

User Manual

Hybrid Inverter



Applicable models

N1PH-1N3K
N1PH-1N3.6K
N1PH-1N5K
N1PH-1N6K

Applicable System

Single phase system

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Notice

This manual contains important safety instructions that must be followed during installation and maintenance of the equipment.

Save the manual!

PLEASE READ THOROUGHLY AND SAVE MANUAL FOR FUTURE REFERENCE

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1. About this Manual

1.1 Applicability

Please read the product manual carefully before installation, operation or maintenance of the inverter. This manual contains important safety instructions and installation instructions that must be followed during installation and maintenance of the equipment. This manual is applicable to the following inverter models.

N1PH-1N3K N1PH-1N3.6K N1PH-1N5K N1PH-1N6K

1.2 Target User

This manual is intended for qualified electrical engineers / technicians responsible for installation and commissioning of the hybrid inverter.

1.3 Symbols Used

Symbols used have the following meaning:

	DANGER! 'Danger' indicates a hazard with a high level of risk that if not avoided may result in death or serious injury.
	WARNING! 'Warning' indicates a hazard with a medium level of risk that if not avoided may result in death or serious injury.
	CAUTION! 'Caution' indicates a hazard with a low level of risk that if not avoided could result in minor or moderate injury.
NOTICE	NOTICE! 'Notice' indicates a situation that if not avoided could result in equipment or property damage.
	NOTE! 'Note' provides tips that are valuable for the optimal operation of product.





2. Safety

2.1 General Safety Information

The hybrid inverter has been designed and tested strictly according to international safety regulations. Read all safety instructions carefully prior to any work and observe them at all times when working on or with the hybrid inverter. Incorrect operation or work may cause:

- ◆ injury or death to the operator or a third party;
- ◆ damage to the inverter or other properties.

2.2 Important Safety Instructions











	<p>DANGER!</p> <ul style="list-style-type: none"> ◆ PV strings will produce electrical power when exposed to sunlight and can cause lethal voltage and electric shock. ◆ Only qualified personnel should work on PV panels. ◆ Do not open lid when the inverter is operating. Unauthorized opening will void warranty and warranty claims and in most cases terminate the operating license. ◆ When lid is opened, live components will be exposed, touching these may result in death or serious injury. ◆ Operating damaged inverter can lead to hazardous situations that can result in death or serious injuries due to electric shock. ◆ Batteries store large amount of electrical energy, short circuiting or incorrect installation may lead to burns or serious injuries. ◆ Lethal voltages are present at battery terminals and cables connecting to the inverter. Severe injuries or death may occur if the cables and terminals are touched. ◆ PV negative (PV-) and battery negative (BAT-) on inverter side are not grounded intentionally. Connecting PV- or BAT- to EARTH is strictly forbidden.
	<p>WARNING!</p> <ul style="list-style-type: none"> ◆ Do not disconnect PV, AC and/or battery plugs and cables while the inverter is operating. Before working on the system power down on all supplies and wait for 5 minutes to discharge. Verify that there is no voltage or current before disconnecting any plugs or cables. Use personal protective equipment, including rubber gloves and protective boots during installation or maintenance.
	<p>CAUTION!</p> <ul style="list-style-type: none"> ◆ Do not touch any hot parts such as the heat sink during operation, temperature of inverter surface may exceed 60 C during operation.
NOTICE	<p>CAUTION!</p> <ul style="list-style-type: none"> ◆ Electrical installation and maintenance must only be carried out by trained and qualified electrician, following all local regulations. ◆ Do not open inverter lid or change components without Nahui Energy's authorization. Unauthorised work will invalidate warranty. ◆ Operate inverter as explained in this manual, failure will damage equipment and invalidate warranty.
	<p>NOTE!</p> <ul style="list-style-type: none"> ◆ With an integrated universal current-sensitive residual current monitoring unit included, the inverter will disconnect immediately from the mains power once a fault current with a value exceeding the limit is detected. However if an external residual current device (RCD) is mandatory, the switch must be triggered at a residual current of 300 mA (recommended), or it can be set to other values according to local regulations. For example in Australia, the inverter can use an additional 30 mA(type A)RCD in installations.

Anti-Islanding Effect

Islanding is a condition when grid connected PV / batteries back feed energy into the Grid when Grid is turned off for maintenance work, putting maintenance personal at serious risk. N1PH series inverters prevent islanding through Active Frequency Drift (AFD).

2.3 Explanation of Symbols

Symbols on label:

Symbol	Explanation
	TUV mark.
	CE mark. The inverter complies with the requirements of the applicable CE guidelines.
	Beware of hot surface. The inverter can become hot during operation. Avoid contact during operation.
	Danger of high voltages. Danger to life due to high voltages in the inverter!
	Danger. Risk of electric shock!
	Inverter should not be disposed off with the household waste. Disposal information can be found in this manual.
	Don't work on this inverter until it is isolated from battery, mains and on-site PV generation suppliers.
	Danger to life due to high voltage. Inverter holds stored energy, wait for 5 minutes to discharge before opening lid.
	Please read this manual before installation.
	RCM (Regulatory Compliance Mark) The product meets the requirements of the applicable Australian standards.

3. Introduction

3.1 Electrical system design

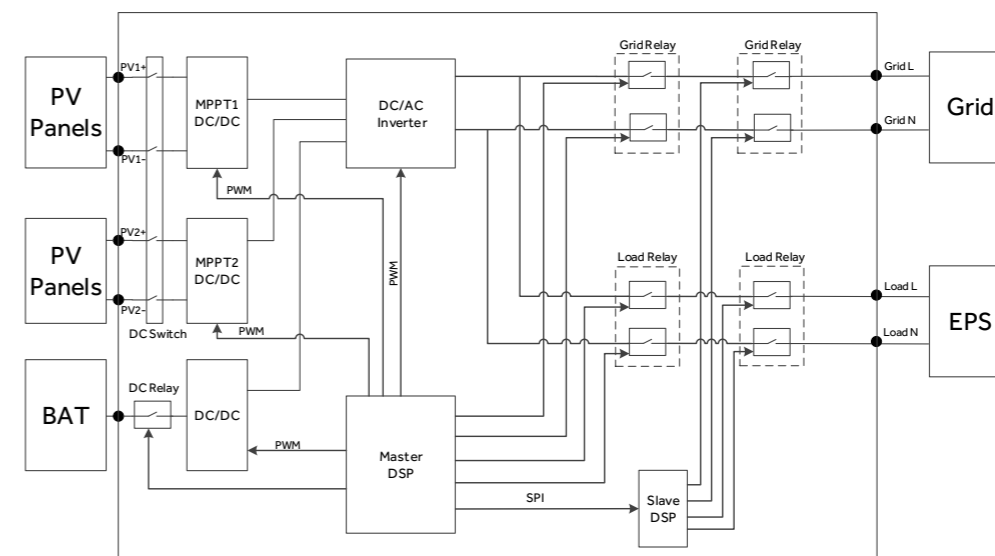


Figure 3-1 Conceptual diagram of Hybrid Inverters

3.2 Basic Features

The N1PH series hybrid inverters apply to PV energy storage system with PV module, battery, loads and grid. The energy produced by PV system shall be used to optimize self-consumption, excess power charge battery and the rest power could be fed into the grid. Battery shall be discharged to support loads when PV power is insufficient to meet self-consumption. If both PV power and battery power is insufficient, the system will take power from grid to support loads. The inverter can't be installed in multiple combinations.

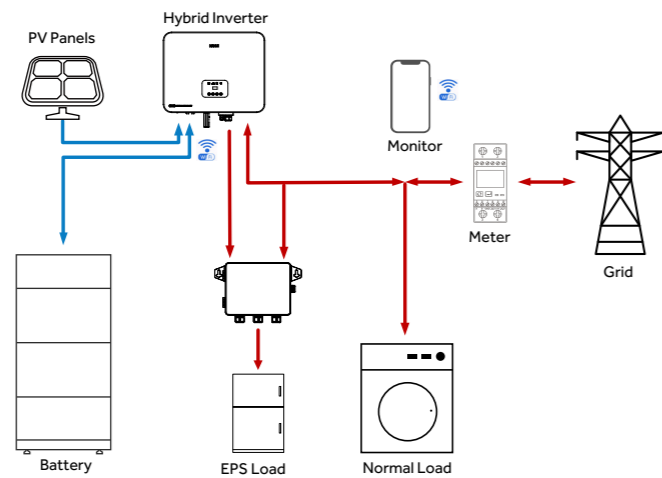


Figure 3-2 Use of Hybrid Inverters

3.3 Work Modes

The N1PH series hybrid inverter has the following work modes based on the configuration and connected equipment.

Work mode: Self-use

- Priority:**
 PV generated energy to
 a. Meet load
 b. Charge battery
 c. Export to grid

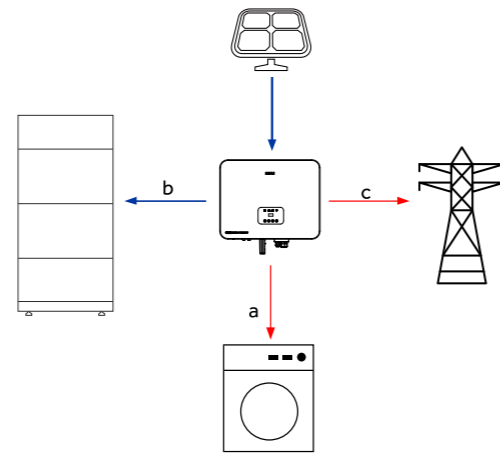


Figure 3-3 Self-use Mode

On site consumption of PV energy is the highest priority. Excess generation is used to charge batteries, and finally export to grid.

Work mode: Feed in Use

- Priority:**
 PV generated energy to
 a. Meet load
 b. Export to grid
 c. Charge battery

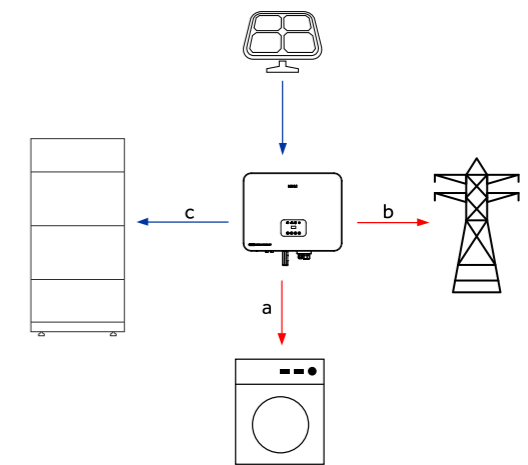


Figure 3-4 Feed in Use Mode

This mode is preferred for areas with Feed-in Tariff. PV energy is first used to meet load, excess exported to grid and finally to charge battery.

Work mode: Time of Use

- Priority:**
 During battery charging
 a. Charge battery
 b. Meet load
 c. Buy from grid

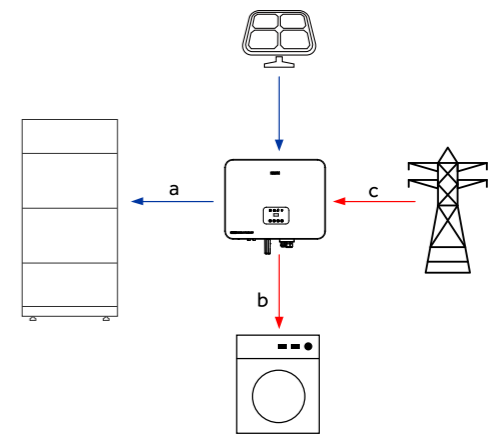


Figure 3-5 Time of Use Mode 1

- During battery discharge
 a. Meet load
 b. Discharge battery
 c. Buy from grid

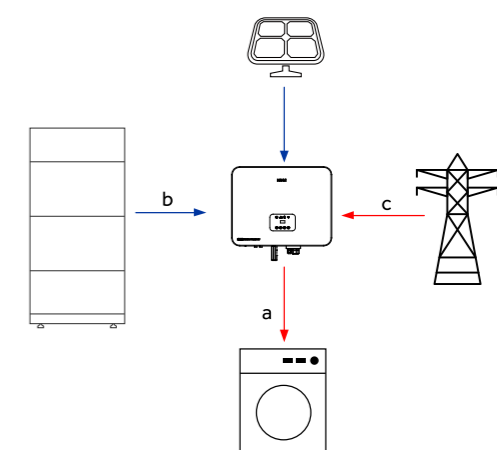


Figure 3-6 Time of Use Mode 2

This mode applies the area that has peak and economy electricity price. User can choose off-peak electricity to charge battery. Charging may be set flexibly, and the rest of time is in self-use mode.

Work mode: Back up Use

Priority:

PV generated energy to

- a. Charge battery
- b. Meet load
- c. Buy from grid

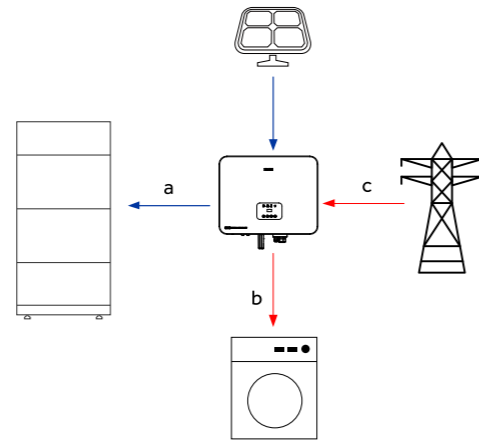


Figure 3-7 Back up Use Mode

This mode applies to area that face frequent power outages. This mode ensures the battery will has enough energy to supply during a grid outage. Back up load could be supported by PV and battery in the event of a blackout.



WARNING!

Ensure that the load powered is with in EPS's discharge power limit, failure will result in inverter shut down with 'Over Load' warning. When 'over load' error is displayed, adjust load to make sure it is with the range of the EPS output, and turn inverter back on. For nonlinear load, do pay attention to inrush power, make sure it is within the range of the EPS output.

3.4 Terminals

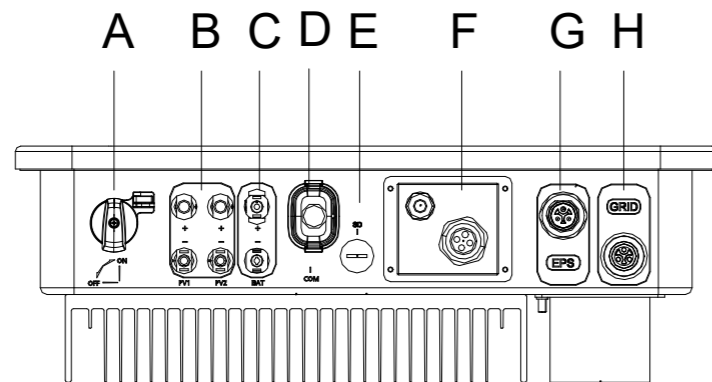


Figure 3-8 Terminals

Object	Description	Object	Description
A	DC switch	E	SD port
B	PV connector	F	Communication port
C	Battery connector	G	EPS port
D	Monitoring module port	H	AC port

Note: The DC switch is used to isolate PV strings.

Table 3-1 Interface Definition

3.5 Dimension

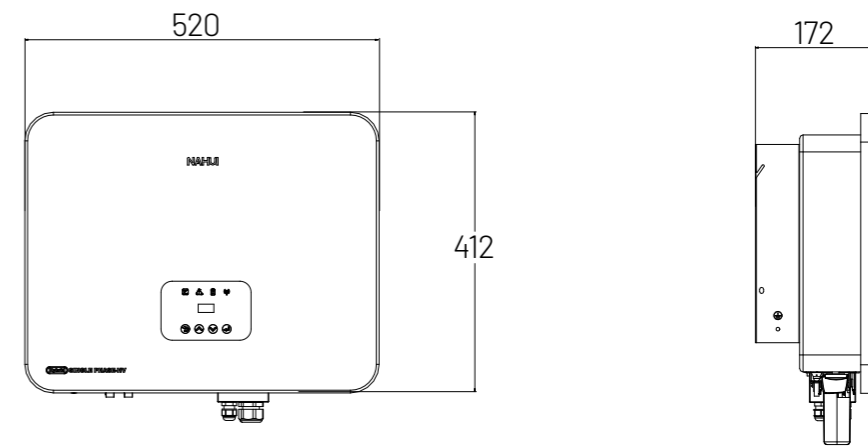


Figure 3-9 Product Size

4. Technical Data

Model	N1PH-1N3K	N1PH-1N3.6K	N1PH-1N5K	N1PH-1N6K
PV Input Data				
Max. Recommended PV Power(W)	4500	5500	7500	9000
Max.DC Input Voltage (V)	600			
MPPT Voltage Range (V)	120~550			
Rated DC input voltage (V)	360			
Start-up Voltage (V)	150			
No. of MPP Trackers	2			
No. of Input Strings per Tracker	1			
Max. DC Input Current (A)	13.5/13.5			
Max. Short Circuit Current(A)	17/17			
Backfeed Current to Array(A)	0			
DC Switch	Integrated			

Model	N1PH-1N3K	N1PH-1N3.6K	N1PH-1N5K	N1PH-1N6K
AC Output Data(on-grid)				
Rated AC Power (W)	3000	3680	5000*1	6000
Rated Apparent Power(VA)	3000	3680	5000*1	6000
Rated.AC Current(A)	13	16	21.7*1	26.1
Max.AC current(VA)	13	16	21.7*1	26.1
Rated AC Voltage/Range(V)	230; 160 - 290			
Grid Frequency/Range(Hz)	50/60;±5			
Adjustable Power Factor [cosφ]	0.8leading ~0.8lagging			
Output THDi (@Rated Output) (%)	<2			
AC Inrush Current (A)	35			
AC Maximum Output Fault Current(A)	80			
Output DC(Battery)				
Battery Type	Lithium			
Battery Voltage Range (V)	80-450			
Norminal Battery Voltage(V)	384			
Max. Charging / Discharging Current (A)	25			
Max. Short Circuit Current (A)	384			
Max. Charging / Discharging Power(W)	4500 / 3000	5500 / 3680	6000 / 5000	6000 / 6000
Communication Interface	CAN			
EPS Output (With Battery)				
EPS Rated Power (W)	3000	3680	5000	6000
EPS Rated Voltage (V)	220/230			
EPS Rated Frequency (Hz)	50/60			
EPS Rated current (A)	13	16	21.7	26.1
Output THDi (@Rated Output) (%)	<3			
Automatic Switch Time (s)	<0.5			
Peak Apparent Power, Duration (VA, s)	4500, 10	5520, 10	7500, 10	9000, 10
Efficiency				
Max. Efficiency (%)	97.42	97.45	97.50	97.50
Euro Efficiency (%)	97.15	97.17	97.20	97.20
MPPT Efficiency (%)	99.90	99.90	99.90	99.90
Max. Battery Discharge Efficiency (%)	97.15	97.17	97.20	97.20
Protection				
DC Insulation Monitoring	Integrated			
Input Reverse Polarity Protection	Integrated			

Model	N1PH-1N3K	N1PH-1N3.6K	N1PH-1N5K	N1PH-1N6K
Anti-island Protection	Integrated			
Residual Current Monitoring	Integrated			
Over-heat Protection	Integrated			
AC Overcurrent Protection	60A			
AC Short-circuit Protection	Integrated			
AC Overvoltage Protection	Integrated			
DC Surge Protection	Integrated (Type II)			
AC Surge Protection	Integrated (Type III)			
General Data				
Size (Width * Height * Depth mm)	520*412*172			
Weight (kg)	20			
User Interface	LED+OLED			
Communication	RS485 and USB (Standard), WIFI or 4G or Ethernet(Optional)			
Operating Temperature Range (C)	-30 ~ 60			
Relative Humidity (%)	0-100			
Operating Altitude (m)	≤2000			
Standby Self Consumption (W)	<15 for hot standby			
Topology	Non-isolation			
Cooling	Natural Convection			
Enclosure	IP65 (outdoor & indoor)			
Protective Class	I			
Overvoltage Category	III(Mains) II(PV)			
Pollution Degree(PD)	PD3			
Environmrntal Categories	Outdoor			
Noise (dB)	<35			
Warranty	10 years			
Certifications & Standards				
Grid Regulation	AS4777			
Safety Regulation	IEC 62109-1, IEC 62109-2			
EMC	IEC 61000-6-1, IEC 61000-6-3, EN 61000-6-1, EN 61000-6-3			

Table 4-1 Technical Data

*1:The AC output power for VDE-AR-N 4105, VDE0126 and NRSO97-2-1 are limited to 4600VA, for AS/NZS 4777.2 is limited to 4999VA & 21.7A.

5. Installation

5.1 Unpacking

Please check the delivery for completeness and contact your local distributor if anything is missing.



Object	Quantity	Description
A	1	N1PH inverter
B	1	Bracket
C	2	Battery Connectors (1* positive, 1*negative)
D	8	PV Connectors (2* positive, 2*negative) & PV Pin contact (2* positive, 2*negative)
E	1	EPS Terminal & L-shaped screwdriver
F	1	AC Terminal
G	1	8P Pluggable Terminal Block
H	6	Tubular terminal
I	1	WIFI or 4G or Ethernet Module(Optional)
J	3	Ethernet RJ45 Connector
K	2	M5 Screw
L	1	Earth Terminal
M	4	Expansion tubes& Expansion screws
N	1	Energy Meter(Meter)
O	1	User Manual
P	1	Quality Certificate

Table 5-1 Accessory Kit

Open the package and inspect product, check transportation damage. Also check to ensure receipt of all accessories as listed in page 12.

The instruction manual is an integral part of the unit and should therefore be read and stored carefully for future use. It is recommended that the packaging should not be opened till the unit is delivered to installation site.

5.2 Check for Transport Damage

On opening packaging, inspect product for any damage, in case of concern, please contact dealer immediately.

5.3 Installation Preparation

The N1PH series inverter is designed for outdoor installation (IP65).

WARNING!

- Do not install inverter in direct sunlight.
- Do not mount inverter on flammable material.
- Do not install inverter in areas where flammable materials are stored.
- Do not install inverter in potentially explosive areas.
- Do not install inverter during rain or high humidity (>95%).

Provide adequate ventilation when using batteries, and also read the warning label on the bottom of the inverter.

- Install inverter where air temperature would be below 40°C. Children should not have access to inverter.
- The inverter emits a slight noise when operating, this is normal and will not affect performance.
- Mounting should not tilt more than 5 degrees.
- The inverter is heavy, ensure the mounting is strong enough to hold the weight of the inverter.
- If installed in a cabinet, closet or other small enclosed areas, sufficient air circulation must be ensured in order to dissipate heat generated by the unit.

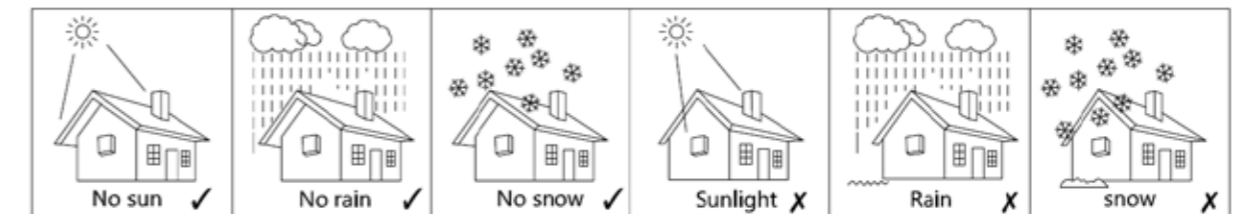


Figure 5-1 Recommended Installation Locations

5.4 Space Requirement

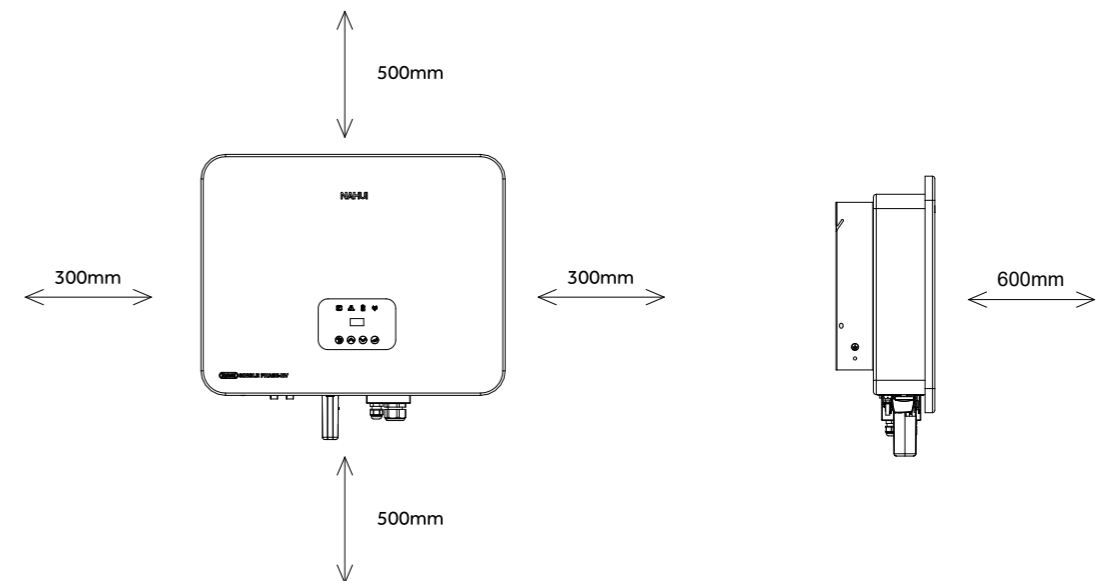


Figure 5-2 Minimum Clearance Required

5.5 Installation Tools










No.	Tool	Model	Function
1		Sprit level	To ensure proper install
2		Two-Speed Hammer Drill	Drill holes on the wall
3		Hammer	Hanging the bracket
4		Impact Wrench Set	Hanging the bracket
5		PV-AZM-410	Stripping plier for PV cable
6		PV-CZM-22100	Crimping plier for PV cable
7		Screwdriver	Wiring
8		RJ45 Crimping Tool	Crimping tool for RJ45 terminal
9		Crimping plier	Crimping Tool For Insulated Electrical Connectors

Table 5-2



NOTE!

These tools are not included in product accessories.

Lifting and Handling

The unit is heavy. Do not lift it alone.

- Ensure that the method of lifting will not allow the unit to slip from chains, slings or turn-over from lifting devices.
- Transportation must be carried by qualified persons wearing necessary personal protection equipment.
- Do not walk or stand beneath or in the proximity of the load.
- Accessible for maintenance and repair work.
- Loading capacity and hardness of the supporting surface, load rating of mounting bracket should be at least four times the weight of the devices according to IEC62109-1. And supporting characteristics will be impaired by wear, corrosion, material fatigue or ageing, which should be calculated by inspection of the design data of supporting material and consulting construction engineer.

5.6 Installation Steps

Step 1: Fix bracket on the wall.

- Use the wall bracket as a template to mark the position of the 4 holes.

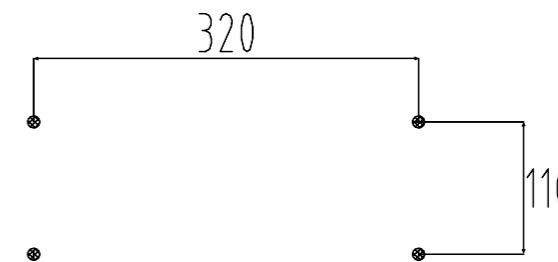


Figure 5-3 Inverter wall mounting

- Drill holes with ϕ 10 drill bit carefully, make sure the holes are deep enough (at least 45mm).
- Insert anchors fully into the holes. Install wall bracket using screws provided.

Step2: Hang the N1PH inverter on the wall bracket.

- Lifting inverter needs at least 2 people, use the handles at the sides of the inverter.
- To hang the inverter over the bracket, move the inverter close to it, slightly lower inverter making sure the 4 mounting bars on the back of the inverter is fixed well with 4 grooves on the bracket.

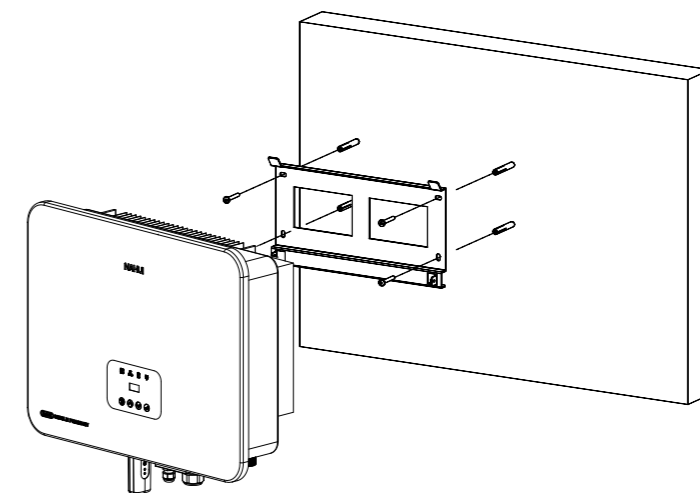


Figure 5-4 Wall Mount Bracket



WARNING!

The inverter must be mounted vertically.

5.7 Electrical Connection

For an overview of the connection terminals of the inverter please refer to Figure 3-7, and for other wiring details, refer to chapter 3.1.

System Connection Diagrams

Note: Diagram below is for Australia, South Africa and New Zealand where neutral line can't be switched.

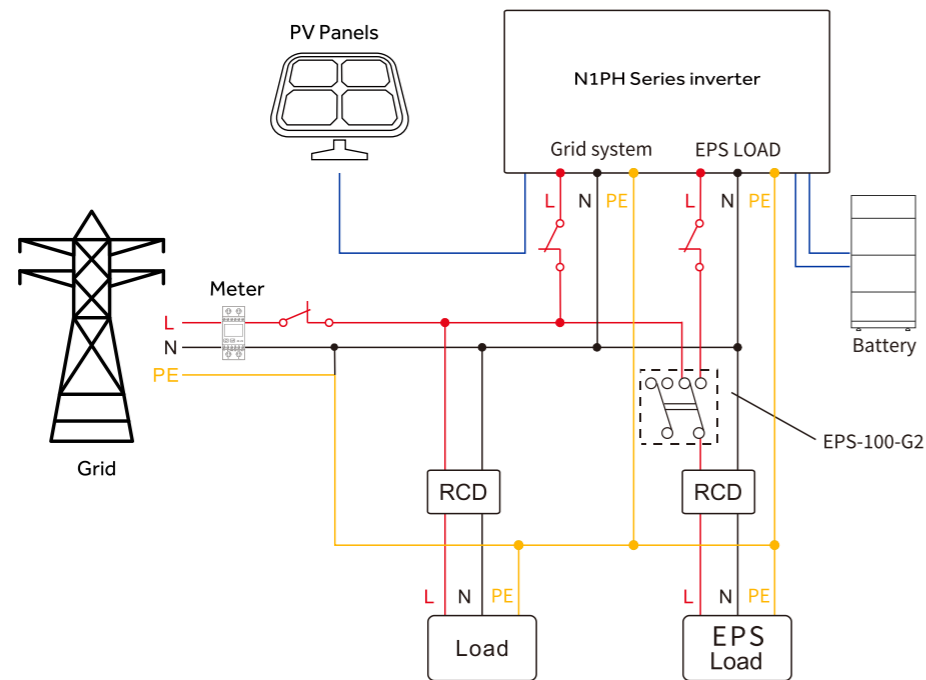


Figure 5-5

Note: Diagram below is for grid system without special requirement.

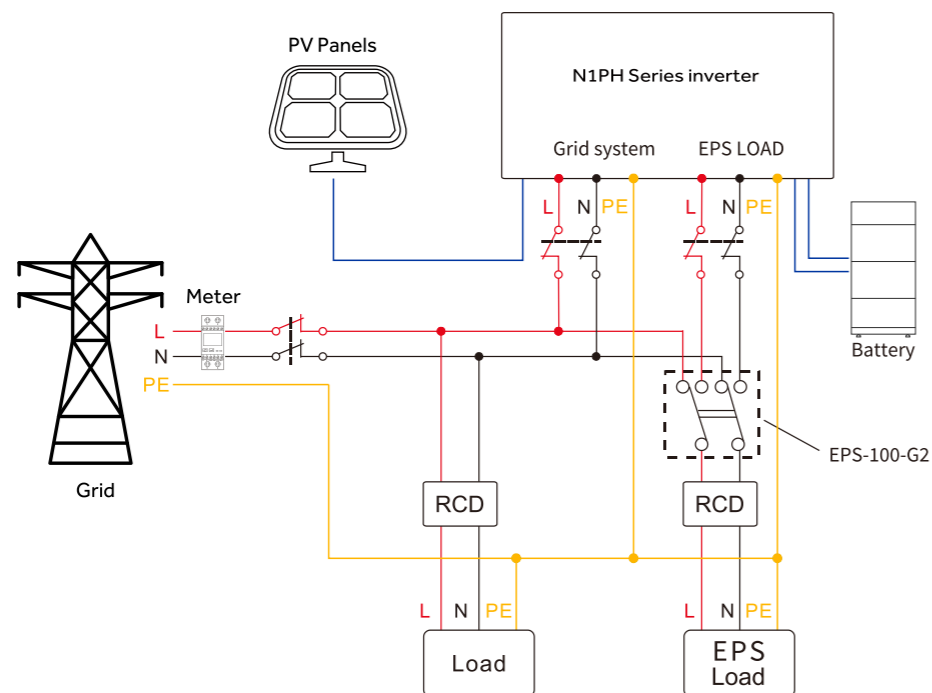


Figure 5-6



NOTICE!

- The EPS Box is not included as part of the inverter.
- The inverter has not been tested to AS/NZS 4777.2:2020 for multiple inverter combinations and/or multiple phase inverter combinations so combinations should not be used or external devices should be used in accordance with the requirements of AS/NZS 4777.1.
- For the high voltage battery, NHS-1Y Series is the only battery the inverter is compatible with.

Main steps to connect the N1PH series system

- PV string connection
- AC output connection
- Battery connection
- Battery power connection
- Battery communication connection
- EPS connection
- Earth connection
- Communication connection

5.7.1 PV Connection

Before connecting PV strings to N1PH Series hybrid inverter, ensure the following :

- The total short-circuit current of PV string must not exceed inverter's maximum DC current .
 - Make sure that open circuit voltage of PV string is less than 600V.
 - PV strings are not connected to earth/grounding conductor.
 - Use the right PV plugs from accessory box, Battery plugs look similar to PV plugs, do confirm before using.
- Note: The array is to be floating.

Connection Steps:

1. Turn off the DC switch.
2. Prepare 4-6mm² PV cable and PV plugs as below.
3. Strip 7mm of the conductor with stripping plier. Use a suitable stripping tool for this (e.g. "PV-AZM-410").
4. Insert striped cable into pin contact and ensure all conductor strands are captured in the pin contact.

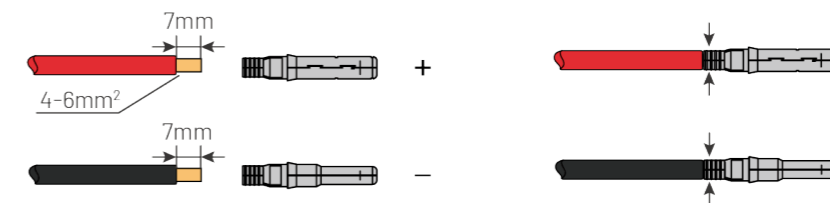


Figure 5-7

5. Crimp pin contact by using a crimping pliers(PV-CZM-22100). Put the pin contact with striped cable into the corresponding crimping pliers and crimp the contact.
6. Insert pin contact through the cable nut to assemble into back of the male or female plug. When clicked the pin contact assembly is seated correctly.
7. Tightening DC connector.
 - a. Slide the cable nut towards the back shell.
 - b. Rotate the cable nut to secure the cable.

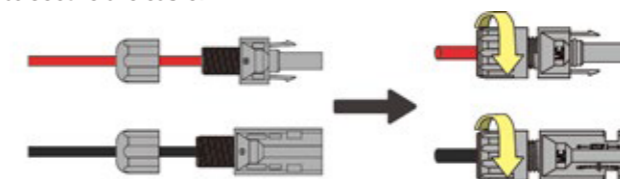


Figure 5-8

8. After securing the cable tightly, align the 2 half connectors and join together by hand until a "Click" is felt or heard.
9. Measure PV voltage of DC input with multimeter, verify DC input cable polarity.

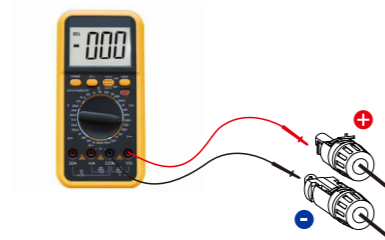


Figure 5-9

10. Connect the wired DC terminal to the inverter as shown in the figure, and a slight "Click" is heard to prove the connection is correct.

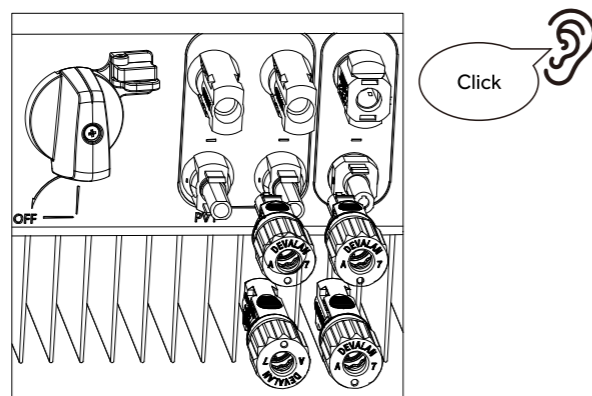


Figure 5-10

11. To separate the DC connector.
 - a. Use the specified wrench tool.
 - b. To separate the DC+ connector, push the tool down from upside.
 - c. To separate the DC- connector, push tool down from the bottom side.
 - d. Separate the connectors by hands.



CAUTION!

If DC inputs are accidentally reversely connected or inverter is faulty or not working properly, it is not allowed to turn off the DC switch. Otherwise it may cause DC arc and damage the inverter or even lead to a fire disaster. The correct actions are:

- Use a clip-on ammeter to measure the DC string current.
- If it is above 0.5A, please wait for the solar irradiance reduces until the current decreases to below 0.5A.
- Only after the current is below 0.5A, you are allowed to turn off the DCs witches and disconnect the PV strings.
- In order to completely eliminate the possibility of failure, please disconnect the PV strings after turning off the DC switch to avoid secondary failures due to continuous PV energy on the next day. Please note that any damages due to wrong operations are not covered in the device warranty.

5.7.2 Battery Connection

When building a on site consumption storage system, high voltage battery is a necessary part. The N1PH Series inverter provides the necessary the interfaces to connect the battery.



WARNING!

Make sure to select cables of the right specification. Failure could cause fire and result in death or serious injury.

1. Battery Power Cable Connection

- 1) Prepare tin-plated cables of conductor cross section of 4 to 8 mm² (AWG 8).
- 2) Strip 15mm insulation off the conductor. Use a suitable stripping tool for this (e.g. "Knipex Solar 121211").
- 3) Open spring using a screwdriver(Figure 5-11) .

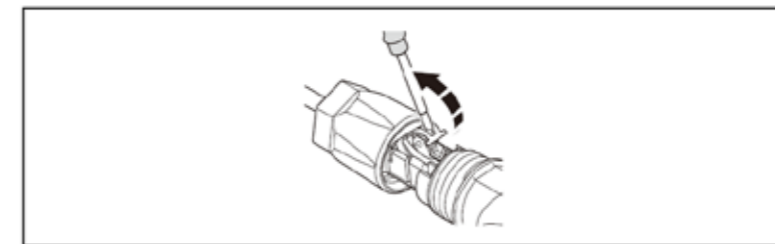


Figure 5-11

- 4) Carefully insert the stripped wire with twisted conductors all the way in (Figure 5-12, A). The litz wire ends have to be visible in the spring.
- 5) Close the spring. Make sure that the spring is snapped in (Figure 5-12, B).

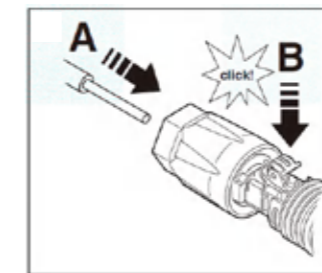


Figure 5-12

6. Push the insert into the sleeve (Figure 5-13, C).
7. Tighten the cable gland to 2 Nm (Figure 5-13, D). Use a suitable and calibrated torque wrench of size 15. Use an open-jaw wrench, size 16, to hold the connector in place.

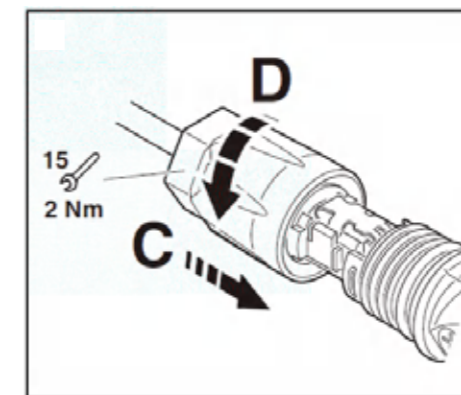


Figure 5-13

8. Fit the two connectors together until the connection audibly locks into place.
9. Check to make sure the connection is securely locked.
10. Measure DC voltage of DC input with multimeter, verify DC input cable polarity.

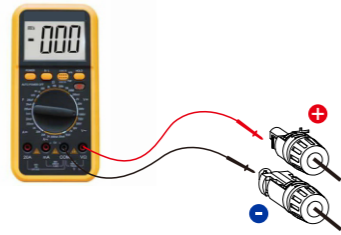


Figure 5-14

11. Connect the inverter end to the battery input port of the inverter as shown below, and push it in until you hear a "Click" sound which proves the fastened connection.

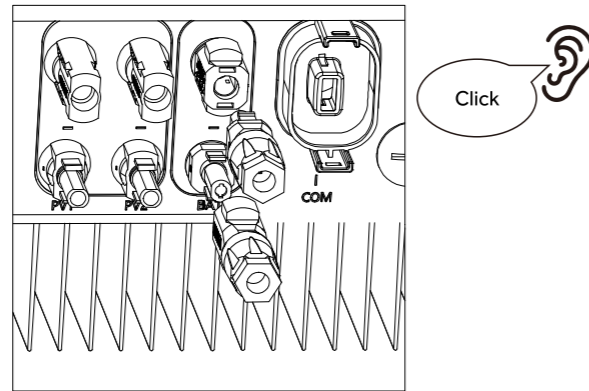


Figure 5-15

12. Separating connectors.

- 1) Insert the screwdriver into one of the four openings (Figure 5-16, A).
- 2) Leave the screwdriver in the opening. Pull the two connectors apart (Figure 5-16, B).

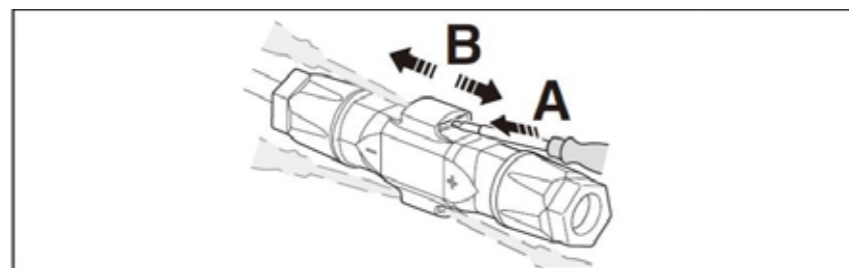


Figure 5-16

NOTE!

If the resistance to earth of each conductor of the PV array and battery system lower than the detection, the inverter will report Earth Fault Alarm. This inverter complies with IEC 62109-2 clause 13.9 for earth fault alarm monitoring. If an Earth Fault Alarm occurs, the red light will be on and the ISO Check fault will be displayed on the LCD screen, and the fault can be found in the history of the fault. For the machine installed with WiFi/GPRS, the alarm information can be seen on the corresponding monitoring website, and can also be received by the APP on the mobile phone.

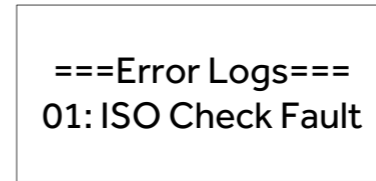


Figure 5-17

2. Battery Communication Connection

The communication interface between battery and inverter is CAN with a RJ45 connector. The Pin definitions are as below.

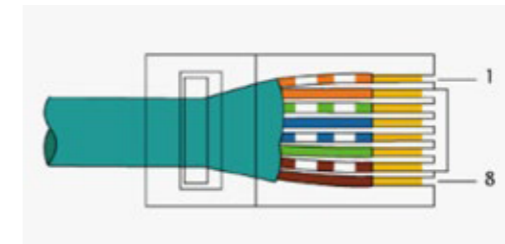


Figure 5-18

Pin	1	2	3	4	5	6	7	8
Function	NC	NC	NC	CANH	CANL	NC	NC	NC

Table 5-3

Overview for all battery connections

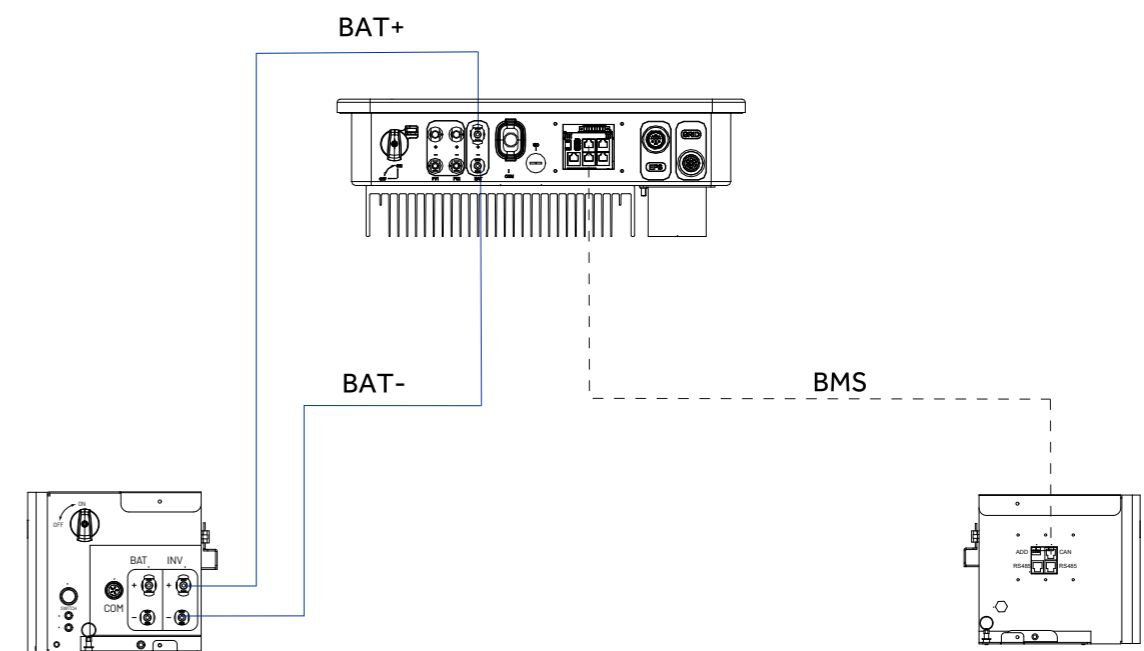


Figure 5-19

5.7.3 AC Output Connection

N1PH series inverters have already integrated RCMU (residual current monitoring unit) inside, however if an external RCD is required, a type A RCD with rated residual current of 30mA or higher is recommended.

There are two AC terminals and the assembly steps for both are the same, just need to check one for 'Grid' another for 'EPS'. The AC cable and micro-breaker specification for AC side of N1PH series inverter as below.

Model	N1PH-1N3K	N1PH-1N3.6K	N1PH-1N5K	N1PH-1N6K
Cable(Cu)	4mm ²	4mm ²	6mm ²	6mm ²
Micro-Breaker	25A	25A	32A	32A

Table 5-4



WARNING!

Select cables of the correct specifications. Failure could result in fire and lead to death or serious injury. Don't connect the line/phase cable to 'PE' terminal, failure will result in improper operation of the inverter.

If the AC cable is connected from the EPS port, the dust plug on the connector needs to be opened with a L-shaped screwdriver. The dust cap should not be opened if the load is not connected from the EPS port.

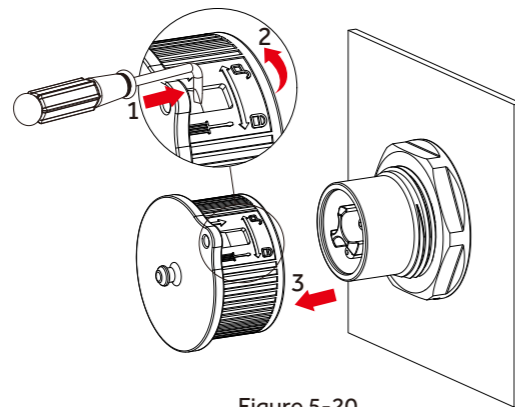


Figure 5-20

Connection Step:

1. Lead the AC cable through the cable gland and the housing.

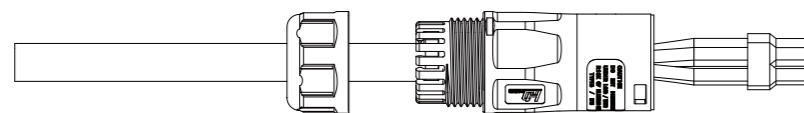


Figure 5-21

2. Remove the cable jacket by 40 mm, and strip the wire insulation by 8 mm–15 mm.
3. Fully insert the conductors to the corresponding terminal and tighten the screws with the torque 0.8 Nm. Pull cables outward to check whether they are firmly installed.

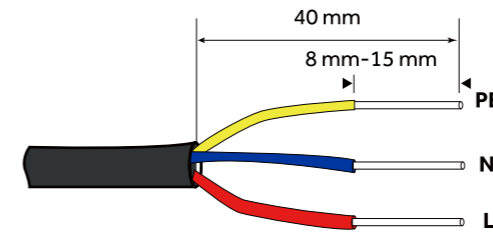


Figure 5-22

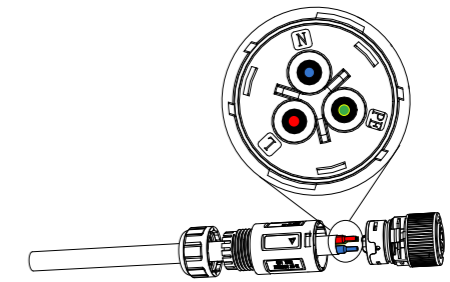


Figure 5-23

4. Assemble the housing, the terminal block and cable gland (torque 4 –5 Nm). Make sure that the rib of the terminal block and the groove on the housing engage perfectly, with a click.

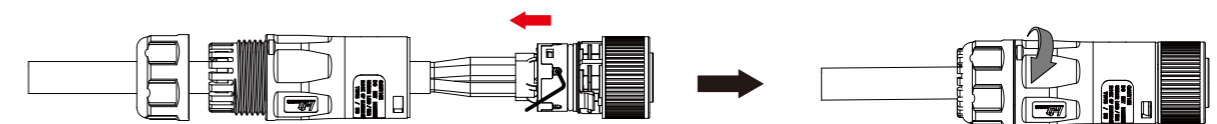


Figure 5-24

5. Push the AC Grid or EPS Connector into the AC Grid Port or AC EPS Port on the inverter and rotate the rotatory ring on the connector to the direction as marked "LOCK" on the connector.

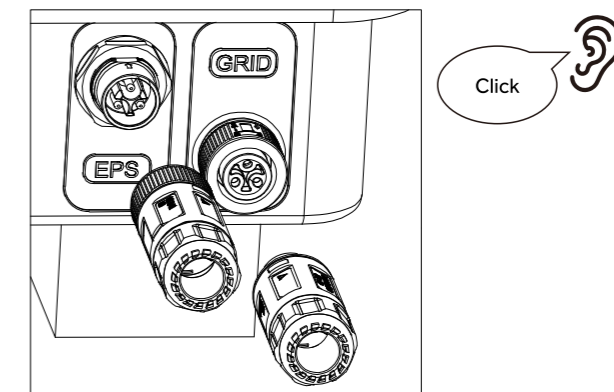


Figure 5-25



NOTE!

A continuity test shall be made to ensure that the correct terminations have been made after field wiring.

Disassembly step:

Use an L-shaped screwdriver to unlock them, using the Grid side as an example, refer to the diagram below:

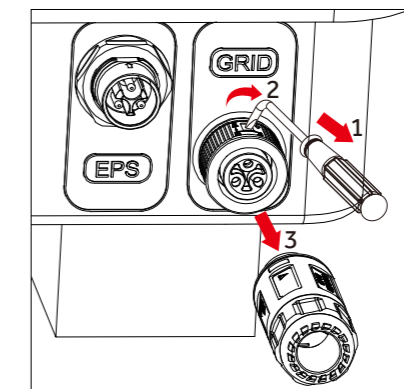


Figure 5-26

5.7.4 Earth Connection

One may earth the inverter enclosure or a second earth or equipotential bonding if required under local regulations. This prevents touch current if the original protective conductor fails.

Cable size: 12AWG

Connection step:

- Strip the earthing cable insulation.
- Insert the stripped cable into the ring terminal.
- Clamp the end of the ring terminal.
- Unscrew the screw of the earthing connector.
- Attach the ring terminal on the earthing connector
- Attach the gasket on the earthing connector.
- Tighten the screw of the earthing connector.

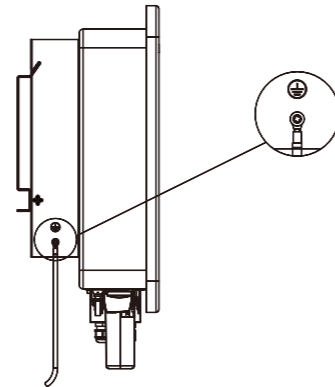


Figure 5-27

5.7.5 Communication Connection

Communication interface

This product has a series communication interfaces besides WIFI or 4G or Ethernet(optional). Dry contact and extend port and for human and machine communication, etc., can be sent to a PC or other monitoring equipment via these interfaces.

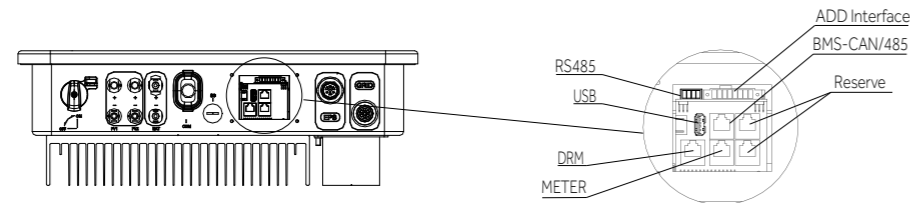


Figure 5-28

1. WIFI or 4G or Ethernet

For details please refer to the WIFI or 4G or Ethernet module user manual.

2. RS485 Interface

Function: Used for Modbus RTU communication with 3rd party external device or controller.

RS485 interface PINS definition:

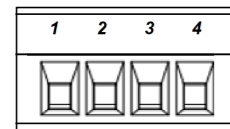


Figure 5-29

Pin	1	2	3	4
Function	+5V	GND	485A	485B

Table 5-5

3. ADD Interface

ADD interface PINS definition:

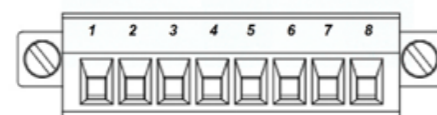


Figure 5-30

Pin	1	2	3	4	5	6	7	8
Function	METER-485A	METER-485B	GENA	GENB	+5V	SHUTDOWN	NC	NC

Table 5-6

Meter communication:

METER_485A & METER_485B---pin1 & pin2

Relay contact output for generator (Reserve): GENA & GENB---pin3 & pin4

Shut down the hybrid inverter: +5V & SHUTDOWN---pin5 & pin6

4. METER port

Function: Used for RS485 communication between inverter and the smart meter.

Meter port PINS definition:

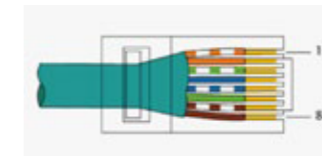


Figure 5-31

Pin	1	2	3	4	5	6	7	8
Function	METER-485A	METER-485B	NC	NC	NC	NC	NC	NC

Table 5-7

The function of meter port same as pin1& pin2 of ADD interface.

4.1 Meter wiring diagram for Typical Energy Storage System

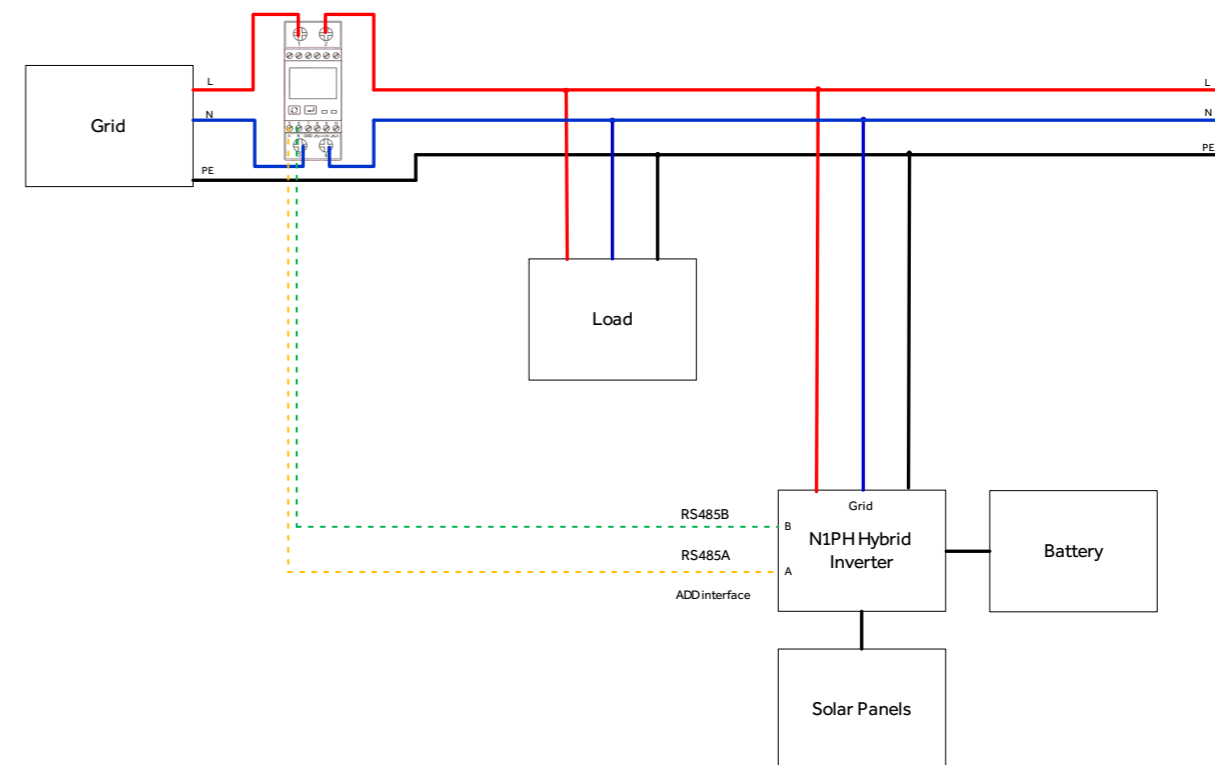


Figure 5-32

The N1PH series energy storage inverter adopts EASTRON SDM230-Modbus smart meter. The connect steps are as follows:

- Before connecting the smart meter to the system, please read the signs on the meter carefully. Please connect the PIN1 and PIN3 of the meter to the grid, and connect the PIN2 and PIN4 of the meter to the inverter and load.
- Connect the smart meter PIN5, PIN6 to the ADD interface of inverter (meter PIN5 to inverter RS485 A, meter PIN6 to inverter RS485 B).



NOTE!

The local address and the meter address need to be set as "001" on the inverter screen. The address of the smart meter itself needs to be set to "001".



WARNING!

If one chooses a flexible wire, ensure the cord section is pressed on the crimping terminal before connecting it to the meter as below.



4.2 Meter wiring diagram for AC Retrofit System

Nahui Hybrid inverters can be used in the following situations also. If the site already has a grid tied PV system and want to increase module capacity or provide back-up power. Additional meter between the grid-connected inverters and N1PH hybrid inverter is required. One N1PH Hybrid inverter can be connected maximum two On-Grid single-phase inverters, and in the system, the smart meter must be the EASTRON SDM230-Modbus.

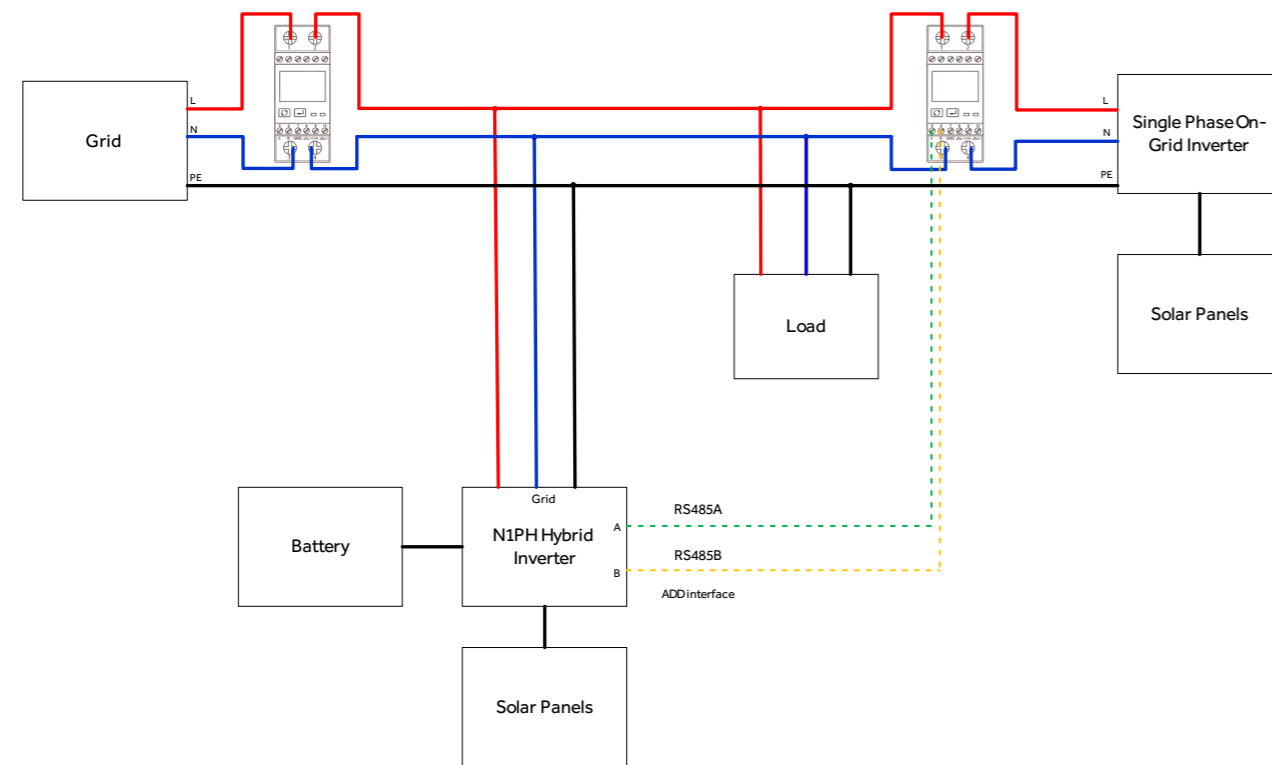


Figure 5-33



NOTE!

The local address needs to be set as "001" on the inverter screen, and meter1 address set as "001", meter2 address set as "004". The address of the smart meter1 itself needs to be set to "001", and the smart meter2 needs to be set as "004".

5. DRED

This application meets the requirements of local Australian grid code (AS/NZS 4777.2) which, among specific requirements for connection, calls for compatibility with Demand Response Enabling Devices (DRED). The DRED is under control of a local network operator and allows to put the inverter in one of the Demand Response Modes (DRMs) defined by the standard:

- DRM 0 Operate the disconnection device.
- DRM 1 Do not consume power.
- DRM 2 Do not consume at more than 50% of rated power.
- DRM 3 Do not consume at more than 75% of rated power and source reactive power if capable.
- DRM 4 Increase power consumption (subject to constraints from other active DRMs).
- DRM 5 Do not generate power.
- DRM 6 Do not generate at more than 50% of rated power.
- DRM 7 Do not generate at more than 75% of rated power and sink reactive power if capable.
- DRM 8 Increase power generation (subject to constraints from other active DRMs).

Currently, it is mandatory to respond to DRM0, which allows the network manager to remotely decouple the installation from the distribution network.

DRM PINS definition:

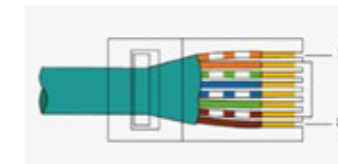


Figure 5-34

Pin	1	2	3	4	5	6	7	8
Function	DRM1/5	DRM2/6	DRM3/7	DRM4/8	+3.3V	COM/DRM0	GND	GND

Table 5-8

5.8 Inverter Configuration

Start inverter after checking all the following:

- Check that the device is fixed well on the wall.
- Make sure all the PV wiring and the AC wiring are completed.
- Make sure the meter are connected well.
- Make sure the battery is connected correctly.
- Turn on the external AC, DC switch.
- Turn on the DC switch to the 'ON' position.
- Set sysswitch on the screen of the inverter to 'Turn on'.
- Measure DC voltage of PV strings and battery and ensure the polarity is correct.
- Measure AC voltage and frequency and ensure they are within local standard.

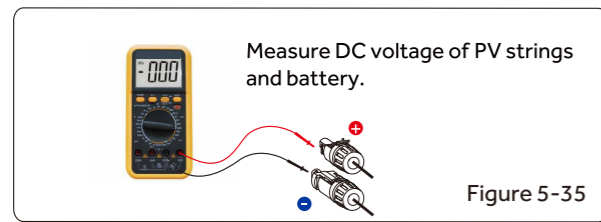


Figure 5-35

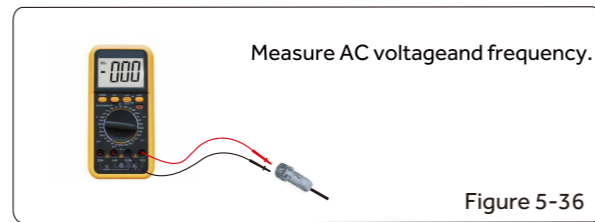


Figure 5-36

Starting inverter:

- Inverter will start automatically when the PV panel generate enough energy or the battery is charged.
- Check the status of LED and LCD screen, first LED should be green and the LCD screen should display the main interface.
- If first LED is not green please check the below:
 - All the connections are right.
 - All the external disconnect switches are closed.
 - The DC switch of the inverter is in the 'ON' position.
 - Switch on the external AC breaker between inverter and grid and have it connected through.
- Enter the setting interface.
- Set the safety standard as in page 34; Set the system time as in page 33; PV connection mode as in page 33; Set work mode as in page 33; Set the communication address as in page 34; Set the EPS as in page 32; Set monitoring module according to the manual (ST-WIFI-G2 User Manual V1.1).



NOTE!

Please configure the inverter if operating first time. Above steps are for regular start-up of the inverter. If the inverter is turned on for the first time, set the language, time, and safety regulations in turn according to the boot guidance.

Shut down inverter:

- For maintenance or other service work, the inverter must be switched off. Proceed as follows to disconnect the inverter from the AC and DC power sources. Lethal voltages or damage to the inverter will follow if otherwise.
- Disconnect the external AC circuit breaker between inverter and grid completely and secure it against reconnection.
 - Rotate the DC switch to the "OFF" position for disconnecting all of the PV string inputs.
 - Wait about 10 minutes until the capacitors inside the inverter completely discharge.
 - Ensure that the DC cable is current-free via a current clamp (Figure 5-36) .



Figure 5-37



CAUTION!

Danger of burns! Even if the inverter is shut down, it may still be hot and cause burns. Wear protective gloves before operating the inverter after it cools down.

6. System Commissioning

6.1 Indicators and Buttons

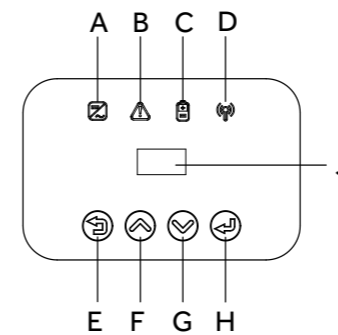


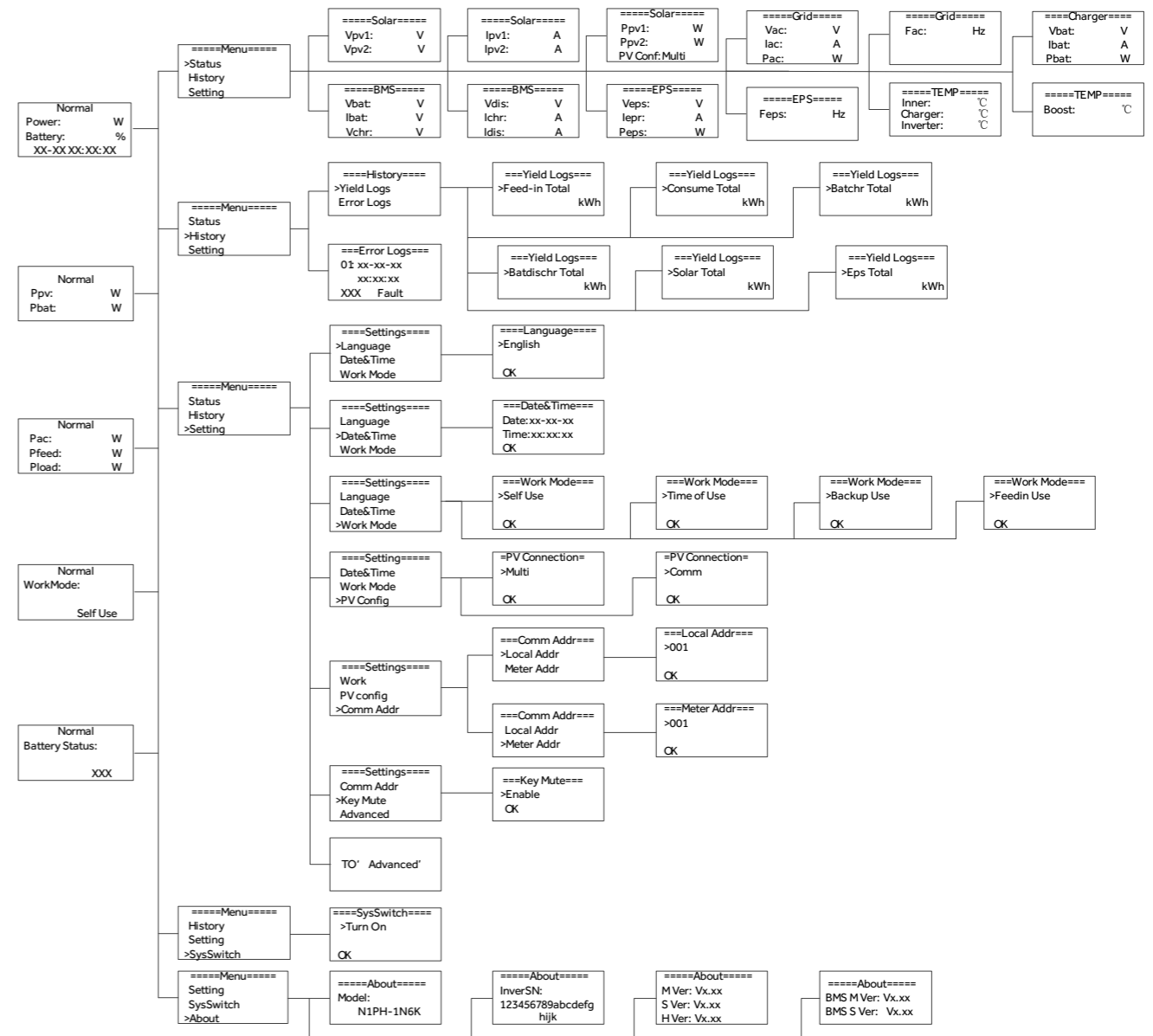
Figure 6-1

Object	Name	Description
A	Indicator LED	Green: Normal working Status.
B		Red: Fault.
C		Green: Battery communication status
D		Green: RS485 communication status.
E	Function Button	ESC button: Leave from current interface or function.
F		Up button: Move cursor to increase value.
G		Down button: Move cursor to decrease value.
H	OK button: Press and hold for 2~3 seconds to confirm the selection.	
J	LCD Screen	Display the information of the inverter.

Table 6-1

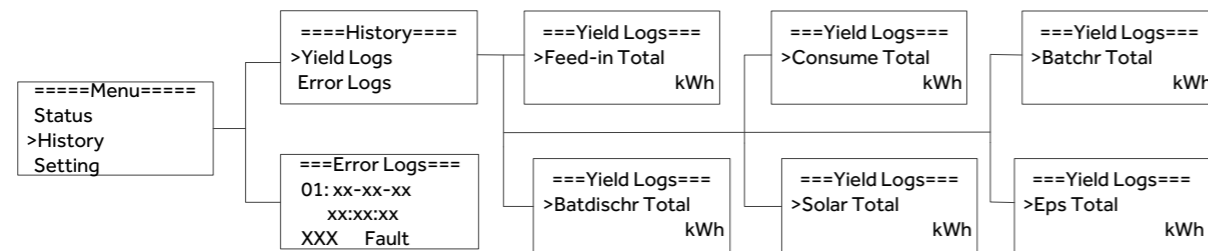
6.2 Setting Inverter Parameters via LCD

Menu structure :



3. History

The history function contains three aspects of the information: inverter yield, battery yield and error log. Press up and down to select, and review the data of system, press 'ESC' to return to the Menu.

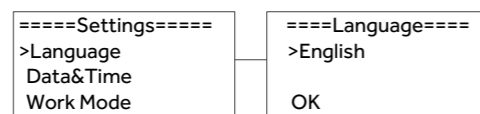


4. Settings

Setting function is used for set the inverter for language, date and time, work mode, communication address, advanced and so on.

4.1) Language

Press up or down button to change language. Press 'OK' to confirm.



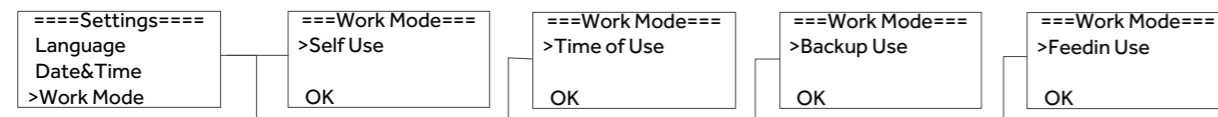
4.2) Date Time

Press up or down button to change date and time. Press 'OK' to confirm.



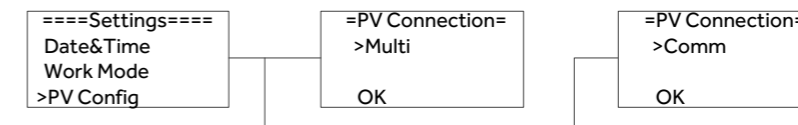
4.3) Work Mode

Press up or down button to select different work modes. Press 'OK' to confirm.



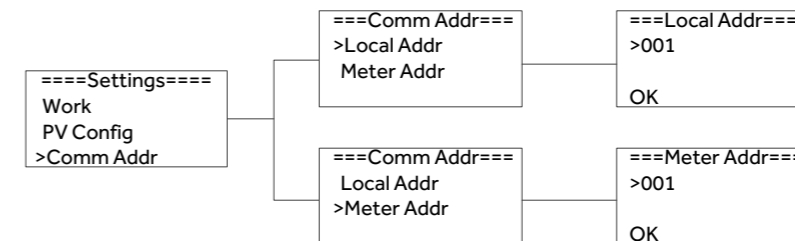
4.4) PV Connection

This function can set the mode of PV input. There are two modes for selection: Comm and Multi. The 'Comm' mode means single MPP tracking, 2 MPPT working together; 'Multi' means multi-MPP tracking, 2 MPPT work independently. Press up or down button to select and press 'OK' to confirm.

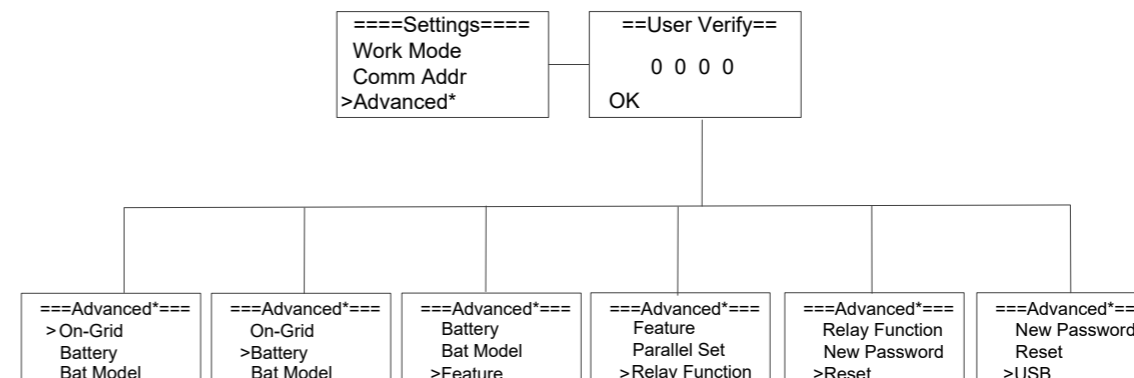


4.5) Communication Address

Press up or down button to change address of local and meter. Press 'OK' to confirm.

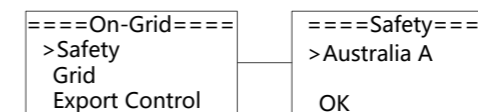


Advanced settings require the original password '0000'. Press 'OK' to confirm.



4.6) Safety

User can set safety standard according to different countries and local standards. Press up or down button to change the grid code. Press 'OK' to confirm.



NOTE!

For compliance with AS/NZS 4777.2:2020, please select from Australia A/B/C/ or New Zealand. Please contact your local grid operator to select the region according to the grid code list.

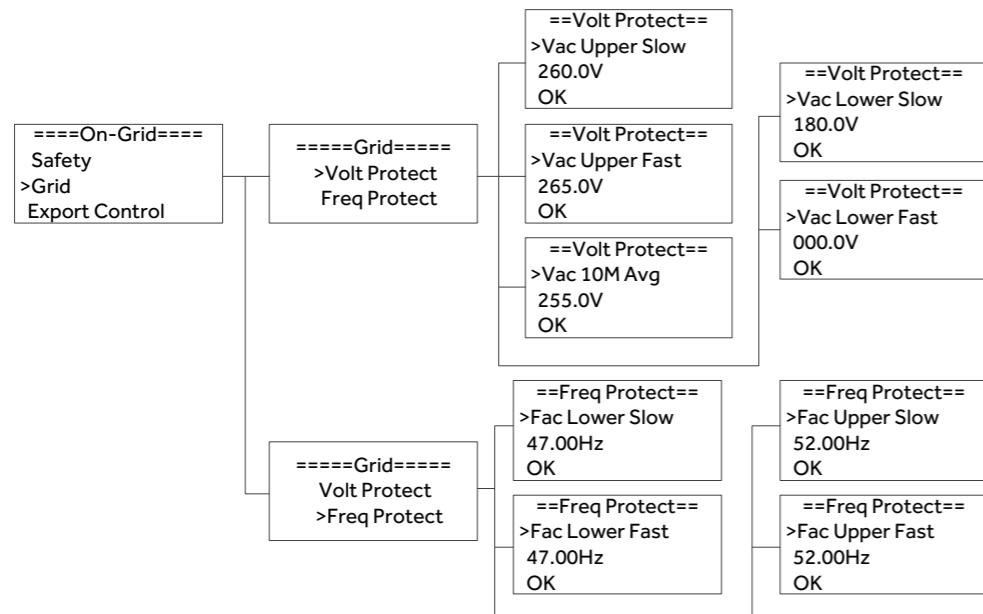
No.	National/Regional Grid Code	Description
0	VDE4105-DE	Germany power Grid, meet Grid standards "VDE-AR-N-4105".
1	CEI0-21	Italy power Grid.
2	Australia A	For large interconnected power systems. e.g. all Australian networks other than Australia B/C and New Zealand.
3	RD1699	Spain power Grid.
4	EN50549	Default EN50549 Grid setting.
5	EN50549-DK-W	West Denmark power Grid.
6	Greece	Greece power Grid.
7	EN50549-NL	Netherland power Grid, meet Grid standards "EN50438".
8	C10/11	Belgium power Grid.
9	G99	UK power Grid.
10	China	China power Grid, meet Grid standards "CN-NBT".
11	VDE0126-FR	France power Grid, meet Grid standards "VDE 0126".
12	EN50549-PL	Poland power Grid.
13	Brazil-180s	Brazil power Grid ,connect/reconnect time 180s
14	VDE0126-DE	Germany power Grid, meet Grid standards "VDE 0126".
15	CEI0-16	Italy power Grid, meet Grid standards "CEI 0-16".
16	G98	UK power Grid.
17	Greece Island	Greece Island power Grid.
18	EN50549-CZ	Czech Republic power Grid, meet Grid standards "EN50438Y2007-CZ".
19	IEC61727-IN	India power Grid.
20	Korea	Korea power Grid.
21	EN50549-SW	Sweden power Grid.
22	China-W	China power Grid, Grid voltage range: 160-290V
23	China-H	Grid frequency range: 47-53HZ.
24	IEC61727-IN-W	China power Grid, meet standards "CQC".
25	Brazil	India power Grid, meet Grid standards "IEC61727".
26	IEC61727-SL	Sri Lanka power Grid, meet Grid standards "IEC61727".

No.	National/Regional Grid Code	Description
27	Mexico	Mexico power Grid, meet Grid standards "IEC61727 60HZ".
28	New Zealand	All systems in New Zealand.
29	Philippines	Philippines power Grid, meet Grid standards "IEC61727 60HZ spec".
30	IEC61727-SL-W	Sri Lanka power Grid, Grid voltage range: 160-280V, Grid frequency range: 47-52HZ.
31	PEA	Thailand power Grid.
32	PEA-W	Thailand power Grid, Grid voltage range: 160-280V, Grid frequency range: 47-52HZ.
33	IEC61727-VN	Vietnam power Grid.
34	IEC61727-VN-W	Vietnam power Grid, Grid voltage range: 160-280V, Grid frequency range: 47-52HZ.
35	Tunisia	Tunisia
36	MEA	Thailand power Grid.
37	MEA-W	Thailand power Grid, Grid voltage range: 160-280V, Grid frequency range: 47-52HZ.
38	Brazil-LV	120V 60Hz voltage of grid L to N(R3-10-15K-LV only,others reserved
39	EN50549-DK-E	East Denmark power Grid
40	Tunisia-W	Tunisia wide range
41	Chile	Chile Power Grid
42	Brazil-W	Brazil power Grid , meet Grid standards "NBT 16150".
43	EN50549-PL-W	Poland power Grid.
44	Brazil-180s-W	Brazil power Grid , meet Grid standards "NBT 16150".
45	UNE217002-ES	Spain power Grid.
46	G98-NI	G98 for Northern Ireland
47	G99-NI	G99 for Northern Ireland
48	EN50549-NW	Norway-400VLine
49	EN50549-NW-LV	Norway-230VLine-R3-10-15K-LV only,others reserved
50	IEC61727-LV	133V 50Hz, low voltage power grid
53	Australia B	For small interconnected power systems. e.g. Western Power
54	Australia C	For isolated or remote power systems. e.g. Horizon Power and TasNetworks

Table 6-2 National/Regional Grid Code

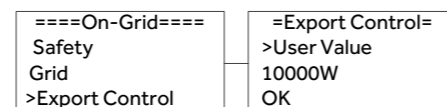
4.7) Grid

Normally, the end user do not need to set the grid parameters, all default value has set on factory according to safety standards of different countries. If need to reset, please refer to the requirement of local grid to do changes. Press up or down button to change the value of grid voltage and grid frequency protect. Press 'OK' to confirm.



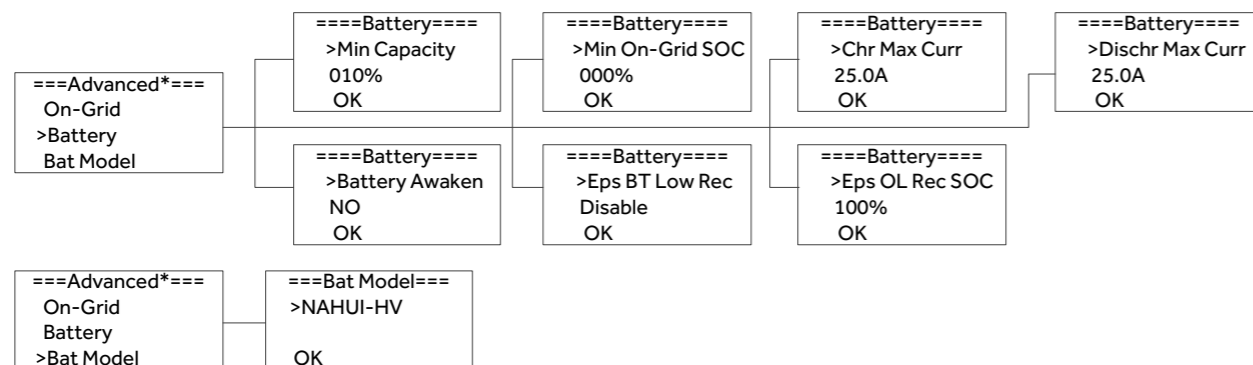
4.8) Export control

With this function the inverter can control the energy export to the grid. Press up or down button to change the export power. Press 'OK' to confirm.



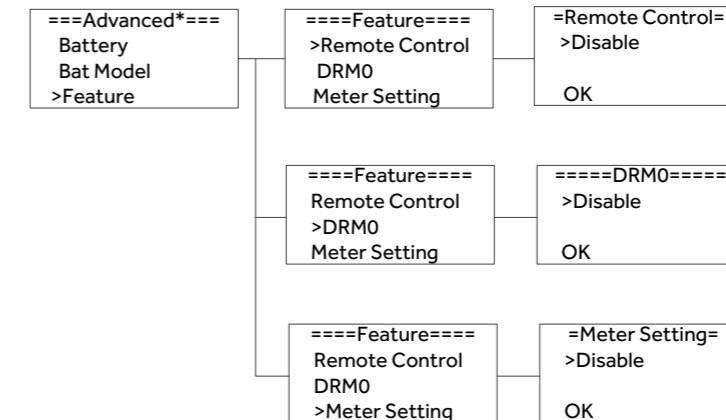
4.9) Battery & Bat Model

Press up or down button to set the parameters of battery. 'Eps BT Low Rec' means recovery enable switch when battery low capacity in EPS mode, 'Eps OL Rec SOC' means EPS overload due to low capacity for battery, if recovered, min soc. Press 'OK' to confirm. Users need to set the battery model before using, press 'OK' to confirm.



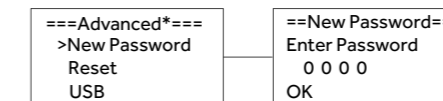
4.10) Feature

Press up or down button to enable or disable remote control, DRM0, and Meter. Press 'OK' to confirm.



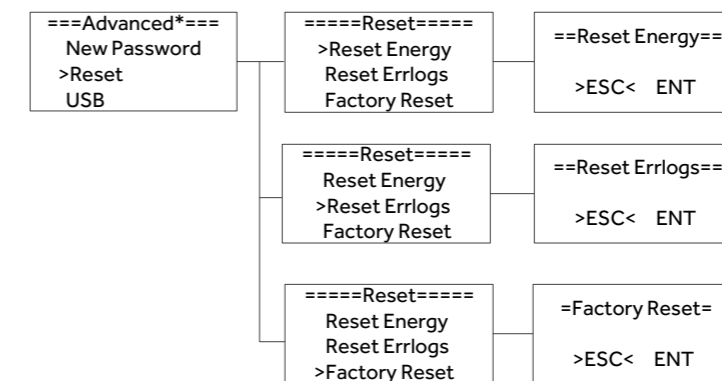
4.11) New Password

Press up or down button to set new password. Press 'OK' for more than 3 seconds to confirm.



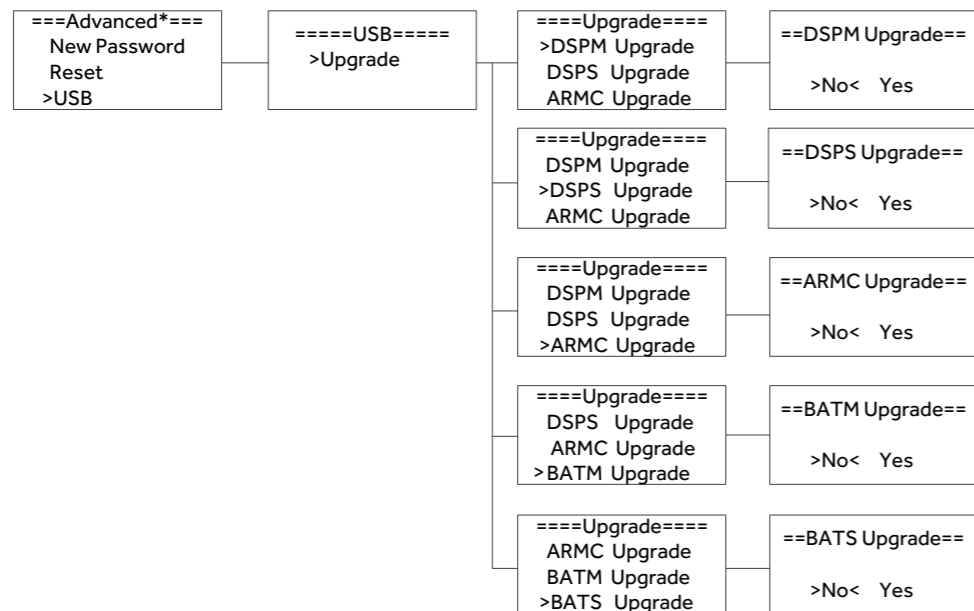
4.12) Reset

Press up or down button to reset energy, reset errors or factory reset. Press 'OK' to confirm.



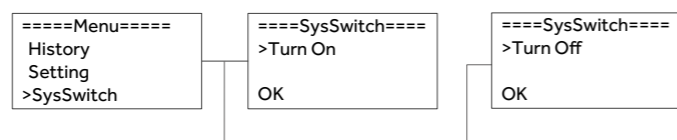
4.13) USB

Press up or down button to upgrade DSPM, DSPTS, ARMC, BATM or BATS. Press 'OK' to confirm.



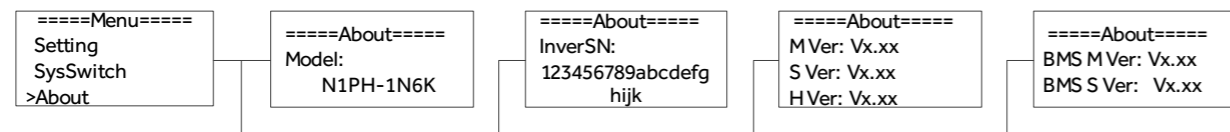
5. System Switch

Press up or down button to turn on or turn off the inverter. Press 'OK' to confirm.



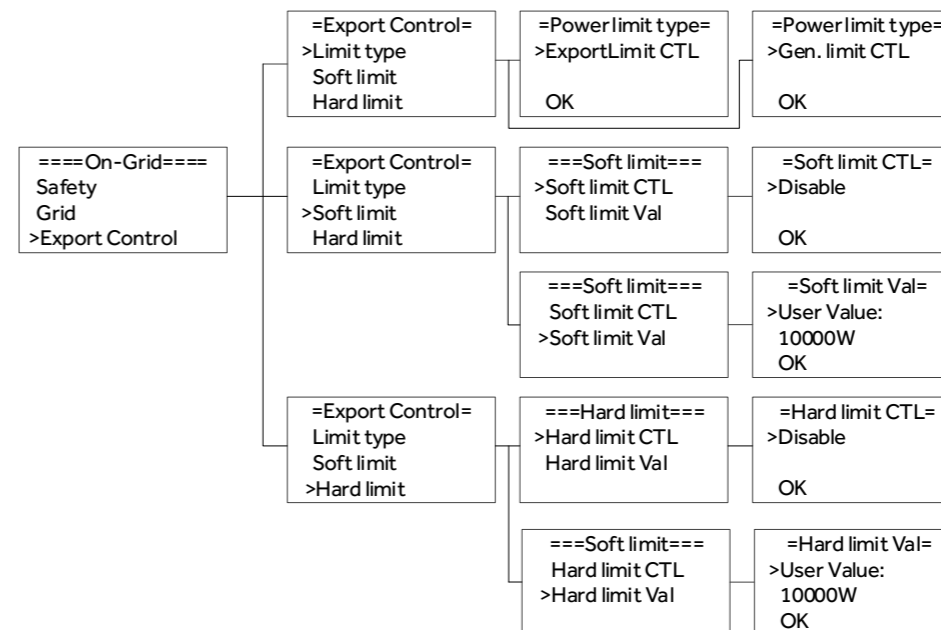
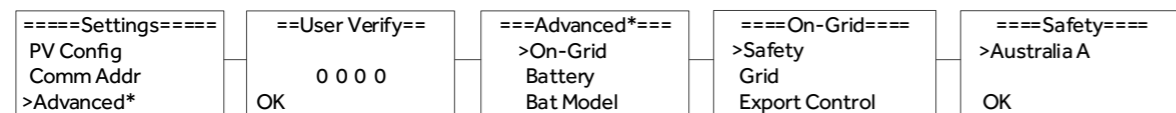
6. About

This interface shows the information of the inverter, such as series number and software version.



6.4 Export Power Control

The export power control function is designed to comply with AS/NZS4777.2:2020. Please select from Australia A/B/C and New Zealand. Users can find the export power control settings in the following path on the LCD. The hard limit value setting can be a little larger than the soft limit value setting.



7. APP Commissioning

7.1 APP Download

There are three ways to download and install the latest APP:

1. You can search the APP in Google Play or App Store.
2. You can scan this QR code below to download.
3. You can search in www.nahui-newenergy.com.



Figure 7-1

7.2 APP Remote Operation

For some functions setting, the end user can achieve them through APP remotely. Such as power factor, reactive power, DRM0 and so on.

Please refer to the user manual of WIFI module in the box for more details about configuration and power plant creating. (ST-WIFI-G2 User Manual V1.1)

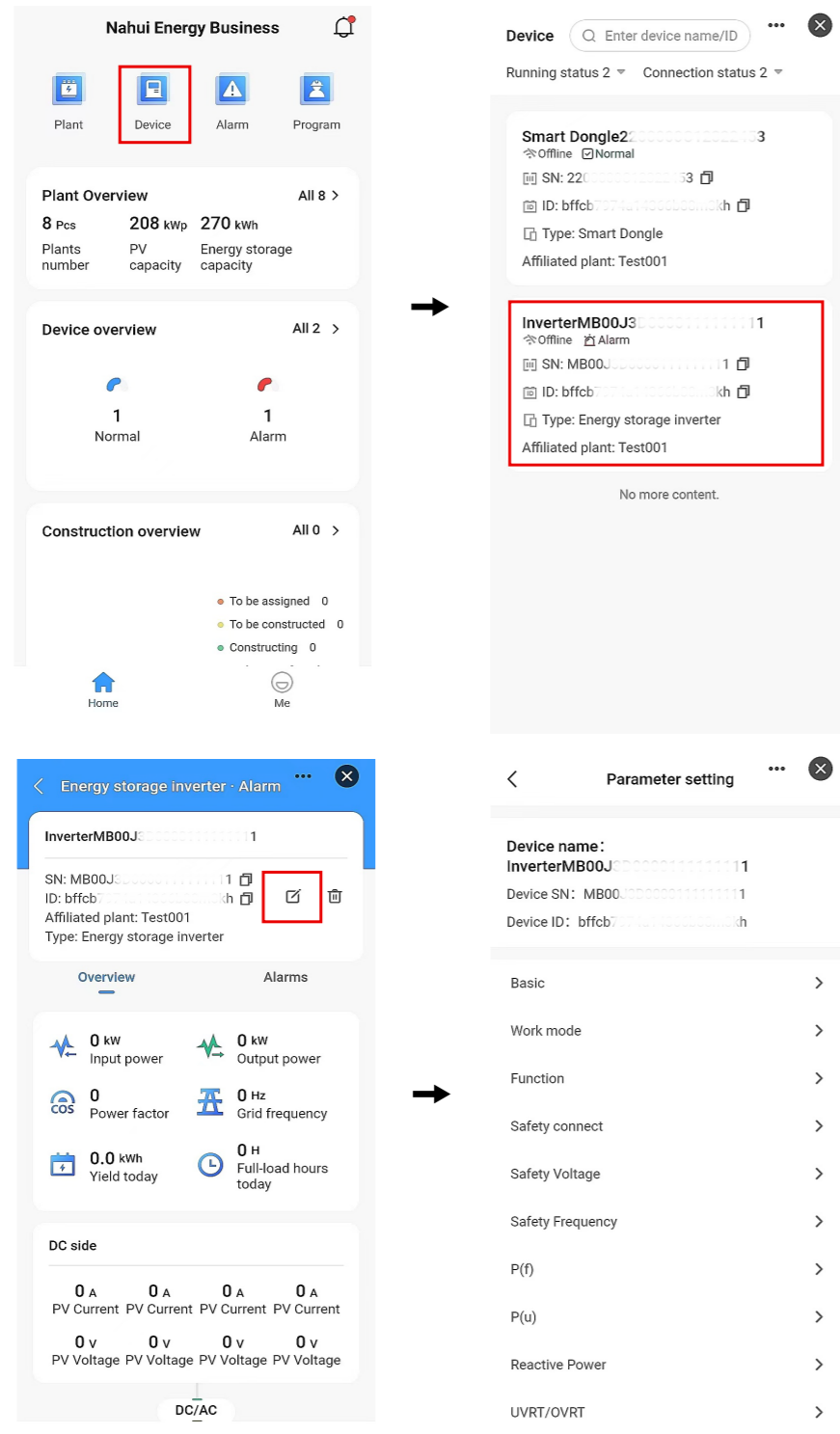


Figure 7-2

7.2.1 Reactive Power (For specific country if required by the local grid.)

There are 5 modes for selecting: None, Fixed PF, Fixed Q, CosphiP, and Q(U), users can select the corresponding mode according to local standards.

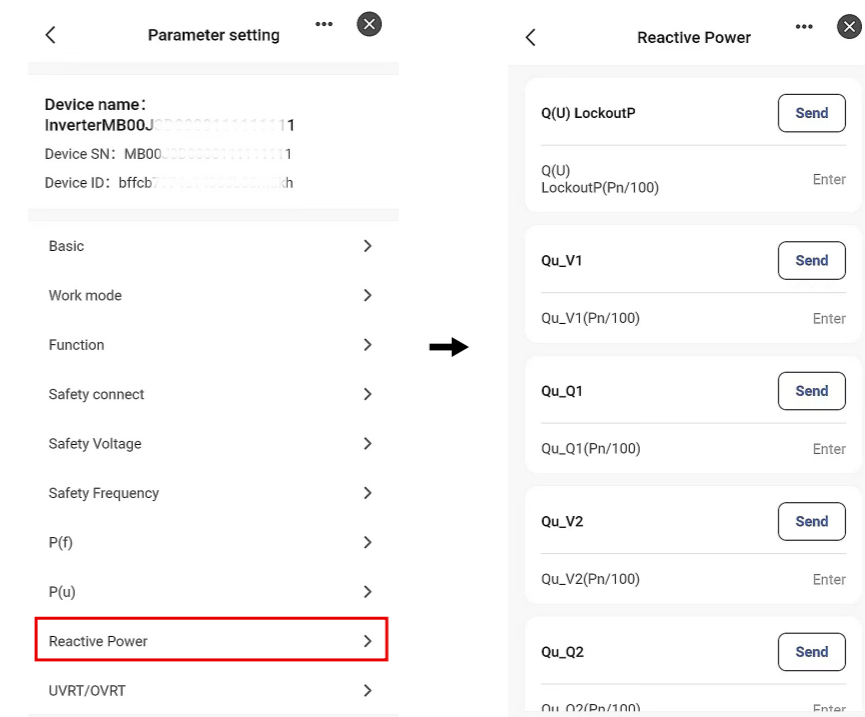


Figure 7-3

7.2.2 P(u) function

P(u) function is Volt-watt response mode which is required by standard NZS4777.2 and applies to NZS4777.2 only. The default value of the function is "enable", choose "disable" means the function is turn off.

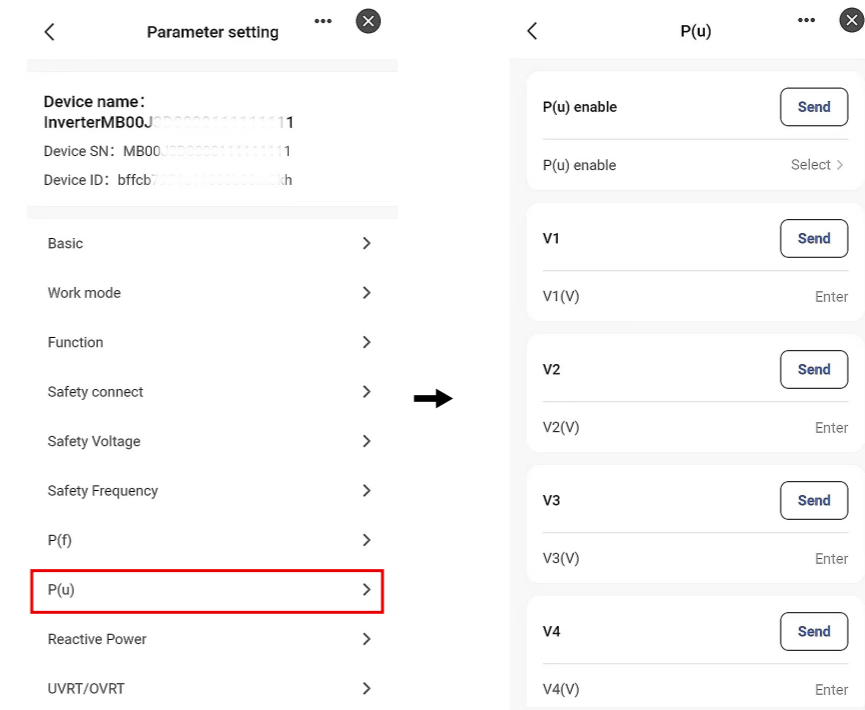


Figure 7-4

7.2.3 P(f) function

P(f) function is Freq-watt response mode which is required by standard NZS4777.2 and applies to NZS4777.2 only. The default value of the function is "enable", choose "disable" means the function is turn off.

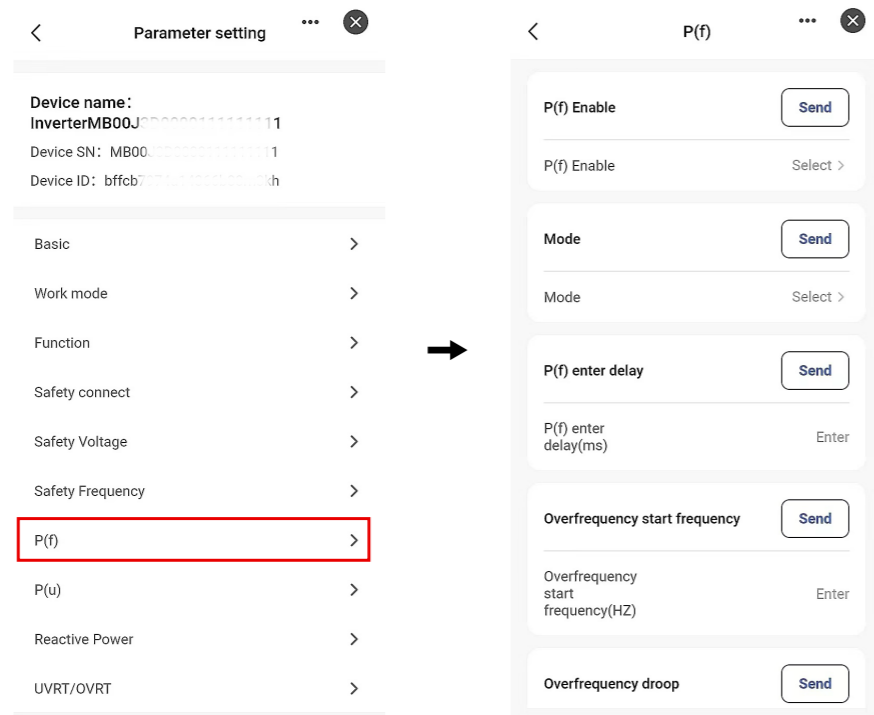


Figure 7-5

7.2.4 DRM function

DRM function is Demand Response Mode which is required by standard NZS4777.2 and applies to NZS4777.2 only. The default value is "enable", choose "disable" means the function is turn off.

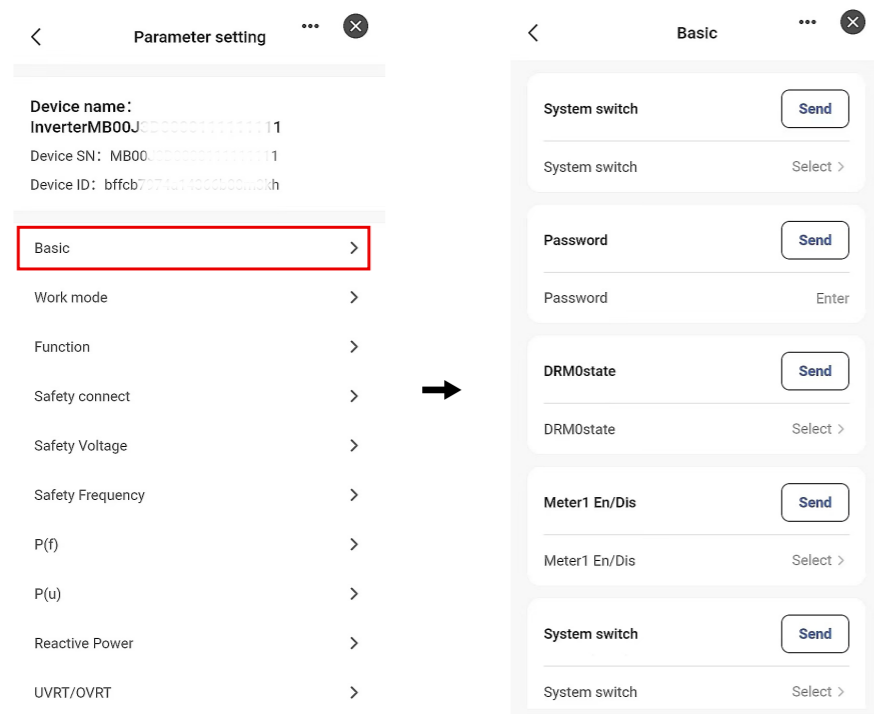


Figure 7-6

7.2.5 Power rate limit function

Power rate limit function is required by standard NZS4777.2 and applies to NZS4777.2 only. This function is defined as power rate limits for increase and decrease in power level per minute.

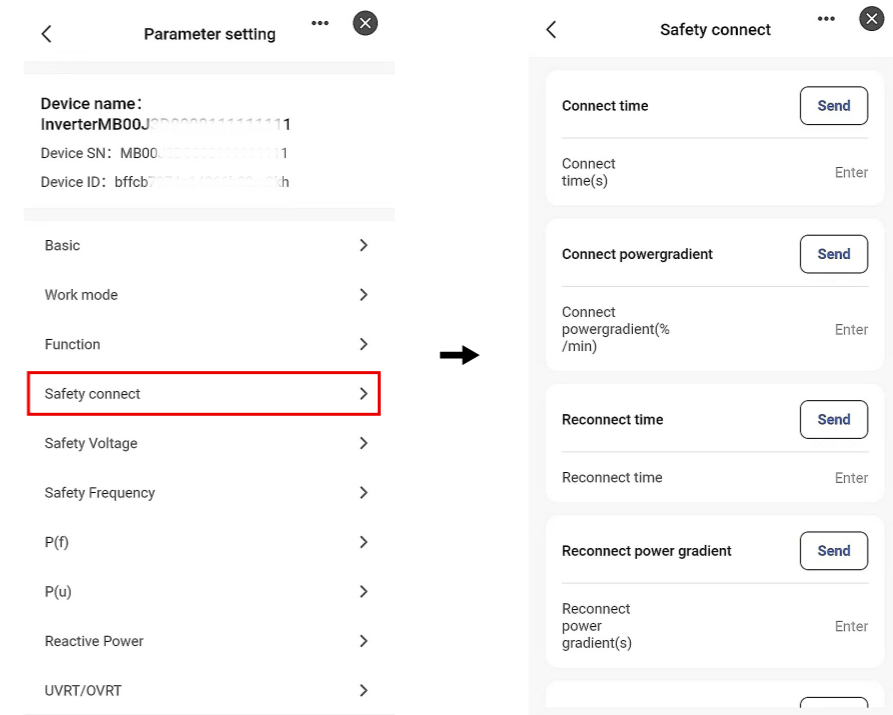


Figure 7-7

8. Troubleshooting and Maintenance

8.1 Troubleshooting

This section contains information and procedures for solving possible problems with the N1PH series inverters, and provides you with trouble shooting tips to identify and solve most problems that could occur with the N1PH series inverters.

This section will help you narrow down the source of any problems you may encounter. Please read the following trouble-shooting steps.

- Check the warning or fault messages on the System Control Panel or Fault codes on the inverter information panel. If a message is displayed, record it before doing anything further.
- Attempt the solution indicated in below table.

Fault	Cause	Solutions
HW Protect Fault	Inverter over-current, battery over-current, or PV over-current detected by hardware.	<ol style="list-style-type: none"> 1. Disconnect the AC output switch, DC input switch & battery switch, then connect them 5 minutes later. 2. Contact the dealer or the after-sales service if the problem persists.
Grid Lost Fault	<ol style="list-style-type: none"> 1. Utility grid power fails. 2. The AC cable is disconnected, or the AC breaker is off. 	<ol style="list-style-type: none"> 1. The alarm is automatically cleared after the grid power supply is restored. 2. Check whether the AC cable is connected and the AC breaker is on.
Grid Volt Fault	<ol style="list-style-type: none"> 1. The grid voltage exceeds the permissible range, or the duration of high voltage exceeds the requirement of HVRT. 2. The grid voltage is lower than the permissible range, or the duration of low voltage exceeds the requirement of LVRT. 	<ol style="list-style-type: none"> 1. If the problem occurs occasionally, the utility grid may be abnormal temporarily. The inverter will recover automatically after detecting that the utility grid is normal. 2. If the problem occurs frequently, check whether the grid voltage is within the permissible range.
Grid Freq Fault	<ol style="list-style-type: none"> 1. Utility grid exception. The actual grid frequency exceeds the requirement of the local grid standard. 2. Utility grid exception. The actual grid frequency is lower than the requirement of the local grid standard. 	<ol style="list-style-type: none"> 1. If the problem occurs occasionally, the utility grid may be abnormal temporarily. The inverter will recover automatically after detecting that the utility grid is normal. 2. If the problem occurs frequently, check whether the grid frequency is within the permissible range.
PV Volt Fault	PV voltage out of range.	Check the serial connection of the PV array. Make sure that the open circuit voltage of the PV string is not higher than the maximum operating voltage of the inverter.
Bus Volt Fault	Bus voltage out of range detected by hardware.	<ol style="list-style-type: none"> 1. Disconnect the AC output switch, DC input switch & battery switch, then connect them 5 minutes later. 2. Contact the dealer or the after-sales service if the problem persists.
Bat Volt Fault	Battery voltage fault.	Check if the battery input voltage is within the normal range, then restart the system and confirm whether the fault persists.
Vgrid 10M Fault	The grid voltage is out of range for the last 10 Minutes.	<ol style="list-style-type: none"> 1. If the problem occurs occasionally, the utility grid may be abnormal temporarily. The inverter will recover automatically after detecting that the utility grid is normal. 2. If the problem occurs frequently, check whether the grid voltage is within the allowed range.

Fault	Cause	Solutions
		<ul style="list-style-type: none"> • Contact the local power company if the grid voltage exceeds the permissible range. • Modify the grid overvoltage rapid protection threshold after obtaining the consent of the local power company if the grid voltage is within the permissible range.
DCI OCP Fault	DC component is out of limit in output current.	<ol style="list-style-type: none"> 1. Disconnect the AC output switch, DC input switch & battery switch, then connect them 5 minutes later. 2. Contact the dealer or the after-sales service if the problem persists.
DCV OVP Fault	DC component is out of limit in output voltage.	
SW OCP Fault	Output current high detected by software.	
RC OCP Fault	The residual current is high.	<ol style="list-style-type: none"> 1. If the problem occurs occasionally, it may be caused by a cable exception. The inverter will recover automatically after the problem is solved. 2. Check whether the impedance between the PV string and PE is too low if the problem occurs frequently or persists.
Iso Check Fault	<ol style="list-style-type: none"> 1. The PV string is short-circuited to PE. 2. The PV system is in a moist environment and the cable is not well insulated to the ground. 	<ol style="list-style-type: none"> 1. Check whether the resistance of the PV string to PE exceeds 50kΩ. If no, check the short circuit point. 2. Check whether the PE cable is connected correctly.
Temp Over Fault	The inverter temperature is high.	Check the ventilation and the ambient temperature at the installation point. If the ventilation is poor or the ambient temperature is too high, improve the ventilation and heat dissipation.
BatConDir Fault	The battery connection is reversed.	<ol style="list-style-type: none"> 1. Check if the positive pole and negative pole of battery are correctly connected. 2. Contact the dealer or the after-sales service if the problem persists.
AD Sample Fault	The sampling value between the main and slave DSP is inconsistent.	<ol style="list-style-type: none"> 1. Disconnect the AC output switch, DC input switch & battery switch, then connect them 5 minutes later. 2. Contact the dealer or the after-sales service if the problem persists.
EPS Over Load	EPS over load.	<ol style="list-style-type: none"> 1. Check the EPS load to ensure it does not exceed the inverter EPS Rated Power. 2. Disconnect the AC output switch and DC input switch & battery switch, then connect them 5 minutes later.
Over Load Fault	Over load in on grid mode.	<ol style="list-style-type: none"> 1. Disconnect the AC output switch, DC input switch & battery switch, then connect them 5 minutes later. 2. Contact the dealer or the after-sales service if the problem persists.

Fault	Cause	Solutions
PV Cnf Fault	PV connection setting is wrong.	Reset the PV connection.
Bat Low Fault	Battery SOC is too Low.	1. Wait the battery to be recharged. 2. Disconnect the AC output switch and DC input switch, then connect them 5 minutes later. Contact the dealer or the after-sales service if the problem persists.
M/S DspCommFault	The communication between master and slave is fault.	1. Disconnect the AC output switch, DC input switch & battery switch, then connect them 5 minutes later. 2. Contact the dealer or the after-sales service if the problem persists.
BMS Lost	The communication between BMS and Inverter is interrupted.	Check if the communication cable between BMS and inverter is connected correctly.
Dsp Lost Fault	The communication is fail between ARM and master DSP.	1. Disconnect the AC output switch, DC input switch & battery switch, then connect them 5 minutes later. 2. Contact the dealer or the after-sales service if the problem persists.
Inter Fan Fault	Internal fan Device failure.	
AC HCT Fault	AD sampling failure.	
Inv EEPROM Fault	DSP EEPROM failure.	
GFCI HW Fault	The residual current circuit is fault.	1. Please check if the insulation of the electric wires is damaged. 2. Disconnect the AC output switch, DC input switch & battery switch, then connect them 5 minutes later. 3. Contact the dealer or the after-sales service if the problem persists.
ByPassRelay Fault	1. The relay is abnormal or short-circuited.	1. Disconnect the AC output switch, DC input switch & battery switch, then connect them 5 minutes later. 2. Contact the dealer or the after-sales service if the problem persists.
EPS Relay Fault	2. The control circuit is abnormal.	
Grid Relay Fault	3. The AC cable connection is abnormal, like a virtual connection or short circuit.	
Other Dev Fault	Other device fault.	1. Disconnect the AC output switch, DC input switch & battery switch, then connect them 5 minutes later. 2. Contact the dealer or the after-sales service if the problem persists.
HMI EEPROM Fault	HMI eeprom failure.	1. Disconnect the AC output switch, DC input switch & battery switch, then connect them 5 minutes later. 2. Contact the dealer or the after-sales service if the problem persists.
Meter1 Lost Fault	The communication between smart meter1 and Inverter is interrupted.	1. Check if the communication cable between smart meter and Inverter is connected correctly. 2. Check if the smart meter is powered on.
Meter2 Lost Fault	The communication between smart meter2 and Inverter is interrupted.	

Fault	Cause	Solutions
Dsp Lost Fault	The communication is fail between ARM and master DSP.	1. Disconnect the AC output switch, DC input switch & battery switch, then connect them 5 minutes later. 2. Contact the dealer or the after-sales service if the problem persists.
BMS AD_AFE Fault	The difference between the total voltage of battery AD and AFE is too large.	
BMS Tepr Fault	Battery temperature sensor fault.	
BMS InCom Fault	Battery internal communication fault.	
BMS Other Fault	Other battery fault.	
BMS PreChg Fault	Battery pre charge fault.	
BMS Relay Fault	The battery relay is fault.	
BMS Cell Fault	Battery cell error.	
BMS Protect OV	Battery over voltage protection.	
BMS Protect LV	Battery under voltage protection.	
BMS Prot ChgOC	Battery over current charging protection.	
BMS Prot DsgOC	Battery over current discharging protection.	
BMS Prot TemHigh	Battery temperature is high.	
BMS Prot TemLow	Battery temperature is low.	
BMS Volt Fault	Battery voltage sensor fault.	
BMS OutCom Fault	BMS external communication fault.	
BMS ISO Fault	Battery insulation test failed.	
BMS Check Fault	Battery self-test failed.	
BMS Prot TemDiff	The difference in battery cell temperature is too large.	
BMS Prot AD_AFE	The difference between the total voltage of battery AD and AFE is too large, triggering protection.	
BMS Prot Hard OC	Battery hardware overcurrent protection.	

Table 7-1 Fault List



NOTE!

If the inverter displays any alarm message as listed in Table 7-1; please turn off the inverter and wait for 5 minutes before restarting it . If the failure persists, please contact your local distributor or the service center.

Please keep ready with you the following information before contacting us.

- Serial number of Nahui Single Phase Inverter.
- The distributor/dealer of Nahui Single Phase Inverter (if available).
- Installation date.
- The description of the problem together with necessary information, pictures, attachment.
- The PV array configuration (e.g. number of panels, capacity of panels, number of strings, etc.).
- Your contact details.

Remark

If your inverter's information panel is not displaying a Fault light, check the following list to make sure that the present state of the installation allows proper operation of the unit.

- Is the inverter located in a clean, dry, and adequately ventilated place?
- Have the DC input breakers been opened?
- Are the cables adequately sized and short enough?
- Are the input and output connections and wiring in good condition?
- Are the configurations settings correct for your particular installation?
- Are the display panel and the communications cable properly connected and undamaged?

Contact Nahui Energy Customer Service for further assistance. Please be prepared to describe details of your system installation and provide the model and serial number of the unit.

8.2 Maintenance

Inverters generally do not need any daily or routine maintenance. Heat sink should not be blocked by dust, dirt or any other items. Before the cleaning, make sure that the DC SWITCH is turned OFF and the circuit breaker between inverter and electrical grid is turned OFF. Wait at least for 5 minutes before the Cleaning.

During the process of using the inverter, the manage person shall examine and maintain the machine regularly.

The concrete operations are follow.

- 1: Check that if the cooling fins on the rear of house are covered by dirts, and the machine should be cleaned and absorbed dust when necessary. This work shall be check time to time.
- 2: Check that if the indicators of the inverter are in normal state, check if the keys of the inverter are in normal state, check if the display of the inverter is normal. This check should be performed at least every 6 months.
- 3: Check that if the input and output wires are damaged or aged. This check should be performed at least every 6 months.
- 4: You should keep the inverter panels clean and their security checked at least every 6 months.

- Inverter cleaning

Please clean the inverter with an air blower, a dry & soft cloth or a soft bristlebrush. Do not clean the inverter with water, corrosive chemicals, detergent, etc.

- Heat sink cleaning

For the long-term proper operation of inverters, ensure there is enough space around the heat sink for ventilation, check the heat sink for blockage (dust, snow, etc.) and clean them if they exist. Please clean the heat sink with an air blower, a dry & soft cloth or a soft bristle brush. Do not clean the heat sink with water, corrosive chemicals, detergent, etc.

9. Decommissioning

9.1 Dismantling

- Disconnect the inverter from DC input and AC output.
- Disconnect battery wiring.
- Wait for 5 minutes for de-energizing.
- Disconnect communication and optional connection wiring.
- Remove the inverter from the bracket.

9.2 Packing

If possible, please pack the inverter with the original packaging.

If it is no longer available, you can also use an equivalent carton that meets the following requirements.

- Suitable for loads more than 25kg.
- With handle.
- Can be fully closed.

9.3 Storage

Store the inverter in dry place where ambient temperatures are always between -20 °C - +60 °C.

9.4 Disposal

When the inverter or other related components need to be disposed, have it carried out according to local waste handling regulations. For safe disposal, take inverter to appropriate waste recycling center in your local area.



NAHUI

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