USER MANUAL

Three-phase Hybrid Inverter

HISTORY

VERSION	ISSUED	COMMENTS
1.0	11-Jan.-23	First release
1.1	27-Apr.-23	Revise M12 expansion screws to M10.
1.2	15-Jun.-23	Update the packing List, left side Appearance, LED description and the related details of the external button and the removal tool of Grid/BACKUP connector. Add PV connection warning.

Preface

About This Manual

This manual describes the installation, electrical connection, commissioning and maintenance, APP operation of the inverter. Please first read the manual and related documents carefully before using the product and store it in a place where installation, operation and maintenance personnel can access it at any time. The illustration in this user manual is for reference only. This user manual is subject to change without prior notice. (Specific please in kind prevail.)

Target Group

Three phase hybrid inverters must be installed by professional electrical engineers who have obtained relevant qualifications.

Scope

This manual is applicable to the following inverters:

- 5K
- 6K
- 8K
- 10K

Conventions

The following safety instructions and general information are used within this user manual.

⚠️ **DANGER**	Indicates an imminently hazardous situation which, if not correctly followed, will result in serious injury or death.
⚠️ **WARNING**	Indicates a potentially hazardous situation which, if not correctly followed, will result in serious injury or death.
⚠️ **CAUTION**	Indicates a potentially hazardous situation which, if not correctly followed, could result in moderate or minor injury.
⚠️ **NOTICE**	Indicates a potentially hazardous situation which, if not correctly followed, could result in equipment failure to run, or property damage.
📄 **NOTE**	Call attention to important information, best practices and tips: supplement additional safety instructions for your better use of the Three phase hybrid inverter to reduce the waste of you resource.

CONTENTS

Preface

1. Safety

Before using the inverter, please read all instructions and cautionary markings on the unit and manual. Put the instructions where you can take them easily.

The three phase hybrid inverter of ours strictly conforms to related safety rules in design and test. Local safety regulations shall be followed during installation, operation and maintenance. Incorrect operation work may cause injury or death to the operator or a third party and damage to the inverter and other properties belonging to the operator or a third party.

1.1 Symbols Used

Safety Symbol	Description
	Danger of high voltage! Only qualified personnel may perform work on the inverter.
5 mins	Residual voltage exists after the inverter is powered off. It takes 5 minutes for system to discharge to a safe voltage.
	Danger of hot surface
Do not disconnect under load!	Do not disconnect under load, otherwise there will be a danger of fire.
20	Environmental Protection Use Period
	Refer to the operating instructions
	Don't dispose of the inverter with the household waste.
	Grounding terminal

1.2 Safety Precaution

- Installation,maintenance and connection of inverters must be performed by qualified personnel, in compliance with local electrical standards, wiring rules and requirements of local power authorities and/or companies.

- After the inverter is powered off, the remaining electricity and heat may still cause electric shock and body burns. Do not touch parts of inverter for 10 minutes after disconnection from the power sources.

- The temperature of some parts of the inverter may exceed 60℃ during operation. Do not touch the inverter during operation to avoid being burnt.

- Ensure children are kept away from inverters.

- Don't open the front cover of the inverter. A part from performing work at the wiring terminal (as instructed in this manual), touching or changing components without authorization may cause injury to people, damage to inverters and annulment of the warranty.

- Static electricity may damage electronic components. Appropriate method must be adopted to prevent such damage to the inverter; otherwise the inverter may be damaged and the warranty annulled.

- Ensure the output voltage of the proposed PV array is lower than the maximum rated input voltage of the inverter; otherwise the inverter may be damaged and the warranty annulled.

- When exposed to sunlight, the PV array generates dangerous high DC voltage. Please operate according to our instructions, or it will result in danger to life.

- PV modules should have an IEC61730 class A rating.

- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

- Completely isolate the inverter before maintaining. Completely isolate the inverter should: turn off the PV switch and disconnect the PV terminal, battery terminal, and AC terminal

- Prohibit inserting or pulling the AC and DC terminals when the inverter is running.

- In Australia, the inverter internal switching does not maintain the neutral integrity, neutral integrity must be addressed by external connection arrangements.

- Don't connect Three phase hybrid inverter in the following ways:
  The BACKUP Port should not be connected to grid;
  The single PV panel string should not be connected to two or more inverters.

2. Product Introduction

2.1 Overview

Hybrid Inverter

The hybrid inverters are 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 into 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).

Sensor and Normal Load are optional.   **Hybrid Inverter Application System**

2.2 Product Appearance

213.3

530

619.6

550

Width(mm)	Height(mm)	Depth(mm)
530.0	550.0	213.3

PV

BAT

GRID

BACKUP

COM

ALARM

LED Details

LED Indicators	PV BAT GRID BACKUP COM ALARM

The External View of Hybrid Inverter

1. PV Switch
2. PV Input Terminals
3. Battery Connect Terminals
4. COM1 Ports
   (RS485, BMS, DRMs/RCR, CT,
   NTC/DI/DO, RSD/RMO, PARAL)
5. COM Port
   (WIFI/LAN)
6. BACKUP Output Terminal
7. Grounding Terminal
8. GRID Output Terminal

The bottom view of hybrid inverter

2.3 Model Definition

The letters in the product model have the specific informations.
(Take 5K as example.)

5K

Power(5000W)

3. Installation

3.1 Packing List

After unpacking, please check the following packing list carefully for any damage or missing parts. If any damage or missing parts occurs, contact the supplier for help.

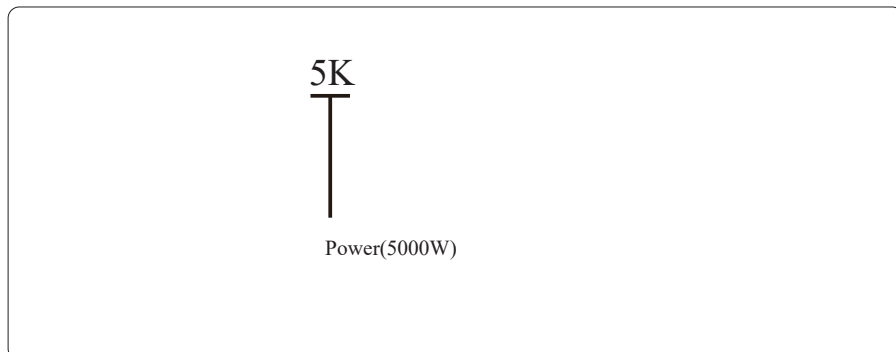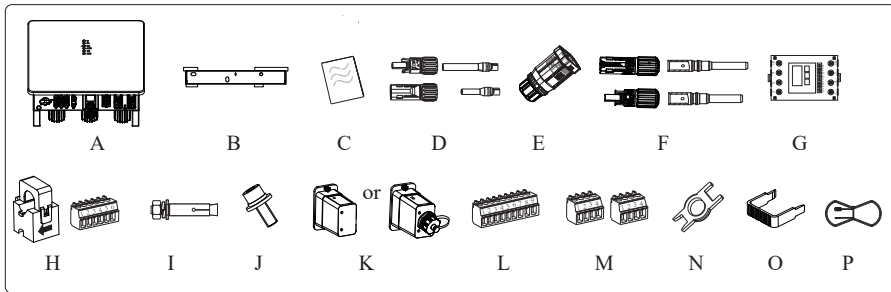| Number	Quantity	Description
A	1	Inverter
B	1	Mounting bracket
C	1	File package
D	2/2 for 5/6K; 3/3(for 8/10K)	PV terminal connector group (PV+/PV-) ;
E	2	Grid/BACKUP connector
F	1/1	Battery terminal connector group (BAT+/BAT-) ;
G	1	Meter (Optional)
H	1	CT pack (3pcs CT + 1pcs 6-Pin terminal)
I	3	M10 Expansion screws
J	1	M6 Security screw
K	1	WIFI/LAN module (Optional)
L	1	9-Pin terminal
M	2	4-Pin terminal
N	1	Removal tool for PV/BAT connector
O	1	Removal tool for Grid/BACKUP connector
P	1	Battery Temperature sensor (Optional)

3.2 Selecting the Mounting Location

3.2.1 Installation Environment Requirements

a. The storage inverter protection class is IP65 and can be mounted indoors or outdoors.

b. To ensure optimum operation and long service life, the ambient temperature must be below 50℃.

c. Do not install the inverter in a rest area since it will cause noise during operation.

d. The inverter carrier must be fire-proof. Do not mount the inverter on flammable building materials.

e. Ensure that the wall meets the requirements of the inverter installation.

f. Product label and warning symbols shall be clear to read after installation.

g. The installation height should be reasonable and make sure it is easy to operate and view the display.

h. Please avoid direct sunlight, rain exposure, snow cover.

| No direct sunlight ✓ | No rain exposure ✓ | No snow cover ✓ |
| Direct sunlight ✗ | Rain exposure ✗ | Snow cover ✗ |
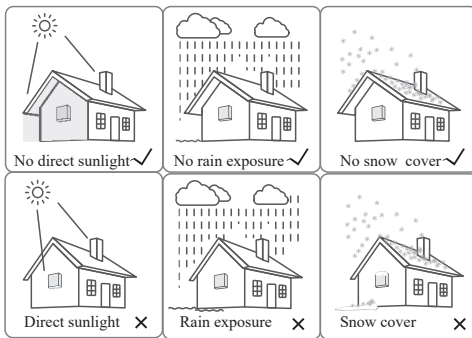
3.2.2 Mounting Requirements

Mount the inverter vertically or tilted backward by max 15°. The device can not be installed with a wrong mode and the connection area must point downward.
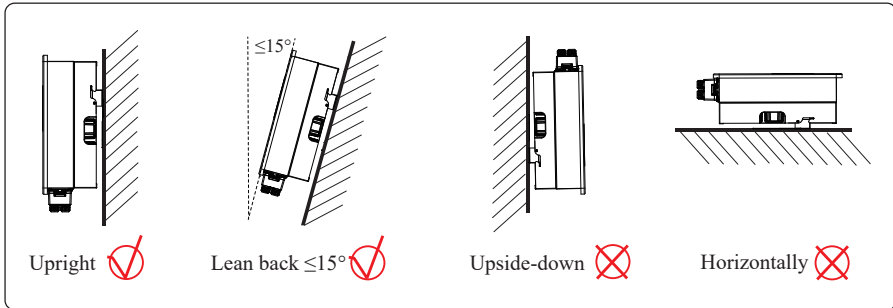
3.2.3 Installation Space Requirements

To ensure the inverter normally and easy to operate, there are requirements on available spaces of the inverter, e.g. to keep enough clearance. Refer to the following figures.

Above: 500mm

Below: 600mm

Front: 1000mm

Left side: 350mm

Right side: 350mm

Installation along the same line for multiple inverter
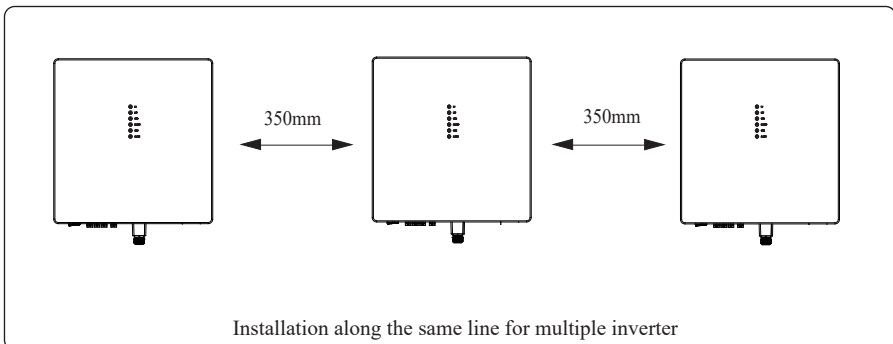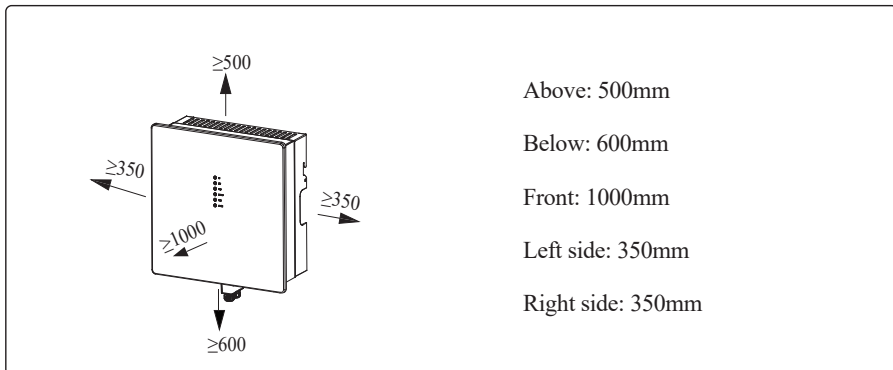
3.3 Mounting

Before mounting the inverter, you have to prepare expansion screws and security screw.

Step 1. Install the mounting bracket

1. Use a level ruler to mark the position of the 3 holes on the wall. Refer to Figure a. And drill 3 holes, 16mm in diameter and 55mm in deep. Refer to Figure b.

2. Knock the expansion screw kit into the hole together with a hammer. Refer to Figure c.
   Note: Do not remove the nut unit in this step.

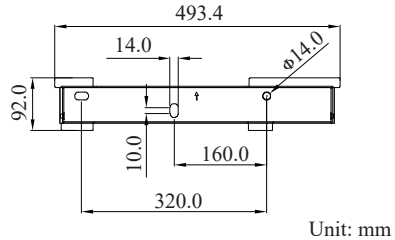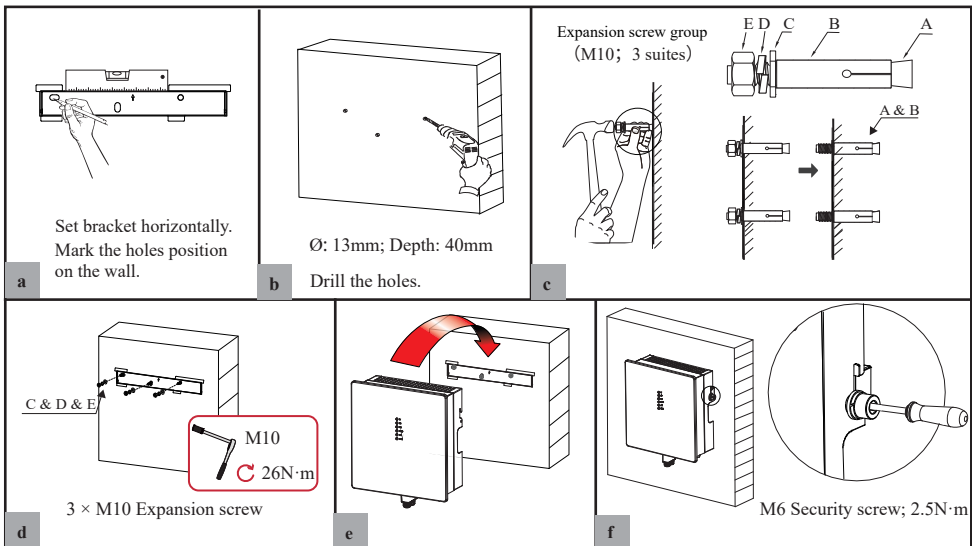3. After tightening 2-3 buckles, the expansion bolts are tight and not loose, and then unscrew the bolts, spring washer, gasket. Refer to Figure c.

4. Install and fix the mounting bracket on the wall. Refer to Figure d.

493.4
14.0
ø14.0
92.0
10.0
160.0
320.0

Unit: mm

Step 2. Install the inverter on the mounting bracket. Then lock the inverter using the security screw. Refer to Figure e, Figure f.

a Set bracket horizontally. Mark the holes position on the wall.	**b** Ø: 13mm; Depth: 40mm Drill the holes.	**c** Expansion screw group (M10; 3 suites) E D C B A / A & B
d C & D & E / M10 / 26N·m / 3 × M10 Expansion screw	**e**	**f** M6 Security screw; 2.5N·m

⚠ **DANGER**	Before frilling the hole on the wall, ensure no damage on the electric wire and/or water pipe inside the wall.

⚠ **CAUTION**	To prevent potential damages and injuries from inverter falling down, please hang the inverter on the bracket, do not loosen grip unless confirm the inverter is well mounted.

4. Electrical Connection

This chapter shows the details connection of Three phase hybrid inverter. The following illustration only uses the hybrid inverters as an example.

Three phase hybrid inverter system connection diagram:

Connection mode for whole-house load

Note:

       1. BMS communication connection is only for lithium battery.

       2. Meter is optional.

       3. About breakers:

       DC breaker on BATTERY side ≥80A

       AC breaker on load side ≥40A

       AC breaker on Grid side ≥40A

COM
L1
L2
L3
N
PE
Breaker

Non-parallel connection mode

COM
L1
L2
L3
N
PE
Breaker

Flow from grid to inverter

PV Array

Normal Load
PE

Inverter Breaker
PE
Critical Load

Lithium battery/
lead-acid battery

BMS Communication cable

CT/Meter Communication cable

CT
or
Meter

CT1
CT2
CT3

Main Breaker

Grid PE

DTSU666
(80A)

Main Breaker

Grid PE

(CT)
CT1+
GND
CT2+
GND
CT3+
GND

PARA
NTC
GND
DI
DO2
DO1
RMO
RSD

BMS
DRMS
RS485

Pin12 45
(BMS)

Pin 78
(Meter)

Note
1. BMS communication connection is only for lithium battery.
2. Meter is optional.
3. About breakers: DC breaker on BATTERY side ≥80A; AC breaker on critical load side ≥40A; AC breaker on Inverter side ≥40A

⚠ **DANGER**	Ensure that inverter and all cables to be installed are completely powered off during whole installation and connection. Otherwise, fatal injury can occur due to the high voltage.

Three phase parallel connection mode-Scheme A (N=2)

Turn this switch to "ON".

PARA

No.2 Inverter

CT1+
GND
CT2+
GND
CT3+
GND

NTC
GND
DI
DO2
DO1
RMO
RSD

BMS

PV Array

DRMS

RS485

PE

① Parallel communication connection

PV Array

No.1 Inverter

Lithium battery/
lead-acid battery

Turn this switch to "ON".

CT

PARA

CT1+
GND
CT2+
GND
CT3+
GND

NTC
GND
DI
DO2
DO1
RMO
RSD

BMS
Pin **12** **45**

DRMS

RS485

Critical Load

Normal Load

Or

Meter

PARA

CT1+
GND
CT2+
GND
CT3+
GND

NTC
GND
DI
DO2
DO1
RMO
RSD

BMS
Pin **12** **45**

DRMS

RS485
Pin **78**

CT3

CT2

CT1

**CT
or
Meter**

DTSU666
(80A)

① Parallel communication connection
② CT/Meter communication connection
③ BMS communication connection
∗ These communication cables can be connected to
  any inverter, but they must be inserted into the same
  inverter and we call this inverter No. 1 inverter.

COM
L1
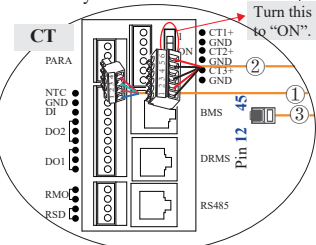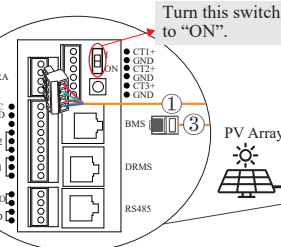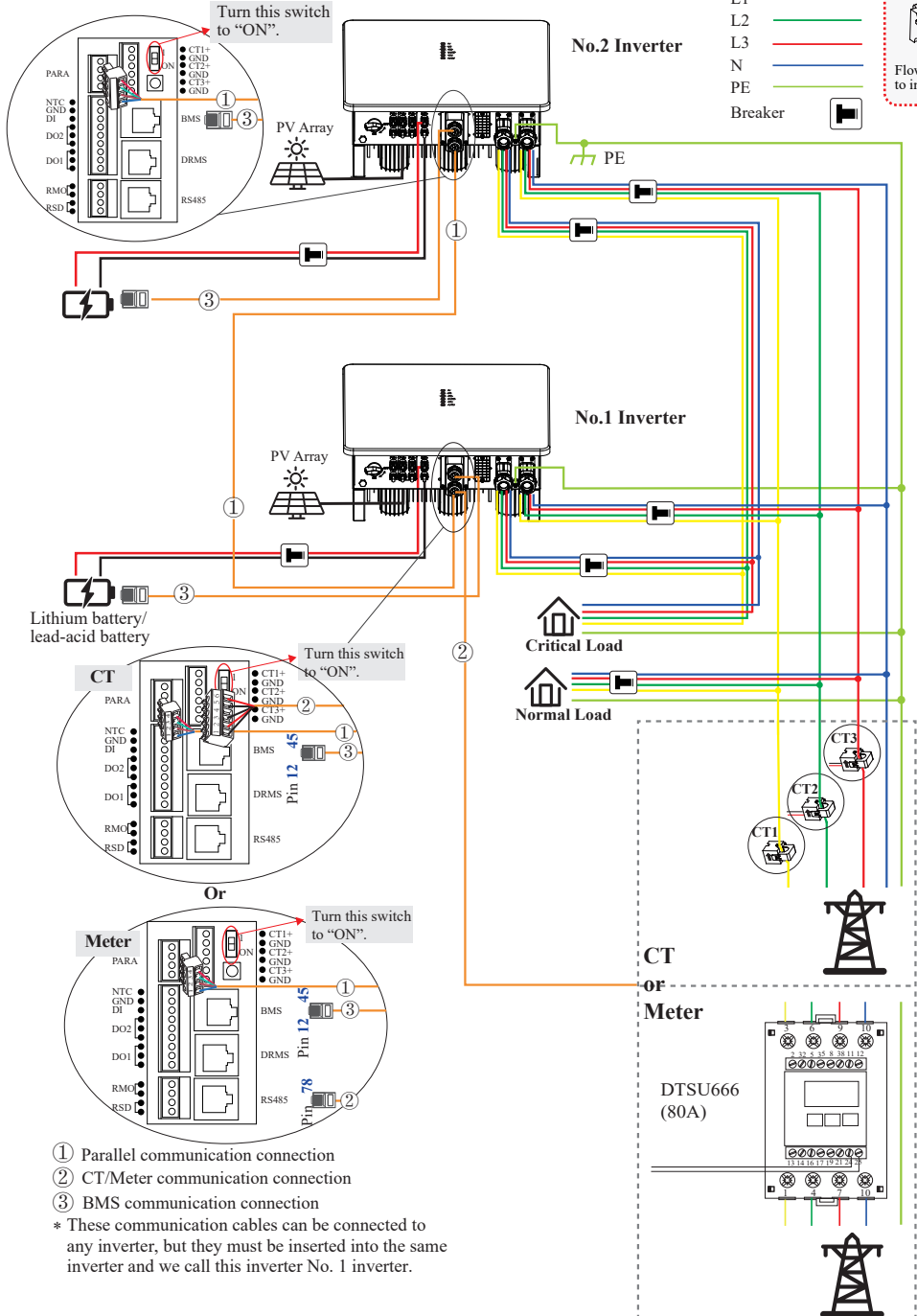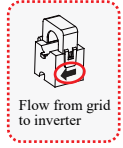L2
L3
N
PE
Breaker

Flow from grid
to inverter

Note for Scheme A:

1. BMS communication connection is only for lithium battery.

2. With parallel connection mode, it is necessary to connect APP to one of inverters and then go to Console > Other Setting page to enable Parallel mode on APP. Please refer to section 7.2.3.

3. About breakers:

DC breaker on BATTERY side ≥80A

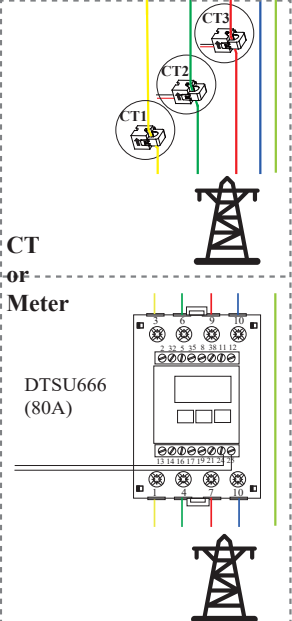AC breaker on critical load side ≥40A

AC breaker on Inverter side ≥40A

⚠ **DANGER**	Ensure that inverter and all cables to be installed are completely powered off during whole installation and connection. Otherwise, fatal injury can occur due to the high voltage.

Three phase parallel connection mode-Scheme B (N>2)

COM	
L1	
L2	
L3	
N	
PE	
	Flow from grid to inverter
Breaker	

Turn this switch to "ON".

PARA

NTC
GND
DI
DO2
DO1
RMO
RSD

CT1+
GND
CT2+
GND
CT3+
GND

BMS
DRMS
RS485

Pin 12 45

No.N Inverter

PV Array

PE

Turn this switch to "1".

PARA
NTC

CT1+
GND
CT2+
GND
CT3+
GND

No.2 Inverter

PVArray

No.1 Inverter

PV Array

Lithium battery/
lead-acid battery

Turn this switch to "ON".

PARA

NTC
GND
DI
DO2
DO1
RMO
RSD

CT1+
GND
CT2+
GND
CT3+
GND

BMS
DRMS
RS485

Pin 12 45
Pin 78

Critical Load

Normal Load

DTSU666

CT3
CT2
CT1

① Parallel communication connection

② Meter communication connection

③ BMS communication connection

* These communication cables can be connected to
any inverter, but they must be inserted into the same
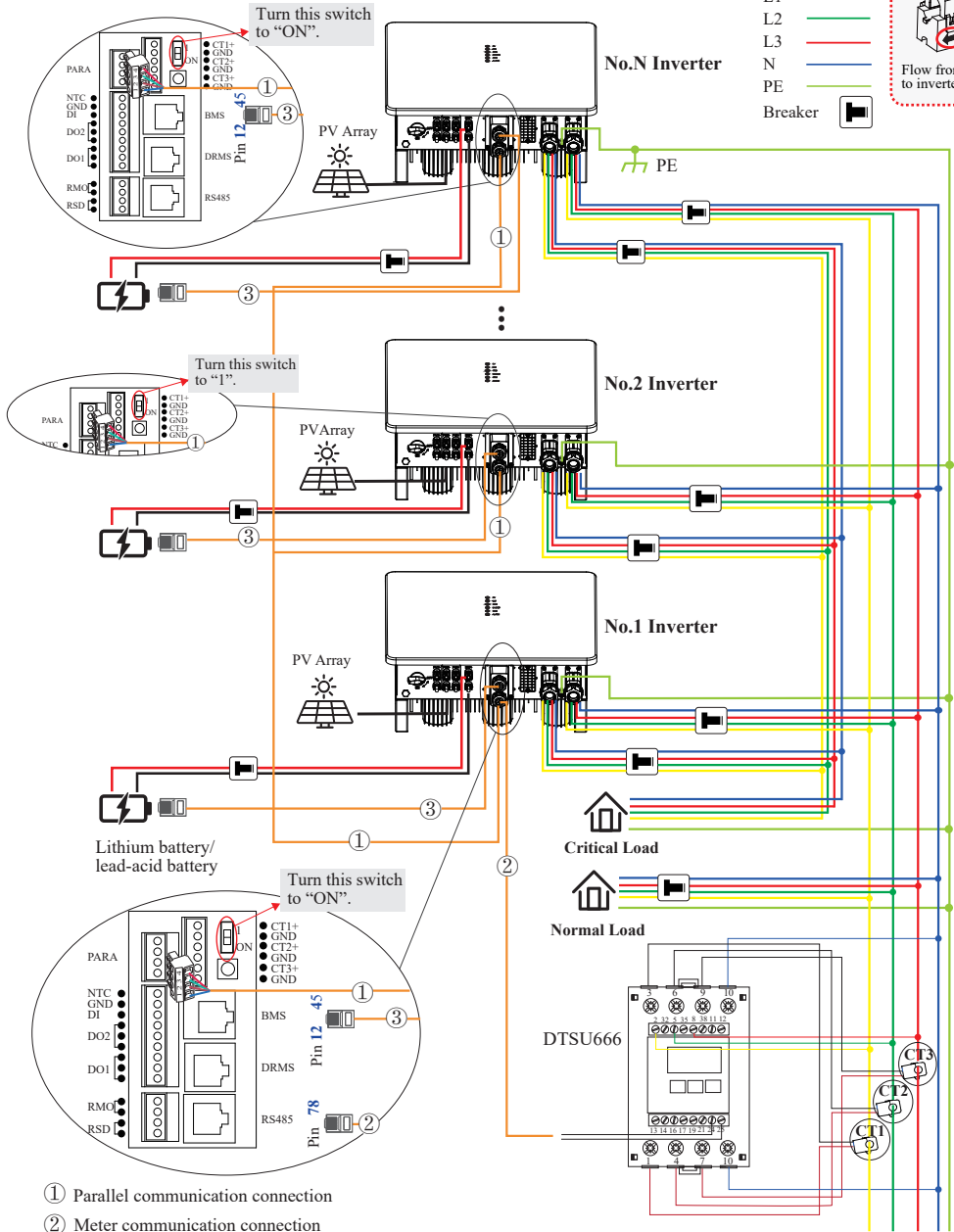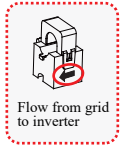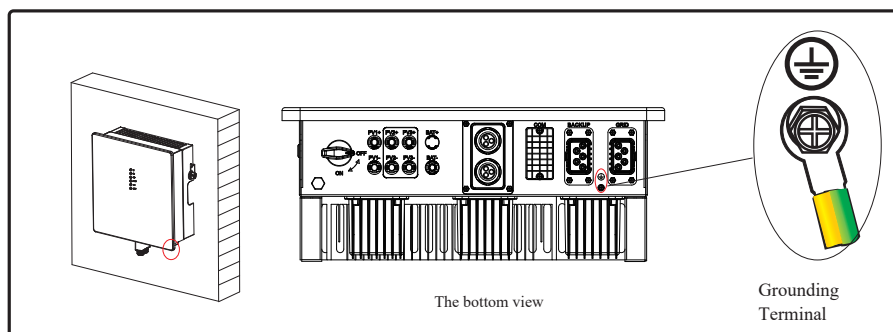inverter and we call this inverter No. 1 inverter.

Grid

Note for Scheme B:

1. BMS communication connection is only for lithium battery.

2. It is necessary to turn the matched resistance switch of No. 1 inverter and No. N inverter to "ON" in parallel connection mode.

3. With parallel connection mode, it is necessary to connect APP to one of inverters and then go to Console > Other Setting page to enable Parallel mode on APP. Please refer to section 7.2.3.

4. About breakers:

DC breaker on BATTERY side ≥80A

AC breaker on critical load side ≥40A

AC breaker on Inverter side ≥40A

⚠ **DANGER**	Ensure that the inverter and all cables to be installed have been completely powered off during the whole process of installation and connection. Otherwise, fatal injury could be caused by the high voltage.

4.1 Grounding

A protective earth (PE) terminal is equipped at the side of the inverter. Please be sure to connect this PE terminal to the PE bar for reliable grounding. AWG 10 yellow green lines are recommended.

The bottom view

Grounding Terminal

⚠ **WARNING**	The inverter must be grounded; otherwise, there may be electric shock risk.

⚠ **CAUTION**	If the positive pole or negative pole of the PV array is required to be grounded, then the inverter output (to AC grid) must be isolated by transformer in accordance with IEC62109-1, -2 standards.

4.2 GRID/BACKUP Connection

If necessary, please refer to below to disassemble the GRID/BACKUP terminal.

| Cable Gland | Threaded Sleeve | Connection Terminal |

GRID/BACKUP Connector Structure
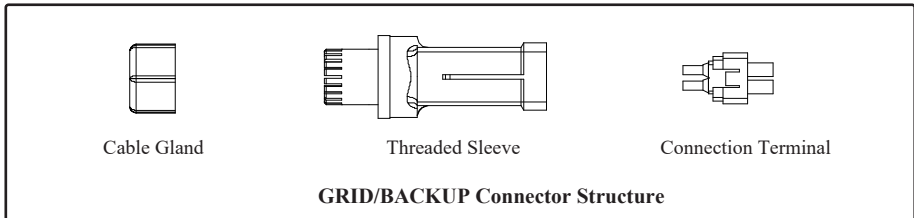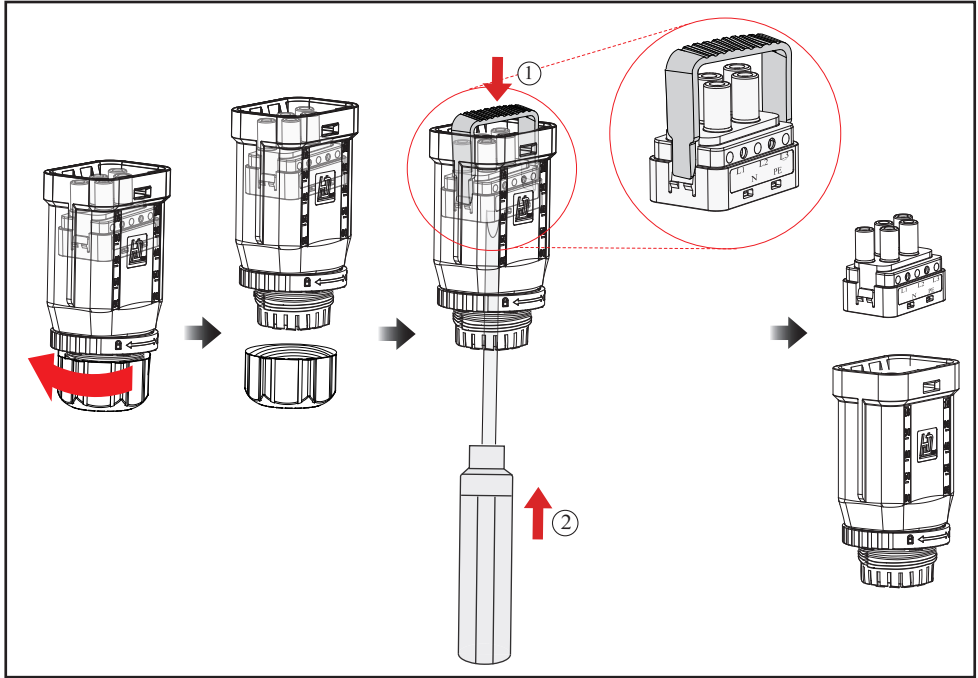
Before connecting the GRID/BACKUP terminal, ensure that both the AC terminal and the DC terminal are powered OFF and the PV switch is OFF. Otherwise there is a risk of high voltage shock.
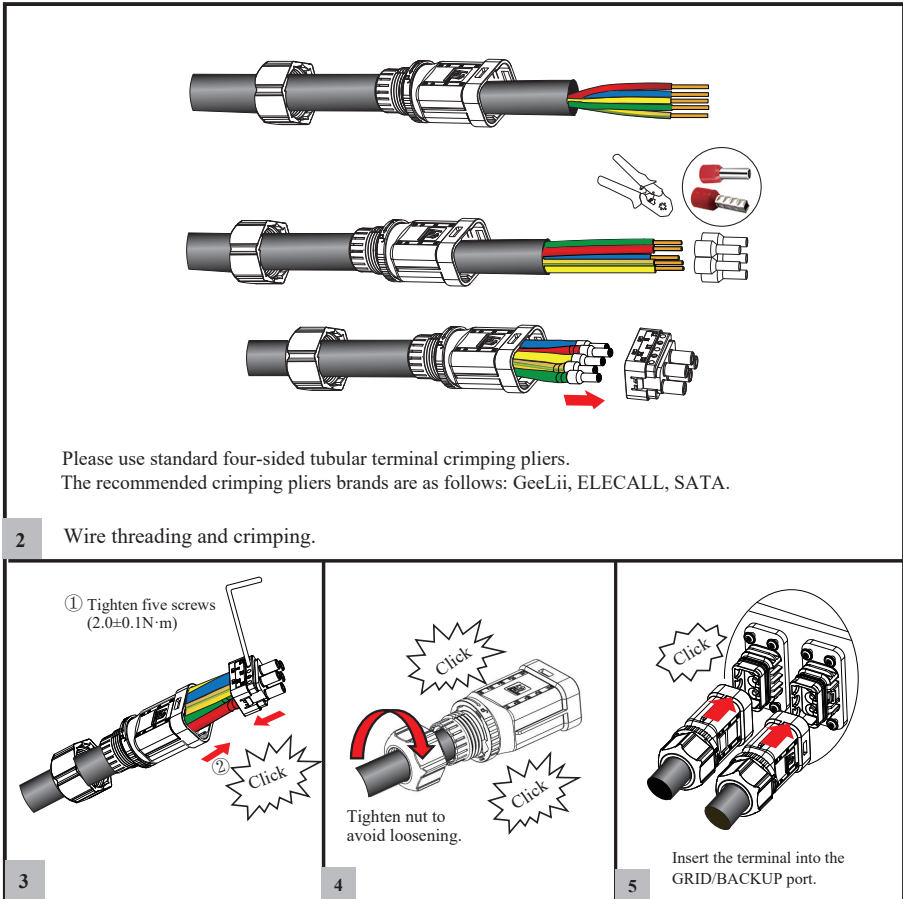
GRID/BACKUP connection please refer to below.
Step 1: Assemble the AC connector.

It is recommended to use outdoor dedicated cables with multiple copper cores.

D (Diameter): 18 ~ 24mm

S (Cross sectional area): ≥5mm²

L (Length): 16±1mm

L1: 60±2mm

1 Wire stripping.

Please use standard four-sided tubular terminal crimping pliers.
The recommended crimping pliers brands are as follows: GeeLii, ELECALL, SATA.

| 2 | Wire threading and crimping. |

① Tighten five screws (2.0±0.1N·m)

② Click

Click

Tighten nut to avoid loosening.

Click

Click

Insert the terminal into the GRID/BACKUP port.

| 3 | | 4 | | 5 | |

Step 2: Connect the AC connector.

An AC breaker should be installed between inverter and the GRID/BACKUP.

a. Before connecting the AC cable from inverter to AC breaker, you should confirm the AC breaker is working normally. Turn off the AC breaker and keep the status.

b. Connect the PE conductor to grounding electrode, and connect the N and L conductors to AC breaker.

c. Connect the AC breakers to the GRID/BACKUP.

| ⚠ **NOTICE** | • Multiple inverters are not allowed to share a circuit breaker. |
| | • Load is not allowed to connect between the grid and the AC breaker. |

To ensure that the inverter can be safely and reliably disconnected from the grid, an AC breaker（≥40A）should be installed only for inverter GRID/BACKUP port.
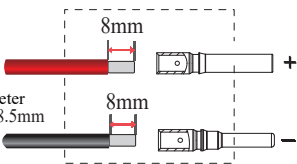
4.3 Battery Connection

Three phase hybrid inverter now only supports the lithium / lead-acid battery. The recommended lithium battery brands are as follows: PYLON LPF, Aoboet LPF, Dyness LPF, UZENERGY L051100-A.

This part in this manual only describe the battery connection on inverter side. If you need more detailed connection information about the battery side, please refer to the manual of the battery you using.

Before connecting to battery, please install a separate DC breaker between inverter and battery. This ensure the inverter can be security disconnected during maintenance.
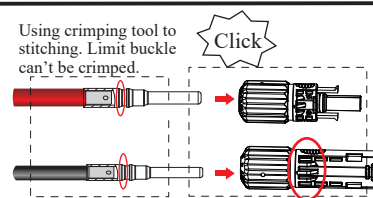
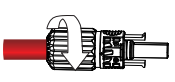**a** Cross sectional area of the battery cable: 10mm² (recommended)
Length of the battery cable should be less than or equal to 3m.

Pay attention to the difference between the battery terminal and the PV terminal to avoid confusion.

b DC Breaker 80A
It is recommended that the battery cable be less than or equal to 3 m.
This product is not equipped with DC breakers.
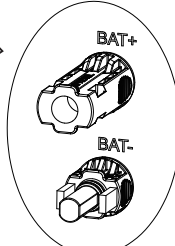
c Positive Connector
Negative Connector
Warning!
Polarity reverse will damage the inverter!

⚠ WARNING	• Polarity reverse will damage the inverter! • Be careful of electric shock and chemical hazards! • To reduce risk of injury, please use the suitable recommended cable size.

Battery Communication Connection

If the battery type is lithium battery which need communication between the inverter and battery management system (BMS), the connection must be installed. Please refer to section 4.6.1 for details.

NTC connection for lead-acid battery

Pin8 9

Pin	Function
Pin8	GND S
Pin9	NTC BAT+

Temperature sensor
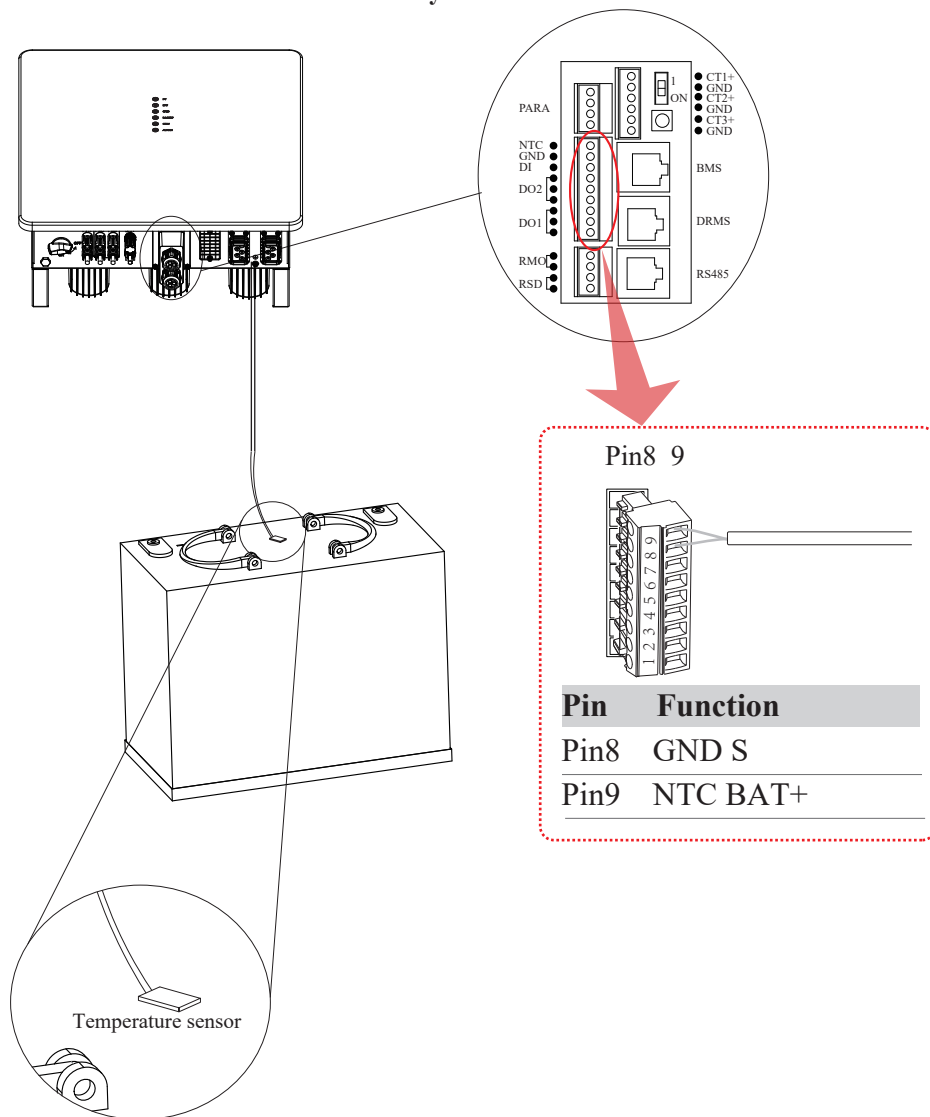
4.4 PV Connection

PV connection please refer to below.

Note: DC cable should be dedicated PV cable (suggest using 4~6mm² PV1-F cable).

⚠️ **NOTICE**	• Before connection the PV panels, make sure the plug connector have the correct polarity. Incorrect polarity could permanently damage the inverter. • PV array shouldn't be connected to the grounding conductor. • The minimum insulation resistance to ground of the PV panels must exceed 33.3kΩ, there is a risk of shock hazard if the requirement of minimum resistance is not met.

⚠️ **WARNING**	Please check polarity of PV connectors! If polarity reversed, do not try to disconnect any PV connector until the irradiance declines and the DC currents fall below 0.5 A! Only then disconnect the PV plugs and correct the polarity before reconnecting.

4.5 Meter/CT Connection (Direct connect)

You can monitor usage with a meter or a CT.

4.5.1 Meter Connection

This section is applicable to non-parallel connection mode only.
Three phase hybrid inverter supports the meter CHINT-DTSU666 meter by default.
The meter is optional.

DTSU666
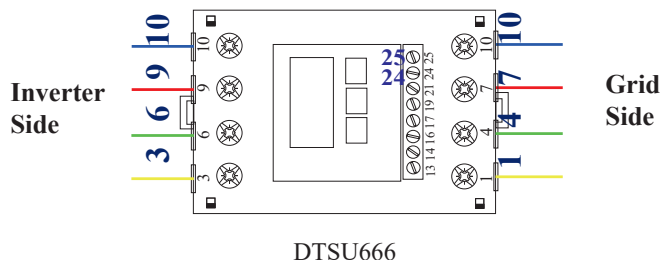
Before connecting to Grid, please install a separate AC breaker (≥40A; not equipped) between meter and Grid. This ensure the inverter can be security disconnected during maintenance.

The connection diagram of power cable of meter is as shown in the figure below:
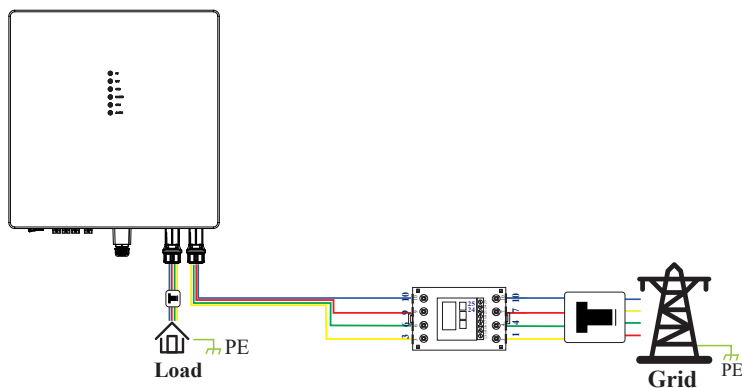
Please refer to the meter instruction manual for details.

4.5.2 CT Connection

Before connecting to Grid, please install a separate AC breaker (≥40A; not equipped) between CT and Grid. This ensure the inverter can be security disconnected during maintenance.

The connection diagram of power cable of CT is as shown in the figure below:
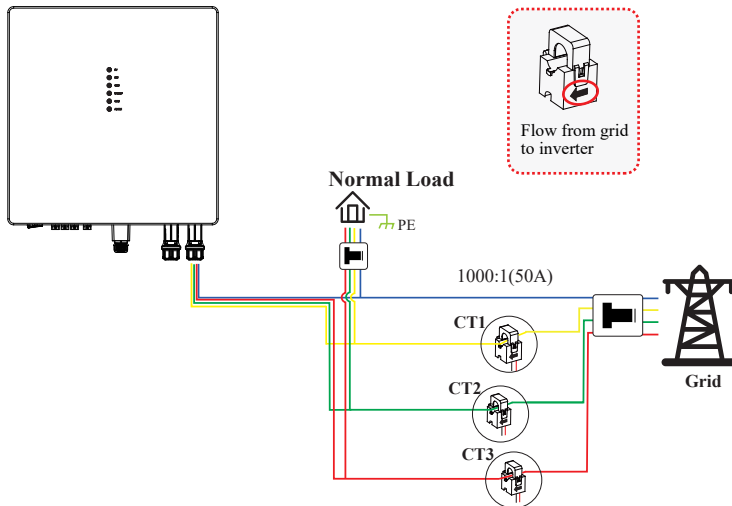
Please attention to the Current interchanger (CT) connection. The arrow on the CT indicates the current flow from grid to inverter. And lead the live line through the detection hole of CT.

NOTE	The current direction from grid to inverter is defined as positive and current direction from inverter to grid is defined as negative.

4.6 Communication Connection

There are communication interfaces in the communication port on the bottom of the inverter as show below：
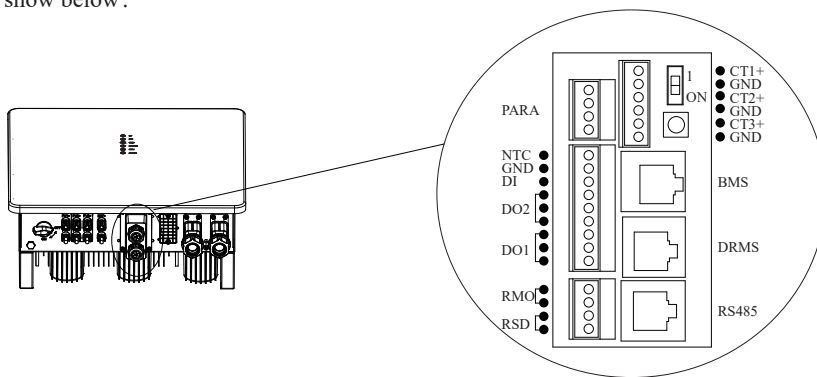
Interface		Descriptions
PARA		4-Pin interface for parallel communication
		A matched resistance switch for parallel communication
RS485		RS485 communication
DRMs		Demand response mode for Australia application
CT		6-Pin interface for grid/load current sensor.
BMS		Lithium battery communication interface
9-Pin	NTC	Temperature sensor terminal of lead-acid battery
	DRY	DI/DO control
RSD/RMO		RSD control power and remote off
COM		For WIFI/LAN communication.

4.6.1 BMS Connection (Only for Lithium Battery)

RJ45 Terminal Configuration of Battery Communication (BMS)
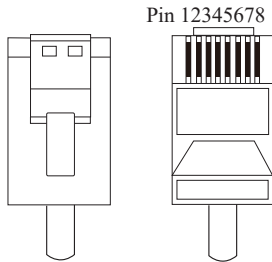
Pin 12345678

PIN	1	2	3	4
Function Description	RS485_ A	RS485_B	GND	CAN_H

PIN	5	6	7	8
Function Description	CAN_L	/	/	/

This manual describes the cable sequence of the inverter. For details about the cable sequence of the battery, see the manual of the battery you used.

Refer to the following steps:

a Unscrew the waterproof cover and loosen the rubber nut on waterproof cover.	**c** ① Insert RJ45 terminals into corresponding ports. ② Screw the waterproof cover back to inverter firmly with 4 x M4 screws(1.2N·m). ③ Install the seal into the threaded sleeve, fasten the rubber nut.

b Make the RJ45 terminal according to above function description of each Pin definition.
Lead the BMS cable through the rubber nut, seal and waterproof cover in turn.

Threaded sleeve

RJ45 terminals

BMS cable

Lithium Battery

Rubber nut

Inverter side

Seal   Waterproof cover

⚠ Don't cut off any communication cables.

Press the BMS cable in the seal via the side incisions.

4.6.2 DRMs Connection

DRMs is a shortened form for "inverter demand response modes". It is a compulsory requirements for inverters in Australia.

Note: With DRMs connection, it is necessary to connect APP to inverter and then go to Console > Other Setting page to enable DRM function on APP. Please refer to section 7.2.3.

RJ45 Terminal Configuration of DRMs
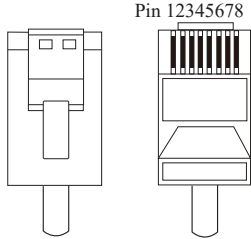
Pin 12345678

DRMs

PIN	1	2	3	4	5	6	7	8
Function Description	DRMs1/5	DRMs2/6	DRMs3/7	DRMs4/8	REF	GND	/	/

Refer to the following steps:

a Unscrew the waterproof cover and loosen the rubber nut on waterproof cover.	**c** ① Insert RJ45 terminals into corresponding ports. ② Screw the waterproof cover back to inverter firmly with 4 x M4 screws(1.2N·m). ③ Install the seal into the threaded sleeve, fasten the rubber nut.

b Make the RJ45 terminal according to above function description of each Pin definition.
Lead the DRMs/RCR cable through the rubber nut, seal and waterproof cover in turn.

DRMs Control Module

DRMs/RCR cable

Threaded sleeve

RJ45 terminals

Rubber nut

Inverter side

Seal   Waterproof cover

⚠ Don't cut off any communication cables.

Press the DRMs cable in the seal via the side incisions.

4.6.3 Monitoring/Meter Connection

RJ45 Terminal Configuration of Monitoring/Meter Communication
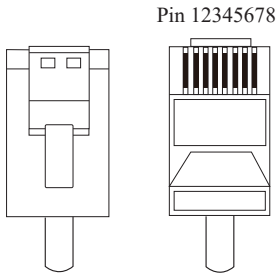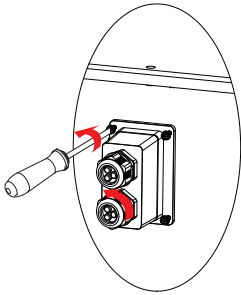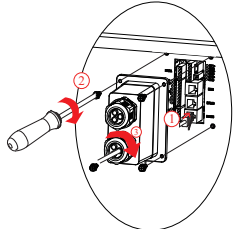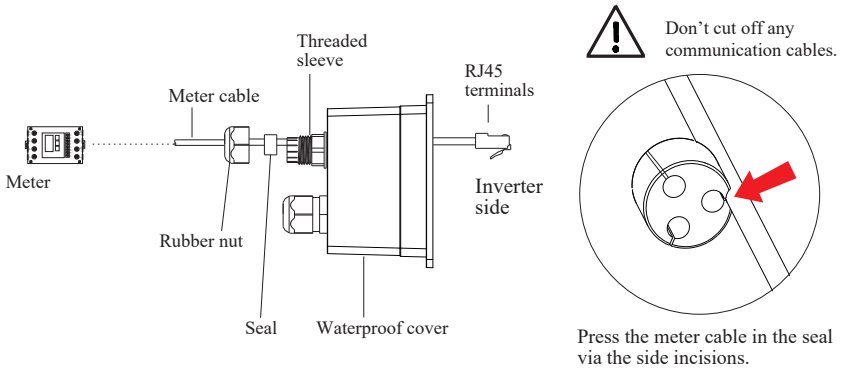
Pin 12345678

PIN	1	2	3	4	5	6	7	8
Function Description	RS485_A	RS485_B	/	/	/	/	RS485_A	RS485_B

Meter cable connection overview

Inverter	Meter
Pin7(RS485_A)	Pin24
Pin8(RS485_B)	Pin25

Pin7
Pin8

DTSU666
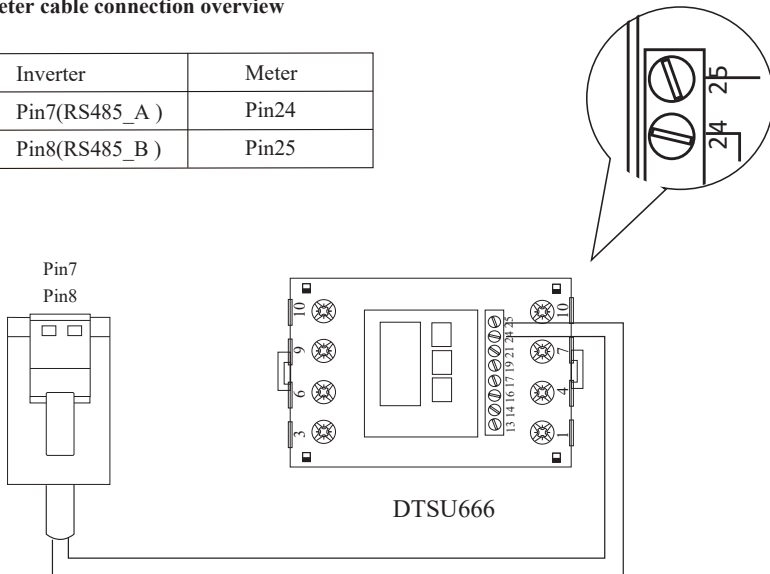
Connect meter. Refer to the following steps:

a Unscrew the waterproof cover and loosen the rubber nut on waterproof cover.	**c** ① Insert RJ45 terminals into corresponding ports. ② Screw the waterproof cover back to inverter firmly with 4 x M4 screws(1.2N·m). ③ Install the seal into the threaded sleeve, fasten the rubber nut.

b Make the RJ45 terminal according to above function description of each Pin definition.
Lead the meter communication cable through the rubber nut, seal and waterproof cover in turn.

Threaded sleeve

RJ45 terminals

Meter cable

Meter

Inverter side

Rubber nut

Seal   Waterproof cover

Don't cut off any communication cables.

Press the meter cable in the seal via the side incisions.

4.6.4 CT Connection

CT cable connection overview

Inverter	CT
Pin1(GND)	Black
Pin2(CT3+)	White
Pin3(GND)	Black
Pin4(CT2+)	White
Pin5(GND)	Black
Pin6(CT1+)	White
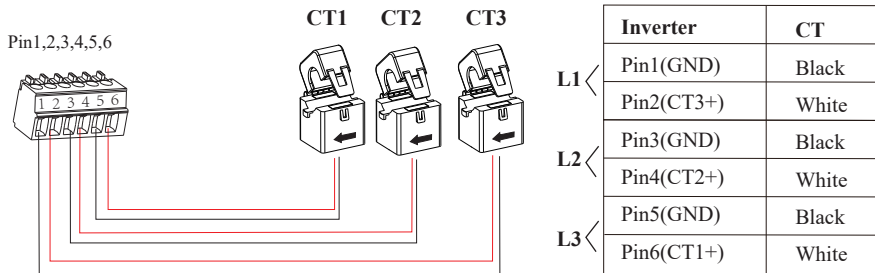
Connect CT. Refer to the following steps:

a Unscrew the waterproof cover and loosen the rubber nut on waterproof cover.

c
① Insert RJ45 terminals into corresponding ports.
② Screw the waterproof cover back to inverter firmly with 4 x M4 screws(1.2N·m).
③ Install the seal into the threaded sleeve, fasten the rubber nut.

b Make the 6-pin terminal according to above function descripti on of each Pin definition.
Lead the CT cable through the rubber nut, seal and waterproof cover in turn.

Don't cut off any communication cables.

Press the CT cable in the seal via the side incisions.

4.6.5 Parallel Communication Connection

4-Pins Terminal Configuration of parallel Communication

PIN	1	2	3	4
Function Description	GND_S	PARA_SYNC	CAN_L	CAN_H
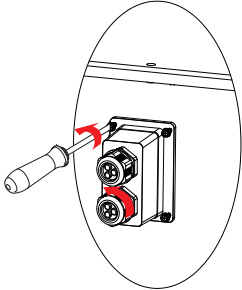
Parallel communication cable connection overview
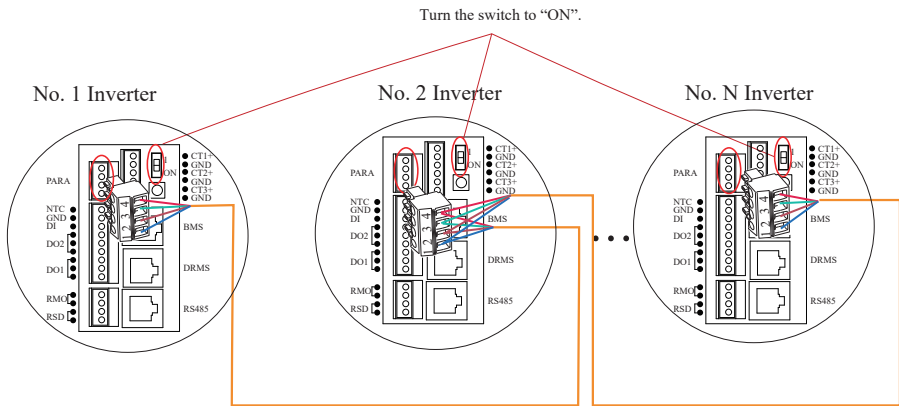
It is necessary to turn the matched resistance switch of No. 1 inverter and No. N inverter to "ON" in parallel connection mode.
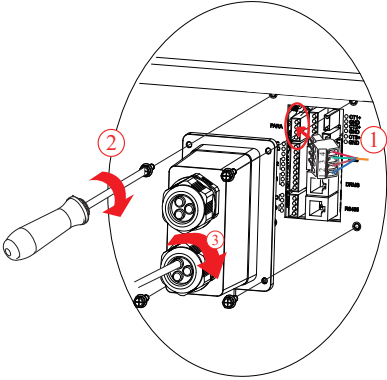
No. 1 Inverter	No. 2 Inverter	No. N Inverter
Pin4(CAN_H)	Pin4(CAN_H)	Pin4(CAN_H)
Pin3(CAN_L)	Pin3(CAN_L)	Pin3(CAN_L)
Pin2(PARA_SYNC)	Pin2(PARA_SYNC)	Pin2(PARA_SYNC)
Pin1(GND_S)	Pin1(GND_S)	Pin1(GND_S)

Refer to the following steps:

a Unscrew the waterproof cover and loosen the rubber nut on waterproof cover.
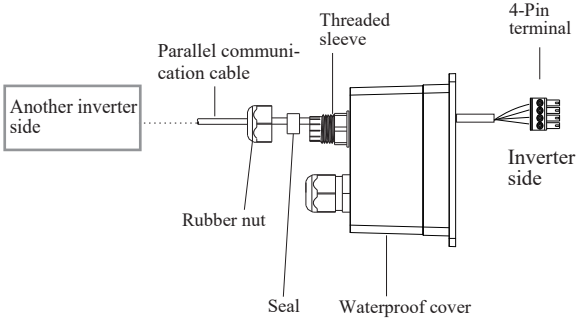
c
① Insert 4-Pin terminal into corresponding ports.
② Screw the waterproof cover back to inverter firmly with 4 x M4 screws(1.2N·m).
③ Install the seal into the threaded sleeve, fasten the rubber nut.
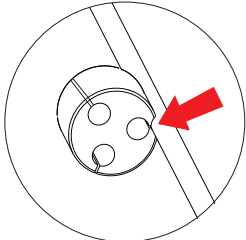
b Make the 4-Pin terminal according to above function description of each Pin definition.

Lead the Parallel cable through the rubber nut, seal and waterproof cover in turn.

Don't cut off any communication cables.

Press the Parallel communication cable in the seal via the side incisions.

4.6.6 NTC/DI/DO Connection(s)

9-Pins Terminal Configuration of Auxiliary Communication

Pin 123456789
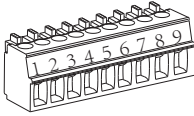
PIN	Function Description
1	NO (Normal Open)
2	COM
3	NC (Normal Close)
4	NO (Normal Open)
5	COM
6	NC (Normal Close)
7	DI
8	GND S
9	NTC BAT+

Refer to the following steps:

a   Unscrew the waterproof cover and loosen the rubber nut on waterproof cover.

b   Make the 9-Pin terminal according to above function description of each Pin definition for the auxiliary port you want to use.

Lead the NTC/DI/DO cable(s) through the rubber nut, seal and waterproof cover in turn.

Don't cut off any communication cables.

Threaded sleeve

9-Pin terminal

NTC/DI/DO cable(s)

NTC/DI/DO Control Module(s)

Rubber nut

Inverter side

Seal   Waterproof cover

Press the NTC/DI/DO cable(s) in the seal via the side incisions.

Pin	Function
9	NTC
8	
7	DI
6	
5	
4	DO
3	
2	
1	

c Insert its 9-Pin terminal into the corresponding NTC/DI/DO port on the Three phase hybrid inverter.Install the seal into the threaded sleeve, fasten the rubber nut and screw the waterproof cover back to inverter firmly with 4 x M4 screws; 1.2N·m.
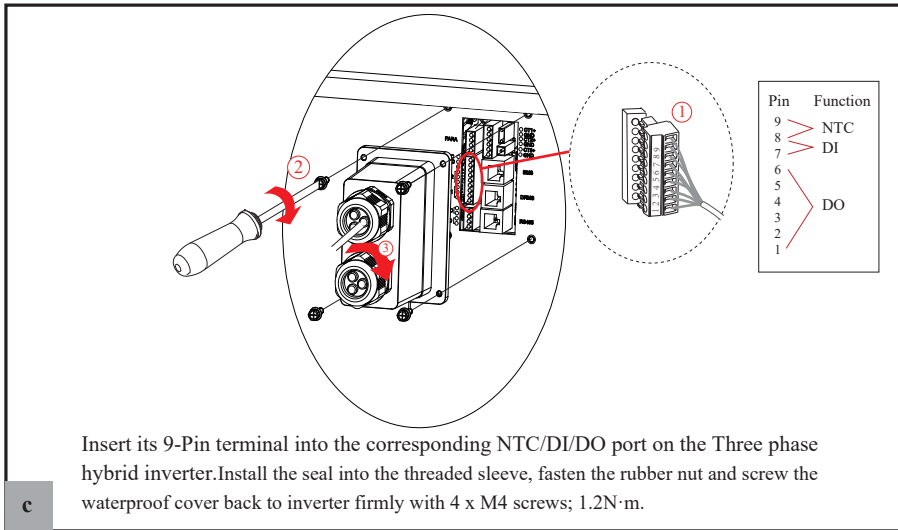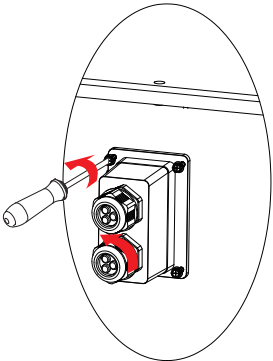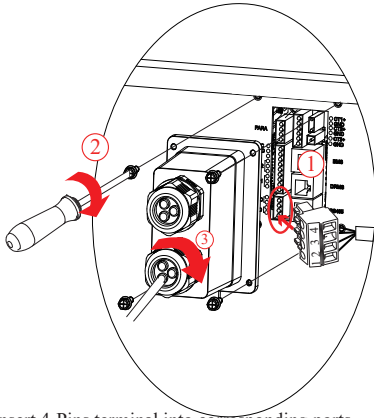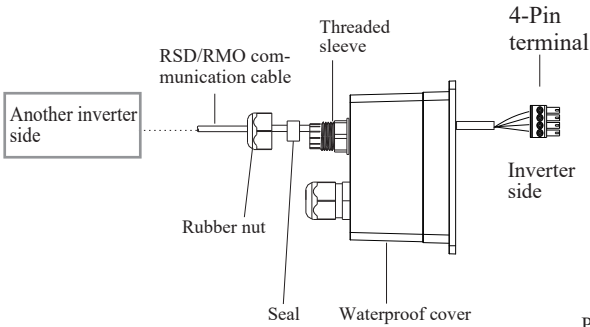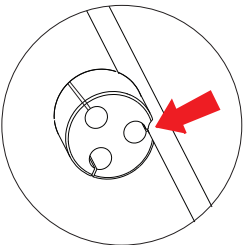
4.6.7 RSD/RMO Connection(s)

4-Pins Terminal Configuration of RSD/RMO Communication
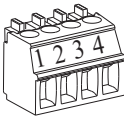
PIN	1	2	3	4
Function Description	+12V	GND	GND	REMOTE OFF

Refer to the following steps:

Unscrew the waterproof cover and loosen the rubber nut on waterproof cover.

a

① Insert 4-Pins terminal into corresponding ports.
② Screw the waterproof cover back to inverter firmly with 4 x M4 screws(1.2N·m).
③ Install the seal into the threaded sleeve, fasten the rubber nut.

c

b

Make the 4-Pin terminal according to above function description of each Pin definition.

Lead the RSD/RMO cable through the rubber nut, seal and waterproof cover in turn.

RSD/RMO communication cable

Threaded sleeve

4-Pin terminal

Another inverter side

Inverter side

Rubber nut

Seal   Waterproof cover

Don't cut off any communication cables.

Press the RSD/RMO communication cable in the seal via the side incisions.

4.6.8 WiFi/LAN Module Connection (Optional)

For details, please refer to the corresponding Module Installation Guide in the packing.

The appearance of modules may be slightly different. The figure shown here is only for illustration.

Loosen two screws and remove the cover. **a**	Insert WIFI/LAN module into WIFI/LAN port, and ensure that it does not fall off. **b**

2 × M4 screws; 0.8N·m

Or

c Install the module.
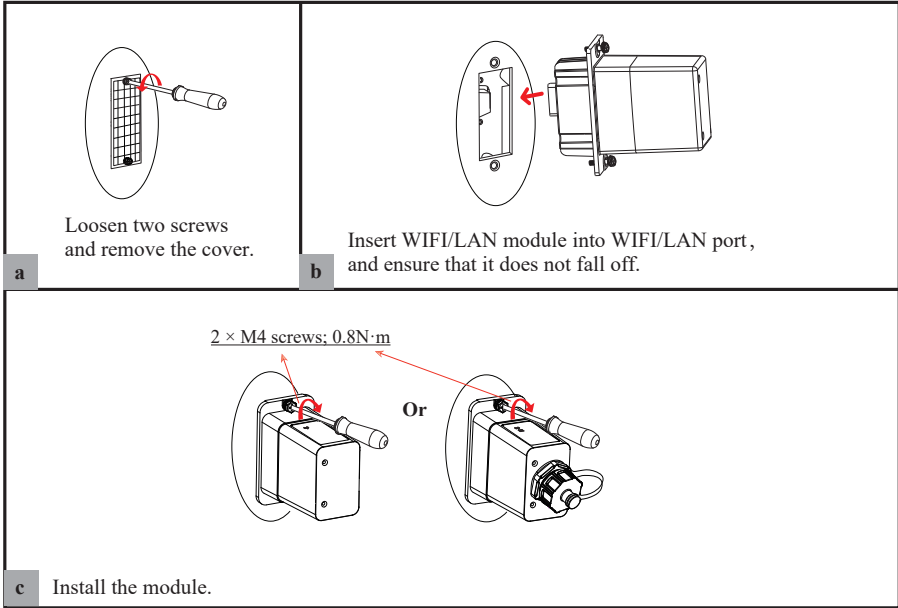
5. System Operation

5.1 Inverter Working Mode

The inverter supports several different working modes.

5.1.1 Self Used Mode

Go to the "Hybrid work mode" menu, and select the "Self used mode".

Under Self Used mode, the priority of PV energy consumption will be Load > Battery > Grid, that means the energy produced by PV gives priority to powering local loads, the excess energy is used to charge the battery and the remaining energy is fed into the grid.

This is the default mode to increase self-consumption rate. There are several situations of self-used working mode based on PV energy.

a) Wealthy PV Energy

When PV energy is wealthy, the PV energy will be first consumed by loads, the excess energy will be used to charge the battery and then the remaining energy will be fed into the grid.

① ② ③ is the sequence of PV energy transmission.

b) Limited PV power

When the PV energy is not enough to cover all consumption, the PV energy will be entirely used by loads, and the insufficient part will be supplied by battery. Then still insufficient parts will be supplied by grid.
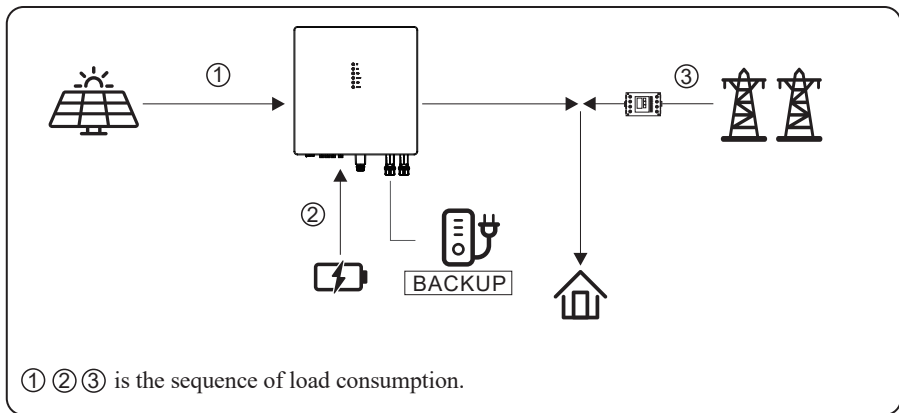
① ② ③ is the sequence of load consumption.

c) No PV Input

The inverter will first discharge the battery energy for home load consuming when no PV input (such as in the evening or some cloudy or rainy days). If the demand is not met, the loads will consume grid energy.

① ② is the sequence of load consumption.
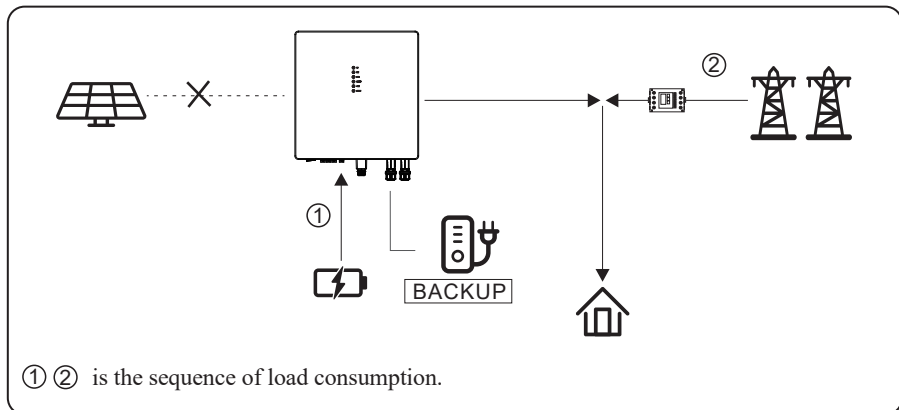
5.1.2 Feed-in Priority Mode

Go to the "Hybrid work mode" menu, and select the "Feed-in priority mode".

Under this mode, the priority of PV energy consumption will be Load > Grid > Battery, that means the energy produced by PV gives priority to powering local loads, the excess energy is fed into the grid, and the remaining energy is used to charge the battery.

a) Wealthy PV Energy

When PV energy is wealthy, the PV energy will be first consumed by loads. If there is excess PV power, the power will be fed into grid. If there is still PV energy left after load consuming and grid feeding, then the remaining PV power will be used to charge the battery.

① ② ③ is the sequence of PV energy transmission.
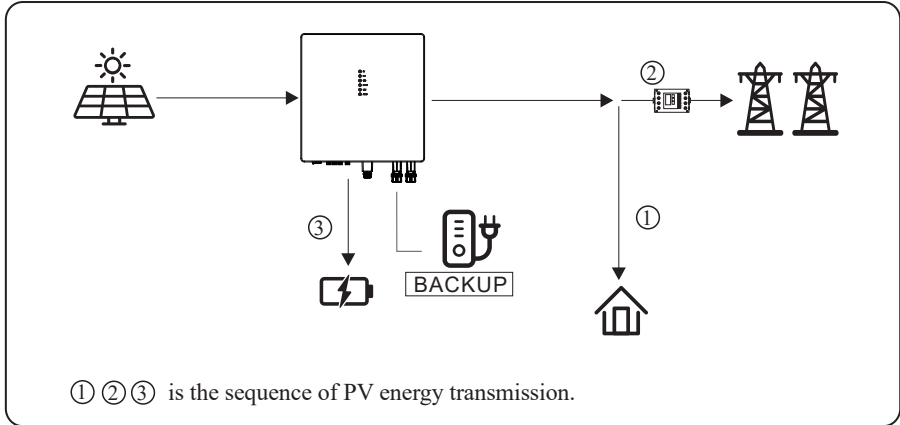
b) Limited PV Energy

When PV energy is limited and can not meet the feed-in grid power, the battery will discharge to meet it.
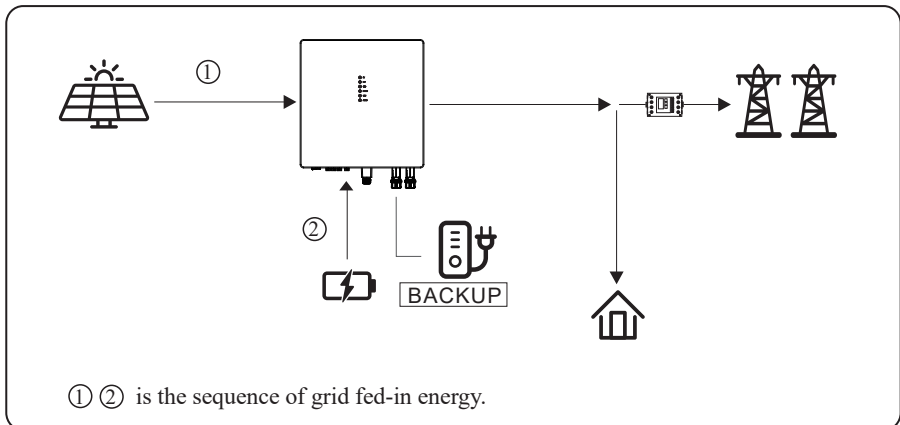
① ② is the sequence of grid fed-in energy.

c) No PV Input

The inverter will first discharge the battery energy for home load consuming when no PV input (such as in the evening or some cloudy or rainy days). If the demand is not met, the loads will consume the grid energy.

$$P_{BAT} < P_{Load}$$

$$P_{BAT} \geq P_{Load}$$
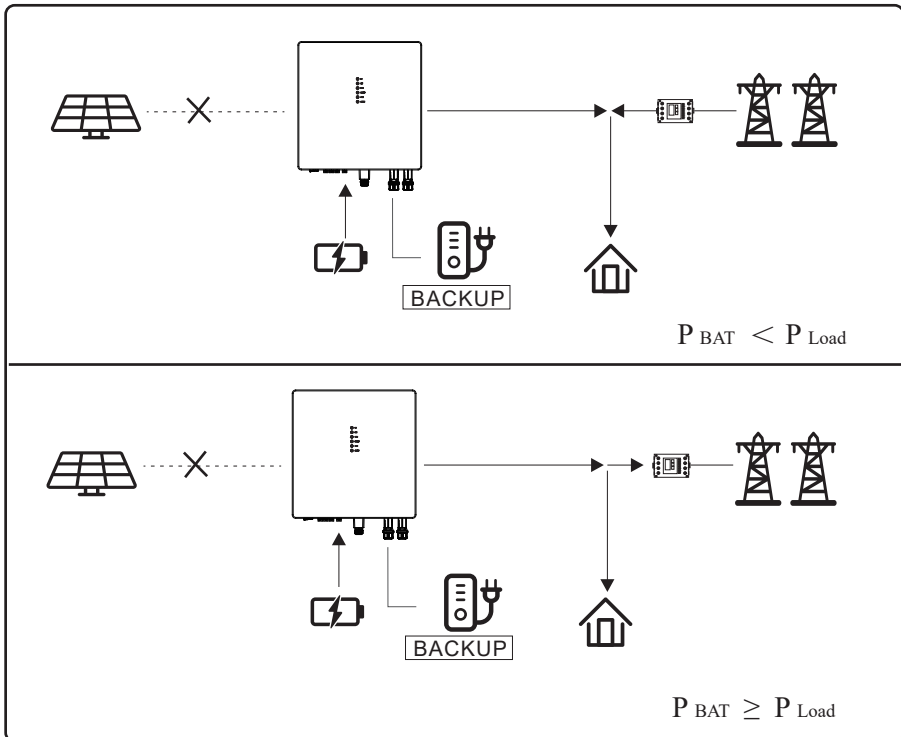
5.1.3 Time-Based Control Mode

Go to the "Hybrid work mode" menu, and select the "Time-based Control".

Under this mode, you can control the charging and discharging of the inverter. You can set the following parameters based on your requirements:

- Charge and discharge frequency: one time or daily
- Charging start time: 0 to 24 hours
- Charging end time: 0 to 24 hours
- Discharge start time: 0 to 24 hours
- Discharge end time: 0 to 24 hours

You can also choose whether to allow the grid to charge the battery, which is prohibited by default. If the user enables the "Grid charge function", the "Maximum grid charger power" and "Capacity of grid charger end" can be set. When the battery capacity reaches the set value, the grid will stop charging the battery.

5.1.4 Back-up Mode
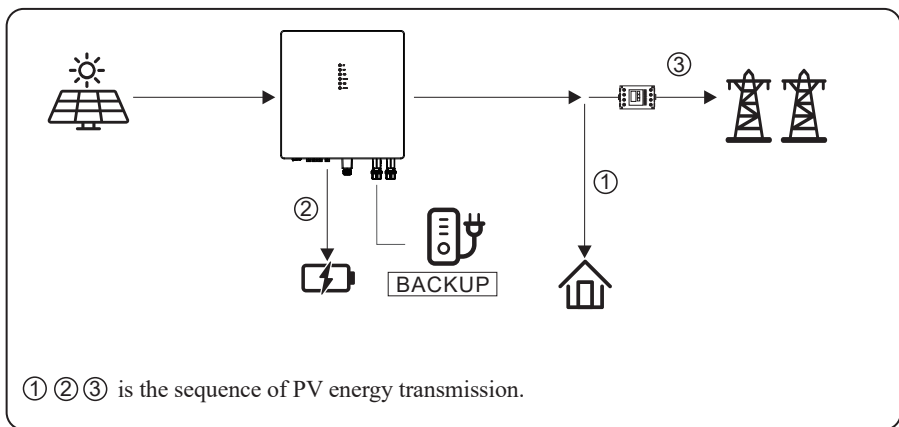
Go to the "Hybrid work mode" menu, and select the "Back-up Mode".

Under this mode, the priority of PV energy consumption will be Battery > Load > Grid.
This mode aims at charging the battery quickly, and at the same time, you can choose whether to allow AC to charge the battery.

Forbid AC charging

In this mode, the battery can be charged only with PV power, and the charging power varies with PV power.

a) Wealthy PV power

When PV energy is wealthy, PV charges the battery first, then meets the load, and the rest is fed into the grid.

① ② ③ is the sequence of PV energy transmission.
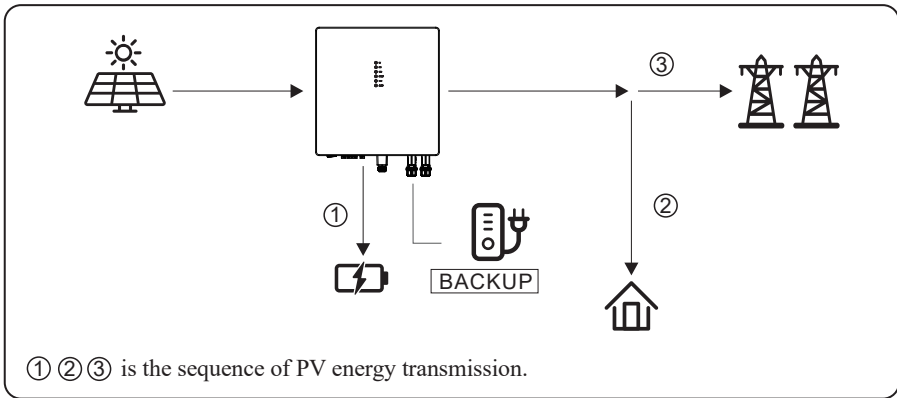
b) Limited PV power

When PV energy is limited, PV gives priority to charging the battery, and the grid directly meet the load demand.
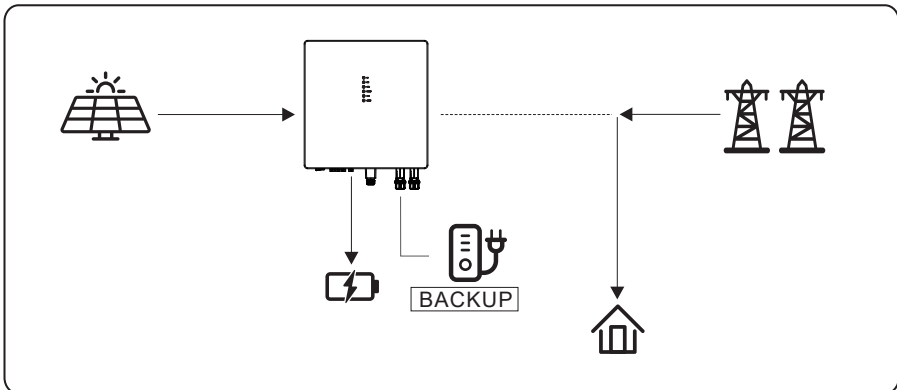
Allow AC charging

In this situation, the battery can be charged both with PV and AC.

a) Wealthy PV power

When PV energy is wealthy, PV charges the battery first, then meets the load, and the rest is fed into the grid.

① ② ③ is the sequence of PV energy transmission.
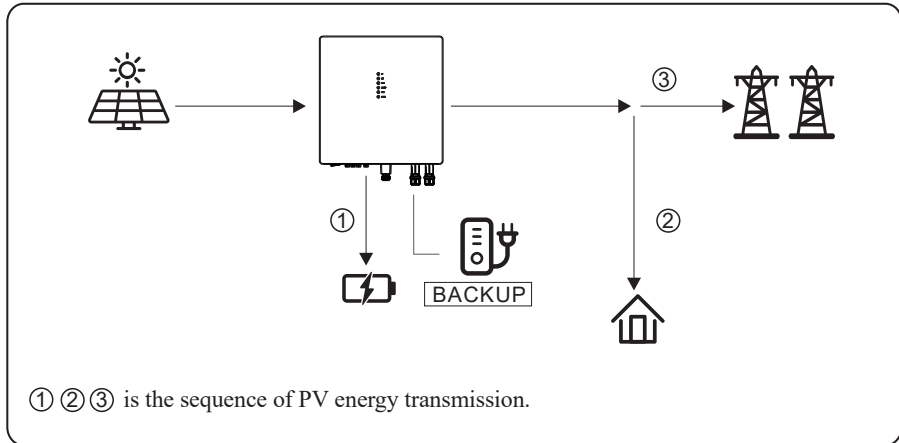
b) Limited PV power

When the PV energy is not enough to charge the battery, the grid energy will charge the battery as supplement. Meanwhile, the grid energy is consumed by loads.
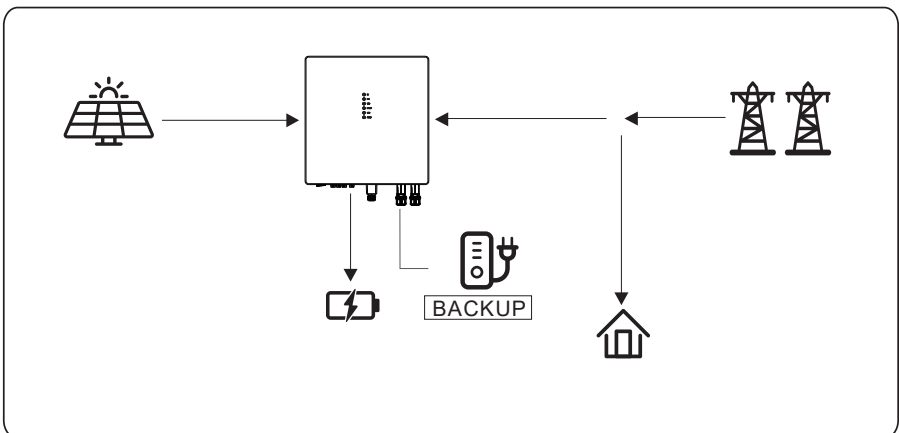
5.1.5 Off Grid Mode

When the power grid is cut off, the system automatically switches to Off Grid mode.
Under off-grid mode, only critical loads are supplied to ensure that important loads continue to work without power failure.
Under this mode, the inverter can't work without the battery.

a) Wealthy PV power

When PV energy is wealthy, the PV power will be first consumed by critical load, then charge the battery.

① ②   is the sequence of PV energy transmission.
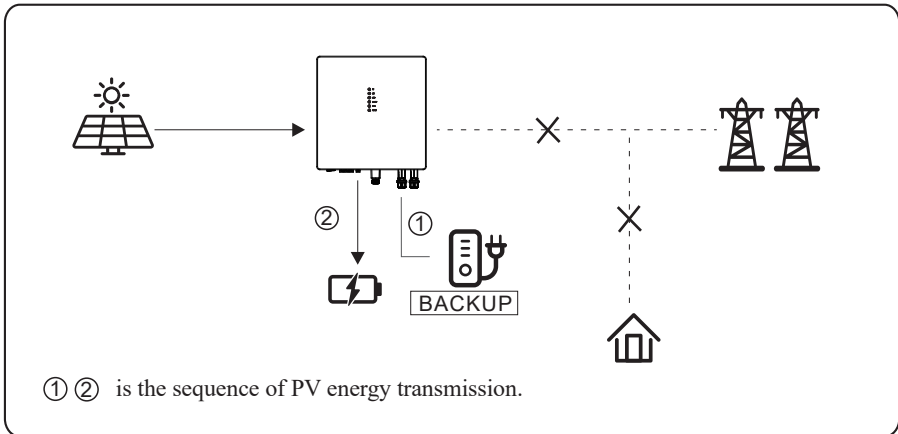
b) Limited PV power

When PV energy is limited, BACKUP loads are first powered by PV and then supplemented by battery.

① ② is the sequence of BACKUP load consumption.
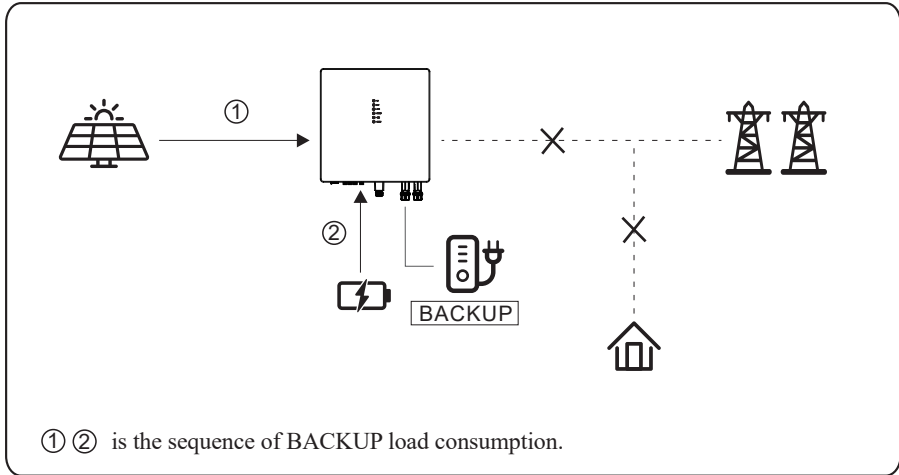
⚠ NOTICE	• Under this mode, please complete the output voltage and frequency settings. • It is better to choose the battery capacity larger than 100Ah to ensure BACKUP function work normally. • If BACKUP output loads are inductive or capacitive loads, to make sure the stability and reliability of system, it is recommended to configure the power of these loads to be within 50% BACKUP output power range.

5.1.6 On-grid Unbalanced Output

1) The normal load is single phase.

2) The three phases of normal load are the same or unbalanced.

This is the best scheme to meet your needs.

On-grid Unbalanced Output
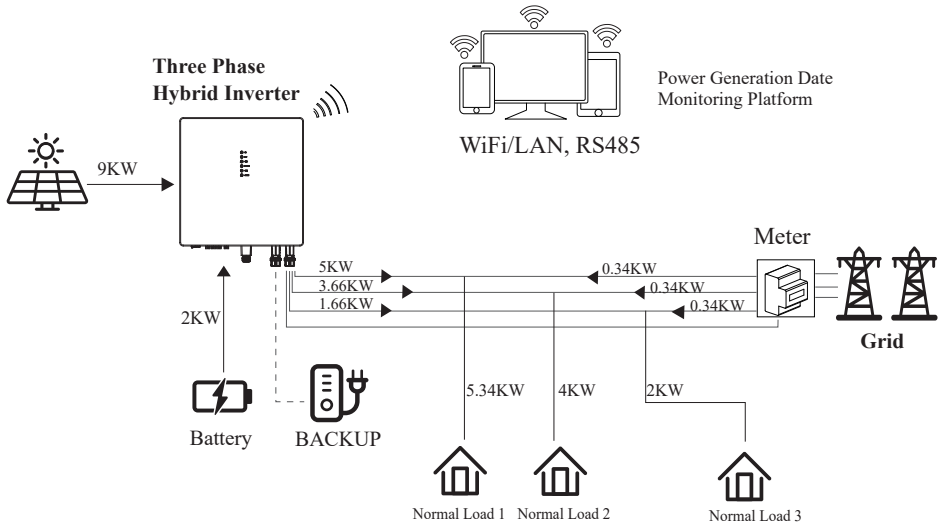
5.1.7 Back-up Unbalanced Output

1) The critical load is single phase.
2) The three phases of normal load are the same or unbalanced.
This is the best scheme to meet your needs.

Back-up Unbalanced Output
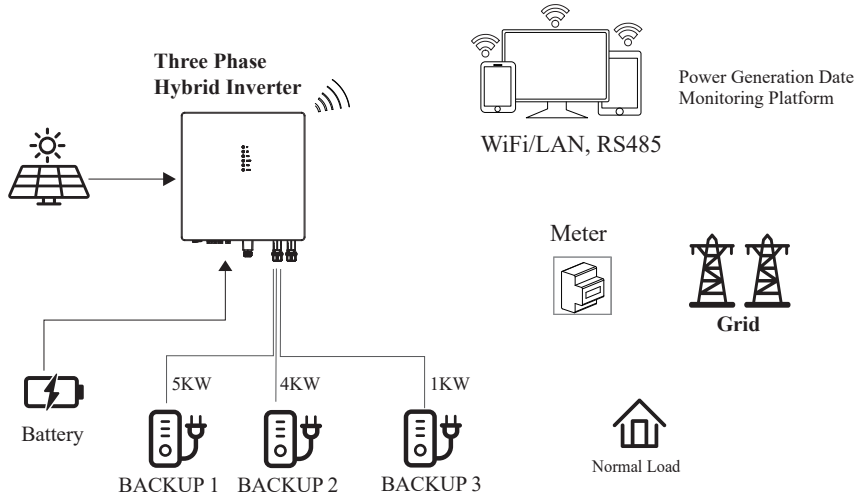
5.2 Startup/Shutdown Procedure

5.2.1 Startup Procedure

Check and confirm the installation is secure and strong enough and that the system grounding is OK. Then confirm the connections of AC, battery, PV etc. are correct. Confirm the parameters and configurations conform to relevant requirements.

AC Frequency	50/60Hz	PV Voltage	160~950V
Battery Voltage	150~600V	Grid AC Voltage	180~270V(311~467V)

Startup Procedure

① PV Switch

③ Grid

② Battery

④ BACKUP

⑤ The **first** time:
Go to APP (Quick Setup)

* The **non-first**-time:

5s   "Beep"
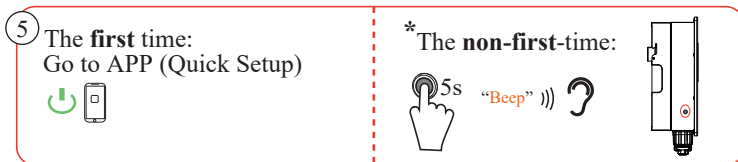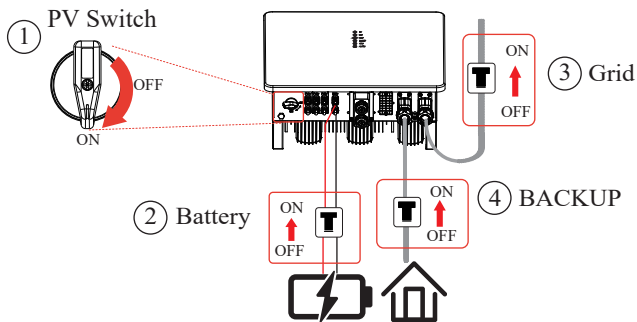
* To act the non-first-time startup, press and hold down the button on the left side of the inverter for about 5 seconds, until you hear the "beep" sound.

Shutdown Procedure
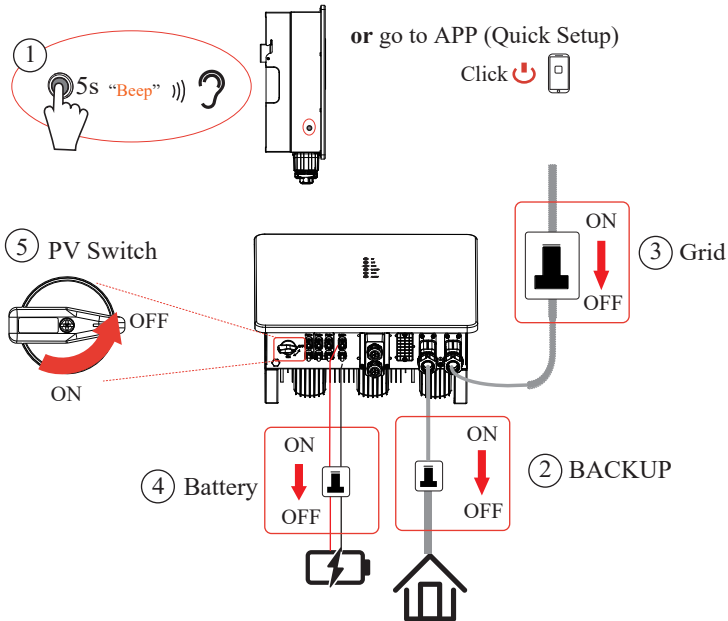
or go to APP (Quick Setup)

Click ⏻ 📱

After the inverter is powered off, the remaining electricity and heat may still cause electric shock and body burns. If need to disconnect the inverter cables, please wait at least 10 minutes before touching these parts of inverter.

6. Commissioning

It is necessary to make a complete commissioning of the inverter system. This will essentially protect the system from fire, electric shock or other damages or injuries.

6.1 Inspection

Before commissioning, the operator or installer (qualified personnel) must inspect the system carefully and make sure:

1) The system is firmly installed correctly following the contents and notifications of this manual, and there are enough spaces for operation, maintenance and ventilation.

2) All the terminals and cables are in good status without any damages.

3) No items are left on the inverter or within the required clearance section.

4) The PV, battery pack is working normally, and grid is normal.

6.2 Commissioning Procedure

After the inspection and make sure status is right, then start the commissioning of the system.

1) Power on the system by referring to the **Startup Procedure** section 5.2.1.

2) Setting the parameters on the App according to user's requirement.

3) Finish commissioning.

7. User Interface

7.1 LED

This section describes the LED panel. LED indicator includes PV, BAT,
GRID, BACKUP, COM, ALARM indicators.
It includes the explanation of indicator states and summary of indicator
states under the running state of the machine.

LED Indicator	Status	Description
PV	On	PV input is normal.
	Blink	PV input is abnormal.
	Off	PV is unavailable.
BAT	On	Battery is charging.
	Blink	Battery is discharging. Battery is abnormal.
	Off	Battery is unavailable.
GRID	On	GRID is available and normal.
	Blink	GRID is available and abnormal.
	Off	GRID is unavailable.
COM	Blink	Data are communicating.
	Off	No data transmission
BACKUP	On	BACKUP power is available.
	Blink	BACKUP output is abnormal.
	Off	BACKUP power is unavailable.
ALARM	On	Fault has occurred and inverter shuts down.
	Blink	Alarms has occurred but inverter doesn't shut down.
	Off	No fault.

Details	Code	PV LED	Grid LED	BAT LED	BACKUP LED	COM LED	ALARM LED
PV normal		●	◎	◎	◎	◎	○
No PV		○	◎	◎	◎	◎	○
PV over voltage	B0						
PV under voltage	B4						
PV irradiation weak	B5	★	◎	◎	◎	◎	○
PV string reverse	B7						
PV string abnormal	B3						
On grid Bypass output		◎	●	◎	◎	◎	○
Grid over voltage	A0						
Grid under voltage	A1						
Grid absent	A2						
Grid over frequency	A3	◎	★	◎	◎	◎	○
Grid under frequency	A4						
Grid abnormal	A6						
Grid over mean voltage	A7						
Neutral live wire reversed	A8						
Battery in charger		◎	◎	●	◎	◎	○
Battery absent	D1	◎	◎	○	◎	◎	○
Battery in discharge		◎	◎	★★	◎	◎	○
Battery under voltage	D3						
Battery over voltage	D2						
Battery discharge over current	D4						
Battery over temperature	D5	◎	◎	★	◎	◎	○
Battery under temperature	D6						
Communication loss (Inverter - BMS)	D8						
BACKUP output active		◎	◎	◎	●	◎	◎
BACKUP output inactive		◎	◎	◎	○	◎	◎
BACKUP short circuit	DB						
BACKUP over load	DC						
BACKUP output voltage abormal	D7	◎	◎	◎	★	◎	○
BACKUP over dc-bias voltage	CP						

Details	Code	PV LED	Grid LED	BAT LED	BACKUP LED	COM LED	ALARM LED
RS485/DB9/BLE/USB		◎	◎	◎	◎	★	◎
Inverter over temperature	C5	◎	◎	◎	◎	◎	★
Fan abnormal	C8						
Inverter in power limit state	CL						
Data logger lost	CH						
Meter lost	CJ						
Remote off	CN						
PV insulation abnorma	B1	◎	◎	◎	◎	◎	●
Leakage current abnormal	B2						
Internal power supply abnormal	C0						
Inverter over dc-bias current	C2						
Inverter relay abnormal	C3						
GFCI abnormal	C6						
System type error	C7						
Unbalance Dc-link voltage	C9						
Dc-link over voltage	CA						
Internal communication error	CB						
Internal communication loss(E-M)	D9						
Internal communication loss(M-D)	DA						
Software incompatibility	CC						
Internal storage error	CD						
Data inconsistency	CE						
Inverter abnormal	CF						
Boost abnormal	CG						
Dc-dc abnormal	CU						

Remark: ● Light on   ○ Light off   ◎ Keep original status

★ Blink 1s and off 1s   ★★ Blink 2s and off 2s

7.2 App Setting Guide

7.2.1 Download App

• Scan the QR code on the inverter to download the APP.

• Download APP from the App Store or Google Play.

The APP should access some permissions such as device's location. You need to grant all access rights in all pop-up windows when installing the APP or setting your phone.

7.2.2 App Architecture

It contains "Cloud Login" and "Local Connection".

• Cloud login: APP read data from cloud server through API and display inverter parameter

• Local connection: APP read data from inverter through Bluetooth connection with Modbus protocol to display and configure inverter parameter.
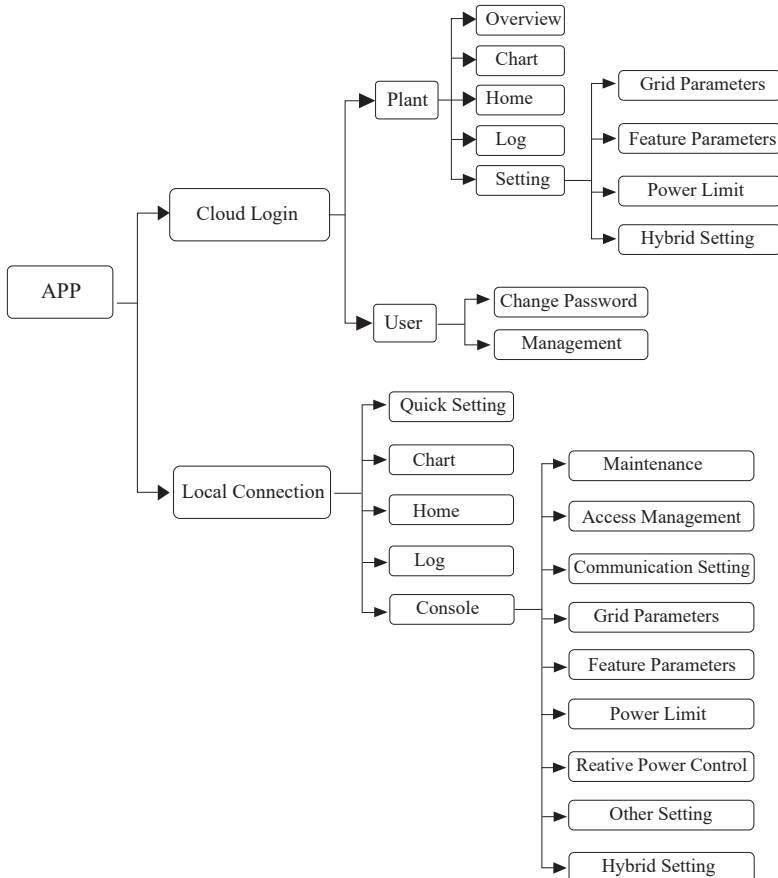
7.2.3 Local Setting

■ **Access Permission**

Before using the local setting, the APP should access some permissions. (You need to grant all access rights in all pop-up windows when installing the APP or setting your phone.) When the APP asks for permission, please click Allow.

■ **Connect Inverter**

Firstly, open the Bluetooth on your own phone, then open the APP.

Press Local Setting to go to the connect page. This page shows the inverters which you can connect or you have connected. (As shown below) Press the inverter's name to connect it.
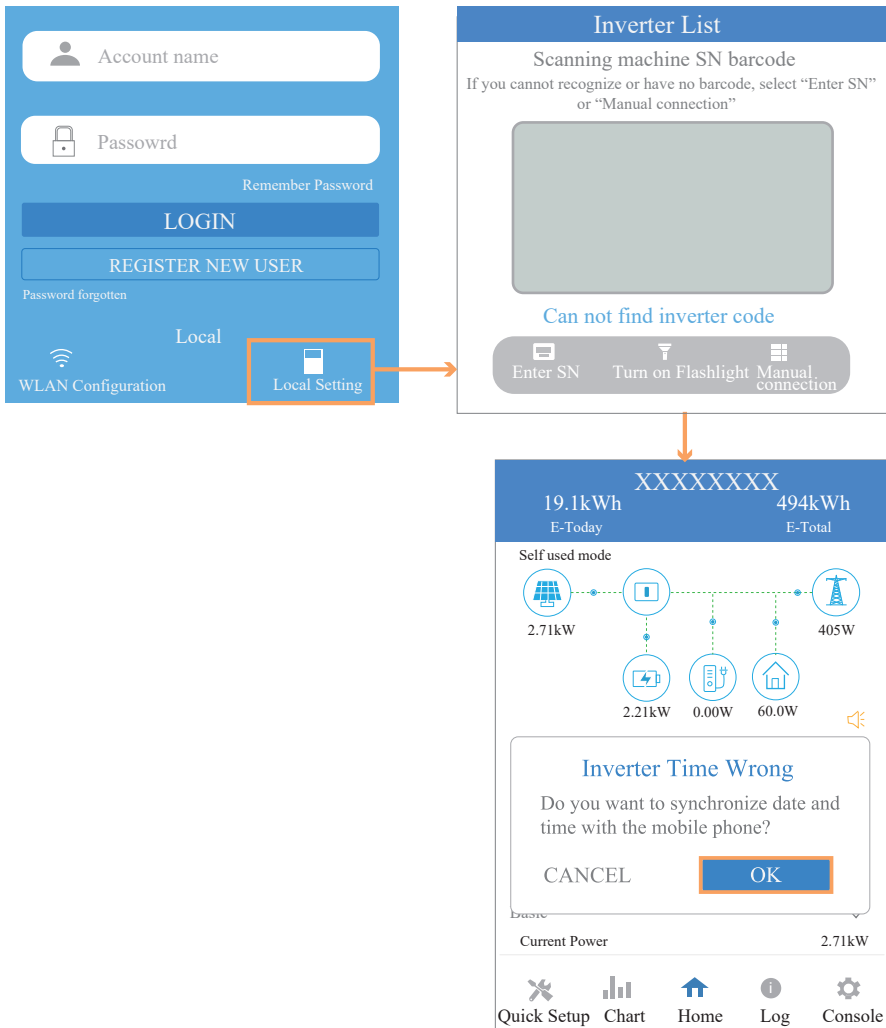
■ **Quick Setting**

1. Connect to the router.

   Step 1 Go to Quick Setting page.

   Step 2 Click each item to enter the informations, then click Next.
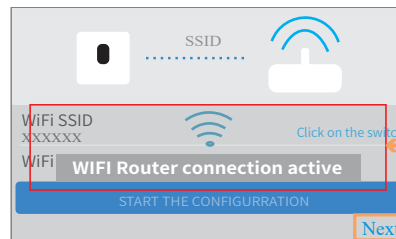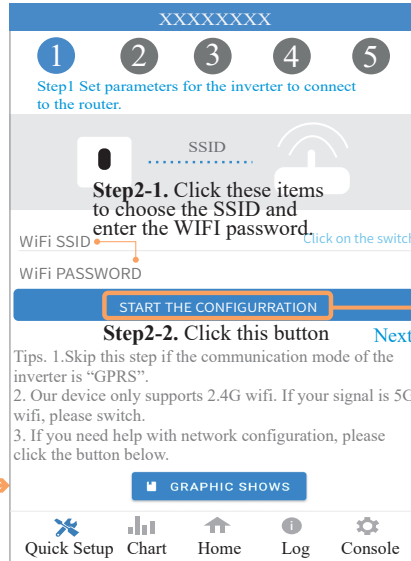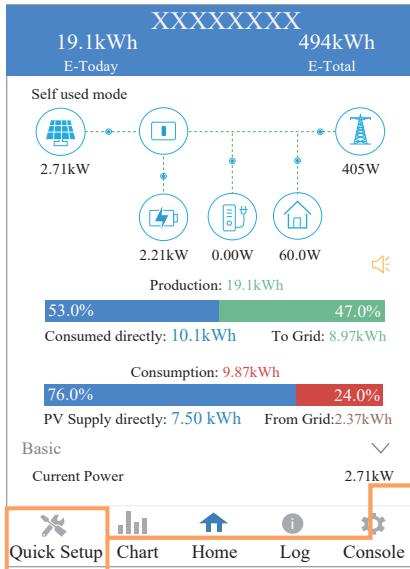
2. Set parameters of power grid.

   Step 1 Click each item to enter the parameters
           of power grid.

   Step 2 Click Next.

   Step 3 Click Previous back to the previous page.
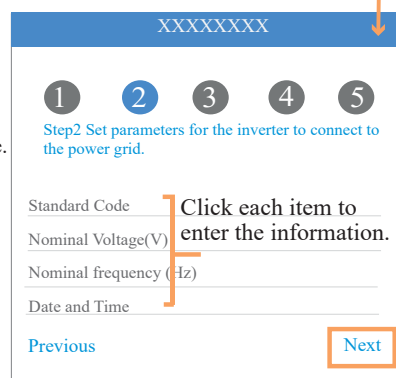
3. Set parameters of power limit

Step 1 Click each item to enter the parameters of power limit.

Step 2 Click Next.

Step 3 Click Previous back to the previous page.

XXXXXXXX
① ② ③ ④ ⑤
Step3 Set parameters for the inverter to connect to the power limit.
Power control
Meter location   Click each item
Meter Type   to enter the
informations.
Power flow direction
Digital meter modbus address
Maximum feed in grid power(W)
Previous   Next
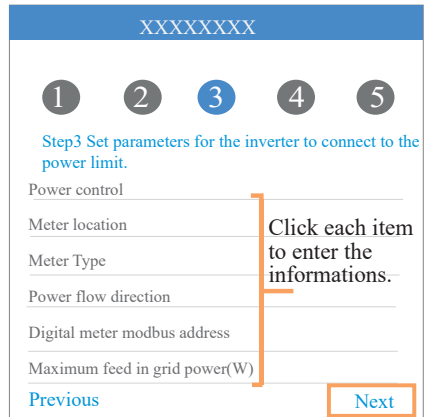
4. Set parameters of work mode

Step 1 Click each item to enter the informations of work mode.

Step 2 Click Next.

Step 3 Click Previous back to the previous page.

XXXXXXXX
① ② ③ ④ ⑤
Step4 Set parameters for the inverter to connect to the workmode.
Hybrid work mode   Click each item to enter
the informations.
Battery type selection
Off-grid mode
Previous   Next
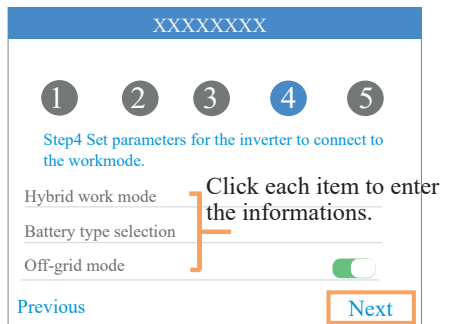
5. Start Inverter

Step 1 Click ⏻.

Step 2 Click Previous back to the previous page.

XXXXXXXX
① ② ③ ④ ⑤
Step5 Please click the button below to start the inverter.
Click it to start.
Previous

■ **APP Power Chart**

The power chart is showed by Day, Month and Year in our APP. For each exhibition method, it includes both Production and Consumption. We use different icons and colors for different power messages. The icon and color definition as below:

Color: Blue
Definition: Load consumption only from PV

Color: Red
Definition: Battery charge power with PV or AC

Color: Red
Definition: Battery discharge power for load consumption or feed-in grid

Color: Purple
Definition: Consumption power from grid

Color: Purple
Definition: Feed-in grid power from PV or battery

Color: Orange
Definition: Load power

Color: Orange
Definition: PV generating power

1. Query (Daily) Data

Go to Chart > Day page. It will show the Daily Production or Consumption Curve in this page. You can swipe the screen left and right to switch the graph.

● Day Chart--Production

The above combination day chart shows the PV production power distributed with three parts:

- load consumption power (Blue)
- battery charge power (Red)
- feed-in grid power (Purple)

● Day Chart--Consumption

The above combination day chart shows the load consumption power from three parts:
- PV generation power (Blue)
- battery discharge power (Red)
- grid power (Purple)

Power supported by PV + power supported by battery + power supported by grid = Load consumption power.

2. Query (Monthly) Data

Go to Chart > Month page. It will show the Monthly Production or Consumption Curve in this page. You can swipe the screen left and right to switch the graph.

● Month Chart--Production
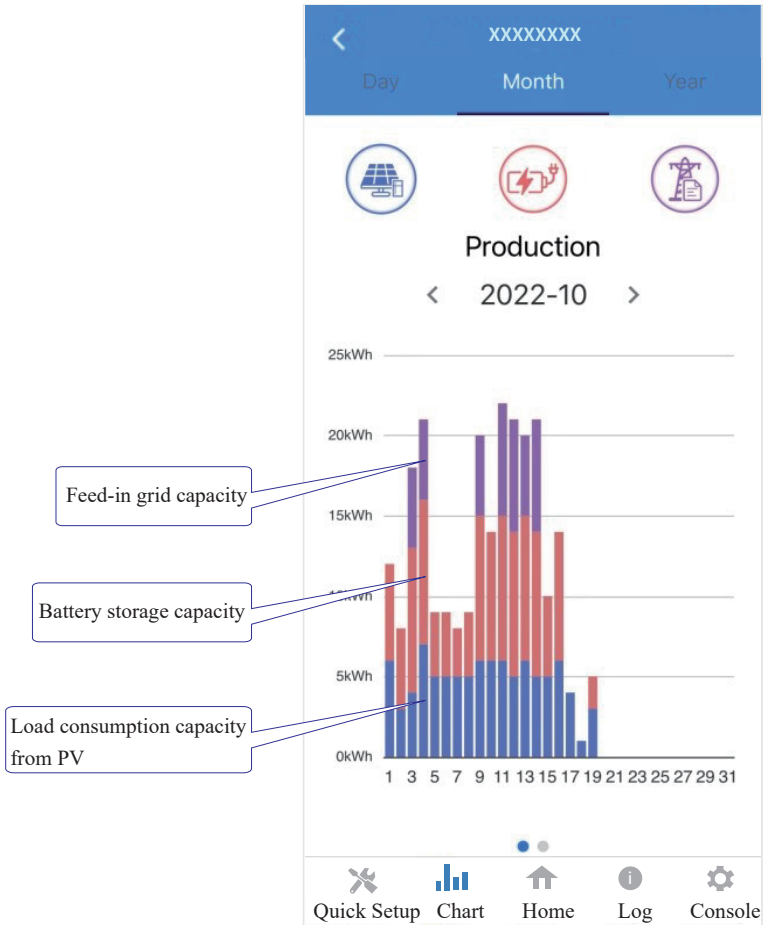
The above combination day chart shows the load consumption power from three parts:

- load consumption capacity (Blue)
- battery storage capacity (Red)
- feed-in grid capacity (Purple)

● Month Chart--Consumption

Load consumption capacity from grid

Load consumption capacity from battery

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Load consumption capacity from PV

Quick Setup   Chart   Home   Log   Console
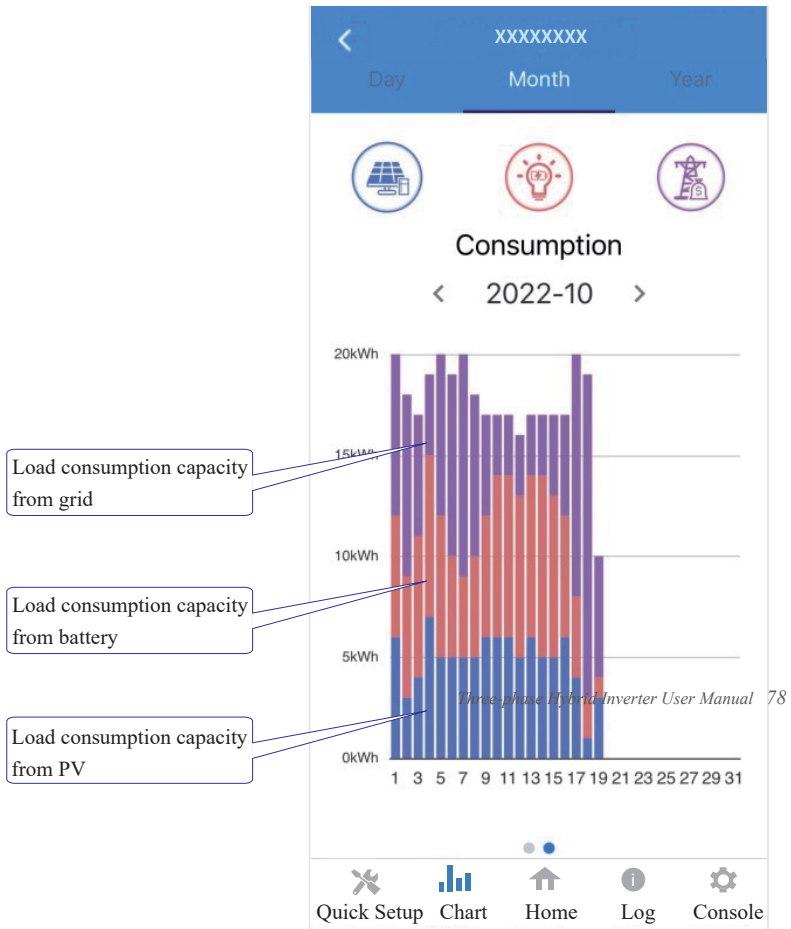
The above combination month chart shows the load consumption capacity from three parts:
- PV generation capacity (Blue)
- battery discharge capacity (Red)
- grid capacity (Purple)

2. Query (Yearly) Data

Go to Chart > Year page. It will show the Annually Production or Consumption Curve in this page. You can swipe the screen left and right to switch the graph.

● Year Chart--Production
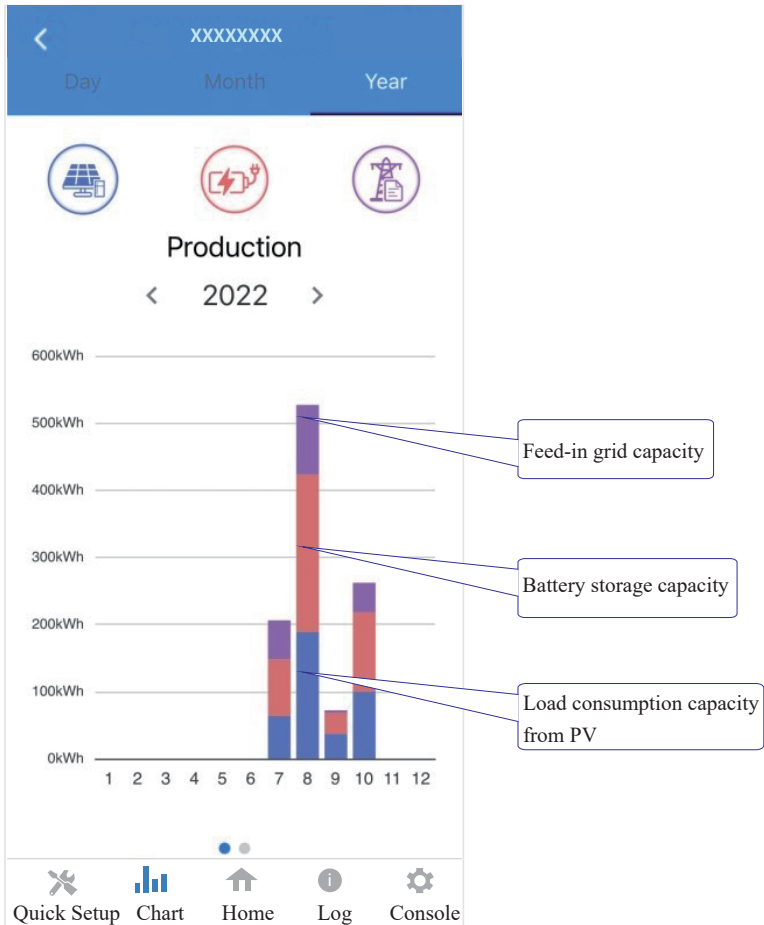
The above combination year chart shows the distribution of PV production capacity with three parts:
- load consumption capacity (Blue)
- battery storage capacity (Red)
- feed-in grid capacity (Purple)

● Year Chart--Consumption
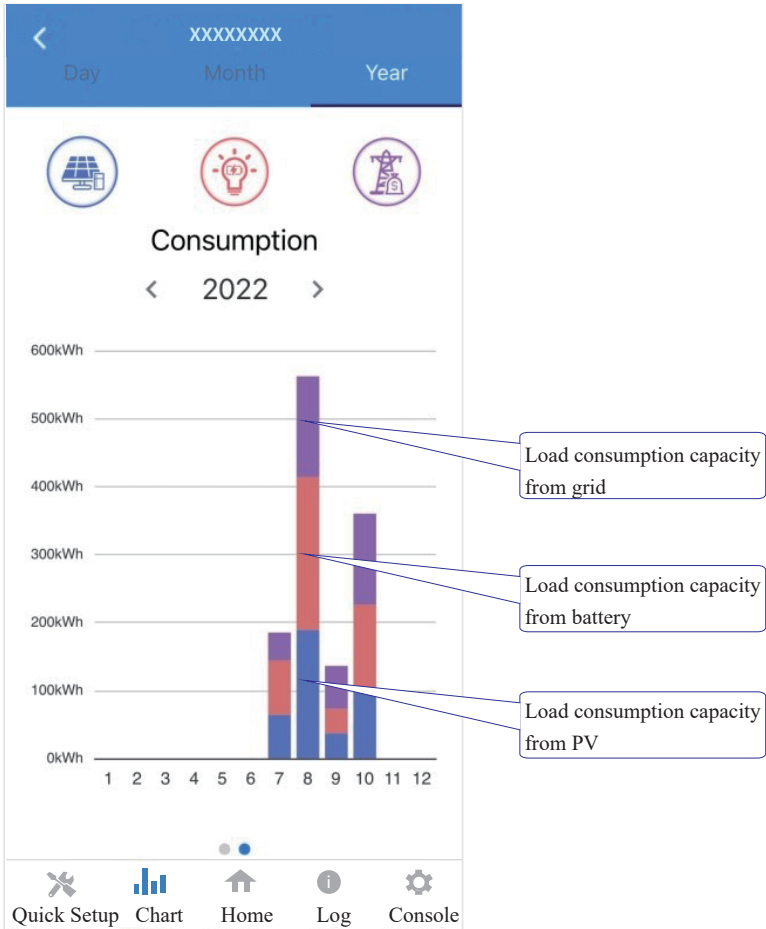
The above combination year chart shows the load consumption capacity from three parts:
- PV generation capacity (Blue)
- battery discharge capacity (Red)
- grid capacity (Purple)

■ Local Setting Homepage

This page shows the basic information of inverter. Click ◁ to display the warning message.
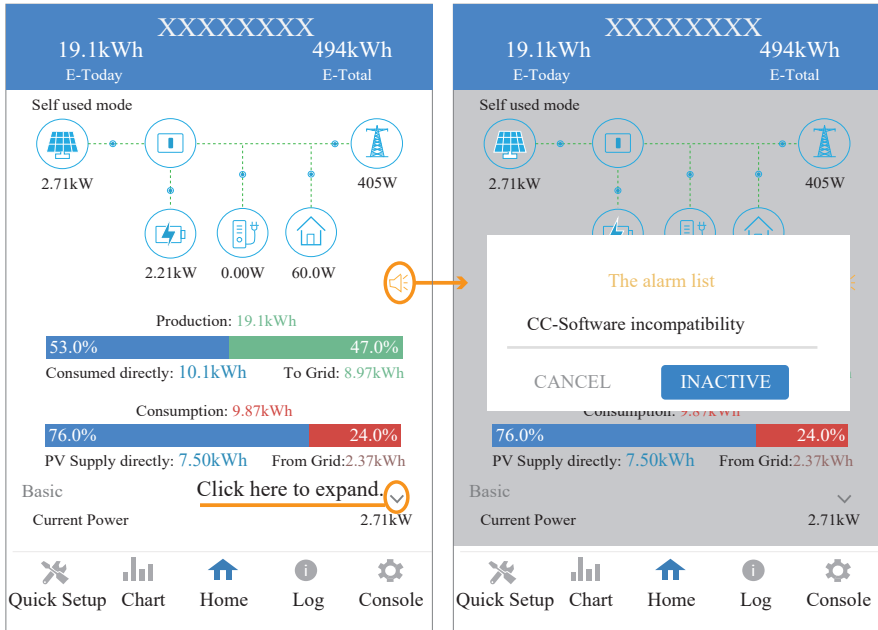
■ History Log

Press Log at the bottom and then go to the history log page (as shown below). It contains all the logs for the inverter.
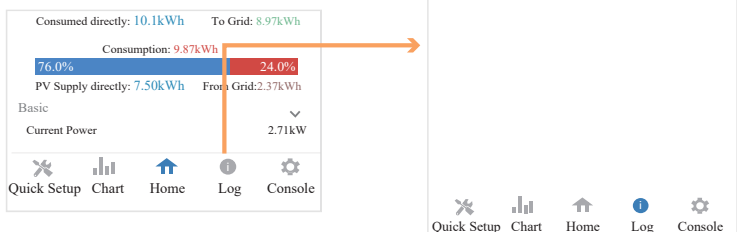
■ **Maintenance**

Go to Console page. And click Maintenance

XXXXXXXX
🔧 Maintenance ❯
👤 Access Management ❯
(•) Communication Setting ❯
⚡ Grid Parameters ❯
▦ Feature Parameters ❯
↓ Power Limit ❯
⚙ Reactive Power Control ❯
🔕 Masking Fault Detection ❯
☰ Other Setting ❯
🔋 Hybrid Setting ❯
Logout
Quick Setup   Chart   Home   Log   Console

Consumed directly: 10.1kWh   To Grid: 8.97kWh

Consumption: 9.87kWh

76.0%   24.0%

PV Supply directly: 7.50kWh   From Grid:2.37kWh

Basic

Current Power   2.71kW

Quick Setup   Chart   Home   Log   Console

Then you need to enter password in a popup window (as shown below).

Login As Administrator

Enter administrator password

CANCEL   OK

In this page, you can view the basic information like some version information, do some maintaining operations like turn off/on the inverter and manage data.
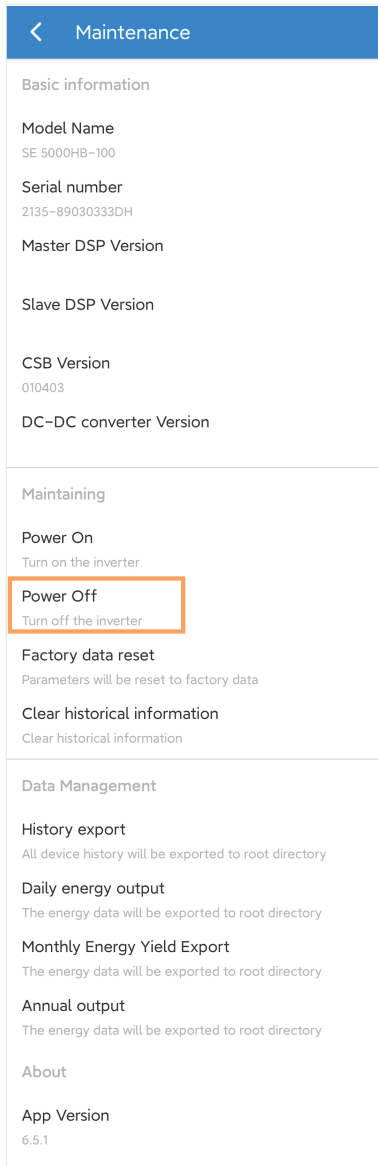
■ **Console**

Access Management

Go to Console > Access Management page. In this page, you can switch the login permission.
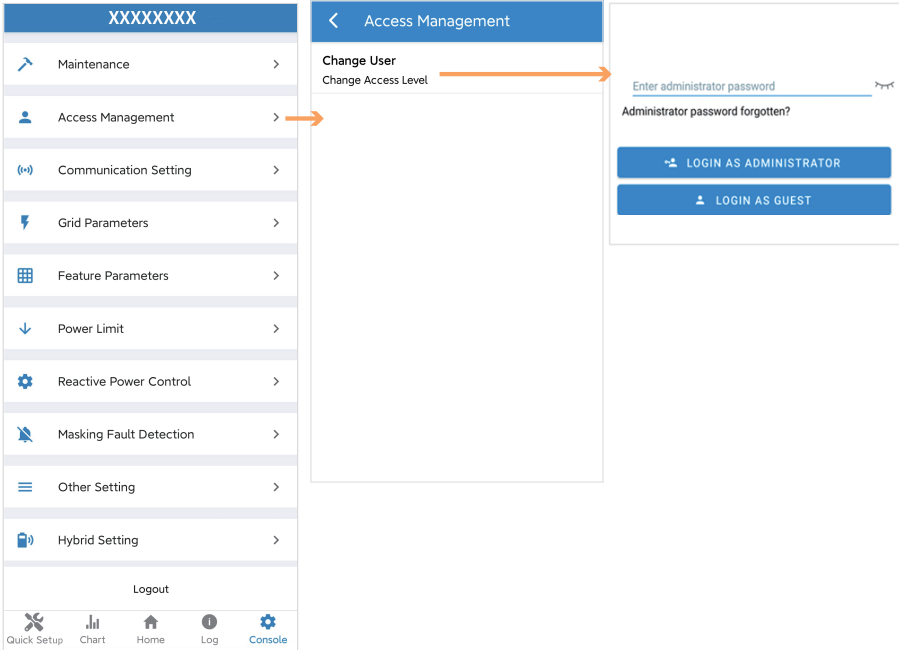
Communication Setting

Go to Console > Communication Setting page. In this page, you can set or change the parameters of communication settings: Basic Setting, RS485 Setting and Ethernet Setting.
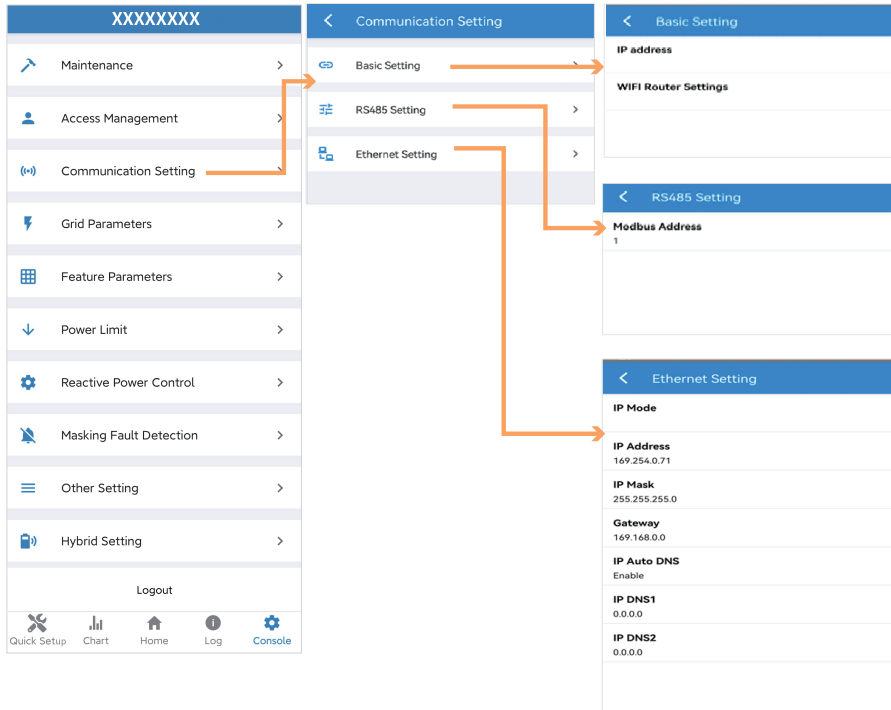
Grid Parameters

Go to Console > Grid Parameters page. In this page, you can set or change the parameters of Grid side, as shown in the figure.

Feature Parameters

Go to Console > Feature Parameters page. In this page, you can set or change the feature parameters, as shown in the figure.

Power Limit

Go to Console > Power Limit page. In this page, you can set or change the parameters of power limit, as shown in the figure.

XXXXXXXX
Maintenance ⟩
Access Management ⟩
Communication Setting ⟩
Grid Parameters ⟩
Feature Parameters ⟩
Power Limit ⟩
Reactive Power Control ⟩
Masking Fault Detection ⟩
Other Setting ⟩
Hybrid Setting ⟩
Logout

Quick Setup Chart Home Log Console
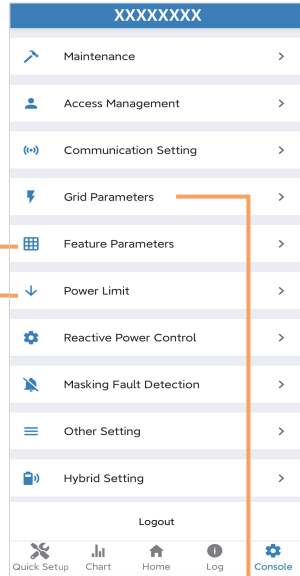
Power Limit

Power control	
Digital Power Meter	
Meter location	
On Grid	
Meter Type	
CHINT/DTSU666	
Power flow direction	
From grid to inverter	
Digital meter modbus address	
200	
Maximum feed in grid power(W)	
70000	

Feature Parameters

Low Voltage Through	⊙
Island Detection	⊙
Isolation Detection	⊙
Leakage Current Detection(GFCI)	⊙
Terminal Resistor	⊙
Derated Power(%)	
0	
Power Factor	
0.00	
Insulation Impedance(kΩ)	
Leakage Current Point(mA)	
Unbalanced Voltage Point(%)	
Moving Average Voltage Limit(V)	
0	

Grid Parameters

Standard Code	
Unknown	
First Connect Delay Time(s)	
Reconnect Delay Time (s)	
Frequency High Loss Level_1(Hz)	
0	
Frequency Low loss Level_1(Hz)	
0	
Voltage High Loss Level_1(V)	
0	
Voltage Low Loss Level_1(V)	
0	
Frequency High Loss Time Level_1(ms)	
0	
Frequency Low loss Time Level_1(ms)	
0	
Voltage High Loss Time Level_1(ms)	
0	
Voltage Low Loss Time Level_1(ms)	
0	
Frequency High Loss Level_2(Hz)	
0	
Voltage High Loss Level_2(V)	
0	
Frequency High Loss Time Level_2(ms)	
0	
Voltage High Loss Time Level_2(ms)	
0	

Reactive Power Control

Go to Console > Reactive Power Control page. In this page, you can set or change the Reactive Power
Control parameters.

XXXXXXXX	
🔧 Maintenance	›
👤 Access Management	›
((•)) Communication Setting	›
⚡ Grid Parameters	›
▦ Feature Parameters	›
↓ Power Limit	›
⚙ Reactive Power Control	›
🔕 Masking Fault Detection	›
☰ Other Setting	›
🔋 Hybrid Setting	›
Logout	
Quick Setup Chart Home Log Console	

‹ Reactive Power Control
Reactive Power Control Settling Time (s)
0
Reactive Power Control Mode
Pure Active power
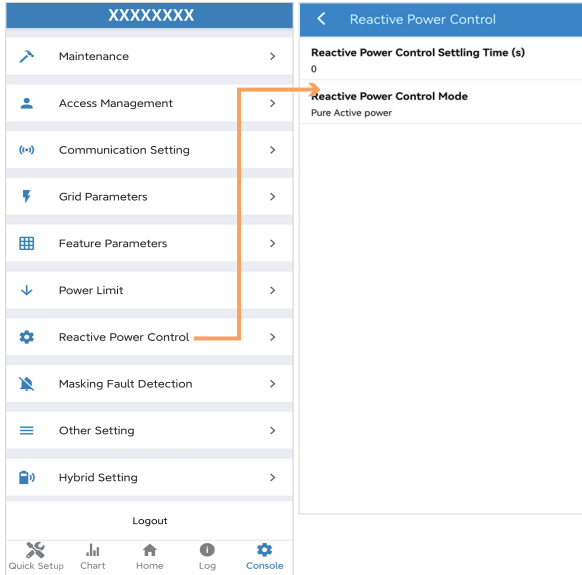
Other Setting

Go to Console > Other Setting page. In this page, you can set other setting parameters.

XXXXXXXX	
🔧 Maintenance	›
👤 Access Management	›
((•)) Communication Setting	›
⚡ Grid Parameters	›
▦ Feature Parameters	›
↓ Power Limit	›
⚙ Reactive Power Control	›
🔕 Masking Fault Detection	›
☰ Other Setting	›
🔋 Hybrid Setting	›
Logout	
Quick Setup Chart Home Log Console	

‹ Other Setting
Date and Time
2022-07-15 10:31:28
PV panel connect type
PV panel independence
Buzzer ON ⬭
DRM Function ⬭
Parallel Mode ⬭

Enable Buzzer On to open
the Buzzer function.

Enable DRM Function to open
the Buzzer function.

Enable Parallel mode when
parallel connection.

Hybrid Setting

Go to Console > Hybrid Setting page. In this page, you can set Hybrid Setting parameters.

8. Maintenance

⚠️ **CAUTION**	Before maintaining and commissioning inverter and its peripheral distribution unit, switch off all the charged terminals of the inverter and wait at least 10 minutes after the inverter is powered off.	

8.1 Routine Maintenance

Items	Check Content	Maintain Content	Maintenance Interval
Inverter output status	Statistically maintain the status of electrical yield, and remotely monitor its abnormal status.	N/A	Weekly
Inverter cleaning	Check periodically that the heat sink is free from dust and blockage.	Clean periodically the heat sink.	Yearly
Inverter running status	Check that the inverter is not damaged or deformed. Check for normal sound emitted during inverter operation. Check and ensure that all inverter communications is running well.	If there is any abnormal phenomenon, replace the relevant parts.	Monthly
Inverter electrical connections	Check that all AC, DC and communication cables are securely connected; Check that PGND cables are securely connected; Check that all cables are intact and free from aging.	If there is any abnormal phenomenon, replace the cable or re-connect it.	Semiannually

8.2 Inverter Troubleshooting

When the inverter has an exception, its basic common warning and exception handing methods are shown below.

Code	Alarm Information	Suggestions
A0	Grid over voltage	1. If the alarm occurs occasionally, possibly the power grid voltage is abnormal for a short time, and no action is required. 2. If the alarm occurs repeatedly, contact the local power station. After receiving approval of the local power bureau, revise the electrical protection parameters settings on the inverter through the App. 3. If the alarm persists for along time, check whether the AC circuit breaker /AC terminals is disconnected or not, or if the grid has a power outage.
A1	Grid under voltage	
A3	Grid over frequency	
A4	Grid under frequency	
A2	Grid absent	Wait till power is restored.
B0	PV over voltage	Check whether the maximum voltage of a single string of input PV modules is greater than the allowable voltage. If the maximum voltage is higher than the standard voltage, modify the number of pv module connection strings.
B1	PV insulation abnormal	1. Check the insulation resistance against the ground for the PV strings. If a short circuit has occurred, rectify the fault. 2. If the insulation resistance against the ground is less than the default value in a rainy environment, set insulation resistance protection on the App.
B2	Leakage current abnormal	1. If the alarm occurs occasionally, the inverter can be automatically recovered to the normal operating status after the fault is rectified. 2. If the alarm occurs repeatedly, contact your dealer for technical support.
B4	PV under voltage	1. If the alarm occurs occasionally, possibly the external circuits are abnormal accidentally. The inverter automatically recovers to the normal operating status after the fault is rectified. 2. If the alarm occurs repeatedly or last a long time, check whether the insulation resistance against the ground of PV strings is too low.
C0	Internal power supply abnormal	1. If the alarm occurs occasionally, the inverter can be automatically restored, no action required. 2. If the alarm occurs repeatedly, pls. contact the customer service center.

C2	Inverter over dc-bias current	1. If the alarm occurs occasionally, possibly the power grid voltage is abnormal for a short time, and no action is required. 2. If the alarm occurs repeatedly, and the inverter fails to generate power, contact the customer service center.
C3	Inverter relay abnormal	1. If the alarm occurs occasionally, possibly the power grid voltage is abnormal for a short time, and no action is required. 2. If the alarm occurs repeatedly, pls. refer to the suggestions or measures of Grid over voltage. and the inverter fails to generate power, contact the customer service center. If there is no abnormality on the grid side, the machine fault can be determined. (If you open the cover and find traces of damage to the relay, it can be concluded that the machine is faulty.) And pls. contact the customer service center.
CN	Remote off	1. Local manual shutdown is performed in APP. 2. The monitor executed the remote shutdown instruction. 3. Remove the communication module and confirm whether the alarm disappears. If it does, replace the communication module. Otherwise, please contact the customer service center.
C5	Inverter over temperature	1. If the alarm occurs occasionally, the inverter can be automatically restored, no action required. 2. If the alarm occurs repeatedly, pls. check the installation site for direct sunlight, good ventilation, and high ambient temperature (Such as installed on the parapet). If the ambient temperature is lower than 45 ° C and the heat dissipation is good, contact the customer service center.
C6	GFCI abnormal	1. If the alarm occurs occasionally, it could have been an occasional exception to the external wiring, the inverter can be automatically recovered, no action required. 2. If it occurs repeatedly or cannot be recovered for a long time, pls. contact customer service to report repair.
B7	PV string reverse	Check and modify the positive and negative polarity of the input of the circuit string.
C8	Fan abnormal	1. If the alarm occurs occasionally, pls. restart the inverter. 2. If it occurs repeatedly or cannot be recovered for a long time, check whether the external fan is blocked by foreign objects. Otherwise, contact customer service.
C9	Unbalance Dc-link voltage	1. If the alarm occurs occasionally, the inverter can be automatically recovered and no action is required. 2. If the alarm occurs repeatedly, the inverter cannot work properly. Pls. contact the customer service center.
CA	Dc-link over voltage	

CB	Internal communication error	1. If the alarm occurs occasionally, the inverter can be automatically recovered and no action is required. 2. If the alarm occurs repeatedly, the inverter cannot work properly. Pls. contact the customer service center.
CC	Software incompatibility	1. If the alarm occurs occasionally, the inverter can be automatically recovered and no action is required. 2. If the alarm occurs repeatedly, the inverter cannot work properly. Pls. contact the customer service center.
CD	Internal storage error	1. If the alarm occurs occasionally, the inverter can be automatically recovered and no action is required. 2. If the alarm occurs repeatedly, the inverter cannot work properly. Pls. contact the customer service center.
CE	Data inconsistency	1. If the alarm occurs occasionally, the inverter can be automatically recovered and no action is required. 2. If the alarm occurs repeatedly, the inverter cannot work properly. Pls. contact the customer service center.
CF	Inverter abnormal	1. If the alarm occurs occasionally, the inverter can be automatically recovered and no action is required. 2. If the alarm occurs repeatedly, the inverter cannot work properly. Pls. contact the customer service center.
CG	Boost abnormal	1. If the alarm occurs occasionally, the inverter can be automatically recovered and no action is required. 2. If the alarm occurs repeatedly, the inverter cannot work properly. Pls. contact the customer service center.
CJ	Meter lost	1. Check the meter parameter Settings 2. Local APP checks that the communication address of the inverter is consistent with that of the electricity meter 3. The communication line is connected incorrectly or in bad contact 4. electricity meter failure. 5. Exclude the above, if the alarm continues to occur, please contact the customer service center.

D2	Battery over voltage	1. If the alarm occurs occasionally, the inverter can be automatically recovered and no action is required. 2. Check that the battery overvoltage protection value is improperly set. 3. The battery is abnormal. 4. If exclude the above, the alarm continues to occur, please contact the customer service center.
D3	Battery under voltage	1. If the alarm occurs occasionally, the inverter can be automatically recovered and no action is required. 2. Check the communication line connection between BMS and inverter (lithium battery). 3. The battery is empty or the battery voltage is lower than the SOC cut-off voltage. 4. The battery undervoltage protection value is improperly set. 5. The battery is abnormal. 6. If exclude the above, the alarm continues to occur, please contact the customer service center.
D4	Battery discharger over current	1. Check whether the battery parameters are correctly set. 2. Battery undervoltage. 3. Check whether a separate battery is loaded and the discharge current exceeds the battery specifications. 4. The battery is abnormal. 5. If exclude the above, the alarm continues to occur, please contact the customer service center.
D5	Battery over temperature	1. If the alarm occurs repeatedly, please check whether the installation site is in direct sunlight and whether the ambient temperature is too high (such as in a closed room). 2. If the battery is abnormal, replace it with a new one. 3. If exclude the above, the alarm continues to occur, please contact the customer service center.
D6	Battery under temperature	
D7	BACKUP output voltage abnormal	1. Check whether the BACKUP voltage and frequency Settings are within the specified range. 2. Check whether the BACKUP port is overloaded. 3. When not connected to the power grid, check whether output is normal. 4. If exclude the above, the alarm continues to occur, please contact the customer service center.
D8	Communication error (Inverter-BMS)	1. Check whether the battery is disconnected. 2. Check whether the battery is well connected with the inverter. 3. Confirm that the battery is compatible with the inverter. It is recommended to use CAN communication. 4. Check whether the communication cable or port between the battery and the inverter is faulty. 5. If exclude the above, the alarm continues to occur, please contact the customer service center.

| D9	Internal communication loss(E-M)	1. Check whether the communication cables between BACKUP, electricity meter and inverter are well connected and whether the wiring is correct 2. Check whether the communication distance is within the specification range
DA	Internal communication loss(M-D)	3. Disconnect the external communication and restart the electricity meter and inverter. 4. If exclude the above, the alarm continues to occur, please contact the customer service center.
CU	Dcdc abnormal	1. If the alarm occurs occasionally, the inverter can be automatically recovered and no action is required. 2. If the alarm occurs repeatedly, please check: 1) Check whether the MC4 terminal on the PV side is securely connected. 2) Check whether the voltage at the PV side is open circuit, ground to ground, etc. If exclude the above, the alarm continues to occur, please contact the customer service center.
CP	BACKUP over dc-bias voltage	1. If the alarm occurs occasionally, the inverter can be automatically recovered and no action is required. 2. If the alarm occurs repeatedly, the inverter cannot work properly. Pls. contact the customer service center.
DB	BACKUP short circuit	1. Check whether the live line and null line of BACKUP output are short-circuited. 2. If it is confirmed that the output is not short-circuited or an alarm, please contact customer service to report for repair. (After the troubleshooting of alarm problems, BACKUP switch needs to be manually turned on during normal use.)
DC	BACKUP over load	1. Disconnect the BACKUP load and check whether the alarm is cleared 2. If the load is disconnected and the alarm is generated, please contact the customer service. (After the alarm is cleared, the BACKUP switch needs to be manually turned on for normal use.)

8.3 Removing the Inverter

⚠️ **WARNING**	Before removing DC input connector, double check DC input switch is turned to OFF to avoid inverter damage and personal injury.

Perform the following procedures to remove the inverter:

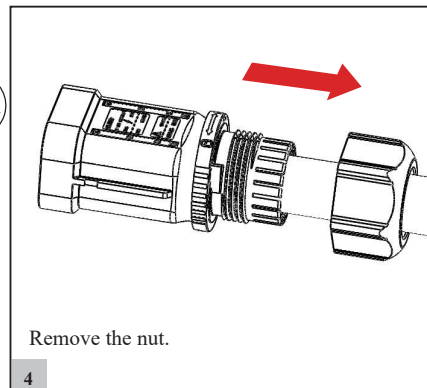Step 1. Disconnect all cables from the inverter, including communications cables, DC input power cables, AC output power cables, and PGND cable, as shown below.
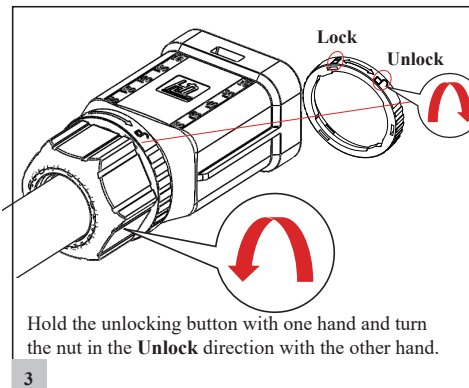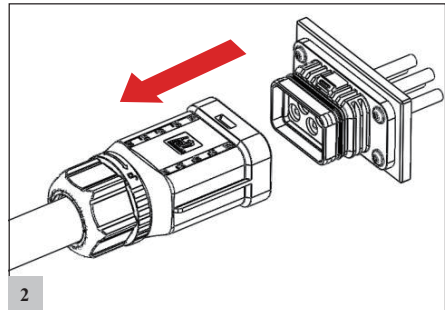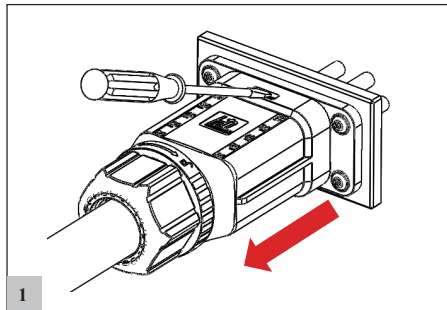
PV Connectors Removing Detail
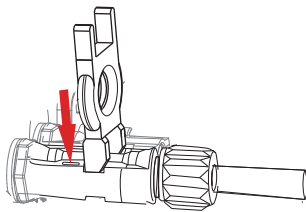
📄 **NOTE**

To remove the PV connectors, insert the removal tool into the bayonet according to the position indicated in the drawing, press inward, and then take out the connector outward.

GRID/BACKUP Connectors Removing Detail

1

2

Lock
Unlock

Hold the unlocking button with one hand and turn the nut in the **Unlock** direction with the other hand.

3

Remove the nut.

4
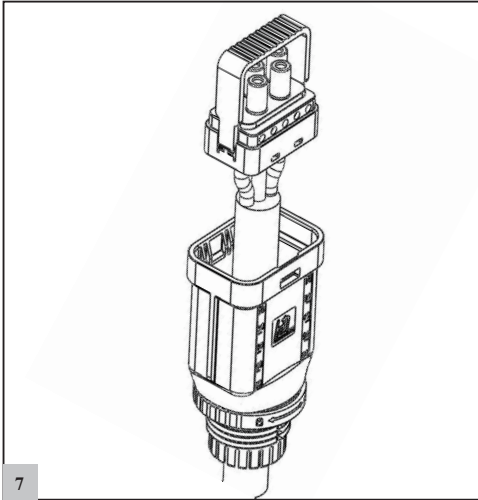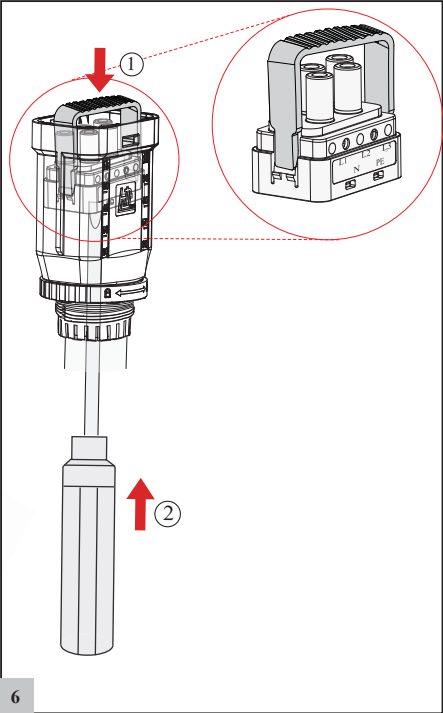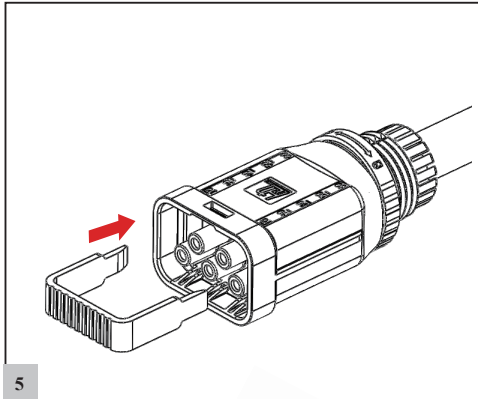
Step 2. Remove the inverter from the mounting bracket.

Step 3. Remove the mounting bracket.

9. Technical Specification

Model	5K	6K	8K	10K
Input (PV)				
Max. Input Voltage	1000V			
MPPT Operating Voltage Range	160-950V			
Max. Input Power	9000W	9000W	15000W	15000W
Max. Input Current	15A/15A	15A/15A	20A/30A	20A/30A
Max. Short Circuit Current	20A/20A	20A/20A	30A/40A	30A/40A
Max. Number of PV Strings	2(1/1)		3(1/2)	
No. of MPPTs	2			
Input (Battery)				
Compatible battery type	Lithium-ion/Lead-acid			
Battery voltage range	150-600V			
Nominal battery voltage (Full load)	250-600V			
Max. charge/discharge current	25A/25A	25A/25A	50A/50A	50A/50A
Max. charge/discharge power	9000W/5800W	9000W/7000W	15000W/9100W	15000W/11300W
Lithium battery charge curve	Self-adaption to BMS			
Output (On Grid)				
Rated Grid voltage	380V/400V/415V 3W+N+PE			
Rated Grid Frequency	50Hz/60Hz			
Grid Frequency Range**	45Hz-55Hz/55Hz-65Hz			
Nom. Power (Output)	5000W	6000W	8000W	10000W
Maximum Power (Output)	5500W	6600W	8800W	11000W
Apparent Power (Output)	5500VA	6600VA	8800VA	11000VA
Maximum Current (Output)	3*8.3A	3*10A	3*13.3A	3*16.7A/3*16A[①]
Maximum Current (Input)	3*25A	3*25A	3*25A	3*25A
THDI	<3%(Rated Power)			
DC Current Injection	<0.5%ln			
Power Factor	> 0.99 Rated power (Adjustable 0.8 Leading - 0.8Lagging)			
Output (Backup)				
Nom. power	5000VA	6000VA	8000VA	10000VA
Maximum power(5min)	6000VA	7200VA	9600VA	12000VA
Maximum power(10s)	7500VA	9000VA	12000VA	15000VA
Rated voltage	380V/400V/415V 3W+N+PE			
Backup switch time	10ms(typical), 20ms(max)			
THDV	<3% (R Load) ,8% (RCD Load)			
Efficiency				
Max. Efficiency (PV to Grid)*	98.2%	98.2%	98.4%	98.4%
European Efficiency (PV to Grid)*	97.2%	97.2%	97.9%	97.9%
Max. Charge Efficiency (PV to Battery)*	98%	98%	98%	98%
Max. Charge/Discharge Efficiency (Grid to Battery)*	98%	98%	98%	98%

①: The specification of "3*16A" is only for British Market.

Protection		
DC switch	Support	
Anti-islanding protection	Support	
AC overcurrent protection	Support	
AC short circuit protection	Support	
AC over-voltage protection	Support	
SPD	DC Type2, AC Type2	
GFCI	Support	
AFCI	Optional	
RSD	Optional (Tigo/APS)	
Insulation detection	Support	
General		
Topology	Transformerless	
IP Rating	IP65	
Cooling	Natural cooling	
Operating Temperature Range	-25℃-60℃	
Relative Humidity Range	0-100%	
Max. Operating Altitude	4000m(>2000m derating)	
Noise	<30dB(Measured at 1m)	
Dimensions (W*H*D)	530*550*213mm	
Weight	29.6KG	32KG
HMI & COM		
Display	APP +LED	
Communication	WiFi/GPRS/4G/Ethernet(optional);	
	BMS(CAN/RS485)	
	DRM	
	1*DI	
	2*DO	
	METER(RS485)	
	RS485	
Certification		
Safety	IEC 62109-1/2 ,IEC 62040,IEC 62477	
EMC	IEC/EN 61000-6-3, IEC 61000-3-11, IEC 61000-3-12, IEC/EN 61000-6-2	
Grid Code	IEC 61727, IEC 62116, EN 50549-1, VDE 4105, AS 4777,CEI 0-21,G98	
Warranty	5 Years/10 Years (Optional)	

Remarks :

- *Not yet test；
- **The range of output voltage and frequency may vary depending upon diffierent grid codes.
- Specifications are subject to change without advance notice.