

XY DC-E160 series electric vehicle DC integrated charger



User manual

(Version number: A/0)

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Before operation, please read the instructions carefully to understand the correct use of the equipment, please keep it properly for future examination.

Warning

The input and output voltage of this equipment is dangerous high voltage, which will endanger human life. Please strictly follow all warnings and instructions on the machine and in the manual. Unauthorized professional maintenance personnel do not remove the outer cover of the chassis

Notes

- 1) Do not put flammable, explosive or combustible materials, chemicals, combustible steam and other dangerous goods near the charging pile.
- 2) Keep the charging gun head clean and dry. If there is dirt, please dry with clean dry cloth.
- 3) It is strictly forbidden to use charging pile in the case of defects, cracks, wear, rupture, bare charging cable of charging gun or charging cable, if found, please contact the staff in time.
- 4) Do not try to disassemble, repair, refit charging piles, if there is a need for maintenance, modification, please contact the staff, improper operation may cause damage, leakage, leakage and so on.
- 5) It is strictly forbidden to remove the gun head during charging to ensure the safety of life and vehicle during charging.
- 6) If there is any abnormal situation during use, you can immediately press the stop button to cut off all input and output power.
- 7) If it rains and thunder, please charge carefully.
- 8) Children should not approach and use charging piles during charging to avoid injury.
- 9) Please close the doors on both sides when charging to avoid electric shock.
- 10) During charging, the vehicle is prohibited from driving and can only be charged at rest. Please turn off the hybrid tram before charging.

Chapter 1 Product Overview

1.1 Product Profile

XY DC -E160 series of dc integrated charger, mainly used for dc fast charging of electric vehicles, this product integrates power conversion, charging control, man-machine interactive control, communication, charging and metering, and has good dustproof and waterproof functions. the protection grade reaches IP54, Safe outdoor use. he power conversion unit of charging pile follows the principle of modular design. a single module 15/20 KW, can be flexibly configured to meet the charging needs of electric vehicles with different capacities. it is the best choice for outdoor fast and dc charging.

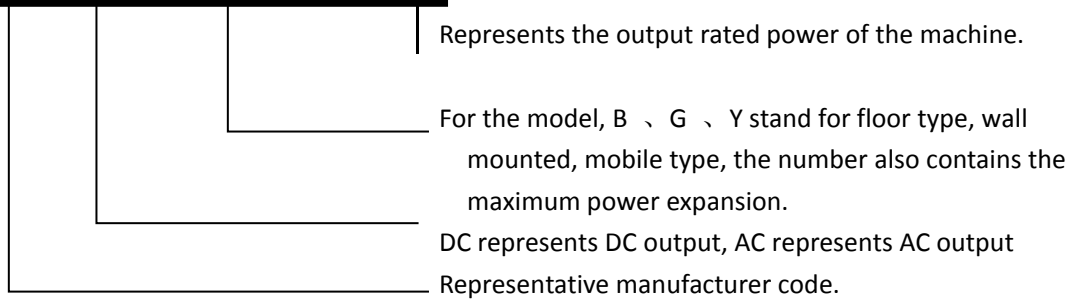


Shape diagram of charging pile

This product is mainly composed of man-machine interactive touch screen, card reader, electric energy metering module, charging module, communication module, charging interface, control module and Cabinet composition. The charging module adopts the latest power supply technology and technology, and dual digital DSP control, specially designed for new energy vehicle charging station. The front stage adopts the industry-leading three-phase active power factor correction (APFC) technology. The input voltage range is wide, the total harmonic current is less than 5, the input power factor is 99 and the efficiency is up to 95. High efficiency, high power density, high reliability, the module adopts forced air cooling heat dissipation mode, occupies small space, easy to assemble!

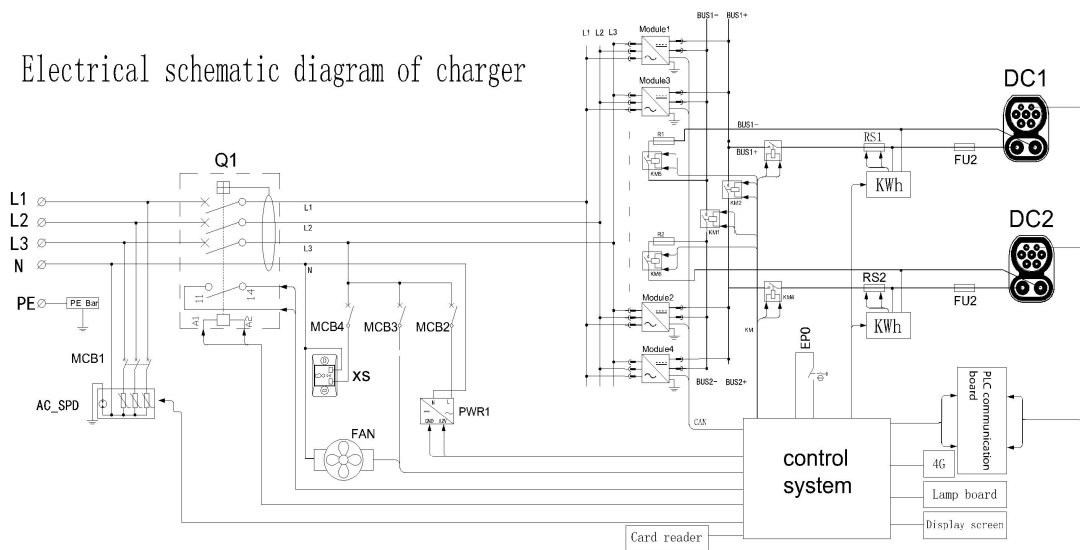
1.2 Product name

XY DC -E160-120KW



1.3 Electrical schematic

Electrical schematic diagram of charger



1.4 Parameter Description

Table 1 Technical parameters of charging pile

Model	XY DC-E160-80KW	XY DC-E160-120KW	XY DC-E160-160KW
Number of modules	4	6	8
Maximum output power of single module	20KW		
System power	80KW	120KW	160KW
AC input parameters			
AC input voltage	323~437 Vac		
AC power frequency	45~65 Hz		
Input power factor	>0.99		
Total harmonic factor	THD<5 per cent		
System output parameters			
Output voltage	VDC 100~750		
Output current	Product of current of single module and number of system modules		
Steady flow accuracy	$\pm 0.5\%$		
Output current error	$\leq \pm 1$ per cent (30 A \geq);		
	≤ 0.3 A (30 A)		
Output voltage error	$\pm 0.5\%$		
Peak efficiency	$\geq 95\%$		
Basic parameters			
Charging mode	Automatic Full Mode, Time Mode, Electricity Mode, Amount Mode		
Remote control	Remote instruction can be sent to the charging pile to control the switch machine, stop tripping, remote etc		
Startup mode	Credit card startup, password startup, APP、 WeChat public number		
Subsection fees	Can be set according to peak flat valley period, section charge setting is simple and clear		
Networking	Ethernet interface, GPRS、 WIFI		
Noise	≤ 65 dB		
Protection level	IP54		
Allow ambient temperature	$-20^{\circ}\text{C} \sim +65^{\circ}\text{C}$ (over 50°C reduction)		

Cooling mode	Air cooling	
Allow relative humidity	0~95 per cent (no condensation)	
Highest Elevation	3000 m	
Interface standards	IEC 62196-3(CCS Combo 2)	
Charging Standard	IEC 61851-1, IEC 61851-24, DIN 70121Combo Typ2	
Platform Communication Protocol	OCPP1.6	
Module parameters		
AC input voltage	260~530 Vac, ≤ 310 Vac 50 per cent reduction	
AC power frequency	45~65 Hz	
Input power factor	>0.99	
Total harmonic factor	THD <5 per cent	
Output voltage range	VDC 100~750	VDC 100~750
Maximum output current	570~750 VDC full power output ,100~570 VDC,35A	400~750 VDC full power output ,100~400 VDC,50A
Steady flow accuracy	$\pm 0.5\%$	
Output current error	$\leq \pm 1$ per cent (30 A \geq);	
	≤ 0.3 A (30 A)	
Output voltage error	$\pm 0.5\%$	
Peak efficiency	$\geq 95.2\%$	
Protection level	IP20	
Protection function	Input over-voltage; output over-voltage, over-current, short circuit, over-temperature, under-voltage alarm and other protection functions	
Allow ambient temperature	$-40^{\circ}\text{C} \sim +75^{\circ}\text{C}$ (over 50°C reduction)	
Cooling mode	Air cooling	
Volume (width * depth * height)	395mm*226mm*84mm	
Weight	$\leq 10.5\text{KG}$	

1.5 Performance characteristics

Product performance

- High efficiency and low harmonic, A quality: system efficiency ≥ 95 , power density industry leading, low equipment energy consumption, high energy efficiency. Charging module adopts active power factor correction technology, harmonic interference ≤ 5 , power factor up to 0.99.
- Modular design, reliable system: the system adopts multi-module parallel output mode, flexible configuration, convenient maintenance, single module failure does not affect the system, greatly improve the reliability and stability of the system.
- Full protection, operation safety: with input, output, component self-inspection and operation connection protection, input over / undervoltage protection, DC output overvoltage / short circuit protection, module overheating / fault protection, insulation protection, charging pile and battery connection inspection and other multiple protection functions. Ensure the safe and reliable operation of the system and effectively prevent accidents.
- Wide voltage output, easy to use: according to different application needs, charging module wide range adjustable, to meet the different battery terminal voltage charging needs, can be charged for different voltage levels of electric vehicles.

Human-computer interaction

Can choose automatic setting mode and manual setting mode two kinds.

- In the process of charging, the charging pile dynamically adjusts the charging parameters according to the data provided by the battery management system, performs the corresponding operation, and completes the charging process.
- The manual setting mode is mainly to charge by time, charge by amount, charge by quantity of electricity, when charging pile adopts manual setting mode, there is clear operation indication information.

Display output:

- Display charging voltage, charging current, SOC、 charging time, metering and charging, battery information and other information in real time.
- Display manual input information during manual setting.
- Display the corresponding prompt information in case of failure.
- Can display the relevant information of charging pile in each state.

Parameter Settings

Can receive the parameter setting instruction of the partition monitoring terminal, the operator enters the setting interface through the password, sets the parameters such as over / undervoltage protection threshold, overcurrent protection threshold, main station / pile body IP、 communication port and so on.

Self-inspection

self-check of charging pile when power on, the inspection contents include pile body, clock, power supply, storage space, etc.

Can display fault information through state indicator lamp or display screen, and form fault

information record at the same time.

Software upgrade

There is a master monitoring system to support software remote and local upgrades, no master monitoring system to support local upgrades.

Data transmission and storage

a) transmission

Charging pile reserved data transmission interface, collect and upload charging pile use and charge information data and charging pile fault data.

b) storage

The transaction data is stored in the non-volatile memory in the form of records, which ensures the correct, continuous, complete and effective storage of the data, and keeps no less than 10000 records space. When the transaction records are stored, the charging pile can collect the data in time.

Settlement function

Able to read charging card data and power metering information.

Can achieve mobile phone APP 、 WeChat public number client payment.

Alarm function

when charging pile dc output abnormal, power module alarm/fault, dc output over/under voltage, dc output over current, charging pile input side switch tripping/fuse fuse, charging monitoring unit and partition monitoring module communication interruption, monitoring unit failure and other charging pile fault, the monitoring unit can issue acousto-optic alarm and output charging pile display through the communication port.

Operation Permission Function

Charging pile has operation authority password management function. Administrators can set charging pile parameters and view charging data through passwords.

Timing function

The charging pile can receive the timing command of the district monitoring terminal to meet the PPS(second pulse) and PPM (minute pulse) timing requirements.

Chapter 2 Installation of equipment

2.1 Equipment handling and installation

Note:

- Charging pile as a whole, no matter transport or installation can not decompose it, unauthorized modification caused by failure is not within the scope of quality assurance.
- The charging pile must be transported strictly in accordance with the contents of this chapter.
- In the process of charging pile transportation, no matter whether with external packaging, the movement process is strictly prohibited to tilt.
- The tilt angle $<5^\circ$. If the charging pile tilt angle is too high, it may cause the charging pile to overturn, causing casualties or other accidents.
- Avoid excessive mechanical impact on charging piles during movement.
- Charging pile transportation process should ensure no rain or bad weather, if not avoid please take protective measures.
- Charging piles should be avoided in low-lying areas that may produce stagnant water.

Equipment installation dimensions and weights

Model	W(width)	D(depth)	H(High)	Wight(weight)
XY DC-E160-80KW	700mm	550mm	1600mm	180KG
XY DC-E160-120KW	700mm	550mm	1600mm	200KG
XY DC-E160-160KW	700mm	550mm	1600mm	200KG

(Weight does not contain modules)

In order to ensure that the charging pile is in a better protective state during transportation, please choose the packing transportation as far as possible, select the appropriate handling tools according to the size and weight of the machine, and carry out the transportation strictly according to the indication of various marks on the package



Please confirm whether there is any damage caused by the handling process before installation. If there is no electricity to the machine, please contact the handling company or directly with us.



Only a professional electrician or qualified person can operate the contents of this chapter

Make sure the AC side is disconnected and the terminal is not charged.

Installation of environmental requirements

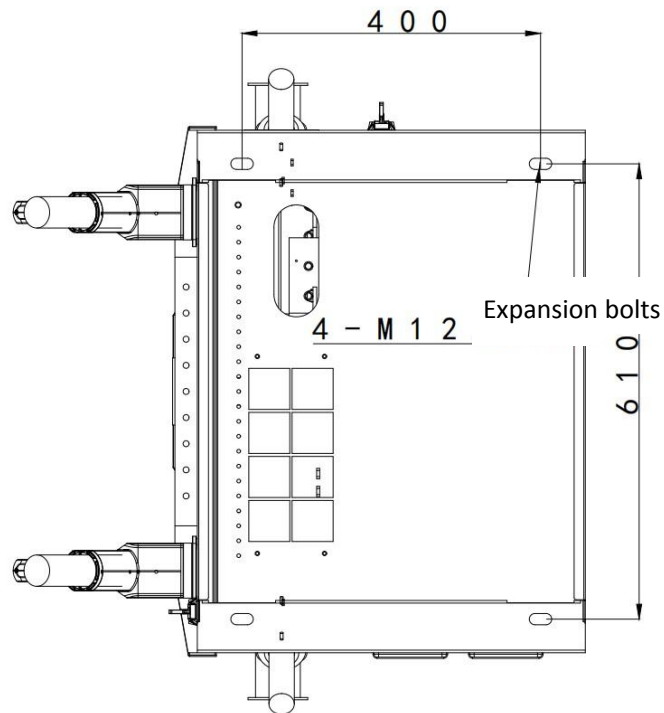
The protection grade of XY DC-E160 series integrated DC charging pile is IP 54.

In order to ensure that the charging pile can operate safely and efficiently, the following requirements must be observed when selecting the installation environment:

- There are no combustible gases and combustible materials in the installation space.
- Install the ground dry flat; strictly prohibit water on the ground; ensure that the ground level does not shake, can fully carry the weight of the machine.
- The ambient temperature range of the installation site is $-20^{\circ}\text{C}\sim+65^{\circ}\text{C}$, and the relative humidity range is $0\sim95\%$ (no condensation).
- Before and after charging pile left and right, top and wall reserved enough distance to ensure ventilation and heat dissipation, installation and maintenance, safe escape.
- Install position to ensure easy and clear view of LED indicator and LCD screen on pile.

Base mounting

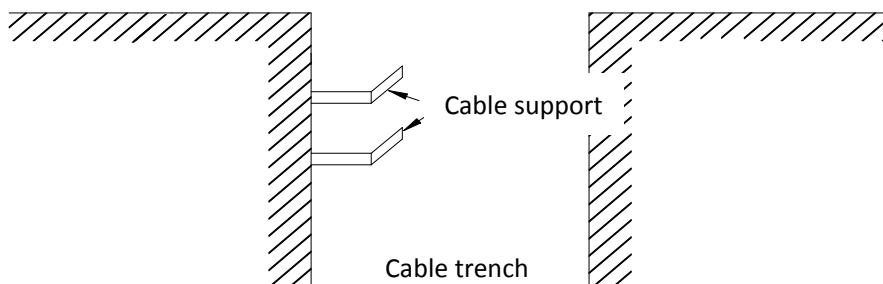
The machine needs to be installed on a flat foundation or channel steel support with a flame retardant surface. It is necessary to ensure that the foundation is smooth and solid, safe and reliable, and has sufficient bearing capacity. It is forbidden to have depression or tilt on the surface of the foundation. The foundation needs to be perforated in advance, and the size of the hole must be exactly the same as the positioning hole of the charging pile base, so that the charging pile can be firmly connected with the foundation. The charging pile base is equipped with 4 positioning waist holes, which are recommended to be fixed with M12 expansion bolts, as shown below (unit: mm).



XY DC-E160 series charging pile base installation diagram

Cable cable

Cable groove design should consider the weight and size of the equipment. The charging pile is the way of entering the line. It is suggested that the machine and the external cable should be connected from the cable trench to facilitate installation and maintenance. Signal, power cable separate, signal cable with shielding wire to improve communication quality, pay attention to anti-rat processing.



Heat dissipation, space reserved for maintenance

To ensure the reliable and efficient operation of the charging pile, the charging pile must keep an appropriate and sufficient distance from the wall and other equipment to meet the requirements of the narrowest maintenance passage, escape route and ventilation. The following is the minimum space requirement for the normal

operation of the charging pile. If field conditions permit, it is recommended to choose a larger spacing.

Model	Before	After	Left	Right	Top
160 Series	1000 mm	100 mm	600 mm	600 mm	200mm

2.2 Cable access

The three-phase cable embedded in the pile foundation is connected to the input end of the pile body, and the connection method of the five lines is paid attention to, the color is corresponding, and the grounding line of the cabinet body is connected to the ground wire. Note: the cross-sectional area of the phase line and the N line and ground line of the AC input is not less than 35 mm².



- Only professional electricians or qualified personnel can operate the contents of this chapter.
- Before the installation of the equipment, please make sure that the charging pile and the terminal are not charged, the electrical switches before and after the charging pile are disconnected, and ensure that the charging pile will not be powered on during the self-connection process. When there are live parts in the area where the staff may approach during the cable connection, the corresponding parts should be isolated and protected to prevent the operator from accidentally touching.

Recommended Cable Specifications

Cable name	Copper cable minimum size (mm ²)		
	XY DC-E160-80KW	XY DC-E160-120KW	XY DC-E160-160KW
Input phase A	50	70	50*2
Input phase B	50	70	50*2
Input phase C	50	70	50*2
Input phase N	50	70	50*2
Ground ground	50	70	50*2

- When the connection cable specification is different from the recommended cable in the above table, the selected cable specification should meet the

requirements of overcurrent and voltage, with sufficient allowance, and the cable on the same side should be of the same specification type.

- Charging pile input and output current and voltage please refer to Table 1 electrical parameters.

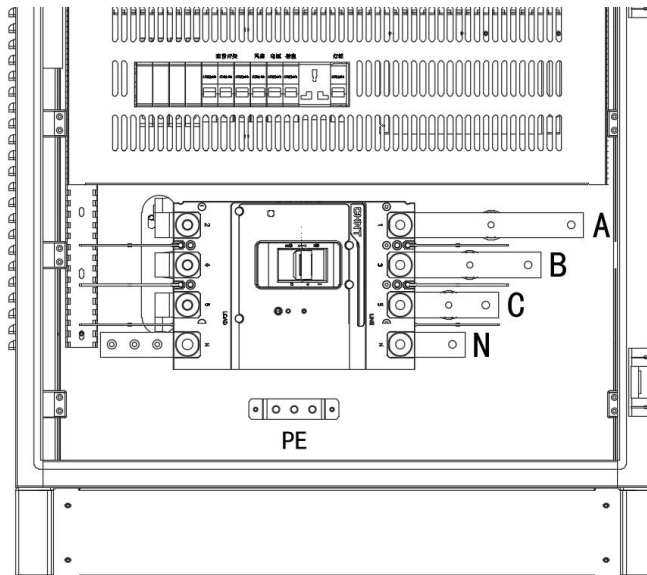


1: The cables recommended in the form must conform to the relevant local national standards, copper cables of well-known brands and, if cables of other materials (e.g. aluminum-copper cables, etc.) are to be thickened, the local distribution line regulations, the specific application environment (temperature and physical support media, etc.) and the requirements in the IEC62109-1/IEC62477-1 should be consulted.

2: Terminal selection should be matched with cable.

Wiring Area

The AC input terminal and ground copper bar of the charging pile are all located under the front of the cabinet, and each terminal is clearly marked. As shown below:



AC input position of charging pile

Project	Name of name
A\B\C\N	AC input of charging pile
PE	Grounded copper bars

Input wiring

Charging pile terminal contains A、B、C、N stickers, please strictly according to the wiring marking line, pay attention to screw fastening torque, screw length is moderate, to ensure electrical and electrical, electrical and housing safety distance.

Input A wiring	A
Input B wiring	B
Input C wiring	C
Input N wiring	N

Ground connection

There is a grounding sticker at the ground copper row of the charging pile, and the grounding impedance of the ground copper row is not more than 4 ohms with reference to the label connection when wiring

Grounded copper bars	PE
----------------------	----

Note: cable connection please refer to the corresponding identification, wiring areas have corresponding identification.

Bolting fixed

In order to prevent the connection copper nose from loosening, causing poor contact, or increasing contact resistance, causing heat or even fire, it is necessary to ensure that the following torque requirements are met when fastening the connection copper nose.

Screw size	M3	M4	M5	M6
Torque	0.7-1	1.8-2.4	4-4.8	7-8
Screw size	M8	M10	M12	M16
Torque	17-20	34-40	60-70	120-140

2.3 Charging module installation

After opening the right door of the charging pile, you can see the module slot of the charger. After removing the outer packaging of the module, insert the corresponding number of modules from top to bottom into the charger slot. Confirm that the front panel of the module will be flush with the sheet metal surface of the slot.

If the front panel of the module can not be naturally level with the slot sheet

metal after the module is inserted, remember not to push the module into force with violence, Check that the link terminal behind the module is aligned with the docking terminal in the chassis or that there is a foreign body. If non-alignment or foreign body problem can not be inserted into the position, please contact after sale



If the module is not in place and forced use of the charger may cause tail terminal heating and fire burning!

Setting of charging pile module address

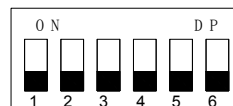
Each charging module in the charging pile has a unique address, and the address code of the charging module must be set strictly according to the relevant address, otherwise the charging pile can not run normally.

Distribution Position of Module Uncode Switch

Each charger module has a code-out switch that can be set, distributed as follows:



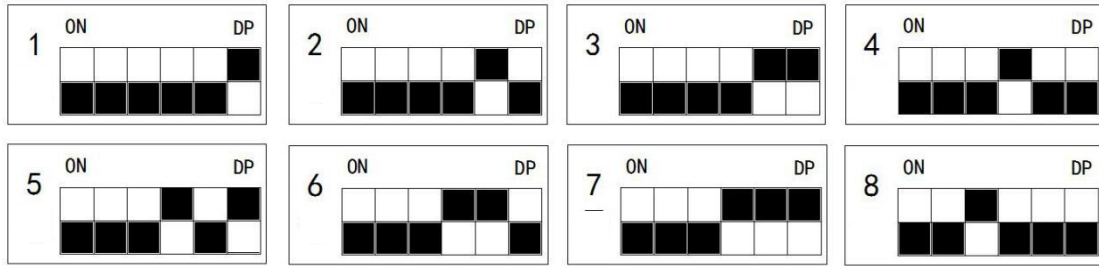
Location Map of Address Switch



Unplug switch

Set module address code

At the left of the module slot, there is a dial label with the number of modules. It is necessary to set the dial code of the corresponding module strictly according to the order of the dial code on the dial code label. The black ■ indicates that the dial code is dialed up above, and the following indicates that the dial is down:



Dial Code Setup Table

Unplug switch Address code	1	2	3	4	5	6
Address 1	Lower drawing	Lower drawing	Lower drawing	Lower drawing	Lower drawing	Upper
Address No .2	Lower drawing	Lower drawing	Lower drawing	Lower drawing	Upper	Lower drawing
Address No .3	Lower drawing	Lower drawing	Lower drawing	Lower drawing	Upper	Upper
Address No .4	Lower drawing	Lower drawing	Lower drawing	Upper	Lower drawing	Lower drawing
Address No .5	Lower drawing	Lower drawing	Lower drawing	Upper	Lower drawing	Upper
Address No .6	Lower drawing	Lower drawing	Lower drawing	Upper	Upper	Lower drawing
Address No .7	Lower drawing	Lower drawing	Lower drawing	Upper	Upper	Upper
Address No .8	Lower drawing	Lower drawing	Upper	Lower drawing	Lower drawing	Lower drawing

Warning:

- Set module address code when charging module is forbidden to live
- Disallow charging module to set address code in operation
- Do not set duplicate address codes
- Do not unplug all switches.

Chapter 3 Operational Instructions

3.1 Screen operation instructions

- 1) Power on the default initial interface, click on "swipe card charging ", enter charging mode selection.

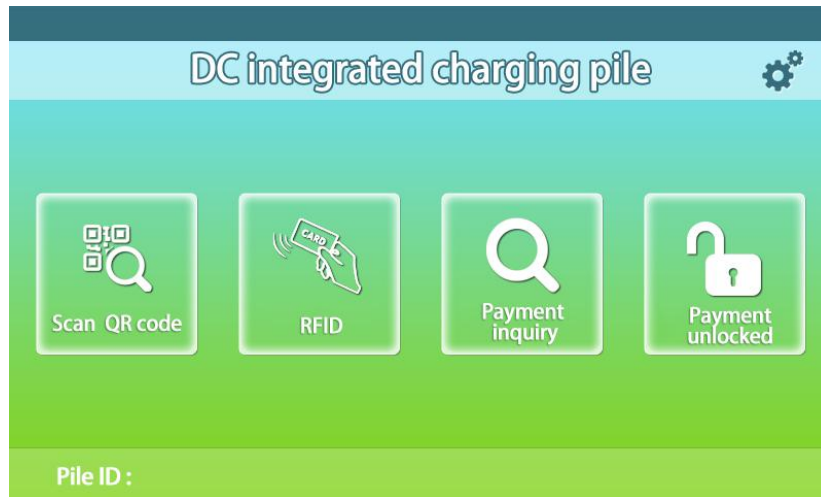


Figure 3-1 Initial interface

- 2) Charging mode selection interface, such as automatic charging directly into the swipe card interface, swipe card interface has a specified 30 S countdown, if not completed in the countdown card, please click again, such as select other modes of charging, This mode needs to be set simply. The following figure lists several charging modes, namely "time mode ", " amount mode ", " electricity mode ", click on the input box to set up.

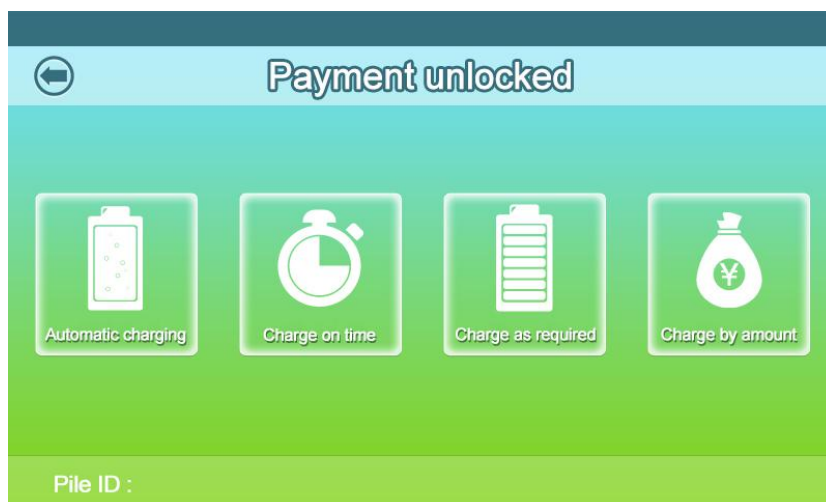


Figure 3-2 Charging Mode Selection Interface

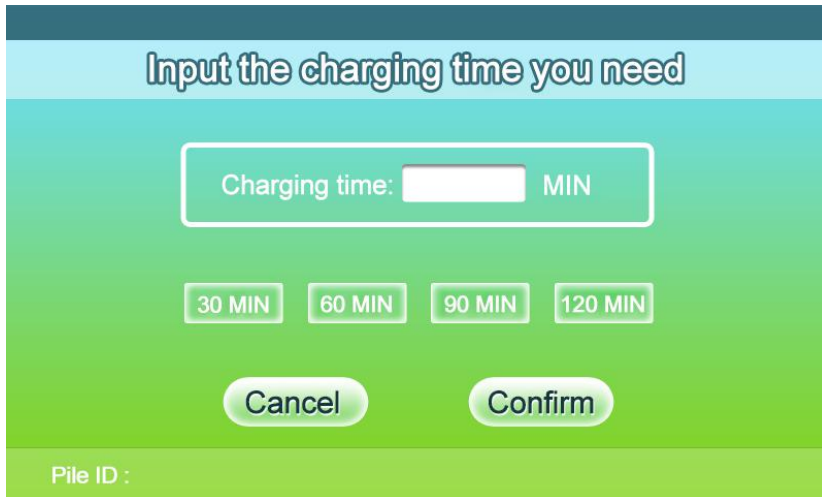


Figure 3-3 On-time Charging Mode Interface

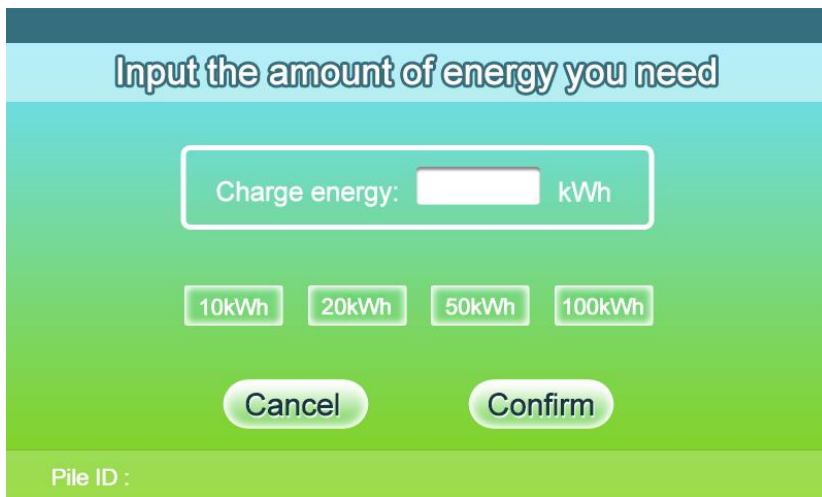


Figure 3-4: Charging Mode Interface

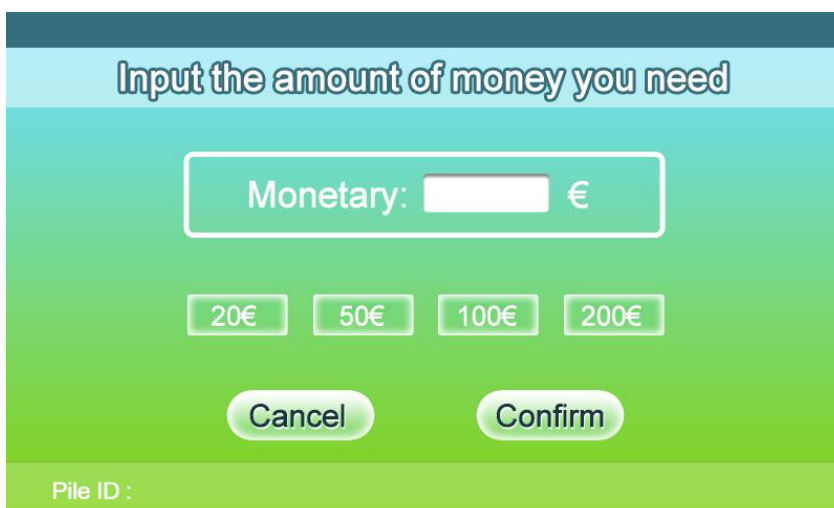


Figure 3-5 Charging Mode Interface

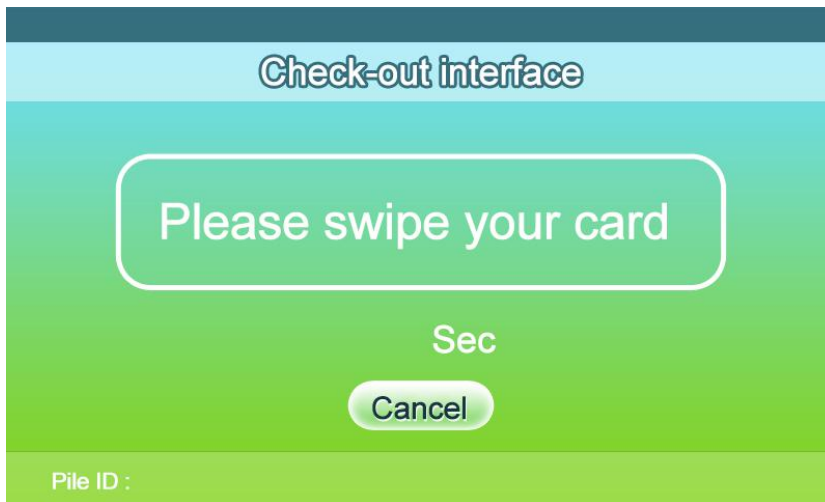


Figure 3-6 Swipe Card Interface

- 3) Next, if the charging gun is not connected after swiping the card, jump to the prompt "please connect the charging gun" interface, if the charging gun has been connected, jump to the charging start countdown, as shown in figure 3-7,3-8 below.

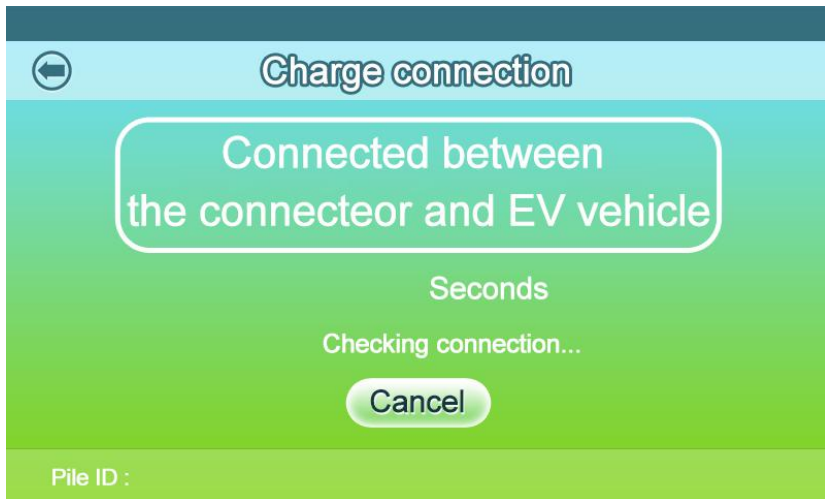


Figure 3-7 Insert a charging gun

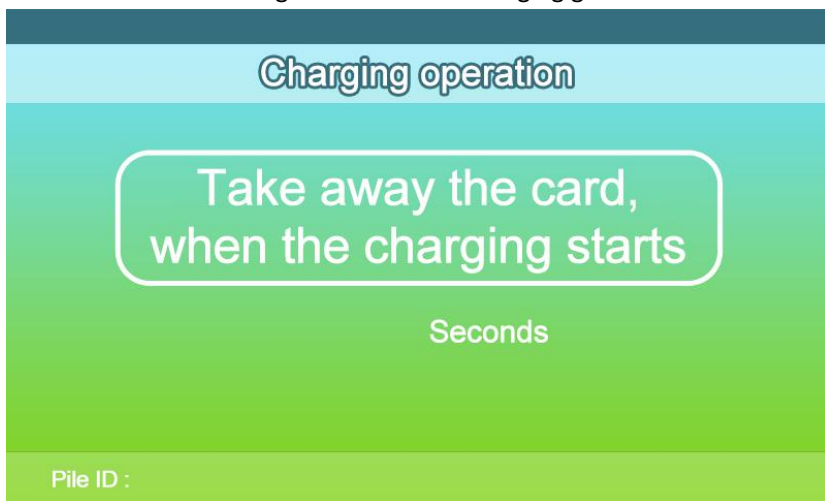


Figure 3-8 Startup Countdown

- 4) The user is charging, showing charging information, and prompted to click the stop button to end charging ahead of time.

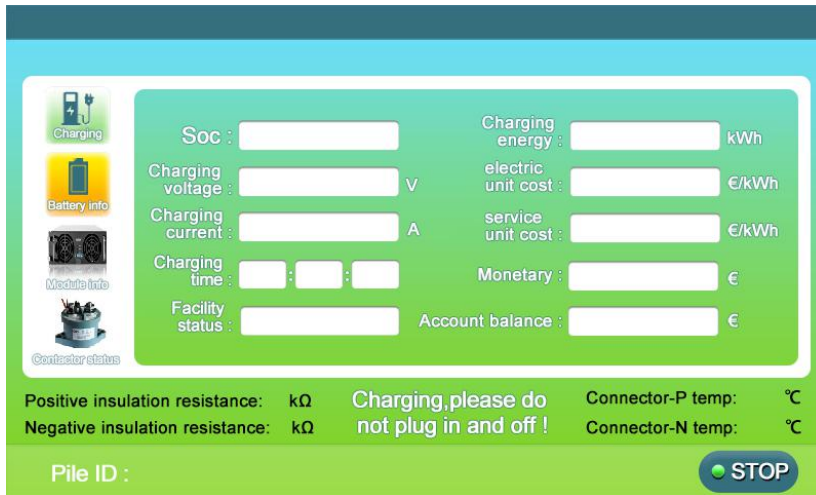


Figure 3-9 Charging Interface

- 5) Automatic stop and manual stop will jump to the settlement interface, the settlement interface click on the confirmation will again require credit card.

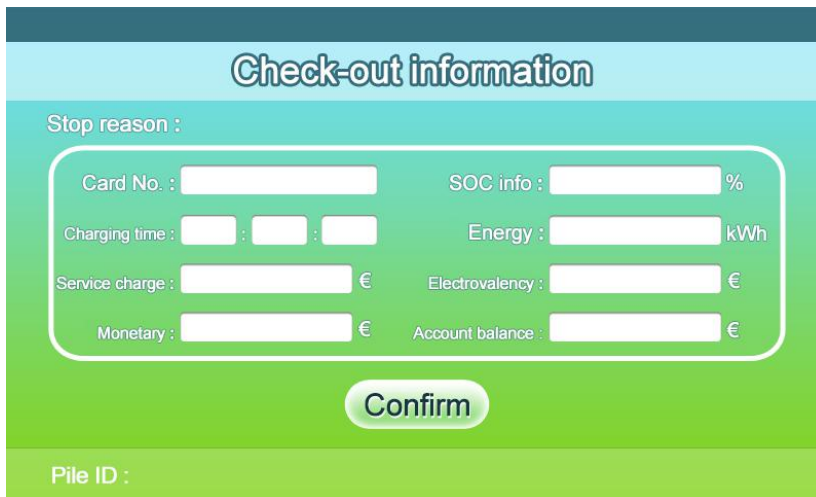


Figure 3-10 Settlement Interface

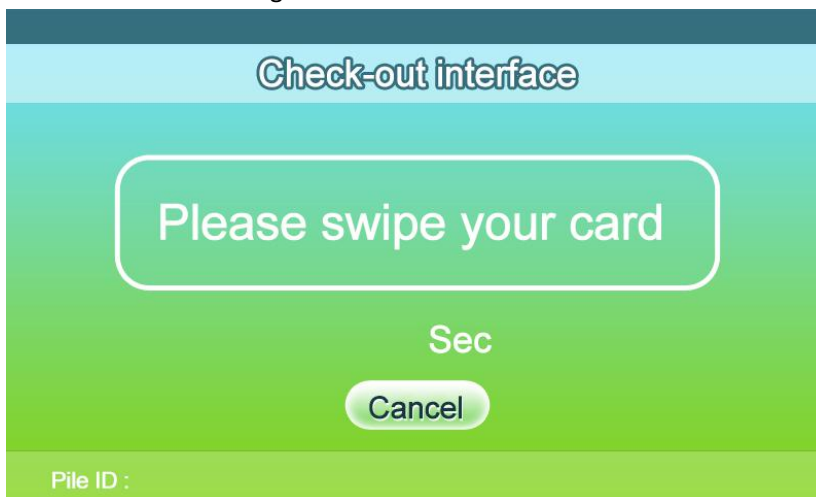


Figure 3-11 Charge Settlement Swipe Card Interface

- 6) If you confirm that you want to connect to the background when buying, you need to set up the network for the first time in the field, click the settings icon in the upper right corner of the initial interface, enter the password 130131 and enter the settings interface.

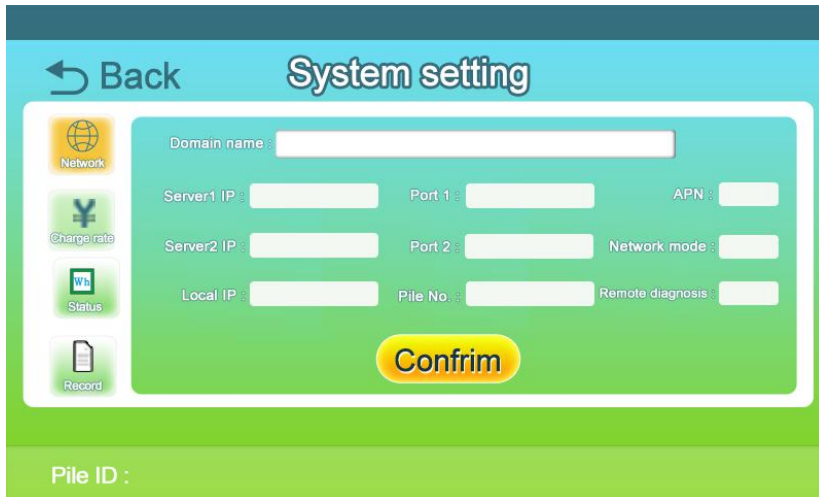


Figure 3-12 Network Setup Interface

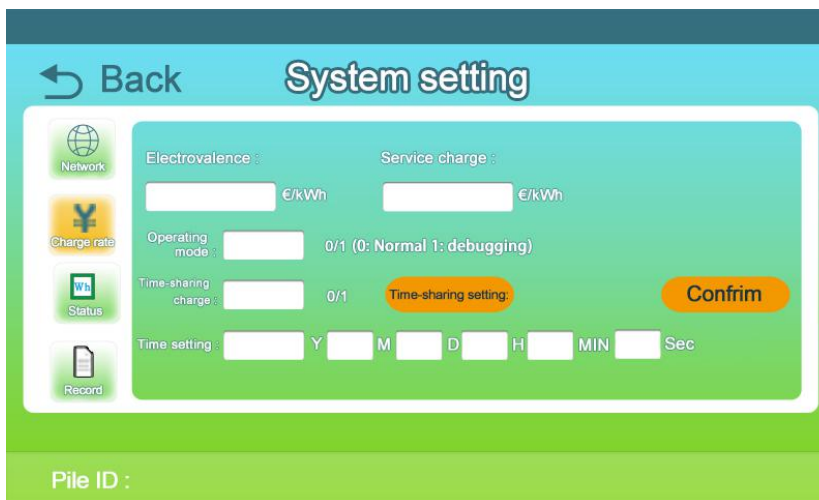


Figure 3-13 System Rate Setup Interface



Figure 3-14 System State Setup Interface

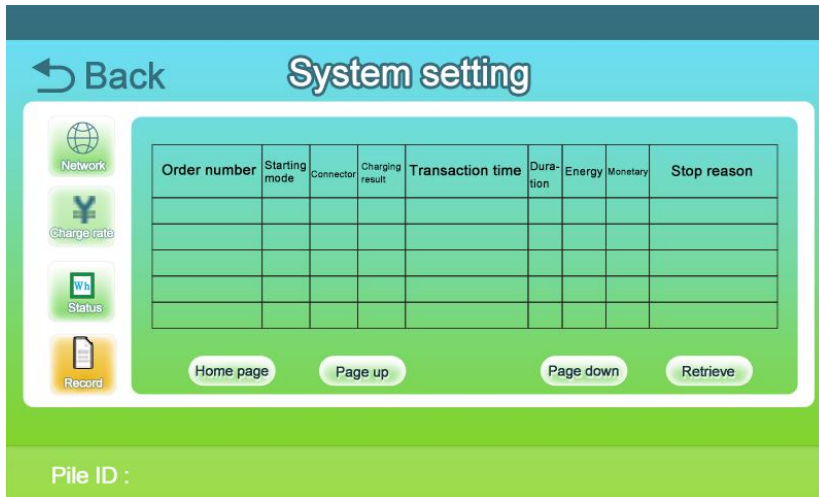


Figure 3-15 System Charging History Interface

3.2 Operational considerations

- If the screen shows machine failure, please do not charge, please contact the staff;
- Confirm that the IC card balance is sufficient when swiping the card, and the insufficient balance during charging will automatically terminate the charging;
- When the two charging interfaces are used at the same time, the user should carefully identify whether he is a A user or a B user in the credit card process, and swipe the card according to the operation prompt of the interface to avoid misoperation;
- Please operate according to the relevant instructions of charging equipment;
- When pulling the charging gun, pay attention to the strength, must not force too hard;
- Credit card operation process, the need to hear the "beep" sound to remove the card, otherwise may lead to failure of the operation;
- When the charging gun is inserted into the interface and the yellow indicator above lights up, it indicates that it has been electrified. Please do not unplug the charging gun to prevent electric shock;
- When an emergency occurs, press the emergency stop switch, you can not charge at this time, if the charge is in progress, you will immediately stop charging.
- In the process of use, the small pin or indication window on the lightning protector should be checked frequently. If the pin protrudes out or the window becomes red, the lightning protector has been damaged and should be replaced immediately.

Note:

- If the machine leaks electricity, press the emergency stop switch immediately.
- If fire, electric shock and other abnormal conditions, please immediately press the emergency stop switch.
- If the charger fails, if you can not stop charging, internal circuit short circuit and other abnormal conditions, please immediately press the emergency stop switch.
- When the non-charging state presses the emergency stop switch, the fault light is on and the LCD screen jumps to the fault interface.
- When the emergency is lifted, rotate the emergency stop switch, otherwise you can not

continue charging.

3.3 Indicator status note

There are three state indicator lights above the equipment, yellow, green, red light.

- Green light: power indicator light, the green light is always on after the equipment is powered on.
- Yellow light: The yellow light is on and is charging; The yellow light goes out and the charge stops.
- Red light: The red light is the equipment malfunction, the red light extinguishes is the breakdown eliminates.

3.4 Fault information table

Type of fault	Responses
Meter Address Communication Fault	Please check the meter address information of the parameter setting interface. If the corresponding meter address is incorrect, please re-enter the table address and restart the charger
AC input overvoltage/ undervoltage	Please check if the AC input voltage is too high or too low, if there is any fault after removing the input anomaly, then check that the parameter setting interface setting threshold is correct
DC output overvoltage/ overcurrent	Please check if the output voltage and current are in the range of parameter setting, if not, check if the output voltage, current is too high, or if the parameter setting is reasonable
Card reader failure	Loosening, shedding or failure of card reader
Insulation fault	Please check that the insulation of the DC bus is normal
Monitor board communication failure	Check that the monitor board communication line is correct
Charging gun connection malfunction	The charging gun is disconnected, please check that the charging gun is connected
Stop button pressed	Check if the stop button is pressed, if so, please pull out the stop button one by one according to the above steps, the fault can be eliminated
Shutdown failed	After pressing the stop button to ensure the minimum current, check whether the communication bus CAN the monitoring board and the power module is loose

3.5 Routine inspection maintenance

this charging pile can be used for outdoor products, affected by outdoor ambient temperature, humidity, dust and vibration, the device inside the charging

pile will be aging, wear and long-term use will produce dust accumulation, which will affect the charging pile can not run efficiently and potentially cause failure risk. therefore, it is necessary to carry out daily and regular inspection and maintenance of the charging pile to ensure its normal operation and prolong its service life.

Maintenance projects	Maintenance cycle
Regular cleaning:	3 month
Clean the radiator and air outlet inside the chassis	
Check cables and connections regularly: check that all cable connections are loose, if loose must be fastened; check that connection terminals and insulation are discolored or shedding, replace damaged or corroded terminals, Replace damaged cables.	12 month
Check that the affixed warning label is firm or clear and replace it if necessary.	12 month
Check the function of each fan regularly: check whether the fan has abnormal noise, whether the fan has cracks, the fan runs without vibration, and the rotation is stable.	6 month
Check the function of each switch regularly: switch, contactor and other switch devices in the line regularly check its function to see if there is damage or metal corrosion.	12 month
Check the emergency stop function regularly to see if the emergency stop switch is normal	1 month
Check regularly whether there is abnormal noise during the operation of charging pile.	3 month



- Only a professional electrician or qualified person can operate the contents of this chapter
- Carry out maintenance work, do not leave screws, washers and other metal parts in the charging pile, otherwise it may be damaged, after the equipment maintenance needs to check the cabinet to ensure that the charging pile can run normally.
- Equipment maintenance and repair must cut off the charging pile AC side power supply, disconnect AC and DC switches, machine stop at least 15 minutes after the need to use multimeter to detect the voltage, radiator and other high temperature components temperature, Confirm safety before operation.
- During the maintenance of the equipment, necessary measures should be taken to prevent the charging pile from being electrified by mistake, and obvious maintenance marks should be set up. The live parts that the operator may approach should be isolated and protected to avoid touching.

Chapter 4 Order Instructions and After-sales Service

4.1 Guidance Notes

- 1) Must understand the application and use of equipment, fill in customer requirements form;
- 2) Provide product name, model, specification, system parameters and configuration requirements when ordering;
- 3) When the user has special use environment or technical requirements for the equipment, please negotiate with the technical personnel of the factory and sign the agreement.

4.2 Annex List

- 1) Supporting equipment such as fixed bolts, backup of common devices can be equipped according to customer needs.
- 2) Technical documents: instruction manual, certificate of qualification, warranty card, factory inspection report.

4.3 After-sales service

If the product is damaged or can not be used normally due to the quality problems of the manufacturer, the manufacturer has the responsibility to repair, debug or replace the parts free of charge for the user.

Disclaimer:

The Company has the right not to carry out quality assurance in the following cases:

- whole machine and parts are out of free warranty
- transport damage
- incorrect installation, modification or use
- operating in very harsh conditions beyond those described in this manual
- machine failure or damage caused by installation, repair, modification or disassembly of non-company services
- machine failure or damage caused by the use of non-standard components
- any installation and use beyond those specified in relevant international standards
- Damage caused
- an abnormal natural environment