7/11kW AC EVSE
Installation & User Manual

Star Charge®

Wanbang Digital Energy Co., Ltd.

Identifying symbols

Symbols	Meaning
	**“Warning”, which indicates a hazard** Pay attention to personal injuries or death caused by operation steps, practice or incorrect implementation. The operation after the "warning" sign can only be performed when the conditions are fully understood and satisfied.
	**“Caution”, which indicates a hazard.** Pay attention to the damaged or destroyed product caused by the operation steps, experiments or incorrect execution. Only after fully understanding and satisfying the indicated conditions, the operation after the “caution” mark can be performed.
	**"Hint", which indicates skill or useful information.** Skills and useful information are marked as “Hint”. It does not contain information that warns of dangerous or harmful features.
	**“Garbage disposal”, which indicates electrical and electronic waste.** This symbol is located on the product, in the instruction manual or on the packaging, indicating that the electrical and electronic equipment and its accessories should be disposed separately from ordinary household waste. Materials can be reused based on their markings. By reusing old equipment, materials and other forms of reuse, you can make a significant contribution to the environment.

Content

1. Key Information

1.1 Safety Instruction

Symbol	Content
	Failure to follow safety instructions can result in death, injury, and equipment damage. Refuse to bear any claims arising from this. ● **Electrical hazard** Only trained, qualified and authorized electrical professionals are responsible for installation. The first time to commission and maintain the charger, it should comply with existing standards and installation regulations when performing the aforementioned operations. See chapter "A Installation Instructions" for details. ● **Electrical hazard / fire hazard** ➢ Must regularly check the charging connector (including cable) in charger for damage and check whether the case is damaged (visual inspection). ➢ If the charger is damaged, it must be turned off and replaced immediately. ➢ Do not perform the charger maintenance work without authorization. Only the manufacturer can perform the operation (replace the charger). ➢ Do not modify or modify the charger. ➢ Never remove signs such as safety symbols, warnings, nameplates, signs or pipeline markings. ● No extension cable shall be used when connecting the electric vehicle to the electric vehicle power supply device. ● Only connect electric vehicles or their charging equipment. Do not connect other loads (power tools, etc.). ● Hold the connector when pulling the charging connector, and do not pull the cable. ● Do not bend, squeeze or tilt the charging connector so that it is mechanically damaged. ● Do not touch the heat source, dirt or water on the contact surface. ● Some vehicles may generate toxic or explosive gases in the indoor area during charging, so an external ventilation system must be provided. ● When using an integrated charger to charge your electric car, please read the vehicle's tips and instructions carefully.
	CAUTION ● Damage hazard.

	Never use spray water to clean the charging point (Hose for garden watering, high pressure cleaners, etc) ● The adaptors or conversion adapters and extension cords are not allowed to be used. ● Cord extension sets are not allowed to be used.

1.2 Specified Use

- This product is AC charger that can charge electric powered vehicles (for example, an electric car) in indoor and outdoor areas.
- When installing and connecting the charger, follow the regulations of each country.
- The intended use of the equipment includes, in all cases, the environmental conditions established for the equipment.
- The storage of charger should be met the following requirements:
  - Before the equipment installation, the charger with components should be stored in the indoor dry and ventilated place. The warehouses' temperature is between -40℃ and ＋85℃, the monthly average relative humidity is not exceeded 90%, and there is no corrosive or explosive gas. During the storage, please avoid rain, exposure, condensation and frost.
  - After the equipment installed, the charger shell should be kept sealed to avoid raining and soaking.
- The equipment is developed, produced, inspected and filed according to relevant safety standards. Therefore, if the instructions and safety technical instructions for the intended use are observed, the product will not cause damage to property or endanger the health of the person under normal circumstances.
- The instructions contained in this manual must be strictly observed, otherwise there may be a safety hazard or the device may fail. Although this manual describes the relevant safety instructions, it is important to pay attention to the safety regulations and accident prevention regulations when the charging equipment is used.
- Due to technical and legal restrictions, it is not possible to supply all models to all countries and regions.
- Equipment for locations with non-restricted access.

1.3 About this manual

- This manual applies to the device type: AC charger
- This manual is for the following people:
  - End customer (AC charger user).
  - Debugging and service technicians.

2. Product Overview

2.1 Product Features

Detailed description of product performance		
Model	DH-AC0070XG70 (Case C: plug, type2) DH-AC0070XG71 (Case B: socket, type2)	DH-AC0110XG70 (Case C: plug, type2) DH-AC0110XG71 (Case B: socket, type2)
Rated Power	7 kW	11 kW
Dimension	282 mm×409 mm×148 mm	
Cable length	5 m	
Weight	approx. 4.4 kg	approx. 5.7 kg
Installation	Wall-mounted / Pole-mounted	
Technical Parameters	Input Voltage: AC230±10%	Input Voltage: AC400±10%
	Input Mode： Single-phase, L1+N+PE	Input Mode： Three-phase, L1+L2+L3+N+PE
	Output Current: 32A max.	Output Current: 16A max.
	Frequency: 50 Hz/60 Hz	
	Charging modes: Mode 3	
	Protection against electric shock: Class I	
	Overvoltage Category: OVC III	
	Output Voltage: AC230±10%	Output Voltage:AC400±10%
	IP and IK rating: IP55(Case C),IP54(Case B),IK10 Material: PC	
Codes and standards	IEC 61851-1:2017；IEC 61851-21-2:2018	

2.2 Product Functions

1）Charging function：During the charging process, the charger can identify the connection state between the charger and the vehicle end, and according to this state, the vehicle can be guided to perform safe charging. The vehicle can control the start and stop of charging.

2）The charger controller has the functions of measurement, control and protection for the charger.

3）With lighting protection, overload protection, short circuit protection, leakage protection, over voltage protection, under voltage protection and grounding detection.

4）Charger supports OCPP 1.6J communication protocol, and the charger can be linked to the data service platform and management platform (Cloud platform) of OCPP 1.6J.

5）The charger can keep normal working status when used in outdoor environment (Protection level is IP55(Case C),IP54(Case B), IK10).

2.3 Technical Characteristics

1）Charging method:

- Use the mobile APP to scan the charging QR code for charging.
- Swipe the RFID card to start charging.

2）Have perfect protection functions.

3）Suitable for all vehicles complying with IEC 62196-2.

4）Output power configuration：support output power configurable (Maximum output current set by DIP switch, single-phase 0A-32A, three-phase 0A-16A).

3. Operation Instruction

3.1 Appearance Introduction

- **Case C**

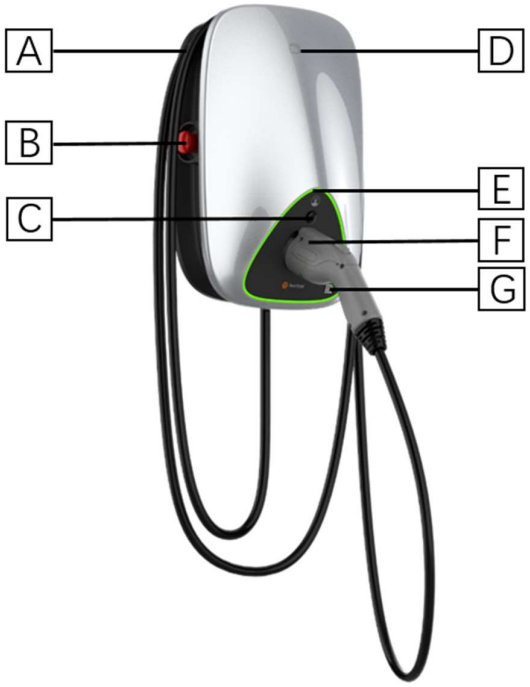


Figure 3-3 Appearance of the wall-mounted (Subject to the actual product)

- **[A]**——Cable winding trough
- **[B]**——Emergency stop: press the button to stop the device running when the device is running abnormally
- **[C]**——Charge plug unlock button: press the button to unlock the charging plug
- **[D]**——Authenticate to start by swiping RFID card
- **[E]**——LED status indicator, standby mode constant green
- **[F]**——Position of the charging connector
- **[G]**——Authenticate to start charging by scanning QR code

- The appearance is subject to the actual product.
- When charger is not used, the charging cable should be rolled up and put back into the cable winding trough in position [A] as indicated in figure 3-3, and the charging connector should be inserted into the designated position [F] for safe storage.

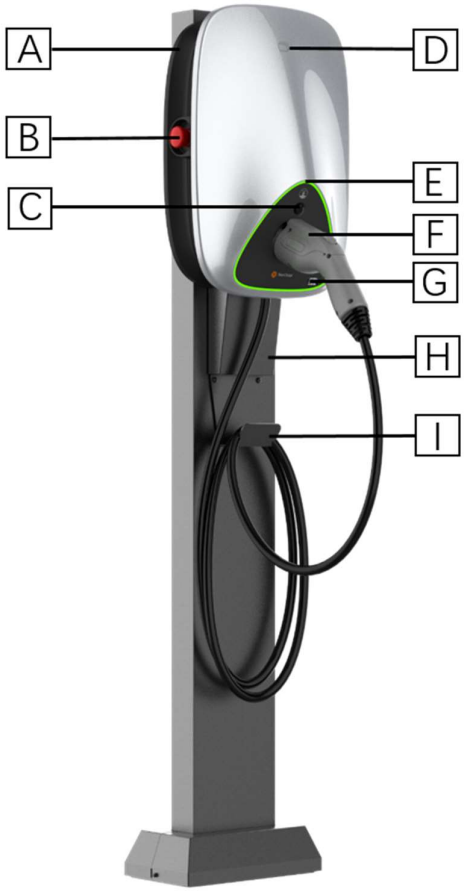


Figure 3-4 Appearance of the pole-mounted (Subject to the actual product)

- **[A]**——Optional cable winding trough
- **[B]**——Emergency stop: press the button to stop the device running when the device is running abnormally
- **[C]**——Charge plug unlock button: press the button to unlock the charging plug
- **[D]**——Authenticate to start by swiping RFID card
- **[E]**——LED status indicator, standby mode constant green.
- **[F]**——Position of the charging connector
- **[G]**——Authenticate to start charging by scanning QR code
- **[H]**——Mounting Column
- **[I]**——Cable winding bracket

- The appearance is subject to the actual product.
- When charger is not used, the charging cable should be rolled up and put back into the cable winding trough in position [A] or placed on the bracket [I] of the stand as indicated in figure 3-4, and the charging connector should be inserted into the designated position [F] for safe storage.

3.2 storage of charging cable and connector

When charger is not used, the charging cable should be rolled up and put back into the cable winding trough in position [A] in figure 3-5 or placed on the bracket [I] of the stand as indicated in Figure 3-6,and the charging connector should be inserted into the designated position [F] for safe storage

Wall Mounted

Figure 3-5 Proper storage of cable &connector

Pole Mounted

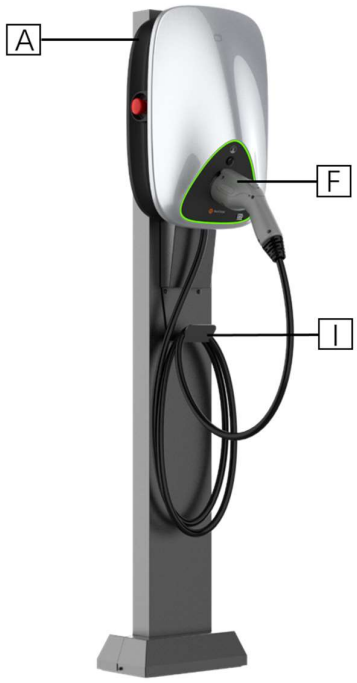


Figure3-6 Proper storage of cable &connector

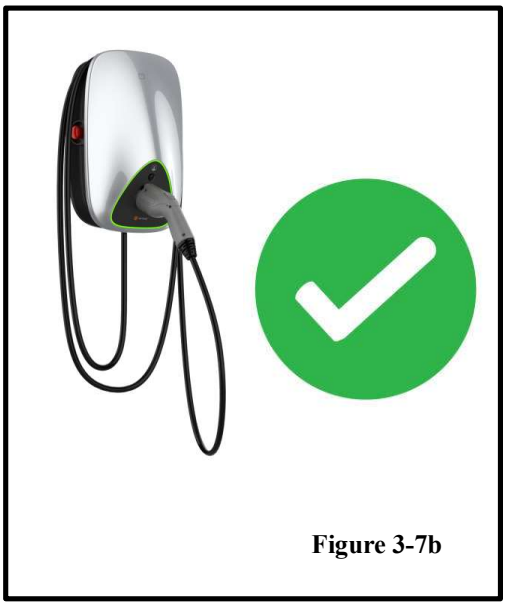


Figure 3-7: Example of Cable & Connector not proper stored (Figure 3-7a), versus proper storage (Figure 3-7b)

3.3 Start-up charger

Precondition

- The charging connector is not inserted in the vehicle.
- The charger is ready for operation (the LED status is constant green).

The steps

Step 1 Insert the charging connector into the vehicle and confirm that it is connected properly, the blue LED lights up means the charger is in connection status.

Step 2 (Option 1) Use the mobile APP of the binding platform to scan the charging QR code for charging.

Step 3 (Option 2) Or using the RFID card to place in the card swiping area until the LED indicator continues to flash, the frequency of flashing is 4 times in 1s. If the start-up by card swiping is not successful due to network reasons, please re-start the card swiping process.

Step 4 When the brightness of the blue LED changes gradually, it means that the charging process has started.

--End

3.4 End charger

The steps

Step 1 After swiping card or using the App provided by the Charge Point Operator to end charging process, the charging connector can be pulled out from the vehicle to completely to end the whole charging process

Step 2 Put back the charging cable into the bracket provided with the charger and properly store the cable as shown in item 3.2 of this manual.

--End

3.5 Instructions to User

The below instructions and safety precautions shall be installed and placed right beside the charging station by the Charge Point Operator in a manner that is sturdy and visible to the user.

1. Basic Instructions to use the Charger:

   Start Procedure

   1) Check if the power is “ON” (Green light is “ON”).
   2) Plug-in the charging cable to the vehicle (The light will turn Blue).
   3) Tap the RFID Card or Scan the QR code via the provided Mobile App by the Charge Point Operator.
   4) Once the charging begins, the blue light will start breathing.

Note: Refer to the light status to make sure that the charger is charging. Please refer to item 3.6 in this manual

Stop Procedure

1) If the car is fully charged the charger will stop automatically.
2) To stop the charging manually, tap the RFID card or tap the “End Charging” on the Mobile App provided by the Charge Point Operator.
3) Unlock the charging cable from the vehicle.
4) Remove the charging cable.
5) Cover or plug-in the cable into the charger.
6) Roll up the charger cable to original position.

2. Safety Precautions

1) Do refrain from using Charger in thundery weather if Charger is located outdoors.
2) In case of emergency, press the red emergency stop button to deactivate the charging process
3) Check that the housing of the charging station is intact and hasn’t suffered any obvious mechanical damage or deformation
4) Check that the charging station is securely fastened to the wall or on the pole
5) Check that nothing is obstructing the connection of the charging cable to the charger socket
6) Do not use brute force to pull out the mechanically locked charging connector out of the charger socket or the Electric Vehicle socket.

3.6 Indicator Description

Basic/Smart			
NO.	**Charger Status**	**LED indicator color**	**LED Effect**
1	Standby	Green	Constant
2	Charging	Blue	Changes gradually
3	Fault	Red	Constant
4	Vehicle end S2 disconnected	Blue	Pulsate (1Hz)
5	Charging current＜ 1A for 10 minutes	Blue	Constant

3.7 Emergency button

In the event of an emergency, the user should depress the emergency stop button on the charger. Once activated, the emergency stop button will cut off the power supply of the charger from the relay coil and disconnect the hardware circuit board. At the same time, the backend charging management system located in Singapore at AWS data center will be alerted that the emergency stop button has been depressed and this charger will then be immediately

deactivated from the system. A deactivated charger will not be able to be used for charging until it is reactivated on the charging management system by customer service engineer.

4. Troubleshooting

Fault	Possible causes and solutions
Power LED is off	● No power supply ➢ Damaged, please contact your service partners.
Unable to start the charging process	● Did not insert the connector into the vehicle properly: ➢ Pull out and plug in again. ● Did not execute charging steps correctly: ➢ Follow the instructions in the 3.2 Start-up charger process section. ● The connector is dirty or damaged around the security area: ➢ Clean or replace the charging connector.
The vehicle is not fully charged or the charging time increased	● Due to extreme high temperature of the vehicle or the integrated charger the current drops: ➢ Visually check if the plug device is smudgy, worn out or damaged. ➢ If necessary, please contact your service partners. ● Due to the external control device (power supply equipment, PV equipment, or others), the charging cannot be completed.
Fault status: red LED lights on	● Fault ➢ Check all possible cause for failure in the first place (*). ➢ Make sure that the emergency stop button pressed. ➢ Cut off the power supply of the charger, pull out the charging connector of the vehicle and switch the power supply back on. ● Damage ➢ Please contact your service partners.

(*) Possible causes for failure（fault status, red LED light on):

In principle, the fault should be solved by pulling the charging connector out of the vehicle：

□□The emergency stop button is pressed to cause a power failure.

Please contact the administrator for hardware recovery.

□□Ungrounded, leaked, and no charging station ID.

Please contact your service partner to maintain the equipment.

5. Routine Maintenance

The following routine maintenance items are for reference only. Please refer to the relevant standards and operation instructions for operation.

5.1 Power distribution system

Power on and off steps of the distribution box.

1） **Check** if the supply voltage is normal.

2） **Power on:** first turn on the main switch of the distribution box and then the branch circuit switch.

3） **Power off:** first turn off the branch circuit switch, and then turn off the main switch of the distribution box.

5.2 Wiring System

5.2.1 Cable

- Weekly routine inspection: check cable for heating and breakage.
- Monthly routine inspection: check cable for heating, breakage, whether the cable is subjected to external pull force, Fixed securely.
- Annual routine inspection: check whether the cable is connected closely to the switch, whether the grounding is reliable, whether the cable is hot or damaged, and whether the insulation resistance of the cable is in accordance with the regulations. The sealing measures of cable into the box are intact, hole sealing is tight.

5.3 Circuit Components

5.3.1 Components

- **Weekly routine inspection:** the emergency stop button is working normally. After pressing the emergency stop button and that it is confirmed the control circuit is disconnected, check whether all operation indicator lights and buzzers are working normally and if the charging connector's fixed clasp is damaged or the connection is abnormal.
- **Quarterly routine inspection:** check whether the circuit components are fixed firmly and if there is a phenomenon of fire burning at the connection of the components. If any abnormality is found, please replace the components as fast as possible.
- **Annual routine inspection:** use the brush and vacuum cleaner to remove the dust from the box. When cleaning, be careful to not blow dust into the components because it will cause a short circuit.

Complete inspection of all components and parts of the box. If any abnormality is found, please replace the parts as fast as possible.

5.4 Auxiliary System

5.4.1 Indicator Lights

- **Monthly routine inspection:** check if the indicator lights burning phenomenon are fixed firmly.
- **Annual inspection:** make sure the wire and indicator light connections are tightly sealed and that do not have corrosion and that all the accessories of the indicator lights are completed, fixed firmly and have not burned out. Also check if the incoming insulation is in compliance with the regulations.

5.5 Electrical Ground System

Electrical grounding is very important in electrical operation. The safety of human and equipment depends largely on the integrity and safety of grounding equipment. If the grounding equipment is not solid, not reliable and does not conform to the standard requirements, it will inevitably lead to security risks, and there is always the possibility of personal and equipment safety crisis.

Therefore, careful inspection and timely maintenance must be carried out to make the ground system always operate in a safe state.

- **Weekly routine inspection:** check if the grounding of the equipment is loose, lost or altered. Observe carefully whether the grounding of the equipment is intact and if the anti-loosening device is completed, damaged or removed.
- **Monthly routine inspection:** make sure whether the connection of electrical grounding system is not rusty, without oxidation or unstable; if it does, it will increase earthling resistance. Also check if the grounding mark is completed or damaged. Check the device in the switch box for looseness, corrosion, and rust.
- **Annual routine inspection:** make sure the grounding wires and terminals are in good condition. Use the multi-meter to detect whether the grounding resistance meets or exceeds the standard grounding requirements.

5.6 Appearance

Monthly routine inspection, check whether there are stains in the appearance of the device, the overall cleanliness of the whole device, timely modify the appearance.

5.7 Maintenance Period

Inspection item	Every month	Every quarter	Every half year	Annual	Treating method
Charging connector	√	√	√	√	Check
Leakage switch protection	√	√	√	√	Check
Emergency stop function check	√	√	√	√	Test
Dust inspection of control board	√	√	√	√	Check and Clear

6. Customer Service

6.1 Preparation

If you have any questions or problems, please contact the company responsible for performing the electrical installation.

Before contacting Customer Service:

- **Check** the troubleshooting measures in the *Troubleshooting* section of this manual.
- **Check** the troubleshooting measures in the *Vehicle Manufacturer's manual*.
- **Record** the model and serial number of the device and send to the contact information in 6.2 below.

6.2 Contact Information

Company address: No.39, Longhui Road, Wujin High-tech zone, Changzhou, Jiangsu, China.

Website: www.starcharge.com

Company E-mail: starcharge@wanbangauto.com

Hotline in China: 400-828-0768

A. Installation Instruction

A.1 Installation Requirements

- The charger should not be installed close to dangerous locations such as water pipes, gas pipes, and steam pipes.
- The installation location should be convenient for charging. When laying the circuit, the wiring length should be shortened, and the cable resistance energy consumption should be reduced.
- The installation position of the vertical charging station should not be set at a place where the terrain is low and water or dripping is easy. The installation should be vertical and the center of gravity should not be too high to prevent tipping or tilting. It should not be placed in a place with severe vibration or high temperature. The height of the charging column should be about 60cm from the horizontal plane.
- The wall-mounted charging station must be connected to the wall at least two points, and the tool charging station cannot be removed. The wall should be installed to withstand the weight of the charging station and its accessories and should not be tilted after installation. The wall and internal lines should not be too close.
- The indoor installation protection level is at least IP41, and the outdoor is at least IP44. It is recommended that the charger be installed in an environment with a sunshade or umbrella; the lighting and passage of the charger installation site must be guaranteed.
- A certain space should be reserved for the installation of the charger, so that the engineering personnel can open the back door of the equipment for inspection and maintenance. Ensure that the ground wire is securely connected to the ground wire of the power supply system.
- Case B is not recommended for public charging stations.
- It shall recommended to install MCB, Shunt release and Type-B RCD with below two ways,
  1.Choose a waterproof box and a Isolator switch that both complies with local regulations. First, install MCB, Shunt release and Type-B RCD in the box, then, install the Isolator switch at front end of the box, as shown in Figure A-3.
  2.Install MCB, Shunt release and Type-B RCD to the front section inside the power distribution cabinet(PDC) and an Isolator switch that complies with local regulations at front end of the MCB and Type-B RCD.
- The waterproof box shall have a minimum of IP44 degree rating.
- The user needs to install MCB, shunt release and a type B residual current protector (B RCD) in the front-end power distribution cabinet. Please see the table in D.1 Equipment Accessories List, in which MCB, shunt release and type B RCD is included.

Power	Rated voltage	Rated current	Tripping characteristics
7kW	230V	40A	C

11kW	400V	20A	C

- Type B residual current protection device should comply with IEC 61008-1, IEC 61009-1, IEC 60947-2 and IEC 62423;
- The circuit breaker should comply with IEC 60898-1 or IEC 60947-2 or IEC 61009-1.

- Shunt release recommended model specifications are as follows:

Shunt release	Brand	Model	fn	Un
7kW single-phase charging station	Schneider	A9A26476	50/60Hz	100VAC-415VAC
11kW three-phase charging station	Schneider	A9A26476	50/60Hz	100VAC-415VAC

- Type B RCD recommended model specifications are as follows:

Type B RCD	Brand	Model	In	I△n	Un
7kW single-phase charging station	ABB	F202 B-40/0,03	40A	30mA	230VAC
	Schneider	A9Z61240	40A	30mA	230VAC
11kW three-phase charging station	ABB	F204 B-25/0,03	25A	30mA	400VAC
	Schneider	A9Z61225	25A	30mA	400VAC

- MCB recommended model specifications are as follows:

MCB	Brand	Model	In	Un	Curve code
7kW single-phase charging station	ABB	S202-C40	40A	230VAC	C
	Schneider	A9F18240	40A	230VAC	C
11kW three-phase charging station	ABB	S204-C20	20A	400VAC	C
	Schneider	A9F18420	20A	400VAC	C

- Electrical installation drawing

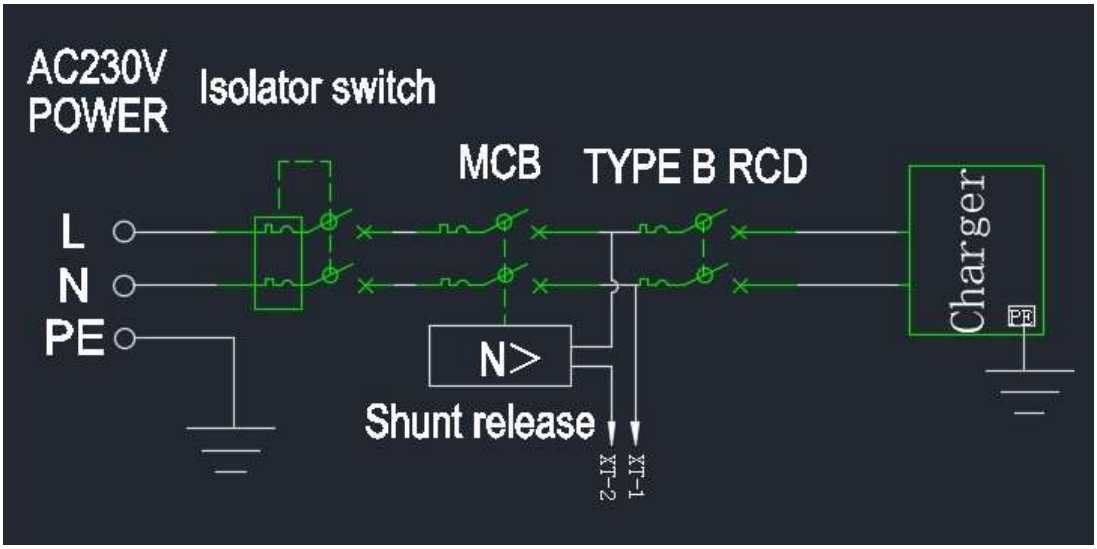


Figure A-1 7kW Installation electrical diagram

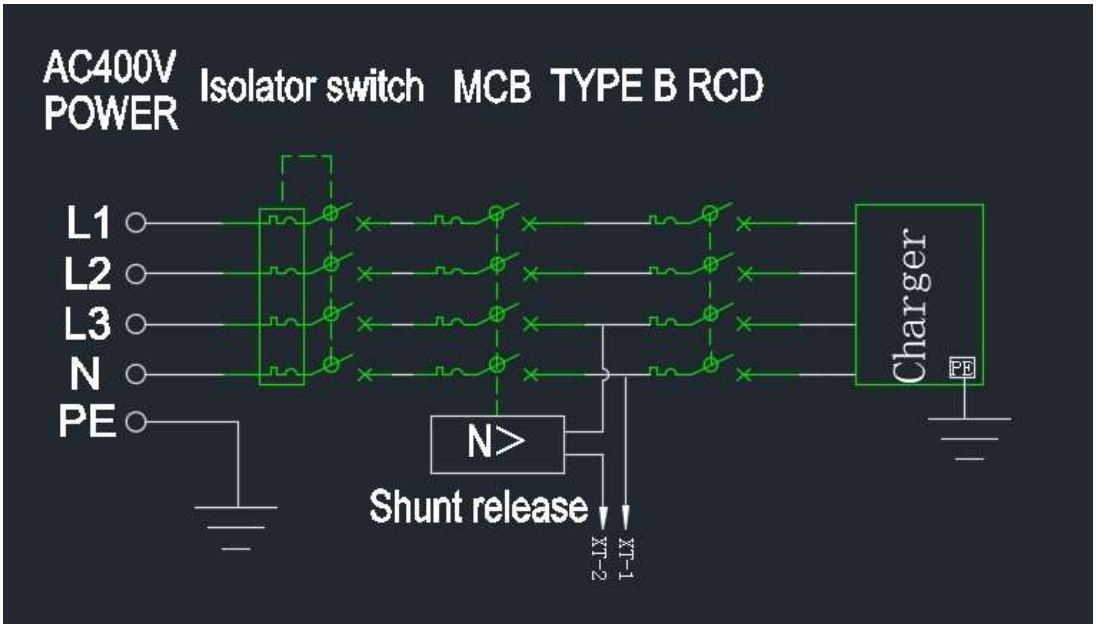


Figure A-2 11kW Installation electrical diagram

Figure A-3 Installation diagram

The components in detail as below,

Figure A-4 MCB

Figure A-5 Type-B RCD

Figure A-6 Shunt release

Figure A-7 Isolator switch

A.2 Power Supply Requirements

The power supply mode of the 7kW AC charger is AC single-phase power supply, and the input electrical requirements are showed as follow:

- AC working voltage: AC 230V
- AC working frequency:50Hz/60Hz
- Voltage asymmetry: no more than 5%
- Voltage distortion rate: 10% of non-sinusoidal content does not exceed 10% of 230V
- The power supply mode of the 11kW AC charger is AC three-phase power supply, and the input electrical requirements are showed as follow:
- AC working voltage: AC 400V
- AC working frequency: 50Hz/60Hz

- Voltage asymmetry: no more than 5%
- Voltage distortion rate: 10% of non-sinusoidal content does not exceed 10% of 400V

A.3 Environmental Requirements

- Working environmental temperature: -30℃～ + 50℃
- Relative humidity: 5% to 95%
- Installation vertical tendency: ≤5%
- Installation and operation altitude: ≤ 2000 meters
- There is no strong vibration and impact at the place of use, and there is no strong electromagnetic interference.

A.4 Wiring Requirements

- Recommended cable specifications of 7kW charger :6mm^2 ((brown L1, blue N, green yellow PE), outside diameter 13 mm-15 mm;
- Recommended cable specifications of 11kW charger:2.5mm^2 (brown L1, black L2, grey L3, blue N，green yellow PE), outside diameter 13 mm-17 mm, Inlet seal rubber plug, as shown in Figure A-8.

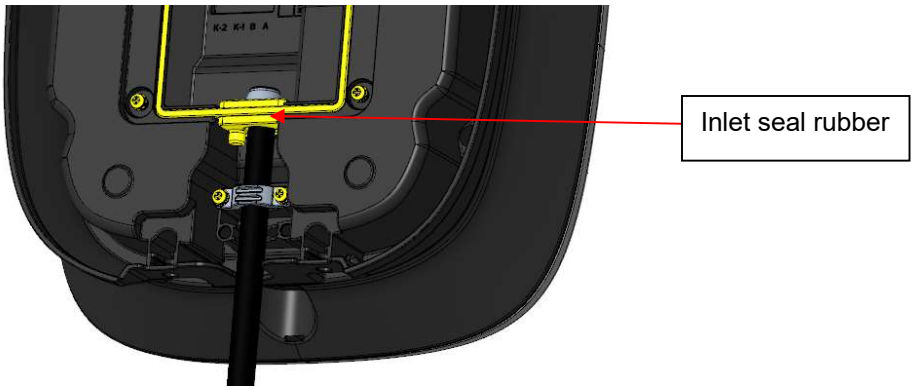


Figure A-8 Location of inlet seal rubber

- Conductive core maximum allowable operating temperature: 105℃
- Ambient temperature: 0℃ and above

A.5 Product Installation

➢ **Tool list**

Electric drill, tape measure, Phillips screwdriver, pen, tape, tool hammer, star hexagon screwdriver T30, line pressing pliers, paper knife.

A.5.1 Wall-mounted charger

□The general assembly drawing is shown in Figure A-9.

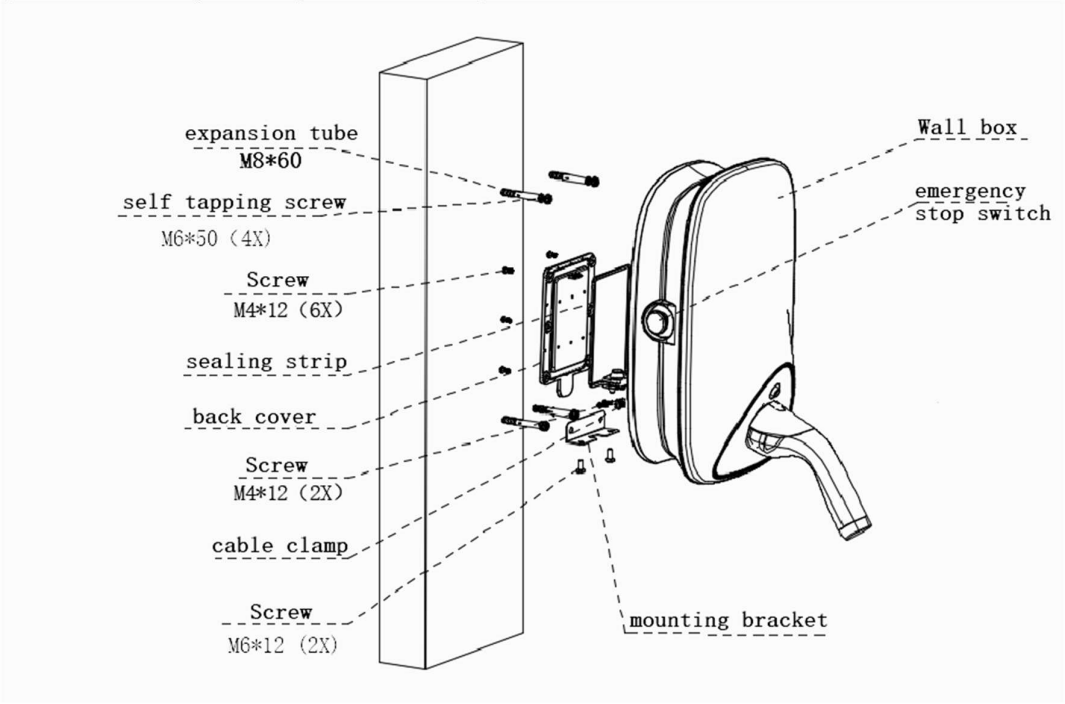


Figure A-9 General assembly drawing of wall-mounted charger

- Chargers use a same installation method between charger with charging cable (Case C) and with socket (Case B).

➢ Installation

1. Please confirm the installation location and mark it on the wall. It is suggested that the bottom height of charging station should be about 1.1 meters from the ground, as shown in Figure A-10 and the height of the pole mounting is as shown in Figure A-11.

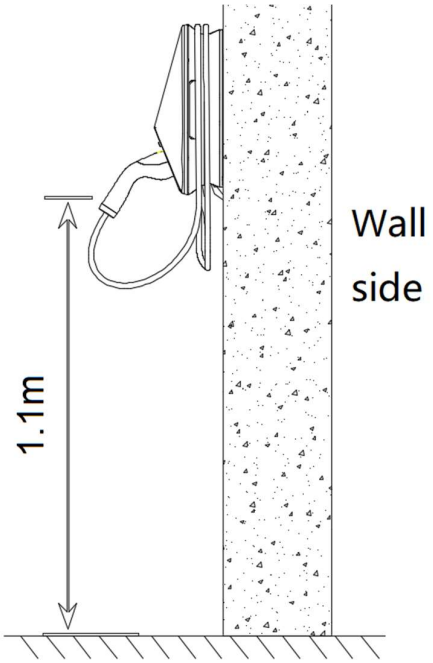


Figure A-10 Wall mounting height

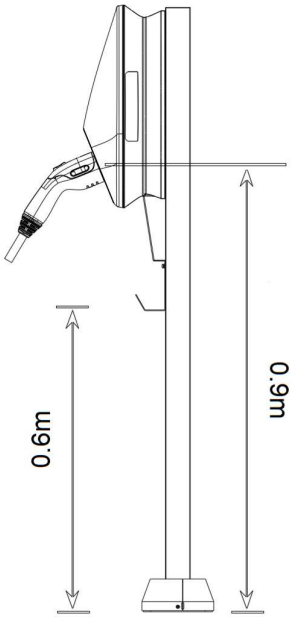


Figure A-11 Pole mounting height

2. As shown in Figure A-12, the center distance of the wall drilling hole, place the punching template at a suitable height, and mark the punching position on the wall with a pencil.

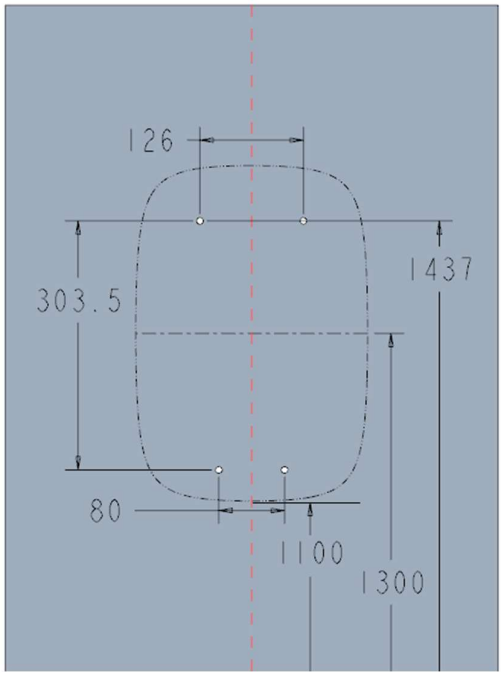


Figure A-12 Wall drilling center distance

3. Use a Φ8 drill bit for the wall to open 4 holes with a depth of 70mm, install an Φ8*60 expansion tube, and use two M6 self-tapping screws to fasten the wall mount to the two holes under the wall, and directly tighten the two holes on the top. Insert two M6 self-tapping screws. Note that the screw head protruding height is 7mm, as shown in Figure A-13.

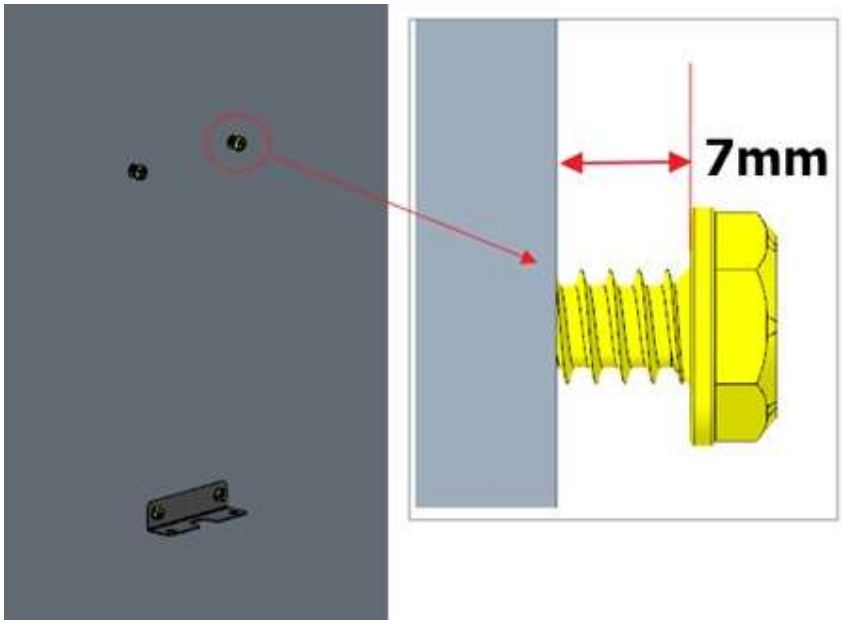


Figure A-13 Fixed Socket and Socket holder bracket

4. Thread the incoming cable through the large hole in the center of the rubber plug of the cable, compress the terminal, and fasten it to the wiring connector with a screw (torque 1.8 Nm, there is a wiring comparison table in the shell).
5. (Optional) If you need to install a network cable (optional, depending on the configuration), you need to cut through the channel on the left side of the cable, insert the network cable, and plug it into the corresponding interface.
6. (Optional) If you need to install a SIM card (optional, depending on the configuration), insert the SIM card directly into the corresponding connector.
7. (Optional) If an external shunt trip is required, the two connecting points reserved according to the indicated position of the product shall successively connect the shunt trip control circuit with a voltage not higher than 230Vac and a current not exceeding 1A in the control circuit, as shown in the following Figure A-14:

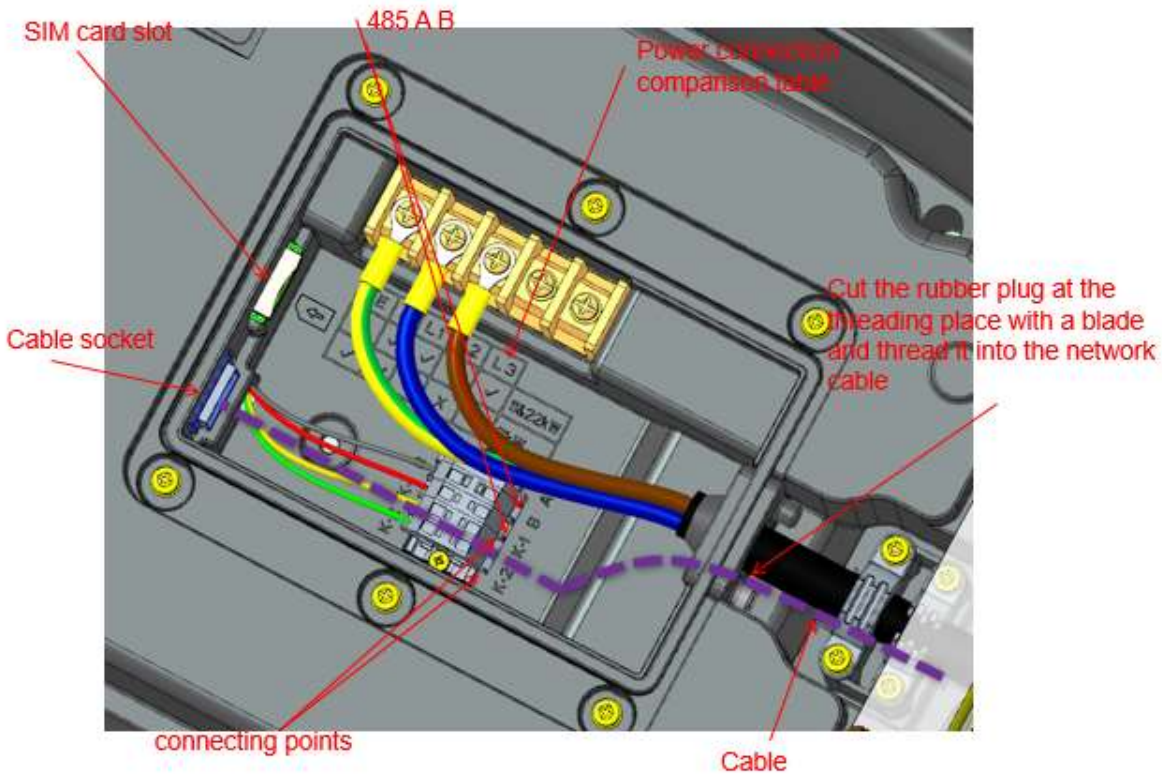


Figure A-14 7kW wiring diagram

8. The 11kW charger is connected with 5 entry cables, as shown in Figure A-15.

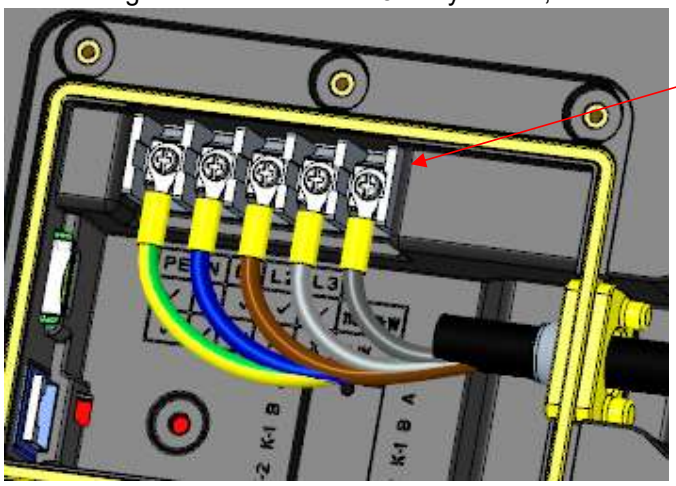


Figure A-15 11W wiring diagram

9. Use 6 M4*12 screws to tighten the wiring compartment cover, and 2 M4*12 screws to tighten the crimping ferrule. Note that there are two positions for the crimping ferrule, depending on the thickness of the incoming cable, as shown below A-16.

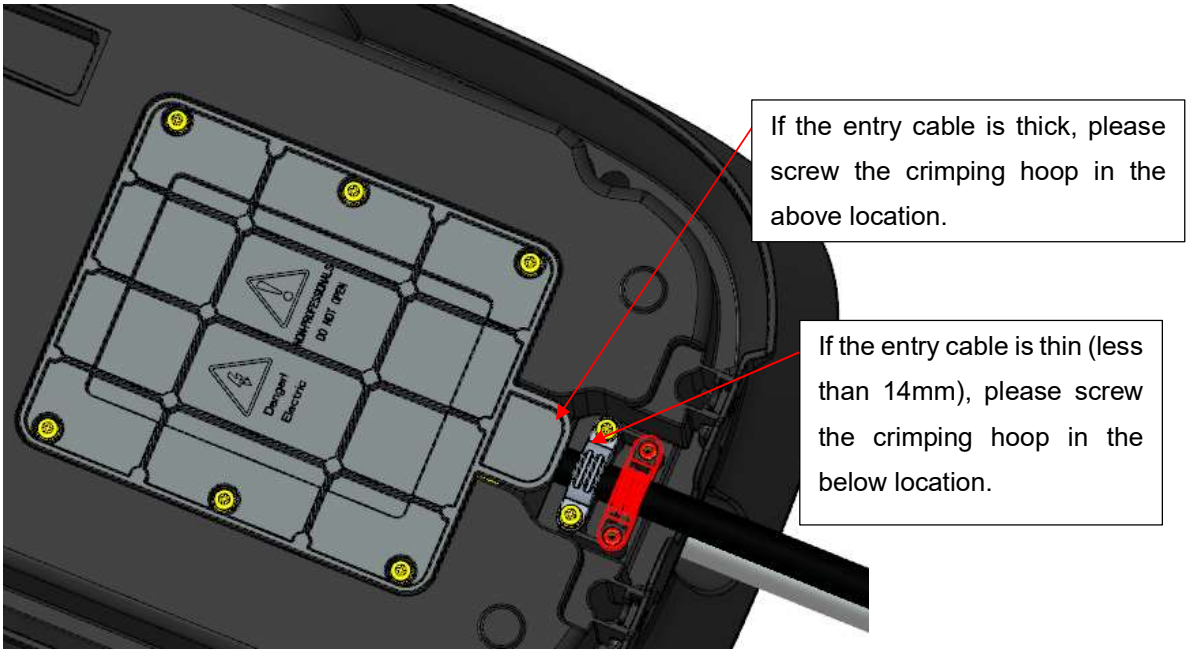


Figure A-16 Install the wiring cover and the cable entry clamp

10. Hang the charger through the two recessed buckles in the rear case and the two screws on the wall, screw in the two M6*12 Torx screws below to tighten the charging station and the wall hanging fitting, as shown in Figure A-17:

Figure A-17 Hanging charger and bottom fastening

➢ **Check after installation**

1. Clean up

- Dispose of all shipping and packaging materials in accordance with local regulations.
- Clean the charger and surrounding debris, such as small cables, straps, screws/mothers, etc. Do not leave the installation tools on site or in the charging station (record the type and quantity of tools to prevent omission).

- Wipe the insulation with an antistatic cloth. Do not use any corrosive solvents.

2. Inspection

- Check that the base is secure and sealed.
- Check that the internal components of the device are securely fastened.
- Check that the electrical connections and wiring are correct and complete, that the connections are secure, and that the grounding is reliable.
- Check that the degree of protection of the equipment meets the requirements, especially at the cable entry at the bottom of the charging station.
- View appearance, marking, integrity, cleanliness.

A.5.2 Pole-mounted charger

The general assembly drawing is shown in Figure A-18.

Figure A-18 Pole-mounted assembly drawing

➢ Install incoming line and charging station

1. Lay the column flat on the ground and pass the incoming line out from the front.

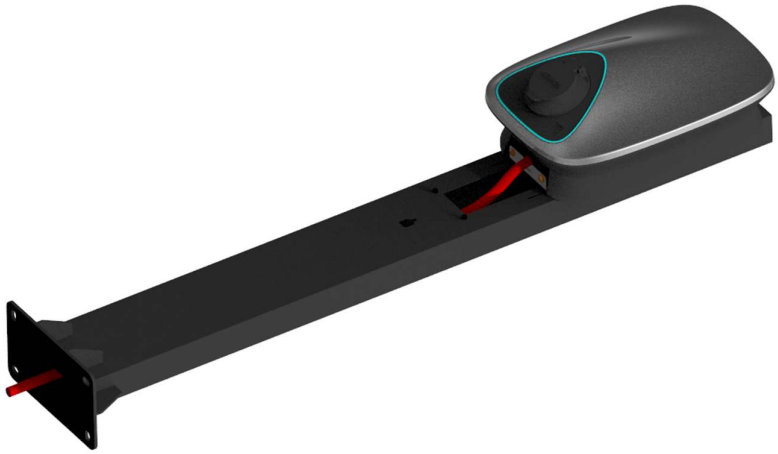


Figure A-19 Into the line installation

2. After connecting the inlet line with the charging station body, fix the charging station body on the vertical column. First, use 2 cross M6*12 (torque: 1.8-2.0n.m) combination screws to fix the wall mount on the column.
3. Hang the charging station on the column, screw in two pattern M6*12 (torque: 1.8~2.0 N.M) combination screws at the bottom, as shown in Figure A-20.

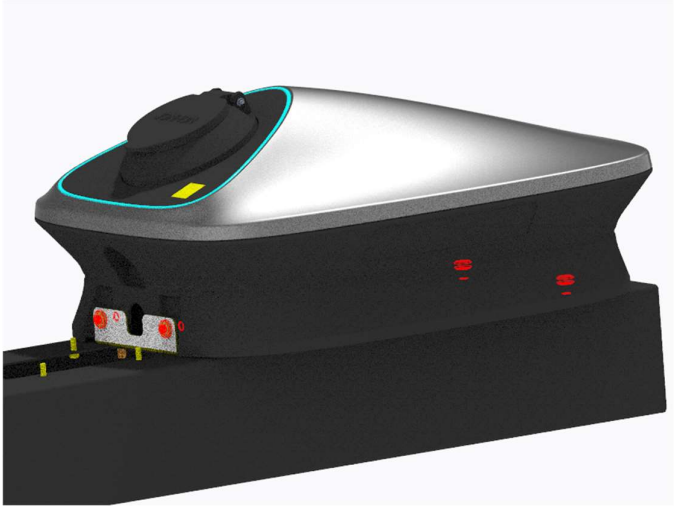


Figure A-20 Charger installation

4. Insert the hanger hook and guard cover into the mounting position and push them up, and then lock them from the front with two M4*12 pattern composite screws (Torque: 1.4~1.6 N.M) with column core head, as shown in Figure A-21.

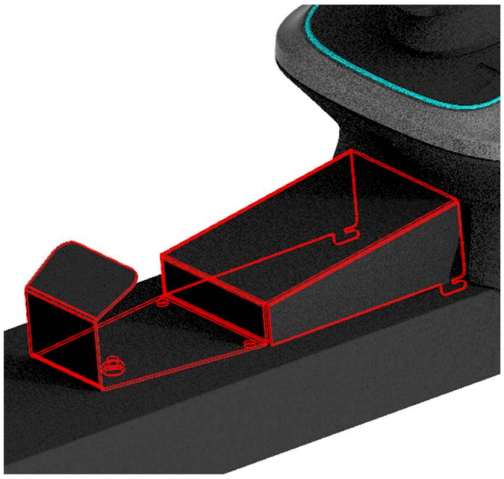


Figure A -21 Thread hook and thread guard installation

- Fixed base

1. Drill 4 holes with A diameter of 10mm and A depth of 150mm on the concrete floor, and the spacing between hole centers is 100mm*200mm. Use 4 M10*120 expansion screws to install and tighten the charging station posts, as shown in Figure A-22 and A-23.

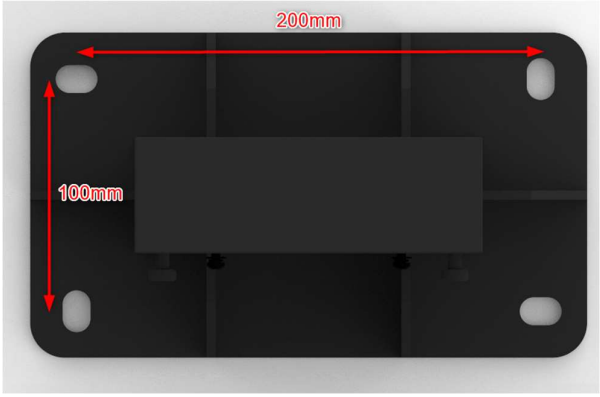


Figure A-22 Fixed base

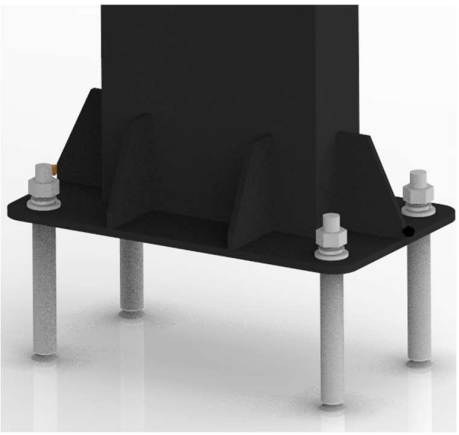


Figure A-23 Fixed column

2. Place the rear decorative cover on the bottom plate of the column.

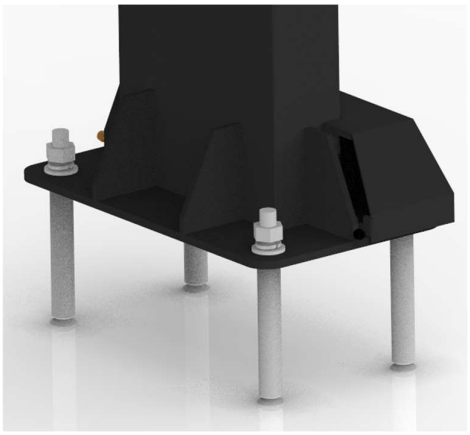


Figure A-24 Install the rear decorative cover

3. Insert the front decorative cover into place from top to bottom and the back decorative cover, and fix both sides of the front decorative cover with 2 M4*12 flower-shaped composite screws (Torque: 1.4~1.6 N.M) with column core.

Figure A-25 Fixed the decorative cover

➢ **Check after installation**

1. Clean up

- Dispose of all shipping and packaging materials in accordance with local regulations.
- Clean the charger and surrounding debris, such as small cables, straps, screws/mothers, etc. Do not leave the installation tools on site or in the charging station (record the type and quantity of tools to prevent omission).
- Wipe the insulation with an antistatic cloth. Do not use any corrosive solvents.

2. Inspection

- Check that the base is secure and sealed.
- Check that the internal components of the device are securely fastened.
- Check that the electrical connections and wiring are correct and complete, that the connections are secure, and that the grounding is reliable.
- Check that the degree of protection of the equipment meets the requirements, especially at the cable entry at the bottom of the charging station.
- View appearance, marking, integrity, cleanliness.

B. Appendix

The following documents are the product design standards:

- IEC 61851-1:2017Electric vehicle conductive charging system –Part 1: General requirements
- IEC 61851-21-2:2018 Electric vehicle conductive charging system –Part 21-2: Electric vehicle requirements for conductive connection to an AC/DC supply – EMC requirements for off-board electric vehicle charging systems
- IEC 60068-2 Environmental testing
- IEC 60068-2-1:2007 Environmental testing - Part 2-1: Tests - Test A: Cold
- IEC 60068-2-2:2007 Environmental testing - Part 2-2: Tests - Test B: Dry heat
- IEC 60068-2-30:2005 Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle)
- IEC 60068-2-78:2012 Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, IEC 61000-4 Electromagnetic compatibility (EMC)
- IEC 61000-4-2:2008, Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test
- IEC 61000-4-3:2006, Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test
- IEC 61000-4-4:2012, Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test
- IEC 61000-4-5:2014, Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test
- IEC 61000-4-6:2013, Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields
- IEC 61000-4-11:2004, Electromagnetic compatibility (EMC) – Part 4-11: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests steady state
- IEC 60950-1:2005 Information technology equipment - Safety - Part 1: General requirements
- BS EN 62196-1:2014 Plugs, socket-outlets,vehicle connectors and vehicle inlets — Conductive charging of electric vehicles - Part 1: General requirements
- IEC 62196-3:2014 Plugs, socket-outlets, vehicle connectors and vehicle inlets – Conductive charging of electric vehicles –Part 3: Dimensional compatibility and interchangeability requirements for d.c. and a.c./d.c. pin and contact-tube vehicle couplers

C. Warranty Card

C.1 Warranty Terms and Conditions

- **Basic information**

1.Welcome to buy products for Wanbang Digital Energy Technology Co., LTD

2.If there are any requirements for the products purchased or used that exceed the standard warranty, please call 400-828-0768 to learn about various warranty upgrades and extended warranty services.

- **Product warranty policy**

1. If the user has a performance failure within 7 days of the purchase, they can choose to exchange the goods or apply for free maintenance. If the user applies for replacement, they need to provide the purchase invoice, warranty card, original packaging box and any other accessories.

2. When the user applies for free maintenance service during the warranty period, they need to provide a valid purchase invoice and warranty card. The start date of the warranty period is the purchase date indicated in the invoice. The warranty period of the product is subjected to the date of delivery date of the product recorded if the user cannot provide a valid purchase invoice or the warranty card, or if the information listed in the above warranty certificate does not conform to the product, or it is altered or unidentifiable. If a valid product release date is not available, a free warranty will not be possible.

3. The machine repaired by the company will continue to enjoy the warranty service during the original warranty period.

4. The faulty parts or faulty machines that have been replaced after the repair are owned by Wanbang.

5. The user must properly keep the warranty card; the company does not reissue a new one.

Product warranty does not include the following conditions:

1. Any damage caused by man-made or transport damage.

2. Products that have been disassembled and repaired by users and non-authorized service organizations.

3. Products that have been damaged due to unpacking and improper use.

4. Failure or damage caused by use in a work environment not allowed by the product, including exceeding the product's workload.

5. Failure and damage caused by improper storage by the user.

C.2 Information Registration

Product name	
Product model	
Warranty period	
User name	
Contact Phone	
Contact address	
Dealer stamp	

D. Equipment Accessories

D.1 Equipment Accessories List

NO.	Equipment component	Quantity	Comments
1	AC charger	1	/
2	Terminal connectors	1	7kW Pin terminal:E6012-BLACK,KST*3 Round terminal:RVL5-4,KST*3 Ground terminal:AVK16RD*1 11kW Pin terminal:E2508-BLUE,KST*5 Round terminal:RV3-4,KST*5 Ground terminal:AVK16RD*1
3	Wall hanging	1	Wall hanging*1 M6 Self-tapping screws*4 8mm diameter plastic expansion tube*4 M6 flower type pan head combination screw*2
4	RFID Card	2	/
5	User manual	1	/
6	Pole(Optional)	1	M3 flower type pan head combination screw*2 M4 flower type pan head combination screw*2 M6 flower type pan head combination screw*2 M10 Expansion bolt*4 M6 hexagon nut*1 Pole*1 Cable protection cover *1 Front decorative cover*1 Rear decorative cover*1
7	MCB	1	7kW Schneider, A9F18240, IC65N 2P C40A ABB, S202-C40 ,40A 230VAC 11kW Schneider, A9F18420, IC65N 4P C20A ABB, S204-C20, 20A 400VAC
8	Type B RCD	1	7kW Schneider, A9Z61240,2P/40A/230VAC/30mA ABB, F202 B-40/0.03, 2P/40A/230VAC/30mA 11kW Schneider, A9Z61425, 4P/25A/400VAC/30mA ABB, F204 B-25/0.03, 4P/25A/400VAC/30mA
9	Shunt Release	1	7kW, Schneider, A9A26476, 100VAC-415VAC 11kW Schneider, A9A26476, 100VAC-415VAC，50/60HZ

22 kW AC EV Charger
Installation & User Manual

Star Charge®

Wanbang Digital Energy Co., Ltd.

Identifying symbols

Symbols	Meaning
	**“Warning”, which indicates a hazard** Pay attention to personal injuries or death caused by operation steps, practice or incorrect implementation. The operation after the "warning" sign can only be performed when the conditions are fully understood and satisfied.
	**“Caution”, which indicates a hazard.** Pay attention to the damaged or destroyed product caused by the operation steps, experiments or incorrect execution. Only after fully understanding and satisfying the indicated conditions, the operation after the “caution” mark can be performed.
	**"Hint", which indicates skill or useful information.** Skills and useful information are marked as “Hint”. It does not contain information that warns of dangerous or harmful features.
	**“Garbage disposal”, which indicates electrical and electronic waste.** This symbol is located on the product, in the instruction manual or on the packaging, indicating that the electrical and electronic equipment and its accessories should be disposed separately from ordinary household waste. Materials can be reused based on their markings. By reusing old equipment, materials and other forms of reuse, you can make a significant contribution to the environment.

Content

1. Key Information

1.1 Safety Instruction

Symbol	Content
	Failure to follow safety instructions can result in death, injury, and equipment damage. Refuse to bear any claims arising from this. ● **Electrical hazard** Only trained, qualified and authorized electrical professionals are responsible for installation. The first time to commission and maintain the charger, it should comply with existing standards and installation regulations when performing the aforementioned operations. See chapter "A Installation Instructions" for details. ● **Electrical hazard / fire hazard** ➢ Must regularly check the charging connector (including cable) in charger for damage and check whether the case is damaged (visual inspection). ➢ If the charger is damaged, it must be turned off and replaced immediately. ➢ Do not perform the charger maintenance work without authorization. Only the manufacturer can perform the operation (replace the charger). ➢ Do not modify or modify the charger. ➢ Never remove signs such as safety symbols, warnings, nameplates, signs or pipeline markings. ● No extension cable shall be used when connecting the electric vehicle to the electric vehicle power supply device. ● Only connect electric vehicles or their charging equipment. Do not connect other loads (power tools, etc.). ● Hold the connector when pulling the charging connector, and do not pull the cable. ● Do not bend, squeeze or tilt the charging connector so that it is mechanically damaged. ● Do not touch the heat source, dirt or water on the contact surface. ● Some vehicles may generate toxic or explosive gases in the indoor area during charging, so an external ventilation system must be provided. ● When using an integrated charger to charge your electric car, please read the vehicle's tips and instructions carefully.
	CAUTION ● Damage hazard.

	Never use spray water to clean the charging point (Hose for garden watering, high pressure cleaners, etc) ● The adaptors or conversion adapters and extension cords are not allowed to be used. ● Cord extension sets are not allowed to be used.

1.2 Specified Use

- This product is AC charger that can charge electric powered vehicles (for example, an electric car) in indoor and outdoor areas.
- When installing and connecting the charger, follow the regulations of each country.
- The intended use of the equipment includes, in all cases, the environmental conditions established for the equipment.
- The storage of charger should be met the following requirements:
  - Before the equipment installation, the charger with components should be stored in the indoor dry and ventilated place. The warehouses' temperature is between -40℃ and ＋85℃, the monthly average relative humidity is not exceeded 90%, and there is no corrosive or explosive gas. During the storage, please avoid rain, exposure, condensation and frost.
  - After the equipment installed, the charger shell should be kept sealed to avoid raining and soaking.
- The equipment is developed, produced, inspected and filed according to relevant safety standards. Therefore, if the instructions and safety technical instructions for the intended use are observed, the product will not cause damage to property or endanger the health of the person under normal circumstances.
- The instructions contained in this manual must be strictly observed, otherwise there may be a safety hazard or the device may fail. Although this manual describes the relevant safety instructions, it is important to pay attention to the safety regulations and accident prevention regulations when the charging equipment is used.
- Due to technical and legal restrictions, it is not possible to supply all models to all countries and regions.
- Equipment for locations with non-restricted access.

1.3 About this manual

- This manual applies to the device type: AC charger
- This manual is for the following people:
  - End customer (AC charger user).
  - Debugging and service technicians.

2. Product Overview

2.1 Product Features

Detailed description of product performance	
Model	DH-AC0220XG70 (Case C: plug, type2)
Rated Power	22 kW
Dimension	282 mm×409 mm×148 mm
Cable Length	5m
Weight	5.6 kg
Installation	Wall-mounted , Pole-mounted
Technical Parameters	Input Voltage: AC400±10%
	Input Mode： Three-phase, L1+L2+L3+N+PE
	Output Current: 32A max.
	Frequency: 50 Hz/60 Hz
	Charging modes: Mode 3
	Protection against electric shock: Class I
	Overvoltage Category: OVC III
	Output Voltage:AC400±10%
	IP and IK rating: IP55 (Case C), IK10 Material: PC
Codes and standards	IEC 61851-1:2017, IEC 61851-21-2:2018, TR25:2016

2.2 Product Functions

1）Charging function：During the charging process, the charger can identify the connection state between the charger and the vehicle end, and according to this state, the vehicle can be guided to perform safe charging. The vehicle can control the start and stop of charging.

2）The charger controller has the functions of measurement, control and protection for the charger.

3）With lighting protection, overload protection, short circuit protection, leakage protection, over voltage protection, under voltage protection and grounding detection.

4）Charger supports OCPP 1.6J communication protocol, and the charger can be linked to the data service platform and management platform (Cloud platform) of OCPP 1.6J.

5）The charger can keep normal working status when used in outdoor environment (Protection level is IP55 (Case C), IK10).

2.3 Technical Characteristics

1）Charging method:

- Use the mobile APP to scan the charging QR code for charging.
- Swipe the RFID card to start charging.

2）Have perfect protection functions.

3）Suitable for all vehicles complying with IEC 62196-2.

4）Output power configuration：support output power configurable (Maximum output current set by DIP switch, three-phase 0A-32A).

3. Operation Instruction

3.1 Appearance Introduction

- **Case C Charger**

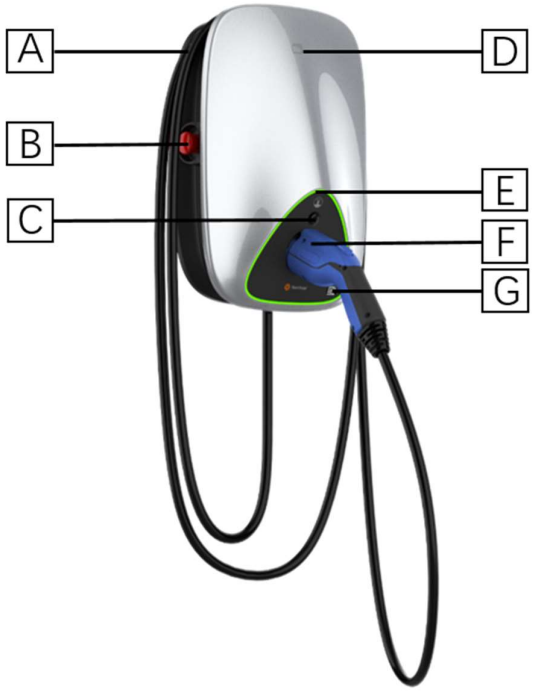


Figure 3-1 Appearance of the wall-mounted (Subject to the actual product)

- **[A]**——Cable winding trough
- **[B]**——Emergency stop: press the button to stop the device running when the device is running abnormally
- **[C]**——Charge plug unlock button: press the button to unlock the charging plug
- **[D]**——Authenticate to start by swiping RFID card
- **[E]**——LED status indicator, standby mode constant green
- **[F]**——Position of the charging connector
- **[G]**——Authenticate to start by scanning QR code

- The appearance is subject to the actual product.
- When charger is not used, the charging cable should be rolled up and put back into the cable winding trough in position [A] as indicated in figure 3-1, and the charging connector should be inserted into the designated position [F] for safe storage.

- **Pole-mounted charger**

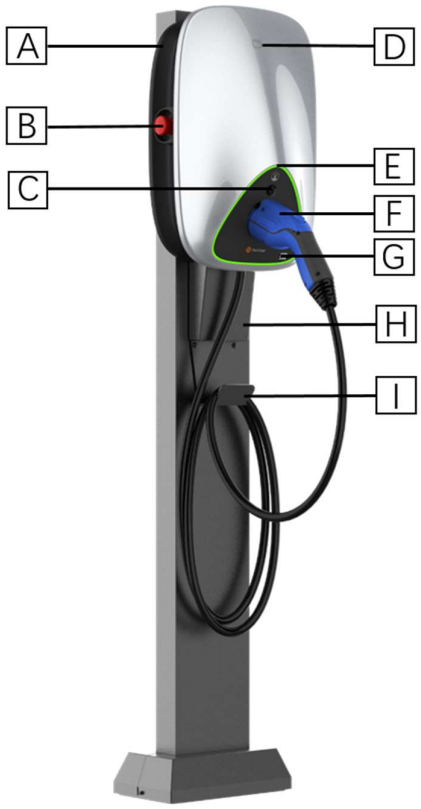


Figure 3-2 Appearance of the pole-mounted (Subject to the actual product)

- **[A]**——Optional cable winding trough
- **[B]**——Emergency stop: press the button to stop the device running when the device is running abnormally
- **[C]**——Charge plug unlock button: press the button to unlock the charging plug
- **[D]**——Authenticate to start by swiping RFID card
- **[E]**——LED status indicator, standby mode constant green.
- **[F]**——Position of the charging connector
- **[G]**——Authenticate to start charging by scanning QR code
- **[H]**——Mounting Column
- **[I]**——Cable winding bracket

- The appearance is subject to the actual product.
- When charger is not used, the charging cable should be rolled up and put back into the cable winding trough in position [A] or placed on the bracket [I] of the stand as indicated in figure 3-4, and the charging connector should be inserted into the designated position [F] for safe storage.

3.2 storage of charging cable and connector

When charger is not used, the charging cable should be rolled up and put back into the cable winding trough in position [A] in figure 3-5 or placed on the bracket [I] of the stand as indicated in Figure 3-6,and the charging connector should be inserted into the designated position [F] for safe storage

Wall Mounted

Figure 3-3 Proper storage of cable &connector

Pole Mounted

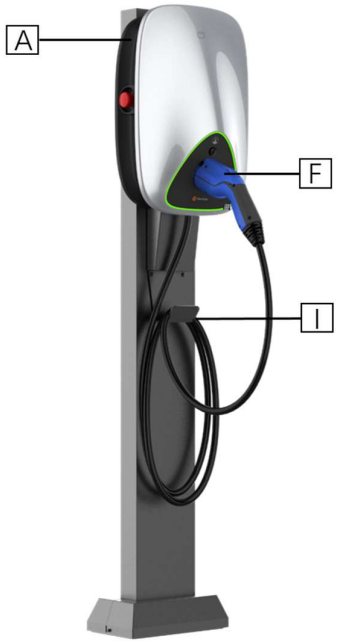


Figure3-4 Proper storage of cable &connector

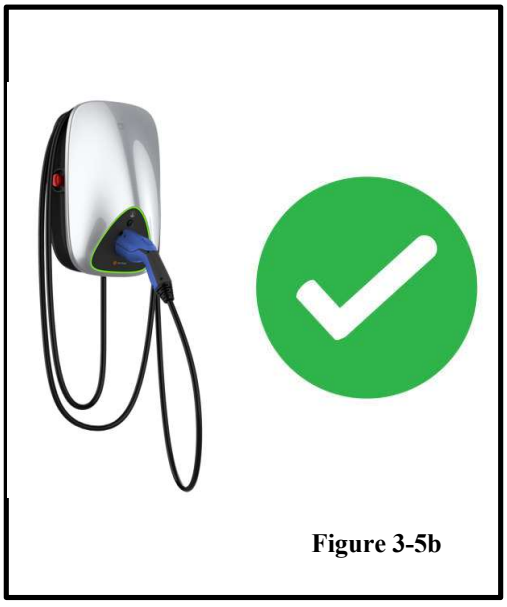


Figure 3-5 Example of Cable & Connector not proper stored (Figure 3-5a), versus proper storage (Figure 3-5b)

3.3 Start-up charger

Precondition

- The charging connector is not inserted in the vehicle.
- The charger is ready for operation (the LED status is constant green).

The steps

Step 1 Insert the charging connector into the vehicle and confirm that it is connected properly, the blue LED lights up means the charger is in connection status.

Step 2 (option 1) Use the mobile APP of the binding platform to scan the charging QR code for charging.

Step 3 (option 2) Or using the RFID card to place in the card swiping area until the LED indicator continues to flash, the frequency of flashing is 4 times in 1s. If the start-up by card swiping is not successful due to network reasons, please re-start the card swiping process.

Step 4 When the brightness of the blue LED changes gradually, it means that the charging process starts.

--End

3.4 End Charger

The steps

Step 1 After swiping card or using the App provided by the Charge Point Operator to end charging process, the charging connector can be pulled out from the vehicle to completely to end the whole charging process.

Step 2 Put back the charging cable into the bracket provided with the charger and properly store the cable as shown in item 3.2 of this manual.

--End

Normal full end operation steps

Step 1 Confirm that the charging station LED indicator is in a steady blue state.

Step 2 Press the charging connector unlock button, pull out the charging connector on the vehicle, and close the protective cover of the vehicle charging socket.

Step 3 Put away the charging cable and wrap it in the charging station cable storage slot, and insert the charging connector into the charging station connector base.

--End

3.5 Instructions to User

The below instructions and safety precautions shall be installed and placed right beside the charging station by the Charge Point Operator in a manner that is sturdy and visible to the user.

1. Basic Instructions to use the Charger:

Start Procedure

1) Check if the power is “ON” (Green light is “ON”).
2) Plug-in the charging cable to the vehicle (The light will turn Blue).
3) Tap the RFID Card or Scan the QR code via the provided Mobile App by the Charge Point Operator.
4) Once the charging begins, the blue light will start breathing.

Note: Refer to the light status to make sure that the charger is charging. Please refer to item 3.6 in this manual

Stop Procedure

1) If the car is fully charged the charger will stop automatically.
2) To stop the charging manually, tap the RFID card or tap the “End Charging” on the Mobile App provided by the Charge Point Operator.
3) Unlock the charging cable from the vehicle.
4) Remove the charging cable.
5) Cover or plug-in the cable into the charger.
6) Roll up the charger cable to original position.

2. Safety Precautions

1) Do refrain from using Charger in thundery weather if Charger is located outdoors.
2) In case of emergency, press the red emergency stop button to deactivate the charging process
3) Check that the housing of the charging station is intact and hasn’t suffered any obvious mechanical damage or deformation
4) Check that the charging station is securely fastened to the wall or on the pole
5) Check that nothing is obstructing the connection of the charging cable to the charger socket

Do not use brute force to pull out the mechanically locked charging connector out of the charger socket or the Electric Vehicle socket..

3.6 Indicator Description

Basic/Smart			
NO.	**Charger Status**	**LED indicator color**	**LED Effect**

1	Standby	Green	Constant
2	Charging	Blue	Changes gradually
3	Fault	Red	Constant
4	Vehicle end S2 disconnect	Blue	Pulsate (1Hz)
5	Charging current＜ 1A for 10 minutes	Blue	Constant

3.7 Emergency button

In the event of an emergency, the user should depress the emergency stop button on the charger. Once activated, the emergency stop button will cut off the power supply of the charger from the relay coil and disconnect the hardware circuit board. At the same time, the backend charging management system located in Singapore at AWS data center will be alerted that the emergency stop button has been depressed and this charger will then be immediately deactivated from the system. A deactivated charger will not be able to be used for charging until it is reactivated on the charging management system by customer service engineer

4. Troubleshooting

Fault	Possible causes and solutions
Power LED is off	● No power supply ➢ Damaged, please contact your service partners.
Unable to start the charging process	● Did not insert the connector into the vehicle properly: ➢ Pull out and plug in again. ● Did not execute charging steps correctly: ➢ Follow the instructions in the 3.3 Start-up charger process section. ● The connector is dirty or damaged around the security area: ➢ Clean or replace the charging connector.
The vehicle is not fully charged or the charging time increased	● Due to extreme high temperature of the vehicle or the integrated charger the current drops: ➢ Visually check if the plug device is smudgy, worn or damaged. ➢ If necessary, please contact your service partners. ● Due to the external control device (power supply equipment, PV equipment, or others), the charging cannot be completed.
Fault status: red LED lights on	● Fault ➢ Check all possible cause for failure in the first place (*). ➢ Make sure that the emergency stop button pressed. ➢ Cut off the power supply of the charger, pull out the charging connector of the vehicle and switch the power supply back on. ● Damage ➢ Please contact your service partners.
The emergency stop button had been pressed	● Once the emergency stop button had been pressed ➢ The charger status on Charging Station Management System(CSMS) will turn to "In Maintenance" and will stay in this status until administrator of CSMS unlock it manually. The status will then temporarily turn to offline until the charger report latest status to CSMS and refresh the status. ➢ This function is to avoid the situation that one charger that not works well and had been pressed the emergency stop button. In this case, the charger has risk to be dangerous for users to start using the chargers if the user can release the emergency stop button directly, so it is necessary for Charge Point Operator(CPO) to send the site manager to check and unlock it on CSMS after checking everything is in good condition.

(*) Possible causes for failure（fault status, red LED light on):

In principle, the fault should be solved by pulling the charging connector out of the vehicle：

□□The emergency stop button is pressed to cause a power failure.

Please contact the administrator for hardware recovery.

□□Ungrounded, leaked, and no charging station ID.

Please contact your service partner to maintain the equipment.

5. Routine Maintenance

The following routine maintenance items are for reference only. Please refer to the relevant standards and operation instructions for operation.

5.1 Power distribution system

Power on and off steps of the distribution box.

1） **Check** if the supply voltage is normal.

2） **Power on:** first turn on the main switch of the distribution box and then the branch circuit switch.

3） **Power off:** first turn off the branch circuit switch, and then turn off the main switch of the distribution box.

5.2 Wiring System

5.2.1 Cable

- Weekly routine inspection: check cable for heating and breakage.
- Monthly routine inspection: check cable for heating, breakage, whether the cable is subjected to external pull force, Fixed securely.
- Annual routine inspection: check whether the cable is connected closely to the switch, whether the grounding is reliable, whether the cable is hot or damaged, and whether the insulation resistance of the cable is in accordance with the regulations. The sealing measures of cable into the box are intact, hole sealing is tight.

5.3 Circuit Components

5.3.1 Components

- **Weekly routine inspection:** the emergency stop button is working normally. After pressing the emergency stop button and that it is confirmed the control circuit is disconnected, check whether all operation indicator lights and buzzers are working normally and if the charging connector's fixed clasp is damaged or the connection is abnormal.
- **Quarterly routine inspection:** check whether the circuit components are fixed firmly and if there is a phenomenon of fire burning at the connection of the components. If any abnormality is found, please replace the components as fast as possible.
- **Annual routine inspection:** use the brush and vacuum cleaner to remove the dust from the box. When cleaning, be careful to not blow dust into the components because it will cause a short circuit.

Complete inspection of all components and parts of the box. If any abnormality is found, please replace the parts as fast as possible.

5.4 Auxiliary System

5.4.1 Indicator Lights

- **Monthly routine inspection:** check if the indicator lights burning phenomenon are fixed firmly.
- **Annual inspection:** make sure the wire and indicator light connections are tightly sealed and that do not have corrosion and that all the accessories of the indicator lights are completed, fixed firmly and have not burned out. Also check if the incoming insulation is in compliance with the regulations.

5.5 Electrical Ground System

Electrical grounding is very important in electrical operation. The safety of human and equipment depends largely on the integrity and safety of grounding equipment. If the grounding equipment is not solid, reliable and does not conform to the standard requirements, it will inevitably lead to security risks, and there is always the possibility of personal and equipment safety crisis.

Therefore, careful inspection and timely maintenance must be carried out to make the ground system always operate in a safe state.

- **Weekly routine inspection:** check if the grounding of the equipment is loose, lost or altered. Observe carefully whether the grounding of the equipment is intact and if the anti-loosening device is completed, damaged or removed.
- **Monthly routine inspection:** make sure whether the connection of electrical grounding system is rusty, with oxidation or unstable; if it does, it will increase earthling resistance. Also check if the grounding mark is completed or damaged. Check the device in the switch box for looseness, corrosion, and rust.
- **Annual routine inspection:** make sure the grounding wires and terminals are in good condition. Use the multi-meter to detect whether the grounding resistance meets or exceeds the standard grounding requirements.

5.6 Appearance

Monthly routine inspection, whether there are stains in appearance of device, the overall cleaning of whole device, timely modify the appearance.

5.7 Maintenance Period

Inspection item	Every month	Every quarter	Every half year	Annual	Treating method
Charging connector	√	√	√	√	Check
Leakage switch protection	√	√	√	√	Check
Emergency stop function check	√	√	√	√	Test
Dust inspection of control board	√	√	√	√	Check and Clear

6. Customer Service

6.1 Preparation

If you have any questions or problems, please contact the company responsible for performing the electrical installation.

Before contacting Customer Service:

- **Check** the troubleshooting measures in the *Troubleshooting* section of this manual.
- **Check** the troubleshooting measures in the *Vehicle Manufacturer's manual*.
- **Record** the model and serial number of the device 6.2 Contact information.

6.2 Contact Information

Company address: No.39, Longhui Road, Wujin High-tech zone, Changzhou, Jiangsu, China.

Website: www.starcharge.com

Company E-mail: starcharge@wanbangauto.com

Hotline in China: 400-828-0768

A. Installation Instruction

A.1 Installation Requirements

- The charger should not be installed close to dangerous locations such as water pipes, gas pipes, and steam pipes.
- The installation location should be convenient for charging. When laying the circuit, the wiring length should be shortened, and the cable resistance energy consumption should be reduced.
- The installation position of the vertical charging station should not be set at a place where the terrain is low and water or dripping is easy. The installation should be vertical and the center of gravity should not be too high to prevent tipping or tilting. It should not be placed in a place with severe vibration or high temperature. The height of the charging column should be about 60cm from the horizontal plane.
- The wall-mounted charging station must be connected to the wall at least two points, and the tool pile cannot be removed. The wall should be installed to withstand the weight of the charging station and its accessories and should not be tilted after installation. The wall and internal lines should not be too close.
- The indoor installation protection level is at least IP41, and the outdoor is at least IP44. It is recommended that the charger be installed in an environment with a sunshade or umbrella; the lighting and passage of the charger installation site must be guaranteed.
- A certain space should be reserved for the installation of the charger, so that the engineering personnel can open the back door of the equipment for inspection and maintenance. Ensure that the ground wire is securely connected to the ground wire of the power supply system.
- Case B is not recommended for public charging stations.
- It is recommended to install MCB, Shunt release and Type-B RCD with below two ways:
  1) Choose a waterproof box and a Isolator switch that both complies with local regulations. First, install MCB, Shunt release and Type-B RCD in the box, then, install the Isolator switch at front end of the box, as shown in Figure A-3.
  2) Install MCB, Shunt release and Type-B RCD to the front section inside the power distribution cabinet(PDC) and an Isolator switch that complies with local regulations at front end of the MCB and Type-B RCD.
- The waterproof box shall have an IP44 degree at least.
- The user needs to install MCB, shunt release and a type B residual current protector (B RCD) in the front-end power distribution cabinet. Please see the table in D.1 Equipment Accessories List, in which MCB, shunt release and type B RCD is included.

Power	Rated voltage	Rated current	Tripping characteristics
22kW	400V	40A	C

- Type B residual current protection device should comply with IEC 61008-1, IEC 61009-1, IEC 60947-2 and IEC 62423.
- The circuit breaker should comply with IEC 60898-1 or IEC 60947-2 or IEC 61009-1.

- Shunt release recommended model specifications are as follows

Brand	Model	fn	Un
Schneider	A9A26476	50/60Hz	100VAC-415VAC

- Type B RCD recommended model specifications are as follows

Brand	Model	In	I△n	Un	Action features
ABB	F204-B40	40A	30mA	230/400VAC	C
Schneider	A9Z61440	40A	30mA	230/400VAC	C

- MCB recommended model specifications are as follows

Brand	Model	In	Un	Curve code
ABB	S204-C40	40A	400VAC	C
Schneider	A9F18440	40A	400VAC	C

- Electrical installation diagram

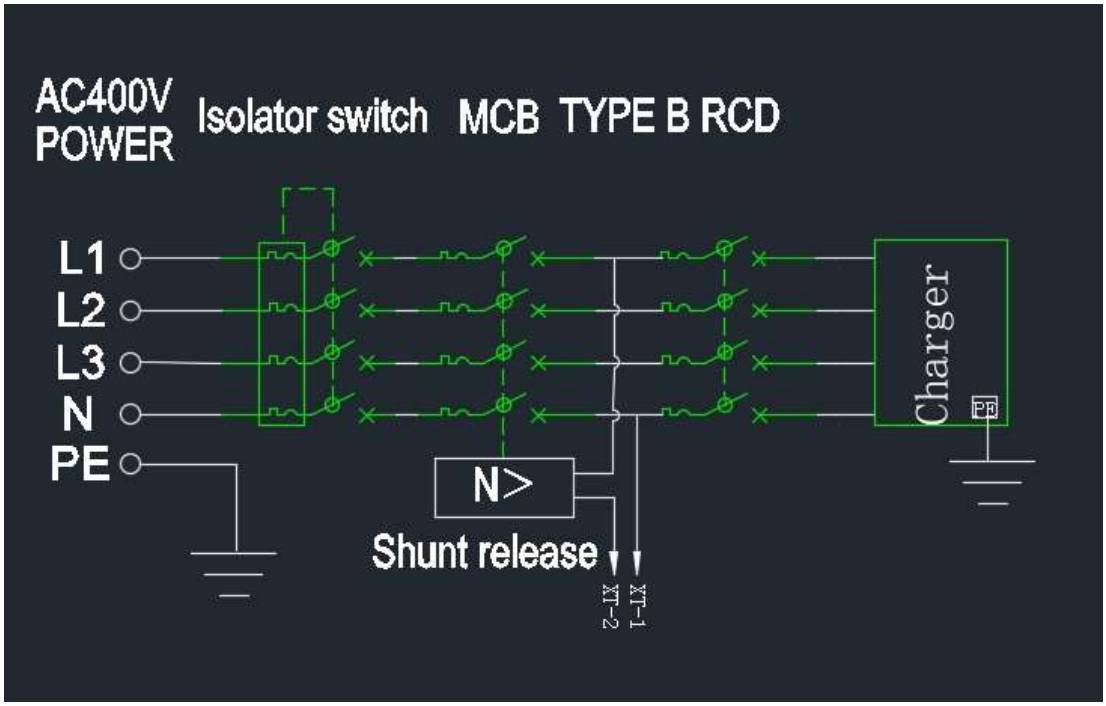


Figure A-1 22KW Installation electrical diagram

Figure A-2 Installation diagram

The components in detail as below,

Figure A-3 MCB

Figure A-4 Shunt release

Figure A-5 Type-B RCD

Figure A-6 Isolator switch

A.2 Power Supply Requirements

- AC working voltage: AC 400V
- AC working frequency: 50Hz/60Hz
- Voltage asymmetry: no more than 5%
- Voltage distortion rate: non-sinusoidal content does not exceed 10% of 400V

A.3 Environmental Requirements

- Working environmental temperature: -30℃～ + 50℃
- Relative humidity: 5% to 95%
- Installation vertical tendency: ≤5%

- Installation and operation altitude: ≤ 2000 meters
- There is no strong vibration and impact at the place of use, and there is no strong electromagnetic interference.

A.4 Wiring Requirements

- Recommended cable specifications of 22kW charger: 6mm^2 (brown L1, black L2, grey L3, blue N，green yellow PE), outside diameter 13 mm-17 mm, Inlet seal rubber plug, as shown in Figure A-7.

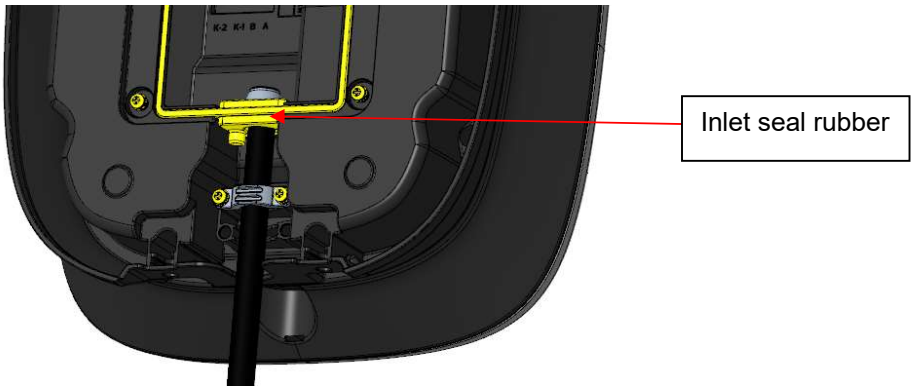


Figure A-7 Location of inlet seal rubber

- Conductive core maximum allowable operating temperature: 105℃.
- Ambient temperature: 0℃ and above.

A.5 Product Installation

- **Tool list**
- Electric drill, tape measure, Phillips screwdriver, pen, tape, tool hammer, star hexagon screwdriver T30, line pressing pliers, paper knife.

A.5.1 Wall-mounted charger

□The general assembly drawing is shown in Figure A-8.

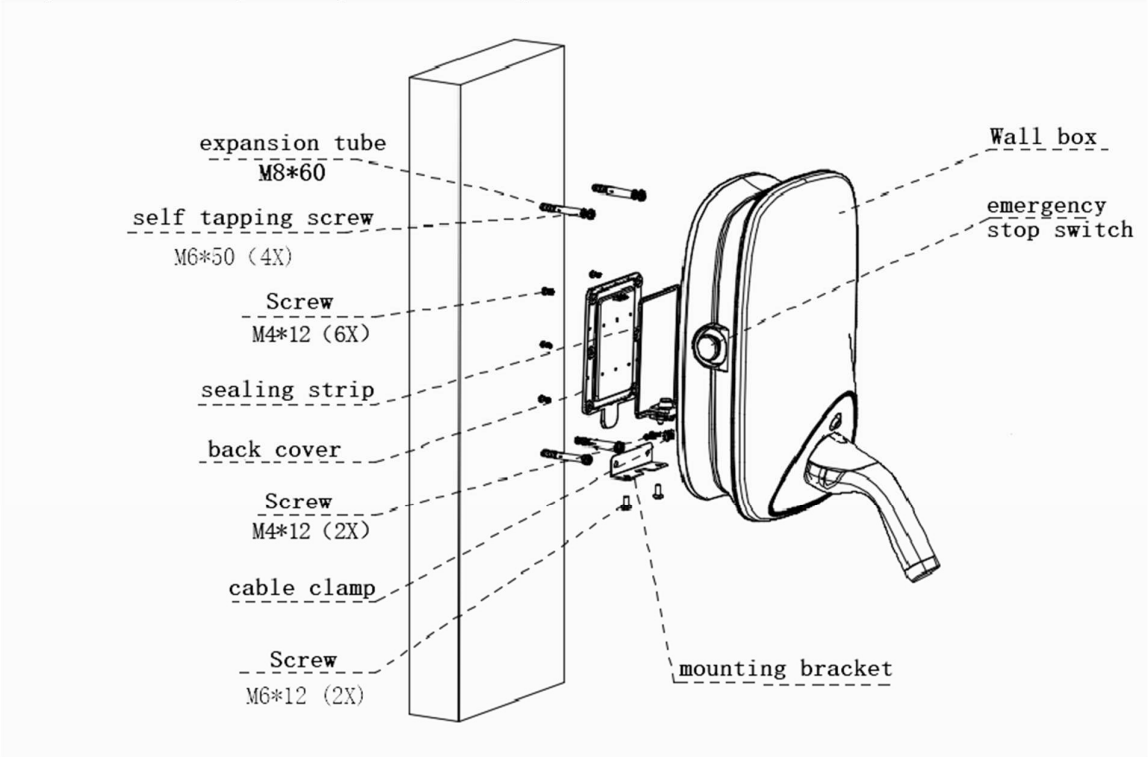
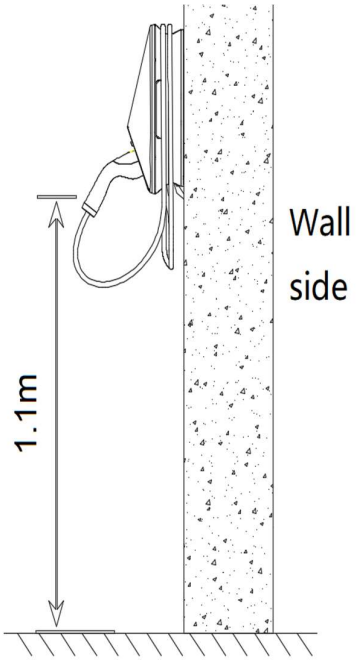


Figure A-8 General assembly drawing of wall-mounted charger

➢ Installation

1. Please confirm the installation location and mark it on the wall. It is suggested that the top height of charging station should be about 1.1 meters from the ground, as shown in Figure A-9 and the height if the pole mounting is as show in in Figure A-10.



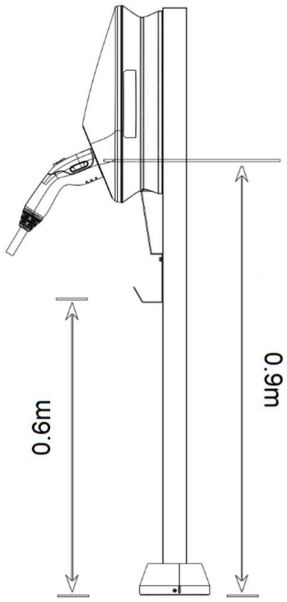


Figure A-9 Wall mounting height Figure A-10 Pole mounting height

2. As shown in Figure A-11, the center distance of the wall drilling hole, place the punching template at a suitable height, and mark the punching position on the wall with a pencil.

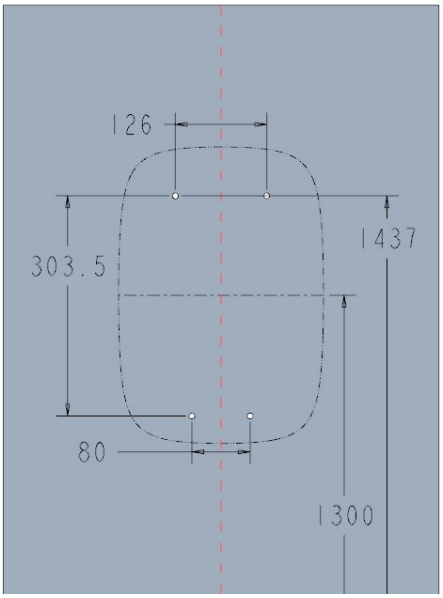


Figure A-11 Wall drilling center distance

3. Use a Φ8 drill bit for the wall to open 4 holes with a depth of 70mm, install an Φ8*60 expansion tube, and use two M6 self-tapping screws to fasten the wall mount to the two holes under the wall, and directly tighten the two holes on the top. Insert two M6 self-tapping screws. Note that the screw head protruding height is 7mm, as shown in Figure A-12.

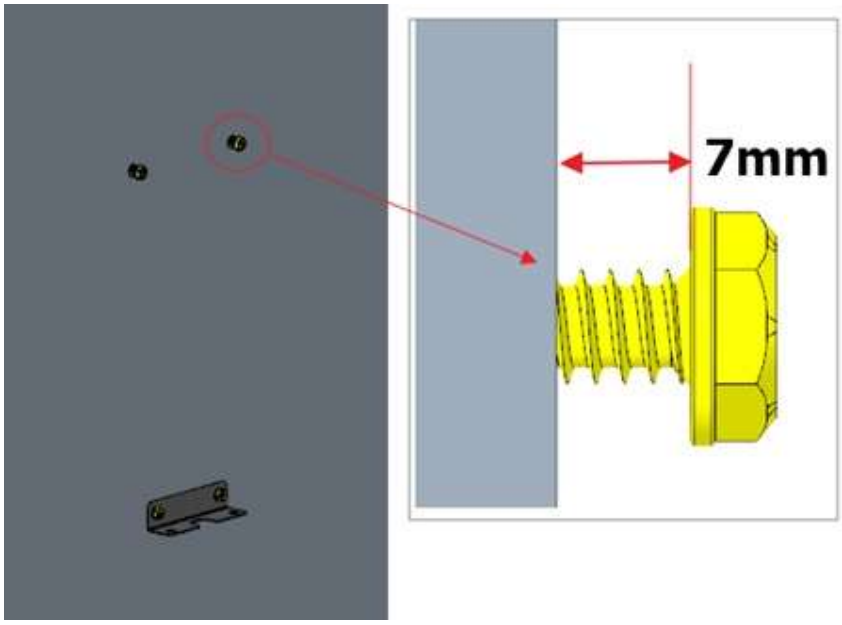


Figure A-12 Fixed Socket and Socket holder bracket

4. Thread the incoming cable through the large hole in the center of the rubber plug of the cable, compress the terminal, and fasten it to the wiring connector with a screw (torque 1.8 Nm, there is a wiring comparison table in the shell).
5. (Optional) If you need to install a network cable (optional, depending on the configuration), you need to cut through the channel on the left side of the cable, insert the network cable, and plug it into the corresponding interface.
6. (Optional) If you need to install a SIM card (optional, depending on the configuration), insert the SIM card directly into the corresponding connector.
7. (Optional) If an external shunt trip is required, the two connecting points reserved according to the indicated position of the product shall successively connect the shunt trip control circuit with a voltage not higher than 400VAC and a current not exceeding 1A in the control circuit, as shown in the following figure A-13:

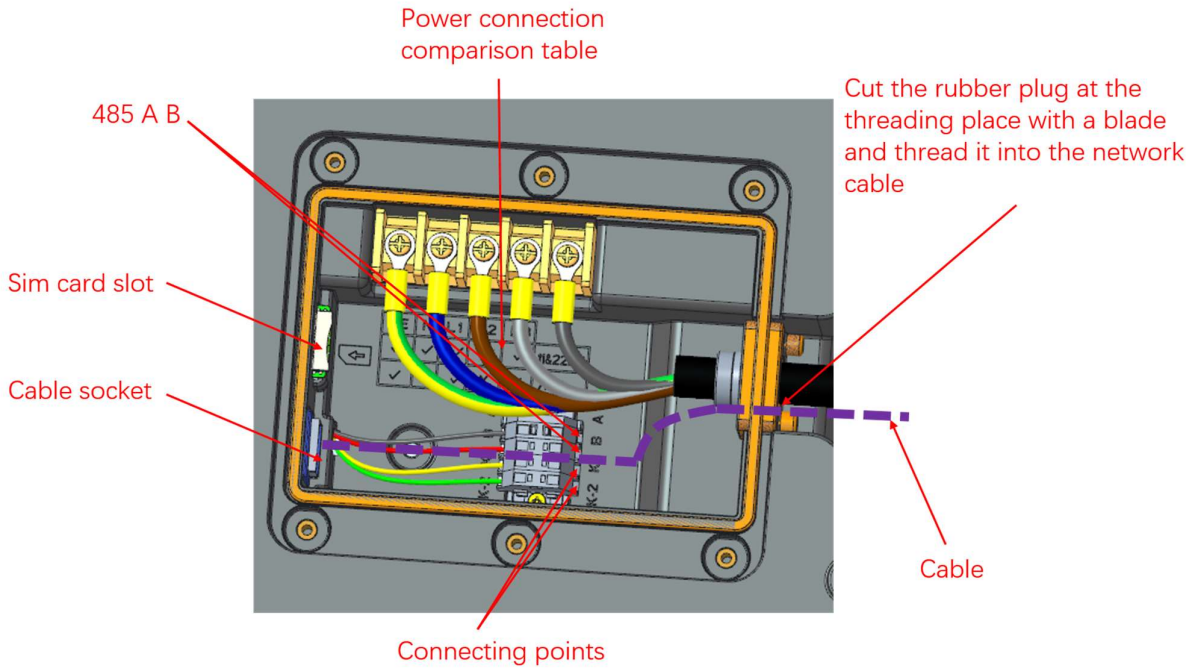


Figure A-13 22kW wiring diagram

8. Use 6 M4*12 screws to tighten the wiring compartment cover, and 2 M4*12 screws to tighten the crimping ferrule. Note that there are two positions for the crimping ferrule, depending on the thickness of the incoming cable, as shown below A-13.

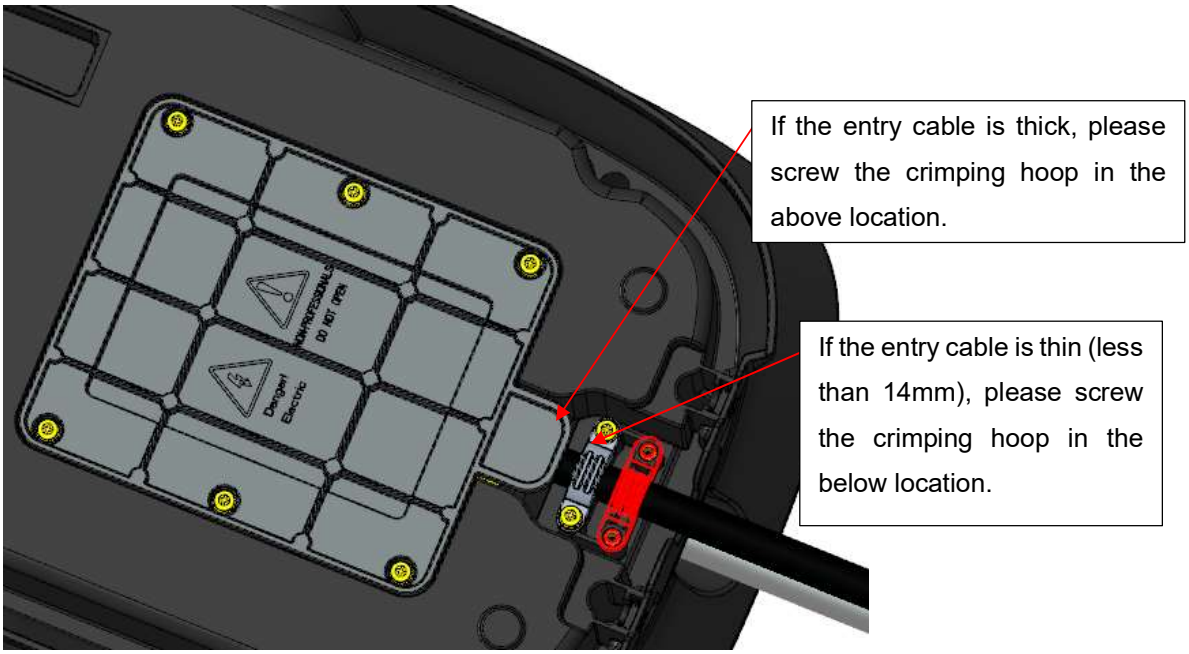


Figure A-14 Install the wiring cover and the cable entry clamp

9. Hang the charger through the two recessed buckles in the rear case and the two screws on the wall, screw in the two M6*12 Torx screws below to tighten the charging station and the wall hanging fitting, as shown in Figure A-15:

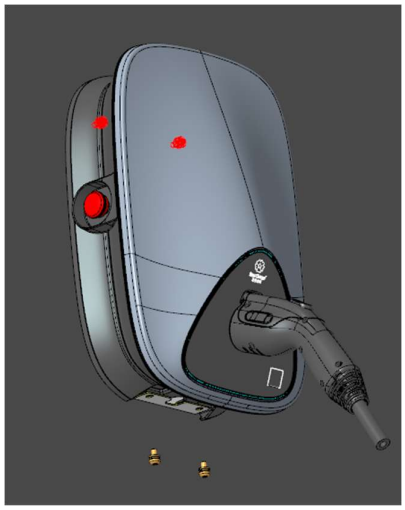


Figure A-15 Hanging charger and bottom fastening

➢ **Check after installation**

1. Clean up

- Dispose of all shipping and packaging materials in accordance with local regulations.
- Clean the charger and surrounding debris, such as small cables, straps, screws/mothers, etc. Do not leave the installation tools on site or in the charging station (record the type and quantity of tools to prevent omission).
- Wipe the insulation with an antistatic cloth. Do not use any corrosive solvents.

2. Inspection

- Check that the base is secure and sealed.
- Check that the internal components of the device are securely fastened.
- Check that the electrical connections and wiring are correct and complete, that the connections are secure, and that the grounding is reliable.
- Check that the degree of protection of the equipment meets the requirements, especially at the cable entry at the bottom of the charging station.
- View appearance, marking, integrity, cleanliness.

A.5.2 Pole-mounted charger

The general assembly drawing is shown in Figure A-16.

Figure A-16 Pole-mounted assembly drawing

- Install incoming line and charging station

1. Lay the column flat on the ground and pass the incoming line out from the front.

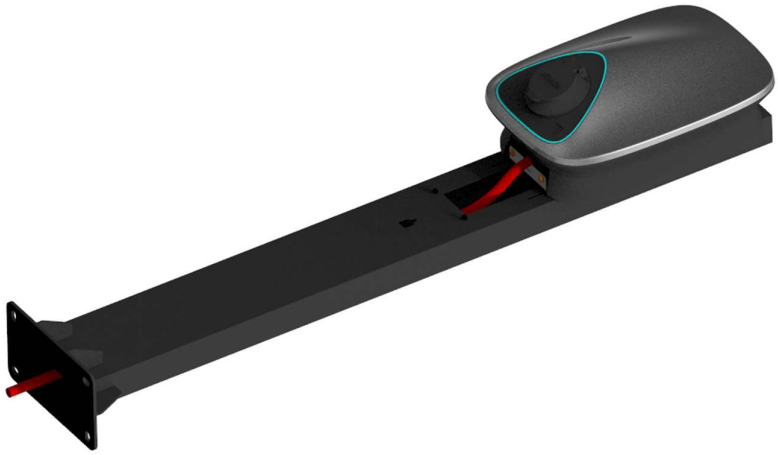


Figure A-17 Into the line installation

2. After connecting the inlet line with the charging station body, fix the charging station body on the vertical column. First, use 2 cross M6*12 (torque: 1.8-2.0n.m) combination screws to fix the wall mount on the column.
3. Hang the charging station on the column, screw in two pattern M6*12 (torque: 1.8~2.0 N.M) combination screws at the bottom, as shown in Figure A-18.

Figure A-18 Charger installation

4. Insert the hanger hook and guard cover into the mounting position and push them up, and then lock them from the front with two M4*12 pattern composite screws (Torque: 1.4~1.6 N.M) with column core head, as shown in Figure A-19.

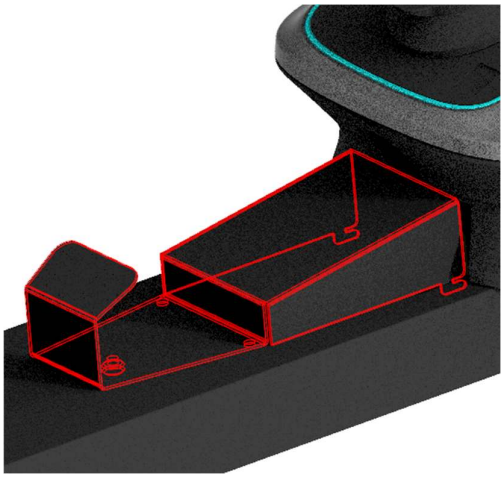


Figure A -19 Thread hook and thread guard installation

- Fixed base

1. Drill 4 holes with A diameter of 10mm and A depth of 150mm on the concrete floor, and the spacing between hole centers is 100mm*200mm. Use 4 M10*120 expansion screws to install and tighten the charging station posts, as shown in Figure A-20 and A-21.

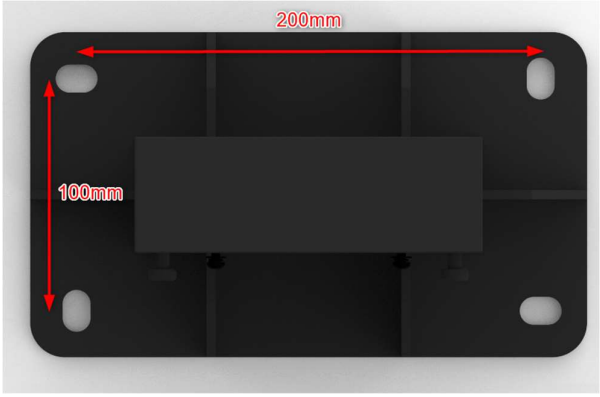


Figure A-20 Fixed base

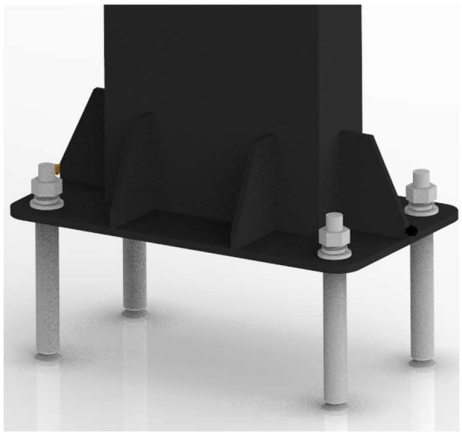


Figure A-21 Fixed column

2. Place the rear decorative cover on the bottom plate of the column.

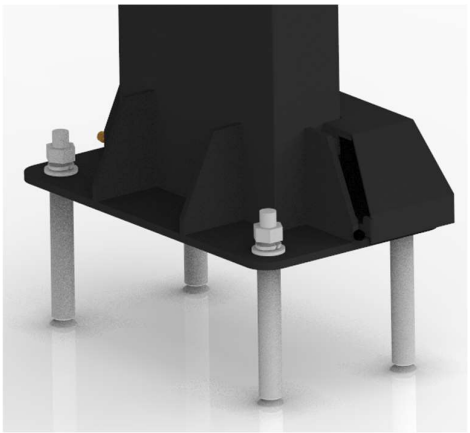


Figure A-22 Install the rear decorative cover

3. Insert the front decorative cover into place from top to bottom and the back decorative cover, and fix both sides of the front decorative cover with 2 M4*12 flower-shaped composite screws (Torque: 1.4~1.6 N.M) with column core.

Figure A-23 Fixed the decorative cover

➢ **Check after installation**

1. Clean up

- Dispose of all shipping and packaging materials in accordance with local regulations.
- Clean the charger and surrounding debris, such as small cables, straps, screws/mothers, etc. Do not leave the installation tools on site or in the charging station (record the type and quantity of tools to prevent omission).
- Wipe the insulation with an antistatic cloth. Do not use any corrosive solvents.

2. Inspection

- Check that the base is secure and sealed.
- Check that the internal components of the device are securely fastened.
- Check that the electrical connections and wiring are correct and complete, that the connections are secure, and that the grounding is reliable.
- Check that the degree of protection of the equipment meets the requirements, especially at the cable entry at the bottom of the charging station.
- View appearance, marking, integrity, cleanliness.

B. Appendix

The following documents are the product design standards:

- IEC 61851-1:2017Electric vehicle conductive charging system –Part 1: General requirements
- IEC 61851-21-2:2018 Electric vehicle conductive charging system –Part 21-2: Electric vehicle requirements for conductive connection to an AC/DC supply – EMC requirements for off-board electric vehicle charging systems
- IEC 60068-2 Environmental testing
- IEC 60068-2-1:2007 Environmental testing - Part 2-1: Tests - Test A: Cold
- IEC 60068-2-2:2007 Environmental testing - Part 2-2: Tests - Test B: Dry heat
- IEC 60068-2-30:2005 Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle)
- IEC 60068-2-78:2012 Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, IEC 61000-4 Electromagnetic compatibility (EMC)
- IEC 61000-4-2:2008, Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test
- IEC 61000-4-3:2006, Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test
- IEC 61000-4-4:2012, Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test
- IEC 61000-4-5:2014, Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test
- IEC 61000-4-6:2013, Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields
- IEC 61000-4-11:2004, Electromagnetic compatibility (EMC) – Part 4-11: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests steady state
- IEC 60950-1:2005 Information technology equipment - Safety - Part 1: General requirements
- BS EN 62196-1:2014 Plugs, socket-outlets,vehicle connectors and vehicle inlets — Conductive charging of electric vehicles - Part 1: General requirements
- IEC 62196-3:2014 Plugs, socket-outlets, vehicle connectors and vehicle inlets – Conductive charging of electric vehicles –Part 3: Dimensional compatibility and interchangeability requirements for d.c. and a.c./d.c. pin and contact-tube vehicle couplers

C. Warranty Card

C.1 Warranty Terms and Conditions

- **Basic information**

1. Welcome to buy products for Wanbang Digital Energy Co., Ltd.

2. If there are any requirements for the products purchased or used that exceed the standard warranty, please call 400-828-0768 to learn about various warranty upgrades and extended warranty services.

- **Product warranty policy**

1. If the user has a performance failure within 7 days of the purchase, they can choose to exchange the goods or apply for free maintenance. If the user applies for replacement, they need to provide the purchase invoice, warranty card, original packaging box and any other accessories.

2. When the user applies for free maintenance service during the warranty period, they need to provide a valid purchase invoice and warranty card. The start date of the warranty period is the purchase date indicated in the invoice. The warranty period of the product is subjected to the date of delivery date of the product recorded if the user cannot provide a valid purchase invoice or the warranty card, or if the information listed in the above warranty certificate does not conform to the product, or it is altered or unidentifiable. If a valid product release date is not available, a free warranty will not be possible.

3. The machine repaired by the company will continue to enjoy the warranty service during the original warranty period.

4. The faulty parts or faulty machines that have been replaced after the repair are owned by Wanbang.

5. The user must properly keep the warranty card; the company does not reissue a new one.

Product warranty does not include the following conditions:

1. Any damage caused by man-made or transport damage.

2. Products that have been disassembled and repaired by users and non-authorized service organizations.

3. Products that have been damaged due to unpacking and improper use.

4. Failure or damage caused by use in a work environment not allowed by the product, including exceeding the product's workload.

5. Failure and damage caused by improper storage by the user.

C.2 Information Registration

Product name	
Product model	
Warranty period	
User name	
Contact Phone	
Contact address	
Dealer stamp	

D. Equipment Accessories

D.1 Equipment Accessories List

NO.	Equipment component	Quantity	Comments
1	AC charger	1	/
2	Terminal connectors	1	22kW Pin terminal:E2508-BLUE,KST*5 Round terminal:RV3-4,KST*5 Ground terminal:AVK16RD*1
3	Wall hanging	1	Wall hanging*1 M6 Self-tapping screws*4 8mm diameter plastic expansion tube*4 M6 flower type pan head combination screw*2
4	RFID Card	2	/
5	User manual	1	/
6	Pole(Optional)	1	M3 flower type pan head combination screw*2 M4 flower type pan head combination screw*2 M6 flower type pan head combination screw*2 M10 Expansion bolt*4 M6 hexagon nut*1 Pole*1 Cable protection cover *1 Front decorative cover*1 Rear decorative cover*1
7	MCB	1	Schneider, A9F18440, 40A 400VAC ABB, S204-C40, 40A 400VAC
8	Type B RCD	1	Schneider, A9Z61440, 4P/40A/400VAC/30mA ABB, F204-B40, 4P/40A/400VAC/30mA
9	Shunt Release	1	Schneider, A9A26476, 100VAC-415VAC，50/60HZ