

# **Operation and installation manual**

Depot Charge 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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## Manufacturer and contact data

Manufacturer name and address	Contact
ABB E-mobility USA ABB E-mobility Inc. 950 W Elliott Rd Tempe AZ 85284 Suite 101 United States of America Phone: 800-825-2556 E-mail: US-evci@us.abb.com	ABB E-mobility in your country can give you support on the EVSE <u>https://new.abb.com/ev-charging</u>
ABB E-mobility Canada ABB E-mobility Inc. 800 Boul. Hymus St-Laurent, Quebec H4S 0B5 Canada Phone: 800-825-2556 E-mail: CA-evci@us.abb.com	ABB E-mobility in your country can give you support on the EVSE <u>https://new.abb.com/ev-charging</u>

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# 1. Introduction and general information

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

#### Chapter recipients:



## 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 gives the information that are necessary to safely do these tasks: • Install the EVSE

• Operate the EVSE

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• Perform basic maintenance tasks



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.

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

• Depot Charge Box (NA version)

	NOTE
-	The Depot Charge I

The Depot Charge Box are 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 <u>9AKK108468A6195</u>).

#### NOTE The in

The installation of Dual Depot Charge Box connected to HVC 150/160 power cabinet is described in a dedicated available manual.

## 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 elective	
CPU	Central processing unit
DC	Direct current
EMC	Electromagnetic compatibility
EV	Electric vehicle
EVSE	Electric vehicle supply equipment
НМІ	Human Machine Interface
HVC	Heavy Vehicle Charger
МСВ	Miniature circuit breaker
MID	Measuring Instruments Directive
NFC	Near field communication

Abbreviation / Termin	Description
OCPP	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 electrcial 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				
<b>NOTE</b> it is possible that	not all terms are present in this document.				

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# 1.7 Document revision history

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Version	Date	Description
001	November 2023	Initial version
002	May 2024	<ul> <li>Updated Par. 7.2.2 and 7.2.3: PE cable lug info.</li> <li>New Par. 10.1.1 Environmental Condition info.</li> </ul>
	NOTE	

Latest version of the manual is available online (ABB Library ID <u>9AKK108468A6590</u>).

# 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:



# 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 commercing 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.

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## 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.

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.



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#### DANGER

The manufacterer 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 forbbiden:

- 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.

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### 2.2.2 Residual risks

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

Risk analysis and description	Suggested action
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 allows 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
Δ	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
4	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

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Symbol	Description
	Rotating parts that can cause a risk of entrapment
	Hot surface that gives risk of burn injuries
i	With signal word 'NOTE': A note gives more data, to make it easier to do the steps, for example
000 	Information about the condition of the EVSE before you start the procedure
ŝ	Requirements for personnel for a procedure
	General safety instructions for a procedure
	Information about spare parts that are necessary for a procedure
X	Information about support equipment that is necessary for a procedure
<pre>Sel</pre>	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
$\bigcirc$	Alternate current
	Direct current
	Protective Earth (PE)
	Sign that means that you must read the manual before you install the EVSE
X	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.



# 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.

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## 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.



- 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





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# 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.



# 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

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# **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:

-	•	
С С	<ul><li> Owner</li><li> Installer</li></ul>	

# 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

G –	н	<u>רי</u> ר				— К
	ABI				QR CODE Global ID	<u> </u>
F —	MODEL					
Е —	PN	<u> </u>	ISN		QR	
D -	Global ID	/	Weight			
			weight		Defecto manual	
	FOR USE WITH ELECTRIC	CAL VEHICLES				
с –						м
	ABB E-Mobility B.V. Heertieslaan 6.					
B _	2629 JG Delft, The Nederlands					
		<u> </u>				
Α -	MADE IN ITALY				Prod. date WW YYYY	N
						<u> </u>
Ref.	Description					
А	Country of origin					
В	Address of the manuf	acturer				
С	Technical data					
D	Global ID					
Е	Part number					
F	Model designation					
G	Manufacturer					
Н	Weight					
<u> </u>	Serial number					
J	Certification marks					
K	Global ID - QR code					
L	Serial number - QR co	de				
М	Additional rating data	ι				
Ν	Safety and info symbo	ols				
0	Production date					
i	NOTE Find the type plate	e on your EVSE	to see the applic	able data.		

## 3.2.1 EVSE identification code

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

ABB code description	Description
HVC DCB UL 7M	Depot Charge Box GEN1 with 7 m CCS 1 charging cable
HVC DCB UL 9M	Depot Charge Box GEN1 with 9.5 m CCS 1 charging cable

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# 3.3 System Overview



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

Colours	Description
	AC input connection
	DC output connections
	Optional elements
	Communication and monitoring connections

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# 3.4 Depot Overview



Ref.	Part	Function
А	Power distribution board	To supply the electrical energy of the EVSE
В	Power cabinet	To supply DC output power to the Depot Charge Box
С	Depot Charge Box	Depot Charge Box wall mounted
D	EV	Hybrid and/or full electric Bus
Е	Depot Charge Box	Depot Charge Box floor mounted
F	Depot	Overnight depot

Colours	Description	
	AC Power Supply	
	DC output cables from power cabinet	
	Communication and signals lines	

# 3.5 Depot Charge Box - Overview



# 3.5.1 Overview outside



Ref.	Part	Function
А	Depot Charge Box	Electric vehicle supply equipment
В	Door	To access the internal parts
С	Emergency stop button	To stop a charging session due to an emergency
D	Hanging bracket for charge cable	To hang the charge cable
Е	CCS connector and cable	To connect the EVSE to the EV
F	CCS connector holder	To place the charging connector at the end of the charging session
G	Handle lock	To open and close the front door
Н	Charge stop button	To stop a charging session
Ι	Charging status beacon	To show the EVSE status based on the colours
J	Wall brackets or pedestal anchor points	To install the wall brackets or to install the EVSE to the pedestal

# 3.5.2 Overview inside



Ref.		Part	Function
A	CCB-U	ССВ	Core Control board. To connect the option "Long distance kit"
В		Internal protective cover	Protection barrier for DC contactors
С	#01#13	Cable glands	To route the cables inside the box
D	PE2	Protective earth (PE) threaded stud	Main Protective earth (PE) and Lighting Protective earth connection point
Е	F3	DC SPD	DC lines surge protection device
F	F1,F2	DC SPD fuses	DC SPD protection fuses
G	X1, X2	Signal screw terminal block	To connect Interlock, DC guard, ext. Emergency button, ext. LED Tower Lights, ext. Charge Stop button
Н		Cable conduits	To arrange and protect the cables inside the box
I	U2	Ethernet to fiber converter	To convert the communication line from Ethernet to optic fiber
J	U1	CanBus to fiber converter	To convert the communication line from CanBus to optic fiber
К	F4	AC aux. power supply SPD	AC aux. line surge protection device
L	F5	AC aux. power supply breaker	To turn on/off the Depot Charge Box
М	Х3	AC aux. power supply terminal blocks	To connect AC aux. line (L, N and PE) coming from HVC-200/300/360 Power Cabinet or external
N	A1 (-)	Negative DC busbar	To connect DC negative pole coming from HVC-200/300/360 Power Cabinet
0	A2 (+)	Positive DC busbar	To connect DC positive pole coming from HVC-200/300/360 Power Cabinet

## 3.5.3 Overview of the cable glands



Ref.	Part	Function
#01	DC- In	Negative DC input pole
#02	Spare for DC-	Spare cable gland for Negative pole
#03	DC+ In	Positive DC input pole
#04	Spare for DC+	Spare cable gland for positive pole
#05	Spare Fiber optic	Spare cable gland for fiber optic cable
#06	Fiber optic	Fiber optic cable
#07	Spare	Spare cable gland
#08	Spare	Spare cable gland
	Ext. Emergency button	The cable gland is equipped with a multientry gasket that
#09	Ext. LED Tower Lights	allows to seal till 4 cables (External Emergency button, LED
	Ext. Charge Stop button	Tower lights and Charge stop button)
#10	Interlock and DC Guard	The cable gland is equipped with a multientry gasket that
#10	Interlock and DC Guard	allows to seal till 4 cables (Interlock In and Interlock Out)
#11	Protective Earth (PE)	Main Protective Earth cable
#12	AC auxiliary power Input	AC auxiliary power supply cable
#13	Lighting protection Earth	Lighting Protective Earth cable (earth electrode)

3.6

## EVSE status beacon

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



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# 3.7 Working principles



Colours	Description
	Bold lines: power connection
	Thin lines: auxiliary power connection
	Ethernet line
	Control signal or monitoring signal
	CAN bus

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# **3.8** 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.



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.

## 3.9 Options

## 3.9.1 Wall-mounting brackets

The Depot Charge Box can be easily mounted on a wall using the internal holes. In alternative is possible to use dedicated brackets (to be ordered separately).



Ref.	Part	Function
А	AWS41-304	Kit for wall-mounting brackets, SS304 (ELDON)
В	Depot Charge Box	EVSE to be installed on the wall
С	Wall bracket	Bracket to install the EVSE to the wall
D	Fasteners	To fasten the wall bracket to the EVSE

## 3.9.2 Floor pedestal

The pedestal can be used to attach the Depot Charge Box in an open space when the EVSE is not being mount on a wall.

Two pedestal variants are available:





Cable routing from the bottom and rear sides



**NOTE** Refer to <u>"11.1.2. Depot Charge Box and optional Pedestal (ABB1-AA001-BB156)"</u> for specification.

Ref.	Part	Function
A	3ACD0610AA004	Pedestal for Depot charge box (cable routing from the bottom side)
A1	ABB1-AA001-BB156	Pedestal for Depot charge box (cable routing from the bottom and rear sides)
В	Removable front door	To route the cables
С	Foundation fasten points	To fasten the pedestal to the foundation
D	Fasten points	To fasten the EVSE to the pedestal
Е	Lifting point	To connect a crane or lift truck

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## 3.9.3 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
А	1SFA611821R1000	Yellow case
В	84-902 EAO	Yellow serigraph
С	1SFA619550R1051	Emergency Stop Push Button

### 3.9.4 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
Α.	Stop button	To use to stop the charge session
i	<b>NOTE</b> The placement of this button is cu	stomized for every configuration.

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## 3.9.5 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
А	KL70 -305R (1SFA616070R3051)	Red LED element
В	KL70-305L (1SFA616070R3054)	Blue LED element
С	KL70-305G (1SFA616070R3052)	Green LED element
D	KT70-1002 (1SFA616075R1002)	Terminal for base mounting (including cap)
Е	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	Depot Charge Box	EVSE
Н	Roof of the depot	
I	LED Tower lights	
·		



NOTE

Refer to <u>"11.1.4. External LED Tower Lights"</u> for specification.

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# 4. Transport, handling and unpacking

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

#### **Chapter recipients:**



# 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 occured, 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 regualtions 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

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# 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.

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country of installation.

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

The components of the packaging must be disposed in accordance with the regulations in force in the

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



### WARNING

NOTE

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 Depot Charge Box on the ground with its top facing up.
- Remove all protective foam.





## 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
Contraction of the second seco	Keys to open the EVSE door	4
	DC cable lug (M10, 185mm²)          NOTE         Pre-installed on the DC busbars	4 (2 on the positive pole busbar + 2 on the negative pole busbar)

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# 5. Access to the internal parts

In this section are illustrated all the acces procedures.

**Chapter recipients:** 

· Installer

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# 5.1 Front door



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



There is one unique door key for each EVSE.



#### Open the front door.

- Insert the key in the lock (A)
- Turn the key to unlock the lock (B)
- Pull out the handle (C)
- Turn the handle (D) to unlock the door.



• Open the door.



#### Close the front door.

• Repeat the operations described above in reverse order

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## 5.2 Remove internal protective cover



#### Remove the internal protective cover.

• Remove the 4 cross-head screws (A) of the internal protective cover (B).



#### Install the internal protective cover.

• Repeat the operations described above in reverse order by screwing the 4 fastners (torque of 2.5 Nm).

# 5.3 Remove the cover of the Pedestal (option)



#### Remove the cover of the Pedestal.

- Unscrew and remove the 6 torx screws.
- Remove the front cover plate from the Pedestal.



#### Install the cover of the Pedestal.

• Repeat the operations described above in reverse order by screwing the 6 fastners (torque of 4 Nm).

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# 🛛 6. Installation

In this section are illustrated all the installation procedure.

Chapter recipients:

• Owner • Installer

The installation of the EVSE can be done in 2 ways:

• Wall installation.

**NOTE** This type of installation can be done using the holes on the back of the box or using the wall brackets (optional components). Refer to <u>"3.9.1. Wall-mounting brackets"</u>

• Floor installation.



**NOTE** In this type of installation it is necessary to use the pedestal (optional component). Refer to <u>"11.1.1. Depot Charge Box and optional Pedestal (3ACD0610AA004)"</u> or <u>"11.1.2. Depot Charge</u> <u>Box and optional Pedestal (ABB1-AA001-BB156)"</u>

In both type of installation the equipment must be installed vertically:



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Wall space requirements

# 6.1 Wall Installation

6.1.1

# **Z1** FRONT VIEW **X1** X2 | o Z2 TOP VIEW X2 | **X1 Y1**

Paramete	r Description	Specification [mm]
X1	Space to the left to open completely the door	100
X2	Space to handling of the charging cable	500
Y1	Space to install and maintain the equipment	900
Z1	Space to install the equipment	200
Z2	Space to route the cables inside the box and to arrange the charging cable	up to the floor
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## 6.1.2 Install the box on a wall

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



Parameter	Description	Specification [mm]
X1	Space between the two box holes	560
X2	Space between the center of the hole and the edge of the box	20
Х3	Space between the two holes of the brackets (horizontally installed)	645.4
X4	Space between center of bracket hole and center of box hole	42.7
Z1	Space between the two box holes	760
Z2	Space between the center of the hole and the edge of the box	20
Z3	Space between the two holes of the brackets (vertically installed)	845.4
Z4	Space between center of bracket hole and center of box hole	42.7

WARNING

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



It is an installer's responsibility to choose appropriate type of wall 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.



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# 6.2 Floor Installation

# 6.2.1 Floor space requirements



Paramete	r Description	Specification [mm]
X1	Space to the left to open completely the door	300
X2	Space to handling of the charging cable	500
Y1	Space to install and maintain the equipment	1200
Y2	Space to install the pedestal	150
Z1	Total height of Depot charge box with pedestal	1914
i	<b>NOTE</b> The distances are intended as minimum	
i	<b>NOTE</b> The pedestal must be installed on a custom foundation that is suitable to support the weight o the equipment.	

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### 6.2.2 Prepare the foundation

#### 6.2.2.1 Prepare a custom foundation



• Make the foundation (A) and place the cable conduits (B) according to the specifications. Refer to <u>"11.1.3. Footprint -</u> <u>Custom foundation"</u>.

• Leave the foundation 15 mm (Z1) above ground level (C) to avoid water accumulation inside the foundation.

#### 6.2.3 Install the Pedestal on the foundation



- Remove the front cover (1) of the Pedestal (option). Refer to <u>"5.</u> Access to the internal parts".
- Place pedestal on foundation and align the mounting holes with the foundation ones (2).



WARNING

Pay attention that personnel cannot be crushed or become trapped while moving the Pedestal.

- Use 4 bolts to install the Pedestal on the foundation (3).
- Tighten the bolts with a tightening torque suitable for the type of anchors used.

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## 6.2.4 Install the Depot Charge Box on the Pedestal



- Open the door of the EVSE (A).
- Carefully place the equipment against the Pedestal.
- Make sure that the enclosure holes on the back side are aligned with the studs of the the Pedestal.
- Install the four M8 nuts, washer and sealing washer (C) from the inside of the box onto the studs (B).
- Tighten the fasteners with a tightening torque of 10...15 Nm.

#### 6.2.5 Route the cables inside the foundation



• Route all the cables inside the foundation thought the conduits (cable slack of each cable 2000 mm).

#### NOTE



The cable routing from the bottom side of the pedestal is allowed on both optional Pedestal (PNs 3ACD0610AA004and ABB1-AA001-BB156)

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



Using the Pedestal ABB1-AA001-BB156, the cables can be routed also from the back side using a conduit suitable with the hole on the pedestal.

• Route all the cables inside the foundation thought the conduits (cable slack of each cable 2000 mm).

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

# **7. Electrical connection**

In this section are listed all the electrical connection procedure.

#### **Chapter recipients:**



• Installer

#### HAZARDOUS VOLTAGE

The electrical connection of the EVSE must be carried out with the equipment disconnected from any voltage sources. Refer to <u>"2.5. Safety instructions"</u> paragraph on this manual to know all the necessary information to safely operate on the EVSE.

# 7.1 Overview of the cable glands

All the connection cables must be passed trought the cable gands (on the bottom side of the box). Here below is described the function of each cable gland.



Ref.	Part	Clamping range [mm]	Function
#01	DC- In	2232	Negative DC input pole
#02	Spare for DC-	2232	Spare cable gland for Negative pole
#03	DC+ In	2232	Positive DC input pole
#04	Spare for DC+	2232	Spare cable gland for positive pole
#05	Spare Fiber optic	1825	Spare cable gland for fiber optic cable
#06	Fiber optic	1825	Fiber optic cable
#07	Spare	510	Spare cable gland
#08	Spare	510	Spare cable gland
#09	Ext. Emergency button Ext. LED Tower Lights Ext. Charge Stop button	56 (each)	The cable gland is equipped with a multientry gasket that allows to seal till 4 cables (External Emergency button, LED Tower lights and Charge stop button)
#10	Interlock and DC Guard	89 (each)	The cable gland is equipped with a multientry gasket that allows to seal till 4 cables (Interlock In and Interlock Out)
#11	Protective Earth (PE)	612	Main Protective Earth cable
#12	AC auxiliary power Input	612	AC auxiliary power supply cable
#13	Lighting protection Earth	612	Lighting Protective Earth cable (earth electrode)

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

An additional Lighting Protective Earth, coming from an earth electrode installed near to the Depot Charge Box, can be connected to the box.



The connection of Protective Earth cables must be done on the PE2 threaded stud, passing the cable through the dedicated cable gland (#11).

Connection specifications		
PE2 threaded stud _ Connecting capacity	35 mm² (minimum) - M8 cable lug	
PE2 threaded stud _ Torque	15 Nm	
Cable gland capacity	6 12 mm	
Cable gland Torque	4.5 Nm	



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

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<u>ភ</u>្ជ 7.2

In compliance with standards it is necessary to install a main earthing cable between power cabinet and the protective earth terminal of the Depot Charge Box, with a minimum section as indicated in the table below:

Cable	Cross section
PE (Yellow/Green)	35 mm <sup>2</sup> minimum cross section
CAUTION	



The value on this table are valid only if the protective earthing conductor is made of the same metal as the phase conductors. 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.

## 7.2.1 Connect the Earth wire onto Pedestal (option)

If the Depot Charge Box is installed on the optional pedestal, the earth wire must be connected to the pedestal first and then inside the charge box.



- Remove the front cover of the Pedestal (option). Refer to <u>"5. Access to the internal parts"</u>.
- Cut the Main PE (A) wire from the Power Cabinet to the correct length to reach the PE connection point (B) of the Pedestal and install cable lug.

Cable lug	
Hole	for a M6 bolt (Ø7)
i	<b>NOTE</b> Another Main PE wire (D), sufficient to reach the connection point inside the Depot Charge Box, must be installed on the Pedestal PE connection point (B).
Connect th	ne front cover (C) to PE connection point

• Connect the front cover (C) to PE connection point of the Pedestal (B). Cut a PE wire (E) between the pedestal and the front cover and install cable lugs at both end.

Cable lug	
Hole	for a M6 bolt (Ø7)

- Install the Main Protective Earth (PE) wire and the Cover PE wire to the PE connection (B) of the pedestal point following the installation sequence:
  - Contact washer
  - Main PE wires from the power cabinet (A)
  - Main PE wires to the Depot Charge Box (D)
  - Toothed washer
  - Cover PE wire (E)
  - Flat washer
  - M6 Nut
- Tighten the nut.

Torque (Nm)

PE connection point 8 Nm

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### 7.2.2 Connect the Main PE

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



- Open the box and remove the internal protective cover. Refer to <u>"5. Access to the internal parts"</u>.
- Unscrew and remove the ring of PE cable gland #11.
- Route the PE wire through the cable gland (ring and body).
- Cut the PE wire to the correct length to reach the PE2 threaded stud.
- Tighten the ring of the cable gland to secure the PE wire.
- Strip the insulation and crimp the cable lug on the PE wire.

Cable lug		
Hole	for a M8 bolt (Ø9)	

- Install the wire on the PE2 threaded stud using the M8 nut (preinstalled).
- Tighten the nut to the following torque:

Torque (Nm)	
PE2 threaded stud	15 Nm

## 7.2.3 Connect the Lighting PE

NOTE

In some cases additional Lighting Protection Earth is required (one electrode of maximum 10  $\Omega$ ) at the Depot Charge Box side (based on local safety and electrical regulations).

If the grid is TT based, consult the grid owner. It is possible that an extra 0,9  $\Omega$  electrode will be required.



- Open the box and remove the internal protective cover. Refer to <u>"5. Access to the internal parts"</u>.
- Unscrew and remove the ring of PE cable gland #13.
- Route the PE wire through the cable gland (ring and body).
- Cut the PE wire to the correct length to reach the PE2 threaded stud.
- Tighten the ring of the cable gland to secure the PE wire.
- Strip the insulation and crimp the cable lug on the PE wire.

#### Cable lug

Hole for a M8 bolt (Ø9)

- Install the wire on the PE2 threaded stud using the M8 nut (preinstalled).
- Tighten the nut to the following torque:

Torque (Nm)	
PE2 threaded stud	15 Nm

# 7.3 AC auxiliary connection

The AC auxiliary power supply can be provided to the Depot Charge Box in two ways:

• Provided by the dedicated single phase AC output of HVC-200/300/360 Power Cabinet (recommended option).



• The second option is an external AC single phase line.



The connection of the AC auxiliary power supply must be made on X3 connector passing the cable through the cable gland #12.



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



- Open the box and remove the internal protective cover. Refer to <u>"5. Access to the internal parts"</u>.
- Unscrew and remove the rings of the AC power input cable gland #12.
- Route the AC auxiliary power supply cable through the cable gland (ring and body).
- Cut the AC cable to the correct length to reach the X3 screw terminal blocks.

NOTE

- The wire must be route inside the cable duct.
- Tighten the ring of the cable gland to secure the AC cable.
- Strip the insulation and crimp a ferrule on the phase (L), neutral (N) and protective earth (PE) wires.
- Install the wires on the screw terminal block X3:

Terminal and wire color	Description
X3-1 and X3-2 (brown)	Phase (L)
X3-3 and X3-4 (blue)	Neutral (N)
X3-5 and X3-6 (yellow/green)	Protective Earth (PE)

• Tighten the the screw of the connector block to the following torque:

Srque (Nm)
.3 Nm

# 7.4 DC power input connection

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

- Positive pole on K1:A2 busbar passing the cable through the cable gland #03.
- Negative pole on K1:A1 busbar passing the cable through the cable gland #01.





- Open the box and remove the internal protective cover. Refer to <u>"5. Access to the internal parts"</u>.
- Unscrew and remove the rings of the DC power input cable glands #01 and #03.
- Route the DC input positive pole wire through the cable gland #03 (ring and body).
- Route the DC input negative pole wire through the cable gland #01 (ring and body).
- 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 busburs).
   Cable lug

Cable lug	
Hole	for a M10 bolt (Ø11).

- Install the DC input wires following the installation sequence:
  - 1. DC cable lug
  - 2. Flat washer
  - 3. Spring washer
  - 4. M10 Nut
- Tighten the nut.

	Torque (Nm)
DC connection points	20 Nm

# 7.5 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 Depot Charge 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.

	Power cabinet HVC-200/300/360		Depot Charge Box
/	Interlock GND CP OUT CL CP IN CL CP DC1 GUARD DC1 GUARD RTN	2x2x0.75 mm <sup>2</sup> + shield	Interlock Shield: -X1:1 Interlock IN: -X2:1 Interlock OUT: -X2:2 DC Guard A: -X2:5 DC Guard GND: -X2:6

The connection of the Interlock and DC Guard signals, coming from the power cabinet, must be made on X1 and X2 connector passing the cable through the cable gland #10.







- Open the box and remove the internal protective cover. Refer to <u>"5. Access to the internal parts"</u>.
- Unscrew and remove the rings of the Interlock and DC Guard cable gland #10.
- Route the Interlock and DC Guard cable through the cable gland (ring and body).
- Cut the Interlock and DC Guard cable (from the Power Cabinet) to the correct length to reach the X1 and X2 screw terminal blocks.



• Tighten the ring of the cable gland to secure the Interlock and DC Guard cable.

 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:

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The wire between X2-3 and X2-4 terminals must be present. Do not remove it.

• Tighten the the screw of the connector block to the following torque:

	Torque (Nm)
Screw terminal X1 and X2	1.3 Nm

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#### **Communication connection** 7.6

The communication between Power Cabinet and Depot Charge Box is based on 2 fiber optic lines:

- Can Bus fiber optic line
- Ethernet fiber optic line



The connection of the 2 fiber optic lines must be done on:

- U1 Can Bus to Fiber converter (Tx and Rx)
- U2 Ethernet to Fiber converter (Tx and Rx)

connectors

both passing the cable through the dedicated cable gland (#05).



А	Protection tube	To protect the cable when it is routed through conduit
В	OM3 or greater fiber optic cable	PCF or fiberglass fiber optics
С	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
Е	Fiber optic with B-FCO(ST®)	To connect the fiber optics to the converters

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- Open the box and remove the internal protective cover. Refer to <u>"5. Access to the internal parts"</u>.
- Unscrew and remove the rings of the Fiber optic cable gland #05.
- Route the Fiber optic cable through the cable gland (ring and body).
- Cut the Fiber optic cable (from the Power Cabinet) to the correct length to reach the U1 and U2 converters. The fiber optic must be route inside the cable duct.

#### CAUTION



Make bend radius not smaller than 65 mm, otherwise the core of the fiber cable may break.

- Strip the insulation and install connectors on each fiber optic.
- Remove the protection covers from the optical connectors of both converters.
- Connect the CanBus line on the U1 converter:

)/360)
)/360)
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#### NOTE

The connection of the Tx and Rx signals between the Power cabinet and the converter inside the Depot Charge Box must be crossed.

Connect the Ethernet line on the U2 converter:

Terminal	Description		
Td of U2 converter	Ethernet line Rx (from HVC- 200/300/360)		
Rd of U2 converter	Ethernet line Tx (from HVC- 200/300/360)		
NOTE			

The connection of the Tx and Rx signals between the Power cabinet and the converter inside the Depot Charge Box must be crossed.

• Tighten the ring of the cable gland to secure the Fiber optic cable.



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

The connection of the external optional devices must be made on X2 connector passing the cable through the cable gland #09.





- Open the box and remove the internal protective cover. Refer to <u>"5. Access to the internal parts"</u>.
- Unscrew and remove the rings of the Stop button, Emergency button and LED Tower lights cable gland #09.
- Route the cables through the cable gland (ring and body).
- Cut the cables to the correct length to reach the X2 screw terminal blocks. The wire must be route inside the cable duct.



• Tighten the ring of the cable gland to secure the cables.



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- Strip the insulation and crimp a ferrule on the wires.
- Install the wires on the screw terminal block X2:

	Y2 Terminal			
Ref.	block	Description		
Α	·	Stop button cable		
A1	X2-9	External stop button +		
A2	X2-10	External stop button -		
A3	X2-13	External stop button +24 V		
A4	X2-14	External stop button 0 V		
В		Emergency button cable		
B1	X2-21	External emergency button S1-1		
B2	X2-22	External emergency button S1-2		
B3	X2-23	External emergency button S2-1		
Β4	X2-24	External emergency button S2-2		
С		LED Tower lights cable		
C1	X2-25	External tower light - Red LED		
C2	X2-26	External tower light - Green LED		
C3	X2-29	External tower light - Blue LED		
C4	X2-30	External tower light +24 V		

#### NOTE

The wire between X2-21 and X2-22 terminals and X2-23 and X2-24 terminals must be removed if the Emergency stop button is installed.

• Tighten the the screw of the connector block to the following torque:

	Torque (Nm)
AC screw terminal X3	1.3 Nm



# 8. Operation and correct use

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

Chapter recipients:



# 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 pre sent 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 (1700/2100 MHz), or 12 (700 MHz).

#### NOTE

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.



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.





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• 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 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, press the **Stop** button on the front door of the Depot Charge Box.



**Danger: Hazardous voltage** The connector is unlocked by the vehicle when the Depot box beacon light changes color to green.

• Take the connector out of the vehicle and put it back in the connector holder (A) on the Depot Charge Box



#### 8.3.3 Emergency stop of a charge session

#### NOTE

#### Stop by emergency button

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.

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# 9. Maintenance and troubleshooting

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

Preliminary requirements



# 9.1 Maintenance schedule for the owner

Frequency	Task	Procedure
		<ul> <li>Clean:</li> <li>Cleaning agent with pH value between 6 and 8</li> <li>Remove dirt by hand. Do not use abrasive tools.</li> <li>Remove rough dirt by rinsing with tap water. Do not apply high-pressure water jets.</li> <li>Rinse thoroughly with tap water.</li> <li>Optionally, apply wax on the front for extra protection and gloss.</li> </ul>
4 months	<ul> <li>Clean the cabinet</li> <li>Do a check for damage</li> </ul>	Check for: • Cracks or ruptures on the external parts • Visible internal wires of the cable • Signs of rust that cause ingress of water
		Note: When the EVSE is put in a corrosion sensitive environment, superficial rust is possible on welding points. This rust is only visual. There is no risk for the integrity of the cabinet.
1 year	Make sure that the manufacturer does maintenance on the EVSE	Ask the manufacturer to do the task.
1 year	Emergency stop inspection	<ul> <li>Test only when the charger is in idle mode and ready to charge:</li> <li>Press the emergency button. The beacon light will turn red.</li> <li>Reset the emergency button by turning the knob clockwise. After a few moments, the charger returns to its idle state.</li> </ul>

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If necessary Special inspections	In the following cases the charger must be checked by service personnel before further use: • If it was struck by lightning. • If it is damaged due to an accident or fire. • If its location has been flooded.
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# 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:

ŝ	• Owner • Installer					
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# 10.1 Technical data - Depot Charge Box

	Depot Charge Box
Product information and main features	
Depot charging (Overnight)	Yes
Opportunity charging	-
CCS cable integrated	Yes
Sequential charging	No
Accessory	Pedestals
	ext. Emergency stop button, ext. Charge stop button,
Connectable external devices	ext. LED tower lights
AC Auxiliary Power supply	
Input connection	Single-phase: L + N + PE
Nominal input voltage	115 V AC
Input voltage range	90132 V AC
Input frequency range	47 - 63 Hz
RCD protection	AC 30 mA
DC Output	
Charge cable length	7 m / 9.5 m
Connector type	CCS 1
DC output power rating	100160 kW
DC output voltage	150850 V DC
DC output current rating	200 A DC
Overvoltage category	ll
Mechanical	
Dimensions (D x W x H)	240 x 699 x 961 mm (without charging cable)
Dimensions with optional pedestal	414 x 600 x 1014 mm (without charging cable)
3ACD0610AA004 (D x W x H)	414 x 059 x 1514 mm (without that ging table)
Dimensions with optional pedestal	435 x 699 x 1914 mm (without charging cable)
ABB1-AA001-BB156 (D x W x H)	
Mounting Type	Wall mounted (optional wall bracket)
	Floor mounted (with optional pedestal)
Weight - Depot Charge Box	65 kg (with 7.0 m charge cable)
Weight - Pedestal	approx. 116 kg
Dimensions including packaging (H x W x D)	1250 x 900 x 530 mm (including pallet)
Weight including packing	102 kg
Enclosure material	Painted stainless steel 304 (Color RAL 9002)
Environmental	
IP rating	IP65 (excluding charging cable)
IK rating according to IEC 62262	IK10
Noise level	<65 dB(A) at 1m distance @25°C on front door, at full power
Interface	
Communication	Optic fiber
Communication Protocol	Open Charger Point Protocol (OCPP) 1.6
Emergency stop button	Yes + connectable external device
Charge stop button	Yes + connectable external device
LED beacon	Yes 3 color LED Red/ Green/ Blue + connectable external
	device
HMI	-
RFID reader	
Standards	
Declaration of Conformity	NA markets, CSA
Protective class of equipment	1)
Standards	UL 2202: 2009 R2.18, CSA 22.2 NO. 107.1:16 (R2021)
Communication to the EV	ISO 15118 basic charging

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### **10.1.1 Environmental Conditions**

	Storage (in the package)	Transportation ⁴ (in the package)	Installation (Operation) ⁵
Environment type	Indoor	Weather-protected <sup>3</sup>	Indoor and Outdoor
Ambient air temperature	23104 °F (-5+40 °C)	-31131 °F (-3055 °C)	-31131 °F (-3555 °C) derating from 104 °F (40 °C)
Relative Humidity	595% @ 86 °F (30 °C)	5100% @ 80.6 °F (27 °C)	5100% @ 80.6 °F (27 °C)
Altitude (without derating)	-	-	6500 ft (2000 m)
Condensation	No <sup>6</sup>	No <sup>6</sup>	Yes
Wind-driven precipitation	No	No	Yes
Formation of ice	No	No	Yes
Maximum storage time <sup>1</sup>	1 year ²	-	-

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

## 7. Cable specifications

#### NOTE

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

Depot Charge Box - Power cables				
Specifications	DC Power	PE	AC power sypply	
Number of cores	1 positive and 1 negative	1	3	
Cross section	95185 mm <sup>2</sup>	35 mm²	2.5 mm <sup>2</sup>	
Min – Max external cable diameter	2232 mm	612 mm	612 mm	
Conductor	acc	. to VDE 0295 cl.5/IEC	Cl.5	
Insulation	Special rubber of	or PVC (outdoor use, l resistant)	JV-protected, oil	
Ambient Temperature range	-4090 °C	-4070 °C	-4080 °C	
Identification	Red(+) and Black (-)	Yellow/Green	Acc. to IEC 60446	

Depot Charge Box - Data cables	
Specifications	Interlock
Number of cores	4
Cross section	0.752.5 mm <sup>2</sup>
Min – Max external cable diameter	89 mm
Shielding	Yes
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	-4070 °C
Identification	Acc. to DIN 47100

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Depot Charge Box - Data cables for external devices				
Specifications	LED Tower lights	Charge stop button	<b>Emergency button</b>	
Number of cores	4	2	4	
Cross section	0.50.75 mm <sup>2</sup>			
Min – Max external cable diameter	56 mm			
Shielding	No			
Conductor	Fine strand copper wire			
Inculation	PVC or other material that can be used for industrial and			
	outdoor applications, and are UV-protected			
Ambient Temperature range	-4070 °C			
Identification	Numbering or color			

Depot Charge Box - Communication cable			
Specifications	Fiber optic		
Number of fibers	4		
Min – Max external cable diameter	1825 mm		
Conductor	Fiber optic with ST connectors (B-FCO)		
Cable type	OM3 or greater, PCF or fiberglass (multimode, 850 nm)		
Identification	Numbering or color		

# 10.2 Torque specification

	Depot Charge Box
Parameter	Specification [Nm]
AC auxiliary screw terminal blocks (X3)	1.3
Data cables screw terminal blocks (X1 and X2)	1.3
PE2 threaded stud (Protective Earth connection point)	15
PE connection points on the Pedestal (option)	8
DC connection points on the busbars	20
Wall Brackets (option)	1015
Fastners Pedestal-Depot Charge Box (option)	1015
Pedestal front covers screws (option)	4

# 10.3 Charging interface

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

Attachments

# 11. Attachments

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



**NOTE** If you need further information, please contact your local manufacturer service dept. Refer to section <u>"Manufacturer and contact data"</u> Ш

# 11.1 Overall dimensions

## 11.1.1 Depot Charge Box and optional Pedestal (3ACD0610AA004)

Overall dimensions of Depot Charge Box including optional Pedestal 3ACD0610AA004.



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NOTE

## 11.1.2 Depot Charge Box and optional Pedestal (ABB1-AA001-BB156)

Overall dimensions of Depot Charge Box including optional Pedestal ABB1-AA001-BB156.



The dimensions are expressed in millimeters.







# 11.1.3 Footprint - Custom foundation

The drawing (top view) shows all the necessary measurements to:

- drill the holes to fasten the EVSE to the floor/basement (in yellow)
- prepare the position of the cables in the ground (in blue)



**FRONT SIDE** 



# 11.1.4 External LED Tower Lights

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# 11.2 Connection diagram

The connection diagram shows all necessary and optional connections of the Depot Charge Box.



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