Dear Valued Customer,
Thank you for choosing our products! Before using this product, we kindly ask you to carefully read this manual. It contains important information and recommendations regarding installation, usage, and more. Please keep this manual in a safe place for future reference.
Please note that any updates to product specifications may occur without prior notification.

PHYLION

PHYLION

USER MANUAL

BDB-2.76L
BALCONY ENERGY STORAGE BATTERY for PLUG &PLAY SOLAR SYSTEM

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1. Manual Overview

1.1 This manual applies to the wall-mounted, floor-standing integrated power supply, 51.2V/54Ah series, produced by Phylion Battery Co., Ltd., designed for DIY energy storage applications.

1.2 Target Audience

This manual is intended for end users. No specific qualifications are required to operate the product, and it can be used by the end users themselves. However, users should be familiar with the following:

(1) Understand the basic operation of the battery product.

(2)Follow the instructions provided in this manual and adhere to all safety guidelines.

1.3 Safety Guidelines

To ensure safety, installation personnel must familiarize themselves with this manual's content and all warnings before proceeding.

⚠ Warnings

(1) Environmental Requirements:

- Do not expose the battery to temperatures exceeding 60°C;
- Avoid placing the battery near heat sources;
- Prevent the battery from being exposed to moisture or liquids;
- Do not expose the battery to environments containing corrosive gases or liquids;
- Avoid prolonged exposure to direct sunlight;
- Place the battery in a secure location, away from children and pets;
- Do not place objects on top of the battery.

(2) Operational Precautions:

- Due to the battery's weight, at least two people are required for handling and installation to prevent accidents or injuries;
- This product is a low-voltage device and should not be connected in series;
- Do not disassemble the battery yourself;
- Avoid direct contact with the battery terminals using conductive materials;
- Do not touch electrical appliances with wet hands;
- Avoid squeezing, dropping, or puncturing the battery;
- Comply with local safety regulations when handling the product;
- Follow the user manual's guidelines for battery storage;
- Do not short-circuit the battery. Before installation or transportation, remove all jewelry that could cause a short circuit;
- Do not use batteries that are severely damaged or deformed;
- Before installation and maintenance, disconnect the battery from the power source/load and turn off the battery power;
- During storage or transportation, avoid stacking batteries.

Note that the battery experiences self-discharge. If unused for an extended period, turn off all switches and recharge the battery every 6 months.

2. Product Introduction

This product is a 51.2V DC battery system designed for DIY energy storage applications. When used in conjunction with inverters and other equipment, it forms a complete system that meets the daily energy consumption needs of households.

2.1 Functional Characteristics

• Utilizes lithium iron phosphate (LiFePO4) batteries known for high safety performance;

• Equipped with comprehensive protective functions;

• Incorporates high-precision voltage and current sampling, as well as SOC (State of Charge) estimation capabilities.

2.2. Product Overview

3. Installation Instructions

3.1 Unboxing and Inspection

(1) Open the device packaging and inspect the following components: main unit, floor stand, screws, power and communication cables (optional wall-mounted accessories: hanging bracket, clamp plate, 8 M5 screws, and 4 expansion screws).

(2) Check the device for any damage incurred during transportation. If any damage or missing parts are identified, do not power on the device. Immediately notify the carrier and distributor.

3.2 Precautions for Installation and Storage

(1) The device can be installed by the user or by professional installers.

(2) The battery can be mounted on a solid wall or placed on the floor.

(3)During transportation, ensure proper protective measures are taken. If the device has been moved from a low-temperature to a high-temperature environment, condensation may form. Allow the device to fully dry before use to ensure safety.

(4) Do not expose the device to extreme environments such as high humidity, flammable or explosive conditions, or excessive dust accumulation. Avoid covering or blocking ventilation openings. Maintain at least a 10 cm clearance around the device to ensure proper ventilation and heat dissipation.

(5) If the device will not be used for an extended period, ensure that all switches on the side panel are turned off.

3.3 Floor-Standing Installation Instructions

Step 1: Recommended installation clearance for battery pack, as shown in the above figure, can be reduced within practical limits.

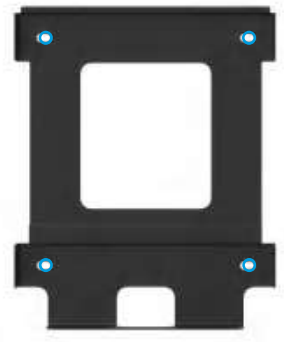
Step 2: Secure the bracket to the battery pack using 2 M5 screws from the accessory kit. Tighten the screws to a torque of 2.5 N.m.

Step 3: Determine the mounting points for the expansion bolts based on the placement location of the battery pack. The recommended drilling specifications are a hole diameter of φ10mm and a depth greater than 60mm. Once drilling is complete, use expansion bolts to securely attach the battery pack to the wall.

3.4 Wall-Mounted Installation Instructions (Optional)

Step 1: The recommended installation clearance for the battery pack, as shown in the figure above, can be reduced within practical limits based on your installation environment.

Step 2: Attach the drilling guide template to the wall and drill holes according to the positions indicated on the template. The recommended drilling specifications are a hole diameter of φ 10mm and a depth greater than 60mm.

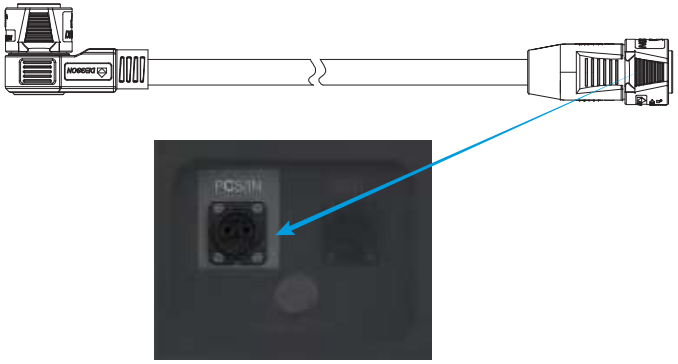


Step 3: Attach the mounting bracket to the wall using expansion bolts. Tighten the bolts to a torque of 20 N.m.

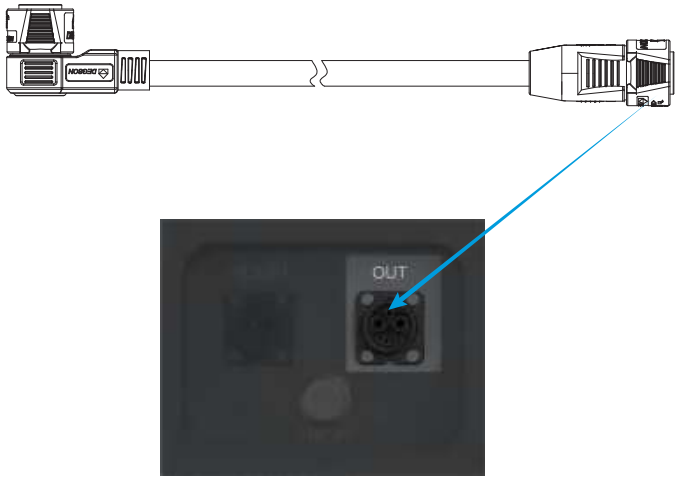
Step 4: Mount the battery pack onto the bracket using 8 M5 screws from the accessory kit. Tighten the screws to a torque of 2.5 N.m.

4. Function Description

4.1 Wiring sequence



Step 1: Connect the power and communication cable to the "PCS/IN" port on the battery and the other end to PCS.



Step 2: Connect additional power and communication cable to the "OUT" port on this battery and the other end to the "PCS/IN" port on another battery(Only For Multiple Batteries Paraller Use).

Step 3: Turn the circuit breaker key from "OFF" to "ON".

Step 4: Press the self-reset button to start battery operation.

4.2 Power off sequence

Step 1: Press and hold the self-reset button "3-6s" to turn off the battery power.

Step 2: Turn the circuit breaker key from "ON" to "OFF".

4.3 LED instructions

The device features six LED indicators. Four green LEDs indicate battery capacity, with one red LED indicating faults during alarms and protection, and one green LED indicating battery standby, charging, and discharging status.

4.3.1 Capacity indication

Status		Charge				Discharge			
Capacity indicator light		L4●	L3●	L2●	L1●	L4●	L3●	L2●	L1●
Residual capacity	0～25%	OFF	OFF	OFF	Flashing	OFF	OFF	OFF	Steady on
	25～50%	OFF	OFF	Flashing	Steady on	OFF	OFF	Steady on	Steady on
	50～75%	OFF	Flashing	Steady on	Steady on	OFF	Steady on	Steady on	Steady on
	≥75%	Flashing	Steady on	Steady on	Steady on	Steady on	Steady on	Steady on	Steady on
Operation indicator●		Steady On				Flashing			

4.3.2 State Indication

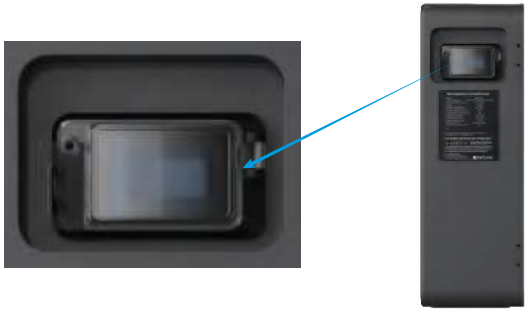
System status	Operating status	RUN	ALM	SOC				Notes
		●	●	●	●	●	●	
Power off	Sleep	OFF	OFF	OFF	OFF	OFF	OFF	All OFF
Standby	Normal	Flashing 1	OFF	OFF	OFF	OFF	OFF	standby status
Charge	Normal	Steady On	OFF	According to the battery indication				Top LED Flashing 2
	Overcurrent alarm	Steady On	Flashing 2	According to the battery indication				Top LED Flashing 2
	overvoltage protection	Flashing 1	OFF	OFF	OFF	OFF	OFF	
	Temperature, overcurrent protection	Flashing 1	Flashing 2	OFF	OFF	OFF	OFF	
Discharge	Normal	Flashing 3	OFF	According to the battery indication				According to the battery steady on indication
	Alarm	Flashing 3	Flashing 3					
	Temperature,overcurrent, short circuit protection	OFF	Steady On	OFF	OFF	OFF	OFF	Discharge stopped, forced sleep if no action after 48h offline
	undervoltage protection	OFF	OFF	OFF	OFF	OFF	OFF	Stop discharging

4.4 Sleep-Wake Function (External Switch and Circuit Breaker)

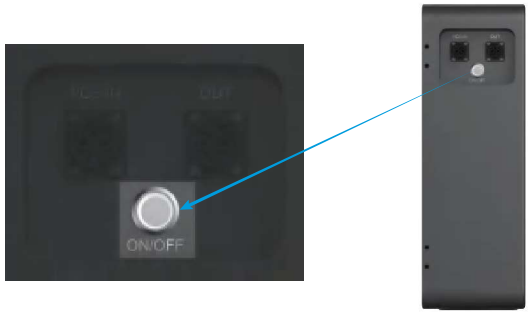
The Battery Management System (BMS) features both manual and automatic sleep functions:

Automatic Sleep: If there is no charging or discharging activity for 48 hours, the battery will automatically enter sleep mode. It will maintain communication for 1 minute upon reaching over-discharge protection before transitioning to sleep mode.

Manual sleep:



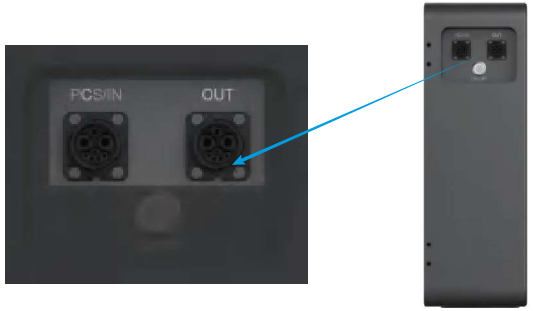
(1) Using an external circuit breaker switch, disconnect or connect the battery's positive terminal and the BMS's positive terminal. (Highest priority)



(2) Use an external switch to control power on and off. When the switch is in the closed state, the system powers on; when the switch is in the open state, the system powers off. (When the external circuit breaker is on, the battery positive terminal and the BMS positive terminal are connected).

4.5 Power Output ports

The power output ports can be directly connected to the corresponding terminals of the inverter at the backend. Once the entire system is connected, the matching function can be achieved.



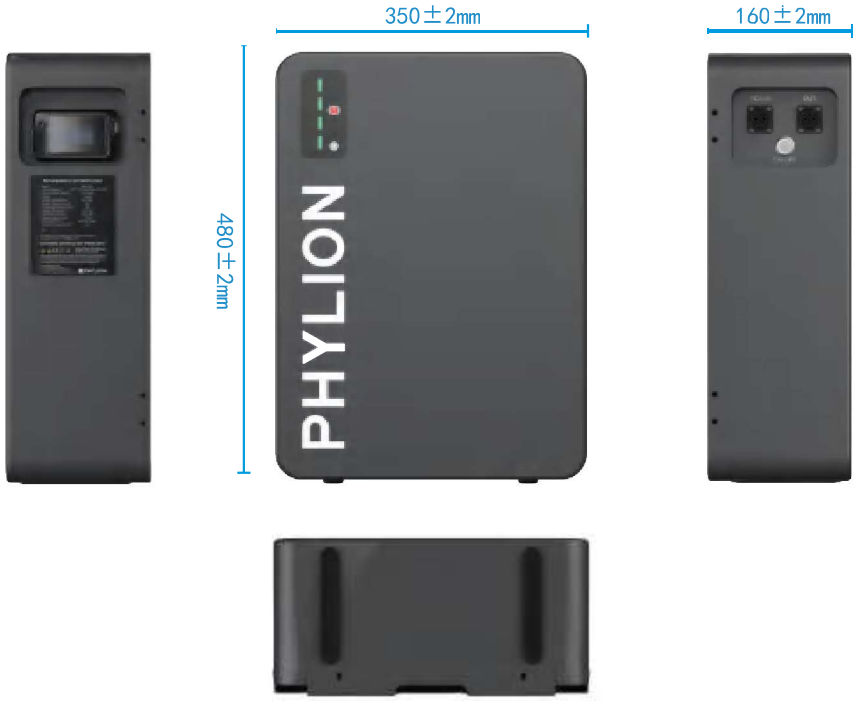
4.6 Heating film heating function

When the battery cell temperature drops below 0℃ and the battery pack is connected to an external power source for charging, the heating film will automatically initiate heating.

5. Product Specifications

NO.	Items	Parameters
1	Product model	BDB-2.76L
2	Nominal voltage	51.2V
3	Nominal capacity	54Ah
4	Voltage range	40-57.6V
5	Maximum charging current	30A
6	Maximum discharge current	20A
7	Charging temperature	– 20～55℃
8	Discharge temperature	– 20～60℃
9	Dimensions (H*W*D)	480*350*160mm
10	Ingress protection	IP 65
11	Installation method	Floor stand or wall-mounted
12	Recommend charging current	0.3C

6. Exterior Dimensions



7. Storage and Packaging

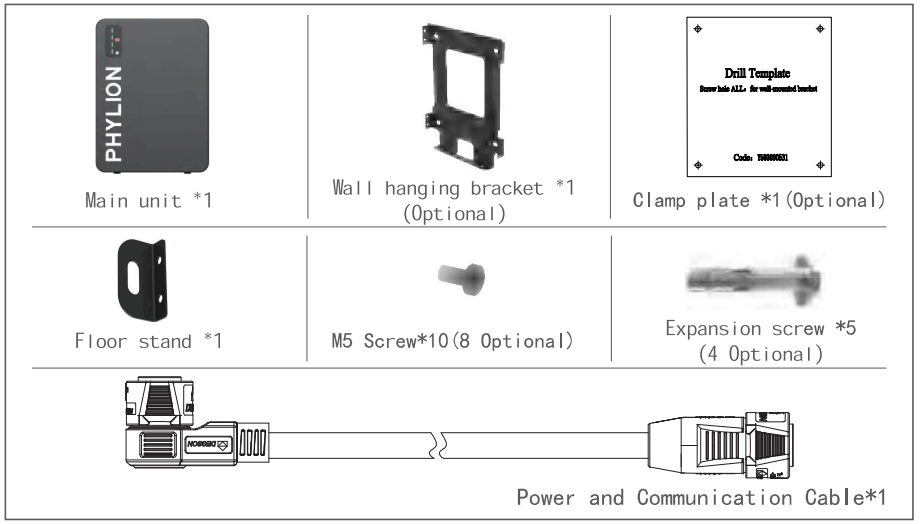
7.1 Storage environment

If the device is not immediately installed for use, please ensure that the storage environment meets the following conditions:

- Within 3 days of unboxing, if installation is not performed, it is recommended to store the device inside the packaging box.
- Storage SOC: 25-50% SOC. Perform one charge-discharge cycle every 6 months.
- Storage temperature range: Storage up to 1 month at conditions between -20℃ -0℃; Storage up to 1 year at conditions between 0℃-35℃.
- Humidity range: 0-95% non-condensing. Do not install when the battery interface exhibits moisture or condensation.
- Store the device in a shaded area, avoiding direct sunlight.
- Keep the device away from flammable, explosive, corrosive items.
- The device should be protected from rain.

7.2 Packing list

- Before opening the battery packaging, check for any damage to the external packaging and verify the battery model. If any anomalies are detected, do not open the packaging box and promptly contact the after-sales service center.
- After opening the battery packaging, verify the product delivery completeness based on the packaging information. If any anomalies are detected, promptly contact the after-sales service center.



8. Battery Recycling Instructions

Our company does not handle battery recycling. Customers should contact local recycling organizations for proper disposal.

⚠ Warnings

- If any issues arise affecting the battery or the energy storage solar system, contact after-sales personnel. Do not attempt to disassemble the unit yourself.
- If copper wires are exposed within the conductive wires, avoid contact as there is a high voltage risk. Contact after-sales personnel immediately and do not attempt to disassemble the unit yourself.
- In the event of other emergencies, promptly contact after-sales personnel. Follow their instructions or wait for on-site assistance.
- If the battery experiences over-discharge or other malfunctions that prevent its use, it will be permanently protected and cannot reset itself. Please contact the manufacturer for professional repair and handling.