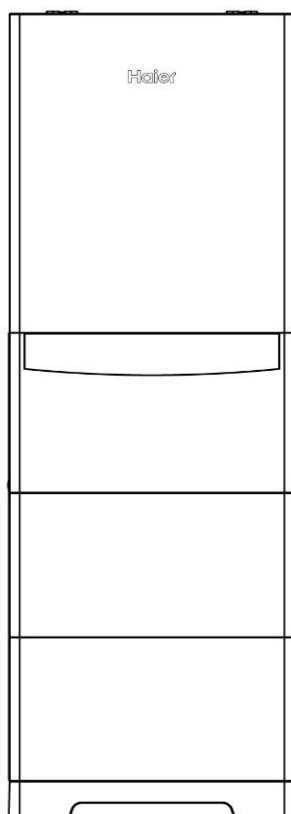




ENERGY STORAGE SYSTEM

User Manual



HA1L-3K/3.6K/5K5A1

HA1L-3K/3.6K/5K/6K10A1

HA1L-3K/3.6K/5K/6K15A1

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1 Safety precaution

Read the manual carefully and operate in accordance with the safety precautions. Refer to local safety regulations on items not covered in this manual. Electrical installation, maintenance must be performed by professional / qualified personnel.

1.1 Storage and installation environment

- Handle the product gently, prevent from dropping.
- Avoid open flame; keep away from flammables, explosives or corrosive chemicals.
- Choose cool and dry place for storage and installation.
- Prevent from water or humid intrusion.
- Prevent from accidental access (children and animals).
- Do not step on the product packaging.
- Do not place any foreign objects on top of the battery pack.
- Do not store the battery pack upside down.

1.2 Battery safety guidelines

- Prevent from electrostatic discharge.
- Wear insulating gloves when handling batteries.
- Do not energize auxiliary power during installation.
- Check the polarity carefully before switching on the system.
- Defected or damaged batteries shall not be charged or discharged.

1.3 Warning signs and stickers

	Warning Generic Hazard		Do not mix with domestic
	Warning High Voltage - Electrical shock hazard		Please recycle
	No flame		This side up
	No stepping on		User manual
	Warning High temperature		Protective Earth (connector)

	Warning High Voltage Wait 5 min till fully discharged		Protective Earth (general identification)
	Do not short circuit (cut off power)		Keep away from children
	Fragile		Do not get wet

1.4 Emergency handling

Wear personal protective equipment (PPE) such as goggle, face mask, insulated gloves and boots. Evaluate the situation before taking remedy action. When it is safe to do so, disconnect external AC or DC power connection.

Damaged or deformed battery enclosure

Risk of chemical leakage (i.e. electrolyte) and internal short-circuit.



Warning

Deformed or severely damaged battery pack can lead to piercing of cell pouch (chemical leakage) or internal short-circuit (thermal runaway). The damaged battery pack can release toxic gas. Keep away from it.

In case of accidental skin contact, wash the skin thoroughly with soap and seek medical advice. For eye contact, wash under running water (~15 minutes) and require immediate medical attention.

Fire hazard

If the fire is not from the battery or not spread to the battery, use FM-200 or CO₂ fire extinguisher to put out the fire.

If the battery pack catches fire, do not attempt to put out the fire and evacuate immediately. Seek medical in case of inhalation of pungent and toxic fumes.

Keep damaged batteries isolated and call your local fire department. Contact service for further support.

Water damage

Risk of electric shock and internal short-circuit. In case of splash or water spillage, when it is safe to do so, dry the product. If any part of the battery system is submerged, keep away from water.

Do not reuse the submerged battery. Contact a service for support.

2 Product description

HA1L-3K/3.6K/5K5A1/10A1/15A1 and HA1L-6K10A1/15A1 consist of PCS module shell, Power distribution module, and battery module. This document provides product introduction, installation, commissioning, maintenance, troubleshooting, packaging and transportation information.

2.1 Product introduction

- Residential energy storage system with lithium iron phosphate (LFP) technology
- Modular design; single battery system with 5 to 15kWh (1 – 3 pcs battery)
- Indoor or outdoor installation (IP65) (Hybrid Inverter IP66, the Battery & Distribution box IP 65)
- Advanced battery management system (BMS) provides data acquisition, status monitoring and control to ensure the safe and reliable operation of the system.

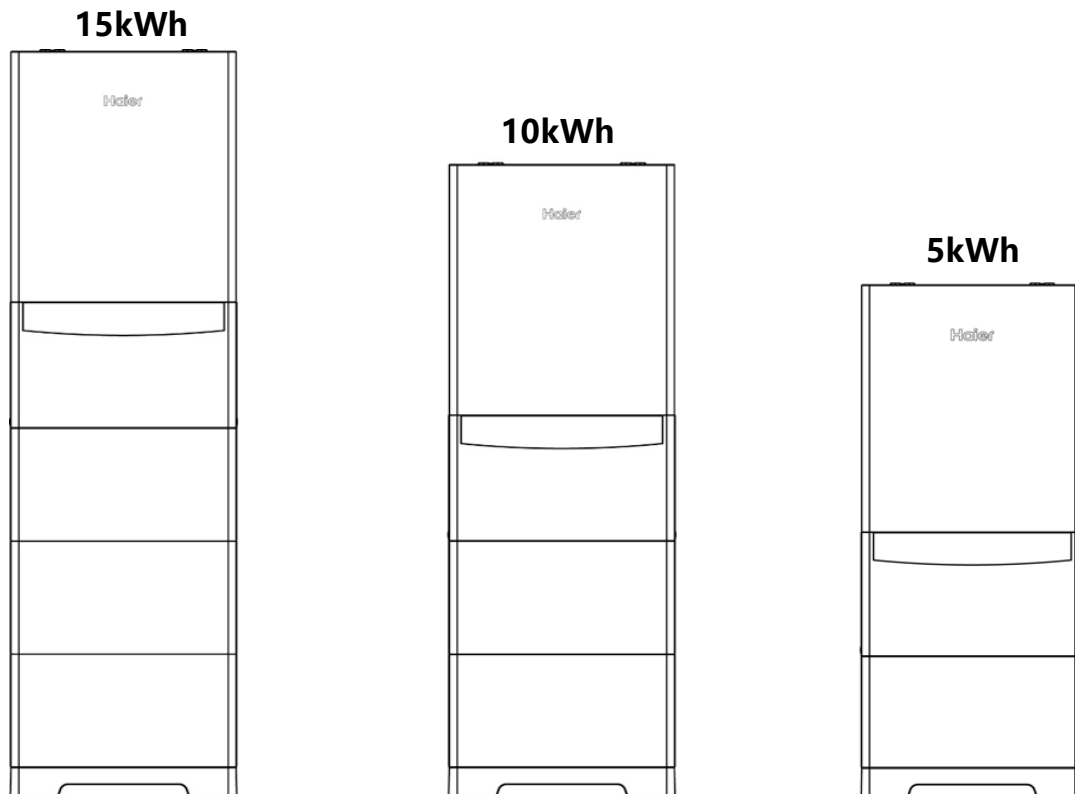


Figure 2-1-1 HA1L-3K/3.6K/5K5A1/10A1/15A1 and HA1L-6K10A1/15A1 configurations

2.2 Module introduction

● Appearance description

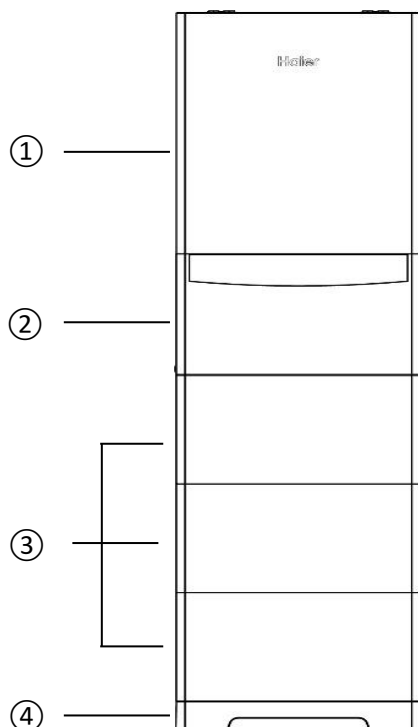


Figure 2-2-1 Appearance of the whole machine

① PCS module

② Power distribution module

③ Battery module

④ Mounting base

● Control module

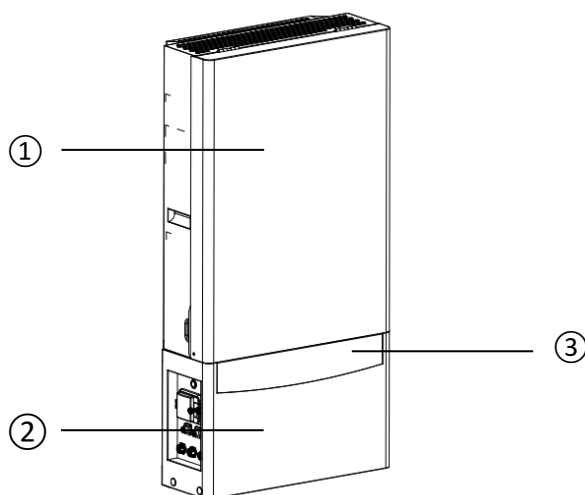


Figure 2-2-2 Left side of Power distribution module

① PCS module shell

② Power distribution module

③ Display

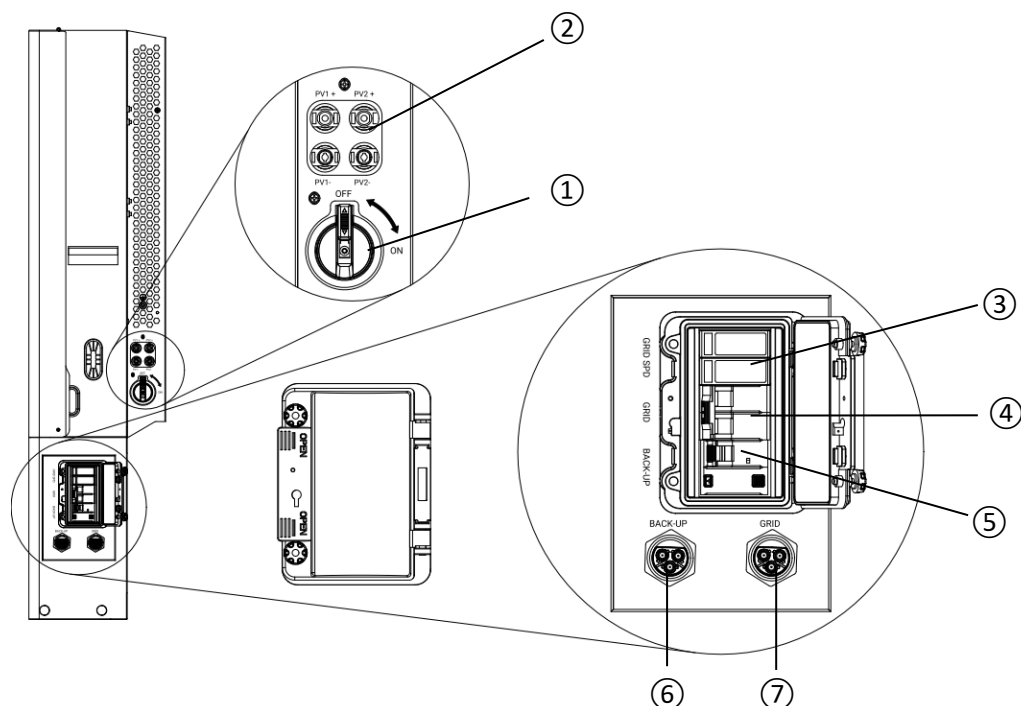


Figure 2-2-4 Right side of the Power distribution module

Functional part	Function/Operation
①PV switch	Connect or disconnect the system and PV. Check the surge protection module.
②PV MC4 port	2 channels for PV input.
③GRID surge protection device	Normal operation: indicator shows green. Failure alarm: indicator shows red.
④GRID breaker	Connect or disconnect the system and grid. The system input or output from the grid.
⑤BACK-UP breaker	a. Connect or disconnect the system and important load. b. The system can output power to the load. c. Regular maintenance: disconnect PV and GRID, keep the breaker is ON, press the leakage protection button. If the circuit breaker is tripping, the breaker is normal. Please reset the leakage protection button after checking. If there is no tripping, it means the breaker failed, and need to replace the new one. d. Recommended monthly inspection, no matter in use or long-term idle.
⑥ BACK-UP connecting port	—
⑦GRID connecting port	—

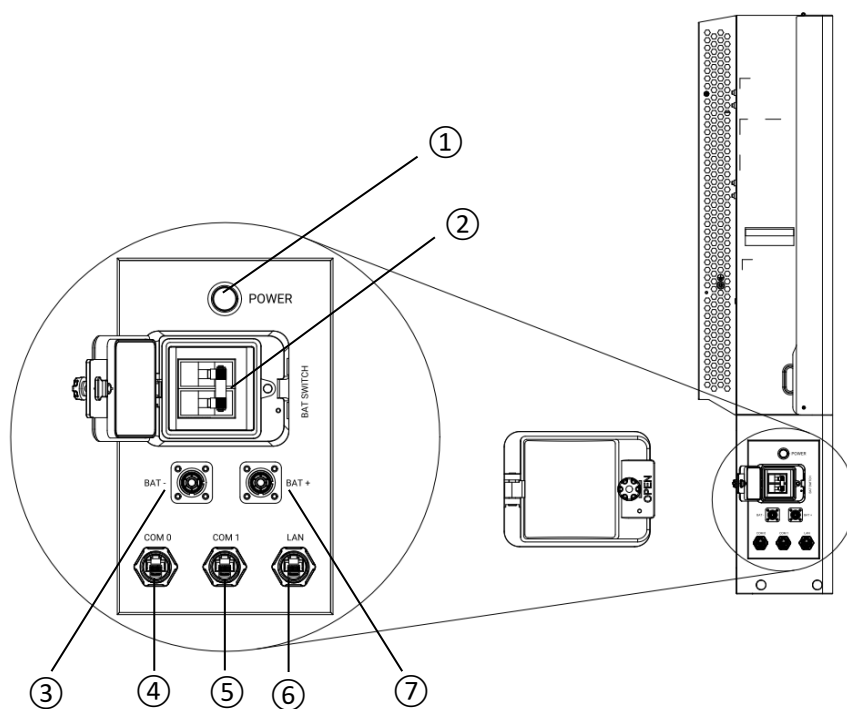


Figure 2-2-3 Left side of the Power distribution module

Functional part	Function/Operation
① POWER button	Press and hold for 3s, battery turn on. Press and hold for 3s, battery power off. Short press, display light up.
② BAT switch	Before powering on, close the switch first and then press the button; Before powering off, press the button first and then disconnect the switch
③ BAT- connecting port	Parallel negative power interface
④ Parallel communication 0 (COM0)	Parallel communication interface
⑤ Parallel communication 1 (COM1)	Parallel communication interface
⑥ Maintenance (LAN)	—
⑦ BAT+ connecting port	Parallel positive power interface

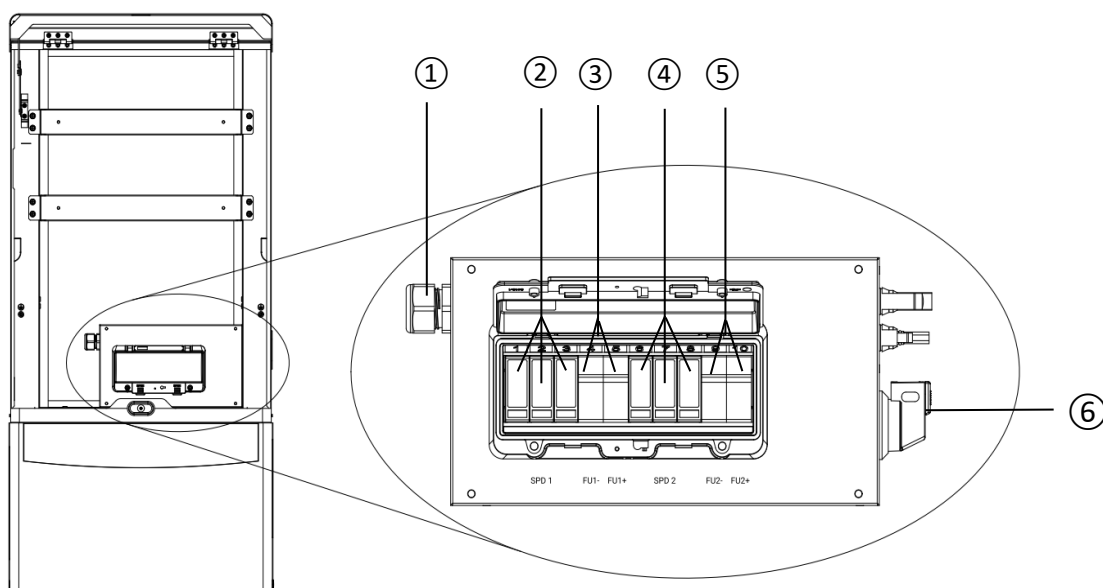


Figure 2-2-4 front side of the PV box

Functional part	Function/Operation
①PV interface (to PCS)	—
②Surge protection Device (PV1)	Normal operation: indicator display green Failure alarm: indicator display red
③Fuse protector(PV1)	Before maintenance, make sure that the switch is in the disconnected state Failure alarm: indicator display red
④Surge protection Device (PV2)	Normal operation: indicator display green Failure alarm: indicator display red
⑤Fuse protector(PV2)	Before maintenance, make sure that the switch is in the disconnected state
⑥PV Switch	Turn the button on, the PV modules connect with the inverter; Turn the button off, the PV modules disconnect with the inverter;

- Battery module

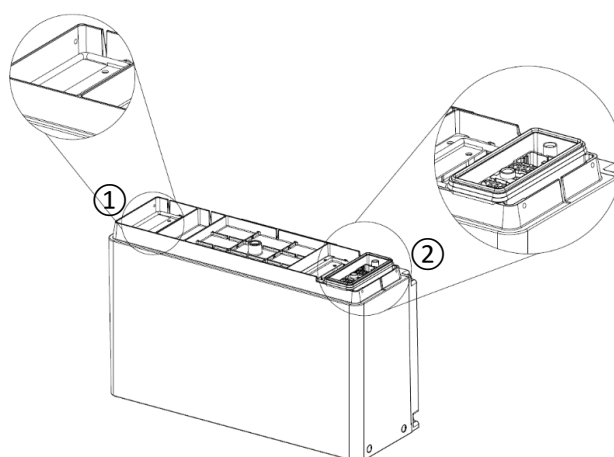


Figure 2-2-5 Structure diagram of Battery module

① Handle

② Power/Communication connector

2.3 Display description

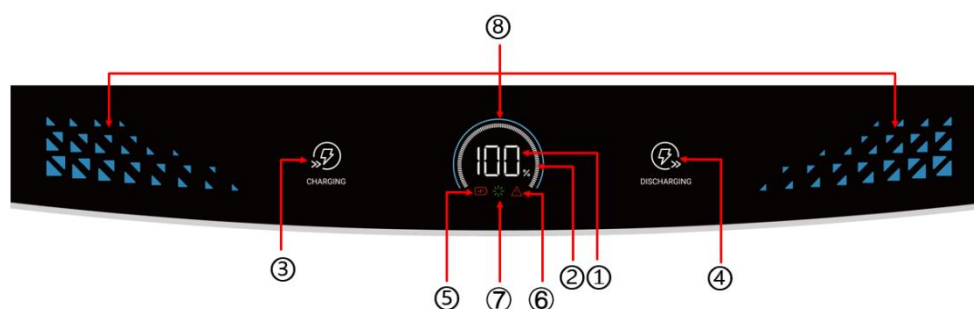


Table 5-3-1 Display

Item	Description	Function
①	SOC value	Digital display of real-time SOC
②	SOC power bar	The number of power bar display of real-time SOC, consistent with SOC value
③	Charging status	System is charging
④	Discharging status	System is discharging
⑤	Low SOC status	[Flashing] system is in low energy state ($SOC \leq 10\%$) [Off] $SOC > 10\%$
⑥	Fault status	[Flashing] system operation failure [Off] No fault or fault relieved
⑦	System operation normally	[Light on] System is in normal operation (No fault, $SOC > 10\%$)
⑧	Decorative lamp	System power up, it keeps lighting until the screen automatically turns off

- Boot initialization: the screen shows 100% SOC with other indicator lit up. One second later, the screen display the current SOC and system status, as well as the decorative lamp ⑧ light up.
- System operating status
 - Normal operation status (no charging or discharging): ①②⑦⑧ lighting.
 - Charging status: ③⑦⑧ lighting, ①② display with system energy
 - Discharging status: ④⑦⑧ lighting, ①② display with system energy
 - Failure status: ⑥ flashing, ①② display with system energy, ⑧ lighting
Relieve the alarm: ⑥ goes out after the system fault is eliminated.
- Automatic screen off: The display will automatically off after no operation for 10 min.
 - The system in normal running (charging or discharging status): the display will go dark after no operation for 10 minutes.
 - The system in failure: ⑥ flashing, other indicators are extinguished.
Relieve the alarm: ⑥ goes out after the system fault is eliminated.
 - The system in low energy: ⑤ flashing, other indicators off
Relieve the alarm: system energy > 10%, ⑤ goes out
- Wake up screen: Short press the POWER button (1s) to wake up the screen, indicators display according to the system status.
- SOC Display:
 - SOC power bar: A unit consisting of 1 small block light up or go off, for a total of 100 units (each unit represents 1% of power). The corresponding quantity is displayed with the current SOC value, starting from the left lower.
 - SOC value: Displays integer values, increasing or decreasing by 1%
- System battery upgrade: In the process of system upgrade, ② real-time display of the current upgrade progress (in 1% units, such as 0%, 1%..... 9%, 100%), ⑧ light up. Then the system will be auto restart.
- Power distribution module: The screen goes off and auto restarts.

System description		Indicator								Remark
		①	②	③	④	⑤	⑥	⑦	⑧	
Boot initialization		●	●	●	●	●	●	●	●	●keep lighting
System operating status	Normal operation	●	●					●	●	
	Charging	●	●	●					●	
	Discharging	●	●		●				●	
	Low energy	●	●			●			●	
	Failure	●	●				●		●	
Automatic screen off	Normal operation									●flashing
	Charging									

(Display will go dark after no operation for 10 minutes)	Discharging									
	Low energy					◐				
	Failure						◐			
System upgrade	Upgrade progress	●							●	
Wake up screen		Indicators display according to the system status								

Note: Due to the inherent characteristics of the battery, it is normal that the SOC of the battery experience a jump after charging or discharging.

3 Installation guide

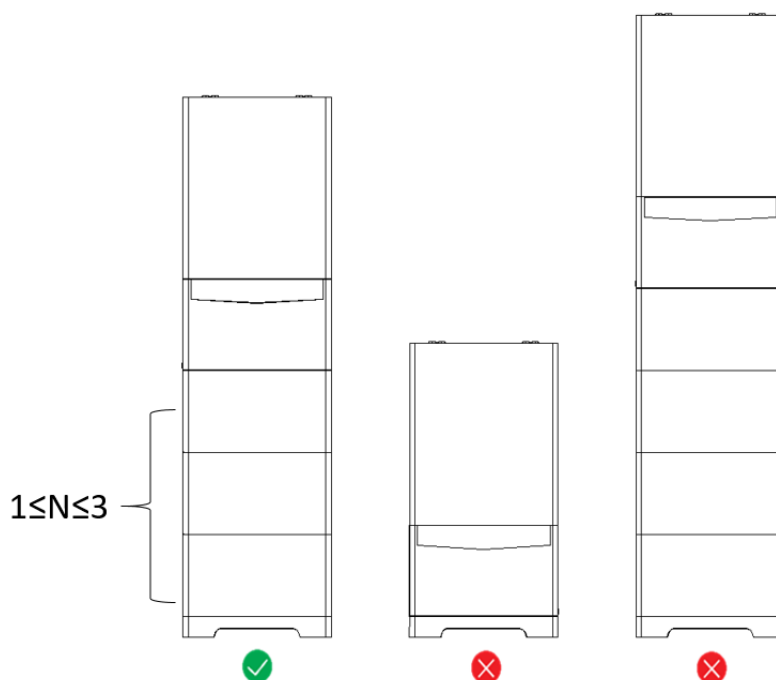
3.1 Environmental requirements

- a. Ambient temperature: Charging:[-10,50]°C,Discharging:[-20,50]°C
(recommended: 10°C~35°C or 50°F~95°F)
- b. Ambient humidity: 10%-95%
- c. Altitude <4000m. (Power derating with the altitude over 2000m)
- d. For outdoor installation
 - Avoid direct sunlight
 - Avoid rain and snow
 - Avoid location susceptible to flooding
 - Install under shed if possible
- e. For indoor installation
 - 3 feet clearance from doors, windows, driveway or other batteries
 - Keep away from heating device
 - Prevent from corrosive chemicals
 - Prevent from water spillage
 - Install on a floor or strong structure capable of bearing the weight of the machine. Install vertically with a maximum incline of 3 degrees to ensure the stability of the system.
 - To avoid overheating, make sure the flow of air around the system is not blocked. Please refer to the picture at page 12.

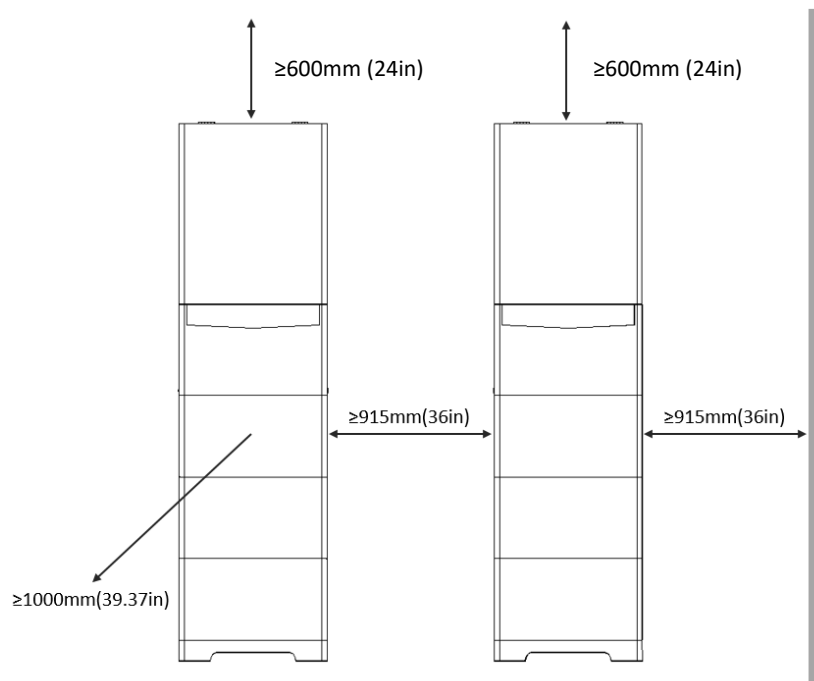


3.2 Installation physical requirements

a. Item inspection

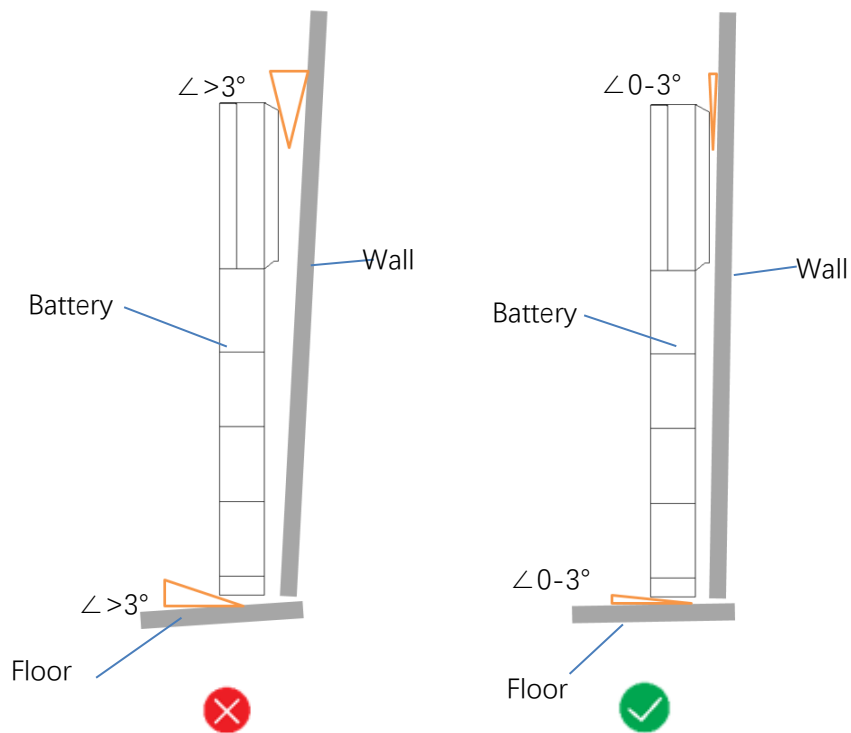


b. Installation clearance



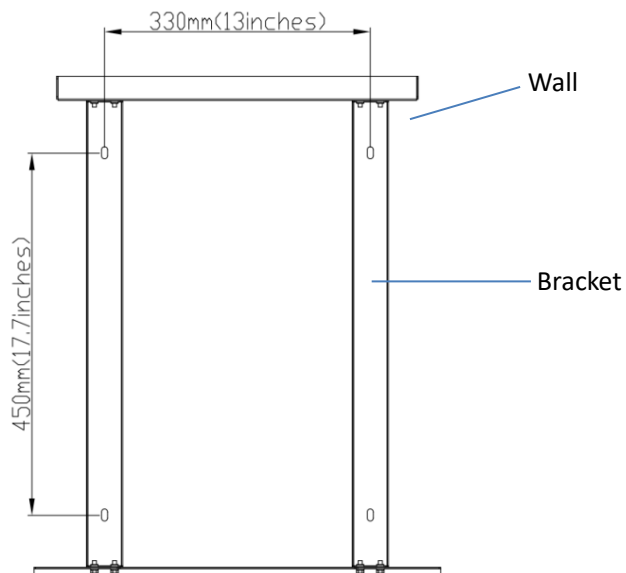
Note: Please reserve the minimum free space needed in front of the product in order to open the cover.

c. Level control



d. Bracket fixing bolt positioning

Take into account the actual surface condition before fixing the bracket. The bolt horizontal spacing of the two vertical beams is 330mm (13 inches) and the upper and lower bolt spacing of the same vertical beam is 450mm (17.7 inches), as illustrated below.



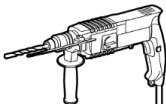
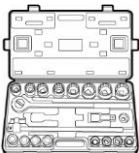
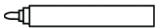
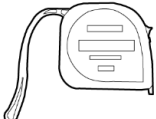
e. Prepare the wall-mounting surface before drilling



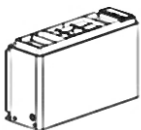
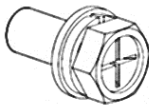
Avoid electricity wire, metal conduit or pipe inside the wall; consider using wall scanner (wall detector)

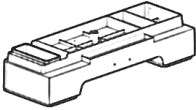
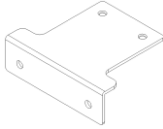
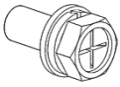
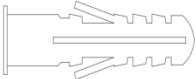
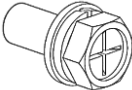
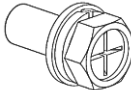
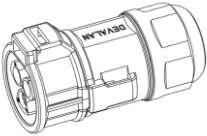
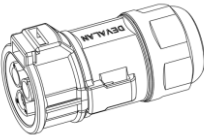
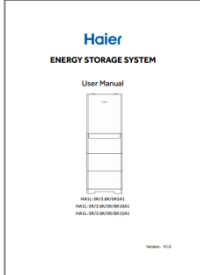
3.3 Installation

3.3.1 Installation tools

Professional Installation Equipment			
 Impact drill (3/8 & 13/64 drill)	 Torque wrench (7/16 & 9/16 hexagonal socket)	 Marker pen	 Electric batch
 Hammer	 Detector	 Steel tape	 Level ruler
Personal Protective Equipment (PPE)			
 Safety gloves	 Safety goggles	 Dust mask	 Safety shoes

3.3.2 Packaging components

Battery Module Packaging Components		
 Battery module X1	 Screw cover X4	 Fixing screws (M5*12) X4
Control Module Packaging Components		

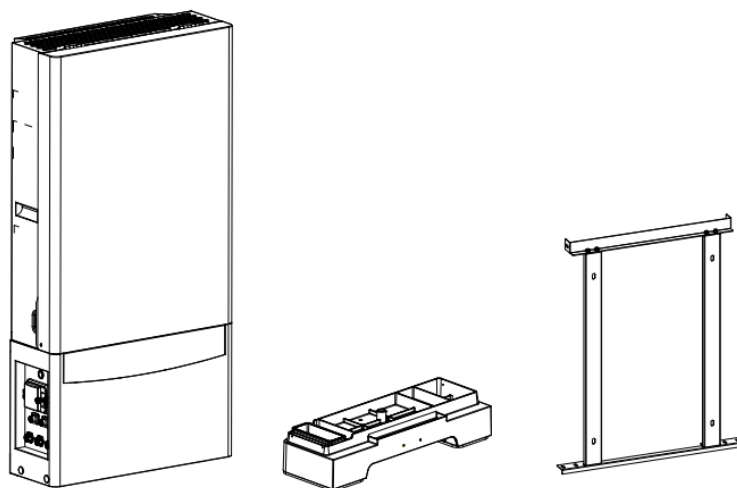
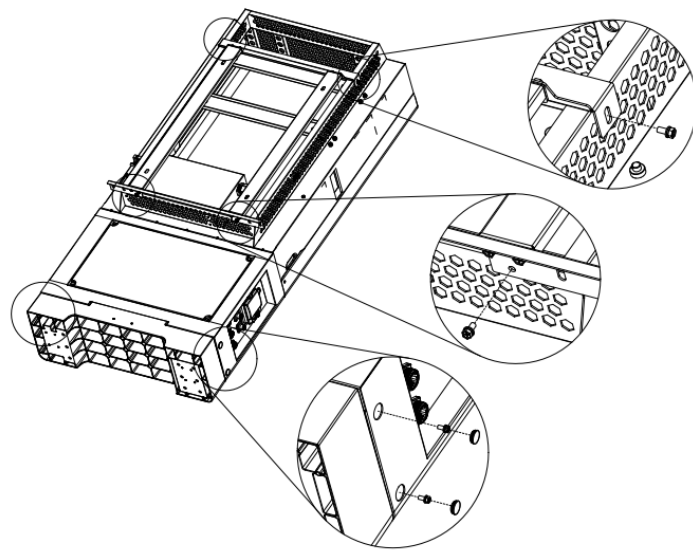
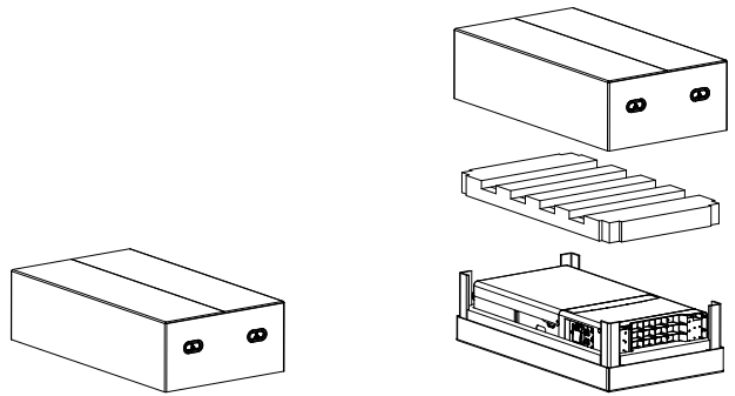
			
Control module X1	Base X1	bracket X1	Angle bracket X2
			
Fixing screws (M5*12) X12	Expansion plastic pipe X6	Self-tapping screws (ST6.3*40) X6	Screwdriver (φ5*100mm) X1
			
Round terminal X2	Ground cable X 1	Fixing screws (M6*14) X4	Fixing screws (M4*40) X2
			
BACKUP connector X1	GRID connector X1	User manual X1	

3.4 Installation steps

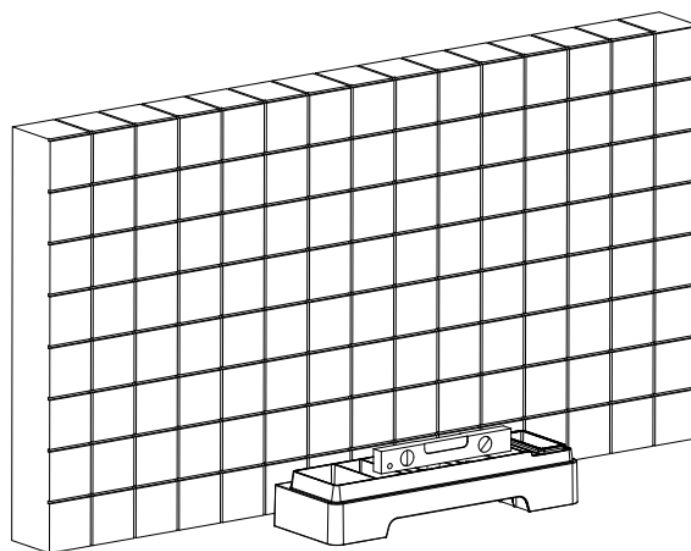
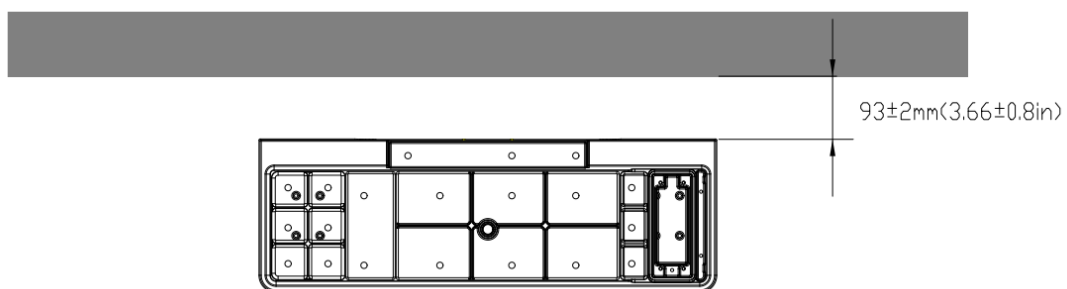
3.4.1 Installation battery

a. Place the base

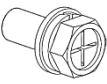
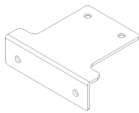
Put the Power distribution module out of the carton. Loosen screws secured to base and Power distribution module, bracket and Power distribution module. Then place them side by side.

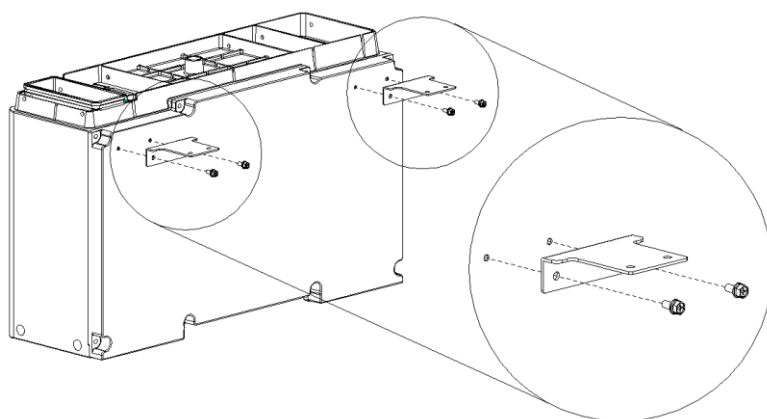


The base module should place on a level ground, parallel to the wall. The clearance to the wall should be 93mm (3.66inches). Use a level rule to check the horizontal angle of the base. Ensure that the tilt angle is less than 3°.

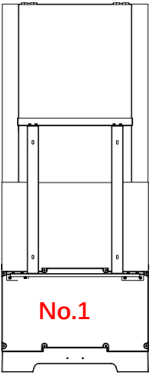
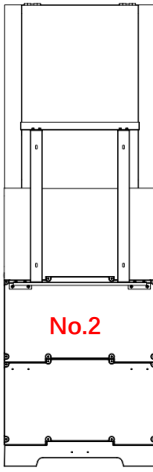
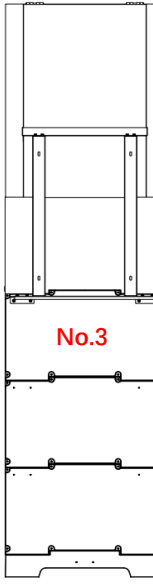


b. Install the angle bracket

Components			
Fixing screw	M5*12	4 pcs	
Angle bracket	-	2 pcs	



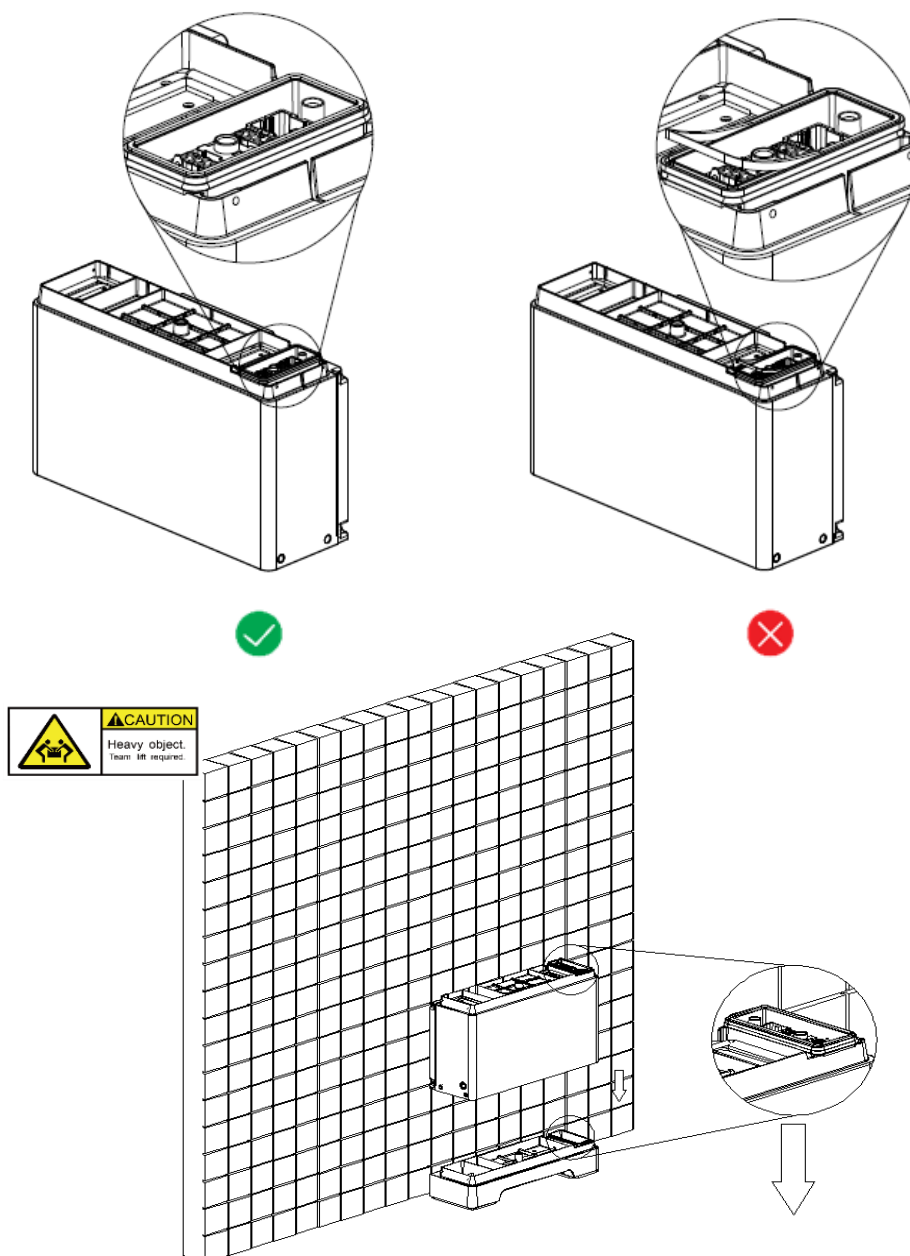
Refer to the following for the recommended the wall mounting assembly (angle bracket + bracket) installation: (Only the top battery pack that Power distribution module directly stack need the angle bracket)

 No.1	 No.2	 No.3
1 pcs mounting assembly on Batt. No.1 ✓	1 pcs mounting assembly on Batt. No.2 ✓	1 pcs mounting assembly on Batt. No.3 ✓

c. Stack battery module



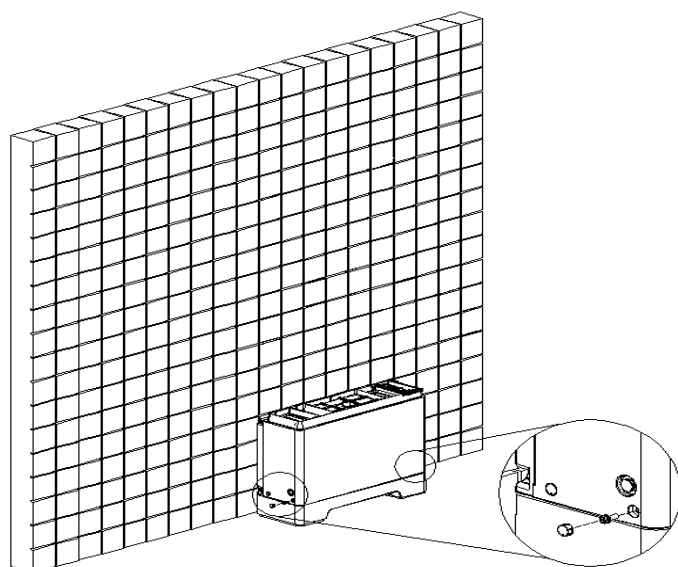
Before stack battery module, please check that the terminal sealing ring is well fixed.



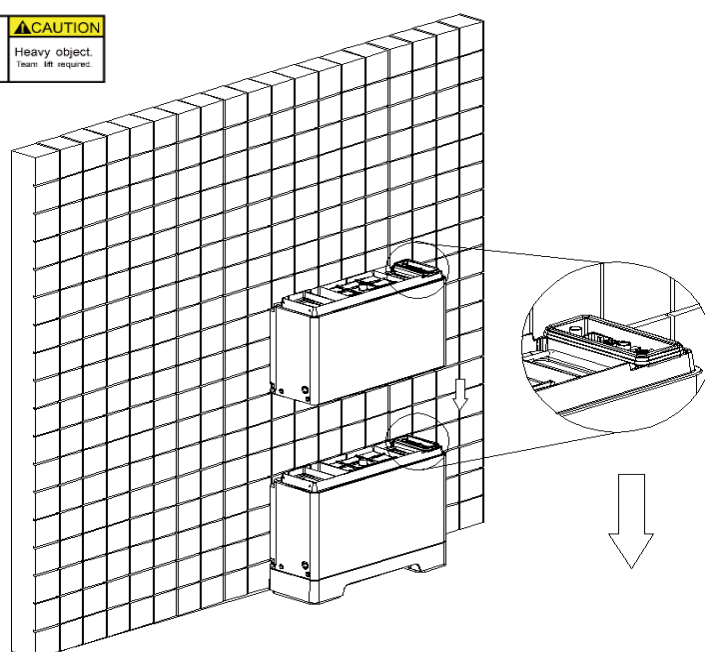
Unit weights 50kg (110.2lbs). Two or more people are necessary. Align the connector side first; then stack gently to avoid damaging the connector!

Fasten the installed battery module

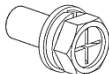
Components			
Fixing screw	M5*12	4 pcs	
Screw cover	plastic	4 pcs	

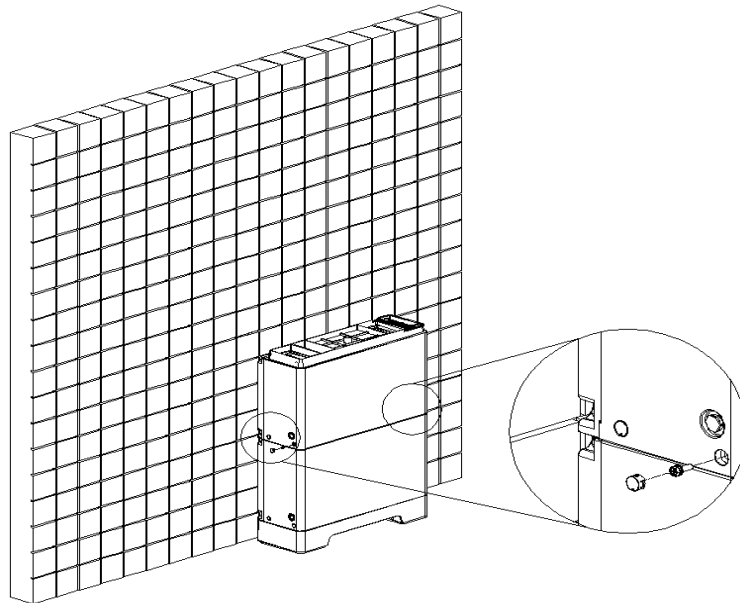


d. Adding additional battery module

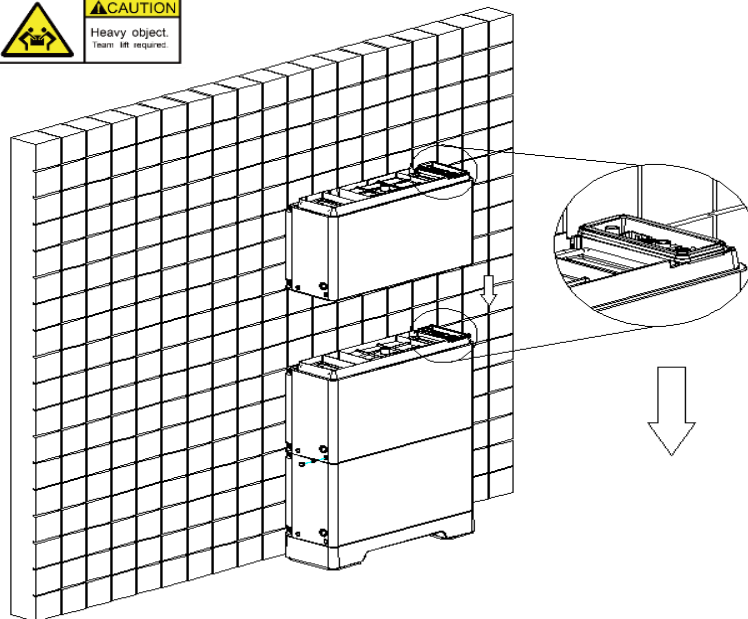


Fasten the stacked battery module

Components			
Fixing screw	M5*12	4 pcs	
Screw cover	plastic	4 pcs	

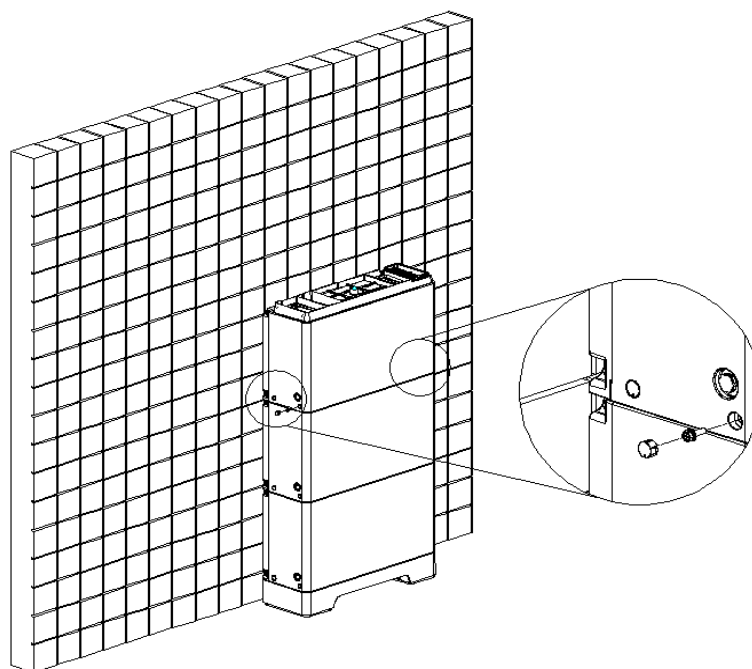


e. Adding additional battery module



Fasten the stacked battery module

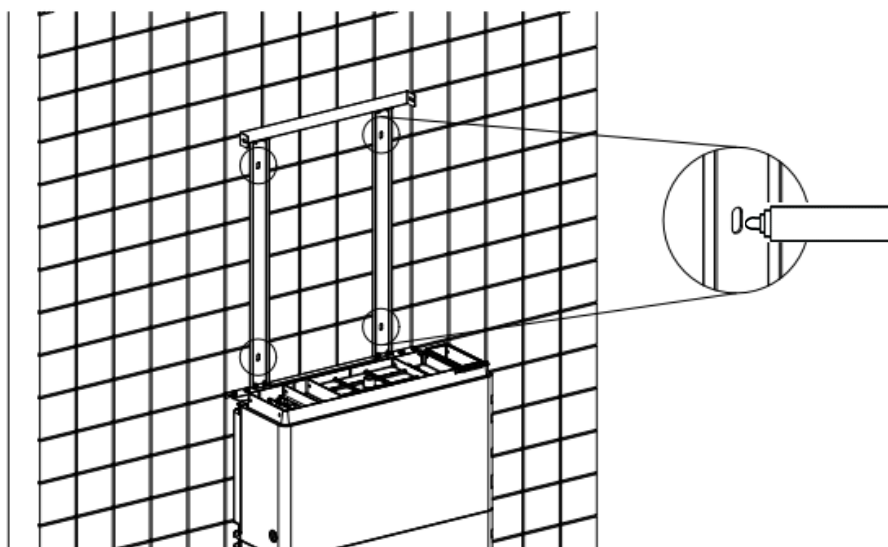
Components			
Fixing screw	M5*12	4 pcs	
Screw cover	plastic	4 pcs	



f. Install the Bracket

① Mark the screw position

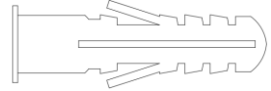
Place the bracket against the wall on the angle bracket (**Ensure the screw holes of bracket are aligned**) and mark the drilling point.



② Drilling (for concrete or brick wall) and fixing the bracket on the wall.

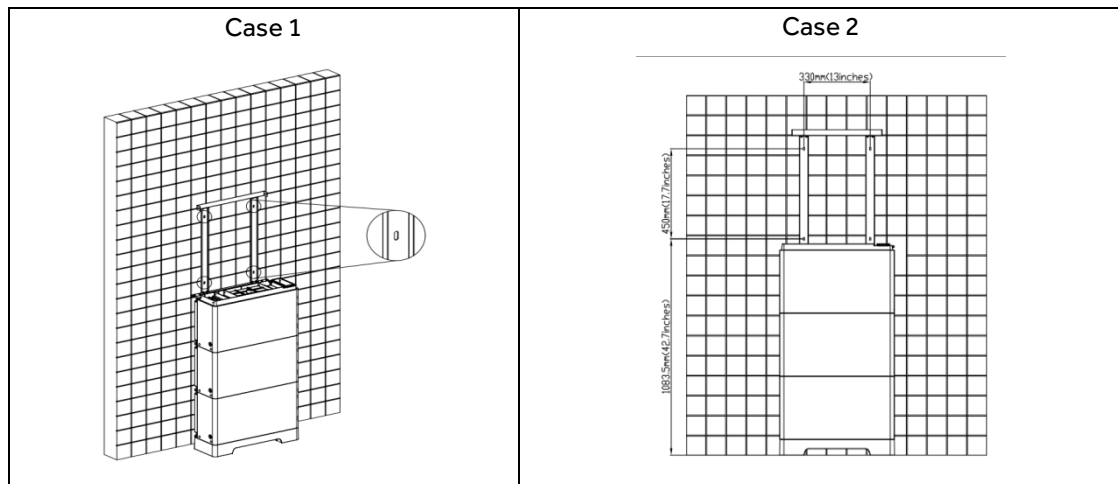
Covering on the battery connector to prevent falling debris. (Such as the PE bag of product packaging).

This case is useful for Concrete or wooden wall.

Components			
Self-tapping screw	ST6.3*40	4 pcs	
Expansion plastic pipe	Ø6*40	4 pcs	

Note: The self-tapping screw must penetrate the wall 38mm at least.

1. Use ST6.3*40 4pcs self-tapping screws to drill directly into the wooden wall to fix the Bracket.
2. Use a 13/64 bit to pre-drill the holes if there is concrete wall. Insert expansion tubes into the holes, then use the ST6.3*40 4pcs self-tapping screws to fix the bracket.

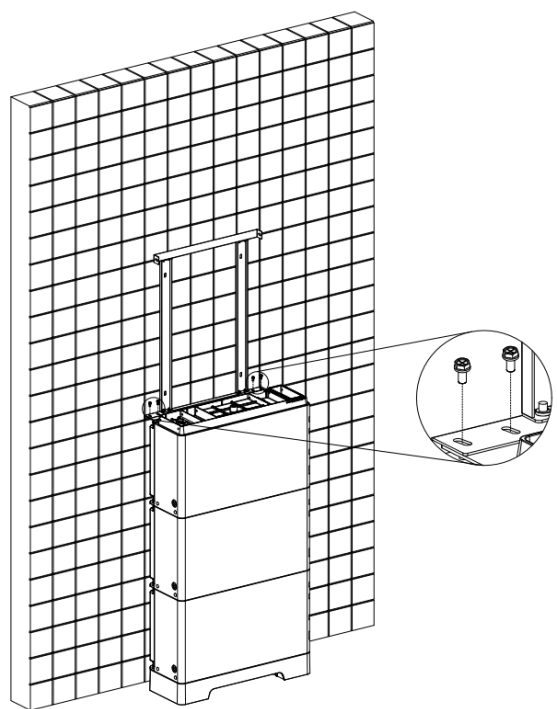


Make sure the connector is clean from debris.

③ Bracket assembly

Reinforce the bracket by fixing the screws with angle bracket.

Components			
Hex screw	M5*14	4 pcs	

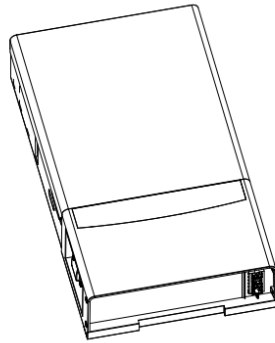


g. The overall bracket installation and battery modules stacking are completed.

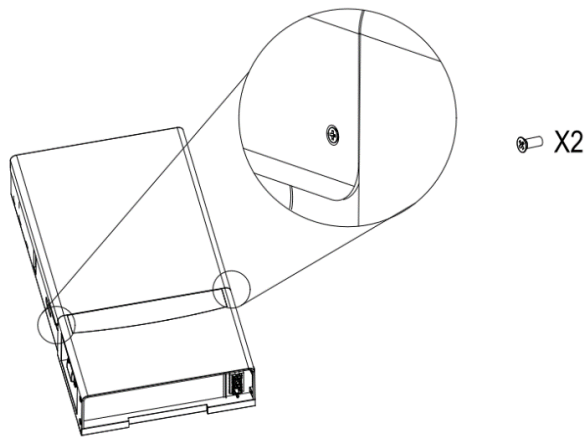
HA1L-3K/3.6K/5K5A1	HA1L-3K/3.6K/5K/6K10A1	HA1L-3K/3.6K/5K/6K15A1
Concrete wall (Wooden wall)	Concrete wall (Wooden wall)	Concrete wall (Wooden wall)

3.4.2 Installation of Power distribution module and inverter

a. Place the Power distribution module horizontally on level ground.



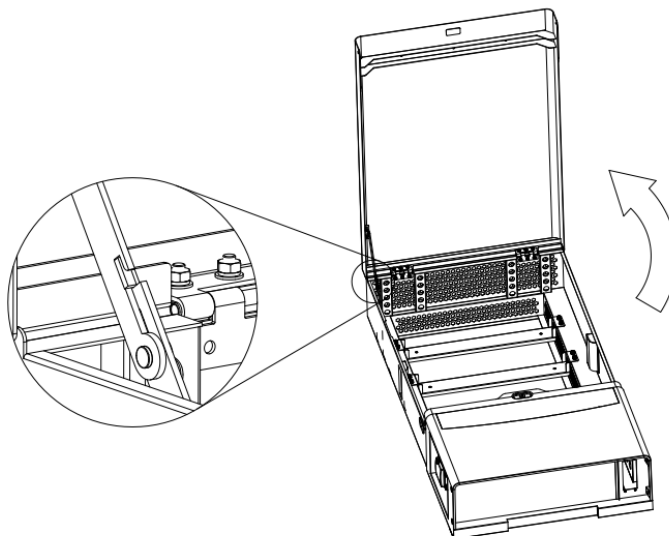
b. Loosen the screws on both sides of the inverter shell cover.



c. Open the inverter shell upwards to 90° and clamp the bracing piece into the slot.



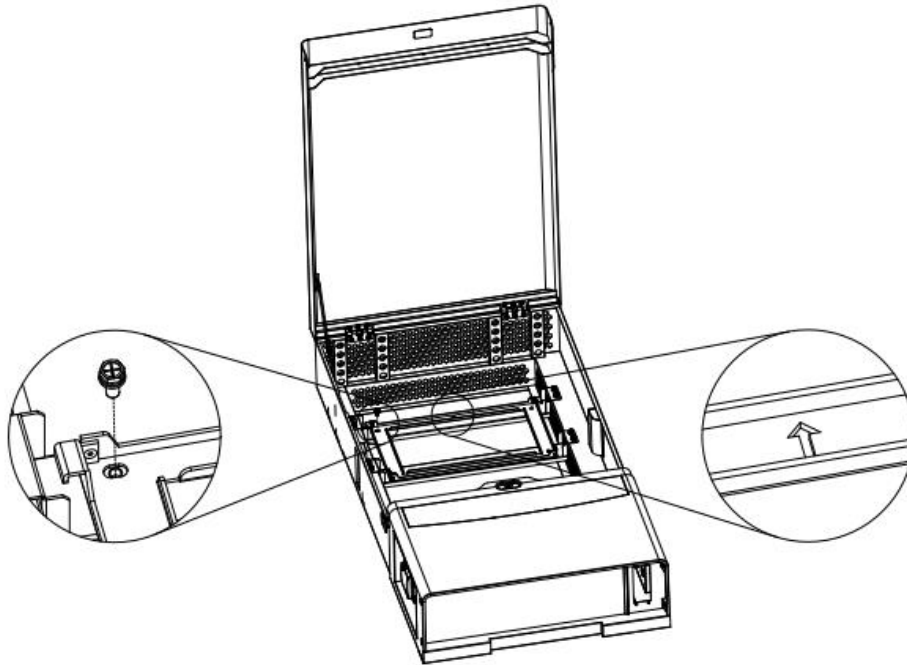
Make sure the bracing piece clamp in place. Avoid the shell falling, causing injury.



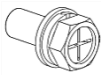
d. Fix the mounting beam with inverter bracket to the shell interior.

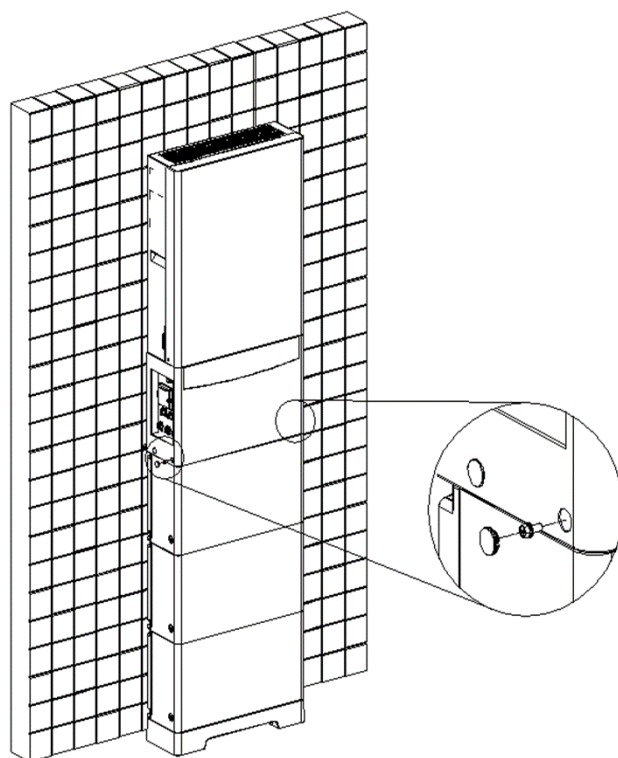


The inverter bracket should be mounted with the arrow facing upward.

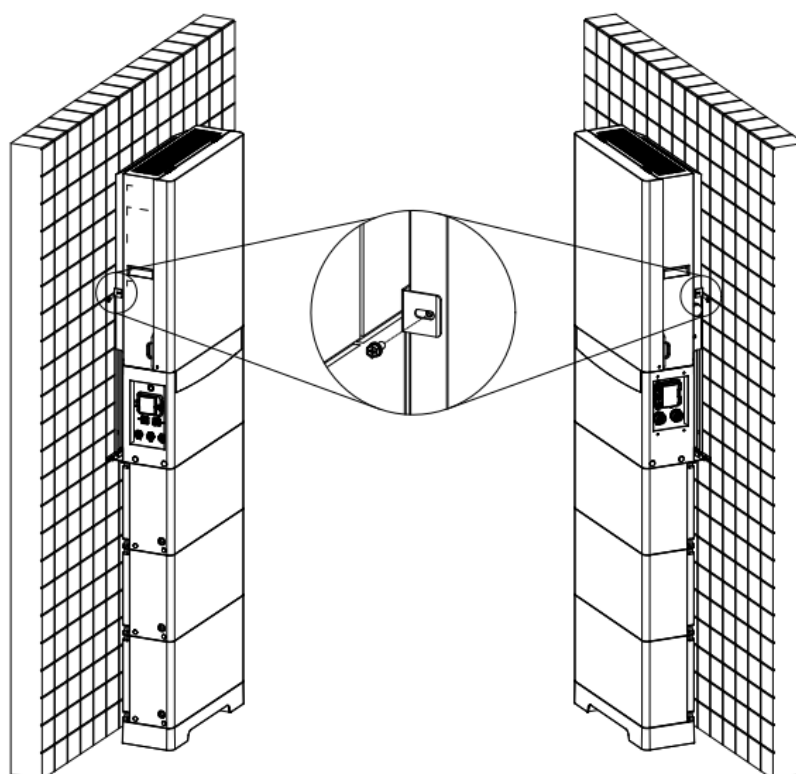


e. Close the cover. Stack the Power distribution module on top of battery modules stack. Fasten the battery module and Power distribution module.

Components			
Fixing screw	M5*12	4 pcs	
Screw cover	plastic	4 pcs	

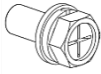
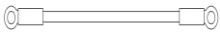
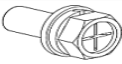


Components			
Hex screw	M5*12	2 pcs	



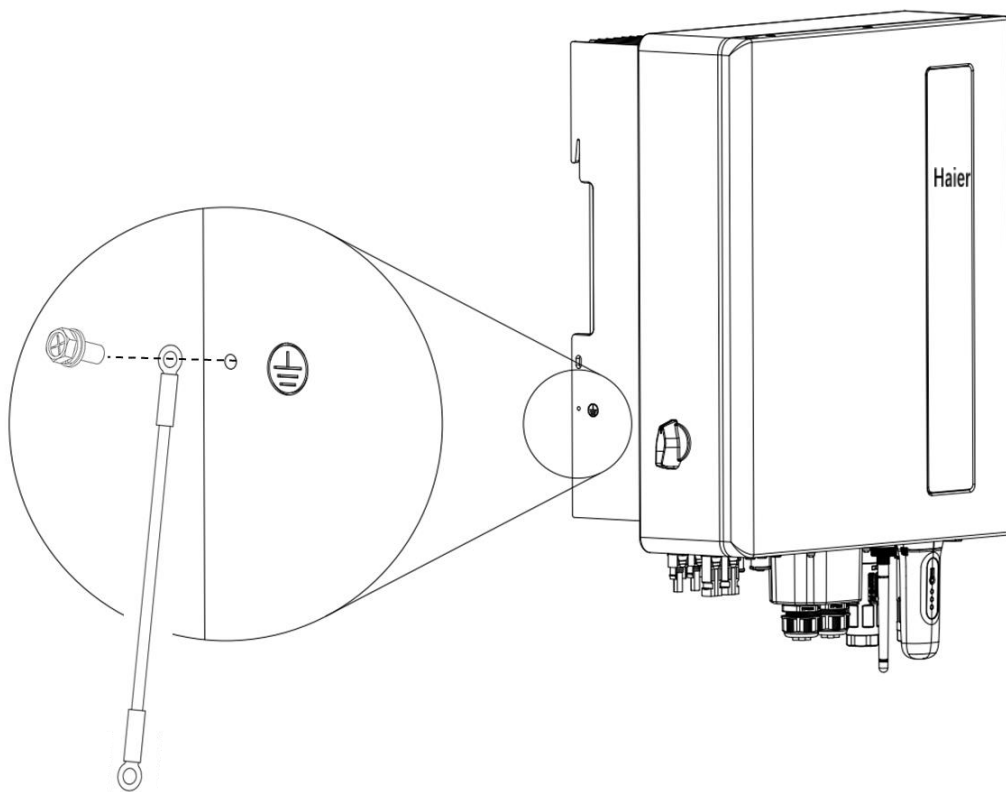
f. Install the inverter.

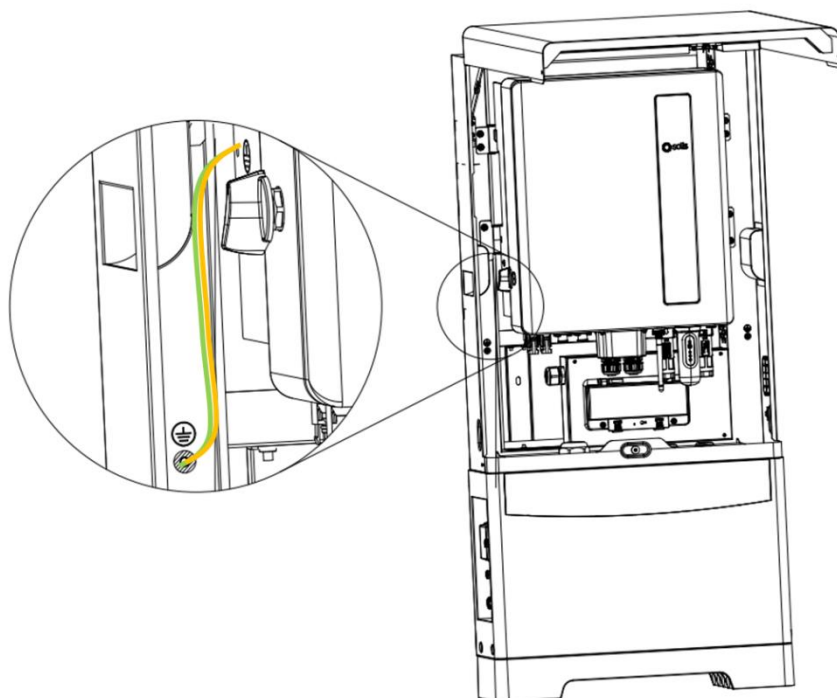
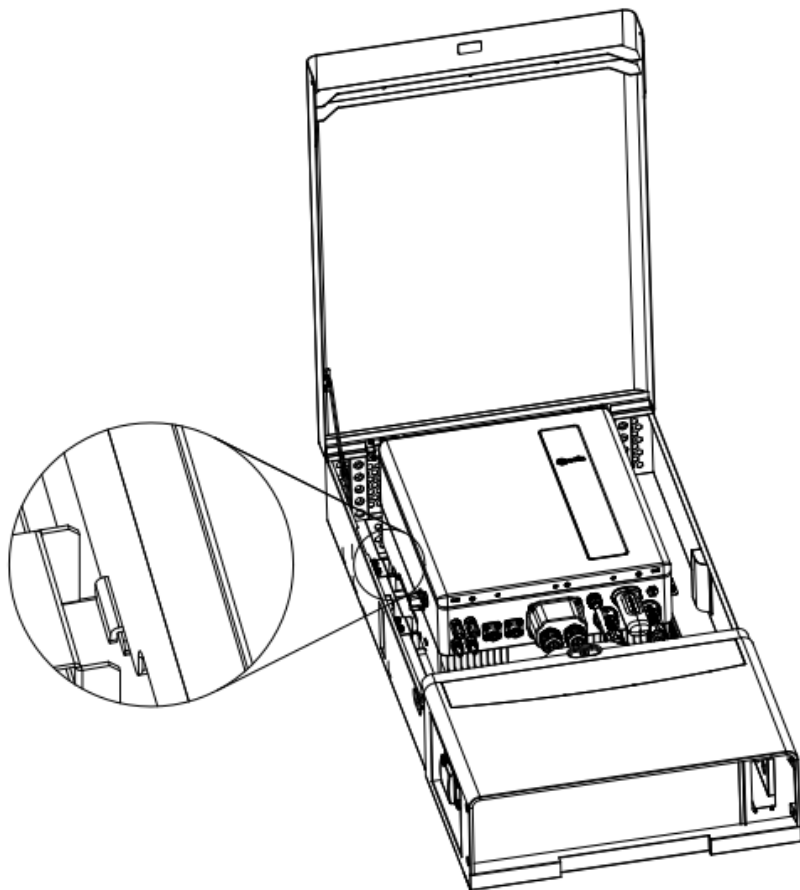
- ① **Fasten the ground cable on the inverter side with screw (M5*12).**
- ② **Open the cover according to step c.**
- ③ **Must by two men to lift the inverter and hung it into the shell. Align the inverter bracket with the convex section of the inverter.**
- ④ **Fasten the ground cable on the PCS module shell with screw (M5*12).**
- ⑤ **Fasten the screw (M4*40) between inverter and PCS module shell from outer sides of shell.**

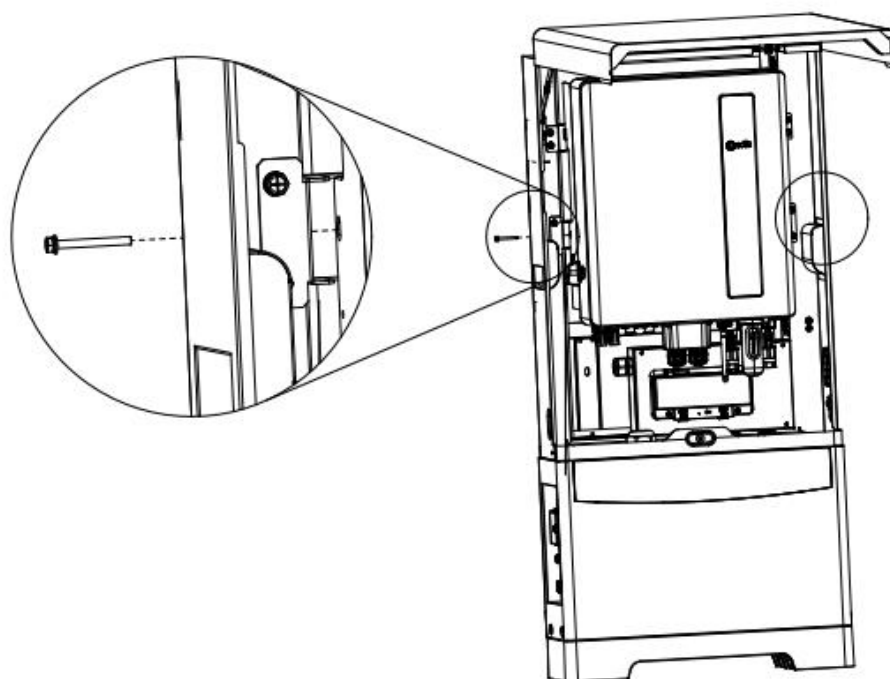
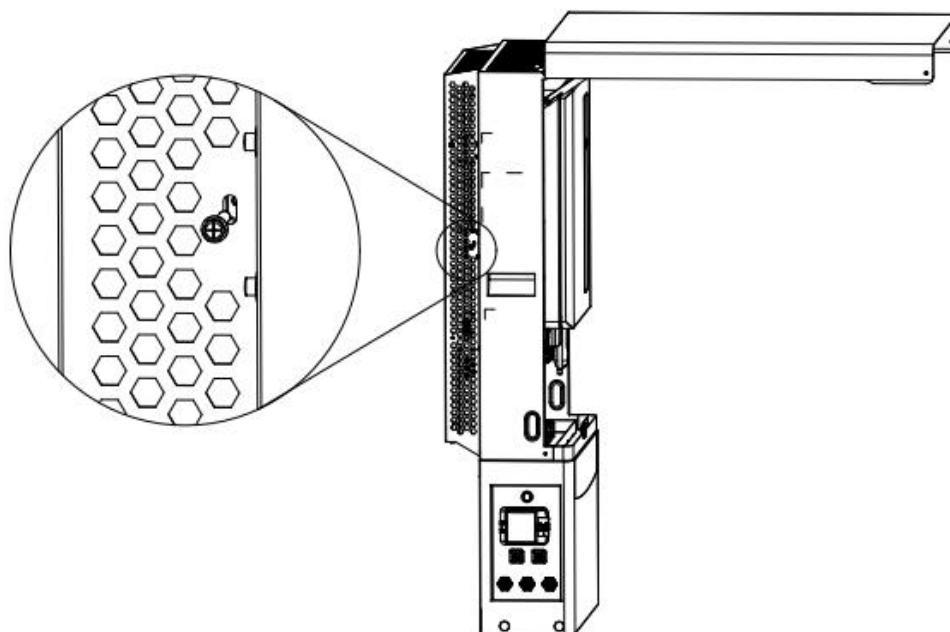
Components			
Fixing screw	M5*12	4 pcs	
Ground cable	M5,300mm	1 pcs	
Fixing screw	M4*40	2pcs	



Make sure the inverter is install securely.

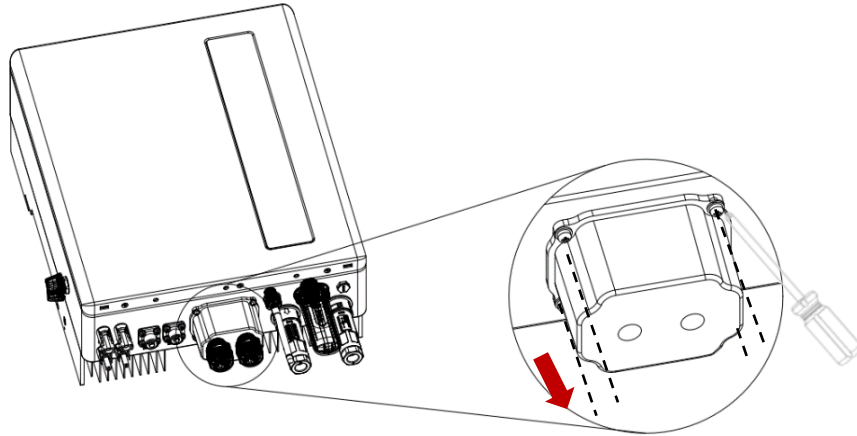






g. Meter installation

Before install the inverter, use the screwdriver to take out the screws of protective cover assembled. Loose the cable gland and remove the large watertight cap with screwdriver. For subsequent wiring, please refer to the inverter instruction manual.



CAUTION:

Make sure the AC cable is totally isolated from AC power before connecting the Smart Meter and CT.

A Smart Meter with the CT in product box is compulsory for hybrid system installation. (They are in the packaging box of the inverter). It can be used to detect the grid voltages and current directions, provide the operating condition of the hybrid inverter via RS485 communications.

NOTE:



- 1. The Smart Meter with CT is already configured; please do not change any settings on the Smart Meter.**
- 2. One Smart Meter can be used with only one hybrid inverter.**

The Haier H1PL Series inverter is able to connected Acrel meters or Eastron meters to fulfill the control logic of the self-consumption mode, export power control, monitoring, etc.

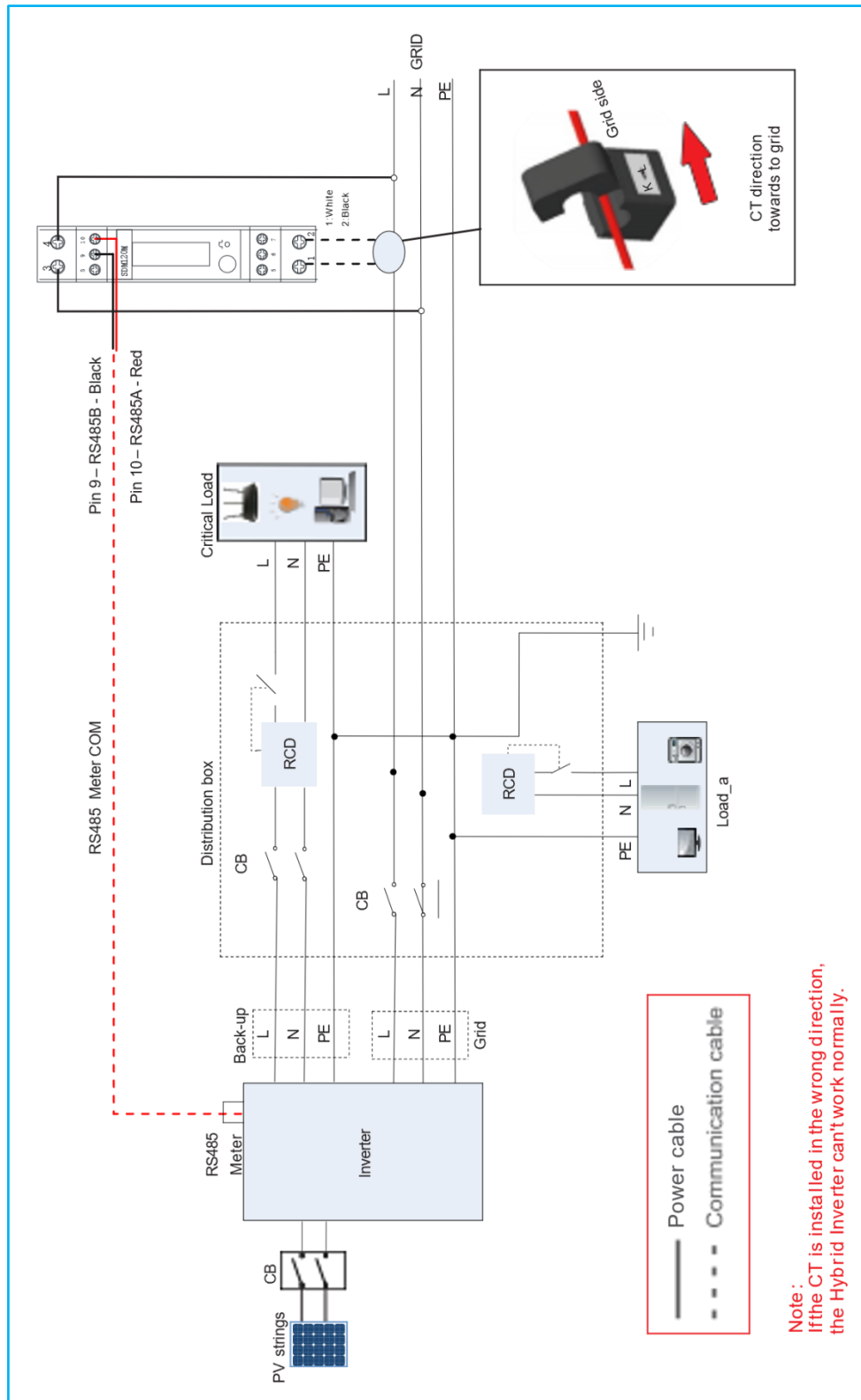
Meter type	Easton 1ph meter(with CT)
Model	SDM120CTM
Meter RS485 Pin Definition	Pin 9 – RS485B Pin 10 – RS485A

The following Figure describes the connection diagram of 1ph meter Easton SDM120CTM.



NOTE:

Please note that the CT orientation must be correct, otherwise the system will not work properly.

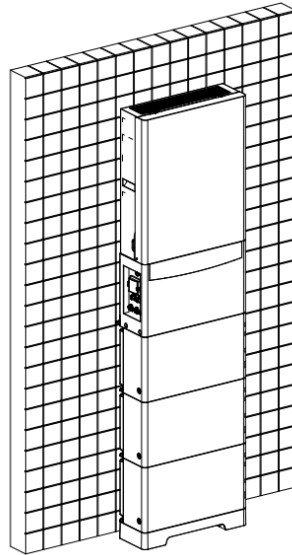


After connecting the wires, use screwdriver to fix the screws on the protective cover and waterproof cover. Then tidy up the wires, thread the wires out of the hole on the right side after installing the inverter, and then connect the other end to the meter.

If you want to use the Communication Ports of PCS.

Please refer to the inverter user manual for subsequent wiring.

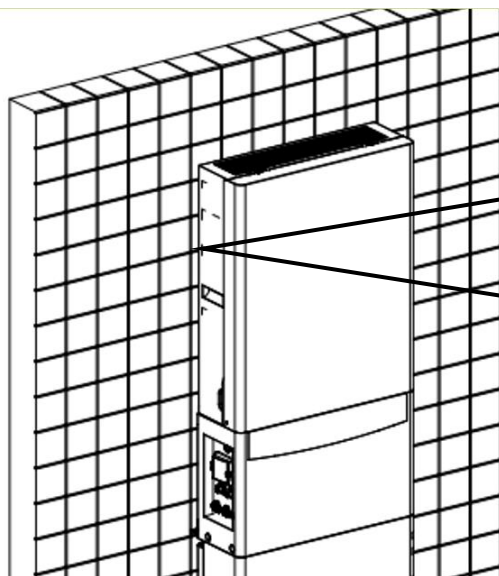
g. After connecting the cables of inverter, close the cover. Inverter and Power distribution module installation is completed.



Note: If the system derate due to the inverter with high temperature, it is recommended to open the front cover for cooling.

h. Check model. Tick the nameplate model according to the number of installed battery modules and the out power of inverter.

5kWh: HA1L-3k/3.6k/5K 5A1	10kWh: HA1L-3k/3.6k/5k/6K 10A1	15kWh: HA1L-3k/3.6k/5k/6K 15A1
------------------------------	-----------------------------------	-----------------------------------



Haier Rechargeable Lithium Iron Phosphate Battery System			
Model	☐ HA1L-3K5A1	☐ HA1L-3K10A1	☐ HA1L-3K15A1
	☐ HA1L-3.6K5A1	☐ HA1L-3.6K10A1	☐ HA1L-3.6K15A1
	☐ HA1L-5K5A1	☐ HA1L-5K10A1	☐ HA1L-5K15A1
	☐ HA1L-6K10A1	☐ HA1L-6K15A1	
Rated Capacity	100Ah	200Ah	300Ah
Dimensions(W*D*H)(mm)	573*263*1529	573*263*1844	573*263*2159
Enclosure Type	IP65		
Battery Type	Li-ion		
Nominal Voltage	51.2Vd.c.		
Max. Charge Current	100A	180A	200A
Max. Discharge Current	100A	180A	200A
Maximum short circuit current and duration time:3000A/1ms			
Qingdao Nahui Energy Technology Co., LTD.			
Room 102-3, Building E2, No. 289 Laiqing Road,			
Wenquan Street Office, Jimo District, Qingdao City,			
Shandong Province, China			
www.nahui-newenergy.com			
MADE IN CHINA			

4 Electrical connections



Do not power on the system during electrical connection.

Please refer to the interface description of inverter and Power distribution module.

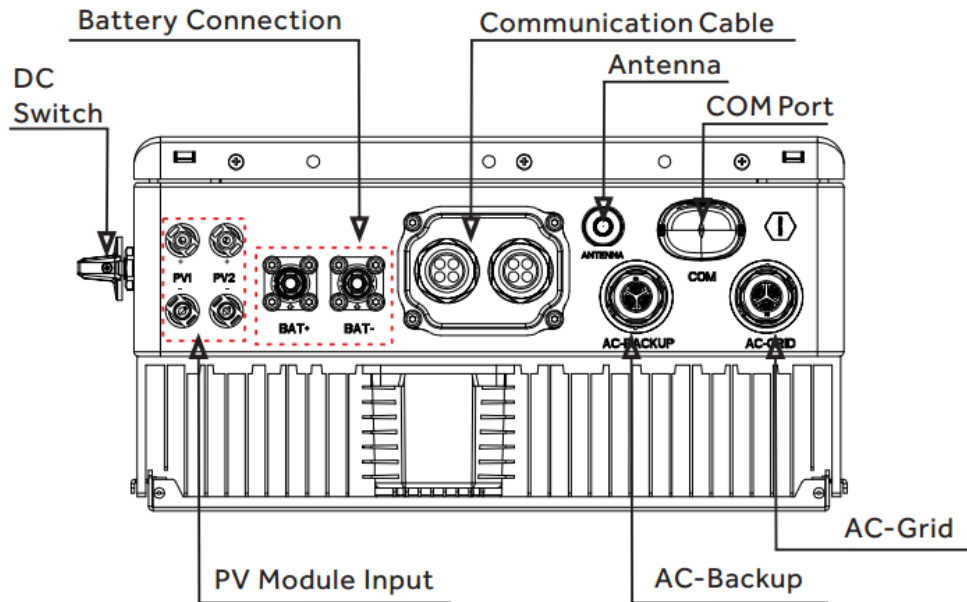


Figure 4.1 Bottom side view of inverter

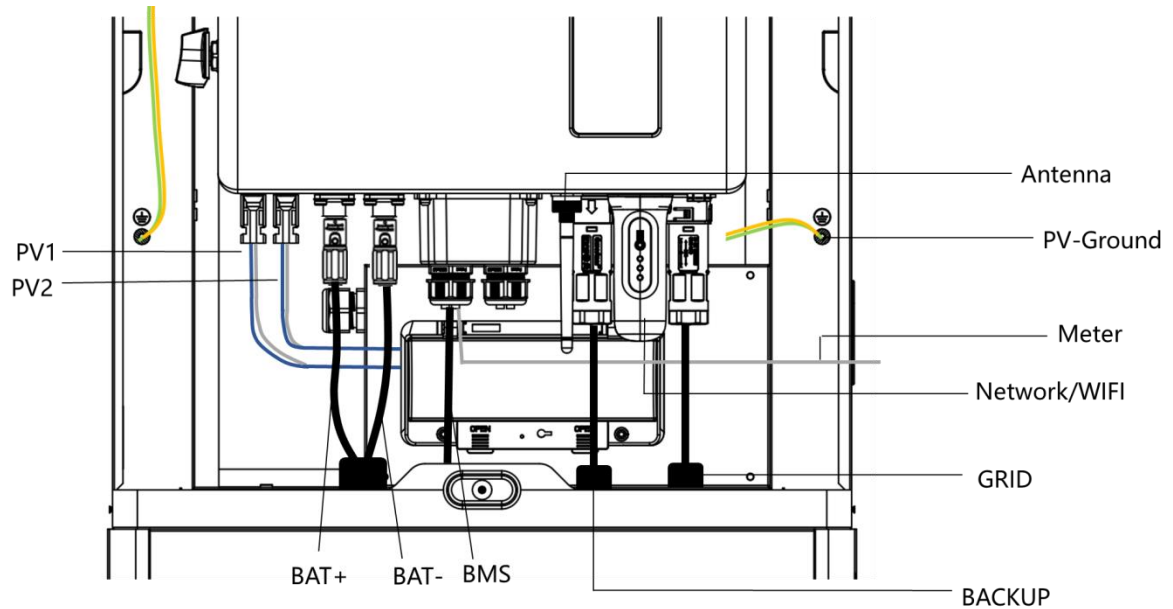


Figure 4.2 System cable connection diagram

4.1 Power/BACKUP/GRID/Antenna/BMS connection

The connectors of Power/BACKUP/GRID/Antenna is preinstalled, only connect the plug and socket.

a. Power cable connection

According to the colors, matching the plug and socket. Push the plug and socket to tight junction. If you need to remove the cables, press the button on cable, and then remove.

b. BACKUP/GRID cable connection

According to the position of cable and interface, select the corresponding plug and socket and push the connectors to tight junction. Rotate the circle at the interface and hear a "click" to lock.

c. Antenna cable connection

Align the ports of the cable and interface, rotate and tighten.

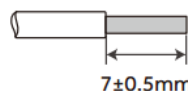
d. BMS cable connection

The BMS cable passes through the protective cover assembled of inverter bottom. Select the corresponding interface and insert.

Note: The network cable connection is optional. Connect the network cable to the outside of system cabinet can enhance the WIFI signal.

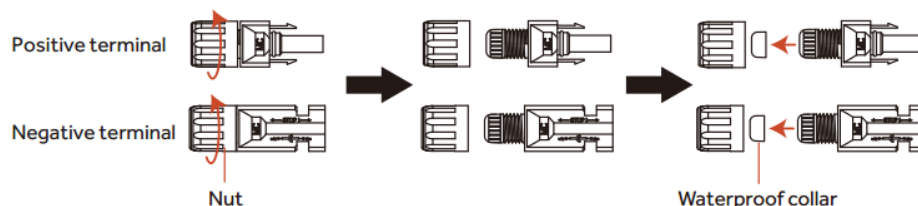
4.2 PV cable installation

a. Select a suitable DC cable and strip the wires out by $7 \pm 0.5\text{mm}$. Please refer to the table below for specific specifications.

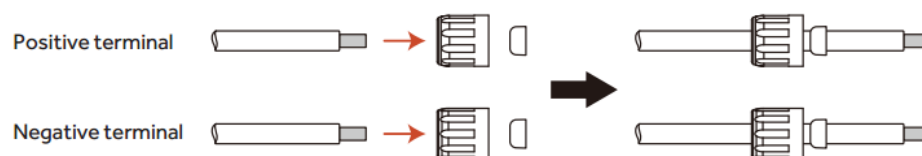


Cable type	Cross section (mm ²)	
	Range	Recommended value
Industry generic PV cable	4.0~6.0 (12~10AWG)	4.0 (12AWG)

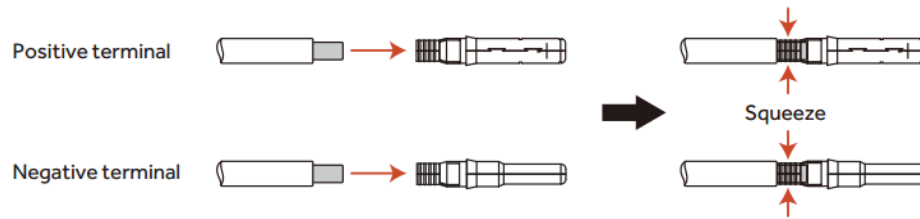
b. Take the DC terminal out of the accessory bag from the packaging box of the inverter, turn the screw cap to disassemble it, and take out the waterproof rubber ring.



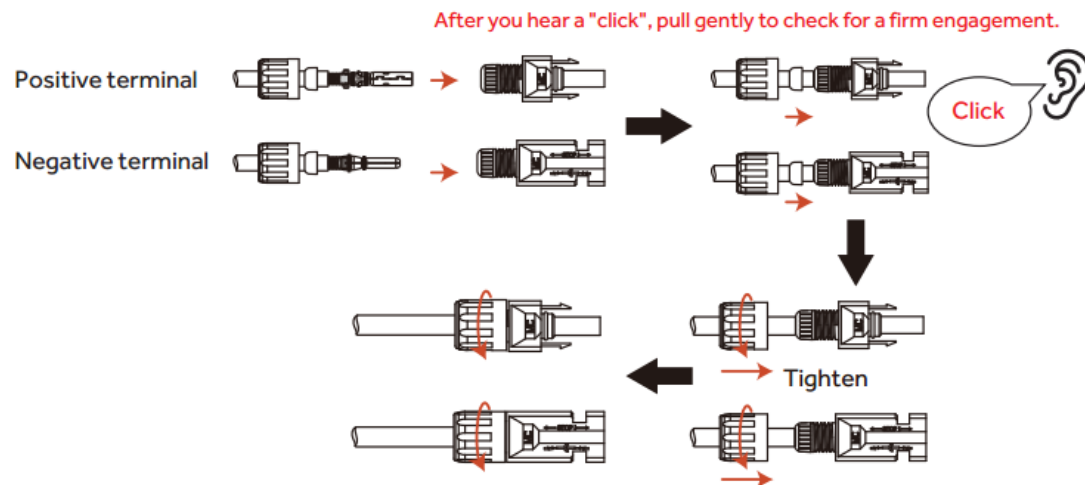
c. Pass the stripped DC cable through the nut and waterproof rubber ring.



d. Connect the wire part of the DC cable to the metal DC terminal and crimp it with a special DC terminal crimping tool.



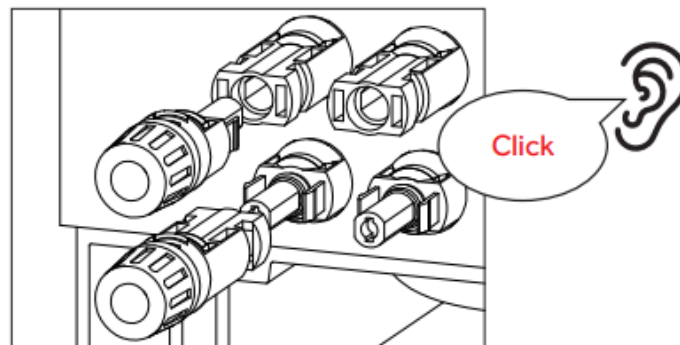
e. Insert the crimped DC cable into the DC terminal firmly, then insert the waterproof rubber ring into the DC terminal and tighten the nut.



f. Measure the PV voltage of DC input with multimeter, verify DC input cable polarity.



g. Connect the wired DC terminal to the inverter as shown in the figure, and a slight "click" is heard to prove the connection is correct.



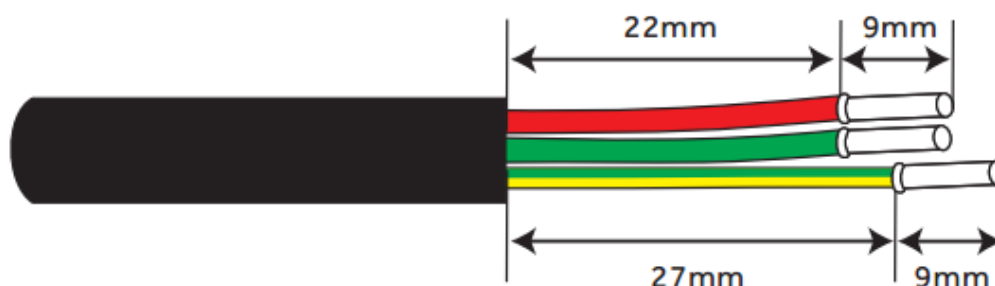
Note: The rated current of PV modules must not exceed 16A, and the short-circuit current cannot exceed 25A.

4.3 AC cable installation

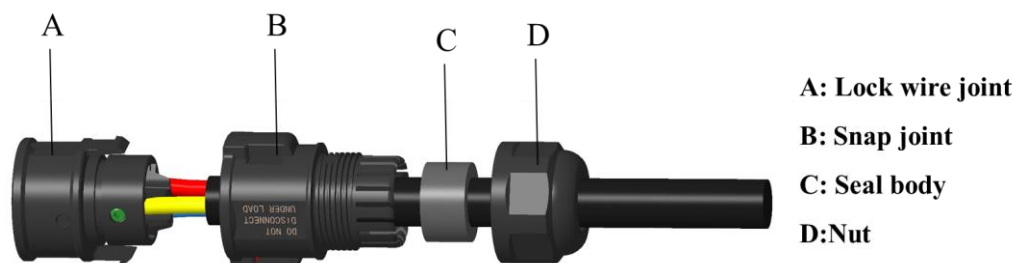
There are two AC terminals (BACKUP connector and GRID connector), and the assembly steps for both are the same. Please refer to the table below for specific specifications about cables.

Describe	Numerical value
Cable diameter	10~14mm
Traverse cross sectional area	8~10mm ²
Exposure Length	9mm

a. Disassemble the AC connector. Strip the AC wires about 9mm



b. Set the parts on the cable.



c. Crimp wires screw twisting torque 0.8+/-0.1N·m

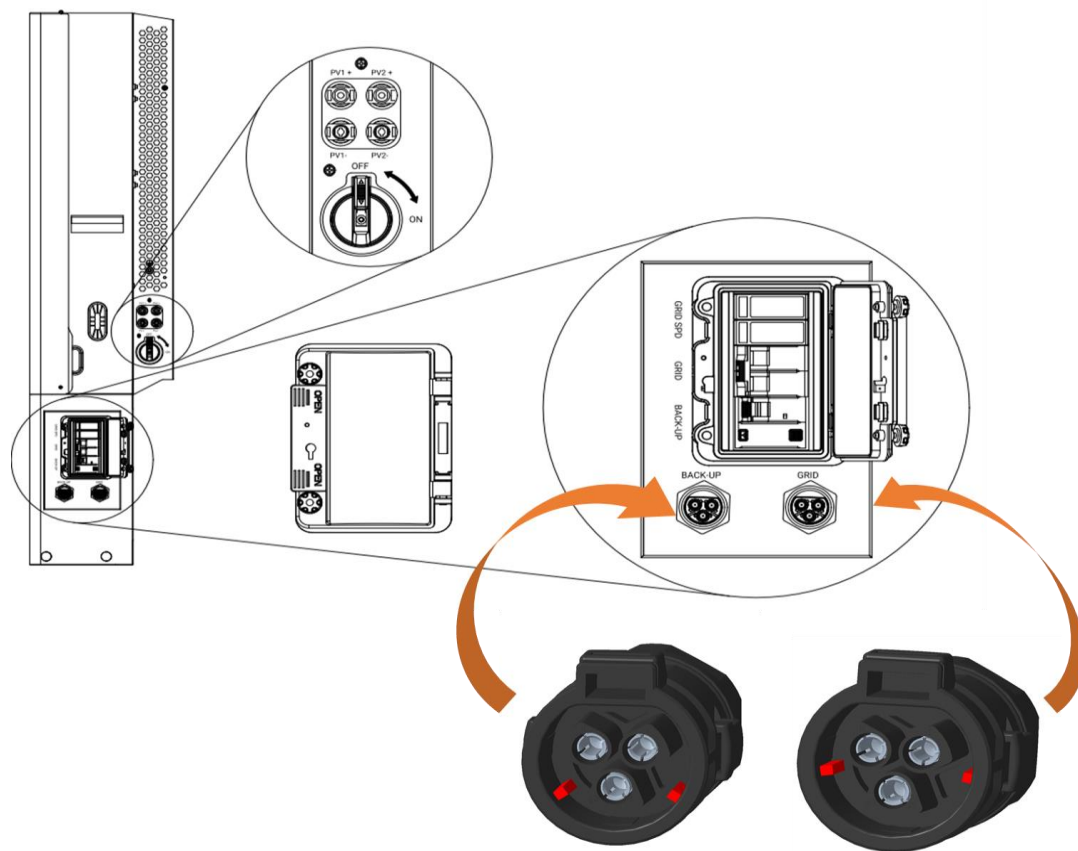


d. Push the Snap joint into Lock wire joint.



e. The same installation for both cable end plug and socket connectors.

f. Mating plug and socket: Push the plug into the socket completely according to the buckle position of the connectors.



5 System Commissioning

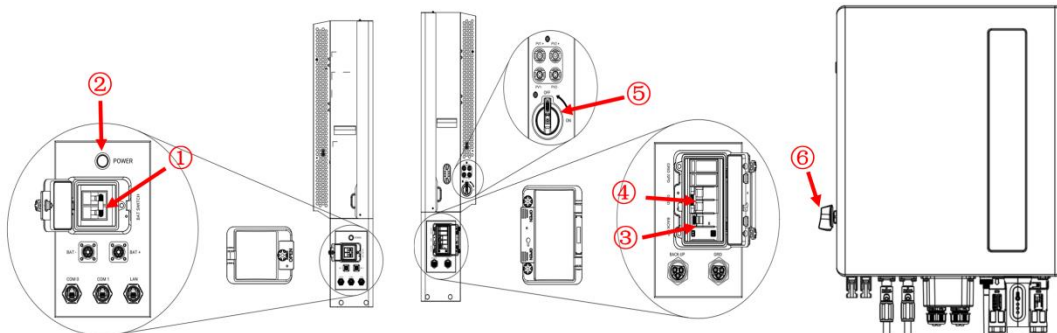


Check all connections thoroughly before proceeding.

5.1 System Initializing

- Ensure all the connections to the system is completed. (include grid, PV and load connections)
- An Android or IOS mobile phone with Bluetooth function is available.
- Measure DC voltage of PV strings and battery and ensure the polarity is correct.
- Measure AC voltage and frequency and ensure they are within local standard.
- Close the BAT switch①, then press and hold the POWER button②for more than 3s.
- Close the GRID breaker③ and BACK UP breaker④ of the Power distribution module.
- Close the PV switch of Power distribution module⑤ and DC switch of inverter⑥.

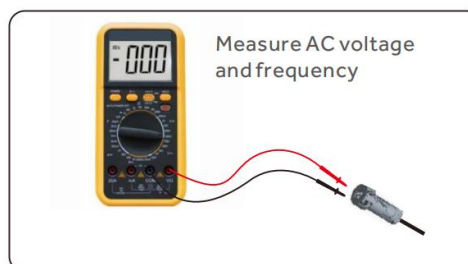
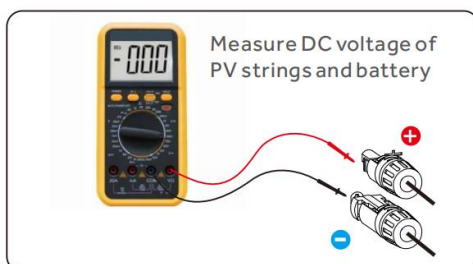
Note: Please close the switch⑤ and⑥ before the PV power input.



- Check on the display about battery and PCS.

The POWER button lights up, as well as the display interface lights up. The system can normal operation.

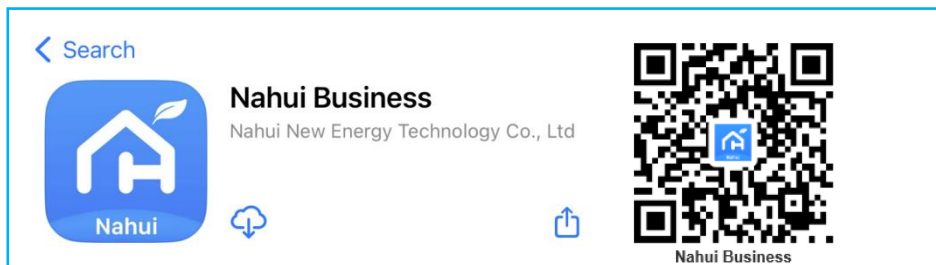
If the display is abnormal, please check on the fault code table for maintenance.



5.2 APP Download

There are three ways to download and install the latest APP:

1. Search the "Nahui Business" APP in Google Play or App Store.
2. Scan the QR code below to download.
3. Search at www.nahui-newenergy.com.



Please note that "Nahui Business" is for business installers who use the APP to set the parameters of the inverter.

NOTE:



This sequence is critical. Set the parameters of the inverter before the data logger distribution network. You cannot set the inverter parameters if the network distribution is performed first. In this situation, you need to clean the inverter data. (For details, refer to Figure 5.14).

The operation interface will change as the software version upgraded. Please scan the QR code of manual last page for the latest manual.

5.3 Login the APP via Bluetooth

Step 1: **Register an account.**

For new users, please click "Register Company/Organization" and select the user types (Company/ Personal).

If you are an installer/distributor in the company, please select "Company" to fill in the information as prompted and get the verification code by phone or E-mail to register.

Suppose you are an individual installer without organization or a user who wants to create a plant yourself. In that case, you must select "Personal" to fill in the information as prompted to register.

Figure 5.1

NOTE:



If your organization has already registered an account in the system, It is needn't to register again. Please contact your organization's administrator to add you as a member in the system back-end.

Step 2: Login the APP.

Entering the account and password, then check the **"Privacy Policy"** and **"User Agreement,"** then click **"Log In"**.

Figure 5.2

Step 3: Add the Plant.

Click the **"Plant"** to enter the plant management module to **"Add plant"** and fill in the Information to **"Save"**.

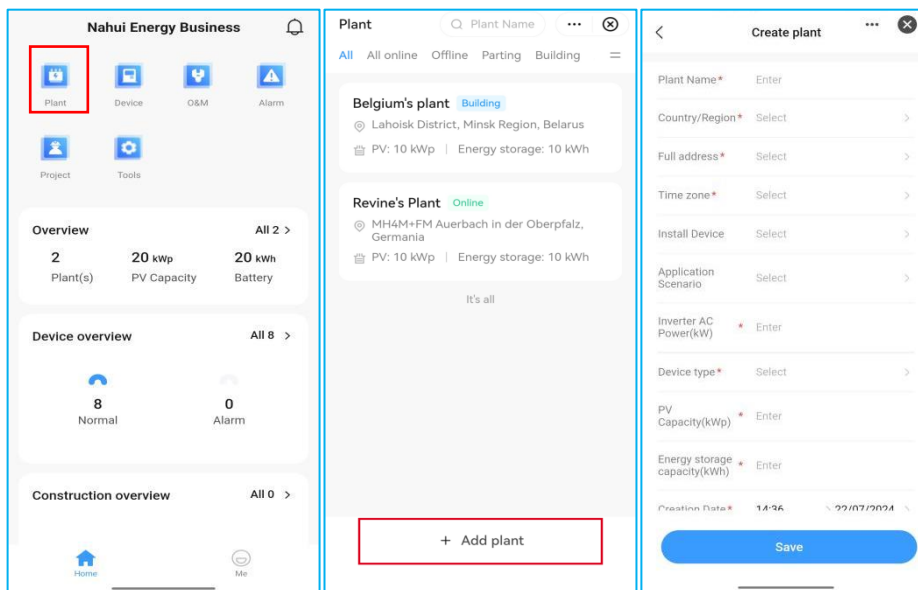


Figure 5.3

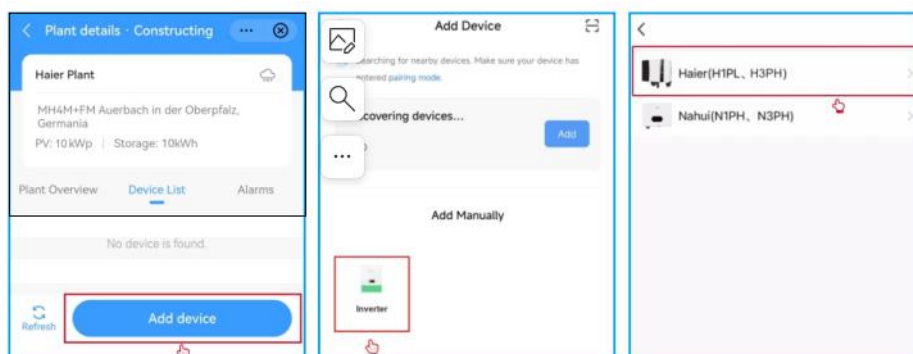


NOTE:

When setting the plant time zone, please keep it consistent with the installed site of the inverter.

Step 4: Connect the inverter with Bluetooth.

1. Click the "Add device" to enter the device list webpage. Click the inverter icon below the "Add Manually" to choose the "Haier (H1PL, H3PH)" and add it.
2. Choose the consistent SN code with inverter (displays the inverter icon) to enter the Control Validation passage. The default role is installer, then set your initial password for control validation. (After the login for the first time, initial settings are required.).
3. The inverter configuration page is displayed after the configuration is complete. You can click the "Setting" to set the parameters of the inverter.



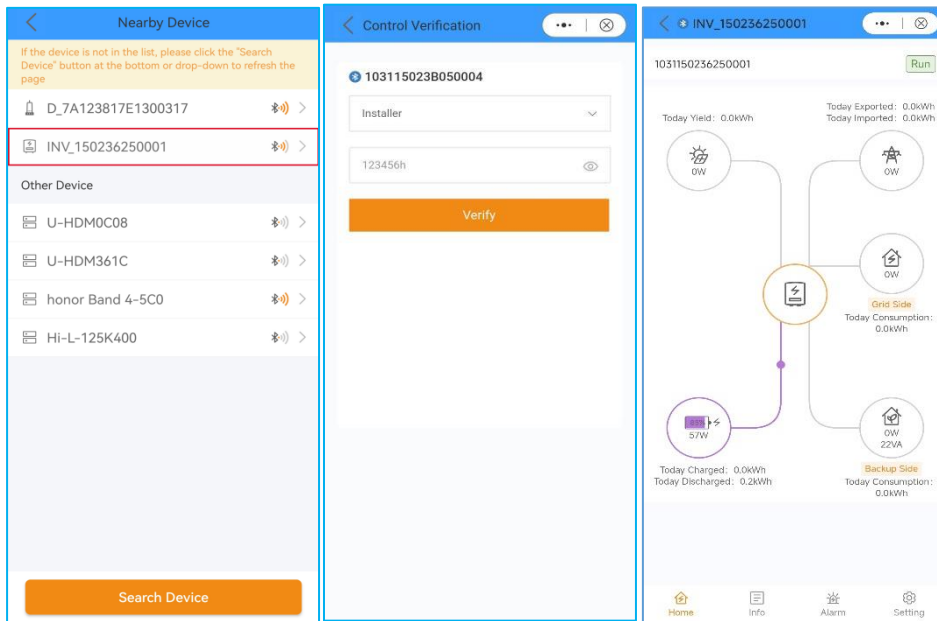


Figure 5.4

NOTE:



1. Please ensure your phone has Bluetooth/GPS turned on and the app has been authorized to use Bluetooth.
2. Click the inverter icon on the Nearby Device Page to add an inverter to set parameters.
3. Click the data logger icon of the Nearby Device Page to add an inverter to distribute the network. (For details, refer to the user manual of datalogger S2-WL-ST(USB).)

Step 5: Set the parameters of the inverter.

After connecting the inverter for the first time, you need to perform initial settings on the inverter. Click "Quick Settings" to enter the quick Settings page.

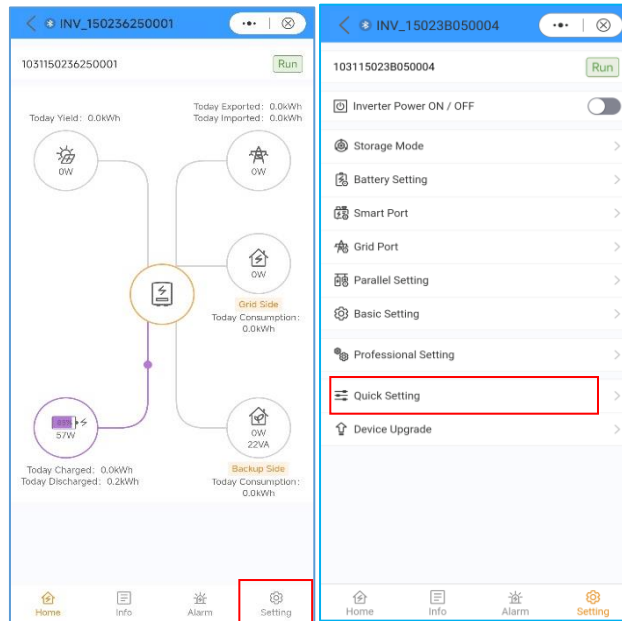


Figure 5.5

Step 5.1: **Set the inverter Date and Time.**

You can set it to follow the time on your mobile phone.

Step 5.2: **Set the battery model.**

It must be based on the battery model that is actually connected to the inverter. The default setting for battery over-discharge SOC is 20%, and force charge SOC is 10%. Please refer to the battery setting on page 54.

Step 5.3: **Set the meter setting.**

Meter Type needs to be set. It must be based on the meter type that is actually connected to the inverter.

Meter Installation Location needs to be set. It is suggested to install the meter at the system grid connection point and select **“grid side”**.

If there is no meter connected for the moment, please select **“No Meter”** to avoid alarms.

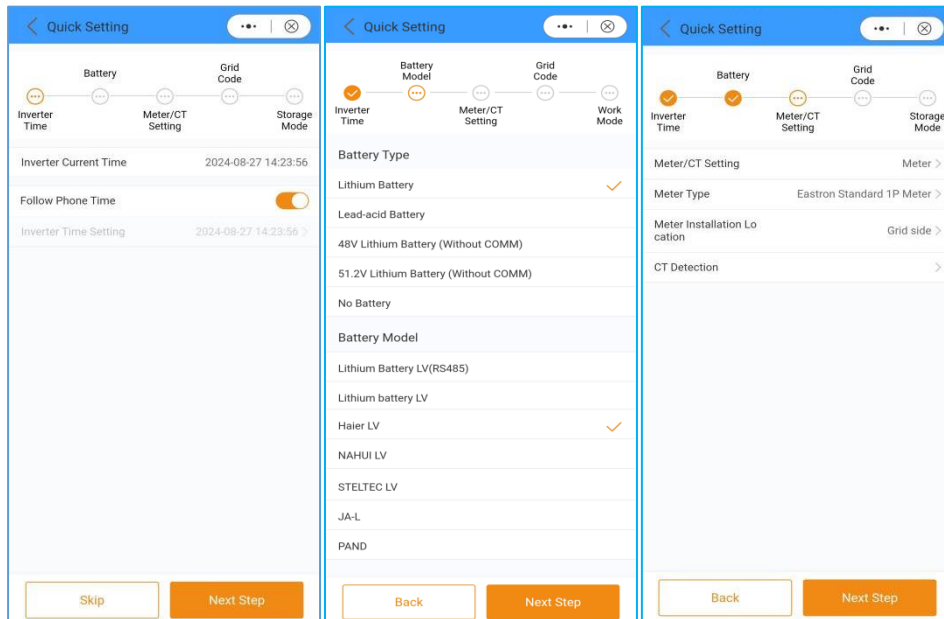
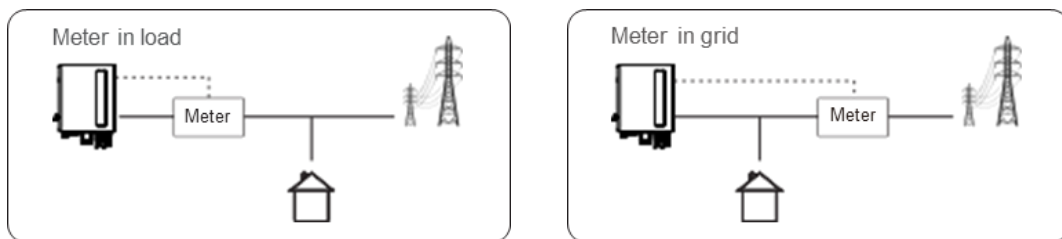


Figure 5.6



Step 5.4: Set the grid code setting.

Please select the grid code based on the local grid network requirements.

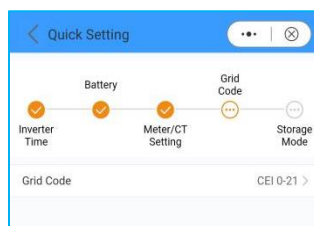


Figure 5.7

Step 5.5: Set the Storage Mode setting.

There are 3 storage modes that can be set.

- Storage mode1: Self use Mode
- Storage mode2: Off grid Mode
- Storage mode3: Selling first Mode

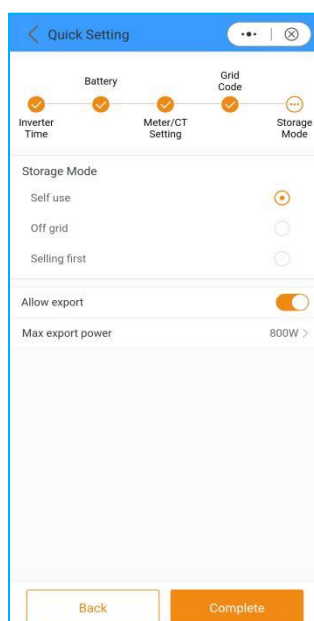


Figure 5.8

Storage mode1: Self use Mode

The recommended setting is Self use Mode.

This mode can maximize the use of PV power generation for household electricity or store it in batteries and use it for household electricity.

If you need to manually control the battery charging and discharging with respect to time, please use the Time of Use switch and the following set points.

The “Allow Grid Charging” is recommended to be turned on (If turned off, the inverter will not force charge the battery, and the battery could potentially go to sleep)

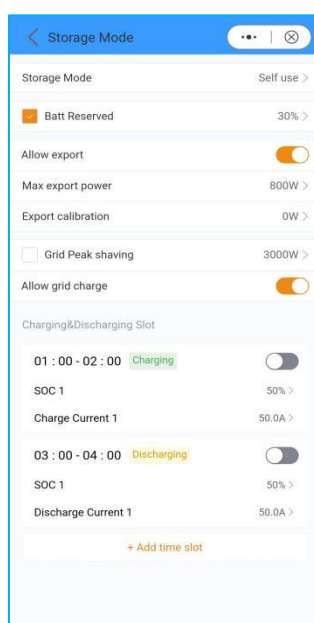


Figure 5.9

Storage mode2: Off grid Mode

This mode is only used for pure off-grid and is not recommended for standard storage systems. Note that if this mode is enabled in the grid-connected state, the working logic of the machine will be confused, and the "Off-grid" will be displayed.

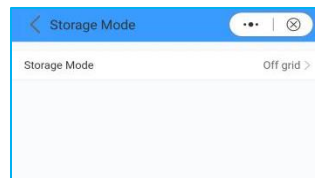


Figure 5.11

Storage mode3: Selling first Mode

This mode can preferentially send power to the grid when the load is met, used in areas with a subsidy for power to the grid.

If you need to manually control the battery charging and discharging with respect to time, please use the Time of Use switch and the following set points.

The "Allow Grid Charging" is recommended to be turned on (If turned off, the inverter will not force charge the battery, which could potentially go to sleep).

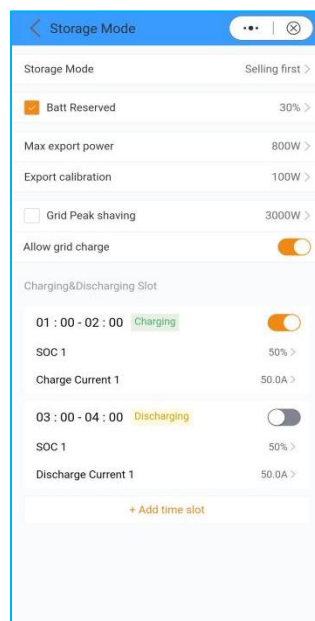


Figure 5.10

Grid Peak shaving setting

After setting Self use or Selling first Mode, Grid Peak shaving can also be selected when the local grid company charges the electricity price based on the peak power consumption of the system. Customers can select this peak shaving to avoid the peak consumption power at the

grid connection point.

Customers can set a maximum import power limit for this system, and the inverter can automatically discharge the battery to compensate for the excess load consumption to ensure the maximum import power limit at the grid connection point is not breached. (The correct operation logic depends on the availability of the battery; Nahui is not responsible for the excess electricity price caused by the battery fault.)

When the system load consumption power is lower than the max import power limit and the battery SOC is lower than the Peak SOC, the system may charge the battery from the grid by using the difference between the max import limit and the actual load consumption power until the battery SOC is charged to Peak SOC. This logic ensures the battery can have enough energy to support the peak shaving logic.

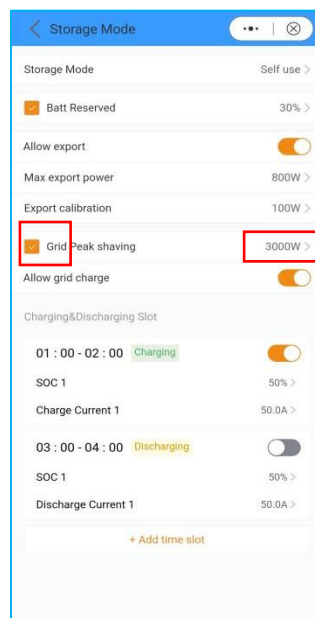


Figure 5.12

Step 5.6: Setup complete.

Now the initial settings on the inverter have been set, and you can switch on the inverter. DC switch and switch on the battery breaker to start up the system. You can also explore the APP to check the operating data, alarm message, or other advanced settings.

Step 5.7: Self-testing in Italy

Step 5.7.1 Click the "Setting" to enter the settings page;

Step 5.7.2 Click "Professional Setting " -- "Device Setting " --"CT Detection " -- "Start Auto Test" successively to enter the system test page.

Step 5.7.3 Checking the test report.

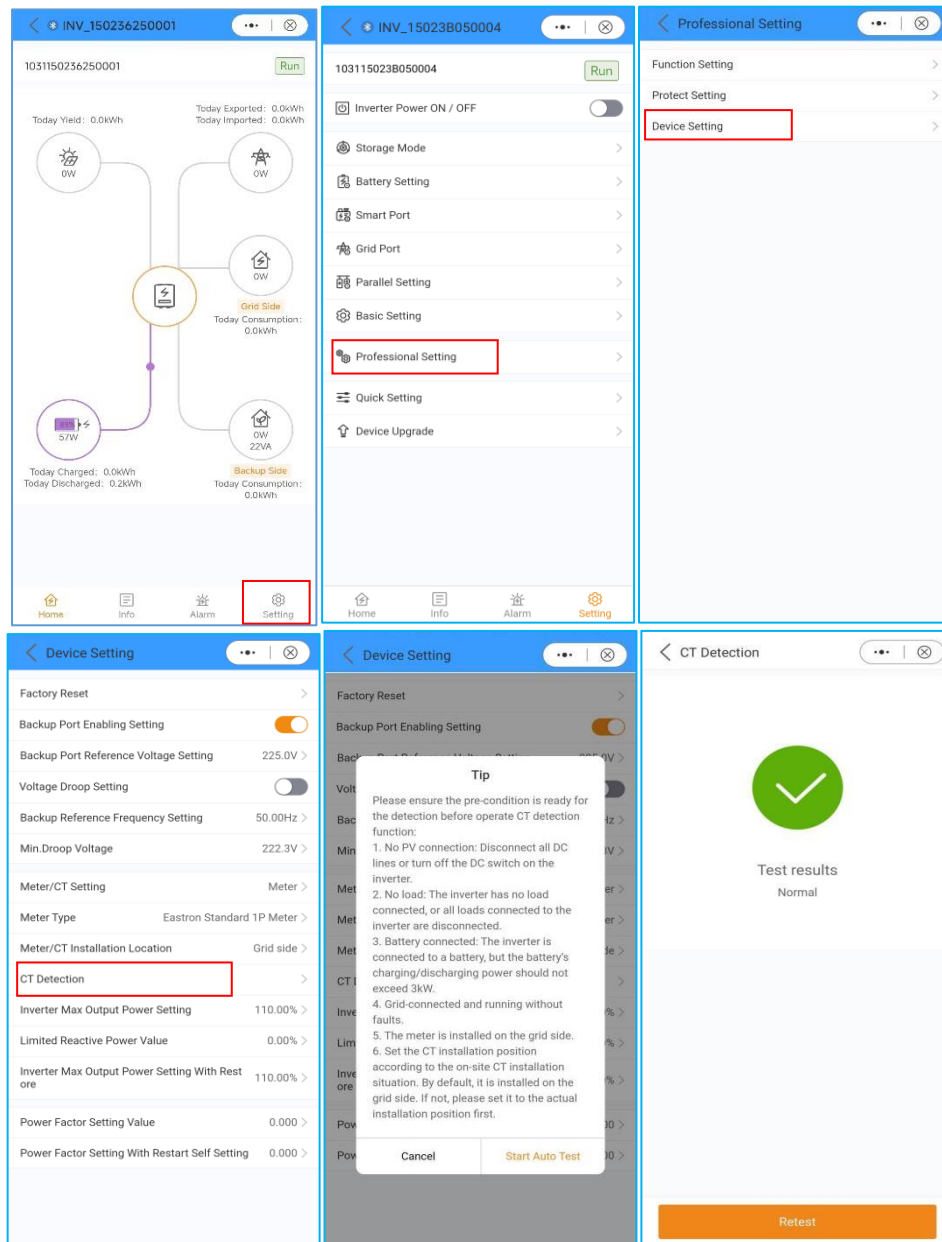


Figure 5.13

If the network distribution of the datalogger is performed first, the inverter parameters cannot be set. In this situation, you need to clean the datalogger of the device list.

Step1: Enter the added plant;

Step2: Click the datalogger in the device list;

Step3: Click the delete icon to confirm delete;

Step 4: Add the device again. (Please add the inverter to set parameters, then add the datalogger to distribute the network.)

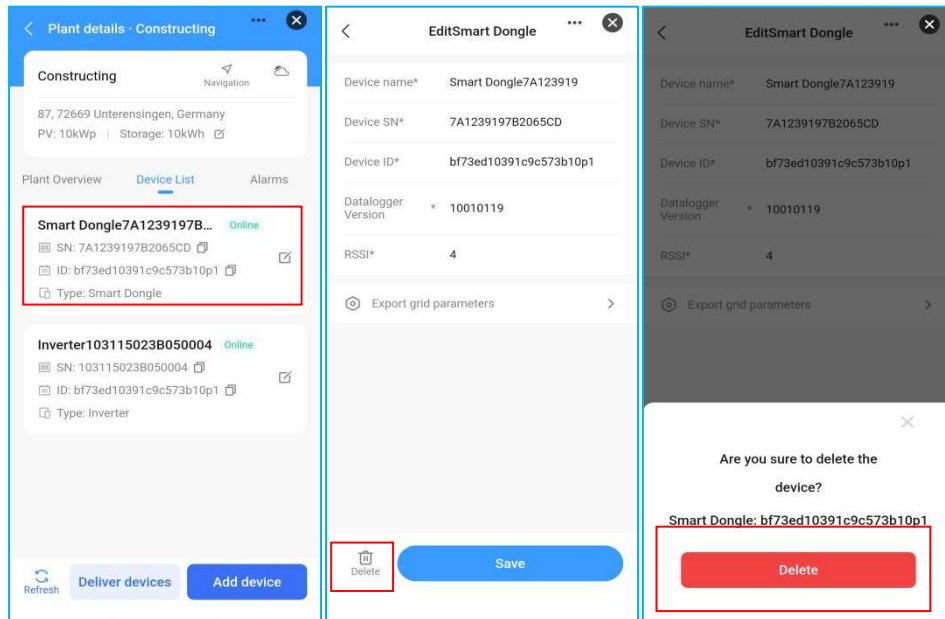


Figure 5.14

Note: After setting up the inverter, you can refer to the Quick Installation Manual Of WL Stick Datalogger for installing the datalogger and distributing the network, transferring the plant to the appropriate end user, and other operations.

App Interface Structure

The interface structure of APP is shown as follows.

Check system data, equipment information, and alarms on Overview and Parameters interface. Set system equipment parameters on Setting interface.

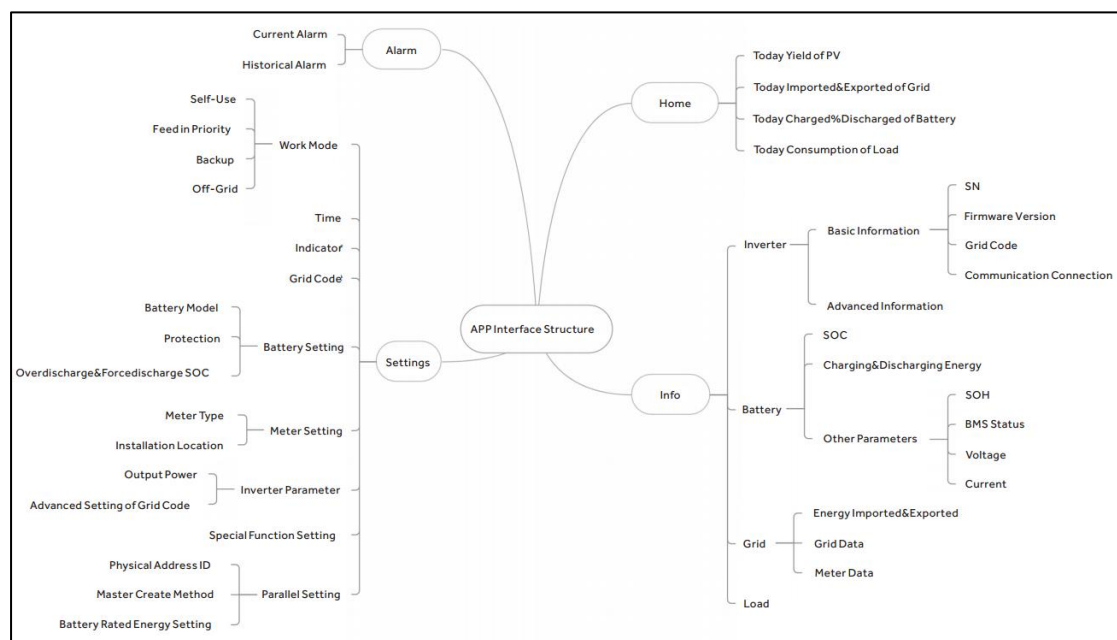


Figure 5.15

Energy flow diagram

The home page can display the working state, Today Yield of PV, Today Imported/ Exported of Grid, Today Charged/Discharged of battery and Today Consumption of household electricity.

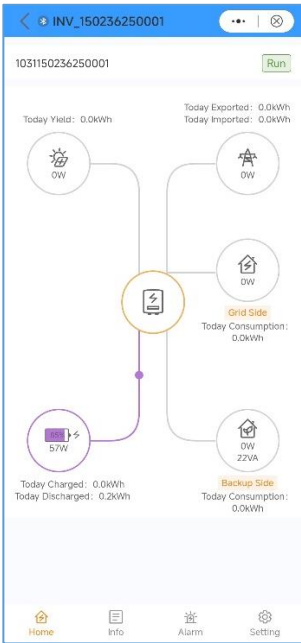


Figure 5.16

Information

The PV page can display today yield , total yield, historical yield, and PV data.

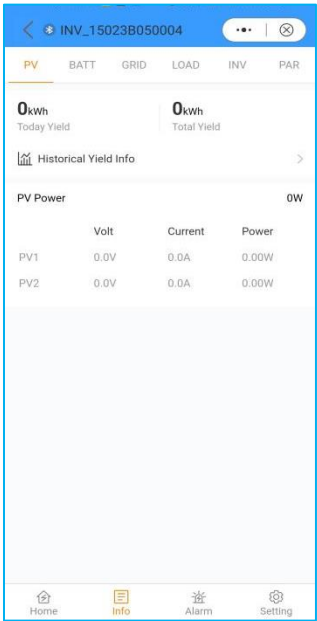


Figure 5.17

The Battery page can display Charging & Discharging power, battery SOC, Charging &

Discharging Energy, Other Parameters (From BMS), Other Parameters (From inverter).

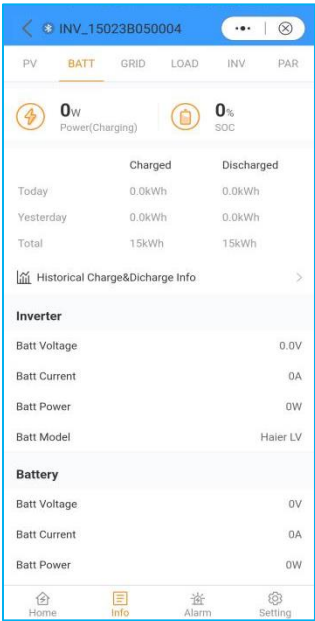


Figure 5.18

The grid page can display Energy Imported & Exported Grid Data and Meter data.

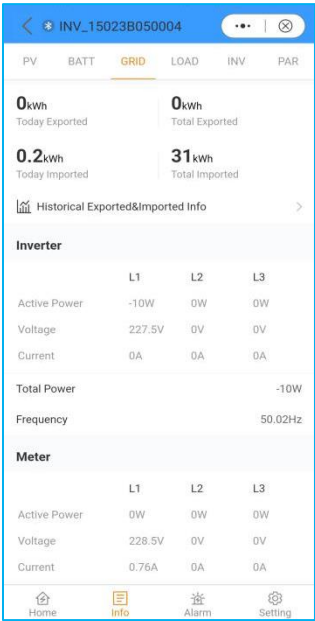


Figure 5.19

The Load page can display the load power consumption in the grid side and the backup side.

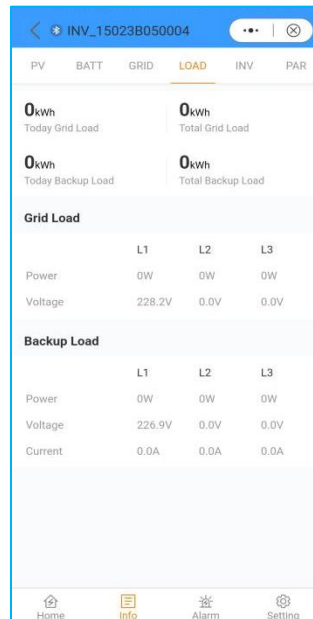


Figure 5.20

The Inverter page can display basic information such as SN, model, rated power, model number, DSP/ARM firmware version, grid code and communication connection, and the Genset's today/total yield, power and frequency. The advanced information is authorized by the installer.

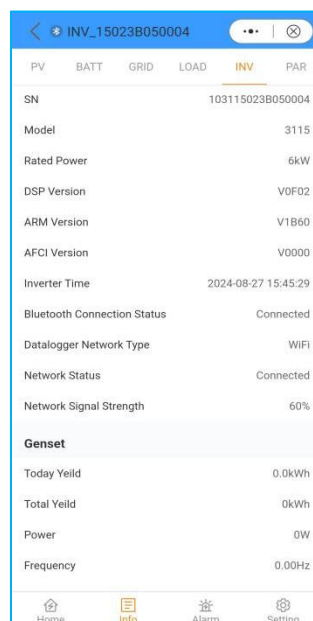


Figure 5.21

Settings

Storage Mode Setting

The interface can display the current storage mode, **Please refer to Step 5.5 for specific introduction.**

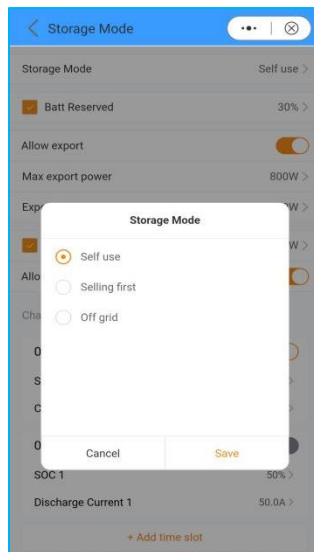


Figure 5.22

Grid Code Setting

Please select the Grid code from the grid port page .



Figure 5.23

Battery Setting

Battery Model: select the battery model to be connected.

Battery Over-voltage/Under-voltage Protection: fill in the appropriate data to protect the battery and extend its life.

Over-discharge SOC: when the battery is discharged to the over-discharge SOC, the battery will not discharge actively. (Due to the internal current conduction, there is a small self-

consumption power, if not charged for a long time, the SOC will slowly continue to decline.) Force-charge SOC: due to the battery power consumption, when the over-discharge SOC drops to the force-charge SOC, the inverter will directly charge the battery according to the maximum battery charging current until the battery SOC reaches the over-discharge SOC.(The charging power is not limited to sources, which may be from PV or from the grid. If "Charging form grid" is set to "Not Allow", the charging logic may not be implemented.) It is not recommended to set the over-discharge & force-charge SOC to the same value, which may cause frequent charging and discharging.



Figure 5.24

Meter Setting

Meter type: please select a correct meter type. The wrong option will cause the meter RS485 communication Failed. If the battery and meter are not connected, you can select the " NO Meter" to shield the alarm of meter communication fault. Meter Installation

Location: Meter in Grid/Meter in Load/Grid +PV inverter.

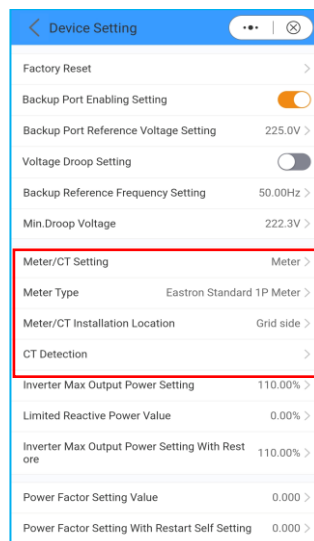


Figure 5.25

Backup Setting

Backup Port Enabling Setting: please turn on it if the Backup port is needed.

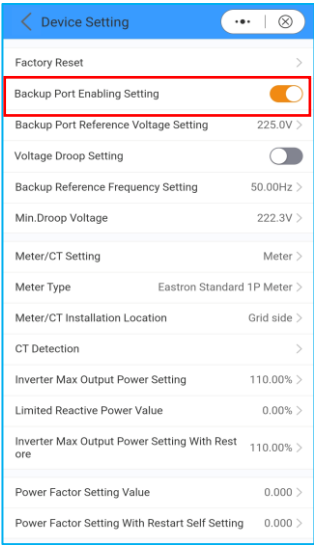


Figure 5.26

Alarm

The Alarm page can display the Current Alarm (unsolved faults) and the Historical Alarm (resolved faults).

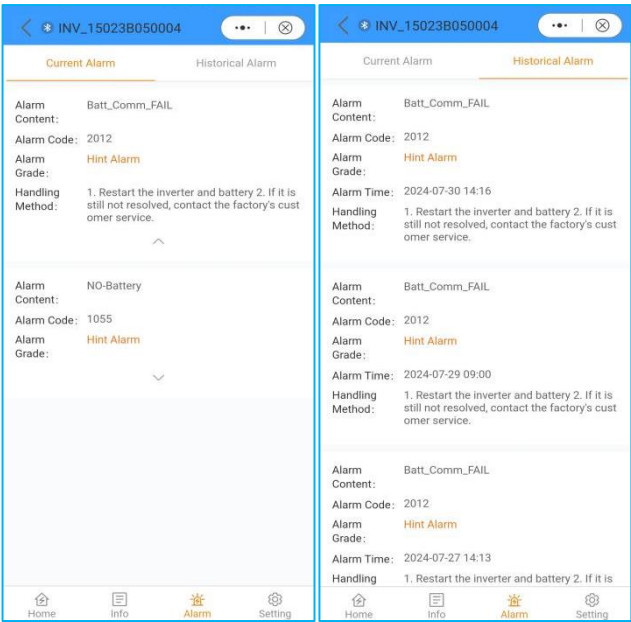


Figure 5.27

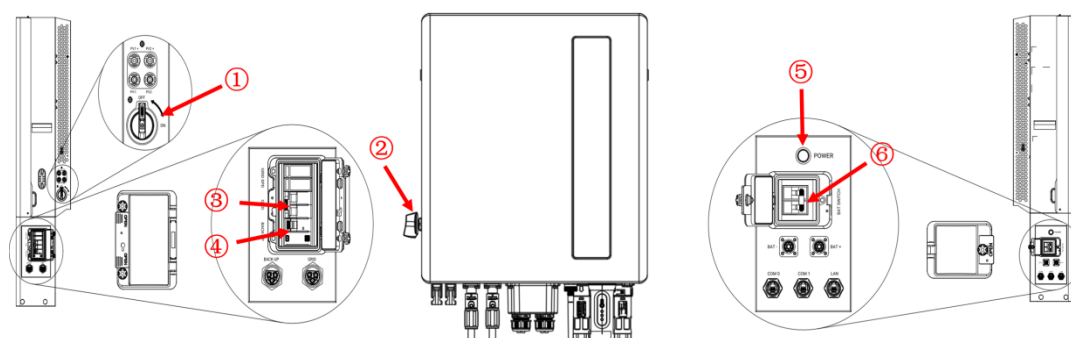


For more details about operation connection of inverter and APP, please refer to the inverter operation manual of H1PL-1JXK-EU series.

5.4 System shutdown

- Disconnect the PV switch of Power distribution module①.
- Disconnect the DC switch of inverter②.
- Disconnect GRID breaker③ and BACK UP breaker④ of the Power distribution module
- Press the POWER button⑤ and hold on more than 3s.
- Disconnect the BAT breaker of system⑥.

The system is powered off. Both Power button and the display screen are turned off.



6 Maintenance and troubleshooting

6.1 Routine maintenance

- Maintenance charge every 6 months

From the date of manufacturer shipment, the battery shall be recharged every 6 months. Action must be taken to ensure the SOC of the battery is not lower than 30%, according to the below:

Ambient temperature	Must be recharged within
(45, 50] °C	7 days
(35, 45] °C	15 days
$\leq 35^{\circ}\text{C}$	30 days

- Disconnect the battery if not being used

BMS consumes power even when the battery is not being used. Disconnect the battery output to prevent the battery draining off. For storage, insure the SOC will not be less than 30% before disconnect.

- Check the battery system regularly, and contact your support if any anomaly detected.
- The system will derate based on the temperature of the battery or inverter:

Battery performance (based on cell temperature)

When $T > 45^{\circ}\text{C}$ or $T \leq 10^{\circ}\text{C}$, the battery will reduce its charging or discharging power;

Charging

- ① When $\text{SOC} \geq 80\%$, the voltage protection strategy will start to execute and the battery charging power will decrease;
- ② When $-10^{\circ}\text{C} < T \leq 0^{\circ}\text{C}$, the battery cell need to be heated to more than 3°C before charging;
- ③ When $T > 45^{\circ}\text{C}$, the battery cell will reduce power due to overheating, with a maximum temperature of 54°C ;

Discharge

- ① When $T < 10^{\circ}\text{C}$, the battery cell will reduce power due to low temperature, with a minimum temperature of -20°C ;
- ② When $T > 45^{\circ}\text{C}$, the battery cell will reduce power due to overheating, with a maximum temperature of 58°C ;

Inverter performance (based on the temperature of the inverter)

- ① When the inverter operates under off-grid state with rated power for a long time, the system may occur an overheating alarm. The system will derate or shut down for a while until the alarm removed.
- ② When the inverter operates with grid connected, under high ambient temperature or poor ventilation environment, the inverter will derate to ensure the system continuous operation.

6.2 Troubleshooting

Fault	Cause	Solution
BATTERY		
POWER button no response	1. Damaged POWER button 2. Damaged cable or poor contact	1. Repair or replace the PCS or Power distribution module 2. Please contact the supplier
Short discharge time	battery SOC is low	Charge the system in time. Keep the SOC exceeds the minimum protection energy value
	Low ambient temperature	Guarantee the product working under the recommended temperature range
	Product overload	Check load status and remove non-essential loads
	Batteries age and capacity decreases	Please contact the supplier to replace the battery and components
Unable to charge and discharge	Internal failure	Log in to the Nahui Business APP to view the fault information and contact the supplier
	Battery report charging or discharging protection failure	Log in to the Nahui Business APP to view the fault information and contact the supplier
	After the battery is discharged to the SOC protection value, it needs to be charged for a period of time before it is allowed to discharge.	The battery is charged to the SOC value set by the restart
	Battery over temperature	Stand at room temperature for more than 3 hours
The display cannot be lit or the displayed content is abnormal when the system power on	Display failure	1. Please try restarting the battery 2. Please contact the supplier to repair or replace the Power distribution module
The display cannot wake up and light up during system operation	1. If the POWER button light off, the POWER button is faulty or the button wiring is loose 2. If the display still does not light up after restarting, the display is faulty	1. Log in to the Nahui Business APP to view the fault information 2. Please try restarting the battery 3. Please contact the supplier to repair or replace the PCS and Power distribution module
Abnormal battery communication	Communication disconnection	Check whether the battery stack is installed reliably, and confirm the abnormal battery through the battery status indicator on the display
The system status light on the display is abnormal and blinks every 1S	Battery protection	Log in to the Nahui Business APP to view the fault information and contact the supplier
The heater works abnormally	Heating circuit failure	Log in to the Nahui Business APP to view the fault information and contact the supplier

PV/ Grid charging failure	1. PV/ GRID switch trip 2. PV/ GRID SPD is connection loose or faulty	1. Stop the operation of the system. Check by a professional for short circuit or leakage. 2. Stop the operation of the system. Check by a professional for the connection or the indicator display of PV/ GRID SPD. 3. If the indicator display the warning state (red light), please contact the supplier to repair or replace the PV/ GRID SPD.
INVERTER		
Off	Control device to shutdown	1. Turn on the device in the ON/OFF Setting.
LmtByEPM	The device's output is under controlled	1. Confirm whether the inverter is connected to an external EPM/meter to prevent reverse current. 2. Confirm whether the inverter is controlled by an external third-party device. 3. Confirm whether the power setting of the inverter power control is limited.
LmtByDRM	DRM Function ON	1. No need to deal with it.
LmtByTemp	Over temperature power limited	1. No need to deal with it, the device is in normal operation.
LmtByFreq	Frequency power limited The device is in the	
LmtByVg	Volt-Watt mode	1. Due to the requirements of local safety regulations, when the grid voltage is high, the Volt-watt working mode is triggered, which generally does not need to be dealt with. 2. Inverter factory test errors causing this mode to open, if you need to close, you can close this mode in LCD, set the process: Main menu Advanced Settings Password 0010 STD mode settings Working Mode Working mode: NULL Save and exit.
LmtByVar	The device is in the Volt-Var mode of operation	1. Due to the requirements of local safety regulations, when the grid voltage is high, the Volt-watt working mode is triggered, which generally does not need to be dealt with. 2. Inverter factory test errors causing this mode to open, if you need to close, you can close this mode in LCD, set the process: Main menu Advanced Settings

		Password 0010 STD mode settings Working Mode Working mode: NULL Save and exit.
LmtByUnFr	Under frequency limit	1. No need to deal with it
Standby	Bypass run	
StandbySynoch	Off grid status to On grid status	
GridToLoad	Grid to load	
Surge Alarm	On-site grid surge	1. Grid side fault, restart the device. If it is still not eliminated, please contact the manufacturer's customer service.
OV-G-V01	Grid voltage exceeds the upper voltage range	1. Confirm whether the power grid is abnormal. 2. Confirm that the AC cable is properly connected. 3. Restart the system and check if the fault persists.
UN-G-V01	Grid voltage exceeds the lower voltage range	
OV-G-F01	Grid frequency exceeds the upper frequency range	
UN-G-F01	Grid frequency exceeds the lower frequency range	
G-PHASE	Unbalanced grid voltage	
G-F-GLU	Grid voltage frequency fluctuation	
NO-Grid	No grid	
OV-G-V02	Grid transient overvoltage	1. Restart the system, confirm if that the fault continues.
OV-G-V03	Grid transient overvoltage	
IGFOL-F	Grid current tracking failure	1. Confirm whether the power grid is abnormal. 2. Confirm that the AC cable is properly connected. 3. Restart the system and check if the fault persists.
OV-G-V05	Grid voltage RMS instantaneous overvoltage fault	
OV-G-V04	Grid voltage exceeds the upper voltage range	
UN-G-V02	Grid voltage exceeds the lower voltage range	
OV-G-F02	Grid frequency exceeds the upper frequency range	
UN-G-F02	Grid frequency exceeds the lower frequency range	
NO-Battery	Battery is not connected	1. Verify the battery voltage is within standards. 2. Measure battery voltage at plug.
OV-Vbackup	Inverting overvoltage	1. Check whether the backup port wiring is normal 2. Restart the system, confirm that the fault continues.
Over-Load	Load overload fault	1. Backup load power is too large, or some inductive load startup power is too large, need to remove some backup load, or remove the inductive load on the backup.
BatName-FAIL	Wrong battery brand selection	1. Confirm whether the battery model selection is consistent with the actual one.

CAN Fail	CAN Fail	1. Can failure is a failure of communication between inverter and battery. Check cable conditions. Check to ensure you have it plugged in on the CAN port of the battery and inverter. Check that you are using the right cable.
OV-Vbatt	Battery overvoltage detected	1. Measure battery voltage at inverter connection point. Contact us for further service.
UN-Vbatt	Battery undervoltage detected	1. Restart the system and check if the fault persists. If it is still not eliminated, please contact us for further service.
Fan Alarm	Fan alarm	1. Check if the internal fan is working correctly or jammed.
OV-DC01 (1020 DATA:0001)	DC 1 input overvoltage	1. Check if the PV voltage is abnormal.
OV-DC02 (1020 DATA:0002)	DC 2 input overvoltage	2. Restart the system, confirm that the fault continues.
OV-BUS (1021 DATA:0000)	DC bus overvoltage	1. Restart the system, confirm that the fault continues.
UN-BUS01 (1023 DATA:0001)	DC bus undervoltage	
UNB-BUS (1022 DATA:0000)	DC bus unbalanced voltage	
UN-BUS02 (1023 DATA:0002)	Abnormal detection of DC bus voltage	
DC-INTF. (1027 DATA:0000)	DC hardware overcurrent (1, 2, 3, 4)	1. Check if the DC wires are connected correctly without loose connection.
OV-G-I (1018 DATA:0000)	A phase RMS value overcurrent	1. Confirm that the grid is abnormal. 2. Confirm that the AC cable connection is not abnormal. 3. Restart the system, confirm that the fault continues.
OV-DCA-I (1025 DATA:0000)	DC 1 average overcurrent	1. Restart the system, confirm that the fault continues.
OV-DCB-I (1026 DATA:0000)	DC 2 average overcurrent	
GRID-INTF. (1030 DATA:0000)	AC hardware overcurrent (abc phase)	
DCInj-FAULT (1037 DATA:0000)	The current DC component exceeds the limit	1. Confirm that the grid is abnormal. 2. Confirm that the AC cable connection is not abnormal. 3. Restart the system, confirm that the fault continues.
IGBT-OV-I (1048 DATA:0000)	IGBT overcurrent	1. Restart the system, confirm that the fault continues.
OV-TEM (1032 DATA:0000)	Module over temperature	1. Check whether the surrounding environment of the inverter has poor heat dissipation. 2. Confirm whether the product installation meets the requirements.
RelayChk-FAIL (1035 DATA:0000)	Relay failure	1. Restart the system, confirm that the fault continues.
UN-TEM (103A DATA:0000)	Low temperature protection	1. Check the working environment temperature of the inverter. 2. Restart the system to confirm if the fault continues.
PV ISO-PRO01 (1033 DATA:0001)	PV negative ground fault	1. Check whether the PV strings have insulation problems.

PV ISO-PRO02 (1033 DATA:0002)	PV positive ground fault	2. Check whether the PV cable is damaged.
12Power-FAULT (1038 DATA:0000)	12V undervoltage failure	1. Check current leakage to ground. Verify your grounding. Verify all wires are in good condition and not leaking current to ground.
ILeak-PRO01 (1034 DATA:0001)	Leakage current failure 01 (30mA)	
ILeak-PRO02 (1034 DATA:0002)	Leakage current failure 02 (60mA)	
ILeak-PRO03 (1034 DATA:0003)	Leakage current failure 03 (150mA)	
ILeak-PRO04 (1034 DATA:0004)	Leakage current failure 04	
ILeak_Check (1039 DATA:0000)	Leakage current sensor failure	
GRID-INTF02 (1046 DATA:0000)	Power grid disturbance 02	1. Confirm whether the grid is seriously distorted. 2. Check whether the AC cable is connected reliably.
OV-Vbatt-H/ OV-BUS-H (1051 DATA:0000)	Battery overvoltage hardware failure / VBUS	1. Check if the battery circuit breaker is tripping. 2. Check if the battery is damaged.
OV-ILLC (1052 DATA:0000)	LLC hardware overcurrent	1. Check whether the backup load is overloaded. 2. Restart the system, confirm that the fault continues.
INI-FAULT (1031 DATA:0000)	AD zero drift overlink	1. Restart the system, confirm that the fault continues.
DSP-B-FAULT (1036 DATA:0000)	The master-slave DSP communication is abnormal	
AFCI-Check (1040 DATA:0000)	AFCI self-test failure	
ARC- FAULT (1041 DATA:0000)	AFCI failure	1. Verify connections are tight within your PV system. Arc fault setting can be changed in advanced settings if further adjustment is necessary.

7 Warehouse storage guidelines

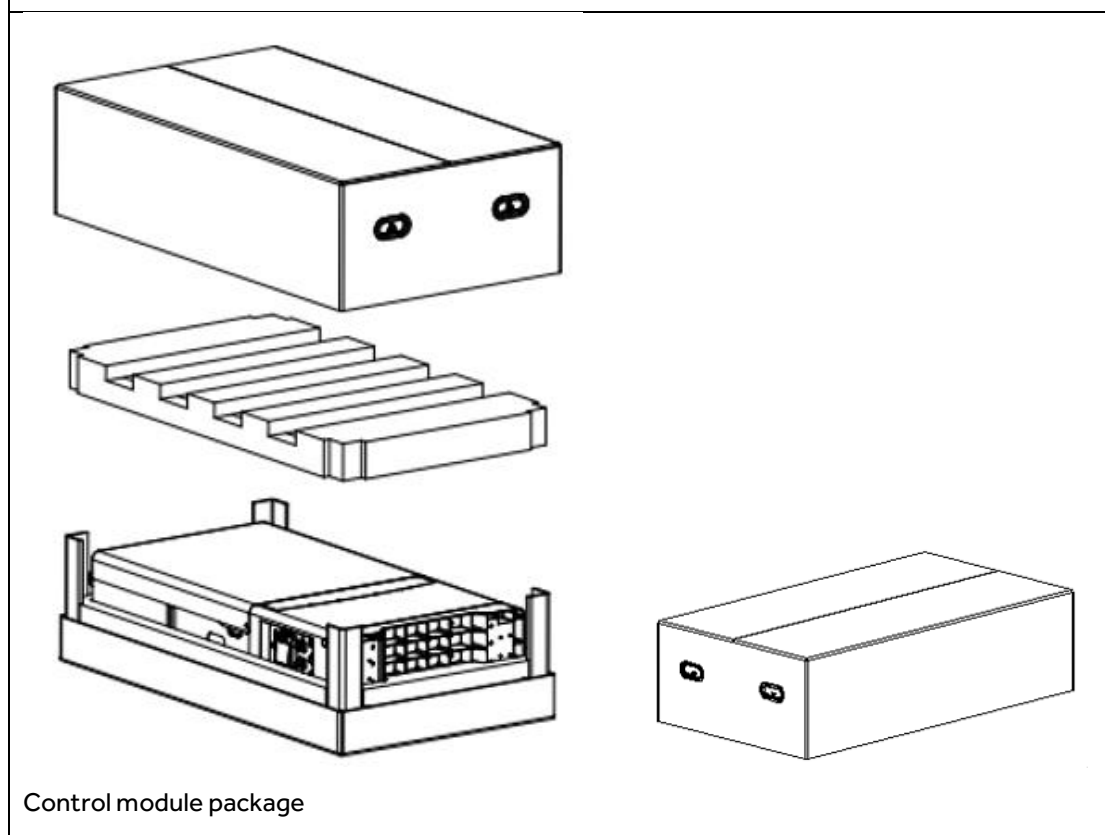
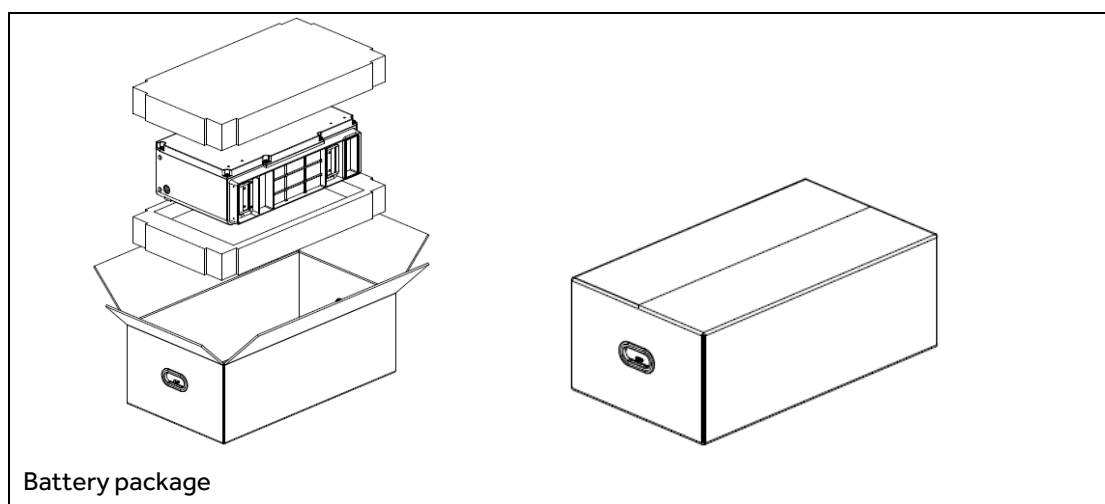
7.1 Packaging guidelines

Lithium-ion battery is recognized as dangerous goods. The packaging requirements for battery products are as follows:

- a. The packaging manufacturer with the packaging qualification for dangerous goods is responsible for providing product packaging, and the packaging manufacturer has a record in the local Commodity Inspection Bureau;
- b. After the packaging manufacturer completes the packaging, the supplier needs to apply to the Commodity Inspection Bureau, and the Commodity Inspection Bureau will provide the "Dangerous Package Product Use Inspection Sheet" and "Dangerous package product performance inspection sheet", and complete the dangerous package commodity inspection;
- c. All battery packs should be packaged with product instruction manuals. The packaged product should be placed in a dry, dust-proof and moisture-proof packing box;
- d. The product name, model, quantity, gross weight, manufacturer, and ex-factory date should be marked on the outside of packing carton.
- e. The necessary signs such as "upward" and "fear of fire" shall meet the requirements of GB/T 191;
- f. The packing method is: packing in a carton with molded foam buffer material in the carton;
- g. Accessories packaging: single accessories are first fastened with cardboard or plastic film or braided straps, neatly placed in the carton, and filled with regular fillers (foam pads, cardboard, etc.) to prevent the accessories from shifting in the box. The following documents should be included with the product when leaving the factory:
 - 1) Product certificate (both in Chinese and English);
 - 2) Product use (installation) manual;
 - 3) Product packing list (both in Chinese and English);
 - 4) Factory inspection report (both in Chinese and in English).
- h. Clean battery

Regular cleaning of the battery system is recommended. If the case is dirty, use a soft dry brush or dust collector to remove the dust. Cleaning liquid materials include solvents, abrasives, etc. Corrosive liquids should not be used to clean the housing.

i. Packaging



7.2 Storage

The battery pack is stored in a clean, dry and ventilated room with an ambient temperature of $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ and a relative humidity of not more than 75%. The battery pack has a state of charge not be less than 30%. Avoid contact with corrosive substances and keep away from fire and heat sources.

8 Dispose of used batteries

Comply with applicable local regulations for the disposal of electronic waste and used batteries.

- Do not mix with your household waste.
- Do not expose the battery to high temperature or direct sunlight.
- Do not expose battery to high humidity or corrosive environments.

Contact supplier or original manufacturer for disposal options.

9 Detailed specifications

9.1 System parameters

Item	Parameter		
System Model	HA1L-3K/3.6K/5K 5A1	HA1L-3K/3.6K/5K/6K 10A1	HA1L-3K/3.6K/5K/6K 15A1
System Capacity	5KWh	10KWh	15KWh
No. of Battery Parallel	1	2	3
Net Weight(kg)	105±2	155±3	205±4
Cycle Life	6000 times (25°C, 0.5C/0.5C, 90%DOD)		
Ambient Temperature	Charging:[-10,50]°C		
	Discharging:[-20,50]°C		
Working Humidity	10%~95%RH		
Cooling	Natural cooling		
Dimensions (W* D * H, mm)	573*263*1529	573*263*1844	573*263*2159
Working Altitude	<4000m (derate over 2000m)		
Enclosure Type	IP65		
Protection Class	I		
Warranty	10 years		
Certification	IEC62619, CE, UN38.3, CEI 0-21		

Note:

- The system can operate in the low ambient temperature (-10°C) by heating the battery until the temperature of cell reaches 3°C;
- The current will be reduced when the battery temperature is below 10°C.

9.2 Battery module

Item	Parameter
Battery Model	B051100P03-H
Battery Type	LFP
Compatible with Cell Models	SBP-01-1000
	IFP50160116A-102Ah
Rated Voltage	51.2V
Connection	1P16S
Rated Energy	5kWh
Working Voltage Range	44.8V ~ 55.2V

Rated Charging/Discharging Current	50A
Max. Charging /Discharging Current	100A
Standard charging method	Constant current and voltage limit (constant voltage point: 55.2V, stop-charging current 5A)
Protection Function	Charge over-voltage, discharge under-voltage, over-current, over-temperature, short circuit protection, etc.
Dimensions (W*D*H, mm)	573*189*347
Weight(kg)	50±2
Certification	IEC 62619, CE,UN 38.3

9.3 Hybrid Inverter

PV String Input Data				
Model	H1PL-1J3K-EU	H1PL-1J3.6K-EU	H1PL-1J5K-EU	H1PL-1J6K-EU
Max. PV Input Power	4.8kW	5.7kW	8.0kW	9.6kW
PV Input Voltage Range	330V (90V~520V)	330V (90V~520V)	330V (90V~520V)	330V (90V~520V)
Start-up voltage	90V	90V	90V	90V
Full load MPPT Voltage Range	105-520V	125-520V	175-520V	210V~520V
PV Input Current	16A/16A	16A/16A	16A/16A	16A/16A
Max. short circuit current	24A/24A	24A/24A	24A/24A	24A/24A
No. of MPPT Tracker	2/2	2/2	2/2	2/2
Battery				
Battery Type	Li-ion / Lead-acid			
Maximum Charging Power	3kW	3.6kW	5kW	6kW
Maximum Charge/discharge current	62.5A	75A	105A	125A
Communication	CAN			
Output AC (Back-up)				
Rated Output Power	3kW	3.6kW	5kW	6kW
Max .output current	19.1A	22.7A	31.8 A	36.4A
Rated Output Voltage	1/N/PE,220/230V	1/N/PE,220/230V	1/N/PE,220/230V	1/N/PE,220/230V
Output Frequency	50 Hz /60Hz	50 Hz /60Hz	50 Hz /60Hz	50 Hz /60Hz
Output THDv (@linear load)	2%	2%	2%	2%
Output AC (Grid side)				

Rated Output Power	3kW	3.6kW	5kW	6kW
Rated Output Voltage	1/N/PE,220/230V			
Voltage Range of Grid	187-253V	187-253V	187-253V	187-253V
Frequency of Grid	50 Hz /60Hz (45-55 Hz /55-65Hz)	50 Hz /60Hz (45-55 Hz /55-65Hz)	50 Hz /60Hz (45-55 Hz /55-65Hz)	50 Hz /60Hz (45-55 Hz /55-65Hz)
Rated Output Current of Grid	13.6A/13.0A	16.4 A/15.7 A	22.7 A/21.7 A	27.3 A/26.1 A
Max. Output current	13.6A/13.0A	16.4 A/15.7 A	22.7 A/21.7 A	27.3 A/26.1 A
Power Factor	>0.99 (0.8 leading - 0.8 lagging)	>0.99 (0.8 leading - 0.8 lagging)	>0.99 (0.8 leading - 0.8 lagging)	>0.99 (0.8 leading - 0.8 lagging)
Output THDi	<2%	<2%	<2%	<2%
Input AC (Grid side)				
Input voltage range	187 - 253 V			
Max. input current	20A	24.6 A	32A	40 A
Frequency range	45 - 55 Hz / 55 - 65 Hz			
General Data				
Dimensions(W*H*D) mm	405 * 480 * 205			
Weight(kg)	24.2			
Topology	High frequency isolation (for battery)			
Ambient Temperature	[-20,50] °C			
Protection rating	IP66			
Cooling concept	Natural convection			
Working Altitude	4000 m			
Grid connection standard	G98 or G99, VDE-AR-N 4105 / VDE V 0124, EN 50549-1, VDE 0126 / UTE C 15 /VFR:2019, RD 1699 / RD 244 / UNE 206006 / UNE 206007-1, CEI 0-21, C10/11, NRS 097-2-1, TOR, EIFS 2018.2, IEC 62116, IEC 61727, IEC 60068, IEC 61683, EN 50530, MEA, PEA			
Safety & EMC standard	IEC/EN 62109-1/-2, EN 61000-6-1/-2/-3/-4			
Features				
DC connection	MC4 connector			
AC connection	Quick connection plug			
Display	LED + APP			
Communication	RS485, CAN, Wi-Fi, LAN; Optional: GPRS			

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Please adhere to the actual products in case of any discrepancies in this user manual. If you encounter any problem on the product, please find out the S/N and contact us, we will try to respond to your question ASAP.