



SHARED AND BEYOND



About SUNKETESS LFP 5000 battery

LFP 5000 battery can be installed in Parallel and Series mode, more attention should be paid for the DIP and address selection following with part 5.3.2.

About this manual

This manual is intended for the SUNKETESS LFP 5000 Energy Storage battery, but the hybrid inverter and any other equipment is not included. The SUNKETESS hot line and <http://www.sunketess.com> are both available if you want to get additional information.

Declaration

SUNKETESS declares that this LFP 5000 is compliance with the essential requirements and other relevant of RE Directive 2014/53/EU. The declaration of conformity may be consulted at <http://www.sunketess.com>.

Contents

About SUNKETESS LFP 5000 battery.....	
About this manual	
Declaration	
1. Safety introduction.....	1 -
1.1 Important Safety Instructions	1 -
1.2 Warnings in this Document	1 -
1.3 Battery handling guide.....	1 -
1.4 Response to emergency situations.....	2 -
1.5 Installers	3 -
1.6 APP download.....	3 -
1.7 Scrap battery.....	3 -
1.8 Contact information	3 -
2. Product Introduction	4 -
2.1 Technical data.....	4 -
2.2 Exploded views of battery.....	4 -
2.3 Indicator and ports.....	6 -
2.4 Communication interface plat (DVC-A ₂ voltage)	6 -
2.5 How it works	6 -
2.6 Feature.....	7 -
3. Guidance for disconnection of batteries during shipment	8 -
4. Installation Prerequisites.....	9 -
4.1 Installation location.....	9 -
4.2 Installation process.....	9 -
4.3 Installation materials	9 -
4.4 Tools.....	10 -
4.5 Safety instruments.....	10 -
4.6 Network cable	10 -
4.7 Storage.....	11 -

5.	Battery Installation	- 12 -
5.1	Package items	- 12 -
5.2	Checks before installation	- 12 -
5.3	Installation the battery	- 12 -
5.3.1	Install the battery	- 12 -
5.3.2	Address select of Primary and Sub battery(ies) connection	- 14 -
5.4	Cable connections	- 18 -
5.4.1	Cable connection for Series connection	- 18 -
5.4.2	Cable connection for Parallel connection	- 19 -
6.	Configuration	- 21 -
6.1	Configure device WIFI	- 21 -
6.2	Register your account	- 22 -
6.3	Settings for CAN /485 bus pins	- 23 -
7.	Commissioning	- 25 -
7.1	Commissioning battery	- 25 -
7.2	Shut down battery	- 25 -
8.	Troubleshooting	- 26 -
9.	Firmware Update	- 27 -

1. Safety introduction

1.1 Important Safety Instructions

This manual contains important instructions for: LFP 5000 Energy Storage product and this manual must be followed when installing and using this product.

The product is designed and tested in accordance with international safety requirements IEC 60364, but as with all electrical and electronic equipment, certain precautions must be observed when installing and/or operating the product. To reduce the risk of personal injury and ensure the safe installation and operation of the product, you must carefully read and follow all instructions, cautions and warnings in this manual.

1.2 Warnings in this Document

A warning describes a hazard to equipment or personnel. It calls attention to a procedure or practice, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the SUNKETESS equipment and/or other equipment connected to the SUNKETESS equipment or personal injury.

Symbol	Description
	Caution, risk of electric shock
	Heavy enough may cause severe injury
	Keep the battery away from open flame or ignition sources
	Keep the battery away from children
	Do not dispose of the product with household waste
	Recycling
	Read this manual before installation and operation

For safety reasons, installers are responsible for familiarizing themselves with the contents of this manual and all warnings before performing installation.

1.3 Battery handling guide

- Use the battery pack only as directed.
- If the battery defective, appears cracked, broken or otherwise damaged, or fails to operate, contact the SUNKETESS hot line immediately.
- Do not attempt to open, disassemble, repair, tamper with, or modify the battery. The battery pack is not user serviceable.
- To protect the battery and its components from damage when transporting, handle with care.
- Do not subject it to any strong force.
- Do not insert foreign objects into any part of the battery pack.

- Do not use cleaning solvents to clean the battery.
- The battery shall not be connected directly to SELV circuit.

1.4 Response to emergency situations

The SUNKETESS battery is designed with multiple safety strategies to prevent hazards resulting from failures. However, SUNKETESS cannot guarantee their absolute safety for uncertain situations.

1.4.1 Leaking batteries

If the battery pack leaks electrolyte, avoid contact with the leaking liquid or gas. Electrolyte is corrosive and contact may cause skin irritation and chemical burns. If one is exposed to the leaked substance, do these actions:

Inhalation: Evacuate the contaminated area, and seek medical attention immediately.

Eyes contact: Rinse eyes with flowing water for 15 minutes, and seek medical attention immediately.

Skin contact: Wash the affected area thoroughly with soap and water, and seek medical attention immediately.

Ingestion: Induce vomiting as soon as possible, and seek medical attention immediately.

1.4.2 Fire

In case of a fire, make sure that an ABC or carbon dioxide extinguisher is nearby and does not use water to extinguish the fire.



WARNING

The battery pack may catch fire when heated above 130°C.

If a fire breaks out where the battery is installed, do these actions:

1. Extinguish the fire before the battery catches fire.
2. If the battery has caught fire, do not try to extinguish the fire. Evacuate people immediately.

WARNING

If the battery catches fire, it will produce poisonous gases. Do not approach.

1.4.3 Wet battery

If the battery is wet or submerged in water, do not try to access it. Contact SUNKETESS hot line or your distributor for technical assistance.

1.4.4 Damaged battery

If the battery damaged, please contact SUNKETESS hot line or your distributor for help as soon as possible, because damaged battery is dangerous and must be handled with extreme caution. Damaged battery is not suit for use and may pose a danger to people or property. If the battery seems to be damaged, return it to SUNKETESS or your distributor.

CAUTION

Damaged battery might export electrolyte or flammable gas, so contact SUNKETESS for advice and information immediately we will deal with it within 48h.

1.5 Installers

SUNKETESS Energy Storage battery is suggested installing by skilled worker or electrician. A skilled worker is defined as a people who had been trained and qualified electrician or had all of the following skills and experience:

- Knowledge of the functional principles and operation of on-grid Energy Storage systems.
- Knowledge of the dangers and risks associated with installing and using electrical devices and acceptable mitigation methods.
- Knowledge of the installation of electrical devices
- Knowledge of and adherence to this manual and all safety precautions and best practices.

1.6 APP download

SUNKETESS Energy storage battery monitor App could be downloaded by www.sunketess.com

1.7 Scrap battery

For scrap battery (- ies), please treat with local laws or regulations to recycle or scrap.

1.8 Contact information

Use the contacts below for technical assistance. This phone numbers is available only during business hours on weekdays.

Phone number 86-510-68005868

Address No.888 Qinghong Road, Ehu Town, Xishan District, Wuxi City

E-mail sales@sunket.cn

2. Product Introduction

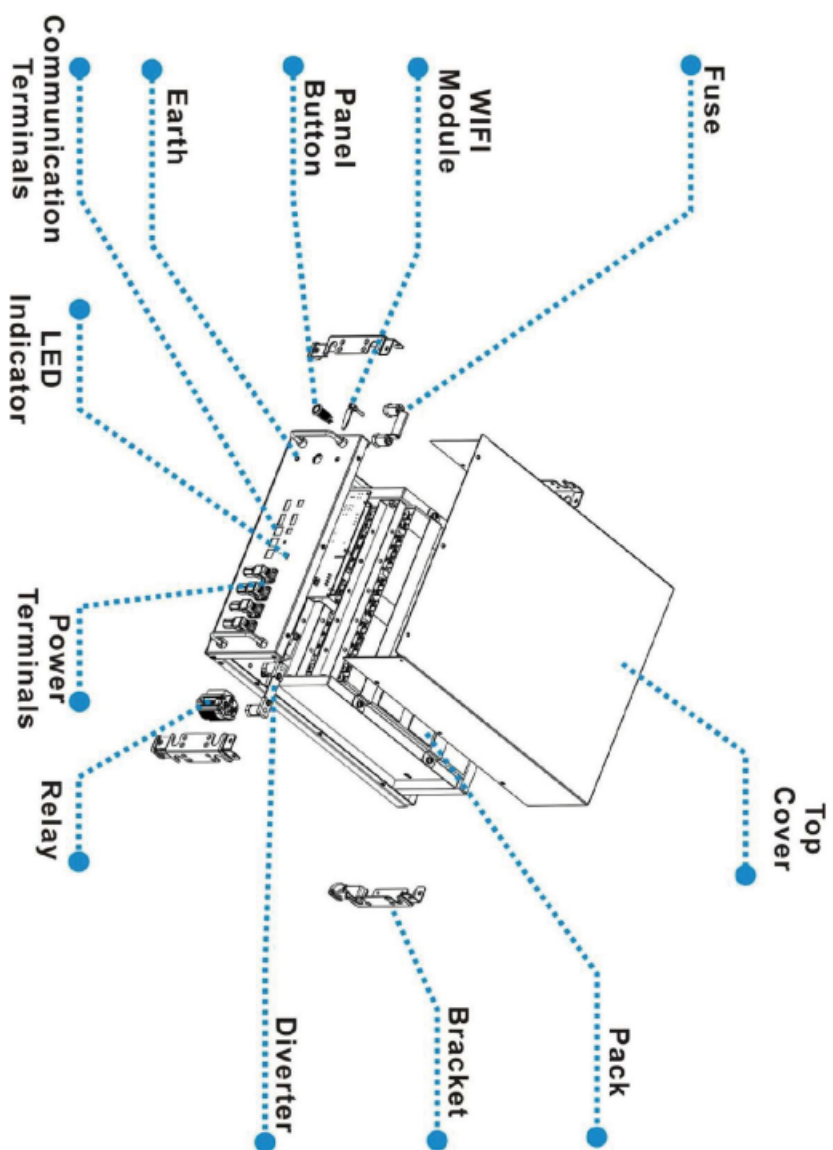
2.1 Technical data

Model	LFP 5000	
Total Energy*	5.1kWh	
Usable Energy(DC)*	4.8kWh	
Nominal Charge/Discharge Power	3.0kW	
Peak Power(Only discharge)	6.0kW for 3 seconds	
Constant Current(Only discharge)	80A	
Voltage	48~56Vd.c	
Nominal Voltage	51.2Vd.c	
Nominal Current	60A	
Max. Charge Voltage	57.6V	
Max. Recommended DOD (Off-grid)	90%	
Operating Condition	Indoor	
Operating Temperature	Charge	From 0~50°C
	Discharge	From -10~55°C
Dimension(L*W*H)	550*442*135 mm	
WIFI Frequency Range	2400MHz-2483MHz	
Max. Transmission Power	<20dBm	
Weight	45kg	
Humidity	< 60% (No Condensed Water)	
Pollution Degree	3	
Over Voltage Category	II	
Cooling Type	Natural cooling	
Case Material	Metal	
Color	Black or Grey	
Installation	Wall Mounting/ Ground Installation	
IP rating	IP 20	
Protective Class	I	
Max. Number of Parallel or Series	8	
Warranty	10 years	
Communication	CAN/ RS485	
Protection Mode	Triple hardware protection	
Battery Protection	Over-current/Over-voltage/Short circuit/ Under-voltage/Over temperature	
Safety	Cell CE+CB	
	Pack TUV(IEC 62619, IEC 62040-1)	
Hazardous Material Classification	9	
Transportation	UN 38.3	

Testing conditions based on temperature 25°C at the beginning of life.

*Total Energy/Usable Energy measured under specific conditions from SUNKETESS 0.2C CC-CV

2.2 Exploded views of battery



2.3 Indicator and ports

2.3.1 Indicator

There are two LED indicators on the front of the battery to show its operating status.

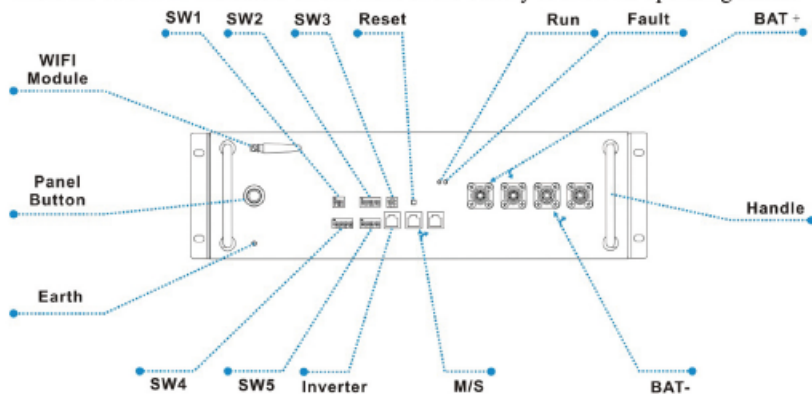
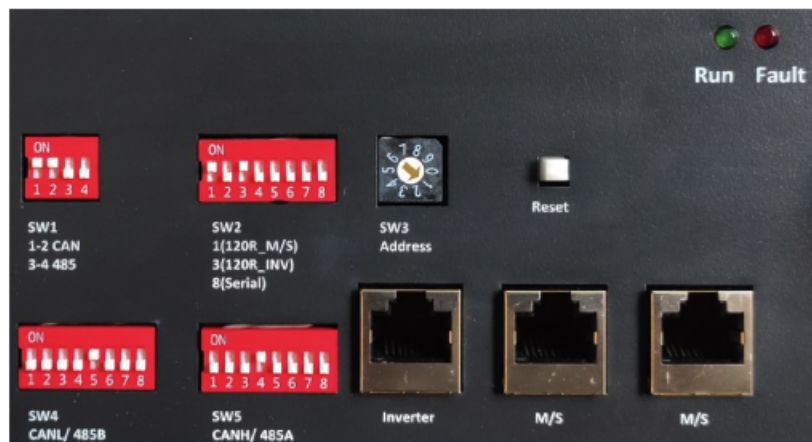


Table 2-1 Designations on the battery

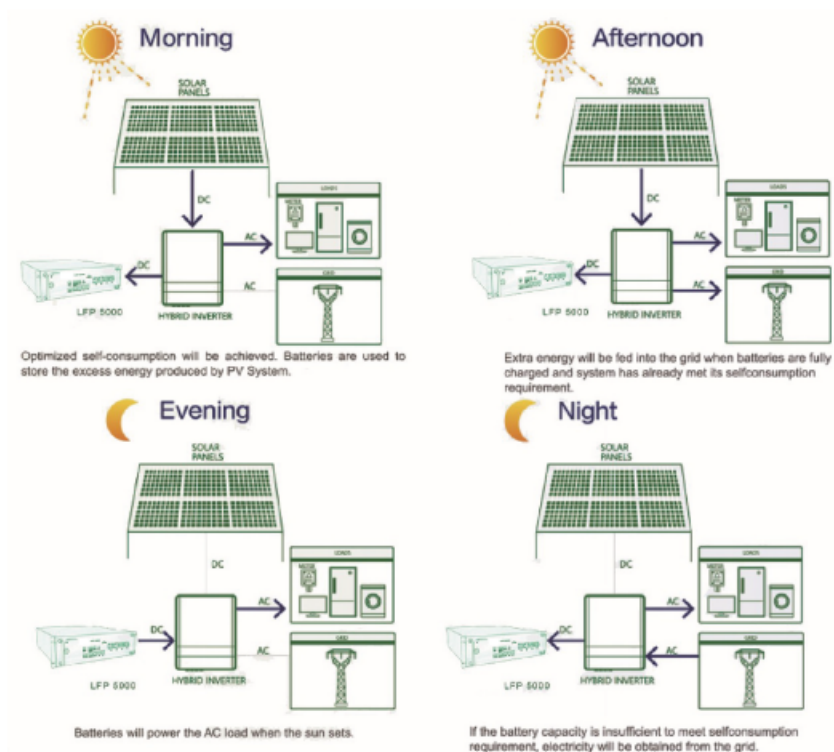
Item	Designation	Definition
1	Running	Battery normally working without fault
2	Fault	Battery is in a warning state, see troubleshooting in Chapter 6

2.4 Communication interface plat (DVC-A₂ voltage)



SW1	DIP switch select for CAN or RS485
SW2	Resistance for communication and DIP switch for parallel or Series connection
SW3	Switch for battery's Address select
SW4 & SW5	Communication interface for battery or Primary battery with Inverter
Reset	Reset the WIFI or GPPS/GPS module configure

2.5 How it works



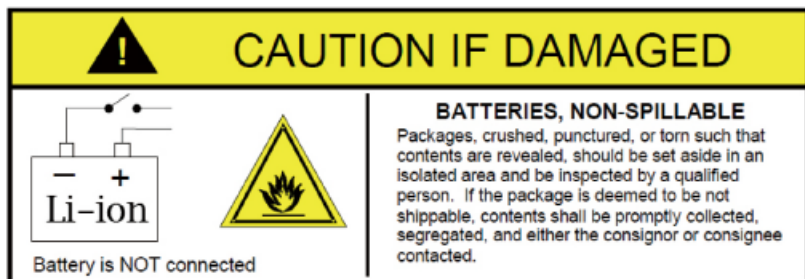
2.6 Feature

The SUNKETESS Energy Storage battery has following features:

- **Energy storage unit:** This battery is suit for photovoltaic system compatibility.
- **Battery management system (BMS):** The battery built-in BMS monitors its operation and prevents the battery from operating outside design limitations. See **Troubleshooting on Chapter 8**.
- **Monitor:** The battery BMS built-in with WIFI module, the battery running information could be seeing in mobile phone and computer.
- **Easy firmware update:** The BMS firmware can be updated to the latest version. See **Chapter 9 Firmware Update** on page 28.
- **Expandability:** The battery capacity can be increased by adding another battery. See **part 5.6 Parallel connection** on page 20.

3. Guidance for disconnection of batteries during shipment

- 3.1 Cartons that have been crushed, punctured, or torn in such a way that contents are revealed shall be set aside in an isolated area and inspected by a skilled person. If the package is deemed to be not shippable, the contents shall be promptly collected, segregated, and either the consignor or consignee contacted.
- 3.2 The DC circuit of SUNKETESS LFP 5000 battery has been disconnected before outgoing.
- 3.3 A precautionary label had been affixed to the shipping carton to alert individuals as to the battery within the package have been disconnected; otherwise, the battery should not be transported.
- 3.4 We have conducted comprehensive tests to ensure the equipment they distribute around the world is safe for **shipping** transport. These products shall be handled with care and immediately inspected if visibly damaged. If the cartoon visibly damaged, please contact with SUNKETESS hot line to confirm whether the battery could be used safely or not.



4. Installation Prerequisites

4.1 Installation location

Make sure that the installation location meets the following conditions:

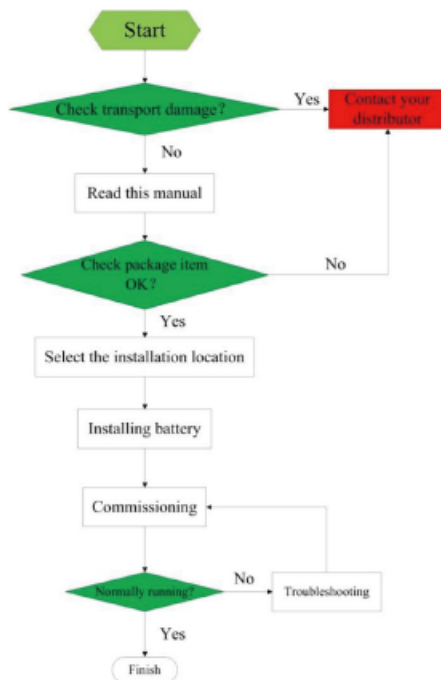
- The building is designed to withstand earthquakes.
- Far away from the sea to avoid salt water and humidity.
- The floor is flat and level.
- No flammable or explosive materials nearby.
- Optimal ambient temperature is between 15°C and 30°C.
- Temperature and humidity stays at a constant level.
- Minimal dust and dirt in the area.
- No corrosive gases present, including ammonia and acid vapor.

The SUNKETESS battery is rated at IP20, so the battery only suite for indoor usage.

If the ambient temperature is outside the operating range, battery will protect itself by shutting down. The battery optimal operate temperature is 15°C to 30°C. Frequent exposure to severe operating condition would exacerbate the performance and lifetime of the battery.

4.2 Installation process

The battery should be installed according to the following flow chart. The detail installation process described in chapter 4 **Install process**.



4.3 Installation materials

Following installation materials should be prepared by installers.

- Power cable
- Data cable
- Ground wire
- Bipolar external isolator, when two or more battery systems in parallel, each of them shall have a bipolar isolator.

NOTICE

Make sure that the cross-sectional area of charging cables is 25 to 35 mm².

NOTICE

A breaker between SUNKETESS battery and inverter was recommended to install, and the breaker's min. current should be over 150A or following with local regulations.

4.4 Tools

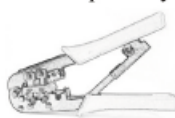
To install the battery pack, those following tools are probably required:



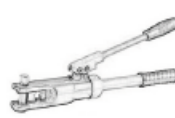
Phillips Screwdriver



Torque wrench



Cable crimper



Wire clamp



Voltmeter



Tape measure



Drill



Flat-head screwdriver

In order to protect operator and installer's safety, please select and use suitable tools and measuring instruments that are certified for precision and accuracy.

4.5 Safety instruments

When dealing with the battery, following safety gears should be equipped. Installers must meet the relevant requirements of IEC 60364 or the domestic legislation and other relevant international standards.



Insulated glove

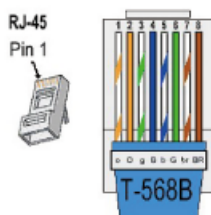


Safety goggles



Safety shoes

4.6 Network cable



If needed, the network cable should be made like that diagram. But the network cable between battery and Inverter should be made following the definition of Inverter. If available, use a LAN cable tester to check whether the cable is faulty.

4.7 Storage

If the battery is not to be installed immediately, or removed from operation and needs to be stored for a long period, please choose an appropriate location to store it.

Instructions for storage are:

- Do not stack more than 8 battery boxes.
- The temperature of battery stored recommended in the range of -20°C to 25°C .
- Do not expose to water

The battery box should be upright as shown in the following figure and not stacked upside down when storing the battery box.



If the battery needs to be stored over 3 months, the DC circuit of battery suggests to be disconnecting. Otherwise, the battery would discharge at a minimum rate and capacity degrades depended on storage time, the battery self-consumption less than 5w. And, if the battery stored over 6 months, it is suggested to connect the battery with inverter and commission the system.

5. Battery Installation

5.1 Package items

These items are included in the package.



Battery*1



Cardboard*1



User Manual



Warranty



Battery link*2



Data Cable*1

5.2 Checks before installation

There are a few things to check before installing the battery to ensure that it has no defects.

Check item 1: Check the battery voltage.

WARNING

If this checking process is executed for any reason after the battery is fully installed, make sure that the inverter is turned off or break the connection between battery and inverter while checking the battery.



Press and hold the panel button for about 4s and then release it after the two LED lights on, measure the voltage at the terminal interface with a voltmeter. If the voltage is lower than 48 V, do not use the battery and contact SUNKETESS hot line or your distributor.

5.3 Installation the battery

NOTICE



The symbol located on the front of battery, and the earth wire between battery and inverter is compulsive for Series Connection. For Parallel connection, the earth wire was recommended to be installed.

5.3.1 Install the battery

To prevent the battery from moving, make sure the battery fixed to a wall.

NOTICE

If the battery is installed above the floor or on a platform, make sure

that the wall or platform is capable of supporting the battery's weight.

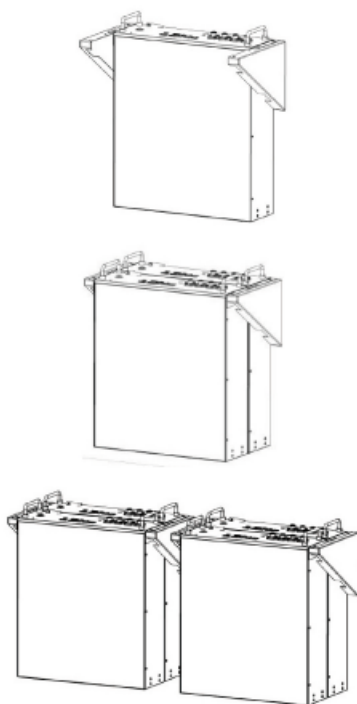
5.3.1.1 Wall mounting



1. Determine bracket mounting place to be fixed using this Positioning cardboard.
2. Drill holes in the wall for the M8 expansion screw anchors, which depth should be at least 50 mm. Tighten the screws to a torque around 2.5 N·m.

3. Fasten the battery to bracket fasten hole with M6 screws with 2.0N·m roughly.

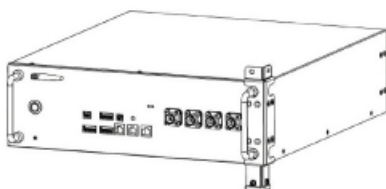
4. Meanwhile, two or four batteries could be installed by these brackets.



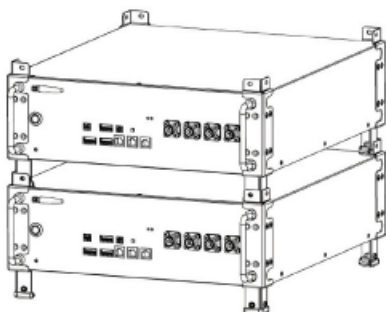
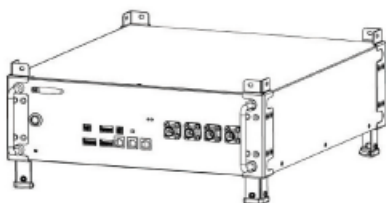
Note: if more than 4 batteries installed, a cabinet recommended to be selected for the battery's stable.

5.3.1.2 Ground installation

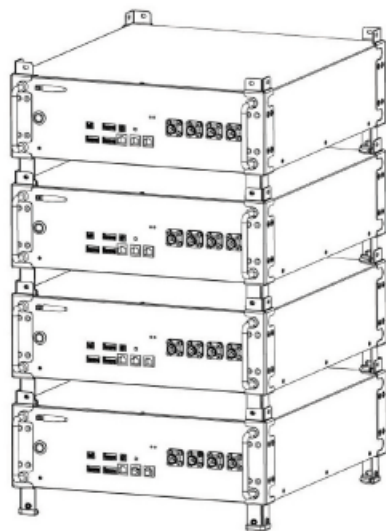
Meanwhile, LFP 5000 battery also could be installed on floor, the installation step as following:



1. Fix the braced feet to battery's mounting holes one by one.



2. If more power and energy needed, two or more (less than 4) batteries could be installed in one stack.
3. But if the number of batteries at the range of 4-8, a cabinet recommended to be selected.



5.3.2 Address select of Primary and Sub battery (ies) connection

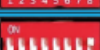
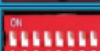


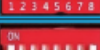
For Series connection, please make sure the SW2 DIP switch of selected as this type.

WARNING

Please make sure the SW2 DIP switch selected correctly, if the battery connected in Parallel mode, but select SW2 DIP8 at ON position, probably lead serious fault even dangerous. Meanwhile, if battery connected in Series mode select SW2 DIP8 at OFF status, serious fault and dangerous probably occurred.

Connected battery number	Group	Set of SW2		Address Set (SW3)
		Series connect	Parallel connect	
1	—			
2	Primary			
	Sub			
3	Primary			
	Sub 1			
	Sub 2			
4	Primary			
	Sub 1			
	Sub 2			
	Sub 3			
5	Primary			

	Sub 1			
	Sub 2			
	Sub 3			
	Sub 4			
6	Primary			
	Sub 1			
	Sub 2			
	Sub 3			
	Sub 4			
	Sub 5			
7	Primary			
	Sub 1			
	Sub 2			
	Sub 3			
	Sub 4			
	Sub 5			
	Sub 6			
8	Primary			
	Sub 1			
	Sub 2			
	Sub 3			
	Sub 4			

	Sub 5			
	Sub 6			
	Sub 7			
9	Primary			
	Sub 1			
	Sub 2			
	Sub 3			
	Sub 4			
	Sub 5			
	Sub 6			
	Sub 7			
	Sub 8			
10	Primary			
	Sub 1			
	Sub 2			
	Sub 3			
	Sub 4			
	Sub 5			
	Sub 6			
	Sub 7			
	Sub 8			
	Sub 9			

5.4 Cable connections

WARNING

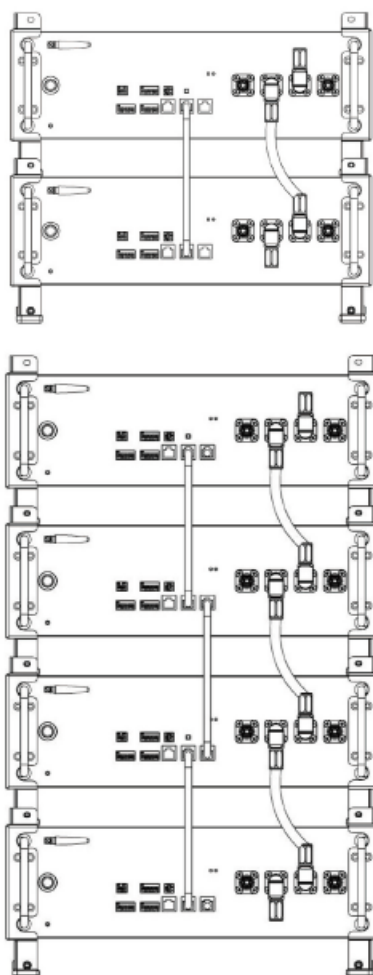
Before connecting battery with inverter, please make sure that no inverter connected or the inverter turned off.

5.4.1 Cable connection for **Series connection**

NOTICE

The voltage difference of each battery should be less than 100mV.

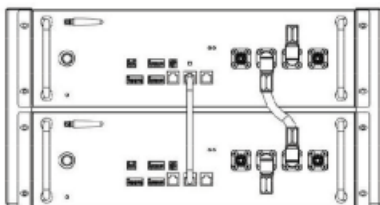
5.4.1.1 Ground installation



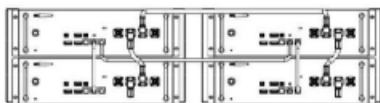
Feed a data cable to M/S communication terminal interface one by one directly.

If more than 4 batteries installed, a cabinet was recommended.

5.4.1.2 Wall mounting



For wall mounting, the battery Series connection number should be less than 4, if more batteries installed, a cabinet was recommended.

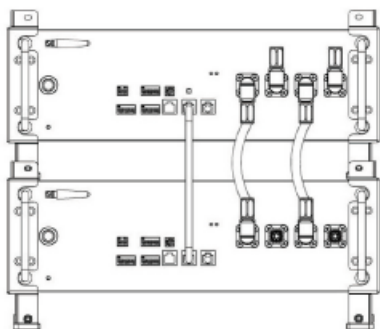


NOTICE

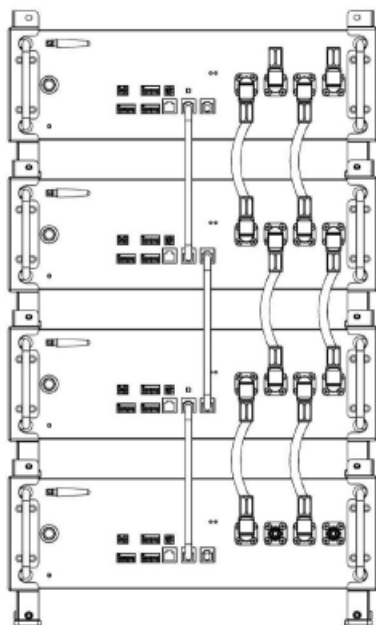
If battery connected in Series mode, it's better to be installed in Ground installation method, for the Power cable resistance difference between stack and battery pack, which will have fade effect on voltage balance.

5.4.2 Cable connection for **Parallel connection**

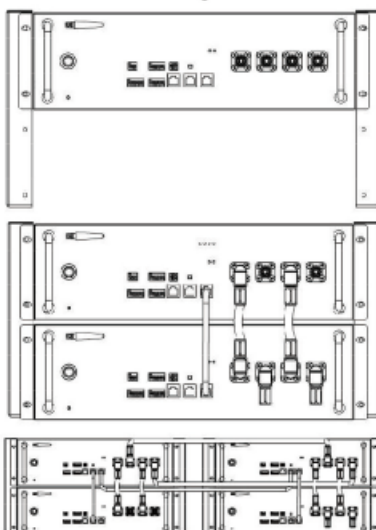
5.4.2.1 Ground installation



For parallel installation, please pay attention on Cable connection, and the DIP8 of SW2 no need to be changed and stayed on Initial Factory state.



5.4.2.2 Wall mounting



For wall mounting, the battery Series connection number should be less than 4, if more batteries installed, a cabinet was recommended.

NOTICE

Before two or more batteries installed in parallel, please check the voltage of each battery and make sure the voltage different less than 1.0V.

6. Configuration

DIP switch should be set correctly for proper communication between inverter and battery.

If parallel connecting multiple batteries, please set the DIP switches as following:

6.1 Configure device WIFI

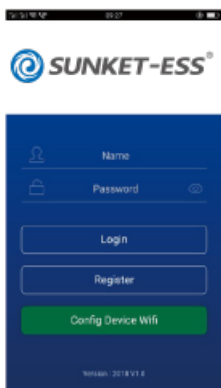
The SUNKETESS battery has a built-in WIFI module for use with the SUNKETESS APP.



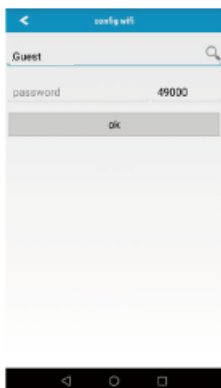
The WIFI setting of battery should be as following



1. Press and hold the Reset button for 7 seconds.
2. Connect the 'USR-WIFI232-XX_XXXX' with your smart phone, and then the light of WIFI will turn on by itself within 5 seconds.
3. Open the APP monitor of battery, select 'Config Device Wifi' option box.



4. Search and select SSID connected and input the password, press ok and finish. The light of WIFI module would light automatically under WLAN accessible condition.



NOTICE

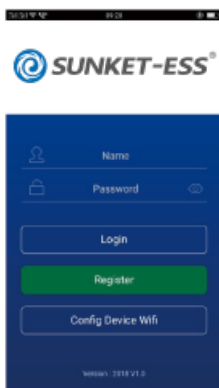
If the WIFI cannot be set or there is no WLAN accessible, the battery can still operate normally.

6.2 Register your account

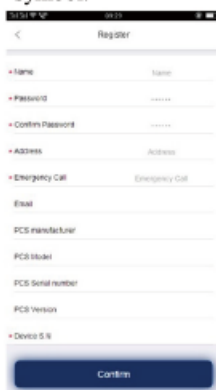
NOTICE

The SUNKETESS battery could be registered only one time.

1. Open the APP monitor of battery, select 'Register' option box.



2. After scanning the bar code of battery, there are some personal messages need to be filled which noted by “*” symbol.



3. After those messages filled and signature, the APP would jump to the running interface automatically.

NOTICE

The SUNKETESS battery running is not associated with registration or not.

6.3 Settings for CAN /485 bus pins



Confirm that the CANL/485BDIP switch is set to SW2 which pin is used for CAN high signal by inverter (4-CANH/485A), and the CANL/485BDIP switch is set to SW1 which pin is used for CAN low signal by inverter (5-CANL/485B). As SW3 the CAN/485GND DIP switch, installer should confirm which pin is used for ground by inverter or not.

NOTICE

The battery default protocol is CAN bus, if an inverter communication mode is RS485 or other protocol, please contact SUNKETESS hot line before installed the battery.

7. Commissioning

7.1 Commissioning battery

If there is only one battery installed, use the following steps to put it in operation:

1. Press and hold the panel button on the left side of the unit for about 4s, after the indicator lights on, release the panel button.
2. Make sure that the Runlight is on. If it stays off, do not use the battery and contact SUNKETESS or your distributor.
3. Turn the inverter on, and wait for the start-up sequence to complete fully.

When there are two or more batteries connected with parallel mode, after the charging cable and the data cable has been connected correctly, follow these steps to put them in operation:

1. Check battery voltage level is above 48V
 - a) If battery voltage is under 45V contact your distributor or SUNKETESS after service hot line for help.
2. Press and **HOLD** the panel button for about 4s, after four seconds the indicator lights will turn on.
3. Release the panel button.
 - a) For all batteries, make sure that the Run light is on.
 - b) Make sure the maximum voltage different between batteries less than 1.0V.
 - c) If not, the installer should balance the battery voltage and then parallel connect batteries together.
 - d) Set the DIP switches like part **6-1 Setting for communication interface**.
4. Turn the inverter on, and wait for the start-up sequence to complete fully.

7.2 Shut down battery

Shut down the battery only when the battery is no charge or discharge current which could be seen in your smart phone with APP.

1. Press and hold the Panel Button about 8s, after a disconnect voice of relay come can release it.
2. Make sure that every light on the battery is off.

8. Troubleshooting

1. Every fault is presented by a fault code. If the battery fault light is on, please check the Fault code in Homepage.
2. If the battery fault light on, pls check the Troubleshooting number in Homepage in your SUNKETESS APP, if the code is 0x1***, this problem would be recovered by itself. But if the code is 0x2*** or 0x3***, please contact the SUNKETESS after service hot line or your distributor for help.
3. If the information of battery cannot be seen in the monitoring system, check the battery status first. If the battery status is OFF, please turn the battery on, and then check the WLAN is accessible for battery.
4. If Register the battery failure, please check the network of mobile phone nearby the battery installation site available and stable.

Table 8-1 Fault Code of Battery

Fault Code	Detail fault message
0x1001	Battery under voltage warning
0x1002	Battery over voltage warning
0x1003	Battery under temperature warning
0x1004	Battery over temperature warning
0x1005	Battery charge over current warning
0x1006	Battery discharge over current warning
0x1007	Cell over discharge warning
0x1008	Cell over charge warning
0x1009	Battery charge with over temperature warning
0x1010	Battery discharge with over temperature warning
0x1011	Battery charge with under temperature warning
0x1012	Battery discharge with under temperature warning
0x2001	Battery under voltage protect
0x2002	Battery and cell over discharge protect
0x2003	Battery over charge protect
0x2004	Battery over voltage and cell over charge protect
0x2005	Battery under temperature protect
0x2006	Battery over temperature protect
0x2007	Battery charge over current protect
0x2008	Battery discharge over current protect
0x2009	Cell over discharge protect
0x2010	Cell over charge protect
0x3000	Communication broken between Primary and Sub Battery
0x3001	Address select fault

9. Firmware Update

It is possible to update the BMS firmware version manually via the WIFI monitor system App.

After a new firmware version is uploading to the server, the firmware could be updated over the Internet by itself after holder confirmed.

