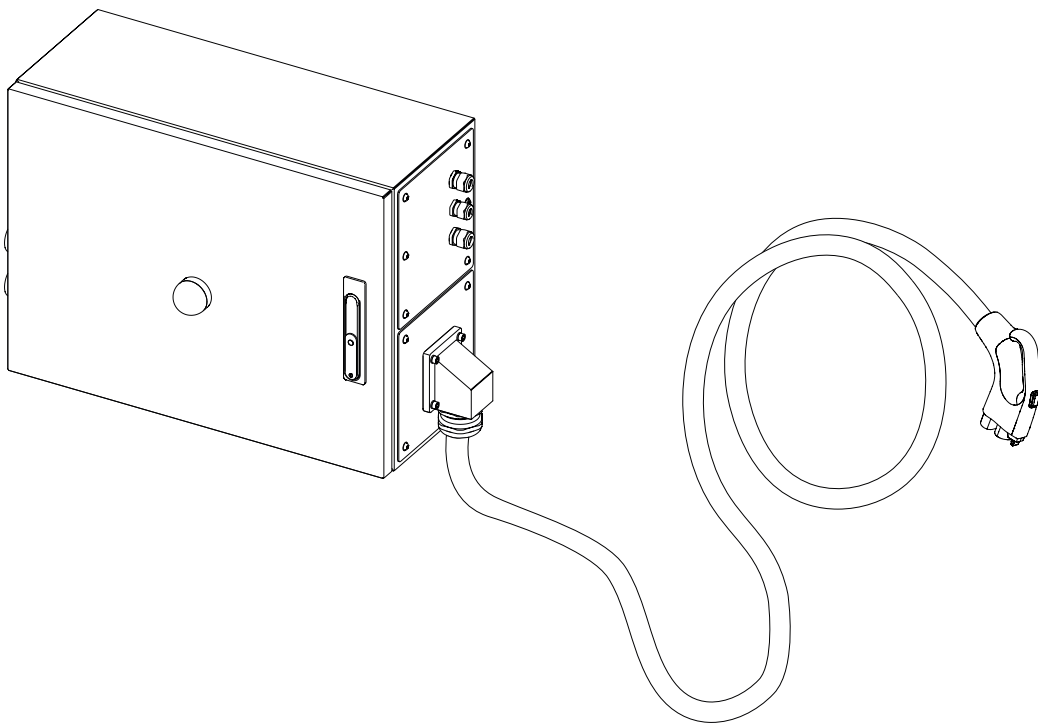


Operation and installation manual

CCS Control Box (NA version)

for HVC 200/300/360 multi-outlet cabinet



**ATTENTION – IMPORTANT SAFETY INSTRUCTIONS**

This manual contains important safety instructions that must be followed during the installation and maintenance of the equipment.

**ATTENTION – SAVE THESE INSTRUCTIONS**

This document is a part of the equipment, keep it in a safe place near the equipment for easy reference during installation, operation and maintenance.

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1. Introduction and general information

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

Chapter recipients:



- Owner
- Installer
- User

1.1 Disclaimer and warranty conditions

ABB E-mobility shall not be liable for any damages, losses, costs or expenses resulting from the improper handling of the EVSE, in particular resulting from non compliance with the instructions of this document and other applicable regulations and standards (e.g. installation, transport, occupational health and other safety standards).

The warranty Terms and Conditions are considered to be valid if all indications in this manual are adhered to.



ATTENTION

If the equipment is used in a manner not specified in this manual (any condition deviating from those described herein must be expressly agreed with the manufacturer), the protections and the certifications provided by the equipment may be impaired with the consequent loss of warranty.



ATTENTION

Any modification, manipulation, or alteration not expressly agreed with the manufacturer, concerning either hardware or software, shall result in the immediate cancellation of the warranty.

1.2 Function and target of this document

The purpose of this document is to give the information that are 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.

The document is applicable to ABB E-mobility HVC (Heavy Vehicle Charger) EVSE based on the CCS charging standard:

- **CCS Control Box (NA version)**



NOTE

The CCS Control Box is part of HVC systems and must be connected to the HVC 200-300-360 power cabinet. All informations relating to the power cabinet are available in a dedicated manual available online (ABB Library ID [9AKK108468A6195](#)).



NOTE

The installation of CCS Control Box or CR connected to HVC 150/160 power cabinet is described in a dedicated available manual.



NOTE

“Control box” is a generic name for the EVSE models to address the main types of the EVSE.

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.
Do 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
- Qualified installer

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
NFC	Near field communication

Abbreviation / Termin	Description
OCP	Open charge point protocol
PE	Protective earth
PPE	Personal protective equipment
RCD	Residual current device
RFID	Radio-frequency identification
SPD	Surge protective devices

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.
Protective Earth (PE) or protective ground (PGND)	To identify any terminal which is intended for connection to an external conductor for protection against electric shock in case of a fault, or the terminal of a protective earth (ground) electrode.
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
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.

1.7 Document revision history

Version	Date	Description
001	November 2023	Initial version



NOTE

Latest version of the manual is available online (ABB Library ID [9AKK108468A7163](#))

2. Safety

This chapter contains the safety instructions which must obey during installation, commissioning, operation and maintenance of the equipment. Always obey and follow the reading order of instruction exactly as described in this manual to prevent injury or damage to the equipment.

The manufacturer accepts no liability for failure to comply with the instructions for a correct installation and cannot be held responsible for any other upstream or downstream equipments.

The instructions provided in the manual do not replace:

- the safety devices
- the technical and operative data labels on the product
- the safety regulations in force in the country of installation

**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
- Installer
- User

2.1 Liability

The manufacturer declares that the equipment 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 equipment) 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 equipment.
- Accumulation of dirt or ingress of foreign substances within the equipment.
- 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 equipment 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 equipment.
- Fault tracing caused by problems from a source external to the scope of work.
- Unprofessional or incorrect installation, installation not complying to standards, or installation not following the 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 equipment.
- Non-compliance with the applicable safety regulations or other legal standards by other parties than the manufacturer.
- Insufficient ventilation of the equipment.
- Operation of the equipment outside of its design conditions.
- Damage or failure due to relocations or alterations of the equipment from the original installation location or alteration of the overall normal condition of the system.
- Only make changes to the equipment if the manufacturer approves in writing of the changes.
- Damage or loss due to improper use of the equipment.
- 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;
- The manufacturer is not responsible for disposal of the equipment, or part of it, which does not take place on the basis of the regulations and laws in force in the country of installation.
- Damage resulting from improper storage conditions.

2.1.1 Responsibilities and qualifications for the Users

Operators responsible of installation, operation, maintenance and service must:

- To know and implement the applicable laws and rules.
- To identify the hazards and do a risk assessment prior to commencing work that result from the working conditions on the site.
- To operate the equipment with the protective devices installed and make sure that all protective devices are re-installed after any installation or maintenance operation.
- To make an emergency plan that instructs people what to do in the event of an emergency relating to the equipment or to another site emergency.
- To 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.
- To make sure that there is sufficient space around the equipment to safely do maintenance and installation activities.
- To identify a site operator who is responsible for the safe operation of the equipment and for the coordination of all work, if the owner does not do these tasks.

Moreover the installer must:

- Fully knows the EVSE and its safe installation.
- Be qualified according to the applicable local rules to do the work.
- Obeys all local rules and the instructions in the installation procedures in this document.

2.2 Intended use

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



NOTE

Depot charging (overnight): truck and bus fleets that have short daily operating cycles often rely on overnight charging at the depot when a lower power can be used to charge the vehicles. The charging is spread out over the night when the vehicle is parked reducing the energy consumption and grid connection costs. Some of the vehicles might return to the depot during the day for some shorter and higher power charge sessions.



DANGER

The manufacturer isn't liable for any risk and damage related to its different use. Use the equipment only for its intended use and do not change or alter the system under any circumstances. If you use the EVSE in any other way than described in the related documents, you can cause death, injury and damage. Only use it in its original condition and with its proper aim.



NOTE

The equipment can be only connected to the electricity grid in countries for which it has been certified. The equipment may only be used in compliance with all its technical characteristics. Only use the EVSE with accessories that the manufacturer provides and that obey the local rules.

2.2.1 Risks related to improper use or product defect

Any improper use of the device is forbidden, even for common other arrangement related to the final scope and function.

To avoid any serious consequence on personal safety, please contact the service of the manufacturer in case of need of further warnings concerning the ways in which the equipment must not be used and which could occur.

In the event of residual risks which persist, despite the protection and safety measures integrated in the machine and the complementary measures adopted, contact the service of the manufacturer immediately.



DANGER

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

To avoid risk related to improper use of the product, it is forbidden:

- To install the equipment in environments subject to particular conditions of flammability or in adverse or disallowed environmental conditions, (temperature and humidity).
- To use the equipment with safety devices which are faulty or disabled.
- To use the equipment or parts of the equipment 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 equipment to vary its performance or change its isolation.
- To clean with corrosive products that could corrode parts of the equipment or generate electrostatic charges.
- To place any heavy object, sit or stand up on the device.





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
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 equipment cooling slots or systems.	Use suitable PPE. Wait for the parts to cool down before opening the equipment. Do not block cooling vents or heat sinks.
Inadequate cleaning that: - does not allow adequate air intake for cooling - does not allow the reading of safety labels.	Clean the equipment, labels and installation environment.
Stored energy in components that could generate hazardous discharges.	Ensure that the components have discharged their energy before working on them.
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, equipment or its components temporarily mounted.	Prevent unauthorized access to the installation area. Use a sufficient number employees and PPE.
No cable extensions, adapters, Y-cables or similar may be used unless explicitly stated by the vehicle manufacturer.	Manufacturer and national guidelines and regulations about charging stations must be taken into account.
The AC cable, owned by the user, could be damaged	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.

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
	Risk of falling equipment, this can cause injury or death





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
	Waste from electrical and electronic equipment

**NOTE**

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

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

2.5 Safety instructions

- Only perform the procedures as indicated in this document.
- Only perform any services as installation engineer or use the EVSE when you are fully qualified to do so.



DANGER

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

2.5.1 Safety instructions during transport



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



2.5.2 Safety instructions during installation



- Make sure that there are any supply voltages on the input cables during the complete installation procedure.
- Keep unqualified personnel at a safe distance during installation.
- Only use electrical wires of sufficient gauge and insulation to handle the rated current and voltage demand.
- Make sure that the load capacity of the grid is in accordance with the EVSE.
- Make sure that the wiring inside the EVSE is protected from damage and cannot get trapped when you open or close the EVSE.
- Do not open any covers/doors of the equipment in case of adverse climatic conditions. Infiltration of water or sand and presence of high humidity can cause damage of the equipment. It is of paramount importance to evaluate the weather conditions in the risk assessment prior any intervention on the equipment.
- Protect the EVSE with safety devices and measures that the local rules specify.
- 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.
- Put on the correct personal protective equipment.



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 during cleaning or maintenance



- Make sure that there are any supply voltages on the input cables during the complete cleaning or maintenance procedure.
- Keep unauthorized personnel at a safe distance during cleaning or maintenance.
- If for cleaning or maintenance it is necessary to remove safety devices, immediately install the safety devices after the work.
- Put on the correct personal protective equipment.



2.5.4 Safety instructions during the use



- Do not use the EVSE and immediately get in contact with the manufacturer if the safety or the safe use of the EVSE is at risk. This includes, but is not limited to, these conditions:
 - An enclosure has damage.
 - An EV charge cable or connector has damage.
 - Lightning struck the EVSE.
 - There was an accident or a fire at or near the EVSE.
 - Water entered the EVSE

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 local directive on waste of electrical and electronic equipment.
- As the symbol of the crossed out wheeled-bin on your EVSE indicates, 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 Cyber security



NOTE

This topic is valid for a wired Ethernet connection

This product is designed to be connected to and to communicate information and data via a network interface. It is the Owner's sole responsibility to provide and continuously ensure a secure connection between the product and Owner's network or any other network (as the case may be). The Owner shall establish and maintain any appropriate measures (such as but not limited to the installation of firewalls, application of authentication measures, encryption of data, installation of anti-virus programs, etc) to protect the product, the network, its system and the interface against any kind of security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information. The manufacturer (ABB E-mobility) and its affiliates are 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

2.9 Conformity

This manual is compliant with the following directives and applicable regulations:

Standard	Description
UL	UL (Underwriters Laboratories) certification
FCC	FCC (Federal Communications Commission) Part 15 certification
IEC 62262	International standard for impact protection rating
IEC 82079-1	International Standard on information/instruction for use of products
Directive 2001/95/EC	General Product Safety Directive (“GPSD”)
Directive 85/374/EEC	Product Liability Directive (“PLD”)
Directive 2011/65/EU	Use of certain hazardous substances in electrical and electronic equipment (“RoHS”)
Directive IEC 61439-7	Low-voltage switchgear and controlgear assemblies
Directive IEC 61851-1	Electric vehicle conductive charging system
SAE J1772 for CCS1	Standard connector for EV charging stations
DIN 70121 - ISO 15118	Road vehicles - Vehicle to grid communication interface

For the regulations of individual countries, refer to the national and international certification bodies as follows:

Country	Standard	Description
USA	ASTM	American Society for Testing and Materials
EU	CEN	International Organization for Standardization
EU	CENELEC	European Committee for Electrotechnical Standardization
Italy	CEI	Comitato Elettrotecnico Italiano
International	IEC	International Electrotechnical Commission
International	ISO	International Organization Standard
International	SAE International	Society of Automotive Engineers
International	UL	Underwriters Laboratory
International	FM Globa	Global Factory Mutual Insurance Company

3. Description

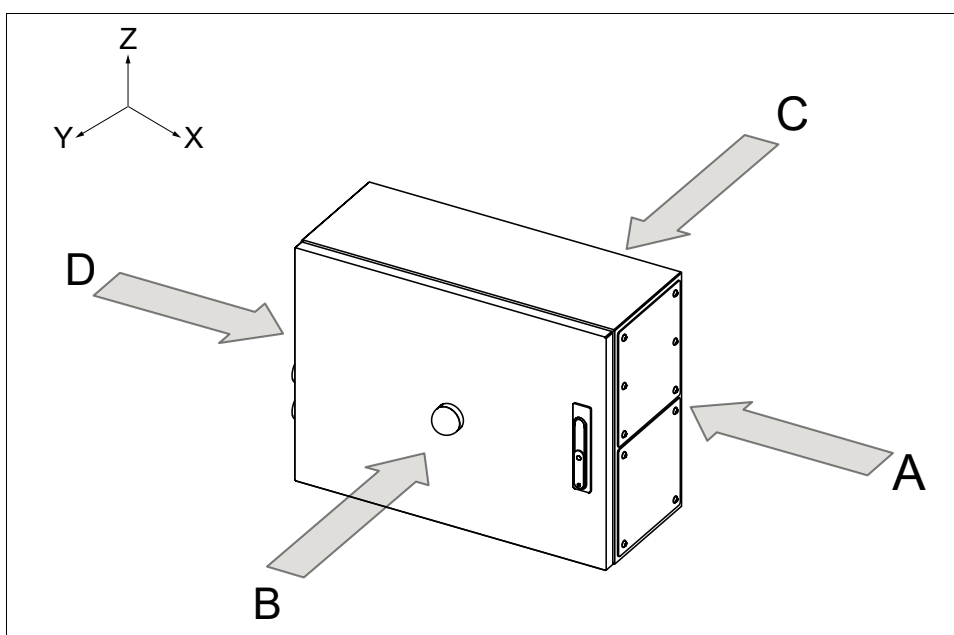
This chapter contains information about the models, details of the equipment, characteristics and technical data, overall dimensions and equipment identification.

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

Chapter recipients:

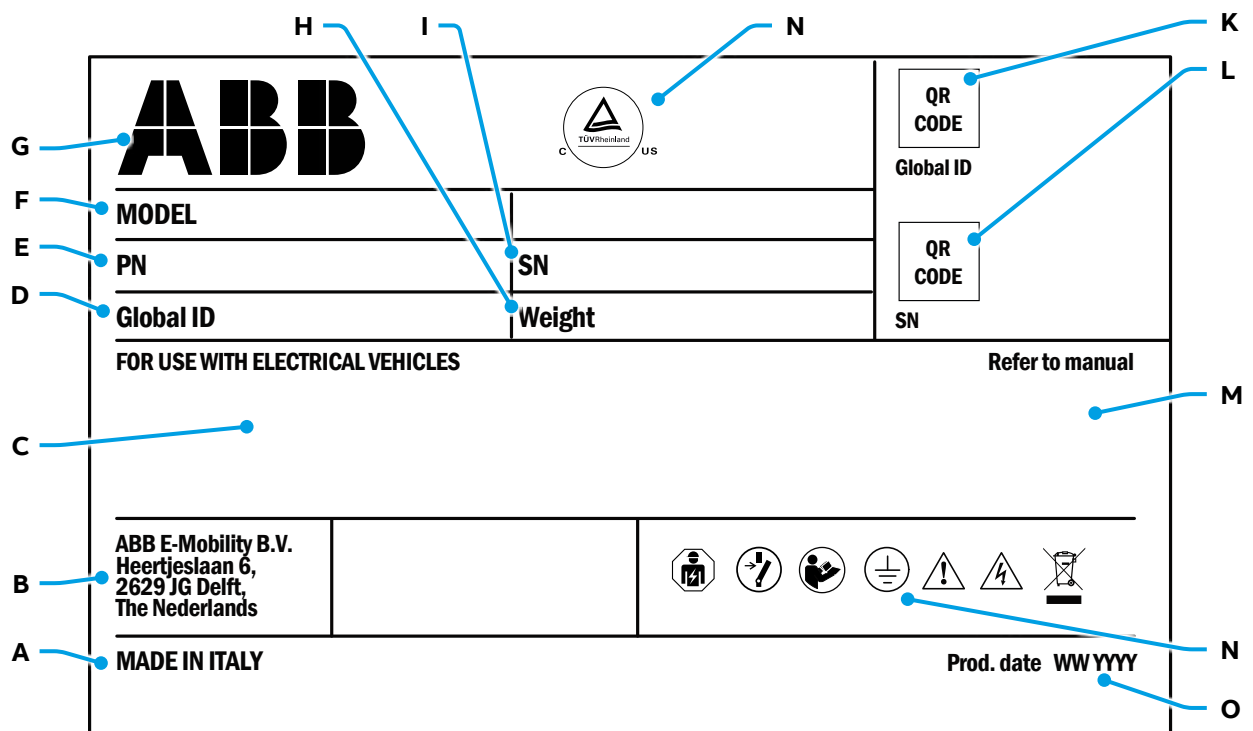
- Owner
- Installer

3.1 Orientation agreements



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

3.2 Type plate - Identification of equipment



Ref.	Description
A	Country of origin
B	Address of the manufacturer
C	Technical data
D	Global ID
E	Part number
F	Model designation
G	Manufacturer
H	Weight
I	Serial number
J	Certification marks
K	Global ID - QR code
L	Serial number - QR code
M	Additional rating data
N	Safety and info symbols
O	Production date



NOTE

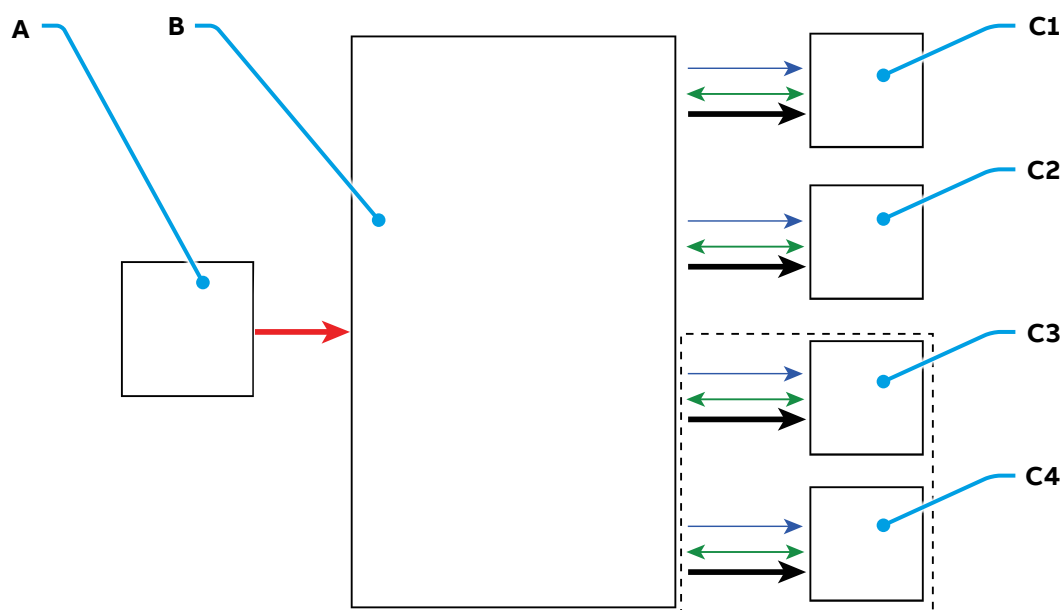
Find the type plate on your EVSE to see the applicable data.

3.2.1 EVSE identification code

In the table are listed the identification codes of the EVSE.

ABB code description	Description
HVC CCS CB 7 NA	Control Box CCS with 7 m CCS 1 charging cable
HVC CCS-CB 9 NA	Control Box CCS with 9.5 m CCS 1 charging cable

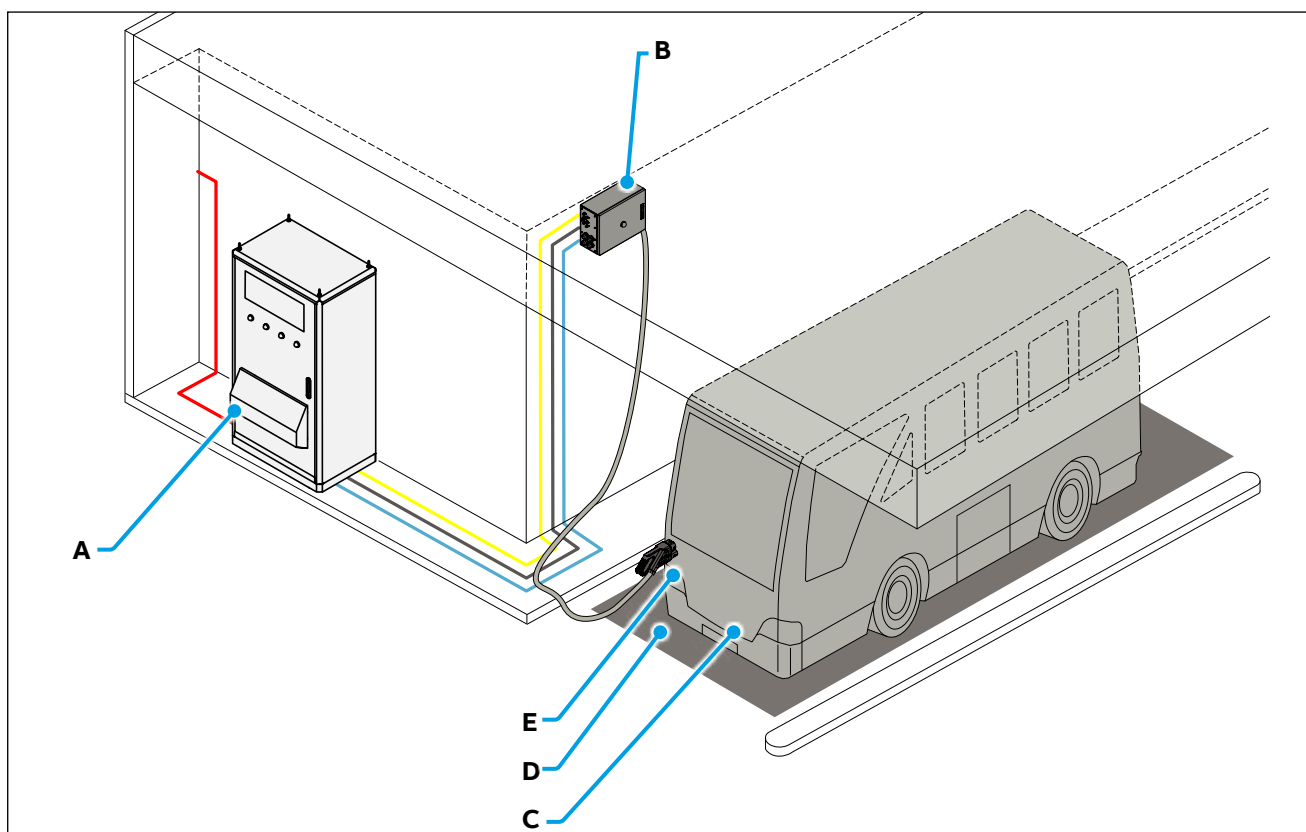
3.3 System Overview








Ref.	Part	Function
A	Power distribution board	To supply the electrical energy to EVSE
B	HVC 200/300/360	Power cabinet 2 or 4 outputs. Output power 200, 300 or 360 kW
C1-C4	Charging interfaces installed on outputs 1-4	Available Charging Posts for connection with HVC-200/300/360 Power Cabinet

Colours	Description
—	AC input connection
—	DC output connections
- - - -	Optional elements (or based on the product configuration)
—	Communication and monitoring connections
—	DC auxiliary line to supply the Control Box

3.4 Depot Overview

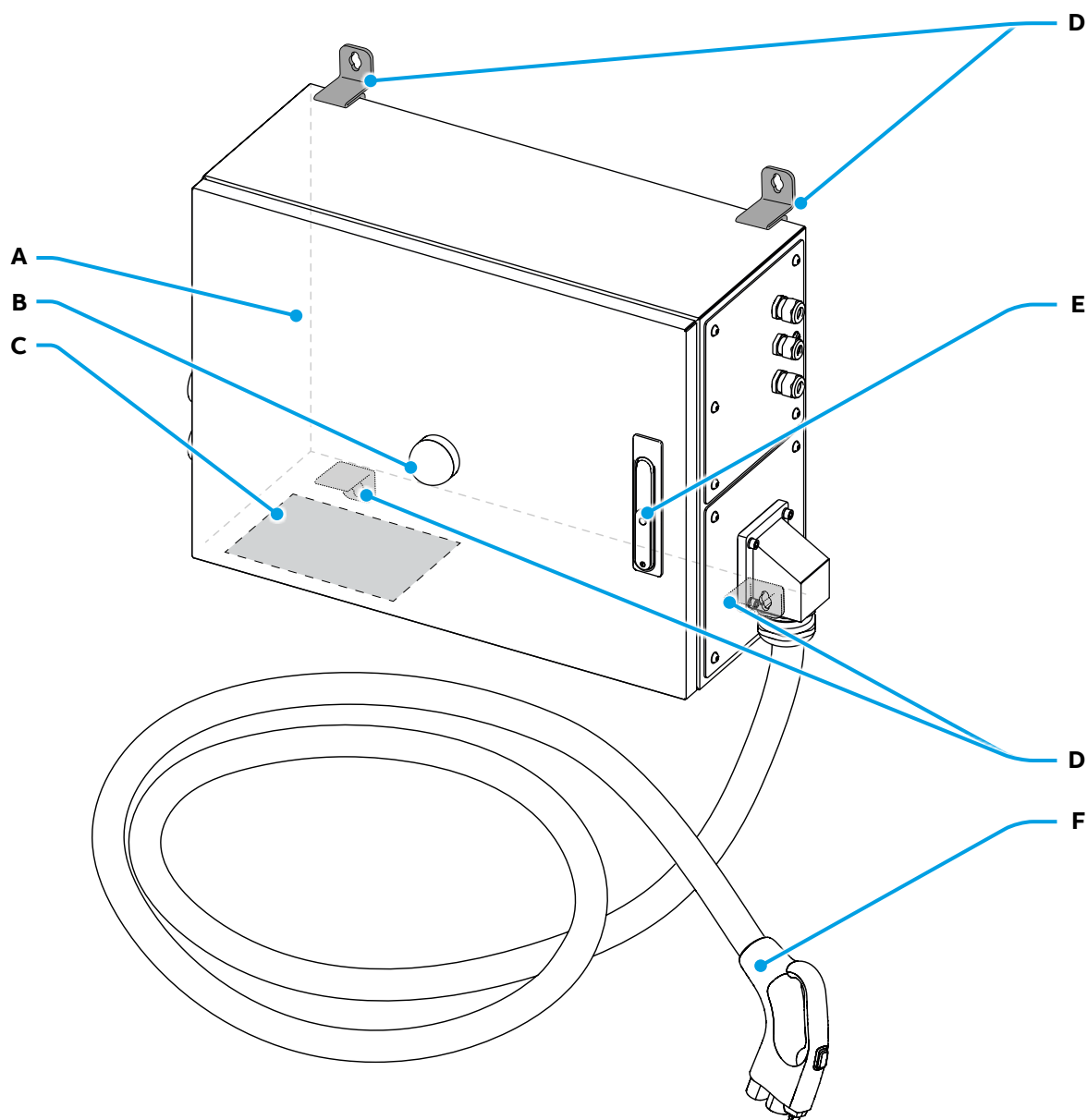


Ref.	Part	Function
A	Power cabinet	To change the AC input power into DC output power
B	CCS Control Box	To control the charge process
C	EV	The EV of which the batteries need to be charged
D	Parking space	Parking space
E	CCS connector	Combined Charging System connector

Colours	Description	Function
	AC Power Supply.	To supply the electricity from the power distribution board to the EVSE
	Auxiliary AC input cable	To supply electricity to external device from the HVC 200/300/360
	DC output cables from power cabinet	To conduct the DC output from the HVC 200/300/360 to the Control Box
	DC output auxiliary connection	To conduct the DC auxiliary power supply from the Power cabinet to the Control Box
	Communication and signals lines	

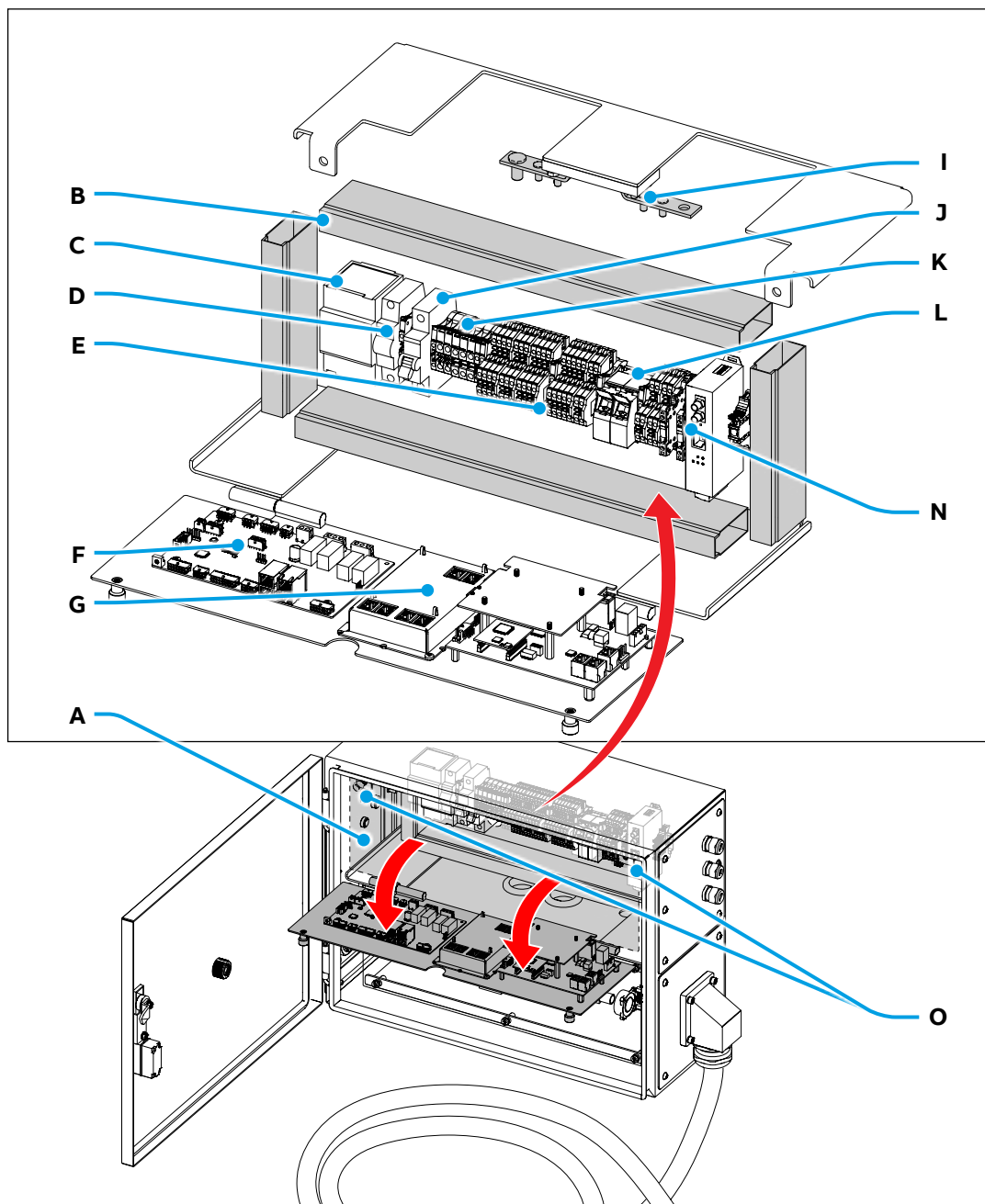
3.5 CCS Control Box - Overview

3.5.1 Overview - Outside



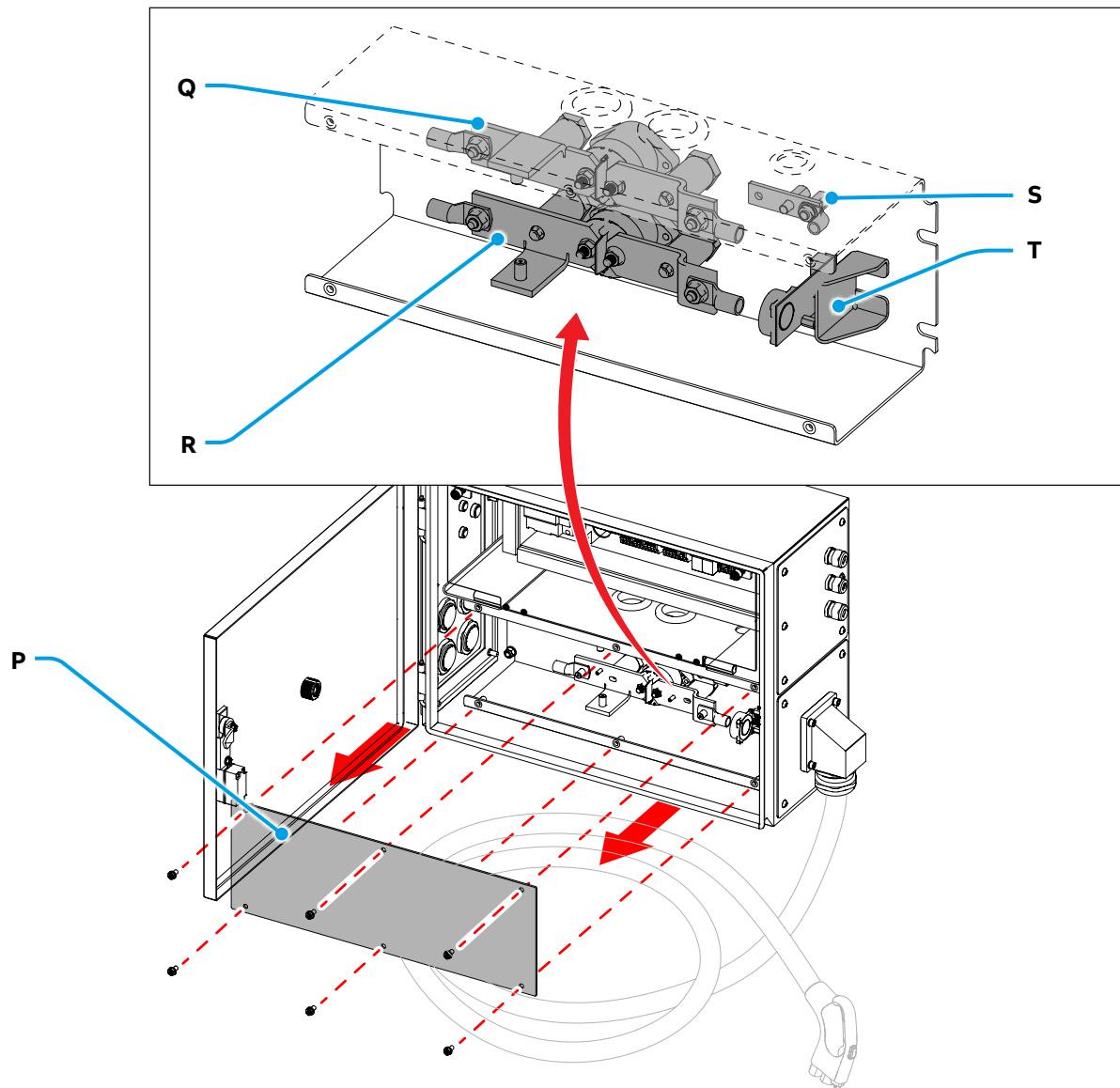
Ref.	Part	Function
A	Front door	To access the internal parts of the EVSE
B	Charging status beacon	To show the EVSE status based on the colours
C	Type plate	To show the identification and technical data of the box
D	Wall/Structure brackets	To install the Control Box on a wall/roof structure
E	Handle lock	To open and close the front door
F	CCS connector and cable	To connect the EVSE to the EV

3.5.2 Overview - Inside



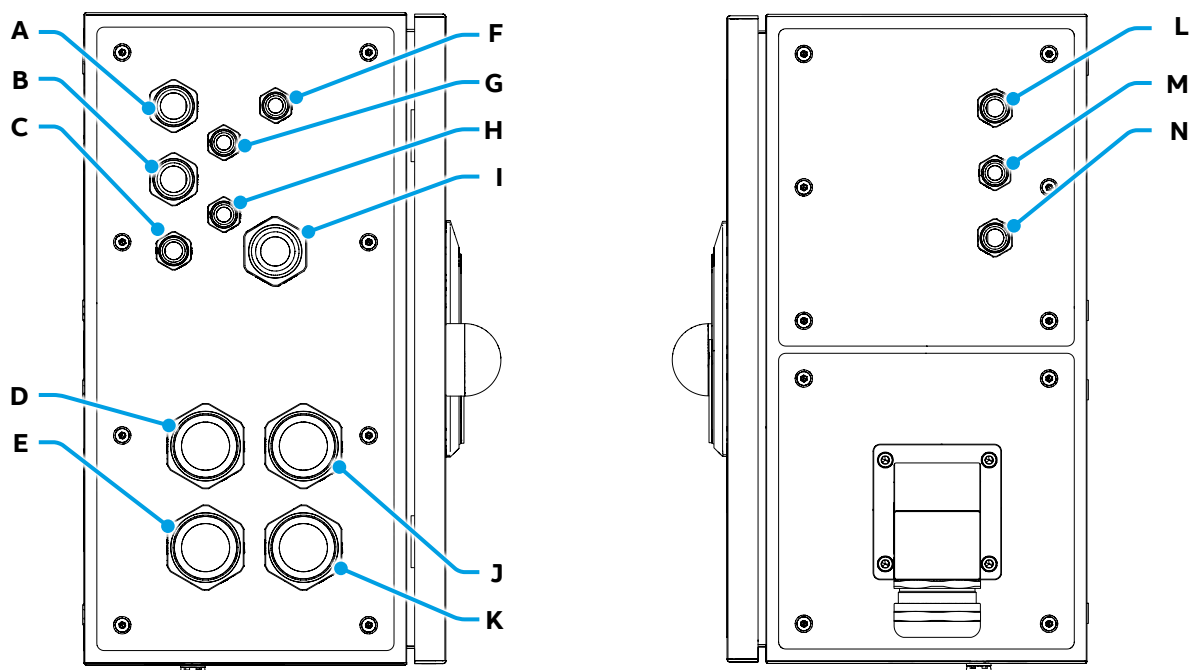
Ref.	Part		Function
A	Internal flip cover		Protection barrier. If opened, it allows access to the internal connection and components
B	Cable conduits		To arrange and protect the cables inside the box
C	F1	DC SPD	DC lines surge protection device
D	F2	DC SPD fuses	DC SPD protection fuses
E	X1	Signal screw terminal block	To connect Interlock, DC guard, ext. Emergency button, ext. LED Tower Lights, ext. Charge Stop button
F	CCB2	CCB (Core Control board)	To connect the option “Long distance kit”
G	CAN to Ethernet converter		To convert the communication line from CanBus to Ethernet
I	Protective earth (PE) busbar		Main Protective earth (PE) and Lighting Protective earth connection point
J	Q1	DC aux. power supply breaker	To turn on/off the Control Box
K	X1	DC aux. power supply terminal blocks	To connect DC aux. line coming from HVC-200/300/360 Power Cabinet

L	X2, X3	Ethernet connectors	Standard communication line between Control Box and HVC-200/300/360 Power Cabinet
N		Optional "Long distance kit" components (Ethernet to fiber converter and relay)	To convert the communication line from Ethernet to optic fiber
O		Internal flip cover fasten points	To lock in place the internal flip cover



Ref.	Part	Function
P	Internal removable cover	Protection barrier. If removed, it allows access to the internal connection and components
Q (-)	Negative DC busbar	To connect DC negative pole coming from HVC-200/300/360 Power Cabinet
R (+)	Positive DC busbar	To connect DC positive pole coming from HVC-200/300/360 Power Cabinet
S	Protective earth (PE) busbar (DC output side)	Protective earth (PE) of the DC output charging cable
T	Current probe	To measure the output current on the charging cable

3.5.3 Overview - Cable glands




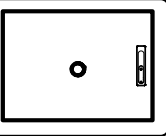



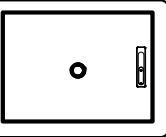



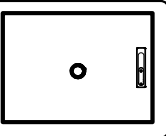



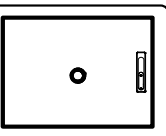



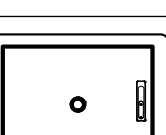
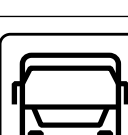
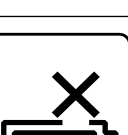
Ref.	Part	Function
A	Ext. Emergency button Ext. LED Tower Lights Ext. Charge Stop button	The cable gland is equipped with a multientry gasket that allows to seal till 3 cables (External Emergency button, LED Tower lights and Charge stop button)
B	Ethernet	Ethernet communication cable
C	Spare	Spare
D	DC- In	Negative DC input pole
E	DC+ In	Positive DC input pole
F	Auxiliary DC input cable	DC auxiliary power supply cable
G	PE from HVC-200/300/360 Power Cabinet	Main Protective Earth cable
H	Interlock + DC guard	Interlock and DC guard cable
I	Fiber optic	Fiber optic cable when using Long Distance Kit
J	DC- In (Spare)	Spare cable gland for Negative pole
K	DC+ In (Spare)	Spare cable gland for positive pole
L	Ethernet (Spare)	Spare cable gland for Ethernet communication cable
M	Interlock + DC guard (Spare)	Spare cable gland for Interlock and DC guard cable
N	Auxiliary DC input cable (Spare)	DC auxiliary power supply cable

—

3.6 EVSE status beacon

EN


The EVSE is equipped with a beacon on the front of the box, that indicates the status based on the colours. In the table are described the main status:


LEDs color	Description
   	The EVSE is in idle mode and ready for use: The beacon of the EVSE is solid green
   	The EVSE is in waiting/getting ready to charge: The beacon of the EVSE is blinking green
   	The charge session starts: The beacon of the EVSE is blinking blue
   	The charge session is completed: The beacon of the EVSE is solid blue
   	The EVSE is error status The beacon of the EVSE is solid red

—

3.7 Authorization to charge

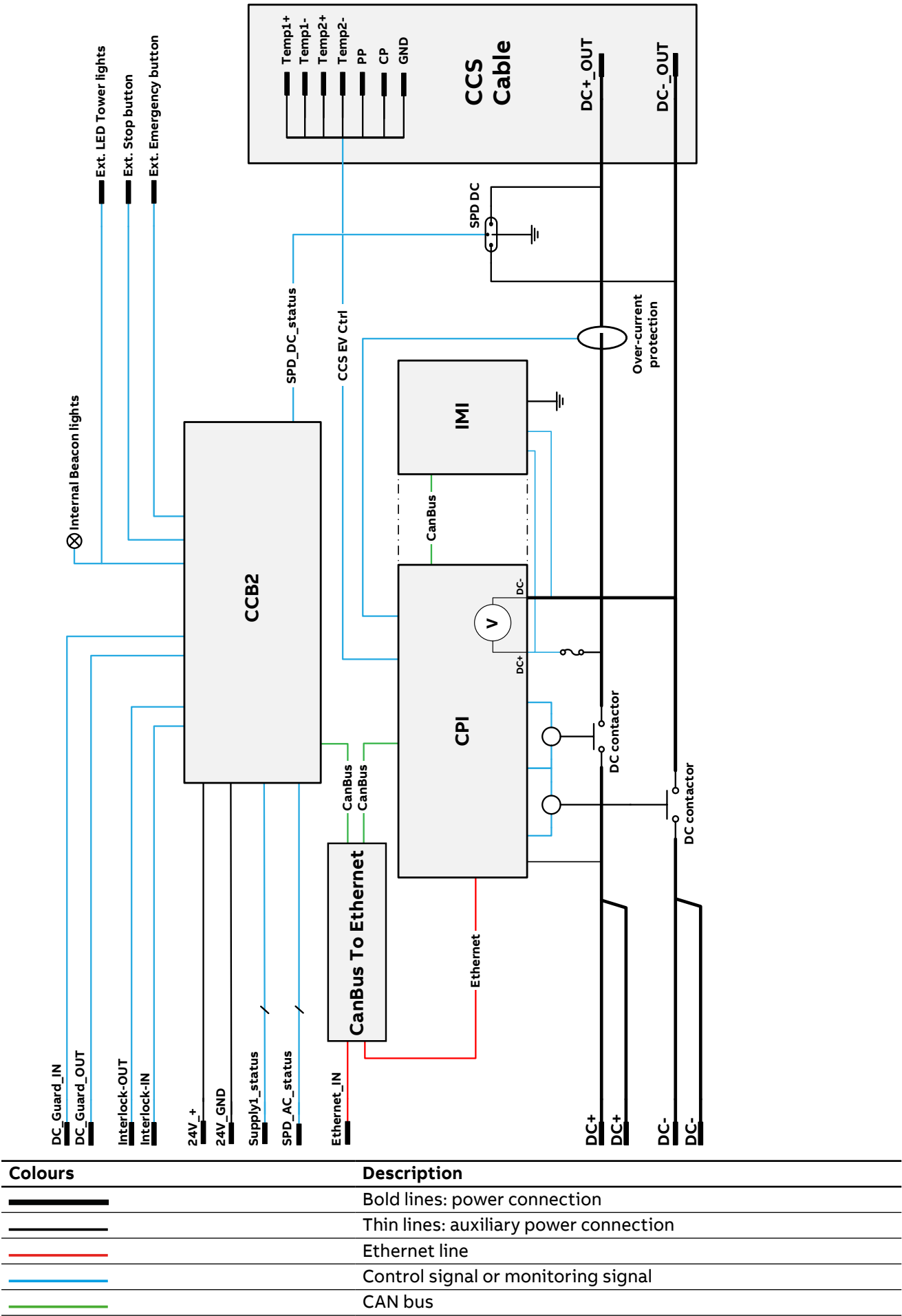
The standard setting is without authorization. This means that every vehicle supporting CCS is able and allowed to start a charge session.

- 

NOTE
Operating a charger with authorization can only be done based on the Vehicle ID and requires a subscription to a back office.
- 

NOTE
This product does not support RFID authentication.

3.8 Working principles



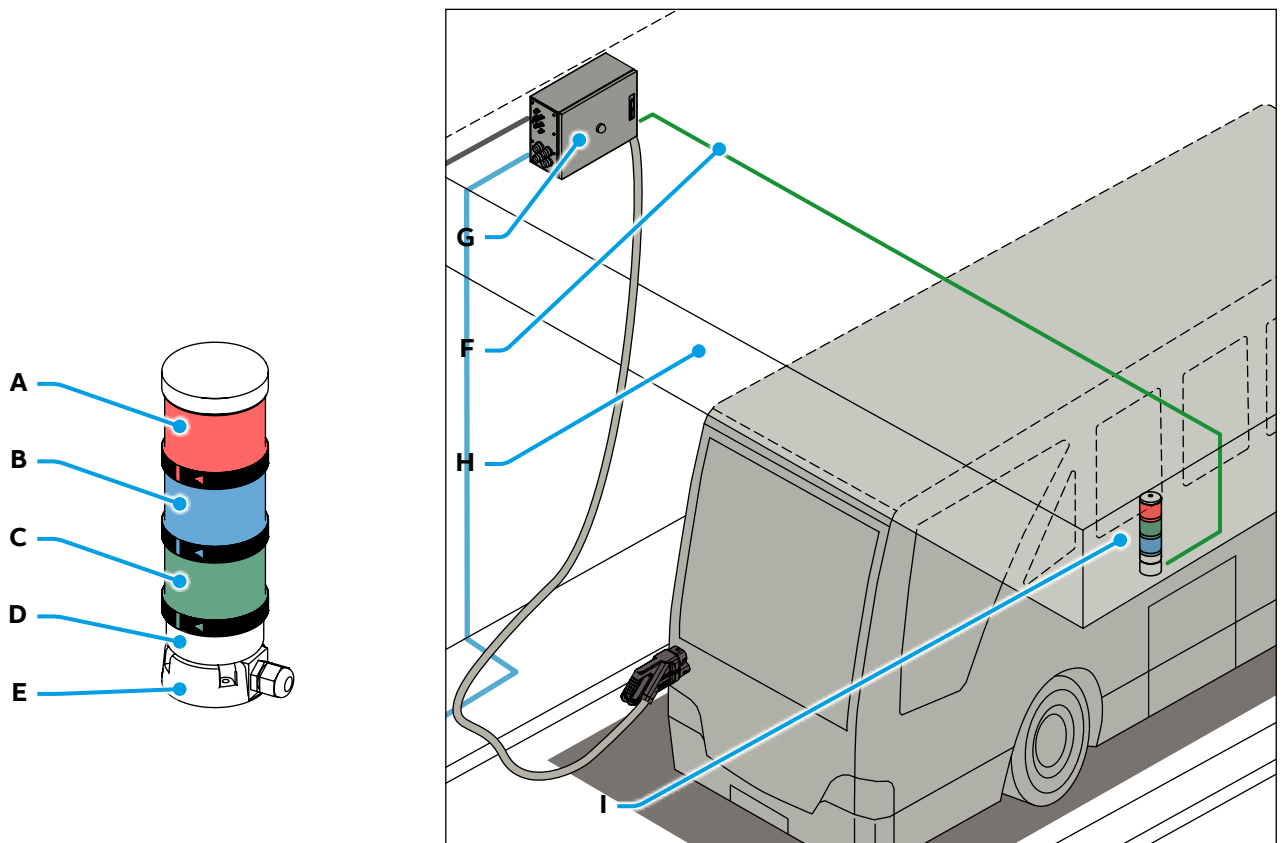
3.9 Optionals

3.9.1 External LED Tower lights

A LED Tower lights can be installed externally to view and check the EVSE status from different positions without having to check the beacon on the box itself.

Each signal tower module is equipped with a bayonet fixing with integral contact system. The modules are fastened together by aligning the corresponding white marks then with a gentle twist they are locked into place.

In the example below the External LED Tower lights has been installed on the roof of the depot:



Ref.	Part	Function
A	KL70 -305R (1SFA616070R3051)	Red LED element
B	KL70-305L (1SFA616070R3054)	Blue LED element
C	KL70-305G (1SFA616070R3052)	Green LED element
D	KT70-1002 (1SFA616075R1002)	Terminal for base mounting (including cap)
E	KA70-1001 (1SFA616077R1001)	Contact box element (Cable exit at side).
F	LED Tower lights cable	To connect the LED Tower lights to the EVSE
G	Caontrol Box CCS	EVSE
H	Roof of the depot	
I	LED Tower lights	



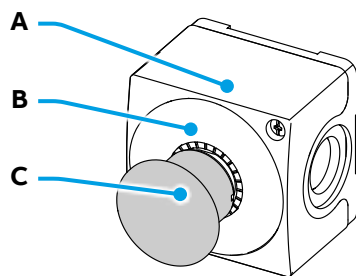
NOTE

Refer to [“11.1.3. External LED Tower Lights”](#) for specification.

3.9.2 External Emergency stop button

The external Emergency stop button (EMO) is used to stop the charge session in case of an emergency (the beacon will become red).

The Emergency stop button is equipped with 2 contacts normally closed (NC)

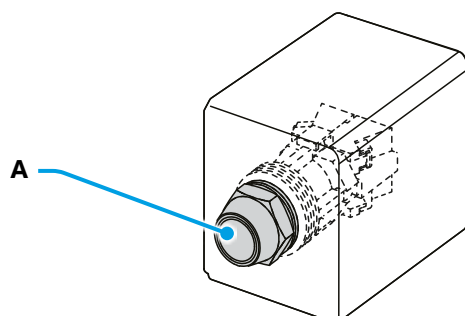


Ref.	Part	Function
A	1SFA611821R1000	Yellow case
B	84-902 EAO	Yellow serigraph
C	1SFA619550R1051	Emergency Stop Push Button

3.9.3 External Charge stop button

The external Charge stop button is used to start/stop the charge session and have the following specification:

- 1 contact normally open (<1A, 24VDC) and can be equipped with background light 24V DC.



Ref.	Part	Function
A	Stop button	To use to stop the charge session



NOTE

The placement of this button is customized for every configuration.

3.9.4 Long distance communication kit

The CAN/Ethernet communication between the Power Cabinet and Control Box is done via an ethernet cable (standard configuration).

However, in case of installations with distance more than 100 m between Power Cabinet and Control Box, the Long distance communication kit, based on a fiber optic communication line, can be used. When using this kit, ethernet cable is replaced by glass fiber cable.



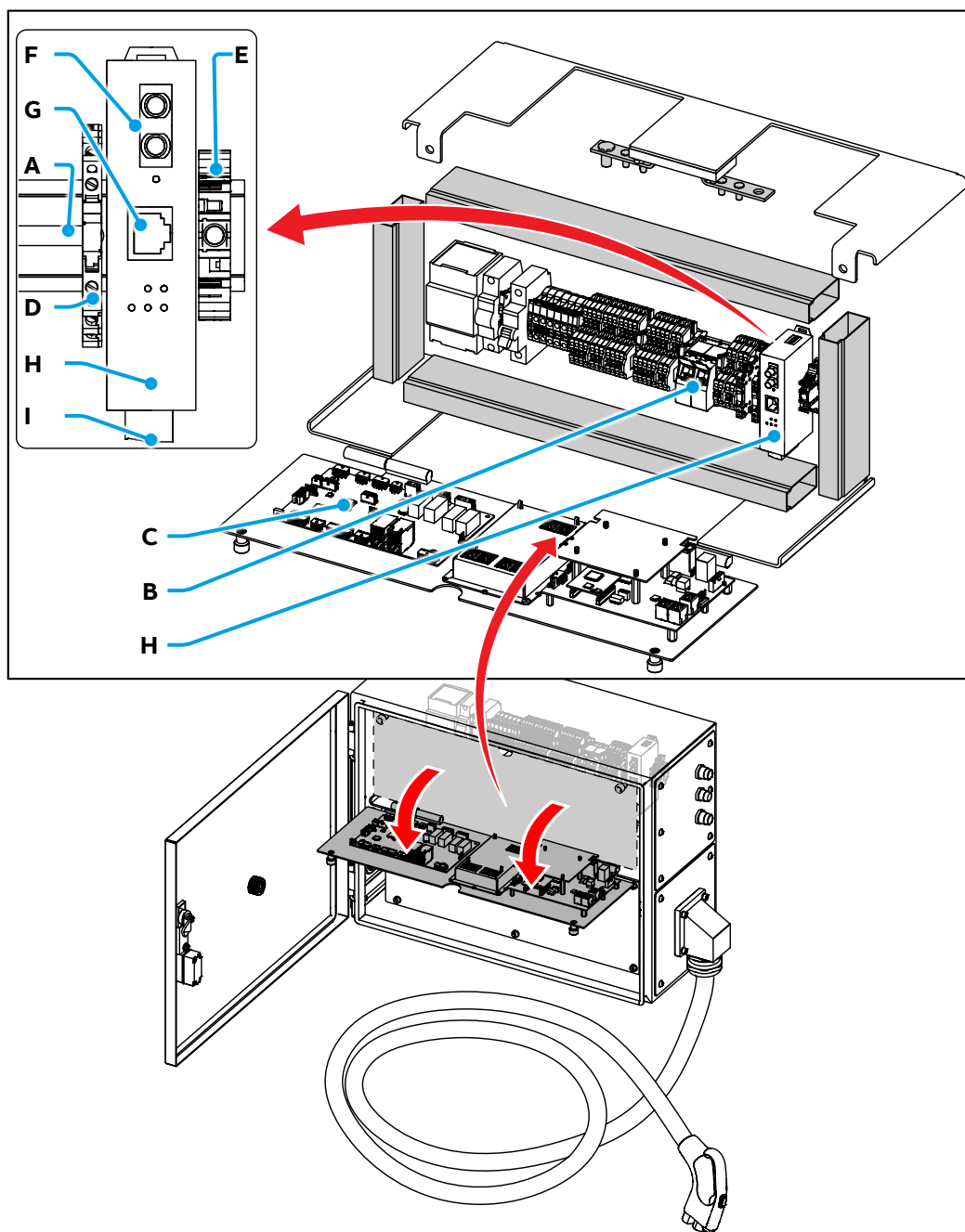
NOTE

The Long Distance Communication kit has to be ordered separately.



CAUTION

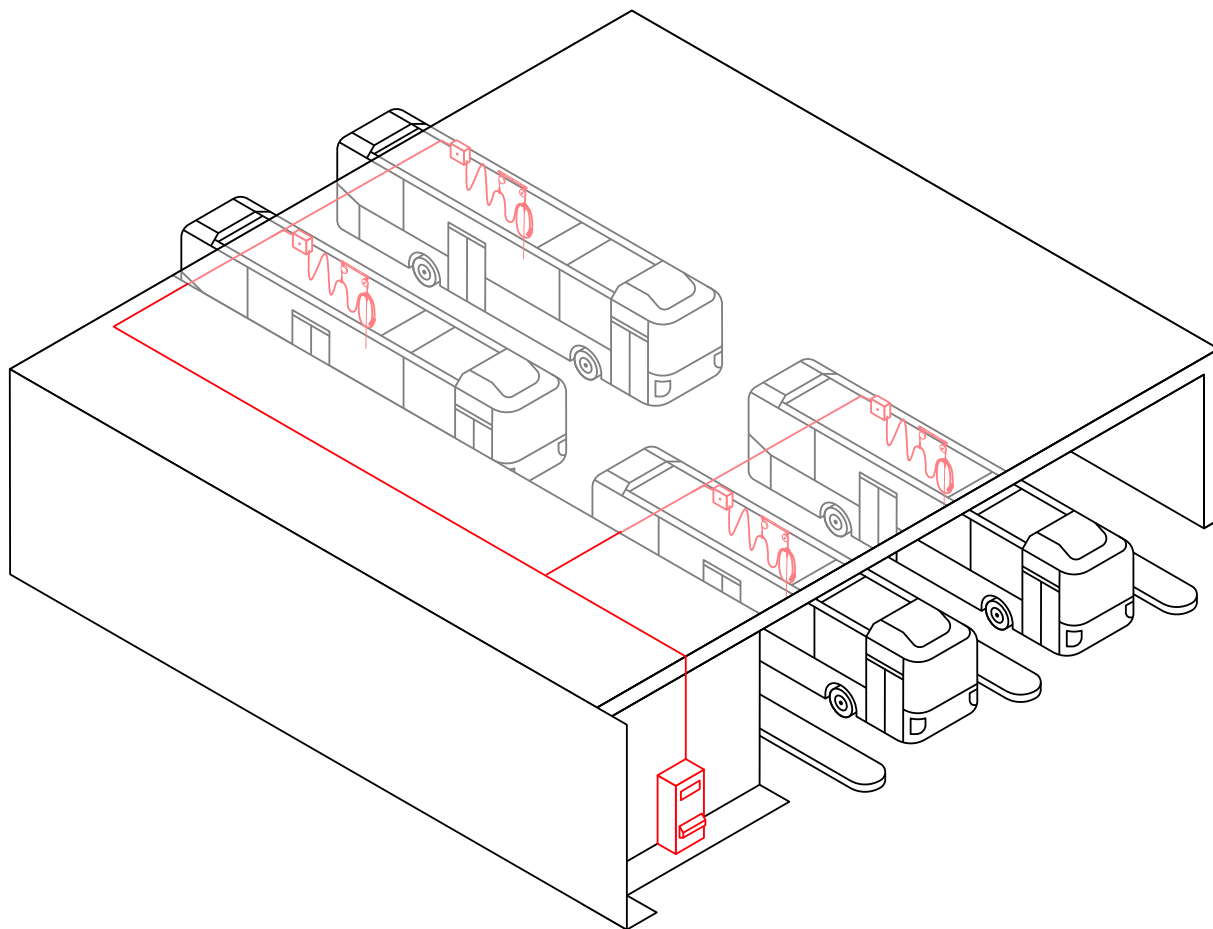
If installing the long distance kit, the connection of the Ethernet cables inside the HVC-200/300/360 Power Cabinet must be reconfigured. Refer to the instructions [“7.3.5. HVC 200/300/360 reconfiguration for Long distance kit”](#)



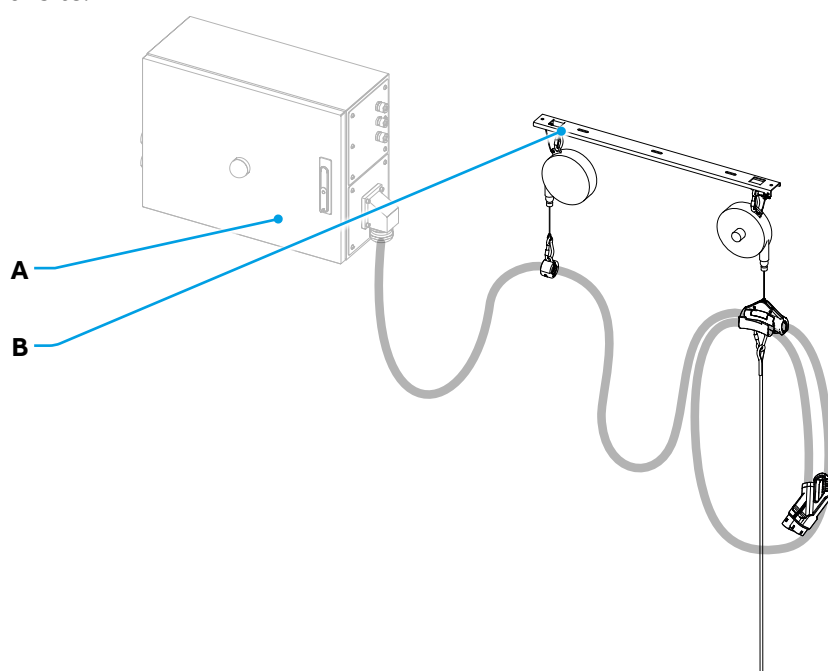
Ref.	Part	Function
	ABB6AGC084183	Global ID of Long Distance Kit
A	DIN rail	Where to install the kit components
B	Ethernet connector	Ethernet connector of Control Box
C	CCB (Core Control board)	To supply the kit components
D	Relay K1	Relay to power supply the Ethernet to fiber converter
E	DIN rail end stop	To lock the DIN rail components in place
F	Fiber optic connectors (B-FOC type)	To connect fiber optic coming from power cabinet
G	Converter ethernet connector	Ethernet connector of the converter (H)
H	Ethernet to fiber converter	To convert the communication line from Ethernet to optic fiber
I	X3 connector	Power supply connector of ethernet to fiber converter

3.9.5 Cable balancer

For depot applications where charger footprint is limited, we provide control boxes that can be ceiling mounted to avoid chargers being installed on the ground. For such use cases, cable management also becomes essential for easy usability of the CCS charging cable and connector.



Our cable balancer system seamlessly integrates with the charging interface to provide a manual extension and retraction system for the CCS cable. The cable balancer system can be ordered separately to be installed onsite.



Ref.	Part	Function
A	CCS Control Box	To control the charge process
B	Cable balancer	To manage the charging cable

4. Transport, handling and unpacking

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

Chapter recipients:



- Owner
 - Installer
-

4.1 Transport of the EVSE - Preliminary operation

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



NOTE

If you need to store the equipment before installation, obey the ambient conditions for storage. DO NOT store the equipment in a location exposed to severe weather conditions (e.g. rain, snow or a high level of humidity).



CAUTION

You are prohibited from transporting or handling the equipment unless you are authorised to handle it and you comply with the following safety measures!



WARNING

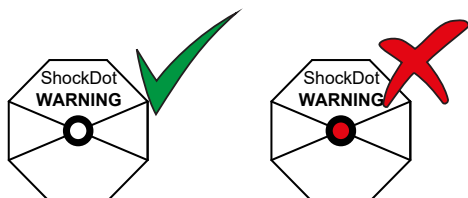
Please follow these steps to comply with the applicable Safety measures applicable to the working area including instructions for safe handling of the equipment.



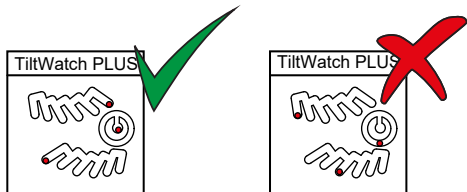
DANGER

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.

- Choose the lifting equipment based on the weight of the equipment
- Check the weight on the transport document before moving the load.
Check that the lifting equipment for loading/unloading is suitable and is able to move the equipment based on weight, and that is fully able to move into the pallet to provide full support. Lifting operators must comply to all local regulations.
- Check the position of the center of gravity before lifting the equipment in order to avoid overturning.
- Check that the pallet is not damaged. Otherwise please contact the responsible Health and Safety manager for the site to get instructed on how to unload the equipment and move it in a safe way.
- Check If you see any damage on the equipment, through the packaging material. If yes, do not unpack the equipment and contact the manufacturer to give details of the delivery problems.
- Do a check on the transport sensors (if present on the box):
 - If the sensor (A) show that a shock was detected.



- If the sensors (B) show a tilt that is too high.



Do not refuse the shipment.

Make notation on delivery receipt and inspect for damage.

If damage has occurred, leave item in its original packaging and request immediate inspection from carrier within the applicable time period.

- 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 equipment are fully aware of the safety measures and keep sufficient distance away from moving equipment.



NOTE

The manufacturer is not liable for any damages resulting from the improper handling and transportation of the equipment, 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 Move the EVSE with a forklift truck

- Move the forks of the forklift truck in the gaps of the pallet.



WARNING

Risk of pinching or crushing, the equipment is heavy

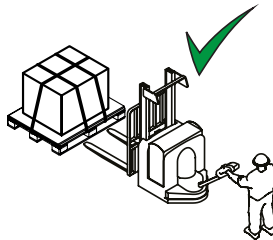
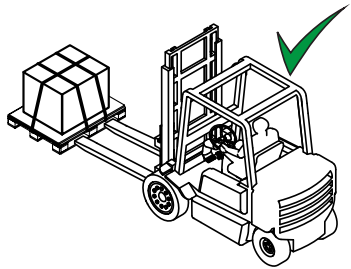
- Obey the safety instructions that apply to the forklift truck.
- Take into account the weight, the dimensions and the center of gravity of the equipment.



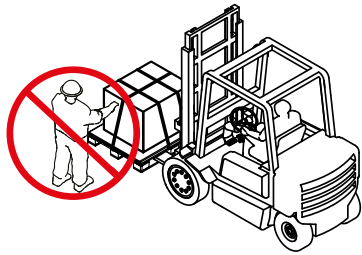
CAUTION

- Do not drop the equipment.
- Do not tilt the equipment more than allowed.

- Move the equipment to the correct location paying attention to the following indications:



- Choose a forklift truck suitable to lift the EVSE safely.



- Do not stand near the EVSE during handling

4.2 Unpacking

4.2.1 Unpacking procedure



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 find damage or the parts are not according to the order, contact the local manufacturer service dept.

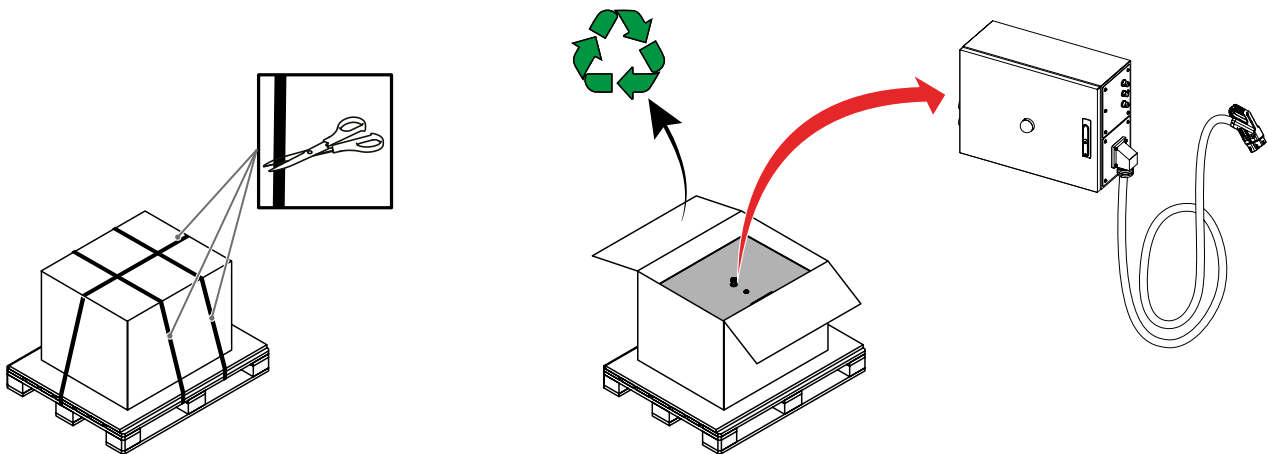
- Open the box
- Take the bag which contain components supplied with the equipment (keys, cover caps, mounting material, etc..).
- Lift the Control Box out of the box.



WARNING

In case of manual lifting the number of required operators necessary to lift the equipment must be in accordance to local regulations relating lifting limits per operator.

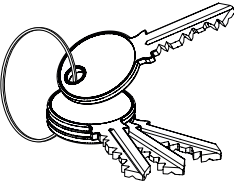
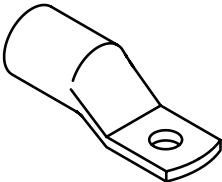

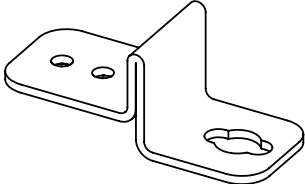

- Place the Control Box on the ground with its top facing up.
- Remove all protective foam.



- Do a visual check for damage on the outside and inside of the boxes.
- Make sure that all parts are delivered according to the order.
- If you find damage or the parts are not according to the order, contact the local representative of the manufacturer (ABB EV Infrastructure).

4.2.2 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 door	4
	DC cable lug (M10, 185mm²) <div> NOTE Pre-installed on the DC busbars</div>	2 (1 on the positive pole busbar + 1 on the negative pole busbar)
	Wall/Roof structure bracket	4
	Screw to install the wall/structure bracket to the control box	4

5. Access to the internal parts

In this section are illustrated all the acces procedures.

Chapter recipients:

 • Installer

5.1 Access to the internal parts - CCS Control Box



Hazardous voltage

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

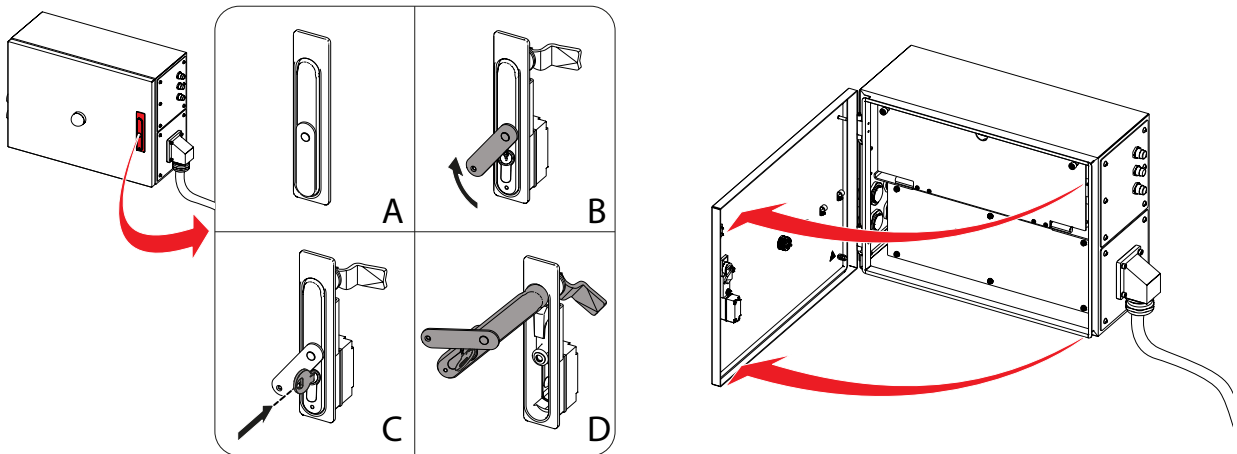


NOTE

There is one unique door key for the Control Box.

5.1.1 Open the lock of the door - CCS Control Box

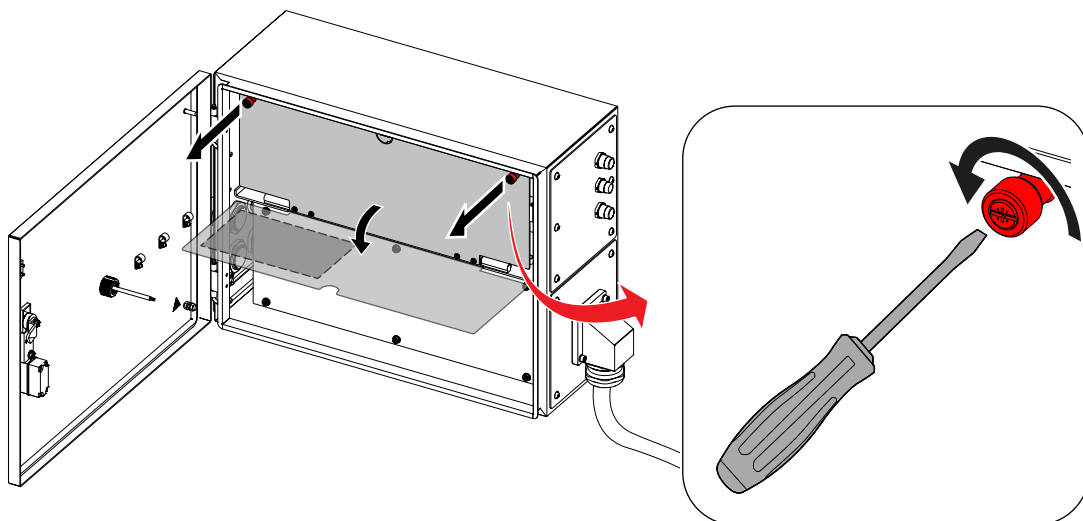
- Use the door key to unlock the lock and open the front door.
- Proceed by unscrewing the locking screw of the protection cover (A).
- Then, rotate the protection cover (B) and insert the key (C).
- Then lift the lock block by turning it and unlocking the box (D).
- Open the door.



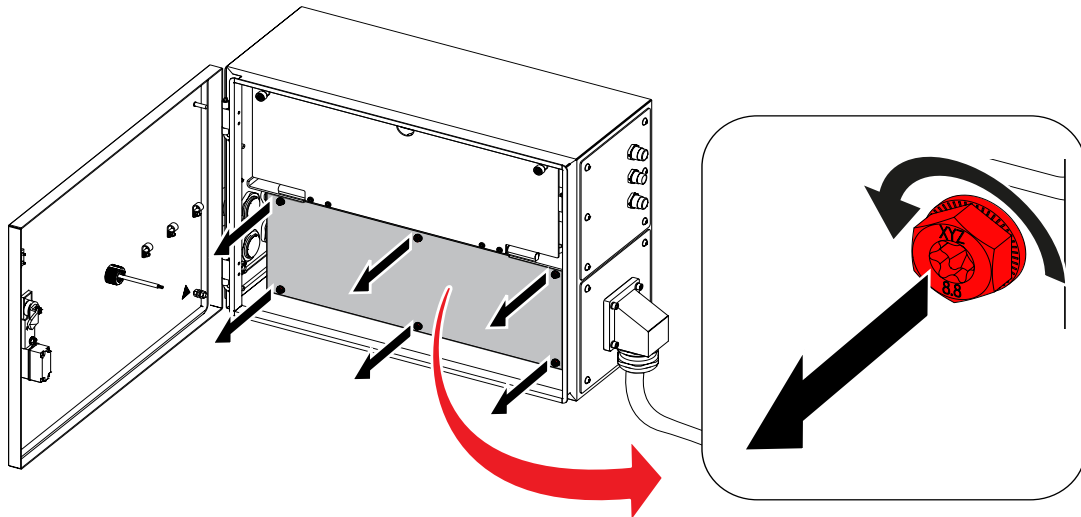
5.1.2 Open/remove the internal covers - CCS Control Box

Internal covers

Unscrew the bolts on the 2 internal latches on the top of the box of the EVSE and open the door.



Unscrew the bolts on the 6 internal latches on the lower internal part of the EVSE and extract the cover.



5.1.3 Close the doors - CCS Control Box



Hazardous voltage

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



NOTE

There is one unique door key for each cabinet.

In order to close the doors of the EVSE, repeat the operations described in the “Open doors paragraphs” in reverse order.

6. Installation

In this section are illustrated all the installation procedure.

Chapter recipients:



- Owner
- Installer

6.1 Wall/Structure installation of the Control Box

The installation of the Control Box can be done on a wall or roof structure:

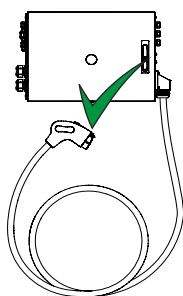


NOTE

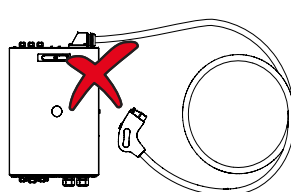
This type of installation can be done using the supplied wall brackets.

The equipment must be installed horizontally:

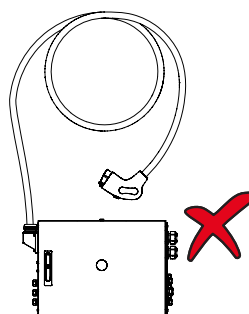
Horizontal installation is allowed



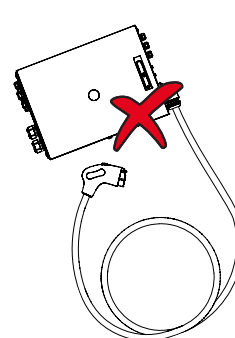
Vertical installation is not allowed



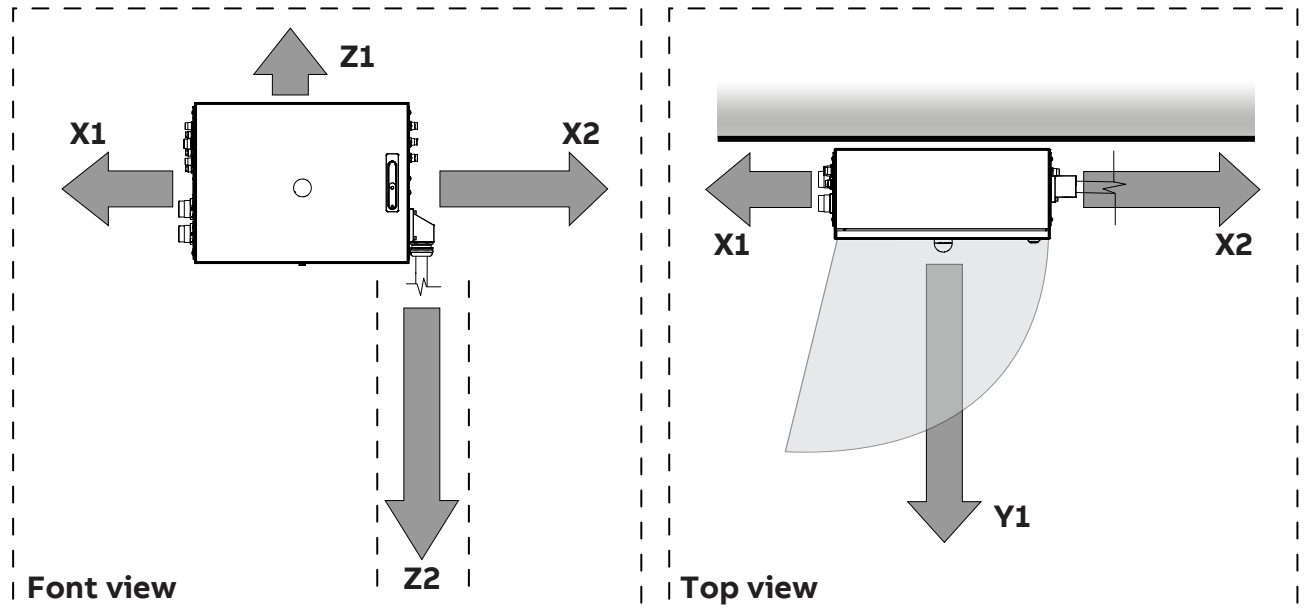
Reverse installation is not allowed



Inclined installation is not allowed



6.1.1 Wall space requirements



Parameter	Description	Specification [mm]
X1	Space to route the cables inside the box	800
X2	Space to route the cables inside the box	500
Y1	Space to install, open and maintain the equipment	1000
Z1	Space to install the equipment	150
Z2	Space to route the charging cable to the EV	up to the floor in correspondence of the charging cable


NOTE

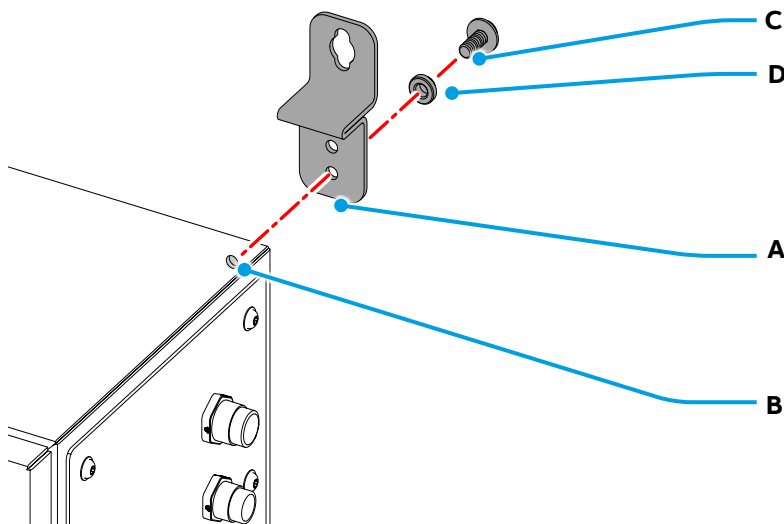
The distances are intended as minimum.

6.1.2 Install the brackets on the Control Box


NOTE

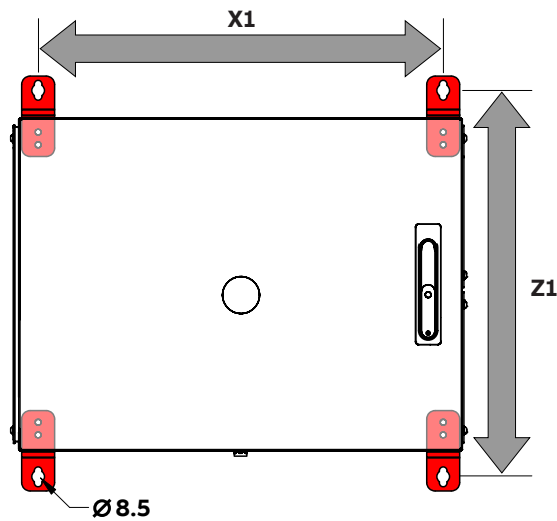
Install all four brackets vertically.

- Align the hole in the brackets (A) with the hole in the box (B).
- Install the washer (D) on the screw (C) and install the bracket on the back of box.



6.1.3 Install the Control Box on the wall/structure

- Mark the 4 fastening points using the following measurements as a drilling template



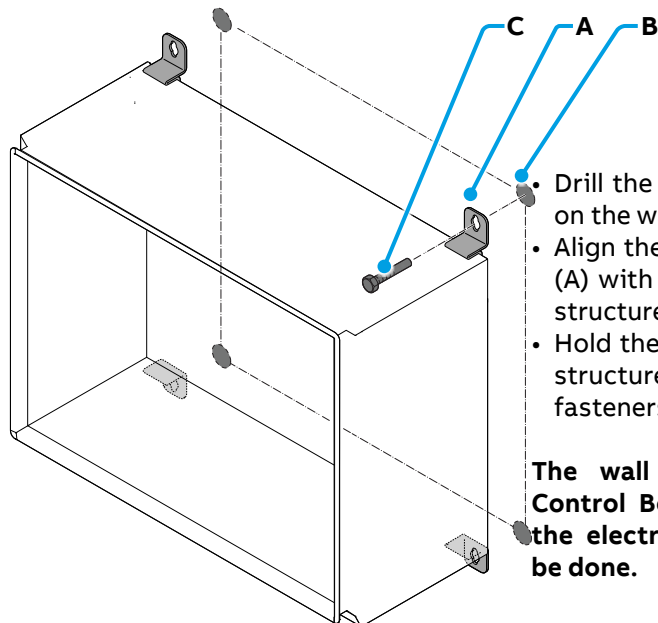
Parameter	Description	Specification [mm]
X1	Space between the two holes of the brackets (vertically installed)	530
Z2	Space between the two holes of the brackets (vertically installed)	508,6

- Depending on the type of anchor chosen, drill the required 4 holes to mount the bracket.



WARNING

It is an installer's responsibility to choose appropriate type of anchors. The choice must be based on the type of support (concrete wall, wood or other support) and their ability to support at least 4 times the equipment's weight.



- Drill the 4 the mounting holes on the wall/structure.
- Align the holes in the brackets (A) with the holes in the wall/structure (B).
- Hold the box against the wall/structure and screw the 4 fasteners (C).

The wall installation of the Control Box is completed and the electrical connections can be done.

7. Electrical connection

In this section are listed all the electrical connection procedure.

Chapter recipients:

 • Installer

7.1 Electrical installation of CCS Control Box

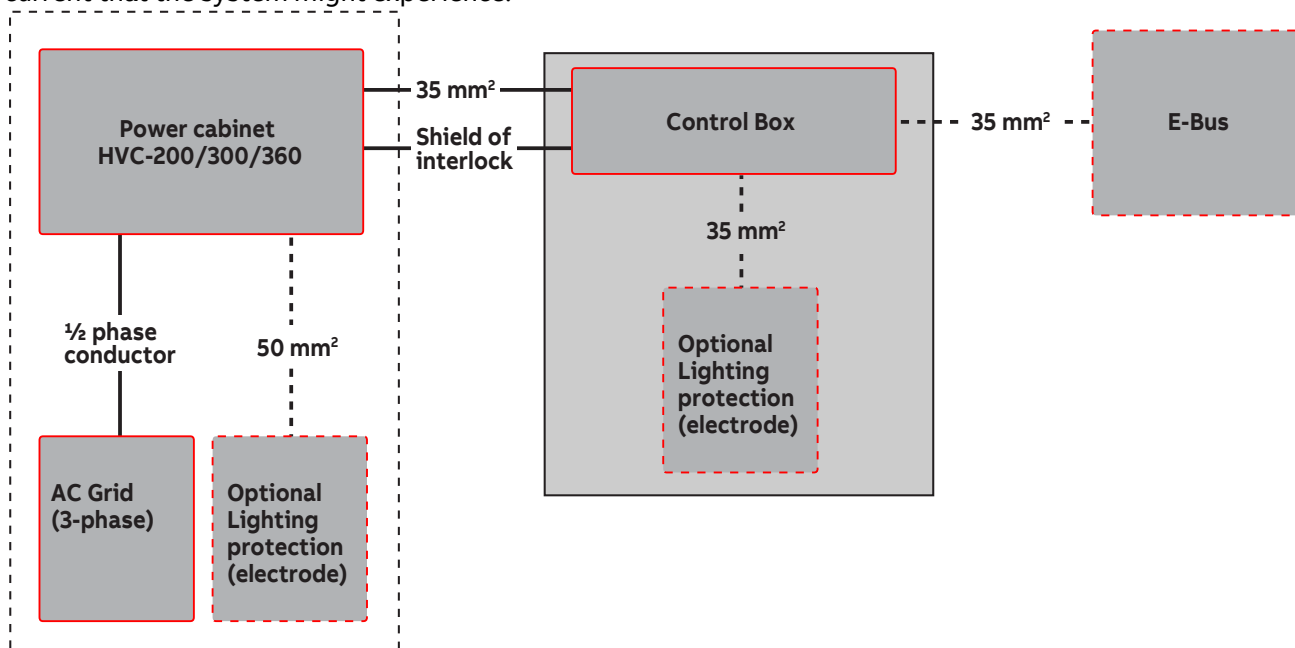
7.1.1 Protective earth (PE) connection



HAZARDOUS VOLTAGE

Before carrying out any operation, check that any external switch of voltage sources (downstream to the EVSE) are in OFF position and check for input voltage absence!

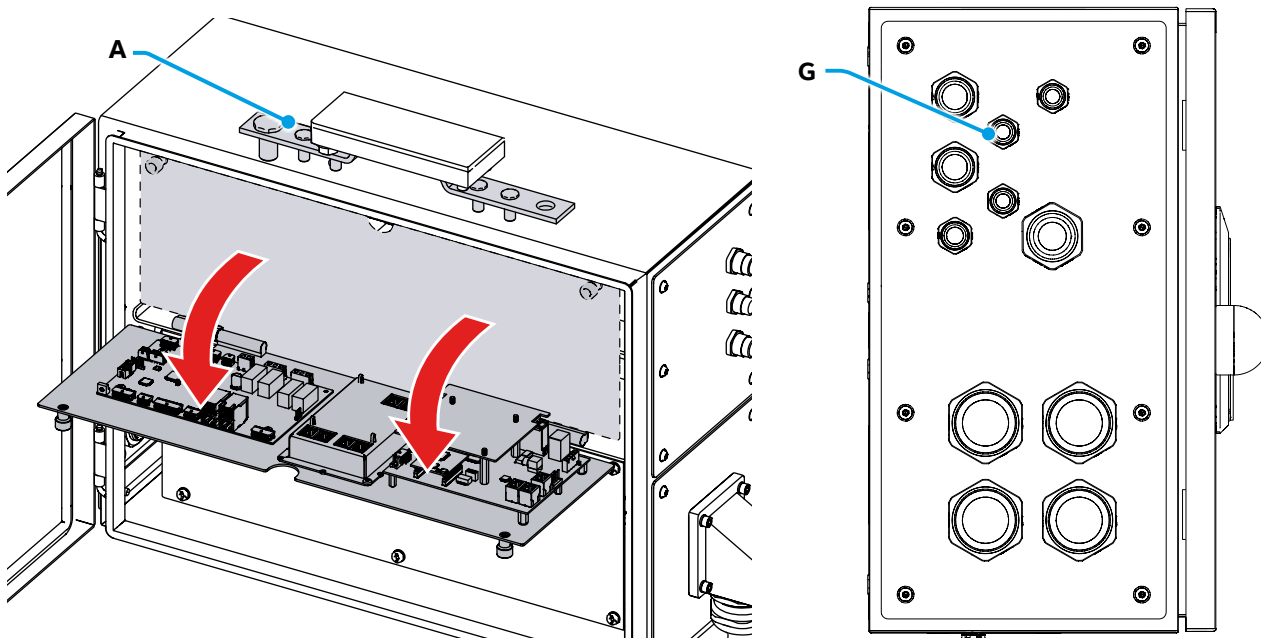
The Protective Earth (coming from the Power Cabinet) must be connected to point marked with the protective earth symbol and using a cable with an appropriate conductor cross-section for the maximum ground fault current that the system might experience:



The earth connection must be made on the Protective Earth (PE) internal connection busbar (A) passing the cable through the dedicated cable gland (G).

Connection specifications

PE busbars _ Connecting capacity	35 mm ² cable lug (minimum)
PE busbars _ Torque	20 Nm
Cable gland (G) capacity	5 ... 10 mm
Cable gland (G) Torque	3 Nm



**NOTE**

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

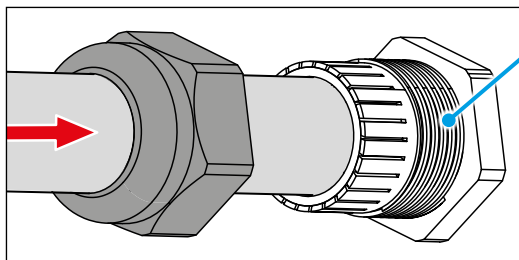
In compliance with standards it is necessary to install a earthing cable in one of the protective earth terminal with a minimum section as indicated in the table below:

Cable	Cross section
PE (Yellow/Green)	35 mm ² minimum cross section

**CAUTION**

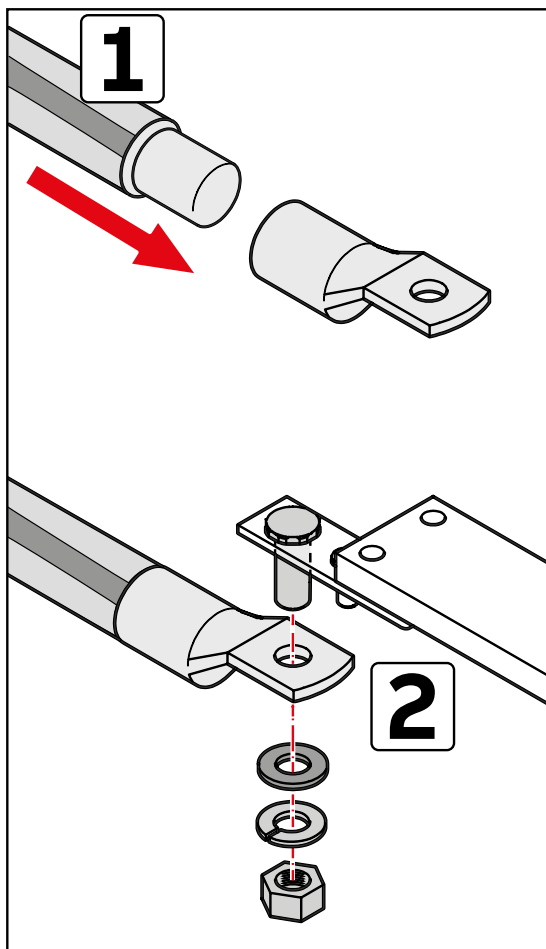
The value on this table are valid only if the protective earthing conductor is made of copper. If this is not so, the cross-sectional area of the earthing conductor is to be determined in a manner which produces a conductance equivalent to that which results from the application of this table.

The Protective Earth connection wire is coming from the Power Cabinet and is mandatory.



G

- Open the box and open the Internal flip cover. Refer to [“5.1. Access to the internal parts - CCS Control Box”](#).
- Unscrew and remove the ring of PE cable gland (G).
- Route the PE wire cable through the cable gland (ring and body).



- Cut the PE wire to the correct length to reach the PE busbar (A).

**NOTE**

The cable inside the cable duct must not be too tight.

- Strip the insulation and crimp cable lug on the PE wire.

Cable lug

Hole	for a M10 bolt (Ø11)
------	----------------------

- Install the wire on the PE busbar using the M10 nut preinstalled on the threaded stud.

- Tighten the nut to the following torque:

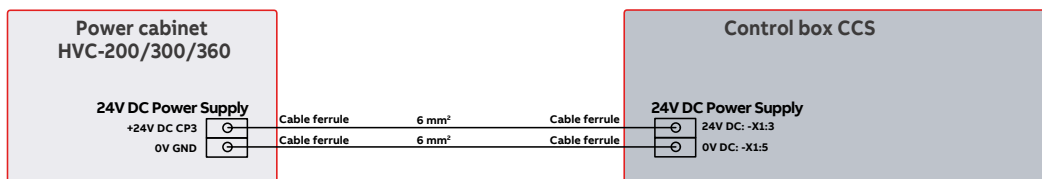
Torque (Nm)

PE busbar	20 Nm
-----------	-------

- Tighten the ring of the cable gland to secure the PE wire.

7.1.2 DC auxiliary connection

The DC auxiliary power supply is supplied by the dedicated 24V DC output of HVC-200/300/360 Power Cabinet.



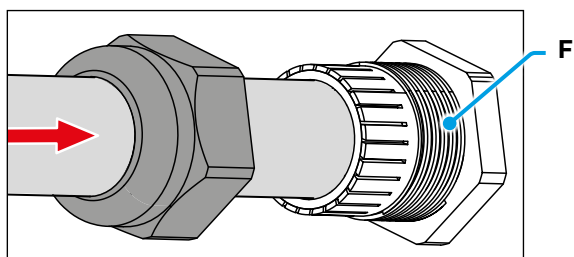
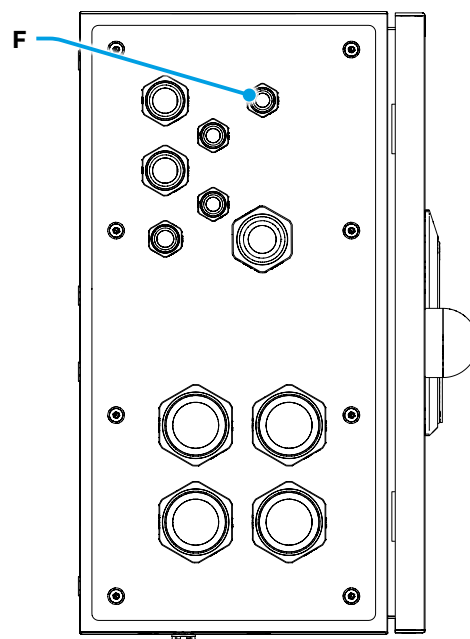
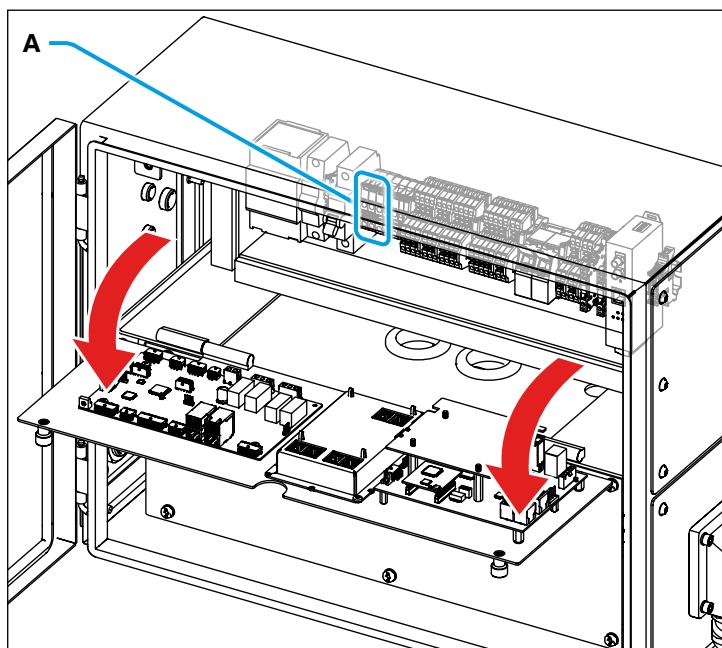
NOTE

The 24 V DC power supply can be also supplied by an external power supply (output current 5 A min.).

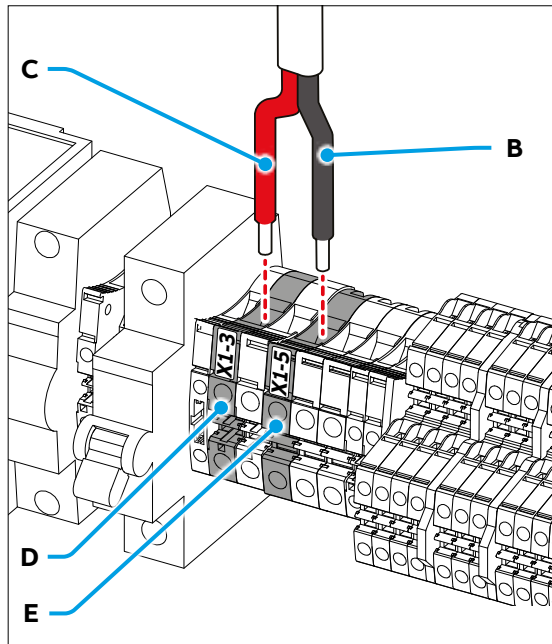
The connection of the DC auxiliary power supply must be made on X1 connector (A) passing the cable through the dedicated cable gland (F).

Connection specifications

X1_ Connecting capacity	0.5 ... 10 mm ² wire with non insulated ferrule
	0.5 ... 6 mm ² wire with insulated ferrule
X1_ Torque	1.3 ± 0.3 Nm
Cable gland (F) capacity	6 ... 12 mm
Cable gland (F) Torque	4.5 Nm



- Open the box and open the internal flip protective cover. Refer to [“5.1. Access to the internal parts - CCS Control Box”](#).
- Unscrew and remove the ring of DC power input cable gland (F).
- Route the PE wire cable through the cable gland (ring and body).



- Cut the DC cable to the correct length to reach the X1 screw terminal blocks.

**NOTE**

The cable inside the cable duct must not be too tight.

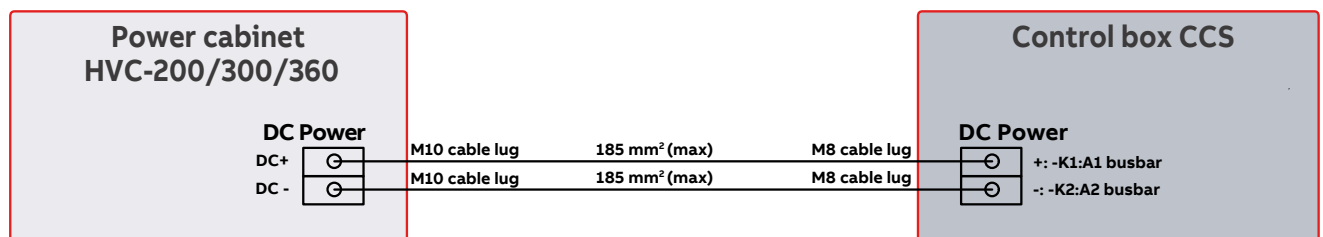
- Strip the insulation and crimp a ferrule on the positive pole (C) and negative pole (B).
- Install the wires on the screw terminal block X1:

Terminal and wire color	Description
X1-3 (D)	Positive pole (+)
X1-5 (E)	Negative pole (+)

- Tighten the screw of the terminal blocks.
- Tighten the ring of the cable gland to secure the DC cable.

7.1.3 DC input power connection

This connection is used to bring DC power from the HVC-200/300/360 Power Cabinet to the Control Box which will be used for charging the EV

**NOTE**

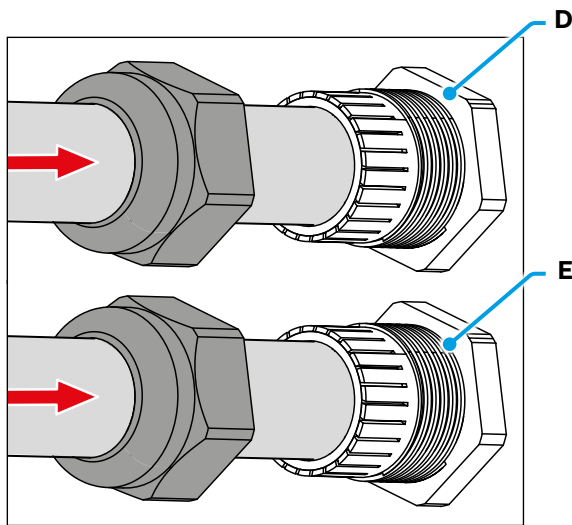
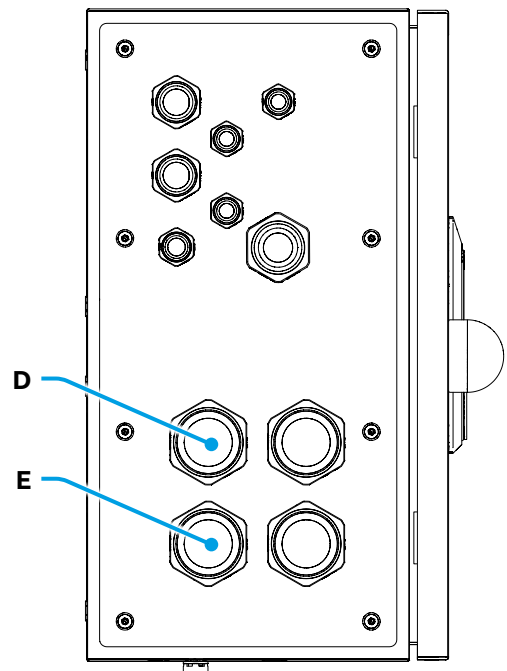
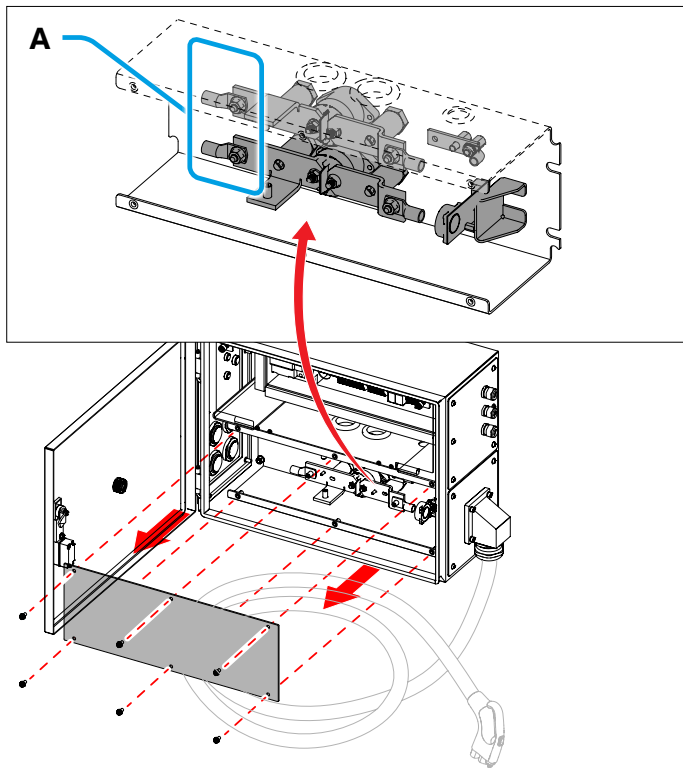
Calculate the cable cross-section to guarantee the voltage drop below 7V.

The connection of the DC cables, coming from the power cabinet, must be made on the busbars (A) as below:

- Positive pole on K1:A1 busbar passing the cable through the cable gland (E).
- Negative pole on K2:A2 busbar passing the cable through the cable gland (D).

Connection specifications

DC power busbars _ Connecting capacity	185 mm ² cable lug (preinstalled on the busbars)
DC power busbars _ Torque	30 Nm
Cable gland (D, E) capacity	22 ... 32 mm
Cable gland (D, E) Torque	10 Nm

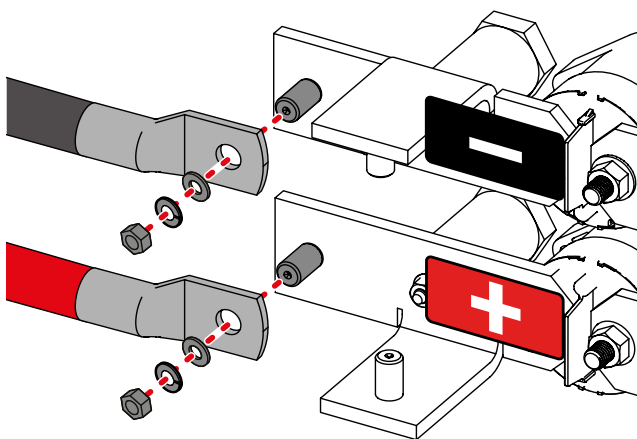


- Open the box and remove the lower internal protective cover. Refer to [“5.1. Access to the internal parts - CCS Control Box”](#).

- Unscrew and remove the rings of the DC power input cable glands (D) and (E).

- Route the DC input positive pole wire through the ring and body of cable gland (E).

- Route the DC input negative pole wire through the ring and body of cable gland (D).



- Cut the DC wires (from the Power Cabinet) to the correct length to reach the DC busbars and install cable lug (supplied and pre-installed on the busbars).

- Install the DC input wires following the installation sequence:
 - DC cable lug
 - Flat washer
 - Spring washer
 - M10 Nut

- Tighten the nut on the DC input power busbars.

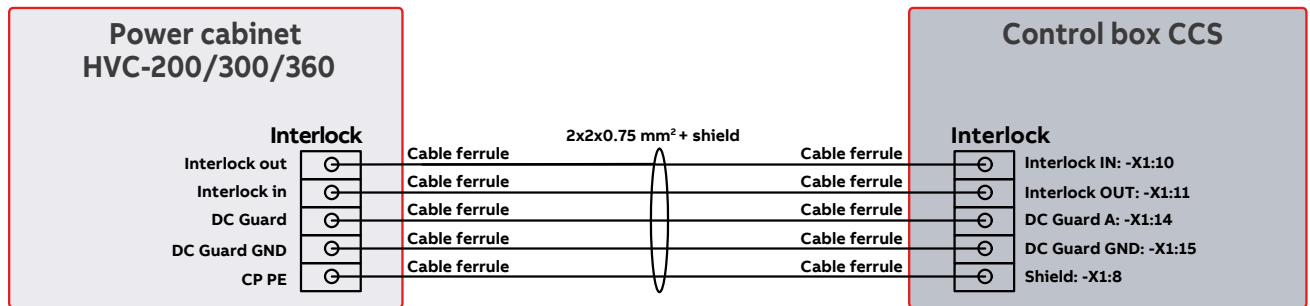
- Tighten the ring of the cable glands to secure the DC input cables.

7.1.4 Interlock and DC Guard connection

The interlock and the DC guard are two control systems that work interconnected with each other.

- The system interlock is a current loop that runs between all devices of the system (in this case the Power Cabinet and the CCS Control Box).
- The DC Guard is a control system (implemented by an extra current loop on the DC bus) to avoid connecting two electric vehicles together.

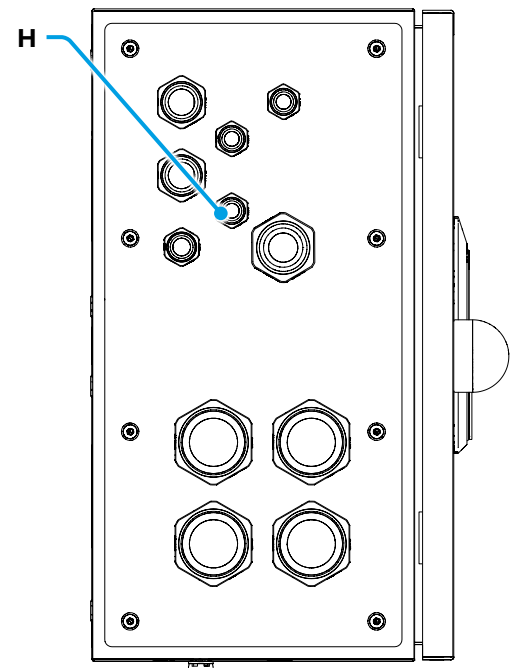
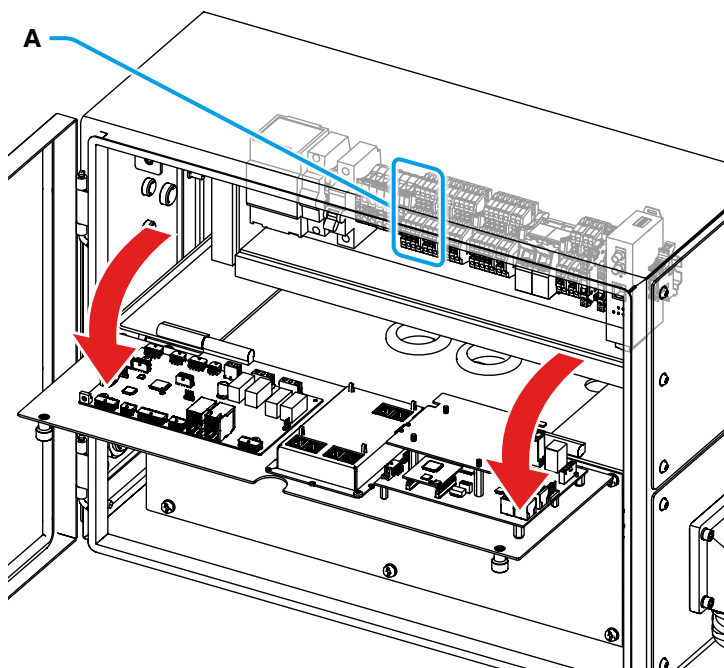
Internal contactors automatically avoids any direct path between two Electric Vehicles. This prevention is done by activating the interlock within 100ms of activating the output contactors; this delay is to give this system to check and activate the interlock (not enabling the charging session) if necessary.

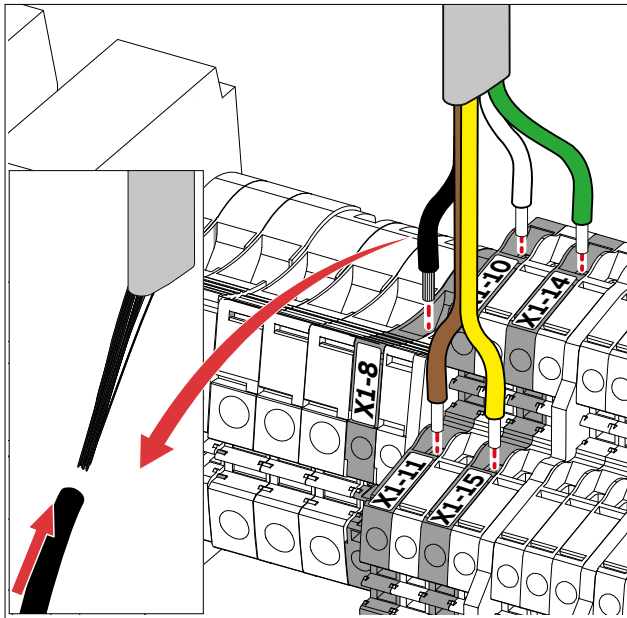
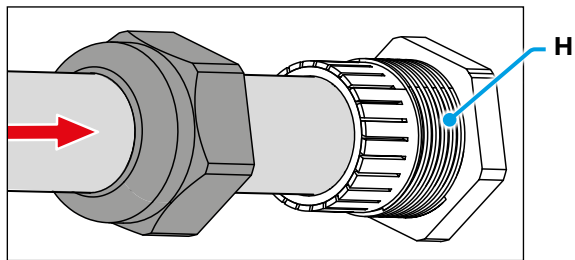


The connection of the Interlock and DC Guard signals, coming from the power cabinet, must be made on X1 connector passing the cable through the cable gland (H).

Connection specifications

X1 _ Connecting capacity	0.22 ... 4 mm ² wire with non insulated ferrule
	0.22 ... 2.5 mm ² wire with insulated ferrule
X1 _ Torque	0.6 ± 0.1 Nm
Cable gland (H) capacity	5 ... 10 mm
Cable gland (H) Torque	3 Nm





- Open the box and open the internal flip protective cover. Refer to [“5.1. Access to the internal parts - CCS Control Box”](#).
- Unscrew and remove the rings of the DC power input cable gland (H).
- Route the Interlock and DC Guard cable through the ring and body of cable gland (H).
- Strip the insulation and crimp a ferrule on the interlock and DC guards wires.
- Twist and slide a shrink tube over the shield of the cable.
- Install the wires on the screw terminal block X1 and X2:

Terminal and wire color	Description
X1-10 (White)	Interlock In
X1-11 (Brown)	Interlock Out
X1-14 (Green)	DC Guard A
X1-15 (Yellow)	DC Guard A - GND
X1-8 (shield)	Interlock GND
- Tighten the screw of the terminal blocks.
- Tighten the ring of the cable gland to secure the Interlock and DC Guard cable.

7.1.5 Ethernet connection

The charger's Ethernet port is configured by default to enable communication, without the need for specific settings. If an on-site internet connection is available, the charger will be automatically configured to transmit telemetry data to the ABB EVCI Cloud without the need to install any additional devices (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>.

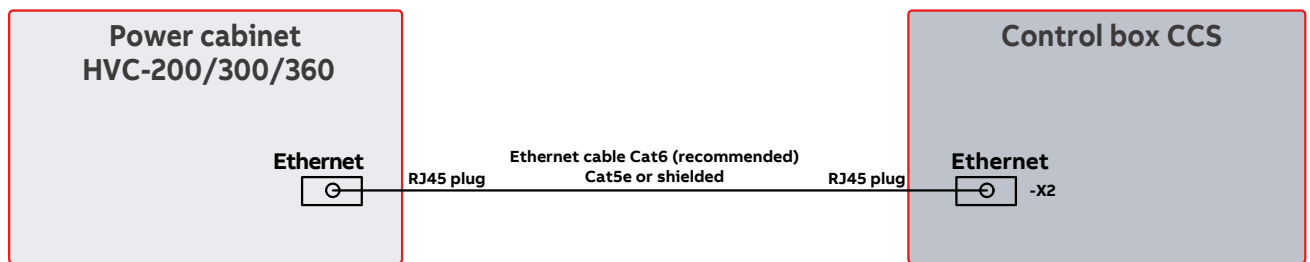
We recommend using at least a CAT 5e category Ethernet cable for standard connection performance. For installations in environments with a high presence of electromagnetic interference and/or noise, we recommend using at least a CAT 6 shielded LAN cable.

For installations in environments subject to extreme conditions, consult an expert technician.



NOTE

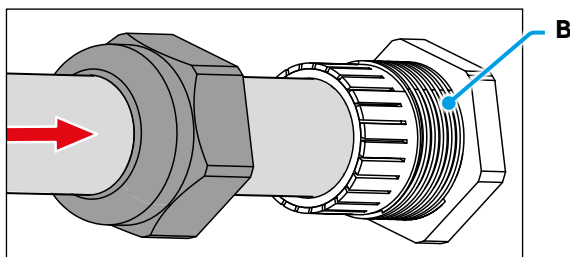
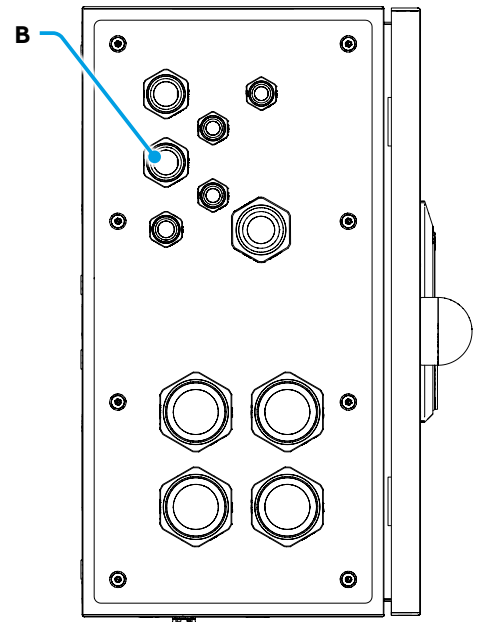
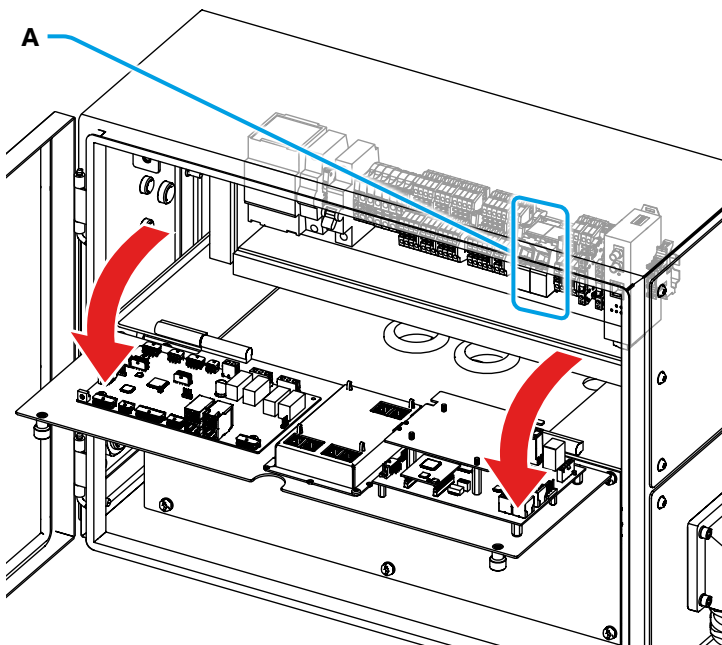
In case of using Long Distance Kit (optical fibers instead of ethernet cable) refer to [“7.3. Installation of Long distance kit \(optional\)”](#).



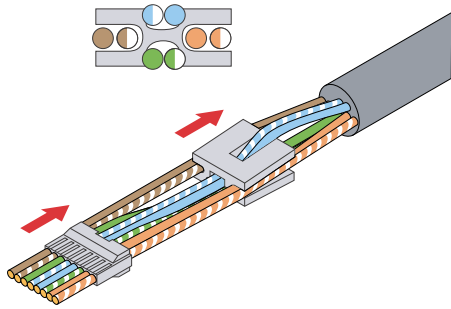
The connection of the Ethernet cable, coming from the Power Cabinet, must be made on X2 connector (A) passing the cable through the cable gland (B).

Connection specifications

Cable gland (B) capacity	13 ... 18 mm
Cable gland (B) Torque	5 Nm



- Open the box and open the internal flip protective cover. Refer to [“5.1. Access to the internal parts - CCS Control Box”](#).
- Unscrew and remove the rings of the Ethernet cable gland (B).
- Route the Ethernet cable through the ring and body of cable gland (B).



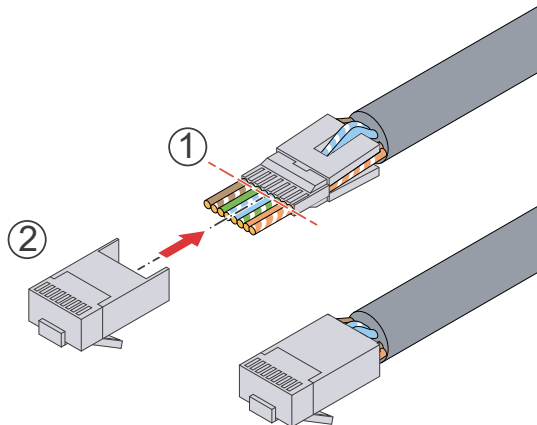
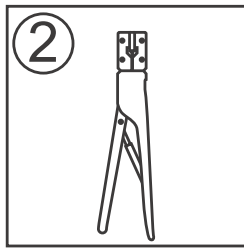
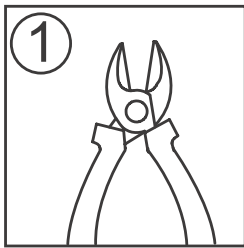
- Cut the Ethernet cable (from the Power Cabinet) to the correct length to reach the X2 connector. The wire must be route inside the cable ducts.

**NOTE**

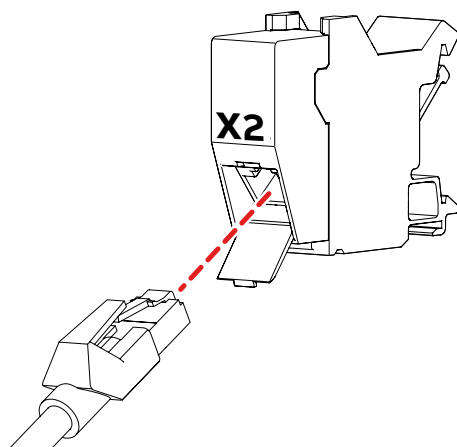
The cable inside the cable duct must not be too tight.

Install an RJ45 connector on the cable following the instruction:

- Strip 50 mm of the insulation from the end of the cable.
- Move the copper shield mesh over the insulation.
- Remove the aluminum foil completely from each pair of the wires.
- Insert the wires into the organizer (T-568B Straight-Through configuration).
- Insert the wires into the loadbar.
- Make sure that the loadbar is in the upper position and the wires are in the correct sequence.



- Cut the excess length of the wires.
- Install the RJ45 connector on the assembly.
- Crimp the wires with the dedicated crimping tool.
- Remove the excess of the copper shield mesh.



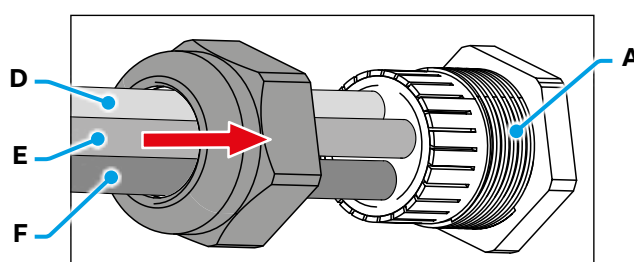
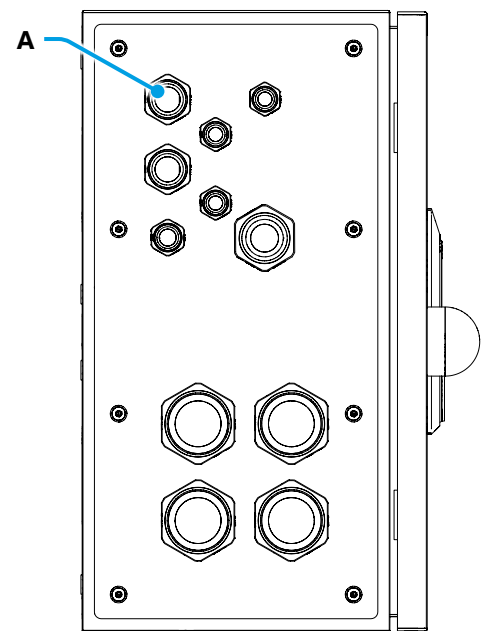
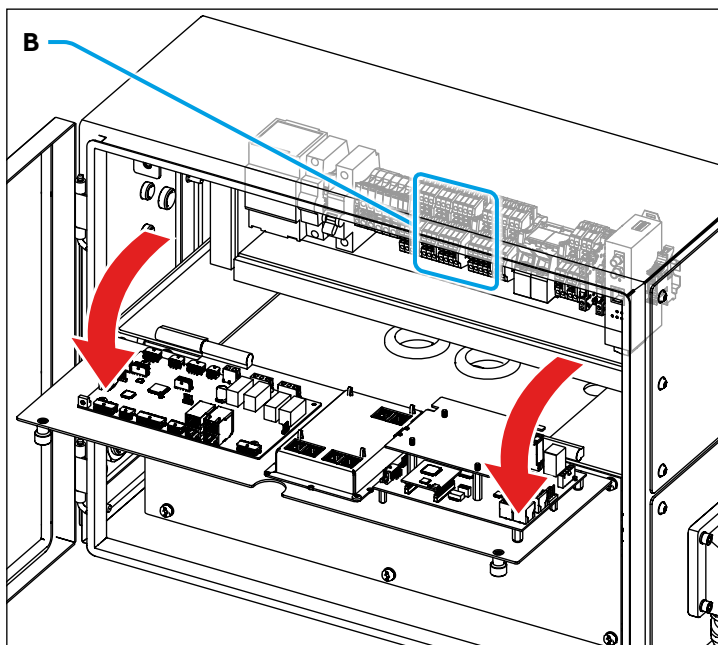
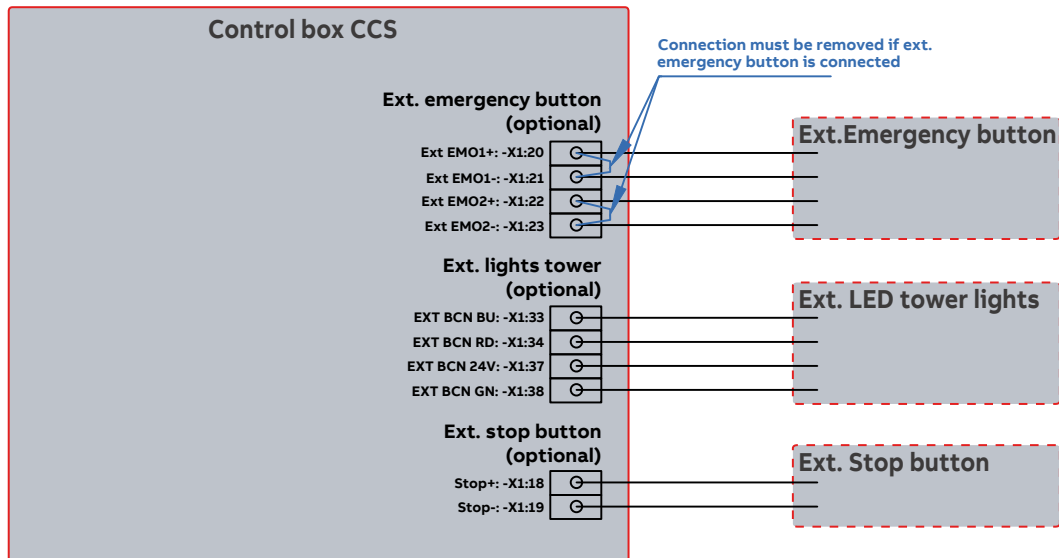
- Open the cover on the connector X2.
- Connect the Ethernet cable to the Ethernet connector X2.
- Tighten the ring of the cable gland to secure the Ethernet cable.

7.2 External Stop button, Emergency button and LED Tower lights connection (optional)

The connection of the external optional devices must be made on X1 (B) connector passing the cable through the cable gland (A).


Connection specifications

X1 _ Connecting capacity	0.22 ... 4 mm ² wire with non insulated ferrule
	0.22 ... 2.5 mm ² wire with insulated ferrule
X1 _ Torque	0.6 ± 0.1 Nm
Cable gland (A) capacity	5 ... 6 mm (each hole fo the multientry gasket)
Cable gland (A) Torque	5 Nm



- Open the box and remove the internal protective cover. Refer to [“5.1. Access to the internal parts - CCS Control Box”](#).
- Unscrew and remove the rings of the Stop button, Emergency button and LED Tower lights cable gland (A).
- Route the cables (D, E, F) through the ring and body of cable gland (A).

- Cut the cables to the correct length to reach the X1 screw terminal blocks. The wire must be route inside the cable duct.




NOTE

The cable inside the cable duct must not be too tight.

- Strip the insulation and crimp a ferrule on the wires.
- Install the wires of Emergency button on the screw terminal block X1:

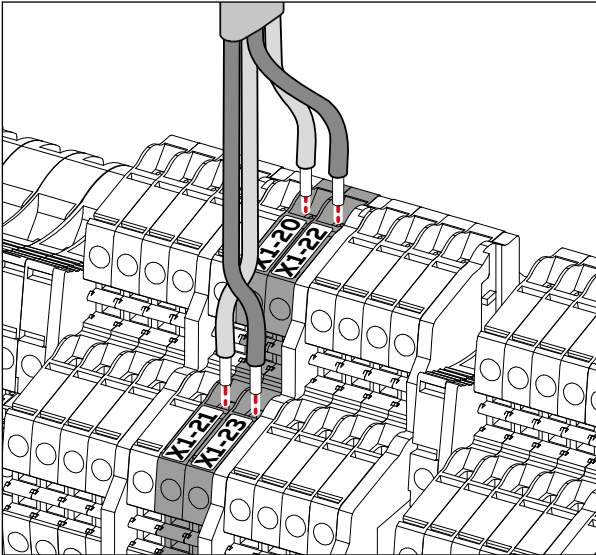
X1 Terminal block	Description
Emergency button cable	
X1-20	External emergency button S1-1
X1-21	External emergency button S1-2
X1-22	External emergency button S2-1
X1-23	External emergency button S2-2



NOTE

The wire between X1-20 and X1-21 terminals and X1-22 and X1-23 terminals must be removed if the Emergency stop button is installed.

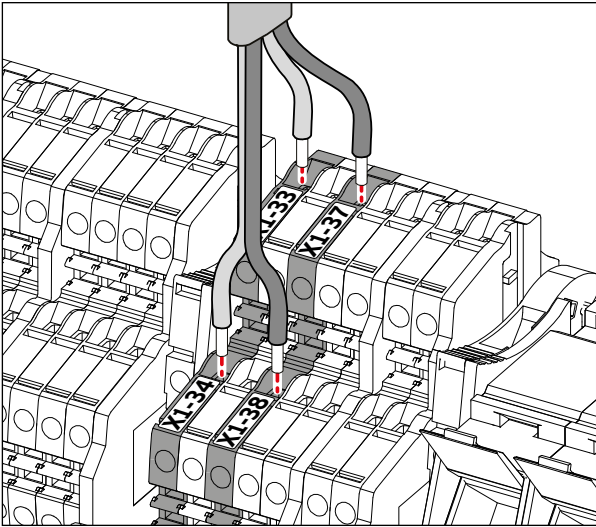
- Tighten the screw of the terminal blocks.



- Install the wires of LED tower lights on the screw terminal block X1:

X1 Terminal block	Description
LED Tower lights cable	
X1-34	External tower light - Red LED
X1-38	External tower light - Green LED
X1-33	External tower light - Blue LED
X1-37	External tower light +24 V

- Tighten the screw of the terminal blocks.

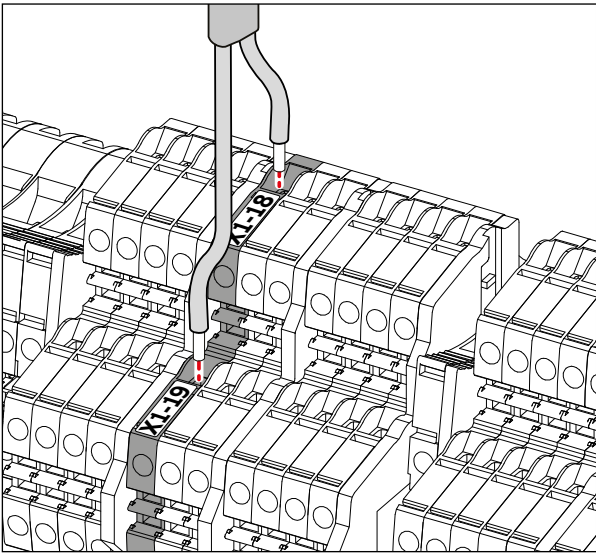


- Install the wires of Stop button on the screw terminal block X1:

X1 Terminal block	Description
Stop button cable	
X1-18	External stop button +
X1-19	External stop button -

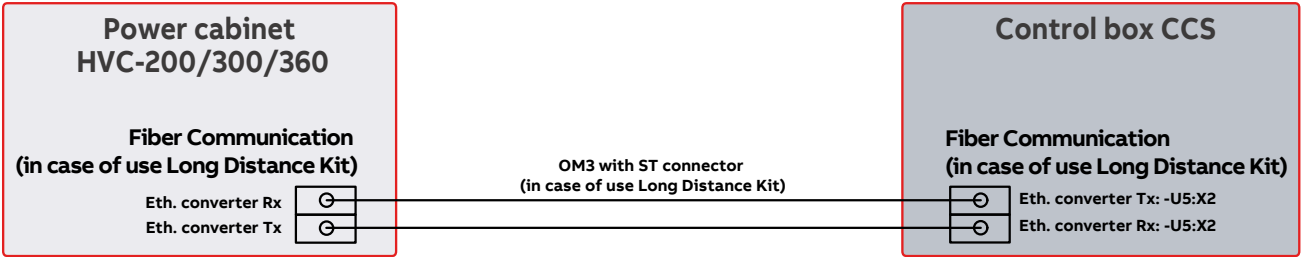
- Tighten the screw of the terminal blocks.

- Tighten the ring (C) of the cable gland (A) to secure the cables.



7.3 Installation of Long distance kit (optional)

In case of installations with distance more than 100 m between Power Cabinet and CCS Control Box, the Long distance communication kit, based on a fiber optic communication line, can be used. When using this kit, ethernet cable between Cabinet and charge post is replaced by glass fiber cable.



NOTE
The connection of the Tx and Rx signals between the Power cabinet and the box must be crossed.

7.3.1 Long distance kit composition

Component	Description
	<ul style="list-style-type: none">• DIN rail end stop• Relay to power supply the Ethernet to fiber converter• Ethernet to fiber converter
	Ethernet cable
	Positive wiring harness to power supply the Ethernet to fiber converter (after K4 relay)
	Wiring harness from J5 to K4/Ethernet and to fiber converter
	Wiring harness from J14 to the K4 relay .


7.3.2 Optic fiber cable (not supplied)

The ethernet to fiber converter (FL MC 2000T) comes with one 10/100 Mbps twisted-pair RJ45 port and one 100 Mbps multimode fiber port with ST connectors.

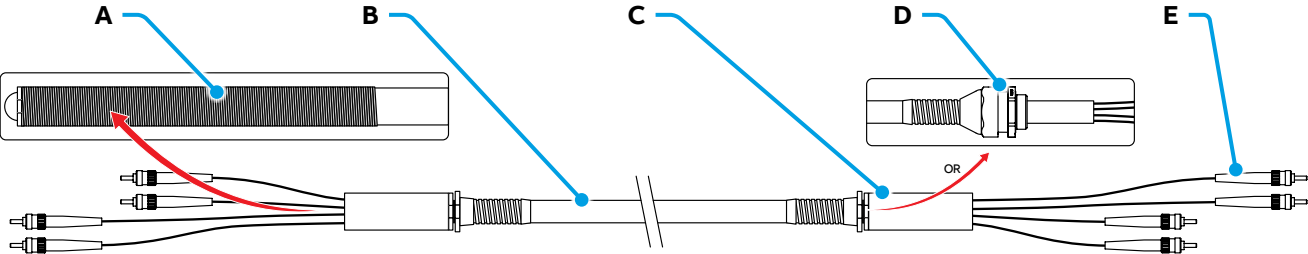
NOTE
The glass fiber cable must be prefabricated and ordered separately by the installer.

Please note that the fiber optic cable must pass through the M32 gland installed on the Control Box.
In alternative:

- Order a fiber optic cable with M32 gland assembled on it.
- Crimp the fiber optic on the site after passing through the cable gland.

**NOTE**

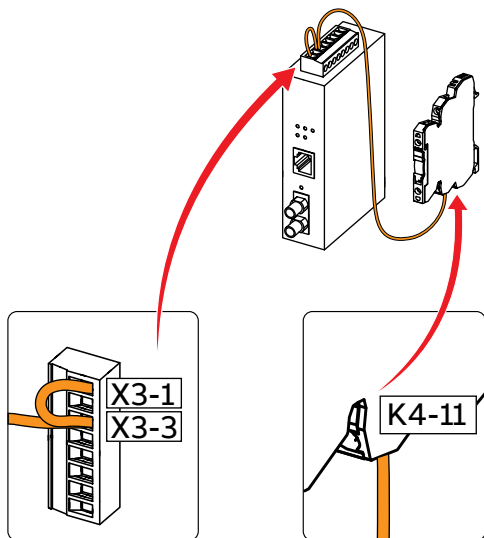
Cable length must be defined by the installer during site survey.



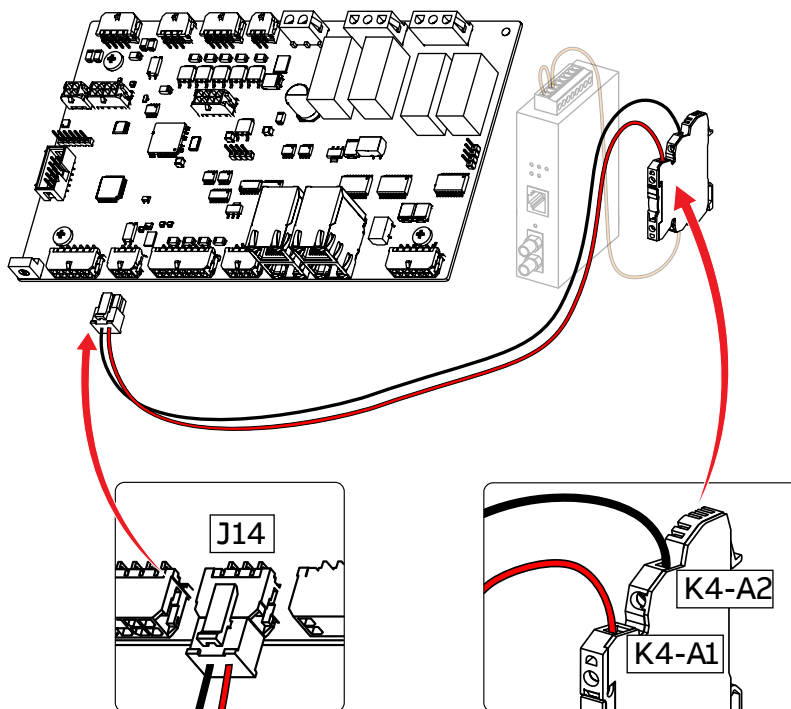
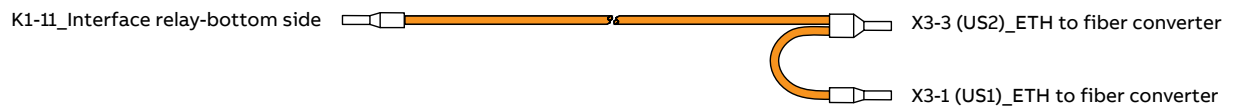
Ref.	Part	Function
A	Protection tube	To protect the cable when it is routed through conduit
B	OM3 fiber optic cable	For long distance communication line
C	Metal finish	To install the cable inside the M32 cable gland (length 50 – 80 mm)
D	M32 cable gland	M32 cable gland preassembled on the fiber optic cable
E	Fiber optic with ST connectors	To connect the fiber optic to the converter (1 pair for the connection and 1 pair as spare)

7.3.3 Install the Long distance kit

- Open the front door of the Control Box.
- Install following components of the kit on the DIN rail (A) following the order shown in the illustration:
 - Power supply relay (D) with contacts A1 and A2 to the top
 - Eth to fiber converter (H) with K3 connector (I) to the bottom
 - DIN rail end stop (E)



- Take the wiring harness indicated and connect it as indicated in the picture .



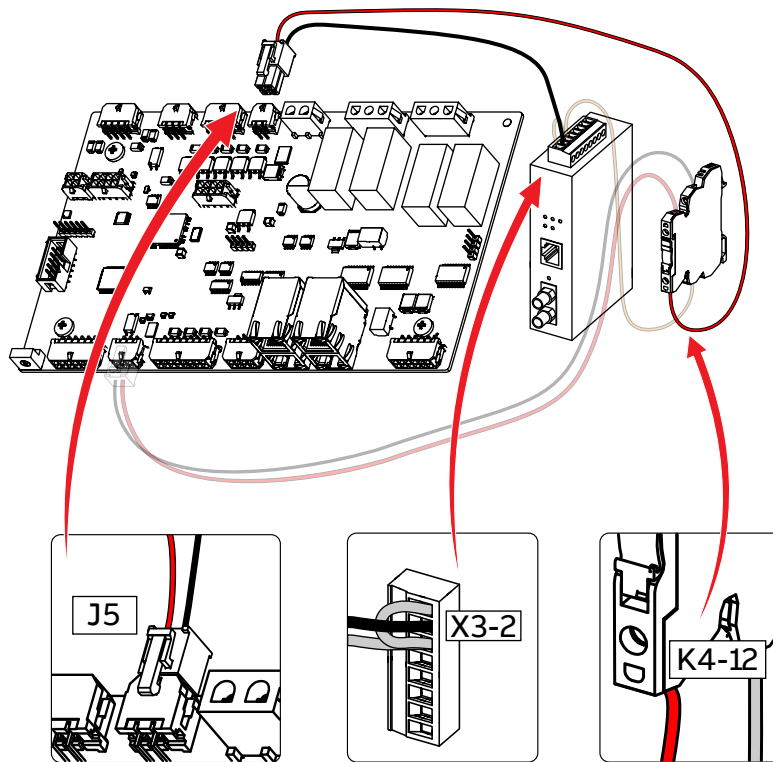
- Take the wiring harness indicated and connect it as indicated in the picture .

NOTE

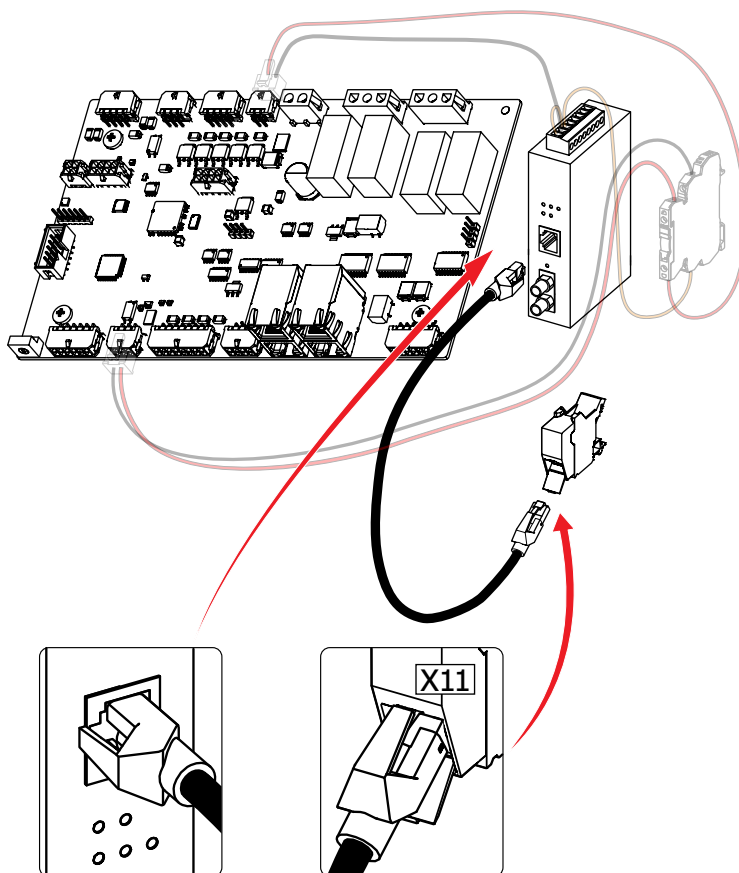
If there is already present a connector in the J14 slot, replace it.

J14_CCB2 board





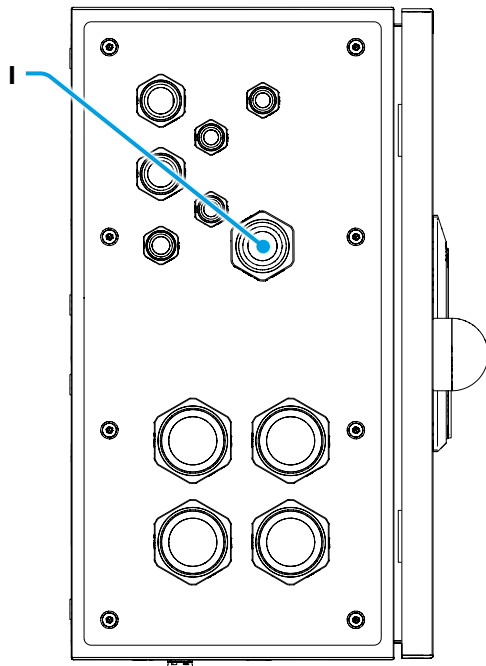
- Take the wiring harness indicated and connect it as indicated in the picture.



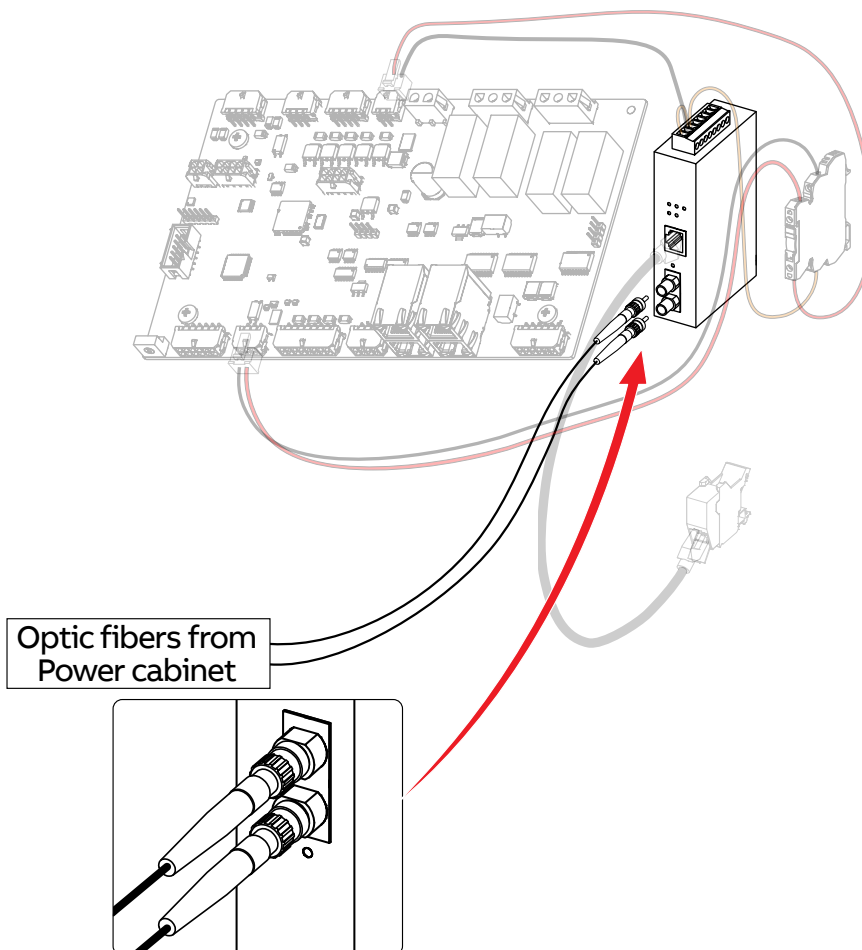
- Take the ethernet cable and connect it as indicated in the picture.



ETH to fiber converter  X-11 or X12_Depot charge box Ethernet connector



- Insert the fiber optic cable through the cable gland (I).



- Remove the protection covers from the optical connectors.
- Connect the two fiber cables
 - Rx. Connect it with Tx coming from power cabinet.
 - Tx. Connect it with Rx coming from power cabinet.
- At the end of installation all the wiring harness and cables must be placed inside cable ducts on the inside of Control Box.

**NOTE**

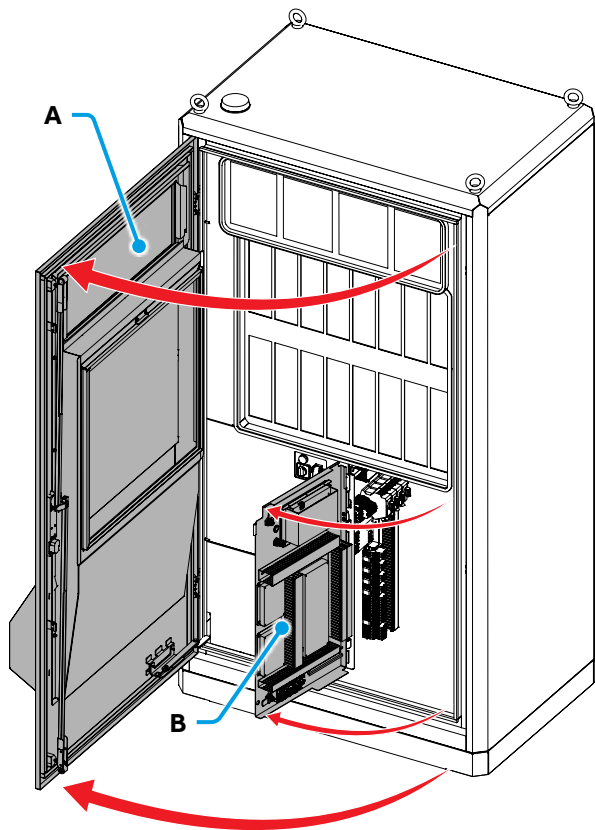
The cable inside the cable duct must not be too tight.

**CAUTION**

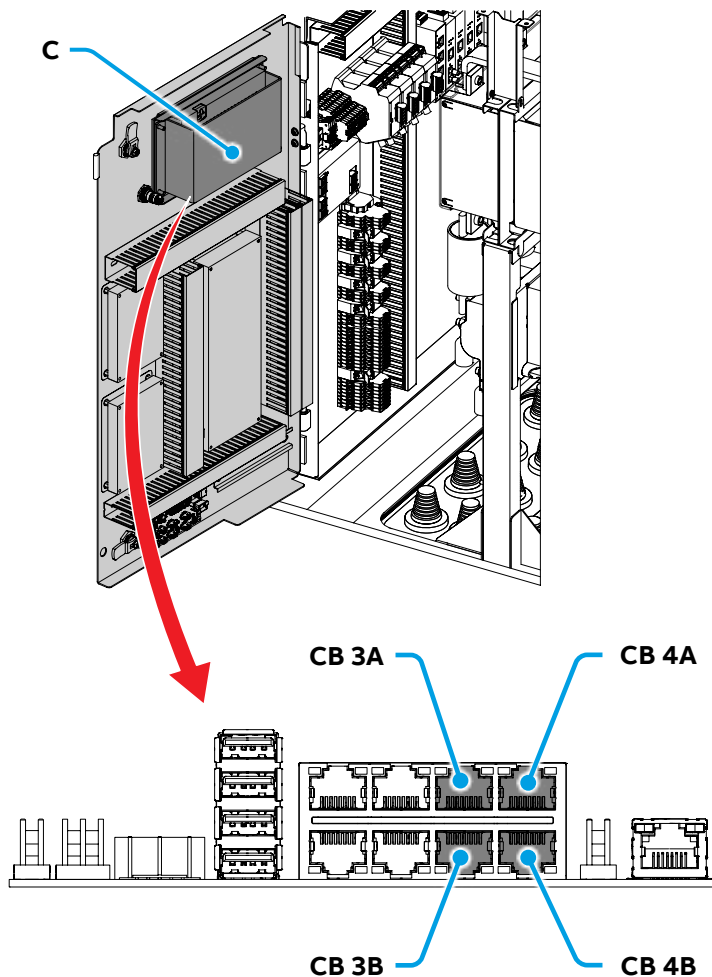
Use the cable ducts in order to avoid damage caused by door closing or by hot parts.

7.3.5 HVC 200/300/360 reconfiguration for Long distance kit

In order to ensure the communication, using the Long distance kit, the following operation must be performed on the HVC 200/300/360 power cabinet.

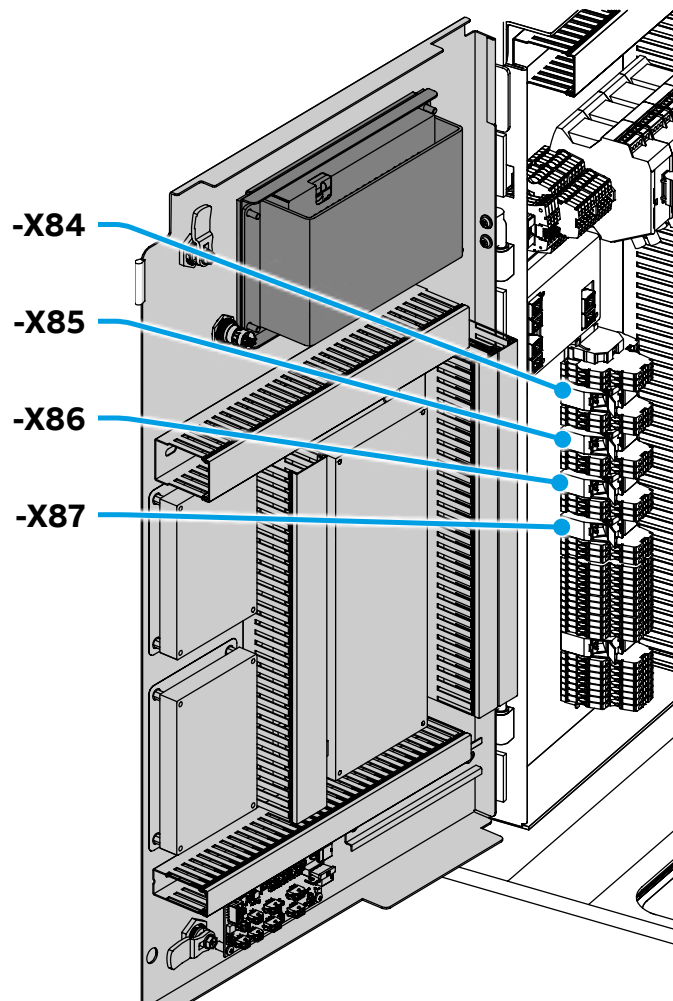


- Open the front door (A) and the internal door (B) on the HVC 200/300/360. Refer to the dedicated manual of the power cabinet.



- Disconnect the Ethernet cable on the ARM XL board (C) relating to the output on which the Long distance kit is connected. See below table:

Outlet number of the HVC 200/300/360 power cabinet	ARM XL board
Outlet 1	socket CB 4B
Outlet 2	socket CB 4A
Outlet 3	socket CB 3B
Outlet 4	socket CB 3A



- Connect the cable(s) (previously removed from the ARM XL board) to the Ethernet connectors installed on the DIN rail. See table below:

From ARM XL board	To Ethernet connectors
socket CB4B (Outlet 1)	-X84 (-X4:8)
socket CB4A (Outlet 2)	-X85 (-X5:8)
socket CB3B (Outlet 3)	-X86 (-X6:8)
socket CB3A (Outlet 4)	-X87 (-X7:8)

8. Operation and correct use

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

Chapter recipients:



- Owner
 - Installer
 - User
-

8.1 Prepare for commissioning



Danger: Hazardous voltage

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

1. Tell the owner that the EVSE is ready for commissioning

2. Make sure that the site is in accordance with these requirements:

- The EVSE is installed
- AC input power is available from the grid provider
- You are present during the commissioning, for assistance and to energize the power to the EVSE on the power distribution board
- The Power cabinet must be positioned in a place where internet access is available, through cellular (default) or wired Ethernet connection.

Connection to the EVSE using the charger's standard featured hardware with ABB's Charger Connect service offering, is the preferred method. This solution provides internet access via 4G LTE wireless network. It is expected that a cellular availability test is performed prior to construction to ensure there is reasonable signal quality to at least one of the above-mentioned operators 4G LTE bands 2 (1900 MHz), 4 (1700/2100MHz), or 12 (700 MHz).



NOTE

The Charger supports SIM cards provided by ABB only. Any other types of SIM cards are not supported.

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

If the cellular connection is not available, ethernet connection must be made to the charger.



NOTE

Once the charger is connected to the fixed Local Area Network (LAN), some settings must be performed by ABB service. Contact ABB for more details.

- An EV must be available with a compatible connection. If the EVSE has more than one connection type, an EV of each type must be available
- Night illumination must be sufficient to easily see the charging cables and other obstacles around the EVSE
- The site operator or owner is available to receive instructions from the service engineer of the manufacturer

3. Make sure that these data are available:

- Contact data of the contact person on site
- Address of the EVSE
- Site name
- Exact location of the EVSE: longitude and latitude. If there are more EVSEs on one location, make sure that the coordinates are slightly different (at least 0.0001 degree) so that the EVSEs are not at the same location on the map.
- Specification of the external fuse at the power distribution board
- Date that the installation is done
- Special remarks, for example to decline the authorization for the service engineer of the manufacturer to take photos
- Photo of the surroundings of the EVSE

8.2 Prepare before use

- Appoint a site operator and an installation engineer, if these are other persons than you.
- Make sure that the EVSE is installed according to the instructions in Operation and installation manual..
- Make an emergency plan that instructs people what to do in case of an emergency.
- Give instructions to each end user for a charge session. Refer to section **"8.3. Charge session"**.
- Make sure that the manufacturer service or authorized service partner commissions the EVSE. If not, contact the manufacturer when the EVSE is ready for commissioning.



General risk:

Make sure that you have approval of the manufacturer to use the EVSE after commissioning. After approval, do not perform any change on the EVSE.

- Make sure that the space around the EVSE cannot get blocked.
- If necessary, remove condensation before use, to prevent damage to the EVSE.
- Start/stop a charge session. Refer to section **"8.3. Charge session"**.

8.3 Charge session

8.3.1 Start a charge session

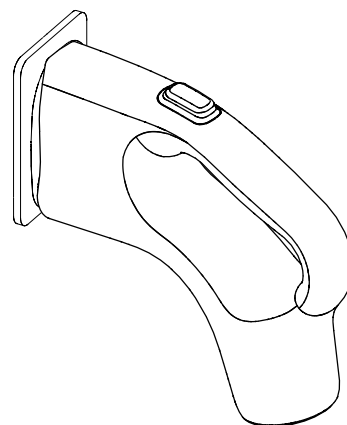
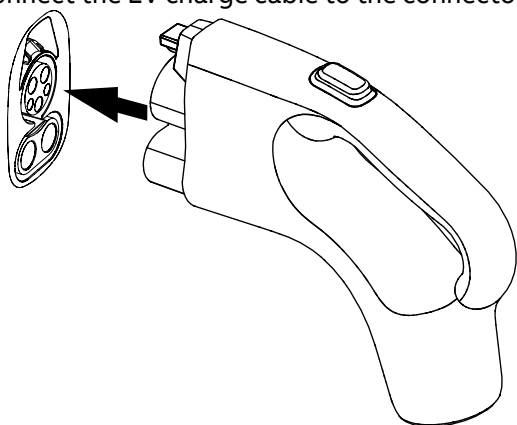
- Park the electric vehicle with the charge inlet within reach of the connector.
- Turn off the electric vehicle.



Danger: Hazardous voltage

Check the integrity of the charging cable and connector before connecting the electric vehicle. Do not start the charge session if damage is found.

- Remove the EV charge cable from the EVSE.
- Connect the EV charge cable to the connector on the EV.



- The charger will automatically start to charge the vehicle after the preparation phase, and will indicate the progress by the beacon light.



Danger: Hazardous voltage

The charging connector will be locked in position in order not to allow removal during the charging phase.

8.3.2 Stop a charge session

**NOTE**

The charge session will automatically stop after completing the bulk charge mode (standard setting is 99% for this setup but can be customized).

- To manually stop a charge session an external stop button connected to the Control Box should be installed. Otherwise the charging session can be stopped by the Electrical Vehicle control panel.

**Danger: Hazardous voltage**

The connector is unlocked by the vehicle when the Control Box beacon light changes color to green.

- Take the connector out of the vehicle and put it back in the connector holder.

8.3.3 Emergency stop of a charge session (optional)

**NOTE**

Emergency button must be installed and connected to the Control Box.

**NOTE**

The EVSE stops the charge session when the emergency stop is pushed. Only push the emergency stop if there is an emergency!

If there is an emergency:

- Push the emergency stop button. The Charger stops the operation and the beacon light will become red.
- Contact the Site operator.

If the emergency stop button is accidentally pushed:

Verify that the situation is safe.

Pull the emergency stop button out by twisting the button. The EVSE is reactivated and after a few seconds the charger returns to normal operation.

9. Maintenance and troubleshooting


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

Preliminary requirements



Owner

9.1 Maintenance schedule for the owner

Frequency	Task	Procedure
4 months	<ul style="list-style-type: none"> • Clean the cabinet • Do a check for damage 	<p>Clean:</p> <ul style="list-style-type: none"> • Cleaning agent with pH value between 6 and 8 • Remove dirt by hand. Do not use abrasive tools. • Remove rough dirt by rinsing with tap water. Do not apply high-pressure water jets. • Rinse thoroughly with tap water. • Optionally, apply wax on the front for extra protection and gloss. <p>Check for:</p> <ul style="list-style-type: none"> • Cracks or ruptures on the external parts • Visible internal wires of the cable • Signs of rust that cause ingress of water <div>  <p>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 cabinet.</p> </div>
1 year	Make sure that the manufacturer does maintenance on the EVSE	Ask the manufacturer to do the task.
If necessary	Special inspections	<p>In the following cases the charger must be checked by service personnel before further use:</p> <ul style="list-style-type: none"> • If it was struck by lightning. • If it is damaged due to an accident or fire. • If its location has been flooded.

9.2 Troubleshooting

The site operator or helpdesk is the first response to a customer call. The helpdesk can remotely solve simple problems for the customer.

10. Technical data

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

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

Chapter recipients:



- Owner
 - Installer
-

10.1 Technical specification - CCS Control Box

10.1.1 Technical data - CCS Control Box

CCS Control Box	
Product information and main features	
Depot charging (Overnight)	Yes
Opportunity charging	-
CCS cable integrated	Yes
Sequential charging	Optional
Accessory	Cable balancer
DC Auxiliary Power supply	
Input connection	1x positive, 1x negative
Input voltage	24V DC (coming from HVC360 power cabinet or external power supply)
DC Output	
Charge cable length	7 m or 9.5 m
Connector type	CCS 1
DC output power rating	100...160 kW
DC output voltage	150...850 V DC
DC output current rating	200 A DC ¹⁾
Overvoltage category	II
Mechanical	
Dimensions (D x W x H)	250 x 600 x 450 mm (without charging cable)
Mounting Type	Wall or roof mounted (wall bracket included)
Weight	50 kg (with 7.0 m charge cable)
Enclosure material	Painted stainless steel 304 (Color RAL 9002)
Environmental	
IP rating	IP65 (excluding charging cable)
IK rating according to IEC 62262	IK10
Enclosure Type	Indoor and Outdoor
Maximum operating altitude	up to 2000 m
Storage temperature	-10°C to +70°C
Storage conditions	Indoors, dry
Operative temperature range	-35°C to +45°C
Operating humidity	5-95 % Rh non-condensing
Noise level	<65 dB(A) at 1m distance @25°C on front door, at full power
Interface	
Communication	Ethernet (default) Optic fiber (optional)
Communication Protocol	Open Charger Point Protocol (OCPP) 1.6
Emergency stop button	Connectable external device
Charge stop button	Connectable external device
LED beacon	Yes 3 color LED Red/ Green/ Blue + connectable external device
HMI	-
RFID reader	-
Standards	
Declaration of Conformity	CSA
Protective class of equipment	I ²⁾
Standards	UL 2202: 2009 R2.18, CSA 22.2 NO. 107.1:16 (R2021)
Communication to the EV	ISO 15118 basic charging

¹ As specified by cable/ connector supplier and measured according to IEC 62196-1, current rating and duration is highly dependent on the vehicle inlet and the ambient temperature.

² According to EN 61851-1.

10.1.2 Cable specifications - CCS Control Box

NOTE



- All cables must be resistant to being placed in the ground using conduit.
- All cables must have an isolation that is self-extinguishing and flame retardant according to IEC 60332-1-2.
- All cables must correspond to the directive of the installation country.
- To identify the function of the cable must be marked on every 2000 mm and on both ends.

CCS Control Box - Power cables			
Specifications	DC Power	PE	DC Power supply
Number of cores	1 positive and 1 negative	1	1 positive and 1 negative
Cross section	95...185 mm ² ³⁾	35 mm ²	2.5...10 mm ²
Min – Max external cable diameter	22...32 mm	10...14 mm	10...14 mm
Conductor	acc. to VDE 0295 cl.5/IEC Cl.5		
Insulation	Special rubber or PVC (outdoor use, UV-protected, oil resistant)		
Ambient Temperature range	-40...90 °C	-40...80 °C	-40...80 °C
Identification	Red(+) and Black (-)	Yellow/Green	Acc. to IEC 60446

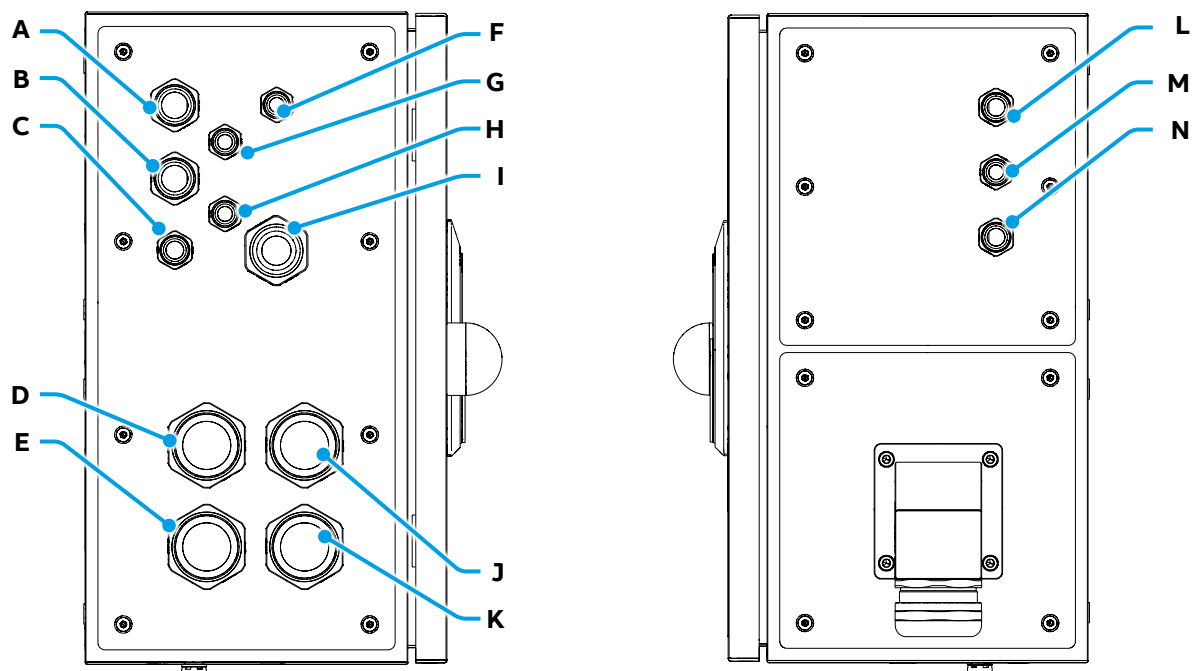
CCS Control Box - Data cables		
Specifications	Interlock	Ethernet (S/FTP, CAT6)
Number of cores	4 + Shield	8 + Shield
Cross section	1.5...2.5 mm ²	0.5 - 0.75 mm ²
Min – Max external cable diameter	5...10 mm	5...10 mm
Shielding	Yes	Yes
Conductor	Fine strand copper wire	
Insulation	PVC or other material that can be used for industrial and outdoor applications, and are UV-protected	
Characteristic impedance	100 Ω (CAT. 6 or CAT. 5e)	
Ambient Temperature range	-40...80 °C	
Identification	Acc. to DIN 47100	T568-B

CCS Control Box - Signal cables for external devices			
Specifications	LED Tower lights	Charge stop button	Emergency button
Number of cores	4	2	4
Cross section	1.5...2.5 mm ²		
Min – Max external cable diameter	5...6 mm	5...6 mm	5...6 mm
Shielding	No		
Conductor	Fine strand copper wire		
Insulation	PVC or other material that can be used for industrial and outdoor applications, and are UV-protected		
Ambient Temperature range	-40...80 °C		
Identification	Numbering or color		

CCS Control Box - Fiber optic cable for Long distance kit ⁴⁾	
Specifications	Fiber optic
Number of fibers	4 (2 for Tx and Rx connection, 2 for spare)
Min – Max external cable diameter	18...25 mm
Conductor	Fiber optic with ST connectors (B-FCO)
Cable type	OM3 or greater, PCF or fiberglass (multimode, 850 nm)
Identification	Numbering or color

3 Calculate the cable cross-section to guarantee the voltage drop below 10 Vdc. If the voltage drop is above 7 Vdc, consult the manufacturer.
 4 If the length of the cables between the power cabinet and the control box is above 100 m, you need to install a long-distance kit.

10.1.3 Cable glands - CCS Control Box

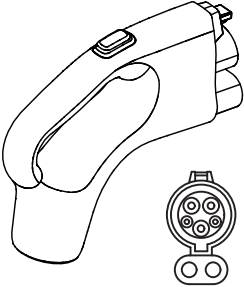


Ref.	Part	Clamping range [mm]	Torque [Nm]
A	Ext. Emergency button / Ext. LED Tower Lights /Ext. Charge Stop button	13...18	5 Nm
B	Ethernet	13...18	5 Nm
C	Spare	5...10	3Nm
D	DC- In	22...32	10Nm
E	DC+ In	22...32	10Nm
F	Auxiliary DC input cable	6...12	4.5Nm
G	PE from HVC-200/300/360 Power Cabinet or External power supply	5...10	3Nm
H	Interlock + DC guard	5...10	3Nm
I	Fiber optic	18...25	15Nm
J	DC- In (Spare)	22...32	10Nm
K	DC+ In (Spare)	22...32	10Nm
L	Ethernet (Spare)	6...12	4.5Nm
M	Interlock + DC guard (Spare)	5...10	3Nm
N	Auxiliary DC input cable (Spare)	6...12	4.5Nm

10.1.4 Torque specification - CCS Control Box

CCS Control Box	
Parameter	Specification [Nm]
DC auxiliary screw terminal blocks (X1)	1.3
Data cables screw terminal blocks (X1)	0.6
PE busbar	20
DC connection points on the busbars	30
Wall Brackets	5

10.1.5 Charging interface - CCS Control Box

Charging interface	Max. Voltage capability [V]	Max. current capability [A]
CCS1 (air cooled)	1.000V DC	200 A DC
		

11. Attachments

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

**NOTE**

If you need further information, please contact your local manufacturer service dept. Refer to section [“Manufacturer and contact data”](#)

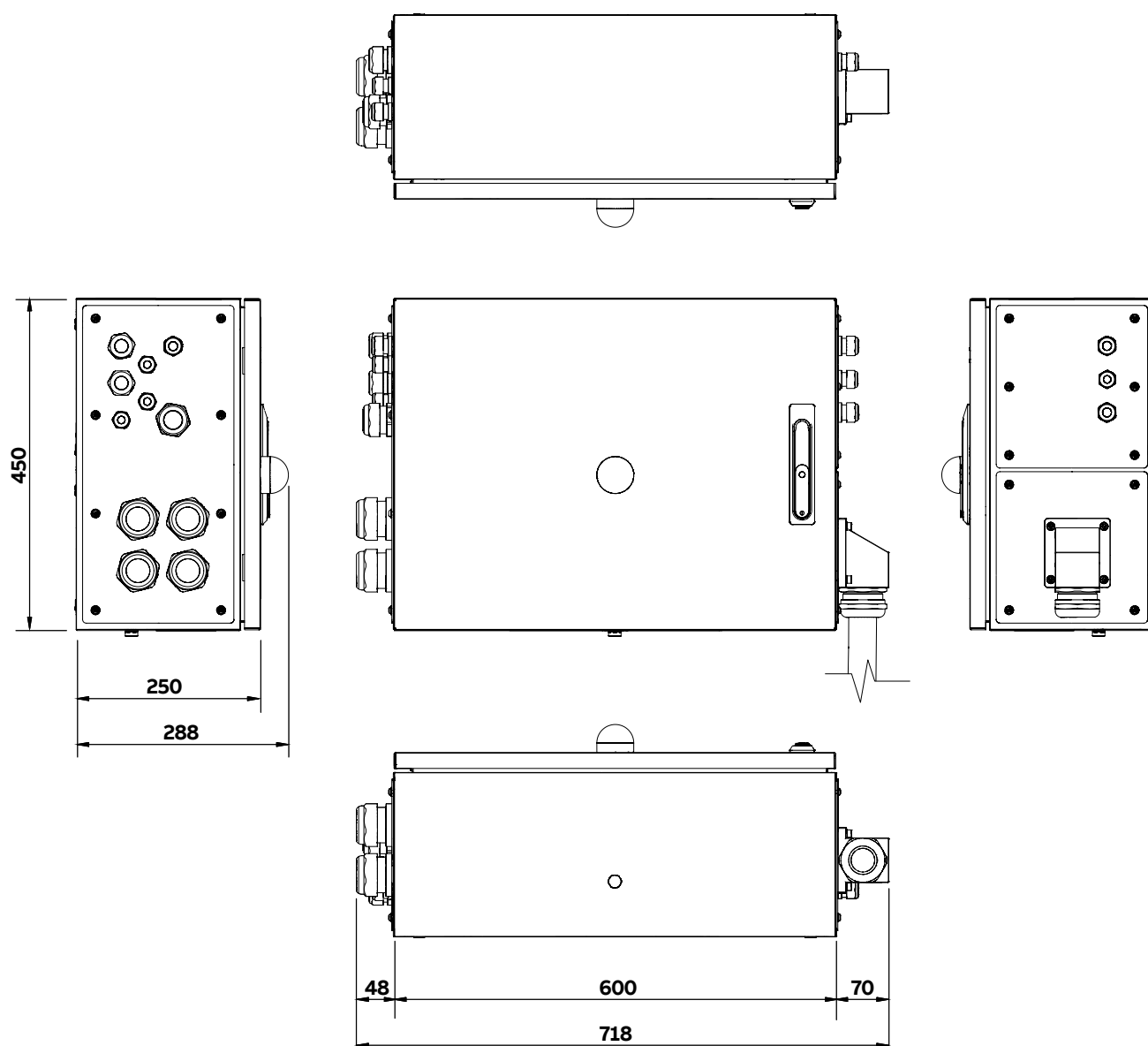
11.1 Overall dimensions

11.1.1 CCS Control Box

Overall dimensions of CCS Control Box.

**NOTE**

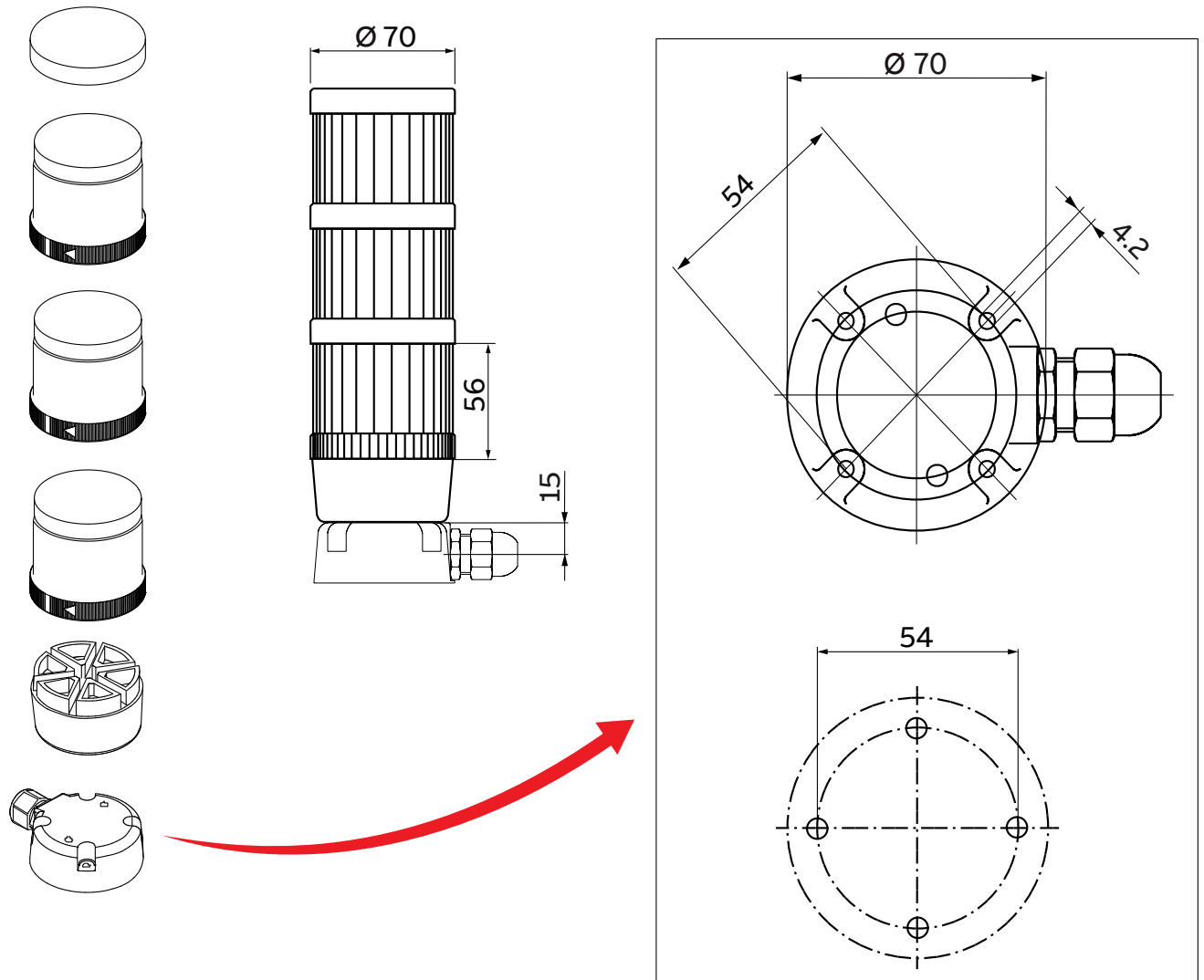
The dimensions are expressed in millimeters.



11.1.2 External LED Tower Lights

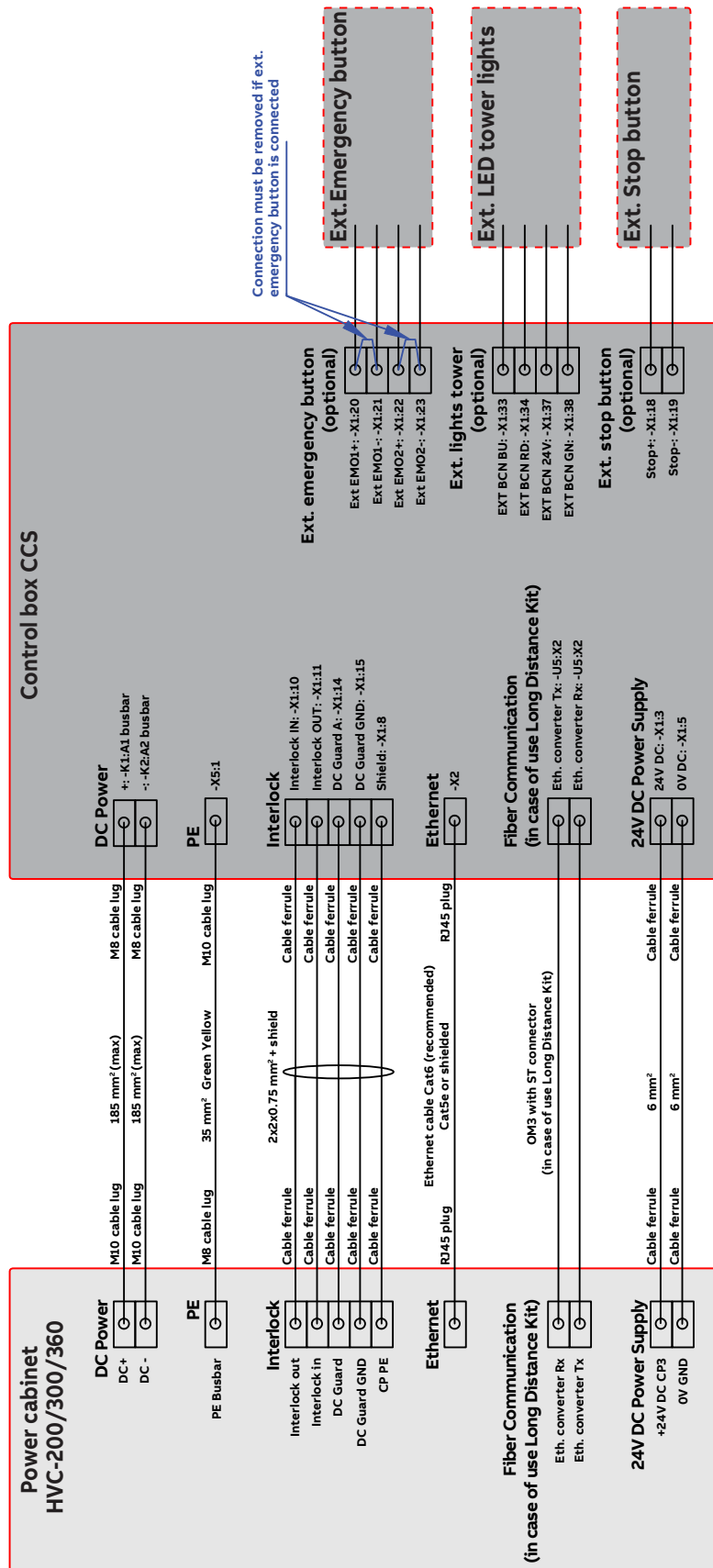
**NOTE**

The dimensions are expressed in millimeters.



11.2 Connection diagram

The connection diagram shows all necessary and optional connections of the CCS Control Box.





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<https://new.abb.com/ev-charging>