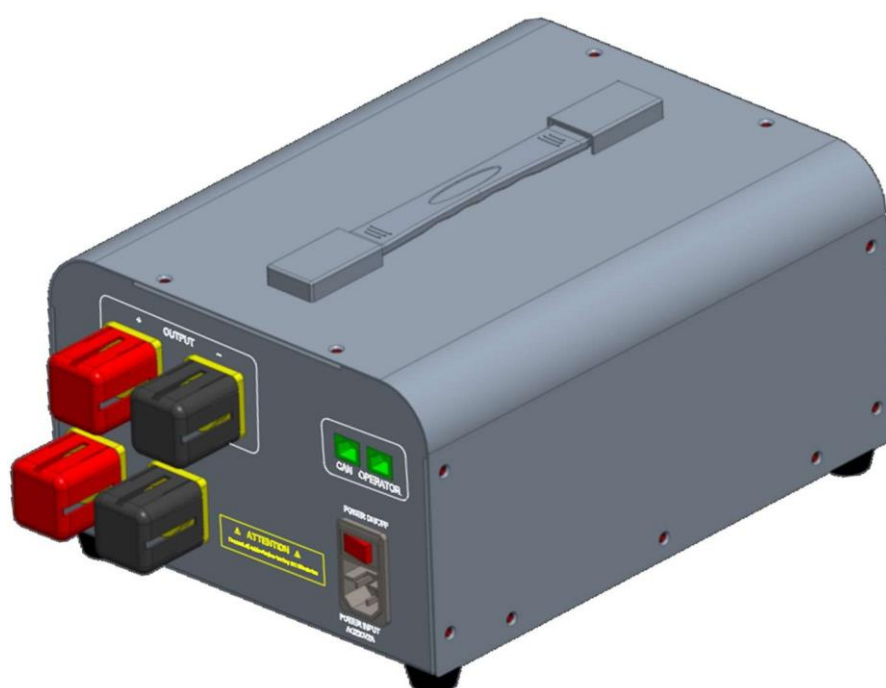




## Installation and user manual LBC-150E



## Declarations:

This product is a single battery pack charging control device, and will be also mentioned below as "Charge Controller". Due to product upgrades or other reasons, this document will be adjusted appropriately. Unless otherwise agreed, this document is intended for guidance only and all statements, information and advice in this document do not constitute any express or implied; Please contact us for more information.

# 1. Preface

Thank you for choosing our LBC-150E charge controller, we will provide you with high-quality products and reliable after-sales service.

In order to protect the safety of users and products, please carefully read the detailed information on product features, construction, operating standards, maintenance and troubleshooting provided in this manual.

## 2. Information in the manual

### 2.1 About the manual

This manual is the LBC-150E charge controller manual, and the manual must be strictly followed when using the device or installation program.

### 2.2 Scope of application

This manual applies only to our LBC-150E charge controller.

### 2.3 Special instructions

The specifications of the product can be changed without notifying the customer.

### 2.4 Use of Flags

Meaning of logos:



**Warning:**

Warnings indicate minor equipment damage or personal injury if not avoided.



**Attention:**

Note that if not avoided, it can cause damage to product performance.



**Information:**

Information flag provides the most suitable installation and operation tips.

## 3. Security

### 3.1 Warnings and notifications



**Attention:**

Installation environment requirements: LBC-150E charge controller is designed for use in the case of capacity inconsistency in the battery pack, must be installed in a location that meets the IP21 protection level, if the installation environment does not meet the IP21 protection requirements, the product may fail and cannot guarantee any accidents or damage.

### 3.2 Safety guidelines



**Warning:**

Short circuits between the positive and negative terminals must be avoided during installation and use, all electrical connection work regarding the LBC-150E charge controller must be performed by qualified professionals, and the user must comply with the safety precautions and warning information described in this manual. If any of the following precautions are not fully understood or there are any problems, please contact customer service for assistance.

# 4. Product overview

## 4.1 Product introduction

This system is mainly designed for battery system maintenance and power replenishment, with the ability to adjust the voltage imbalance or undervoltage of a single battery pack,this equipment can be used to charge and control a single battery pack. The system comes with a battery management system to realize battery protection, charge management, temperature control and other functions.

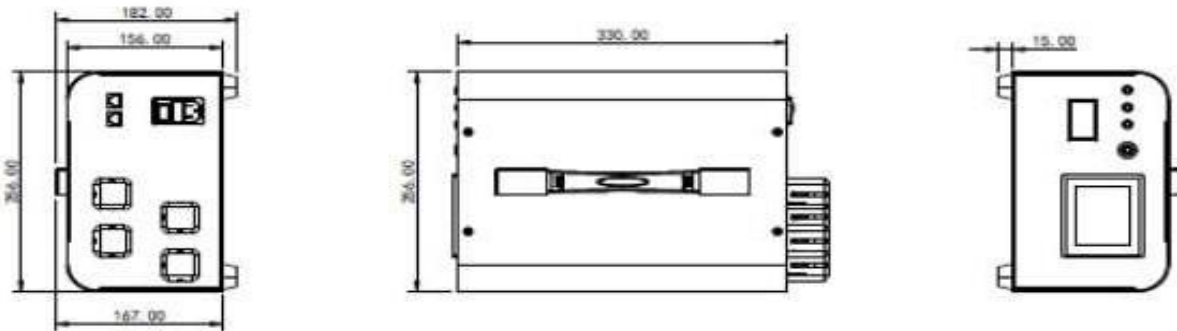
## 4.2 Product technical parameters

| Technical performance data sheet |                         |                                                                                       |
|----------------------------------|-------------------------|---------------------------------------------------------------------------------------|
| Category                         | Subject                 | Specifications                                                                        |
| System power supply parameters   | Power supply mode       | AC powered                                                                            |
|                                  | Input voltage range     | 85-264VAC                                                                             |
|                                  | Frequency range         | 47-63Hz                                                                               |
|                                  | Reference diagram       |  |
| System operating parameters      | Operating voltage range | 0-60VDC                                                                               |

|  |                                                             |                        |
|--|-------------------------------------------------------------|------------------------|
|  | Maximum continuous charge and discharge current (suggested) | 150A<br>(10A)          |
|  | Charging temperature range                                  | 0-55℃                  |
|  | Discharge temperature range                                 | -20-60℃                |
|  | Protection                                                  | Overcharge/overcurrent |
|  | Protection parameters                                       | Cell overvoltage 3.65V |

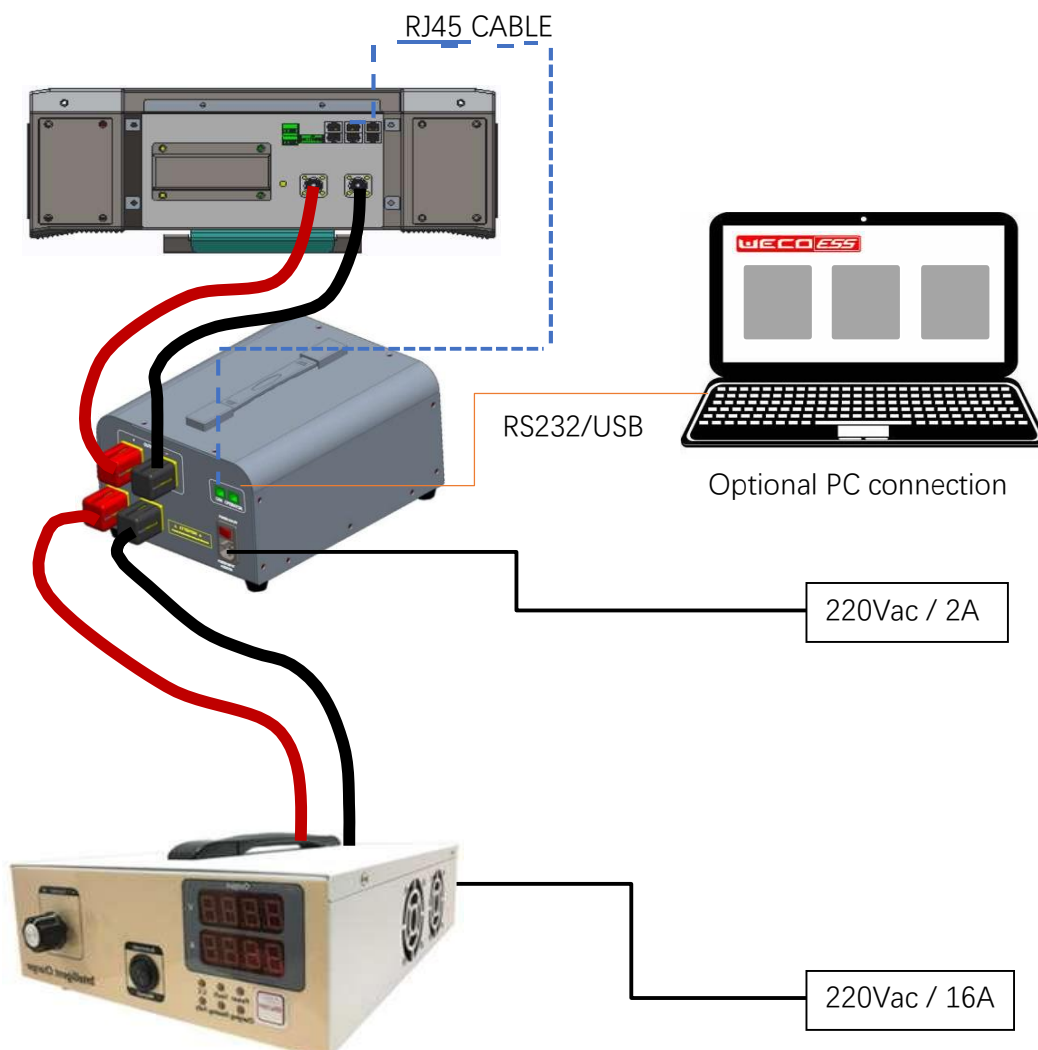
|                              |                          |               |               |
|------------------------------|--------------------------|---------------|---------------|
| Auxiliary input              | Vac                      | 220V          | 2A (max)      |
| Charger input                | Vdc                      | 0-60V         | 150A (max)    |
| Charger protection           | Contactors               | 750Vdc        | 200A          |
| Battery device communication | RS232-1                  | MODBUS        | /             |
| Touch screen interface       | Charging voltage/current | Unit voltage  | SOC %         |
| External communications      | RS232-2                  | WeCo PC       | CSV Output    |
| Dimensions and weight        | Weight 6.2 kg            | 256x330x156mm | IP 21         |
| Charging target              | Target SOC               | 100%          | /             |
| Touch screen information     | 16 cells Info            | Total Current | Total Voltage |

## 4.3 Product specifications

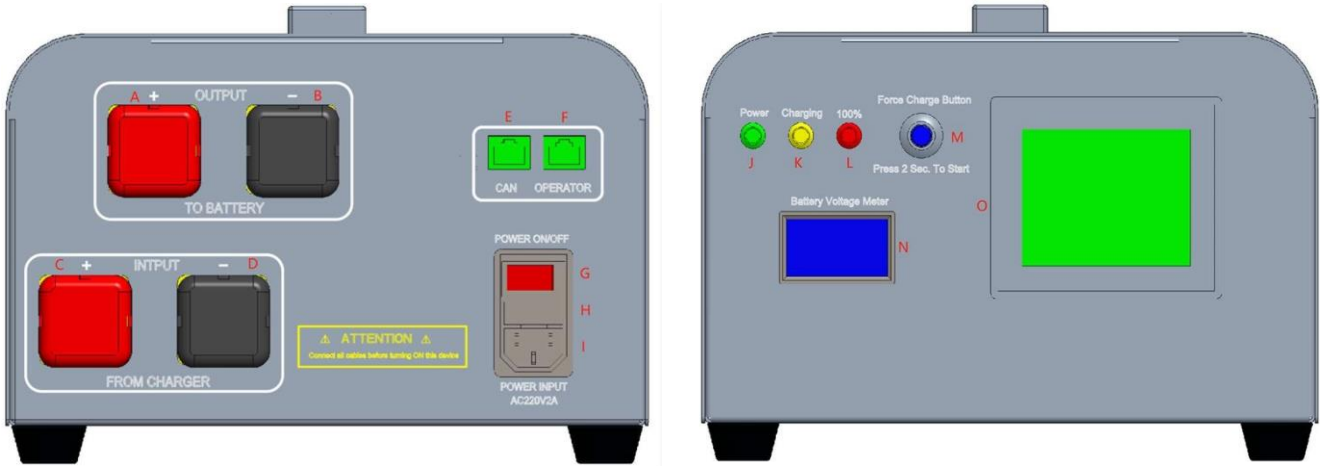


## 5. Interface definition

The charge controller can be used with any type of DC charger with a maximum voltage of 60Vdc and a maximum current of 150Adc, however, it is recommended to use a 10A charger to replenish discharged batteries. Independent of the charger, it acts as a protective interface between the charger and the battery. The wiring diagram is as follows:



5.1 Panel definition



A. Panel definition A

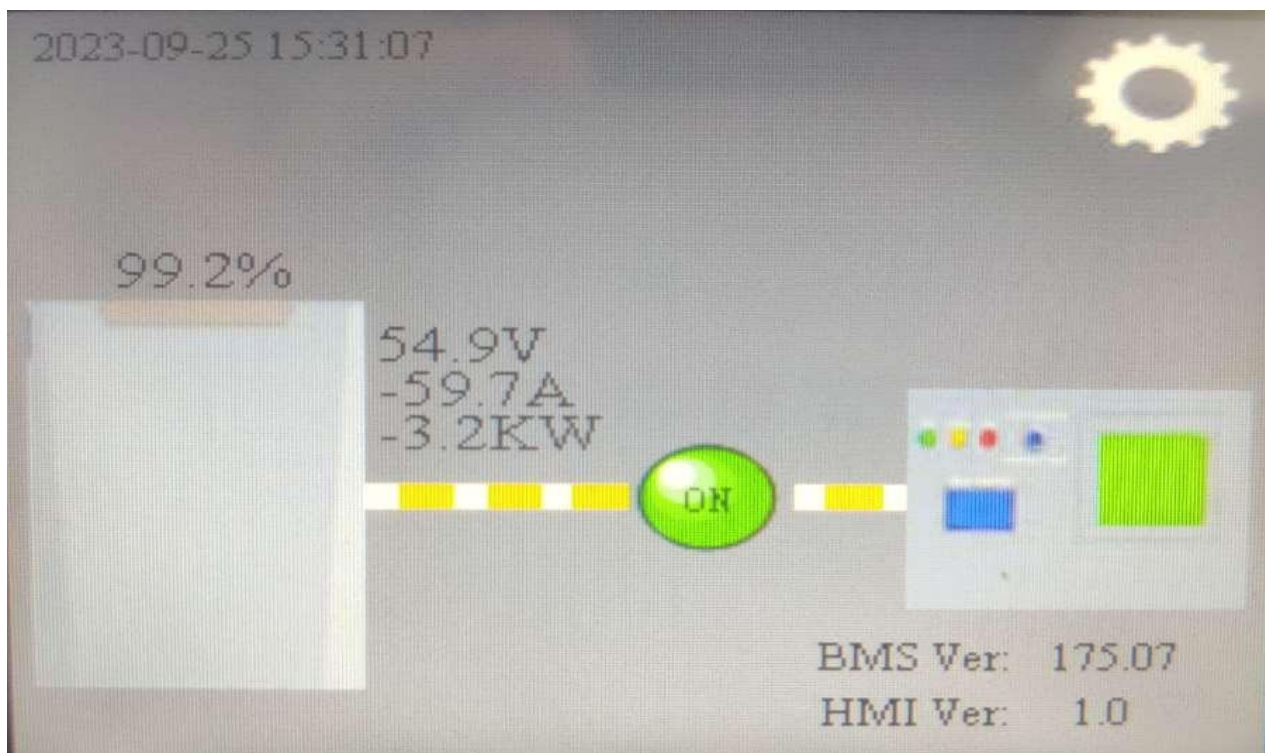
| NO. | Name          | Function                   | Note |
|-----|---------------|----------------------------|------|
| A   | B+            | Positive output            |      |
| B   | B-            | Negative output            |      |
| C   | P+            | Positive input             |      |
| D   | P-            | Negative input             |      |
| E   | RS232         | Battery pack communication |      |
| F   | OPERATOR      | PC Software communication  |      |
| G   | ON/OFF        | ON/OFF switch              |      |
| H   | Ac power fuse | AC power supply fuse       |      |
| I   | L             | AC powered input           |      |
|     | N             |                            |      |
|     | PE            |                            |      |

## B. Panel definition B

| NO. | Name                | Function             | Note                                                                        |
|-----|---------------------|----------------------|-----------------------------------------------------------------------------|
| J   | Power               | Run Led              | On when powered                                                             |
| K   | Charging            | Charging Led         | On during the charge                                                        |
| L   | 100%                | Full charge LED      | On when the battery reach 100%                                              |
| M   | Force charge button | Forced charge button | Press for 3S to start the forced charge. After 3min forced charge will end. |
| N   | HMI                 | Status display       |                                                                             |
| O   | Voltmeter           | DC voltage display   |                                                                             |

## 6. HMI introduction

### 6.1 Main



After switching on, the device automatically accesses the main page displaying the current SOC value of the battery, charging voltage, charging current and charging power.

Click the Alarm button on the Home page to enter this interface, mainly displaying current faults and alarm information of the device.

## 6.4 Detail

|      |        |       |        |     |
|------|--------|-------|--------|-----|
| V01  | 3.398V | V09   | 3.397V | M01 |
| V02  | 3.397V | V10   | 3.398V |     |
| V03  | 3.395V | V11   | 3.395V |     |
| V04  | 3.397V | V12   | 3.399V |     |
| V05  | 3.396V | V13   | 3.397V |     |
| V06  | 3.396V | V14   | 3.397V |     |
| V07  | 3.396V | V15   | 3.398V |     |
| V08  | 3.397V | V16   | 3.396V |     |
| T1   | 32°C   | T3    | 32°C   |     |
| T2   | 32°C   |       |        |     |
| Main |        | Alarm |        |     |

Click the Alarm button on the Detail page to enter this interface, which mainly displays the cell voltage and cell temperature of a single battery.

## 6.5 Gear icon

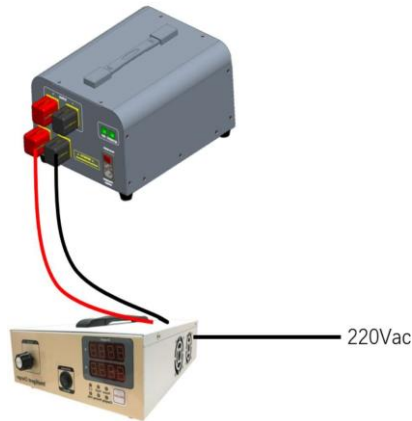
|                |       |                |      |
|----------------|-------|----------------|------|
| Cell OV        |       | Cell UV        |      |
| SumVol OV      |       | SumVol UV      |      |
| Charge OT      |       | Charge UT      |      |
| Discharge OT   |       | Discharge UT   |      |
| Charge OC      |       | Discharge OC   |      |
| Insulation FLT |       | Internal FLT   |      |
| Power Switch   | ON    | Fault LED      | OFF  |
| DO1            | OFF   | DO2            | OFF  |
| Hall GAIN      | 150.0 | Charge Curt    | 0.0A |
| Hall OFFSET    | 2491  | Discharge Curt | 0.0A |
| Main           |       | Alarm          |      |

Click the Gear icon on the Main page to enter this interface, mainly showing some of the current hardware status of the device.

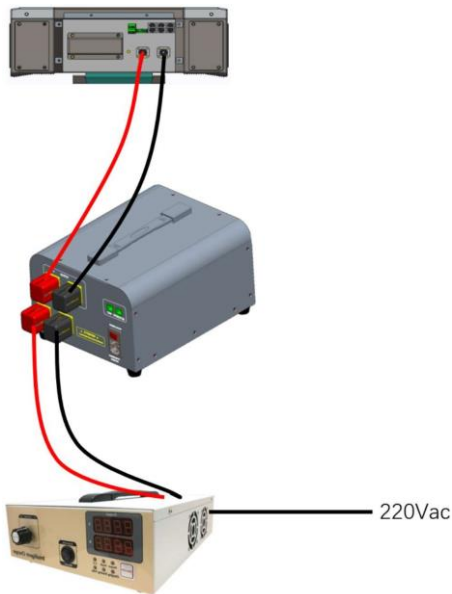
## 7. Battery connection

### 7.1 Normal battery charging connection

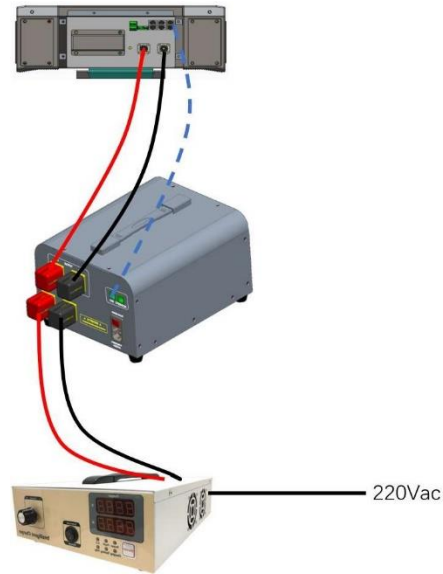
a. Firstly, connect the positive terminal of the external charger to the charge controller INPUT + (P+), and the negative terminal of the external charger to the charge controller INPUT - (P-) and the charging controller, and the charger control is connected to the power supply.



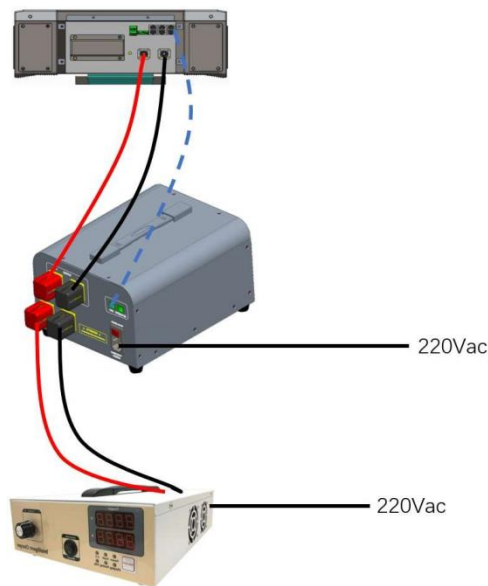
b. Then use the power cable to connect the charge controller OUTPUT + (B+) and OUTPUT - (B-) to the battery positive and negative terminals, please connect the charger end first, and then connect the battery output end.



- c. Use the RJ45 communication cable to connect the battery communication port of the charge controller to the battery RS232 port for battery communication.



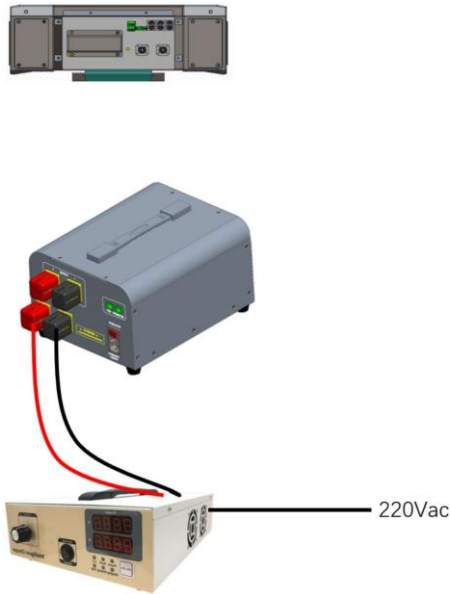
- d. Connect the charge controller's power cable to an AC power source and turn the power button to ON. If the battery voltage is above 32 V, press the battery run button; once communication is established, the charge controller will automatically charge the battery to 100%



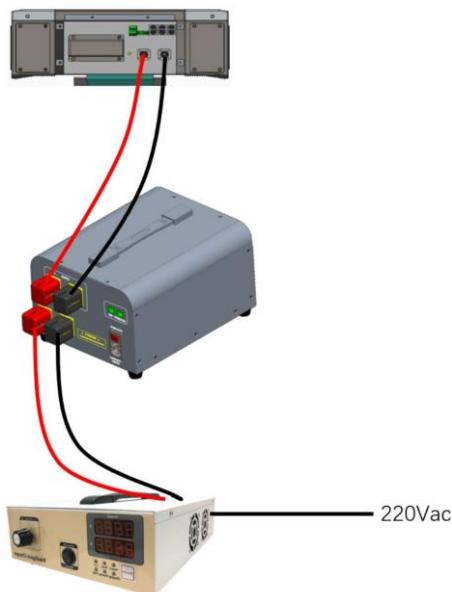
- e. When the battery is fully charged or enters the self-protection state, the charge controller is disconnected.

## 7.2 Forced charge mode

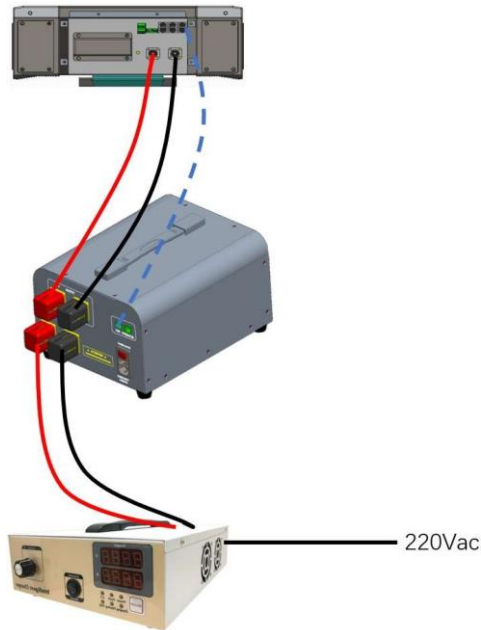
- a. Firstly, connect the positive terminal of the external charger to the charge controller INPUT + (P+), and the negative terminal of the external charger to the charge controller INPUT - (P-) and the charging controller, and the charger control is connected to the power supply.



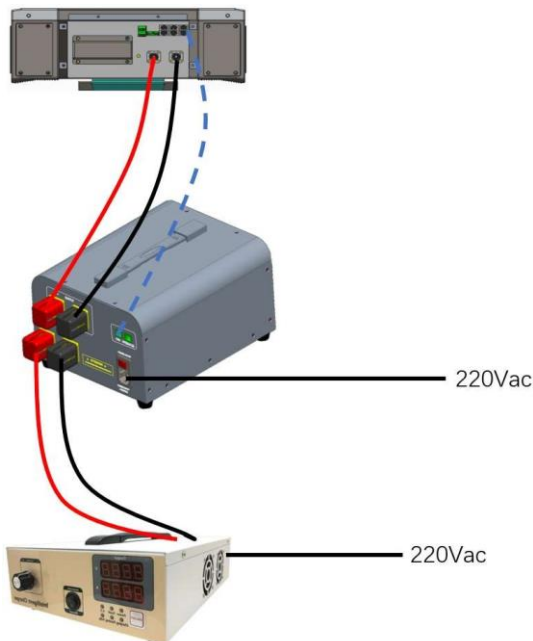
- b. Then use the power cable to connect the charge controller OUTPUT + (B+) and OUTPUT - (B-) to the battery positive and negative terminals, please connect the charger end first, and then connect the battery output end.



- c. Use the RJ45 communication cable to connect the battery communication port of the charge controller to the battery RS232 port for battery communication.



- d. If the voltage is between 25V and 30V the battery cannot be started, press the Force Charge Button for three seconds, the led will turn on blue and the contactor closing sound can be heard the after few second; the charger will start charging the battery. After reaching 44V or after 5 minutes the contactor opens (the disconnection sound can be heard), the button blue light is off and the forced charge ends. Now the battery should turn on, connect the communication cable between the battery and the charge controller, turn on the battery to automatically start the 100% charge.



Note: During forced charging, the battery does not communicate with the controller, there is still full voltage and overcurrent protection, but there is no single overvoltage protection, it is a dangerous operation that requires the presence of the technician throughout.

## 8. System exceptions and solutions

| No. | Fault description                | Possible causes                          | Processing method                                                                                                                                                                       |
|-----|----------------------------------|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | The system is not working        | The operating voltage is incorrect.      | Check whether the operating voltage is within the normal voltage range, check that the automatic address line, battery power supply and CAN bus are connected correctly.                |
|     |                                  | The power supply is damaged              | Ask a technician for repair                                                                                                                                                             |
| 2   | The touch screen is not working  | No supply voltage                        | Check whether the main control board (BMS) has voltage, and whether the main control board (BMS) and the touch screen are wired correctly.                                              |
| 3   | The alarm is displayed           | Voltage overvoltage, undervoltage        | The contactor will not automatically recover after overvoltage or undervoltage protection, and the contactor can only be restored by power-off and restart the power supply box system. |
|     |                                  | Overtemperature                          | Disconnect the charger or stop running. Check whether the battery pack temperature collection is normal on the battery touch screen.                                                    |
|     |                                  | Communication is lost                    | Check the touch screen BUS communication status first to check whether the battery CAN communication is connected correctly.                                                            |
| 4   | Touch screen communication error | The control board RS232 is not operating | Check that the control board RS232 is working properly.                                                                                                                                 |

|   |                                                                   |                                                   |                                                                                                                                                                   |
|---|-------------------------------------------------------------------|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   |                                                                   | The communication cable is not properly connected | Check whether the touch screen communication interface is loose.                                                                                                  |
|   |                                                                   | The interface is incorrect                        | DB9 connector, connected to the touchscreen COM1 interface.                                                                                                       |
| 5 | Temperature is not displayed                                      | The temperature sensor is not connected           | Please check the battery temperature line for damage.                                                                                                             |
| 6 | No current display                                                | The current sensor is not well connected          | Check whether the current sensor is well connected, and check the current through the clamp flow meter to determine whether the current detection Hall is normal. |
| 7 | The current is displayed incorrectly when charging or discharging | Hall parameters are incorrect or not calibrated   | Gain=750. Offset =2500<br>Connect the charge controller via PC software, check the Hall parameter if it is correct, the right value are Gain=750, offset=2500     |

## 9. Storage and other matters

### 9.1 Storage

Store in a clean, dry and ventilated room with an ambient temperature of  $-20\text{ }^{\circ}\text{C} \sim 40\text{ }^{\circ}\text{C}$ , should avoid contact with corrosive substances, and should be away from fire and heat sources.

## **10. Operation instructions and precautions during use**

### **10.1 Charge**

The charging current must not exceed the specified maximum current. Charging with currents exceeding the recommended values may cause damage to the charge-discharge contactors, mechanical properties and safety problems.

### **10.2 Discharge**

The discharge current must not exceed the specified maximum current, and a high discharge current may cause damage to the contactor.

### **10.3 Voltage**

The charging voltage must not exceed 60V, otherwise it will cause damage to the MOS device.

# 11. Functional Block Diagram

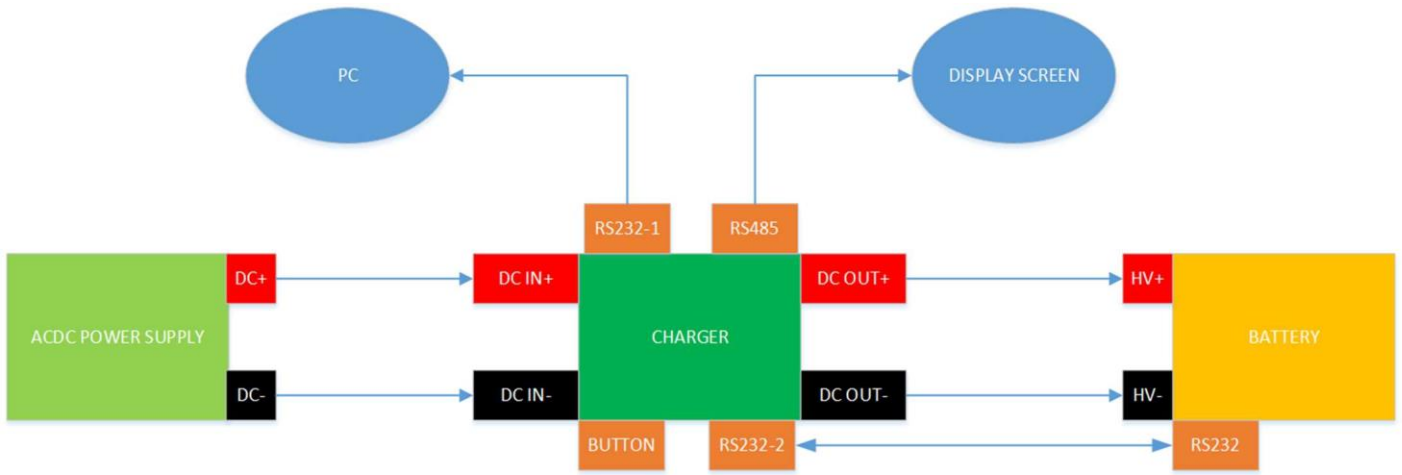


Figure 1 High voltage terminal

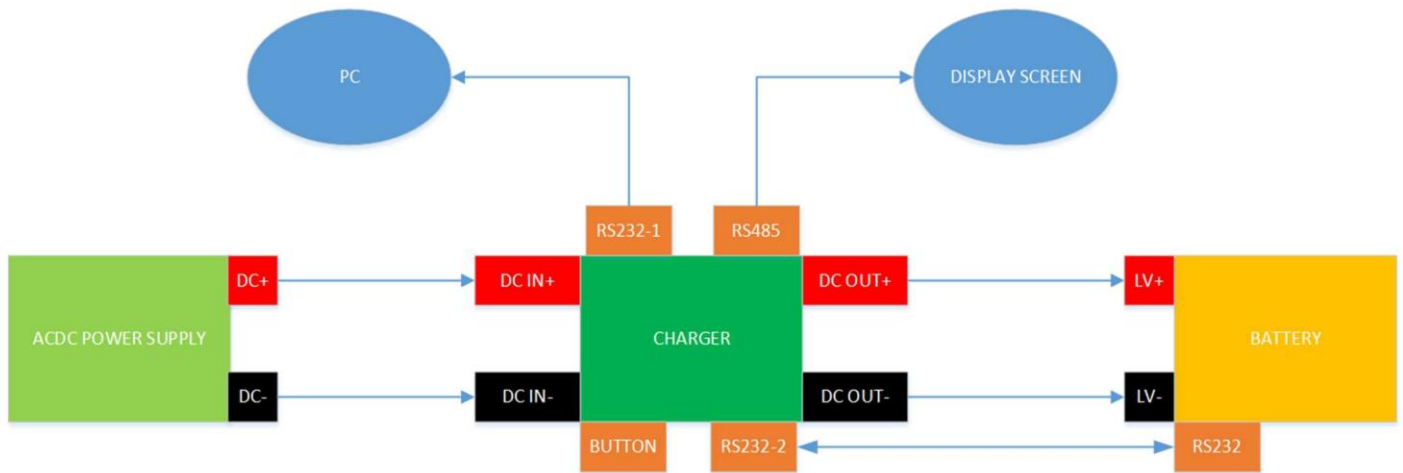


Figure 2 Low voltage terminal