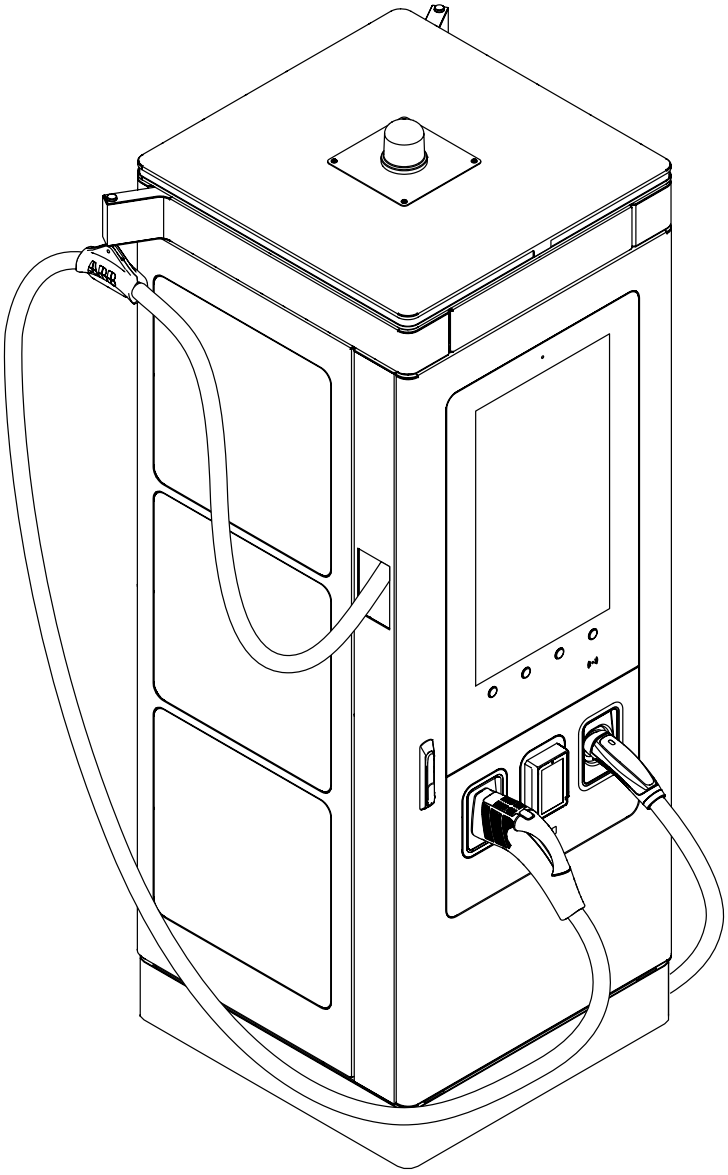
ABB E-MOBILITY CHARGING STATION

Operation and installation manual

A400 - NA



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ATTENTION – IMPORTANT SAFETY INSTRUCTIONS
This manual contains important safety instructions that must be followed during operation, installation, handling and maintenance of the EVSE.

ATTENTION – SAVE THESE INSTRUCTIONS
This document is a part of the EVSE, keep it in a safe place near the EVSE for easy reference during installation, handling, operation and maintenance.

Copyright

Manufacturer and contact data

Manufacturer name and address	Contact
ABB EV Infrastructure USA ABB Inc. 950 W Elliot St Suite 101 Tempe, AZ 85284 United States of America	Phone: 800-435-7365 E-mail: US-evci@us.abb.com ABB E-mobility in your country can give you support on the EVSE. The latest version of this document is available on the website: https://e-mobility.abb.com/
ABB E-mobility Canada Inc. 800 Boulevard Hymus Saint-Laurent, Quebec, Canada H4S 0B5	Phone: 800-435-7365 E-mail: CA-evci@us.abb.com ABB E-mobility in your country can give you support on the EVSE. The latest version of this document is available on the website: https://e-mobility.abb.com/

Document revision history

Version	Date	Description
001	August 2024	Initial version
002	December 2024	Released version

NOTE
Latest version of the manual can be dowloaded at this ABB library link

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1. Introduction and general information

This chapter will give instruction on the correct use of this document.

Chapter recipients:

- Owner
- Qualified installer
- Handling and transportation company
- User

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1.1 Disclaimer and warranty conditions

ABB E-mobility is not liable for any damages, losses, costs or expenses resulting from the improper handling, installation and use of the product described in this document and product related features, in particular resulting from non-compliance with the instructions of this document and other applicable regulations and standards (e.g. installation, transport, occupational health, digital security, and other safety standards).

ATTENTION
Any modification, manipulation, or alteration not expressly agreed with the manufacturer, concerning either hardware or software, shall result in the immediate nullification of the warranty.
In the event that the instructions set out in this manual are not strictly complied with, any warranty applicable to this EVSE will be rendered null and void with immediate effect. Any deviation to the instructions contained in this manual must be approved (in writing) prior to such deviation is executed by ABB E-mobility or authorized Service partners. In the event that ABB E-mobility suffers any damage as a result of the non-compliance with the instructions set out herein, ABB E-mobility reserves the right to seek recourse for such damages from the party causing such damages. Reach out to the contact centre for support: https://e-mobility.abb.com/contact-centers/

ATTENTION
The use of any adaptors, conversion adapters or cord extension are not permitted, and will render any warranty null and void. In addition, ABB E-mobility does not accept any liability for any damages caused as a result of not following this instructions.

1.2 Function and target of this document

The document is applicable to **A400** product (Including all variants and options).

The purpose of this document is to give the information that is necessary to safely do these tasks:
- Install the EVSE
- Operate the EVSE
- Perform basic maintenance tasks

NOTE
This manual covers the EVSE only and NO other equipment (external protection devices, electrical vehicles, etc) to which it is connected. Some component’s information given in this manual is taken from the original supplier documents. Please refer to the supplier websites for the complete and updated documentation.

1.3 Language

The original instructions of this document are in English (EN-US). All other language versions are translations of the original instructions and the manufacturer cannot be held liable for errors in the translation. Refer to the original English version in case of doubts.

1.4 How to use this document

Make sure that you know the structure and contents of this document.
Read the safety chapter and make sure that you know all the instructions.
Follow the steps in the procedures fully and in the correct sequence.

The document is intended for these groups:
- Owner of the EVSE
- Electrical designers and System integrator
- Transporters and Handlers
- Qualified installers
- User

1.5 Abbreviations

Abbreviation / Termin	Description
AC	Alternating current
CAN	Controller area network
CCS	Combined Charging System, a standard charging method for electric vehicles
CHAdeMO	Abbreviation of CHArge de MOve, a standard charging method for electric vehicles
CPU	Central processing unit
DC	Direct current
EMC	Electromagnetic compatibility
EV	Electric vehicle
EVSE	Electric vehicle supply equipment
HMI	Human Machine Interface
HVC	Heavy Vehicle Charger
MCB	Miniature circuit breaker
MID	Measuring Instruments Directive
NA	North American market
NACS	North American Charging Standard
NFC	Near field communication
NEVI	National Electrical Vehicle Infrastructure
OCPP	Open charge point protocol
PE	Protective earth
PPE	Personal protective equipment
RFID	Radio-frequency identification
SPD	Surge protective devices

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

1.6 Terminology

Terminology	Description
Network operating center of ABB EV Infrastructure	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
Power cabinet	Intermediate unit that provides DC power to the Charge control set. Gets its power from a power distribution board.
Interlock	The Interlock is an isolated current loop and is a feature that makes the state of two mechanisms or functions mutually dependent.
Cable slack	Extra length of cable from the top of the foundation so that the cable length is sufficient to connect to the correct terminal in the EVSE
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
Protective devices	Devices for the personal protection of individuals against the risk of injury or electrical shock when they do commissioning, operation and maintenance activities. Examples of protective devices are a door, the electrical parts covers, the latches, etc.
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
Qualified installer	The installer is a qualified person to install the EVSE according to the applicable local rules and fully knows the EVSE and its safe installation. The qualified installer obeys all local rules and the instructions in the operation and installation manual.
Owner	Legal owner of the EVSE
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.

2. Safety

This chapter contains the safety instructions which must be complied with during handling, installation, commissioning, operation and maintenance of the EVSE. Always obey and follow the reading order of instruction exactly as described in this manual to prevent injury or damage to the EVSE.
The manufacturer is not liable for any damage caused as a result of such failure to comply with the instructions for any upstream or downstream equipment to the EVSE.

The instructions provided in the manual do not replace:
- the safety devices
- the technical and operative data labels on the product
- the safety local rules

NOTE
The operators must read and comply with the technical information and instruction provided in the manual and in any additional attached documentation.

Chapter recipients:

- Owner
- Qualified installer
- Handling and transportation company
- User

2.1 Liability

The manufacturer declares that the EVSE complies with the regulations currently in force in the country of installation and has issued the corresponding declaration of conformity.

The manufacturer is not liable for damages, losses, costs or expenses incurred by any user of the EVSE (e.g. the installation engineer or owner of the EVSE) if such damages, losses, costs or expenses result from a failure to comply with the applicable safety instructions given by the manufacturer, including, but not limited to, the following:

- Comply with the local rules and the instructions in this manual. If the local rules contradict the instructions in this manual, the local rules must be applied.
- Power outages or disruptions to the electrical supply to the EVSE.
- Accumulation of dirt or ingress of foreign substances within the EVSE.
- Corrosion of component parts.
- Damage to software or hardware due to any IT security problem, such as but not limited to a virus breakout or malicious hacking of the system.
- Damage or failure of EVSE caused by vermin, insect infestations or the like.
- Damage or failure resulting from faults in some other equipment connected to the EVSE.
- Damage or loss caused by hazards such as fire, flood, storm or the like or spillage or leakage of chemicals or harmful substances onto the EVSE.
- Fault tracing caused by problems from a source external to the scope of work.
- Unprofessional or incorrect handling of the EVSE, not complying to this manual and/or local rules
- Unprofessional or incorrect installation, installation not complying to standards, or installation not following these installation instructions contained in the product specific manual.
- Improper operation (in breach of the technical requirements or specifications or manuals of the product), negligence or repairs carried out by the Owner (or any third party not authorized by the manufacturer). It is absolutely forbidden to modify the EVSE.
- Non-compliance with the applicable safety regulations or other legal standards by other parties than the manufacturer.
- Insufficient ventilation of the EVSE.
- Operation of the EVSE outside of its design conditions.
- Damage or failure due to relocations or alterations of the EVSE from the original installation location or alteration of the overall normal condition of the system.
- Only make changes to the EVSE if the manufacturer approves in writing of the changes.
- Damage or loss due to improper use of the EVSE.
- EV low battery during use.
- Any check to make sure the battery is sufficiently recharged before using the EV.
- Deterioration resulting from transportation or particular environmental conditions;
- Performing maintenance incorrectly or not at all;
- Disposal of the EVSE, or any part thereof, or violation of any applicable laws and regulations resulting from such disposal by User or third parties.
- Damage resulting from improper storage conditions.

2.1.1 Responsibilities and qualifications for the Users

Operators responsible for handling, installation, operation, maintenance and service must:

- Comply with the applicable (local) laws and regulations..
- Identify any hazards and do a risk assessment prior to commercing work that result from the working conditions on the site.
- Operate the EVSE with the protective devices installed and make sure that all protective devices are re-installed after any installation or maintenance operation.
- Prepare and execute an emergency plan that instructs people what to do in the event of an emergency relating to the EVSE or to another site emergency.
- Make sure that all employees, the owner and third parties are qualified according to the applicable local laws and/or rules to do the work.
- Make sure that there is sufficient space around the EVSE to safely handling, commissioning, do maintenance and installation activities.
- Identify a site operator who is responsible for the safe operation of the EVSE and for the coordination of all work, if the owner does not do these tasks.

Moreover the qualified installer must:
- Fully knows the EVSE and its safe installation.
- Be a qualified technician and have a valid license to work on EVSEs.
- Comply all local rules and the instructions in the installation procedures in this document.

2.2 Intended use

This EVSE has the exclusive function of fast EV charging and it is intended to be used both in indoor and outdoor environments.

DANGER
ABB E-mobility is not liable for any risk and damage related to any use other than the use described in this manual. The EVSE shall only be used in accordance with the intended use set out in this manual and no party has the right to make any changes without express permission from ABB E-mobility.

NOTE
The EVSE can be only connected to the electricity grid in countries for which it has been certified.
The EVSE may only be used in compliance with all its technical characteristics.
Only use the EVSE with accessories that the ABB E-mobility provides and that comply with local laws and regulations.

2.2.1 Risks related to improper use or product defect

To avoid risk related to improper use of the EVSE, it is forbidden:
- To install the EVSE in environments subject to particular conditions of flammability or in adverse or disallowed environmental conditions, (temperature and humidity).
- To use the EVSE with safety devices which are faulty or disabled.
- To use the EVSE or parts of the EVSE by linking it to other machines or equipment, unless expressly provided for.
- To modify operating parameters that are not accessible to the operator and/or parts of the EVSE to vary its performance or change its isolation.
- To clean with corrosive products that could corrode parts of the EVSE or generate electrostatic charges.
- To place any heavy object, sit or stand up on the EVSE.

To avoid any serious consequence on personal safety, to know the ways in which the EVSE must not be used and in the event of residual risks which persist, despite the protection and safety measures integrated in the EVSE, reach out to the local entity of ABB E-mobility for support.

DANGER
Do not proceed with installation if the integrity of the EVSE is compromised.
Do not use the EVSE if you find any operating anomalies.

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2.2.2 Residual risks

Despite the warnings and safety systems, there are still some residual risks that cannot be eliminated. These risks are listed in the following table with some suggestions to prevent them:

Risk analysis and description	Suggested action
Stored energy in components that could generate hazardous discharges.	Wait at least 15 minutes after turning off the EVSE and perform the total isolation procedure before working on the internal components of the charger (refer to “9.3. Total de-energization of the EVSE”).
Noise pollution due to installation in unsuitable environments or where individuals routinely work and/or animals dwell most of the time.	Reassess the environment or the place of installation.
Adverse external climatic conditions, accumulations of rainwater, low temperatures, high humidity, etc.	Maintain ambient conditions suitable for the system.
Overheating of components (transformers, accumulators, coils, etc.) which could cause burns. Clogged EVSE cooling slots or systems.	Use suitable PPE. Wait for the parts to cool down before opening the EVSE. Do not block cooling vents or heat sinks.
Inadequate cleaning that: - does not allow adequate air intake for cooling - does not allows the reading of safety labels.	Clean the EVSE, labels and installation environment.
The EVSE contains components and circuit boards that are sensitive to electrostatic discharge.	Take ESD prevention measures to protect the electronic components during installation and maintenance of the EVSE.
Inadequate training of staff.	Ask for supplementary courses.
Incomplete installation, EVSE or its components temporarily mounted.	Prevent unauthorized access to the installation area by barricading the area and placing warning signs indicating the condition of the EVSE.
The AC cable, owned by the user, could be damaged (valid only if the AC socket is present on the EVSE).	Check the integrity of the cable and connectors before connecting the cable to the EVSE.
Not allowed to place in ATEX environment.	Reassess the environment or the place of installation.
Hand/finger crushed into CMS slot of the EVSE when it comes back to resting position	The CMS is retracted by its spring towards its resting position. Pay attention and do not put your hand or fingers along the path of CMS, when the CMS is moving, there is risk of injury.

2.3 General signs and signal words

In the manual and/or in some cases on the equipment, the danger or hazard zones/components are indicated with signs, labels, symbols or icons.

Symbol	Description
	General risk
	With signal word ‘Danger’: If you do not obey the instruction, this can cause injury or death
	With signal word ‘Warning’: If you do not obey the instruction, this can cause injury
	With signal word ‘Caution’: If you do not obey the instruction, this can cause damage to the EVSE or to property
	Hazardous voltage that gives risk of electrocution
	Risk of pinching or crushing of body parts

Symbol	Description
	Rotating parts that can cause a risk of entrapment
	Hot surface that gives risk of burn injuries
	With signal word ‘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
	Alternate current
	Direct current
	Protective Earth (PE)
	 Sign that means that you must read the manual before you install the EVSE
	Center of gravity (CoG)

NOTE
It is possible that not all symbols or signal words are present in this document

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2.4 Personal protective equipment

A Personal Protective Equipment (PPE) is clothing or equipment designed to protect/reduce employees from exposure to work place hazards and the risk of injury.

Symbol	Description
	Protecting clothing
	Safety gloves
	Safety shoes
	Safety glasses
	Work helmet

2.5 Safety instructions

- Only perform the procedures as indicated in this document.
- Only perform any services as qualified installer or user of the EVSE when you are fully qualified to do so.

DANGER
In case of inconsistency or contradiction between any requirements or procedure contained in this document and any such local laws and/or rules, comply with the stricter conditions.

2.5.1 Safety instructions - Transport of the EVSE

- Wear on the correct personal protective equipment.
- Only use hoisting equipment to lift the EVSE as permitted by ABB E-mobility.
- Take into account the mass and the center of gravity of the EVSE.
- Obey the applicable safety instructions for the hoisting equipment or for the forklift truck. For example, the instructions specified on the related shipment label that is applied to the EVSE packaging.

2.5.2 Safety instructions - Installation of the EVSE

- Wear on the correct personal protective equipment.
- Make sure that there is no voltage on the input cables prior to conducting any installation activities.
- 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.
- During installation and electrical connection of the cables (AC, PE, Ethernet, signals, etc.) do not modify the configuration and positioning of the electrical system inside the EVSE.
- Make sure that the internal electrical system and connection cables (AC, PE, Ethernet, signals, etc.) are protected from damage and cannot get trapped in any part of the EVSE.
- Do not open any covers/doors of the EVSE in case of adverse climate conditions. Infiltration of water or sand and presence of high humidity can cause damage of the EVSE. It is of paramount importance to evaluate the weather conditions in the risk assessment prior any intervention on the EVSE.
- Protect the EVSE with safety devices and measures as specified in accordance with local legislation and regulations.
- Make sure that the EVSE is connected to a Protective Earth (PE).
- Make sure that the connections to the EVSE comply with all applicable local rules.

Additional instructions during ground works

- Make sure that the equipments used during ground works are certified.
- Comply with all applicable local rules.

2.5.3 Safety instructions - Maintenance of the EVSE

- Wear on the correct personal protective equipment.
- Make sure that there aren't supply voltages on the input cables during the complete cleaning or maintenance procedure. Refer to "9.3. Total de-energization of the EVSE".
- Keep unauthorized personnel at a safe distance during cleaning or maintenance.
- If for cleaning or maintenance it is necessary to remove safety devices or protection, immediately install them after the work.

2.5.4 Safety instructions - Use of the EVSE

Do not use the EVSE if the safety or the safe use of the EVSE is at risk. In these cases immediately contact the manufacturer.
This includes, but is not limited to, these conditions:

- An enclosure has damage.
- An EV charge cable or connector is damaged.
- Lightning struck the EVSE.
- There was an accident or risk of fire at or near the EVSE.
- Water entered the EVSE.
- The EVSE is hit by any object (vehicle, fallen tree, etc).
- The EVSE shows signs of vandalism.

2.6 Discard the EVSE or parts of the EVSE

Incorrect waste handling can have a negative effect on the environment and human health due to potential hazardous substances. With the correct disposal of this product, you contribute to reuse and recycling of materials and protection of the environment.

- Obey the local law and rules when you discard parts, packaging material or the EVSE.
- Discard electrical and electronic equipment separately in compliance with the local directive on waste of electrical and electronic equipment.
- Do not mix or dispose the EVSE with your household waste, at the end of use. Instead, hand the EVSE over to your local community waste collection point for recycling.
- For more information, contact the Government Waste-Disposal department in your country.

2.7 Cybersecurity

This product and its features are designed to be connected to and to communicate information and data via a network interface. The owner and site operator agree to use the product and its features at their sole risk, in its judgment. It is the manufacturer’s responsiblity to provide connectivity to the customers backend. Thereafter it is the owners and the site operator’s sole responsibility to provide and continuously ensure connection between the manufacturer’s network and the owner’s and/or site operator’s network or any other network (as the case may be). The owner and site operator shall establish and maintain any appropriate measures (such as but not limited to the installation of firewalls, application of authentication measures, encryption of data, installation of anti-virus programs, etc) to protect its network, its system and the interface against any kind of security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information. Use of embedded software and ABB systems by owner and site operator is at your sole risk and quality, accuracy, and performance efforts are with you. ABB E-mobility 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.

2.8 FCC remarks

The equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection 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, there 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 receiver.
- Connect the equipment into 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.

NOTE
This topic is valid for a wired Ethernet connection

3. Description

This chapter contains information about the models, details of the EVSE, characteristics and technical data, overall dimensions and EVSE identification.

A description of the EVSE characteristics is provided to identify its main components and specify the technical terminology used in the manual.

Chapter recipients:

- Owner
- Qualified installer
- User

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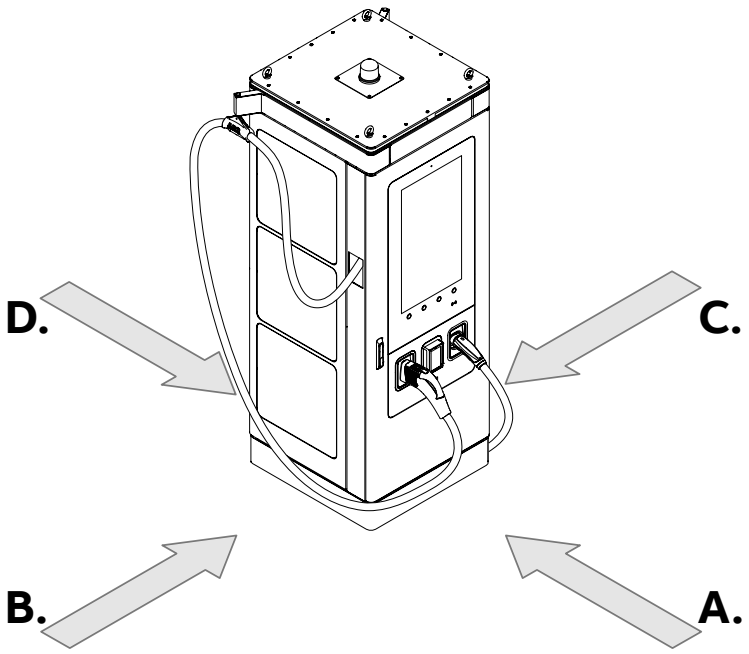
3.1 Orientation agreements



A. Front side: face forward to the EVSE during normal use
B. Left side
C. Right side
D. Rear side

3.1.1 EVSE identification code

Structure of the identification code of the EVSE.

A400	-4	NA	CC
Main product	Number of power modules	Localization	EV charge cable connection

Field Description
• **A is the “charger identification”:** – A = “All in one” product family • **PPP is the “output power”:** – 400 = 400 kW output power
• **N is the number of installed power modules:** – 4 = 4 x 100kW power module
• **MM is the “localization”:** – NA = for North America market
• **XX is the “EV charging cable type”:** – CC = CCS1 + CCS1 – CN = CCS1 + NACS – NN = NACS + NACS

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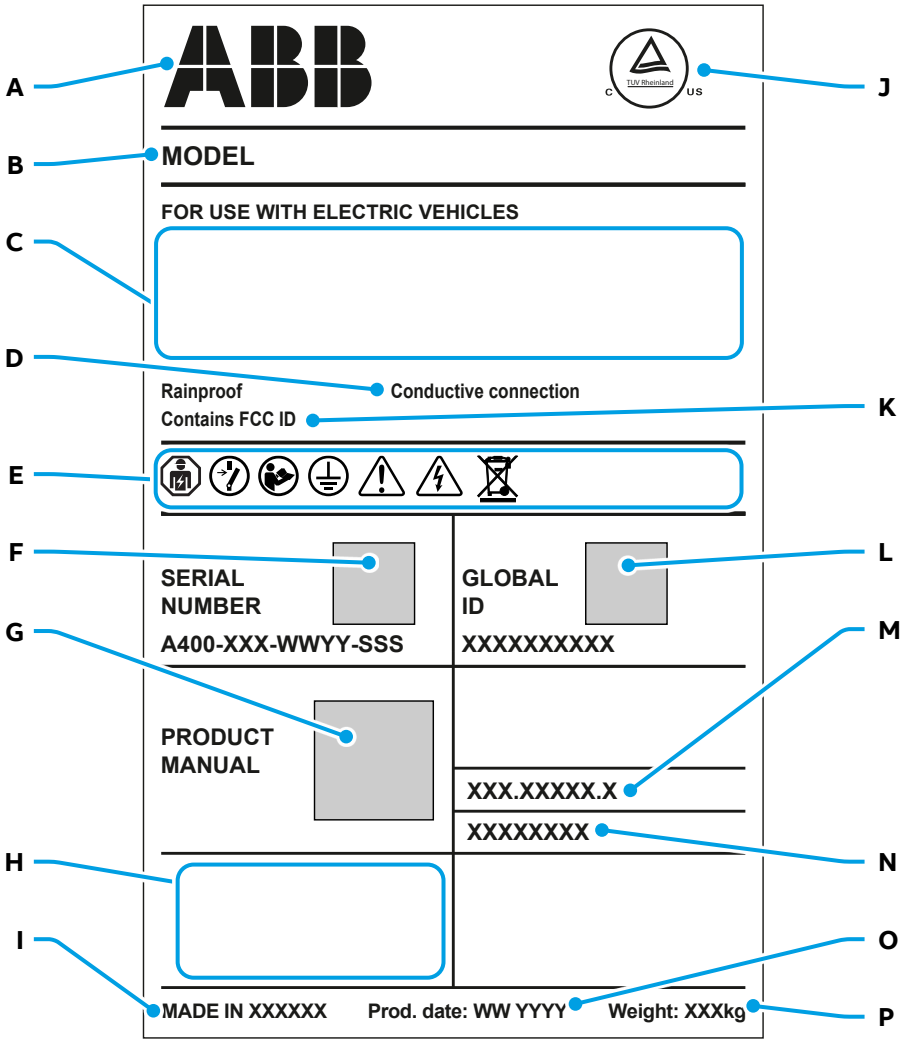
3.2 Type plate - Identification of equipment



Ref.	Description
A	Manufacturer
B	EVSE Model designation
C	EVSE main technical data
D	Connection type between EVSE and EV
E	Safety and information symbols
F	Serial number of the EVSE with related QR code
G	QR code to download the manual of the product
H	Address of the manufacturer (legal entity location)
I	Country of production
J	Certification marks
K	Certified radio frequency devices contained on the EVSE
L	ABB E-mobility Global ID
M	SAP Part number of the EVSE (Internal ABB use)
N	SAP Serial number of the EVSE (Internal ABB use)
O	Production Date
P	EVSE weight

NOTE
Find the type plate on your EVSE to see the applicable data.

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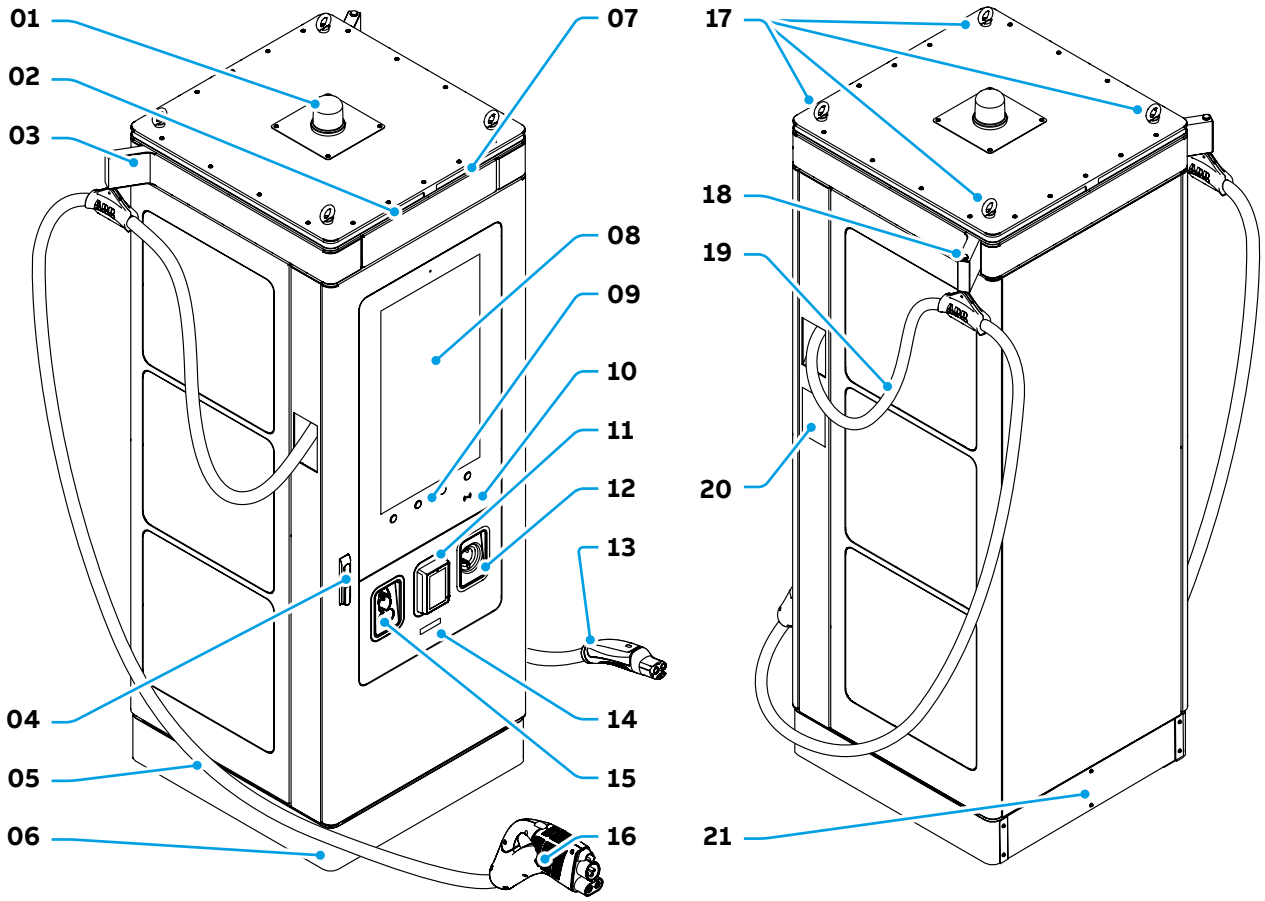
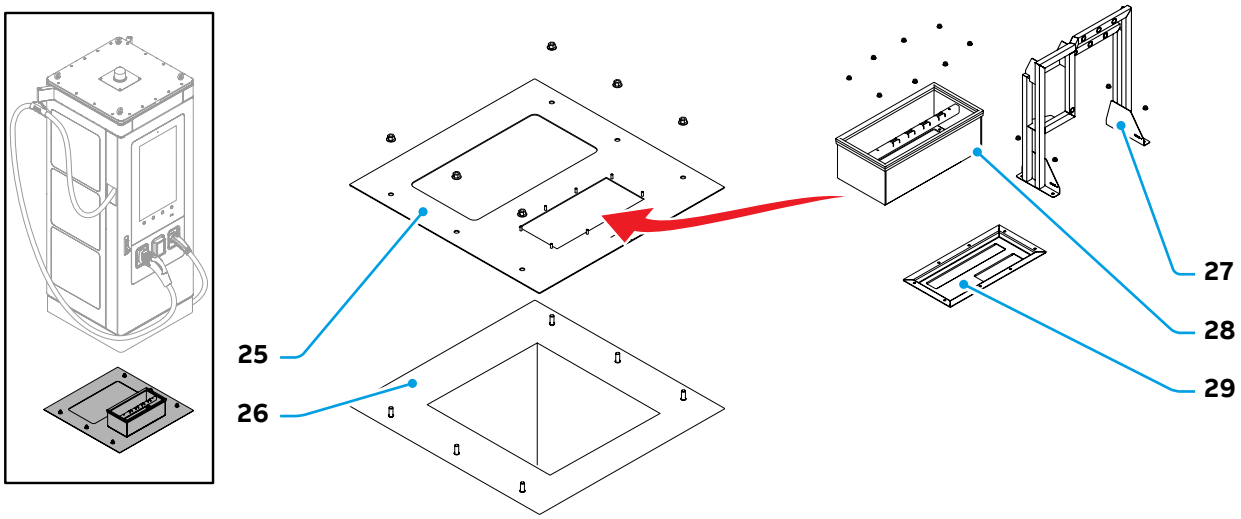
3.3 A400 Overview

3.3.1 Overview - EVSE outside



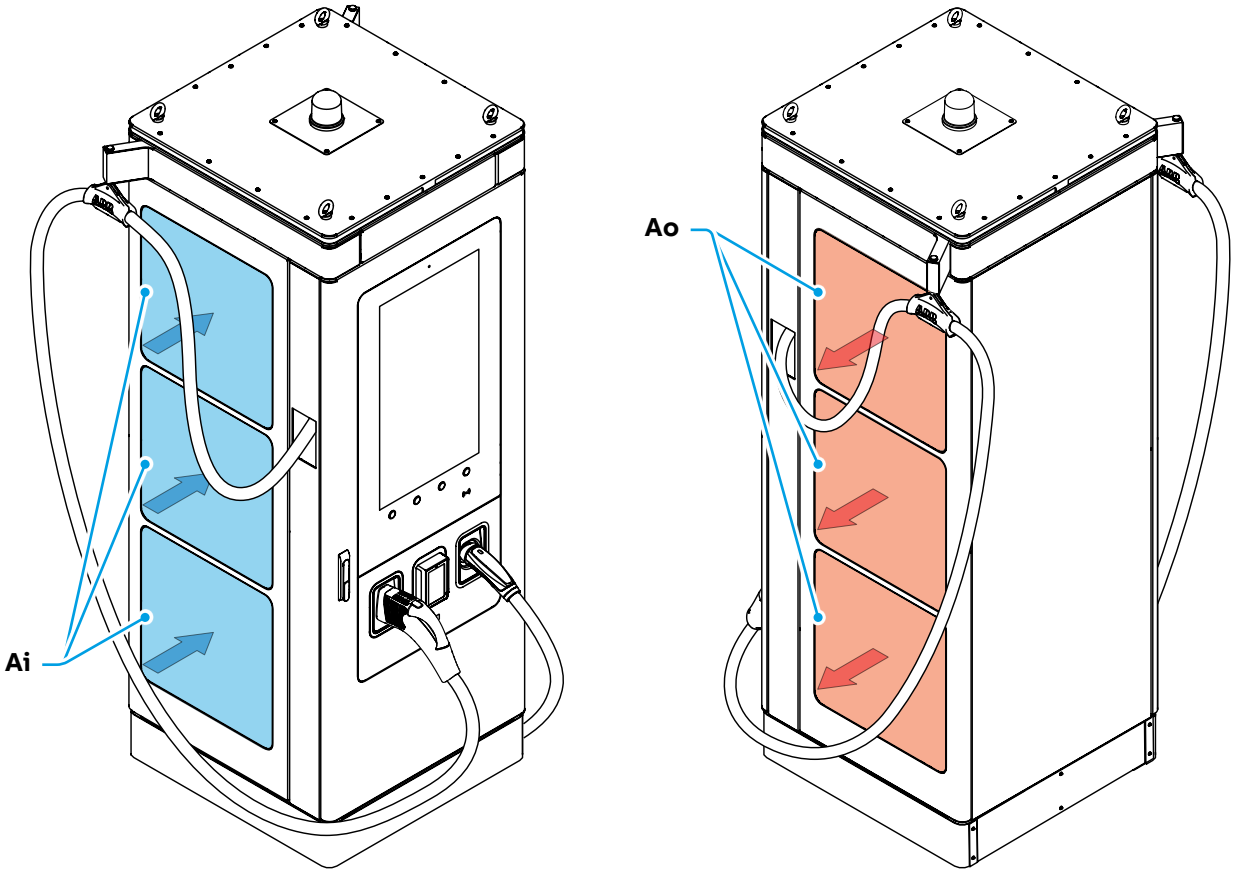
Ref.	Part	Function
01	Wireless antenna	To send and receive data via cellular signal
02	Status LED strip - Output 1	To view the status of the Output 1
03	CMS - Output 1	Cable management system of the Output 1
04	Swing handle lock	To lock and open the front door
05	Charging cable - Output 1	To connect the Output 1 of the EVSE to the EV
06	Removable base cover	To access the EVSE’s anchoring points to the foundations
07	Status LED strip - Output 2	To view the status of the Output 2
08	Display	Human-machine interface (HMI)
09	Display’s buttons	To interact with the display menu
10	RFID	To read the information from an RFID card
11	Payment terminal (optional)	To pay for the charging session
12	Connector holder with LED - Output 2	To hold the charging connector and show the status of Output 2
13	Charging connector - Output 2	To connect the Output 2 of the EVSE to the EV (e.g. NACS)
14	Meter display (optional)	To read the meter data
15	Connector holder with LED - Output 1	To hold the charging connector and show the status of Output 1
16	Charging connector - Output 1	To connect the Output 1 of the EVSE to the EV (e.g. CCS 1)
17	Lifting points (Eyebolts)	Lifting points to connect the hoisting equipment
18	CMS - Output 2	Cable management system of the Output 2
19	Charging cable - Output 2	To connect the Output 2 of the EVSE to the EV
20	Type plate	Identification and technical data label
21	Rear base cover	Where to attach the Removable base cover

3.3.2 Overview - Foundation and cables entry



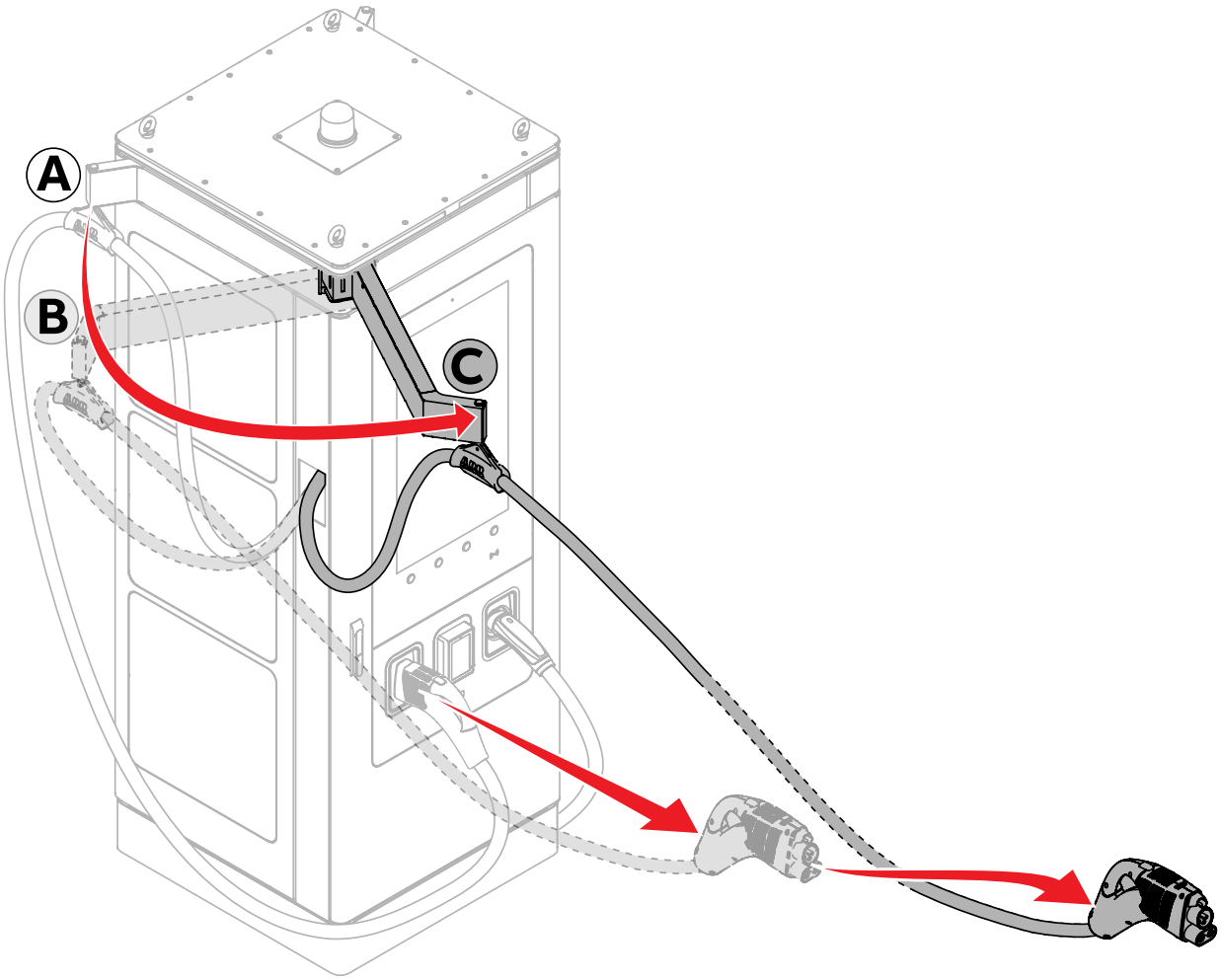
Ref.	Part	Function
25	Foundation interface plate	To route the cables inside the EVSE in the right position
26	Custom foundation	To anchor the EVSE on the floor and route the cables
27	AC cables Jig (optional)	To simulate AC and PE connection points and prepare the cables
28	Cables entry box	To anchor the cables and insulate the EVSE with foam
29	Cables entry plate	To route the cables inside the EVSE in the right position

3.3.3 Overview - Air openings and filters



Ref.	Part	Function
Ai	Air inlet with filter	To filter and let cooling air in. The airflow makes sure that the parts on the inside of the EVSE do not become too hot.
Ao	Air outlet with filter	To filter and let cooling air out.

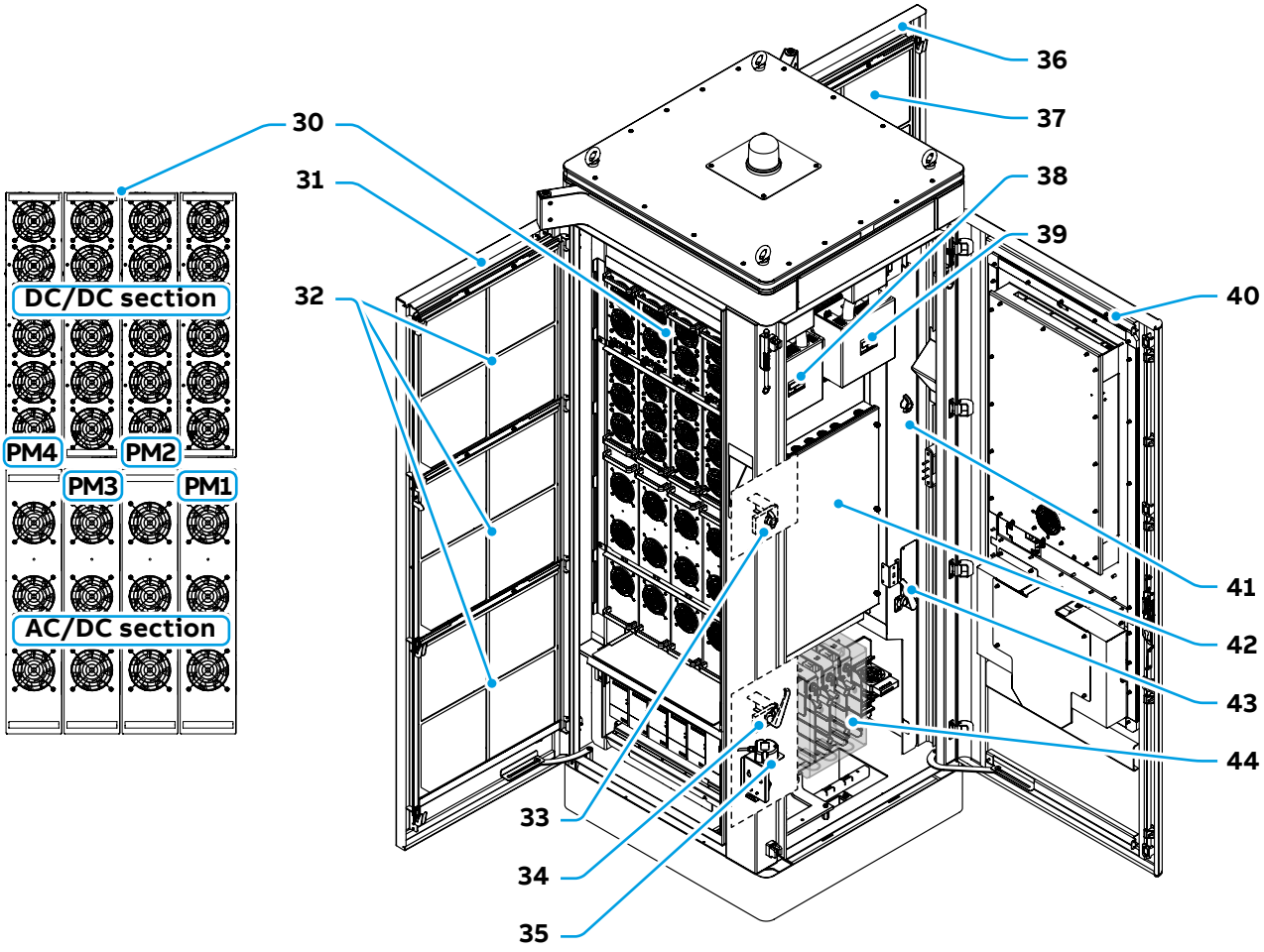
3.3.4 Overview - CMS (cable management system)



Ref.	Part	Function
A	CMS closed position	Rest position
B	CMS half open	Maximum side extended position
C	CMS fully open	Maximum front extended position

NOTE
The illustration shows how the CMS of Output 1 works. The same applies to the CMS of Output 2

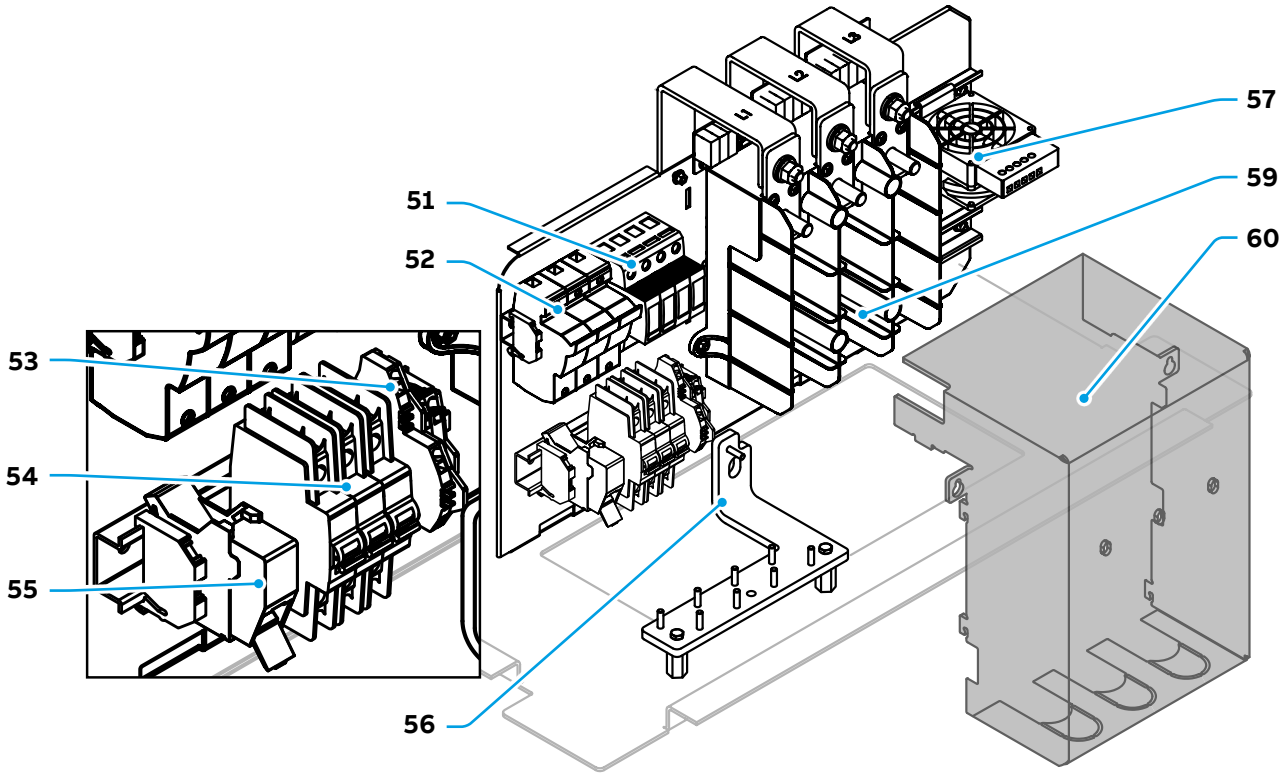
3.3.5 Overview - EVSE inside



Ref.	Part	Function
30	Power modules	To provide power to the EVSE (PM1, PM2, PM3 and PM4)
31	Left door	To access the air inlet filter, power modules and auxiliary power supplies
32	Inlet air filter	To filter the air inlet
33	Left door latch	To keep the left door in the semi-closed position after opening the handle
34	Left door handle	To unlock the left door and move it to the semi-closed position
35	Tilt sensor device (optional)	Optional device to disconnect the AC input in case of collision, and consequent tilt, against EVSE
36	Right door	To access the air outlet filter, rear side of power modules and AC input fuses
37	Outlet air filter	To filter the air outlet
38	Meters for MRU - Output 1 (optional)	To read the Output 1 values and pass the data to the dedicate display on the front port
39	Meters for MRU - Output 2 (optional)	To read the Output 2 values and pass the data to the dedicate display on the front port
40	Front door	To access the connection and the Communication and control section
41	Right door latch	To keep the right door in the semi-closed position after opening the handle
42	Communication and control section	To allocate the communication and control board
43	Right door handle	To unlock the right door and move it to the semi-closed position
44	Connection section	To connect AC, PE, Ethernet, External stop button and tilt sensor (optional) cables

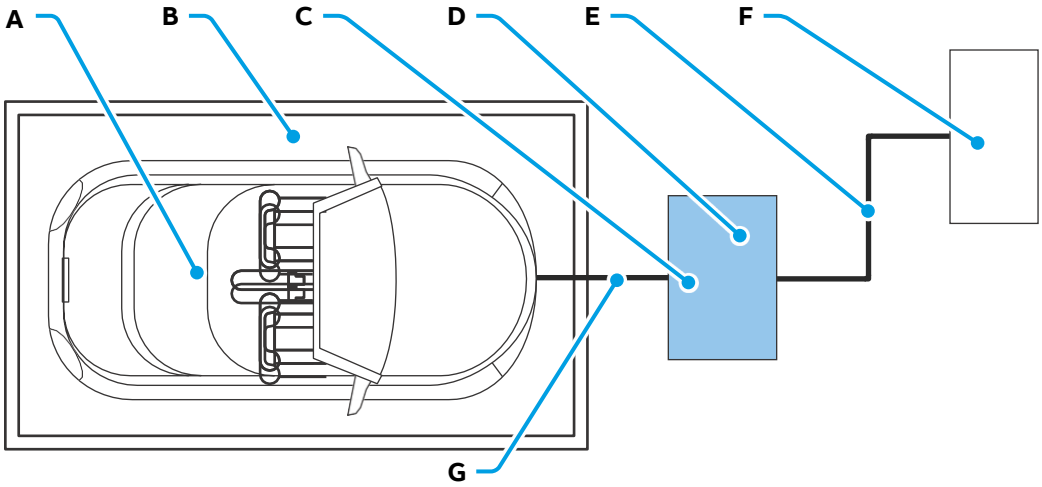
EN

3.3.6 Overview - Connection section



Ref.	Part	Function
51	Main AC SPD	Surge protection device. To protect the AC input line from overvoltage
52	Auxiliary disconnect fuses	To isolate the AC auxiliary line
53	X2 terminal block	To connect External stop button (optional) cable
54	Auxiliary circuit breaker	To protect and isolate the AC auxiliary line
55	Ethernet connector	To connect the EVSE to Internet (e.g. in case of lack of cellular signal)
56	PE busbar	To connect the Protective Earth (PE) cable
57	Heater	To remove internal condensation
59	Main AC terminals	To connect the AC input cable
60	Main AC protection barrier	To protect the AC terminals from accidental contact

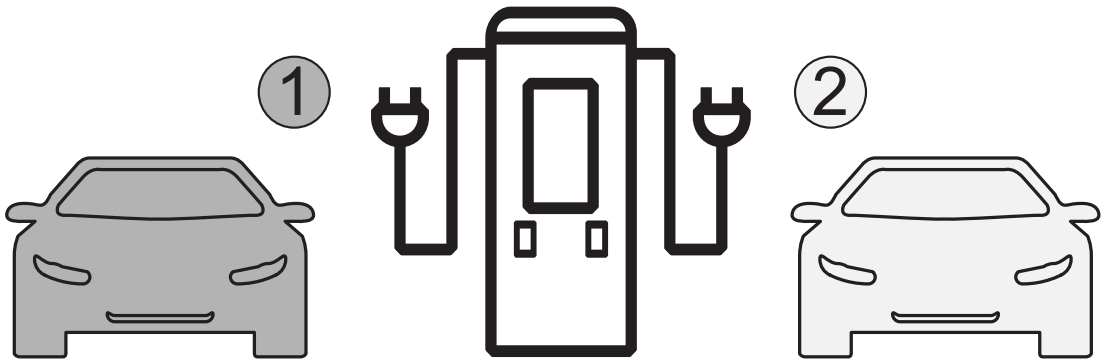
3.4 System Overview



Ref.	Part	Function
A	EV	Electrical Vehicle to be recharged
B	Parking space	To park the EV during charge session
C	Front of the EVSE	Side of EVSE with EV connectors and HMI (User Interface)
D	EVSE	EV charger
E	AC input cable	To supply the input AC voltage to the EVSE
F	Power distribution board	AC grid input protection and distribution circuits
G	EV charge cable	To connect the EV to the EVSE

3.5 Power allocation strategy

The charging power can be allocated between the 2 outputs in this way:

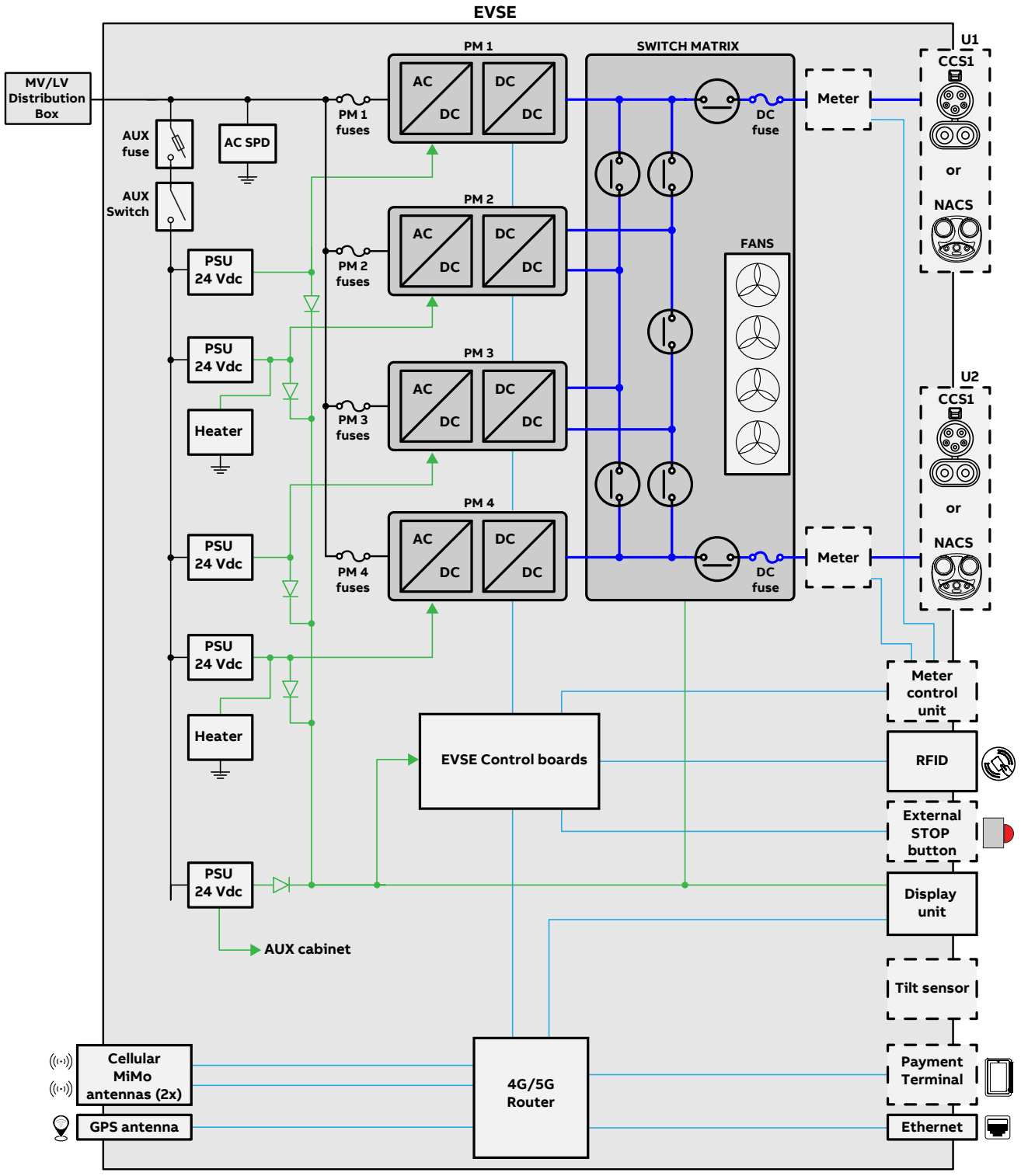


Output 1		Output 2	
Power	**Current**	**Power**	**Current**
400 kW	Max 600 A	0 kW	0 A
300 kW	Max 600 A	100 kW	Max 300 A
250 kW	Max 600 A	150 kW	Max 450 A
200 kW	Max 600 A	200 kW	Max 600 A
150 kW	Max 450 A	250 kW	Max 600 A
100 kW	Max 300 A	300 kW	Max 600 A
0 kW	0 A	400 kW	Max 600 A

EN

3.6 Block diagram

Block diagram of A400 with simple power distribution, allocation power with a resolution of 50% of the rated power.

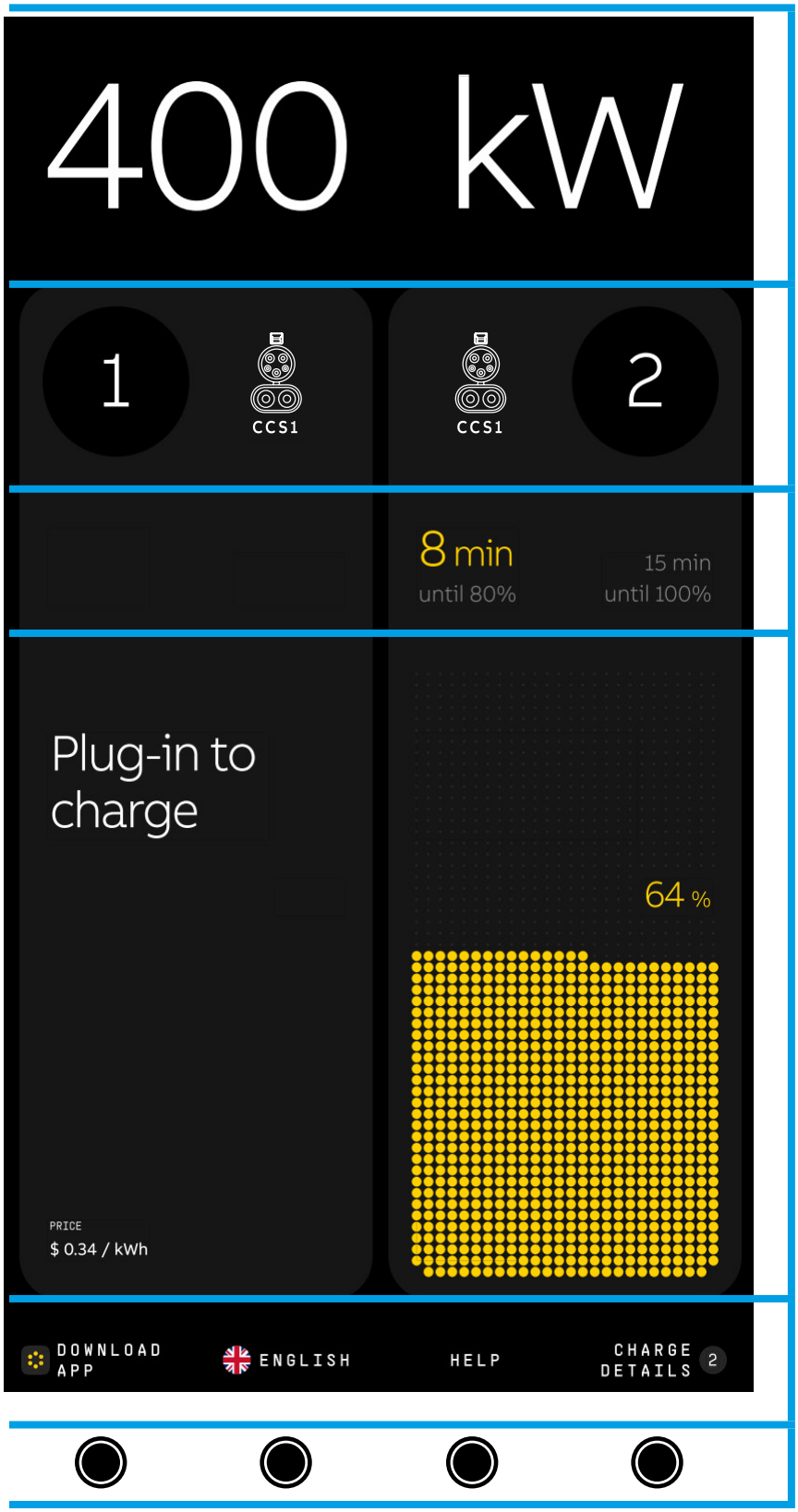


Colours	Description
	Bold lines: AC power line
	Thin lines: AC auxiliary line
	DC power line
	Control signal or monitoring signal
	DC auxiliary line (24 Vdc)

EN

3.7 Description of the HMI

3.7.1 Home screen description



Nominal power of EVSE

Connector index and the connector type.

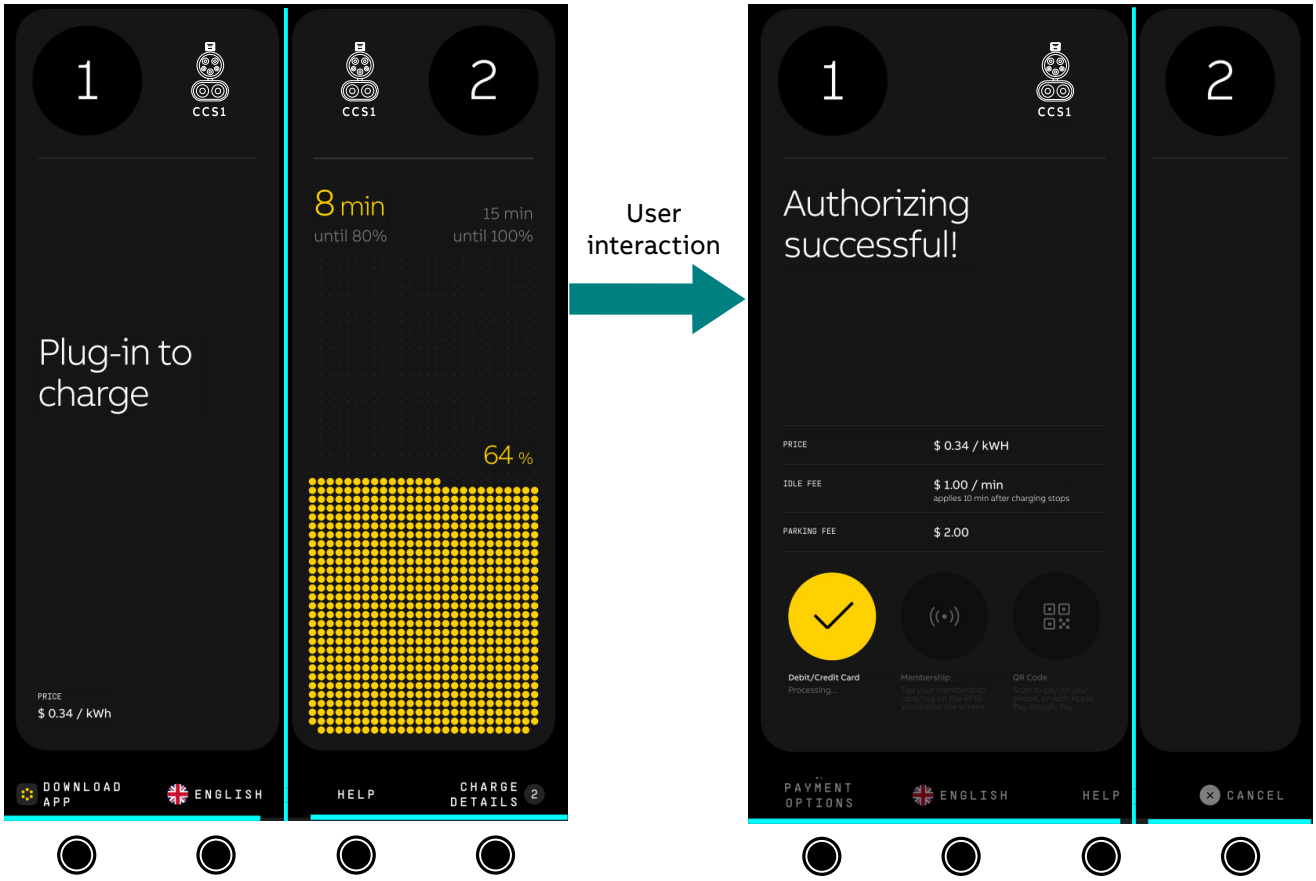
Contextual status info such as charging status or whether the car is idling.

Information and guiding “Call to actions” at each step.

The menu carries contextual actions for each step of the flow. The menu is the digital extension to the buttons underneath the screen.

Illuminated push button to navigate the menu.

In Home view two columns split the screen 50:50, giving content to the respective connector side.
As the user interacts with the charger, the respective display section will expand (75:25), creating more space for interaction.



3.7.2 Menu and buttons

The menu is the digital extension to the buttons underneath the screen and is contextual to the step of the charging process.

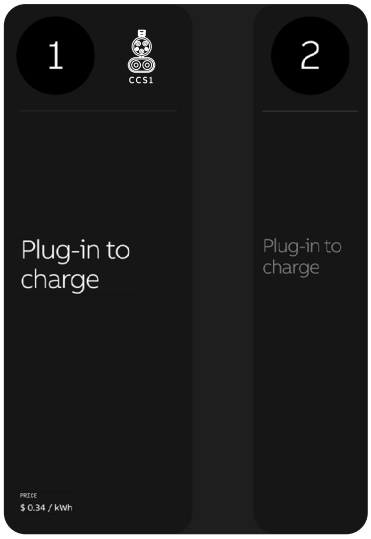
Buttons only illuminate if there is a respective menu option in the UI.

NOTE
“Language” and “help” buttons are constant options.
Help is a button shows up throughout the journey, and therefore will give access to contextual information at different stages of the journey.

3.7.3 Screen colors and status

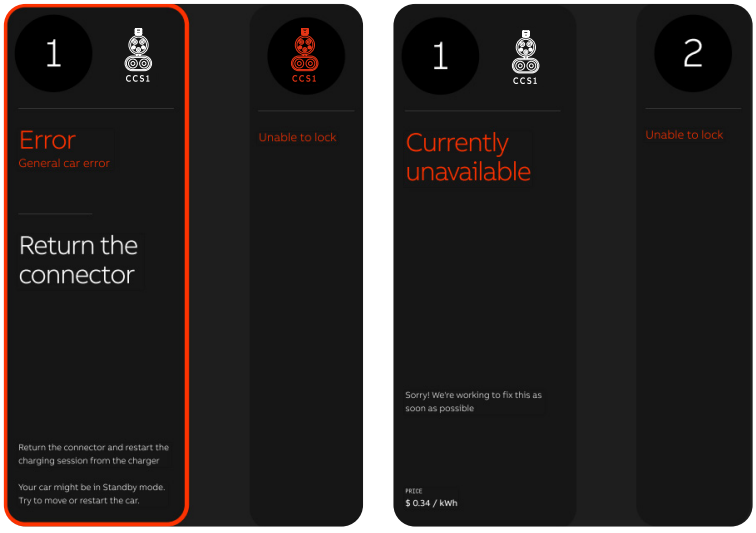
The system follows a simple color logic that embodies the following charger states:

- **White** - Default color
  Example: available (default and contracted)



- **Yellow** - Charging moments, connecting moments, accents
  Example: connecting and charging (default and contracted)

- **Red** - Connector has an error
  Example: error status (default and contracted)



3.8 RFID - Authorization to charge

It is possible to use the EVSE with or without authorization.
An authorization can be based on radio frequency identification (RFID), a personal identification number, or a mobile authentication method. Authorization can be a standard solution from the manufacturer, or from an external company that offers authorization solutions via OCPP.

NOTE
RFID Authorization shall be enabled by Charge Point Operator (CPO) OCPP server backend

3.9 Cloud service portal

ABB E-mobility provides a set of cloud-based tools to commission, monitor and troubleshoot the EVSE.

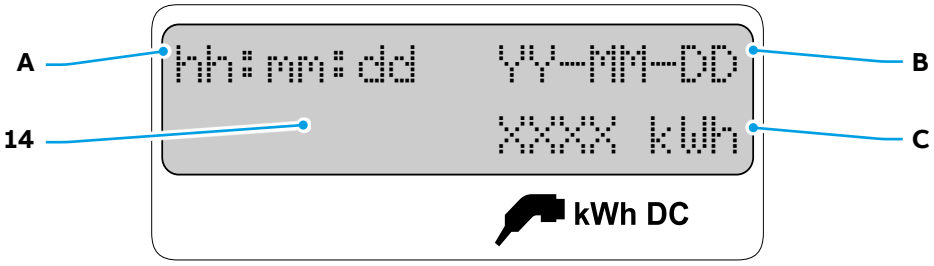
NOTE
Reach out to the local entity of ABB E-mobility for more information:
https://e-mobility.abb.com/contact-centers/.

EN

3.10 Options

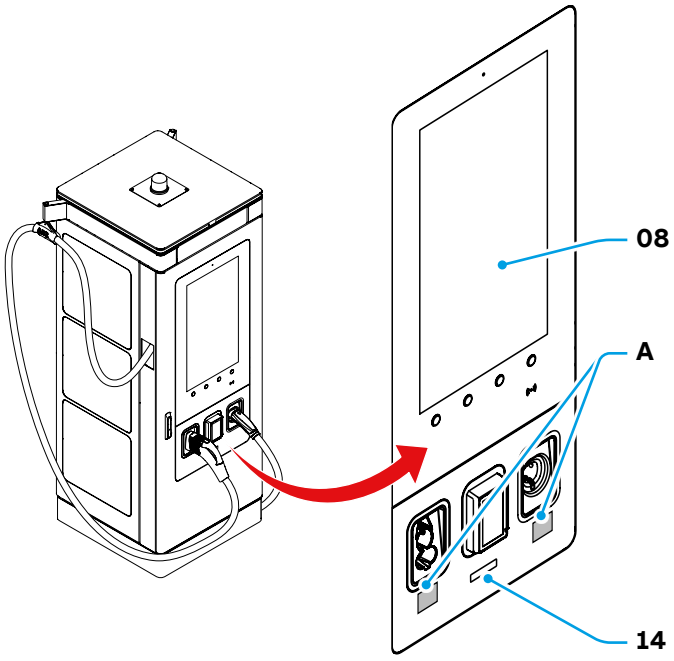
3.10.1 Fiscal metering system

The EVSE can optionally be equipped with a DC energy metering system. The dedicated Meter display **(14)** on the front panel shows:
A. Time (hh:mm:ss)
B. Date (YY-MM-DD)
C. Delivered DC power (kWh)



NOTE
The presence of the energy metering system is mandatory in some countries. Do a check of the regulations that are applicable in the region of installation.

The legally relevant metering display **(14)** can be found next to the main HMI **(08)** (which is showing non legally relevant data) on the front door of the EVSE.



The signed meter data created by the metering system can be retrieved by users from the operator of the charging station; the data integrity can be checked using the public keys **(A)** that allows to decrypt the legally relevant metering data of the charging session.
Transparency software (V1.3.0) shall be used for data validation. It can be retrieved at https://safe-ev.org/en/.

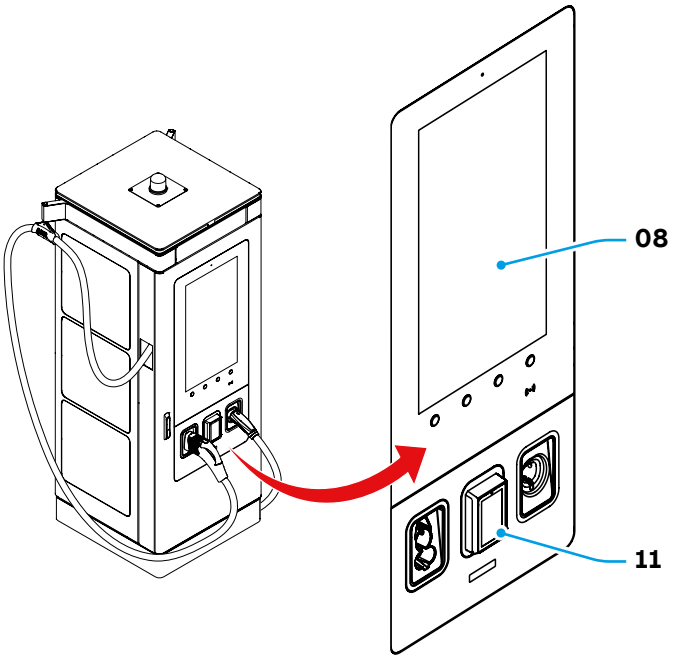
The public key is an unique ID of an energy meter installed on the EVSE which is connected to the corresponding outlet and is visible on a QR-code sticker next to the charging connector holder **(A)**.

NOTE
For more detailed information please reach out to the operator of the charging station.

3.10.2 Payment terminal

The EVSE is equipped with payment terminal **(11)** enabling merchants to provide secure payment methods and enhance their customer’s experience.

Payment terminal **(11)** is fully integrated with EVSE software providing guidance during the payment process on the EVSE display **(08)**.



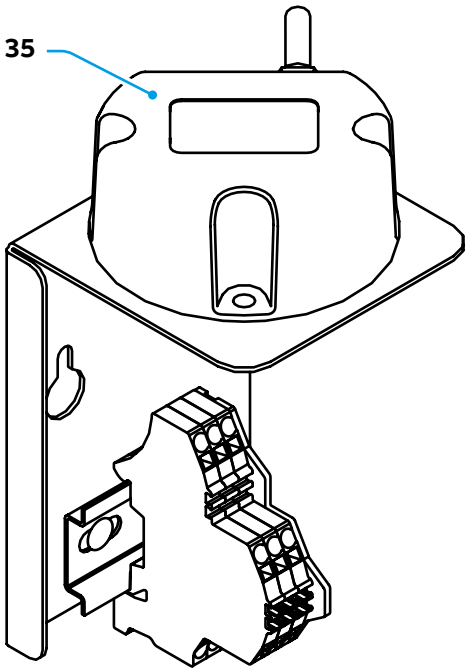
NOTE
It is the owner’s and site owner’s sole responsiblity to inspect the payment terminal on a daily basis for:
- Damaged seal label. The label is broken and left “VOID” on the payment terminal
- Missing or damaged screws
- Incorrect or redundant keyboard overlays
- Holes in the payment terminal housing that should not existent
- External wires exist around the payment terminal
- Missing or unmatched manufacturer barcode label
- Any suspicious objects internal and around IC card slot

If any of the above anomolies are discovered or if any tampering or opening of the payment terminal, please stop using the payment terminal immediately and reach out to the local entity of ABB E-mobility https://e-mobility.abb.com/contact-centers/.

3.10.3 Tilt sensors

The tilt sensor device **(35)** is an optional component inside the EVSE that disables the power from the incoming AC source when a tilt of the EVSE (in any direction) is detected.

The tilt sensor is generally closed and opens when the tilt exceeds 10° in any direction, for example if a vehicle impacts against the EVSE. In these situations, the undervoltage release in the branch circuit breaker that supplies power to the EVSE is de-energized and the branch circuit breaker opens.

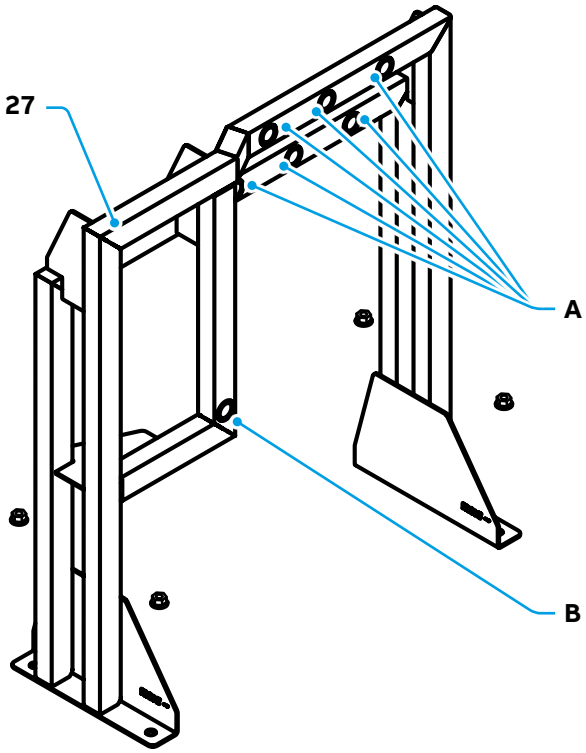


3.10.4 AC cables Jig

The AC cables Jig **(27)** is an accessory for the A400 useful for cutting AC cables to the correct length for installation on the Main AC switch **(50)**.

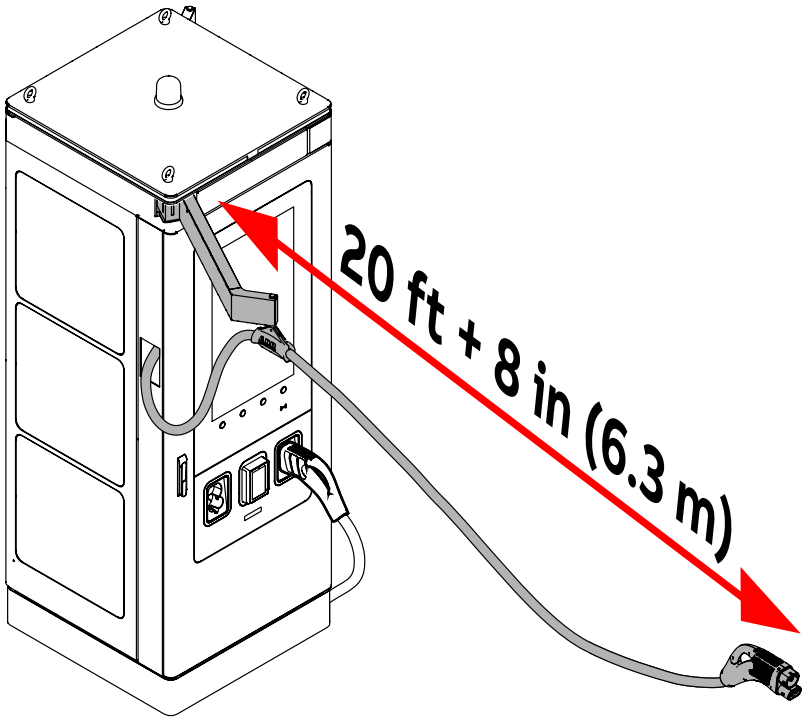
> **NOTE**
> AC cables Jig **(27)** part ID 6AGC125734.
> It can be reused to install other units of A400.

The holes on the Jig can be used as reference points for cutting the power cables:
- 6 holes **(A)** for the AC input cables (2 cables each phase)
- 1 hole **(B)** for the PE.



3.10.5 Charging cable - 7 meters

The EVSE can be optionally equipped with 22 ft + 11.6 in / 7 meters long charging cables. The cable range is 20 ft + 8 in / 6.3 m (9 ft + 2 in / 2.8 meters extended compared to the standard solution).



4. Transportation, handling and unpacking

In this section are explained all the transport specification, including handling and unpacking procedures of the EVSE.

Chapter recipients:

- Owner
- Qualified installer
- Handling and transportation company

4.1 Transport the EVSE to the site

A transport company delivers the EVSE close to the site.

CAUTION
The risk transfers to the operator upon delivery in accordance with the agreed INCOTERMS 2020. Any responsiblity and liability with respect to handling of the EVSE after the point of delivery is for the account of the operator.

NOTE
If you need to store the EVSE before installation, obey the ambient conditions for storage (refer to section "10.1.2. Environmental Conditions").
DO NOT store the EVSE in a location exposed to severe weather conditions (e.g. rain, snow or a high level of humidity).

CAUTION
It is prohibited to transport or handle the EVSE without following the applicable instructions accurately. Comply with all instructions to safely handle the EVSE

WARNING
Please follow these steps to comply with the applicable safety measures applicable to the working area including instructions for safe handling of the EVSE

DANGER
Handling personnel must wear all appropriate and applicable personal protective equipment (PPE) and follow all the applicable Health and Safety measures applicable to the working area.

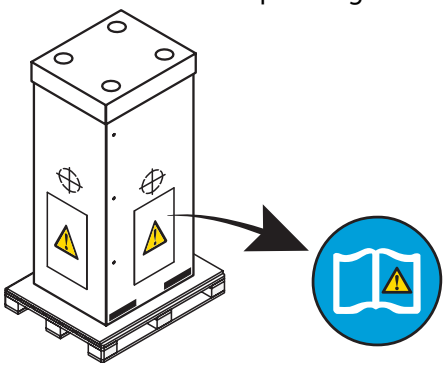
NOTE
The manufacturer is not liable for any damages resulting from the improper handling and transportation of the EVSE, in particular resulting from non- compliance with these instructions and other applicable regulations and standards (e.g. transport, occupational health and other safety standards).

4.1.1 Visual inspection on the packaged EVSE

- Check and respect the indications of the symbols on the packaging:

Symbol	Description
	Handle with care
	Fragile
	Keep dry
	Center of gravity
	This side Up
	Do not stack
	Do not tilt

- Read and follow the operating and safety instructions labeled on the package.



- The package of product should must not be broken and/or scratched in any point.

> **NOTE**
> If the package is damaged and/or scratched check the external cosmetic of product by removing the protections. If damage is observed, document it and contact ABB E-mobility.

- The pallet shall be intact and not damaged for a safe transportation and handling of the product.

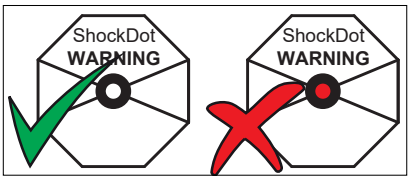
> **NOTE**
> If damage is observed, document it and contact ABB E-mobility.

- Check the shock and tilt sensor labels.

> **NOTE**
> The Tilt Watch and Shock Watch sensor label are placed on the outside of the packaging of the EVSE.

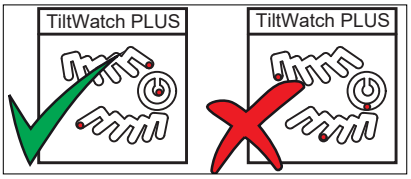
In the event that the tilt sensor shows that the EVSE has been tilted by more than 50° and/or if the shock sensor has been activated, proceed to:
- inspect the EVSE. The packaging must be removed in order to examine the extent of the damage to the EVSE. In case the EVSE is mechanically damaged, externally or in its inner parts, and cannot be installed, provide pictures to ABB E-mobility service team.
- take photographs as evidence of any damage.
- record the damage on the transportation document (e.g. CMR/waybill or AWB/air waybill) before accepting the delivery. State which type of EVSE is damaged and how many EVSE’s are damaged.
- accept the EVSE with reserve and return to the forwarder the transport document with the reserve indicating the damage.

<u>How to check the Shock sensor label</u>



The Shock Watch sensor contain a tube filled with red liquid held in suspension. When the EVSE is subjected to an impact exceeding a specified G-level, the shock disrupts the surface tension of the liquid, releasing the highly visible red dye into the length of the tube, creating a permanent and immediate indication of mishandling.
Normal movement or road shock will not affect the shock sensor device (it is only triggered by those impacts for which it is designed).
Once activated, the shock watch sensor cannot be reset.

<u>How to check the Tilt sensor label</u>



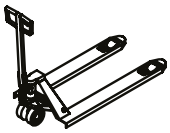
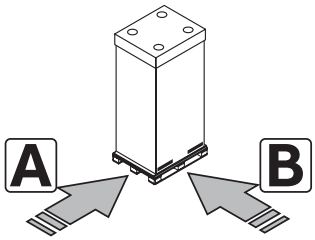
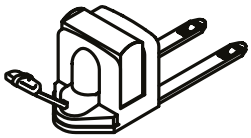
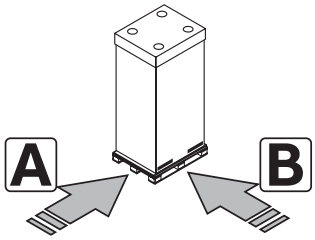
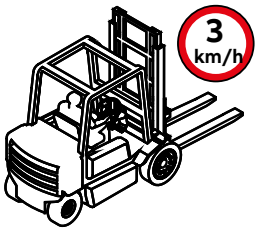
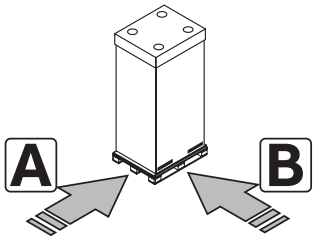
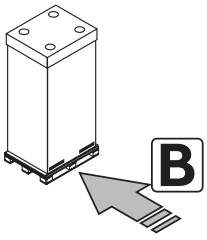
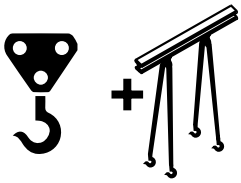
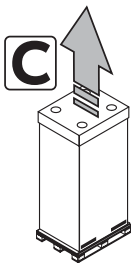
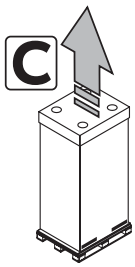
The Tilt Watch Sensor provides 360° monitoring and indicating the exact angle of tilt or whether complete overturn occurred. This represent an indication of mishandling that may result into a damage.
The Tilt Watch Sensor is immune to normal handling conditions and aircraft takeoff angles.

- Check the integrity of the charging connector(s) of the EVSE. The charging connector(s) and their cables shall be not damaged and/or scratched.

> **NOTE**
> If damage is observed, document it and contact ABB E-mobility service team.

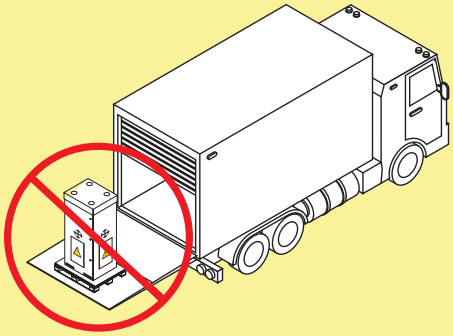
4.1.2 Preliminary checks on lifting equipment

- Handling personnel must wear all appropriate and applicable personal protective equipment (PPE) and follow all the applicable Health and Safety measures applicable to the working area.
- Handling operators must comply to all local regulations.
- Check the weight on the transport document before moving the load.
- Check the position of the center of gravity before lifting the EVSE.
  The higher the position of center of gravity, the more care is required to handle the EVSE to avoid overturning.
- Check that the equipment used to move or hoist the EVSE is suitable, able to move the EVSE based on weight.

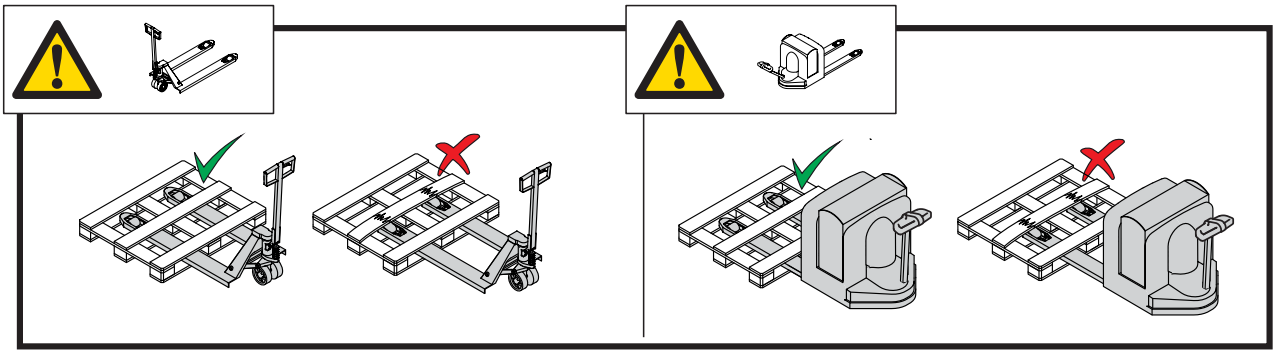
Equipment	Movement	Lifting
• Pallet Jack 	 Only short move	
• Pallet Stacker 	 Only short move	
• Forklift Truck • Wheel loader pallet fork 		
• Hoist / Crane 		

DANGER

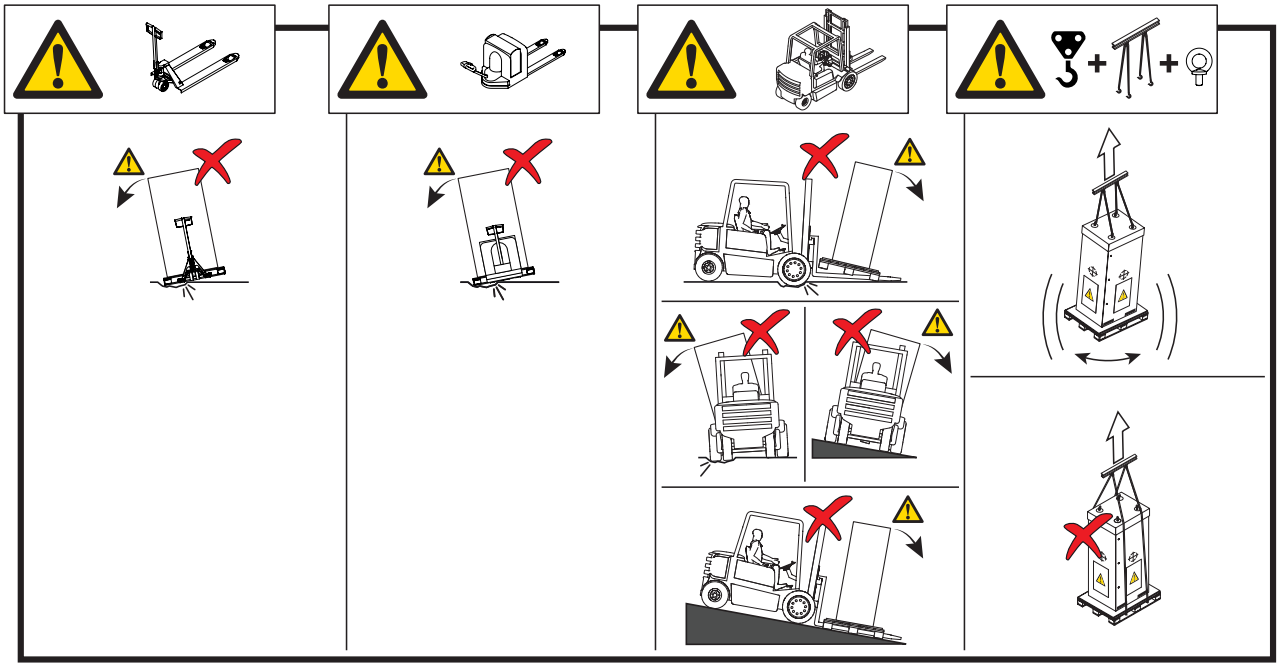
- The forks need to be fully able to move into the pallet to provide full support and operated by trained staff.
- Knowing the total weight, ropes and chains needs to be suitable and in safe conditions and operated by trained staff.
- Pallet jack and Pallet stacker are not suitable to lift up the EVSE. They can be used for short distance movement only.
- During movement operations the EVSE must be raised 3 cm max from the ground level.
- Do not use truck tail lift as lifting equipment.



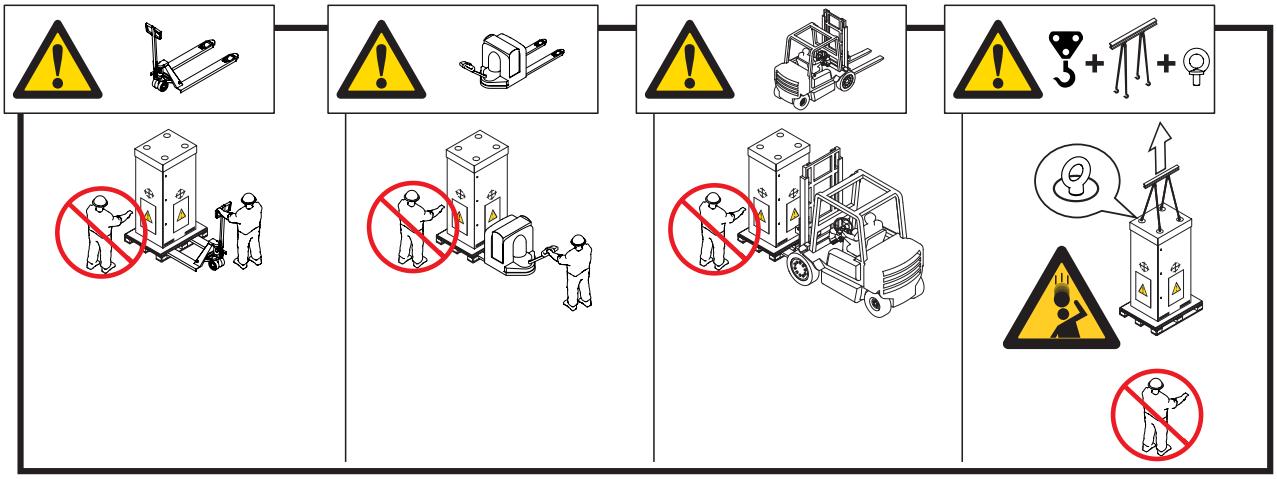
- Check that the pallet is not damaged. If there is damage, contact the responsible Health and Safety manager for the site to get instructed on how to unload the EVSE and move it in a safe way.
  Pay particular attention to the position of the wheels of the Pallet jack and pallet stacker to avoid damaging the pallet.



- Check that the working place conditions are safe before handling the load (such as obstacle-free unloading area, proper flooring, safe path and other conditions).



- Ensure that the area is not accessible to unauthorized personnel and the personnel involved in handling the EVSE are fully aware of the local rules and processes that apply when handling the EVSE and keep sufficient distance away from the moving EVSE.



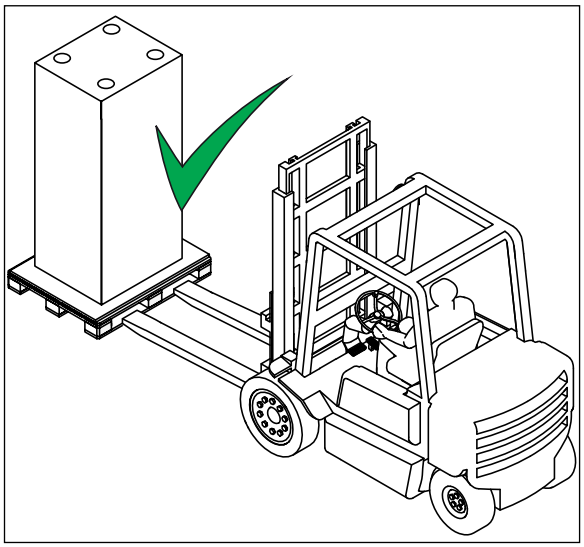
EN

4.2 Lifting of the EVSE

WARNING
- Risk of pinching or crushing, the EVSE is heavy
- Make sure that the hoisting equipment can lift the EVSE safely
- Obey the safety instructions that apply to the hoisting equipment
- Take into account the dimensions, the weight and the center of gravity of the EVSE.
- Ensure the lifting & hoisting activity is performed under supervision.

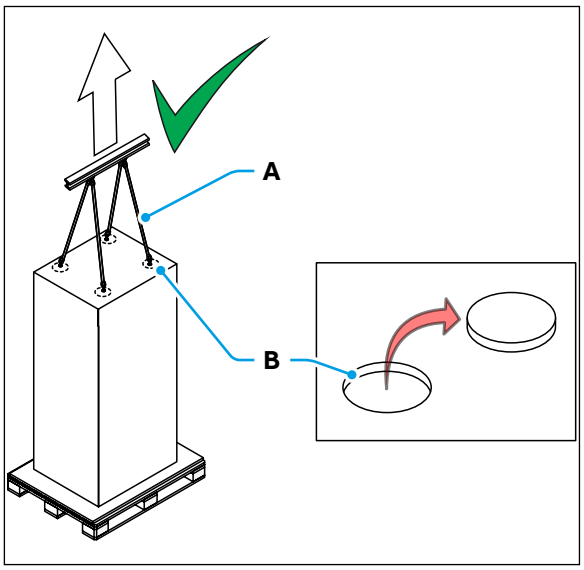
CAUTION
- Do not drop the cabinet.
- Do not tilt the cabinet.
- Make sure there are no dynamic forces on the lifting points.

4.2.1 Forklift Truck / Wheel loader pallet fork



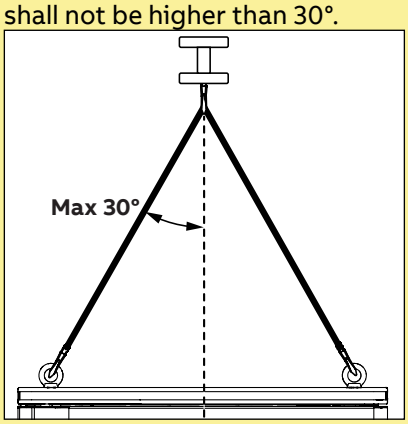
- Move the forks of the forklift truck in the gaps at the side of the cabinet.
- Move the cabinet to the correct location.

4.2.2 Hoist / Crane



- Open the four holes **(B)** on the top cover by pushing the precut cardboard in correspondence with each eyebolt.
- Connect the ropes or chain **(A)** of the hoisting equipment to the four eyebolts **(B)**.
- Align eyebolts (unscrewing it) to ropes/chains direction when lifting the EVSE.

DANGER
Inclination of ropes/chain from the vertical shall not be higher than 30°.



- Move the cabinet to the correct location.

4.3 Unpacking

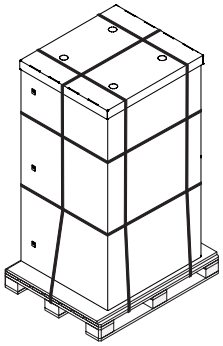
WARNING
Packaging elements (cardboard, cellophane, staples, adhesive tape, straps, etc.) may cause cuts and/or injuries if not handled with care. They should be removed with the proper equipment.

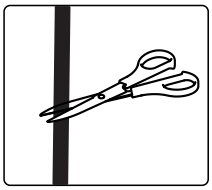
NOTE
The components of the packaging must be disposed in accordance with the regulations in force in the country of installation.

NOTE
If you notice any damage either on the outside of the packaging, on the EVSE when opening the packaging, or parts not according to the order, please reach out to the local entity of ABB E-mobility B.V. for support:
https://e-mobility.abb.com/contact-centers/.

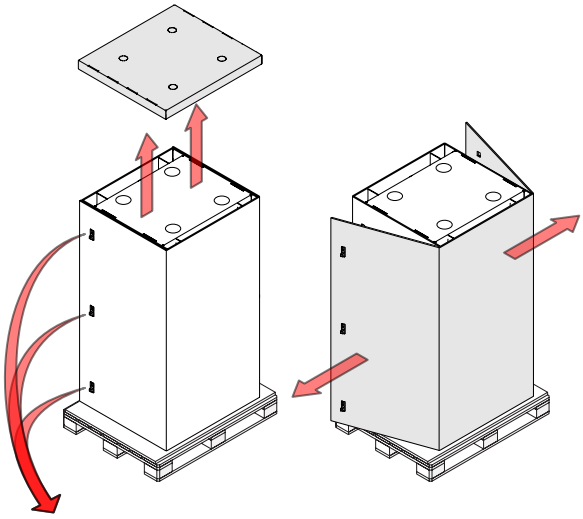
4.3.1 Unpacking procedure

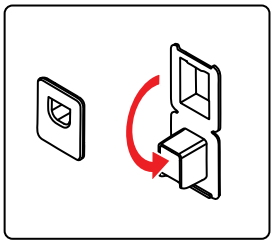
NOTE
Make sure that all parts are delivered according to the order.



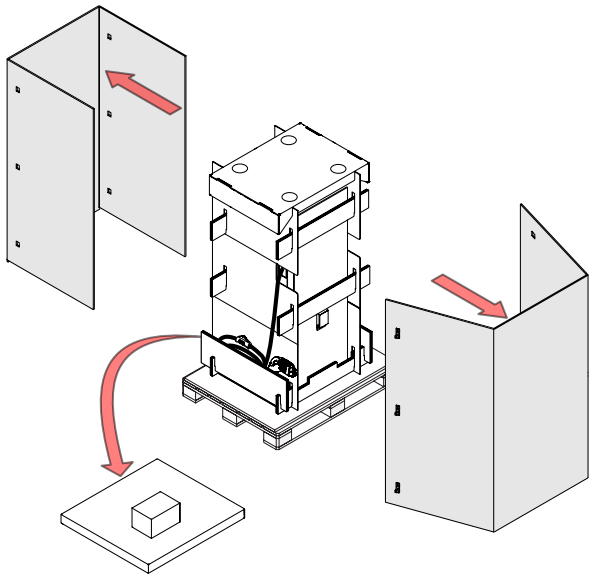


- Cut the plastic straps.

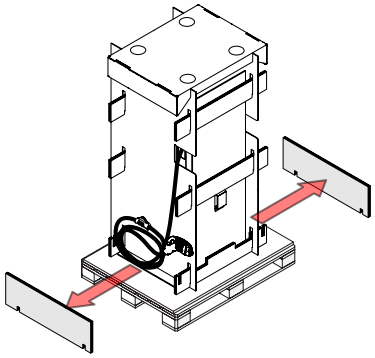




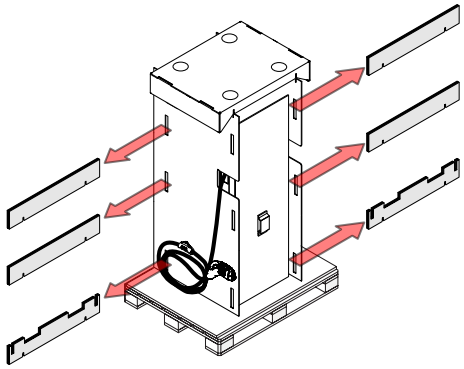
- Open the six locking mechanisms (3 on both sides).
- Remove the external top cover.
- Spread the cardboard on both sides.



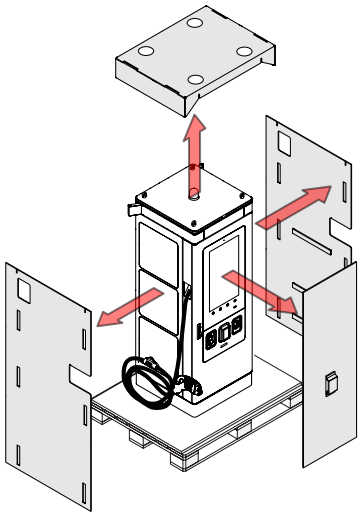
- Remove the two main parts (front and rear) of the packaging.
- Take out the boxes containing the supplied components. Refer to “6. Installation”).



- Remove the 2 lateral supports.



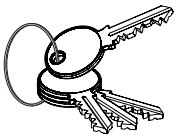
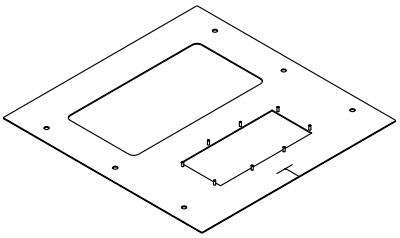
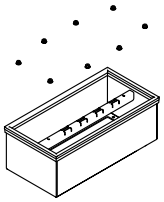
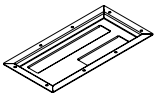
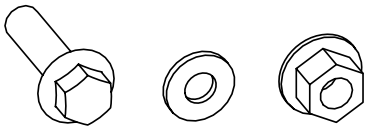
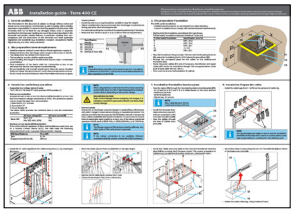
- Remove the 6 cardboard support beams.



- Remove the internal top cover.
- Remove the 2 lateral cardboard walls.
- Remove the front protective foam.

4.3.2 Components supplied with the EVSE

When the EVSE is unpacked, make sure all components supplied with the EVSE are present:

Component	Description	Quantity
	Keys to open the EVSE front door	2
	Concrete foundation interface plate	1
	Cables entry box + installation nuts	1 + 6
	Cables entry plate	1
	Nuts to install the EVSE to the Prefabricated foundation	6
	Bolts + Washers + Nuts to install AC and PE cables	4 + 8 + 4 (Preinstalled on the AC terminals and PE busbar)
	Bolts to be installed in place of the eyebolts	4
	Installation guide	1

5. Access to the inside of EVSE

In this section are illustrated all the access procedures.

Chapter recipients:

- Qualified installer

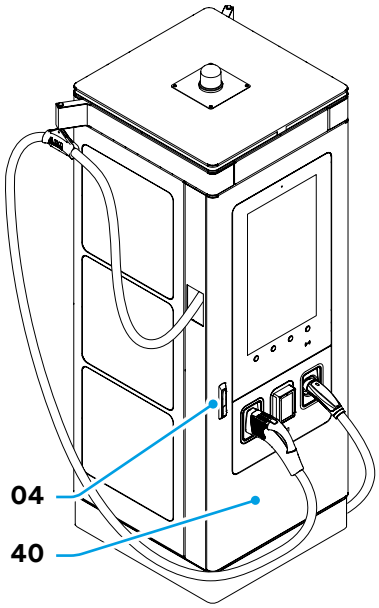
5.1 Open the doors

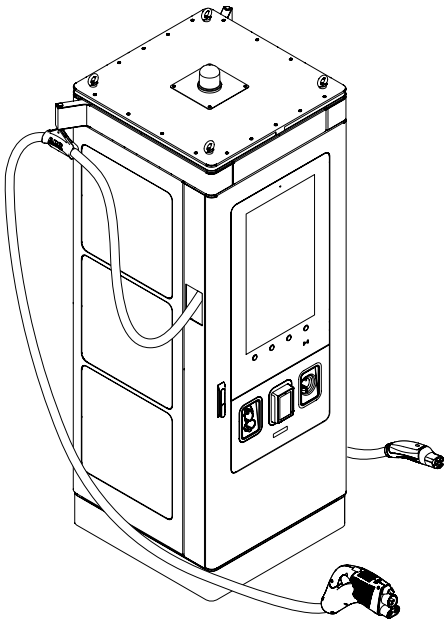
HAZARDOUS VOLTAGE
Make sure that only qualified persons have access to the door key and is wearing the correct protective clothing as set out above.

NOTE
There is one unique door key for each EVSE.

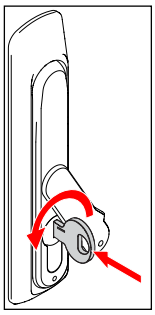
5.1.1 Open the front door

Use the door key to unlock the swing handle lock **(04)** and to open the front door **(40)**.

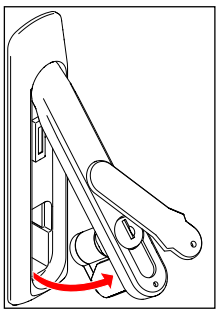




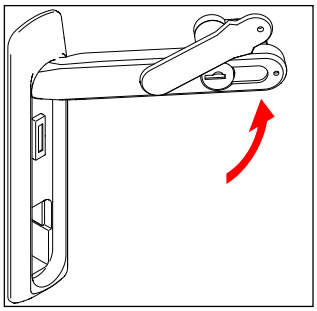
- Remove the charging connectors from the connector holders and put them down, being careful not to damage them.



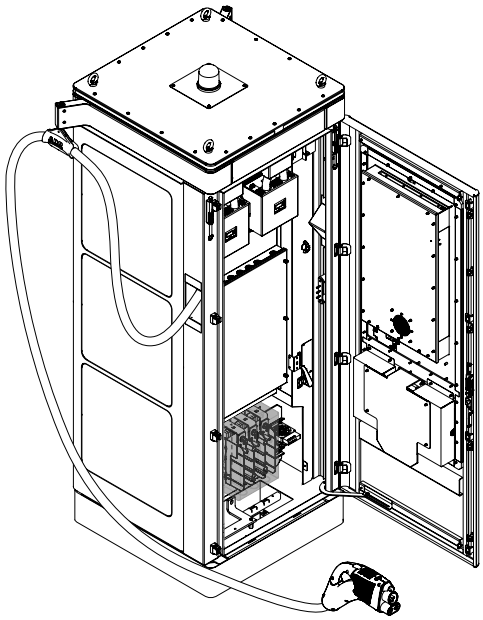
- Move the protection and insert the key. Turn the key to unlock the handle.



- Pull the handle forward until you can turn it to the right.



- Turn the handle to the right until the front door is free to open.



- Open the front door.

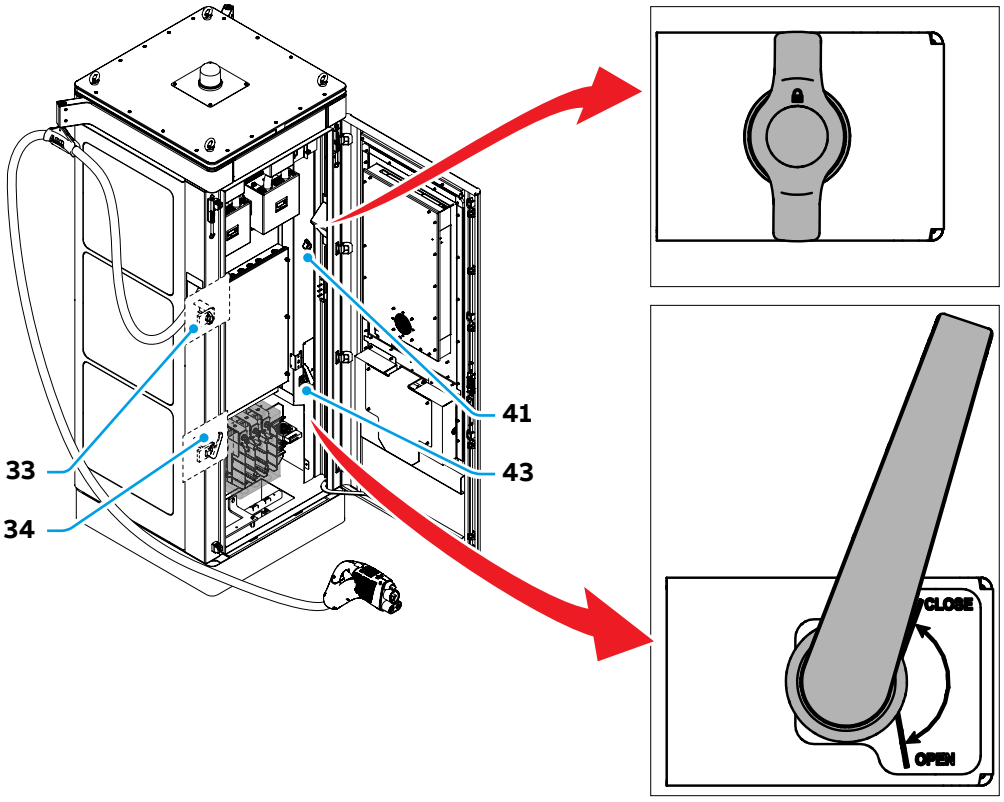
5.1.2 Close the front door

In order to close the front door **(40)** of the EVSE, repeat the operations described in the “Open the front door“ section in reverse order.

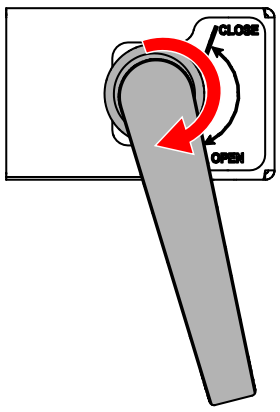
NOTE
Close the door applying the proper force in a way that it fits its final position before turning the handles.

5.1.3 Open the side doors

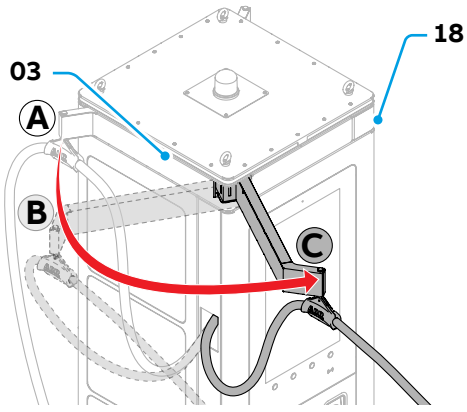
When the front door **(04)** is open it is possible to access the side door opening systems:
Left door **(31)** - Left door handle **(34)** and Left door latch **(33)**.
Right door **(36)** - Right door handle **(43)** and Right door latch **(41)**.



NOTE
The procedure below can be applied to both side doors.

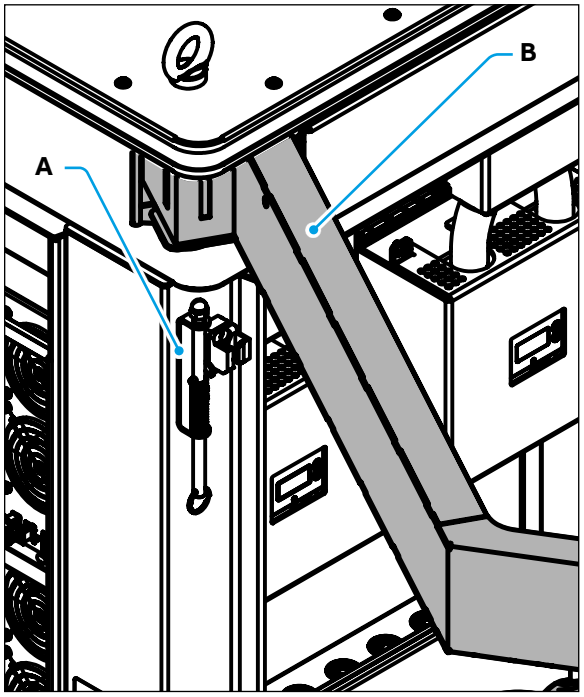


- Push the handle (left or right) downwards to unlock the side door. The door will be locked in the safe position by the door latch.

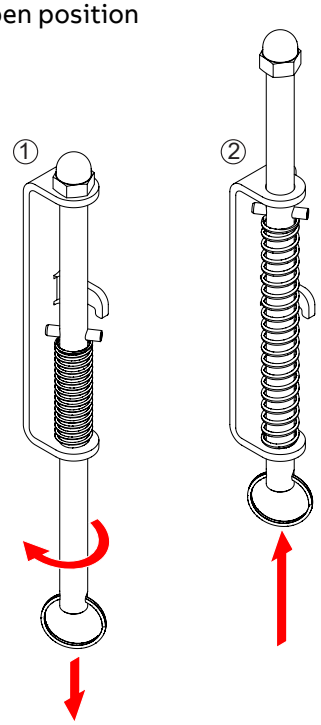


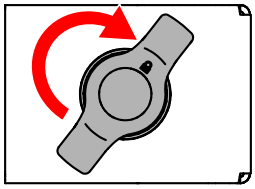
- Open the CMS.
  CMS - Output 1 **(03)** on the left side
  CMS - Output 2 **(18)** on the right side

NOTE
Pay attention to the loose cable on the floor.

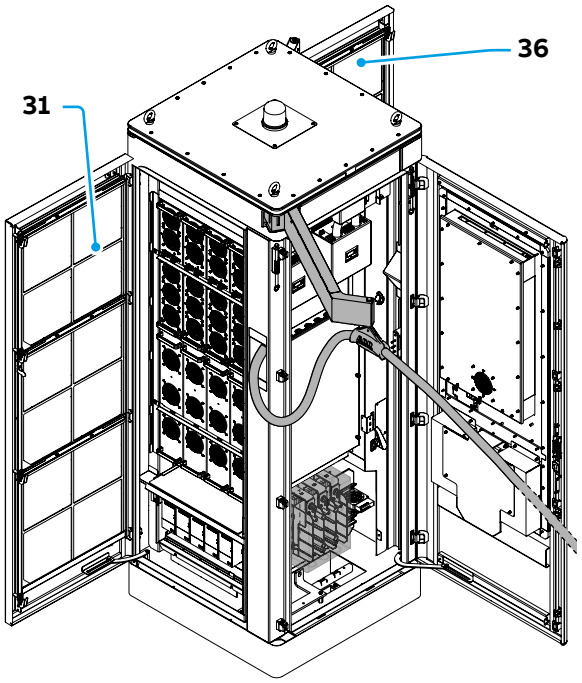


- When the CMS **(B)** is completely open, block it in place using the dedicated system **(A)**
  1. Pull down the pin using the ring and rotate it counterclockwise
  2. Let the pin comes out completely to block the CMS in an open position



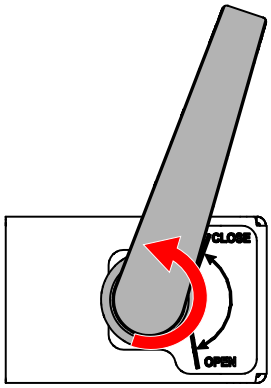


- Unlock the door using the door latch and open it completely.
  Press the door lightly while operating the latch to facilitate the unlocking operation



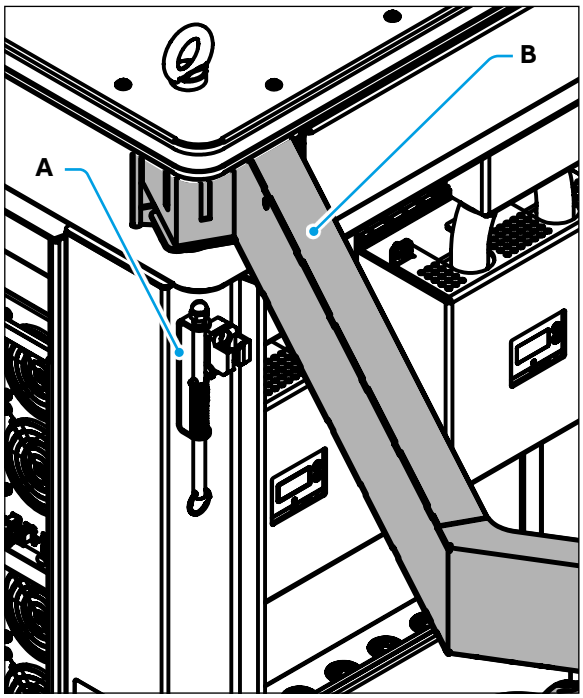
- Open the desired side door:
  Left door **(31)**
  Right door **(36)**

5.1.4 Close the side doors

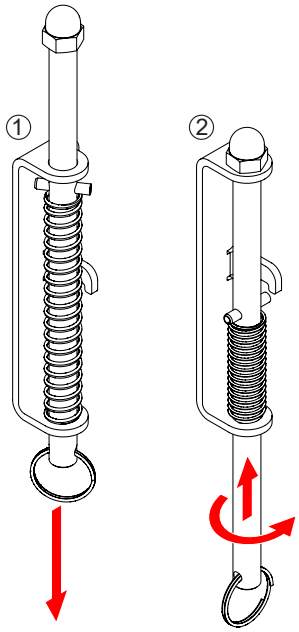


- In order to close the Left door **(31)** and/or the Right door **(36)** is necessary to push the door and rotate the internal handle in CLOSE position.

NOTE
Close the door applying the proper force in a way that it fits its final position before turning the handle.



- Close the CMS **(B)** by unlocking the pin of the blocking system **(A)**.
  1. Pull down the pin using the ring
  2.Rotate it clockwise and release the pin in the rest position



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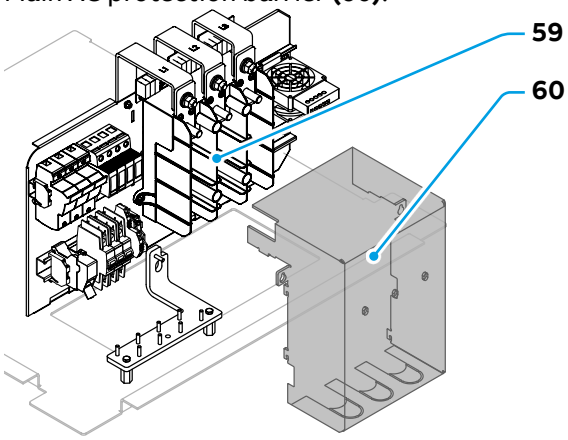
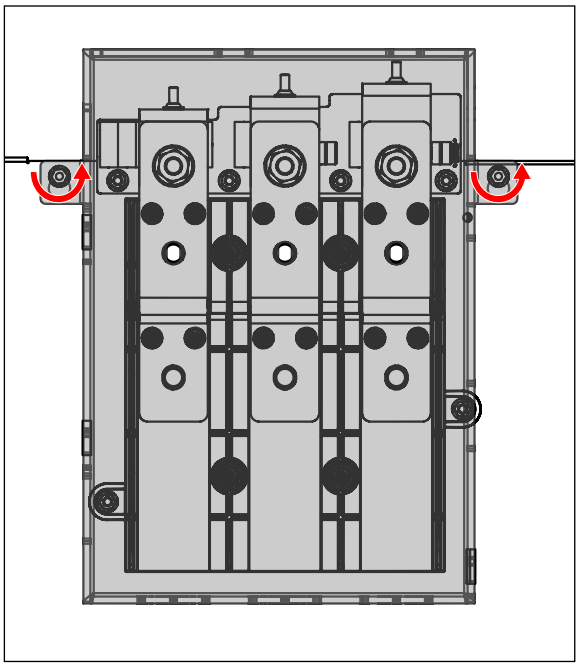
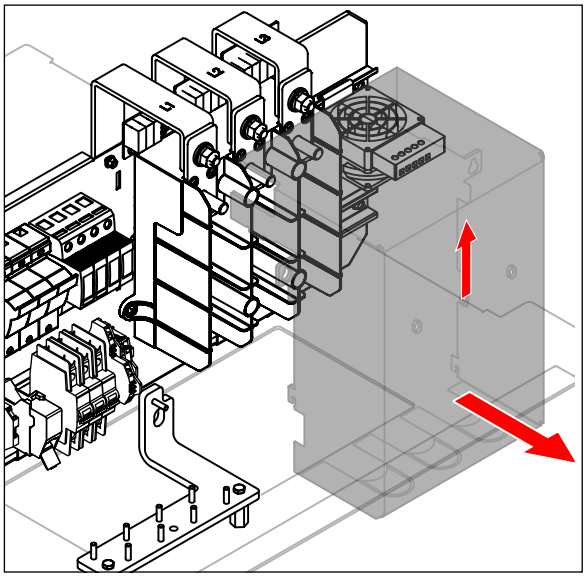
5.2 Remove the Main AC protection barrier

To access the AC input connection terminals **(59)**, located on the lower front side, is necessary to remove the Main AC protection barrier **(60)**.





- Slightly unscrew the 2 fasteners on the sides of Main AC protection barriers **(60)**.



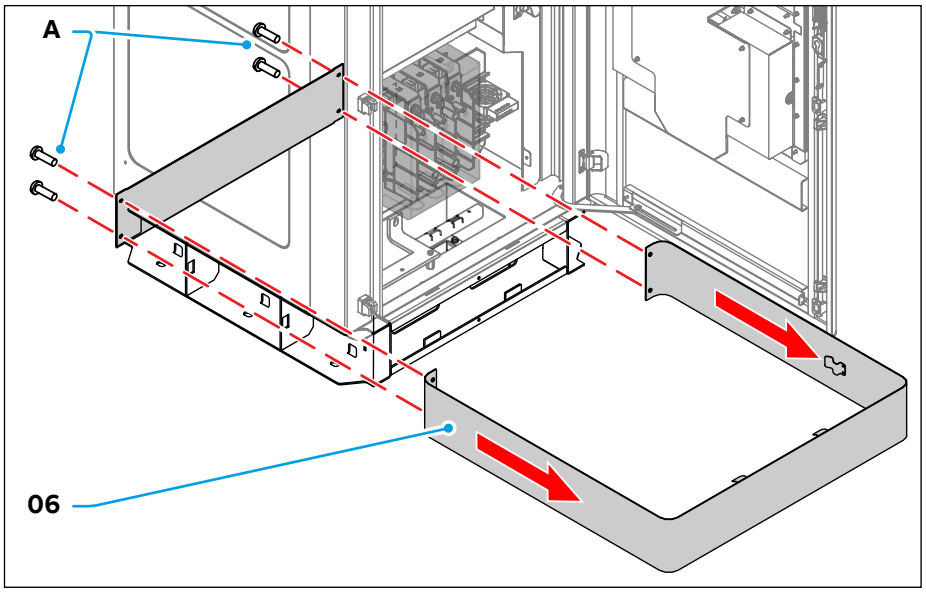
- Slide the Main AC protection barrier **(60)** upwards and then remove it by pulling it forward.

  Once the protections have been removed, it is possible to access the AC input connection terminals **(59)**.

HAZARDOUS VOLTAGE
Do not turn on the EVSE without the Main AC protection barrier **(60)**.

5.3 Remove the Base cover

To access the fastener between the EVSE and the foundation is necessary to remove the Base cover **(06)**.



- Unscrew and remove the 4 fasteners **(A)** on the rear side of the EVSE.
- Remove the base cover **(06)** by sliding it forward to release the internal latches that hold the cover in place.

6. Installation

In this section are illustrated all the installation procedure.

Chapter recipients:

- Owner
- Qualified installer
- Handling company

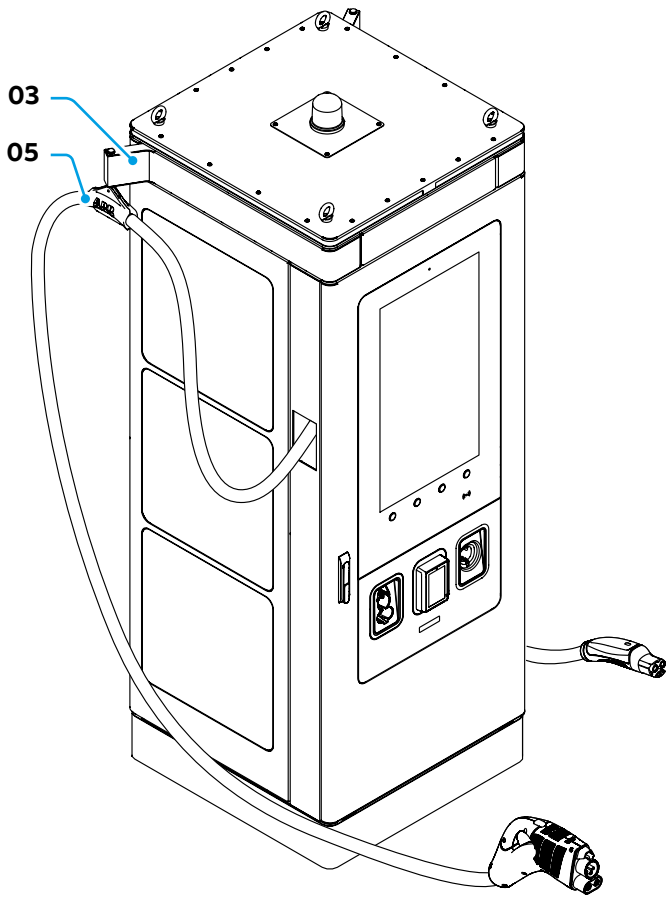
EN

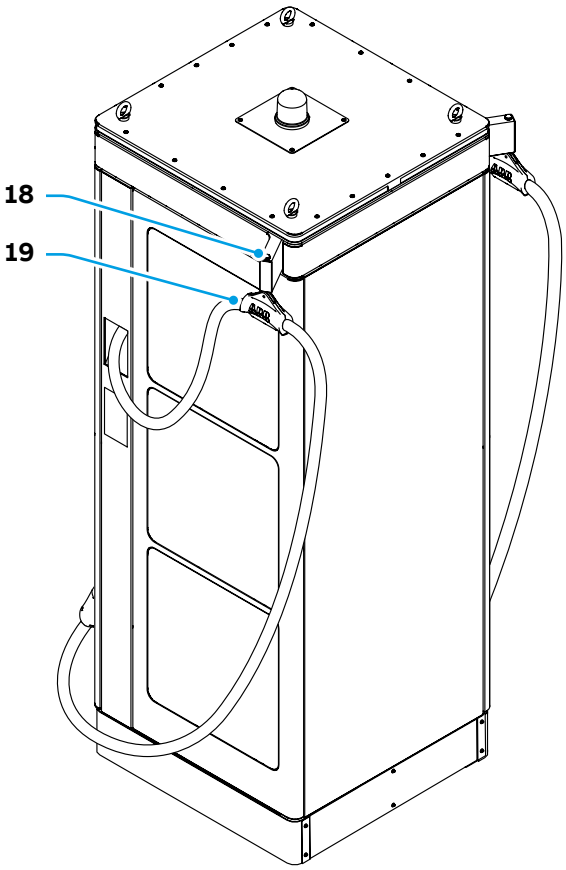
6.1 Installation of the EVSE

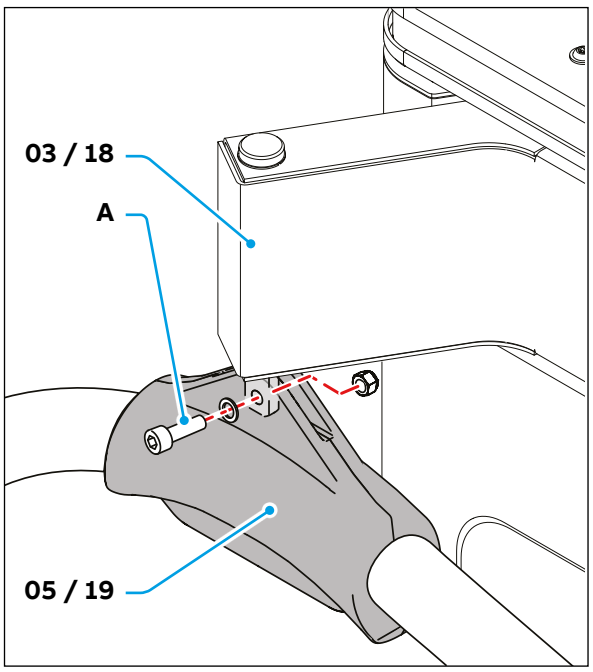
6.1.1 Install the charging cables on the CMS

After removing the packaging, the charging cables must be installed on the respective CMS:

- Charging cable - Output 1 **(05)** on the CMS - Output 1 **(03)**
- Charging cable - Output 2 **(19)** on the CMS - Output 2 **(18)**







- Install the two charging cable **(05) (19)** on the swivel pin of the respective CMS **(03) (18)**.

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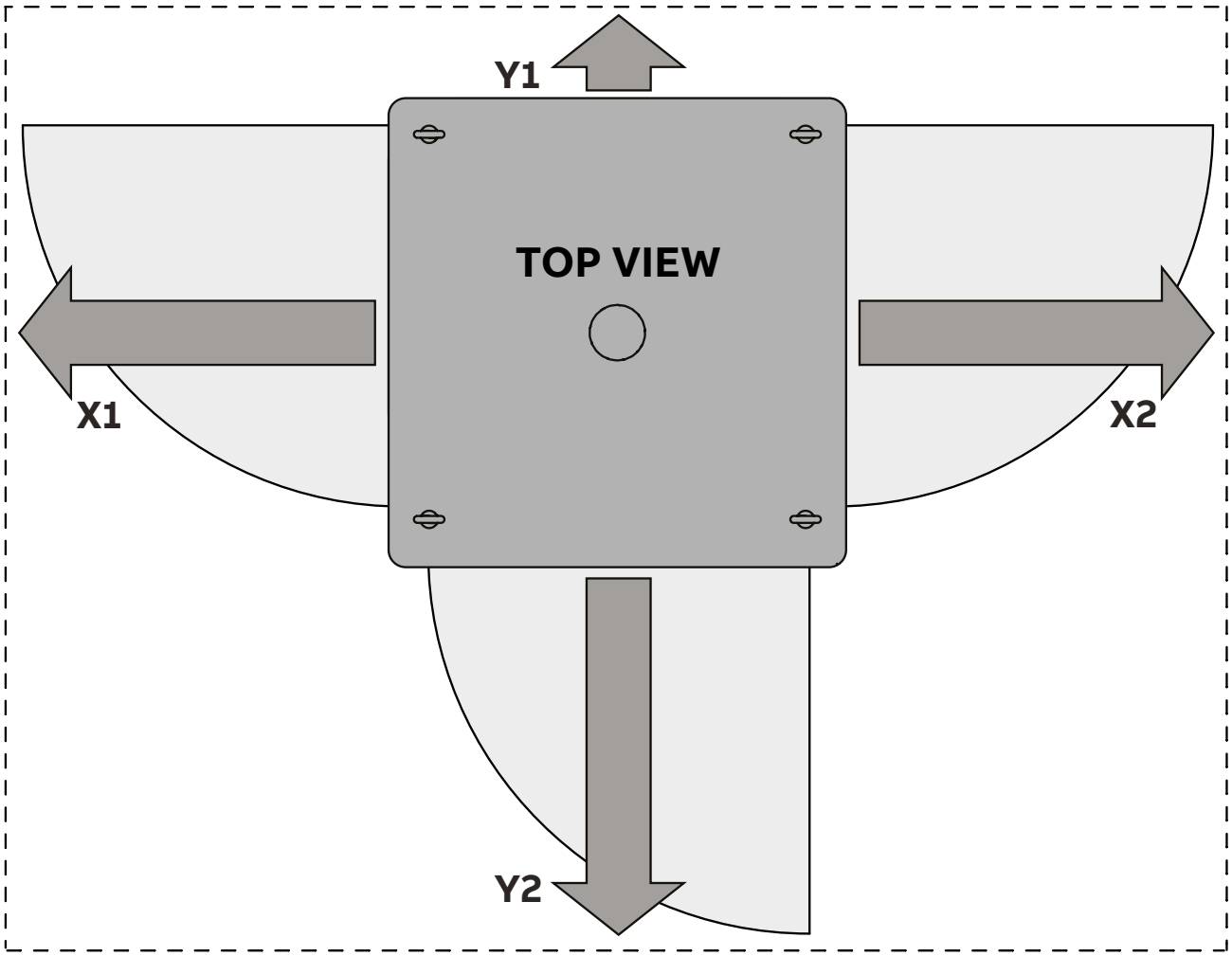
6.1.2 Floor space requirements



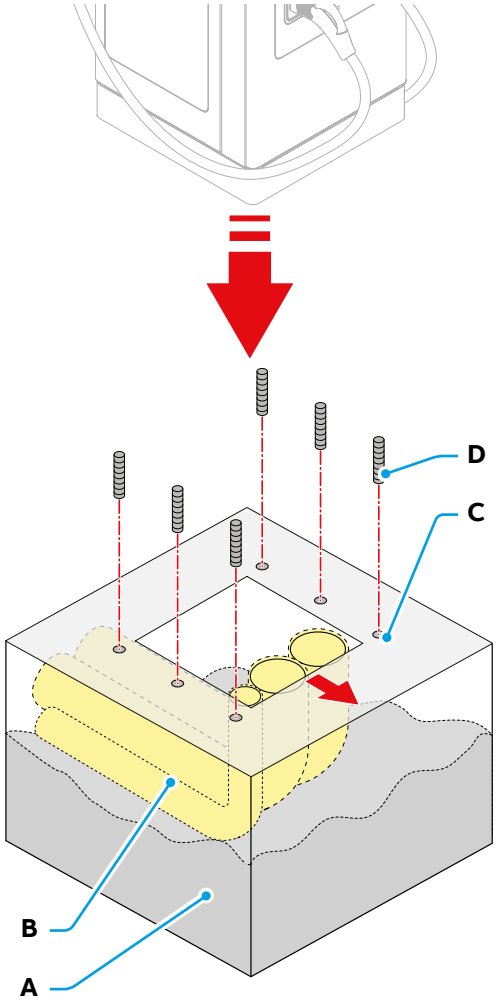
Parameter	Description	Specification [in (mm)]
X1	Space to open the left side door	32 (800)
X2	Space to open the right side door	32 (800)
Y1	Space to secure the removable base cover	6 (150)
Y2	Space to open the front door	32 (800)

NOTE
These dimensions only refer to the required space to open the doors/CMS of the EVSE. A minimum of 1000 mm extra on front, left and right sides is required to allow commissioning and maintenance operations on the EVSE.

6.1.3 Prepare the foundation

The EVSE shall be installed on a custom foundation suitable to support the weight of the equipment. Use the drawing of the "11.3. Foundation interface plate" to build the foundations before to install the EVSE as described in the instruction below.

NOTE
In the event that the customer designs a customised foundation, the customer shall comply with all applicable (local) legislation and regulations with respect to the use and stability of the EVSE and its foundation



- Dig the hole **(A)** for the casted foundation. For the specifications, refer to section "11.3. Foundation interface plate"
- Prepare the site and the underground cable conduits (the red arrow indicate the front side of the EVSE).

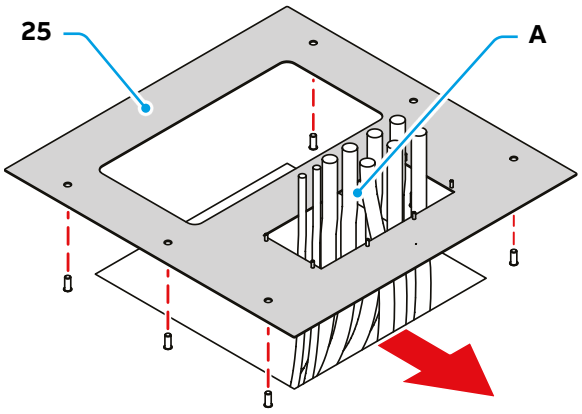
  NOTE
  Is recommended to route the power and signal cables inside separated underground cable conduits.

- Pour the concrete into the hole. Make sure that the cable conduits **(B)** are in the correct position.

  NOTE
  Let the concrete dry.

- Drill the fixing points **(C)**.
- Install the dowels **(D)**.

6.1.4 Install the EVSE on the foundation



- Pass the cables **(A)** through the Foundation interface plate **(25)**:
  - L1 (2 cables)
  - L2 (2 cables)
  - L3 (2 cables)
  - Protective Earth PE
  - Ethernet (optional)
  - Signals (eg. tilt sensor)

  NOTE
  Max. cable diameter 1½ in (38 mm).
  Cable slack at least 27 $^{9}/_{16}$ in (700 mm).

- Install the Foundation interface plate **(25)** without screwing it to the foundation.

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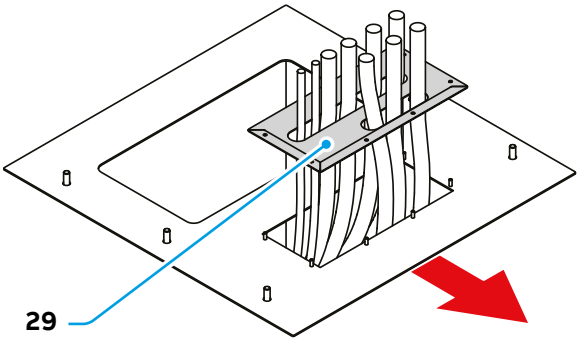


- Pass the cables through the base of Cables entry plate **(29)**.

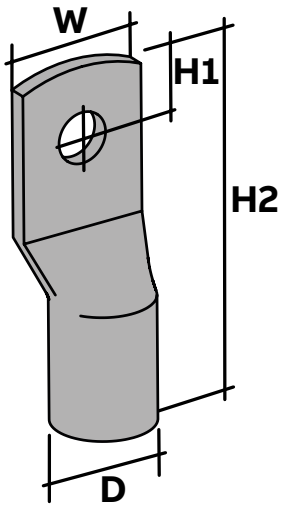
NOTE
The next step of the installation procedure is to take measurements to cut the cables (PE and AC) to the correct length. This step can be done:
METHOD 1 - without using the AC cable Jig **(27)**
METHOD 2 - using the AC cable Jig **(27)**

METHOD 1

Take measurements to cut the cables (PE and AC) to the correct length without using the AC cable Jig **(27)**

- Choose the cable lugs suitable for the cables used taking into consideration that the maximum dimensions of the cable lugs must be:

Cable lug dimension [in (mm)]	
W	1 17/32 in (39 mm)
H1	19/32 in (15 mm)
H2	4 21/64 in (110 mm)
D	1 17/64 in (32 mm)
Hole	Ø 33/64 in (13 mm)



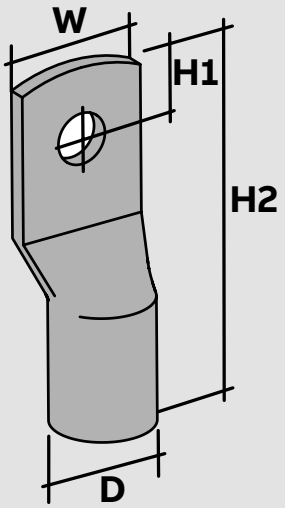
METHOD 2 (recommended)

Take measurements to cut the cables (PE and AC) to the correct length using the AC cable Jig **(27)**

NOTE
AC cables Jig **(27)** is an option (part ID 6AGC125733). It can be reused to install other units of A400.

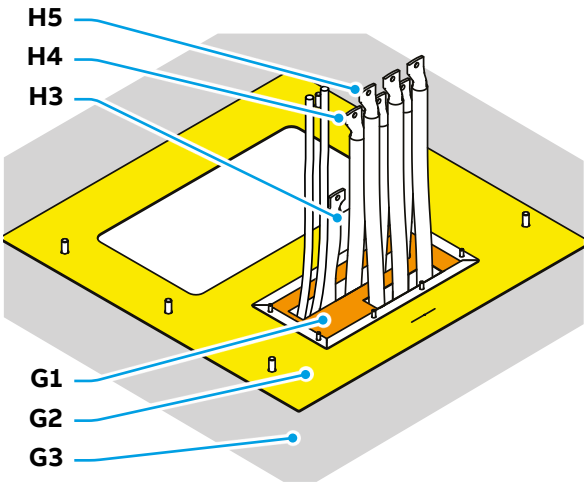
- Choose the cable lugs suitable for the cables used taking into consideration that the maximum dimensions of the cable lugs must be:

Maximum cable lug dimension	
W	1 17/32 in (39 mm)
H1	19/32 in (15 mm)
H2	4 21/64 in (110 mm)
D	1 17/64 in (32 mm)
Hole	Ø 33/64 in (13 mm)

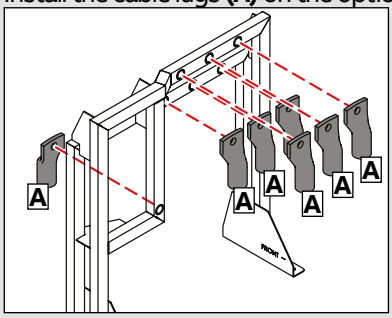


- The measurement of the cables length ends to the center of the cable lug hole and can be carried out taking different planes as reference:
  G1 - Cables entry plate
  G2 - Foundation interface plate
  G3 - Foundation/ground level

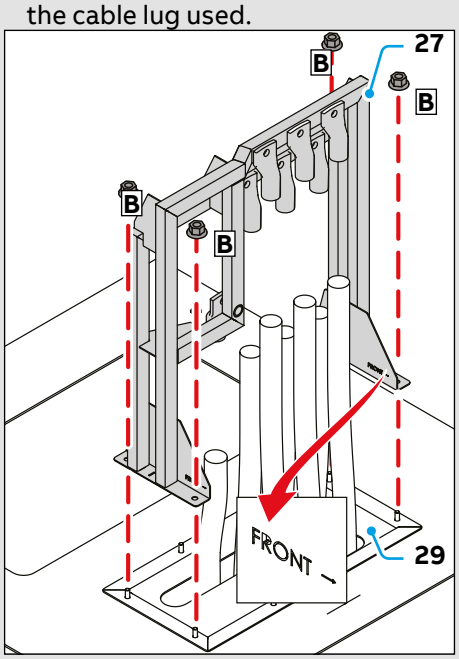
Cable length	**H3** - PE cable [in (mm)]	**H4** - AC cables low row [in (mm)]	**H5** - AC cables high row [in (mm)]
G1	9.69 (246)	15.75 (400)	18.58 (472)
G2	8.98 (228)	15.04 (382)	17.87 (454)
G3	9.09 (231)	15.16 (385)	17.99 (457)



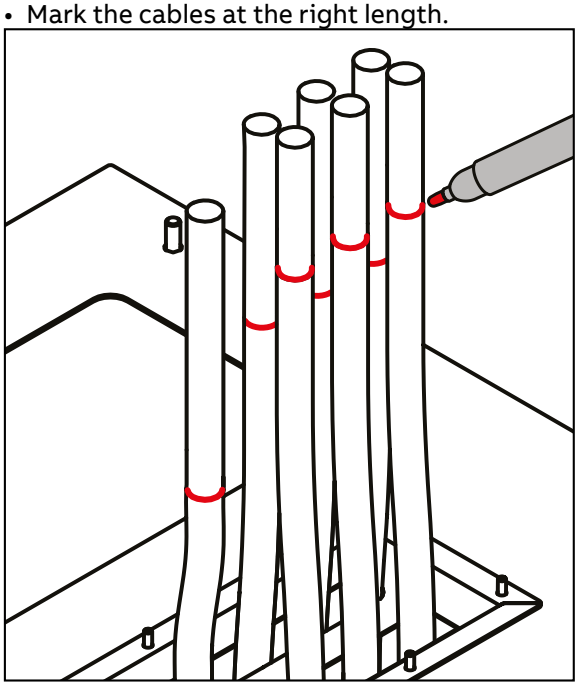
- Install the cable lugs **(A)** on the optional AC cable Jig **(27)**.



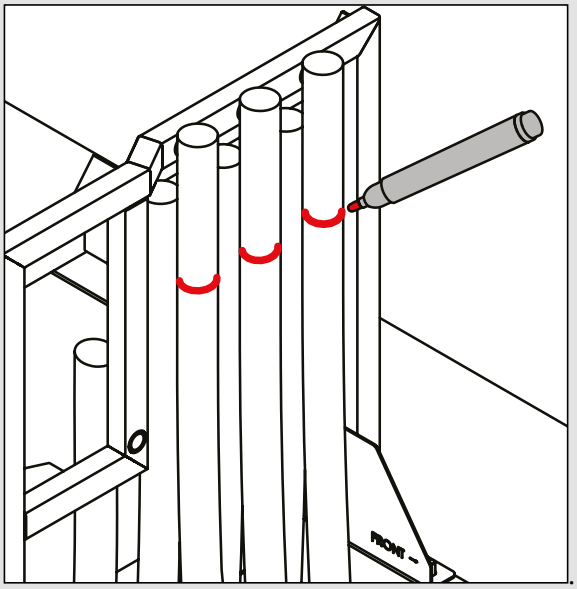
- Use 4 nuts **(B)** to install the AC cable Jig **(27)** on the Cables entry plate **(29)**. The Jig simulates the height of the installation terminals and is useful to cut the cables at the right length taking in consideration the cable lug used.



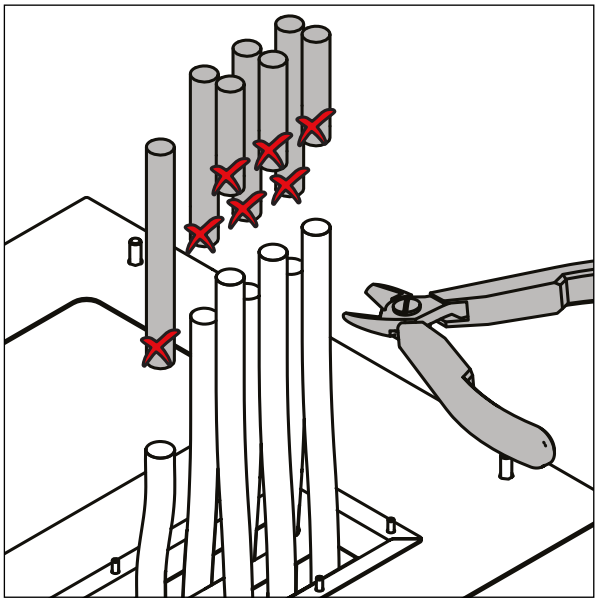
- Mark the cables at the right length.



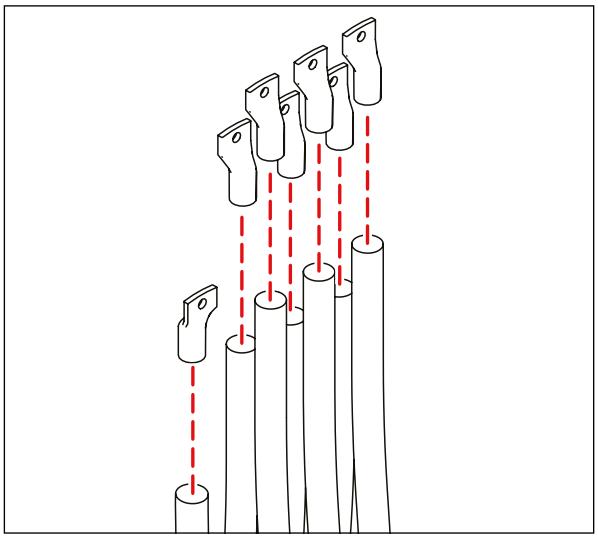
- Mark the cables at the right length.



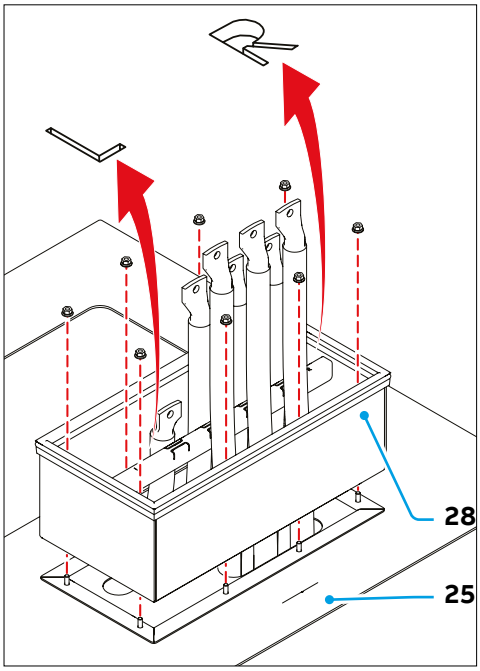
- Remove the AC cable Jig **(27)** by unscrew the 4 nuts.



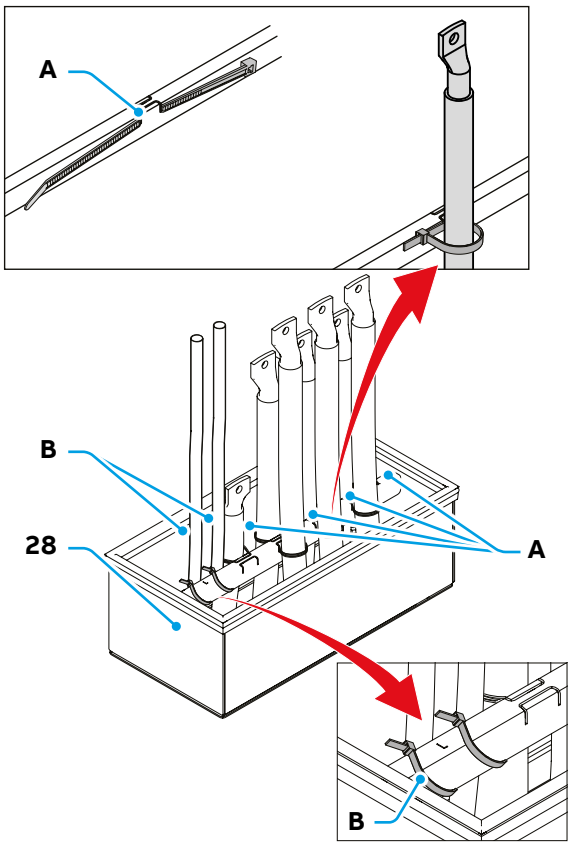
- Regardless of the method used to measure the cables proceed to cut the cables at the right length.



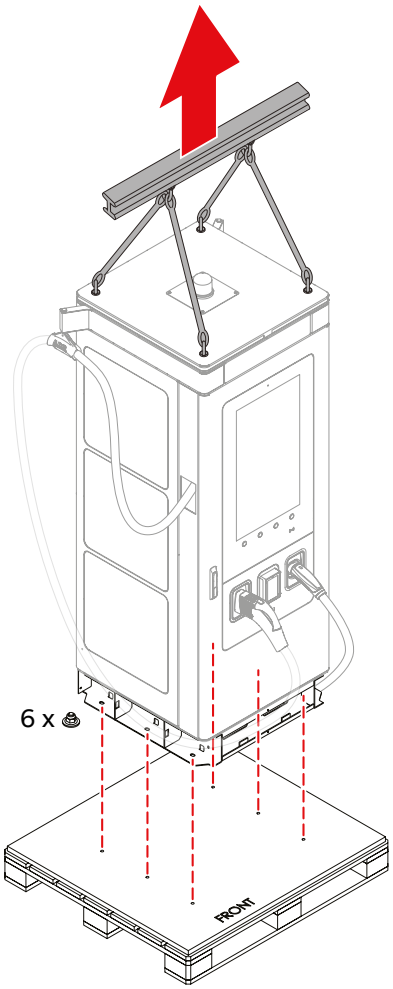
- Crimp the terminals in the correct orientation.



- Install the Cables entry box **(28)** on the Foundation interface plate **(25)** by screwing the 8 fasteners (nuts). The correct orientation is indicated by the letters **L** (left) and **R** (right).

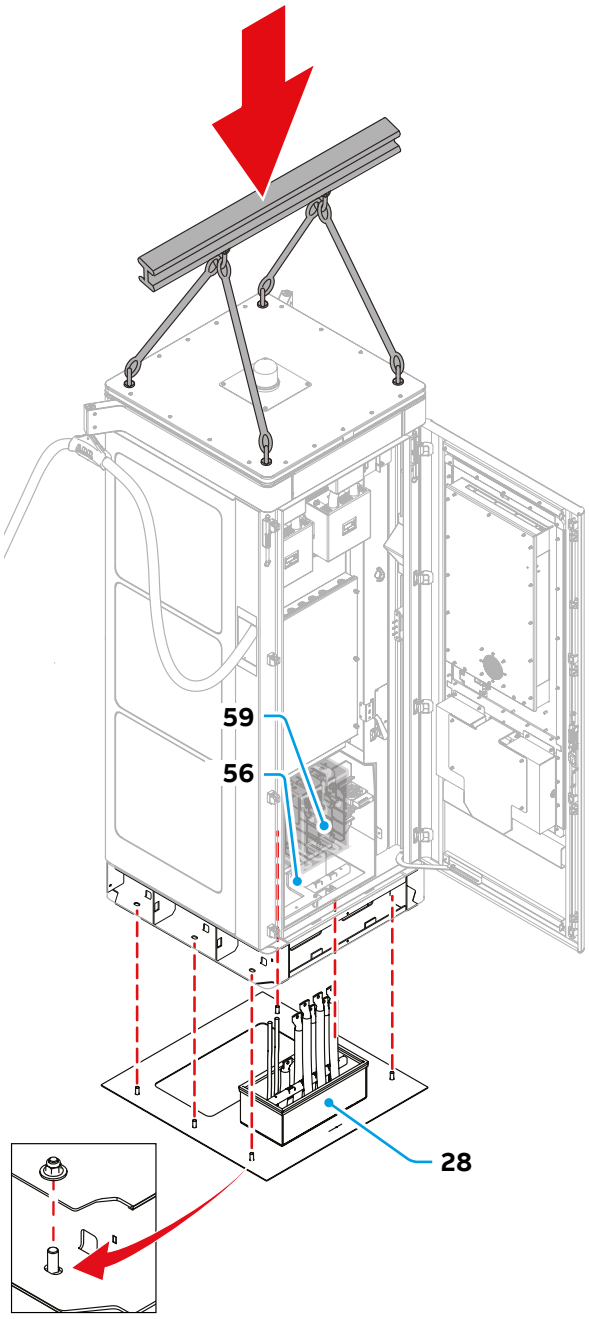


- Secure the L1, L2, L3 and PE cables in place using the slots for the cable ties **(A)** on the bar of the Cables entry box **(28)**.
- Secure the cables for the optional connection (Ethernet, External Stop button, Tilt sensor) on the bar of the Cables entry box **(28)** using cable ties **(B)**.
- Isolate the cables inlets (eg. using insulation foam).



- Open the front door. Refer to "5.1. Open the doors".
- Remove the Main AC protection barrier **(60)**. Refer to "5.2. Remove the Main AC protection barrier".
- Connect the ropes/chains of the hoisting equipment to the eyebolts installed on the top side of EVSE.
- Hook up the lifting means and stretch the ropes leaving them slightly loose.
- Remove the Removable base cover **(06)**. Refer to "5.3. Remove the Base cover".
- Remove the 6 bolts (3 on each side) used to secure the EVSE to the pallet.
- Close the front door.
- Lift the EVSE.

CAUTION
Before lift the EVSE check all the doors are closed.



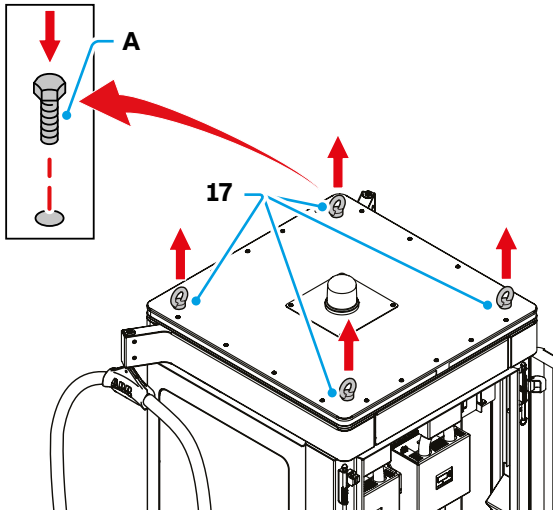
- Open the front door of the EVSE when is near to ground.
- Carefully lower the EVSE on the foundation.
  During this phase the cables coming from the Cables entry box **(28)** must be aligned to the Main AC terminals **(59)** and PE busbar **(56)**.

Risk of pinching or crushing of body parts
Make sure that cables do not get trapped between the EVSE and the base and that are aligned to the AC and PE connection terminals.

NOTE
Align the 6 holes in the EVSE to the threaded studs on the foundation.

CAUTION
Make sure that there are no kinks in the cables

- Install the 6 nuts to secure the EVSE to the foundation.
- Tighten the fasteners to 177 lbf-in (20 Nm).
- Close all doors of EVSE.



- Remove the Lifting points (Eyebolts) **(17)** on the roof.
- Install the plastic caps **(A)** by pushing them on the holes where the eyebolts were installed.

The mechanical installation of the EVSE is completed and the electrical connections can be done.

7. Electrical connection

In this section are listed all the electrical connection procedure.

Chapter recipients:

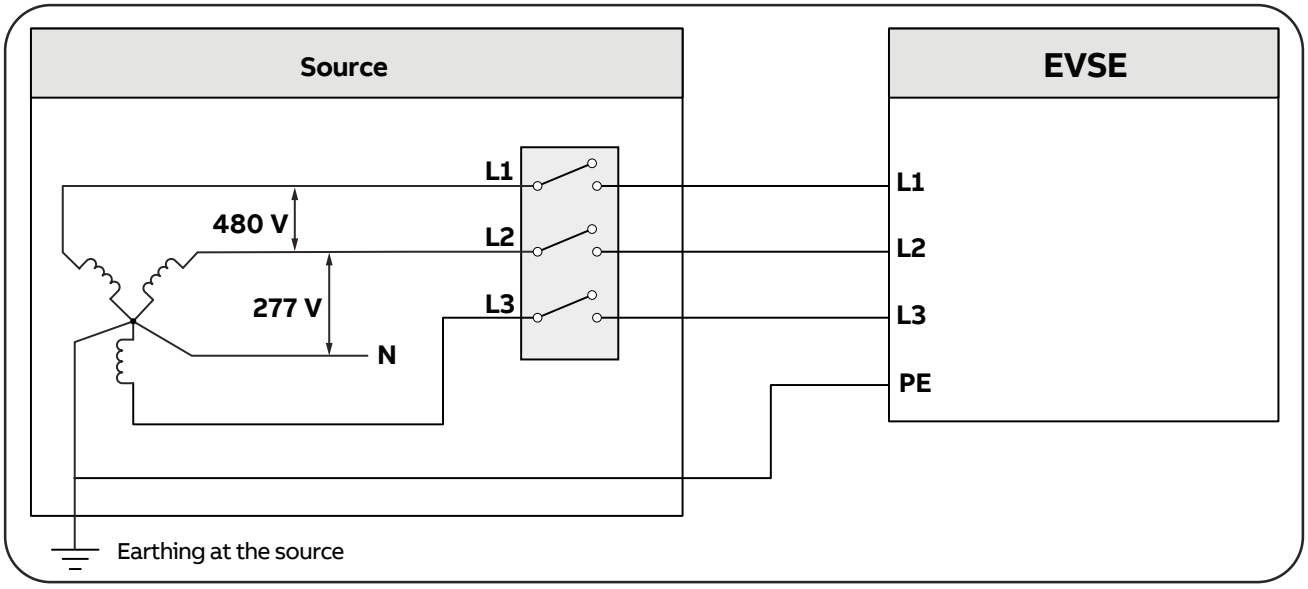
- Qualified installer

EN

7.1 Electrical connection - preliminary operations

7.1.1 AC low voltage network configuration

The following network configuration is allowed for the AC connection of the EVSE:

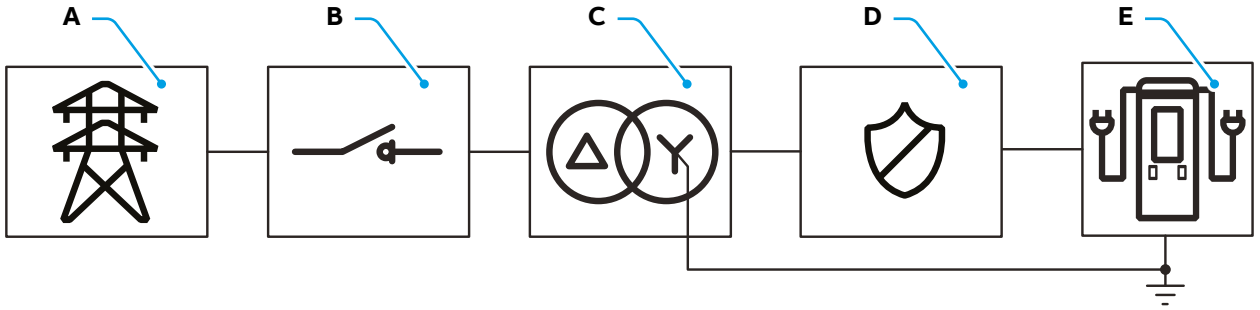


- Wire L1, L2, L3
- Wire PE to the charger earthing bar without interruption

NOTE
The EVSE must be wired with a WYE input. The neutral (N) connection is not required.

7.1.2 External AC input protections

General schematic to identify the position of AC protection devices.



Parameter	Description
A	Medium voltage network
B	Medium voltage breaker
C	Medium voltage/Low voltage transformer
D	Low voltage protection devices: - Overcurrent protection - Surge Protection Device (SPD) Type 1 This information does not supersede any legal regulations. The installer engineer should be aware that local regulations may impose requirements not reflected in this document. The most stringent requirements shall be applied.
E	EVSE

7.1.2.1 Overcurrent protection

An external overcurrent protection device shall be installed to protect the line from medium voltage transformer to EVSE. The protection system can be chosen between the 3 options below:

1. Main switch 800A + 3x fuses 700A (Class L)
2. 3x fuses 700A (Class L)
3. Circuit Breaker 3p 800A (thermal protection not mandatory)

NOTE
In weak grids the AC voltage may vary from nominal voltage; in these conditions EVSE works with higher input current then nominal one. This information has to be taken in consideration to properly select the overcurrent protection device.

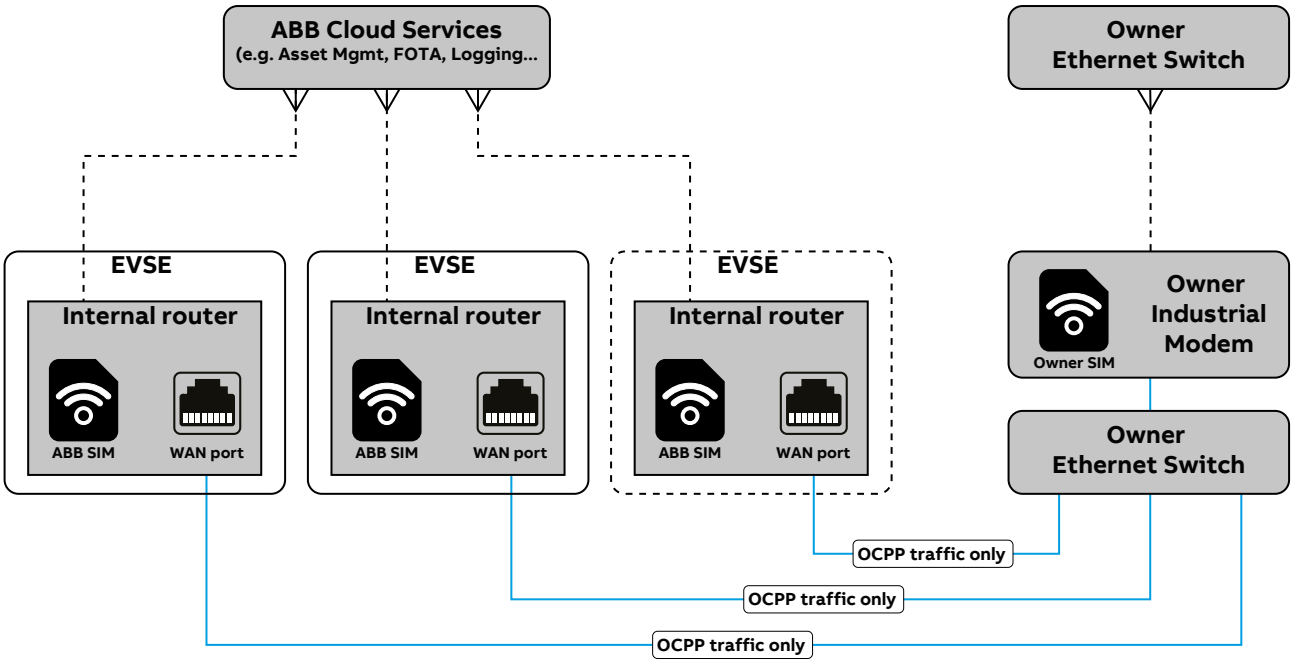
The below table provides the technical data to size the overcurrent protection:

	A400
Rated AC input current	510 A @ rated AC input voltage (480 Vac)
Max AC input current	561 A @ min. input voltage 408 Vac (480 Vac - 15%)
Maximum energy withstand short-circuit capability	13 MA^2s

7.1.3 Internet access

ABB E-mobility requires an Internet connection to the charger for remote service operations including diagnosis, troubleshooting and performing software/firmware update.
The owner is responsible for a stable and reliable Internet connection for the EVSE.
Contingency planning and the associated costs are the responsibility of the installer/owner.

The standard product configuration, provides two different interfaces based on traffic splitting:
- Internet via cellular Ethernet network is dedicated exclusively to ABB connected services
- Internet via WAN (Ethernet connection) is dedicated exclusively to managing the Owner OCPP connection .
An example of this architecture can be found below:



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7.1.3.1 Internet via cellular network connection

This is the standard connection to the Internet using the EVSE’s standard featured hardware. The solution provides internet access via 3G and 4G cellular network, but it’s reserved for ABB’s connected services only.
it is expected thet a cellular availability test is performed, prior to construction of the site, to ensure thet there is a reasonable signal quality in one of the following frequencies range:

- 698...960 MHz
- 1710...2690 MHz

NOTE
Signal strength must be greater than -85 dBm and measured with a cellular signal meter. Handheld mobile phones are not recommended for assessing signal strength since they are not reliable measuring devices

NOTE
The EVSE supports SIM cards provided by ABB E-mobility only. Any other types of SIM cards are not permitted.

7.1.3.2 Internet via WAN (Ethernet connection)

The WAN port (Ethernet connection) in the EVSE must be connected to the Owner’s own router or network, allowing the EVSE to use the Owner-provided Internet connection for OCPP traffic to the Owner CSMS (backend).
It is up to the owner to decide how to provide connectivity with their router connected to the EVSE WAN port.

NOTE
Reach out to the local entity of ABB E-mobility for exception to this standard configuration: https://e-mobility.abb.com/contact-centers/.

7.2 Protective earth (PE) connection

HAZARDOUS VOLTAGE
The EVSE’s protective earth (PE) connection is mandatory.

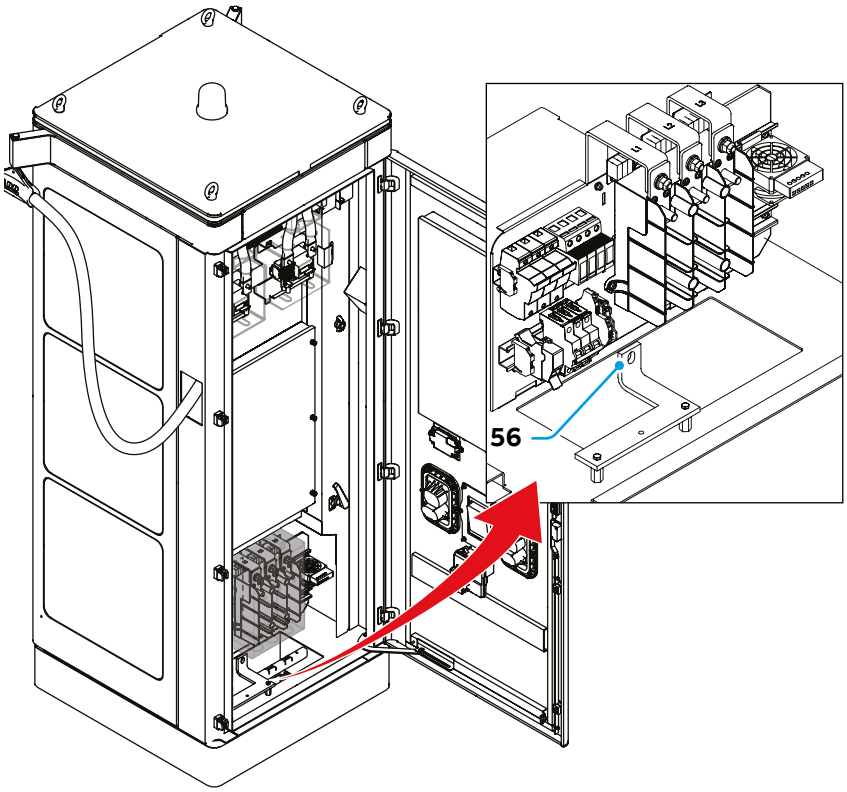
CAUTION
A touch current > 3.5 mA AC RMS is possible in case of a fault condition of loss of electrical continuity of the earthing conductor.

HAZARDOUS VOLTAGE
Before carrying out any operation, check that any external switch of voltage sources (upstream to the EVSE) are in OFF position and check for voltage absence on the AC conductors!

The EVSE must be earthed via the connection points marked with the protective earth symbol and using a cable with an appropriate conductor cross-section for the maximum ground fault current that the system might experience.

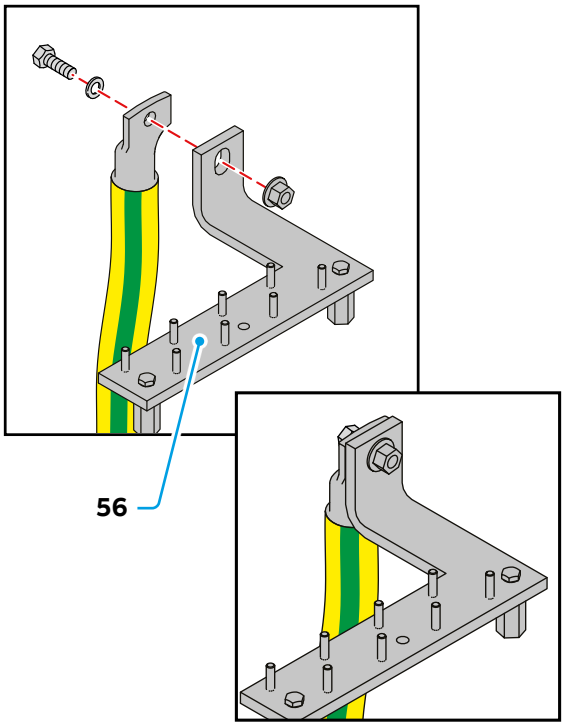
The earth connection must be made through the Protective Earth (PE) internal connection busbar **(56)**.

NOTE
Any failure of the EVSE not connected to PE is not covered by the warranty.



CAUTION
It is necessary to select the Ground (PE) wire size per NEC or local electric code.

7.2.1 Connect the PE wire



- Install the Main Protective Earth (PE) cable on the PE busbar **(56)**.
- Tighten the fasteners respecting following torque:

	Cross section (mm^2)	Torque [lb-in (Nm)]	Bolt (mm)
PE	as per NEC or local electric code	553 ± 20% (62.5 ± 20%)	M12 x 40

NOTE
Is suggested to make torque markings when tightening the fasteners to the required torque.

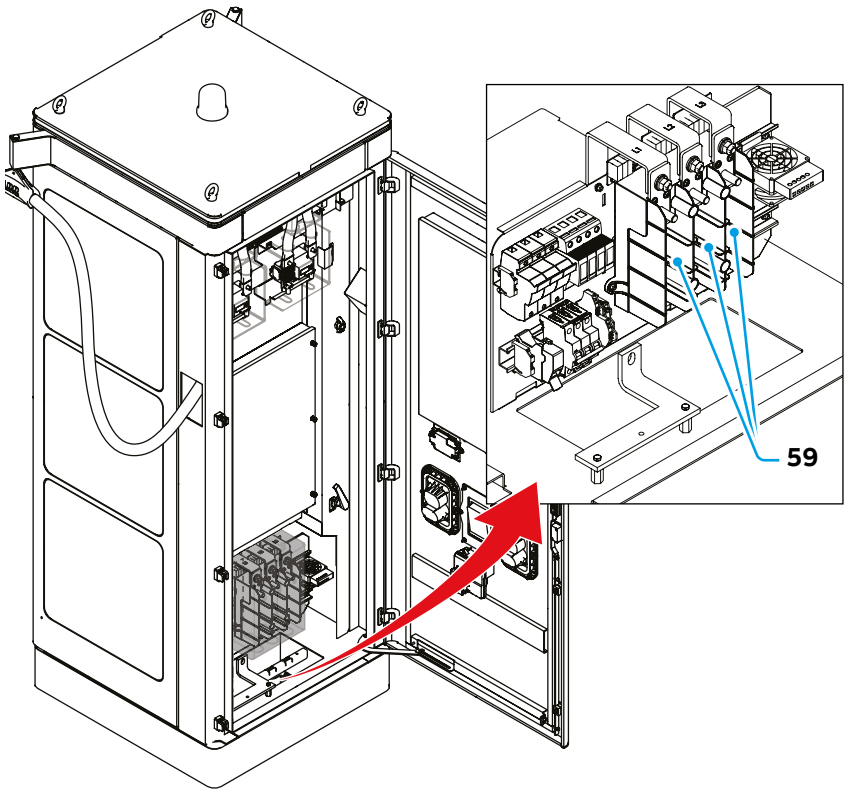
EN

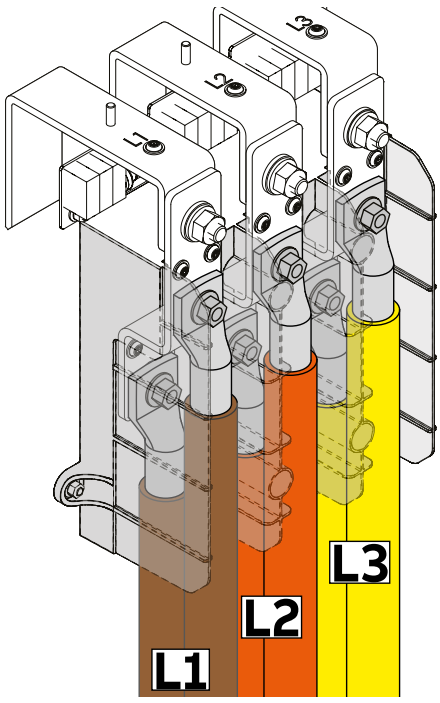
7.3 AC input connection

The EVSE must be connected to the AC input using cables with an appropriate conductor cross-section for minimize loss of power.

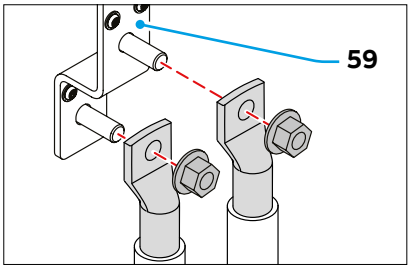
NOTE
Any failure of the EVSE not connected to PE is not covered by the warranty.

The AC connection must be made on the Main AC terminals **(59)**.





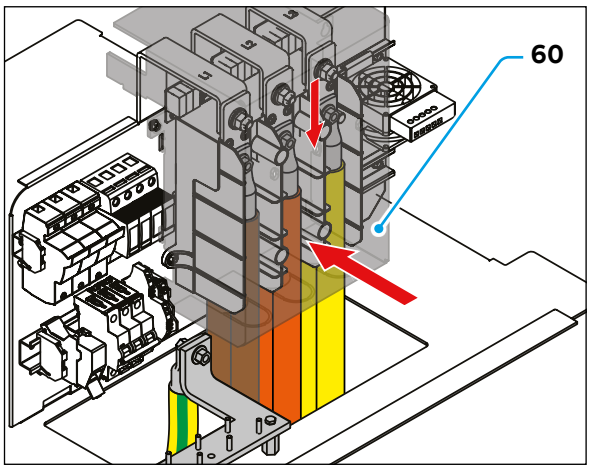
- Connect the AC cables to the Main AC terminals **(59)**.

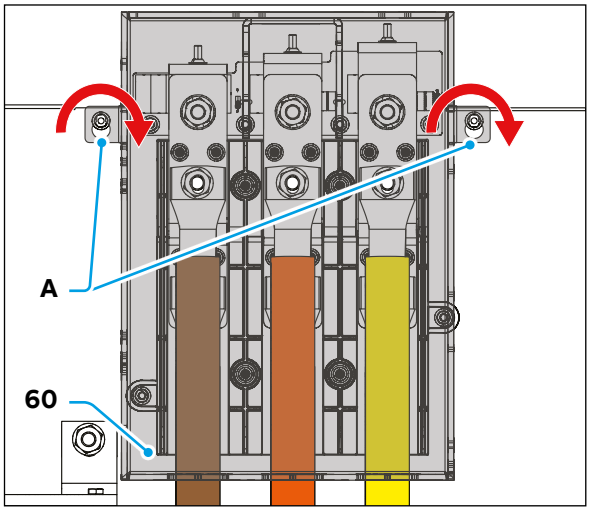


- Tighten the fasteners respecting following torque:

	Cross section (MCM)	Torque [lbf-in (Nm)]	Bolt (mm)
L1 (Brown)	up to 2 x 600	553 ± 20% (62.5 ± 20%)	M12 x 40
L2 (Orange)	up to 2 x 600	553 ± 20% (62.5 ± 20%)	M12 x 40
L3 (Yellow)	up to 2 x 600	553 ± 20% (62.5 ± 20%)	M12 x 40

NOTE
Is suggested to make torque markings when tightening the fasteners to the required torque.





- Install the Main AC protection barrier **(60)** using the 2 nuts **(A)**.

	Torque [lbf-in (Nm)]	Nut (mm)
Main AC protection barrier	13 (1.5)	M4

7.4 Ethernet

The WAN port (Ethernet connection) in the EVSE must be connected to the Owner's own router or network, allowing the EVSE to use the Owner-provided Internet connection for OCPP traffic to the Owner CSMS (backend).
It is up to the owner to decide how to provide connectivity with their router connected to the EVSE WAN port.

NOTE
Reach out to the local entity of ABB E-mobility for exception to this standard configuration: https://e-mobility.abb.com/contact-centers/.

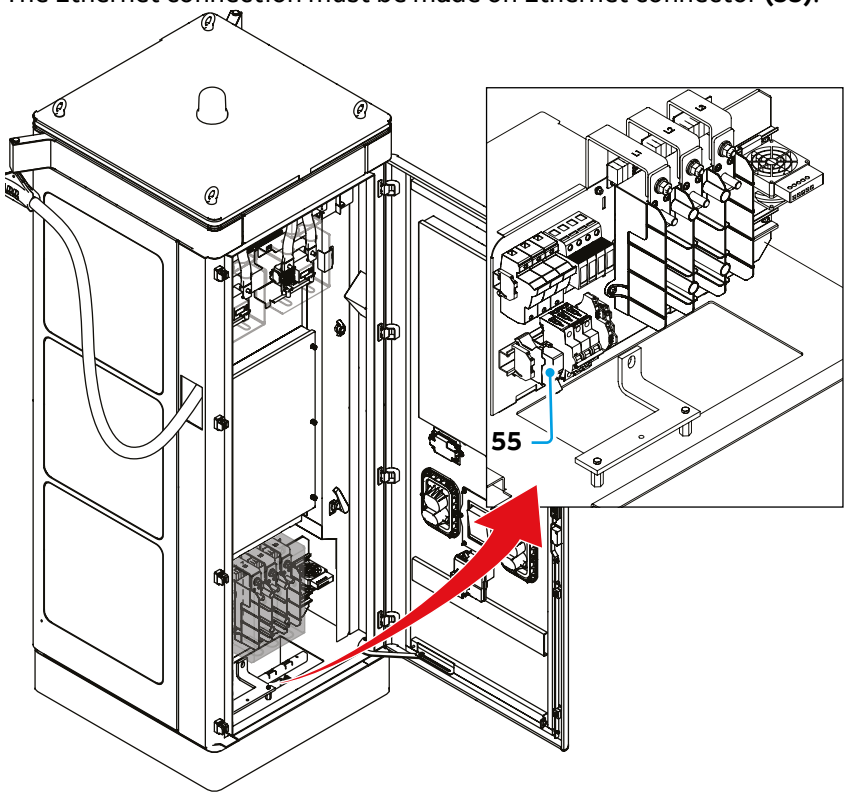
The EVSE transmits telemetry data to the ABB EVCI Cloud (the logging functionality is already integrated into the charger by default). ABB's EVCI cloud platform consists of several solutions for monitoring and management of chargers in real-time. For more information, please refer to https://new.abb.com/ev-charging/connected-services/web-modules.

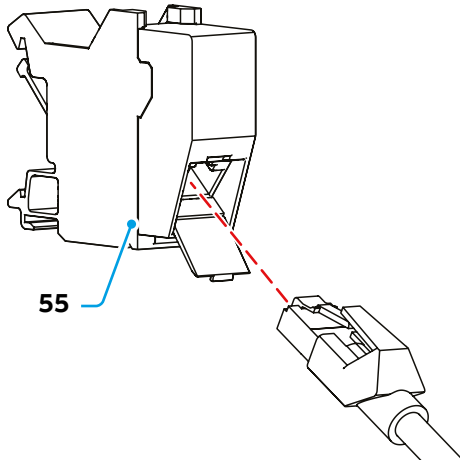
EN

NOTE
We recommend using at least a CAT 5e category Ethernet cable for standard connection performance.
For installations in environments with a high presence of electromagnetic interference and/or noise, we recommend using at least a CAT 6 shielded LAN cable.
For installations in environments subject to extreme conditions, consult an expert technician.

7.4.1 Connect the Ethernet cable

The Ethernet connection must be made on Ethernet connector **(55)**.





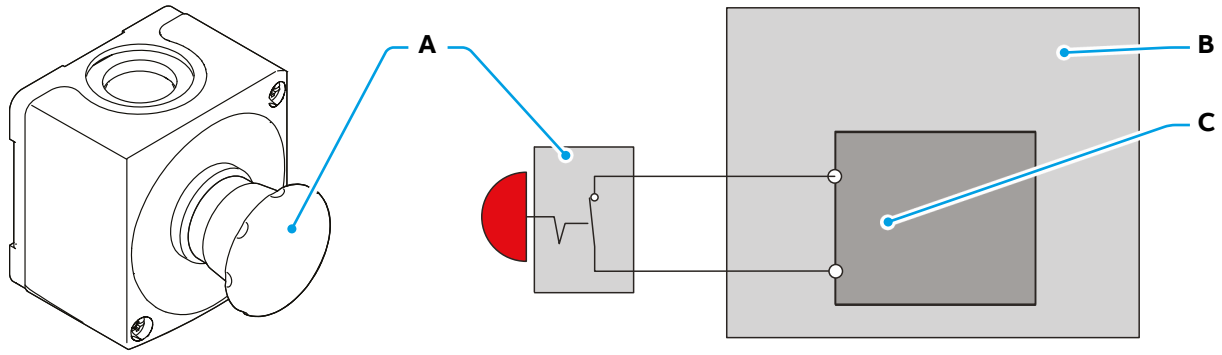
- Open the protective cover on the Ethernet connector **(55)**.
- Connect the Ethernet cable to the Ethernet connector **(55)**.

7.5 External Stop button

An External Stop button can be connected to the EVSE to stop the charging session (software shutdown).

NOTE
The External Stop button is optional.
The placement of this button is external to the EVSE and must be decided during the system design phase.

The External Stop button must have a normally closed contact. When the button is activated (contact is open) the EVSE will to stop the charging session.

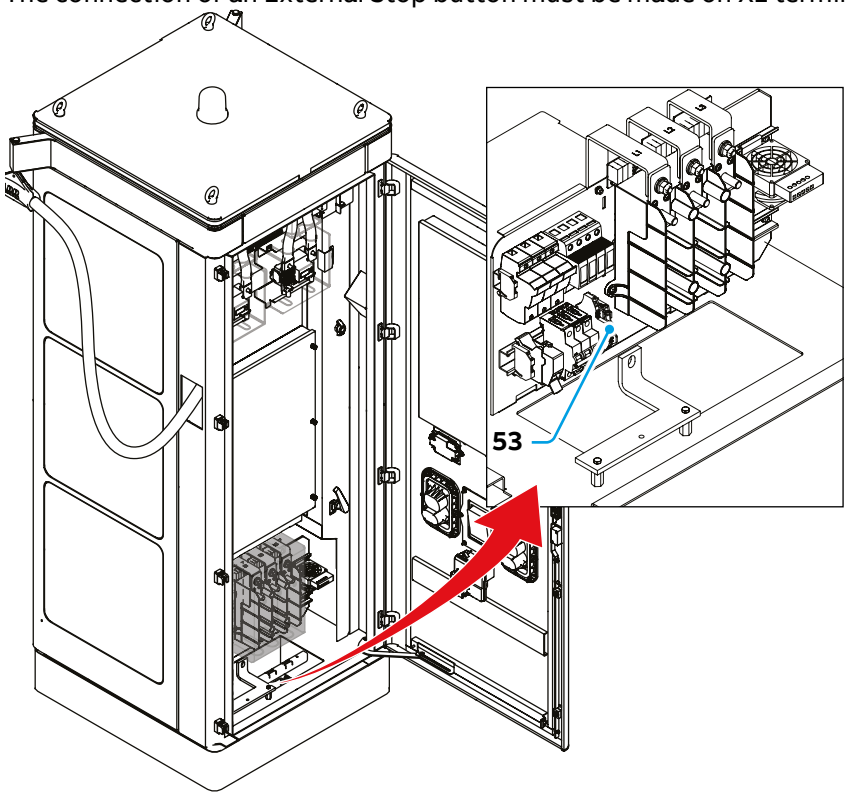


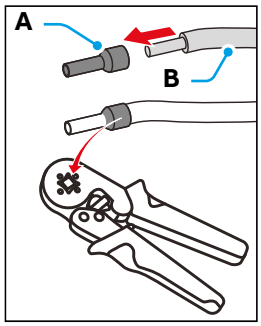
Ref.	Description
A	External Stop button
B	EVSE
C	X2 terminal block

NOTE
The Stop button and all other external components to the EVSE are not within the scope of ABB E-mobility, therefore are not provided.

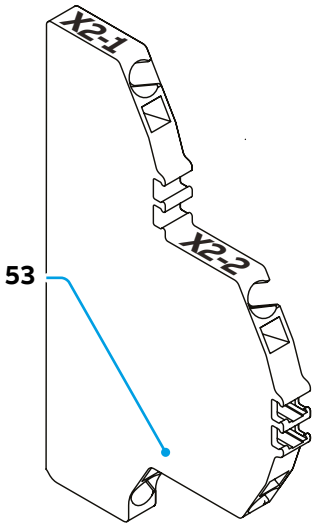
7.5.1 Connect External Stop button

The connection of an External Stop button must be made on X2 terminal block **(53)**.

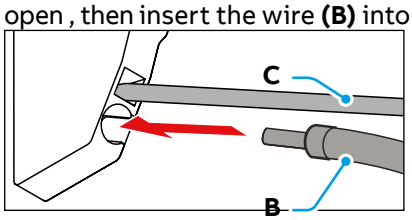




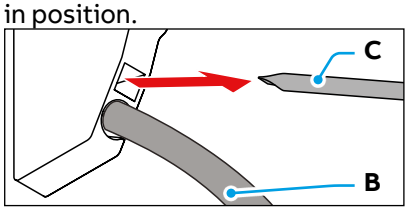
- Cut the 2 wires to connect the External Stop button, so that they reach the lower side of terminal block X2 **(53)**.
- Strip the insulation from the end of the wires.
- Crimp a ferrule **(A)** on the end of the wires **(B)**.



- To install the wires on the spring terminal blocks follow the step:
  - Insert a flat screwdriver **(C)** and push till the spring is open , then insert the wire **(B)** into the connector.



  - Remove the flat screwdriver **(C)** keeping the wire **(B)** in position.



- Remove the jumper on the lower side of the terminal block between the X2-1 and X2-2 terminals.
- Connect the following wires:

Wire	X2 Terminal	Description
EMO1	X2-1	EMO1 In
EMO_GND	X2-2	EMO1 GND

EN

7.6 Tilt sensor (optional)

The tilt sensor connections allow to connect the circuit to enable AC circuit breaker tripping mechanism during activation of EVSE tilt sensors. When the tilt sensor is activated (tilt more than 10°) the undervoltage release in the branch circuit breaker that supplies power to the EVSE is de-energized and the branch circuit breaker opens.
The tilt sensor has a contact that is closed when the tilt sensor is de-enenergized and there is no tilt detected.

NOTE
The manufacturer recommends to use and an uninterruptible power supply for the 24 V DC, to prevent tripping of the branch circuit breaker.

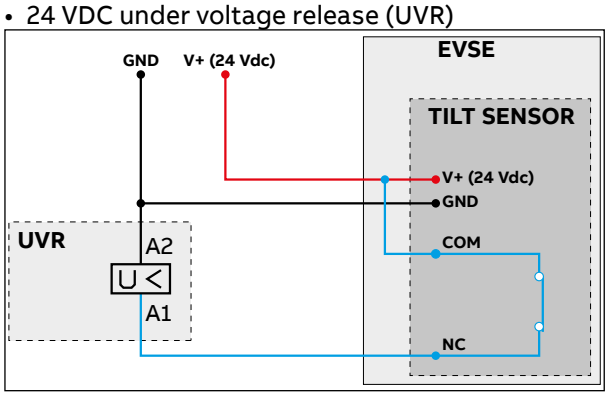
NOTE
The owner is responsible for considering a voltage drop on the 24 V DC circuit.
The owner must make sure that the undervoltage release of the branch circuit breaker receives the correct input voltage according to the required specifications.

NOTE
The circuit breaker, 24 V DC power supply delivered from an UPS and all other external components to the EVSE are not within the scope of ABB E-mobility, therefore are not provided.

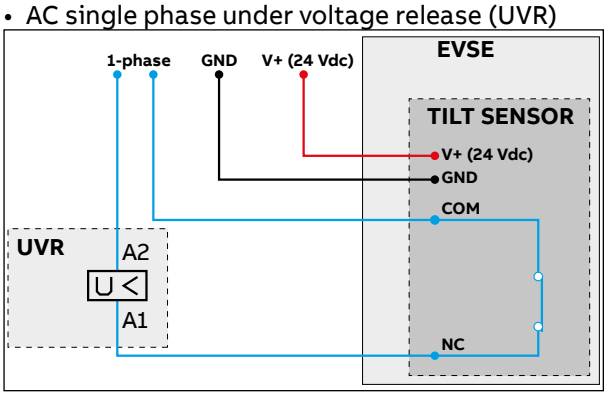
NOTE
Refer to “10.1.1. Technical data table” for technical specifications.

The illustration shows the tilt sensors interface with the power distribution system of the site:

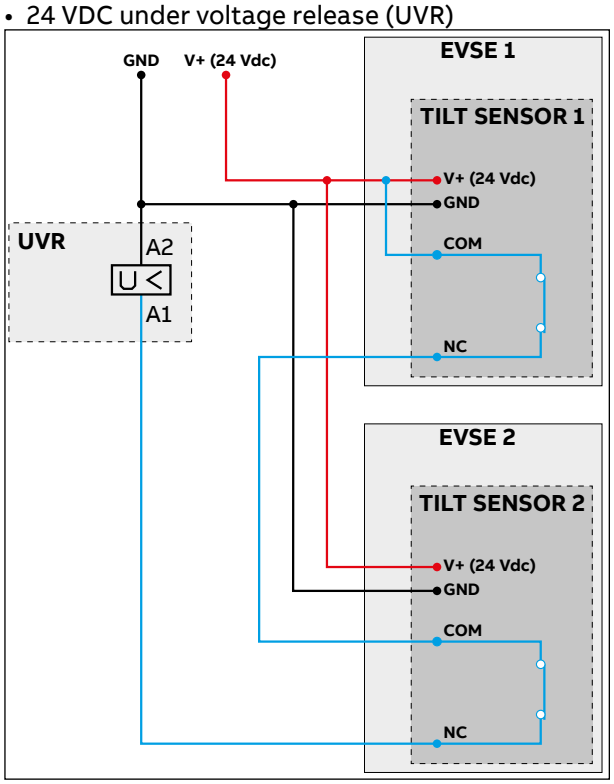
- Single EVSE
- 24 VDC under voltage release (UVR)



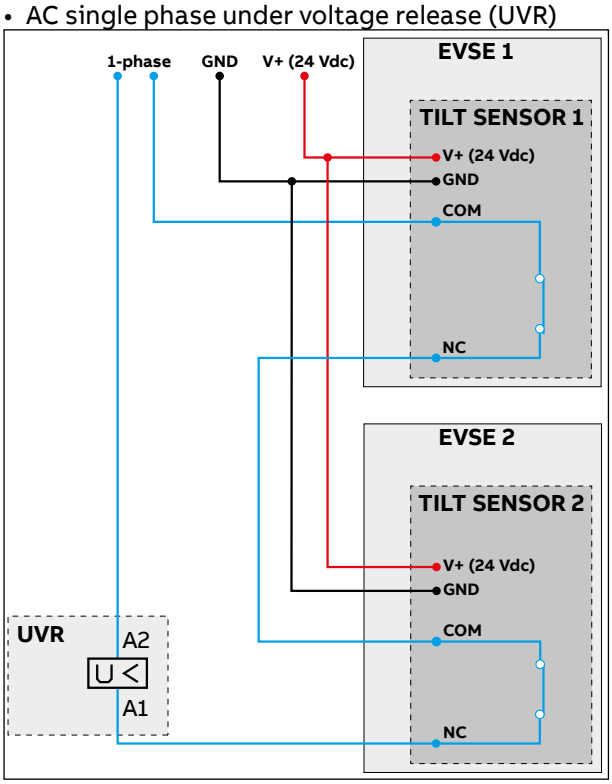
- Single EVSE
- AC single phase under voltage release (UVR)



- Multi EVSE
- 24 VDC under voltage release (UVR)

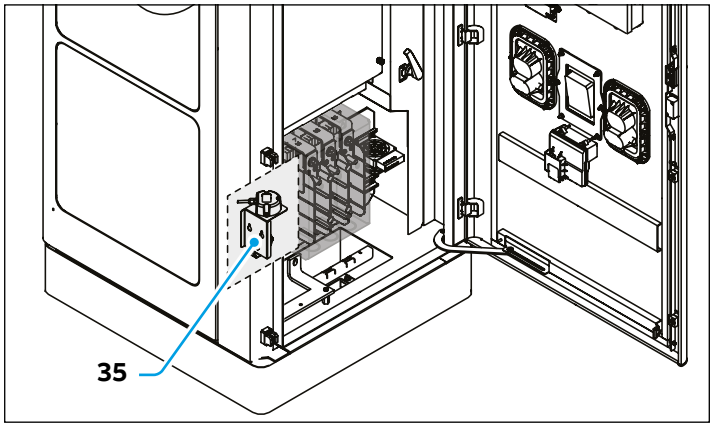


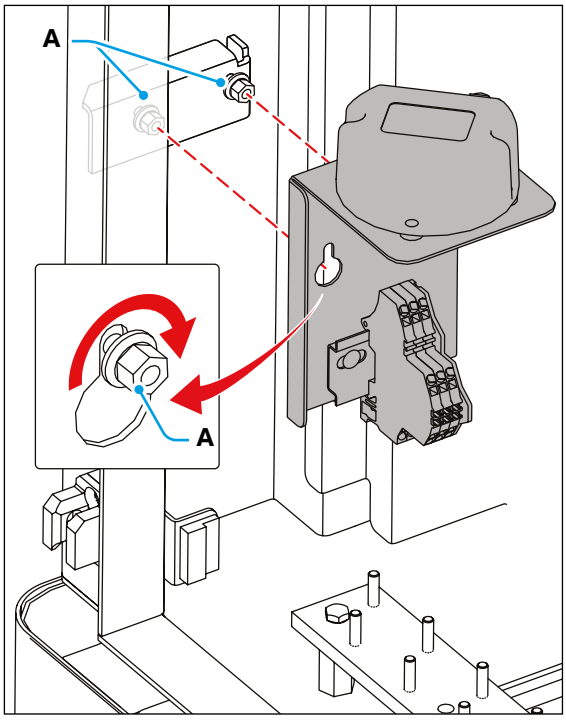
- Multi EVSE
- AC single phase under voltage release (UVR)



7.6.1 Connect the tilt sensor

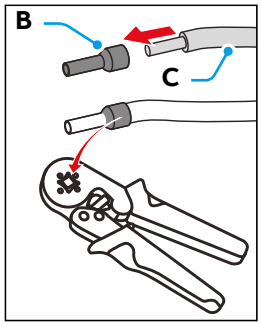
The tilt sensor **(35)** must be installed inside the EVSE (front, lower left side) and connected on X2 terminal block (supplied with the EVSE).



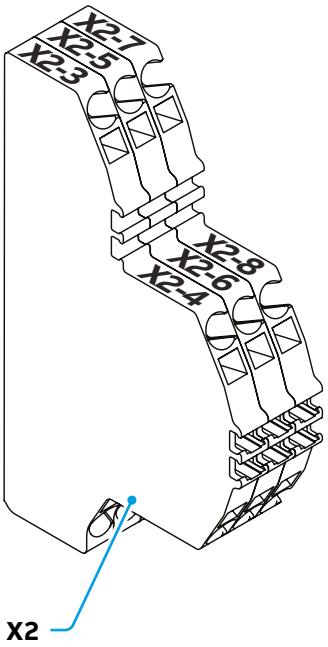


- Install the tilt sensor on the dedicated bracket (inside the EVSE), using the 2 fasteners **(A)**.

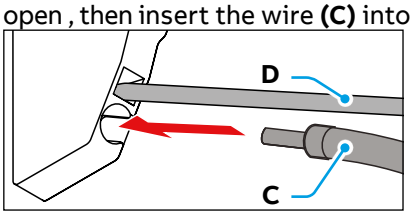
	Torque [lbf-in (Nm)]	Nut (mm)
Tilt sensor fasteners	13 (1.5)	M4



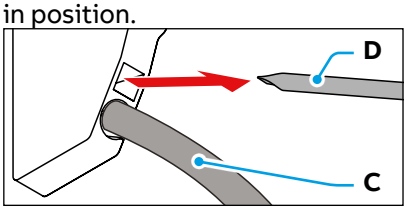
- Cut the 5 wires to connect the tilt sensor, so that they reach the lower side of terminal block X2.
- Strip the insulation from the end of the wires.
- Crimp a ferrule **(B)** on the end of the wires **(C)**.



- To install the wires on the spring terminal blocks follow the step:
  - Insert a flat screwdriver **(D)** and push till the spring is open , then insert the wire **(C)** into the connector.

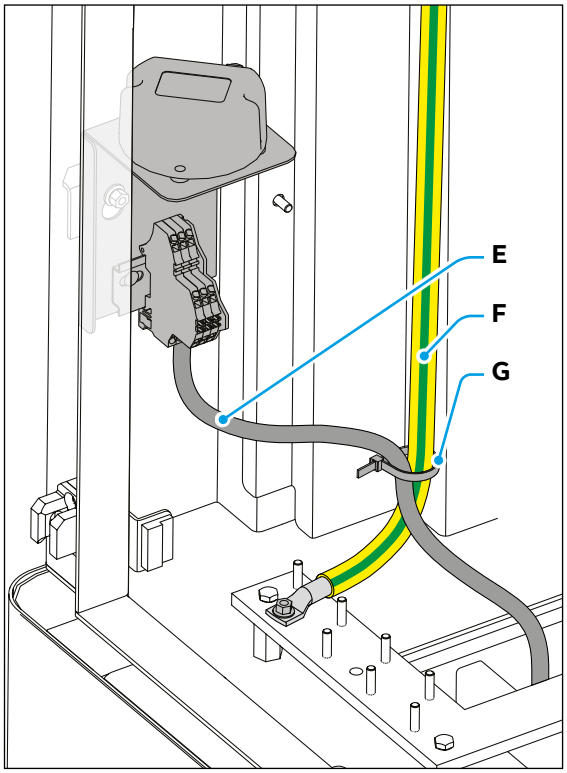


  - Remove the flat screwdriver **(D)** keeping the wire **(C)** in position.



- Connect the following wires:

Wire	X2 Terminal	Description
GND	X2-3	Power supply (24V) ground
+Vs	X2-4	Power supply (24V) positive
Relay_NO	X2-6	Relay - Normally open contact
Relay_COM	X2-8	Relay - Common contact
Relay_NC	X2-7	Relay - Normally closed contact



- Secure the tilt sensor cable **(E)** in place, together with the internal PE cable **(F)**, using a cable tie **(G)**.

8. Operation and correct use

This chapter will give instruction on the correct use of the EVSE.

Chapter recipients:

- Owner
- Qualified installer
- User

8.1 Prepare for commissioning of the EVSE

Danger: Hazardous voltage
Under no circumstances is any person other than a service engineer of ABB E-mobility (or service partners) authorized to commission the EVSE.

The below requirements and operations are Owner/Qualified installer responsibilities before commissioning of EVSE can take place:

1. The qualified installer have to inform the owner that the EVSE is ready for commissioning
2. The owner/qualified installer must inform ABB E-mobility that the EVSE is installed correctly in order to schedule the commissioning and ensure that the site complies with these requirements:
   - The EVSE is correctly installed
   - AC input power is available from the grid provider
   - The qualified installer have to be present during the commissioning, for assistance and to energize the power to the EVSE on the power distribution board
   - Internet access is available, through cellular (default) or wired Ethernet connection. Refer to "7.1.3. Internet access"
   - An electrical vehicle, with compatible connection inlet, have to be available to test the EVSE functionalities. If the EVSE has more than one charging connector type, electrical vehicles with charging inlet for each type must be available
   - Night illumination must be sufficient to easily see the charging cables and other obstacles around the EVSE
   - The owner is available to receive instructions from the ABB E-mobility service engineer
   - If necessary, remove internal condensation before use, to prevent damage to the EVSE.
3. The owner/qualified installer have to make sure that these data are available:
   - Contact data of the contact person on site
   - Address of the EVSE
   - Site name
   - Installation date
   - 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 AC protection devices at the power distribution board
   - Special remarks (e.g.. to decline the authorization for the service engineer of the manufacturer to take photos)
   - Photo of the top view, side view, foundation/cables arrival view, torque markings of the EVSE
   - Any safety incidents occurred
   - Any concerns/challenges face during installation

8.2 Prepare for use of the EVSE

Once the EVSE has been commissioned, and before it is used by the operator or any user, the owner of the EVSE must ensure that the EVSE is installed in accordance with the manual. The owner, the operator or any user may only operate the EVSE after obtaining the (written) approval from ABB E-mobility that the commissioning was sucessful and that the EVSE is ready for use:

General risk:
After the approval:
- do not perform any change on the EVSE.
- Make an emergency plan that instructs people what to do in case of an emergency
- If necessary, give special instructions to end user on how use the EVSE
- Make sure that the space around the EVSE cannot get blocked

8.3 Charging session

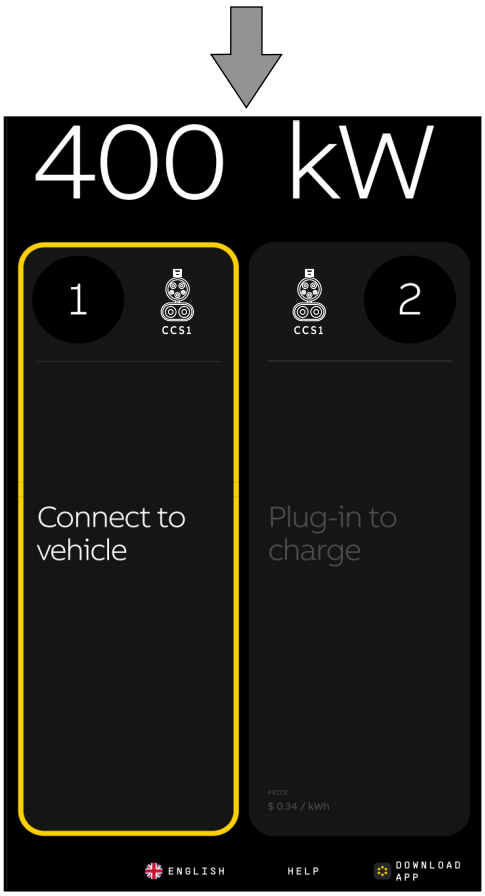
To initiate a charging session, the user can either plug first, or tap their credit card/RFID tag to authorize first.

NOTE
To interact with the display remember that the menu is the digital extension to the buttons underneath the screen and is contextual to the step of the charging process.
Buttons only illuminate if there is a respective menu option in the UI.

EN

8.3.1 Start a charging session (Plug first)

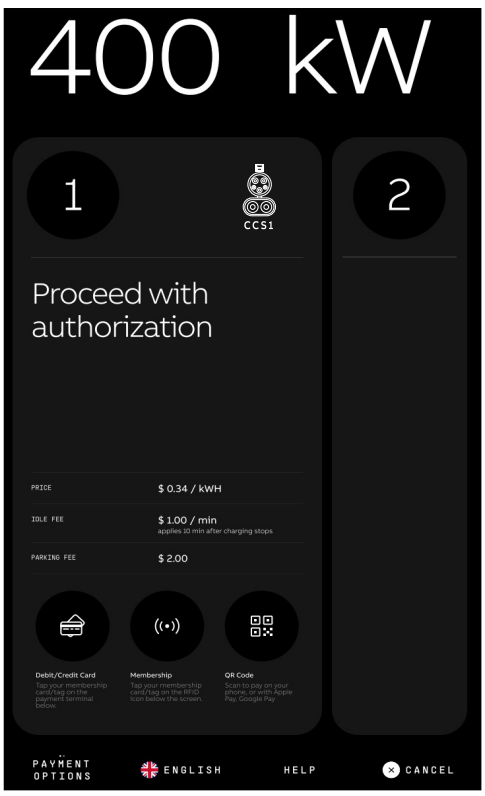
To initiate a charging session the user must remove the charging connector from the EVSE and plug it on the EV (in this case connector on Output 1)



Take the charging connector from the EVSE

Connector taken

Yellow outline as feedback to reassure users of taken connector and that action needs to be taken.



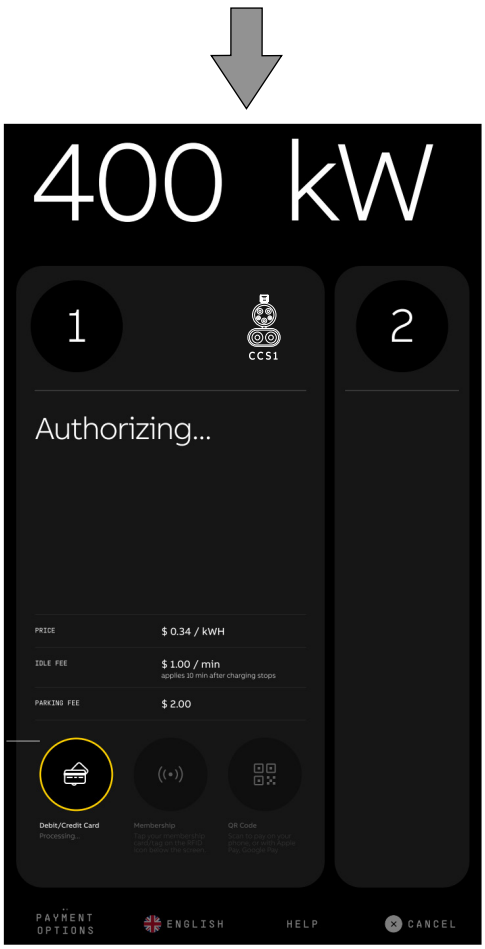
Charging connector plugged in successfully

Authorization

If successful, connector module expands for payment instructions.

The payment screen offers pricing, main payment options and a button to reveal further (regional/CPO) payment options.

Payment options shouldn’t require any further user interaction with the screen, ie. selecting. QR codes are directly scannable, the PT and RFID reader are ready to be presented with a card.

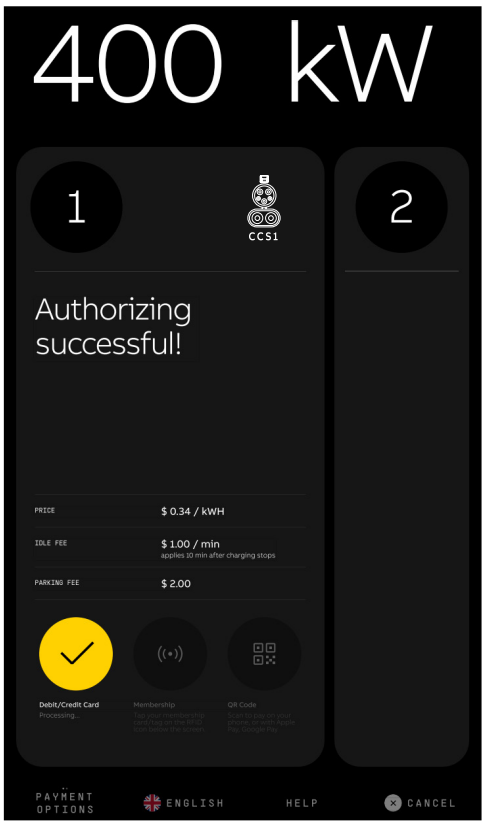


Use one of the payment method:

1. Tap Debit/credit card
2. Tap membership card/tag RFID
3. Scan the QR code to pay with the phone

Waiting for authorization

After tapping the card or RFID, the screen will display the loading phase.

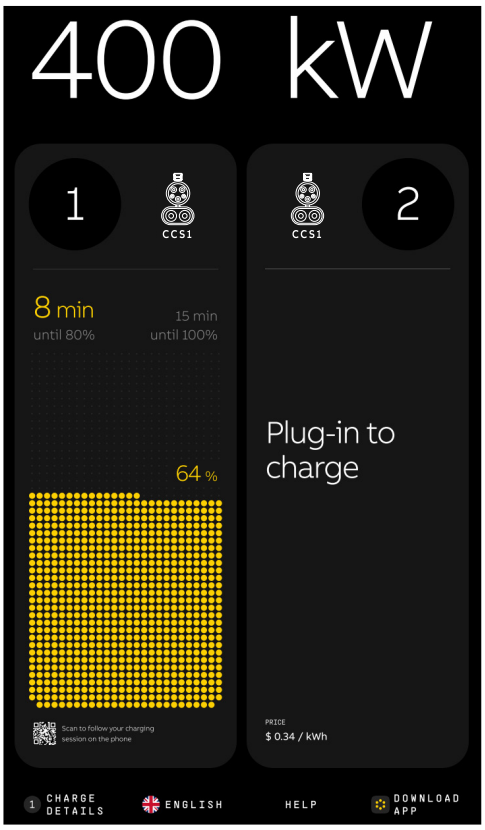


Wait for the end of transaction

Authorizing successful!

A confirmation animation (on the selected payment method) is displayed before moving to charging home view.

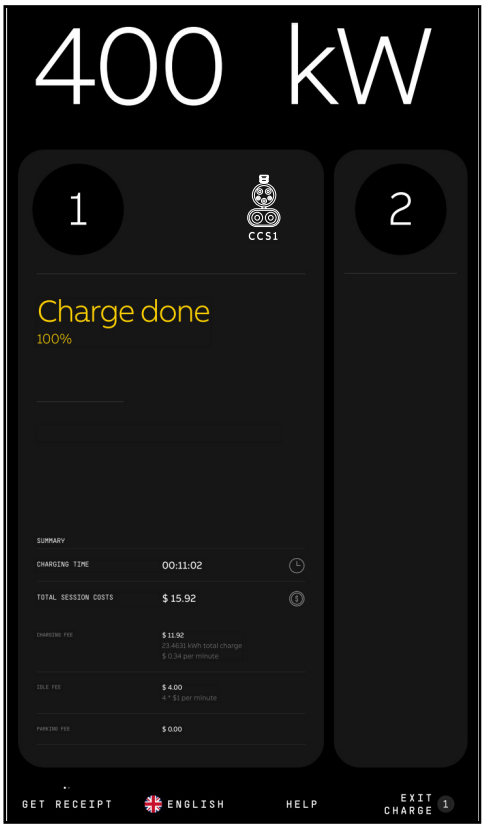
Start of charging session (automatic process)



Starting the charging session.

As soon as the EV is connected the charging session will begin

Wait for the end of the charging session and return the charging connector



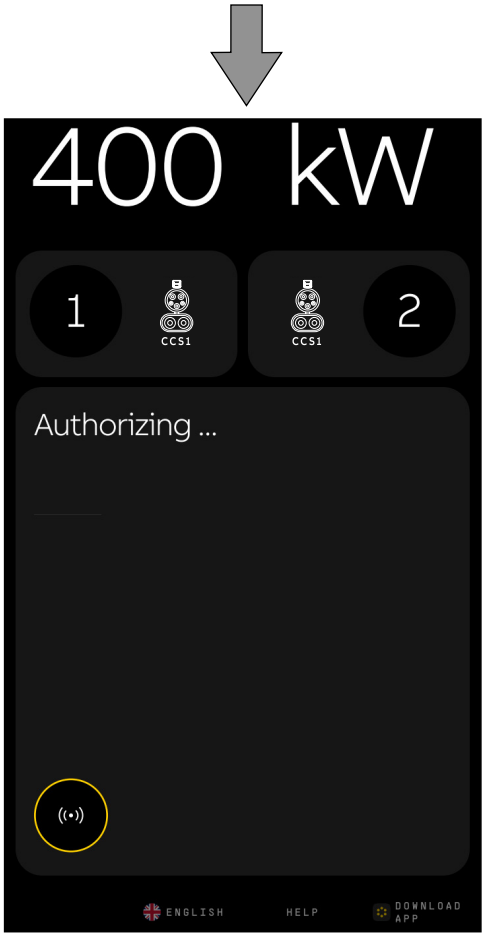
Final charge details after returning connector

Pricing and charging detail.

Danger: Hazardous voltage
The charging connector will be locked in position to not permit the disconnection during the charging session.

8.3.2 Start a charging session (Payment first)

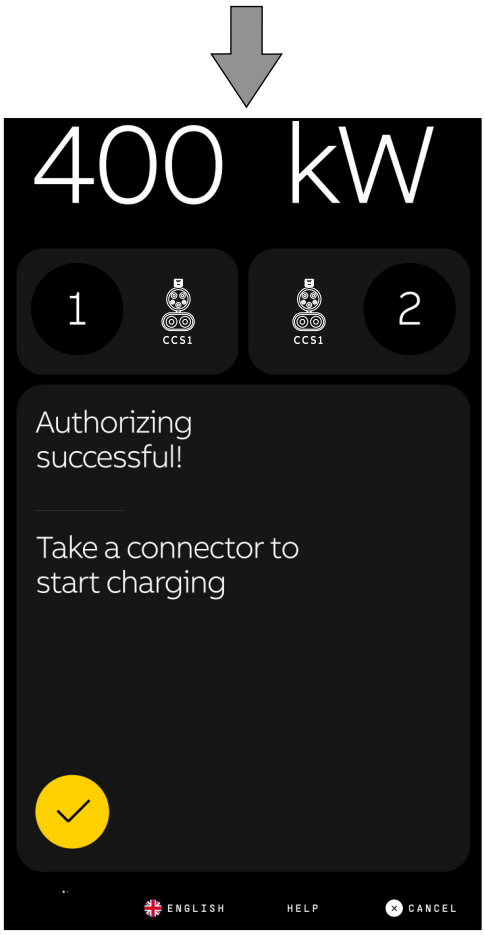
Users can pay as first step.



Use one of the payment method:
1. Tap Debit/credit card
2. Tap membership card/tag RFID

Waiting for authorization

After tapping the card or RFID, the screen will display the loading phase.



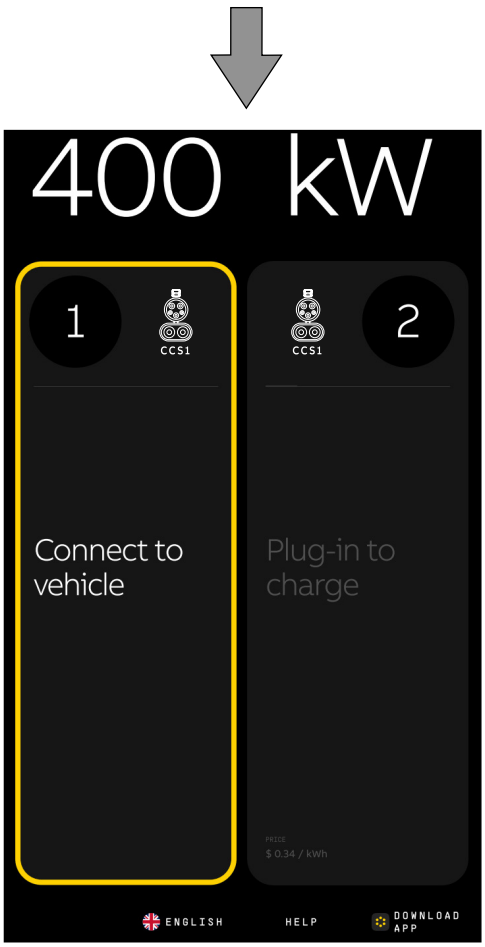
Wait for the end of transaction

Authorizing successful!

A confirmation animation (on the selected payment method) is displayed.

The display shows that it is possible to extract the desired connector to recharge the EV.

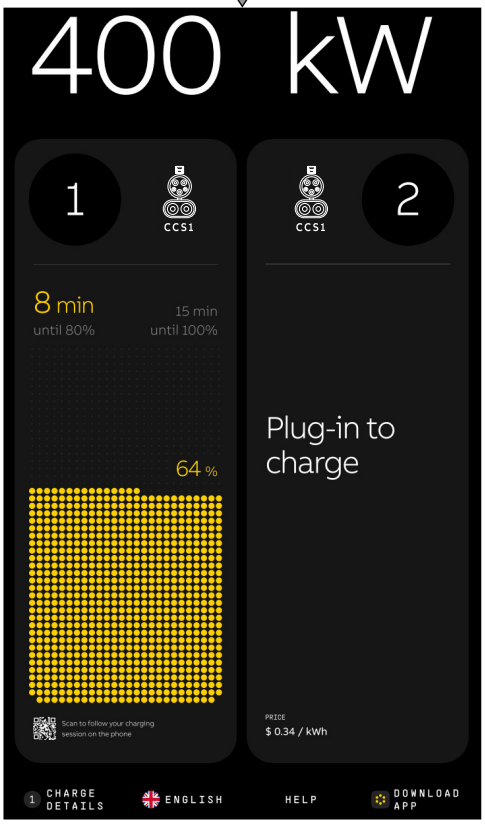
As soon as the EV is connected the charging session will begin



Take the charging connector from the EVSE

Connector taken

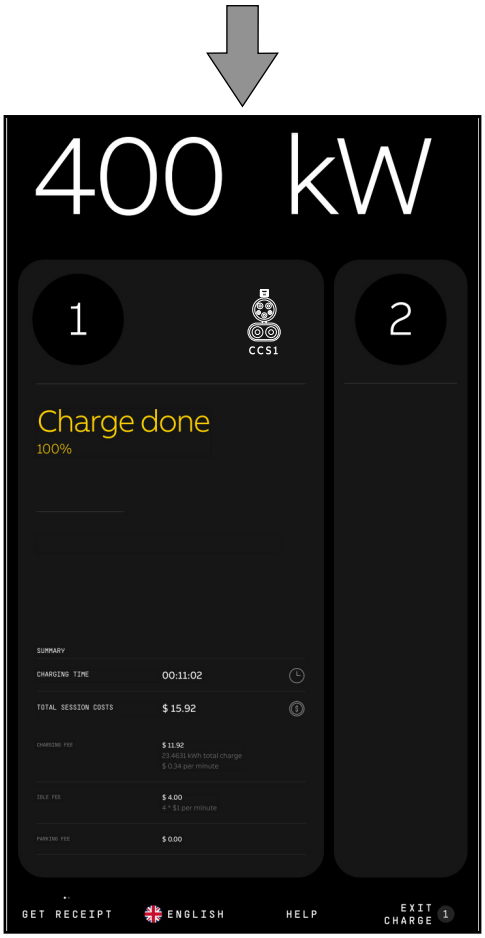
Yellow outline as feedback to reassure users of taken connector and that action needs to be taken.



Connect the charging connector to the EV

Starting the charging session.

As soon as the EV is connected the charging session will begin



Wait for the end of the charging session and return the charging connector

Final charge details after returning connector

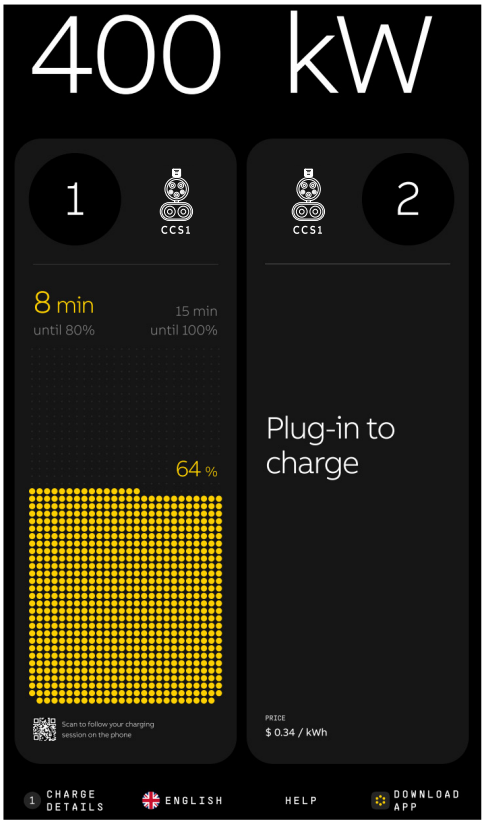
Pricing and charging detail.

Danger: Hazardous voltage
The charging connector is locked in position in order not to permit removal during the charging session.

EN

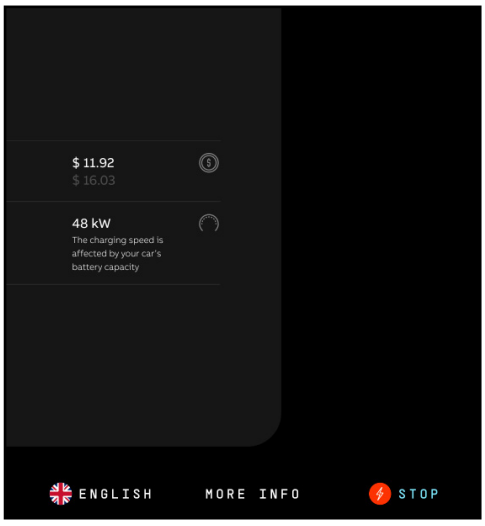
8.3.3 Stop a charging session

It is possible to stop the charging session at any time by selecting stop on the display menu



Charging session is ongoing

Press stop



Charging session stopped!

The connector can be unplugged from the EV.
Insert the cable into the connector holder related to the output used for charging (located on the same side).

NOTE
If installed, is possible to stop the charging session using a dedicated external button positioned near to the EVSE.

NOTE
The connector is unlocked by the vehicle.

NOTE
In some cases, the EV locks the connector to the EV. To unlock the connector, obey the instructions for the EV.

9. Maintenance and troubleshooting

In this section the user will be instructed on maintenance and cleaning procedures.

Preliminary requirements

- Owner
- Qualified installer
- ABB E-mobility Service or authorized service partners

EN

9.1 Routine maintenance

Maintenance activities on the EVSE shall be performed, at regular time-based intervals, to increase the lifespan and reduce possible downtime.

NOTE
The routine maintenance schedule may vary depending on the environmental conditions and number of charging sessions of the EVSE.

NOTE
In addition to routine maintenance, a scheduled component replacement shall be performed to guarantee the continuity of operation of the EVSE.
Contact ABB E-mobility for more information on available Service Level Agreements.

HAZARDOUS VOLTAGE
Operation on the inside of the EVSE shall be performed only by authorized or trained personnel. If is necessary to operate on the internal parts of the EVSE, wait at least 15 minutes after turning off the EVSE and perform the total isolation procedure (refer to “9.3. Total de-energization of the EVSE”

The below table shows the frequency and the list of activities to be performed on the EVSE:

Frequency	Responsible	Activity
3 months (or as needed)	• Owner • Qualified installer	**Visual inspection on the external parts of the EVSE:** • Exterior of the cabinet • Charging cables • Charging connectors • Connector holders • Cable management systems (if present) • Signs of rust that cause ingress of water **NOTE** When the EVSE is put in a corrosion sensitive environment, superficial rust is possible on welding points. This rust is only visual. There is no risk for the integrity of the EVSE. • Check there are no obstacles (animals, insects, leaves or anything) which could reduce the heat exchanging capacity of the EVSE. **Functionality checks:** • Display • Display buttons • Status LED strip • RFID • Meter display (if present) • Payment terminal (if present) **Clean the external parts of the EVSE:** • Cleaning agent with pH value between 6 and 8 • Do not use abrasive tools. • Do not apply high-pressure water jets.
1 year	• Qualified installer	**Clean or replace the internal parts of the EVSE:** • Air filters (inlet and outlet) **General risk:** To be carried out only if: • having completed the dedicated course by ABB E-mobility • the activity is not included in the Service Level Agreement (SLA) **NOTE** Environment characteristic and number of charging sessions may increase or decrease the number of replacements during the life time of the charger.

9.2 Troubleshooting

If you get a problem on the EVSE, the below troubleshooting can help to resolve the problem.

NOTE
If you cannot find a solution for the problem, please reach out to the local entity of ABB E-mobility B.V. for support:
https://e-mobility.abb.com/contact-centers/.

Problem	Possible cause	Possible solution
The display is black and it does not light up when you press a display button	Main AC voltage is missing	Check main AC voltage presence
	Upstrem AC protection trip	Check and reactivate the upstream AC protection
	EVSE internal problem	Contact ABB E-mobility Service dept.
The display shows this message: **Unable to lock the connector**	The EV charge cable is not connected correctly to the EV.	Connect the EV charge cable to the EV correctly.
	You are not authorized for the charge session	Make sure that you have authorization to charge the EV.
The display shows this message: **Unable to unlock the connector from car**	A dangerous voltage is present on the EV charging cable	• Wait 5 minutes and start/stop the charging session again. • Press the Stop button (if present).
The display shows this message: **Insulation detection error**	There is an insulation problem on the EV or the EVSE	• Try to restart the charging session • Try another EVSE to charge the EV in order to understand in the problem is coming from the EV. • If the problem come from the EVSE, reach out to the local entity of ABB E-mobility B.V. for support.
The display shows this message: **The vehicle misbehaved**	There is a communication problem between the EV and the EVSE	Reach out to the local entity of ABB E-mobility B.V. for support
The display shows this message: **Out of order**	The owner disabled the EVSE	Check if the EVSE is disabled via ABB EVCI Cloud or OCPP back-end and if required enable it.
	EVSE internal problem	Contact ABB E-mobility Service dept.

EN

9.3 Total de-energization of the EVSE

The total de-energization instruction specifies the use of mandatory PPE, tools, equipment and operations to carry out the electrical de-energization of the EVSE.

NOTE
This instruction does not supersede any legal regulations. The local regulations may impose requirements not reflected in this standard. The most stringent requirements must be applied.

9.3.1 Reference standards

- EN 50110-1 (CENELEC/CEN)
- Refer to EN 50110-2 (CENELEC/CEN) for additional National Annexes dedicated to CENELEC members Countries

9.3.2 Hazards

The system de-energization is not a sufficient condition to operate. All sources (AC input voltage, optional tilt sensor power supply, etc.) must be accurately identified and isolated with external isolation by dedicated breakers, they must be locked and tagged, then accurately verify the absence of any voltage atop (below the main breaker) the main incoming line.

9.3.3 Risk assessment - Weather conditions

- This instruction can be applied only in case of dry environment, without storming, lightning and raining.
- The doors must be placed in a locked position when opened.
- In the event of wind, it is necessary to strengthen the door locking mechanism with appropriate tools.

9.3.4 Working area preparation

Unplug and remove any vehicle from the EVSE under maintenance and secure it from any vehicles connection, if necessary, barricade the area with barriers, put warning signs to avoid unauthorized people to use them. Check that the area is dry and free from flammable materials and others hazard.

9.3.5 Personal Protective Equipment (PPE)

The below table mentions the mandatory Personal protective equipment (PPE) to be worn by the engineers working on-site.

NOTE
Check PPE before use. All the activities of this procedure (until the completion of the procedure) must be performed wearing the PPE.
Insulation gloves must be verified before and after use.

PPE	Description
Arc-flash rated clothes	• Multi-Layer: ATPV 8 cal/cm^2 Shirt and Trousers combined with ATPV 25 cal/cm^2 Jacket and Trousers or • Single-Layer: ATPV 40 cal/cm^2 Full suite
Insulating gloves	• Insulating composite gloves class 0 ≥1000V combined with Protective overgloves in leather Cat 3
Face and Ear protection	• Complete Hood Cat 3 • Ear protection Class 5
Safety shoes	• EH Rated Leather Boots

9.3.6 Safety equipment and tools

The below table shows the required tools and equipment's that are necessary to perform the steps of the total de-energization procedure.

NOTE
For safety reasons, service engineers shall check the functionality of the tools before start of work.

Tools and Equipment	Description
Voltage detector (EN 61243-2)	Duspol Digital 1,2kVdc 1kVac (suggested)
Safety tags "DO NOT OPERATE"	Safety tags "DO NOT OPERATE" with identification data (Name - Company - P. Ph number)
Safety Padlocks	Padlocks used to secure the Lockout Tagout device in place.
Grounding kit (IEC 61230)	Suggested kit composition: • Dehn: KFP 20 M10 (p/n: 754205) • Dehn: KFP 20 M12 (p/n: 754200) • Dehn : KKH 20 FS (p/n: 772312) • Dehn: UK 25 SK (p/n: 773 034) • Dehn: EKV4u1 16 G (four poles earthing and short-circuiting device)

9.3.7 Total de-energization procedure

1. **Preliminary control**:
   Make sure that the unit must be turned on.

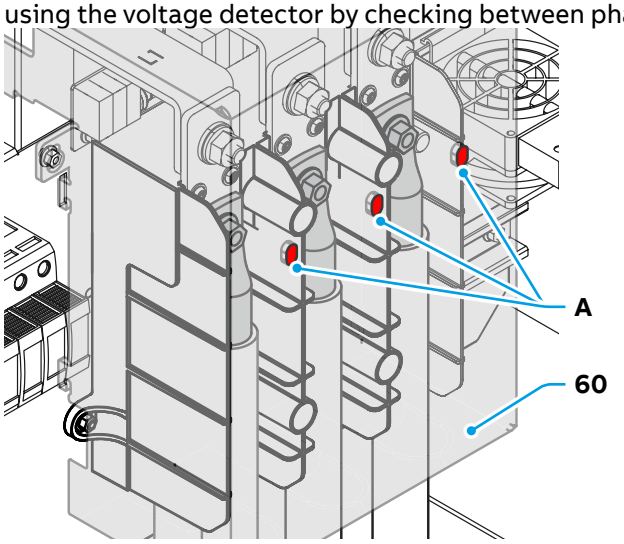
2. **Identification of AC external main source**:
   Clearly identified the external AC main breaker with the plant manager cooperation and, if necessary, by functionality test of it.

3. **Operate the main AC external source isolation and secure**:
   Turn off the external AC main breaker and carry out a LOTO.

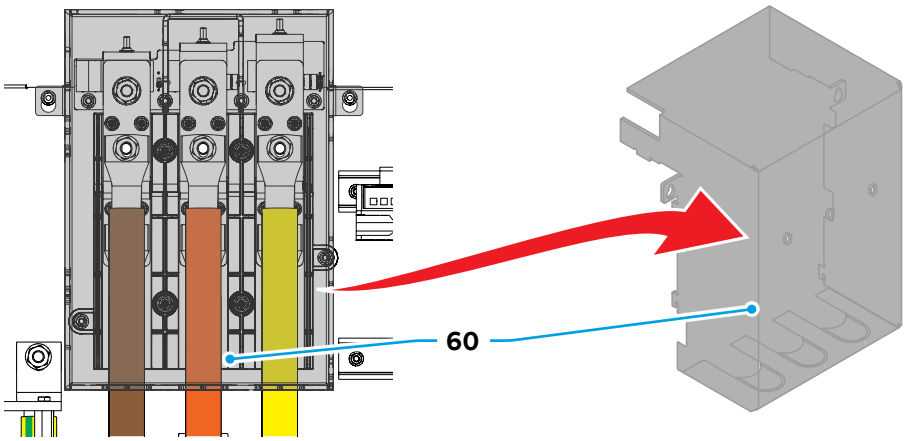
   HAZARDOUS VOLTAGE
   Wait at least 15 minutes after turning off the EVSE before perform any operation on the EVSE.

4. **Functionality check**:
   Check that the charger is shut down.

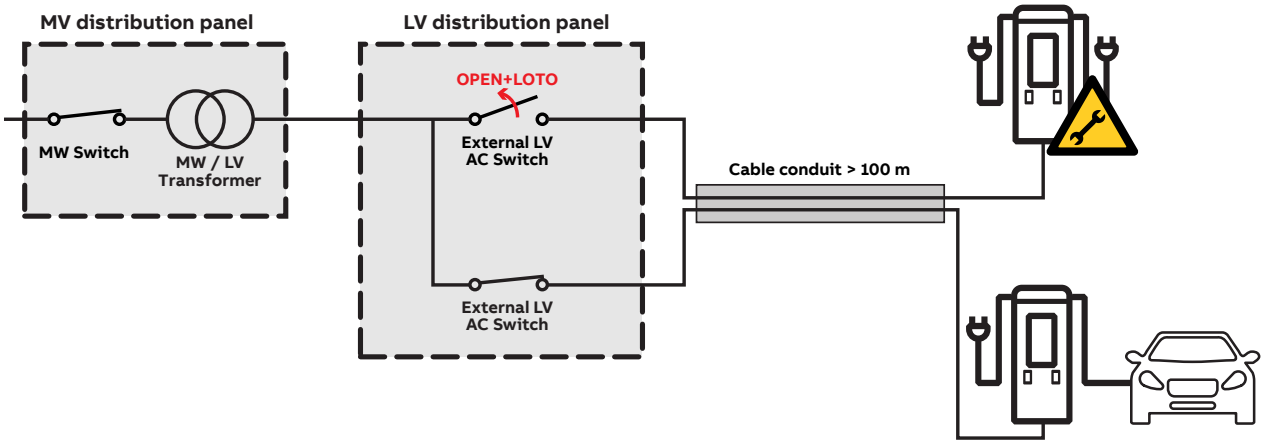
5. **Main Voltage absence check**:
   Check the absence of voltage below the main breaker of the EVSE, using the dedicated holes **(A)**.
   The verification must be carried out through the dedicated holes **(A)** in the Main AC protection barrier **(60)**, using the voltage detector by checking between phases to ground and respectively between them.



6. **Protection barrier removal**:
   Remove the protection barrier on the bottom side of AC main switch.

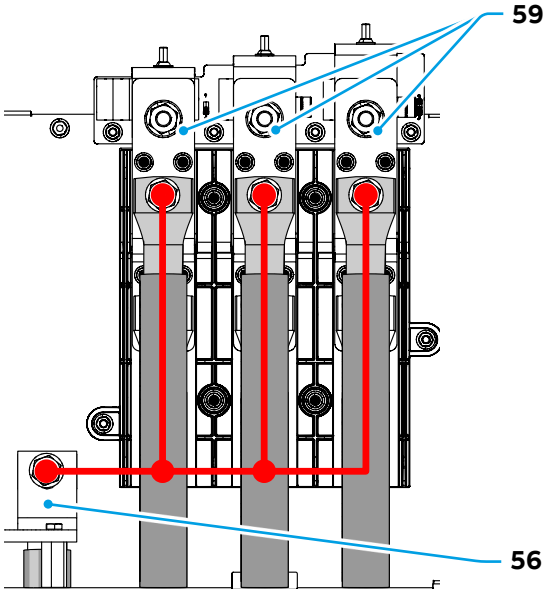


7. **Earthing and short circuiting incoming line assessment**:
   Is needed to make the earth and short-circuit connection on the main AC incoming line in presence of a site configured as below:



NOTE
Multiple chargers – AC lines in common cable conduit > 100m length – an AC line charged

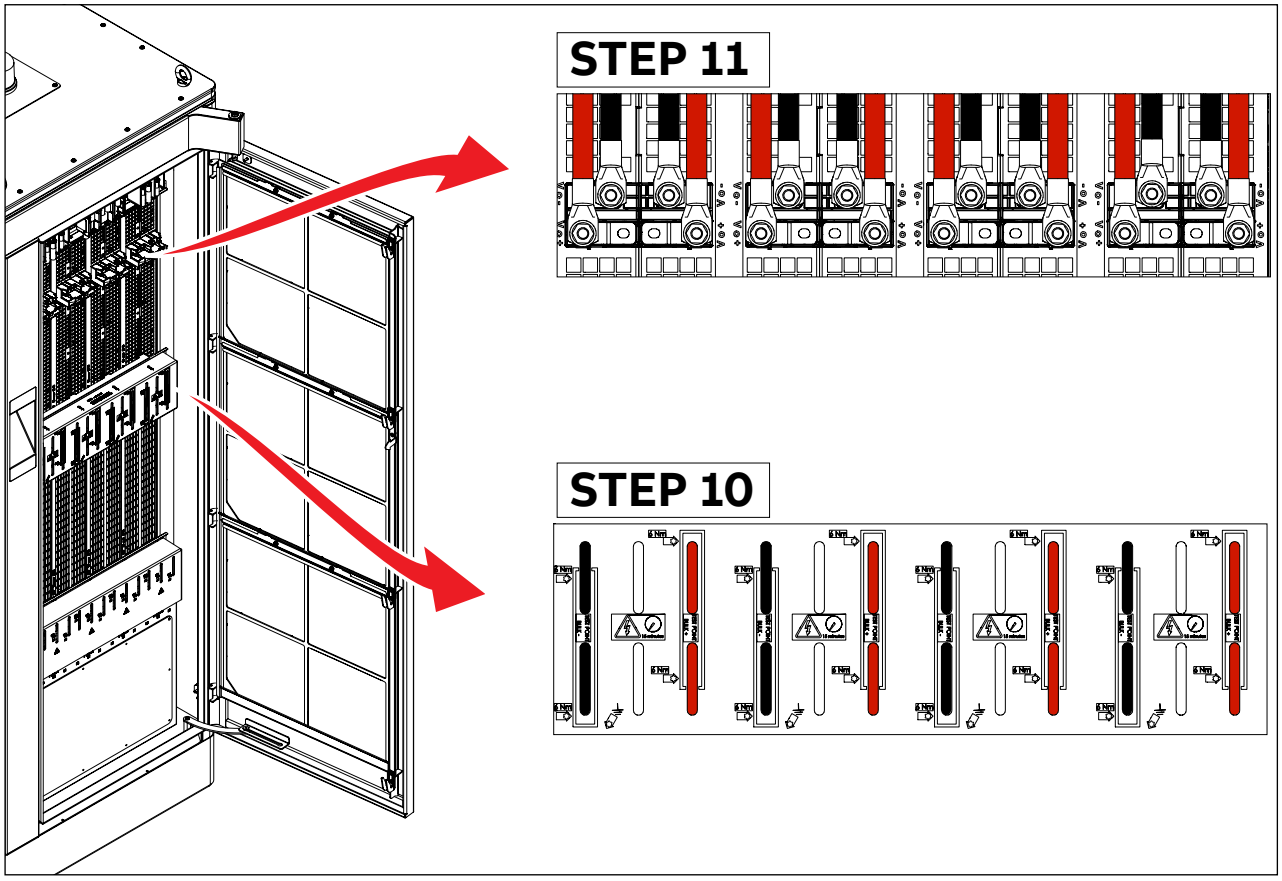
8. **Earthing and short circuiting (Only if necessary)**:
   According to evaluation before, prepare the grounding kit and connect it from PE busbar **(56)** point to Main AC terminals **(59)**.



9. **AC/DC–DC/DC converters interconnection protection barrier**: This interconnection (located on the right side of the EVSE) is connect to DC bulk. Is needed to wait 15 minutes (after de-energization) to carry out a voltage absence check, by dedicated holes atop the screen, so that internal stored energy can discharge.

> **Warning**: **General hazard**
> Presence of dangerous voltage for about 15 minutes after the total de-energization of the EVSE.

10. **DC/DC Modules Output:** Conduct a voltage absence check by measuring the voltage between the 8x DC positive terminals and ground, the 8x DC negative terminals and ground, and between the 8x DC positive and 8x DC negative terminals for all the four DC/DC power module outputs.



11. **Access to intervention area**: Access inside the intervention area is now allowed.

12. **End of activity**: When the tasks are completed, remove any tools that were used (as well as the earthing short-circuiting if installed).

13. **Protection barriers restore**: At the end of intervention, it will be necessary to restore the protection barriers previously removed. Proceed by aligning them with the fixing holes and placing the self-tapping screws applying the proper tightening torque.

10. Technical data

This chapter contains information about the models, details of the EVSE, characteristics and technical data, overall dimensions and EVSE identification.

A description of the EVSE characteristics is provided to identify its main components and specify the technical terminology used in the manual.

Chapter recipients:

- Owner
- Qualified installer

EN

10.1 Technical data

10.1.1 Technical data table

	A400
EVSE configuration	
Charging standard (IEC 61851-1)	Mode 4
Number of outputs	2
Number of EV served	Up to two EV in parallel
Output combinations	CC configuration. Output 1: CCS 1 / Output 2: CCS 1 CN configuration. Output 1: CCS 1 / Output 2: NACS NN configuration. Output 1: NACS / Output 2: NACS
Cable type	Air cooled cable
Cable length and reach	Length: 15 ft + 9 in (4.8 m) / Reach: 11 ft + 5.8 in (3.5 m) Optional solution: Length: 22 ft + 11.6 in (7 m) / Reach: 20 ft + 8 in (6.3 m)
Efficiency	> 95% at nominal output power
DC Output (CCS 1)	
Rated DC power	400 kW
Rated DC voltage	150...980 V
DC current	Peak 600 A
Overvoltage category	II
DC Output (NACS)	
Rated DC power	367.5 kW
Rated DC voltage	150...980 V
DC current	Peak 375 A
Overvoltage category	II
UHF Transmitter Frequency	315 MHz
AC Input	
AC connection	3 Phases + PE
Rated AC voltage	480 V +10...-15 %
Rated frequency	60 Hz ± 5%
Rated AC current	510 A
Max AC current @ Min. input voltage 408 (480 - 15%)	561 A
Maximum energy withstand short-circuit capability	13 MA^2s
Short circuit current (SCCR)	65 kA
Rated apparent power	425 kVA
Power Factor	> 0.98 % @ rated DC power
Total Harmonic Distortion (THD)	< 3 %
Earthing systems	WYE System
Overvoltage category	III
Protection Class	I
Protection	Overcurrent, overvoltage, undervoltage, ground fault including DC leakage protection, overtemperature, integrated SPD
SPD	Yes, Type 1
Tilt sensor (optional)	
Voltage input	20..24 V DC
Current consumption	Maximum 30 mA
Protection	Reverse polarity

	A400
Mechanical	
Dimensions (W x H x D)	31.89 x 85.43 x 31.10 in (810 x 2170 x 790 mm) Including wireless antenna: 31.89 x 88.82 x 31.10 in (810 x 2256 x 790 mm)
Mounting Type	Floor mounted
Weight	1610 lbs (730 kg)
Enclosure type	Stainless steel 430 and Aluminum
IK rating	IK10 (Display: IK08)
Lifting points	4 x eyebolts (on the top of the EVSE)
Environmental	
Ingress protection	NEMA 3R
Environmental type	Indoor and Outdoor
Pollution degree	3 Outside (2 Inside)
Noise level	65 dB(A) @ 39.3 in (1 m), 77 °F (25°C), full power (on front door)
User Interface	
Display type	32” LCD
Display keyboard	4 x push button
Display languages	English, French, Spanish (others available via Software upgrade)
Lighting	RGB Led strips in the roof and connector holder (per output)
Authentication methods	RFID, Option: payment terminal - Vourity IM30
RFID system	Mifare ISO 14443 A/B to part 4 and ISO15693, ISO18092 / ECMA-340 (NFC). Others available on request (Calypso, Ultralight, PayPass, HID; and more)
Energy metering	NIST
Connectivity	
Embedded communication interface	Cellular, LAN
GPS	Yes
Cellular modem	4G / 5G / LTE
Communication Protocol	Open Charger Point Protocol (OCPP) 1.6 and 2.0.1
Standards	
Mark of Conformity	cTUVus
Safety standards	UL2202, UL 2231-1, UL 2231-3, UL 1998, CSA 22.2 No, 346:22
FCC Standards	47 CFR FCC part 22, 24, 27 (3G and 4G), 47 CFR FCC part 15.225 (Elatec RFID and Pax RFID), 47 CFR FCC part 15b, 47 CFR FCC part 1.1310 (MPE)
ISED Standard	RSS 132 + RSS 139 + RSS 199 (3G and 4G), RSS 210 Issue 10 Annex B, RSS GEN Issue 5 (Elatec RFID and Pax RFID), RSS-102 (MPE)
Additional standards	DC plugs compliant with UL 2251: 2017 (R2022) CSA C22.2 No. 282-17:2nd (R2022)

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10.1.2 Environmental Conditions

Caution:
Contact ABB E-Mobility if installing the EVSE in the presence of:
- high concentration of fine particles (PM10>100ug/m^3)
- conductive polluted areas like coal mining
- within 3km from shore in marine areas

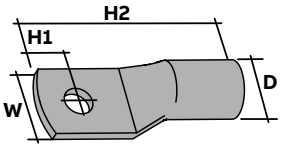
General risk:
The EVSE is equipped with a heater being active in harsh conditions (high humidity and very low temperature). It is highly recommended not to keep the installed EVSE de-energized with no cover nor shelter to avoid condensation or formation of ice inside the EVSE.

	Storage (in the package)	Transportation [4] (in the package)	Installation (Operation) [5]
Environment type	Indoor	Weather-protected [3]	Indoor and Outdoor
Ambient air temperature	23...104 °F (-5...+40 °C)	-31...131 °F (-30...55 °C)	-26...131 °F (-30...55 °C) derating from 104 °F (40 °C)
Relative Humidity	5...95% @ 86 °F (30 °C)	5...100% @ 80.6 °F (27 °C)	5...100% @ 80.6 °F (27 °C)
Altitude (without derating)	-	-	6500 ft (2000 m)
Condensation	No [6]	No [6]	Yes
Wind-driven precipitation	No	No	Yes
Formation of ice	No	No	Yes
Maximum storage time [1]	1 year [2]	-	-

1. Starting from manufacturing date
2. Contact ABB E-mobility if the EVSE has been stored for longer periods
3. Protected from the influences of meteorological conditions
4. Transportation conditions are those that the product can be exposed to while transported and handled in its original package
5. EVSE powered on
6. Moderate condensation on the package may occasionally occur due to variations in temperature

10.2 Cable specifications

AC Input		
AC cable cross section		up to 2 x 600 MCM each phase [1)]
AC connection type		M12 (15/32) cable lug
	Max. cable lug dimension	
	W	1 17/32 in (39 mm)
	H1	19/32 in (15 mm)
	H2	4 21/64 in (110 mm)
	D	1 17/64 in (32 mm)
	Hole	Ø 33/64 in (13 mm)
AC cable diameter (cable entry plate)		Max. 1½ in (38 mm)
Insulation		Material serviceable for outdoor, UV-protected and suitable for use in underground ducts according to local rules.
Protective Earth (PE)		
PE cable cross section		Select the Ground (PE) wire size per NEC or local electric code
PE connection type		M12 (15/32) cable lug
PE cable diameter (cable entry plate)		Max. 1 1/2 in (38 mm)
Insulation		Material serviceable for outdoor, UV-protected and suitable for use in underground ducts according to local rules.



Ethernet	
CAT	CAT 5e (recommend) CAT 6 (high presence of electromagnetic interference and/or noise)
Ethernet cable diameter (cable entry plate)	Max. 1 $^{1}/_{2}$ in (38 mm)
Insulation	Material serviceable for outdoor, UV-protected and suitable for use in underground ducts according to local rules.
Tilt sensor (option)	
Number of wires	4 (2 wires for power supply and 2 wires for relay contacts)
Max. Wires cross section	12 AWG (4 mm^2) without ferrule 14 AWG (2.5 mm^2) with ferrule
Cable diameter (cable entry plate)	Max. 1 $^{1}/_{2}$ in (38 mm)
Conductor	Fine strand copper wire
Insulation	Material serviceable for outdoor, UV-protected and suitable for use in underground ducts according to local rules.

1. Electrical designers/qualified installers shall select the proper conductor cross section depending on type of core, insulation, ambient temperature, method of installation and other conditions. Special cable lugs with reduced footprint may be required; they shall respect the max cable lug dimension.

10.3 Torque specification

Parameter	Specification
Fasteners for the PE wire	553 ± 20% lbf-in (62.5 ± 20% Nm)
Fasteners for the L1, L2, L3	553 ± 20% lbf-in (62.5 ± 20% Nm)
Main AC protection barrier	13 lbf-in (1.5 Nm)
Fasteners to connect the EVSE to the base (M12 bolt)	177 lbf-in (20 Nm)

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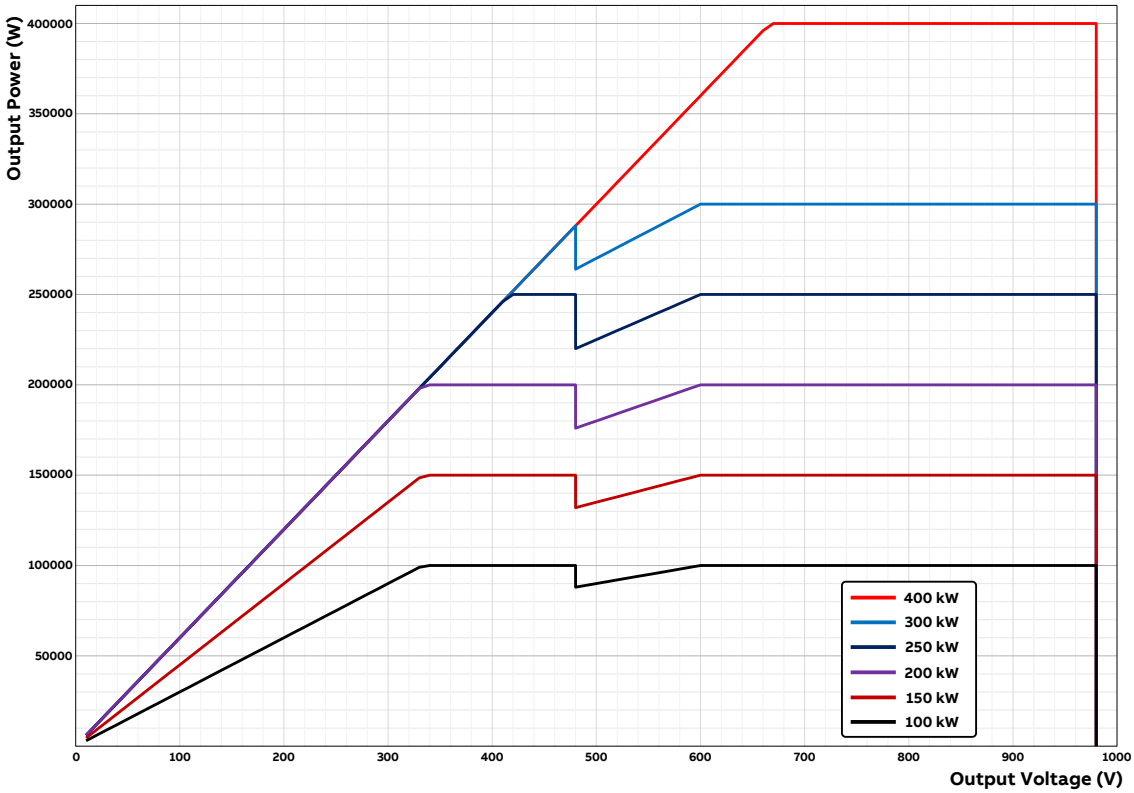
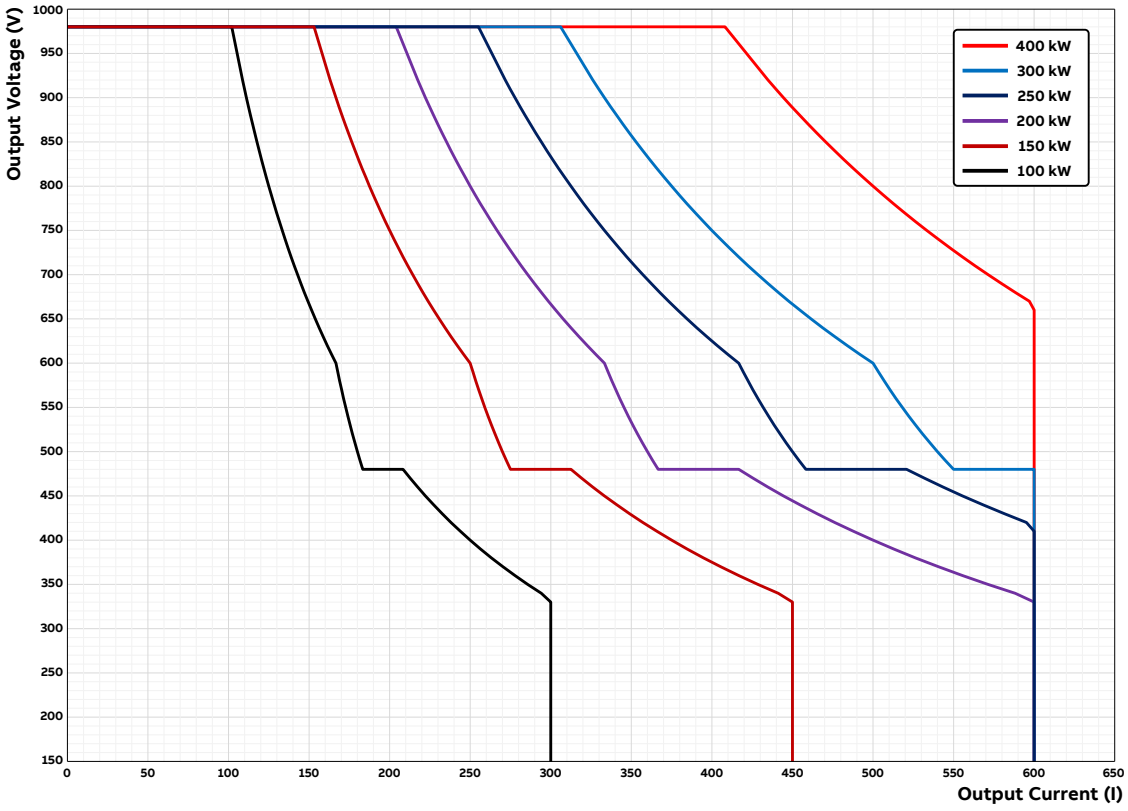
10.4 Output curves

EVSE output power may be reduced by:
- Environmental conditions(e.g ambient temperature)
- Time between charging sessions
- E-Vehicle power peak duration and battery State of Charge (SoC)

10.4.1 Output power Vs output voltage curve



10.4.2 Output voltage Vs output current curve



11. Attachments

In this section additional technical drawing, specification, schematics are given.

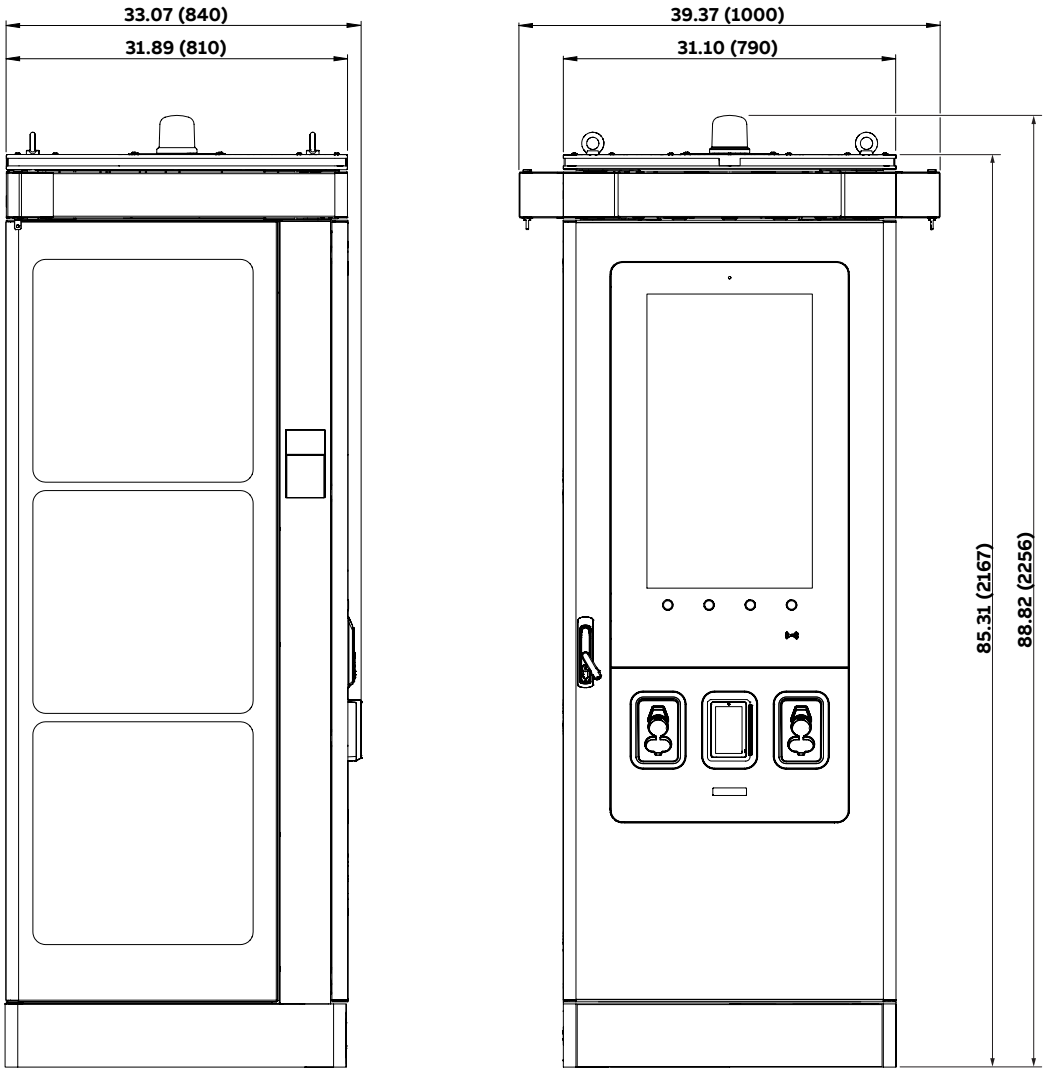
NOTE
If you need further information, reach out to the local entity of ABB E-mobility B.V. for support:
https://e-mobility.abb.com/contact-centers/

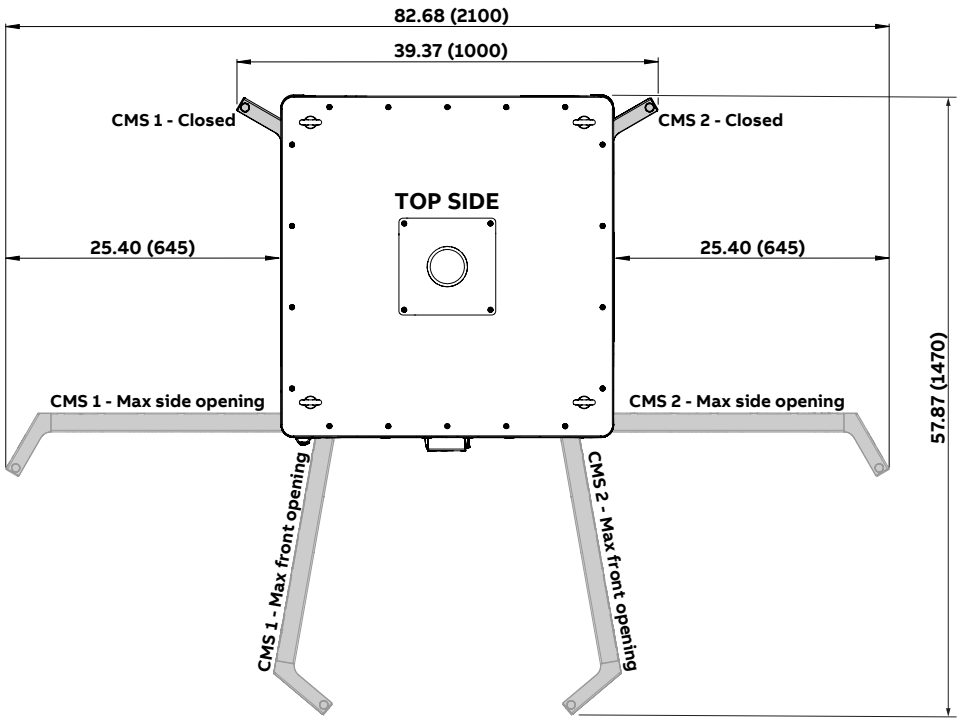
Chapter recipients:

- Owner
- Qualified installer

11.1 Dimensions

NOTE
The measurements in the drawing are in inches and millimeters [in (mm)]





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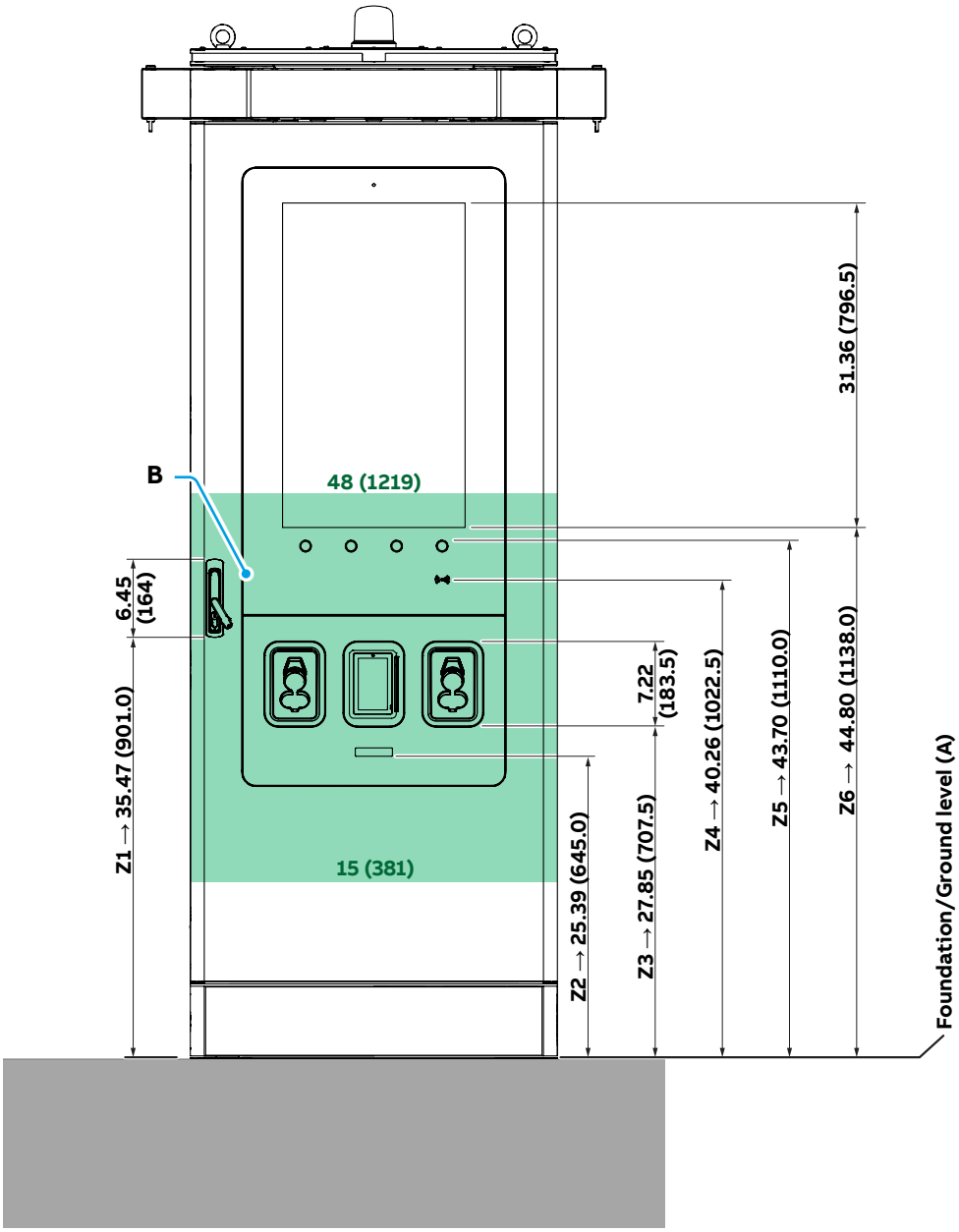
11.2 Height of user operable elements

According to ADA (American with Disabilities Act) the height of user operable elements must be between specific limits. The distance from the base of the EVSE to the minimum and maximum height of the user operable elements must be accordance with the ADA recommendations.

NOTE
It is the responsibility of the installer to make sure that the EVSE complies with ADA requirements.
The measurements in the drawing are in inches and millimeters [in (mm)]



Parameter	Description
A	Foundation/Ground level
B	Area for user operable elements (in green) according to ADA requirements
Z1	Height of Swing handle lock
Z2	Meter display (lowest height of user operable elements)
Z3	Heights of connector holders and payment terminal
Z4	Height of RFID reader
Z5	Height of display buttons (highest height of user operable element)
Z6	Height of display

11.3 Foundation interface plate

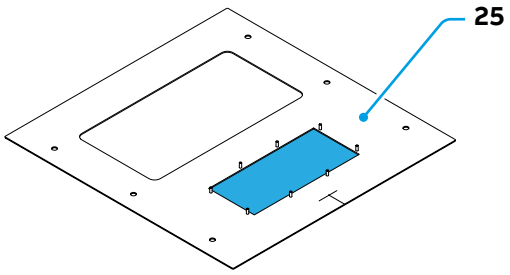
The drawing (top view) shows all the necessary measurements to prepare a custom foundation:
- drill the holes to fasten the EVSE to the floor/basement (in yellow)
- prepare the position of the cables coming from the underground cable conduit (in blue)

NOTE
The red arrow indicates the front side of the plate.

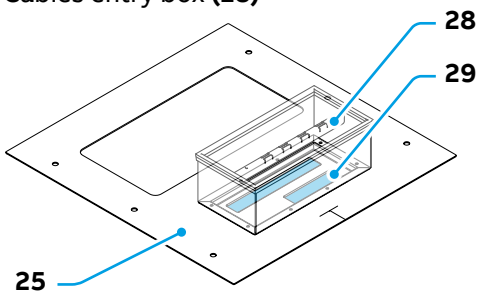
NOTE
The measurements in the drawing are in inches and millimeters [in (mm)]

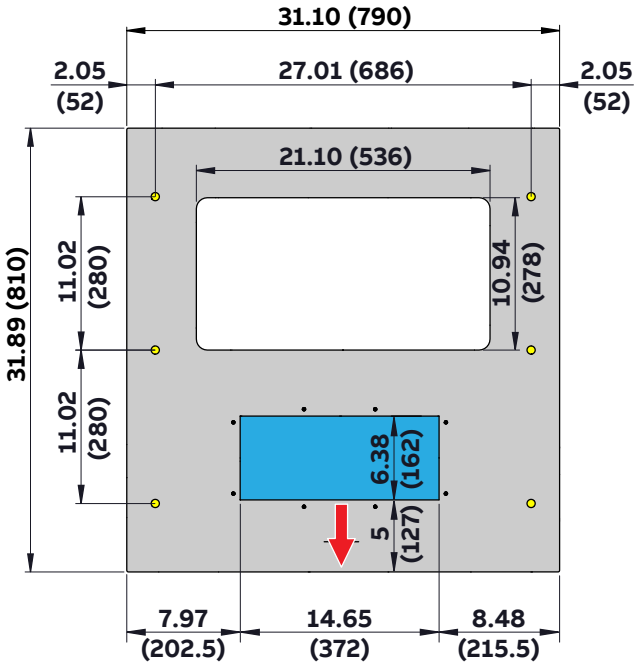
Cable entry system for customized foundation

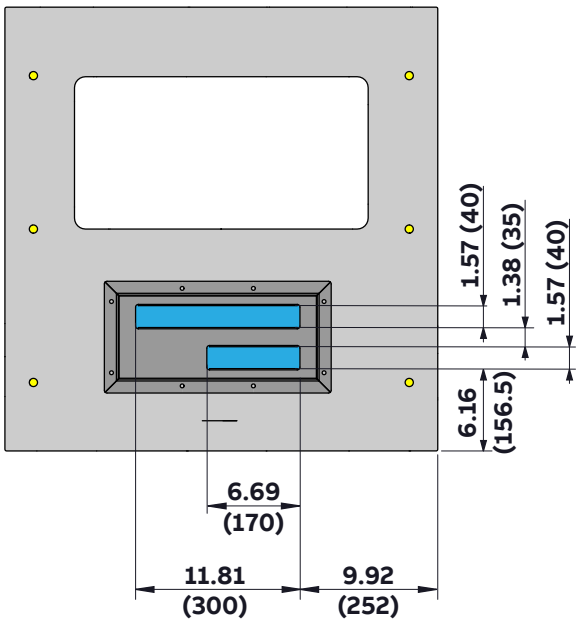
Foundation interface plate **(25)** to determinate the cables arrival area



Complete entry system:
- Foundation interface plate **(25)**
- Cables entry plate **(29)**
- Cables entry box **(28)**







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