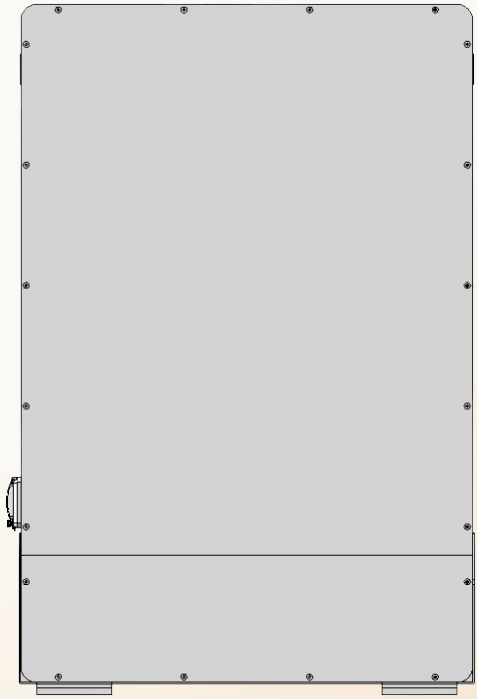


LiFePO4 Powerwall Battery

384V50Ah User Manual

Version:V1.0

CONTENTS

Preface

This users manual describes the Powerwall battery in terms of basic specification, installation, electrical connections, functions, maintenance, and troubleshooting. Please read this document through before installing and operating it.

NOTE

Depending on different contract, product version and market region, details may appear slightly different.

Symbol Conventions

Please pay particular attention to the information provided by the following symbol.

Symbol	Description
WARNING	Indicates a hazardous situation which, if not avoided, could result in injury or death
CAUTION	Indicates a hazardous situation which, if not avoided, could result in minor injury or damage to the equipment
NOTICE	Indicates potentially hazardous situations which, if not avoided, could cause damage to the battery, loss of data, or impairment of performance.NOTICE is used to address practices not related to personal injury
NOTE	Indicates important supplements that leads to the best result, but is not safety or damage related

1.SAFETY INSTRUCTIONS

Reminded

WARNING

Do not expose cable outside.

CAUTION

- Do not connect battery with PV solar wiring directly.
- Do not use cleaning solvents to clean the battery.

NOTICE

- If the battery is stored for long time , it is required to charge them every six months, and the SOC should be no less than 60%.
- Battery needs to be recharged within 12 hours, after fully discharged.

NOTE

Please contact the supplier within 24 hours if there is something abnormal.

Before Connecting

WARNING

It is prohibited to connect the battery and AC power directly.

CAUTION

- The embedded BMS in the battery is designed for 384VDC, please DO NOT connect battery in series.
- Before installation, be sure to cut off the grid power and make sure the battery is in the turned-off mode.
- Wiring must be correct, do not mistake the positive and negative cables, and ensure no short circuit with the external device.

NOTICE

- It is prohibited to connect the battery with different type of battery.
- Keep the battery away from water and fire.

NOTE

- After unpacking, please check product and packing list first, if product is damaged or lack of parts, please contact with the local retailer.
- Please ensure the electrical parameters of battery system are compatible to related equipment.

In Using

WARNING

In case of fire, only dry powder fire extinguisher can be used, liquid fire extinguishers are prohibited.

CAUTION

If the battery system needs to be moved or repaired, the power must be cut off and the battery is completely turned off.

2.PRODUCT OVERVIEW

2.1 Brief Introduction

iPower Puls series LiFePO4 battery is specially tailored for energy storage system, it offers a greater efficiency, higher reliability, intelligent battery management system, intelligent battery monitoring system, long lifespan to your solar energy backup.

iPower Puls series LiFePO4 battery is ideal for off-grid and hybrid applications, offering a solution that's built for the long run and has the ability to be deployed and used in a variety of scenarios, for instance, residential, farm, factory, data room, holiday hotel, etc.

2.2 Features

- Lithium iron phosphate chemical material, which endows iPower safer performance, longer service life and superior energy density.
- The fully intelligent battery management system (BMS) protects battery pack and cells from over-current, under-voltage, over-voltage, impulse current, short circuit, and severe temperature damage, which further increases the safety performance of battery.
- The intelligent monitoring system allows you to monitor and download real time data of your iPower in on your computer.
- The cell balancing function greatly extends the service life of the battery pack.
- Without any memory effect, you can deep charge and release your iPower.
- With tiny self-discharge consumption, the battery will automatically enter low power consumption mode if you don't use it for more than 24 hours.
- Environmentally friendly. No heavy metals and no harmful substances, iPower meets ROHS requirements.
- Scalability. Multiple battery packs can be used in parallel, which is suitable for any scenario that requires greater power backup.
- Maintenance-free. iPower requires no active maintenance, a one-time purchase guarantees longevity (assuming you're using a properly fitted battery and following usage guidelines).

2.3. Specifications Performance

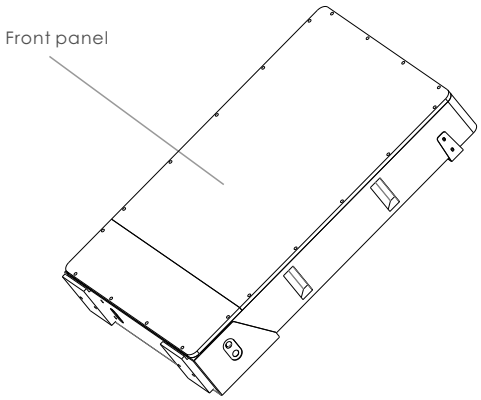
2.3.1 Battery Parameters

Table 2-1

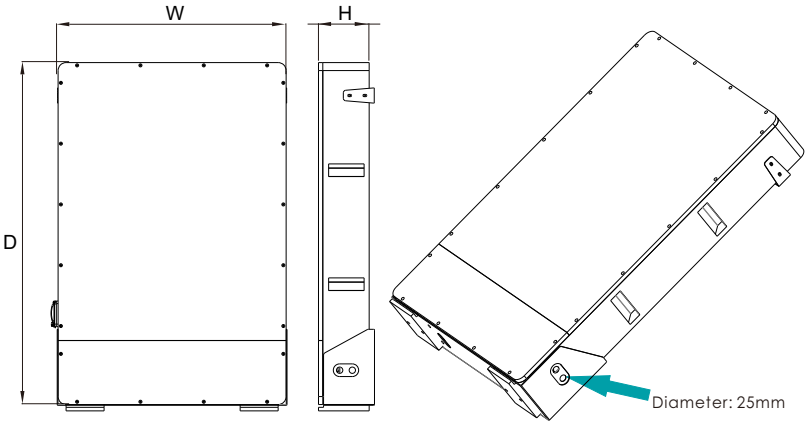
Series	iPower HV
Battery Type	LiFePO4
Model	YL-WS384050
Nominal Voltage[V]	384
Nominal Capacity[Ah]	50
Nominal Energy[kWh]	19.20
Max. output Power[kW]	19.20
Net Weight[kg]	182
Dimension [mm]W*D*H	1350*900*200
Working Voltage[V]	324~438
Operating Temperature Charging[°C]	0~55
Operating Temperature Discharging[°C]	-20~60
Max. Charge Current[A]	50
Max. Discharge Current[A]	50
Recommend Charge Current[A]	25
Charge Mode	CC-CV
Communication	CAN
IP Level	IP65
Temperature & Period Storage[°C]	Less than 6 Month@-10°C~35°C
	Less than 3 Month@-10°C~45°C
	Less than 1 Month@-20°C~45°C

2.3.2.Interface Definition

a) The Battery appearance is shown in below figure as a reference

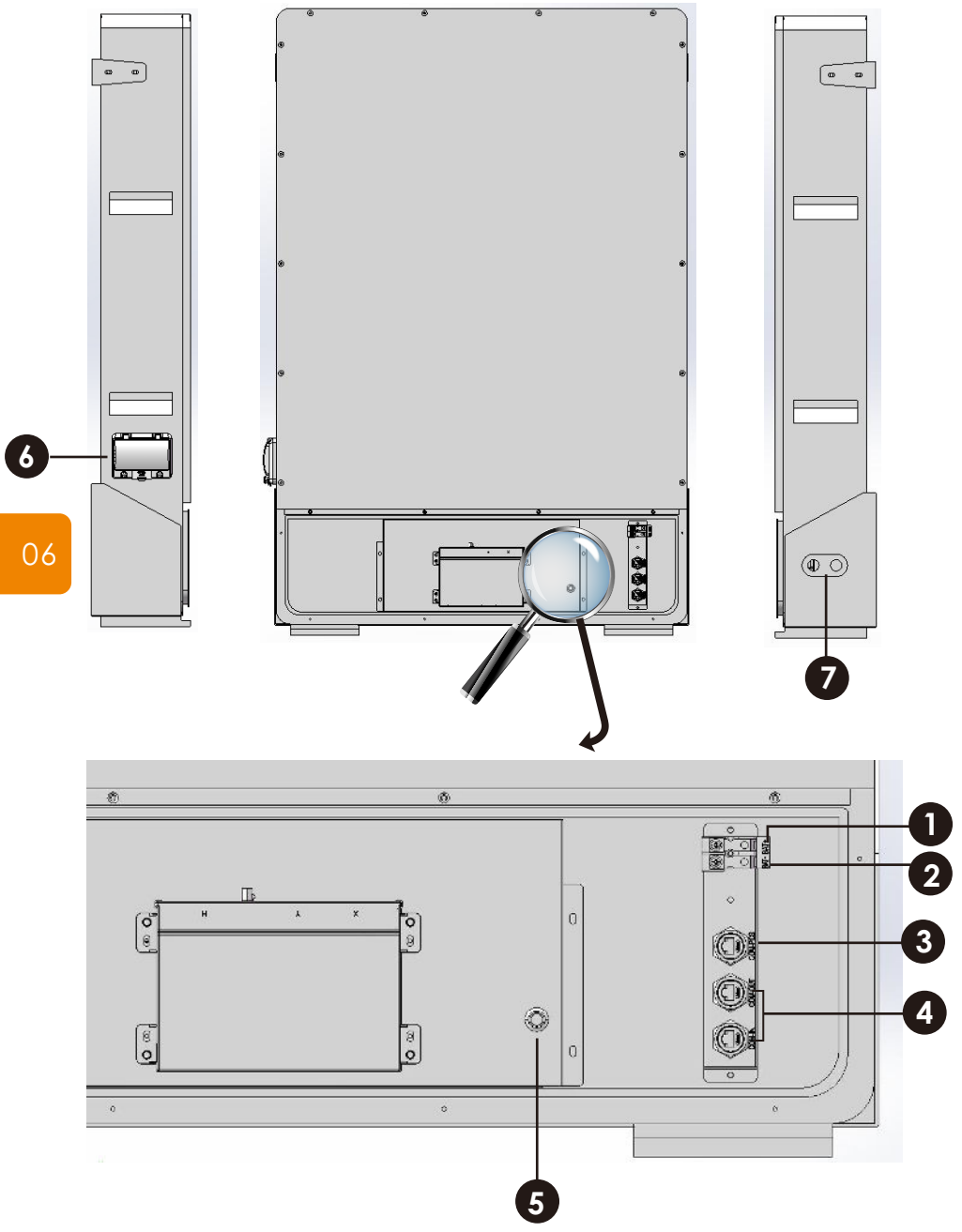


b) The Battery dimension is shown in below figure as a reference



iPower HV LiFePO4 Battery	
Model	YL-WS384050
Energy[kWh]	19.20
Width[mm]	900
Height[mm]	200
Depth[mm]	1350
Conduit Diameter[mm]	25mm (standard), diameter size can be selected

c) Bottom area and all the interfaces is shown in below figure as reference



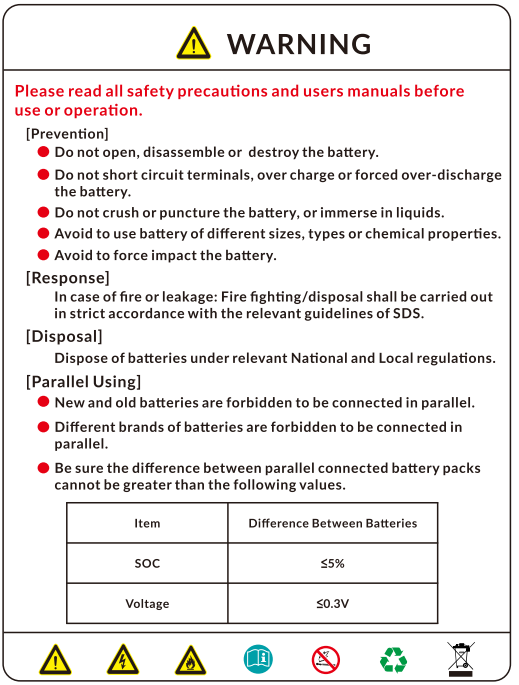
No.	Items	Description
1	+ Power Terminal	Power cable terminals: there are two pair of terminals with same function, one connect to equipment, the other one paralleling to other battery module for capacity expanding.for each single module, each terminal can achieve charging and discharging function.
2	- Power Terminal	
3	COM-PCS	Rj45 Port,used to connect to the inverter's CAN port
4	COM-OUT/COM IN	RJ45 Port,used communication in parallel,and connect PC
5	Power Switch	To turn ON/OFF the whole battery
6	MCB	Turn ON/OFF
7	Cable Conduit Port	For conduit connections, all DC cables go through the conduit to inverter/PCS,Diameter: 25mm

2.3.3 Battery Management System

Function	
Alarm	Protection
Cell Over-charge Voltage	Cell Over-charge Voltage
Cell Over-discharge Voltage	Cell Over-discharge Voltage
Pack Over-charge Voltage	Pack Over-charge Voltage
Pack Over-discharge Voltage	Pack Over-discharge Voltage
Over-current Charge	Over-current Discharge
Over-current Discharge	Over-current Discharge
Mos Over Temperature	Mos Over Temperature
Cell Charge Low Temperature	Cell Charge Low Temperature
Cell Charge Over Temperature	Cell Charge Over Temperature
Cell Discharge Low Temperature	Cell Discharge Low Temperature
Cell Discharge Over Temperature	Cell Discharge Over Temperature
Environment Low Temperature	Environment Low Temperature
Environment Over Temperature	Environment Over Temperature
	Short Circuit Protection
	Fault Protection

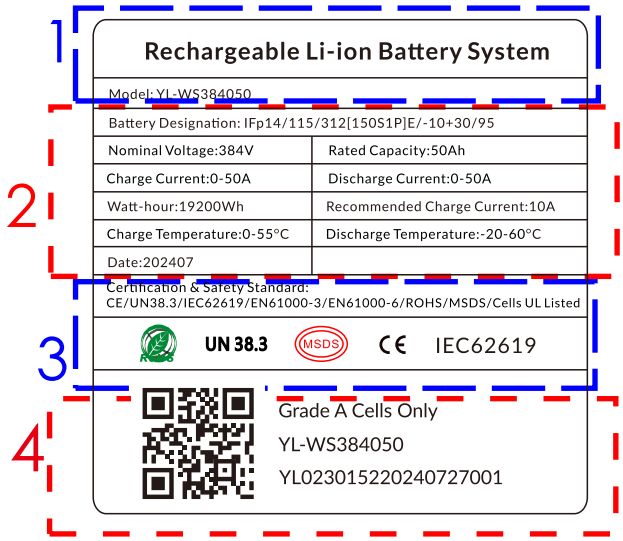
2.4 Label Description

2.4.1 Box Warning Label



Symbol	Symbol Name	Symbol Description
	Warning	Be careful with your actions and be aware of the dangers
	Anti-electric Shock Warning	Battery voltage is higher than safe voltage, direct contact with electric shock hazard
	Beware Of Fire	Serious improper operation will cause battery failure and cause fire
	View Manual	Read the user manual before using
	No Burning	Strictly prohibit all sources of fire
	Recyclable	After the battery life is terminated, the battery can continue to be used after it recycled by the professional recycling organization and do not discard it at will
	Don't Throw Into The Trash Can	The scrapped battery cannot be put into the garbage can and must be professionally recycled

2.4.2 Battery Nameplate



No.	Description
1	Trademark and product type
2	Important technical parameters of the product
3	Identification of the certification system that the product complies with
4	Product traceability QR code

Symbol	Symbol Name	Symbol Description
	ROHS	The battery product meets Restriction of Hazardous Substances
UN 38.3	UN38.3	The battery product meets United Nations Manual of Tests and Standards for Transport of Dangerous Goods
MSDS	MSDS	The battery product meets Material Safety Data Sheet
CE	CE	The battery product meets European directive requirements
IEC62619	IEC62619	The battery product meets IEC requirements

YL-WS84050
YL023015220240727001

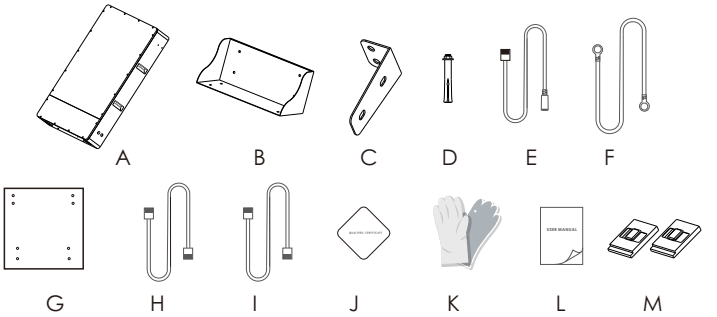
NOTE
Each product has a unique barcode.

3. INSTALLATION

3. 1 Checking Before Installation

3.1.1Accessories Checking

- When the equipment arrives at the installation site, loading and unloading should be carried out according to the rules and regulations, so as to prevent from being exposed to sun and rain.
- Before unpacking, the total number of packages shall be indicated according to the shipping list attached to each package, and the case shall be checked for good condition.
- In the process of unpacking, handle with care and protect the surface coating of the object.
- Open the package, the installation personnel should read the technical documents, verify the list, according to the configuration table and packing list, ensure objects are complete and intact, if the internal packing is damaged, should be examined and recorded in detail.



No.	Items	Qty	Remark
A	Battery	1	384V50Ah Battery
B	Wall-mounted Bracket	1	Material: SPCC
C	Wall-mounted Bracket	2	Material: SPCC
D	Expansion Screw And Tube	8	M8;Fixed bracket
E	CAN Box Cable	1	USB connector to RJ45 connector; Length 1.5m
F	Power Cable	2	One positive and negative pole each, one end connected to the battery, one end to the inverter; Length 2.0m
G	Positioning Cardboard	1	Mark screw hole position
H	Communication Cable	1	RJ45 connectors,Parallel battery communication,Length 2m
I	Communication Cable	1	RJ45 connectors, Connected battery and inverter,Length 2m
J	Qualified Certificate	1	QC PASS
K	Insulated Gloves	1	Protect hands
L	USER MANUAL	1	For users to refer to, install, and train
M	Pads	2	Floor installation

3. 1.2 Tools Needed

Hex Key

Mark Pen

Electric drill

Hammer

Torque wrench

3.2 Safety Requirement

This system can only be installed by personnel who have been trained in the power supply system and have sufficient knowledge of the power system;The safety regulations and local safety regulations listed below should always be followed during the installation.

- All circuits connected to this power system with an external voltage of less than 384V must meet the SELV requirements defined in the IEC60950 standard.
- If operating within the power system cabinet, make sure the power system is not charged. Battery devices should also be switched off.
- Distribution cable wiring should be reasonable and has the protective measures to avoid touching thesecables while operating power equipment.
- When installing the battery system, must wear the protective items below:

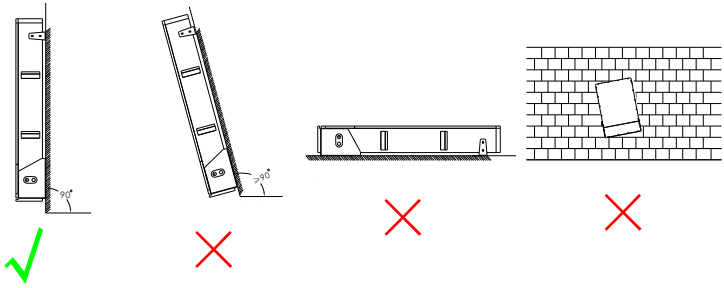
Insulated gloves

Safety goggles

Safety shoes

Mask

- The battery should be installed vertically on the wall.Please refer to below figure:



- Firefighting equipment should be provided near the equipment, such as portable dry powder fire extinguisher.

- Automatic fire fighting system shall be provided for the case where necessary.
- No flammable, explosive and other dangerous articles are placed beside the battery.

3.3 Electronic Checking

- Check that the equipments connected with batteries are right and in good conditions.
- Check the DC interface position of the equipment, check and confirm the output voltage is in the range shown in table 2-1.
- Check DC device interface, make sure the maximum output current is matched with the selected battery.
- Check the maximal working current of devices backed by the battery , make sure that the current is less than the maximum discharge current of the products shown in table2-1.

3.4 Environmental Requirements

- Working temperature: -20°C ~ +60°C.

  Charging temperature range is 0°C~+55°C;

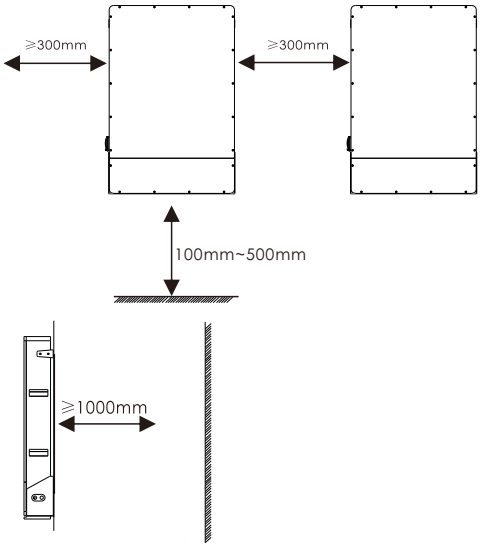
  Discharging temperature range is -20°C ~+60°C
- Storage temperature: : -10°C ~ +45°C.
- Relative humidity: 5% ~ 85%RH.
- Elevation: no more than 4000m.
- Operating environment: no conductive dust and corrosive gas sites.
- Installation location should be away from the sea to avoid brine and high humidity environment.
- The ground is flat and level.
- There is no flammable explosive near to the installation places.
- The optimal ambient temperature is 15°C ~ 35°C.
- Keep away from dust and messy zones.

NOTICE

If the ambient temperature is out of the operating range, if will triggered the battery temperature protect function to turn off working. The optimal temperature range for the battery pack to operate is 15°C to 35°C. Frequent exposure to harsh temperatures may deteriorate the performance and life of the battery pack.

3.5 Space Requirements

Clearance Requirements: To ensure battery working normally and easy to operate, there are requirements on available spaces of the battery, e.g.to keep enough gap. Refer to below figure:



WARNING

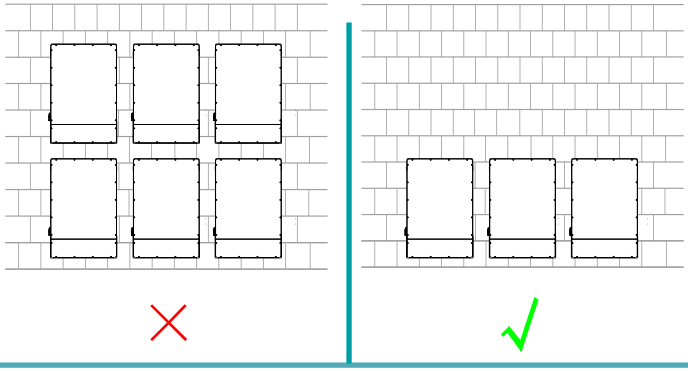
Please install the battery out of the reach of children.

CAUTION

Please make sure the wall thickness is over 80mm.

NOTE

When multiple install the batteries in one location, to optimize the installation and increase performance and safety of system, it's recommended to always follow below instructions when install batteries. Refer to below figure:

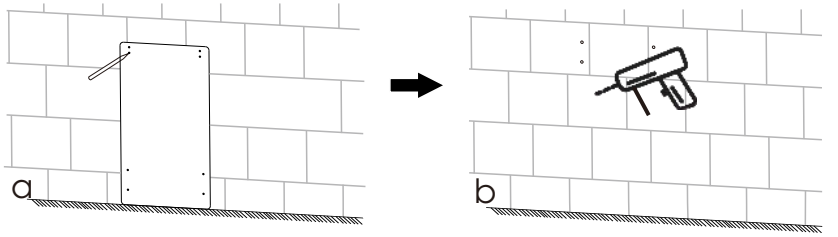


3.6 Floor Installation

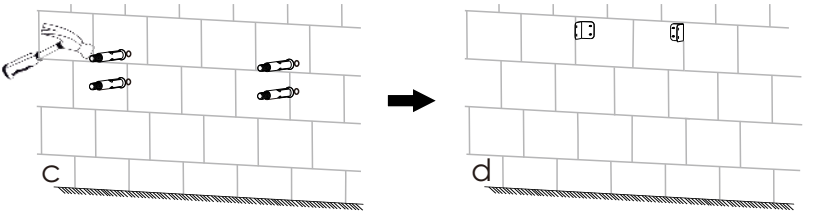
3.6.1 Install The Upper Bracket

a) Use the positioning plate provided to mark the opening position of the 4 screws on the wall.(The bottom of board must be good connection with the ground level while drawing the holes.)

b) 4 holes with diameter of 10mm shall be opened on the wall with electric drill according to the marked position, and the hole depth shall be 60mm to fit the expansion bolts of M8.



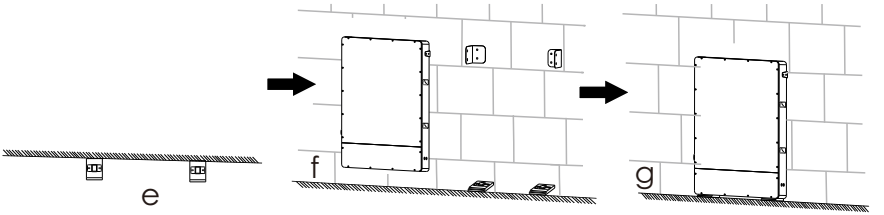
d) The bracket is fixed on the wall with M8 bolts, and then the nuts are tightened to control the torque of 10N.M.



3.6.2 Install The Battery On The Upper Bracket

e) Fix the 2 black foot on the bottom of the battery with M8 bolts.

f/g)Carry the battery to the installation site, Place the battery 10 mm away from the wall while maintaining the balance of the battery, fixing the hanger and the upper part of the battery with M8 bolts.



WARNING

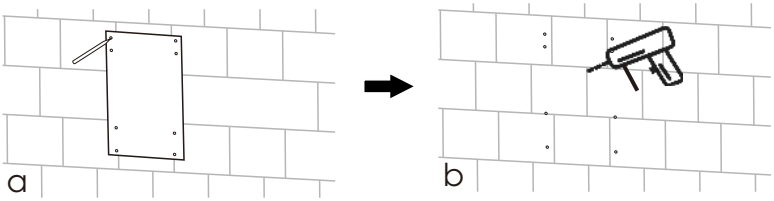
In order to prevent any electric shocks or other injuries, please make sure there are no electricity, plumbing or gas pipeline in the wall where selected to drilling holes for installation.

3.7 Wall Mounted Installation

3.7.1 Install The Wall-mounting Bracket

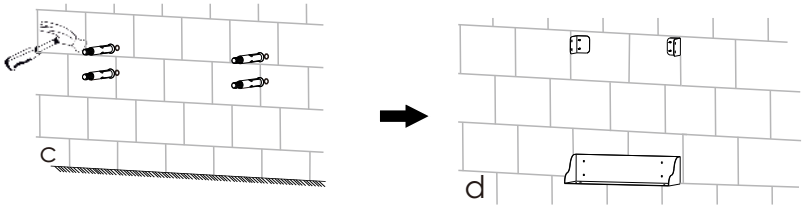
a) Use the positioning board provided to draw the opening position of the screw with a marker on the wall.

b) 8 holes with diameter of 10mm shall be opened on the wall with electric drill according to the marked position, and the hole depth shall be greater than 50mm to fit the expansion bolts of M8.



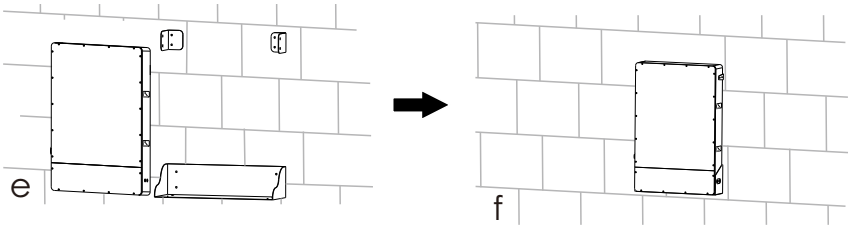
c) Use a hammer to fix the expansion bolt M8 in the hole on the wall.

d) The bracket is fixed on the wall with M8 bolts, and then the nuts are tightened to control the torque of 10N.M.



3.7.2 Install The Battery On The Wall-mounting Bracket

Raise the Battery a little higher than the mounting frame while maintaining the balance of the Battery. Hang the Battery on the frame through the match hooks.



WARNING

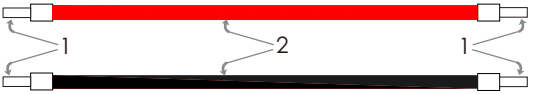
In order to prevent any electric shocks or other injuries, please make sure there are no electricity, plumbing or gas pipeline in the wall where selected to drilling holes for installation.

4. OPERATION

4. 1 Electronic Connection

4. 1.1 Cabling Introduction

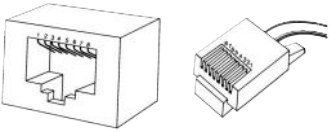
The battery output terminal are the OT terminal ;Power cable section 25mm□.



No.	Items	Remark
1	Terminal	15-8
2	Cable	Cross-section:15mm^2

4. 1.2 Communication Port Definition

RJ45 Communication Port Definition

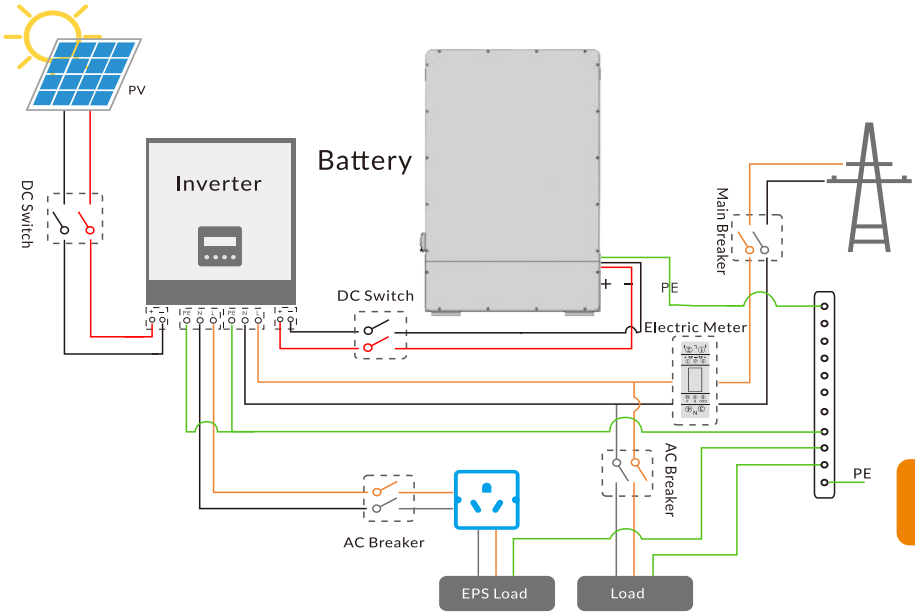


Pin	CAN------8P8C RJ45 Port
	Function Description
1	NC
2	GND
3	NC
4	CANH
5	CANL
6	NC
7	NC
8	NC

NOTE

Different inverters have different pin definitions, please pay attention to the compatibility with batteries.

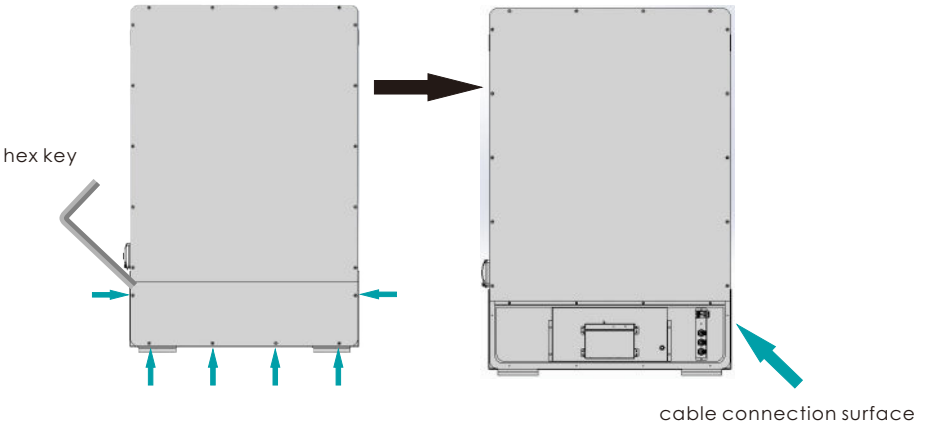
4. 1.3 System Connection Diagram



Cable Color	Description	Cable Color	Description
	Positive Power Cable		Live Wire
	Negative Power Cable		Neutral Wire
	Ground Wire		

4. 1.4 Cable Connection

Use the hex key to open the lower cover.



Cable connection

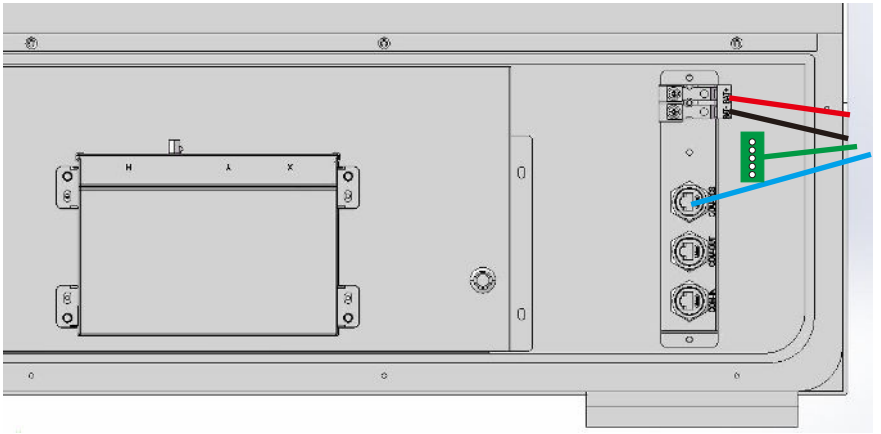
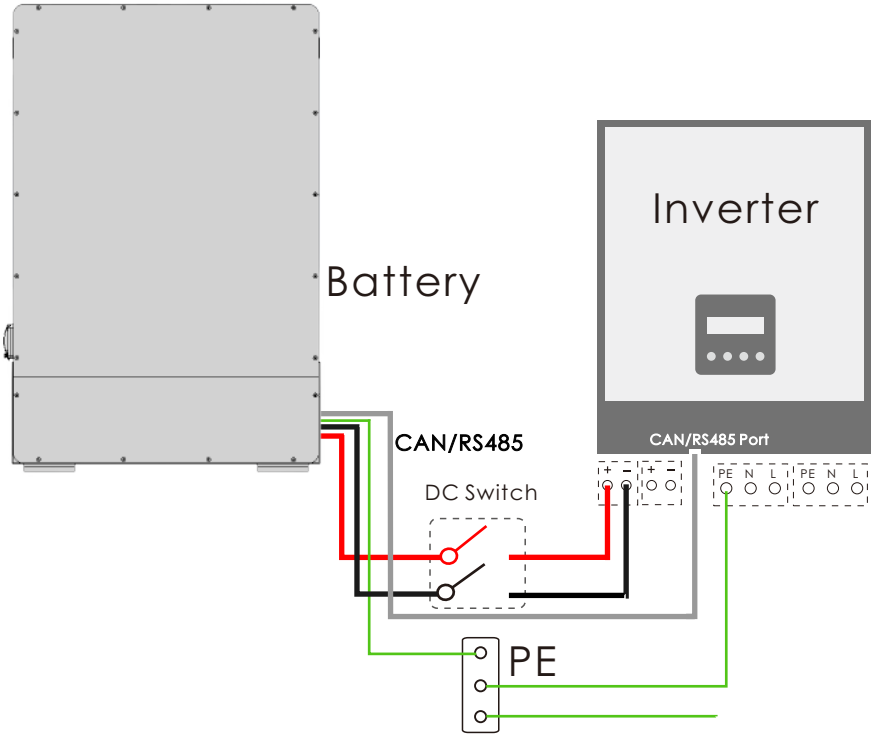


Figure : Cable connection view

Cable Color	Description	Cable Color	Description
	Positive Power Cable		Battery&Inverter Communication Cable CAN-CAN
	Negative Power Cable		Display cable(Optional

4. 1.5 Battery Single Used

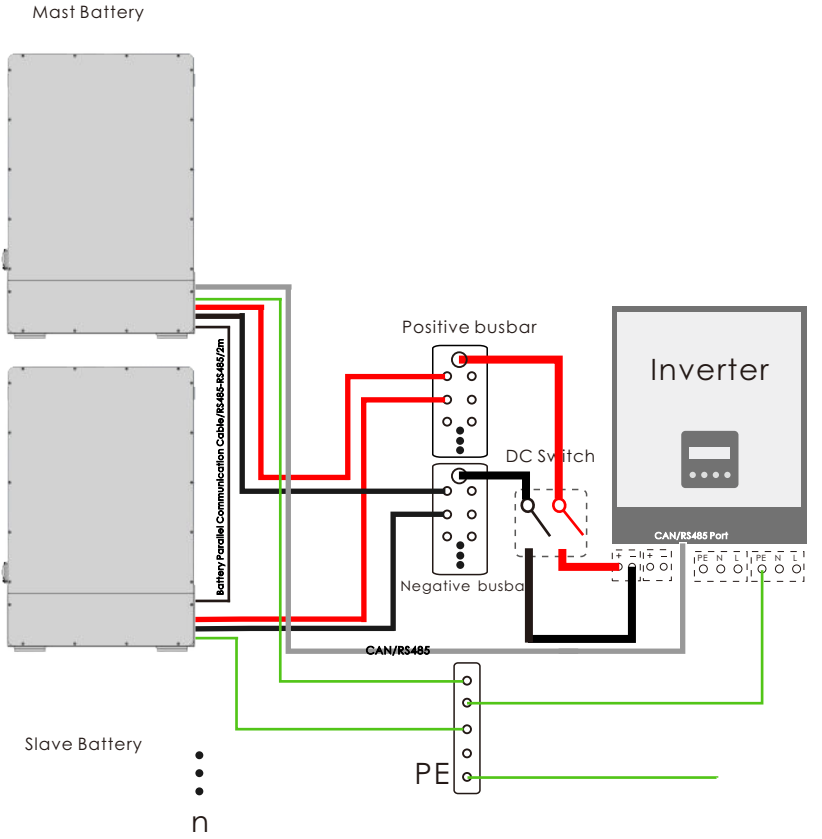


Cable Color	Description	Cable Color	Description
	Positive Power Cable		Ground Wire
	Negative Power Cable		Battery&Inverter Communication Cable CAN-CAN

NOTICE

Before connection, the positive and negative pole of the inverter input interface and the battery output interface should be confirmed, The red power line is connected to the positive pole and the black power line is connected to the negative pole.

4. 1.6 Battery Parallel Used



Cable Color	Description	Cable Color	Description
	Positive Power Cable		Ground Wire
	Negative Power Cable		Battery Parallel Communication Cable CAN-CAN
	Battery&Inverter Communication Cable CAN-CAN		

4. 2 Function and Commission

4. 2.1 LCD Display Description

Refer to below flow chart which shows the information option interfaces and interconnection. Operator can search target information by following below directions.

Main interface

No.	Items	Description
1	Vol_Bat/V	Battery Voltage
2	Cur_Bat/A	Battery Current
3	Temp/C	Battery Temperature
4	SOC	Battery SOC
5	Time	Local Time

No.	Items	Description
1	Cell Vol	Cell Voltage
2	Cell Temp	Cell Temperature
3	Heating Temp	NON
4	Relay Status	Battery System Status
5	Sta_Inf	BMS Status
6	Others	NON

5. CARE AND MAINTENANCE

5.1 Care

Before storing, make sure that the battery SOC is 50%-60%. Insulate it and store it in a cool and dry place. The recommended long-term storage temperature is 20°C -30°C. During storage, please charge the battery according to the following table:

Storage Temperature	Recharge Frequency	SOC
20~30°C	Every 6 Months	50%~60%

5.2 Maintenance

NOTICE

When replace the battery, install the same number and same type of battery.

WARNING

The battery system operates with hazardous voltages. Repairs must be carried out only by qualified maintenance personnel.

CAUTION

Even after the unit is disconnected from the power supply, the internal components are still connected to the battery cells, which is potentially dangerous.

CAUTION

Before carrying out any kind of service and/or maintenance, disconnect the batteries and make sure that no current and hazardous voltage exists in the terminals.

CAUTION

Only those who are fully familiar with battery and have the required precaution may replace the batteriyand supervise operations. Unauthorized personnel are strictly prohibited to disassemble the battery.

CAUTION

Verify that there is no voltage between the battery terminals and the ground before maintenance or repair. In this product, the battery circuit is not isolated from the input voltage. Hazardous voltages may occur between the battery terminals and the ground.

CAUTION

Battery may cause electric shock and have a high short-circuit current. Please remove all wristwatches, rings and other metal personal objects before maintenance or repair, and only use tools with insulated grips and handles for maintaining or repairing.

6. FAQ AND TROUBLESHOOTING

6.1 FAQ

Question 1: Why the charge current is only 20A or 0.5C?

Solution:The charge current depends on:

a) The power of your charge devices;

b) The settings of charge current limit module in battery pack;

c) Charging communication data from the battery to the inverter.

When the inverter is connected to the battery in the user-defined mode and the charging current given by the inverter is more than 1C (default value), the battery's charging current module will work to limit the charging current to 20A to better maintain the battery.

NOTE

For battery batter maintenance, we do not recommend setting the charging current to exceed 0.2C.

Question 2: How many batteries do I need to configure my inverter?

Solution: It depends on:

a) Your daily backup power requirements;

b) The battery DOD;

c) The output power of your inverter.

We suggest the configuration as below:

Off grid / hybrid Inverter output power	6~8kw	8~12kw	12~15kw	15~17kw	17~20kw
Battery Model And Min Parallel QTY.	384V50Ah 19.2kWh * 1	384V50Ah 19.2kWh * 2		384V50Ah 19.2kWh * 3	

NOTICE

Before choosing the number of batteries you need, you need to consider your daily backup time requirements and the power match between the battery and the inverter, battery output power parameters shall greater than inverter's.

Question 4: Why the monitoring software show abnormal?

Solution: After connect the battery with computer by RJ45-USB cable. You need to download the USB driver to make sure the computer access to the battery data.

Question 5: Why not throw away used batteries at will?

Solution: After the used battery is abandoned, the outer casing of the battery will slowly corrode, and the metal substances in it will gradually penetrate into the water and soil, causing pollution. The biggest feature of metal pollution is that it cannot be degraded in nature and can only be eliminated through purification. On the other hand, the effective recovery of metals and the utilization of surplus energy can also bring considerable economic benefits.

6.2 Troubleshooting

Analysis and treatment of common faults.

Fault Phonemenon	Reason Analysis	Solution
The battery cannot be turned on	System protection	Battery cannot turn on, switch on the lights are all no lighting or flashing.If the battery external switch is ON, the RUN light is flashing, and the external power supply voltage is 48V or more, the battery still unable to turn on, please contact manufacturer
Red light is lighting, and cannot charge or discharge	System protection	Change power parameters; Charge the battery immediately(When over discharge protection)
DC power supply time is too short	Battery capacity become smaller	Storage battery replacement
The power line sparks once power on and ALM light RED	Power connection short-circuit	Turn off the battery, check the cause of the short circuit
Abnormal communication	PC cannot read device information	Whether the device is turned on; Is the PC software used correctly; Whether the PC software correctly reads the serial port; Signal line wiring and address are correct.

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