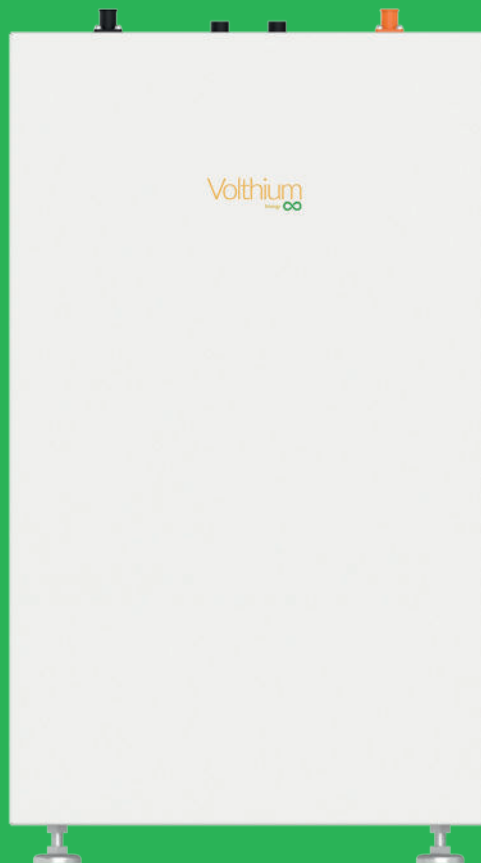


51.2 V 314 Ah USER MANUAL



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Legal Provisions

This manual describes in detail the requirements and procedures for safe installation and operation of lithium battery pack. Please read this manual carefully, only qualified persons are allowed to install, operate and maintain the system, otherwise it may cause product damage or personal safety risks.

Any actions against safety operation, or do not follow rules of this manual and limited warranty letter, will void warranty and qualification of this product. Meanwhile, the manufacturer will be not responsible for the product damage, property damage, personal injury or even death.

The information contained in this manual is accurate when it's issued. Manufacturer reserve right to change specification (such as optimization, upgrade or other operations) without prior notice, please always view the latest document via QR code. In addition, please noted that the diagrams/schematics in this document are used to help understand system configuration and installation instructions, which may be different from the actual items at the installation.

Legal Terms

Manufacturer will retain the copyright of this document, do not extract, copy or translate in any ways without the written permission.

1. Information

1.1 Validity

This document is valid for: 51.2-314-ESS Battery Pack 4/1/2026

1.2 Target Group

This document is intended for qualified persons and operators. Only qualified persons are allowed to perform the activities marked in this document with a warning symbol and the caption "Qualified person". Qualified persons must have the following skills:

- Knowledge of how lithium iron phosphate batteries work and are operated.
- Knowledge of how an energy storage system (including PV/battery/hybrid inverter, MPPT, Meter, Distribution box etc.) works and is operated.
- Knowledge of local applicable connection requirements, standards, and directives.
- Training in the installation and commissioning of electrical devices, batteries.
- Training in how to deal with the dangers and risks associated with installing, repairing and using electrical devices, batteries.

1.3 Levels of Warning Messages

The following levels of warning messages may occur when handling the product

Symbol	Description
 DANGEROUS	Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
 WARNING	Indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
 CAUTIONS	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury or product permanent damage.
 NOTICE	Indicates a situation which, if not avoided, can result in property damage or product not work or accelerated product damage

1.4 Symbol Description

1.4.1 Symbols on products label

Label	Definition
	Beware of electrical shock.
	Do not place the battery within children/pet touchable area.
	Do not place the battery near heat source and flammable material.
	Do not expose the battery to direct sunlight, rain and snow.
	Do not short circuit the battery.
	Recycle label.
	WEEE designation.
	The UL1973 certificate label for Safety by Intertek

1.4.2 Other symbols

Label	Definition
 Qualified person	Indicates activities that can only be performed by qualified persons.
	Grounding point.

1.5 Abbreviation Description

Abbreviation	Definition
Battery/battery pack/battery module	Single 51.2-314-ESS rechargeable lithium iron phosphate battery pack including cells, BMS and enclosure etc.
Battery system/cluster	Multiple 51.2-314-ESS battery pack connected in parallel with power, communication and grounding cables and installation auxiliaries.
BMS	Battery management system. Electronical Unit to ensure lithium cells' safety and display information or control the battery work mode.
SOC	State of charge. The battery state of charge refers to the percentage of the remaining capacity and rated capacity of the battery.
SOH	State of health. The battery health status refers to the percentage between the full charged capacity and the rated capacity of the battery.
DIP switch	Dual in-line package switch
COCF	Charge over current protection.
DOCP	Discharge over current protection.
COVP	Cell over voltage protection.
POVP	Pack over voltage protection.
CHTP	Charge high temperature protection.
DHTP	Discharge high temperature protection.
CUPV	Cell under voltage protection.
PUVP	Pack under voltage protection.
CLTP	Charge low temperature protection.
DLTP	Discharge low temperature protection
SCP	Short circuit protection

2. Safety Precautions

2.1 Safety precautions

Symbol	Description
 DANGEROUS	Explosion risk - Do not impact the battery with heavy objects. - Do not squeeze or pierce the battery pack. - Do not throw the battery pack into the fire.
 WARNING	Fire risk - Do not expose the battery pack to the condition over 80°C. - Do not put the battery near a heat source, such as a fireplace. - Do not expose the battery pack to direct sunlight or raining.
 CAUTIONS	Electric shock risk - Do not allow non-qualified person to disassemble the battery pack. - Do not touch the battery pack with wet hands. - Do not expose the battery pack to moisture or liquid environment.
 NOTICE	Damage risk - Do not short-circuit or reverse connect the battery. - Do not use chargers or charging devices unapproved by the manufacturer to charge the battery. - Do not mix batteries from different manufacturers or different kinds, types or brands.

2.2 Safety instructions

The battery has been designed and tested in accordance with international (such as UL, IEC, UN38.3 etc.) safety requirements. However, due to various factors during the whole lifetime process, Volthium cannot guarantee absolute safety, in order to prevent personal injury and property damage and ensure long-term operation of the battery, please do read the below section carefully to operate the battery and handle emergency situations.

2.2.1 Safety gear

It is required to wear the following safety gear when installing and handling the battery pack



Insulated gloves



Safety Glasses



Safety Shoes

2.2.2 Emergency safety measures

Water invasion

Please cut off the AC power supply of the system first and then disconnect all switched under the premise of ensuring safety.

Electrolyte or gas leakage

If the battery pack leaks electrolyte, avoid contact with the leaking liquid or gas. If one is exposed to the leaked substance, immediately perform the actions described below.

- Gas Inhalation: Evacuate the people in the contaminated area and seek medical aid immediately.
- Eye Contact: Flush your eye with clean and flowing water for 15 min, and seek medical aid immediately.
- Skin Contact: Thoroughly rinse the exposed area with soap and water to be sure no chemical or soap is left on them, and seek medical aid immediately.
- Ingestion: Induce vomiting, and seek medical help immediately.



WARNING

In case of fire situations, please use carbon dioxide fire extinguisher rather than liquid to put out fires.

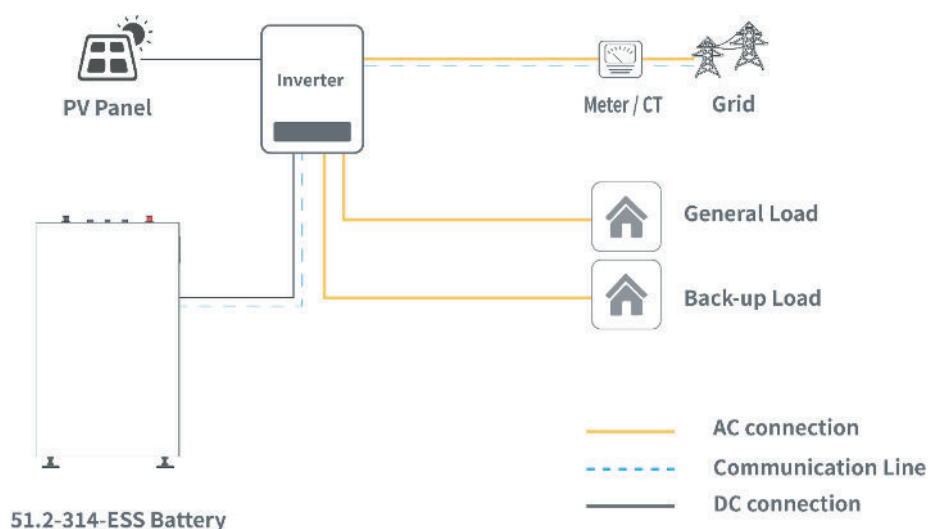
2.2.3 Other Tips

- All the product are strictly inspected before shipment, please contact your supplier for replacement if you notice there's any defectives such as swelling.
- Do not disassemble batteries and components, otherwise the manufacturer will not be responsible for any damage caused by unauthorized disassembly or repair.
- Do enable the battery to be safely grounded before use to make sure the system in safe and normal operation.
- Please ensure that the electric parameters of these devices are compatible mutually before connecting the battery to other devices.
- Please take the environmental factors into careful considerations to ensure that the system can work in a suitable condition as the environment and storage methods have a certain impact on the service life and reliability of this product.

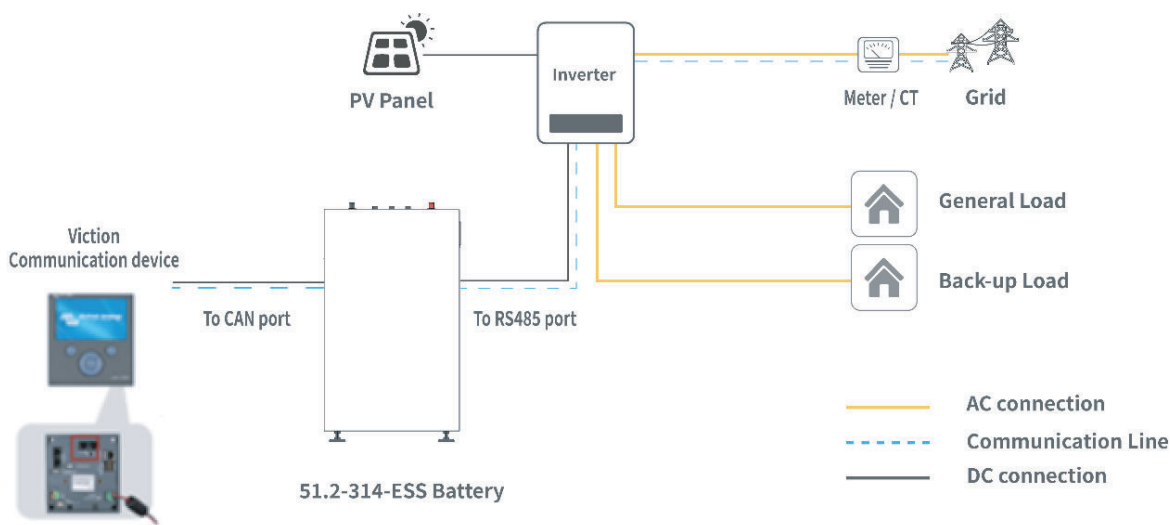
3. Product Overview

3.1 Introduction

The 51.2-314-ESS battery is designed for residential application and works as a storage unit in the photovoltaic system. It is a 51.2V lithium battery system, with BMS inside. It could be operated in both on-grid, back-up and off-grid modes with compatible inverters. The following illustration shows basic application of this battery. It also includes following devices to have a complete running system.



Another scenario is that after the inverter is connected to the battery through communication, the battery can also be connected to VICTRON cerbo GX VE.can through CAN communication.





CAUTIONS

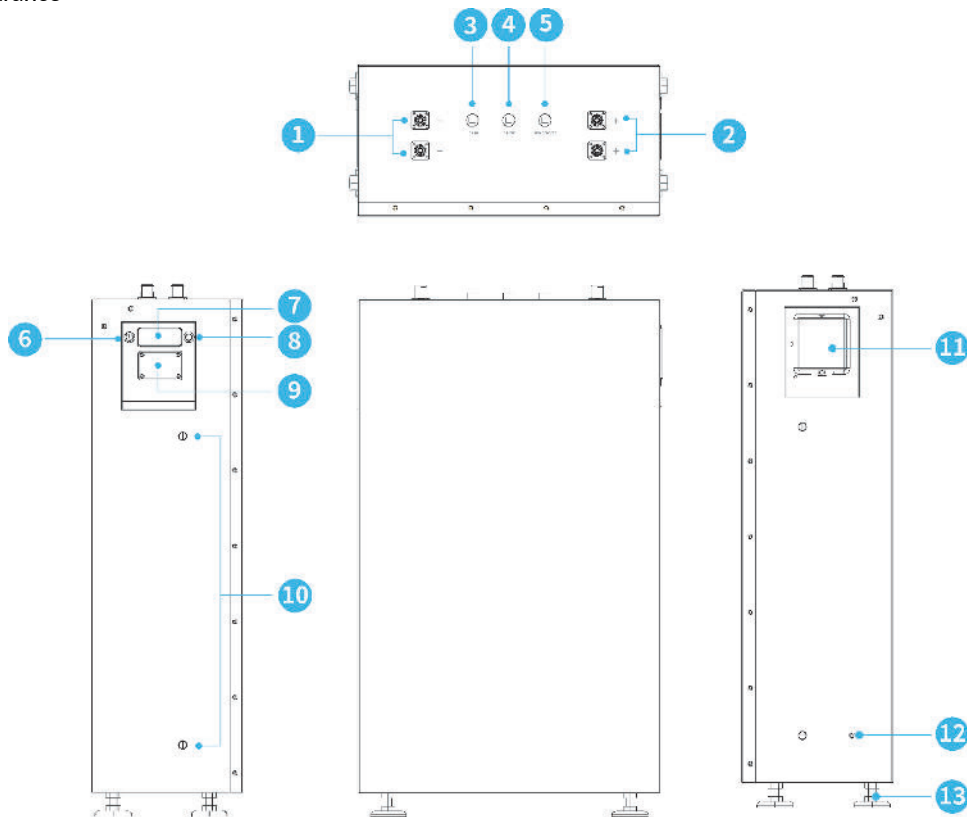
This electrical connection in this diagram is only for illustration, please follow the Manual suggestions of related devices and operate in accordance with locally applicable connection requirements, standards, and directives.

3.2 Features

- Highest safety, battery is made from LiFePO4 chemistry and comply with highest international safety and transport standard.
- Modular and flexible, support up to 32 units in parallel to expand the system energy.
- Built-in pre-charge circuit to avoid rush current when connecting with different inverter/chargers.
- Automatic dynamic addressing function when connected multiple batteries together.
- Support a maximum of 96% DOD under off-grid and back-up application
- Built in BMS provide warning and protection functions including over-discharged, over-charged, over-current, short-circuit and high/low temperature.
- CAN/RS485 port for external communication and upgrade the BMS firmware.
- Rapid shut down function for North American market.

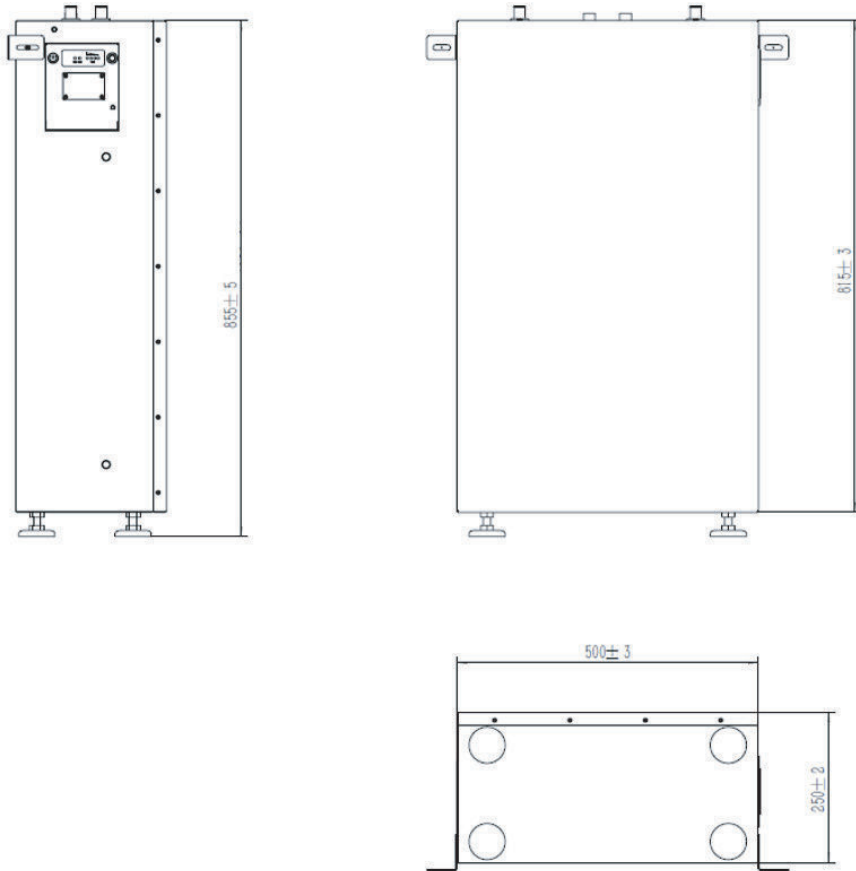
3.3 Specification

3.3.1 Appearance



No.	Name	Description
1	Negative Port	Used to connect the inverter/charger
2	Positive Port	
3	LINK IN	For internal and inverter communication
4	LINK OUT	
5	DRY CONTACT	For use with external dry contacts
6	POWER	Used to Power on/off battery
7	SOC Light	Used for displaying the SOC, run and alarm state
8	IOT	Used to communicate with WIFI
9	DIP Switch	Used for replacing the inverter protocol
10	Handle Point	For handling, installation and disassembly of battery
11	Breaker	Turn on/ off the circuits and have a protective effect
12	Grounding Point	Used to connect battery to ground
13	Footed glass	Used for fixing the battery

3.3.2 Dimension



3.3.3 Parameters

Items	Parameters
Nominal voltage	51.2 V
Nominal energy@0.2C	16.1KWh
Nominal capacity@0.2C	314Ah
Internal resistance@1khz AC	≤30 mOhm
Operation voltage range	(With communication) : 48V~56V (Without communication) : 44.8V~57.6V
Charge voltage	56.0V
Allowed MAX charge current	200A
Recommend charge current	≤150A
Allowed MAX discharge current	230A
Recommend discharge current	≤150A
Peak current limit	270A@15s
Short circuit protection	Yes
End Discharge	46.4V
Communication	CAN/RS485
Parallel and Series connection	Support Max. 32 in parallel
Cycle life	≥8000 cycles After Normal charge, discharge @0.2C current with 90% DOD, Repeat above process until discharge capacity reduce to 60% of initial value.

IP rating		IP65
Dimension(W*H*D)		500*855*250mm
Weight (without accessories)		~130kg (with footed glasses)
Operation temperature ¹		Charge: -20~55°C Discharge: -20~55°C
Heating		Yes
Operation altitude		<4000m
Self-discharge rate ²	Residual capacity	≤3%/month ≤15%/year
	Recover capacity	≤1.5%/Month ≤8%/ year
Storage environment ³	≤3 months	-10~45°C 5~90%RH
	>3 months Recommend environment	15~35°C 45~85%RH
Compatible inverter list		SMA / Victron / Sol-Ark / Growatt / Voltronic / Deye / Solis SAJ / LUXPOWER / MEGAREVO / Schneider / SRNE
Installation types		Floor mounted

¹ Battery pack will stop work to protect itself when the temperature is out of the operation range. The optimum operating temperature range is from 15°C to 35°C, Frequent exposure to harsh temperatures may worsen the performance of the battery pack and cycle life.

² These conditions is based on battery pack is in sleep or power off mode.

³ For long time storage, we recommend charge the battery over 50% SOC and if the battery does not have a sleep or power off mode, please consult Volthium first.

4. System Installation

4.1 Checking Before the Installation

4.1.1 Unpacking

Before unpacking, Please check the followings:

1. Check the outer package for damage, such as cracking, deformation, opening or other signs of damage to the equipment. In case of damage, do not open the package to use the product, and please contact the dealer.
2. Check whether the model specification is correct. If the product does not match the specification, please contact the dealer.
3. Check whether the contents are complete and for any obvious external damage. If there is any missing or damage, please contact the dealer.

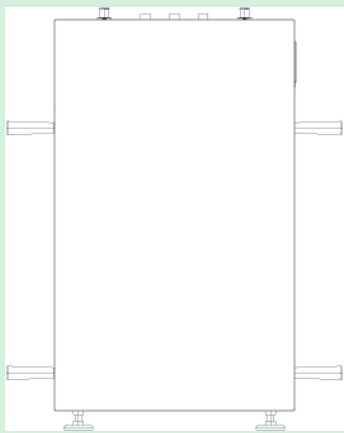


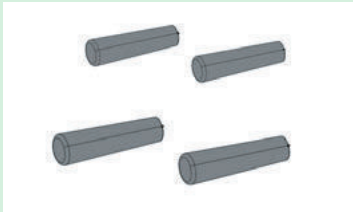
NOTE

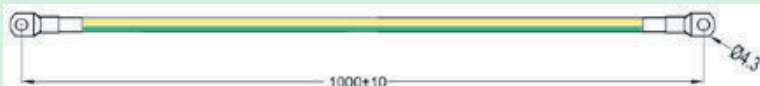
Please read the packing list to check the quantity of deliverables shipped in the box.

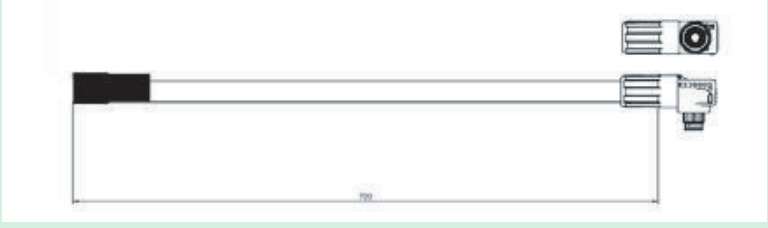
4.1.2 Scope of Delivery

Check the scope of delivery for completeness and any externally visible damage. Contact your supplier for supplementary delivery if the listed material is incomplete or damaged.

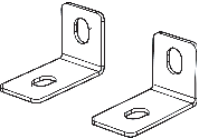
Unpacking List	Detail	Qty
Battery pack		X 1
Fixed support		X 2

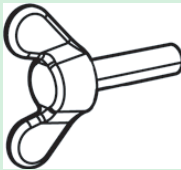
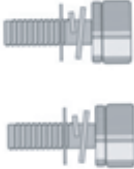
A: Right Side beam		X4
Bolt(M6)		X2
Handle		X 4
User manual		X 1

Wire package	Detail	Qty
Ground wire		X 1
Battery positive line (orange)		X 1

Battery negative line (black)		X1
Battery positive terminal(orange)		X1
Battery negative terminal(black)		X 1
Battery communica- tion line		X 1

Optional materials

Junction box		X 1
Fixed bracket		X 2

Thumbscrew M5*12		X 4
Cross recessed combination screw M6*12		X 4

4.2 Preparing Tools and Instruments

Category	Tools and meters	
Installation	 Diagonal pliers	 Art Knife
	 Marker pen	 Percussion drill
	 Hammer	 Electric screwdriver
	 Crimping pliers PV-SC002	 Spanner

Personal protective articles	 Protective gloves	 Eye protector
	 Protective footwear	 Protective mask

NOTICE

The battery will be installed in accordance with local electrical, building, fire and other codes or utility requirements as applicable to the installation and equipment, by qualified service personnel in accordance with the installation instructions and appropriate practices.

4.3 Installation

Installation environment

1. Ensure that the equipment is not installed in a flammable, explosive and corrosive environment before installation.
2. The battery are only intended to be installed in attached or detached garages, sheds, enclosed utility closets, basements, storage or utility spaces within dwelling units and are not intended for installation in habitable spaces and livings spaces in dwelling units.
3. Installation position to avoid direct sunlight, and build an awning if necessary.
4. The installation position should avoid the range of exposure to children. The equipment may produce high temperature during operation, please beware of scald.
5. The installation position should avoid rain and snow, not to affect the normal use of the equipment.
6. The installation position should avoid the water pipes and cables in the wall, to avoid the unpredictable danger during drilling.
7. The installation environment temperature and humidity should be within the appropriate range. Recommended temperature (Min./Max.): 41°F(5°C)~95°F(35°C). Relative Humidity (Min./Max.): 5%~75% RH
8. The installation altitude should be below 4000m.
9. The installation space shall meet the requirements of ventilation, heat dissipation and operation space.
10. Keep away from the strong magnetic field and avoid electromagnetic interference. If there is a radio station or a wireless communication device below 30 MHz near the installation location, ensure that the distance between the battery and the wireless device is over 40m.
11. The distance from the air outlet of PCS is more than 0.5 meters.

CAUTIONS

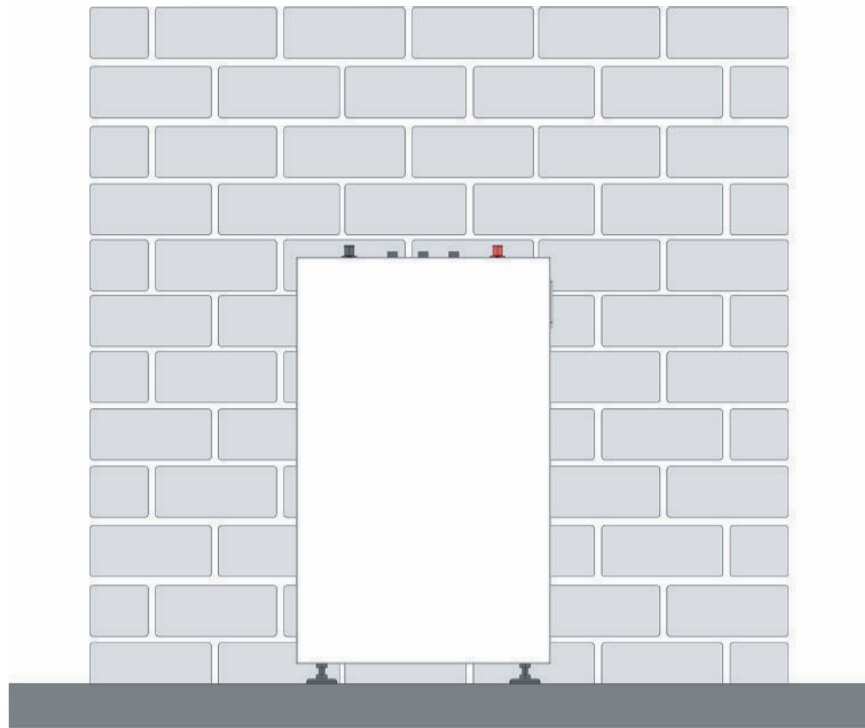
The battery will be installed in accordance with local electrical, building, fire and other codes or utility requirements as applicable to the installation and equipment, by qualified service personnel in accordance with the installation instructions and appropriate practices.



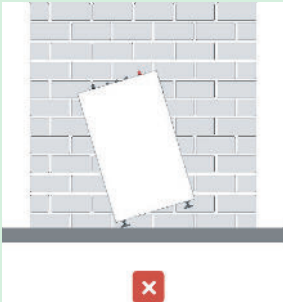
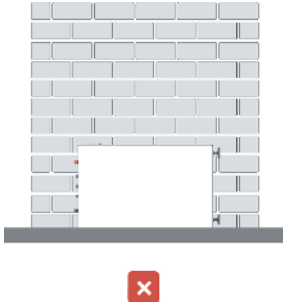
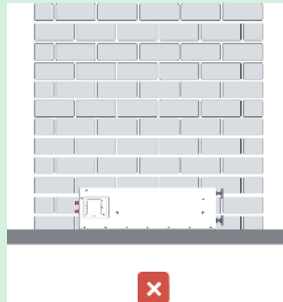
Weight	Method	Recommendation
<18 kg (40lbs)	Manual handling	1 person
18~32 kg (40~70lbs)	Manual handling	2 persons
32~55 kg (70~121lbs)	Manual handling	3 persons
55~68 kg (121~150lbs)	Manual handling	4 persons
>68 kg (150lbs)	Moving device	Forklift

Installation requirements:

- Do not install the battery forward, inverted, backward and roll.
- Please choose solid brick structure, concrete wall and ground for installation. If other walls and ground are selected, the wall and ground should be built of flame-retardant materials and can meet the load-bearing requirements of the battery.
- When installing, please ensure that there is no other unrelated equipment and inflammable, explosive items around. Enough space should be reserved to ensure the heat dissipation and safety isolation.
- When installing on the wall, items should be prevented under the battery.
- When installing, to be close to the wall to prevent the battery from dumping.
- Check whether the power cable pair(s) used meets the maximum current requirement for operation.



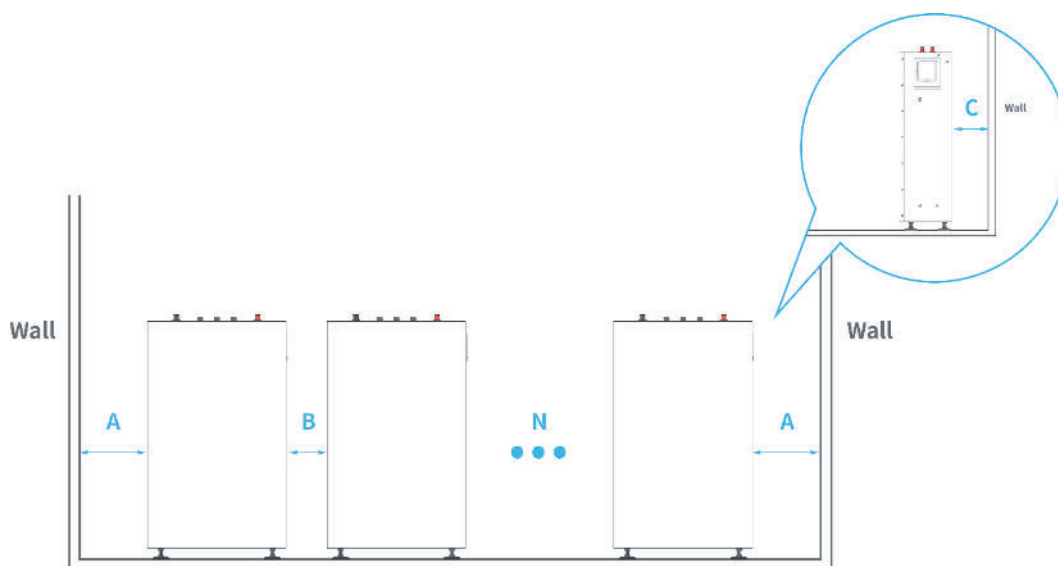
Installation not allowed

Inclined installation	Left/Right side flip	Direct upside down
		



CAUTIONS

Batteries should be installed in a clean flat place with no direct sunlight, away from water and fire sources, and at a suitable temperature. The installation location is recommended to meet the size requirements of the figure below:

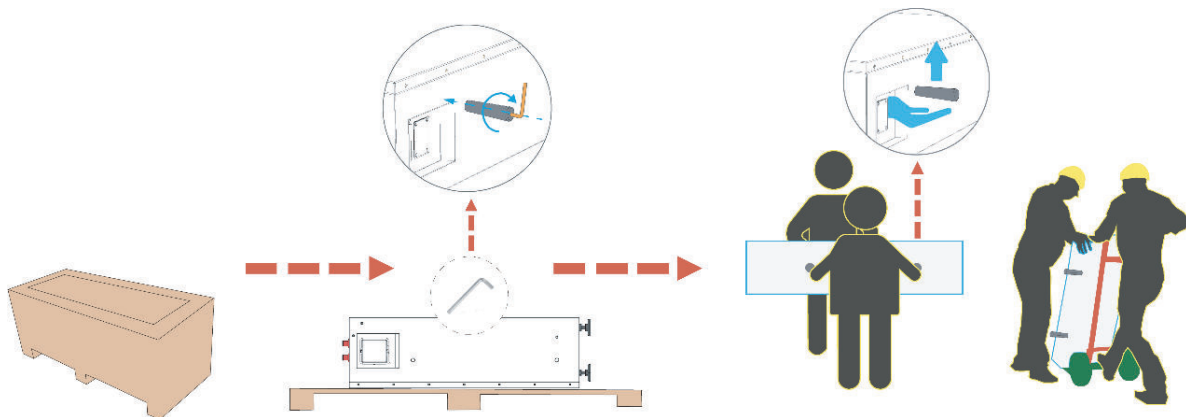


NOTE: This requirement only applies to floor-mounted installation.

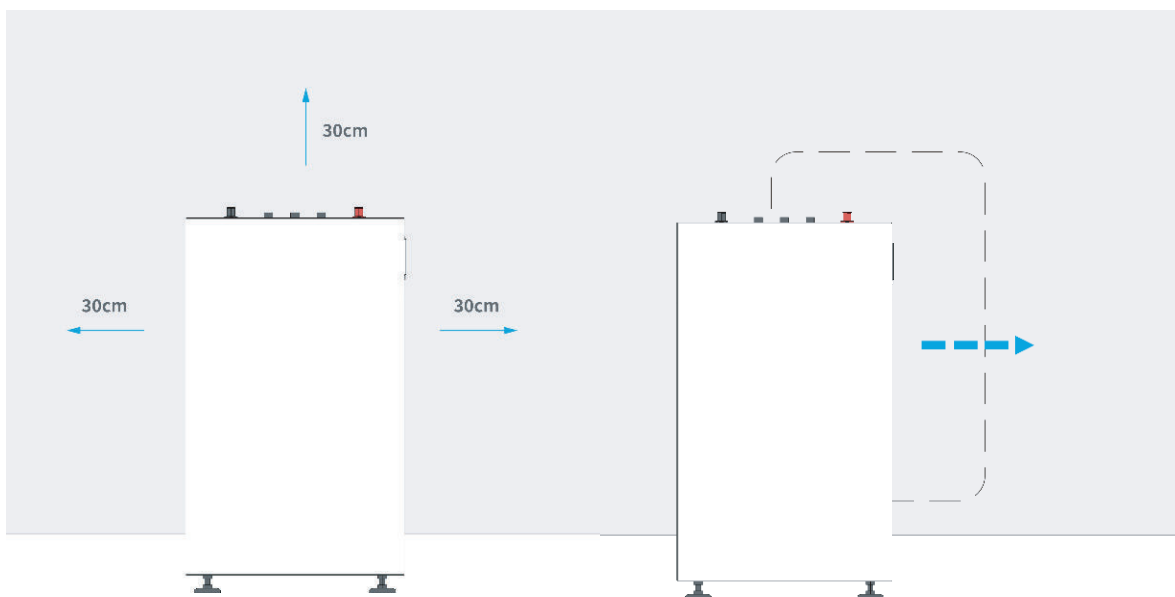
Élément	Distance (mm)
A	400
B	200
C	30

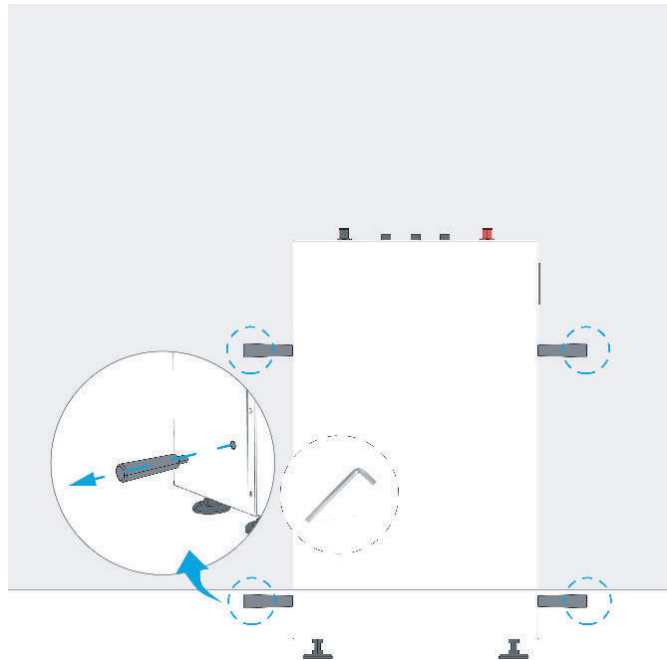
4.3.1. Flooring Mounting(with footed glass)

1. Open the wooden box and install the handles on both sides of the battery. Transport or use other equipment to deliver the batteries to the designated location

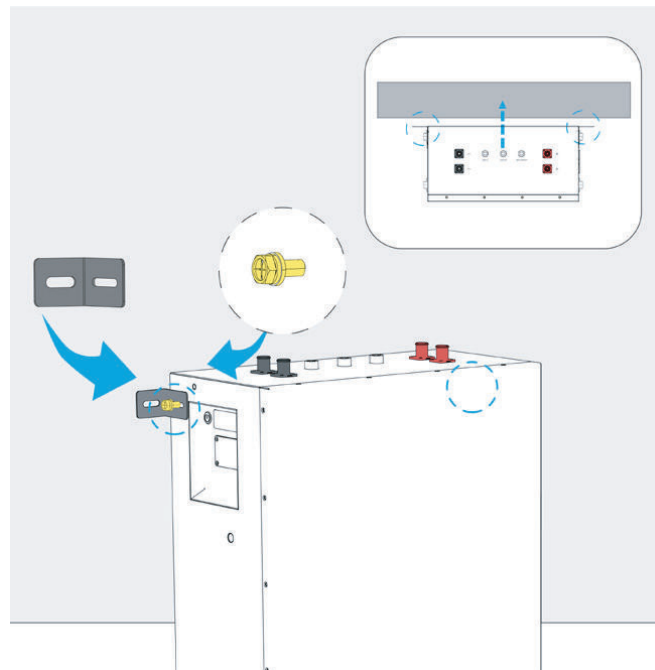


2. According to the design requirements, determine the installation position of the battery on a flat ground and draw a line mark.

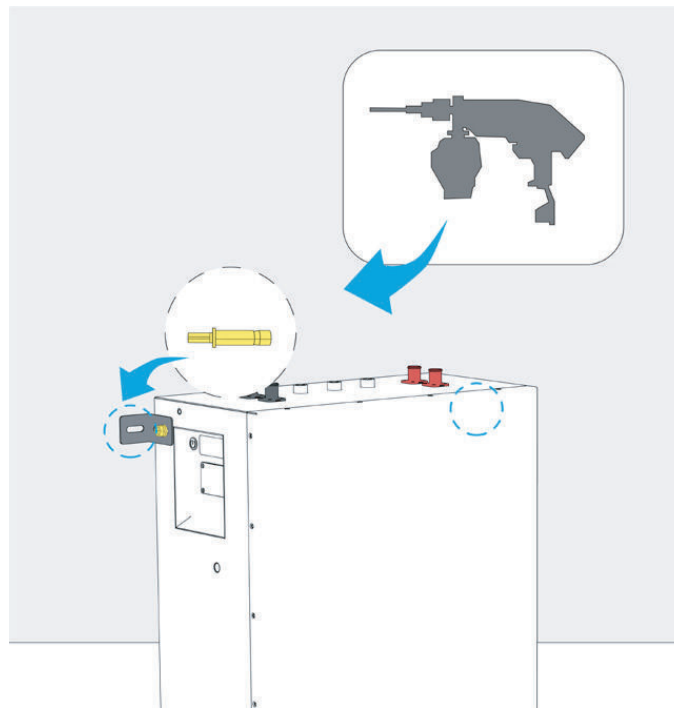




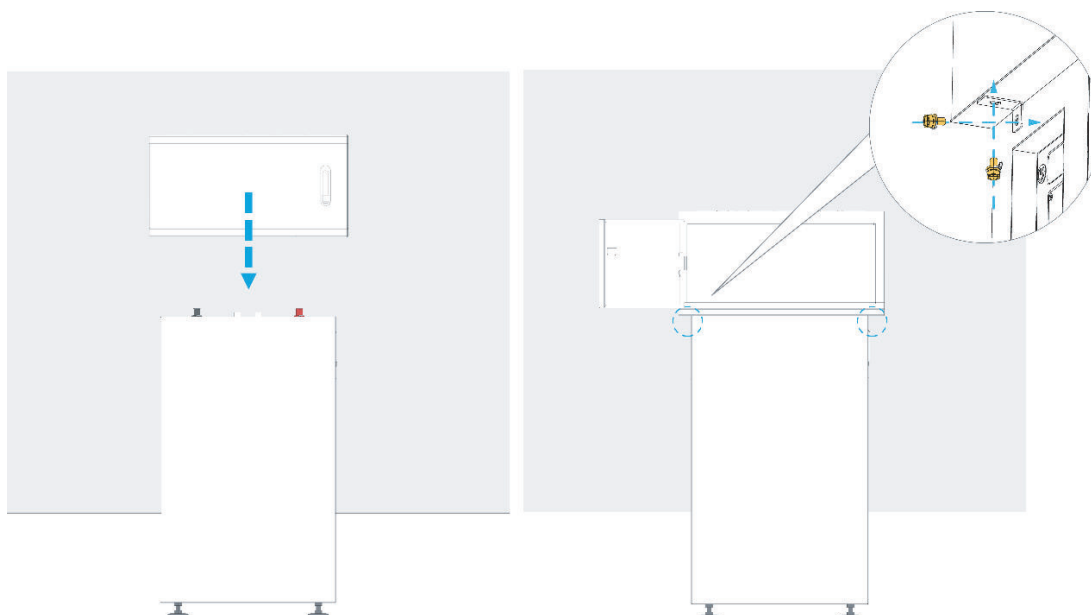
3. After placing the battery in the designated position, use 2 screws of M6 to secure two fixed supports to the left and right side of the battery.



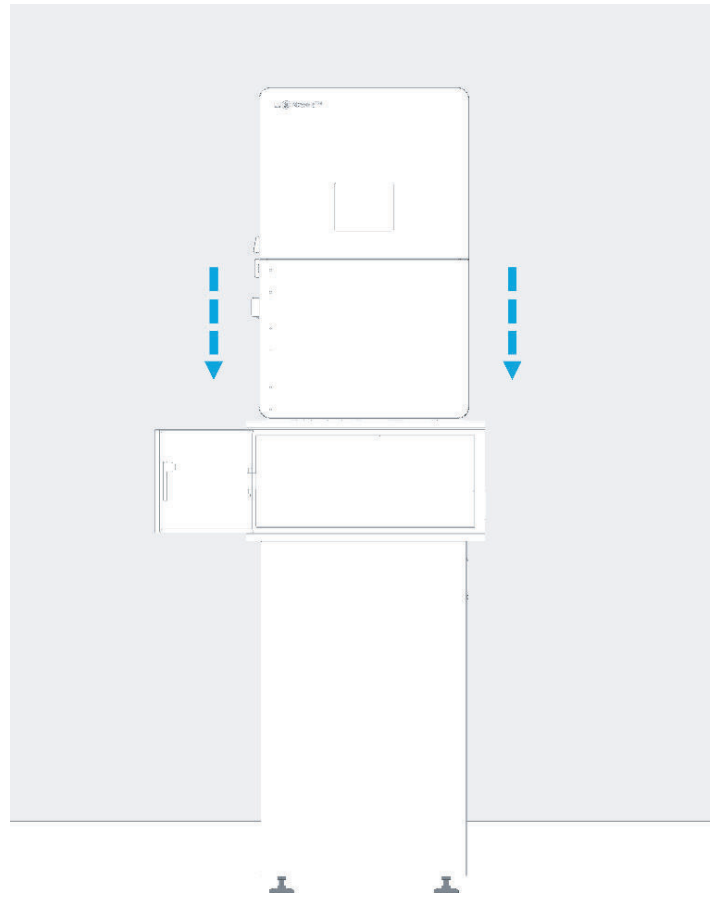
4. Place the battery about 30mm away from the wall, and then mark locations of two assembly holes. Drill two holes and secure the battery to the wall.



5. Place the junction box on top of the battery and secure the bracket on the side.



6. Install the inverter above the junction box, aligning the holes between the inverter and the junction box.



5. Electrical Connections

5.1 Safety Precautions



DANGEROUS

- Before making electrical connections, please ensure that the battery breaker and all switches associated with all energy storage systems are "OFF", otherwise electrical connections may result in a risk of electric shock.
- Make sure that the appliance is disconnected when connecting it, otherwise there may be a risk of electric shock.
- Please strictly observe the safety precautions in the operating instructions and the safety signs on the equipment.
- All operations, cables and component specifications used in the electrical connection process must comply with local laws and regulations.
- When crimping the terminal block, please ensure that the cable conductor and terminal block are in full contact, do not crimp the cable insulation and terminal block together, otherwise the equipment may not operate or the terminal block may become hot after operation, resulting in a safety hazard.



WARNING

- Damage to the equipment caused by incorrect wiring is not covered by the equipment warranty.
- Operations relating to electrical connections must be carried out by a specialist electrical technician.
- The technician must wear personal protective equipment when carrying out operations related to electrical connections.



NOTICE

All electrical connection diagrams in this section refer to cable colors for information purposes only and should be selected in accordance with local cable standards (yellow and green wires may be used for earthing protection only).

5.2 Electrical Connections

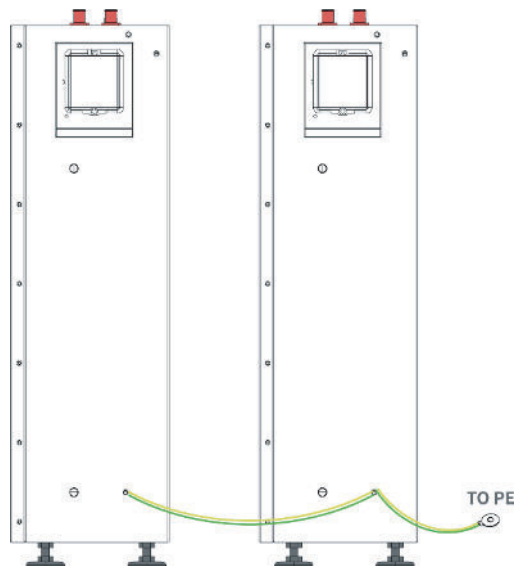
5.2.1 Grounding cable connection

Your battery system must be well grounded. Proceed as follows:

Step 1: Take out the grounding screw on the battery panel, and get the cable conductor through it.

Step 2: Fix them together, with a cylinder screwdriver and tighten it.

Step 3: Fix the other end to the customer's ground point.



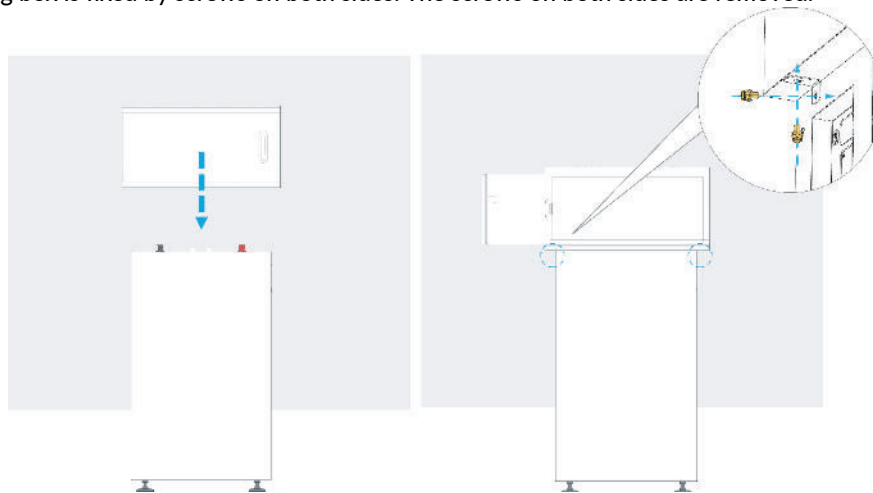
5.2.2 Communication cable connection



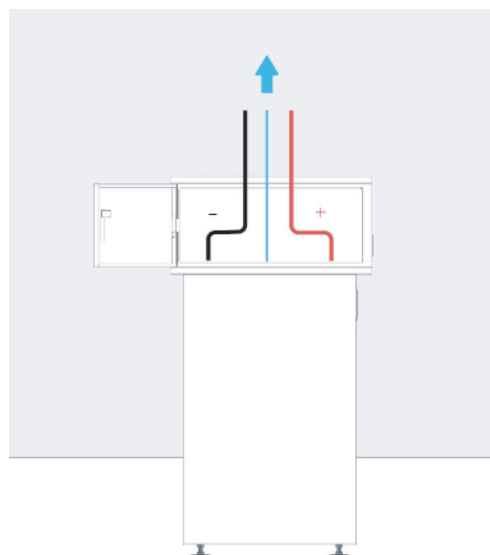
CAUTIONS

- 51.2-314-ESS battery contain three RJ45 communication interfaces, and all the wiring definition are consistent.
- There are 3 ports: IN/OUT/DRY CONTACT, please check 3.3.1 to connect cabs correctly.
- The communication cable for connection is supplied optional. If is not selected, the cables need to be provided by the user.
- Be careful to avoid misuse of lines used for communication between Hybrid inverter and battery, battery and battery.
- Try to avoid cross-connection
- If damaged after use, the user can refer to the following wiring definitions to make their own.

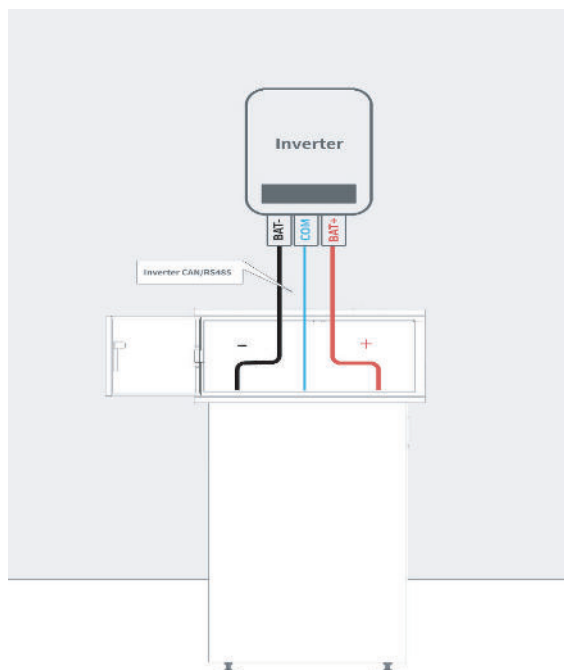
Step 1: The shielding box is fixed by screws on both sides. The screws on both sides are removed.



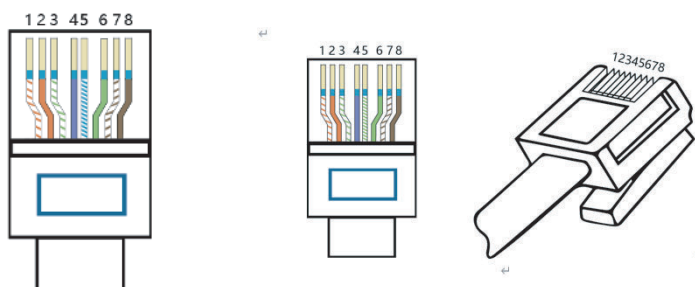
Step 2: Remove the waterproof cover at the battery communication port (refer to 3.3.1), and insert the communication network cable into the RJ45 communication port, and secure it.



Step 3: Connect the other end of the communication cable to the corresponding communication port of the inverter



RJ45 Terminal



IN

PIN	COM	Description
1	DIB	Communicating with inverter/ Parallel communication between battery modules
2	DIA	

3	SGND	Grounding
4	CAN-H1	Communicating with inverter or connecting to a computer
5	CAN-L1	
6	SGND	Grounding
7	RS485-A	Parallel communication between battery modules
8	RS485-B	

OUT

PIN	COM Right	Description
1	DOB	Parallel communication between battery modules
2	DOA	
3	SGND	Grounding
4	CAN-H1	Connecting to a computer, parallel communication between battery modules
5	CAN-L1	
6	SGND	Grounding
7	RS485-A2	Parallel communication between battery modules
8	RS485-B2	

DRY CONTACT

PIN	COM Right	Description
1	K!B	After the charging protection is triggered, this dry contact is connected.
2	K!A	
3	/	/
4	RSD	External emergency stop
5	RSD	
6	/	/
7	K2B	After the charging protection is triggered, this dry contact is connected.
8	K2A	

5.2.3 Battery-Inverter connection

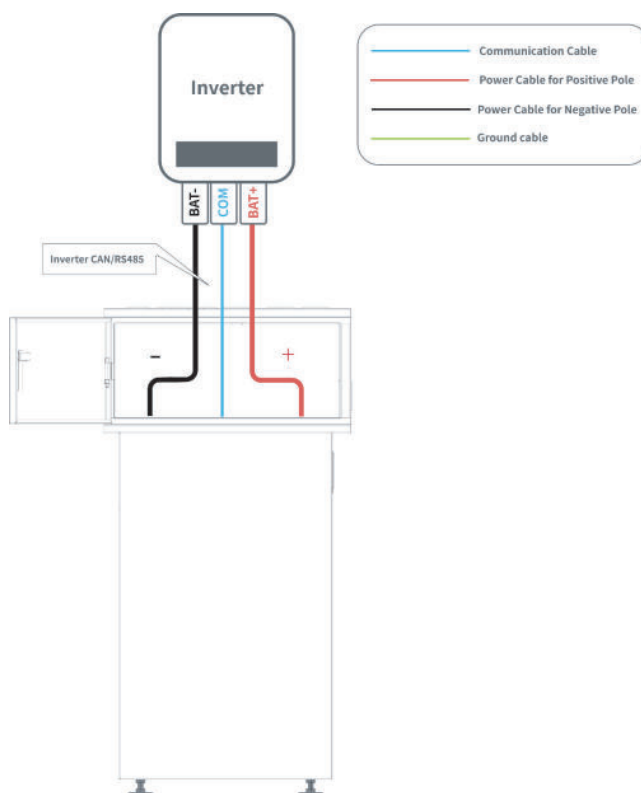


CAUTIONS

- Confirm inverter AC input and PV input is disconnected before wiring connection, and the DC/AC signal switch of inverter/charger is off status
- Remove the waterproof cover at the battery communication port and insert the communication network cable into the RJ45 communication port and secure it.

1. Communication cable wiring

Attach the battery to the inverter by connecting the communication line into the "485" or "CAN" port battery positive line into the "+" port and battery negative line into the "-" port.



2. Multiple towers and inverters cable wiring

Step 1: Attach one battery to another one by connecting the communication line from "OUT" port of previous battery to the "IN" port of the next battery.

Step 2: Connecting Master battery CAN or 485 port to PCS communication port via inverter communication cable (customized).

Step 3: Install the busbar into the junction box, which has reserved Lynx power screw holes. Connect all battery power lines to the busbar.

Step 4: A grounding point is reserved in the junction box, which can connect all the grounding points of the junction box and finally connect them to the grounding point of the inverter.

Step 5: Connect the inverter to the busbar using power lines.

Multiple pairs cable wiring:



⚠ NOTICE

The power cables used in the parallel operation should be the same. It is strongly recommended to use the bus bar to connect multiple batteries in parallel. Considering system stability, when you install multiple batteries, please always keep a certain capacity margin of 30~50%. It is recommended to configure the inverter capacity with battery energy in 1: 2 proportion.

⚠ NOTICE

- The maximum communication cable length is required to be less than 15m between inverter/charge and battery.
- The maximum power cable length is suggested to be less than 5m between inverter/charge and battery.

⚠ CAUTIONS

The maximum allowable current per power cord is 200A, and the maximum allowable current for the battery terminals is 250A. Please use the appropriate number of power cord pairs according to the site configuration and local connection requirements, standards and directives.

6. System Running

6.1 Battery Commissioning

The battery system allows you to select protocols compatible with the inverter and monitor battery status via the screen.

6.1.1 LED description

SOC light								
State	Charging				Discharging			
SOC	L4 	L3 	L2 	L1 	L4 	L3 	L2 	L1 
0%	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
1~25%	FLASH2	OFF	OFF	OFF	ON	OFF	OFF	OFF
26~50%	ON	FLASH2	OFF	OFF	ON	ON	OFF	OFF
51~75%	ON	ON	FLASH2	OFF	ON	ON	ON	OFF
76~99%	ON	ON	ON	FLASH2	ON	ON	ON	ON
100%	ON	ON	ON	ON	ON	ON	ON	ON

Mode	Status	RUN	ALM	LED indicator				Description
								
Power off	-	OFF	OFF	OFF	OFF	OFF	OFF	All OFF
Standby	Normal	FLASH1	OFF	According to battery SOC				See note
	Warning	FLASH1	FLASH3					
Charge	Normal	ON	OFF	According to battery SOC (highest SOC LED: FLASH2)				See note
	Warning	ON	FLASH3					
	COCP	FLASH1	OFF	According to battery SOC				Stop charging

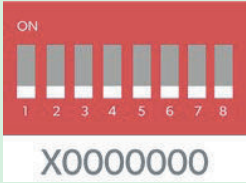
Discharge	Normal	FLASH3	OFF	According to battery SOC				See note
	Warning	FLASH3	FLASH3					
	CUVP/PUVP	OFF	FLASH3	OFF	OFF	OFF	OFF	Stop discharging
	DOCP	OFF	ON	OFF	OFF	OFF	OFF	Stop discharging
Temperature	CHTP/DHTP CLTP/DLTP	OFF	ON	OFF	OFF	OFF	OFF	Stop charging/ discharging
Failure	Cell/NTC failure Sensor failure MOS failure Reversed polarity /SCP	OFF	ON	OFF	OFF	OFF	OFF	Stop charging/ discharging

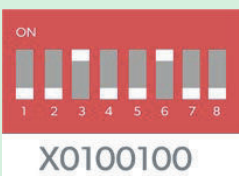
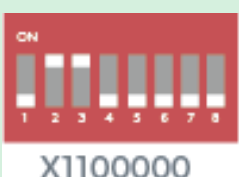
FLASH Type	ON	OFF
FLASH1	0.25S	3.75S
FLASH2	0.5S	0.5S
FLASH3	0.5S	1.5S

6.1.2 Communication protocol selection

The 51.2-314-ESS is equipped with the function of matching multiple inverters, and the inverter protocol needs to be switched according to the DIP switch address.

Remove ADD (refer to 3.3.1) using a screwdriver, and select your DIP switch settings as shown in the following picture.

RS485 Connection		CANbus Connection		DIP setting (Master battery)
Protocol ID	Inverter	Protocol ID	Inverter	
0	Voltronic/MPP/Alpha outback/Phocos/Kodak	0	Victron/SMA/Studer Innotec/Sofar	 X0000000
0	Voltronic/MPP/Alpha outback/Phocos/Kodak	1	SolArk/Solis/Goodwe /Deye/Growatt/-SAJ/Megarevo/IN-VT/Sermatec/MUST/Sunsynk	 X0001000
0	Voltronic/MPP/Alpha outback/Phocos/Kodak	2	Schneider	 X0000100
0	Voltronic/MPP/Alpha outback/Phocos/Kodak	3	LUX power	 X0001100
1	SRNE	0	Victron/SMA/Studer Innotec/Sofar	 X1000000
1	SRNE	1	SolArk/Solis/Goodwe /Deye/Growatt/-SAJ/Megarevo/IN-VT/Sermatec/MUST/Sunsynk	 X1001000

1	SRNE	2	Schneider	
1	SRNE	3	LUX power	
2	LUX power	0	Victron/SMA/ Studer Innotec/Sofar	
2	LUX power	1	SolArk/Solis/Goodwe /Deye/Growatt/- SAJ/Megarevo/IN- VT/Sermatec/ MUST/Sunsynk	
2	LUX power	2	Schneider	
2	LUX power	3	LUX power	
3	SolArk/PYLON	0	Victron/SMA/ Studer Innotec/Sofar	

3	SolArk/PYLON	1	SolArk/Solis/Goodwe /Deye/Growatt/- SAJ/Megarevo/INVT/- Sermatec/ MUST/Sunsynk	
3	SolArk/PYLON	2	Schneider	
3	SolArk/PYLON	3	LUX power	

6.2 System Power On/Off

No.	Inverter setting parameters	OFF
1	Absorption voltage	56.0V
2	Float voltage	55.2V
3	Re-charge/Generator start voltage	≥50V
4	Re-start voltage	52V
5	Low Voltage cut-off	48.0V
6	Rated charging current limited value	150A*N (N is the Quantity of the battery pack)
7	Rated discharging current limited value	150A*N (N is the Quantity of the battery pack)

8	Max. charging current limited value	200A*N (N is the Quantity of the battery pack)
9	Max. discharging current limited value	230A*N (N is the Quantity of the battery pack)
10	Force charge	Enable

For more information about connecting with different inverter/charger, please contact your supplier for technical support.



CAUTIONS

If your system is a back-up or off-grid system, make sure your configuration can cover the worst situation to avoid battery to be over-discharged.

6.2 System Power On/Off

Before operating the product, be sure to check the following to prevent damage to the system.

- All cables are wired correctly and firmly.
- All fasteners including bolts and screws are tightened firmly.
- No bystanders or animals enter the working area.
- Keep foreign objects , especially metal, away from the battery .
- The installation environment meets the requirements, ensuring a reasonable installation space, a clean and tidy environment and no construction leftovers.

6.2.1 System Power On



NOTICE

51.2-314-ESS Please power up within 24 hours of opening the package; for later maintenance, power down for no more than 24 hours.

1. Turn on the inverter switch. If a circuit breaker exists between the inverter and the battery, turn on the circuit breaker.
2. Close the circuit breaker on the battery and press the power switch on the battery. Once the LCD screen lights up, you can use the battery system normally.

6.2.2 System Power Off



DANGEROUS

When operating and maintaining the battery system, please disconnect the energy storage system from the power supply. Operating the equipment with electricity may cause damage to the equipment or risk of electric shock.

- After the system is powered down, there may still be residual power and heat in the chassis, which may cause electric shock or burns. Therefore, after the system has been powered down for 5 minutes, wear protective gloves before operating the energy storage system. Make sure that all the lights of the energy storage system are off before performing maintenance operations on the system.

1. Switch the circuit breaker on the battery to OFF
2. Turn off the inverter
3. Disconnect the electrical connection between the battery and the inverter.
4. Turn off the push button switch on battery.

6.3 Protection Function

Items	Description	Remark
Charge end COVP POVP	The BMS will stop charging if any cell or PACK voltage reach the protection value and it will be auto-released only when both Pack and cell voltage back to the release voltage range or there is efficient discharge current.	
Discharge end CUVP PUVP	The BMS will stop discharging if any cell or PACK voltage is under the protection value and it will be released only when all the cell voltage back to the release voltage range or there is efficient charge current.	Can Automatic recovery. Please charge timely, otherwise it may be in Low-power mode to be over-discharged and damage battery.
CHTP DHTP	The BMS will stop charging or discharging or both if any cell/environment/MOS temperature is beyond the range.	Automatic recovery when temperature falls.
CLTP DLTP	The BMS will stop charging or discharging or both if any cell/environment/MOS temperature is under the range.	Automatic recovery when temperature rise.
COCP	The BMS will stop charging when the charging current is higher than the protection value. And it will release from the protection when the system delays time is met.	Automatic recovery. If locked after three consecutive times, manual intervention is required.
DOCP	The BMS will stop discharging when the discharging current is higher than the protection value. And it will release from the protection when the system delays time is met.	Automatic recovery. If locked after three consecutive times, manual intervention is required.
SCP Reversed polarity	The BMS will stop charging when detect short circuit or reversed polarity.	Charge to release. Manual press reset.

Temperature, Voltage, Current sensor failure	Enter the failure mode, manual intervention is required no charging and discharging.	Manual intervention.
Sleep mode	After reaching a certain condition, BMS will enter dormancy mode to reduce BMS consumption	Charge, press reset or restart to activate.

7. System Maintenance

7.1 Routine Maintenance



CAUTIONS

When performing maintenance such as system cleaning, electrical connections, etc. perform the system power down operation first.

Maintenance List

Inspection content	Inspection method	Maintenance cycle
System cleaning	Regularly check the air inlet and outlet for shading and dust dirt	At least not once every three months.
System operation status	- Observe the appearance of the battery system for damage or deformation - Whether there are abnormal sounds during the operation of the battery system - During the operation of the energy storage system, check whether the parameters are correct	Semi-annually.
Electrical connection	- Check the cable connection for disconnection and looseness - Check the cable for damage, focusing on whether the skin of the cable in contact with the metal surface has signs of cuts. - Check the unused DC input terminal, energy storage terminal, COM port, and knob switch, whether they are in the locked state.	Every six months after the first transfer test.
Environment	Check if there is any debris accumulation around the system, if so, please clean it up to avoid affecting the battery heat dissipation.	Semi-annually

7.2 Troubleshooting and FAQ

Items	Solution	Measure
Unable to start	• Power on battery and press RESET 6s to observe whether the battery can be started. • Charge the battery use a charger or inverter to provide 54~57.6V voltage and observe it can be started.	If the abnormal status still alive after above steps, please contact your supplier. If there is any other situation(s) excluding in this table, turn off the fault battery, contact your supplier.
Unable to charge	• Check whether the cable connection between the battery and the inverter/charger is correct. • Check whether the inverter/charger setting is correct. • Check whether the battery is in charge protection mode, if yes, try to discharge the battery.	
Electrical connection	• Check whether the cable connection between the battery and the inverter/charger is correct • Check whether the battery occurs short circuit, reverse connection, pre-charge failure during connection inverter. • Check whether the battery is in discharge protection mode, if yes, try to charge the battery.	
High/Low temperature	• Stop the battery system for a while, check whether the installation location temperature meet the requirement. • Avoid continuous full charging and discharging.	
ALM always on	• Check the fault information on the inverter APP or display if possible. • Ask your supplier to offer BMS monitoring software to locate the reason and back to them for solution.	
Communication fail	• Check the communication cable type is correct and is contacted well. • Check the DIP switch setting is correct. • Check the inverter protocol related setting is correct. • Check both battery and inverter are working properly.	

Q1: Battery maximum SOC is 98~99% and never goes to 100%SOC during daily cycle use, why?

This is normal and have no influence on capacity, usually BMS will calibrate the SOC to 100% when reached cut-off current or trigger HVP, however, to avoid battery from being overcharged and to extend the cycle life as longer as possible, we left a room and set a charging profile to let battery charge slowly near full, please float the battery about 0.5~1 hour to calibrate the SOC.

Q2: 'High voltage' and 'cell unbalance' warning and alarm in rare cases, does it mean battery is damaged?

No. This is not unusual and happened on new batteries that are not balanced yet, please lower the maximum charge voltage (56V) and float the battery via grid or generator. If not solved, please contact your supplier.

Q3: When having multiple batteries in parallel connection, the battery on the end can't be fully charged.

Pay attention to your wiring diagram, please always follow the manual wiring advises and choose proper cable size and pair.

Q4: The current is 0A when connecting with a very small load at the situation that having multiple batteries in parallel connection, how to solve it?

Each BMS has a threshold current of 0.5A (~25W) before it begins to report, this leads the inaccurate display of the current.

Q5: SOC is not accurate or suddenly jumps to 100% during charging.

This mostly happen in off-grid applications on batteries that have not been calibrated SOC for a long time or situations that are similar to Q4 that with inverter in Idle mode or a small DC load or store the battery for a long time, we suggest fully charging at once the batteries per month refer to Q1.

Q6: The system is still running when the inverter log shows 'internal failure' Warning.

This is our logic and this warning flag indicates there is 1 or more module(s) is in communication offline from the system, the system will derating and until communication is recovered.

Q7: Inverter pulling power from Grid to charge batteries in self-consumption mode.

When reached certain conditions such as low state of charge etc., battery will send charge request to ask inverter to charge the batteries, to avoid this, please discharge DOD as manual suggested.

8. Transport, Storage

- Do not violently shake, impact or squeeze, and prevent sun and rain during the transportation.
- Do light take and put and strictly prevent falling, rolling, and heavy pressure during loading and unloading.
- The battery should be placed in a dry, clean, dark, and well-ventilated indoor environment for long-term storage, and the recommended storage temperature range is 15~35.
- No harmful gases, flammable and explosive products and corrosive chemical substances in the storage location.
- The batteries should be stored and transported in close to 50% SOC, do not store over 80% SOC for long time.
- If do not use for a long time, the battery needs to be charged every 6 months.
- No fall down, no pile up over 5 layers, and keep face up.

9. Disposal of Battery

Disposal of battery must comply with the local applicable disposal regulations for electronic waste and used batteries, please review your local Battery recycling or management regulations or contact your supplier for more information.

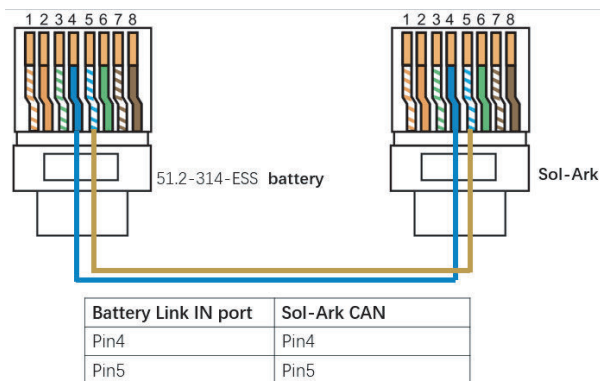
Integration guide NTEGRATION GUIDE

Sol-ark

Inverter PIN CONFIGURATIONS OF "BATTERY CANBUS" PORT FOR MODBUS & CAN BUS PROTOCOLS

Pin	Battery CAN Bus Port	
	Modbus	CAN Bus
1	RS-485 A+	--
2	RS-485 B-	--
3	--	--
4	--	CAN Hi
5	--	CAN Lo
6	GND	GND
7	RS485 A+	--
8	RS485 B-	--

Connection method of CAN communication line :

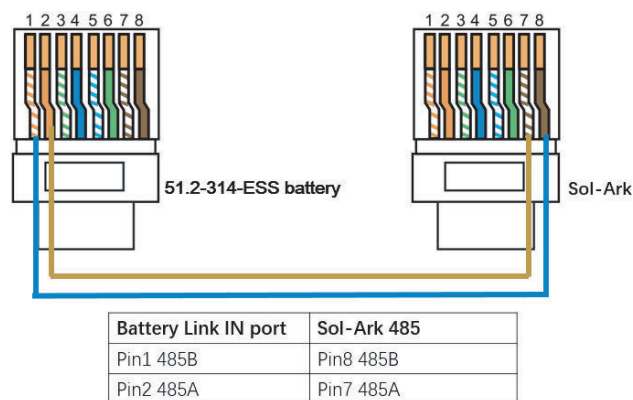


CAN communication Battery DIP selection:



The protocol number for selecting the inverter during CAN communication is:02

Connection method of RS485 communication line:



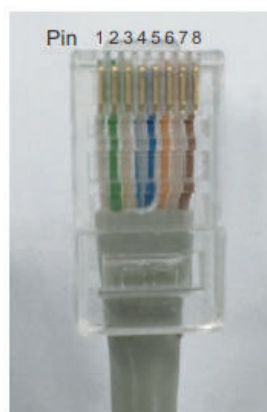
Connection method of RS485 communication line:



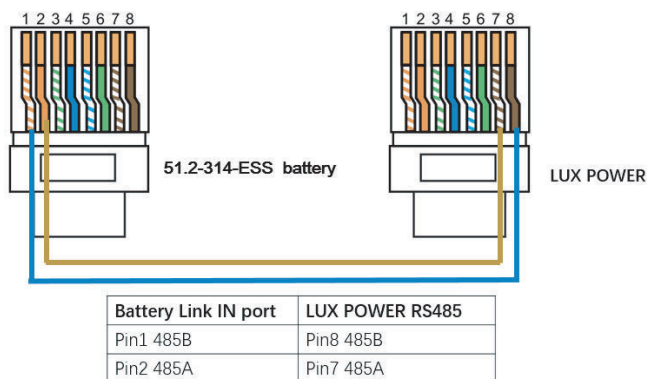
Lux POWER

Inverter PIN CONFIGURATIONS OF "BATTERY CANBUS" PORT FOR MODBUS & CAN BUS PROTOCOLS

Pin	Description
1	NC
2	GND
3	NC
4	BAT CAN H
5	BAT CAN L
6	NC
7	BAT RS485 A
8	BAT RS485 B



Connection method of RS485 communication line:



RS485 communication Battery DIP selection:



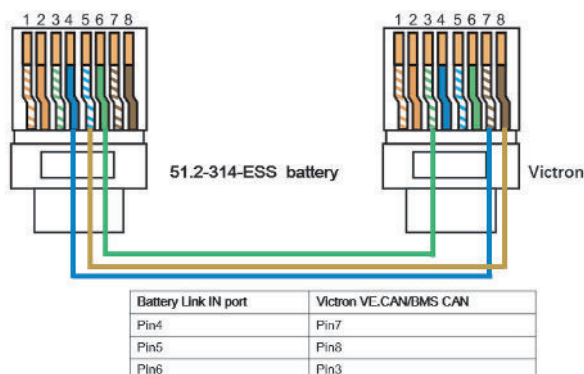
The protocol number for selecting the inverter during CAN communication is: 6

VICTRON

Inverter PIN CONFIGURATIONS OF "BATTERY CANBUS" PORT FOR MODBUS & CAN BUS PROTOCOLS

Victron VE.Can pin# a	
1	NC
2	NC
3	NET-C (V-)
4	NC
5	NC
6	NET-S (V+)
7	CAN-H
8	CAN-L

Connection method of CAN communication line:



CAN communication Battery DIP selection:



The protocol number for selecting the victron during CAN communication is : 500K