BE-M Series

User, Maintenance and Installation Manual

ELECTRIC VEHICLE CHARGHER

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ZP91211-EN-3

SCAME

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Abbreviations / Symbols

A	Ampere
AC	Alternating Current
API	Application Programming Interface
CCS	Combined Charging System
CE	European Conformity
CHAdeMO	CHArge de MOve
DC	Direct Current
EV	Electric Vehicle
GPRS	General Packet Radio Service
GSM	Global System for Mobile
HMI	Human Machine Interface
Hz	Hertz
IEC	International Electrotechnical Commission
IK	Impact Protection (K – Kinetic)
IP	Ingress Protection
JSON	JavaScript Object Notation
kg	Kilogramme
kW	Kilowatt
kWh	Kilowatt-hour
LED	Light-emitting diode
m	Metre/meter
mA	Milliampere
MCB	Miniature Circuit Breaker
MDB	Main Distribution Board
mm	Millimetre
OCA	Open Charge Alliance
OCPP	Open Charge Point Protocol
RCBO	Residual Current circuit Breaker with Overcurrent protection
RCCB	Residual Current Circuit Breaker
RFID	Radio Frequency Identification
SAE	Society of Automotive Engineers
SDB	Sub Distribution Board
THD	Total Harmonic Distortion
UL	Underwriters' Laboratories
UPS	Uninterruptible Power Supply/Source
V	Volt
VAC	Volts AC power
Ω	Ohm

1. Introduction

This manual is valid for BE-M Series CHARGING STATION.

It is intended for the owner and technician who will use and/or handle the CHARGING STATION. Therefore, its purpose is to provide clear, objective, and concise information about the equipment, more precisely:

- Features and electrical specifications
- Operational behaviour
- Installation
- Maintenance

The illustrations/pictures contained in this manual are only visual examples and representations of the standard model of the equipment. The model purchased by you may differ from the one presented here.

PLEASE NOTE

All information contained in this manual are updated and coherent at the time of its release. However, anticipating future improvements of the equipment, SCAME PARRE S.p.a. reserves the right to modify its features and, therefore, information contained herein, at any time.

2. Warnings and safety instructions

Throughout this manual, you will notice warnings and instructions regarding the CHARGING STATION's usage, installation, and maintenance, which must be followed.

Non-compliance of these instructions can result in personal and material damage!

The safety signs used herein have the following meaning:

 DANGER!	Warns of an imminently hazardous situation that will cause serious personal injury or dead if the corresponding instructions are not followed.
 WARNING!	Warns of a potentially hazardous situation, which can cause serious personal injury or dead if the corresponding instructions are not followed.
 CAUTION!	Warns of a potentially hazardous situation, which can cause minor or moderate personal injury or material damage if the corresponding instructions are not followed.
 ATTENTION!	Indicates that material damage can occur if the corresponding safety measures are not followed.
	Information or recommendations. It does not warn of dangerous situations.

2.1. General instructions

 WARNING!	Read all the instructions before using and/or handling the equipment.
 WARNING!	Children should be supervised when near the equipment or during its use.
 WARNING!	Check the information specified in your EV before using the CHARGING STATION.
 WARNING!	Do not use the CHARGING STATION near chemical, flammable, explosive or combustible materials.
 WARNING!	Do not touch the CHARGING STATION's socket with your fingers, nor with metallic objects, such as wire, needles, or tools.
 WARNING!	Only cables specified in this manual can be used to connect to the CHARGING STATION.
 WARNING!	Do not use charging cables that are visibly damaged or in conditions that may compromise the correct functioning of the equipment.
 WARNING!	Do not connect cable extensions to the CHARGING STATION's charging cable.
 WARNING!	When connecting/disconnecting the charging cable, handle it with care!
 WARNING!	Do not disassemble, repair, or modify the equipment, nor its components. Please contact a technician certified by SCAME PARRE S.p.a. to do so.
 WARNING!	The equipment is not specifically designed for earthquake conditions.
 WARNING!	Turn off the power supply at the circuit breaker before cleaning the equipment.
 WARNING!	Do not put the equipment in contact with water or any other type of liquid, dirt, or heat sources. The same applies to the cable.

If the cable, socket, or any component of the equipment is damaged:

1. Do not use the equipment.
2. Turn off the power supply at the circuit breaker.
3. Contact SCAME PARRE S.p.a.'s technical support.

In case of emergency:

1. Press the emergency button.
2. Contact the owner/operator.

If the equipment is affected by the following situations:

- Atmospheric electric discharge (lightning).
- Fire in the vicinity.
- Be submerged by water or any other fluid.
- Show signs of damage.

1. Turn off the power supply at the circuit breaker.
2. Contact SCAME PARRE S.p.a.'s technical support or operator.

The CHARGING STATION was specifically designed for EV charging. Do not connect to the CHARGING STATION's socket/plug any other devices than those indicated.

Connect the charging plugs only into a compliant socket.

Do not subject the equipment to temperatures outside the range of -25° C to +50°C.

Do not remove any markings from the CHARGING STATION (e.g., type plate, safety signs, wire markings, among others).

Unplug the charging cable by pulling the plug, not the cable itself.

Do not bend, step, press, or make any kind of cut to the cable or any component of the equipment, at the risk of damaging and rendering them unusable.

Never clean the CHARGING STATION, nor its charging cable, with products or aggressive solvents, scouring materials, water jets or excessive force or pressure.

Clean, periodically, the CHARGING STATION and the charging cable with a clean, dry cloth.

The information contained in this manual does not exempt the user of responsibility to follow all applicable or safety standards.

Use all equipment components as described and instructed in this manual (e.g., place the charging cable in its holder), to ensure its preservation.

3. About the BE-M Series

The BE-M Series consists in a single unit that combines harmoniously both Power and Human Machine Interface. The BE-M Series is the perfect solution for a secure and rapid public charging. It is an EV DC and AC Quick CHARGING STATION Station used to charge all EV's with a standard connection. The CHARGING STATION uses a DC flow to charge EVs batteries that support a CCS, CHAdeMO or EVs with AC Mode 3 protocol.

It has a user-friendly interface that displays a graphical charging status indication, including elapsed time, energy consumption in kWh and battery charging level.

The network connection to the BE-M Series can be made via Ethernet and/or 3G/4G. It is possible to have a software API for integration and management.

Ideal for charging at:

- Outdoor and Indoor service stations
- Fleet bases
- EV service workshops
- Short time parking places

Plug's type:

3.1. Compliances

The BE-M Series is compliant with:

- IEC 61851; Electric vehicle conductive charging system (IEC 61851-1 IEC 61851-21-2, IEC 61851-24 , and IEC 61851-23 (Low-voltage switchgear and controlgear assemblies – Part 7: Assemblies for specific applications such as marinas, camping sites, market squares, electric vehicle charging stations).
- IEC 61439-7, IEC 62196; Plugs, sockets-outlets, vehicle connectors and vehicles inlets, Conductive charging of electric vehicles (IEC 62196-1, IEC 62196-2 and IEC 62196-3).
- CHAdeMO 0.9, 1.0 and 1.2.
- Meets the CCS specification, DIN 70121.
- RFID complies with ISO 14443A/B.

3.2. BE-M Series

POSSIBLE CONFIGURATION	
OPTION 1 (standard)	**OPTION 2 (on request)**
	

- Maximum output power: 150kW
- Multiples of 30 kW power configuration
- Multiple output connectors
- HMI with 4 push buttons for commands
- Emergency stop button
- RFID
- Ethernet, 3G/4G/GPRS/GSM
- Options:
  - Connector types and configuration
  - Cabinet and panel colour customisable
  - Advertising support

3.3. Features

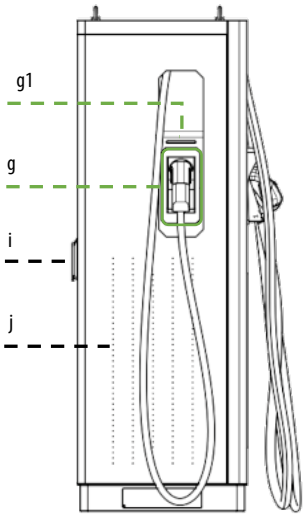
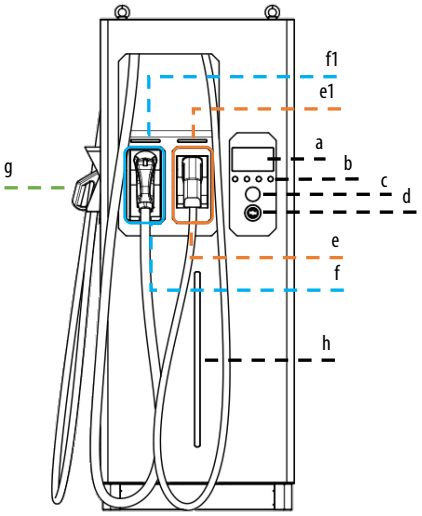
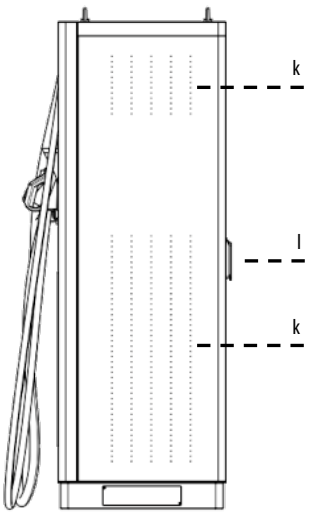
LEFT		FRONT		RIGHT	
					
g	AC	a	Display	k	Air outlets
g1	LED-P1	b	Push buttons	l	Main Lock
i	Lock	c	RFID reader		
j	Air inlets	d	Emergency button		
		e	CCS		
		e1	LED-P3		
		f	CHAdeMO		
		f1	LED-P2		
		g	AC		
		h	LED		

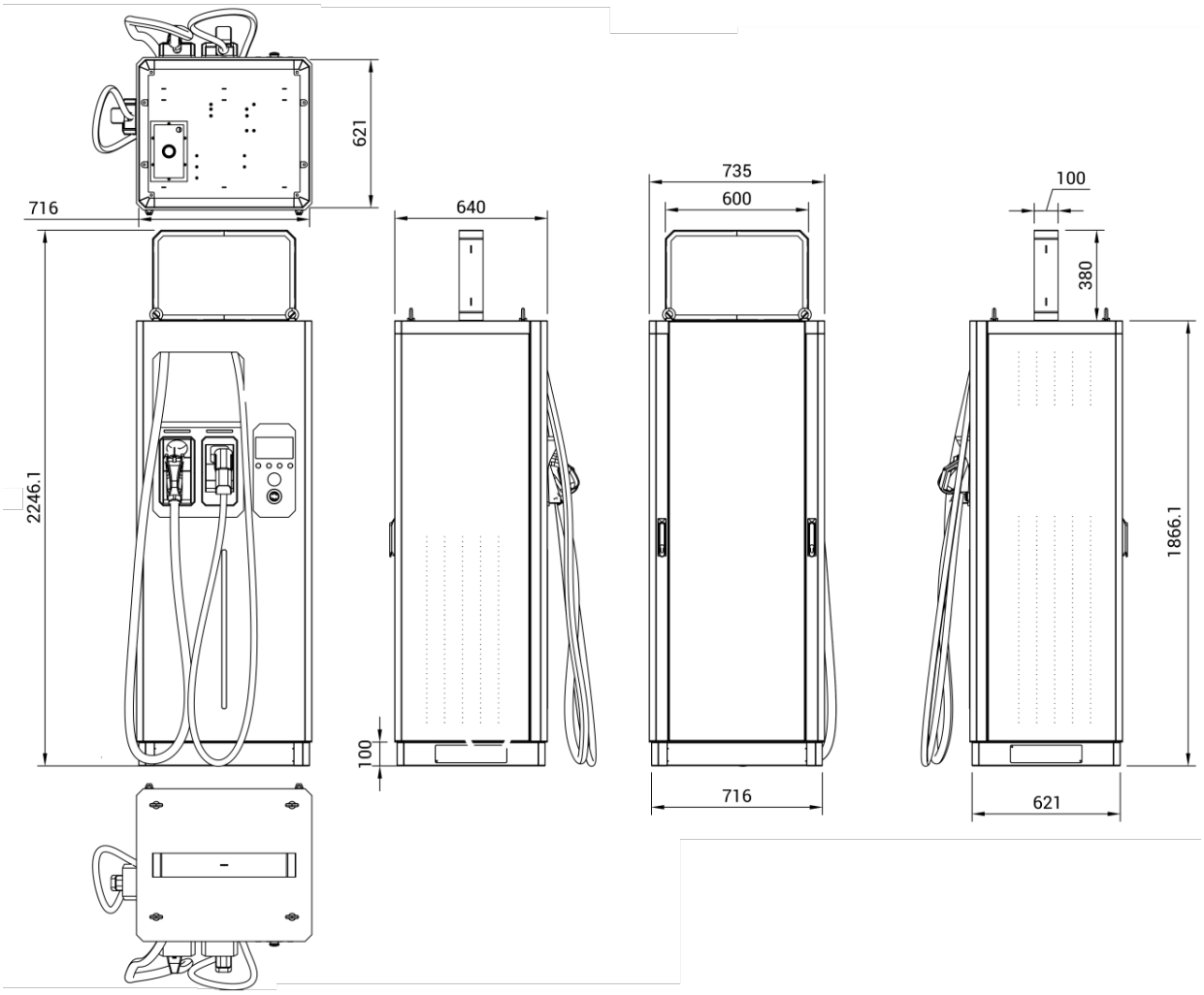
Fig. 1 - Description of the CHARGING STATION's elements

PLEASE NOTE

Depending on the model and options chosen, the figures above may differ from the purchased equipment.

Overall dimensions

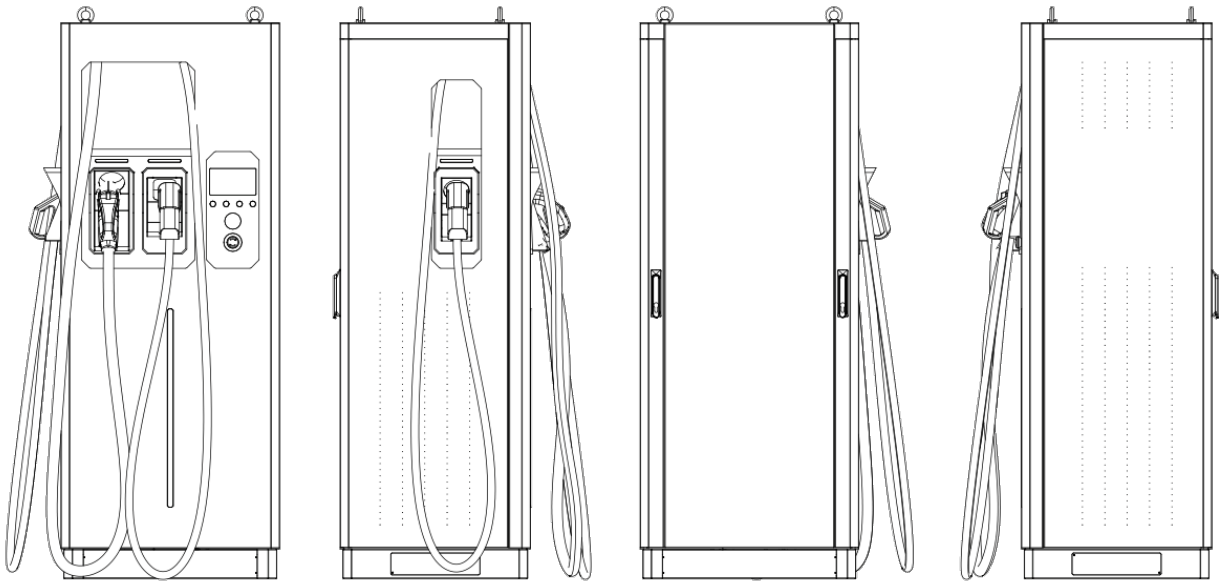
DIMENSIONS	
W x H x D	735 x 1866 x 640 mm
Weight	300 - 430 kg (varies according to the maximum power)



3.3.1. Views

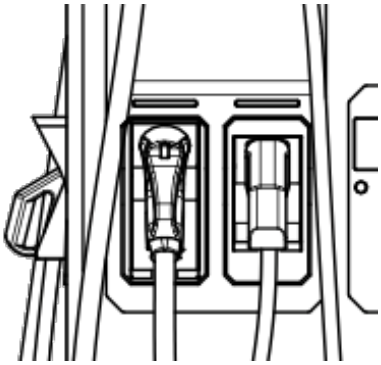
Outside View

Overall View

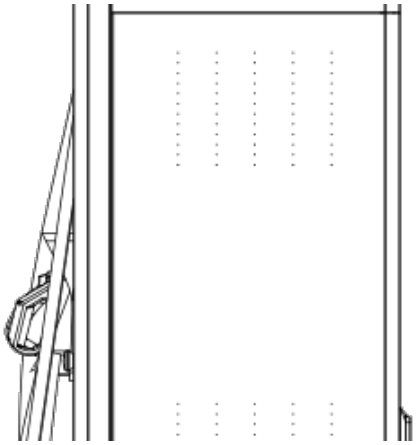


Plugs View

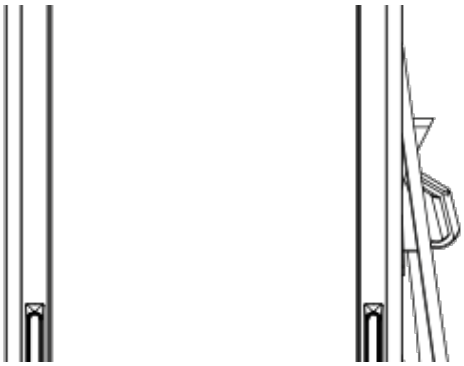
A **FRONT**



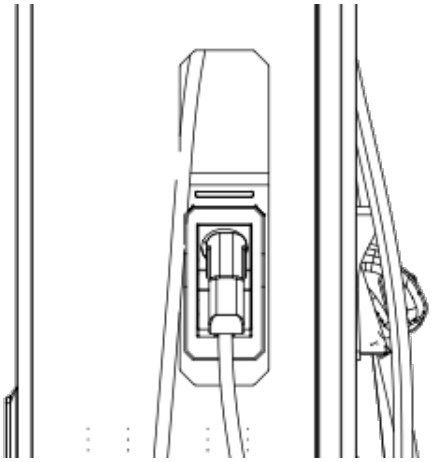
B **LEFT**



C **BACK**



D **RIGHT**



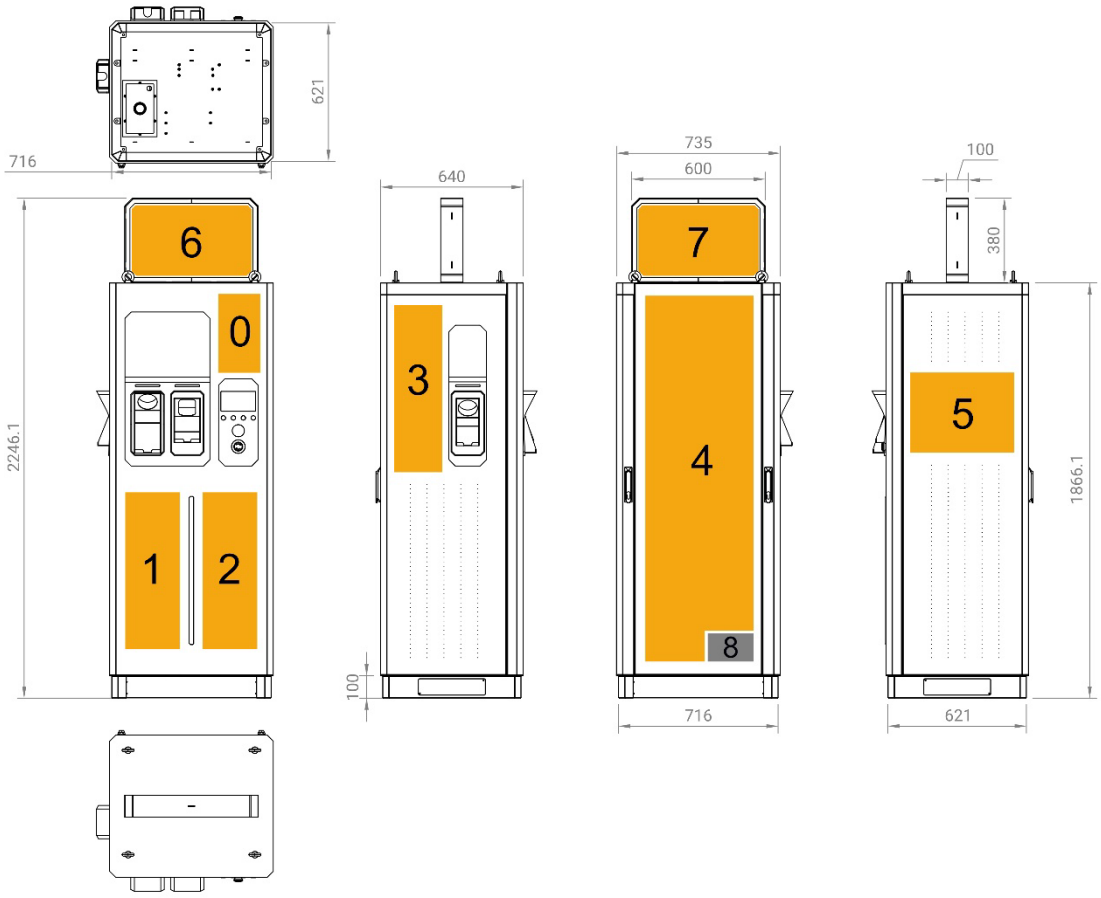
Internal View

RIGHT SIDE

LEFT SIDE

3.3.2. Decoration areas

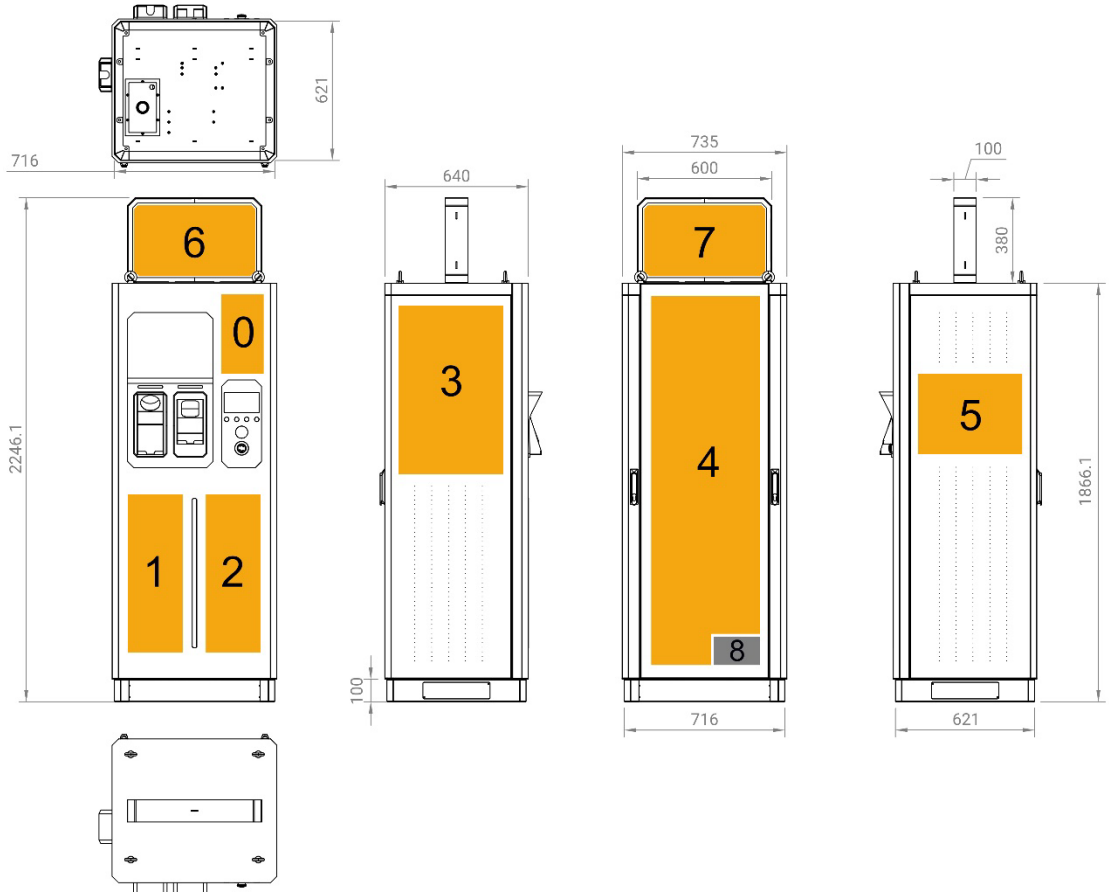
3.3.2.1. Standard version (3 plugs)



Section dimensions (mm)								
0	1	2	3	4	5	6	7	8
337x177	717x248	717x248	762x199	1657x488	455x390	102x60	102x60	15x7

0	1	2	3	4	5	6	7	8	Description
								×	decoration not allowed
×		×							recommended decoration sections
	×		×	×	×				decoration sections to consider upon request
						×	×		decoration to be placed on the upper ring

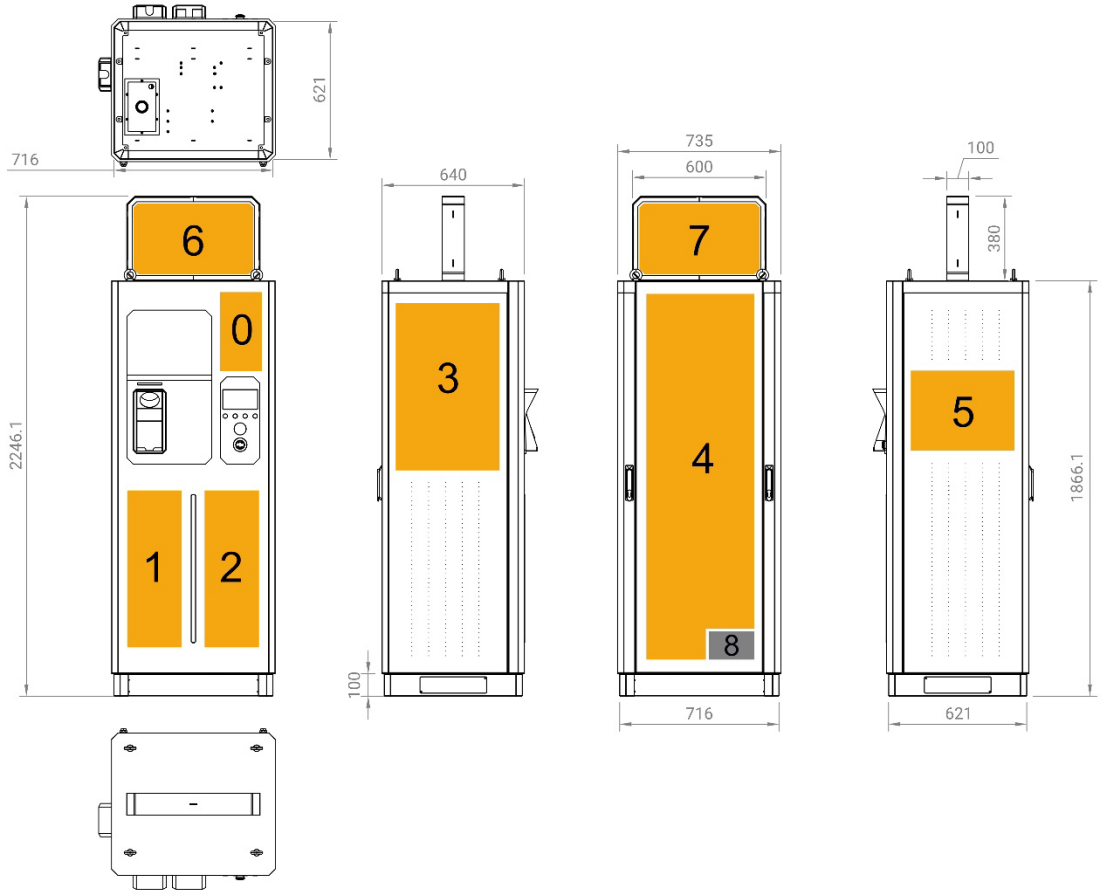
3.3.2.2. Non-standard version (2 plugs)



Section dimensions (mm)								
0	1	2	3	4	5	6	7	8
337x177	717x248	717x248	762x454	1657x488	455x390	102x60	102x60	15x7

0	1	2	3	4	5	6	7	8	Description
								×	decoration not allowed
×		×							recommended decoration sections
	×		×	×	×				decoration sections to consider upon request
						×	×		decoration to be placed on the upper ring

3.3.2.3. Non-standard version (1 plug)

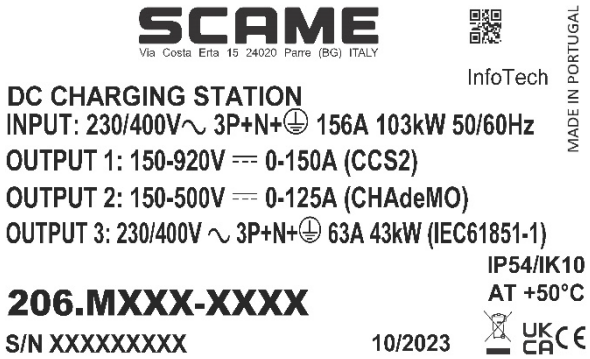


Section dimensions (mm)								
0	1	2	3	4	5	6	7	8
337x177	717x248	717x248	762x454	1657x488	455x390	102x60	102x60	15x7

0	1	2	3	4	5	6	7	8	Description
								×	decoration not allowed
×		×							recommended decoration sections
	×		×	×	×				decoration sections to consider upon request
						×	×		decoration to be placed on the upper ring

3.3.3. Type plate

The type plate is located on the back of the CHARGING STATION in the bottom right corner. Its main purpose is the identification of the equipment and to provide certain electrical specifications.



PRODUCTION DESCRIPTION es.: BE-M PPP-V0000-M0

PPP	60	60kW DC output power: 2 power modules installed
	90	90kW DC output power: 3 power modules installed
	120	120kW DC output power: 4 power modules installed
	150	150kW DC output power: 5 power modules installed
V	L	Low Voltage: 150-500V
	H	High Voltage: 150-1000V
0000	C	CCS option installed
	J	CHAdeMO option installed
	A	AC Type 2 22kW or 43kW Plug (cable) option installed
MINOR OPTIONS	D	Dual DC option
	U	Upgradeable up to 180kW
	I	High-current plug
	L	CCS Type 1

3.4. Specifications – low current version

PRODUCT DESCRIPTION				BE-M Series-PPPH
Description	EV fast CHARGING STATION BE-M Series, maximum 180 kW triple DC CHARGING STATION Supports new generation high voltage EVs and BUS			
TYPE	**60**	**90**	**120**	**150**
INPUT POWER				
Voltage Rating	400 VAC ± 10%, 3P+N+PE, 50/60 Hz			
AC Current (DC|DC+AC)	92|156 A	138|202 A	184|248 A	230|294 A
Power (DC|DC+AC)	63|106 kVA	95|138 kVA	127|170 kVA	158|201 kVA
Power factor	0.99 at nominal output			
THD	< 5%			
Efficiency	96% at nominal output power			
OUTPUT POWER				
DC Voltage range	150 – 920 VDC			
DC max current CCS	150 A	200 A	200 A	200 A
DC max current CHAdeMO	125 A	125 A	125 A	125 A
DC max Power CCS at 400V	60 kW	80 kW	80 kW	80 kW
DC Voltage Ripple + Noise	500 mVp-p			
DC Current Ripple (typ.)	<1 Arms @ Rated Power (measured with a resistive load)			
AC Voltage	400 V (same as Input Voltage)			
AC Current	3-Phase 64 A max			
AC Power	43 kW max			
USER INTERFACE AND SYSTEM CONTROL				
DC Output plug Types	Options: CCS2, CCS1, CHAdeMO, GBT			
AC Output plug Types	Optional: Type 2 cable at 22kW or 43kW IEC62196-2			
HMI	7 inch graphical LCD (800x480), Push buttons for commands			
Support Languages	Dual language (Local plus English)			
Emergency Button	1 emergency stop button			
Charge Options	One session | one DC + AC simultaneous | DC + DC + AC, 3 simultaneous			
Power Management	Configurable dynamic load distribution (doble DC outputs optional)			
User Authentication	ISO / IEC 14443 A / B Mifare RFID reader			
Network Interface	Ethernet, GSM/3G/4G			
Communication Protocol	OCPP 1.6 JSON upgradable, others by request			
Protection	Over current, Under/Over voltage, Short circuit, Ground fault, Over temp, Open door			
MECHANICAL AND ENVIRONMENTAL				
Operating Temperature	Operating from -25 C to +50 C, derating from +50 C to +60 C			
Humidity	5% to 90% relative humidity, non-condensing			
Altitude	< 2.000 m			
Protection level	IP54 / IK10 according to IEC 62262			
Cooling	Forced air			
Charging Cable Length	3 m (standard) - maximum 7,5 m (optional)			
Decorative top flag	Optional (not included as base configuration)			
Dimension (W x D x H)	735 x 640 x 1866 mm			
Weight (depends on configuration)	330-430kg approx.			

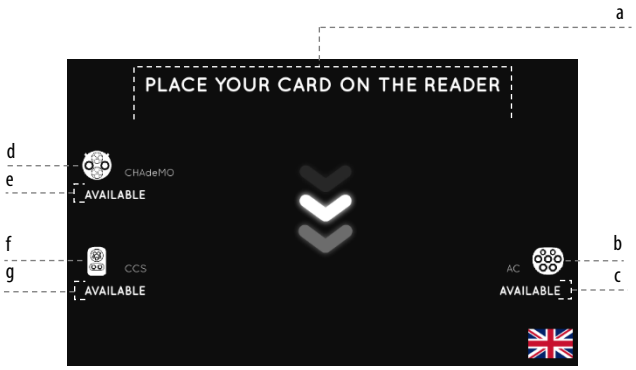
3.5. Specifications – high current version

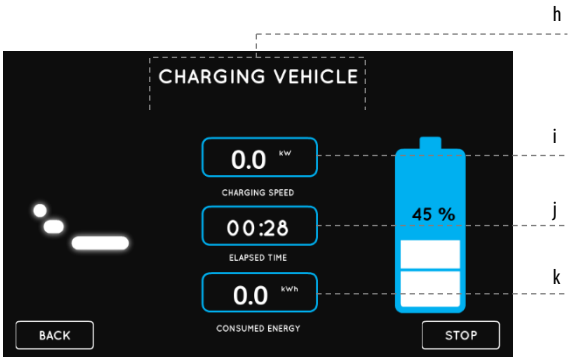
PRODUCT DESCRIPTION				BE-M Series-PPPH-I
Description	EV fast CHARGING STATION R4 model, maximum 180 kW triple DC CHARGING STATION Supports new generation high voltage EVs and BUS			
TYPE	**60**	**90**	**120**	**150**
INPUT POWER				
Voltage Rating	400 VAC ± 10%, 3P+N+PE, 50/60 Hz			
AC Current (DC|DC+AC)	92|156 A	138|202 A	184|248 A	230|294 A
Power (DC|DC+AC)	63|106 kVA	95|138 kVA	127|170 kVA	158|201 kVA
Power factor	0.99 at nominal output			
THD	< 5%			
Efficiency	96% at nominal output power			
OUTPUT POWER				
DC Voltage range	150 – 920 VDC			
DC max current CCS	150 A	225 A	300 A	375 A
DC max current CHAdeMO	125 A	125 A	125 A	125 A
DC max Power CCS at 400V	60 kW	90 kW	120 kW	150 kW
DC Voltage Ripple + Noise	500 mVp-p			
DC Current Ripple (typ.)	<1 Arms @ Rated Power (measured with a resistive load)			
AC Voltage	400 V (same as Input Voltage)			
AC Current	3-Phase 64 A max			
AC Power	43 kW max			
USER INTERFACE AND SYSTEM CONTROL				
DC Output plug Types	Options: CCS2, CCS1, CHAdeMO, GBT			
AC Output plug Types	Optional: Type 2 cable at 22kW or + 43kW IEC62196-2			
HMI	7-inch graphical LCD (800x480), Push buttons for commands			
Support Languages	Dual language (Local plus English)			
Emergency Button	1 emergency stop button			
Charge Options	One session | one DC + AC simultaneous | DC + DC + AC, 3 simultaneous			
Power Management	Configurable dynamic load distribution (doble DC outputs optional)			
User Authentication	ISO / IEC 14443 A / B Mifare RFID reader			
Network Interface	Ethernet, GSM/3G/4G			
Communication Protocol	OCPP 1.6 JSON upgradable, others by request			
Protection	Over current, Under/Over voltage, Short circuit, Ground fault, Over temp, Open door			
MECHANICAL AND ENVIRONMENTAL				
Operating Temperature	Operating from -25 C to +50 C, derating from +50 C to +60 C			
Humidity	5% to 90% relative humidity, non-condensing			
Altitude	< 2.000 m			
Protection level	IP54 / IK10 according to IEC 62262			
Cooling	Forced air			
Charging Cable Length	3 m (standard) - maximum 7,5 m (optional)			
Decorative top flag	Optional (not included as base configuration)			
Dimension (W x D x H)	735 x 640 x 1866 mm			
Weight (depends on configuration)	330-430kg approx.			

3.6. Graphical Interface

The graphical interface has as main purpose to show the charging process status, namely the charging speed, elapsed time and the consumed energy (kWh), among other elements, as shown in Table 1. It can also display images and/or advertising.

Table 1 - Description of the content displayed on the BE-M Series graphical interface





a	Action to carry out	h	Status
b	Plug 1	i	Charging speed (kW)
c	Plug status 1	j	Elapsed time (min.:sec.)
d	Plug 2	k	Consumed energy (kWh)
e	Plug status 2		
f	Plug 3		
g	Plug status 3		

3.7. RFID reader

The BE-M Series CHARGING STATION is equipped with a RFID reader, having the function of user identification, access control and management of the charging process.

It should be noted that there is a time limit of 30 seconds for reading the RFID card. After this period, you must repeat the process. For example, if you connect the charging cable into the CHARGING STATION, to start charging, you will have 30 seconds to place your RFID card near the reader.
Also, If the reader is not reading your card, try to position over the reader one other corner of the card, as the reading sensor is positioned on different corners of the card, depending of each card.

The figure below indicates the location of the RFID reader, where your RFID card should be placed.

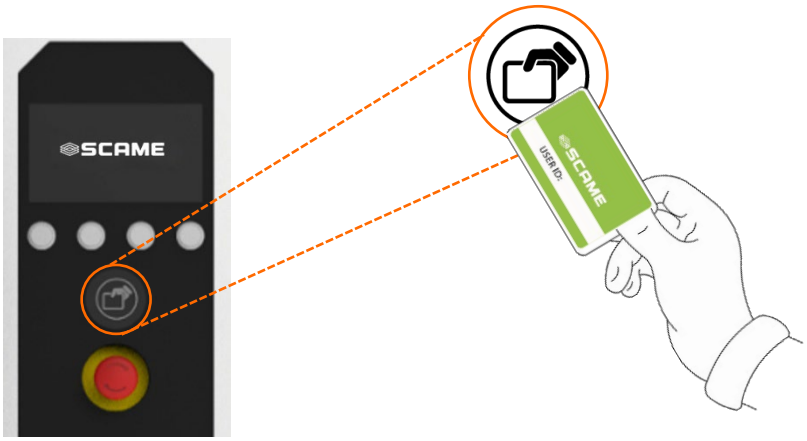
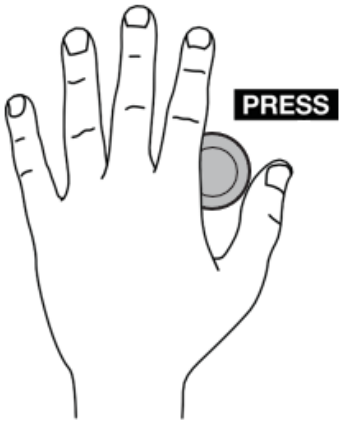
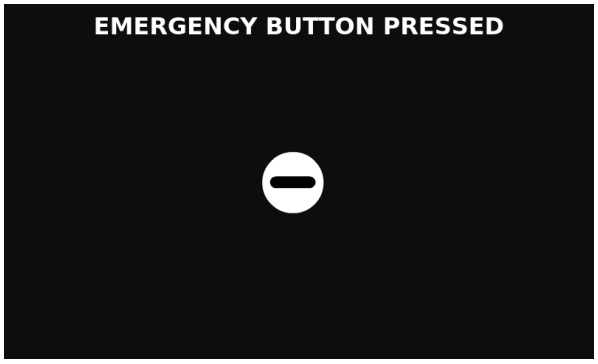
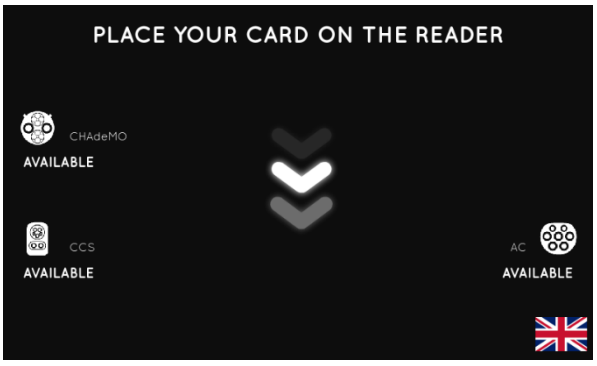


Fig. 2 - RFID reader

3.8. Emergency stop button

Due to a failure/malfunction, if it is necessary to activate the emergency button, follow the instructions in the pictures below. This will immediately interrupt the charging process.

PRESS	RELEASE
	
After pressing the emergency button, the following image should appear on the graphic interface of the equipment:	After releasing the emergency button, the following image should appear on the graphic interface of the equipment:
	

4. Using the CHARGING STATION

4.1. LED status indicators

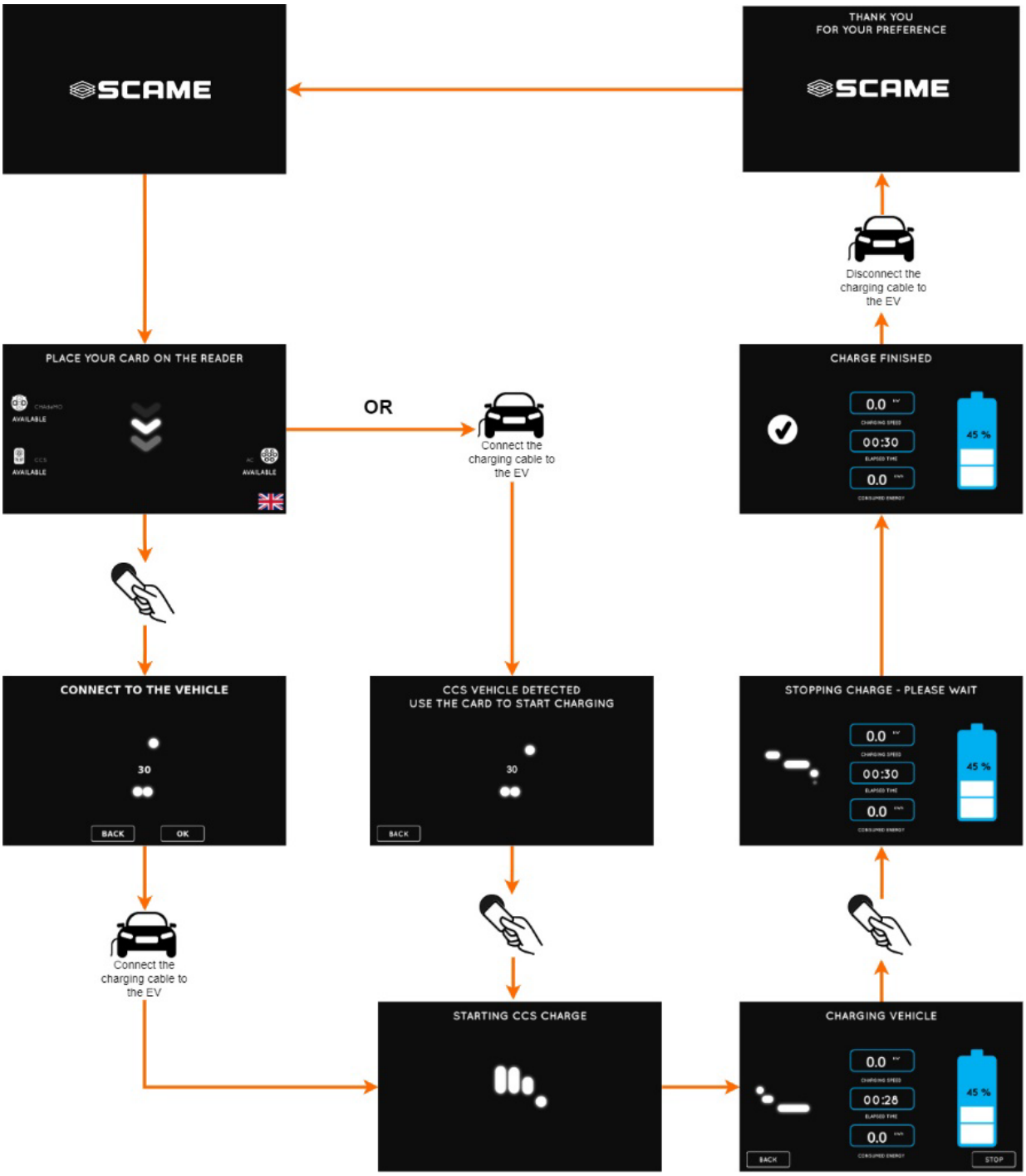
The LED-P informs about the CHARGING STATION's plug status. It may present different colours, as indicated below.

LED-P STATUS		
LED	**Colour**	**Description**
	-	OFF
	Green	Ready
	Flashing green	Cable connected and EV detected or Charge process complete
	Blue	Charge in process
	Flashing blue	Paused[(a)]
	Red	Unavailable

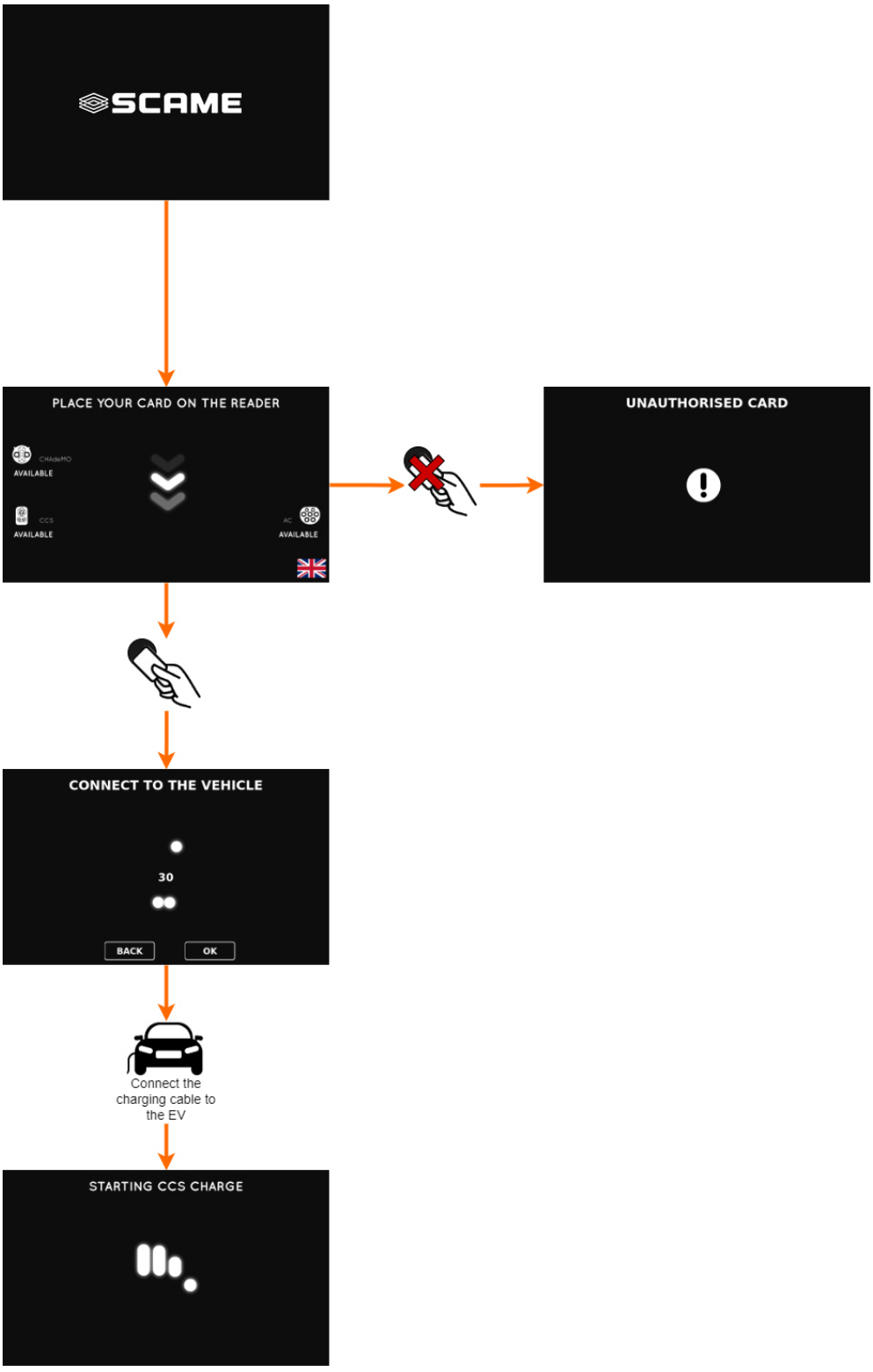
[(a)] The charging process goes into pause mode in several occasions, such as:

- Opening one of the EV doors.
- The EV is scheduled to start charging later.
- When the EV turns on the cooling system.
- Among others.

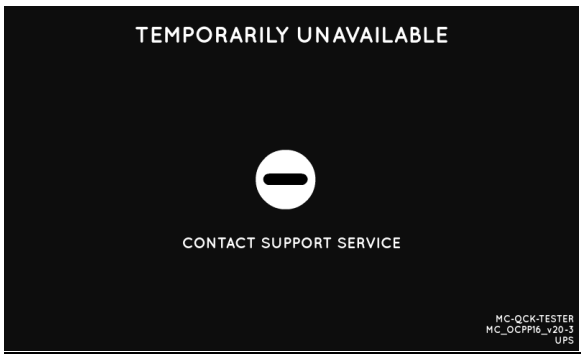
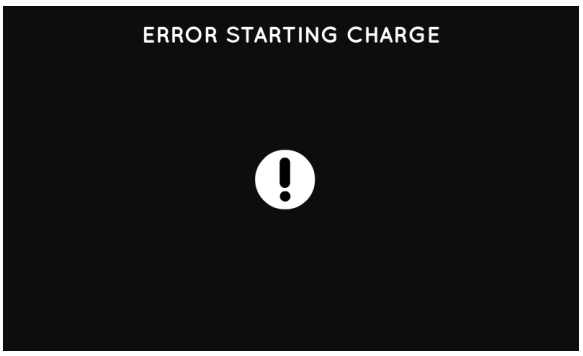
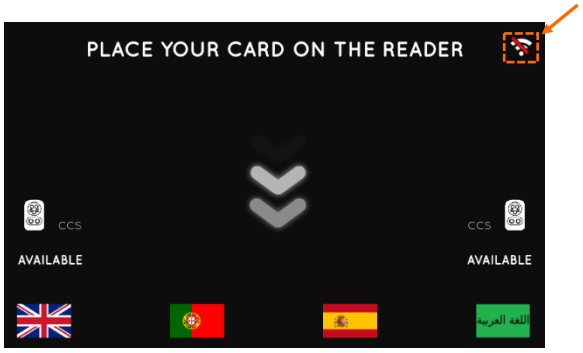
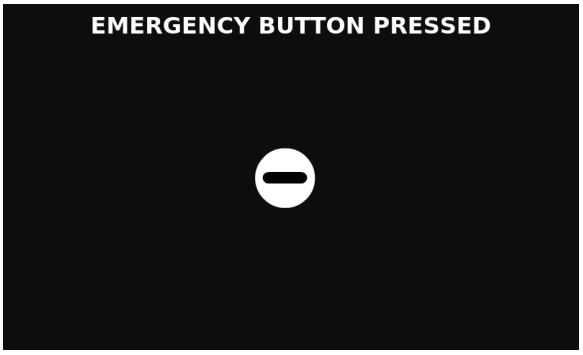
4.2. Charging process



4.2.1. RFID card unauthorised



4.2.2. Alerts – Temporarily unavailable

CHARGING STATION TEMPORARILY UNAVAILABLE [b]	ERROR STARTING CHARGE[b]
	
CHARGING STATION WITHOUT NETWORK [b]	**EMERGENCY BUTTON PRESSED[b]**
	

[b] See 5. Troubleshooting

5. Troubleshooting

LED INDICATORS		
Error	**Possible cause**	**Remedy**
OFF	No power supply	Check if the MCB, in the MDB, is turned on.
		Check if the MCB, inside the CHARGING STATION, are turned on.
		Check if the UPS is turned on.
		Check whether there is power in the remaining electrical installation.
	Defective LED	Contact the operator or technical support.
Flashing green	EV at the end of the charging process	Check the charge status of the EV's battery.
	Charging cable properly connected to the EV, but the user did not use the RFID card to start charging	Remove the connector from the EV and start the process again.
Flashing blue	EV put the charging process on pause	Check if the vehicle is in battery ventilation mode. If so, wait for ventilation to finish. The charge will resume shortly after.
	The user has paused the charging process	End the session, remove the plug from the EV and restart the charging process.
Red	Defect	Switch off and switch on the circuit breaker of the CHARGING STATION (in the MDB and those in its interior) and wait for the LED-S lights up green. Repeat the charging process. If the error remains, please contact the operator or technical support.

SOCKET/PLUG STATUS		
Error	**Possible cause**	**Remedy**
The CHARGING STATION does not detect the EV	Charging cable connected incorrectly	Unplug the charging cable (on the EV side) and plug it back in.
	CHARGING STATION defective	Contact the operator or technical support.
Charging process does not start	Charging cable is not plugged in correctly	Unplug the charging cable and plug it in again.
	The charging process was not carried out correctly	Follow the instruction in 4.2 Charging process.
	RFID card reading time out	Disconnect the charging cable, reconnect, and place the RFID card near the reader.
	The EV's battery is fully charged	Check the EV.
	EV's scheduled charging	Check if the EV has a scheduled charging start.
	Defective charging cable	Check for possible damage on the charging cable. If there is damage, please contact the operator or technical support.
Charging cable does not disconnect from the socket	Charging process unfinished	Check if the CHARGING STATION has a flashing green LED-S1/LED-S2/LED-S3 (see 4.1. LED status indicators).
	RFID card unused	Place the RFID card near the RFID reader to finish the charging process and disconnect the cable (see 4.2. Charging process).
Message – temporarily unavailable	No power supply	Check if the protections, inside the CHARGING STATION and in the MDB, are turned on.
		Check whether there is power in the remaining electrical installation.
		There might be errors in communication with energy meters.
		There might be tension of lagged phases.
		There might be a failure to communicate with the load control boards.
		Contact the operator or technical support.
CHARGING STATION without network	CHARGING STATION offline	Check the data network.

RFID CARD		
Error	**Possible cause**	**Remedy**
Invalid RFID card	RFID card not programmed to access the CHARGING STATION	Contact the CHARGING STATION's operator.
	Damaged RFID card	Contact the operator or technical support for card replacement.
RFID card not detected	Incorrect RFID card placement	Place the RFID card near the reader in different ways.
	Defect	Contact the operator or technical support.

6. Maintenance

The owner must check, whenever possible, for damage, defects, or failures in all equipment components (namely socket, plug and charging cable, buttons, LEDs, among others) as well as in the box (visual control).

To ensure proper maintenance of the CHARGING STATION, follow these instructions:

- Keep the exterior of the equipment always clean.
- Use a soft, damp cloth for cleaning. For stubborn dirt use a mild, solvent-free, non-scouring cleaning agent.
- Always keep the plugs in their respective holders.
- If the equipment is damaged, contact the equipment supplier.

INSTALLATION INSTRUCTIONS

7. Installation site

Before the CHARGING STATION installation, check the EV position in the parking place, so that the charging cable can reach the charging door/socket.

The installation site of the BE-M Series CHARGING STATION must meet the following requirements:

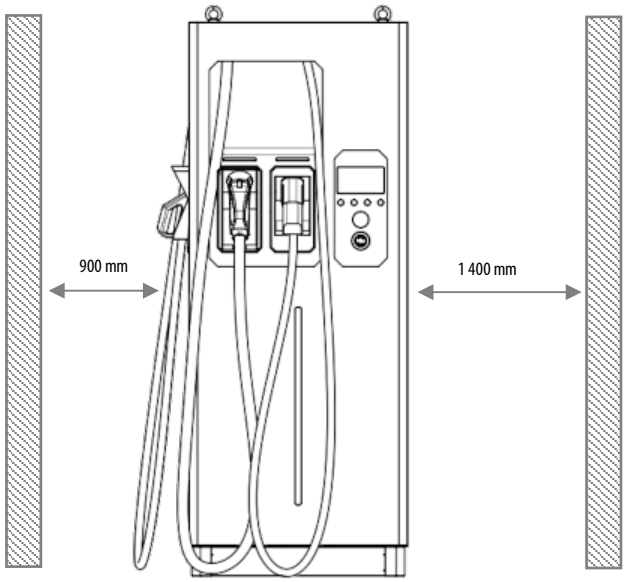
- The equipment shall not be at an altitude higher than 2 000 m above sea level.
- The equipment must NOT be submersed in water, or any other fluid.
- The operational temperature must be between -25°C and 50°C.

The BE-M Series CHARGING STATION installation requires the following construction work:

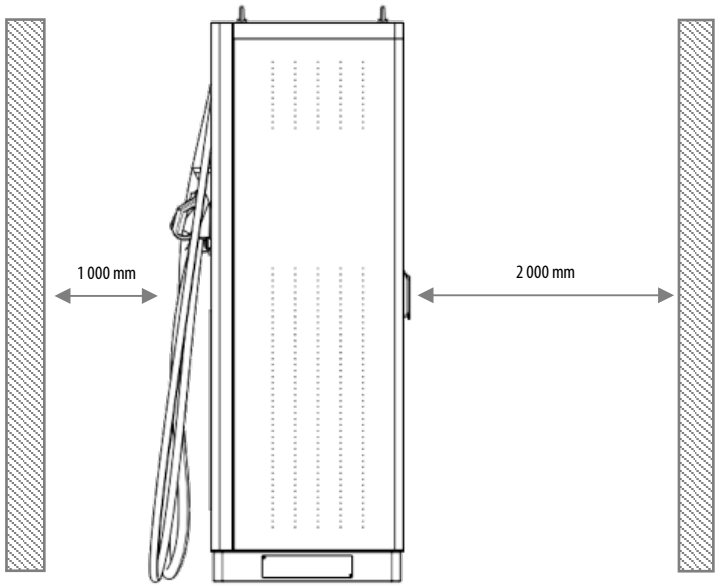
- Three phases + neutral + protective earth connections.
- Solid foundation.
- Conduits for electrical cables, between the MDB and the BE-M Series (usually these cable conduits are installed below ground).
- Parking space for EVs.

The CHARGING STATION must be positioned so that several EV can access the equipment, as mentioned in 7.1 Examples of CHARGING STATION layouts, as well as there must be a free space around the equipment, with the minimum dimensions indicated in Fig. 3.

FRONT



RIGHT



RIGHT

It should be noted that the equipment doors open, at a 90-degree amplitude and have a spatial occupancy of 550 mm.

Fig. 3 - Minimum required space around the equipment

Recommendations

Installation of barriers/posts between the BE-M Series and the parking place, in order to protect the CHARGING STATION against possible collisions.

Use of traffic signs and/or markings to indicate that the parking spaces are reserved for charge EVs.

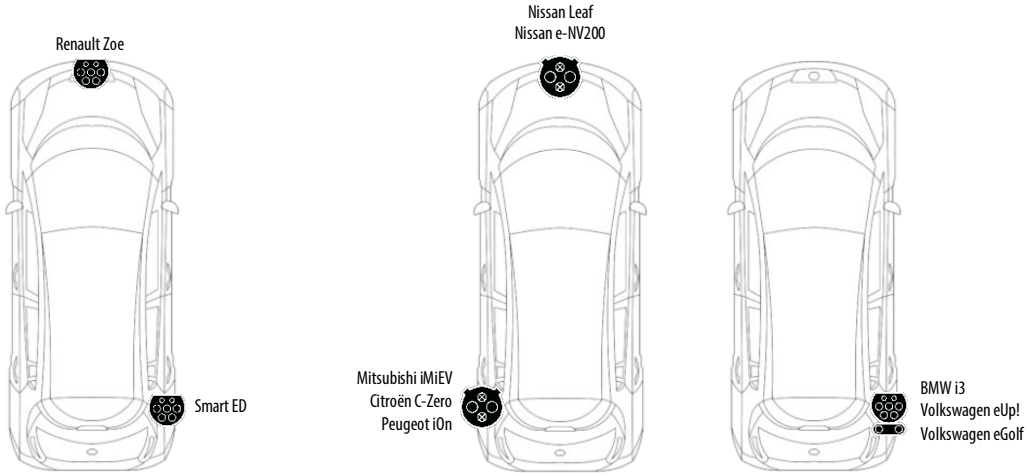
If the CHARGING STATION will be exposed to direct sunlight and high ambient temperatures for most of the day it is recommended to install protection from direct sunlight.

As a means of preventing vandalism and/or theft, please consider the following recommendations:

- Installation of the CHARGING STATION in a place where it can be clearly monitored.
- Use of security control (24 hours a day).
- Sufficient lighting installation around the CHARGING STATION.

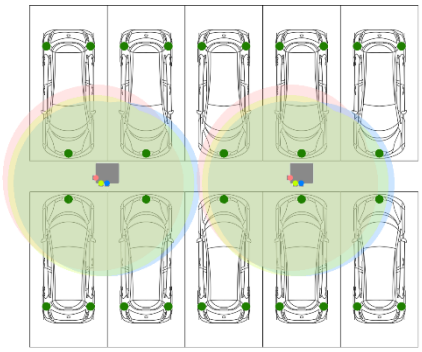
7.1 Examples of CHARGING STATION layouts

The layout of the sockets on an EV may differ depending on its type, as illustrated below.

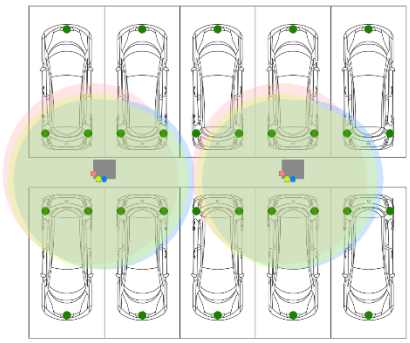


Below are represented the different possibilities for the CHARGING STATION layouts.

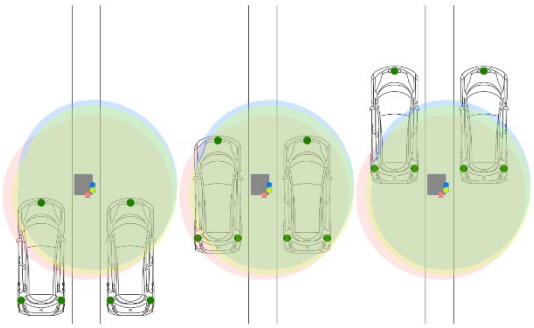
Forward parking



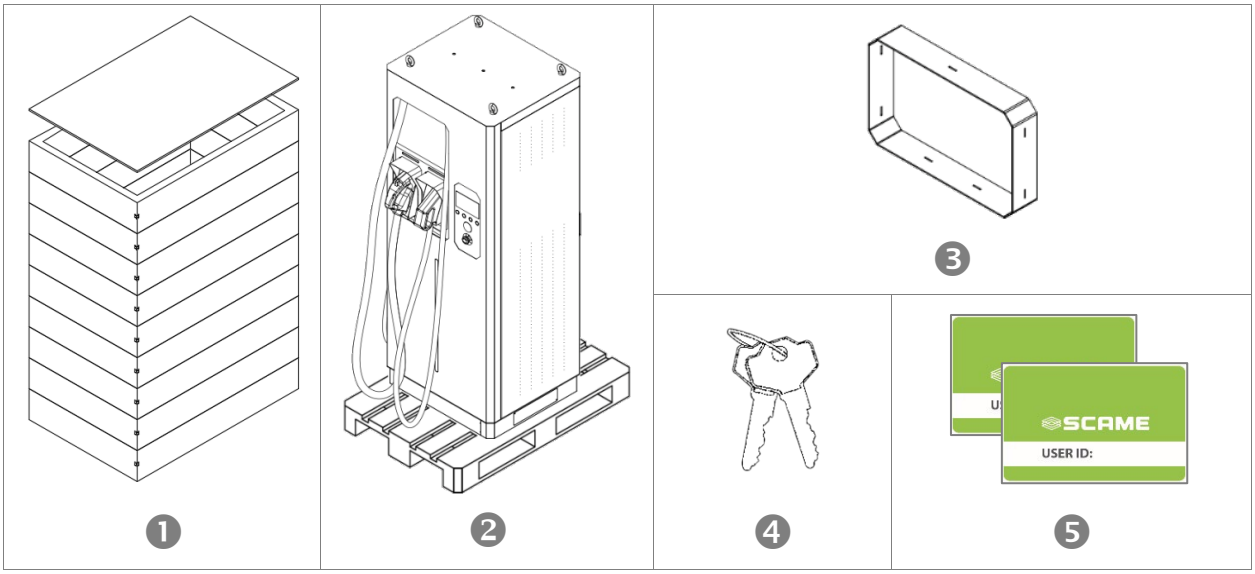
Backward parking



Drive Through



8. Package content



BE-M Series		
	Description	**Qty.**
1	Packaging	1
2	CHARGING STATION | Euro pallet	1 | 1
3	Decorative piece (optional)	1
4	Keys	1 pair
5	RFID cards	2

PLEASE NOTE

Whenever possible, the BE-M Series CHARGING STATION must be unloaded at the installation and operation site. In case of unloaded at a temporary location for storage, it is convenient to not remove the packaging and store them, meeting the following minimum requirements:

- Safety: BE-M Series CHARGING STATION must be protected against negative elements such as heat radiation, direct solar radiation, mechanical damage, organic dissolvent impacts, etc.
- Temperature: for temperatures below -25° C and over +50° C special attention must be paid to the storage and handling.
- Environment: BE-M Series CHARGING STATION must be stored in a dry and dust-free location. The distance from a heat source must be one metre away. Outdoor storage of the unit has to be avoided.

9. Installation

9.1. Safety instructions

 DANGER!	Turn off the power supply at the MDB before performing any disassembly, repair, or replacement on the equipment.
 DANGER!	Do not install the CHARGING STATION near chemical, flammable, explosive or combustible materials.
 DANGER!	The BE-M Series must NOT be submersed in water, or any other fluid.
 DANGER!	Please make sure that the installation site is not higher than 2 000 m above sea level.
 DANGER!	The BE-M Series contains conductors that have hazardous electrical voltages.
 DANGER!	The grid connection terminals located at the service door have hazardous voltages, even if all circuit breakers are switched off.
 DANGER!	Properly lock the doors after any installation or service operation.
 DANGER!	Only proper cables may be used to connect equipment.
 WARNING!	Only professionals certified by SCAME PARRE S.p.a. are allowed to install and connect the equipment.
 WARNING!	Ensure that the materials used, and the installation procedures follow local building and safety standards.
 WARNING!	Check if all protection devices are correctly installed before using or handling the equipment and, also, before installation or maintenance.
 WARNING!	Prepare the site where the CHARGING STATION will be installed, according to the requirements presented in this manual.

 WARNING!	Check if there is enough space around the CHARGING STATION to facilitate installation and maintenance work.
 WARNING!	The BE-M Series has air inlets and outlets to control the temperature. Do not install any objects near these air inlets and outlets. If necessary, take precautions to prevent snow blocking the inlets and outlets.
 WARNING!	The installation site must be clean and unobstructed of any object that could jeopardize its installation.
 WARNING!	Do not install the CHARGING STATION if it is visibly damaged.
 WARNING!	When installing the equipment, it must be immediately fixed to its base. The concrete foundation must ensure that the CHARGING STATION does not fall.
 WARNING!	Ensure that the equipment is properly installed and visually inspected before connecting it to the network.
 WARNING!	Wear protective shoes and gloves when handling and installing the equipment.
 CAUTION!	The BE-M Series is heavy equipment. 1. Use a forklift or pallet truck when you have to lift or move the CHARGING STATION. 2. Do not drop the CHARGING STATION. 3. Do not exceed the 30° inclination.
 CAUTION!	Do not install the equipment on unstable ground.

9.2. Tools and materials required

To install the CHARGING STATION, the following materials and tools are required.

Materials:

- Pencil/marker
- VD conduit pipe + pipe clamps

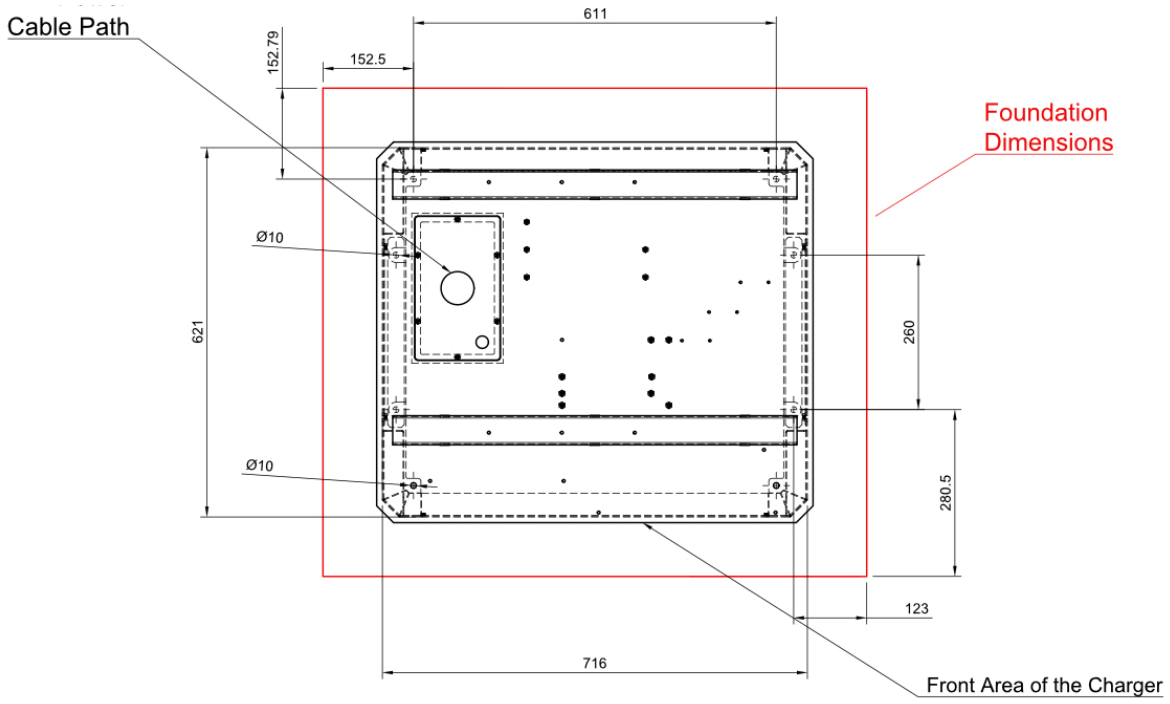
Tools:

- Power drill
- M4, M6, M8 drill
- Tape measure
- Construction level
- PZ2 screwdriver
- Wrench
- Digital multimeter
- Ratchet with extender
- Power quality analyser (optional)
- Digital earth resistance tester (optional)

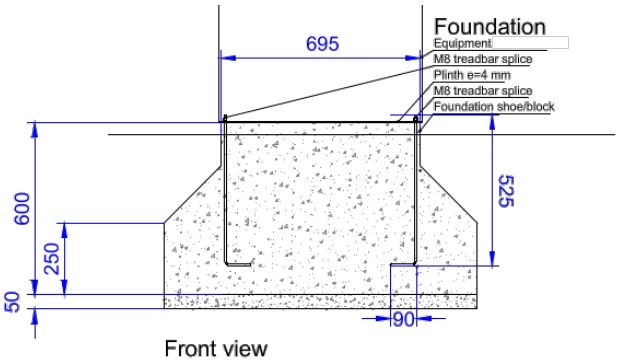
9.3. Foundations

Regarding the CHARGING STATION concrete foundation, the time of application of the concrete and curing must be respected in accordance with the laws of application. Therefore, concrete must be properly chosen and made with care to avoid being contaminated by other lands.

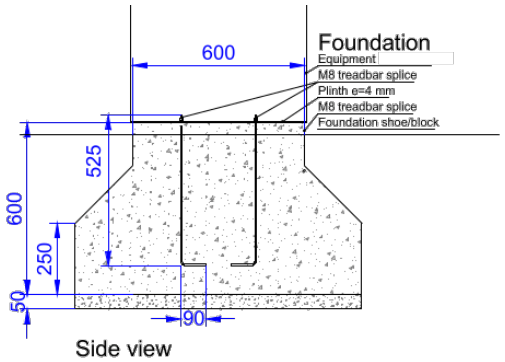
The below figure indicates the dimensions of the base of the BE-M Series CHARGING STATION, which should be considered when producing the concrete foundation.



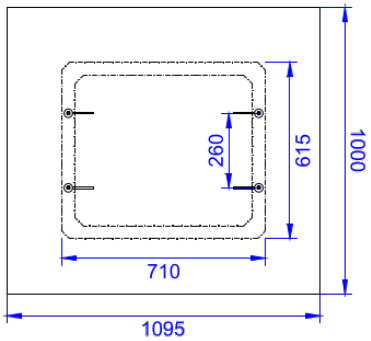
The below figure indicates the dimensions of the foundation for the BE-M Series CHARGING STATION.



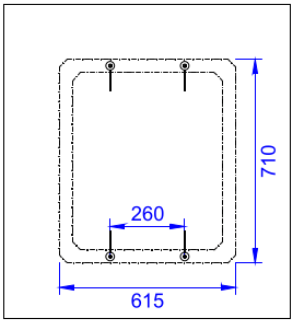
Front view



Side view



Top view

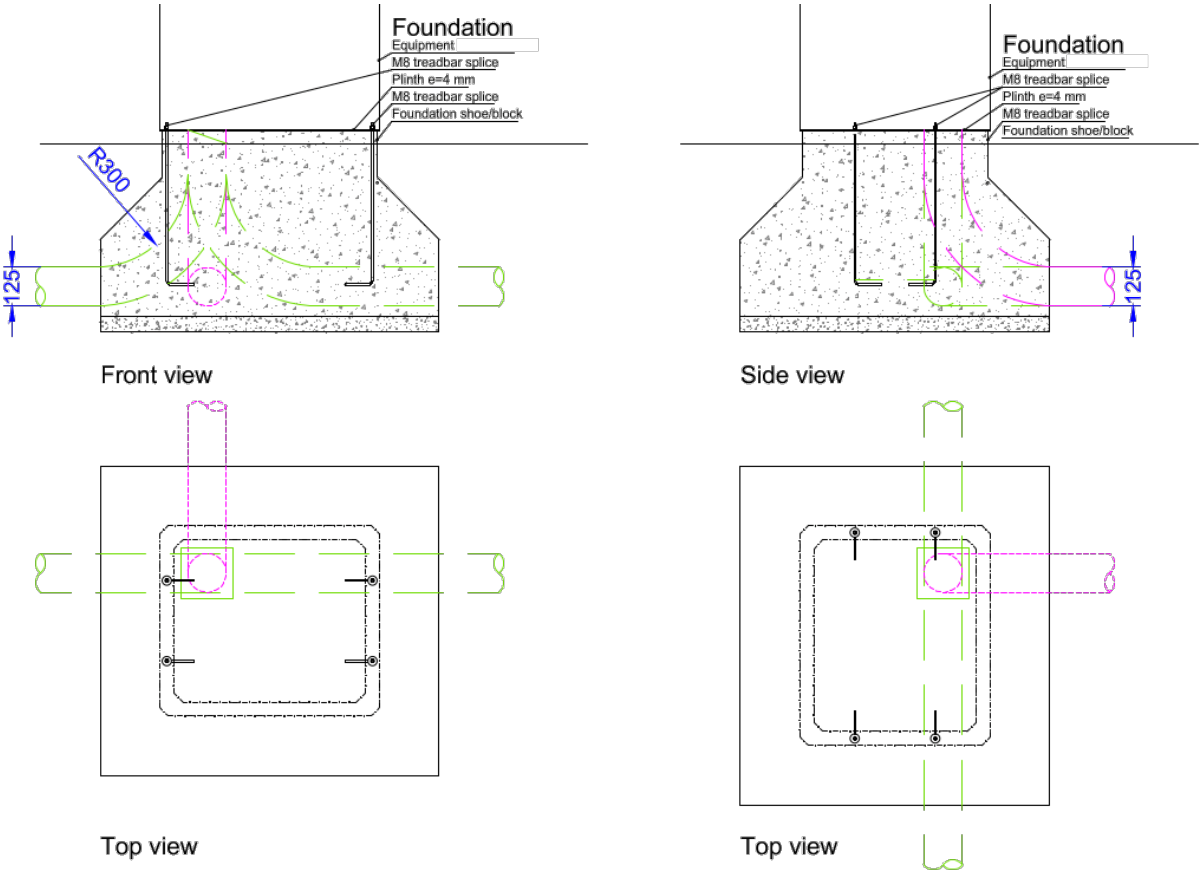


Top view

9.3.1. Electrical preparation

For the installation of BE-M Series CHARGING STATIONs, you need the following civil works.

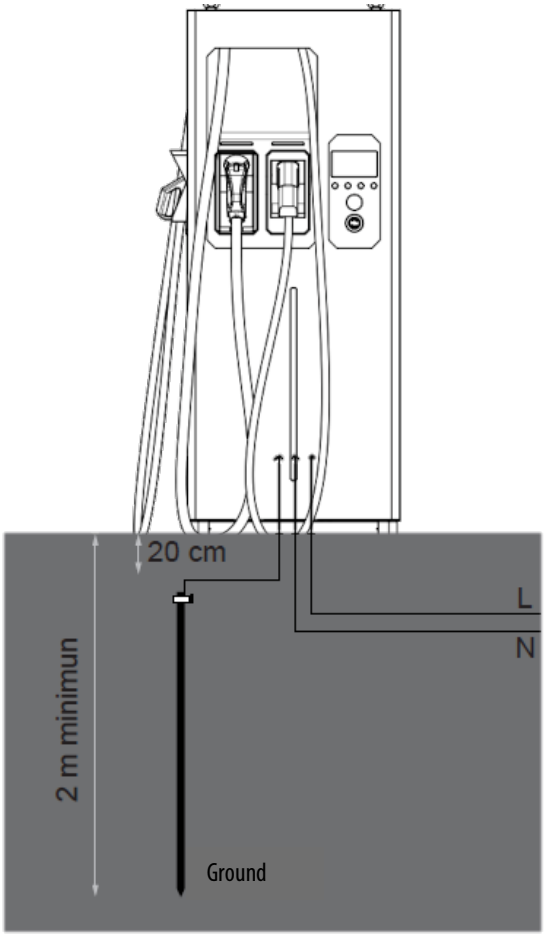
- The depth to which the tubing must be buried, shall be compliant with Local Technical regulation of Low Voltage Electrical Installations, therefore, the cables should be buried in the normal ground at least 600 mm of soil surface.
- This distance must be increased to at least 1000 mm in the crossings of routes accessible to vehicles and length of 500 mm on each side of these pathways.
- When choosing the spatial disposition of the CHARGING STATION. It must reserve work area/access equipment of 700 mm and 1000 mm (respectively) all around the product and as shown.



9.3.1.1. Ground circuit

The metal structure of the BE-M Series CHARGING STATIONs should be connected to a ground circuit.

The figure below shows the land arrangement of the design:



9.4. Electrical installation

To ensure that the electrical installation is carried out correctly, the following parameters should be analysed and confirmed.

Parameters:

- Measurement of the voltage and current harmonic distortion (≤ 15%)
- Earth resistance value: < 180Ω
- Neutral-to-earth voltage: ≤ 2V
- Single-phase system (Fig. 4):
  - Phase-to-neutral voltage: 230V (+/- 10%)
  - Phase-to-earth voltage: 230V (+/- 10%)
- Three-phase system (Fig. 5):
  - Phase-to-neutral voltage: 230V (+/- 10%)
  - Phase-to-earth voltage: 230V (+/- 10%)
  - Phase-to-phase voltage: 400V (+/- 10%)

Single-phase system

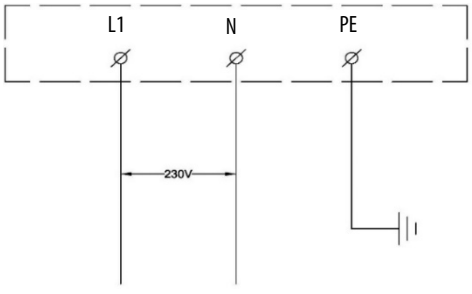


Fig. 4

Three-phase system

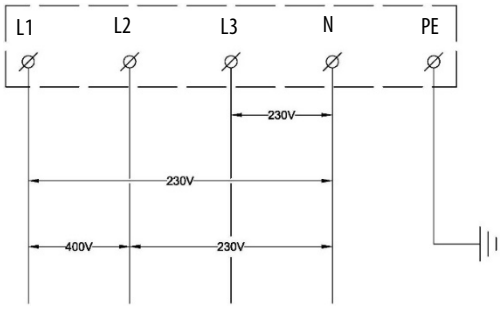


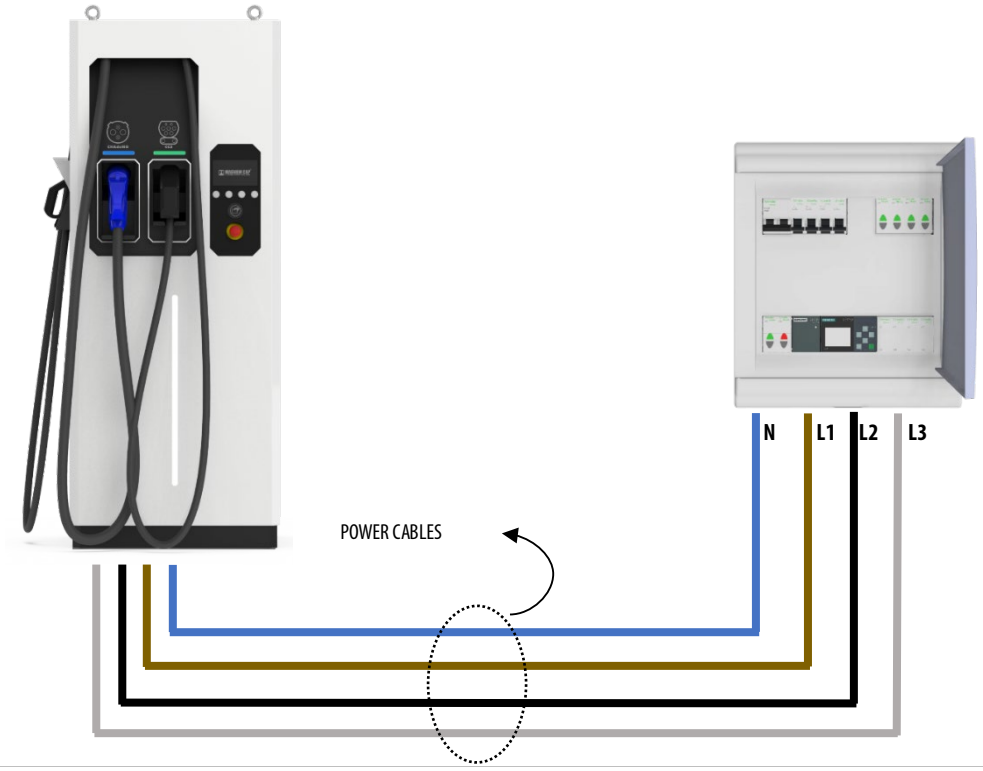
Fig. 5

According to IEC 60446, below are the colours of each electric cable (E.C.) conductor:

FUNCTION	COLOUR	CONDUCTOR
Phase 1 (ph/L1) | Phase (single-phase system)	Brown	
Phase 2 (ph/L2)	Black	
Phase 3 (ph/L3)	Grey	
Neutral (N)	Blue	
Protective earth (PE)	Green and yellow	

9.4.1. Electrical protections

	MAIN DISTRIBUTION BOARD	
	RCBO	
BE-M Series	WITH AC 43KW	WITHOUT AC
60kW	200A | 300mA | Type A | 3P + N	100A | 300mA | Type A | 3P + N
90kW	200A | 300mA | Type A | 3P + N	150A | 300mA | Type A | 3P + N
120kW	250A | 300mA | Type A | 3P + N	200A | 300mA | Type A | 3P + N
150kW	400A | 300mA | Type A | 3P + N	250A | 300mA | Type A | 3P + N



9.4.2. Upgrade grid

The BE-M Series CHARGING STATION can be connected directly to the electrical grid or to an existing customer power distribution board. In both cases 280 A, 400 Vac, 3P+N+PE connection is necessary that meets the following requirements:

- RCCB - 400 A, 300 mA, type A
- MCB - curve type C for 400 A
- PE connected to the main PE rail.

9.4.3. Cable section

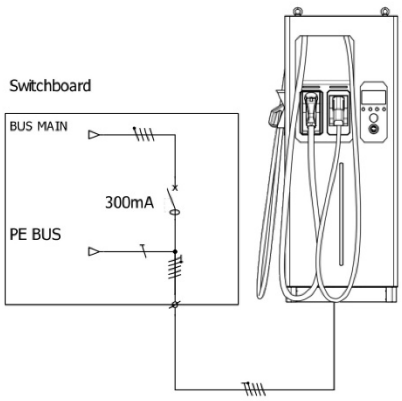
BE-M Series	With AC	With CCS	With CHAdeMO	< 75 m	< 100 m	> 100 m
60kW	✕	✕	✕	5G70	5G70	5G95
		✕	✕	5G50	5G70	5G70
		✕		5G50	5G70	5G70
			✕	5G50	5G70	5G70
90kW	✕	✕	✕	5G95	5G120	5G150
		✕	✕	5G70	5G95	5G120
		✕		5G70	5G95	5G120
			✕	5G50	5G70	5G70
120kW	✕	✕	✕	5G120	5G150	5G185
		✕	✕	5G95	5G95	5G120
		✕		5G595	5G595	5G120
			✕	5G50	5G70	5G70
150kW	✕	✕	✕	5G150	5G185	5G185
		✕	✕	5G120	5G120	5G150
		✕		5G120	5G120	5G150
			✕	5G50	5G70	5G70

PLEASE NOTE

The distance between the MDB and the CHARGING STATION should always be kept in mind. The cable section must be calculated with a maximum voltage drop of 3%. It is advisable to use RV-K cable type.

9.4.4. Electrical diagrams

9.4.4.1. Main Distribution Board

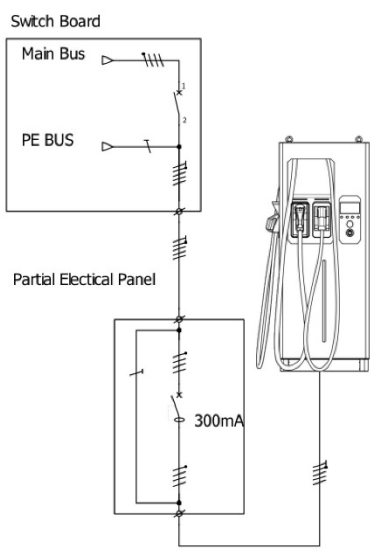


Type	Current (A) with AC43	Voltage (V)	RCBO*	Cable
60	148	400	200A/300mA	See chapter 14 of the installation manual
90	192			
120	236		250A/300mA	
150	279		400A/300mA	

Type	Current (A) with AC43	Voltage (V)	RCBO*	Cable
60	87	400	100A/300mA	See chapter 14 of the installation manual
90	130		150A/300mA	
120	173		200A/300mA	
150	217		250A/300mA	

*Type A differential circuit breaker with C curve
*if purchasing upgradable, refer to 180kW

9.4.4.2. Sub Distribution Board



Type	Current (A) with AC43	Voltage (V)	Circuit Breaker**	RCBO*	Cable
60	148	400	250	200A/300mA	See chapter 14 of the installation manual
90	192			250A/300mA	
120	236		400		
150	279			400A/300mA	

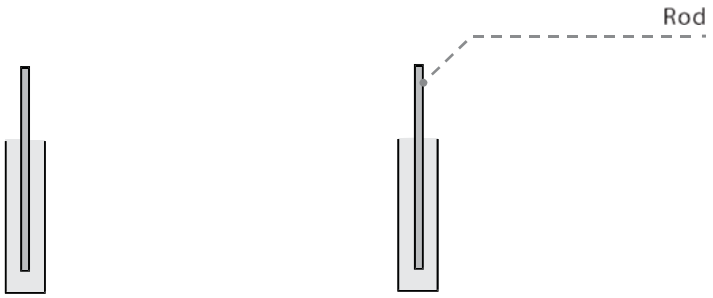
Type	Current (A) with AC43	Voltage (V)	Circuit Breaker**	RCBO	Cable
60	87	400	150	100A/300mA	See chapter 14 of the installation manual
90	130		200	150A/300mA	
120	173		250	200A/300mA	
150	217		400	250A/300mA	

*Type A differential circuit breaker with C curve
**Circuit breaker with C curve

9.5. Installation

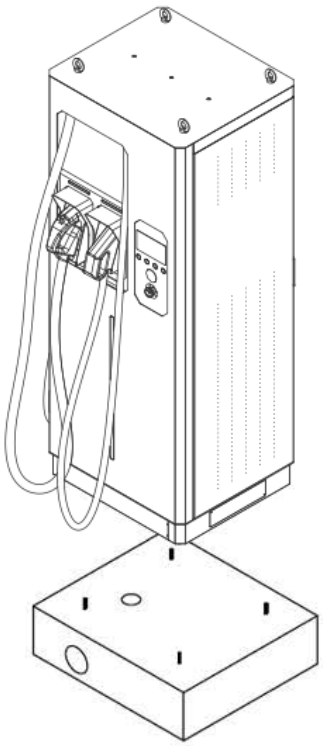
STEP 1

It is necessary to open 4 holes in the foundation to place the rods (using metallic bushing or chemical bushing).
The rods (M10) should be 500 mm under the foundation.



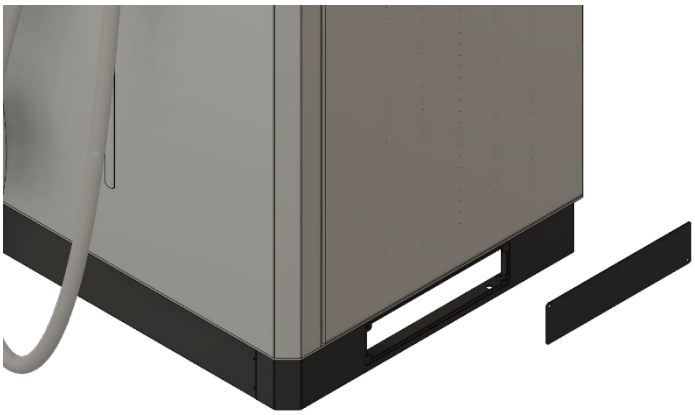
STEP 2

Place the CHARGING STATION in the foundation.



STEP 3

Remove the left and right metal grills.



STEP 4

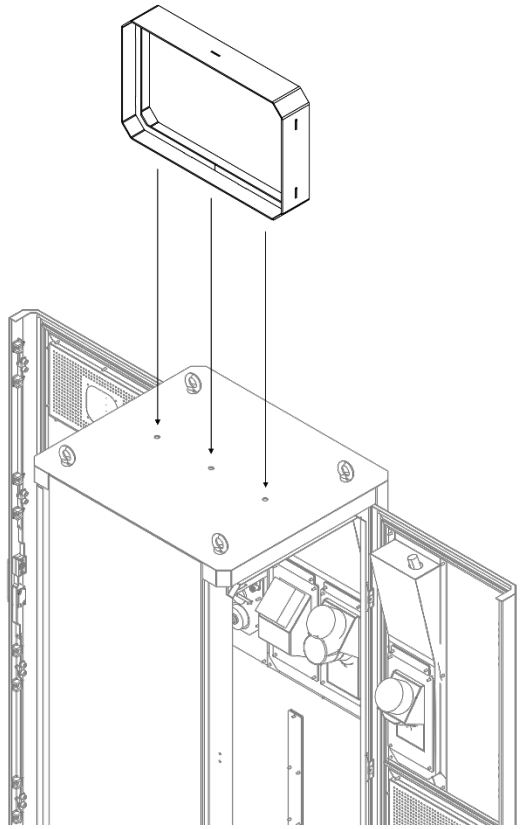
Apply the nuts, and tighten them.

STEP 5

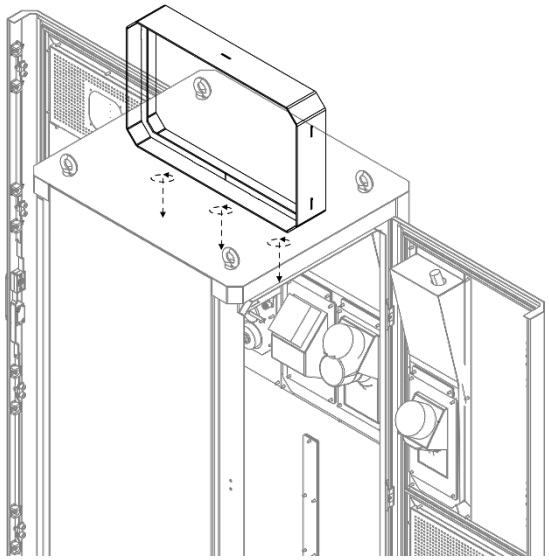
Put the grills back to place.

9.5.1. Decorative piece

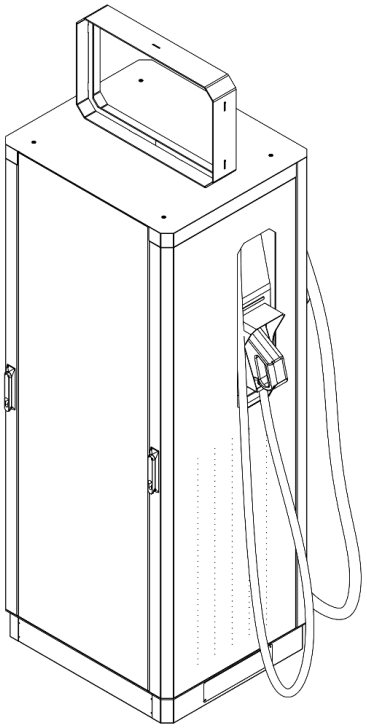
STEP 1



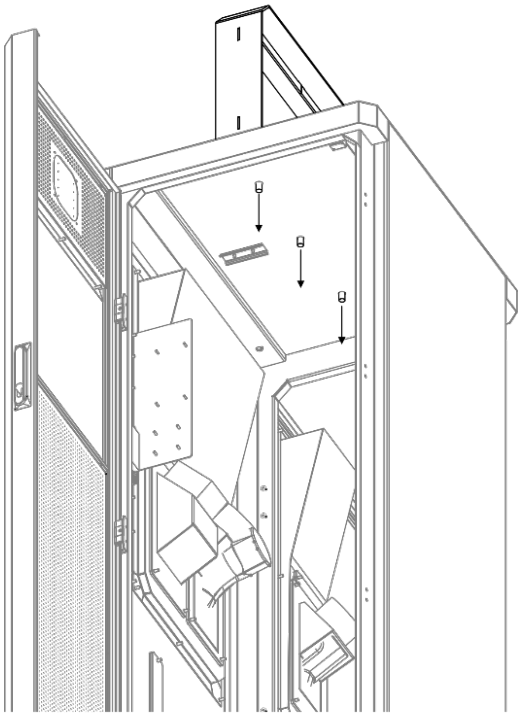
STEP 2



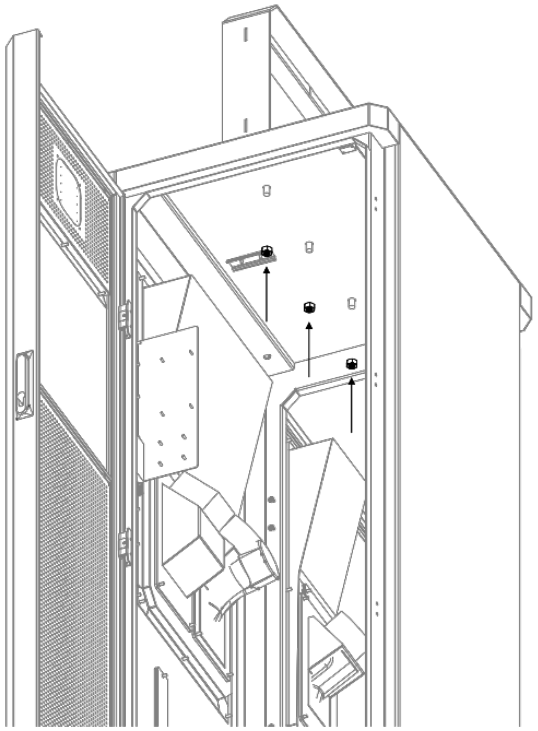
Step 3



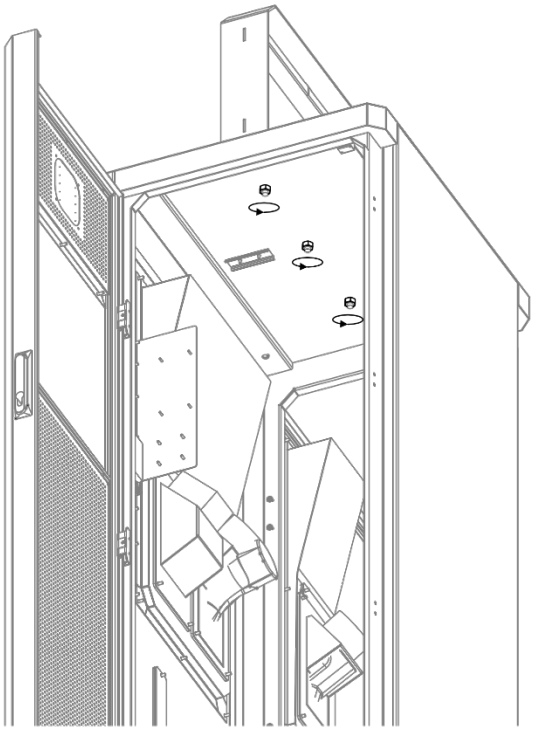
Step 4



Step 5

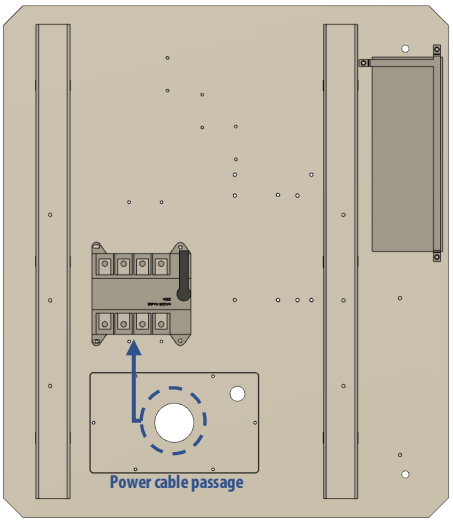


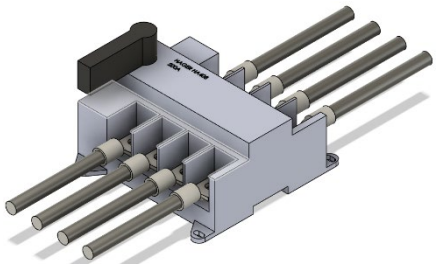
Step 6



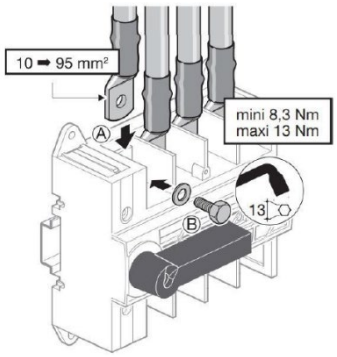
9.5.2. BE-M Series – 60 – Power cables connections

1. Open the CHARGING STATION door.
2. Route the power cables through the holes in the foundations and the base of the CHARGING STATION.
3. Connect the power cables to the electrical protection, as illustrated below:

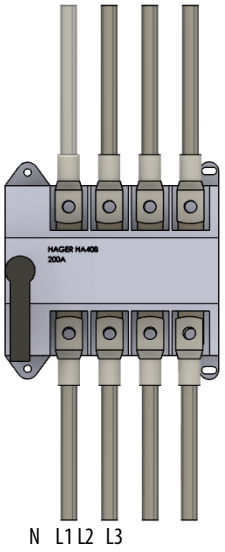




4. Apply the recommended torque RCBO (8Nm) to the connections to be made.

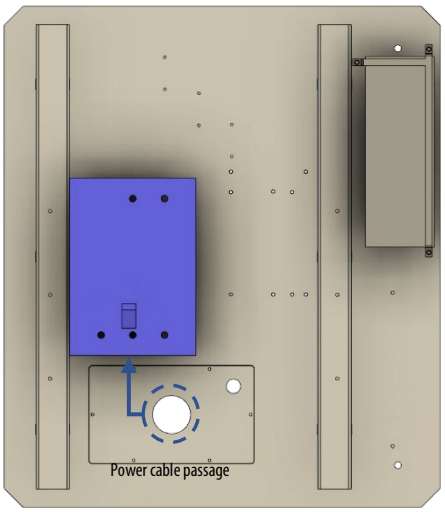


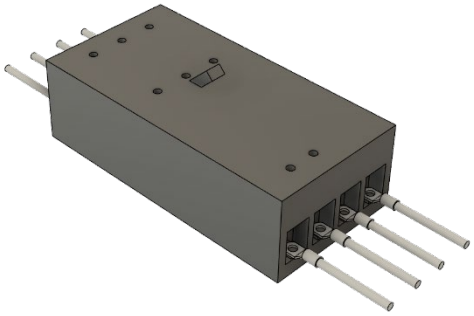
5. Connect the phase and neutral conductors in the following order:



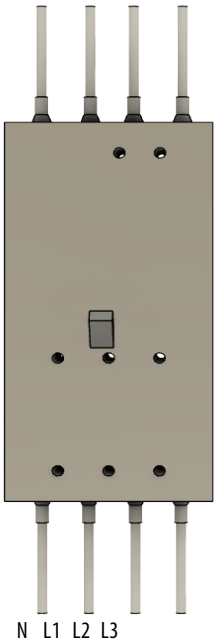
9.5.3. BE-M Series – 90 to 150 – Power cables connections

1. Open the CHARGING STATION door.
2. Route the power cables through the holes in the foundations and the base of the CHARGING STATION.
3. Connect the power cables to the electrical protection, as illustrated below:





4. Apply the recommended torque RCBO (8Nm) to the connections to be made.



9.5.4. Verification and power-on of equipment

STEP 1

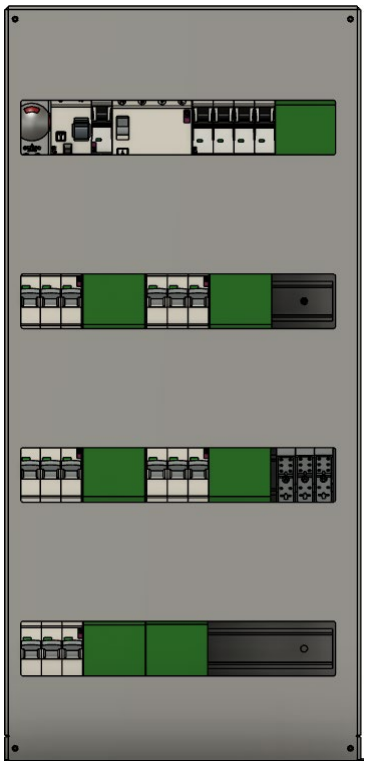
Confirm the RCBO and contactor tightening, using the recommended torque:

BE-M Series – 60:
Across-the-board Cut – 13 Nm
Contactor – 5 Nm

BE-M Series – 90 to 150:
RCBO – 8 Nm
Contactor – 18 Nm

STEP 2

Open the door on the right side and move the protection case.



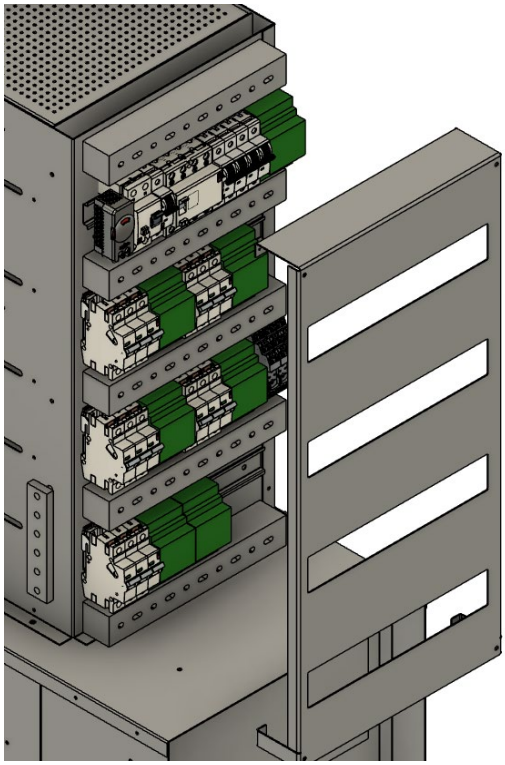
STEP 3

Confirm tightening's on all electrical protections, devices and electrical sensors using the recommended torque:

MCB – 16 Nm

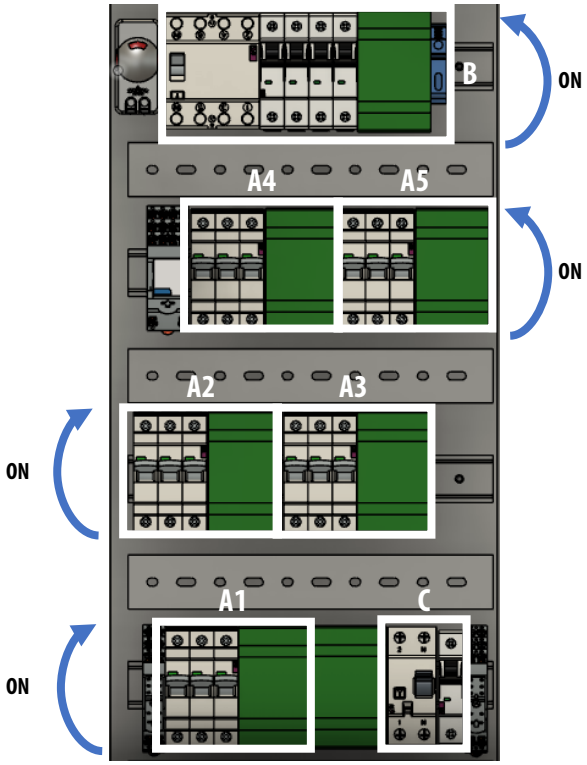
Carlo Gavazzi energy meter EM 340 – 2.8 Nm

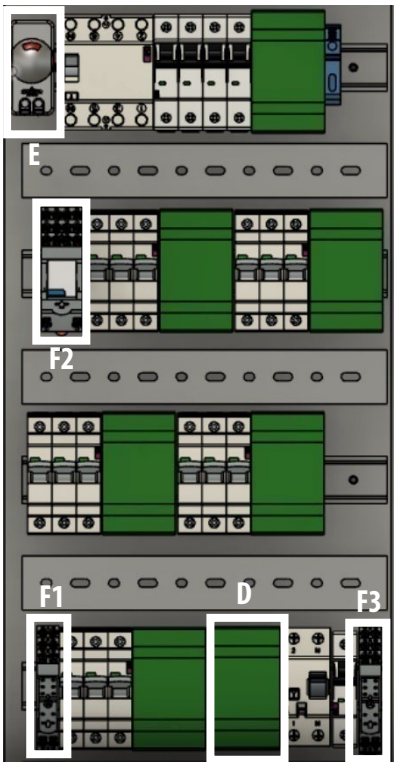
Thermostat – 1 Nm



STEP 4

- Place the RCBO in the ON position
- Position all differentials and circuit breakers to the ON position





NOTE:

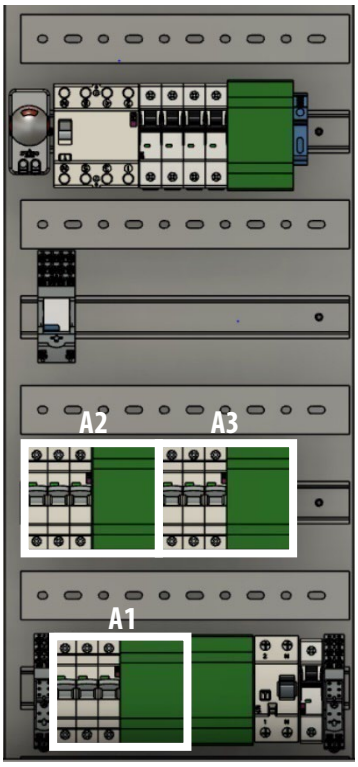
AX - Circuit breaker and energy meter for power modules on the AC side.
B - Differential, circuit breaker and energy meter from AC outlet.
C - Differential and control circuit breaker.
D - AC power meter with current transformers.
E - Thermostat.
FX - Signal relays.

STEP 5

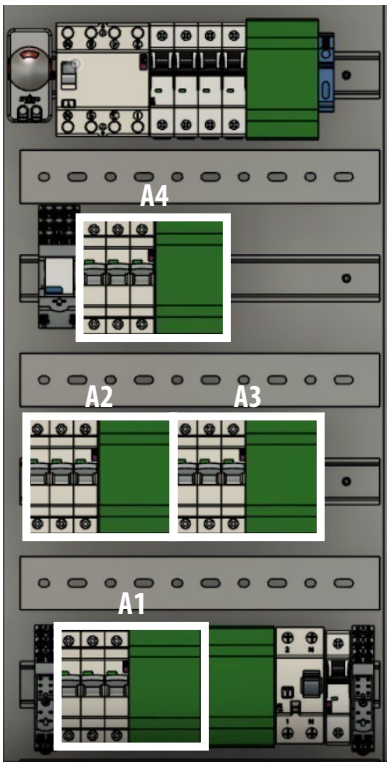
Depending on the version of the CHARGING STATION the number of circuit breakers and energy meters varies.

BE-M Series – 60

BE-M Series – 90

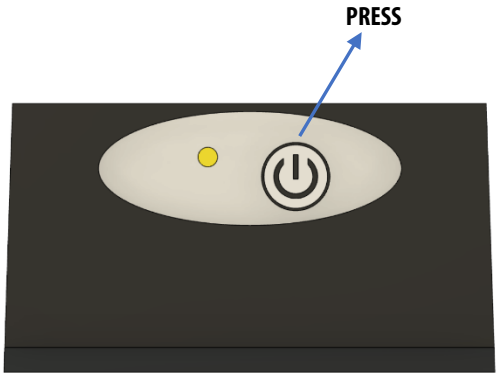


BE-M Series – 120

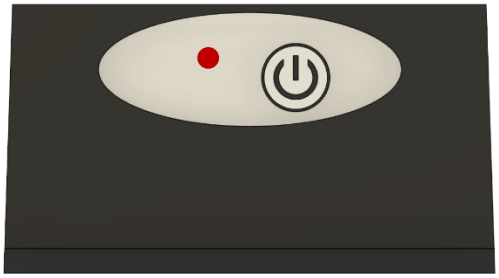


STEP 6

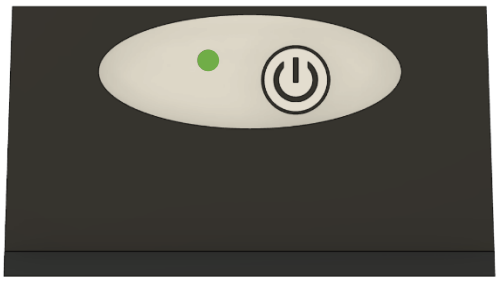
1. Locate the UPS present at the bottom of the CHARGING STATION.
2. Press the UPS button to the ON position.



3. After pressing the ON button, if the equipment is still not connected to the mains, the signal RED by the UPS will appear due to mains fault.

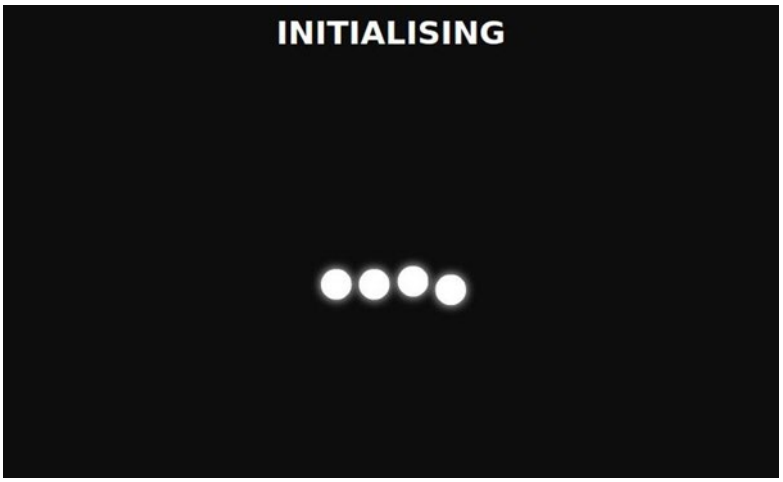


4. When the equipment is connected to the mains and the protections are in the ON position, the GREEN UPS light should appear.



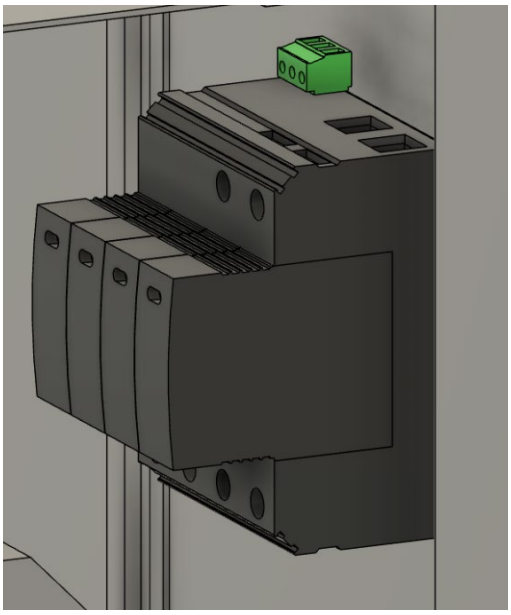
STEP 7

Close all equipment doors and wait for the interface to complete all initialization processes.



STEP 8 - Surge Controller (if applicable)

A surge protective device is designed to protect electrical systems and equipment from surge and transient events by limiting transient voltages and diverting surge currents. It is a device that utilize high-capacity varistors to provide high-quality protection. For safety and critical operations is mandatory to use a surge controller.



10. Commissioning

Commissioning is the last phase necessary to get the BE-M Series CHARGING STATION up and running.

- The objective is to check the CHARGING STATION is functioning for its operational purpose.
- During commissioning, the safety and functioning of the CHARGING STATION will be tested.

Before the technician can start commissioning, the following requirements must be fulfilled:

- All civil works must be completed.
- All electrical installations must be completed.
- All network installations must be completed.
- Energy must be available at the time of commissioning.
- An on-site technician must be present to switch on and off.
- A CCS/CHAdeMO/AC compliant car must be available.

Early warning:

- It is not allowed to move BE-M Series CHARGING STATIONs after commissioning.
- Provide the end user contact information.

Warranty

SCAME PARRE S.p.a. warrants that, during a period defined in the Warranty Certificate, the BE-M Series CHARGING STATION are free of manufacturing defects.

The warranty period begins on the installation date. This requires filling out the Warranty Registration and return it to SCAME PARRE S.p.a., within thirty (30) days from the date of purchase, or date of delivery (invoice date) (in case the customer or third party install the products).

Please note this warranty only covers the initial purchaser and DOES NOT cover accessories and hoses. Ask about our extended warranty program.

Validity

The warranty is valid only when:

- The Product is purchased from SCAME PARRE S.p.a., or from its authorized dealers or distributors.
- The Product is NOT transferred to any third party either in ownership or during the period of contract.
- The Product is not repaired, or service is provided by any party other than one appointed by SCAME PARRE S.p.a..
- The Product is installed by an entity appointed by SCAME PARRE S.p.a..
- The model and serial label should not be defaced or removed from the Product.

Exclusions

The warranty is not applicable to:

- Damage or loss caused by modification, alteration, repair by any unauthorized party.
- Damage or loss caused by mishandling of the customer or authorized person(s).
- Normal wear and tear.
- Damage or loss caused by disasters or any other cause beyond of SCAME PARRE S.p.a. control.
- Damage or loss as a result of external bodies.
- Damage or loss caused by another device that is connected to the Product.
- Damage resulting from accidents, misuse, abuse, tampering or failure of the customer to follow normal operating procedures outlined in the user manual.
- General Maintenance and servicing.
- Routine maintenance required is neglected and damages or problems are directly related to such neglect. It is the user responsibility to keep equipment in proper condition.

Procedure

In case a complaint is presented regarding a Product delivered, SCAME PARRE S.p.a. will, after due analysis, decide to repair or replace the Product.

To honour the warranty the following must be followed:

- A complaint shall be sent to SCAME PARRE S.p.a. together with this Warranty Certificate, date of purchase or installation (if done by SCAME PARRE S.p.a.), and purchase invoice. The complaint shall indicate the type of defect detected.
- The decision to cover the complaint by this warranty is taken by SCAME PARRE S.p.a. personnel, when necessary, after a technical inspection to the Products.
- If the complaint is accepted by SCAME PARRE S.p.a., the Product will be repaired and SCAME PARRE S.p.a. undertakes to bear the cost of the components resulting from repairs carried out by the its Technical Services or the by a company official service network partner under this guarantee, and it is incumbent upon the customer to bear all costs related to people working hours and travel expenses resulting from such repairs.
- In case that the system repair is not possible to be conducted on-site, the system must be returned to SCAME PARRE S.p.a. premises, being the transportation fees to return and after repair to deliver (at SCAME PARRE S.p.a.'s instruction) a customer responsibility.
- If your system or equipment needs repair, SCAME PARRE S.p.a. shall be informed and will send a repair plan. In case system needs to be returned to SCAME PARRE S.p.a. premises, a Return Authorization Number (RA) will be issued, together with all the necessary information. SCAME PARRE S.p.a. will not accept returns without a RA number.
- All returns must be properly packaged to prevent damage during transportation. The RA number must be clearly visible.
- The customer will be responsible for insurance and respective expenses of the product for damages or loss during transportation/shipment.
- In case the Product is not repairable SCAME PARRE S.p.a. will replace the Product and, in any event, will SCAME PARRE S.p.a. reimburse the amount paid or reduce the price of Product.

*****Certain parts of the equipment are not covered by the SCAME PARRE S.p.a. warranty due to the fact they require replacement after multiple use. For example, external connector and cables, buttons, hoses, seals, batteries, etc. These parts replacement will be at the owner's cost.**

Limitation of liability

SCAME PARRE S.p.a. and the manufacturer of the Product will not be held responsible for any damages or loss related to the purchase or the use of the Product, even if in case of defects. SCAME PARRE S.p.a. excludes its responsibility for all physical and moral damages related to the purchase and use of their products.

This warranty does not cover:

- Shipping costs for replacement parts.
- Shipping costs of defective machines.

Warranties are **NON-TRANSFERABLE POST SALE SERVICE**.

Technical Support

SCAME PARRE S.p.a. and all their main Distributors are equipped with an extremely knowledgeable and certified team of technicians who are available to assist you with any questions or needs that you have.

Glossary

Charging cable Type 1 (SAE J1772)	Also called "Yazaki", it is used in countries like Japan and USA, and composed by five pins: phase, neutral, earth, proximity pilot and control pilot.
Charging cable Type 2 (IEC 62196)	Three-phase up to 44 kW (63 A per phase) and composed by seven pins: three phases, neutral, earth, proximity pilot and control pilot.
Charging Mode 3 (IEC 61851-1)	Used in AC and EV charging stations with the same system. Its purpose is to improve the EV's charging safety, using a security system such as interlocking the plug into the socket after connection, energizing and cutting the voltage in the socket when not in use, communication of the current gauge, among other features.
Charging Mode 4 (IEC 61851-1)	Used in DC charging stations and in EVs with the same system, Mode 4 allows fast or super-fast charging, reaching charging powers above 50kWh. Indirect charging mode, through which current is supplied directly to the EV battery. In this case, the EV controls the charging process.
MID	European directive setting requirements for all equipment involving the sale or purchase of active power (EN50470-1, EN50470-3). Aims to harmonize standards related to energy meters billing of residential spaces, tertiary sector, and industrial lighting.
OCPP	Developed by OCA, this is an open protocol and available to all electric mobility's players. It allows bidirectional communication between EV's charging stations and central management systems, as well as control the charging processes, their access and ending.

Notes

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