Caro Series Wallbox EV Charger

User Manual

AC7000-AE-35 ▌ AC011K-AE-35

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About this manual

Thank you for choosing our Caro series charger.

This manual is provided as a guide to installation and operation and is specifically applicable to the Caro Intelligent EV charger. Failure to install and operate the Caro in accordance with these instructions may damage the unit and invalidate the manufacturer's warranty.

Unauthorized modification of the Caro Product voids the manufacturer's warranty.

The guide is for reference only and does not constitute a warranty of any kind. The actual product (including but not limited to color, size, and functions) may vary. If this guide is inconsistent with the description on the official website, the latter prevails.

Some functions may be subject to change, according to the charger's latest software updates.

General symbols and signal words used in the document

With signal word 'Danger':

If you do not obey the instruction, this can cause death.

With signal word 'Warning':

If you do not obey the instruction, this can cause injury.

With signal word 'Caution':

If you do not obey the instruction, this can cause damage to the EVSE or to property.

With signal word 'Note':

A note gives more data or give some tips, to make it easier to do the steps.

1. Safety Instruction

- Do not install or use the product in or near areas with flammable, explosive, chemical materials, or steam.
- Before installing or cleaning the product, switch off the upstream residual current operated circuit-breakers with integral over current protection (RCBO) of it.
- Do not use or replace the product in extreme weather conditions.
- Do not remove the safety marks, warning signs, nameplates, or cabling marks from the product.
- Do not spray water or any liquids on the product.
- Keep children and pets away from the product.
- Do not disassemble, repair, or modify the product on your own; instead, contact a certified or qualified professional.
- When installing the product, install the ground cable first. When uninstalling the product, remove the ground cable last. Do not work on the product in the absence of a properly installed ground cable.
- Do not install or remove power cables with the power on. Before switching on the upstream RCBO, ensure that cables are correctly connected to the charger.
- Use cables that comply with local regulations and ensure that the insulation layer is intact.
- Do not fold or crush any component of the product, or damage it with sharp objects.
- Do not use the product if it is defective, cracked, damaged, or malfunctioned.
- A generator cannot serve as the power supply for the product.
- Do not connect the product to devices other than a vehicle.
- Cord extension sets are not allowed to be used.
- Do not insert your fingers or sharp objects into an components of the product.
- Radio waves generated by the product may affect normal operation of implanted medical appliances or personal medical appliances, such as the pacemakers, cochlear implants, and hearing aids. Consult the manufacturer of your medical equipment for more information.

- Ensure that the installation surface is solid enough to hold the charger. It is recommended that the wall have a bearing capacity of at least 100 kg.
- Ensure that the wall is flat and reserve sufficient space around the installation position to ensure good ventilation.
- Ensure that the wall is larger than the rear cover of the charger.
- When installing the product, use a screwdriver with a proper torque to tighten the screws.
- When routing power cables, ensure that there is no coiling or twisting.
- Do not join or weld power cables. If necessary, use a longer cable.
- Do not install or use the product in an environment with strong magnetic fields or near a wireless transmitter.
- Do not use third-party cables or adapters.
- Do not drop, squeeze, or pierce the product to avoid device faults.
- Before charging your electric or hybrid vehicle, turn off the car.

2. Packing List

Upon receipt of your shipment, kindly verify the contents against the packing list. Should any items be absent, please contact us.

Item	Icon	Quantity
M4*32 screw		6
Wall plug		6
Cable holster		1
L-shaped wrench		1
Dismounting tool		1
Seal cap		1
Wire ferrule		3 (single phase) 5 (three phases)
Cable clip		1
RFID card		2
M4*12 screw		2
6-PIN connector		1
M3*12 screw		2
Drilling template		1

3. Product Overview

The Caro Product specified in this document is design for the market to charge European Standard plug-in electric vehicles (PEVs), plug-in hybrid electric vehicles (PHEVs), and battery electric vehicles (BEVs). It provides EU standard Type 2 AC charger cable connector.

3.1 Product Features

- **Universal Type 2 cable lead.**
- **Power rating – Up to 7kW or 11kW models.**
- **Adjustable power rating: 7kW: 6~32A, 11kW: 6~16A.**
- **Intelligent Authentication:**
    1). Smart RFID/App Authentication.
- **Multiple charge modes**
    1). Plug to Charge
    2). General mode: start charging via RFID card, start charging via App
    3). Scheduled charging via App
    4). ECO Mode
    5). EMS compatible
- **Built-in LED charging status indicator.**
- **OCPP 1.6 compliant.**
- **CE and CB certified.**
- **Dynamic Load Balancing.**

  The Caro Serials charger has a Dynamic Load Balancing capability which is designed to prevent overloads of the property's power supply when electric vehicles are being charged.

  Once correctly installed and configured, the system will monitor the power being drawn by the charging process and will compare this to the permissible maximum for the property as a whole(need to be set). With this information, the power made available for charging can be dynamically adjusted to reduce the load before the property's maximum load is exceeded.

!

- *Load balancing* ONLY *controls power made available to the vehicle. It does not control power to other equipment(home applications), and it is still possible that other equipment cause overload the property's power supply. Please address the source of the equipment that actually caused the overloading.*
- *Depending on the manufacturer, electric vehicles need a minimum of around 6 Amps to charge. If the available power is below this level, the vehicle may stop the charge session.*
- *In order to monitor the total load, eManager with inbuilt meter is needed.*
- *The lower the power available for charging, the more slowly the vehicle will be charged.*

- **PV energy utilization**

  The Caro Series chargers can utilize photovoltaic generation and energy storage technologies to offer a clean, efficient, and reliable power supply for electric vehicles, thereby diminishing reliance on conventional power grids and fostering the adoption of green energy.

  Note: SAJ's H2+B2/HS2/AS2/HS3 energy storage system and eManager is required.

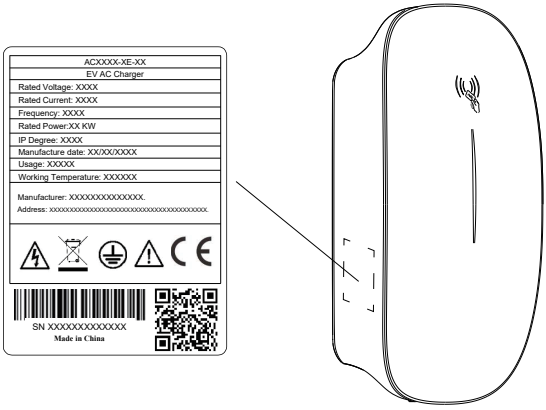
  PV energy refers to the electricity produced by solar panels that transform sunlight into a usable power source for homes and businesses.

- **Energy management system (EMS) integration - SAJ eManager**

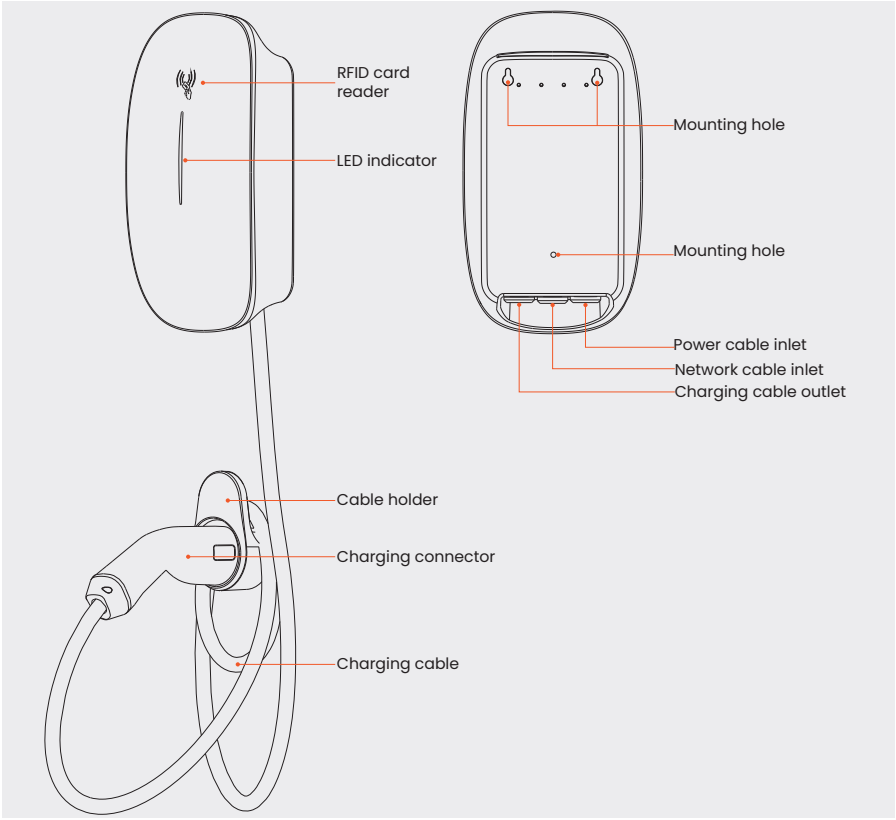
  The Caro Series chargers are designed with dedicated ports to ensure seamless integration with various EMS systems, providing flexible energy management solutions.

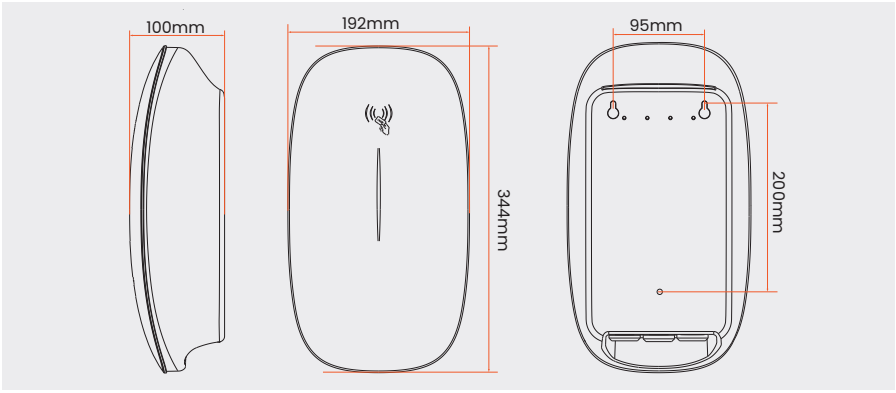
  The Energy Management System (EMS) is like an intelligent butler that monitors your energy usage, automatically adjusts the operation of devices, and uses energy in the most economical and efficient way, while ensuring safety and reducing waste, helping you save money and protect the environment.

3.2 Labelling



4. Exterior Overview





5. Technical Specification

Model		AC7000-AE-35	AC011K-AE-35
Electrical Specification	Rated power	7kW	11kW
	Power supply	1P+N+PE	3P+N+PE
	Rated voltage	230V AC	400V AC
	Rated current	32A	16A
	Frequency	50/60Hz	
Basic Attributes	Charge connector	Type 2	
	Cable length	7m	
	Enclosure	PC	
	Installation	Wall-mount/Pole-mount (optional)	
Interactive interface	LED indicator	Green/Yellow/Red	
	RFID reader	Mifare ISO/IEC14443 A	
	Start mode	Plug to charge / App /RFID card	
Communication	OCPP	OCPP1.6 Json	
	RS485	Support	
Safety	RCD	30mA Type A + 6mA DC	
	Ingress protection	IP65 (cable)	
	Impact protection	IK08	
	Electrical protection	Over current protection, Residual current protection, Surge protection, Over/Under voltage protection, Over/Under frequency protection, Over temperature protection	
	Certification	CE/CB/RoHs	
	Certification standard	EN IEC 61851-1:2019 IEC61851-1:2017 IEC61851-21-2:2021	
	Warranty	Three years	
Working environment	Working temperature	-30 ℃ to 50 ℃	
	Working humidity	5% to 90%	
	Working altitude	＜ 2000m	

6. Installation

Before the installation, ensure that:

- The charger power is within the allowed load range of the place.
- Cables and RCBOs meet the installation and usage requirements.
- If the AC input power cable exposed to the outdoor environment is 3m or longer, consult the local installer. You are advised to install a surge protective device (SPD) at the upstream of the charger's RCBO.
- A network cable that is long enough is prepared if the charger is connected to a wired network.

6.1 Required Cable and Accessory

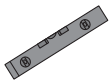
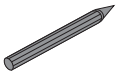
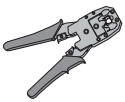
Before installation, you will need to prepare the following accessories and cables on your own:

> **!** To facilitate cabling, aluminum wires and solid copper wires are not recommended.
>
> RS485 cable are necessary solely for the implementation of its respective function.

Item	**Specification**
Power cable	Operating current: 32A: Cross section area: ≥6mm^2 Operating current: 16A: Cross section area: ≥2.5mm^2
RCBO	2P RCBO, C40, 40 A (50 A is recommended if the ambient temperature is higher than 45°C), Type A, in compliance with local regulations.
RS485 cable	22 to 24AWG shielded twisted pair

6.2 Required Tools

The tools are not included with the charger; they are commercially available.

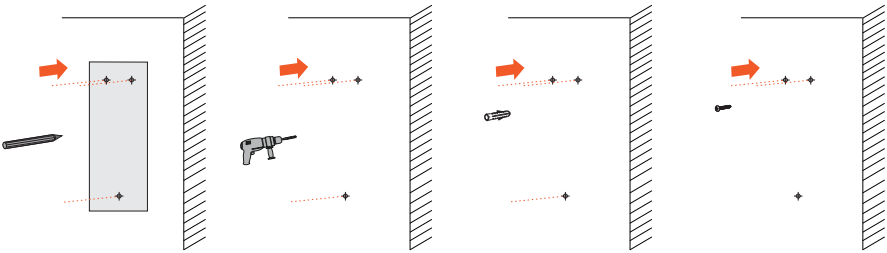
Tool	Icon	Function
Tape ruler		Measure the installation height
Electric screw driver		Fasten the screws
Hammer		Drive the wall plugs into the wall
Wire stripper		Strip the wire
Multimeter		Check the voltage and current
Level (> 180mm)		Keep the charger level
Marker		Make marks on the wall
Electric drill		Drill holes on the wall
Wire cutter		Cut the cable
Crimping pliers		Clamp cord end terminal
Hydraulic clamp		Clamp the RJ45 connector

6.3 Installation Procedure

- *Please note that the installation drawings are for illustrative purpose only, and the actual installation should be based on the physical charger.*
- *Please note that the internal structure of the charger may differ based on the supported communication methods.*

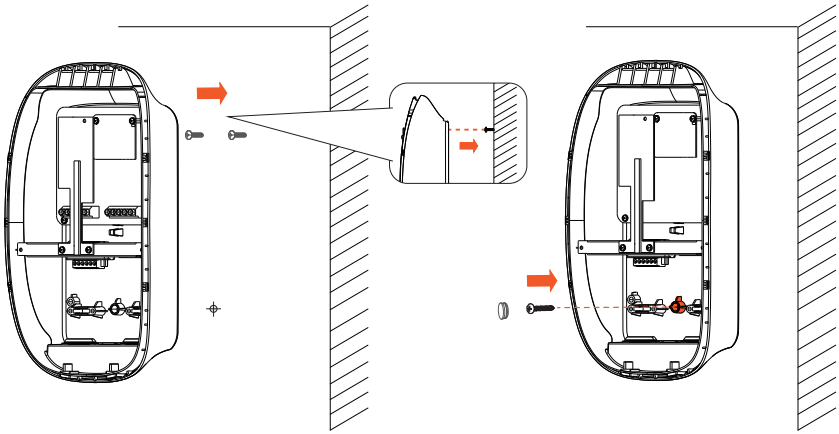
1 Install wall mounting screw

1. Place the drilling diagram on the wall, aligning it properly.
2. Make marks on the wall corresponding to the holes indicated on the diagram.
3. Drill three holes, each 40mm deep, at the marked spots.
4. Drive three wall plugs into the drilled holes, ensuring they are flush with the wall surface.
5. Drive two wall mounting screws into the upper two wall plugs, leaving a **5mm** gap between the screw heads and the wall surface to form hooks.



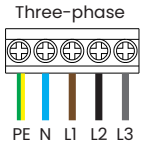
2 Hang the enclosure on the screws

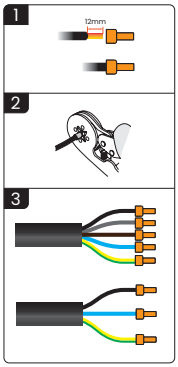
1. Position the enclosure on the wall mounting screws by aligning and inserting the protruding screws into the mounting holes on the back of the enclosure.
2. Seal the middle mounting hole with the seal cap.

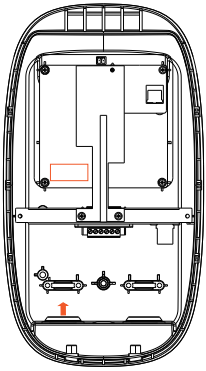


3 Connect power cable

1. Use a wire striper to stripe the power cable, exposing a 12mm length of conductors.
2. Warp the exposed conductors with wire ferrules.
3. Use a cable crimping tool to securely crimp the wire ferrules.
4. Connect the crimped end into the terminal block.
5. Use a cable clip to secure the power cable in place.







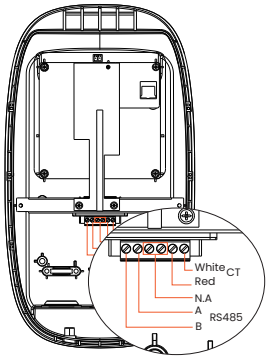
4 Connect RS485 cable

> ! *The charger body is marked with labels for the RS485 and CT ports; please refer to these labels and follow the provided instructions to properly connect the wires.*

The locations of the RS-485 and CT ports remain consistent regardless of whether the charger is single-phase or three-phase; their variations in positioning are primarily dictated by the distinct communication methods employed.

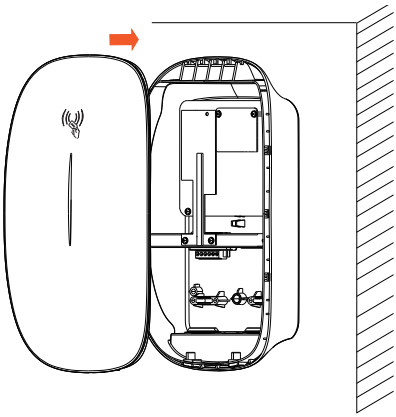
The connection ports for cable model:

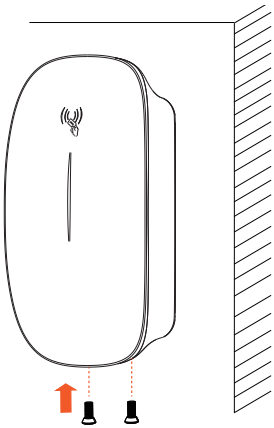
Connect the wires to 6-PIN connector following the wiring sequence, and then plug the connector into the corresponding port.



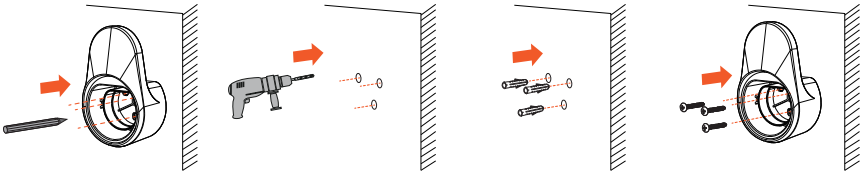
5 Secure the enclosure and faceplate of the charger

1. Tighten the wall mounting screw into the middle hole to firmly secure the enclosure to the wall.
2. Mount the faceplate onto the enclosure and secure it in place.
3. Installation completed.





6 Install the cable holder



7. Charging

7.1 Charging via App (elekeeper)

Caro Wallbox can be monitored or controlled through nearby or remote operations on the SAJ elekeeper App.

To download the Elekeeper and install it on your mobile phone, scan the QR code on the left below.

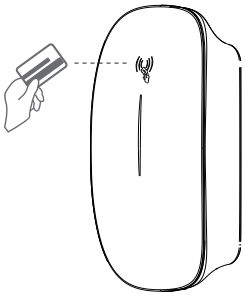
To view configuration instructions of the Caro Wallbox, scan the QR code on the right below. Alternatively, you can view the product documentation on the SAJ Website: www.saj-electric.com

elekeeper Download (IOS&Android))

Configuration Instructions

7.2 Charging via RFID card

- Plug the charging connector in, and the indicator flashes green quickly for five times.
- Swipe card, and the indicator flashes yellow quickly for up to five times.
- During charging, the indicator gradually brightens, then gradually dims in green.
- Swipe card and unplug to the connector.



8. Indicator

Indicator color	EV charger status	Indicator status
Green	Standby	Cycle: Slow flashing: on for 1s, then off for 3s.
	Charging initiated, awaiting vehicle response	Cycle: Rapid flashing twice (on for 200ms, then off for 1000ms), followed by a 3000ms off.
	Charging connector plugged in, ready for Charging	Cycle: Rapid flashing for 5 times (on for 200ms, then off for 1000ms), followed by a 3000ms off.
	Charging in progress	Cycle: gradually brightens, then gradually dims, on for 1s, off for 1s.
	Charging completed	Steady green.
Yellow	No Network/Not Connected to Server	Cycle: The green light is on for 1s, followed by the yellow light on for 1s, then off for 3s.
	Bluetooth lock	Cycle: Flashing: on for 4s, then off for 1s.
	Scheduled charging in Bluetooth mode	Cycle: Rapid flashing: on for 2s, then off for 2s.
	Insufficient Power Allocated, Pausing Charging	Cycle: Rapid flashing for 5 times (on for 200ms, then off for 1000ms), followed by a 3000ms off.
	Card Identified Successfully	Cycle: Rapid flashing: The indicator light is on for 100ms, then off for 100ms, with a maximum of 5 repetitions.
	Charger Reserved (Occupied)	Rapid flashing: on for 2s, then off for 2s
	Alarm	Steady yellow.
White	Program is upgrading	Cycle: Rapid flashing: on for 200ms, then off for 1000ms, this pattern repeats five times, followed by a 3000ms off.
	Power-On Self-Test	Cycle: Breathing light: Gradually brightens, then gradually dims, on for 1s, off for 1s.

9. Troubleshooting

Indicator color	EV charger status	Indicator status	Solution
Red	**Relay adhesion**	Steady red	Please contact after-sales
	Leakage current fault	Cycle: on for 500ms, then off for 500ms once, followed by 3s off.	
	CP fault	Cycle: on for 500ms, then off for 500ms, twice; followed by 3s off.	
	Overcurrent fault	Cycle: on for 500ms, then off for 500ms, 3 times; followed by 3s off.	
	Reverse polarity fault	Cycle: on for 500ms, then off for 500ms, 4 times; followed by 3s off.	
	Leakage current loop anomaly (self-check)	Cycle: on for 500ms, then off for 500ms, 5 times; followed by 3s off.	
	Input terminal overheat fault	Cycle: on for 500ms, then off for 500ms, 6 times; followed by 3s off.	
	Relay Overheat	Cycle: on for 500ms, then off for 500ms, 7 times; followed by 3s off.	
	Output voltage fault	Cycle: on for 500ms, then off for 500ms, 9 times; followed by 3s off.	
Red + Yellow	**Undervoltage fault**	Cycle: yellow on for 2s, followed by the red flashing once (on for 500ms, off for 500ms), then 3s off.	Please try again 10 minutes later
	Overvoltage fault		
	Overfrequency fault	Cycle: yellow on for 2s, followed by the red flashing twice (on for 500ms, off for 500ms), then 3s off.	
	Underfrequency fault		
	Smart meter communication failure	Yellow on for 2s, followed by the red flashing 4 times (on for 500ms, off for 500ms), then 3s off.	Please contact after-sales
	Current transformer (CT) anomaly	Yellow on for 2s, followed by the red flashing 5 times (on for 500ms, off for 500ms), then 3s off.	

Red + Yellow	**Charging connector lock anomaly**	Yellow on for 2s, followed by the red flashing 6 times (on for 500ms, off for 500ms), then 3s off.	Please contact after-sales
	Charging connector current anomaly	Yellow on for 2s, followed by the red flashing 7 times (on for 500ms, off for 500ms), then 3s off.	
Whtie	**BOOT security verification failed or security chip is malfunctioning**	Cycle: Flashing white twice (on for 200ms, then off for 1000ms), followed by 5000ms off.	
	The charger in a disabled state	Steady white	

10. Routine Maintenance

Chargers do not need special maintenance. You are advised to check and clean the enclosure of the charger and accessories such as the charging connector every six months.

Check whether the charger and cables are damaged.

Use a dry cloth to clean the surface of the charger. Do not spray water directly on the charger.

Do not use corrosive cleaners, glass cleaners, or organic solvents.

11. Storage and Transportation

Chargers should be transported in the original packages. Do not place other objects on the top of the charger.

Before transportation, store the product in a clean, dry, and well ventilated place with a relative humidity of not more than 80% and free from corrosive gases.

The environmental specifications for storage and transportation shall not go beyond those specified in the Technical Specifications.

12. Disassembly

Only authorized and qualified electricians are allowed to disassemble the product.

Power off the charger before disassembling it. Disassemble a charger in the reverse order of installation.

13. Disposal/Scrapping

The product should be disposed of at recycling points for electronic equipment. Dispose of the product in a correct and environmental friendly manner in compliance with local laws and regulations.

Electronic devices cannot be disposed of as household waste.

PIN CODE