

Hybrid Energy Storage Inverter

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1. Notes on this Manual

1.1 Scope of Validity

This manual is an important part of hybrid energy storage inverters and describes the assembly, installation, commissioning, maintenance and fault types of the product. Read carefully before operation. The current hybrid series is the O6KL1DA-PLUS model.

1.2 Target Group

This manual is for qualified electricians. The tasks described in this manual only can be performed by qualified electricians.

1.3 Symbols Used

The following types of safety instructions and general information appear in this document as described below:



Danger!

"Danger "indicates a hazardous situation which, if not avoided, will result in death or serious injury.



Warning!

"Warning "indicates a hazardous situation which, if not avoided, could result in death or serious injury.



Caution!

"Caution" indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



Note!

"Note" provides tips that are valuable for the optimal operation of ours.

2. Safety

2.1 Safety Precautions



Danger!

- Danger to life from high voltages inside the inverter!
- All work must be carried out by qualified electrician.
- The appliance is not to be used by children or persons with reduced physical sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction.
- Children should be supervised to ensure that they do not play with the appliance.



Caution!

- Danger of burn injuries due to hot enclosure parts!
- During operation, the enclosure body may become hot.
- During operation, only the touch screen needs to be operated.



Caution!

- Do not stay within 20 cm of the inverter for extended periods. Possible health risks may arise from radiation effects!



Note!

- PV modules should have an IEC61730 class A rating.
- PV modules with IEC61730 class A can be used in systems higher than DC 50V or 240W, and these systems are potentially accessible or accessible to the public.



Warning!

- Ensure input DC voltage ≤Max. DC voltage. Over voltage may cause damage.
- Permanent damage to inverter or other losses, which will not be included in warranty!



Warning!

- Authorized service personnel must disconnect both AC and DC power from inverter before attempting any maintenance or cleaning or working on any circuits connected to inverter.



Warning!

- Do not touch anything other than the screen during operation, there is a risk of electric shock.

2.1.1 Important Safety Instructions

- Please keep the user manual properly. When operating equipment, in addition to following the general precautions in this document, follow the specific safety instructions. We will not be liable for any consequence caused by the violation of the safety operation regulations and design, production, and usage standards.
- Only accessories shipped together with the inverter are recommended. Other- wise may result in a risk of fire, electric shock, or injury to person.
- Make sure that existing wiring is in good condition and that wire is not undersized. Do not disassemble any parts of inverter which are not mentioned in installation guide. It contains no user-serviceable parts. See Warranty for instructions on obtaining service. Attempting to service the inverter yourself may result in a risk of electric shock or fire and will void your warranty.
- Keep away from flammable, explosive materials to avoid fire disaster.
- The installation place should be away from humid or corrosive substance.
- Authorized service personnel must use insulated tools when installing or working with this equipment.
- Never touch either the positive or negative pole of PV connecting device. Strictly prohibit touching both at the same time.
- The unit contains capacitors that remain charged to a potentially lethal voltage after the MAINS, battery and PV supply has been disconnected.
- Hazardous voltage will present for up to 5 minutes after disconnection from power supply.
- CAUTION-RISK of electric shock from energy stored in capacitor, never operate on the inverter couplers,the MAINS cables, Battery cables, PV cables or the PV generator when power is applied. After switching off the PV, battery, and Mains, always wait for 5minutes to let the intermediate circuit capacitors discharge before unplugging DC, battery in plug and MAINS couplers.
- When accessing the internal circuit of inverter, it is very important to wait 5 minutes before operating the power circuit or demounting the electrolyte capacitors inside the device. Do not open the device beforehand since the capacitors require time sufficiently discharge!
- The capacitors do not stop conducting electricity until the voltage at both ends falls below 30 volts.

2.1.2 PE Connection



WARNING!

- Earth connection essential before connecting supply.

Incorrect grounding can cause physical injury, death, equipment malfunction, and increase electromagnetic interference.

2.1.3 Battery Safety Instructions

Inverter should be worked with low voltage battery, for the specific parameters such as battery type, nominal voltage and nominal capacity etc. please refer to section 3.6.

As accumulator batteries may contain potential electric shock and short-circuit current danger, to avoid accidents that might be thus resulted, the following warnings should be observed during battery replacement:

(1) Do not wear watches, rings or similar metallic items.

(2) Use insulated tools.

(3) Put on rubber shoes and gloves.

(4) Do not place metallic tools and similar metallic parts on the batteries.

(5) Switch offload connected to the batteries before dismantling battery connection terminals.

(6) Only personal with proper expertise can carry out the maintenance of accumulator batteries.

(7) Ensure that the battery is not accidentally grounded. If accidentally grounded, please remove the power supply from the ground and contact any part of the grounded battery, which may cause electric shock. (Suitable for devices without grounded power circuits and remote battery power supplies). It can reduce the possibility of such electric shocks.

2.2 Explanation of Symbol

This section gives an explanation of all the symbols shown on the inverter and on the type label.

Symbols on the Type Label.

	Refer to the operating instructions.
	Products should not be disposed as household waste.
	Components of the product can be recycled.
	Danger of hot surface!
	Danger of high voltage and electric shock!
	Caution! Failure to observe a warning indicated in this manual may result in injury.

3. Introduction

3.1 Basic Features

The hybrid Energy Storage Inverter series is a high-quality inverter that converts solar energy into AC energy and stores the energy as a battery.

The inverter can be used to optimize self-consumption and store energy in the battery for future use. Work mode depends on PV energy and user's preference. It can provide power for emergency use during the grid lost by using the energy from battery and inverter (generated from PV).

3.2 System Diagram

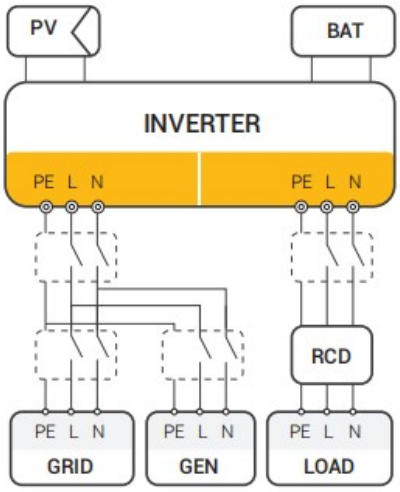


Figure3-1 O6KL1DA-PLUS System

All switches and RCD devices in the figure are for reference only, and the specific installation shall be subject to local regulations.

Note!

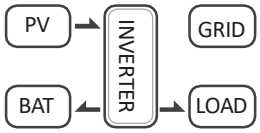
- Please control the home load and ensure that its output power is within the rated range; otherwise, the inverter will shut down with an "Overload" warning.
- Please confirm with the mains grid operator whether there is any special regulations for grid connection.

3.3 Work Modes

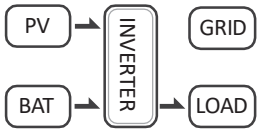
The inverter offers multiple working modes according to different requirements.

Work mode: Self Consumption

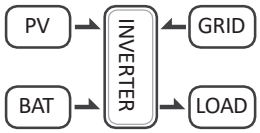
I. When PV, Grid/Gen, Battery is available:



Solar energy provides power to the loads as first priority, If the solar energy is sufficient to power all connected loads, then the surplus solar energy will charge the battery.

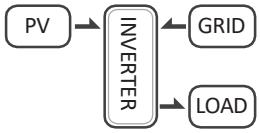


Solar energy provides power to the loads as first priority., If solar energy is not sufficient to power all connected loads, battery energy will supply power to the loads at the same time.



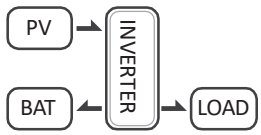
Solar energy provides power to the loads as first priority, If solar energy and battery are not sufficient to power all connected loads, utility energy (Main Grid/Gen) will supply power to the loads with solar energy at the same time.

II. When PV, Grid/Gen is available (without battery):

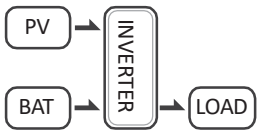


Solar energy provides power to the loads as first priority, if solar energy is sufficient to power all connected loads, Grid/Gen energy will supply power to the loads at the same time.

III. When PV, Battery is available (Grid/Gen is disconnected):



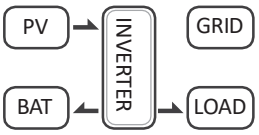
Solar energy provides power to the loads as first priority, if solar energy is sufficient to power all connected loads, solar energy will provide to charge battery.



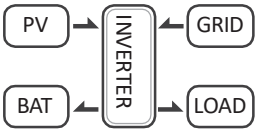
Solar energy provides power to the loads as first priority, if solar energy is not sufficient to power all connected loads, battery energy and solar energy will supply power to the loads at the same time.

Work mode: Battery Priority

I. When PV, Grid/Gen, Battery is available:

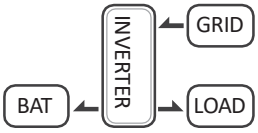


Solar energy will charge battery as first priority, if solar energy is excess, the excess power will supply load. If there is still excess energy, the surplus power will be limited.



Solar energy will charge battery as first priority, if solar energy is excess, the excess power will supply load. If solar energy is not sufficient to charge battery and supply loads, grid/gen will supply power to loads.

II. When Grid/Gen, Battery is available (PV is disconnected):



Grid/Gen will supply power to load and charge battery at the same time.

Note!

- Once on the work mode of Self Consumption, battery priority, hybrid energy storage inverters do not supply power to the grid.
- PV cannot provide energy to the load alone, and needs to be connected to the battery or the grid at the same time.

In addition to the above three basic modes, there is also an “Advanced Mode”. Please refer to Chapter 7 for details.

3.4 Dimension

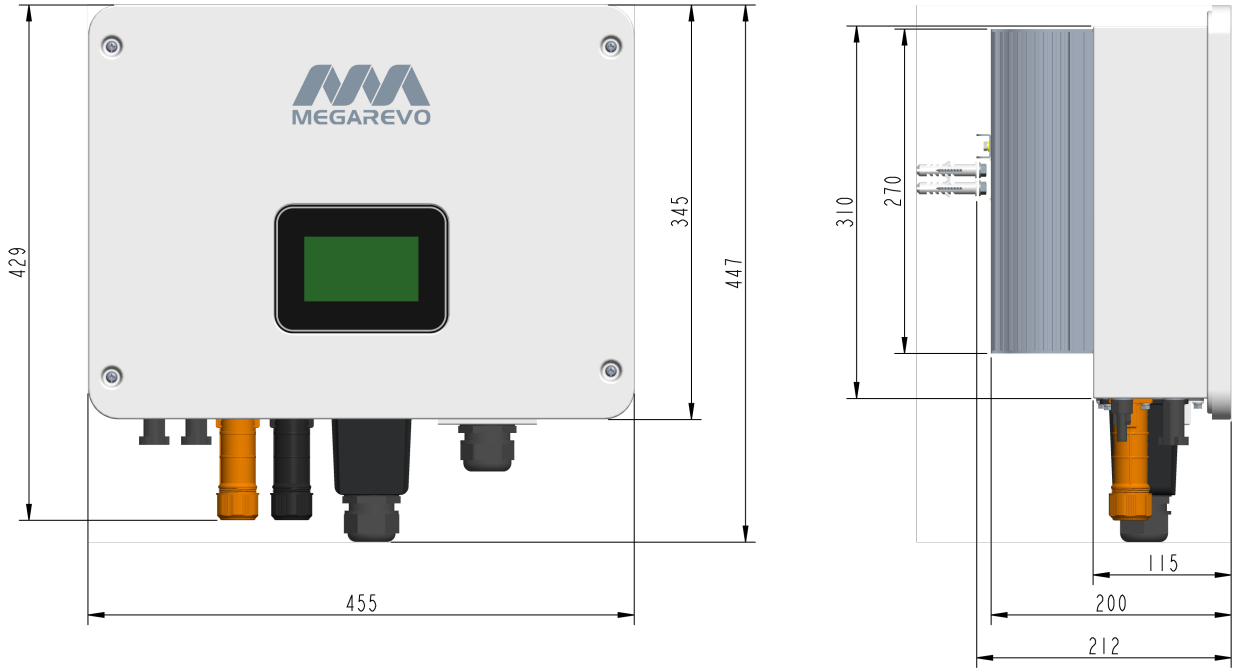
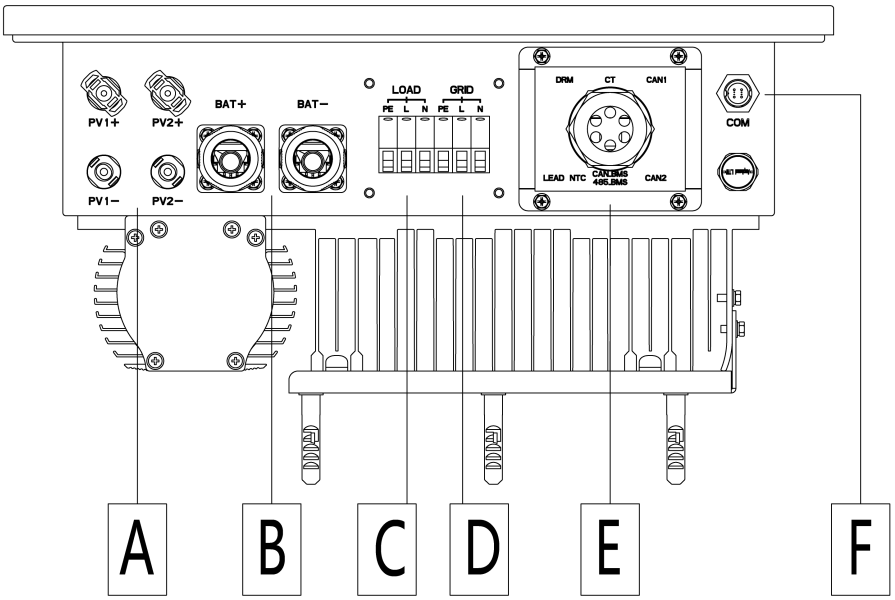


Figure3-2



3.5 Energy storage inverter terminal

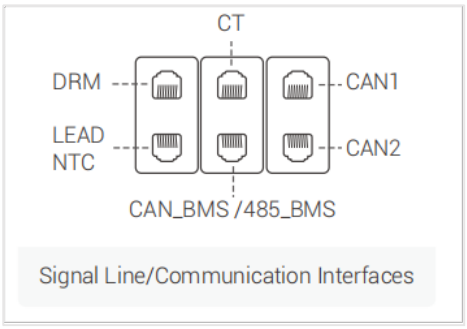
Object	Description
A	PV input

B	BAT input
C	Load
D	Grid
E	DRM/LEAD NTC/CT/CAN_BMS/485_BMS/CAN1/CAN2
F	COM1(WIFI)

Table 3.1

WARNING!

Qualified electrician will be required for the installation.



DRM	CT	CAN1
LEAD NTC	CAN_BMS 485_BMS	CAN2

Table 3.2

***Port Function**

- CAN1/CAN2: Parallel communication.
- CAN_BMS/ 485_BMS: BMS communication for lithium batteries.
- CT: For external grid side CT to detect current size.
- DRM: Demand response modes.
- LEAD NTC: Used for communication of battery temperature.

3.6 Technical Parameters

Technical Data	O6KL1DA-PLUS
PV Input Data	
MAX PV Input Power	12kW
MPPT Tracker/Strings	2/2
MAX PV Input Voltage	500V
MPPT Voltage Range	100-430V
MAX Input Current	16+16A
Short Circuit Current	24+24A
Battery Input Data	
Nominal Voltage	48V
Battery Voltage Range	40-58V
MAX Charging /Discharging Current	120A/120A
Battery Type	Lithium Or Lead Acid Battery
Charging Strategy for Li-Ion Battery	Self-adaption to BMS
AC Output Data(hybrid)	
Nominal Output Power	6KW
Nominal Output Voltage	230Vac
Output Frequency	50/60Hz
AC Input/Output Rated Current	26A
Max, AC Input/Output Current	28.6A
Output Power Factor	1(0.8Leading…0.8Lagging)
THDU	< 3%
Switching Time	10ms
AC Input Data (On-Grid)	
Nominal Input Voltage	230Vac
Grid Voltage Input Range	176-270Vac
Nominal Grid Voltage	50/60Hz
THDI	< 3%
Type Of Grid Connection	L+N+PE
AC Input Data(On-GEN)	
Maximum Input Power	6KW
Maximum Input Current	26A

Efficiency	
Max Efficiency	97.4%
Protection	
Island Protection	YES
Insulation Resistor Detection	YES
PV Input Reverse Protection	YES
Output Over Current Protection	YES
Output Short Protection	YES
Output Over Voltage Protection	YES
Output Under Voltage Protection	YES
AC/DC Surge Protection	YES
General Data	
Operating Temperature Range	-25 - +60℃
Relative Humidity	5-95%
Operating Altitude	0-2000m
Ingress Protection	IP65
Weight	18kg
Size (Width*Depth*Height)	455*200*447mm
Cooling	Natural Convection
Noise Emission	<35dB
Display	Color Screen
Communication With RS485/WIFI/GPRS/CAN/DRM	Possess/Optional/Optional/Possess/Possess
Standby Loss	< 15W
Pollution Degree	II
Topology	Non-isolated

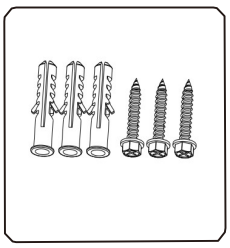
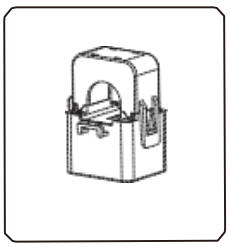
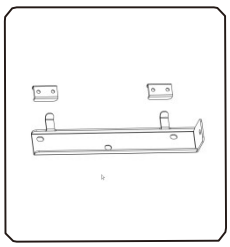
4. Installation

4.1 Check for Physical Damage

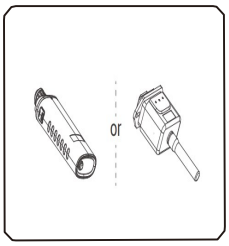
Make sure the inverter is intact during transportation. If there is any visible damage, such as cracks, please contact your dealer immediately.

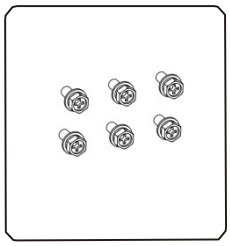
4.2 Packing List

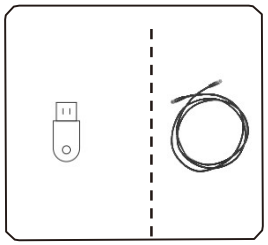
Open the package and take out the product, please check the accessories first. The packing list shown as below.

A B C D







E F G H I G

Object	Description
A	Inverter
B	Expansion Pipe and Self-tapping Screw
C	CT (CTSA016-90A-90mA, inner radius 16mm)
D	Hanger
E	WIFI Module or GPRS Module (Optional)
F	PV Connectors (2*Positive, 2*Negative)
G	Hex Head Bolt
H	User Manual
I	USB flash drive
G	2M Parallel Machine Line (Optional)

4.3 Mounting

➢ **Installation Precaution**

Inverter is designed for indoor installation (IP 65). Make sure the installation site meets the following 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 2000m above sea level.
- Not in environment of precipitation or humidity (> 95%).
- Under good ventilation condition.
- The ambient temperature in the range of -25 ~ +60°C.
- The slope of the wall should be within ± 5°.
- The wall hanging the inverter should meet conditions below:

  1. solid brick/concrete, or strength equivalent mounting surface.
  2. the inverter must be supported or reinforced if the wall's strength is insufficient (such as wooden wall, the wall covered by thick layer of decoration).

  Please AVOIDE direct sunlight, rain exposure, snow laying up during installation and operation.

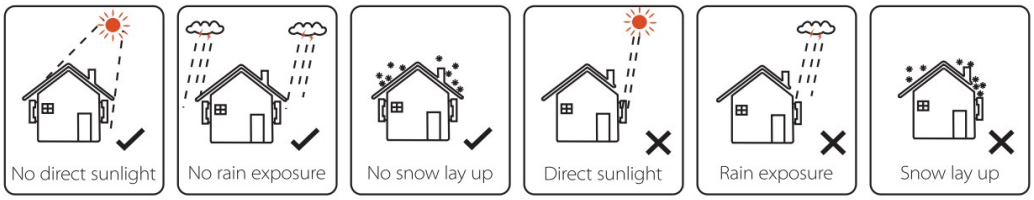
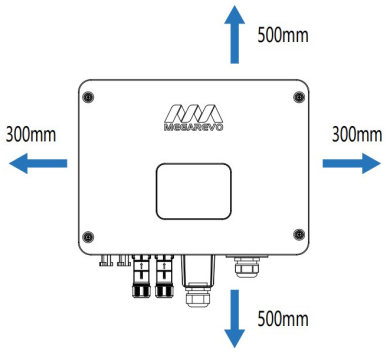


Figure4-1 Recommended Installation Locations

➢ **Space Requirement**



Position	Min. size
Left	300mm
Right	300mm
Top	500mm
Bottom	500mm
Front	1000mm

Figure4-2 Inverter Mounting Clearance

➢ **Installation**

Tools required for installation.

Installation tools: crimping pliers for binding post and RJ45, screwdriver, manual wrench etc.

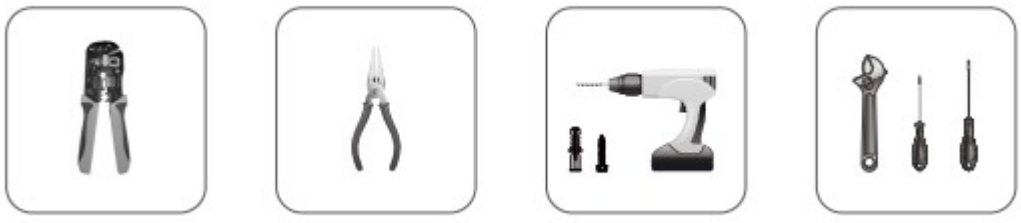


Figure4-3 Installation tools

Step 1: Mounting the hanging rack on the wall

1. Place the hanging rack on the wall, mark the location of the 3 holes and then remove it.
2. Drill holes with a drill, making sure they are deep enough (about 50~60 mm) to support the inverter.
3. Then install the expansion pipes into the hole with a proper hammer, and fix the hanging rack with self-tapping screws.

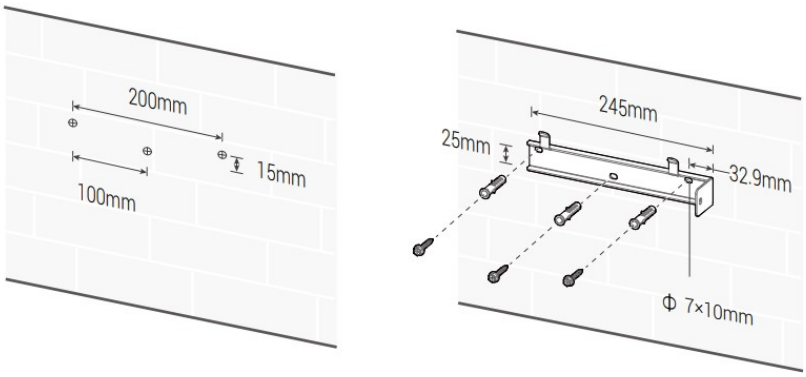


Figure4-4 Inverter wall mounting

Step 2: Lift the inverter and fix the inverter to the wall by aligning the hole of the inverter with the expansion bolt.

Step 3: Tighten the fixing screws on the right side of the inverter.

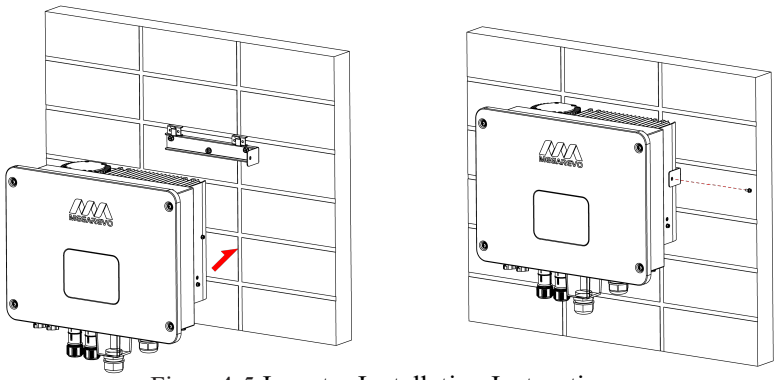


Figure4-5 Inverter Installation Instructions

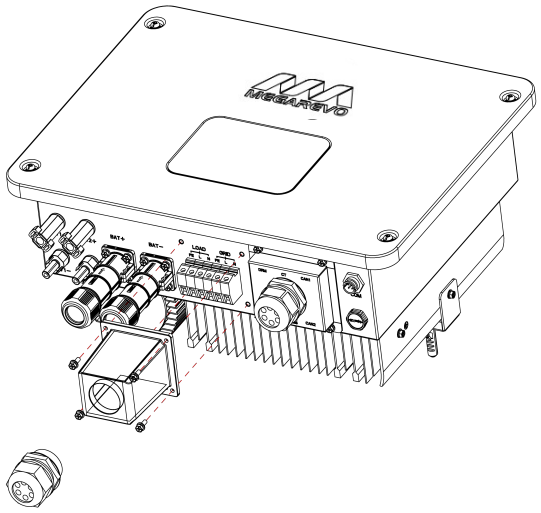


Figure4-6 Inverter Installation Instructions

Step 4: Use a screwdriver to remove the waterproof box under the lower part of the machine

Step 5: After installation, to ensure that the machine does not fall off, please double check if the machine is fixed to the rack.

Note!

Nothing should be stored on or placed against the inverter.

5. Electrical Connection

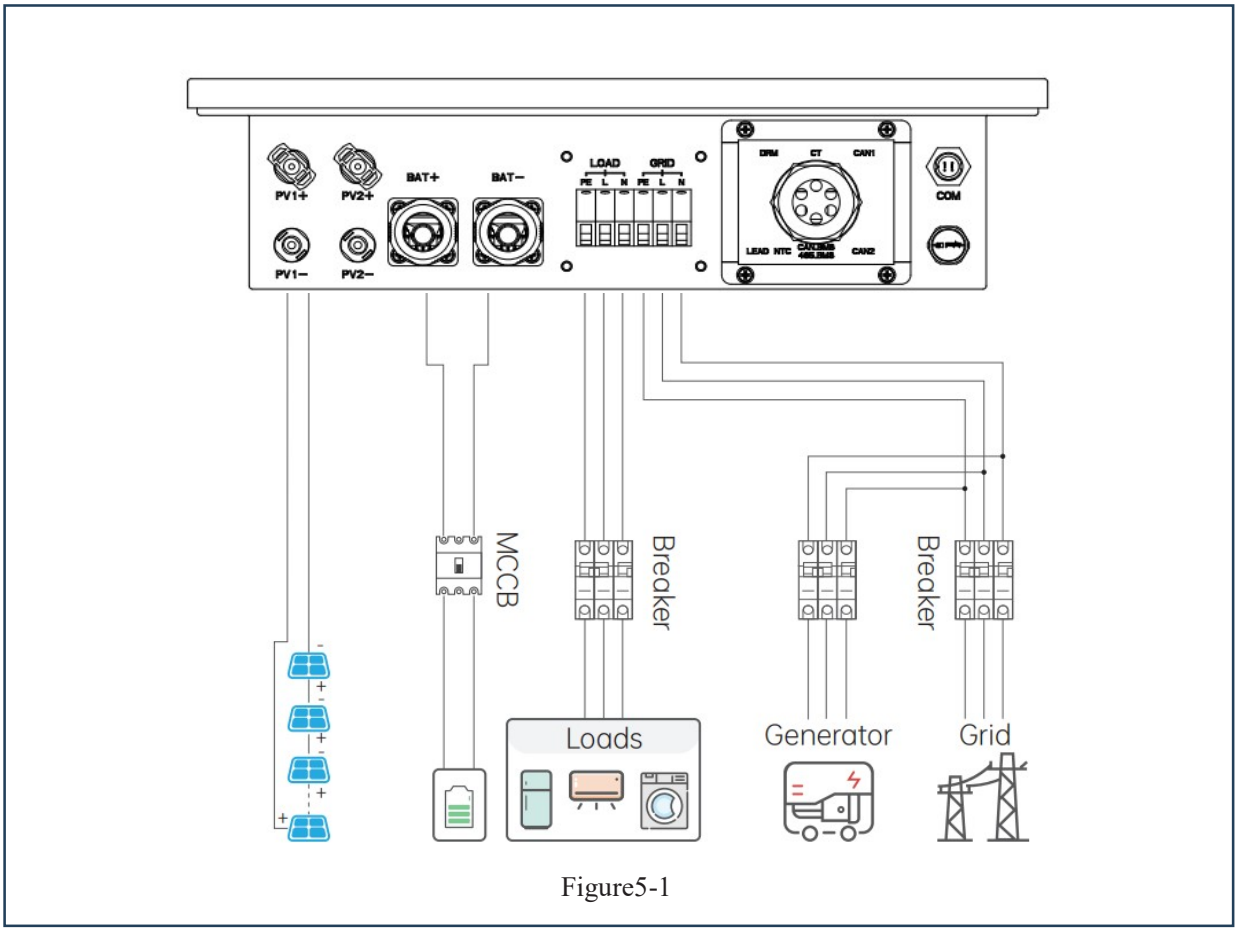
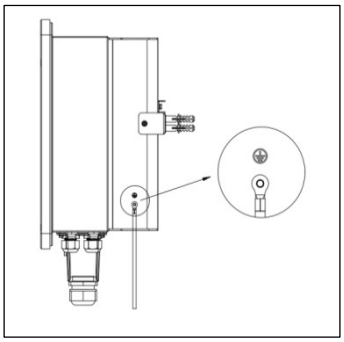


Figure5-1

5.1 PE Cable Installation

An external ground connection is provided on the right side of the inverter. Prepare OT terminals: M4. Use proper tooling to crimp the lug to the terminal. The cable Size is 8AWG.

Connect the OT terminal with ground cable to the right side of inverter. The torque is 2Nm.



5.2 PV Input Cable Installation

Hybrid energy storage inverter can be connected in series with 5Kw or 6Kw PV modules. Select PV modules with excellent function and reliable quality. The open-circuit voltage of module arrays connected in series should be less than the maximum DC input voltage, and the operating voltage should conform to the MPPT voltage range.

Technical Data	O6KL1DA-PLUS
MAX DC Input Voltage	500V
MPPT Range	100V-430V

Table 5.1

Warning!

- PV module voltage is very high, which already achieve dangerous voltage range, please comply with electric safety rules when connecting.
- Please do not make PV positive or negative ground!

Note!

The following requirements of PV modules need to be applied for each input area. In order to save cable and reduce the DC loss, we suggest to install the inverter near PV modules.

Connection Steps:

Step1: Checking PV module

(1) Use multimeter to measure module array voltage.

(2) Check the PV+ and PV- from the PV string combiner box correctly.

(3) Please make sure the impedance between the positive pole and negative pole of PV to earth (Warning: should be MΩ level).

Step2.: Separating the DC connector

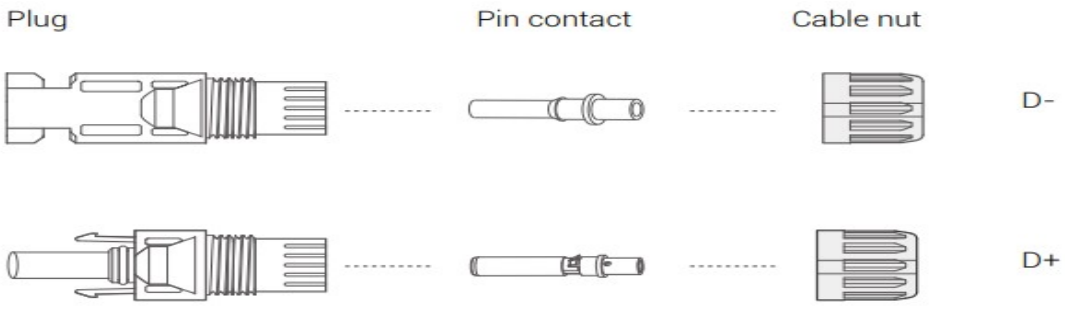


Figure5-2

Step3: Wiring

(4) Choose the 10 AWG wire to connect with the cold-pressed terminal.

(5) Remove 10mm of insulation from the end of wire.

(6) Insert the insulation into pin contact and use crimping plier to clamp it.



Figure5-3

Step4: Insert pin contact through the cable nut to assemble into back of the male or female plug. When you feel or heard a “click” sound the pin contact assembly is seated correctly.

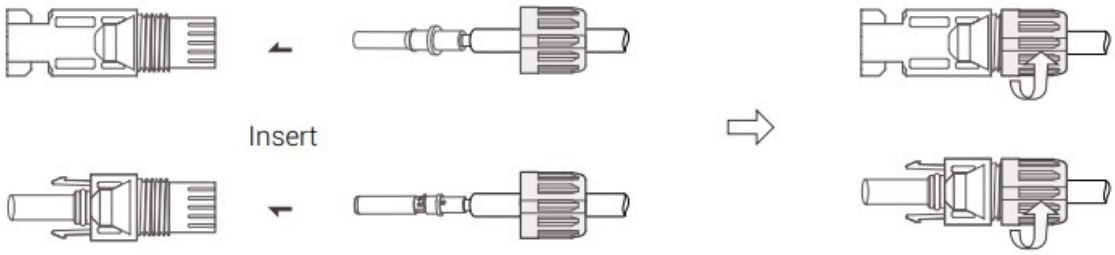


Figure5-4

Step5: Measure PV voltage of DC input with multimeter, verify DC input cable polarity.

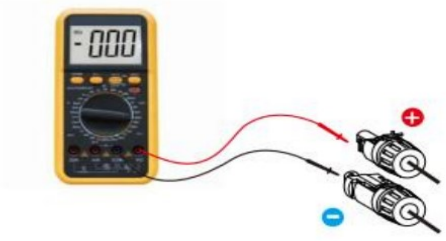


Figure5-5

Step6: Plug the PV contactor into the corresponding PV connector on inverter.

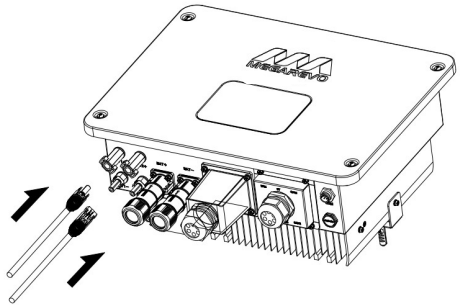


Figure5-6

Caution!

Danger of burn injuries due to hot enclosure parts! If the DC input is misconnected or reversed to cause abnormal work. The correct actions are:

*Use a clip-on ammeter to measure the DC string current.

*If it is above 0.5A, please wait for the solar irradiance reduces until the current decreases to below 0.5A.

*Only after the current is below 0.5A, you can disconnect the PV string.

* In order to completely eliminate the possibility of failure, After the power is turned off, disconnect the PV series to avoid secondary failures caused by continuous power supply of the PV the next day. Please note that any damages due to wrong operations are not covered in the device warranty.

5.3 AC Cable Installation (Grid or Gen)

Install AC circuit breakers between the power grid output and the power grid Ensure safety.

Mode	**O6KL1DA-PLUS**
Micro-breaker	39A

Step1: Check the grid voltage

1. Check the grid voltage and compare with the permissive voltage range (Please refer to technical data).
2. Disconnect the circuit board from all the phases and secure against re-connection.

Step2: Select the appropriate cable and cable lug. A 8AWG and larger cables are recommended for the O6KL1DA-PLUS.

Step3: Remove the waterproof connector and cover, then thread the cable through the connector.

Step4: Wiring

3. Connect the wire to the cold crimp terminal.
4. Remove 18mm of insulation from the end of the wire.
5. Insert the stripped end into the cable lug and clamp it with crimping pliers.

Step5: Insert the terminal into the grid port and use a flathead screwdriver to loosen or tighten the crimp terminal screw. (The wiring method of the generator is the same as that of the power grid).

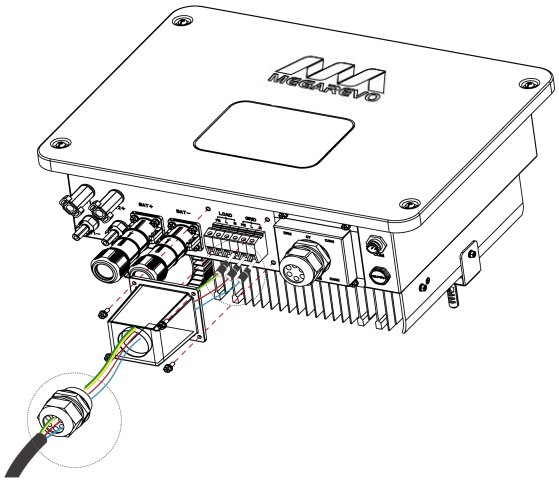


Figure5-7

5.4 AC Cable Installation (LOAD)

- The inverter has grid-connected and hybrid functions and outputs power through the load port. When the inverter is off grid, users need to open "Hybrid enable" function， the battery supplies power to the load.
- In a standard PV installation for an inverter, it typically involves connecting the inverter to both solar panels and batteries. The ”Hybrid enable” function is not recommended for use in systems that are not connected to batteries. Failure to follow this instruction will void the standard warranty and the user will be held liable for any related consequences.
- Hybrid inverters can provide overload output, Refer to the technical parameters of the inverter for details. The inverter is equipped with self-protection against high ambient temperatures.
- For complex applications or special loads, please contact our aftersales support.



Note!

In case of discrepancies between wiring mode of local policy and the operation guide above, especially for the wiring of neutral line, grounding and RCD, please contact us before any operation.

Load Connection:

Install an AC circuit breaker on the load output cable for safety.

Mode	**O6KL1DA-PLUS**
Micro-breaker	39A



Note:

The absence of an AC circuit breaker in case of a short circuit in the load circuit may damage the inverter.

Step1: Select the appropriate cable and wire connector. A 8AWG and larger cables are recommended for the O6KL1DA-PLUS.

Step2: Disassemble the waterproof connector and waterproof cover, and thread the cable through the waterproof connector.

Step3: Wiring

1. Connect the wire to the cold crimp terminal.
2. Remove 18mm of insulation from the end of the wire.
3. Insert the stripped end into the cable lug and clamp it with crimping pliers.

Step 4: Insert the terminals into load ports (loosen or tighten the crimp terminal screws with a one-way screwdriver).

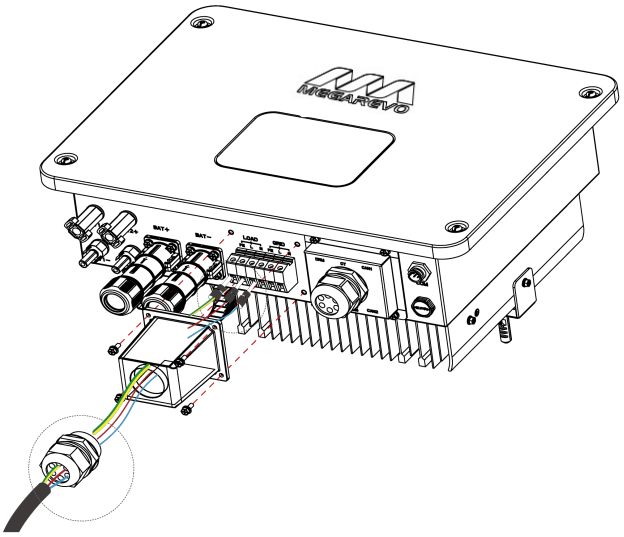


Figure5-8

Warning!

Ensure that the load output power is within its rated power, otherwise the inverter will shut down with an "over load" warning.

When an "Overload" occurs, adjust the load power to ensure it is within the output power range before restarting the inverter.

For nonlinear loads, make sure the surge power is within the load output power range.

5.5 Battery Cable Installation

The charging & discharging system of inverter is designed for 48V lithium battery. Before choosing battery, please note the maximum voltage of battery can not exceed 60V and the battery communication should be compatible with inverter.

Battery breaker:

Before connecting to battery, please install a no-polarized DC breaker to make sure inverter can be securely disconnected during maintenance, A 120A DC circuit breaker is recommended for the O6KL1DA-PLUS.

Battery connection diagram:

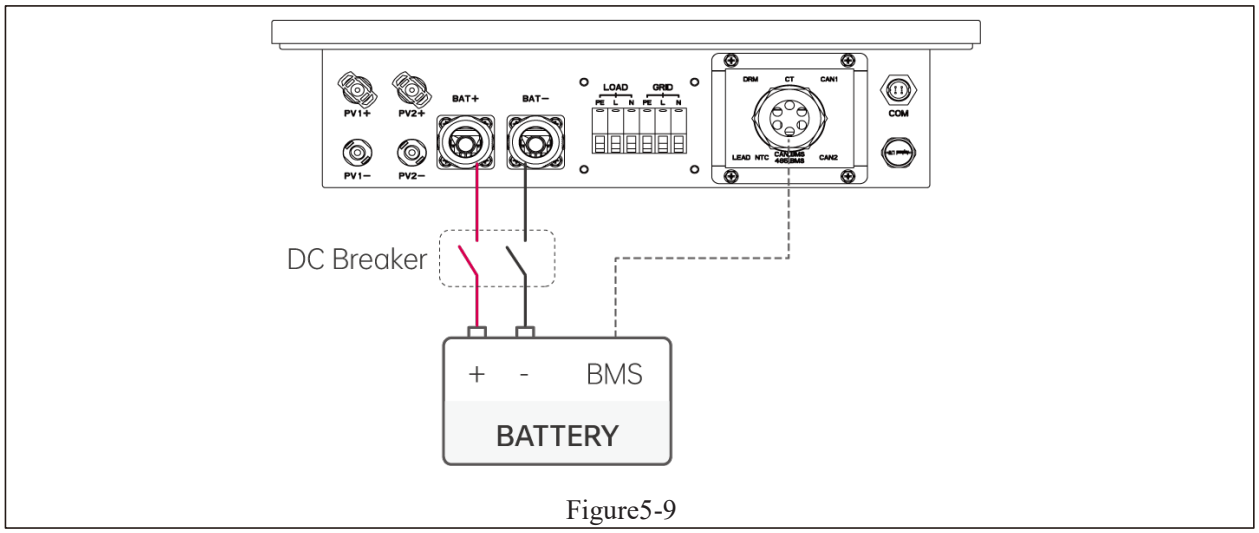
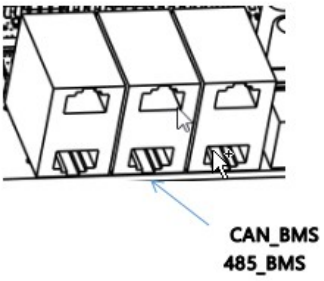


Figure5-9

BMS PIN Definition:

The communication interface between inverter and battery is RS485 or CAN with a RJ45 connector.





CN10

	1	2	3	4	5	6	7	8
CAN	X	X	GND	CAN_BMS_H	CAN_BMS_L	X	X	X
RS485	X	X	X	X	X	GND	RS485_BMSA	RS485_BMSB

Table 5.2

Note!

The battery communication can only work when the battery BMS is compatible with the inverter.

Battery connection steps:

Step1: Select the appropriate cable and O-terminal with an M8 bore,50mm² and larger cables are recommended for the O6KL1DA-PLUS.

Step2: Disassemble the waterproof connector and waterproof cover, and thread the cable through the waterproof connector.

Step3: Wiring

1. Connect the wire to the cold crimp terminal.
2. Remove 18mm of insulation from the end of the wire.
3. Insert the stripped end into the O-terminal with an M8 bore and clamp it with crimping pliers.

Step 4: Insert the terminals into battery ports (loosen or tighten the crimp terminal screws with a one-way screwdriver).

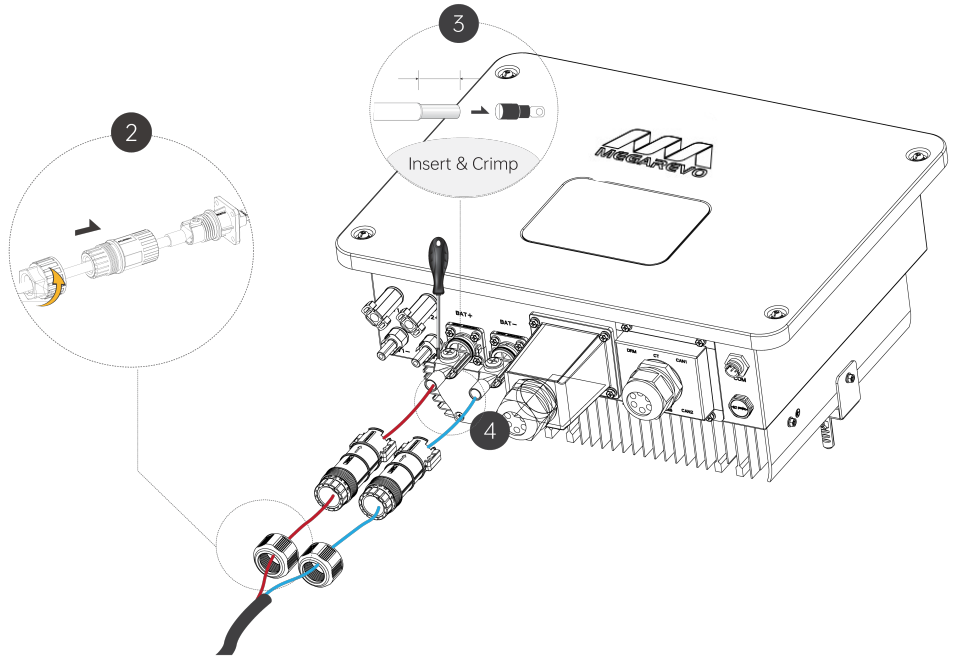


Figure5-10

Note!

Positive and negative lines are not allowed to reverse.

BMS connection steps:

Step 1: Disassembly of waterproof connector and waterproof cover.

Step 2: Prepare a communication cable (without sheath) and pass the cable through the waterproof connector.

Step 3: Insert the RJ45 connector into the BMS port of the inverter.

Step 4: Assemble waterproof connectors and waterproof cover.

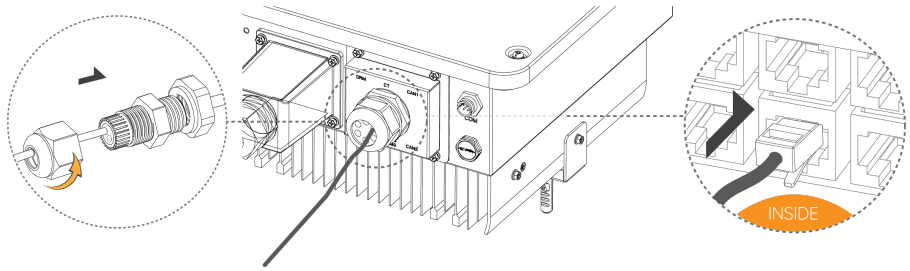


Figure5-11

Note!

The seal is for waterproofing. Please make sure it is put back in.

5.6 CT Installation instructions

CT is short for “current transformer” and is used to detect grid current.

Note!

- If CT is not installed or installed reversely, the functions of "Anti-reflux", "Self-Consumption", "Peak-shift "… will not be realized.
- The direction of the arrow on the CT points from this inverter to the GRID!
- When connected to single-phase power grid, and the CT is connected to L phase.

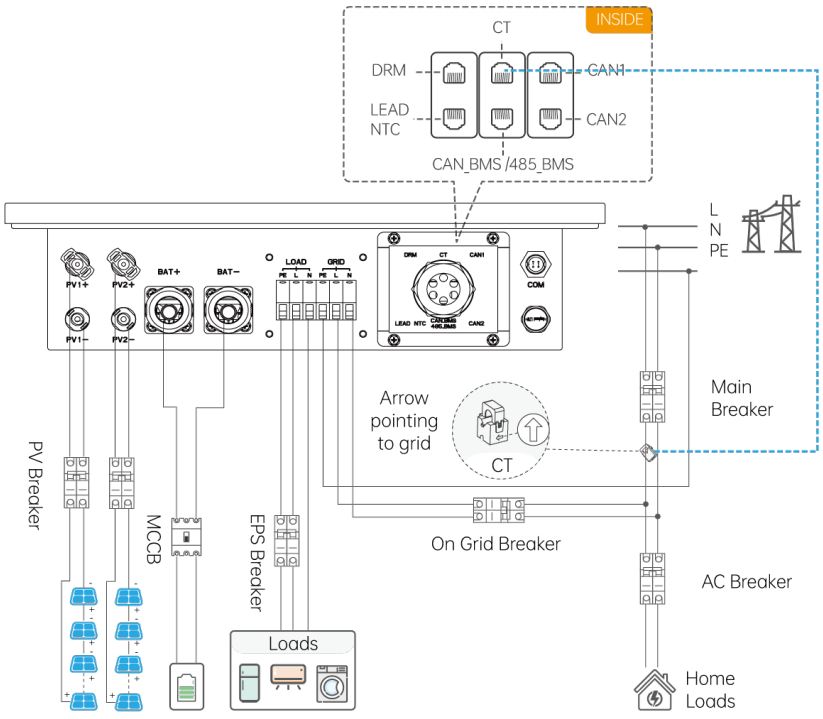


Figure5-12

CT connection steps:

Step 1: Disassembly of waterproof connector and waterproof cover.

Step 2: Prepare a communication cable (without sheath) and pass the cable through the waterproof connector.

Step 3: Insert the RJ45 connector into the CT port of the inverter.

Step 4: Assemble waterproof connectors and waterproof cover.

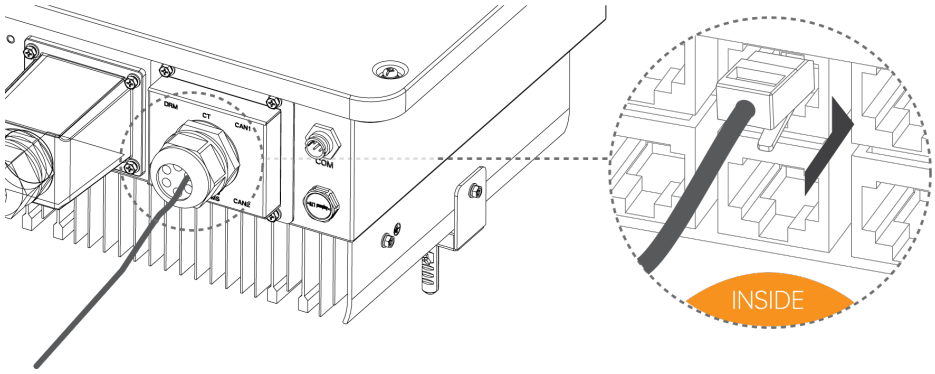


Figure5-13

Note!

The seal is for waterproofing. Please make sure it is put back in.

5.7 WIFI Connection (optional)

The inverter provides a WIFI port that can collect data from the inverter and transmit it to a monitoring website via WIFI.

Purchase the product from supplier if needed.

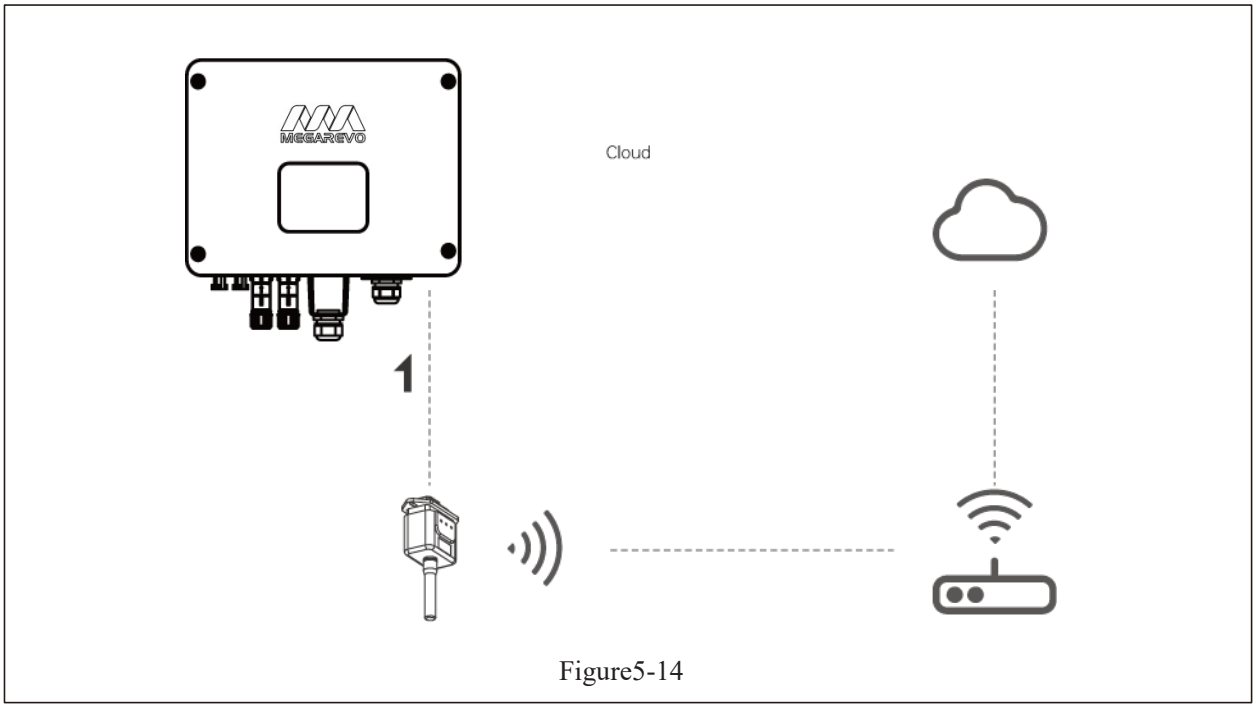


Figure5-14

WIFI connection steps:

Step1: Assemble WIFI adaptor to COM port at the bottom of the inverter.

Step2: Establish the connection between the inverter and the router.

Step3: Create a user account online (Please check the "WIFI adaptor user manual" for more details).

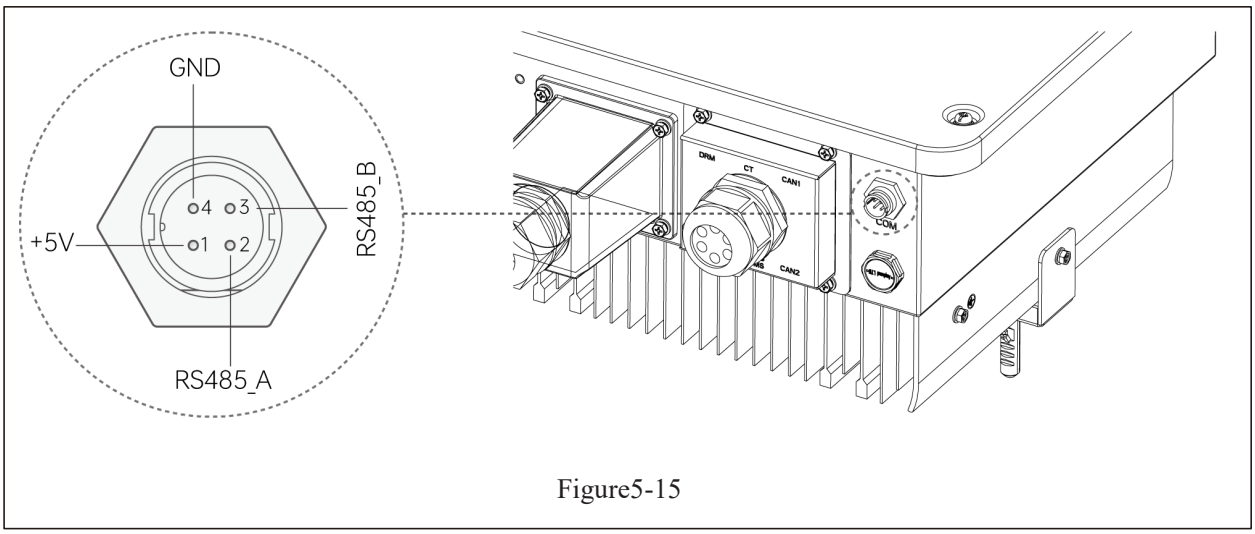


Figure5-15

5.8 Inverter Parallel Guide

5.8.1 Parallel System Diagram

Multiple inverters can be installed together in parallel to provide more power. When AC loads are present, all units effectively share the load. The system diagram is as follows.



NOTE:

If using Common CT connection Method, please contact your dealer to purchase a larger capacity CT to ensure sampling accuracy.

1. The BMS port: BMS communication for lithium batteries.
2. The CT port: For external grid side CT to detect current size.
3. CAN port: parallel port.

For parallel communication, CAT 6 cables are needed. The units should be connected hand by hand. When using common batteries, BMS cable needs to be connected to the master unit. THE inverter shares the BMS information by inter -unit parallel communication cable.

For details about how to configure parallel devices, see 7.1.3 Setting Option (2) Parallel Settings.

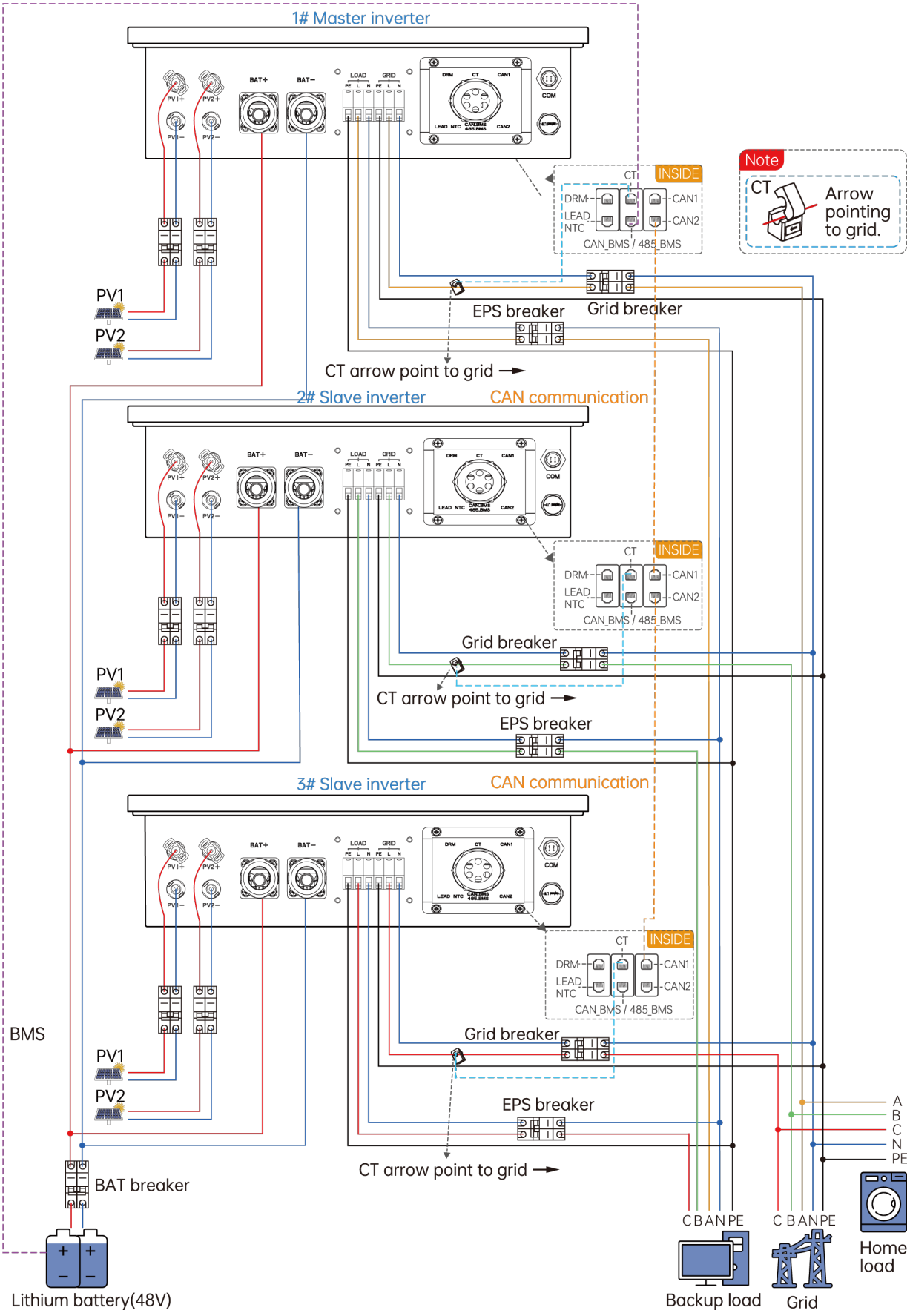

1# Master inverter
2# Slave inverter
3# Slave inverter
CAN communication
CAN communication
INSIDE
CT
DRM
LEAD
NTC
CAN1
CAN2
CAN_BMS / 485_BMS
Note
CT
Arrow pointing to grid.
PV1
PV2
EPS breaker
Grid breaker
CT arrow point to grid
BMS
BAT breaker
Lithium battery(48V)
A
B
C
N
PE
Backup load
Grid
Home load

Figure5-16

5.8.2 Parallel use matters

1.Ensure that all units in parallel have the same software version.



Figure5-17

2.Connect the loads of the two inverters together first. It should be noted that the grid power line and the load line of the two inverters should be roughly the same length. If user wants to add grid /load ac breaker, please make sure the lines are paralleled/jointed before connected to breaker.

3.Make sure the CT Limiter sensor is installed properly.

4.Please note that the slaver unit will be in the same work mode automatically as the master unit.

5.Only the parallel connection of shared batteries is supported. The BMS communication must be connected to the host.

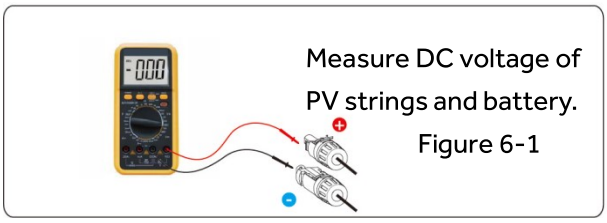
6.The photovoltaic input source is independent, and the grid is shared.

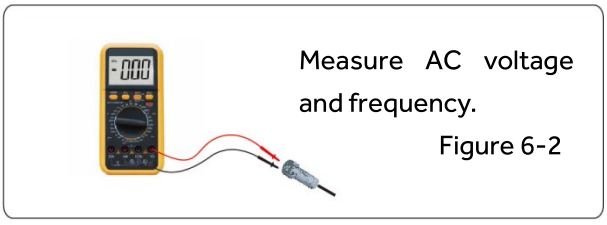
7.Set the master and slave servers, number of parallel servers, and address of parallel servers.

6. Inverter Configuration

Start inverter after checking all the following:

· Ensure all the devices are accessible for operation, maintenance and service.
· Check and confirm that the inverter is firmly installed.
· Space for ventilation is sufficient for one inverter or multiple inverters.
· Nothing is left on the top of the inverter or battery module.
· Inverter and accessories are correctly connected.
· Cables are routed in safe place or protected against mechanical damage.
· Warning signs and labels are suitably affixed and durable.
· Switch on the external AC breaker to power on the inverter control board.
· Measure DC voltage of PV strings and battery and ensure the polarity is correct.
· Measure AC voltage and frequency and ensure they are within local standard.





Starting inverter:

· The inverter will start automatically when the PV panels generate enough energy or the battery is charged.
· Check the status of LCD screen, the LCD screen should display the main interface.
· If the LCD screen reports a fault or alarm, please check the below:
  -All the connections are right.
  -All the external disconnect switches are closed.
· Enter the setting interface.
· Setting grid standards, Set the PV connection mode, set the working mode, Set the battery type.

Shut down inverter:

· Disconnect the external AC circuit breaker and secure it against reconnection.
· Wait about 5 minutes until the capacitors inside the inverter completely discharge.
· Ensure that the DC cable is current-free via a current clamp (Figure 6-3).

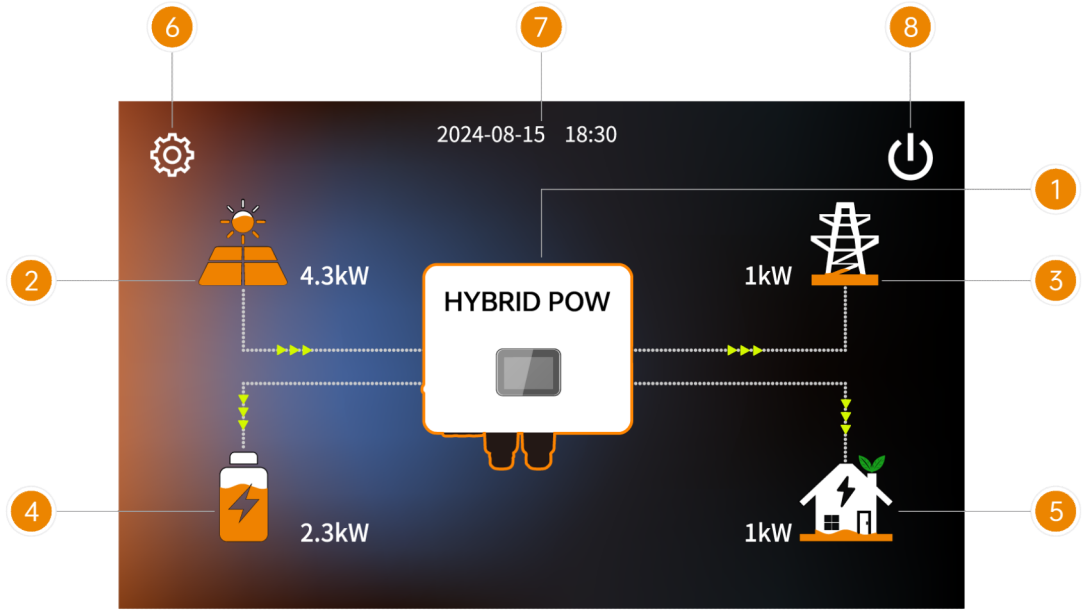


Figure 6-3

7. Operation

7.1 LCD Operation

7.1.1 Home Page



Code	Name	Explanation
①	Energy Storage Inverter	Click “Energy Storage Inverter” to view its working status. Of the energy storage inverter, see section 7.1.2(1) for details.
②	PV	Displays real-time PV power. Click PV to enter the working status interface of PV, see section 7.1.2(2) for details.
③	Grid	Display the real-time grid power. Click Grid to enter the working status interface of grid, see section for 7.1.2(3) details.
④	Battery	Display the real-time battery power and percentage of battery surplus capacity from the BMS. Click Battery to enter the working status interface of battery, see section for 7.1.2(4)details.
⑤	Load	Display the real-time load power. Click Load to enter the working status interface of load, see section for 7.1.2(5) details.
⑥	Setting	Users can click Setting to enter the settings interface, see section 7.1.3 for details.
⑦	Time	Display time.
⑧	Switch	Click the switch to set the switch of the energy storage inverter, see section for 7.1.2(7) details.

7.1.2 Working Status

(1) Energy Storage Inverter



①Users can click on the icon above to switch device status data (PV, Battery, Energy Storage Inverter, Load, Grid) and return to the Home Page. (not to be repeated later)

②Display status information, including System status, Inverter status, DCDC status and Parallel State.

System Status: Display complete machine status information, including: INIT, STANDBY, PV GRID, BAT GRID, BYP, AC BAT CHG, HYBRID POW etc.

INV: Displays the inverter status information, including: STANDBY, OFF GRID, GRID, OFF GRID PL, INV TO PFC.

GRID: Grid-Connected Operation of the Inverter

OFF GRID PL: The inverter is synchronizing with the grid and waiting to connect to the grid.

OFF GRID: Off-Grid Operation of the Inverter.

DCDC Status: Displays charging and discharging status information,including: STANDBY, CHARGE, DISCHARGE.

③The voltage, current, and power of the inverter side are displayed in real time.

④**VBUS**: Real-time voltage of bus capacitor of the machine.

⑤Temperature:

INV-T(℃): Temperature of the inverter.

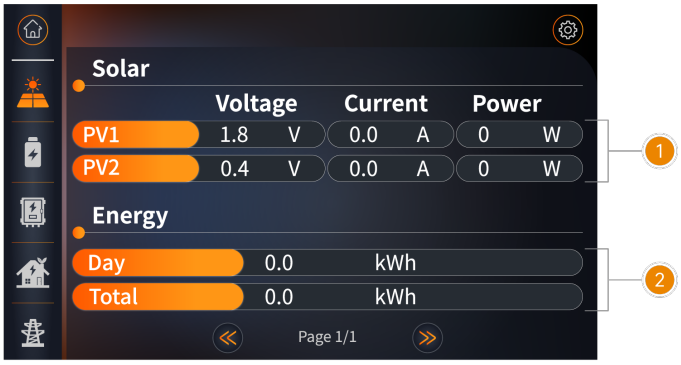
Inside-T(℃): Internal temperature of the machine.

DCDC-T(℃): Internal temperature of DCDC.

Leak current: Real-time leak current of the machine.

⑥**Parallel State:** Display the parallel status of the inverter, including: DISABLE, MASTER, SLAVE.

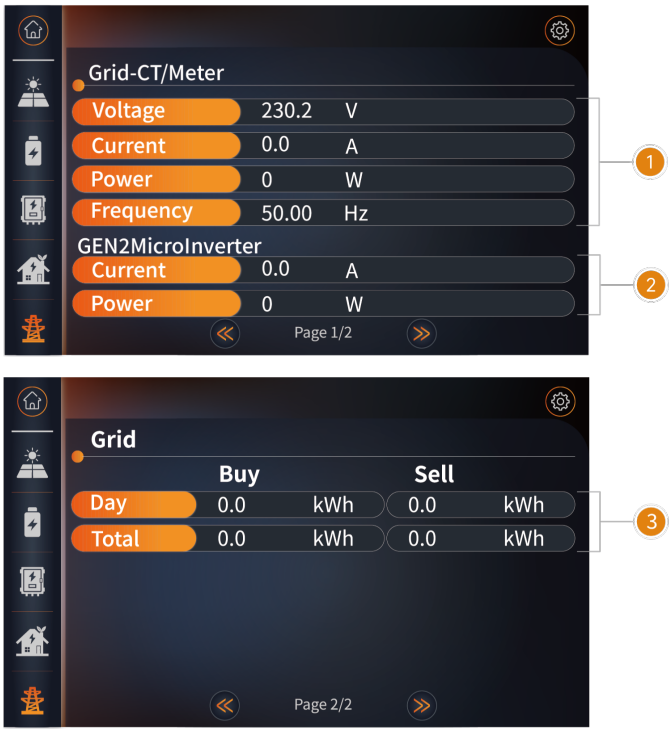
(2) PV



①Real-time display of PV voltage, current, power.

②Display the cumulative charging capacity of the PV, including daily and total accumulated energy.

(3) Grid

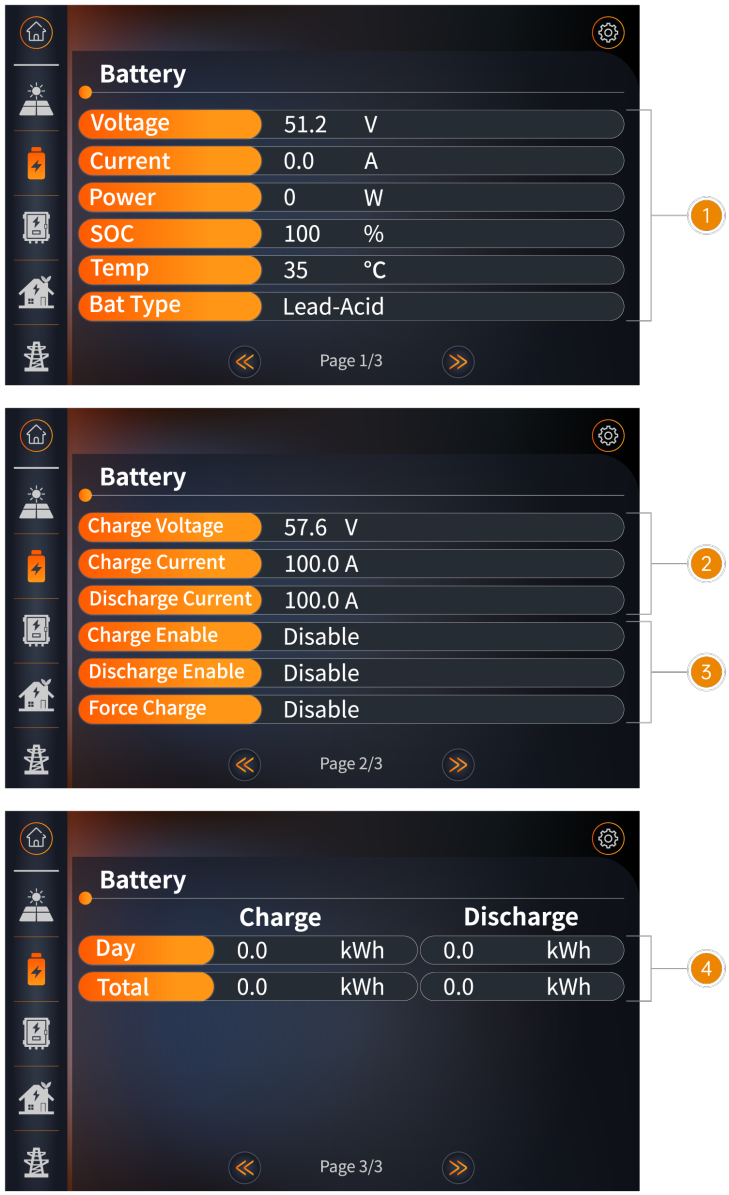


①Display the working parameters on the grid, including **Frequency**, **real-time voltage**, **real-time current**, and **real-time power**.

②Display real-time data from the PV inverter connected to the diesel generator port.

③Accumulated energy from the power grid to the equipment (Buy) and accumulated energy from equipment to the power grid (Sell), including daily and total accumulated energy.

(4) Battery



①Display the working parameters of the battery, including **real-time voltage**, **real-time current**, **battery surplus capacity**, **battery temperature**, **battery power**, and **battery type**.

②Display the maximum **charge voltage**, maximum **charge current**, and maximum **discharge current** transmitted by the battery BMS.

③Three working states of batteries (from BMS), including **charging**, **discharging**, and **forced charging**.

Charge Enable： Disable means Forbidden charge the battery ; Enable means Charging the battery is allowed.

Discharge Enable： Enable means Discharging the battery is allowed. Disable means Forbidden Discharge the battery

④Accumulated discharge and charging capacity of the battery, including daily and total accumulated energy.

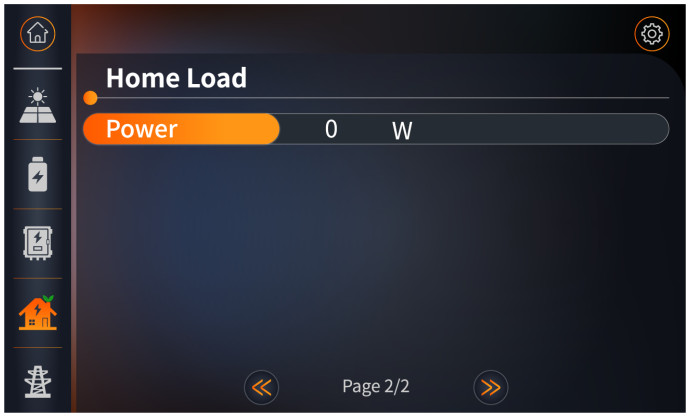
(5) Load

Load/Page One

Load

User can click « to return to the previous page, and click » to enter the next page. (not to be repeated later) ①Display the working parameters of the load, including **real-time voltage**, **current**, and **power.** ②Accumulated usage of load, including daily and total accumulated energy.

Load/Page Two

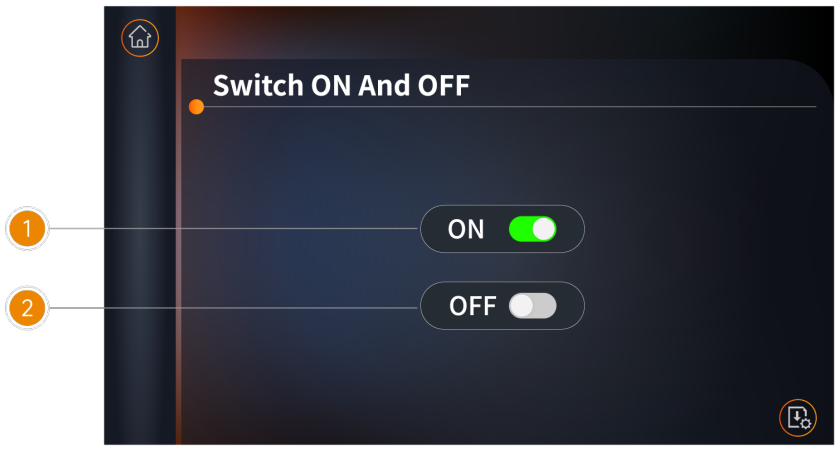
Load

When set Home load EN to "**ENABLE**", if you have a load connected to the grid port that between the CT installation location and the power grid port, you can see its Home load power.

(6) Generator



Displays the operating parameters of the generator, including real-time frequency, voltage, current, and power.

(7) Switch

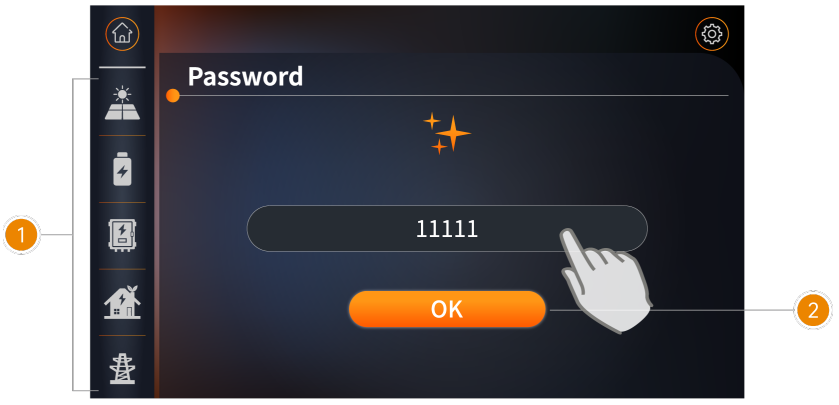


①Power on, the energy storage inverter works.
②Power off, the energy storage inverter stops working.

7.1.3 Setting

Enter Setting

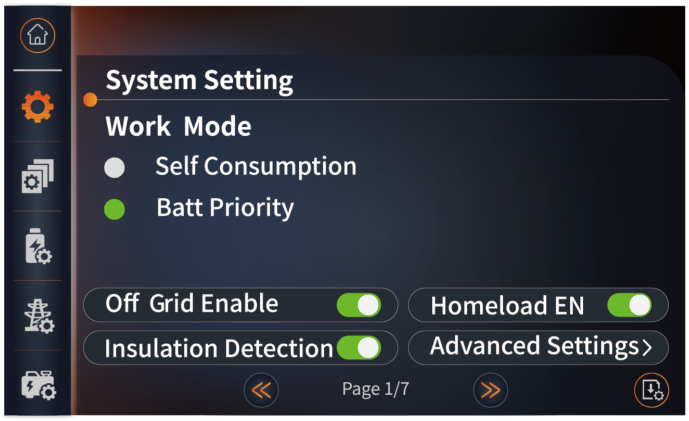
(1) Input password



①Users can click on the icon above to enter device status data (**PV**, **Battery**, **Energy Storage Inverter**, **Load**, **Grid**) and return to the Home Page.

②To enter the settings, a password is required. The default password is “11111”. Click OK to enter the settings interface.

(2) Enter the settings interface



Users can click on the icon above to switch between setting options, machine related information, and return to the Home Page.

System Setting　Parallel Setting　Battery Setting

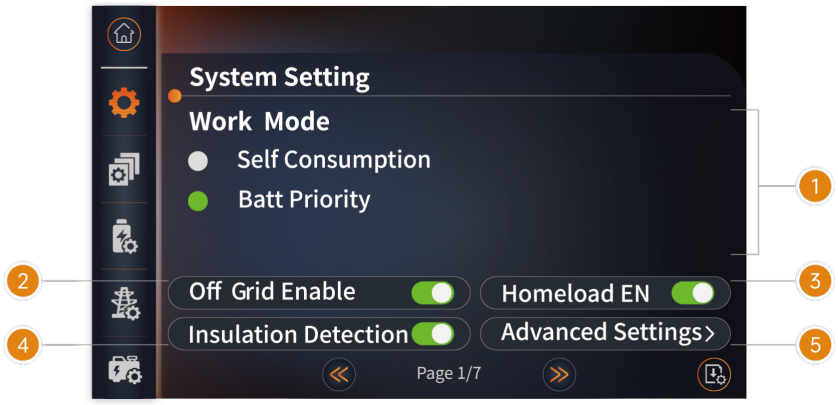
Grid Setting　Generator Setting　Return Home Page

After modifying the parameters, the user needs to click on this icon to confirm the modification.

Setting Option

(1) System Setting

System Setting/ Page One:



① Users have two working modes to choose from, Self Consumption, and Battery Priority.

Self Consumption: The inverter automatically regulates the charging and discharging of the battery based on the grid power, load power and PV power generation.

The default logic is to prioritize the load. The load will first use the PV power. When the PV power is insufficient, both the PV and the battery will supply power to the load together. When the sum power of the PV and the battery is less than the load, the mains power will make up for the insufficient power. At the same time, you can set other work logic by using the "Advanced Settings" yourself.

Batt Priority: The PV power and the mains power charge the battery together until it is fully charged. The charging current of the battery can be controlled by setting "Battery Charging Current", and the maximum charging power of the grid for charging the battery can be controlled by setting "Grid Charge Power".

②**Off grid Enable**: When the Grid and PV are powered off, Enable the battery to supply power to the load, default option is enable.

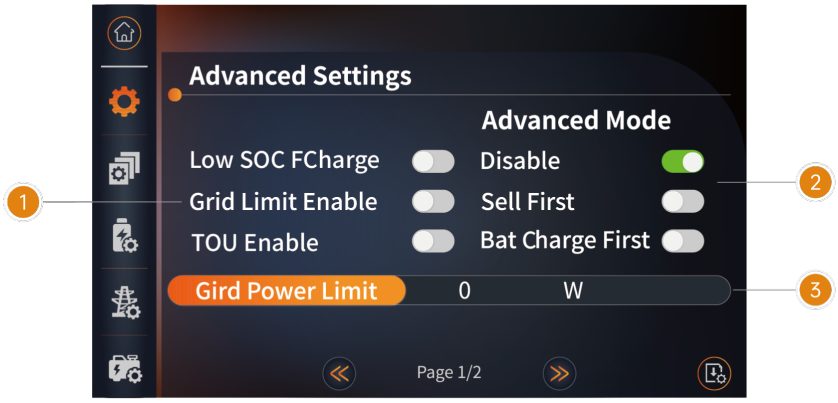
③**Home load EN**: Enable external load calculation at the power grid end.

④**Insulation Detection**: Insulation detection (The default option is enabled). When the insulation detection function is enabled in the grid connected state, the insulation detection is performed once a day when the photovoltaic energy comes in. During the insulation test, the inverter switches to bypass mode that the load using the mains power. In the off-grid mode, during the insulation test of the inverter, the load will lose power. Therefore, during the off-grid operation, the insulation test is only conducted when the PV is powered on for the first time.

⑤Advanced Settings

Users can click to "**Advanced Settings**" enter the advanced settings interface. **All the "Advanced Settings" options only take effect in the self-consumption mode**.

Advanced Settings/ **Page One**:



①Users have three advanced settings to choose from, namely **SOC LOW FCharge**, **Grid Limit Enable** and **TOU Enable.** Select the priority of battery power.

SOC LOW FCharge: When the battery is at a low charge level for a long time, to prevent battery depletion, the battery is forcibly charged to the "GridEndChg SOC" when it falls below the "GridStartChg SOC", in order to protect the battery and extend its service life.

Grid Limit Enable: In the self-consumption mode, before discharging the battery, it is allowed to use a limited amount of power from the grid to charge the battery.

The PV energy is prioritized for supplying power to the load. Only when the PV is sufficient and greater than the load's power consumption will the battery be charged; when the PV is insufficient and less than the load's power, power will be taken from the grid first. When the power from the mains is less than the "Grid Power Limit" setting value, both the PV and the mains will supply power to the load, and the battery will not discharge; when the power taken from the grid is greater than the " Grid Power Limit " setting value, the battery will supply power to the load, maintaining that the power consumption of the mains is less than or equal to the " Grid Power Limit ".

TOU Enable: The battery charging and discharging operate according to time periods, maintaining the battery at the set SOC.

②**Advanced Mode**: Select the priority of PV power.

There are three options here: Disable, Sell First and BatCharge First. The advanced mode takes effect only in automatic self-consumption mode.

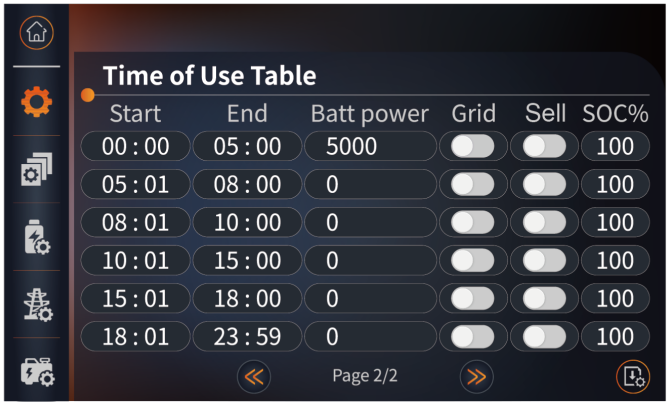
Disable: Use the default self-consumption control logic of the inverter, that is Load First. The load uses the PV power first. When the PV power is insufficient, the battery discharges. At this time, both the PV and the battery supply power to the load together. When the sum of the power from the PV and the battery is less than the load, the mains power supplements the insufficient power.

Sell First: The PV power is prioritized for conversion into AC output to supply to the load and the grid. Charging of the battery is only carried out when the PV energy is sufficient.

BatCharge First: The PV power is prioritized to charge the battery. It will only supply power to the load and the grid when the power exceeds the allowable charging power of the battery.

③**Grid Power Limit:** This setting is used to determine the maximum grid power that can be utilized when Grid Power Limit is enabled. The battery will discharge only when the power consumption exceeds the set value of Grid Power Limit.

Advanced Settings/**Page Two：**



Time-of-use Start: Set the start time for the TOU (Time-of-Use) operation.

Time-of-use End: Set the end time for the TOU operation.

Batt power： The maximum power allowed for battery discharge within the specified time period.

Grid：Whether the power grid is allowed to charge the battery within a certain period of time. Grid is ticked, indicating that during this period of time, the power grid is permitted to charge the battery. if not ticked, the power grid will not charge the battery.

Sell: Set whether the battery is allowed to discharge power to the power grid. Sell is ticked, indicating that during this period of time, the battery is allowed to discharge at the set power. If the discharge power exceeds the load power, the electricity will be sold to the power grid.

SOC: Set the target SOC of the battery within the specified time period.

If the current SOC of the battery is greater than the set target SOC, then the battery will discharge at this time.

If the current SOC of the battery is lower than the set target SOC, when the PV power is greater than the load power or the grid is allowed to charge the battery, the battery will be charged at this time.

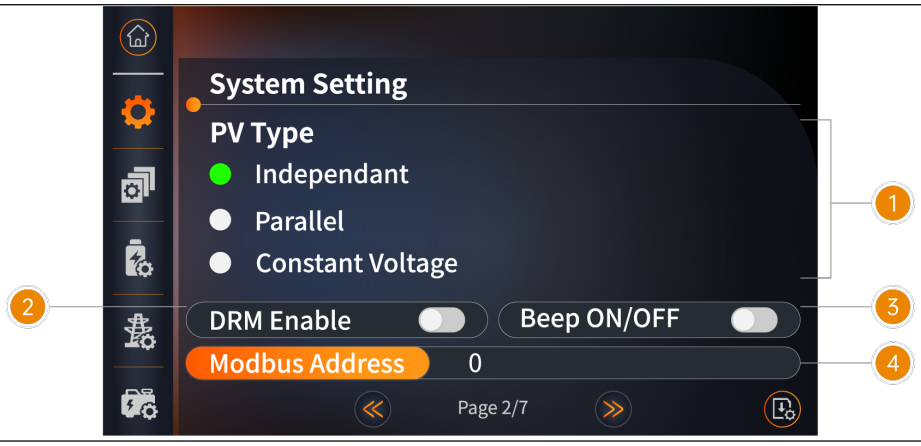
Outside the time period: If " **BatCharge First** " is set simultaneously, then outside the time period, the system will operate according to the" **BatCharge First** " logic.

If " **Sell First** " is set at the same time, then outside the specified time period, the logic of " **Sell First** " will be applied. If the " **Grid Limit Enable** " is set at the same time, then outside the specified time period, the system will operate according to the logic of "**Grid Limit Enable**".

The priority of the parameters within the advanced settings is as follows:

"TOU Enable>> BatCharge First>> Sell First>> Grid Limit Enable>> SOC LOW FCharge"

System Setting/Page Two:



①Users can set PV types, including **Independent**, **Parallel** and **Constant Voltage.**

Independent： When each group of PV strings connected is independent, set the PV Type to "Independent".

Parallel: When each group of PV strings connected is derived from the same group of strings, set the PV Type to "Parallel".

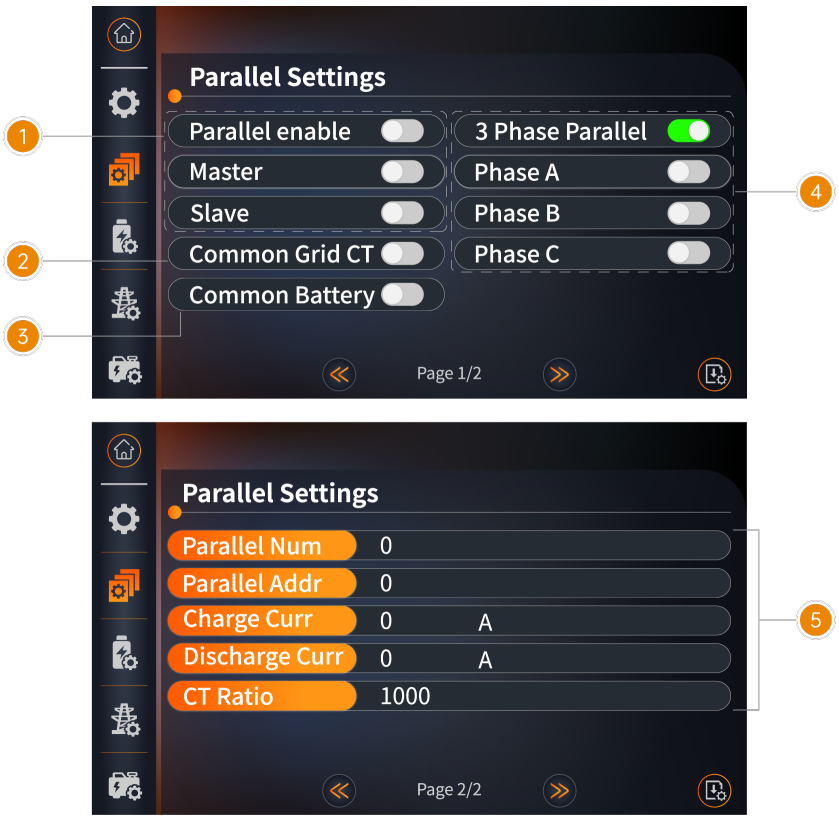
Constant Voltage: When a constant-voltage direct current source power is connected to the PV port, set the PV Type to "Constant Voltage".

②**DRM Enable:** Enable or Disable Demand Response Modes.

③**Beep ON/OFF:** Users can enable or disable the beep function, which takes effect when the inverter alarms.

④**Modbus Address:** The default modbus address is 1. Users can change the Modbus address as required.

(2) Parallel Setting



①**Parallel enable:** Enable or disable the parallel function.

Master/Slave: This interface is used for parallel, and the inverter is selected as the master or slave.

②**Common Grid CT:** Enable or disable CT sharing.

③**Common Battery:** Enable or disable Battery sharing. If connecting multiple devices using a single battery, please check "Common Battery". If each inverter is connected to its own battery, please do not check this option.

④**3 Phase Parallel:** Enable or disable group 3 phase enable. When using a single-phase inverter to form a three-phase system, please check it and **do not check the "Parallel enable".**

PHASE A/B/C: This interface is used to select the output phase of the device when three phases are used.

⑤**Parallel num:** This operation is used to select the number of parallel machines.

Parallel addr: This interface is used to select the parallel address, the host address is set to 1 by default, there is a slave, and the slave is set to 2; If there are two slaves, the slaves are set to 2 and 3 respectively; the address settings of each inverter cannot be the same.

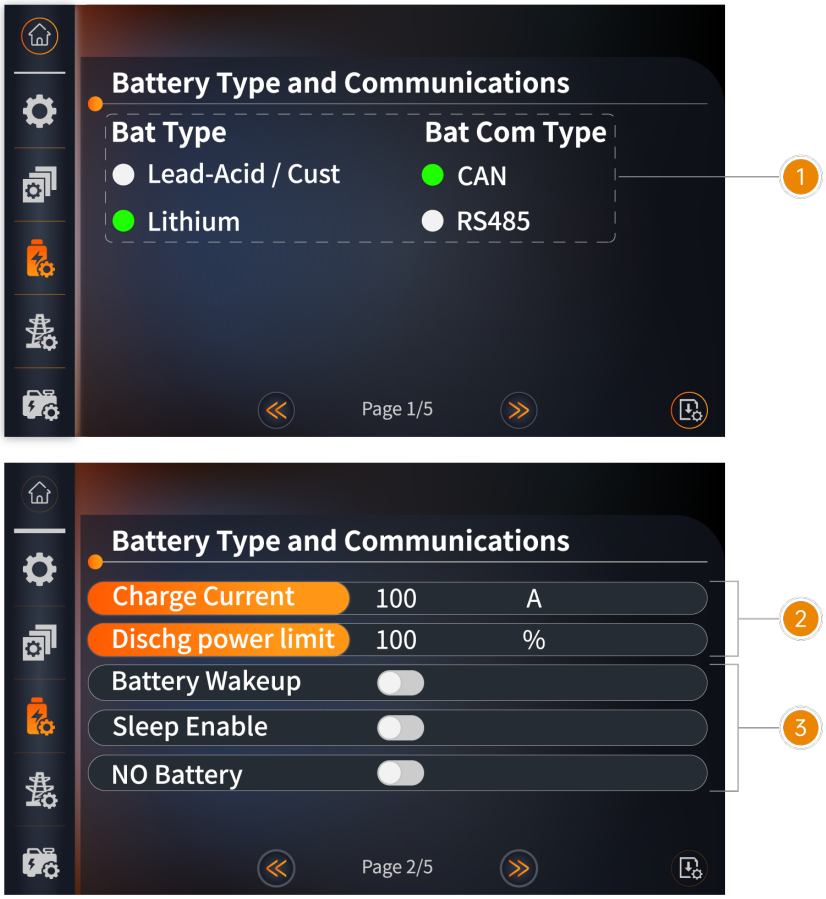
CT Ratio: Set the detection ratio of CT. Set the CT ratio to 1000:1 by default.

Charge Curr: Set the charging current of parallel machine.

Discharge Cur: Set the discharge current of parallel machine.

(3) Battery Settings

Battery Settings/Page One



①Set Battery Type and Battery Communication method

Users can choose the **battery type** is lead-acid battery/lithium battery, and the **battery communication** method is CAN/485.The default option is CAN.

②Users can manually input the value of charging current and discharge power limit.

③**Battery wakeup**:

When the battery is low and the battery relay has been disconnected, the inverter will send instructions to the battery forcibly sucking relay by BMS, and the inverter will charge.

The default option is disabled. (Partial battery support)

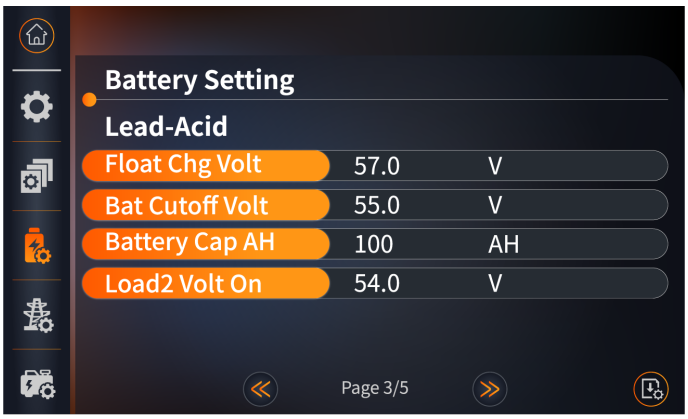
If you want to use this feature, please consult the battery brand supported by the dealer. Use it only when the battery is too low.

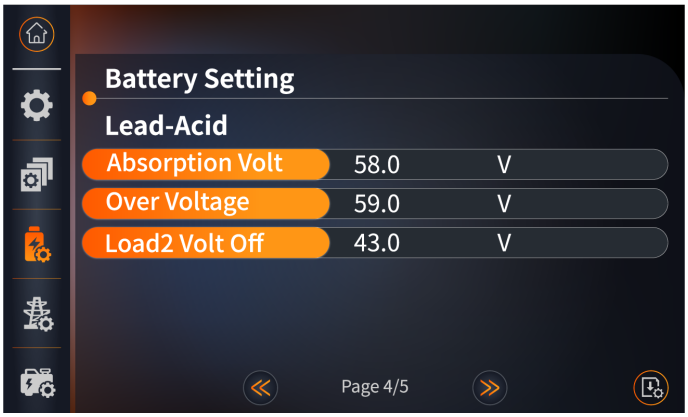
After the battery wakes up successfully, please turn off the function, otherwise it will affect the normal operation of the machine.

NO Battery: If you select this option when the battery is not connected, no battery alarm will be generated.

Sleep Enable: If this function is enabled during grid connection, the DC-DC does not work and the battery does not provide energy for the load.

Battery Settings/Page Two





Settings required when using lead-acid batteries

Float Chg Volt: Set the floating charge voltage of the lead-acid battery. (The input value ranges from 40 to 59.5) Set the floating charge voltage to be less than the **Absorption Volt**).

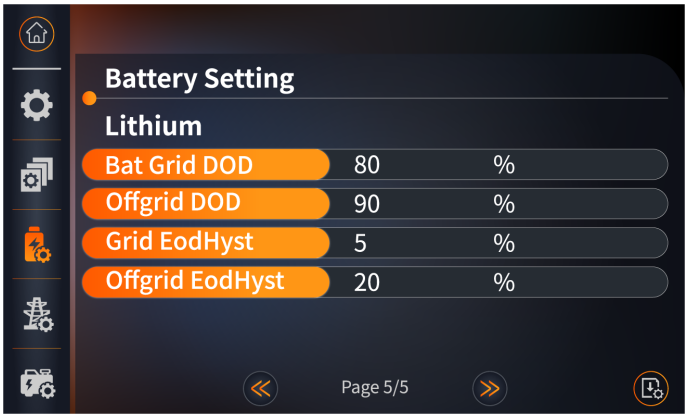
Bat Cutoff Volt: Discharge protection voltage (The input value ranges from 40 to 51). Discharge cut-off voltage, as recommended by the battery manufacturer). When the battery voltage drops below the set value, the inverter will issue a low battery alarm.

Battery Cap AH: Battery capacity. (The input value ranges from 50 to 1000) The battery capacity setting will affect the maximum charging current, for example, set 100Ah, the maximum charging current is 100A*0.2=20A).

Absorption Volt: Set the equal charging voltage for lead-acid batteries.

Over Voltage: Charging protection voltage (The input value ranges from 50 to 59.5, Charge protection voltage, as recommended by the battery manufacturer). When the current battery voltage exceeds the set value of Over Voltage, the inverter will issue a battery overvoltage alarm.

Battery Settings/Page Three



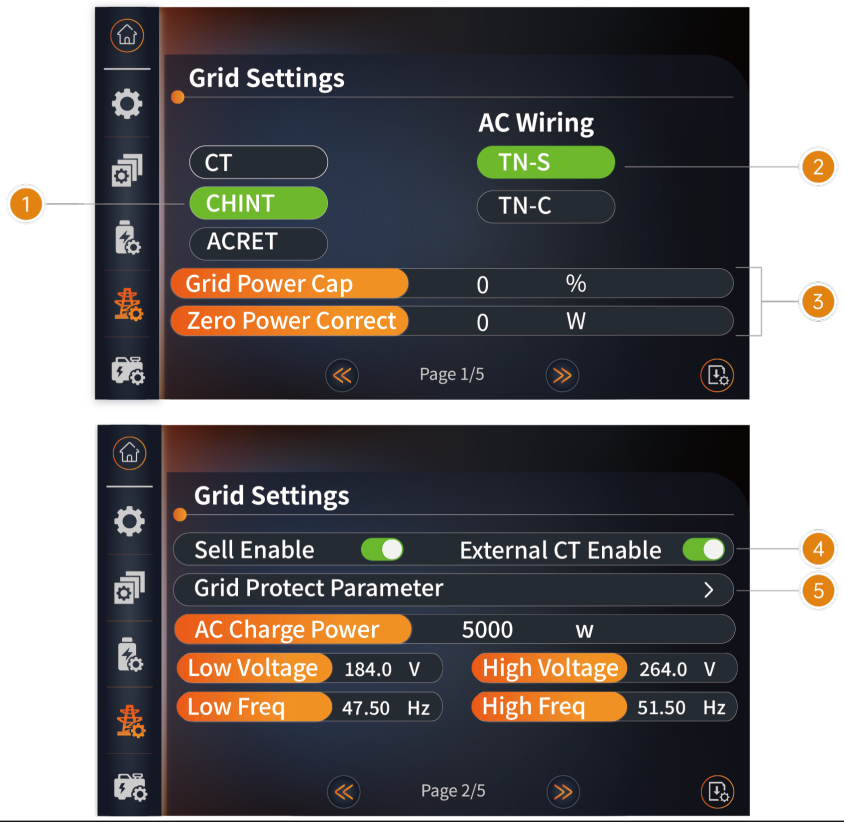
Settings required when using lithium

Bat Grid DOD/ Off grid DOD: When the Battery discharge depth is higher than the threshold, that is, the battery SOC is less than EOD (end of discharge, equal to 100-DOD), the inverter generates a battery low voltage alarm and stops discharging. The Bat off-grid DOD is usually greater than the grid DOD. When the inverter operates in off-grid mode, if the battery SOC is lower than (100 - Bat off-grid DOD), the inverter switches to standby mode and stops supplying power to the load. When the inverter is on-grid, if the battery SOC is lower than (100 – Bat grid DOD), the inverter stops discharge from battery.

Grid Eod Hyst:/Off grid Eod Hyst: When the low voltage alarm is generated, the battery has stopped discharging and wait for charging. When the battery SOC is higher than the (100-DOD + **Eod Hyst**), the alarm is cleared and the battery can continue to discharge.

(4) Grid Setting

Grid Setting/Page on



①Users can choose to use **CT** or electricity meter to detect the grid current, currently supported by the grid manufacturers **CHINT** and **ACREL**.

②Users can set the AC wiring system to TN-S or TN-C.

③**Grid Power Cap:** This setting is used to limit the power that the inverter discharges to the grid and to limit the charging power of the grid to the battery. The default parameter is 100%.

Zero Power Correct: If the sampling error occurs when there is no power in the grid, the user can set the corresponding value to correct it.

④ **Sell Enable:** Whether the inverter is allowed to sell electricity to the grid. The option is checked, which means that the inverter can generate electricity to the grid.

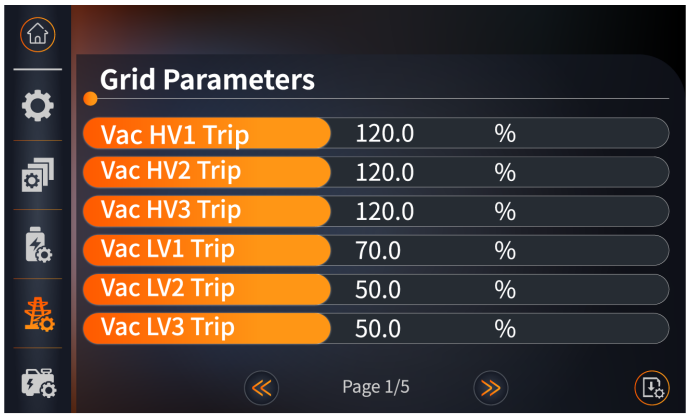
⑤**Grid Protect parameter**

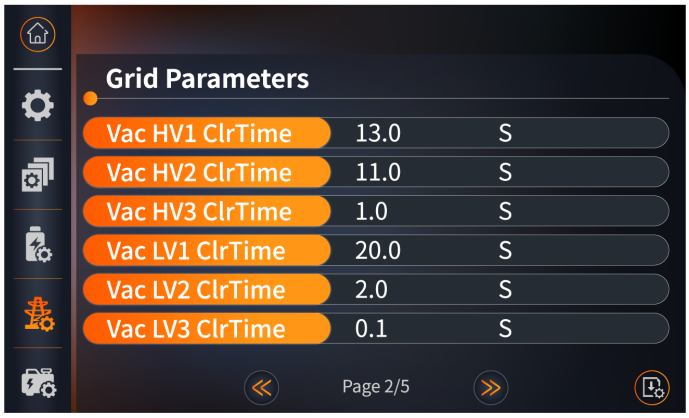
Users can click to" Grid Protect parameter" enter the advanced settings interface.

Grid parameters/page one:

On this page, users can set overvoltage protection, overvoltage protection time, undervoltage protection, and undervoltage protection time. When grid standards are set, these values are automatically updated according to local safety regulations.

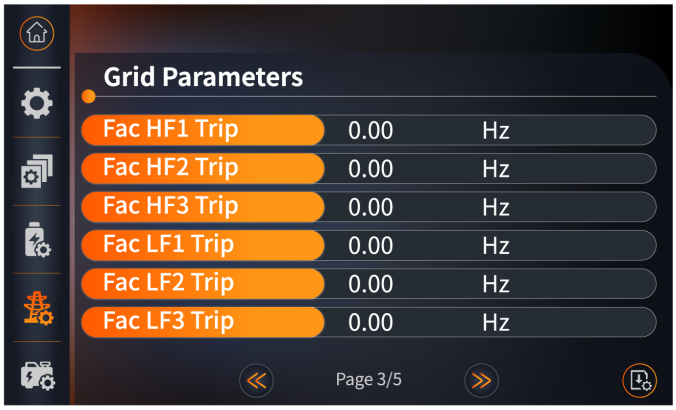
AC Charge Power: Set the maximum power at which the grid charges the battery

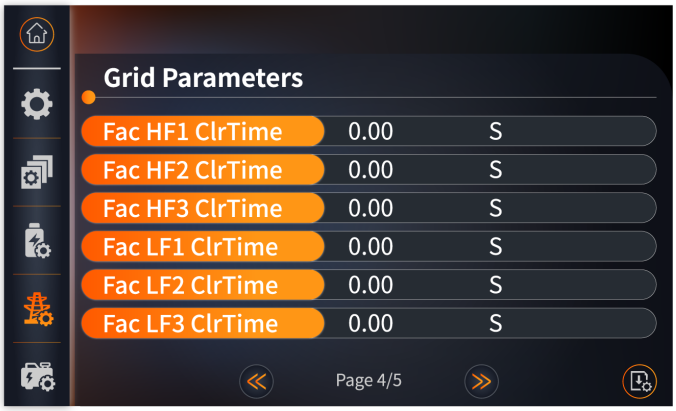




Grid parameters/page two:

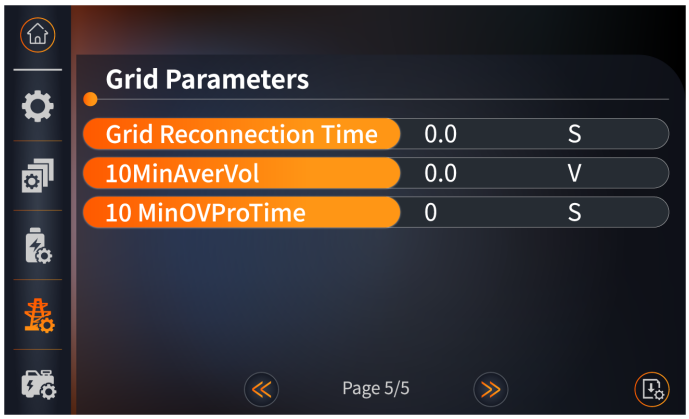
On this page, users can set over frequency protection, over frequency protection time, underfrequency protection, underfrequency protection time, and grid reconnection time. When grid standards are set, these values are automatically updated according to local safety regulations.



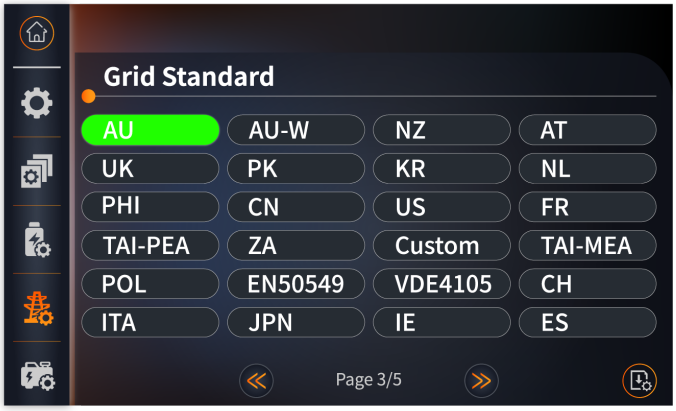


Grid parameters/page three:

Ten minutes Protection voltage and ten protection time, default values are 253V and 603S. The setting value of the protection voltage cannot exceed the primary overvoltage protection value of the power grid standard. The protection time can only be changed if the Italian safety regulations are set, and the value range is 600 to 610S. Every increase of 1 means that the Italian self-test level 1 overvoltage detection time is increased by 1000ms.



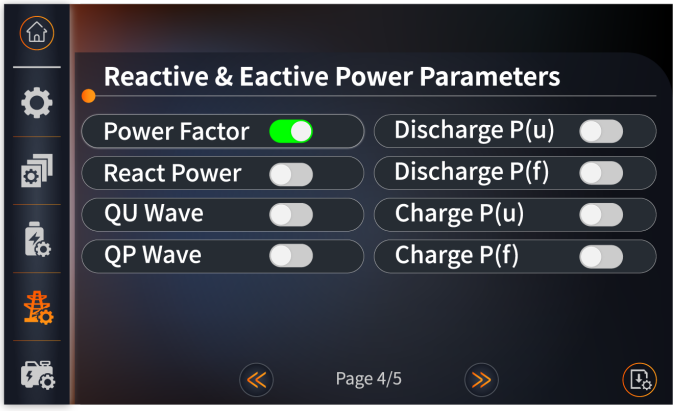
Grid Setting/Page Two



This interface is used to select Grid standard. User can set and switch grid standards according to their needs.

AU: Australia	AU-W: Western Australia	NZ: New Zealand	AT：Austria
UK: United Kingdom	PK: PAKISTAN	KR: Korea	NL：Netherlands
PHI: Philippines	CN: China	US: America	FR：France
TSAIL: THAILAND	ZA: South Africa	Custom: User defined	
POL: Poland	EN50549	VDE4105	CH：Switzerland
ITA: Italy	JPN: Japan	IE: Ireland	ES：Spain

Grid Setting/Page Three



REACT Power Parameter：REACT Power Parameter，including: **Power Factor**, **React Power**, **QU Wave**, **QP Wave**. (For specific country if required by the local grid.)

Power Factor: The input value should range between L0.80 and L0.99 or C0.8 and C1.00.

React Power: Reactive power control

The input value should range between -60% and +60%, which varies with the standard.

QU Wave: Voltage-reactive curve

QP Wave: Active power-reactive power curve

(These two functions are not available on the screen, please contact the distributor if you need to use them).

Discharge P(u): Discharge voltage response.

When the power grid voltage is abnormal, limit the discharge active power and enable the function according to the requirements of the national power grid standard.

Discharge P(f): Discharge frequency response.
When the power grid frequency is abnormal, limit the discharge active power and enable the function according to the requirements of the national power grid standard.
Charge P(u): Charge voltage response.
When the power grid voltage is abnormal, limit the Charge active power and enable the function according to the requirements of the national power grid standard.
Charge P(f): Charge frequency response.
When the power grid frequency is abnormal, limit the Charge active power and enable the function according to the requirements of the national power grid standard.

(5) Generator Setting



①Diesel generator enable settings:
Gen Enable: Enable control of the Generator function.
Gen Chare Enable: Generator Charge Enable control.
Gen Manual Mode: If the user wants the Generator to be controlled manually, enable it (Manual control enable and automatic control enable are mutually exclusive when set).
Gen Manual Start/Stop:The on/off command in manual control mode.
Gen Auto Start/Stop: If the user wants the Generator to be automatically controlled to start and stop through the dry contact, please enable it.
Gen Connect to Grid: Connect the diesel generator to the power grid input port to enable the generator parameters to take effect. If the generator is not enabled, the power grid is enabled by default.
Gen2MicroInverter Enable: If check this box, the PV Inverter can be connected to the diesel

generator input port.

②Diesel generator parameter setting:

Start SOC: When the SOC of battery is lower than the setpoint , the Generator dry contact is enabled and Generator Manual operation is disabled, the connected Generator will be started.

Stop SOC: When the SOC of battery is higher than the set point, the Generator dry contact is enabled and Generator Manual operation is disabled, the connected Generator will be stopped (START SOC < STOP SOC).

Charge Current: It indicates the maximum current that the inverter charges the battery from Generator.

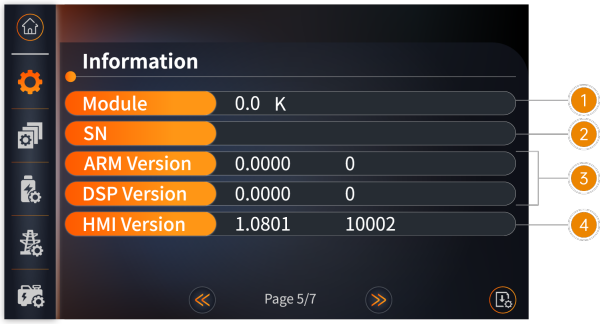
Gen Power: Rated power of Generator.

Cooling Time: It indicates the waiting time of the Generator to restart after it has reached the running time. The unit is 0.1 hour.

Max Operating: It indicates the longest time Generator can run in one day, when time is up, the Generator will be turned off. The value 240 means 24hours in which state the Generator will not be shut down all the time. The unit is 0.1 hour.

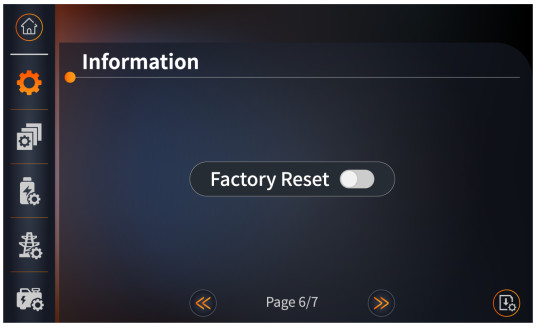
(6)Machine Information

Machine Information/Page One



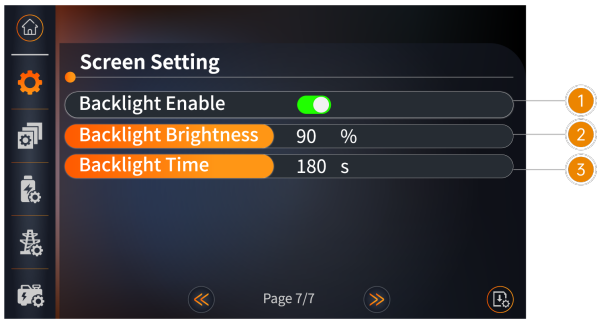
①Show inverter model.
②Energy storage inverter serial number.
③Show Software version.
④Display HMI version

Machine Information/Page Two

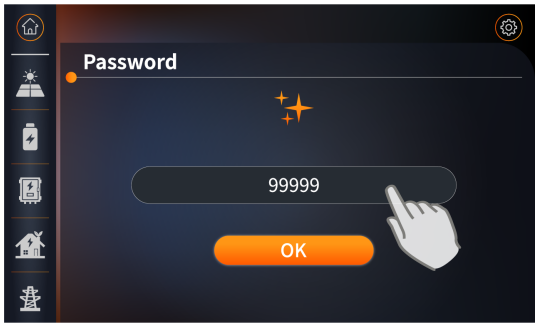
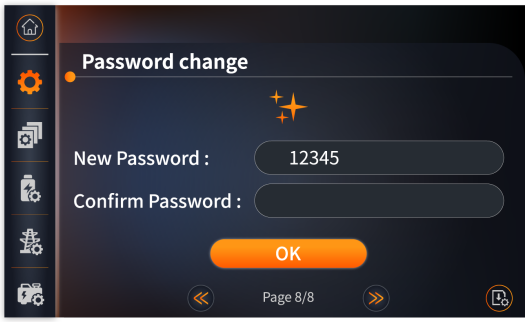


This interface is used to reset the inverter.

Machine Information/Page Three

	①LCD backlight is enabled. It is enabled by default. ②Backlight brightness adjustment. The default value is 0, and the value ranges from 0 to 100%. ③Backlight time setting. The default value is 180s.and the value ranges from 5 to 250s.

(7)Administrator account

	Users can set ”99999 to enter the administrator account, change the initial password.
	Click on Machine Information Page four, Change the default password. This page is displayed only when you enter the administrator account.

8. APP Operation

8.1 Home Page

The bottom of the home page includes functions such as home, Device, Report, and menu. Clicking the upper right corner allows you to add a home, and then add devices to the home for display. The upper left corner shows the current home name. Personal information and language switching settings are in the menu option.

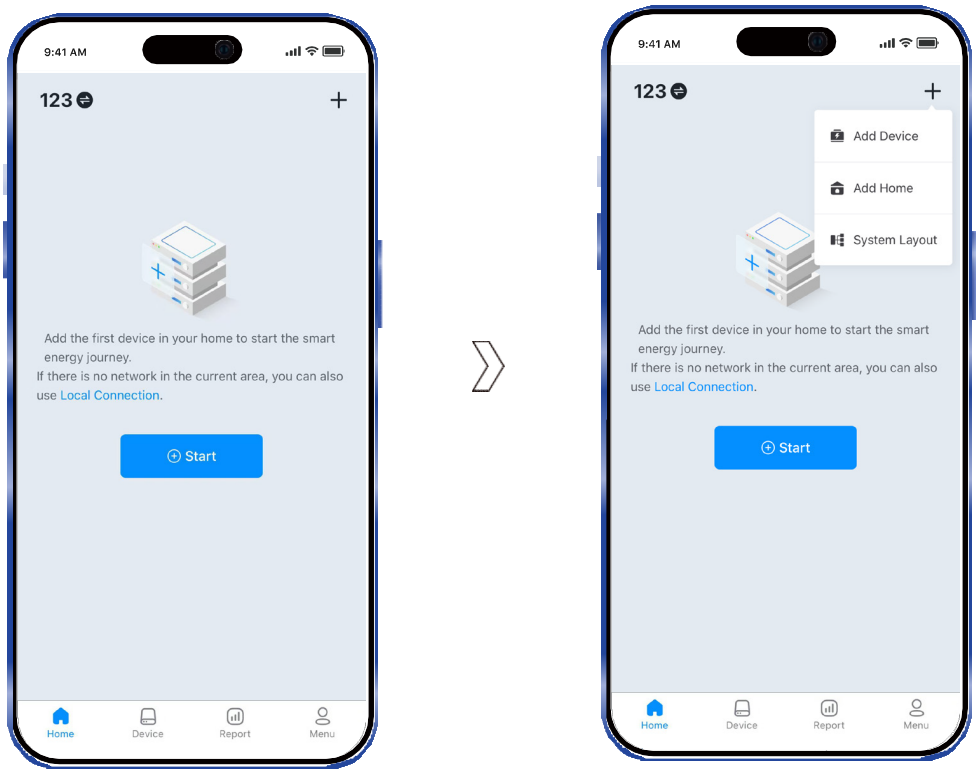


Figure 8-1

When using the smart set app, the users can view the relevant status of the device in real time and control it wirelessly.

The APP provides the user with two different connectivity options, IoT remote mode (configured by the user according to the SOLARMAN smart APP's user manual) and local mode.

8.2 Local Mode

8.2.1 Add a Logger

Click on the blue "Local connection" text in the middle of the screen. It will immediately take you to the local connection interface. Click on the bottom "Connect to device" button to enter the scanning interface. Scan and enter the serial number of the logger (you can find the serial number on the outer packaging or the logger itself), or click "Enter serial number" to manually input the serial number.

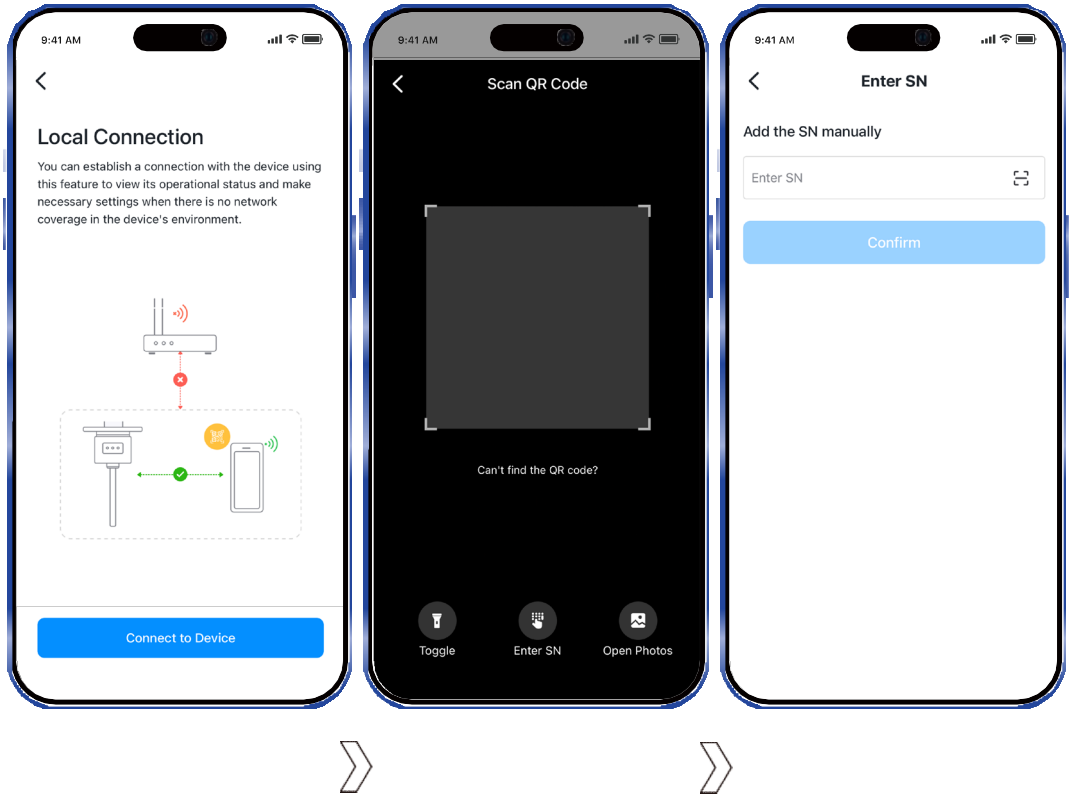


Figure 8-2

8.2.2 Bluetooth ON

The local connection mode only supports bluetooth connection. You can turn on the bluetooth function in advance, or add a logger first and then follow the prompts on the page to turn on bluetooth. If the connection fails, the user needs to reconnect the logger.

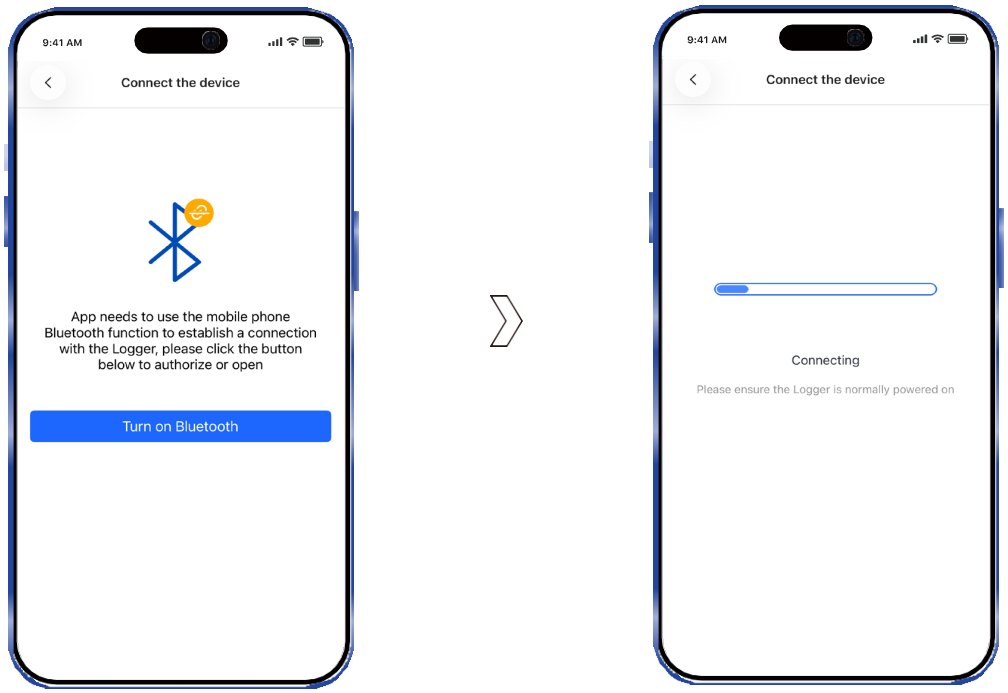


Figure 8-3

8.2.3 Enter the local mode interface

Once the connection is complete, you can view the operating status of the device and the parameters set. Click on the grouping to go to the detailed parameter page.

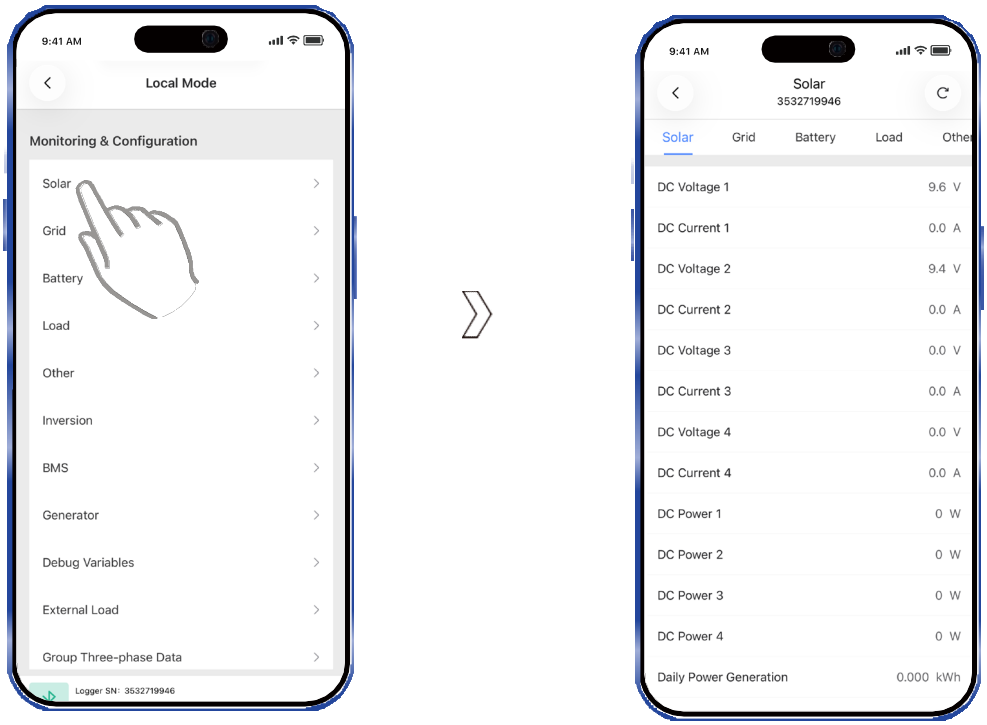


Figure 8-4

8.2.4 Working status

Click on the top groups to switch. The monitoring & configuration page contains the following subgroups: Solar, Grid, Battery, Load, Other (Display software version SN code, fault information, working mode, device temperature, inverter temperature, etc.), Inversion, BMS, GEN, DEBUG, Home load, Parallel 3Phase.

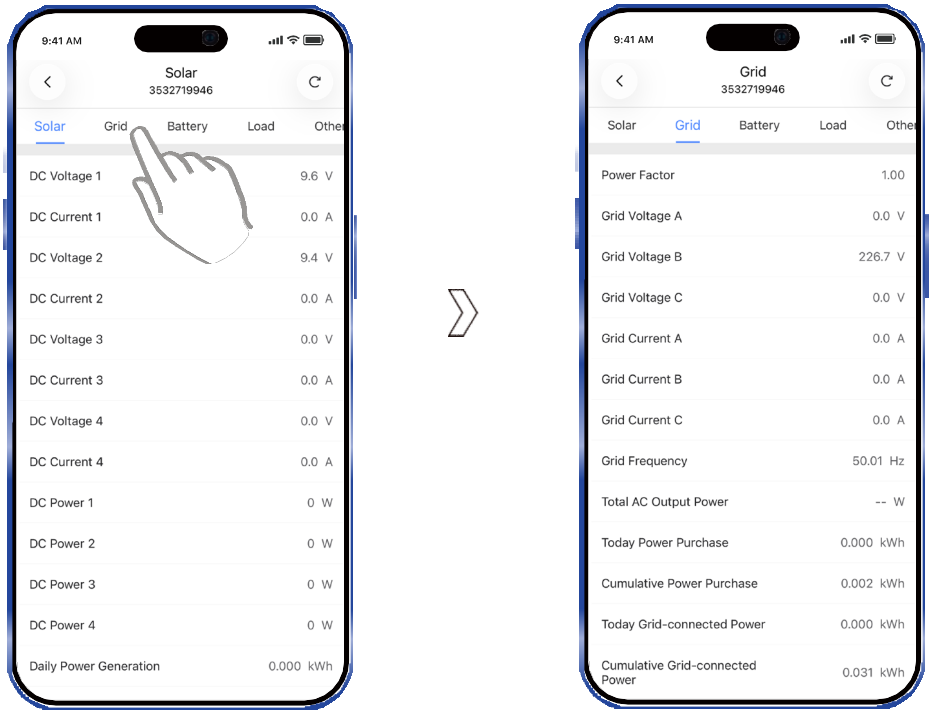


Figure 8-5

8.2.5 Set Parameters

You can set the operating parameters of the device according to their needs. The parameters set by the user need to be within the specified range.

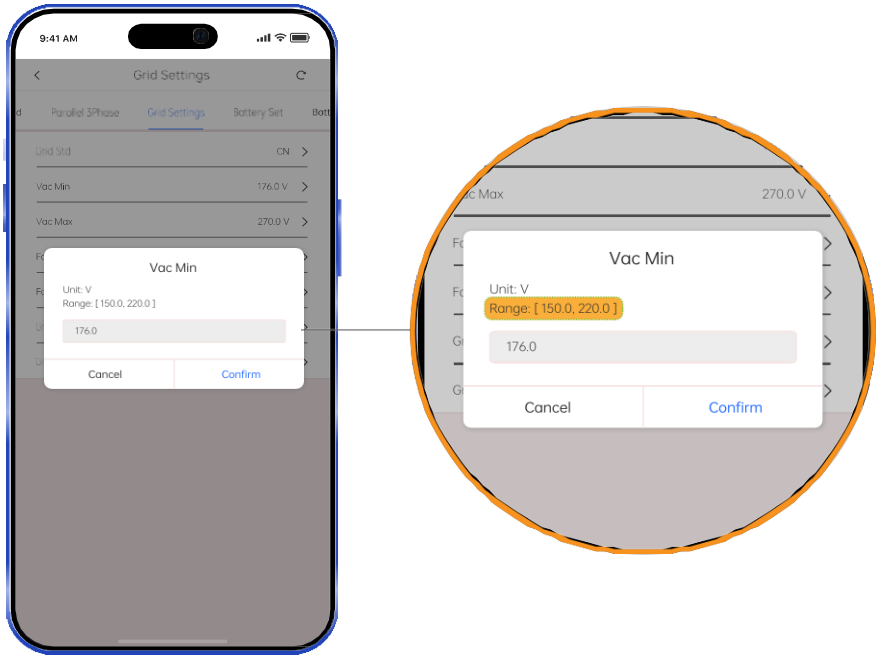


Figure 8-6

(1) Battery settings

The battery settings allow you to select the corresponding battery type, communication method, and charging/discharging current settings.

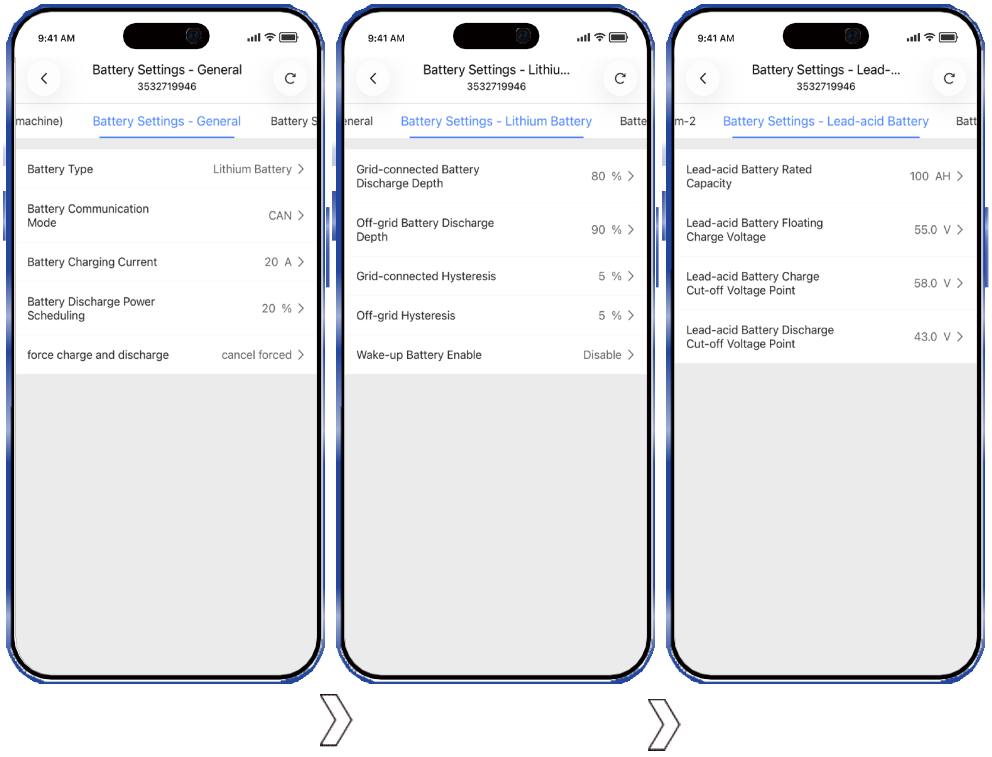


Figure 8-7

(2) Set the working mode and other parameters

Set the working mode of the inverter, the type of PV input, system language, date/time, etc. parameters.

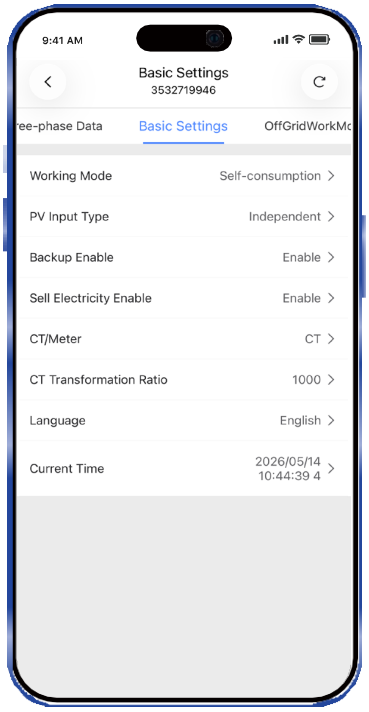


Figure 8-8

(3) Grid settings

Set the grid type and standards for the inverter.

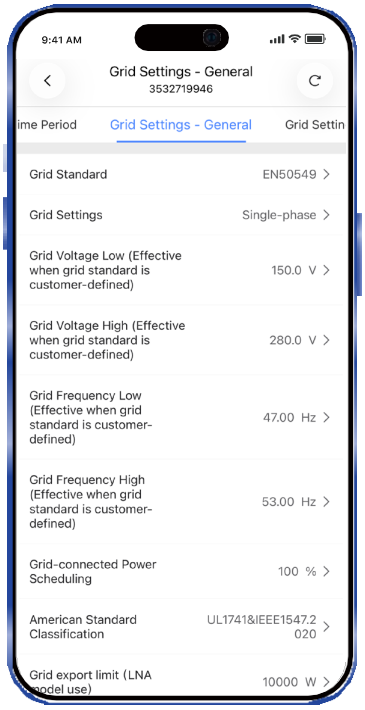


Figure 8-9

(4) Peak shift

Set peak-shift charging and discharging time. When the operating mode is peak-shift, you need to enter this interface to set the charging and discharging time and manually enter the start charging/ discharging time and the end charging/discharging time.

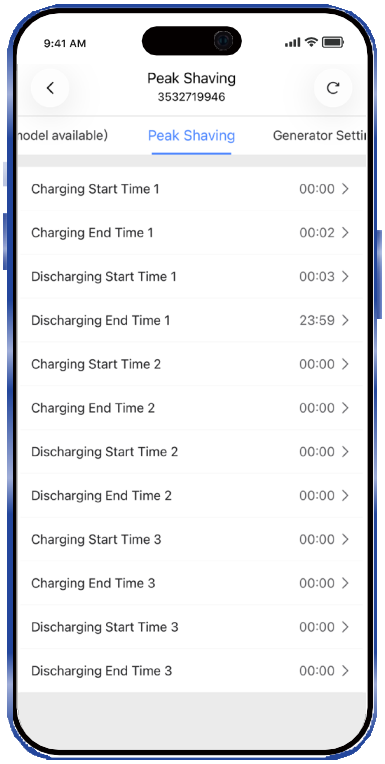


Figure 8-10

(5) Parallel set, Generator set , Advance work mode set and AC couple

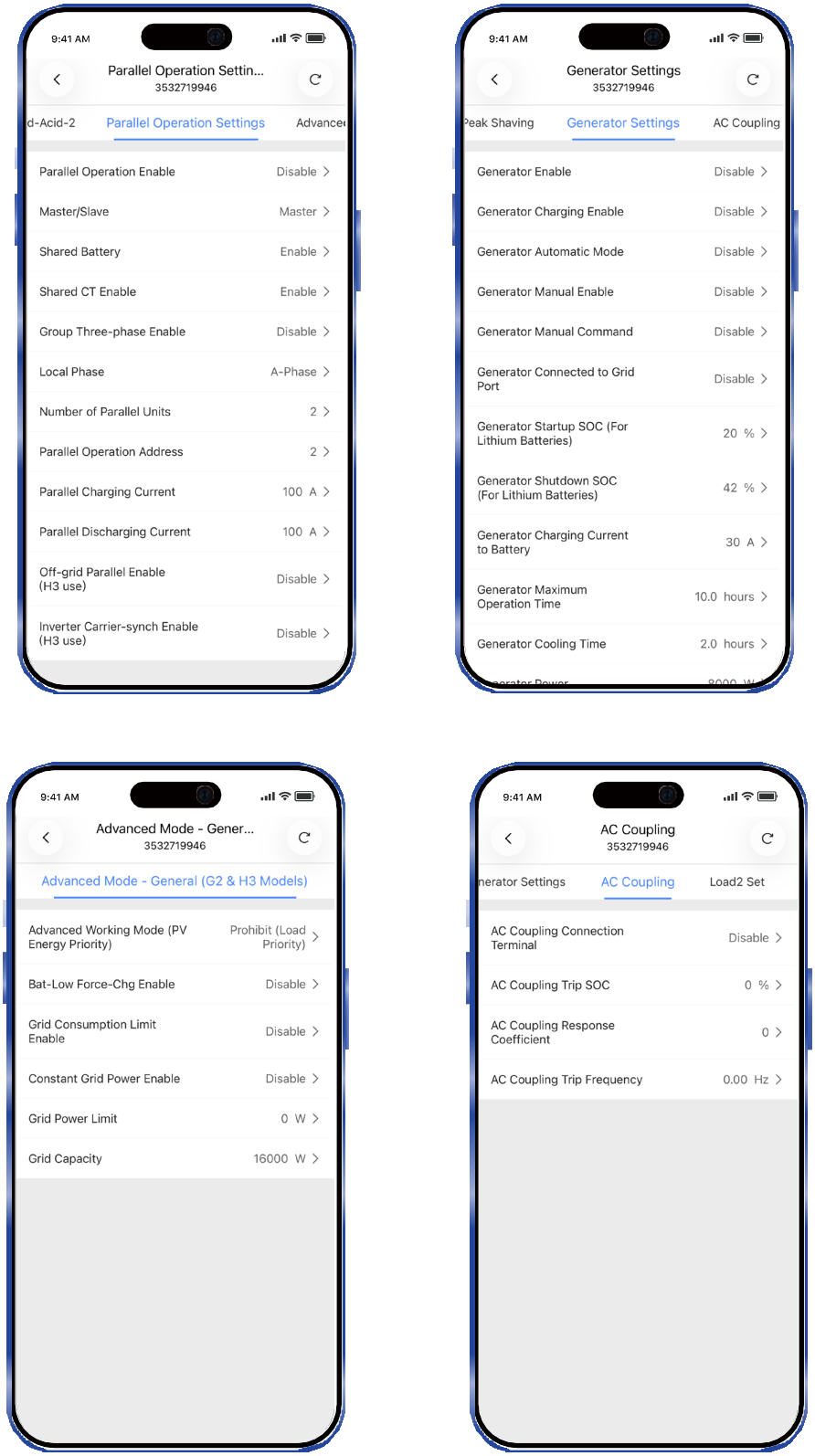


Figure 8-11

9. Fault diagnosis and solutions

The inverter is easy to maintain. When you encounter the following problems, please refer to the Solutions below, and contact the local distributor if the problem remains unsolved. The following table lists some of the basic problems that may occur during the actual operation as well as their corresponding basic solutions.

Fault diagnosis table

Content	Codes	Explanation	Solutions
Discharge Over Current	01	Battery discharge over current. When the battery is loaded, the load is too large.	(1) No action is required. Wait one minute for the inverter to restart. (2) Check whether the load is in compliance with the specification. (3) Cut off all the power and shut down all the machines; disconnect the load and plug in to restart machines, then check
Over Load	02	The load power is greater than other power (PV, BAT).	(1) Check whether the load is in compliance with the maximum power of the machine. (2) Cut off all the power and shut down all the machines; disconnect the load and plug in to restart machines, then check whether the load is short circuited if the fault has been eliminated. (3) Contact customer service if error warning continues.
Bat Disconnected	03	Battery Disconnect. (Battery voltage not identified)	(1) Check whether the battery is connected. (2) Check if battery wiring port is open circuited. (3) Contact customer service if error warning continues.
Bat Under Volt	04	Battery voltage low that normal range.	(1) Checking System Settings, If so, power off and restart. (2) Check if the grid power down. If so, waitting for the grid power up, the inverter will automatically charge. (3) If the error persists, contact customer service.
Bat Low Capacity	05	Bat Low capacity	(1) Battery Low that setting capacity. (SOC<100%-DOD)
Bat Over Volt	06	The battery voltage is greater than the Inverter maximum voltage.	(2) Checking System Settings, If so, power off and restart. (3) Contact customer service if error warning continues.

Gird Low Volt	07	Grid voltage is abnormal	(1) Check if the grid is abnormal. (2) Restart the inverter and wait until it functions normally. (3) Contact customer service if error warning continues.
Grid Over Volt	08		
Grid Low Freq	09	Grid Frequency is abnormal.	(1) Check if the grid is abnormal. (2) Restart the inverter and wait until it functions normally. (3) Contact customer service if error warning continues.
Grid Over Freq	10		
Gfci Over	11	Inverter GFCI exceeds standard.	(1) Check PV string for direct or indirect grounding phenomenon. (2) Check peripherals of machine for current leakage. (3) Contact the local inverter customer service if fault remains unremoved.
Parallel CAN bus failure	12	The parallel communication is abnormal.	(1) Check the cable, crystal, Line sequence. (2) Check if the wiring is correct.
Bus Under Volt	14	BUS voltage is lower than normal.	(1) Check the input mode setting is correct. (2) Restart the inverter and wait until it functions normally. (3) Contact customer service if error warning continues.
Bus Over Volt	15	BUS voltage is over maximum value.	(1) Check the input mode setting is correct. (2) Restart the inverter and wait until it functions normally.
INV Over Current	16	The inverter current exceeds the normal value.	(1) Restart the inverter and wait until it functions normally.
Charge Over Current	17	Battery charge current over than the Inverter maximum voltage.	(1) Restart the inverter and wait until it functions normally.
Meter Comm Fail	18	The meter communication is abnormal.	(1) Check the cable, crystal, Line sequence. (2) Check if the wiring is correct.
INV Under Volt	19	INV voltage is abnormal	(1) Check if the INV voltage is abnormal. (2) Restart the inverter and wait until it functions normally. (3) Contact customer service if error warning continues.
INV Over Volt	20		
INV Freq Abnor	21	INV frequency is abnormal	(1) Check if the INV frequency is abnormal. (2) Restart the inverter and wait until it functions normally. (3) Contact customer service if error warning continues.

IGBT Temp High	22	The inverter temperature is higher than the allowed value	(1) Cut off all the power of the machine and wait one hour, then turn on the power of the machine.
Bat Over Temp	24	Battery temperature is higher than the allowed value.	(1) Disconnect the battery and reconnect it after an hour.
Bat Under Temp	25	Battery temperature is low than the allowed value.	(1) Check the ambient temperature near the battery to see if it meets the specifications.
BMS Comm Fail	28	Communication between lithium battery and inverter is abnormal.	(1) Check the cable, crystal, Line sequence. (2) Checking the Battery switch.
Fan Fault	37	Fan Fault	(1) Check whether the Inverter temperature is abnormal. (2) Check whether the fan runs properly.(If you can see it)
Grid Phase ERR	31	The grid fault phase.	(1) (1) Check power grid wiring
Arc Fault	32	PV Arc Fault	(1) Check Photovoltaic panels, PV wire. (2) Contact customer service if error warning continues.
Bus Soft Fail	33	The inverter may be damaged	(1) Restart the inverter and wait until it functions normally. (2) Contact customer service if error warning continues.
INV Soft Fail	34		
Bus Short	35		
INV Short	36		
PV Iso Low	38	PV Iso Low	(1) Check if the PE line is connected to the inverter and is connected to the ground. (2) Contact customer service if error warning continues.
Bus Relay Fault	39	The inverter may be damaged	(1) Restart the inverter and wait until it functions normally. (2) Contact customer service if error warning continues.
Grid Relay Fault	40		
EPS Relay Fault	41		
Gfci Fault	42		
System Fault	46		



Note!

If an error occurs that is not listed in the table, Please Contact customer service.