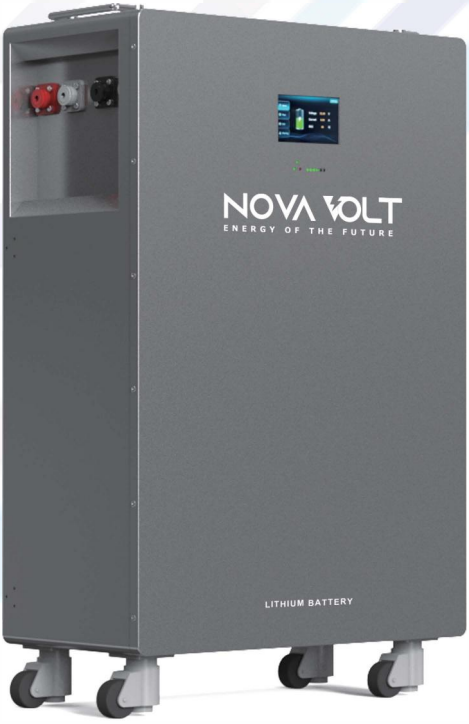
NOVA VOLT
ENERGY OF THE FUTURE

51.2V280AH
Floor Standing LiFePO4 Battery
User Manual



Directory

1.Notes

Attention!

(1) It is important and necessary to read the user manual (attachment) carefully before installing or using the battery.The safety precautions mentioned in this manual do not represent all safety matters to be observed and only complement all safety precautions;
(2) When installing, operating and maintaining equipment, local safety regulations and regulations shall be observed;
(3) Do not wear any conductive objects such as watches, bracelets, bracelets and rings when installing, operating and maintaining equipment;
(4) If the battery is stored for too long, it needs to be charged and discharged every six months, and the battery charge shall not be less than 70%;
(5) After the battery is fully discharged, it should be charged within 12 hours;
(6) Before maintenance, batteries and equipment need to be cut off;
(7) Do not use cleaning solvents to clean batteries;
(8) Do not expose batteries to flammable or irritating chemicals or vapors;
(9) Do not connect cells directly to photovoltaic solar wires;
(10) Our company is not responsible for any loss caused by violation of general safety operation requirements or violation of design, production and use of equipment safety standards.

Warning!

1.1 Before installation

1.1.1 Cut off the power supply to ensure that the battery is off;
1.1.2 Wiring must be correct, do not mistake positive and negative cables, and ensure that external devices are not short-circuited;
1.1.3 Direct connection of batteries and AC power is prohibited; battery must be charged in appropriate charger or inverter only, and don't continuous charging over 24 hours;
1.1.4 Battery protection system is designed for 48 V or 51.2V DC, **don't series**;
1.1.5 Please ensure that the electrical parameters of the battery system are compatible with the relevant equipment;
1.1.6 Keep the battery away from water and fire.

1.2 Use

1.2.1 If the battery system needs to be moved or repaired, the power must be cut off and the battery completely stops working;
1.2.2 Strictly prohibit to connect batteries to batteries of different types or brands;
1.2.3 Prohibit connecting batteries to faulty or incompatible devices;
1.2.4 Before starting the battery, make sure that the power and communication cables are properly connected;
1.2.5 When starting up, first open all the battery packs that need to be used, and then turn on the inverter after the battery shows normal operation; When shutting down the system, first turn off the inverter, and then turn off the battery;
1.2.6 Fire occurs, only dry powder fire extinguishers can be used, liquid fire extinguishers are prohibited;
1.2.7 Do not disassemble batteries privately.

2.Introduction

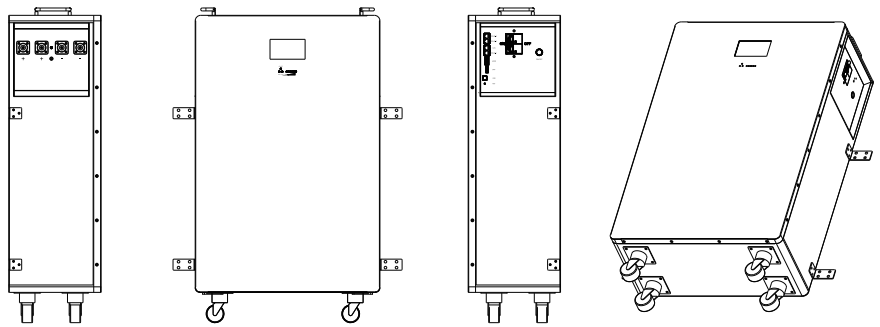
2.1 The battery is a new type of energy storage product, which can be used to provide reliable power supply for various equipment and systems;
2.2 It is especially suitable for applications with large power, limited installation space, limited bearing capacity and long life;
2.3 Battery built-in bms battery management system, battery voltage, current, temperature and other information management and monitoring;
2.4 In addition, the battery pack can balance the charge and discharge of the battery to prolong the cycle life;
2.5 Multiple battery packs can be parallel to expand capacity and power, parallel to expand capacity and longer power support time requirements.

3.Characteristics

★ **Environmental protection and pollution-free:** the whole module using materials are non-toxic, pollution-free;
★ **Long safety life:** the core material of battery module is made of LiFePO4, good safety performance and long service life;
★ **Protection function:** battery management system can protect battery module over discharge, over charge, over current and high / low temperature;
★ **Equilibrium function:** the battery management system has its own passive equalization, can balance the battery module each single string core;
★ **Expansion:** flexible configuration, multiple battery modules can be parallel expansion capacity, applicable to different standby time requirements;
★ **Low power consumption:** the battery has the function of automatic dormancy, when no live equipment is connected, it can enter the low power state by itself and reduce the self-loss;
★ **No memory:** no memory effect, shallow charge and discharge performance is excellent;
★ **Wide temperature range:** working temperature range-20~60℃, charge 0~60℃, discharge-20~60℃, good discharge performance and cycle life.
★ **Portable:** Small, lightweight, easy to install and maintain.

4.Parameter Specifications

4.1 Product structure diagram



4.2 Battery Parameters

4.2.1 51.2V Battery parameters

Project	Parameters
Version	51.2V 280AH
Nominal Voltage	51.2V
Nominal Capacity	280AH
Cell & Method	16 S
Weight	About 118 KG
Working Voltage	44.8-55.2V
Charge Voltage	57.6±0.1V
Standard Charge Current	≤120A
Maximum Charge Current	150A
Standard Discharge Current	≤120A
Maximum Discharge Current	150A
Charge Temperature Range	0~60℃
Discharge Temperature Range	-20~60℃
Communication Method	RS485、CAN
Cycle Life	≥6000 Cycles（80% DOD）
Lithium Battery Type	LiFePO4（LFP）
Working Environment	Charge Temperature: 0℃~60℃ Discharge Temperature: -20℃~60℃ Relative Humidity : ≤90 %

4.3 Interface definitions

① RS485-2
② RS485-1 CAN
③ ADDR
④ DRY
⑤ USB
⑥ RST
⑦ Circuit Breaker
⑧ ON/OFF Switch
⑨ RUN ALM SOC
⑩ Positive Terminal
⑪ Negative Terminal
⑫ GND

4.3.1 Battery Power on/off Instructions:

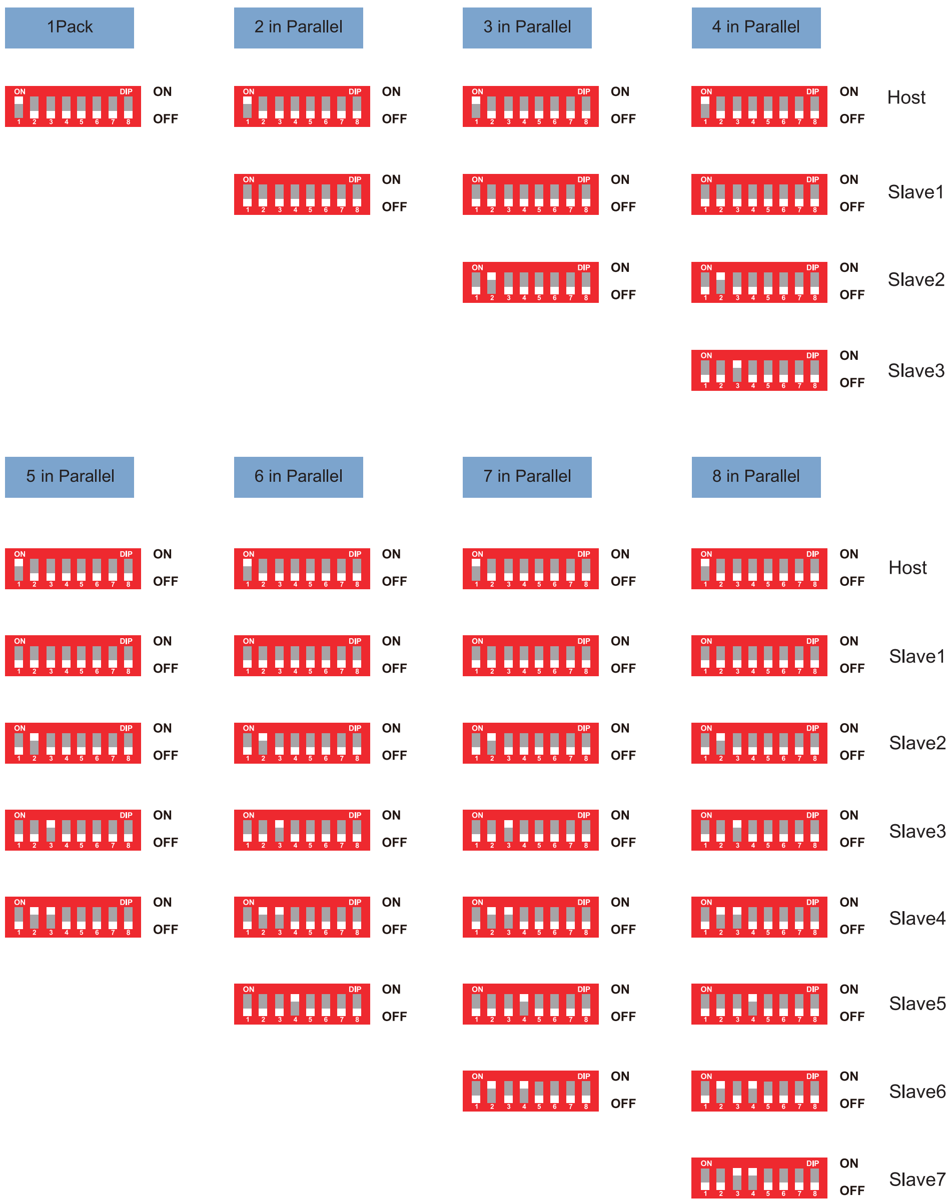
Generally speaking, you need to press the round switch to turn the battery on and off;
If you also need to operate the circuit breaker , you need to operate in the following order:
1. When turning on, please turn on the circuit breaker switch first, and then turn on the round switch.
2. When shutting down, please turn off the round switch first, and then turn off the circuit breaker.

4.3.2 RST：RESET KEY

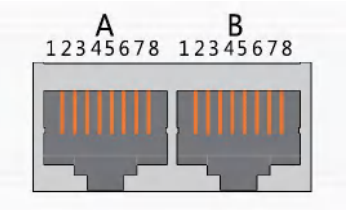
When the BMS is dormant, press the button 3 S and release, the protection board is activated, and the LED indicator lights up for 0.5 seconds from the RUN.
When the BMS is active, press the button 3 S and release, the protection board is dormant, and the LED indicator lights up for 0.5 seconds from the lowest power lamp.
When the BMS is activated, press the button for 6 S and release, the protection board is reset, and the LED lights are lit for 1.5 seconds at the same time.
After the BMS is reset, the parameters and functions set through the upper computer are still retained. if restore to the initial parameters can be achieved through the upper computer's "restore default value ", but the relevant running records and storage data remain unchanged
(such as electricity, cycle times, protection records, etc).

4.3.3 ADS：ADDRESS

DIP switches have the following main roles, please see the following contents in the table for details
1.With 1#, select the master and slave batteries, 1# is ON for master battery and 1# is OFF for slave battery
2.After determining the main battery, select the communication protocol for the main battery through 2#~6#
3. After determining the slave battery, select the ID number of the slave through 2#~6#
4.Add/disconnect RS485 bus adapter resistor through 7#
5.Add/disconnect CAN bus adapter resistors through 8#


1Pack
2 in Parallel
3 in Parallel
4 in Parallel
ON
OFF
Host
Slave1
Slave2
Slave3
5 in Parallel
6 in Parallel
7 in Parallel
8 in Parallel
Host
Slave1
Slave2
Slave3
Slave4
Slave5
Slave6
Slave7
DIP

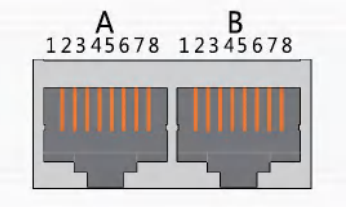
4.3.4 Inverter communication interface



Interface	Defined declaration			Defined declaration		
X1 Communication Port Definition	Part A CAN interface	PIN1/3/6/7/8	NC	Part B RS485-1 interface	PIN1/4	RS485-B1
		PIN2	CGND		PIN2/5	RS485-A1
		PIN4	CANH		PIN3/6	RS485-GND
		PIN5	CANL		PIN7/8	NC

4.3.5 RS485-2 communication interface definition

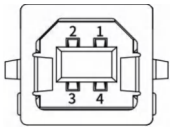
Used for parallel communication between batteries.



Interface	Defined declaration			Defined declaration		
X2 Communication Port Definition	Part A RS485-2 interface	PIN1/8	RS485-B2	Part B RS485-2 interface	PIN1/8	RS485-B2
		PIN2/7	RS485-A2		PIN2/7	RS485-A1
		PIN3/6	RS485-GND		PIN3/6	RS485-GND
		PIN4/5	NC		PIN4/5	NC

4.3.6 Definition of USB communication port

Connected to upper computer



Interface	Definition Description	
X7 Communication port definition	PIN 1	VBUS
	PIN 2	D-
	PIN 3	D+
	PIN 4	GND

4.3.7 LED Indicator

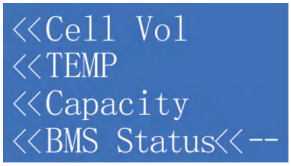
Define how to flash the light in each state

Operation Mode	ON (s)	OFF (s)
Flash 1	0.5	3.5
Flash 2	0.5	0.5
Flash 3	0.5	1.5

Table Flashing Modes

4.3.8 Inverter protocol choose (Button screen)

Please choose the inverter protocol based on the brand of the inverter.



4.3.9 Inverter protocol choose (Touch screen)

Please choose the inverter protocol based on the brand of the inverter.

RS485	
Abbreviation	**Protocol**
NONE	NONE
VKIN	VKING
VLTC	VOLTRONIC
GRWT	GROWATT
SOLX	SOLAX
LTW	LTW
PACE	PACE
MUST	MUST
SRNE	SRNE
BYKE	BAYKEE
SMK	SMK
AFOR	AFORE
GENI	GENIXGREEN
BITA	BITTA
STON	STONE
PYLN	PYLON

CAN	
Abbreviation	**Protocol**
NONE	NONE
VKIN	VKING
GDWE	GOODWE
GRWT	GROWATT
SOLX	SOLAX
SOFA	SOFAR
LXPR	LUXPOWER
MUST	MUST
LTW	LTW
VICT	VICTRON
PYLN	PYLONI
SRTC	SOROTEC
AFOR	AFORE
IMON	IMEON
SHDR	SCHNEIDER
DEYE	DEYE
INHE	INHENERGY
SMA	SMA
GNLG	GINLONG
DONN	DONNERGY
SENR	SENERGY
SNWY	SUNWAYS
STDR	STUDER

4.3.10 Definition of flashing mode

<table>
<tr><td rowspan="2">Status</td><td rowspan="2">Normal/Alarm/Protection</td><td rowspan="2">Running light</td><td rowspan="2">Warning light</td><td colspan="6">Battery light</td><td rowspan="2"></td></tr>
<tr><td>15%</td><td>30%</td><td>45%</td><td>60%</td><td>75%</td><td>90%</td></tr>
<tr><td>Power off</td><td>Sleep</td><td>Off</td><td>Off</td><td>Off</td><td>Off</td><td>Off</td><td>Off</td><td>Off</td><td>Off</td><td></td></tr>
<tr><td rowspan="2">Standby</td><td>Normal</td><td>Flash 1</td><td>Off</td><td colspan="6" rowspan="2">Based on power indication</td><td>Standby state</td></tr>
<tr><td>Alarm</td><td>Flash 1</td><td>Flash 3</td><td>All alarms and protections (excluding overcharge alarms and protections)</td></tr>
<tr><td rowspan="5">Charging</td><td>Normal</td><td>Normally On</td><td>Off</td><td colspan="6" rowspan="2">Based on the power indicator (when power indicator is maximum, the LED flashestwice)</td><td rowspan="2">When power indicator is maximum, the LED flashes (twice) ,For overcharge ALM, no flashing</td></tr>
<tr><td>Alarm</td><td>Normally On</td><td>Flash 3</td></tr>
<tr><td>Total voltage overcharge protection</td><td>Normally On</td><td>Normally On</td><td>Normally On</td><td>Normally On</td><td>Normally On</td><td>Normally On</td><td>Normally On</td><td>Normally On</td><td>If there is no mains power, the indicator is in a standbymode</td></tr>
<tr><td>Single section overcharge protection</td><td>Normally On</td><td>Off</td><td>Normally On</td><td>Normally On</td><td>Normally On</td><td>Normally On</td><td>Normally On</td><td>Normally On</td><td>If there is no mains power, the indicator is in a standbymode</td></tr>
<tr><td>Temperature protection</td><td>Off</td><td>Normally On</td><td>Flash 2</td><td>Flash 2</td><td>Off</td><td>Off</td><td>Off</td><td>Off</td><td>Stopcharging</td></tr>
<tr><td>Overcurrent Protection</td><td>Off</td><td>Normally On</td><td>Off</td><td>Off</td><td>Flash 2</td><td>Flash 2</td><td>Off</td><td>Off</td><td>Stopcharging</td></tr>
</table>

Battery discharge	Normal	Flash1	Off	Basedon power indication						
	Alarm	Flash1	Flash3							
	Total voltage over-discharge protection	Flash1	Normally On	Off	Off	Off	Off	Off	Off	If there is no load, the indicator is in a standbymode
	Single section over-discharge protection	Flash1	Off	Off	Off	Off	Off	Off	Off	If there is no load, the indicator is in a standbymode
	Temperature protection	Normally On	Off	Flash 2	Flash 2	Off	Off	Off	Off	Stop discharge
	Overcurrent Protection	Normally On	Off	Off	Off	Flash 2	Flash 2	Off	Off	Stop discharge
Failure	Cell failure	Flash2	Flash2	Flash 2	Off	Off	Off	Off	Off	Stop charging and discharging
	Charge/discharge MOS failure	Flash2	Flash2	Off	Flash 2	Off	Off	Off	Off	Stop charging and discharging
	AFE failure	Flash2	Flash2	Off	Off	Flash 2	Off	Off	Off	Stop charging and discharging
	Current sampling resistor failure	Flash2	Flash2	Off	Off	Off	Flash 2	Off	Off	Stop charging and discharging

	Voltage failure	Flash2	Flash2	Off	Off	Off	Off	Flash 2	Off	Stop charging and discharging
	Reverse polarity failure	Flash2	Flash2	Off	Off	Off	Off	Off	Flash 2	Stop charging and discharging
	Short	Flash2	Flash2	Flash 2	Flash 2	Flash 2	Flash 2	Flash 2	Flash 2	Stop charging and discharging

Table Meaning of Flashing

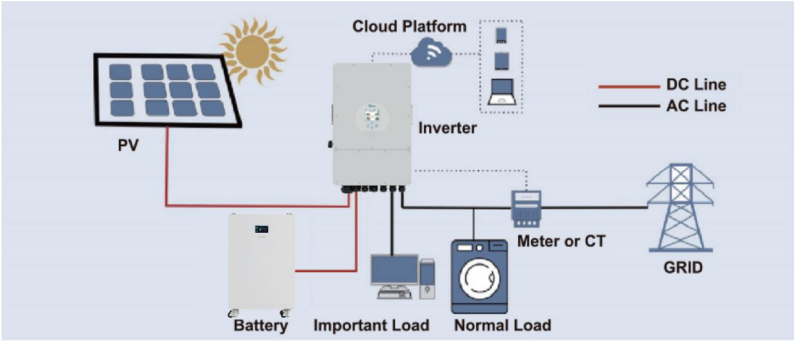
Status	Charging						Battery discharge					
Capacity indicator	LED1	LED2	LED3	LED4	LED5	LED6	LED1	LED2	LED3	LED4	LED5	LED6
0%~17%	Flash 2	Off	Off	Off	Off	Off	Normally On	Off	Off	Off	Off	Off
17%~33%	Normally On	Flash 2	Off	Off	Off	Off	Normally On	Normally On	Off	Off	Off	Off
33%~50%	Normally On	Normally On	Flash 2	Off	Off	Off	Normally On	Normally On	Normally On	Off	Off	Off
50%~66%	Normally On	Normally On	Normally On	Flash 2	Off	Off	Normally On	Normally On	Normally On	Normally On	Off	Off
66%~83%	Normally On	Normally On	Normally On	Normally On	Flash 2	Off	Normally On	Normally On	Normally On	Normally On	Normally On	Off
83%~100%	Normally On	Normally On	Normally On	Normally On	Normally On	Flash 2	Normally On	Normally On	Normally On	Normally On	Normally On	Normally On
Running light	Normally On						Flash3					

Table Capacity Expression

5.Lithium Battery Safety Operating Guidelines

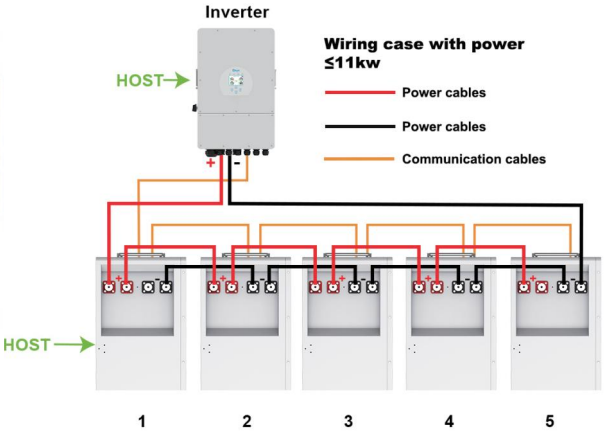
5.1 Application schematic

5.1.1 Single battery use



5.1.2 Parallel connection of batteries

Noted :
If the number of connections exceeds 5 units, a custom combiner box needs to be added. Please contact our sales staff to design a solution according to your needs.



5.2 Tools

The following tools are needed to install batteries.


Tape measure


Hammer


Percussion drill


Wrench

Diagonal cutting pliers

Network cable crimping pliers

Screwdriver

Use insulated tools to prevent accidental electric shock or short circuit. If there is no insulation tool, use insulation tape to cover all exposed metal surfaces of the tool for insulation treatment.

5.3 Security Equipment

When handling the battery pack, it is recommended to wear the following safety equipment.

Rubber insulating gloves

Goggles

Insulated shoes

6.Wall Mounted Battery Installation

6.1 Installation location

Ensure that the installation location meets the following conditions:

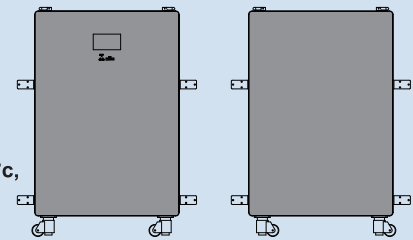
6.1.1 The area is waterproof;

6.1.2 The metope is flat;

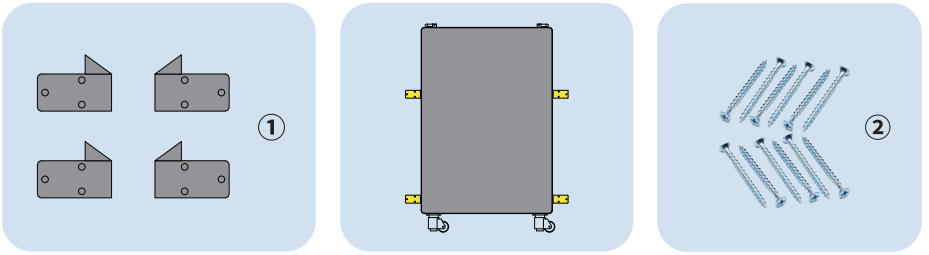
6.1.3 No flammable and explosive items;

6.1.4 Ambient temperature is between 0°c and 50°c, the relative Humidity : ≤ 90 %;

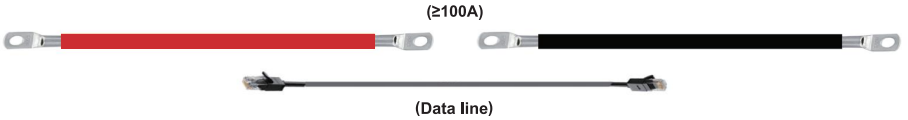
6.1.5 This area has little dust and dirt.



6.2 Wall mounted battery accessories

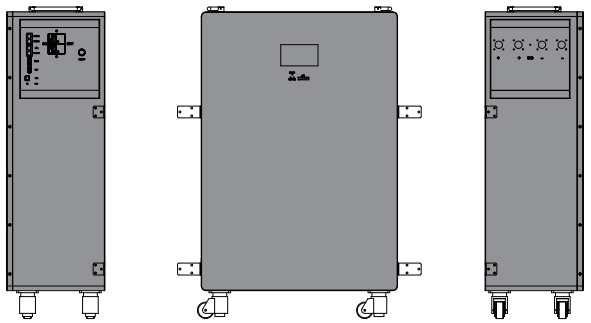


Other accessories:(Optional)
Parallel Cable



6.3 Installation instructions

6.3.1 Install the four fixing brackets ① on the battery's shell
6.3.2 Place the battery close to the wall, mark the hole's positions on the wall, and drill holes at the marked mounting holes with an impact drill;
6.3.3 Then use screws ② to fix the battery to the wall. This completes the installation of the floor standing battery.



6.4 Installation Precautions

6.4.1 It's better to install the machine at the eye level from the ground, so as to observe and read the LED display information, which is convenient for daily maintenance.
6.4.2 The machine shall not be directly exposed to the sun or other heat sources.
6.4.3 For outdoor installation, the machine shall be equipped with rain proof and sunscreen canopy to avoid direct sunlight and rain immersion.
6.4.4 The installed wall should be able to bear the weight of the machine, which is more than 1.5 times of the weight of the machine.
6.4.5 When the machine is installed, it shall be installed vertically or tilted backward by 15 °and it is strictly prohibited to install horizontally or upside down.
6.4.6 The machine must be placed in an air circulation space， and keep out of the reach of children.

7.Maintenance Precautions

Attention!

7.1 If the ambient temperature is out of working range, the battery pack will stop working. The optimal operating temperature of the battery pack ranges from 0 to 50 degrees Celsius. often exposed to harsh temperatures may affect battery pack performance and lifetime.
7.2 In the later stage of installation and use, the iron lithium battery can be simply maintained and inspected, because of its maintenance-free characteristics, the maintenance period can be extended, such as once every 3 months.

- Check whether the pole column and connection line of lithium iron phosphate battery are loose, damaged, deformed or corroded;
- Observe the state of the battery pack running indicator light, normal state is green light, battery pack CAPACITY light only the last flicker, indicating that the battery power is low, the battery is about to dry off the output;
- When there is a failure, the battery pack flashes ALM the red light and sends out an alarm. Please check whether the battery connection is correct or overcurrent; then press the RST reset key to see if the failure is eliminated after the battery restarts. If it can not be eliminated, please contact the manufacturer to handle, do not open the battery box;
- For a multi-cell parallel application scenario, if one of the cells fails to need to be replaced, make sure that the voltage difference between the newly replaced battery pack and the other battery packs to be parallel is within 2 V, if the pressure difference is large, High voltage battery pack charge low voltage battery pack large current, low voltage battery pack charge overcurrent protection, resulting in unable to charge;
- Record the time and number of power outages, the battery power supply time to do detailed statistics.

8.FAQ Analysis and Solutions

8.1 Undervoltage alarm

Phenomenon: ALM alarm indicator lights flicker, RUN operation indicator lights out.
Cause analysis:
(1) The load current is too large to exceed the battery discharge protection value.
(2) Battery protection panel failure.
Solution: The protection board will lock the state after entering the overcurrent state until the charger can be activated at the charging input end.

8.2 Discharge overcurrent protection

Phenomenon: ALM alarm indicator lights flicker, RUN operation indicator lights out.
Cause analysis:
(1) The load current is too large to exceed the battery discharge protection value.
(2) Battery protection panel failure.
Solution: The protection board will lock the state after entering the overcurrent state until the charger can be activated at the charging input end.

8.3 Temperature Protection

Phenomenon: ALM alarm indicator lights flicker, RUN operation indicator lights out.
Cause analysis: Ambient temperature may be too high or too low
Solution: When the temperature at the NTC end returns to normal, the protection board recovers from the temperature protection state and the red ALM lamp goes out.

8.4 Battery no Voltage Output

Phenomenon: The power indicator lights out, the voltage at both ends of the battery is 0 V. measured
Cause analysis: The battery is not activated or the battery management system is abnormal.
Solution: Activate the battery or reset the battery through the reset key on the battery panel in the activated state "RST", there is still no voltage output, contact the manufacturer professional to handle.

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