

Electric Vehicle Charging Station

EVMS-150

USER MANUAL

2021 V1.0


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PART 1 Safety Instruction

1.1 General Instruction


Operating at AC mains high voltage, the charger is composed of high current/voltage withstanding components. Proper installation of the charger to be grounded to defense electric shock and foreign objects. Installation service should be performed by qualified technician or authorized service partner of the manufacturer.

	Operations inside the charger should be performed by qualified technician or authorized service partner of the manufacturer.
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1.1.1 Symbols introduction

	Warning Refer to the manual for more information.
	Danger There is risk of electric shock, the charger has high voltage.
	Note Read this information to avoid damage to the charger.

1.1.2 Grounding symbol

	Protective grounding wire Grounding terminals must be connected before making other connections to the charger.
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1.1.3 Safety notes

- 1) Please carefully follow the safety instructions to keep the electric car out of danger;
- 2) Before charging, check the charger touch screen and indicator light. If there's fault, the fault must be solved before using the charger to charge.
- 3) Before the charger starts charging, make sure that the Electric car is in power off state;
- 4) Completely follow the text prompts to conduct charging process.

5) It is prohibited to unplug the charging connector during charging process to prevent Any kind of unwanted accident and ensure safety;

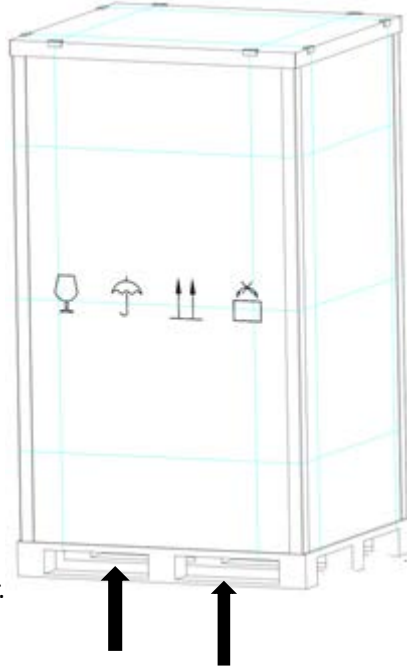
6) The entire charging process is completely automatic, EVMS-150 will shut down by itself while it finishes charging the car. The charging process don't need any human intervention but we recommend regular inspection to check if there's any abnormal situation,

7) When not in use, try to avoid direct exposure of the tip of Charging connector, and plug it back into the socket to prevent damage. Check the charging cable or charging tip if the shell is damaged, exposed cables and other problems, please stop using until fixing it t;

PART 2 EVMS-150 Charger Installation

2.1 transport

Note: The center of gravity of the equipment is not in the center. When using a forklift to unload and transport, please fork in the direction as shown in the figure to prevent the



equipment from tipping over.

sketch map

Transport, road transport choice, should choose a better road traffic, to prevent excessive turbulence can also choose rail transport and water transport.

2.2 Charger Receiving Inspection

When receiving the charger, please carefully check the box and the charger whether there are any signs of physical damage. The logo on the box should be complete. If there is a rupture or suspected rupture, please inform:

- * Carrier
- * Manufacturer



NOTE!

Visible Transport Damage must inform the carrier immediately upon receipt of the goods!

Other transport damage must also be declared immediately and the

carrier must be notified within seven days of receiving the equipment.

The packaging material should be kept for later inspection.

2.3 Charger Storage

If the charger is not to be installed immediately it must be stored in stable position, and in a certain temperature and humidity environment, the environmental conditions are as follows:

Temperature : -25°C to 60°C

Relative humidity: ≤95%, non-condensing

The recommended storage temperature is between: 10°C to 30°C.

2.4 Installation environment

To ensure the safe and healthy use of the charger, the location should be appropriate. Not only to maintain a clean working environment, avoiding moisture, flammable gases, flammable liquids or corrosive substances; users can place them at designated locations by means of manpower or equipment, but be careful to maintain the spacing around the charger, to facilitate air circulation and heat dissipation.

The following points should be noted:

- A minimum of one meter of space must be left in front of and behind the machine to ensure adequate space for operation and maintenance.
- The input cable for the AC enters from the bottom of the charger.

Input and output wiring check

To ensure the safety of personnel during the installation of the charger, it is important to ensure that all connections are made in the following conditions:

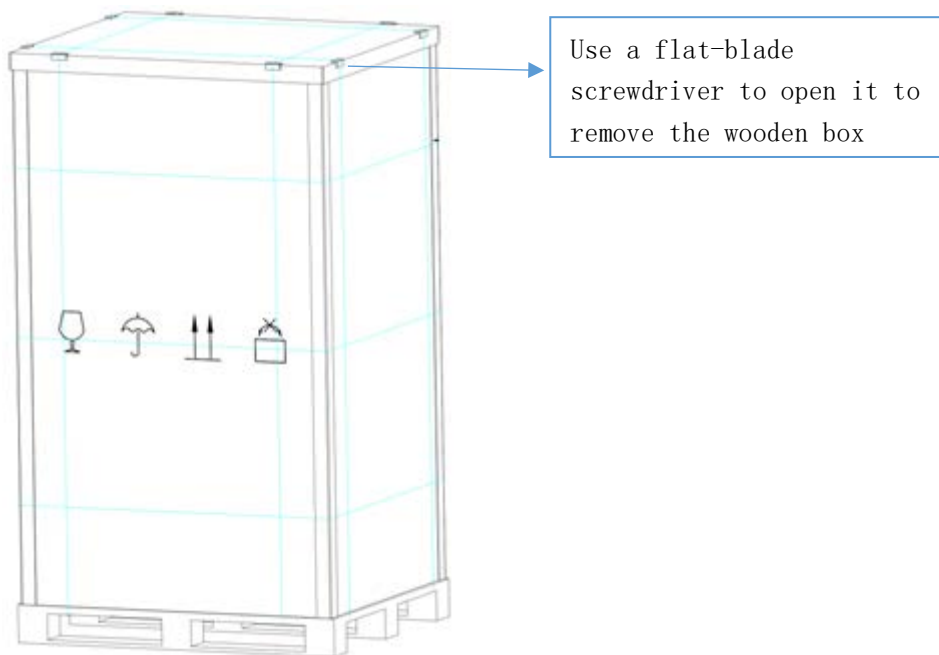
- Keep EVMS-150 installation area clean and dust free
- All power cables are Proper length and diameter
- Startup and operational checks are performed by authorized service personnel.
- Confirm the input and output voltage and frequency of the charger
- Ground connection in accordance with IEC standards or local regulations.

Installation environment

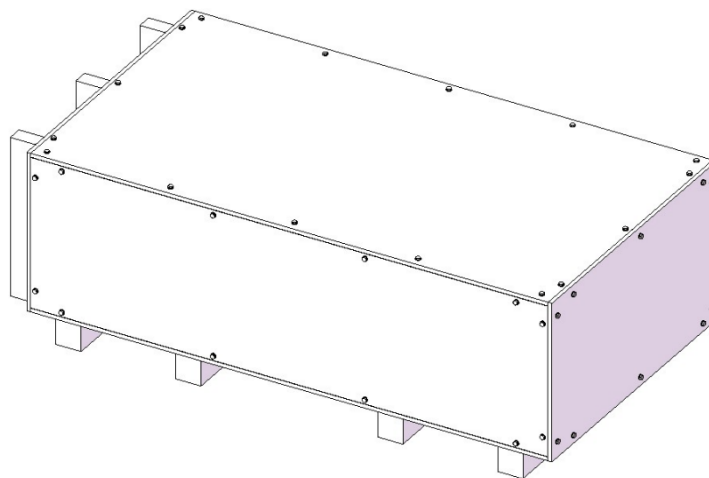
- Sufficient ventilation distance should be maintained on all sides of the charger case
- Away from heat and corrosive substances, avoid direct sunlight
- Maintaining normal operating temperature and altitude; Working temperature: $-20\text{ }^{\circ}\text{C} \sim 60\text{ }^{\circ}\text{C}$

2.5 Unboxing

- ◇ Vertical steel edge wooden packaging



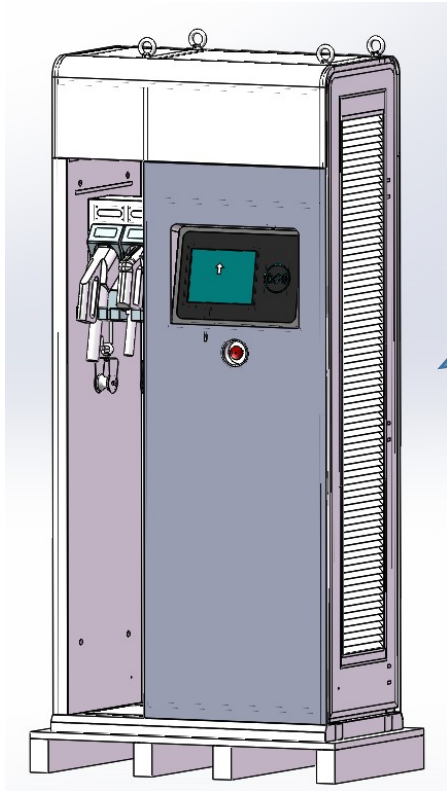
- ◇ Horizontal detachable packaging



Disassembly and assembly are carried out in the horizontal state:

Use the open spanner SJGJ-17-19 to disassemble and assemble the bolts and washers in the blue frame line as shown in the figure, each with 40 pcs.

Save the bolt, washer, and the honeycomb inner corner removed, according to the position of the mounting place when unpacking the package again.



Before installing the charger, it should be checked as follows: the device is damaged, if damaged, the shipper immediately; product label check, confirm the correctness of the device. The equipment label is affixed to the equipment, and the model, capacity and main parameters are indicated on the label.

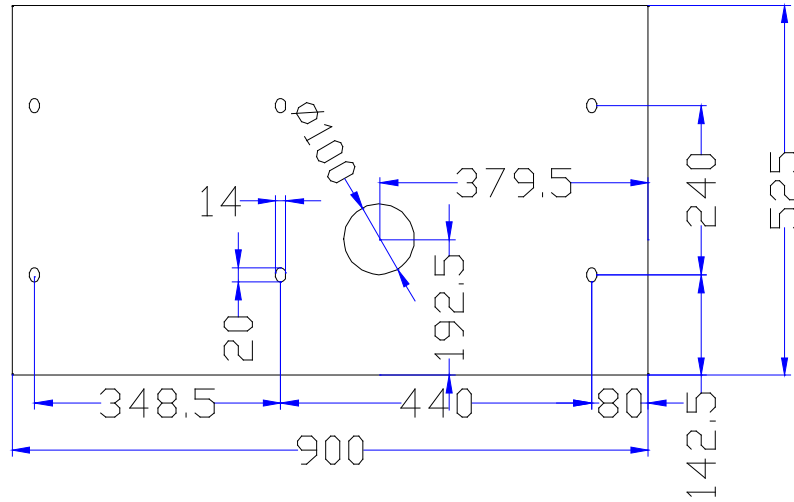
2.6 Position

In order to ensure smooth and reliable charger, the charger must be vertical basic construction charger mounted on cement concrete cement based on custom and mounted above the base level of the ground is not less than 220mm,.

Drilling template according to claim 6 Drill hole depth of 12mm in diameter 100mm in a cement base, and then through the wall portion of the expansion bolt is inserted in a hole drilled;

Charging the cement foundation piles and reliable ground connection, the ground resistance must $\leq 4\Omega$.

Base anchoring hole diagram



Front

Remove the anti-vibration components at the bottom of the cabinet, and then use a crane (recommended) or a forklift to move the cabinet to the installation location on the concrete foundation.



1. The lifting equipment used to carry the charger must have sufficient lifting capacity.
2. When removing the loaded pallet, ensure that there is sufficient manpower and lifting equipment.
3. The charger has a high center of gravity, so be careful to tip over.

PART 3 Introduction and installation of charge

3.1 Product Overview

EVMS series Electric Vehicle charger station is an intelligent integrated DC charging station system promoted to meet market demands. It adopts modular concept and cutting-edge electronic circuit technology, integrating power conversion, charge control, management, query, display and background communication in one cabinet. By communication with the BMS of electric vehicles, to achieve intelligent control of the entire charging process. It is composed of Human-machine Interaction Unit, Control Unit, Charging Module unit, Measurement Unit and Protection Unit. The design conforms to EN61851, EN62196, DIN70121, CHAdeMO1.2 and other standards.

3.2 Feature

The charger supports CCS2 connectors could be used simultaneously.

Built-in power meter with charging power metering function.

Configured with DPM1000/30 charging modules.

Support RFID Card charging(Mobile app optional) , support reservation function.

widescreen TFT touch screen with good human-machine interface, which can display QR code, status information, metering information, alarm, charging records, etc.

LED indicators of power, charging status and fault.

Self-identifying electric vehicle BMS protocol function, multi-models compatible charging;

Emergency stop button can cut off the charger output in urgent situations.

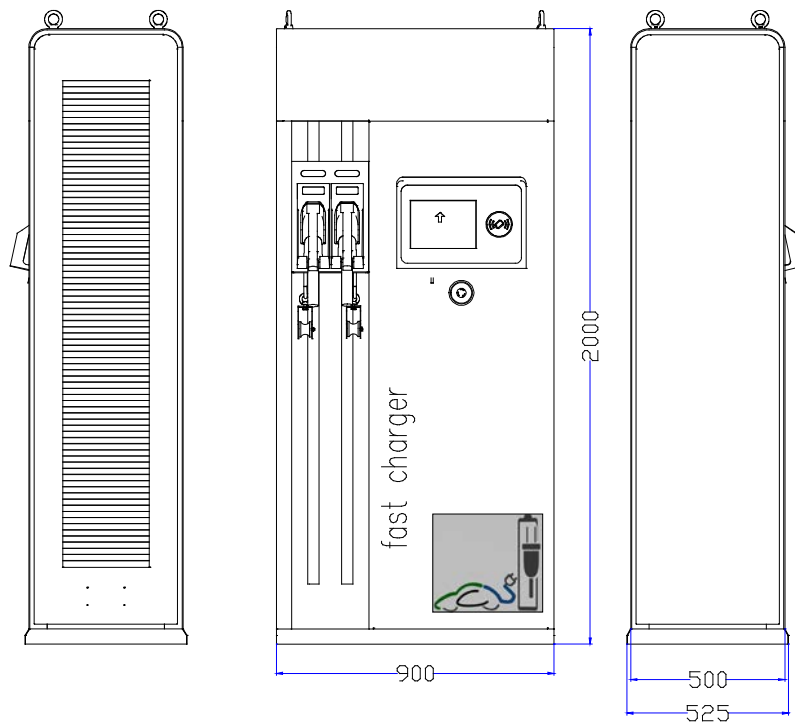
protection, AC input over voltage protection, AC input under voltage protection, short circuit retraction protection, DC output over voltage protection, DC output under voltage protection, battery anti-reverse protection, current anti-reverse and other protection functions;

Charging process protection function, when it occurs BMS communication failure,

disconnection, battery temperature, voltage exceeds the allowable limit, etc. During charging process, the charge will immediately stop charging;

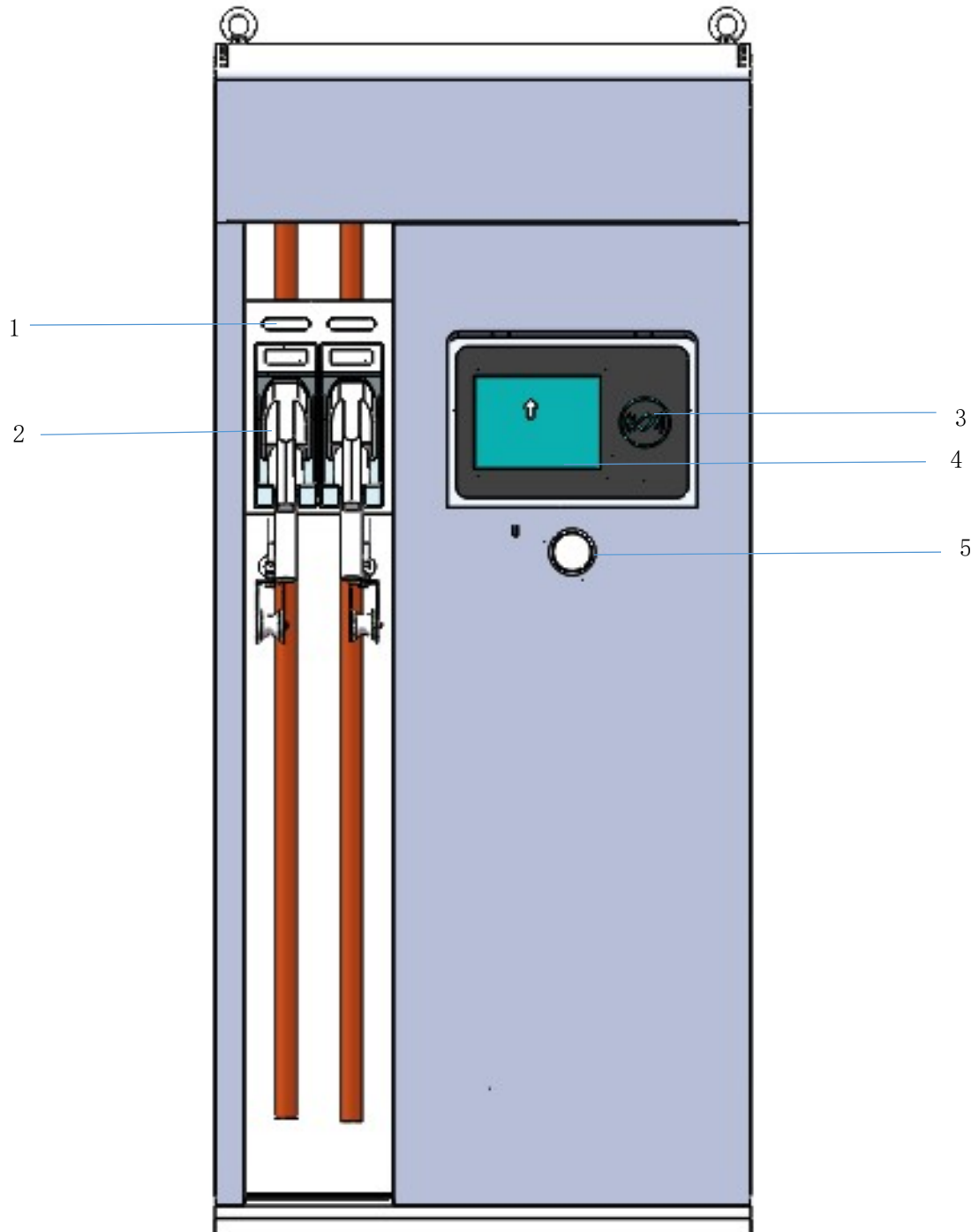
It has function of communicating with the monitoring system of the station, and can upload the charging information through Ethernet or 3G, 4G wireless network to realize remote monitoring. Built-in DSP in the charging module realizes intelligent management and digital control functions; Built-in active power factor correction module in the charging module, input THDi $\leq 3\%$; power factor 0.99. The charging module adopts ZVZCS and LLC resonant soft switching technology, the efficiency up to 95%.

3.3 Outline Dimension

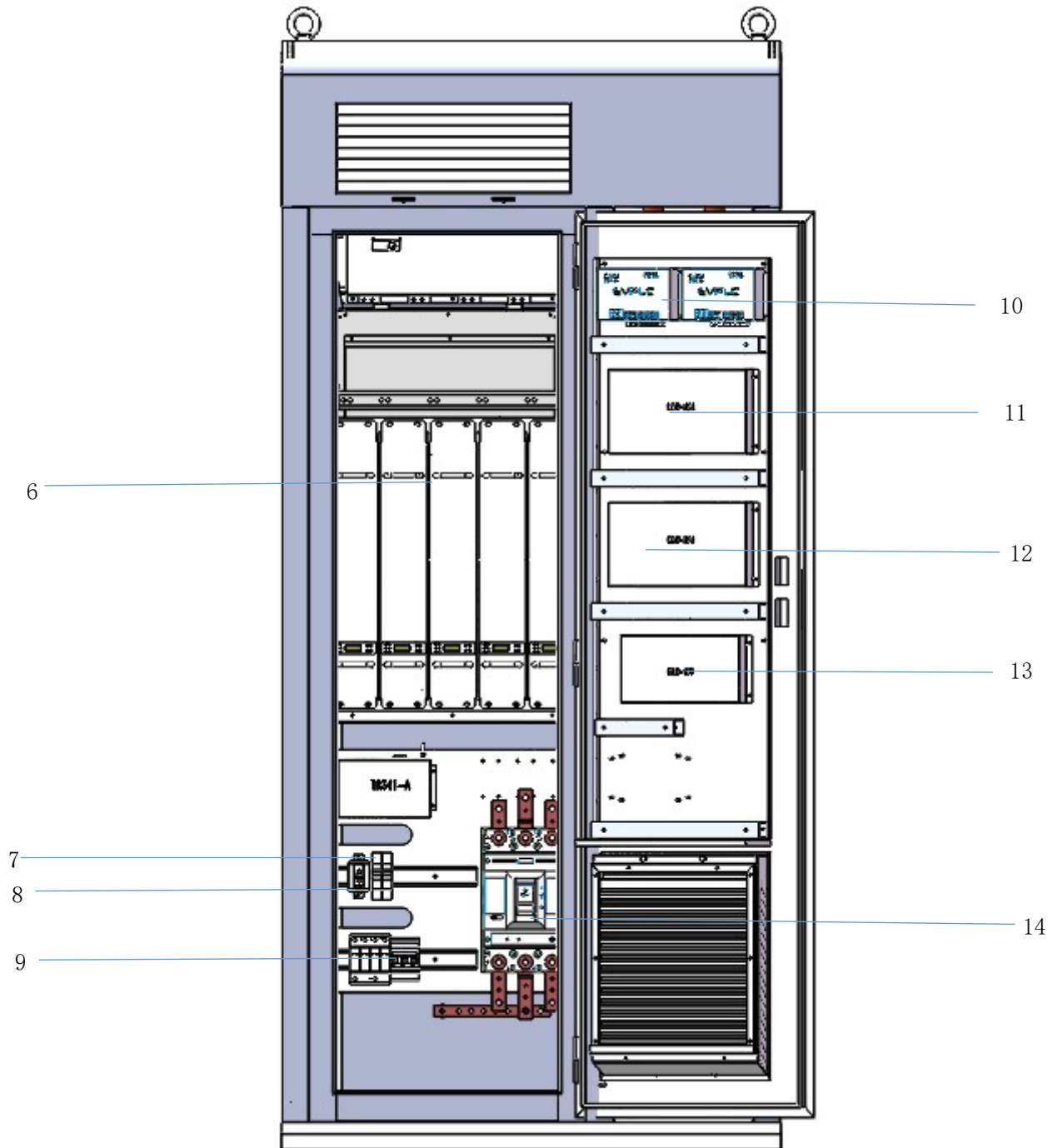


3.4 Appearance

Front View



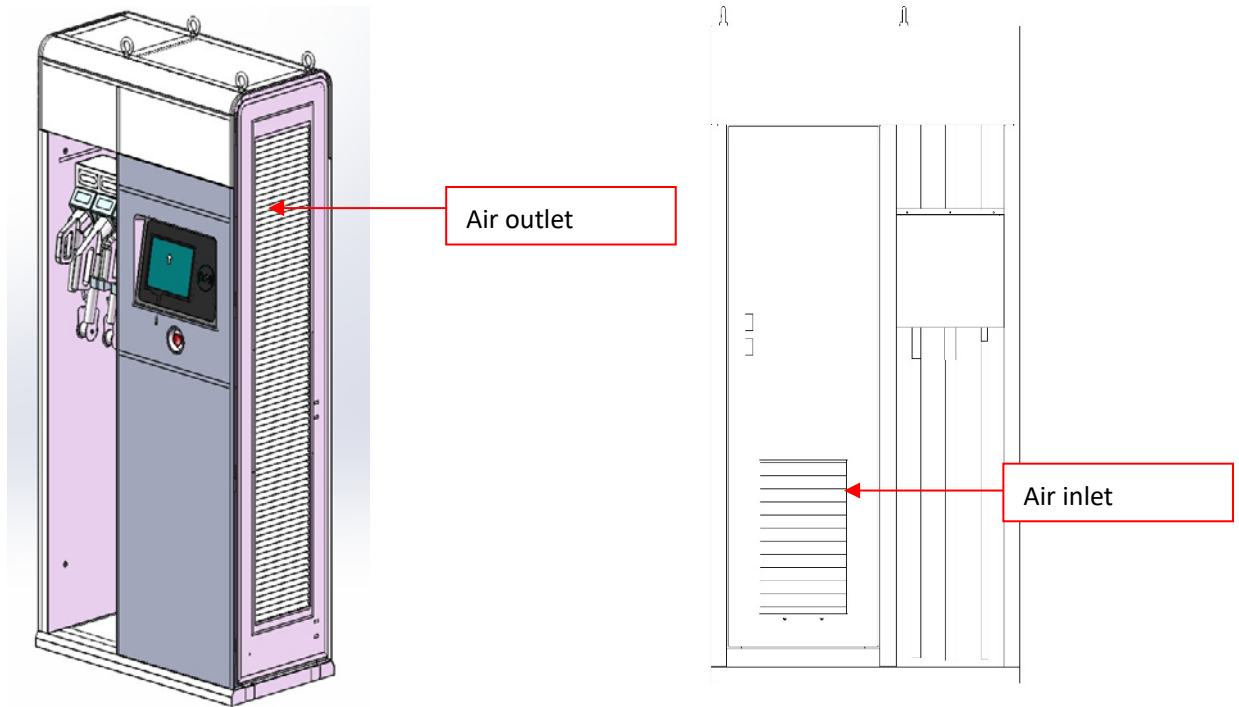
Internal view



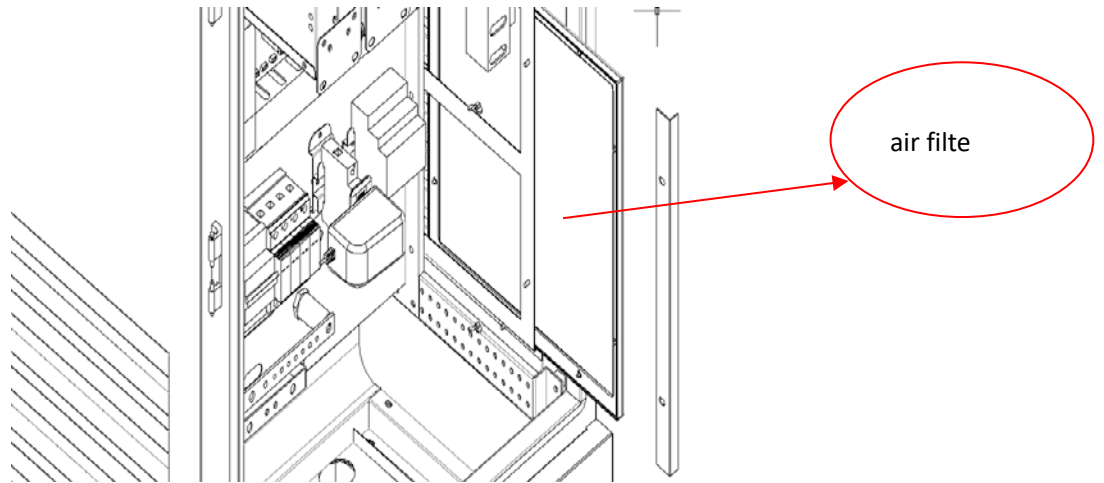
1	Charging status LED	2	charging connector
3	RFID Reader	4	Monitor display
5	Emergency stop button	6	Charging module
7	Industrial Switch	8	leakage protector
9	SPD	10	EVPLC

11	EVMS-MCM	12	EVMS-MCM2
13	EVMS-CSU	14	AC input switch

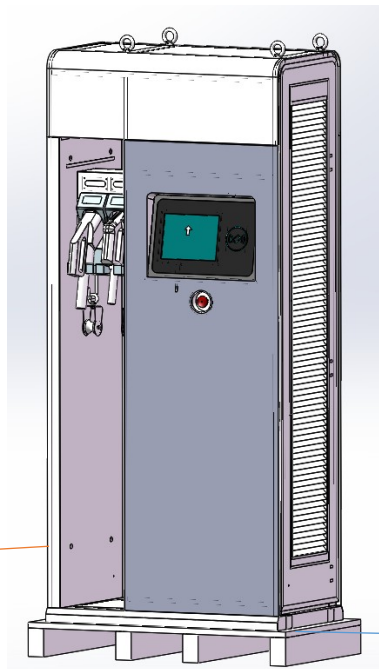
3.5 Charger dust screen and air inlet and outlet



Note: Effective ventilation of equipment In order to prevent dust and obstruct the harmful substances such as PM2.5, the equipment is dust-proofed by adopting international advanced honeycomb textile technology on the side

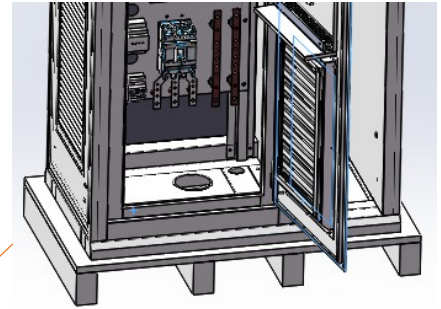


Note: Please open front door to replace the air filter on the side of the device. There' s butterfly nut at the side of device (no need of any tools), just to pull out the air filter for flushing or fan dust



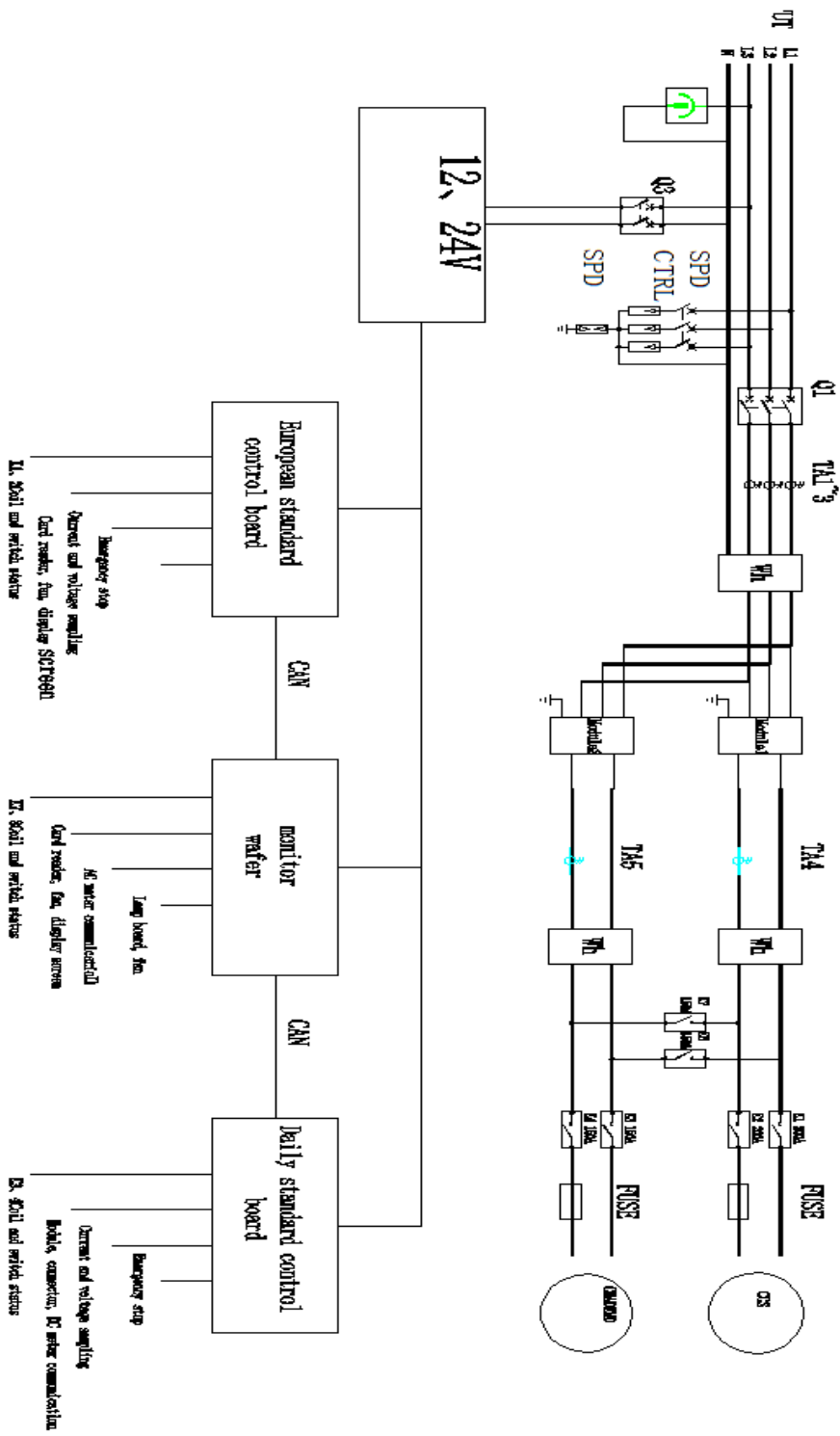
Use a screwdriver to remove 4 screws and open the side door. Please note that when disassembling, it is recommended that both the inside and outside doors fall down. It is recommended that two people operate and dump carefully

Vibration-proof

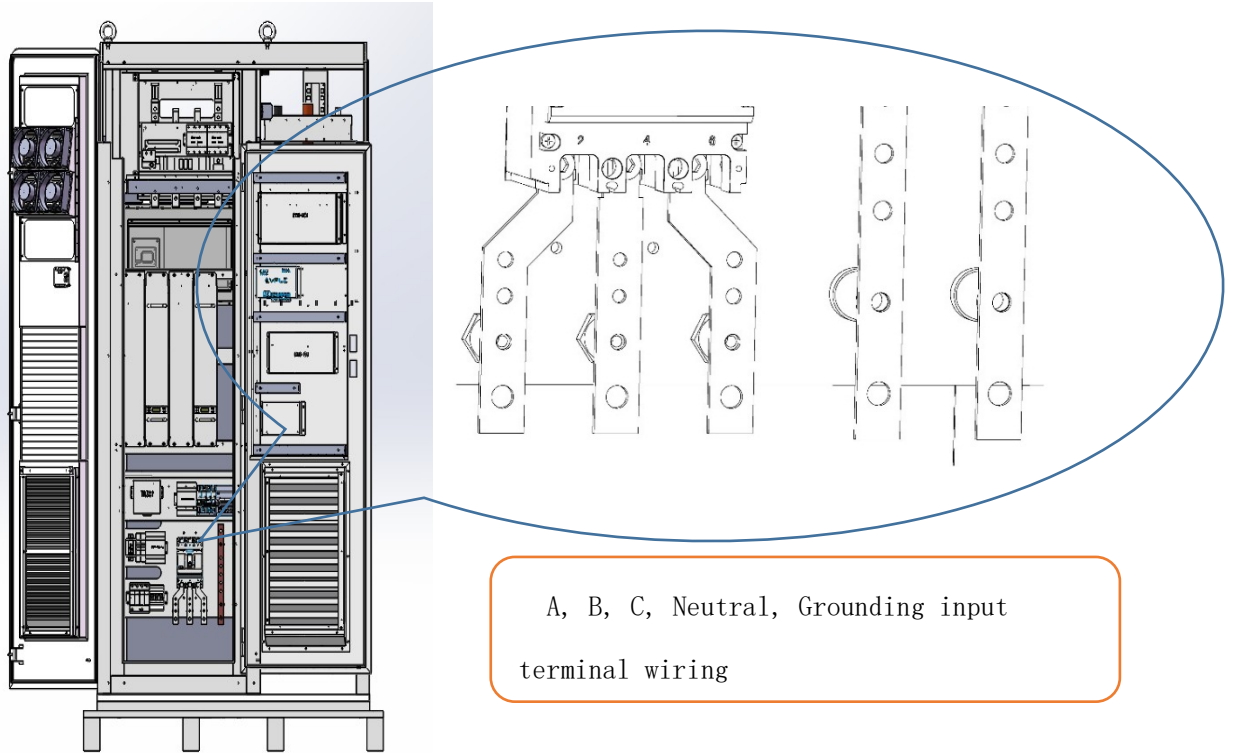


To remove the shockproof components at the bottom of the cabinet, you need to open the rear door, left door, and all of them. Use a wrench to remove the bolts at the bottom of the cabinet and remove the wooden base. The installation of the DC charger adopts the method of lower cable entry, the pile body is aligned with the hole, placed on the cement base, fixed with 6 M12*60 anchor bolts, tightened and locked;

3.6 Charger diagram



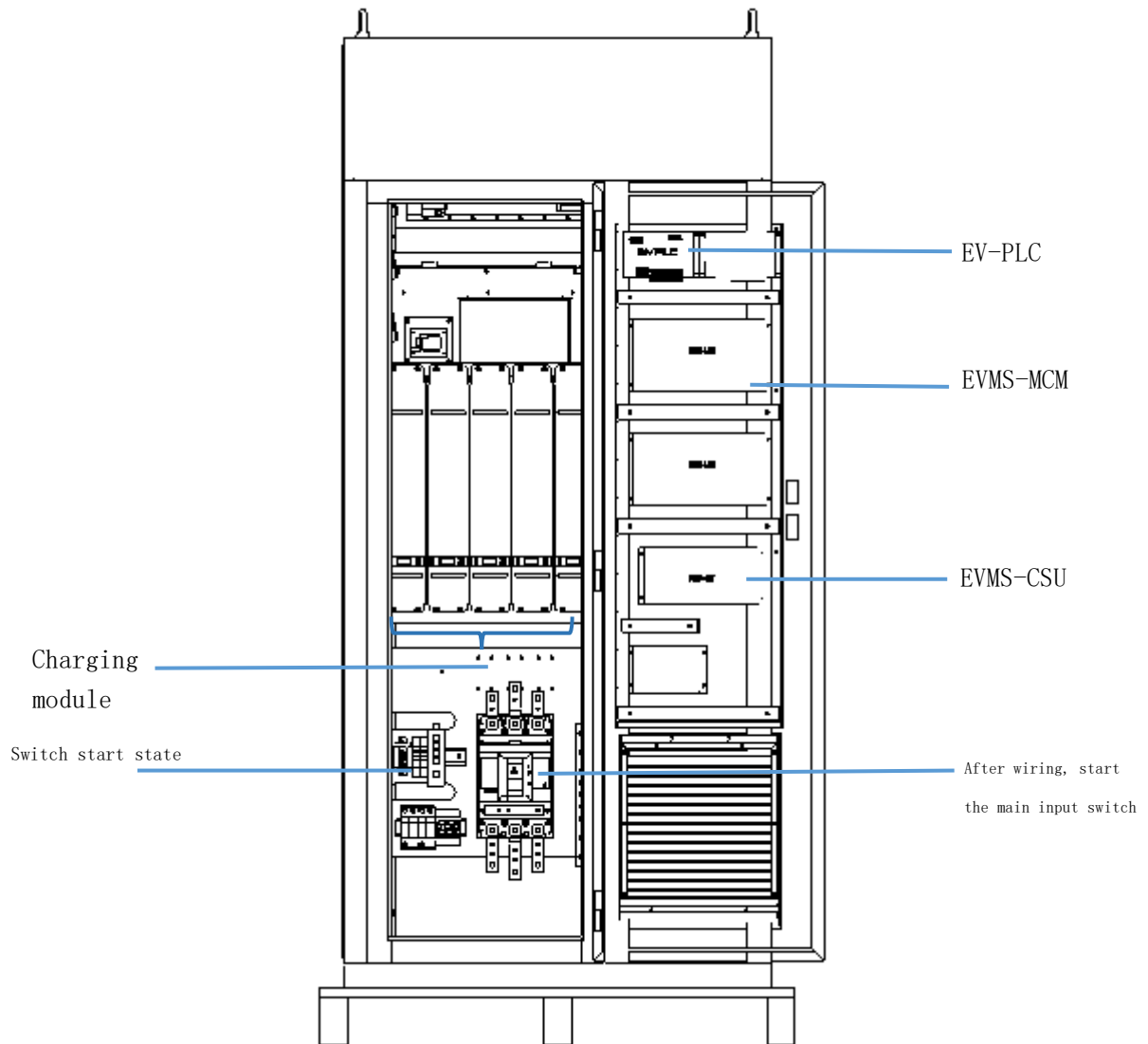
3.7 Input Connection Terminals



A, B, C, Neutral, Grounding input terminal wiring


Note: For safety, AC input wiring is recommended to use 150 mm² cable! The wiring is directly connected to the upper port of the terminal, from left to right: A, B, C. Neutral and Grounding are on the right side of the circuit breaker. Circuit breaker has type A RCD function, RCD rated residual operating current is 30 mA.

3.8 Install and remove the main power module



The installation steps of the main power module are as follows:

1. Insert the AC input and DC output of the cabinet into the corresponding module position;
2. Fix the module to the cabinet through the fixing holes on the upper and lower front panel of the module;

 NOTE!
After the module is installed in the system, please set the address of the module as "-01", "-02", "-03" and so on in order from left to right.

3.9 After the initial setup boot

Before the system boot, check whether the module is installed, whether the AC input wiring is correct, after all the preparations are completed, turn on all the switches, a module address bits are set in accordance with 5.2 after power, and the background set in accordance with 8.1.

3.10 Charging status indicator

With luminous and indicating function, the charger is convenient for customers to conduct charging operations at night. Three-color indicator: red, yellow, green.

- 1) Red light indicates fault and alarm status; it will not light on when charger work normally.
- 2) Yellow light indicates the load is charging.
- 3) Green light indicates that the battery is fully charged; the charger is in standby mode.

3.11 Emergency stop button

There's emergency stop button above card billing area. When the charger fails, user can press the emergency stop button, which make the charger output disconnected, meanwhile the indicator light keeps to be red. After corresponding troubleshooting, the emergency stop button will restore by rotated to the right.

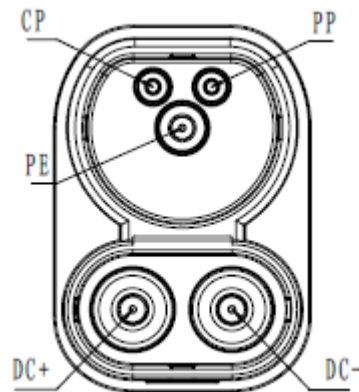
3.12 Charger connector bin

EV charger CHAdeMO charger and support CCS2 standards and interfaces

Charger connectors comply with BS EN 62196 standard.

Prohibit prolongation of connector wires without authorization.

Adapters and conversion adapters are not allowed



3.13 RFID Card reader

The charger supports contactless card reader with ISO 14443-compliant Type A, Type B, MF1 cards and ISO7816-compliant PSAM and ESAM cards. (Detail operation with RFID will be provided separately)

3.14 Charging strategy

EVMS series electric vehicle charger supports CCS2 charging output modes, The 2 Output Plugs could be used simultaneously.

3.15 Charger parameters.

Model	EVMS-150	
Dimension	900*500*2000	
Input		
Rated input voltage	380Vac/400Vac/415Vac	
Range of input voltage	304V~456V	
Input AC limiting voltage	600V	
Input frequency	50/60Hz; Range:45Hz~65Hz	
Input PF	≥0.99	
Output	DC	
Interface	CCS2	
Output voltage	150-1000Vdc	
Output current	200A max	
Charging modes	Mode 4;	
Display	10.4" touch screen	
Card reader	Type A、 Type B 、 MF1、 PSAM、 ESAM	
Network interface	Standard Configuration:	LAN
	Optional:	4G/Wifi
Communication protocol	OCPP1.6J	
Environment	Indoor/Outdoor	
Operating temperature	-20℃~+60℃	
Relative humidity	≤95%,Non-condensing	
Altitude	2000m	
Noise	<55 dB	
Protection degree	IP54 IK10	

PART 4 Product Overview

4.1 Module Introduction

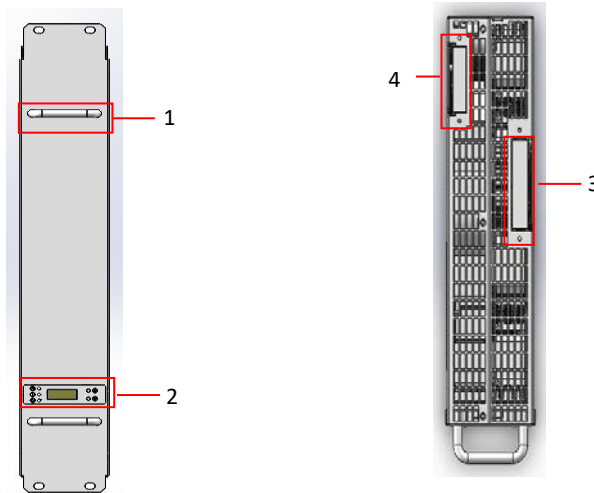
DPM1000/30 charging module is the internal DC power module of out-door integrated DC charging piles, which converts AC to DC and then charge electric vehicles, providing reliable DC supply for equipment requires DC power. The input of charging module is three-phase mains; output DC is adjustable between 150VDC~1000VDC, to meet various voltage demands of different battery packs.

The module has power-on self-test function, AC input over/under voltage protection, overload/ over-temperature protection; multi modules can constitute parallel redundant systems and realize multiple charging modules using in parallel within the cabinet.

The module adopts three-phase active power factor calibration technology and DC-DC conversion technology, digital DSP control technology. The DC-DC power circuit uses interleaving tri-level series resonant soft switching technology, the efficiency of which can reach 300KHz, with high reliability, high availability, high maintainability and high efficiency

4.2 Appearance





number	nomenclature
1	Handle
2	LED
3	DC output & signal pin
4	AC input pin

This area has the functions of red, yellow and green indicator lights, among which:

- 1) The green indicator light indicates normal operation and working status of the charger;
- 2) The yellow indicator light indicates the alarm state, and it does not light up when the charging module is working normally
- 3) The red indicator light indicates the fault state, and the charging module does not light up when it is working normally;

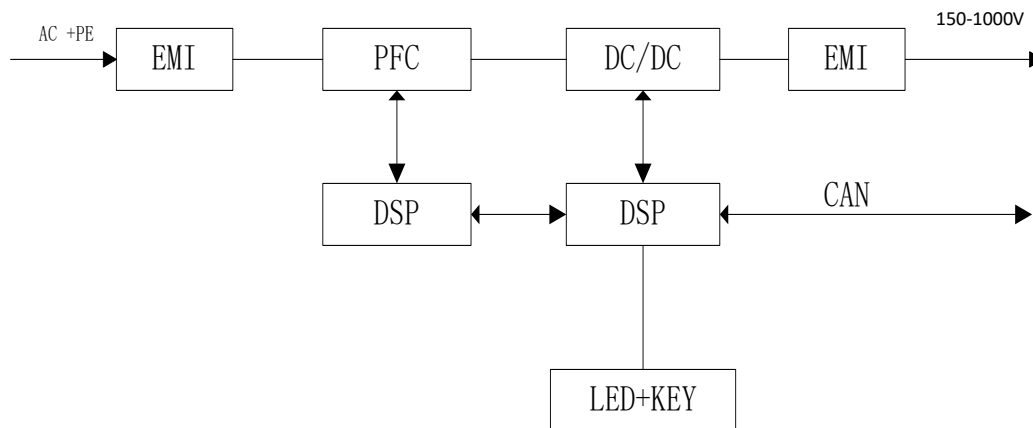
Nixie tube display: This area shows the module voltage (indicated by four digits), current (beginning with the letter C), address bit (beginning with -), which is convenient for observing the status of the module.

Address setting: Press the right up and down keys at the same time to display "- -00", you can press the up and down keys to set the address yourself. After the setting is completed, press the right up and down keys at the same time again.

4.3 Feature

- High power density saves system space, 30KW power module;
- Wide range of input voltage 260V~530V,input surge protection design
- DSP control, achieves pure digital control from input to output; adopts interlaced series resonance soft switch technology to reduce the tolerance of power devices.
- Input THDI $< 3\%$, input PF is 0.99, 95% and above efficiency;
- Ultra-wide range of output voltage,150~1000VDC(adjustable), to meet various voltage demands of different battery packs;
- Low output DC ripple wave, has no influence on battery working lives;
- Standard CAN communication interface, can easily exchange data with external devices;
- Input over voltage protection, under voltage alarming, output over current and short circuit protection functions;
- Can constitute parallel redundancy systems and has hot-swapped function, which improves the availability, reliability and maintainability.

4.4 Module diagram



PFC rectifier

PFC rectifier adopts three-phase active power factor calibration technology, converses AC voltage into DC required by the DC-DC converter; Low impulse, low THDI and high input power factor.

Input THDI $< 3\%$, input PF > 0.99 , which can reduce the pressure of generator and transformer.

converter

DC-DC converter is to convert the PFC output DC voltage into the required output voltage, it adopts

cutting-edge interlaced series resonance soft switch technology to achieve the soft switch of power devices, reduce overall power loss and extend the life of power devices.

Digital control

Advanced DSP control, achieves pure digital control in protection and management of the whole machine, which can manage the whole machine more accurately and monitor the input, output and internal working status of modules. With the LED and CAN communication interface, it communicates with system monitor and exchanges data.

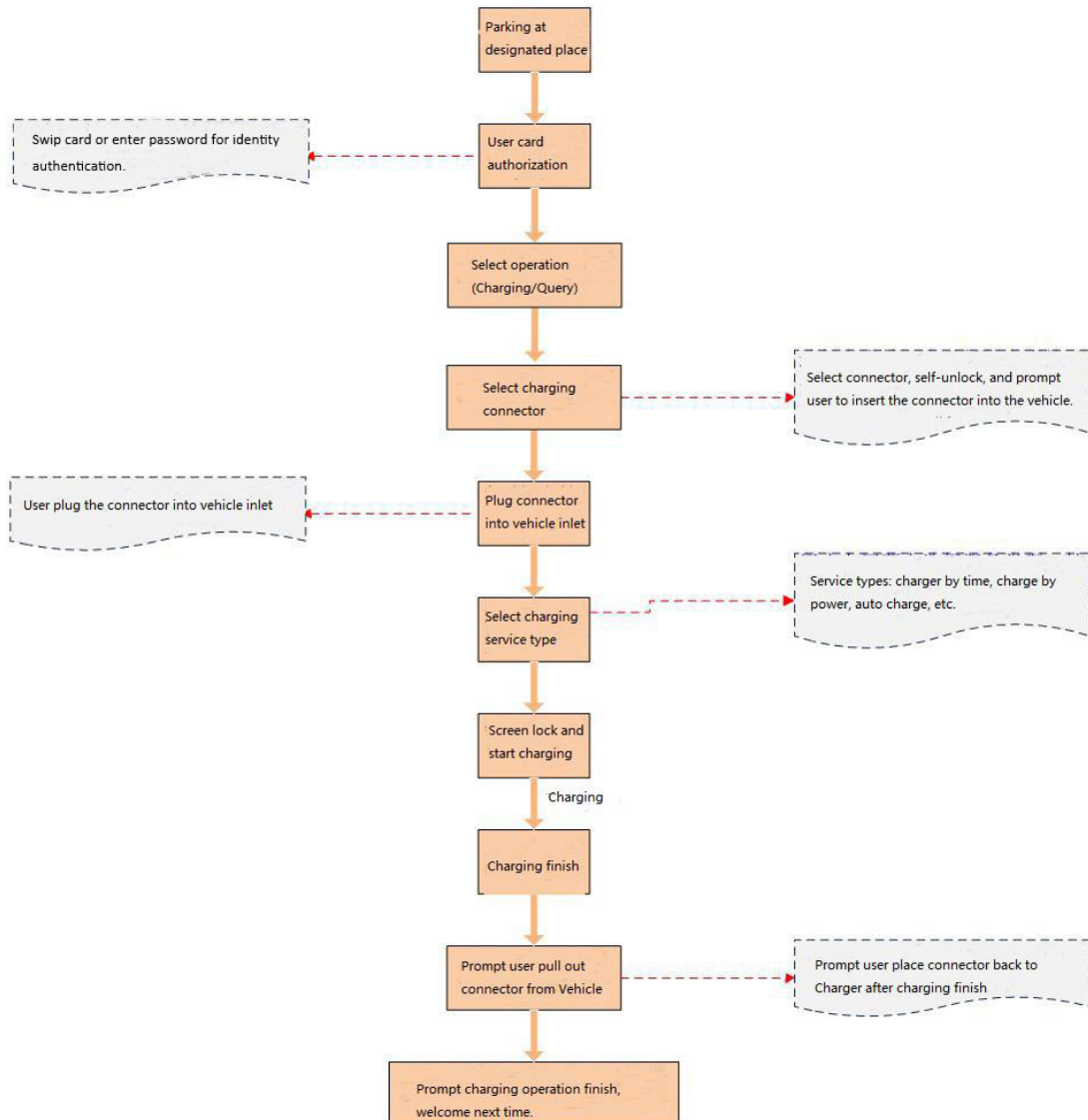
4.5 Specification

DPM model	DPM1000/30
Output capacity	30KW
Input voltage	380Vac three-phase three-wire
Range of input voltage	260V~530V (260~304VAC,output power derating 50%)
Input frequency	50/60HZ
Input power factor	0.99
Input THDI	≤3%
Efficiency	95%
Output voltage	150V-1000V
Output current	100A max
Voltage regulation accuracy	<0.5%
Current regulation accuracy	<1%
Peak-to peak noise voltage of DC output	<1%
Start up&Shutdown overshoot	<10%
Soft start time	3~8S
Operating temperature	-20℃~+60℃,during 50℃~60℃ derating to 60%
Storage temperature	-40℃~+60℃
Ambient temperature	0-90%,40±2℃, non-condensing
Altitude	2000m
Weight	13KG

PART 6 Charging Operation









6.1 Charging Flow Chart

The EVMS Series CCS2 electric vehicle charger operates with a 10.4-inch touch screen with text prompts. Simple operations bring the best experience for users. Below is a flow chart of the charging operation.



6.2 Charging process

With pictures to introduce the charging process

	Manual charge	Swipe to charge	Charging scan code
procedure 1	 Start interface		
2	 Select connector		
3	 Click the password to charge, the default password is "1"	 Scan the QR code and enter the password to charge	 Charging scan code
4	 Connect the charger		
5	 Optional Type Charging: 1, 2 automatically filled, the charging time, charging by the battery 3		
6	 During charging		
7	Click Password charging is completed	Scan the QR code and enter the password to finish charging	Swipe to end charging

PART 7 Enter the administrator interface

7.1 How to enter the administrator interface

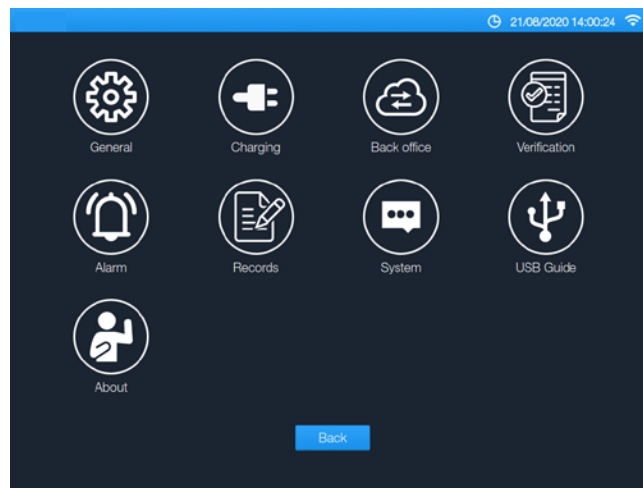
Note: Parameter setup function is limited to maintenance

Click the left top corner of below page, come to Maintenance mode password screen, as shown below, the initial password is "888888".



7.2 Each unit described

Enter the administrator interface: general parameters, charging parameters, background settings, charging verification, alarm threshold, record query, system information, USB wizard, about this machine function



PART 8 Troubleshooting

Alarm	Troubleshooting
Background communication fault	Check whether the background system is normal.
Insulation fault	Check whether between output and PE terminal are lack of insulation.
Input over voltage	Check whether three phase input voltage of input breaker is normal.
Input under voltage	Check whether three phase input voltage of input breaker is normal.
Input phase loss	Check whether input power wire is normal.
Output short-circuit	Check whether output is short circuit.
Single cell over voltage	Check whether the battery in ev is normal.
Single cell over temperature	Check whether the battery in ev is normal.
BMS fault	Check whether BMS is normal. Replug connector to eliminate the alarm.
Emergency button fault	Check whether the emergency button is pressed.
Power grid frequency fault	Check whether the power grid frequency is normal.
Card reader communication fault	Please contact the supplier.
Touch screen communication fault	
Meter communication fault	
BMS fault	
Module communication fault	
Temperature fault	
Memory fault	
PFC bus over voltage	
PFC bus under voltage	
DC/DC fault	
Module Temperature fault	
DC contactor fault	
Input over current	
Output over voltage	
Output under voltage	
Output over current	
Output circuit open	

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