Lenercom

8-12 kW Lenercom Residential ESS

User's Manual

Thank you for purchasing this product.

Please read this manual before use.

Please keep this manual properly for consultation.

Foreword

Overview

This document mainly introduces the installation, electrical connection, debugging, maintenance and troubleshooting methods of LC-E2 (battery high voltage) Lenercom ESS (hereinafter referred to as “LC-E2”). Please read this manual carefully before installing and using LC-E2 high-voltage products to understand the safety information and the functions and features of LC-E2 high-voltage products.

Scope

This manual is applicable to:

- Installer
- User

Symbols

The following symbols in this manual shall have the meanings as follows.

Symbol	Description
	To indicate the serious danger which will cause death or serious injury if not avoided
	To indicate the intermediate danger which may cause death or serious injury if not avoided
	To indicate the slight danger which may cause slight or moderate injury if not avoided
	To indicate the warning information for the safety issues about the equipment or environment, if not avoided, which may lead to equipment damage, data loss, performance degradation or other unpredictable results. “Note” does not involve personal injury.
	To highlight the important/key information, best practices, tips, etc. “Description” is not safety warning information, and does not involve any personal, equipment or environmental damage information.

Version information

S/N	Revision No.	Revision	Date	Remarks
1	V1.0 (first edition)		4/11/2022	
2	V1.1	Content independence of three-phase energy storage products and BMS content update.	15/12/2022	
3	V2.0	Peak-valley arbitrage content update. Picture content update.	3/3/2023	
4	V2.1	1. Adjust the internal components of the inverter box, the DC control module is independent, and the back picture connector position is replaced. 2. Add the G-type battery pack and the corresponding configuration model content	24/4/2023	
5	V2.2	1. Add the description of the DRM interface and function. 2. Fault code and content updates.	13/8/2023	

Table of Contents

1 Safety Precautions

1.1 General safety

Statement

When installing, operating and maintaining equipment, please read this manual first and follow the identification on the equipment and all safety precautions in this manual.

The "Notes", "Cautions", "Warnings" and "Dangers" in this manual do not represent all safety precautions to be observed, but only serve as supplements to all safety precautions. Lenercom does not assume any responsibility caused by violation of the general safe operation requirements or the safety standards for the design, production and use of equipment. This equipment shall be used in the environment in line with the design specifications, otherwise the equipment fault may be caused, and the resulting equipment abnormality or component damage, personal safety accident, property loss, etc. may not be covered by the quality assurance. When installing, operating and maintaining equipment, please observe the local laws, regulations and specifications. The safety precautions in this manual are only used as a supplement to local laws, regulations and specifications.

Lenercom assumes no responsibility for any of the following situations:

● Operation beyond the conditions of use described in this manual.

● Installation and use environment not in line with relevant international or national standards.

● Unauthorized disassembly, modification of products or modification of software codes.

● Failure to follow the operation instructions and safety warnings of products and documents.

● Equipment damage caused by abnormal natural environment (force majeure, such as earthquake, fire, storm, etc.).

● Damage during the transportation arranged by customer.

● Damage caused by storage conditions inconsistent with the requirements of product documents.

General requirements

Live operation is strictly prohibited during installation.

Do not install, use or operate outdoor equipment or cables (including but not limited to handling equipment, operating equipment and cables, plugging and unplugging signal interfaces connected to outdoors, aerial work, outdoor installation, etc.) in severe weather such as lightning, rain, snow and strong winds above Grade 6.

● After installing the equipment, remove the empty packaging materials in the equipment area, such as cartons, foam, plastics, cable ties, etc.

● In case of fire, withdraw from the building or equipment area and press the fire alarm bell or call the fire emergency number. Under no circumstances is it allowed to re-enter the burning building.

● Do not artificially alter, damage or block the marks and nameplates on the equipment.

● When installing the equipment, use tools to tighten the screws according to the specified torque.

● Fully understand the components, working principle of LC-E2 high-voltage products and relevant standards in the country/region where the project is located.

● Repair the paint scratches during equipment transportation and installation in time which shall not be exposed to outdoor environment for a long time.

● Do not open the back panel of inverter.

Personal safety

In case of the fault that may cause personal injury or equipment damage in the process of equipment operation, terminate the operation immediately, and make report to the person in charge to take effective protective measures.

● Be knowledgeable of the correct use of tools before use to avoid personal injury and equipment damage.

● When the equipment is running, the shell temperature is high, and there is a danger of burning. Please do not touch it.

1.2 Personnel requirements

Personnel for the installation and maintenance of LC-E2 high-voltage products shall first receive the rigorous training to understand various safety precautions and correct operation methods.

● Equipment shall only be installed, operated and maintained by the qualified professionals or trained personnel.

● Safety facilities and repair equipment shall only be removed by the qualified professionals.

● Personnel who operate equipment, including operators, trained personnel and professionals, shall have special operation qualifications required by local countries, such as high-voltage operation, working at heights and special equipment operation qualifications.

● Equipment or parts (including software) shall only be replaced by professionals or authorized personnel.

Description

● Professionals: People who have training or experience in operating equipment, and can know all kinds of potential hazard sources and hazard levels in the process of equipment installation, operation and maintenance.

● Trained person: A person with appropriate technical training and necessary experience, who is aware of the danger that may be brought to him when performing an operation, and can take measures to minimize the danger to himself or other personnel.

● Operators: Operators who may come into contact with equipment except trained personnel and professionals.

1.3 Electrical Safety

Grounding requirements

● When installing the equipment to be grounded, install the protective grounding wire first. When removing equipment, remove the protective grounding wire last.

● Do not damage the grounding conductor.

● Do not operate the equipment without installing the grounding conductor.

● Permanently ground the equipment. Before operating the equipment, check the electrical connection of the equipment to ensure that the equipment is reliably grounded.

General requirements

Danger

Before the electrical connection, please ensure that the equipment is not damaged, otherwise the electric shock or fire may be caused.

● All electrical connections shall meet the electrical standards of the country/region.
● The grid can be connected for power generation only after the permission is obtained from the power authority of the country/region.
● User-provided cables shall comply with local laws and regulations.
● Special insulating tools shall be used for high voltage operation.

AC/DC operation

Danger

Live installation and removal of power line are prohibited. When touching the conductor, the power line core will produce electric arc or spark which can lead to fire or personal injury.
● Before the electrical connection of the equipment, if live parts may be touched, the corresponding breaking device at the front stage of the equipment shall be disconnected.
● Power line label shall be correctly identified before the connection of power line.
● If the equipment has multiple inputs, all inputs of the equipment shall be disconnected, and the equipment can be operated only after the complete power-off.

Wiring requirements

● The insulation layer may be aged and damaged when the cable is used in high temperature environment, and the distance between the cable and the periphery of heating device or heat source area shall be at least 30mm.
● Cables of the same kind shall be bound together, and cables of different kinds shall be laid at the interval of at least 30mm. Winding or cross laying shall be avoided.

1.4 Requirements of installation environment

● Please ensure that the installation environment of equipment is well ventilated.
● When the equipment is running, do not block the vents or heat dissipation system to prevent the fire caused by high temperature.
● Do not place the equipment in the environment of flammable, explosive gas or smoke, and do not carry out any operation in this environment.
● Do not place equipment in high salt spray environment.
● Load strength of installation ground shall be greater than the load caused by product weight.
● The annual temperature of the installation area should range from 0℃ and 50℃.
● Relative humidity of air should be less than 85%.

1.5 Mechanical safety

Drilling safety

The following safety precautions shall be considered when drilling holes on walls and ground:
● Wear goggles and protective gloves when drilling holes.
● Shield the equipment during drilling to prevent debris from falling into the equipment. After drilling, clean the debris in time.

Safety of carrying weights

● When carrying weights, prepare for bearing loads to avoid injury.

● When handling equipment, wear protective gloves to avoid injury.

< 18 kg (< 40 lbs)	1 person	32 ~ 55 kg (70 ~ 121 lbs)	3 persons
18 ~ 32 kg (40 ~ 70 lbs)	2 persons	> 55 kg (> 121 lbs)	4 persons or machinery

1.6 Debugging safety

When the equipment is powered on for the first time, the parameters shall be set correctly by professionals.

1.7 Maintenance and replacement

During the operation, there is high voltage, which may produce electric shock, resulting in death, serious personal injury or property loss. Therefore, the equipment shall be powered off before any maintenance, which shall be conducted in strict accordance with the safety precautions listed in this manual and other relevant documents.

● Please maintain the equipment after being knowledgeable of this manual and preparing suitable tools and test devices.

● Before the maintenance, please power off the equipment first, and then follow the instructions of the delayed discharge label and wait properly to ensure that the equipment has been powered off before operating the equipment.

● During the maintenance, please prevent the irrelevant personnel from entering the maintenance site, and set the temporary warning signs or fences for isolation.

● If the equipment fails, please contact your dealer for treatment.

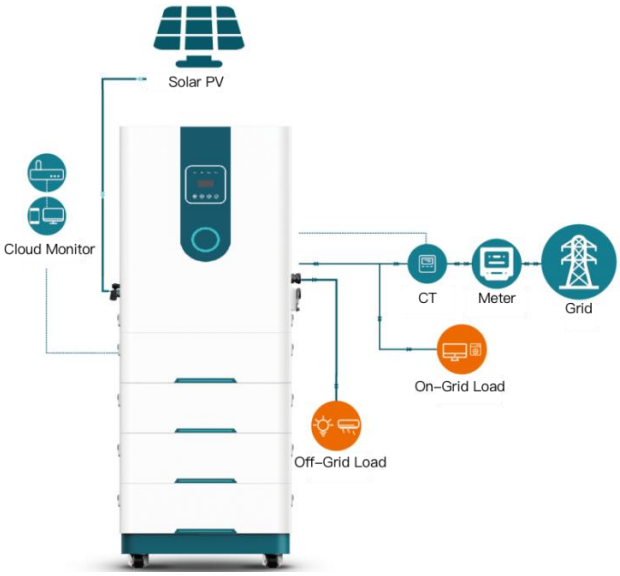
● The equipment can be powered on again only after the fault is solved, otherwise the failure may be deteriorated or the equipment may be damaged.

2 Product Introduction

2.1 Introduction of products

Features

LC-E2 products are comprised of PV energy storage hybrid inverter, energy storage battery module and wireless communication module. PV power generation system can be formed if PV is connected. The product mainly functions to convert DC power of PV and battery into AC power and output it to loads. The system, in conjunction with the household EMS (Energy Management System) and BMS (Battery Management System) independently developed by Lenercom, can realize remote data monitoring, early warning and control of LC-E2.



The system can be used in off-grid system and grid-connected system, and is suitable for many applications such as home users, small agriculture, small business and electric vehicle charging.

LC-E2 configuration instructions：

LC-E2= inverter * 1 + battery module * n + base * 1

Note: n is the number of battery modules Three-phase model: 2≤ n≤ 7.

n> 6 Please contact your dealer or Lenercom, we will recommend the installation method according to the actual situation of the site.

The G-type battery supports up to 3 battery modules

LC-E2 Model

mainly includes the following models

LC-E2-810T-G LC-E2-815T-G LC-E2-815T LC-E2-820T LC-E2-825T
LC-E2-830T LC-E2-835T LC-E2-1010T-G LC-E2-1015T-G LC-E2-1015T
LC-E2-1020T LC-E2-1025T LC-E2-1030T LC-E2-1035T
LC-E2-1210T-G LC-E2-1215T-G LC-E2-1225T LC-E2-1230T LC-E2-1235T

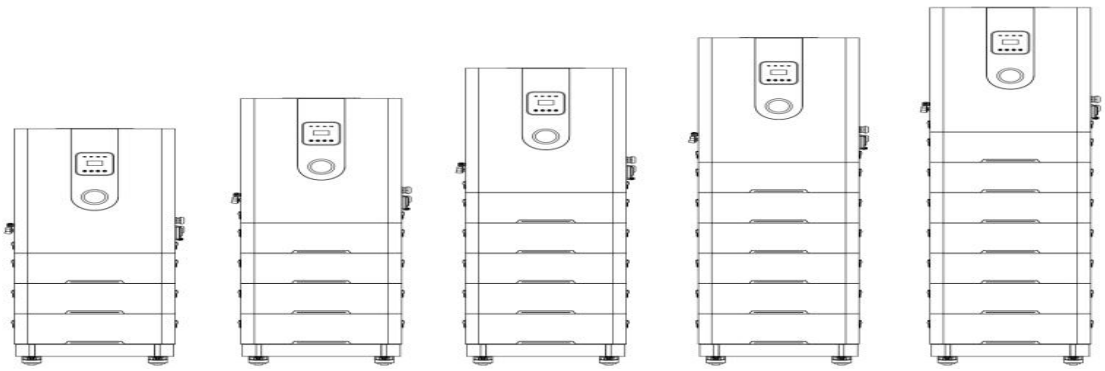
Model description

LC-E2-1015T-G	10	15	T	G
Product line	Rated power(kW)	Battery capacity	T stands for three-phase	G level
LC-E2-1020T	10	20	T	
Product line	Rated power (kW)	Battery capacity	T stands for three-phase	

Note: G type battery pack only be used with 2~3, and can't be used with not G type battery pack.

Description of battery capacity

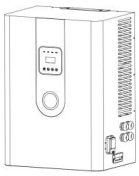
Model	10	15	20	25	30	35
No of battery modules	2	3	4	5	6	7
Battery capacity	5. 12kWh*2	5. 12kWh*3	5. 12kWh*4	5. 12kWh*5	5. 12kWh*6	5. 12kWh*7



Inverter mainly includes the following models

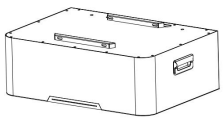
LC-8KH3 LC-10KH3 LC-12KH3

Model description

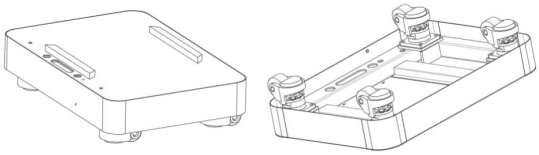
LC-10KH	10k	H	3	
Product line	Inverter Power	High voltage of battery	3 stands for three-phase 380Vac	

Battery module models

LC-BH512 LC-BH512-G

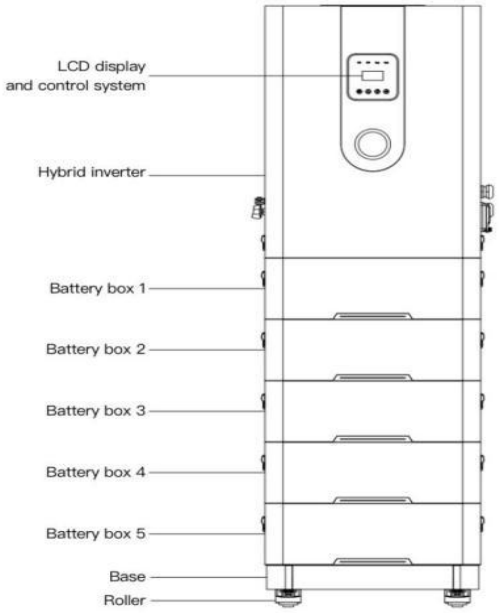
LC-BH512	B	H	512		
Product line	Battery Module	High voltage of battery	Battery capacity 5.12kWh		
LC-BH512-G	B	H	512	G	
Product line	Battery Module	High voltage of battery	Battery capacity 5.12kWh	G level	

Base is as shown in the following figure.



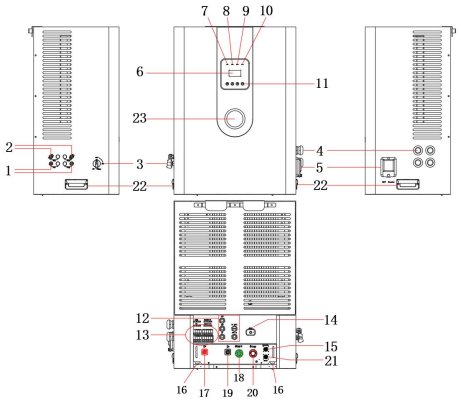
2.2 Description of appearance and interfaces

2.2.1 Equipment appearance



Instruction: Lenercom LC-E2 8-12kW products can accommodate up to 7 battery modules for three-phase model. In case of more that 6 battery modules, please contact your dealer or Lenercom.We will recommend the installation method according to the actual situation of the site

2.2.2 Appearance and interfaces of inverter



Description

2 channels of PV input for three-phase model

Code	Name	Description	
1	Cathode MC4 socket of PV	To connect PV cathode	
2	Anode MC4 socket of PV	To connect PV anode	
3	PV switch	To turn on/off PV	
4	AC inlet/outlet	Grid, generator and load	
5	DC breaker	Breaker for the connection of battery pack and inverter	
6	LCD display panel	To display the data and set the functions of inverter	
7	Grid-connected operation indicator	Green when connected to the grid	See the description of

8	Off-grid operation indicator	Green for off-grid with load	control panel for details
9	Alarm indicator	Yellow when an alarm is given	
10	Fault indicator	Red for serious fault	
11	Function button	To set the functions	
12	Communication port	See 5.2.1 “Definitions of inverter communication interfaces” for details	
13	Grid-connected grid input/off-grid AC output terminal	Three-phase models: A/B/C/N/PE	
14	COM	Data Collector	
15	BMS mainframe communication port	BMS Debug Port	
16	Longitudinal bolt	For installation and positioning	
17	Anode socket	To connect the master anode	
18	Button switch	Start switch of battery	
19	Cathode socket	To connect the master cathode	
20	Button switch	Emergency stop button of battery	
21	BMS battery communication port	BMS battery communication link	
22	Handle	For handling	
23	Breathing light	To display the battery level and BMS fault	

Description

Description of breathing light: breathing light of inverter can feed back the relevant status of inverter battery in real time as shown in follows:

Battery power: 40% < SOC ≤ 100%, it turns to blue with low frequency flashing.

Battery power: 15% < SOC ≤ 40%, it turns to green with low frequency flashing.

Battery power: SOC ≤ 15%, it turns to yellow with low frequency flashing.

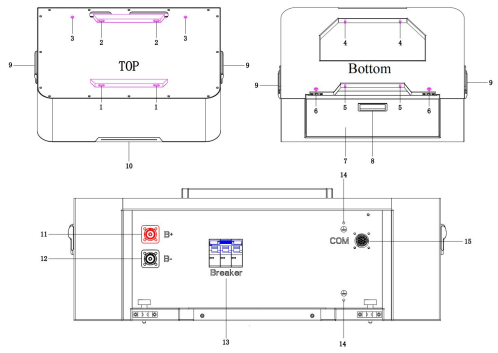
When the BMS fails, it flashes in red.

After troubleshooting, breathing light displays the power again.

Instruction: "SOC" stands for battery power.

2.2.3 Appearance and interfaces of battery module

The interface of battery module is located on the back of battery module. Open the back cover of battery module and you can see it, as shown in the following figure



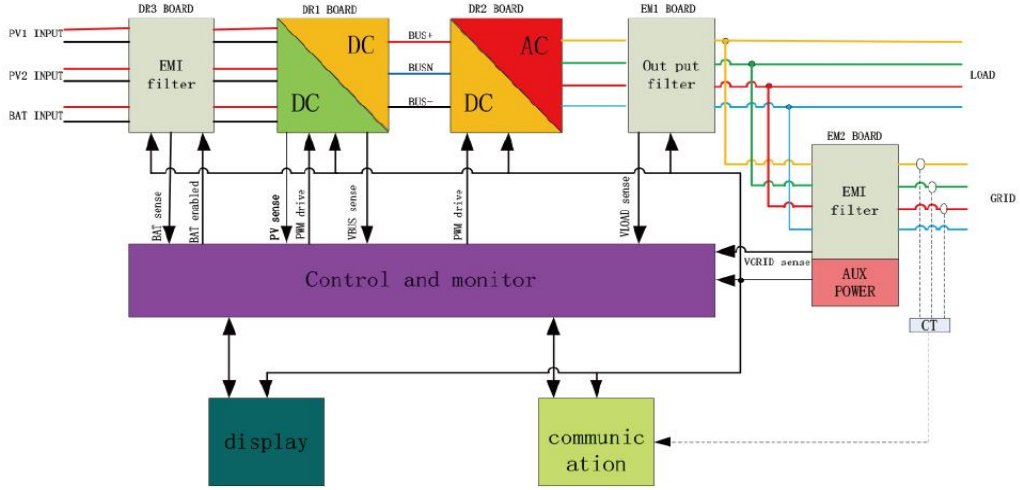
Code	Name	Description
1	Front locating hole	Transverse
2	Rear locating hole	Transverse
3	Rear locating hole	Longitudinal
4	Front locating pin	Transverse
5	Rear locating pin	Transverse
6	Rear locating pin	Longitudinal
7	Back panel	Openable
8	Back panel handle	
9	Handle	
10	Indicator	To be blue if the battery module is powered on
11	Anode socket	To connect the cathode of battery module or anode of inverter
12	Cathode socket	To connect anode of battery module below
13	Switch of battery module	To power on/off the battery module
14	Grounding point	To connect the grounding point of adjacent battery or inverter
15	BMS communication interface	To connect BMS communication interface of adjacent battery or inverter

2.3 Working principle

LC-E2 is connected with a PV string and an energy storage battery, converts the direct current of PV and battery into alternating current and outputs it to the loads. The direct current of PV can charge the battery at the same time. LC-E2 is connected with a AC power supply, bypass the output to the load. At the same time, the inverter can convert the AC input power into DC power to charge the battery.

2.3.1 Block diagram of circuits

Block diagram of three-phase circuit



3 Application and Setting of System Networking

3.1 System networking mode

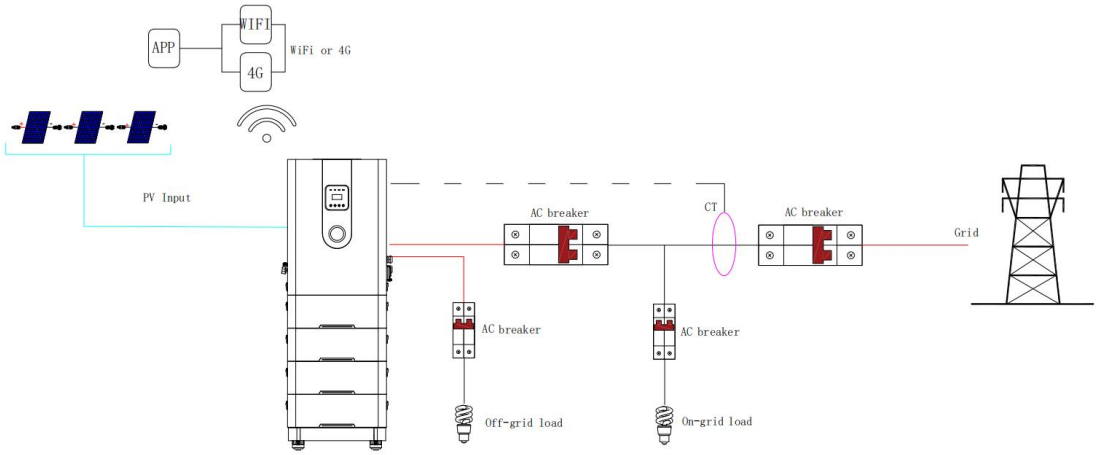
LC-E2 three-phase product networking is mainly used in household, small industrial and

commercial enterprises, pure off-grid PV energy storage system. There are two main networking modes:

- Grid and off-grid networking system.
- Pure off-gird networking system.

Networking 1: LC-E2 system networking

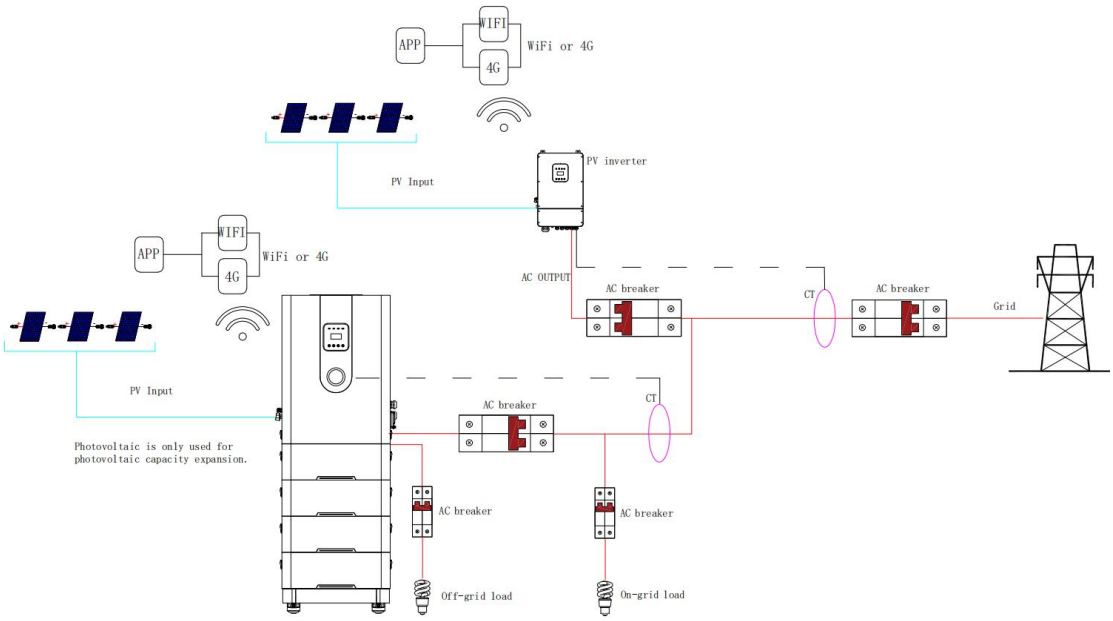
Grid and off-grid energy storage system consists of PV string, LC-E2 energy storage system, load and distribution unit, current transformer, power grid, etc. PV string converts solar energy into electric energy, which is converted to load power supply and fed to power grid through inverter. When the grid is powered off, the equipment automatically switches to off-grid (EPS) mode. At this time, the off-grid load can be used normally, but the grid-connected load cannot be used.



Instruction: the above picture is a single-line schematic diagram which is applicable to three-phase systems.

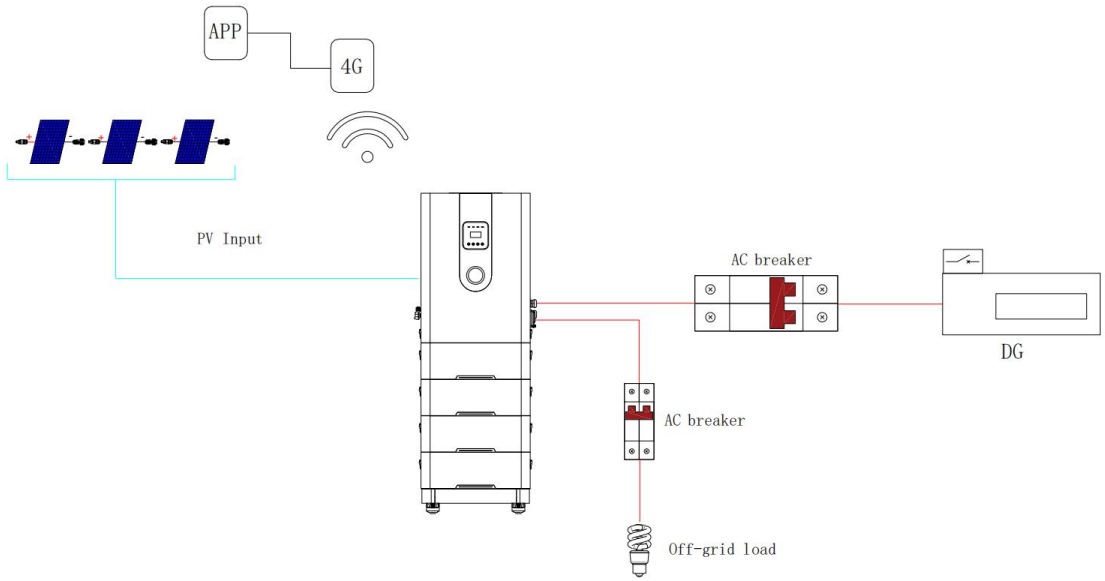
Networking 2: LC-E2 system + PV grid-connected inverter

Grid and off-grid energy storage system supports cascade with PV inverter of any manufacturer to form AC coupling system. Grid input is connected to AC grid-connected end, and off-grid load is connected to LC-E2 system. AC coupling system can effectively solve the problem of remaining power storage of PV. LC-E2 system may not be connected with PV, and can also be directly used for the transformation of original PV system.



Networking 3: LC-E2 system + diesel generator (off-grid)

Grid and off-grid energy storage system supports connection with diesel generator and is used in areas without grid coverage.



3.2 System application mode and setting

LC-E2 energy storage system can provide a variety of working modes according to different requirements.

- Self-generating and self-use.
- Peak-valley arbitrage.
- Battery preferred (standby) .

3.2.1 Self-generating and self-use

Working mode: Self-generating and self-use

PV priority: load > battery > grid

● Suitable for areas with high electricity price, low or no subsidy for Internet access.

● PV supplies power to the load first, and the excess generated power of PV is stored in the battery. When PV power generation is insufficient or there is no PV power generation at night, the battery discharges for the load, and the gap is supplemented by the power grid. This mode improves the self-use rate of PV system and the self-sufficiency rate of household energy, and saves electricity expenses.

● The working mode is "self-generating and self-use". The default charge cut-off capacity of Lenercom LC-E2 system is
100%, and the discharge cut-off capacity is 10%. If it is necessary to modify the charge or discharge cut-off capacity, refer to 8.3 “Energy Storage Control Settings”.
Instruction: Control [anti-countercurrent] {allowed/prohibited}. factory default setting {prohibited}.

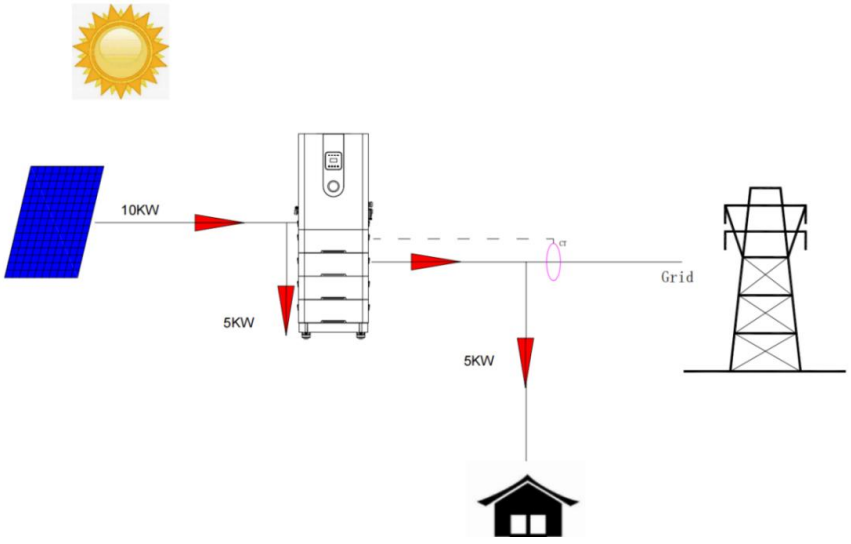
Examples of self-generating and self-use

1.When PV illumination is sufficient, PV input power is 10kW, load consumption is 5kW, and charge power of energy storage system is 5kW.

2.When PV illumination becomes weak, PV input power is 4kW, load consumption is 8kW, and discharge power of energy storage for load is 4kW.

3.When there is no illumination, the load consumes 10kW, the energy storage discharges 8kW to the load, and the grid supplies 2kW to the load.

1.



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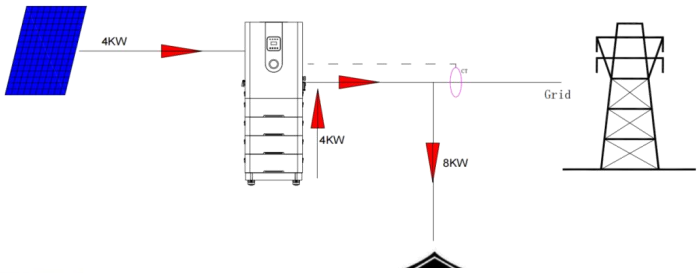

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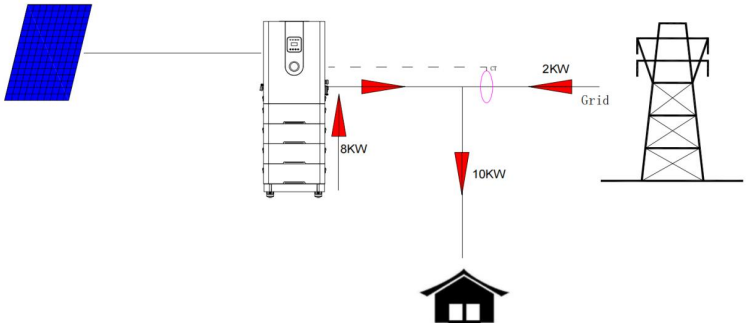


Working mode: Self-generating and self-use, surplus electricity fed to grid

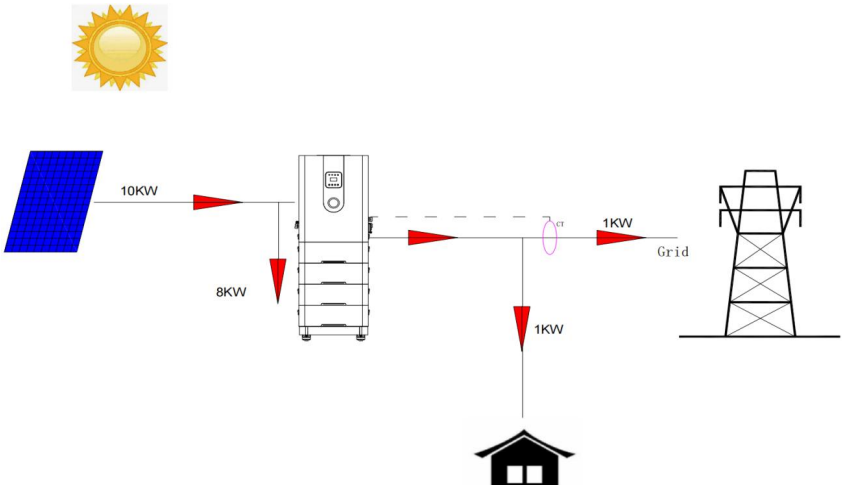
PV priority: load > battery > grid

● Suitable for areas with high electricity price, low or no subsidy for Internet access.

● PV supplies power to the load first, and the surplus generated power of PV is stored in the battery, and the surplus power is connected to the grid. When PV power generation is insufficient or there is no PV power generation at night, the battery discharges for the load, and the gap is supplemented by the power grid. This mode improves the self-use rate of PV system and the self-sufficiency rate of household energy, and saves electricity expenses.

Example of working mode:

When PV illumination is sufficient, PV input power is 10kW, load consumption is 1kW, charge power of energy storage system is 8kW, and discharge to power grid is 1kW.



3.2.2 Peak load shifting

Working mode: peak load shifting

PV priority: Battery > load > grid (charging)

PV priority: Load > battery > grid (discharging)

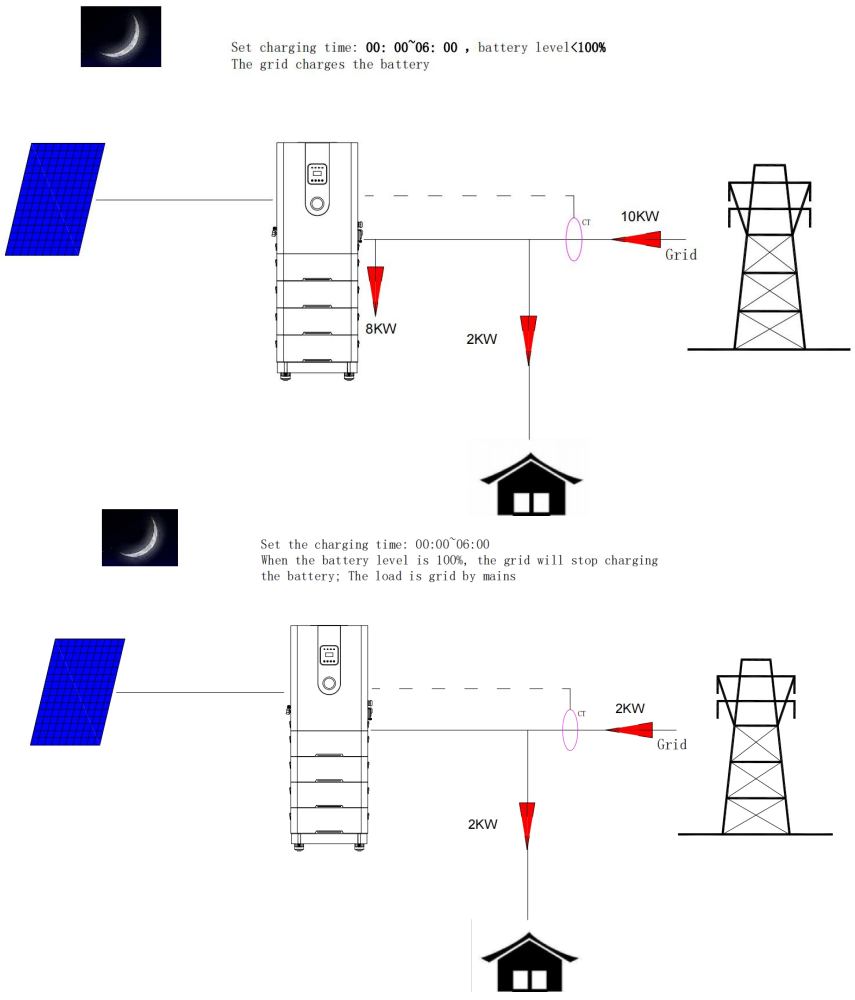
● It is suitable for large peak-valley price difference.

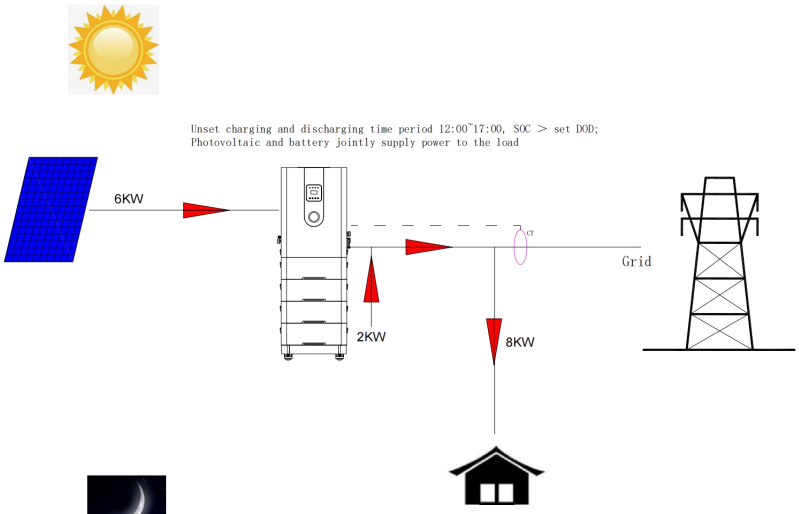
● The working mode is "peak load shifting", and the charging and discharging period is manually set, for example, the low electricity price period at night is selected for charging, during which the system charges the energy storage system with the maximum charging power, and the high electricity price period is selected for discharging, so the battery can only discharge in the discharging period, thus saving the household electricity cost.

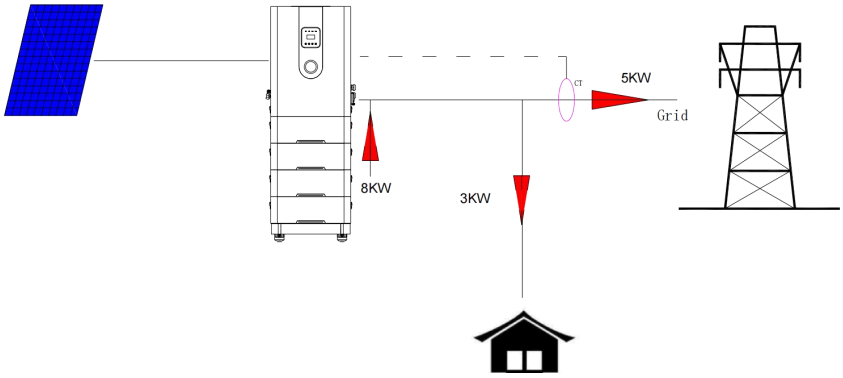
● Up to 3 periods can be set, and the charging and discharging parameters can be set with reference to 8.3 “Energy Storage”.

● This mode requires at least one set of charging and discharging time periods. During the charging time period, the grid is allowed to charge the energy storage, and during the discharging time period, it can supply power for important loads and grid connection. Other unset time periods are powered by photovoltaic power generation and batteries (in off-grid mode, the power grid is powered off, and the stored energy can be discharged at any time).

Example of peak load shifting





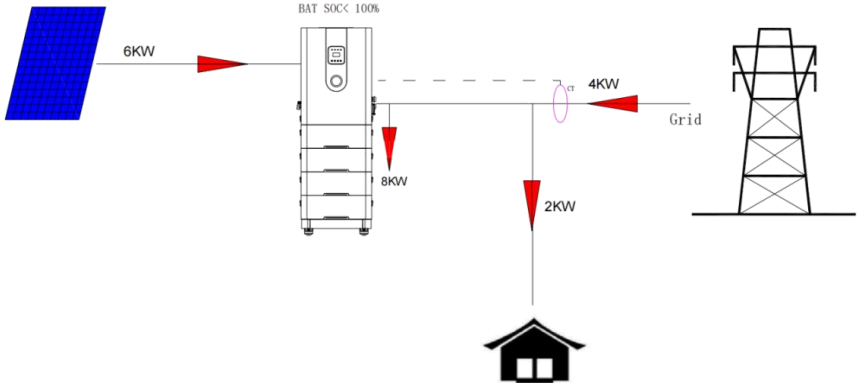


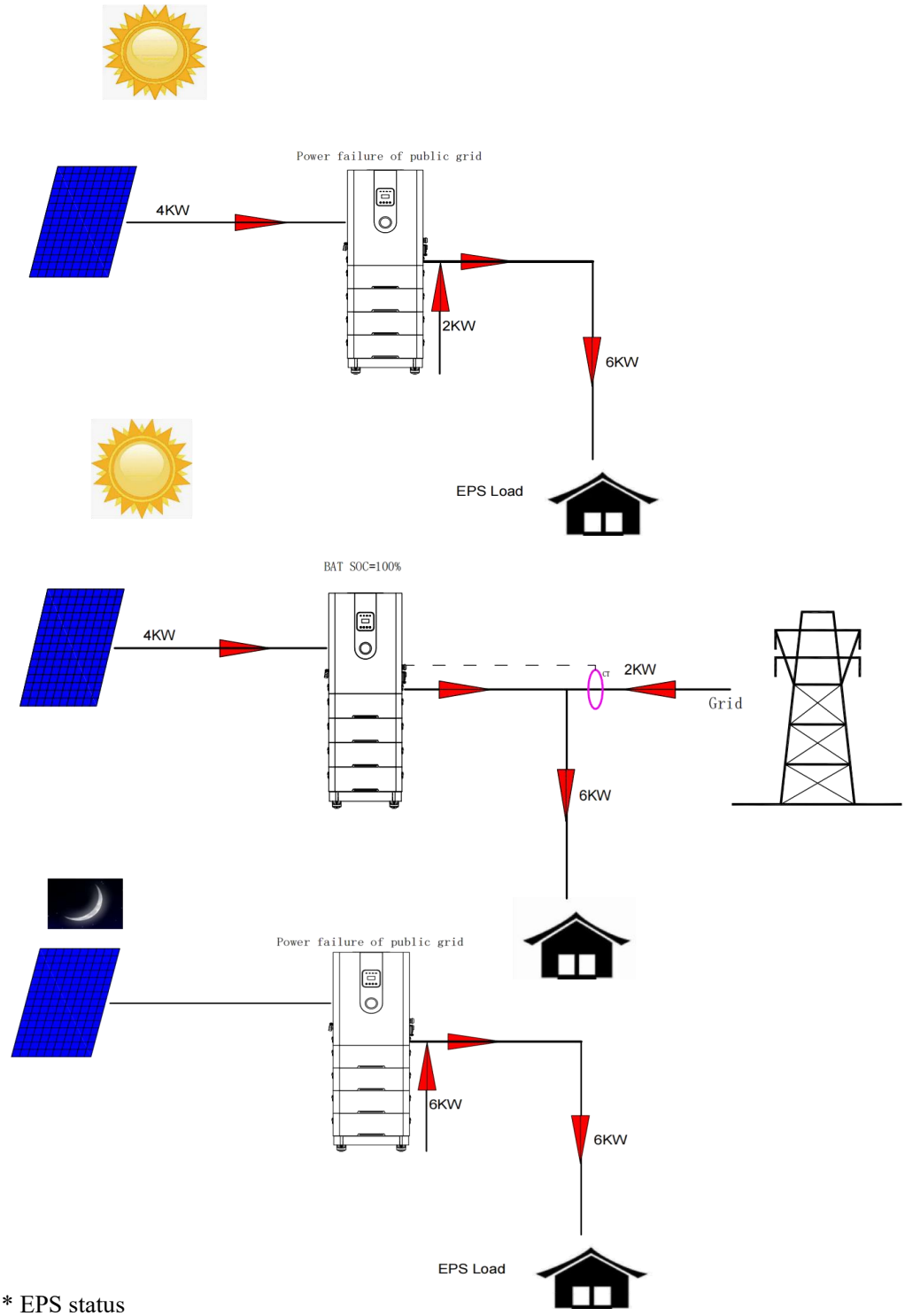
3.2.3 Battery preferred (standby)

Working mode: battery preferred (standby)

PV priority: battery > load > grid

This mode is suitable for areas with frequent power outages. When the grid is disconnected, this mode ensures that the battery has enough energy supply. In this mode, the battery will be charged at the maximum set power and will never discharge when the grid is connected.





* EPS status

When the grid is off, the system will provide emergency power through PV or battery to power the household load.

4 Installation of Equipment

4.1 Check before installation

Check of external package

Before unpacking the inverter, check the external package for visible damage, such as holes, cracks or other signs of possible internal damage, and check the models of inverter and battery

module. In case of any package anomaly or incorrect inverter model, do not open it and contact your dealer as soon as possible.

Check of fittings

Check the following list of parts to ensure no missing part.

Lenercom provides the necessary parts for installation in the box, including:

				
2 Screw	3 Expansion bolt	1 Pair of brackets	2 Pairs of MC4	N +1 Ground wire
				
N -1 Battery series wire	1 * Battery negative lead	1 * Battery positive lead	1 Battery communication	1 Current transformer
				
1 USB upgrade cable	1 BMS debugging line	1 Screwdriver	1 Instructions	1 Certificate

Instruction: "N" is the number of LC-E2 battery modules.

Data collection module has been assembled before its delivery.

4.2 Tools preparation

Category	Tools and Instruments		
Installation	 Percussion drill (bit φ 8mm)	 Torque socket spanner	Torque spanner
Category	**Tools and Instruments**		
Category name	 Oblique plier	 Wire stripping plier	 Torque screwdriver
	 Utility knife	 Crimping plier (Model: PVCZM-22100/19100)	 Multimeter (DC voltage range≥ 600V DC)
	 Removal and installation tools (Model: PVMS-HZ open spanner)	Cable tie	 Clip-on ammeter
	Marker pen	 Steel tape	
Category	**Tools and Instruments**		
Personal protective equipment	 Safety gloves	 Protective goggles	 Dust mask
	 Safety shoes		

4.3 Selection of installation location

● The product shall be installed in a well-ventilated indoor environment to ensure good heat dissipation.

● LC-E2 shall not be installed in areas where flammable and explosive materials are stored.

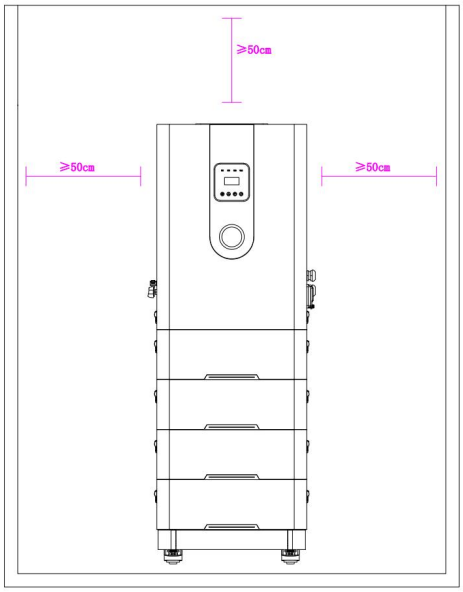
● LC-E2 will be corroded when installed in high salt spray areas, which may cause fire.

● LC-E2 shall not be installed on the flammable building materials.

● LC-E2 is heavy, so the mounting surface shall be firm and can support the inverter.

4.4 Space requirements for installation

The distance between product and surrounding objects shall be more than 50cm to ensure the sufficient heat dissipation and maintenance space as follows:

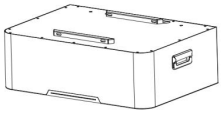
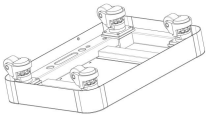


4.5 Installation steps

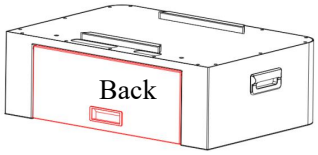
⚠Caution

The equipment shall be mounted by no less than 3 installers who shall wear the safety shoes, gloves and other protective tools.

Step 1: Take out inverter, battery, base and accessories.

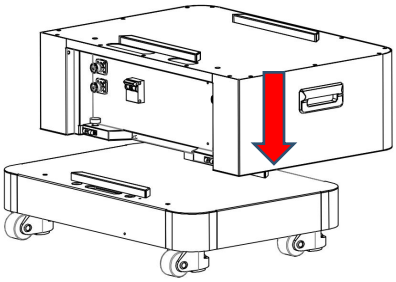
Inverter	
Battery module	
Base	

Step 2: First place the base at the installation position of equipment, take off the back panel of each battery box, and put the first battery box on the base



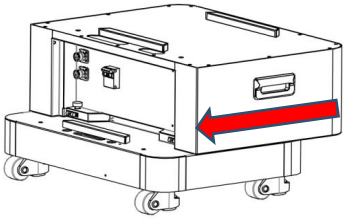
Remove the back panel of battery module

\



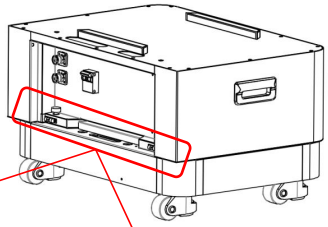
Place the battery module at the assembly position on base in the direction of arrow

In the direction of arrow, push the battery on the left and right sides at the same time to insert the limit post of battery into the limit hole of base.

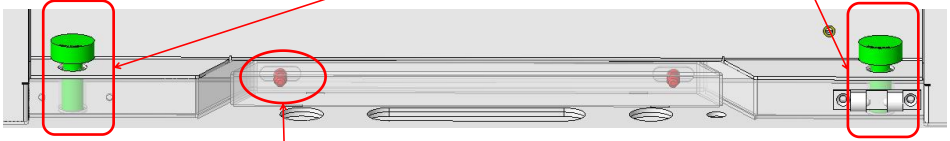


Step 3: Align the transverse locating pin at the bottom of battery box with the axis of transverse locating hole of base. push the battery to the extent that the longitudinal locating pin of battery is aligned with the longitudinal locating hole of base, put down the longitudinal locating pin at the back of battery, and complete the installation after the clamping sound of pin.

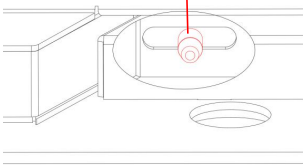
Rotate and drop two longitudinal locating pins respectively, insert the locating pin into the locating hole and complete the installation after the clamping sound of pin



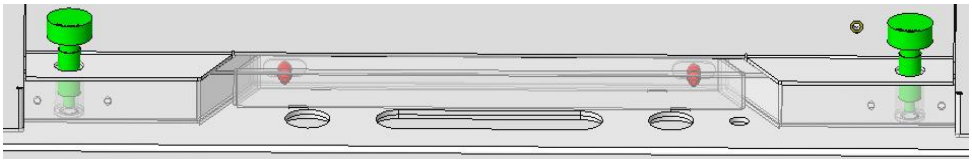
Description of correct installation: the locating pin is fully inserted into the locating hole.



Description of correct installation: the locating pin is fully inserted into the locating hole.

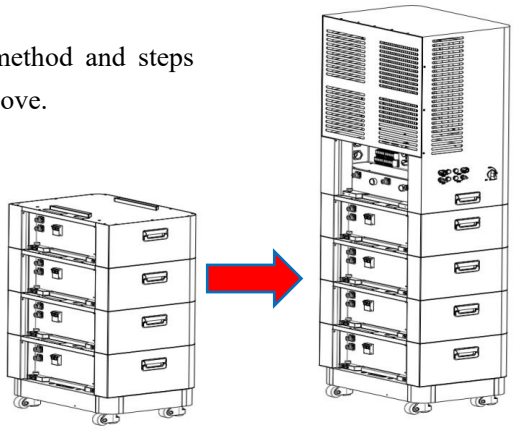


Description of wrong installation: Locating pin is not fully inserted into locating hole.



Step 5: Install the rest of the batteries and inverters according to the same method and steps as above.

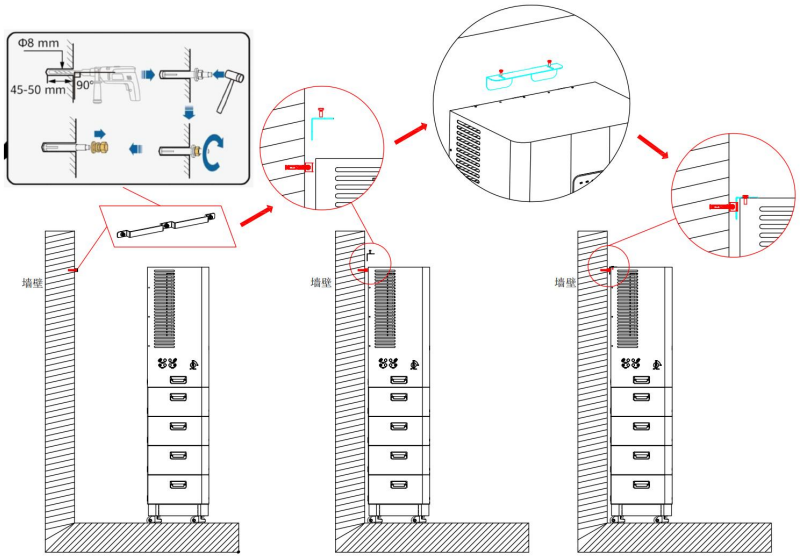
The installation method and steps are the same as above.



Step 6: Fix the equipment, and after completing all installations and debugging, apply the rear cover of battery box, install two fixing supports on the back of inverter, punch two expansion screws on the wall according to the height of screw holes of the fixing support, move the equipment against the wall, and lock the fixing support on the expansion screw.

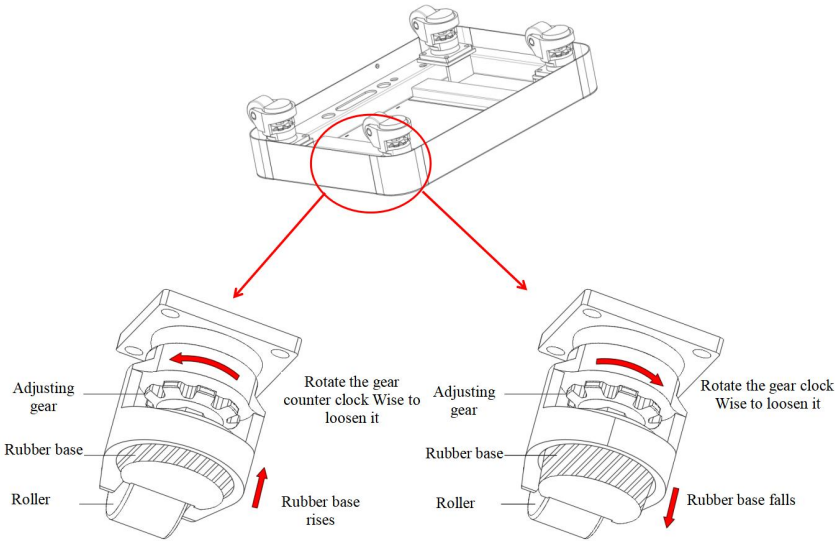
Caution

Equipment shall be installed by not less than 3 installers who shall wear safety shoes, gloves and other protective tools.



Step 7: Lock the universal wheel

After fixing the equipment, lock the universal wheel according to the following figure:



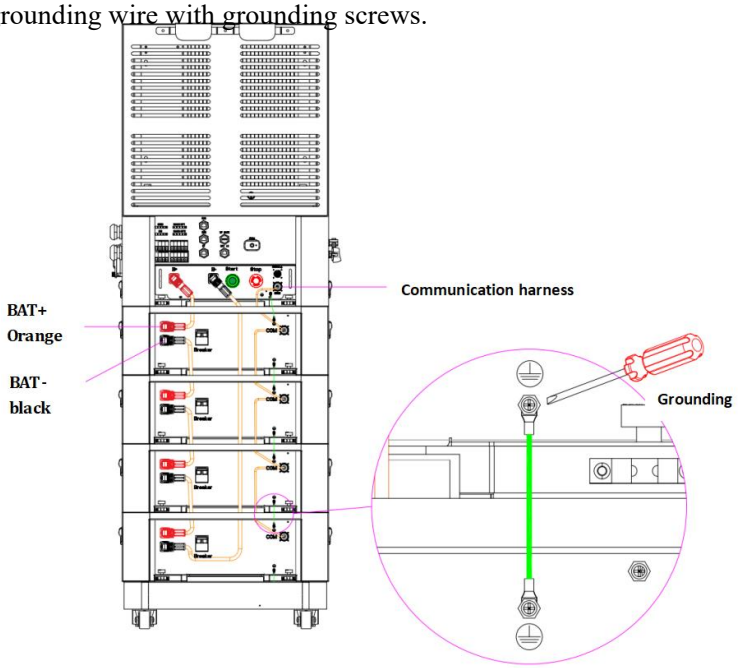
Loosen the universal wheel Lock the universal wheel

5 Electrical Connection

5.1 Internal wiring of equipment

5.1.1 Connection of grounding wire and communication wire

1. The connection wires between the battery and the inverter have orange ends on both sides for the positive pole, and black ends on both sides for the negative pole. The battery series connection wire has an orange end for the positive pole and a black end for the negative pole.
2. Connect the communication cable bundle sequentially from top to bottom, green tail(if have) of this cable at the bottom order).
3. Connect the grounding points of the base, battery module, and inverter in sequence, and secure the grounding wire with grounding screws.



5.1.2 Power line connection

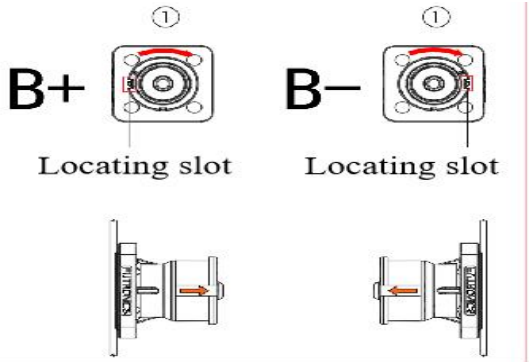
Both ends of the anode connection line between battery and inverter are orange, and both ends of the cathode connection line between battery and inverter are black.

The anode end of the battery series wire is orange and the cathode end is black.

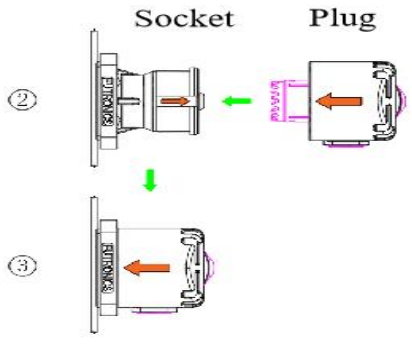
S/N	Name	Illustration	Description
1	Grounding wire		Grounding
2	Communication harness		Communication link between battery boxes Communication wire is installed from top to bottom. First, insert the plug into the socket. After pushing the metal part of the plug forward, rotate it clockWise. The connection is completed when a beep sound is heard.
3	Anode of power output line (Orange)		To connect inverter "B +" and battery "B +".
4	Cathode of power output line (Black)		To connect inverter "B-" and battery "B-".
5	Battery series wire (Black and orange)		To connect “B+” and "B -" of adjacent batteries Black end is connected with B-, and orange end with B+.

Precautions for connector installation

The locating ring of the battery anode/cathode socket can be rotated, and there are two locating slots. Before connecting the cable, make the locating slot indicated by the socket arrow face outward (B+ is to the left, B- is to the right)



The power line plug has two locating pins. Align the plug with the socket arrow, insert the power line plug into the socket, and complete the connection when a crisp sound is heard.



Power-on check of battery: after the internal cables are connected, test whether the battery high voltage system can be turned on normally according to steps 2 and 3 of Chapter 6.1. If it fails to turn on, please check again whether the internal wiring of equipment is correct and whether the connector is plugged in place. After confirming that it can be started normally, please turn off the battery high voltage system according to steps 5 and 6 of Chapter 6.2, and then complete the external wiring of the equipment.

5.2 External wiring of equipment

5.2.1 Inverter grid input and load output wires

1. AC input (Grid connection) (three-phase models)

Hybrid inverter is specially designed for three-phase power grid. Voltage is 380V and the frequency is 50Hz/60Hz (automatic detection frequency).

Miniature breaker shall be installed between the inverter and power grid, and no load shall be directly connected to the inverter

Cable Suggestions for use: choose 4-6mm² for 8kW models and 6-10 mm ² copper core wire for 10-12kW models.

Step 1: Check the grid voltage

1.1 Check whether the grid voltage/range conforms to the grid voltage range of equipment (380V between live wires and 230V between live wire and null wire).

1.2 Disconnect the AC input power supply, and turn off LC-E2 (operate 5min after shutdown) to ensure that the whole equipment is powered off.

Step 2: Select the wire to connect with cold-pressed terminal.

Step 3: Fit the grid cable through the grid port and connect the grid cable to the grid terminal.

2. Load output (BACK-UP1/BACK-UP2 connection) (three-phase models)

The inverter has grid-connected and off-grid functions. When the power grid is connected, the inverter enables the output through the AC port. Output is enabled through BACK port when power grid is disconnected.

Miniature breaker shall be installed between the inverter and load, and no load shall be directly connected to the inverter.

Cable Suggestions for use: choose 4-6mm² for 8kW models and 6-10 mm ² copper core wire for 10-12kW models.

Step 1: Check the voltage of **BACK** port

1.1 Check whether the voltage/range of **BACK** end conforms to the grid voltage range of equipment (380V between live wires and 230V between live wire and null wire).

1.2 Disconnect the AC input power supply, and turn off LC-E2 (operate 5min after shutdown) to ensure that the whole equipment is powered off.

Step 2: Select the wire to connect with cold-pressed terminal.

Step 3: Fit the load cable through **BACK** port and connect the load cable to the load terminal.

3. Generator input (DG) (Reserve development interface)

Hybrid inverter is specially designed for three-phase power grid. Voltage is 380V and the frequency is 50Hz/60Hz (automatic detection frequency).

Miniature breaker shall be installed between the inverter and generator, and no load shall be directly connected to the inverter.

Cable Suggestions for use: choose 4-6mm² for 8kW models and 6-10 mm ² copper core wire for 10-12kW models.

Step 1: Check the output voltage of generator.

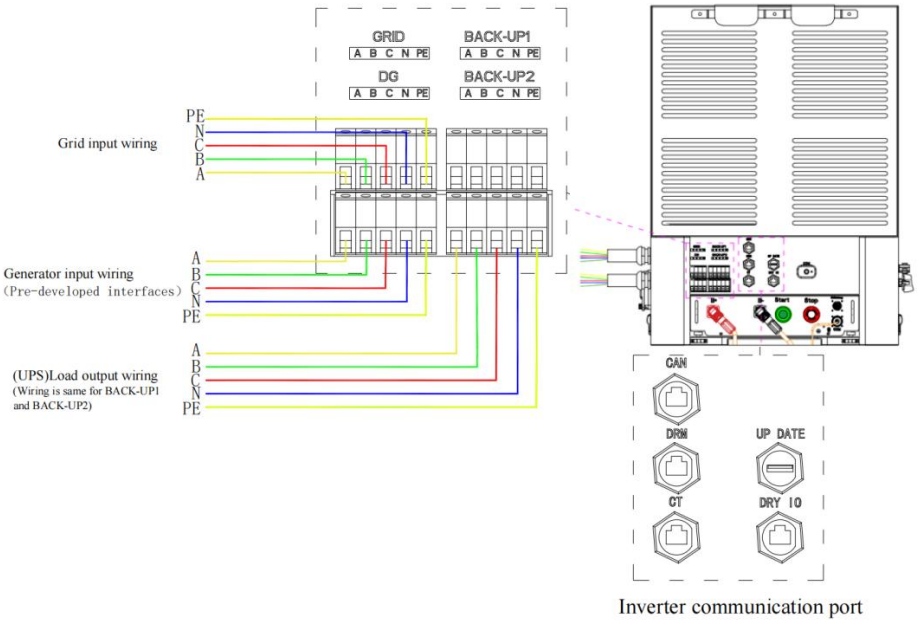
1.1 Check whether the output voltage/range of generator conforms to the grid voltage range of equipment (380V between live wires and 230V between live wire and null wire).

1.2 Disconnect the AC input power supply, and turn off LC-E2 (operate 5min after shutdown) to ensure that the whole equipment is powered off.

Step 2: Select the wire to connect with cold-pressed terminal.

Step 3: Fit the grid cable through the grid (DG) port and connect the grid cable to the grid (DG) terminal.

Schematic diagram of three-phase model wiring:



Inverter communication port

Definitions of inverter communication ports:

No.	Name	Description
1	CAN	Internal communication (parallel), not developed yet
2	DRY IO	Dry contact, not yet developed.
3	CT	To connect the grid side CT (transformer)
4	DRM	Active demand response interface
5	UP DATE	Upgrade port for USB firmware

5.2.2 PV input wiring

Instructions:

PV input voltage range of 8/10/12kW three-phase models is 180V-850Vdc, and the maximum open circuit voltage is 1000Vdc. It is recommended that the number of PV modules in series per channel is 8-16.

The open circuit voltage (VOC) of PV module shall not be greater than the maximum open circuit voltage of inverter MPPT (e.g., maximum open circuit voltage of PV < 1000V for three-phase models) .

The open circuit voltage (VOC) of PV module shall be higher than the minimum voltage of battery.

The voltage of the maximum power PV module (Vmp) shall be close to or within the optimal VMP of the inverter. If one PV module cannot meet this requirement, multiple PV modules shall be connected in series. Please refer to the table below.

Inverter model	8kW - three-phase	10kW - three-phase	12kW - three-phase
Maximum input power of PV	12kW	15kW	18kW

Number of MPPT controller channels	2 channels of MPPT / number of parallel controllers of each channel - 1 in parallel
PV charge current	13A/13A
Maximum open circuit voltage of PV array	1000V
MPPT voltage range of PV array	180V～850V

Step 1: connection steps of PV panel:

Check PV components:

1.1 Measure the voltage of module array with a multimeter.

1.2 Check whether the PV + and PV- connections between PV string and all-in-one machine are correct.

1.3 Ensure that PV module anode and cathode impedance to ground is of M Ω grade.

Step 2: wiring steps of PV connector :

1 Prepare the harness.

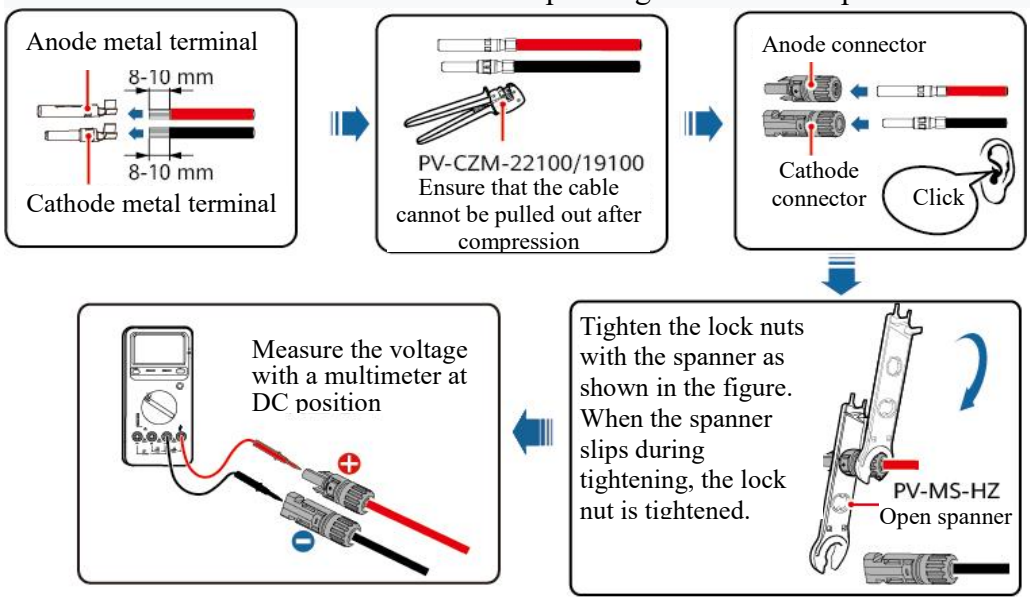
1.1 Select 12AWG conductor and cold-pressed terminal (male pin and female pin).

1.2 Strip 8—10mm insulation from wire ends.

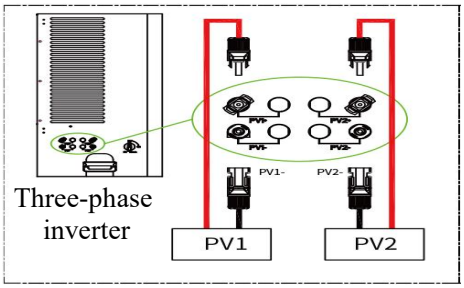
1.3 Insert the insulated wire into the pin contact and press it firmly with a special pressing clamp.

1.4 PV cable is assembled to the back of the male or female plug after passing through the connector nut and flange head. When you feel or hear a "click" sound, the pin contact component is in place correctly.

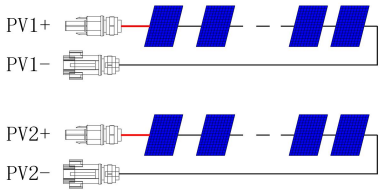
1.5 Insert the PV connector into the corresponding PV connector port on the inverter.



Use Staubli MC4 anode, cathode metal terminals and DC connectors. The use of other incompatible models of anode, cathode metal terminals and DC connectors may result in serious consequences, and the resulting equipment damage is not covered by the warranty.

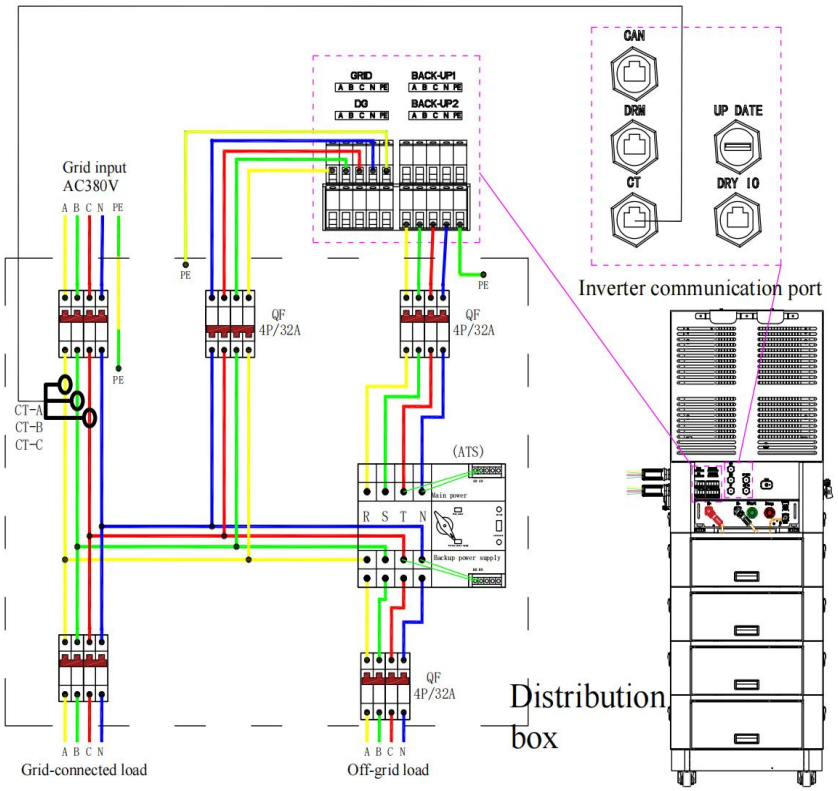


PV string connection is as shown in the following figure.

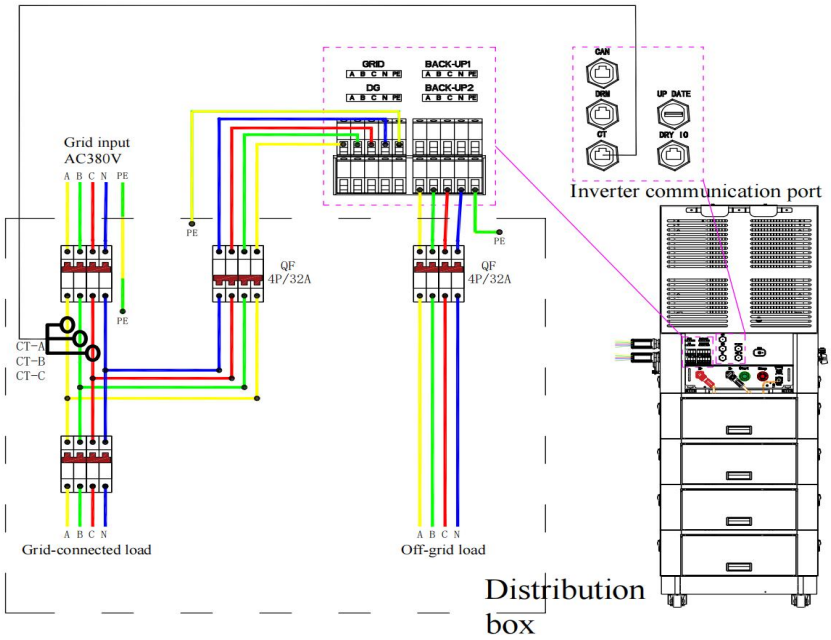


5.2.3 Distribution box wire:

1. Wiring diagram with dual power switch (three-phase models).



2. Wiring diagram without dual power switch (three-phase models):



5.3 Precautions for CT installation:

5.3.1 CT Installation of Three-phase electricity

Caution

All works shall be performed by trained operators with safe and appropriate tools.

This product is an open-close transformer. Please pay attention to the cleanliness of magnetic core surface when installing. If there is dirt on the magnetic core surface, the accuracy of the product will deteriorate.

1.Before the transformer is connected to the equipment, please ensure that the circuit is powered off to prevent electric shock.

2.Turn on CT as shown in Picture 1.

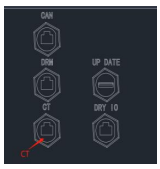
3.Clip the CT on the cable under test. Ensure that the maximum current in the circuit does not exceed the maximum input current of CT. the current is in the direction of the arrow on the CT shell, i.e. the arrow points to grid side.

4.Fasten the CT. At this time, the cable under test shall be inside the CT window (see Picture 2)

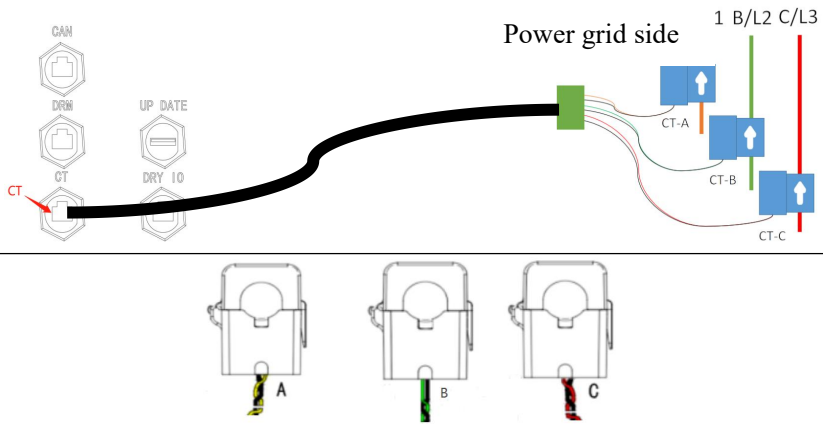
5.Fix the CT to the cable under test with nylon tie to prevent the CT from sliding (see Picture 3)

6.Connect the CT output black line (RJ45) to the CT communication port of inverter. (See Picture 4).

7.After checking that the circuit is correct, turn on the power supply that CT starts to measure the current in the circuit.

Picture 1	Picture 2	Picture 3	Picture 4
			
Turn on CT	Install CT	Fix CT	Connect CT output
Referring to the above installation method, connect the A, B, and C phase cables to the CT, as			

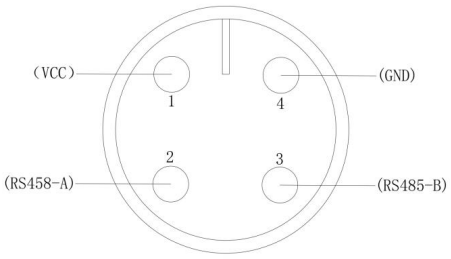
shown in the following diagram:



Phase A(U)	Phase B(V)	Phase C(W)	RJ45 8pin
Yellow-black stranded wire	Green-black stranded wire	Red-black stranded wire	CT interface of inverter

5.4 Definitions of COM interfaces

Inverter COM port



Definition of COM interface:

Pin	Description	Network name	Type	Description
1	Power supply	VCC	POWER	+5Vdc power supply
2	Data communication	A	I/O	RS485_A line
3	Data communication	B	I/O	RS485_B line
4	Power supply grounding	GND	GND	GND

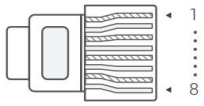
5.5 Installation of WiFi data collector

5.5.1 Funtion introduction

Data collection bar (WiFi) can monitor PV power generation system for a long time by collecting and recording the working status and power generation of inverter. Collection bar can be connected with a single inverter through "RS485 interface", and receive various information of PV system from the inverter. Meanwhile, the system cloud platform can provide powerful data support for the collection bar. Collection bar sends the data to the monitoring platform wirelessly, and the real-time status and historical data of PV system can be presented in the form of charts, which is intuitive, clear and easy to understand. WiFi module is integrated inside the collection bar, so data can be transmitted through WiFi network.

5.6 DRM Connection

The DRM supports several demand response modes by transmitting control signals as shown below.



PIN	1	2	3	4	5	6	7	8
Definition	DRM1/5	DRM2/6	DRM3/7	DRM4/8	+5V	DRM0	GND	GND

Mode	Requirement
DRM0	Operate the disconnection device
DRM1	Do not consume power
DRM2	Do not consume at more than 50% of rated power
DRM3	Do not consume at more than 50% of rated power AND Source reactive power if capable
DRM4	Increase power consumption (subject to constraints from other active DRMs)
DRM5	Do not generate power
DRM6	Do not generate at more than 50% of rated power
DRM7	Do not generate at more than 50% of rated power AND Sink reactive power if capable
DRM8	Increase power generation (subject to constraints from other active DRMs)

6 Power On/Off

6.1 Power on

Step 1: Check whether the harness is correctly connected according to the requirements of the manual (grounding wire, battery power line, communication wire, external power distribution (including CT) and PV wire). Please confirm that all of them have been connected properly and have passed the safety acceptance.

Step 2: Close the BAT Breaker on the right side of inverter cabinet.

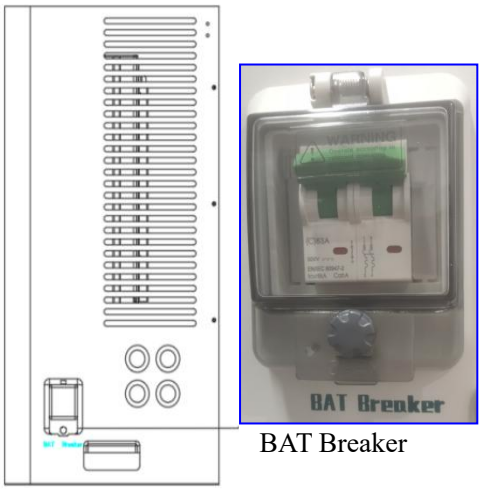
Step 3: Turn on the DC breaker of the battery box body from top to bottom or from bottom to top.

Step 4: After confirming that the emergency stop button (STOP) is open (normally close contact is closed), press the green start button (Start)1.5 second on the back panel of inverter cabinet. It is estimated that the click sound of internal relay after 2—3s will be heard, and the high-voltage system of battery pack will be started.

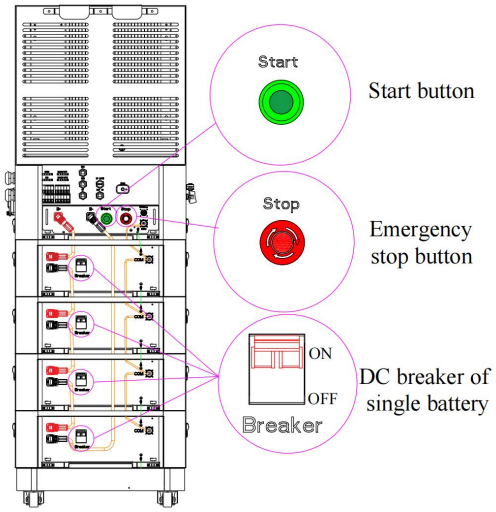
Step 5: Turn the PV rotary switch on the left side of inverter cabinet. If the PV modules are not installed, you do not need to turn on the PV switch.

At this point, the all-in-one machine is started.

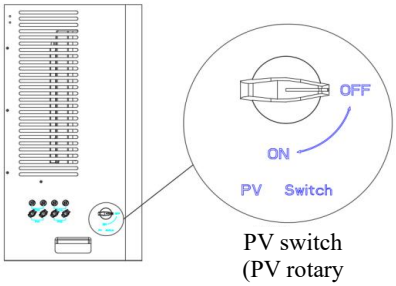
The legend of operation is attached as follows:



BAT Breaker



① Open BAT breaker of inverter cabinet.
② Turn the DC breaker of single battery to ON from bottom to top.
③ Hold down Start button (green)1.5 second.
④ PV rotary switch Rotate it to ON position.



PV switch
(PV rotary

6.2 Shutdown

Caution

If the all-in-one machine is out of service for a long time, please make sure that the power is above 50% of SOC before shutdown, and replenish the power every 3 months. Do not store the machine for a long time when the power is lower than 10% of SOC.

Step 1: Disconnect the EPS from the electricity load.

Step 2: Disconnect the grid from the GRID of all-in-one machine.

Step 3: Turn the PV rotary switch to OFF position.

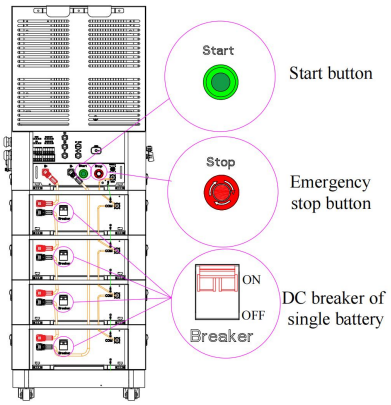
Step 4: Disconnect the BAT Breaker on the right side of inverter cabinet.

Step 5: Press the emergency stop button (STOP) to shut down the high-pressure box system (rotate it to the right and return it to the open status).

Step 6: Disconnect DC breaker of each battery box from top to bottom.

At this point, the all-in-one machine is shut down.

① Press the emergency stop button (restore before starting up) .
② Switch the DC breaker of single battery to OFF from top to bottom in sequence .



7 Instructions of APP

7.1 Product Introduction

Lenercom APP is a client for PV and energy storage system monitoring and control provided for LC-E2. Customers can remotely view the operating parameters of LC-E2 through APP, monitor the running status and working conditions of equipment, and remotely issue control commands, thus realizing remote management of LC-E2.

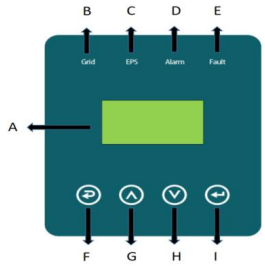
7.2 APP download

(1) Overseas Android users visit Google Store and search for "Lenercom" to download (or download by scanning QR code on the last page of manual).

(2) IOS users visit app store and search for "Lenercom EMS" to download for installation (or download by scanning QR code on the last page of manual).

8 Setting

8.1. Control panel



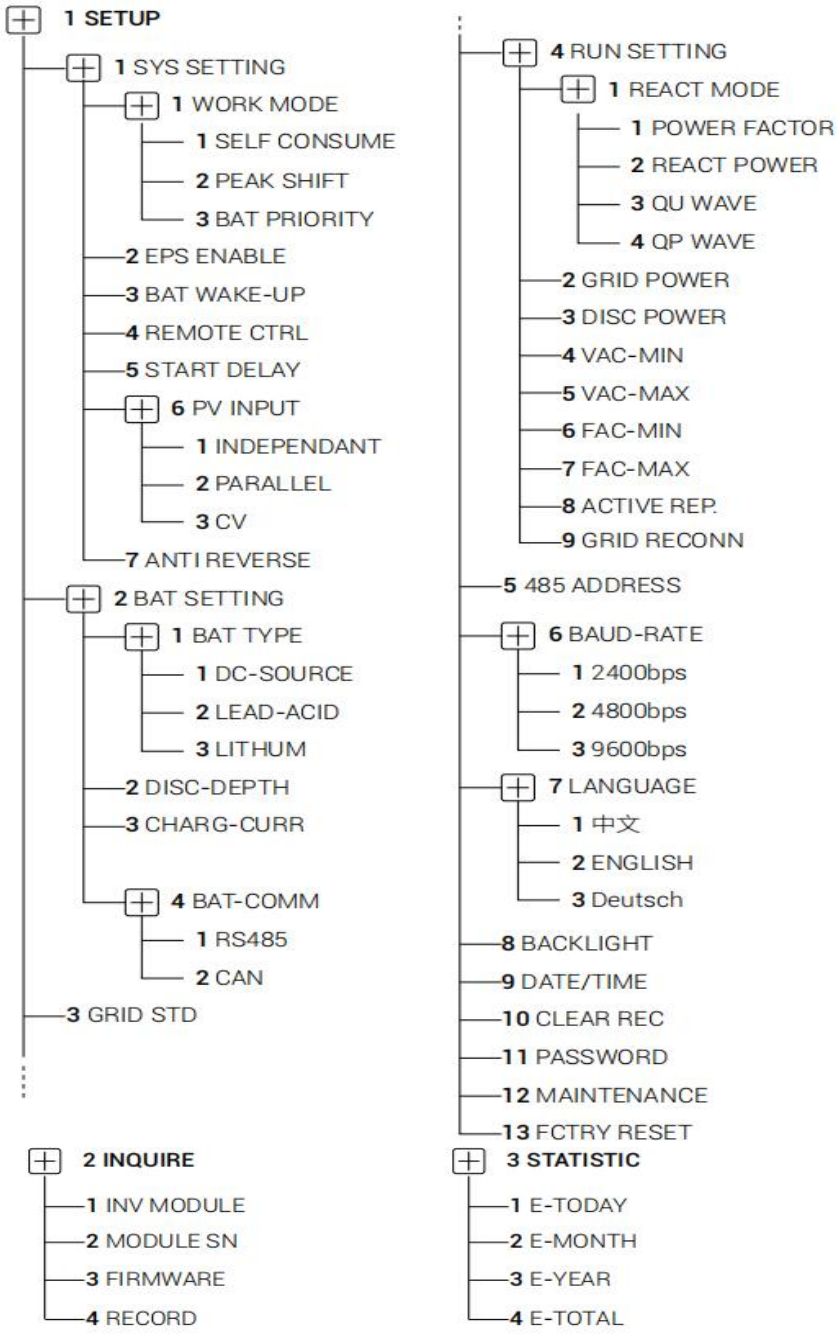
S/N	Name	Description
A	LCD display	To display all information about the whole machine
B	Indicator	On: Inverter works in grid-connected mode Off: Inverter works not in grid-connected mode
C		On: Inverter works in off-grid mode Off: Inverter works not in off-grid mode
D		On: Warning for whole machine Off: No warning for whole machine
E		On: Serious fault of whole machine Off: No fault of whole machine
F	Touch screen buttons	Esc: Return from the current setting interface
G		Up: Move the cursor up or increase the setting value
H		Down: Move the cursor down or decrease the setting value
I		Enter: Confirm and save the current settings

8.2 Description of LED indicator

Status of whole machine	Grid (Green)	EPS (Green)	Alarm (yellow)	Fault (red)
Initialization	Off	Off	Off	Off
Standby	Off	Off	Off	Off
Grid-connected	On	Off	Off	Off
Off-grid	Off	On	Off	Off
Bypass	Off	On	On	Off
Fault	Off	Off	Off	On

8.3 Quick setup guide

Summary of display items



8.4 Operation method of setting item

① Cycle interface, touch the ESC button lightly.

② Press Enter button and click Settings.

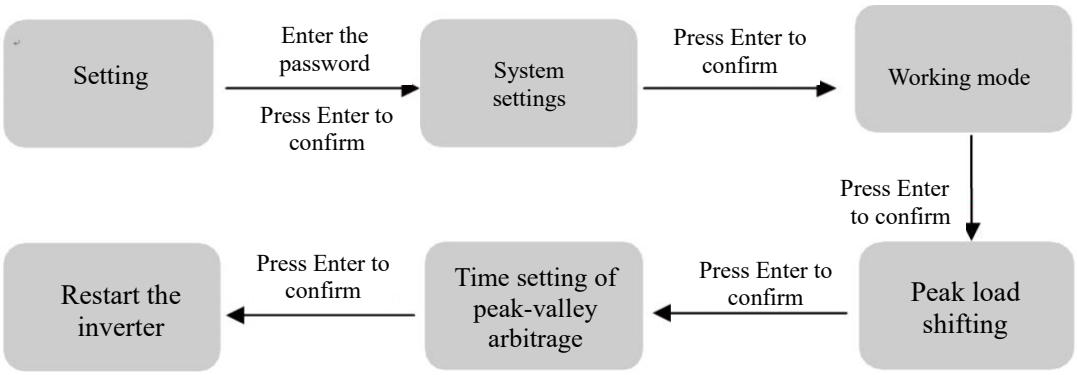
③ Enter password: 00000 ,Click Enter to the next step.

④ Enter the setting menu

① ② ③ ④

Examples:

Peak load shifting



8.5 Detailed description of display and setting parameters

8.5.1 Description of parameter information

Error information

·Numbers represent error codes and text is error message.

·Refer to Chapter 12 for contents.

NOTE: When appears in the upper right corner of the screen , you cannot turn the page, you need to press to unlock it first.

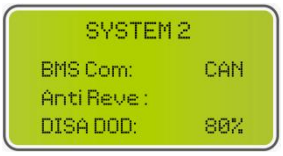
System setting 1

·State: Set the working mode of the whole inverter. Including: SELF CONSUME, PEAK SHIFT and BAT PRIORITY.

·Grid standard: Displays the actual set grid standard.

·PV input mode: The displayed value is the set value for the PV input type, including INDEPENDANT, PARALLEL, CV.

System setting 2

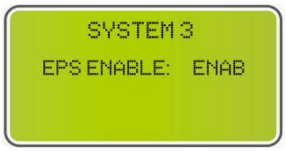


·BMS Com: Battery Management System communication mode, Including CAN or RS485.

·Anti-Reverse :Indicates whether the inverter is not allowed to generate power to the grid, including DISABLE, ENABLE.

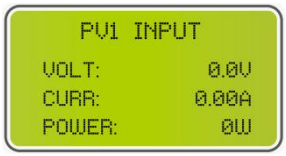
·DOD: The depth of discharge of the battery. When the battery is discharged beyond this setting, the inverter will report a low or undervoltage alarm and the battery stops discharging.

System setting 3



·EPS ENABLE: Enables the battery to supply power to the load when the grid and PV are off, which is enabled by default.

PV1 Input display interface

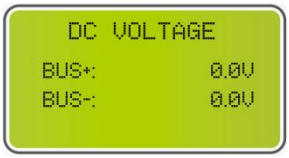


- PV1 input real-time voltage.
- PV1 input real-time current.
- PV1 input real-time power.

PV2 Input display interface

·PV2 input real-time voltage.
·PV2 input real-time current.
·PV2 input real-time power.

DC Voltage interface



·BUS+: Real-time voltage of bus capacitor of the inverter.
·BUS-: Real-time voltage of bus capacitor of the inverter.

Battery interface

·Battery real-time voltage.
·Battery real-time current.
·STA: Battery status.

C : Indicates that the battery is chargeable (from the BMS).

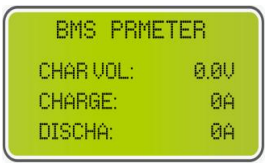
D : Indicates that the battery can be discharged (from BMS).

F : The battery requires forced charging (from BMS).

Battery information interface

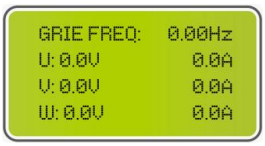
·TYPE: Battery type:(lead-acid, lithium battery).
·TEMP: Battery temperature.
·SOC: Percentage of battery capacity from the BMS.

Battery current interface



·CHAR VOL: Max. charging voltage requested by the battery BMS.
·CHARGE: Max. charging current requested by the battery BMS.
·DISCHA: Max. discharging current requested by the battery BMS.

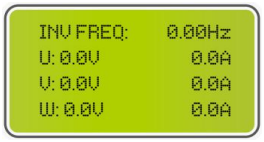
Grid-connected



• GRID FREQ: Grid real-time frequency.
• U: Gird-phase U real-time voltage | CT real-time current.
• V: Gird-phase V real-time voltage | CT real-time current.
• W: Gird-phase W real-time voltage | CT real-time current.

CT: Current transformer

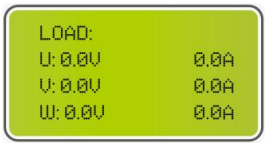
INV



INV FREQ: Grid real-time frequency.
U: INV -phase U real-time voltage | INV -phase U real-time current.
V:INV -phase V real-time voltage | INV -phase V real-time current.
W: INV -phase W real-time voltage | INV -phase W real-time.

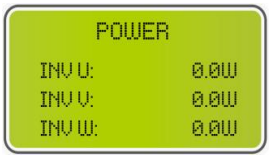
LOAD

Synonymy: BACK-UP/EPS/LOAD



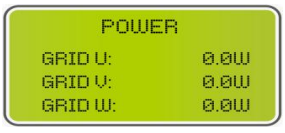
·U: Load-phase U real-time voltage | Load-phase U real-time current.
·V: Load -phase V real-time voltage | Load-phase V real-time current.
·W: Load -phase W real-time voltage | Load-phase W real-time current.

INV POWER



·INV U: INV -phase U power.
·INV V: INV -phase V power.
·INV W: INV -phase W power.

GRID POWER



·GRID: GRID -phase U power.
·GRID: GRID -phase V power.
·GRID: GRID -phase W power.

The CT arrow points to the power grid. The discharge from the inverter to the grid is “+”, and the opposite is “-”.

LOAD POWER PER

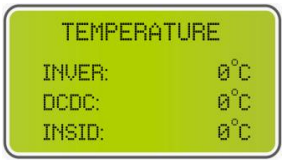
·U : Load-phase U power percentage.
·V : Load-phase V power percentage.
·W: Load-phase W power percentage.

POWER

·PV : PV power.

·BAT: Battery power.

Temperature



·INVER: DC/AC temperature.

·DCDC: DC/DC temperature.

·INSIDE: Internal ambient temperature.

State

SYS: Display complete inverter status information, Including: Initialization, Standby,PV connected to grid, Battery connected to Grid, Hybrid power supply, Fault, Service ,Self -check, Off gird, grid, INV to PFC , Charging enable, Discharge enable, Force charge enable, etc.

·INV: Displays the inverter status information.

·DCDC: Displays charging and discharging status information.

8.5.2 Description of setting item:

USER

·SETUP: Press ↩ to enter user settings interface.

·INQUIRE: Query inverter model, serial number,software version.

·STATISTIC: View inverter operating statistics.

Password

·Enter the password required for setting. The default password is“00000”.

·Press ∧ or ∨ to adjust the number, press ↩to move the cursor forward, and press ↪ move the cursor backWard.

Setup

4: RUN SETTING 5:
485 ADDRESS 6:
BAUD RATE
7: LANGUAGE
8: BACKLIGHT
9: DATE/TIME
10: CLEAR REC
11: PASSWORD
12: MAINTENANCE
13: FCTRY RESET

This interface is used for various information inquiry menus.

·Press ∧/ ∨ to select the corresponding option.

·Press ↩ to enter the selected menu.

·Press ↪ to return to the user interface.

·There are 13 options in total.

8.5.3 System setup:

SYS setting

·This interface is used to access system information.

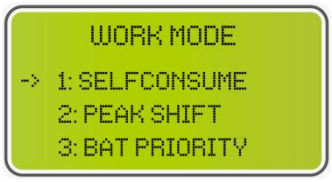
·Press ⓐ/ⓥ to select corresponding option.

·Press ⏎ to enter the selected menu.

·Press ⮌ to return to the setting interface.

·There are 11 options in total.

Work mode



·This interface is used to select the working mode.

·Press ⮌ to return to setting interface.

Peak shift work time

·This interface is used to select the working mode.

·Press ⮌ to return to setting interface.

·Select the peak shift mode, you also need to set the charge and discharge time.

·It's allowed to set 3 charging and discharging periods.

When setting the time, ensure that the time of the inverter is the local time.

·Press ⏎ to enter the next menu.

·This parameter is set to one day. If the specified time conflicts, the first time is executed as the primary time. If the three time ranges do not conflict, the three time ranges are executed sequentially.

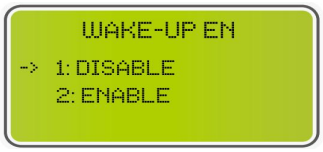
·This interface is used to adjust the timing of battery charging and discharging during peak periods.

·Press ⓐ/ⓥ to select the corresponding option.

EPS enable

· When the Grid and PV are powered OFF, enable the battery to supply power to the load, default option is enable.

Battery wake-up



· When the battery is low and the battery relay has been disconnected, the inverter will send a signal through the BMS to the battery force-suck relay and the inverter will charge.

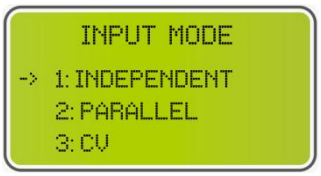
· The default option is disabled. (Supported by partial lithium batteries)

·If you want to use this function, please consult your dealer for supported battery brands. Use only when the battery is too low.

Sleep enable

·Reserved.

PV input mode



·Setup of PV Input mode.
·End users please select INDEPENDENT mode.
·PARALLEL & CV modes for testing purposes only.

Anti Reflux

·Anti- Reflux: Whether the inverter is not allowed to supply power to the grid.
·The default option is disable.

Home load

·Press ⓐ/ⓥ to select the corresponding option.
·Press ⏎ to confirm.

8.5.4 Battery parameter

Bat setting

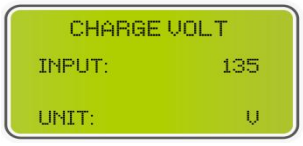
·This interface is the battery parameters menu.
·Press ⓐ/ⓥ to select corresponding option.
·Press ⏎ to enter the selected menu.
·Press ⮌ to return to setting interface.

Bat type

·This interface is used to select battery type.
·Press ⓐ/ ⓥ to select corresponding option.
·Press ⏎ to enter the selected menu.
·Select the LEAD-ACID , press ⏎ to enter LEAD-ACID interface.
·Option 1 is used for R&D testing and is disabled for customers.

Lead-acid battery parameter

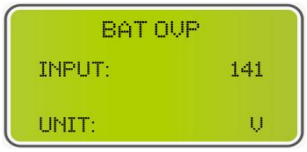
·This interface is LEAD-ACID battery parameters menu.
·Press ⓐ/ ⓥ to select corresponding option.
·Press ⏎ to enter the selected menu.



· This interface is used to set the lead acid battery charging voltage. (The input value ranges from 135 to 600).

· This interface is used to set the lead-acid battery discharging voltage.(The input value ranges from 108 to 600).

· Cut-off discharge voltage, as recommended by the battery manufacturer.



· This interface is used to set the lead acid battery charge protection voltage. (The input value ranges from 141 to 600).

· Charge protection voltage, as recommended by the battery manufacturer.

·This interface is used to set the lead acid battery capacity. It is related to the input power. (The input value ranges from 50 to 1000).

· The battery capacity setting will affect the maximum charging current. For example, if it is set to 100Ah, the maximum charging current will be 100A×0.2=20A.

Bat-comm

·This interface is used to select battery communication BMS type.

·Press ⓐ/ ⓥ to select corresponding option.

·Press ⊖ to confirm.

·The default option is CAN.

Grid standard

4: UK
5: VDE
6: KR
7: PHI
8: CN
9: US-CA
10: THAIL
11: ZA
12: CUSTOM
13: POL
14: EN50549
15: VDE4105
16: JPN
17: ITA
18: SLO
19: CZE
20: SWE
21: HU
22: SK

·This interface is used to select Grid standard.

·Press ⓐ/ ⓥ to select the corresponding option.

·Press ⊖ to confirm.

1:AU-Australia	240V/415V 50Hz
2:AU-W-Western Australia	240V/415V 50Hz
3:NZ-New Zealand	240V/415V 50Hz
4:UK-United Kingdom	230V 50Hz
5:PK	230V 50Hz
6:KR-Korea	220V/380V 60Hz
7:PHI-Philippines	110V/220V 60Hz
8:CN-China	220V/380V 50Hz
9:US-CA-America	120V/240V208V/240V 60Hz
10:THAIL	220/380V 50Hz
11:ZA	230V 50Hz
12:CUSTOM-User defined	-
13:POL	230V/380V 50Hz
14:EN50549	217V/220V/240V380V/400V 50Hz/60Hz
15:VDE4105-Germany	230V/380V 50Hz
16:Japan	110V/190V/60Hz
17:Italy	230V/380V/50Hz
18: Slovenia	230V/380V/50Hz
19: Czech Republic	230V/380V/50Hz
20: Sweden	230V/380V/50Hz
21: Hungary	230V/380V/50Hz
22: Slovakia	230V/380V/50Hz

If none of the above options are available, please consult your dealer.

8.5.5 Run setting

Run setting

·This interface is run setting menu.

·Press ⓐ/ ⓥ to select the corresponding option.

·Press ⓔ to enter the selected menu.

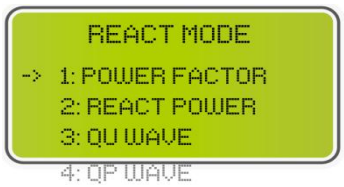
· To modify the factory default settings, please contact your dealer.

React mode

·This interface is used to select react mode.

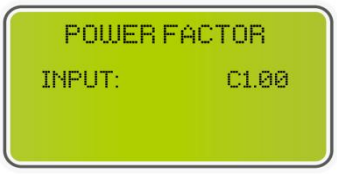
·Press ⓐ/ ⓥ to select the corresponding option.

·Press ⓔ to enter the selected menu.

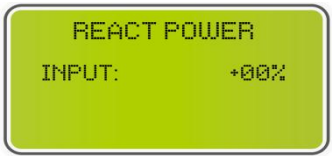


·QU WAVE (Reserved)

·QP WAVE (Reserved)

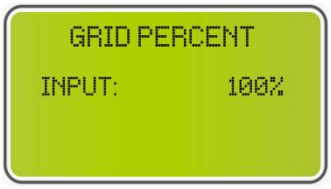


The input value should range between L0.80 and L0.99 or C0.8 and C1.00.



The input value should range between -60% and +60%, which varies with the standard.

Grid power

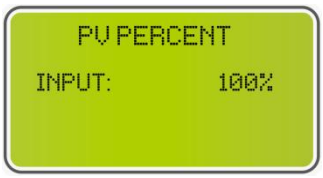


The input value is the power percent of the grid.

Discharge power

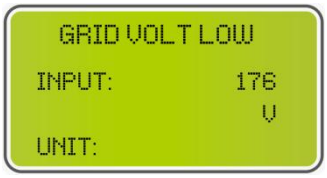
The input value is the power percent of battery discharge.

PV power



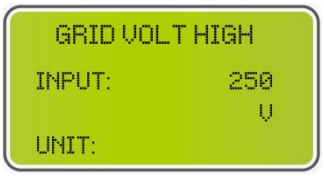
The input value is the power percent of PV.

VAC-Min



The input value of grid low voltage. (This is valid only if the grid standard is "custom").

VAC-Max

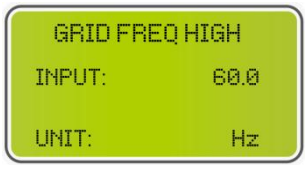


The input value of grid high voltage. (This is valid only if the grid standard is "custom").

FAC-Min

The input value of grid low frequency. (This is valid only if the grid standard is "custom").

FAC-Max



The input value of grid high frequency.(This is valid only if the grid standard is "custom").

Active rep

This interface is used to enable or disable the relevant function for on-grid operation.

·Press ⓐ/ ⓥ to select corresponding option.

·Press ⓔ to enter the selected menu.

1: PWR-VOLT RES	Generation voltage response
2: PWR-FREQ RES	Generation frequency response
3: PFC-VOLT RES	Charging voltage response
4: PFC-FREQ RES	Charging frequency response
5: ACTIVE ISLAND	Active island detection
6: LEAK CURRENT	Leakage current detection
7: INSULATION DETE	Insulation Inspection

Active Island

- Press ⓐ/ ⓥ to select corresponding option.
- Press ⓔ to confirm.

Grid reconnect

This feature is a custom function, the default is allowed and does not need to be set. For adjustment, please consult your dealer.

485 address

This interface is used to set 485 address.

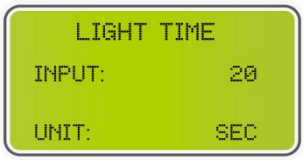
Baud rate

This interface is used to select baud rate.

Language

This interface is used to select language.

Backlight



This interface is used to set backlight duration of LCD.

Date/time

This interface is used to set date and time.

Clear REC

This interface is used to clear operation history.

Password

This interface is used to set password.

Maintenance

Reserved.

Factory reset

This interface is used to reset the inverter.

8.5.6 Statistics

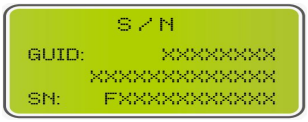
Inquire

Press ⓐ/ ⓥ to select corresponding option.
Press ⊖ to enter the selected menu.
Press ⊜ to return to other interface.

INV module

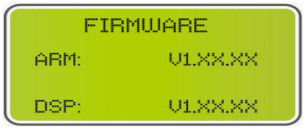
This interface displays inverter model.

Module SN



This interface displays module SN.

Firmware



This interface displays software version.

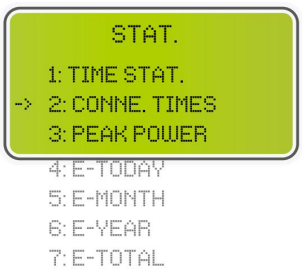
Running records

This interface displays running recorders.

Diagnose

For internal use in the factory.

Statistic



This interface displays inverter operation statistics.
1: Displays inverter operation and grid-connection time statistics.
2: Displays inverter Grid-connection times.
3: Displays power peak in history and for the day.
4: Displays the amount of power generated for the day (kWh).
5: Displays the amount of power generated for the month (kWh).
6: Displays the amount of power generated for the year (kWh).
7: Displays the total amount of power generated (kWh).

NOTE: If the inverter is shut down before 24:00 of the day, the statistics of the day will not be stored.

9 Technical Data

9.1 Parameter list of three-phase model

Model		LC-E2-810T-G	LC-E2-815T-G	LC-E2-815T	LC-E2-820T	LC-E2-825T	LC-E2-830T
PV input	Maximum PV input power	12kW	12kW	12kW	12kW	12kW	12kW
	Maximum PV input voltage	1000V	1000V	1000V	1000V	1000V	1000V
	MPPT voltage range	180～850V	180～850V	180～850V	180～850V	180～850V	180～850V
	MPPT voltage range at full power	330～850V	330～850V	330～850V	330～850V	330～850V	330～850V
	Maximum PV input current	13A/13A	13A/13A	13A/13A	13A/13A	13A/13A	13A/13A
	PV short circuit current	16A/16A	16A/16A	16A/16A	16A/16A	16A/16A	16A/16A
	Number of MPPT / Maximum number of strings in parallel of each MPPT	2/1	2/1	2/1	2/1	2/1	2/1
Battery parameters	Input voltage range of battery	166～233V	249～350V	125～175V	166～233V	208～292V	249～350V
	Rated voltage of battery pack	204.8V	307.2V	153.6V	204.8V	256V	307.2V
	Battery capacity	5.12kWh*2	5.12kWh*3	5.12kWh*3	5.12kWh*4	5.12kWh*5	5.12kWh*6
	Maximum charge/ discharge current	40A/40A	40A/40A	40A/40A	40A/40A	40A/40A	40A/40A
	Maximum charge / discharge power	8kW	8kW	7.68kW	8kW	8kW	8kW
	Battery type	LiFePO4(LFP)	LiFePO4(LFP)	LiFePO4(LFP)	LiFePO4(LFP)	LiFePO4(LFP)	LiFePO4(LFP)
	Communication interface	CAN	CAN	CAN	CAN	CAN	CAN
Grid-connected output/input	Rated grid voltage	3W+N+PE, 220/380 V; 230/400 V; 240/415 V	3W+N+PE, 220/380 V; 230/400 V; 240/415 V	3W+N+PE, 220/380 V; 230/400 V; 240/415 V	3W+N+PE, 220/380 V; 230/400 V; 240/415 V	3W+N+PE, 220/380 V; 230/400 V; 240/415 V	3W+N+PE, 220/380 V; 230/400 V; 240/415 V
	Rated grid frequency	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz
	Rated output power	8kW	8kW	8kW	8kW	8kW	8kW
	Maximum grid-connected output apparent power	8.8kVA	8.8kVA	8.8kVA	8.8kVA	8.8kVA	8.8kVA
	Maximum grid-connected output current	12.7A	12.7A	12.7A	12.7A	12.7A	12.7A
	Maximum grid-connected input apparent power	17.6kVA	17.6kVA	17.6kVA	17.6kVA	17.6kVA	17.6kVA
	Maximum grid-connected input current	25.5A	25.5A	25.5A	25.5A	25.5A	25.5A
	Power factor	0.8ind...0.8cap	0.8ind...0.8cap	0.8ind...0.8cap	0.8ind...0.8cap	0.8ind...0.8cap	0.8ind...0.8cap
	Total harmonic distortion rate of current	＜3%	＜3%	＜3%	＜3%	＜3%	＜3%
Off-grid output	Rated off-grid voltage	3W+N+PE, 220/380 V; 230/400 V; 240/415 V	3W+N+PE, 220/380 V; 230/400 V; 240/415 V	3W+N+PE, 220/380 V; 230/400 V; 240/415 V	3W+N+PE, 220/380 V; 230/400 V; 240/415 V	3W+N+PE, 220/380 V; 230/400 V; 240/415 V	3W+N+PE, 220/380 V; 230/400 V; 240/415 V
	Rated off-grid frequency	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz
	Maximum off-grid output apparent power	8.8kVA	8.8kVA	8.8kVA	8.8kVA	8.8kVA	8.8kVA
	Maximum off-grid output	12.7A	12.7A	12.7A	12.7A	12.7A	12.7A

	current						
	Switching duration	≤10ms	≤10ms	≤10ms	≤10ms	≤10ms	≤10ms
	Total harmonic distortion rate of voltage	＜2%	＜2%	＜2%	＜2%	＜2%	＜2%
Efficiency parameter	Maximum efficiency	97.9%	97.9%	97.9%	97.9%	97.9%	97.9%
	European efficiency	97.20%	97.20%	97.20%	97.20%	97.20%	97.20%
	MPPT efficiency	≥99.50%	≥99.50%	≥99.50%	≥99.50%	≥99.50%	≥99.50%
	Charge/discharge efficiency of battery	97.50%	97.50%	97.50%	97.50%	97.50%	97.50%
General data	Dimensions (W/D/H)	600mm/420mm/1390mm	600mm/420mm/1610mm	600mm/420mm/1550mm	600mm/420mm/1750mm	600mm/420mm/1950mm	600mm/420mm/2150mm
	Net weight	187.5kg	240.5kg	256.5Kg	314.5Kg	372.5Kg	430.5Kg
	IP grade	IP20	IP20	IP20	IP20	IP20	IP20
	Working temperature	-15℃~55℃	-15℃~55℃	-15℃~55℃	-15℃~55℃	-15℃~55℃	-15℃~55℃
	Noise	＜35dB	＜35dB	＜35dB	＜35dB	＜35dB	＜35dB
	Display	LCD	LCD	LCD	LCD	LCD	LCD
	Communication mode	RS485/CAN/ DRM Have 4G/WIFI Optional	RS485/CAN/ DRM Have 4G/WIFI Optional	RS485/CAN/ DRM Have 4G/WIFI Optional	RS485/CAN/ DRM Have 4G/WIFI Optional	RS485/CAN/ DRM Have 4G/WIFI Optional	RS485/CAN/ DRM Have 4G/WIFI Optional
Model		**LC-E2-835T**	**LC-E2-1010T-G**	**LC-E2-1015T-G**	**LC-E2-1015T**	**LC-E2-1020T**	**LC-E2-1025T**
PV input	Maximum PV input power	12kW	15kW	15kW	15kW	15kW	15kW
	Maximum PV input voltage	1000V	1000V	1000V	1000V	1000V	1000V
	MPPT voltage range	180～850V	180～850V	180～850V	180～850V	180～850V	180～850V
	MPPT voltage range at full power	330～850V	430～850V	430～850V	430～850V	430～850V	430～850V
	Maximum PV input current	13A/13A	13A/13A	13A/13A	13A/13A	13A/13A	13A/13A
	PV short circuit current	16A/16A	16A/16A	16A/16A	16A/16A	16A/16A	16A/16A
	Number of MPPT / Maximum number of strings in parallel of each MPPT	2/1	2/1	2/1	2/1	2/1	2/1
Battery parameters	Input voltage range of battery	291～409V	166～233V	249～350V	134.4～175.2V	166～233V	208～292V
	Rated voltage of battery pack	358.4V	204.8V	307.2V	153.6V	204.8V	256V
	Battery capacity	5.12kWh*7	5.12kWh*2	5.12kWh*3	5.12kWh*3	5.12kWh*4	5.12kWh*5
	Maximum charge/ discharge current	40A/40A	40A/40A	40A/40A	40A/40A	40A/40A	40A/40A
	Maximum charge / discharge power	8kW	10kW	10kW	10kW	10kW	10kW
	Battery type	LiFePO4(LFP)	LiFePO4(LFP)	LiFePO4(LFP)	LiFePO4(LFP)	LiFePO4(LFP)	LiFePO4(LFP)
	Communication interface	CAN	CAN	CAN	CAN	CAN	CAN
Grid-connected output/input	Rated grid voltage	3W+N+PE, 220/380 V; 230/400 V; 240/415 V	3W+N+PE, 220/380 V; 230/400 V; 240/415 V	3W+N+PE, 220/380 V; 230/400 V; 240/415 V	3W+N+PE, 220/380 V; 230/400 V; 240/415 V	3W+N+PE, 220/380 V; 230/400 V; 240/415 V	3W+N+PE, 220/380 V; 230/400 V; 240/415 V
	Rated grid frequency	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz
	Rated output power	8kW	10kW	10kW	10kW	10kW	10kW
	Maximum grid-connected output apparent power	8.8kVA	11kVA	11kVA	11kVA	11kVA	11kVA
	Maximum grid-connected output current	12.7A	15.9A	15.9A	15.9A	15.9A	15.9A
	Maximum grid-connected	17.6kVA	22kVA	22kVA	22kVA	22kVA	22kVA

	input apparent power						
	Maximum grid-connected input current	25.5A	31.9A	31.9A	31.9A	31.9A	31.9A
	Power factor	0.8ind...0.8cap	0.8ind...0.8cap	0.8ind...0.8cap	0.8ind...0.8cap	0.8ind...0.8cap	0.8ind...0.8cap
	Total harmonic distortion rate of current	＜3%	＜3%	＜3%	＜3%	＜3%	＜3%
Off-grid output	Rated off-grid voltage	3W+N+PE, 220/380 V; 230/400 V; 240/415 V	3W+N+PE, 220/380 V; 230/400 V; 240/415 V	3W+N+PE, 220/380 V; 230/400 V; 240/415 V	3W+N+PE, 220/380 V; 230/400 V; 240/415 V	3W+N+PE, 220/380 V; 230/400 V; 240/415 V	3W+N+PE, 220/380 V; 230/400 V; 240/415 V
	Rated off-grid frequency	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz
	Maximum off-grid output apparent power	8.8kVA	11kVA	11kVA	11kVA	11kVA	11kVA
	Maximum off-grid output current	12.7A	15.9A	15.9A	15.9A	15.9A	15.9A
	Switching duration	≤10ms	≤10ms	≤10ms	≤10ms	≤10ms	≤10ms
	Total harmonic distortion rate of voltage	＜2%	＜2%	＜2%	＜2%	＜2%	＜2%
Efficiency parameter	Maximum efficiency	97.9%	98.2%	98.2%	98.2%	98.2%	98.2%
	European efficiency	97.20%	97.5%	97.5%	97.5%	97.5%	97.5%
	MPPT efficiency	≥99.50%	≥99.50%	≥99.50%	≥99.50%	≥99.50%	≥99.50%
	Charge/discharge efficiency of battery	97.50%	97.50%	97.50%	97.50%	97.50%	97.50%
General data	Dimensions (W/D/H)	600mm/420mm/2350mm	600mm/420mm/1390mm	600mm/420mm/1610mm	600mm/420mm/1550mm	600mm/420mm/1750mm	600mm/420mm/1950mm
	Net weight	488.5Kg	187.5kg	240.5kg	256.5Kg	314.5Kg	372.5Kg
	IP grade	IP20	IP20	IP20	IP20	IP20	IP20
	Working temperature	-15℃~55℃	-15℃~55℃	-15℃~55℃	-15℃~55℃	-15℃~55℃	-15℃~55℃
	Noise	＜35dB	＜35dB	＜35dB	＜35dB	＜35dB	＜35dB
	Display	LCD	LCD	LCD	LCD	LCD	LCD
	Communication mode	RS485/CAN/ DRM Have 4G/WIFI Optional	RS485/CAN/ DRM Have 4G/WIFI Optional	RS485/CAN/ DRM Have 4G/WIFI Optional	RS485/CAN/ DRM Have 4G/WIFI Optional	RS485/CAN/ DRM Have 4G/WIFI Optional	RS485/CAN/ DRM Have 4G/WIFI Optional
Model		**LC-E2-1030T**	**LC-E2-1035T**	**LC-E2-1210T-G**	**LC-E2-1215T-G**	**LC-E2-1225T**	**LC-E2-1230T**
PV input	Maximum PV input power	15kW	15kW	18kW	18kW	18kW	18kW
	Maximum PV input voltage	1000V	1000V	1000V	1000V	1000V	1000V
	MPPT voltage range	180～850V	180～850V	180～850V	180～850V	180～850V	180～850V
	MPPT voltage range at full power	430～850V	430～850V	510～850V	510～850V	510～850V	510～850V
	Maximum PV input current	13A/13A	13A/13A	13A/13A	13A/13A	13A/13A	13A/13A
	PV short circuit current	16A/16A	16A/16A	16A/16A	16A/16A	16A/16A	16A/16A
	Number of MPPT / Maximum number of strings in parallel of each MPPT	2/1	2/1	2/1	2/1	2/1	2/1
Battery parameters	Input voltage range of battery	249～350V	291～409V	166～233V	249～350V	208～292V	249～350V
	Rated voltage of battery pack	307.2V	358.4V	204.8V	307.2V	256V	307.2V
	Battery capacity	5.12kWh*6	5.12kWh*7	5.12kWh*2	5.12kWh*3	5.12kWh*5	5.12kWh*6
	Maximum charge/ discharge current	40A/40A	40A/40A	40A/40A	40A/40A	40A/40A	40A/40A
	Maximum charge /	10kW	10kW	12kW	12kW	12kW	12kW

	discharge power						
	Battery type	LiFePO4(LFP)	LiFePO4(LFP)	LiFePO4(LFP)	LiFePO4(LFP)	LiFePO4(LFP)	LiFePO4(LFP)
	Communication interface	CAN	CAN	CAN	CAN	CAN	CAN
Grid-connected output/input	Rated grid voltage	3W+N+PE, 220/380 V; 230/400 V; 240/415 V	3W+N+PE, 220/380 V; 230/400 V; 240/415 V	3W+N+PE, 220/380 V; 230/400 V; 240/415 V	3W+N+PE, 220/380 V; 230/400 V; 240/415 V	3W+N+PE, 220/380 V; 230/400 V; 240/415 V	3W+N+PE, 220/380 V; 230/400 V; 240/415 V
	Rated grid frequency	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz
	Rated output power	10kW	10kW	12kW	12kW	12kW	12kW
	Maximum grid-connected output apparent power	11kVA	11kVA	13.2kVA	13.2kVA	13.2kVA	13.2kVA
	Maximum grid-connected output current	15.9A	15.9A	19.1A	19.1A	19.1A	19.1A
	Maximum grid-connected input apparent power	22kVA	22kVA	26.4kVA	26.4kVA	26.4kVA	26.4kVA
	Maximum grid-connected input current	31.9A	31.9A	38.2A	38.2A	38.2A	38.2A
	Power factor	0.8ind...0.8cap	0.8ind...0.8cap	0.8ind...0.8cap	0.8ind...0.8cap	0.8ind...0.8cap	0.8ind...0.8cap
	Total harmonic distortion rate of current	＜3%	＜3%	＜3%	＜3%	＜3%	＜3%
Off-grid output	Rated off-grid voltage	3W+N+PE, 220/380 V; 230/400 V; 240/415 V	3W+N+PE, 220/380 V; 230/400 V; 240/415 V	3W+N+PE, 220/380 V; 230/400 V; 240/415 V	33W+N+PE 220/380 V; 230/400 V; 240/415 V	3W+N+PE, 220/380 V; 230/400 V; 240/415 V	3W+N+PE, 220/380 V; 230/400 V; 240/415 V
	Rated off-grid frequency	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz
	Maximum off-grid output apparent power	11kVA	11kVA	13.2kVA	13.2kVA	13.2kVA	13.2kVA
	Maximum off-grid output current	15.9A	15.9A	19.1A	19.1A	19.1A	19.1A
	Switching duration	≤10ms	≤10ms	≤10ms	≤10ms	≤10ms	≤10ms
	Total harmonic distortion rate of voltage	＜2%	＜2%	＜2%	＜2%	＜2%	＜2%
Efficiency parameter	Maximum efficiency	98.2%	98.2%	98.2%	98.2%	98.2%	98.2%
	European efficiency	97.5%	97.5%	97.5%	97.5%	97.5%	97.5%
	MPPT efficiency	≥99.50%	≥99.50%	≥99.50%	≥99.50%	≥99.50%	≥99.50%
	Charge/discharge efficiency of battery	97.50%	97.50%	97.60%	97.60%	97.60%	97.60%
General data	Dimensions (W/D/H)	600mm/420mm/2150mm	600mm/420mm/2350mm	600mm/420mm/1390mm	600mm/420mm/1610mm	600mm/420mm/1950mm	600mm/420mm/2150mm
	Net weight	430.5Kg	488.5Kg	187.5kg	240.5kg	372.5Kg	430.5Kg
	IP grade	IP20	IP20	IP20	IP20	IP20	IP20
	Working temperature	-15℃~55℃	-15℃~55℃	-15℃~55℃	-15℃~55℃	-15℃~55℃	-15℃~55℃
	Noise	＜35dB	＜35dB	＜35dB	＜35dB	＜35dB	＜35dB
	Display	LCD	LCD	LCD	LCD	LCD	LCD
	Communication mode	RS485/CAN/ DRM Have 4G/WIFI Optional	RS485/CAN/ DRM Have 4G/WIFI Optional	RS485/CAN/ DRM Have 4G/WIFI Optional	RS485/CAN/ DRM Have 4G/WIFI Optional	RS485/CAN/ DRM Have 4G/WIFI Optional	RS485/CAN/ DRM Have 4G/WIFI Optional

Model		**LC-E2-1235T**		
PV input	Maximum PV input power	18kW		
	Maximum PV input voltage	1000V		
	MPPT voltage range	180～850V		
	MPPT voltage range at full power	510～850V		
	Maximum PV input current	13A/13A		
	PV short circuit current	16A/16A		

	Number of MPPT / Maximum number of strings in parallel of each MPPT	2/1		
Battery parameters	Input voltage range of battery	291～409V		
	Rated voltage of battery pack	358.4V		
	Battery capacity	5.12kWh*7		
	Maximum charge/ discharge current	40A/40A		
	Maximum charge / discharge power	12kW		
	Battery type	LiFePO4(LFP)		
	Communication interface	CAN		
Grid-connected output/input	Rated grid voltage	3W+N+PE, 220 / 380 V. 230 /400 V. 240/415 V		
	Rated grid frequency	50/60Hz		
	Rated output power	12kW		
	Maximum grid-connected output apparent power	13.2kVA		
	Maximum grid-connected output current	19.1A		
	Maximum grid-connected input apparent power	26.4kVA		
	Maximum grid-connected input current	38.2A		
	Power factor	0.8ind...0.8cap		
	Total harmonic distortion rate of current	＜3%		
Off-grid output	Rated off-grid voltage	3W+N+PE, 220 / 380 V. 230 /400 V. 240/415 V		
	Rated off-grid frequency	50/60Hz		
	Maximum off-grid output apparent power	13.2kVA		
	Maximum off-grid output current	19.1A		
	Switching duration	＜20ms		
	Total harmonic distortion rate of voltage	＜2%		
Efficiency parameter	Maximum efficiency	98.2%		
	European efficiency	97.5%		
	MPPT efficiency	≥99.50%		
	Charge/discharge efficiency of battery	488.5Kg		
General data	Dimensions (W/D/H)	600mm/420mm/2350mm		
	Net weight	461Kg		
	IP grade	IP20		
	Working temperature	-15℃~55℃		
	Noise	＜35dB		
	Display	LCD		
	Communication mode	RS485/CAN/DRM Have 4G/WIFI Optional		

9.2 Table of battery module parameters

Model	LC-BH512	LC-BH512-G
Battery type	Lithium iron phosphate	Lithium iron phosphate
Capacity	5.12kWh	5.12kWh
Rated voltage	51.2V	102.4V
Maximum charge/ discharge current	40A	40A
Range of charging temperature	0℃ ~+55℃	0℃~+55℃
Range of discharging temperature	-15℃ ~+55℃	-15℃~+55℃
Communication mode	CAN	CAN
Dimensions (W/D/H)	600mm/420mm/200mm	600mm/420mm/220mm
Weight	58kg±1	53kg±1
Prompt: the discharge rate will be attenuated when the temperature is lower than 0 ° C When the temperature is lower than 0 ℃, the battery cannot be charged When the temperature is lower than -15℃, the battery cannot be discharged		

9.3 Dimensions and weight of equipment

Equipment name	Dimension (mm)	Net weight(kg)
6 -15kW hybrid inverter (W/D/H)	600*420*820	67.5±1
LC-BH512 Battery module (W/D/H)	600*420*200	58±1
LC-BH512-G Battery module (W/D/H)	600*420*220	53±1
Base (W/D/H)	590*410*130	15

9.4 Dimensions and weight of packaging

Packaging	Dimension (mm)	Net weight (kg)
Packing carton of inverter (W/D/H)	730*475*950	10
LC-BH 512 battery module packaging(W/D/H)	750*520*310	4.5
LC-BH 512-G battery module packaging(W/D/H)	750*520*310	4.5
Packing carton of base (W/D/H)	620*440*180	2

10 Transportation

Basic Requirements

● LC-E2 shall be packed and shipped separately.

● Before packing and transportation, the package shall be intact and undamaged, and the product model and identification information shall be clear and complete.

● The product shall not be transported together with inflammable, explosive and other dangerous goods.

● The equipment shall be transported on the pallet with anti-dumping measures to avoid the violent vibration.

11 Storage

Before the assembly of LC-E2, the inverter, battery module and base shall be packed and stored separately. If they are not put into use immediately, the storage shall meet the following requirements:

● Do not remove the outer package of inverter, battery module and base.

● The storage temperature shall be kept at -20 ℃ ~ + 60 ℃, and the recommended temperature is 25 ℃ ± 5 ℃. the relative humidity shall be kept at 5% RH ~ 85% RH，Recommended humidity is 35%—45%RH.

● The product shall be stored at the clean and dry place to prevent the erosion caused by dust and water vapor.

● Up to 7 layers can be stacked. The equipment shall be stacked carefully to avoid personal injury or equipment damage caused by rollover.

● During the storage period, a regular packaging inspection is required (it is recommended to check once every three months). If the packages are damaged by insects and rat,the packaging materials shall be replaced in time.

● During the storage period, the battery shall be checked regularly to supplement the power loss caused by self-discharge and keep about 50% of power (it is recommended to check once every 6 months).

● If the storage time of battery is 6 months or more, the battery shall be checked and tested by professionals before put into use.

● If the storage time of inverter is 1 years or more, the battery shall be checked and tested by professionals before put into use.

12 Fault Diagnosis

When you encounter any of the following issues, please refer to the following solutions. If such issue remains unresolved, please consult your local distributor.

Fault	Fault code	Explaination	Solution
DischgOverCur	00	Battery discharge over current. When the battery is loaded, the load is too large.	(1) Inverter will restart automatically 1min later. (2) Check whether the load size is consistent with the description in the specification. (3) Cut off all power switches and power on the whole machine again after the display goes off. (4) If the issue remains unsolved, check whether there is a short circuit at the load end.
Over load	01	The load power is greater than other power(PV,BAT).	(1) Check whether the load size is lower than the maximum power of whole machine. (2) Cut off all power switches and power on the whole machine again after the display goes off. (3) If the issue remains unsolved, check whether there is a short circuit at the load end.
BatDisconnect	02	Battery Disconnect. (Battery voltage not identified)	(1) Check whether the battery is connected. (2) Check the connection wire of battery for the open circuit. (3) If the error/warning remains, please contact customer service.
Bat Under Vol	03	Battery voltage lower than normal range.	(1) Check whether the voltage setting range of the battery is compatible with that of the current battery. (2) Check whether the power grid and PV are live. If not, the battery will be automatically charged after power restoration. (3) If the error/warning remains, please contact customer service.
Bat Low capacity	04	Bat Low capacity	Low battery setting capacity(SOC<100%-DOD).
Bat Over Vol	05	The battery voltage is over than the Inverter maximum	(1) Checking system settings, re-power and restart. (2) If the error/warning remains, please contact customer service.

		voltage.	
Gird low vol / over vol	06 07	Grid voltage is abnormal.	(1) Check whether the grid is abnormal. (2) Power off the whole machine, wait for the LCD display to be turned off, and then power it on. (3)If the error/warning remains, please contact customer service.
Gird lowFreq / overFreq	08 09	Grid Frequency is abnormal.	(1) Check whether the grid is abnormal. (2) Power off the whole machine, wait for the LCD display to be turned off, and then power it on. (3) If the error/warning remains, please contact customer service.
Gfci over	10	Inverter GFCI exceeds standard.	(1) Check PV string for direct or indirect grounding phenomenon (2) Check peripherals of inverter for current leakage (3) If the error/warning remains, please contact customer service
Bus under vol	13	BUS voltage is lower than normal.	(1) Check the input mode setting is correct (2) Restart the inverter and wait until it functions normally (3) If the error/warning remains, please contact customer service
Bus over vol	14	BUS voltage is over maximum value.	(1) Check whether the input mode is correct (2) Power off the whole machine, wait for the LCD display to be turned off, and then power it on (3) If the issue remains unresolved, please consult your local distributor
Inv over cur	15	The inverter current exceeds the normal value.	Restart the inverter and wait until it functions normally
Chg over cur	16	Battery charge current over than the Inverter maximum voltage.	Restart the inverter and wait until it functions normally
Inv under vol / over vol	18 19	INV voltage is abnormal.	(1) Check if the INV voltage is abnormal (2) Restart the inverter and wait until it functions normally (3) If the issue remains unresolved, please consult your local distributor
InvFreqAbnor	20	INV frequency is abnormal.	(1) Check if the INV frequency is abnormal (2) Restart the inverter and wait until it functions normally (3) If the issue remains unresolved, please consult your local distributor
Igbt temp high	21	The inverter temperature is higher than the allowed value.	Disconnect all power from the inverter, wait one hour, and then turn on the power to the inverter
BMS sys error	22	The BMS detects alarm from battery	Restart the battery and check whether the alarm is cleared.
Bat over temp	23	Battery temperature is higher than the allowed value.	Disconnect the battery and reconnect it after an hour
Bat UnderTemp	24	Battery temperature is lower than the allowed value.	Check the ambient temperature near the battery to confirm it meets the specifications
Bat CellUnbal1	25	BMS Single voltage difference alarm.	Check whether the battery cell voltage difference is too large.
Bat Reverse	26	The positive and negative terminals of the battery are connected in	Check whether the positive and negative terminals of the battery are connected in reverse mode.

BMS comm.fail	27	Communication between lithium battery and inverter is abnormal.	(1) Check the cable, RJ45 header, line sequence. (2) Checking the Battery switch.
Battery fail	28	Battery failure.	(1) Check that the battery is abnormal.. (2)Check whether the battery BMS alarm is normal
Grid Over Load	29	Excessive load power	（1）Check whether the load power is too large. （2）Power on the whole machine, wait for the LCD display to turn off, power on. If the problem is still not resolved, please consult a local distributor.
Grid Phase error	30	The power grid phase sequence is incorrectly connected.	Check power grid wiring
Arc Fault	31	PV Arc Fault	(1) Check Photovoltaic panels, PV wire (2) If the error/warning remains, please contact customer service
Bus soft fail / Inv soft fail	32 33	The inverter may be damaged.	(1) Restart the inverter and wait until it functions normally (2) If the issue remains unresolved, please consult your local distributor
Bus short / Inv short	34 35	The inverter may be damaged.	(1) Restart the inverter and wait until it functions normally (2) If the issue remains unresolved, please consult your local distributor
Fan fault	36	Fan fault	(1) Check whether the Inverter temperature is abnormal. (2) Check whether the fan runs properly.(If you can see it)
PV iso low	37	PV Low insulation impedance.	(1) Check if the PE line is connected to the inverter and is connected to the ground (2) If the error/warning remains, please contact customer service
Bus Relay Fault	38	The inverter may be damaged.	(1) Restart the inverter and wait until it functions normally (2) If the issue remains unresolved, please consult your local distributor
Grid Relay Fault	39	The inverter may be damaged.	(1) Restart the inverter and wait until it functions normally (2) If the issue remains unresolved, please consult your local distributor
EPS rly fault	40	The inverter may be damaged.	(1) Restart the inverter and wait until it functions normally (2) If the issue remains unresolved, please consult your local distributor
Gfci fault	41	The inverter may be damaged.	(1) Restart the inverter and wait until it functions normally (2) If the issue remains unresolved, please consult your local distributor
Current DCover	42	The inverter may be damaged.	（1）Restart the inverter and wait until it functions normally （2）If the error/warning remains, please contact customer service.
PV short	43	The inverter may be damaged	（1）Restart the inverter and wait until it functions normally. （2）If the error/warning remains, please contact customer service.
Selftest fail	44	The inverter may be damaged.	(1) Restart the inverter and wait until it functions normally (2) If the issue remains unresolved, please consult your local distributor
System fault	45	The inverter may be damaged.	(1) Restart the inverter and wait until it functions normally (2) If the issue remains unresolved, please consult your local distributor

If an error occurs that is not listed in the table, please contact customer service.

13 Warranty

13.1 Warranty Period

Hunan Lenercom Technology Co., Ltd. (hereinafter referred to as "Lenercom") provides quality assurance services that meet the scope and conditions of quality assurance for its LC-E2 ESS series energy storage system.

◎Inverters and inverter ancillary products

Provide 60 months warranty for the inverter from the acceptance date 1 .

provide 24 months warranty for ancillary products (WIFI, GPRS) from the acceptance date.

◎Battery module

Provide 120 months warranty of no less than 70% of the initial available capacity.

13.2 Warranty Conditions

According to the warranty terms,LC-E2 ESS series products that were purchased and installed through Lenercom or its authorized partners, and operate according to the product manual can apply. New, used or refurbished products purchased through other unauthorized channels are not covered by this warranty.

During the standard warranty period, we undertake the material cost of parts for maintenance or replacement of the machine caused by product quality problems, but not bear other direct or indirect losses. In any case, the maximum amount of compensation for losses shall not be higher than the value of the equipment.

After evaluation, if it is confirmed as a non-product quality problem, Lenercom reserves the right to charge for the services. The service fee shall be subject to the "After-sales Service Quotation".

If the machine or its parts need to be shipped back to factory, make sure to protect the products in the original or equivalent Packaging for protection during transportation to avoid any product loss or secondary damage. Otherwise, the applicant needs to bear the corresponding compensation costs.

13.3 Procedure for Claiming a Warranty

During the warranty period, if the product fails to work under normal operation according to the product manual, please send the "After-sales Acceptance Form" to Lenercom by phone/fax/email or provide sufficient information to help the after-sales service team to

1 Acceptance date refers to: the acceptance completion date of EXW, FOB, CIF.

2 Available power test conditions: 90% depth of discharge, 25±3°C temperature range, 0.5C charge and Discharge proceed the process.

If the product fails during the warranty period, Lenercom will resolve the issue in one of the following methods:

◎Online technical support.

◎On-site maintenance by Lenercom or its authorized partner.

◎Return to Lenercom Repair Center for repairment.

◎If the original model has been confirmed as no maintenance value by Lenercom engineer, or the original model has stopped manufacturing and/or out of stock. Lenercom reserve the right to provide products of same value and functions for replacement.

Depending on the fault information, Lenercom shall arranges online technical support or on-site inspection to find out the cause. The customer who applies for repairment have the responsibility

to provide the site inspection authority, time and safety for Lenercom technicians or the authorized partners.

Technicians have the right to refuse to enter the site if it is unsafe for the operation. The customer who applies for repairment is responsible for inspection failures due to negligence in terms of site access conditions, timing or safety.

Return shipment of the replaced product or parts must be in the original or equivalent packaging. The replacement product will automatically inherit the remaining warranty period of the replaced product. Before the freight party entrusted by Lenercom retrieves the replaced product, the customer who applies for repairment is responsible for keeping the product in a proper condition, and the customer will be responsible for compensation of the replaced product lost during this period.

13.4 Non-warranty liability

Warranties and services shall not apply in the following circumstances:

◎Failure to comply with applicable safety regulations.

◎Damaged by transportation, lost or stolen.

◎Damage or failure not caused by product quality.

◎Misuse or improper storage, operation, commissioning or modification of the product, failure to comply with the equipment instruction manual, maintenance procedures and time intervals.

◎Damage caused by live work and installation wiring, or misuse of tools.

◎Damage caused by opening, repairing, processing, replacement, installation or commissioning by an unauthorized or uncertified distributor or installer, or by any negligence, reckless or intentional act of a third party.

◎Product operating environment is outside the normal temperature (-15°C - 55°C).

◎Damage or failure caused by improper installation position (such as the distance from the 2wall does not meet the installation requirements, the exterior shell of the machine has been corrosive, dust polluted and water ingress due to being placed outdoors, sea level is beyond requirement or exposed to coastal/salt water or other corrosive environmental conditions).

◎Any failure or warning of battery system that causes the system not work or work abnormally must be reported accordance with the term stated in Warranty and Service Conditions within two weeks.

◎Battery systems shall be installed and operated by professionals. Professionals should be familiar with local regulations and electrical system specifications, professional training and knowledge of the product .

◎The battery system should be equipped with Lenercom's inverter. If the customer want to use any other brand of product, it shall confirm its compatibility with Lenercom in advance, otherwise the battery failure or performance decline caused by compatibility problems is not within the scope of the warranty.

◎Please read the relevant instructions of anti-countercurrent products to understand the principle of anti-countercurrent, please note that the current technical scheme of anti-countercurrent products itself determines that the power generated by the inverter cannot be completely avoided to the grid, that means there may still be a trace of electricity delivered to the grid during working.

◎Using any products of Lenercom , the solar power station project involved must be reported to the local competent authorities. Lenercom will not bear any loss caused by the risks and fines of

the unreported solar power station. For the reported power station, the responsibility shall not exceed the order amount of the related products.

◎Intentionally disrupt or defile, make non-indelible marks (such as paint).

◎Damage caused by the risk of the installation location, such as the storage place of flammable. and explosive products, high humidity area (humidity over 85% without condensation, long-term water accumulation area).

◎Damages caused by the product accessories or consumables from unauthorized agencies.

◎Natural loss or battery loss due to long-term suspending for more than 6 months.

◎Customers refuse to provide product installation, debugging, operation, installation environment and fault information.

◎Damages caused by force majeure (including but not limited to extreme weather, fires, floods, earthquake, thunderstrike, lighting, war and epidemic).

◎All other environments and behaviors that may damage the normal use of the device.

13.5 Service after Expiration of Warranty Period

For products beyond the warranty period, Lenercom can still provide related services, but all the costs and expenses shall be borne by the customer. including but not limited to:

◎On-site service fee: including the cost of travel, labor-hour rate and service charge.

◎materials fee: cost of replacement parts/materials (including any shipping/admin fee that may apply).

◎Logistics fee: cost of delivery and any other expenses Included the cost of defective products from the user to Lenercom or/and repaired products from Lenercom to the user.

13.6 Other terms

Purchase invoices/contract/record should be properly kept as a basis for repairs. without the mentioned relevant documents may cause the failure of warranty.

The warranty terms are the only express warranty terms of Lenercom for the LC-E2 series products, and there is no other express, implied, oral or written warranties.

Warranty can't be understood as a guarantee of the service life of the product or the availability of products of the same type.

During the warranty period, Lenercom is responsible for the maintenance and testing labour costs and the required material costs, and does not bear other costs.

Unless otherwise provided in the separate service agreement between Lenercom and the customer, this agreement shall prevail.

According to national laws and regulations and relevant policies, Lenercom may update the above product warranty terms and policy. To get the latest version, please visit the official.

website: www.Lenercom.com

Lenercom reserves the right of final interpretation of the above terms.

13.7 Contact Information

Hunan Lenercom Technology Co., Ltd.

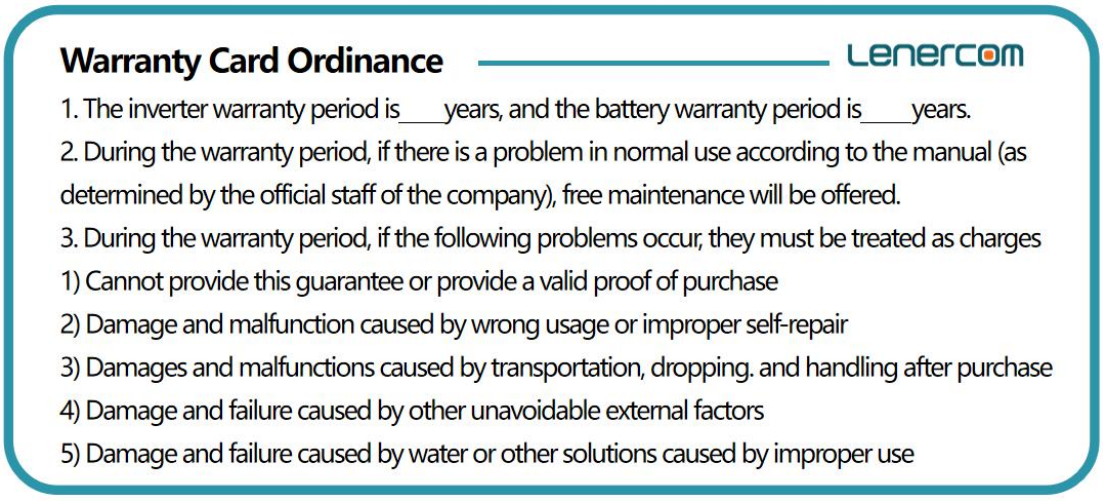
Tel: +86 0731-88051567

E-mail: service@lenercom.com

Official website: www.lenercom.com

Address: Building B1, Lugu Innovation and Entrepreneurship Park, Yuelu District, Changsha City, Hunan Province.

Warranty card



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