



HOPETREK

ESS-LB5 Series

Low-Voltage Wall-Mount Energy Storage Battery System User Manual



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Contents

1 Disclaimer and Safety Warnings	1
1.1 Disclaimer	1
1.2 Safety Warnings	2
1.2.1 General Safety Requirements	2
1.2.2 Operator Requirements	2
1.2.3 Electrical Safety	2
1.2.4 Emergency Measures	3
1.2.5 Battery Recycling	4
1.2.6 Warning Labels and Signs	4
2 Product Introduction	5
2.1 Product Introduction	5
2.2 Product Overview	5
2.2.1 Dimensions	5
2.2.2 Interfaces and Indicator Lights	6
3 Device Inspection and Storage	9
3.1 Delivery Inspection	9
3.2 Packing List	9
3.3 Device Storage	10
3.4 Device Transportation	10
4 Device Installation	11
4.1 Installation Preparation	11
4.2 Device Installation	12
5 Electrical Connection	14
5.1 Connect the Grounding Cable	14
5.2 Connect Power Cable and Communication Cable	15
5.2.1 Method 1	15
5.2.2 Method 2	15
6 System Commissioning	17
6.1 Pre-Power-On Inspection	17

6.2 System Power-On17

6.3 System Power-Off.....17

7 System Maintenance18

7.1 Routine Maintenance18

7.2 Troubleshooting18

7.3 After-sales Service20

8 Technical Specifications.....21

1 Disclaimer and Safety Warnings

1.1 Disclaimer

Copyright Statement

No part of this manual may be copied, reproduced, translated or distributed in any form or by any means without prior consent in writing from our company (referred to as us hereafter).

About This Manual

- This manual is intended for multiple product models, and the photos, illustrations, descriptions, etc., in this manual may be different from the actual appearances, functions, features, etc., of the product.
- Despite our best efforts, technical or typographical errors may exist in this manual. Our company cannot be held responsible for any such errors and reserves the right to change the manual without prior notice.
- Users are fully responsible for the damages and losses that arise due to improper operation.
- Our company reserves the right to change any information in this manual without any prior notice or indication. Due to such reasons as product version upgrade or regulatory requirement of relevant regions, this manual will be periodically updated.

Disclaimer of Liability

- Before installing, operating, or maintaining the device, please read the manual and follow all safety precautions indicated on the device and in the manual.
- This device should be used in an environment that meets the design specifications; otherwise, it may cause malfunctions, leading to device failure, personal injury, or property damage, which are not covered under the product warranty.
- Our company does not warrant that its software is free from defects or that customers will not encounter any issues or interruptions when using the software.
- Our company, as well as its partners or suppliers, shall not be liable under the warranty terms for any data loss and any direct or indirect financial losses caused by the product's inability to function or business interruptions.
- Under no circumstances (including where explicitly agreed upon through contracts or other forms), shall the maximum compensation payable by our company and its partners or suppliers for losses incurred by the customer due to their liability exceed the amount paid by the customer for the purchase of the product.
- Our company has the final authority to interpret the warranty policy and can make necessary changes to the warranty information, product performance, or policy specifications without notifying the customers.

LVD/EMC Directive



This product complies with the European Low Voltage Directive 2014/35/EU and EMC Directive 2014/30/EU.

WEEE Directive-2012/19/EU



The product this manual refers to is covered by the Waste Electrical & Electronic Equipment (WEEE) Directive and must be disposed of in a responsible manner.

Battery Regulation- (EU) 2023/1542



Battery in the product complies with the European Battery Regulation (EU) 2023/1542. For proper recycling, return the battery to your supplier or to a designated collection point.

1.2 Safety Warnings

1.2.1 General Safety Requirements

- When transporting, installing, or maintaining the device, comply with the laws, regulations, and relevant standards of the region.
- Any signs of damage found during transportation, installation, or use should be repaired promptly; do not leave the damaged part exposed to the outdoor environment for an extended period.
- Follow the warning labels on the device and implement appropriate protective measures. Do not alter, cover, or damage the labels and markers on the device.
- Avoid outdoor installation or operation during severe weather conditions such as thunderstorms, rain, snow, or high winds.
- Keep the battery away from children and animals.
- Use tools properly to avoid personal injury and device damage. Use proper personal protective equipment during the installation.
- Measure the voltage at contact points before touching any conductors or terminals; do not perform installation, wiring, or maintenance operations while the device is powered.
- Obtain the necessary electrical permits from the local authority before connecting the device to the grid.
- After completing installation, clean the installation area and dispose of the packaging materials properly. It is forbidden to place flammable and explosive materials near the device.
- Ensure that the device is properly grounded and that all cables are securely connected before using it.
- Do not touch the casing during operation or malfunction. The high temperature of the casing may cause burns.
- Do not disassemble, modify the product, or alter the software code without authorization from the manufacturer.
- Do not clean the device with water.
- In case of fire, evacuate the area immediately and contact the fire department.

1.2.2 Operator Requirements

- Operators responsible for the installation and maintenance of this device must undergo rigorous training and master the correct operating methods.
- Operators should be thoroughly familiar with the entire photovoltaic grid-connected power generation system, its working principles, and relevant standards in the region.
- When operating the device, operators must use insulated tools and wear personal protective equipment to ensure safety. When handling electronic components, operators should wear anti-static gloves, anti-static wristbands, and anti-static clothing to protect the device from static damage.

1.2.3 Electrical Safety

Grounding Safety Requirements

- When wiring the device, complete the grounding operation first; when disconnecting, remove the ground wire last.
- The device must maintain its grounding status after installation, regardless of whether it is powered on.
- Before operating the device, check the reliability of the grounding.

Inverter Safety Requirements

- Inverters are high-voltage products and must be handled with caution.
- Use special insulated tools during cable connections.

- Pay attention to and follow the warning labels on the product, and strictly adhere to the safety instructions.
- Rigorously follow all safety instructions listed in this manual and other related documents.

Photovoltaic Safety Requirements

- Operators must wear appropriate personal protective equipment during electrical connections.
- Before installing the device, carefully read the documentation for the PV strings to understand the product and precautions, and strictly follow all safety instructions.
- Ensure that the module frames and mounting system are properly grounded.
- Use the PV connectors included in the packaging. Using different models of PV connectors may lead to severe consequences; any resulting damage to the device is not the manufacturer's responsibility.
- Use a multimeter to measure the DC cable's positive and negative terminals, ensuring correct polarity and that the voltage is within the inverter's allowable range.

Battery Safety Requirements

- Batteries used with the inverter must pass the compatibility test conducted by the inverter manufacturer.
- Before installing the device, carefully read the battery's user manual to understand the product and precautions, and strictly follow all safety instructions.
- Operators must wear appropriate personal protective equipment during electrical connections.
- Disconnect the battery from all power sources and ensure it is turned off before performing any operations on it.
- Use a multimeter to measure the DC cable's positive and negative terminals, ensuring correct polarity and that the voltage is within the inverter's allowable range.
- Avoid impacts, tilting, standing, or sitting on the battery.
- If a battery short-circuits, the instantaneous current can become extremely high, releasing a large amount of energy that may cause fires and personal injury.
- There is a lethal voltage at the battery terminals and the connections to the inverter. Check the cable insulation and connections to prevent exposure to metal parts, which could lead to severe injuries or death.
- If the battery fails to start, contact the after-sales service center as soon as possible, otherwise, it may become permanently damaged.

1.2.4 Emergency Measures

Battery electrolyte leakage

- Inhalation of gas: Evacuate the contaminated area and seek immediate medical assistance.
- Eye contact: Rinse with clean water for at least 15 minutes and seek immediate medical assistance.
- Skin contact: Thoroughly wash the affected area with soap and clean water and seek immediate medical assistance.
- Ingestion: Induce vomiting and seek immediate medical assistance.

Fire

Improper operations such as short-circuiting the positive and negative terminals of the battery may result in overheating, fire, toxic and harmful gases.

- Carbon dioxide fire extinguishers should be equipped near the device in case of fire.
- Do not use dry powder fire extinguishers.

1.2.5 Battery Recycling

- Do not dispose of the batteries as household waste. You have a legal obligation to return old batteries.
- Waste batteries may contain pollutants. Improper storage or disposal can cause environmental and health hazards.
- Batteries contain important raw materials such as iron and lithium, which can be recycled and reused.

1.2.6 Warning Labels and Signs

Label	Description
	High voltage warning. This product must be handled carefully only by qualified professionals.
	Be cautious of electrolyte leakage. The electrolyte is corrosive.
	Do not step on this product. It will cause device damage.
	Keep the product away from fire.
	Be sure to wear protective gloves when handling or installing the product.
	Please read the user manual carefully before operation.

2 Product Introduction

2.1 Product Introduction

Introduction

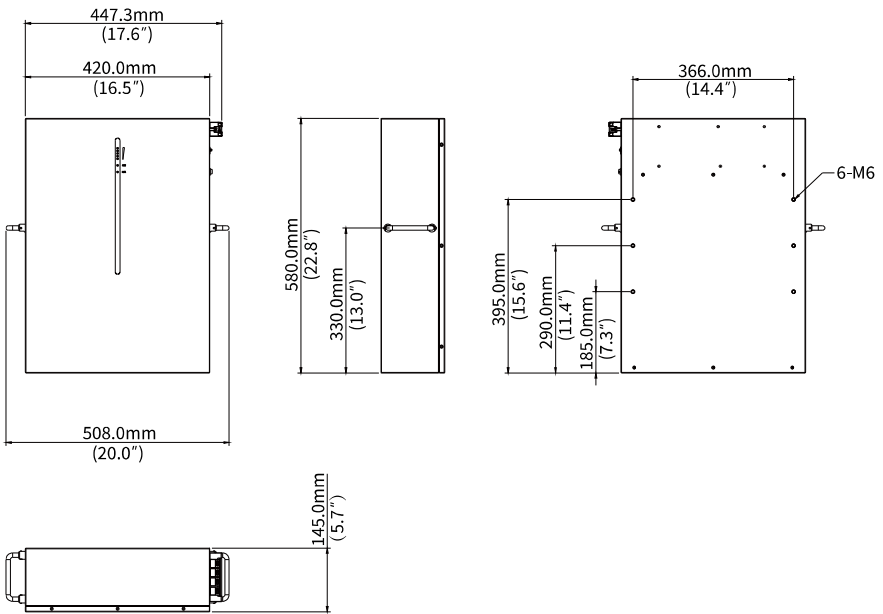
This product is a low-voltage wall-mount energy storage battery system for energy storage and management for higher energy utilization efficiency. This product adopts a modular design and supports up to 16 batteries connected in parallel, with each battery having a capacity of 5.12kWh.

Applicable Models

This manual is applicable to the battery model ESS-LB5-W01.

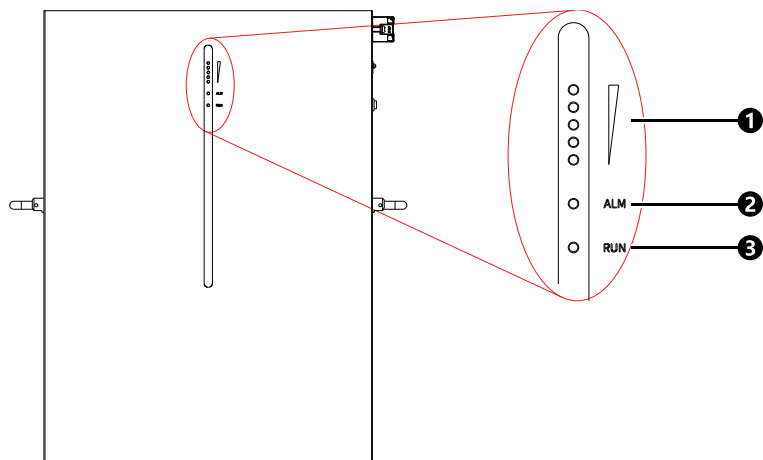
2.2 Product Overview

2.2.1 Dimensions



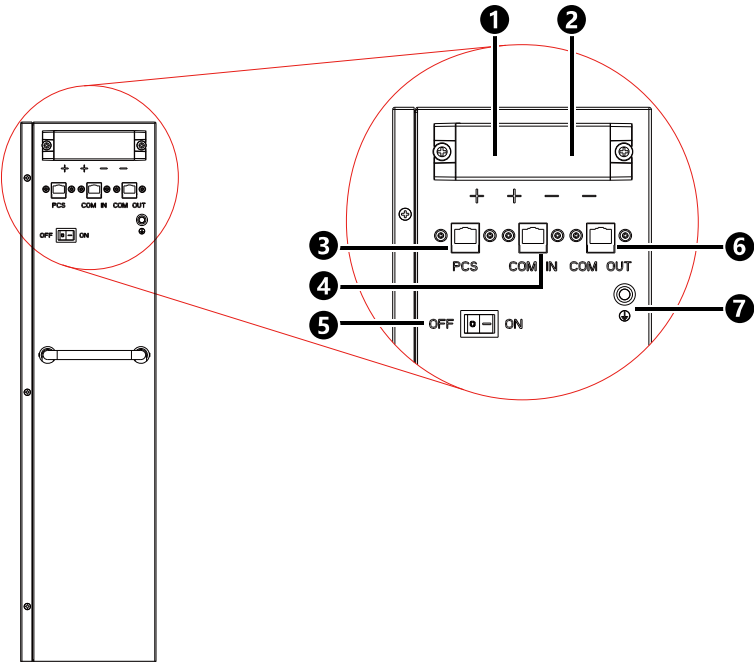
2.2.2 Interfaces and Indicator Lights

Figure 2-1 Indicator Lights



No.	Indicator Light	Description
❶	SOC	Battery indicator light
❷	ALM	Alarm indicator light
❸	RUN	Status indicator light

Figure 2-2 Interfaces



No.	Interface	Description
1	BAT+	Positive terminal of battery
2	BAT-	Negative terminal of battery
3	PCS	BMS communication interface for inverter connection
4	COM IN	Used for inter-battery pack communication, connecting to the COM OUT interface of the previous battery pack.
5	Power button	Power on/off switch of battery
6	COM OUT	Used for inter-battery pack communication, connecting to the COM IN interface of the next battery pack.
7	Grounding	Grounding protection

Definitions of Communication Interfaces

PCS		COM IN		COM OUT	
1	-	1	DI+	1	DO+
2	-	2	DI-	2	DO-
3	-	3	-	3	-
4	CANH	4	-	4	-
5	CANL	5	-	5	-
6	-	6	-	6	-
7	-	7	485A	7	485A
8	-	8	485B	8	485B

Indicator Light Status

Indicator	System Status	Indicator Light Status
Status indicator	Standby	RUN light off, ALM light off, SOC light on
	Charging	RUN light on, ALM light off, last SOC light blinking
	Discharging	RUN light on, ALM light off, SOC light on
	Protection	RUN light off, ALM light on, SOC light on
	Low battery	RUN light blinking, other indicators follow standby, charging, discharging, or protection states
Power indicator	Charging	SOC light: Only 1 blinking: $0\% \leq \text{SOC} \leq 20\%$ 1 light on, 1 blinking: $20\% < \text{SOC} \leq 40\%$ 2 lights on, 1 blinking: $40\% < \text{SOC} \leq 60\%$ 3 lights on, 1 blinking: $60\% < \text{SOC} \leq 80\%$ 4 lights on, 1 blinking: $80\% < \text{SOC} \leq 100\%$
	Discharging, standby, alarm	SOC light: Off: 0% 1 light on: $0\% < \text{SOC} \leq 20\%$ 2 lights on: $20\% < \text{SOC} \leq 40\%$ 3 lights on: $40\% < \text{SOC} \leq 60\%$ 4 lights on: $60\% < \text{SOC} \leq 80\%$ 5 lights on: $80\% < \text{SOC} \leq 100\%$
	Sleep	The light board stops supplying power, and the five SOC lights are off.

3 Device Inspection and Storage

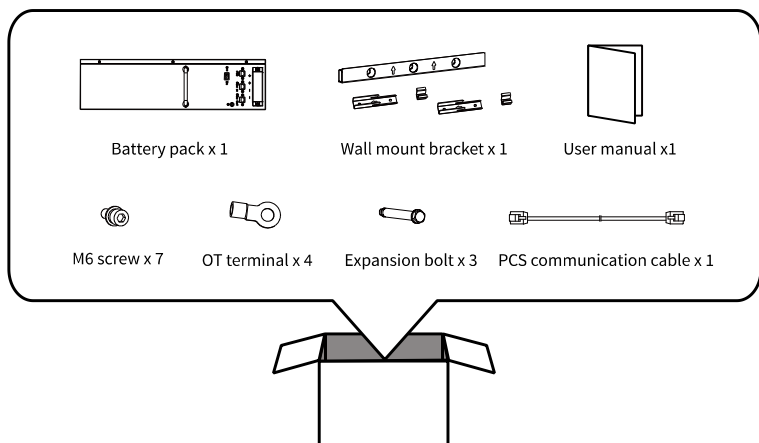
3.1 Delivery Inspection

After receiving the product, please carefully check the following items. If any issues are found, please contact customer service in a timely manner:

- Check the outer packaging of the product for any damage, including compression, deformation, cracks, holes, etc., as these could potentially affect the device inside.
- Ensure that the product model matches the order model. If there is a discrepancy, do not open the packaging.
- Check if the types and quantities of accessories inside the packaging match the contents listed on the packing list, and check for any damage.

3.2 Packing List

The package contents may vary with device model and version.



CAUTION!

- The battery pack is heavy. Please handle it with care when removing it from the packaging.
- The cable package for the inverter and battery packs is not supplied. Please purchase separately as needed.

3.3 Device Storage



WARNING!

Before storing the device, ensure that the battery system is powered off, the circuit breaker is open, and the power button is in the off position.

If the system will not be used immediately or will be stored for a long time, follow these requirements for storage:

- When storing the battery packs, place them according to the labels on the packaging box. Do not put the batteries upside down or randomly.
- When stacking cartons, please follow the instructions on the outer packaging.
- Handle the battery packs with care to avoid damage.
- If the batteries have been unpacked but not installed, put the battery packs back into the packaging box.
- The device should be stored in a cool place and avoid direct sunlight.
- Keep the device away from flammable and explosive materials.
- If the batteries are not used for a long time, you need to charge the battery to 50% every six months. The recommended storage conditions: 0°C~35°C, RH ≤ 60%.

3.4 Device Transportation



WARNING!

Improper transportation can lead to personal injury. Please strictly adhere to the following guidelines.

- Comply with the relevant national road regulations when transporting.
- Do not smoke during vehicle transportation or loading/unloading processes. In accordance with the regulations for the road transportation of dangerous goods, two compliant carbon dioxide fire extinguishers must be equipped in the vehicle.
- When transporting the battery system, place it flat and avoid tilting or inverting it. To prevent sliding inside the vehicle, use restraints to secure it.
- Avoid unpacking the transportation packaging before reaching the destination.
- Due to the heavy weight of the battery pack, it may crush accessories during transportation. When loading/unloading, please wear protective gloves and shoes to avoid injury.

4 Device Installation

4.1 Installation Preparation

Environment Requirements

- Do not install the device in easily accessible areas or near children's activity zones.
- Flammables and explosives must be kept away from the device; independent fire alarm devices must be provided.
- Do not expose the battery pack to sunlight or near any heat sources.
- Do not install the device in areas prone to water accumulation. Do not expose the device to rain.
- The device should be installed in a place with sufficient load-bearing capacity and levelness, and should not be tilted, laid down, or placed upside down.
- The optimal operating condition of the device is at an ambient temperature of around 25°C. Operation in high temperatures should be avoided.
- The installation altitude of the device should not exceed 2000m.
- Sufficient space should be kept around the device for efficient ventilation and heat dissipation.

Tools



Safety gloves



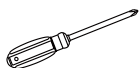
Safety goggles



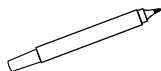
Safety shoes



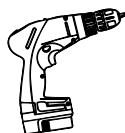
Dust mask



Phillips screwdriver



Marker



Hammer drill

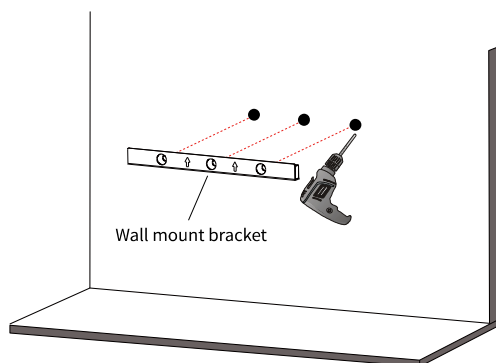


Hex key

4.2 Device Installation

1. Install the wall mount bracket.

- (1) Determine the hole positions on the wall according to the three holes on the wall mount bracket. Choose a drill bit with a diameter that matches the outer diameter of the expansion bolts. Drill holes in the wall, ensuring the hole depth matches the length of the expansion bolts.

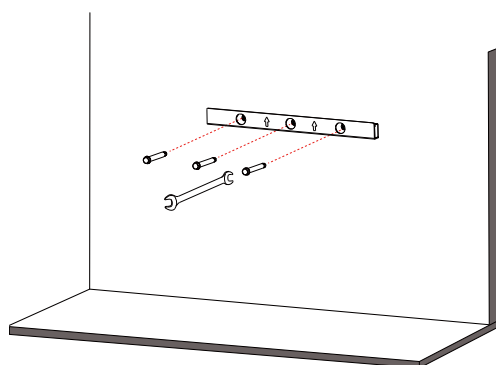


- (2) Align the bracket with the holes on the wall, insert the three expansion bolts into the holes, and tighten using a wrench.

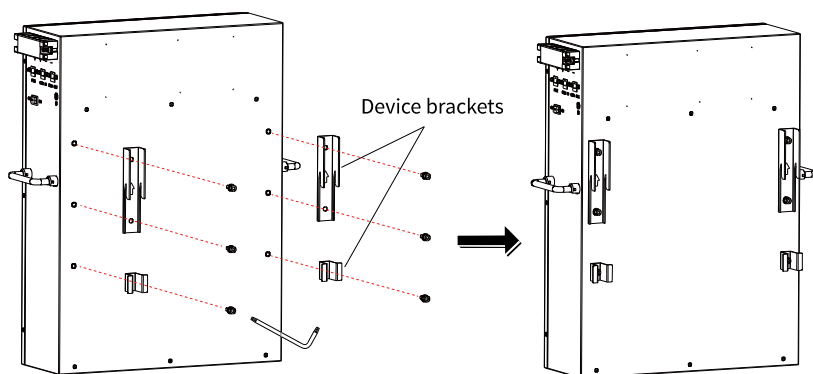


CAUTION!

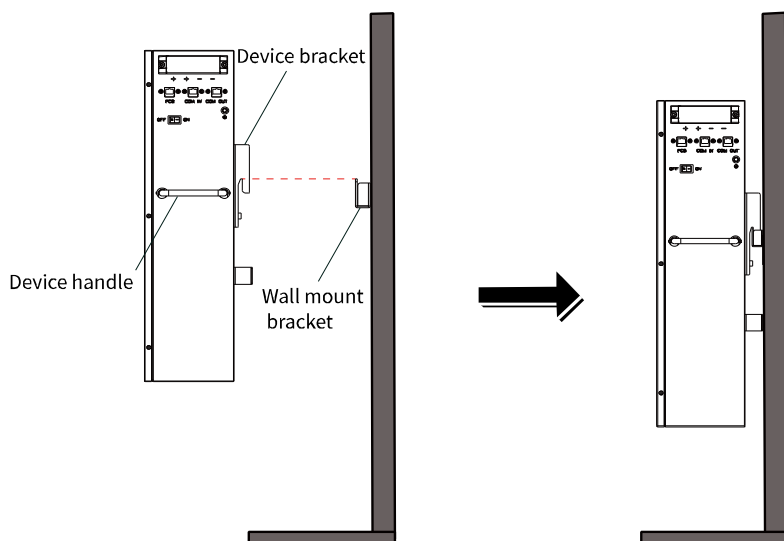
- Install the wall mount bracket with the arrows facing upwards.
- You may also use a socket wrench to install the bracket.



2. Install device brackets. Attach both brackets to the device and tighten all six M6 screws using the hex key.



3. Mount the device on the wall. Lift the device by holding the two handles, align the two brackets with the wall mount bracket, and slot them into place as shown below.



5 Electrical Connection

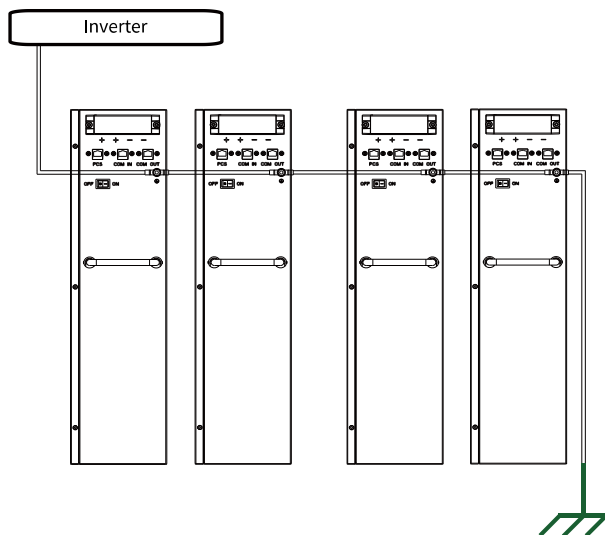


CAUTION!

- Choose the appropriate wiring method based on the actual condition.
- Before making electrical connections, ensure that this product is intact. Any damage may pose a risk of danger.
- Before making electrical connections, ensure that all battery switches and all switches connected to the inverter are in the OFF position. Failure to do so may result in electrical shock.
- All operations for electrical connections and the specifications of the cables used must comply with local laws and regulations.
- Improper actions during the wiring process can cause fatal injury to the operator or irreversible damage to this product. Contact a professional for wiring operations.
- Cables must not be intertwined with each other or arranged in a crisscross pattern.

5.1 Connect the Grounding Cable

Use the grounding cable to connect the grounding port of each battery pack. The first battery pack should also be connected to the grounding port of the inverter.



NOTE!

It is recommended to use 10AWG cables for grounding.

5.2 Connect Power Cable and Communication Cable

1. Flip open the positive and negative terminal protective covers upward on the battery pack.
2. Connect the power cables.
3. Connect the communication cables.
4. Close the protective cover of all the battery pack.

Different energy storage systems have different installation methods. Refer to the following two installation methods for details.

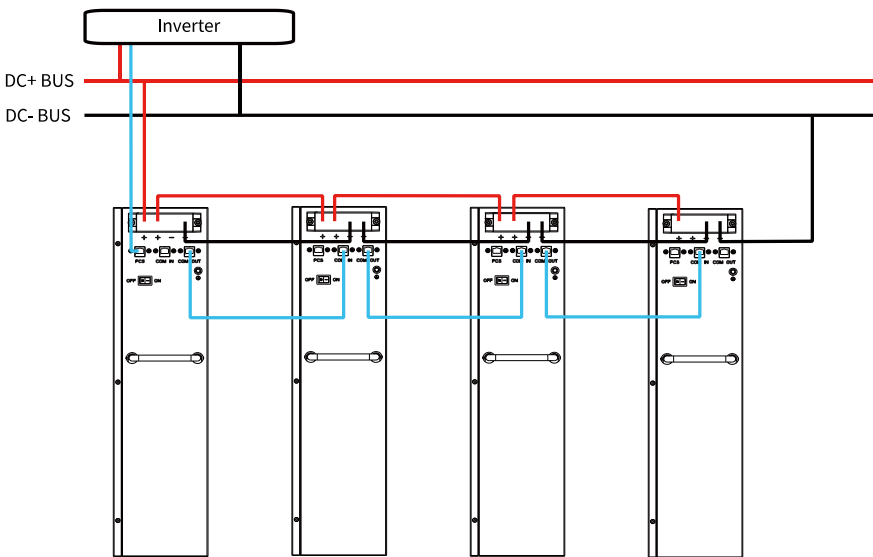
5.2.1 Method 1

Before connecting using this method, ensure that the maximum working current of the inverter in the system does not exceed 100A.



CAUTION!

If the maximum current handled by the inverter exceeds 100A, choose Method 2.



NOTE!

It is recommended to use 4AWG cables for power connections.

5.2.2 Method 2

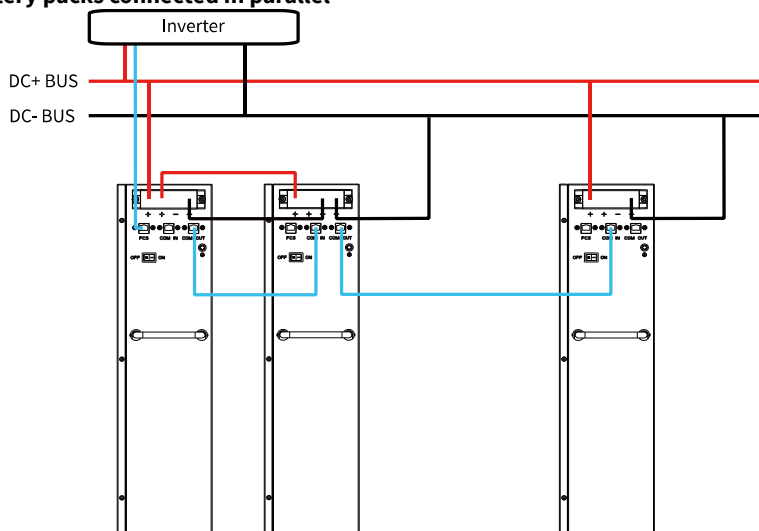
If the inverter's maximum operating current in the system exceeds 100A, please install according to the following method. The diagrams illustrate configurations for 3, 4, and 6 battery packs. Adjust accordingly based on your actual requirements.



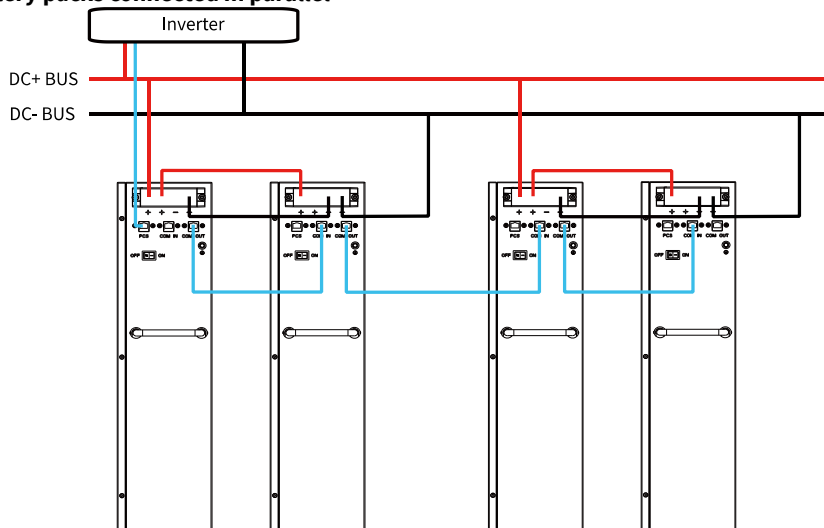
CAUTION!

A maximum of 2 battery packs form a group, and each group of battery packs requires one set of PCS cables.

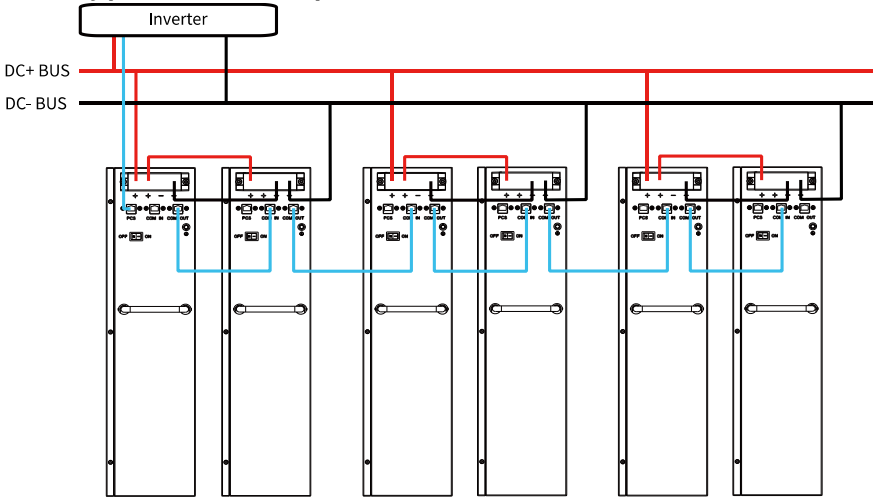
3 battery packs connected in parallel



4 battery packs connected in parallel



6 battery packs connected in parallel



6 System Commissioning

6.1 Pre-Power-On Inspection

Before powering on the system, ensure the following items have been checked:

- The device is installed correctly, and the installation environment meets the requirements.
- The cables are arranged appropriately according to the specifications.
- Cable ties are fastened neatly, evenly distributed, and there are no sharp edges on the cut ends.
- Grounding, power, and communication cables are connected correctly and securely.
- The power button is in the OFF position.

6.2 System Power-On

Turn on the power switch of all battery packs that are not connected to the inverter's communication interface, and then turn on the power switch of the battery pack connected to the inverter's communication interface.

6.3 System Power-Off

Turn off the power switches of all battery packs.

7 System Maintenance

When one or more battery packs in the system become unusable, the faulty battery/batteries should be removed from the system, and the remaining battery packs can be reconnected for normal operation.

7.1 Routine Maintenance



NOTE!

It is recommended to fully charge the battery at least once a month.

- To ensure the long-term stable operation of the system, it is recommended to perform a routine maintenance every six months.
- Check for obstacles, dust, dirt, or debris on the battery pack; clean them immediately if found.
- Clean with a dry cloth to avoid moisture contact with the battery pack.
- Check if the battery pack is loosely installed.
- Check the exterior of the battery pack for any deformation or damage.
- During the operation of the battery pack, check for any abnormal noises.
- Check that all operation parameters for the battery pack are set correctly.
- Check that all terminals are securely connected.
- Check the exposed wires for signs of wear.
- Check that the grounding is secure.

7.2 Troubleshooting

Fault information can be viewed through the SOC sequence. When a fault occurs, both the ALM and SOC lights remain on; if multiple faults are present, the SOC will cycle through them.



CAUTION!

If a fault occurs in the battery system, please contact after-sales service for assistance. It is not recommended to handle the issue on your own.

Error	Low battery voltage	Abnormal cell voltage difference	Low system voltage
	High charge current	High discharge current	Internal communication error
	Pre-charge error	Battery temperature error	AFE error
	Battery voltage error	Charging MOS error	Discharging MOS error
	High MOS temperature	Overcurrent lockout	MOS temperature error
	Battery deeply discharged	Short circuit protection	
Solution	- Turn off the system power and wait for 5-10 minutes. - Check the battery pack and cables for any damage. - Check that the system wiring is correct. - After the above items are checked correct, turn on the system power. - If the alarm persists, please contact technical support.		

Error	High battery discharge temperature	Low battery discharge temperature	High battery charge temperature
	Low battery charge temperature	Abnormal cell temperature difference	
Solution	- Check whether the ambient temperature at the installation site is within the permissible operating temperature range for the device. - If there is no ventilation or the ambient temperature is too high, enhance ventilation and cooling; if the ambient temperature is too low, increase the ambient temperature or change the installation location. - If the ambient temperature is normal, please contact technical support.		

7.3 After-sales Service

We provide comprehensive technical support and after-sales service to our customers. The free warranty period is subject to the contract provisions.

The following situations are not covered by our free warranty:

- Failure to operate according to the instructions and caused system damage or malfunction.
- Failure to connect and power the system according to relevant electrical safety regulations, or damage or malfunction due to poor site environment.
- System damage or malfunction caused by unauthorized modifications by the user.
- System damage or malfunction caused by force majeure events such as typhoons, earthquakes, floods, fires, or adverse environmental conditions (such as high temperature, low temperature, high humidity, acid rain, etc.).
- After a fault occurred, the user failed to maintain the initial fault status and proceeded to handle the fault without promptly notifying the manufacturer, resulting in the inability to identify the original fault.
- Power loss or device damage caused by failure to store in accordance with the instructions.

8 Technical Specifications

Model	ESS-LB5-W01
System rated energy (kWh)	5.12
Battery type	LFP(LiFePO ₄)
Rated voltage (V)	51.2
Operating voltage (V)	43.2~58.4
Rated continuous charge/discharge current (A)	50/50
Maximum continuous charge/discharge current (A)	50/50
Charge temperature (°C)	0~55
Discharge temperature(°C)	-20~55
Operating humidity (RH)	20%~90%
Storage temperature (°C)	-20~60
Storage humidity (RH)	5%~95%
Altitude (m)	≤2000
PCS communication method	CAN
Cooling	Passive cooling
Ingress protection rating	IP20
Electrical protection rating	I
Installation	Wall mount bracket
Dimensions (W*H*D, mm)	420*580*145
Weight (kg)	44.6
Certification	UN38.3

Company: Zhejiang Uniview Technologies Co., Ltd.

Manufacturing Company: HopeTrek Innovations Co., Ltd.

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