LIVOLTEK

USER MANUAL

Motion Fast DC Charging Station

V.01

This document is subject to change without advance notice.

Catalogue

1. About this Manual

1.1 Applicable chargers

LIVOLTEK Motion Fast DC Charging Station (also known as “MF” series in this manual)

1.2 Application readers

Charger user

Charger installer

Charger maintenance personnel

1.3 Signal words in this manual

Sign	Description
 INDICATE	Description text, indicating supplementary description and interpretation of the text.
 NOTICE	Attention text, meaning to remind the user of some important operations or prevent potential injury and property loss.
 WARNING	Warning text, indicating that there are potential risks. If not avoided, it may cause injury accidents, charger damage or charging interruption.

1.4 Manual preservation

Please read this manual carefully before using the charger and keep it for future reference.

2. Safety statements

INDICATE

Quality requirements for installation and maintenance personnel:

Have the qualification certificate or experience in electrical power system installation and maintenance, and have the qualification to engage in relevant work (such as live working). In addition, they must have the following knowledge and operating skills.

-Have basic knowledge and installation skills of charger.

-Have basic knowledge and operation skills of electrical power line wiring.

-Have basic power safety knowledge and skills, and be able to read the contents of this manual.

NOTICE

Quality requirements for installation and maintenance personnel:

Have the qualification certificate or experience in electrical power system installation and maintenance, and have the qualification to engage in relevant work (such as live working). In addition, they must have the following knowledge and operating skills.

-Have basic knowledge and installation skills of charger.

-Have basic knowledge and operation skills of electrical power line wiring.

-Have basic power safety knowledge and skills, and be able to read the contents of this manual.

WARNING

Persons not authorized by LIVOLTEK are not allowed to open the charger.

Do not disassemble, repair or refit the charger and relevant ancillary facilities without permission. Improper operation may cause damage, water leakage, electric leakage and other damage to the charger or potential personal injury. If you need maintenance, modification, etc., please contact LIVOLTEK customer service.

Do not put flammable, explosive or combustible materials, chemicals, combustible gases and other dangerous articles near the charger.

Children are not allowed to approach or use the charger during charging to avoid accidental injury.

Please start and stop the charging according to the user manual and relevant prompts provided by LIVOLTEK. When plugging in and out the vehicle connector, pay attention to the appropriate

force and press the unlock button.

When inserting the vehicle connector, ensure that the lock catch of the vehicle connector head is fully fastened to the groove of the vehicle inlet to ensure full connection; do not pull the vehicle connector too hard, and pull the vehicle connector forcibly in the locked state.

It is forbidden to drive and move the vehicle during charging, and it is forbidden to draw the vehicle connector directly during charging.

In case of leakage, fire, electric shock or other abnormal emergency during charging, please press the emergency stop button immediately.

After the charging operation is completed normally, please plug the vehicle connector back into the socket in the charger in time to avoid the vehicle connector being directly exposed to the outside as far as possible to prevent the vehicle connector from abnormal contamination.

Leakage, and charge only after it is confirmed to be safe.

In wet weather, it shall be confirmed that the vehicle connector and vehicle inlet are dry. If the charger or vehicle connector is found to be abnormally wet and soaked, charging shall be prohibited.

It is strictly prohibited to use the charger when the charger (including vehicle connector, charging cable, leakage protection device and other auxiliary parts) has defects, abnormal cracks, bare charging line, etc. If there are abnormalities or doubts about the use safety of the charger, you can contact LIVOLTEK customer service on time.

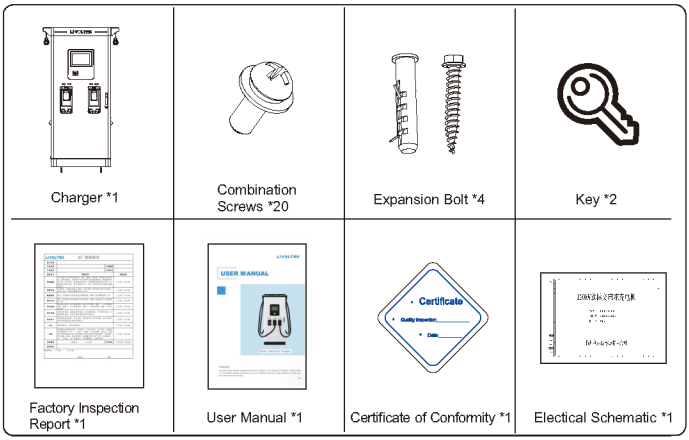
It is strictly forbidden to touch the vehicle connector and vehicle inlet with metal objects. If the vehicle connector and vehicle inlet are found to be damaged by melting and foreign matters, please stop using the charger immediately and consult the LIVOLTEK customer service for proper treatment.

For the unused charger, it is recommended to disconnect the circuit breaker associated with the charger to prevent power loss or unknown accidents.

Adaptors or conversion adapters are not allowed to be used.

3. Packing list

The packing list is shown in the table below:



No.	Name	Description	Quantity
1	Charger	Motion Fast DC Charging Station	1PCS
2	Combination screws	M5* 10mm	20PCS
3	Expansion bolt	M12* 100mm	4PCS
4	Key	/	2PCS
5	Factory Inspection Report	/	1PCS
6	Certificate of Conformity	/	1PCS
7	User's Manual	/	1PCS
8	Electrical Schematic	/	1PCS
9	Mounting Hole Diagram	/	1PCS

4 Product introduction

4.1 Product appearance

Figure 4-1-1 MF Series (with optional 22kW AC)

Figure 4-1-2 MF Series

4.2 Description of Model Meaning

Product Name:

Motion Fast DC Charging Station (also known as “MF” series in this manual)

Models:

M0601000E1EY M1201000E1EY

M0601000E2MY M1201000E2MY

M0601000E2EY M1201000E2EY

M0821000E3MY M1421000E3MY

M0821000E3EY M1421000E3EY

M0901000E1EY

M0901000E2MY

M0901000E2EY

The Motion Fast DC Charging Station naming rules are shown in Figures 4-2.

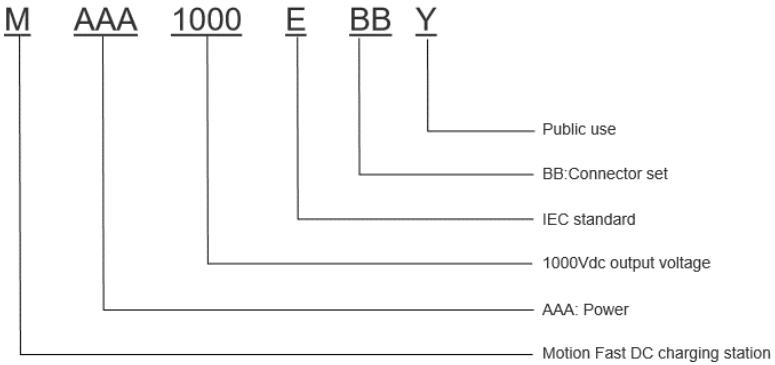


Figure 4-2 Naming Rule

** AAA: 060 - 60kW; 082 - 82kW (60kW DC + 22kW AC); 090 - 90kW; 120 - 120kW; 142 - 142kW (120kW DC + 22kW AC)*

** BB: 1E – CCS2; 2E – CCS2 + CCS2; 2M – CCS2 + CHAdeMO; 3M – CCS2 + CHAdeMO + AC Socket; 3E – CCS2+ CCS2 + AC Socket*

4.3 Technical specifications

The Motion Fast DC Charging Station is a high power charging equipment for the rapid charging needs of electric vehicles. With stable output power and efficient charging efficiency, this charger can provide fast, safe and reliable charging service for electric vehicles.

Model	MF 60	MF 90	MF 120
	M0601000E1EY M0601000E2MY M0601000E2EY M0821000E3MY M0821000E3EY	M0901000E1EY M0901000E2MY M0901000E2EY	M1201000E1EY M1201000E2MY M1201000E2EY M1421000E3MY M1421000E3EY
Rated Power	DC 60kW + Optional AC 22kW	DC 90kW	DC 120kW + Optional AC 22kW
AC Connection	3P + N + PE		
AC Input Voltage	400 Va.c. ± 10%		
AC Input Max.Current	116A (148A with optional AC)	174A	232 A (264A with optional AC)
Rated Frequency	50/60Hz		
Power Factor	≥0.99 at nominal load		
THD	≤5%（50%～100% load）		
Output Voltage Range	150~1000Vdc		
Output Constant Voltage Range	300~1000Vdc		
Output Current*(1)	Plug A: CCS2 200A Plug B: CCS2 200A / CHAdeMO 125A; Plug C: Type2 AC 32A	Plug A: CCS2 250A Plug B: CCS2 250A / CHAdeMO 125A;	Plug A: CCS2 250A Plug B: CCS2 250A / CHAdeMO 125A; Plug C: Type2 AC 32A
Output Efficiency	≥95%（20~100% Load）		
Environment of use	Indoor / Outdoor		
User Authorization	RFID (ISO 14443 A/B), APP, Contactless NFC Customized		
Working Noise	≤ 75dB （Nominal Load, measured at 1m from the front of the charger）		
Operating Temperature	-25℃～50℃		
Storage Temperature	-30℃～70℃		
Working Humidity	5%～95% RH		

Working Altitude	≤2000m		
IP Degree	IP54		
Cooling	Force Fan Cooling		
Dimension (W*H*D)	910*1750*575 mm		
Energy Management	Support		
Net Weight	≤245kg	≤275kg	≤300kg
Standby Power Consumption	≤ 50 W		
Length of Charging Cable	5m standard (7m customized)		
Firmware Upgrade	Local (USB)/ OTA		
Connectivity & Modem	4G: LTE-FDD: B1/3/7/8/20/28A, LTE-TDD: B38/40/41 25dBm; WCDMA: B1/8 25dBm; GSM: B3/8 35dBm; Ethernet:10/100 Mbps; RFID:13.56MHz -8.6dBμA/m		
External Communication	RS485 / RS232 / CAN		
Communication Protocol	OCPP 1.6J, support update to OCPP 2.0.1		
User Interface	10.1" Touch Screen; Charging LED Indicators		
Multiple Protection	Over Voltage Protection, Under Voltage Protection, Overcurrent Protection, Over Temperature Protection, Grounding Protection, Surge Protection, Short Circuit Protection, Fault Self-check, Insulation Detection		
Leakage Current Protection	DC - RCD 30mA Type A + 6mA DC leak sensor AC Socket - RCBO 30mA Type B (optional)		
Safety	IEC 61851-1, IEC-61851-23, IEC 62196-2/3		
EMC	IEC 61851-21-2 Class B		
Communication	IEC 61851-24, DIN 70121, ISO/IEC 15118		

*(1) *output type & number refer to connector sets in model MAAA1000E**BB**Y description, **BB** indicates connector set.*

4.4 Product Performance and Features

- The system has a modular design with parallel outputs for flexible configuration and easy maintenance.
- The system provides comprehensive protection
- The appearance is simple and beautiful.
- Adopts 10.1-inch high-definition touch screen with vivid colours and IP54 level of protection.
- Supports multiple communication modes
- The system supports OCPP1.6 and will be upgraded to OCPP2.0.1 in the future.

4.5 Outlooks

The outlooks of the Motion Fast DC Charging Station is shown in Figure 4-3.

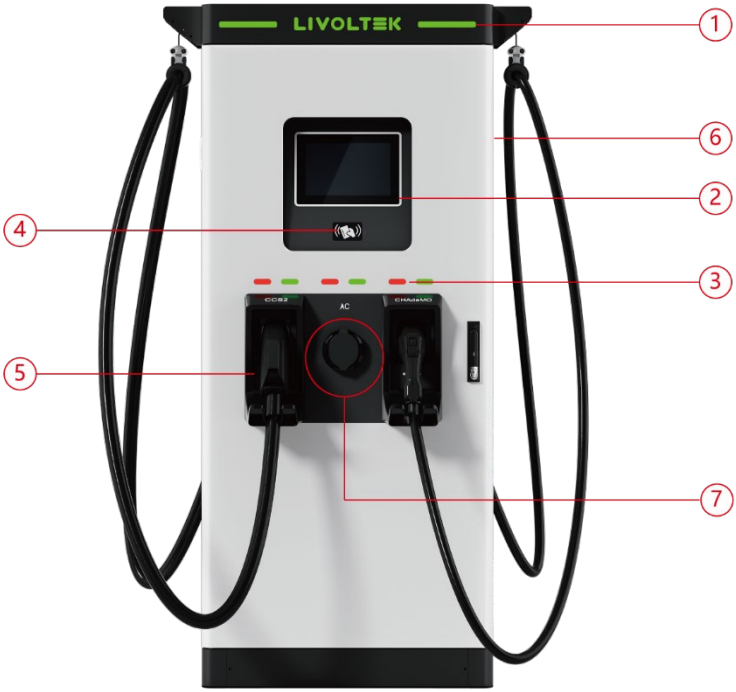


Figure 4-3 MF Series (with optional 22kW AC)

The charger operational description is shown in Table 4-2.

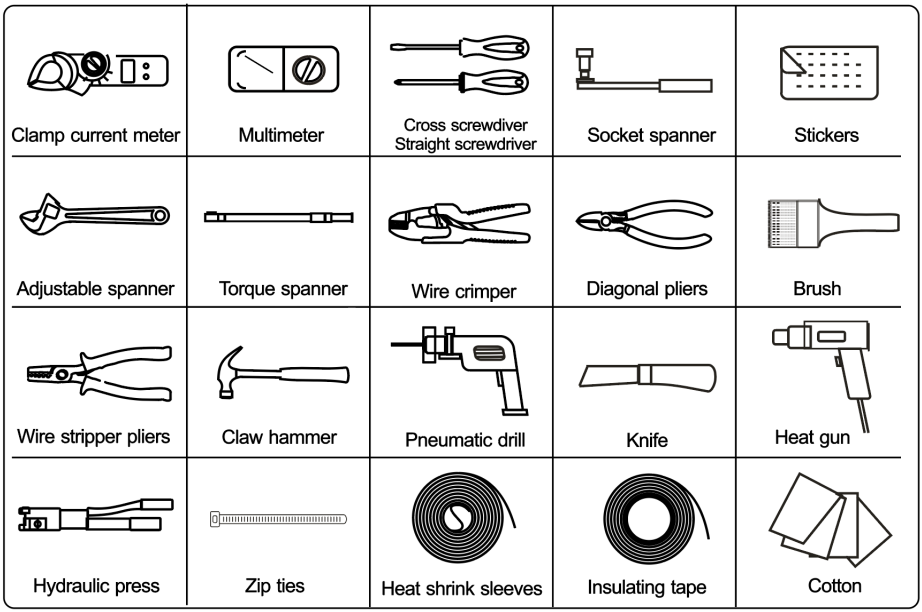
No.	Name	Description
①	Power indicator	Green color is always on after power on.
②	Display touch screen	HMI interaction.

③	Status indicator	Blue color	When not charging, the blue light does not light up; when the connector is inserted (but charging has not been officially started), the blue light flashes; during the charging process, the blue light remains on.
		Red color	When not charging, the red light does not light up; when a fault occurs, the red light remains on.
④	Swipe card area	When you need to swipe the card, gently place the charging card on the area to swipe the card to start or stop charging.	
⑤	Charging connector holder	The charging connector is returned to its position and inserted into the connector holder.	
⑥	Emergency stop button	In case of system abnormality, you can press the emergency stop button, and the system will stop charging output immediately to protect the charger and the safety of the car.	
⑦	22 kW type 2 socket	Configurable 22kw Type 2 socket	

5 Installation & wiring

5.1 Tools preparation

The list of installation tools is shown in the table below:



5.2 Installation requirements

5.2.1 Environments

- This charging post is an outdoor type electric vehicle charging post, which meets the protection level of IP54 and is suitable for installation in a dry and dust-free environment.
- The foundation must ensure the stability and safety of the charging post installation location; l
- Please make sure the working temperature is within the range of -30℃ to +70℃, so that the charging post can work in a better condition;
- When the charger is installed in an open environment, in order to better improve the user's experience and satisfaction, it is recommended to arrange a canopy above the equipment to prevent rainwater from directly drenching the equipment and to facilitate the user's

operation;

- The charger installation environment should be well ventilated and away from water sources, heat sources and flammable and explosive items. Avoid installing the charger in an environment with direct sunlight, dust, volatile gas, corrosive substances and excessive salt.

5.2.2 Wiring Requirements

Generally speaking, the wire diameter specification of the inlet end of the charger is shown in Table 5-1. When the cable length exceeds 200m, considering the pressure drop on the cable, the cable specification should be increased accordingly.

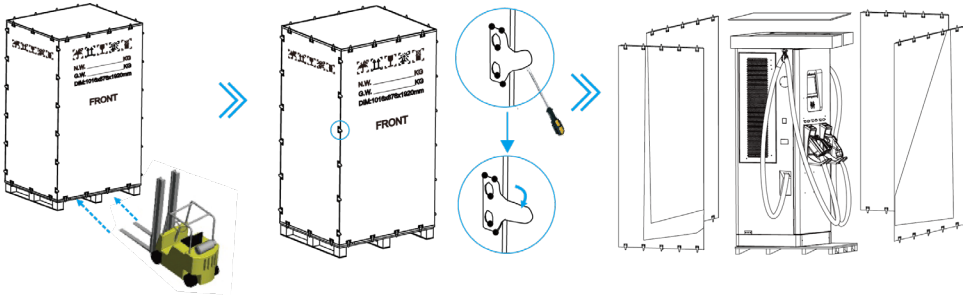
Recommended values for each core wire diameter		
A/B/C/N	Wire diameter (mm²)	95
	Terminal Model	DT-95
Ground PE	Wire Diameter (mm ²)	50
	Terminal Model	DT-50

Table 5-1 Minimum cable specification (mm²) and recommended terminal departments

Length of reserved cable inside the cabinet (beyond the upper surface of the foundation): The length of reserved cable inside the cabinet is 1m for power cables and 1mfor network cables. If you have any questions, please contact our customer service.

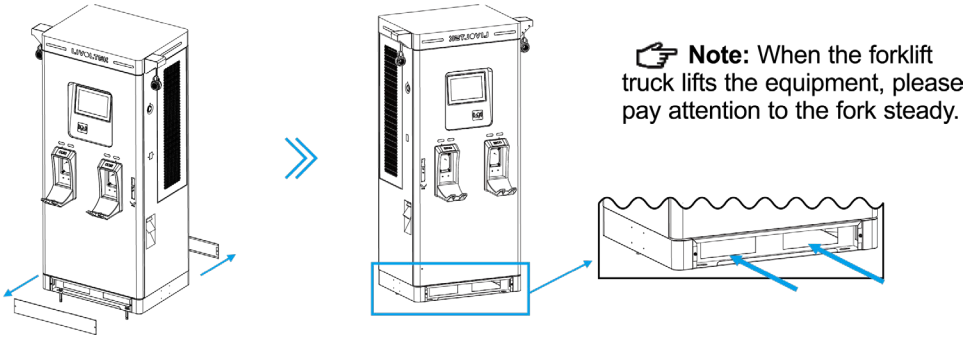
5.3 Installation of charger

5.3.1 Unpacking



Step 1: Use a forklift to transport the equipment to the designated location.

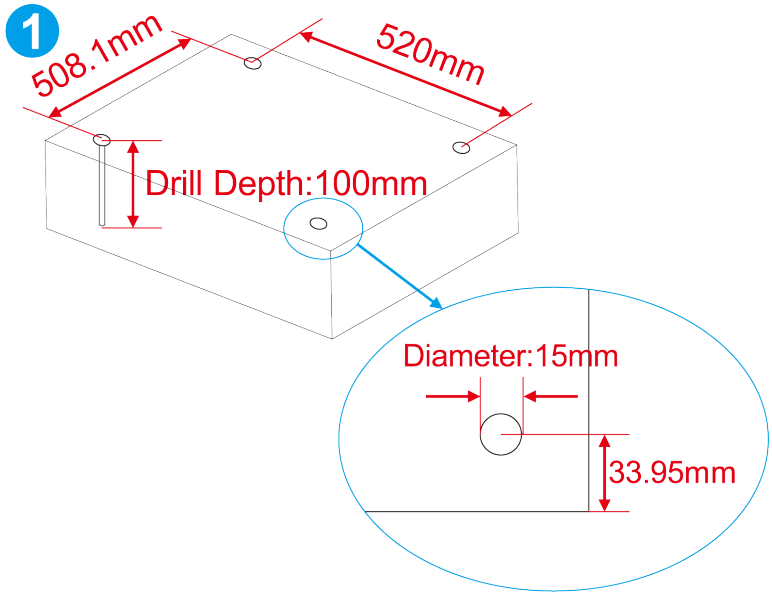
Step 2: Use tools to pry open the buckles on the outer packaging;



Note: When the forklift truck lifts the equipment, please pay attention to the fork steady.

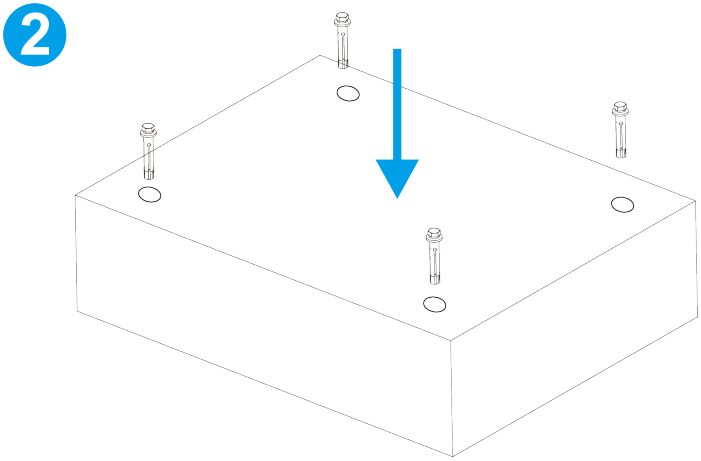
step 3: Remove the front and rear covers at the bottom of the charger, after which the charger can be fork lifted with a forklift.

5.3.2 Installation of Charger



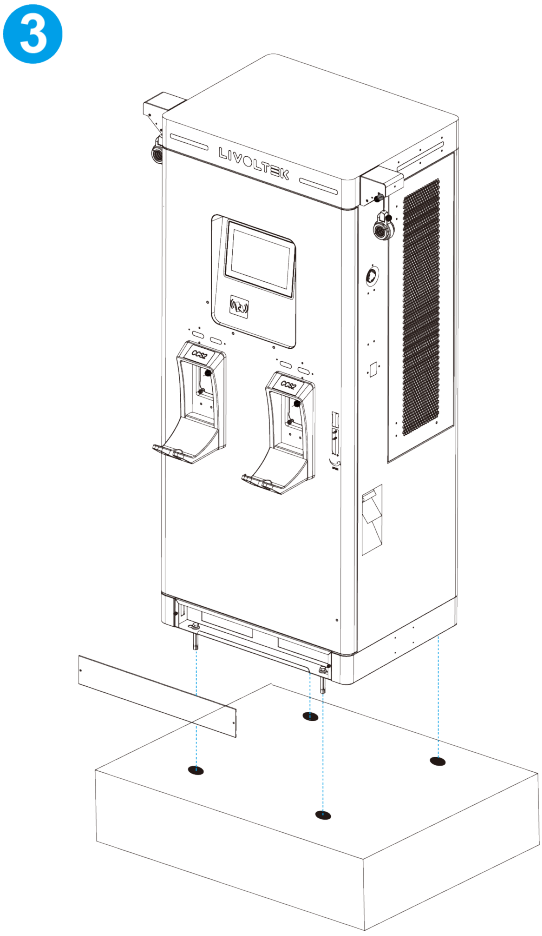
Mounting

Step 1: Choose a suitable installation site and make a cement base to facilitate installation and wiring, and drill 4 holes.



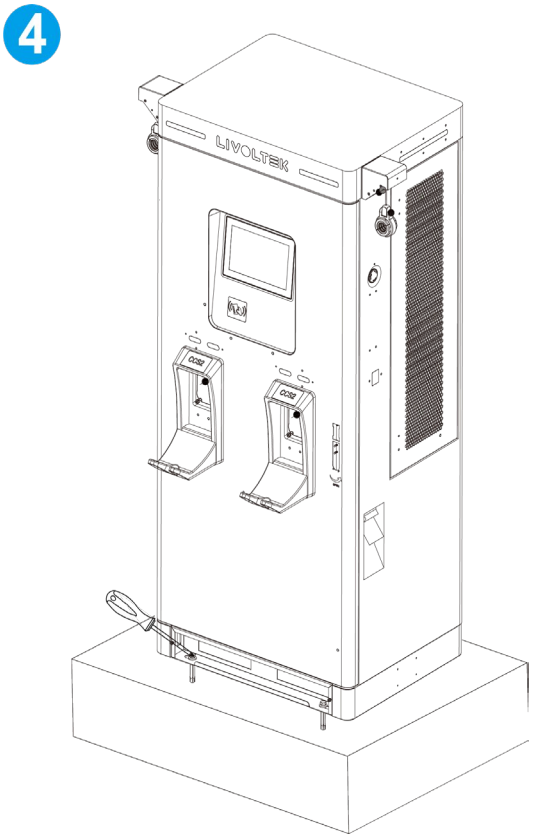
Drive expansion bolts

Step 2: Drive 4 M12*100 expansion bolts into the cement base.



Move the charger

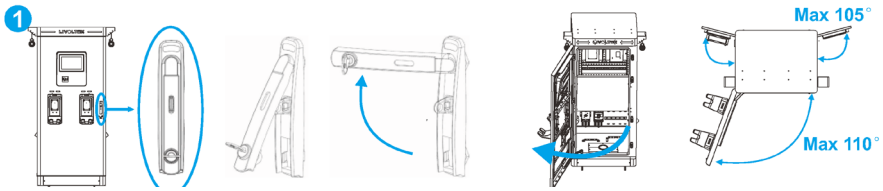
Step 3: Remove the panel, and move the charger from the wooden pallet to the cement base with a forklift.



Tighten the screws

Step 4: Align the charger mounting holes with the expansion bolts and tighten the screws.

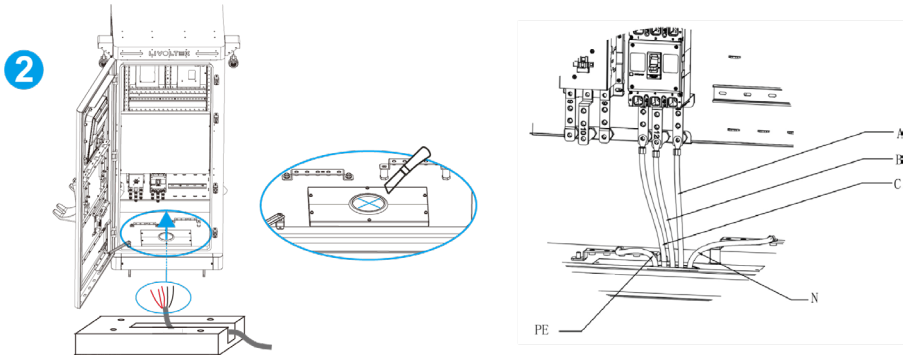
5.4 Grid architecture wiring



Open the door

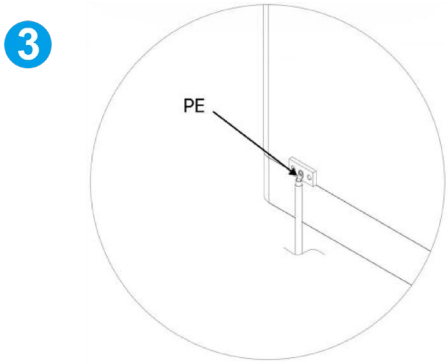
Step 1: Use the key to open the door.

(Note: It is strictly prohibited to open the charger door when the Lock charger is charging.)



Wiring Techniques

Step 2: Put the utility input line through the inlet gutter, and connect it to the A/B/C phase and zero line of the lower part of the AC circuit breaker.



Ground wire

Step 3: Make sure the ground wire is connected to the ground.

Step 4: After the wiring is completed and all connections are confirmed to be correct, close the door of the charger and lock it.

Note: Length of reserved cable inside the cabinet (beyond the upper surface of the foundation): The length of reserved cable inside the cabinet is 1m for power cables and 1mfor network cables. If you have any questions, please contact our customer service.

6 Operating instructions

This chapter mainly introduces the touch screen operation of the charger, including touchscreen function, main interface introduction, switching operation, screen setting, parameter setting, current fault query, history information query restoring factory settings.

🕮 The parameter values and other specific details in the pictures in this chapter are for illustration only, the actual interface parameters please refer to the touch screen display of the received product.

6.1 Touch screen function

The following functions can be realized by operating the LCD touch screen, as shown in Table6-1.

Table 6-1TouchScreen Functions

Item	Function Description
Main interface	You can check the current status of the charging post: idle, charging in progress, charging completed.
Account login	Different personnel have different permissions for setting and modifying.
Operation Information	Display all the current measurement data and operation status of the system.
Charging Records	Users can view the charging records, including charging start and end time, payment card number, charging duration, charging amount, charging power, charging maximum current, voltage and vehicle identification number.
Network Settings	The network setting interface allows you to configure the server IP address, server port, local IP address, subnet mask, default gateway and terminal number.
Screen Settings	Users can set the date, time and backlight brightness.

6.2 Main Interface

When the system is powered on, it enters the default main interface, which is convenient for monitoring the system. The default main interface is shown in Figure 6-1.

Figure 6-1 Main Interface

This page contains information such as device number, signal strength, time, charging connector type and status, etc.

6.3 Charging Process

Step 1: The user selects the type of charging connector on the main page, as shown in Figures 6-2.

Figure6-2 Main Interface

Step 2: User selects authentication method, as shown in Figure 6-3.

Figure 6-3 Authentication Method

Step 3: The charger prompts the user to insert the charging connector into the EV charging port, as shown in Figures 6-4.

Figure 6-4 Connecting the vehicle to the charger

Step 4: Charging starts, the user can check the charging time, cost, charging progress and other details, as shown in Figures 6-5.

Figure 6-5 Charging page

Step 5: After charging for a period of time, the system will automatically return to the main page. Click on the connector type user selected to enter the details page.

Step6: Remind the charging end page and authenticate again, as shown in Figures 6-6.

Figure 6-6 Authentication Method

Step 7: Return connector reminder, charging ends, then user could check the details of charging, as shown in Figures 6-7.

Figure 6-7 End page

6.4 LED Indicators

The status indicators consists of green, red and blue LEDs, which are driven by the charge controller to indicate the status of "standby", "charging" and "alarm", respectively. The specific definition of the status indicator board is shown in Table 6-2.

type	color	Status information indication
Power Indicator	Green	Steady on: The device is powered on normally.
charging indicator	Blue	Flashing slowly: The vehicle has been connected and is waiting for the customer to start. Flashing quickly: charging is starting Steady on: Charging is in progress
Alarm indicator light	Red	Flashing slowly: insulation alarm Steady on: There is an error or malfunction

Table 6-2 Definition of indicator status

7 Troubleshooting

This chapter mainly introduces the common fault handling program.

See Table 8-1 for specific fault types and solutions:

Fault type	solution
Emergency stop button action fault	Troubleshooting emergency stop button
AC input circuit breaker fault	Troubleshooting AC input circuit breakers
DC bus bar output contactor refuses to act/mis-actuates faults	Troubleshooting DC bus contactors
Charging interface electronic lock failure	Troubleshooting charging interface electronic lock
Lightning arrester fault	Troubleshooting lightning arrester
Insulation monitoring fault	Re-insert charging gun
Vehicle control guide failure during charging	Troubleshoot charging post CP voltage
Charging interface over-temperature fault	Check charging port status
Charging gun not in position alarm	Check whether the charging plug is in place
BMS communication fault	Replace the vehicle for testing
Input voltage overvoltage fault	Check input voltage
Input voltage undervoltage fault	Check input voltage
DC bus output overvoltage fault	Troubleshooting charging post module
DC bus output undervoltage fault	Troubleshooting charging post module
DC bus output overcurrent fault	Troubleshooting Charging Module Failure
Charging module fault	Troubleshooting Charging Module
Charging module AC input fault	Troubleshooting Charging Module
Charging module AC input overvoltage fault	Troubleshooting Charging Module
Charging Module AC Input Undervoltage Fault	Troubleshooting Charging Module
Charging module AC input phase loss fault	Troubleshooting Charging Module
Charging Module DC Output Short Circuit Fault	Troubleshooting Charging Module
Charging module DC output overcurrent fault	Troubleshooting Charging Module
Charging module DC output overvoltage fault	Troubleshooting Charging Module
Charging module DC output	Troubleshooting Charging Module

undervoltage fault	
Charging module over-temperature fault	Troubleshooting Charging Module
Charging module communication fault	Troubleshooting Charging Module
Charging Module Fan Failure	Troubleshooting Charging Module
Charger cabinet door failure	Checking door switches
Drain circuit fault	Check charging module
Bridge contactor refusal/mis-actuation failure	Check bridge contactor
Pre-charge stage voltage regulation failure	Check charging module

8 Routine Maintenance

8.1 Safety precautions

In order to perform safe and successful maintenance of the power supply system, knowledge of safety precautions must be observed, the necessary tools and test equipment must be used, and qualified maintenance personnel must be involved. Always pay attention to the following safety procedures:

- It must always be borne in mind that dangerous voltages may still be present inside the charging post even if the charging post system is not operating. After disconnecting the inputs, there may be an undischarged charge on the internal charging module output BUS bus, which requires that the charging post be left in place for more than 10 minutes before performing internal maintenance. Before performing maintenance, check with a voltmeter to ensure that the power is off and in a safe condition;
- Do not wear conductive objects such as rings, watches, etc. when checking the charger inside the machine;
- There is a danger of high voltage inside the machine, so non-professionals should not open the charging post without authorization.

8.2 Equipment Maintenance

The basic task of charger equipment maintenance is to ensure that the relative humidity, cleanliness, electrostatic interference, noise, strong electromagnetic interference and other elements meet the requirements, ensure the stable performance and reliable operation of power supply equipment, and ensure the normal power supply of communication equipment. The basic requirements of equipment management are to ensure that the mechanical properties of the equipment are in good condition, the electrical properties of the equipment meet the standard requirements, the operation of the equipment is stable and reliable, and the technical data and original records related to the equipment are complete. The maintenance test items are shown in Table 5-2 (for reference only).

Table 7-2 Management and Maintenance Test Items

No.	Maintenance test items	Period

1	Wear and tear inspection of charging connector connecting cable, check insulation and charging connector for damage	Season
2	Check input and output terminals to ensure good contact, check terminals for discoloration.	Season
3	Check the inside of the cabinet for standing water or water damage	Monthly
4	Surface cleaning of cabinets.	Monthly
5	Cleaning the touch screen, check that the display shows normal.	Monthly
6	Check the working condition of the fan to prevent debris from blocking the air outlet.	Monthly
7	Cleaning dust from air inlets and outlets of equipment.	6 month
8	Replacing air filters.	Annual
9	Clean the charging connector for proper use.	Monthly

9 Packaging, Transportation and Storage

9.1 Packaging

Packaging should pay attention to the requirements for the placement direction of each part. The sides of the wooden case are printed with warning patterns such as fear of moisture, careful and gentle placement, and upward. The side of the wooden boxes is printed with the model number of the equipment and other information. The front side of the wooden case is printed with the company logo and the name of the equipment.

9.2 Transportation

During transportation, pay attention to the warning signs on the packing box and do not subject it to violent impact. During transportation, the device should be placed strictly according to the direction marked on the packing box to avoid vibration damage to the device. During transportation, it is not allowed to be shipped with flammable, explosive and corrosive articles. It shall not be stored in the open warehouse during transit. The device is not allowed to be exposed to rain, snow or liquid substances and mechanical damage.

9.3 Storage

When the equipment is stored, the direction of placement should be strictly according to the direction indicated on the packing box. The packing box should be padded 200mm from the ground, at least 500mm from the wall, heat source, cold source, window or air inlet, relative humidity of 20% to 80%, the warehouse does not allow a variety of hazardous gases, flammable, explosive substances and corrosive chemicals, and should be free of strong mechanical vibration, impact and strong magnetic field effect. In this article, under the conditions of storage period, if no other provisions, generally should be 6 months. More than 6 months should be re-examined.

10 Disclaimer

There are clear requirements and conditions for the transportation, storage, installation and use of electric vehicle charging posts. LIVOLTEK is **not responsible** for providing free related service, technical support or compensation in the following cases, including but not limited to:

- The Charging station is out of warranty and extended warranty has been purchased.
- A valid serial number, warranty card or invoice for the Charging Stake cannot be provided.
- The Charging station has been damaged by humans.
- The Charging station is damaged by force majeure (e.g. earthquake, flood, storm, fire, etc.).
- The installation and use of the charging post violates the relevant local policies and regulations.
- Installation and use of the charging post does not comply with the requirements in this manual.
- Changing the hardware or software of the charging post authorization from LIVOLTEK.
- Obtaining relevant communication protocols from other illegal sources without authorization from LIVOLTEK.
- Establishing a monitoring system without authorization from LIVOLTEK.

LIVOLTEK will reserve the right to interpret all contents of this user manual.

LIVOLTEK

Manufacturer: Hangzhou LIVOLTEK Power Co., Ltd.

Add: 1418-35 Moganshan Road, Hangzhou City, China

E-mail: info@livoltek.com Web: www.livoltek.com

Importer: XXX

Address: XXX