BE-M Series

User and installation manual

CE

READ CAREFULLY BEFORE USING THE STATION

KEEP FOR FUTURE REFERENCE

SCAME

CONTENTS

ABBREVIATIONS/SYMBOLS

A	Ampere
AC	Alternating current
API	Application programming interface
CCS2	Combined charging system
EC	European Compliance
CHAdeMO	CHArge de Move (charge for moving)
DC	Direct current
EV	Electric vehicle
GPRS	General Packet Radio Service
GSM	Global system for mobile communications
Interface	Human-machine interface
Hz	Hertz
IEC	International Electrotechnical Commission
IK	Impact protection (K - Kinetics)
IP	Ingress protection
JSON	JavaScript Object Notation
kg	Kilograms
kW	Kilowatts
kWh	Kilowatt-hour
LED	Light-emitting diode
mA	Milliampere
MCB	Dedicated circuit breaker
MAIN	Main electrical panel
OCA	Open Charge Alliance
OCPP	Open Charge Point Protocol
RCBO	Residual Current Breaker with Over-current
RCCB	Residual-Current Circuit Breaker
RFID	Radio Frequency identification
THD	Total harmonic distortion
V	Volts
VAC	AC power supply voltage
Ω	Ohm

1. INTRODUCTION

1.1 PURPOSE OF THE MANUAL

The object of this user and installation manual is all the versions of the **BE-M** series electric vehicle charging station (see chapter 3).

The purpose of this manual is to provide:

- the user with all the information required for the safe use of the station and its maintenance in optimal operating conditions.
- the installer with all the information required to work safely during the installation and commissioning of the station.

1.2 MANUFACTURER IDENTIFICATION

The Manufacturer of the station covered by this manual is:

SCAME PARRE SPA
Via Costa Erta 15
24020 Parre BG - Italy
www.emobility-scame.com

1.3 LAYOUT OF THE MANUAL

This manual is divided into chapters that refer to different topics related to the various phases of the life cycle of the station that are of interest to the end user. Each chapter is divided into paragraphs, each of which deals with specific points of the overall topic to which the chapter refers.

1.4 LIABILITY AND WARRANTY

- The manufacturer's warranty included in the Italia Consumer Code (Articles 128 et seq.) applies to the station and covers the reimbursement, repair or replacement necessary to remedy any manufacturing defects that may occur during standard use for a period of 24 months from the date that the station is delivered.
- Any modifications to the station, or installations and start-ups not compliant with the instructions reported in this manual shall result in the nullification of the warranty and the invalidation of the product certificates.
- The full or partial reproduction of this manual is prohibited without the permission of the Manufacturer.
- The Manufacturer reserves the right to make changes or improvements to the station and documentation without prior notice.

1.5 SUPPORT

For more information on the station and its applications, consult the documentation provided on the website by the Manufacturer by scanning the QR code or visiting the website: e-mobility.scame.com/download.

Please use the contact details below if you need support from the Manufacturer:

InfoTECH

ITALY	WORLDWIDE
Numero Verde 800-018009	ScameOnLine www.scame.com www.emobility-scame.com

2. SAFETY

WARNING

The Manufacturer is not liable for any damage to persons or property if the conditions described in this manual are not respected.

2.1 GENERAL INFORMATION

- This manual contains warnings and instructions that must be followed for the installation, use and maintenance of the charging station and must be available for consultation by authorised personnel.
- The installation and commissioning of the station, as well as maintenance work, must be carried out by qualified and specifically authorised personnel, in compliance with safety standards, regulations and legislation in force.
- The station manufacturer is not responsible for any damage to persons, animals and/or property resulting from failure to comply with the instructions contained in this manual.
- In order to ensure continuous improvement, we reserve the right to make changes to the product and this manual at any time.
- The full or partial reproduction of this manual is prohibited without the prior consent of Scame Parre S.p.A.

DANGER

Risk of electric shock, explosion or electric arc.

- Before performing any operation on the charging station, disconnect the power supply and use appropriate tools to check that the power supply is disconnected from all parts.
- Before putting the station into operation, check that the metal structure is connected to the ground through the green-yellow wire and protect the power line with an automatic safety device and a residual-current device coordinated with the earthing system.
- Before connecting the vehicle, make sure the station is anchored.
- The power cables, sockets and plugs used to connect the vehicle must comply with the safety requirements of current legislation.

Failure to follow safety precautions can result in serious injury and even death.

WARNING

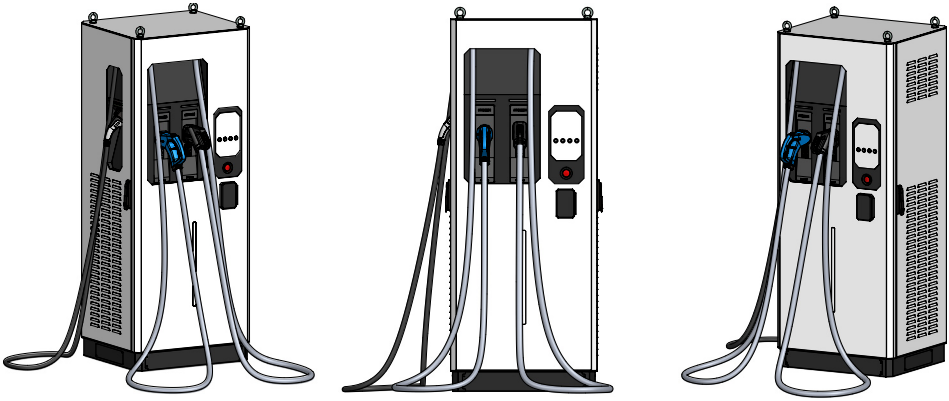
Risk of damage to the station.

- Do not touch printed circuit boards and use appropriate tools when accessing components/parts subject to electrostatic discharge.
- If the station is damaged, it must not be installed or used.
- Use a damp cloth or a neutral detergent safe for use with plastic for cleaning.

WARNING

avoid immersing the station components in liquid. If the connectors are immersed, do not attempt to recharge them and contact customer support

3. ABOUT THE BE-M SERIES



- The EV charging stations of the BE-M Series produced by Scame meet the following classification requirements of the IEC/EN 61851-1 standard:

1. Features of the mains power supply input: EV mains power supply equipment connected to the AC mains power supply network.
2. Electrical connection method: Permanently connected.
3. Features of the power supply output: Direct current (CCS2 and/or CHAdeMO) and/or Alternating Current (Type 2) EV power supply equipment.
4. Standard environmental conditions: Outdoor use.
5. Operation from -25 C to +40 C
6. Access condition: equipment for places with unrestricted access.
7. Assembly method: fixed equipment, floor assembly.
8. Protection against electric shock: Class I equipment.
9. Charging mode: Modes 3 and 4.

- The EV charging stations of the BE-M Series produced by Scame meet the following classification requirements of the IEC/EN 61851-23 standard:

1. System structure: insulated direct current EV charging station - reinforced insulation.
2. System control: regulated DC EV Charging Station - controlled current charging and controlled voltage charging.
3. System used: System A and/or System C.
4. Output voltage: over 60 V, up to and including 1500 V.

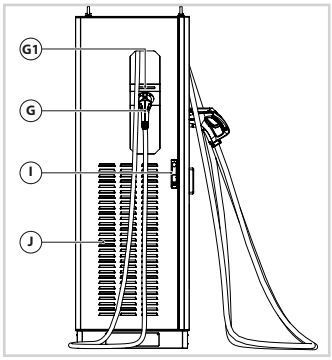
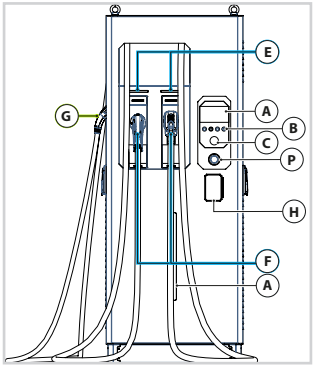
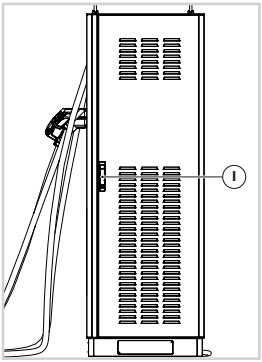
- The BE-M Series EV charging stations produced by Scame use dedicated connectors according to IEC/EN 62196-1 and 3 standards

3.1 COMPLIANCE

The BE-M series complies with:

- IEC 61851 Series - Conductive charging systems for electric vehicles (IEC 61851-1, IEC 61851-21-2, IEC 61851-23, IEC 61851-24).
- IEC 61439-7 - Assembled low-voltage switchgear and controlgear assemblies (LV panels, Part 7).
- IEC 62196 Series - Plugs, socket-outlets, vehicle mobile and fixed connectors, conductive charging of electric vehicles (IEC 62196-1, IEC 62196-2, IEC 62196-3).
- CHAdeMO 0.9, 1.0, 1.2.
- CCS2, DIN SPEC 70121.
- RFID, ISO 14443 A/B

3.2 FEATURES

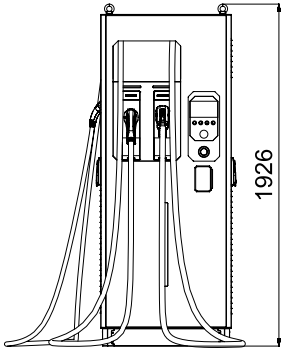
LEFT	FRONT	RIGHT
		
J Air Inlets	**P** Manual stop button	**I** Door lock
G AC output	**A** Display	
G1 AC output LED	**B** Buttons	
	C RFID Reader	
	And DC output status LED	
	F DC output	
	A Led indicator strip	
	H POS payment terminal	

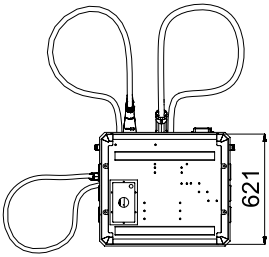
NOTE

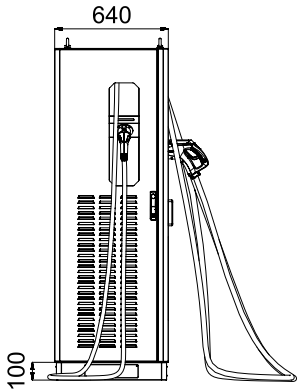
The figures shown above may differ from the equipment purchased depending on the model and options chosen.

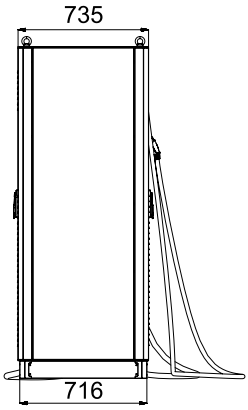
3.3 OVERALL DIMENSIONS

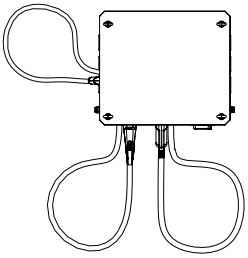
W x H x D	735 x 1866 x 640 mm
Weight	300 - 430 kg (varies based on maximum power)

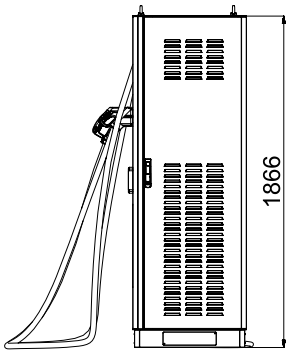




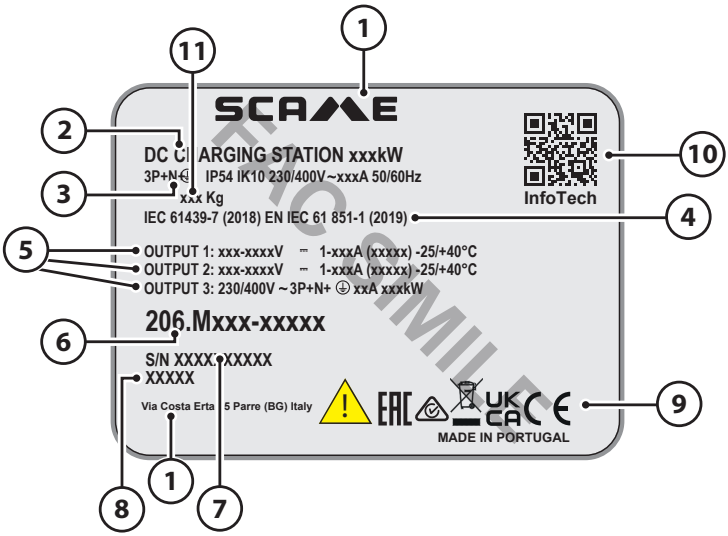








3.3.1 LABEL



1. Manufacturer Data
2. Station description
3. Input technical data
4. Regulatory reference
5. Output technical data
6. Station code
7. Serial number
8. Production date
9. Markings
10. QR Code
11. Weight

3.4 SPECIFICATIONS

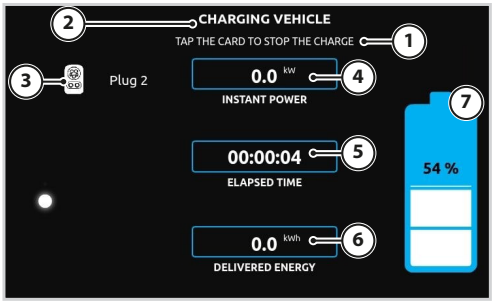
Max. POWER kW (No. of modules)	60 (2)	90 (3)	120 (4)	150 (5)
INPUT POWER				
Rated voltage	230/400 V AC ± 10%, 3P+N+PE, 50/60 Hz			
AC Current (DC) (DC+AC)	92A 125A	138A 171A	184A 217A	230A 263A
Power factor	0.99 nominal output			
THD	< 5%			
Efficiency	94% at rated output power			
OUTPUT POWER				
CCS2 DC voltage range	150-1000 V DC			
CHAdeMO DC voltage range	150-500 V DC			
CCS2 maximum DC current	150A	225A	300A	300A
CHAdeMO maximum DC current	125A			
DC power	60kW	90kW	90kW	105kW
DC Voltage Ripple + Noise	500 mVp-p			
DC current ripple (typical)	<1 Arm at rated power (measured with resistive load)			
AC Voltage	400 V (as input voltage)			
AC current	Three-phase 32 A max			
AC supply	22 kW max			
USER INTERFACE AND SYSTEM CONTROL				
DC Output Connector Types	Options: CCS2, CHAdeMO			
AC Output Connector Types	Optional: IEC62196-2 22kW Type 2 Cable			
HMI interface	7-inch graphic LCD (800x480), control buttons			
Supported languages	Change to "Multi language (max 4 languages)			
Manual stop button	1 manual stop button			
Charging options	One Session | One DC + AC Simultaneous Charge | DC + DC + AC, 3 Simultaneous			
User authentication	Mifare ISO / IEC 14443 A / B RFID reader Optional: payment terminal			
Network interface	Ethernet, GSM/3G/4G			
Communication protocol	OCPP 1.6 JSON upgradeable, others on request			
Protection	Overcurrent, under/overvoltage, short circuit, earth leakage, overheating, door open			

MECHANICAL AND ENVIRONMENTAL SPECIFICATIONS	
Operating temperature	operation at -25°C to +40°C
Humidity	5% to 90% relative humidity, non-condensing
Altitude	< 2,000 m
Protection rating	IP54 / IK10 according to IEC 62262
Cooling	Forced air
Charging cable length	4.5 m (standard) - max 7.5 m (optional)
Decorative panel	Optional (not included in basic configuration)
Dimensions (WxDxH)	735 x 640 x 1866 mm
Weight (depends on configuration)	approx. 330-430 kg

3.5 GRAPHIC INTERFACE

The main purpose of the graphic interface is to indicate the status of the charging process, i.e. the charging speed, time elapsed and energy consumed (kWh) among other features, it can also display images and/or advertising.

Description of the contents displayed on the graphic interface of the BE-M series



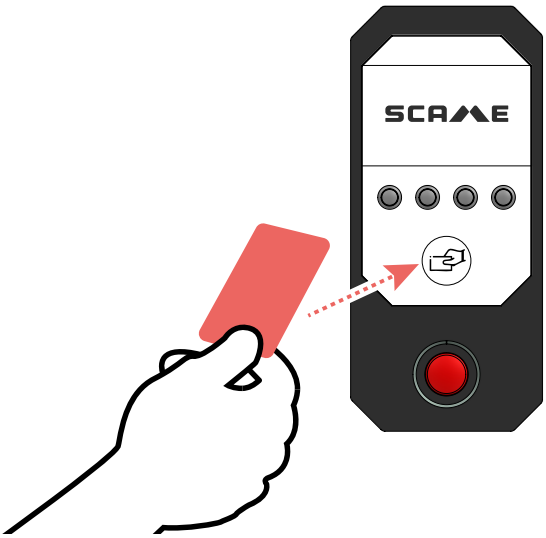
1. Action to be taken
2. Status
3. Connector
4. Charging power (kW)
5. Time elapsed (min:sec)
6. Power output (kWh)
7. Battery percentage

3.6 RFID READER

The BE-M Series charging station is equipped with a function to authorise charging via a pre-enabled RFID device (card, key fob, or other form factor).

Note that scanning the RFID device authorises the user for a maximum time interval of 30 seconds, after which it is necessary to proceed with further authorisation.

The figure below indicates the position of the RFID reader for scanning the RFID device.



3.7 AUTHORISATION VIA OCPP CENTRAL STATION

The station can be configured to be monitored and controlled by a central station via the OCPP 1.6JSON protocol.

In this case, all the typical uses of charging platforms are supported, such as billing, charging point reservation and remote identification through a mobile application.

Note that the registration of authorised users must be carried out on the management platform. Detailed instructions on how to carry out this authorisation must be requested from the administrators of this internet service.

Connecting the stations to a third party central station may require a contract to be signed with the electric mobility service provider and the application of annual subscription fees.

Connect to the system via WEB-UI to configure the station via OCPP control unit.

3.8 AUTHORISATION VIA POS CENTRAL STATION

The BE-M Series charging station can be equipped with a POS payment terminal for the acceptance of payments by credit, debit and prepaid card and to enable the start of electric charging.

3.9 MANUAL STOP BUTTON

Follow the instructions in the figures below if you need to activate the stop button due to a fault/malfunction. This immediately stops the charging process.

the graphic interface will highlight the lock status of the charging station.

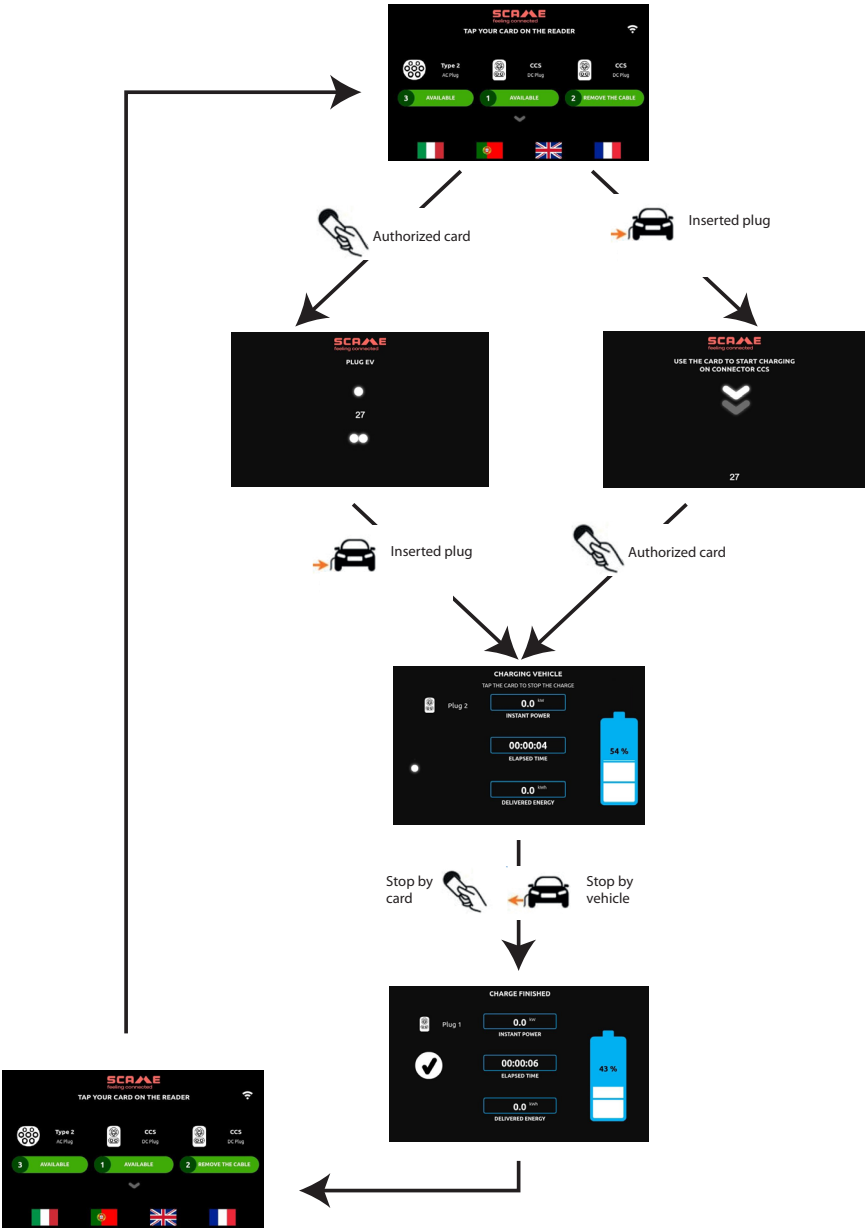
4. USING THE CHARGING STATION

4.1 STATUS LED INDICATORS

LED	COLOUR	DESCRIPTION
	-	Off
	Green	Ready
	Flashing green	Cable connected and EV detection (fast flashing) or charging process complete (slow flashing)
	Blue	Charging in progress
	Flashing blue	Suspended
	Red	Not available
	Yellow	Connector reserved

4.2 CHARGING PROCESS

With local permission. Alternatively authorisation can also be completed via OCPP



5. TROUBLESHOOTING

LED INDICATORS		
ERROR	**POSSIBLE CAUSE**	**REMEDY**
	No power supply	Check if MCB, in the main electrical panel, is on
		Check if MCBs in the charging station are switched on
		Check presence of 12 V AC aux from wiring diagram
		Check if the station is powered correctly
	Faulty LED	Contact Technical Support
	EV charging process completed	Check the battery charge status of the electric vehicle
	The charging cable was correctly connected to the vehicle, but the user did not authorise charging via RFID device	Remove the connector from the EV and restart the procedure
	EV charging process paused	Check if the vehicle is in battery vent mode. In this case, wait until the ventilation has finished. Charging will resume shortly afterwards*
	The user has paused the charging process	End the session, remove the connector from the electric vehicle and restart the charging process
	Defect	Turn the charging station switch off and on again (in the main and internal electrical panels) and wait for the LED-S to turn green. Repeat the charging process. If the error persists, contact technical support
	The charging cable is incorrectly connected	Disconnect the charging cable (on the EV side) and reconnect it
	Faulty charging station	Contact Technical Support
	Connector is not inserted correctly	Disconnect the charging cable (on the EV side) and reconnect it
	Charging process not successful	Follow the instructions in the section dedicated to the charging process
	RFID card reading time out	Disconnect the connector, reconnect it and place the RFID card near the reader
	The battery of the electric vehicle is fully charged	Check EV
	Scheduled charging of electric vehicles	Check if the electric vehicle has a scheduled start for charging
	Faulty charging cable	Check that the charging cable is not damaged. If damaged, contact technical support
	Failure to close the access doors to the components	Check that the charging station is closed correctly

LED INDICATORS		
ERROR	**POSSIBLE CAUSE**	**REMEDY**
The connector does not disconnect from the power socket	Charging process not completed	Check if the charging station has a flashing green LED-S1/LED-S2/ LED-S3 (see 4.1. LED status indicators)
	RFID card not used	Place the RFID card near the RFID reader to complete the charging process and disconnect the connector (see 4.2.). Charging process)
Message - temporarily unavailable	No power	Check that the protections, in the charging station and main electrical panel, are activated
		Check if the station is powered correctly
		Errors may occur when communicating with energy meters
		There may be delayed phase voltages
		There may be a communication error with the charging controller boards
		Contact Technical Support
Charging station with no internet connection	Charging station offline	Turn the Charging Station switch off and on again (in the main and internal electrical panels) and wait for the LED-S to turn green. Repeat the charging process. If the error persists, contact technical support

RFID CARD		
ERROR	**POSSIBLE CAUSE**	**REMEDY**
Invalid RFID card	The RFID card is not programmed to access the Charging Station	Contact the charging station operator
	Damaged RFID card	Contact technical support to replace the card
RFID card not detected	Incorrect positioning of the RFID card	Place the RFID card near the reader in different ways
	Defect	Contact Technical Support

6. INSTALLATION SITE

Before installing the Charging Station, check the position of the vehicle in the parking lot, so that the charging cable can reach the charging point/socket.

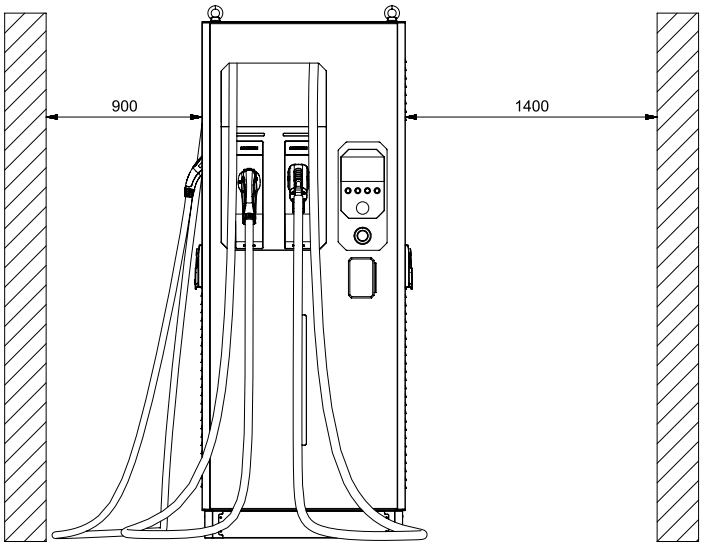
The installation site of the BE-M Series Charging Station must meet the following characteristics:

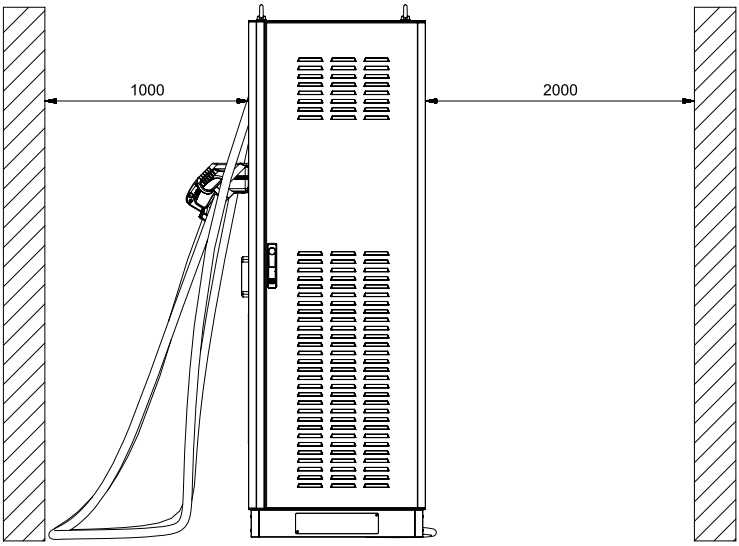
- The equipment must not be at an altitude higher than 2,000 m above sea level.
- The equipment must NOT be immersed in water or any other liquid.
- The operating temperature must be between -25ºC and 40ºC.

Installation of the BE-M Series Charging Station requires the following construction work:

- Three phase + neutral + protective earth connections.
- Solid foundations.
- Sheaths for electrical cables, between main electrical panel and the BE-M Series (usually these sheaths are installed below ground level).
- Parking space for electric vehicles.

The Charging Station must be positioned so that different EVs can access the equipment, as indicated in 6.1 Examples of Charging Station Layouts, and there must be a free space around the equipment, with the minimum dimensions indicated below





NOTE

The installation of barriers/poles between the BE-M Series and the parking lot is recommended to protect the charging station from collisions.

NOTE

If the charging station is likely to be exposed to direct sunlight and high ambient temperatures for most of the day, it is advisable to install protection from direct sunlight.

NOTE

Consider the following recommendations to prevent acts of vandalism and/or theft:

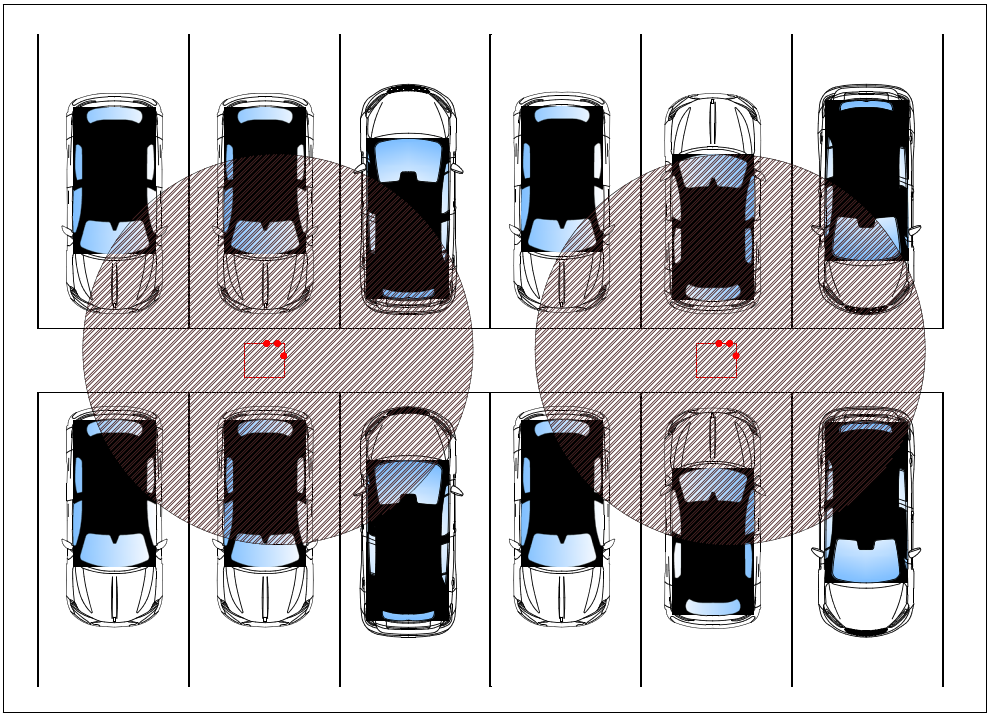
Installation of the charging station in a place where it can be clearly monitored.

Use of security check (24 hours a day).

Installation of sufficient lighting around the charging station.

6.1 EXAMPLES OF CHARGING STATION LAYOUTS

The different layout possibilities of the charging station are shown below.



7. CONTENTS OF THE PACKAGING

- Packaging
- Pallet
- Keys
- RFID cards
- Wiring diagram
- Safety instruction sheet

NOTE

Whenever possible, the BE-M Series Charging Station should be unloaded at the place of installation and operation. If it is unloaded in a temporary place for storage, do not remove the packaging and store it, respecting the following minimum requirements:

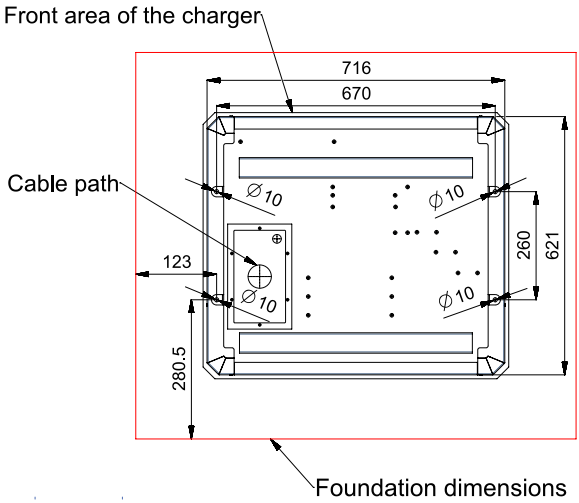
- **Safety - the BE-M series charging station must be protected from adverse elements such as heat radiation, direct sunlight, mechanical damage, contact with organic solvents, etc.**
- **Temperature - for temperatures below -25°C and above +50°C, special attention should be paid to storage and handling.**
- **Environment - the BE-M Series Charging Station must be stored in a dry and dust-free place. The distance from any heat sources must be at least one metre. Avoid storing the station outdoors.**

8. INSTALLATION

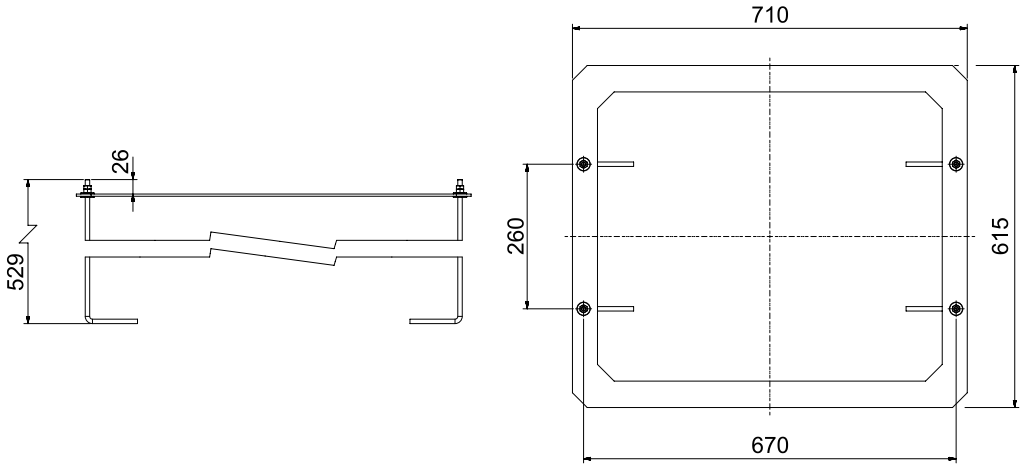
8.1 FOUNDATION

In the case of reinforced concrete foundations, the concrete application and curing times must be observed in accordance with the applicable regulations. Consequently, the concrete must be chosen and prepared with care to avoid contamination by other types of soil.

The following figure indicates the base dimensions of the BE-M Series Charging Station, which must be considered when constructing the concrete foundation.



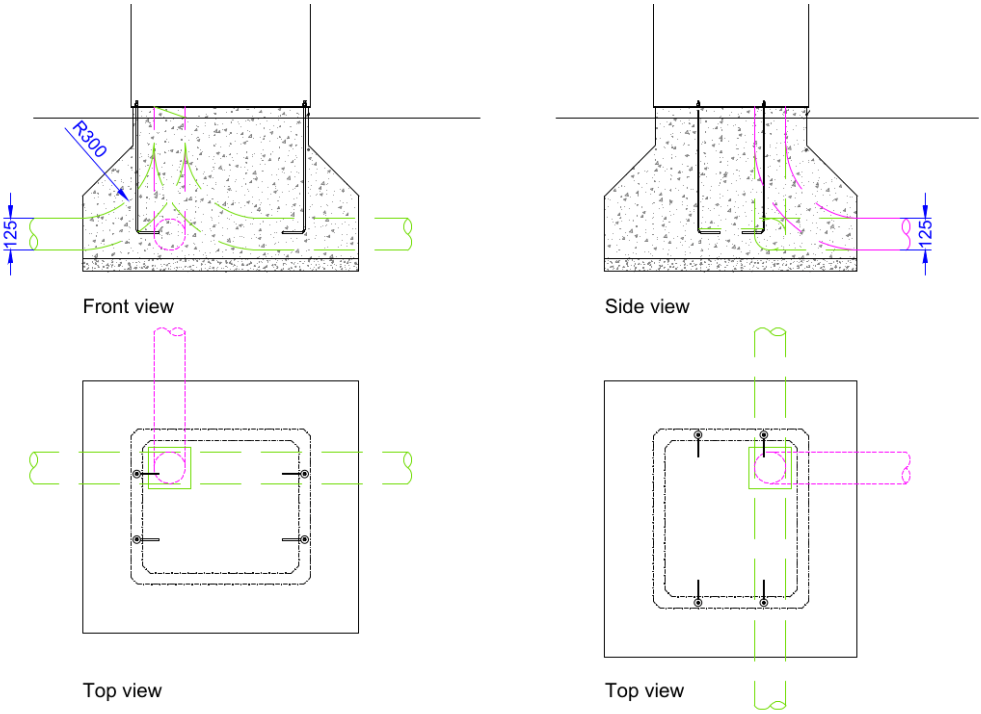
The following figure indicates the base dimensions of the BE-M Series charging station and 208.AP84 cramp irons fastener kit.



8.2 ELECTRICAL PREPARATION

The following structural works are required for the installation of the BE-M Series charging station.

- The depth at which the pipes are buried must comply with local technical regulations for low voltage electrical systems, therefore the cables must be buried in the standard ground at least 600 mm below the surface.
- This distance must be increased to at least 1000 mm in the crossings of vehicle access points and to a length of 500 mm on each side of these access points.
- When choosing the area in which to install the charging station, an area of 700 mm and 1000 mm (respectively) must be reserved for access all around the product, as indicated.



8.3 ELECTRICAL INSTALLATION

The following prerequisites must be verified for installation. Values outside these ranges can adversely affect the performance of the charging station:

- Three-phase power distribution system + PE
- Earthing system TT, TN(S), TN(C)
- Phase-to-phase voltage (L-L) 260 V AC ~ 530 V AC
- Phase to neutral voltage (L-N) 150V AC ~ 306V AC
- Neutral to ground voltage (N-PE) less than 5 V AC
- 50 or 60 Hz frequency (f), depending on the local grid code
- Earthing resistance less than 50 Ω
- Three-phase imbalance (difference between maximum and minimum voltages between phase and neutral) 10V or less

NOTE

The metal structure of the BE-M Series Charging Station must be connected to an earthing circuit.

WARNING

In the event of a fault where the earth conductor loses electrical continuity, a contact current > 3.5 mA AC RMS is possible.

8.3.1 GRID ADJUSTMENT

The BE-M series charging station can be connected directly to the electricity grid or to a customer's electricity distribution panel according to the instructions of the electrical system designer.

NOTE

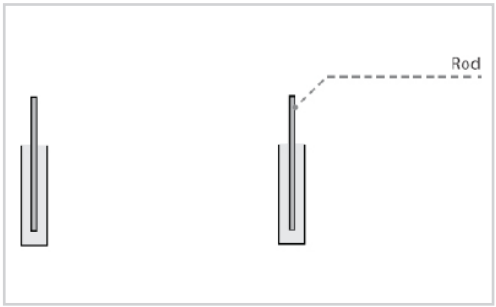
The power supply line must be designed with cable cross sections suitable for the load and have adequate protection installed upstream. If required by local regulations, a type B residual current device (RCD) or an equivalent protection device against direct differential currents must be used. A nominal differential current of 300 mA is recommended. The designer of the electrical system is the only person in charge of sizing the power line.

NOTE

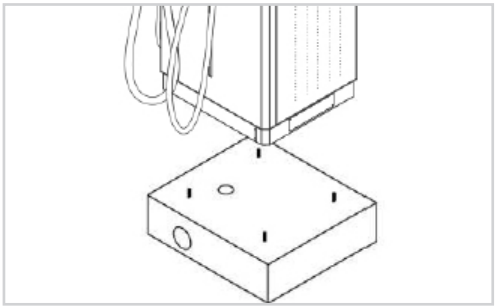
Please always keep in mind the distance between main electrical panel and the charging station. The wire gauge must be calculated with a maximum voltage drop of 3%.

8.4 INSTALLATION

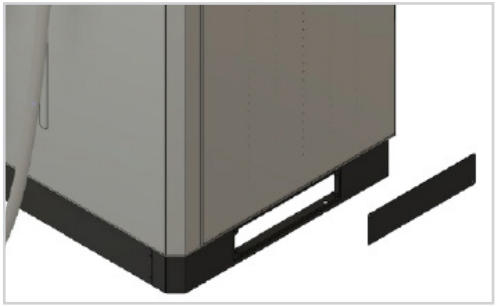
1. The 4 holes in the base must be opened to position the threaded rods (using metal bolts or a chemical hardener).
   The threaded rods (M10) must be 500 mm below the foundation.



2. Place the charging station on the base.

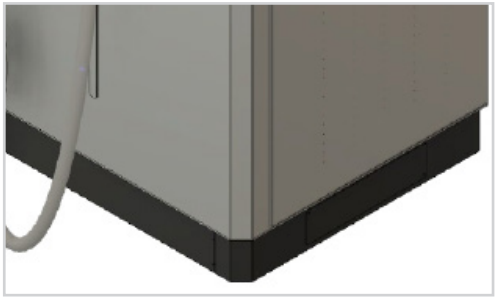


3. Remove the right and left metal grids.



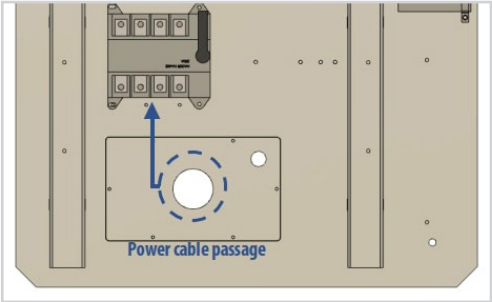
4. Apply the nuts and tighten them.

5. Put the grids back in place.

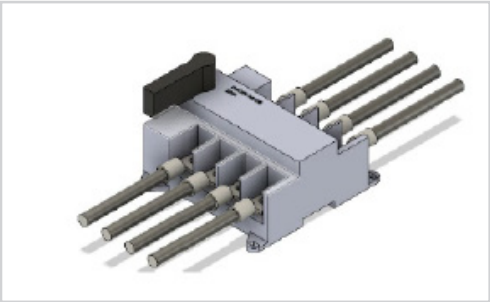


8.4.1 CONNECTION OF POWER CABLES (60KW)

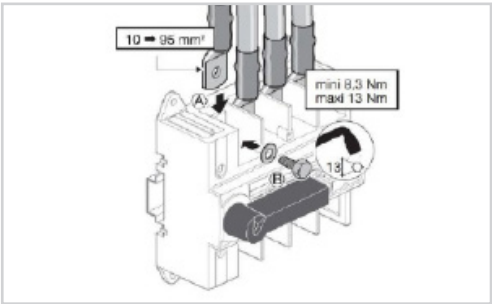
1. Open the door of the charging station.



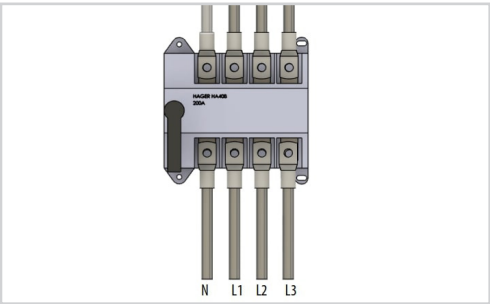
2. Pass the power cables through the holes in the foundations and base of the charging station.
3. Connect the power cables to the electrical protection, as shown below:



4. Apply the RCBO manufacturer's recommended torque to the clamps.

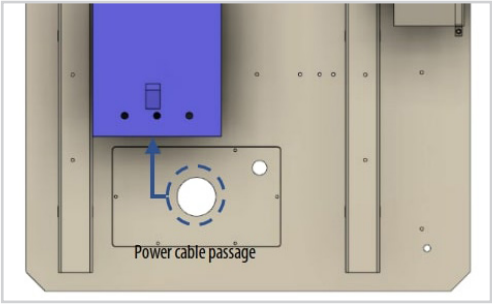


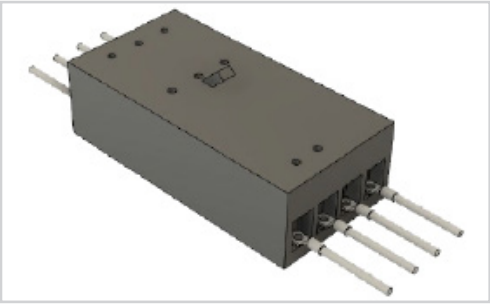
5. Connect the phase and neutral conductors in the following order:



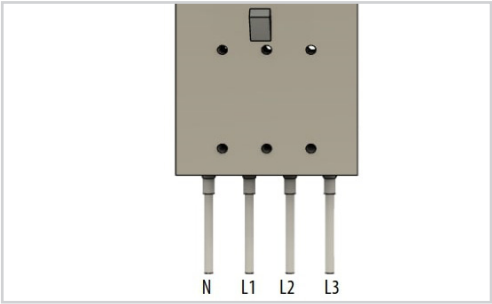
8.4.2 CONNECTION OF POWER CABLES (FROM 90 TO 150KW)

1. Open the door of the charging station.
2. Pass the power cables through the holes in the foundations and base of the charging station.
3. Connect the power cables to the electrical protection, as shown below:





4. Apply the RCBO manufacturer's recommended torque to the clamps.



9. CLEANING AND MAINTENANCE

9.1 CLEANING

Use a damp cloth or a neutral detergent safe for use with plastic for cleaning the station.

After charging the vehicle, take care to store the connector in the appropriate support to prevent external agents from depositing on the charging socket.

9.2 MAINTENANCE

WARNING

The charging station is an electrical panel to all extents. Maintenance shall be carried out by qualified and authorised personnel only.

All components of the equipment (i.e. connector and charging cable, buttons, LEDs) and inside the station must be checked for damage, defects or faults every six months (visual inspection).

- To ensure proper maintenance of the charging station, follow the instructions below:
- Always keep the outside of the equipment clean.
- Use a soft, damp cloth for cleaning. For stubborn dirt, use a mild, solvent-free, non-abrasive cleaner.
- Always store the connectors in their respective holders.
- If the equipment is damaged, contact the equipment supplier.
- Replace the ventilation filters regularly (authorised personnel).

NOTE

Before opening the front door of the charging station, turn off the power from the main switch to avoid the risk of electric shock or injury.

Do not remove or bypass the envisaged protection devices.

10. DISPOSAL

"Implementation of Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE)", relating to the reduction of the use of hazardous substances in electrical and electronic stations, as well as waste disposal".

The crossed-out wheelie bin symbol on the station or its packaging indicates that the product must be disposed of separately from other waste at the end of its life.

The user must then dispose of discarded stations at appropriate separate collection centres for electrical and electronic waste.

For more details, please contact your local authority.

Proper separate collection of the stations for subsequent recycling, treatment or environmentally sound disposal helps to prevent harm to the environment and human health and promotes reuse and/or recycling of the station materials.

NOTE

The improper disposal of the station or its parts by the user will result in the application of administrative penalties provided for by the laws in force in the country where the station is disposed of.

SCAME

InfoTECH

ITALY

Numero Verde

800-018009

WORLDWIDE

ScameOnLine

www.scame.com

www.emobility-scame.com

SCAME PARRE S.p.A.
Via Costa Erta 15
24020 Parre (BG) - Italy
TEL. +39 035 705000
emobility-scame.com

ZP91211-GB-4