Residential Energy Storage Battery Pack

User Manual

Version 1.5

Household energy storage battery pack User Manual V1.5	Date
Written by:	
Checked by:	
Approved by:	
Approved by:	

Revision Sheet

Release No.	Date	Revision Description

ENVIRONMENTAL POLICY

Service personnel are advised that when changing any parts of the system, care should be taken to dispose of those parts according to the laws and regulations of the local authorities. Where applicable, parts appropriate for recycling shall be separately collected and transferred for recycling.

TABLE OF CONTENTS

Chapter

1

1. ABOUT THIS MANUAL

1.1 PURPOSE

This document describes the product information, safety precautions, and installation procedures of the battery system. Before installing and using the product, read this manual carefully to understand the safety information and functions and features of the product.

1.2 NOTATIONS

Here are the definitions of icon warnings, precautions, and comments:

	**Equipment should be kept away from open flames or ignition sources.**
	**Keep equipment away from children.**
	**Do not use water to extinguish fires.**
	**Warning!** **Any information containing danger or warning.** **Failure to comply with these regulations may result in personal injury and/or damage to equipment.**
	**Caution!** **This icon indicates the safest installation, operation, or maintenance procedure and should be followed strictly.** **Failure to comply may result in damage to the equipment.**
	**Attention!** **This information is important and should be followed.**

1.3 GENERAL SAFETY PRECAUTIONS

- The document content may be updated from time to time due to product version upgrade or other reasons. Without special agreement, the document content cannot replace the safety precautions on the product label. All descriptions in this document are for use only.
- Before installing the device, read this document carefully to understand the products and precautions.
- All operations of the equipment must be carried out by professional and qualified electrical technicians who are familiar with the relevant standards and safety regulations of the project site.
- When operating the device, use insulation tools and wear personal protective equipment to ensure personal safety. Wear ESD gloves, an ESD wrist strap, and an ESD suit when touching electronic devices to protect the devices from electrostatic damage.
- The manufacturer is not responsible for device damage or personal injury caused by the failure to install, use, or configure batteries in accordance with the document requirements.

- Before operating a device in the system, ensure that the device is powered off to prevent electric shock. When operating the device, strictly observe all the safety precautions in this document and the safety labels on the device.
- Do not remove, modify, or repair the battery or control box without the official authorization of the device manufacturer. Otherwise, electric shocks may occur or the device may be damaged, and the resulting losses are beyond the manufacturer's responsibility.
- Do not hit, pull, drag, squeeze or step on the device, and do not place the battery in the fire, otherwise the battery may explode.
- Do not place the battery in a high temperature environment. Ensure that there is no heat source or direct sunlight near

the battery. If the ambient temperature exceeds 60°C, a fire may occur.

- Do not use the battery or control box if it has obvious defects, cracks, damage, or other conditions. Battery damage may result in electrolyte leakage.
- To protect the battery pack and its components from damage during transportation, ensure that the transportation personnel are professionally trained. Record the operation steps during transportation, and keep the equipment balanced to prevent the equipment from falling.
- If a battery device is heavy, assign personnel according to the weight of the device. Otherwise, personnel may be injured due to the heavy weight of the device.
- If the battery does not start, contact the after-sales service center as soon as possible. Otherwise, the battery may be permanently damaged.
- Do not move the battery system while the battery is working. If a battery needs to be replaced or added, contact the after-sale service center.

- Ensure that the battery system is not damaged during transportation and storage.
- Transport must be carried out by trained professionals and operations must be documented during the process.
- Ensure that the device is securely placed and not tilted. Tipping the device may cause equipment damage or personal injury.
- The insulation layer may be aged or damaged when cables are used in high temperatures. The distance between the cables and the heating device or the heat source area must be at least 30mm.
- Cables of the same type must be bound together and laid at least 30mm apart from each other. Do not intertwine or cross cables.

If the battery module leaks electrolyte, avoid contact with the leaking liquid or gas. The electrolyte is corrosive and contact may cause skin irritation and chemical burns. If you come into contact with a leaked substance, do the following:

• Inhalation: Evacuate from contaminated areas and seek immediate medical help.

	• Eye contact: Rinse with water for at least 15 minutes and seek immediate medical help. • Skin contact: Wash contact areas thoroughly with soap and water and seek immediate medical help. • Ingestion: induce vomiting and seek medical attention immediately.
	➢ When the battery temperature exceeds 150 ° C, the battery has the risk of fire, and the battery may release toxic and harmful gases after fire. ➢ To avoid a fire, make sure you have a carbon dioxide, Novac1230 or FM-200 fire extinguisher nearby. ➢ Do not use ABC dry powder fire extinguishers to extinguish fires. Firefighters should wear protective clothing and self-contained breathing apparatus.

1.4 IMPORTANT NOTES

	➢ The photos that appear in this manual were taken under factory conditions. Any objects that may appear, other than those mentioned in the accompanying title, should be ignored. ➢ In some photos, the outer cover of the machine may have been removed for easy viewing. ➢ There may be subtle differences between the photos that appear in this manual and the systems/components delivered.

Chapter

2

2. SYSTEM OVERVIEW

2.1. GENERAL DESCRIPTION

Our core patented cooling technology is engineered to deliver exceptional efficiency and safety. Some of the benefits include:

① Unparalleled commitment to safety, our intelligent thermal management system mitigates the risk of battery explosion from heat generating and thermal runaway.

② Class leading energy efficiency.

③ Prolonged life span and performance.

④ Integrated cabinet design, modular assembly and anti-collision design, more convenient installation and replacement.

⑤ IP65 protection grade.

⑥ Excellent safety protection mechanism to provide safe power to users.

⑦ Stacked design, more simple connection, more comfortable use.

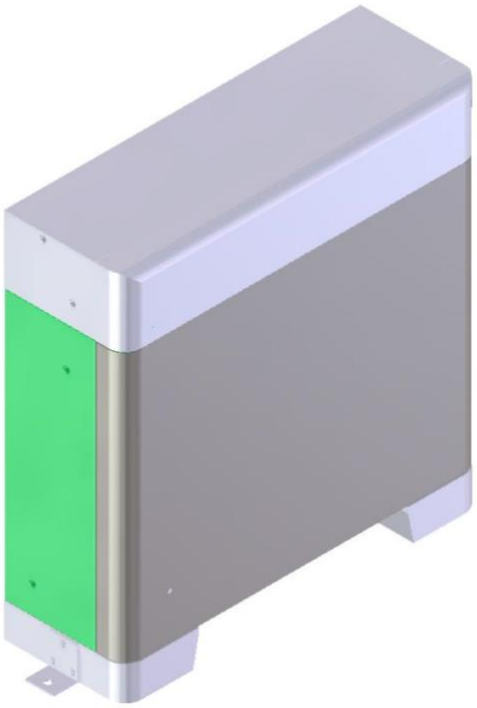


FIGURE 2.1: 3D VIEW OF THE OPENED CELL LOADING MACHINE

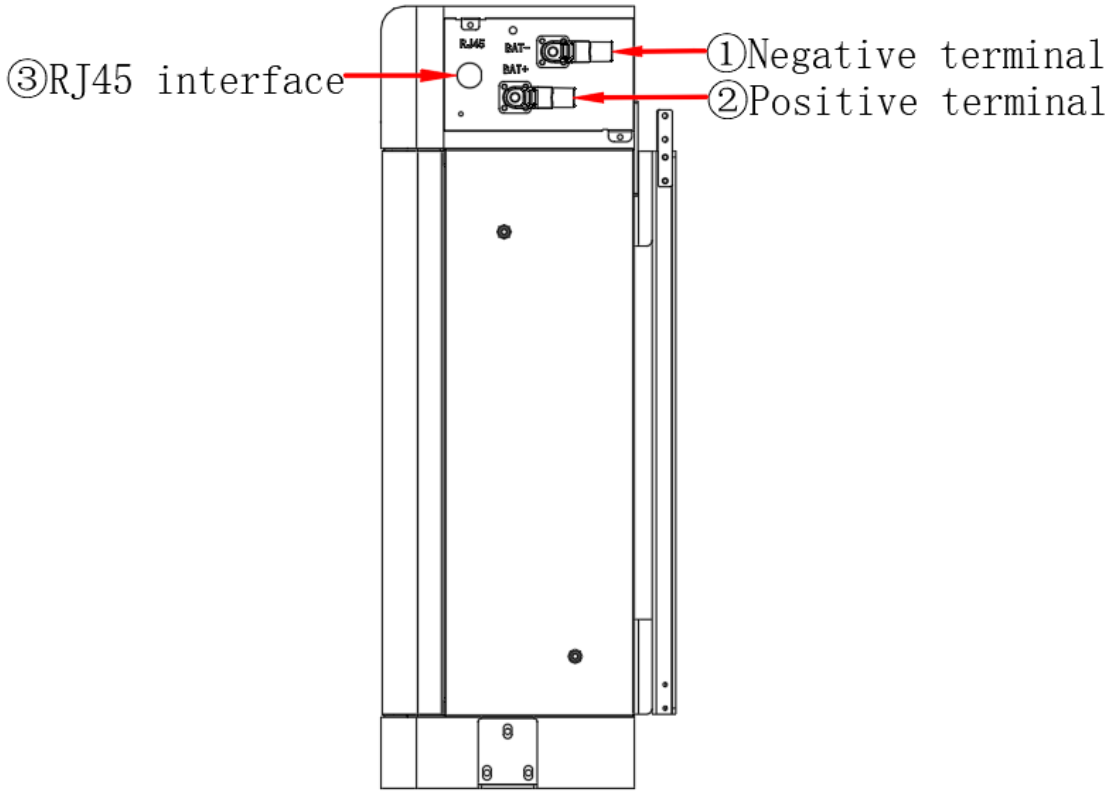


FIGURE 2.2: STRUCTURE SPECIFICATION

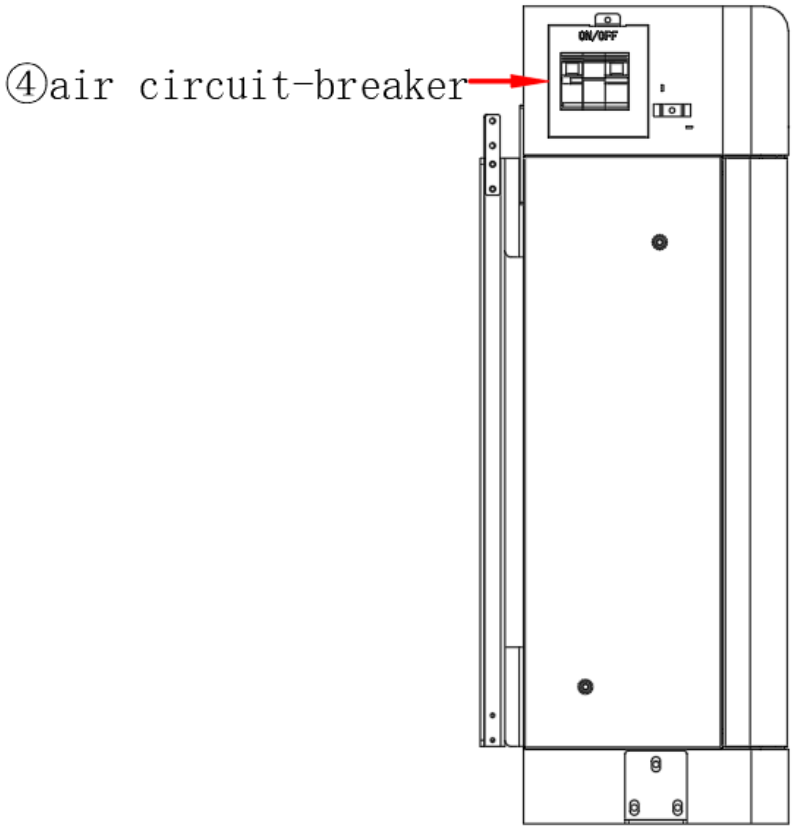
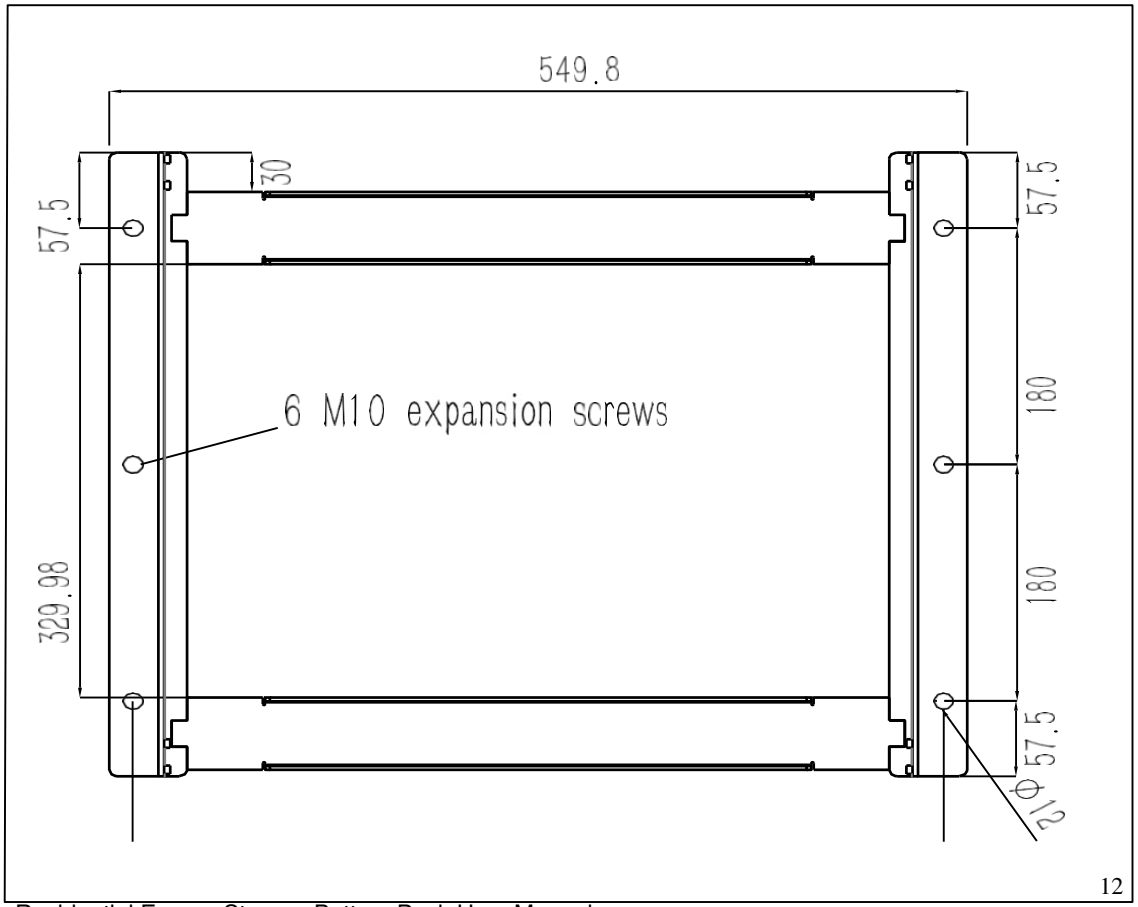


FIGURE 2.3: STRUCTURE SPECIFICATION



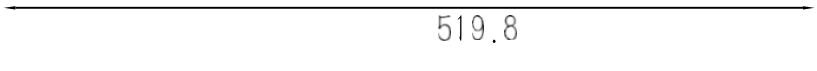


FIGURE 2.4: WALL MOUNT COMPONENT DIMENSIONS

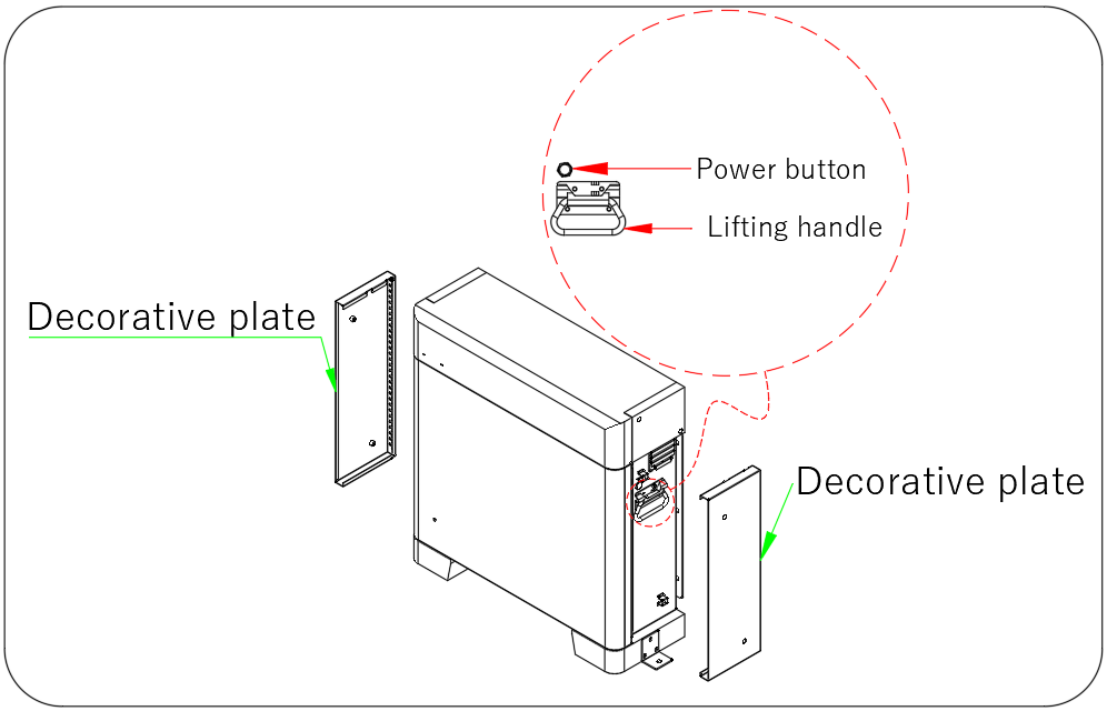
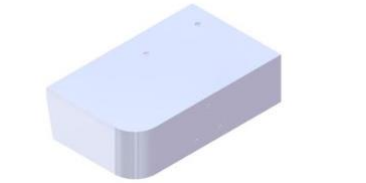


FIGURE 2.5: STRUCTURE SPECIFICATION

Name	Main function	Picture
Wall mount assembly	Support and fix	
Lid	Protection and decoration	
①Negative terminal	Connect the negative line	

②Positive terminal	Connect the positive line	
Left foot sheet metal	Bottom-supported fixed platform	
Right foot sheet metal	Bottom-supported fixed platform	
Fixed foot	Product Stability	
RJ45 connector	Communication port connector	

2.1.2 Technical parameter

General Characteristic:

- **Integrated cabinet design, modular assembly, more convenient installation and replacement.**
- **Humanized appearance arc surrounded anti-collision design, beautiful and safe.**
- **IP65 protection grade, more safe and reliable.**
- **Excellent protection mechanism to provide safe power, use more at ease.**
- **Stacked design, more simple connection, more comfortable use.**

Technical Parameters

No.	Item	Specification	Notes
1	Array Mode	1P16S	
2	Battery Type	LFP, Prismatic Cell	
3	BMS Communication	RS485/CAN	
4	Nominal Capacity	5.12kWh	
5	Nominal Voltage	51.2V	
6	AC Impedance Resistance	≤8mΩ	
7	Charge Voltage	57V	CC/CV
8	Discharge Cut-off Voltage	41V	
9	Max. Continuous Charging Current	100A	
10	Max. Continuous Discharge Current	100A	
11	PACK Weight	61Kg	
12	Storage Temperature	-5°C ~35°C	
	RH for Storage	65±20%	
13	Operating Temperature	Charge: 0~60°C	>45°C Derating

		Discharge: -20~60°C	
14	Cycling Performance	5300 Cycles	Capacity Retention≥70%
15	Cell set Cycling Performance	6000 Cycles	
16	Aggregate Throughput1 (MWh)	23.373	
17	Max Depth of Discharge	96%	
18	Short Circuit Current	350A	
19	IP Rating	IP65	
20	DC isolator	Two poles circuit breaker	Comply with AS/NZS 60898 certified
21	Mounting environment	Indoor or outdoor	Mounting in accordance with AS/NZS 5139, details refer to the mounting manual
Protection Characteristic			
1	Over / under voltage protection	Integrated	BMS comply with IEC 62619 evaluated
2	Over current protection	Integrated	BMS comply with IEC 62619 evaluated
3	Over / under temperature protection	Integrated	BMS comply with IEC 62619 evaluated
General Characteristic information:			
1	Protection Degree	IP65(Wiring Compartment: IP54)	
2	Cooling	Forced ventilation	

3	Air cooled Fan Power Consumption (W)	0.72	
4	Operating Temperature Range (℃)	-25~60°C, >45°C Derating	
5	Max. relative humidity	UP to 95% RH, non-condensing	
6	Max. altitude	< 2000 m (≥ 2000 m derating)	
7	Noise Level @1m	＜40dB	
8	Size (H*W*D mm)	660*630*220	
9	PACK Weight (kg)	61	
10	Installation	Wall-mounted or Floor mounted	

Note:

- Measured at the battery AC output.
- Refer to the battery warranty letter for conditional application.

Chapter

3

3. INSTALLATION AND REMOVAL

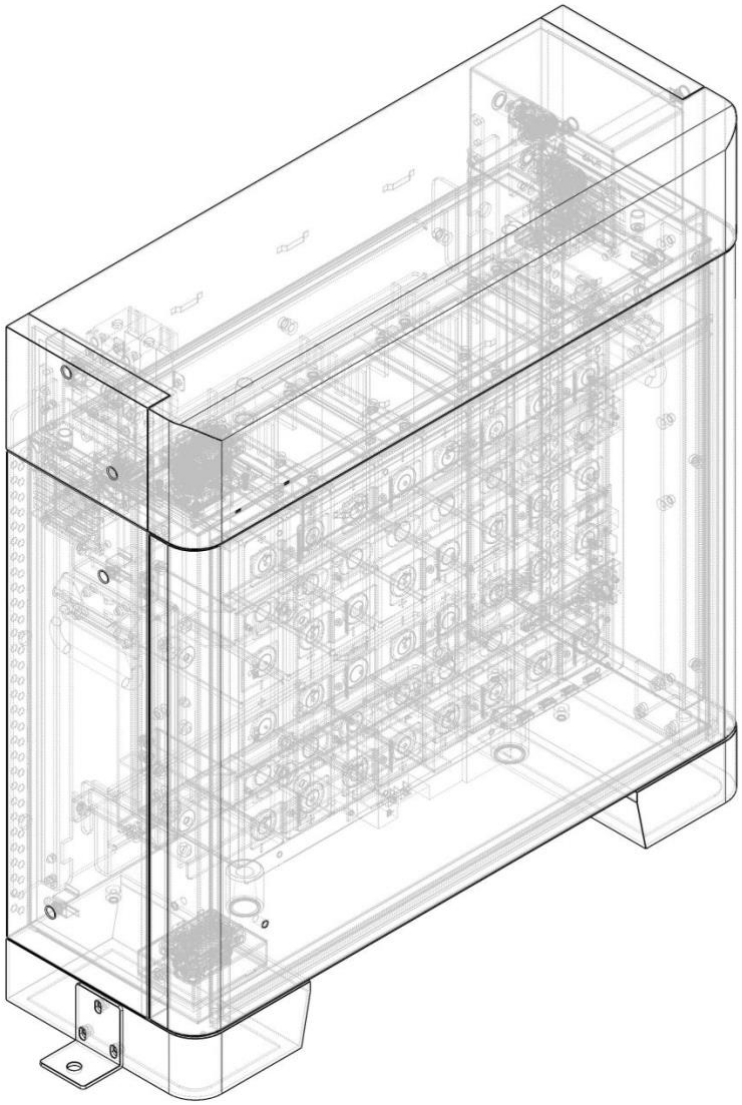


FIGURE 3.1: SYSTEM LAYOUT

3.1 GENERAL REQUIREMENT

3.1.1 Installation Instructions

Please read and understand this part carefully before installation of product.

3.1.2 Personnel qualification

The installer of the product shall have the local electrician qualification, have received the safety and technical training, obtain the qualification authorized for the installation of the product, possess the
experience in installation and use of electrical equipment, and the following capabilities, including but not limited to:

- Setting, activation, shutdown, grounding, short circuit and repair of electrical equipment Standard maintenance and use of protective devices for electrical equipment.
- Provision of emergency rescue for the injured.
- Compliance with local laws, regulations, standards ,installation and maintenance procedures.

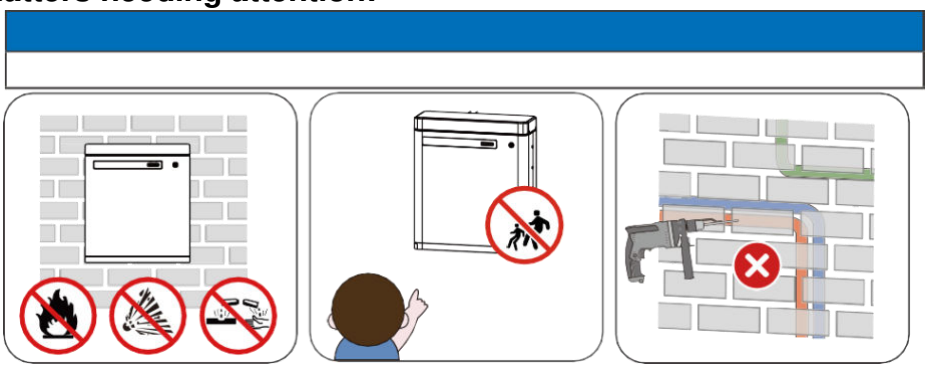
3.1.3 Notes

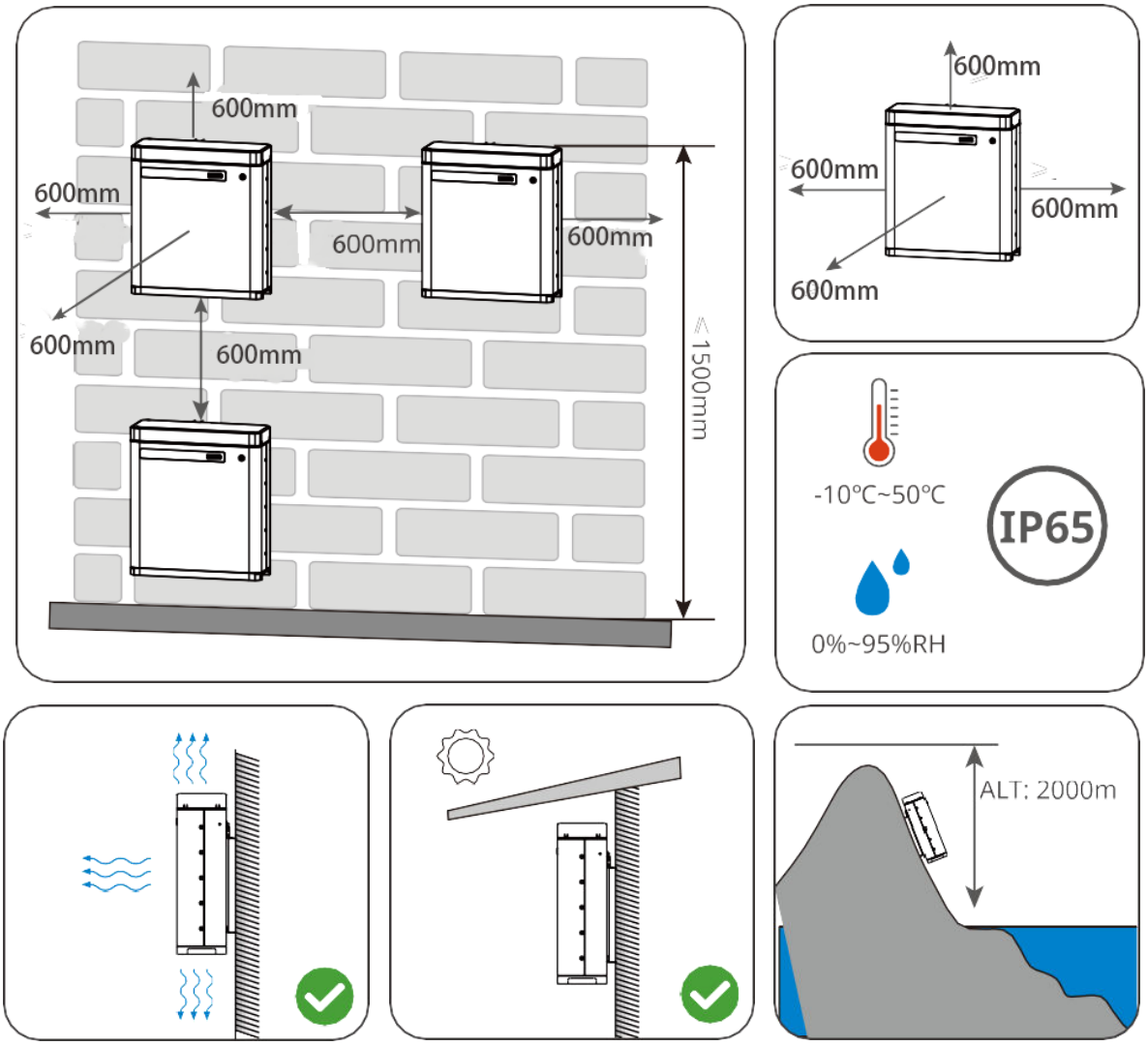
The attention shall be paid to the following:

- Check whether the product is damaged prior to installation. The product has been carefully checked and packed prior to shipment, but may still be damaged possibly during transportation.
- Wear personal protective equipment during installation of product, in order to avoid the electric shock.
- Please check whether the base is equipped with Fuse before installation, and if so, remove it to avoid electric shock during installation.
- In the process of handling the product, the product shall be protected from the heavy objects, in order to avoid the damage due to impact by the heavy object.
- Please ensure that all switches of the system are turned off prior to installation, in order to avoid the electric shock.
- Please follow the installation procedures strictly during installation of the product, in order to avoid the safety accidents caused by incorrect installation.
- The installation of the product shall be completed as soon as possible, so as to avoid the irreversible damage caused due to long-term storage of product.

3.2 INSTALLATION ENVIRONMENT REQUIREMENTS

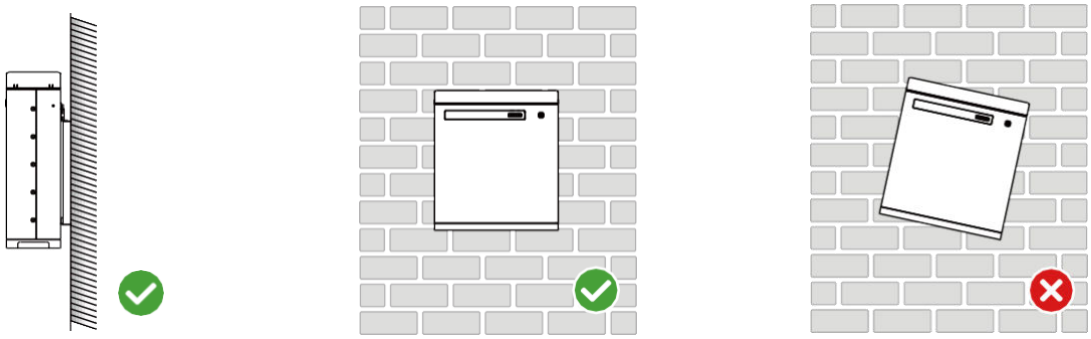
3.2.1 Matters needing attention:





3.2.2 Installation Angle Requirement:

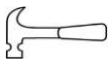
Ensure that the device is installed flat/ horizontally and cannot be tilted or inverted.



3.3 INSTALLATION PREPARATIONS

3.3.1 List of tools:

The following tools may be used during battery pack installation:

	Leveling Instrument		Slotted Screwdriver
	Wire Clamp		Measuring Tape
	Hex Key		Torque Wrench
	Wrench		Hammer
	Electric Drill		Phillips Screwdriver

3.3.2 Personal Protective Equipment

- The product is the household energy storage system; the improper operation may cause the personal injury and property damage.
- The personal protective equipment must be worn during installation, use and maintenance of the product.
- It's recommended to wear the following personal protective equipment: Insulated gloves: ensure the life safety of installers.

Insulated gloves Safety shoes

- Safety shoes: ensure safety in case of accidental falling of modules during installation.

3.4 FORMAL INSTALLATION

3.5.1 Install on the ground: (cannot be mixed with wall mount)

Note: It is necessary to drill holes on hard ground, not on dirt or soft ground.

- Step 1: Place the battery pack in place and mark the floor and wall with a marker, as shown in Figure 3.2.

- Step 2: Move the battery and wall mount pack away, then drill holes (diameter 13mm, depth 65mm) at the marked locations with an electric drill, as shown in Figure 3.3.

- Step 3: Fix the wall mount on the wall with M10 expansion screws, and the torque is 10N·m, as shown in Figure 3.4.

- Step 4: First, fix the foot block on the battery pack with M5 hex socket screws, then fix the battery pack "BAT3" on the ground with M10 expansion screws, and then stack "BAT2" and "BAT1" in sequence. Figure 3.5 shows.

- Step 5: After the battery pack is properly connected to the inverter through power cables and communication cables, press the power button. After the battery communicates with the inverter properly, install the protection boards of the three battery packs one by one as shown in Figure 3.6.

- Step 6: The installation is complete, as shown in Figure 3.7.

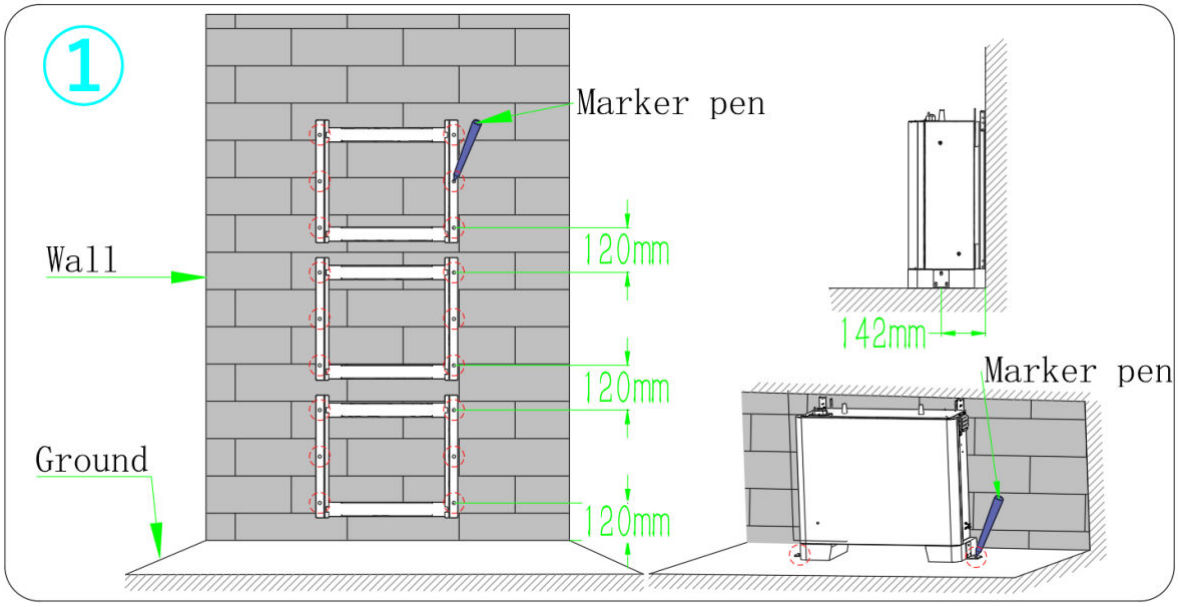


FIGURE 3.2: STEP1

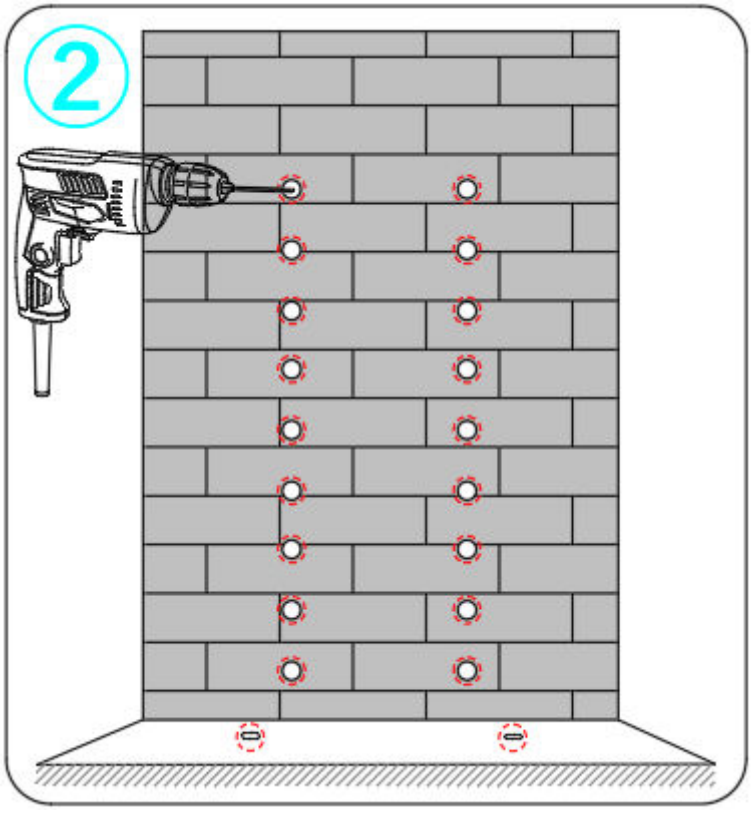


FIGURE 3.3: STEP2

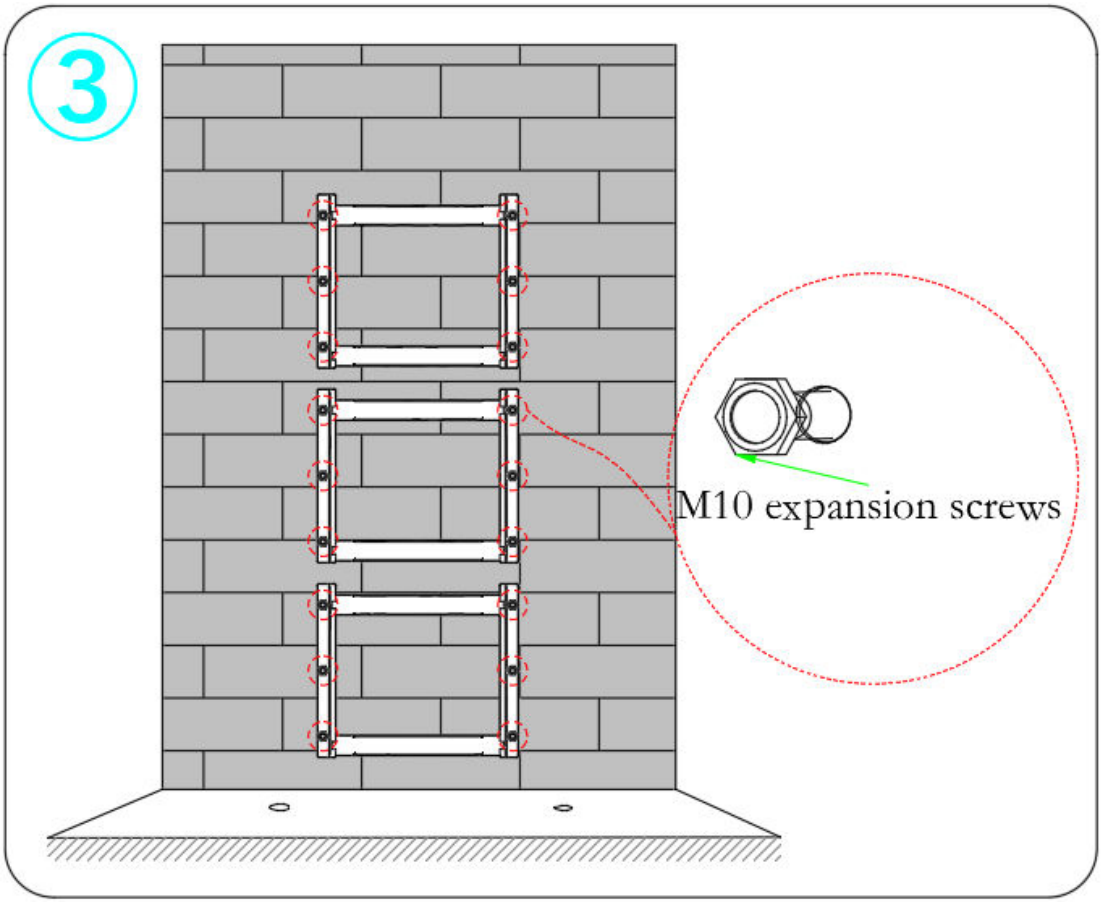


FIGURE 3.4: STEP3

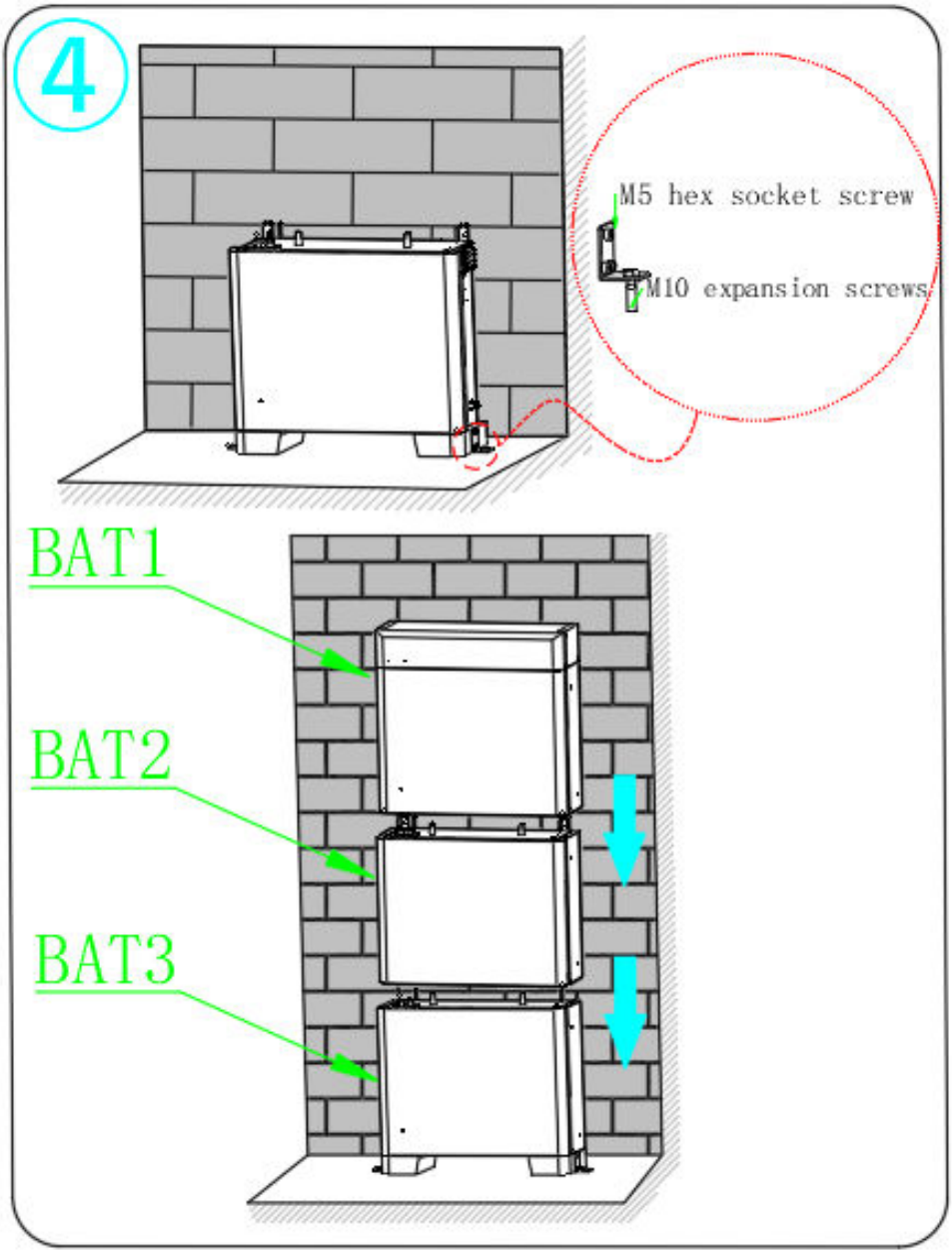


FIGURE 3.5: STEP4

Note: Install according to the serial number on the battery (each battery has a number), as shown in the figure.

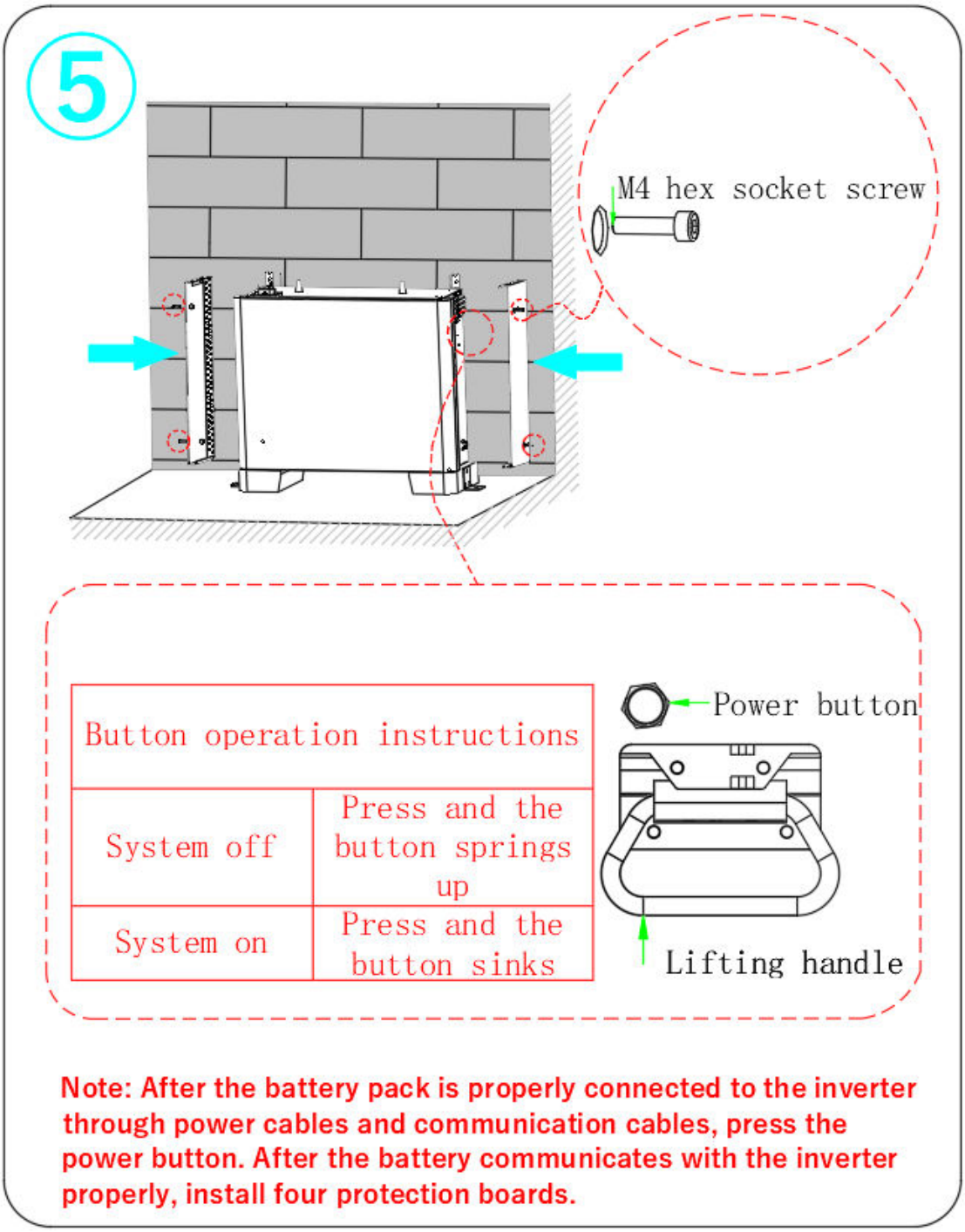


FIGURE 3.6: STEP5

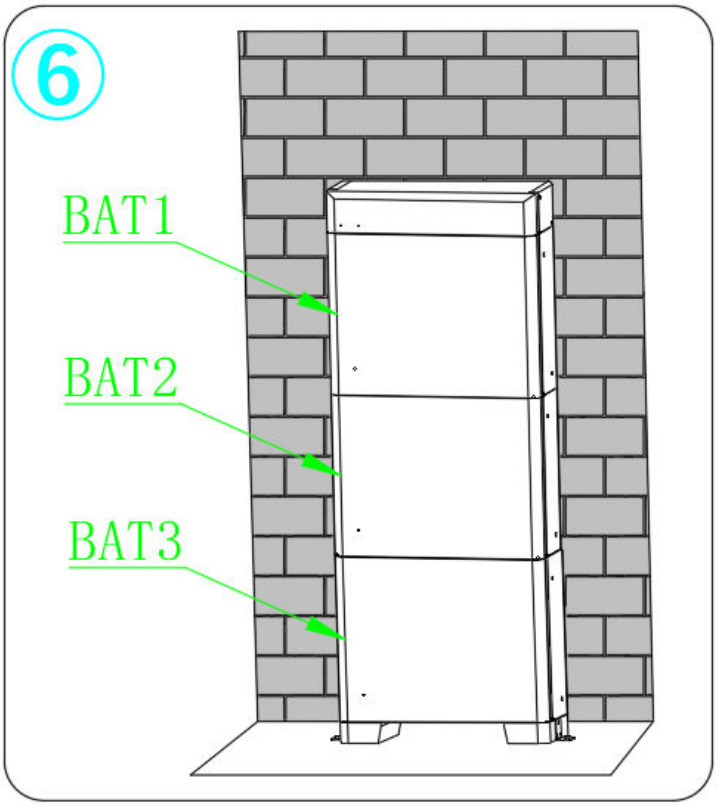


FIGURE 3.7: STEP6

3.4.2 Installation Wall Mount:（cannot be mixed with floor mount）

- Step 1: Place the wall mount close to the wall. Make sure it is securely placed, mark the holes with a marker, and remove the wall hangings, as shown in Figure 3.8.

- Step 2: Drill holes (13mm diameter, 65mm depth) into the marked wall with electric drill. As shown in Figure 3.9.

- Step 3: Secure the pendant to the wall with M10 expansion bolts. The torque requirement is 10N·m. As shown in Figure 4.0

- Step 4: First hang the battery pack "BAT3" on the wall, and then stack "BAT2" and "BAT1" in order. As shown in Figure 4.1.

- Step 5: After the battery pack is properly connected to the inverter through power cables and communication cables, press the power button. After the communication between batteries and inverters is normal, install the battery pack protection boards in sequence as shown in Figure 4.2.

- Step 6: The installation is complete, as shown in Figure 4.3.

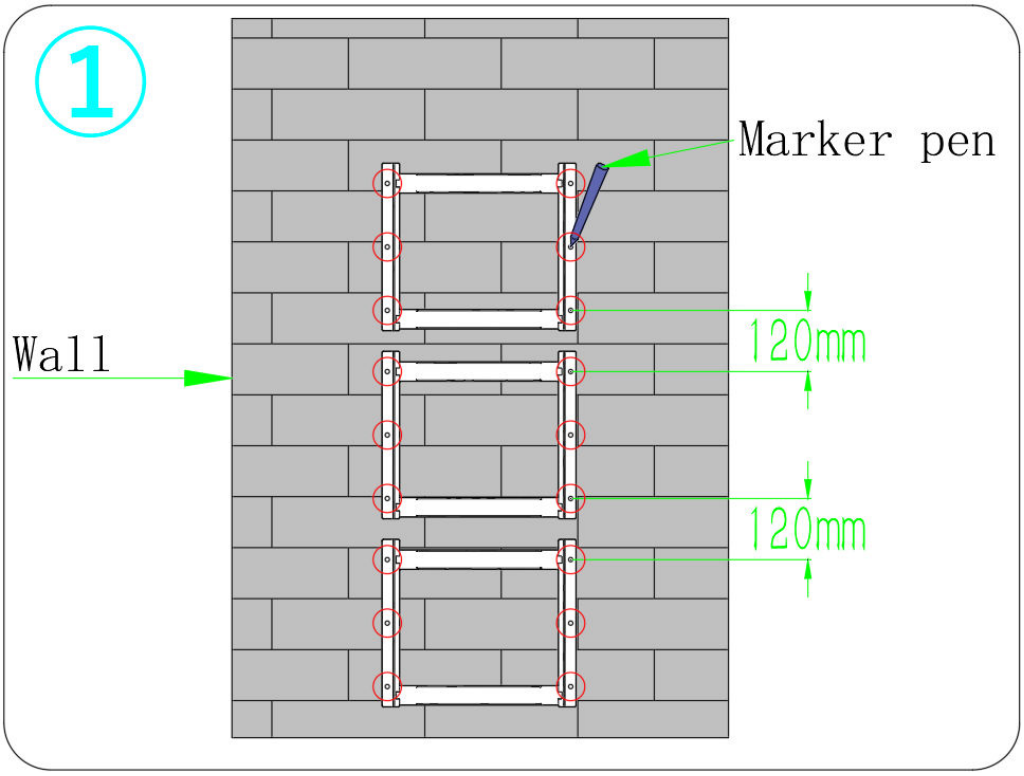


FIGURE 3.8: STEP1

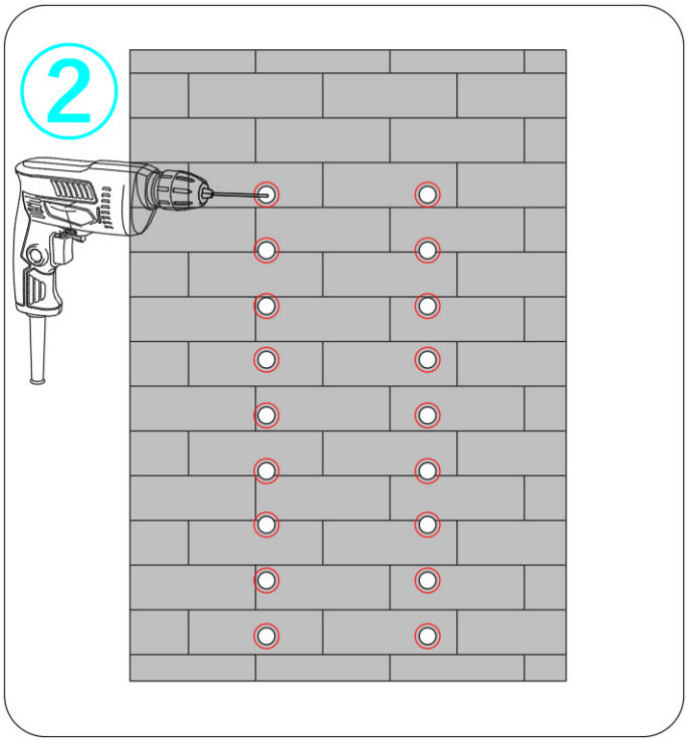


FIGURE 3.9: STEP2

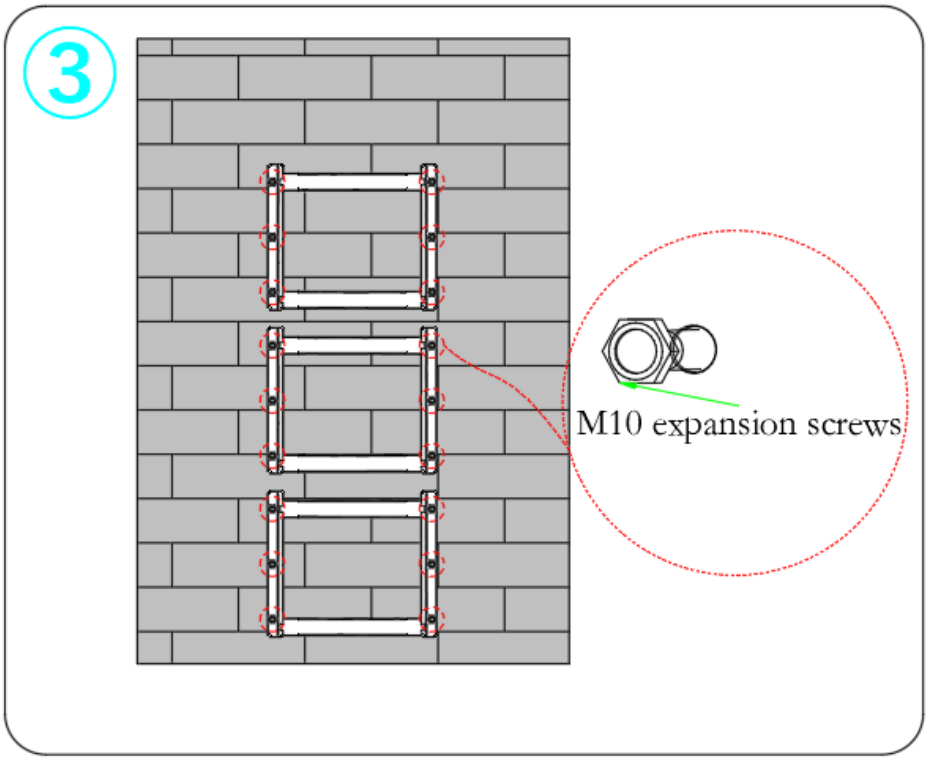


FIGURE 4.0: STEP3

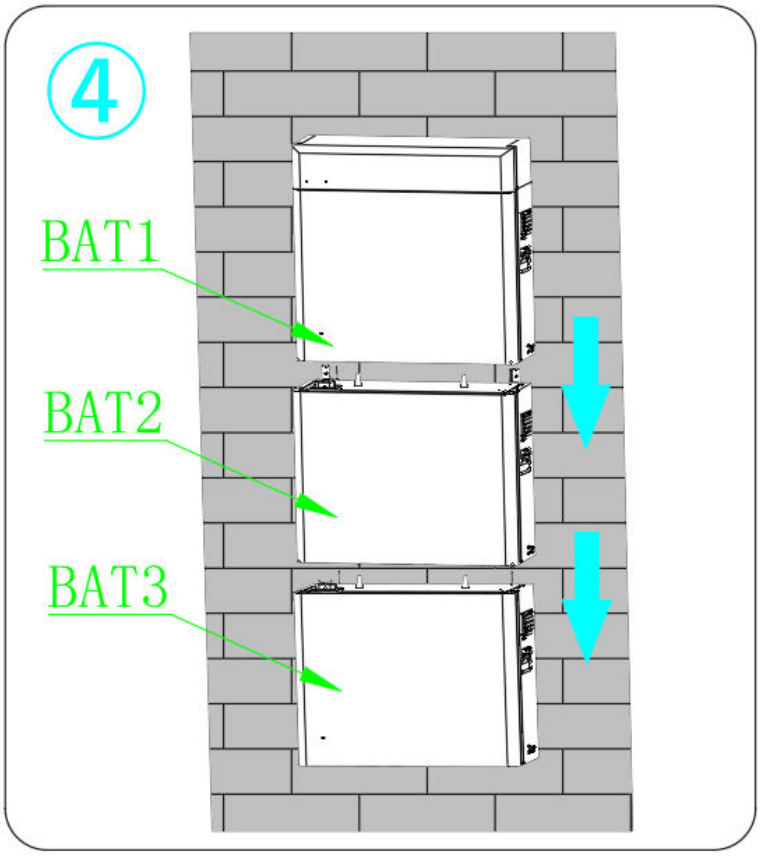


FIGURE 4.1: STEP4

Note: Install according to the serial number on the battery (each battery has a number), as shown in the figure.

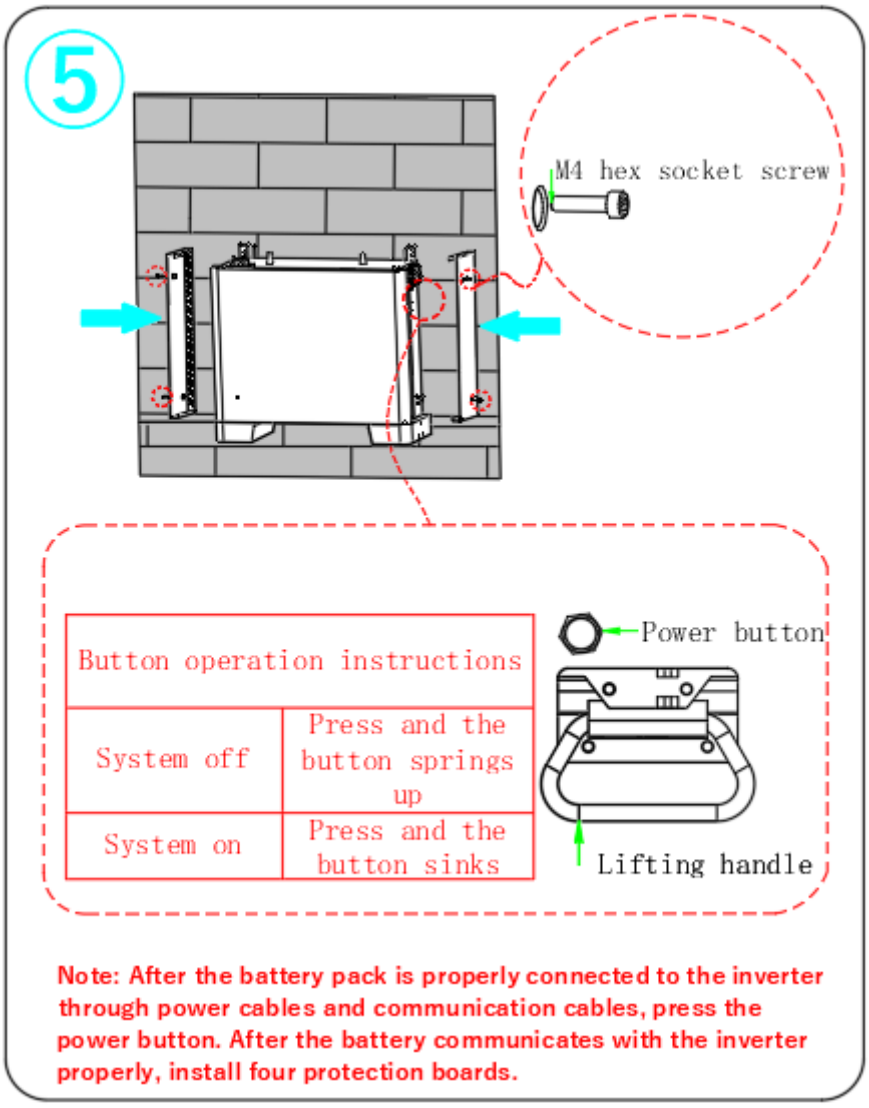


FIGURE 4.2: STEP5

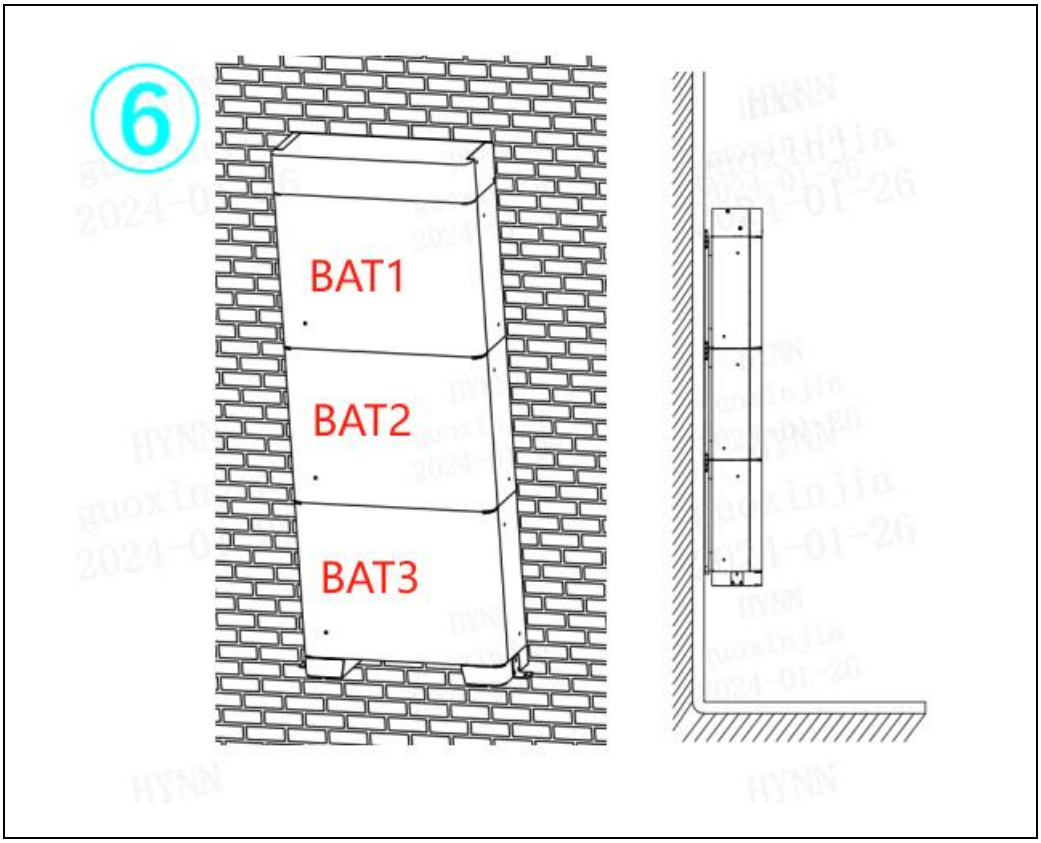


FIGURE 4.3: STEP6

Chapter

4

4. USER MAINTENANCE

•

4.1 SAFETY PRECAUTION

- When maintaining, operating, or removing the battery system and its accessories, wear insulation gloves to avoid electric shock.
- Disconnect power from the battery system by turning the circuit breaker off when maintaining, operating, or removing the battery system or its accessories.
- Internal batteries of the battery system have been charged. Do not disassemble or maintain the battery system by non-professional personnel.
- Do not remove the battery system without permission or authorization. If the battery is faulty, contact the supplier for after-sales service or handle the fault under the guidance of professional technical personnel.
- When the circuit breaker is turned off to cut off the power to the battery system, the battery case may still have excess power and heat, which may cause electric shock or combustion. Therefore, 5 minutes after the air switch is turned off, then wear insulation gloves to operate the battery.
- Do not expose the battery to high temperature, outdoor, humid environment or under water pipes to avoid damage to the battery or accidental electric shock.
- Check whether the battery system is normal before installation. If the battery is damaged (for example, the battery is dropped, damaged, swollen, or dented), contact installation personnel or professional operation and maintenance personnel to remove or replace the battery. Non-professionals should stay away from damaged batteries.
- The battery system installation space is dry, well-ventilated, and dissipates heat. You are advised to install a fire extinguishing device near the battery system.

4.2 MAINTENANCES

Maintenance Items	Inspection/Maintenance Methods	Maintenance Cycle	Actions
Battery system safety	● Check whether the battery system is damaged or deformed. ● Check whether the bolts securing the battery system support are loose.	Bi-annually	Disconnect the power from the battery system
System Cleaning	● Check the surface of the battery system housing for dust or dirt ● Check the surface or bottom of the battery system for water or leaks	Bi-annually	Disconnect the power from the battery system
System operating status	● During the normal operation of the battery, check for abnormal sounds	Bi-annually	-
Electrical connection	● Check whether the positive and negative output terminals and communication are damaged and fastening bolts are loose ● Check whether the cables of the energy storage system are loose or loose ● Check the cable for damage, especially for cuts or burns where the cable meets the metal surface ● Check whether unused DC input terminals, energy storage terminals, communication ports,	Bi-annually	Disconnect the power from the battery system

	and waterproof covers are locked		
Ground reliability	Check whether the ground cable is grounded reliably	Bi-annually	-

4.3 POSSIBLE ISSUE

Number	Alert	Cause	System Action
1	Unit is overcharged	Charged capacity is higher than DOC	Automatically secures when capacity is less than96%
2	Unit is over-discharged	Discharged capacity is lower than DOD	Automatically secures when it is charged
3	Overall overcharged	Total voltage higher than 54V	Automatically secures when it is discharged or total voltage < 54V
4	Overcharge current detected.	Overcharge current	Automatically secures after 1 minute
5	Discharge over-current Alarm	Excessive discharge current	Automatically secures after 1 minute
6	Battery temperature high	The battery temperature is too high.	Disappears when the temperature is < 60℃
7	Battery temperature low	The battery temperature is too low.	Disappears when the temperature is > -15℃

4.4 EMERGENCY MANAGEMENT

In the event of the following situations or other dangerous accidents, please take measures to ensure the personal safety of on-site personnel, and immediately contact our service engineers.

Battery damaged from impact / drop

- If there is an obvious odour, damage, smoke or fire, evacuate immediately and call emergency services.
- If the battery is not significantly deformed, damaged, or has no obvious odor, damage, smoke, or fire, contact a professional to move the battery to an open and safe place or contact a recycling company for disposal.

Water Damage

- If there is water in any part of the battery, do not touch the battery to avoid electric shock.
- Do not use flooded batteries. Contact the battery recycling company for disposal.

Smoke or Fire

- Lithium battery ignition will release flammable and toxic gases. Therefore, all rescue workers should wear personal protective equipment (fire-resistant clothing, gas mask/respirator, fire helmet/mask, insulation shoes, etc.)
- The fire could last several hours. An extinguished potassium battery may re-burn due to residual heat release from internal battery damage. After the

open flame is extinguished, water is continuously sprayed to cool the battery until the difference between the temperature and the ambient temperature is within 10°C. Monitor the battery for 24 hours and remove the battery when there is no sign of heat. Remove the removed battery to a safe place (a safe place outside in the open space is recommended) and then place it in a fireproof sandbox or salt water.

The battery is leaking liquid

- The electrolyte that leaks is a colourless, viscous liquid that is flammable and evaporates quickly, leaving behind a white salt residue. As a corrosive substance, it has a pungent odour and is irritating to the eyes and skin. Do not touch these electrolytes.
- Professional maintenance and fire personnel should wear filtered gas masks, personal protective equipment (PPE) and other necessary protective equipment when dealing with chemical spills.

In case of contact, the following measures should be taken:

- Inhalation: Evacuate from contaminated areas to fresh air and seek immediate medical attention.
- Eye contact: Rinse eyes with plenty of water for at least 15 minutes, do not rub eyes. Seek immediate medical attention.
- Skin contact: Wash the contaminated area with plenty of water and soap and seek medical attention immediately.
- Ingestion: Seek immediate medical attention.

Emergency and subsequent operations are complete

- After the battery fire is extinguished and there are no potential safety risks on site, contact the supplier or installation personnel according to local laws and regulations. Professional personnel should wear insulation gloves, shoes, and protective supplies to dispose of the affected batteries and recycle them. The manufacturer can assess the damage after an accident and replace the affected battery in accordance with the relevant procedures to restore the operation of the energy storage system.
- After the battery fire is extinguished, the extinguishing water may pollute the surrounding soil and water source. It is suggested to notify the relevant departments to evaluate and deal with the pollution.

Chapter

5

5. WARRANTY

5.1 Warranty Card

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure

Maintenance Record:

Maintenance time	Fault situation/cause	Trouble shooting situation	Date of submission	Maintenance personnel

A consumer hires an electrical worker to maintain the Battery storage system. The contract says that the electrical worker will repair any defect within 10 years of the Battery system being installed.

This promise is a warranty against defects.

Company Name: Inno Energy Group Pty Ltd
Address: U2/262 Parramatta Road, Granville, NSW, Australia
Post Code:2142
Name: Daniel Hu
E-mail: info@innoenergy.com.au
Website: www.innoenergy.com.au