

# User Manual

## UHB Li-HV System



EN Version: V2.0

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# Preface

## **Overview**

This manual is aimed at electricians, specialists with professional qualifications and end users. It mainly introduces the assembly, installation, electrical connection, debugging, maintenance and troubleshooting of the products. Before installing and using battery, please read this manual carefully, understand the safety information and be familiar with the functions and characteristics of hybrid battery.

## **Target Groups**

This manual is applicable to the electrical installers with professional qualifications and end-users.

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# 1 Safety Instructions

## 1.1 Safety Notes

Before installation, please read this manual and warning labels on battery carefully and follow the instructions in this manual strictly.

## 1.2 Important Safety Matters

SAVE THESE IMPORTANT SAFETY INSTRUCTIONS.

UHB Stackable Li-HV system installation and maintenance instructions Must have high voltage electrical knowledge. The Company assumes no liability for injury or property damage due to repairs attempted by unqualified individuals or a failure to properly follow these instructions. These warnings and cautions must be followed when using our product.

 Warning	Read this entire document before installing or using UHB stackable Li-HV system. Failure to do so or to follow any of the instructions or warnings in this document can result in electrical shock, serious injury, or death, or can damage UHB stackable Li-HV system, potentially rendering it inoperable.
 Warning	A battery can present a risk of electrical shock, fire, or explosion from vented gases. Observe proper precautions.
 Warning	UHB stackable Li-HV storage system installation must be carried out only by Installers, who have been trained in dealing with high voltage electricity.
 Warning	The product is heavy and challenging to lift.

 Warning	Use UHB Battery only as directed.
 Warning	Do not use UHB Battery if it is defective, appears cracked, broken, or otherwise damaged, or fails to operate.
 Warning	Do not attempt to open, disassemble, repair, tamper with, or modify UHB Battery. UHB Battery is not user serviceable. LFP Cells in UHB Battery are not replaceable. Contact the UHB Authorized Reseller who sold the UHB Battery for any repairs.
 Warning	Do not connect UHB Battery to alternating current carrying conductors. UHB storage system including battery and battery must be wired to either a battery or a DC combiner panel that is then wired to an inverter. No other wiring configuration may be used.
 Warning	UHB Battery contains components, such as switches and relays, that can produce arcs or sparks.
 Warning	To protect UHB Battery and its components from damage when transporting, handle with care. Do not impact, pull, drag, or step on UHB Battery. Do not subject UHB Battery to any strong force. To prevent damage, leave UHB Battery in its shipping packaging until it is ready to be installed.
 Warning	Do not insert foreign objects into any part of UHB Battery.
 Warning	Do not expose UHB Battery or its components to direct flame.

 Warning	Do not install UHB Battery near heating equipment.
 Warning	Do not immerse UHB Battery or its components in water or other fluids.
 Warning	Do not use cleaning solvents to clean UHB Battery, or expose UHB Battery to flammable or harsh chemicals or vapors.
 Warning	Do not use fluids, parts, or accessories other than those specified in this manual, including use of non-genuine UHB parts or accessories, or parts or accessories not purchased directly from UHB or a UHB -certified party.
 Warning	Do not place UHB Battery in a storage condition for more than one (1) month, or permit the electrical feed on the UHB Battery to be severed for more than one (1) month, without placing UHB Battery into a storage condition in accordance with UHB' s storage specifications.
 Warning	Do not paint any part of UHB Battery, including any internal or external components such as the exterior shell or casing.
 Warning	Do not connect UHB Battery directly to photovoltaic (PV) solar wiring.

### 1.3 Environmental Conditions

 Warning	Install UHB Battery at a height that prevents damage from flooding.
 Warning	Operating or storing UHB Battery in temperatures outside its specified range might cause damage to UHB Battery.
 Warning	Do not expose the UHB Battery to ambient temperatures above 55°C (131°F ) or below -20°C (-4°F ).
 Warning	Ensure that no water sources are above or near UHB Battery, including downspouts, sprinklers, or faucets.

### 1.4 Symbol on the Battery Label

Symbol	Description
	Do not sit or put heavy things on product.
	Do not drop, deform, impact, cut or spearing with a sharp object.
	Do not place close to open flame or flammable material.
	Do not place at a children' s or pet' s reach.

Symbol	Description
	Electric shock hazard, live parts, risk of electric shock, do not touch.
	If fire, switch off the breaker on DC side and stay away from battery.
	Please read the instructions carefully before installation.
	The battery cannot be disposed of with household waste.

## 1.5 Symbol on the Packing Box

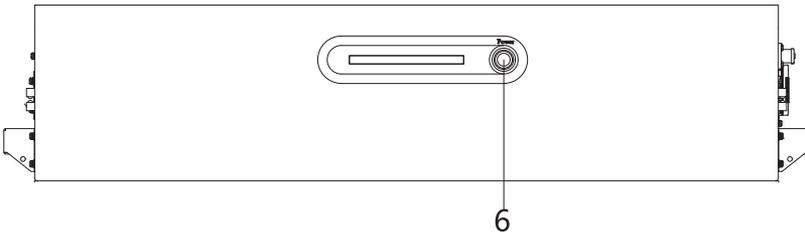
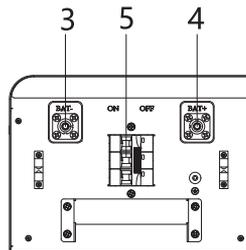
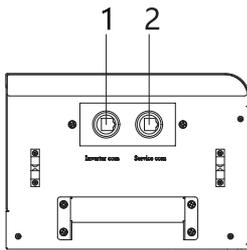
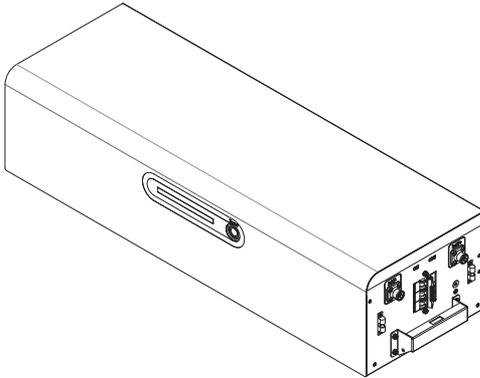
Symbol	Description
	Handle with care.
	This side up.
	Keep dry.
	Stacked layers.

## 2 Battery Introduction

### 2.1 Appearance Introduction

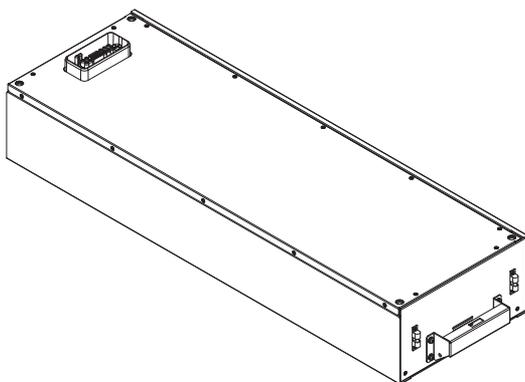
#### 2.1.1 Modules

##### 2.1.1.1 Control Module

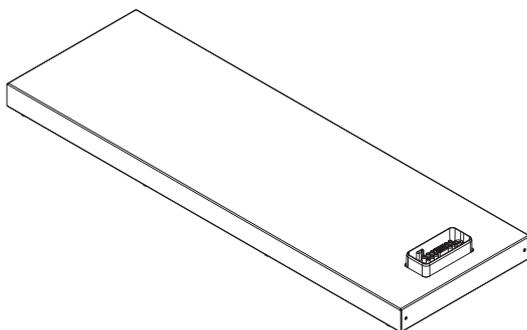


Item	Terminal	Note
1	Inverter COM	Connect to the inverter communication port
2	Service COM	Specified Debug Interface
3	Battery output -	/
4	Battery output +	/
5	Battery MCB	Control battery output
6	Power button	Turn the battery on and off

### 2.1.1.2 Battery Module



### 2.1.1.3 Base



## 2.2 Packing List

The package includes 1PCS control battery module, 1-9PCS slave battery modules, and 1PCS battery base and other installation accessories. Please check if the battery modules and accessories are complete in the package when receiving the goods, See the following figure for your reference.

### Master module packing list



Control Battery Module×1 PCS



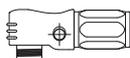
Left side cover assembly ×1PCS



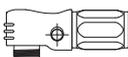
Right side cover assembly ×1PCS



Fixed bracket ×2PCS



Black terminal-Battery Plug×1 PCS



Orange terminal-Battery Plug ×1 PCS



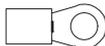
M3-8Countersunk screw ×4PCS



M4-10 Cross head combination screw×5PCS



8-60Expansion screw ×4PCS



OT-RNB5.5-4L Terminal ×1PCS



User Manual ×1PCS

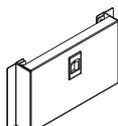


Quality Certificate ×1PCS

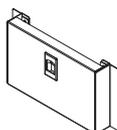
### Slave module packing list



Slave Battery Module× 1~9 1PCS



Left side cover assembly ×1PCS



Right side cover assembly ×1PCS



Alignment pin ×4PCS

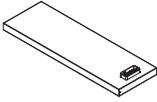


Quality Certificate ×1PCS

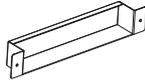


M3-8Countersunk screw ×4PCS

**Base packing list**



Base  
×1PCS



Side cover assembly  
×2PCS



Alignment pin  
×4PCS



M3-8 Countersunk screw  
×4PCS



Quality Certificate  
×1PCS

## 3 Installation

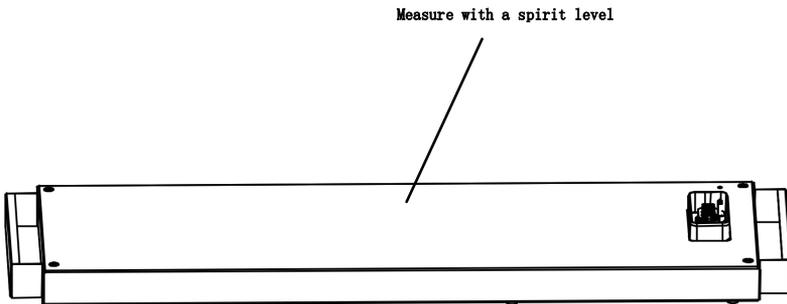
### 3.1 Location Requirements

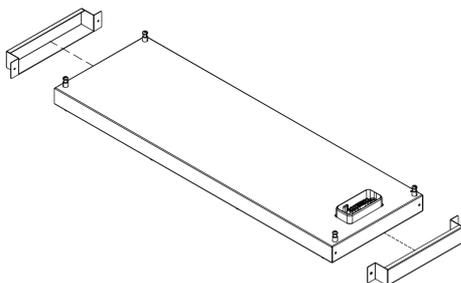
- ① The area is completely water proof. The floor is flat and level.
- ② There are no flammable or explosive materials.
- ③ The ambient temperature is within the range from -20 to 55 degree.
- ④ The temperature and humidity are maintained at a constant level. There is minimal dust and dirt in the area.
- ⑤ The distance from heat source is more than 2 meters.
- ⑥ Keep the distance of the whole battery system from the air outlet more than 0.5m. Do not cover or wrap the battery cabinet please!
- ⑦ Keep the battery out of kids' and pets' reach please. There should be no direct sunlight at the installation location.
- ⑧ There are no mandatory ventilation requirements for battery module, but please avoid installation in confined space (Installation to the wall should between 20-120mm).
- ⑨ The aeration shall avoid of high salinity.
- ⑩ Make sure the load capacity of the floor not less than 500KG.

### 3.2 Mounting

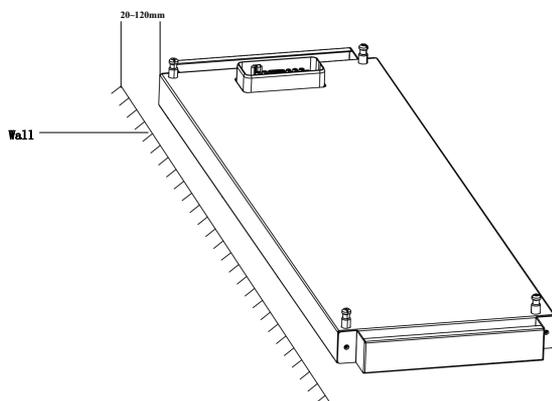
#### 3.2.1 Install the Base

- ① Check the installation environment to ensure ground level.
- ② Place the base on the ground, and make sure it is level and stable.



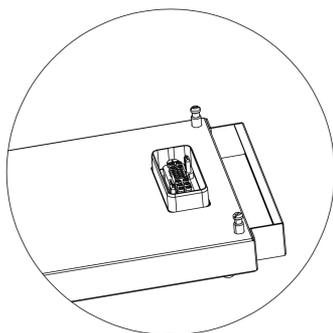


③ Distance between base and wall is 20mm~120mm.

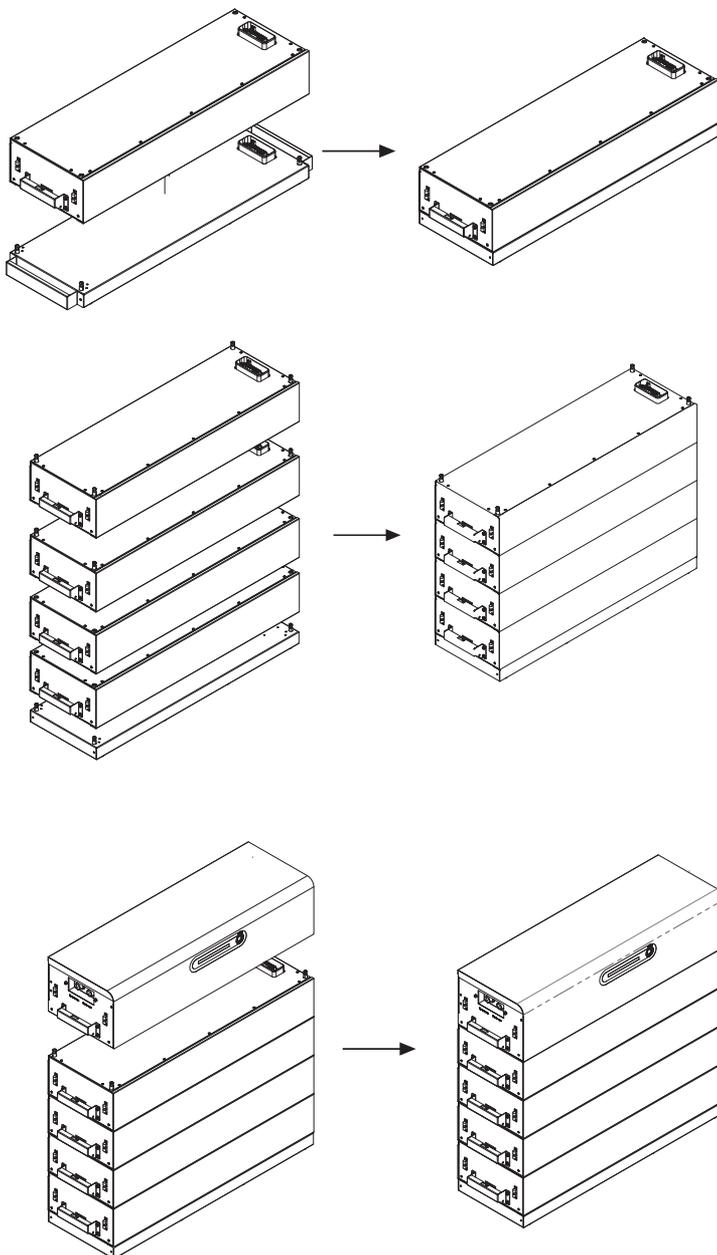


### 3.2.2 Install the Module

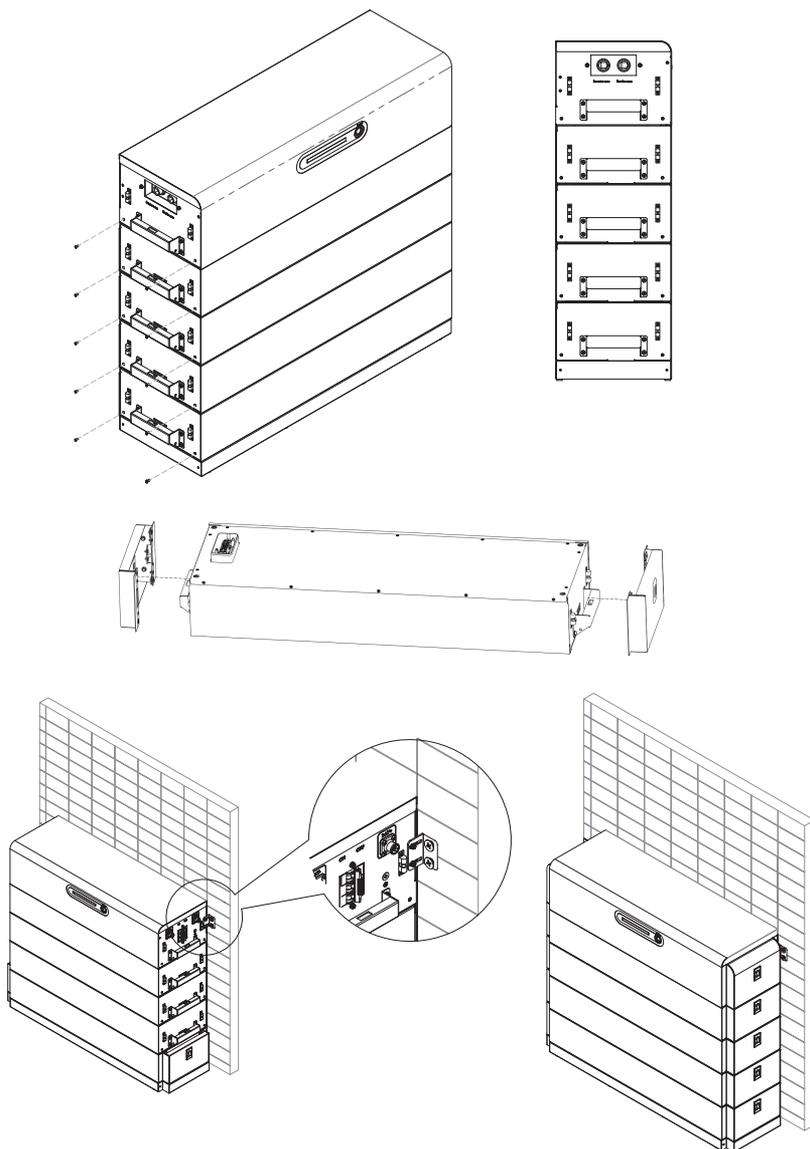
① After the base is installed, remove the protective film of the terminals, and the remaining battery module and control module are then placed in turn.



② Install the battery on the base, the terminals on the bottom of the battery should correctly installed to the terminals on the base.



- ③ Install cover plates on both sides of the base and battery module (no need to disassemble, just install from the side after installing the battery module).



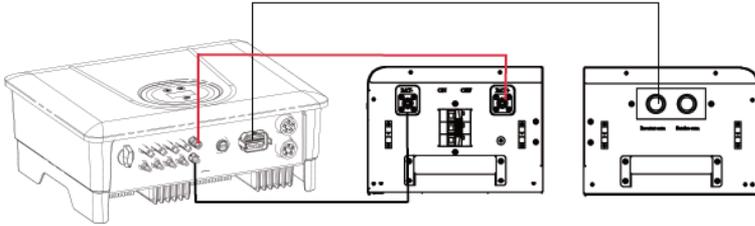
## 4 Electrical Connection

 Warning	A high voltage in the conductive part of the battery may cause an electric shock. When installing the battery, make sure that the DC sides of the battery is completely deenergized.
 Warning	Do not ground the positive or negative pole of the battery output, otherwise it will cause serious damage to the battery.
 Warning	Static may cause damage to the electronic components of the battery. Anti- static measures should be taken during installation and maintenance.
 Warning	Do not use other brands or other types of terminals other than the terminals in the accessory package. The Company has the right to refuse to held liable of all damages caused by the mixed-use of terminals.
 Warning	Moisture and dust can damage the battery, ensure the cable gland is securely tightened during installation. The warranty claim will be invalidated if the battery is damaged as a result of using poorly connected cable connector.

### 4.1 Cables Connection

After the mechanical installation is completed, please connect the inverter and the control battery module with the positive and negative cables, communication and ground cables.

The picture on this page shows the cables connection. Please follow the instruction and make sure all the cables are connected correctly.



### 4.2 Battery Power Connector Assembly Procedures

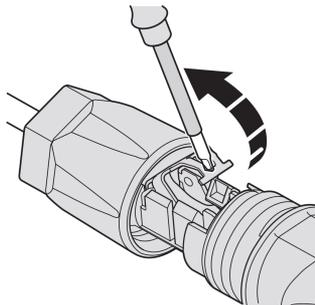
① Select an appropriate DC cable.

Cable type	Conductor cross-sectional area (mm <sup>2</sup> )	
	AWG 10	Outside diameter (mm <sup>2</sup> )
	5.5-8.0	4.0-6.0

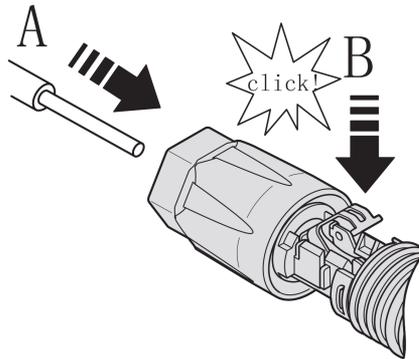
② Peel off the DC cable insulation sleeve for 15 mm, as shown in Figure:



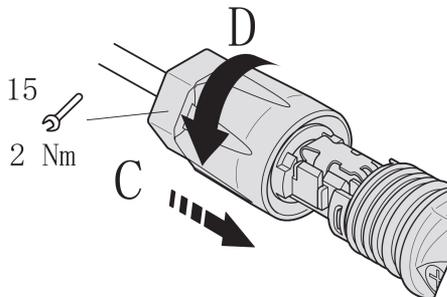
③ Use a flathead screwdriver to open the clamping bracket in the connector, as shown in Figure:



④ Insert the stripped DC cable to the battery connector deep enough and toggle the clamping bracket to make sure it tightly locked with the stripped cable, as shown in Figure:

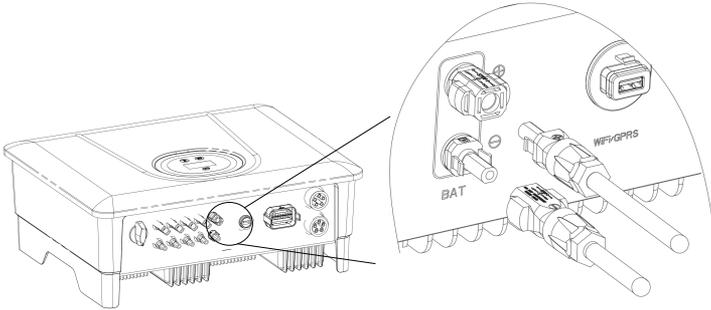


⑤ Push the battery connector to the thread joint, and use an open wrench to lock the connector in a torsion of 2Nm tightly, as shown in Figure:



 Warning	① Before making the battery connector, please make sure the polarity of the cable is correct.
	② Use a multimeter to measure the voltage of the battery pack and make sure the voltage is within the inverter limitation and the polarity is correct.

⑥ Insert the positive and negative connector into the inverter battery terminals respectively, and a “click” sound represents the assembly in place, as shown in Figure:



### 4.3 Communication Cable Connection

One side of the communication cable used to connect the inverter and control module port is preinstalled on the inverter before leaving the factory, insert the other side to the “Inverter COM” port in the control module when installing it.

Communication interface and definition:

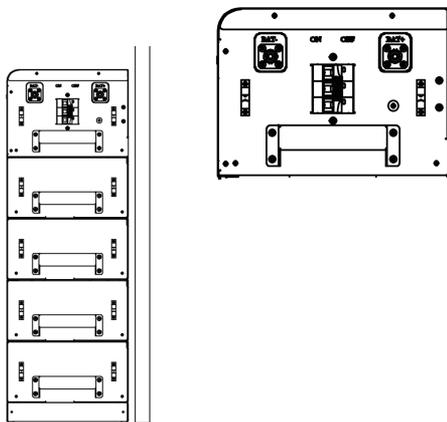
	Item	Service COM	Inverter COM
	1	RS485_A	/
	2	RS485_B	/
	3	/	/
	4	/	CAN_H
	5	/	CAN_L
	6	RS232_RX	/
	7	RS232_TX	/
	8	RS232_GND	/

## 5 System Start and Stop

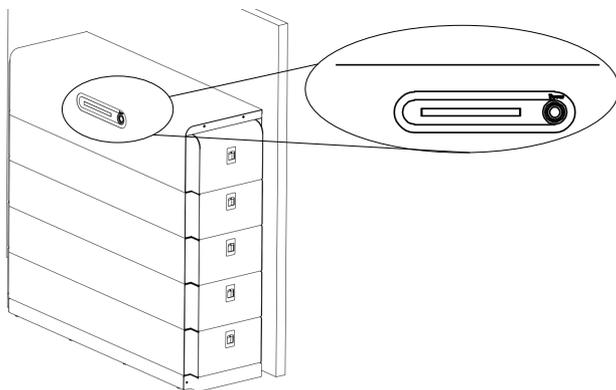
### 5.1 Start System

When starting the system, follow these steps:

- ① Turn on the DC Switch in the bottom of inverter.
- ② Turn on the DC Switch on the control module.



- ③ Hold down the POWER button for 5 seconds until the power button lights up.



- ④ Observe the status indicator, green light flashing indicates the normal output.
- ⑤ Switch on the AC breaker first.
- ⑥ The inverter will start to check the DC and AC input parameters and self-check for 30s~1min, and if everything is normal, the inverter will start to work according to the working mode which you set on the App. The inverter display and indicators will show relevant parameters and status.

## 5.2 Turning Off The System

When turning off the system, please follow the steps below:

- ① Switch off the breakers on the grid and load side.
- ② Turn off the DC Switch on the control module.
- ③ Wait 30 seconds and then turn the inverter DC switch to the "OFF" . At this time, there is remaining power in the inverter capacitor. Wait for 5 minutes until the inverter is completely de-energized before operating.
- ④ If the device is not used for a long time, please unplug the AC and DC cables.

## 5.3 LED indication

### LED status

Battery Status	Protection, alarm normal	RUN	ALM	Capacity				Description
		Green	Red	Green	Green	Green	Green	
Off		Off	Off	Off	Off	Off	Off	All off
On	Normal	Flash 1	Off	Based on capacity				No charging or discharging
	Warning	Flash 1	Flash 3					PACK low voltage
Charge	Normal	ON	Off	Based on capacity, the highest level LED flashes (flash 2), the other SOC lights is on all the times.				
	Warning	ON	Flash 3					
	Over Charge	On	Off	On	On	On	On	Stop charging
	Over Temp/Current, Failure	Off	On	Off	Off	Off	Off	
Discharge	Normal	Off	Flash 3	Based on capacity, the highest level LED flashes, the other SOC lights is on all the times.				
	Warning	Flash 3	Flash 3					
	Over Discharge	Off	Off	Off	Off	Off	Off	Stop discharging
	Over Temp/Current, Failure	Off	On	Off	Off	Off	Off	
Failure		Off	On	Off	Off	Off	Off	Stop charging and discharging

### SOC status

Status		Charge				Discharge			
		L1	L2	L3	L4	L1	L2	L3	L4
Capacity	0~25%	Flash 2	Off	Off	Off	On	Off	Off	Off
	25%~50%	On	Flash 2	Off	Off	On	On	Off	Off
	50%~75%	On	On	Flash 2	Off	On	On	On	Off
	75%~100%	On	On	On	Flash 2	On	On	On	On
Run		On				Flash 3			

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

## 6 Troubleshooting

### 6.1 Maintenance

 Warning	Risk of battery damage or personal injury due to incorrect service!
 Warning	Keep unqualified persons away!
 Warning	Restart the battery only after removing the fault that impairs safety performance. Never arbitrarily replace any internal components.
 Warning	Servicing of the device in accordance with the manual should never be undertaken in the absence of proper tools, test equipment or the latest revision of the manual which has been clearly and thoroughly understood.

### 6.2 Maintenance of electrical components

Item	Project	Checkpoint	Methods	Repair Condition	
1	Electrical	Check whether the voltage output is normal.	Multi-mete	The battery voltage exceeds the preset range	Contact the dealer or manufacturer.
2	Failure to check	Check whether the light is normal.	Visual inspection	Warning	
3	Cable	Insulation, terminal	Visual inspection	Insulation crack, aging, the terminal is peeling or corroded.	Replace the cable, replace the terminal board.

### 6.3 Battery Maintenance

Item	Frequency	Project	Solution
1	Every month	Working environment	Keep away from heat sources and direct sunlight.
		Visual inspection	If there is damage, leakage or deformation, isolate the faulty battery pack, take photos and replace the battery.
2	Every quarter	Visual inspection	Clean appearance with cotton cloth. Be careful when cleaning.
		Connection status	Check whether the wiring is tight, check the temperature of the wire.
3	Half a year	Measure and record voltage	Collect discharge data at least once every six months in the first year. In the second year, discharge data were collected every three months. Check the historical records through the RS232 port. If the alarm information shows that the battery is frequently overcharged, the battery has reached the charging and discharging protection point. This may lead to insufficient time for power preparation. It is recommended to replace the battery immediately.

## 7 Technical Parameters

Model	UHB512	UHB768	UHB1024	UHB1280	UHB1536
<b>Electrical parameters</b>					
NO. Of Series Battery	2	3	4	5	6
Rated Energy (kwh)	5.12	7.68	10.24	12.8	15.36
Usable Energy (kwh)	4.6	6.9	9.2	11.52	13.8
Rated Voltage (V)	102.4	153.6	204.8	256.0	307.2
Voltage Range (V)	89.6~115.2	134.4~172.8	179.2~230.4	224.0~288.0	268.8~345.6
Battery Type	Li-ion (LFP)				
Rated Capacity(Ah)	50Ah				
Charge Current(A)	25A (Rated) /50A (Maximum)				
Discharge Current (A)	25A (Rated) /50A (Maximum)				
Cycle Times	80% DOD, >10000 times, Remaining capacity >60%				
Communication	RS-485 / RS-232 / CAN 2.0				
Protection function	Over voltage / Under voltage / Over temperature / Low temperature / Over current / Short circuit				
<b>Working conditions</b>					
Installation conditions	Indoor				
Range of working temperature	Charge: 0°C~55°C Discharge: -20°C~55°C				
Optimal working temperature range	20°C~30°C				
Storage temperature	-20°C~55°C				
Working humidity	5%-95% (No condensation)				
Altitude	≤2000m				
Cooling method	Natural cooling				
Certificate	CE, UN38.3, MSDS				
Size [W x H x D, mm]	844*255*315	844*255*455	844*255*575	844*255*705	844*255*935
Weight [kg]	66	97	128	159	190

<b>Model</b>	<b>UHB1792</b>	<b>UHB2048</b>	<b>UHB2304</b>	<b>UHB2560</b>
<b>Electrical parameters</b>				
NO. Of Series Battery	7	8	9	10
Rated Energy (kwh)	17.92	20.48	23.04	25.60
Usable Energy (kwh)	16.1	18.4	20.7	23
Rated Voltage (V)	358.4	409.6	460.8	512
Voltage Range (V)	313.6~403.2	358.4~460.8	403.2~518.4	448~576
Battery Type	Li-ion (LFP)			
Rated Capacity(Ah)	50Ah			
Charge Current(A)	25A (Rated) /50A (Maximum)			
Discharge Current (A)	25A (Rated) /50A (Maximum)			
Cycle Times	80% DOD, >10000 times, Remaining capacity >60%			
Communication	RS-485 / RS-232 / CAN 2.0			
Protection function	Over voltage / Under voltage / Over temperature / Low temperature / Over current / Short circuit			
<b>Working conditions</b>				
Installation conditions	Indoor			
Range of working temperature	Charge: 0°C~55°C Discharge: -20°C~55°C			
Optimal working temperature range	20°C~30°C			
Storage temperature	-20°C~55°C			
Working humidity	5%-95% (No condensation)			
Altitude	≤2000m			
Cooling method	Natural cooling			
Certificate	CE, UN38.3, MSDS			
Size [W x H x D, mm]	844*255*965	844*255*1095	844*255*1225	844*255*1355
Weight [kg]	221	252	283	314



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## UPOWER ELECTRIC CO.,LTD

**Email:** [info@ucanpower.com](mailto:info@ucanpower.com) **Web:** [www.ucanpower.com](http://www.ucanpower.com)

**Add:** 4F-A Block, No.62, Yinhe Road, Longgang District, Shenzhen, Guangdong, China