SRNE

# User Manual


## *All-in-One Solar Charge Inverter*

ASP48140U300-H
ASP48150U300-H
ASP48160U300-H

Ver. : V00 2025-12-16

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# 1. Safety

## 1.1 How to Use This Instruction Manual

This manual contains important product information, guidelines, and operating and maintenance instructions.
Read the manual and other related documents before performing any operation on the inverter. Documents must be stored carefully and be available at all times.

## 1.2 Symbols in this manual

| | |
|---|---|
| DANGER | DANGER indicates a hazardous situations which if not avoided will result in death or serious injury. |
| WARNING | WARNING indicates a hazardous situations which if not avoided could result in death or serious injury. |
| CAUTION | CAUTION indicates a hazardous situations which if not avoided could result in minor or moderate injury. |
| NOTICE | NOTICE provide some tips on operation of products. |

## 1.3 Safety Instructions

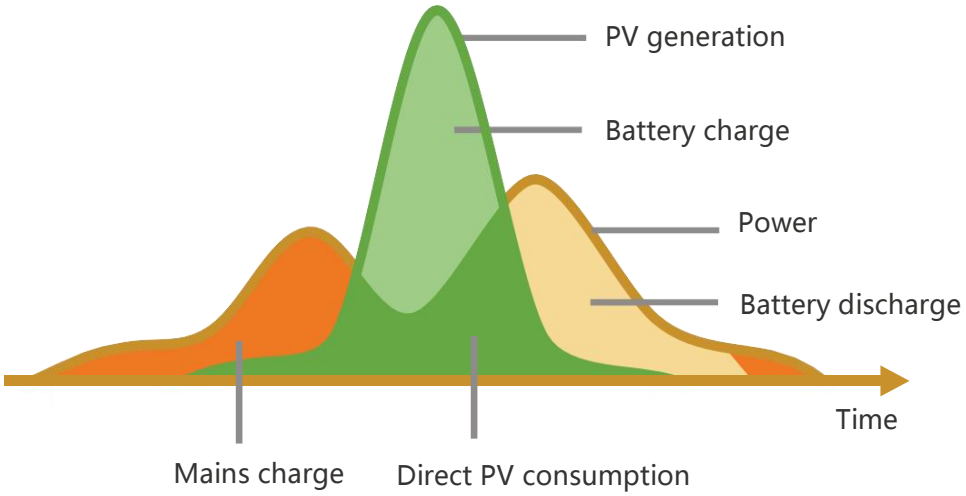
**WARNING:** This chapter contains important safety and operating instructions. Read and keep this manual for future reference.

- Be sure to comply the local requirements and regulation to install this inverter.
- Beware of high voltage. Please turn off the switch of each power sources before and during the installation to avoid electric shock.
- For optimum operation of this inverter, please follow required specification to select appropriate cable size and necessary protective device.
- Do not connect or disconnect any connections when the inverter is working.
- Do not open the terminal cover when the inverter working.
- Make sure the inverter is well grounding.
- Never cause AC output and DC input short circuited.
- Do not disassembly this unit, for all repair and maintenance, please take it to the professional service center.
- Never charge a frozen battery.
- Please keep children away from touching or mishandling the inverter.
- Please make sure that this inverter is the only input power source for the load, do not use it in parallel with other input AC power sources to avoid damage.Ensure this inverter is the sole input power source for the load. Do not parallel it with other AC input power sources to avoid damage.

# 2. Product Introduction

## 2.1 Product Description

The Product is a new type of solar storage inverter that integrates PV storage, mains charge, and energy storage and outputs sinusoidal AC. Equipped with DSP control and advanced control algorithm, it has high response speed and good reliability, and applies to industrial scenarios.




## 2.2 Features

- Support the connection of various types of energy storage batteries such as lead-acid battery and lithium-ion battery
- Features Dual activation function when lithium-ion batteries are in hibernation; activation of lithium-ion batteries can be triggered by either mains power or photovoltaic power input.
- Support split-phase pure sine wave output.
- Support adjusting the voltage of each phase within the range of 100 VAC, 105 VAC, 110 VAC,115 VAC, 120VAC ,127VAC.
- Supports two-way photovoltaic input, with the function of simultaneously tracking the maximum power charging or load-carrying capacity of two MPPTs.
- Dual MPPT with 99% efficiency and maximum 36A current in a single circuit, perfectly adapted to high power modules.
- Provide four charge modes: only PV, grid first, PV first, and grid + PV.
- Have the timed charge and discharge function, that is, users can set the charge and discharge time according to the time-of-use price to save electricity costs.
- Have the energy-saving mode, reducing no-load energy losses.
- With two output modes of utility bypass and inverter output, with uninterrupted power supply function.

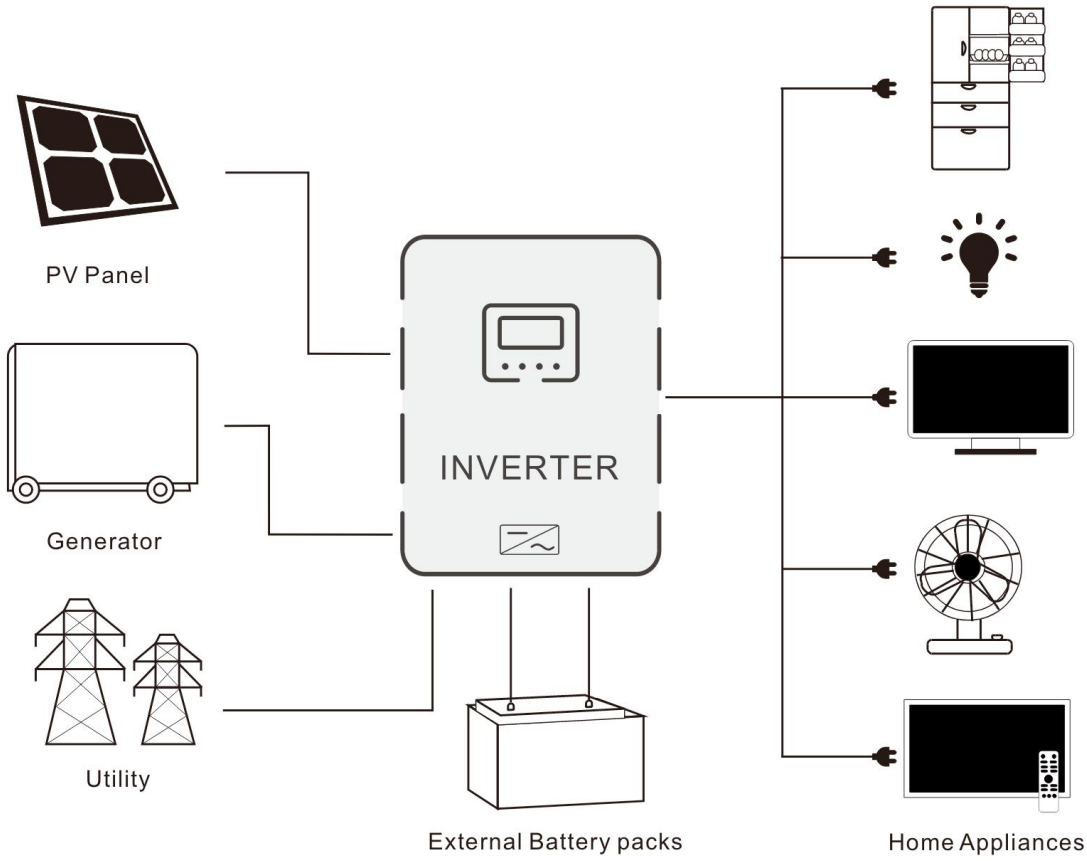
- LCD large screen dynamic flow diagram design, easy to understand the system data and operation status.
- 360° protection with complete short circuit protection, over current protection, over under voltage protection, overload protection, backfill protection, etc.
- Support CAN, USB, and RS485 communication.
- Support 130% unbalanced load.

## 2.3 System Connection Diagram

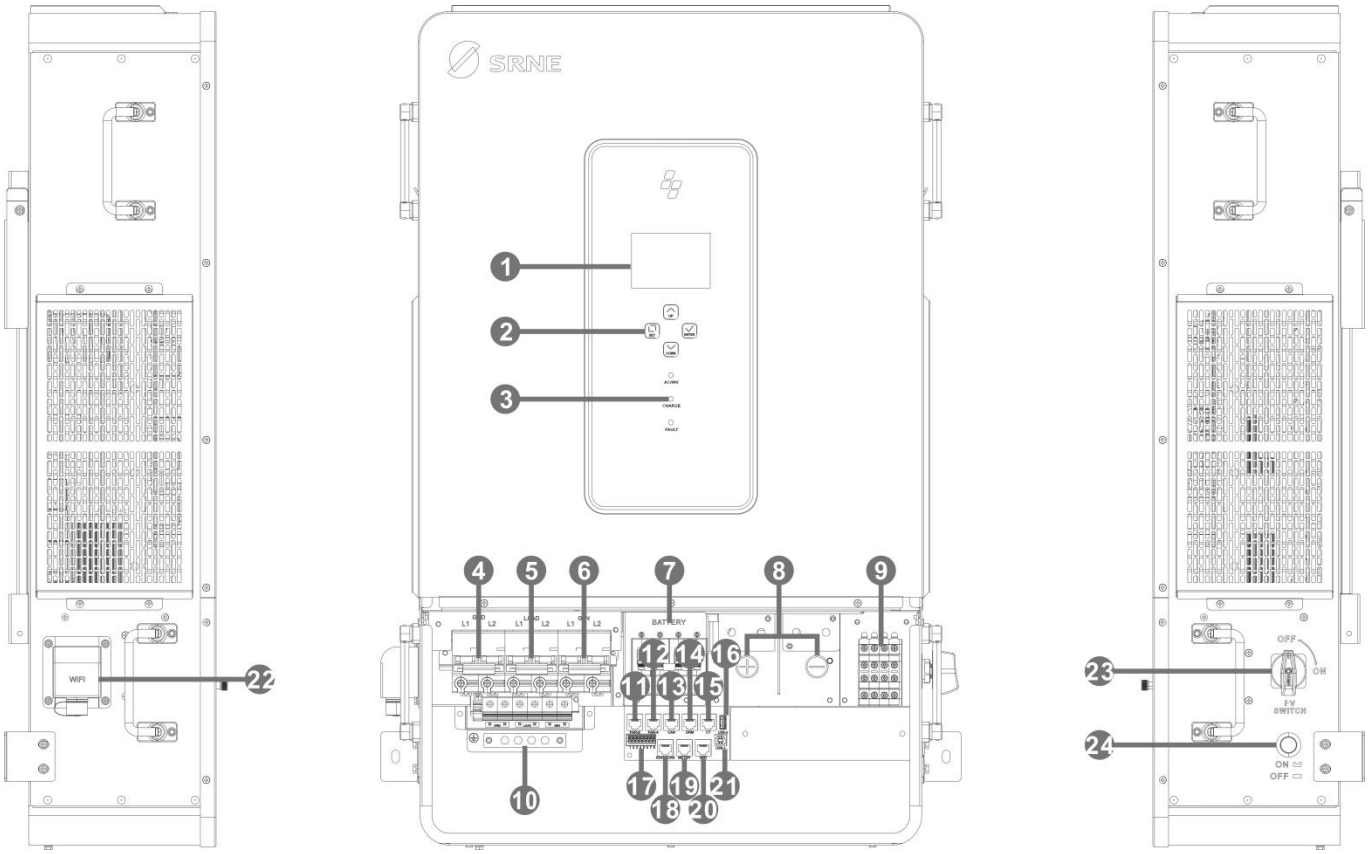
The diagram below shows the system application scenario of this product. A complete system consists of the following components:

- **PV modules:** Converts light energy into DC energy, which can be used to charge the battery via an inverter or directly inverted into AC power to supply the load.
- **Grid or generator:** Connected to the AC input, it can supply the load and charge the battery at the same time. The system can also operate generally without the mains or generator when the battery and the PV module power the load.
- **Battery:** The role of the battery is to ensure the regular power supply of the system load when the solar energy is insufficient and there is no mains power。
- **Home load:** Various household and office loads can be connected, including refrigerators, lamps, televisions, fans, air conditioners, and other AC loads.
- **Inverter:** The energy conversion device of the whole system.

**Note: The actual application scenario determines the specific system wiring method.**

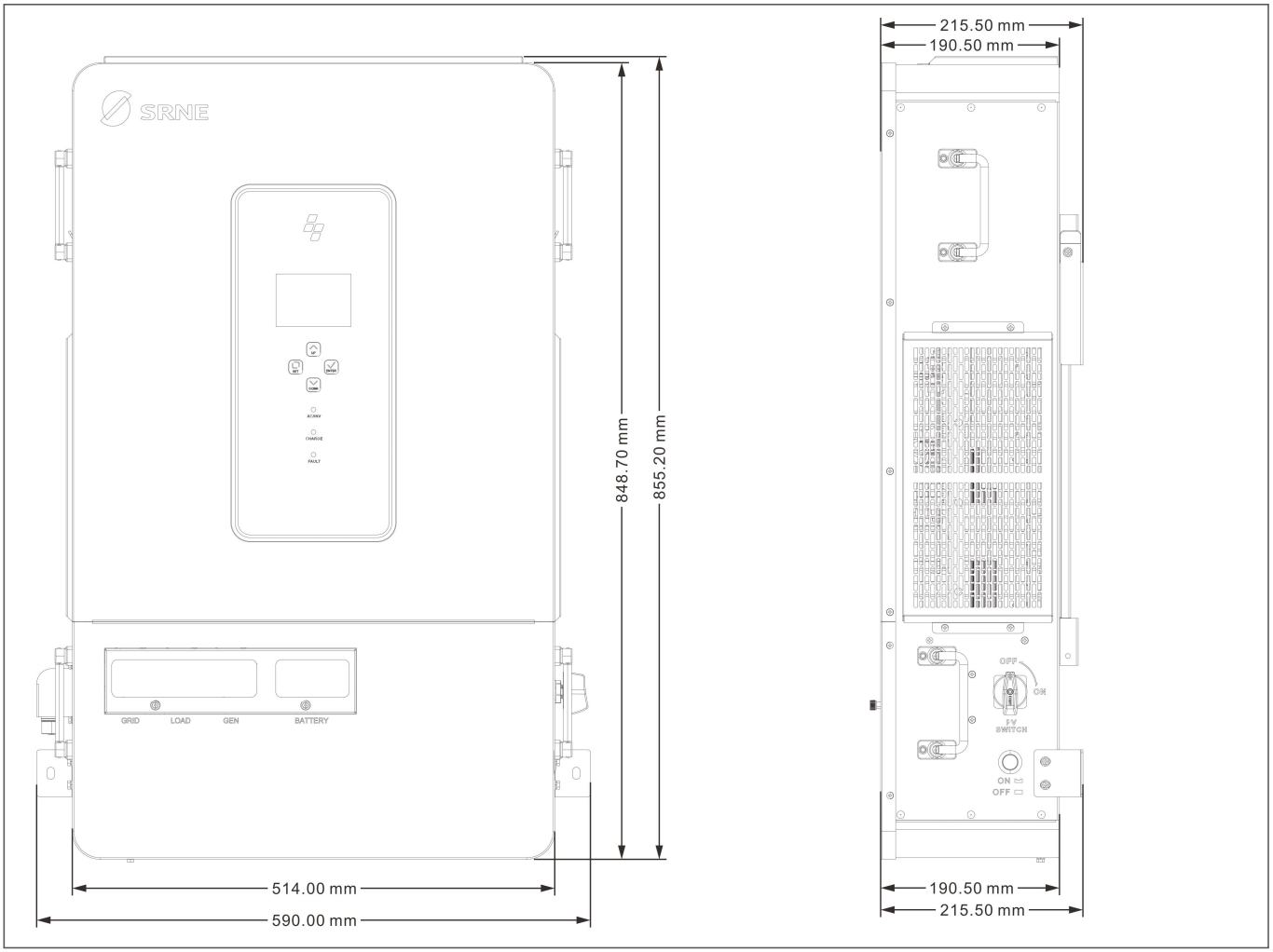


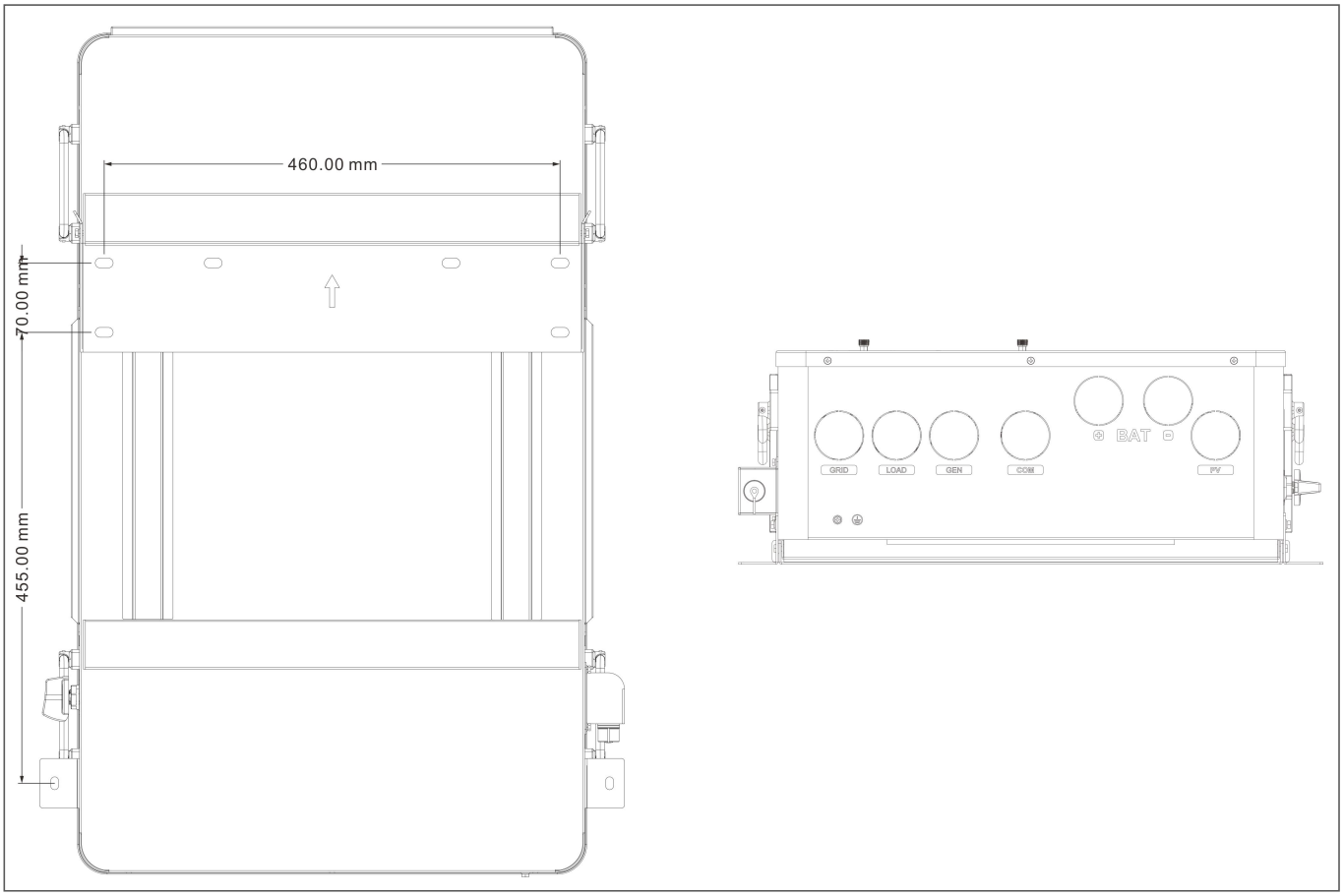
# 2.4 Product Overview




| | | | | | |
|---|---|---|---|---|---|
| 1 | LCD Screen | 2 | Operation Buttons | 3 | LED Indicators |
| 4 | Grid Input (L1+L2+N) | 5 | Load Output (L1+L2+N) | 6 | Generator Input(L1+L2+ N) |
| 7 | Battery Circuit Breaker | 8 | Battery Port | 9 | PV Input |
| 10 | Grounding Screw | 11 | Parallel Port (PAR-B) | 12 | Parallel Port (PAR-A) |
| 13 | CAN Port | 14 | DRM Port | 15 | CT Port |
| 16 | USB-2 Port | 17 | Dry Contact Prot | 18 | RS485/CAN Port |
| 19 | Meter Port | 20 | WIFI Port 1 | 21 | USB-1 Port |
| 22 | WIFI Port 2 | 23 | PV Switch | 24 | Power on/off switch |

# 2.5 Product Size

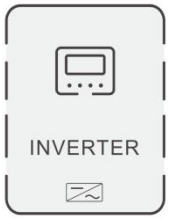


# 3. Installation

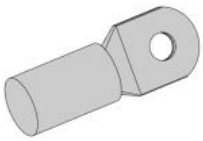
## 3.1 Parts List

Please check the equipment before installation. Make sure that there is no damage to the packaging.You should have received the following items in the package:



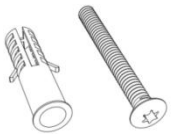

Inverter
x 1pcs

Wall mount bracket
x 1pcs



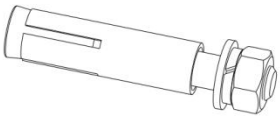
Crimp Terminal SC95-8
x 4pcs


M8 Socket screwdriver
x 1pcs



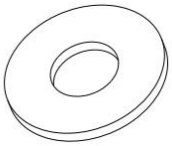
Round-head self-tapping screws FA6x35 + white rubber plugs
x 1bag

Black screw M4*8mm
x 4pcs

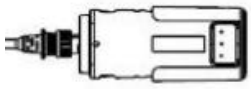


Expansion bolt
M8*60mm
x 4pcs

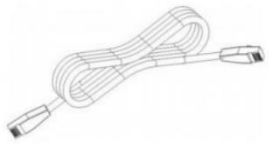
Hex Key_L-Type_5mm
x 1pcs



M8 flat washer
x 3pcs

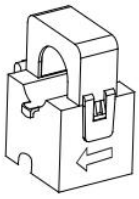


WIFI logger
x 1pcs

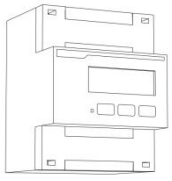


Parallel cable
x 1pcs

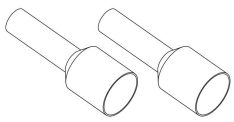
Hexagon socket cross recessed screw
M8*12mm / M5*10mm
x 5pcs / x 4pcs



CT (Optional)
x 1pcs



Meter (Optional)
x 1pcs



Ferrule terminal
x 8pcs

User manual
x 1pcs


Quality certificate
x 1pcs

Outgoing inspection report
x 1pcs

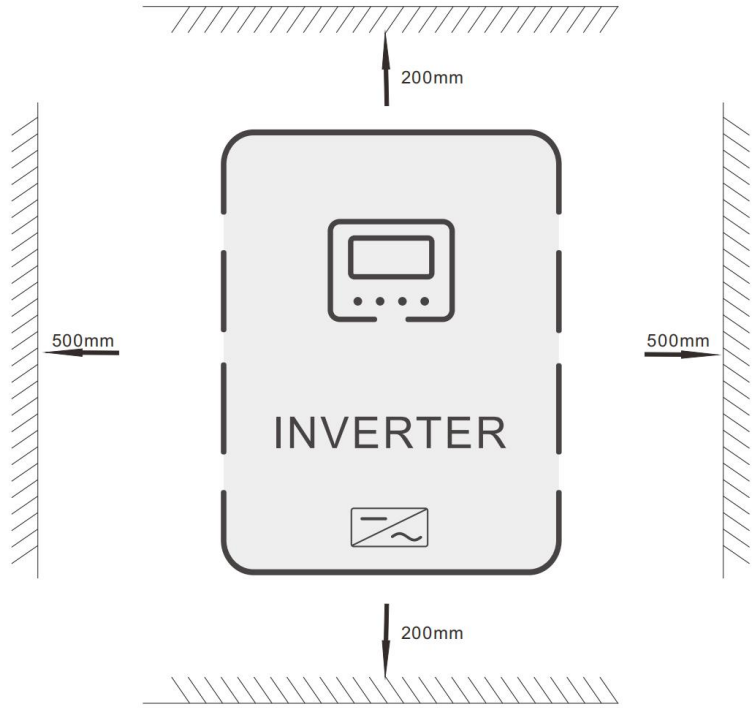
Warranty Card
x 1pcs

# 3.2 Mounting Instructions

## 3.2.1 Installation Location Selection

The product is designed for indoor use only (IP20 rated). Consider the following factors when selecting the installation location:

- Choose the solid wall to install the inverter.
- Mount the inverter at eye level.
- Adequate heat dissipation space must be provided for the inverter.
- The ambient temperature should be between -10℃ ~ 55℃ ( 14℉ ~ 131℉ ) to ensure optimal operation.




**DANGER**

- Do not install the inverter where highly flammable materials are near by.
- Do not install the inverter in potential explosive areas.
- Do not install the inverter with lead-acid batteries in a confined space.

**CAUTION**

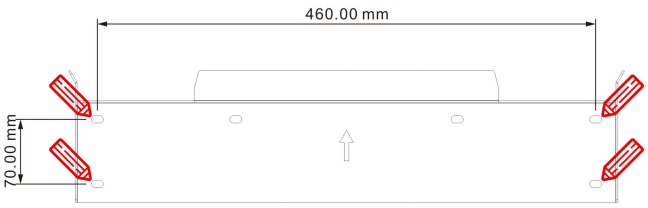
- Do not install the inverter in direct sunlight.
- Do not install or use the inverter in a humid environment.

## 3.2.2 Mounting the Inverter

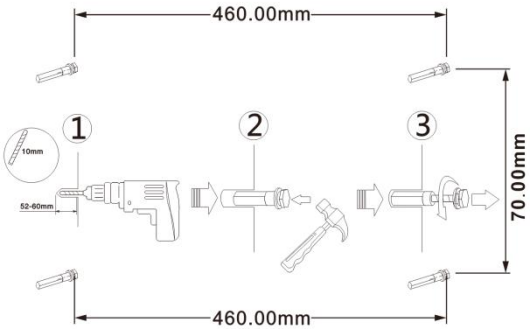
- **Step 1:** Use the wall-mounting bracket as a template to determine the drilling positions. Ensure the holes are level, mark them with a marker, and use a rotary hammer to drill into the wall. Keep the drill perpendicular to the wall to avoid shaking and prevent surface damage. If there is significant deviation in hole positioning, remeasure and reposition.

- **Step 2:** Select a solid wall with a thickness of at least 80 mm, and drill four holes according to the marked positions (hole diameter: φ8, depth: 45–50 mm). Insert M8 expansion bolts into the holes and tighten the nuts securely.
- **Step 3:** Align the wall-mounting bracket with the drilled holes, and fasten it firmly to the wall by tightening the expansion bolts and nuts.
- **Step 4:** ① Install the inverter. Slowly hang the inverter on the frame via the matching hooks, then tighten the screws on both sides. ② Mark the positions of the bent feet on both sides according to the hole positions. Remove the bent feet and drill two holes with a diameter of φ6 and a depth of 35-40 mm. Then install the bent feet and tighten them with M6 self-tapping screws.

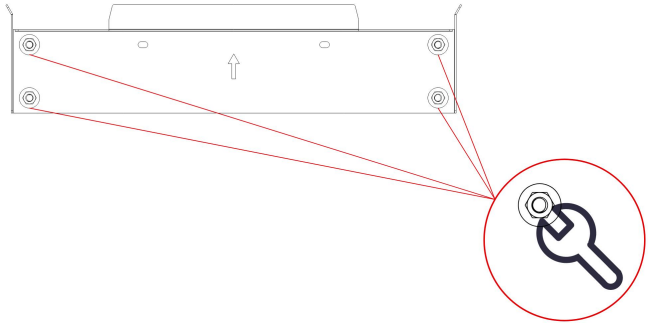
**Step 1**



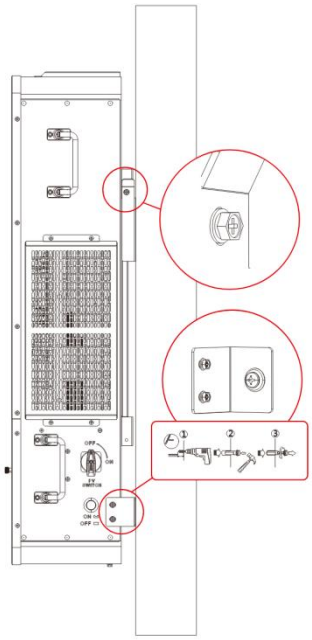

**Step 2**




**Step 3**

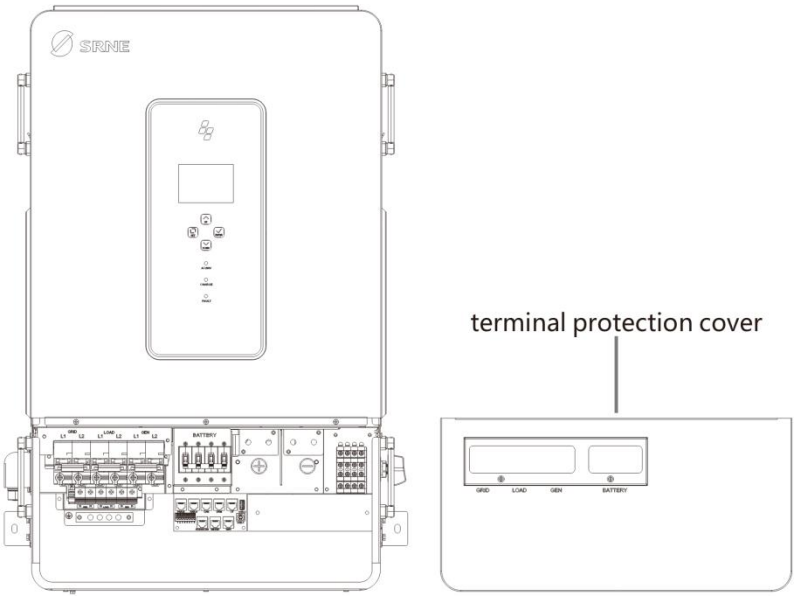


**Step 4**

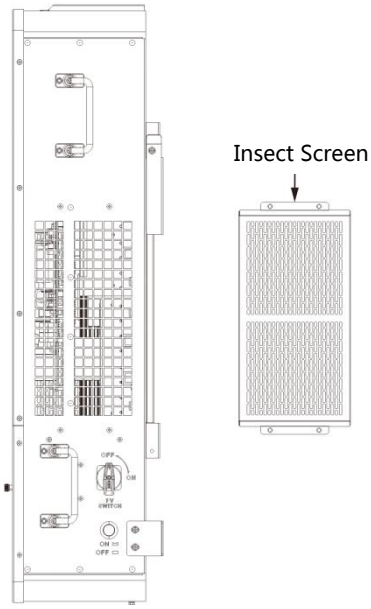


### 3.2.3 Removing the Terminal Protection Cover

Use a screwdriver to remove the terminal cover and insect screen.




Remove the insect-proof net when cleaning.

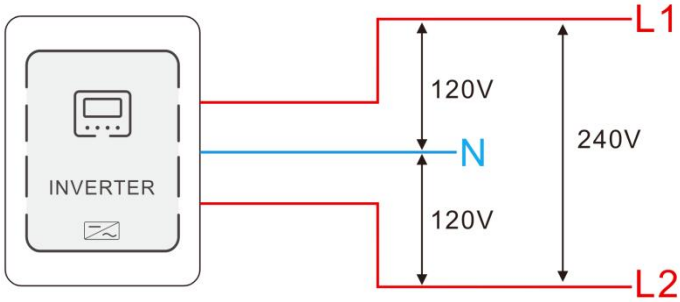


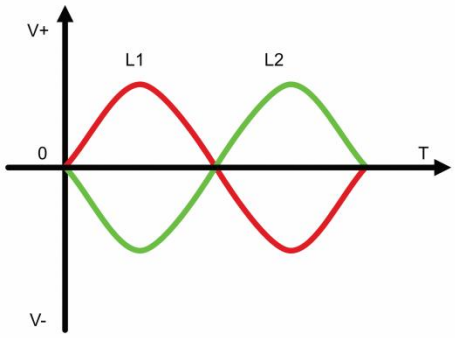

**NOTICE**

When using the device in areas with poor air quality, the dust screen is prone to being blocked by air particles. Please regularly remove and clean the dust screen to avoid affecting the internal air circulation rate of the frequency converter, which may cause over-temperature protection faults (Fault 19/20) and affect the service life of the power supply and inverter.

# 4. Connection Instructions

## 4.1 Split-phase Mode



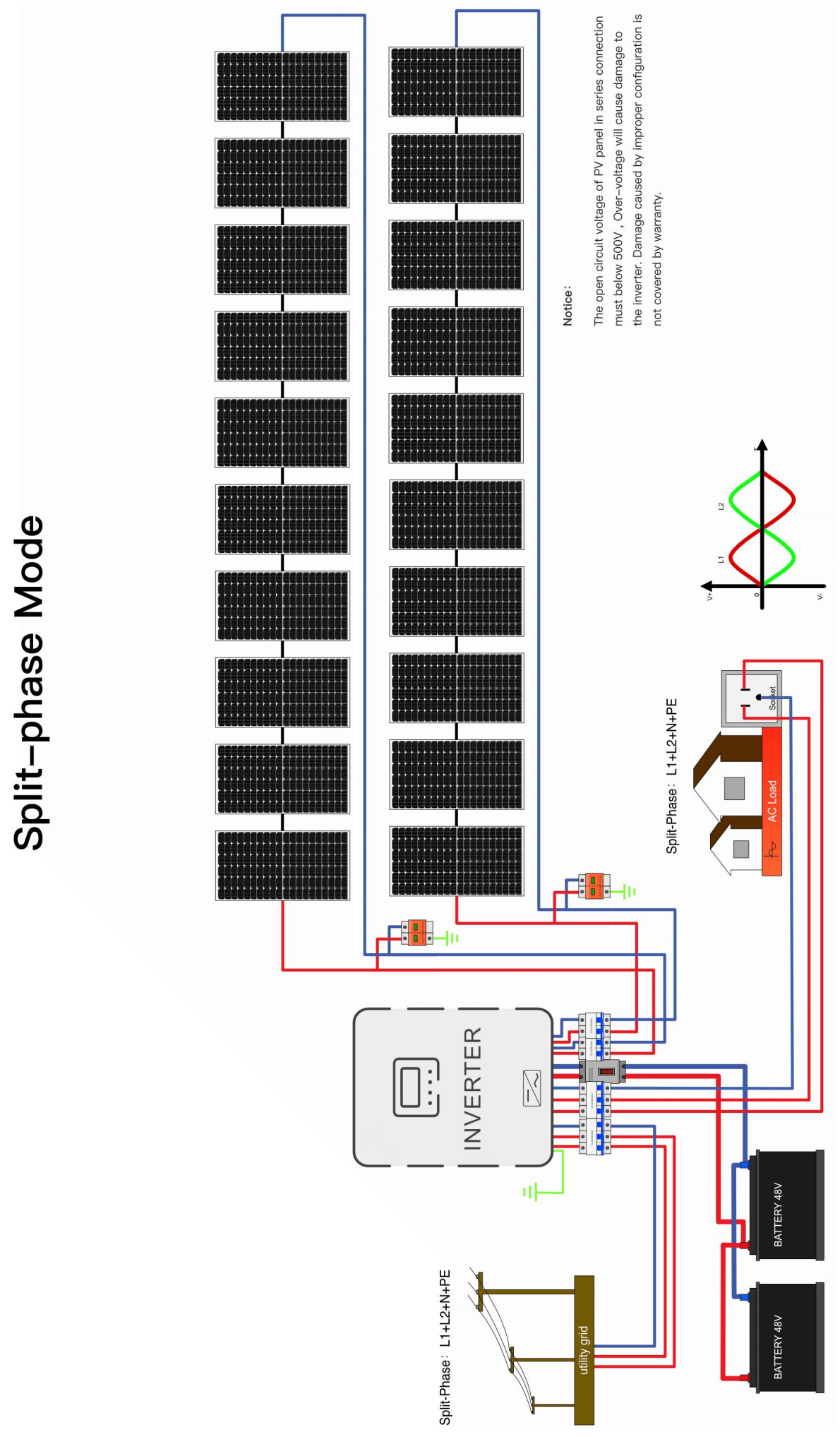




| Project | Description |
|---|---|
| AC output phase voltage (L-N) | 100-120Vac, 120Vac default |
| AC output line voltage (L1-L2) | 200-240Vac, 240Vac default |

**NOTICE**

- Users can change the output voltage through the settings menu. For details, please refer to Chapter 5.2.
- The output voltage corresponds to parameter setting item [38], and the output phase voltage can be set within the range of 200V to 240V.

# Split-phase Mode



# 4.2 Cable & Circuit Breaker Requirement

## ■ PV

| Models | Circuit Count | Cable Diameter | Max. Input Current | Circuit Breaker Spec |
|---|---|---|---|---|
| ASP48140U300-H<br>ASP48150U300-H<br>ASP48160U300-H | PV1 | 6mm²/10 AWG | 36A | 2P-45A |
| | PV2 | 6mm²/10 AWG | 36A | |

## ■ Battery

| Models | Cable Diameter | Max. Input Current | Circuit Breaker Spec |
|---|---|---|---|
| ASP48140U300-H<br>ASP48150U300-H<br>ASP48160U300-H | 85mm²/000 AWG | 300A | 2P-350A |

## ■ Grid

| Models | Cable Diameter | Max. Input Current | Circuit Breaker Spec |
|---|---|---|---|
| ASP48140U300-H<br>ASP48150U300-H<br>ASP48160U300-H | 30mm²/2 AWG | 100A | 2P-125A |

## ■ Generator

| Models | Cable Diameter | Max. Input Current | Circuit Breaker Spec |
|---|---|---|---|
| ASP48140U300-H<br>ASP48150U300-H<br>ASP48160U300-H | 35mm²/2 AWG | 66.7A | 2P-100A |

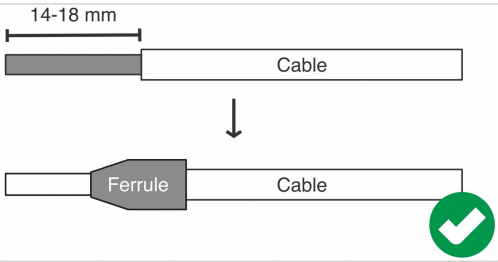
## ■ Load

| Models | Cable Diameter | Max. Input Current | Circuit Breaker Spec |
|---|---|---|---|
| ASP48140U300-H<br>ASP48150U300-H<br>ASP48160U300-H | 35mm²/2 AWG | 100A | 2P-125A |

NOTICE

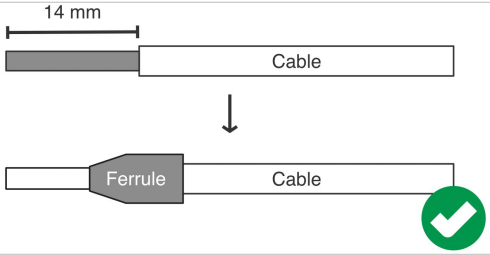
- **Grid & Generator input, Load output:**

1. Use a wire stripper to remove 14-18mm of insulation from the cable.
2. Secure the tubular terminal to the cable end (provided by the user).



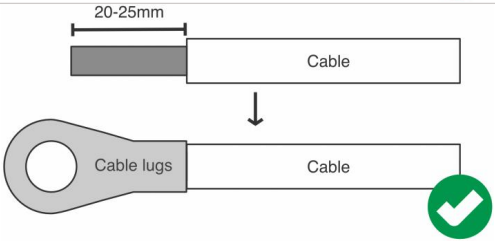

- **PV input:**

1. Use a wire stripper to remove 14mm of insulation from the cable.
2. Secure the tubular terminal to the cable end (included in the box).




- **Battery:**

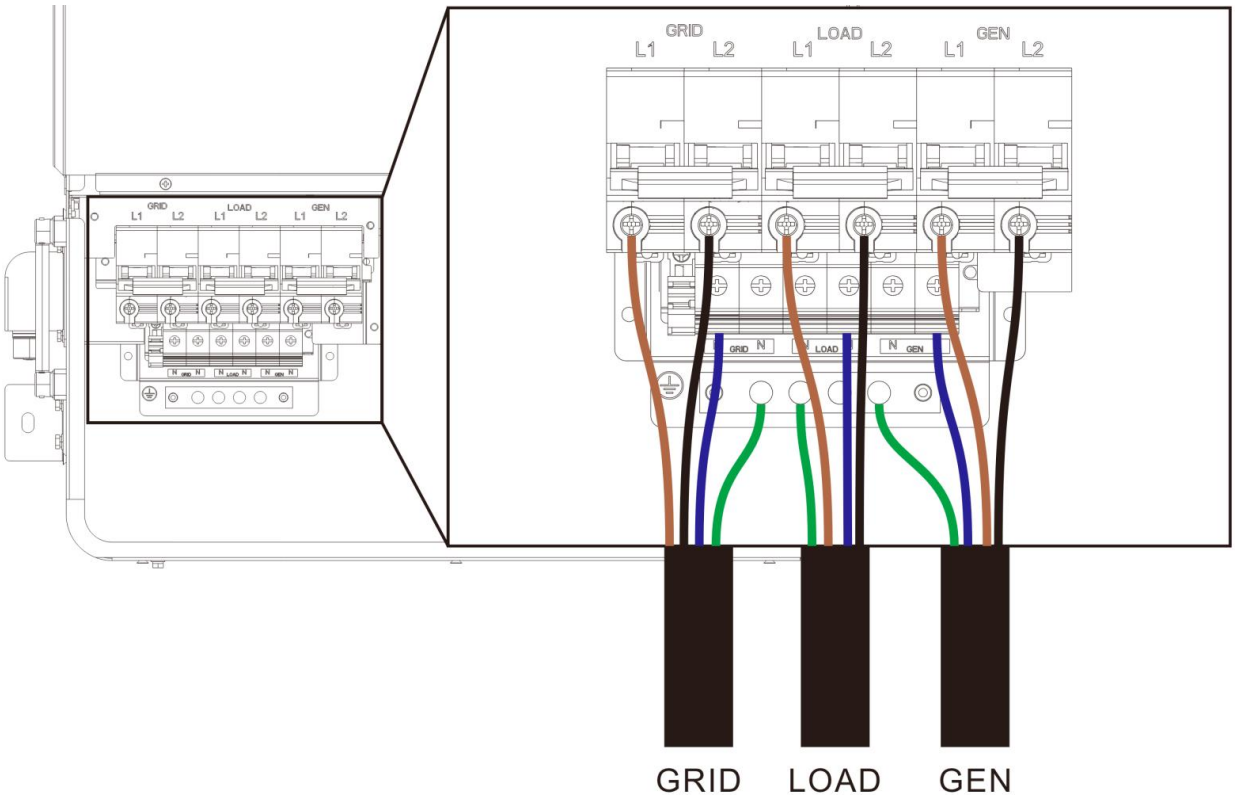
1. Use a wire stripper to remove 20-25mm of insulation from the cable.
2. Fix the cable lug provided with the package at the cable end.

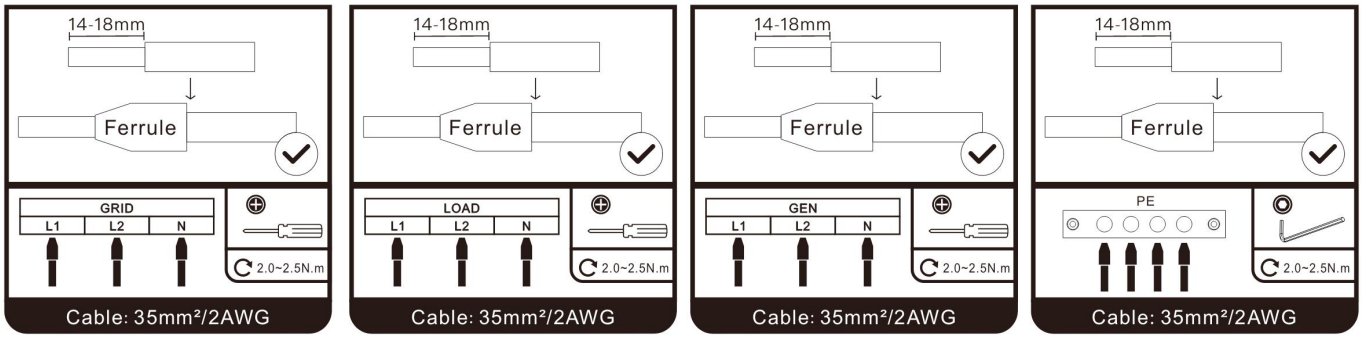



The wire diameter is for reference only. If the distance between the PV array and the inverter or between the inverter and the battery is long, using a thicker wire will reduce the voltage drop and improve the performance of the system.

# 4.3 Grid & Load & Generator Connection

Connect the live wire, neutral wire, and ground wire according to the cable position and sequence shown in the following figure.



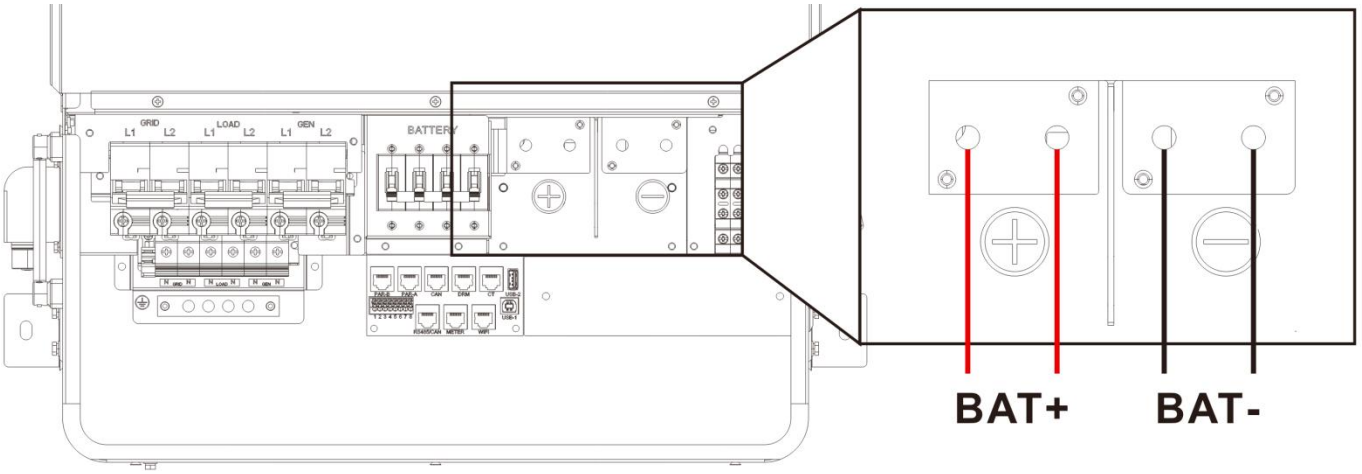


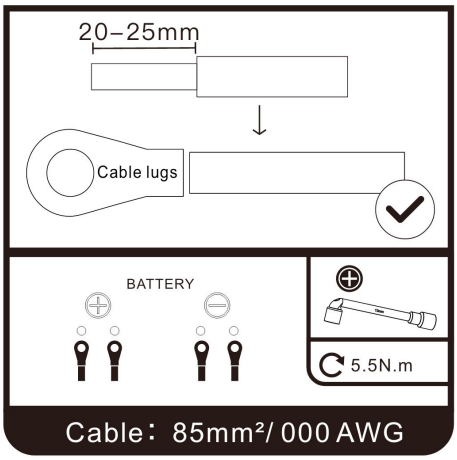

**DANGER**

- Before connecting AC input and output, the circuit breaker must be turned off to avoid electric shock hazards, and never operate with electricity.
- Please check that the cable used is sufficient for the requirements, too thin, poor quality cables are a serious safety hazard.

# 4.4 Battery Connection

Connect the positive and negative cable of the battery according to the diagram below. Both the positive and negative terminals require the installation of two cables.Each cable is recommended to be 85 mm² / 000 AWG, using crimp terminals SC95-8.



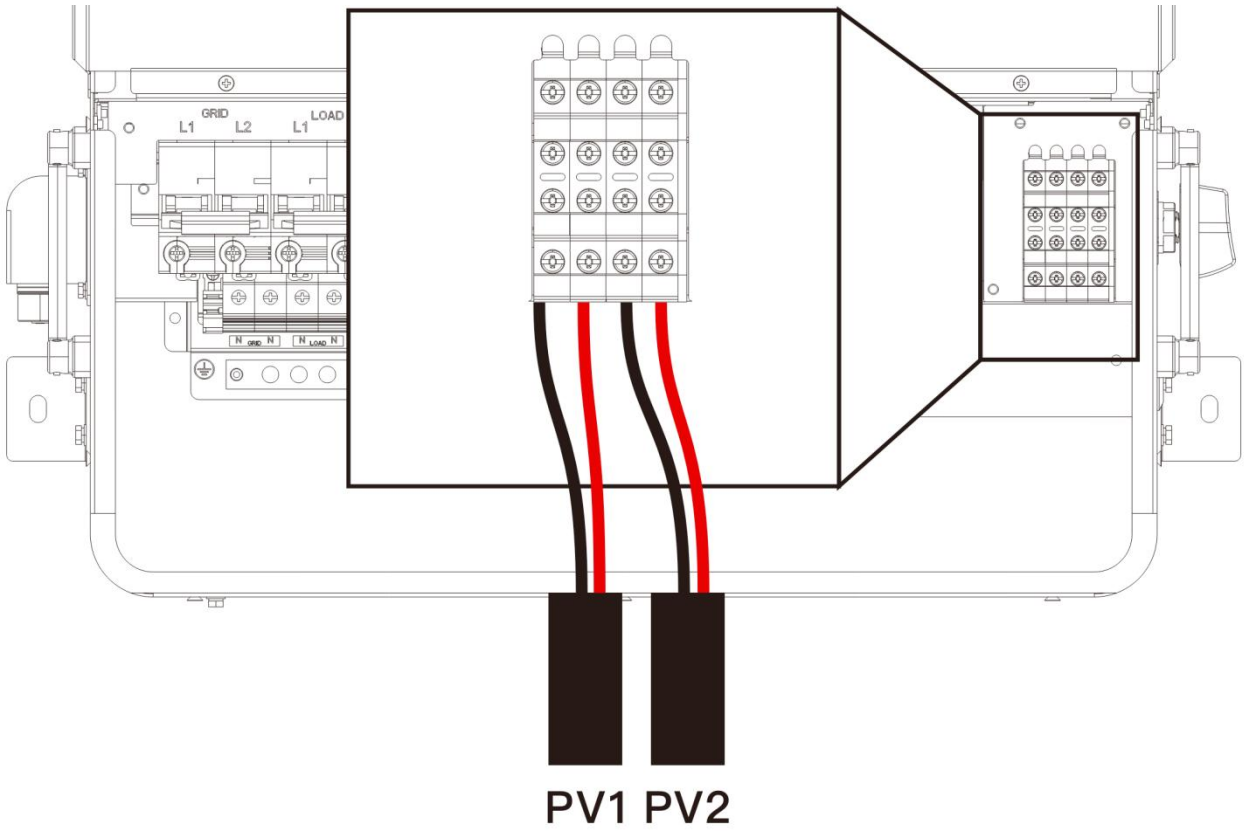




**DANGER**

- Before connecting battery, the circuit breaker must be turned off to avoid electric shock hazards, and never operate with electricity.
- Make sure that the positive and negative terminals of the battery are connected correctly, reversed polarity connection on battery will damage the inverter.
- Please check that the cable used is sufficient for the requirements, too thin, poor quality cables are a serious safety hazard.

# 4.5 PV Connection

Before connecting PV, first close the external circuit breaker and make sure that the cable used is sufficiently thick. Please refer to section "4.2 Cable & Circuit Breaker Selection".



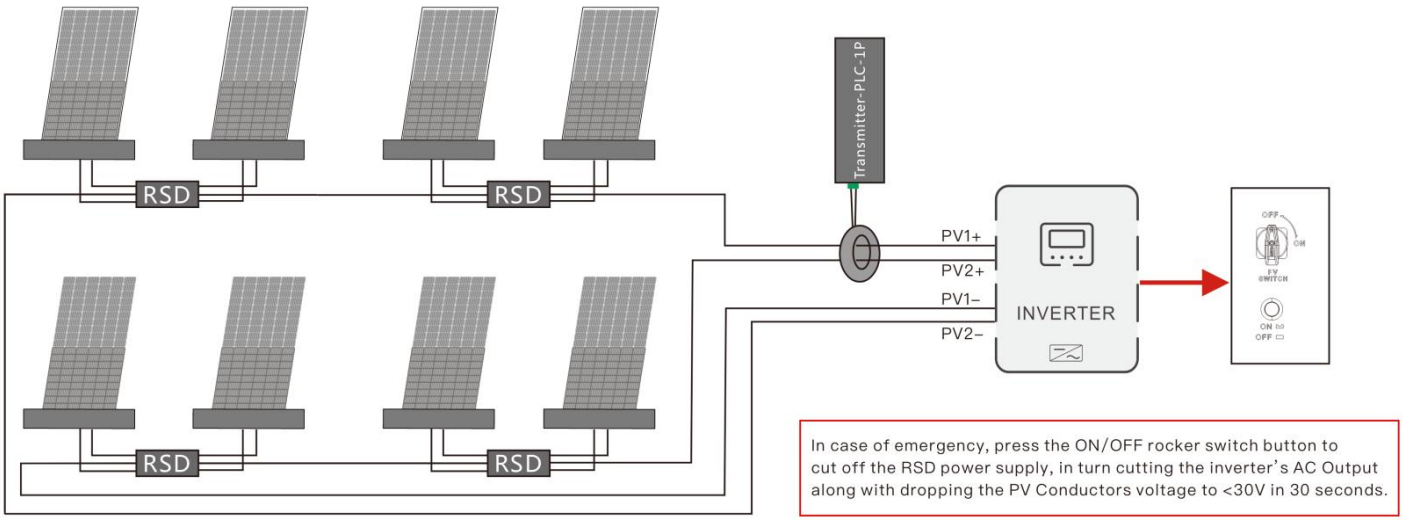

**DANGER**

- Before connecting the PV, the circuit breaker must be turned off to avoid electric shock hazards, and never operate with electricity.
- Make sure that the open-circuit voltage of the PV modules connected in series does not exceed the maximum open-circuit voltage of the inverter (the value is 650V), otherwise the inverter may be damaged.

## Transmitter-PLC Device (Optional)

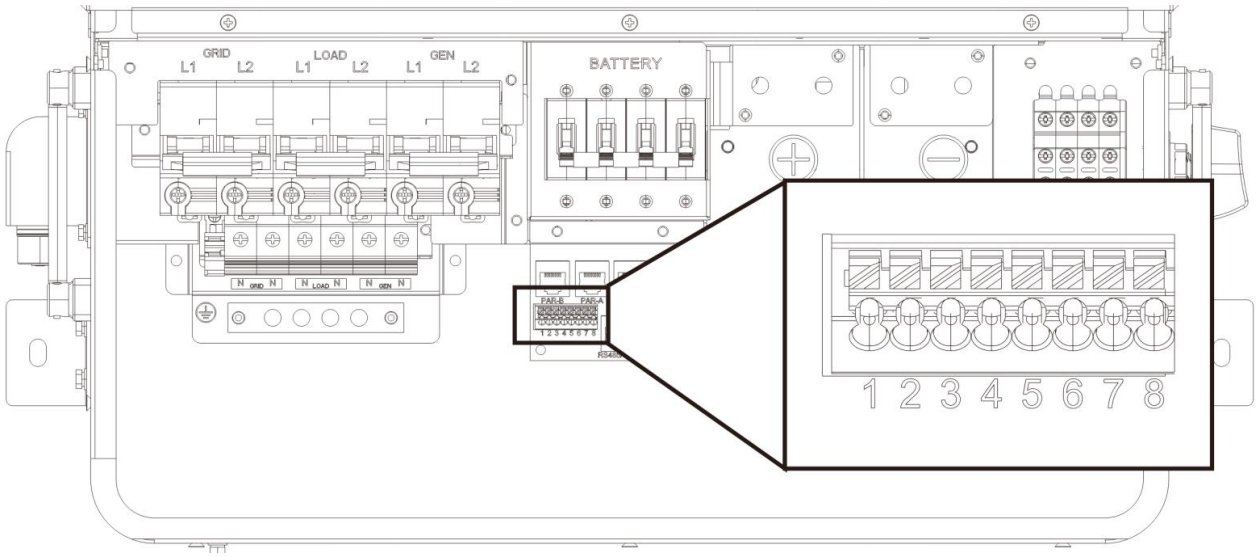

The inverter includes a rapid shutdown system that complies with 2017 and 2020 NEC 690.12 requirements. A rapid shutdown switch should be connected to the RSD terminals on the inverter and mounted on a readily accessible location outdoors (check with your AHJ for requirements).

The APsmart Rapid Shutdown System Transmitter-PLC is part of a rapid shutdown solution when paired with APsmart RSD, a PV module rapid shutdown unit. While powered on, the Transmitter-PLC sends a signal to the RSD units to keep their PV modules connected and supplying energy. RSD units automatically enter rapid shutdown mode when the Transmitter-PLC is switched off and resume energy production when power is restored to the Transmitter-PLC.



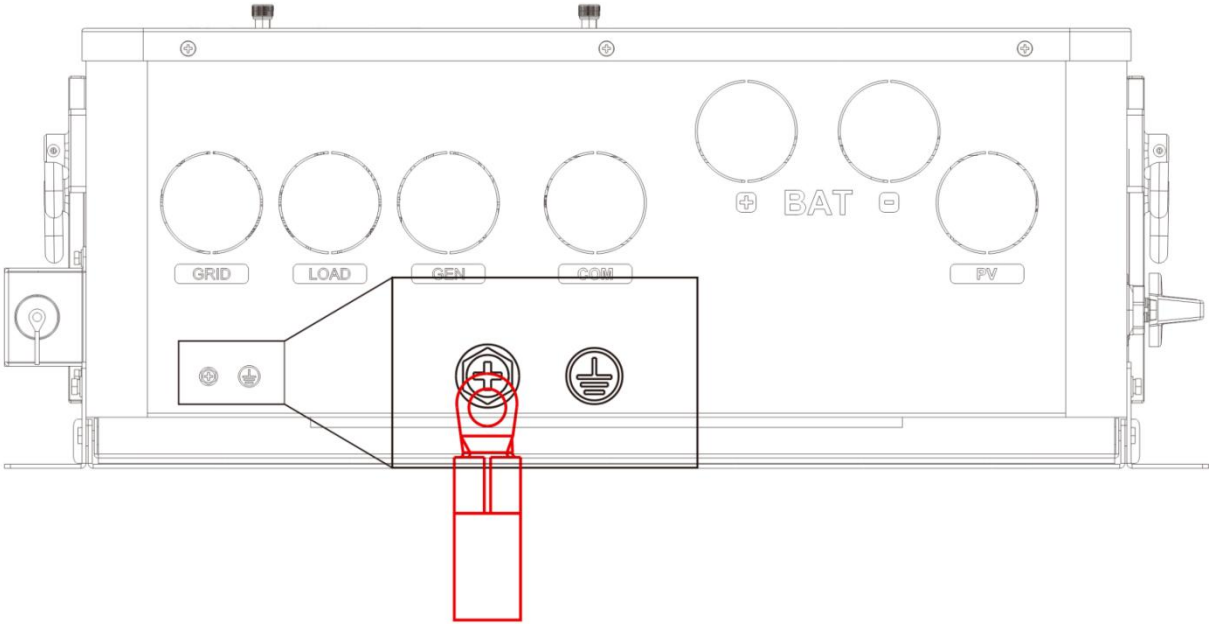

# 4.6 Dry Contact Connection

Use a small screwdriver to push back the direction indicated by the arrow, then insert the communication cable into the dry junction port.
(Communication cable diameter 0.2~1.5mm²)



# 4.7 Grounding Connection

Please make sure the grounding terminal connect to the Grounding Bar.




> ⚠ *NOTICE*
>
> Grounding wire shall be not less than 4 mm² in diameter and as close as possible to the earthing point.

# 4.8 Inverter start

After ensuring that the wiring is reliable and the wire sequence is correct, install the terminal protection cover in place.

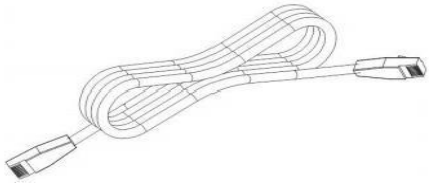
- **Step 1:** Close the circuit breaker of the battery.
- **Step 2:** Press the ON/OFF switch on the side of the inverter. The screen and indicator lights turning on indicates that the inverter has been activated.
- **Step 3:** Sequential close of the circuit breakers for PV, AC input and AC output.
- **Step 4:** Start the loads one by one in order of power from small to large.

# 4.9 Parallel Connection

## 4.9.1 Introduction to Parallel Connection

1. Up to six units connected in parallel.
2. When using the parallel operation function, the following connecting lines (package accessories) shall be firmly and reliably connected.

**Parallel communication line*1**



## 4.9.2 Precautions for Connecting the Parallel Connecting Lines

### Warning

**1.PV connection:**

When connecting in parallel, the PV arrays connected to each inverter must be independent of each other. The PV arrays corresponding to PV1, PV2 ports of the same inverter must also be independent.

**2.Battery connection:**

When paralleling, all solar energy storage inverters must be connected to the same battery, with BAT+ connected to BAT+ and BAT- connected to BAT-. Before powering on and starting, it is necessary to check and ensure that the connections, wiring length, and cable size are correct to prevent abnormal operation of the parallel system output caused by incorrect connections.

**3.Load connection:**

All solar storage inverters must be connected in the manner of N-to-N and PE-to-PE. The L lines of all inverters in the same phase shall be connected together, but the AC output L lines of different phases shall not be connected together.Refer to the schematic diagram for wiring.

**4.Grid connection:**

All solar storage inverters must be connected in the manner of N-to-N and PE-to-PE. The L lines of all inverters in the same phase shall be connected together, but the AC input L lines of different phases shall not be connected together.Refer to the schematic diagram for wiring.

**5.Communication Lines:**

Our parallel communication cable is a shielded 8-pin network cable suitable for parallel connections. Each unit must have one input and one output connection.

In a parallel system, the "Parallel A" interface of this machine must be connected to the "Parallel B" interface of the target machine. It is strictly prohibited to connect the "Parallel A" interface of this machine to either the "Parallel B" interface of the same machine or the "Parallel A" interface of the target machine. Additionally, secure each unit's parallel communication cable firmly to the 8-pin network connector to prevent disconnections or poor contacts, which may lead to abnormal system operation or damage to the output.

**6**.Before and after connecting the system, carefully refer to the system wiring diagram below. Ensure all connections are correct and secure before powering on.

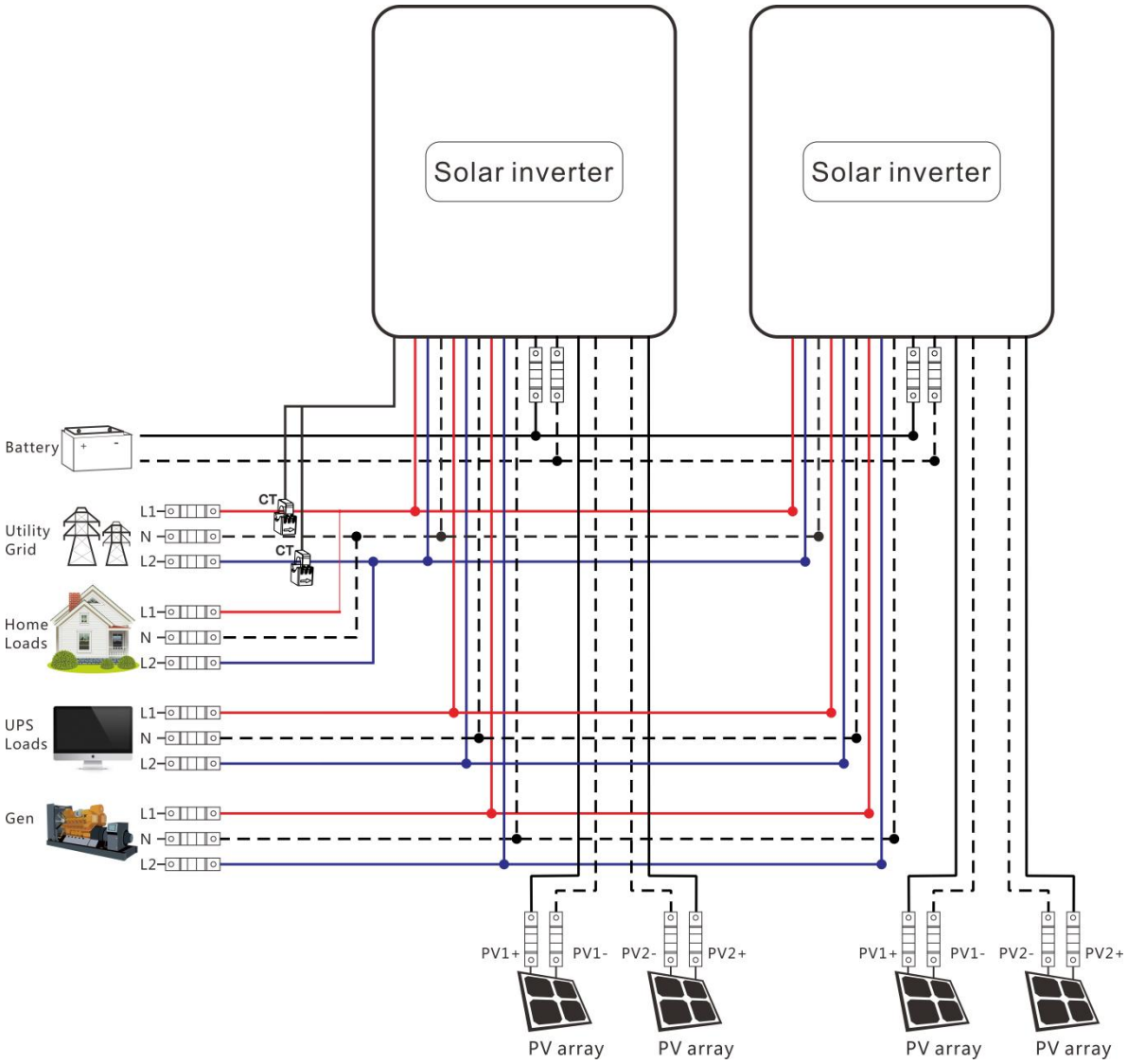
**7.** After the system is correctly wired, powered on, and operating normally, if a new inverter needs to be connected, ensure that the battery input, PV input, AC input, and AC output are disconnected, and all solar energy storage inverters are powered off before reconnecting to the system.

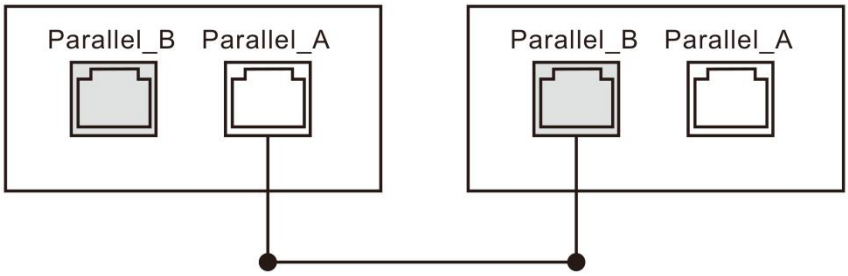
### 4.9.3 Wiring diagram for split-phase parallel connection (phase difference between L1 and L2: 180°)

Set the item [31] to PAL, and set the item [68] to 180°.

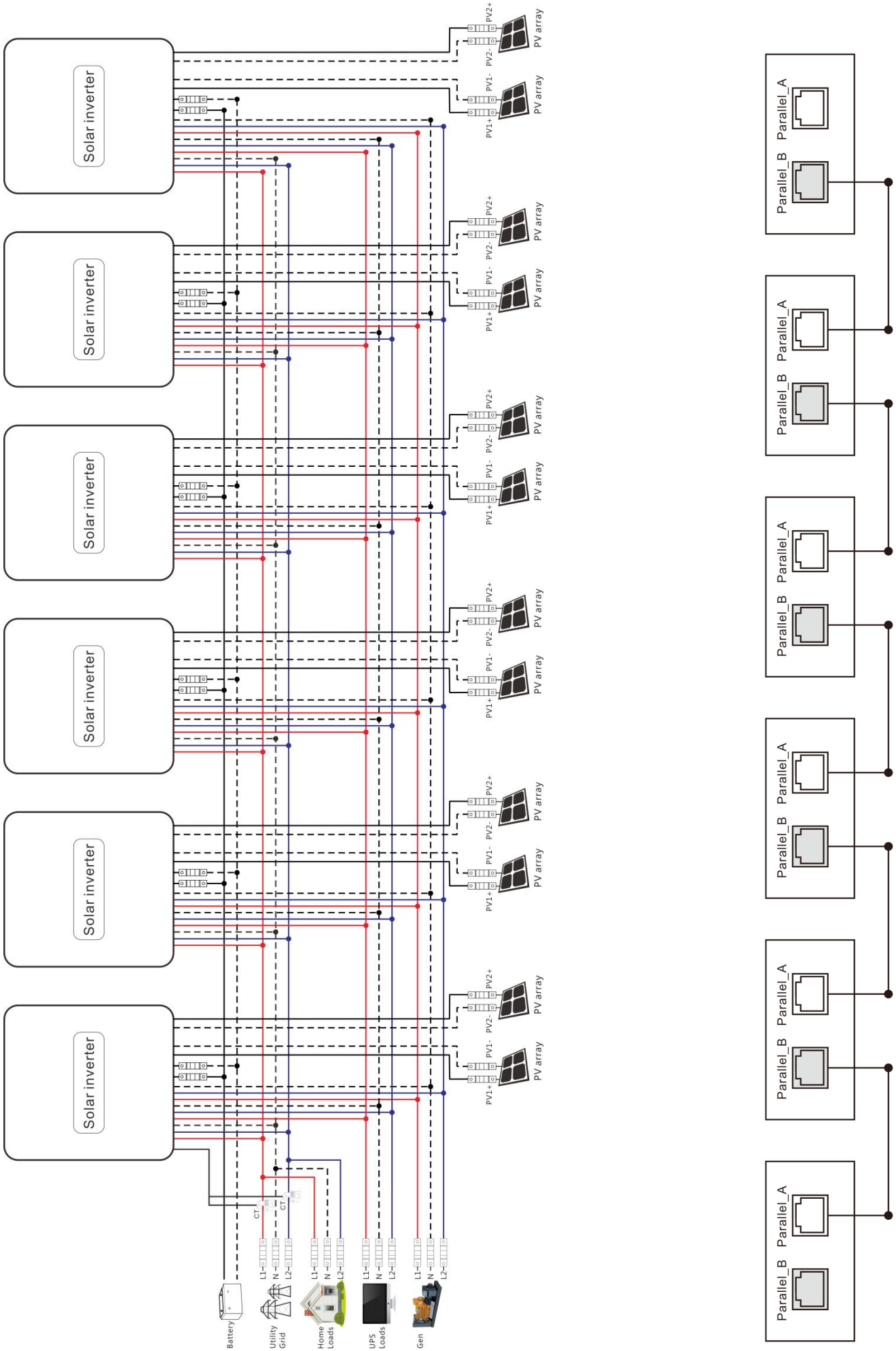
When setting the item [38] to "120 V," the L1-L2 voltage is 240 V, and the L1-N voltage is 120 V, L2-N voltage is 120V.

When multiple units are operating in parallel, the schematic diagram for parallel connection guidance is as follows:




Up to six inverters parallel


Solar inverter
Solar inverter
Solar inverter
Solar inverter
Solar inverter
Solar inverter
PV1+
PV1-
PV2+
PV2-
PV array
CT
L1
N
L2
Battery
Utility Grid
Home Loads
UPS Loads
Gen
Parallel_A
Parallel_B

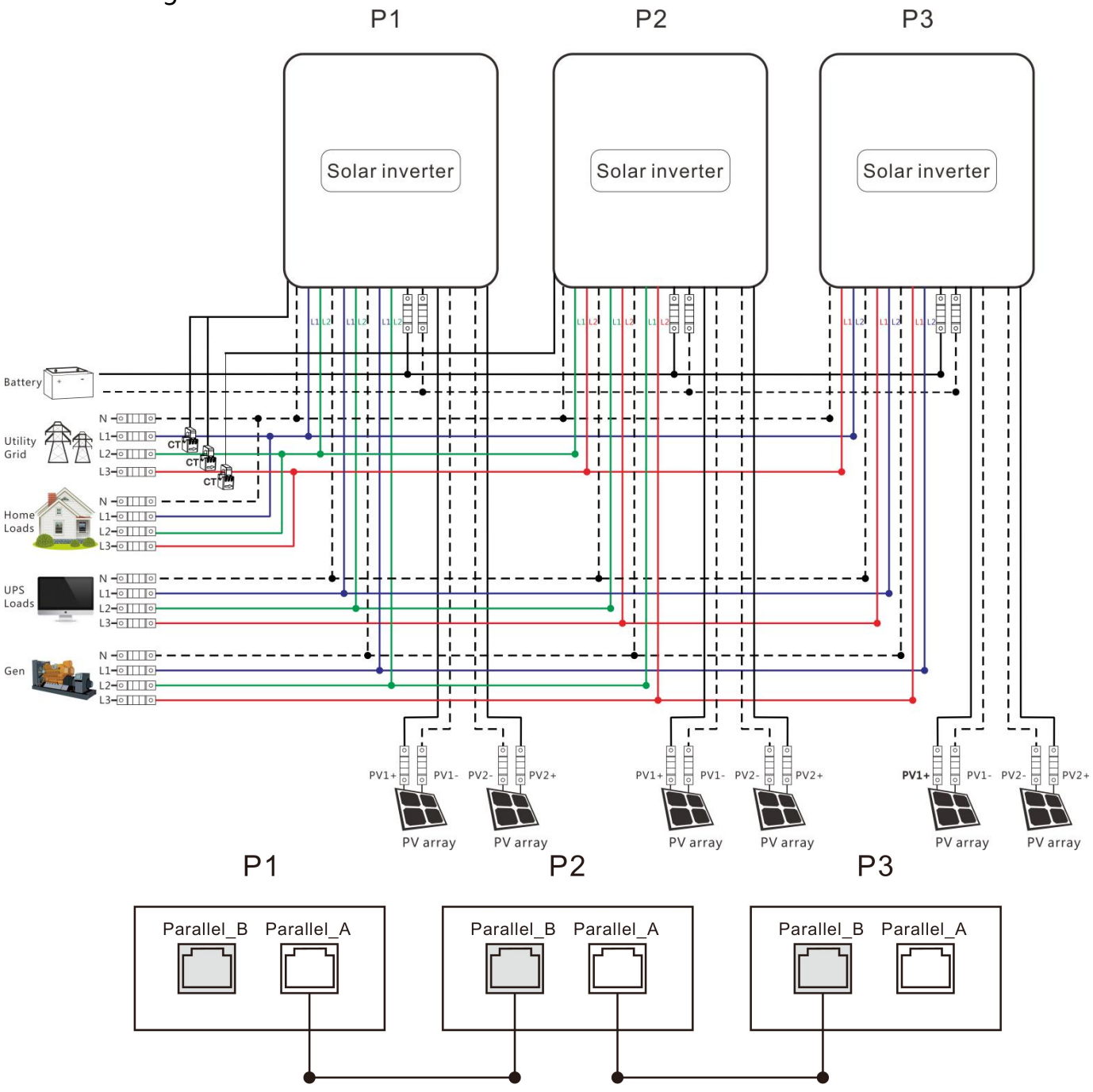
## 4.9.4 Wiring diagram for three-phase parallel connection

1.Ensure the parallel communication cables of solar energy storage inverters are securely clamped without looseness.

2.When multiple inverters are operating in parallel, refer to the following schematic diagram:

P1: Set the item [31] to "3P1;" P2: Set the item [31] to "3P2;" P3: Set the same to "3P3" , all of P1/P2/P3 inverters item [68] can not be set, it is default "120°" ;

At this point, 3P1-L1 is in phase with 3P3-L2, 3P1-L2 is in phase with 3P2-L1, and 3P2-L2 is in phase with 3P3-L1. The phase difference between the voltages of (3P1-L1, 3P2-L1, 3P3-L1) is 120 degrees. When the output voltage set in [38] is 120Vac, the voltage between the live wire L1 of phase 3P1 and the live wire L2 of phase 3P2 is 120*1.732=208Vac. Similarly, the line voltage between 3P1-L1 and 3P3-L1 is 208Vac, and the line voltage between 3P3-L1 and 3P2-L1 are also 208Vac.




P3
P2
P1
Solar inverter
PV array
PV1+
PV1-
PV2+
PV2-
CT
N
L1
L2
L3
Battery
Utility Grid
Home Loads
UPS Loads
Gen
Parallel_A
Parallel_B

***Notice:***

1. Before powering on and lighting up the screen, check for correct wiring according to the above wiring diagrams to avoid system problems.
2. Check all connections for firm fixing to avoid detachment and abnormal system operation.
3. When connecting the AC output to the load, complete wiring according to the requirements of the electrical load to avoid damage to the load.
4. Setting [38] must be configured consistently across all units or set only on the master unit. During parallel operation, the voltage set on the master unit takes precedence, and the master will force all slave units to match this setting. This option is configurable only in standby mode.
5. The machine ships in standalone mode by default. To enable parallel operation or three-phase functionality, configure parameter [31] via the display. Procedure: Power on one machine at a time while keeping others powered off. Set parameter [31] according to your system's operational mode. After successfully configuring this unit, turn off its power switch and wait for it to power down. Then configure the remaining units sequentially. Once all units are configured, power them all back on simultaneously to enter operational status.
6. In split-phase parallel operation:

Item 【31】 set to PAL, Item 【68】 set to 180°. When Item 【38】 is set to "120V", the line voltage between L1 and L2 is 240V, while the voltage between L1 and N and between L2 and N is 120V. When setting 【68】 to 120°, and 【38】 to "120V", the line voltage between L1 and L2 is 208V, while the voltages between L1 and N, and L2 and N are 120V.

7. In three-phase parallel operation:

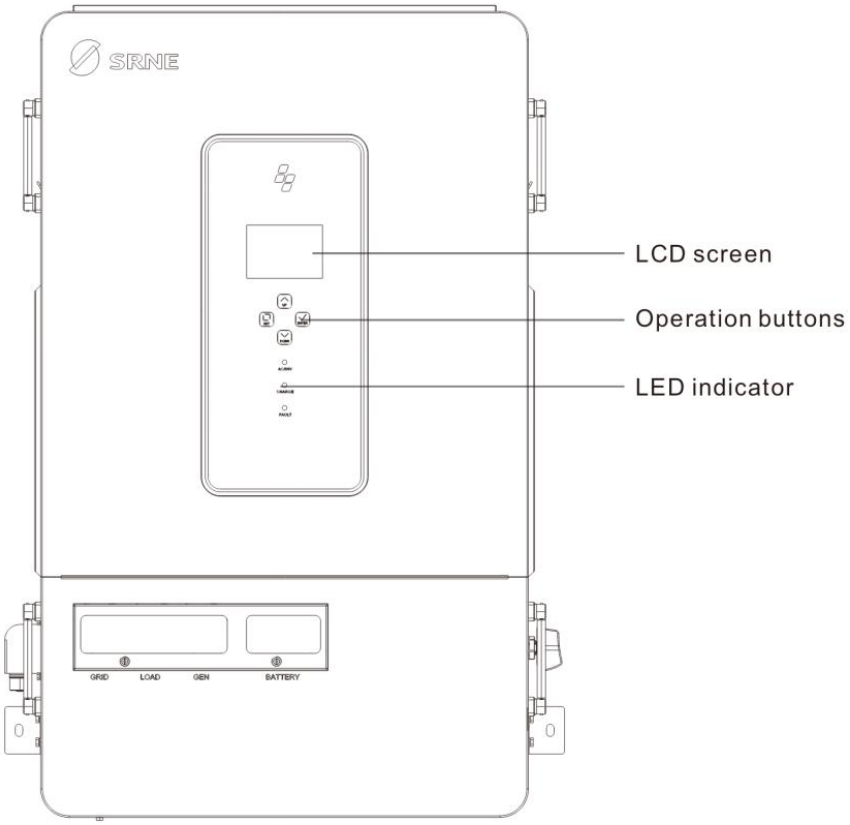
Set P1 device [31] to "3P1", P2 device [31] to "3P2", and P3 device [31] to '3P3'. The default parameter for [68] is "120°" and cannot be modified. At this point, 3P1-L1 and 3P3-L2 are in phase, 3P1-L2 and 3P2-L1 are in phase, and 3P2-L2 and 3P3-L1 are in phase. The voltage phases between (3P1-L1, 3P2-L2, 3P3-L1) differ by 120 degrees. When the output voltage set in [38] is 120Vac, the voltage between the live wire L1 of phase 3P1 and the live wire L2 of phase 3P2 is 120*1.732=208Vac. Similarly, the line voltage between 3P1-L1 and 3P3-L1 is 208Vac, and the line voltage between 3P3-L1 and 3P2-L1 are also 208Vac.

8. After the system runs, measure the correct output voltage before connecting to loads.
9. For other unbalanced three-phase parallel inverter systems, please contact the manufacturer for technical support.
10. When operating in parallel, inverters shall be installed in accordance with the proximity principle to avoid communication abnormalities caused by excessively long communication lines. If the line length is unavoidable, additional network cables can be used for end-to-end connection to optimize the communication loop.

# 5. Operation

## 5.1 Operation and Display Panel

The operation and display panel below includes 1 LCD screen, 3 LED indicators, and 4 Operation buttons.



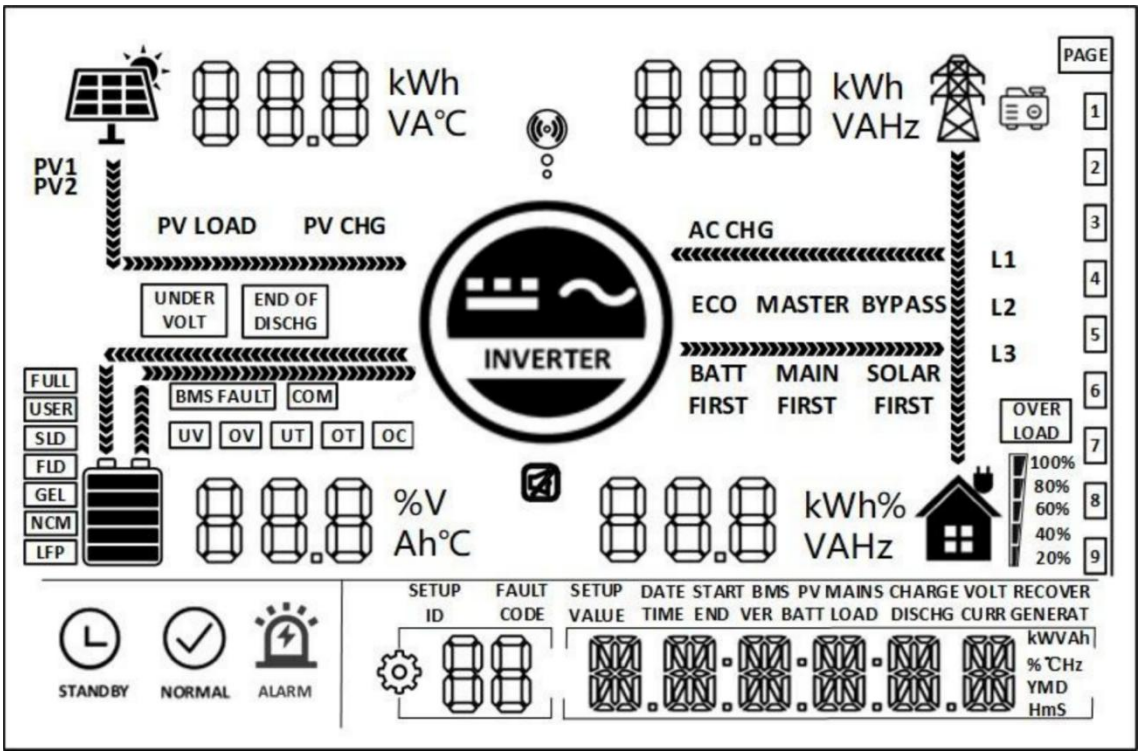

### ■ Operation buttons

| Button | Description |
|---|---|
| SET | To enter/exit settings menu. |
| UP | To go to previous selection. |
| DOWN | To go to next selection. |
| ENTER | To confirm/enter selection in settings menu. |

### ■ LED indicators

| Indicator | Color | Description |
|---|---|---|
| AC/INV | Green | Steady on: Mains bypass output |
| | | Flashing: Inverter output |
| CHARGE | Yellow | Steady on: Charging completed |
| | | Flashing: Charging in progress |
| FAULT | Red | Flashing: Fault occurred |

## ■ Display Panel



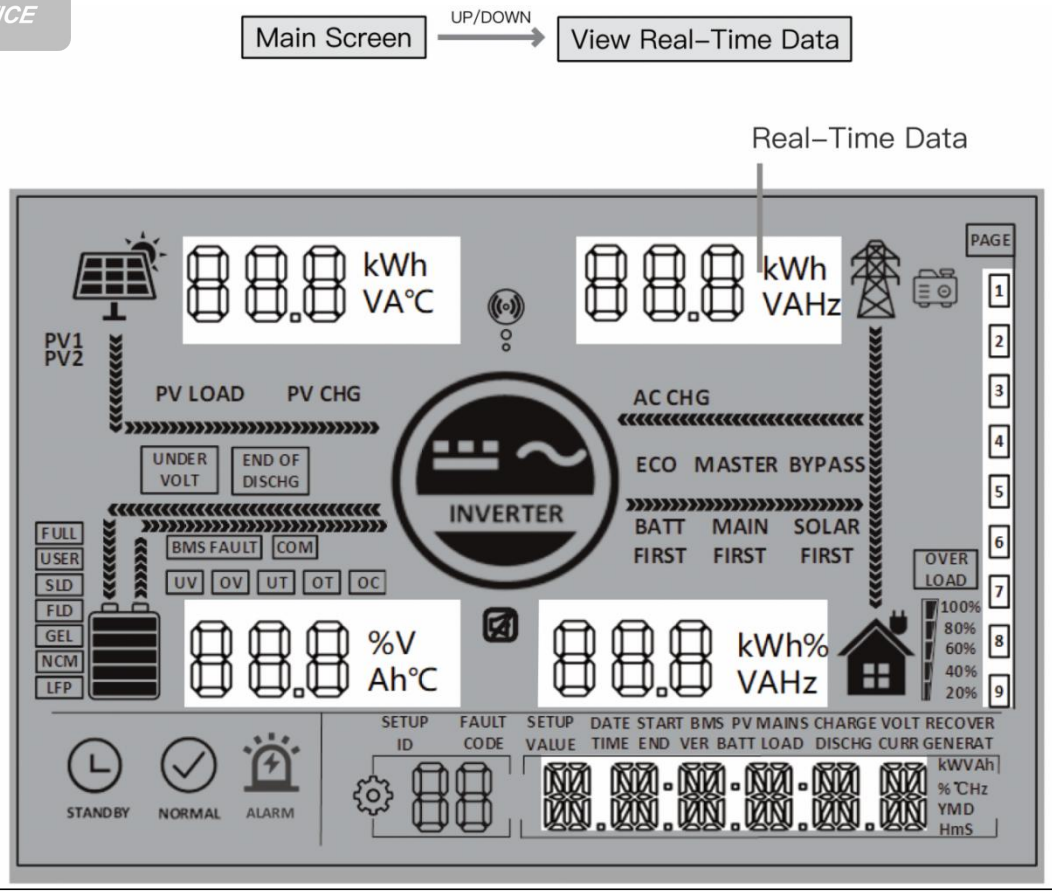

| Icon | Description | Icon | Description |
|---|---|---|---|
|  | Solar Panel |  | Grid |
|  | Battery |  | Generator |
|  | Inverter Working Status |  | Home load |
|  | The inverter is communicating with the data collector |  | The buzzer is in mute mode |
|  | Power Flow Direction | | |
|  | The inverter is in standby mode |  | The inverter is working normally |
|  | There is a fault |  | Settings |
|  | Load power: 80%–100% |  | SOC: 80%–100% |

| | | | |
|---|---|---|---|
|  | Load power: 60%–79% |  | SOC: 60%–79% |
|  | Load power: 40%–59% |  | SOC: 40%–59% |
|  | Load power: 20%–39% |  | SOC: 20%–39% |
|  | Load power: 5%–19% |  | SOC: 5%–19% |
| UNDER VOLT | Battery under-voltage | END OF DISCHG | Battery over-discharge |
| OVER LOAD | Overload | BMS FAULT | BMS fault |
| COM | System communication error | UV | System under-voltage |
| OV | System overvoltage | UT | System temperature too low |
| OT | Too high system temperature | OC | System over-current |
| FULL | Battery full power | USER | User-defined battery |
| SLD | Sealed lead-acid battery | FLD | Flooded lead-acid battery |
| GEL | Gel lead-acid battery | NCM | Ternary Li-ion battery |
| LFP | LFP Li-ion battery | ECO | Energy-saving mode |
| PV LOAD | PV energy is carrying the load | PV CHG | PV power is charging the battery |
| AC CHG | AC input power is charging the battery | MAINS FIRST | The output mode of the inverter is mains first |
| BYPASS | The output mode of the inverter is mains bypass | SOLAR FIRST | The output mode of the inverter is Solar first |
| BATT FIRST | The output mode of the inverter is battery first | | |

## ■ View real-time data

On the screen, press the UP/DOWN button to view real-time data of the inverter in operation.

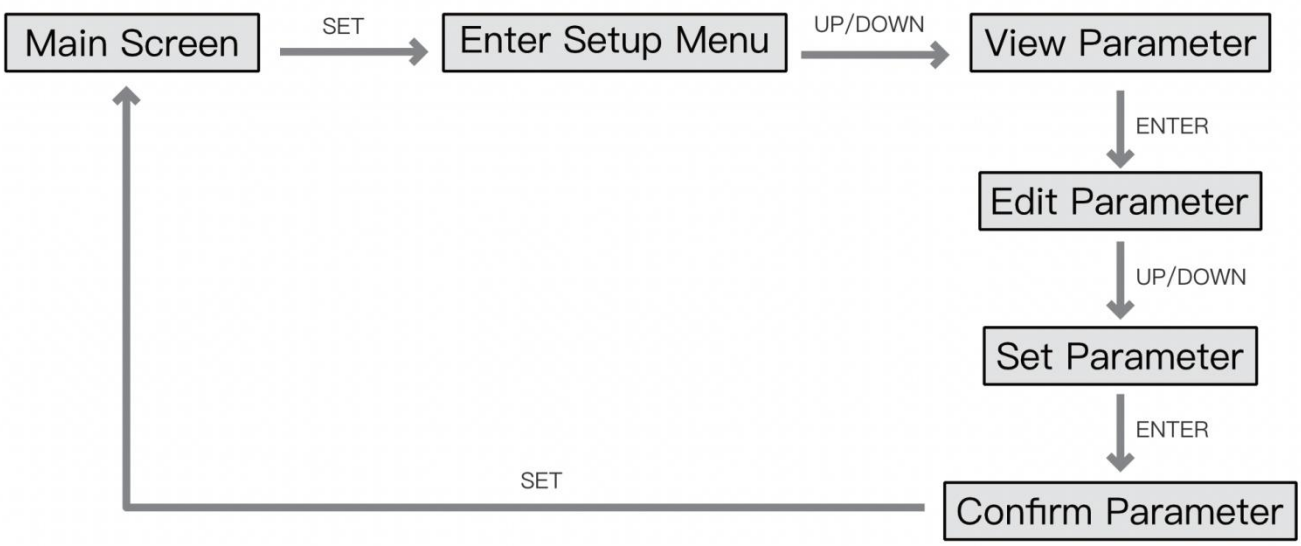
NOTICE

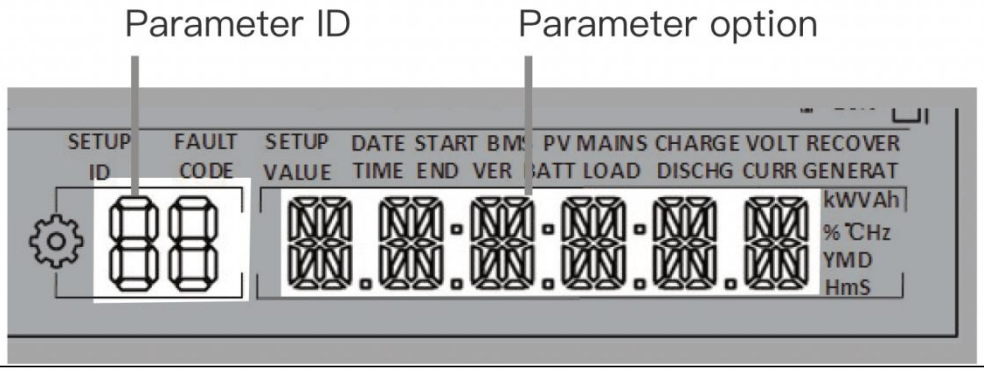



| Page | PV | Battery | AC input | Load | General |
|---|---|---|---|---|---|
| 1 | PV input voltage | Battery voltage | AC input voltage | Load phase voltage | Current time |
| 2 | PV input current | Battery current | AC input current | Load phase current | Current date |
| 3 | PV input power | Battery power | AC total input power | Load phase active power | Total PV power generation |
| 4 | PV daily power generation | BMS battery voltage | AC daily charging capacity | Load phase apparent power | Total load power consumption |
| 5 | PV - side heat sink temperature | Battery SOC | AC frequency | AC output frequency | RS485 address |
| 6 | INV heat sink temperature | Max. charging current | Bus voltage | UPS phase active power | Main chip software version |
| 7 | BAT heat sink temperature | Grid Max. charging current | Grid / diesel generator maximum current | UPS phase apparent power | Slave chip software version |
| 8 | | Diesel generator Max. charging current | Home load active power | Secondary load phase active power | Parallel operation mode |
| 9 | | | | Secondary load phase apparent power | Customer ID |

# 5.2 Setting

NOTICE







| ID | Parameter | Option | Description |
|---|---|---|---|
| Battery voltage setting logic: 【15】< 【12】< 【04】< 【14】< 【35】< 【37】< 【05】< 【09/11】 | | | |
| **00** | Exit | ESC | Exit the setup menu. |
| **01** | AC output mode | UTI | PV energy priority with the load, When PV power is insufficient, the grid and PV jointly supply the load. When PV power exceeds the load demand, the surplus charges the battery.<br>Grid charging is activated only when the battery is over-discharged. (parameter item [06] Settings as" OSO(only PV)", the grid power will not charge), the battery discharges during the scheduled discharge period or when operating in off-grid mode. |
| | | SBU | Prioritises the use of PV to power the load and switches back to the grid to power the load only when the battery voltage is lower than the set value in parameter item [4] or battery under-voltage (When connected to a BMS, the condition will be triggered when the SOC is less than or equal to the value specified in Parameter Item [61] or parameter item [59]). When the battery voltage is higher than the value in parameter item [5] or reaches the preset full-charge threshold (when connected to a BMS, this condition applies when the SOC is greater than or equal to the value of parameter item [62] or parameter item [60]), it switches back to the PV from the grid to supply the load. |
| | | SUB<br>**default** | PV energy first used for charging. When PV is insufficient, the battery will be charged by a combination of the utility grid and PV power (if parameter item [06] settings as " OSO(only PV ) " , he grid energy will not used for charging), and the utility grid will supply power to the loads simultaneously. When the PV system can fully meet the charging demand, the surplus PV energy will be combined with the utility grid to supply power to the loads. The battery will discharge during the scheduled discharge period or when operating in off-grid mode. |
| | | SOL | PV first mode. When the PV power is unavailable or the battery voltage is lower than the set value in the parameter item [04] or battery under-voltage, it will switch to the grid mode |
| **02** | AC input frequency | 50.0Hz | In grid mode the AC output frequency will adapt to the grid frequency, otherwise the output will follow the preset values. |
| | | 60.0Hz<br>**default** | |

| | | | |
|---|---|---|---|
| **03** | AC input voltage range | UPS **default** | When the output voltage is 220/230V, the input voltage range is 170-280V |
| | | APL | When the output voltage is 220/230V, the input voltage range is 90-280V |
| **04** | Voltage point of battery switch to grid | 49.2V **default** | When parameter **[01]= SBU/SOL**, output source will switch to grid from battery when the battery voltage below the preset value.<br>Setting range: 40V~52V. |
| **05** | Voltage point of grid switch to battery | 56.8V **default** | When parameter **[01]=SBU/SOL**, output source will switch to battery from grid when the battery voltage above the preset value.<br>Setting range: 48V~60V. |
| **06** | Battery charging mode | SNU **default** | When both PV power and mains are used to charge the battery at one time, the PV charge first and when the PV power is insufficient, the mains tags in. Only in bypass mode can both PV power and mains be used to charge the battery at one time, and only the PV charge mode can be enabled during inverter operation. |
| | | OSO | Do not enable the mains charge mode when in only PV charge mode |
| **07** | Battery charge current | 200A **default** | Setting range: 0~300A |
| **08** | Battery type | USER | User-defined, user can set all battery parameter. |
| | | SLd | Sealed lead-acid battery. |
| | | FLd | Flooded lead-acid battery. |
| | | GEL | Gel lead-acid battery. |
| | | L14/ L15/ L16 **default** | L14/ L15/ L16 lithium iron phosphate batteries, corresponding to lithium iron phosphate batteries 14, 15, 16 series. |
| | | N13/ N14 | Ternary lithium batteries, N13/N14, corresponding to ternary lithium batteries 13 series, 14 series. |
| | | No bat | No battery. |
| **09** | Boost charging voltage | 56.8V **default** | Setting range 48V~58.4V, step 0.4V, valid when battery type is custom and lithium battery. |
| **10** | Boost charging maximum time | 120 **default** | Boost charging maximum time setting, refers to the constant voltage charging when the voltage reaches the **parameter [09]** setting voltage maximum charging time, set the range of 5min~900min, step of 5 minutes. |
| **11** | Battery float charging voltage | 56.8V **default** | Setting range 48V~58.4V, step 0.4V, this parameter can not be set after the BMS communication is successful. |
| **12** | Battery over - discharge voltage (delayed shutdown) | 48.8V **default** | When the battery voltage is lower than the judgement point, and triggers the **parameter [13]**, the inverter output is switched off, the setting range is 40V~48V. |

| | | | |
|---|---|---|---|
| **13** | Battery over-discharge delay time | 30<br>**default** | The battery voltage is lower than **parameter [12]**, and the inverter output is switched off after triggering the delay time set in this parameter, the setting range is 5s~50s, the step is 5s. |
| **14** | Battery under-voltage alarm point | 49.6V<br>**default** | When the battery voltage is lower than this judgement point, the device will under-voltage alarm, the output will not be switched off, the setting range is 40V~52V, the step is 0.4V. |
| **15** | Battery discharge limiting voltage | 43.2V<br>**default** | When the battery voltage is lower than this parameter value, the output will be turned off immediately. The setting range is 40V~52V, the step is 0.4V. |
| **16** | Battery equalization charging | DIS<br>**default** | Disable equalization charging. |
| | | ENA | Enable equalization charging, valid when battery type is FLd, SLd, and USER. |
| **17** | Battery equalization charging voltage | 56.8V<br>**default** | Setting range 48V~58V in 0.4V steps, valid when battery type is FLd, SLd, and USER. |
| **18** | Battery equalization charging duration | 120<br>**default** | Setting range 5min~900min in 5 min steps, valid when battery type is FLd, SLd, and USER. |
| **19** | Battery equalization charging delay time | 120<br>**default** | Setting range 5min~900min in 5 minute steps, valid when battery type is FLd, SLd, and USER. |
| **20** | Battery equalization charging interval | 30<br>**default** | Setting range 0~30 days in 1 day steps, valid when battery type is FLd, SLd, and USER. |
| **21** | Battery equalization charging stop-start | DIS<br>**default** | Start equalization charging immediately. |
| | | ENA | Stop equalization charging immediately. |
| **22** | Energy-saving mode | DIS<br>**default** | Disable energy-saving mode. |
| | | ENA | Enable energy-saving mode, when the load power is less than 25W, the output of the inverter will switch off after a 5-minute delay. When the load exceeds 50W, the inverter will restart automatically. |
| **23** | Overload automatic restart | DIS | Disable overload automatic restart, if an overload occurs to shut down the output, the machine will not be restored to power on again. |
| | | ENA<br>**default** | Enable overload automatic restart. If an overload occurs that shuts down the output, the machine delays for 3 minutes before restarting the output. After accumulating 5 times, it will not restart again. |
| **25** | Buzzer alarm | DIS | Disable buzzer alarm. |
| | | ENA<br>**default** | Enable buzzer alarm. |

| | | | |
|---|---|---|---|
| **26** | Mode Change Reminder | DIS | Disable alarm prompt when the status of the main input source changes. |
| | | ENA **default** | Enable alarm prompt when the status of the main input source changes. |
| **27** | Inverter Overload to Bypass | DIS | Disable automatic switching to grid to power the load when the inverter is overloaded. |
| | | ENA **default** | When the inverter is overloaded, it automatically switches to grid to power the load. |
| **28** | Grid charging current | 150A **default** | Setting range: 0~300A. |
| **29** | BMS fault causes the battery to stop working. | DIS **default** | Disable BMS Faulty battery stops working. |
| | | ENA | Enable BMS Faulty battery stops working. |
| **30** | RS485 communication address | ID: 1 | RS485 address setting range: 1~254. |
| **31** | Parallel mode （turn off the rocker switch can be set） | SIG default | Single inverter operation |
| | | PAL | Parallel operation |
| | | 3P1/3P2/3P3 | Three-phase parallel operation |
| | | P1 Machine Settings: Screen set to “3P1”. When the output phase voltage is selected as “120V”, the output voltage between L1 and L2 is 208V, the voltage between L1 and N is 120V, and the voltage between L2 and N is 120V.<br>P2 Machine Settings: Set the screen to “3P2”. When the output phase voltage is selected as “120V”, the output voltage between L1 and L2 is 208V, the voltage between L1 and N is 120V, and the voltage between L2 and N is 120V.<br>P3 machine settings: Screen set to “3P3”. When output phase voltage is selected as “120V”, the output voltage between L1 and L2 is 208V, the voltage between L1 and N is 120V, and the voltage between L2 and N is 120V;<br>During three-phase balanced parallel operation: 3P1-L1 is in phase with 3P3-L2, 3P1-L2 is in phase with 3P2-L1, and 3P2-L2 is in phase with 3P3-L1. The phase difference between (3P1-L1, 3P3-L1, 3P2-L1) is 120 degrees. | |
| **32** | RS485 communication function | SLA **default** | Enable PC and Remote Monitoring Protocol |
| | | 485 | Enable the BMS communication function based on RS485 communication |
| | | CAN | Enable the BMS communication function based on CAN communication |
| **33** | BMS communication | When **item [32] = 485 / CAN**, the corresponding lithium battery manufacturer brand should be selected for communication. | |

| | | | |
|---|---|---|---|
| | | WOW **default** | **485 protocol:** PAC=PACE, RDA=RITAR, AOG=ALLGRAND，OLT=OLITER, CEF=CFE, XWD=SUNWODA, DAQ=DYNESS, WOW=SRNE, PYL=PYLONTECH，POW=POWMr, VOL=VILION, SGP=SGP, GSL Energy, PYT=Pylon tech 2 |
| | | | **CAN protocol:** UZE=YUZE, SGP=SGP, GSL Energy, PYT=Pylon tech 2, WOW=SRNE |
| **34** | On-grid and anti-reverse current | DIS **default** | Disable this function. |
| | | HOME LOAD | When **parameter [01]=UTI**, PV energy will be prioritized for load supply. Excess energy will be subject to anti-backflow control, and any remaining excess energy will be used to charge the battery.<br>When **parameter [01]=SUB**, PV energy will be prioritized for charging. After meeting the battery's requirements, the remaining energy will be used for load supply, and any further excess energy will be subject to anti-backflow control. |
| **35** | Battery under-voltage recovery point | 52.0V **default** | When the battery is under-voltage, the battery voltage needs to be higher than this setting value in order to restore the battery inverter AC output,<br>setting range: 44V~54.4V. |
| **37** | Battery full charge and recharging recovery point | 52.0V **default** | Inverter stops charging when the battery is full. Inverter resumes charging when the battery voltage below this value. Setting range: 44V~54V. |
| **38** | AC output voltage （turn off the rocker switch can be set） | 120Vac **default** | Setting range: 100/105/110/115/120/127 VAC |
| **39** | Charge current limit (when BMS works) | LCSET | The maximum battery charge current is not greater than the set value of [item 07] |
| | | LCBMS **default** | The maximum battery charge current is not greater than the maximum value of BMS |
| | | LCINV | The maximum battery charge current is not greater than the logical judgment value of inverter |
| **40** | 1st slot grid start charging | 00:00:00 **default** | Setting range: 00:00:00–23:59:00 |
| **41** | 1st slot grid end charging | 00:00:00 **default** | Setting range: 00:00:00–23:59:00 |
| **42** | 2nd slot grid start charging | 00:00:00 **default** | Setting range: 00:00:00–23:59:00 |
| **43** | 2nd slot grid end charging | 00:00:00 **default** | Setting range: 00:00:00–23:59:00 |
| **44** | 3rd slot grid start charging | 00:00:00 **default** | Setting range: 00:00:00–23:59:00 |

| | | | |
|---|---|---|---|
| **45** | 3rd slot grid end charging | 00:00:00 **default** | Setting range: 00:00:00–23:59:00 |
| **46** | Time slot grid charging function | DIS **default** | Disable the function |
| | | ENA | After enabling the **Time slot grid charging function**, the power supply mode will switch to SBU mode, and the system will switch to utility grid for charging during the preset charging period or after battery over-discharge.<br>If the scheduled discharge function is enabled simultaneously, the system power supply mode will switch to UTI mode: the system will only switch to utility grid for charging during the preset charging period, and will switch to battery inverter power supply during the preset discharge period or when the utility grid fails. |
| **47** | 1st slot battery start discharging | 00:00:00 **default** | Setting range: 00:00:00–23:59:00 |
| **48** | 1st slot battery end discharging | 00:00:00 **default** | Setting range: 00:00:00–23:59:00 |
| **49** | 2nd slot battery start discharging | 00:00:00 **default** | Setting range: 00:00:00–23:59:00 |
| **50** | 2nd slot battery end discharging | 00:00:00 **default** | Setting range: 00:00:00–23:59:00 |
| **51** | 3rd slot battery start discharging | 00:00:00 **default** | Setting range: 00:00:00–23:59:00 |
| **52** | 3rd slot battery end discharging | 00:00:00 **default** | Setting range: 00:00:00–23:59:00 |
| **53** | Time slot battery discharging function | DIS **default** | Disable this function. |
| | | ENA | Enable the segmented scheduled battery discharge function.<br>When parameter item [01] is set to SBU or SOL mode, the system will switch to inverter power supply during the preset discharge period.<br>When parameter item [01] is set to UTI or SUB mode, the battery will work with the utility grid in hybrid load-supply mode, and the maximum discharge current of the battery will be limited by the value specified in parameter item [78].<br>Note: If the time-segmented battery charging function is enabled simultaneously and the time periods overlap, the system will default to the charging period. |
| **54** | Local date | 00:00:00 **default** | Year/Month/Day<br>Setting range: 00:01:01–99:12:31 |
| **55** | Local time | 00:00:00 **default** | Setting range: 00:00:00–23:59:59 |

| | | | |
|---|---|---|---|
| **56** | Leakage current detection protection | DIS **default** | Disable detecting Leakage current value. |
| | | ENA | Enable detecting Leakage current value. |
| **57** | Stop charging current | 3 | Charging stops when the charging current is less than this setting (unit: A). |
| **58** | Discharging alarm SOC setting | 15 | Triggers an alarm when the battery SOC is less than the set value<br>(unit: %, valid only when BMS communication is normal). |
| **59** | Discharging cut-off SOC setting | 5 | Stops discharging when the battery SOC is less than the set value<br>(unit: %, valid only when BMS communication is normal). |
| **60** | Charging cut-off SOC setting | 100 | Stops charging when the battery SOC is higher than the set value<br>(unit: %, valid only when BMS communication is normal). |
| **61** | Switching to grid SOC setting | 10 | Switch to grid power when the battery SOC is less than this setting value<br>(unit: %, valid only when BMS communication is normal). |
| **62** | Swithing to inverter output SOC setting | 100 | Switches to inverter output mode when SOC is higher than this setting value<br>(unit: %, valid only when BMS communication is normal). |
| **63** | N-PE bonding automatic switching function | DIS **default** | Disable automatic switching of N-PE connections. |
| | | ENA | Enable automatic switching of N-PE connections. |
| **68** | AC output phase mode (turn off the rocker switch can be set) | 120 | 120 represents split-phase mode<br>Assuming the 38-item AC output voltage is 120V, with a phase difference of 120 degrees between L1 and L2, the phase voltage L1-N/L2-N is 120V, and the line voltage L1-L2 is 208V. |
| | | 180 **default** | 180 represents split-phase mode<br>Assuming the AC output voltage of parameter 38 is 120V, with a phase difference of 180 degrees between L1 and L2. Therefore, the phase voltage L1-N/L2-N is 120V, and the line voltage L1-L2 is 240V. |
| | | NO N | Without N-wire(When you set" No N" ,the phase difference is 180° default) |
| **70** | Insulation impedance detection | DIS **default** | Disable detecting insulation impedance value. |
| | | ENA | Enable detecting insulation impedance value. |
| **72** | Battery grid-connected discharge enable | DIS **default** | The battery is not permitted to discharge to the grid. |
| | | ENA | The battery is permitted to discharge to the grid. |
| **73** | Generator charging current setting | 150A **default** | Configurable when the generator is GEN_IN, with a maximum of 300A. |

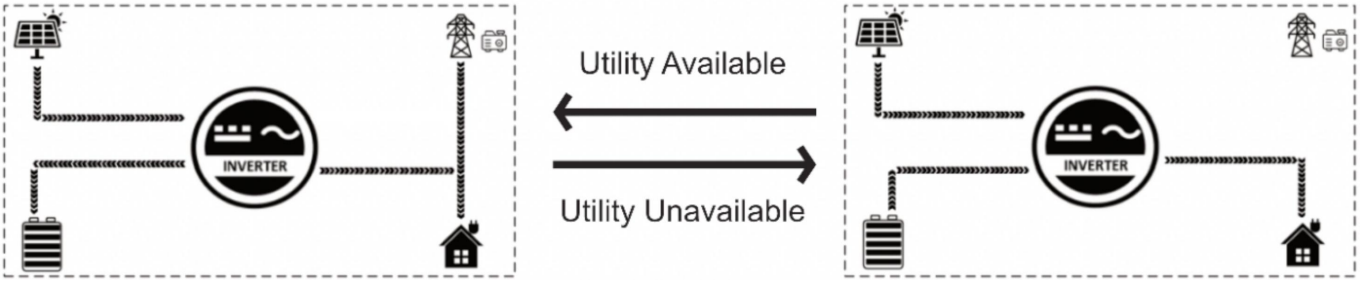
| | | | |
|---|---|---|---|
| **74** | Generator power setting | 16kW | When the generator is set to GEN_IN,<br>the maximum combined load and charging power of the generator is 16 kW.<br>Setting range: 0~16 kW |
| **76** | External CT transformation ratio | 2000 | Setting range: 0~5000 |
| **77** | External CT anti-backflow error power | 100W **default** | It can be set between 0W and 500W, which means that in order to prevent power sampling errors, 0-500W of electricity is drawn from the grid to ensure that there is no backflow at all. |
| **78** | Battery hybrid network discharging current setting | 300A **default** | Battery discharge hybrid network current.<br>Setting range: 0~300A |
| **79** | AFCI enable | DIS **default** | Disable AFCI function. |
| | | 1-10 | Enable AFCI function. Detection Threshold: 1–10 |
| **80** | AFCI fault manual clearing | NULL **default** | Do not clear. |
| | | CLEAR | Manually clear the AFCI fault. |
| **81** | Generator operating mode | GEN IN **default** | Generator interface used as generator function input. |
| | | AC OUT | Generator interface used as secondary load port output. |
| **82** | CT manual enabling | NO CT **default** | No CT input. |
| | | TO INV | CT direction set to inverter flow as positive direction. |
| | | TO GRD | CT direction set to grid flow as positive direction. |

# 5.3 AC Output Mode

The AC output mode corresponds to parameter setting item 01 and 34, which allows the user to set the AC output power source manually.

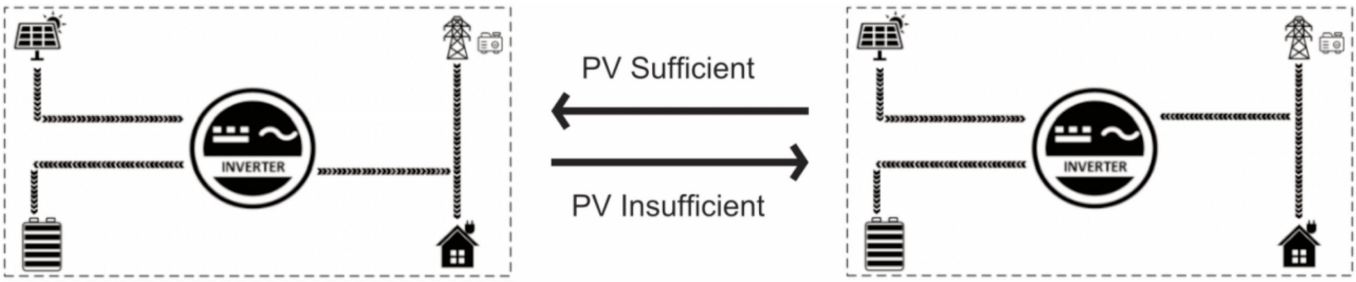
- **Utility Priority, PV Loading Priority 01 UTI**

PV energy priority with the load, When PV power is insufficient, the grid and PV jointly supply the load. When PV power exceeds the load demand, the surplus charges the battery.Grid charging is activated only when the battery is over-discharged. (parameter item [06] Settings as" OSO(only PV)", the grid power will not charge), and the battery is only discharged when off the grid.



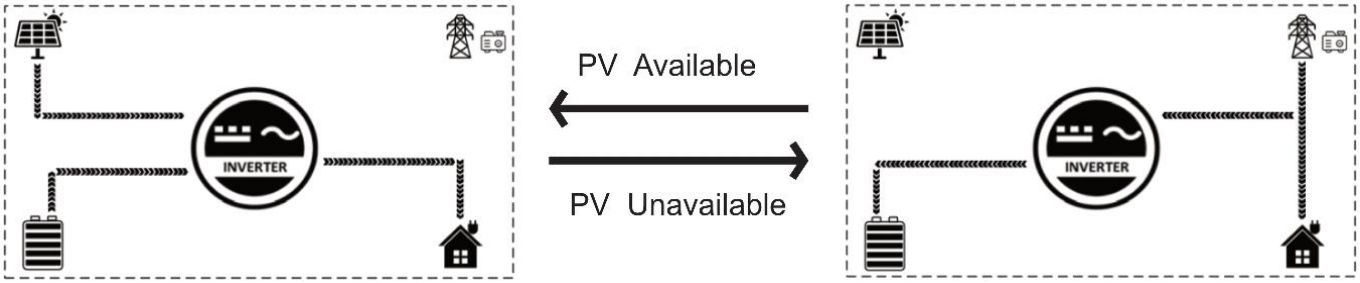

- **Utility Priority, PV Charging Priority 01 SUB (default)**

PV priority charging; When PV power is insufficient, utility power and PV will perform hybrid charging (when item 06 is set to "PV-only charging", utility power will not be used for charging), and utility power will supply the load. When PV power meets the charging demand but cannot meet the load demand, PV and utility power will perform hybrid loading, and the battery will only discharge in off-grid mode.




- **PV Priority Output 01 SOL**

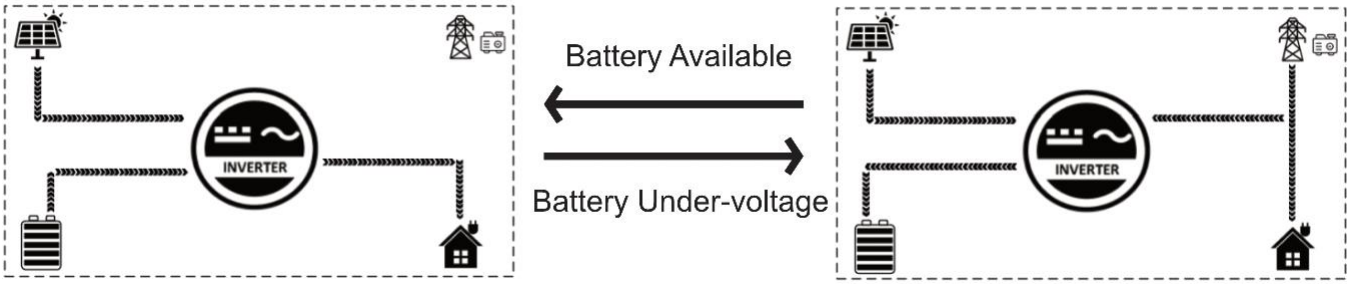
PV prioritizes power supply to the load. When PV meets the load demand, the excess power will charge the battery. When PV energy is insufficient, the battery will supplement energy to power the load. When PV is invalid, it will switch to utility power supply, and finally use battery power supply. When PV energy is insufficient, and when the battery level is lower than the parameter (Battery to utility ) or the SOC setting value for switching to utility, it will switch to utility power supply for the load and charging. PV charges when there is no load. This mode can maximize the use of PV power generation while maintaining battery capacity, and is suitable for areas with stable power grids. **(Priority: PV > Utility > Battery)**




- **Inverter Priority Output 01 SBU**

The PV will supply power to the loads on a priority basis. If the PV is insufficient or unavailable, the battery will be used as a supplement to supply power to the load. When the battery voltage touches the value of parameter [04] (Voltage point of

battery switch to utility), it will switch to utility power supply to the load (without BMS connected) / When the BMS is connected and the Li-ion battery SOC touches the value of parameter [61] (Switching to utility SOC setting), it will switch to utility power supply to the load. This mode maximises the use of DC energy, and it is suitable for the areas where the utility power is stable. **(Priority: PV > Battery > Utility)**

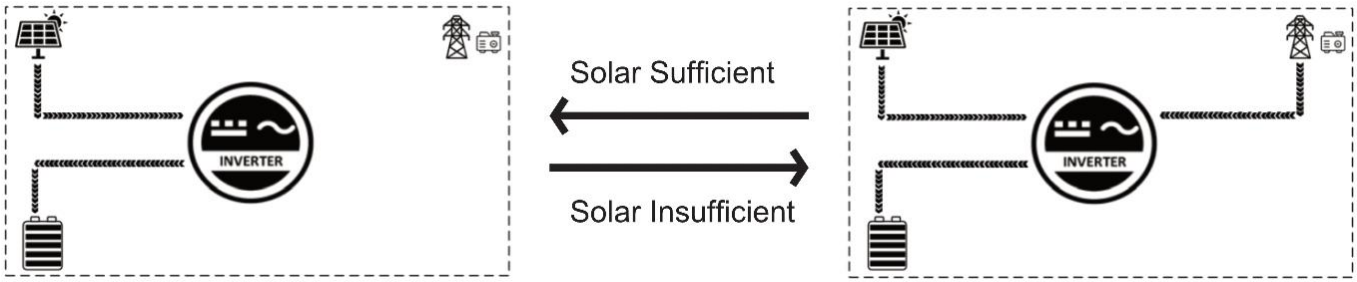



# 5.4 Battery Charging Mode

The charging mode corresponds to parameter [06], which allows the user to set the charging mode manually.

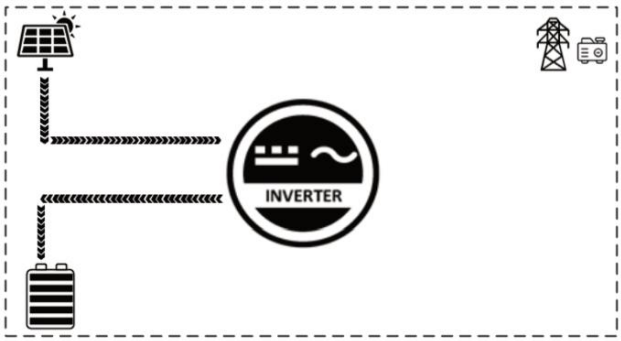
- **Hybrid Charging SNU (default)**

PV and utility power charge the battery at the same time, with PV taking priority and mains power acting as a supplement when PV is insufficient. This is the fastest charging method and is suitable for areas with insufficient power supply, providing sufficient backup power for users. **(Priority: PV > Utility)**




- **Only PV Charging OSO**

Only PV power is used to charge the battery, without starting the utility charging. This is the most energy-efficient method, with all battery power coming from solar energy, and is usually used in areas with good radiation conditions.

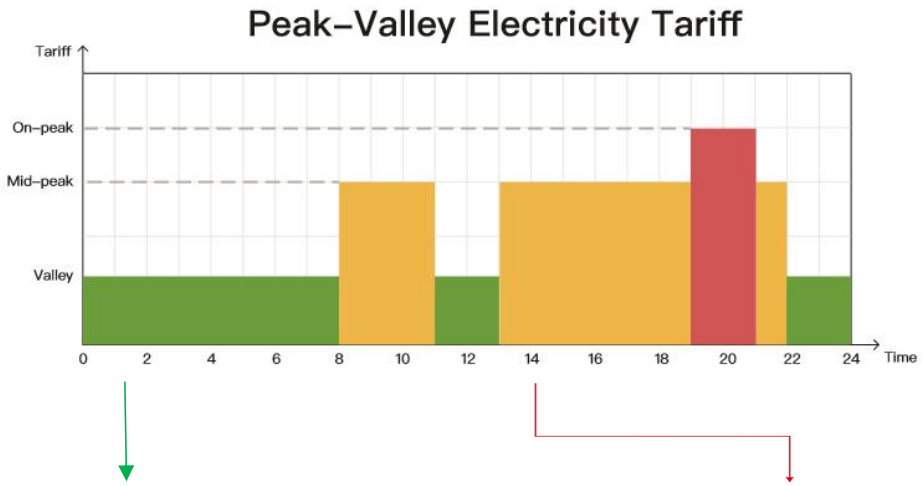


# 5.5 Timed charge/discharge function

ASP series has the timed power charge/discharge function. Users can set different charge and discharge periods according to the local time-of-use price, thus reasonably using mains and PV power. When mains is expensive, the battery inverter is used to supply power to the load; when mains is cheap, it can be used to supply power to and charge the load, thus helping users reduce electricity expenses to the full extent. Users can turn on/off the timed charge/discharge function in items 46 and 53 in the setup menu, and set charge and discharge periods in parameters 40–45 and 47–52.

The following is an example to help users understand the function.

Before using the function for the first time, please set the local time and date in parameters 54 and 55, and then you can set corresponding periods based on the local time-of-use price.




**Timed charge and loading function**


With 3 definable periods, users can freely set the mains charge/loading period in the range of 00:00 –23:59. During the period set by the user, in case of PV energy output, it will be used first; in case of no PV energy output or lack of PV energy, mains will be used as a supplement.

**Timed battery discharge function**

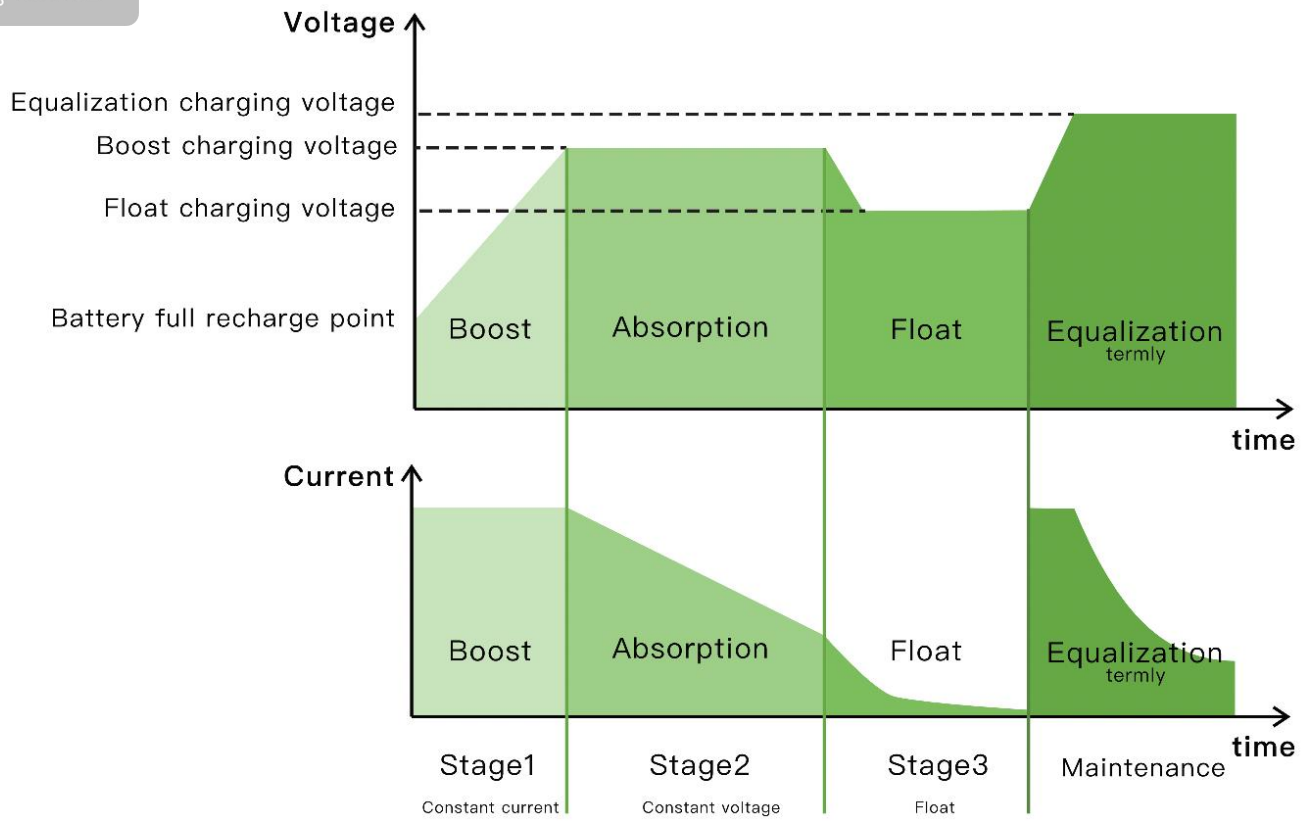

With 3 definable periods, users can freely set the battery discharge period in the range of 00:00–23:59. During the period set by the user, the inverter will first use the battery inverter to load; if the battery power is insufficient, the inverter will automatically switch to mains to ensure stable operation of the load.

# 5.6 Battery Parameters

## ■ Lead-acid battery

| Parameters \ Battery type | Sealed lead acid battery (SLD) | Gel lead acid battery (GEL) | Flooded lead acid battery (FLD) | User-defined (USE) |
|---|---|---|---|---|
| Overvoltage Disconnect Voltage | 60V | 60V | 60V | 60V |
| Equalization Charging Voltage | 58V | 56.8V | 58V | 40 ~ 60V settable |
| Boost Charging Voltage | 57.6V | 56.8V | 57.6V | 40 ~ 60V settable |
| Float Charging Voltage | 55.2V | 55.2V | 55.2V | 40 ~ 60V settable |
| Undervoltage Alarm Voltage | 44V | 44V | 44V | 40 ~ 60V settable |
| Undervoltage Disconnect Voltage | 42V | 42V | 42V | 40 ~ 60V settable |
| Discharge Limit Voltage | 40V | 40V | 40V | 40 ~ 60V settable |
| Over-discharge Delay Time | 5s | 5s | 5s | 1 ~ 30s settable |
| Equalization Charging Duration | 120 min | - | 120 min | 0 ~ 600 min settable |
| Equalization Charging Cycle | 30d | - | 30d | 0 ~ 250d settable |
| Bulk Charging Cycle | 120m | 120m | 120m | 10 ~900m settable |

NOTICE

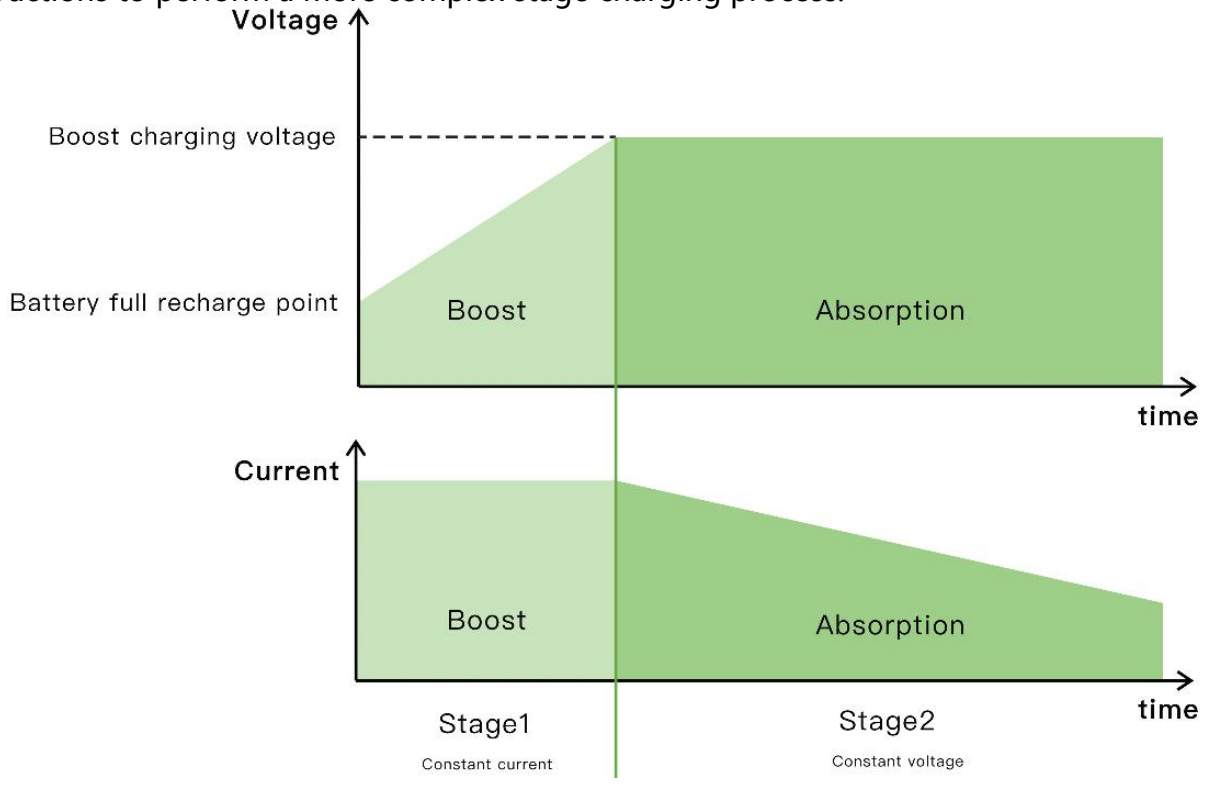


## ■ Lithium-ion Battery

| Parameters \ Battery type | Ternary (N13) | Ternary (N14) | LFP (L16) | LFP (L15) | LFP (L14) | Adjustable |
|---|---|---|---|---|---|---|
| Overvoltage Disconnect Voltage | 60V | 60V | 60V | 60V | 60V | 60V |
| Equalization Charging Voltage | - | - | - | - | - | 40 ~ 60V settable |
| Boost Charging Voltage | 53.2V | 57.6V | 56.8V | 53.2V | 49.2V | 40 ~ 60V settable |
| Float Charging Voltage | 53.2V | 57.6V | 56.8V | 53.2V | 49.2V | 40 ~ 60V settable |
| Undervoltage Alarm Voltage | 43.6V | 46.8V | 49.6V | 46.4V | 43.2V | 40 ~ 60V settable |
| Undervoltage Disconnect Voltage | 38.8V | 42V | 48.8V | 45.6V | 42V | 40 ~ 60V settable |
| Discharge Limit Voltage | 36.4V | 39.2V | 46.4V | 43.6V | 40.8V | 40 ~ 60V settable |
| Over-discharge Delay Time | 30s | 30s | 30s | 30s | 30s | 1 ~ 30s settable |
| Equalization Charging Duration | - | - | - | - | - | 0 ~ 600 min settable |
| Equalization Charging Cycle | - | - | - | - | - | 0 ~250d settable |
| Boost Charging Cycle | 120 min settable | 120 min settable | 120 min settable | 120 min settable | 120 min settable | 10 ~ 900 min settable |

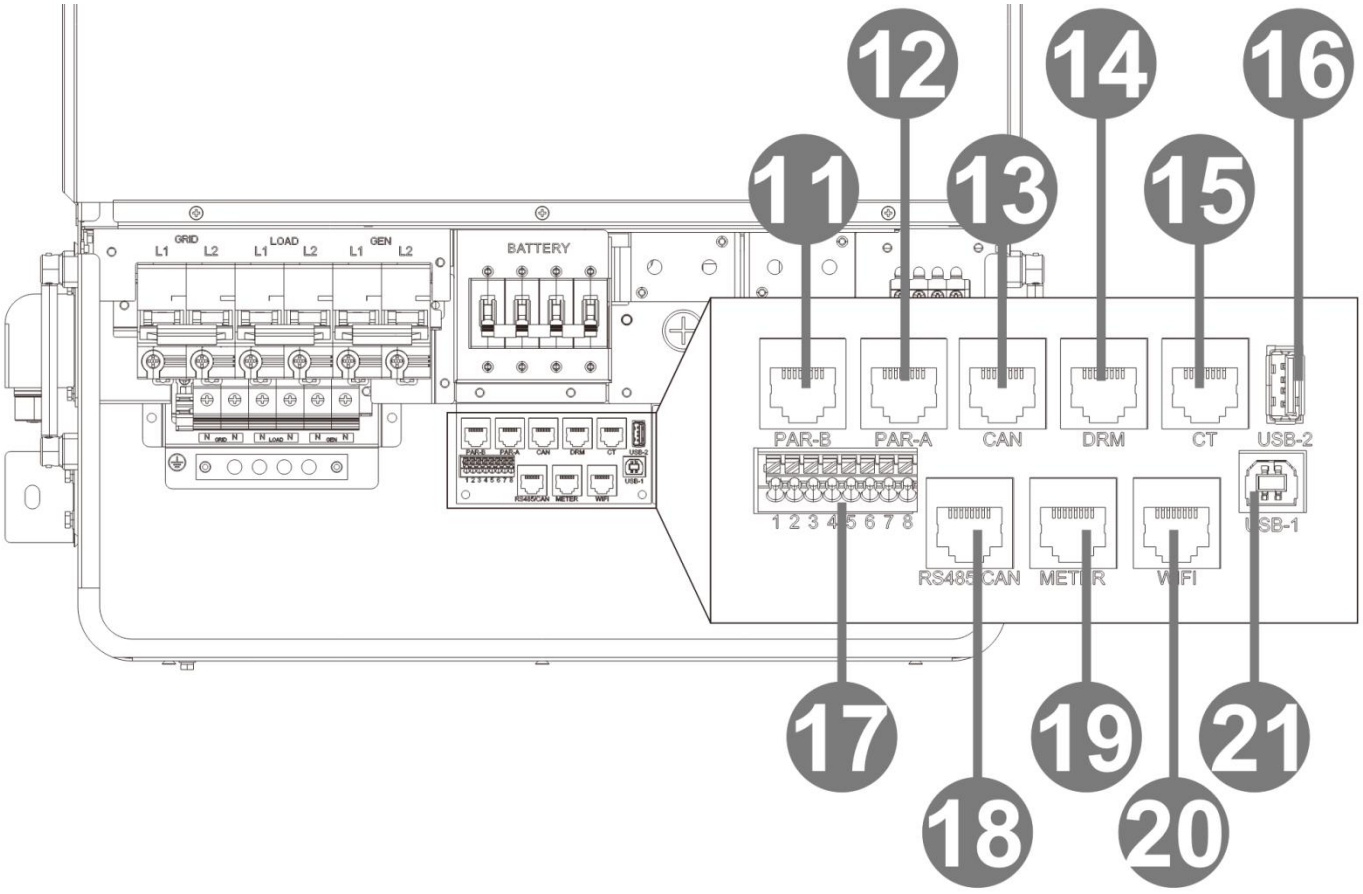
*NOTICE*

If no BMS is connected, the inverter will charge according to the battery voltage with a preset charging curve. When the inverter communicates with the BMS, it will follow the BMS instructions to perform a more complex stage charging process.



# 6.Communication

## 6.1 Product Overview

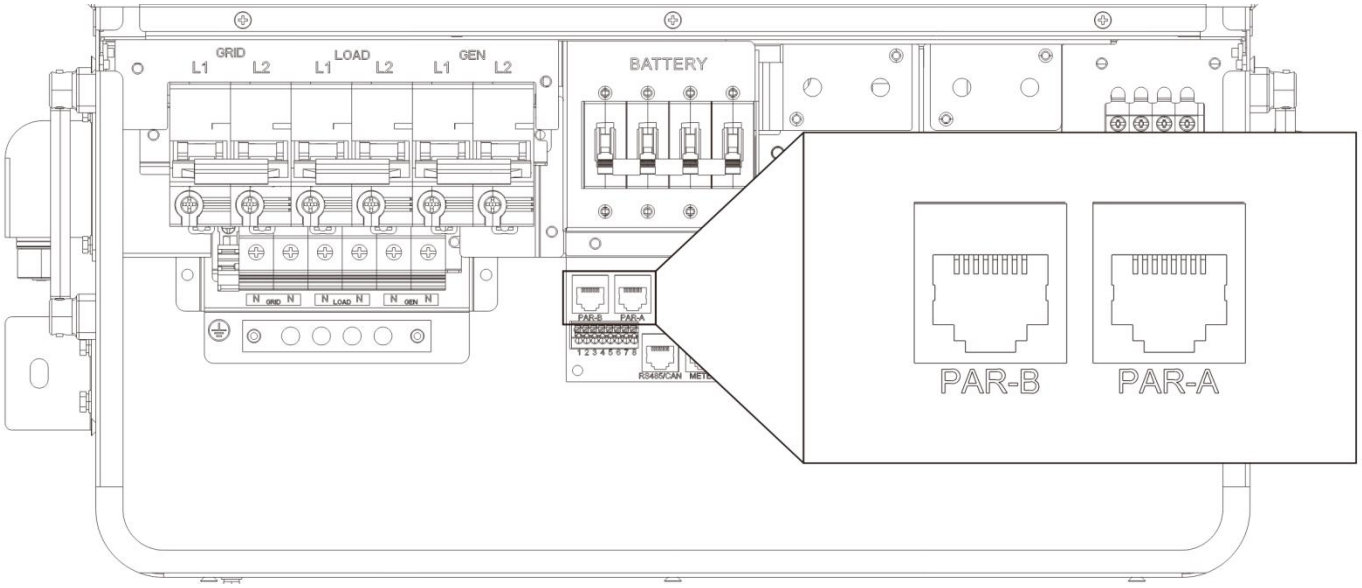



| | | | | | |
|---|---|---|---|---|---|
| 11 | Parallel Port (PAR-B) | 12 | Parallel Port (PAR-A) | 13 | CAN Port |
| 14 | DRM Port (Reserved) | 15 | CT Port | 16 | USB-2 Port (Reserved) |
| 17 | Dry Contact Prot | 18 | RS485/CAN Port | 19 | Meter Port |
| 20 | WIFI Port 1 | 21 | USB-1 Port | | |

## 6.2 Parallel Function (For parallel operation only)

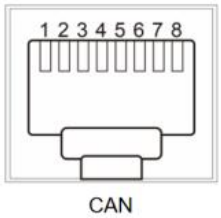
This port is a parallel communication port, through which parallel modules can communicate with each other when connected.

1.Each device is equipped with two 8-pin parallel communication ports: PAR-A (Parallel Port A) and PAR-B (Parallel Port B).
2.For connection, connect the PAR-A (Parallel Port A) of the current device to the Parallel Port B of the device to be paralleled, or connect the PAR-B (Parallel Port B) of the current device to the Parallel Port A of the device to be paralleled.
3.Direct connection between the PAR-A and PAR-B of the same device is prohibited.




# 6.3 CAN Function

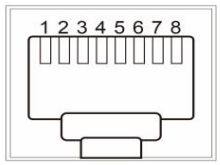
The CAN port is used to connect to the BMS of Liion battery.



CAN

| RJ45 | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|
| Description | / | / | / | CANH | CANL | / | / | / |

# 6.4 DRM (Reserved,Only Australia)

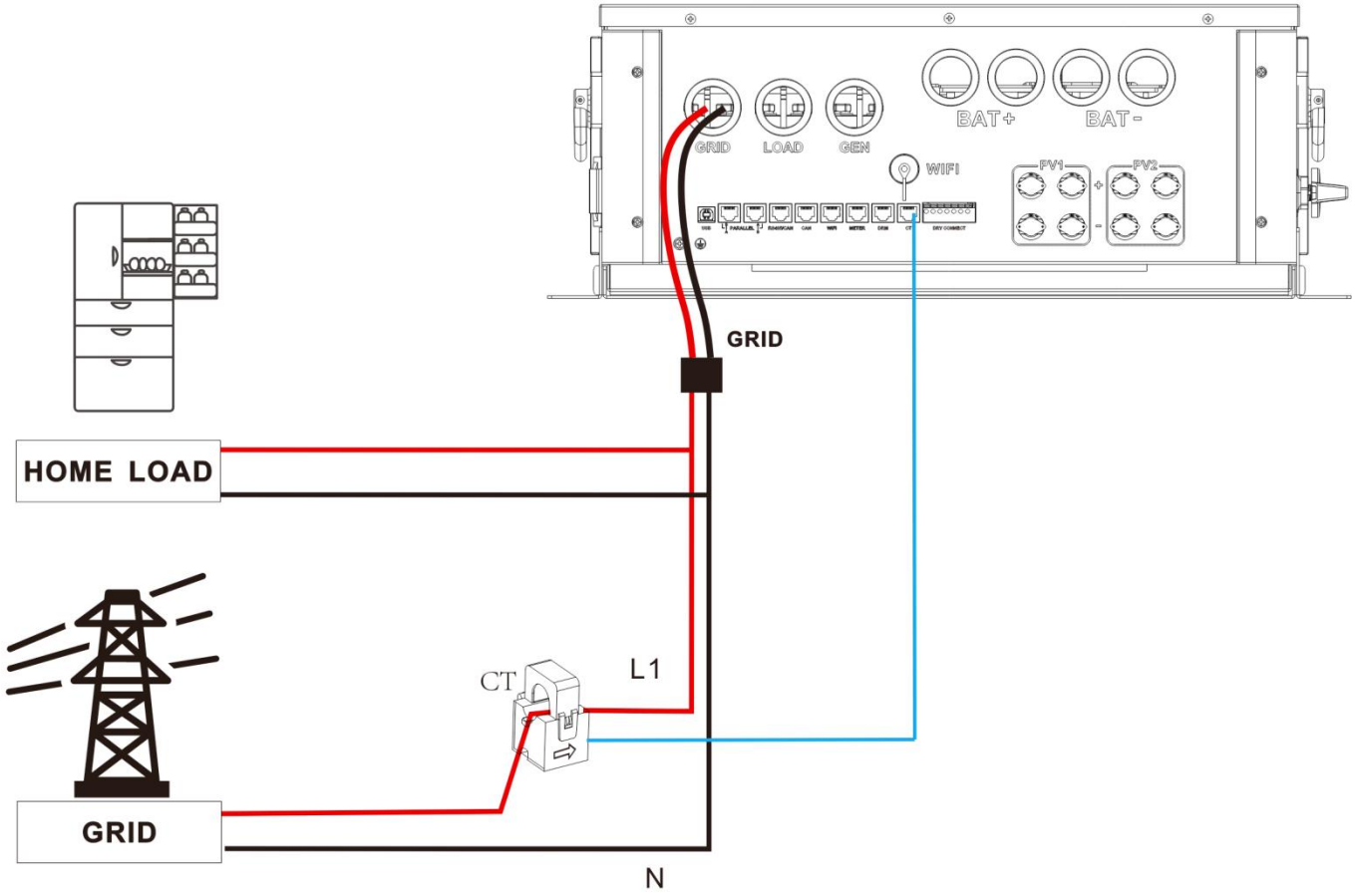


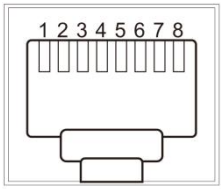
DRM

| RJ45 | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|
| Description | DRM5 | DRM6 | DRM7 | DRM8 | RefGen | COM/ DRM0 | V+ | V- |

| MODEL | RJ45 socket asserted by shorting pins | | Requirement |
|---|---|---|---|
| DRM0 | 5 | 6 | Operate the power-off device. |
| DRM5 | 1 | 5 | Do not generate power to the grid. |
| DRM6 | 2 | 5 | The power generation shall not exceed 50% of the rated power. |
| DRM7 | 3 | 5 | The power generation shall not exceed 75% of the rated power, and reactive power shall be absorbed when possible. |
| DRM8 | 4 | 5 | Increase power generation (limited by other active DRM). |

# 6.5 External CT Connection

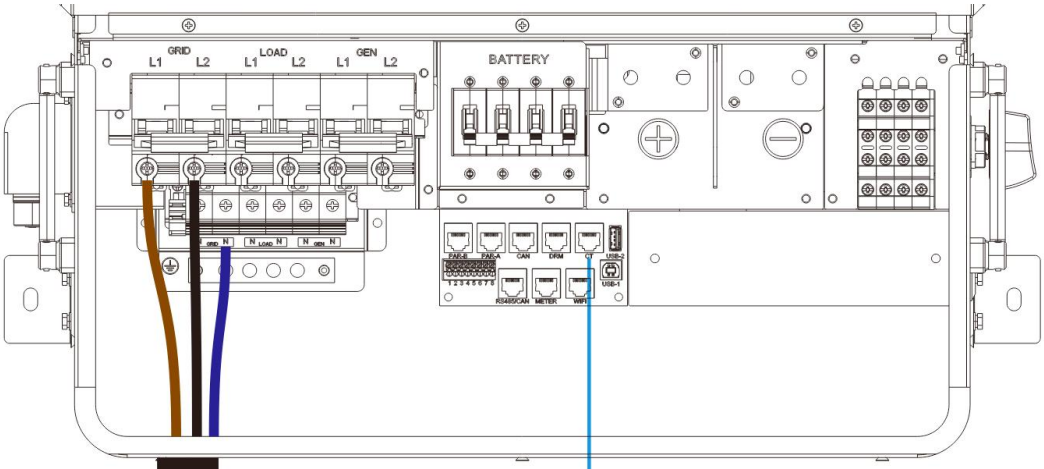


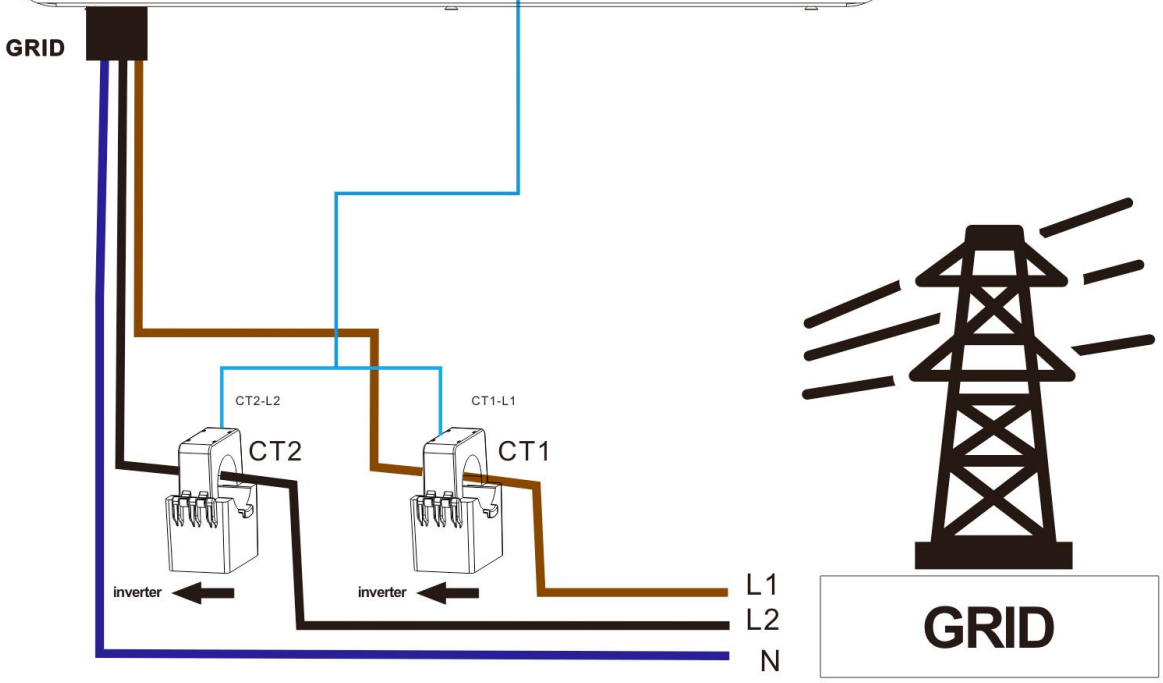



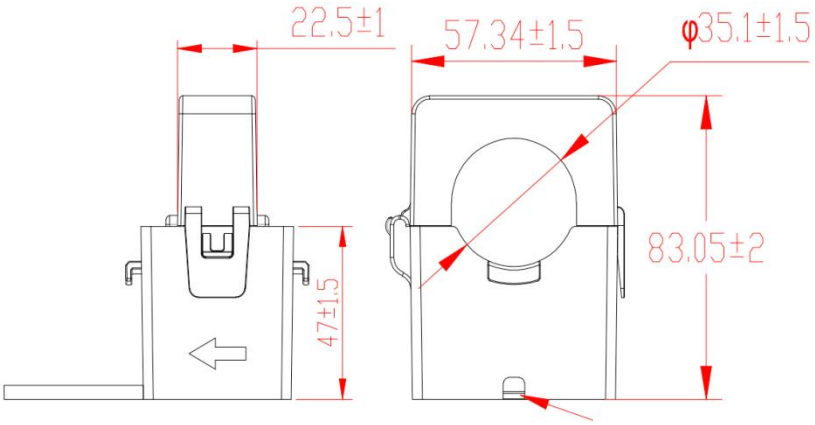

CT

| RJ45 | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|
| Description | / | / | / | CT2+ | CT2- | / | CT1+ | CT1- |

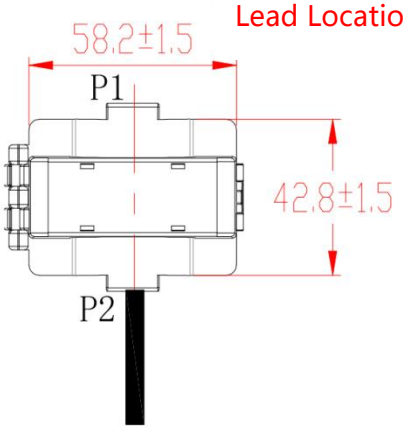
1. Split Core Current Transformer (CT) dimension: (mm)
2. Secondary output cable length is 4m.




Lead Location



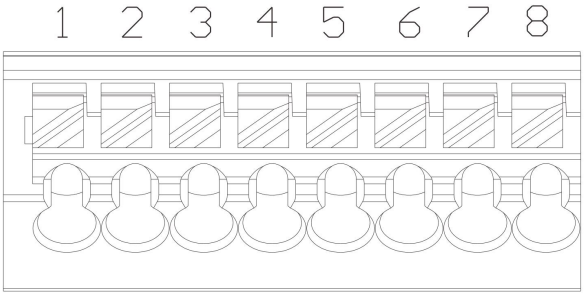

Laser Marking


Lead Side

# 6.6 Dry Contact Function

**The dry contact port has 4 functions :**

1. RSD power supply
2. Remote switch on/off (reserved)
3. Switching signal output (reserved)
4. Battery temperature sampling (reserved)
5. Generator remote start/stop



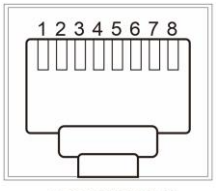

| Function | Description |
|---|---|
| RSD power supply | PIN 1 is GND，PIN 2 is RSD 12V+ |
| Remote switch on/off (reserved) | When pin 1 is connected to pin 3, the inverter will shut off AC output. When pin 1 is disconnected from pin 3, the inverter will resume normal output. |
| Switching signal output (reserved) | When the battery voltage reaches the battery discharge limit voltage (parameter [15]), the voltage between pin 4 and pin 1 is 0V. When the battery is charging normally, the voltage between pin 4 and pin 1 is 5V. |
| Temperature sampling (reserved) | Pin 1 & Pin 5 can be used for battery temperature sampling compensation. |
| Generator remote switch | When the battery voltage reaches the battery under-voltage alarm point (Parameter [14]) or the voltage point for switching to mains power (Parameter [04]), pins 7 to 6 are normally open, and pins 8 to 6 are normally closed.<br>When the battery voltage reaches the voltage point for switching to mains power (parameter [05]) or the battery is fully charged, pins 7 to 6 are normally closed, and pins 8 to 6 are normally open. (Pins 6/7/8 output 125Vac/1A, 230Vac/1A, 30Vdc/1A). |

⚠ *NOTICE*

If you need to use the remote start/stop function of the generator with dry contact, ensure that the generator has ATS and supports remote start / stop.

# 6.7 RS485/CAN Communication Function

The RS485/CAN communication port is used to connect to the BMS of Liion battery.



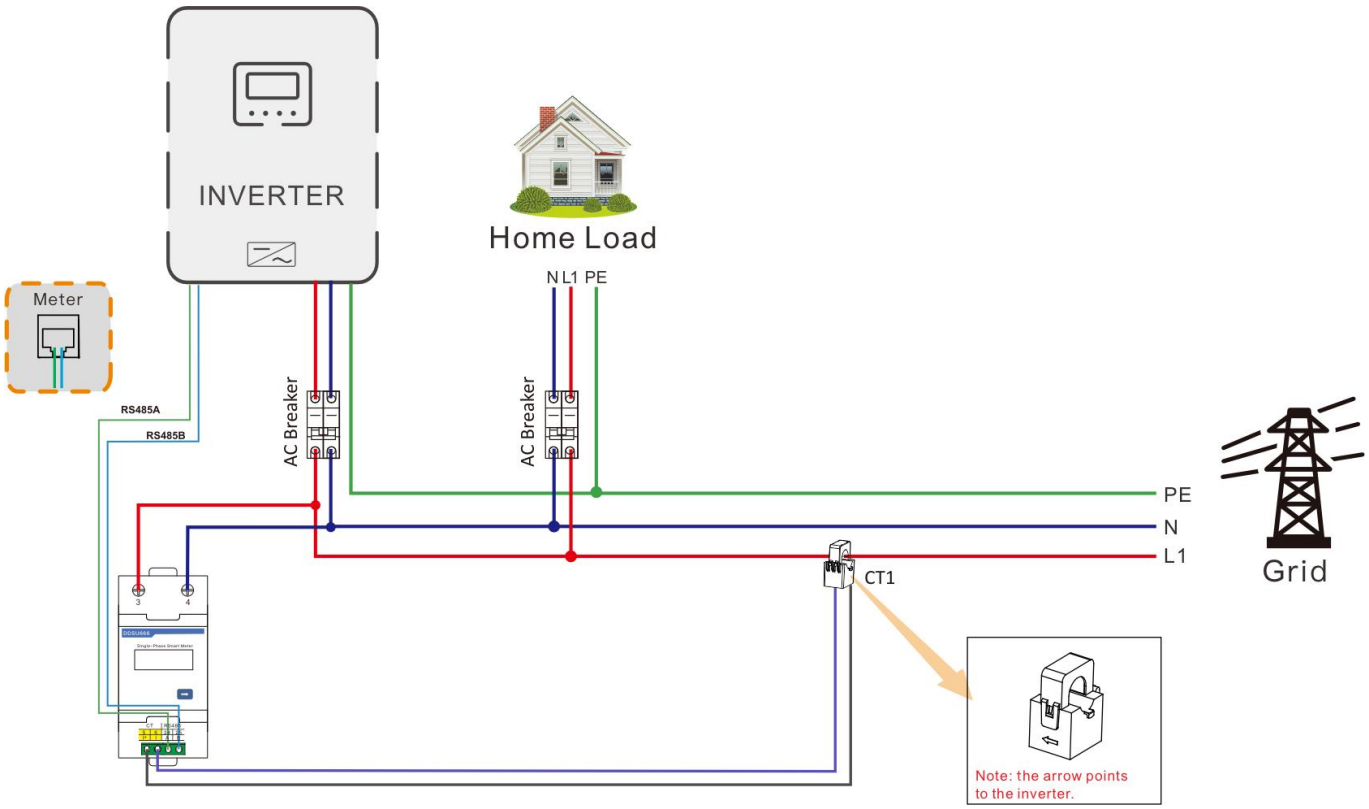

RS485/CAN

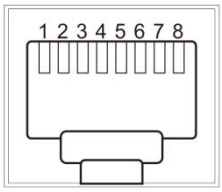
| RJ45 | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|
| Description | RS485-B | RS485-A | / | CANH | CANL | / | RS485-A | RS485-B |

⚠ *NOTICE*

If you need to use the inverter to communicate with the lithium battery BMS, please contact us for the communication protocol or upgrade the inverter to the appropriate software programme.

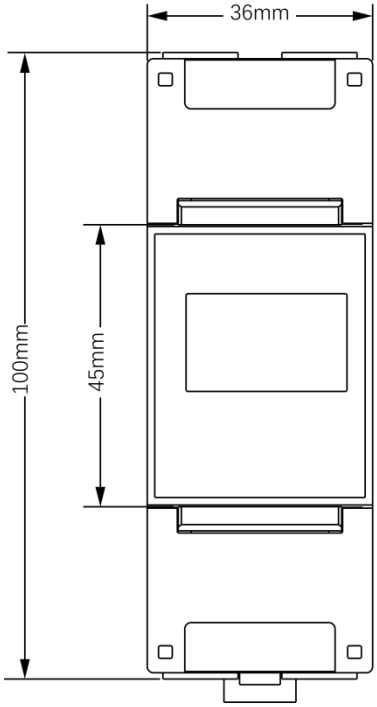
# 6.8 Meter Communication (Optional)




Meter

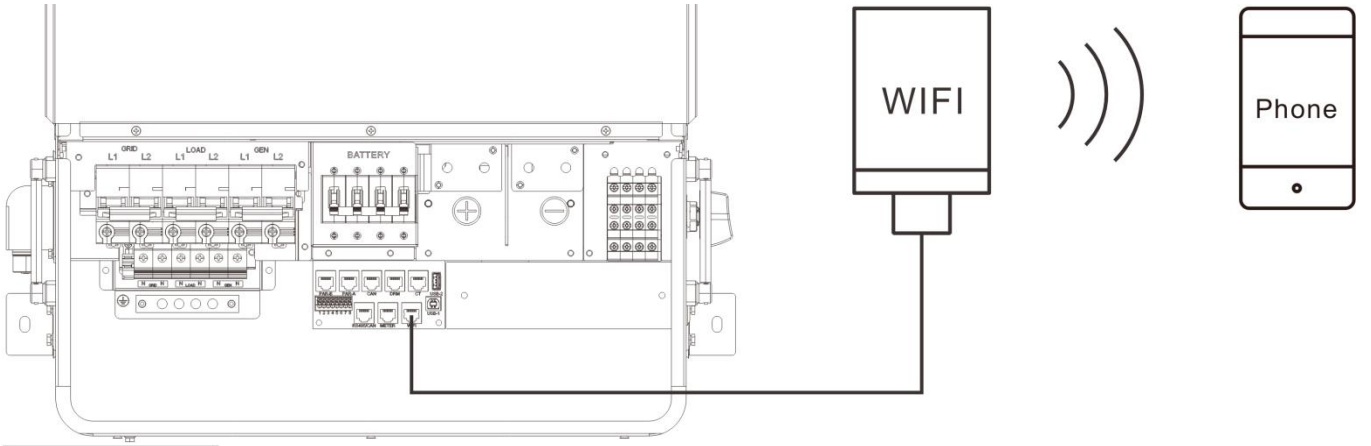
| RJ45 | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|
| Description | RS485-B | RS485-A | / | / | / | / | RS485-A | RS485-B |

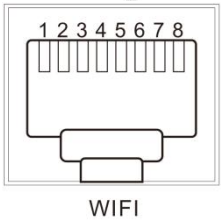


# 6.9 WIFI Communication Function

The WIFI communication port can be connected to the optional RS485-to-WIFI/GPRS communication module developed by our company. After installing this module, it can connect to our inverter, allowing users to view the inverter's operating status and parameters through a mobile APP.

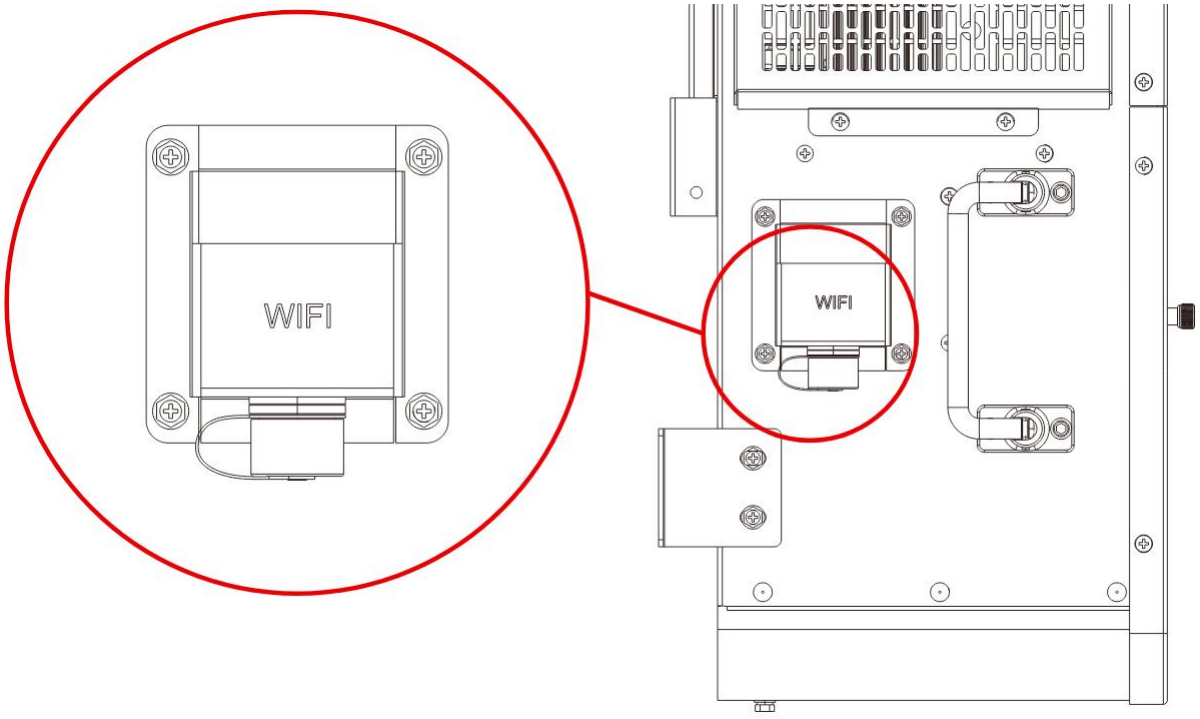
- **WIFI Port 1 (either one)**



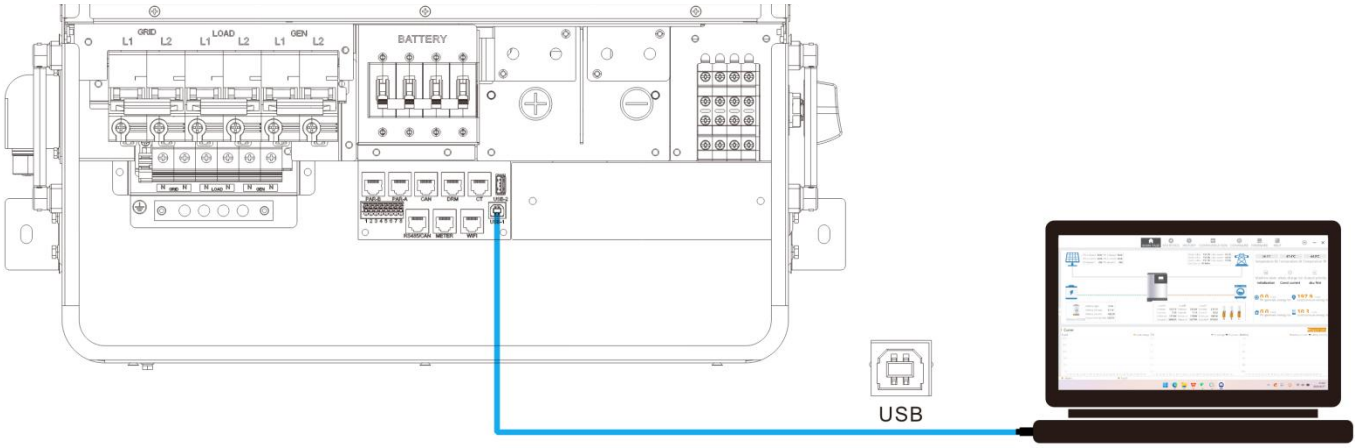

| RJ45 | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|
| Description | 5V | GND | / | / | / | / | RS485-A | RS485-B |

- **WIFI Port 2 (either one)**



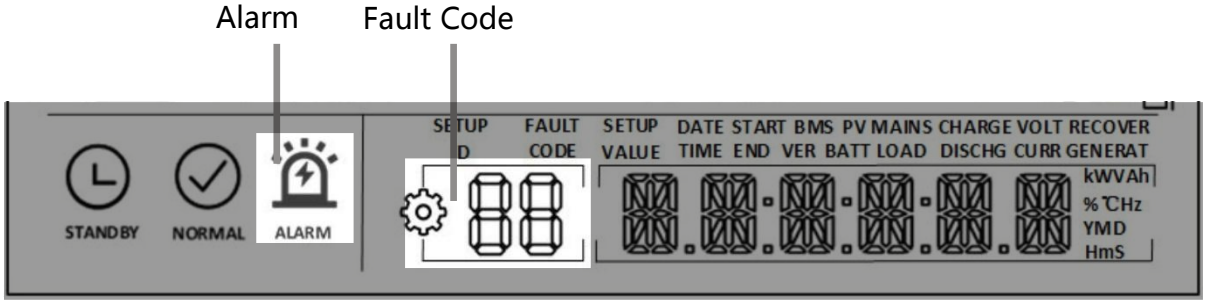
# 6.10 USB-1 Communication Function

Users can use the host computer software to read and modify the device parameters through this port. If you need the installation package of the host computer software, The installation package is available for download on the official website, or you may contact us to get it.




# 7. Fault Codes and Countermeasures

## 7.1 Fault codes




| Fault Code | Fault name | Whether it affects the output or not | Description |
|---|---|---|---|
| 【01】 | BatVoltLow | No | Battery undervoltage alarm. |
| 【02】 | BatOverCurrSw | Yes | Battery discharge average current overcurrent (software protection). |
| 【03】 | BatOpen | Yes | Battery not-connected alarm. |
| 【04】 | BatLowEod | Yes | Battery undervoltage stop discharge alarm. |
| 【05】 | BatOverCurrHw | Yes | Battery overcurrent (hardware protection). |
| 【06】 | BatOverVolt | Yes | Charging overvoltage protection. |
| 【07】 | BusOverVoltHw | Yes | Bus overvoltage (hardware protection). |
| 【08】 | BusOverVoltSw | Yes | Bus overvoltage (software protection). |
| 【09】 | PvVoltHigh | No | PV overvoltage protection. |

| | | | |
|---|---|---|---|
| 【10】 | PvAFCIErr | No | PV arc fault. |
| 【11】 | PvOCHw | No | Boost overcurrent (hardware protection). |
| 【12】 | SpiCommErr | Yes | SPI communication fault of master and slave chips. |
| 【13】 | OverloadBypass | Yes | Bypass overload protection. |
| 【14】 | OverloadInverter | Yes | Inverter overload protection. |
| 【15】 | AcOverCurrHw | Yes | Inverter overcurrent (hardware protection). |
| 【16】 | AuxDSpReqOffPWM | Yes | Slave chip OFF request fault. |
| 【17】 | InvShort | Yes | Inverter short-circuit protection. |
| 【18】 | Bussoftfailed | Yes | Bus soft-start failure. |
| 【19】 | OverTemperMppt | No | PV radiator over-temperature protection. |
| 【20】 | OverTemperInv | Yes | Inverter heat dissipation over-temperature protection |
| 【21】 | FanFail | Yes | Fan blockage or failure fault. |
| 【22】 | EEPROM | Yes | Memory failure. |
| 【23】 | ModelNumErr | Yes | Model setting error. |
| 【24】 | Busdiff | Yes | Positive and negative bus voltage imbalance. |
| 【25】 | BusShort | Yes | Bus short-circuit. |
| 【26】 | RlyShort | Yes | Inverted AC Output Backfills to Bypass AC Input. |
| 【27】 | LinePhaselose | Yes | Grid input phase lose. |
| 【28】 | LinePhaseErr | Yes | Grid input phase error |
| 【29】 | BusVoltLow | Yes | Bus voltage undervoltage protection. |
| 【30】 | BatCapacityLow1 | No | Alarm given when battery capacity rate is lower than 10% (setting BMS to enable validity). |
| 【31】 | BatCapacityLow2 | No | Alarm given when battery capacity rate is lower than 5% (setting BMS to enable validity). |
| 【32】 | BatCapacityLowStop | Yes | Inverter stops when battery capacity is low (setting BMS to enable validity). |
| 【33】 | ControlCanFault | Yes | Control CAN fault in parallel operation. |
| 【34】 | CanCommFault | Yes | CAN communication fault in parallel operation. |
| 【35】 | ParaAddrErr | Yes | Parallel ID （communication address）setting error. |
| 【36】 | Balance currentOC | Yes | Balance bridge arm overcurrent failure. |
| 【37】 | ParaShareCurrErr | Yes | Parallel current sharing fault . |
| 【38】 | ParaBattVoltDiff | Yes | Large battery voltage difference in parallel mode. |
| 【39】 | ParaAcSrcDiff | Yes | Inconsistent AC input source in parallel mode. |
| 【40】 | ParaHwSynErr | Yes | Hardware synchronization signal error in parallel mode. |
| 【41】 | InvDcVoltErr | Yes | Inverter DC component of voltage abnormality. |
| 【42】 | SysFwVersionDiff | Yes | Inconsistent parallel operation program versions. |
| 【43】 | ParaLineContErr | Yes | Parallel wiring fault. |
| 【44】 | Serial number error | Yes | Serial number not set at factory. |
| 【45】 | Error setting of split-phase mode | Yes | [31] Incorrect settings for parallel operation mode. |

| | | | |
|---|---|---|---|
| 【46】 | MeterComErr | Yes | Meter communication error. |
| 【48】 | AFCIComErr | Yes | AFCI communication error. |
| 【56】 | Low insulation resistance fault | No | PV1+, PV2+ and PV- abnormally low impedance to ground. |
| 【57】 | Leakage current overload fault | Yes | System leakage current exceeds limit. |
| 【58】 | BMS communication error | No | BMS communication fault. |
| 【60】 | BMS battery low temperature alarm | No | BMS low-temperature alarm (takes effect after successful BMS communication). |
| 【61】 | BMS battery over temperature alarm | No | BMS over-temperature alarm (takes effect after successful BMS communication). |
| 【62】 | BMS battery over current alarm | No | BMS over-current alarm (takes effect after successful BMS communication). |
| 【63】 | BMS battery undervoltage alarm | No | BMS under-voltage alarm (takes effect after successful BMS communication). |

# 7.2 Troubleshooting

| Fault Code | Meaning | Cause | Solution |
|---|---|---|---|
| / | No screen display | There is no power input, or the device switch at its bottom is not turned on | Check if the battery air-switch or PV air-switch has been closed; check if the switch is in "ON"; press any button on the screen to exit the screen sleep mode. |
| **01** | Battery under-voltage | The battery voltage is lower than the value set in parameter [14] | Charge the battery until the battery voltage exceeds the value set in parameter [14]. |
| **03** | Disconnected battery | The battery is not connected, or the BMS of the lithium-ion battery is in the discharge protection state | Check if the battery is reliably connected; check if the circuit breaker of the battery is off; ensure that the BMS of the lithium-ion battery can communicate normally. |
| **04** | Battery over-discharge | The battery voltage is lower than the value set in parameter 12 | Manual reset: Turn off the power, and restart<br>Automatic reset: Charge the battery until the battery voltage is higher than the value set in parameter [35] |
| **06** | Rechargeable battery overvoltage protection | The battery is in the overvoltage state | Manually turn off the power, and restart<br>Check if the battery voltage exceeds the limit. If the limit is exceeded, discharge the battery until the voltage is below the overvoltage recovery threshold of the battery |
| **13** | Bypass overload (software detection) | The output power or current of the bypass is overloaded within a certain period | Reduce the load power and restart the equipment. For more details, refer to item 11 in the protection functions. |
| **14** | Inverter overload (software detection) | The output power or current of the inverter is overloaded within a certain period | |
| **19** | Over-high temperature of the heat sink for PV input (software detection) | The temperature of the heat sink for PV input exceeds 90°C for 3s | When the temperature of the heat sink cools below the over-temperature recovery threshold, normal charging and discharging resume. |
| **20** | Over-high temperature of the heat sink for inverter output (software detection) | The temperature of the heat sink for inverter output exceeds 90°C for 3s | |
| **21** | Fan fault | Software detection founds the fan has a fault | Shut down, manually flick the fan, and check if any foreign objects are blocking it |
| **26** | AC input relay short-circuit | Stuck relay for AC output | Manually shut down, and restart. If the fault occurs again after restarting, contact the after-sales service personnel to repair the machine |

| | | | |
|---|---|---|---|
| **28** | Mains input phase fault | The phase of AC input is inconsistent with that of AC output | Ensure that the phase of AC input is the same as that of AC output. For example, if the output is in the split-phase mode, the input shall also be in the split-phase mode. |

**NOTICE**

If you encounter product faults that cannot be solved by the methods in the above table, please contact our after-sales service department for technical support and do not disassemble the equipment by yourself.

# 8. Protection and Maintenance

## 8.1 Protection Functions

| No. | Protection Function | Description |
|---|---|---|
| **1** | PV current-limiting protection | When the charge current or power of the configured PV array exceeds the rated current and power of the inverter, it will charge at the rated current and power |
| **2** | PV overvoltage protection | If the PV voltage exceeds the maximum allowable value of hardware, the machine will report the fault, and stop the step-up of PV to output sine AC waves |
| **3** | Reverse charge protection at night | At night, as the battery voltage is greater than that of the PV module, it will prevent the battery from discharging to the PV module |
| **4** | mains input overvoltage protection | When the mains voltage of each phase exceeds 140 VAC, it will stop mains from charging, and switch it to inverter output |
| **5** | Mains input under-voltage protection | When the mains voltage of each phase is lower than 90 VAC, it will stop mains from charge, and switch it to inverter output |
| **6** | Battery overvoltage protection | When the battery voltage reaches the overvoltage disconnect voltage threshold, it will automatically stop PV and mains from charging the battery, thus preventing damage to the battery due to overcharge |
| **7** | Battery under-voltage protection | When the battery voltage reaches the low-voltage disconnect voltage threshold, it will automatically stop discharging the battery, thus preventing damage to the battery due to overdischarge |
| **8** | Battery overcurrent protection | When the battery current exceeds the allowable range of hardware, the machine will turn off the output, and stop discharging the battery |
| **9** | AC output short-circuit protection | When a short-circuit fault occurs at the load output terminal, it will immediately turn off the output of AC voltage. Only after manually powering on the device, normal output restores |
| **10** | Heat sink over-temperature protection | When the internal temperature of the inverter is too high, the inverter will stop charging and discharging; when the temperature returns to normal, the inverter will charge and discharge again |
| **11** | Overload protection | After overload protection is triggered, the inverter output will be restored after 3 min, and after 5 times of overload, the output will be off until the frequency changer is restarted.<br>(102%< load <110%): An error will be reported, and the output will be turned off after 5 min.<br>(110%< load <125%): An error will be reported, and the output will be turned off after 10s. |
| **12** | AC backward protection | Prevent the mains of battery inverter backward to bypass AC input |
| **13** | Bypass overcurrent protection | Built-in circuit breaker for AC input overcurrent protection |
| **14** | Bypass wiring error protection | When the phase of the two bypass inputs is different from that of the inverter split-phase, the machine will prohibit connecting to the bypass, thus preventing the power failure or short circuit of load when connecting to the bypass |

# 8.2 Maintenance

**To maintain optimal long-term performance, it is recommended to perform the following inspections twice a year for inverter systems:**

1.Ensure that the airflow around the inverter is not blocked and remove any dirt or debris from the radiator.
2.Check that all exposed conductors are not damaged by sunlight, friction with other surrounding objects, dry rot, insect or rodent damage, etc. The conductors need to be repaired or replaced if necessary.
3.Verify that the indications and displays are consistent with the operation of the equipment, note any faults or incorrect displays and take corrective action if necessary.
4.Check all terminals for signs of corrosion, insulation damage, high temperatures or burning/discolouration and tighten terminal screws.
5.Check for dirt, nesting insects and corrosion, clean as required, clean insect screens regularly.
6.If the lightning arrester has failed, replace the failed arrester in time to prevent lightning damage to the inverter or other equipment of the user.

**⚠ DANGER**

Make sure that the inverter is disconnected from all power sources and that the capacitors are fully discharged before carrying out any checks or operations to avoid the risk of electric shock.

**The Company shall not be liable for damage caused by :**

1.Damage caused by improper use or use in a wrong location.
2.PV modules with an open-circuit voltage exceeding the maximum permissible voltage.
3.Damage caused by the operating temperature exceeding the restricted operating temperature range.
4.Dismantling and repair of the inverter by unauthorised persons.
5.Damage caused by force majeure: damage during transport or handling of the inverter.

# 9. Datasheet

| MODEL | ASP48140U300-H | ASP48150U300-H | ASP48160U300-H | Setting |
|---|---|---|---|---|
| **AC OUTPUT** | | | | |
| Rated Output Power | 14000W | 15000W | 16000W | |
| Max. Peak Power | 2 times rated power, 10s | | | |
| Max. Apparent Power | 14000VA | 15000VA | 16000VA | |
| Rated Output Voltage | 120Vac/240Vac (L1+L2+N+PE) | | | |
| Rated Output Current | 58.3Aac | 62.5Aac | 66.7Aac | √ |
| Motor Load Capacity | 9HP | | | |
| Rated Output Frequency | 50/60Hz | | | |
| Waveform | Pure sine wave | | | |
| Switch Time | 10 ms (typical) | | | |
| **BATTERY** | | | | |
| Battery Types | Li-ion / Lead-Acid / User Defined | | | √ |
| Rated Battery Voltage | 48Vdc | | | |
| Battery Voltage Range | 40-60Vdc | | | |
| Max. Grid/Generator Charging Current | 300Adc | | | √ |
| Max. Charging/Discharging Current | 300Adc | | | √ |

| | | |
|---|---|---|
| Charging Curve | 3 Stages / Equalization | |
| Charging Strategy for Li-Ion Battery | Self-adaption to BMS | |
| **PV INPUT** | | |
| No. of MPPT Trackers | 2 | |
| Max. PV Input Power | 12000W + 12000W | |
| Max. PV Input Current | 36Adc + 36Adc | |
| PV Short-circuit Current | 50Adc + 50Adc | |
| PV Start-up Voltage | 90Vdc / 90Vdc | |
| Max. PV Open-Circuit Voltage | 650Vdc / 650Vdc | |
| MPPT Operating Voltage Range | 120-600Vdc / 120-600Vdc | |
| **GRID / GENERATOR INPUT** | | |
| Rated Input Voltage | 120Vac/240Vac (L1+L2+N+PE) | |
| Input Voltage Range | 85-140Vac / 170-280Vac | |
| Rated Input Frequency | 50/60Hz | |
| Charging Current Error | 2% | |
| Bypass Overload Current (Grid) | 100Aac | |
| Bypass Overload Current (Generator) | 66.7Aac | |
| **EFFICIENCY** | | |
| MPPT Tracking Efficiency | >99% | |
| Max. Inverter Efficiency | 94.3% | |
| Max. Charging Efficiency | 93.4% | |
| **PROTECTION** | | |
| Has PV Current Limiting Protection, PV Overvoltage Protection, Night Anti - backcharging Protection, Mains Input Overvoltage Protection, Mains Input Undervoltage Protection, Battery Overvoltage Protection, Battery Undervoltage Protection, Battery Overcurrent Protection, AC Output Short - circuit Protection, Heat Sink Overtemperature Protection, Overload Protection, AC Backfeed Protection, Bypass Overcurrent Protection, Bypass Wiring Error Protection, Arc Fault Protection, Leakage Current Protection, Rapid Shutdown Signal Generator (Optional), AFCI/GFCI/RSD (Optional) | | |
| **GENERAL DATA** | | |
| Parallel Capacity | 1~6 units | |
| Dimensions (W * H * D) | 514*848*215mm | |
| Weight | 47.5kg | |
| Protection Degree | IP20, indoor use only | |
| Operating Temperature | -10~55℃, >45℃ Derated | |
| Noice | <60dB | |
| Altitude | 2000m | |
| Cooling Time | Intelligent Air Cooling | |
| **COMMUNICATION** | | |
| Internal Interface | RS485 / CAN / WIFI / Dry contact | √ |
| External Module (optional) | Wi-Fi/4G Stick | √ |
| **CERTIFICATION** | | |
| Safety | IEC62109-1, IEC62109-2, UL1741 | |
| EMC | EN61000-6-1, EN61000-6-3, FCC 15 class B | |

# SRNE Solar Co,.Ltd


| | |
|---|---|
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