

**GOODWE**



## **User Manual**

### **Lynx Home F Series (HV)**

V 1.2  
2022-02-18

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## Limitation of Liability

The manufacturer shall not be liable for any consequences like battery damage or property loss under the following circumstances:

- Modify, alter, or replace parts of the battery system without official authorization from the manufacturer.
- Anyone except technicians from the manufacturer changes or erases the serial number.
- Establish a battery system that does not meet the criteria, safety regulations, and other related requirements.
- Non-observance to the User Manual.
- Improper use or misuse of the battery.
- Inadequate ventilation.
- The maintenance routine does not follow accepted standards.
- Force majeure like earthquakes, storms, thunders, over voltage, or fire hazards, etc.
- Any external factors.

## Updates

The latest document contains all the updates made in earlier issues.

### **V1.0 2021-09-15**

- First release.

### **V1.1 2021-12-20**

- Updated **5.3** Battery System Installation.

### **V1.2 2022-02-18**

- Updated **2.2** Symbol Description.
- Updated **4.2** Packing List.
- Updated **5.4** Electrical Connection.
- Updated **6.4** Indicator Status.
- Updated **07** Battery Parameters.

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# 01 Safety Precaution

## DANGER

- Please keep Power Off before any operations to avoid danger. Strictly follow all safety precautions outlined in this manual and safety labels on the equipment.
- All installation operations should be performed by trained and knowledgeable technical personnel who are familiar with local standards and electric systems. Learn about the product before installation.
- Do not use the battery or the power control unit if it is defective, broken, or damaged.
- Do not disassemble, modify, or replace any part of the battery or the power control unit without official authorization from the manufacturer.
- Damaged battery may leak electrolyte. Do not contact with the liquid leakage or volatile matter. Please contact After-sales Service for help immediately.

## WARNING

Anyone contact the leaked substance accidentally has to do as following:

- Breath in the leaked substance: Evacuate from the polluted area, and seek immediate medical assistance.
- Eye contact: Rinse your eyes for at least 15 minutes with clean water and seek immediate medical assistance.
- Skin contact: Thoroughly wash the touch area with soap and clean water, and seek immediate medical assistance.
- Ingestion: Induce vomiting, and seek immediate medical assistance.
- Do not move the battery system if it is connected with external battery expansion modules. Please contact After-sales Service to replace batteries or add batteries.

## CAUTION

### Transportation:

- Protect the battery system from damage during transportation and storage.
- Take the weight of the battery and the power control unit into account and carefully lift the battery and the power control unit.
- Wear gloves when handling the battery.
- Do not hit, pull, drag, or step on the battery system or put unrelated items into any part of the battery system.
- The transportation must be carried out by trained professionals. All operations during the process have to be recorded.
- Keep the equipment stable to avoid dumping, which can result in equipment damage and personal injuries.
- In the event of a fire, please make sure that the carbon dioxide extinguisher or Novac1230 or FM-200 is nearby.
- The fire cannot be put out by water or ABC dry powder extinguisher. Firefighters are required to wear full protective clothing and self-contained breathing apparatus.
- The battery may explode when the ambient temperature exceeds 150°C.
- Please use appropriate tools and take protective measures when installing and maintaining heavy equipment. Improper operations will cause personal injuries.
- Use professional insulating tools when operating the equipment under high voltage.
- Place the cables at least 30mm away from the heating components or heat sources, otherwise the insulation layer of the cables may be aging or broken due to high temperature.
- Tie the cables of the same type together, and place cables of different types at least 30mm apart. Do not place the cables entangled or crossed.

## EU Declaration of Conformity

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The Battery System sold in the European market meets the following directives and requirements:

- Electromagnetic compatibility Directive 2014/30/EU (EMC)
- Electrical Apparatus Low Voltage Directive 2014/35/EU (LVD)
- Restrictions of Hazardous Substances Directive 2011/65/EU and (EU) 2015/863 (RoHS)
- Waste Electrical and Electronic Equipment 2012/19/EU
- Registration, Evaluation, Authorization and Restriction of Chemicals (EC) No 1907/2006 (REACH)

You can download the EU Declaration of Conformity on <https://en.goodwe.com>.

# 02 Product Introduction

## 2.1 Product Description

- This user manual describes the Lynx Home F Series (HV) Battery System (Battery System for short) in terms of the introduction, application, installation, commission, maintenance, and technical parameters, etc.
- The Battery System consists of the LX F3.3-H Battery Module (Battery Module for short) and LX F-H Power Control Unit (PCU).
- The battery system can be compatible with the following inverter series:



Goodwe Inverter



GE Inverter

Details of different Battery Systems:

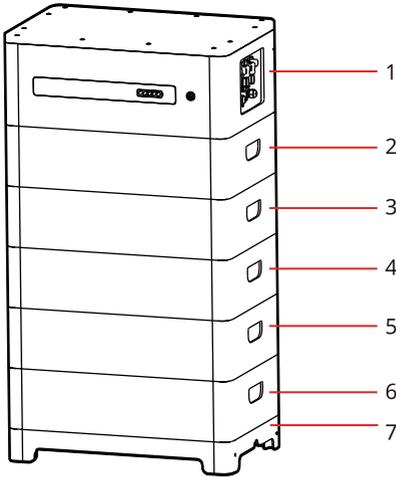
Battery System	Number of Battery Module	Number of PCU	Number of Base
LX F6.6-H	2	1	1
LX F9.8-H	3	1	1
LX F13.1-H	4	1	1
LX F16.4-H	5	1	1

## 2.2 Symbol Description

Symbol	Description	Symbol	Description
	Potential risks exist. Wear proper PPE before any operations.		Install the equipment away from fire sources.
	High voltage hazard. Power off the equipment first before any operations.		Keep the equipment away from children.
	Operate the equipment properly to avoid explosion danger.		No extinguishing with water.
	The equipment contains corrosive electrolytes. In case of a leak in the equipment, avoid contact the leaked liquid or gas.		Do not dispose of the equipment with household garbage at its end of life.
	Read through the user manual before any operations.		Put the battery in the right place and recycle it in compliance with local environmental regulations.
	Pay attention to safety protection during installation		CE Mark
	RCM Mark		Grounding. To indicate PE cable connection position.

## 03 Parts Introduction

### 3.1 Battery System Introduction

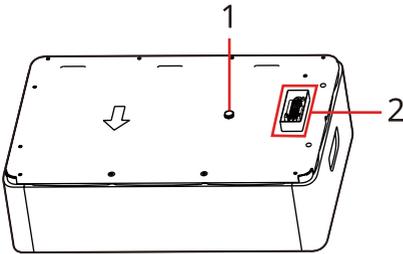


#### Notice

- Ensure that the PCU is installed above the Battery Module. Do not install any Battery Modules above the PCU.
- This manual will show you the installation and cable connection of 5 Battery Modules.

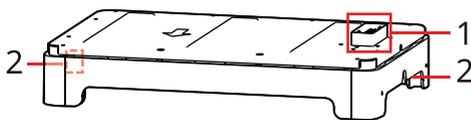
No.	Parts
1	PCU
2, 3, 4, 5, 6	Battery Module
7	Base

### 3.2 Battery Introduction



No.	Parts
1	Ventilation Valve
2	Rectangular Connector

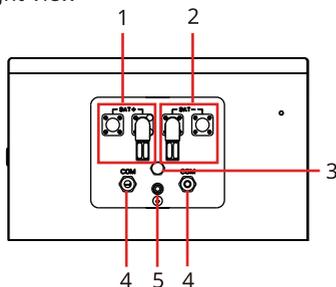
### 3.3 Base Introduction



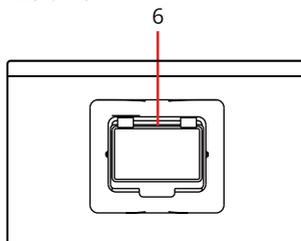
No.	Parts
1	Rectangular Connector
2	Grounding Point

### 3.4 Power Control Unit Introduction

Right View



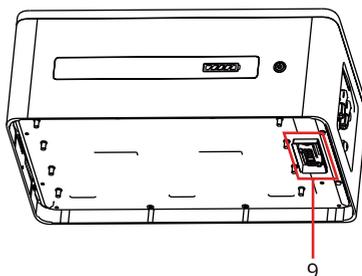
Left View



Front View

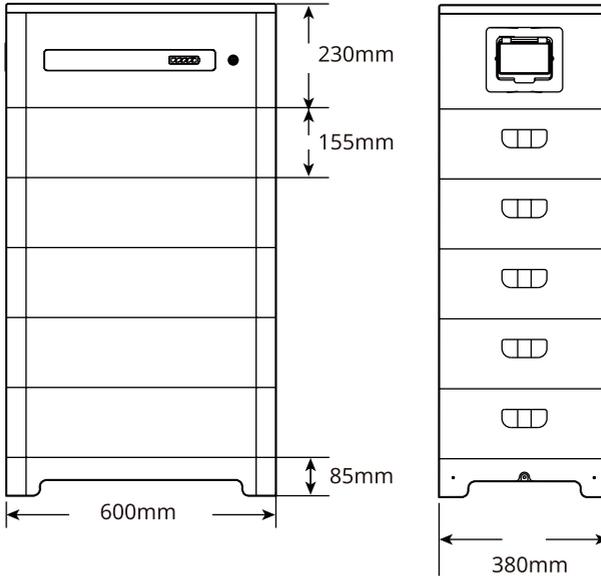


Bottom



No.	Parts
1	Positive Pole of Power
2	Negative Pole of Power
3	Ventilation Valve
4	COM Cable Port
5	Grounding Point
6	Circuit Breaker
7	SOC Indicator
8	Button Indicator
9	Rectangular Connector

## 3.5 Dimensions



## 04 Storage and Package

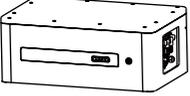
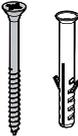
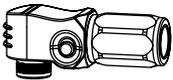
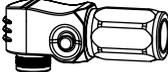
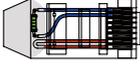
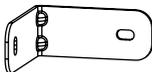
### 4.1 Storage Environment

If the equipment is not to be installed or used immediately, please ensure that the storage environment meets the following requirements:

- Pack the equipment using a packing box and put some desiccant in the box before sealing.
- Put the equipment back in the packing box if it is not to be installed in 3 days after unpacking.
- Storage SOC: 25%~50%SOC. Circle the charge-discharge every 3 months.
- Recommended storage temperature: -20°C~45°C(less than one month) or 0°C~35°C(less than one year).
- Recommended storage humidity: 0%~90%RH(no condensation). Do not install the battery if there is any moisture or condensation.
- Place the equipment in a cool place where away from direct sunlight.
- Keep the equipment away from flammable, explosive, and corrosive matters.
- Keep the equipment away from the rain.

### 4.2 Packing List

- The Battery System consists of the Battery Module, the CPU, and the base.
- Check outer packing for damage and model before unpacking the Battery System. If you find any damage or the model is not what you requested, do not unpack the product and contact the After-sales Service as soon as possible.
- Check whether the deliverables are intact and complete first after unpacking the Battery System. If anything wrong, contact the After-sales Service as soon as possible.

<b>Power Control Unit</b>			
 PCU x1	 Base x1	 Expansion Bolts x4	 Red Power Connector x1
 Black Power Connector x1	 Terminal Resistor x 1	 M5*12 Screw x4	 Grounding Terminal x2
 Locking Bracket x4	 User Manual x1	 M5 hexagon screw x2	 Protection cover x1
 Protection cover x2	N/A	N/A	N/A

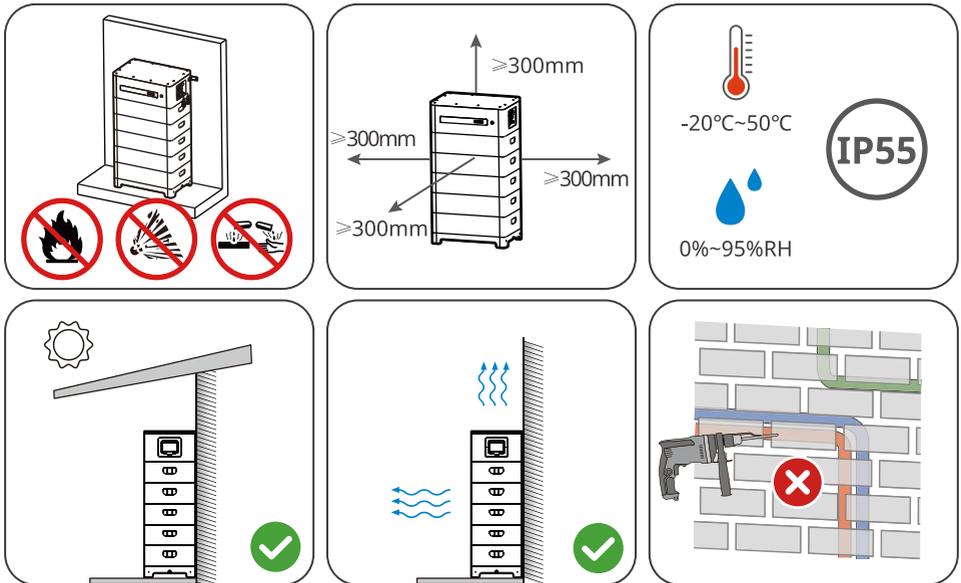
<b>Battery Module</b>
 Battery Module x1

## 05 System Installation

### 5.1 Installation Environment

- Install the Battery System on a ground with sufficient bearing capacity and flatness. Increase the bearing capacity and flatness of the ground by laying the foundation, adding bearing plates, and so on.
- The optimal working temperature for the Battery System is 20~40°C.
- Avoid exposing the equipment to direct sunlight or rain.
- Install the equipment away from heat/cold source.
- Do not install the equipment in a place where the temperature changes extremely.
- Install the equipment away from strong interferences to ensure its regular work.
- Keep children away from the equipment.
- Do not install the equipment in places prone to accumulate water.
- Do not put flammable or explosive matters near the equipment.

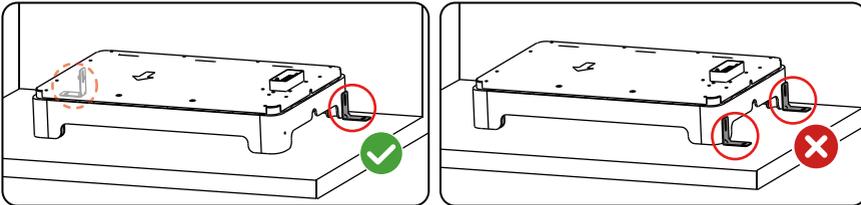
### 5.2 Space Requirements



## 5.3 Battery System Installation

### Notice

- Make sure that the ground is flat and no inclination.
- Put the base cling to the floor vertically.
- Put all the base cling to the wall, and the arrow points outward.
- Put all the batteries cling to the wall, and the arrows point outwards.
- Align the holes of the upper and the lower Battery Modules when placing the upper Battery Module.
- Put the bracket cling to the wall.
- Watch out for Battery Modules dropping.
- Do not install the two locking brackets on one side.



**Step1:** Take the Battery Module, the Base and the PCU out.

**Step2:** Install the locking bracket to the base.

**Step3:** Place the base cling to the wall and mark the drilling positions. Then move the base.

**Step4:** Drill a hole in the floor, Diameter 10mm and depth 80mm.

**Step5:** Screw the expansion bolts to fix the Base. Tightening torque: 10N·m.

**Step6:** Place the Battery Module on the base.

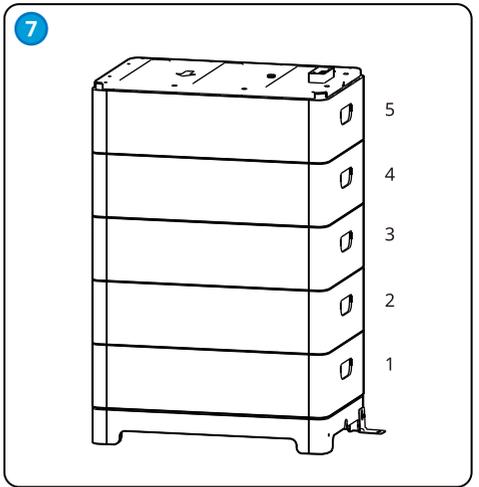
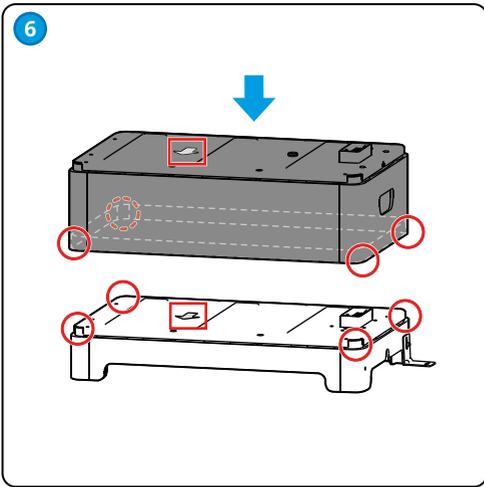
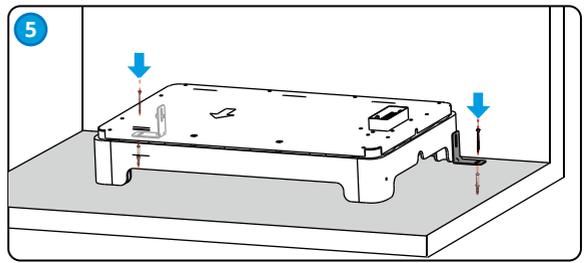
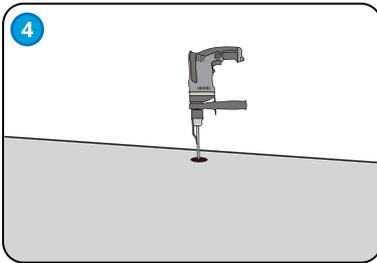
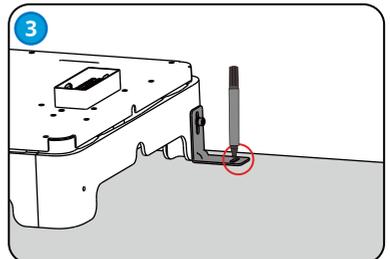
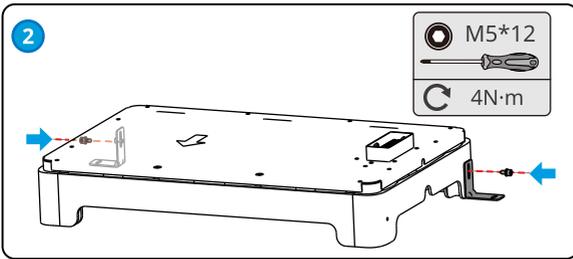
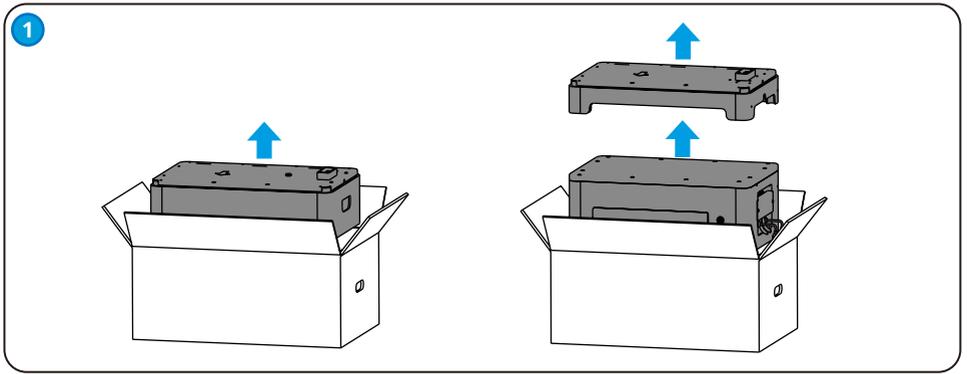
**Step7:** Repeat step 1 and 2 to install the second to fifth battery modules from bottom to top.

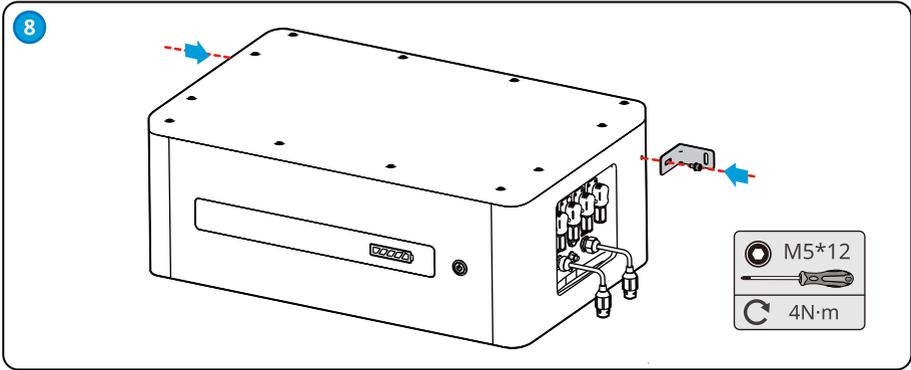
**Step8:** Install the locking bracket.

**Step9:** Put the PCU above the installed Battery Module securely. Mark the drilling hole using a marker, then remove the PCU.

**Step10:** Drill a hole in the wall, Diameter 10mm and depth 80mm.

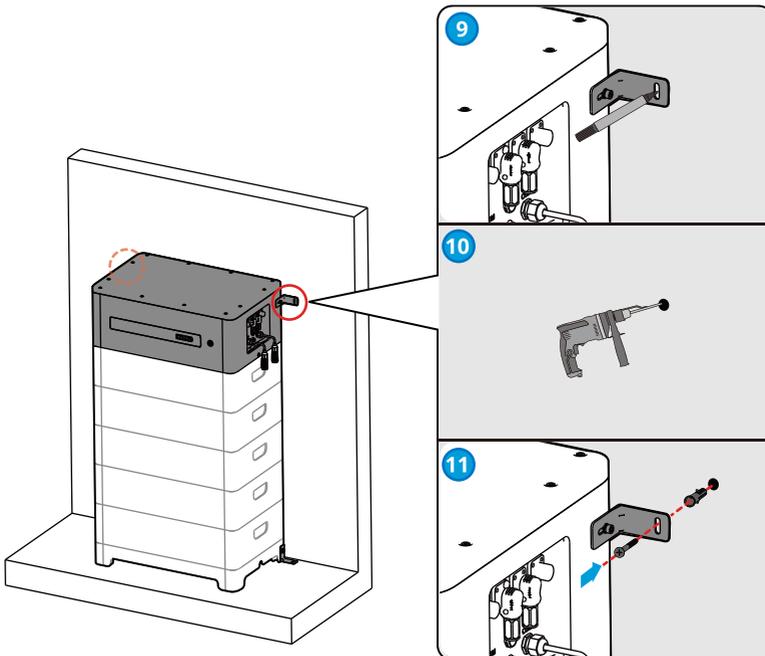
**Step11:** Screw the expansion bolts to fix the PCU. Tightening torque: 10N·m.





### Notice

- Shelter the equipment using paperboards when drilling to avoid dust.
- Put the locking bracket cling to the wall. And the bracket bottom cling to the Battery Module.
- Watch out for Battery Modules dropping.

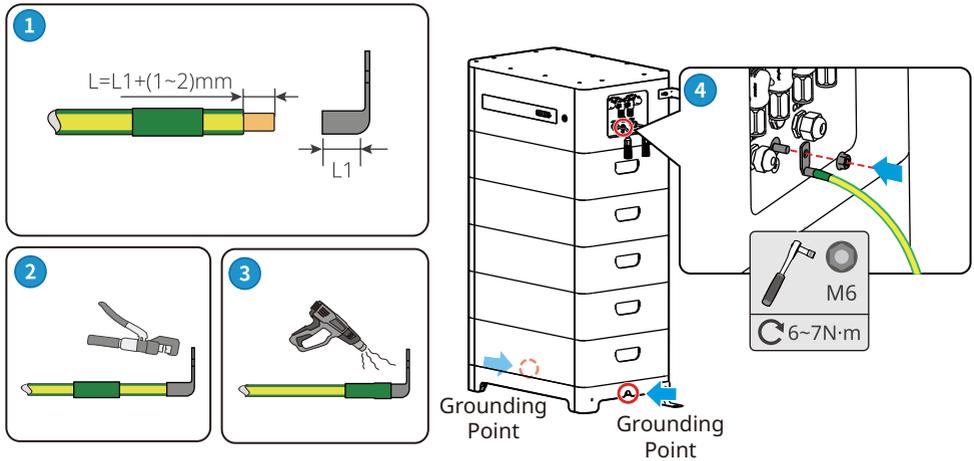


## 5.4 Electrical Connection

### 5.4.1 Connecting the PE Cable

#### Notice

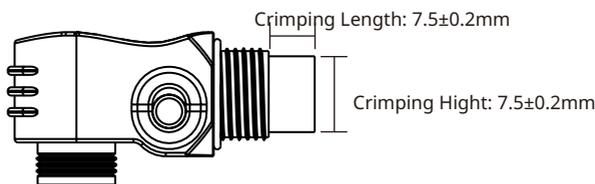
- Connect the PE cable first before installing the equipment. Disconnect the PE cable before dismantling the equipment.
- The PE cable should be prepared by customers. The cross-sectional area of the PE cable conductor: 5mm<sup>2</sup>. The cable should meet standards for outdoor use.
- The drawing force of the cable after crimping should be at least 400N.
- Connect the PE cable to the PCU or to the base in the same way.



### 5.4.2 Connecting the Power Cable

#### Notice

- Power off the Battery System before connecting the power cable to avoid high voltage danger.
- The DC input cable should be prepared by customers. Connect the red power connector to the red wire harness. And the black power connector to the black wire harness. The cable should meet standards for outdoor use.
- The recommended tool is a manual hydraulic press plier. Crimping height: 7mm, Mould: 16mm<sup>2</sup> (AWG 6).
- Screw the nut and make sure there is no space.
- Use any one of the two power ports. The reserved one should be protected using a cover.



## Connecting the Battery Power Cable (Compatible with EHB Series Inverters)

### Notice

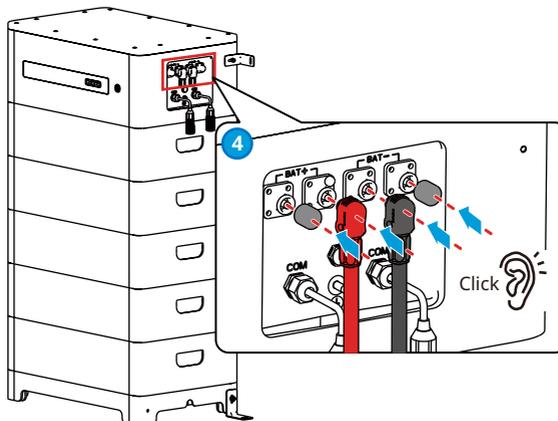
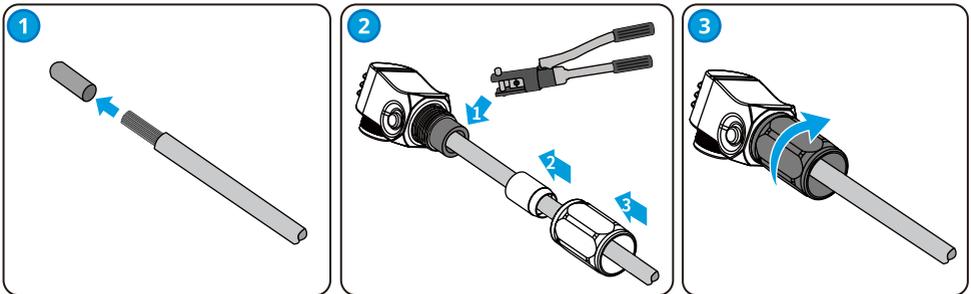
- Use a power cable to connect the EHB series inverters and the Battery System. The cross-sectional area of the power cable conductor:  $16\text{mm}^2$ (AWG 6). The strip length of the conductor:  $18\pm 1\text{mm}$ . The drawing force of the cable after crimping should be at least 1200N.
- Make sure that the striped conductor is fine and has no burrs.
- The copper tube should be prepared by customers. Copper tube length: 17mm. Copper tube inner diameter: 5.80mm.

**Step1:** Strip the conductor and put it into the copper tube.

**Step2:** Crimp the power cable.

**Step3:** Tighten the nut.

**Step4:** Connect the power cable.



## Connecting the Battery Power Cable (Compatible with ET,BT,EH,BH Series Inverters)

### Notice

- Use a power cable to connect the ET, BT, EH, and BH series inverters and the Battery System. Replace the white seal ring inside the power connector with a black seal ring before crimping the power cable. Inner diameter 4.59mm. The cross-sectional area of the power cable conductor: 6mm<sup>2</sup>(AWG 10). The strip length of the conductor: 33±1mm. The drawing force of the cable after crimping should be at least 500N.
- Make sure that the striped conductor is fine and has no burrs.
- The copper tube should be prepared by customers. Copper tube length: 17mm. Copper tube inner diameter: 5.80mm.

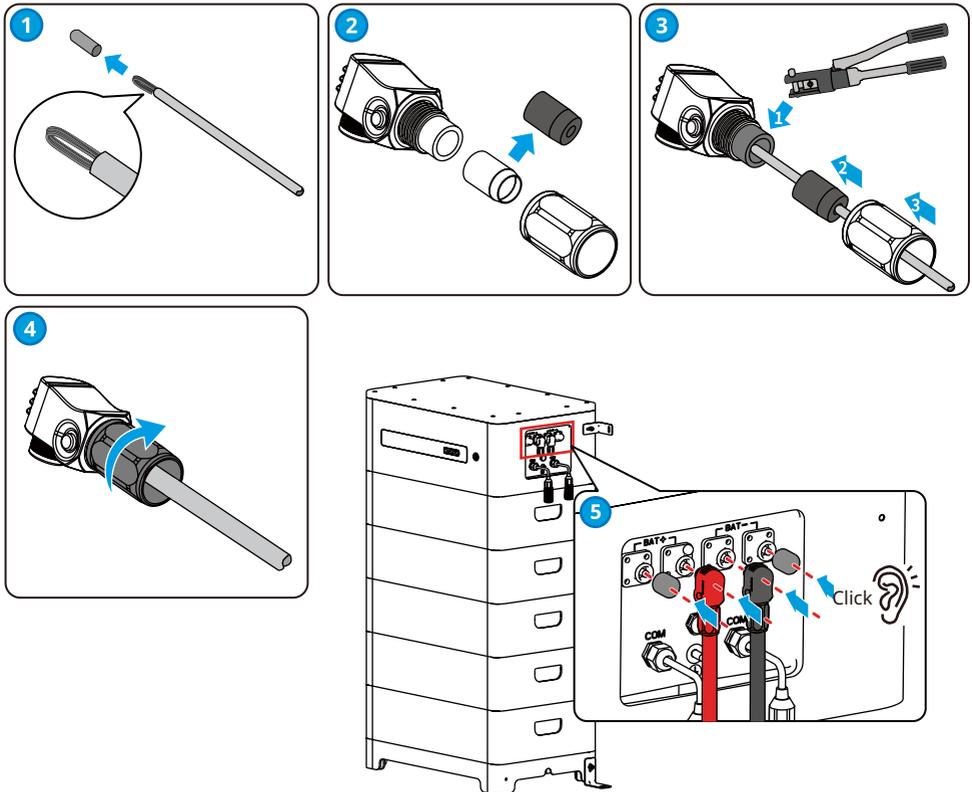
**Step1:** Strip the conductor and fold it in half. Put the folded conductor into the copper tube.

**Step2:** Replace the white seal ring inside the power connector with a black seal ring.

**Step3:** Crimp the power cable.

**Step4:** Tighten the nut.

**Step5:** Connect the power cable.

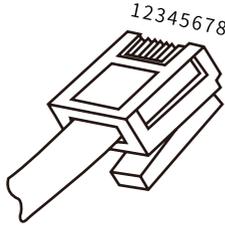
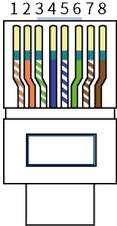


### 5.4.3 Connecting the COM Cable

#### Notice

- The two communication ports are the same.
- Connect the cable to any one of the two communication ports. And connect the terminal resistor to the other port.
- For the EHB series and GE series inverters, the manufacturer does not supply the battery communication cable.
- Please refer to the following pin definitions if you need to make a new battery communication cable.

#### RJ45 Modular Connector



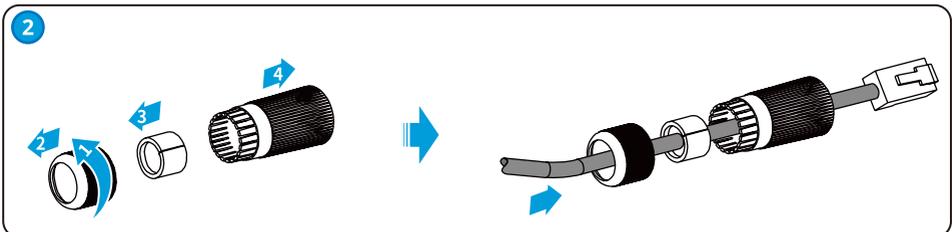
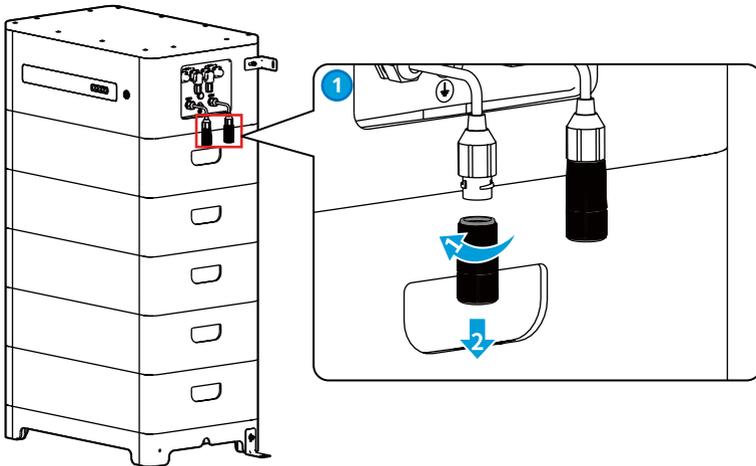
#### CAN COM Port

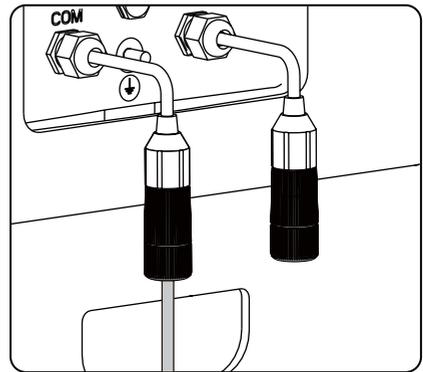
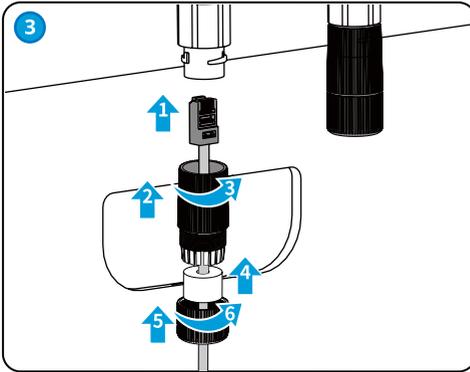
PIN	PIN Definition
4	CAN_H
5	CAN_L
1, 2, 3, 6, 7, 8	N/A

**Step1:** Disassemble the waterproof module.

**Step2:** Thread the cable to the waterproof module.

**Step3:** Connect the communication cable to the Battery Module. Tighten the nut.





### 5.4.4 Install the terminal resistor

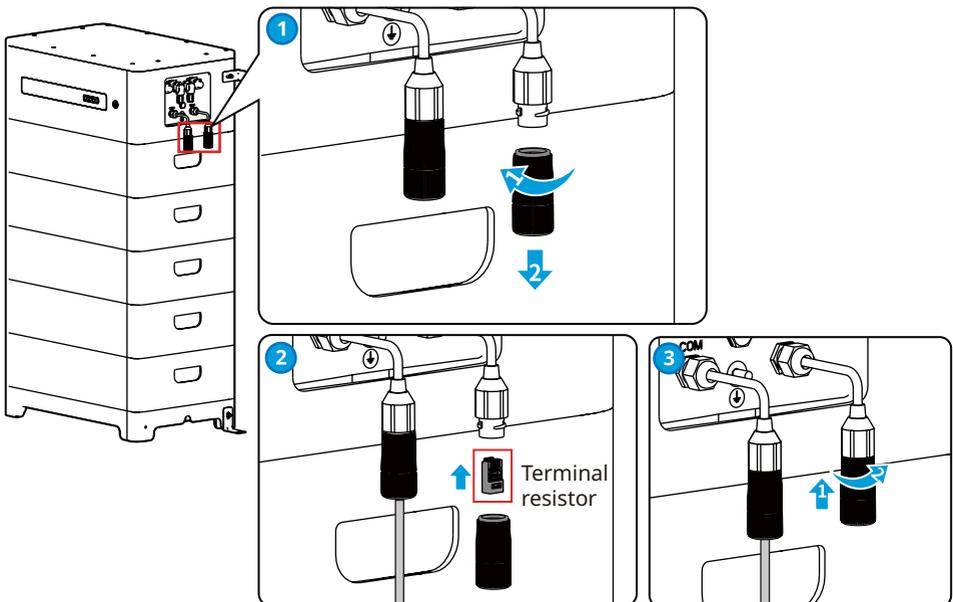
#### Notice

If the terminal resistor is not installed, the Interlock Failure will occur, and the system cannot work correctly.

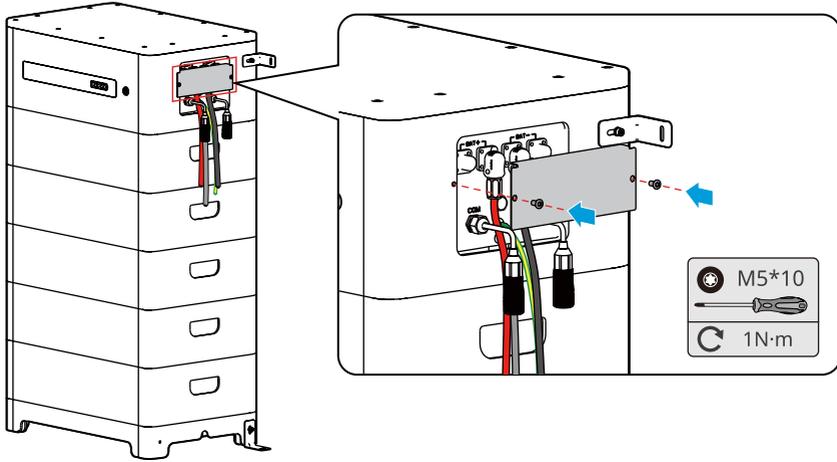
**Step1:** Disassemble the waterproof module.

**Step2:** Install the terminal resistor.

**Step3:** Tighten the nut.



## 5.5 Install the protection cover



# 06 System Operation

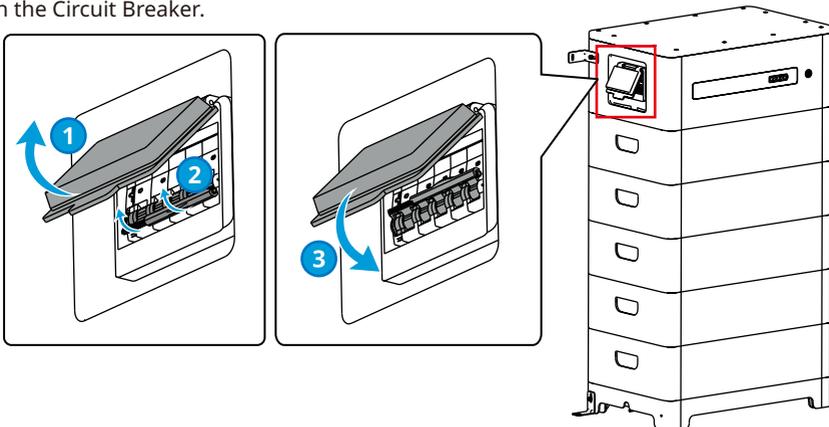
## 6.1 Check Items Before Switching Power ON

Check the following items before power on to avoid the System be damaged.

No.	Check Item
1	The inverter is firmly installed in a clean place where is well-ventilated and easy to operate.
2	The PE cable, power cable, communication cable, and terminal resistance are connected correctly and securely.
3	Cable ties are routed properly and evenly, and no burrs.
4	Unused ports and terminals are sealed.

## 6.2 Battery Module Power On

Turn on the Circuit Breaker.



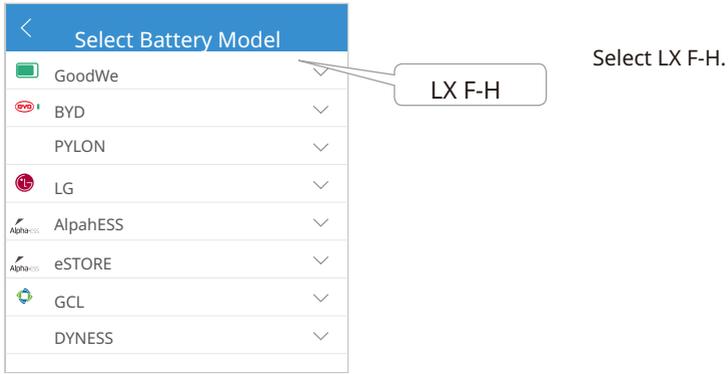
## 6.3 Battery Parameters

Select battery model via PV Master after successfully connecting the Battery Module and the inverter.

App installation and connection



Set battery model via PV Master App.



### Notice

"Battery Communication Failure" will be displayed if you select the wrong battery model. Please select the right battery model accordingly.

## 6.4 Indicator Status



Button Indicator	Status
Green	Standby or Working
Red	Alarming or Faulty

### 6.4.1 Normal

Button Indicator	SOC Indicator	Description
Idle: green blink 2 times Standby: green blink 1 time Working: steady green		SOC<5%
		5%≤SOC<25%
		25%≤SOC<50%
		50%≤SOC<75%
		75%≤SOC<95%
		SOC≥95%

#### Notice

- The SOC indicator keeps on when charging.
- The SOC indicator blinks one time when discharging.

### 6.4.2 Alarming

Button Indicator	SOC Indicator	Alarm	Solutions
Red Blink 2 times		Battery Overvoltage	Restart the battery. If the problem persists, contact the after-sales service.
		Battery Undervoltage	Long press the button for 5s when charging. If the problem persists, contact the after-sales service.
		Overcurrent Charging	Restart the battery. If the problem persists, please contact the After-sales service.
		Overcurrent Discharging	Restart the battery. If the problem persists, please contact the After-sales service.
		Temperature Difference Exception	Power off and wait for 2 hours. If the problem persists, please contact the After-sales service.
		High Temperature	Power off and wait for 2 hours. If the problem persists, please contact the After-sales service.
		Low Temperature	Power off and wait for 2 hours. If the problem persists, please contact the After-sales service.
		Interlock Failure	Contact the after-sales service.
		Others	Contact the after-sales service.

**Notice**

Using the Circuit Breaker to restart the battery module.

### 6.4.3 Faulty

Button Indicator	SOC Indicator	Fault	Solutions
Steady Red		Battery Overvoltage	Restart the battery. If the problem persists, contact the after-sales service.
		Battery Undervoltage	Long press the button for 5s when charging. If the problem persists, contact the after-sales service.
		Overcurrent Charging	Restart the battery. If the problem persists, please contact the After-sales service.
		Overcurrent Discharging	Restart the battery. If the problem persists, please contact the After-sales service.
		Temperature Difference Exception	Power off and wait for 2 hours. If the problem persists, please contact the After-sales service.
		High Temperature	Power off and wait for 2 hours. If the problem persists, please contact the After-sales service.
		Low Temperature	Power off and wait for 2 hours. If the problem persists, please contact the After-sales service.
		Inconsistent Software Version	Contact the after-sales service.
		Precharge Fault	Restart the battery. If the problem persists, contact the after-sales service.

Steady Red		Relay Fault	Restart the battery. If the problem persists, please contact the after-sales service.
		Circuit Breaker Fault	Restart the battery. If the problem persists, please contact the after-sales service.
		Insulation Fault	Do not touch the battery, and contact the after-sales service.
		Internal Communication Fault	Power off and check the COM cable. Restart the battery. If the problem persists, contact the after-sales service.
		SN Fault	Contact the after-sales service.
		Voltage Balance Fault	Restart the battery. If the problem persists, contact the after-sales service.
		Inconsistent Master and Slave	Restart the battery. If the problem persists, contact the after-sales service.
		Temp. Sensor Fault	Restart the battery. If the problem persists, contact the after-sales service.
		Others	Contact the after-sales service.

## 6.5 Battery Module Power Off

Follow the steps to power off the Battery System to avoid the System be damaged.

### Method 1:

1. Press the button for at least 15s.
2. Make sure that both the SOC indicator and the button indicator of the control unit are off.

### Method 2:

1. Turn off the air switch.
2. Make sure that both the SOC indicator and the button indicator of the control unit are off.

## 07 Battery Parameters

Technical Data	LX F6.6-H	LX F9.8-H	LX F13.1-H	LX F16.4-H
Usable Energy (kWh) <sup>*1</sup>	6.55	9.83	13.10	16.38
Battery Module	LX F3.3-H: 102.4V 3.27kWh			
Number of Modules	2	3	4	5
Cell Type	LFP(LiFePO4)			
Cell Configuration	64S1P	96S1P	128S1P	160S1P
Nominal Voltage (V)	204.8	307.2	409.6	512
Operating Voltage Range (V)	182.4~230.4	273.6~345.6	364.8~460.8	456~576
Nominal Dis-/Charge Current (A) <sup>*2</sup>	25			
Nominal Discharge Power (kW) <sup>*2</sup>	5.12	7.68	10.24	12.80

<b>Communication</b>		CAN			
<b>Weight (Kg)</b>		115kg	158kg	201kg	244kg
<b>Dimensions (W*D*H) (mm)</b>		600*380*625	600*380*780	600*380*935	600*380*1090
<b>Operating Temperature (°C)</b>		Charge: 0<T≤50 ; Discharge: -20<T≤50			
<b>Storage temperature (°C)</b>		20~45 (≤ One Month); 0~35 (≤ One Year)			
<b>Humidity(%)</b>		≤95			
<b>Altitude (m)</b>		≤2000			
<b>Enclosure Type</b>		IP55(Outdoor / Indoor)			
<b>Installation Location</b>		Ground-Mounted			
<b>Standard and Certification</b>	<b>Safety</b>	IEC62619, CEC			
	<b>EMC</b>	CE, RCM			
	<b>Transportation</b>	UN38.3			
<p>*1: Test conditions, 100% DOD, 0.2C charge &amp; discharge at +25±3 °C for battery system at beginning life. System Usable Energy may vary with different Inverter.</p> <p>*2: Nominal Dis-/Charge Current and power derating will occur related to Temperature and SOC.</p>					

## 08 Maintenance

Item	Period
Check the wall mounting plate, fix it if it is not secured	Once every 6 months
Check whether the outer enclosure is broken. Repair the painting or contact After-sales Service if there is any broken.	Once every 6 months
Check whether there is an exposed cable. Replace the exposed cable or contact After-sales Service for help.	Once every 6 months
Check whether there is debris accumulation around the Battery Module to avoid affecting heat dissipation.	Once every 6 months
Check for water and pest to avoid prolonged intrusion.	Once every 6 months

### WARNING

- Contact After-sales Service for help if you find any problems that may influence the Battery Module or the inverter. Disassemble without permission is strictly forbidden.
- Contact After-sales for help if the conductive wire is exposed because high voltage danger exists. Do not touch or disassemble privately.
- In case of other emergencies, contact the After-sales as soon as possible. Operate following the instructions of the After-sales personnel. Or wait for the After-sales operators.



GoodWe  
Website



PV Master  
App

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