Contents

About This Manual

The manual mainly describes the product informa□on, guidelines for installa□on, opera□on and maintenance. The manual cannot include complete informa□on about the photovoltaic (PV) system.

How to Use This Manual

Read the manual and other related documents before performing any opera□on on the inverter. Documents must be stored carefully and be available at all □mes.

Contents may be periodically updated or revised due to product development. The informa□on in this manual is subject to change without no□ce. The latest manual can be acquired via service@deye.com.cn

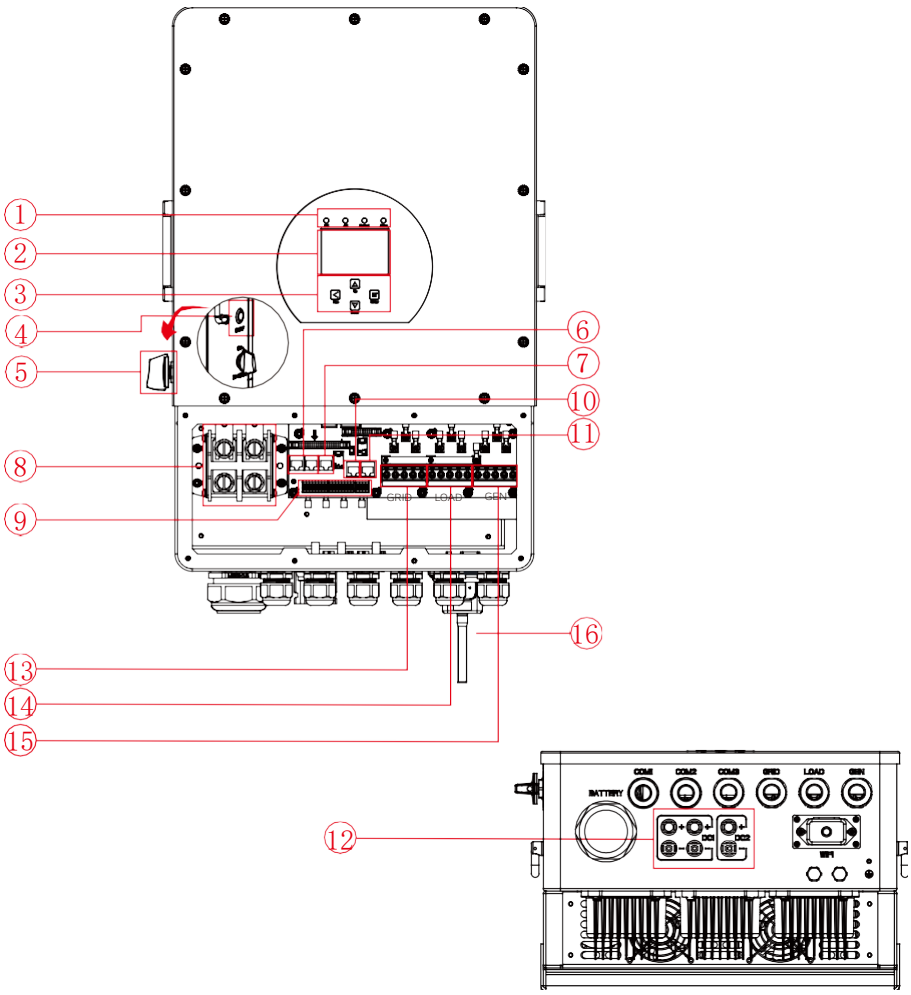
1. Safety Introduc□ons

· This chapter contains important safety and opera□ng instruc□ons. Read and keep this manual for future reference.
· Before using the inverter, please read the instruc□ons and warning signs of the ba□ery and corresponding sec□ons in the instruc□on 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 a□emp□ng any maintenance or cleaning. Turning off the unit will not reduce this risk.
· Cau□on: Only qualified personnel can install this device with ba□ery.
· Never charge a frozen ba□ery.
· For op□mum opera□on of this inverter, please follow required specifica□on to select appropriate cable size. It is very important to correctly operate this inverter.
· Be very cau□ous when working with metal tools on or around ba□eries. Dropping a tool may cause a spark or short circuit in ba□eries or other electrical parts, even cause an explosion.
· Please strictly follow installa□on procedure when you want to disconnect AC or DC terminals. Please refer to "Installa□on" sec□on of this manual for the details.
· Grounding instruc□ons - this inverter should be connected to a permanent grounded wiring system. Be sure to comply with local requirements and regula□on to install this inverter.
· Never cause AC output and DC input short circuited. Do not connect to the mains when DC input short circuits.

2. Product Introduc□on

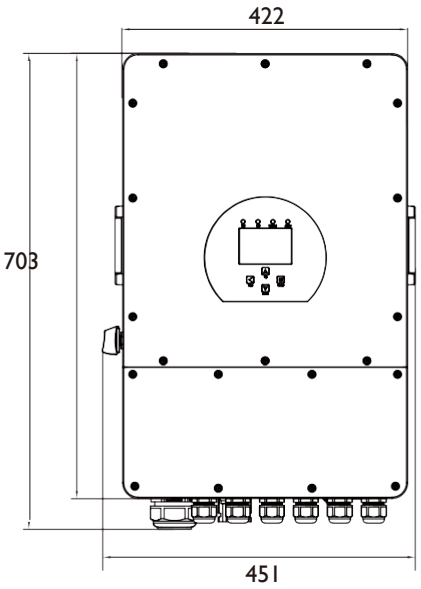
This is a mul□func□onal inverter, combining func□ons of inverter, solar charger and ba□ery charger to offer uninterrup□ble power support with portable size. Its comprehensive LCD display offers user configurable and easy accessible bu□on opera□on such as ba□ery charging, AC/solar charging, and acceptable input voltage based on different applica□ons.

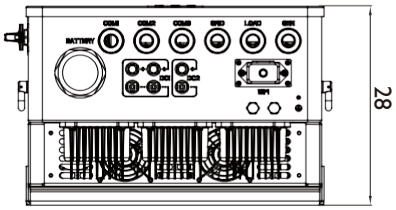
2.1 Product Overview



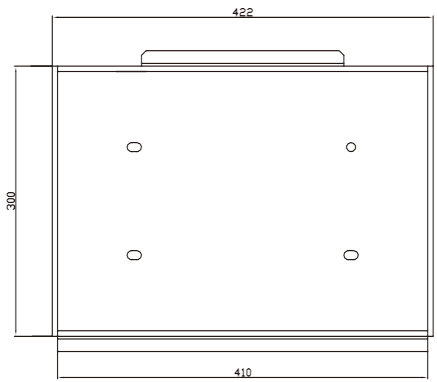
1: Inverter indicators
2: LCD display
3: Func﷯on bu﷯ons
4: Power on/off bu﷯on
5: DC switch
6: Parallel port
7: Meter-485 port
8: Ba﷯ery input connectors
9: Func﷯on port
10: ModeBUS port
11: BMS port
12: PV input with two MPPT
13: Grid
14: Load
15: Generator input
16: WiFi Interface

2.2 Product Size





Inverter Size



Moun◆ng bracket

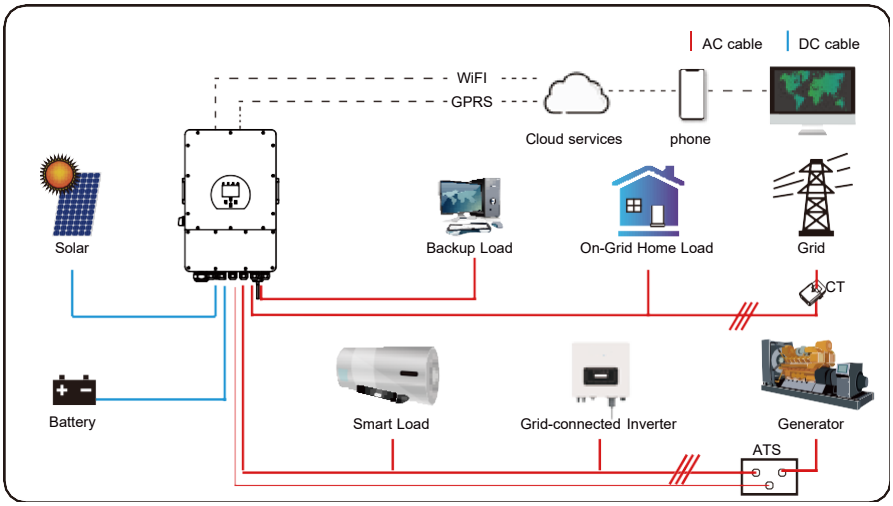
2.3 Product Features

- 230V/400V Three phase Pure sine wave inverter.
- Self-consump﷯on and feed-in to the grid.
- Auto restart while AC is recovering.
- Programmable supply priority for ba﷯ery or grid.
- Programmable mul﷯ple opera﷯on modes: On grid, off grid and UPS.
- Configurable ba﷯ery charging current/voltage based on applica﷯ons by LCD se﷯ng.
- Configurable AC/Solar/Generator Charger priority by LCD se﷯ng.
- Compa﷯ble with mains voltage or generator power.
- Overload/over temperature/short circuit protec﷯on.
- Smart ba﷯ery charger design for op﷯mized ba﷯ery performance
- With limit func﷯on, prevent excess power overflow to the grid.
- Suppor﷯ng WIFI monitoring and build-in 2 strings for 1 MPP tracker, 1 string for 1 MPP tracker.
- Smart se﷯able three stages MPPT charging for op﷯mized ba﷯ery performance.
- Time of use func﷯on.
- Smart Load Func﷯on.

2.4 Basic System Architecture

The following illustra﷯on shows basic applica﷯on of this inverter.
It also includes following devices to have a Complete running system.
- Generator or U﷯lity
- PV modules

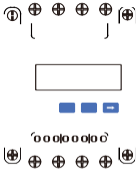
Consult with your system integrator for other possible system architectures depending on your requirements.
This inverter can power all kinds of appliances in home or office environment, including motor type appliances such as refrigerator and air condi﷯oner.



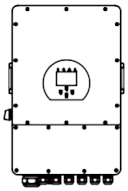
3. Installaon

3.1 Parts List

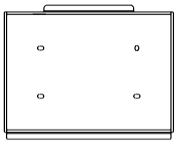
Check the equipment before installaon. Please make sure nothing is damaged in the package. You should have received the items in the following package:



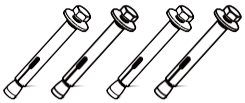
Meter(oponal) x 1



Hybrid inverter
x1



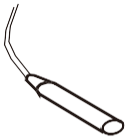
Wall moun[illegible]ng bracket x1



Stainless steel an[illegible]-collision bolt M8×80
x4

Parallel communica[illegible]on cable x1

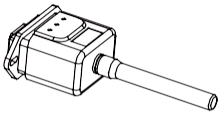
L-type Hexagon wrench
x1



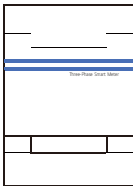
Ba[illegible]ery temperature sensor
x1

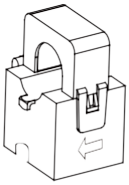
User
manual

User manual x1



Wi-Fi-Plug (op[illegible]onal) x1





Sensor Clamp
x 3

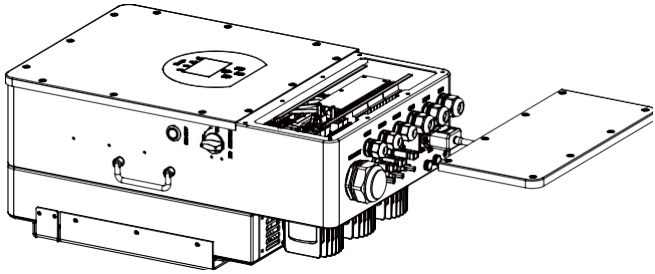
3.2 Moun□ng instruc□ons

Installa□on Precau□on

This Hybrid inverter is designed for outdoor use(IP65), Please make sure the installa□on site meets below condi□ons:

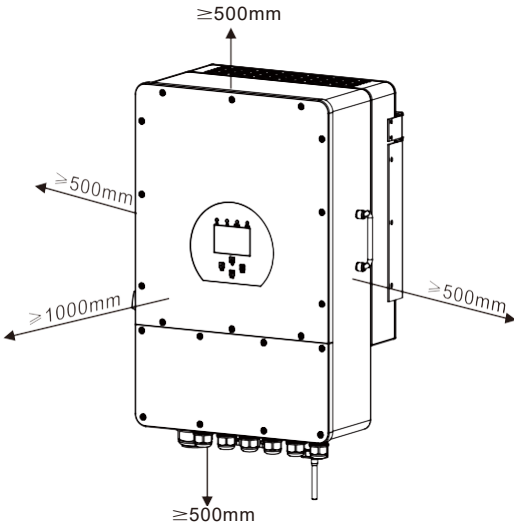
· Not in direct sunlight
· Not in areas where highly flammable materials are stored.
· Not in poten□al explosive areas.
· Not in the cool air directly.
· Not near the television Antenna or antenna cable.
· Not higher than al□tude of about 2000 meters above sea level.
· Not in environment of precipita□on or humidity(>95%)

Please AVOID direct sunlight, rain exposure, snow laying up during installa□on and opera□on. Before connec□ng all wires, please take off the metal cover by removing screws as shown below:



Considering the following points before selec□ng where to install:

· Please select a ver□cal wall with load-bearing capacity for installa□on, suitable for installa□on on concrete or other non-flammable surfaces,installa□on is shown below.
· Install this inverter at eye level in order to allow the LCD display to be read at all □mes.
· The ambient temperature should be between -25~60℃ to ensure op□mal opera□on.
· Be sure to keep other objects and surfaces as shown in the diagram to guarantee sufficient heat dissipa□on and have enough space for removing wires.

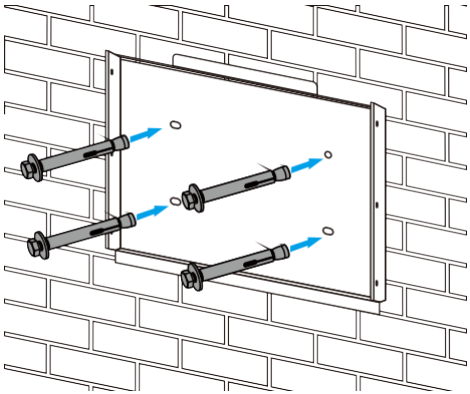


For proper air circulaon to dissipate heat, allow a clearance of approx. 50cm to the side and approx. 50cm above and below the unit. And 100cm to the front.

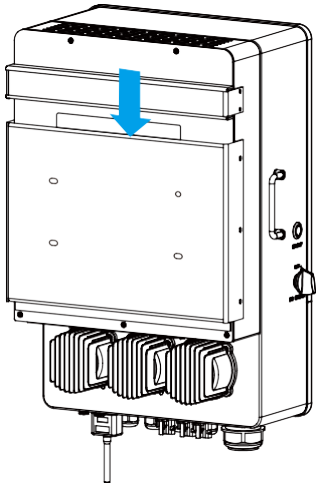
Mounng the inverter

Remember that this inverter is heavy! Please be careful when liing out from the package. Choose the recommend drill head(as shown in below pic) to drill 4 holes on the wall, 52-60mm 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 mounng.



Inverter hanging plate installaon



3.3 Ba﷽ery connec﷽on

For safe opera﷽on and compliance, a separate DC over-current protector or disconnect device is required between the ba﷽ery and the inverter. In some applica﷽ons, switching devices may not be required but over-current protectors are s﷽ll required. Refer to the typical amperage in the table below for the required fuse or circuit breaker size.

Model	*Wire Size*	*Cable(mm²)*	*Torque value(max)*
8Kw	1AWG	40	24.5Nm
10Kw	1/0AWG	60	24.5Nm
12Kw	1/0AWG	60	24.5Nm

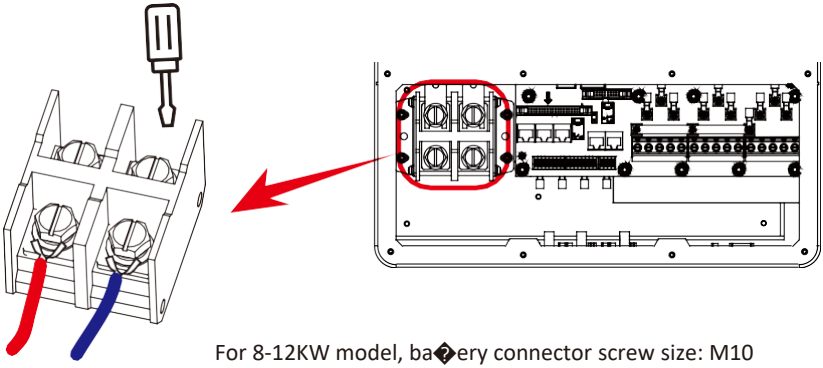
Chart 3-2 Cable size

All wiring must be performed by a professional person.

Connecng the baery with a suitable cable is important for safe and efficient operaon of the system. To reduce the risk of injury, refer to Chart 3-2 for recommended cables.

Please follow below steps to implement baery connecon:

1. Please choose a suitable baery cable with correct connector which can well fit into the baery terminals.
2. Use a suitable screwdriver to unscrew the bolts and fit the baery connectors in, then fasten the bolt by the screwdriver, make sure the bolts are ghtened with torque of 24.5 N.M in clockwise direcon.
3. Make sure polarity at both the baery and inverter is correctly connected.



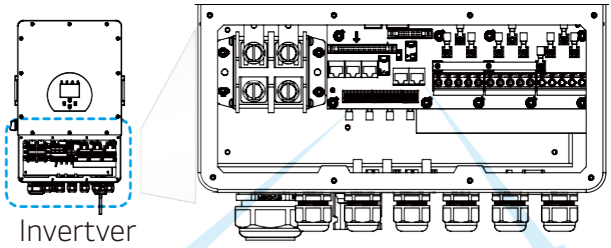
For 8-12KW model, baery connector screw size: M10

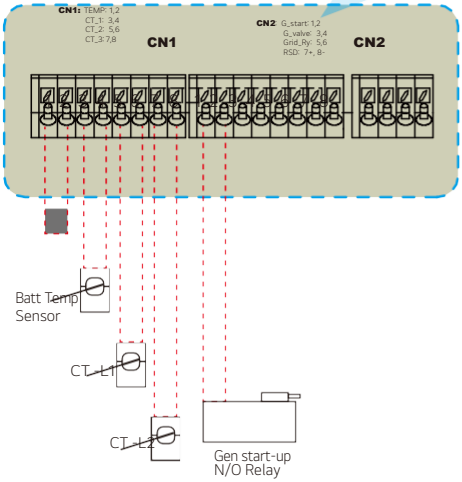
3. In case of children touch or insects go into the inverter, Please make sure the inverter connector is fasten to waterproof posion by twist it clockwise.

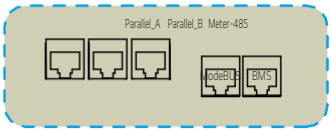
Installaon must be performed with care.

Before making the final DC connecon or closing DC breaker/disconnect, be sure posive(+) must be connect to posive(+) and negave(-) must be connected to negave(-). Reverse polarity connecon on baery will damage the inverter.

3.3.2 Func□on port defini□on







Parallel A: Parallel communica□on port 1 (CAN interface).
Parallel B: Parallel communica□on port 2 (CAN interface).
Meter_485: for energy meter communica□on.
ModeBUS: Reserved.
BMS: BMS port for ba□ery communica□on(CAN/RS485).

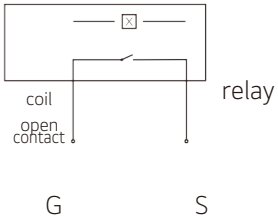
CN1:

CT -L3

TEMP (1,2): ba□ery temperature sensor for lead acid ba□ery.
CT-L1 (3,4): current transformer (CT1) for"zero export to CT"mode clamps on L1 when in three phase system.
CT-L2 (5,6): current transformer (CT2) for"zero export to CT"mode clamps on L2 when in three phase system.
CT-L3 (7,8): current transformer (CT3) for"zero export to CT"mode clamps on L3 when in three phase system.

CN2:

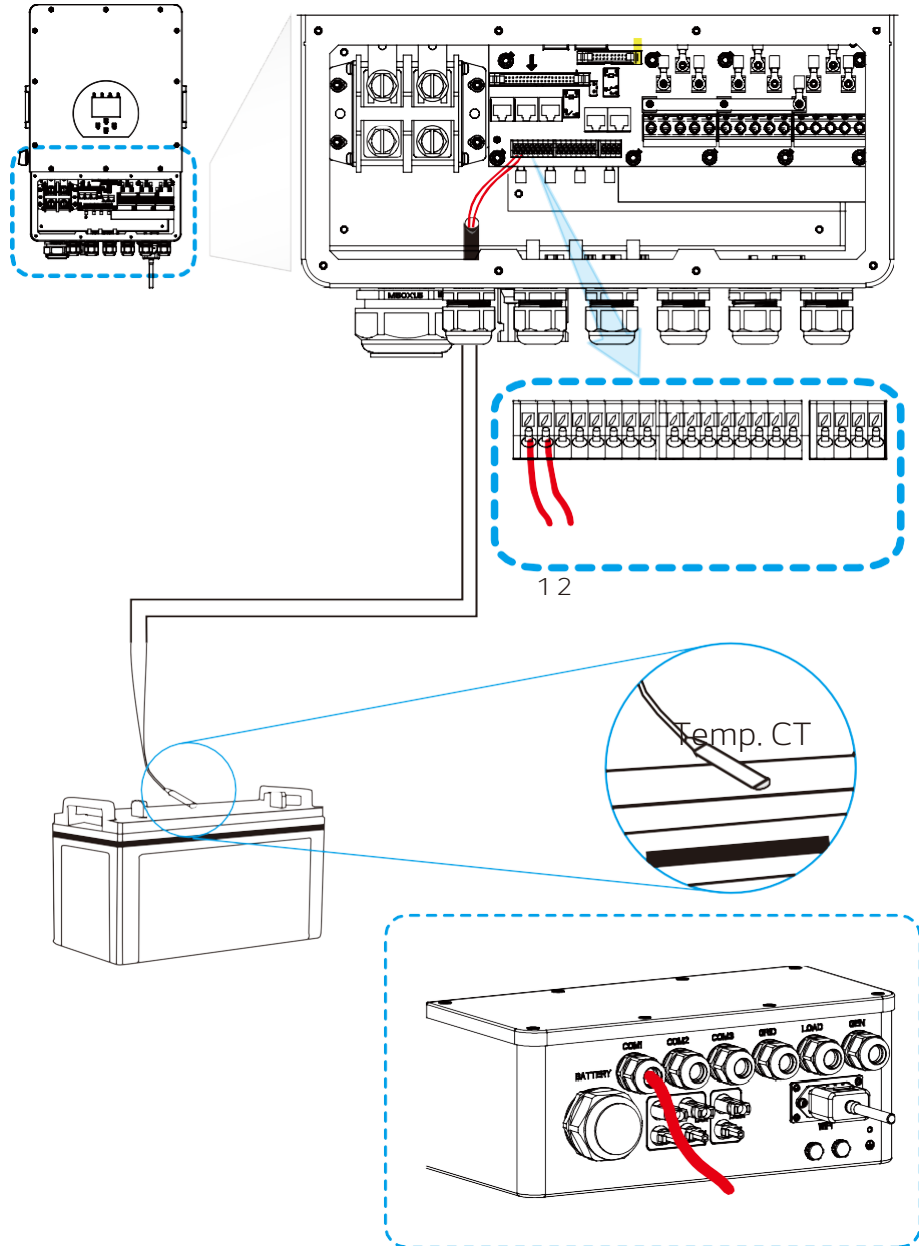
G-start (1,2): dry contact signal for startup the diesel generator.
When the "GEN signal" is ac□ve, the open contact (GS) will switch on (no voltage output).
G-valve (3,4): reserved.



RSD (7,8): When ba□ery is connected and the inverter is in "ON" status, it will provide

12Vdc.	GS (diesel generator startup signal)

3.3.3 Temperature sensor connec&#xfffd;on for lead-acid ba&#xfffd;ery



3.4 Grid connec﬩on and backup load connec﬩on

· Before connec﬩ng to grid, please install a separate AC breaker between inverter and grid. Also, it is recommended that installs an AC breaker between backup load and inverter.This will ensure the inverter can be securely disconnected during maintenance and fully protected from over current.The recommended of AC breaker for the load port is 20A for 8kw, 32A for 10kw and 32A for 12KW. The recommended of AC breaker for the grid port is 63A for 8kw, 63A for 10kw and 63A for 12KW.

· There are three terminal blocks with "Grid" "Load"and "GEN" markings. Please do not misconnect input and output connectors.

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

backup load connec﬩on

Model	*Wire Size*	*Cable(mm²)*	*Torque value(max)*
8/10/12KW	10AWG	4	1.2Nm

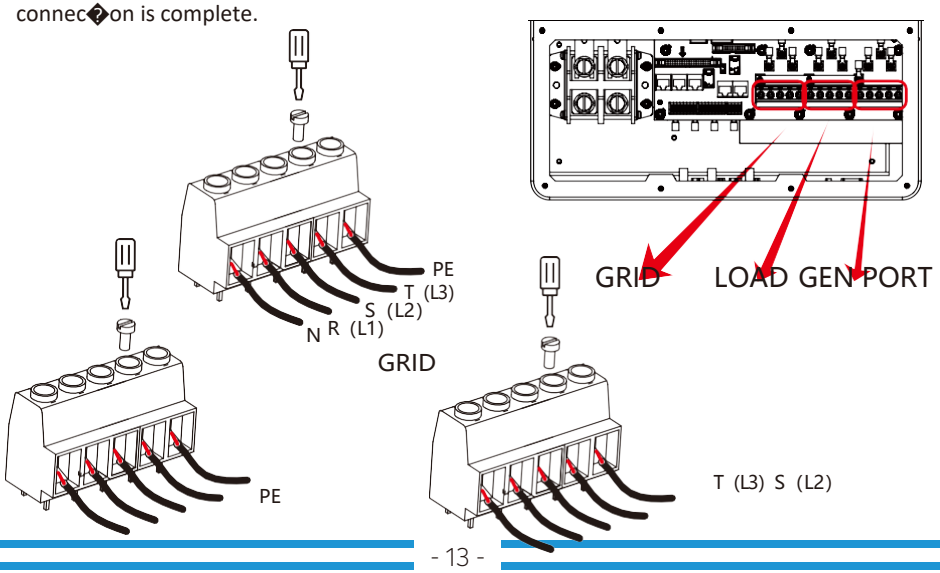
Grid connec﬩on

Model	*Wire Size*	*Cable(mm²)*	*Torque value(max)*
8/10/12KW	10AWG	6	1.2Nm

Chart 3-3 Recommended Size for AC wires

Please follow below steps to implement Grid, load and Gen port connec﬩on:

1. Before making Grid, load and Gen port connec﬩on, be sure to turn off AC baeaker or disconnector first.
2. Remove insula﬩on sleeve 10mm length, unscrew the bolts, insert the wires according to polari﬩es indicated on the terminal block and ﬩ghten the terminal screws. Make sure the connec﬩on is complete.




N
R (L1)
PE
S (L2)
T (L3)

LOAD N R (L1) GEN PORT

Be sure that AC power source is disconnected before a□emp□ng to wire it to the unit.

3. Then, insert AC output wires according to polari□es indicated on the terminal block and □ghten 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 condi□oner are required at least 2-3 minutes to restart because it is required to have enough □me to balance refrigerant gas inside of circuit. If a power shortage occurs and recovers in short □me, it will cause damage to your connected appliances. To prevent this kind of damage, please check manufacturer of air condi□oner if it is equipped with □me-delay func□on before installa□on. Otherwise, this inverter will trigger overload fault and cut off output to protect your appliance but some□mes it s□ll causes internal damage to the air condi□oner

3.5 PV Connec□on

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

Model	*Wire Size*	*Cable(mm^2)*
8/10/12KW	12AWG	4

Chart 3-4 Cable size

To avoid any malfunc□on, do not connect any PV modules with possible current leakage to the inverter. For example, grounded PV modules will cause current leakage to the inverter. When using PV modules, please be sure NO grounding.

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

3.5.1 PV Module Selecon:

When selecng proper PV modules, please be sure to consider below parameters:

1) Open circuit Voltage (Voc) of PV modules not exceeds max. PV array open circuit voltage of inverter.
2) Open circuit Voltage (Voc) of PV modules should be higher than min. start voltage.

Inverter Model	*8KW*	*10KW*	*12KW*
PV Input Voltage	550V (150V~800V)		
PV Array MPPT Voltage Range	200V-650V		
No. of MPP Trackers	2		
No. of Strings per MPP Tracker	1+1	2+1	2+1

Chart 3-5

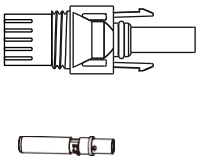
3.5.2 PV Module Wire Connecon:

1. Switch the Grid Supply Main Switch(AC)OFF.
2. Switch the DC Isolator OFF.
3. Assemble PV input connector to the inverter.

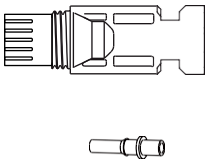
Safety Hint:
Please don't connect PV array posive or negave pole to the ground, it could cause serious damages to the inverter.

Safety Hint:
Before connecon, please make sure the polarity of the output voltage of PV array matches the "DC+" and "DC-" symbols.

Safety Hint:
Before connecng inverter, please make sure the PV array open circuit voltage is within the 1000V of the inverter.



Pic 5.1 DC+ male connector (MC4)



Pic 5.2 DC- female connector (MC4)

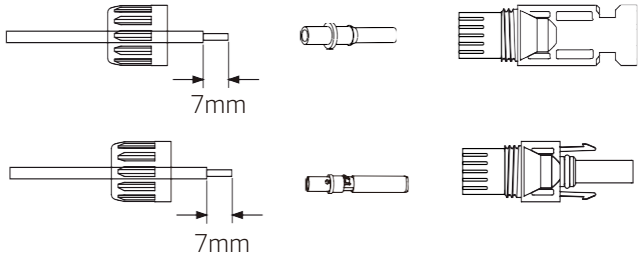
Safety Hint:
Please use approved DC cable for PV system.

Cable type	*Cross section* (mm²)	
	Range	*Recommended value*
Industry generic PV cable (model: PV1-F)	4.0~6.0 (12~10AWG)	4.0(12AWG)

Chart 3-6

The steps to assemble the DC connectors are listed as follows:

a) Strip off the DC wire about 7mm, disassemble the connector cap nut (see picture 5.3).

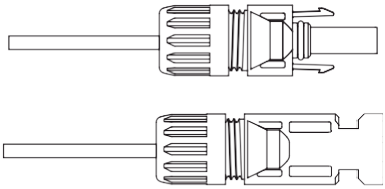


Pic 3.3 Disassemble the connector cap nut

b) Crimping metal terminals with crimping pliers as shown in picture 5.4.

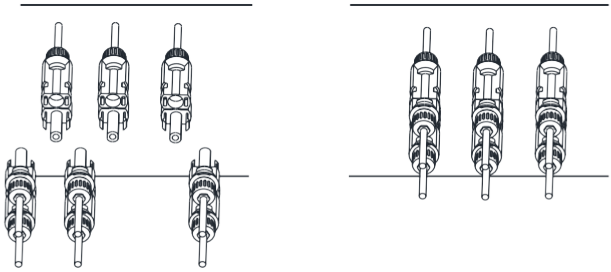
Pic 3.4 Crimp the contact pin to the wire

c) Insert the contact pin to the top part of the connector and screw up the cap nut to the top part of the connector. (as shown in picture 5.5).



Pic 3.5 connector with cap nut screwed on

d) Finally insert the DC connector into the posiﬀve and negaﬀve input of the inverter, shown as picture 5.6

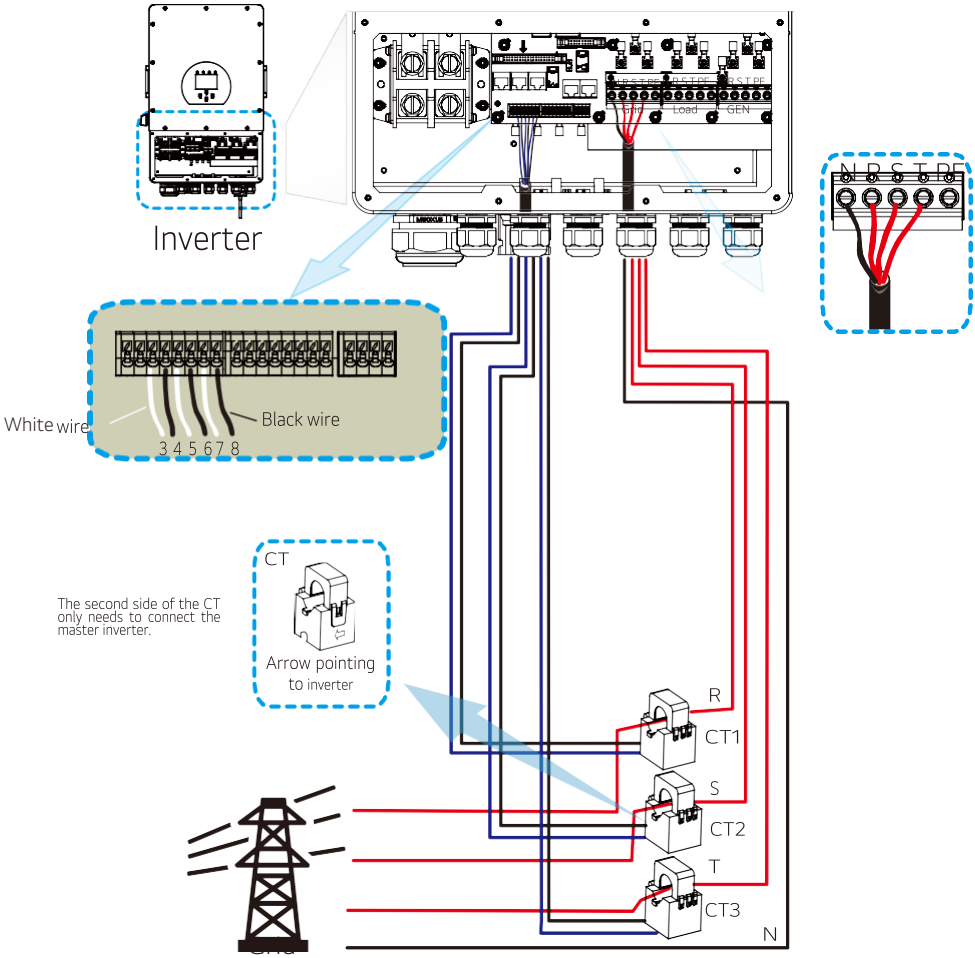


Pic 3.6 DC input connecﬀon

Warning:

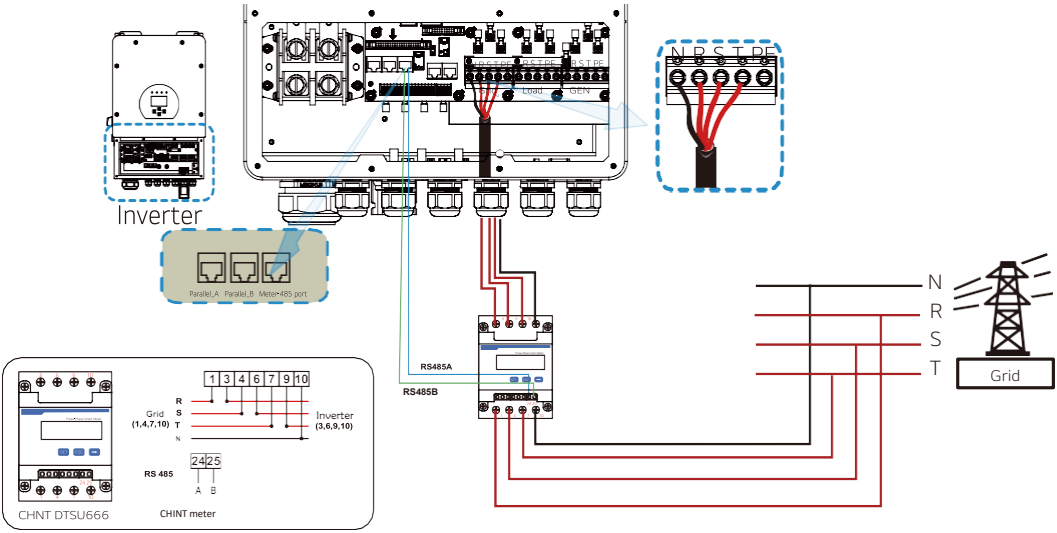
Sunlight shines on the panel will generate voltage, high voltage in series may cause danger to life. Therefore, before connecﬀng the DC input line, the solar panel needs to be blocked by the opaque material and the DC switch should be 'OFF', otherwise, the high voltage of the inverter may lead to life-threatening condiﬀons.

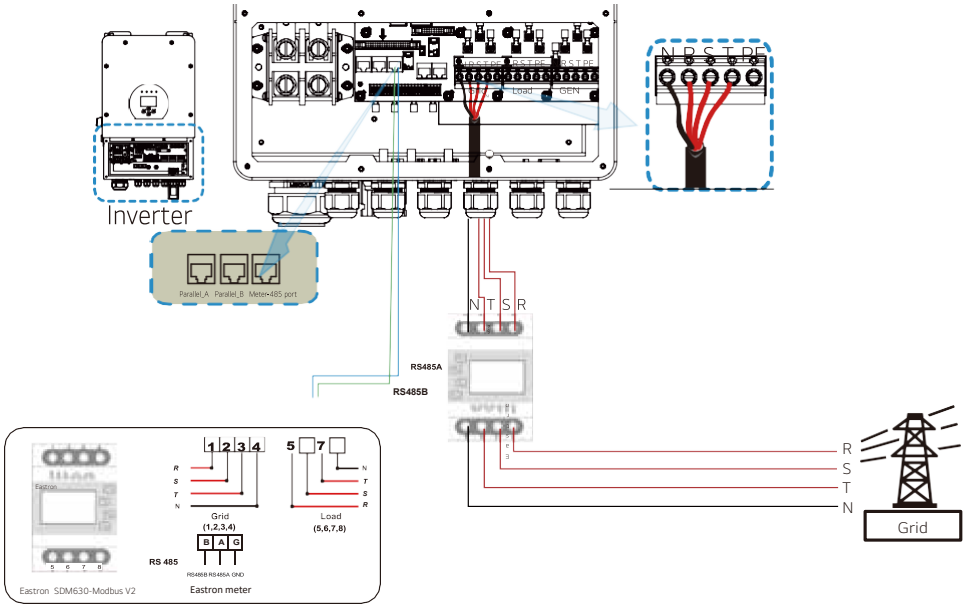
3.6 CT Connec&#xfffd;on



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

3.6.1 Meter Connec&#xfffd;on

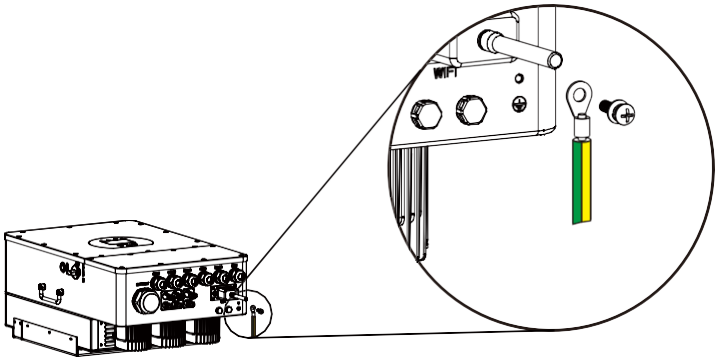




Note:
When the inverter is in the off-grid state, the N line needs to be connected to the earth.

3.7 Earth Connec&#xfffd;on(mandatory)

Ground cable shall be connected to ground plate on grid side this prevents electric shock. if the original protec&#xfffd;ve conductor fails.

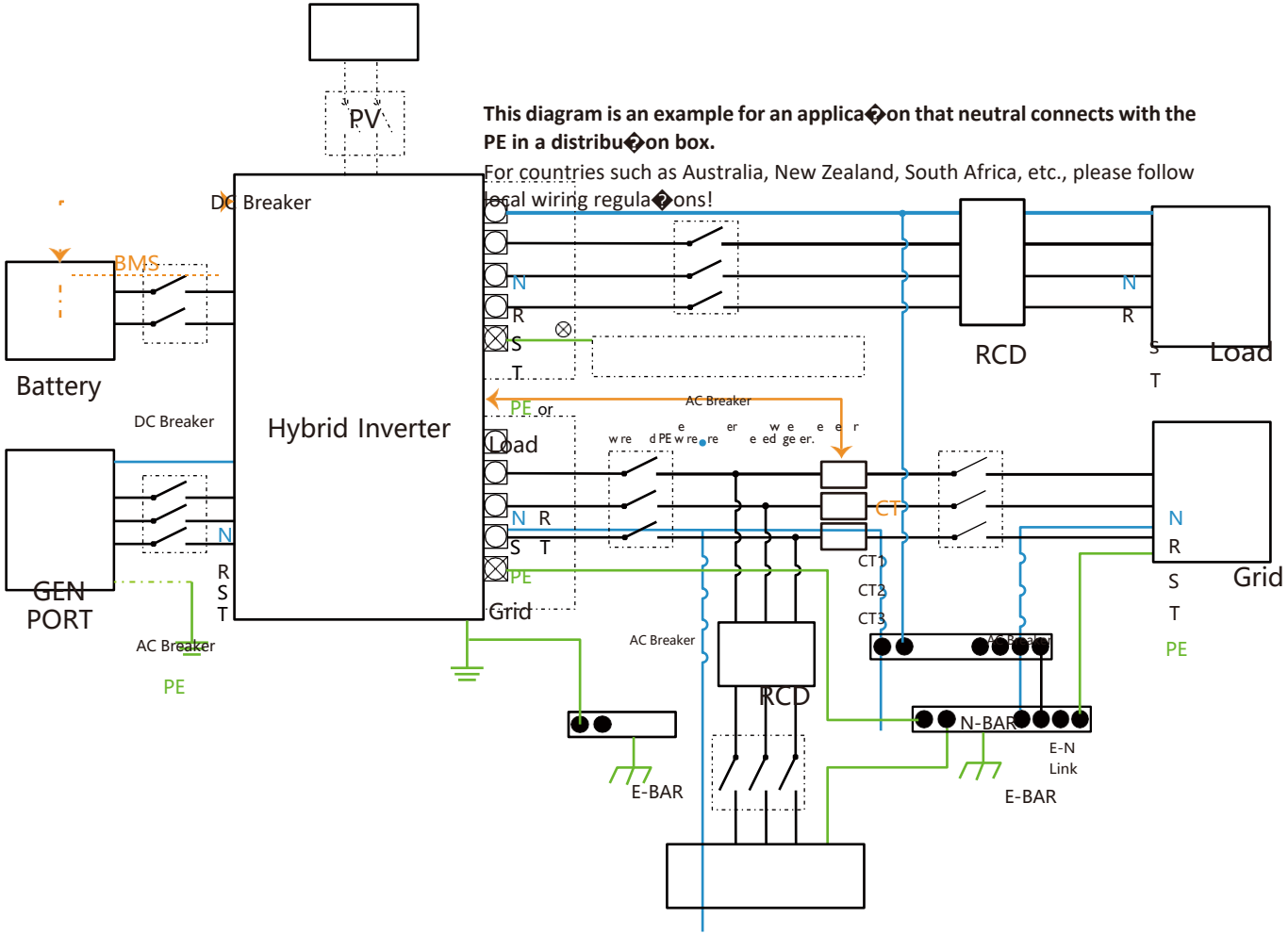


3.8 WIFI Connec&#xfffd;on

For the configura&#xfffd;on of Wi-Fi Plug, please refer to illustra&#xfffd;ons of the Wi-Fi Plug.

This diagram is an example for an applica□on that neutral connects with the PE in a distribu□on box.

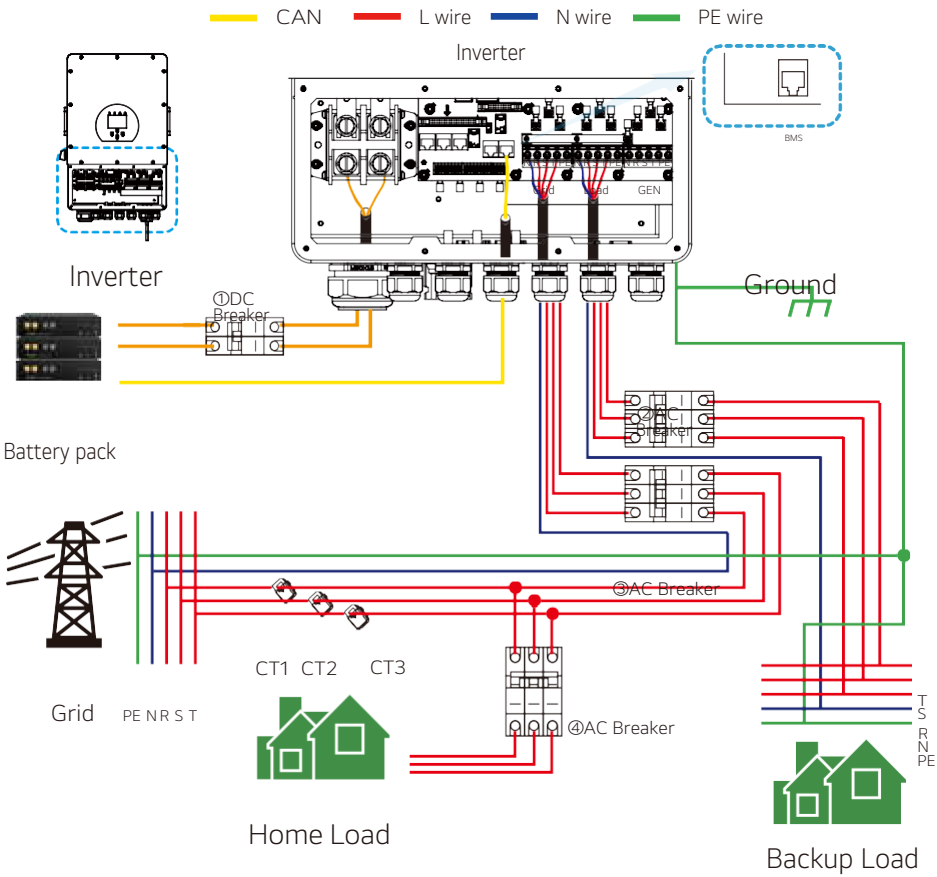
For countries such as Australia, New Zealand, South Africa, etc., please follow local wiring regula□ons!



N R S T PE

Home Loads

3.10 Wiring diagram



① DC Breaker for battery
SUN 8K-SG: 250A DC breaker

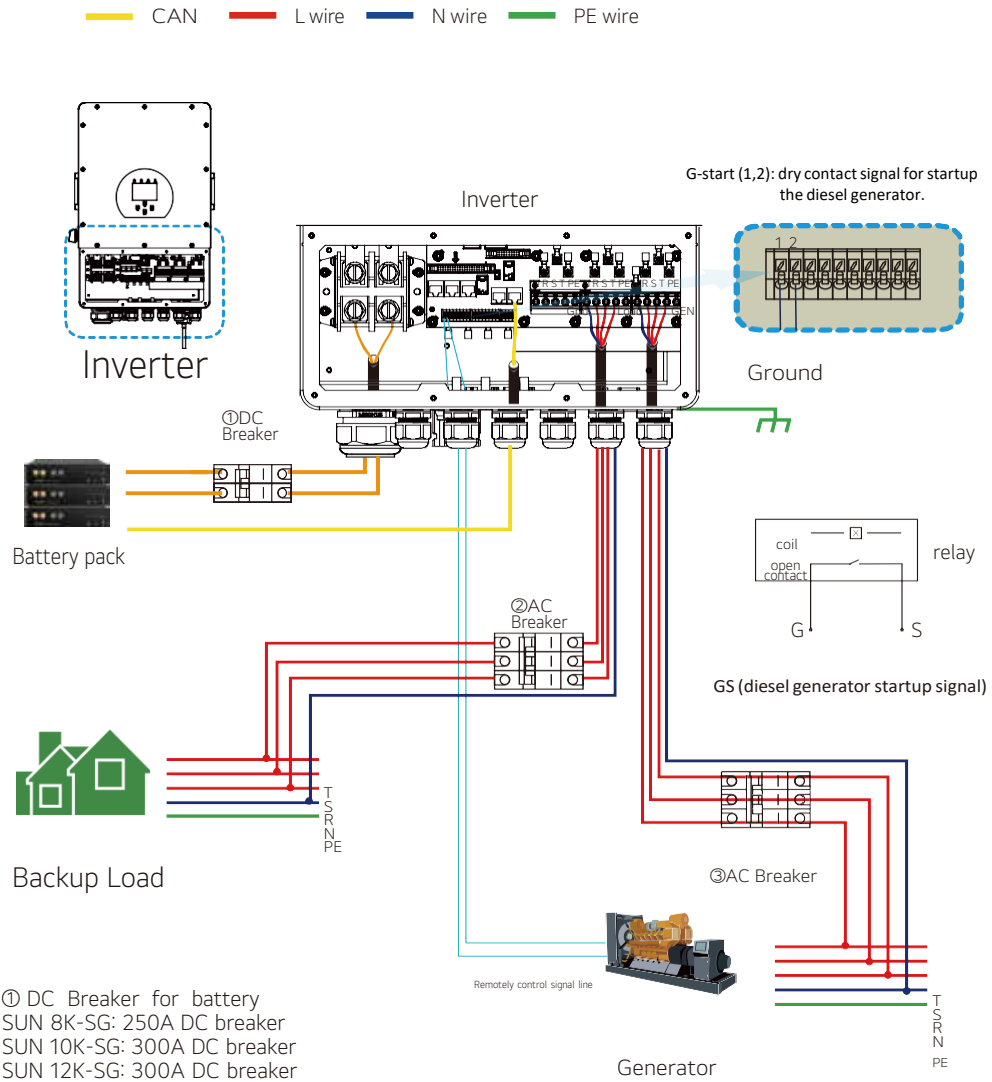
SUN 10K-SG:300A DC breaker
SUN 12K-SG:300A DC breaker

② AC Breaker for backup load
SUN 8K-SG: 20A AC breaker
SUN 10K-SG:32A AC breaker
SUN 12K-SG:32A AC breaker

③ AC Breaker for grid
SUN 8K-SG: 63A AC breaker
SUN 10K-SG:63A AC breaker
SUN 12K-SG:63A AC breaker

④AC Breaker for home load
Depends on household loads

3.11 Typical applica&#xfffd;on diagram of diesel generator

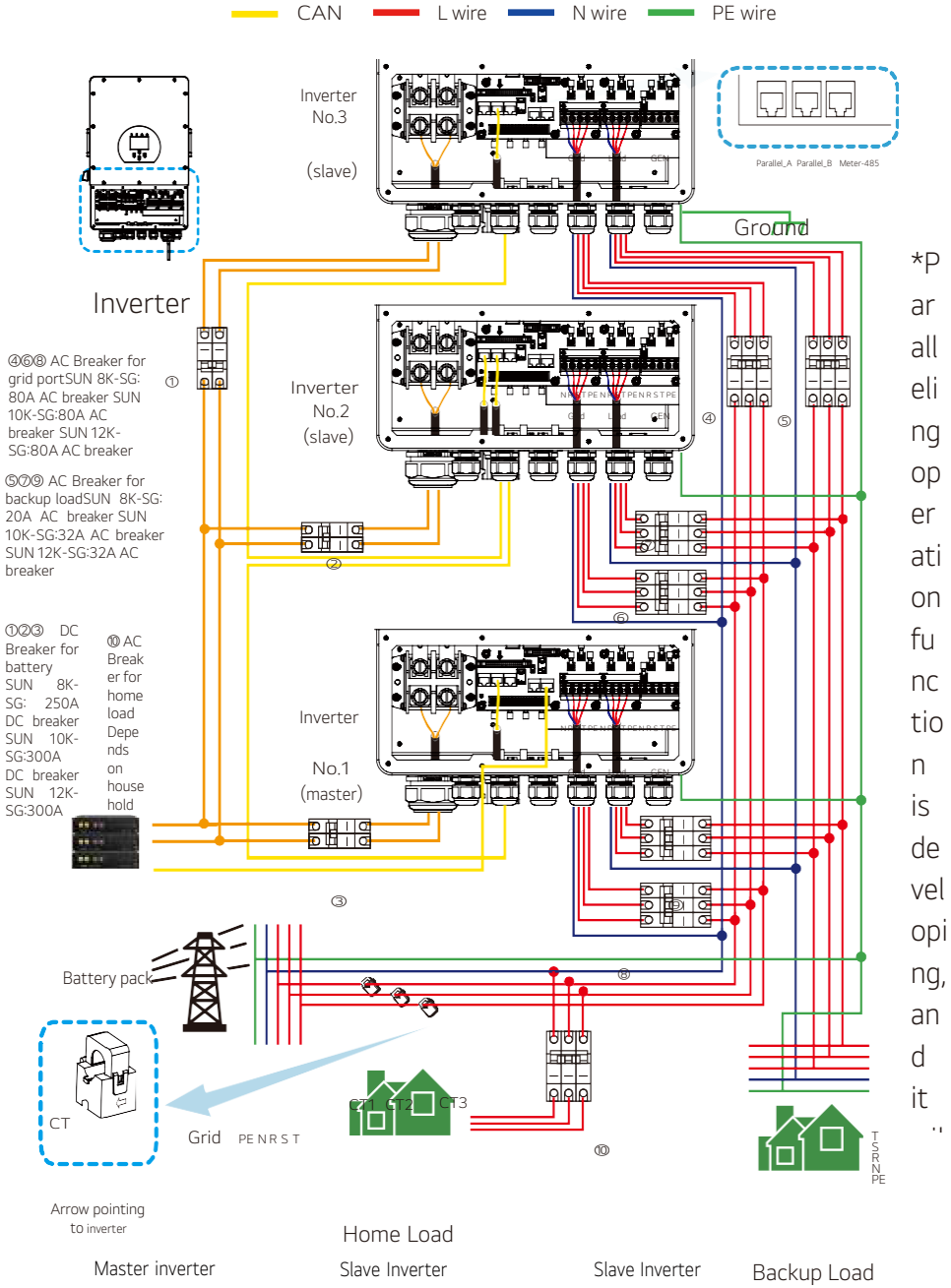


① DC Breaker for battery
SUN 8K-SG: 250A DC breaker
SUN 10K-SG: 300A DC breaker
SUN 12K-SG: 300A DC breaker

② AC Breaker for backup load
SUN 8K-SG: 20A AC breaker
SUN 10K-SG: 32A AC breaker
SUN 12K-SG: 32A AC breaker

③ AC Breaker for Generator port
SUN 8K-SG: 63A AC breaker
SUN 10K-SG: 63A AC breaker
SUN 12K-SG: 63A AC breaker

3.12 phase parallel connec﬩on diagram(Under development)



*Parallel operation function is developing, and it ''

Advanced Function	Advanced Function	Advanced Function
01	02	03
No Meter	No Meter	No Meter

4. OPERATION

4.1 Power ON/OFF

Once the unit has been properly installed and the ba□eries are connected well, simply press On/Off bu□on(located on the le□ side of the case) to turn on the unit. When system without ba□ery connected, but connect with either PV or grid, and ON/OFF bu□on is switched off, LCD will s□ll light up(Display will show OFF), In this condi□on, when switch on ON/OFF bu□on and select NO ba□ery,system can s□ll working.

4.2 Opera□on and Display Panel

The opera□on and display panel, shown in below chart, is on the front panel of the inverter. It includes four indicators, four func□on keys and a LCD display, indica□ng the opera□ng status and input/output power informa□on.

LED Indicator		*Messages*
DC	Green led solid light	PV Connec□on normal
AC	Green led solid light	Grid Connec□on normal
Normal	Green led solid light	Inverter opera□ng normal
Alarm	Red led solid light	Malfunc□on or warning

Chart 4-1 LED indicators

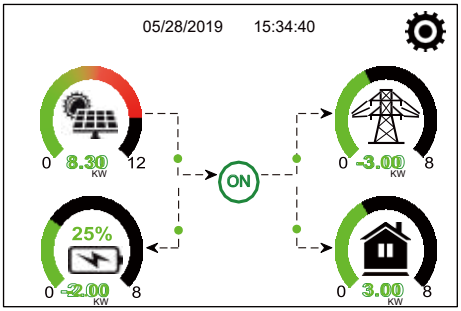
Function Key	*Description*
Esc	To exit se□ng mode
Up	To go to previous selec□on
Down	To go to next selec□on
Enter	To confirm the selec□on

Chart 4-2 Func□on Bu□ons

5. LCD Display Icons

5.1 Main Screen

The LCD is touchscreen, below screen shows the overall informaon of the inverter.



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

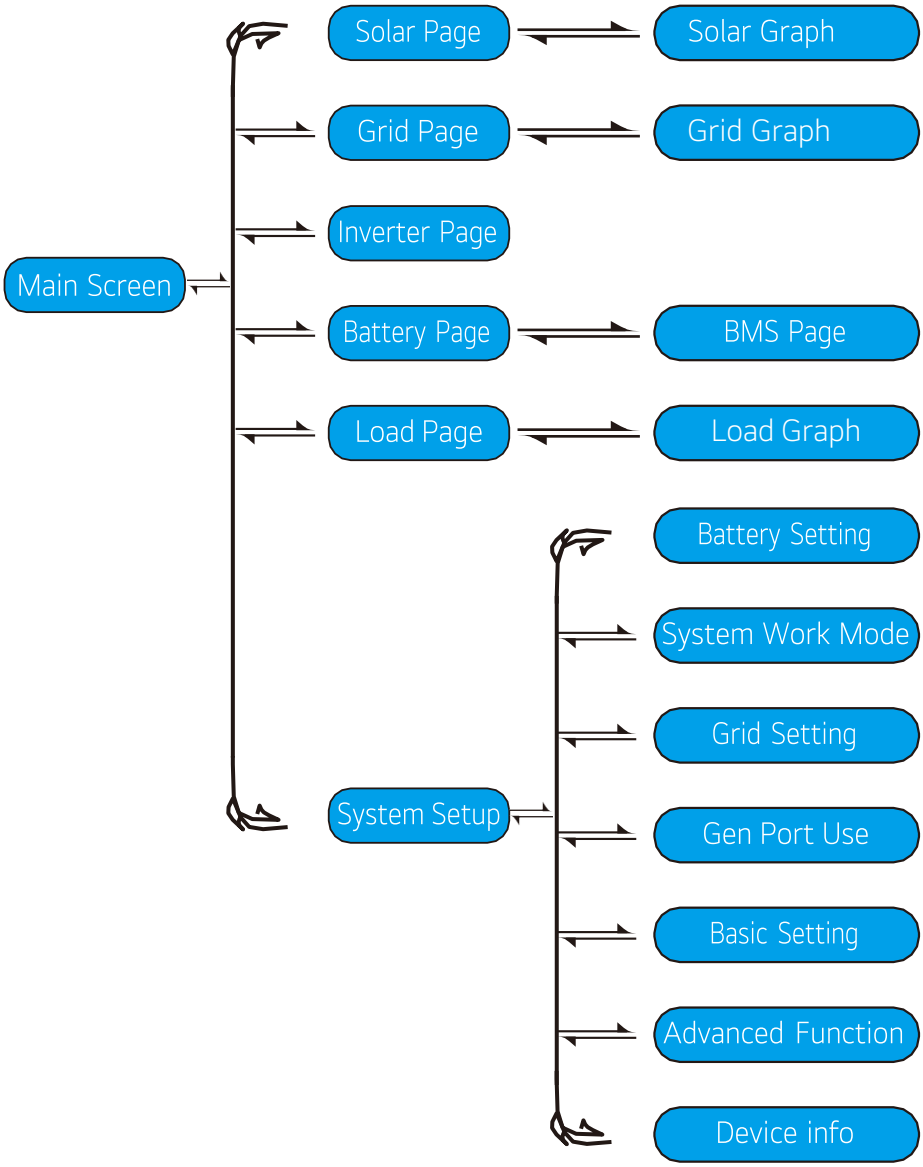
2. At the top of the screen is the me.

3. System Setup Icon, Press this set buon,you can enter into the system setup screen which including Basic Setup, Baery Setup, Grid Setup, System Work Mode, Generator port use, Advanced funcon and Li-Ba info.

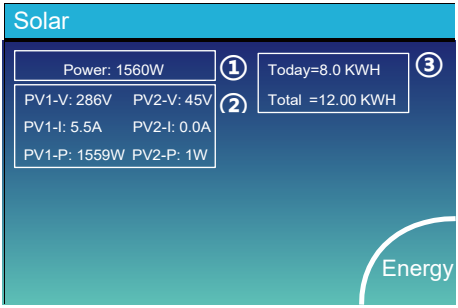
4. The main screen showing the info including Solar, Grid, Load and Baery. Its also displaying the energy flow direcon by arrow. When the power is approximate to high level, the color on the panels will changing from green to red so system info showing vividly on the main screen.

· PV power and Load power always keep posive.
· Grid power negave means sell to grid, posive means get from grid.
· Baery power negave means charge, posive means discharge.

5.1.1 LCD opera&#xFFFD;on flow chart



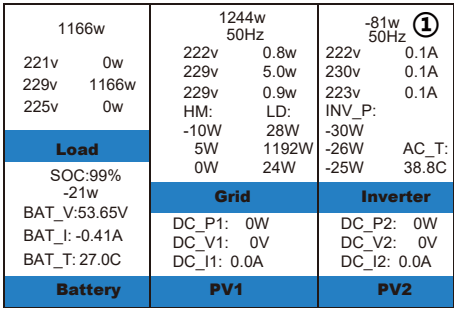
5.2 Solar Power Curve



This is Solar Panel detail page.

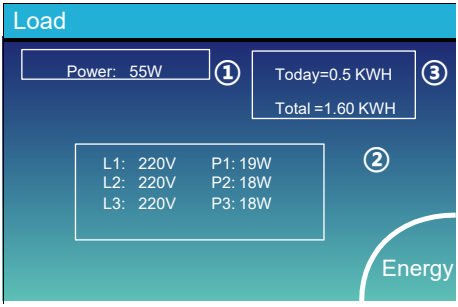
1. Solar Panel Genera on.
2. Voltage, Current, Power for each MPPT.
3. Solar Panel energy for Day and Total.

Press the "Energy "bu on will enter into the power curve page.



This is Inverter detail page.

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



This is Back-up Load detail page.

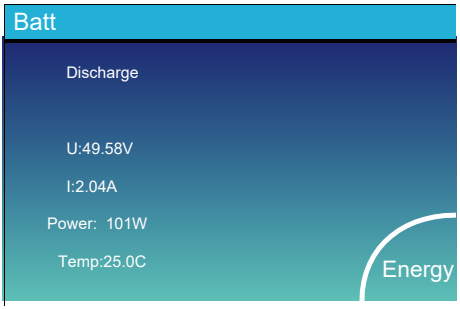
1. Back-up Power.
2. Voltage, Power for each Phase.
3. Back-up consump on for Day and Total.

Press the "Energy " bu on will enter into the power curve page.

This is Grid detail page.

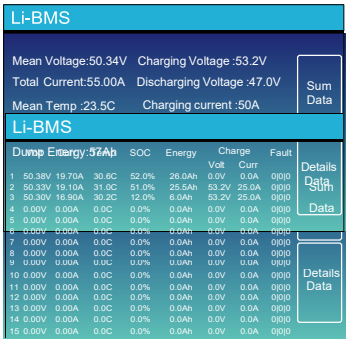
1. Status, Power, Frequency.
2. L: Voltage for each Phase
   CT: Power detected by the external current sensors
   LD: Power detected using internal sensors on AC grid in/out breaker
3. BUY: Energy from Grid to Inverter,
   SELL: Energy from Inverter to grid.

Press the "Energy " bu on will enter into the power curve page.

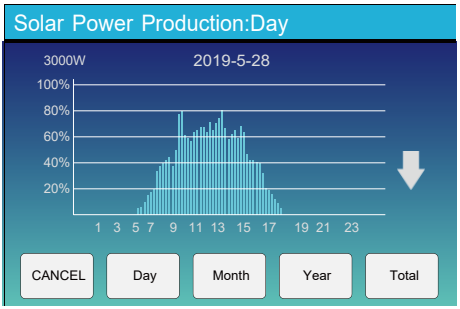


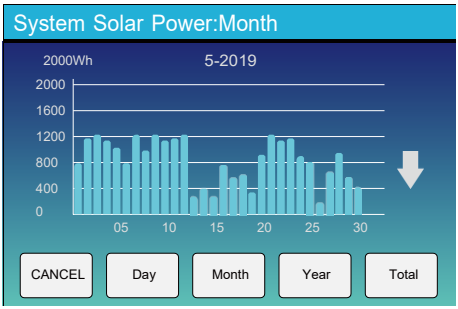
This is Baery detail page.

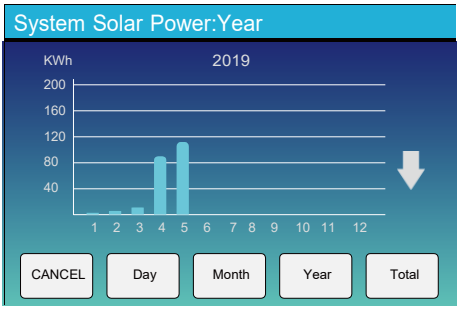
if you use Lithium Baery, you can enter BMS page.

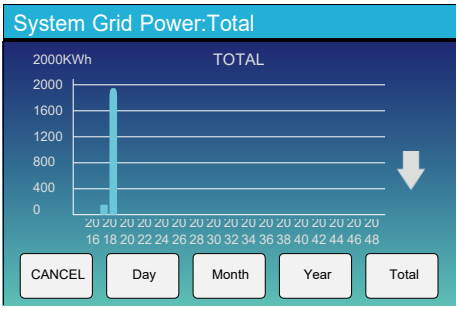


5.3 Curve Page-Solar & Load & Grid



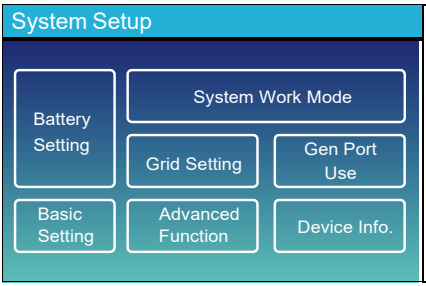






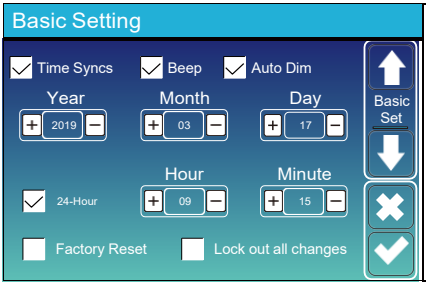
Solar power curve for daily, monthly, yearly and total can be roughly checked on the LCD, for more accuracy power generaon, pls check on the monitoring system. Click the up and down arrow to check power curve of different period.

5.4 System Setup Menu



This is System Setup page.

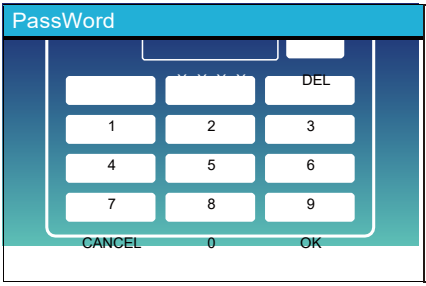
5.5 Basic Setup Menu



Factory Reset: Reset all parameters of the inverter.

Lock out all changes: Enable this menu for se◆ng 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 se◆ng.

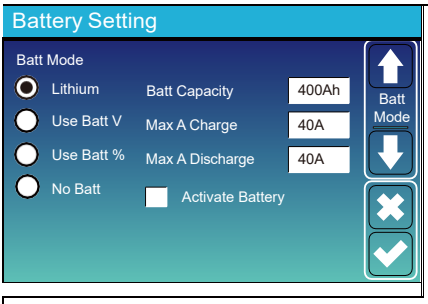
The password for factory se◆ngs is 9999 and for lock out is 7777.



Factory Reset PassWork: 9999

Lock out all changes PassWork: 7777

5.6 Baﬂery Setup Menu



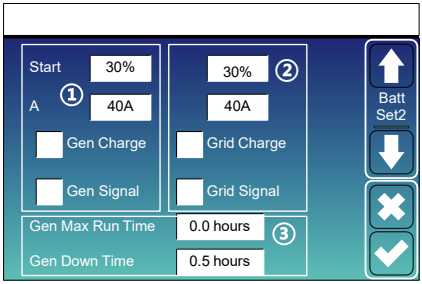
Baﬂery capacity: it tells Deye hybrid inverter to know your baﬂery bank size.

Use Baﬂ V: Use Baﬂery Voltage for all the seﬂngs (V).

Use Baﬂ %: Use Baﬂery SOC for all the seﬂngs (%).

Max. A charge/discharge: Max baﬂery charge/discharge current(0-115A for 5KW model, 0-90A for 3.6KW model). For AGM and Flooded, we recommend Ah baﬂery size x 20%= Charge/Discharge amps.
. For Lithium, we recommend Ah baﬂery size x 50% = Charge/Discharge amps.

. For Gel, follow manufacturer' s instrucﬂons.
No Baﬂ: ﬂck this item if no baﬂery is connected to the system.
Acﬂve baﬂery: This feature will help recover a baﬂery that is over discharged by slowly charging fm the solar array or grid.



This is Baﬂery Setup page. ①③

Start =30%: Percent S.O.C at 30% system will AutoStart a connected generator to charge the baﬂery bank.

A = 40A: Charge rate of 40A from the aﬂached generator in Amps.

Gen Charge: uses the gen input of the system to charge baﬂery bank from an aﬂached generator.

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

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

Gen Down Time: It indicates the delay ﬂme of the Generator to shut down aﬂer it has reached the running ﬂme.

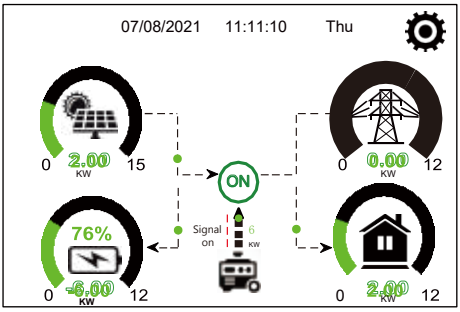
This is Grid Charge, you need select. ②

Start =30%: No use, Just for customizaﬂon.

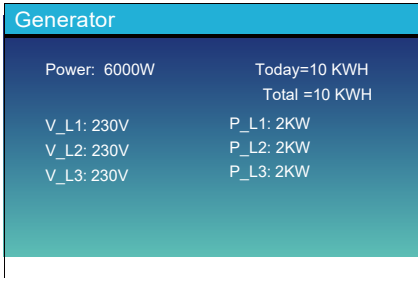
A = 40A: It indicates the Current that the Grid charges the Baﬂery.

Grid Charge: It indicates that the grid charges the baﬂery.

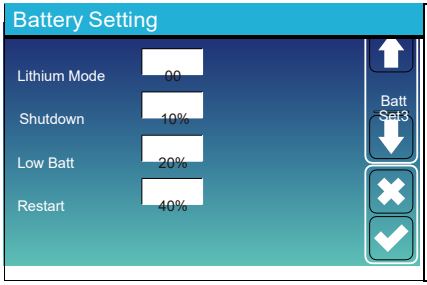
Grid Signal: Disable.



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



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

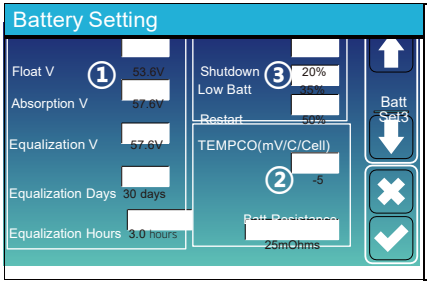


Lithium Mode: This is BMS protocol.Please reference the document(Approved Baery).

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

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

Restart 40%: Baery voltage at 40% AC output will resume.



There are 3 stages of charging the Baery . ①

This is for professional installers, you can keep it if you do not know. ②

Shutdown 20%: The inverter will shutdown if the SOC below this value.

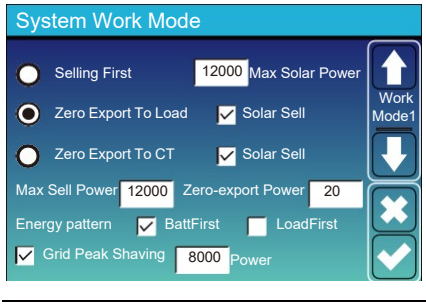
Low Ba 35%: The inverter will alarm if the SOC below this value. ③

Restart 50%: Baery SOC at 50% AC output will resume.

Recommended baery sengs

Battery Type	*Absorption Stage*	*Float Stage*	*Torque value (every 30 days 3hr)*
AGM (or PCC)	14.2v (57.6v)	13.4v (53.6v)	14.2v(57.6v)
Gel	14.1v (56.4v)	13.5v (54.0v)	
Wet	14.7v (59.0v)	13.7v (55.0v)	14.7v(59.0v)
Lithium	Follow its BMS voltage parameters		

5.7 System Work Mode Setup Menu



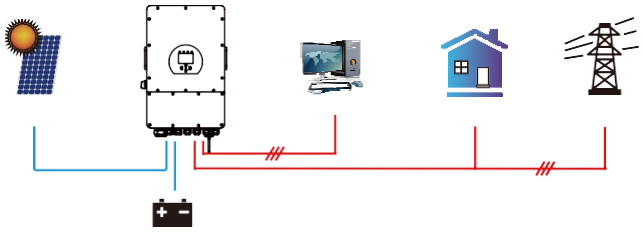
Work Mode

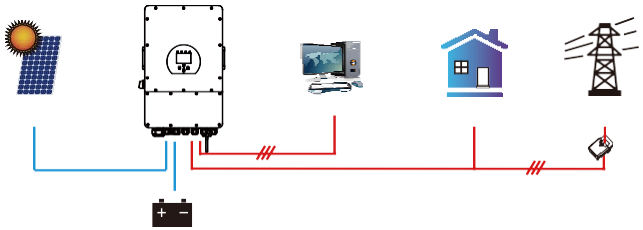
Selling First: This Mode allows hybrid inverter to sell back any excess power produced by the solar panels to the grid. If me of use is acve, the baery energy can be sold into grid.

The PV energy will be used to power the load and charge the baery and then excess energy will flow to grid.

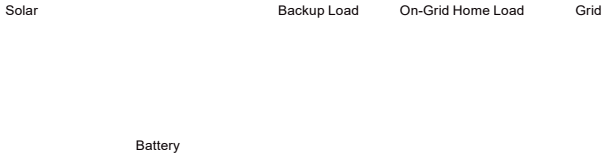
Power source priority for the load is as follows:

1. Solar Panels.
2. Grid.
3. Baeries (unl programable % discharge is reached).

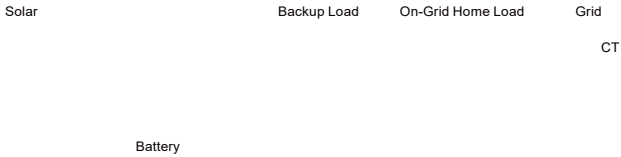




Zero Export To Load: Hybrid inverter will only provide power to the backup load connected. The hybrid inverter will neither provide power to the home load nor sell power to grid. The built-in CT will detect power flowing back to the grid and will reduce the power of the inverter only to supply the local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



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 baon method of the CT please refer to chapter 3.6 CT Connecery and home load.



Solar Sell: “Solar sell” is for Zero export to load or Zero export to CT: when this item is ac�ve, the surplus energy can be sold back to grid. When it is ac�ve, PV Power source priority usage is as follows: load consump�on and charge ba�ery 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.

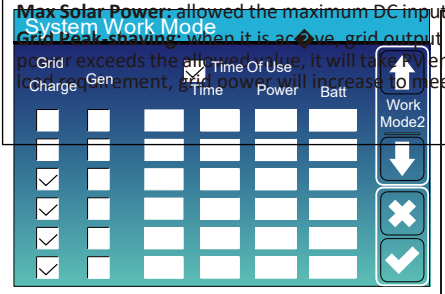
Energy Pa�ern: PV Power source priority.

Ba� First: PV power is firstly used to charge the ba�ery and then used to power the load. If PV power is insufficient, grid will make supplement for ba�ery and load simultaneously.

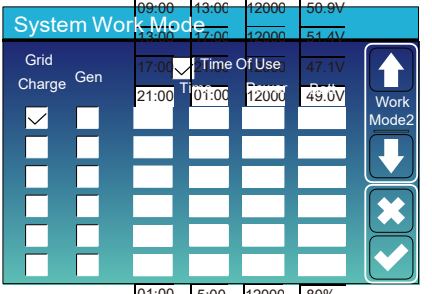
Load First: PV power is firstly used to power the load and then used to charge the ba�ery. If PV power is insufficient, Grid will provide power to load.

Max Solar Power: allowed the maximum DC input power.

Grid Peak-shaving: When it is ac�ve, grid output power will be limited within the set value. If the load power exceeds the set value, it will take PV energy and ba�ery as supplement. If still can't meet the load requirement, grid power will increase to meet the load needs.



01:00	5:00	12000	49.0V
05:00	9:00	12000	50.2V
09:00	13:00	12000	50.9V
13:00	17:00	12000	51.4V
17:00	21:00	12000	47.1V
21:00	01:00	12000	49.0V



01:00	5:00	12000	80%
05:00	8:00	12000	40%
08:00	10:00	12000	40%
10:00	15:00	12000	80%
15:00	18:00	12000	40%
18:00	01:00	12000	35%

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 check "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.

Grid charge: utilize grid to charge the battery in a time period.

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

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

Power: Max. discharge power of battery allowed.

action is to happen.

For example:

During 01:00-05:00, when battery SOC is lower than 80%, it will use grid to charge the battery until battery SOC reaches 80%.

During 05:00-08:00 and 08:00-10:00, when battery SOC is higher than 40%, hybrid inverter will discharge the battery until the SOC reaches 40%.

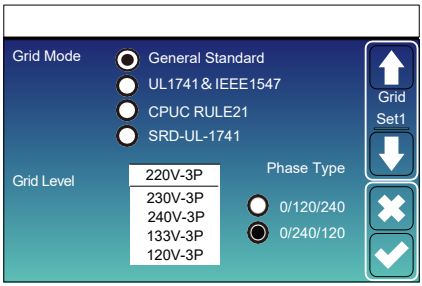
Batt (V or SOC %): battery SOC % or voltage at when the

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 18:00-01:00, when battery SOC is higher than 35%, hybrid inverter will discharge the battery until the SOC reaches 35%.

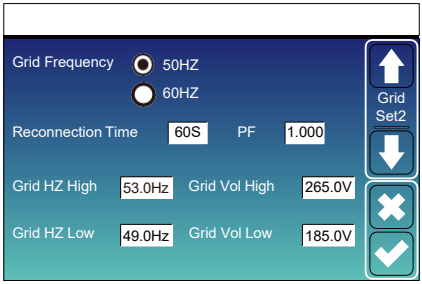
5.8 Grid Setup Menu



Please select the correct Grid Mode in your local area. If you are not sure, please choose General Standard.

Please select the correct Grid Type in your local area, otherwise the machine will not work or be damaged.

Phase type: When the inverter LCD shows “W03”which means the grid phase is error, please try to use "0/120/240".

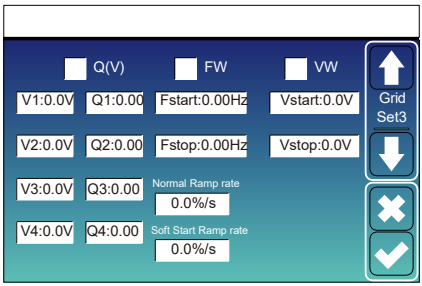


UL1741&IEEE1547, **CPUC RULE21**, **SRD-UL-1741**

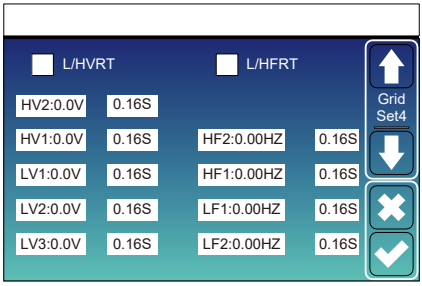
No need to set the funcon of this interface.

General Standard

Please select the correct Grid Frequency in your local area.
You can hole this in default value.

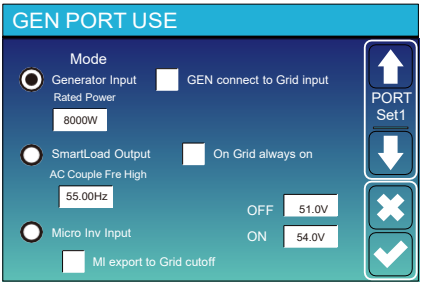


For California only.



For California only.

5.9 Generator Port Use Setup Menu



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: This mode u□lizes the Gen input connec□on as an output which only receives power when the ba□ery SOC and PV power is above a user programmable threshold.
e.g. ON: 100%, OFF=95%: When the PV power exceeds 500W, and ba□ery bank SOC reaches 100%, Smart Load Port will switch on automa□cally and power the load connected. When the ba□ery bank SOC < 95% , the Smart Load Port will switch off automa□cally.

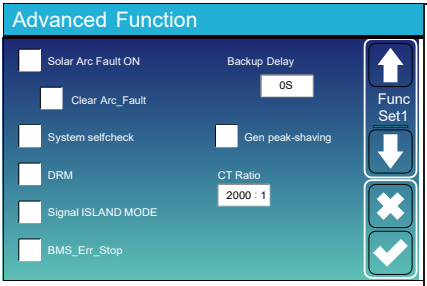
Smart Load OFF Ba□
• Ba□ery SOC at which the Smart load will switch off.
Smart Load ON Ba□
• Ba□ery SOC at which the Smart load will switch on. simultaneously and then the Smart load will switch on.
On Grid always on: When click "on Grid always on" the smart load will switch on when the grid is present.
Micro Inv Input: To use the Generator input port as a micro-inverter on grid inverter input (AC coupled), this feature will also work with "Grid-Tied" inverters.

* Micro Inv Input OFF: when the ba□ery SOC exceeds se□ng value, Microinveter or grid-□ed inverter will shut down.
* Micro Inv Input ON: when the ba□ery SOC is lower than se□ng value, Microinveter or grid-□ed inverter will start to work.

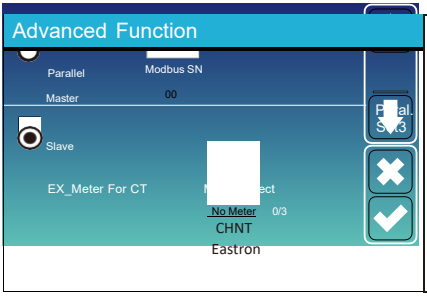
AC Couple Fre High: If choosing"Micro Inv input", as the ba□ery SOC reaches gradually se□ng value (OFF), During the process, the microinverter output power will decrease linear. When the ba□ery SOC equals to the se□ng value (OFF), the system frequency will become the se□ng value (AC couple Fre high) and the Microinverter will stop working.
MI export to grid cutsoff: Stop expor□ng power produced by the microinverter to the grid.

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

5.10 Advanced Func&#xfffd;on Setup Menu

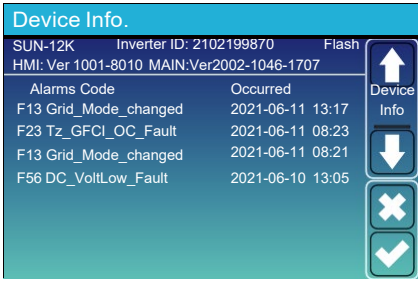


Solar Arc Fault ON: This is only for US.
System selfcheck: Disable. this is only for factory.
Gen Peak-shaving: Enable When the power of the generator exceeds the rated value of it, the inverter will provide the redundant part to ensure that the generator will not overload.
DRM: For AS4777 standard
Backup Delay: Reserved
BMS_Err_Stop: When it is ac&#xfffd;ve, if the ba&#xfffd;ery BMS failed to communicate with inverter, the inverter will stop working and report fault.
Signal island mode: Reserved.



Ex_Meter For CT: when using zero-export to CT mode, the hybrid inverter can select EX_Meter For CT func&#xfffd;on and use the different meters.e.g.CHNT and Eastron.

5.11 Device Info Setup Menu



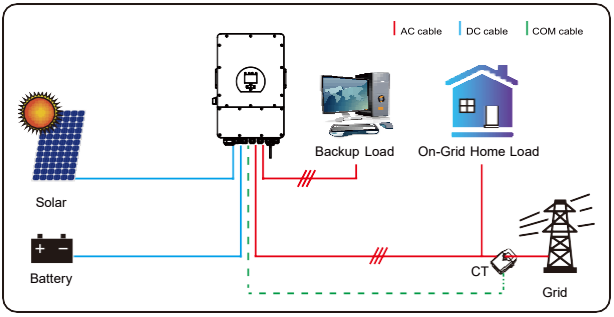
This page show Inverter ID, Inverter version and alarm codes.

HMI: LCD version

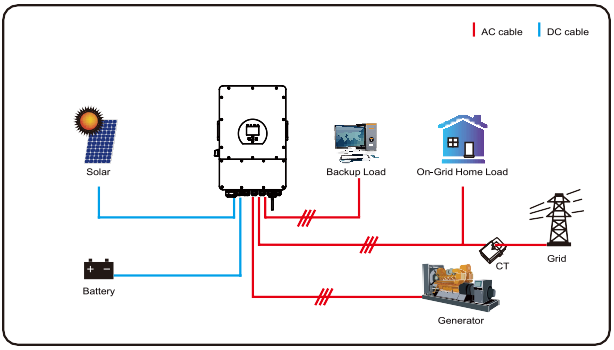
MAIN: Control board FW version

6. Mode

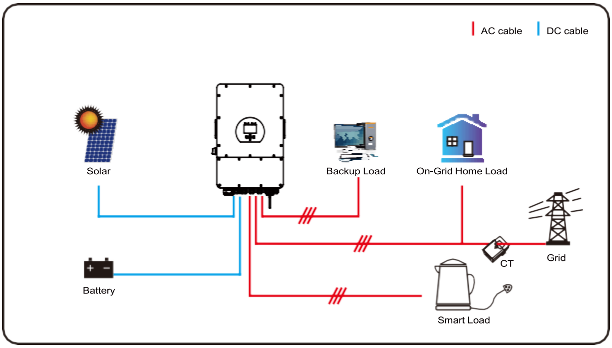
Mode I:Basic



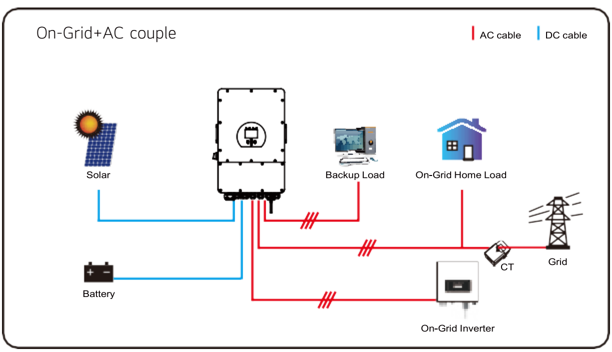
Mode II: With Generator



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.

Error code	Description	Solutions
F01	DC input polarity reverse fault	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 still same, and turn off the DC switch and AC switch and wait for one minute and then turn on the DC/AC switch; 6. Seek help from us, if can not go back to normal state.
F15	AC over current fault of software	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 in normal; 3. Seek help from us, if can not go back to normal state.
F16	AC leakage current fault	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	AC over current fault of hardware	AC side over current fault 1. Please check whether the backup load power and commonload power are within the range; 2. Restart and check whether it is in normal; 3. Seek help from us, if cannot go back to normal state.
F20	DC over current fault ofthe hardware	DC side over current fault 1. Check PV module connect and battery connect; 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. Turn off the DC switch and AC switch and then wait one minute, then turn on the DC/AC switch again; 4. Seek help from us, if can not go back to normal state.

Error code	Description	Solutions
F21	Tz_HV_Overcurr_fault	BUS over current. 1, Check the PV input current and battery current setting 2. Restart the system 2~3 times. 3. If the fault still exists, please contact us for help.
F22	Tz_EmergStop_Fault	Remotely shutdown 1, it tells the inverter is remotely controlled.
F23	Tz_GFCI_OC_ current is transient over current	Leakage current fault 1. Check PV side cable ground connection. 2. Restart the system 2~3 times. 3. If the fault still exists, please contact us for help.
F24	DC insulation failure	PV isolation resistance is too low 1. Check the connection of PV panels and inverter is firmly and correctly; 2. Check whether the PE cable of inverter is connected to ground; 3. Seek help from us, if can not go back to normal state.
F26	The DC busbar isunbalanced	1. Please wait for a while and check whether it is normal; 2. When the load power of 3 phases is big different, it will report the F26. 3 .When there's DC leakage current, it will report F26 4. Restart the system 2~3 times. 5. Seek help from us, if can not go back to normal state.
F48	AC lower frequency	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.
F29	Parallel CAN Bus fault	1. When in parallel mode, check the parallel communication cable connection and hybrid inverter communication address setting; 2. During the parallel system startup period, inverters will report F29.But when all inverters are in ON status, it will disappear automatically; 3. If the fault still exists, please contact us for help.
F34	AC Overcurrent fault	1, Check the backup load connected, make sure it is in allowed power range 2, If the fault still exists, please contact us for help
F41	Parallel system stop	1, Check the hybrid inverter work status. If there ≤ 1pcs hybrid inverter shutdown, all hybrid inverters will report F41 fault. 2, If the fault still exists, please contact us for help

F42	AC line low voltage	Grid voltage fault 1. Check the AC voltage is in the range of standard voltage inspecification; 2. Check whether grid AC cables are firmly and correctly connected; 3. Seek help from us, if can not go back to normal state.

Error code	Description	Solutions
F46	backup battery fault	1, Please check each battery status, such as voltage/ SOC and parameters etc., and make sure all the parameters are same. 2, If the fault still exists, please contact us for help
F47	AC over frequency	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 lower frequency	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.
F55	DC busbar voltage is too high	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.
F56	DC busbar voltage is too low	Battery voltage low 1. Check whether battery voltage is too low; 2. If the battery voltage is too low, using PV or grid to charge thebattery; 3. Seek help from us, if can not go back to normal state.
F58	BMS communication fault	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
F34	AC Overcurrent fault	1, Check the backup load connected, make sure it is in allowed power range 2, If the fault still exists, please contact us for help
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	Heat sink high temperaturefailure	Heat sink temperature is too high 1. Check whether the work 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 informaon

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 transportaﬧon of equipment；
· Damage caused by incorrect installaﬧon or commissioning；
· Damage caused by failure to comply with operaﬧon instrucﬧons, installaﬧon instrucﬧonso maintenance instrucﬧons；
· Damage caused by aﬧempts to modify, alter or repair products；
· Damage caused by incorrect use or operaﬧon；
· Damage caused by insufficient venﬧlaﬧon of equipment；
· Damage caused by failure to comply with applicable safety standards or regulaﬧons；
· Damage caused by natural disasters or force majeure (e.g. floods, lightning, overvoltage, storms, fires, etc.)

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

8. Datasheet

Model	*SUN-8K-SG04LP3*	*SUN-10K-SG04LP3*	*SUN-12K-SG04LP3*
Battery Input Date			
Baery Type	Lead-acid or Li-Ion		
Baery Voltage Range(V)	40-60V		
Max. Charging Current(A)	190A	210A	240A
Max. Discharging Current(A)	190A	210A	240A
Charging Curve	3 Stages / Equalizaon		
External Temperature Sensor	yes		
Charging Strategy for Li-Ion Baery	Self-adapon to BMS		
PV String Input Data			
Max. DC Input Power(W)	10400W	13000W	15600W
PV Input Voltage(V)	550V (150V~800V)		
MPPT Range(V)	200V-650V		
Start-up Voltage(V)	150V		
PV Input Current(A)	13A+13A	26A+13A	26A+13A
Max.PV ISC(A)	17A+17A	34A+17A	34A+17A
No. of MPPT Trackers	2		
No. of Strings Per MPPT Tracker	1+1	2+1	2+1
AC Output Data			
Rated AC Output and UPS Power(W)	8000	10000	12000
Max. AC Output Power(W)	8800	11000	13200
Peak Power(off grid)	2 mes of rated power, 10 S		
AC Output Rated Current(A)	12A	15A	18A
Max. AC Current(A)	18A	23A	27A
Max. Connuous AC Passthrough(A)	50A		
Output Frequency and Voltage	50/60Hz; 230/400Vac (Three phase)		
Grid Type	Three Phase		
Current Harmonic Distoron	THD<3% (Linear load<1.5%)		
Efficiency			
Max. Efficiency	97.60%		
Euro Efficiency	97.00%		
MPPT Efficiency	99.90%		
Protection			
PV Arc Fault Detecon	Integrated		
PV Input Lightning Protecon	Integrated		
An-islanding Protecon	Integrated		
PV String Input Reverse Polarity Protecon	Integrated		
Insulaon Resistor Detecon	Integrated		
Residual Current Monitoring Unit	Integrated		
Output Over Current Protecon	Integrated		
Output Shorted Protecon	Integrated		
Output Over Voltage Protecon	DC Type II / AC Type II		

Certifications and Standards	
Grid Regulaon	VDE 0126, AS4777, NRS2017, G98, G99, IEC61683, IEC62116, IEC61727
Safety Regulaon	IEC62109-1, IEC62109-2
EMC	EN61000-6-1, EN61000-6-3, FCC 15 class B
General Data	
Operang Temperature Rande(℃)	-25~60℃, >45℃ Derang
Cooling	Smart cooling
Noise(dB)	<55 dB
Communicaon with BMS	RS485; CAN
Weight(kg)	34.5
Size(mm)	422W×658H×281D
Protecon Degree	IP65
Installaon Style	Wall-mounted
Warranty	5 years