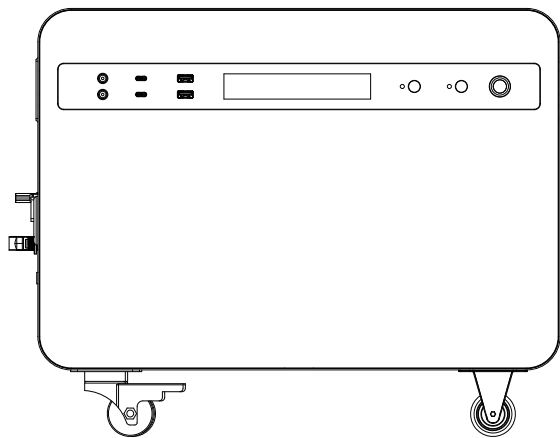


ALL-IN-ONE Energy Storage System User Manual

LE3000-3A



Thank you for choosing our company's product. In order to better experience the convenience and value that the product brings to you, please read this booklet carefully before using this product!

PREFACE

Summary:

This document mainly introduces the product introduction, application scenario, installation, commissioning, system maintenance and technical data of wall mounted household energy storage battery and battery expansion module.

Reader object:

This document is mainly applicable to the following Engineers:

- ♦ Marketing Engineer
- ♦ System Engineer
- ♦ Technical support engineer

Symbolic Convention:

The following symbols may appear in this article, and they represent the following meanings:

Symbol	Explanation
 DANGER	Indicates a hazard with high risk that will lead to death or serious injury if not avoided.
 Warning	Indicates a hazard with medium risk that may lead to death or serious injury if not avoided.
 Attention	Indicates a hazard with low-level risk that may cause slight or moderate injury if not avoided.
 Notice	It is used to transmit equipment or environmental safety warning information. If not avoided, it may lead to equipment damage, data loss, equipment performance degradation or other unpredictable results. The "instructions" do not involve personal injury.
 Explanation	Indicates a hazard with high risk that will lead to death or serious injury if not avoided.

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1. Information of this volume

This manual introduces the assembly, installation, operation, and troubleshooting of this machine. Please read this manual carefully before installation and operation. Please keep this booklet properly for future reference.

1.1 Range

This manual provides safety and installation guidelines, as well as information about tools and wiring.

1.2 Target group

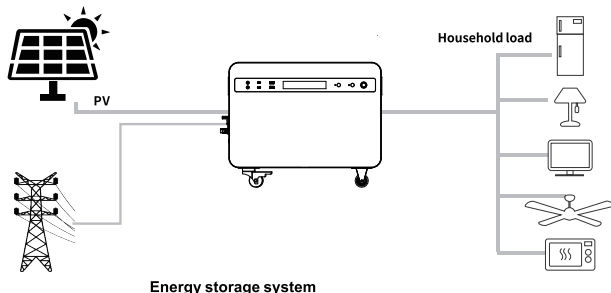
This document is applicable to qualified employees and end users, and tasks that do not require any specific qualifications can also be performed by end users. Qualified personnel must possess the following skills:

1. Understand the working principle and operating methods of inverters.
2. Received training on how to handle the hazards and risks associated with the installation and use of electrical equipment and installation
3. Training on the installation and commissioning of electrical equipment and installation.
4. Understand applicable standards and directives.
5. Understand and comply with this document and all safety information.

1.3 Safety instructions

1. Before using this machine, please read all instructions and warning labels on the machine manual, as well as all relevant chapters of this manual. Our company has the right not to provide quality assurance. Failure to follow the instructions in this manual during installation may result in equipment damage.
2. Please choose which battery system is needed (lithium battery system or lead-acid battery system). If the wrong system is selected, the energy storage system will not function properly.
3. Do not disassemble this machine. When maintenance or repair is required, please send it to a qualified service center. Incorrect reassembly may lead to a risk of electric shock or fire.
4. All operations and connections must be carried out by professional electrical or mechanical engineers, and all electrical installations must comply with local electrical safety standards.
5. Attention: In order to reduce the risk of injury, only deep cycle lead-acid rechargeable batteries and lithium batteries can be charged. Other types of batteries may burst, causing personal injury and damage.
6. To reduce the risk of electric shock, please disconnect all electrical wires before performing any maintenance or cleaning. Turning off the power supply does not reduce the risk of electric shock.
7. In order to ensure the optimal operation of this inverter/charger, please select the appropriate cable size according to the required specifications. It is very important to operate this inverter/charger correctly.
8. Grounding Instructions - This inverter should be connected to a permanently grounded wiring system. When installing this inverter, be sure to comply with local requirements and regulations.
9. It is strictly prohibited to cause short circuits between AC output and DC transmission. When the DC transmission line is short circuited, it is strictly prohibited to connect to the mains.
10. Please do not install the machine in harsh environments such as outdoor, damp, greasy, flammable, explosive, or dust accumulation.
11. Warning!! Only qualified maintenance personnel can repair this equipment. If the fault persists after troubleshooting according to the troubleshooting table, please return the inverter/charger to your local dealer or service center for repair.
12. The polarity of the battery output terminal of this product is prohibited from being reversed, as it may damage the equipment or cause unpredictable hazards. Before operation, please confirm that the inverter has been fully assembled.

1.4 Application Introduction



The photovoltaic energy storage inverter is a new type of hybrid solar energy storage inverter control system (off grid energy storage inverter) that integrates solar energy storage and mains charging energy storage, DC output, and AC sine wave output. It adopts DSP control and advanced control algorithms, with high response speed, high reliability, and high industrial standards. There are four charging modes to choose from: solar, mains priority, solar priority, and mains & solar; This product integrates solar charging controllers, system controllers, inverters, lithium batteries, DC 12 V, USB fast charging, Type-C PD3.0, and a battery management system. It stores clean and environmentally friendly solar energy in the battery, which can be used for home lighting, computers, low-power household appliances, mobile phone charging, etc. in indoor power outages or outdoor situations. This system has the advantages of stable performance, safety and reliability, and convenient use.

The solar charging module adopts the latest optimized MPPT tracking technology, which can quickly track the maximum power point of the photovoltaic array in any environment and obtain the maximum energy of the solar panel in real time.

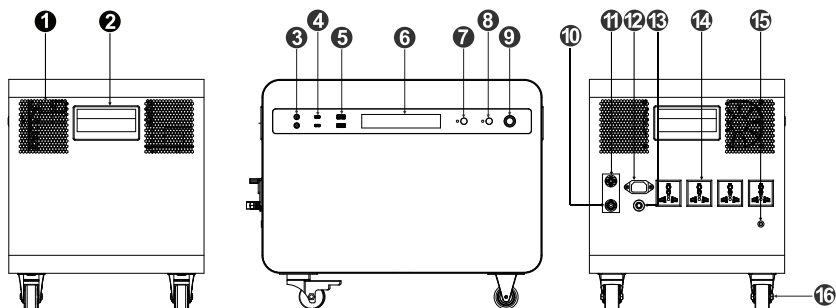
The AC-DC charging module adopts advanced control algorithms to achieve fully digital voltage and current dual closed-loop control, with high control accuracy and small size. The AC voltage input range is wide, and the input/output protection functions are complete, ensuring stable and reliable charging and protection of the battery.

The DC-AC inverter module is based on fully digital intelligent design and adopts advanced SPWM technology to output pure sine waves, converting direct current into alternating current. It is suitable for AC loads such as household appliances, electric tools, industrial equipment, electronic audio and video, etc. The product adopts a segmented LCD screen display design, which real-time displays the operating data and status of the system. Comprehensive electronic protection functions ensure that the entire system is safer and more stable.

1.5、Product Features

- 1.The LE3000-3A portable energy storage power supply product consists of one independent 3KWH battery cell and a 3KW high-frequency inverter integrated unit. It is a new type of hybrid solar energy storage inverter control integrated unit that integrates solar energy storage, municipal power charging energy storage, generator charging energy storage, and AC sine wave output. It adopts DSP control and advanced control algorithms, featuring fast response speed and high reliability.
- 2.The solar charging module adopts the latest optimized MPPT tracking technology, which can quickly track the maximum power point of the photovoltaic array in any environment, and obtain the maximum energy of the solar panel in real time.
- 3.The AC-DC charging module adopts advanced control algorithms to achieve full digital dual closed-loop control of voltage and current, featuring high control accuracy and compact size. The AC voltage input range is wide, and the input/output protection functions are complete, which can stably and reliably charge and protect the battery.
- 4.The DC-AC inverter module is based on a fully digital and intelligent design, adopting advanced SPWM technology to output pure sine waves, converting direct current into alternating current. It is suitable for AC loads such as household appliances, power tools, industrial equipment, and electronics for audio and video.
- 5.The product adopts a segmented LED screen display design to show status of the system. Comprehensive electronic protection functions ensure that the entire system is safer and more stable.

2. Overview



Arrow Identification			
➊	Cooling fan	➎	Power On&Off
➋	Plastic handle	➏	PV-
➌	DC5521 Output	➐	PV+
➍	TYPE-C Output	➑	AC Input
➎	USB-A Output	➒	Thermal Circuit Breaker
➏	Led Display Screen	➓	AC Output
➐	AC On&Off	➔	EARTH
➑	DC On&Off	➕	Contact Roller

3. Install

3.1. Unpacking inspection

Before installation, please inspect the unit. Be sure that nothing inside the package is damaged. You should have received the following items in the package:

The following are options:

- The unit x 1
- User manual x 1
- AC power cable x 1

3.2. Installation precautions

Consider the following points before selecting where to install:

1. Do not install the inverter on flammable building materials.
2. The ambient temperature should be between 0°C and 40°C to ensure optimal operation.
3. Be sure to keep other objects and surfaces as shown in the guarantee sufficient heat dissipation and to have enough space for removing wires.

3.3 AC input/output connection

CAUTION!! Before connecting to AC input power source, please install a separate AC breaker between machine and AC input power source. This will ensure the inverter can be securely disconnected during maintenance and fully protected from over current of AC input.

CAUTION!! There are two terminal blocks with “IN” and “OUT” markings. Please do NOT mis-connect input and output connectors.

WARNING! All wiring must be performed by a qualified personnel.

WARNING! It’s very important for system safety and efficient operation to use appropriate cable for AC input connection. To reduce risk of injury, please use the proper recommended cable size as below.

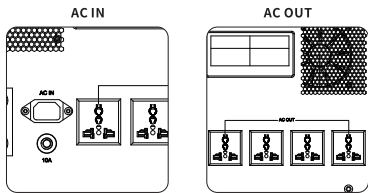
Suggested cable requirement for AC wires:

Recommended AC input wiring diameter	Max. bypass input current	Recommended air switch or circuit breaker models	Torque value
2.5mm²/13AWG	10A	2P-16A	1.2-1.6Nm

Recommended AC output wiring diameter	Max. bypass output current	Recommended air switch or circuit breaker models	Torque value
2.5mm²/13AWG	10A	2P-16A	1.2-1.6Nm

Please follow below steps to implement AC input/output connection:

- 1. Before making AC input/output connection, be sure to open DC protector or disconnecter first.
- 2. Remove insulation sleeve.
- 3. screws. Be sure to connect PE protective conductor (⏚) first.
- 4. Make sure the wires are securely connected.



CAUTION: Important

Be sure to connect AC wires with correct polarity. If L and N wires are connected reversely, it may cause utility short-circuited when these inverters are worked in parallel operation.

CAUTION: Appliances such as air conditioner are required at least 2-3 minutes to restart because it’s required to have enough time to balance refrigerant gas inside of circuits. If a power shortage occurs and recovers in a short time, it will cause damage to your connected appliances. To prevent this kind of damage, please check with manufacturer of air conditioner that if it’s equipped with time-delay function before installation. Otherwise, this off grid solar inverter will trig overload fault and cut off output to protect your appliance but sometimes it still causes internal damage to the air conditioner.

3.4 PV Connection

Warning! Before connecting the PV module, please install a separate DC circuit breaker between the inverter and the PV module.

Warning! All wiring must be carried out by qualified personnel.

Warning! The use of appropriate cables to connect PV components is crucial for the safe and efficient operation of the system . To reduce the risk of injury ,please use the correct recommended cable size shown.

Recommended PV input wiring diameter	Max. PV input current	Recommended air switch or circuit breaker models	Torque value
3.3mm²/12AWG	18A	2P-32A	1.2-1.6Nm

PV Module Selection:

When selecting proper PV modules, please be sure to consider below parameters:

- 1. Open circuit Voltage (Voc) of PV modules not exceeds max. PV array open circuit voltage of inverter.
- 2. Open circuit Voltage (Voc) of PV modules should be higher than min. battery voltage.

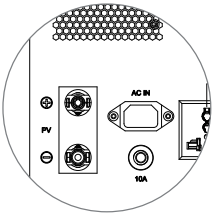
Max.PV array open circuit	500Vdc
Starting voltage	100Vdc
PV array MPPT voltage range	85Vdc~450Vdc

Please follow below steps to implement PV module connection:

- 1. Check correct polarity of connection cable from PV modules and PV input connectors. Then, connect positive pole (+) of connection cable to positive pole (+) of PV input connector. Connect negative pole (-) of connection cable to negative pole (-) of PV input connector.
- 2. Make sure the wires are securely connected.

PV+:PV input positive pole

PV-:PV input negative pole



3.5 Start machine

- Step1: After connecting all lines,turn on the power switch.
- Step2: Press the DC button with short shoot,the USB /Type-C/DC output would be power on,and press DC button for about 2 seconds continuously,the USB /Type-C/DC output would be power off.
- Step3: Press the AC button,the AC output would be power on,and press AC button for about 2 seconds continuously,the AC output would be power off.
- Step4: Start the load one by one in the order of powerd from small to large.

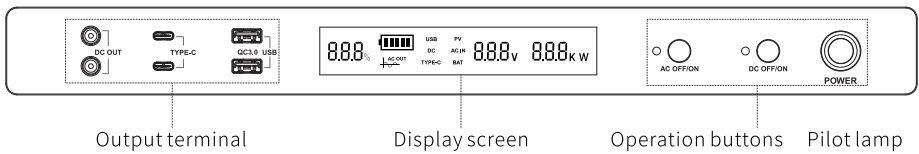
4. Operation

4.1 Power on/off

Once the device is properly installed and the battery connection is good, simply press the power switch (located on the chaOnce the unit has been properly installed and the batteries are connected well, simply press On/Off switch (located on the button of the case) to turn on the unit.

4.2 Operation and display panel

The operation and display panel, as shown in the figure below, is located on the front panel of the inverter. It includes Output terminal, 3 indicator lights, 4 function keys, and 1 LCD display screen, displaying the operating status and input/output power information.



Introduction to operating buttons

Function keys	Description
	AC On&Off
	DC On&Off
	Power On&Off

- 1.Press the DC button,beep will be sound for one second,and then DC mark will be lighted.press the DC button for about 2seconds continuously, DC out won' t output and the DC mark will be extinguished.
- 2.Press the AC button,beep will be sound for one second,and then AC mark will be lighted.press the AC button for about 2seconds continuously, AC out won' t output and the DC mark will be extinguished.
NOTE:if turn of the AC output,you should press this button again after more than 10 seconds.
- 3.if the keys on the panel were not be touched in 5 minutes,the display led will turn off, in this case ,you can press the DC button or AC button to wake up the LED displaying again.
- 4.if now the machine is charged by PV,then the PV light will be lighted.
- 5.if now the machine is charged by AC,then the AC light will be lighted.
- 6.in case the machine is in status of discharge,the sine wave,power rate and voltage would be displayed according to the present value.

5.Battery parameters

Parameter \ Battery type	LiFePO4(LFP)
Rated Voltage (VDC)	25.6V
Battery capacity (Ah)	119Ah
Battery Energy (Wh)	3.046kWh
Battery voltage range (VDC)	20-29.2V
Maximum overcharge voltage(VDC)	29.2V
Battery input under voltage protection	20V
Battery input under voltage recovery point(VDC)	22.08V
Battery input overvoltage recovery point(VDC)	27.04V

6.Fault and alarm description

Fault: The inverter enters the fault mode, the red LED light is always on and the LCD displays the fault code.

Fault Reference Code

Fault Code	Fault Event	Icon on
01	Fan is locked when inverter is off.	⚠01
02	Over temperature or NTC is not connected well.	⚠02
03	Battery voltage is too high.	⚠03
04	Battery voltage is too low.	⚠04
05	Output short circuited or over temperature is detected by internal converter components.	⚠05
06	Output voltage is too high.	⚠06
07	Over load time out.	⚠07
08	Bus voltage is too high	⚠08
09	Bus soft start failed	⚠09
51	Over currents or surge	⚠51
52	Bus voltage is too low	⚠52
53	Inverter soft start failed	⚠53
55	Over DC voltage in AC output	⚠55
57	Current sensor failed	⚠57
58	Output voltage is too low	⚠58
59	PV voltage is over limitation	⚠59

7. Troubleshooting

Problem	LCD/LED/Buzzer	Explanation/Possible cause	What to do
Unit shuts down automatically during startup process.	buzzer will be active for 3 seconds and then complete off.	The battery voltage is too low (<1.91V/Cell)	1. Re-charge battery. 2. Replace battery.
No response after power on.	No indication	1. The battery voltage is far too low.(<1.4V/Cell) 2. Internal fuse tripped.	1.Contact repair center for replacing the fuse. 2. Re-charge battery. 3. Replace battery. Check if AC breaker is tripped and AC wiring is connected well.
When the unit is turned on, internal relay is switched on and off repeatedly.	LCD display and LEDs are flashing	Battery is disconnected.	Check if battery wires are connected well.
Buzzer beeps continuously and red LED is on.	Fault code 07	Overload error. The inverter is overload 105% and time is up.	Reduce the connected load by switching off some equipment.
		If PV input voltage is higher than specification, the output power will be derated. At this time, if connected loads is higher than derated output power, it will cause overload.	Reduce the number of PV modules in series or the connected load.
	Fault code 05	Output short circuited.	Check if wiring is connected well and remove abnormal load.
		Temperature internal converter component is over 120°C.	Check whether the air flow of the unit is blocked or whether the ambient temperature is too high.
	Fault code 02	Internal temperature of inverter component is over 100°C	
	Fault code 03	Battery is over-charged	Return to repair center.
		The battery voltage is too high.	Check if spec and quantity of batteries are meet requirements.
	Fault code 01	Fan fault	Replace the fan.
	Fault code 06/58	Output abnormal (Inverter voltage below than 190Vac or is higher than 260Vac)	1. Reduce the connected load. 2. Return to repair center
	Fault code 08/09/53/57	Internal components failed.	Return to repair center.
	Fault code 51	Over current or surge.	Restart the unit, if the error happens again, please return to repair center.
	Fault code 52	Bus voltage is too low.	
	Fault code 55	Output voltage is unbalanced.	
	Fault code 59	PV input voltage is beyond the specification.	Reduce the number of PV modules in series.

8. Protection and Maintenance

8.1 Protections provided

Serial Number	Protection function	Introduction
1	PV current/power limiting protection	When charging current or power of the PV array configured exceeds the PV rated, it will charge at the rated.
2	PV night reverse-current protection	At night, the battery is prevented from discharging through the PV module because the battery voltage is greater than the voltage of PV module.
3	Mains input over voltage protection	When the mains voltage exceeds 280V (230V model), the mains charging will be stopped and switched to the inverter mode.
4	Mains input under voltage protection	When the mains voltage is lower than 170V (230V model /UPS mode) or 90V (APL mode), the mains charging will be stopped and switched to the inverter mode.
5	Battery over voltage protection	When the battery voltage reaches the overvoltage disconnection point, the PV and the mains will be automatically stopped to charge the battery to prevent the battery from being overcharged and damaged.
6	Battery low voltage protection	When the battery voltage reaches the low voltage disconnection point, the battery discharging will be automatically stopped to prevent the battery from being over-discharged and damaged.

Serial Number	Protection function	Introduction
7	Load output short circuit protection	When a short circuit fault occurs at the load output terminal for more than 200 milliseconds, the AC output is immediately turned off.
8	Heat sink over temperature protection	When the internal temperature is too high, the all-in-one machine will stop charging and discharging; when the temperature returns to normal, charging and discharging will resume.
9	Overload protection	Output again 3 minutes after an overload protection, and turn the output off after 5 consecutive times of overload protection until the machine is re-powered. For the specific overload level and duration, refer to the technical parameters table in the manual.
10	PV reverse polarity protection	When the PV polarity is reversed, the machine will not be damaged.
11	AC reverse protection	Prevent battery inverter AC current from being reversely input to Bypass.
12	Bypass over current protection	Built-in AC input overcurrent protection circuit breaker.
13	Battery input over current protection	When the discharge output current of the battery is greater than the maximum value and lasts for 1 minute, the AC input would switched to load.
14	Battery input protection	When the battery is reversely connected or the inverter is short-circuited, the battery input fuse in the inverter will blow out to prevent the battery from being damaged or causing a fire.
15	Charge short protection	When the external battery port is short-circuited in the PV or AC charging state, the inverter will protect and stop the output current.

8.2 Maintenance

In order to maintain the best long-term performance, it is recommended to conduct following checks twice a year.

1. Make sure that the airflow around the unit is not blocked and remove any dirt or debris from the heat sink.
2. Check that all exposed wires are damaged by exposure to sunlight, friction with other objects around them, dryness, bite by insects or rodents, etc., and the wires shall be repaired or replaced if necessary.
3. Verify for the consistency of indication and display with the operation of the device. Please pay attention to the display of any faults or errors, and take corrective actions if necessary.
4. Check all wiring terminals for corrosion, insulation damage, signs of high temperature or burning/discoloration, and tighten the screws.
5. Check for dirt, nesting insects and corrosion, and clean up as required.
6. If the arrester has failed, replace in time to prevent lightning damage to the unit or even other equipment of the user.

The company does not assume any liability for damage caused by:

- a) Improper use or use in improper site.
- b) Open circuit voltage of the PV module exceeds the maximum allowable voltage rated.
- c) Temperature in the operating environment exceeds the limited operating temperature range.
- d) Disassemble and repair the all-in-one solar charge inverter without permission.
- e) Force majeure: Damage that occurs in transportation or handling of the all-in-one solar charge inverter.

⚠ NOTICE

⚠ DANGER

Danger of electric shock! When doing the above operations, make sure that all power supplies of the all-in-one machine have been disconnected, and all capacitors have been discharged, and then check or operate accordingly!

9. Product Specifications

Model	LE3000-3A
AC Output	
Rated output power	3000W
Surge power	6000VA/2S
Rated output voltage	230V±10%
Output frequency	50Hz (Optional 60Hz)
DC Output	
USB-A output	2*5V/2.4A
TYPE-C output	2*5V/3A,9V/3A,12V/2A
DC5521 output	2*12V/3A
LFP Battery	
Nominal energy	3046Wh
Nominal voltage	25.6V
Operation ambient temperature(Charge)	0°C-40°C (32°F-104°F)
Operation ambient temperature(Discharge)	-10°C-40°C (14°F-104°F)
PV Input	
Max.PV input power	4500W
Max. input voltage(Voc)	500V
MPPT operating voltage range	85-450Vdc
Max. input current per MPPT	18A
AC Input	
AC input voltage	200~240V
Acceptable input voltage range	150~265V
Nominal input frequency	50Hz/60Hz
General Parameters	
Noise level	≤50dB
G.W.	42kg
Dimension	470*317*373mm
IP rating	IP21
Safety & Certification	UN38.3/MSDS