LV
48070 Plus

User Manual

3.58KWh

LiFePO4 Lithium-ion Battery Product

About this manual

This user manual introduces LV48070 Plus. It provides information about the main technical parameters, using and maintenance methods of the product, and precautions during usage.

Please read this manual before you to install the battery and follow the instructions carefully during the installation process. Any confusion, please contact technical support for advice for advice and clarification.

Content

⚠	Attention

1. Safety Precautions

1) It is very important and necessary to read the user manual carefully (in the accessories) before installing or using battery. Failure to do so or to follow any of the instructions or warnings in this document can result in electrical shock, serious injury, or death, or can damage battery, potentially rendering it inoperable.

2) If the battery is stored for long time, it is required to charge them every six months, and the SOC should be no less than 30%;

3) Battery needs to be recharged within 12 hours, after fully discharged;

4) Do not expose cable outside;

5) All the battery terminals must be disconnected for maintenance;

6) Please contact the supplier within 24 hours if there is something abnormal.

7) Do not use cleaning solvents to clean battery;

8) Do not expose battery to flammable or harsh chemicals or vapors;

9) Do not paint any part of battery, include any internal or external components;

10) Do not connect battery with PV solar wiring directly;

11) The warranty claims are excluded for direct or indirect damage due to items above.

12) Any foreign object is prohibited to insert into any part of battery.

⚠	Attention

1.1 Before start:

1) After unpacking, please check product and packing list first, if product is damaged or lack of parts, please contact with the local retailer;

2) Before installation, be sure to shut-down the external power and make sure the battery is in the switched-off mode;

3) Wiring must be correct, do not mistake the positive and negative cables, and make sure no short circuit with the external device;

4) It is prohibited to connect the battery and AC power directly;

5) The battery's embedded BMS is designed for 48VDC, please DO NOT connect multiple batteries in serial connection;

6) Battery system must be well grounded and the resistance must be less than 1Ω;

7) Please ensured the electrical parameters of battery system are compatible to related equipment;

8) Keep the battery away from water and fire.

1.2 In using:

1) If the battery system needs to be moved or repaired, the power must be cut off and the battery is completely shutdown;

2) It is prohibited to connect the battery with different type ofbattery.

3) It is prohibited to put the batteries working with faulty or incompatible inverter;

4) It is prohibited to disassemble the battery (QC tab removed or damaged);

5) When the fire around the battery system, only dry powder extinguisher can be used to extinguish the fire within the fire range. And please keep the battery pack as far away from the fire as possible ;

6) Please do not open, repair or disassemble the battery except staffs from manufacture or authorized by technical support. We do not undertake any consequences or related responsibility which because of violation of safety operation or violating of design, production and equipment safety standards.

2. Product Introduction

LV48070 Plus lithium iron phosphate battery is an energy device. It can be used as a reliable power source for various applications with special requirements for high power, limited installation, restricted load-bearing and long cycle life.

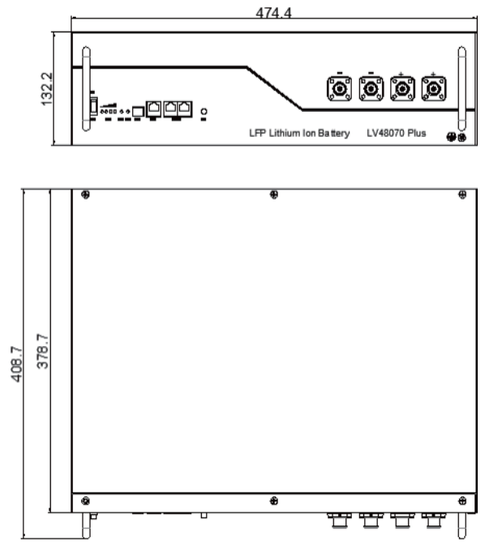
LV48070 Plus has a built-in BMS battery management system that can monitor cell parameters such as voltage, current, and temperature. Moreover, it can balance cell charging and discharging process to extend cycle life. Multiple batteries can be connected in parallel to expand energy and power capacity.

2.1 Product Features

- The whole module is non-toxic, non-polluting and environmentally friendly;
- Cathode material is made from LiFe PO4 with safety performance and long cycle life;
- Battery management system (BMS)has protection functions including over- discharge, over-charge, over-current and high / low temperature;
- 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, up to 6 months without charging it on shelf, no memory effect, excellent performance of shallow charge and discharge;
- Working temperature range is from -10℃ to 50℃, (Charging 0~50℃;discharging-10~50℃) with excellent discharge performance and cycle life;
- Small size and light weight, standard of 19-inch embedded designed module is comfortable for installation and maintenance;

2.2 Product Specifications

2.2.1 Dimensions

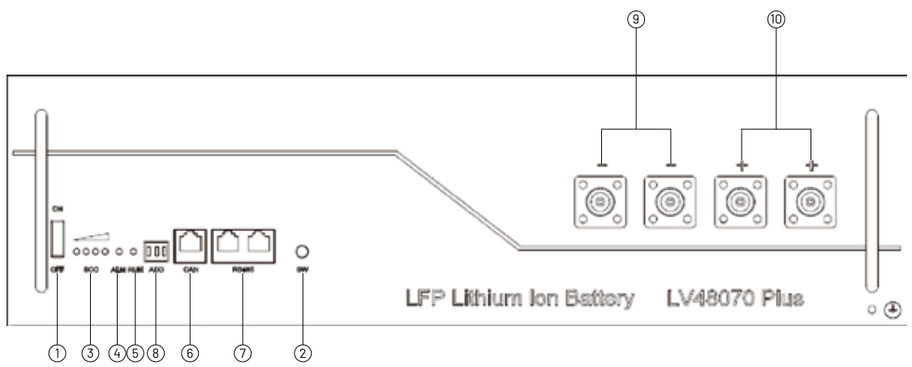


2.2.2 Specifications

Product Name	LV48070 Plus
Nominal Voltage (V)	51.2
Nominal Capacity (kWh)	3.58
Usable Capacity (kWh)	3.2
Dimension (mm)	474.4*408.7*132.2
Weight (kg)	35±1
Discharge Voltage (V)	43.2~56.0
Charge Voltage (V)	55.2~57.6
Recommend Charge/Discharge Current (A)	35
Max.lutput Current (A)	55
Max.Output Current (A)	70
Peak Output Current (A)	100 @5S
Communication	RS485, CAN
Battery String Configuration	1 ~ 8 units in parallel
Working Temperature	0~50℃ Charge
Recommended Working Temperature	-10~50℃ Discharge

Recommended Working Temperature	0~35℃
Storage Temperature	15~35℃
Depth of Discharge	90%
Overload protection	integrated
Short-circuit protection	integrated
Power self-consumption when running	≤2W
Power self-consumption when standby	1W@≤48h ； 0W@＞48h
Cooling method	Nature Cooling
IP rating of enclosure	IP20
Humidity	0 ~ 85%RH
Reference to standards	CE,IEC62619,UL164 2, IEC61000, UN38.3, ROHS

2.3 Illustration of Appearance



1) ON/OFF: Power Switch
ON – to start the battery's self-detection process and enter working status if no fault is detected. OFF – to shut-down the battery.

2) POWER: Power Reset Button
Short press 1 second to enter the normal working mode, long press 3 seconds to enter the hibernation mode.

3) SOC: State of Charge Indicators
One LED represents for 0~25% energy capacity. 4 LEDs on stands for SOC≥ 75%.

4) ALM: Alarm LED
The red ALM LED flashing indicates warning message, ALM LED on indicates self-protection mode.

5) RUN: operation status LED
The green RUN LED flashing indicates normal working status.

6) CAN port
For external CAN communication (500KB/s) between the battery and the power control device.

7) RS485 port
For internal communication between batteries, or between battery and the adapter board of battery cabinet (optional).

RJ45 Pin definitions:

Pin No.	RS485 protocol	CAN protocol
1	RS485 B	–
2	RS485 A	–
3	GND	GND
4	–	CAN_L
5	–	CAN_H
6	GND	GND
7	RS485 A	–
8	RS485 B	–

8) ADD: DIP switches of battery sequence (address).

PACK No.	DIP1	DIP2	DIP3	DIP4
PACK #1	ON	OFF	OFF	OFF
PACK #2	OFF	ON	OFF	OFF
PACK #3	ON	ON	OFF	OFF
PACK #4	OFF	OFF	ON	OFF
PACK #5	ON	OFF	ON	OFF
PACK #6	OFF	ON	ON	OFF
PACK #7	ON	ON	ON	OFF
PACK #8	OFF	OFF	OFF	ON

Note:
*** The above configurations are applicable for batteries installed in a battery cabinet with adapter board for communication with inverters. For batteries that directly connect to inverter, a different set of DIP switch configurations will be applied, therefore please contact technical support for technical advice.**

9) Power terminal –

10) Power terminal +

11) LED Indications:

L1●	L2●	L3●	L4●	●	●
SOC				ALARM	RUN

Condition	L1	L2	L3	L4	Run	Alarm
Power off	OFF	OFF	OFF	OFF	OFF	OFF
Idle / Normal	OFF	OFF	OFF	OFF	**FLASH**	OFF
Error / Protection	OFF	OFF	OFF	OFF	OFF	**FLASH**
Charging	Number of Lighting LEDs indicates SOC level, the last lighting LED is flashing				On	OFF
Discharging	Number of Lighting LEDs indicates SOC level				**FLASH**	OFF

2.4 Built-in BMS functions:

Protection and Alarm	Management and Monitor
Charge/ Discharge End	Cells Balance
Charge Over Voltage	Intelligent Charge Model
Discharge Under Voltage	Charge/ Discharge Current Limit
Charge/ Discharge Over Current	Capacity Retention Calculate
High/Low Temperature(cell/BMS)	Administrator Monitor
Short Circuit	Operation Record
Power Cable Reverse	

3. Safe handling of lithium batteries Guide

3.1 Caution label

3.2 Installation tools

The following tools are required to install the battery :

Wire cutter

Crimping Modular Plier Crimping

Modular Plier

Note:
Use properly insulated tools to prevent accidental electric shock or short circuits. If insulated tools are not available, cover the entire exposed metal surfaces of the available tools, except their tips, with electrical tape.

3.3 Safety Gear

It is recommended to wear the following safety gear when dealing with the battery pack.

Insulated Gloves

Safety goggles

Safety shoes

4. Installation

4.1 Installation Location:

Make sure that the installation location meets the following conditions:

• The area is completely water proof.

• The floor is flat and level.

• There are no flammable or explosive materials.

• The ambient temperature is within the range from 0°C to50°C.

• The temperature and humidity is maintained at a constantlevel.

• There is minimal dust and dirt in the area.

• The distance from heat source is more than 2 meters

• The distance from air outlet of inverter is more than 0.5 meters.

• Do not cover or wrap the battery case or cabinet.

• Do not place at a children or pet touchable area.

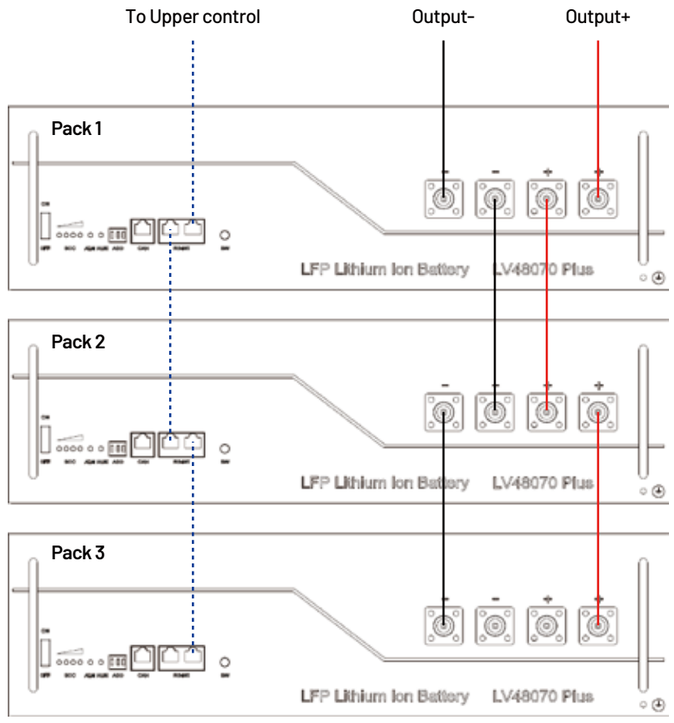
• The installation area shall avoid directsunlight.

• There are no mandatory ventilation requirements for battery, but please avoid installation in confined area. The ambient shall avoid high salinity, humidity or temperature.

⚠	Attention

If the ambient temperature exceeds the operating range, the battery pack will stop operating to protect itself. The optimal temperature range for the battery pack to operate is 0°C to 35°C. Frequent exposure to harsh temperatures may deteriorate the performance and life of the battery pack.

4.2 Connection layout of communication cables

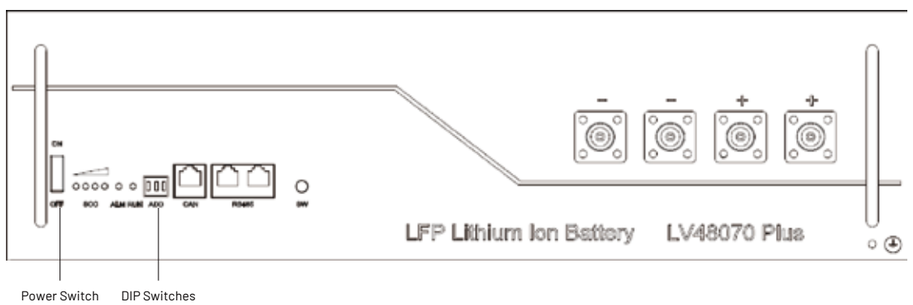


4.3 Power on

Double check all the power cables, communication cables, and **DIP switches** to make sure proper connections / settings.

Turn on the **power switch**; the battery will start self-detection process.

After self-detection process completed, if no fault is found, the SOC LEDs will light on sequentially.



⚠	Attention

- To avoid current pulse of the inverter add on the battery bank. Shall start inverter first or switch on breaker between battery and inverter after all connected batteries turned on.
- A DC breaker should be installed between battery bank and inverter for safety issue.
- All installation operation must follow local electric standard.
- The battery has a built-in battery management system (BMS). Usage beyond the operating voltage range will damage the BMS and may cause the loss of safety protection function. Multiple batteries can only be grouped in parallel, not in serial connections.

5. Trouble shooting

5.1 Upon start, please make sure:

1) Whether the battery can be turned 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 be charged/discharged ornot

5.2 Basic steps:

1) The battery cannot be powered on:
If the battery's power switch has been turned on but no LED indicator is on or flashing, and the external power supply voltage is above 57.6V, please contact the dealer.

2) The battery has been powered on and the red ALM indicator turns on. The battery is under abnormal status, please check the following values:

A) Temperature:
If ambient temperature is above 50 ℃ or below -10 ℃, the battery cannot work. Solution: make sure ambient temperature is within the operating temperature range. Recommended operating temperature 0℃~35℃

B) Current:
If charging current is over 55A or the discharge current is over 70A, battery's self- protection function will be activated. Solution: Check whether the current is too large, if it is too large, change the settings on the power supply side.

C) Over-Voltage:
When the charging voltage exceeds 58V, the battery's self -protection will be activated. Solution: Adjust the charging voltage of the power supply device.

D) Low voltage:
When the battery is discharged to 43.2V or lower, the battery's self -protection will be activated.
Solution: Charge the battery until the red light turns off.

If the above measures have been taken but problem still exists, please switch off the battery and contact your dealer for help.

5.3 Advanced steps:

1) Unable to charge the battery: Switch off the battery, disconnect the power cables from external power device, measure the output voltage of the power device.

- If the voltage is within 53 ~ 54V, reconnect the power cables and switch on the battery again.
- If the problem still exists, please switch off the battery and contact yourdealer.

2) Unable to discharge the battery:

Disconnect the power cables and measure the battery voltage.

- If the voltage is lower than 44.5V, please charge the battery until the voltage reaches above 48V;
- If the battery voltage is over 48V and it still cannot be discharged, please switch off the battery and contact the dealer.

6. Emergencies

1) Leaking Batteries
If a battery leaks, avoid contact with the leaking liquid or gas. In case if anyone has been exposed to the leakage substances, please follow the below instructions accordingly:

- Inhalation: Evacuate from the contaminated area, and seek for medicalattention.
  Contact with eyes: Rinse eyes with flowing water for 15 minutes, and seek for medical attention.
- Contact with skin: Wash the affected area thoroughly with soap and water, and seek for medical attention.

• Ingestion: Induce vomiting, and seek for medical attention.

2) Fire

I When the fire around the battery system, only dry powder extinguisher can be used to extinguish the fire within the fire range. Keep the battery pack as far away from the fire as possible.

II When the fire in the battery pack, first immediately cut off the external power supply of the battery pack, and then put out the fire with plenty of water.

3) Wet Batteries

If a battery is wet or submerged in water, people must keep away from it. Please contact your dealer or licensed electrician for help immediately.

4) Damaged Batteries

Damaged batteries are dangerous and must be handled with the utmost care. They may pose a threat to the safety of people or property.If a battery seems to be damaged, please pack it in its original carton or proper substitute, and then callyour dealer or a licensed recycler for further treatment.

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