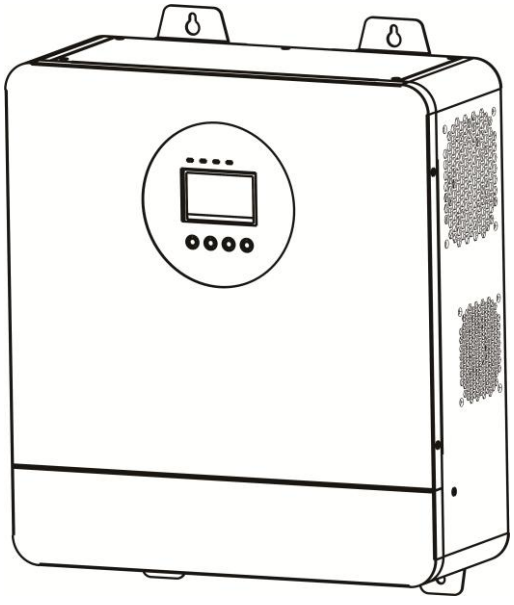
# User Manual



NKF series 3KW-6.4KW

**Dear Customers**

It’s very grateful to you for trusting our company and selecting our products! Before using this product, please read carefully this user manual, including installation, using, failure investigation and other important information and suggestion, we also suggest you keep this manual well!

**Catalogue**

## 1 Product Features

● Excellent performance because of double MCU intelligent control technology.

● Settable mains supply preferred mode and battery preferred mode for flexible using.

● Settable charge current and multiple threshold voltages for meeting the selection of the different types of batteries.

● Settable output voltage and frequency, making it convenient and practicable.

● Settable unattended function, good for wide range of application scenarios.

● Pure sine wave output, suitable for various types of loads .

● Intelligent cooling device, efficient and energy-saving.

● LCD real-time display of equipment information and operating status.

● Overall protection and alarm functions, safe and reliable.

## 2 Installation、Storage instruction

### （1） Unpacking Inspection

1.1 Open the package, inspect product accessories, including:1 host,1 piece user manual

1.2 Inspect whether the machine have been damaged during the transport or not, If it have some damage, don’t start the machine, contact the logistics company and dealer.

### （2） Installation、Storage Notes

2.1 The product installation should be operated by professionals，or assisted by dealer.

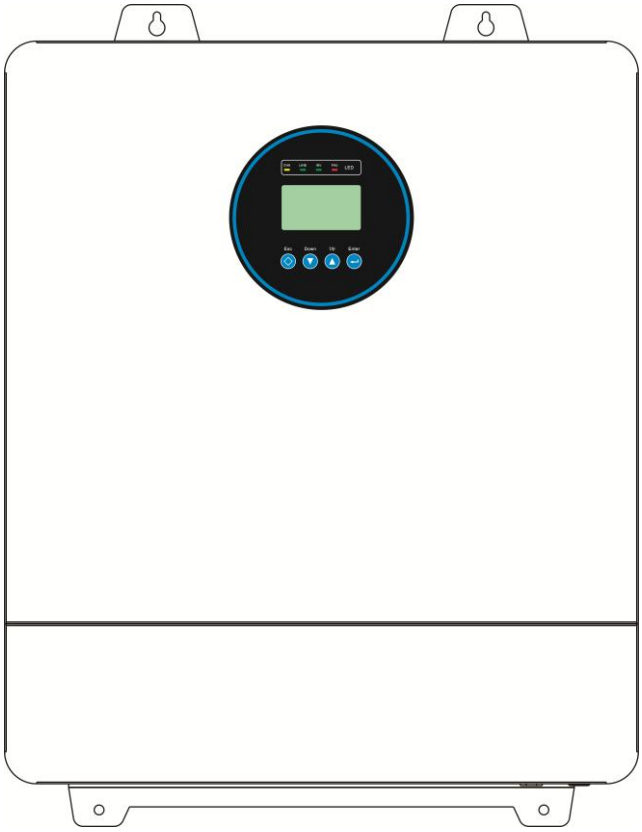
2.2 If it needs to transport machine, please take proper protection measures; move the machine from low temperature environment to high temperature environment，may appear droplet, please keep it dry and ensure safety.

2.3 Don’t let the machine exposure in damp, inflammable and explosive or large accumulation of dust environment. Don’t cover and block vents, please preset above 10cm air circulation clearance so that having a good cooling.

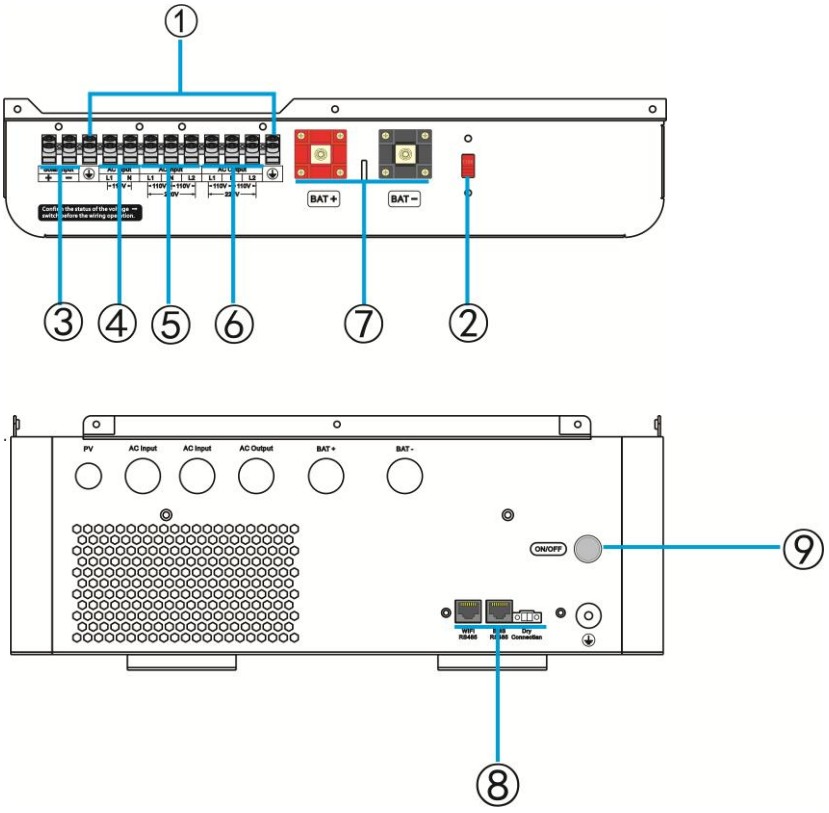
2.4 It is battery switch must be shut down when the equipment is not connected with the grid and not being used

## 3 Equipment appearance graphical representation guide

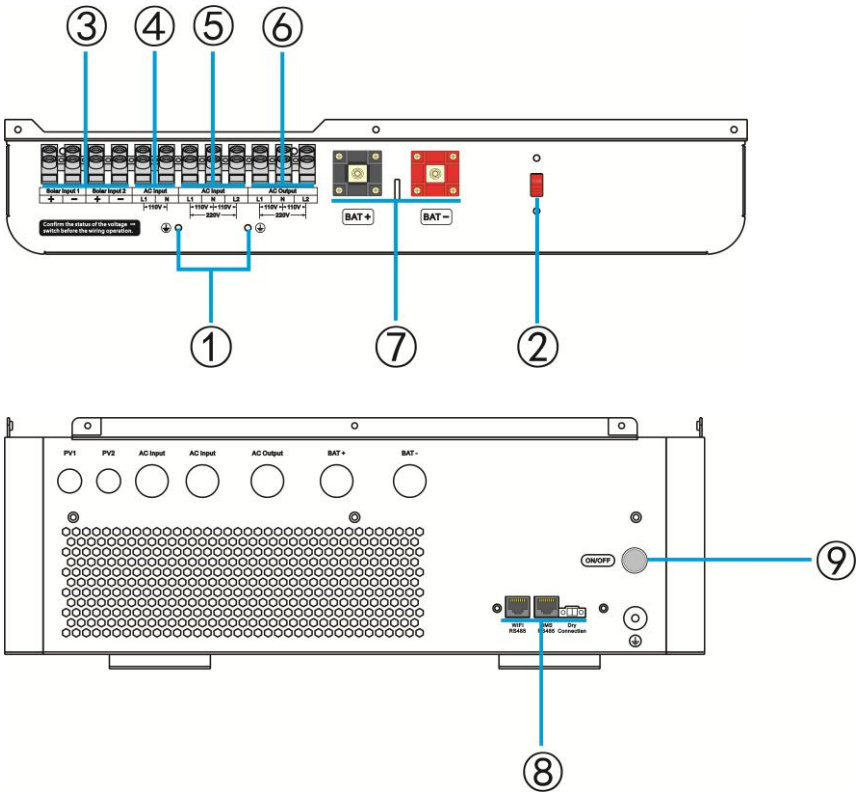
### （1）Front panel diagram introduction



### （2）Bottom panel diagram introduction




3KW

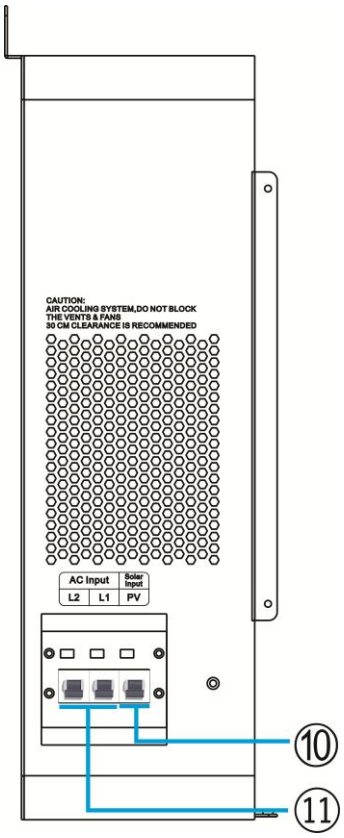



5KW-6.4KW

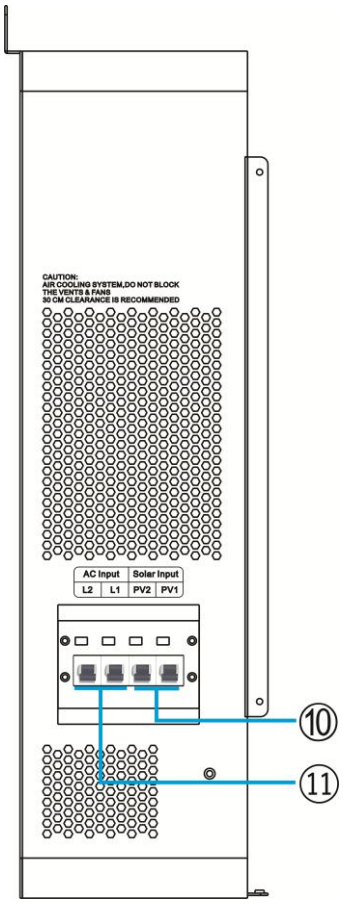
Introduction:

①-- Earth terminal
②-- 110V/220V AC input voltage switch
③-- Solar input port
④-- 110V AC input port(L1-N)
⑤-- 220V AC input port(L1-N-L2)
⑥-- AC output port(L1-N-L2)
⑦-- Battery terminal positive/negative input terminal
⑧-- WIFI port,BMS port,Dry connect port
⑨-- Power ON/OFF

## （3） Side panel icon




**3KW**



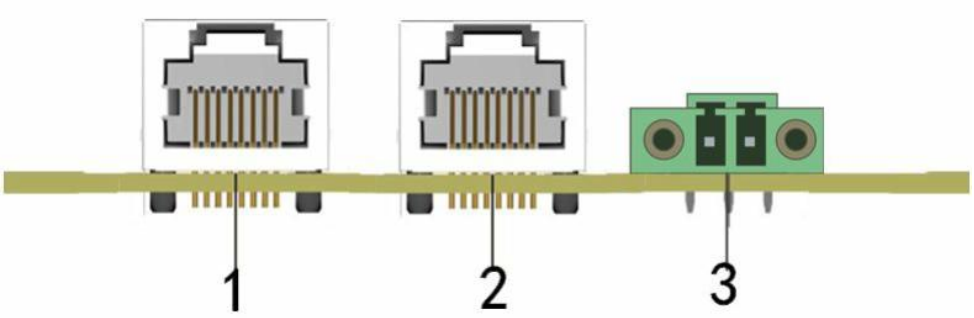

**5KW-6.4KW**

Introduction：

⑩-- Solar input breaker (PV/PV1/PV2)

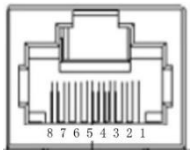
⑪--AC Input breaker(L1/L2)

# Description of central control board



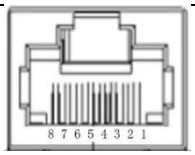

| Central control board | | |
|---|---|---|
| **NO** | **Description** | **Type** |
| 1 | WIFI (RS485 network interface) | RJ45 |
| 2 | BMS (RS485 network interface) | RJ45 |
| 3 | Dry connect ( Dry junction) | |

## [1] WIFI (RS485 network interface)



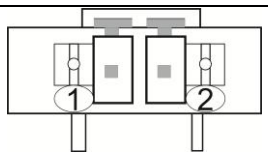

| NO | Symbols | Description |
|---|---|---|
| 1,8 | RS485-B | 485-B Communication interface |
| 2,7 | RS485-A | 485-A Communication interface |
| 3,6 | GND | Ground |
| 4,5 | +5V | + 5V Power (5V serial power supply) |

## [2] BMS (RS485 network interface)




| NO | Symbols | Description |
|---|---|---|
| 1,8 | RS485-B | 485-B Communication interface |
| 2,7 | RS485-A | 485-A Communication interface |
| 3 | GND | Ground |
| 4 | NC | NC (Normally Closed Interface) |
| 5 | NC | NC (Normally Closed Interface) |
| 6 | GND | Ground |

## [3] Dry connect ( Dry junction)




| NO | Symbols | Description |
|---|---|---|
| ① | NC | NC (Normally Closed Interface) |
| ② | NO | NO (normally open interface) |

# 4 Operating instructions

## 4.1 Panel LCD display graphical representation instruction

The LCD is on the front panel of the inverter and consists of four buttons and an LCD screen, displaying the working status and information of the inverter.


### 4.1.1 Description of buttons

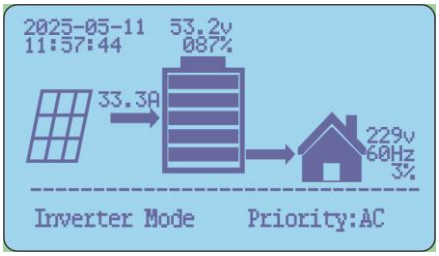
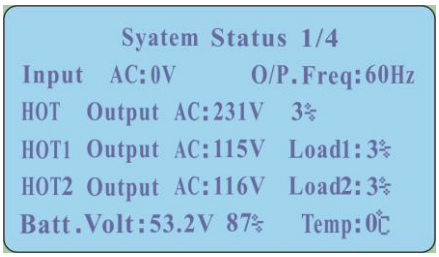
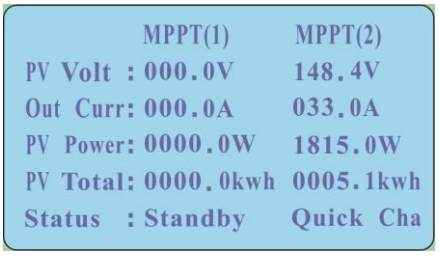
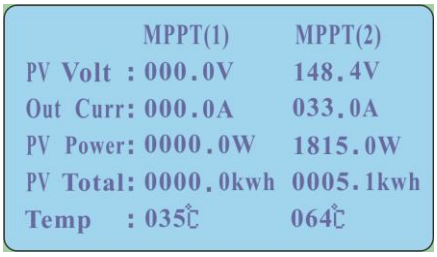
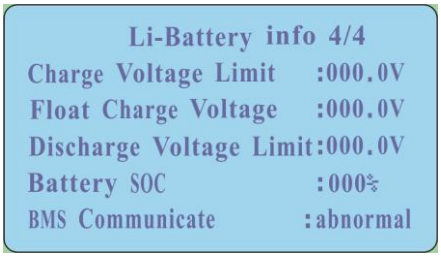
| Button Function | | Instruction |
|---|---|---|
| ◇ | Esc | Return to main interface |
| ▲ | UP | Short press to view inverter parameters in the main interface, short press to increment in the setting interface. |
| ▼ | Down | Short press to view the inverter parameters in the main interface, and short press to reduce in the setting interface. |
| ↵ | Enter | Under the main interface, press and hold for less than 3 seconds to enter the setting interface, under the setting interface, press and hold to confirm the parameters. |

**4.1.2** LED Status Description

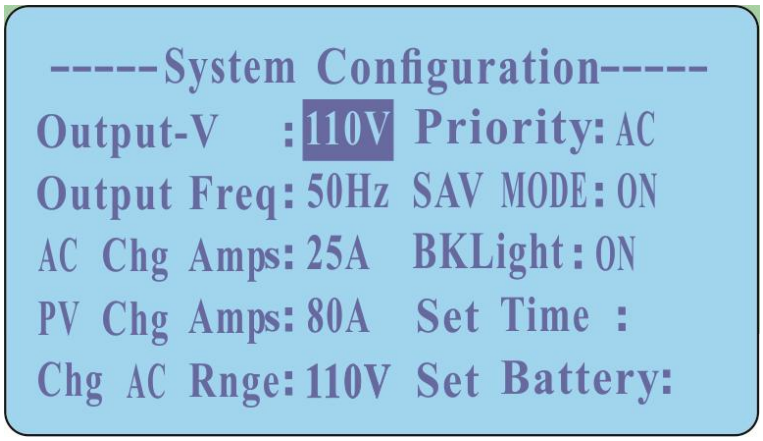
| LED display | | | Description |
|---|---|---|---|
| CHA | Yellow | Light | PV start charging |
| | | OFF | PV stop charging |
| LINE | Green | Light | The AC is connected and the output is bypassed |
| | | Flash | The AC is connected and in standby mode. |
| | | OFF | Do not connect AC power or it is in inversion state |
| INV | Green | Light | The device is in inversion state |
| | | OFF | The device is not in inversion state |
| FAU | Red | Light | AC output overload or Inverter fault |
| | | OFF | The device work normally |

### 4.1.3 LCD display main interface and instructions

View the LCD main interface by pressing the "Up" or "Down" key to switch in turn, the information includes: working mode, AC input/output voltage, battery voltage, output frequency, load Percentage,etc.;

| Display information | LCD display |
|---|---|
| When the inverter is properly connected to the load, battery, and mains power, press the power-on button to enter main interface (Default) |  |
| Input voltage /Battery voltage/Output Frequency/Load Percentage/ Temperature |  |
| PV voltage/Charge current/PV power/Total Power Generation/MPPT module(Status 、 Temperature 、 Output Voltage) |  |
| |  |
| BMS Communicate status/Charge Voltage Limit/Float Charge Voltage/Discharge Voltage Limit/Battery SOC |  |

### 4.1.4 LCD parameter setting

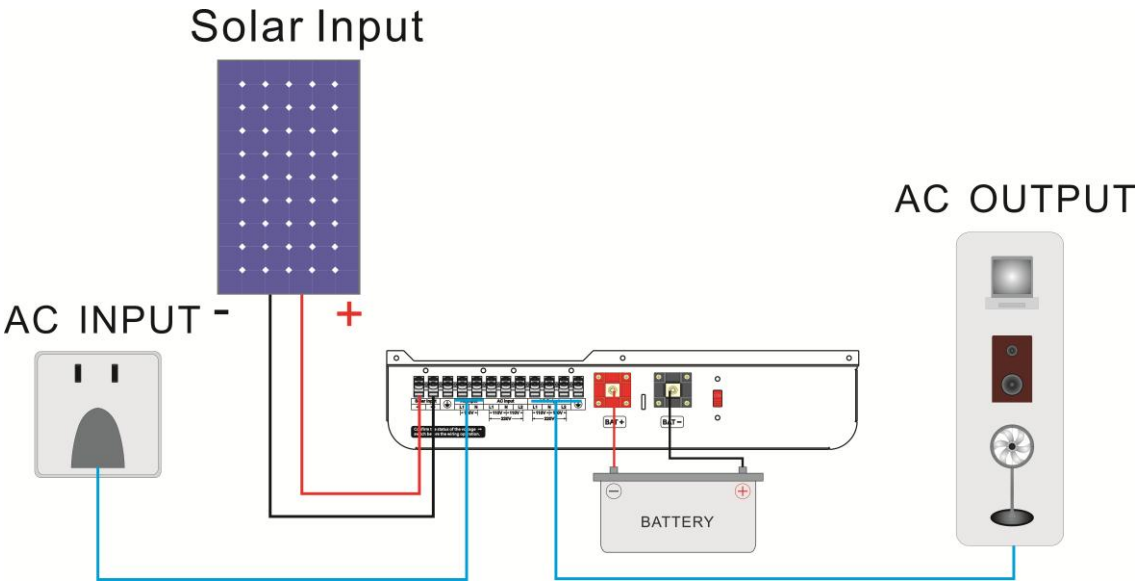



| | |
|---|---|
| Press and hold the "Enter" button for more than 3 seconds in any main interface to enter the program setting mode, and the program option is flashing. Short press the "Up" or "Down" button to select the program, and then short press the "Enter" button to enter, the corresponding parameters It is flashing. Short press the "Up" or "Down" key to set the parameter value, short press the "Enter" key again to confirm and return to the program setting mode. | |
| Display option | Options can be set |
| Output-V | 100V/105V/110V/115V/120V |
| Output Freq | 50Hz/60Hz |
| AC Cha Amps | OFF/15A/25A/35A/50A |
| PV Chg Amps | OFF/10A/30A/60A/80A/120A/160A/200A/240A |
| Chg AC Rnge | 110V/220V |
| Priority | Solar/AC |
| | AC Time Control |
| SAV MODE | ON/OFF<br>(After setting on, the inverter output will be turned off in the case of empty load, and the empty load power consumption will be reduced to 10W.) |
| BKLight | Normal(1 Min) |
| | ON |

| | |
|---|---|
| Set Time | Date |
| | Time |
| | OK |
| Set Battery | CC-V: The setting range is from 48V to 64V, Increment of each click is 0.4V |
| | FLA-V: The setting range is from 48V to 64V, Increment of each click is 0.4V |
| | DC-RECR:The setting range is from 40V to 58V, Increment of each click is 0.4V |
| | LV-OFF:The setting range is from 30V to 48V, Increment of each click is 0.4V |
| | LV-ALM: The setting range is from 32V to 50V, Increment of each click is 0.4V |
| | AC-KCIN: The setting range is from 36V to 52V, Increment of each click is 0.4V |
| | Reset Fectory Settings:ON/OFF |

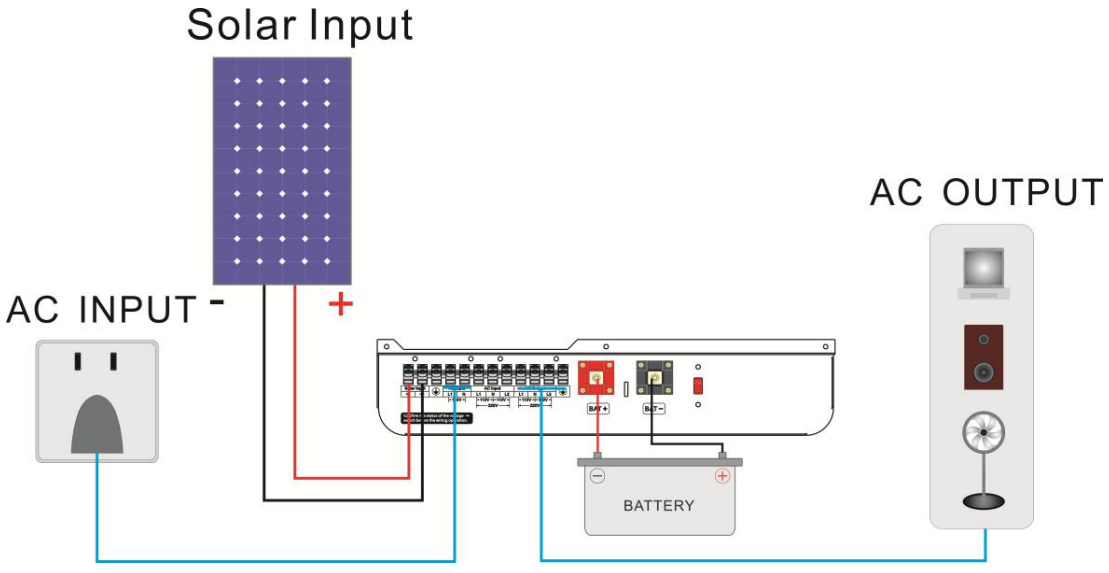
## 5 Equipment wiring diagram guide

### 5.1 Battery wiring graphical representation

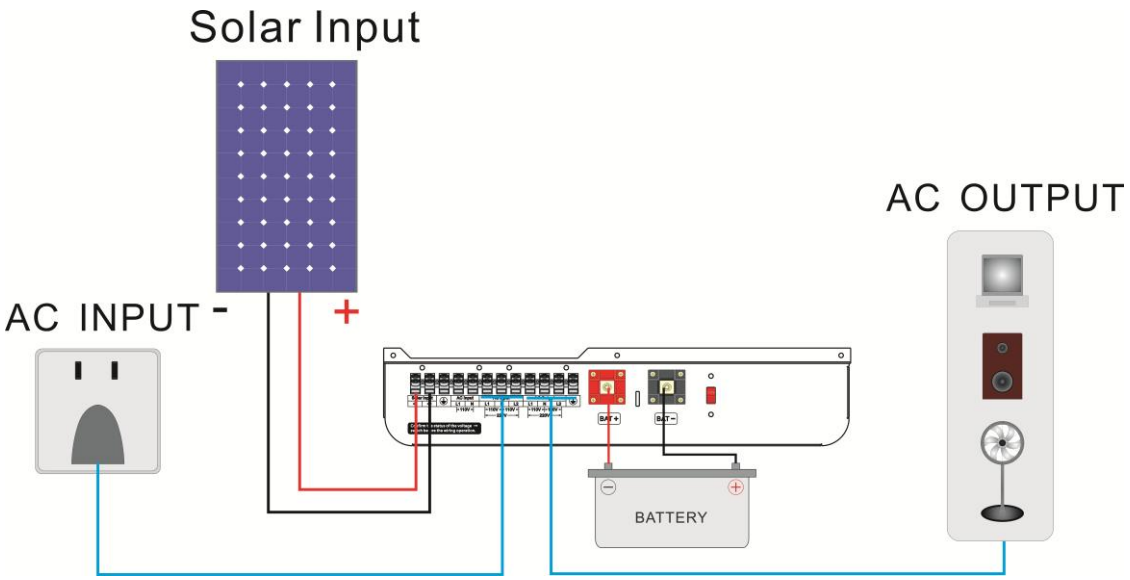



***It can be adapted to lead-acid batteries or lithium batteries,make sure polarity at both the battery and the inverter is correctly connected and conductors are tightly screwed into the battery terminals.**

### 5.2 Input/Output wiring diagram




110V AC input(L1-N)




220V AC input(L1-N-L2)

*** Important Notice:**

**1. Confirm the status of the "②-- 110V/220V AC input voltage switch " before the wiring operation**

**2. When inputting 110V (L1-N), switch to the 110V setting; When inputting 220V (L1-N- L2), switch to the 220V setting;**

**3.110V (L1-N) and 220V (L1–N–L2) cannot be input simultaneously;**

***Warning:**

**Abnormal operation that does not comply with the requirements may damage the equipment and is not covered under the warranty.**

## 5.3 Direction for using of wire diameter

### 5.3.1 Battery Connection wire diameter

| Rate Power | 12V | 24V | 48V |
|---|---|---|---|
| **1000W** | 16mm² | 10mm² | 6mm² |
| **2000W** | 32mm² | 16mm² | 10mm² |
| **3000W** | 50mm² | 25mm² | 16mm² |
| **4000W** | 70mm² | 35mm² | 20mm² |
| **5000W** | | 50mm² | 25mm² |
| **6000W** | | 50mm² | 25mm² |
| **8000W** | | | 35mm² |
| **10kW** | | | 35mm² |

### 5.3.2 AC Input / Output Connection wire diameter

| Rate Power | AC 220V/240V | AC 110V/120V |
|---|---|---|
| **1000W** | 2.5mm² | 2.5mm² |
| **2000W** | 2.5mm² | 2.5mm² |
| **3000W** | 4mm² | 6mm² |
| **4000W** | 4mm² | 8mm² |
| **5000W** | 4.5mm² | 10mm² |
| **6000W** | 6mm² | 12mm² |
| **8000W** | 10mm² | 16mm² |
| **10kW** | 10mm² | 16mm² |

## 5.4 Photovoltaic module access instructions

After connecting the photovoltaic module with a suitable wire diameter, make sure that the voltage and power are within the rated range, and connect it to the "③--Solar input port " on the side panel of the equipment. Pay attention to the polarity error in the connection process of the photovoltaic module, so as not to damage the equipment.

## 5.5 Mains access instructions

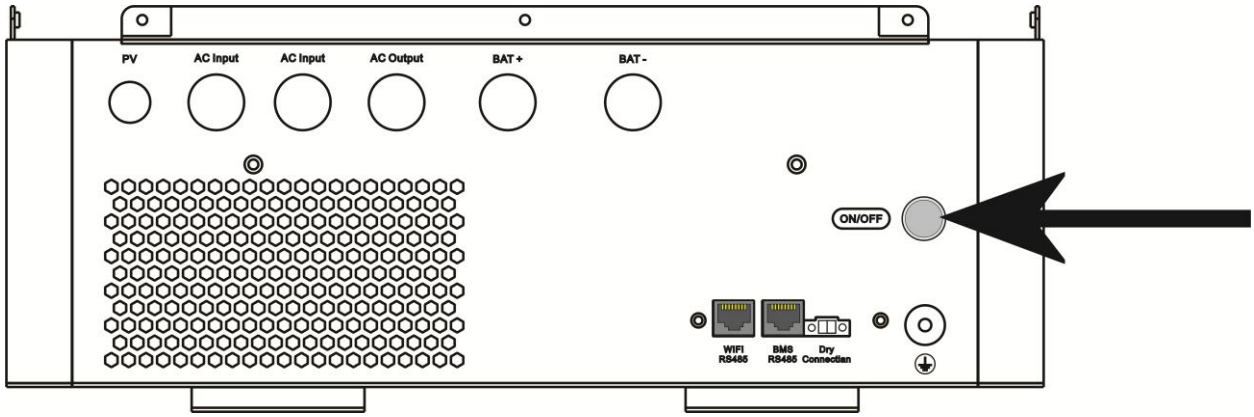
Select the right diameter of the wire to connect the power supply to the side board of the equipment on the "④--110V AC Input port(L1-N)"or"⑤--220V AC Input port(L1-N-L2)"

**5.5.1** Note that the input AC voltage should be within the input range of the equipment to avoid damage the equipment .

**5.5.2** To operate the "②--110V / 220V AC Input voltage switch" it is essential to ensure that the inverter is in power-off state. When using 110V input, switch to the 110V setting.When inputting 220V, switch to the 220V setting.

## 6 Power ON/RUN

6.1 Inverter Power ON/RUN




Once 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 equipment.

6.2 Equipment shutdown

Shutdown: Turn off the loads, disconnect AC input, and then press the " on / off " button, release after the internal relay action, the device off the AC output and LCD screen is turned off. Switch off all the circuit breakers.

## 7 Care and Maintenance

（1）This series products only need rarely care, battery only need keeping charging  so that can get expected lifetime.

（2）If the equipment will not be used for long-term, we suggest it should be charged 1 time every 4~6 month. Usually, the battery can be used for 3~5 years, if it has some problem, then the battery should be changed as soon as possible. When changing battery, it must be operated by professional and obey battery supplier indicate.

（3）Before changing the battery, it must be closed equipment and break away from the grid, close the battery switch. Take off the metal objects such as rings.

（4）Connect the battery line, tiny spark in joint belongs to the normal phenomenon, and will not cause harm to the personal safety and equipment. Never connect the battery positive and negative into short or the reverse.

## 8 Technology Parameter sheet

| | | | | |
|---|---|---|---|---|
| Inverter | Type：NKF- | 3KW | 5KW | 6.4KW |
| | Rated power | 3000W | 5000W | 6400 W |
| | Peak power | 9KW | 15KW | 19.2KW |
| | Battery voltage | 24V/48V | | |
| Solar Controller | Charge current | 60A | 120A | |
| | PV input way | 1 ways（60A） | 2 ways（120A） | |
| | PV Array MPPT Voltage Range | 30V-180V(24V system)<br>60V-180V(48Vsystem) | | |
| | Max PV Array Power | 1440W(24V/60A system)<br>2880W(48V/60A system)<br>2880W*2(48V/120A system) | | |
| | Controller transfer efficiency | ≈99% | | |
| | Unattended mode | Power off: MPPT can charge when there is sunshine, realizing unattended photovoltaic power generation. | | |
| AC input | AC input Voltage Range | (L1-N)110VAC:80-130VAC | | |
| | | (L1-N-L2)220VAC:160-260VAC/130-280VAC | | |
| | AC input Voltage Range | 45Hz-65Hz(Intelligent automatic detection) | | |
| | AC input current (can be set) | close(Turn off the mains power charging function) | | |
| AC output | AC Output wave | Pure sine wave | | |
| | AC Output Efficiency | ≈90% | | |
| | AC Output voltage | (L1-N,L2-N):110VAC<br>(L1-L2):220VAC | | |
| | AC Output Frequency | 50Hz/60Hz(can be set) | | |
| | Energy-saving mode loss | 5W | | |
| Work mode | INV mode | Utility priority mode、Battery priority mode、Energy-saving mode、Unattended mode、Generator mode | | |

| | | | |
|---|---|---|---|
| Battery | Support battery type | Lead-acid battery/ Gel battery /Lithium battery/ Ternary lithium battery /User-Defined battery | |
| | Battery custom parameters | Balanced Charging,<br>Floating charging、Battery recovery、Utility recovery、Low voltage alarm、low voltage protect | |
| | Battery charging way | Lead-acid:3-Step,<br>Constant Current,Balanced Charging, Floating charging | |
| | | Lithium: Constant Current,Balanced Charging | |
| | Number of lithium battery strings | Lithium battery:3.2V<br>Ternary lithium battery:3.7V | |
| Protect | Battery under-voltage | Battery under-voltage / Battery over-voltage / Overload protection / High temperature protection / charging way etc. | |
| Display | LED Display | Utility status、Inverter status、charging status、alarm | |
| | Screen Display | Work status、AC input/output voltage、PV information display、inverter setting parameters etc. | |
| | Language | Chinese/English | |
| Transfer Time | | <10ms | |
| Heat loss | | Smart Temperature Control | |
| Communication | | WIFI/ RS485/Dry connect | |
| Operating ambient temperature | | (-10C~40C) | |
| Altitude | | ≤3000m | |
| Machine Size | | 525*420*167 | 625*485*180 |
| Package Size | | 555*515*238 | 655*580*250 |

Note: Our company has the right of changing this user manual without any information