阳 光 电 源
SUNGROW

Product Maintenance Instruction Manual

IDC180E

Clean Power for All

CONTENTS

1 Overview

1.1 Purpose

In order to ensure that technical service engineers have mastery of principle, performance, structures and usage of products and have the abilities of product operation, troubleshooting and maintenance, and that the product maintenance knowledge can be carried forward, this Manual is specially prepared.

This Manual describes in detail the product structure, definitions of LED indicator lights and interfaces, and troubleshooting steps to guide technical service engineers to maintain products.

1.2 Scope of application

This manual is applicable to the commissioning of IDC180E.

1.3 Target users

The Manual is only for the internal use of Sungrow's Engineering and Technical Service Center, and shall be in the strictest confidence.

2 Product introduction

2.1 Characteristic parameters

IDC180E DC Charger adopts the world's leading power supply technology and design concept to provide safe, reliable and controllable DC energy for electric vehicles. It has ultra-wide range of output voltage with constant power, making it capable of meeting the charging requirements of virtually all electric vehicles available in the market today. It has the characteristics of active power correction, high efficiency, high power density, high reliability, ultra-low standby power consumption, intelligent control and excellent human-computer interaction experience.

The IDC180E Charger is purposefully crafted for destination charging scenarios, predominantly catering to public and semi-public charging scenarios such as charging on expressways and dedicated fleet charging.

The function and feature parameters of IDC180E are listed in Table 2-1.

Table 2-1 Table of functions and features

Input (AC)	
Input voltage	400Vac±10%
Nominal frequency	50HZ
Max.input current	322A
Input cable specification	4*150mm²+1*70mm²(Outdoor five-core copper cable) See user manual for more details
Power input	3P+N+PE
Output (DC)	
DC output power	180kW
DC output voltage	200~920 Vdc
Max.output current	250A
Cable Length	5m or 7m
Charge connector	CCS2
Protection	
Insulation monitor	Yes
Over/Under voltage protection	Yes
Over load protection	Yes
Short circuit protection	Yes
Over temperature protection	Yes
Lightning protection	Yes
Overvoltage level	III
Interfaces	

Touch screen	10-inch color touch screen
RFID card system	ISO/IEC14443A，ISO/IEC 15693
Communication interface	2G/3G/4G/wifi/Ethernet
Communication protocol	OCPP 1.6
General Data	
Dimensions(W*H*D)	930*1930*615mm
Weight	＜490kg
Mounting method	Wall-mounting/Pole-Mounting(Optional)
Operation noise level	＜72dB
Degree of protection	IP65,IK10(Shell),IK08(Screen)
Operating ambient temperature range	-35 to 55℃
Allowable relative humidity range	5% to 95%
Max.Efficiency	≥96%
Max.operating altitude	2000m
Warranty	3years（Extend warranty optional）

2.2 Block diagram of system principle

The IDC180E Charger is an integrated DC Charger with dual DC connector configuration. In the single connector usage scenario, the vehicle undergoes a full power charge, whereas dual-connector operation allows each connector to output 90KW power. The charging connector cables are 5m long (length optional), and the head and socket of the charging connectors comply with the European standards IEC 62196-1 & IEC 62196-3.

The basic components of IDC180E Charger include: power supply interface, AC/DC power conversion unit, DC charging connector, charging control unit, low-voltage auxiliary power supply, Bluetooth module, Wi-Fi module, 4G network module, metering unit, cooling fan, indicator unit, monitoring unit, and enclosure.

The system block diagram of IDC180E Charger is shown in Fig.2-1.

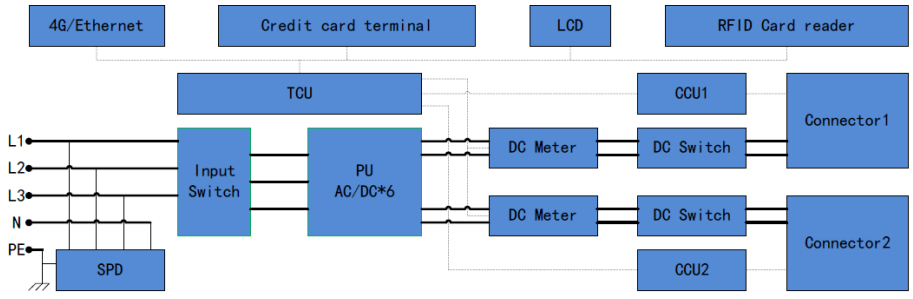


Fig.2-1 System block diagram of IDC180E

2.3 Introduction to system structure

Structurally, the IDC180E Charger is divided into two sides. The right side incorporates a concealed door handle structure. The front part of the right side includes the cable outlet, emergency stop button, right-side electric meter, and charging connector holder from top to bottom, while the rear part serves as the ventilation opening for the power unit's heat dissipation.

The front part of the left side includes the cable outlet, charging connector holder and left-side electric meter from top to bottom, while the rear part of the left side serves as the ventilation opening for the power unit's heat dissipation.

The CBU exploded view of IDC180E Charger is shown in Fig.2-2.

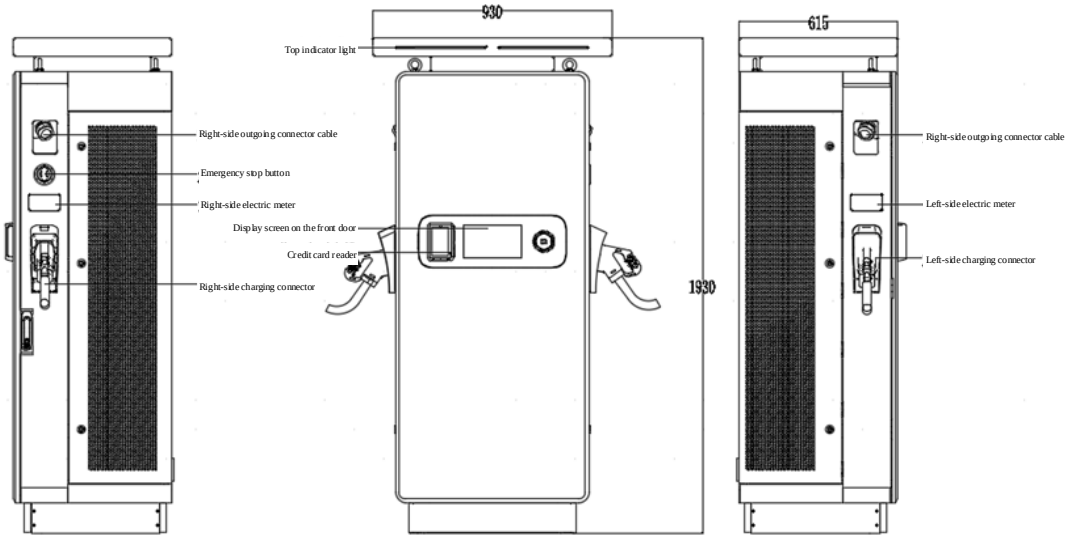


Fig.2-2 CBU exploded view

The CBU external view and internal structure of IDC180E Charger are shown in Fig.2-3, Fig.2-4, Fig.2-5 and Fig.2-6.

Fig.2-3 External view of IDC180E

Fig.2-4 Physical external structure of IDC180E

See Table 2-4 for the internal components of IDC180E Charger.

Table 2-4 Internal components of IDC180E

No.	Component name
1	POS machine
2	Display screen
3	Indicator lights + card reader
4	Emergency stop button
5	Electric meter
6	Connector holder
7	Charging connector

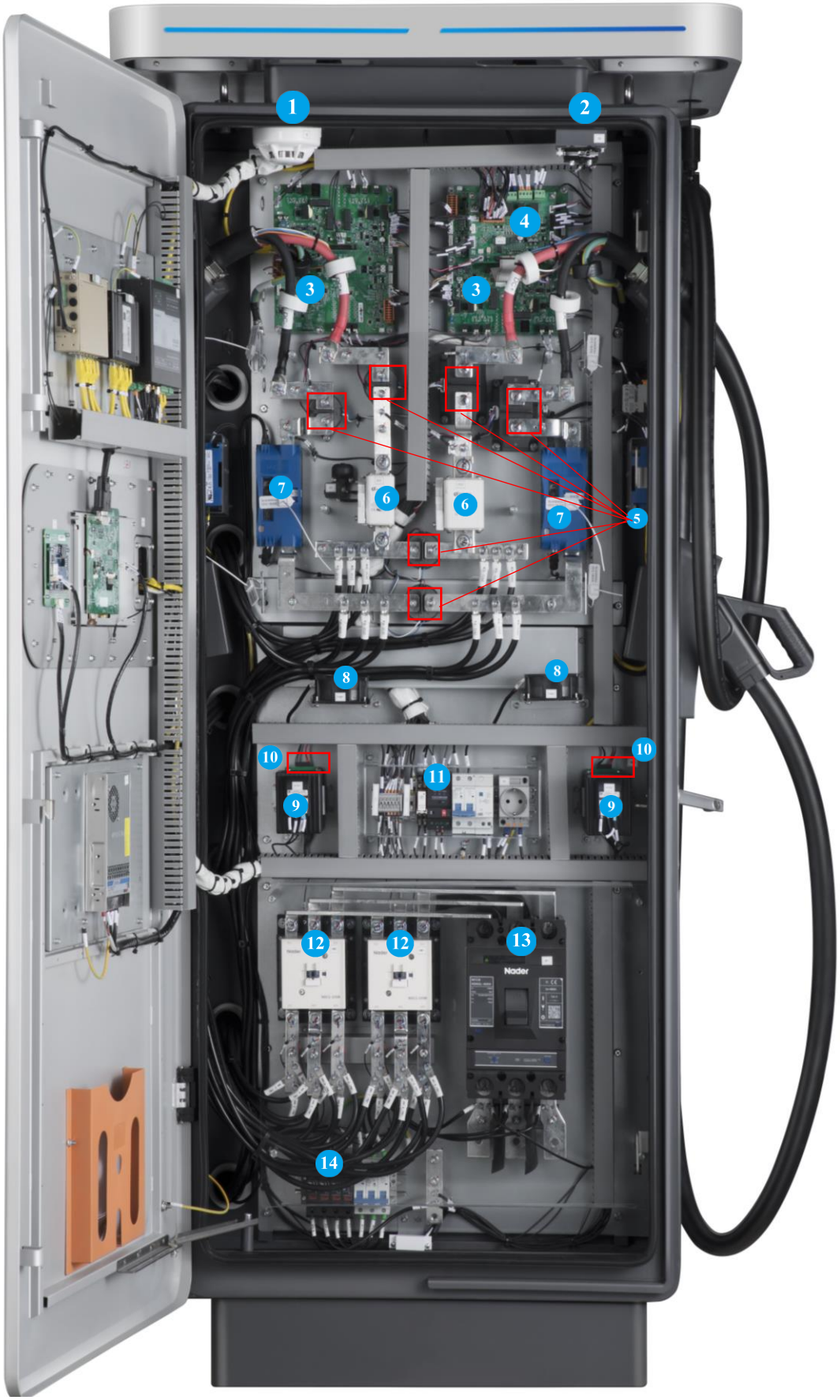


Fig.2-5 Internal structure of IDC180E

See Table 2-2 and Table 2-3 for the internal components of IDC180E Charger.

Table 2-2 Internal components of IDC180E

No.	Component name
01	Smoke alarm
02	Access control switch
03	CCU
04	Peripheral interface board
05	Contactor
06	Output fuse
07	Electric meter shunt sensor
08	Fan
09	Heater
10	Insulation monitor
11	Water immersion controller
12	AC contactor
13	Molded case circuit breaker
14	Lightning arrester

Fig.2-6 Internal structure of IDC180E

Table 2-3 Description of internal components of EMU200

No.	Component name
01	4G router
02	Switch
03	TCU
04	Card reader + light board
05	Display screen board
06	POS machine
07	Switching power supply

2.3.2 PCB Function

CCU control board is the control centre of the Charger, IDC180E has two CCU control boards, CCU1 and CCU2, each gun corresponds to one control board, detailed interface functions are described below.

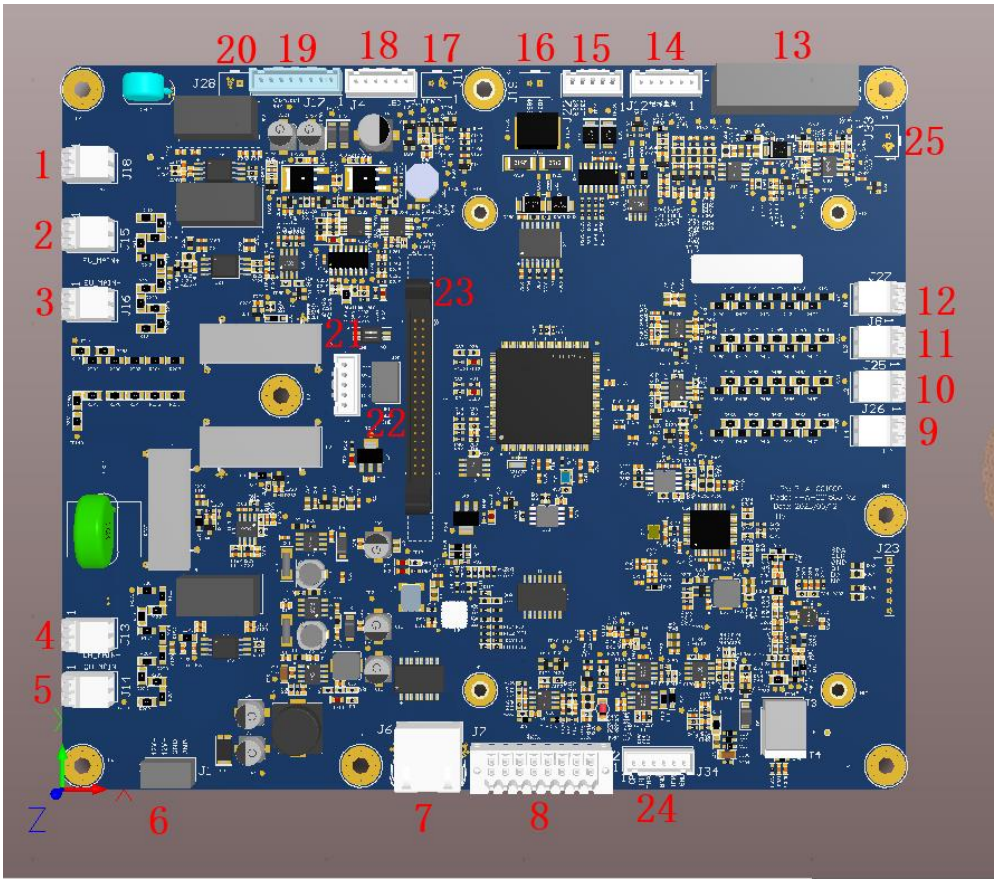


Fig.2-7 CCU PCB

NO.	SYMBOL	DESCRIPTION	Cable Type
1	J18	Single gun output current sampling	None
2	J15	Positive DC voltage sampling on EV side of single gun	None
3	J16	Negative DC voltage sampling on EV side of single gun	None
4	J13	Positive DC voltage sampling on the pile side of a single gun	None
5	J14	Negative DC voltage sampling on the pile side of a single gun	None

6	J1	12Vdc power supply	GC001363/ female plug _3A_2.5mm_4P_ cladding _S_NS_S
7	J6	RJ45 network port	None
8	J7	Gunline Signal	GC000686/ Screw Locking Plug _10A_3.5mm_2x8P_ sprung _S_WE_S
9	J26	AC Relay adhesion detection L1	None
10	J25	AC Relay adhesion detection L2	None
11	J8	AC Relay adhesion detection L3	None
12	J27	AC Relay adhesion detection N	None
13	J24	Liquid-cooled pump signals	Reserve
14	J12	Insulation Monitor Signal	GC000745/ Buckle plug _3A_2.5mm_6P_NA_S_NS_S
15	J22	RS232 signal	None
16	J19	RS485 signal	GC001361/female plug_3A_2.5mm_2P_ cladding _S_NS_S
17	J11	Temperature resistance signal	None
18	J4	LED Light belt control signal	GC000745/ Buckle plug _3A_2.5mm_6P_NA_S_NS_S
19	J17	Single gun output DC positive and negative contactor control feedback signal	GC001213/ plug _3A_2.5mm_8P_ cladding _S_WC_S
20	J28	Control board reset signal	GC001361/ female plug _3A_2.5mm_2P_ cladding _S_NS_S
21	J3	SWD Debugging port	GC000745/ Buckle plug _3A_2.5mm_6P_NA_S_NS_S
22	J29	Double-gun interlock signal	GC001362/ female plug _3A_2.5mm_3P_ cladding _S_NS_S
23	J5	Peripheral board signal	None
24	J34	Gun line signal redundancy	None
25	J33	scram signal	None

The PCU peripheral board is located on top of the CCU2 board and has the following detailed functions.

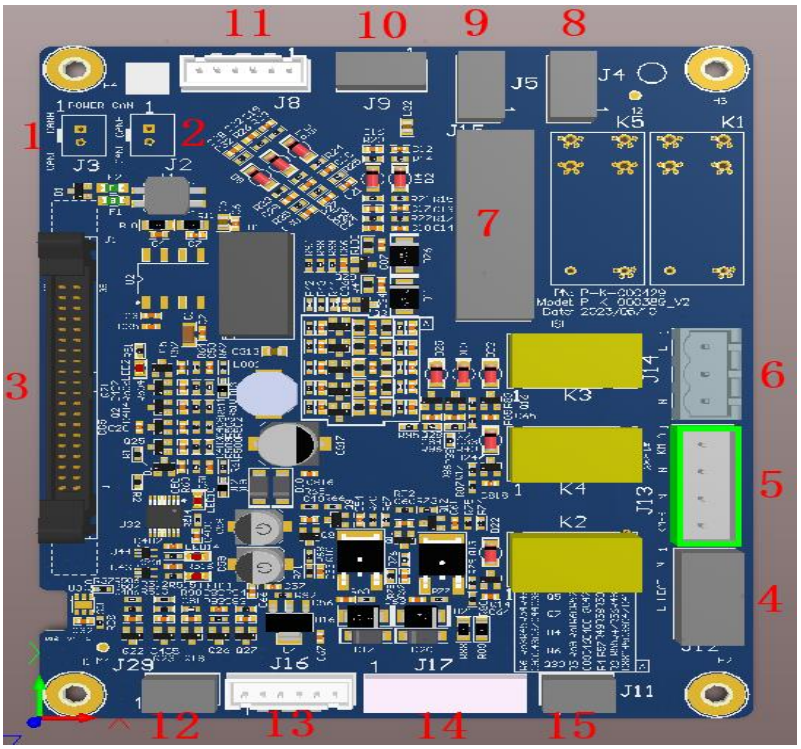
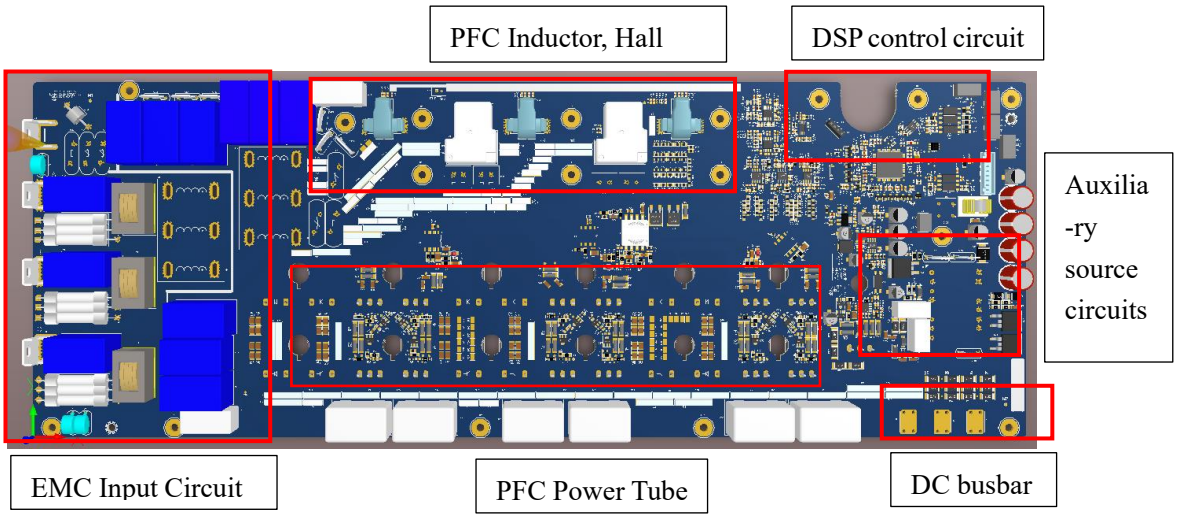


Fig.2-8 PCU PCB

NO.	SYMBOL	DESCRIPTION	Cable Type
1	J3	Power unit CAN communication debugging port	GC001361/ female plug _3A_2.5mm_2P_ cladding _S_NS_S
2	J2	Power unit CAN communicate	GC001361/ female plug _3A_2.5mm_2P_ cladding _S_NS_S
3	J1	Interface signal between peripheral board and control board	None
4	J12	Heater power supply	GC000003/ plug _12A_5.08mm_3P_Screw_S_PH_S
5	J13	Two AC relays drive power supply	GB000130/ plug _20A_5.08mm_4P_ Screw _S_GZ_S
6	J14	AC line L and N input	GC000003/ plug _12A_5.08mm_3P_ Screw _S_PH_S
7	J15	Turbulence, cooling fan control and feedback	GC000686/ Screw locks the plug _10A_3.5mm_2x8P_ Sprung _S_WE_S
8	J4	smoke signal	GC001363/ female plug _3A_2.5mm_4P_ cladding _S_NS_S

9	J5	Flooding signal	GC001363/ female plug _3A_2.5mm_4P_ cladding _S_NS_S
10	J9	Spoiler fan signalling	Reserve
11	J8	Access control, lightning protection, dumping.	GC000745/ Buckle Plugs _3A_2.5mm_6P_NA_S_NS_S
12	J29	Contactor interlock signal (from another CCU)	GC001362/ female plug _3A_2.5mm_3P_ cladding _S_NS_S
13	J16	Polygon Ring LED Light Board	GC000745/ Buckle Plugs _3A_2.5mm_6P_NA_S_NS_S
14	J17	Power division contactor control and feedback	GC001213/ plug _3A_2.5mm_8P_ cladding _S_WC_S
15	J11	CAN Termination 120R Resistor	GC001362/ female plug _3A_2.5mm_3P_ cladding _S_NS_S

IDC180E has 6 power units, 30KW each, the power module consists of PFC and LLC, the detailed function is described as follows.



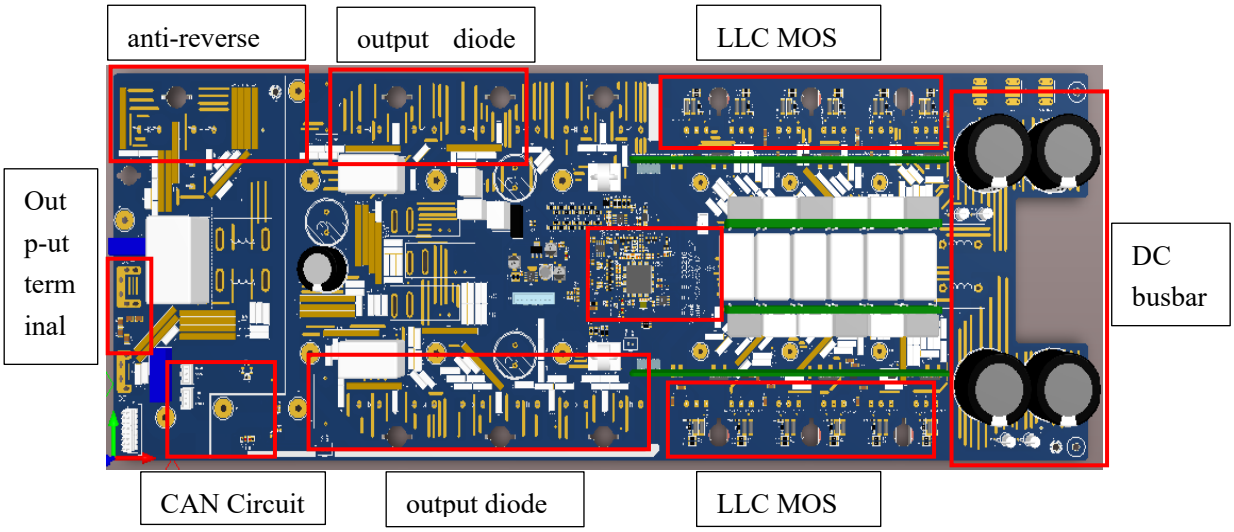


Fig.2-9 Power Module Internal PCB

There are two types of indicator lights on IDC180E Charger, the top light located on the top of the pile and the star concentrator ring light located on the front of the pile. The top light is used to indicate the status of the charging guns, and the left and right guns are controlled individually; the Star Convergence Ring Light is used to indicate the status of the whole pile, and the definitions of flickering in different colors are listed in Table 2-6.

Table 2-6 Status description of LED lights

Indicator light style	Indicator light effect	Charger status	Remarks
Top light	Green light normally on	Charging connector on standby	Normal, indication for left and right connectors separately
	Blue light breathing	Charging in progress	Normal, indication for left and right connectors separately
	The blue light is normally on	Fully charged	Normal, indication for left and right connectors separately
	Red light normally on	Fault	Abnormal, indication for left and right connectors separately
Starry energy-gathering ring light	Blue light flickering	Wait for the user to initiate charge by swiping the card	Normal
	The blue light is	Normal pile	Normal

	normally on		
	Red light normally on	Faulty pile	Abnormal. No indication for single-connector fault, with blue light normally on

2.4 Introduction to system interfaces

2.4.1 Login and exit of operation and maintenance mode

Press and hold the box icon in the upper left corner of the Charger LCD screen in any state (client interface), as shown in Fig.2-10.

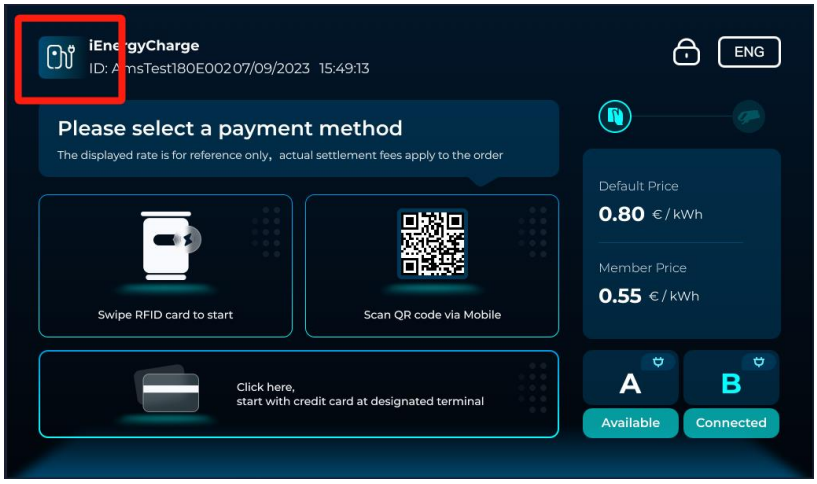


Fig.2-10 Client interface

Input password in the pop-up dialog box, and then tap "Enter" (default password: 202301)

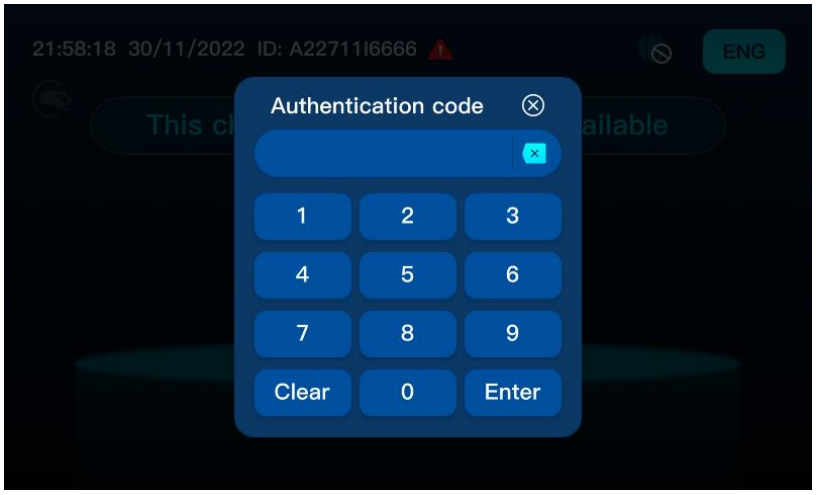


Fig.2-11 Password input interface

To exit the operation and maintenance mode, tap "hide" on the interface to return to the normal client interface, as shown in Fig.2-12.

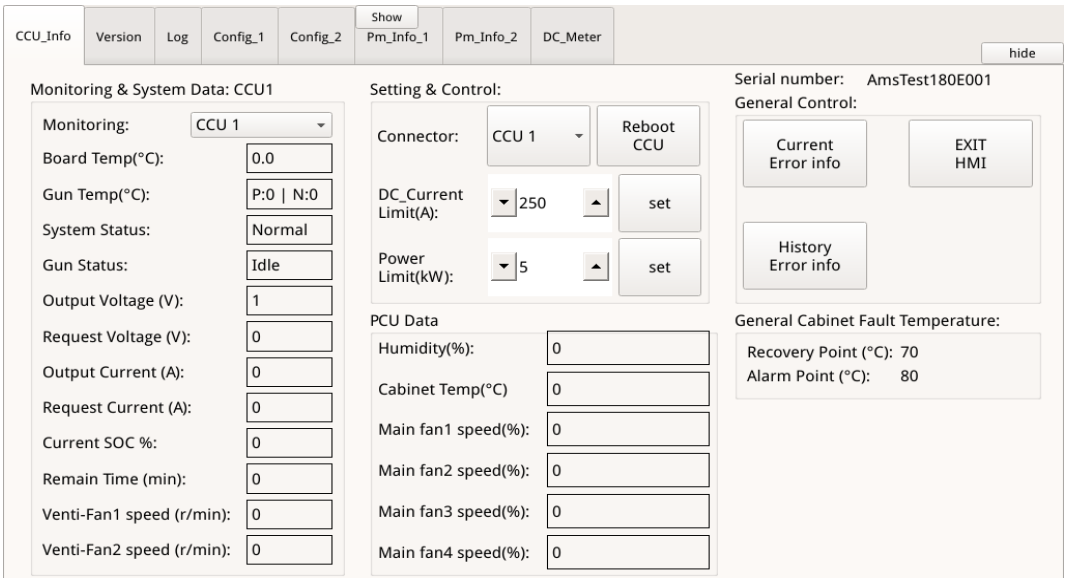


Fig.2-12 Interface of operation and maintenance mode

2.4.2 CCU_Info

Select "CCU_Info" from the navigation bar to enter the CCU_Info page. The CCU_Info page is in two types: user page and administrator page. The following function instructions are based the administrator page. In the Setting->CCU Select section, select the CCU number (connector number) from the drop-down menu. The CCU number determines the data displayed on the CCU_Info page.

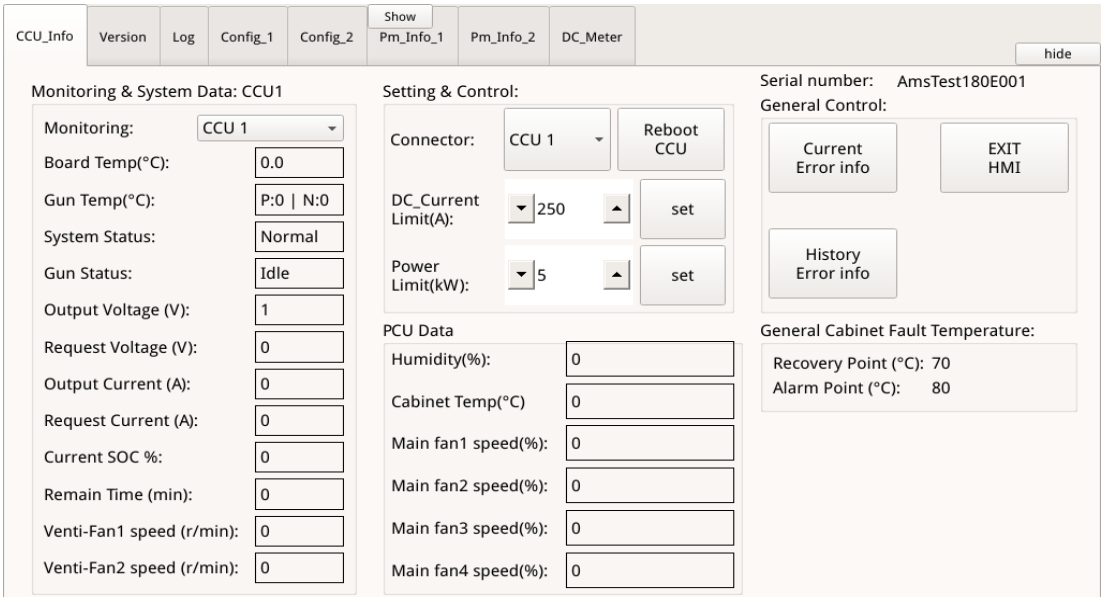


Fig.2-13 CCU_Info interface

System Data: The main displayed data include cabinet temperature, charging connector temperature, system status, output voltage, requested voltage, output current, requested current, current SOC and remaining time.

EXIT HMI: Tap the button to exit the charging program.

Reset CCU: After tapping the button, CCU will be restarted automatically.

History error information: Tap the button to display historical error information in the pop-up dialog box. Tap "Earlier Pages", "Newer Pages" and "Latest Page" to switch among error message information pages, and tap the "Close" button to close the dialog box.

Current Error info: Tap the button to display the current real-time error information in the pop-up dialog box, and tap "Close" to close the dialog box.

Cabinet fault temperature: Alarm temperature: When the cabinet temperature exceeds the alarm temperature, the Charger will reduce power or stop charging; Recovery temperature: When the cabinet temperature is lower than the recovery temperature, the Charger restores the original output power.

Setting: Tap  or  to adjust the maximum current or maximum power of CCU; Tap “Set" to set the local charging current or power of CCU.

2.4.3 Config_1

Select "Config_1" in the navigation bar to enter the Config_1 page. The Config_1 page is in two types: user page and administrator page. The following function instructions are based the administrator page.

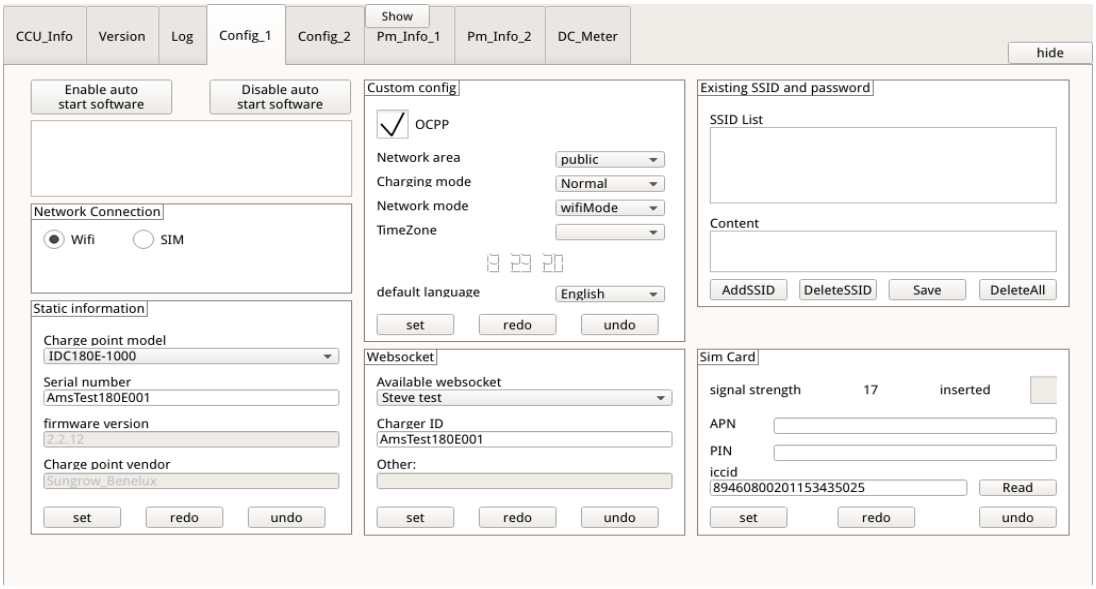


Fig.2-14 Config_1 interface

The main functions of the Config_1 interface are as follows:

- Network Connection - select a network connection mode of Charger

- Static information - display and modify the SN of the Charger
- Custom config - the user can set the charging mode (Normal: Normal charging mode, and card swiping is required; Plug and Play: Plug and Play mode, and card swiping is not required), network mode, time zone, and language
- Websocket
- Existing SSID and password - connect the Charger to WiFi
- SIM Card - edit APN information and PIN code of the SIM card

2.4.4 Process of charging operation

2.4.4.1 Process in card-swiping mode

1. Touch the LCD screen of the Charger. Select "Charging Card" to access the card swiping page, as shown in Fig.2-15;

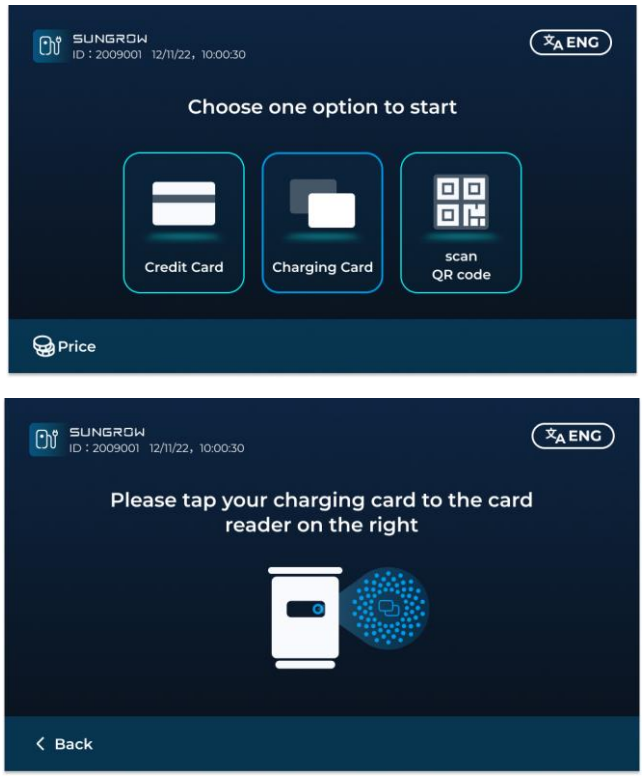


Fig.2-15 Card swiping page

2. According to the feedback from OCPP platform, the card swiping result will be displayed. Successful authorization is shown in the following Fig.

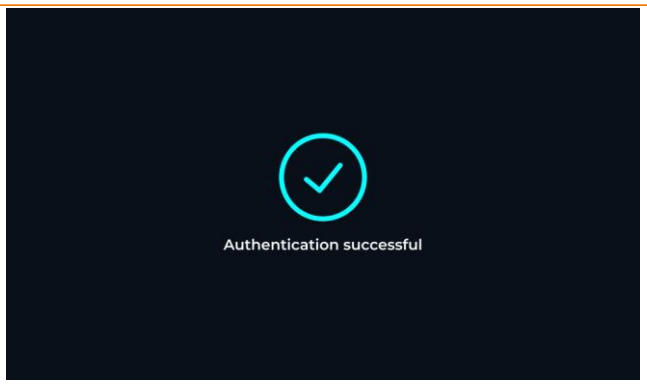


Fig.2-16 Successful authorization page

Authorization failure is shown in the following Fig., and the possible reasons for authorization failure are as follows:

1) The card cannot be identified;

2) The card has been blocked;

3) The card has expired;

4) The card has been used;

5) There is an unknown error;

6) The card is not in the local list (offline mode only).

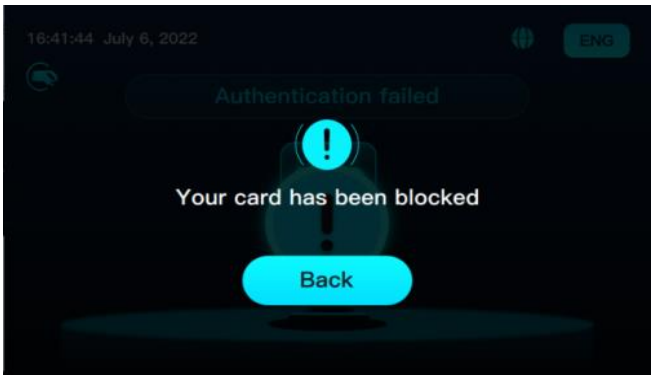


Fig.2-17 Authorization failure page

3. Following a successful card swipe, proceed to the connector selection interface, as shown in Fig. 2-18;

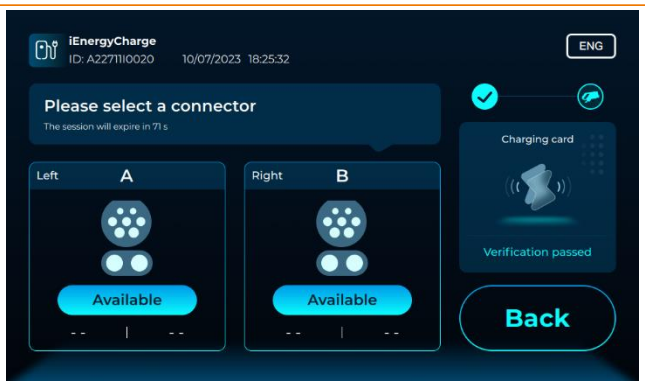


Fig.2-18 Connector selection interface

4. Upon selecting a connector, a pop-up prompts the user to plug in the connector within the stipulated time frame, as shown in Fig.19;

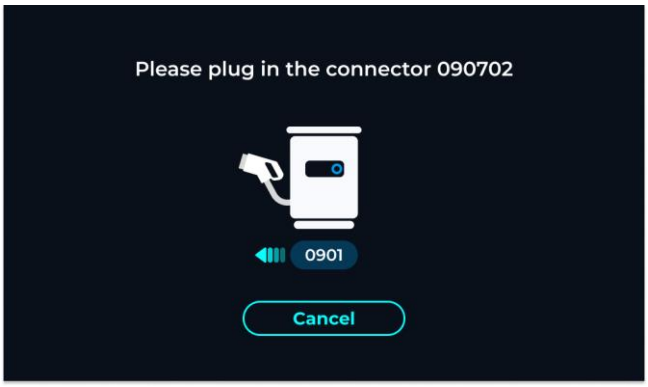


Fig.2-19 Interface prompting the user to plug in the connector

5. In the charging preparation stage, the user can tap the Cancel button to terminate the charging process;

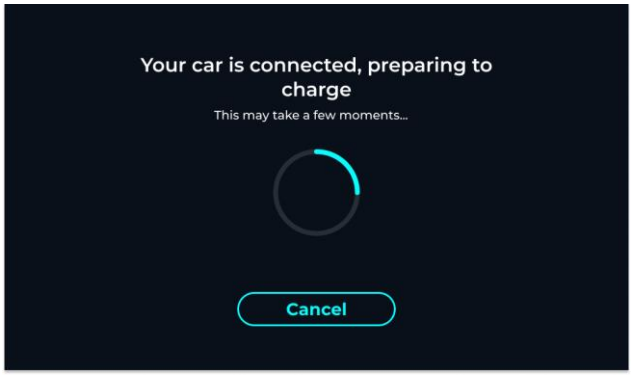


Fig.2-20 Preparation page

6. After completing the preparatory stage, the system transitions to the normal charging interface. Tap and on the screen or slide the screen to switch information display, as shown in Fig.2-21;

Fig.2-21 Interfaces of normal charging

Stop charging: After swiping the card and entering the charging page, tap Stop and subsequently tap Confirm to stop charging.

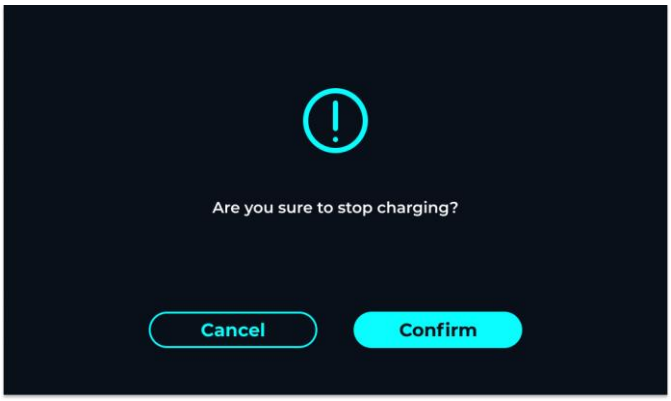


Fig.2-22 Stop charging by tapping the Stop button

After charging is finished, if the vehicle is fully charged, the user can manually stop charging. If there is an abnormality in the charging process, a page indicating charging stopping is displayed, as shown in Fig.2-23. After completely stopping, a page indication charging completion is displayed, as shown in Fig.2-24. The user can view relevant information, including total electric quantity and service time, and receives a prompt to disconnect the charging connector.

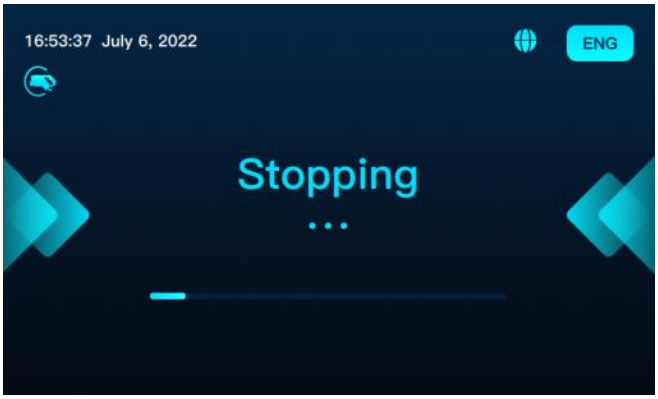


Fig.2-23 Stopping page

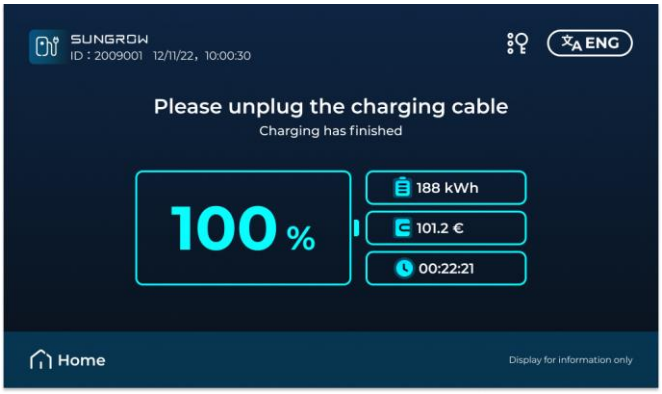


Fig.2-24 Charging completion page

3 Troubleshooting and fault solving

3.1 Pre-maintenance inspection

3.1.1 IDC180E Charger Power Failure Maintenance Action Description

The following requirements need to be noted when opening the cabinet door or checking the electricity:

1) Wear safety protective equipment such as helmet, insulated boots, insulated gloves;

2) Disconnect all external connections of IDC180E (front level circuit breaker for AC input)

3) Disconnect the miniature circuit breaker inside the Charger, as shown in Fig.3-1;

4) Disconnect the moulded case circuit breaker inside the Charger, as shown in Fig.3-1;

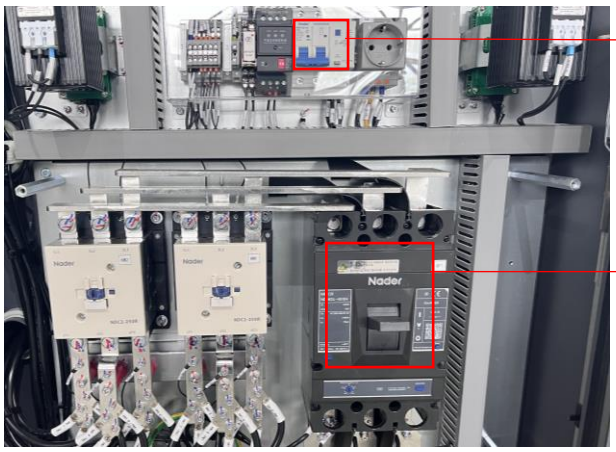
5) Hit the cabinet door of the Charger and remove the strong electric shield;

6) Use a multimeter to measure the voltages of DC+ and DC- of the moulded case circuit breaker, miniature circuit breaker, machine casing, AC input terminal and DC gun wire respectively, to ensure that the AC side disconnection is complete.

7) Wait at least 10 minutes until the residual voltage is released before maintaining any devices inside the IDC180E Charger.

The IDC180E charging post's AC input ports "PE, N, L3, L2, L1" as well as the DC+, DC- of the DC gun cable may have high voltage. Therefore, before performing maintenance on the IDC180E Charger, make sure the Charger is out of service, the AC input is disconnected, and the grounding wire is well grounded.

The physical layout of the internal AC input ports of the IDC180E Charger is shown in the Fig. below:



3.1.2 Major safety rules

In order to ensure the safety of operators when maintaining or overhauling IDC180E Chargers, the following five safety rules must be observed:

- Disconnect all external connections to the IDC180E (prime circuit breakers for AC input) and ensure that the IDC180E Charger has stopped operating.
- Warning sign placed in front of pile, Ensure that IDC180E Charger will not be accidentally powered up.
- Check with a multimeter and ensure that the IDC180E Charger is completely uncharged.

3.1.3 Information collection

In case of IDC30 Charger failure on site, the following relevant information needs to be collected.

1) The SN of the IDC180E Charger;
2) Information such as the brand, model and configuration of the vehicle connected to IDC180E Charger;
3) Description of fault;
4) Photos of fault;
5) Software version of the IDC180E Charger;
6) System log of IDC180E.

3.2 Faults and methods for solving faults

The common faults and troubleshooting methods of IDC180E Charger are listed in the following table.

Troubleshooting of CCU Faults

3.2.1 CCU-1

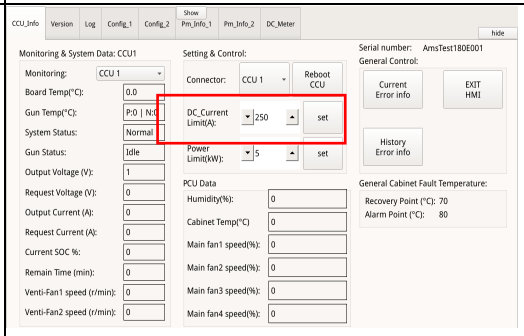
Fault name	Motherboard voltage fault (Err_Sys_CCU_Motherboard_Volatge_Abnomal_Alarm)
Fault type	Pile fault
Fault condition	The power supply voltage of the CCU board is lower than 9V
Steps and methods of troubleshooting	1. Check whether the CCU board is damaged and whether the wiring is loose; 2. If the CCU board is not damaged, please export CCU messages for further analysis; 3. If the CCU board is damaged, replace it after message analysis.

Remarks	

3.2.2 CCU-2

Fault name	Emergency stop fault (Err_Sys_Emergency_Stop_Alarm)
Fault type	Pile fault
Fault condition	The emergency stop button has been pressed
Steps and methods of troubleshooting	1. Release the emergency stop button of the pile; 2. If the fault persists, please check whether the emergency stop button is damaged. If it is damaged, please replace it.
Remarks	

3.2.3 CCU-12

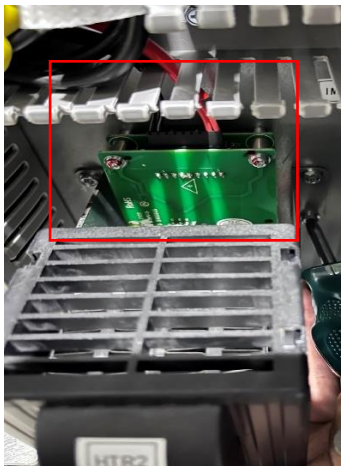
Fault name	Connector cable over-temperature fault (Err_Connector1_Connector_Over_Temp_Warning)
Fault type	Gun fault
Fault condition	The sampled temperature of either the positive or negative terminal of the connector cable exceeds 120°C
Steps and methods of troubleshooting	1. Check whether all internal fans are operating normally. Replace any damaged fans; 2. Switch to the factory mode, limit the charging current of the corresponding connector cable via the CCU page, and observe temperature changes. If the sampled temperature is below 110°C, the fault is resolved; 3. If the temperature does not drop, please export all messages for further analysis.
Remarks	 Setting the current in the CCU page here

3.2.4 CCU-13

Fault name	Connector cable temperature alarm (Err_Connector1_Connector_Over_Temp_Alarm)
Fault type	Gun fault
Fault condition	The sampled temperature of either the positive or negative terminal of the connector cable exceeds 90°C
Steps and methods of troubleshooting	1. Check whether all internal fans are operating normally. Replace any damaged fans; 2. Switch to the factory mode, limit the charging current of the corresponding

	connector cable via the CCU page, and observe temperature changes. If the sampled temperature is below 84°C, the fault is resolved; 3. If the temperature does not drop, please export all messages for further analysis.
Remarks	

3.2.5 CCU-23

Fault name	Insulation monitor communication fault (Err_Connector1_Insulation_Monitor_Communication_Failed_Alarm)
Fault type	Gun fault
Fault condition	The loss of communication between the CCU and insulation monitor lasts for more than 20s
Steps and methods of troubleshooting	1. Enter the cabinet through the door. Check insulation monitor for visible damage, and then check for loose wiring; 2. If the insulation monitor is intact and the wiring is normal, export all messages for further analysis.
Remarks	 The insulator monitor is behind the heater

3.2.6 CCU-24

Fault name	Insulation monitor failure (Err_Connector1_Insulation_Monitor_Selfcheck_Device_Abnormal_Alarm)
Fault type	Gun fault
Fault condition	In State A, the charging pile performs a positive pole and negative pole self-test every 1min. If 5 consecutive self-tests fail, the insulation monitor reports an error.
Steps and methods of troubleshooting	1. Enter the cabinet through the door. Check insulation monitor for visible damage, and then check for loose wiring; 2. If the insulation monitor is intact and the wiring is normal, export CCU messages for further analysis. 3. If any component is damaged, replace the component after message analysis.
Remarks	Ibid

3.2.7 CCU-26

Fault name	Busbar P-to-GND self-check fault (Err_Connector1_Insulation_Monitor_Selfcheck_DCp_to_GND_Abnormal_Alarm)
Fault type	Gun fault
Fault condition	In State A, the charging pile performs a positive pole self-test every 1min. If 5 consecutive self-tests fail, the insulation monitor reports an error.
Steps and methods of troubleshooting	Please export all messages for further analysis
Remarks	

3.2.8 CCU-28

Fault name	Insulation resistor level 1 alarm (Err_Connector1_DC_Bus_Insulation_Abnormal_Level_1_Alarm)
Fault type	Gun fault
Fault condition	The DC+/DC- resistance to PE falls below 92kΩ
Steps and methods of troubleshooting	Stop charging, and export all messages for further analysis
Remarks	

3.2.9 CCU-31

Fault name	Positive output contactor drop-out fault (Err_Connector1_DCp_Output_Contactor_not_Drop_Out_Alarm)
Fault type	Gun fault
Fault condition	When positive output contactor is disconnected, the feedback level of positive DC output contactor does not match the actual action level for 150 consecutive milliseconds
Steps and methods of troubleshooting	1. Check whether the contactor is damaged and whether the input terminal wiring is loose; 2. If the contactor is not damaged, measure the voltage at the input terminal with a multimeter. Absence of voltage indicates wire damage; 3. If the contactor is damaged, replace it after message analysis.
Remarks	

3.2.10 CCU-35

Fault name	Connector head voltage greater than 60V at State A/B initialization (Err_Connector_1_Dc_Initialization_OV_Protection)

Fault type	Gun fault
Fault condition	The error is reported under the following conditions: 1. The CP is in State A/B 2. The external output voltage of the connector cable remains above 60V for 10 consecutive seconds
Steps and methods of troubleshooting	1. Check the connector head for damage; 2. Export all messages for further analysis; 3. If the connector cable is damaged, replace it after message analysis.
Remarks	

3.2.11 CCU-36

Fault name	State E triggered by CP (Err_Connector_1_Cp_StateE_Alarm)
Fault type	Gun fault
Fault condition	The CP on the vehicle/pile side is in State E (the maximum level is 0V), and a shutdown error occurs on the connector
Steps and methods of troubleshooting	Please export all messages for further analysis
Remarks	

3.2.12 CCU-38

Fault name	Error of temporary overvoltage of DC+ to PE (Err_Connector_DCp_to_PE_Overvoltage)
Fault type	Gun fault
Fault condition	The sampled voltage of DC+ to PE exceeds 990V for more than 2 seconds
Steps and methods of troubleshooting	Please export all messages for further analysis
Remarks	

3.2.13 CCU-40

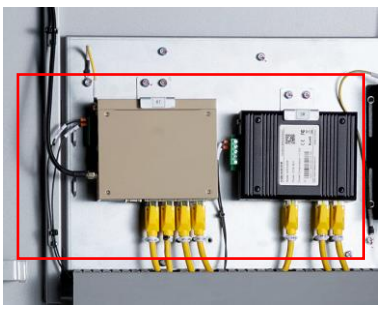
Fault name	DC voltage output exceeds the battery overvoltage protection value (Err_Connector_DC_Ev_Battery_Overvoltage)
Fault type	Gun fault
Fault condition	During charging, the current output voltage exceeds the vehicle battery's maximum voltage by more than 5V for 10 consecutive seconds
Steps and methods of troubleshooting	Please export all messages for further analysis
Remarks	

Troubleshooting of TCU Faults

3.2.14 TCU-2

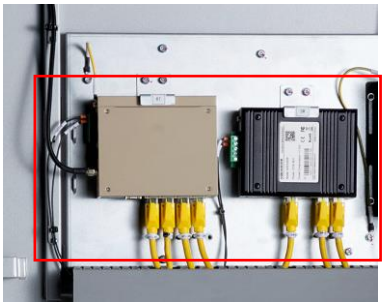
Fault name	Card reader communication fault (1Err_TCU_CardReader_Comm_Error)
Fault condition	The communication between the TCU and the card reader is interrupted for more than 60s
Steps and methods of troubleshooting	1. Open the cabinet door to check the card reader on the cabinet door for damaged, and check for loose wiring; 2. If the card reader is not damaged and the wiring is normal, export all messages for further analysis; 3. Replace the card reader if it is found to be damaged.
Remarks	 Check the wiring of the card reader communication cable here

3.2.15 TCU-6

Fault name	Network disconnection alarm (The network is unreacheable)
Fault condition	The pile is unable to connect to the network. There are two scenarios: 1. When the pile operates in a public network, 8.8.8.8 cannot be pinged successfully 2. When the pile operates in a private network, the host address of the operating platform cannot be pinged successfully
Steps and methods of troubleshooting	1. Check whether the connection of the SIM card or the 4G router network cable as indicated in the diagram below is normal; 2. Check whether the network service is active and paid for; 3. If the fault persists, export all messages for further analysis.
Remarks	 Check the communication cable here

3.2.16 TCU-7

Fault name	Failure to establish a connection with OCPP despite a network (The OCPP backend is unreachable)

Fault condition	The pile can be connected to the public network, but cannot be connected to the OCPP main platform.
Steps and methods of troubleshooting	1. First check whether the communication cable as indicated in the diagram below is connected correctly; 2. Switch to the factory mode to check whether OCPP is selected and check whether the OCPP address is correct; 3. Record the SN of the pile, and check whether the pile is registered on the iEnergyCharge platform.
Remarks	 Check the communication cable here

3.2.17 TCU-8

Fault name	Card Blocked (Your card has been blocked)
Fault condition	The RFID card is blocked by the platform
Steps and methods of troubleshooting	1. Check whether the card is matched with the pile, and check whether the card is damaged; 2. Check if the card has been blocked on the platform.
Remarks	

3.2.18 TCU-9

Fault name	Card Expired (Your card has been expired)
Fault condition	The RFID card has expired
Steps and methods of troubleshooting	1. Check whether the card is matched with the pile, and check whether the card is damaged; 2. Check if the card has been blocked on the platform.
Remarks	

3.2.19 TCU-10

Fault name	Card Invalid (Unable to identify your card)
Fault condition	The RFID card cannot be identified
Steps and methods of troubleshooting	1. Check whether the card is matched with the pile, and check whether the card is damaged; 2. Check if the card has been bound on the platform.
Remarks	

3.2.20 TCU-11

Fault name	Card ConcurrentTx (This card is being used, please use another card)
Fault condition	The transaction associated with the RFID card is not completed on the platform, preventing the initiation of a new order
Steps and methods of troubleshooting	Check if there is any ongoing charging order related to the card.
Remarks	

3.2.21 TCU-12

Fault name	Card swiping timeout or wrong card swiped (Please use the card you scanned at the beginning)
Fault condition	When both connectors are in use, the current RFID card cannot locate the corresponding charging process
Steps and methods of troubleshooting	Use the same card that was initially used for charging, or use another card to start the charging process.
Remarks	

3.2.22 TCU-16

Fault name	This charging point is unavailable
Fault condition	The pile is unavailable, with a pile error code or both connectors out of service.
Steps and methods of troubleshooting	1. Check the charging pile for any damaged components; 2. Check backend error codes and export all messages for further analysis.
Remarks	

3.2.23 TCU-22

Fault name	Charging request timeout, please retry
Fault condition	The charging request timeout is generally triggered under any of the following conditions: 1. SLAC timeout 2. EV handshake timeout 3. Payment authorization timeout of the pile
Steps and methods of troubleshooting	In case of connector insertion timeout, reinsert the connector and swipe the card.
Remarks	

Troubleshooting of PCU Faults

3.2.24 PCU-1

Fault name	Overall Fault State

Fault condition	The pile is in an overall fault state under any of the following conditions: 1. Overall turbulence-inducing fan fault; 2. Water immersion fault; 3. Access control fault; 4. Lightning protector fault; 5. Smoke detector fault; 6. Tilt fault; 7. Communication fault of the power module; 8. Overall power module fault; 9. Pile overtemperature fault; 10. Pile humidity fault
Steps and methods of troubleshooting	Power off and then restart the pile. If the fault persists, export all messages for further analysis.
Remarks	

3.2.25 PCU-2

Fault name	Turbulence-inducing fan 1 fault (Err_Sys_System_Fan_1_Failed_Warning)
Fault condition	The actual rotating speed of turbulence-inducing fan 1 does not match the set rotating speed
Steps and methods of troubleshooting	The fault does not affect the current charging session. However, it is necessary to check fan 1 for damage or loose wiring. If the fan is damaged, replace it. If the wiring is loose, tighten it and retry.
Remarks	

3.2.26 PCU-3

Fault name	Turbulence-inducing fan 2 fault (Err_Sys_System_Fan_2_Failed_Warning)
Fault condition	The actual rotating speed of turbulence-inducing fan 2 does not match the set rotating speed
Steps and methods of troubleshooting	The fault does not affect the current charging session. However, it is necessary to check fan 2 for damage or loose wiring. If the fan is damaged, replace it. If the wiring is loose, tighten it and retry.
Remarks	Ibid

3.2.27 PCU-4

Fault name	Turbulence-inducing fan 3 fault (Err_Sys_System_Fan_3_Failed_Warning)
Fault condition	The actual rotating speed of turbulence-inducing fan 3 does not match the set rotating speed
Steps and methods of troubleshooting	The fault does not affect the current charging session. However, it is necessary to check fan 3 for damage or loose wiring. If the fan is damaged, replace it. If the wiring is loose, tighten it and retry.
Remarks	Ibid

3.2.28 PCU-5

Fault name	Turbulence-inducing fan 4 fault (Err_Sys_System_Fan_4_Failed_Warning)
Fault condition	The actual rotating speed of turbulence-inducing fan 4 does not match the set rotating speed
Steps and methods of	The fault does not affect the current charging session. However, it is necessary to check fan 4 for damage or loose wiring. If the fan is damaged, replace it. If

troubleshooting	the wiring is loose, tighten it and retry.
Remarks	Ibid

3.2.29 PCU-7

Fault name	Positive power division contactor drop-out fault (Err_DCp_Power_Distribute_Contactor_not_Drop_Out_Alarm)
Fault condition	The feedback level does not match the actual action level when the control positive power division contactor is disconnected
Steps and methods of troubleshooting	The fault does not affect the current charging session. However, the corresponding contactor needs maintenance or replacement.
Remarks	

3.2.30 PCU-8

Fault name	Positive power division contactor pick-up fault (Err_DCp_Power_Distribute_Contactor_not_Pick_Up_Alarm)
Fault condition	The feedback level does not match the actual action level when the control positive power division contactor is closed
Steps and methods of troubleshooting	The fault does not affect the current charging session. However, the corresponding contactor needs maintenance or replacement.
Remarks	

3.2.31 PCU-9

Fault name	Negative power division contactor drop-out fault (Err_DCn_Power_Distribute_Contactor_not_Drop_Out_Alarm)
Fault condition	The feedback level does not match the actual action level when the control negative power division contactor is disconnected
Steps and methods of troubleshooting	The fault does not affect the current charging session. However, the corresponding contactor needs maintenance or replacement.
Remarks	

3.2.32 PCU-10

Fault name	Negative power division contactor pick-up fault (Err_DCn_Power_Distribute_Contactor_not_Pick_Up_Alarm)
Fault condition	The feedback level does not match the actual action level when the control negative power division contactor is closed
Steps and methods of troubleshooting	The fault does not affect the current charging session. However, the corresponding contactor needs maintenance or replacement.
Remarks	

3.2.33 PCU-15

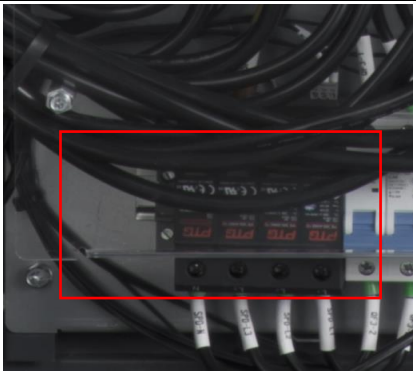
Fault name	Water immersion fault (Err_Sys_Water_Immersion_Alarm)

Fault condition	The feedback level of water immersion detector is 1
Steps and methods of troubleshooting	1. After powering off the pile, open the door for inspecting and discharging water; suspend use temporarily; 2. Check the overall condition of the pile; it may require maintenance and inspection.
Remarks	

3.2.34 PCU-16

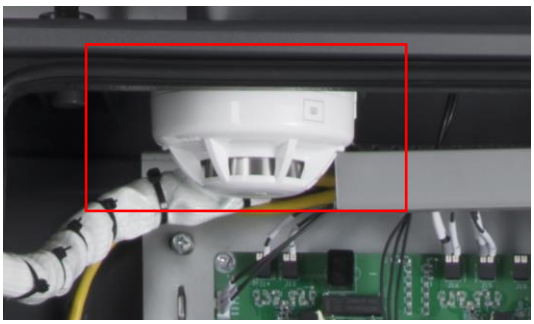
Fault name	Access control fault (Err_Sys_Door_Open_Alarm)
Fault condition	The feedback level of the access control trigger is 1
Steps and methods of troubleshooting	1、 Check whether the door is opened or damaged, and examine its actual condition. If the door is damaged, proceed with repairs; 2、 If the door is not damaged, export all messages for further analysis.
Remarks	 Check the access switch here

3.2.35 PCU-17

Fault name	Lightning protector fault (Err_Sys_SPD_Alarm)
Fault condition	The lightning protector feedback level is 1
Steps and methods of troubleshooting	1. Check the lightning protector for damage; if it is struck by lightning, discontinue its use; 2. Export all messages for further analysis;
Remarks	 Check for damage to the lightning protector here

3.2.36 PCU-18

Fault name	Smoke monitor fault (Err_Sys_Smoke_Monitor_Alarm)
Fault condition	The smoke detector feedback level is 1
Steps and	1. After powering off the pile, check for smoke; suspend use temporarily;

methods of troubleshooting	2. Export all messages for further analysis
Remarks	 Detect smoke sensors here

3.2.37 PCU-19

Fault name	Tilt fault (Err_Sys_Anti_Tilt_Alarm)
Fault condition	The tilt detector feedback level is 1
Steps and methods of troubleshooting	1. Check whether the pile is tilted and discontinue its use; 2. If the pile is not tilted, export all messages for further analysis.
Remarks	

3.2.38 PCU-21

Fault name	Power unit communication fault (Err_Sys_All_Power_Unit_Communication_Failed_Alarm)
Fault condition	The pile loses communication with all power modules for 15 consecutive seconds
Steps and methods of troubleshooting	1、 Check for any looseness in communication cable connection; If found, reconnect the cable; 2、 Check the power units for damage. If any unit is damaged, replace it; 3、 Export all messages for further analysis.
Remarks	

3.2.39 PCU-24-25

Fault name	Power module group fault (Err_Sys_Power_Unit_Group_Fault)
Fault condition	All modules within a group are faulty and non-functional
Steps and methods of troubleshooting	Export all messages for further analysis. Check for a red light on the modules, and decide whether to replace them.
Remarks	

3.2.40 PCU-26

Fault name	Overall PCU alarm (OverallFaultWarning)
Fault condition	An overall fault warning is triggered under any of these conditions: 1. A turbulence-inducing fan fails, but other fans are still functional 2. A single module group is not functional 3. The positive power division contactor fails to drop out 4. The positive power division contactor fails to pick up 5. The negative power division contactor fails to drop out 6. The negative power division contactor fails to pick up
Steps and methods of troubleshooting	Export all messages for further analysis
Remarks	

3.2.41 PCU-27-32

Fault name	Power module fault (Err_Sys_Power_Unit Fault)
Fault condition	The power module is faulty and non-functional
Steps and methods of troubleshooting	Export all messages for further analysis. Check for a red light on the modules, and decide whether to replace them.
Remarks	

3.2.42 PCU-33-34

Fault name	Turbulence-inducing fan fault (Err_Sys_System_Fan Failed_Warning)
Fault condition	The actual rotating speed of the turbulence-inducing fan does not match the set rotating speed
Steps and methods of troubleshooting	Check the fan for damage; replace it if it is damaged.
Remarks	

4 System upgrade and log export

4.1 Local upgrade

IDC180E Charger has the function of local upgrading via a USB flash drive. Insert the USB flash drive installed with firmware into the USB port of TCU, and then start the upgrade via operation on the LCD screen on the pile. This operation can upgrade the firmware of TCU and CCU of the Charger. The specific steps are as follows: insert the USB flash drive with firmware into the USB port of TCU, as shown in Fig.4-1. In the interface prompting the user to plug in the connect, press and hold  for several seconds, then a password box pops up. Enter the password 202301 to access the factory mode, as shown in Fig.4-2.

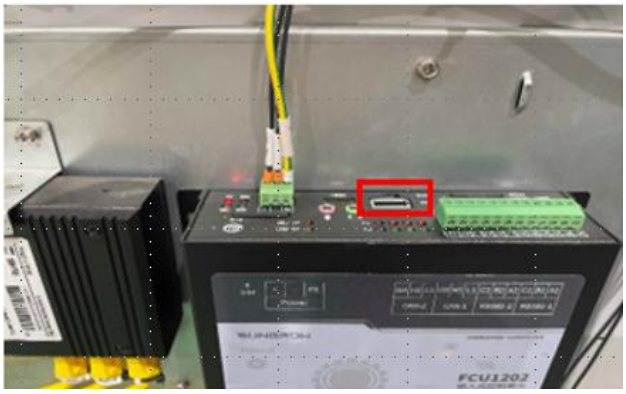
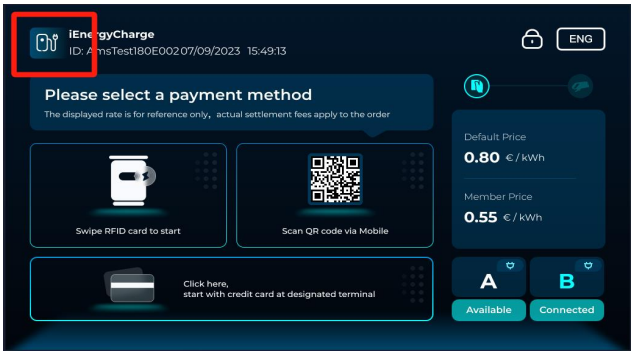


Fig.4-1 USB port of TCU



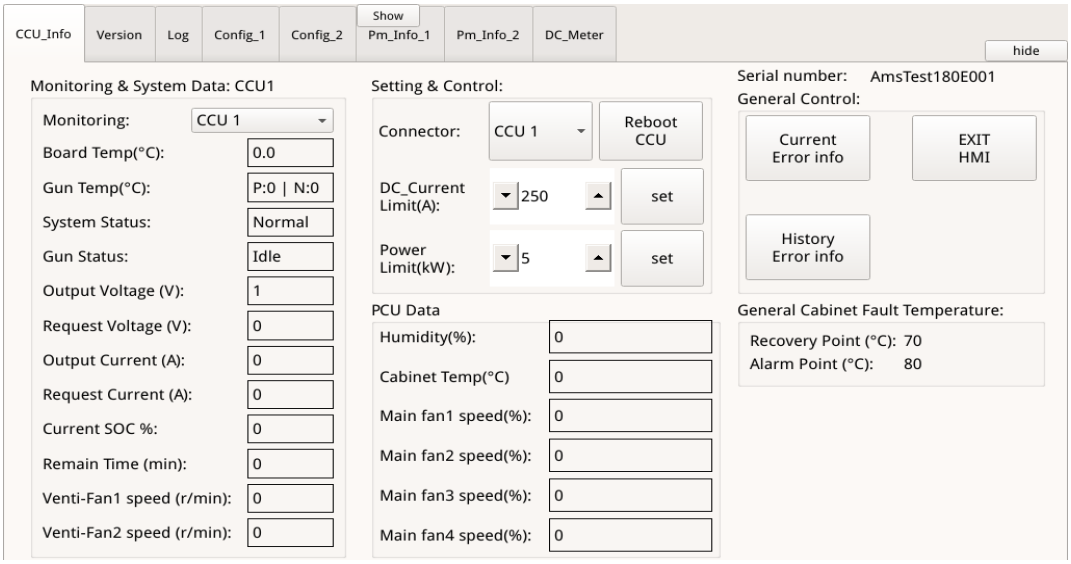


Fig.4-2 Interface of factory mode

1) After accessing the factory mode, navigate to the Version interface, as shown in Fig. 4-3. Tap the drop-down menu "Target Device" and select the target CCU/TCU to be upgraded;

2) Tap the drop-down menu “Device Index”. Select the number of the corresponding module;

3) Tap the drop-down menu “Firmware Source” and select "USB";

4) Tap "Load Firmware”;

5) After firmware loading, tap “Update Device" to upgrade;

6) After the upgrade is completed, the Charger will be automatically restarted. Remove the USB flash drive;

7) Repeat the above steps if multiple modules need to be upgraded. (For details, please refer to "Local firmware upgrade.pdf")

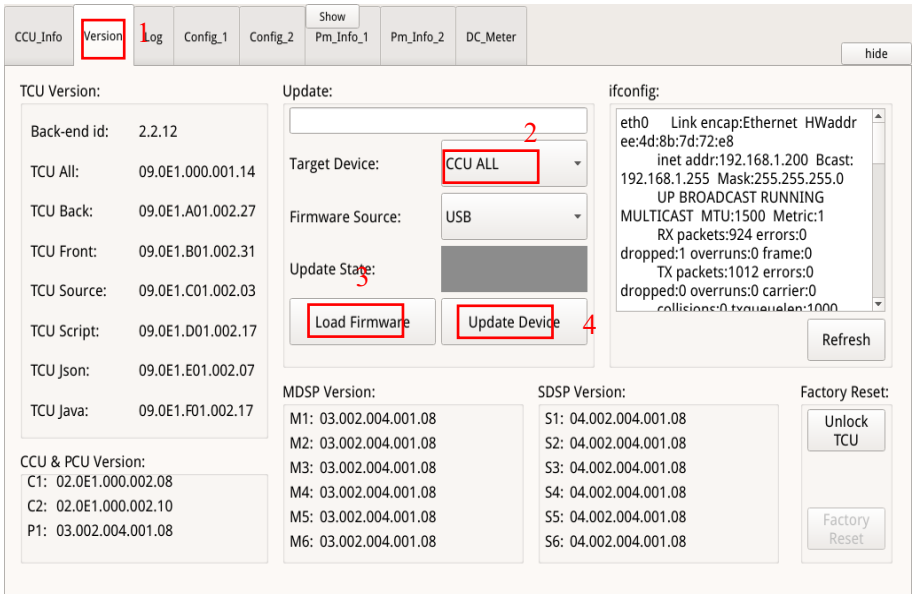


Fig.4-3 Interface of Version

4.2 Remote upgrade

IDC180E Charger has remote upgrade function, and the online upgrade process can be started in the following steps:

1) Enter the factory mode on the LCD screen of the Charger, and then tap "Upgrade" to upgrade the firmware;

2) Select the corresponding Charger on the iEnergyCharge platform and upgrade it;

3) Use the mobile APP to upgrade the Charger (please refer to iEnergyCharge Upgrade instructions.Word for details);

4) In the case of connecting to a third-party OCPP platform, firmware upgrade can be carried out through the third-party platform.

4.3 Log export

Select "Log" in the navigation bar to enter the log page. The log page is in two types: user page and administrator page. The following function instructions are based the administrator page.

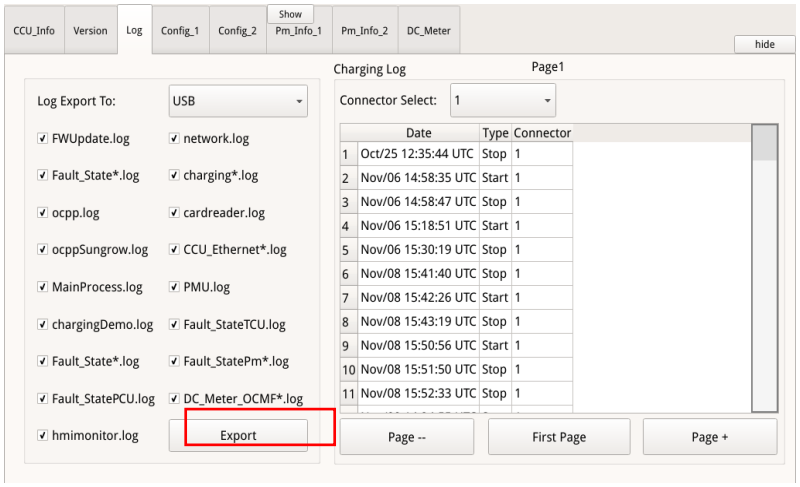


Fig.4-5 Interface of log export

The administrator's log page mainly includes: Export Log and Charging Log. The steps of exporting log are as follows:

1) Prepare a USB flash drive and insert it into the TCU;

2) Tap the drop-down menu "Log Export To" and select "USB";

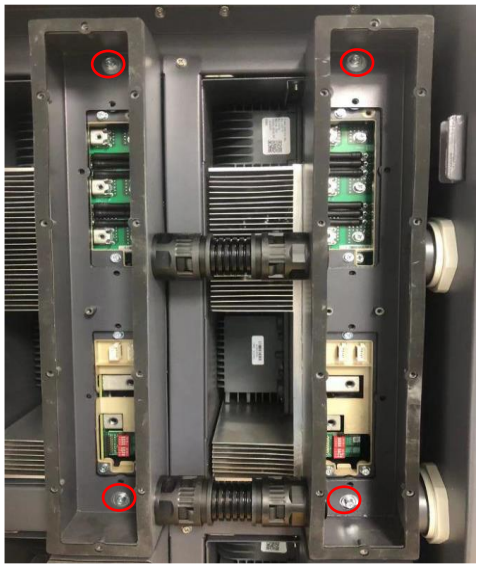
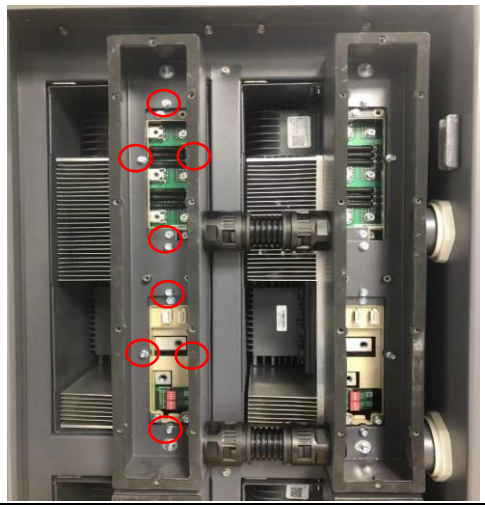
3) Check the name of the log to be exported in the check box (all selected by default);

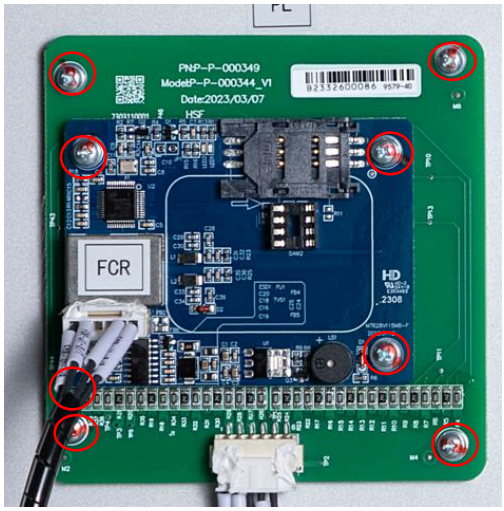
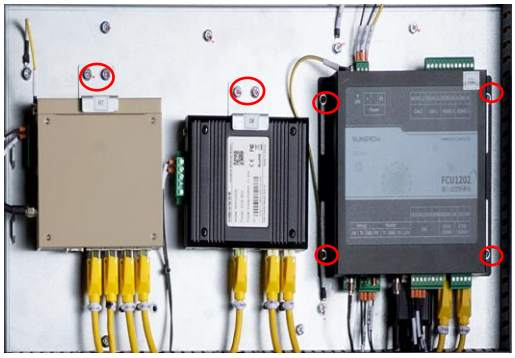
4) Tap "Export" to export.

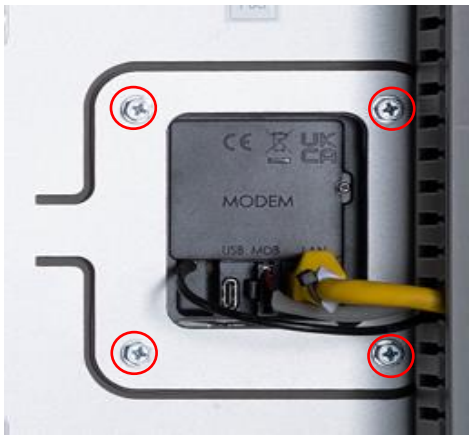
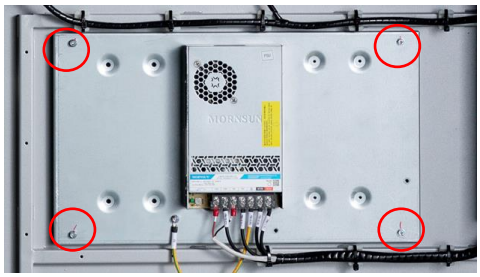
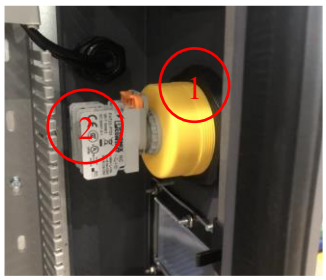
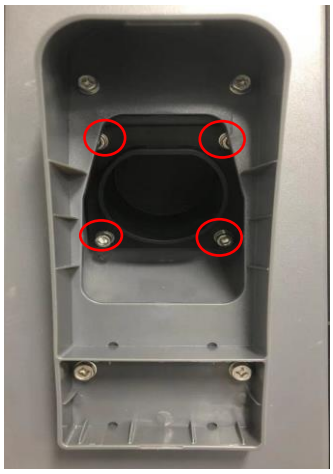
Note: After the pop-up window shows that the export is complete, please wait for 30s before remove the USB flash drive.

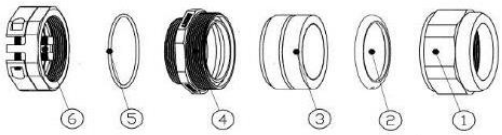
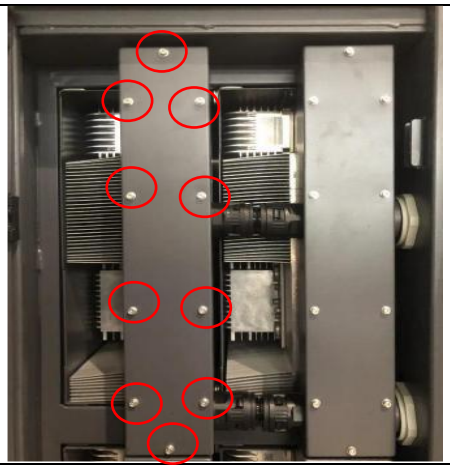
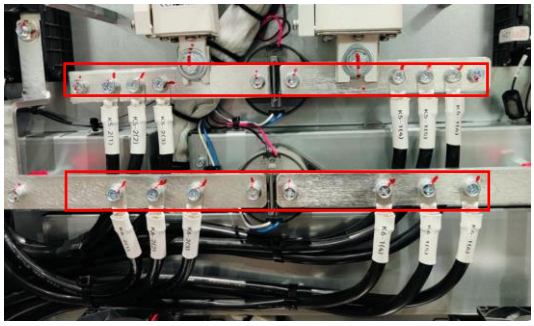
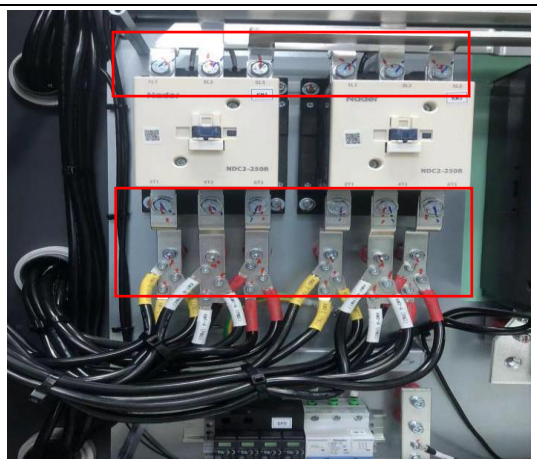
5. Technological requirements of device replacement

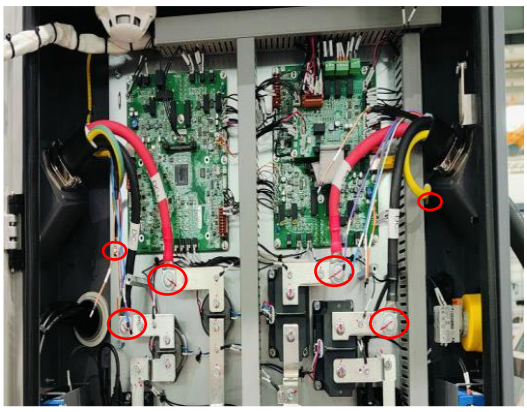
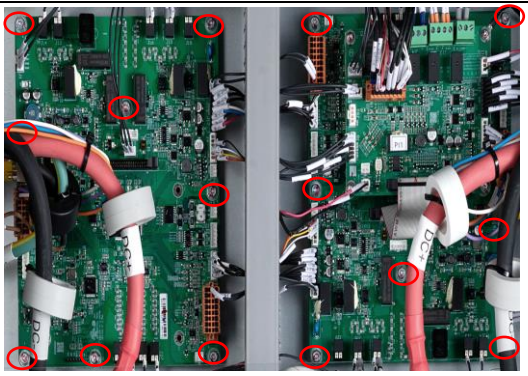
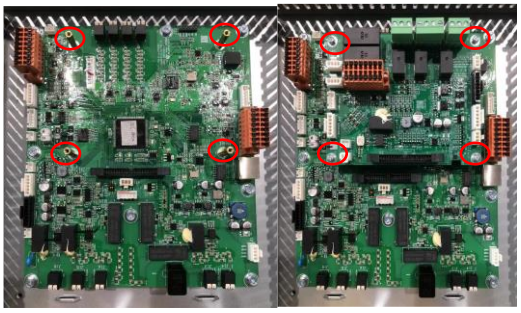
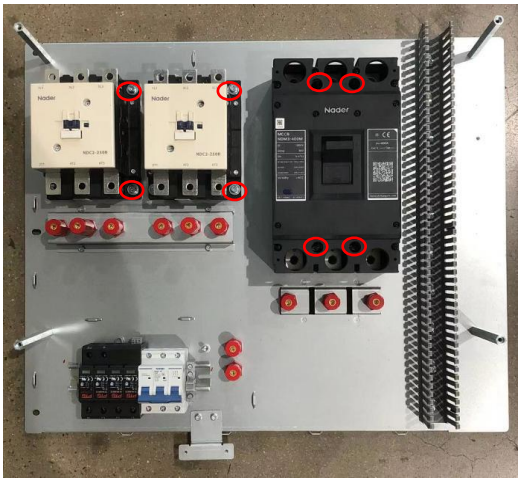
When undertaking equipment replacement, pay attention to the technological requirements.

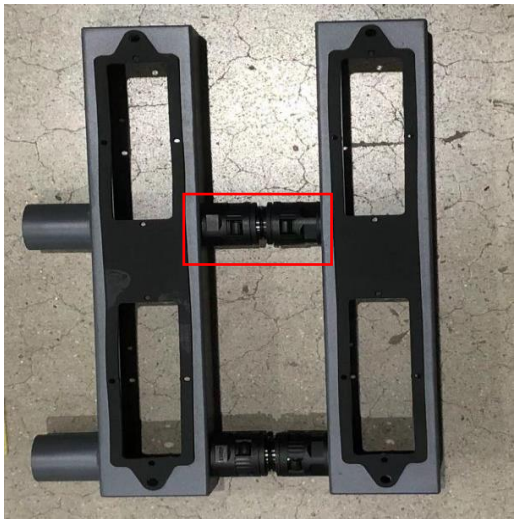
Installation station	Location image	Technological requirements
Fixation of power unit and junction box	 	M4*14 combinations, torque: 1.8±0.1N. m
Installation of grounding lines and copper bars		Installation of grounding copper bars (incoming lines):2/M6*16 combinations, installation of breathable valves: torque: 1±0.1N.m

Suspension installation		Torque for the primary part of the waterproof terminal: 4±0.5N.m, torque for locking nuts: 4±0.5N.m
Installation of door panel assembly		Fixation of light board PL + card reader FCR: 8/M3*8, torque: 0.8±0.1N.m
Installation of door panel assembly		4G router + switch with 4/M4*10, tightening torque: 1.5±0.1N.m TCU: 4/M3*12, tightening torque: 0.8±0.1N.m
Installation of door panel assembly		Fixation of display screen KVM: 4/M3*8, torque: 0.8±0.1N.m

Installation of door panel assembly		POS machine installation: 4/M4*10 combinations, torque: 1.5±0.1N.m
Installation of door panel assembly		Power supply module, torque: 1.5±0.1N.m
Emergency stop component installation	 	Install #1 emergency stop box module with a torque of 5±1N.m Install #2 emergency stop button with a torque of 1.1±0.1N.m
Connector holder installation		Utilize the accompanying M6 screws, torque: 2.5±0.1N.m

Metal cable gland installation	 	Prioritize the fastening of device #4 with a torque of 37±3 N.m Then fasten device #1 with at least one thread retained.
Junction box cover fixation		Junction box cover installation: stainless steel 60/M4*10 combinations, torque: 1.7± 0.1N.m
Large DC cable installation		Large DC cable connection: 12/M6*16 combinations, torque: 4.5±0.5N.m
Connection of large AC cable contactor		large AC cable connection: 18/M4*12 combinations, torque: 1.8±0.1N.m

DC output module		Installation of the power line of connector cable: 4/M8*20+ butterfly nuts, torque: 18±2N.m Grounding wire of the connector cable: 2/M6 flange nuts, torque: 4.5±0.5N.m
DC output module		Sub-control board (CCU1/CCU2) installation: 16/M4*10 combinations, torque: 1.5±0.1N.m
DC output module		Copper stud nut installation: 4/M3*20, torque: 0.8±0.1N.m; peripheral interface board installation: 4/M3*8 combinations, torque: 0.8±0.1N.m
Circuit breaker module		1.AC contactor mounting 8/M5*20 combination piece + large washer; torque: 2.5±0.1N.m 2.Circuit breaker installation Fixing screws: 4/self-contained M6 screws; torque: 6±1N.m 3. Circuit breaker and copper row fixing screws: 6/self-contained M10 screws, torque: 20±2N.m

Junction box module installation		Installation of nylon hose quick connector: torque: 4±0.2N.m

6 Check real-time fault and historical fault

6.1 Check real-time fault

When the product fails, the main screen will automatically display the fault information, and the indicator will turn red, as shown in Figure 6-1.

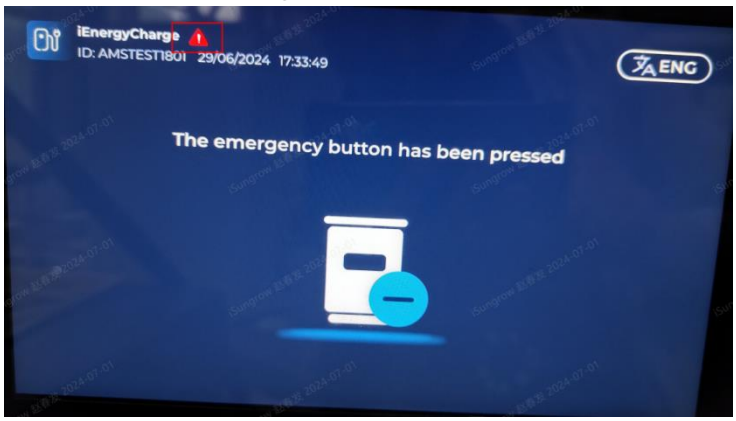


Figure 6-1 Client interface

Press and hold the box icon at the upper left corner in the client interface of the charging pile LCD, as shown in Figure 6-2.

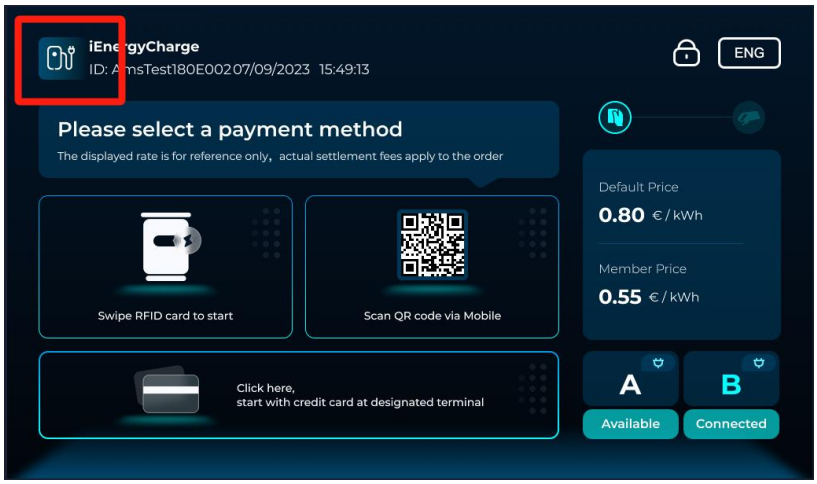


Figure 6-2 Client interface

Input the authentication code in the dialog box, and then click "Enter" (default authentication code: 202301, as shown in Figure 6-3.

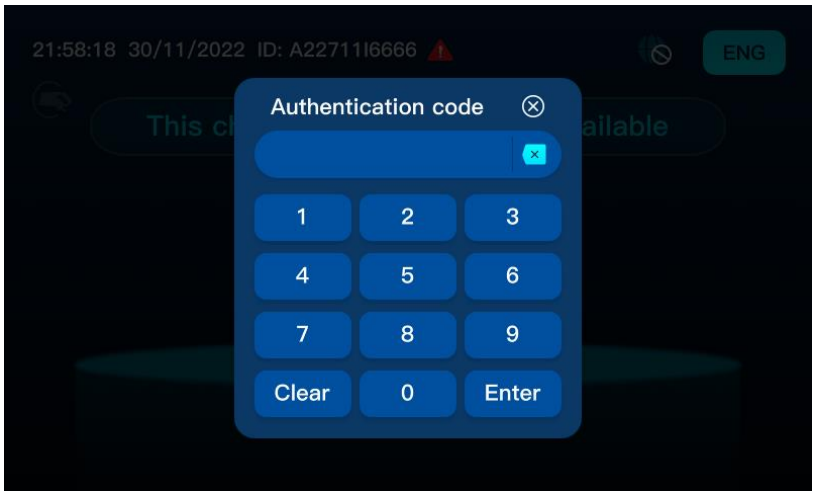


Figure 6-3 Input the authentication code

Select 'CCU_Info' in the navigation bar to enter the CCU_Info page, and click on 'Current Error Info' and 'History Error Info' to view real-time faults and historical faults, as shown in Figure 6-4.

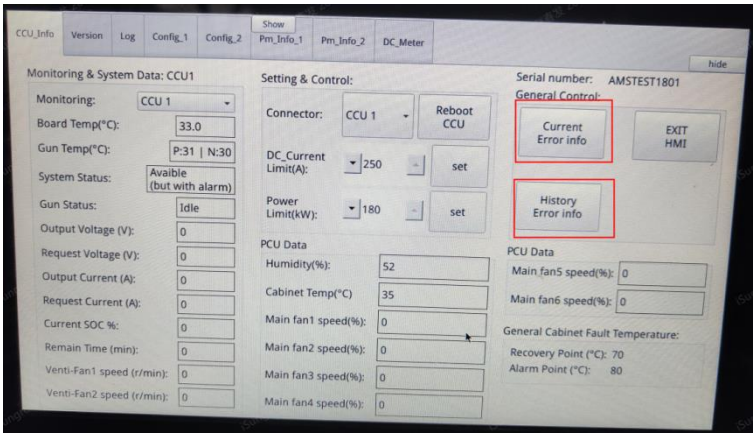


Figure 6-4 Operation and maintenance mode

6.2 Check historical fault

Click ‘History Error info’ to view the corresponding maintenance of the historical fault information of each unit (TCU, CUU1, CUU2, PCU), as shown in Figure 6-5.

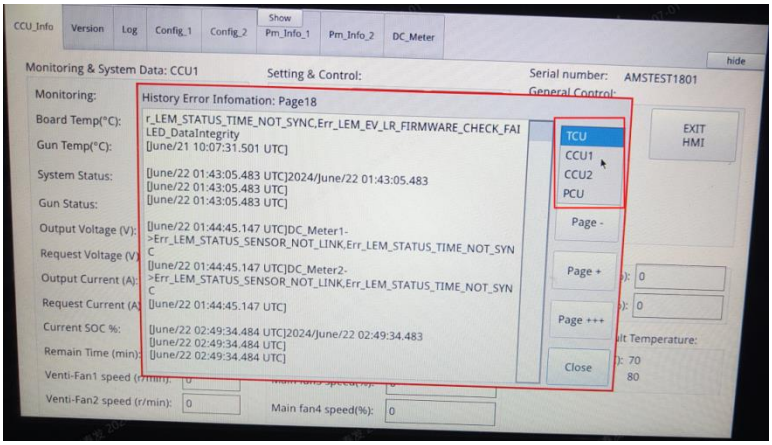


Figure 6-5 Historical fault mode

7 Replacement method of failed components

7.1 Replace the power unit

This charging pile contains 6 power unit modules: PM1-PM6 from top to bottom, which can be removed in sequence in case of failure.

Back Front

Figure 7-1 Power unit

1. Remove the six panel fixing screws on the front of the power unit, as shown in Figure 7-2.

2. Remove the fixing screws of the power unit junction box cover, as shown in Figure 7-3.

3. Remove the DC positive and negative poles, grounding wire and signal wire, as shown in Figure 7-4.

4. Remove the fixing screws of the power supply junction box, as shown in Figure 7-5.

5. After the power unit is replaced, check whether the dip switch settings are correct, as shown in Figure 7-6.

Figure 7-2

Figure 7-3

Figure 7-4

Figure 7-5

Figure 7-6

7.2 Distribution control board

The distribution control board is above the front compartment and consists of three components: CCU1, CCU2 and PCI. In case of a fault, you can replace it based on the specific fault point, as shown in Figure 7-7.

There are 4 copper studs on the distribution control board CUU2, which are uses to support the PCI board. When replacing this board, please remove the studs in turn and pay attention to the tightening torque, as shown in Figure 7-8.

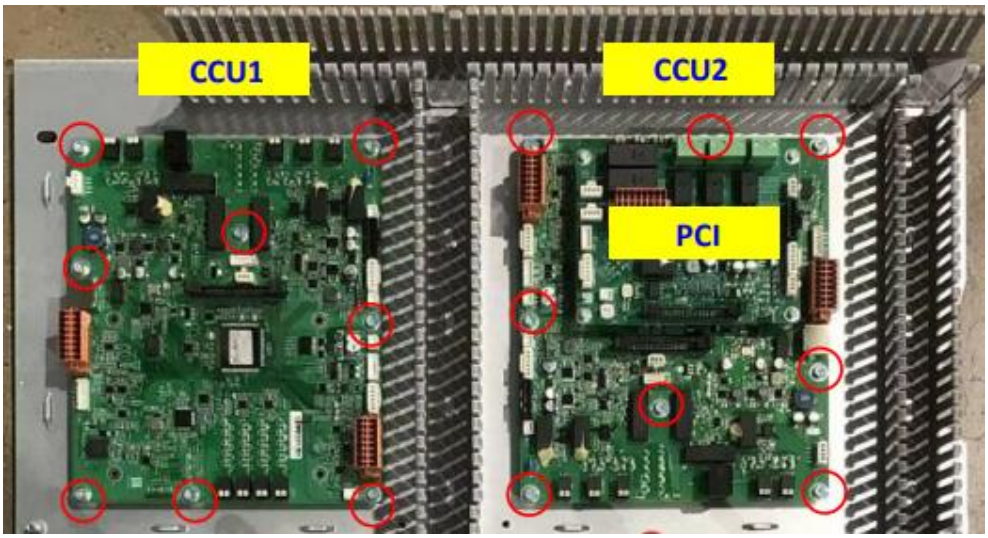


Figure 7-7

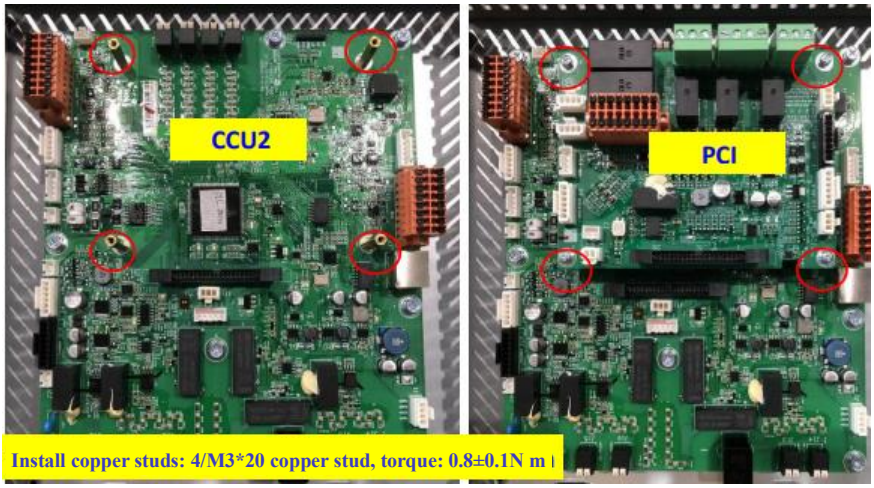


Figure 7-8

7.3 Replace turbulator fans

There are 6 fans in the engine room of this charging pile. Two fans (FAN1, FAN2) are in the front compartment for internal turbulence, as shown in Figure 7-9. Four fans (FAN3, FAN4, FAN5, FAN6) are above the rear compartment for exhaust and cooling, as shown in Figure 7-10. When a fault occurs, you can replace it based on the fault point. Just pull out the fan butt plug when removing it, and pay attention to the exhaust direction of the fan during installation.

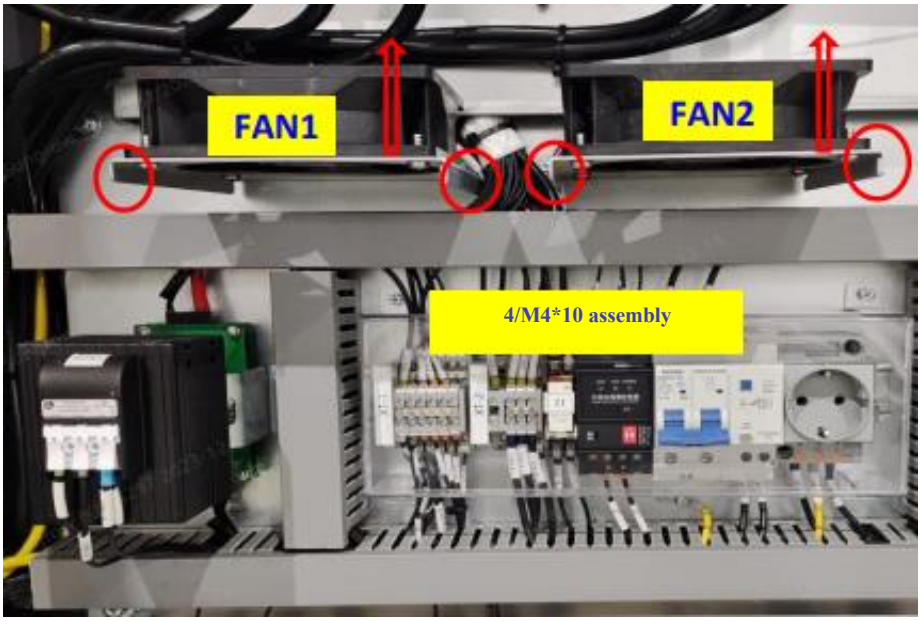


Figure 7-9

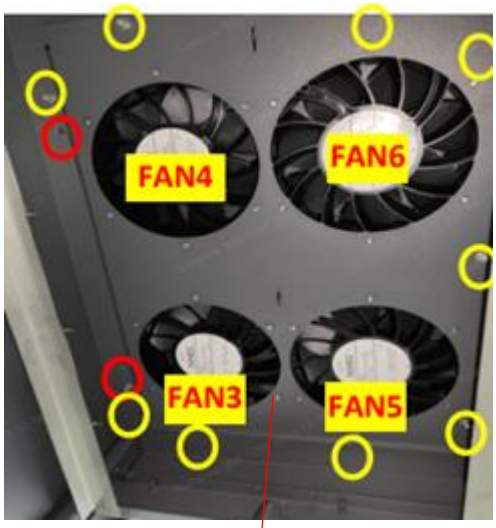


Figure 7-10

Figure 7-11

7.4 Replace the smoke detector

The smoke detector is above the front compartment and consists of a base and an upper cover. The base is used for wire connection, and the upper cover part is used for smoke detection. When a fault occurs, you can replace it based on the fault point. Turn counterclockwise to remove the upper cover and then you can replace the smoke detector, as shown in Figure 7-11.

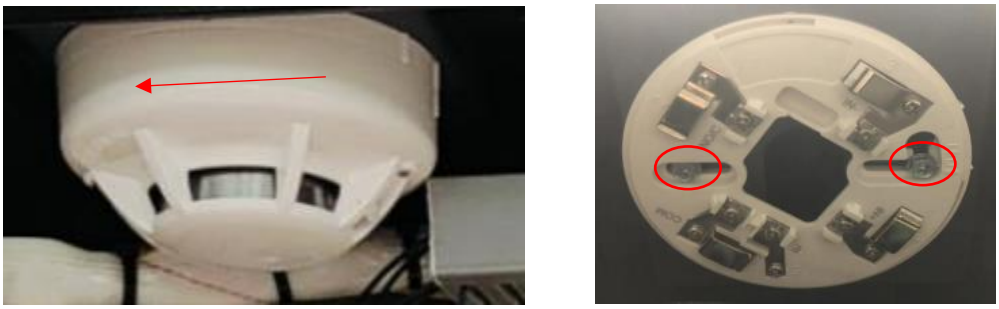


Figure 7-12

7.5 Replace the connector base and the decoration box

The connector bases are located on both sides of the assembly (for connector A and connector B), consisting of the connector base and the decoration box. When a fault occurs, you can replace it based on the fault point, as shown in Figure 7-13.

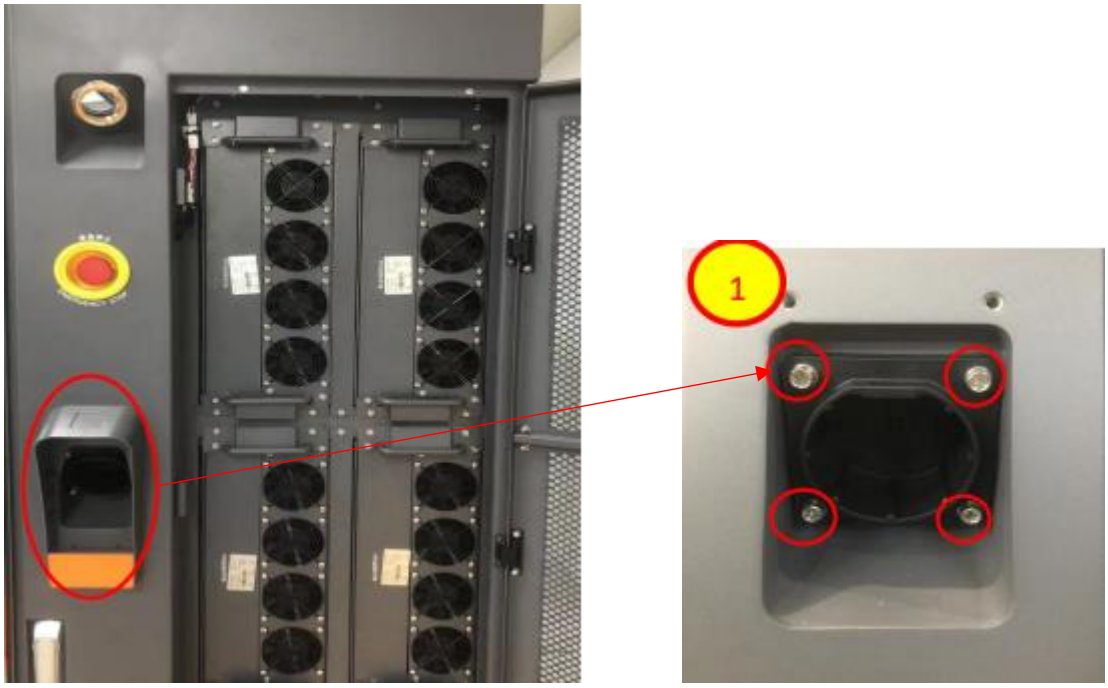
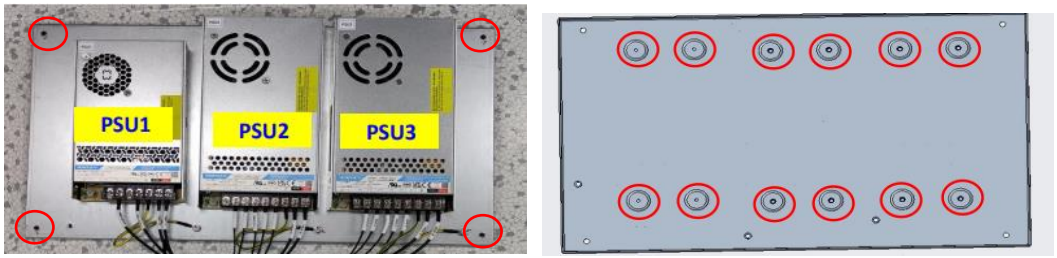


Figure 7-13

7.6 Replace the switching power supply

The switching power supply is on the inside of the cabinet door and is used for weak current power supply. When a fault occurs, you can replace it based on the fault point. To replace the switching power supply, you need to remove the 4 screws that fix the base board, and then remove the power box fixing screws from the back of the base board.



8 Whole pile commissioning method

8.1 Troubleshooting of AC- and DC-side insulation

(1) Check AC-side wiring

1) Set the AC switch to "ON", and measure the resistance between the R/S/T and the enclosure with the Ω range of the multimeter. If the resistance value is greater than 1MΩ, it is normal. If it is lower than 1MΩ, it means that the wire is grounded, as shown in Figure 8-1.

2) Set the multimeter to the buzzer range, place the two probes on the R, S, and T terminals respectively, and test whether any two of the three phases are short-circuited. If no buzzing sound is heard, it is normal, as shown in Figure 8-2.

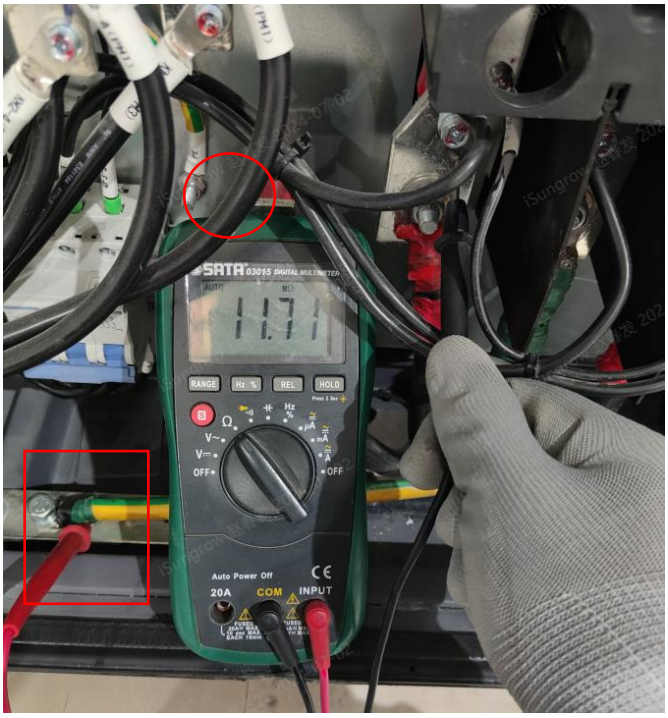


Figure 8-1

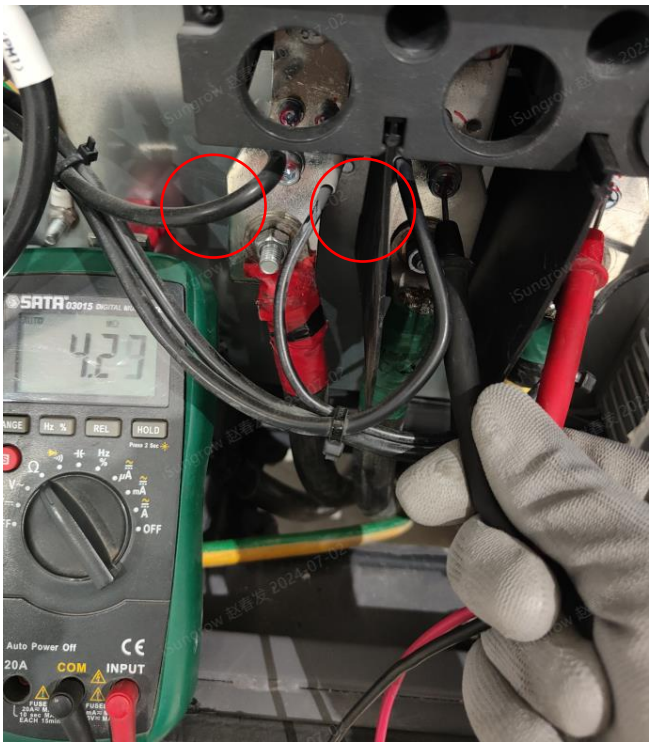


Figure 8-2

(2) Check DC-side wiring

1) Measure the resistance between any positive and negative poles with the Ω range of the multimeter. If the resistance value is greater than 1MΩ, it is normal. If it is lower than 1MΩ, it means that there is a short circuit between the positive and negative poles of the wire, as shown in Figure 8-3.

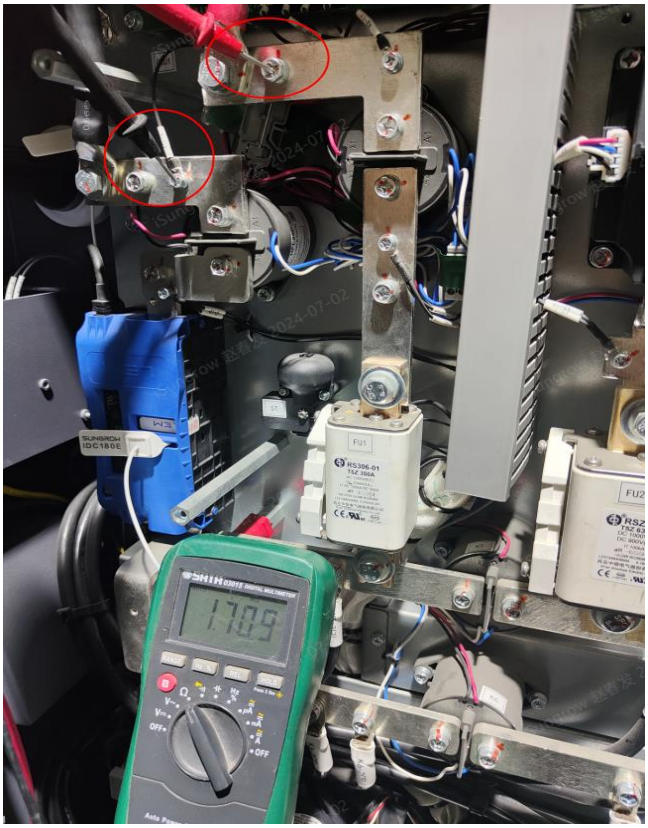


Figure 8-3

8.2 Aging test

After the AC power is applied, the charging pile performs a self-check. Touch the LCD screen of the charging pile and select 'Charging Card' to enter the card swiping page, as shown in Figure 8-3

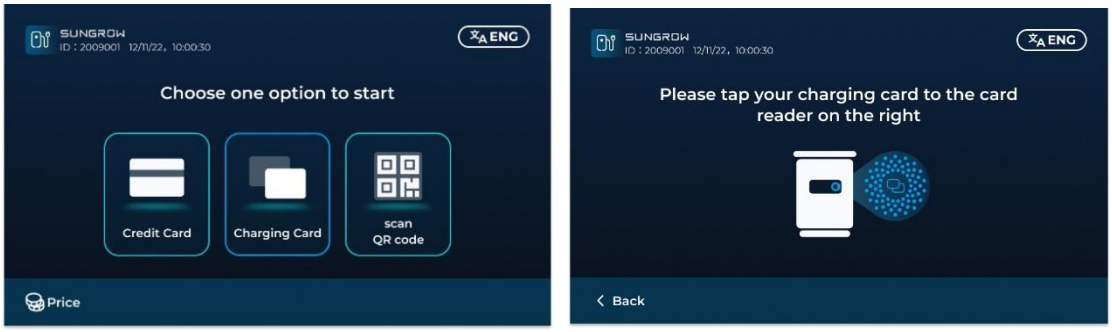


Figure 8-3

2. After successfully swiping the card, you will see the connector selection interface, as shown in Figure 8-4

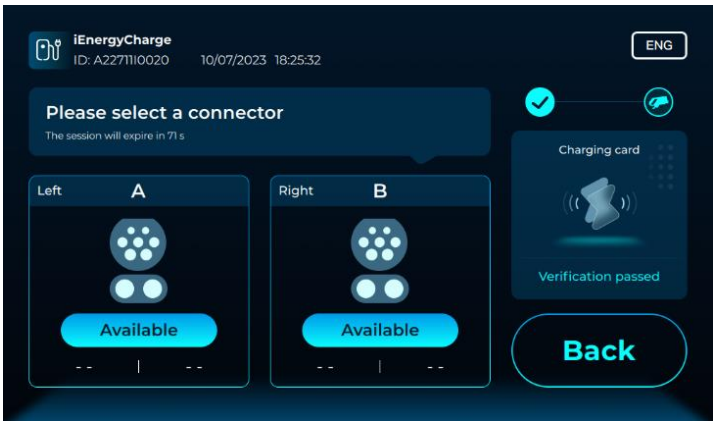


Figure 8-4

3. Insert the connector into the BMS simulator, input the corresponding requested voltage and current in the BMS simulator, and carry out the aging test after the simulator is connected to the charging pile. Pay attention to the change of voltage and current during the test, as shown in Figure 8-5.

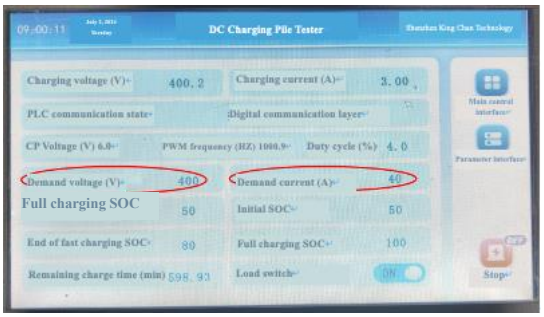


Figure 8-5

4. After the connection is established. you will see the normal charging interface. Click ▶ or ◀, or swipe the screen to switch the information display, as shown in Figure 8-6.

Figure 8-6