipment or the forklift truck.
- Put on the correct personal protective equipment. Refer to section 3.4.

3.7 Safety instructions for earthing

Preliminary requirements



- Make sure that the EVSE is connected to an earthed, metal, permanent electrical system. Alternatively, install an equipment-earthing conductor with circuit conductors. Connect this earthing conductor to an equipment-earthing terminal or lead on battery charger.
- Make sure that the connections to the EVSE comply with all applicable local rules.

3.8 Signs on the EVSE

Symbol	Risk type
	General risk
	Hazardous voltage that gives risk of electrocution
	Risk of pinching or crushing of body parts
	Rotating parts can cause a risk of entrapment
	PE
	Sign that means that you must read the manual before you install the EVSE
	Waste from electrical and electronic equipment



Note: It is possible that not all symbols are present on the EVSE.

3.9 Discard parts or the EVSE

- Obey the local rules to discard parts, packaging material or the EVSE.
- Discard electrical and electronic equipment separately in compliance with the WEEE - 2012/19/EU Directive on waste of electrical and electronic equipment.

4. Transport

4.1 Transport the EVSE to the site

A transport company delivers the EVSE close to the site. The movement of the EVSE to its final location is your responsibility.

- If you need to store the EVSE before installation, obey the ambient conditions for storage. Refer to section 8.6.

4.2 Transport the EVSE on the site

4.2.1 Hoist the cabinet

Preliminary requirements

	1. The cabinet is unpacked. Refer to section 5.4.1.		• Hoisting equipment, including cables, swivel eye bolts or bolts with lifting loops. Refer to section 8.4.
---	---	--	---



Note:

Risk of pinching or crushing, the cabinet is heavy

- Make sure that the hoisting equipment can lift the cabinet safely. Obey the safety instructions that apply to the hoisting equipment. Take into account the dimensions, the mass and the center of gravity of the EVSE. Refer to chapter 8.

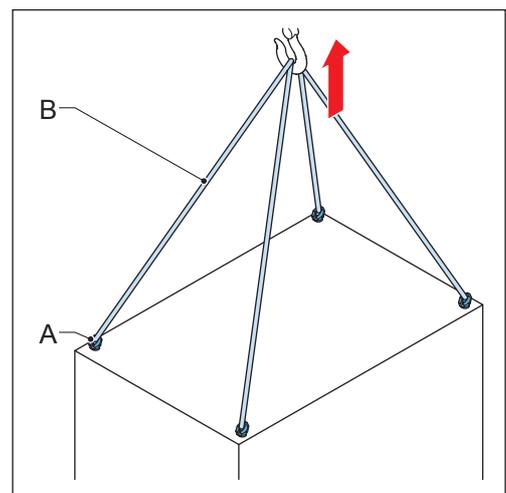


Caution:

- Do not drop the cabinet.
- Do not tilt the cabinet more than allowed. Refer to section 8.9.

Procedure

1. Install the swivel eye bolts or bolts with lifting loops (A).
2. Connect the cables (B) of the hoisting equipment to the swivel eye bolts or bolts with lifting loops.
3. Move the cabinet to the correct location.



4.2.2 Move the cabinet with a forklift truck

Preliminary requirements



1. The cabinet is unpacked.
Refer to section 5.4.1.



- Forklift truck. Refer to section 8.4.



Note:

Risk of pinching or crushing, the cabinet is heavy

- Make sure that the forklift truck can lift the cabinet safely. Obey the safety instructions that apply to the forklift truck. Take into account the mass, the dimensions and the center of gravity of the EVSE. Refer to chapter 8.

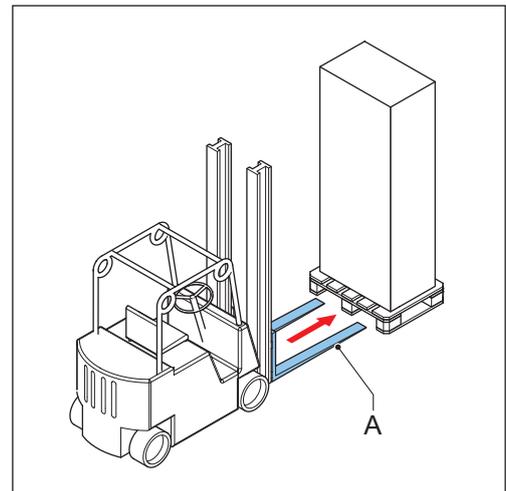


Caution:

- Do not drop the cabinet.
- Do not tilt the cabinet more than allowed. Refer to section 8.9.

Procedure

1. Move the forks (A) of the forklift truck in the gaps at the side of the cabinet.
2. Move the cabinet to the correct location.



5. Installation

5.1 General installation procedure

Preliminary requirements

	<ol style="list-style-type: none">1. All required permits to agree with the local rules, are granted.2. The AC input cable is available.		<ul style="list-style-type: none">• There is no voltage on the AC input cable during the complete installation procedure.
	<ul style="list-style-type: none">• Tools for installation. Refer to section 8.4.		

Procedure

1. Prepare the site. Refer to section 5.2.1.
2. Unpack the EVSE. Refer to section 5.4.1.
3. Move the cabinet above the correct location. Refer to section 4.2.



Note: Make sure that there is some distance between the foundation and the cabinet to guide the cables into the EVSE.

4. Do the mechanical installation. Refer to section 5.5.1.
5. Do the electrical installation. Refer to section 5.6.1.
6. Prepare for commissioning. Refer to section 5.7.

5.2 Site preparation

5.2.1 Prepare the site

1. Make sure that the space and the airflow around the cabinet is sufficient. Refer to section 5.2.2.
2. If the local rules require the installation of an external residual-current device, install an external residual-current device. Refer to section 2.6.
3. Design the site so that the charge cables can get to the inlet for the charge cables on the EVs. For the length of the charge cables, refer to section 8.10.1.
4. Prepare the cables:
 - AC input cable. Refer to section 8.12.2.
 - PE wire. The diameter depends on the length, method of installation and other factors. Make sure that the PE wire agrees with the safety instructions. Refer to section 3.7.
 - Ethernet cable, if no wireless 2G/3G/4G signal is available. Refer to section 8.11. Contact the manufacturer if you require a specific configuration. Refer to section 1.12.



Note:

- The cables enter the cabinet from the bottom.
- Take into account the maximum opening of the cable inlet when you prepare the cables. Refer to section 8.10.1.

5. If you use an Ethernet cable, make sure that the internet connection is available for an approved service engineer and the network operating center of the manufacturer.
6. Make sure that the cable slack is sufficient to guide the cables in the cabinet. Refer to section 8.10.2.
7. Prepare the foundation for the cabinet. Refer to section 5.3.1.

5.2.2 Control the space and airflow around the cabinet

1. Make sure that the floor space agrees with the requirements. Refer to section 8.10.3.
2. Make sure that the air flow inlet and outlet cannot get blocked. Think of snow or objects.

5.3 Prepare the foundation

5.3.1 Prepare the foundation - general procedure

1. Select the correct foundation, based on the surface you install the cabinet on.
2. Embed the cables in the ground with or without a cable duct. Refer to the local rules.

5.3.2 Prepare a standard prefab foundation

Preliminary requirements



1. Prefab foundation. Refer to section 8.10.4.

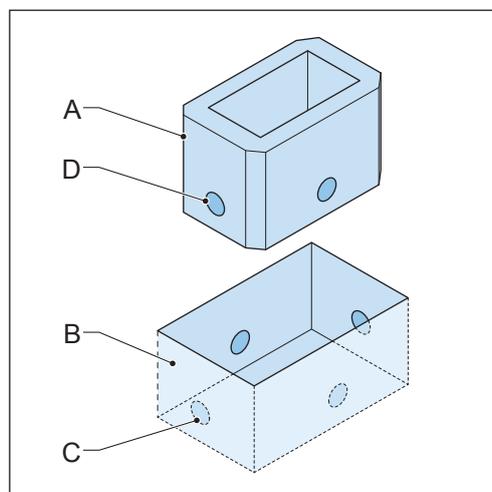
Procedure

1. Make the foundation (A). Do one of these steps:
 - Contact the manufacturer to order the foundation for your EVSE. Refer to section 1.12.
 - Make the foundation according to the specifications.
2. Dig the hole for the foundation (B). For the specifications, refer to section 8.10.4.



Caution:

Make sure that the top surface of the foundation is above the ground level, to prevent intrusion of water.



3. Guide the cables to the locations (C).
4. Install the foundation in the hole.
5. Put the cables through the openings (D) in the foundation. Apply the full cable slack.
6. Fill the foundation with gravel or another substance to prevent rodents to enter the cabinet.

5.3.3 Prepare a custom foundation

Preliminary requirements



1. Prefab foundation. Refer to section 8.10.5.

Procedure

1. Make the custom foundation.
2. Route the cables through the opening in the foundation. Apply the full cable slack.

5.4 Unpacking

5.4.1 Unpacking procedure

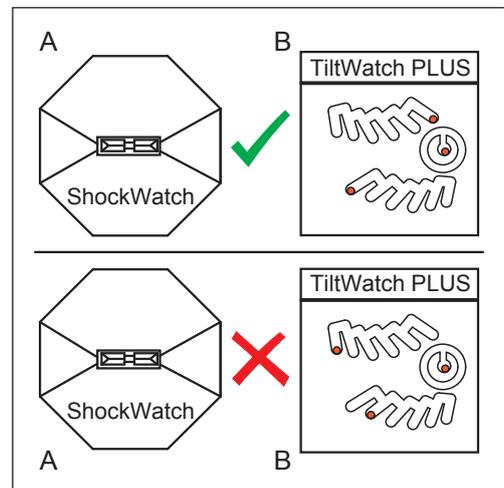
1. Do a check on the transport sensors. Refer to section 5.4.2.
2. Remove the packaging material.
3. Discard the packaging material. Refer to section 3.9.
4. Do a visual check for damage on the outside and inside of the EVSE.
5. Make sure that all parts are delivered according to the order. Refer to the order and section 8.2.
6. If you find damage or the parts are not according to the order, contact the local representative of the manufacturer.
7. Remove the border covers. Refer to section 6.3.
8. Remove the cabinet from the pallet. Refer to section 5.4.3.

5.4.2 Do a check on the transport sensors

1. Do a check on the sensors (A) that record the shocks during transport.
2. Do a check on the sensors (B) that record the maximum tilt during transport.
3. If the sensors (A) show a red indication or the sensors (B) show a tilt that is too high, do these steps:

For the transport specifications, refer to section 8.9.

- a. Refuse the delivery of the EVSE.
- b. Make a note on the delivery receipt.
- c. Within three days of the delivery, ask the transport company for an inspection.
- d. If you see damage on the cabinet, through the packaging material, do not unpack the EVSE.
- e. Contact the manufacturer and give details of the delivery problems. Refer to section 1.12.



5.4.3 Remove the cabinet from the pallet

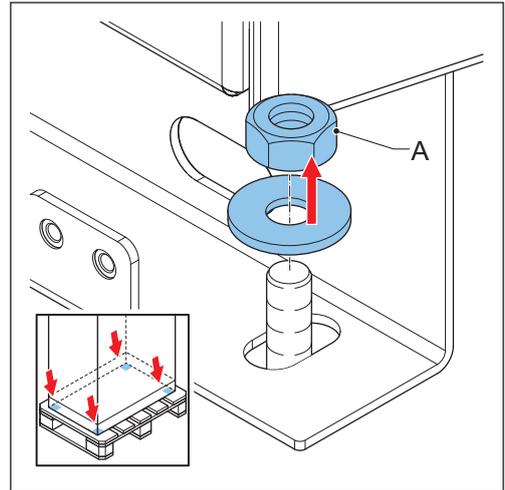
Preliminary requirements



- Open spanner

Procedure

1. Remove the fasteners (A).
2. Discard the fasteners and the pallet.
Refer to section 3.9.



5.5 Mechanical installation

5.5.1 Mechanical installation procedure

Preliminary requirements



1. The cabinet is above the foundation.

Procedure

1. Open the cable inlet and remove the cable gland. Refer to section 5.5.2.
2. Guide the cables through the openings in the cable guide plate. Refer to section 5.5.3.
3. Install these parts:
 1. Cabinet on the foundation. Refer to section 5.5.4.
 2. Border covers. Refer to section 6.4.

5.5.2 Open the cable inlet and remove the cable gland

Preliminary requirements



- Open spanner

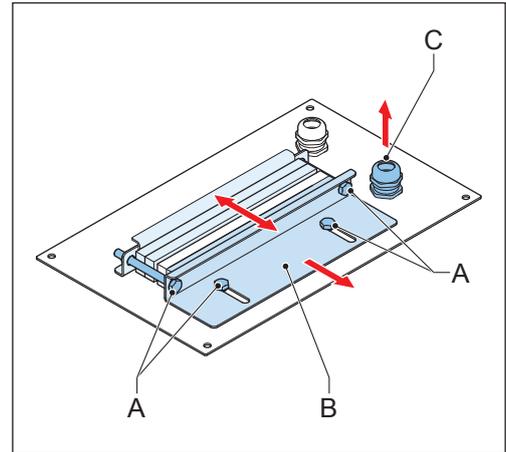
Procedure

1. Open the front and right doors. Refer to section 6.1.
2. Loosen the fasteners (A).
3. Move the sliding plate (B) to open the cable inlet.
4. If it is necessary, remove the cable gland (C) for the Ethernet cable.



Caution:

If the cable gland for the Ethernet cable is not used, make sure that the cable gland is closed and sealed.



5.5.3 Guide the cables through the opening in the cable guide plate

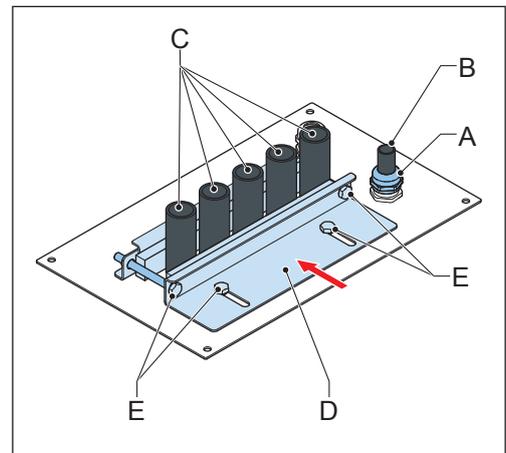
Preliminary requirements



1. The front and right doors are open.
2. The cable inlet is open.

Procedure

1. If it is necessary, install the cable gland (A) over the Ethernet cable (B).
2. Guide the wires (C) of the AC input cable, the PE wire and the earthing conductor for the enclosure through the cable inlet.
3. Pull the wires and cable through the gland plate and the cable inlet. Apply the full cable slack.
4. Close the sliding plate (D).
5. Tighten the fasteners (E).
6. Close the doors. Refer to section 6.2.



5.5.4 Install the cabinet on the foundation

Preliminary requirements



- Open spanner



- Fasteners M10 (bolts and washers), 8x

Procedure

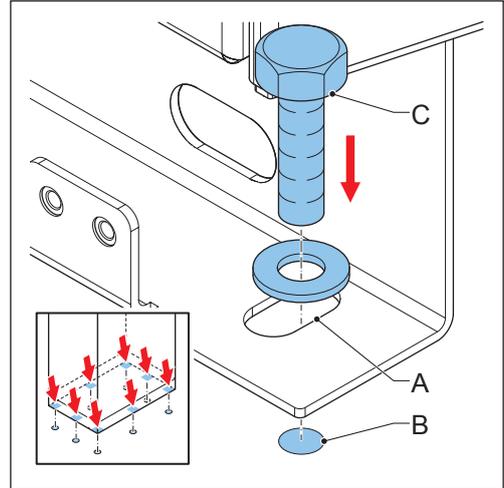
- Carefully lower the cabinet on the foundation.
Refer to section 4.2. Make sure that the holes in the cabinet (A) and the foundation (B) are aligned.



Caution:

Make sure that there is no kink in the cables.

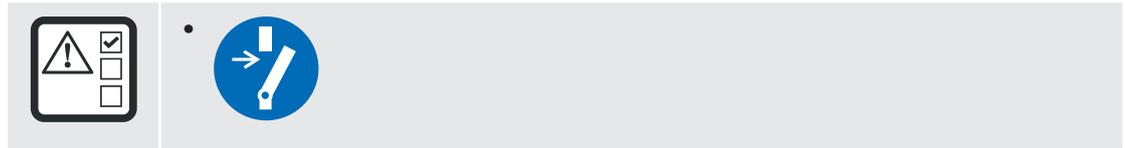
- Install the fasteners (C).
- Tighten the fasteners.



5.6 Electrical installation

5.6.1 Electrical installation procedure

Preliminary requirements



Procedure

- Open the front and right doors. Refer to section 6.1.
- Connect the wires of the AC input cable. Refer to section 5.6.2.
- Connect the PE wire. Refer to section 5.6.3.
- Connect the enclosure to the earth. Refer to section 5.6.4.
- If it is necessary, connect the Ethernet cable. Refer to section 5.6.5.
- Close the doors. Refer to section 6.2.

5.6.2 Connect the wires of the AC input cable

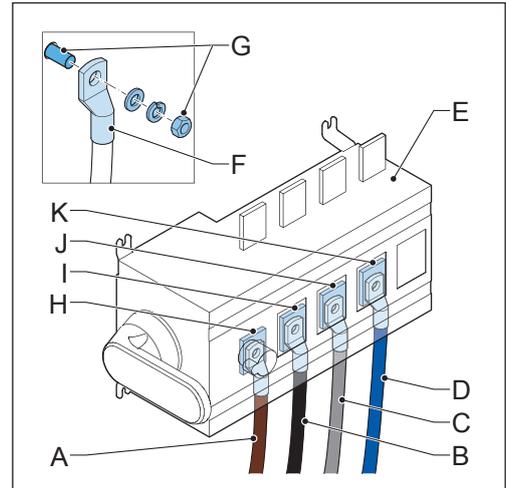
Preliminary requirements

	<ol style="list-style-type: none"> The front and right doors are open. 		<ul style="list-style-type: none"> Wire end rings M11 Fasteners M11
	<ul style="list-style-type: none"> Wire stripper pliers Wire end ring tool Torque socket wrench 		

Procedure

1. Prepare the wires:
 - a. Cut the wires (A) to (D) so they can reach the connectors on the manual switch (E).
 - b. Strip the insulation from the end of the wires. Make sure that the strip length agrees with the wire end rings.
 - c. Attach the wire end rings (F) to the end of the wires. Use the wire end ring tool.
2. Attach the wires to the connectors:
 - Brown L1 wire (A) to the connector (H)
 - Black L2 wire (B) to the connector (I)
 - Gray L3 wire (C) to the connector (J)
 - Blue neutral wire (D) to the connector (K)

Use the fasteners (G).
3. Tighten the fasteners to the correct torque. For the specification, refer to section 8.5.



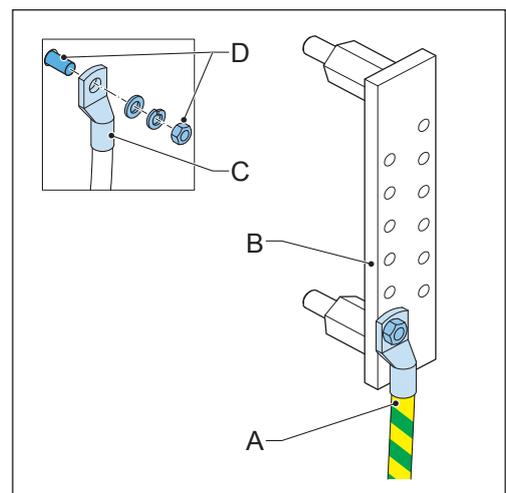
5.6.3 Connect the PE wire

Preliminary requirements

	<ol style="list-style-type: none"> 1. The front and right doors are open. 		<ul style="list-style-type: none"> • Wire end rings M11 • Fasteners M11
	<ul style="list-style-type: none"> • Wire stripper pliers • Wire end ring tool • Torque socket wrench 		

Procedure

1. Prepare the wire:
 - a. Cut the PE wire (A) so that it can reach the PE busbar (B).
 - b. Strip the insulation from the end of the wire. Make sure that the strip length agrees with the wire end ring.
 - c. Attach the wire end ring (C) to the end of the wire. Use the wire end ring tool.
2. Attach the PE wire to the PE busbar. Use the fasteners (D).
3. Tighten the fasteners to the correct torque. For the specification, refer to section 8.5.



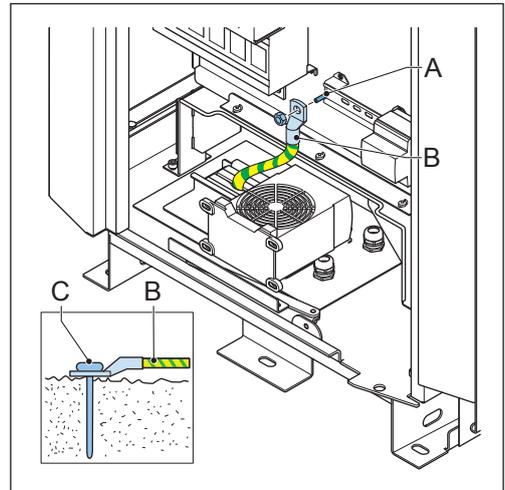
5.6.4 Connect the enclosure to the earth

Preliminary requirements

	<ul style="list-style-type: none">• Earthing electrode• Earthing conductor		<ul style="list-style-type: none">•  Make sure that the earthing connection agrees with the standard IEC 60364-5-54.
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Procedure

1. Connect the earthing conductor (B) to the pin (A) of the enclosure.
2. Connect the earthing conductor to the earthing electrode (C).



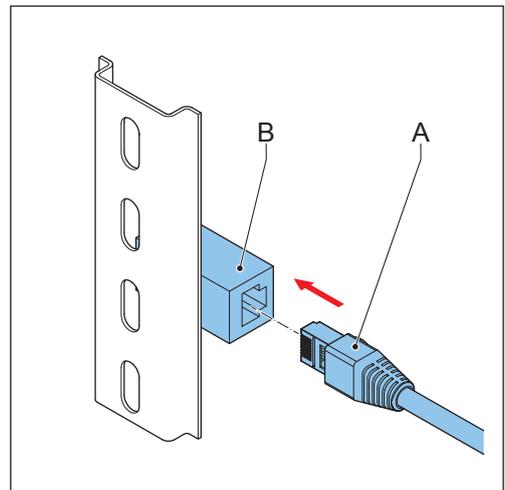
5.6.5 Connect the Ethernet cable

Preliminary requirements

	<ol style="list-style-type: none">1. The front and right doors are open.
---	--

Procedure

1. Connect the Ethernet cable (A) to the Ethernet RJ45 socket (B).



5.7 Prepare for commissioning



Danger:
Hazardous voltage

- Do not commission the EVSE. Only a service engineer of the manufacturer is qualified to commission the EVSE.

1. Tell the owner that the EVSE is ready for commissioning.
2. Make sure that the site agrees with these requirements:
 - The EVSE is installed.
 - AC input power is available from the grid provider.
 - You are present during the commissioning, for assistance and to energize the power to the EVSE on the power distribution board.
 - Internet access is available, through 2G/3G/4G or through a wired Ethernet connection.
 - An EV must be available with a compatible connection. If the EVSE has more than one connection type, an EV of each type must be available.
 - The site operator or owner is available to receive instructions from the service engineer of the manufacturer.
3. Make sure that these data are available:
 - Contact data of the contact person on site
 - Address of the EVSE
 - Site name
 - Exact location of the EVSE: longitude and latitude. If there are more EVSEs on one location, make sure that the coordinates are slightly different (at least 0.0001 degree) so that the EVSEs are not at the same location on the map.
 - Specification of the external fuse at the power distribution board
 - Date that the installation is done
 - Special remarks, for example to decline the authorization for the service engineer of the manufacturer to take photos
 - Photo of the surroundings of the EVSE

6. Access to parts

6.1 Open the doors

Preliminary requirements



- Door key

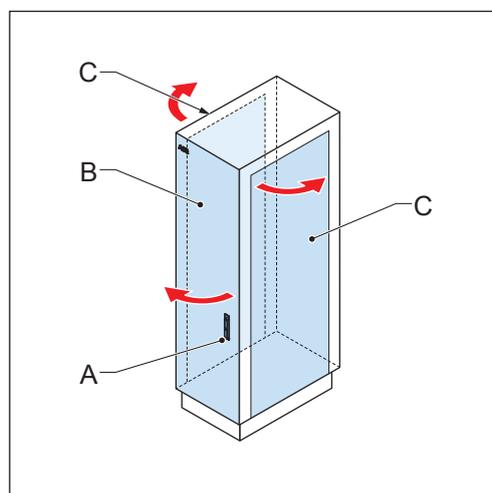


Note:

There is one unique door key for each cabinet.

Procedure

1. Unlock the lock (A) of the front door (B). Use the door key.
2. Open the front door.
3. If necessary, open the left or right doors (C) through the opening of the front door.



6.2 Close the doors

Preliminary requirements



- Door key



Danger:

Hazardous voltage

- Make sure that only qualified persons have access to the door key.

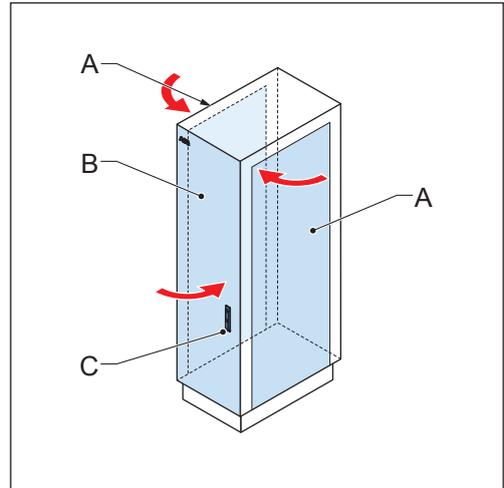


Note:

There is one unique door key for each cabinet.

Procedure

1. If the left or right doors (A) are open, close the doors through the opening of the front door.
2. Close the front door (B).
3. Lock the lock (C) of the front door. Use the door key.



6.3 Remove the border covers

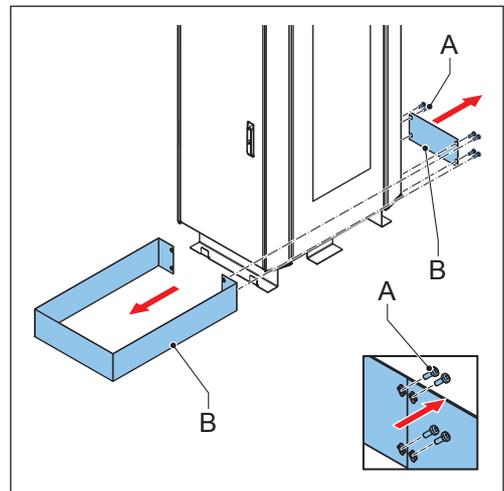
Preliminary requirements



- Set of hex keys

Procedure

1. Remove these parts:
 1. Fasteners (A)
 2. Border covers (B)



6.4 Install the border covers

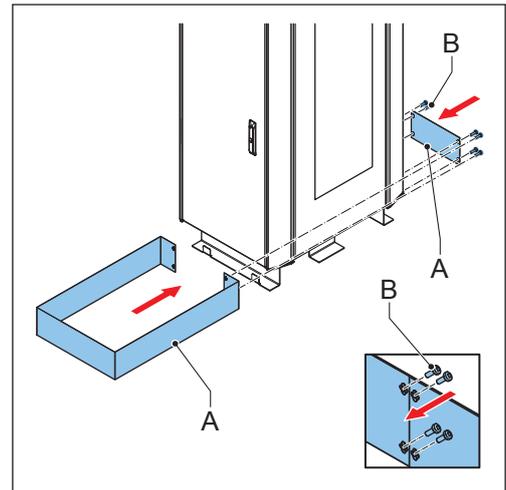
Preliminary requirements



- Set of hex keys

Procedure

1. Install these parts:
 1. Border covers (A)
 2. Fasteners (B)



7. Troubleshooting

7.1 Troubleshooting procedure

1. Try to find a solution for the problem with the aid of the information in this document.
2. If you cannot find a solution for the problem, contact your local representative of the manufacturer.
Refer to section 1.12.

8. Technical data

8.1 EVSE type

The EVSE type is a code.

The code is made out of 4 parts: T UV W

Code part	Description	Value	Meaning of the value
T	Brand	Terra	-
U	Power rating	9	90 kW
		12	120 kW
		18	180 kW
V	Design generation	4	Fourth generation
W	EV charge cable connection	C	One CCS connection
		CC	Two CCS connections

Example

Terra 94 C:

- T = Terra, Brand = Terra
- U = 9, Power rating = 90 kW
- V = 4, Design generation = fourth generation
- W = C, EV charge cable connection = one CCS connection

8.2 Parts included in the delivery

Parameter	Specification
EVSE	Refer to the type plate. Refer to section 2.1.
Door key	Door key for for the cabinet



Note: It is possible that more parts are required in the delivery. Refer to the order.

8.3 General specifications

Parameter	Specification
Compliance and safety	CE
	CHAdEMO 1.2
IP rating	The type plate shows the specification. Refer to section 2.1.
IK rating according to IEC 62262: enclosure	IK10
IK rating according to IEC 62262: touchscreen	IK08
EMC rating	Class B

8.4 Required tools for installation

Parameter	Specification
Philips screwdriver	Size: PH2
Slot screwdriver	Size: 4.5 and 2.5 mm
Hex keys	Size: 5, 5.5 and 6 mm
Torx screwdriver	Size: 15, 20 and 25
Torx angled or bit with ratchet	Size: 20
Open spanner	Size: M5 (8mm), M6 (10 mm), M10 (15 mm), M12 (19 mm) and M16 (24 mm)
Torque socket wrench	5 to 20 Nm, size M8 (13 mm) and M6 (10 mm)
Ratchet spanner with socket and extension	Size: M5 (8 mm) and M6 (10 mm)
Tie-wraps	Standard
Voltage tester	To switch 200 mA of test current (example: Duspol)
Digital multimeter	Standard
Hoisting equipment or forklift truck	Capable to lift the EVSE safely. Take into account the dimensions, the mass, the center of gravity and the maximum tilt angle. Refer to different sections in this document.
Swivel eye bolts or bolts with lifting loops (to use with hoisting equipment)	Thread M10
Wire stripper pliers	To strip the wires of the AC input cable
Wire end ring tool	Size: M11

8.5 Torque specifications

Parameter	Specification [Nm]
Fasteners for the PE wire	Between 33 and 44
Fasteners for the L1, L2, L3 and neutral wire	Between 33 and 44

8.6 Ambient conditions

Parameter	Specification
Environment, general	Indoor and outdoor
Storage temperature	-40°C to +70°C
Temperature during use	-35°C to +50°C
Maximum altitude above sea level	2500 m
Temperature derating	40°C

8.7 Mass and center of gravity

Mass

Mass	Specification
Cabinet	The type plate shows the specification.
Refer to section 2.1.	

Center of gravity

Location of center of gravity	Specification [mm]
X	207
Y	385
Z	1049



Note:

The coordinates correspond with the agreements in section 1.15. 0,0,0 is the left bottom front side of the EVSE.

8.8 Noise level

Noise level	Specification
Maximum noise level	< 62 dB(A)

8.9 Transport specifications

Parameter	Specification
Maximum tilt angle during transport	30°

8.10 Dimensions

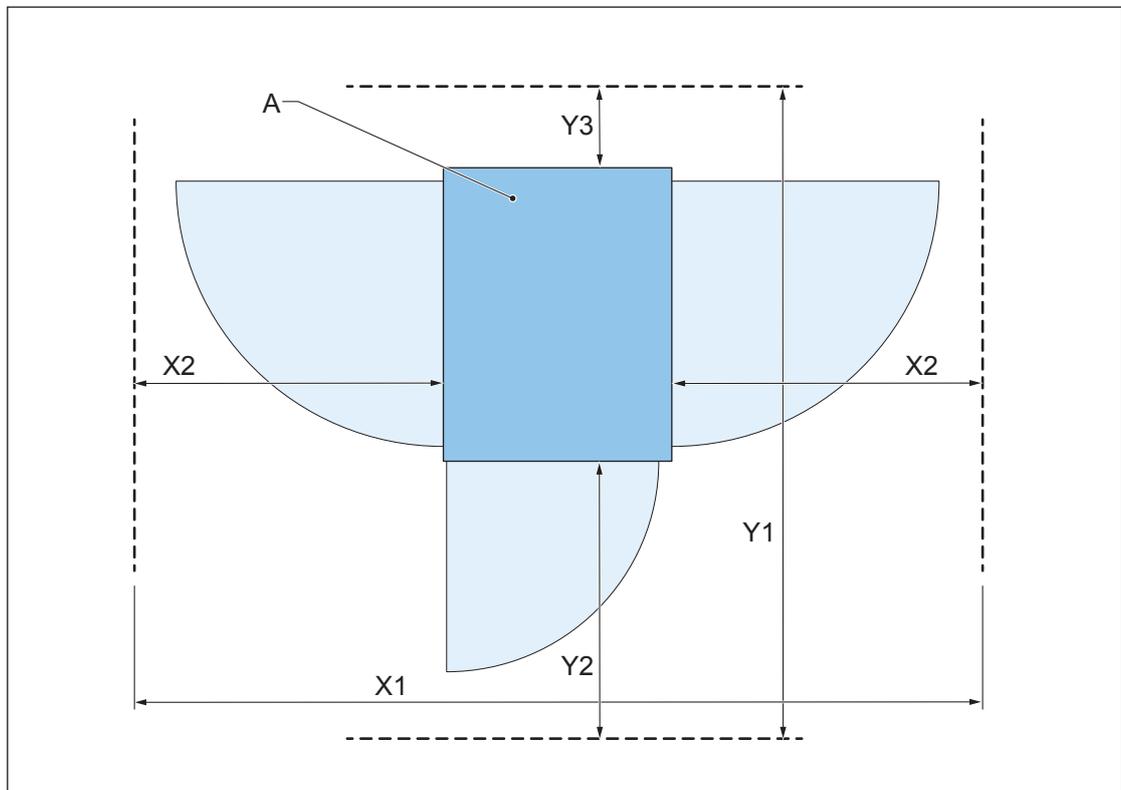
8.10.1 General dimensions

Parameter	Specification [mm]
Width of the cabinet (X-dimension)	565
Depth of the cabinet (Y-dimension)	880
Height of the cabinet (Z-dimension)	1900
Length of the charge cable	6000
	8000 (optional)
Maximum opening size of the cable inlet	206 x 30

8.10.2 Cable slack

Parameter	Specification [mm]
Required cable slack for the Ethernet cable (measured from the top of the foundation)	1000
Required cable slack for the AC input cable (measured from the top of the foundation)	1000

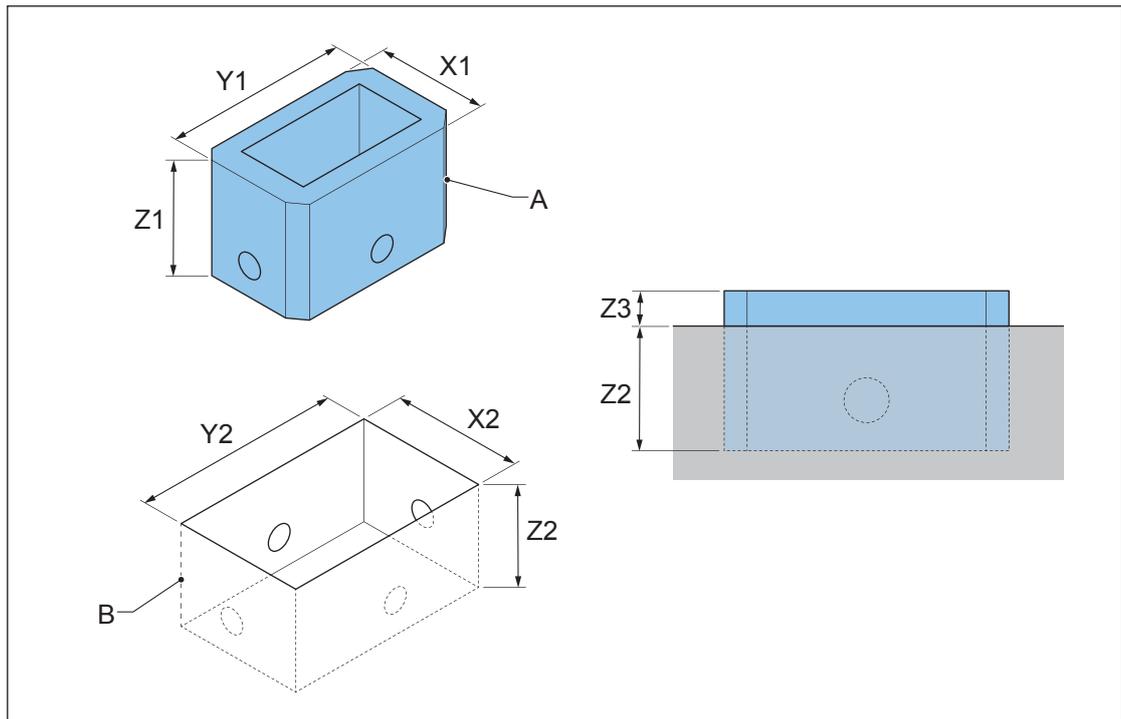
8.10.3 Floor space requirements



- A Cabinet
- X1 Total width
- X2 Space for air inlet and to open the left and right doors
- Y1 Total depth
- Y2 Space to open the front door
- Y3 Space for air outlet

Parameter	Specification [mm]
X1	1550
X2	510
Y1	1460
Y2	600
Y3	100

8.10.4 Prefab foundation



A Foundation

B Hole for the foundation

X1 Width of the foundation

Y1 Depth of the foundation

Z1 Height of the foundation

X2 Width of the hole

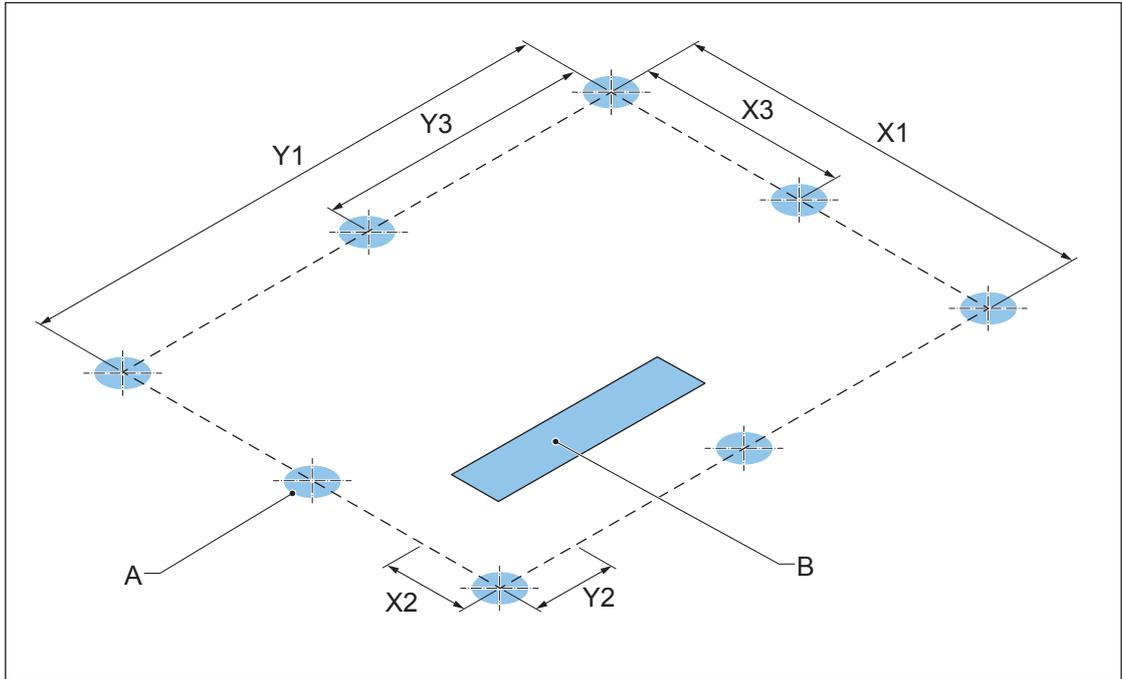
Y2 Depth of the hole

Z2 Height of the hole

Z3 Distance of the foundation above the ground level

Parameter	Specification [mm]
X1	579
Y1	814
Z1	600
X2	600
Y2	850
Z2	585
Z3	15

8.10.5 Custom foundation



A Holes to install the fasteners of the EVSE B Hole for the cables

Parameter	Specification [mm]
A	M10, depth 60
B	100 x 250
X1	378
X2	50
X3	189
Y1	648
Y2	125
Y3	324

8.11 Logic interface specifications

General specifications

Parameter	Specification
RFID standard	ISO 14443 A+ B to part 4 and ISO/IEC 15693
RFID-supported applications	Mifare, NFC, Calypso, Ultralight, Pay-Pass, HID and other
Network connection	3G/4G modem 10/100 Base-T Ethernet

Ethernet cable

Parameter	Specification
Ethernet type	RJ45
Cable type	8P + PE, shielded
Example of a cable for distance of 75 m or less	HELUKAT 600E
Bandwidth, upload	Minimum 128 kbit/s
Bandwidth, download	Minimum 4 Mbit/s
Availability	99.9%

8.12 AC input specifications

8.12.1 General AC input specifications

Parameter	Specification
Input AC power connection	3P + N + PE
Earthing systems	TN-S
	TN-C
	TN-C-S
	IT
Input voltage range	400 VAC +/- 10% (50 Hz or 60 Hz)
Power factor at full load	> 0.96
Efficiency	> 94% at nominal output power
Total harmonic distortion (current)	< 5%

8.12.2 AC input cable

Parameter	Specification
Cable shielding (optional)	If the local rules require shielded cables, the cable shielding must be connected to the PE rail at both ends of the cable.
Diameter of the phase conductors	Refer to the local rules.
Diameter of the PE conductor	The same as the diameter of the phase conductors
Surface	minimum 150 mm ²
Diameter, including shielding	34 to 45 mm

8.12.3 ChargeMax 90

Parameter	Specification [A]
Maximum rated input current	140



Note:

There are power limiting options available. Ask the manufacturer.

8.12.4 ChargeMax 120

Parameter	Specification [A]
Maximum rated input current	185



Note:

There are power limiting options available. Ask the manufacturer.

8.12.5 ChargeMax 180

Parameter	Specification [A]
Maximum rated input current	280



Note:

There are power limiting options available. Ask the manufacturer.

8.13 DC output specifications

8.13.1 General specifications

Parameter	Specification
DC output voltage range, CCS	150-920 V DC
Minimum DC output current	15 A
Connection standard	CCS

8.13.2 ChargeMax 90

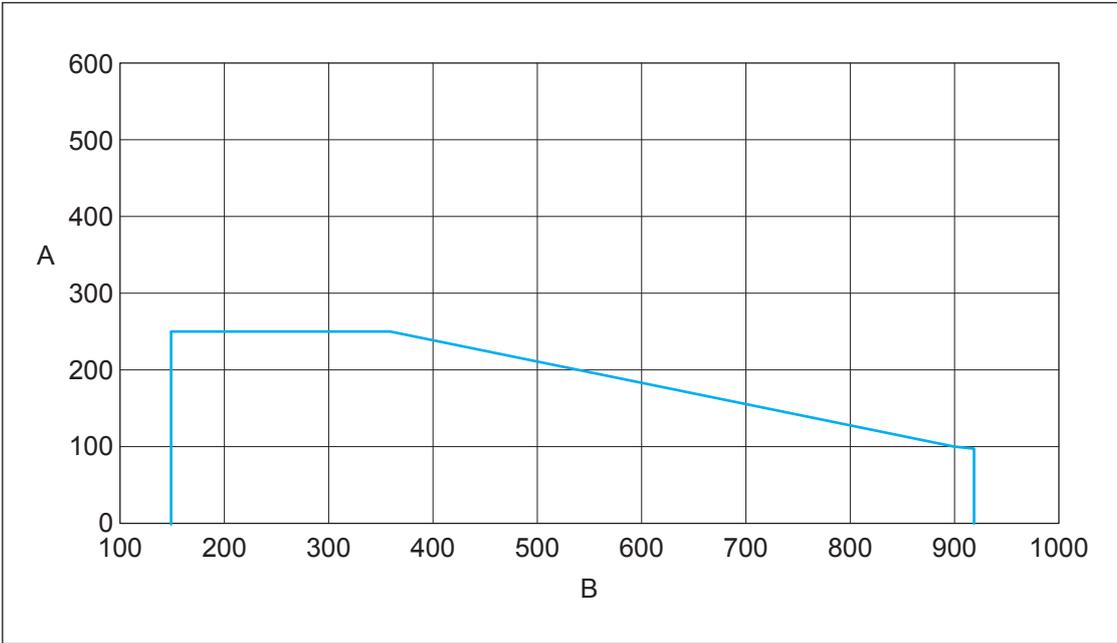
Parameter	Specification
DC output power, mode 1, continuously on one EV charge cable	Maximum 90 kW
Simultaneous DC on two outlets	No. One DC output operates at a time.



Note:

- You can upgrade the EVSE to deliver 120 kW or 180 kW and enable parallel charging on two EVs.
- You can install a different EV charge cable to increase the output current.

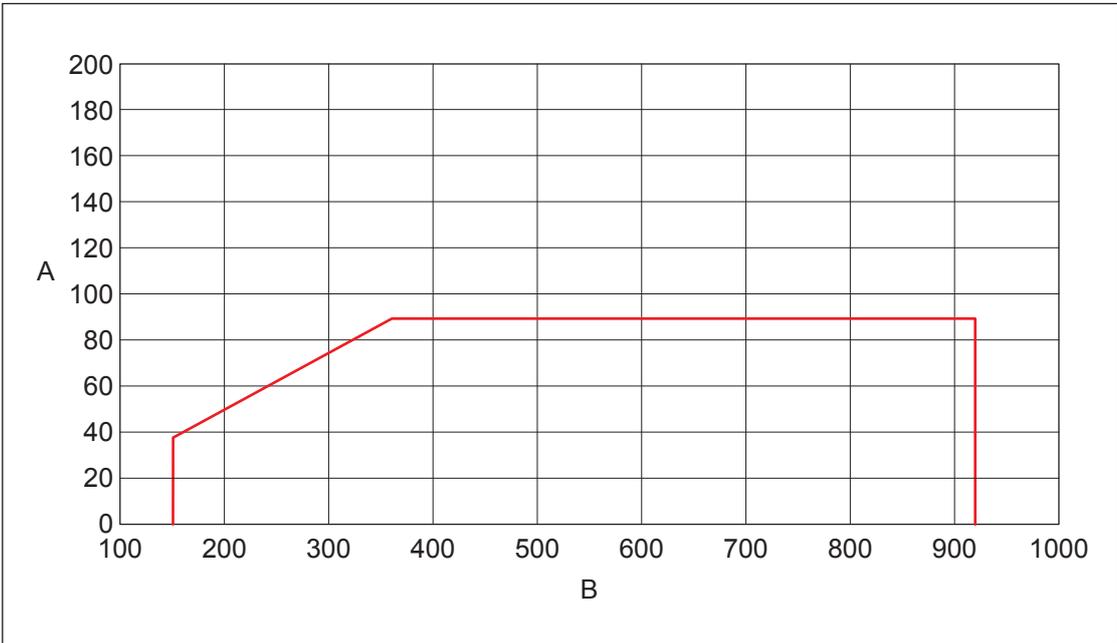
Output current in function of output voltage



A Output current [A]

B Output voltage [V]

Output power in function of output voltage



A Output power [kW]

B Output voltage [V]

8.13.3 ChargeMax 120

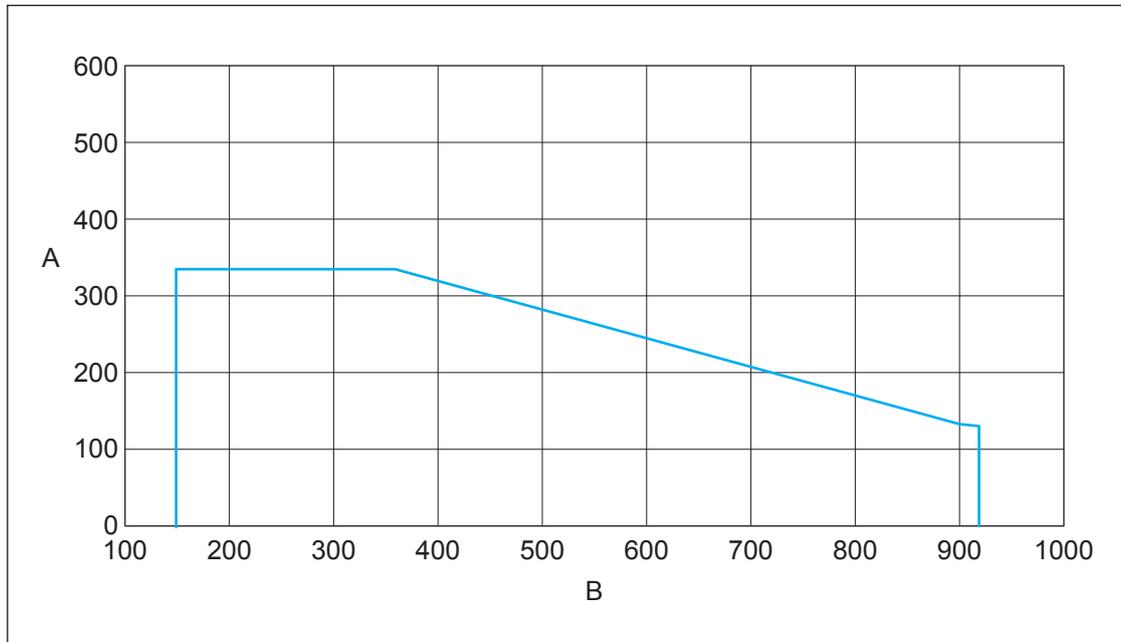
Parameter	Specification
DC output power, mode 1, continuously on one EV charge cable	Maximum 120 kW
DC output power, mode 2, continuously on two EV charge cables	Maximum 60 kW
Simultaneous DC on two outlets	Yes. Two DC outputs operate in parallel.
Maximum DC output current Cooled cable (option)	300 A



Note:

- The user can select mode 1 or 2.
- You can install a cooled cable on a standard EVSE.

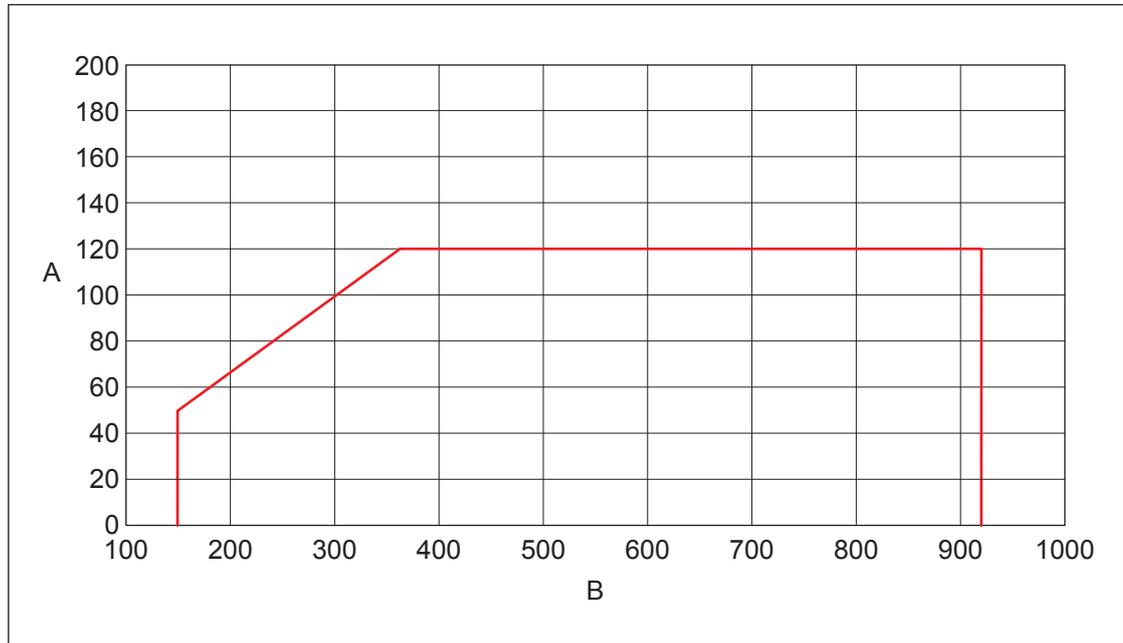
Output current in function of output voltage



A Output current [A]

B Output voltage [V]

Output power in function of output voltage



A Output current [kW]

B Output voltage [V]

8.13.4 ChargeMax 180

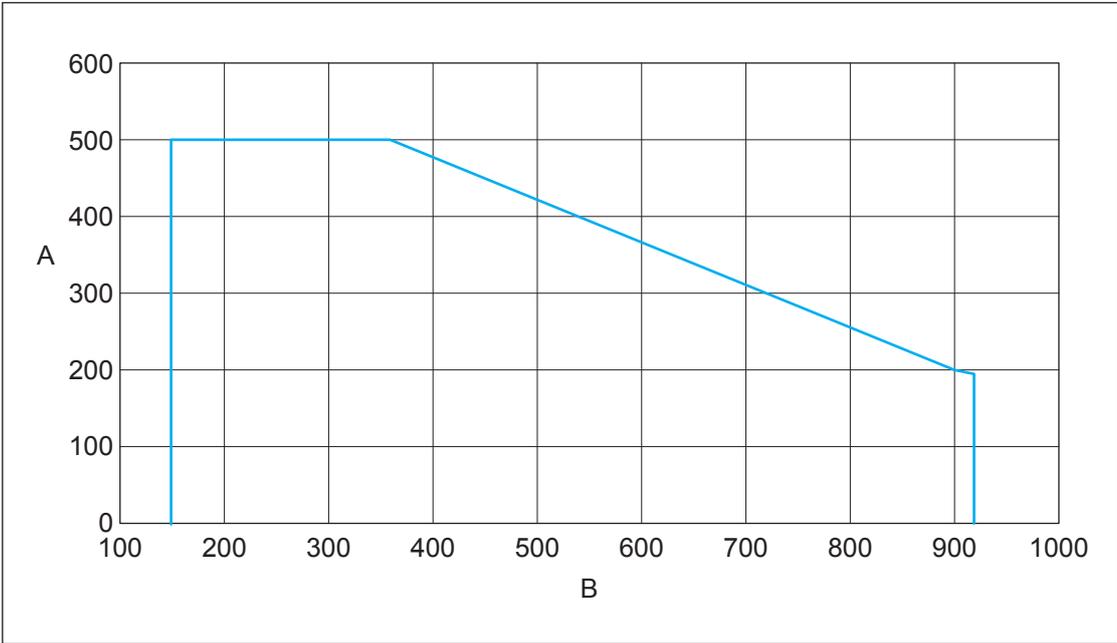
Parameter	Specification
DC output power, mode 1, continuously on one EV charge cable	Maximum 180 kW
DC output power, mode 2, continuously on two EV charge cables	Maximum 90 kW
Simultaneous DC on 2 outlets	Yes. Two DC outputs operate in parallel.
Maximum DC output current Cooled cable (option)	300 A



Note:

- The user can select mode 1 or 2.
- You can install a cooled cable on a standard EVSE.

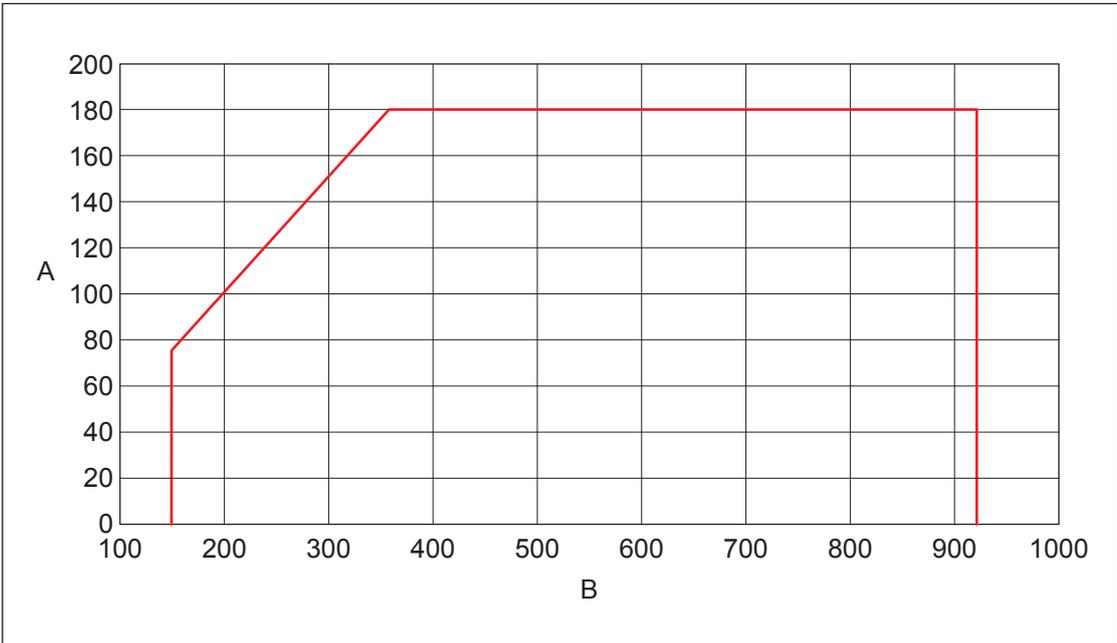
Output current in function of output voltage



A Output current [A]

B Output voltage [V]

Output power in function of output voltage



A Output power [kW]

B Output voltage [V]

8.14 Power consumption

8.14.1 General specifications

Parameter	Specification
Standby power	80 W, excluding the heater



Note:

The heater will operate daily when the outside air reaches the dew point, to avoid condensation inside the cabinet. When the heater operates, the heater will use most of the required standby power.

8.14.2 ChargeMax 90

Parameter	Specification [kVA]
Power consumption during normal operation	5.4

8.14.3 ChargeMax 120

Parameter	Specification [kVA]
Power consumption during normal operation	7.2

8.14.4 ChargeMax 180

Parameter	Specification [kVA]
Power consumption during normal operation	10.8

8.15 Current peaks during the start of a charge cycle

Parameter	Specification
Duration of the current peaks	25 μ s
Maximum current peak	60 A

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ISO14001
Environmental
Management System



IATF16949
Quality
Management System

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