# XES Stackable LV Battery

## User manual


Document Version: V1.1

# Foreword

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# Limitation of Liability

The equipment manufacturer will not bear any direct or indirect responsibility for any damage to the energy storage battery system or property loss caused by the following circumstances.

• Without the authorization of the equipment manufacturer, the energy storage battery system has been modified, modified or replaced.

• The serial number of the energy storage battery system should be changed or cleared by non-equipment manufacturer technicians.

• The design and installation of the system composed of other equipment does not meet the standards, safety regulations and other relevant requirements.

• Equipment damage caused by failure to comply with the relevant requirements of the energy storage battery system user manual.

• Equipment damage caused by improper use or misuse of the energy storage battery system.

• Equipment damage caused by insufficient ventilation of the energy storage battery system.

• Maintenance procedures regarding energy storage battery systems did not follow acceptable standards.

• Equipment damage caused by force majeure, such as: earthquake, storm, lightning, overvoltage, fire, etc.

• Equipment damage caused by any external factors.

# 01 Safety Instructions

- There is an unsafe voltage inside the energy storage battery system. Before operating the equipment in the system, please turn off the power to avoid danger, and strictly abide by all safety precautions in this manual and safety signs on the equipment.
- Only professionals are allowed to operate the energy storage battery system. Professionals need to be familiar with local laws and regulations and electrical systems, have undergone professional training, and be familiar with the relevant knowledge of this product.
- Do not use if the battery module is visibly defective, damaged or missing.
- Do not disassemble or modify any part of the battery module without the official authorization of the equipment manufacturer.
- Damaged battery modules may cause electrolyte leakage. If the electrolyte leaks, do not touch the leaked electrolyte and volatile gas, and contact the after-sales specialist for help immediately.

In case of accidental exposure to spilled material, do the following:

- Inhalation of spilled material: Evacuate from contaminated area and seek medical help immediately.
- Eye contact: Flush with water for at least 15 minutes and seek medical help immediately.
- Skin contact: Wash exposed area thoroughly with soap and water and seek medical attention immediately.
- Ingestion: Induce vomiting and seek immediate medical attention.
- Do not move the energy storage battery system while connecting the external battery expansion module. If you need to replace the battery module or add a battery module, please contact the after-sales specialist.

## Transportation:

- Ensure that the energy storage battery system is not damaged during transportation and storage.
- Be careful and consider its weight when lifting the battery module
- Gloves are required when handling.
- Do not hit, pull, drag or step on the device, and do not put extraneous objects into any part of the battery module.
- Transportation must be carried out by trained professionals, and the operations in the process must be documented.
- Make sure that the device is placed firmly and cannot be tilted. The device may be damaged and personal injury may be caused if the device falls over.
- Make sure there is a CO2, Novac1230 or FM-200 fire extinguisher near the equipment.
- When extinguishing the fire, please use the fire extinguisher of the recommended material, and cannot use water or ABC dry powder fire extinguisher to extinguish the fire; firefighters must wear protective clothing and self-contained breathing apparatus.
- When the ambient temperature exceeds 150°C, the battery may explode.
- Use proper tools and protection when installing and maintaining heavy equipment. Improper handling can result in personal injury.
- When working with high voltage, please use special insulated tools.
- Using the cable in a high temperature environment may cause aging and damage to the insulation layer. The distance between the cable and the outer periphery of the heating device or heat source area should be at least 30mm.
- Cables of the same type should be bundled together, and cables of different types should be separated by at least 30mm. Intertwining or crossing is prohibited.

# 02 Product introduction

## 2.1 Product description

• This document mainly introduces the product introduction, application scenarios, installation, commissioning, maintenance and technical parameters of the XES51104-series stacked low-voltage energy storage battery system (hereinafter referred to as: battery system).

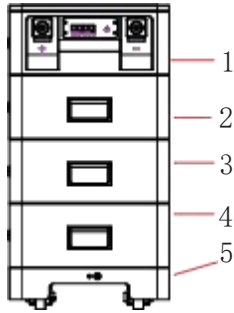
• The energy storage battery system is mainly composed of XES51104 battery modules (hereinafter referred to as: battery modules).

The configuration of each specification battery system model is as follows:

| battery system | Number of battery modules | Number of bases |
|---|---|---|
| XES51104 | 1 | 1 |
| XES51208 | 2 | 1 |
| XES51312 | 3 | 1 |
| XES51416 | 4 | 1 |

# 03 Parts introduction

## 3.1 Introduction of Battery System




| Serial number | Part |
|---|---|
| 1, 2, 3, 4 | battery module |
| 5 | base |

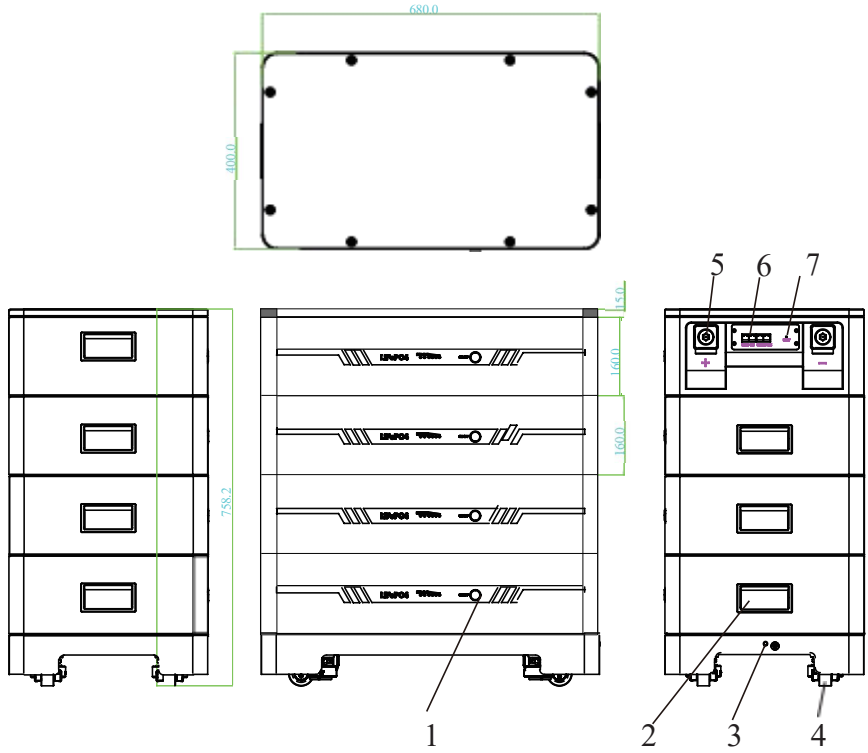
## 3.2 Introduction of Battery Module


| Notice | |
|---|---|
| • This article takes the configuration of 4 batteries as an example to introduce the product installation and wiring steps. | |
| Serial number | Part |
| 1 | blind mate connector |
| 2 | positioning pin |

## 3.3 Base Introduction

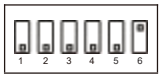

| Serial number | Part |
|---|---|
| 1 | blind mate connector |
| 2 | positioning pin |
| 3 | protective earth point |

## 3.4 Introduction of Battery Module Components

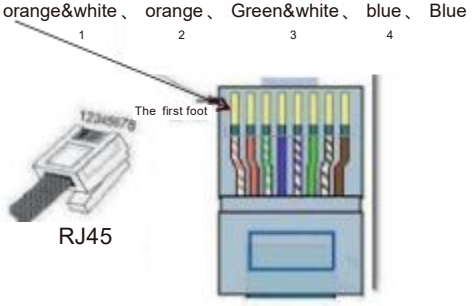



| Serial number | Part |
|---|---|
| 1 | switch |
| 2 | handle |
| 3 | ground wire |
| 4 | wheels |
| 5 | terminal |
| 6 | communication port |
| 7 | RESET |

### 3.5 Comparison table of DIP switch settings




| ADS | Dip switch | | | | | | Instructions |
|---|---|---|---|---|---|---|---|
| | #1 | #2 | #3 | #4 | #5 | #6 | |
| 0 | OFF | OFF | OFF | OFF | OFF | OFF | ( Host) Pack0 |
| 1 | ON | OFF | OFF | OFF | OFF | OFF | ( slave) Pack1 |
| 2 | OFF | ON | OFF | OFF | OFF | OFF | (slave ) Pack2 |
| 3 | ON | ON | OFF | OFF | OFF | OFF | (slave ) Pack3 |
| 4 | OFF | OFF | ON | OFF | OFF | OFF | (slave ) Pack4 |
| 5 | ON | OFF | ON | OFF | OFF | OFF | (slave ) Pack5 |
| 6 | OFF | ON | ON | OFF | OFF | OFF | ( slave) Pack6 |
| 7 | ON | ON | ON | OFF | OFF | OFF | (slave ) Pack7 |
| 8 | OFF | OFF | OFF | ON | OFF | OFF | (slave ) Pack8 |
| 9 | ON | OFF | OFF | ON | OFF | OFF | (slave ) Pack9 |
| 10 | OFF | ON | OFF | ON | OFF | OFF | ( slave) Pack10 |
| 11 | ON | ON | OFF | ON | OFF | OFF | ( slave) Pack11 |
| 12 | OFF | OFF | ON | ON | OFF | OFF | ( slave) Pack12 |
| 13 | ON | OFF | ON | ON | OFF | OFF | ( slave) Pack13 |
| 14 | OFF | ON | ON | ON | OFF | OFF | ( slave) Pack14 |
| 15 | ON | ON | ON | ON | OFF | OFF | ( slave) Pack15 |
| Inverter communication protocol CAN communication (in host mode by DIP 5 and 6 select) | | | | | | | |
| 0 | OFF | OFF | OFF | OFF | OFF | OFF | Luxpowertek |
| 32 | OFF | OFF | OFF | OFF | OFF | ON | PYLONTECH Deye GOODW |
| 16 | OFF | OFF | OFF | OFF | ON | OFF | Victron SMA Sofar |
| 48 | OFF | OFF | OFF | OFF | ON | ON | Growatt |
| Inverter communication protocol RS485 communication (in host mode by DIP 5 and 6 select) | | | | | | | |
| 0 | OFF | OFF | OFF | OFF | OFF | OFF | SRNE PYLONTECH |
| 32 | OFF | OFF | OFF | OFF | OFF | ON | Voltronic |
| 48 | OFF | OFF | OFF | OFF | ON | ON | Growatt |




| | |
|---|---|
| PIN1 (whiteorange) | 485- B |
| PIN2(orange) | 485-A |
| PIN4 | CANH |
| PIN5 | CANL |

# 04 Storage and packaging

## 4.1 Storage environment

If the device is not installed and used immediately, please confirm that the storage environment meets the following conditions:

• The equipment should be packed in a packing box, and the packing box should be sealed after placing the desiccant in the packing box.

• If the device is not installed within 3 days after unpacking, it is recommended to store the device in the packing box.

• Storage SOC: 25% ~ 50% SOC, a charge-discharge cycle is required every 3 months of storage.

• Storage temperature range: -20℃ ~ 45℃ for no more than 1 month; 0 ~ 35℃ for no more than 1 year.

• Humidity range: 0 ~ 95% non-condensing. It cannot be installed when there is moisture condensation on the battery interface.

• The device should be stored in a cool place out of direct sunlight.

• Equipment storage should be away from flammable, explosive, corrosive and other items.

• The device must not be exposed to rain.

| Failure phenomenon | Possible causes | |
|---|---|---|
| BMS cannot be activated | Whether the weak current switch of the BMs is turned on;<br>Module serial connection connection error | Check the connection line and install it according to the method described in the installation manual |
| BMS red light is always on | Red light warning, existence failure | Locate the fault point according to the method described in the above table:<br>1.voltage sensor failure/temperature sensor failure: check whether the sampling line is connected correctly, you can replace the sampling line fortroubleshooting; restart to observe whether it is restored<br>2.charging circuitfailure,dischargingcircuit failure: contact the manufacturer for consultation<br>3. Battery failure: check whether the connection of the Sampling terminal is normal: check whether the voltage value of all modules is within the voltage range in the manual after turning off the BMS:observe whether it is cleared after restarting,otherwise contact the manufacturer<br>4. sampling IC signal failure: check whether the voltage sampling line is connected properly, you can replace the sampling line for troubleshooting:observe whether it is restored after restarting: contact the manufacturer if it is not |
| BMS cannot communicate with dynamic ring | 1 .The BMS aid code address is different from the address of the dynamic loop query<br>2. when multiple units are connected in parallel,they cannot communicate normally<br>3. The communication serial port setting is incorrect<br>4. RS485 communication linesequence is incorrect<br>5. Abnormal physical connection | 1. Detect and reset the RMS dialing address<br>2. when multiple units are connected in parallel,different addresses need to be set, and the dialing address of each product should be reset according to the address of the dynamic loop<br>3.set the correct serial port configuration according to our communication protocol<br>4.connect the communication line correctly as described in the installation manual<br>5.check that the physical connection of the communication circuit is normal |

# 05 System installation

## 5.1 Installation environment

• The battery system must be installed on a ground with sufficient load-bearing capacity and flatness; if the ground does not have sufficient support and flatness, other measures to ensure (such as making foundation, adding load-bearing boards, etc.).

• The battery system works best in a temperature environment of 20-40℃ .

• Avoid installing in direct heat, rain environment.

• Avoid installing near high-temperature heat sources or low-temperature cold sources.

• Avoid installation in areas with extreme changes in ambient temperature.

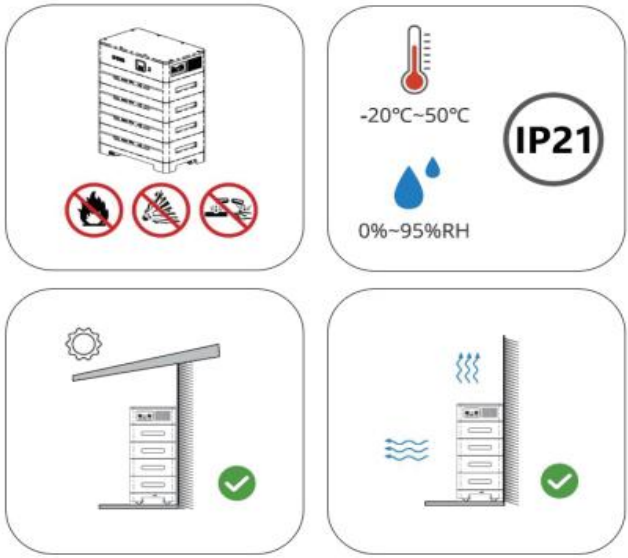
• Avoid installing in strong interference environment.

• Avoid installing in places where children can touch.

• Avoid installing in areas prone to water accumulation.

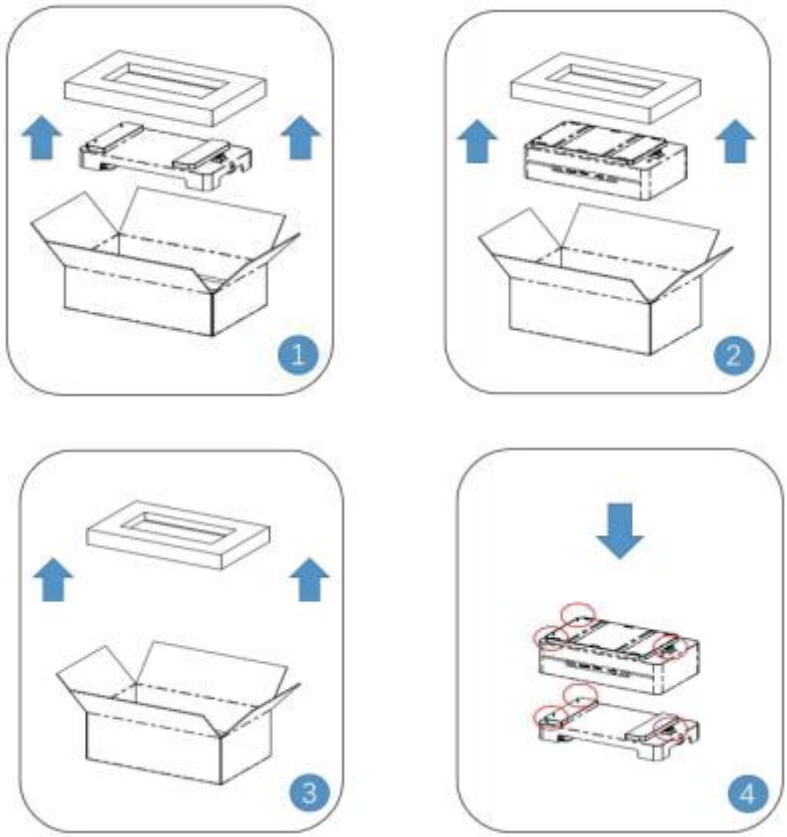
• Do not place flammable, explosive, or corrosive items around the device.

## 5.2 Location requirements



## 5.3 Installing the battery system

- Before installation, check that the ground is flat and not inclined.
- Make sure that the base rollers are vertical to the ground and lock the rollers so that they cannot slide.
- Make sure the base is against a wall and positioned with the blind-mate connector on the base on the right.
- Make sure that all battery modules are placed against the wall and that the blind-mating connectors on the batteries correspond to the blind-mating connectors on the base when placed.
- When placing the upper battery module, make sure that the upper and lower positioning pins are aligned with the blind mating connectors.
- Be careful not to drop the battery module.



# Technical parameters

| General Specifications | | | | |
|---|---|---|---|---|
| Model | XES51104 | XES51208 | XES51312 | XES51416 |
| Layers | 1 Layer | 2 Layers | 3 Layers | 4 Layers |
| Capacity | 5 .3KWh | 10 .6KWh | 15.9KWh | 21.2KWh |
| Dimensions (L*W*H) | 680*400*430mm | 680*400*592mm | 680*400*754mm | 680*400*916mm |
| Weight | 60KG | 105KG | 150KG | 195KG |
| Storage temperature | -20°C～45°C | | | |
| Relative humidity | 5% ～95% | | | |
| Operating temperature | -10°C ～55°C | | | |
| Degree of protection | IP21 (indoor) | | | |
| Topology | Natural convection and fan cooling | | | |
| Communication Interface | CAN/RS485 | | | |
| Installation method | Floor-standing/Mobile | | | |
| Protective function | Short circuit protection, overload protection,ground fault protection, surge protection | | | |
| | Battery Module Specifications (Single layer) | | | |
| Battery rated voltage | 51.2V | | | |
| Battery voltage range | 40-60V | | | |
| Maximum discharge current | 100A | | | |
| Maximum charging current | 100A | | | |
| Energy capacity | 5.32KWh | | | |
| Battery Type | Lithium Iron Phosphate (LiFePO4) | | | |
| Cycle life | 6000 times (25℃, 0.3C, 80%DOD, >60%C25℃) | | | |
| Working voltage range | 44.8-57.6V | | | |
| Internal impedance | ≤ 20mΩ | | | |