



ULB-5120MT

Low Voltage Storage Battery System

User Manual



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1 Notes on this Manual

1.1 Target Group

This manual is for qualified electricians. The tasks described in this manual only can be performed by qualified personnel.

1.2 Symbols Used

The following types of safety instructions and general information appear in this document as described below:

 Danger	Danger! “Danger” indicates a hazardous situation which, if not avoided, will result in death or serious injury.
 Warning	Warning! “Warning” indicates a hazardous situation which, if not avoided, could result in death or serious injury.
 Caution	Caution! “Caution” indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
 Note!	“Note” provides tips that are valuable for the optimal operation of our product.

2 Safety

2.1 Important Safety Instructions

 <p>Danger</p>	<p>Danger! Electric shock and high voltage.</p> <ul style="list-style-type: none"> • Do not expose the storage unit to temperatures in excess of 45°C. • Do not subject the storage unit to any strong force. • Do not touch uninsulated cable termination. • Do not soak the storage unit in water or expose it to moisture environment. • Do not touch the case of the storage unit when it is wet in case of electric shock. • Do not dispose of batteries in fire. The batteries may explode! • Do not place the storage unit near a heat source, such as direct sunlight, a fireplace. • Keep inflammable and explosive dangerous items or flames away from the storage unit. • Do not charge or discharge damaged storage unit. <p>Before performing any work on the storage unit, please disconnect the storage unit from all voltage sources as described in this document.</p>
 <p>Warning</p>	<p>Warning!</p> <ul style="list-style-type: none"> • Installation, repair, recycling, and disposal of storage unit must be performed by qualified personnel in accordance with national and local standards and regulations. • Risks of chemical burn electrolyte or toxic gases. • Do not place heavy objects on the top of the system. • Do not connect any un-dedicated battery pack to UHome storage unit. • If the moisture penetrates the system (e.g., due to casing damage), please do not install or operate the system. Do not use wet hands to touch the system. • Any behavior to change the functionality of the product without permission will cause fatal injury to the operator, third parties, and equipment. UHome is not responsible for these losses and warranty claims. • To ensure property and personal safety, the batteries and inverter shall be well grounded.

 <p>Caution</p>	<p>Caution!</p> <ul style="list-style-type: none"> • Do not modify or tamper with storage unit and other components o the system. • Risk of injury by hoisting or falling system • Batteries are heavy and personal injury can be caused if the battery is improperly lifted or dropped during transport or improper operation when attached or removed from walls. Lifting and moved the products shall be conducted by more than one person.
	<p>Note!</p> <ul style="list-style-type: none"> • Do not extend other brands of batteries at the battery port.

2.2 Explanation of Symbols

This section explains all the symbols shown on the inverter and on the type label.

	<p>Dangerous electrical voltage All work to the battery shall only be carried out by qualified personnel.</p>
	<p>No open flames Do not place or install near flammable or explosive materials.</p>
	<p>Corrosive substance Keep the machine away from corrosive substance.</p>
	<p>Attention Install the product out of reach of children</p>
	<p>Danger of hot surface The components inside the device will release a lot of heat during operation. Do not touch metal plate housing of the machine during operating.</p>
	<p>Danger. Risk of electric shock!</p>
	<p>An error occurred Read the usage manual to troubleshoot problems</p>
	<p>This device SHALL NOT be disposed of in residential waste Please go to Chapter Seven “Battery maintenance” for proper treatment.</p>
	<p>Recyclable</p>

2.3 Emergency situation

Despite of its careful and professional protection design against any hazard results, damage of the battery may still occur. If a small amount of battery electrolyte is released due to a serious damage of the outer casing; or if the battery explodes due to not being treated timely after a fire breaks out nearby, and leaks out poisonous gases such as carbon monoxide, carbon dioxide etc., the following actions are recommended:

- 1) Eye contact: Rinse eyes with a large amount of running water and seek medical advice
- 2) Contact with skin: Wash the contacted area with soap thoroughly and seek medical advice
- 3) Inhalation: If you feel discomfort, dizziness or vomiting, seek medical advice immediately.
- 4) Use a FM-200 or Carbon Dioxide (CO₂) fire extinguishers to extinguish the fire if there is a fire in the area where the battery pack is installed. Wear a gas mask and avoid inhaling toxic gases and harmful substances produced by the fire.
- 5) Use an ABC fire extinguisher, if the fire is not caused by battery and not spread to it yet.

Warning!



- If a fire has just occurred, try to disconnect the battery circuit breaker and cut off the power supply first, but only if you can do so without endangering yourself.
- If the battery is on fire, do not attempt to extinguish the fire and evacuate the crowd immediately.

Potential danger of damaged battery:

Chemical Hazard: Despite of its careful and professional protection design against any hazard results, rupture of battery shall still occur due to mechanical damage, internal pressure etc., and may result in a leakage of battery electrolyte. The electrolyte is corrosive and flammable. When there is fire, the toxic gases produced will cause skin and eyes irritation, and discomfort after inhalation. Therefore:

- 1) Do not open damaged batteries.
- 2) Do not damage the battery again (shock, fall, trample, etc.).
- 3) Keep damaged batteries away from water (except to prevent an energy storage system from catching fire).

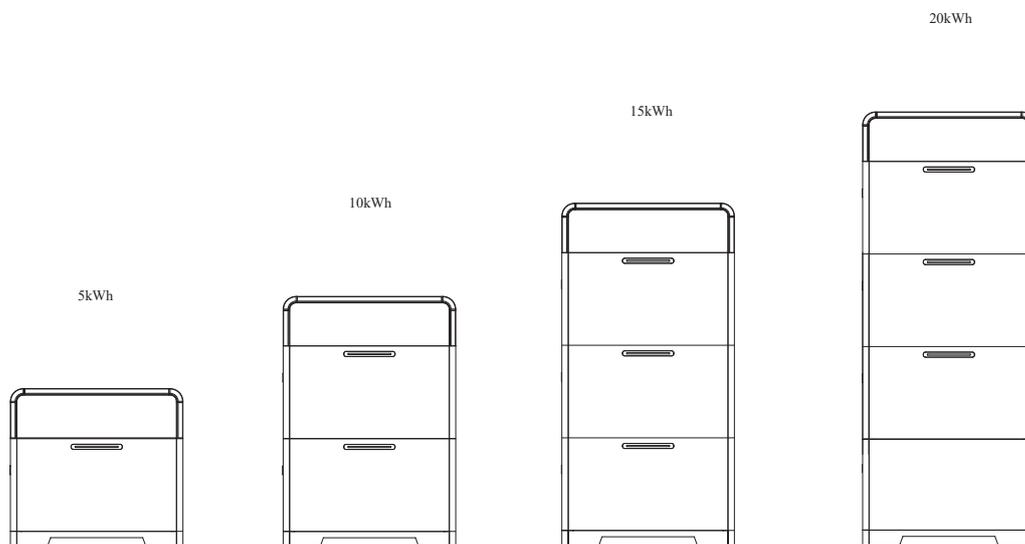
- 4) Do not expose the damaged battery to the sun to prevent internal heating of the battery.

Electrical hazard: The reason of fire and explosion accidents in lithium batteries is battery explosion. Here are the main factors of battery explosion:

- 1) Short circuit of battery. Short circuit will generate high heat inside battery, resulting in partial electrolyte gasification, which will stretch the battery shell. The temperature reaching ignition point of internal material will lead to explosive combustion.
- 2) Overcharge of battery. Overcharge of battery may precipitate lithium metal. If the shell is broken, it will come into direct contact with the air, resulting in combustion. The electrolyte will be ignited at the same time, resulting in strong flame, rapid expansion of gas and explosion.

3 Introduction

3.1 Scope of application



Quantity of Battery	System Capacity
1	5.12kWh
2	10.24kWh
3	15.36kWh
4	20.48kWh

3.2 Product Model Description

ULB – 5120 MT

① ② ③

① **ULB** is the name of the Battery Module section in the All-In-One Storage Unit.

② **5120**:5.12kWh /**2560**:2.56kWh/**3580**:3.58kWh.

③ **MT**: Wall hanging.

3.3 Datasheet

Battery Module	ULB-5120MT
Electrical Parameter	
Battery Type	LiFePO ₄
Battery Capacity per Kit [Wh]	5120
Usable Energy [Wh]	4600
Rated Voltage [V]	51.2
Voltage range [V]	44.8-57.6
Max. Charging and Discharging Rate	1C
Depth Of Discharge [DOD]	≤90%
Cycle Life(25°C,0.5C)	≥ 6000 times,80% Capacity retention
General Data	
Communication Mode	RS485/CAN2.0
Operating Temperature Range	0~50°C (Charge)/-10~50°C(Discharge)
Storage Temperature Range	-15°C~60°C
Cooling Method	Natural Convection
Altitude	<2000m
Ambient Humidity	0-100% non-condensing
Noise[dBA]	<25
Ingress Protection	IP65
Dimensions [H*W*D][mm]	675*200*365
Weight [kg]	53.6

4 Installation Instructions

4.1 Safety Tips

Danger!



- Potential fires and electric shocks that are life threatening.
- Do not place any flammable or explosive materials beside storage unit.
- Equipment connected to high-voltage power generation equipment must be performed by qualified personnel in compliance with national and local standards and regulations.

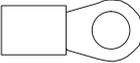
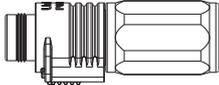
Note!

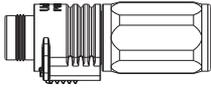


- The pollution level applicable to storage unit is Class II.
- Inappropriate or inconsistent installation environment can shorten the life of storage unit.
- Do not install storage unit directly by exposing it under strong sunlight.
- Please do not install in damp places.
- The installation location must be well ventilated.
- Storage unit (hereinafter also referred to as the master device) can be used with one battery. If the battery capacity needs to be expanded, please use ULB-5120MT (slave device), and maximum 4 batteries are supported for the whole system.

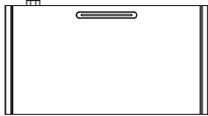
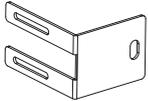
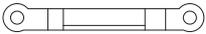
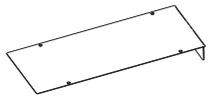
4.2 Packing List

Battery Control Box Package list

			
<p>Battery Control Box * 1 PCS</p>	<p>1* User Manual</p>	<p>1* Ground terminal</p>	<p>2* Battery + connection terminals</p>

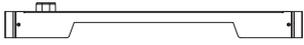
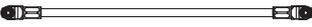
			
2* Battery - connection terminals	1*Waterproof terminal	4*Round head screws M3*5	4*SEM screw M4*10
			
1*Qualified Certificate		1*Packing List	

Storage Battery Module package list

			
1 * Battery	2*Fixed support rack	2*Expansion screw M6	4*Round head screws M3*5
			
4*SEM screw M4*10	4*Guide Pin	1*Grounding Cable	1*Right side cover
			
1*Left side cover	1* Cable grommet	1*Qualified Certificate	8*Countersunk screw

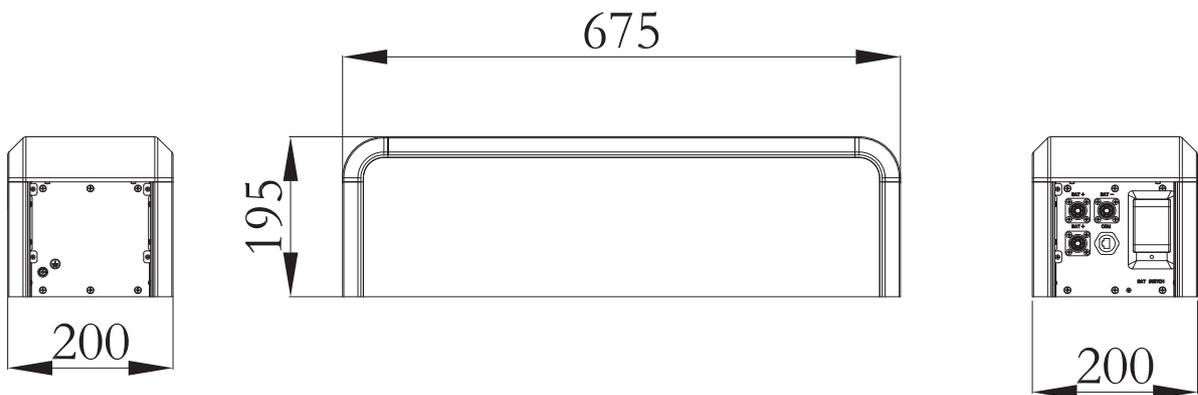

1*Packing List

Battery Base package list

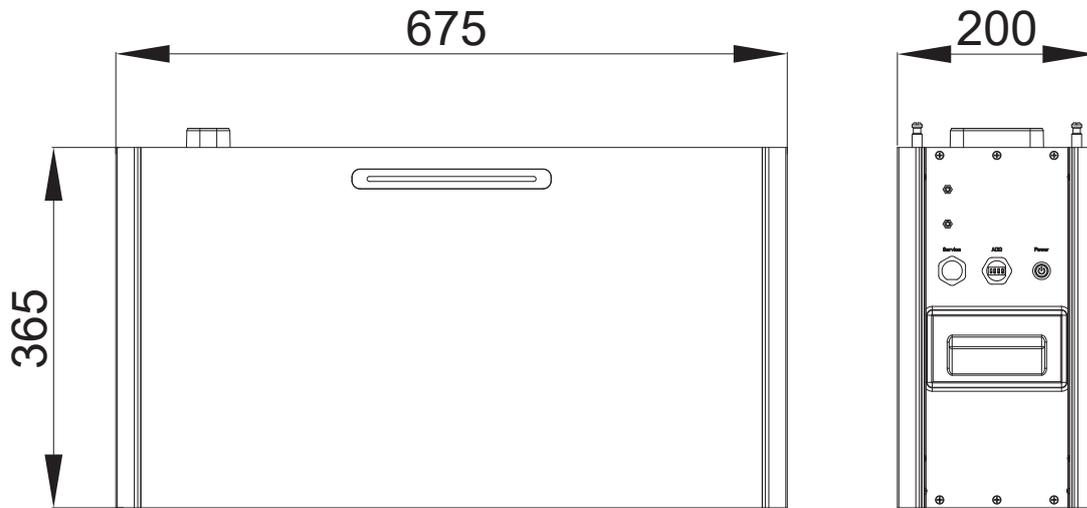
		
1 * Battery	4*Guide Pin	1*Grounding Cable
		
1* External positive connection wire (The length is determined according to the number of stacked batteries)	1*Qualified Certificate	1*Packing List

4.3 Determine the installation method and location

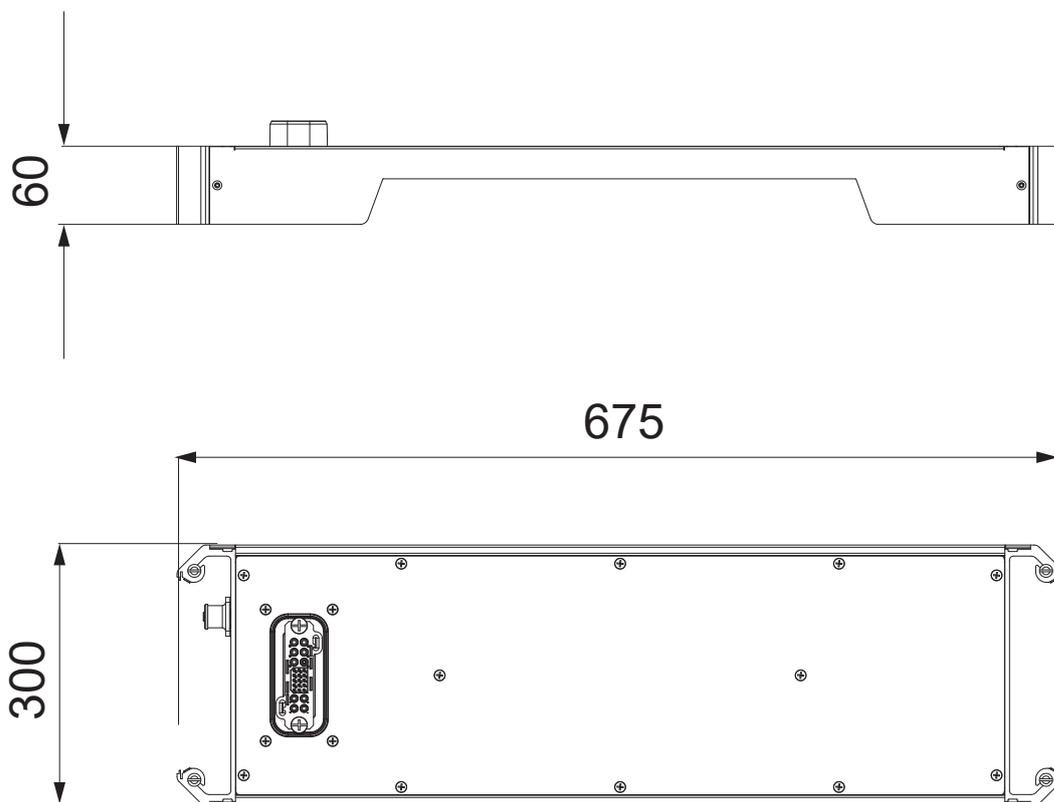
Battery Control Box (mm) :



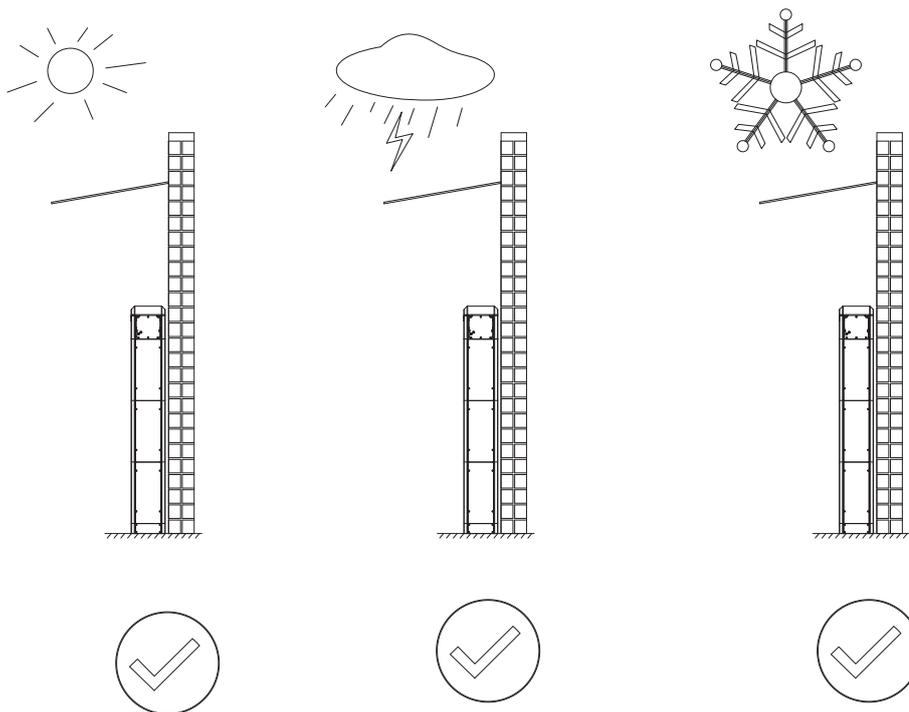
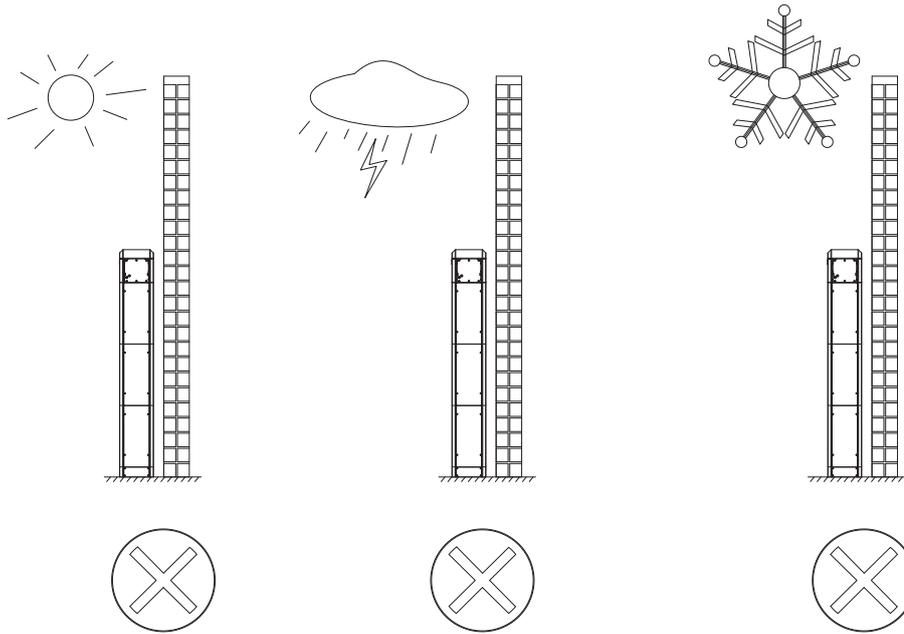
Battery dimension (mm) :



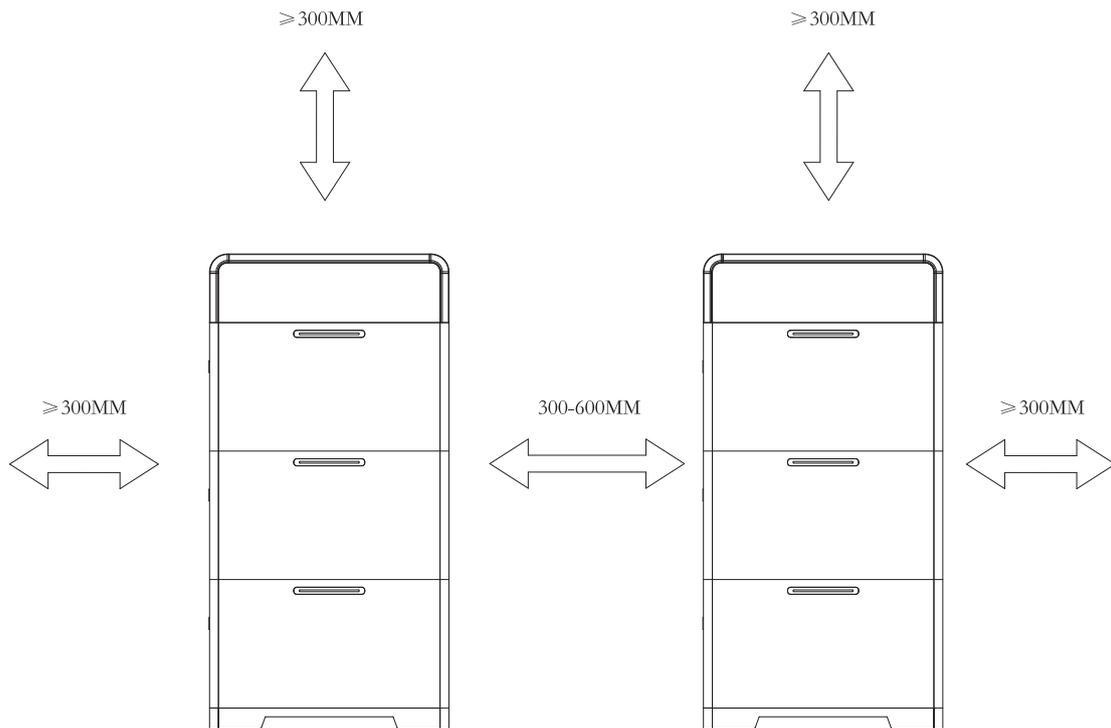
Battery Base dimension (mm) :



Storage unit is cooled by natural wind convection. It is recommended to install in indoors or sheltered areas to avoid direct sunlight, rain and snow.



Please ensure that the air at the installation point is circulated. Bad air ventilation will affect the working performance of internal electronic components and shorten the service life of storage unit.

**The following sites are not allowed for installation:**

- within 600mm of any exit.
- within 600mm of any vertical side of a window or building ventilation that ventilates a habitable room.
- in ceiling spaces.
- in wall cavities or under stairways.
- on roofs, except for were specially deemed suitable.
- under access walkways.
- sites where the freezing point is reached, like garages, carports or other places.
- places with plenty of salt.
- flooded areas.
- within 600mm of any hot water unit, air conditioning unit or any other appliance associated with the pre-assembled integrated battery energy storage system.

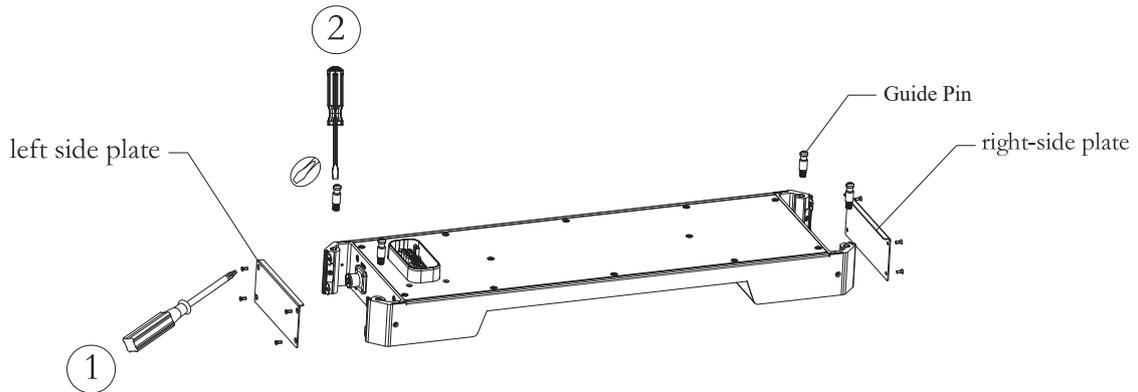
4.4 Preparations before installation

Step 1: Take out the Battery Control Box, battery and base from the packing box.

Step 2: Preparation before base installation :

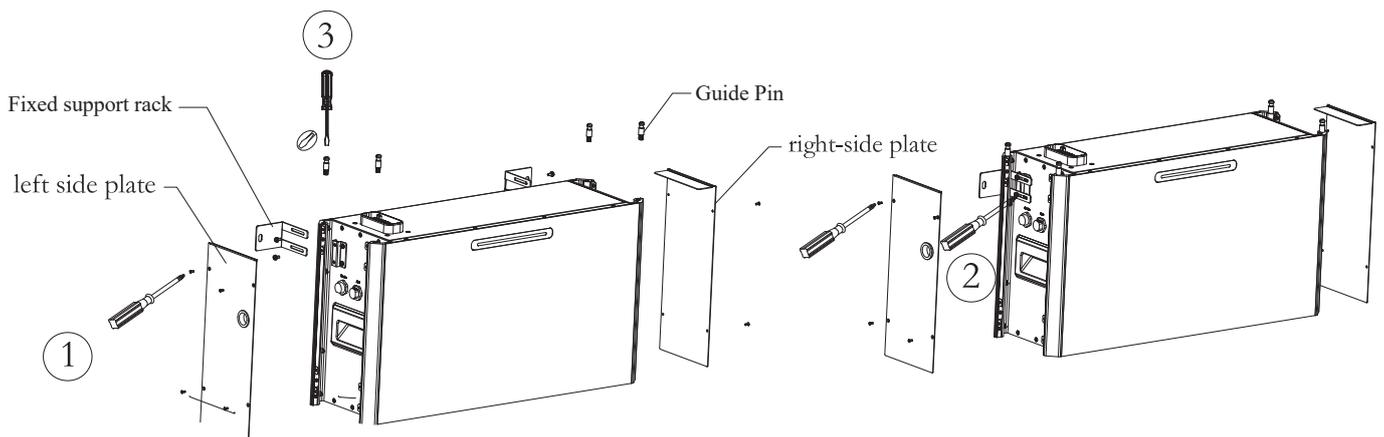
- ① Use screwdriver to loosen the 4 screws on the side of the terminal

- ② Install the 4 positioning pins in the holes at the four corners of the base, and tighten them with a flathead screwdriver.



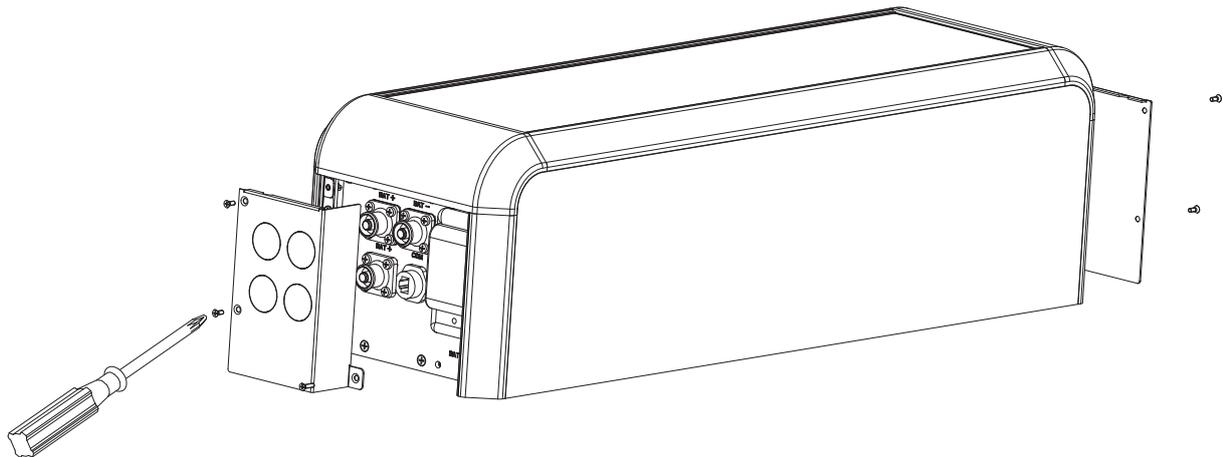
Step 3: Preparations before battery installation :

- ① Use screwdriver to loosen the cover screws on both sides.
- ② Pass the upside-down hanging ear through the mounting hole of the chassis, and fix it with screws. It needs to be adjusted later, so it does not need to be tightened.
- ③ Install the 4 positioning pins in the holes at the four corners of the battery case, and tighten them with a flathead screwdriver.



Step 4: Preparations before Battery Control Box installation :

- ① Use screwdriver to loosen the fixing screws on the side cover and remove the cover.



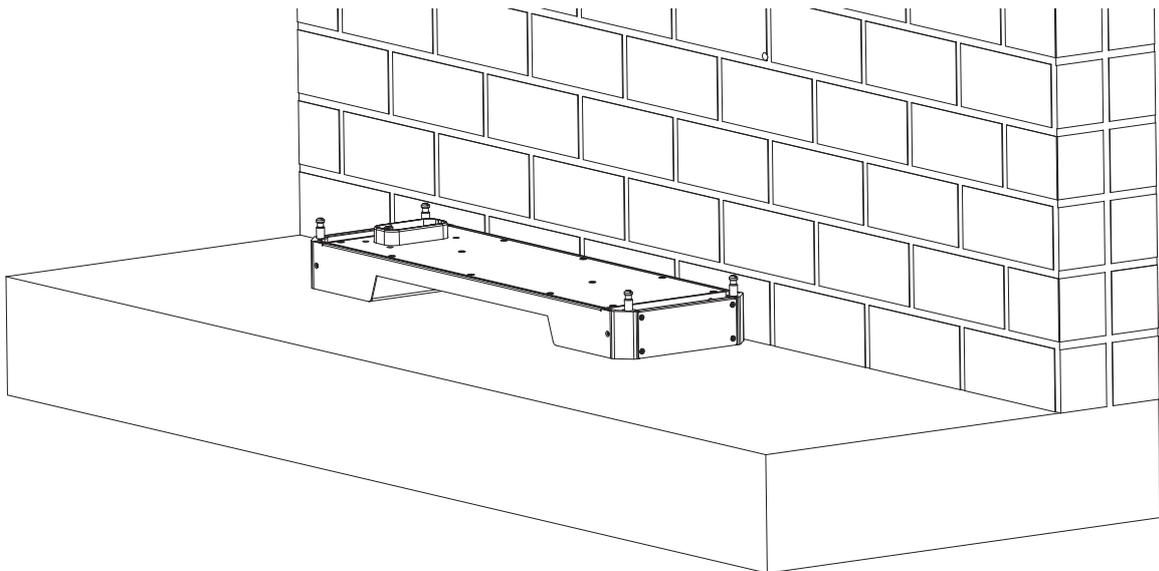
4.5 Installation steps for storage unit



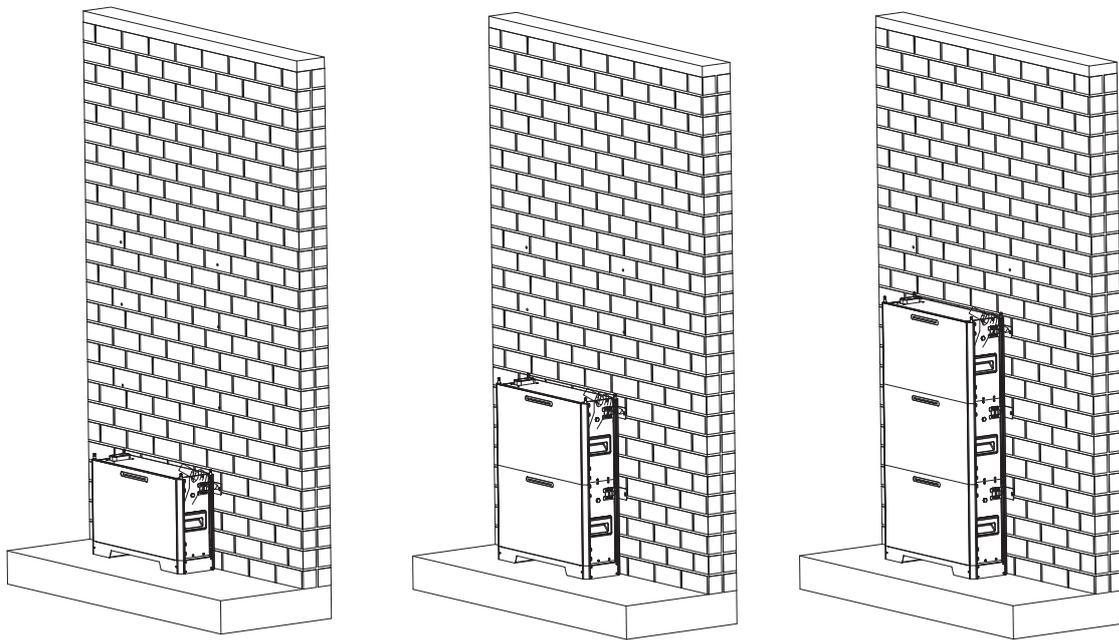
Note!

- strength to fix the screws and bear the weight of battery.

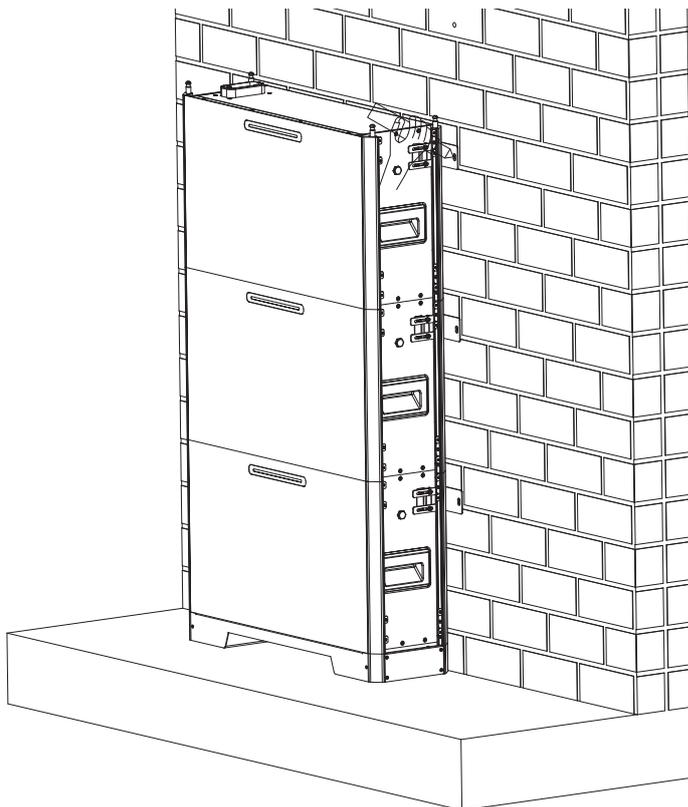
Step 1: Choose the installation location, place the base, adjust it to horizontal, and the base is 10~20mm away from the wall.



Step 2: Stack the battery in sequence.



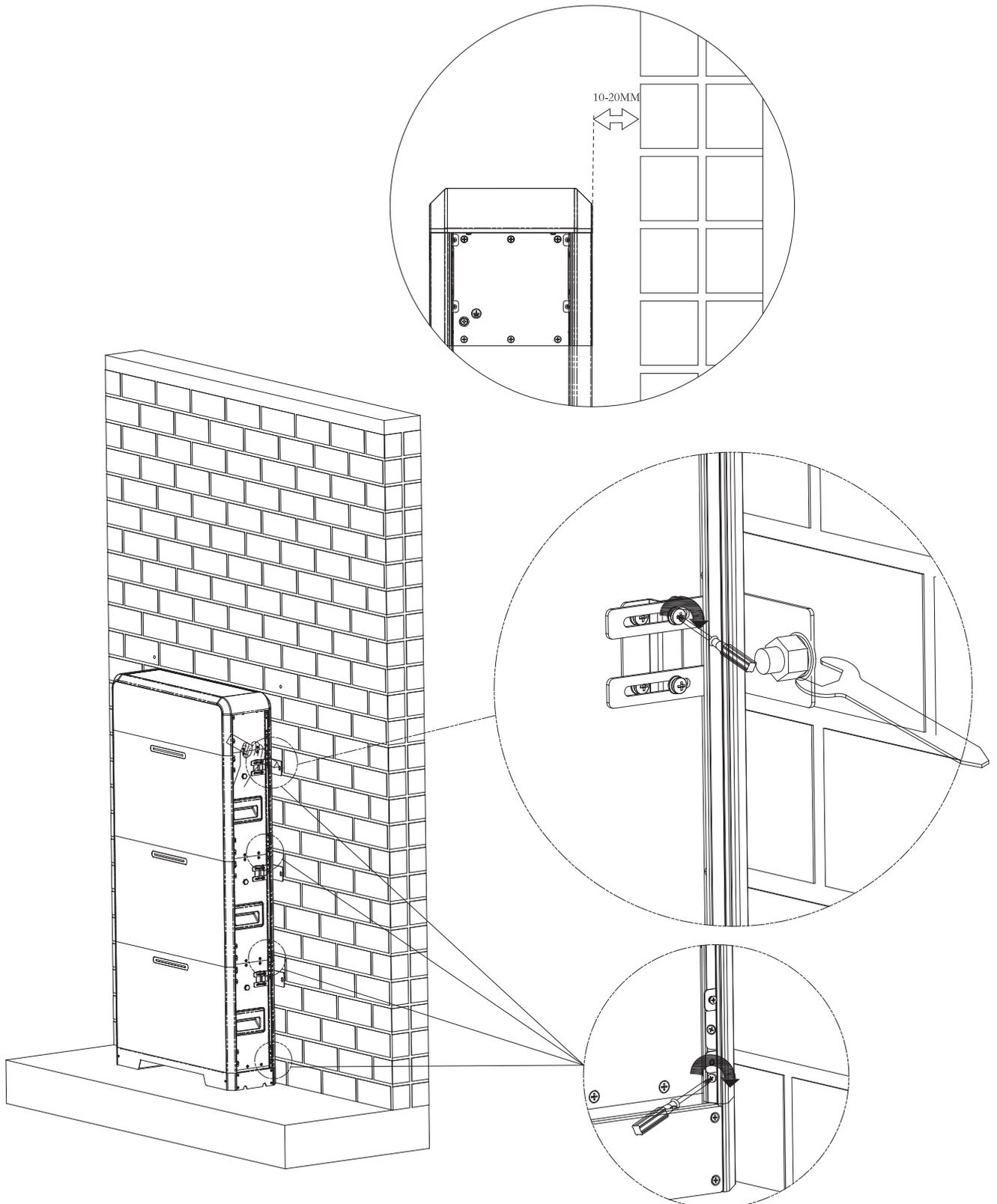
Step 3: Use a marker pen to draw a line in the hole of the wall fixture to determine the position of the screw hole.



Step 4: Take down the battery in sequence.

Step 5: Use a percussion drill to drill holes marked in Step 3 and drive in expansion screws.

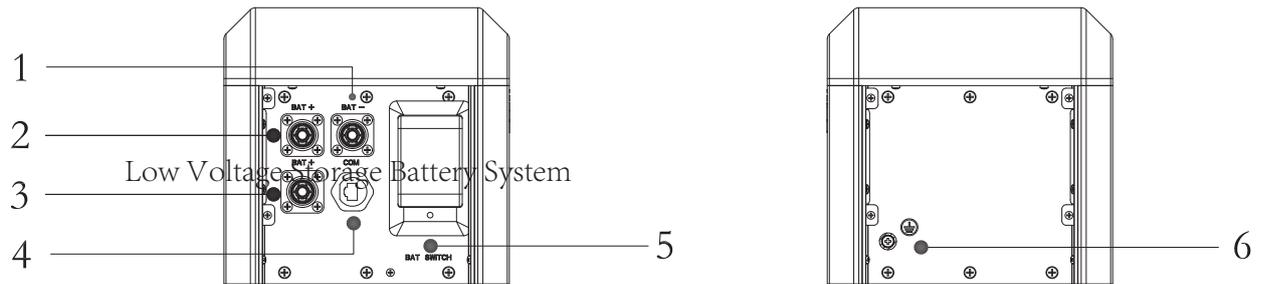
Step 6: Stack the battery module in sequence, tighten the cascading fixing screws, fix the screws and wall fixing parts on the wall with a wrench, adjust the fixing bracket screws of the chassis, and adjust the distance between the chassis and the wall to an appropriate distance (10~20mm) rear locking screw.



5 Electrical Connections

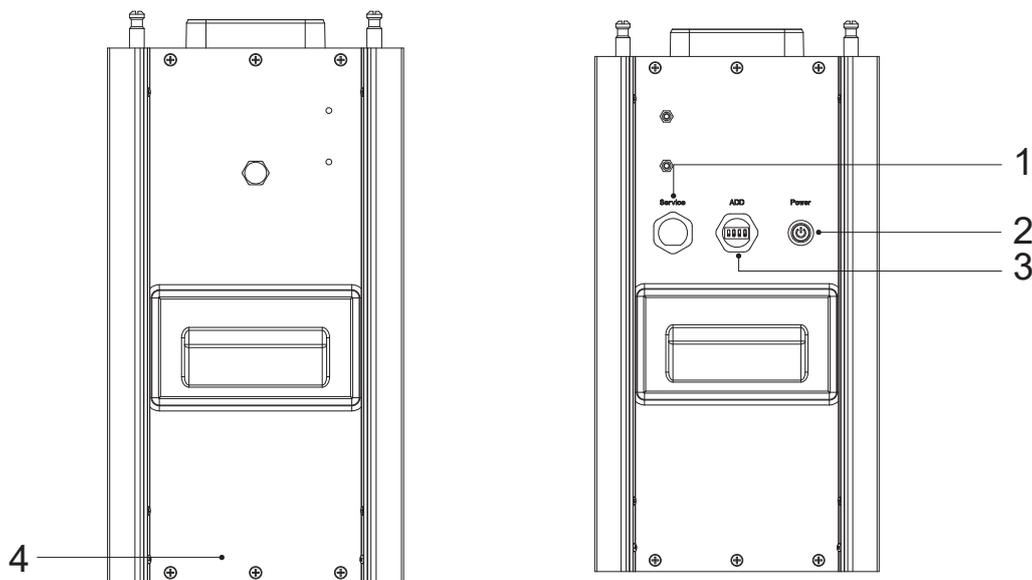
5.1 Electrical Interface Description

5.1.1 Battery Control Box interface description



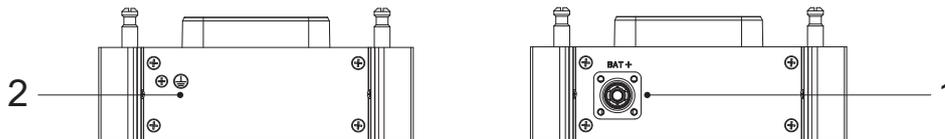
Object	Description	Object	Description
1	Battery -	4	Battery signal port
2	Battery +	5	Battery Switch
3	Battery +	6	Grounding screw

5.1.2 Battery interface description



Object	Description	Object	Description
1	Service port	3	ADD port
2	Power button	4	Grounding screw

5.1.3 Base interface description



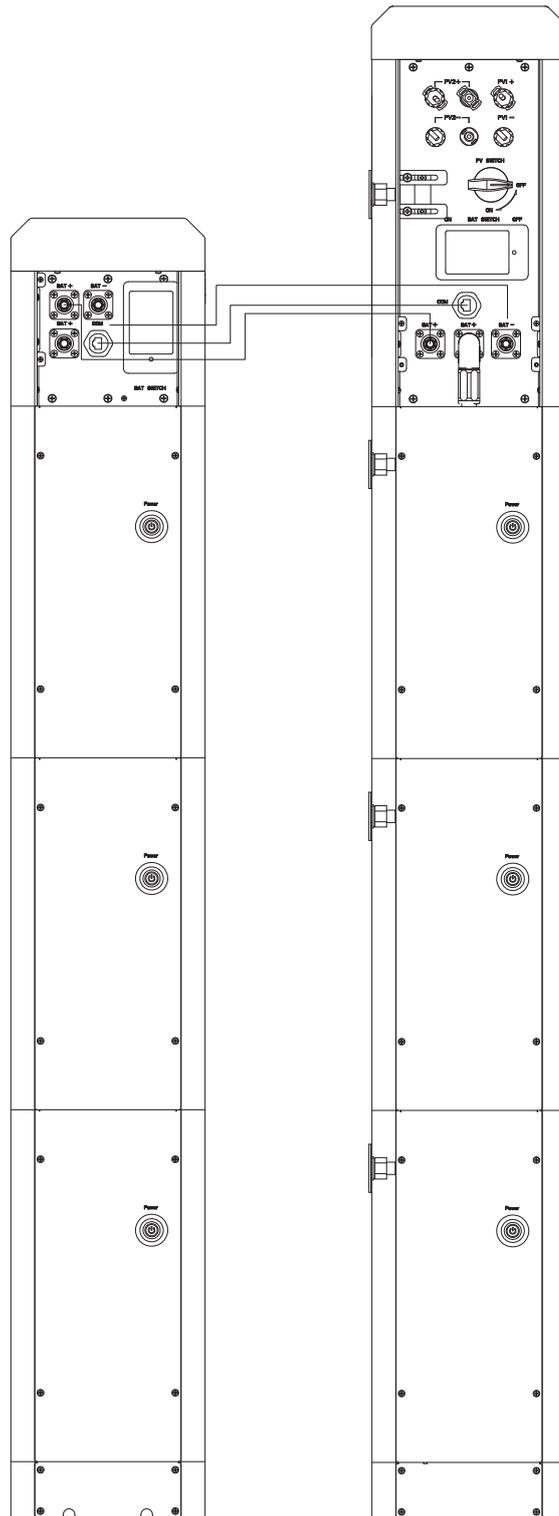
Object	Description	Object	Description
1	Battery + connection port	2	Grounding screw

5.2 System Wiring Schematic

The ULB5120-MT energy storage battery system can be used as an extended battery module for the UHome series all-in-one ESS, or can be used separately with other single-phase low-voltage hybrid inverters.

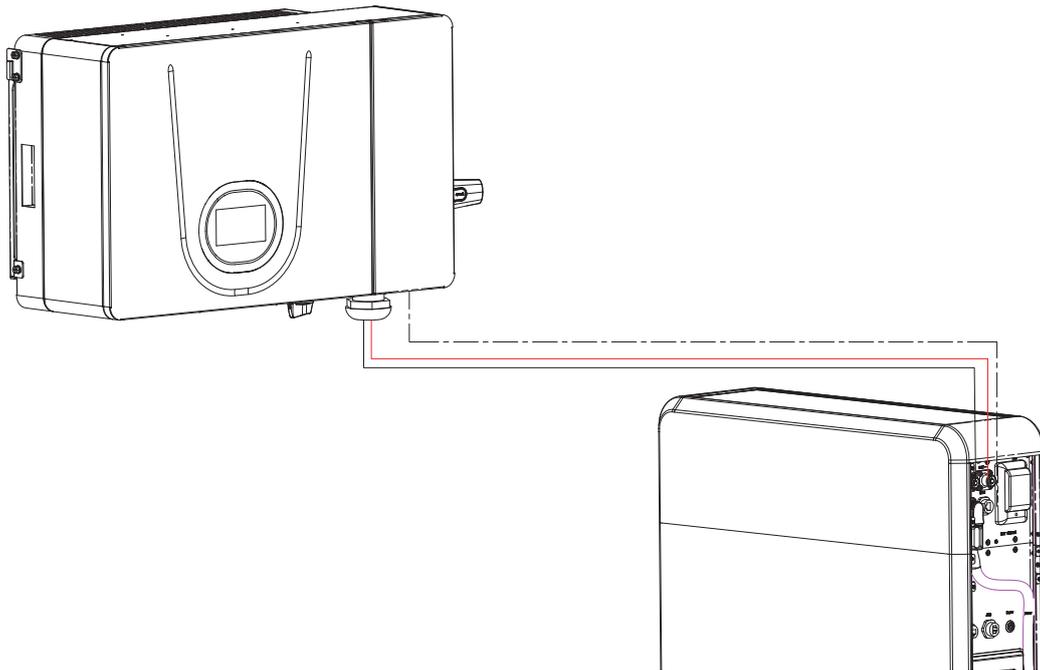
5.2.1 As a UHome expansion battery

Use the accessory harness to connect two sets of batteries, the battery packs are connected in parallel, BAT + connects to BAT +, BAT - connects to BAT -, COM connects to COM.



5.2.2 Connect other low-voltage inverters

Use the accessory harness to connect inverter.



5.3 Battery Wiring

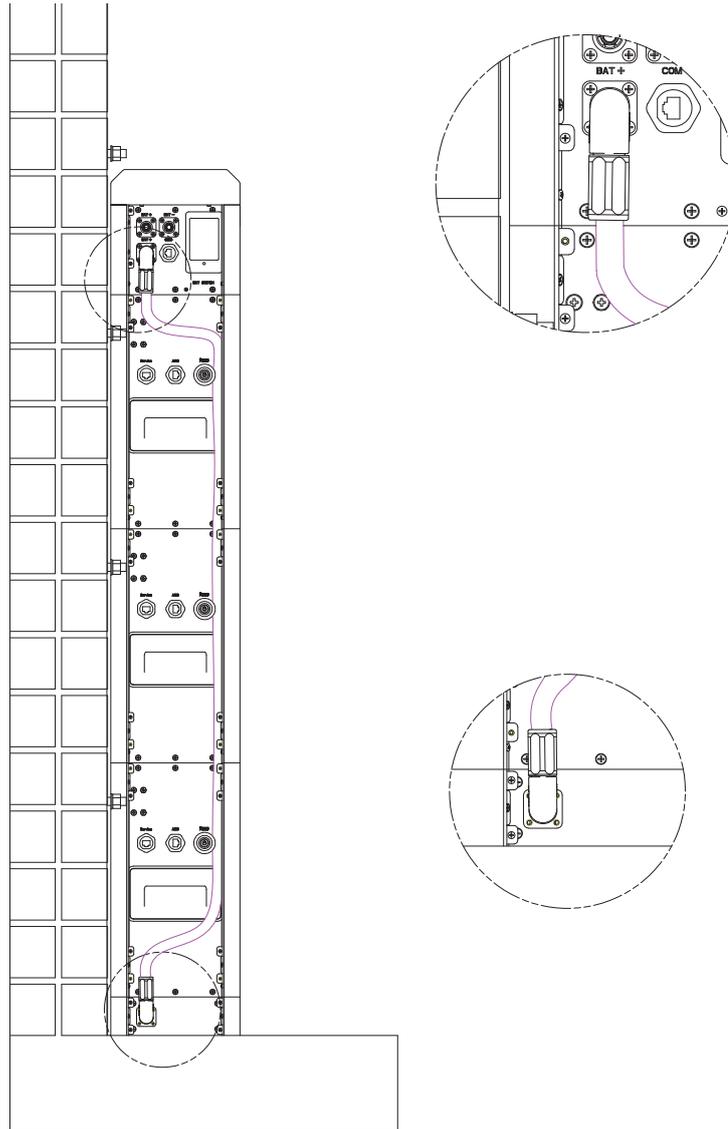


Warning!

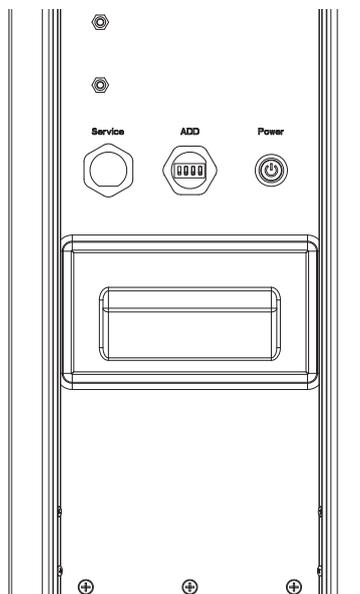
- The Batteries are paralleled to the inverter.
- Ensure Battery switch is off during installation to avoid the risk of short circuit caused by wrong operation during battery wiring.
- Do not connect one Expansion Battery to two different inverter devices at the same time

5.3.1 Battery wiring (Battery does not expand)

Step 1: Take out the wire harness, plug it into the socket of the base, connect the positive socket of the Battery Control Box, hear a "click" sound, the installation is correct, arrange the cables into the edge groove.



Step 2: Set the DIP switch of each battery.



DIP switch configuration can be found below:

Configuration	Battery (No.1)	Battery (No.2)	Battery (No.3)	Battery (No.4)	Battery (No.5)	Battery (No.6)
1* Battery		/	/	/	/	/
2* Battery			/	/	/	/
3* Battery				/	/	/
4* Battery					/	/
5* Battery						/
6* Battery						

5.3.2 Connect the inverter

Step 1: Prepare the cable. The stripping operation must not cut any cable strands, insulation or jacket at places other than specified by the cable stripping dimensions. Take care that the individual strands of the cable are not bent and that the insulation or jacket is not damaged. The surface must be clean and free of contamination.

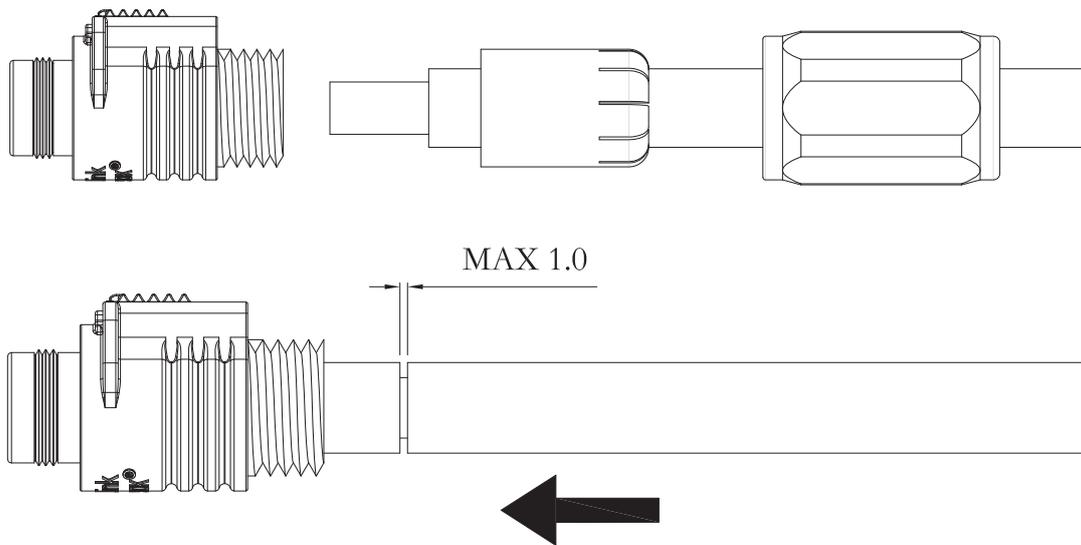


Step 2: Apply the cable onto the crimping position

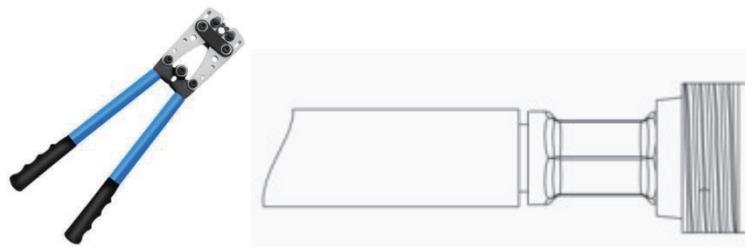
Before crimping, the center terminal must be positioned to fulfill following conditions:

- A max. air gap of 1 mm is allowed between the shoulder of the cable insulation.

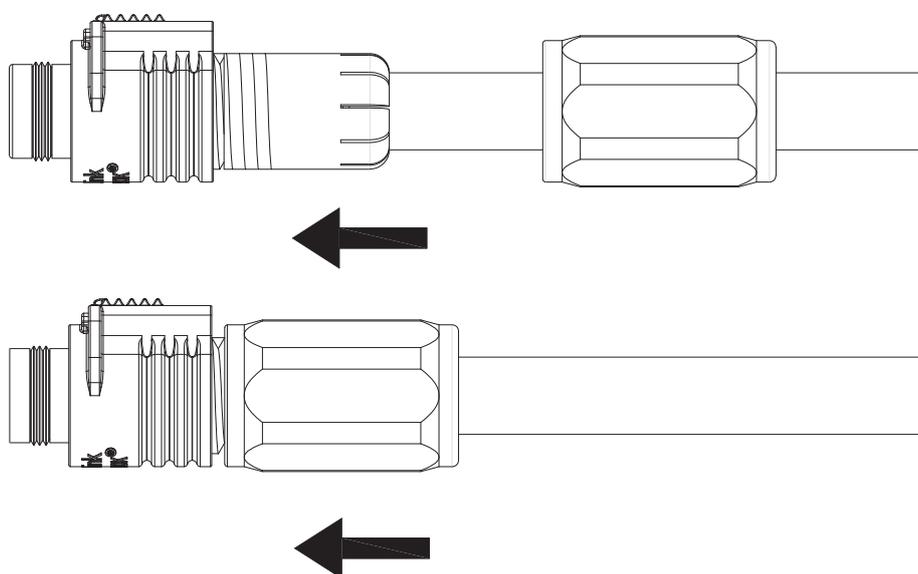
- All strands must be positioned in the crimp barrel.



Step 3: Use a special tool to crimp the cable to ensure that the crimping is intact.



Step 4: Structure and assembly of plug. Slide cable seal assy until it is fully locked.

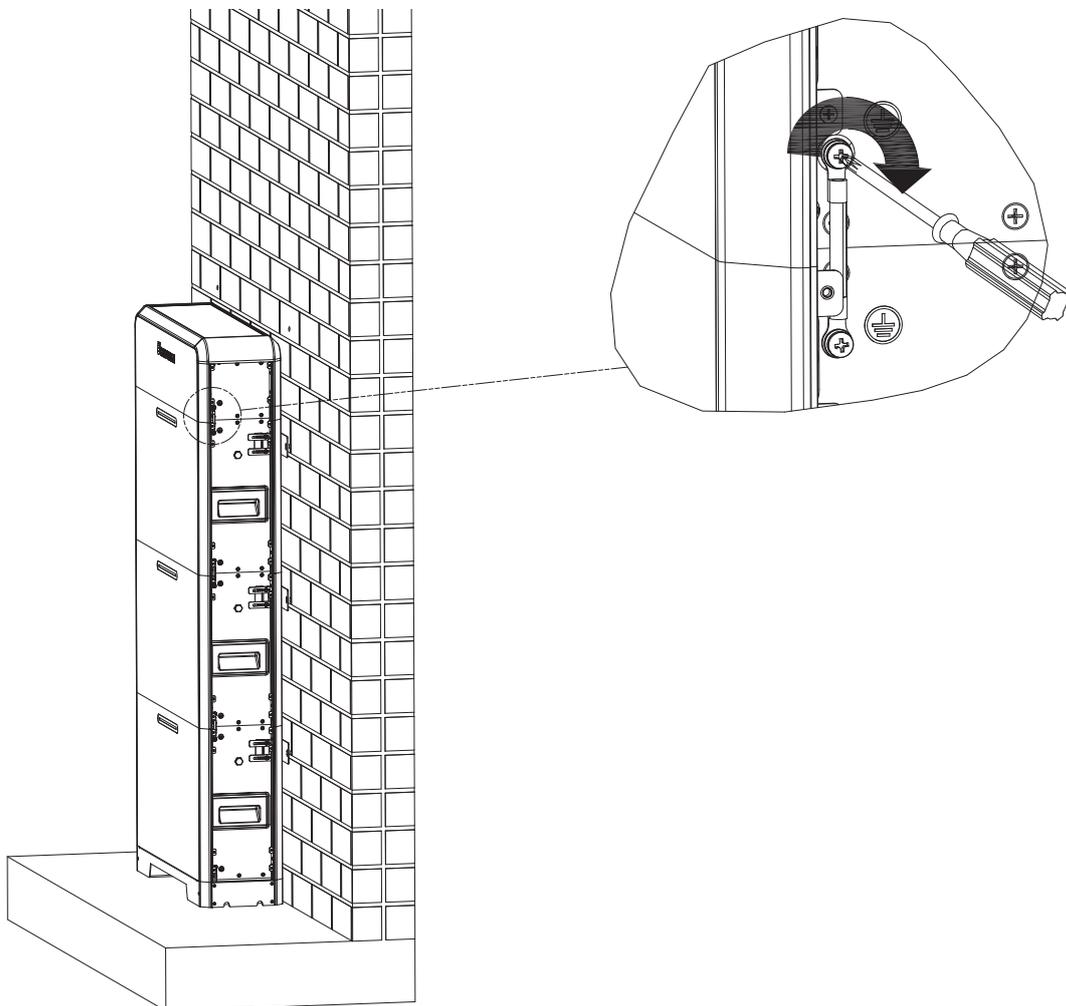


Step 5: According to different inverter instructions, select the crimp terminal on the inverter connection side.

Step 6: Connect the cable from Battery Control Box to the battery side of the inverter, and the network cable connects the RJ-45 port of Battery Control Box to the BMS communication port of the inverter.

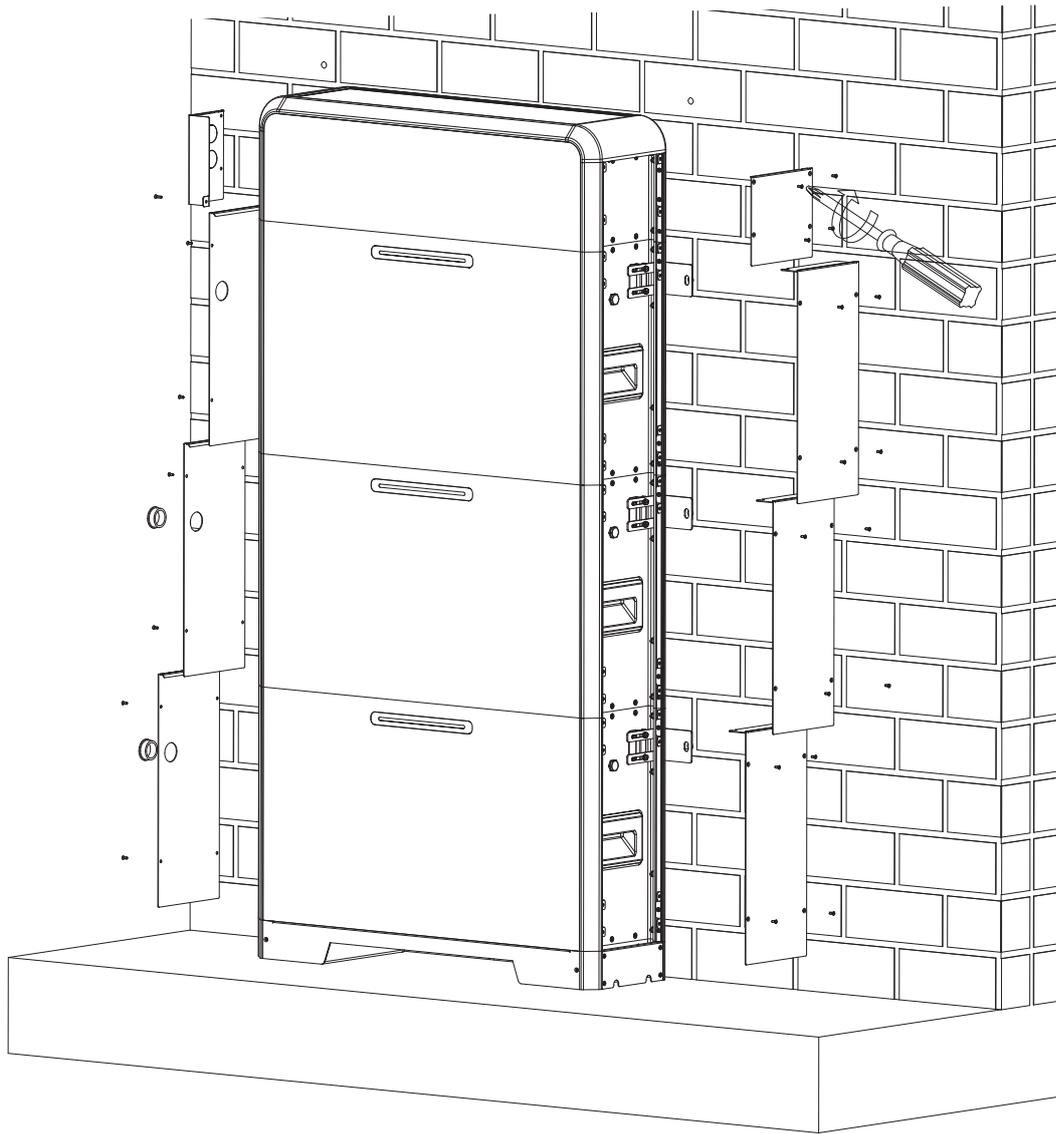
5.3.3 Grounding wire connection

Take out the grounding wire and screw (M4-10), and install it to the corresponding position with a screwdriver.



5.3.4 Side protection cover installation

After connecting the wires, find the corresponding side cover, place it in a suitable position, and screw on the fixing screws with a screwdriver.



6 LED indication

6.1 Bat LED

LED status

Battery Status	Protection, alarm normal	RUN	ALM	Description
		Green	Red	
Off	/	Off	Off	All off
On	Normal	Flash 1	Off	No charging or discharging
	Warning	Flash 1	Flash 3	PACK low voltage
Charge	Normal	ON	Off	/
	Warning	ON	Flash 3	/
	Over Charge	On	Off	Stop charging
	Over	Off	On	

	Temp/Current,Failure			
Discharge	Normal	Flash 3	Off	/
	Warning	Flash 3	Flash 3	/
	Over Discharge	Off	Off	Stop discharging
	Over Temp/Current,Failure	Off	On	
Failure	/	Off	On	Stop charging and discharging

Flash description :

Flash 1: 0.25s on/3.75s off

Flash 2: 0.5s on /0.5s off

Flash 3: 0.5s on,1.5s off

7 Battery Maintenance

7.1 Transportation

Lithium batteries are dangerous goods. Passed the test of UN38.3, this product meets the transportation requirements for dangerous goods for lithium batteries. After the installation of the battery on site, the original packaging (contains the lithium battery identification) should be kept. When the battery needs to be returned to the factory for repair, please pack the battery with the original packaging to reduce unnecessary trouble.

7.2 Storage

After purchasing the battery, please store it with following instructions:

- 1) Please store it in a dry and ventilated environment, keep it away from heat sources.
- 2) Please keep it in an environment with storage temperature as -20 ° C ~ 50 ° C, humidity <85% RH.
- 3) For long-term storage (>3 months), please put it in an environment with a temperature of 18 ° C to 28 ° C and a humidity of < 85% RH.
- 4) The battery should be stored in accordance with the storage requirements mentioned above, and the battery should be installed within 6 months since delivered from the factory and used with compatible inverters.

**Note!**

- The battery remains 30% power when it is sent from the factory.
- The longer the battery is stored, the DOD value is getting bigger. When the battery remaining voltage fails to reach the startup voltage requirement, the battery may be damaged.

The battery cannot be disposed of as household refuse. When the service life of the battery reaches to the limit, it is not required to return it to the dealer or UHome, but it must be recycled to the special waste lithium battery recycling station in the area.

7.3 Cleanliness

Clean the enclosure lid with moistened cloth with clear water only. Do not use any cleaning agents as it may damage the components.



UPOWER ELECTRIC CO.,LTD

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