



# **Integrated Lithium-ion Battery Pack for Floor installation User Manual**

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## **Attention**

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The battery images mentioned in the user manual are for reference only, and the actual product shall prevail.

# FOREWORD

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## Overview

This manual describes the installation, history recording and parameter settings etc. Please keep the manual in safety for more information.



## Readers



This document provides technical details regarding the tools and infrastructure used by the following users:

- Sales engineer
- Technical support engineer
- Installation engineer
- Application engineer
- Maintenance engineer

## Symbol convention

The following symbols may appear in this article, and they are represented as follows:

Symbol	Indication
 Dangerous	Used as warning in an emergency, if not avoided, it will result in death or serious personal injury.
 Warning	Used as a warning of a middle or low potential hazards, if not avoided, it may cause minor or normal injury.

 Caution	Used as a warning of potential dangers, if ignore this information, it may result in equipment broken, data lost, equipment performance decrease and other unpredictable result.
 INTRO	represents the supplement information of main text to emphasize or replenish.



# DIRECTORY

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# 1 OVERVIEW

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## 1.1 Product specification

The model of integrated lithium Ion battery (hereafter referred to as lithium battery or PACK) for floor installation is shown in figure 1-1.

**Figure1-1 The explanation of the product specification(For example)**

**L F 51.2-300**  
①      ②      ③      ④

- ① L stands for LFP
- ② F floor installation
- ③ The rated voltage is 51.2V
- ④ The rated capacity is 300Ah

## 1.2 Product profiles

LF series lithium iron phosphate battery is one of new energy storage products developed and produced by company. It can be used to support reliable power for various types of equipment and systems. LF series is especially suitable for application scene of high power, limited installation space, restricted load-bearing and long cycle life.

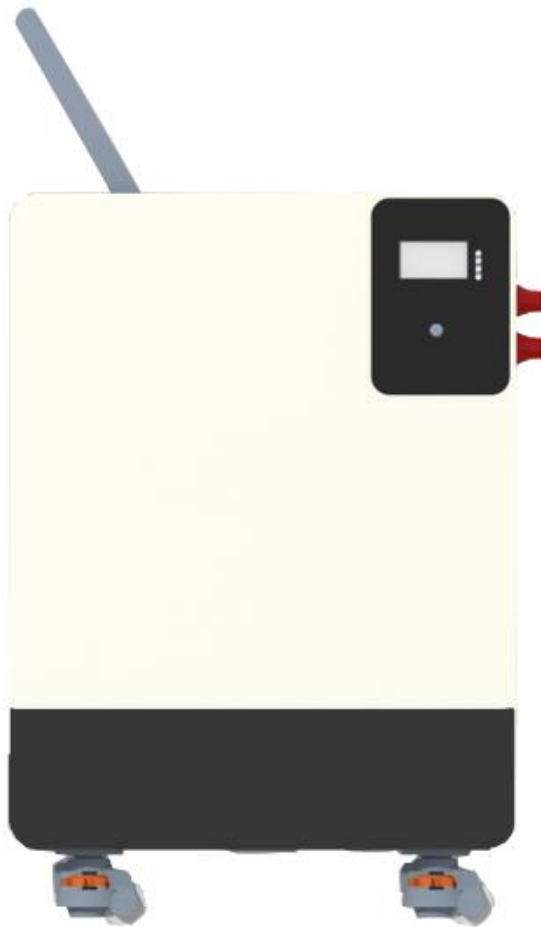
LF series has built-in BMS battery management system, which can manage and monitor cells information including voltage, current and temperature. What's more, BMS can balance cells charging and discharging to extend cycle life. Multiple batteries can be connected in parallel to expand capacity and power in parallel for larger capacity and longer power supporting duration requirements.

Certification: UN38.3,CE

## 1.3 Product structure

The appearance of the lithium battery pack is shown in figure 1-3, for interface description; please refer to the 2.2 panel description".

**Figure1-3 Product picture**



# 2 ILLUSTRATION

## 2.1 Explanation of the structure

The structure of Lithium Ion battery pack as shown in figure 2-1

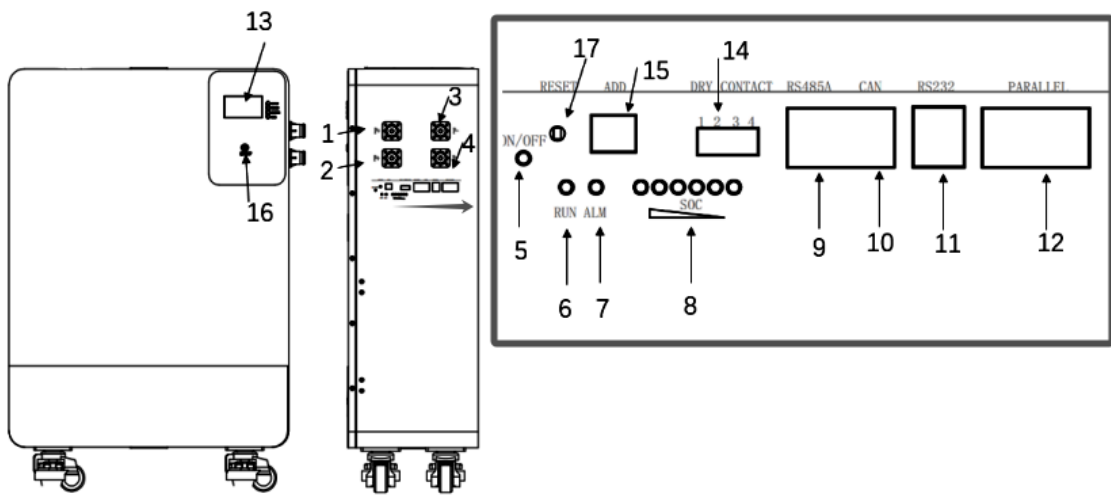


Figure2-1 Product structure

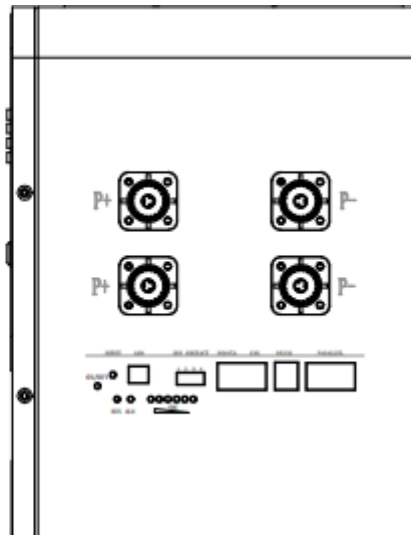
1. P+	2. P+	3. P-	4. P-	5. ON/OFF	6. RUN
7. ALM	8. SOC	9. RS485	10. CAN	11. RS232	12. RS485*2
13. Display	14. DRY CONTACT	15. ADD	16. SWITCH	17. RESET	



## 2.2 Panel description

The panel of the module of the lithium battery pack, as shown in figure

**Figure2-2-1 Module panel description**



### Battery Output

Using 4 pin terminal pins, the left side of the terminal front end is Battery +, Battery +, the right side is Battery -, Battery -, which is connected with the power transmissionline for charging and discharging.

### SOC

The meaning of SOC indication light is shown in table 2-2-2

**Table2-2-2 The relationship between the capacity of the battery and the light.**

**INTRO** indicates ON, indicates OFF.

Condition		Charging						Discharging					
Capacity indicator		L6	L5	L4	L3	L2	L1	L6	L5	L4	L3	L2	L1
Capacity %	0-17%	Off	Off	Off	Off	Off	Flash 2	Off	Off	Off	Off	Off	On
	18-33%	Off	Off	Off	Off	Flash 2	On	Off	Off	Off	Off	On	On
	34-50%	Off	Off	Off	Flash 2	On	On	Off	Off	Off	On	On	On
	51-66%	Off	Off	Flash 2	On	On	On	Off	Off	On	On	On	On
	67-83%	Off	Flash 2	On	On	On	On	Off	On	On	On	On	On
	84-100%	Flash2	On	On	On	On	On	On	On	On	On	On	On
<b>RUN LED</b>		<b>On</b>						<b>flash 3</b>					

## ALM









When the battery is at fault, "ALM" light is red.

## RUN

During charging, the "RUN" light will be flashing.

"RUN" and "ALM" can display the battery status, as shown in table 2-2-3

**Table2-2-3 The explanation of “RUN” and “ALM”**

Condition	Normal/ Alarm/ Protection	RUN	ALM	Capacity LED						Description
				L6 	L5 	L4 	L3 	L2 	L1 	
Shutdown	Sleep mode	Off	Off	Off	Off	Off	Off	Off	Off	All off
Standby	Normal	Flash 1	Off	According to the battery indicator						Standby mode
	Alarm	Flash 1	Flash 3							Low battery
Charging	Normal	On	Off	According to the battery capacity (Check SOC indicator table)						If overcharge occurs, ALM does not flash.
	Alarm	On	Flash 3							
	Overcharge protection	On	Off	On	On	On	On	On	On	If there is no utility power, the indicator is in standby state.
	Over temperature over current, and failure protection	Off	On	Off	Off	Off	Off	Off	Off	Stop charging.
Discharging	Normal	Flash 3	Off	According to the battery capacity						
	Alarm	Flash 3	Flash 3							
	Under voltage protection	Off	Off	Off	Off	Off	Off	Off	Off	Stop discharging.
	Temperature overcurrent short circuit and reverse connection, failure protection	Off	On	Off	Off	Off	Off	Off	Off	Stop discharging.
Failure		Off	On	Off	Off	Off	Off	Off	Off	Stop charging and discharging.

Note: Flash 1- light 0.25s/off 3.75 seconds; Flash 2-0.5 slight /0.5s off; Flash 3 -0.5 slight/1.5s off.

## ADD

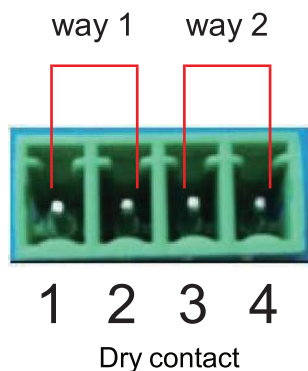
In parallel, band switch using four dip switch to address set cell system.  
The explanation of its dial switch as shown in table 2-2-4.

**Table2-2-4 Band switch address code**

Address Code				ADD	PACK Definition	Explanation
1	2	3	4			
ON	OFF	OFF	OFF	1	PACK1	Use as SlavePack1
OFF	ON	OFF	OFF	2	PACK2	Use as SlavePack2
ON	ON	OFF	OFF	3	PACK3	Use as SlavePack3
OFF	OFF	ON	OFF	4	PACK4	Use as SlavePack4
ON	OFF	ON	OFF	5	PACK5	Use as SlavePack5
OFF	ON	ON	OFF	6	PACK6	Use as SlavePack6
ON	ON	ON	OFF	7	PACK7	Use as SlavePack7
OFF	OFF	OFF	ON	8	PACK8	Use as SlavePack8
ON	OFF	OFF	ON	9	PACK9	Use as SlavePack9
OFF	ON	OFF	ON	10	PACK10	Use as SlavePack10
ON	ON	OFF	ON	11	PACK11	Use as SlavePack11
OFF	OFF	ON	ON	12	PACK12	Use as SlavePack12
ON	OFF	ON	ON	13	PACK13	Use as SlavePack13
OFF	ON	ON	ON	14	PACK14	Use as SlavePack14
ON	ON	ON	ON	15	PACK15	Use as SlavePack15

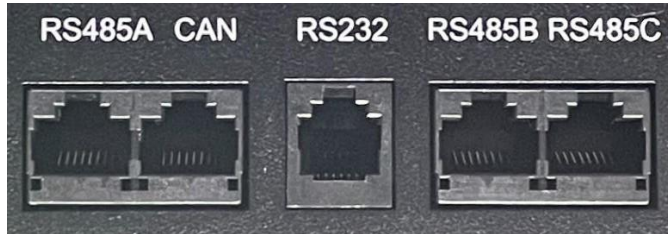
## Dry Contact Terminal

Dry Contact Terminal: provided 2 ways input and 2 ways output dry contact signal.

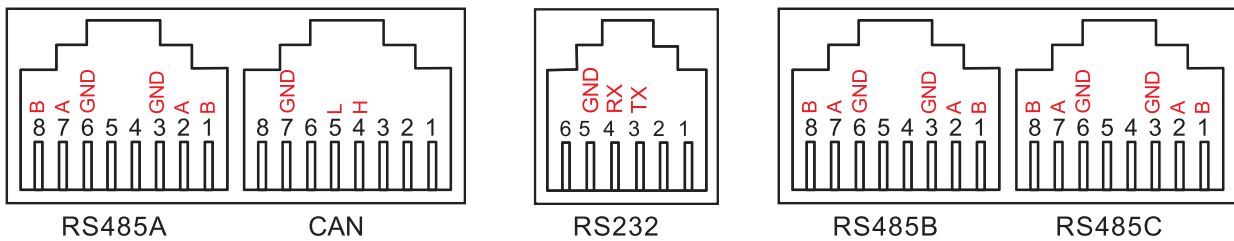


## Interface

### 1) Actual photo



### 2) Pin definition



Inverter to Battery				PC to Battery		Battery to battery Or PC to Battery	
RS485A		CAN		RS232		RS485B/RS485C	
PIN	Definition	PIN	Definition	PIN	Definition	PIN	Definition
1,8	<b>RS485-B</b>	1,2,3,6,8	NC	1,2,6	NC	1,8	<b>RS485-B</b>
2,7	<b>RS485-A</b>	4	<b>CAN-H</b>	3	<b>TX</b>	2,7	<b>RS485-A</b>
3,6	GND	5	<b>CAN-L</b>	4	<b>RX</b>	3,6	GND
4,5	NC	7	GND	5	GND	4,5	NC

NC=No connect

## RESET

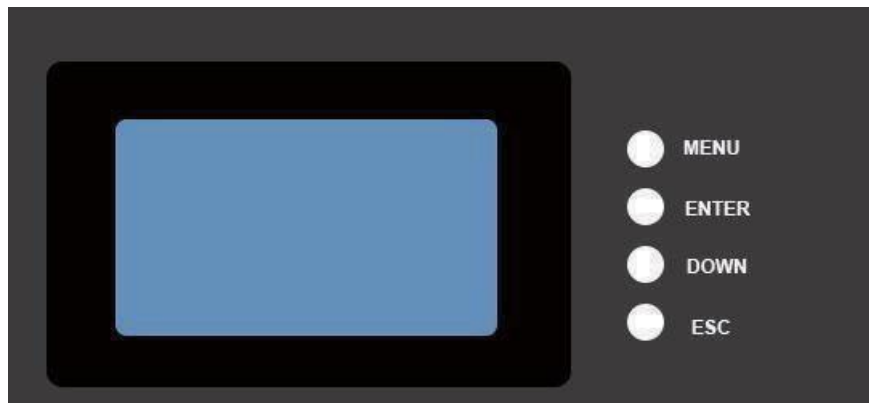
Press RESET key for 5 seconds, then start the device, press the RESET key for 5 seconds again, then shut down the device. When the system is running, should there be an exception, use this button to reset the system (press / release) to ensure the stability of the system.

## 2.3 Menu operation instructions

The LCD display interface is user-friendly, as shown in figure 2-3-1. It provides 320 \* 240 dot matrix graphic display. The LCD is able to display the alarm information in real time, and provides the historical warning records for the user to query, and provide a reliable basis for fault diagnosis.

Users can easily browse the battery parameters through the LCD interface, and obtain timely access to information on the current state of the battery. The interface displays a total of 4 menu keys, the functions described as follows.



**Figure2-3-1 LCD Display**





### The commonly used button function


The display function of the button as shown in table 2-3-2

**Table2-3-2 Button function description**

	Main menu
	Confirm, enter

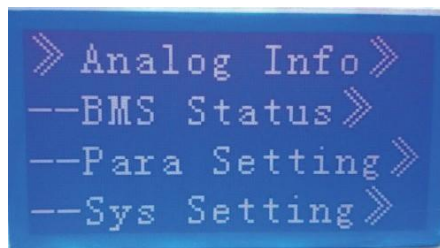
	Page down
	Return, launch

## Operation procedures

- 1) Press  once, the LCD display screen light up, then the welcome interface will be shown.



- 2) Followed by the prompt and then click once to enter the main menu bar.



- 3) Scroll page up , Enter the Menu screen, when the  points to the corresponding bar, press Enter  to confirm.
- 4) Go back on the menu bar, click .

## 2.4 The working principle

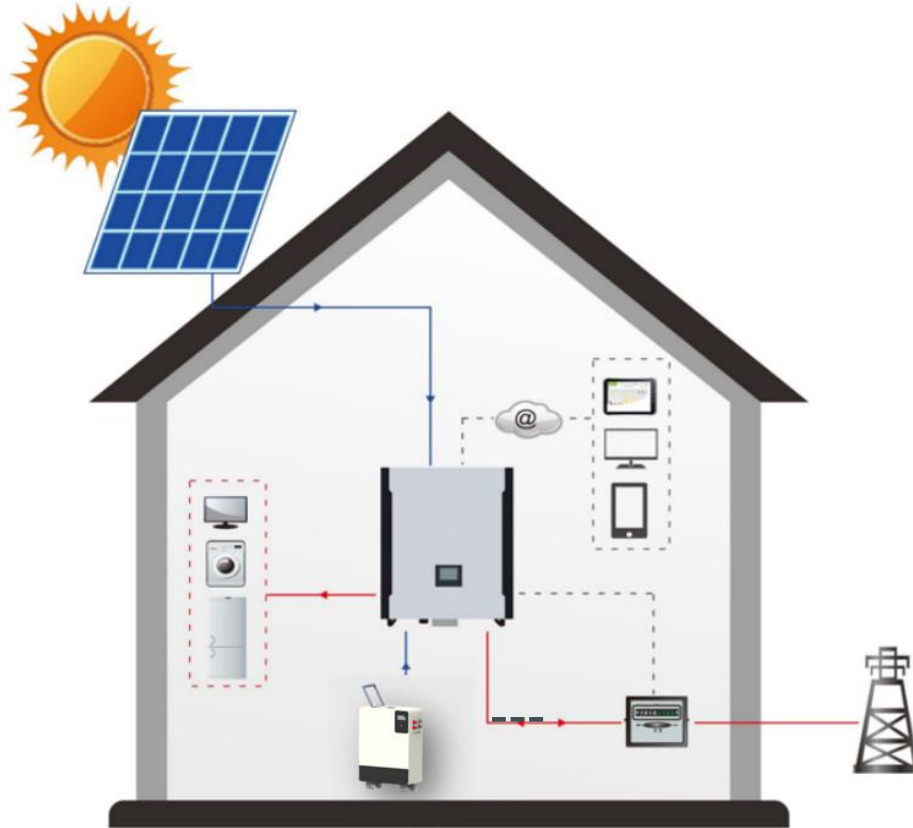
Lithium battery pack is equipped with charging and discharging management module and monitoring module.

Charge and discharge management module protects battery charge and discharge functioning, prevents overcharging, discharge over-current, the charging process by the adapter charger to the DC input form, the discharge process is completed by connecting the load discharge.

The monitoring module has the balance function and power, temperature and SOC. The monitoring module transmits the real-time information collected in the operation of the product through the Telecom protocol network to the monitoring platform, and the user can observe the operation status of the battery in each group through the display screen.

A single module has a 51.2V 300Ah, with a large capacity, can be used in accordance with user requirements arbitrary combination. As shown in figure 2-4

**Figure 2-4 the working principle diagram**



## 2.5 The product features

Integrated lithium battery pack for Floor-Mounted has the following remarkable characteristics:

- The whole module is non-toxic, non-polluting and environmentally friendly;
- The system can automatically manage charge and discharge state and balance current and voltage of each cell;
- Flexible configuration, multiple battery modules can be in parallel for expanding capacity and power
- Adopted self-cooling mode rapidly reduced system entire noise;
- The module has less self-discharge, excellent performance of shallow charge and discharge;
- Working temperature range is from -20°C to 60°C, (Charging 0~45°C; discharging -10~55°C) with excellent discharge performance and cycle life;
- Small size and light weight, designed module is comfortable for installation and maintenance;



## **INTRO**

- a) Telemetry: voltage, current, temperature, SOC, SOH (optional), etc.
- b) Tel-signalling state of charge and discharge, overcharge / over-current, under voltage over-current alarm / alarm, environment / battery /PCBA/ battery temperature alarm, low environmental temperature alarm, battery capacity is too low, the battery temperature /voltage / current sensor failure alarm, batteryfailure alarm (just not cut off the monomer pressure high limit alarm) (optional),battery failure alarm (optional).
- c) Remote control: charge / discharge (optional), alarm sound off, intelligent intermittent charging mode, current limiting charging mode.
- d) Optional: Battery charge / discharge management parameters.



# 3 INSTALLATION GUIDE

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## 3.1 Installation precaution notes

### Comply with local laws and regulations

When operating the equipment, make certain to comply with local laws and regulations.

### Personnel requirements

Technicians who are responsible for installation and maintenance are required to undertake strict training in company at first. Master the correct methods for operation and safety, only then the installation, operation and maintenance can be carried out.

In order to maximize the efficiency of the equipment, to obtain best possible operating results, and ensure maximum lifespan, please pay careful attention to the correct installation and usage requirements.

### Personal safety

- Insulated tools and gloves should be used and worn at all times – During the installation process, watches, bracelets, rings and other metal products should be removed.  
Avoid any fall or collision during the installation process.  
Do not remove the battery components. The maintenance of the battery should be carried out by a professional engineer.  
Should be operated and supervised by engineer who have experience and can take preventive measures for potential hazards of battery.

### Field and environment

#### Site requirements

#### 1) Cleanliness

Lithium battery packs cannot be placed in or near garbage disposals, or accidentally dropped or placed in smaller disposal units, as their interaction with metals is likely to cause short circuits and endanger the system and personal safety.

#### 2) Fire protection

The room is prohibited to store flammable, explosive and other dangerous goods, and it should be equipped with effective fire equipment (such as CO2 fire extinguishers).

#### 3) Ventilation and heat dissipation

In order to facilitate the operation and maintenance of equipment for the heat, the equipment should be left around (50~30) cm around at least, left about 50cm for the upper space. The space should be equipped with exhaust fan, to maintain good indoor ventilation.

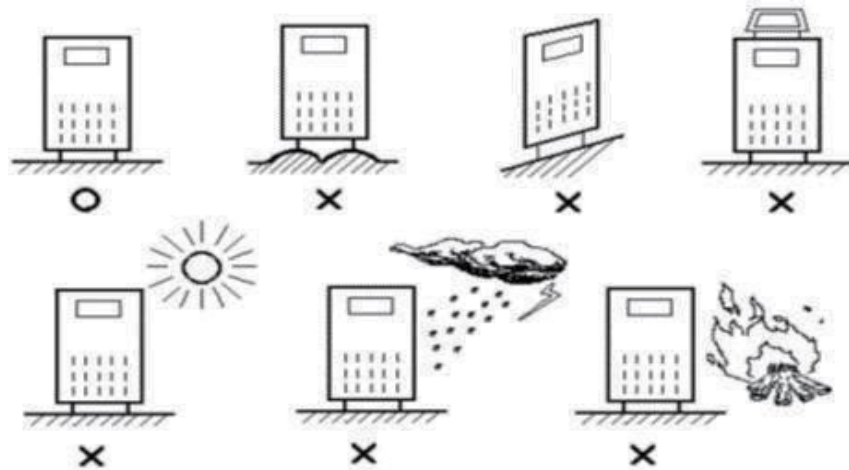
#### 4) Installation requirements

Installation should be carried out as shown in figure 3-1 in order to avoid possible risks.

Put the lithium battery on the ground (to avoid tilt, uneven ground).

Avoid placing in the sunlight, rain or wet surfaces.

**Figure3-1 Requirements for installation scenarios**



- Environmental requirements

Ambient temperature: ( -10~+40) °C.

Relative humidity level: 0%RH~95%RH, no condensation.

Cooling method: air cooler.

Height above sea level: match to the standard requirement of GB3859.2-93.

Verticality: no vibration and the vertical inclination does not exceed 5°.

Pollution level: Level ii .

Recommended operating temperature (20~25) °C, humidity level control within 50%.



Caution

Do not install in the working environment with metal conduction type dust. Do not put anything containing corrosive gases.

Do not put anything in the dust concentrated areas.

Do not place any items on the top of lithium-ion battery pack. People could not sit on the battery.

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## Power check

Before installation, please confirm that the load capability of inlet wire meets the requirements of the new equipment. Check to see if the power supply corresponds to the equipment nameplate of the voltage and frequency and if the current capacity has decreased due to the aging of the wire.

If in doubt, please check with your local power supply Consultation Department.

Ground wire

Earthing terminal is ready; zero voltage required in the room cannot exceed 5V.DC output voltage and load capacity

Lithium-ion battery pack of rated DC output 51.2V.

DC output power

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Caution

When installing the lithium-ion battery pack, the user should check the lithium-ion battery pack in advance to make sure that the contacts and connectors are safely in place to avoid an open circuit or short circuit fault.

During installation, do not connect the lithium batteries polarity in reverse or in any way incorrectly, to avoid causing a short circuit.

Please do not connect the terminals with no security or insulation protection, so as to avoid the risk of electric shock.

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## 3.2 Installation preparation

### 3.2.1 Unpacking and inspection

Lithium batteries and accessories use packaging of cardboard boxes or wooden boxes. When unpacking, be careful when dismantling. Inspect the device and accessories according to the package list, to ensure it's complete and make certain nothing was damaged during shipping.

Before clearing the packaging, make sure that all parts are included. If equipment or accessories are damaged in transit, or incomplete or incompatible,










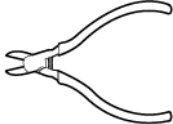

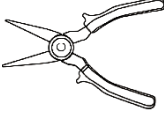
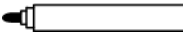


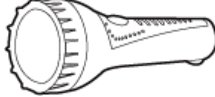

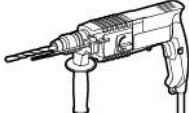
the equipment, accessories and order contracts should be recorded and local branches or offices of company should be contacted immediately.

The site needs to be tidied and inspected once again to make sure the audit documents are in order for the audit. Before inspection, the site should be clean.



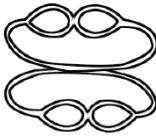
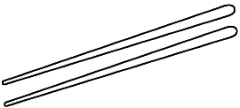
### 3.2.2 Installation tools

Potential commonly used tools as shown in table 3-2-2-1~3-2-2-4 the field technician will increase or decrease the amount according to the construction.

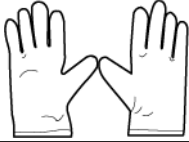
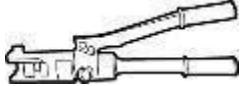
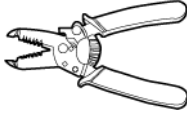
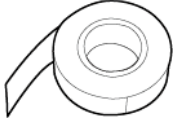
**Table3-2-2-1 General purpose tools**

The appearance of the tools, parameters, and names			
Adjustable wrenches	Phillips screwdriver	Slotted screwdriver	Socket wrench
	 	 	
Torque wrench	Open-end wrenches	Double offset ring spanner	Diagonal cutting pliers
			
Wire cutters	Need lenosed pliers	Marking pen	Working gloves
			
Ladder (2m)	Flashlight	Tape measure	Impact drill
			

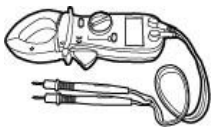
**Table3-2-2-2 Tools for delivery and unpacking**

The appearance of the tools, parameters, and names			
Manual forklifts	Electric forklift	Sling (weight≥ 400kg)	Leverage (weight≥400kg)
			

**Table3-2-2-3 Electrical installation tools**

The appearance of the tools, parameters, and names			
Insulated gloves	Power cable crimping plier	Wire stripping pliers	Electrical tape
			

**Table3-2-2-4 Measuring Tools**

The appearance of the tools, parameters, and names			
Clamp the flow table			-
			-

## 3.3 Installation method

### 3.3.1 Installation step

Step NO.	Name	Definition
1	Turn off power supply	The system should be powered off, to ensure that there is no electric in installation process
2	Electrical installation	1.The base installation
		2.Battery installation
		3.Power line installation
		4.Communication line installation
3	Electrical commissioning	Power system commissioning

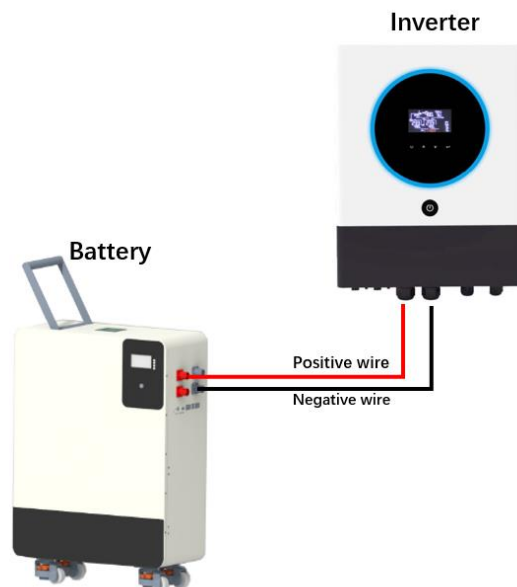
#### Step 1. Interruption Of Power Supply

Before installation, please ensure the battery is powered off, at the same time, shutdown the equipment which need to connect to the battery.

#### Step 2. Electrical Installation

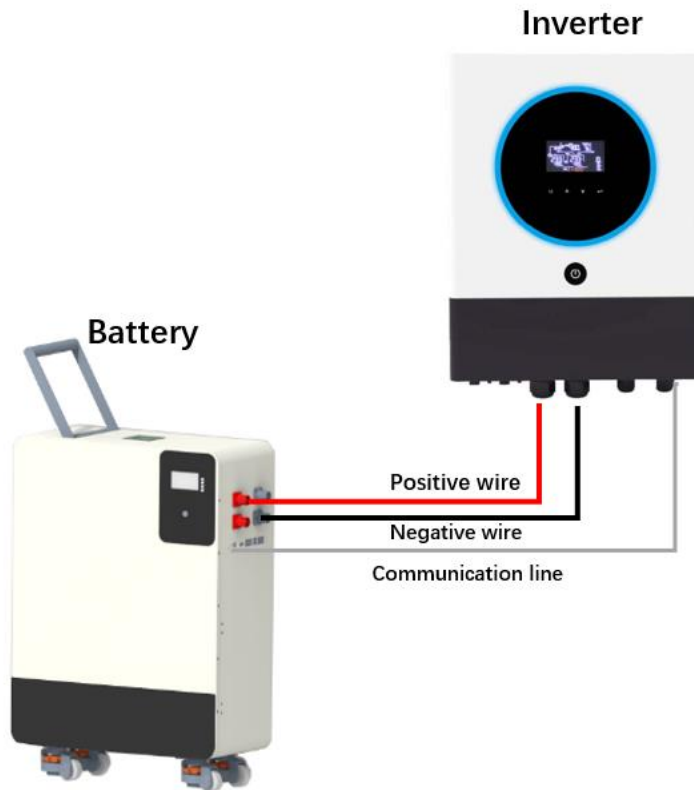
##### ①. Power line installation

The positive terminal of the battery is connected with the positive terminal of the inverter; Connect the negative terminal of the battery with the negative terminal of the inverter; When installing the connecting equipment, make clear the position of the positive and negative terminal posts of the system, connect the positive terminal with red wire, and connect the negative terminal with black wire to ensure that there is no wrong connection.



②.Communication line installation

Connect the RJ-RS485 /CAN port of the battery to the BMS communication port of the inverter using a network cable.Dial the ID to " 1" (see Table 3.2).



If a single battery is used, follow this step. If multiple batteries are used in parallel, set each battery's address code according to Table 3.2, and connect the RJ-45 to RS485 communications ports in sequence. Connect the RS485 port on the first or last battery module to the BMS communication port on the inverter.

**Caution: If there is any problem during installation, please contact the factory technicians in time to avoid damaging the equipment or causing safety accidents.**

**Step 3. Electrical Commissioning**

When these steps are completed, press the ON/OFF button to start the battery, then boot on the whole power system, complete the installation.

**Caution: If the battery does not start , please disconnect the power line inspection and reinstall the start, if still cannot solve please the technical staff of the battery manufacturer, avoid damage to equipment or cause accidents.**

# 4 MAINTENANCE

In order to ensure the lithium-ion battery pack achieves the longest life cycle, the maintenance technician should carry out regular inspections and maintenance care.

The maintenance records should be complete and routine, so that subsequent verification of management parameters of the battery pack can be tracked.

## 4.1 Electrical maintenance

Maintenance of the electrical parts may refer to table

**Table4-1 Table of contents for maintenance**

Items	The checking Points	Methods	Repair conditions	Repair solution
Electrical	Check if the Output of the voltage is normal	Multimeter	Battery voltage out of range set	See the following troubleshooting section
Fault inspection	Check if lights are normal	Visual inspection	Alarm	
Cable	Insulation, Terminal	Visual inspection	<ul style="list-style-type: none"> <li>• Insulation cracks, aging</li> <li>• Exfoliated, corrosion of the terminals</li> </ul>	<ul style="list-style-type: none"> <li>• Replace the cable</li> <li>• Replace the terminal block</li> </ul>



## 4.2 Battery maintenance

**Table4-2 Contents of battery maintenance**

Frequency	Items	Solutions
Monthly	Operating environment	Stay away from heat source and avoid direct sunlight.
	Visual inspection	If there is any breakage, leakage or deformation, Isolate the problematic battery pack, take a photograph and replace the battery.
Quarterly	Visual inspection	Use cotton cloth to clean the appearance. Be careful during cleaning because the voltage is high.
	Connection status	<ul style="list-style-type: none"> <li>• Check each terminal, check the bolt, if it's loose, and tighten it again.</li> <li>• Check the reason if the cable temperature exceeds 40°C.</li> </ul>
Every 6 months	Measure and record the voltage	<ul style="list-style-type: none"> <li>• At the final stage of charging, record the voltage; make sure the positive and negative voltage of the battery are the same. Otherwise, should check and repair the corresponding connection cable.</li> <li>• Collect the discharging data at least once every six months for the first year.</li> <li>• In the second year, capacity is determined by every three months. Through the RS232 interface to view history, which shows frequent overcharge of a battery in the alarm message, indicating that the batteries have reached the charging and discharging protection point. This may result in time for preparing electricity is not enough and suggest changing the battery immediately.</li> </ul>



### INTRO

- 1) Charge and discharge status at the final stage can through capacity light to display. Please refer to 2.2 for the definition of capacity lights.

## 4.3 Trouble shooting steps

### ① Problem determination based on:

1. Whether the battery can turn on or not;
2. If battery is turned on, check the red light is off, flashing or lighting;
3. If the red light is off, check whether the battery can charge/discharge or not.

② **Preliminary determination steps:**

1) Battery cannot turn on, switch on the lights are all no lighting or flashing.

If the battery external switch is ON, the RUN light is flashing, and the external power supply voltage is 51.2V or more, the battery still unable to turn on, please contact company.

2) The battery can be turned on, but red light is lighting, and cannot charge or discharge. If the red light is lighting, that means system is abnormal, please check values as following:

a) Temperature: Above 50°C or under -10°C, the battery could not work.

Solution: to move battery to the normal operating temperature range between -10°C and 50°C

b) Current: If current is greater than 100A, battery protection will turn on.

Solution: Check whether current is too large or not, if it is, to change the settings on power supply side.

c) High Voltage: If charging voltage above 54V, battery protection will turn on.

Solution: Check whether voltage is too high or not, if it is, to change the settings on power supply side.

d) Low Voltage: When the battery discharges to 44.5V or less, battery protection will turn on. Solution: Charge the battery for some time, the red light turn off

Excluding the four points above, if the faulty is still cannot be located, turn off battery and repair.

**c. The battery cannot be charged or discharged**

1) Cannot be charged:

Disconnect the power cables, measure voltage on power side, if the voltage is 53~54V, restart the battery, connect the power cable and try again, if still not work, turn off battery and contact company.

2) Unable to discharge:

Disconnect the power cables and measure voltage on battery side, if it is under 44.5V, please charge the battery; if voltage is above 51.2V and still cannot discharge, turn off battery and contact company.

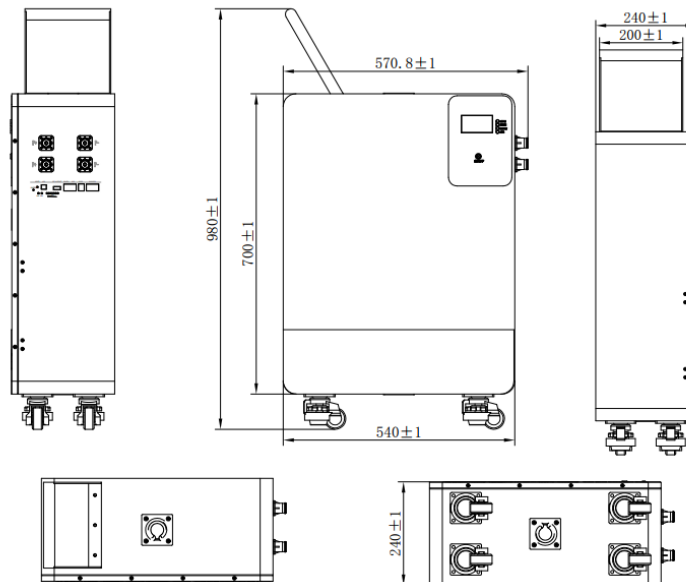
# 5 SPECIFICATIONS

## 5.1 Technical specifications

Lithium batteries with LF series of modules, the main physical dimensions for a single module is shown in table 5-1-1, technical indicators for a single module is shown in table 5-1-2.

**Table 5-1-1 The main physical dimensions for a single module**

Dimensions(mm) of LF51.2-300



**Table 5-1-2 technical indicators for a single module**

Item	Specification
Model	LF51.2-300
Rated Capacity (5HR)	300Ah
Nominal Voltage	51.2V

Discharge Ending Voltage	43.2V
Charging Limited Voltage	57.6V
Max. Charging Current	100A
Max. Continue Discharging Current	200A
Weight	Approx. 118 Kg
Display	With display screen
Protocol	CANBUS/MODBUS
Parallel Connection	Parallel connection is optional (up to 15P).
Dimensions(W*D*H)	540 *240 *700mm
Design life	More than 15 years
Cycle Life	5000 cycles@ 25°C, 0.5C, 80%DOD
IP Class	IP31
Outer Package Material	White bake lacquer steel case (optional)
Operating Temperature	Charging: 0 to +45°C Discharging: -10 to +55°C Storage: -20 to +60°C

## 5.2 The main performance index of the battery

For lithium battery of 51.2V series module, the electrical performance as shown in table 5-2.

**Table 5-2 Multiple group parallel discharge technology parameters**

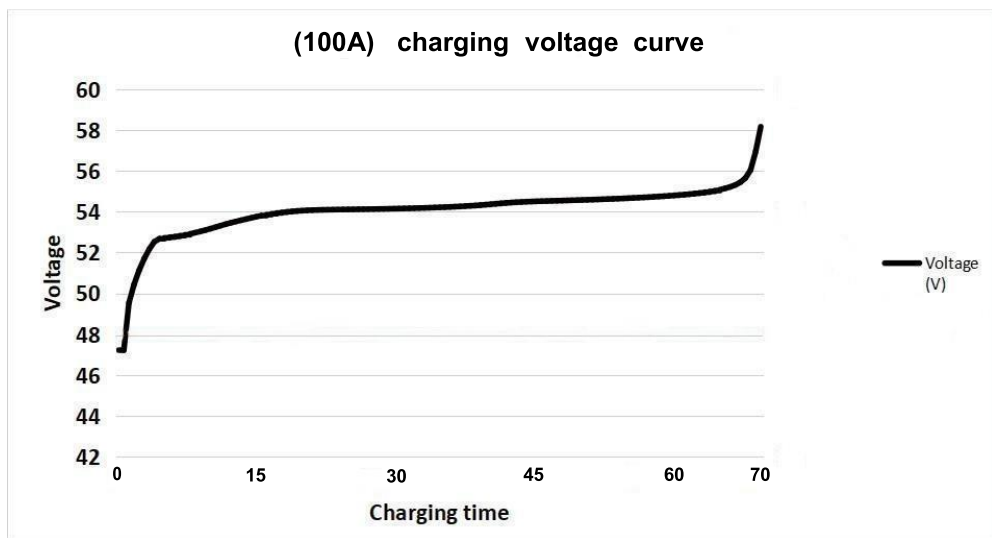
Items for test	Testing methods	Requirements
0.1C discharge performance	Standard battery charge, 1h within 1h with 0.1C discharge current to 43.2V, Record the discharge time.	Discharge time $\geq$ 600min
0.5C discharge performance	Standard battery pack, 1h within 0.5C discharge current to 43.2V, record the discharge time.	Discharge time $\geq$ 115min
High temperature performance	After the battery pack is charged in the standard $(60 \pm 2)^\circ\text{C}$ high temperature box for 4 hours and then discharged to 43.2V at 0.1C, record the discharge time.	Discharge time $\geq$ 600min
Low temperature performance (-10 °C)	After charging, the battery pack is put in the low temperature box of $(-10 \pm 2)^\circ\text{C}$ for 6 hours, then discharged to 43.2V at 0.2C at this temperature, record the discharging time.	Discharge time $\geq$ 180min

<p>Low temperature performance (-20 °C)</p>	<p>After charging, the battery pack is allowed to stand for 6 hours at (-20 ± 2) °C, then discharged to 43.2V at 0.2C at this temperature. Record discharge time.</p>	<p>Discharge time ≥ 120min</p>
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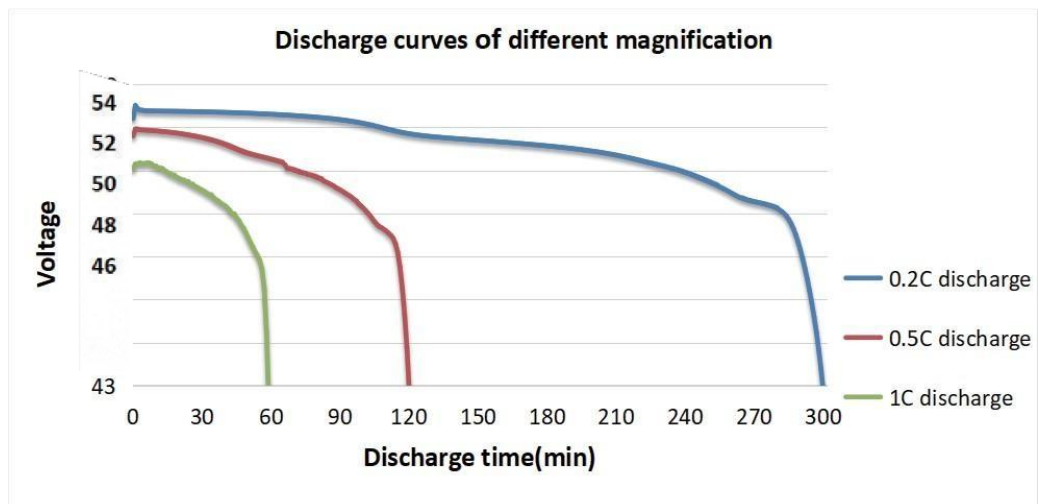
### 5.3 Battery characteristic

For lithium battery of wall mount residential ESS , The charge discharge diagram is as follows.

Charge Curves



Discharge Curves




# 6 ENVIRONMENT PROTECTION

## 6.1 Environmental Label

The product described in this manual does not contain toxic and hazardous substances or elements. It is a green product. It can be recycled after being discarded and should not be discarded at will. The environmental label shown in Table 6-1.

**Table6-1 Environmental label**

Specification	Mark
51.2V	

## 6.2 Recycle



This mark indicates that the product can not be classified with other waste. In order to prevent potentially hazardous substances from hazardous waste disposal hazards to the environment and human health, please refer to the classification of waste recycling in order to promote the sustainable use of material resources.



In order to recycle the used equipment, please use the recycling system or contact the manufacturer or seller of the product or the local authority to manage the product.

# 7 APPENDIX

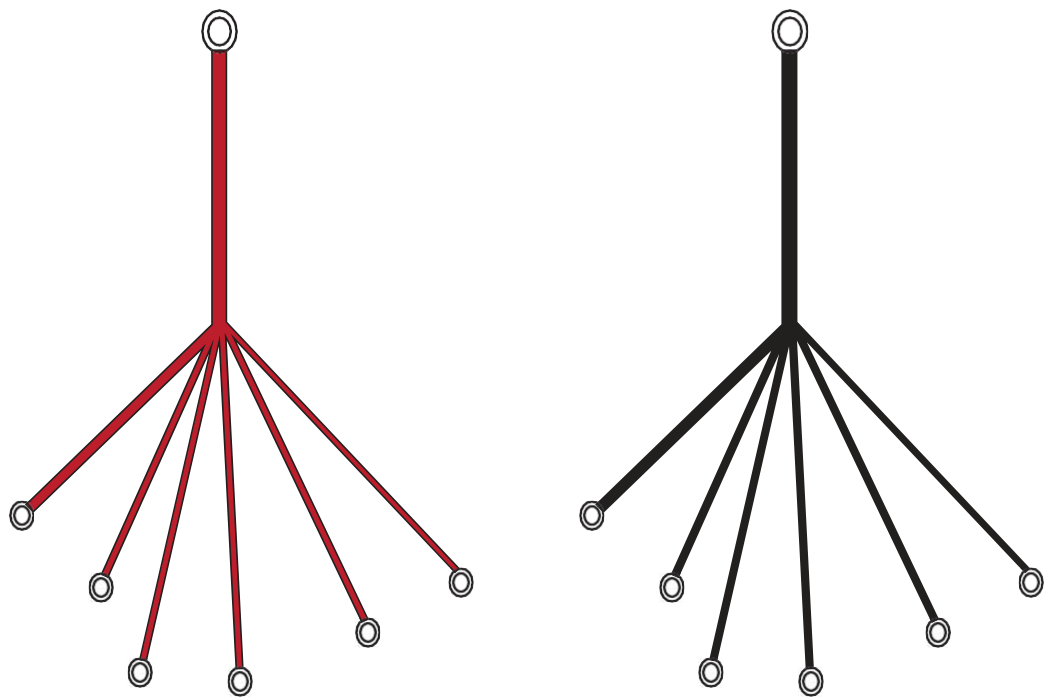
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## 7.1 Connection cable

You can choose the customized wiring cables to replace. Relevant technical requirements are the feeder cable number and the number of parallel battery pack is consistent, and the specifications of each extension cable (length,diameter, and material) are the same.

For example, a customized six parallel wiring cable diagram as shown in figure7-1-1.

**Figure7-1-1 Customized wiring cable diagram**



According to the customer requirements, selecting the appropriate connector, cables, extension cable specifications, refer to relevant cable specifications given in table 7-1.

**Table7-1-2 Corresponds to AWG line number table**

AWG	Diameter		cross-sectional area (mm <sup>2</sup> )	Resistance (Ω/km)	Rated current (A)	Maximum current (A)
	mm	inches				
0000	11.68	0.4600	107.22	0.17	423.2	482.6
000	10.40	0.4096	85.01	0.21	335.5	382.6
00	9.27	0.3648	67.43	0.26	266.2	303.5
0	8.25	0.3249	53.49	0.33	211.1	240.7
1	7.35	0.2893	42.41	0.42	167.4	190.9
2	6.54	0.2576	33.62	0.53	132.7	151.3
3	5.83	0.2294	26.67	0.66	105.2	120.0
4	5.19	0.2043	21.15	0.84	83.5	95.2
5	4.62	0.1819	16.77	1.06	66.2	75.5
6	4.11	0.1620	13.30	1.33	52.5	59.9
7	3.67	0.1443	10.55	1.68	41.6	47.5
8	3.26	0.1285	8.37	2.11	33.0	37.7
9	2.91	0.1144	6.63	2.67	26.2	29.8
10	2.59	0.1019	5.26	3.36	20.8	23.7
11	2.30	0.0907	4.17	4.24	16.5	18.8
12	2.05	0.0808	3.332	5.31	13.1	14.9
13	1.82	0.0720	2.627	6.69	10.4	11.8
14	1.63	0.0641	2.075	8.45	8.2	9.4



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