

iglu



NANUK SE 5/6/8/10KHB-D3P
Energy Storage Hybrid Inverter
User Manual Ver 1.0

For the latest Nanuk SE installation documents in all supported languages, visit:

<https://iglutech.eu/en/>

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE IMPORTANT SAFETY INSTRUCTIONS

This manual contains important instructions for the Nanuk SE hybrid inverter that must be followed during installation and maintenance of the system.

Installation and service require knowledge of high voltage electricity and should only be performed by IGLU TECH Certified Installers. IGLU TECH assumes no liability for injury or property damage due to repairs attempted by unqualified individuals or a failure to properly follow these instructions. These warnings and cautions must be followed when using Nanuk SE energy storage hybrid inverter.

PRODUCT SPECIFICATIONS

All specifications and descriptions contained in this document are verified to be accurate at the time of printing. However, because continuous improvement is a goal at IGLU TECH, we reserve the right to make product modifications at any time.

The images provided in this document are for demonstration purposes only. Depending on the product version and market region, details may appear slightly different.

ERRORS OR OMISSIONS

To communicate any inaccuracies or omissions in this manual, please send an email to:

info@iglutech.eu



ELECTRONIC DEVICE: DO NOT THROW AWAY

Proper disposal of inverter is required. Refer to your local regulations for disposal requirements.

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ABOUT THIS MANUAL

This manual describes the installation, electrical connection, commissioning and maintenance of the NANUK SE three-phase energy storage hybrid 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

Nanuk Se three-phase energy storage hybrid inverters must be installed by professional electrical engineers who have obtained relevant qualifications.

SCOPE

This manual is applicable to the following inverters:

- Nanuk SE 5KHB-D3P
- Nanuk SE 6KHB-D3P
- Nanuk SE 8KHB-D3P
- Nanuk SE 10KHB-D3P

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 ESS inverter to reduce the waste of your resources.

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1. Safety

Warning

Before using the Nanuk SE hybrid 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 Nanuk SE inverter of IGLU TECH 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



DANGER OF HIGH VOLTAGE: Only qualified personnel may perform work on the inverter.



CAUTION, RISK OF ELECTRIC SHOCK, ENERGY STORAGE TIMED DISCHARGE: 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, otherwise there will be a danger of fire.



ENVIRONMENTAL PROTECTION USE PERIOD



REFER TO OPERATING INSTRUCTIONS: Indicates that users should refer to operating or installation instructions before proceeding.



ELECTRONIC DEVICE: DO NOT THROW AWAY: Don't dispose of the inverter with the household waste



GROUNDING TERMINAL

1.2 Safety Precaution

IGLU TECH products are designed with full consideration of safety. However, all electrical appliances can be dangerous if used inappropriately. This can cause a fire or electric shock that leads to severe injury or death. For your protection, please read these safety precautions thoroughly.

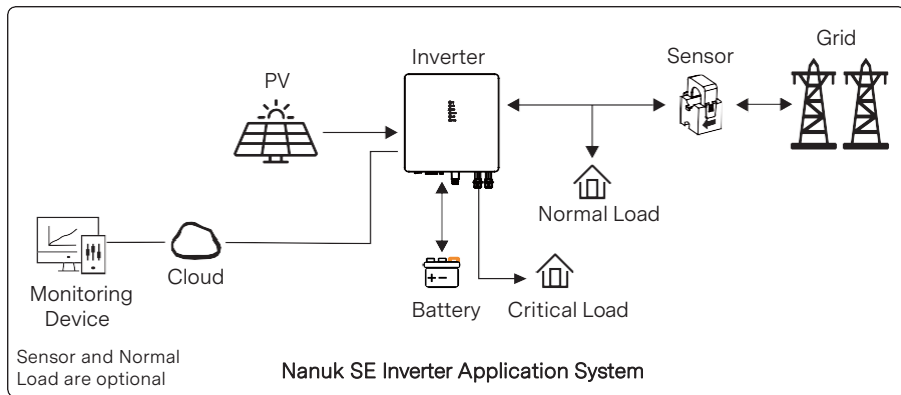
-  **WARNING:** Installation, maintenance and connection of inverters must be performed by qualified personnel, in compliance with local electrical standards, wiring rules and requirements of local power authorities and/or companies.
-  **WARNING:** The temperature of some parts of the inverter may exceed 60°C during operation. Do not touch the inverter during operation to avoid being burnt.
-  **WARNING:** Ensure children are kept away from inverters.
-  **WARNING:** Don't open the front cover of the inverter. Apart 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.
-  **WARNING:** Static electricity may damage electronic components. Appropriate methods must be adopted to prevent such damage to the inverter; otherwise, the inverter may be damaged and the warranty annulled.
-  **WARNING:** 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.
-  **WARNING:** 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.
-  **WARNING:** PV modules should have an IEC61730 class A rating.
-  **WARNING:** If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
-  **WARNING:** 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.
-  **WARNING:** 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 disconnecting from the power sources.
-  **WARNING:** Prohibit inserting or pulling the AC and DC terminals when the inverter is running.
-  **WARNING:** Don't connect NANUK SE inverter in the following ways: The BACKUP Port should not be connected to the grid; A single PV panel string should not be connected to two or more inverters.

2. Product Introduction

2.1 Overview

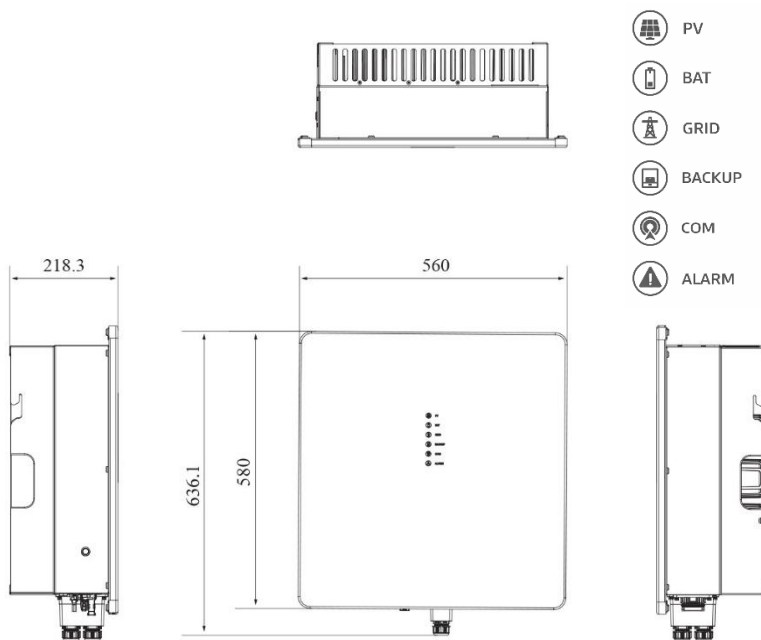
NANUK SE Hybrid Inverters are high-quality inverters which can convert solar energy to AC energy and store energy into battery.

The inverter can be used to optimize self-consumption, store energy in the battery for future use or feed it 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)

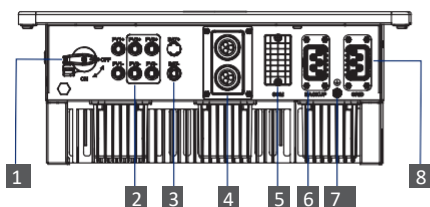


2.2. Product Appearance

The External View of Nanuk SE 5/6/8/10KHB-D3P Inverter Battery



Width (mm)	Height (mm)	Depth (mm)
560.0	580.0	218.3



The bottom view of ESS inverter

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

2.3 Model Definition

The letters in the product model have specific information. (Take 5KHB-D3P as example.)

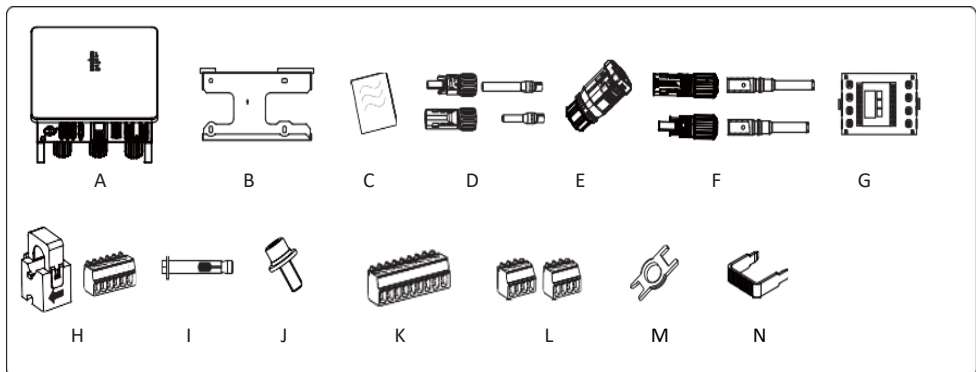
5KHB-D 3 P

5K- Power (5000W)
 HB - Hybrid
 D - Double MPPT Trackers
 3 - Phase configuration
 P - Product generation

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 occur, contact your supplier or IGLU TECH for support.

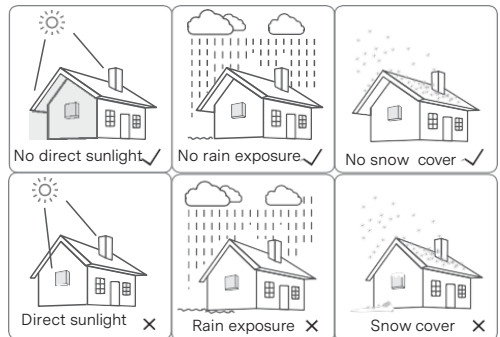


Number	Quantity	Description
A	1	Inverter
B	1	Mounting bracket
C	1	File package
D	3/3	PV connector group (PV+/PV-)
E	2	Grid/Backup connector group
F	1/1	Battery connector group (BAT+/BAT-)
G	1	Meter (Optional)
H	1	CT pack (3pcs CT + 1pc 6-Pin terminal)
I	4	M10 Expansion screw
J	1	M6 Security screw
K	1	9-Pin terminal
L	2	4-Pin terminal
M	1	Removal tool for PV/BAT connector
N	1	Removal tool for Grid/Backup connector group

3.2 Selecting the Mounting Location

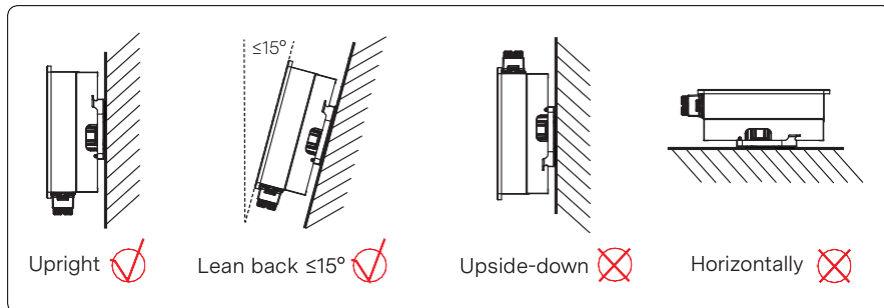
3.2.1 Installation Environment Requirements

- The storage inverter protection class is IP65 and can be mounted indoors or outdoors
- 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.
- The inverter carrier must be fire-proof. Do not mount the inverter on flammable building materials.
- Ensure that the wall meets the requirements of the inverter installation.
- Product label and warning symbols shall be clear to read after installation.
- The installation height should be reasonable and make sure it is easy to operate and view the display.
- Please avoid direct sunlight, rain exposure, snow cover.



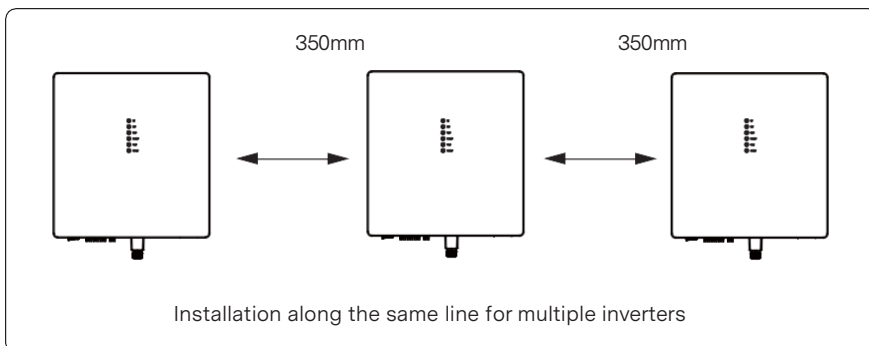
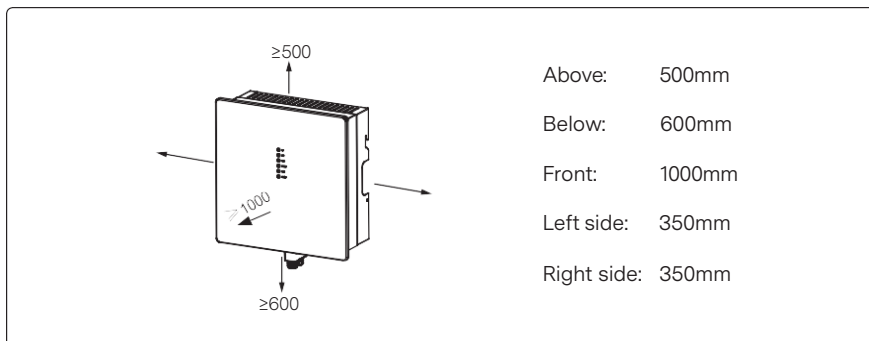
3.2.2 Mounting Requirements

Mount the inverter vertically or tilted backward by max 15°. Never install the inverter in the wrong way. Always make the connection area downward.



3.2.3 Installation Space Requirements

Follow the installation space requirements shown in the figures below to ensure the inverter can run normally and easily operate



3.3 Mounting

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

Step 1. Install the mounting bracket.

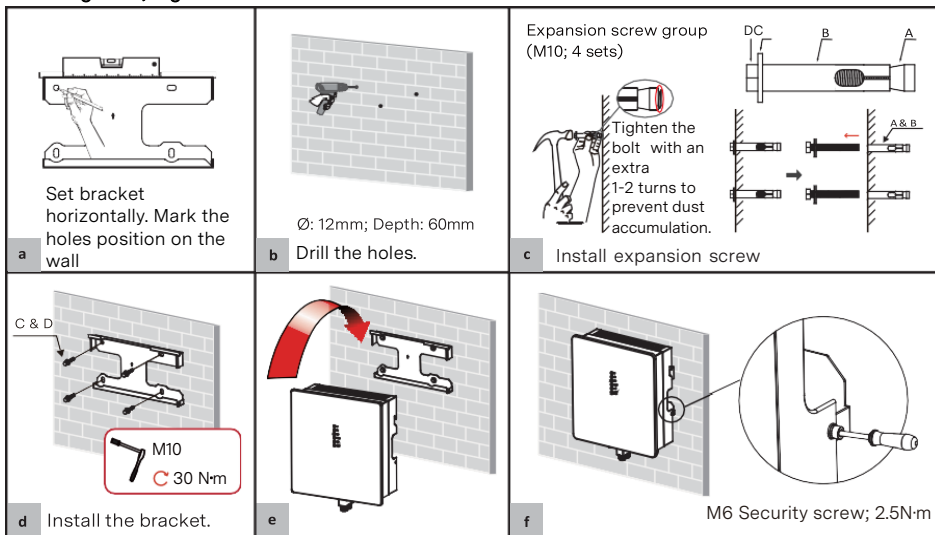
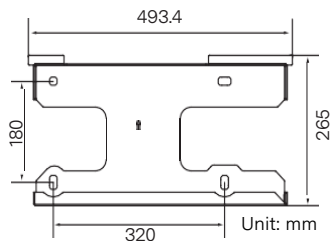
1. Use a level ruler to mark the position of 4 holes on the wall. Refer to Figure a. Then drill 4 holes, 12mm in diameter and 60mm in depth. Refer to Figure b.
2. Tighten the bolts with an extra 1-2 turns to prevent dust accumulation, then knock the expansion screw groups into the holes with a hammer. Refer to Figure c.

Note: Do not remove the threaded bolts and gaskets in this step.

3. Make sure the expansion tubes are tightened, then unscrew the threaded bolts and gaskets. Refer to Figure c

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

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



Danger

Before drilling holes, check whether there are electric power pipes or other pipes buried in the walls to avoid risks.

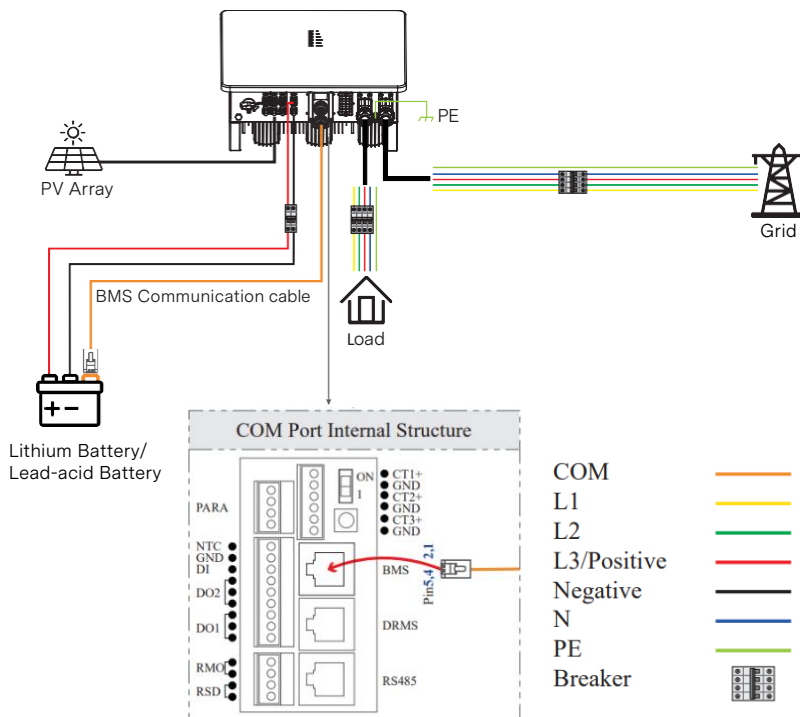


To prevent potential damages and injuries from inverter falling down, please hang the inverter on the bracket, do not loosen grip unless confirm the inverter is well mounted.

4. Electrical Connection

This chapter shows the detailed electrical connection of the three-phase Nanuk SE inverter.

Non-Parallel Connection Wiring Diagram for Whole-House Load



NOTE:

1. BMS communication connection is only for lithium battery.

2. About breakers:

DC breaker on battery side $\geq 80A$

AC breaker on load side $\geq 40A$

AC breaker on grid side $\geq 40A$

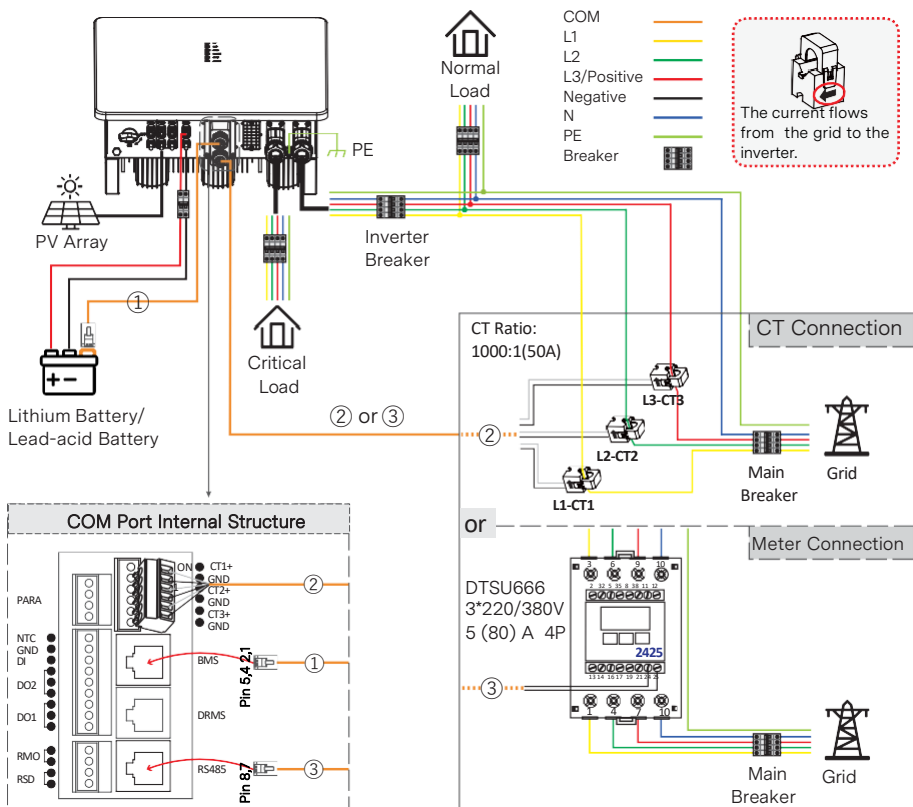
The specifications of main breaker and normal load breaker depend on household loads.



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, high voltage may result in fatal injury.

Non-Parallel Connection Wiring Diagram



NOTE:

1. BMS communication connection is only for lithium battery.

2. Meter is optional.

3. About breakers:

DC breaker on battery side $\geq 80A$;

AC breaker on critical load side $\geq 40A$;

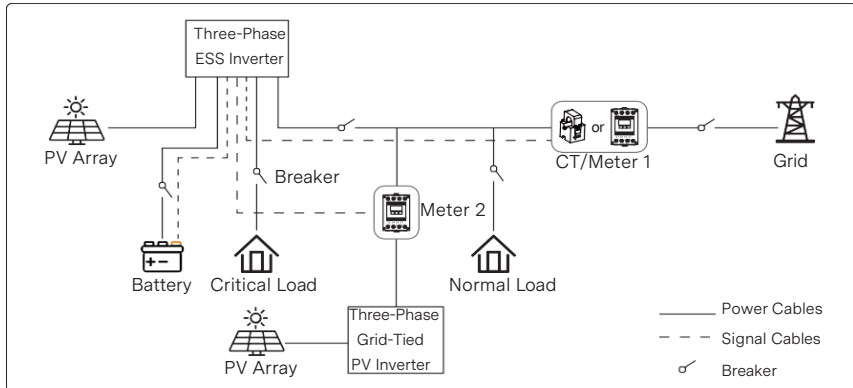
AC breaker on inverter side $\geq 40A$.

The specifications of main breaker and normal load breaker depend on household loads.

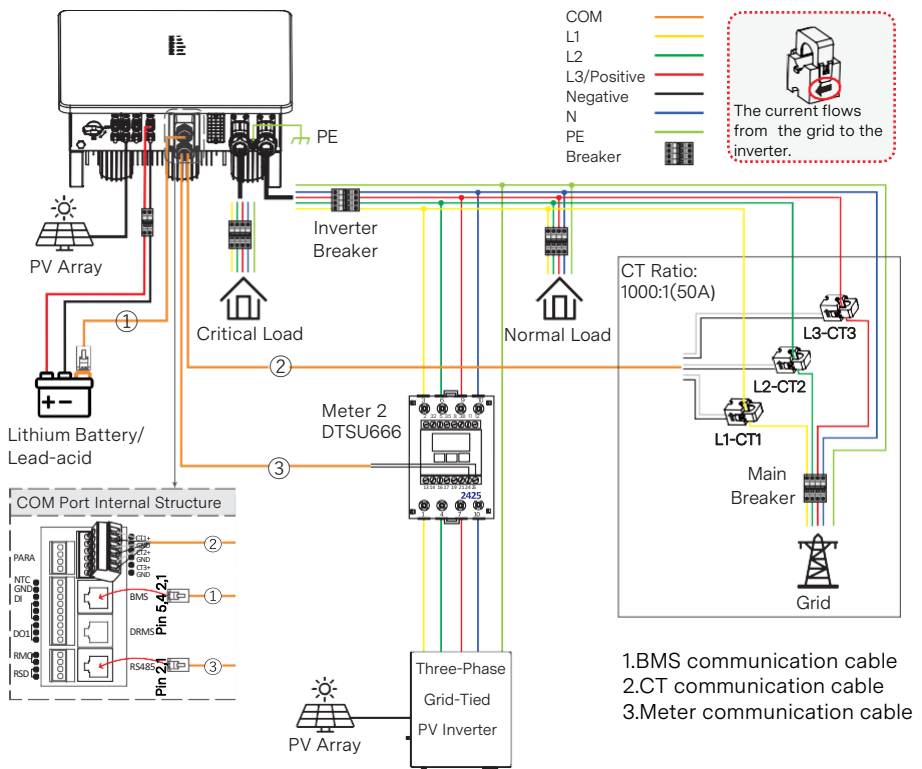
Danger

Ensure that the inverter and all cables to be installed have been completely powered off during the whole process of installation and connection. Otherwise, high voltage may result in fatal injury.

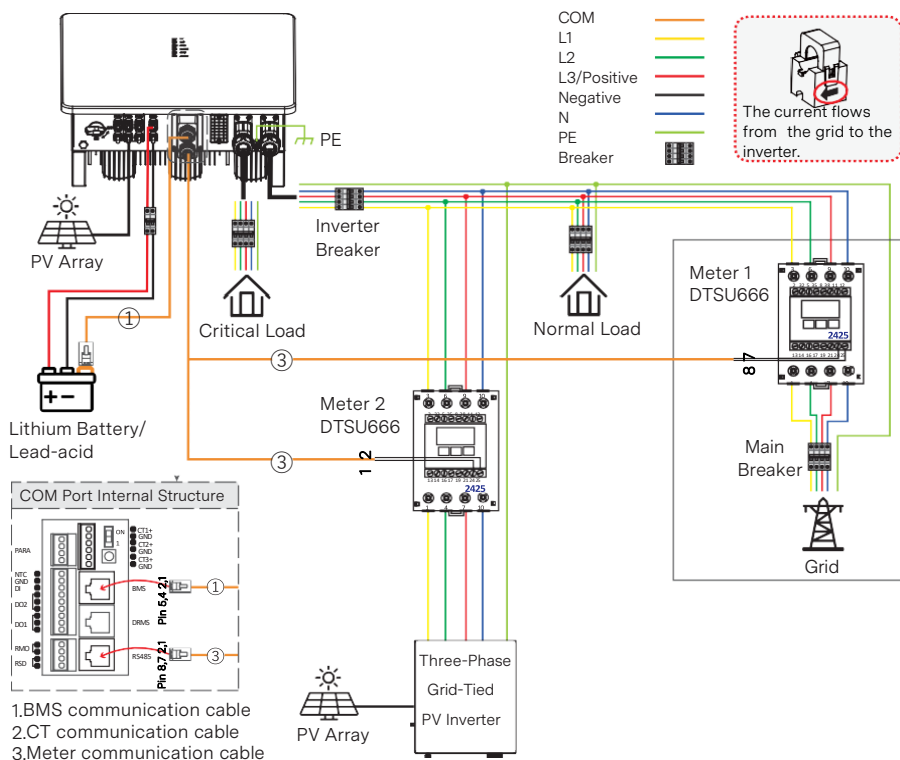
AC Coupling Connection Wiring Overview



AC Coupling Connection Wiring Diagram-Scheme 1



AC Coupling Connection Wiring Diagram-Scheme 2



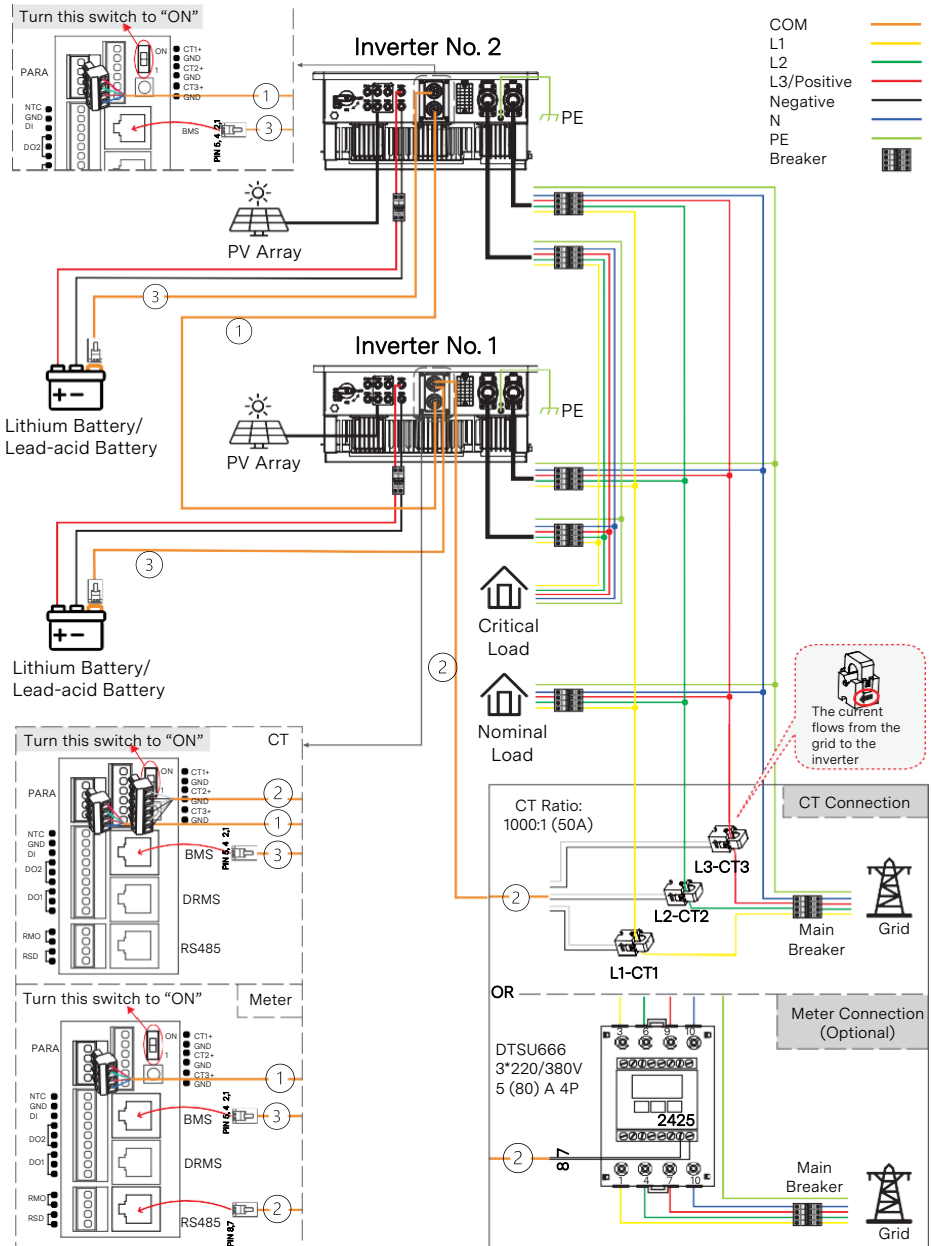
Note for Scheme 1 and Scheme 2:

1. BMS communication connection is only for lithium battery.
2. Meter 1 is optional.
3. About breakers: DC breaker on battery side $\geq 80A$; AC breaker on critical load side $\geq 40A$; AC breaker on inverter side $\geq 40A$. The specifications of main breaker and normal load breaker depend on household loads.
4. Ensure that the Grid phase sequence is the same for both the ESS inverter and Grid-Tied PV inverter, and the grid phases between the inverters must be connected correctly.
5. When connecting the meter, the phase of the meter should be consistent with that of the ESS inverter and Grid-Tied PV inverter
6. Ensure that meter 1 and meter 2 are wired properly and correctly, otherwise unpredictable problems may occur.
7. If the current flowing through the meter is too high, use CT+meter.

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, high voltage may result in fatal injury.

Parallel Connection Wiring Diagram-Scheme A (N=2)



- 1.Parallel communication connection
- 2.CT/Meter communication connection
- 3.BMS communication connection

* CT/ Meter communication cable can be connected to any inverter of the parallel system and this inverter will be inverter No.1.

Note for Scheme A:

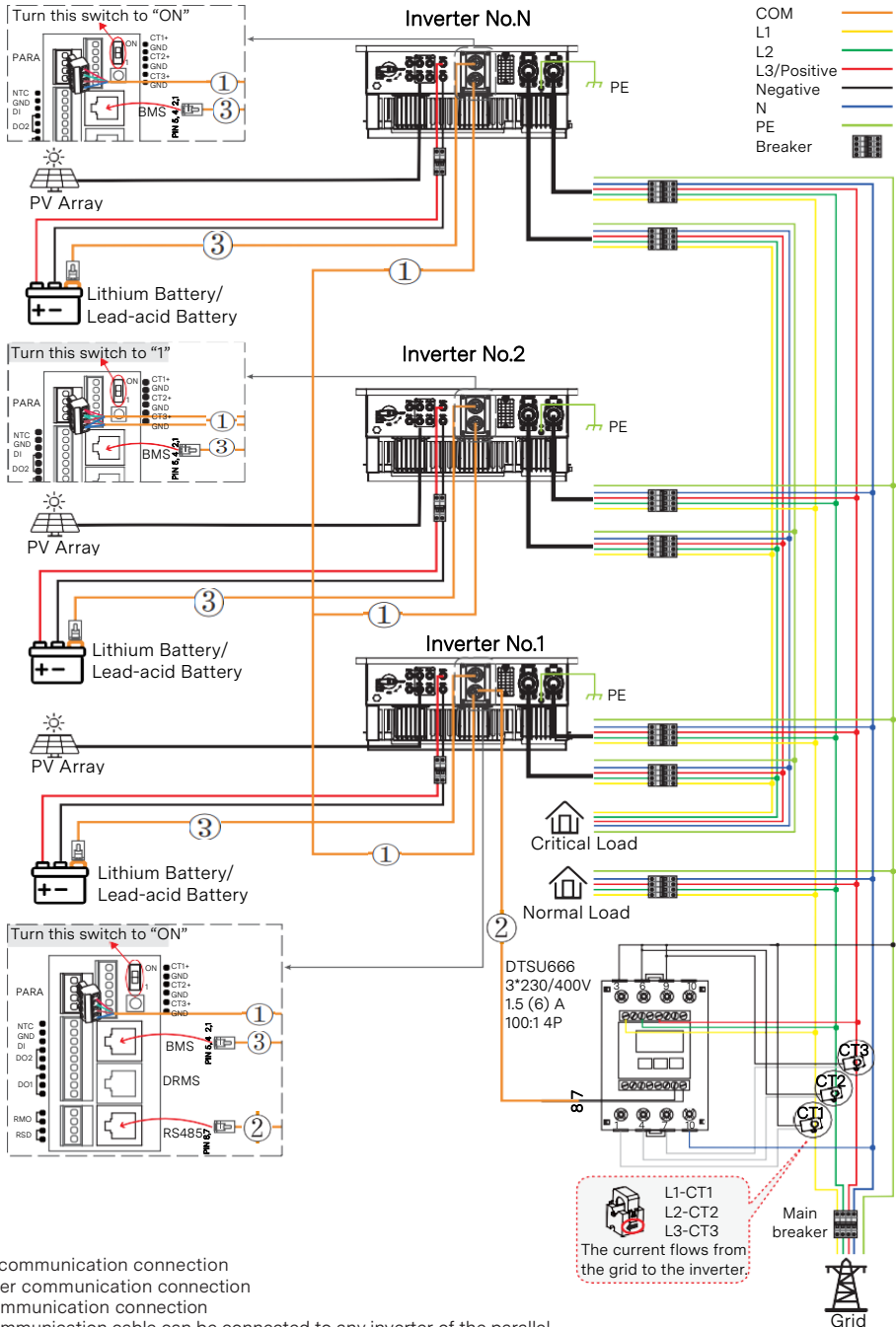
1. BMS communication connection is only for lithium battery.
2. Meter is optional.
3. With parallel connection mode, it is necessary to connect APP to one of inverters and then go to *Console > Hybrid Setting > Other > Parallel mode* page to enable *Parallel mode* on APP. For more information, please refer to manual “Nanuk SE Energy Storage Hybrid Inverter Application Guide”
4. About breakers:
DC breaker on battery side $\geq 80\text{A}$
AC breaker on critical load side $\geq 40\text{A}$
AC breaker on inverter side $\geq 40\text{A}$
The specifications of main breaker and normal load breaker depend on household loads.



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, high voltage may result in fatal injury.

Parallel Connection Wiring Diagram-Scheme B ($2 < N \leq 9$)



- 1.Parallel communication connection
- 2.CT/Meter communication connection
- 3.BMS communication connection

*Meter communication cable can be connected to any inverter of the parallel system and this inverter will be inverter No.1.

Note for Scheme B:

1. BMS communication connection is only for lithium battery.
2. It is necessary to turn the matched resistance switch of inverter No.1 and inverter No.N to “ON” and turn others to “1” in parallel connection mode.
3. With parallel connection mode, it is necessary to connect APP to one of inverters and then go to *Console > Hybrid Setting> Other > Parallel mode* page to enable *Parallel mode* on APP. For more information, please refer to manual “Nanuk SE Energy Storage Hybrid Inverter Application Guide”
4. About breakers:
 DC breaker on battery side $\geq 80A$
 AC breaker on critical load side $\geq 40A$
 AC breaker on inverter side $\geq 40A$
 The specifications of main breaker and normal load breaker depend on household loads.

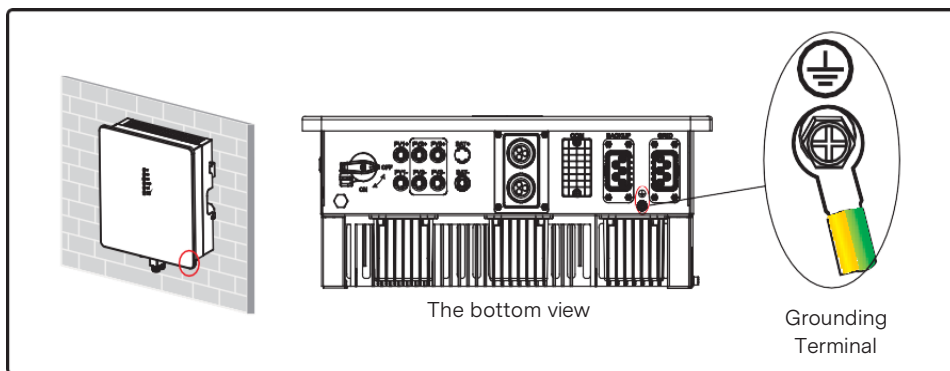


Danger

Ensure that the inverter and all cables to be installed have been completely powered off during the whole process of installation and connection. Otherwise, high voltage may result in fatal injury.

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 green-yellow wires are recommended.



Warning

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

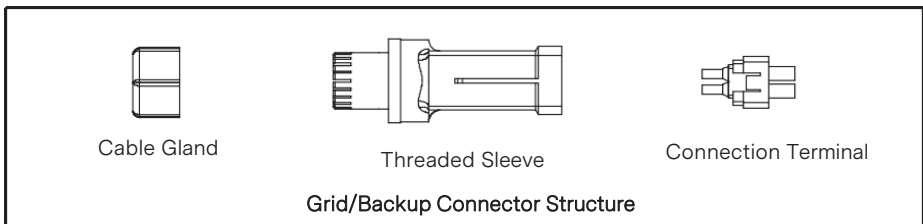
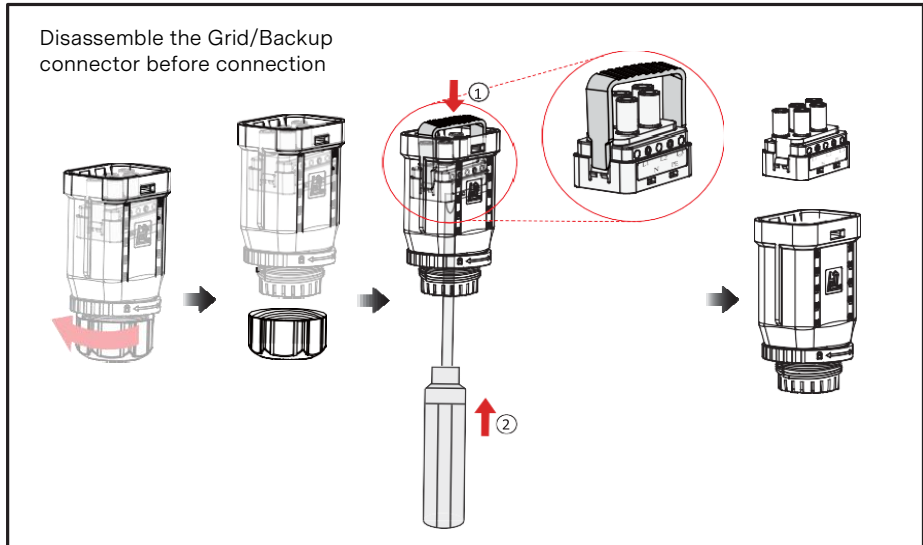


Caution

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.

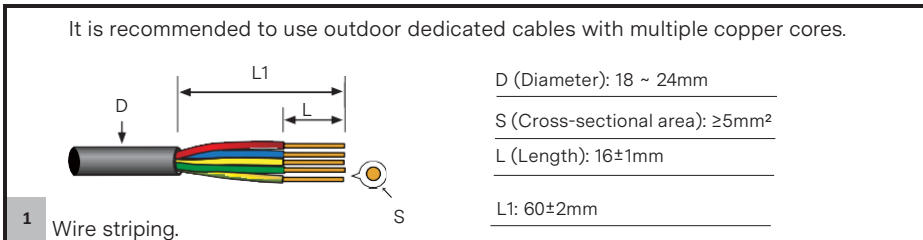
4.2 Grid/Backup Connection

This section explains the requirements and procedures of Grid/Backup connection. Read carefully before connecting.



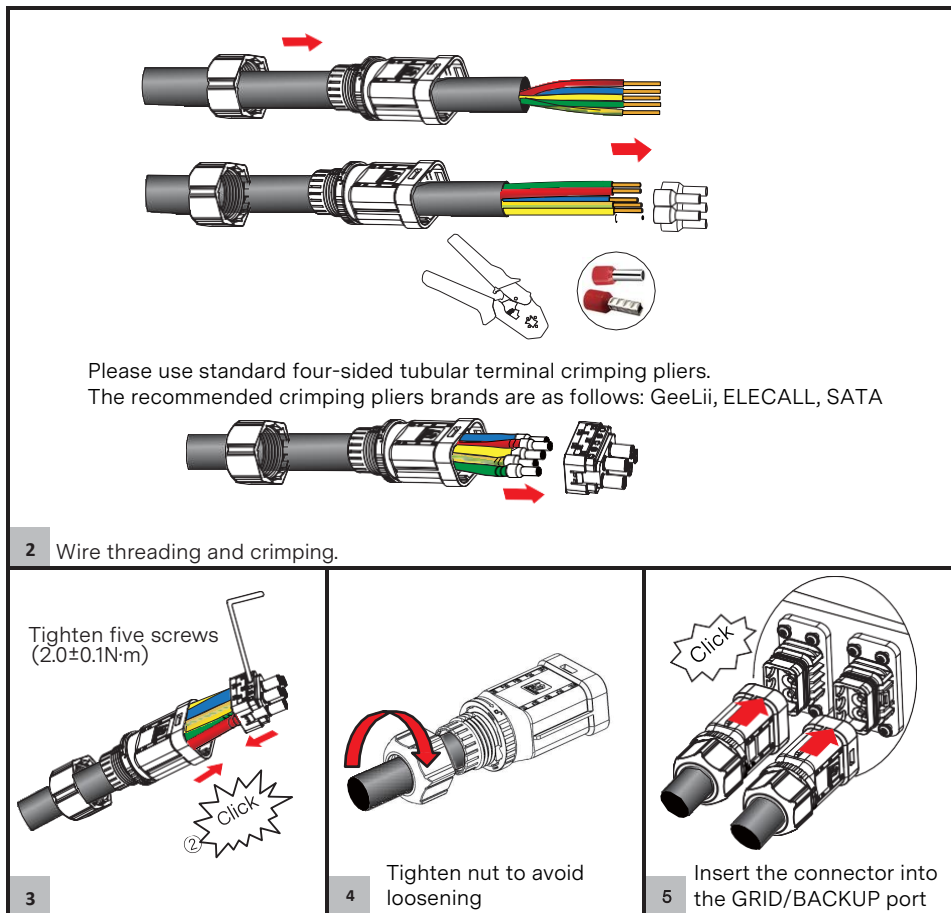
Grid/Backup connection please refer to below:

Step 1: Assemble the AC connector



Notice

Before connecting the Grid/Backup connector, 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.



Step 2: Connect the AC connector.

An AC breaker ($\geq 40A$) should be installed between inverter and the Grid/Backup.

- 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.
- Connect the PE conductor to grounding electrode and connect the N and L conductors to AC breaker.
- Connect the AC breakers to the Grid/Backup.



Notice

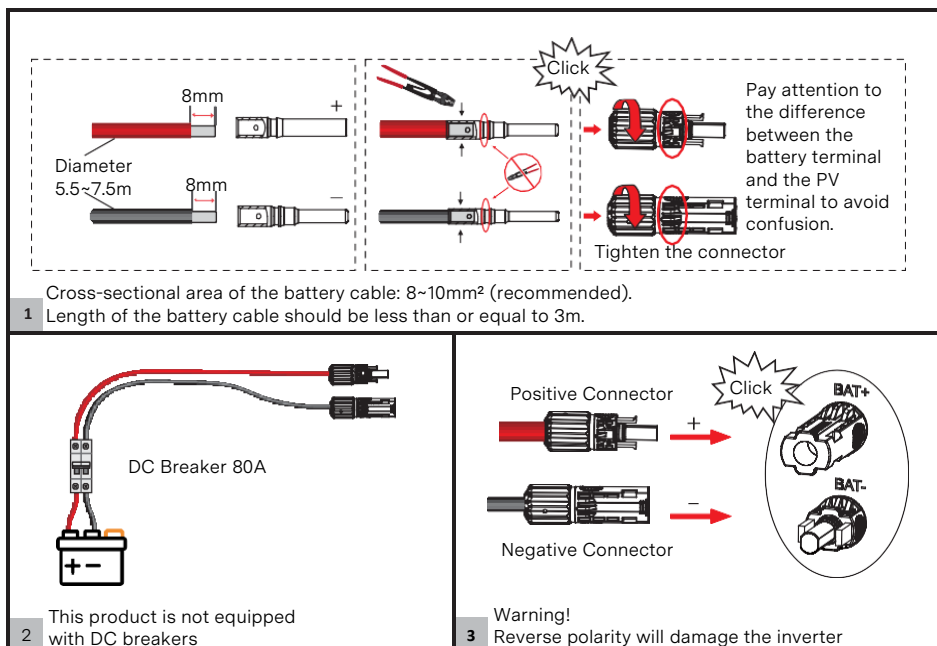
- Multiple inverters are not allowed to share a circuit breaker.
- Load is not allowed to connect between the grid and the AC breaker

4.3 Battery Connection

This part in this manual only describes 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 are using.

Nanuk SE Three-phase ESS inverter now only supports the lithium / lead-acid battery. The recommended lithium battery brands are as follows: IGLU TECH, Weco, Pylon tech, UZ energy series.

Before connecting to battery, please install a separate DC breaker between inverter and battery. This ensures the inverter can be securely disconnected during maintenance.



Warning

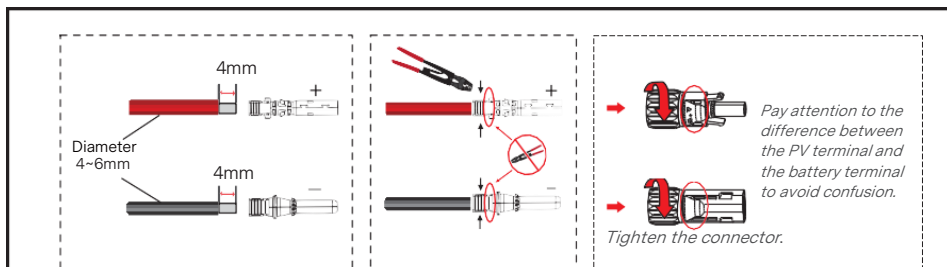
- Reverse polarity will damage the inverter!
- Be careful of electric shock and chemical hazards!
- To reduce risk of injury, please use the suitable recommended cable size.

Battery Communication Connection

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

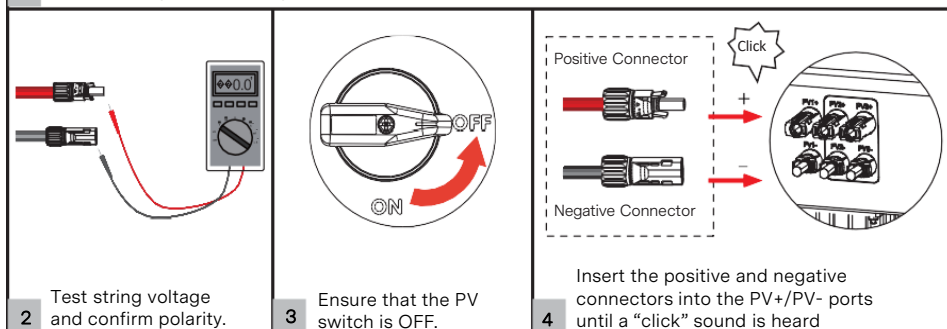
4.4 PV Connection

This section explains the requirements and procedures of PV connection. Read carefully before connecting.



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

1 Wires making and crimping.



Notice

- Before connecting 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 33.3k Ω , there is a risk of shock hazard if the requirement of minimum resistance is not met.



Warning

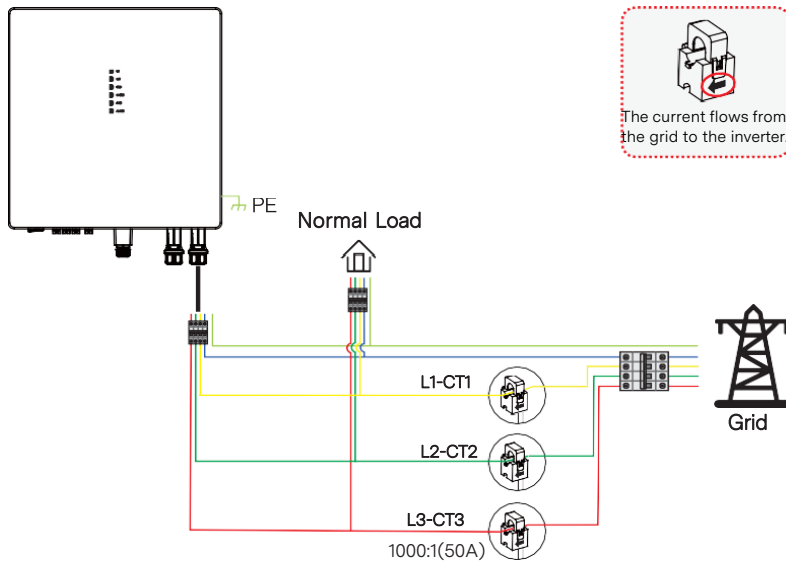
Please check polarity of PV connectors! If polarity reversed, do not try to disconnect any PV connector until the irradiance declines and the DC currents fall below 0.5A! Only then disconnect the PV plugs and correct the polarity before reconnecting.

4.5 CT/Meter Connection (Direct connect)

A CT/Meter is applied to monitor electricity usage of all loads. CT is provided by default

4.5.1 CT Connection

Before connecting to Grid, please install a separate AC breaker ($\geq 40A$; not equipped) between CT and Grid. This ensures the inverter can be securely disconnected during maintenance. The connection diagram of power cable of CT is as shown in the figure below:



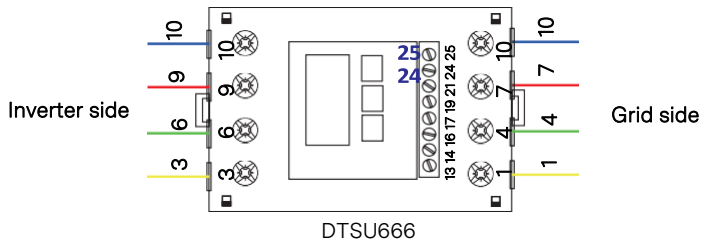
The arrow on the CT indicates that the current flows from the grid to the inverter. When connecting CT, lead the live line through the detection hole of CT and pay attention to the direction of the CT arrow.

NOTE:

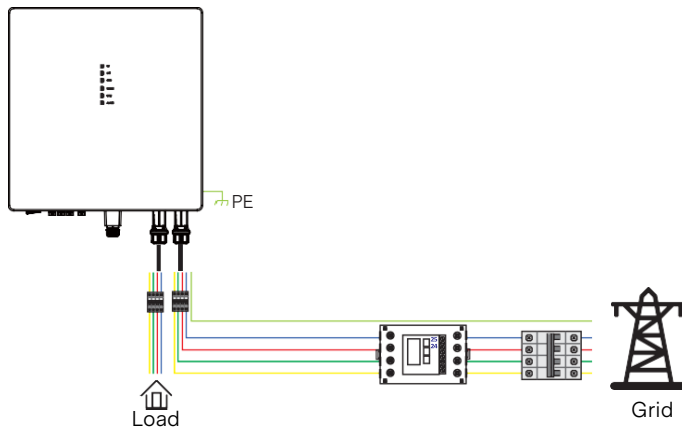
The current direction from grid to inverter is defined as positive and current direction from inverter to grid is defined as negative.

4.5.2 Meter Connection

This section is applicable to non-parallel connection mode only. Nanuk SE inverter supports the meter CHINT-DTSU666 by default.



Before connecting to Grid, please install a separate AC breaker ($\geq 40A$; not equipped) between meter and Grid. This ensures the inverter can be securely disconnected during maintenance. The connection diagram of power cable of meter is as shown in the figure below:

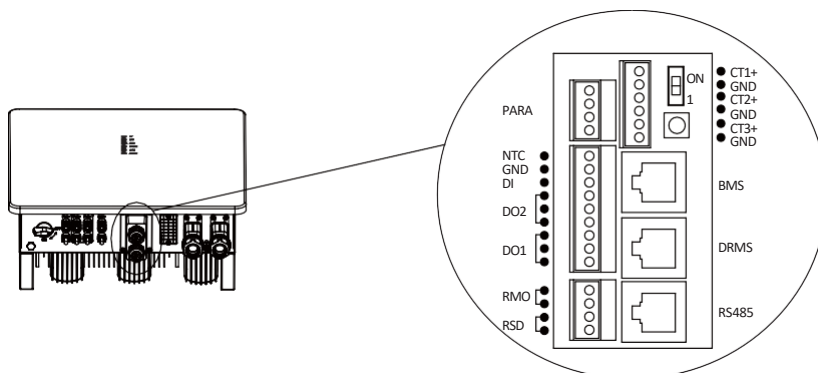


NOTE:

Meter is optional. Please refer to the meter instruction manual for details

4.6 Communication Connection

The interfaces of the communication port on the bottom of the inverter are as below:



Interface		Descriptions
CT		6-Pin interface for grid/load current sensor.
BMS		Lithium battery communication interface
DRMS		Demand response mode for Australia application
RS485		RS485 communication (Monitoring/Meter)
PARA		4-Pin interface for parallel communication
		A matched resistance switch for parallel communication
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)

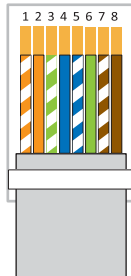
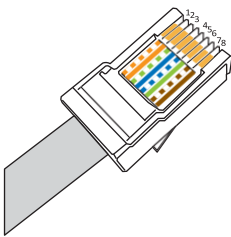
RJ45 Terminal Configuration of Battery Communication at Inverter Side



NOTE:

This manual ONLY illustrates the pinout sequence of BMS at INVERTER SIDE. For details about the pinout sequence at battery side, see the user manual of the battery you use, and the following pinout diagram of battery side is only for illustration.

Standard RJ45 Pinout



RJ45 Pin Configuration	
Pin	Color
1	White-Orange
2	Orange
3	White-Green
4	Blue
5	White-Blue
6	Green
7	White-Brown
8	Brown

Always face the flat side of the terminal, and count the pin slots from left to right, which correspond to 1 to 8. Read the pin definitions of both the battery and inverter carefully.

Pin definition of terminal

INVERTER:

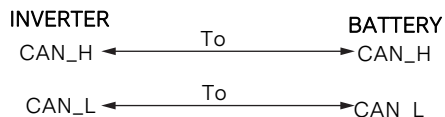
Inverter	
Pin	Definition
1	RS485_A
2	RS485_B
3	GND
4	CAN_H
5	CAN_L
6	/
7	/
8	/

BATTERY:

An example of the battery's pin configuration is as follows:

Battery (example)	
Pin	Definition
1	NC
2	NC
3	GND_S
4	CAN_H
5	CAN_L
6	GND_S
7	NC
8	NC

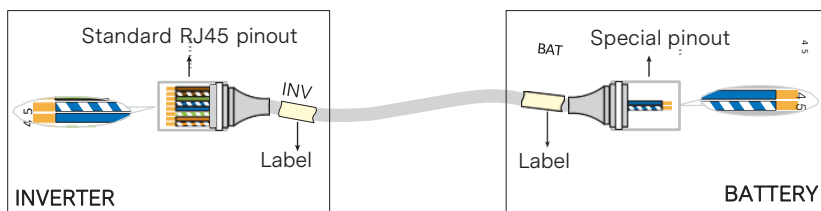
CAN BUS connection principle:



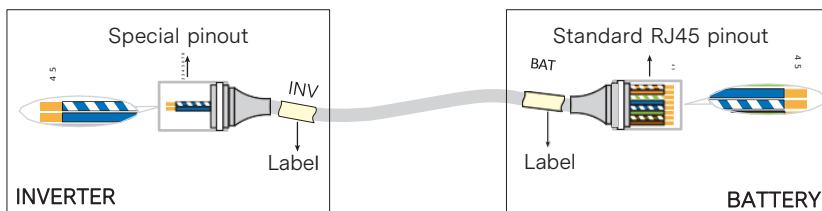
BMS communication cable prepare

1. Prepare RJ45 terminals and strip appropriate length of COM cables.
2. According to pin definitions and cable order, assemble the RJ45 terminals and crimp communication wires. There are two methods to assemble the RJ45 terminals.
3. Then label the RJ45 terminals (BAT or INV) to avoid confusion.
4. After finishing wire-making, use a multimeter or other specific tool to determine if your cable is good, bad, or wired incorrectly.

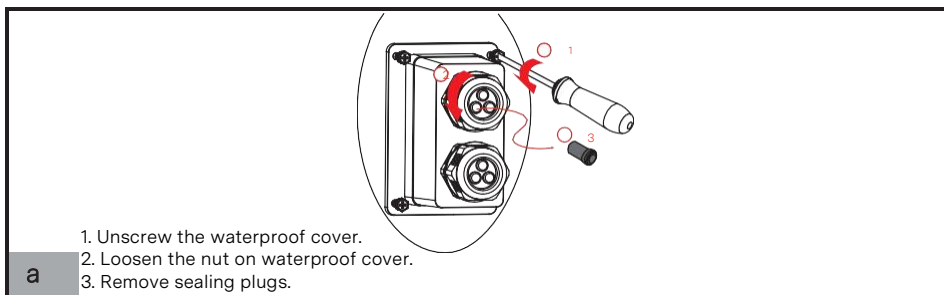
Method 1: Use the INVERTER RJ45 pinout as the standard pinout to crimp wires, then the battery side will be a non-standard one (special pinout). Cut off the other no-used wires (1/2/3/6/7/8) for the battery RJ45 terminal.

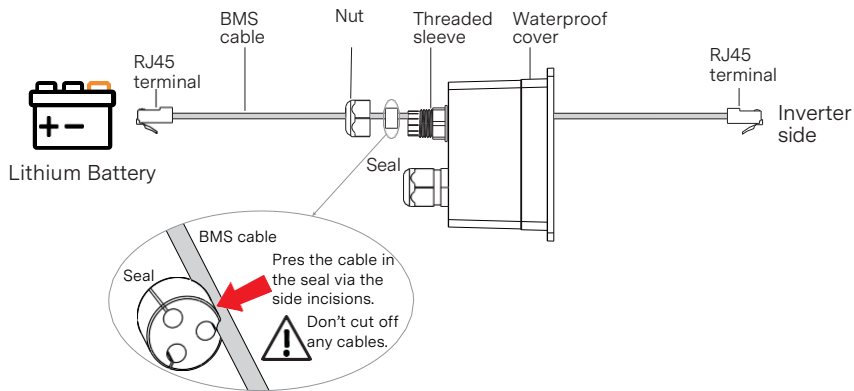


Method 2: Use the BATTERY RJ45 pinout as the standard pinout to crimp wires, then the inverter side will be a non-standard one (special pinout). Cut off the other no-used wires (1/2/3/6/7/8) for the inverter RJ45 terminal.

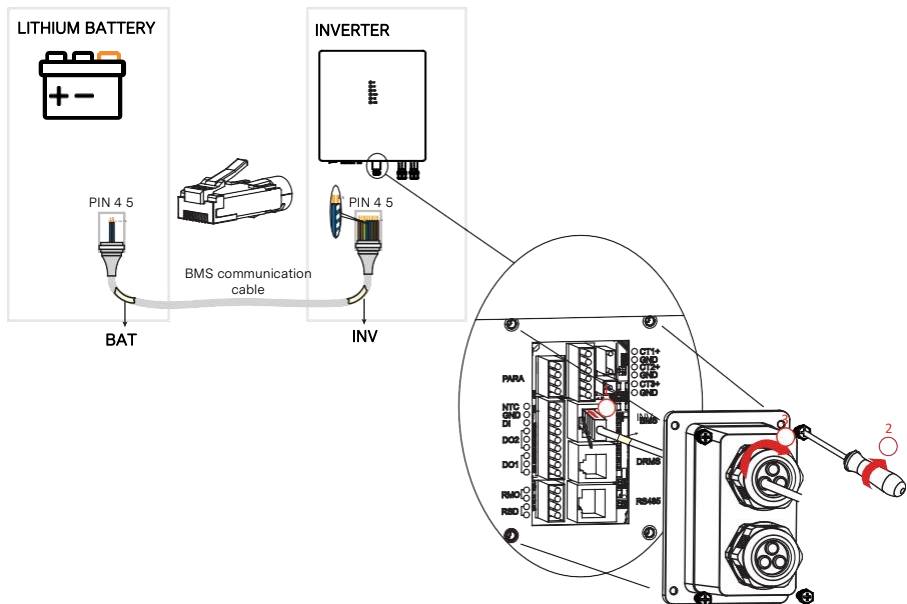


BMS communication cable connection





- b** Lead the BMS cable through the nut, seal and waterproof cover in turn.



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

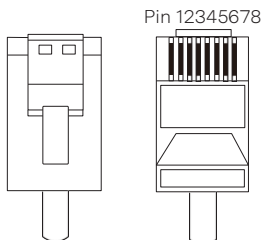
c

4.6.2 DRMs Connection

DRMs is a shortened form for “inverter demand response modes”. It is a compulsory requirement 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. For more information, please refer to manual “Nanuk SE Energy Storage Hybrid Inverter Application Guide”

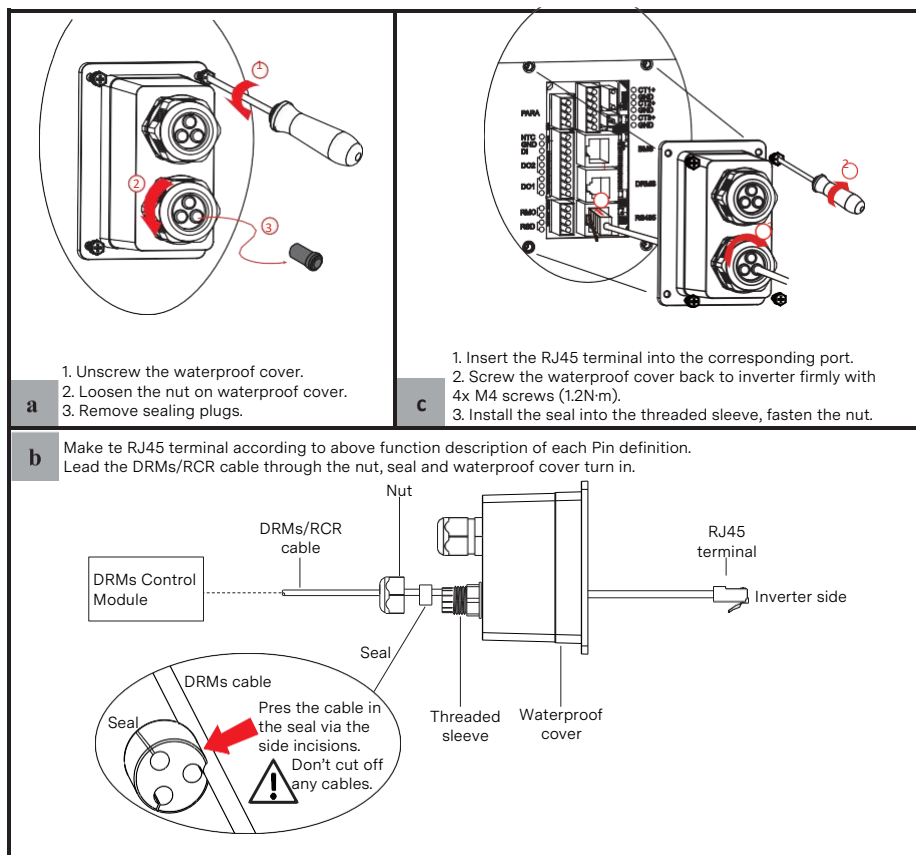
RJ45 Terminal Configuration of DRMs



DRMs

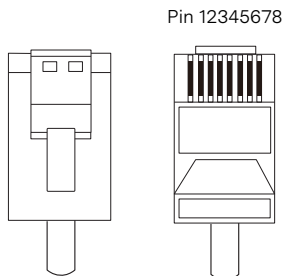
PIN	1	2	3	4	5	6	7	8
Function Description	DRMs 1/5	DRMs 2/6	DRMs 3/7	DRMs 4/8	REF	GND	/	/

Refer to the following steps:



4.6.3 RS485 Communication (Monitoring/Meter Connection)

RJ45 Terminal Configuration of Monitoring/Meter Communication

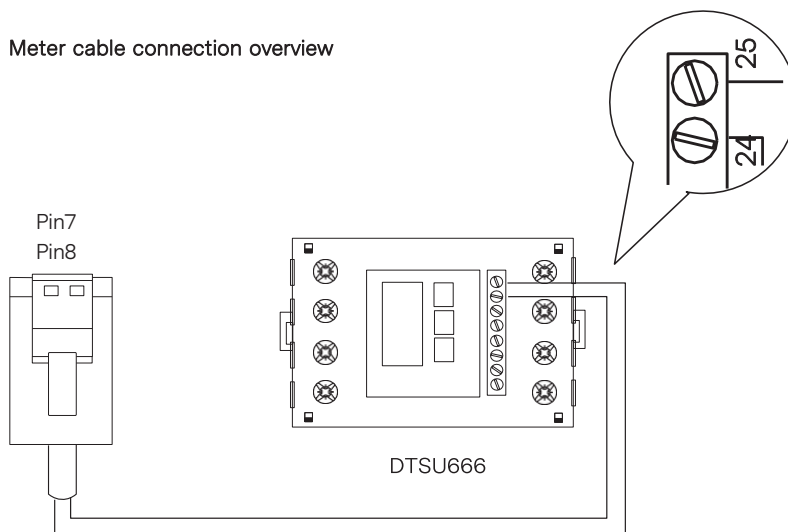


PIN	1	2	3	4	5	6	7	8
Function Description	RS485_A	RS485_B	/	/	/	/	RS485_A	RS485_B

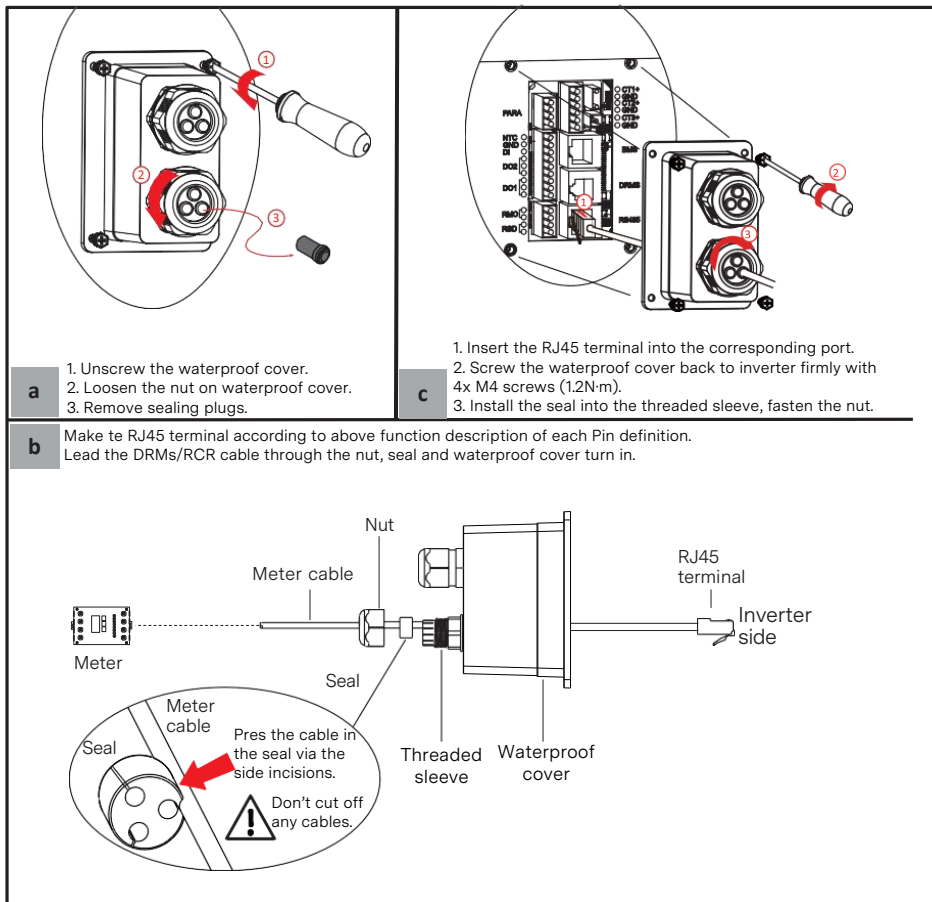
Inverter	Meter1
Pin7(RS485_A)	Pin24
Pin8(RS485_B)	Pin25

Inverter	Monitoring/Meter2
Pin1(RS485_A)	RS485_A
Pin2(RS485_B)	RS485_B

Meter cable connection overview

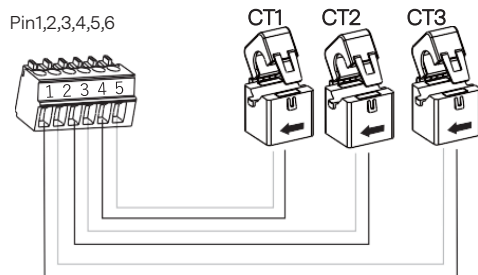


Connect meter. Refer to the following steps:



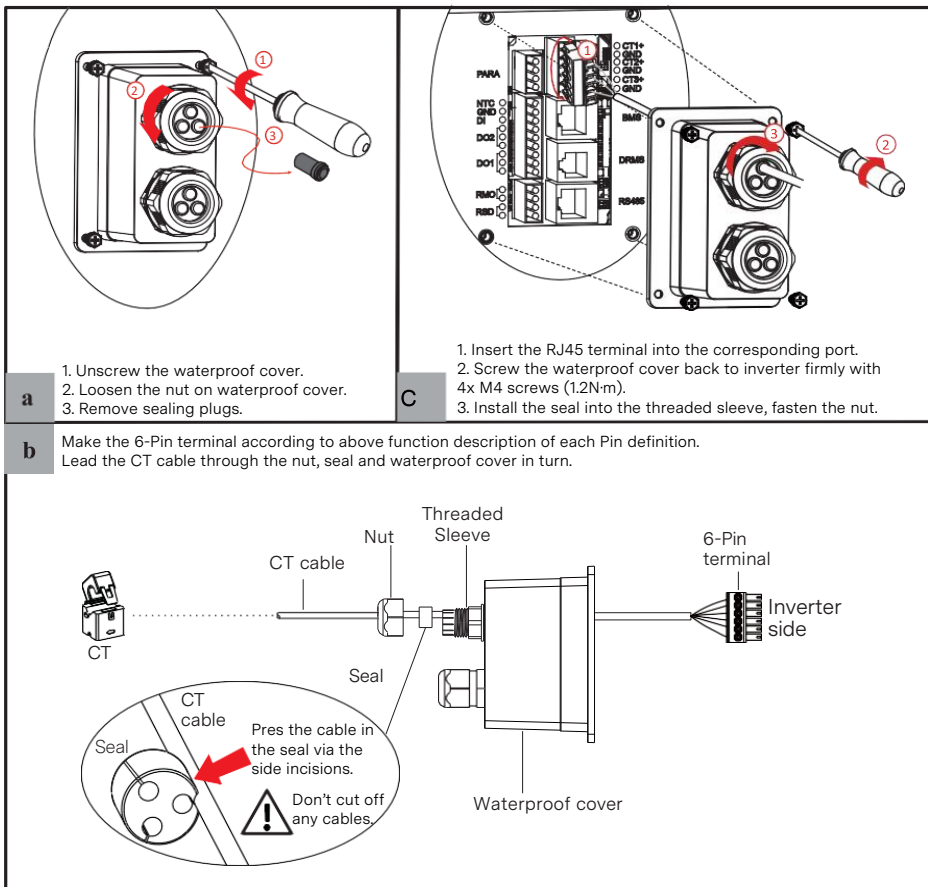
4.6.4 CT Connection

CT cable connection overview



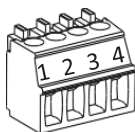
	Inverter	CT
L1 <	Pin1(GND)	Black
	Pin2(CT3+)	White
L2 <	Pin3(GND)	Black
	Pin4(CT2+)	White
L3 <	Pin5(GND)	Black
	Pin6(CT1+)	White

Connect CT. Refer to the following steps:



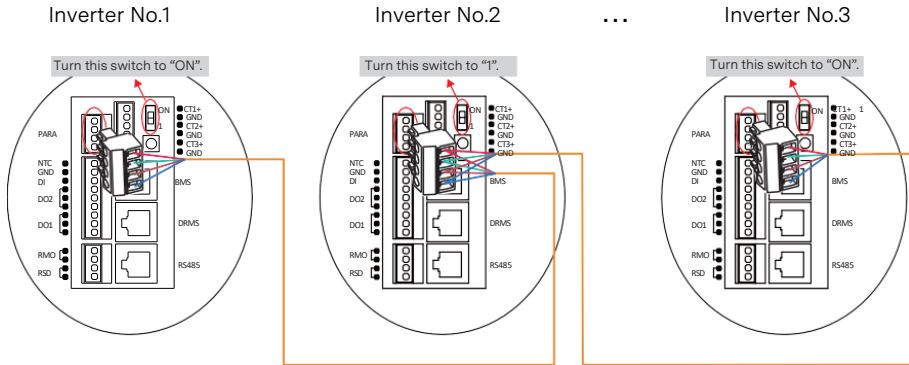
4.6.5 Parallel Communication Connection

Pin Terminal Configuration of parallel Communication



PIN	1	2	3	4
Function Description	GND_S	PARA_SYNC	CAN_L	CAN_H

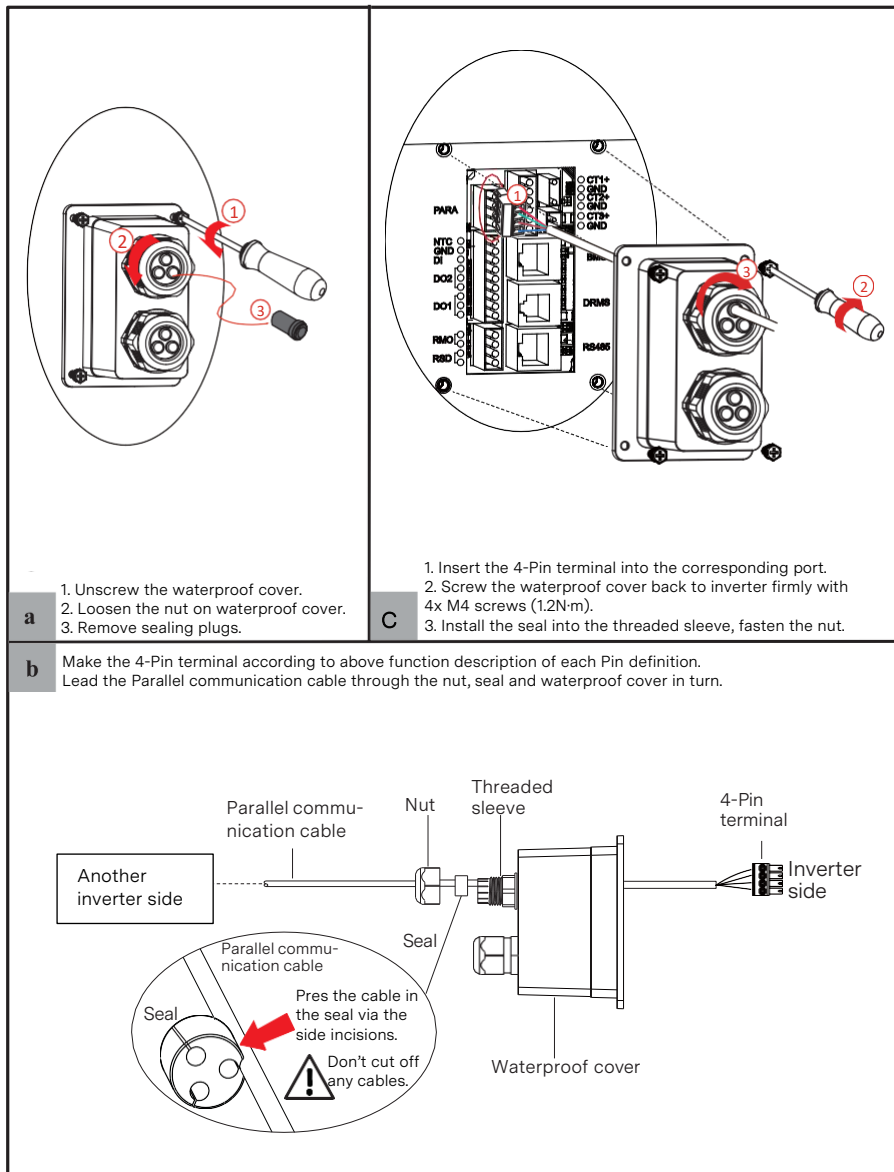
Parallel communication cable connection overview



It is necessary to turn the matched resistance switch of inverter No.1 and inverter No.N to “ON” and turn the matched resistance switch of others to “1” 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)

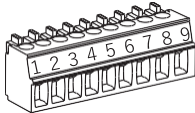
Refer to the following steps:



4.6.6 NTC/DI/DO Connection(s)

9-Pin 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+

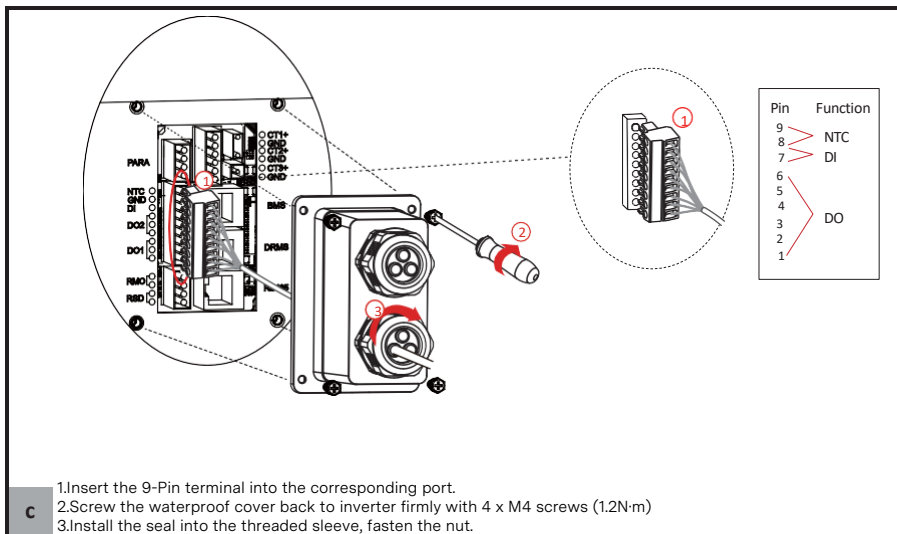
Refer to the following steps:

a

b

1. Unscrew the waterproof cover.
2. Loosen the nut on waterproof cover.
3. Remove sealing plugs.

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 nut, seal and waterproof cover in turn.



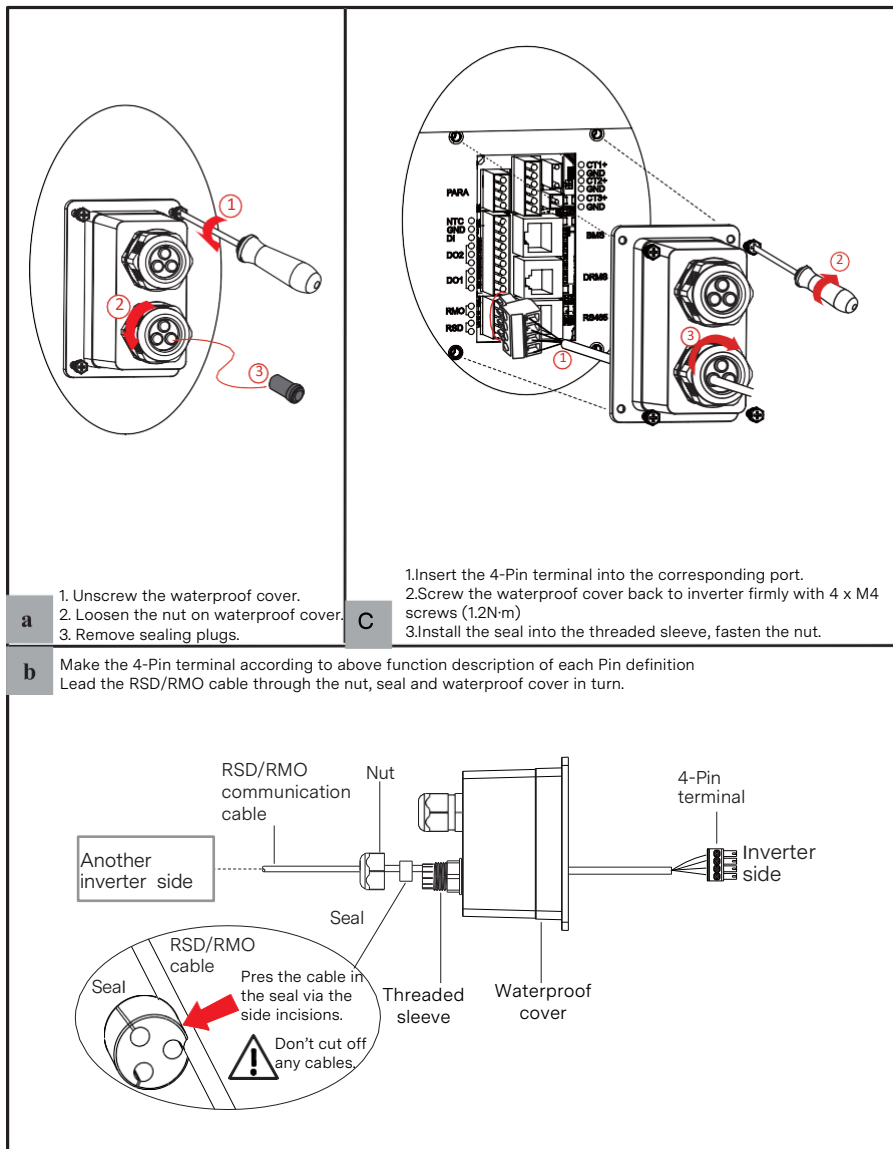
4.6.7 RSD/RMO Connection(s)

4-Pin Terminal Configuration of RSD/RMO Communication



PIN	1	2	3	4
Function Description	+12V	GND	GND	REMOTE OFF

Refer to the following steps:



5. System Operation

5.1 Inverter Working Mode

The Nanuk SE hybrid inverter supports several different working modes.

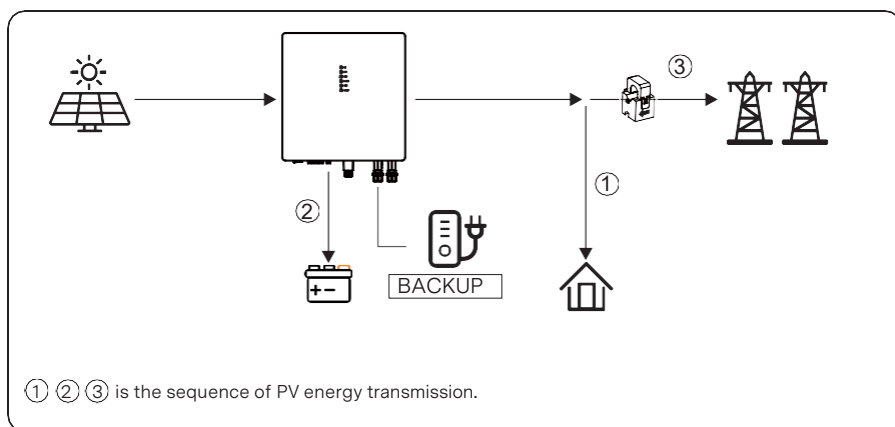
5.1.1 Self-consumption Mode

Go to *Console > Hybrid Setting > Work mode* page, and select *Self-consumption mode*. For more information, please refer to manual “Nanuk SE Energy Storage Hybrid Inverter Application Guide”

Under Self-consumption 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-consumption working mode based on PV energy.

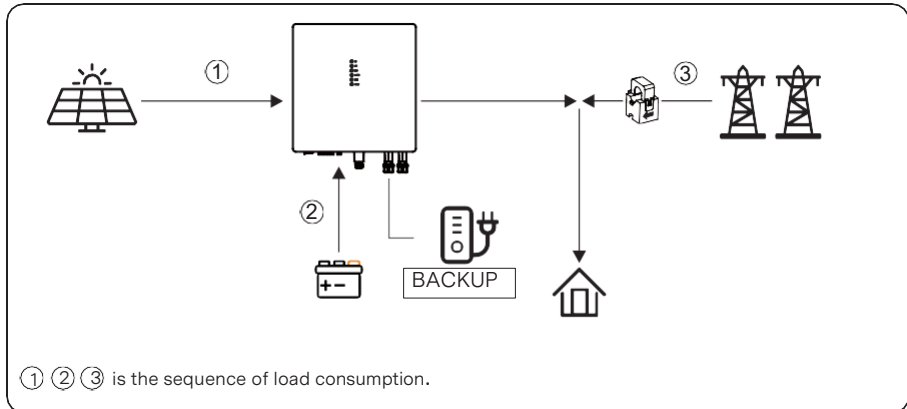
a) Wealthy PV Energy

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.



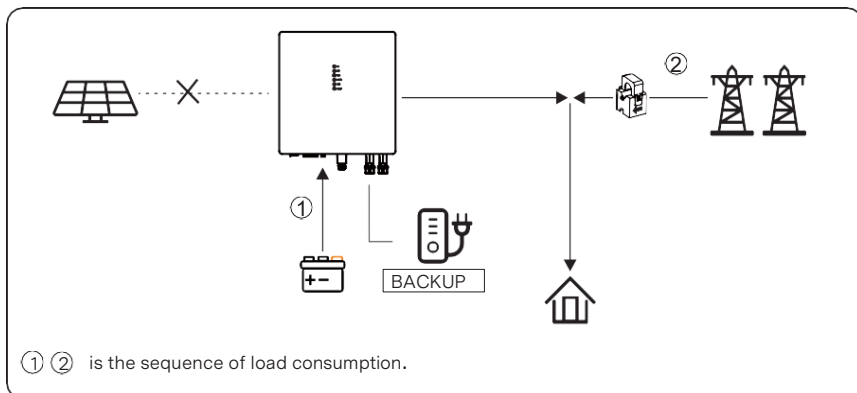
b) Limited PV power

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.



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.



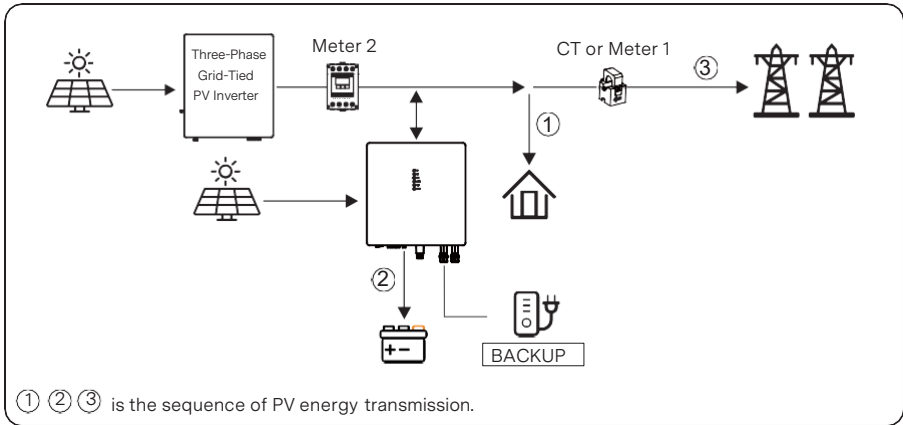
AC Coupling Connection

With AC coupling connection, PV energy generated by grid-tied PV inverters should be used to optimize self-consumption first, excess energy will be used to charge the batteries. If the battery is already full, excess energy could be fed into the grid. Loads are supported in priority by the grid-tied system, then by

the battery power, then by the grid. The following illustrates the general distribution of PV energy.

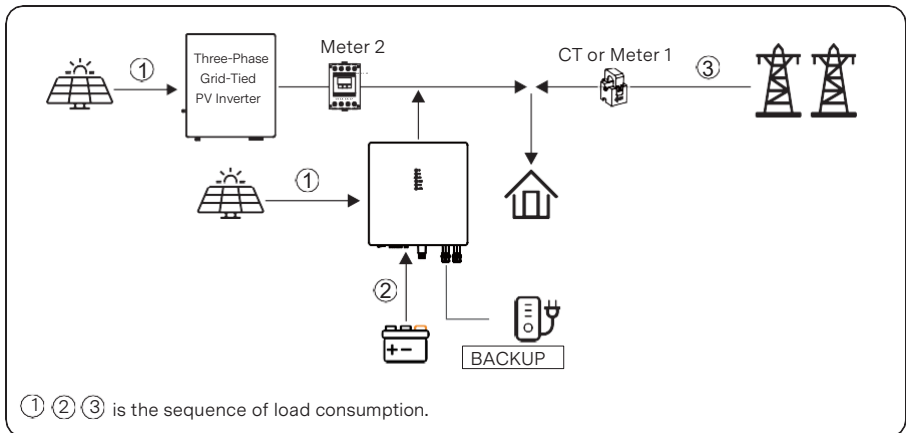
a) Wealthy PV Energy

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.



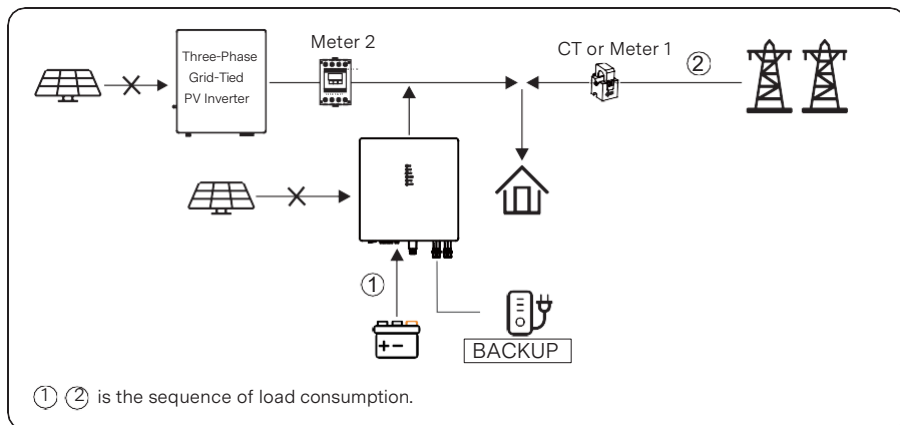
b) Limited PV Energy

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.



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.



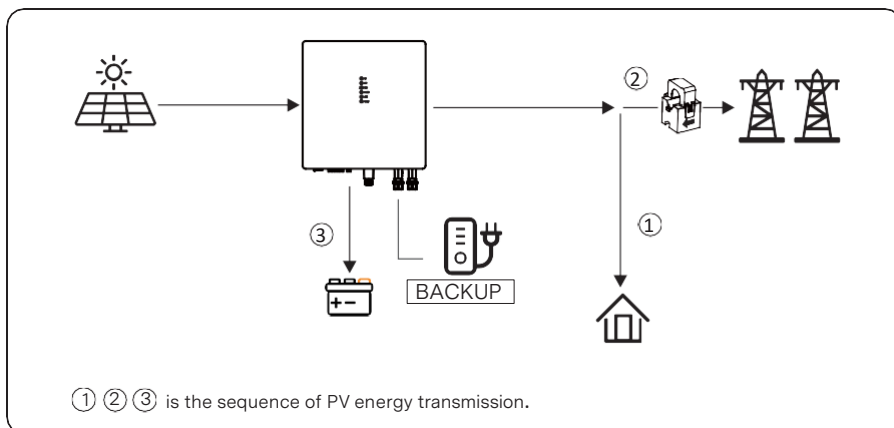
5.1.2 Feed-in Priority Mode

Go to *Console > Hybrid Setting > Work mode* page and select *Feed-in priority mode*. For more information, please refer to manual “Nanuk SE Energy Storage Hybrid Inverter Application Guide”

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.

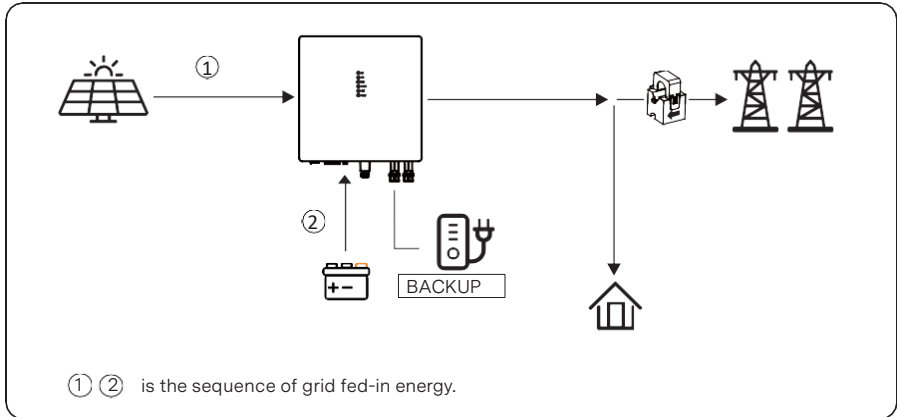
a) Wealthy PV Energy

When PV energy is wealthy, the PV energy will be 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.



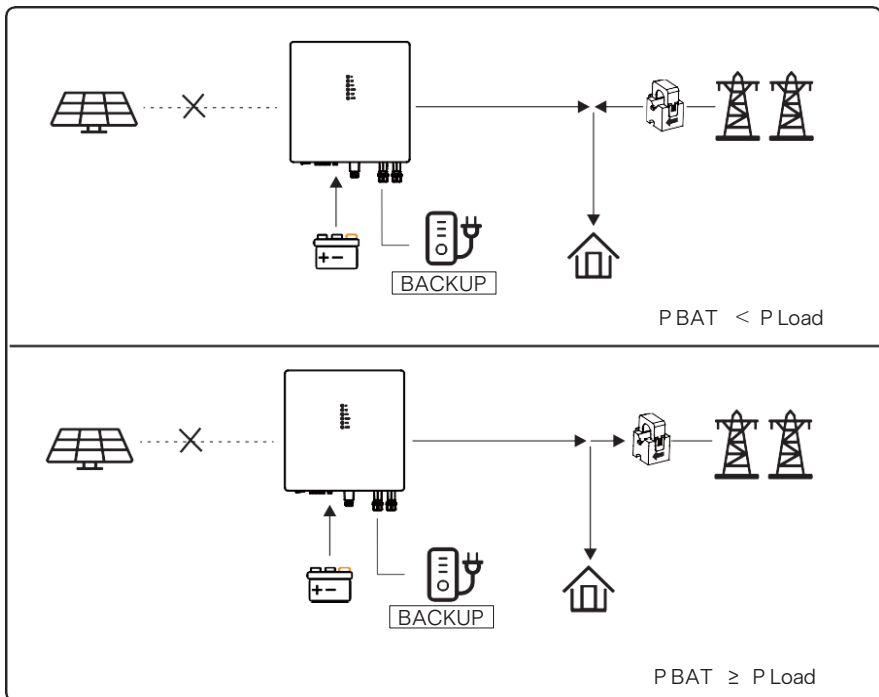
b) Limited PV Energy

When PV energy is limited and cannot meet the feed-in grid power, the battery will discharge to meet it.



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.



5.1.3 Back-up Mode

Go to **Console > Hybrid Setting > Work mode** page and select **Back-up mode**. For more information, please refer to manual “Nanuk SE Energy Storage Hybrid Inverter Application Guide”

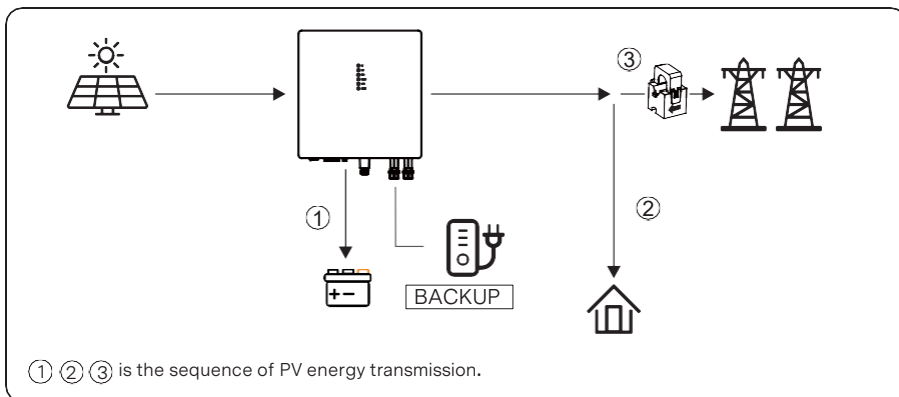
Under this mode, the priority of PV energy consumption will be Battery > Load > Grid. This mode aims at charging the battery quickly, and at the same time, you can choose whether to allow AC to charge the battery.

Forbid AC charging

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

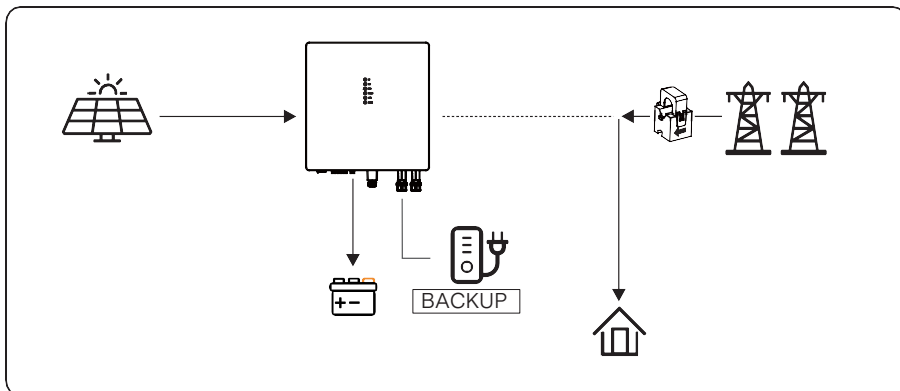
a) Wealthy PV power

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



b) Limited PV power

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

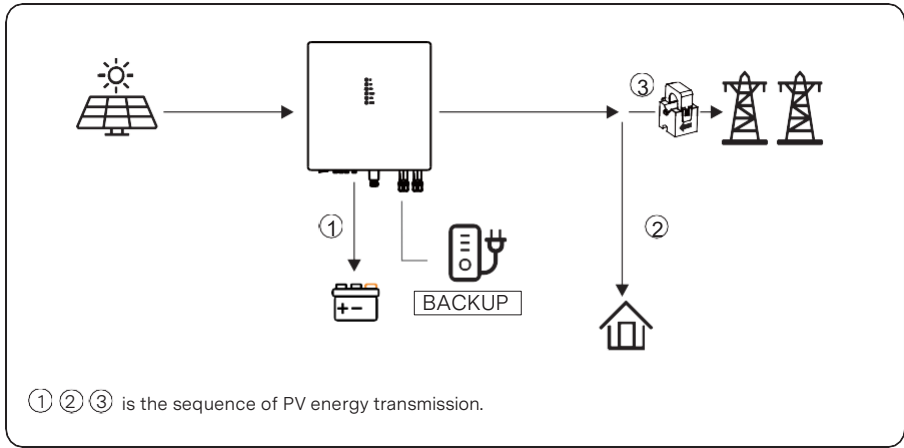


Allow AC charging

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

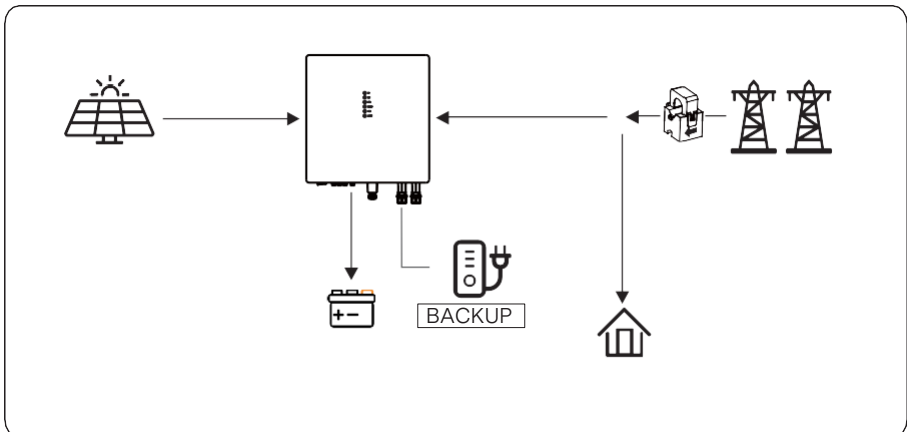
a) Wealthy PV Power

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



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.



5.1.4 Forced Charge/Discharge Function

According to the demands of application, the user can set the inverter to work on forced charge/discharge the battery in any working mode. Please go to **Console > Hybrid Setting > Work mode** to enable **Time-based Control** on APP. For more information, please refer to manual “Nanuk SE Energy Storage Hybrid Inverter Application Guide”

There are three time periods in which you can set this function. Outside of the set periods, the inverter returns to its original working mode. The forced charge/discharge function has the highest priority. For setting details, refer to Work mode in **Console** section.

The relationship between the forced charge/discharge function and working mode shown as below.



M : Self Use Mode/Feed-in Priority Mode/Back-up Mode

T1: Time period 1 for forced charge/discharge parameter setting

T2: Time period 2 for forced charge/discharge parameter setting

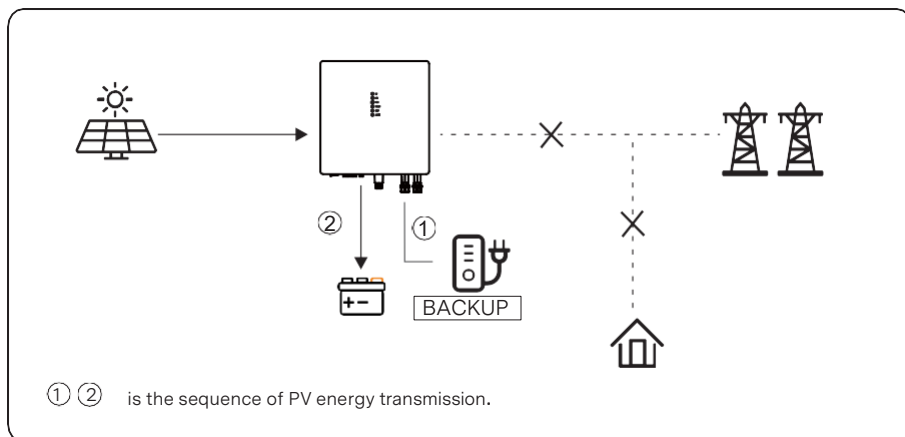
T3: Time period 3 for forced charge/discharge parameter setting T1, T2, and T3 priority to M.

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.

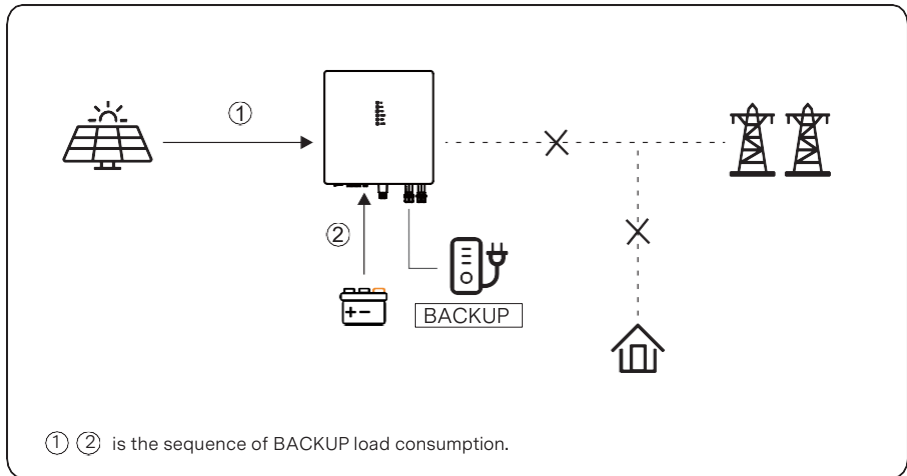
a) Wealthy PV power

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



b) Limited PV Power

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



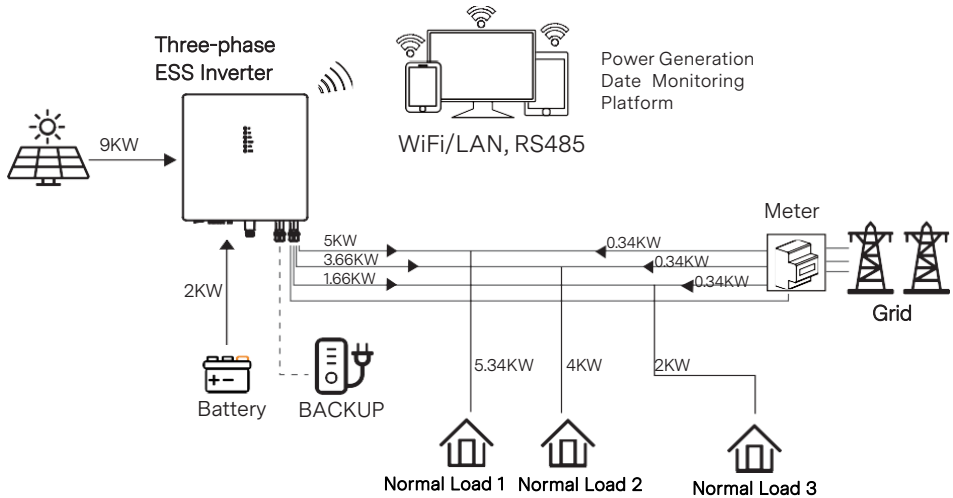
Notice

- Under this mode, please complete the output voltage and frequency settings.
- It is better to choose the battery with a 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.

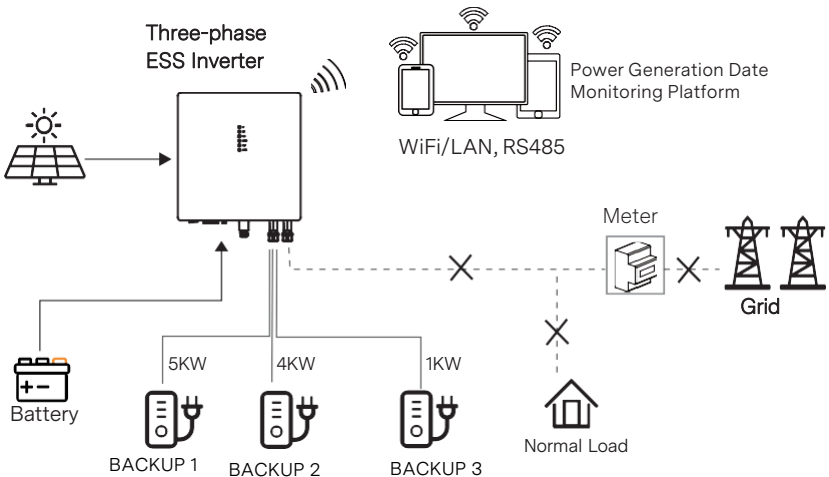
On-Grid Unbalanced Output



5.1.7 Back-up Unbalanced Output

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

Back-up Unbalanced Output



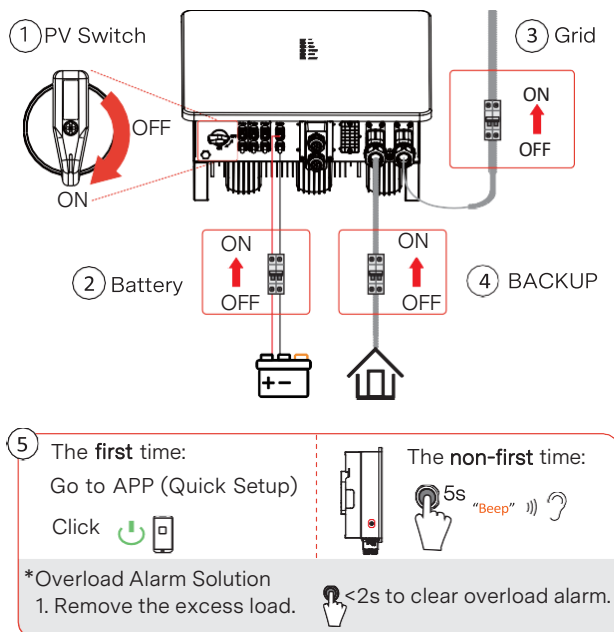
5.2 Startup/Shutdown Procedure

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 120~600V	Grid AC Voltage 180~270V(311~467V)

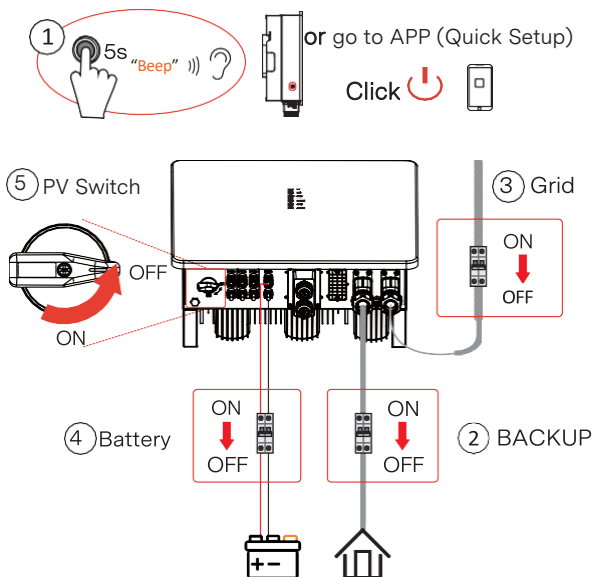
Startup Procedure



*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.

*To startup the inverter for the first-time with the APP, For more information, please refer to manual "Nanuk SE Energy Storage Hybrid Inverter Application Guide"

Shutdown Procedure



Notice

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 damage 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 clearances 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. For more information, please refer to manual "Nanuk SE Energy Storage Hybrid Inverter Application Guide"
- 3) Finish commissioning.



7. User Interface

7.1 LED

This section describes the LED panel. LED indicators include 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 (light on 2s and off 2s). Battery is abnormal (light on 1s and off 1s).
	Off	Battery is unavailable.
GRID	On	GRID is available and normal.
	Blink	GRID is abnormal.
	Off	GRID is unavailable.
BACKUP	On	BACKUP power is available.
	Blink	BACKUP output is abnormal.
	Off	BACKUP power is unavailable.
COM	Blink	Data are communicating.
	Off	No data transmission
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 abnormal	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 abnormal	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

★ Light on 1s and off 1s ★★ Light on 2s and off 2s

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 are 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 handling 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 station, 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 IGLU TECH 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, please contact IGLU TECH support
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 IGLU TECH support
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 IGLU TECH support. 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 please contact IGLU TECH support
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 IGLU TECH support
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 IGLU TECH support.
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, please contact IGLU TECH support 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 IGLU TECH support.
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. Please contact IGLU TECH support.
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. Please contact IGLU TECH support.
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. Please contact IGLU TECH support.
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. Please contact IGLU TECH support.
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. Please contact IGLU TECH support.
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. Please contact IGLU TECH support.

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 IGLU TECH support.
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 IGLU TECH support.
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 cutoff 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 IGLU TECH support.
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 IGLU TECH support.
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.
D6	Battery under temperature	

		3. If exclude the above, the alarm continues to occur, Please contact IGLU TECH support.
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 IGLU TECH support.
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 IGLU TECH support.
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 3. Disconnect the external communication and restart the electricity meter and inverter. 4. If exclude the above, the alarm continues to occur, Please contact IGLU TECH support.
DA	Internal communication loss(M-D)	
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 IGLU TECH support.
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. Please contact IGLU TECH support.
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.)
DO	Meter 2 lost or device communication loss	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 IGLU TECH support.

8.3 Removing the Inverter

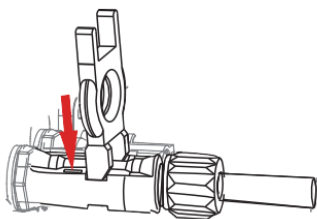
Warning

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.

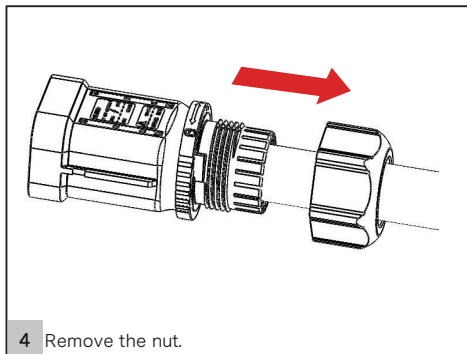
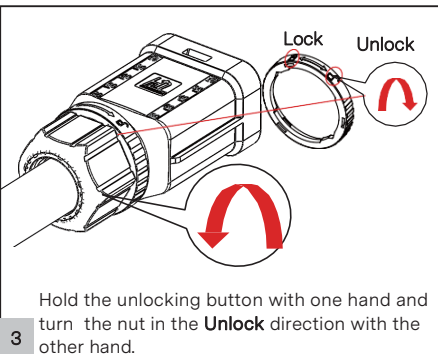
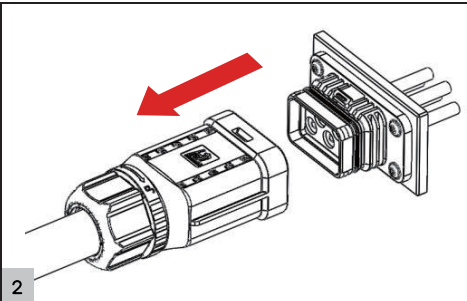
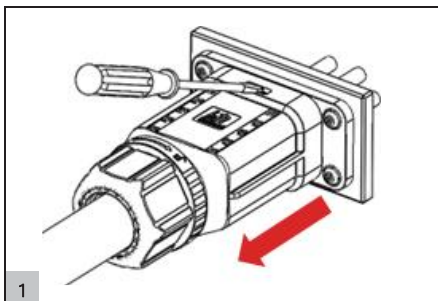
PV Connectors Removing Detail

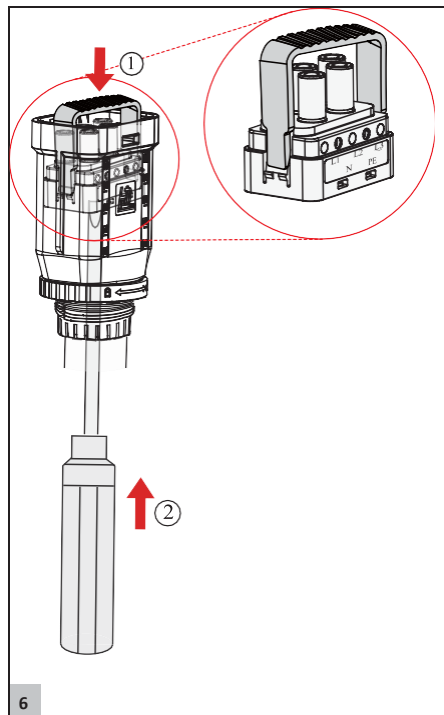
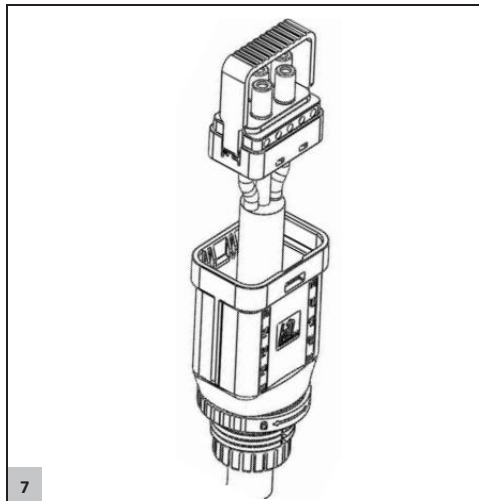
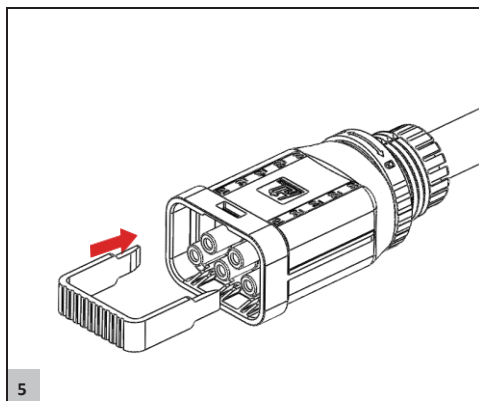


NOTE

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





Step2. Remove the inverter from the mounting bracket.
Step 3. Remove the mounting bracket

9. Technical Specification

Model	NANUK SE 5KHB-D3P		NANUK SE 6KHB-D3P	NANUK SE 8KHB-D3P	NANUK SE 10KHB-D3P
Input (PV)					
Max. Input Voltage	1000V				
MPPT Operating Voltage Range	160-950V				
Max. Input Power	15000W				
Max. Input Current	20A/30A				
Max. Short Circuit Current	30A/40A				
Max. Number of PV Strings	3(1/2)				
No. of MPPTs	2				
Input (Battery)					
Compatible battery type	Lithium-ion/Lead-acid				
Battery voltage range	120-600V				
Nominal battery voltage (Full load)	250-600V				
Max. charge/discharge current	50A/50A	50A/50A	50A/50A	50A/50A	
Max. charge/discharge power	15000W/5800W	15000W/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	
Maximum Current (Input)	3*25A	3*25A	3*25A	3*25A	
THDI	< 5%(according to different on-Grid regulation)				
DC Current Injection	<0.5%In				
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)				

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
Insulation detection	Support
General	
Topology	Transformerless
IP Rating	IP65
Cooling	Natural cooling
Operating Temperature Range	-25°C-60°C
Relative Humidity Range	0-100%
Max. Operating Altitude	4000m(>2000m derating)
Noise	<30dB(Measured at 1m)
Dimensions (W*H*D)	560*580*218mm
Weight	32KG
HMI & COM	
Display	APP+LED
Communication	LAN (optional)
	BMS(CAN/RS485)
	DRM
	1*DI
	2*DO
	METER(RS485)
	RS485
Certification	
Safety	IEC 62109-1/2
EMC	IEC/EN 61000-6-3, IEC 61000-3-11, IEC 61000-3-12, IEC/EN 61000-6-2
Warranty	5 Years/10 Years (Optional)

Remarks: *Not yet test.

**The range of output voltage and frequency may vary depending upon different grid codes.
Specifications are subject to change without advance notice



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