



Vis Tech.

User Manual

Wall-mounted Series LFP Battery

SUN-24100-P

SUN-48100-P



About This Manual

The manual mainly describes the product information, guidelines for installation, operation, and maintenance. The manual cannot include complete information about the solar energy storage system.

How to Use This Manual

Read the manual and other related documents before performing any operation on the battery. Documents must be stored carefully and be always available.

Content may be updated or modified periodically due to product update iterations. The manual is subject to change without prior notice.

1. Safety Introductions



Reminding

1. It is very important and necessary to read the user manual carefully 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 50%.
3. Battery needs to be recharged within 48 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.



Li-ion





Warning

1.1 Before Connecting

- 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 cut off the grid power and make sure the battery is in the turned-off mode.
- 3) Wiring must be correct, do not mistake the positive and negative cables, and ensure no short circuit with the external device.
- 4) It is prohibited to connect the battery and AC power directly.
- 5) Battery system must be well grounded and the resistance must be less than 1Ω .
- 6) Please ensured the electrical parameters of battery system are compatible to related equipment.
- 7) 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 shut down.
- 2) It is prohibited to connect the battery with different type of Battery.
- 3) It is prohibited to put the batteries working with faulty or incompatible inverter.
- 4) It is prohibited to disassemble the battery.
- 5) In case of fire, only dry fire extinguishers can be used. Liquid fire extinguishers are forbidden.
- 6) Please do not open, repair, or disassemble the battery except staffs from Vis Tech. or authorized by Vis Tech.. 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. Introduction

- Wall-mounted Series lithium iron phosphate battery is one of new energy storage products developed and produced by Vis Tech., it can be used to support reliable power for various types of equipment and systems.
- Wall-mounted Series is especially suitable for application scene of high power, limited installation space and long cycle life.
- Wall-mounted Series has built-in BMS battery management system, which can manage and monitor cells information including voltage, current and temperature.
- Multiple batteries can connect in parallel to expand capacity and power in parallel for

larger capacity and longer power supporting duration requirements.

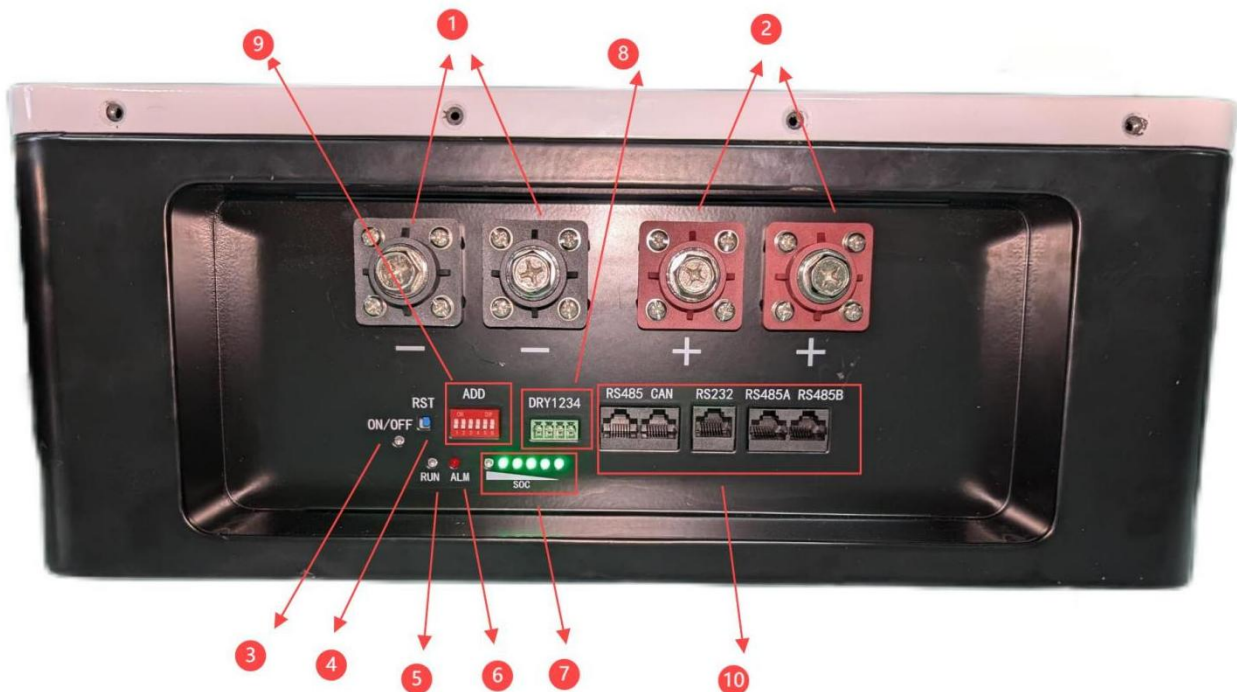
2.1 Product Features

- 1) The whole module is non-toxic, non-polluting, and environmentally friendly.
- 2) Cathode material is made from LiFePO₄ with safety performance and long cycle life.
- 3) Battery management system (BMS) has protection functions including over-discharge, over-charge, over-current and high & low temperature.
- 4) The system can automatically manage charge and discharge state and balance current and voltage of each cell.
- 5) Flexible configuration, multiple battery modules can be in parallel for expanding capacity and power.
- 6) 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.
- 7) Battery module communication address auto networking, easy maintenance, support remotely monitoring and upgrade the firmware.

2.2 Product Overview

This section details the front and side panel of the interface functions.


RW-M6.1-B Product Interface





1. Battery negative	7. SOC light indicator
2. Battery positive	8. Dry Contact
3. ON/OFF light indicator	9. DIP Switch
4. RESET	10. Communication port
5. RUN light indicator	11.ON/OFF switch
6. ALARM light indicator	12. Screen

Power_Switch

Power Switch: to turn ON/OFF the whole battery BMS standby, no power output. 

Battery_positive

Used to connect Inverter positive terminals  , Connect using the red plug in the accessory pack. 

Battery_negative

Used to connect Inverter negative terminals  , Connect using the black plug in the accessory pack. 

RUN

RUN LED: 1 green LED lighting to show the battery running status

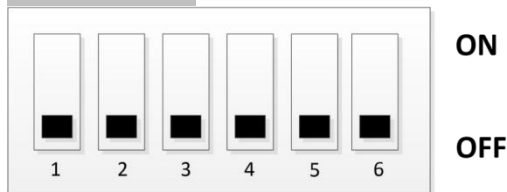
ALM

Alarm LED: 1 red LED lighting to show the battery is under protection.

SOC

SOC LED: 5 green LEDs to show the battery's current capacity.

DIP SWITCH



When PACK is used in parallel, the manual DIP address function is enabled when all DIP switches are dialed to OFF. Otherwise, use the default automatic addressing function. Use the DIP switch on the BMS to set the address to distinguish different packs.

Address bit (binary)	Explain				
	4	3	2	1	
0001(1)	OFF	OFF	OFF	ON	Set PACK1 to be used by a host
0010(2)	OFF	OFF	ON	OFF	Set PACK2
0011(3)	OFF	OFF	ON	ON	Set PACK3
0100(4)	OFF	ON	OFF	OFF	Set PACK4
0101(5)	OFF	ON	OFF	ON	Set PACK5
0110(6)	OFF	ON	ON	OFF	Set PACK6
0111(7)	OFF	ON	ON	ON	Set PACK7
1000(8)	ON	OFF	OFF	OFF	Set PACK8
1001(9)	ON	OFF	OFF	ON	Set PACK9
1010(10)	ON	OFF	ON	OFF	Set PACK10

1011(11)	ON	OFF	ON	ON	Set PACK11
1100(12)	ON	ON	OFF	OFF	Set PACK12
1101(13)	ON	ON	OFF	ON	Set PACK13
1110(14)	ON	ON	ON	OFF	Set PACK14
1111(15)	ON	ON	ON	ON	Set PACK15

LED Status Indicators Instructions

Table 4-11-1 LED display description

State of system	Event	MOS (LED9)	Run (LED8)	Alarm (LED7)	SOC(LED6~1)						DESC	
					LED6	LED5	LED4	LED3	LED2	LED1		
		●	●	●	●	●	●	●	●	●		
Power off	Sleep	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	All LEDs turn off	
static state	Normal	OFF	Flash1	OFF	Refer to table(4-11-2)						/	
	Alarm	OFF	Flash1	Flash3							/	
Charging	Normal	OFF	ON	OFF							/	
	Alarm	OFF	ON	Flash3							The over-voltage alarm does not flash	
	OV protect	ON	ON	OFF	ON	ON	ON	ON	ON	ON	/	
	Temperature, Over-current fail-safe	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	/
Discharging	Normal	OFF	Flash 3	OFF	Refer to table(4-11-2)							
	Alarm	OFF	Flash 3	Flash 3								
	UV protect	ON	Flash2	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	/
	Over-current, short circuit, temperature, fail-safe	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	/

Table 4-11-2 SOC display description

State		Charging						Discharging					
LED		LED6	LED5	LED4	LED3	LED2	LED1	LED6	LED5	LED4	LED3	LED2	LED1
SOC(%)	0~16.6%	OFF	OFF	OFF	OFF	OFF	Flash2	OFF	OFF	OFF	OFF	OFF	ON
	16.6~33.2%	OFF	OFF	OFF	OFF	Flash2	ON	OFF	OFF	OFF	OFF	ON	ON
	33.2~49.8%	OFF	OFF	OFF	Flash2	ON	ON	OFF	OFF	OFF	ON	ON	ON
	49.8~66.4%	OFF	OFF	Flash2	ON	ON	ON	OFF	OFF	ON	ON	ON	ON
	66.4~83.0%	OFF	Flash2	ON	ON	ON	ON	OFF	ON	ON	ON	ON	ON
	83.0~100%	Flash2	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
RUN LED●		ON						Flash 3					

Table 4-11-3 LED flash description

Flash Mode	ON	OFF
Flash1	0.25S	3.75S
Flash2	0.5S	0.5S
Flash3	0.5S	1.5S

Reset key switch description

When the BMS is in hibernation state, press the key (1S) and release it, the protection board is activated, and the LED indicator lights up successively from "LED1" for 0.5 seconds.

When the BMS is active, press the button (3 to 6S), and the LED indicator will turn on for 0.5 seconds from the lowest power indicator. When released, the system will go to sleep.

When the BMS is in the active state, press the button (6-10s) and release it, the protection board is reset, and the LED indicator is displayed according to the current power.

BMS function:

Protection and Alarm	Management and Monitor
Charge/Discharge End	Intelligent Protect Mode
Charge Over Voltage	Intelligent Charge Mode
Discharge Under Voltage	Protect, Charge Current Limit
Charge/Discharge Over Current	Intelligent Protect Mode
High/Low Temperature(cell/BMS)	Intelligent Protect Mode
Short Circuit	Protect

2.3 Product Size



2.4 Technical Data

Model		SUN-24100-P	SUN-48100-P
Battery Chemistry		LiFePO4	
Capacity		100Ah	
Nominal Voltage		25.6V	51.2V
Energy		2.56kWh	5.12kWh
Scalability		Max.16 pcs in parallel	
Charge/Discharge Current	Recommend	50A	
	Max.	100A	
Other Parameter			
Recommend Depth of Discharge		90%	
Product Dimension (W/H/D)		390mm * 155mm * 405mm	390mm * 155mm * 605mm
Package Dimension (W/H/D)		457mm * 290mm * 475mm	460mm * 325mm * 675mm
N.W		28kg	48kg
G.W		33.6kg	56.9kg
Working Temperature		Charge: 0°C ~ +55°C Discharge: -20°C ~ +55°C	
Storage Temperature		0°C ~ 35°C	
Humidity		5%~95%	
Altitude		≤2000m	

Installation	Wall-Mounted
Communication Port	CAN, RS485
Certification	UN38.3, CE

2.5 Product application solutions

The following illustration shows basic application of this battery.

It also includes following devices to have a complete running system.

- Generator or Utility
- PV modules
- Hybrid Inverters (Charge & Discharge)

Consult with your system integrator for other possible system architectures depending on your requirements.



3. Preparations for Installation

3.1 Explanation of Symbol

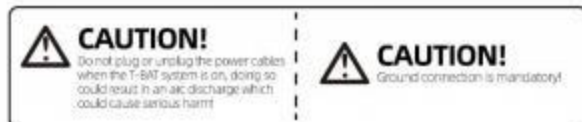


DANGER/HIGH VOLTAGE INSIDE



CAUTION:

- Do not disassemble or alter the battery in any way.
- Do not use the battery for purposes not described in its documentation.
- Do not drop, strike, puncture, or step on the battery.
- In case of electrolyte leakage, keep leaked electrolyte away from contact with eyes or skin, immediately clean with water and seek help from a doctor.
- Do not put the battery into a fire. Do not use it or leave it in a place near fire, heaters, or high temperature sources.
- Do not submerge the battery in water, or expose it to moisture.
- Do not allow the terminals to contact exposed wire or metal.
- The battery is heavy and can cause injury if not handled safely.
- Keep out of reach of children or animals.



3.2 Tools

These tools are required to install the battery.



Torque Screwdriver



Phillips Screwdriver



Hexagon Wrench



Phillips Screwdriver



Slotted Screwdriver



Torque Wrench



Tape Measure



Driller



Pencil or Marker

NOTE:

Use properly insulated tools to prevent accident tale 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.



Safety gloves



Safety goggles



Safety shoes

4. Instructions

4.1 Installation Precaution

Please avoid direct sunlight, rain exposure, snow laying up during installation and operation.

Please make sure the installation site meets below conditions:

- Not in direct sunlight.
- Not in areas where highly flammable materials are stored.
- Not in potential explosive areas.
- Not in the cool air directly.
- Not higher than altitude of about 2000 meters above sea level.
- Not in environment of precipitation or humidity (>95%).

4.2 Installation Location

Make sure that the installation location meets the following conditions:

- Indoor installation.
- The area is completely water proof.
- There are no flammable or explosive materials.
- The ambient temperature is within the range from -20°C to 50°C.
- The temperature and humidity are maintained at a constant level.
- 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 of direct sunlight.
- There are no mandatory ventilation requirements for battery module, but please avoid of installation in confined area. The aeration shall avoid of high salinity, humidity, or temperature.
- The product should be installed in a good ventilated environment, not in a confined space.



CAUTION

If the ambient temperature is outside the operating range, the battery pack stops operating to protect itself. The optimal temperature range for the battery pack to operate is 15°C to 35°C. Frequent exposure to harsh temperatures may deteriorate the performance and life of the battery pack.

4.3 Visual Inspection of the Connection

After connecting the battery, check for:

- Usage of positive and negative cables.
- Connection of the positive and negative terminals.
- All the bolts are tightened.
- Cables fixation and the appearance.
- The installation of the protecting cover.

4.4 System startup and shutdown

Power on steps:

After installation, wiring, and configuration, you must check all connections. When the connection is correct.

- ① Turn on the Inverter switch.
- ② Turn on the battery module circuit breaker
- ③ Press the power button to activate the battery, If the green indicator on the front panel of the battery blinks, the battery system is normal.
- ④ Complete boot.

Power down steps:

- ① Press the battery module button.
- ② Turn off the battery module circuit breaker.
- ③ Finally, turn off the Inverter switch.
- ④ Complete shutdown

5. Inspection, Cleaning and Maintenance

5.1 General Information

- The battery product is not fully charged. It is recommended that the installation be completed within 3 months after arrival; During the maintenance process, do not re-install the battery in the battery product. Otherwise, the performance of the battery will be reduced;
- It is forbidden to dismantle any battery in the battery product, and it is forbidden to dissect the battery;
- After the battery product is over-discharged, it is recommended to charge the battery within 48 hours. The battery product can also be charged in parallel. After the battery product is connected in parallel, the charger only needs to connect the output port of any product battery.

- Never attempt to open or dismantle the battery! The inside of the battery does not contain serviceable parts.
- Disconnect the Li-Ion battery from all loads and charging devices before performing cleaning and maintenance activities
- Place the enclosed protective caps over the terminals before cleaning and maintenance activities to avoid the risk of contacting the terminals.

6.2 Inspection

- Inspect for loose or damaged wiring and contacts, cracks, deformations, leakage, or damage of any other kind. If damage to the battery is found, it must be replaced. Do not attempt to charge or use a damaged battery. Do not touch the liquid from a ruptured battery.
- Regularly check the battery' s state of charge. Lithium Iron Phosphate batteries will slowly self-discharge when not in use or whilst in storage.
- Consider replacing the battery with a new one if you note either of the following conditions:
 - - The battery run time drops below 70% of the original run time.
 - - The battery charge time increases significantly.

5.2 Cleaning

If necessary, clean the Li-Ion battery with a soft, dry cloth. Never use liquids, solvents, or abrasives to clean the Li-Ion battery.

5.3 Maintenance

The Li-Ion battery is maintenance free. Charge the battery to approximately > 80% of its capacity at least once every year to preserve the battery's capacity.

5.4 Storage

- The battery product should be stored in a dry, cool, and cool environment;
- Generally, the maximum storage period at room temperature is 6 months. When the battery is stored over 6 months, it is recommended to check the battery voltage. If the voltage is higher than 51.2V, it can continue to store the battery. In addition, it is needed to check the voltage at least once a month until the voltage is lower than 51.2V. When the voltage of the battery is lower than 51.2V, it must to be charged according to the charging strategy.
- The charging strategy is as follows: discharge the battery to the cutoff voltage with 0.2C current, and then charge with 0.2C current for about 3 hours. Keep the SOC of the battery at 40% -60% when stored;
- When the battery product is stored, the source of ignition or high temperature should be avoided and it should be kept away from explosive and flammable areas.

6. Troubleshooting

To determine the status of the battery system, users must use additional battery status monitoring software to examine the protection mode. The detailed information about the battery can be viewed by the specialized software of the upper computer. Monitor battery information by connecting the Inverter, connecting the battery in lithium battery mode, and viewing battery details on the Inverter display. Once the user knows the protection mode, refer to the following sections for solutions.

Table 7-1: Troubleshooting

Fault Type	Fault Generation condition	Possible Causes	Troubleshooting
BMS fault	<p>The cell voltage sampling circuit is faulty.</p> <p>The cell temperature sampling circuit is faulty</p>	<p>The welding point for cell voltage sampling is loose or disconnected.</p> <p>The voltage sampling terminal is disconnected.</p> <p>The fuse in the voltage sampling circuit is blown.</p> <p>The cell temperature sensor has failed.</p>	Replace the battery.
Electrochemical cell fault	The voltage of the cell is low or unbalanced.	<p>Due to large self- discharge, the cell over discharges to below 2.0V after long term storage.</p> <p>The cell is damaged by external factors, and short circuits, pinpricks, or crushing occur.</p>	Replace the battery.
Overvoltage protection	<p>The cell voltage is greater than 3.65 V in charging state.</p> <p>The battery voltage is greater than 58.4 V.</p>	<p>The busbar input voltage exceeds the normal value.</p> <p>Cells are not consistent. The capacity of some cells deteriorates too fast or the internal resistance of some cells is too high.</p>	If the battery cannot be recovered due to protection against abnormality contact local engineers to rectify the fault.
Under voltage protection	<p>The battery voltage is less than 40V.</p> <p>The minimum cell voltage is less than</p>	<p>The mains power failure has lasted for a long time.</p> <p>Cells are not consistent. The capacity of some cells</p>	Same as above.

	2.5V	deteriorates too fast or the internal resistance of some cells is too high.	
Charge or discharge high temperature protection	The maximum cell temperature is greater than 60°C	The battery ambient temperature is too high. There are abnormal heat sources around	Same as above.
Charge low temperature protection	The minimum cell temperature is less than 0°C	The battery ambient temperature is too low.	Same as above.
Discharge low temperature protection	The minimum cell temperature is less than -20°C	The battery ambient temperature is too low.	Same as above.

By checking the above data and sending the data to the service personnel of our company, the service personnel of our company will reply the corresponding solution after receiving the data.

7. Transportation Requirements

The battery products should be transported after packaging and during the transportation process, severe vibration, impact, or extrusion should be prevented to prevent sun and rain. It can be transported using vehicles such as cars, trains, and ships.

Always check all applicable local, national, and international regulations before transporting a Lithium Iron Phosphate battery.

Transporting an end-of-life, damaged, or recalled battery may, in certain cases, be specially limited or prohibited.













The transport of the Li-Ion battery falls under hazard class UN3480, class 9. For transport over water, air and land, the battery falls within packaging group PI965 Section I.

Use Class 9 Miscellaneous Dangerous Goods and UN Identification labels for transportation of lithium-ion batteries which are assigned Class 9. Refer to relevant transportation documents.



Figure 9-1: Class 9 Miscellaneous Dangerous Goods and UN Identification Label

8. List of compatible inverters

List of compatible inverters				
Inverter brand		protocol	Communicate type	State
PYLON		RS485-protocol-pylon-low-voltage	RS 485-9600	OK
		CAN-Bus-protocol-PYLON	CANBUS-500K	OK
GOODWE		固德威通讯协议	CANBUS-500K	OK
Growatt		SPF BMS RS485	RS485-9600	OK
		Growatt BMS CAN-Bus-protocol-low-voltage(SPF)	CAN	OK
		Growatt BMS communication protocol of growatt low voltage battery (SPH)	CAN	OK
SMA		FSS-ConnectingBat-TI-en-20W	CANBUS-500K	OK
Victron		can-bus_bms_protocol	CANBUS-500K	OK
TBB		TBB 锂电池BMS平台CAN 通讯协议V1.02	CANBUS-500K	OK
MUST		1_PV1800F-CAN communication Protocol1.04.04	CANBUS-500K	OK
SRNE		PACE BMS Modbus Protocol for RS485	RS485-9600	OK
MEGAREVO		深圳迈格瑞能技术混合逆变器_5K_BMS协议V1.01	CANBUS-500K	OK
Deye		RS485-protocol-pylon-low-voltage-新增协议设计-德业12号9600	485	OK
		CAN-Bus-protocol-PYLON-v1.3	CANBUS-500K	OK
INVT		XN Inverter and BMS 485 communication protocol 20200325	RS485-9600	OK
Voltronic		Voltronic Inverter and BMS 485 communication protocol	RS485-9600	OK