



NALESA8-15K Series AIO User Manual



---Safer and more reliable green energy system service provider---

Update Records

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A	New version	February 9, 2023	Yong Zhou
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1. Terms and Definitions

Danger	Indicate a hazard with a high level of risk that may result in death or serious injury if not avoided.
Caution	Indicate a hazard with a medium level of risk that may result in death or serious injury if not avoided.
Note	Indicate a hazard with a low level of risk that may result in minor or moderate injury if not avoided.
Instruction	Used to transmit the equipment or environment safety warning information. If not avoided, it may result in equipment damage, data loss, equipment performance degradation or other unpredictable results. The symbol of "Instruction" does not cause personal injury.
Description	Supplementary instruction of key information in the body. The symbol of "Note" is not safety warning information, and does not involve personal injury or equipment and environmental damage information.
Professional	Persons who own the training and the equipment operation experience and know clearly about various potential danger sources and levels during the equipment installation, operation and maintenance.
Trained personnel	Persons who have accepted the relevant skill training, own the necessary experience and can realize the danger possibly caused by a certain operation and take measures to minimize the danger to themselves and other personnel.
Operator	Operator possibly exposed to the equipment except the trained personnel and professional.

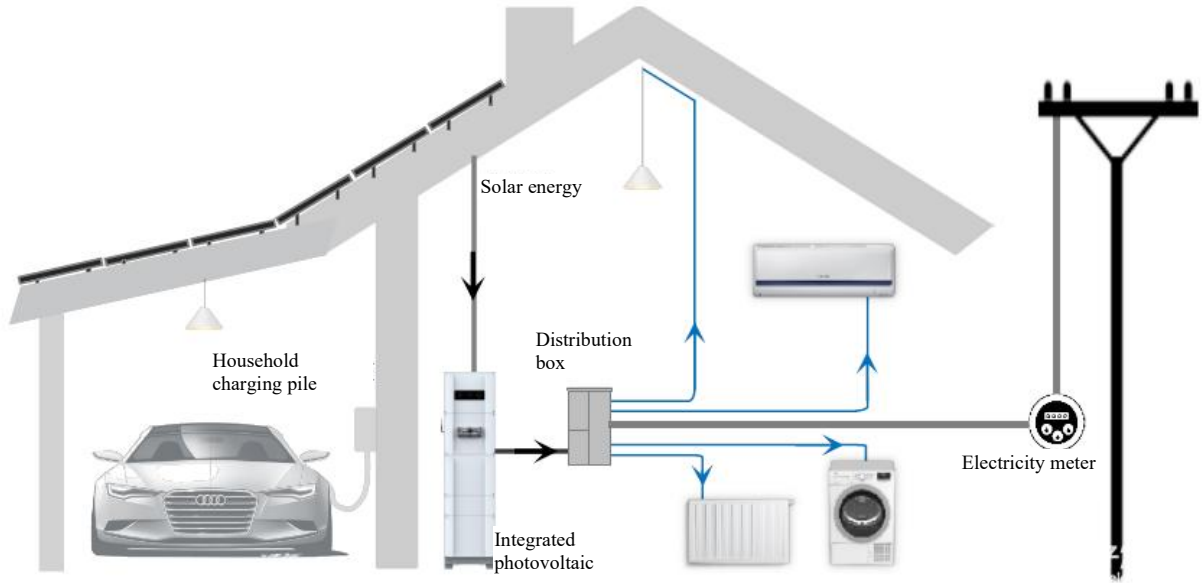
2. Scope

This user manual describes the performance indicators and the service conditions and risk warnings of the NALESA8-15K series AIO product.

The user manual only applies to the NALESA8-15K series AIO product.

The HY8-15K series AIO product consists of the photovoltaic energy storage hybrid inverter, energy storage battery module and wireless communication module or display. It can be connected to a photovoltaic generator to form a photovoltaic power generation system with the main function of converting the DC from the photovoltaic generator and battery into AC and then outputting it to the loads. The system works together with the EMS (energy management system) and BMS (battery management system) to realize the data monitoring, pre-alarm and control of the NALESA8-15K.

It can be used for both off-grid and on-grid systems and applies to multiple application scenarios, including the household, small farms, small businesses and charging of electric vehicle.



3. Product Performance Indicators

3.1 Model description:

Product model	Model description
NALESA7K-15KWH-S	Single-phase AIO equipped with 7 kW high-voltage cabinet and 15 kWh battery pack
NALESA7K-20KWH-S	Single-phase AIO equipped with 7 kW high-voltage cabinet and 20 kWh battery pack
NALESA7K-25KWH-S	Single-phase AIO equipped with 7 kW high-voltage cabinet and 25 kWh battery pack
NALESA7K-30KWH-S	Single-phase AIO equipped with 7 kW high-voltage cabinet and 30 kWh battery pack
NALESA8K-15KWH-S	Single-phase AIO equipped with 8 kW high-voltage cabinet and 15 kWh battery pack
NALESA8K-20KWH-S	Single-phase AIO equipped with 8 kW high-voltage cabinet and 20 kWh battery pack
NALESA8K-25KWH-S	Single-phase AIO equipped with 8 kW high-voltage cabinet and 25 kWh battery pack
NALESA8K-30KWH-S	Single-phase AIO equipped with 8 kW high-voltage cabinet and 30 kWh battery pack
NALESA8K-10KWH-T	Three-phase AIO equipped with 8 kW high-voltage cabinet and 10 kWh battery pack
NALESA8K-20KWH-T	Three-phase AIO equipped with 8 kW high-voltage cabinet and 20 kWh battery pack
NALESA8K-25KWH-T	Three-phase AIO equipped with 8 kW high-voltage cabinet and 25 kWh battery pack
NALESA8K-30KWH-T	Three-phase AIO equipped with 8 kW high-voltage cabinet and 30 kWh battery pack
NALESA8K-35KWH-T	Three-phase AIO equipped with 8 kW high-voltage cabinet and 35 kWh battery pack
NALESA9K-15KWH-S	Single-phase AIO equipped with 9 kW high-voltage cabinet and 15 kWh battery pack
NALESA9K-20KWH-S	Single-phase AIO equipped with 9 kW high-voltage cabinet and 20 kWh battery pack
NALESA9K-25KWH-S	Single-phase AIO equipped with 9 kW high-voltage cabinet and 25 kWh battery pack
NALESA9K-30KWH-S	Single-phase AIO equipped with 9 kW high-voltage cabinet and 30 kWh battery pack
NALESA10K-15KWH-S	Single-phase AIO equipped with 10 kW high-voltage cabinet and 15 kWh battery pack
NALESA10K-20KWH-S	Single-phase AIO equipped with 10 kW high-voltage cabinet and 20 kWh battery pack

NALESA10K-25KWH-S	Single-phase AIO equipped with 10 kW high-voltage cabinet and 25 kWh battery pack
NALESA10K-30KWH-S	Single-phase AIO equipped with 10 kW high-voltage cabinet and 30 kWh battery pack
NALESA10K-10KWH-T	Three-phase AIO equipped with 10 kW high-voltage cabinet and 10 kWh battery pack
NALESA10K-20KWH-T	Three-phase AIO equipped with 10 kW high-voltage cabinet and 20 kWh battery pack
NALESA10K-25KWH-T	Three-phase AIO equipped with 10 kW high-voltage cabinet and 25 kWh battery pack
NALESA10K-30KWH-T	Three-phase AIO equipped with 10 kW high-voltage cabinet and 30 kWh battery pack
NALESA10K-35KWH-T	Three-phase AIO equipped with 10 kW high-voltage cabinet and 35 kWh battery pack
NALESA12K-10KWH-T	Three-phase AIO equipped with 12 kW high-voltage cabinet and 10 kWh battery pack
NALESA12K-20KWH-T	Three-phase AIO equipped with 12 kW high-voltage cabinet and 20 kWh battery pack
NALESA12K-25KWH-T	Three-phase AIO equipped with 12 kW high-voltage cabinet and 25 kWh battery pack
NALESA12K-30KWH-T	Three-phase AIO equipped with 12 kW high-voltage cabinet and 30 kWh battery pack
NALESA12K-35KWH-T	Three-phase AIO equipped with 12 kW high-voltage cabinet and 35 kWh battery pack
NALESA15K-10KWH-T	Three-phase AIO equipped with 15 kW high-voltage cabinet and 10 kWh battery pack
NALESA15K-20KWH-T	Three-phase AIO equipped with 15 kW high-voltage cabinet and 20 kWh battery pack
NALESA15K-25KWH-T	Three-phase AIO equipped with 15 kW high-voltage cabinet and 25 kWh battery pack
NALESA15K-30KWH-T	Three-phase AIO equipped with 15 kW high-voltage cabinet and 30 kWh battery pack
NALESA15K-35KWH-T	Three-phase AIO equipped with 15 kW high-voltage cabinet and 35 kWh battery pack

3.2 Parameter list of three-phase high-voltage cabinet

	Model	HY8K- () -T	HY10K- () -T	HY12K- () -T	HY15K- () -T
Battery interface parameters	Battery voltage range (V)	125~600			
	Maximum battery current (A)	50			
	Maximum charge and discharge power (W)	10400	13000	14400	16500
Photovoltaic interface parameters	Maximum DC input voltage (V)	1000			
	MPPT working voltage range (V)	125~850			
	Starting voltage (V)	125			
	Maximum input current (A)	13/13A	13/13A	13/13A	26/26A
	Maximum DC input power (W)	11400	13000	15600	19500
	Maximum short-circuit current*circuit number of MPPT	16	16	16	16
	Number of MPPT input channels	2	2	2	2
On-grid parameters on the AC side	Channel number of each MPPT circuit	1/1	1/1	1/1	2/2
	Rated output power (VA)	8000	10000	12000	15000
	Maximum output power (VA)	8800	11000	13200	16500
	Maximum input power (VA)	17600	22000	26400	30000
	Maximum output current (A)	12.7	15.8	19	23.8
	Maximum input current (A)	26.8	33.4	40	43
	Maximum power (W)	8000	10000	12000	15000

	Rated output voltage (V)	400V, 3W+N+PE			
	Rated frequency (Hz)	50Hz/60Hz			
	Current harmonic distortion (@rated power)	<3%			
	Power factor	~1 (settable range: -0.8~0.8)			
Off-grid parameters on the AC side	Rated output power (VA)	8000	10000	12000	15000
	Maximum output power (VA)	8800	11000	13200	16500
	Rated output voltage (V)	400V,3W+N+PE			
	Rated frequency (Hz)	50Hz/60Hz			
	Current harmonic distortion (@rated power)	<3%			
	Maximum efficiency	97.9%	98.2%	98.2%	98.5%
	European efficiency	97.2%	97.5%	97.5%	97.6%
	MPPT efficiency	99.5%	99.5%	99.5%	99.5%
	Charge and discharge efficiency of battery	97.5%	97.5%	97.6%	97.8%
Mechanical parameters	L*W*H (mm)	586*435*704			
	Weight (kg)	67.1	68.1	69.1	74.1
Interface parameters	Human-machine interaction	Display or APP			
	BMS interface	CAN			
	Electricity meter communication interface	RS485			
	Cloud communication interface	WIFI or WAN			
Basic parameters	Protection grade	IP55			
	Operating temperature	-20~55°C			
	Relative humidity	0~100%			
	Operating altitude	2000 m without decrease of rated values			
	Cooling mode	Air cooling			
	Noise	≤25dB			
	Installation method	Stack			
Protection function	Anti-island protection	Yes			
	Photovoltaic input reverse connection protection	Yes			
	Battery input reverse connection protection	Yes			
	Insulation resistance detection	Yes			
	Residual current	Yes			

	detection	
	Over-voltage, over-current and over-power protection of PV input	Yes
	Over-voltage, over-current and over-power protection of battery	Yes
	Over-voltage, over-current and over-power protection of AC output and input	Yes
	Over-temperature protection	Yes
	Current limiting of each pulse	Yes
	Reference power supply fault protection	Yes

3.3 Parameter list of single-phase high-voltage cabinet

	Model	HY7K- () -S	HY8K- () -S	HY9K- () -S	HY10K- () -S
Battery interface parameters	Battery voltage range (V)	85~400			
	Maximum battery current (A)	70			
	Maximum charge and discharge power (W)	7400	8400	9400	10500
Photovoltaic interface parameters	Maximum DC input voltage (V)	500			
	MPPT working voltage range (V)	125~500			
	Starting voltage (V)	125			
	Maximum input current (A)	12A			
	Maximum DC input power (W)	12000			16000
	Maximum short-circuit current*circuit number of MPPT	14.4			
	Number of MPPT input channels	4			
Channel number of each MPPT circuit	1/1				
On-grid parameters on the AC side	Rated output power (VA)	7600	8000	9000	10000
	Maximum output power (VA)	8400	8800	9900	11000
	Maximum input power (VA)	9600	9600	12000	12000
	Maximum output current (A)	36.5	38.2	43	47.8
	Maximum input current (A)	40	40	50	50
	Maximum power (W)	9600	9600	12000	12000
	Rated output voltage	175 V-270 V/230 V, single-phase			

	(V)				
	Rated frequency (Hz)	50Hz/60Hz(45-54.9HZ/55-65HZ)			
	Current harmonic distortion (@rated power)	<2%			
Off-grid parameters on the AC side	Rated output power (VA)	7600	8000	9000	10000
	Maximum output power (VA)	8400	8800	9900	11000
	Rated output voltage (V)	230 V, single-phase			
	Rated frequency (Hz)	60Hz			
	Current harmonic distortion (@rated power)	<2%			
Mechanical parameters	L*W*T (mm)	586*435*704			
	Weight (kg)	75.6			
Interface parameters	Human-machine interaction	Display or APP			
	BMS interface	CAN			
	Electricity meter communication interface	RS485			
	Cloud communication interface	WIFI or WAN			
Basic parameters	Protection grade	IP55			
	Operating temperature	-20~55°C			
	Relative humidity	0~100%			
	Operating altitude	2000 m without decrease of rated values			
	Cooling mode	Air cooling			
	Noise	≤25dB			
	Installation method	Stack			
Protection function	Anti-island protection	Yes			
	Photovoltaic input reverse connection protection	Yes			
	Battery input reverse connection protection	Yes			
	Insulation resistance detection	Yes			
	Residual current detection	Yes			
	Over-voltage, over-current and over-power protection of PV input	Yes			
	Over-voltage, over-current and	Yes			

	over-power protection of battery	
	Over-voltage, over-current and over-power protection of AC output and input	Yes
	Over-temperature protection	Yes
	Current limiting of each pulse	Yes
	Reference power supply fault protection	Yes

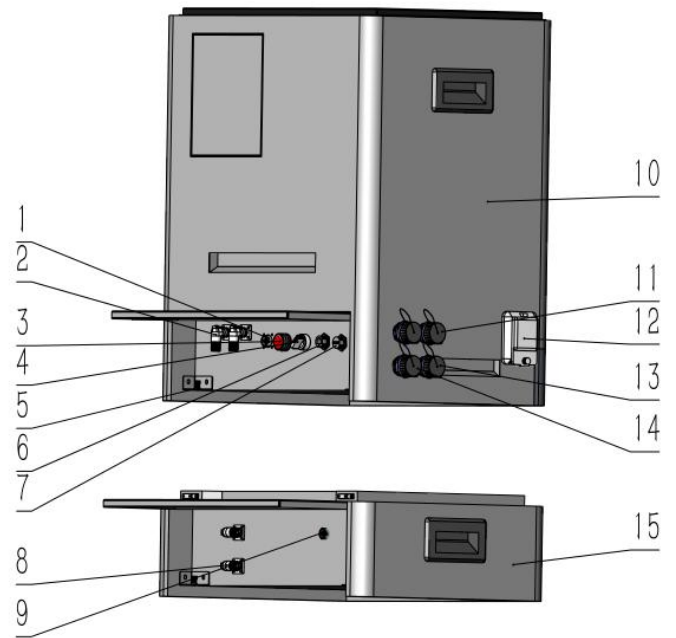
3.4 Parameter list of battery box

Model	HY-()-10K WH-()	HY-()-15K WH-()	HY-()-20K WH-()	HY-()-25K WH-()	HY-()-30K WH-()	HY-()-35K WH-()
Input voltage range of battery	160-233.6V	120-175.2V	160-233.6V	200-292V	240-350.4V	291-408.8V
Rated voltage of battery pack	204.8V	153.6V	204.8V	256V	307.2V	358.4V
Total number of batteries	2	3	4	5	6	7
Dimensions of battery pack (length * width * height)	586*435*421mm	586*435*576mm	586*435*737mm	586*435*895mm	586*435*1053mm	586*435*1211mm
Complete machine dimensions	586*435*1113mm	586*435*1291mm	586*435*1449mm	586*435*1607mm	586*435*1765mm	586*435*1923mm
Voltage range of a single battery	80-116.8V	40-58.4V				
Rated voltage of a single battery	102.4V	51.2V				
Capacity of a single battery	5.12kwh					
Dimensions of battery without bottom wheel (L*W*H)	586*435*158mm					
Dimensions of battery with bottom wheel (L*W*H)	586*435*263mm (including the bottom wheel height of 70 mm)					
Net weight of battery without bottom wheel	49kg					
Net weight of battery with bottom wheel	60kg					

Maximum charge/discharge current	40A/40A
Battery type	LFP
Communication interfaces	CAN
Protection grade	IP55
Operating temperature	-15°C~55°C
Noise	<30dB
Description	Each battery pack contains 1 battery with a bottom wheel and several batteries without a bottom wheel

3.5 Appearance and interface description of the equipment

Code	Name	Description
1	COM1	Communication interface with battery
2	B+, B-	Connect the main cathode and anode of battery
3	Start	Starting switch
4	Stop	E-Stop button
5	Fixing screw	Fix the high-voltage cabinet
6	CT	Connect to the CT sensor
7	Up Date	Interface for inverter program upgrade
8	B1+, B1-	Cathode and anode of battery box
9	COM2	Communication interface of battery box
10	High-voltage cabinet	Integrate electric parts
11	Backup1, 2	Two-way AC discharge port
12	Break	Main circuit breaker
13	GEN	AC charging port of diesel engine
14	Grid	AC charging port of grid
15	Battery box	Integrate battery and connectors



Annotation	Description
PV1	PV1+: Positive input of photovoltaic generator 1, PV1-: Negative input of photovoltaic generator 1
PV2	PV2+: Positive input of photovoltaic generator 2, PV2-: Negative input of photovoltaic generator 2
Backup1	1: Phase A of load line, 2: Phase B of load line, L: Phase C of load line, N: Neutral wire of load line, PE: Ground wire of load line
Backup2	1: Phase A of load line, 2: Phase B of load line, L: Phase C of load line, N: Neutral wire of load line, PE: Ground wire of load line
Grid	1: Phase A of grid line, 2: Phase B of grid line, L: Phase C of grid line, N: Neutral wire of grid line, PE: Ground wire of grid line
GEN	1: Phase A of generator, 2: Phase B of generator, L: Phase C of generator, N: Neutral wire of generator, PE: Ground wire of generator

4. General Safety

4.1 Statement

■ Please read this manual before the installation, operation and maintenance of the equipment and observe the marks on the equipment and all safety precautions in the manual.

■ The "instruction", "note", "warning" and "danger" symbols in this manual are not intended to represent all safety precautions to be observed, but only a supplement to them. Our company shall not bear the responsibilities caused by your violation of the general safety operation requirements or the safety standards for equipment design, production and use.

■ The equipment shall be used under an environment meeting the requirements of the design specifications, otherwise an equipment fault may occur and the dysfunction of equipment or part damage, personal safety accident, property loss, etc. arising therefrom will not be covered by the scope of the equipment warranty.

■ Please abide by the local laws and regulations and relevant codes during the equipment installation, operation and maintenance. The safety precautions in this manual are only a supplement to the local laws and regulations and relevant codes.

Our company shall not bear the responsibility under one of the following circumstances.

- The equipment operates beyond the service conditions described in this Manual.
- The installation and service environment are not in accordance with relevant international and national standards.
- The product is dismantled or changed or the software code is modified without an authorization.
- The equipment is operated beyond the instructions and safety warnings of the product and this manual.
- An equipment damage is caused by abnormal natural environment (force majeure, such as earthquake, fire, storm, etc.).
- The equipment is damaged during transportation by the customer.
- An equipment damage is caused by storage conditions not meeting the requirements of the product document.

4.2 Hazard

■ It is strictly forbidden to install, use and operate the outdoor equipment and cables (including but not limited to handling equipment, operating equipment and cables, plugging and unplugging signal interfaces connected to the outdoors, operating at height, installing outdoors) in lightning, rain, snow, wind above grade 6, and other inclement weather.

■ After the equipment installation, the empty packaging materials within the equipment area, such as the paper box, foam, plastics, cable ties, etc. shall be cleared.

■ In case of fire, evacuate the building or equipment area and press the fire alarm, or call the fire alarm number. It is strictly forbidden to re-enter the burning building in any case.

■ It is strictly forbidden to alter, damage or shield the marks and nameplate on the equipment.

■ When installation the equipment, use proper tools to fasten the screws following the specified moment.

■ Get fully familiar with the composition and working principle of HY8-15K and relevant national/local standards of the project location.

■ When the paint is scratched during the equipment transportation and installation, it must be made up in time. It is strictly forbidden to expose the scratched part to the outdoor environment for a long time.

- Please do not dismantle or modify the HY8-15K AIO arbitrarily.

4.3 Personal safety

■ During the equipment operation, if a fault that may cause the personal injury or equipment damage is found, terminate such operation immediately, report the fault to the person in charge and take effective protection measures.

■ Before using a tool, please master the correct method to use such tool and avoid the personal injury or equipment damage.

■ During the equipment operation, the shell temperature is high and has a risk of burning, so please do not touch it.

4.4 Personnel requirements

■ Personnel responsible for the installation and maintenance of the product must be trained strictly, informed of various safety precautions and master the correct operations.

■ Only qualified professional or trained personnel are permitted to install, operate and maintain the equipment.

■ Only qualified professional are permitted to dismantle safety facilities and overhaul the equipment.

■ Personnel who operate the equipment, including the operators, trained personnel and professional shall own the special operation qualifications meeting the local national requirements, such as the qualifications for high-voltage operation, operation at height, special equipment operation, etc.

■ The equipment or part (including software) must be replaced by the professional or authorized personnel.

5. Electrical Safety

5.1 Grounding requirements

■ Before the installation of equipment that needs to be grounded, the protective ground wire shall be installed firstly; When demolishing the equipment, the protective ground wire shall be removed at last.

■ It is forbidden to damage the grounding conductor.

■ It is forbidden to operate the equipment without the grounding conductor.

■ The equipment shall be permanently connected to the protective ground wire.

■ Before operating the equipment, check the electrical connection to ensure that the equipment has been reliably grounded.

5.2 General requirements

Danger:

Before the electrical connection, please ensure the equipment is not damaged, otherwise an electric shock or fire might occur.

■ All electrical connections must meet the applicable national/local electrical standards.

■ The grid-connected power generation shall not be conducted without the license of the national and local electric power authority.

■ The user's self-provided cables shall meet the requirements of the local laws and regulations.

■ Please use the special insulation tools during the high-voltage operations.

Danger:

It is strictly forbidden to install and remove the power cords with electricity. Electric arc or spark may occur at the moment when the power cord core touches the conductor, which may lead to fire or personal injury.

- Before the electrical connection of the equipment, if the live parts may be touched, please disconnect the previous-level breaking device for the equipment.
- Before connecting the power cord, please ensure it is labeled correctly.
- If the equipment has multiple input channels, disconnect all inputs and, after the equipment is completely powered off, operate the equipment.

5.3 Wiring requirements

- If the cable is used in high temperature environment, the insulation layer may be aged and broken, so the cable shall be at least 30 mm distant from the heat generating device or the periphery of the heat source area.
- The same type of cables shall be tied together, and different types of cables shall be placed at an interval of at least 30 mm. No entanglement or cross placement is permitted.

5.4 Environmental requirements for installation

- Please ensure the installation environment of the equipment is ventilated properly.
- During the equipment operation, please do not shield the air vent or heat radiation system, otherwise the high temperature may lead a fire.
- It is forbidden to place or operate the equipment in an environment containing flammable or explosive gas or smoke.
- It is forbidden to place the equipment in an environment with highly salty mist.
- The load intensity of the installation floor must be greater than the load generated by the product weight.
- The equipment shall not be installed in an area where the ambient temperature is always below 0°C or above 50°C.
- The relative humidity of the air shall be smaller than 95%.

6. Mechanical Safety

6.1 Boring safety

The following safety precautions shall be taken into consideration during the boring on the wall and ground:

- Wear the goggle and protective gloves when boring.
- Shield the equipment during boring to avoid the ingress of debris into the equipment. Clean and clear the debris in time after the boring.

6.2 Handling safety of heavy objects

- Make preparations for bearing the load when carrying heavy objects to avoid being crushed or sprained by such heavy objects.
- When handling the equipment manually, wear protective gloves to avoid a injury.

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

6.3 Commissioning safety

- After the equipment is powered on for the first time, the parameters shall be set by a professional.

6.4 Maintenance and replacement

Danger:

A high voltage during the operation of the equipment may cause an electric shock, which may result in death, serious personal injury or great property losses. Therefore, the equipment must be powered off before the maintenance and operated in strictly accordance with the safety precautions listed in this manual and other relevant documents.

- Please ensure you have been familiar with and understood the contents of this manual and own the proper tools and test device before the maintenance of the equipment.

- Before the maintenance, please power off the equipment and wait a period as specified by the delayed discharge label. Operate the equipment after ensuring the equipment has been powered off.

During the maintenance, please avoid the ingress of irrelevant personnel into the maintenance field. The temporary warning signs or barriers must be arranged for insulation.

- if a fault occurs to the equipment, please contact your dealer for a solution.

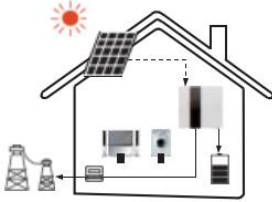
- Only after the fault is cleared can the equipment be powered on again, otherwise the fault may be enlarged or the equipment may be damaged.

7. Basic Characteristics

7.1 Working mode

The NALESA8-15K series AIO can provide multiple working modes based on different requirements.

Working mode: Self-power generation and self-use (with photovoltaic power)



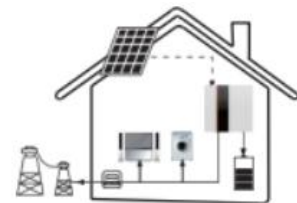
- Priority: Load>battery>grid
- This mode applies to areas featured by low on-grid tariff and high energy price.
- The power from the photovoltaic generator will be firstly supplied to the local loads and then used to charge the battery. The redundant power will be outputted to the public grid.

Working mode: Self-power generation and self-use (no photovoltaic power)



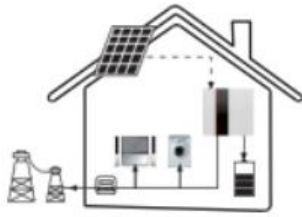
- In case of no photovoltaic power, the battery will discharge for the local loads. When the battery capacity is insufficient, the grid will supply the power.

Working mode: Peak load shifting



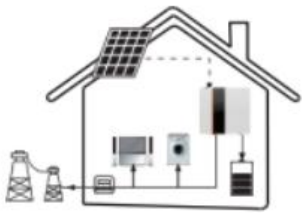
- Priority: Battery>load>grid (during charge)
- Priority: Load>battery>grid (during discharge)
- This mode applies to areas that have a tariff between the peak and valley and users can charge the battery with the non-peak power.
- The charge and discharge time can be set flexibly and users can select charge from the grid or not.

Working mode: Input priority



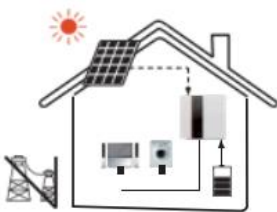
- Priority: Load>grid>battery
- This mode applies to areas featured by high on-grid tariff and export control.
- The power from photovoltaic generator will be firstly supplied to the local loads and then transmitted to the public grid. The redundant power supply will charge the battery.

Working mode: Standby mode



- Priority: Battery>load>grid
- This mode applied to areas featured by frequent power outages.
- When the grid disconnects, this mode ensures the battery has enough energy supply.
- In this mode, the battery will be mandatorily charged within the preset period and will never discharge during the grid connection. It allows users to select whether to charge from the grid.

EPS status




- When the grid disconnects, the system will provide an emergency power supply through the photovoltaic generator or battery and thereby supply power to the household loads.


8. Electrical Connection

8.1 Photovoltaic connection

Select photovoltaic components with excellent performance and reliable quality. The open-circuit voltage of the serial module array shall be smaller than the maximum DC input voltage. The operating voltage shall be within the MPPT voltage range.

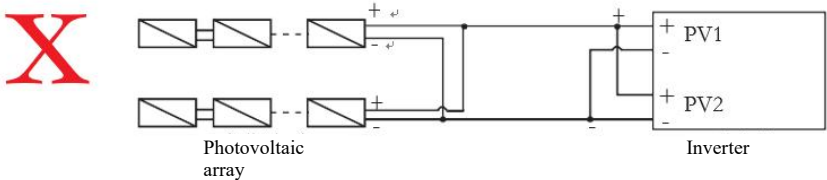
Model of three-phase high-voltage cabinet	HY8K- () -T	HY10K- () -T	HY12K- () -T	HY15K- () -T
Maximum tributary voltage (V)	1000			
MPPT voltage range (V)	125~850			
Model of single-phase high-voltage cabinet	HY7K- () -S	HY8K- () -S	HY9K- () -S	HY10K- () -S
Maximum tributary voltage (V)	500			
MPPT voltage range (V)	125~500			

 **Warning!**
 The photovoltaic voltage is very high and reaches a dangerous range, so please abide by the electrical safety rules during the connection.
 Do not connect the positive or negative terminal of the photovoltaic component to the ground!

 **Note**

- ⊗ The following requirements for the photovoltaic components shall be applied to every input area;
- ⊗ Please do not connect the positive or negative terminal of the photovoltaic component to the ground wire!
- ⊗ To save cables and reduce DC losses, it is recommended to install an inverter near the photovoltaic module.

Caution!
 It is not allowed to use the following photovoltaic connection mode!



Connecting steps:

Step 1: Check the photovoltaic component

- 1.1 Use a multimeter to measure the voltage of the module array.
- 1.2 Correctly check the PV+ and PV- from the photovoltaic module to the combiner box.
- 1.3 Please ensure the impedance to ground of the positive and negative pole of the photovoltaic component is at the MΩ level.

Step 2: Separate the photovoltaic connector

Step 3: Prepare wires

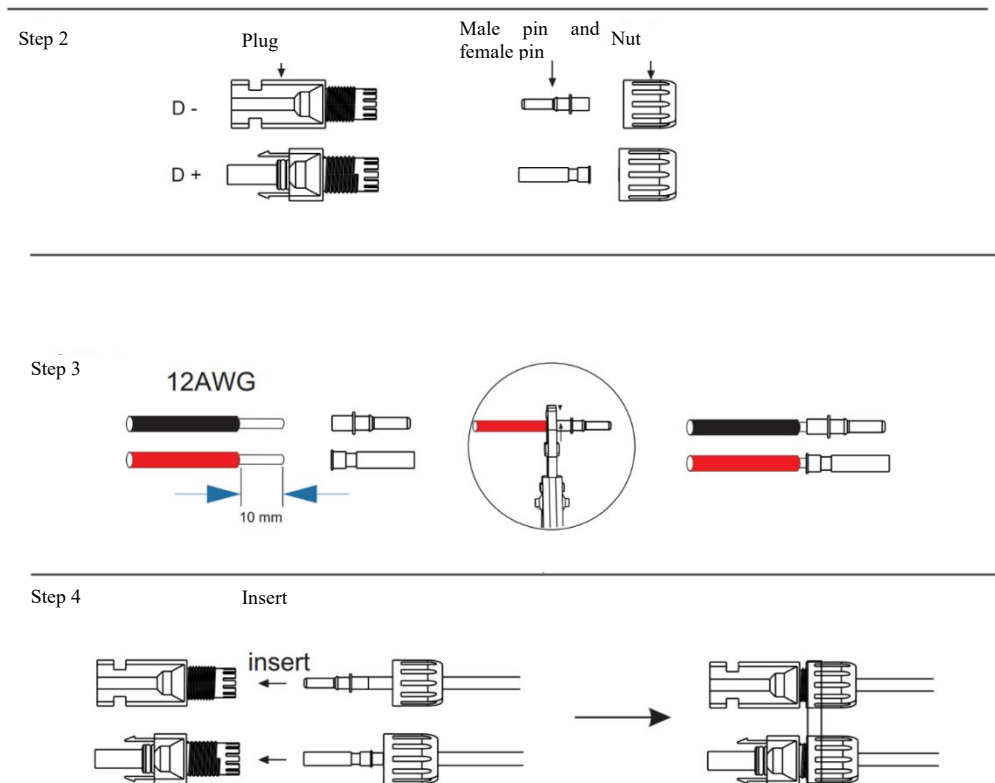
3.1 Select the 12 AWG conductor and cold pressed terminal (male pin and female pin).

3.2 Remove a 10 mm long part of the insulation layer at the end of the wire.

3.3 Plug the wire into the cold pressed terminal (male pin and female pin) and compact it with a wire crimper.

Step 4: Assemble the compacted conductor and the photovoltaic connector correctly.

Step 5: Insert the photovoltaic connector into the corresponding photovoltaic connector port on the inverter.



8.2 Grid connection

The grid voltage is 220/240 V and the frequency is 50/60 Hz. Other technical requirements shall be consistent with the requirements of the local public grid.

Model of three-phase high-voltage cabinet	HY8K- () -T	HY10K- () -T	HY12K- () -T	HY15K- () -T
Cable	4-5mm ²			6mm ²
Miniature circuit breaker	20A			32A
Model of single-phase	HY7K- () -S	HY8K- () -S	HY9K- () -S	HY10K- () -S

high-voltage cabinet				
Cable	8AWG		7AWG	
Miniature circuit breaker	50A		63A	

The miniature circuit breaker shall be installed between the high-voltage cabinet and grid and no load shall be directly connected to the high-voltage cabinet.

Connecting steps:

Step 1: Check the grid voltage.

1.1 Check the grid voltage and compare it with the permissible voltage range (please refer to the technical data).

1.2 Disconnect the circuit from all phases to avoid the re-connection.

Step 2: Find out the plug corresponding to the grid interface and unscrew the protective casing at the tail.

Step 3: Make the AC wires.

3.1 Select proper wires (refer to the table of recommended wire diameters for the cable dimensions).

3.2 Remove a 10 mm long part of the insulation layer at the end of the wire.

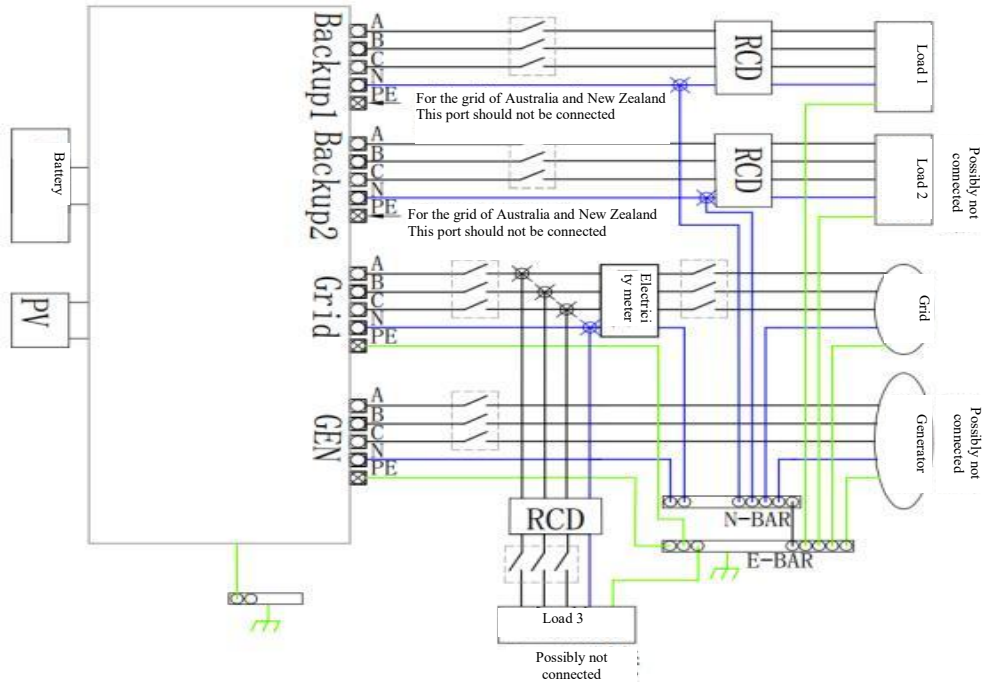
3.3 Insert the end of the wire into the connection part of the plug and tighten the screws (refer to the table of wire definitions for the definition of wire).

8.3 EPS connection (load connection)


The HY8-15K series hybrid high-voltage cabinet supports both off-grid and on-grid functions. The inverter outputs the electrical power through the AC port when the grid is opened, and outputs the electrical power through the EPS port when the grid is closed.

The HY8-15K series product has two EPS versions and the customers can select one of them based on the local rules.

E version applies to the wiring rules that do not isolate the ground wire on the load side of EPS from the ground wire on the grid side (applicable to most countries).

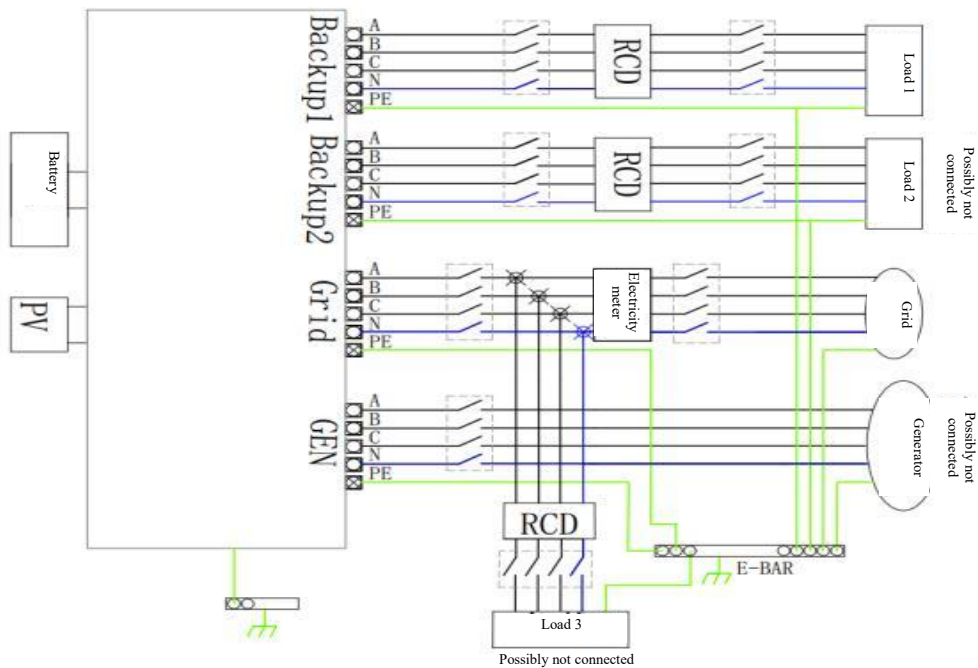


I version applies to the wiring rules that requires the isolation of the ground wire on the load side of EPS from the ground wire on the grid side (applicable to the wiring in the AS/NZS_3000:2012 standard of Australia and New Zealand).



Caution!
If the wiring mode of the local strategy is inconsistent with the above operation guide, please contact before the wiring operations the neutral wire, ground wire and RCD!

Connecting steps:



Step 1: Make EPS (Back 1 and Back 2) wires.

1.1 Select proper wires (refer to the following figure for the cable dimensions).

1.2 Remove a 10 mm long part of the insulation layer from the end of the wire.

1.3 Insert the end of the wire into the connection part of the plug and tighten the screws (refer to the table of wire definitions for the definition of wire).

Model of three-phase high-voltage cabinet	HY8K- () -T	HY10K- () -T	HY12K- () -T	HY15K- () -T
Cable	5mm ²			6mm ²
Miniature circuit breaker	25A			32A
Model of single-phase high-voltage cabinet	HY7K- () -S	HY8K- () -S	HY9K- () -S	HY10K- () -S
Cable	8AWG		7AWG	
Miniature circuit breaker	50A		63A	

Requirements for EPS load:




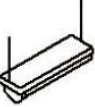
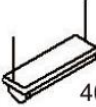



Warning:

- Ensure the rate value of the EPS load power is consistent with the rated value of the INEPS output power, otherwise the output of the high-voltage cabinet will be shut down and the "over-load" warning will be triggered.

- In case of an "over-load", adjust the load power and ensure it is within the range of the EPS output power and power on the high-voltage cabinet again.

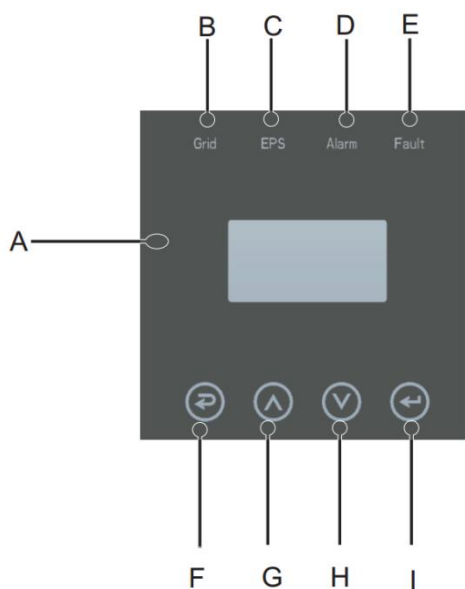
- For nonlinear load, please ensure the surge power is controlled within the range of the EPS output power.

The following table lists some common loads for your reference.

Type	Power		Common equipment	Example		
	Initial	Rated		Equipment	Initial	Rated
Resistor load	R 1	R 1	 Lamp  TV	 100W Lamp	100VA (W)	100VA (W)
Capacitive load	R 2	R 1.5	 Fluorescent	 40W Fluorescent	80VA (W)	60VA (W)
inductor load	R 3~5	R 2	 Fan  Refrigerator	 150W Refrigerator	450-750VA (W)	300VA (W)

9. Settings

9.1 Control panel



S/N	Name	Description
A	LCD display	Display all information of the whole machine
B	Indicator	On: The inverter operates under the on-grid mode Off: The inverter is not under the on-grid status
C		On: The inverter operates under the off-grid mode Off: The inverter does not operate under the off-grid mode
D		On: The whole machine has a warning Off: The whole machine has no warning
E		On: The whole machine has a serious fault Off: The whole machine has no fault
F	Touch button	Esc: Return from the current setting interface
G		Up: Move the cursor upward or increase the set value

H	Down: Move the cursor downward or decrease the set value
I	Enter: Confirm and save the current settings

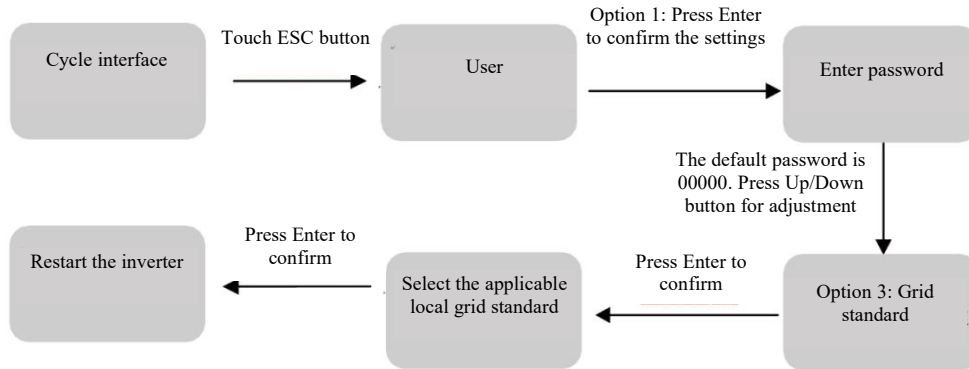
9.2 Description of LED indicator status

Whole machine status	Grid (green)	EPS (green)	Alarm (yellow)	Fault (red)
Initialization	Off	Off	Off	Off
Standby	Off	Off	Off	Off
On-grid	On	Off	Off	Off
Off-grid	Off	On	Off	Off
Bypass	Off	On	On	Off
Fault	Off	Off	Off	On

9.3 Quick setting guide

(1) Set the corresponding grid standard, PV input type and battery type;

Grid standard:

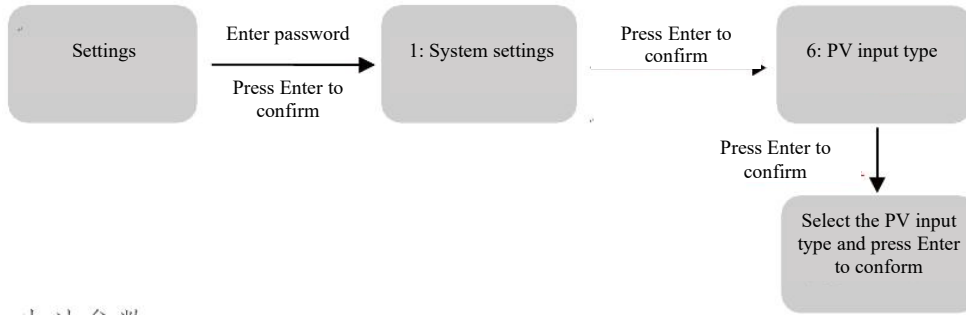


Note: If the local grid connection has a requirement for the reactive power, please set the reactive power as follows.

Set based on the actual demand;

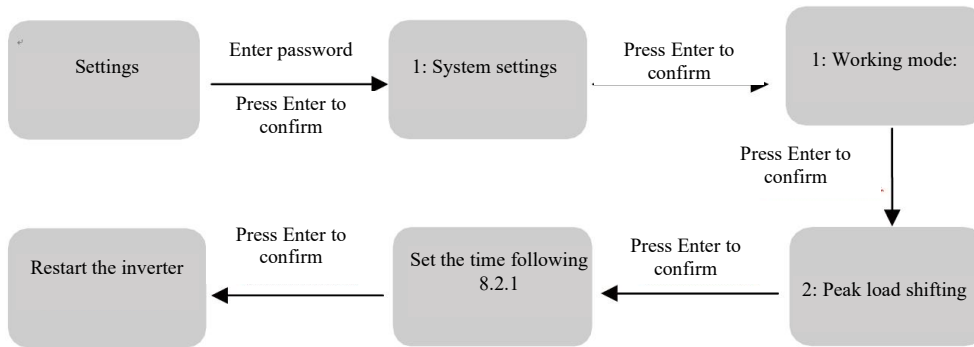


PV input type:



Peak load shifting mode:

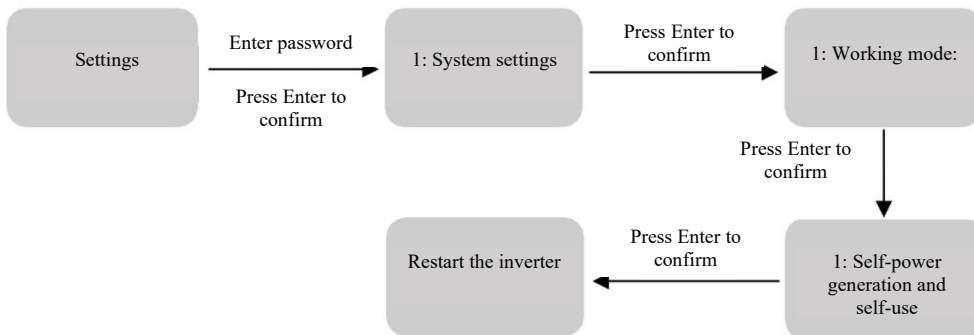
After completing the settings of the peak load shifting mode, you need to set the charge and discharge period.



Note: If the time is not set correctly, you need to set it correctly and press Enter to quit the interface.

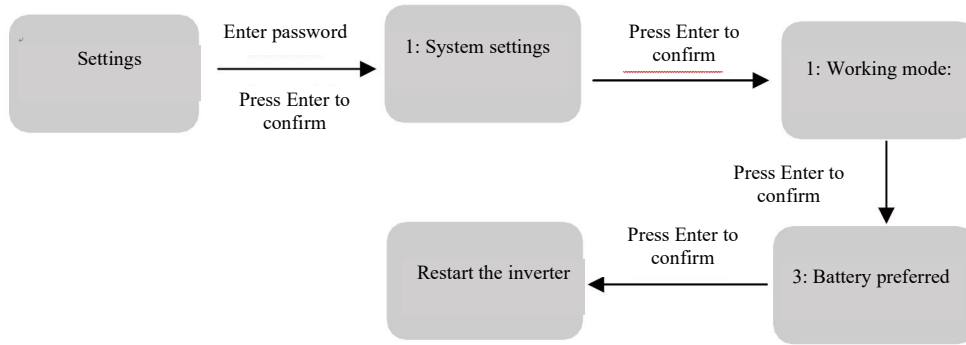
(2) Select the proper mode based on the actual situation

Self-power generation and self-use (system default mode)



If you need to set more items, please restart after completing all settings.

Battery preferred:

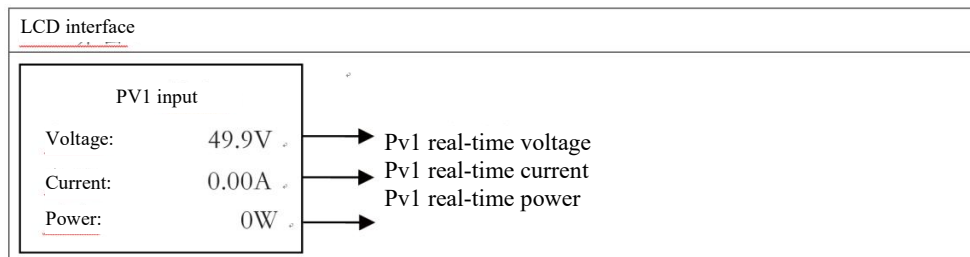


Note: When the battery preferred mode is selected, select the proper charging current according to the battery type. The system default current is 25 A.

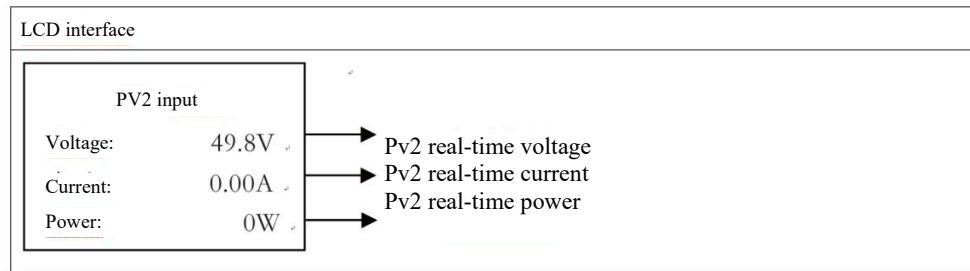
10. Detailed Introduction to Display and Setting Parameters

10.1 LCD display

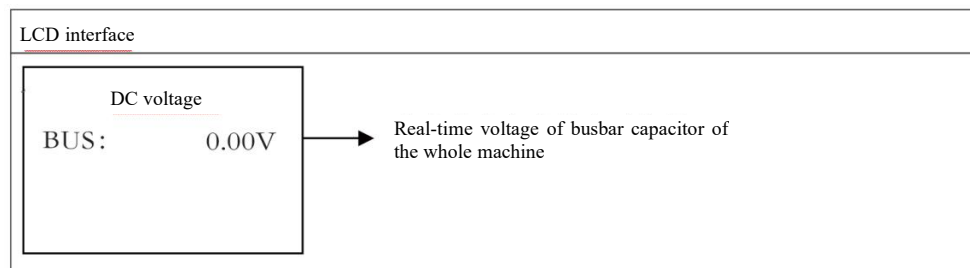
10.1.1 PV1 parameter display interface



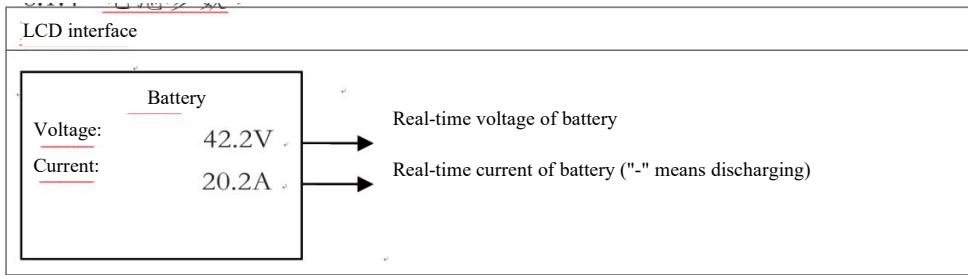
10.1.2 PV2 parameter display interface



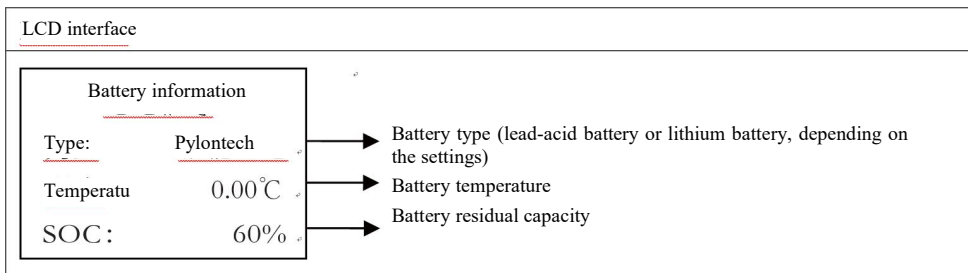
10.1.3 DC voltage



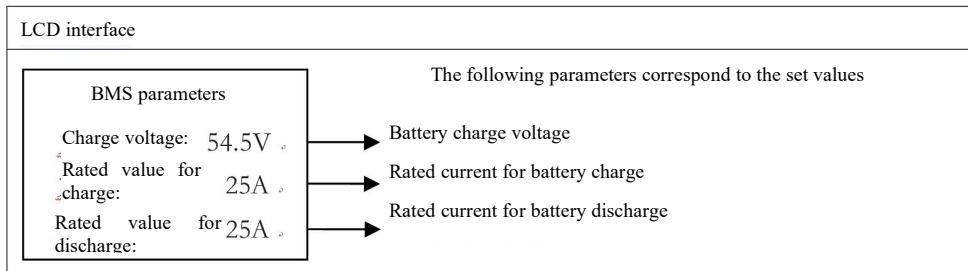
10.1.4 Battery parameters



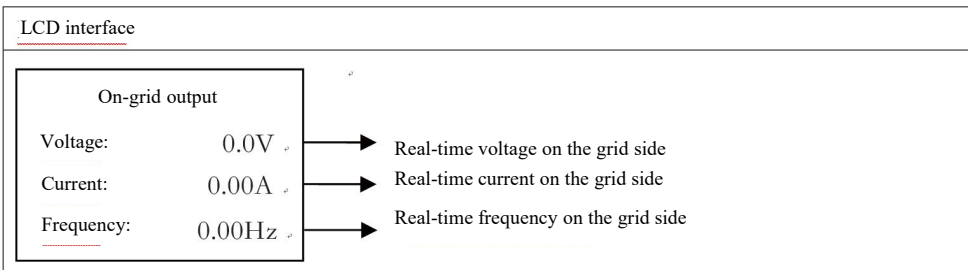
10.1.5 Battery information



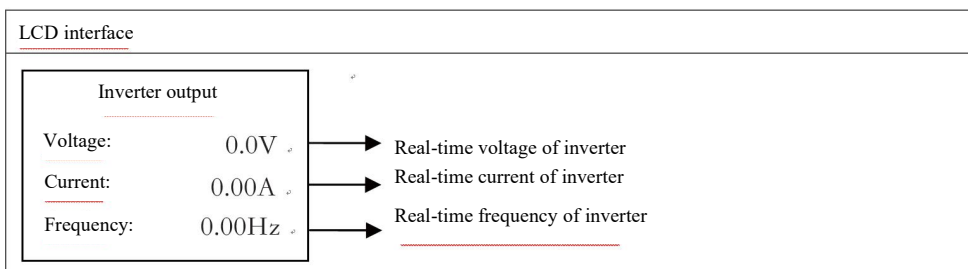
10.1.6 BMS parameters



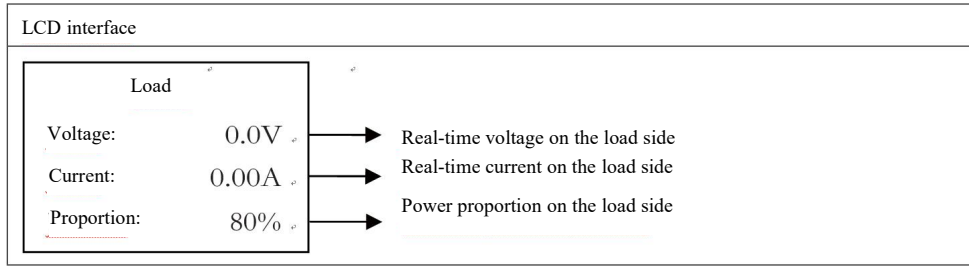
10.1.7 Parameters of the grid side



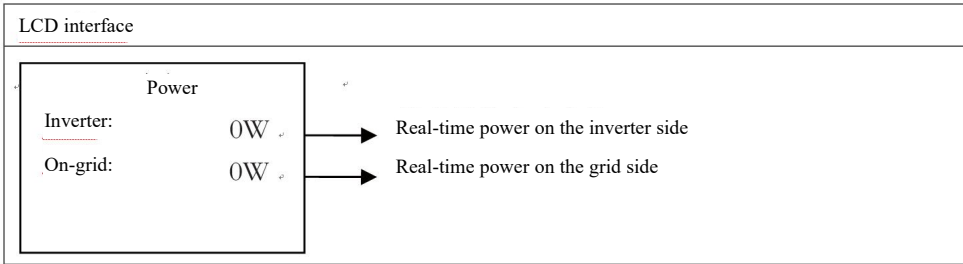
10.1.8 Inverter parameters



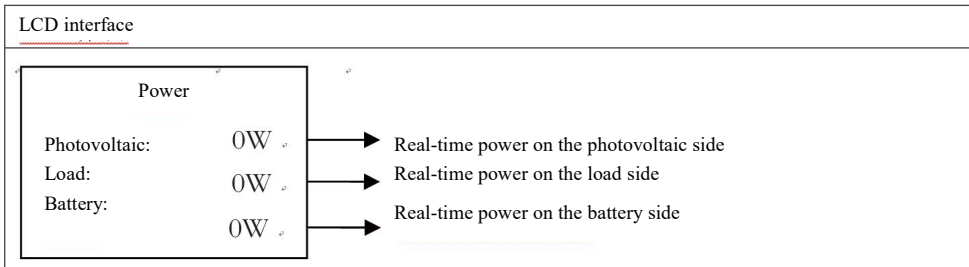
10.1.9 Load Information



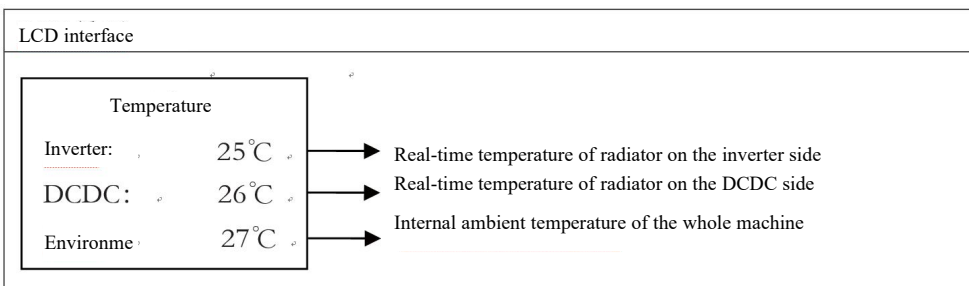
10.1.10 Power on the inverter and grid side



10.1.11 Power on the PV, load and battery side



10.1.12 Internal ambient temperature of the whole machine and temperature of the inverter, charger and discharger



10.1.13 Status information

LCD interface	Details
<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">Status information</p> <p>System: Grid power supply</p> <p>Inverter: Standby</p> <p>DCDC: Standby</p> </div>	<p>System: Displays the status information of the whole machine, including: initialization, standby, grid connection of PV, grid connection of battery, hybrid power supply, charge by mains supply, charge by PV, grid power supply, fault mode, etc.</p> <p>Inverter: Displays the status information of the inverter, including: standby, off-grid, on-grid, off-grid tracking, etc.</p> <p>DCDC: Displays the status information of the charger and discharger, including: standby, charge mode, discharge mode, etc.</p>

10.1.14 Error information

LCD interface	Details
<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">Error information</p> <p>02: Battery not connected</p> </div>	<p>The number indicates the error code and text shows the error information. (For details, refer to Chapter 9)</p> <p>Note: The current page is locked when a lock sign is displayed at the upper right corner of the screen. You may press Enter to unlock it.</p>

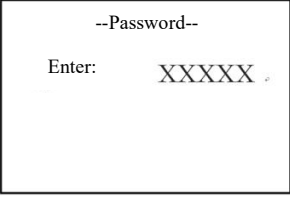
10.1.15 System settings

LCD interface	Details
<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">System settings</p> <p>Status: Self-power</p> <p>Grid connection 220/50</p> <p>standard:</p> <p>PV input: Independent</p> </div>	<p>Status: Set values of the whole machine working mode. The options include: self-power generation and self-use, peak load shifting and battery preferred.</p> <p>Grid standard: The displayed value is the actually selected grid standard.</p> <p>PV input: The displayed value is the set value of the PV input type. The options include: parallel, independent and constant voltage.</p>

10.1.16 User settings

LCD interface	Description
<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">--User--</p> <p>→ 1: Settings</p> <p>2: Query</p> <p>3: Statistics</p> </div>	<p>Press Esc and enter the user settings interface: You may view more information in Chapter 8.2;</p>

A password is required when you enter the settings interface. The detailed information is as follows:

LCD interface	Description
	<p>A password is required when you enter the settings interface. The default password is "00000". You may press Up/Down to adjust the password, press Enter to move the cursor forward and press Esc to move the cursor backward;</p>

10.2 Settings

<p>The interface is used for selecting the peak load offset time.</p> <p>You may press Up/Down to move to the proper option.</p> <p>Press Enter and enter the selected menu.</p> <p>Press Esc and return to the working mode interface.</p>	
<p>② Backup enable</p>	
<p>LCD interface</p>	<p>Description</p>
<p>--Backup enable--</p> <p>→1: Forbid</p> <p>2: Permit</p>	<p>When the on-grid photovoltaic generator is shut down, the battery will be enabled to supply power to the load. The default option is permit.</p>
<p>③ Battery wakeup</p>	
<p>LCD interface</p>	<p>Description</p>
<p>--Battery wakeup--</p> <p>→1: Forbid</p> <p>2: Permit</p>	<p>Enable or disable the battery wakeup.</p> <p>The default option is "Forbid".</p>
<p>④ Remote control enable</p>	
<p>LCD interface</p>	<p>Description</p>
<p>--Remote control enable--</p>	<p>Enable it when you want to control the machine remotely. The default option is</p>

→1: Forbid 2: Permit	"Forbid".
⑤ Start delay	
LCD interface	Description
--Start delay-- Enter: 60 Unit: S	The range of the input value is 20-300, depending on the standard.
⑥ PV input type	
LCD interface	Description
--Input mode-- →1: Independent 2: Parallel 3: Constant voltage	Set the photovoltaic input mode. The default mode is independent; When the parallel input is changed into independent mode, the photovoltaic power will be unbalanced.
10.2.2 Battery parameters	
LCD interface	Description
--Battery parameters-- →1: Battery type 2: Battery discharge depth 3: Battery charge current	The interface is used to select the battery parameters. You may press Up/Down to move to the proper option; Press Enter and enter the selected menu; Press Esc to return to the setting interface;
① Battery type	
LCD interface	Description
--Battery type-- 1: Lead-acid →2: Custom 3: Pylontech lithium battery 4: Boqiang lithium battery 5: Topband lithium	The interface is used to select the battery type. You may press Up/Down to move to the proper option; Press Enter and enter the selected menu; Select the lead-acid storage battery and enter the lead-acid storage battery interface; Select "Custom lithium battery" and enter the "Customer lithium battery" interface; Select the Pylontech lithium battery and enter the Pylontech lithium

battery	battery interface;
Custom lithium battery parameters	
LCD interface	Description
--Custom lithium battery-- →1: Charge voltage 2: Discharge protection voltage 3: Charge protection voltage	The interface is used to select the parameters of custom lithium battery. You may press Up/Down to move to the proper option; Press Enter and enter the selected menu; The options include battery charge voltage, battery discharge voltage and battery over-voltage protection.
10.2.3 Grid standard	
LCD interface	Description
--Grid standard-- →1: 220 V/50 HZ 2: 230 V/50 HZ 3: 240 V/50 HZ 4: 220 V/60 HZ 5: 230 V/60 HZ 6: 240 V/60 HZ	You may press Up/Down to move to the proper option. There are 6 optional standards. Press Enter to confirm your selection. Press Esc to cancel your selection and return to the settings interface (please refer to 10.2)
10.2.4 Operating parameters	
LCD interface	Description
--Operating parameters-- →1: Reactive mode 2: Grid connection power 3: Discharge power 4: Low grid voltage 5: High grid voltage 6: Low grid frequency 7: High grid frequency	You may press Up/Down to move to the proper option; Press Enter and enter the selected menu; Press Esc to return to the settings interface. The options include reactive mode, grid connection power, discharge power, low grid voltage, high grid voltage, low grid frequency and high grid frequency (see ①- ⑦)

① Reactive mode	
LCD interface	Description
-Reactive mode- →1: Power factor control 2: Reactive control 3: QU curve 4: QP curve	You may press Up/Down to move to the proper option; Press Enter and enter the power factor setting interface; (Select 2, press Enter to confirm the entering and enter the reactive control interface; Select 3 or 4 to enable the corresponding mode and return to the parameter settings interface) Press Esc to cancel the entering and return to the parameter interface.
Power factor control	
LCD interface	Description
-Power factor settings- Enter: C1.00 Value range (L1.00~C1.00)	Press Up/Down to increase or decrease the entered value; Press Enter to confirm or press Esc to cancel the entering and return to the operating interface; The entered value shall be between L0.80 and L0.99 or C0.8 and C1.00.
Reactive control	
LCD interface	Description
-Reactive power- Enter: +60% Value range (-60%~+60%)	Press Up/Down to adjust the entered value; Press Enter to confirm or press Esc to cancel the entering and return to the operating interface; The entered value shall be between -60% and +60%, depending on the standard.
② Grid connection power	
LCD interface	Description
-Grid connection power- Enter: 100% Value range (0~100)	Press Up/Down to adjust the entered value; Press Enter to confirm or press Esc to cancel the entering and return to the operating parameter interface; The entered value shall be between 0-100.
③ Discharge power	
-Discharge power-	Press Up/Down to adjust the entered value;

Enter: 050% Value range (0~100)	Press Enter to confirm or press Esc to cancel the entering and return to the operating parameter interface; The entered value shall be between 0-100.
LCD interface	Description
-Low grid voltage- Enter: Unit: V Value range (176~270 V)	Low voltage protection point of grid. Press Up/Down to adjust the entered value; Press Enter to confirm your entering; Press Esc to cancel the entering and return to the operating parameter interface; The value shall be between 176 and 270 V, depending on the standard.
⑤ High grid voltage	
-High grid voltage- Enter: Unit: V Value range (240~280 V)	Over-voltage protection point of grid Press Up/Down to adjust the entered value; Press Enter to confirm your entering; Press Esc to cancel the entering and return to the operating parameter interface; The value shall be between 240 and 280 V, depending on the standard.
⑥ Low grid frequency	
LCD interface	Description
--Low grid frequency-- Enter: Unit: Hz Value range (45~49.8)	Low frequency protection point of grid Press Up/Down to adjust the entered value; Press Enter to confirm your entering; Press Esc to cancel the entering and return to the operating parameter interface; The value shall be between 45 and 49.8, depending on the standard.
⑦ High grid frequency	
LCD interface	Description
--High grid frequency-- Enter: 52.0	Over-frequency protection point of grid Press Up/Down to adjust the entered value;

Unit: Hz Value range (50.5~55)	Press Enter to confirm your entering; Press Esc to cancel the entering and return to the operating parameter interface; The value shall be between 50.5 and 55, depending on the standard.
8.2.5 485 address	
LCD interface	Description
--485 address-- Enter: 1 Value range (1~64)	Press Up/Down to adjust the entered value; Press Enter to confirm or press Esc to cancel the entering and return to the settings interface; The entered value shall be between 1 and 64.
8.2.6 485 baud rate	
LCD interface	Description
--Select-- 1: 2,400 bps 2: 4,800 bps →3: 9,600 bps	You may press Up/Down to move to the proper option; Press Enter to confirm or press Esc to cancel the entering and return to the settings interface; There are three options: 2,400/4,800/9,600.
8.2.7 Language	
LCD interface	Description
--Display language-- →1: Chinese 2: English	You may press Up/Down to move to the proper option; Press Enter to confirm or press Esc to cancel the entering and return to the settings interface;
8.2.8 LCD backlight	
LCD interface	Description
--Backlight duration-- Enter: 20 Unit: Second Value range (20~120)	Press Up/Down to adjust the entered value; Press Enter to confirm or press Esc to cancel the entering and return to the settings interface; The entered value shall be between 20-120.

8.2.9 Date/time	
LCD interface	Description
--Date/time-- Date: September 19, 2018 Time: 10: 01: 12 Day in a week: Saturday	Press Up/Down to adjust the entered value; Press Enter to confirm the entering and return to the settings interface; Press Esc to return to the settings interface; The entered value shall be between 2,000 and 2,099.
8.2.10 Clear history	
LCD interface	Description
--Clear history-- →1: Cancel 2: Confirm	Clear all previous history in the "Query/record" menu. You may press Up/Down to move to the proper option; Press Enter to confirm or press Esc to cancel the entering and return to the settings interface;
8.2.11 Password settings	
LCD interface	Description
--Password-- Old: XXXXX New: XXXXX Confirm: XXXXX	The interface is used to change the password for accessing the settings interface; Press Up/Down to adjust the entered value; Press Enter to move the cursor backward, confirm the change and return to the settings interface; Press Esc to move the cursor forward and return to the settings interface;
8.2.12 Maintenance	
LCD interface	Description
→12: Maintenance	It can only be used by the maintenance personnel.
8.2.13 Factory settings	
LCD interface	Description
-Factory settings- →1: Cancel 2: Confirm	You may press Up/Down to move to the proper option; Press Enter to confirm the selected option.

8.3 Query	
LCD interface	Description
--Query--	You may press Up/Down to move to the proper option;
→1: Machine model	Press Enter to enter the selected option;
2: SN	Press Esc to return to the user interface (please refer to 8.1.16);
3: Software version	There are four options: machine model, SN, software version and
4: Operation record	operation record (please refer to 1-4).
① Machine model	
LCD interface	Description
--Machine model--	The interface displays the machine model of the inverter.
R5KL1	Press Esc to return to the query interface.
② SN	
LCD interface	Description
--SN--GUID: 05DBFF38	The interface displays the SN of the inverter;
430987323639424E	It is unique for any equipment and under any context.
③ Software version	
LCD interface	Description
--Software	The interface displays the software version of inverter ARM and DSP;
version--ARM:	
V1.00.21	
DSP: V1.01.10	
④ Operation record	
LCD interface	Description
--Record(01)--	Record (01): Total number of fault records (500 at most) (those marked as
02: Battery not connected	1 are latest faults or alarms);
Appear: 08-12 15:12	02 : Fault code (for details, refer to Chapter 9 Troubleshooting table);
Disappear:	Appear: Appearing time of fault;
	Press Up/Down to view the record; Press Enter to enter the corresponding

	record description interface; Press Esc to return to the query interface.
8.4 Statistics	
LCD interface	Description
--Statistics-- →1: Time statistics 2: Number of grid connection times 3: Power peak 4: Power generation of the current day 5: Power generation of the current month 6: Power generation of the current year 7: Total power generation	The interface is used to select the statistics item; You may press Up/Down to move to the proper option; Press Enter and enter the selected menu; Press Esc to return to the user interface; There are totally seven options: time statistics/number of grid connection times/power peak/power generation of the current day/power generation of the current month/Power generation of the current year/total power generation (refer to 1-7).
① Time statistics	
LCD interface	Description
--Time-- Operation: 5 On-grid: 0 Unit: Hour	Operating time of inverter (h) On-grid duration (h) Press Esc to return to the statistics interface.
② Number of grid connection times	
LCD interface	Description
--Number of grid connection times-- Numerical value: 0	The interface displays the grid connection times of the inverter; Press Esc to return to the statistics interface.
③ Power peak	

LCD interface	Description
--Power peak-- After start: 5,000 Peak of the current day: 0 Unit: W	The interface displays the history and the power peak of the current day. Press Esc to return to the statistics interface.
④ Power generation of the current day	
LCD interface	Description
--Current day-- Photovoltaic: 0.0 kWh Grid connection: 0.0 kWh Energy consumption: 0.0 kWh	The interface displays the power generation of the current day (kWh) Photovoltaic power generation; On-grid power generation; Power consumption of load and inverter; Press Esc to return to the statistics interface.
⑤ Power generation of the current month	
LCD interface	Description
--Current month-- Photovoltaic: 0.0 kWh On-grid: 0.0 kWh Energy consumption: 0.0 kWh	The interface displays the power generation of the current month (kWh) Photovoltaic power generation; On-grid power generation; Power consumption of load and inverter; Press Esc to return to the statistics interface.
⑥ Power generation of the current year	
LCD interface	Description
--Current year-- Photovoltaic: 0.0 kWh On-grid: 0.0 kWh Energy consumption: 0.0 kWh	The interface displays the annual power generation (kWh) Photovoltaic power generation; On-grid power generation; Power consumption of load and inverter; Press Esc to return to the statistics interface.
⑦ Total power generation	
LCD interface	Description
--Total power	The interface displays the total power generation (kWh)

<p>generation--</p> <p>Photovoltaic: 0.0 kWh</p> <p>On-grid: 0.0 kWh</p> <p>Energy consumption: 0.0 kWh</p>	<p>Photovoltaic power generation;</p> <p>On-grid power generation;</p> <p>Power consumption of load and inverter;</p> <p>Press Esc to return to the statistics interface.</p>
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11. Troubleshooting

When you meet the following problems, please refer to the following solutions. If the problem cannot be solved, please contact the local distributor.

Troubleshooting table		
Fault description	Fault code	Solution
Discharge over-current	00 29	<p>(1) The inverter will restart automatically after 1 minute.</p> <p>(2) Check whether the load is consistent with that described in the specification.</p> <p>(3) Cut off all power switches and power on the whole machine again after the display is shut down.</p> <p>(4) If the problem still exists, check whether a short-circuit problem occurs in at the load side.</p>
Over-load	01	<p>(1) Check whether the load is smaller than the maximum power of the whole machine.</p> <p>(2) Cut off all power switches and power on the whole machine again after the display is shut down.</p> <p>(3) If the problem still exists, check whether a short-circuit problem occurs in at the load side.</p>
Battery not connected	02	<p>(1) Check whether the battery has been connected.</p> <p>(2) Check whether the connecting wire of the battery is open.</p> <p>(3) If the problem is not solved, please consult the local distributor.</p>
Battery under-voltage	03 04 26	<p>(1) Check whether the voltage setting range of the battery is compatible with the current battery.</p> <p>(2) Check whether the grid and PV have been powered on. After they are not powered on, the battery will be charged automatically.</p> <p>(3) If the problem is not solved, please consult the local distributor.</p>
Battery over-voltage	05 27	<p>(1) Check whether the voltage setting range of the battery is compatible with the current battery.</p> <p>(2) Check whether the grid is powered off. If it is powered off, wait for the power-on and then the grid will charge the battery automatically.</p>

		(3) If the problem is not solved, please consult the local distributor.
Grid under-voltage	06	(1) Check whether the grid is abnormal. (2) Power off the whole machine and power it on again after the LCD is shut down. (3) If the problem is not solved, please consult the local distributor.
Grid over-voltage	07	(1) Check whether the grid is abnormal. (2) Power off the whole machine and power it on again after the LCD is shut down. (3) If the problem is not solved, please consult the local distributor.
Low grid frequency	08	(1) Check whether the grid is abnormal. (2) Power off the whole machine and power it on again after the LCD is shut down. (3) If the problem is not solved, please consult the local distributor.
High grid frequency	09	(1) Check whether the grid is abnormal. (2) Power off the whole machine and power it on again after the LCD is shut down. (3) If the problem is not solved, please consult the local distributor.
Leakage current out of limit	10	(1) Check whether a short to ground problem occurs to the photovoltaic panel. (2) Check whether an electric leakage exists between the load side and PE. (3) If the problem is not solved, please consult the local distributor.
Pv not connected	11	(1) Check whether the photovoltaic panel has been connected to the corresponding port. (2) The PV switch on the front panel of the whole machine is not closed. (3) Check whether the photovoltaic panel is damaged.
Grid CT connected reversely	12	(1) Check whether the CT is wired along the correct direction. (2) If the problem is not solved, please consult the local distributor.
Low busbar voltage	13	(1) Check whether the input mode is set correctly. (2) Power off the whole machine and power it on again after the LCD is shut down. (3) If the problem is not solved, please consult the local distributor.
Busbar over-voltage	14	(1) Check whether the input mode is set correctly. (2) Power off the whole machine and power it on again after the LCD is shut down. (3) If the problem is not solved, please consult the local distributor.
Inverter over-current	15	(1) Power off the whole machine and power it on again after the LCD is shut down.

		(2) If the problem is not solved, please consult the local distributor.
Charger over-current	16	(1) Check whether a short-circuit problem occurs to the battery side. (2) Check the settings of charge current. (3) Power off the whole machine and power it on again after the LCD is shut down.
Busbar voltage fluctuation	17	(1) Power off the whole machine and power it on again after the LCD is shut down. (2) If the problem is not solved, please consult the local distributor.
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	20	
High ambient temperature	21	(1) Check whether the current ambient temperature exceeds the recommended operating temperature. If it exceeds, power off the whole machine and power it on again after 1 hour. (2) If the problem is not solved, please consult the local distributor.
High battery temperature	23	(1) Power off the whole machine and power it on again after 1 hour. (2) If the problem is not solved, please consult the local distributor.
Low battery temperature	24	(1) Check whether the ambient temperature around the battery meets the relevant specifications. (2) If the problem is not solved, please consult the local distributor.
Large voltage difference of a single battery	25	(1) Charge and discharge the battery. The operations are as follows: disconnect the grid and PV side firstly, discharge the battery for 1 hour, then re-connect the grid and PV side to charge the battery. Repeat the operations for 1 or 2 times and the battery voltage will return to normal. (2) If the problem is not solved, please consult the local distributor.
Charge over-current	28	(1) Check whether the battery cable is short-circuit. (2) Check the settings of charge current. (3) Power off the whole machine and power it on again after the LCD is shut down. If the problem is not solved, please consult the local distributor.
Soft start failure of busbar	32	(1) Power off the whole machine and power it on again after the LCD is shut down. (2) If the problem is not solved, please consult the local distributor.
	33	
	34	

inverter and busbar	35	
short-circuit	36	
Inverter short-circuit	38	
and fan fault	39	
BUS relay fault	40	
Grid relay fault	41	
EPS relay fault	42	
GFCI fault	44	
Internal CT fault	45	
Off-grid relay fault		
System fault		
Low PV insulation resistance	37	(1) Check whether the PE wire is grounded. (2) If the problem is not solved, please consult the local distributor.
Pv short-circuit	43	(1) Power off the whole machine and power it on again after the LCD is shut down. (2) If the problem is not solved, please consult the local distributor.
Battery connected reversely	46	(1) Check whether the battery cathode and anode are connected correctly. (2) If the problem is not solved, please consult the local distributor.

12. Installation Steps

- Prepare the materials in the following figure.



- Install the 1st battery on the stand.



- Install the 2nd battery on the 1st battery.



- Install the Nth battery on the N-1th battery.



- Install the high-voltage cabinet on the Nth battery.



- Connect the wires properly and press and hold the green start button for 3s to start the battery.

