



# Hybrid Inverter

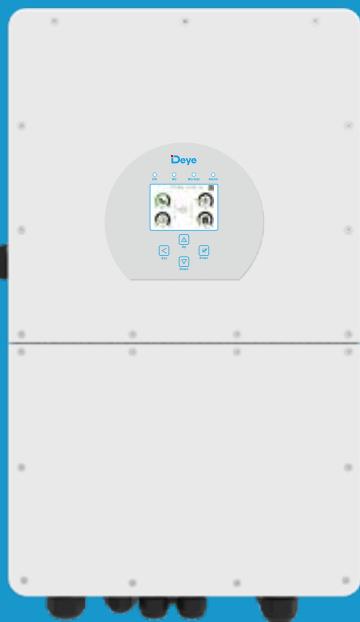
**SUN-8K-SG01HP3-US-AM2**

**SUN-10K-SG01HP3-US-AM2**

**SUN-12K-SG01HP3-US-AM2**

**SUN-15K-SG01HP3-US-AM2**

## User Manual



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## About This Manual

The manual mainly describes the product information, guidelines for installation, operation and maintenance. The manual cannot include complete information about the photovoltaic (PV) system.

## How to Use This Manual

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.

**Contents may be periodically updated or revised due to product development. The information in this manual is subject to change without notice.** The latest manual can be acquired via [service@deye.com.cn](mailto:service@deye.com.cn)

## 1. Safety Introductions

### Labels description

Label	Description
	Caution, risk of electric shock symbol indicates important safety instructions, which if not correctly followed, could result in electric shock.
	The DC input terminals of the inverter must not be grounded.
	Surface high temperature, Please do not touch the inverter case.
	The AC and DC circuits must be disconnected separately, and the maintenance personnel must wait for 5 minutes before they are completely powered off before they can start working.
	CE mark of conformity
	Please read the instructions carefully before use.
	Symbol for the marking of electrical and electronics devices according to Directive 2002/96/EC. Indicates that the device, accessories and the packaging must not be disposed as unsorted municipal waste and must be collected separately at the end of the usage. Please follow Local Ordinances or Regulations for disposal or contact an authorized representative of the manufacturer for information concerning the decommissioning of equipment.

- This chapter contains important safety and operating instructions. Read and keep this manual for future reference.
- Before using the inverter, please read the instructions and warning signs of the battery and corresponding sections in the instruction manual.
- Do not disassemble the inverter. If you need maintenance or repair, take it to a professional service center.
- Improper reassembly may result in electric shock or fire.
- To reduce risk of electric shock, disconnect all wires before attempting any maintenance or cleaning. Turning off the unit will not reduce this risk.
- Caution: Only qualified personnel can install this device with battery.
- Never charge a frozen battery.
- For optimum operation of this inverter, please follow required specification to select appropriate cable size. It is very important to correctly operate this inverter.
- Be very cautious when working with metal tools on or around batteries. Dropping a tool may cause a spark or short circuit in batteries or other electrical parts, even cause an explosion.
- Please strictly follow installation procedure when you want to disconnect AC or DC terminals. Please refer to "Installation" section of this manual for the details.
- Grounding instructions - this inverter should be connected to a permanent grounded wiring system. Be sure to comply with local requirements and regulation to install this inverter.
- Never cause AC output and DC input short circuited. Do not connect to the mains when DC input short circuits.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

**FCC warning:**

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

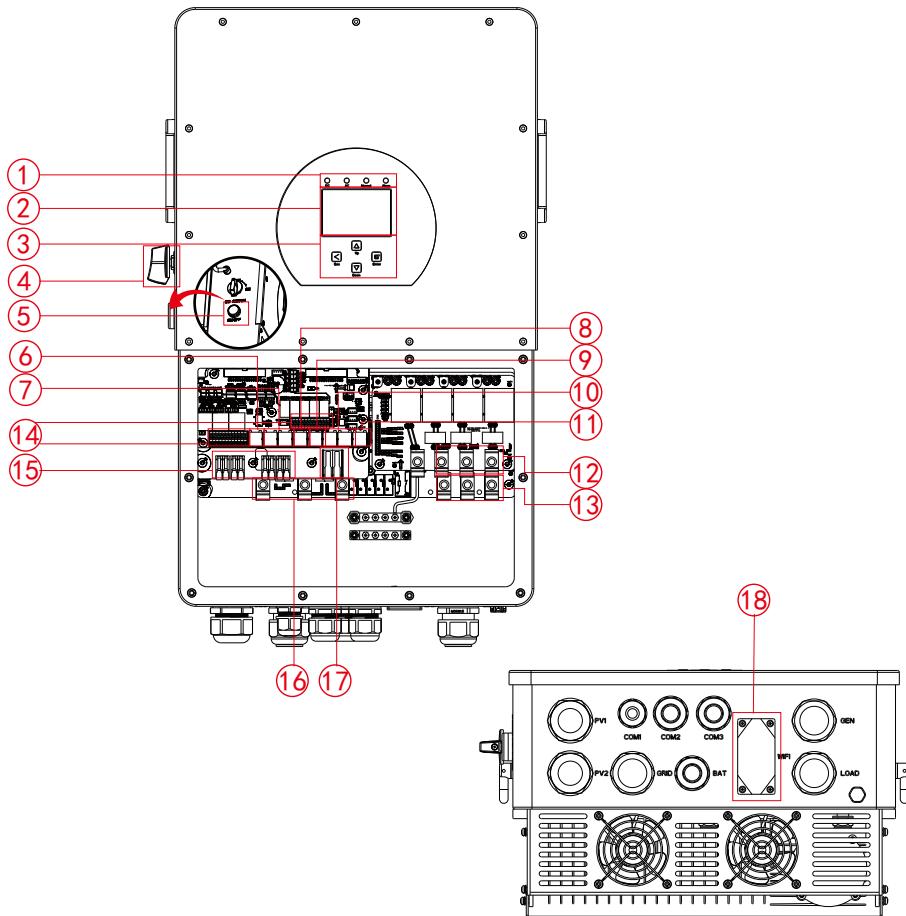
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

## 2. Product Introductions

This is a multifunctional inverter, combining functions of inverter, solar charger and battery charger to offer uninterruptible power support with portable size. Its comprehensive LCD display offers user configurable and easy accessible button operation such as battery charging, AC/solar charging, and acceptable input voltage based on different applications.

## 2.1 Product Overview

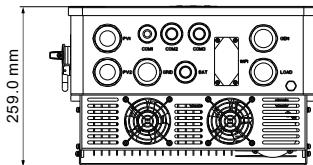
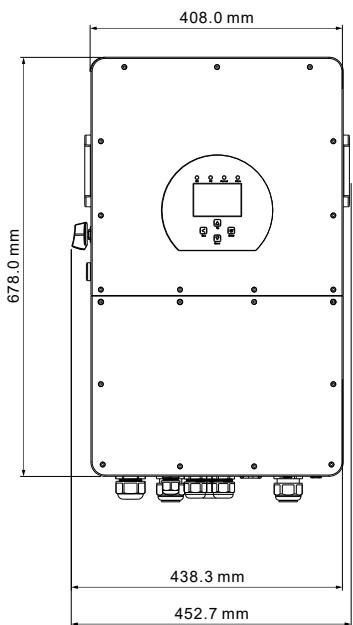


1: Inverter indicators  
2: LCD display  
3: Function buttons  
4: DC switch  
5: Power on/off button  
6: Meter port

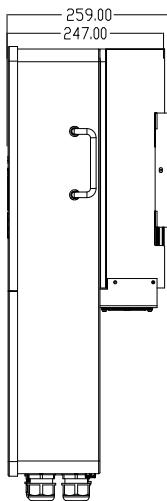
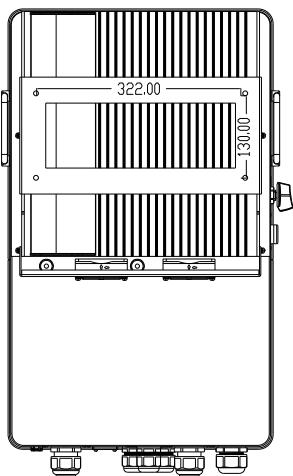
7: Parallel port  
8: CAN port  
9: DRM port  
10: BMS port  
11: RS485 port  
12: Generator input

13: Load  
14: Function port  
15: PV input  
16: Grid  
17: Battery input  
18: WiFi Interface

## 2.2 Product Size



Inverter Size



## 2.3 Product Features

- 120V/208V Three phase Pure sine wave inverter.
- Self-consumption and feed-in to the grid.
- Auto restart while AC is recovering.
- Programmable supply priority for battery or grid.
- Programmable multiple operation modes: On grid, off grid and UPS.
- Configurable battery charging current/voltage based on applications by LCD setting.
- Configurable AC/Solar/Generator Charger priority by LCD setting.
- Compatible with mains voltage or generator power.
- Overload/over temperature/short circuit protection.
- Smart battery charger design for optimized battery performance
- With limit function, prevent excess power overflow to the grid.
- Supporting WIFI monitoring and build-in 2 strings for 1 MPP tracker, 1 string for 1 MPP tracker.
- Smart settable three stages MPPT charging for optimized battery performance.
- Time of use function.
- Smart Load Function.

## 2.4 Basic System Architecture

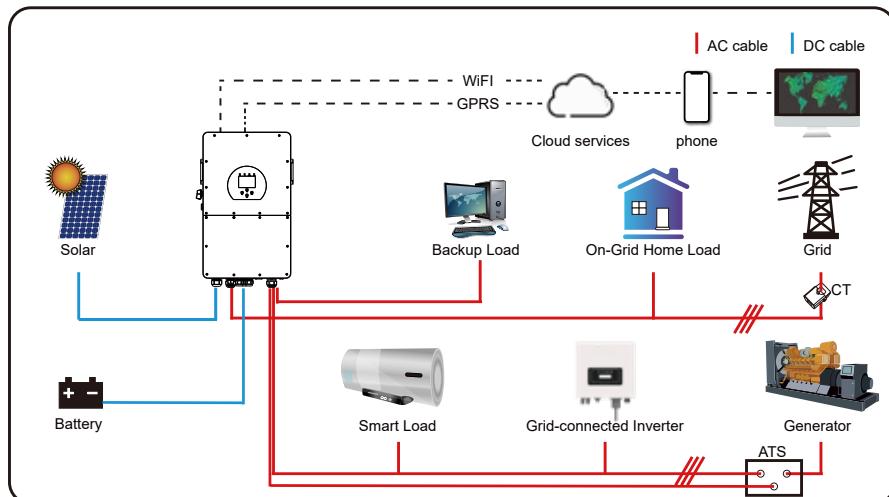
The following illustration shows basic application of this inverter.

It also includes following devices to have a complete running system.

- Generator or Utility
- PV modules

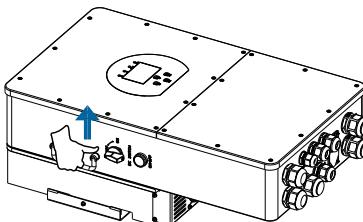
Consult with your system integrator for other possible system architectures depending on your requirements.

This inverter can power all kinds of appliances in home or office environment, including motor type appliances such as refrigerator and air conditioner.



## 2.5 Product handling requirements

Lift the inverter out of the packaging box and transport it to the designated installation location.



transport



### CAUTION:

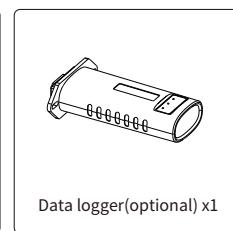
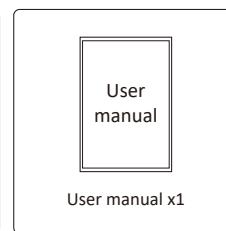
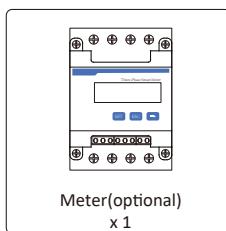
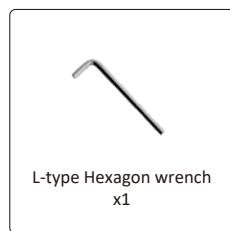
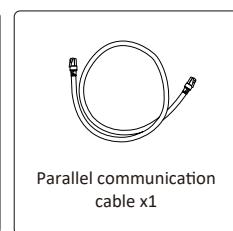
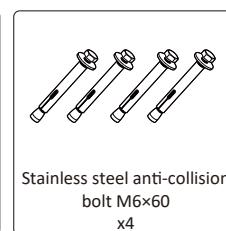
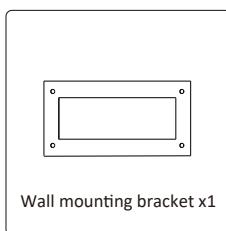
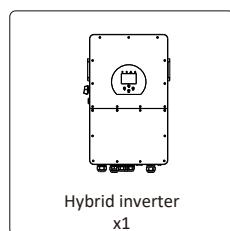
Improper handling may cause personal injury!

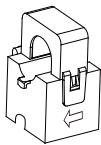
- Arrange an appropriate number of personnel to carry the inverter according to its weight, and installation personnel should wear protective equipment such as anti-impact shoes and gloves.
- Placing the inverter directly on a hard ground may cause damage to its metal enclosure. Protective materials such as sponge pad or foam cushion should be placed underneath the inverter.
- Move the inverter by one or two people or by using a proper transport tool.
- Move the inverter by holding the handles on it. Do not move the inverter by holding the terminals.

## 3. Installation

### 3.1 Parts List

Check the equipment before installation. Please make sure nothing is damaged in the package. You should have received the items in the following package:





Sensor Clamp  
x 3

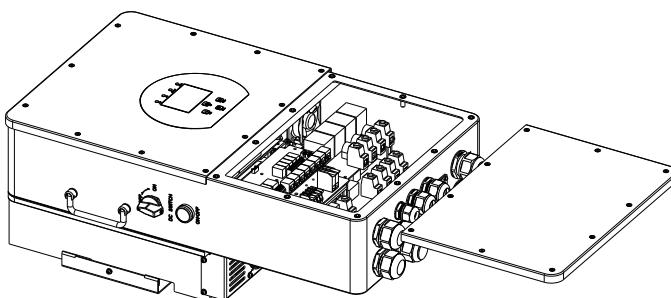
## 3.2 Mounting instructions

### Installation Precaution

This Hybrid inverter is designed for outdoor use(IP65), Please make sure the installation site meets below conditions:

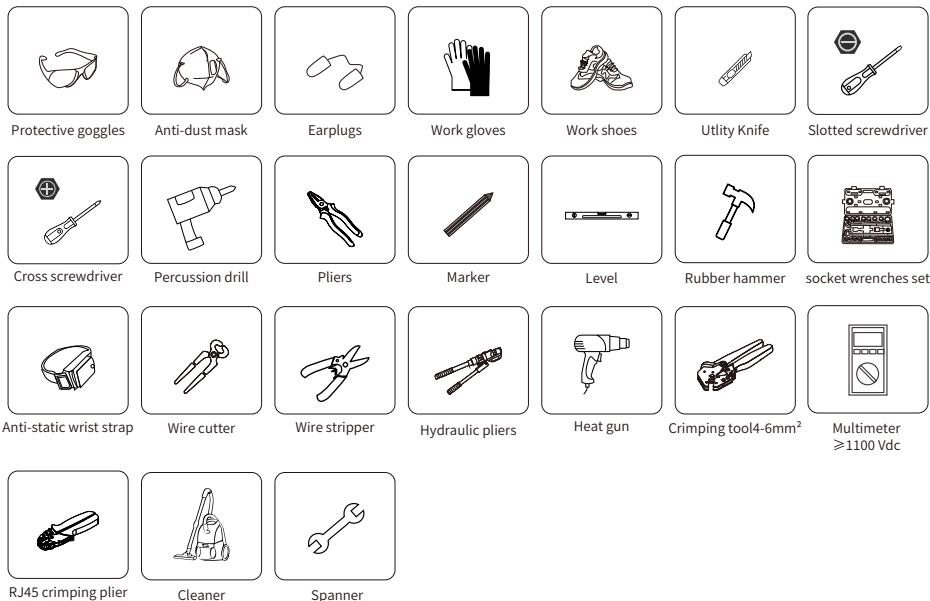
- Not in direct sunlight
- Not in areas where highly flammable materials are stored.
- Not in potential explosive areas.
- Not in the cool air directly.
- Not near the television Antenna or antenna cable.
- Not higher than altitude of about 2000 meters above sea level.
- Not in environment of precipitation or humidity(>95%)

Please AVOID direct sunlight, rain exposure, snow laying up during installation and operation. Before connecting all wires, please take off the metal cover by removing screws as shown below:



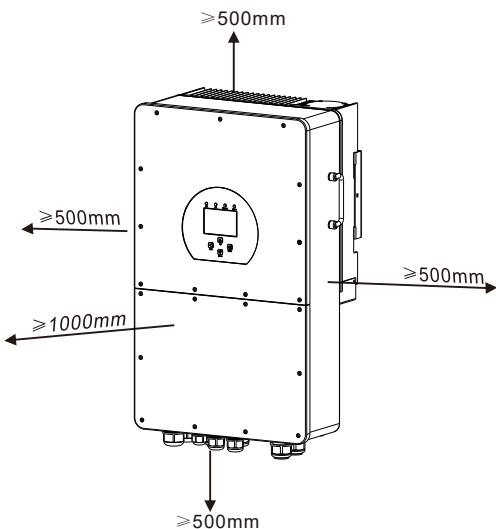
## Installations Tools

Installation tools can refer to the following recommended ones. Also, use other auxiliary tools on site.



### Considering the following points before selecting where to install:

- Please select a vertical wall with load-bearing capacity for installation, suitable for installation on concrete or other non-flammable surfaces, installation is shown below.
- Install this inverter at eye level in order to allow the LCD display to be read at all times.
- The ambient temperature is recommended to be between -40~60 °C to ensure optimal operation.
- Be sure to keep other objects and surfaces as shown in the diagram to guarantee sufficient heat dissipation and have enough space for removing wires.

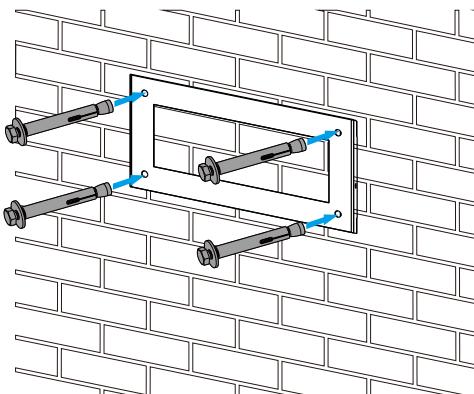


For proper air circulation to dissipate heat, allow a clearance of approx. 50cm to the side and approx. 50cm above and below the unit. And 100cm to the front.

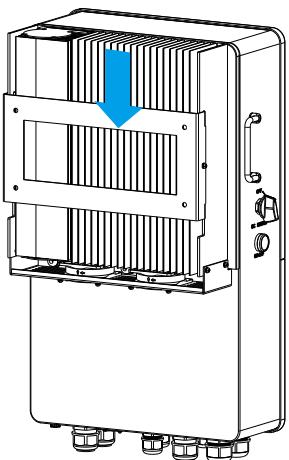
## Mounting the inverter

Remember that this inverter is heavy! Please be careful when lifting out from the package. Choose the recommend drill head(as shown in below pic) to drill 4 holes on the wall, 62-70mm deep.

1. Use a proper hammer to fit the expansion bolt into the holes.
2. Carry the inverter and holding it, make sure the hanger aim at the expansion bolt,fix the inverter on the wall.
3. Fasten the screw head of the expansion bolt to finish the mounting.



Inverter hanging plate installation



### 3.3 Battery connection

For safe operation and compliance, a separate DC over-current protector or disconnect device is required between the battery and the inverter. In some applications, switching devices may not be required but over-current protectors are still required. Refer to the typical amperage in the table below for the required fuse or circuit breaker size.



*Safety Hint:*

Please use approved DC cable for battery system.

Model	Wire Size	Cable( $mm^2$ )
8/10/12/15kW	6AWG	13.3

Chart 3-2



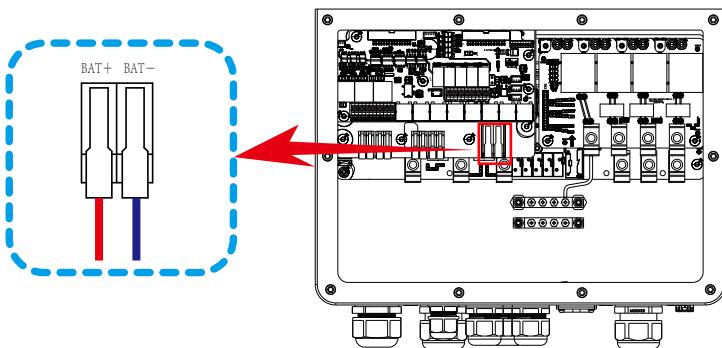
All wiring must be performed by a professional person.



Connecting the battery with a suitable cable is important for safe and efficient operation of the system. To reduce the risk of injury, refer to Chart 3-2 for recommended cables.

Please follow below steps to implement battery connection:

1. Please choose a suitable battery cable with correct connector which can well fit into the battery terminals.
2. Fit the battery connectors in.
3. Make sure polarity at both the battery and inverter is correctly connected.



4. In case of children touch or insects go into the inverter, Please make sure the inverter connector is fasten to waterproof position by twist it clockwise.

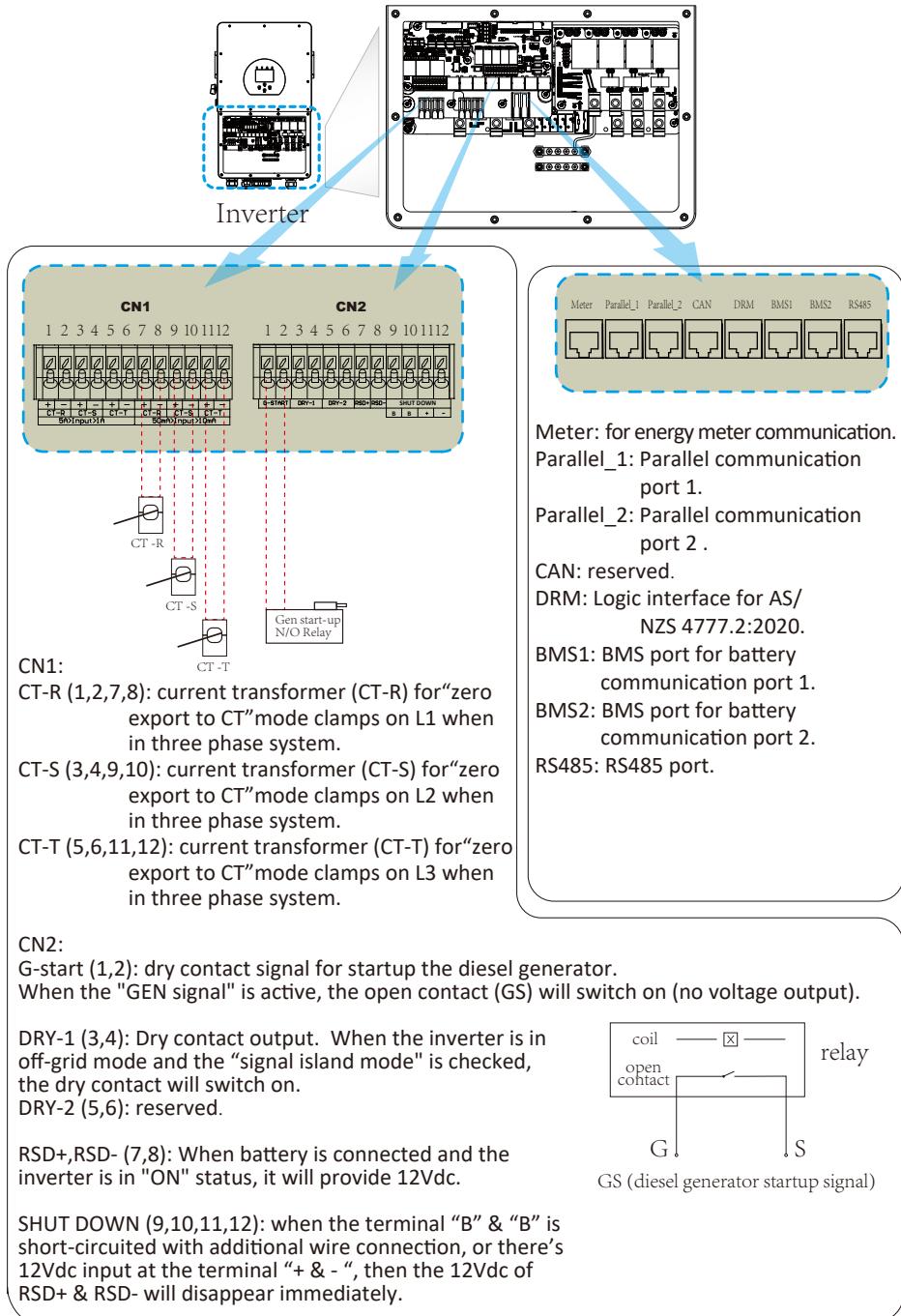


Installation must be performed with care.



Before making the final DC connection or closing DC breaker/disconnect, be sure positive(+) must be connect to positive(+) and negative(-) must be connected to negative(-). Reverse polarity connection on battery will damage the inverter.

### 3.3.2 Function port definition



### 3.4 Grid connection and backup load connection

- Before connecting to the grid, a separate AC breaker must be installed between the inverter and the grid, and also between the backup load and the inverter. This will ensure the inverter can be securely disconnected during maintenance and fully protected from over current. For the 8/10/12/15kW model, the recommended AC breaker for backup load is 100A. For the 8/10/12/15kW model, the recommended AC breaker for grid is 100A.
- There are three terminal blocks with "Grid" "Load" and "GEN" markings. Please do not misconnect input and output connectors.



**Note:**

In final installation, breaker certified according to IEC 60947-1 and IEC 60947-2 shall be installed with the equipment.

All wiring must be performed by a qualified personnel. It is very important for system safety and efficient operation to use appropriate cable for AC input connection. To reduce risk of injury, please use the proper recommended cable as below.

Grid connection and backup load connection (Copper wires) (bypass)

Model	Wire Size	Cable( $mm^2$ )	Torque value(max)
8/10/12/15kW	3AWG	26.7	4.5Nm

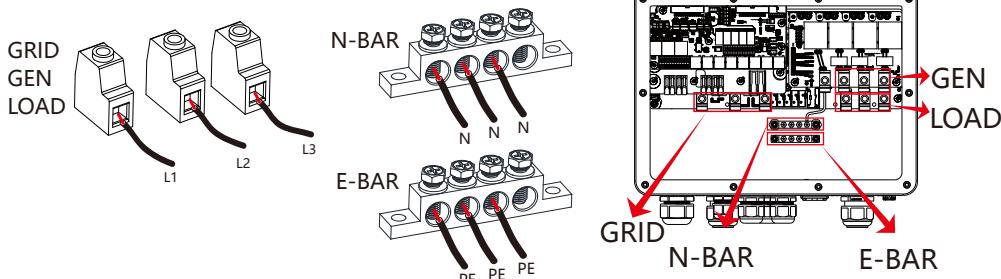
Grid connection and backup load connection (Copper wires)

Model	Wire Size	Cable( $mm^2$ )	Torque value(max)
8kW	6AWG	13.3	3.4Nm
10/12kW	4AWG	21.1	3.4Nm
15kW	3AWG	26.7	4.0Nm

Chart 3-3 Recommended Size for AC wires

#### Please follow below steps to implement Grid, load and Gen port connection:

- Before making Grid, load and Gen port connection, be sure to turn off AC breaker or disconnector first.
- Remove insulation sleeve 10mm length, insert the wires according to polarities indicated on the terminal block. Make sure the connection is complete.





Be sure that AC power source is disconnected before attempting to wire it to the unit.

3. Then, insert AC output wires according to polarities indicated on the terminal block and tighten terminal. Be sure to connect corresponding N wires and PE wires to related terminals as well.
4. Make sure the wires are securely connected.
5. Appliances such as air conditioner are required at least 2-3 minutes to restart because it is required to have enough time to balance refrigerant gas inside of circuit. If a power shortage occurs and recovers in short time, it will cause damage to your connected appliances. To prevent this kind of damage, please check manufacturer of air conditioner if it is equipped with time-delay function before installation. Otherwise, this inverter will trigger overload fault and cut off output to protect your appliance but sometimes it still causes internal damage to the air conditioner

### 3.5 PV Connection

Before connecting to PV modules, please install a separately DC circuit breaker between inverter and PV modules. It is very important for system safety and efficient operation to use appropriate cable for PV module connection. To reduce risk of injury, please use the proper recommended cable size as below.

Model	Wire Size	Cable( $mm^2$ )
8/10/12/15kW	10AWG	5.3

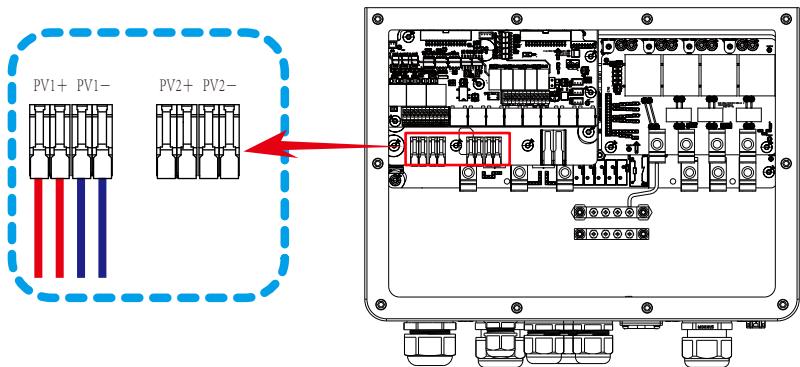
Chart 3-4



To avoid any malfunction, do not connect any PV modules with possible leakage current to the inverter. For example, grounded PV modules will cause leakage current to the inverter. When using PV modules, please ensure the PV+ & PV- of solar panel is not connected to the system ground bar.



It is requested to use PV junction box with surge protection. Otherwise, it will cause damage on inverter when lightning occurs on PV modules.



### 3.5.1 PV Module Selection:

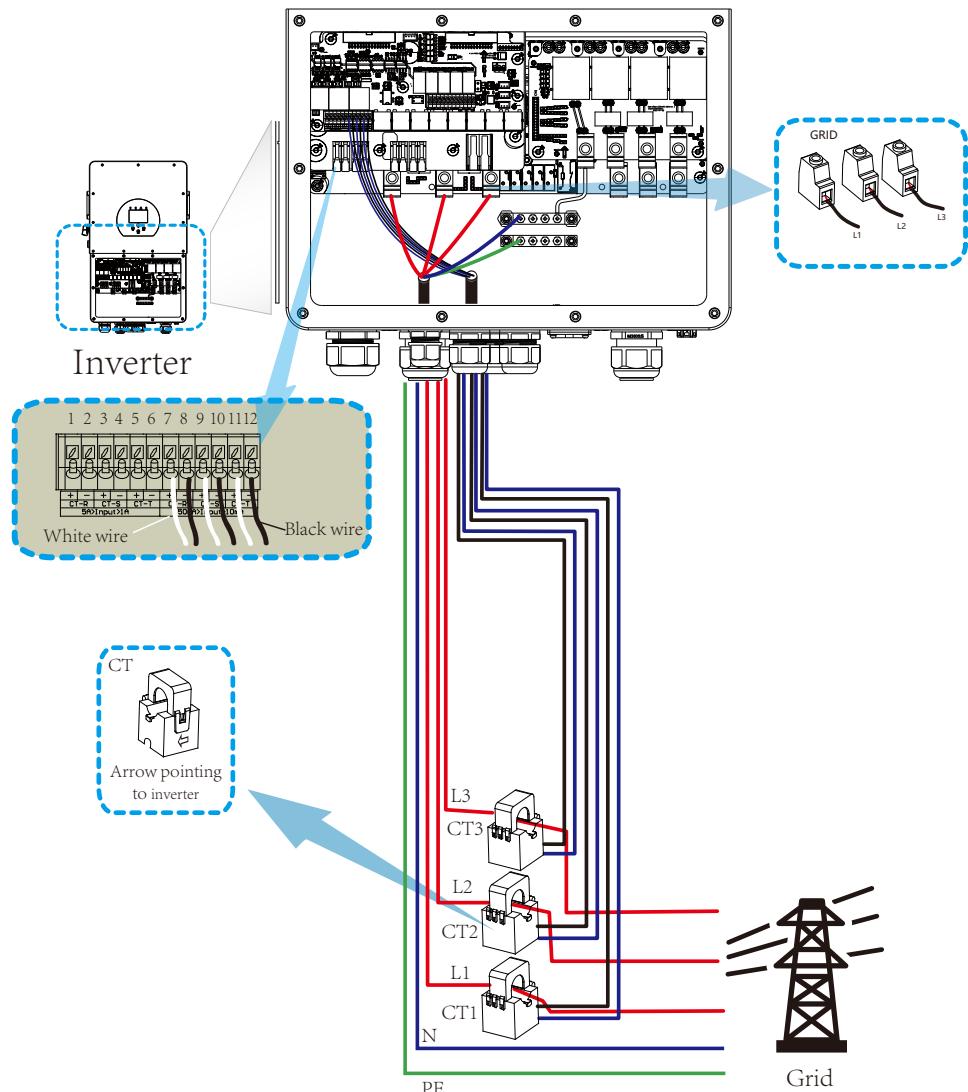
When selecting proper PV modules, please be sure to consider below parameters:

- 1) Open circuit Voltage (Voc) of PV modules can not exceed max. PV array open circuit voltage of inverter.
- 2) Open circuit Voltage (Voc) of PV modules should be higher than min. start voltage.
- 3) The PV modules used to connected to this inverter shall be Class A rating certified according to IEC 61730.

<i>Inverter Model</i>	<i>8kW</i>	<i>10kW</i>	<i>12kW</i>	<i>15kW</i>
PV Input Voltage		380V (180V-550V)		
PV Array MPPT Voltage Range		150V-500V		
No. of MPP Trackers		2		
No. of Strings per MPP Tracker		2+2		

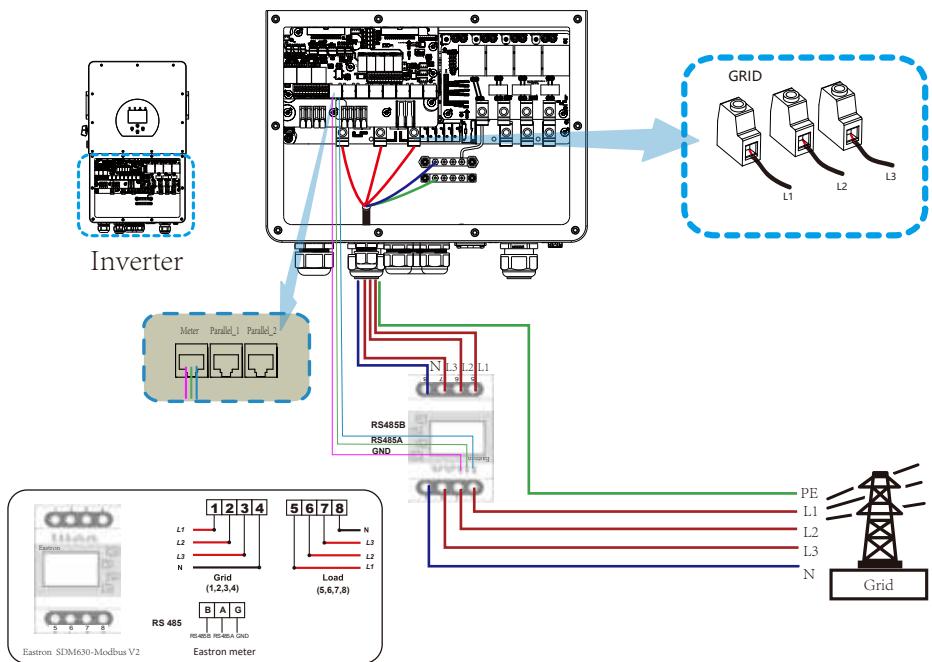
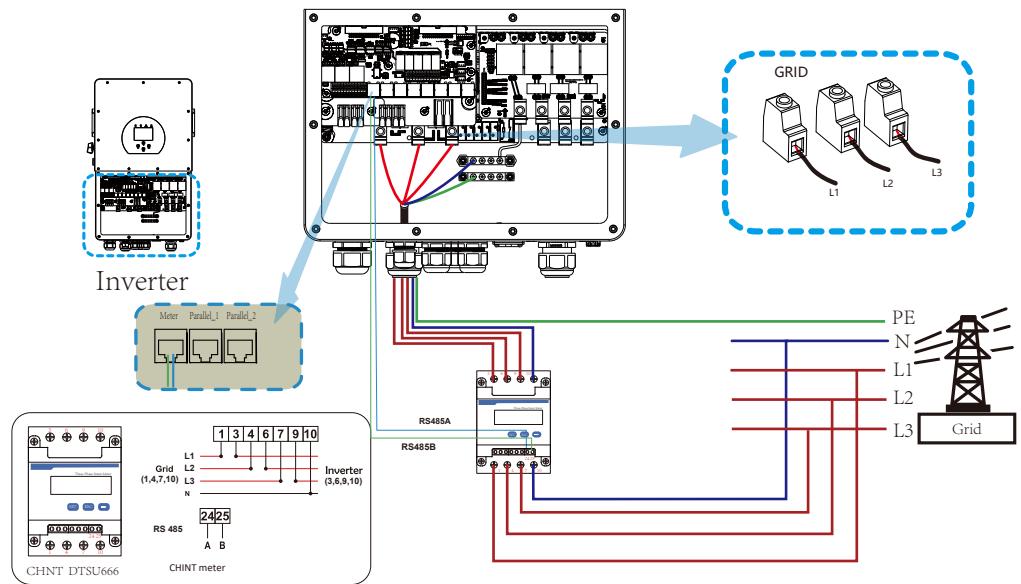
Chart 3-5

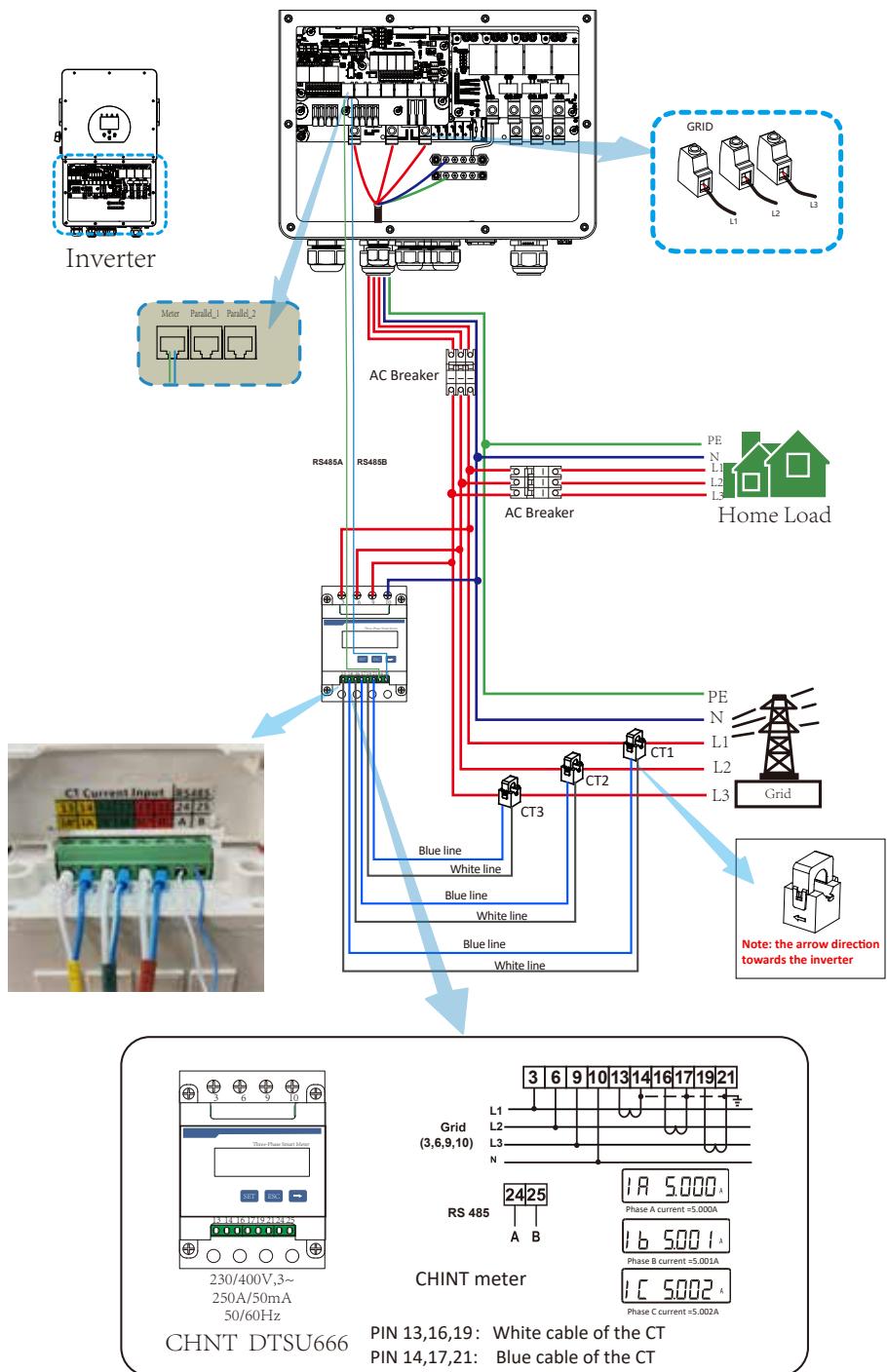
### 3.6 CT Connection

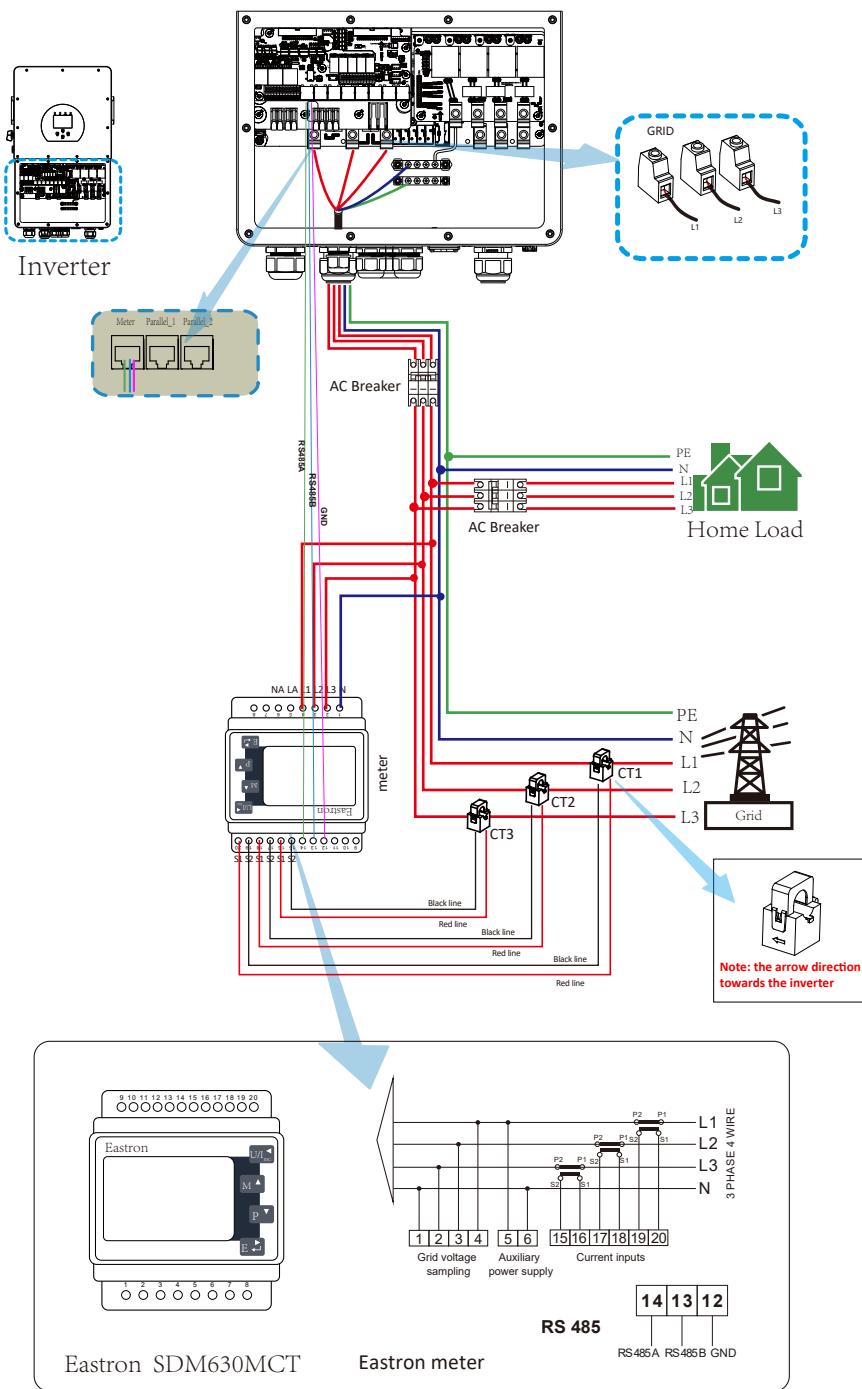


**\*Note:** when the reading of the load power on the LCD is not correct, please reverse the CT arrow.

### 3.6.1 Meter Connection

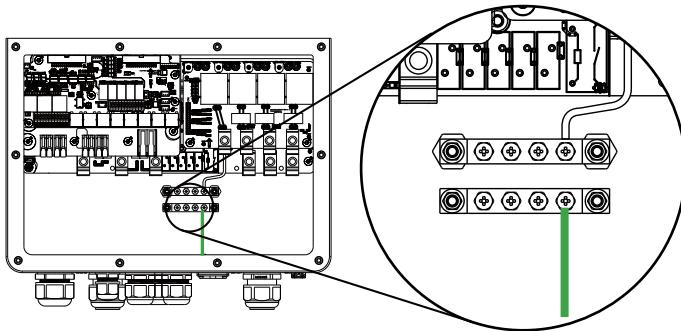






### 3.7 Earth Connection(mandatory)

Ground cable shall be connected to ground plate on grid side this prevents electric shock if the original protective conductor fails.



Earth connection(Copper wires) (bypass)

Model	Wire Size	Cable( $mm^2$ )	Torque value(max)
8/10/12/15kW	8AWG	8.4	4.5Nm

Earth connection(Copper wires)

Model	Wire Size	Cable( $mm^2$ )	Torque value(max)
8/10/12kW	8AWG	8.4	3.4Nm
15kW	8AWG	8.4	4.0Nm

The conductor should be made of the same metal as the phase conductors.



#### Warning:

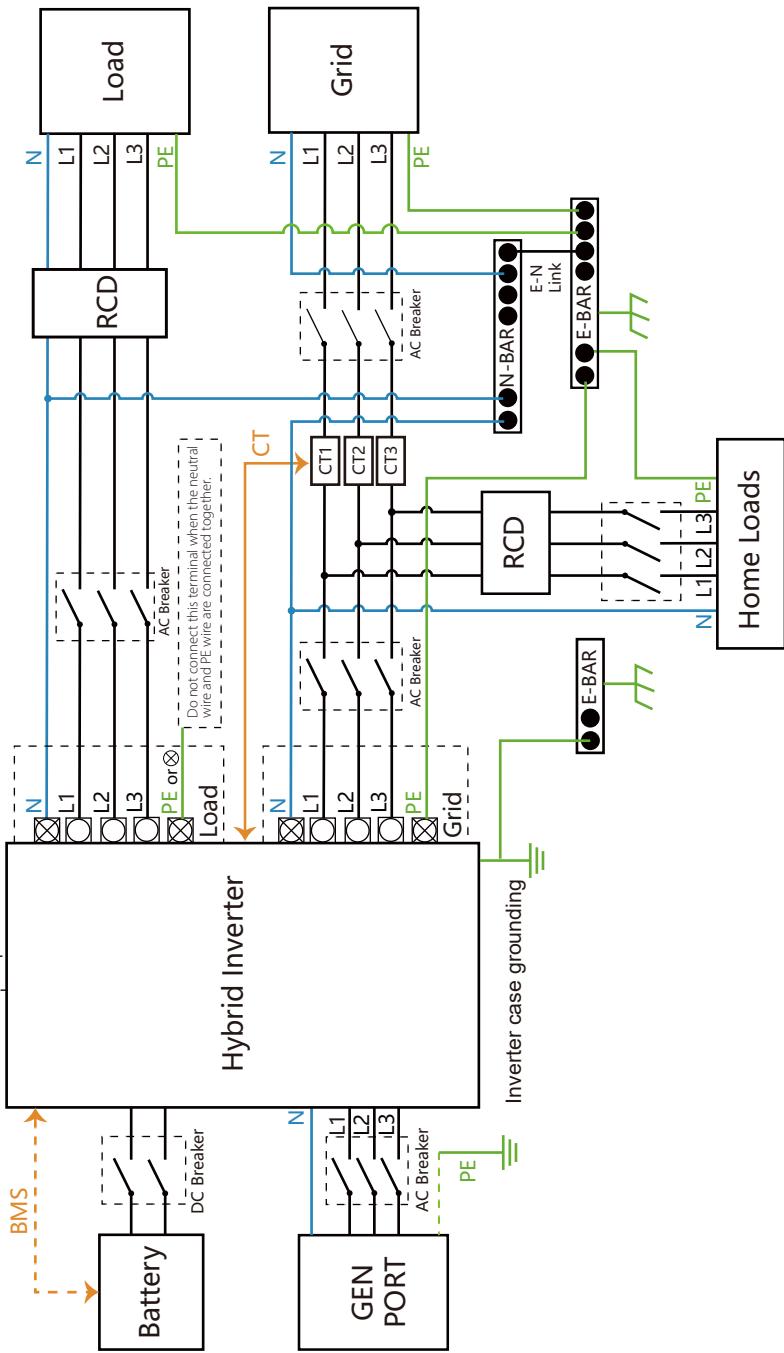
Inverter has built-in leakage current detection circuit,The type A RCD can be connected to the inverter for protection according to the local laws and regulations.If an external leakage current protection device is connected, its operating current must be equal to 300 mA or higher, otherwise inverter may not work properly.

### 3.8 WIFI Connection

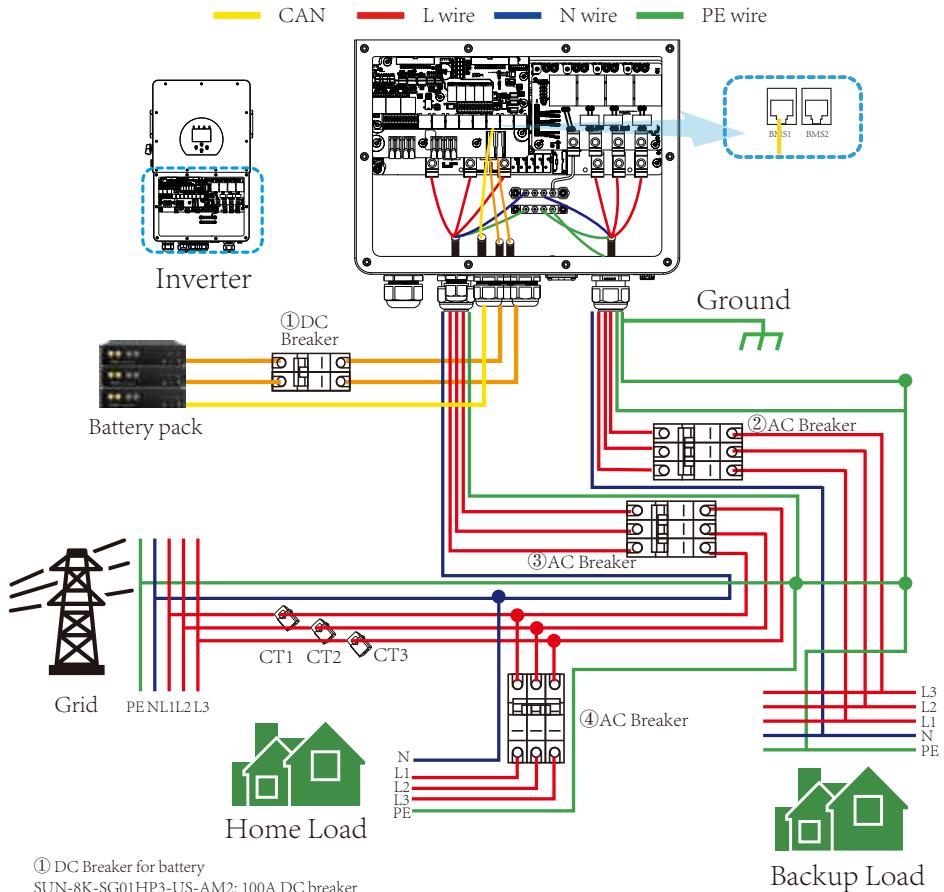
For the configuration of Wi-Fi Plug, please refer to illustrations of the Wi-Fi Plug. The Wi-Fi Plug is not a standard configuration, it's optional.

### 3.9 Wiring System for Inverter

This diagram is an example for an application that neutral connects with the PE in a distribution box.



### 3.10 Typical application diagram of on-grid system



① DC Breaker for battery

SUN-8K-SG01HP3-US-AM2: 100A DC breaker  
 SUN-10K-SG01HP3-US-AM2: 100A DC breaker  
 SUN-12K-SG01HP3-US-AM2: 100A DC breaker  
 SUN-15K-SG01HP3-US-AM2: 100A DC breaker

② AC Breaker for backup load

SUN-8K-SG01HP3-US-AM2: 100A AC breaker  
 SUN-10K-SG01HP3-US-AM2: 100A AC breaker  
 SUN-12K-SG01HP3-US-AM2: 100A AC breaker  
 SUN-15K-SG01HP3-US-AM2: 100A AC breaker

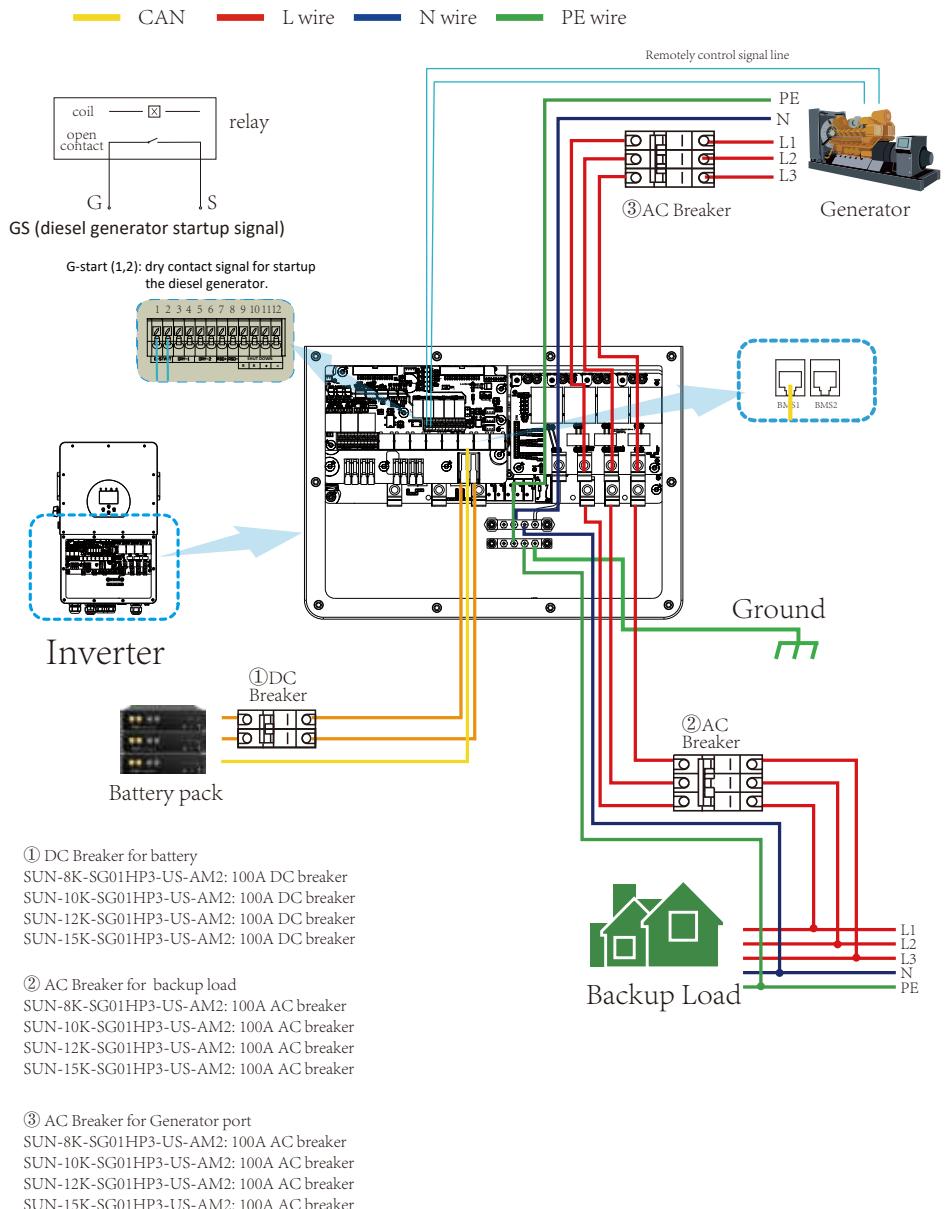
③ AC Breaker for grid

SUN-8K-SG01HP3-US-AM2: 100A AC breaker  
 SUN-10K-SG01HP3-US-AM2: 100A AC breaker  
 SUN-12K-SG01HP3-US-AM2: 100A AC breaker  
 SUN-15K-SG01HP3-US-AM2: 100A AC breaker

④ AC Breaker for home load

Depends on household loads

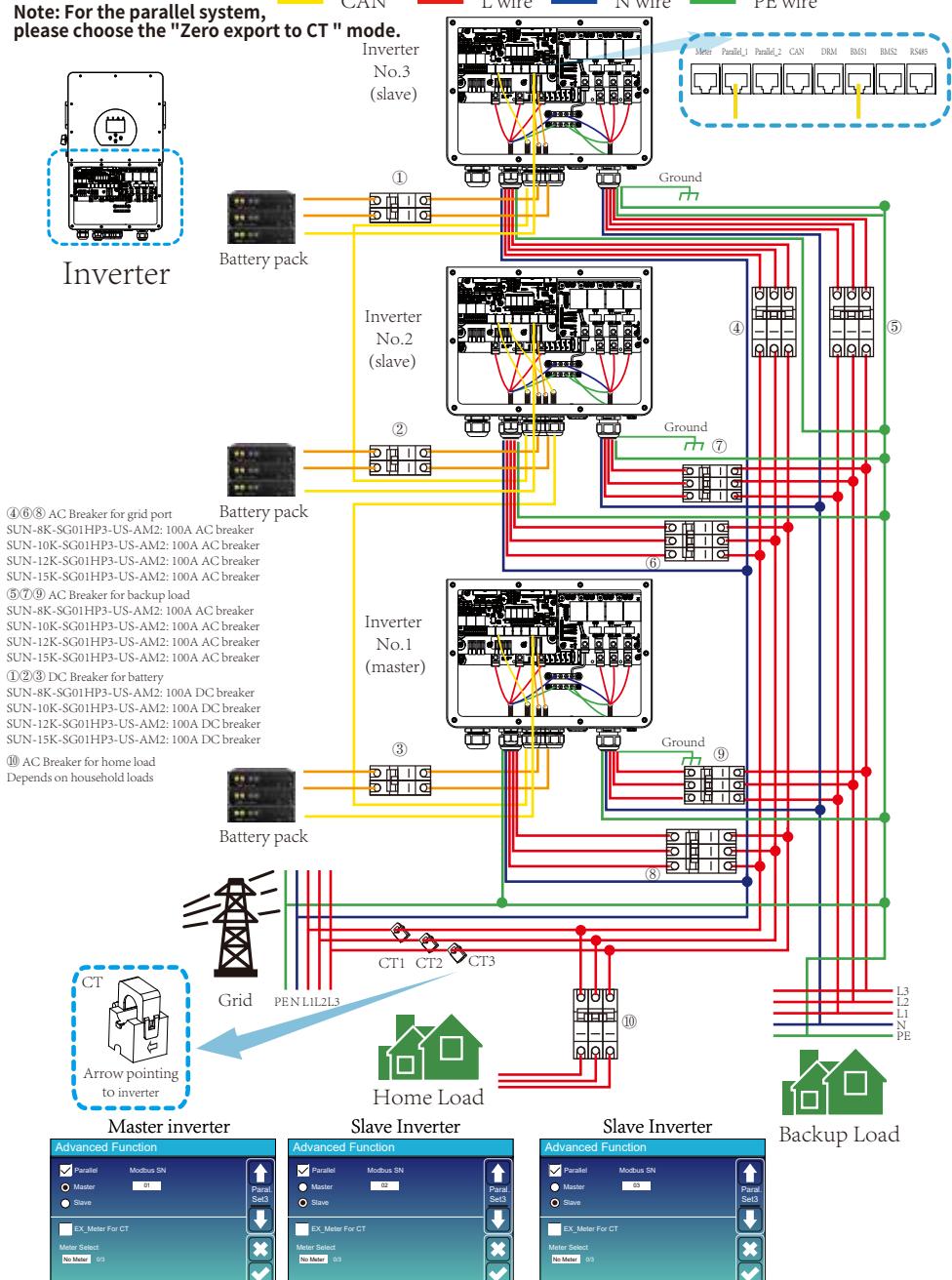
### 3.11 Typical application diagram of diesel generator



### 3.12 Three phase parallel connection diagram

Note: For the parallel system, the lead-acid battery and 'No Batt' mode are not supported. All inverters connected in parallel must be the same model. Please use lithium battery which is on the "Deye Approved Battery list". Each inverter should have its own separate battery set.

**Note: For the parallel system, please choose the "Zero export to CT" mode.**



## 4. OPERATION

### 4.1 Power ON/OFF

Once the unit has been properly installed and the batteries are connected well, simply press On/Off button(located on the left side of the case) to turn on the unit. When system without battery connected, but connect with either PV or grid, and ON/OFF button is switched off, LCD will still light up(Display will show OFF), In this condition, when switch on ON/OFF button and select NO battery,system can still working.

### 4.2 Operation and Display Panel

The operation and display panel, shown in below chart, is on the front panel of the inverter. It includes four indicators, four function keys and a LCD display, indicating the operating status and input/output power information.

<i>LED Indicator</i>		<i>Messages</i>
DC	Green led solid light	PV Connection normal
AC	Green led solid light	Grid Connection normal
Normal	Green led solid light	Inverter operating normal
Alarm	Red led solid light	Malfunction or warning

Chart 4-1 LED indicators

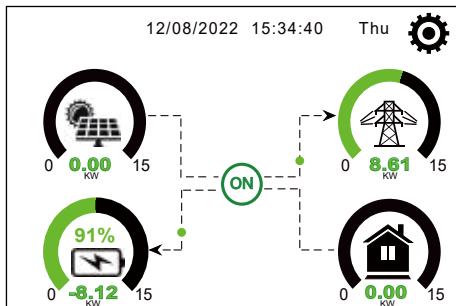
<i>Function Key</i>	<i>Description</i>
Esc	To exit setting mode
Up	To go to previous selection
Down	To go to next selection
Enter	To confirm the selection

Chart 4-2 Function Buttons

## 5. LCD Display Icons

### 5.1 Main Screen

The LCD is touchscreen, below screen shows the overall information of the inverter.



1. The icon in the center of the home screen indicates that the system is Normal operation. If it turns into "comm./F01~F64", it means the inverter has communication errors or other errors, the error message will display under this icon(F01-F64 errors, detail error info can be viewed in the System Alarms menu).

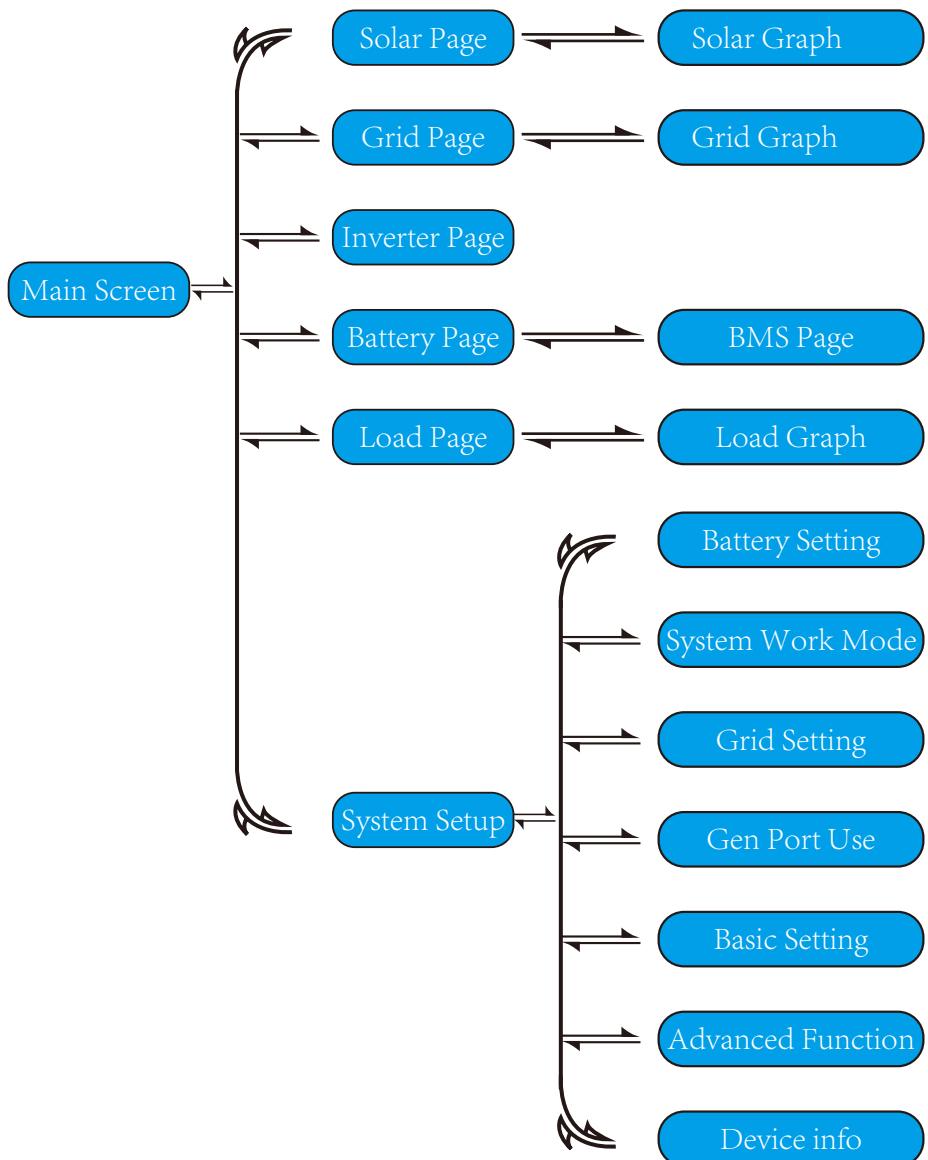
2. At the top of the screen is the time.

3. System Setup Icon, Press this set button, you can enter into the system setup screen which including Basic Setup, Battery Setup, Grid Setup, System Work Mode, Generator port use, Advanced function and Li-Batt info.

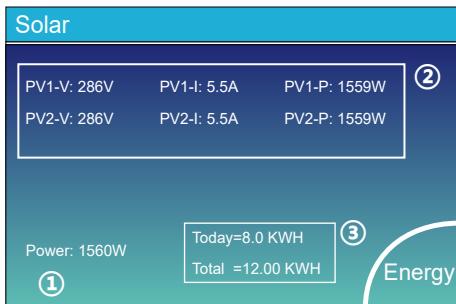
4. The main screen showing the info including Solar, Grid, Load and Battery. Its also displaying the energy flow direction by arrow. When the power is approximate to high level, the color on the panels will changing from green to red so system info showing vividly on the main screen.

- PV power and Load power always keep positive.
- Grid power negative means sell to grid, positive means get from grid.
- Battery power negative means charge, positive means discharge.

### 5.1.1 LCD operation flow chart



## 5.2 Solar Power Curve



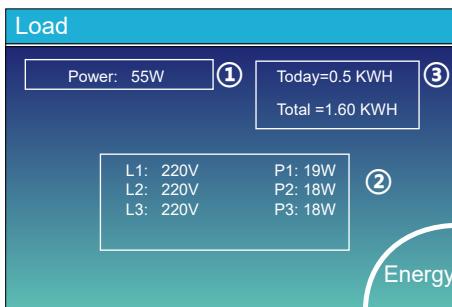
This is Solar Panel detail page.

- ① Solar Panel Generation.
- ② Voltage, Current, Power for each MPPT.
- ③ Daily and total PV production.

1166w	1244w	-81w	①
L1N: 221v 0w	L1N: 222v 0.8A	L1N: 222v 0.1A	
L2N: 229v 1166w	L2N: 229v 5.0A	L2N: 230v 0.1A	
L3N: 225v 0w	L3N: 229v 0.9A	L3N: 223v 0.1A	
<b>Load</b>	HM: LD:	INV_P:	
21w	-10W 28W	-30W	
0w   0w	5W 1192W	-26W	
150V -0.41A 27.0C	0W 24W	-25W	AC_T: 38.8C
<b>Battery</b>	<b>Grid</b>	<b>Inverter</b>	

This is Inverter detail page.

- ① Inverter Generation.
- Voltage, Current, Power for each Phase.
- AC-T: mean Heat-sink temperature.



This is Load detail page.

- ① Load Power.
- ② Voltage, Power for each Phase.
- ③ Daily and total Load consumption .

When you check "Selling First" or "Zero export to Load" on system work mode page, the information on this page is about backup load which connect on Load port of hybrid inverter.

When you check "Zero export to CT" on system work mode page, the information on this page is including backup load and home load.

Press the "Energy " button will enter into the power curve page.



This is Grid detail page.

- ① Status, Power, Frequency.
- ② L: Voltage for each Phase
- CT: Power detected by the external current sensors
- LD: Power detected using internal sensors on AC grid in/out breaker
- ③ BUY: Energy from Grid to Inverter, SELL: Energy from Inverter to grid.

Press the "Energy " button will enter into the power curve page.



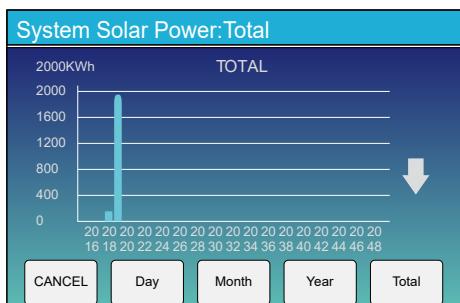
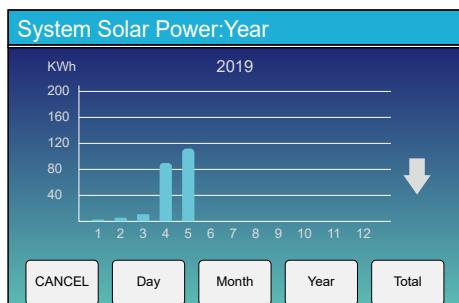
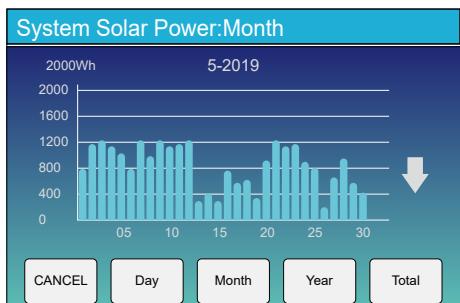
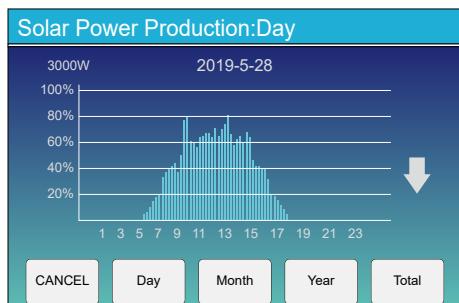
This is Battery detail page.

if you use Lithium Battery, you can enter BMS page.

Li-BMS	
Mean Voltage:170.0V	Charging Voltage :180.0V
Total Current:37.00A	Discharging Voltage :160.0V
Mean Temp :23.5C	Charging current :30A
Total SOC :38%	Discharging current :25A
Dump Energy:57Ah	

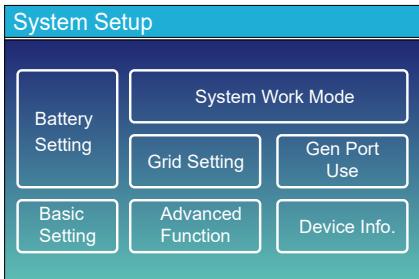
Li-BMS								
Volt	Curr	Temp	SOC	Energy	Charge	Fault		
1. 150.3V	0.00A	19.70A	30.6%	52.00%	26.00Ah	0.0	0.0A	00:00
2. 150.2V	19.10A	31.00C	51.0%	25.5Ah	153.2V	25.0Ah	0.0	00:00
3. 150.1V	16.90A	30.20C	12.0%	6.0Ah	153.2V	25.0Ah	0.0	00:00
4. 00.00V	0.00A	0.00C	0.0%	0.00Ah	0.0V	0.0Ah	0.0	00:00
5. 00.00V	0.00A	0.00C	0.0%	0.00Ah	0.0V	0.0Ah	0.0	00:00
6. 00.00V	0.00A	0.00C	0.0%	0.00Ah	0.0V	0.0Ah	0.0	00:00
7. 00.00V	0.00A	0.00C	0.0%	0.00Ah	0.0V	0.0Ah	0.0	00:00
8. 00.00V	0.00A	0.00C	0.0%	0.00Ah	0.0V	0.0Ah	0.0	00:00
9. 00.00V	0.00A	0.00C	0.0%	0.00Ah	0.0V	0.0Ah	0.0	00:00
10. 00.00V	0.00A	0.00C	0.0%	0.00Ah	0.0V	0.0Ah	0.0	00:00
11. 00.00V	0.00A	0.00C	0.0%	0.00Ah	0.0V	0.0Ah	0.0	00:00
12. 00.00V	0.00A	0.00C	0.0%	0.00Ah	0.0V	0.0Ah	0.0	00:00
13. 00.00V	0.00A	0.00C	0.0%	0.00Ah	0.0V	0.0Ah	0.0	00:00
14. 00.00V	0.00A	0.00C	0.0%	0.00Ah	0.0V	0.0Ah	0.0	00:00
15. 00.00V	0.00A	0.00C	0.0%	0.00Ah	0.0V	0.0Ah	0.0	00:00

### 5.3 Curve Page-Solar & Load & Grid



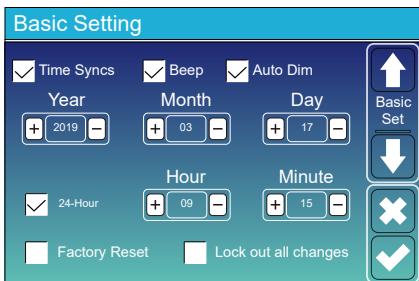
Solar power curve for daily, monthly, yearly and total can be roughly checked on the LCD, for more accuracy power generation, pls check on the monitoring system. Click the up and down arrow to check power curve of different period.

## 5.4 System Setup Menu



This is System Setup page.

## 5.5 Basic Setup Menu



**Factory Reset:** Reset all parameters of the inverter.  
**Lock out all changes:** Enable this menu for setting parameters that require locking and cannot be set up. Before performing a successful factory reset and locking the systems, to keep all changes you need to type in a password to enable the setting. The password for factory settings is 9999 and for lock out is 7777.



**Factory Reset Password:** 9999

**Lock out all changes Password:** 7777

## 5.6 Battery Setup Menu

Battery Setting			
Batt Mode	Batt Capacity	0Ah	
<input checked="" type="radio"/> Lithium	Max A Charge	0A	
<input type="radio"/> Use Batt V	Max A Discharge	0A	
<input type="radio"/> No Batt			
<input type="checkbox"/> Parallel bat1&bat2			

**Battery capacity:** it shows your battery bank size to Deye hybrid inverter.

**Use Batt V:** Use Battery Voltage for all the settings (V).

**Max. A charge/discharge:** Max battery charge/discharge current(0-50A for 8/10/12/15KW model).

For AGM and Flooded, we recommend Ah battery size x 20% = Charge/Discharge amps.

. For Lithium, we recommend Ah battery size x 50% = Charge/Discharge amps.

. For Gel, follow manufacturer' s instructions.

**No Batt:** tick this item if no battery is connected to the system.

**Parallel bat1&bat2:** if one set of battery was connected Bat 1 and Bat 2 then please enable this function.

Battery Setting			
Start	30%	30%	
A	20A	37A	
<input checked="" type="checkbox"/> Gen Charge	<input checked="" type="checkbox"/> Grid Charge		
<input type="checkbox"/> Gen Signal	<input checked="" type="checkbox"/> Grid Signal		
Gen Max Run Time	24.0 hours		
Gen Down Time	0.0 hours		

This is Battery Setup page. ① ③

**Start =30%:** Percent SOC below 30% system will AutoStart a connected generator to charge the battery bank.

**A = 20A:** Charge rate of 20A from the attached generator in Amps.

**Gen Charge:** uses the gen input of the system to charge battery bank from an attached generator.

**Gen Signal:** Normally open relay that closes when the Gen Start signal state is active.

**Gen Max Run Time:** It indicates the longest time Generator can run in one day, when time is up, the Generator will be turned off. 24H means that it does not shut down all the time.

**Gen Down Time:** It indicates the delay time of the Generator to shut down after it has reached the running time.

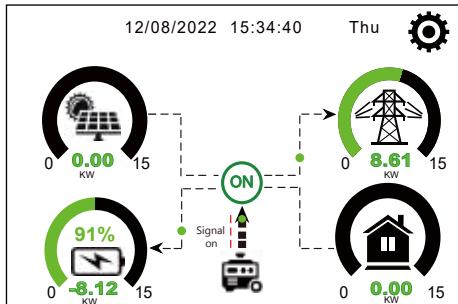
**This is Grid Charge, you need select. ②**

**Start =30%:** No use, Just for customization.

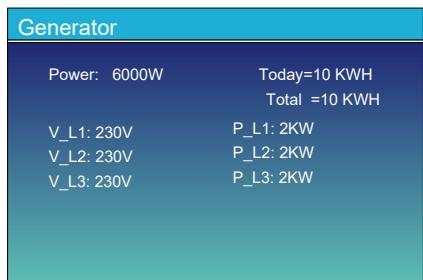
**A = 37A:** It indicates the Current that the Grid charges the Battery.

**Grid Charge:** It indicates that the grid charges the battery.

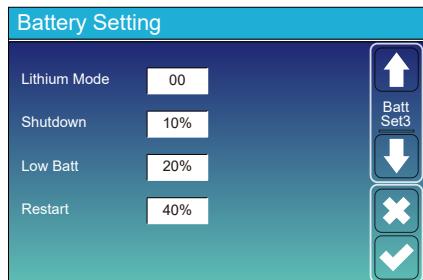
**Grid Signal:** Disable.



This page tells the PV and diesel generator power the load and battery.



This page tells generator output voltage, frequency, power. And, how much energy is used from generator.



**Lithium Mode:** This is BMS protocol. Please reference the document (Approved Battery).

**Shutdown 10%:** It indicates the inverter will shutdown if the SOC below this value.

**Low Batt 20%:** It indicates the inverter will alarm if the SOC below this value.

**Restart 40%:** Battery SOC at 40% AC output will resume.

Recommended battery settings

<b>Battery Type</b>	<b>Absorption Stage</b>	<b>Float Stage</b>	<b>Equalization Voltage (every 30 days 3hr )</b>
Lithium	Follow its BMS voltage parameters		

## 5.7 System Work Mode Setup Menu

System Work Mode	
<input type="radio"/> Selling First	12000 Max Solar Power
<input checked="" type="radio"/> Zero Export To Load	<input checked="" type="checkbox"/> Solar Sell
<input type="radio"/> Zero Export To CT	<input checked="" type="checkbox"/> Solar Sell
Max Sell Power	12000
Zero-export Power	20
Energy pattern	<input checked="" type="checkbox"/> BattFirst <input type="checkbox"/> LoadFirst
<input checked="" type="checkbox"/> Grid Peak Shaving	8000 Power

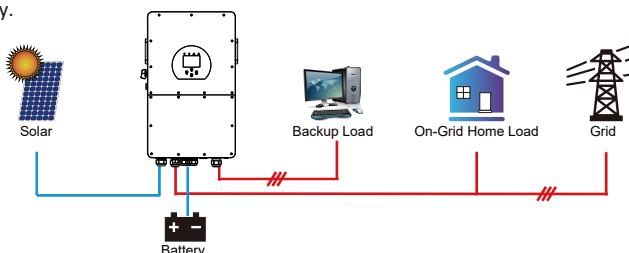
### Work Mode

**Selling First:** This Mode allows hybrid inverter to sell back any excess power produced by the solar panels to the grid. If time of use is active, the battery energy also can be sold into grid.

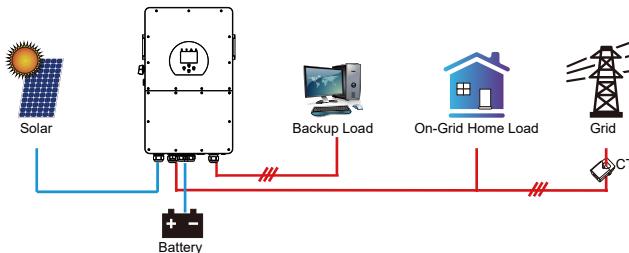
The PV energy will be used to power the load and charge the battery and then excess energy will flow to grid. Power source priority for the load is as follows:

1. Solar Panels.
2. Grid.
3. Batteries (until programmable % discharge is reached).

**Zero Export To Load:** Hybrid inverter will only provide power to the backup load connected. The hybrid inverter will neither provide power to the home load nor sell power to grid. The built-in CT will detect power flowing back to the grid and will reduce the power of the inverter only to supply the local load and charge the battery.



**Zero Export To CT:** Hybrid inverter will not only provide power to the backup load connected but also give power to the home load connected. If PV power and battery power is insufficient, it will take grid energy as supplement. The hybrid inverter will not sell power to grid. In this mode, a CT is needed. The installation method of the CT please refer to chapter 3.6 CT Connection. The external CT will detect power flowing back to the grid and will reduce the power of the inverter only to supply the local load, charge battery and home load.



**Solar Sell:** "Solar sell" is for Zero export to load or Zero export to CT: when this item is active, the surplus energy can be sold back to grid. When it is active, PV Power source priority usage is as follows: load consumption and charge battery and feed into grid.

**Max. sell power:** Allowed the maximum output power to flow to grid.

**Zero-export Power:** for zero-export mode, it tells the grid output power. Recommend to set it as 20-100W to ensure the hybrid inverter won't feed power to grid.

**Energy Pattern:** PV Power source priority.

**Batt First:** PV power is firstly used to charge the battery and then used to power the load. If PV power is insufficient, grid will make supplement for battery and load simultaneously.

**Load First:** PV power is firstly used to power the load and then used to charge the battery. If PV power is insufficient, Grid will provide power to load.

**Max Solar Power:** allowed the maximum DC input power.

**Grid Peak-shaving:** when it is active, grid power will be limited within the set value. If the load power exceeds the allowed value, it will take PV energy and battery as supplement. If still can't meet the load requirement, grid power will increase to meet the load needs.

## System Work Mode

Grid Charge	Gen	Time Of Use			
		Time	Power	Batt	
<input type="checkbox"/>	<input type="checkbox"/>	00:00	05:00	12000	160V
<input type="checkbox"/>	<input type="checkbox"/>	05:00	08:00	12000	160V
<input checked="" type="checkbox"/>	<input type="checkbox"/>	08:00	10:00	12000	160V
<input checked="" type="checkbox"/>	<input type="checkbox"/>	10:00	15:00	12000	160V
<input checked="" type="checkbox"/>	<input type="checkbox"/>	15:00	18:00	12000	160V
<input checked="" type="checkbox"/>	<input type="checkbox"/>	18:00	00:00	12000	160V



**Time of use:** it is used to program when to use grid or generator to charge the battery, and when to discharge the battery to power the load. Only tick "Time Of Use" then the follow items (Grid, charge, time, power etc.) will take effect.

**Note:** when in selling first mode and click time of use, the battery power can be sold into grid.

**Gen charge:** utilize diesel generator to charge the battery in a time period.

**Time:** real time, range of 01:00-24:00.

**Note:** when the grid is present, only the "time of use" is ticked, then the battery will discharge. Otherwise, the battery won't discharge even the battery SOC is full. But in the off-grid mode (when grid is not available, inverter will work in the off-grid mode automatically), the battery will discharge without selecting the "Time Of Use".

**Power:** Max. discharge power of battery allowed.

**Batt(V or SOC %):** battery SOC % or voltage at when the action is to happen.

## Battery Setting

Start	30%	30%	
A	20A	37A	
<input type="checkbox"/> Gen Charge	<input checked="" type="checkbox"/> Grid Charge	①	
<input type="checkbox"/> Gen Signal	<input checked="" type="checkbox"/> Grid Signal		
Gen Max Run Time	24.0 hours		
Gen Down Time	0.0 hours		



## For example

**During 00:00-05:00,**

if battery SOC is lower than 80%, it will use grid to charge the battery until battery SOC reaches 80%.

**During 05:00-08:00,**

if battery SOC is higher than 40%, hybrid inverter will discharge the battery until the SOC reaches 40%. At the same time, if battery SOC is lower than 40%, then grid will charge the battery SOC to 40%.

**During 08:00-10:00,**

if battery SOC is higher than 40%, hybrid inverter will discharge the battery until the SOC reaches 40%.

**During 10:00-15:00,**

when battery SOC is higher than 80%, hybrid inverter will discharge the battery until the SOC reaches 80%.

**During 15:00-18:00,**

when battery SOC is higher than 40%, hybrid inverter will discharge the battery until the SOC reaches 40%.

**During 18:00-00:00,**

when battery SOC is higher than 35%, hybrid inverter will discharge the battery until the SOC reaches 35%.

## System Work Mode

② Grid Charge	Gen	Time Of Use			
		Time	Power	Batt	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	00:00	05:00	12000	80%
<input checked="" type="checkbox"/>	<input type="checkbox"/>	05:00	08:00	12000	40%
<input type="checkbox"/>	<input type="checkbox"/>	08:00	10:00	12000	40%
<input checked="" type="checkbox"/>	<input type="checkbox"/>	10:00	15:00	12000	80%
<input type="checkbox"/>	<input type="checkbox"/>	15:00	18:00	12000	40%
<input type="checkbox"/>	<input type="checkbox"/>	18:00	00:00	12000	35%



It allows users to choose which day to execute the setting of "Time of Use".

For example, the inverter will execute the time of use page on Mon/Tue/Wed/Thu/Fri/Sat only.

## System Work Mode

Mon	<input checked="" type="checkbox"/>	Tue	<input checked="" type="checkbox"/>	Wed	<input checked="" type="checkbox"/>	Thu	<input checked="" type="checkbox"/>	Fri	<input checked="" type="checkbox"/>	Sat	<input checked="" type="checkbox"/>	Sun	<input type="checkbox"/>
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## 5.8 Grid Setup Menu

### Grid Setting/Grid code selection

Grid Mode	General Standard	0/23
Grid Frequency	<input checked="" type="radio"/> 50HZ <input checked="" type="radio"/> 60HZ	Phase Type <input checked="" type="radio"/> 0/120/240 <input checked="" type="radio"/> 0/240/120
Grid Level	LN:220V/LL:380V(AC)	
<input checked="" type="checkbox"/> IT system-neutral is not grounded		

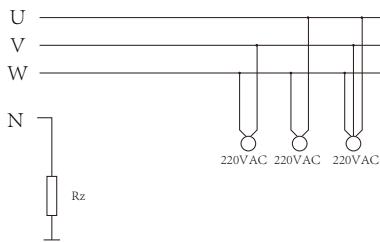
#### Grid Mode:

General Standard, UL1741 & IEEE1547, CPUC RULE21, SRD-UL-1741, CEI\_0\_21\_Internal, EN50549\_CZ\_PPDS(>16A), Australia\_A, Australia\_B, Australia\_C, AS4777\_NewZealand, VDE4105, OVE-Directive R25, EN50549\_CZ\_PPDS\_L16A, NRS097, G98, G99, EN50549\_1\_Norway\_133V, EN50549\_1\_Norway\_230V, Japan\_200VAC\_3P3W, CEI\_0\_21\_External, CEI\_0\_21\_Areti, Japan\_400VAC\_3P3W, Japan\_415VAC\_3P4W, EN50549\_1\_Switzerland.

Please follow the local grid code and then choose the corresponding grid standard.

**Grid level:** there're several voltage levels for the inverter output voltage when it is in off-grid mode. LN:220V/LL:380V(AC), LN:230V/LL:400V(AC).

**IT system:** If the grid system is IT system, then please enable this option. For example, the IT grid system voltage is 230Vac (the Line voltage between any two live lines in a three-phase circuit is 230Vac, and the diagram is as follow) then please enable "IT system" and tick the "Grid level" as LN:230V/LL:400V(AC) as below picture shows.



Rz: Large resistance ground resistor. Or the system doesn't have Neutral line

### Grid Setting/Grid code selection

Grid Mode	General Standard	0/23
Grid Frequency	<input checked="" type="radio"/> 50HZ <input checked="" type="radio"/> 60HZ	Phase Type <input checked="" type="radio"/> 0/120/240 <input checked="" type="radio"/> 0/240/120
Grid Level	LN:230V/LL:400V(AC)	
<input checked="" type="checkbox"/> IT system-neutral is not grounded		

### Grid Setting/Connect

Normal connect	Normal Ramp rate	10s	
Low frequency	48.00Hz	High frequency	51.50Hz
Low voltage	185.0V	High voltage	265.0V
Reconnect after trip	Reconnect Ramp rate	36s	
Low frequency	48.20Hz	High frequency	51.30Hz
Low voltage	187.0V	High voltage	263.0V
Reconnection Time	60s	PF	1.000

**Normal connect:** The allowed grid voltage/frequency range when the inverter first time connect to the grid.

**Normal Ramp rate:** It is the startup power ramp.

**Reconnect after trip:** The allowed grid voltage /frequency range for the inverter connects the grid after the inverter trip from the grid.

**Reconnect Ramp rate:** It is the reconnection power ramp.

**Reconnection time:** The waiting time period for the inverter connects the grid again.

**PF:** Power factor which is used to adjust inverter reactive power.

### Grid Setting/IP Protection

Over voltage U>(10 min. running mean)			260.0V
HV3	265.0V	–	
(1) HV2	265.0V	– 0.10s	(2) HF3 51.50Hz
HV1	265.0V	– 0.10s	HF2 51.50Hz – 0.10s
LV1	185.0V	– 0.10s	HF1 51.50Hz – 0.10s
LV2	185.0V	– 0.10s	LF1 48.00Hz – 0.10s
LV3	185.0V	– 0.10s	LF2 48.00Hz – 0.10s
			LF3 48.00Hz

**HV1:** Level 1 overvoltage protection point;

**(1) HV2:** Level 2 overvoltage protection point; **(2) 0.10s—Trip time.**

**HV3:** Level 3 overvoltage protection point.

**LV1:** Level 1 undervoltage protection point;

**LV2:** Level 2 undervoltage protection point;

**LV3:** Level 3 undervoltage protection point.

**HF1:** Level 1 over frequency protection point;

**HF2:** Level 2 over frequency protection point;

**HF3:** Level 3 over frequency protection point.

**LF1:** Level 1 under frequency protection point;

**LF2:** Level 2 under frequency protection point;

**LF3:** Level 3 under frequency protection point.

## Grid Setting/F(W)

F(W)	
Over frequency	Droop F 40%PE/Hz
Start freq F 50.20Hz	Stop freq F 51.5Hz
Start delay F 0.00s	Stop delay F 0.00s
Under frequency	
Start freq F 49.80Hz	Droop F 40%PE/Hz
Start delay F 0.00s	Stop freq F 49.80Hz
Stop delay F 0.00s	

Grid Set4  
X  
✓

**FW:** this series inverter is able to adjust inverter output power according to grid frequency.

**Droop F:** percentage of nominal power per Hz

For example, "Start freq F > 50.2Hz, Stop freq F < 51.5, Droop F=40%PE/Hz" when the grid frequency reaches 50.2Hz, the inverter will decrease its active power at Droop F of 40%. And then when grid system frequency is less than 50.1Hz, the inverter will stop decreasing output power.

For the detailed setup values, please follow the local grid code.

## Grid Setting/V(W) V(Q)

V(W)		V(Q)	
V1 108.0%	P1 100%	Lock-in/Pn 5%	Lock-out/Pn 20%
V2 110.0%	P2 80%	V1 94.0%	Q1 44%
V3 112.0%	P3 60%	V2 97.0%	Q2 0%
V4 114.0%	P4 40%	V3 105.0%	Q3 0%
		V4 108.0%	Q4 -44%

Grid Set5  
X  
✓

**V(W):** It is used to adjust the inverter active power according to the set grid voltage.

**V(Q):** It is used to adjust the inverter reactive power according to the set grid voltage.

This function is used to adjust inverter output power (active power and reactive power) when grid voltage changes.

**Lock-in/Pn 5%:** When the inverter active power is less than 5% rated power, the VQ mode will not take effect.

**Lock-out/Pn 20%:** If the inverter active power is increasing from 5% to 20% rated power, the VQ mode will take effect again.

For example: V2=110%, P2=80%. When the grid voltage reaches the 110% times of rated grid voltage, inverter output power will reduce its active output power to 80% rated power.

For example: V1=94%, Q1=44%. When the grid voltage reaches the 94% times of rated grid voltage, inverter output power will output 44% reactive output power.

For the detailed setup values, please follow the local grid code.

## Grid Setting/P(Q) P(F)

P(Q)		P(PF)	
P1 0%	Q1 2%	Lock-in/Pn 50%	Lock-out/Pn 50%
P2 2%	Q2 0%	P1 0%	PF1 -0.000
P3 0%	Q3 21%	P2 0%	PF2 -0.000
P4 22%	Q4 25%	P3 0%	PF3 0.000
		P4 62%	PF4 0.264

Grid Set6  
X  
✓

**P(Q):** It is used to adjust the inverter reactive power according to the set active power.

**P(PF):** It is used to adjust the inverter PF according to the set active power.

For the detailed setup values, please follow the local grid code.

**Lock-in/Pn 50%:** When the inverter output active power is less than 50% rated power, it won't enter the P(PF) mode.

**Lock-out/Pn 50%:** When the inverter output active power is higher than 50% rated power, it will enter the P(PF) mode.

Note : only when the grid voltage is equal to or higher than 1.05times of rated grid voltage, then the P(PF) mode will take effect.

## Grid Setting/LVRT

L/HVRT	
HV3 0%	HV3_T 30.24s
HV2 0%	HV2_T 0.04s
HV1 0%	HV1_T 22.11s
LV1 0%	LV1_T 22.02s
LV2 0%	LV2_T 0.04s

Grid Set7  
X  
✓

**Reserved:** This function is reserved. It is not recommended.

## 5.9 Generator Port Use Setup Menu

### GEN PORT USE

<input checked="" type="radio"/> Generator Input Rated Power 8000W	<input type="checkbox"/> AC couple on grid side <input type="checkbox"/> AC couple on load side <input type="checkbox"/> GEN connect to Grid input	PORT Set1 PORT Set2 OFF ON 151.0V 154.0V
<input checked="" type="radio"/> SmartLoad Output AC Couple Frz High 55.00Hz	<input type="checkbox"/> On Grid always on	
<input checked="" type="radio"/> Micro Inv Input	<input type="checkbox"/> MI export to Grid cutoff	

**Generator input rated power:** allowed Max. power from diesel generator.

**GEN connect to grid input:** connect the diesel generator to the grid input port.

**Smart Load Output:** Use the GEN port as an AC output port, and the load connected to this port can be controlled on/off by the hybrid inverter.

**e.g. ON: 100%, OFF: 95%:** When the battery bank SOC reaches 100%, Smart Load Port will switch on automatically and power the load connected. When the battery bank SOC < 95%, the Smart Load Port will switch off automatically.

### Smart Load OFF Batt

• Battery SOC or voltage at which the Smart load will switch off.

### Smart Load ON Batt

• Battery SOC or voltage at which the Smart load will switch on.

**On Grid always on:** When "On Grid always on" is checked, the smart load port will always keep switching on if hybrid inverter is operating in on-grid mode.

**Micro Inv Input:** Use the GEN port as an AC couple input port, which can be connected with micro-inverter or other Grid-Tied inverter.

**\*Micro Inv Input ON:** When the hybrid inverter operates in off-grid mode and the SOC or voltage of battery drops to this set value, the relays on GEN port of hybrid inverter will turn to normally closed(ON), then the Grid-Tied inverter will generate solar power and feed into hybrid inverter. When the hybrid inverter operates in on-grid mode, this parameter will be invalid, the relays on GEN port of hybrid inverter will always be normally closed(ON), Grid-Tied inverter can operate normally.

**AC Couple Frz High:** If choosing "Micro Inv input", as the battery SOC reaches gradually setting value (OFF), during the process, the microinverter output power will decrease linear. When the battery SOC equals to the setting value (OFF), the system frequency will become the setting value (AC couple Frz high) and the Microinverter will stop working.

**MI export to Grid cutoff:** Stop exporting power produced by the microinverter or Grid-Tied inverter to the grid.

**AC couple on Load side:** Connect one or several on-grid inverters on the Load port side of this hybrid inverter.

**AC couple on Grid side:** Connect one or several on-grid inverters on the Grid port side of this hybrid inverter.

**\*Note:** Micro Inv Input OFF and On is valid for some certain FW version only.

## 5.10 Advanced Function Setup Menu

### Advanced Function

<input type="checkbox"/> Solar Arc Fault ON (Optional) <input type="checkbox"/> Clear Arc_Fault (Optional)	Backup Delay 0ms	Func Set1 Func Set2 CEI Report
<input type="checkbox"/> System selfcheck	<input type="checkbox"/> Gen peak-shaving	
<input type="checkbox"/> DRM	2000: 1 CT Ratio	
<input type="checkbox"/> Signal Island Mode		
<input type="checkbox"/> Asymmetric phase feeding	<input type="checkbox"/> CEI Report	

**Solar Arc Fault ON(Optional):** For '-US' version hybrid inverter, this feature is standard. After enabling this function, the inverter will detect whether there is a arcing fault on the PV side. If arcing occurs, the inverter will report a fault and stop outputting power.

**Clear Arc\_Fault(Optional):** After the arc fault on the PV side is eliminated, enabling this function can eliminate the arc fault alarm of the inverter and restore normal operation of the inverter.

**System selfcheck:** Disable. This is only for factory.

**Gen Peak-shaving:** Enable. When the power of the generator exceeds the rated value of it, the inverter will provide the redundant part to ensure that the generator will not overload.

**DRM:** For AS4777 standard.

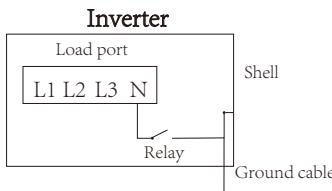
**Backup Delay:** When the grid cuts off, the inverter will give output power after the setting time.

**For example, backup delay: 3ms.** the inverter will give output power after 3ms when the grid cuts off.

**Note:** for some old FW version, the function is not available.

**\*Signal island mode:** If "Signal island mode" is checked and When inverter is in off-grid mode, the relay on the Neutral line (load port N line) will switch ON then the N line (load port N line) will bind to inverter ground.

**\*If this item was selected, please ensure that the shell of the inverter is grounded, otherwise there will be electric shock if you touch the shell.**



**Asymmetric phase feeding:** If it was checked, the inverter will take power from the grid balance of on each phase (L1/L2/L3) when needed.

## Advanced Function

<input type="checkbox"/> Parallel	Modbus SN	Baud Rate
<input checked="" type="radio"/> Master	00	0000
<input checked="" type="radio"/> Slave		
<input type="checkbox"/> EX_Meter For CT	<input type="checkbox"/> Grid Tie Meter2	
Meter Select		
No Meter	0/3	
CHINT		
Eastron		

 Paral. Set3




**Parallel:** Enable this function when several same model hybrid inverters are connecting in parallel.

**Master:** Select any hybrid inverter in the parallel system as the master inverter, and the master inverter needs to manage the working mode of the parallel system.

**Slave:** Set the other inverters managed by the master inverter as slave inverter.

**Modbus SN:** The Modbus address of each inverter, should be different.

**Baud Rate:** The rate at which inverter transmits data.

**Ex\_Meter For CT:** when using zero-export to CT mode, the hybrid inverter can select EX\_Meter For CT function and use the different meters.e.g.CHINT and Eastron.

**Grid Tie Meter2:** When there are one or more grid-tied inverters AC coupled on the grid or load port side of the hybrid inverter, and external meter is installed for this/these grid-tied inverters, it is necessary to enable this function to upload the data of the external meter to the hybrid inverter to ensure that the power consumption data of the load is correct.

## 5.11 Device Info Setup Menu

### Device Info.

Inverter ID: 2102199870	Flash
HMI: Ver 1001-8010 MAIN:Ver2002-1046-1707	
Alarms Code	Occurred
F13 Grid_Mode_changed	2021-06-11 13:17
F23 Tz_GFCL_OC_Fault	2021-06-11 08:23
F13 Grid_Mode_changed	2021-06-11 08:21
F56 DC_VoltLow_Fault	2021-06-10 13:05

 Device Info



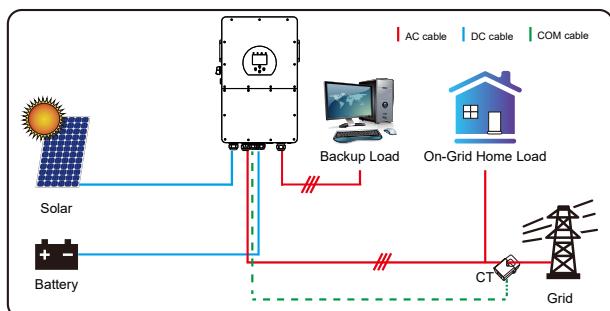

This page show Inverter ID, Inverter version and alarm codes.

**HMI:** LCD version

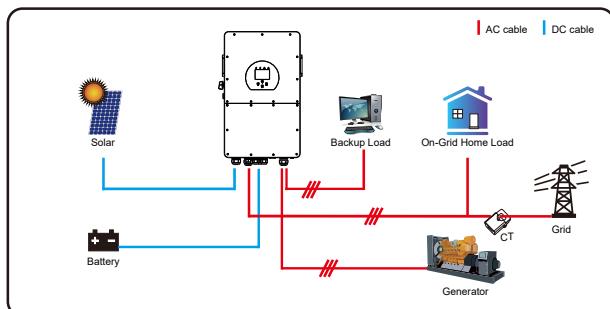
**MAIN:** Control board FW version

## 6. Mode

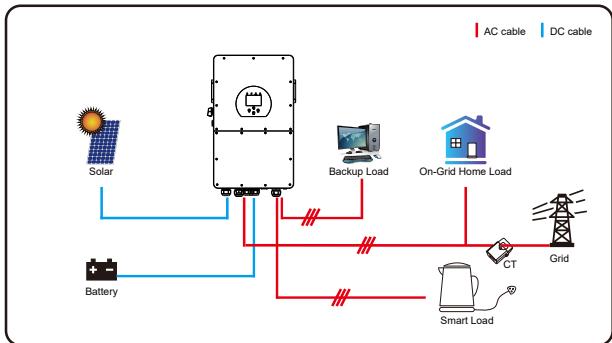
### Mode I: Basic



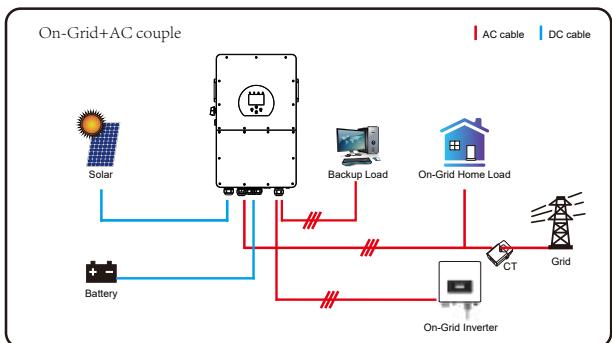
### Mode II: With Generator



## Mode III: With Smart-Load



## Mode IV: AC Couple



The 1st priority power of the system is always the PV power, then 2nd and 3rd priority power will be the battery bank or grid according to the settings. The last power backup will be the Generator if it is available.

## 7. Limitation of Liability

In addition to the product warranty described above, the state and local laws and regulations provide financial compensation for the product's power connection (including violation of implied terms and warranties). The company hereby declares that the terms and conditions of the product and the policy cannot and can only legally exclude all liability within a limited scope.

<b>Error code</b>	<b>Description</b>	<b>Solutions</b>
F01	DC_Inversed_Failure	1, Check the PV input polarity 2, Seek help from us, if can not go back to normal state.
F07	DC_START_Failure	1, The BUS voltage can't be built from PV or battery. 2, Restart the inverter, If the fault still exists, please contact us for help
F13	Working_Mode_change	1. When the grid type and frequency changed it will report F13; 2. When the battery mode was changed to "No battery" mode, it will report F13; 3. For some old FW version, it will report F13 when the system work mode changed; 4. Generally, it will disappear automatically when shows F13; 5. If it remains same, turn on DC and AC switch for one minute, then turn on the DC and AC switch.; 6. Seek help from us, if can not go back to normal state.
F15	AC_OverCurr_SW_Failure	AC side over current fault 1. Please check whether the backup load power and common load power are within the range; 2. Restart and check whether it is normal; 3. Seek help from us, if can not go back to normal state.
F16	GFCI_Failure	Leakage current fault 1, Check the PV side cable ground connection 2, Restart the system 2-3 times 3, if the fault still existing, please contact us for help.
F18	Tz_Ac_OverCurr_Fault	AC side over current fault 1. Please check whether the backup load power and common load power are within the range; 2. Restart and check whether it is normal; 3. Seek help from us, if cannot go back to normal state.
F20	Tz_Dc_OverCurr_Fault	DC side over current fault 1. Check PV module connection and battery connection; 2. When in the off-grid mode, the inverter startup with big power load, it may report F20. Please reduce the load power connected; 3. If it remains same, turn on DC and AC switch for one minute, then turn on the DC and AC switch.; 4. Seek help from us, if can not go back to normal state.

<b>Error code</b>	<b>Description</b>	<b>Solutions</b>
F21	Tz_HV_Overcurr_fault	<p>BUS over current.</p> <ol style="list-style-type: none"> <li>1, Check the PV input current and battery current setting</li> <li>2. Restart the system 2~3 times.</li> <li>3. If the fault still exists, please contact us for help.</li> </ol>
F22	Tz_EmergStop_Fault	<p>Remotely shutdown</p> <ol style="list-style-type: none"> <li>1, it tells the inverter is remotely controlled.</li> </ol>
F23	Tz_GFCl_OC_Fault	<p>Leakage current fault</p> <ol style="list-style-type: none"> <li>1. Check PV side cable ground connection.</li> <li>2. Restart the system 2~3 times.</li> <li>3. If the fault still exists, please contact us for help.</li> </ol>
F24	DC_Insulation_Fault	<p>PV isolation resistance is too low</p> <ol style="list-style-type: none"> <li>1. Check the connection of PV panels and inverter is firmly and correctly;</li> <li>2. Check whether the PE cable of inverter is connected to ground;</li> <li>3. Seek help from us, if can not go back to normal state.</li> </ol>
F26	BusUnbalance_Fault	<ol style="list-style-type: none"> <li>1. Please wait for a while and check whether it is normal;</li> <li>2. When the load power of 3 phases is big different, it will report the F26.</li> <li>3. When there's DC leakage current, it will report F26</li> <li>4. Restart the system 2~3 times.</li> <li>5. Seek help from us, if can not go back to normal state.</li> </ol>
F29	Parallel_Comm_Fault	<ol style="list-style-type: none"> <li>1. When in parallel mode, check the parallel communication cable connection and hybrid inverter communication address setting;</li> <li>2. During the parallel system startup period, inverters will report F29. But when all inverters are in ON status, it will disappear automatically;</li> <li>3. If the fault still exists, please contact us for help.</li> </ol>
F34	AC_Overload_Fault	<ol style="list-style-type: none"> <li>1, Check the backup load connection, make sure it is in allowed power range</li> <li>2, If the fault still exists, please contact us for help</li> </ol>
F41	Parallel_system_Stop	<ol style="list-style-type: none"> <li>1, Check the hybrid inverter work status. If there's 1pcs hybrid inverter shutdown, all hybrid inverters will report F41 fault.</li> <li>2, If the fault still exists, please contact us for help</li> </ol>
F42	Parallel_Version_Fault	<ol style="list-style-type: none"> <li>1. Check whether the inverter version is consistent.</li> <li>2. Please contact us to upgrade the software version.</li> </ol>

<b>Error code</b>	<b>Description</b>	<b>Solutions</b>
F47	AC_OverFreq_Fault	Grid frequency out of range 1. Check the frequency is in the range of specification or not; 2. Check whether AC cables are firmly and correctly connected; 3. Seek help from us, if can not go back to normal state.
F48	AC_UnderFreq_Fault	Grid frequency out of range 1. Check the frequency is in the range of specification or not; 2. Check whether AC cables are firmly and correctly connected; 3. Seek help from us, if can not go back to normal state.
F52	DC_VoltHigh_Fault	BUS voltage is too high 1. Check whether battery voltage is too high; 2. check the PV input voltage, make sure it is within the allowed range; 3. Seek help from us, if can not go back to normal state.
F53	DC_VoltLow_Fault	BUS voltage is too low 1. Check whether battery voltage is too low; 2. If the battery voltage is too low, using PV or grid to charge the battery; 3. Seek help from us, if can not go back to normal state.
F54	BAT2_VoltHigh_Fault	1. Check the battery 2 terminal voltage is high; 2. Restart the inverter 2 times and restore the factory settings; 3. Seek help from us, if can not go back to normal state.
F55	BAT1_VoltHigh_Fault	1. Check the battery 1 terminal voltage is high; 2. Restart the inverter 2 times and restore the factory settings; 3. Seek help from us, if can not go back to normal state.
F56	BAT1_VoltLow_Fault	1. Check the battery 1 terminal voltage is low; 2. Restart the inverter 2 times and restore the factory settings; 3. Seek help from us, if can not go back to normal state.
F57	BAT2_VoltLow_Fault	1. Check the battery 2 terminal voltage is low; 2. Restart the inverter 2 times and restore the factory settings; 3. Seek help from us, if can not go back to normal state.
F58	Battery_comm_Lose	1, It tells the communication between hybrid inverter and battery BMS disconnected when “BMS_Err-Stop” is active; 2, If don’t want to see this happen, you can disable “BMS_Err-Stop” item on the LCD; 3, If the fault still exists, please contact us for help
F62	DRMs0_stop	1, the DRM function is for Australia market only; 2, Check the DRM function is active or not; 3, Seek help from us, if can not go back to normal state after restart the system.
F63	ARC_Fault	1. ARC fault detection is only for US market; 2. Check PV module cable connection and clear the fault; 3. Seek help from us, if can not go back to normal state
F64	Heatsink_HighTemp_Fault	Heat sink temperature is too high 1. Check whether the working environment temperature is too high; 2. Turn off the inverter for 10mins and restart; 3. Seek help from us, if can not go back to normal state.

Chart 7-1 Fault information

Under the guidance of our company, customers return our products so that our company can provide service of maintenance or replacement of products of the same value. Customers need to pay the necessary freight and other related costs. Any replacement or repair of the product will cover the remaining warranty period of the product. If any part of the product or product is replaced by the company itself during the warranty period, all rights and interests of the replacement product or component belong to the company.

Factory warranty does not include damage due to the following reasons:

- Damage during transportation of equipment;
- Damage caused by incorrect installation or commissioning;
- Damage caused by failure to comply with operation instructions, installation instructions or maintenance instructions;
- Damage caused by attempts to modify, alter or repair products;
- Damage caused by incorrect use or operation;
- Damage caused by insufficient ventilation of equipment;
- Damage caused by failure to comply with applicable safety standards or regulations;
- Damage caused by natural disasters or force majeure (e.g. floods, lightning, overvoltage, storms, fires, etc.)

In addition, normal wear or any other failure will not affect the basic operation of the product. Any external scratches, stains or natural mechanical wear does not represent a defect in the product.

## 8. Datasheet

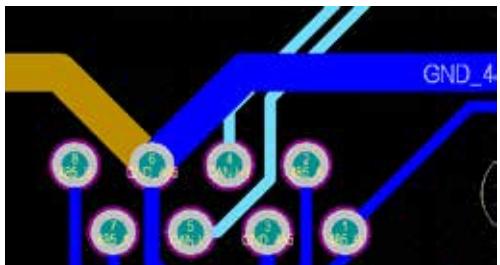
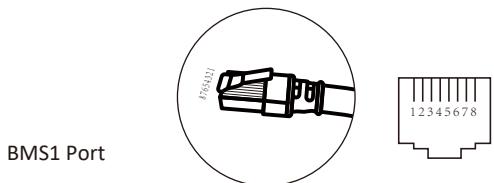
Model	SUN-8K-SG01HP3-US-AM2	SUN-10K-SG01HP3-US-AM2	SUN-12K-SG01HP3-US-AM2	SUN-15K-SG01HP3-US-AM2
<b>Battery Input Data</b>				
Battery Type	Lithium-ion			
Battery Voltage Range(V)	160-500			
Max. Charging Current(A)	50			
Max. Discharging Current(A)	50			
Charging Strategy for Li-ion Battery	Self-adaption to BMS			
Number of Battery Input	1			
<b>PV String Input Data</b>				
Max. PV access power(W)	16000	20000	24000	30000
Max. PV Input Power(W)	12000	15000	18000	22500
Max. PV Input Voltage (V)	550			
Start-up Voltage(V)	180			
PV Input Voltage Range(V)	180-550			
MPPT Voltage Range(V)	150-500			
Full Load MPPT Voltage Range(V)	200-500	250-500	300-500	375-500
Rated PV Input Voltage (V)	380			
Max. Operating PV Input Current(A)	26+26			
Max. Input Short-Circuit Current(A)	39+39			
No. of MPP Trackers/No. of Strings MPP Tracker	2/2+2			
Max. Inverter Backfeed Current To the Array	0			
<b>AC Input/Output Data</b>				
Rated AC Input/Output Active Power(W)	8000	10000	12000	15000
Max. AC Input/Output Apparent Power(VA)	8000	10000	12000	15000
Peak Power (off-grid)(W)	1.5 time of rated power, 10 S			
Rated AC Input/Output Current(A)	22.3	27.8	33.4	41.7
Max. AC Input/Output Current(A)	22.3	27.8	33.4	41.7
Max. Continuous AC Passthrough (grid to load)(A)	80			
Rated Input/Output Voltage/Range(V)	120V/208V 0.88Un-1.1Un			
Grid Connection Form	3L+N+PE			
Rated Input/Output Grid Frequency/Range	60Hz/55Hz-65Hz			
Power Factor Adjustment Range	0.8 leading to 0.8 lagging			
Total Current Harmonic Distortion THDi	<3% (of nominal power)			
DC Injection Current	<0.5% In			
<b>Efficiency</b>				
Max. Efficiency	97.60%			
Euro Efficiency	97.00%			
MPPT Efficiency	>99%			
<b>Equipment Protection</b>				
DC reverse polarity protection	Yes			
AC Output Overcurrent Protection	Yes			
AC Output Overvoltage Protection	Yes			
AC Output Short Circuit Protection	Yes			
Thermal Protection	Yes			
Insulation Impedance detection	Yes			

DC Component Monitoring	Yes
Arc fault circuit interrupter (AFCI)	Yes
Anti-islanding protection	Yes
DC Switch	Yes
Residual Current Detection	Yes
Surge Protection Level	TYPE II(DC), TYPE II(AC)
<b>Interface</b>	
Display	LCD+LED
Communication Interface	RS232, RS485, CAN
Monitor Mode	GPRS/WIFI/Bluetooth/4G/LAN (optional)
<b>General Data</b>	
Operating Temperature Range	-40 to +60°C, >45°C Derating
Permissible Ambient Humidity	0-100%
Permissible Altitude	2000m
Noise	≤ 55 dB
Ingress Protection(IP) Rating	NEMA 3R, IP65
Inverter Topology	Non-Isolated
Over Voltage Category	OVC II(DC), OVC IV(AC)
Cabinet size(W*H*D) [mm]	408W×678H×247D (Excluding connectors and brackets)
Weight(kg)	30
Installation Style	Wall-mounted
Warranty	5 Years/10 Years the Warranty Period Depends the Final Installation Site of Inverter, More Info Please Refer to Warranty Policy
Type of Cooling	Intelligent Air Cooling
Grid Regulation	IEEE 1547.1, SRD V2.0
Safety EMC/Standard	FCC,UL 1741

## 9. Appendix I

Definition of RJ45 Port Pin for BMS1

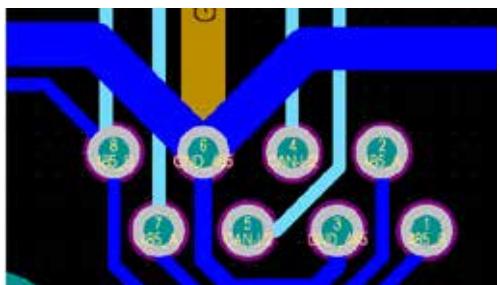
No.	RS485 Pin
1	485_B
2	485_A
3	GND_485
4	CAN-H1
5	CAN-L1
6	GND_485
7	485_A
8	485_B



Definition of RJ45 Port Pin for BMS2

No.	RS485 Pin
1	485_B
2	485_A
3	GND_485
4	CAN-H2
5	CAN-L2
6	GND_485
7	485_A
8	485_B

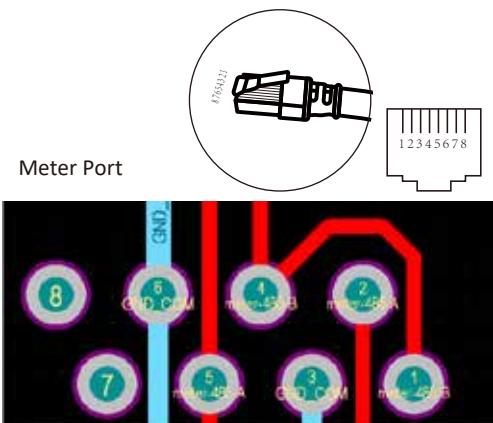
BMS2 Port



Definition of RJ45 Port Pin for Meter

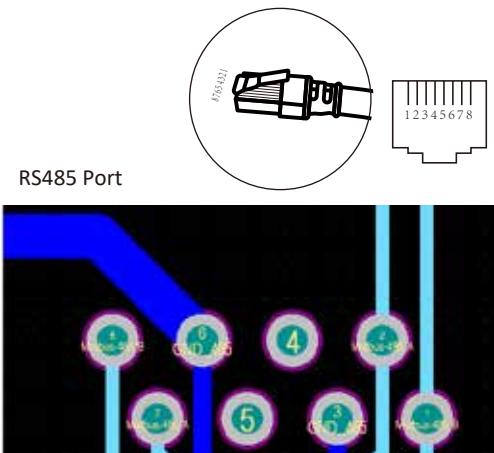
No.	Meter-485 Pin
1	METER-485_B
2	METER-485_A
3	GND_COM
4	METER-485_B
5	METER-485_A
6	GND_COM
7	--
8	--

Meter Port



### Definition of RJ45 Port Pin for RS485

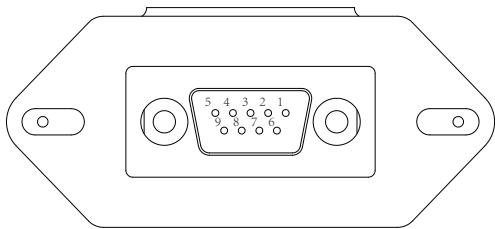
No.	RS485 Pin
1	Modbus-485_B
2	Modbus-485_A
3	GND_485
4	--
5	--
6	GND_485
7	Modbus-485_A
8	Modbus-485_B



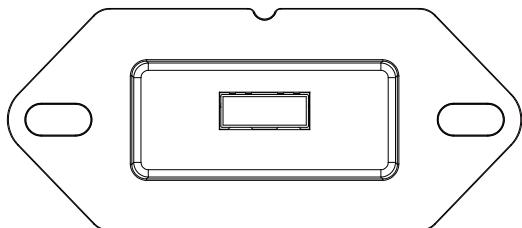
This model of inverter has two types of logger interfaces, DB9 and USB. Please refer to the actual inverter received for the actual interface type.

### RS232

No.	RS232
1	
2	TX
3	RX
4	
5	D-GND
6	
7	
8	
9	12Vdc



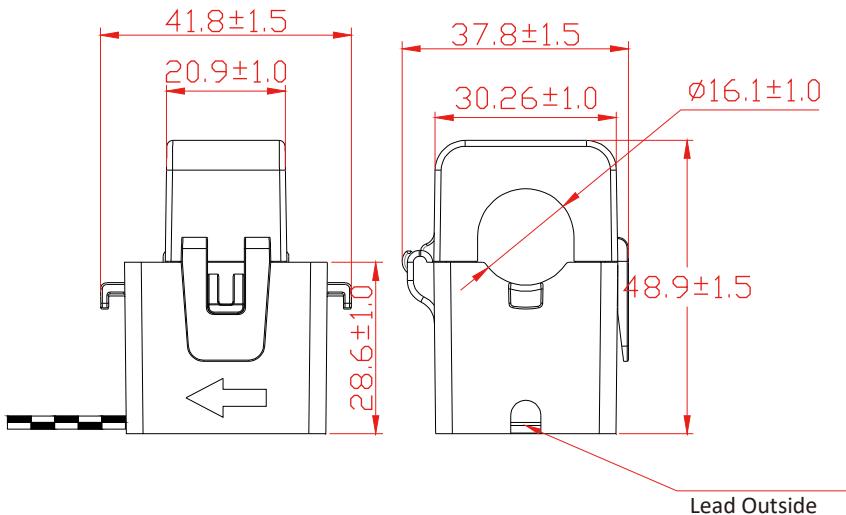
DB9 (RS232)



USB

## 10. Appendix II

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



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