Hybrid Inverter User Manual

CONTENTS

1 Notes on this Manual

1.1 Scope of Validity

This manual is an integral part of Hybrid, It describes the assembly, installation, commissioning, maintenance and failure type of the product. Please read it carefully before operating.

R5KLNA	R6KLNA	R7K6LNA	R8KLNA

　　Naming rules, For example: R7K6LNA
　"7K6、5K" means "output power 7.6kw or 5kw".
　"L、T" means "Output single-phase (1) or three-phase (3)"
　"NA" means "North America"
　Store this manual where it will be always accessible.

1.2 Target Group

This manual is for qualified electricians. The tasks described in this manual only can be performed by qualified electricians.

1.3 Symbols Used

The following types of safety instructions and general information appear in this document as described below:

> ⚠️ **Danger!**
> "Danger" indicates a hazardous situation which, if not avoided, will result in death or serious injury.

> ⚠️ **Warning!**
> "Warning" indicates a hazardous situation which, if not avoided, could result in death or serious injury.

> ⚠️ **Caution!**
> "Caution" indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

> ☞ **Note!**
> "Note" provides tips that are valuable for the optimal operation of our.

2 Safety

2.1 Important Safety Instructions

Danger!
- Danger to life due to high voltages in the inverter!
- All work must be carried out by qualified electrician.
- The appliance is not to be used by children or persons with reduced physical sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction.
- Children should be supervised to ensure that they do not play with the appliance.

Caution!
- Danger of burn injuries due to hot enclosure parts!
- During operation, the upper lid of the enclosure and the enclosure body may become hot.
- Only touch the lower enclosure lid during operation

Caution!
- Possible damage to health as a result of the effects of radiation!
- Do not stay closer than 20 cm to inverter for any length of time.

Note!
- Grounding the PV generator
- Comply with the local requirements for grounding the PV modules and the PV generator. It is recommends connecting the generator frame and other electrically conductive surfaces in a manner which ensures continuous conduction and ground these in order to have optimal protection of system and persons.

Warning!
- Ensure input DC voltage ≤Max. DC voltage. Over voltage may cause damage
- Permanent damage to inverter or other losses, which will not be included in warranty!

	Warning!
⚠	• Authorized service personnel must disconnect both AC and DC power from inverter before attempting any maintenance or cleaning or working on any circuits connected to inverter.

	Warning!
⚠	• Do not operate the inverter when the device is running.

	Warning!
⚠	• Risk of electric shock!

- Please keep the user manual properly. When operating equipment, in addition to following the general precautions in this document, follow the specific safety instructions. We will not be liable for any consequence caused by the violation of the safety operation regulations and design, production, and usage standards.
- Accessories only together with the inverter shipment are recommended here. Other- wise may result in a risk of fire, electric shock, or injury to person.
- Make sure that existing wiring is in good condition and that wire is not undersized. Do not disassemble any parts of inverter which are not mentioned in installation guide. It contains no user-serviceable parts. See Warranty for instructions on obtaining service. Attempting to service the inverter yourself may result in a risk of electric shock or fire and will void your warranty.
- Keep away from flammable, explosive materials to avoid fire disaster.
- The installation place should be away from humid or corrosive substance.
- Authorized service personnel must use insulated tools when installing or working with this equipment.
- Never touch either the positive or negative pole of PV connecting device. Strictly prohibit touching both at the same time.
- The unit contains capacitors that remain charged to a potentially lethal voltage after the MAINS, battery and PV supply has been disconnected.
- Hazardous voltage will present for up to 5 minutes after disconnection from power supply.
- CAUTION-RISK of electric shock from energy stored in capacitor, never operate on the inverter couplers, the MAINS cables, Battery cables, PV cables or the PV generator when power is applied. After switching off the PV, battery, and Mains, always wait for 5minutes to let the intermediate circuit capacitors discharge before unplugging DC, battery in plug and MAINS couplers.

- When accessing the internal circuit of inverter, it is very important to wait 5 minutes before operating the power circuit or demounting the electrolyte capacitors inside the device. Do not open the device beforehand since the capacitors require time sufficiently discharge!
- Surge protection devices (SPDs) for PV installation

⚠	**WARNING !** Over-voltage protection with surge arresters should be provided when the PV power system is installed. The grid connected inverter is not fitted with SPDs in both PV input side and MAINS side.

- Lightning will cause a damage either from a direct strike or from surges due to a nearby strike.
- Induced surges are the most likely cause of lightning damage in majority or installations, especially in rural areas where electricity is usually provided by long overhead lines. Surge may be included on both the PV array conduction and the AC cables leading to the building.

- Specialists in lightning protection should be consulted during the end use application. Using appropriate external lightning protection, the effect of a direct lightning strike into a building can be mitigated in a controlled way, and the lightning current can be discharged into the ground.

- Installation of SPDs to protect the inverter against mechanical damage and excessive stress include a surge arrester in case of a building with external lightning protection system (LPS) when separation distance is kept.

- To protect the DC system, surge suppression device (SPD type2) should be fitted at the inverter end of the DC cabling and at the array located between the inverter and the PV generator, if the voltage protection level (VP) of the surge arresters is greater than 1100V, an additional SPD type 3 required for surge protection for electrical devices.

- To protect the AC system, surge suppression devices (SPD type2) should be fitted at the main incoming point of AC supply (at the consumers cutout), located between the inverter and the meter/distribution system;
- All DC cables should be installed to provide as short a run as possible, and positive and negative cables of the string or main DC supply should be bundled together. Avoiding the creation of loops in the system.
- Spark gap devices are not suitable to be used in DC circuits once conducting, they won't stop conducting until the voltage across their terminals is typically more than 30 volts.
- ➢ Anti-Islanding Effect

Islanding effect is a special phenomenon that grid-connected PV system still supply power to the nearby grid when the voltage loss is happened in the power system. It is dangerous for maintenance personnel and the public.

Hybrid series inverter provide Active Frequency Drift (AFD) to prevent islanding effect.

➢ PE Connection and Leakage Current

•The end-use application shall monitor the protective conductor by residual current operated protective device (RCD) with rated fault current Ifn≤240mA which automatically disconnects the device in case of a fault.

The device is intended to connect to a PV generator with a capacitance limit of approx. 700nf.

> ⚠ **WARNING !**
> High leakage current!
> Earth connection essential before connecting supply.

Incorrect grounding can cause physical injury, death or equipment malfunction and increase electromagnetic.

➢ Battery Safety Instructions

Hybrid Series inverter should be worked with low voltage battery, for the specific parameters such as battery type, nominal voltage and nominal capacity etc., please refer to section 4.3.

As accumulator batteries may contain potential electric shock and short-circuit current danger, to avoid accidents that might be thus resulted, the following warnings should be observed during battery replacement:

   1: Do not wear watches, rings or similar metallic items.

   2: Use insulated tools.

   3: Put on rubber shoes and gloves.

   4: Do not place metallic tools and similar metallic parts on the batteries.

   5: Switch offload connected to the batteries before dismantling battery connection
     terminals.

   6: Only personal with proper expertise can carry out the maintenance of accumulator
     batteries.

2.2 Explanation of Symbol

This section gives an explanation of all the symbols shown on the inverter and on the type label.

Symbols on the Type Label

SGS	UL certified
	This symbol indicates that you should wait at least 5mins after disconnecting the inverter from the utility grid and from the PV panel before touching any inner live parts.
	eep dry! The package/product must be protected from excessive humidity and must be stored under cover.
	Refer to the operating instructions.
	ragile - The package/product should be handled carefully and never be tipped over or slung.
	Products should not be disposed as household waste.
6	No more than six(6) identical packages being stacked on each other
	Components of the product can be recycled.
	Danger of hot surface!
	Danger of high voltage and electric shock!
	Caution! Failure to observe a warning indicated in this manual may result in injury

3. Introduction

3.1 Basic features

Hybrid Series is a high-quality inverter which can convert solar energy to AC energy and store energy into battery.
The inverter can be used to optimize self-consumption, store in the battery for future use or feed in to public grid. Work mode depends on PV energy and user's preference. It can provide power for emergency use during the grid lost by using the energy from battery and inverter (generated from PV).

3.2 System Diagram

Hybrid Series is designed with two BACK-UP versions for customer to choose based on the local rules. The applies to the wiring rules that requires Neutral line of alternative supply must NOT be isolated or switched.
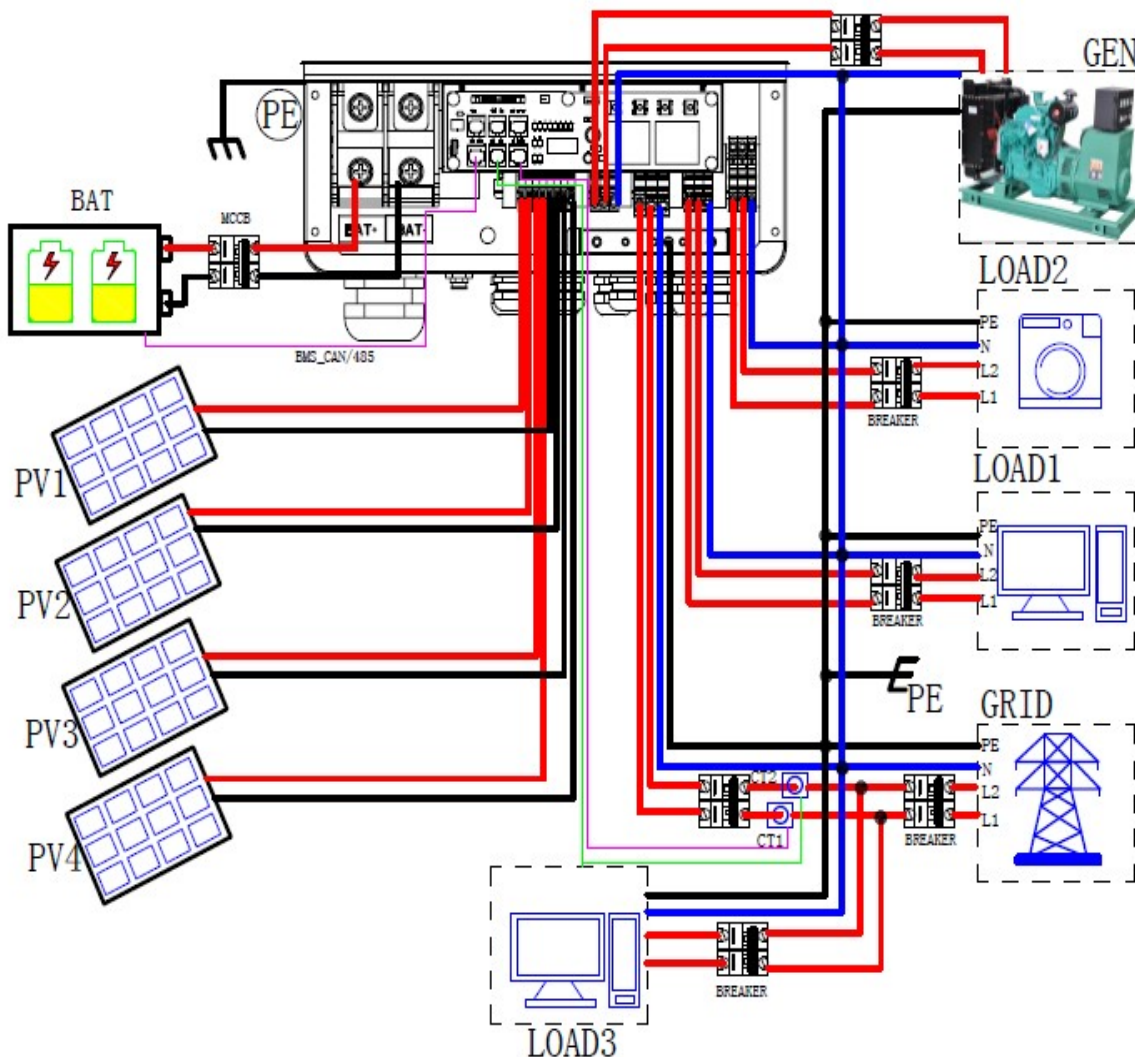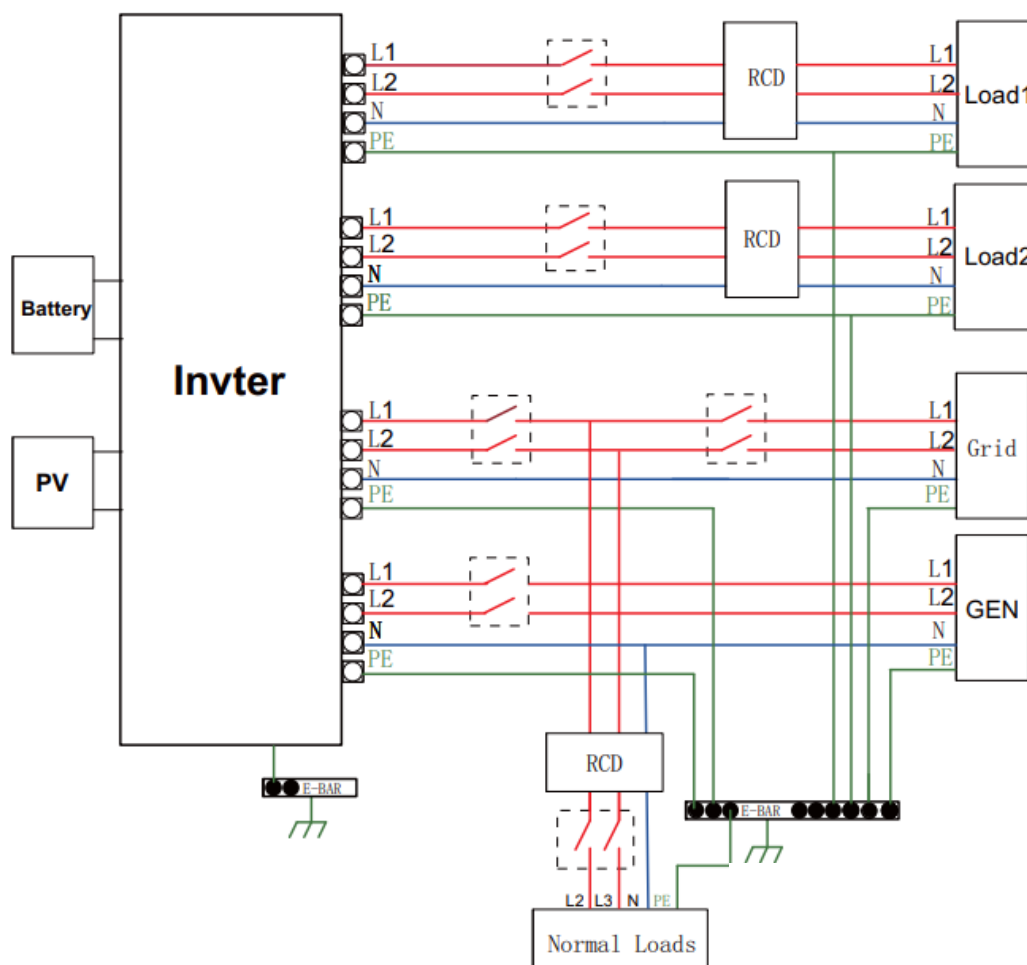
All switches and RCD devices in the figure are for reference only, and the specific installation shall be subject to local regulations

> **Note!**
> Please control the home loads, and make sure it's within the "BACK-UP output rating" under BACK-UP mode, otherwise the inverter will shut down with an "overload fault" warning.
> Please confirm with the mains grid operator whether there is any special regulations for grid connection.

+PV BAT Grid GEN LOAD1 LOAD2

PV   BAT   Grid   GEN   LOAD1   LOAD2

PV Breaker

PV Breaker

BAT Breaker

Pv1   PV2   BAT

On Grid Breaker

L2
L1
N
PE
GRID

Meter

Grid side
CT

Ct1

Ct2

Main Breaker

E-BAR

GEN Breaker

LOAD1 Breaker

LOAD2 Breaker

DG

Loads

Loads
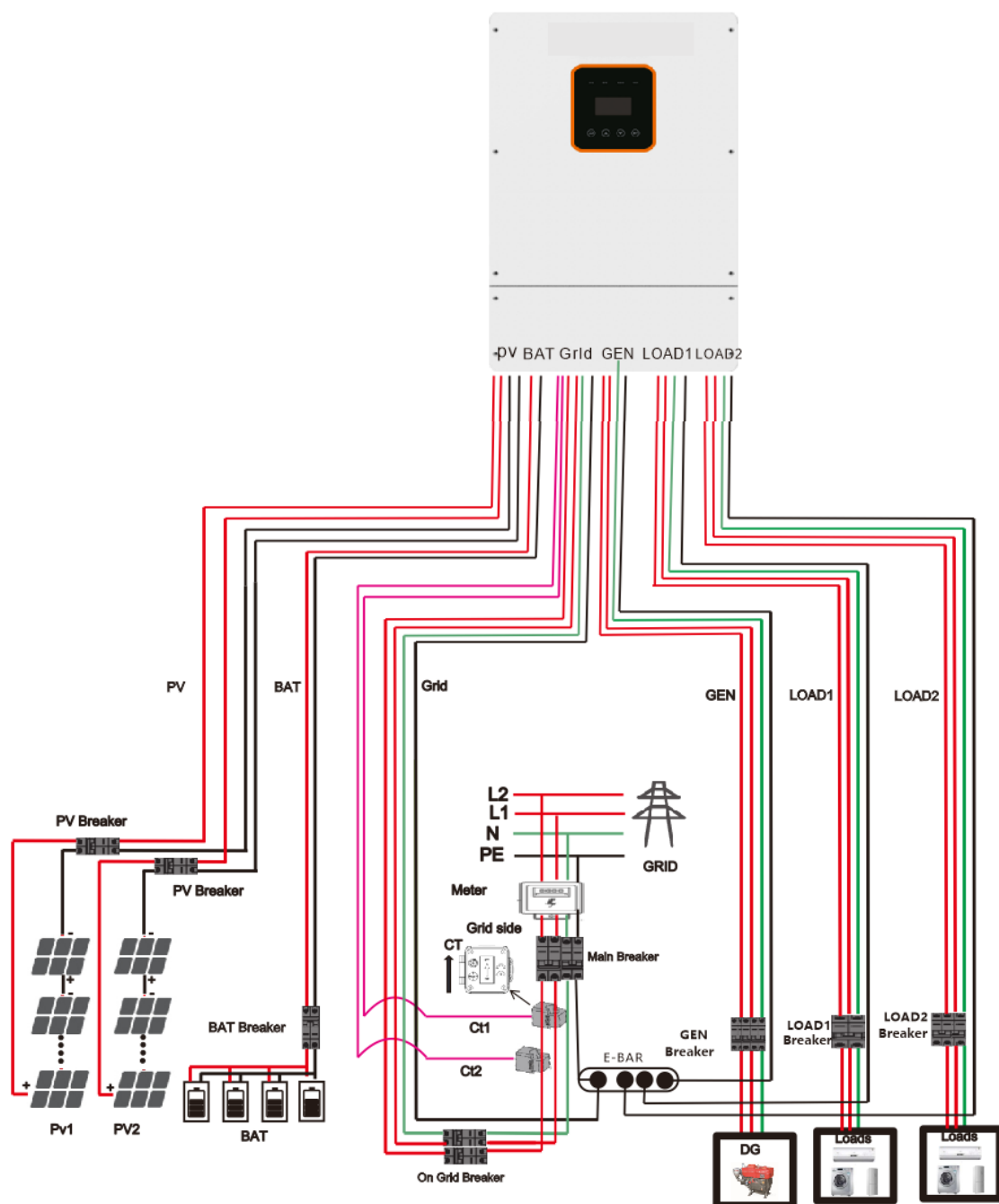
Note!
The arrow on the CT points to the power grid, as shown.
If the CT connector is improperly connected, the inverter cannot read the data correctly, so that the relevant working conditions cannot be realized normally.

3.3 Work Modes

Inverter provides multiple work modes based on different requirements.

Work modes: Self-use

1.When PV, Grid, Battery is available:

A. Solar energy provides power to the loads as first priority, if solar energy is sufficient to power all connected loads, solar energy excess power will provides to charge battery, and then reduntant power will feed to grid.

B. Solar energy provides power to the loads as first priority ,if solar energy is not sufficient to power all connected loads, battery energy will supply power to the loads at the same time.

C. Solar energy provides power to the loads as first priority ,if solar energy and battery are not sufficient to power all connected loads, utility energy (Main Grid) will supply power to the loads with solar energy at the same time.

2 .When PV, Grid is available（without battery):

A. Solar energy provides power to the loads as first priority ,if solar energy is sufficient, the excess power will feed to grid.

B. Solar energy provides power to the loads as first priority, if solar energy is not sufficient to power all connected loads, Grid energy will supply power to the loads at the same time.

3 .When PV, Battery is available（Grid is disconnected):

A. Solar energy provides power to the loads as first priority ,if solar energy is sufficient to power all connected loads, solar energy will provides to charge battery.

B. Solar energy provides power to the loads as first priority ,if solar energy is not sufficient to power all connected loads, battery energy and solar energy will supply power to the loads at the same time.

Work modes: Peak shift

1.When PV, Grid, Battery is available:

A. On charge time, solar energy will charge battery as first priority. The excess energy will supply power to the loads.If solar energy is sufficient to supply loads and charge battery,and If there's still some extra energy, then the excess power will feed the power to grid

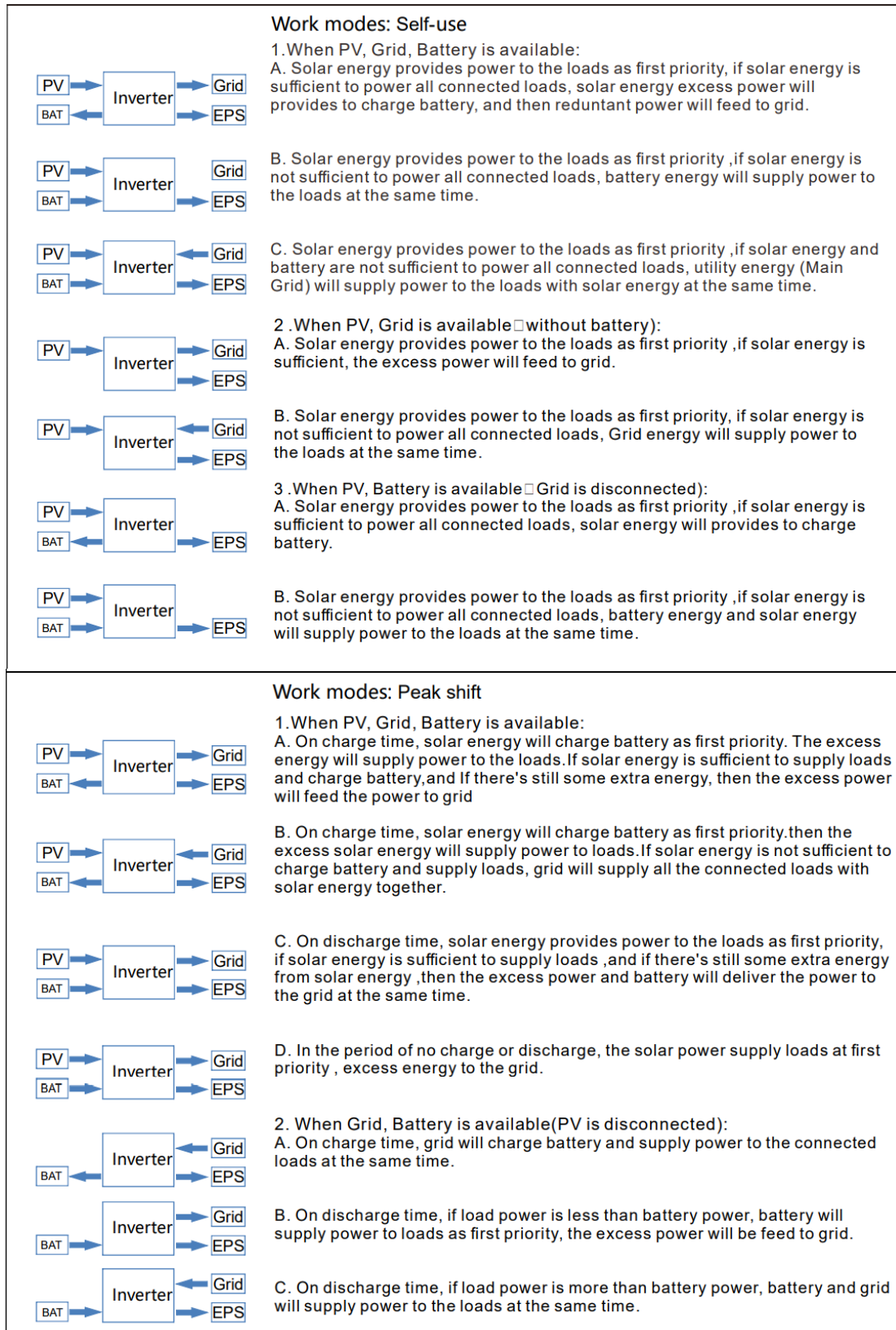B. On charge time, solar energy will charge battery as first priority.then the excess solar energy will supply power to loads.If solar energy is not sufficient to charge battery and supply loads, grid will supply all the connected loads with solar energy together.

C. On discharge time, solar energy provides power to the loads as first priority, if solar energy is sufficient to supply loads ,and if there's still some extra energy from solar energy ,then the excess power and battery will deliver the power to the grid at the same time.

D. In the period of no charge or discharge, the solar power supply loads at first priority , excess energy to the grid.

2. When Grid, Battery is available(PV is disconnected):

A. On charge time, grid will charge battery and supply power to the connected loads at the same time.

B. On discharge time, if load power is less than battery power, battery will supply power to loads as first priority, the excess power will be feed to grid.

C. On discharge time, if load power is more than battery power, battery and grid will supply power to the loads at the same time.

Work modes: Bat priority

1. When PV, Grid, Battery is available:
A. Solar energy will charge battery as first priority, if solar energy is excess, the excess power will supply load. If there's still some extra energy, then the excess power will feed the power to grid .

B. Solar energy will charge battery as first priority, if solar energy is excess, the excess power will supply load.If solar energy is not sufficient to charge battery and supply loads, grid will supply power to loads.
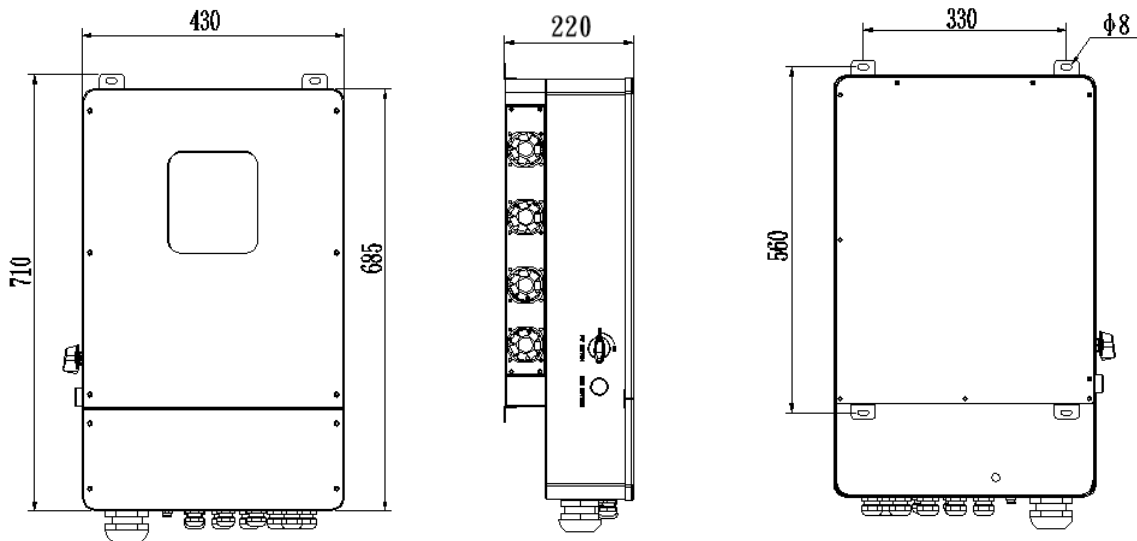
2. When Grid,Battery is available (PV is disconnected):
Grid will supply power to load and charge battery at the same time.

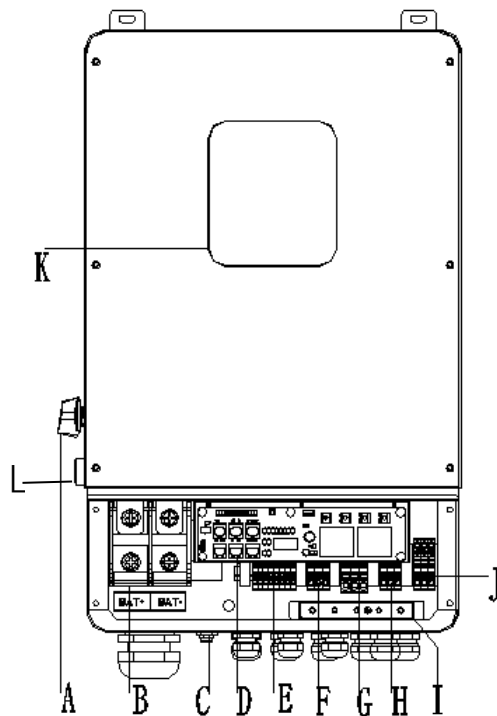**Note!**
If set anti-Reverse function allowable, Once on the work mode of Self-use, Peak shift, battery priority, the system will not feed power to grid.
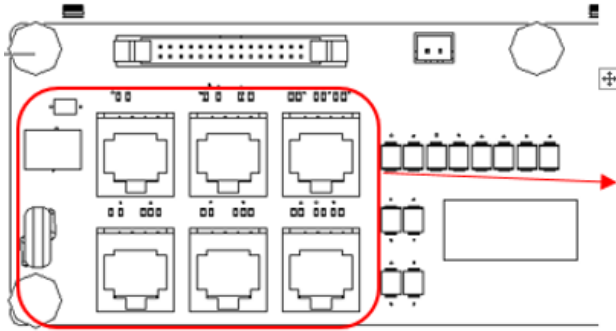
3.4 Dimension

3.5 Terminals of PV inverter

Object	Description
A	DC switch
B	BAT input
C	Wi-Fi
D	CAN1/CAN2/RS485/BMS485,BMSCAN/CTL1/CTL2/Type-c upgrade
E	PV1~PV4 input
F	Generator
G	Grid
H	BACK-UP1 output
I	PE
J	BACK-UP2 output
K	LCD
L	RSD button

⚠️ **WARNING !**
  Qualified electrician will be required for the installation.

TYPE-C UPDATE	CAN1	CAN2	RS485
	BMS-485 BMS-CAN	CT L2	CT L1

* Port Function
    CAN1/CAN2: Communication interface for connecting inverters.
    RS485: Read the internal data of inverter.
    BMS-485/ BMS-CAN: BMS communication for lithium batteries.
    CT L1/CT L2: For external grid side CT to detect current size.
    TYPE-C UPDATE: Update machine software locally on PC via USB-A port.

4. Technical Parameters

4.1 Inverter specication

Technical Data	R5KLNA	R6KLNA	R7K6LNA	R8KLNA
PV Input Data				
MAX.DC Input Power	7.5kW	9kw	12kw	12KW
NO.MPPT Tracker	4			
MPPT Range	120 – 500V			
MAX.DC Input Voltage	500V			
MAX.Input Current	12A			
Battery Input Data				
Nominal voltage (Vdc)	48V	48V	48V	48V
MAX.Charging/Discharging Current	120A/120A	135A/135A	190A/190A	190A/190A
Battery Voltage Range	40–60V			
Battery Type	Lithium and Lead Acid Battery			
Charging Strategy for Li–Ion Battery	Self–adaption to BMS			
AC Output Data(On–Grid)				
Nominal output power Output to Grid	5KVA	6KVA	7.6KVA	8KVA
MAX. Apparent Power Output to Grid	5.5KVA	6.6KVA	8.4KVA	8.8KVA
Output Voltage Range	110–120/220–240V split phase, 1Ø, 230 1 phase			
Output Frequency	50/60Hz（45 to 54.9Hz / 55 to 65Hz）			
Nominal AC Current Output to Grid	20.8A	25A	31.7A	33.3A
Max.AC Current Output to Grid	22.9A	27.5A	35A	36.7A
Output Power Factor	0.8leading···0.8lagging			
OutPut THDI	< 2%			
AC Output Data(Back–Up)				
Nominal. Apparent Power Output	5KVA	6KVA	7.6KVA	8KVA
MAX. Apparent Power Output	5.5KVA	6.6KVA	8.4KVA	8.8KVA
Nominal Output Voltage L–N/L1–L2	120/240V			
Nominal Output Frequency	60Hz			
Output THDU	< 2%			
Efficiency				
Europe Efficiency	>=97.8%			
MAX. Battery to Load Efficiency	>=97.2%			
Protection				
Grounding detection	YES			
Arc Fault Protection	YES			
Island Protection	YES			
Battery reverse Polarity	YES			

|	
Insulation Resistor Detection	YES
Residual Current Monitoring Unit	YES
Output Over Current Protection	YES
Back-up Output Short Protection	YES
Terminal temperature detection	YES
Output Over Voltage Protection	YES
Output Under Voltage Protection	YES
General Data	
Output Conduit	25.4mm
PV Input Conduit	25.4mm
BAT Input Conduit	34.5mm
Operating Temperature Range	.-25 ~ +60℃
Relative Humidity	0-95%
Operating Altitude	0~4000m
Ingress Protection	IP65/NEMA 3R
Weight	32kg
Size (Width*Height*Depth)	430mm x 710mm x 220mm
Cooling	Natural Convection
Noise emission	<38dB
Display	LCD
Communication With BMS/Meter/EMS	RS485，CAN
Supported communication interface	RS485, WLAN, 4G (optional)
Self-consumption at night	< 2.5 W (with battery enabling < 5 W)
Safety	UL1741SA all options, UL1699B, CSA 22.2
EMC	FCC Part 15 Class
Grid connection standards	IEEE 1547, IEEE 2030.5, Hawaii Rule 14H, Rule 21 Phase I,II,III

5. Installation

5.1 Check for Physical Damage

Make sure the inverter is intact during transportation. If there is any visible damage, such as cracks, please contact your dealer immediately.

5.2 Packing List

Open the package and take out the product, please check the accessoires first. The packing list shown as below.
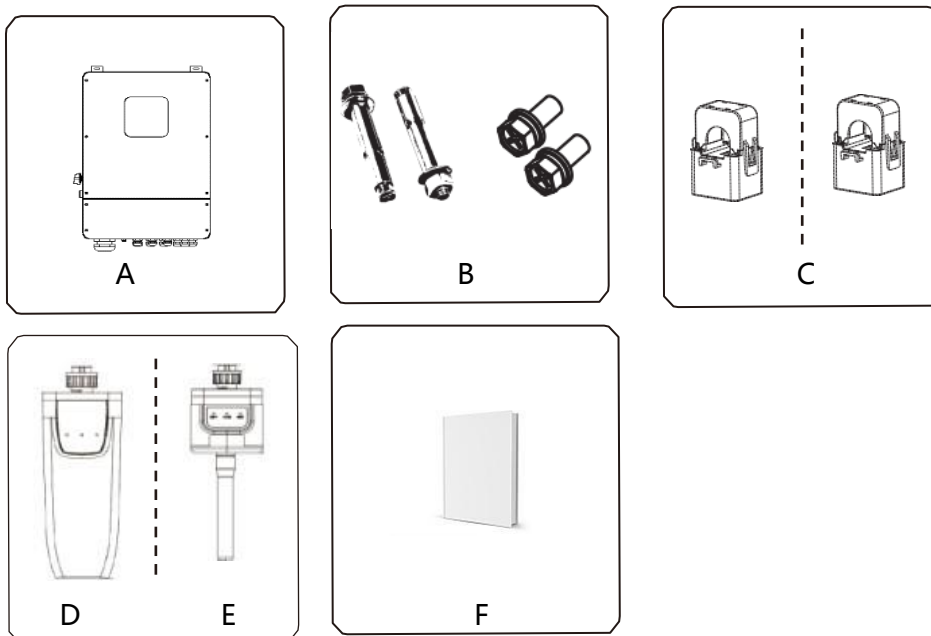
| Object	Description
A	Inverter
B	Expansion screws and pan-head screws
C	CT
D	WiFi module (optional)
E	GPRS module (optional)
F	User manual

5.3 Mounting

➢ Installation Precaution
  Inverter is designed for outdoor installation (IP 65).Make sure the installation site meets the following conditions:

  ◆ Not in direct sunlight.

  ◆ Not in areas where highly Flammable materials are stored.

  ◆ Not in potential explosive areas.

  ◆ Not in the cool air directly.

  ◆ Not near the television antenna or antenna cable.

  ◆ Not higher than altitude of about 2000m above sea level.

  ◆ Not in environment of precipitation or humidity (＞95%).

  ◆ Under good ventilation condition.

  ◆ The ambient temperature in the range of -20℃ to +60℃.

  ◆ The slope of the wall should be within ± 5° .

 ◆ The wall hanging the inverter should meet conditions below:

1.solid brick/concrete, or strength equivalent mounting surface;

2.Inverter must be supported or strengthened if the wall's strength isn't enough(such

as wooden wall, the wall covered by thick layer of decoration)

Please AVOIDE direct sunlight, rain exposure, snow laying up during installation and

operation.
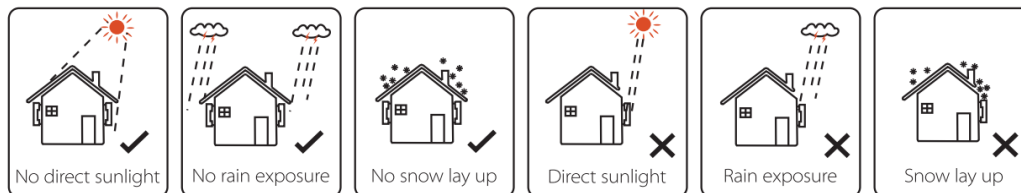
➢ **Space Requirement**
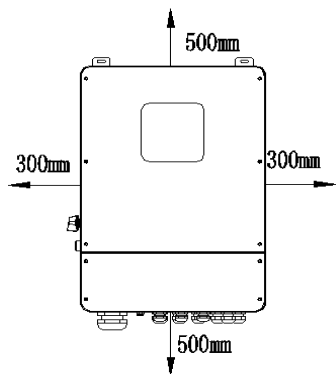
| Position	Min. size
Left	300mm
Right	300mm
Top	500mm
Bottom	500mm
Front	1000mm

➢ Mounting

Tools required for installation.

Installation tools : crimping pliers for binding post and RJ45, screwdriver, manual wrench etc


Step 1: Drill 4 holes in the wall according to the following distance dimensions, 50~60mm depth. Then use a proper hammer to fit the expansion bolt into the holes.
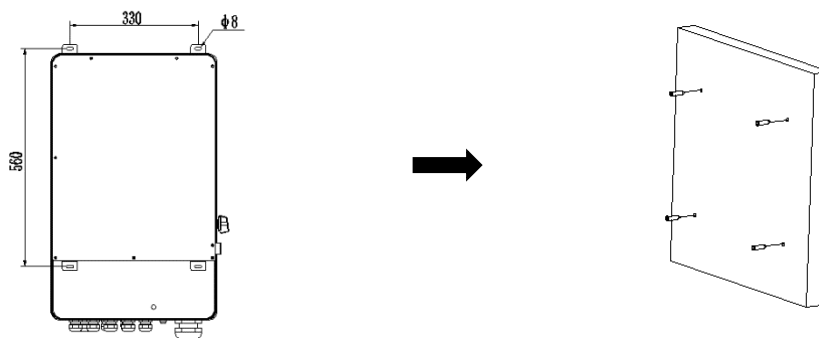

Step 2: Lift up the inverter and align the hole of the inverter with the expansion bolt, Fix the inverter on the wall.

Step 3: Tighten the nut of expansion bolt，and install an anti-theft lock on DC switch of the inverter

19
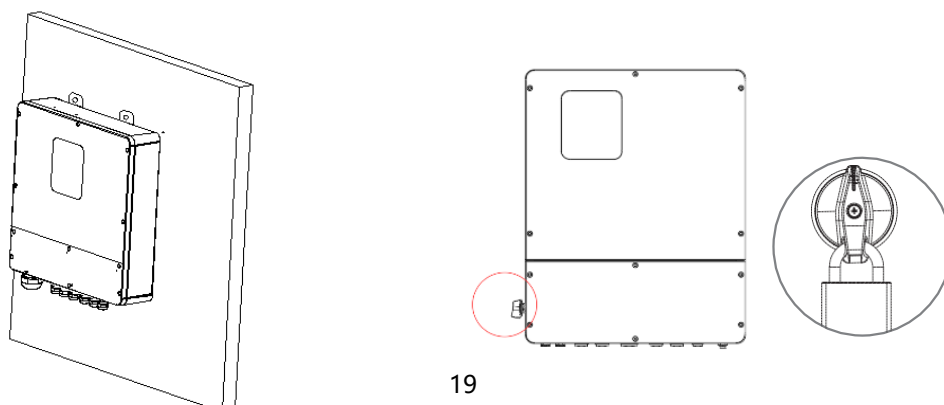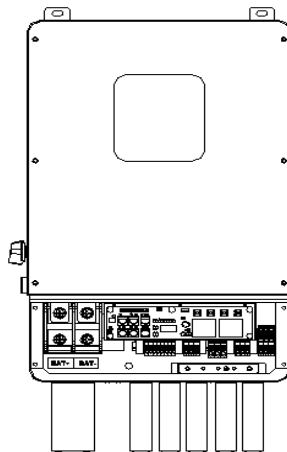
Step 4: Remove the cover screws by Allen Wrench and remove the cover. Remove the waterproof cover by a flat blade screwdriver. Wiring box conduit plugs, Conduit plugs are provided for 1 inch conduit fittings. If used conduit fitting is not 1 inch, an appropriate conduit adaptor should be used.
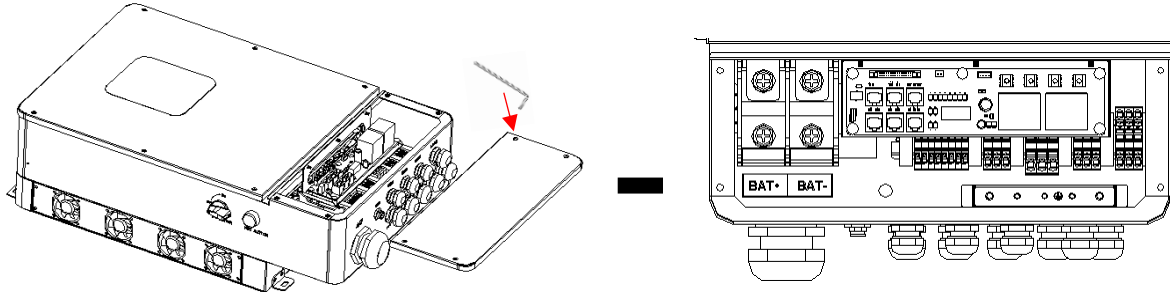
Step 5: Pass the corresponding conduit and fasten the joint.

6. Electrical Connection

6.1 PV connection

Hybrid can be connected in series with 4-strings PV modules for 5kW, 6kW, 7.6kW, 8kW.Select PV modules with excellent function and reliable quality. Open-circuit voltage of module arrays connected in series should be <Max. DC input voltage; operating voltage should be conformed to MPPT voltage range.

⚠	**Warning!**
	PV module voltage is very high, which already achieve dangerous voltage range, please comply with electric safety rules when connecting.
	Please do not make PV positive or negative ground!

| 👉	**Note!**
	The following requirements of PV modules need to be applied for each input area;
	Please do not make PV positive or negative ground!
	In order to save cable and reduce the DC loss, we suggest to install the inverter near PV modules.

Step1. Wiring.
    1.1 Choose the 12 AWG wire to connect with the cold-pressed terminal.
    1.2 Remove 18mm of insulation from the end of wire.
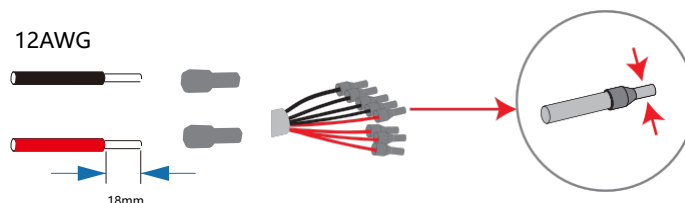
Step2. Cross the PV cables athrough the PV port, Connect PV cables to PV terminals.
        Connect PV cables to PV terminals.
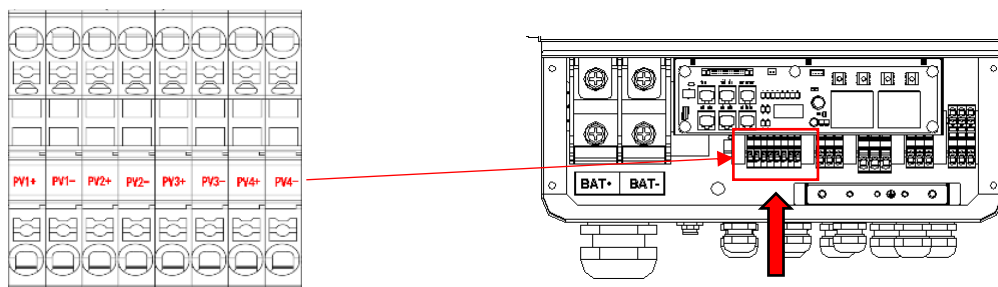
6.2 Grid Connection (GEN connection)

Step1. Check the grid voltage.

    1.1 Check the grid voltage and compare with the permissive voltage range (Please refer to technical data).

    1.2 Disconnect the circuit board from all the phases and secure against re-connection.

Step2. Grid cables choose

    Use the right pin terminal from the accessory box. Press the connectors on cable conductor core tightly.

Model	R5KLNA	R6KLNA	R7K6LNA	R8KLNA
Cable	12AWG		10AWG	

Step3. Choose the wire to connect with the cold-pressed terminal.
    (Remove 18mm of insulation from the end of wire.)

18mm
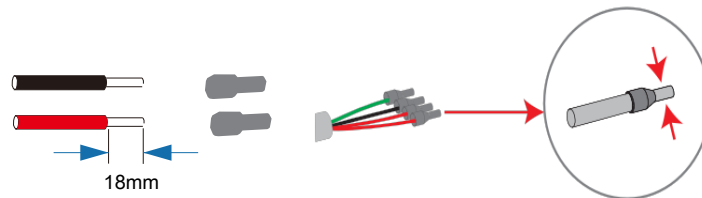
Step4. Cross the Grid cables although the grid port, Connect Grid cables to Grid terminals.

Generator (GEN)

Grid

L1 L2 N
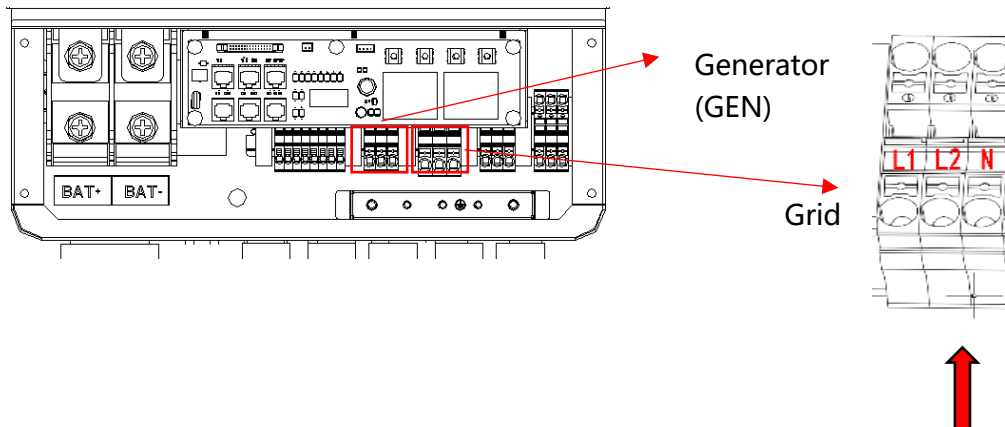
6.3 Back-up:Load1 and Load2 Connection

Inverter has On and Off grid function, the inverter will deliver output power through AC port when the grid is on, and it will deliver output power through back-up port when the the grid is off.

➢ Auto & Manual

BACK-UP function can be achieved automatically or manually according to user's wishes. BACK-UP function can only be triggered automatically.

➢ Load1 port: important load.

Load2 port: When the battery is not sufficient, the load on this interface will power down

1).For inverter, the standard PV installation typically consists of the connection of the inverter with both panels and batteries. In case of systems not connected to the batteries, the Back-Up function is strongly not advised to use. It shall not cover the standard warranty and be liable for any consequences arising from users not following this instruction.

2) Hybrid inverters are able to supply over load output at its "Back-Up". For details please refer to the technical parameters of inverter. And the inverter has self-protection dreading at high ambient temperature.

3) For complicated application, or Special load , please contact after-sales.
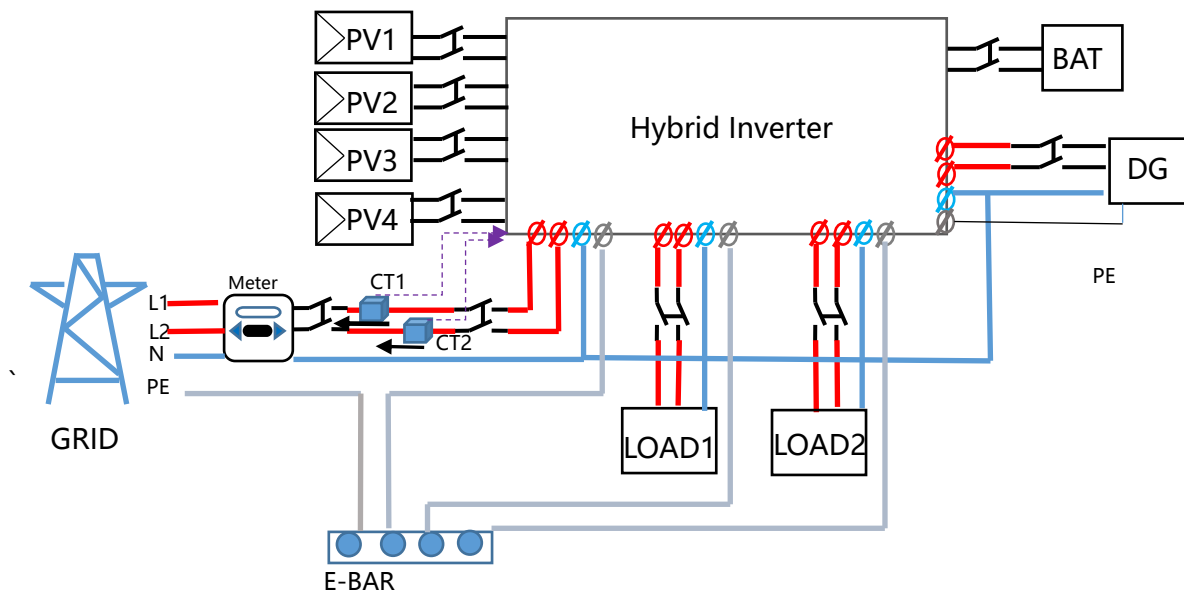
	Note!
👉	In case of discrepancies between wiring mode of local policy and the operation guide above, espescially for the wiring of neutral line, grounding and RCD, please contact us before any operation!

➢ **Back-Up:Load1 and Load2 Connection:**

When using the off grid function, please add off grid AC breaker in off grid output cable to ensure safety.

Model	R5KLNA	R6KLNA	R7K6LNA	R8KLNA
Micro-breaker	32A		40A	

Note: The absence of AC breaker on back-up side will lead to inverter damage if an electrical short circuit happens on back-up side.

Step1.Make BACK-UP wires.

Model	R5KLNA	R6KLNA	R7K6LNA	R8KLNA
Cable	12AWG		10AWG	

18mm
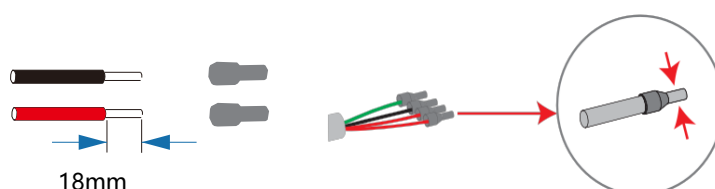
Step2. Connect the cables to the BACK-UP:Load1 and Load2 port of the inverter.

Load2

Load1
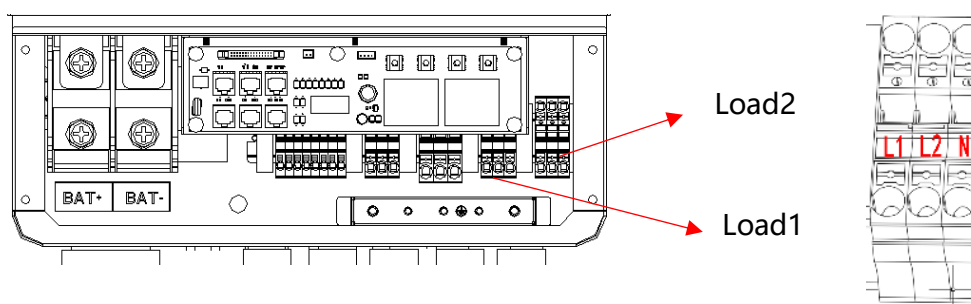
➢ **Requirements for BACK-UP load**

Waring!
Make sure the BACK-UP load power rating is within BACK-UP output rating, otherwise   the inverter will shut down with an "over load" warning.
When an "over load" is appeared, adjust the load power to make sure it is within the BACK-UP output power range, then turn the inverter back on.
For the nonlinear load, please make sure the inrush power should be within the BACK- UP output power range.

6.4 Battery Connection

Charging & discharging system of Hybrid series inverter is designed for 48V lithium battery. Before choosing battery, please note the maximum voltage of battery can not exceed 60V and the battery communication should be compatible with Hybrid inverter.

➢ **Battery breaker**

Before connecting to battery, please install a no-polarized DC breaker to make sure inverter can be securely disconnected during maintenance.

Model	R5KLNA	R6KLNA	R7K6LNA	R8KLNA
Current[A]	160A		250A	

➢ **Battery connection diagram**
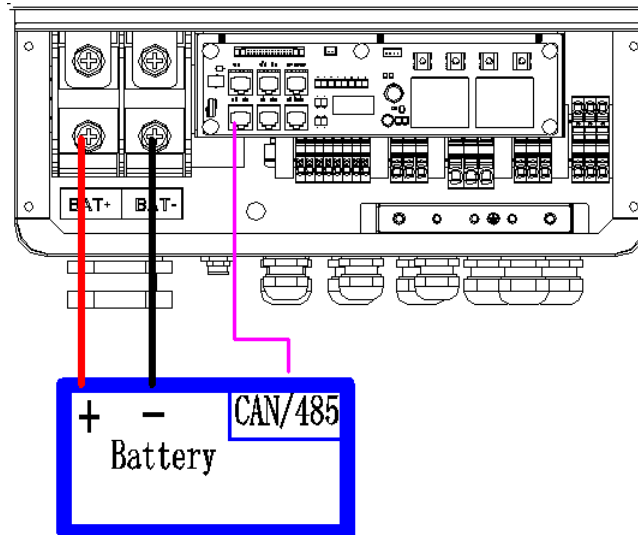
➢ **BMS PIN Definition**

Communication interface between inverter and battery is RS485 or CAN with a RJ45 connector.
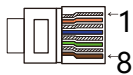
	PIN	1	2	3	4	5	6	7	8
CAN	Definition	X	X	X	BMS_CANH	BMS_CANL	X	X	X
RS485	Definition	X	X	X	X	X	GND	BMS_485A	BMS_485B

When using RS485 protocol, please note that PIN2 must be disconnected!

> **Note!**
> The battery communication can only work when the battery BMS is compatible with the inverter.

➢ Power Connection Battery:

Step1
Choose the 2 AWG wire and strip the cable to 15mm. Select two O-terminals with an aperture of M8. Insert the stripping line into the O-terminal and clamp it with a crimping clamp.

Step2. Cross the battery cable although the battery port. Connect battery cable to battery terminal

BMS

BATTERY INTERFACE

24.5 N.M
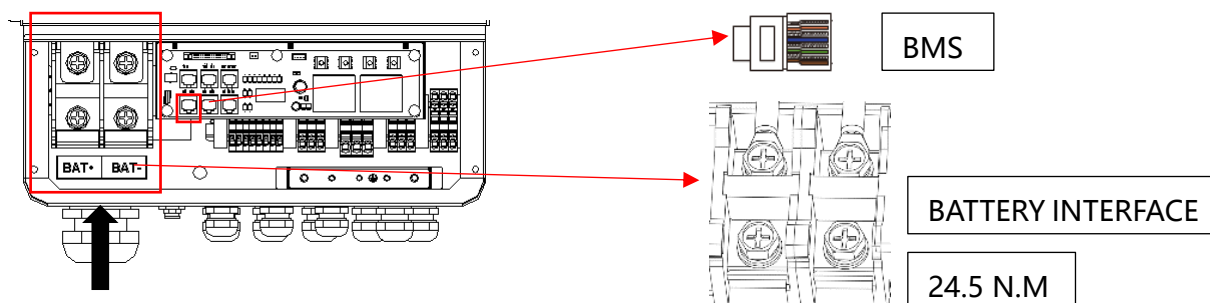
Note!
Positive and negative lines are not allowed to reverse.

6.5 WiFi Connection (optional)

Inverter provides a WiFi port which can collect data from inverter and transmit it to monitoring-website by WiFi.(Purchase the product from supplier if needed)
1) Diagram
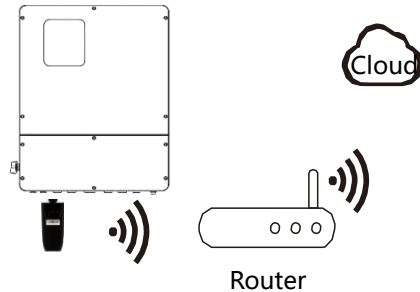
Router

2)WiFi Connection :

Step1. Plug WiFi into "WiFi" port at the bottom of the inverter.
Step2. Build the connection between the inverter and router.
Step3. Create a user account online.(Please check the WiFi user manual for more details).

6.6 GPRS Connection (optional)

Hybrid inverter provides a GPRS(radio frequency) interface which control the switch time of a designated load via an exteral Smart Plug (purchase the product from supplier if needed.) so that the load mostly consumes PV energy and incurs the lowest-possible energy costs during operation.
1)Diagram

AC

Meter
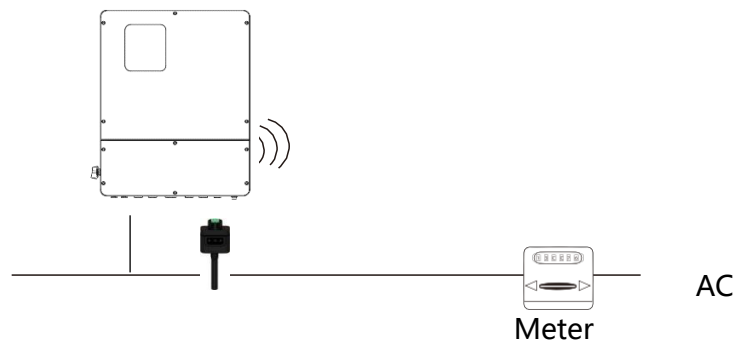
2)GPRS Connection :
Please refer to the Smart Plug user manual for detailed connection

WIFI or GPRS
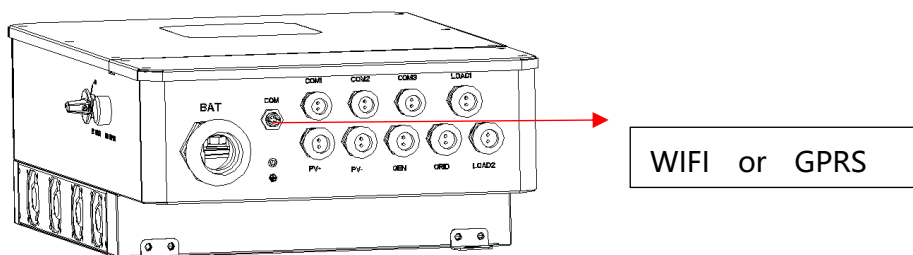
6.7 CT Installation instructions

CT is short for "current transform", is used to detect Grid current.

Note!

- If CT is not installed or installed reversely, the functions of "Anti-reflux", "Self-use", "Peak-shift "... will not be realized.
- The direction of the arrow on the CT points from this inverter to the GRID.

When connected to single-phase power grid (Europe, Africa, Asia, Australia). Only one CT is provided in the accessories. The RJ45 connector of CT is connected to "CT-L1", and the CT is connected to L phase.

When connected to split phase power grid (North America), the accessories provide two CTS, "CT-L1" network interface is corresponds to L1 phase, and "CT-l2" network interface is connected to L2 phase
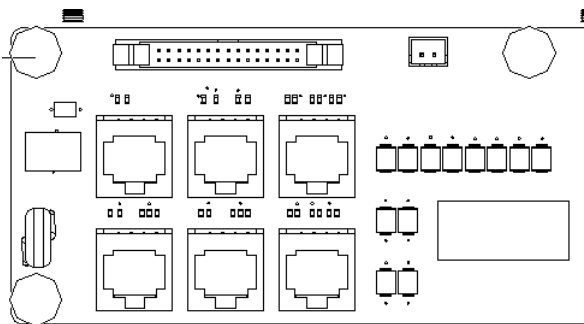
CAN1	CAN2	RS485_METER (Internal Use)
BMS-485 BMS-CAN	CT -L2	CT -L1
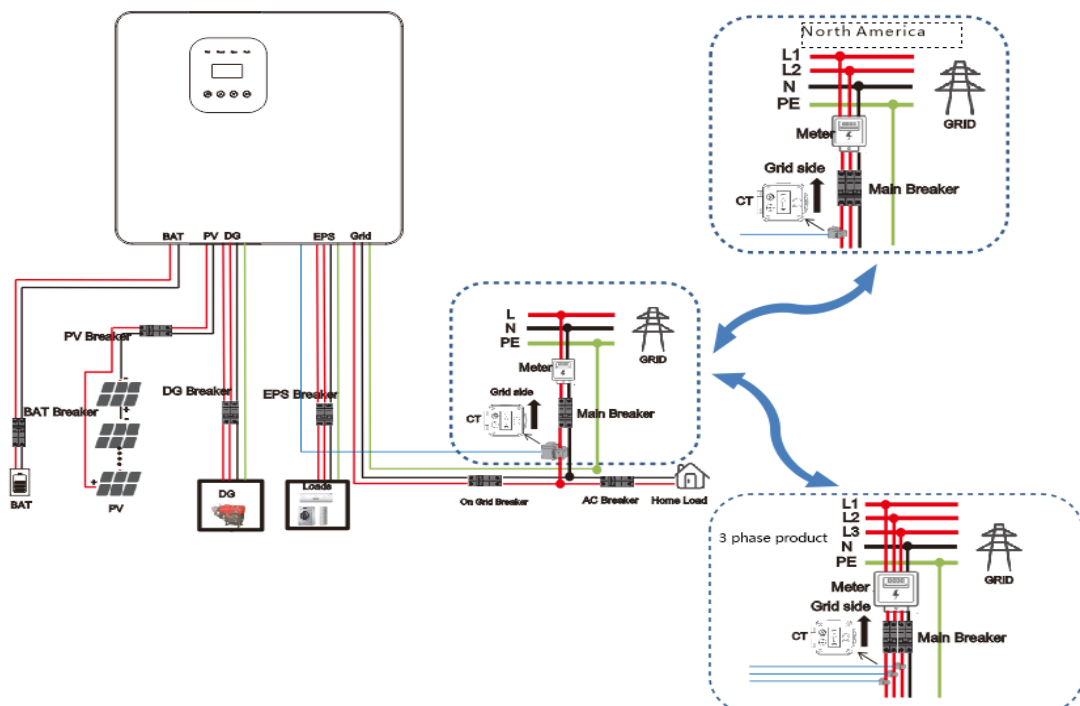
7. LCD Operation

7.1 Control Panel
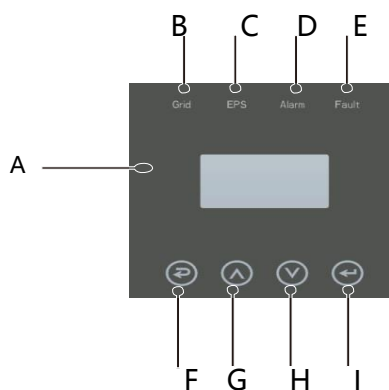
Object	Name	Description
A	LCD	Display the information of the inverter.
B	Indicator LED	lit in green: The inverter is in grid mode. Off: The inverter is in not in grid mode.
C		lit in green: The inverter is in off-grid mode. Off: The inverter is in not in off-grid mode.
D		lit in Yellow: The inverter is in Warning . Off: The inverter has no Inverter Warning
E		lit in red: The inverter is in fault status. Off: The inverter has no errors.
F	Function Button	Esc: Return from current interface or function.
G		Up: Move cursor to upside or increase value.
H		Down: Move cursor to downside or decrease value.
I		Enter: Confirm the selection.

7.2 Instructions for LED Indicator

	Grid （Green）	EPS （Green）	Alarm (Yellow)	Fault (Red)
Initialization	off	off	off	off
Stand-by	off	off	off	off
Grid mode	on	off	off	off
Off-Grid	off	on	off	off
Bypass of mains	off	on	on	off
Fault	off	off	off	on

7.3 Instructions for the use of three modes

```
1.SETUP
 ├─ 1.SYS SETTING
 │   ├─ 1.WORK MODE
 │   │    ├─ 1.SELF CONSUME
 │   │    ├─ 2.PEAK SHIFT
 │   │    └─ 3.BAT PRIORITY
 │   ├─ 2.EPS ENABLE
 │   ├─ 3.BAT WAKE-UP
 │   ├─ 4.REMOTE CTRL
 │   ├─ 5.START DELAY
 │   ├─ 6.PV INPUT
 │   │    ├─ 1.INDEPENDANT
 │   │    ├─ 2.PARALLEL
 │   │    └─ 3.CV
 │   ├─ 7.ANTI REVERSE
 │   ├─ 8.ARC ENABLE
 │   └─ 9.BUTT REVERSE
 │
 ├─ 2.BAT SETTING
 │   ├─ 1.BAT TYPE
 │   │    ├─ 1.DC-SOURCE
 │   │    ├─ 2.LEAD-ACID
 │   │    └─ 3.Lithum
 │   ├─ 2.DISC-DEPTH
 │   ├─ 3.CHARG-CURR
 │   └─ 4.BAT-COMM
 │        ├─ 1.RS485
 │        └─ 2.CAN
 │
 ├─ 3.GRID STD
 ├─ 4.GRID SET
 ├─ 5.RUN SETTING
 │   ├─ 1.REACT MODE
 │   │    ├─ 1.POWER FACTOR
 │   │    ├─ 2.REACT POWER
 │   │    ├─ 3.QU WAVE
 │   │    └─ 4.QP WAVE
 │   ├─ 2.GRID POWER
 │   ├─ 3.DISC POWER
 │   ├─ 4.CHAG POWER
 │   ├─ 5.PV POWER
 │   ├─ 6.VAC-MIN
 │   ├─ 7.VAC-MAX
 │   ├─ 8.FAC-MIN
 │   ├─ 9.FAC-MAX
 │   └─ 10.ACTIVE REP
 │        ├─ 1.PWR-VOLT RES
 │        ├─ 2.PWR-FREQ RES
 │        ├─ 3.PFC-VOLT RES
 │        ├─ 4.PFC -FREQ RES
 │        ├─ 5.ACTIVEISLAND
 │        ├─ 6.Leack Curren
 │        └─ 7.Insulation detection
 ├─ 6.485 ADDRESS
 ├─ 7.BAUD-RATE
 │   ├─ 1.2400bps
 │   ├─ 2.4800bps
 │   └─ 3.9600bps
 ├─ 8.LANGUAGE
 │   ├─ 1.中文
 │   └─ 2.ENGLISH
 ├─ 9.BACKLIGHT
 ├─ 10.DATE/TIME
 ├─ 11.CLEAR REC
 ├─ 12.PASSWORD
 ├─ 13.MAINTENANCE
 └─ 14.FCTRY RESET
```

2、INQUIRE
- 1、INV MODULE
- 2、MODULE SN
- 3、FIRMWARE
- 4、RECORD

3、STATISTIC
- 1、TIME STAT
- 2、CONNE TIMES
- 3、PEAK POWER
- 4、E-TODAY
- 5、E-MONTH
- 6、E-YEAR
- 7、E-TOTAL

For example,Before selecting the mode, you can set it up ac cording to the local power grid, PV input mode and battery type.

Power grid :

Circular display interface → Press Esc button → User → Select 1 : Set up Press Enter button → Enter password

Enter password → Default password 00000 Press UP/DOWN button Adjust the figure. → 3:GRID STD → Press Enter button → Choose according to local power grid → Press Enter button → Circular display interface

PVinput mode :

Setting → Enter password Press Enter button → 1:SYS SETTING → Press Enter button → 6 PV INPUT → Press Enter button → Select PV input mode,Press enter to confirm

Battery parameters :

Setting → Enter password Press Enter button → 1:BAT TYPE → Press Enter button → Set corresponding battery type,Press enter to confirm.

8. LCD Operation

8.1 LCD Interface

8.1.1 Error information

Interface	Description
ERROR NO. 🔒 02:BatDisconnect 27:BMS Comm.fail	Numbers represent error codes and text is error information. Refer to Chapter 9 for specific contents. NOTE: When there is a lock mark 🔒 in the upper right corner of the screen, you cannot turn the page, you need to press Enter to unlock it first.

8.1.2 System setting1

Interface	Description
SYSTEM1 STATE：SELF CSM GRID： CN PV I/P： PARALL	State: Setting of the whole machine working mode. Including: SELF CONSUME, PEAK SHIFT and BAT PRIORITY. Refer to Chapter 3.3 for specific contents. Grid standard: Displays the grid standard actually set. PV input mode: The display value is the setting value of PV input type. Including: INDEPENDANT, PARALLEL, CV.

8.1.3 System setting2

Interface	Description
SYSTEM2 BMS Com： CAN Anti Reve： DISA DOD： 80%	BMS Com: Battery Management System communication mode. Including: CAN, RS485. Anti Reve: Displays Whether Inverter isn't allowed to generate electricity to the Grid. Including: DISABLE,ENABLE DOD: Depth of battery discharge.

8.1.4 System setting3

Interface	Description
SYSTEM2 EPS ENABLE：ENAB	EPS ENABLE：When the Grid and PV are powered off, Enable the battery to supply power to the load, default option is enable.

8.1.5 PV1 Input display interface

Interface	Description
PV1 INPUT VOLT: 0.0V CURR: 0.00A POWER: 0W	PV1 input real-time voltage, current and power.

8.1.6 PV2 Input display interface

Interface	Description
PV2 INPUT VOLT: 0.0V CURR: 0.00A POWER: 0W	PV2 input real-time voltage, current and power.

8.1.7 PV3 Input display interface

Interface	Description
PV3 INPUT VOLT: 0.0V CURR: 0.00A POWER: 0W	PV3 input real-time voltage, current and power.

8.1.8 PV4 Input display interface

Interface	Description
PV4 INPUT VOLT: 0.0V CURR: 0.00A POWER: 0W	PV4 input real-time voltage, current and power.

8.1.9 DC Voltage interface

Interface	Description
DC VOLTAGE VpBUS: 235.0V VnBUS: 235.0A LearkCur: 0mA	VpBUS: Real-time voltage of bus capacitor of the machine. VnBUS: Real-time voltage of bus capacitor of the machine. LeakCurr: Real-time leak current of the machine.

8.1.10 Battery interface

Interface	Description
BATTERY VOLT: 0.0V CURR: 0.0 A STA:	Battery real-time voltage, current.

8.1.11 Battery current interface

Interface	Description
BATTERY INFO TYPE: Lithum TEMP: 26°C SOC: 30%	TYPE: Battery type:(lead acid, lithium battery) TEMP: Battery temperature. SOC: Percentage of battery surplus capacity from the BMS

8.1.12 Battery current interface

Interface	Description
BMS PRMETER CHAR VOL: 0.0V CHARGE: 50A DISCHA: 50A	CHAR VOL: Battery charging or discharing voltage. CHARGE: Battery charging current. DISCHA: Battery discharging current.

8.1.13 Grid-connected

Interface	Description
GRID: 0.00Hz L1: 0.0V 0.00A L2: 0.0V 0.00A	GRID FREQ: Grid real-time frequency. L1: Gird-L1 real-time voltage. CT real-time current L2: Gird-L1 real-time voltage. CT real-time current CT：Current sensor accessories

8.1.14 INV

Interface	Description
INV: 0.00Hz L1: 0.0V 0.00A L2: 0.0V 0.00A	INV FREQ: Grid real-time frequency. L1: INV-L1 real-time voltage. INV-L1 real-time current. L2: INV-L2 real-time voltage. INV-L2 real-time current.

8.1.15 LOAD

Interface	Description
LOAD: L1: 0.0V 0.00A L2: 0.0V 0.00A	L1: LOAD-L1 real-time voltage. LOAD-L1 real-time current. L2: LOAD-L2 real-time voltage. LOAD-L2 real-time current.

8.1.16 ON GRID POWER

Interface	Description
POWER GRID L1: 0W GRID L2: 0W	GRID L1: Grid -L1 power. GRID L2: Grid -L2 power.

8.1.17 INV POWER

Interface	Description
POWER INV L1: 0W INV L2: 0W	INV: INV-L1 power. INV: INV-L2 power.

8.1.18 LOAD POWER PER

Interface	Description
LOAD POWER PER L1: 0W 0% L2: 0W 0%	L1 : Load- L1 power percentage. L2 : Load- L2 power percentage.

8.1.19 POWER

Interface	Description
POWER PV I/P: 0W BAT: 0W	PV I/P: PV power. BAT: BAT power.

8.1.20 Temperature

Interface	Description
TEMPERATURE INVER: 0°C DCDC: 0°C INSIDE: 0°C	INVER: INV Temperature. DCDC: DCDC Temperature. INSIDE: Internal ambient temperature of the machine.

8.1.21 State

Interface	Description
STATE SYS: STANDBY INV: STANDBY DCDC: STANDBY	System information: Display complete machine status information, Including: Initialization, Standby, PV grid connection, Grid connection of battery, Hybrid power supply, etc. INV: Displays the inverter status information. DCDC: Displays charging and discharging status information

8.2 SETTING

8.2.1 State

Interface	Description
USER →1:SETUP 2:INQUIRE 3:STATISTIC	SETUP: Press Enter to user settings interface. INQUIRE: Query machine model, serial number, software version. STATISTIC: View machine run statistics.

8.2.2 SET Password

Interface	Description
PASSWORD INPUT: XXXXX	Enter the password required for setting. The default password is"00000". Press the Up or Down keys to adjust the number, press the Enter key to move the cursor forward, and press the Esc key move the cursor backward.

8.2.3 Setup

Interface	Description
SETUP →1:SYS SETTING 2:BAT SETTING 3:GRID STD 4.GRID SET 5:RUN SETTING 6:485 ADDRESS 7:BAUD RATE 8:LANGUAGE 9:BACKLIGHT 10:DATE/TIME 11:CLEAR REC 12:PASSWORD 13:MAINTENANCE 14:FCTRY RESET	This interface is used for various information inquiry options. Press the Up/Down button to make the corresponding selection. Press Enter button to enter the selected menu. Press ESC button return to the user interface. (Refer to 8.2.1). There are 14 options in total.

8.2.4 System setting

8.2.4.0 System setting

Interface	Description
SYS SETTING →1: WORK MODE 　2: EPS ENABLE 　3: BAT WAKE-UP 　4. Grid SET 　5: REMOTE CTRL 　6: START DELAY 　7: PV INPUT 　8: Anti Reverse	This interface is used to access system information. Press Up/Down button to move corresponding options. Press Enter to enter the selected menu. Press ESC button to return to the setting interface. There are 8 options in total.

8.2.4.1 Work mode

Interface	Description
WORK MODE →1:SELFCONSUME 　2:PEAK SHIFT 　3:BAT PRIORITY	This interface is used to select the working mode. Press ESC button return to setting interface. (Refer to 3.3)

8.2.4.1.1 Peak shift work time

Interface	Description
WORK MODE 　1:SELFCONSUME →2:PEAK SHIFT 　3:BAT PRIORITY	This interface is used to select the working mode. Press ESC button return to setting interface. (Refer to 3.3). Select the peak shift mode, you also need to set the charge and discharge time
WORKTIME →1:TIME 1 　2:TIME 2 　3:TIME 3	It's allowed to set Three charging and discharging periods. When setting the time, ensure that the time of the inverter is the local time. Press Enter to enter the next menu.
CHAG START1 00:00 CHARGE END100:02 DISC　START1 00:03 DISCHA END1 23:59	This interface is used to adjust the time of peak load shifting. There are three time periods you can set. Press Up/Down button to move the corresponding options. Press Enter to enter the selected menu. Press Esc button to return to the working mode interface.

8.2.4.2 EPS enable

Interface	Description
EPS ENABLE 1:DISABLE →2:ENABLE	When the Grid and PV are powered off, Enable the battery to supply power to the load, default option is enable.

8.2.4.3 Battery wake-up

Interface	Description
WAKE-UP EN →1:DISABLE 2:ENABLE	When the battery is low and the battery relay has been disconnected, the inverter will send instructions to the battery forcibly sucking relay by BMS, and the inverter will charge. The default option is disabled. (Partial battery support)

8.2.4.4 REMOTE CTRL

Interface	Description
REMOTE CTRL →1:DISABLE 2:ENABLE	Remote control the inverter on or off. (Subsequent support…) The default option is disabled.

8.2.4.5 START DELAY

Interface	Description
START-UP DELAY INPUT: 60 UNIT: SEC	The input value ranges from 20 to 300, which varies with different standards.

8.2.4.6 PV INPUT MODE

Interface	Description
INPUT MODE →1.INDEPENDENT 2.PARALLEL 3.CV	Setup of PV Input mode. The factory setting by default is Independent, When parallel input is set to be stand-alone mode, PV power will be imbalanced. PARALLEL：In parallel mode is commonly used in test, two or four road PV in parallel. CV： Constant voltage model

8.2.4.7 Anti Reverse

Interface	Description
Anti Reverse →1.DISABLE 　2.ENABLE	Anti Reverse: Whether Inverter isn't allowed to generate electricity to the Grid. The default option is disabled. It's means inverter allowed to generate electricity to the Grid

8.2.4.8 ARC ENABLE

Interface	Description
-ARC- →1.DISABLE 　2.ENABLE	Enable or disable arc pull function detection.

8.2.4.9 BUTT ENABLE

Interface	Description
BUTTON ENABLE →1.DISABLE 　2.ENABLE	When the button is enabled, the button will take effect. After powering on, press the button to run the inverter. If the button is not pressed, the button will not take effect when the machine is zhuang disabled in standby.

8.2.5 BAT SETTING

8.2.5.0 BAT SETTING

Interface	Description
BAT SETTING →1.BAT TYPE 　2.DISC-DEPTH 　3.CHARG-CURR 　4.BAT-COMM	This interface is used to select battery parameters. Press Up/Down button to move corresponding options; Press Enter button to enter the selected menu; Press ESC button to return to setting interface.

8.2.5.1 BAT TYPE

Interface	Description
BAT TYPE 1.DC-SOURCE →2.LEAD-ACID 3.Lithum	This interface is used to select battery type. Press Up/Down button to move corresponding options; Press Enter button to enter the selected menu. Select the LEAD-ACID enter button to enter LEAD-ACID interface;

8.2.5.1.1 Lead-acid battery parameter

Interface	Description
LEAD-ACID →1.CHARG-VOLT 2.BAT END VOLT 3:BAT OVP 4:BAT CAP	This interface is used to select LEAD-ACID battery parameter. Press Up/Down button to move corresponding options; Press Enter button to enter the selected menu;
CHARGE VOLT INPUT: 55.0 V UNIT: V	This interface is used to set the lead acid battery charging voltage.

Interface	Description
BAT END VOLT INPUT: 043.0 UNIT: V	This interface is used to set the lead acid battery discharging voltage.
BAT OVP INPUT: 058.0 UNIT: V	This interface is used to set the lead acid battery Charge protection voltage.
BAT CAP INPUT: 0100 UNIT: AH	This interface is used to set the lead acid Battery capacity.

8.2.5.2 DISC-DEPTH

DISC DEPTH	Grid DOD/ OFF Grid DOD: When the battery discharge is higher than the set parameter, the inverter generates a battery low voltage alarm.
Grid DOD: 080%	
OFF Grid DOD: 080%	Return: When a low-voltage alarm is generated, the alarm is cleared if the battery charge is higher than the specified amount.
~~Return: 020%~~	

8.2.5.3 BAT-COMM

Interface	Description
BAT-COMM 1.RS485 →2.CAN	This interface is used to select battery communication. Press Up/Down button to move corresponding options; Press Enter button to enter the selected menu. The default option is CAN.

8.2.6 Grid standard

8.2.6.0 Grid std

Interface	Description
GRID STD 1.AU 2.AU-W 3.NZ 4.UK 5.VDE 6.KR 7.PHI 8.CN → 9.US-CA 10.JP 11.CUSTOM	This interface is used to select Grid standard. Press Up/Down button to move corresponding options; Press Enter button to enter the selected menu. 1:AU--(Australia) 2:AU-W—(Western Australia) 3:NZ-- New Zealand 4: UK--United Kingdom 5:VDE—Germany 6:KR—Korea 7:PHI—Philippines 8:CN—China 9:US-CA—America 10:JP—Japan 11:CUSTOM--User defined

8.2.6.1 Grid set

	Description
GRID SET → 1.220V single 2:120/240V 3:120/208V 4:120V single	220V single：220V Single-phase electric. 120/240V：120/240V Bipolar electric. 120/208V：120/208V Bipolar electric. 120V single：120V Single-phase electric.

8.2.7 RUN SETTING

8.2.7.0 RUN SETTING

Interface	Description
RUN SETTING 1.REACT MODE → 2.GRID POWER 3.DISC POWER 4.CHAG POWER 5.PV POWER 6.VAC-MIN 7.VAC-MAX 8.FAC-MIN 9.FAC-MAX 10.ACTIVE REP.	This interface is used to select run setting. Press Up/Down button to move corresponding options; Press Enter button to enter the selected menu.

8.2.7.1 REACT MODE

Interface	Description
RUN SETTING → 1.REACT MODE 2.GRID POWER 3.DISC POWER	This interface is used to select react mode. Press Up/Down button to move corresponding options; Press Enter button to enter the selected menu.
REACT MODE → 1.POWER FACTOR 2.REACT POWER 3.QU WAVE 4.QP WAVE	The input value should range between L0.80 and L0.99 or C0.8 and C1.00.
POWER FACTOR INPUT: C1.00	The input value should range between -60% and +60%, which varies with the standard.
REACT POWER INPUT: +00%	Active power adjustment.

8.2.7.2 GRID POWER

Interface	Description
GRID PERCENT INPUT: 100%	The input value is power percent of grid.

8.2.7.3 DISCHARGE POWER

Interface	Description
DISC PERCENT INPUT: 100%	The input value is power percent of battery discharge.

8.2.7.4 CHAG POWER

Interface	Description
CHAG PERCENT INPUT: 100%	The input value is power percent of battery charge.

8.2.7.5 PV POWER

Interface	Description
PV PERCENT INPUT: 100%	The input value is power percent of PV.

8.2.7.6 VAC-MIN

Interface	Description
GRID VOLT LOW INPUT: 176 UNIT: V	The input value of Grid low voltage. It effect when grid mode choose custom.

8.2.7.7 VAC-MAX

Interface	Description
GRID VOLT HIGH INPUT: 270 UNIT: V	The input value of Grid high voltage. It effect when grid mode choose custom.

8.2.7.8 FAC-MIN

Interface	Description
GRID FREQ LOW INPUT: 42.0 UNIT: Hz	The input value of Grid low frequency. It effect when grid mode choose custom.

8.2.7.9 FAC-MAX

Interface	Description
GRID FREQ HIGH INPUT: 58.0 UNIT: Hz	The input value of Grid high frequency. It effect when grid mode choose custom.

8.2.7.10 ACTIVE REF.

Interface	Description
ACTIVE Type 1.PWR-VOLT RES → 2.PWR-FREQ RES 3.PFC-VOLT RES 4.PFC-FREQ RES 5. ACTIVEISLAND 6.Leack Curren 7.insulation detection	This interface is used to select active reference. Press Up/Down button to move corresponding options; Press Enter button to enter the selected menu. Each menu have enable or disable, set it when you need. All default are enable.

8.2.8 485 Address

8.2.8.0 485 Address

Interface	Description
485 ADDRESS INPUT: 1	This interface is used to select 485 address.

8.2.9 485 BAUD RATE

8.2.9.0 BAUD RATE

Interface	Description

Interface	Description
SELECT →1.2400 bps 　2.4800 bps 　3.9600 bps	This interface is used to select 485 baud rate.

8.2.10 LANGUAGE SETTING

8.2.10.0 LANGUAGE

Interface	Description
LANGUAGE 1.Chinese →2.English	This interface is used to select language.

8.2.11 BACKLIGHT

8.2.11.0 BACKLIGHT

Interface	Description
LIGHT　TIME INPUT:　　20 UNIT:　　SEC	This interface is used to set light time.

8.2.12 DATE/TIME　SETTING

8.2.12.0 DATE/TIME

Interface	Description
DATE/TIME DATE:　2021-12-25 TIME:　　22:30:00 WEEK:　　Saturday	This interface is used to set date and time.

8.2.13 CLEAR REC

8.2.13.0 Clear history

Interface	Description

Interface	Description
DEL REC →1.CANCEL 2.CONFIRM	This interface is used to clear operation history.

8.2.14 PASSWORD

8.2.14.0 PASSWORD

Interface	Description
PASSWORD OLD: XXXXX NEW: XXXXX CONFIRM: XXXXX	This interface is used to set password.

8.2.15 MAINTENANCE

8.2.15.0 MAINTENANCE

Interface	Description
PASSWORD INPUT: XXXXX	This interface is used to enter maintenance.

8.2.16 FCTRY RESET

8.2.16.0 FACTORY RESET

Interface	Description
FACTORY RESET →1.CANCEL 2.CONFIRM	This interface is used to reset the inverter.

8.3 INQUIRE

8.3.0 INQUIRE

Interface	Description

INQUIRE	Press Up/Down button to move corresponding options;
→ 1.INV MODULE 2.MODULE SN 3.FIRMWARE 4.RECORD 5.DIAGNOSE	Press Enter button to jump to the selected menu. Press ESC button to return to other interface.

8.3.1 INV MODULE

Interface	Description
MODEL 8K	This interface show inverter model..

8.3.2 MODULE SN

Interface	Description
S / N GUID: XXXXXXXX XXXXXXXXXXXXXX SN:FXXXXXXXXXXX	This interface show module SN.

8.3.3 FIRMWARE

Interface	Description
FIRMWARE ARM: V1.XX.XX DSP: V1.XX.XX	This interface show Software version.

8.3.4 RUNNING RECORDS

Interface	Description
REC(01) 02:Batdisconnect UP: 12-25 23:00 DOWN:	This interface show running recodes.

8.3.5 DIAGNOSE

Interface	Description
DIAGNOSE 000000 000000 000000 000000 000000 000000	Factory internal use.

8.4 STATISTIC

8.4.0 STATISTIC

Interface	Description
STAT. →1.TIME STAT. 　2.CONNE.TIMES 　3.PEAK POWER 　4.E-TODAY 　5.E-MONTH 　6.E-YEAR 　7.E-TOTAL	This interface show inverter operation statistic. 1.　Inverter operation and Grid-connection time statistic. 2.　Inverter Grid-connection times statistic. 3.　Displays power peak in history and for the day. 4.　Displays statistic for the day (KWH). 5.　Displays statistic for the month (KWH). 6.　Displays statistic for the year (KWH). 7.　Displays statistic of the inverter (KWH).

Note: 1. E-TODAY/MONTH/YEAR/TOTAL→INPUT→PV/GRID(Consume)/BATD(Battery discharge)

→OUTPUT→BatC(Battery charge)/GRID(Generation)/

CNSUM(Load consume)

2. If the inverter shut down before 24:00 on that day, and the day statistic will not be stored.

9. Fault diagnosis and solutions

The inverter is easy to maintain. When you encounter the following problems, please refer to the Solutions below, and contact the local distributor if the problem remains unsolved. The following table lists some of the basic problems that may occur during the actual operation as well as their corresponding basic solutions.

Fault diagnosis table

Content	Codes	Explaination	Solutions
DischgOverCur	00	Battery discharge over current. When the battery is loaded, the load is too large.	(1) Nothing need to do, Wait one minute for the inverter to restart. (2) Check whether the load is in compliance with the specification. (3) Cut off all the power and shut down all the machines; disconnect the load and plug in to restart machines, then check
Over Load	01	The load power is greater than other power(PV,BAT).	(1) Check whether the load is in compliance with the maximum power of the machine. (2) Cut off all the power and shut down all the machines; disconnect the load and plug in to restart machines, then check whether the load is short circuited if the fault has been eliminated. (3) Contact customer service if error warning continues.
BatDisconnect	02	Battery Disconnect. (Battery voltage not identified)	(1) Check whether the battery is connected. (2) Check if battery wiring port is open circuited. (3) Contact customer service if error warning continues.
Bat Under Vol	03	Battery voltage low that normal range.	(1) Checking System Settings, If so, power off and restart. (2) Check if the grid power down. If so, waitting for the grid power up, the inverter will automatically charge. (3) Contact customer service if error warning continues.
Bat Low capacity	04	Bat Low capacity	(1) Battery Low that setting capacity.(SOC<100%-DOD)
Bat Over Vol	05	The battery voltage is greater than the Inverter maximum voltage.	(1) Checking System Settings, If so, power off and restart. (2) Contact customer service if error warning continues.
Gird low vol	06	Grid voltage is	(1) Check if the grid is abnormal.

Grid over vol	07	abnormal	(2) Restart the inverter and wait until it functions normally. (3) Contact customer service if error warning continues.
Grid low freq	08	Grid Frequency is abnormal.	(1) Check if the grid is abnormal. (2) Restart the inverter and wait until it functions normally. (3) Contact customer service if error warning continues.
Grid overFreq	09		
gfci over	10	Inverter GFCI exceeds standard.	(1) Check PV string for direct or indirect grounding phenomenon. (2) Check peripherals of machine for current leakage. (3) Contact the local inverter customer service if fault remains unremoved.
bus under vol	13	BUS voltage is lower than normal.	(1) Check the input mode setting is correct. (2) Restart the inverter and wait until it functions normally. (3) Contact customer service if error warning continues.
bus over vol	14	BUS voltage is over maximum value..	(1) Check the input mode setting is correct. (2) Restart the inverter and wait until it functions normally.
Inv over cur	15	The inverter current exceeds the normal value.	(1) Restart the inverter and wait until it functions normally.
Chg over cur	16	Battery charge current over than the Inverter maximum voltage.	(1) Restart the inverter and wait until it functions normally.
Bus vol osc	17	Bus voltage instability.	(1) Check the input and output mode setting is correct. (2) Restart the inverter and wait until it functions normally.
Inv under vol	18	INV voltage is abnormal	(1) Check if the INV voltage is abnormal. (2) Restart the inverter and wait until it functions normally. (3) Contact customer service if error warning continues.
Inv over vol	19		
InvFreqAbnor	20	INV frequency is abnormal	(1) Check if the INV frequency is abnormal. (2) Restart the inverter and wait until it functions normally. (3) Contact customer service if error warning continues.

igbt temp high	21	The inverter temperature is higher than the allowed value	(1) Cut off all the power of the machine and wait one hour, then turn on the power of the machine.
bat over temp	23	Battery temperature is higher than the allowed value.	(1) Disconnect the battery and reconnect it after an hour.
bat UnderTemp	24	Battery temperature is low than the allowed value.	(1) Check the ambient temperature near the battery to see if it meets the specifications.
BMS comm.fail	27	Communication between lithium battery and inverter is abnormal.	(1) Check the cable, crystal, Line sequence. (2) Checking the Battery switch.
Fan fail	28	Fan fail	(1) Check whether the Inverter temperature is abnormal. (2) Check whether the fan runs properly.(If you can see it)
Grid Phase err	30	The grid fault phase.	(1) Check power grid wiring
Arc Fault	31	PV Arc Fault	(1) Check Photovoltaic panels, PV wire. (2) Contact customer service if error warning continues.
bus soft fail	32	The inverter may be damaged	(1) Restart the inverter and wait until it functions normally. (2) Contact customer service if error warning continues.
inv soft fail	33		
bus short	34		
inv short	35		
fan fault	36	Fan fault.	(1) Check whether the Inverter temperature is abnormal. (2) Check whether the fan runs properly.(If you can see it)
PV iso low	37	PV iso low	(1) Check if the PE line is connected to the inverter and is connected to the ground. (2) Contact customer service if error warning continues.

Bus Relay Fault	38	The inverter may be damaged	(1) Restart the inverter and wait until it functions normally. (2) Contact customer service if error warning continues.
Grid Relay Fault	39		
EPS rly fault	40		
Gfci fault	41		
Selftest fail	44		
System fault	45		
Current DCover	46		
Voltage DCover	47		

Note: If an error occurs that is not listed in the table, Please Contact customer service.

NOTICE: