ATESS EVD-80D

DC EV Charging Station
User Manual

Copyright Notice

Thank you for choosing ATESS

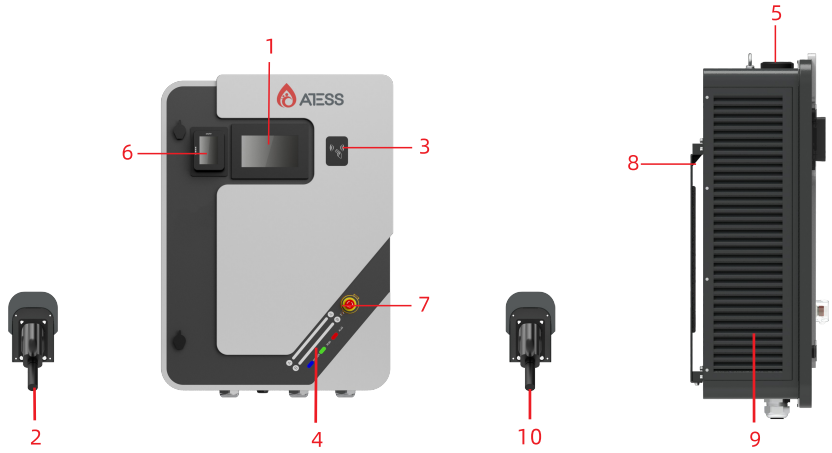
EVD series intelligent DC EV charging station is a device that provides high-efficiency, safe and stable DC power supply for electric vehicles, which has a friendly man-machine interface and integrates corresponding functions of control, billing, communication and security protection. The charging equipment uses OCPP 1.6JSON open protocol for communication with back-office server, thus to realize functions such as reservation and network payment via mobile APP. Diversified communication options, including wired Ethernet, WIFI, 4G, wireless, are provided for customers to conveniently connect the device to a charging network. This product supports CCS2. Each connector works independently. Up to 2 EV could be charged at the same time. All the above features make it most suitable for outdoor charging.

We sincerely hope that this product can meet your needs, and we welcome and value your feedback and suggestions on the performance and function of the product. We will continuously improve the quality of our products and services.

Contents

1 Product Description

1.1 Product summary



1. HMI.
2. Charging connector holder.
3. RFID reader.
4. LED indicators.
5. WIFI/4G antenna.
6. POS (opt, refer to Chapter 7.1 for installation)
7. Emergency Stop button.
8. Mounting bracket.
9. Air intake.
10. Charging connector holder.

Explanation of LED indicators behaviors:

Blue - Standby (The charging equipment can only be used when the blue light lit).

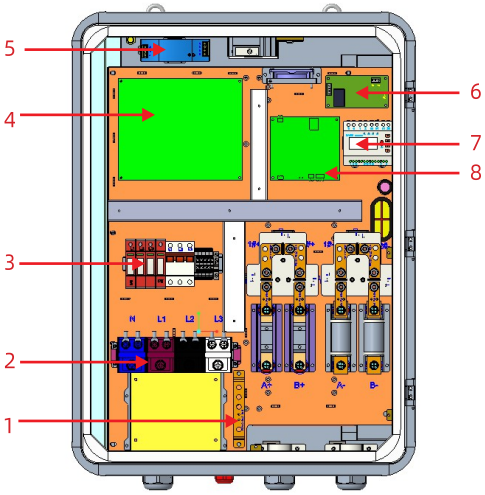
Red Steady on/Flashing - Fault.

Green Steady on - Charging in process.

Green Flashing - Establishing communication.

Yellow Flashing - System initializing.

1.2 Internal view and terminal definition



1. PE terminal
2. AC input terminal block.
Terminal definition is (L1/L2/L3/N).
3. SPD
4. Main board
5. Auxiliary power supply
6. Insulation detection board
7. Power meter
8. SECC communication board

Fig: AC Surge protection device

Note: The charging equipment will detect the current status of the lightning arrester module in real time. When the lightning protection module is damaged, the display will have an alarm indicating that the lightning protection device is faulty. When repairing and replacing the lightning protection module. Then the maintenance person can operate the breaker in the surge protection circuit and replace the lightning protection module. (When the indication window indicates green, the lightning protection module is normal; when the indication window indicates red, the lightning protection module has been broken and damaged, and the lightning protection module needs to be replaced.)

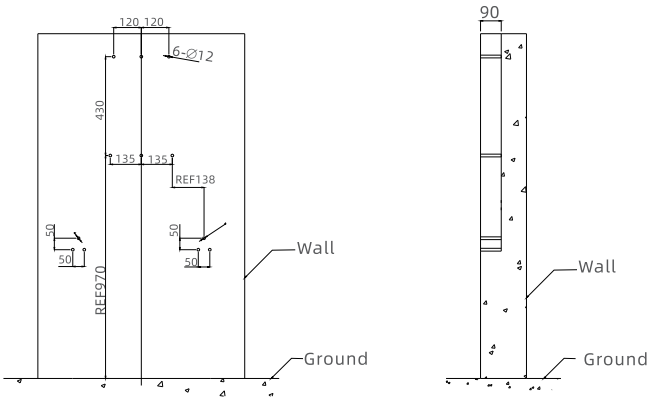
2 Packaging List

No.	Items	Qty	Remark
1	DC EV Charging station	1	
2	User manual	1	
3	Certificate of quality	1	
4	User card	2	
5	Mounting bracket	1	Already installed on the rear side of the charging equipment.
6	Cable holder	2	
7	Cable socket	2	
8	Hex head expansion bolt, M8*80/304 stainless steel.	12	
9	Hexagonal socket head screw, M6*16/304 stainless steel.	8	
10	Standard spring washer,D6/304 stainless steel.	8	
11	Flat washer, D6/304 stainless steel.	8	
12	L-shaped Anti-theft Wrench for Plum Blossom Stud Screws, Size M6.	1	
13	L-shaped Anti-theft Wrench for Plum Blossom Stud Screws, Size M4.	1	

3 Installation and Wiring

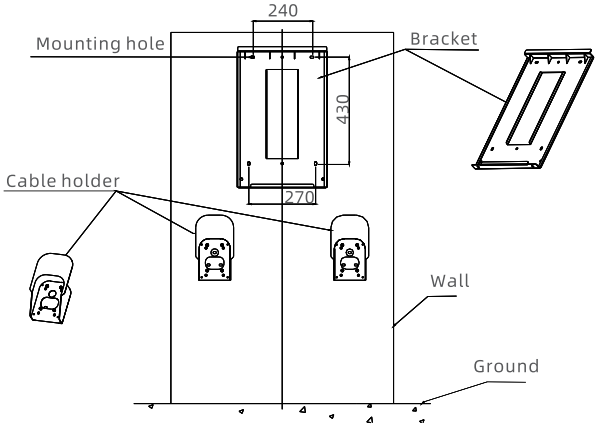
3.1 Installation on the wall

3.1.1 Firstly, according to the specific installation height requirement of the user, determine the installation height of the charging equipment and the installation height of the cable holder. According to the dimensions in the following drawings, drill 4 holes for bracket mounting and 3 holes for cable holder mounting on the wall. Take out the expansion bolts in the packing accessory bag, hammer the expansion bolts into the holes. Remove the nuts and washers for later use.



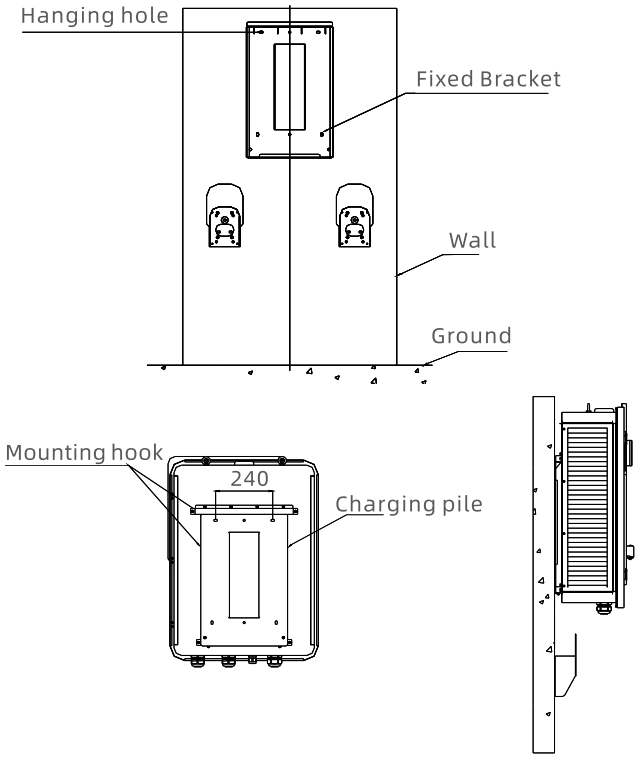
Drill holes on the wall

3.1.2 Loosen the 2 screws at the bottom of the charging equipment that fixes the mounting bracket, keep them properly for later use. Place the mounting bracket onto the bolts just installed and screw the nuts and washers. Take out the cable holder and fix it using the same procedure.



Mount the bracket and cable holder

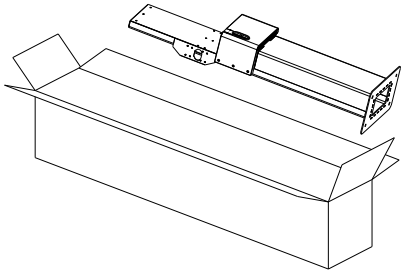
3.1.3 After the mounting bracket and cable holder is fixed, place the charging equipment onto the mounting bracket, with the outward bent part inserted to the slot on the rear side of the charging equipment. Lock the charging equipment onto the bracket at the bottom using the 2 screws. The installation is done.



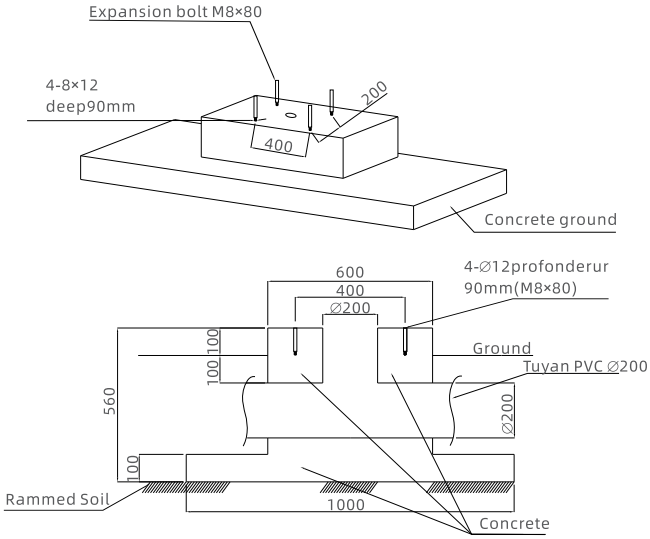
Insert the hanging hooks of the charging pile into the hanging holes and install in place

3.2 Installation on a pole

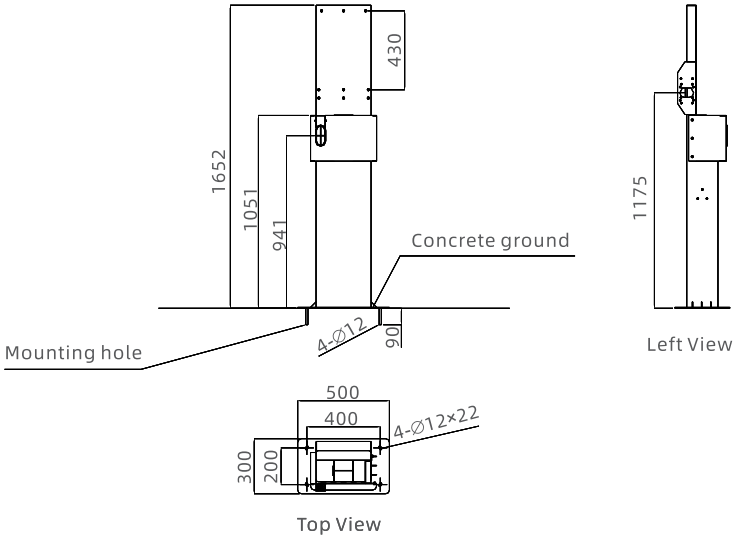
3.2.1 Open the packaging of the pole, take out the pole and mounting accessories.



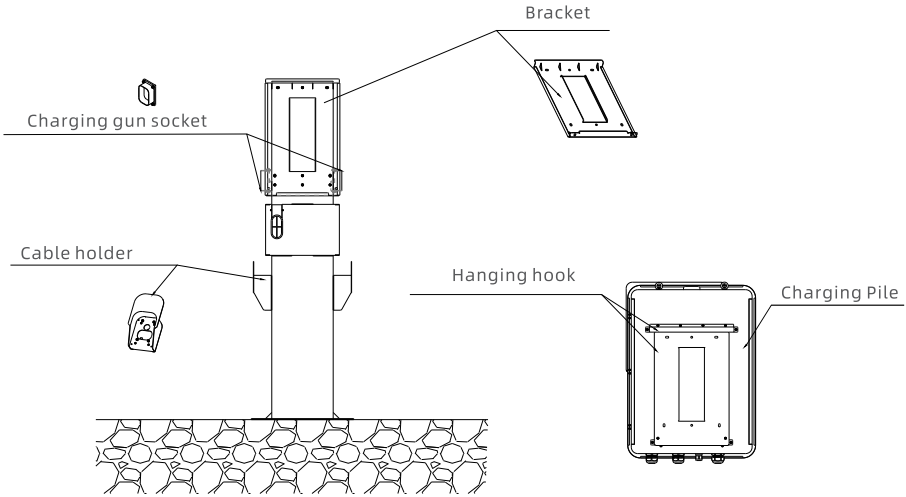
3.2.2 The pole must be installed on a hard surface, concrete surface is recommended, it can also be mounted on a solid ground. Drill holes according to the requirements marked on the illustration for fixing expansion bolts.



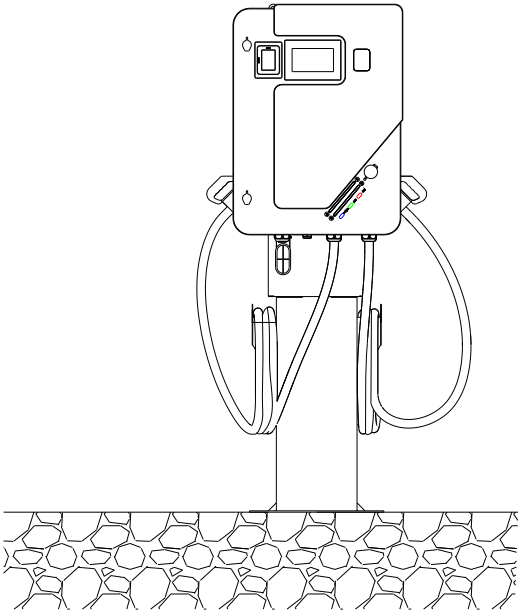
3.2.3 Fix the pole onto the holes with expansion bolts. The input cables shall go into the pole from the bottom middle area and come out of it from the area below the cable holder.



3.2.4 Fix the mounting bracket onto the pole.



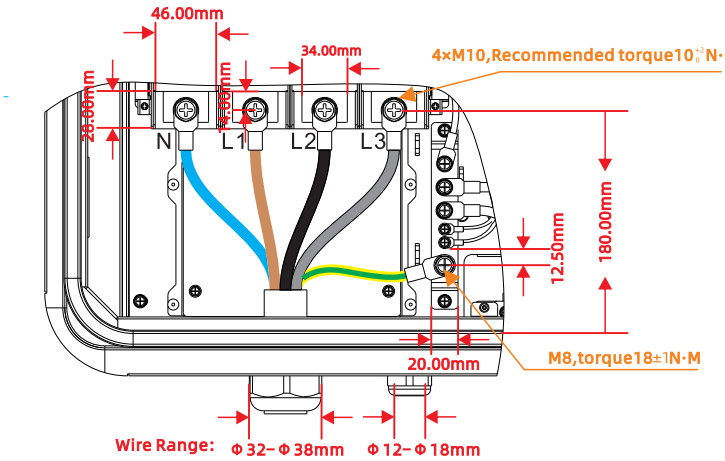
3.2.5 Position the charger onto the bracket and secure it on the bracket with the 2 screws.



3.3 Wiring

Now prepare for wiring. Use 4 power cables and 1 PE cable, it is suggested to use a 5-core cable(with PE included) for the convenience of using the water-proof cable gland. The live wires shall be at least 50mm², PE shall be greater than 25mm². The terminals for L1, L2, L3, and N wires are all secured with M10 screws. The terminal for PE wire is secured with M8 screw. Open the 2 locks at the left side of the upper front cover and open it. Connect the AC input cables into the corresponding terminals through the cable gland on the bottom left side and fasten them(Refer to the Internal view and terminal definition part for wire connection), put the transparent cover on the terminal block for safety purpose. Connect the network cable through the hole in front of the AC input cable gland to the RJ45 socket and fasten the water-proof gland. Turn on the MCB. Close and lock the upper cover after checking internal wiring and breaker position. The wiring is then finished.

	L1	L2	L3	N	PE
Terminal					
Wire	≥50mm² ≥AWG1/0	≥50mm² ≥AWG1/0	≥50mm² ≥AWG1/0	≥50mm² ≥AWG1/0	≥25mm² ≥AWG3



Mechanical and Installation Specifications:

①Copper strip width: 34.00mm

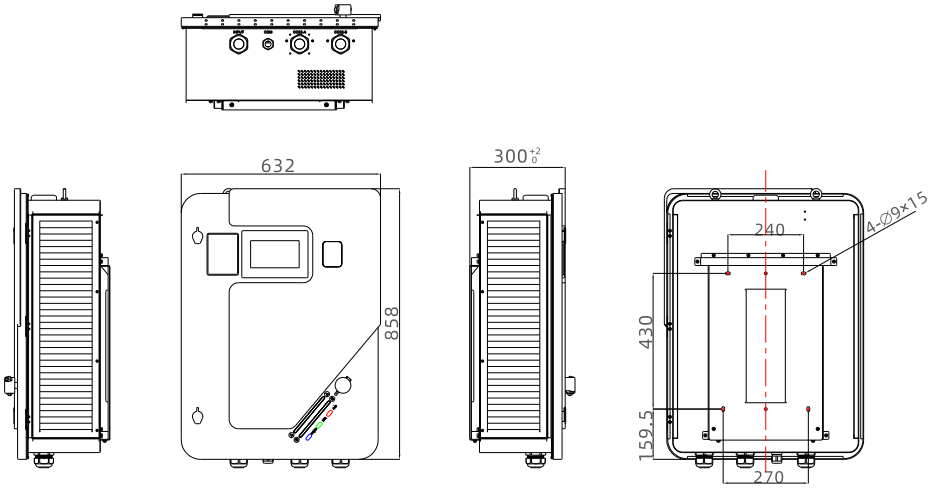
②Recommended torque:

L1,L2,L3,N: 10^{+2}_{0}N·m; PE: 18±1N·m

③Wire crimping range:

L1,L2,L3,N: 50-70mm² ; PE: 25-35mm²

It is recommended to route the cable through the waterproof gland first, and then crimp the terminal.



Note:

1.Only professional personnel can do the wiring, connect the AC input wires in correct phase order according to the markings on the terminal block.

2.The PE terminal shall be connected to the Earth firmly and reliably!

3.No live work! Turn off the upstream breaker in the distribution panel and the breaker inside the charging equipment before repairing or maintaining.

4.It is recommended to install at least TypeA circuit breaker protection at the front of the charger input.

Distribution end RCBO Selection Recommended:

Rated power P: 80kW

Rated voltage Ue: 400Vac

Working voltage U: 320Vac~457Vac

Efficiency η : 95%

Power factor PF: COSΦ≥0.99

Rated current: Ie=P/1.732η UeCOSΦ =123A, recommended RCBO rated current :≥153A=1.25*Ie.

Maximum current: Imax=P/1.732η UCOSΦ =154A, recommended RCBO rated current :≥192A=1.25*Ie.

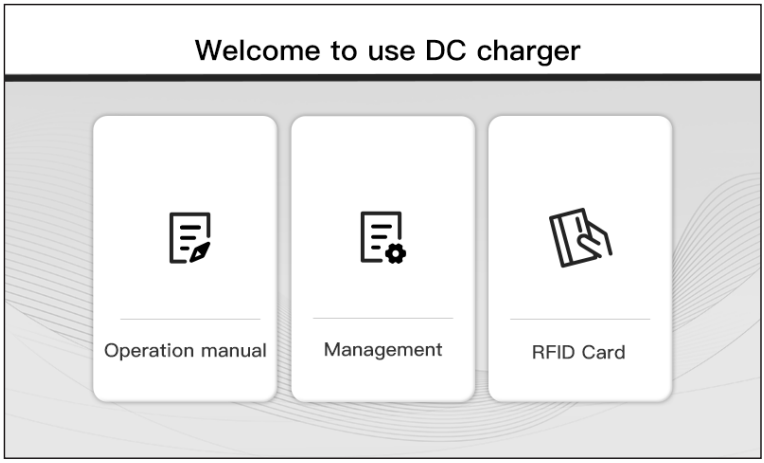
5.Adaptors of conversion adapters that are not allowed to be used

6.Extension cords that are not allowed be used

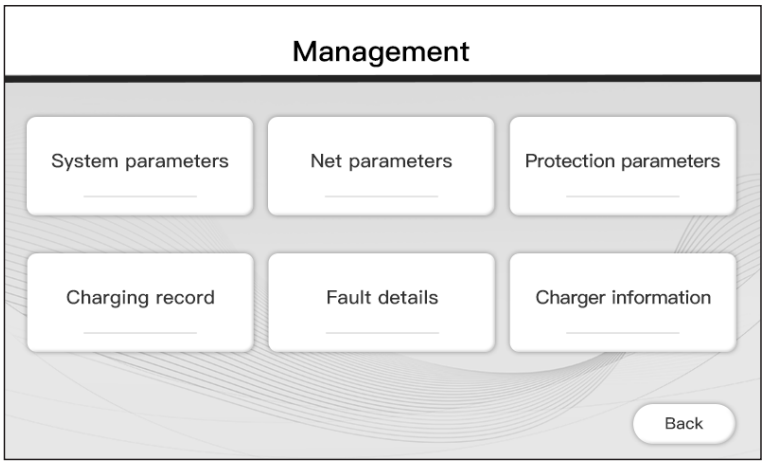
7.Please do not disassemble the unit unless authorized!

4 Parameter Configuration

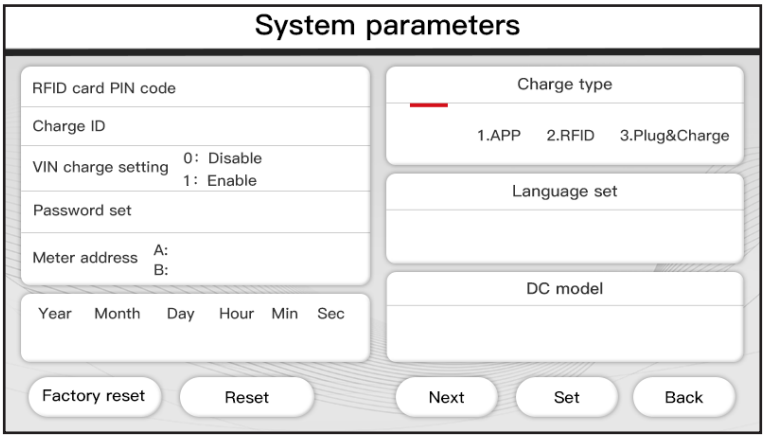
After installed and connected, the charging equipment must first be configured according to the actual needs of the user. The parametersare configured through the LCD touch screen. Save the change and exit then the charging equipment can be used normally.



After the system enters standby, click the button marked by the red rectangle in the above figure to enter the system management page, as shown below.



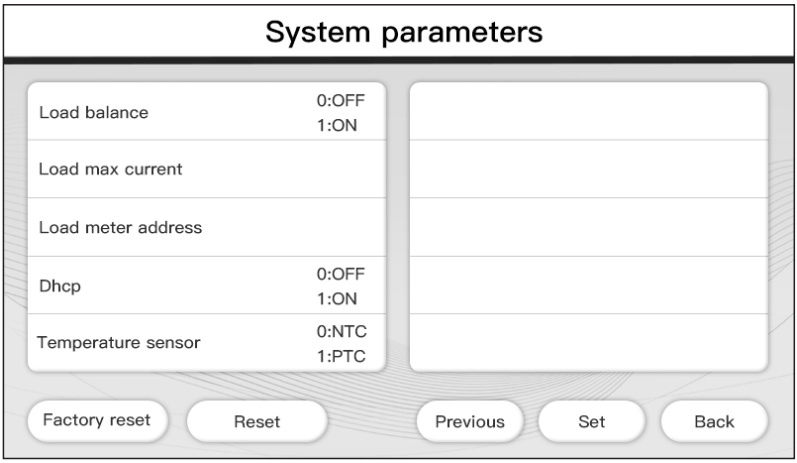
4.1 System Parameters



No.	Parameters	Function description
1	RFID card PIN code	PIN code setting of RFID reader, a 6-digit code, the default setting is 242007. It must be the same with the PIN code of user card. Users can also use other PIN code if they have card writer to change PIN code of user card.
2	Charge ID	Suggested to use serial number as charger ID.
3	VIN charge setting	Custom function.
4	Password set	Password of management page. It's a 4-digit fixed length password, default is "1234".
5	Meter address	DC meter's modbus address(already preset in factory, it is not allowed to modify)
6	Time set	System time setting. Format is Y, M, D, H, M, S. The year setting can only set the last 2 digits, e.g. use 22 for 2022.
7	Charge type	Charging mode setting. 1 is APP mode; 2 is RFID mode; 3 is Plug&charge mode.
8	Language set	Language setting. Currently support English and France dual language display.

No.	Parameters	Function description
9	DC	Charge model (already preset in factory)

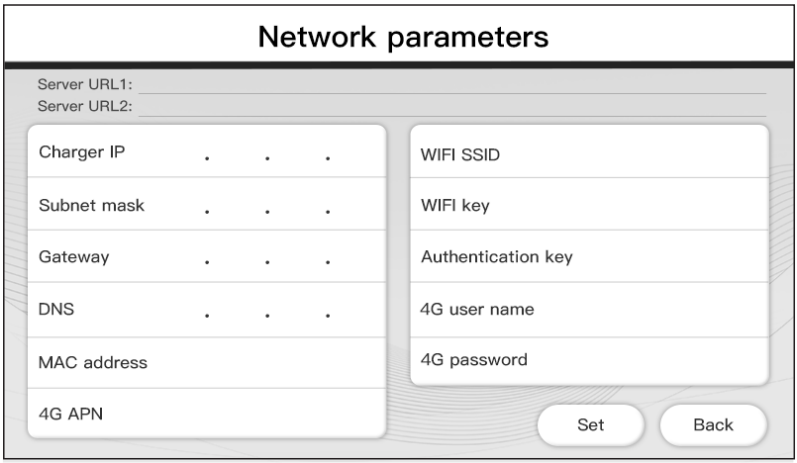
After changing parameters, click the "Set" button to save the setting, then click the "Back" button for the setting to take effect.



No.	Parameters	Function description
1	Load balance	Load balancing switch
2	Load max current	Load balancing limits current
3	Load meter address	Load balancing meter address
4	Dhcp	Automatically switch IP addresses
5	Temperature sensor	Charging cable temperature sensor type

4.2 Network parameters

Network parameters need to be configured when the charging station needs to be connected to back office server for operation and management. Network parameters include server parameters and charger parameters. Currently the charging equipment only support LAN connection, WiFi/4G is yet to develop.

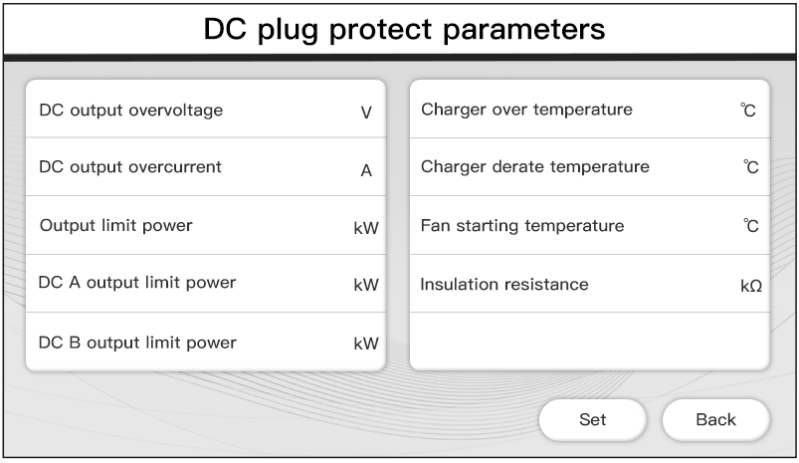


No.	Parameters	Function description
1	Server URL1	Server address setting, used to set domain or IP address of back-office server.
2	Server URL2	Address of backup server. This parameter is not available now, reserved for future use.
3	Charger IP	IP setting of the charging equipment.
4	Subnet mask	Subnet mask setting.
5	Gateway	Gateway setting.
6	DNS	DNS server address.
7	MAC Addr	MAC address.
8	4G APN	4G APN setting.

No.	Parameters	Function description
9	WIFI SSID	WIFI SSID setting, to set the name of the wireless network to which the charging equipment is to be connected. A reserved function for future use.
10	WIFI Key	WiFi password setting. A reserved function for future use
11	Authentication Key	OCPP login authentication setting
12	4G user name	4G user name setting
13	4G user pwd	4G uer password setting

4.3 Protection parameters

The protection-related parameters, such as voltage, current, temperature, power, etc.

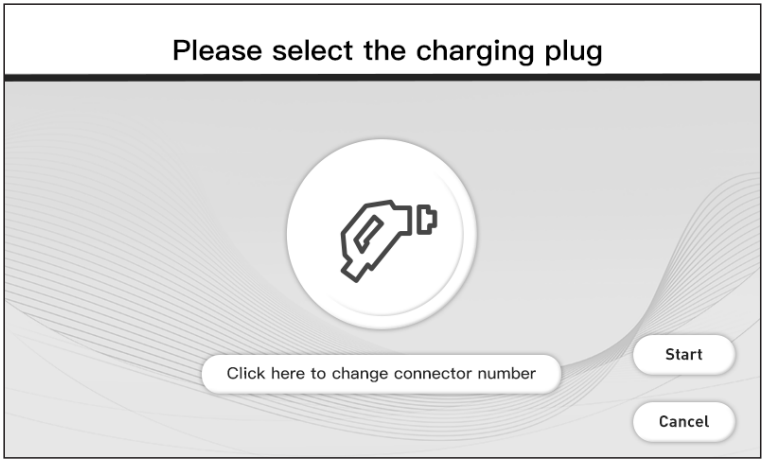


No.	Parameters	Function description
1	DC output overvoltage	Over voltage limit setting of DC output
2	DC output overcurrent	Over current limit setting of DC output

No.	Parameters	Function description
3	DC output limit power	Power limitation setting of DC output.
4	DC A output limit power	Power limitation setting of CCS-2-A output.
5	DC B output limit power	Power limitation setting of CCS-2-B output.
6	Charger over temperature	Over temperature limit setting of charging connector.
7	Charger derate temperature value	Charging connector's temperature at which the charging equipment starts decreasing output power.
8	Fan starting temperature	Fan operating temperature.
9	Insulation resistance	The min value of insulation resistance.

4.4 Plug type

There are CCS2 two plugs optional.



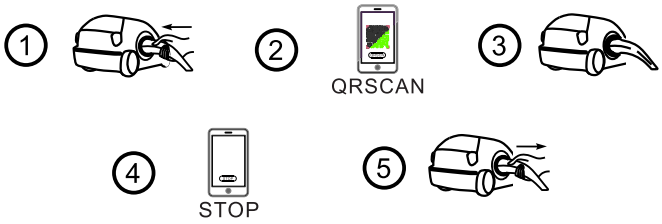
5 Operation instruction and LCD introduction

5.1 Charging mode and operation

APP mode:

Initiate or cease charging by scanning QR code using APP or by swiping RFID card.

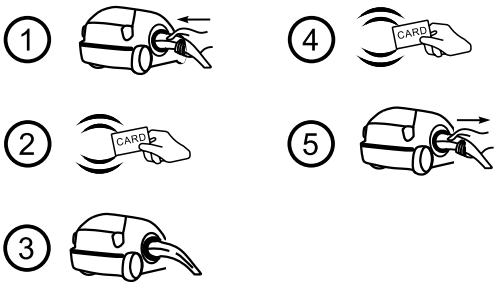
You can also use APP for reservation and payment provided that the back-office server supports such function.



APP mode operation process flow

RFID mode:

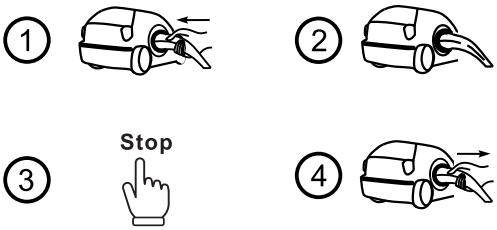
Charging can only be initiated or ceased by swiping RFID card.



RFID mode operation process flow

Plug&Charge:

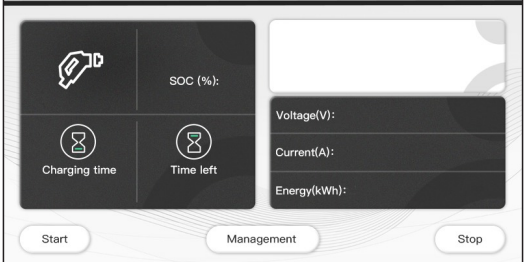
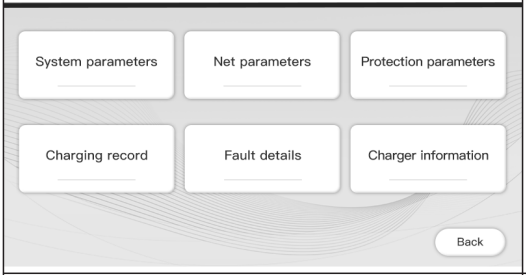
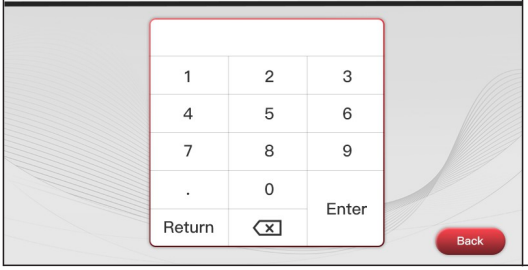
Charging will start automatically after EV plugged in. If you want to stop the charging, just press the stop icon on the screen.

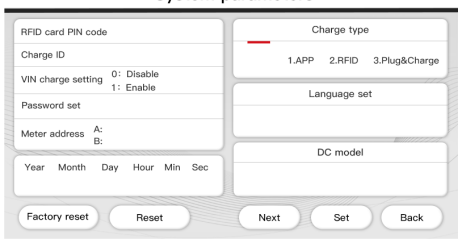


Plug&Charge mode operation process flow

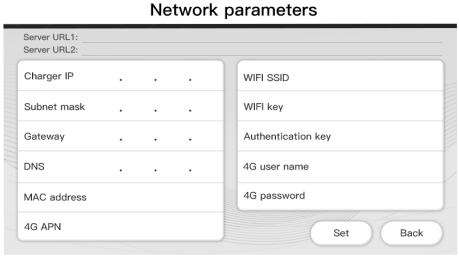
5.2 LCD interface introduction

The charging equipment is equipped with a 7 inch industrial-grade resistor type touch panel. The display content is as below.

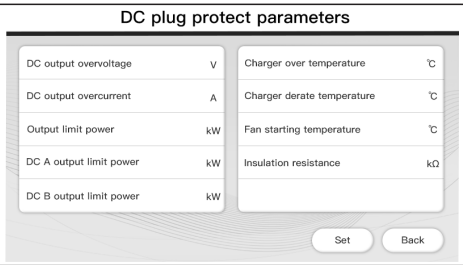
Welcome to use DC charger 	When powered up, the charging equipment will show this display.
DC connector charging information 	Charging information, which will show the status of the charging equipment, such as standby, charging, fault, etc.
Management 	Management page, user can set different kinds of parameters here. Password authentication is required when entering each parameter setting page.
Please enter password 	Password window. Before entering numeric, please first press the text display field to move the cursor there, then you can type in the 4-digit password. A wrong password will cause no response and action.



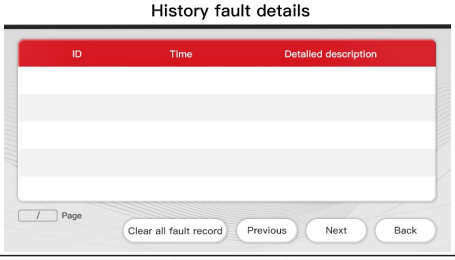
System parameters page.



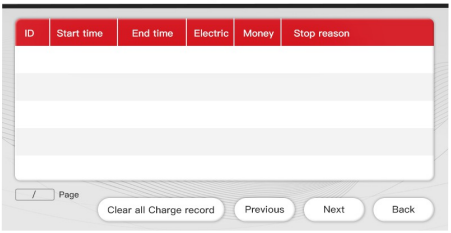
Network parameters page, used to set network related parameters of back-office server and the charging equipment.



Protection parameters page of DC output, used to set limit value of voltage, current, power, temperature, etc.



Fault record page, user can check history fault record here.



Charging record page.

5.3 Appendix: Fault code

No.	Fault description
1	Emergency stop is pressed!
2	Over temperature fault!
3	Lightning protection fault!
4	Power module communication fault!
5	Meter communication fault!
6	DC output overvoltage fault!
7	DC output overcurrent fault!
8	Waiting for BMS communication timeout!
9	Insulation detection timeout!
10	Insulation detection fault!
11	DC+ Contactor sticking fault!
12	DC- Contactor sticking fault!
13	Plug head connection over temperature fault!
14	BMS communication fault!

6 Specification

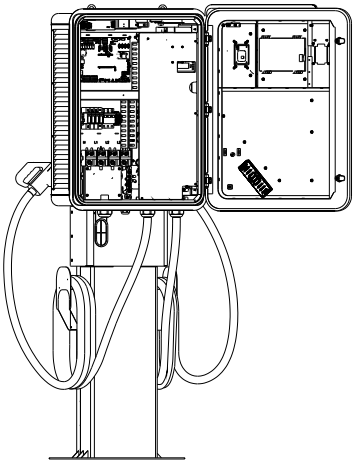
Model	EVD-80D
Dimension(mm)	632*858*300(W*H*D)
Weight(kg)	115kg
Display	LCD
Casing material	Stainless steel&acrylic sheet
AC input	
Grid connection	400V,3 phase 5 wires
Voltage	AC 320~457V
Current	122A
Frequency	50/60Hz
DC output	
Plug type	CCS2
Voltage	DC150~1000V
Current	0~200A
Voltage-stabilizing accuracy	< ±0.5%
Current-stabilizing accuracy	< ±1%
Power factor	≥0.98
Efficiency	≥95% Full Load

Ingress protection	IP54
Operating temperature	-25℃~50℃, derate since 50℃
Relative humidity	5%~95%
Altitude	≤2000m, derate for higher than 2000m
Cooling method	Forced air cooling
Remote monitoring	Ethernet/WIFI/4G/485/232
Payment	APP/RFID/Credit card
Standby power	50W
Standards	IEC 62196-3,IEC61851-1,IEC61851-23,ISO15118
Mounting	Wall or Pole
Certificate	CE
Metering accuracy	0.5
Protection features	
Over/Under voltage of AC output	YES
Over voltage of DC output	YES
Over temperature protection	Derate since 50℃
Emergency stop protection	YES
Lightning protection	Type II

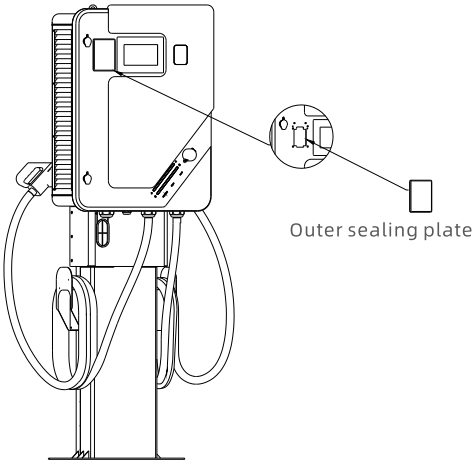
7 Annex A

7.1 POS installation

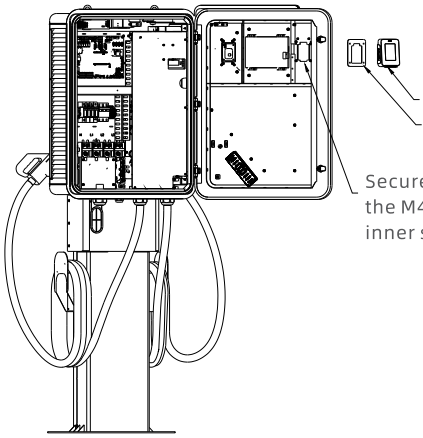
7.1.1Insert Card POS Terminal installation



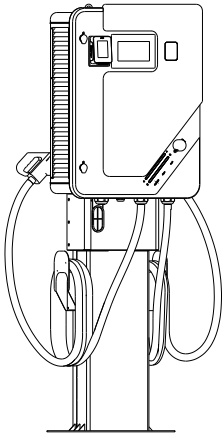
Step 1: Open the cabinet door



Step 2: Remove the outer sealing plate



Step 3: Insert Card POS Terminal installation



Step 4:
After installation completed,
Close the cabinet door

Operation steps:

1.Open the cabinet door with the key.

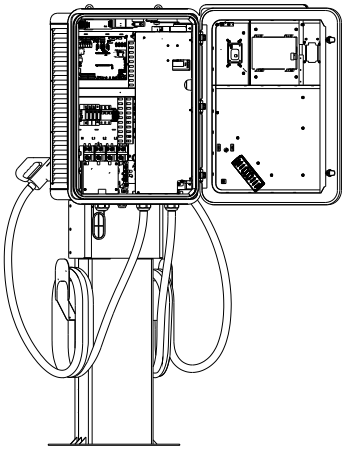
2.Remove the outer sealing plate from the inside of the cabinet with a cross screwdriver.

3. Install the POS machine base on the outer side, place the POS machine, and secure it from the inner side using M4x12 tri-grip screws.

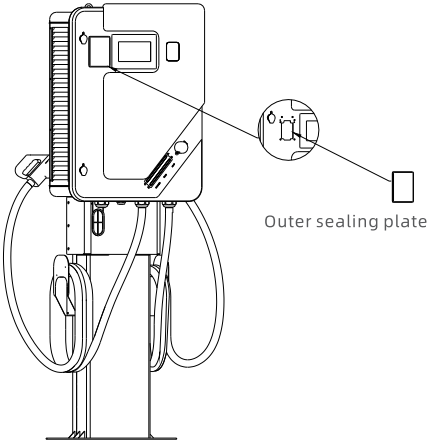
Make sure the POS screws are in place to make the rubber pad waterproof, otherwise there is a risk of water leakage.

4.Close and lock the cabinet door after checking.

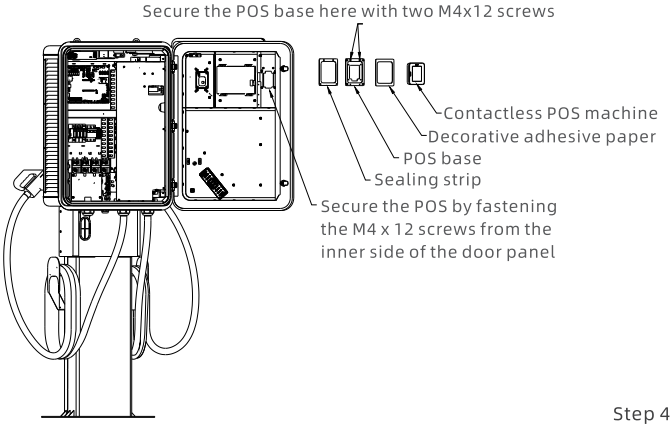
7.1.2 Contactless POS machine installation



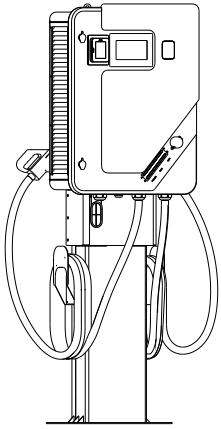
Step 1: Open the cabinet door



Step 2: Remove the outer sealing plate



Step 3: Contactless POS machine installation



Step 4:
After installation completed,
Close the cabinet door

Operation steps:

1.Open the cabinet door with the key.

2.Remove the outer sealing plate from the inside of the cabinet with a cross screwdriver.

3. Install the POS machine base on the outer side, place the POS machine, and secure it from the inner side using M4x12 tri-grip screws.

Make sure the POS screws are in place to make the rubber pad waterproof, otherwise there is a risk of water leakage.

4.Close and lock the cabinet door after checking.

7.2 Electric Diagram

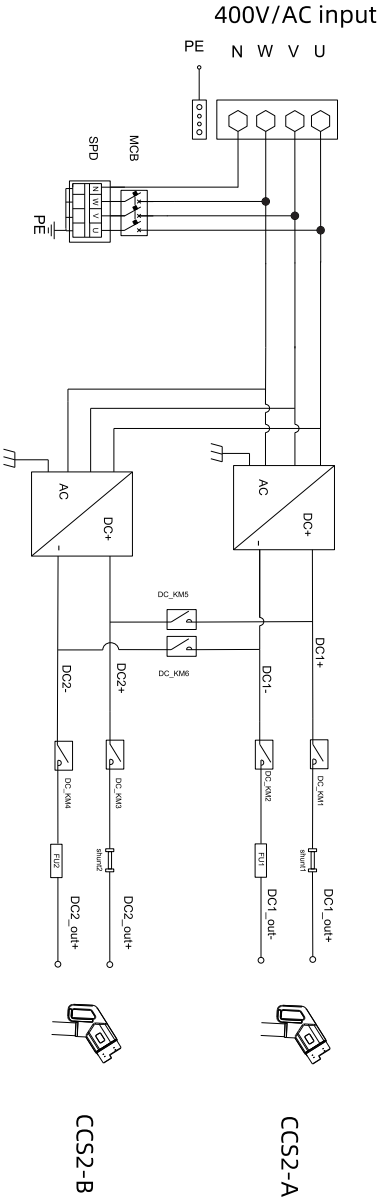


Fig7-2 Main circuit diagram

7.3 Warranty

Warranty period

The warranty period of this product is 3 years. If the contract stipulates otherwise, the contract shall prevail.

For warranty cases during the warranty period, the customer should present the invoice of the purchase of the product to the service personnel of ATESS Power Technology. At the same time, the nameplate on the product should be clearly visible, otherwise the warranty claim might not be accepted.

Warranty condition

ATESS Power Technology Co., Ltd. will repair or replace the product free of charge during the warranty period. The defective machine after replacement shall be owned by ATESS Power Technology, and the customer shall reserve a certain amount of time for ATESS Power Technology to repair the faulty machine.

Liability exemption

ATESS Power Technology reserves the right not to accept the warranty claim if the conditions below happen,

1. No ATESS logo on the product;
2. Warranty period has expired;
3. Failure or damage caused by incorrect installation, by installing the device in a not allowed environment, by improper storage or usage, etc.(e.g. too high or too low temperature, moisture or too try environment, high altitude or unstable voltage/current, etc.)
4. Failure or damage caused by the installation, repair, modification or disassembly by unauthorized service personnel;
5. Failure or damage caused by using ATESS Power Technology's genuine spare parts;
6. Failure or damage caused by accident or human cause (operational error, scratching, handling, bumping, access to inappropriate voltage, etc.), or transport damage;
7. Failure or damage caused by force majeure such as natural disasters (such as earthquakes, lightning strikes, fires, etc.);
8. Other failures or damages that are not caused by quality problem of the product or its components.

8 Annex B: Inspection and Maintenance Manual

8.1 Safety Instructions

Before installing, operating, and maintaining this equipment, you must carefully read and strictly comply with the following safety requirements. Failure to comply with these requirements may result in serious safety accidents such as electric shock to personnel, equipment damage, fire, and explosion, and any resulting liability shall be borne by the operator who fails to comply:

1. Power must be cut off before inspecting the internal structure. During functional testing, the switch must be closed first, followed by closing the cabinet door. Before powering on the equipment, confirm that the protective grounding is properly connected and the grounding resistance meets industry standards to prevent personal injury due to electric shock.

2. The equipment must not be operated in an environment containing flammable or explosive gases or dust, and the working area must be adequately ventilated.

3. No person or organization shall disassemble, modify, or add internal components to the equipment without authorization. If maintenance becomes necessary, contact personnel authorized by the original equipment manufacturer.

4. Do not forcibly disconnect the charging connector during charging. Always follow the on-screen prompts to complete the settlement, high-voltage discharge, and power module shutdown procedures before unplugging or reconnecting the connector.

5. The installation, commissioning, maintenance, and fault rectification of the equipment shall only be carried out by qualified electrical personnel who are properly trained and authorized.

6. Before powering on the equipment, confirm that the input voltage and power frequency match the nameplate ratings. Operation beyond the rated parameters is strictly prohibited.

7. For tools used during operation and maintenance, exposed metal parts other than the working end must be properly insulated (e.g., wrapped with insulating tape) to prevent short circuits caused by contact with the equipment enclosure.

8. The charging connector and cable must not be bent, squeezed, or subjected to excessive stretching or pulling, to prevent electrical hazards caused by mechanical damage.

9. If the charging connector is found to be damaged, cracked, contaminated, or have poor electrical contact, discontinue use immediately and report it for repair.

10. To ensure proper heat dissipation of the equipment, the ventilation dust filter must be cleaned regularly to prevent blockage from dust accumulation.

11. During the installation and operation of the EV chargers, all applicable national and local electrical safety laws and standards shall be complied with.

8.2 Inspection Contents

8.2.1 Charger Environment Inspection

1. Heat Dissipation and Ventilation Requirements: The air inlets/outlets shall be unobstructed (with a distance of ≥ 1.5m). The indoor area shall be adequately ventilated, and the outdoor area shall be protected from direct sunlight to prevent heat accumulation.

2. Safety Zone Requirements: The area around the EV charger shall be kept free of flammable or explosive materials, corrosive liquids, and debris. Fire-fighting equipment shall be unobstructed and readily accessible for emergency use.

3. Installation foundation requirements: The foundation shall be free from structural damage and settlement. The anchor bolts shall be securely fixed. For outdoor or flood-prone areas, the base shall be elevated above ground level and equipped with anti-backflow measures (it is recommended to be ≥ 15cm).

4. Ambient Temperature and Humidity conditions: The ambient temperature shall be between -25 ℃ and 50 ℃, and the relative humidity shall be 5%–95% non-condensing. There shall be no water ingress or condensation in the installation environment.

5. Drainage and Water Accumulation Requirements: There shall be no water accumulation in the installation area. Outdoor areas shall be provided with a drainage slope, and drainage facilities in underground garages shall be properly functioning.

6. Pollution Protection Requirements: There shall be no significant dust accumulation, and no dust-generating sources near the heat dissipation ports. In chemical plants or coastal areas, the equipment shall be protected against corrosion from corrosive gases or salt spray.

7. Electromagnetic Interference and Clearance Requirements: There shall be no interference from high-power electromagnetic equipment (to ensure normal communication), and the equipment shall be protected against collision during construction. The distance between outdoor vegetation and the EV charger's body shall be ≥ 1.5m.

8.2.2 Charging Gun Storage and Inspection

1. Storage status: When not in use, the charging gun must be placed in the designated socket to prevent the ingress of dust and rainwater.

2. Physical status: The charging gun head shall be free from cracks, deformation, and signs of overheating or burning. The cable shall be free from flattening, breakage, exposed conductors, aging, and cracking, and the insulating layer shall be intact. If any of the above conditions are observed, discontinue use of the charging gun immediately and replace it.

3. Connection detection: After inserting the charging gun into the vehicle's charging inlet, the equipment shall be able to promptly identify the connection status and display the corresponding connector insertion icon.

4. Cleaning and maintenance: There shall be no foreign matter or oxidation on the metal contacts inside the charging connector. If any foreign matter is present, it shall be carefully removed using an insulated tool, with the equipment completely powered off and appropriate insulation protection in place. Metal tools shall not be used to contact the terminals.

8.2.3 Charger Appearance Inspection

1. EV Charger Housing: The charger housing shall be free from obvious deformation, collision dents, and deep scratches. The metal parts of the housing shall be free from rust and extensive paint peeling. The plastic parts shall be free from cracks and aging. The sealing rubber strips shall be properly fitted, with no looseness or signs of water ingress at the joints. The installation bracket shall be securely fixed.(with no looseness, detachment, tilting, deformation, or rust.)

2. Display screen: The screen shall be free from cracks, obvious scratches, and persistent stains on the surface. The displayed text and icons shall be clear, with no image blooming, flickering, black screen, or afterimages. The touch control shall be responsive, with no unresponsive areas. The frame shall be properly fitted, with no warping. Outdoor screens shall be free from fogging and water ingress.

3. Indicator lights: The indicator light cover shall be intact, with no yellowing or damage. The lamp holder shall be securely fixed, with no looseness. The indicator light colors shall be accurate (green for standby, yellow for charging, red for fault).The brightness shall be normal, with no abnormal conditions such as failing to light or remaining on continuously. The indicator lights shall respond promptly and accurately when the operating state changes, consistent with the equipment status.

4. Equipment door lock: The lock body shall be free from deformation and rust. The fixing screws shall be properly installed and secure. The mechanical lock shall operate smoothly when the key is inserted and removed. The electronic lock shall respond promptly to electronic inputs. The switch shall operate smoothly without jamming. The sealing gasket shall be intact. The keyhole shall be free from water ingress and corrosion.

5. Emergency stop switch: The button shall be free from damage, deformation, or sticking, and shall return promptly after being pressed. The protective cover (if present) shall be intact and shall open and close smoothly. The "Emergency Stop" marking shall be clear and unobstructed. The sealing at the bottom wiring port shall be intact and properly installed, with no exposed wires.

8.2.4 EV Charger Internal Components Inspection

1. Core requirement: All internal inspections shall be performed with the equipment completely powered off. First, use a multimeter set to AC voltage mode to measure the incoming terminals and verify that no voltage is present before proceeding.

2. Internal cables: The internal cables shall be free from burn marks, oxidation, damage, or rodent bites. The cables shall be properly arranged, with no looseness or displacement caused by bending or tension.

3. Screws and Wiring Terminals: Check the terminals by gently manipulating the cables. The terminals shall be free from looseness, signs of aging, rust, burn marks, or heat discoloration. Screws shall be fastened using an insulated screwdriver, following the diagonal tightening pattern.

4. AC input circuit breaker: The breaker shall operate smoothly, without sticking or jamming. After closing, the contacts shall make proper contact and operate without abnormal noise or sparking.

5. Incoming Cable Hole Sealing: The fire-resistant sealing compound at the AC input cable entry shall be intact, without detachment or cracking, to ensure proper sealing and prevent moisture ingress.

6. Dust Filter: The dust filter at the air inlets and outlets shall be free from excessive dust accumulation and oil contamination. If the dust filter is contaminated, it shall be cleaned by blowing from the inside out using a high-pressure air blower, and shall be replaced if cleaning is insufficient.

7. Circuit board: The circuit board shall be free from scorching, bulging, or liquid leakage. There shall be no detached or cold solder joints, and no oxidation or corrosion of the copper traces. The connectors shall be firmly seated, with no looseness. Cleaning shall be performed only with an anti-static brush by gently brushing, or by blowing with low-pressure dry compressed air from an oblique top position at a distance of ≥ 15 cm. Cleaning with a damp cloth, high-pressure air, or metal tools is strictly prohibited. Operators shall wear anti-static gloves during cleaning to prevent electrostatic damage to components.

8. Power module: The appearance shall be free from signs of scorching or water ingress and shall have no burning smell. The wiring terminals shall be secure, with no looseness. During power-on testing, there shall be no red light alarms. The output voltage and current shall comply with the rated specifications of the equipment. In case of any abnormality, contact the manufacturer.

9. SPD: The appearance shall be free from physical damage, scorching, or rust; the wiring shall be secure (without looseness or detachment), and the pins shall be free from oxidation or corrosion. the indicator light shall function normally (displaying green for normal operation and red for fault).

8.2.5 Charger Function Inspection

1. Charging function: Test that charging can be started normally by means of swiping a card, APP, etc., and the charging start response time shall be within the normal range.

2. Human-computer interaction function: The touch screen shall respond accurately to touch inputs, with no input delay or phantom touches. The information displayed on the interface (voltage, current, energy, etc.) shall be complete and updated in real time.

3. Indication light function: The indicator lights (green for standby, yellow for charging, red for fault) shall accurately reflect the actual operating status of the equipment.

4. Emergency stop function: When the emergency stop button is pressed while the equipment is not charging, the main power supply shall be immediately disconnected. The interface shall display an "Emergency Stop Triggered" alarm. The equipment shall be able to resume normal operation after resetting.

5. Leakage protection function: When the test button on the AC leakage circuit breaker is pressed, the circuit breaker shall trip immediately. The breaker shall be able to reset and close manually without obstruction (press the test button before closing).

6. Metering function: The electric energy meter buttons shall respond properly to user input. The display shall be clear and legible. The measured energy consumption shall match the data shown on both the equipment's local interface and the backend management system.

7. Grounding function: The grounding bolts shall be securely fastened without looseness, the grounding wires shall be intact, without breakage or oxidation, and the grounding continuity shall be properly maintained.

8. Power module function: The module shall operate without abnormal noise, the output voltage and current shall meet the rated parameters of the equipment, and there shall be no red light alarm or fault code (if the red light is on, stop using the equipment immediately and contact the manufacturer).

9. Heat dissipation function: The cooling fan shall start and operate normally during charging, without stalling, vibration, or abnormal noise.

10. Communication function: The connection between the equipment and the server shall be stable without disconnection or loss of data packets.

11. Firmware version: Check whether the software version number displayed on the local interface of the charger is the latest release version; if the versions are inconsistent, contact the manufacturer to confirm whether an upgrade is required.

12. Fault record: The equipment fault log shall be checked to verify that all historical faults have been addressed and that no unresolved alarms remain.

8.3 Inspection Records

8.3.1 Inspection cycle

1. Routine inspection

High-power DC Chargers(60kW and above)/high-utilization chargers: Once every 1-2 months.

Regular DC Chargers: Once every 3 months

AC Chargers: Once every 6 months.

2. Special scenarios: During rainy, humid, or high-temperature seasons, or in coastal areas exposed to salt spray, an additional inspection shall be performed twice a month.

3. Post-Fault Re-inspection: After maintenance or component replacement, a re-inspection shall be completed within 24 hours.

8.3.2 Recording specifications

1. Inspectors shall complete the "Charger Inspection Record Form" (see Appendix) on site. The recorded information shall be accurate, complete, and truthful, and no alterations shall be permitted.

2. If minor potential hazards are identified (such as light dust accumulation or occasional flickering of indicator lights), they shall be corrected on site, and the corrective measures shall be recorded.

3. If major safety hazards are identified (such as cable damage, inadequate grounding, or charging function failure), the equipment shall be taken out of service immediately and warning signs shall be installed. The issue shall be reported immediately to the site owner's management department, which shall in turn notify the equipment supplier and track the maintenance progress.

4. The inspection record forms shall be filed monthly and kept for no less than 2 years.

8.4 Operation Precautions

1. Environmental requirements: When working in humid, rainy, or snowy weather, insulating gloves and insulating footwear shall be worn. It shall be confirmed that the charging connector and the vehicle charging inlet are dry and free from standing water. Operation in the presence of water is strictly prohibited.

2. Conditions Requiring Equipment Shutdown: If the charging connector or cable is damaged or exposed, water leakage is observed from the charger enclosure, the enclosure is energized, or continuous indicator light alarms occur, the equipment shall be taken out of service immediately and authorized service personnel shall be contacted.

3. Gun unplugging specifications: After charging is completed, it is necessary to wait for the interface to jump to the prompts of "settlement completed" and "gun can be unplugged" (voltage and current drop to 0) before plugging or unplugging the charging gun. Forcible gun unplugging is prohibited.

4. Vehicle requirements: During charging, the vehicle shall remain stationary, the ignition shall be switched off, and the parking brake shall be engaged. The vehicle shall not be started during charging.

5. Emergency preparation: Dry powder fire extinguishers shall be provided within a 5-meter radius of the charger. During inspection, confirm that the fire-fighting equipment is intact and effective, and that it is not expired or damaged.

6. Personnel protection: During inspection operations, safety helmets and insulating gloves shall be worn, and tools such as voltage testers, multimeters, and insulating screwdrivers shall be available.

7. Emergency Response Procedures: In case of sudden electric shock or fire:

a.The equipment power supply shall be immediately disconnected.

b.For electric shock, rescue shall be performed using insulated tools.

c.For fire, the fire shall be extinguished using dry powder fire extinguishers.

d.The emergency services shall be notified immediately.

Charger Inspection Record Form			
Charger SN:	Inspection Date:	Installation Address:	
Inspector:	Contact Information:		
Inspection Status			
No.	Type	Inspection Contents	Result
1	Environment	Heat Dissipation and Ventilation: Air inlets/outlets are unobstructed (≥1.5m), well-ventilated, no risk of heat accumulation due to direct sunlight.	☐ Normal ☐ Abnormal
2		Safety Boundary: No accumulation of flammable/explosive substances, corrosive liquids or debris around; fire-fighting equipment is in normal.	☐ Normal ☐ Abnormal
3		Installation Foundation: Foundation is free from damage and settlement; charger's body is firmly fixed; base is at least 15cm above the ground; effective anti-backflow measures are properly adopted.	☐ Normal ☐ Abnormal
4		Temperature and Humidity Conditions: Ambient temperature ranges from -25℃ to 50℃; relative humidity ranges from 5% to 95% (no condensation).	☐ Normal ☐ Abnormal
5		Drainage and Water Accumulation Prevention: No water accumulation on the ground; good drainage conditions.	☐ Normal ☐ Abnormal
6		Pollution Protection: No risk of dust sources, corrosive gases or salt spray erosion.	☐ Normal ☐ Abnormal
7		Surrounding Interference: No serious electromagnetic interference or construction collision risk; distance from vegetation is ≥1.5m.	☐ Normal ☐ Abnormal
8	Charging Gun	Storage Status: Charging gun is stored properly; gun holder is undamaged.	☐ Normal ☐ Abnormal
9		Physical Status: No cracks, deformation or ablation on the gun head; no flattening, breakage, exposed copper, aging or cracking on the cable; insulating layer is intact.	☐ Normal ☐ Abnormal
10		Connection Detection: Equipment can correctly identify the connection status and display the gun insertion symbol.	☐ Normal ☐ Abnormal

No.	Type	Inspection Contents	Result
11	Charging Gun	Cleaning and Maintenance: No foreign matter blockage or metal contact oxidation inside the gun head.	☐ Normal ☐ Abnormal
12	Appearance	Charger's Body Shell: No deformation, depression, deep scratch, rust, paint peeling or cracking; good sealing; no looseness or water leakage at joints; installation bracket is free from looseness, falling off, inclination, deformation or rust.	☐ Normal ☐ Abnormal
13		Display Screen: No cracks, obvious scratches or stains; clear display without screen blooming, flickering or black screen; sensitive touch control; well-fitted frame; no fogging or water ingress.	☐ Normal ☐ Abnormal
14		Indicator Lights: No damage or looseness; accurate color; normal brightness; indication consistent with equipment working conditions.	☐ Normal ☐ Abnormal
15		Equipment Door Lock: No deformation or rust on the lock body; smooth insertion and removal of mechanical lock key; no jamming of the switch.	☐ Normal ☐ Abnormal
16		Emergency Stop Switch: No damage; normal rebound; smooth opening and closing of protective cover; clear marking.	☐ Normal ☐ Abnormal
17	Internal components (completely powered off and confirmed with a multimeter)	Internal Cables: No scorching, damage, etc.; cables are neatly arranged; no winding, looseness or falling off.	☐ Normal ☐ Abnormal
18		Screws and Wiring Terminals: No looseness, rust or discoloration of terminals; no looseness of screws.	☐ Normal ☐ Abnormal
19		AC Input Circuit Breaker: Normal opening and closing; good contact without abnormal noise after closing.	☐ Normal ☐ Abnormal
20		AC Incoming Cable Hole: Complete fire-proof mud sealing at the incoming cable hole; no falling off or cracking.	☐ Normal ☐ Abnormal
21		Dust-proof Net: No serious dust accumulation or oil pollution on the dust-proof net at air inlets/outlets.	☐ Normal ☐ Abnormal
22		Circuit Board: No scorching, liquid leakage, oxidation or dust; no solder joint falling off or cold solder; no loose interfaces.	☐ Normal ☐ Abnormal

No.	Type	Inspection Contents	Result
23	Internal components (completely powered off and confirmed with a multimeter)	Power Module: No scorching, water ingress or abnormal smell; no alarm; normal output voltage and current.	☐ Normal ☐ Abnormal
24		Lightning Protection Module: No damage, scorching or rust in appearance; firm wiring; no pin oxidation; indicator light shows green.	☐ Normal ☐ Abnormal
25	Function	Charging Function: Normal start via card swiping, App, etc.; normal response time.	☐ Normal ☐ Abnormal
26		Human-Computer Interaction Function: Accurate touch control of the touch screen; complete information displayed on the interface.	☐ Normal ☐ Abnormal
27		Indication Function: Indicator light status is consistent with the actual working condition of the equipment.	☐ Normal ☐ Abnormal
28		Emergency Stop Function: In charging state, pressing the emergency stop button stops the equipment from charging and prompts emergency stop fault.	☐ Normal ☐ Abnormal
29		Leakage Protection Function: Circuit breaker trips instantly when the test button is pressed; normal closing without refusal to operate.	☐ Normal ☐ Abnormal
30		Metering Function: Normal response of electric energy meter buttons; clear screen display; normal electricity consumption.	☐ Normal ☐ Abnormal
31		Grounding Function: Grounding screws are fastened; grounding wires are free from breakage and oxidation; good grounding continuity.	☐ Normal ☐ Abnormal
32		Power Module Function: No abnormal noise; output meets rated parameters; no alarm or fault code.	☐ Normal ☐ Abnormal
33		Heat Dissipation Function: Heat dissipation fan starts normally during charging; no stalling or abnormal noise.	☐ Normal ☐ Abnormal
34		Communication Function: Stable connection between equipment and server; no offline or packet loss.	☐ Normal ☐ Abnormal

No.	Type	Inspection Contents	Result
35	Function	Firmware Version: Confirm that the firmware version is the latest without known vulnerabilities (can be confirmed with the manufacturer).	☐ Normal ☐ Abnormal
36		Fault Record: Historical faults have been handled; no unresolved alarms.	☐ Normal ☐ Abnormal

Inspection Results and Abnormal Conditions:

Disposal Plan for Abnormal Inspection Results:

Disposal Results of Abnormal Conditions:

Suggestions for Optimization and Improvement

Content to be Optimized:

Equipment Maintenance and Spare parts Replacement Record

No.	Parts Name	Chargeable
1		☐ Y ☐ N
2		☐ Y ☐ N
3		☐ Y ☐ N

Customer Confirmation

Inspector Engineer(Signature):

Customer in Charge Confirmation(Signature)

Date:

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Revised date: 2026-02-02