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USER MANUAL

Eco Hybrid Inverter

IVAM6048P1G1



Revision History

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NOTE: Due to the inherent update cycle of printed manuals, please refer to the latest electronic version available through official channels for the most up-to-date information.

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About This Manual

This manual provides information on the product specifications, installation, operation, and maintenance of the inverter.It is intended for qualified personnel and end users who are familiar with photovoltaic (PV) systems.This manual does not cover all aspects of the PV system. Additional equipment, system design, and compliance requirements shall be addressed separately.

How to Use This Manual

Read this manual and all related documents carefully before installing, operating, or maintaining the inverter.Keep all documents in a safe and accessible location for future reference.This manual may be updated or revised due to product improvements. The information contained herein is subject to change without prior notice.The latest version of this manual is available at:https://www.felicitysolar.com/

1. Safety Introductions

Symbols	Name	Instruction
	Danger	Indicates a hazardous situation which, if not avoided, **will result in death or serious injury.**
	Warning	Indicates a hazardous situation which, if not avoided, **could result in death or serious injury.**
	Electrostatic sensitive	Damage may occur if the relevant anti-static requirements are not followed.
	Hot surface	Surfaces may become hot during operation. **Do not touch** to avoid burns.
	Earth terminal	The inverter **must be properly grounded** before operation.
	Caution	Indicates a hazardous situation which, if not avoided, **may result in minor or moderate injury or equipment damage.**
NOTE	Note	Provides additional information to ensure proper operation and handling.
	CE mark	Indicates compliance with applicable European Union directives.
	EU WEEE mark	Product shall not be disposed of as household waste. Dispose of according to local regulations.

This manual contains important safety, installation, and operating instructions. Please read all instructions carefully before installing or operating the inverter, and retain this manual for future reference.

- Before using the inverter, read the battery manufacturer's instructions, warning signs, and all relevant sections of this manual.
- Do **NOT** disassemble the inverter. Maintenance and repair must be carried out by qualified service personnel only.
- Improper reassembly may result in electric shock or fire.
- Before performing any maintenance or cleaning, **disconnect all AC and DC power sources.** Turning off the unit alone will not eliminate electrical hazards.
- Installation and wiring must be performed by **qualified and authorized personnel only.**
- Never charge a frozen or damaged battery.
- Select cable sizes strictly according to the specifications in this manual. Incorrect cable sizing may cause overheating or fire.
- Be extremely cautious when working near battery terminals. Dropping metal tools may cause sparks, short circuits, or explosions.
- Follow the prescribed procedures when disconnecting AC or DC terminals.
- The inverter must be permanently grounded in accordance with local electrical codes and regulations.
- Never short-circuit the AC output or DC input.
- Do not connect the inverter to the utility grid if the DC input is short-circuited.

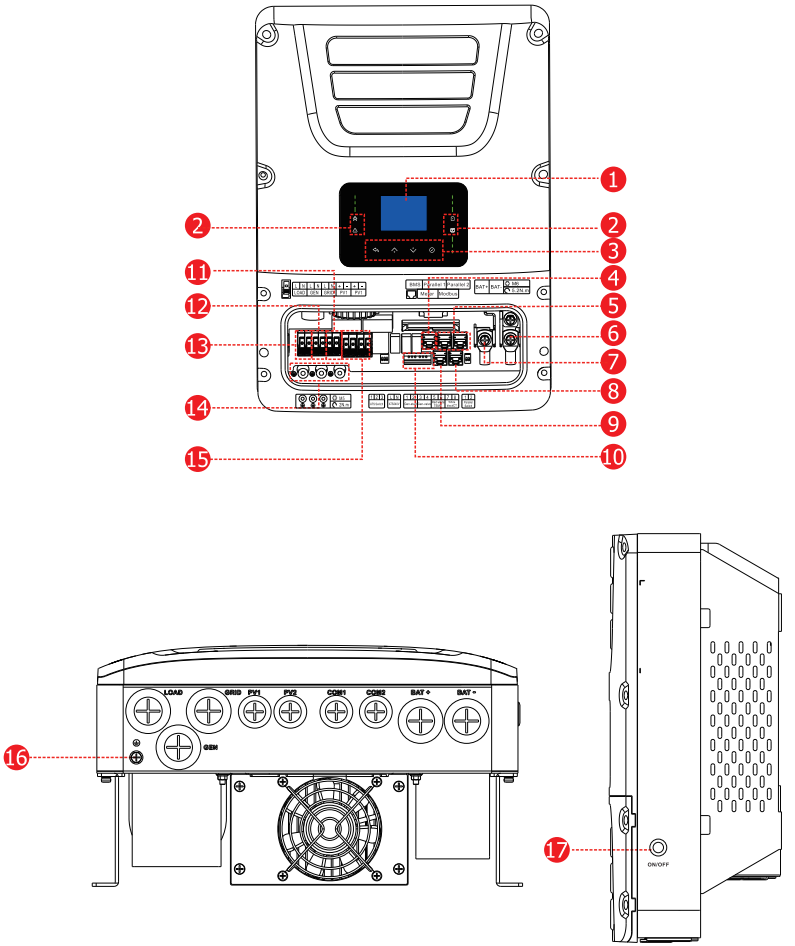
2. Product Introductions

This inverter is a multi-functional power conversion device integrating:

- DC/AC inverter
- Solar charge controller
- (MPPT)

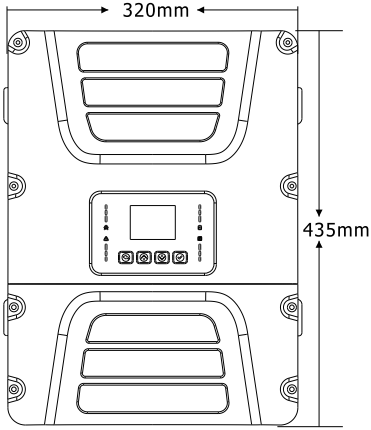
The compact design provides stable and uninterrupted power supply for residential and commercial applications. The built-in LCD display allows users to configure and monitor system parameters such as battery charging, AC/solar charging modes, and input voltage range for different operating conditions.

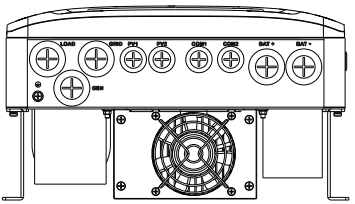
2.1 Product Overview

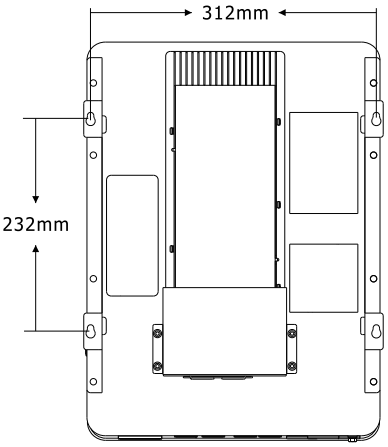


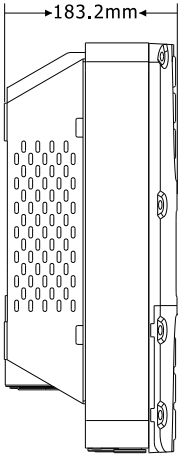
1.LCD Display
2.Inverter indicators
3.Function buttons
4.BMS port
5.Parallel port
6.BAT-
7.BAT+
8.Modbus port
9.Meter port
10.Function port
11.Grid port
12.Generator/Smart Load port
13.Load port
14.Ground of LOAD, GRID and GEN
15. PV input connection port
16.PE
17.Power ON/OFF button

2.2 Product Dimensions







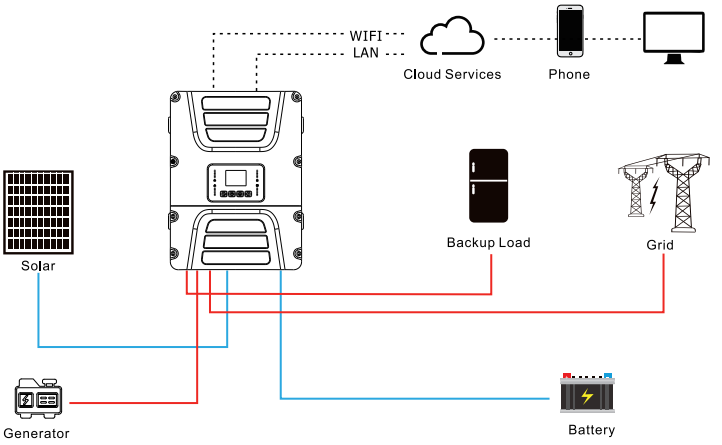


2.3 Product Features

- Supports self-consumption operation
- Automatic restart when AC power is restored
- Programmable operating modes: On-grid / Off-grid / UPS
- Adjustable battery charging current via LCD settings
- Compatible with utility grid or generator input
- Comprehensive protection: overload, over-temperature, and short-circuit
- Built-in export power limiting to prevent feeding excess power back to the grid
- Supports remote monitoring
- Built-in dual MPPT trackers for higher PV efficiency

2.4 Basic System Architecture

- The following illustration shows the basic application of this inverter.
- It also includes the following devices for a complete operating system.
- Generator or Utility
- PV modules
- Consult your system integrator for alternative system configurations based on specific requirements.
- This inverter can supply power to various home or office appliances, including motor-type devices such as refrigerators and air conditioners.

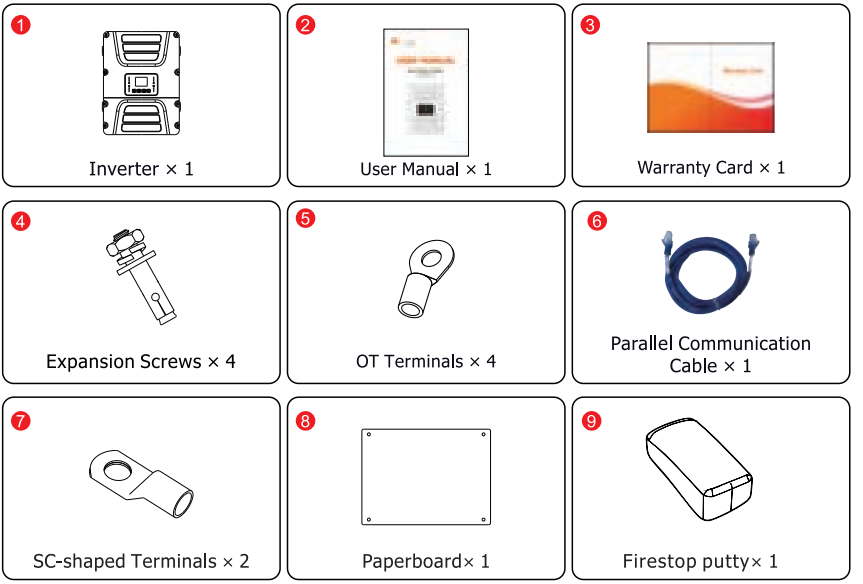


Note: When the GEN port is used as a "generator input" port, the relays on the GRID and GEN ports will not close simultaneously. The GEN relay closes only when the inverter operates in off-grid mode.

3. Installation

3.1 Parts List

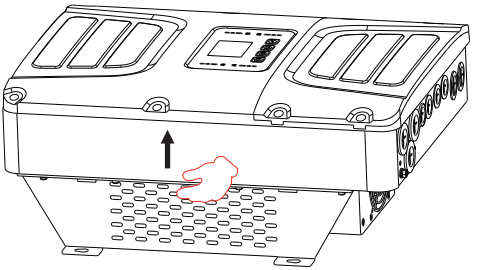
Check all equipment before installation to ensure there is no damage during transportation.
The following items should be included in the package:



No.	Name	Description	Quantity
1	Inverter	Inverter	1
2	User Manual	User manual	1
3	Warranty Card	Warranty card	1
4	Expansion Screws	Used to secure the product's wall mount	4
5	OT terminals	Used for external grounding connection.	4
6	Parallel Communication Cable	Used for communication between multiple parallel inverters.	1
7	SC-shaped Terminals	Used for battery connection.	2
8	Paperboard	Use to assist the position of wall hangers	1
9	Firestop putty	This Firestop putty seals structural gaps to prevent ants and insects from entering.	1

3.2 Product Handling Requirements

Use caution when unpacking and transporting the inverter:



CAUTION:

- Arrange an adequate number of personnel according to the inverter weight.
- Installation personnel must wear appropriate personal protective equipment (PPE), including safety gloves and safety shoes.
- Do not place the inverter directly on hard surfaces to avoid damage to the enclosure. Use protective padding such as foam or sponge mats underneath.
- The inverter may be carried by two persons or transported using suitable handling equipment.
- Keep batteries away from water and fire sources.

Improper handling may cause personal injury or equipment damage.

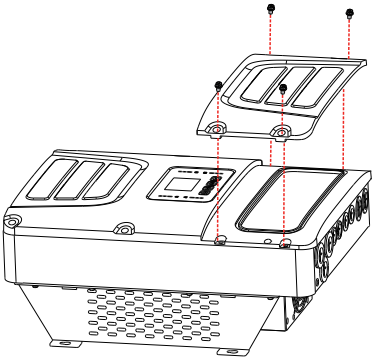
3.3 Mounting Instructions

Installation Environment Requirements

The inverter is designed for outdoor installation (Ip65), provided the following conditions are met:

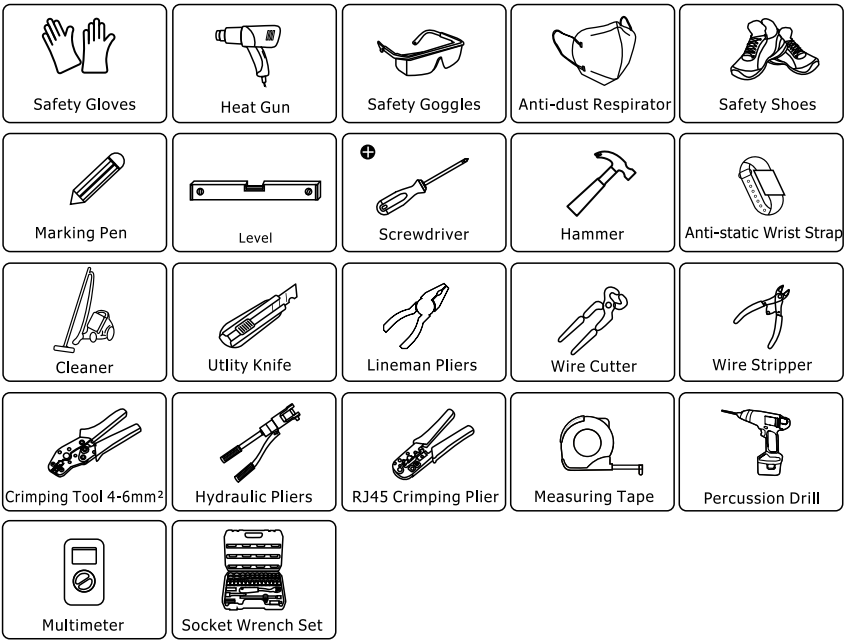
- Avoid direct sunlight exposure
- Avoid areas with highly flammable materials
- Avoid potentially explosive environments
- Avoid direct exposure to cold air
- Do not install near television antennas or antenna cables
- Maximum installation altitude: 3000 m above sea level
- Not in environment of precipitation or humidity(>95%)

Avoid direct sunlight, rain exposure, or snow accumulation during installation and operation. Before connecting the wires, remove the wiring cover by unscrewing the screws as shown below. After wiring, reattach the small cover and tighten the screws to a torque of 1.2 N·m.



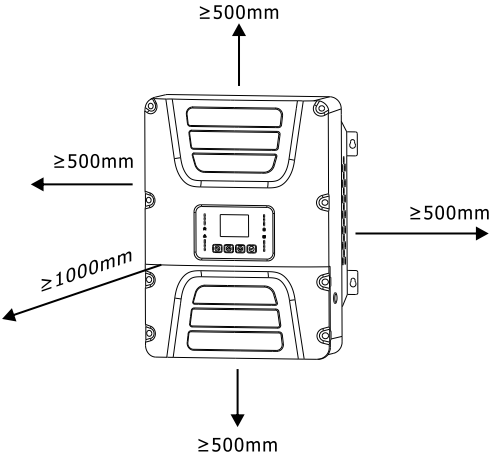
Installation Tools

Refer to the following recommended installation tools. Other auxiliary tools may also be used as needed.



Considering the following points before selecting where to install:

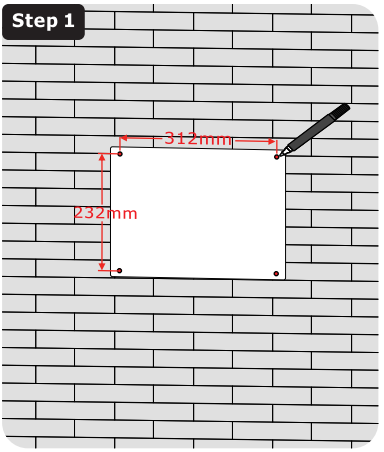
- Select a vertical wall with sufficient load-bearing capacity, preferably made of concrete or other non-flammable material. The installation example is shown below.
- Install this inverter at eye level in order to allow the LCD display to be read at all times.
- The ambient temperature is recommeded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

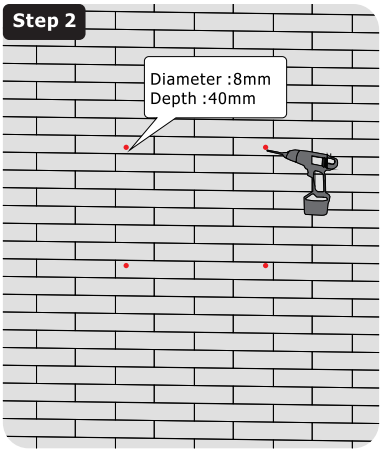


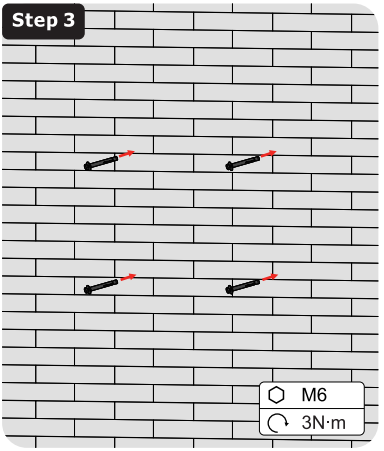
For proper air circulation to dissipate heat, allow a clearance of approx. 50cm to the side and approx. 50cm above and below the unit. And 100cm to the front.

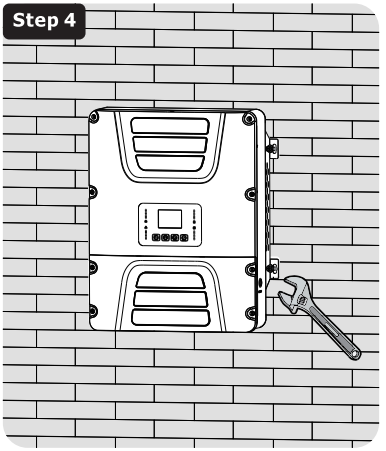
Mounting the inverter

1. Use a marker to mark drilling positions through the mounting holes.
2. Drill four holes using an 8 mm drill bit to a depth of approximately 40 mm.
3. Insert expansion bolts into the holes and remove the nuts.
4. Lift and align the inverter with the expansion bolts.
5. Tighten the nuts securely to complete installation (recommended torque: 3 N·m).



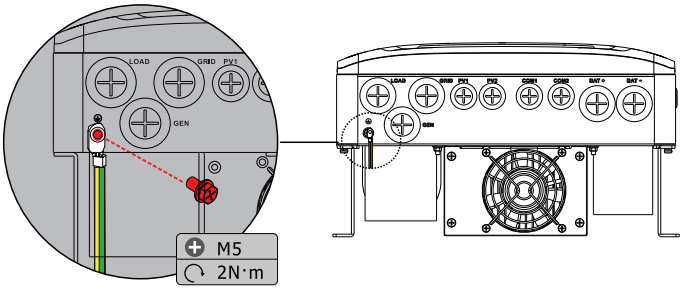






3.4 Earth Connection(Mandatory)

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



Earth connection (Copper wires)

Model	Wire Size	Cable(mm²)	Torque value(max)
6kW	8AWG	6	2.0N·m

Earth connection (Copper wires) (Bypass)

Model	Wire Size	Cable(mm²)	Torque value(max)
6kW	8AWG	6	2.0N·m

Warning:

Inverter has built-in leakage current detection circuit, The type A RCD can be connected to the inverter for protection according to the local laws and regulations.

If an external leakage current protection device is connected, its operating current must be equal to 300 mA or higher, otherwise inverter may not work properly.

3.5 Battery Connection

For safety and regulatory compliance, a dedicated DC over-current protection device (DC circuit breaker or fuse) must be installed between the battery and the inverter.

All wiring must be performed by a professional person.
Connecting the battery with a suitable cable is important for safe and efficient operation of the system.

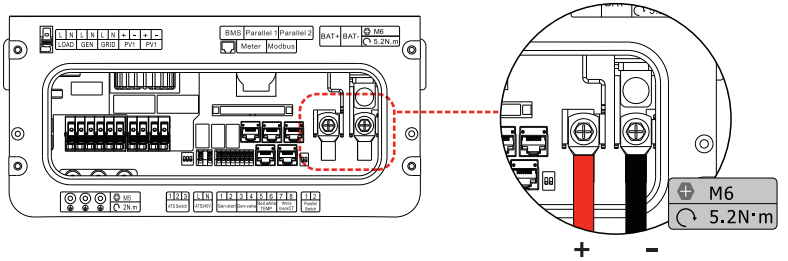
Battery Connection Procedure

1. Select appropriate battery cables and terminals compatible with the battery posts.
2. Strip the cables with 10mm.
3. Use an M8 socket wrench to secure the terminals and tighten clockwise.
4. Verify correct polarity at both battery and inverter terminals (+ to +, – to –).
5. Tighten the waterproof connector cap to prevent ingress of dust, insects, or moisture.

WARNING: Reversed battery polarity will cause severe damage to the inverter.

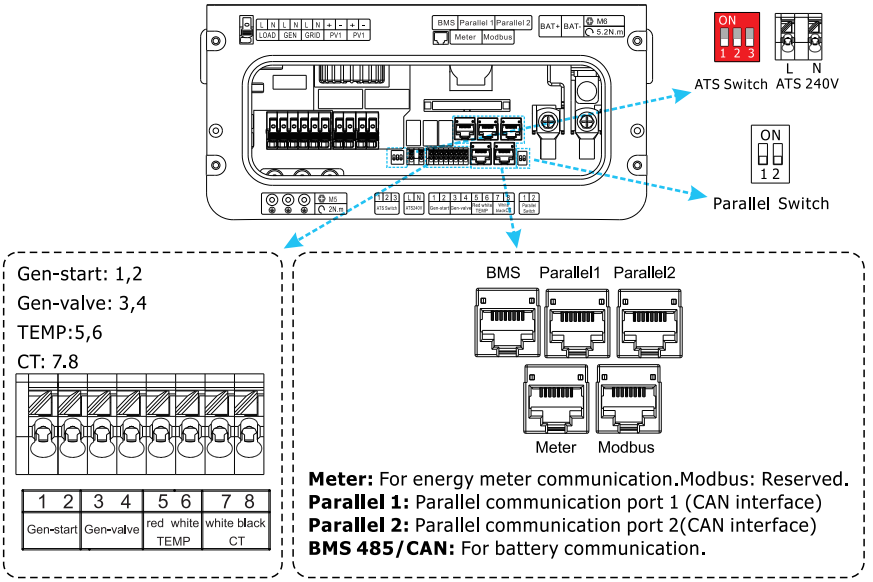


Wire Size	Cable(mm²)
2~0AWG	35~50



- Installation must be performed with care.
- Before making the final DC connection or closing the DC breaker/disconnector, ensure the positive (+) terminal is connected to positive (+) and the negative (-) terminal is connected to negative (-). Reversed battery polarity will damage the inverter.

3.5.1 Function Port Definition



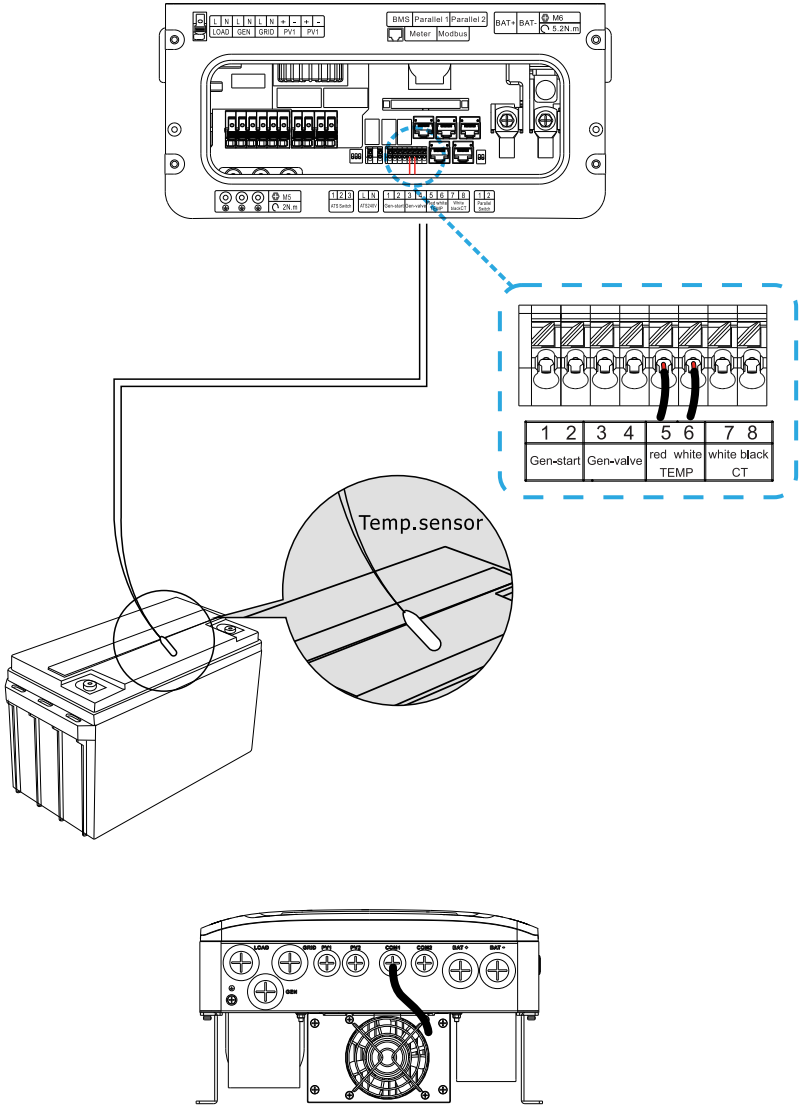
Meter: For energy meter communication.Modbus: Reserved.
Parallel 1: Parallel communication port 1 (CAN interface)
Parallel 2: Parallel communication port 2(CAN interface)
BMS 485/CAN: For battery communication.

Gen-start/ Gen-valve(1,2/3,4): dry contact signal for startup the diesel generator.
When the diesel generator is connected to the GEN port and "GEN Signal" is enabled, the open contact "Gen-start" closes (no voltage output) and acts as a dry contact signal for starting the generator.
When the diesel generator is connected to the GRID port and "Grid Signal" is ticked, the open contact Gen-valve will close (no voltage output) and serve as the dry contact signal for starting the diesel generator.

Gen-start Rated Voltage	250 VAC
Gen-start Rated Current	5 A
Gen-start Dielectric Withstand Voltage	1,000 VAC (50/60 Hz, 1 minute; leakage current ≤ 1 mA)

TEMP(5,6): battery temperature sensor for lead acid battery.
CT(7,8): current transformer for "zero export to CT" mode.
ATS Switch : When all the dials of the dip-switch are in "ON" position, the ATS port will able to output AC voltage. Otherwise, if all the dials of the dip-switch are in opposite position of "ON", the ATS port will not output AC voltage.
NOTE: The "ATS Enable" (in Advanced Function) must be enabled for the dip-switch to take effect.
Parallel Switch: Parallel communication resistor. If the number of inverters in the parallel system is less than or equal to 6, all inverter's DIP switch (1&2) need be ON position. If the number of inverters in parallel system exceeds 6, the main 6pcs inverter's DIP switch needs to be ON position. And the other inverter DIP switch (1&2) needs to be OFF position.

3.5.2 Temperature Sensor Connection for Lead-acid Batteries



3.6 PV Connection

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

Model	Wire Size	Cable(mm²)
6kw	12AWG	2.5



- The photovoltaic cables comply with IEC 62930, featuring a rated DC voltage of 1.5 kV, cross-linked insulation and sheath, UV resistance, and halogen-free flame-retardant properties.
- Do not connect PV modules with potential leakage current to the inverter.
- Ensure PV+ and PV− are not directly grounded unless required by local regulations.
- A PV junction box with surge protection is strongly recommended.
- Lightning strikes or surge events may damage the inverter if proper protection is not installed.

3.6.1 PV Module Selection:

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

1) Open circuit Voltage (Voc) of PV modules not exceeds the Max. PV input voltage of the lable. of inverter.

2) Open circuit Voltage (Voc) of PV modules should be higher thanStart-up Voltage of the lable.

3) The PV modules used to connected to this inverter shall be Class A rating certified according to lEC 61730.

Inverter Model	**6kw**
PV Input Voltage	370V(90V~500V)
MPPT Voltage Range	90V~425V
No. of MPP Trackers	2
No. of Strings MPP Tracker	1+1
Max. PV panels per string(recommended)	8

3.6.2 PV Module Wire Connection:

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



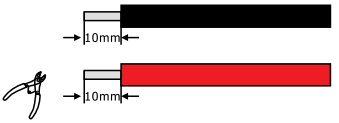
Safety Hint:

- Before connection, please make sure the polarity of the output voltage of PV array matches the “DC+” and “DC-” symbols.
- Before connecting inverter, please make sure the PV array's open circuit voltage less than 500V.

Safety Hint:

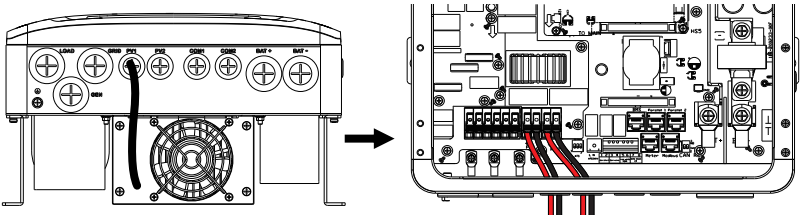
- Please use approved DC cable for PV system.voltage is within the 500V of the inverter.

The steps to assemble the DC connectors are listed as follows:
Step 1: Use wire cutters to cut open the wire sheath by about 10mm



Wire Size	Cable(mm²)
12AWG	2.5

Step 2: Use a tool to cut through the cut wire along this cross-shaped groove, lift the terminal clip, insert the wire and press the clip to fix it.



Warning:

Sunlight shines on the panel will generate voltage, high voltage in series may cause danger to life. Therefore, before connecting 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 conditions.

3.7 Grid Connection and Backup Load Connection

- Install a dedicated AC circuit breaker between the inverter and the utility grid.
- Install a separate AC breaker between the inverter and the backup load for maintenance and over-current protection.
- Recommended AC breaker rating: 40 A.
- There are three terminal blocks labeled "GRID," "LOAD," and "GEN." Do not connect input and output terminals incorrectly.



Note:

- In final installation,breaker certified according to IEC 60947-1 and IEC 60947-2 shall be installed with the equipment.
- All wiring must be performed by a qualified personnel.It is very important for system safety and efficient operation to use appropriate cable for AC input connection. To reduce risk of injury, please use the proper recommended cable

Grid connection and backup load connection (Copper wires)

Model	Wire Size	Cable(mm²)
6kw	8AWG	6.0

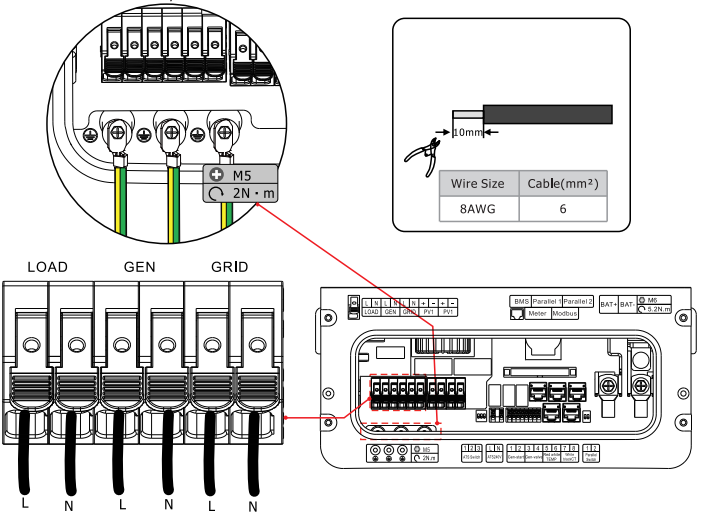
Grid connection and backup load connection (Copper wires) (Bypass)

Model	Wire Size	Cable(mm²)
6kw	8AWG	6.0

AC Wiring Procedure

1. Ensure the AC power source is switched OFF before wiring.
2. Connect the grounding wire first, followed by neutral and live wires.
3. Use wire cutters to cut open the wire sheath by about 10mm, use a tool to cut through the cut wire along this cross-shaped groove, lift the terminal clip, insert the wire and press the clip to fix it.
4. Ensure neutral (N) and protective earth (PE) are correctly terminated.
5. Confirm all terminal connections are secure.

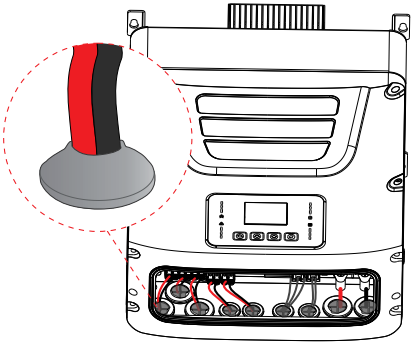
Ground of LOAD, GRID and GEN



Ensure the AC power source is powered off before wiring the unit.

Appliances such as air conditioner are required at least 2-3 minutes to restart because it is required to have enough time to balance refrigerant gas inside of circuit. If a power shortage occurs and recovers in short time, it will cause damage to your connected appliances.

To prevent this kind of damage, please check manufacturer of air conditioner if it is equipped with time-delay function before installation. Otherwise, this inverter will trigger overload fault and cut off output to protect your appliance but sometimes it still causes internal damage to the air conditioner.



(If the protective wire loop is damaged, apply firestop putty.)

Cable-Entry Sealing

After completing all battery, PV, grid, generator and load wiring:
1. Seal all gaps between cables and wing compartment cable entry openings with firestop putty.
2. Ensure gaps are fully filled to prevent moisture, dust and small animals from entering the inverter interior.
3.Working temperature above 0 °C, to use itafter kneading several times until to soft.
4.If Working below 0 °C, please heating the product to soft by the hair dryer or heat gun/hotair gun about 1 min.

3.8 Post- installation Self- inspection Checklist

A. General & Safety
- ☐ Installation performed by qualified personnel
- ☐ Work area is clean, dry, and free of debris
- ☐ No exposed conductors or damaged insulation
- ☐ All wiring is properly secured and routed
- ☐ AC and DC sources were OFF during installation
- ☐ Lockout/tagout applied where required

B. Grounding (Earth Connection)
- ☐ Ground cable connected to inverter (grid side)
- ☐ Ground connected to system earth/ground plate
- ☐ Cable size compliant **(8AWG / 6mm²)**
- ☐ Screw (M5) tightened to **2.0 N·m**
- ☐ Connection is secure and corrosion-free

C. Leakage Protection
- ☐ External RCD installed (if required)
- ☐ RCD rating ≥ **300 mA**
- ☐ RCD complies with local regulations
- ☐ No interference with inverter internal protection

D. Battery System
- ☐ DC breaker/fuse installed between battery
- ☐ and inverter
- ☐ Cable size compliant **(2–0 AWG / 35–50 mm²)**
- ☐ Cables are undamaged and properly rated

E. Battery Connection
- ☐ Correct polarity confirmed **(+ to + / − to −)**
- ☐ Terminals tightened **(M8, 12 N·m)**
- ☐ Connections are firm and secure
- ☐ Waterproof caps installed
- ☐ Final polarity check completed before energizing

F. Temperature Sensor (Lead-Acid Only)
- ☐ Sensor installed on battery
- ☐ Good thermal contact with battery surface
- ☐ Connected to **TEMP port (pins 5–6)**
- ☐ Cable intact and properly routed

G. PV System-General
- ☐ DC breaker installed between PV and inverter
- ☐ Cable size compliant **(12 AWG / 2.5 mm²)**
- ☐ Approved PV DC cables used
- ☐ PV junction box with surge protection installed
- ☐ Lightning/surge protection considered
- ☐ PV+ and PV− not grounded (unless required)

H. PV Module Parameters
- ☐ Open-circuit voltage (Voc) **≤ 500 V**
- ☐ Voc above inverter startup voltage
- ☐ Within MPPT range **(90–425 V)**
- ☐ Correct MPPT/string configuration

I. PV Wiring & Connection
- ☐ AC main switch OFF before PV work
- ☐ DC isolator OFF before connection
- ☐ Correct polarity **(PV+ / PV−)**
- ☐ Cable stripped ~10 mm
- ☐ Connectors properly assembled
- ☐ No exposed conductors
- ☐ All connections tight and secure

J. PV Installation Safety
- ☐ PV modules covered or shaded during installation
- ☐ No live DC exposure risk
- ☐ DC switch OFF during installation
- ☐ System protected against surge/lightning

K. AC Connection (Grid / Load / Generator)
- ☐ AC breaker installed between inverter and grid
- ☐ Separate breaker installed for backup load
- ☐ Breaker rating **40 A** (recommended)
- ☐ Correct terminal usage **(GRID / LOAD / GEN)**
- ☐ No cross-wiring between input/output

L. AC Wiring
- ☐ AC power OFF before wiring
- ☐ Ground (PE) connected first
- ☐ Neutral (N) and Live (L) correctly connected
- ☐ Cable stripped ~10 mm
- ☐ Conductors fully inserted into terminals
- ☐ Terminal screws tightened securely
- ☐ PE and N correctly terminated
- ☐ Cable size compliant (8 AWG / 6 mm²)
- ☐ All cable-entry openings properly sealed with fire-resistant & water-resistant sealing compound.

M. Communication & Function Ports ☐ Meter communication connected ☐ BMS communication (RS485/CAN) connected ☐ Parallel communication configured correctly ☐ Dry contacts (Gen-start / Gen-valve) wired (if used) ☐ DIP switch settings correct ☐ ATS function configured correctly (if used)	**O. Final System Check** ☐ All electrical connections secure ☐ No reverse polarity anywhere in system ☐ Wiring is neat, labeled, and strain-free ☐ System ready for safe energization
N. Appliance Protection ☐ Restart delay considered for appliances (≥ 2–3 min) ☐ Time-delay protection verified (if required) ☐ No frequent rapid cycling risk	

3.9 WIFI Connection

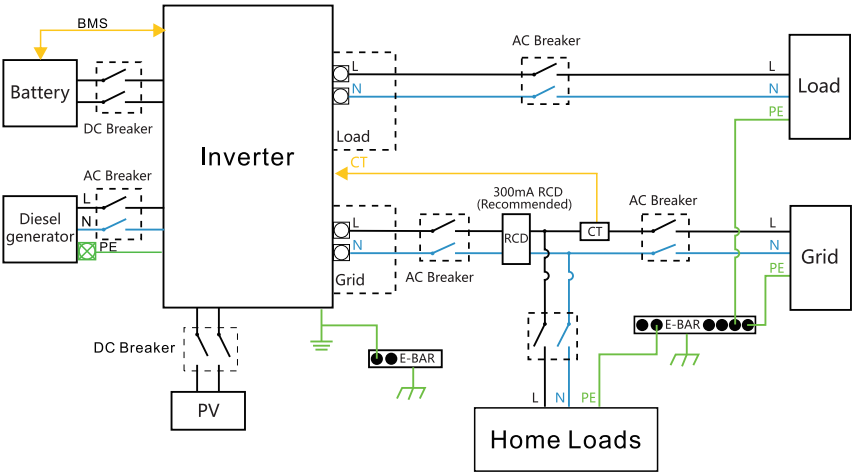
The inverter integrated internal Wi-Fi module. Please refer to the APP manual for detail configurations.

3.10 Wiring System for Inverter

This diagram is an example for grid systems without special requirements on electrical wiring connection.

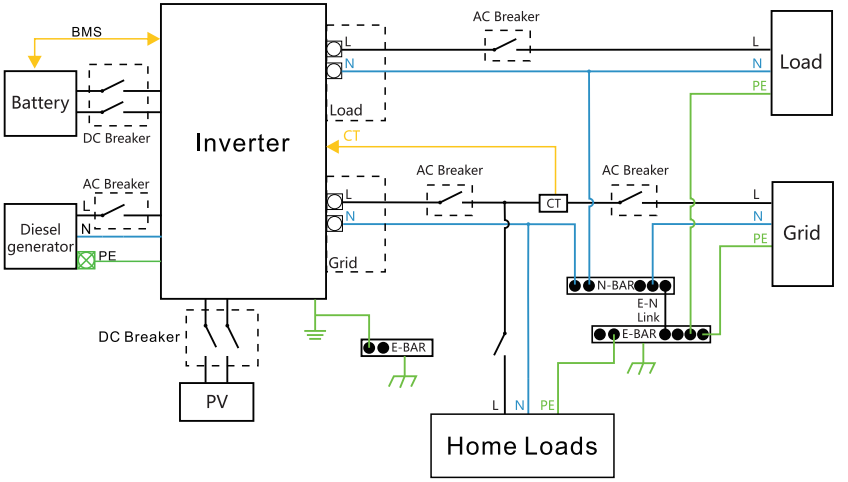
Note: The load PE line and earthing bar must be grounded properly and effectively.

Otherwise the back-up function may be abnormal when the grid fails.



This diagram is an example for application that Neutral connects together with PE in distribution box.

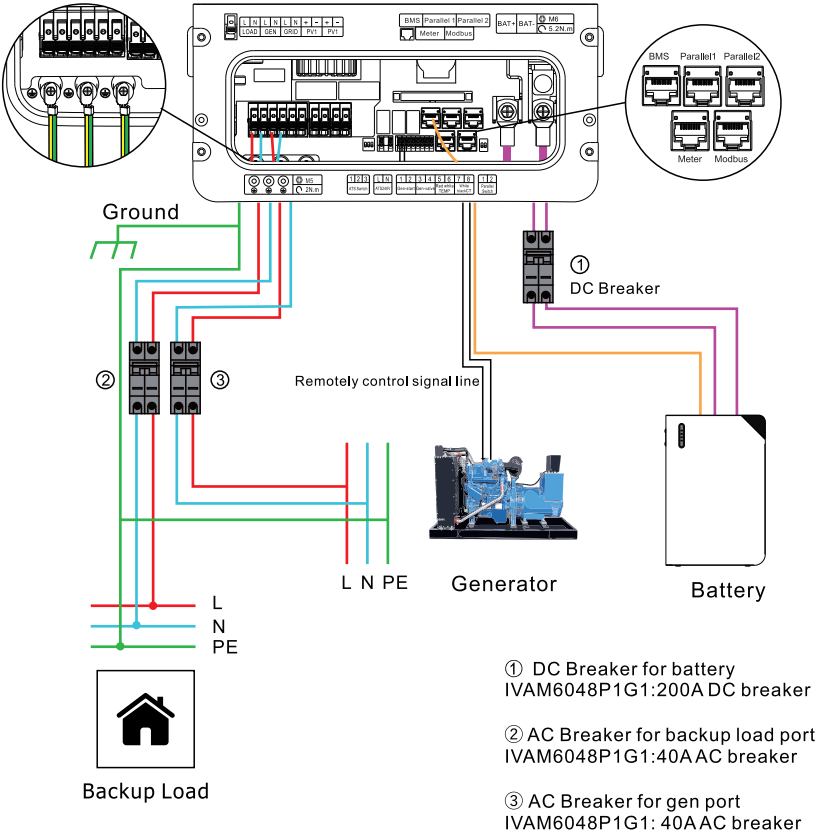
Such as: Australia, New Zealand,etc. (Please follow local wiring regulations!)



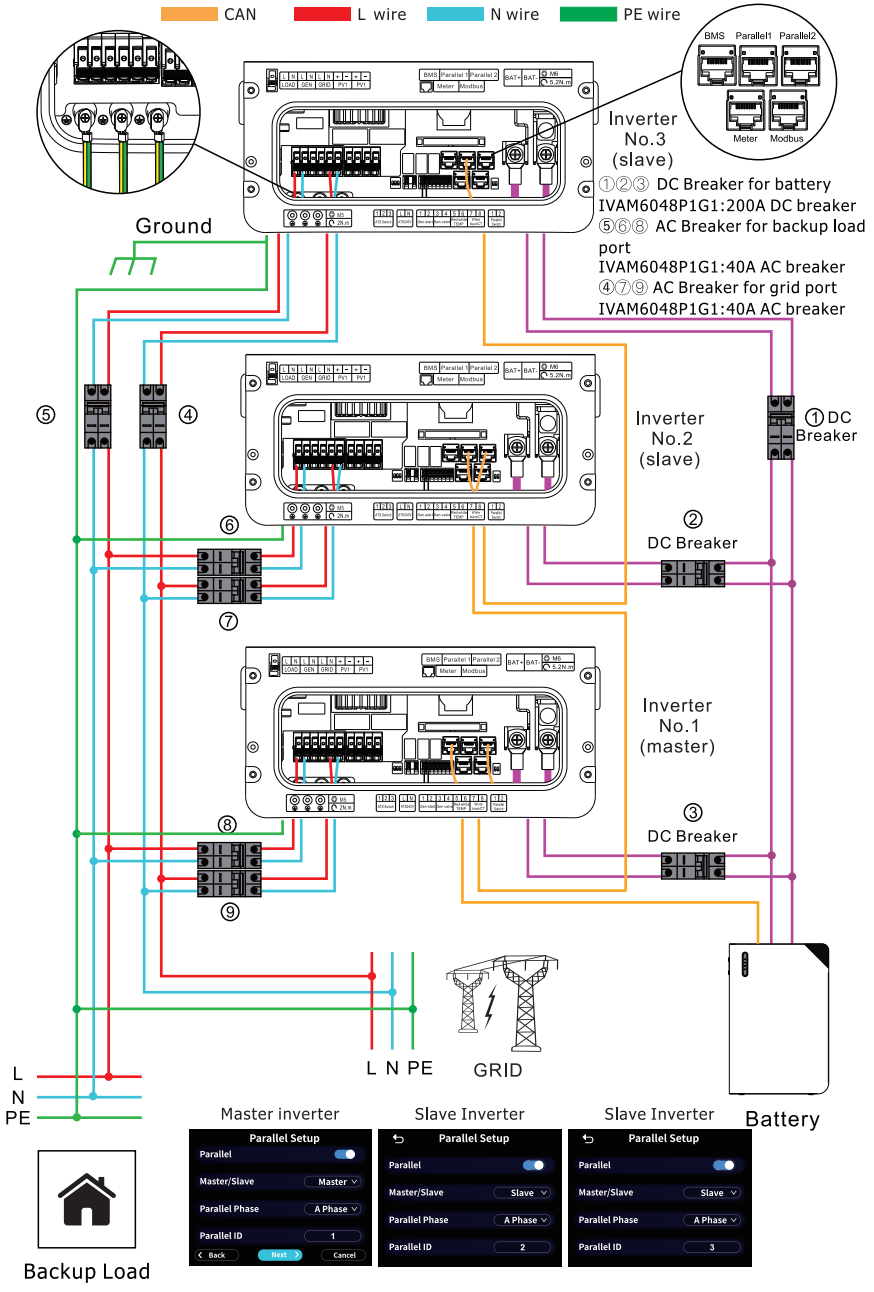
3.11 Typical Application Diagram of Diesel Generator

CAN L wire N wire PE wire

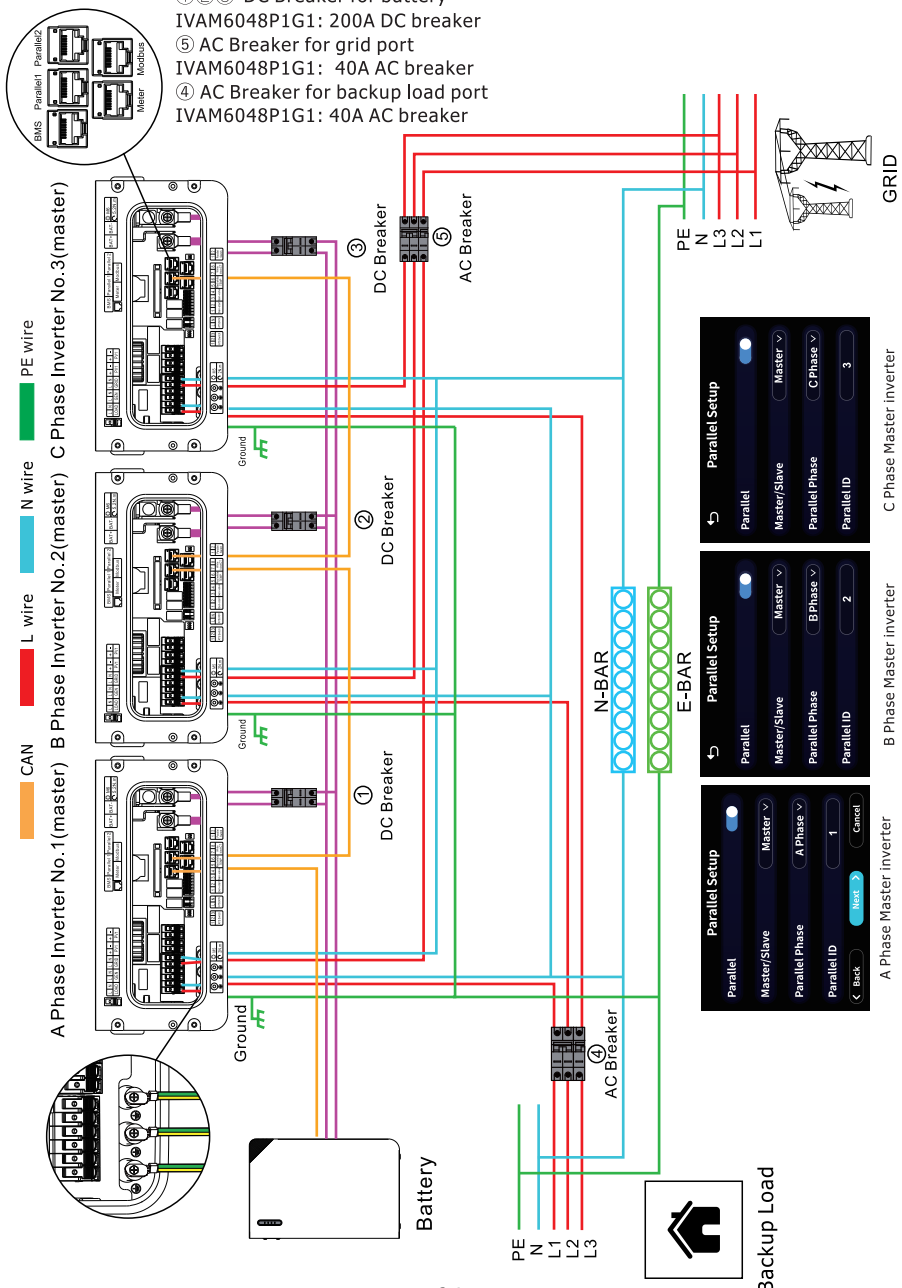
G-start/ G-valve(1,2,3,4): dry contact signal for startup the diesel generator.
When the diesel generator is connected to the GEN port and "GEN Signal" is ticked, the open contact G-start will close (no voltage output) and serve as the dry contact signal for starting the diesel generator.
When the diesel generator is connected to the GRID port and "Grid Signal" is ticked, the open contact G-valve will close (no voltage output) and serve as the dry contact signal for starting the diesel generator.



3.12 Single Phase Parallel Connection Diagram



3.13 Three Phase Parallel Inverter



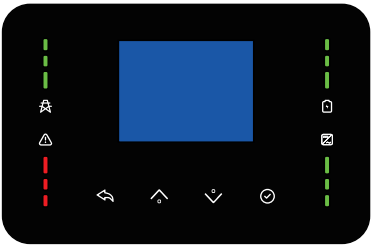
4. OPERATION

4.1 Power ON/OFF

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

4.2 Operation and Display Panel

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



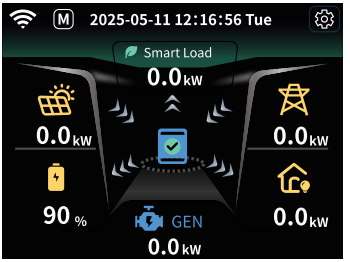
Function Key	Icon	Description
ESC		To exit setting mode
Up		To go to previous selection
Down		To go to next selection
Enter		To confirm the selection

LED Indicator	Icon	Color	State	Description
Battery		Green	solid	The battery is full.
			flashing	The battery is charging.
			dim	The battery is not charged.
Utillity		Green	solid	Inverter is running in utility mode.
			dim	Inverter is not running in utility mode.
Inverter		Green	solid	Inverter is running in off-grid mode.
			dim	Inverter is not running in off-grid mode.
Fault		Red	solid	Inverter works in fault event.
			dim	Inverter works normally.
Buzzer Information				
Buzzer beep	When the buzzer is enabled, it will keep beeping if the inverter experiences a fault.			

5. LCD Display Icons

5.1 Main Screen

1. The LCD is a touch screen, below screen shows the overall information of the inverter.



Operating status	Icon	Color	Description
Normal operation		Green	The icon in the center of the home screen indicates that the system is in normal operation.
Standby		White	The icon in the center of the home screen ndicates that the system is standby.
Fault		Red	If it turns into red and shows "! ", it means the inverter has fault,
Warning		Yellow	If it turns into yellow, it means the inverter has warning

2. At the top of the screen is the time (year-month-day,time), and communication connection status.

Ⓜ: Parallel system master or slave flag.

: WIFI communication success.

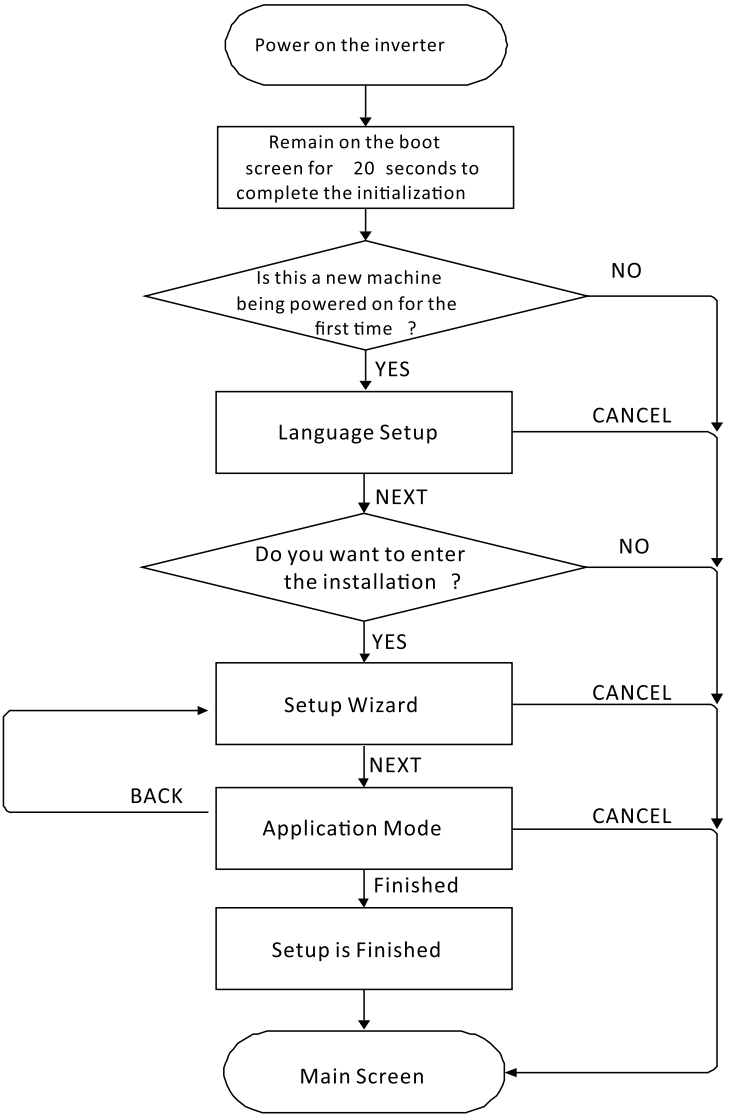
3. System setup icon, press this set button, you can enter into the system setup screen which including Basic Setup, Battery Setup, Grid Setup, Gen PORT Setup, Work Mode, Advanced Function, Parallel Setup, and History Fault.

The main screen includes the icons for PV (left up), grid (right up), battery (left bottom), load (right bottom) ,Smart Load (up), and GEN (bottom). It also displays the energy flow direction using arrows.

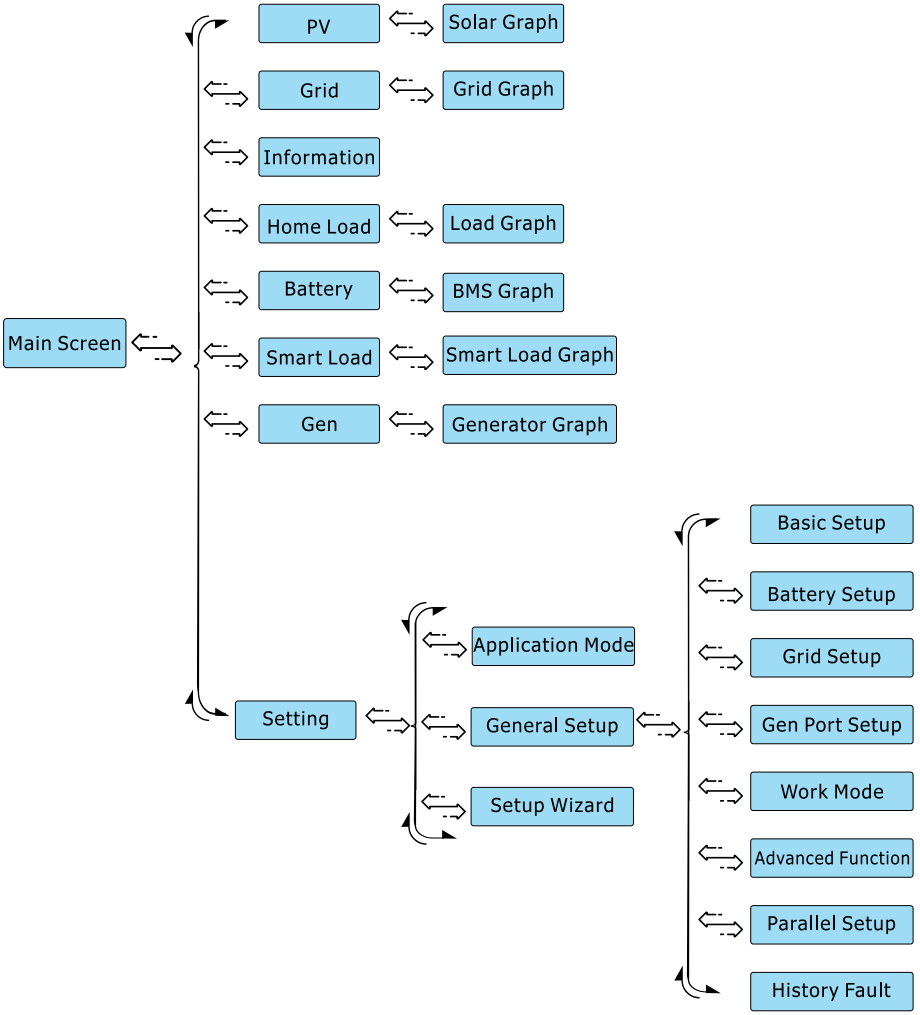
Some clarifications about the system status are as follows:

- PV power will always be positive.
- Grid power negative means sell to grid, positive means get from grid.
- Usually the load power is positive, but in some specifical scenerios, such as several inverters connnected in parallel, the load power may be negative.
- GEN power will always be positive.

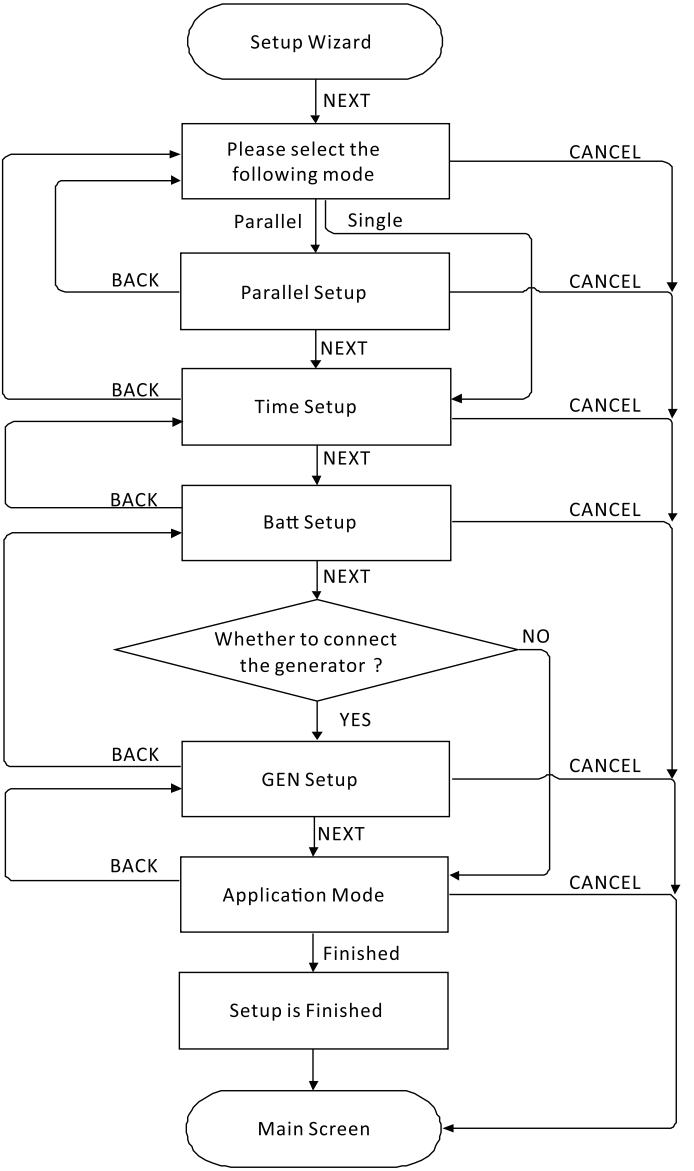
5.1.1 Power-on Instructions



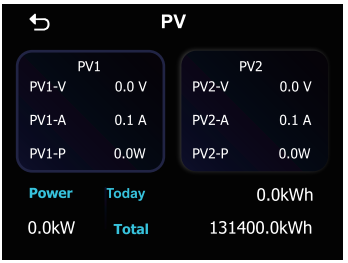
5.1.2 LCD Operation Flow Chart



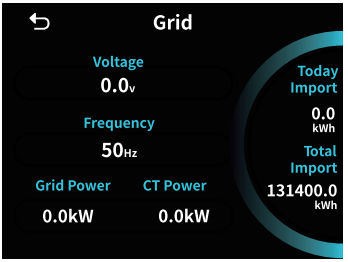
5.1.3 Setup Wizard Steps

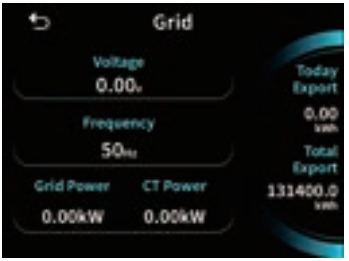


5.2 Solar Power Curve



This is Solar Panel detail page.
Power: Current solar panel generation power.
Today/Total: Today's and total generation energy. Voltage, Current, and Power of each MPPT at the current time.



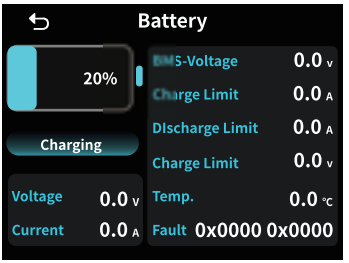


This is Grid detail page.
Grid Power: Power detected by internal sensors on AC grid input port.
CT Power: Power detected by external current transformer or meter.
Voltage: The AC voltage of phase to line on the grid port at current time.
Frequency: The AC frequency on the grid port at current time.
Export: Today's and total import energy from grid to the inverter.

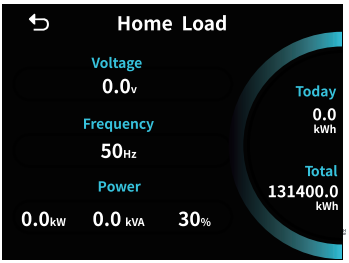
Swipe up or down in the Power Flow area to toggle between viewing Imported Energy and exported Energy.



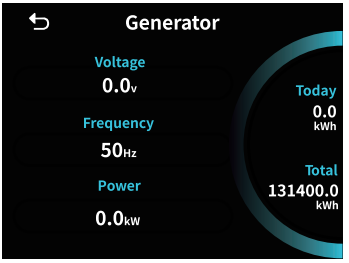
This is Inverter information page
The version information of firmware and the series number of inverter.



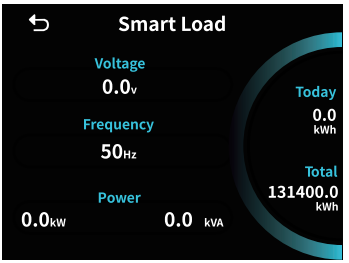
This is Battery detail page.
Voltage: The voltage of the inverter battery port
Current: The current of the inverter battery port. Positive values indicate charge current, and negative values indicate discharge current.
SOC: The SOC of battery uploaded by BMS.
Charging: The operating status of battery.
Force Charging: When the battery voltage or SOC is below the shutdown threshold , the system enters a forced power retention state.
BMS-Voltage: The voltage of battery uploaded by BMS.
Charge Limit: The Battery charge voltage or current limits uploaded by the BMS.
Discharge Limit: The Battery discharge current limits uploaded by the BMS.
Temp: Battery temperature.
- Voltage Mode: Sampled Temperature;
- Li-ion Mode: BMS Temperature.
Fault: The fault codes uploaded by the BMS.



This is Load detail page.
Power: The power consumption of the home load at the current time.
Voltage: The AC voltage on the load port of the inverter.
Frequency: The AC frequency on the load port of the inverter.
Today / Total: Today's and total load consumption energy.



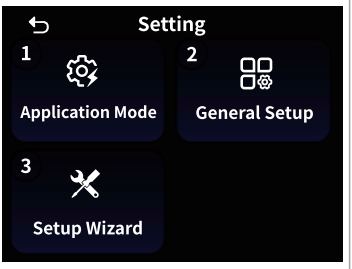
This is Generator detail page.
Power: The power consumption of the generator port.
Voltage: The AC voltage of the generator port.
Frequency: The AC frequency of the generator port.
Today / Total: Today's and total load consumption energy.



This is Smart Load detail page.
Power: The power consumption of smart load at current time.
Voltage: The AC voltage on the smart load port of the inverter.
Frequency: The AC frequency on the smart load port of the inverter.
Today / Total: Today's and total smart load consumption energy.

	**This is Fault Code page.**

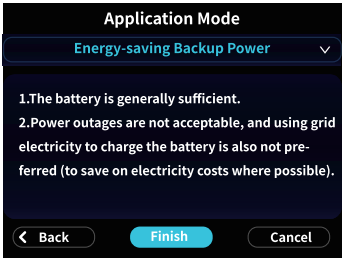
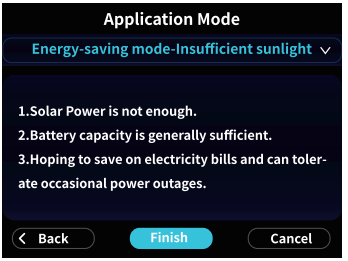
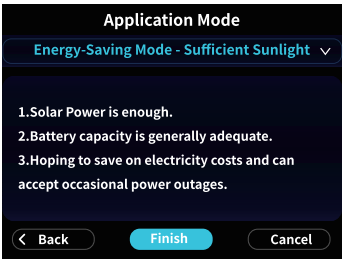
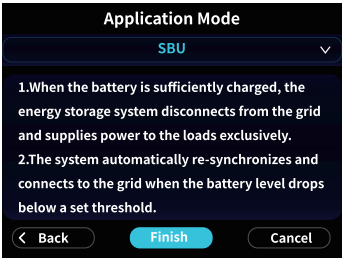
5.3 Setting Menu

	This is Setting page, including Application Mode, General setup, and Setup Wizard.

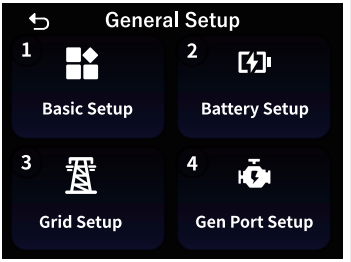
5.3.1 Application Mode

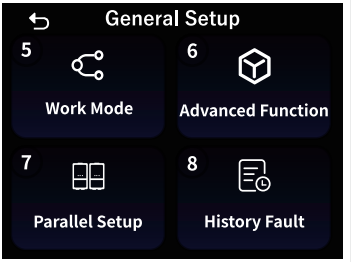
The Application Mode offers a choice of the following five working modes:
Worry-free Backup Power mode, Energy-saving Backup Power mode, Energy-saving mode-Insufficient sunlight mode, Energy-saving mode-sufficient sunlight mode, and SBU.

	**Option 1: Worry-free Backup Power mode** 1.The battery might not be sufficient. 2.Power outages are not acceptable, and it is acceptable to use grid electricity to charge the battery (even if it results in slightly higher electricity costs).

	**Option 2: Energy-saving Backup Power** 1.The battery is generally sufficient. 2.Power outages are not acceptable, and using grid electricity to charge the battery is also not preferred (to save on electricity costs where possible).
	**Option 3: Energy-saving mode-Insufficient sunlight** 1.Solar Power is not enough. 2.Battery capacity is generally sufficient. 3.Hoping to save on electricity bills and can tolerate occasional power outages.
	**Option 4: Energy-Saving Mode-Sufficient sunlight** 1.Solar Power is enough. 2.Battery capacity is generally adequate. 3.Hoping to save on electricity costs and can accept occasional power outages.
	**Option 5: SBU** 1.When the battery is sufficiently charged, the energy storage system disconnects from the gridand supplies power to the loads exclusively. 2.The system automatically re-synchronizes and connects to the grid when the battery level drops below a set threshold.

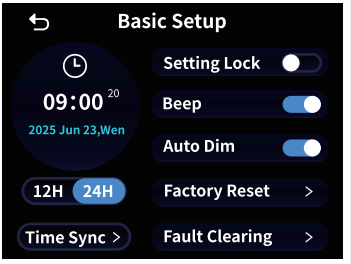
5.3.2 General Setup





This is General setup, including eight items: Basic Setup, Battery Setup, Grid Setup, Gen PORT Setup, Work Mode, Advanced Function, Parallel Setup, and History Fault.
Swipe up and down on the screen to switch options.

① **Basic Setup**



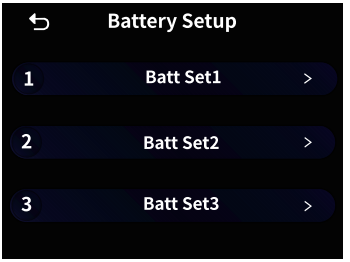
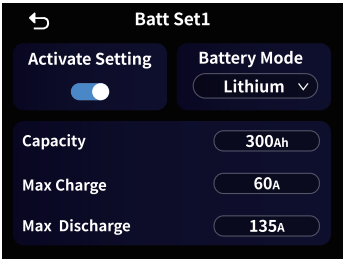


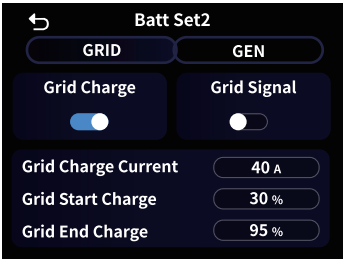
This is Basic Setup page
Time: To set the local day and time for the inverter.
12H/24H: Choose between 12-hour or 24-hour display time. Default：24H.
Time Sync: After enabling, when the inverter is communicating with the cloud platform via data logger, the inverter will keep the time in sync with cloud platform automatically. Default：ON.

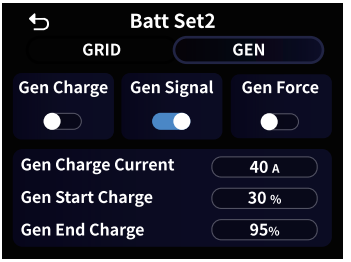
Setting Lock: Once enabled, the following settings become locked and unconfigurable: Battery Setup, Grid Setup, Gen Port Setup, Work Mode, Advanced Function, and Parallel Setup. Default：OFF.
Beep: Enables or disables the buzzer during fault occurrence. Default：ON.
Auto Dim: When it's enabled, the LCD screen will be dim automatically after 5 minutes of non-operation. Default：ON.
Factory Reset: Reset all parameters of the inverter. It can only be set in standby mode.
Fault Clearing: Clear active fault alarms.
Language: Swipe down on the right side of the screen to set the system language.
Options: English, French, Spanish, Portuguese, Arabic, Burmese. Default：English.

	Swiping up and down on the screen can change the selected number to set the current time and date.
	Click the "Factory Reset" option on the "Basic Setup" page, the LCD screen will turn to this page, click "OK" to confirm to restore all the settings of the inverter. click "Cancel" to quit to restore all the settings. The "Factory Reset" is only effective in standby mode.
	Click the "Fault Clearing"option on "Basic Setup" page, the LCD screen will turn to this page, click "OK" to clear current inverter fault. click "Cancel" to quit to clear current inverter fault. The "Fault Clearing" is only effective in standby mode.

②**Battery Setup Menu**

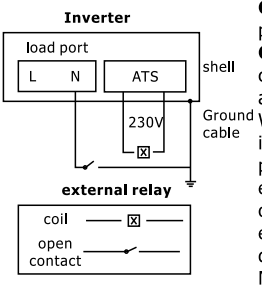
	**This is Battery Setup page.**
	**Activate Setting:** This feature helps recover a battery that has been over-discharged by slowly charging from the solar array or grid. Default:ON. **Battery Mode:** including three options (Default:Lithium): **Lithium:** Control the charging and discharging process of battery under the condition of the BMS of battery is communicating with the inverter. **Batt V:** Control the charging and discharging process directly through battery voltage. **No Battery:** Tick this item if no battery is connected to the system. **Capacity:** The total capacity of battery connected to this system, it can be used to calculated the SOC of battery bank under the "Batt SOC" mode. Default: 300Ah. **Max Charge:** Max battery charging current. Default: 60A. **Max Disharge:** Max battery discharging current. Default: 135A. For AGM and Flooded, we recommend Ah battery size x 20%= Charge/Discharge amps. For Lithium, we recommend Ah battery size x 50%= Charge/Discharge amps. For Gel, follow manufacturer's instructions.





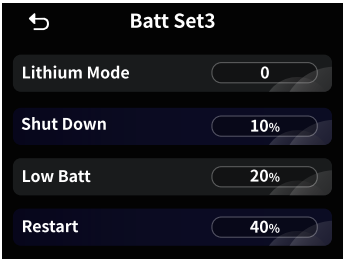
The parameters on GRID row are valid when it's going to use AC power from the Grid port to charge the battery.
The parameters (except Gen Force) on the GEN row are valid when using AC power from the GEN port to charge the battery.

Grid Charge: It's allowed to absorb AC power from the grid port to charge the battery. Default: ON.
Grid Signal: When a generator is connected to the grid port of hybrid inverter, this "Grid signal" can be used to control the dry contact to start or stop the generator. Default: OFF.
Grid Charge Current: The maximum charging current allowed when only use AC power from the grid port to charge the battery. Default: 40A;
Grid Start Charge: When battery SOC or voltage drops to this set value, the inverter will auto start charge the battery from the grid port. Default: 30% SOC or 49V.
Grid End Charge: When the battery SOC or voltage reaches this set value, the inverter will end charge the battery from the grid port. Default: 95% SOC or 54V.
NOTE:"Grid Start Charge" and "Grid End Charge" are only effective when both the "Grid Signal" and "Gen connect to grid input" are active. This is intended for scenarios where the generator is connected to the grid port.



Gen Charge: It's allowed to absorb AC power from the GEN port to charge the battery. Default: OFF.
Gen Signal: When conditions are sufficient, the inverter will close or open the normally open relay used to control the start and stop of the generator.
When"Gen Charge" and "Gen Signal" are enabled and the inverter operates in on-grid mode, the output voltage of the ATS port will be near 0V. When "Gen Charge" and "Gen Signal" are enabled and the inverter operates in off-grid mode, the ATS port outputs approximately 230 V. With this feature and installed external NO type relay, this inverter can automatically disconnect or connect the N and PE terminals of the load port. More details, please refer to left side picture. Default: ON.

Gen Force: When the generator is connected, it is forced to start the generator without meeting other conditions. Default: OFF.
Gen Charge Current: The maximum charging current allowed when only use AC power from the GEN port to charge the battery. Default: 40A.
Gen Start Charge: When battery SOC or voltage drops to this set value, the inverter will auto start charge the battery from the GEN port. Default: 30% SOC or 49V.
Gen End Charge: When the battery SOC or voltage reaches this set value, the inverter will end charge the battery from the GEN port. Default: 95% SOC or 54V.



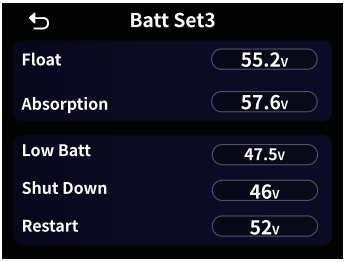
When the "Lithium" mode is selected, The content on the "Batt Set 3" page is shown in the figure on the left.

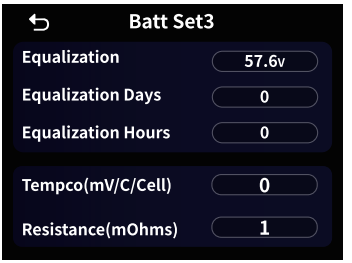
Lithium Mode: This is the BMS communication protocol code which can be confirmed on the "Approved Battery list" based on the battery model you are using. Default: 0.

Shutdown: Be valid in off-grid mode, battery can discharge to this SOC, then the DC/AC inverter module of this inverter will be shut down and the solar power can only be used to charge the battery. Default: 10% SOC.

Low Batt: Be valid in on-grid mode, when the "Grid charge" has been checked, the battery SOC will remain above the set value of "Low Batt". Default: 20% SOC.

Restart: Be valid in off-grid mode, after the DC/AC inverter module of this inverter is shut down, the PV power can only be used to charge the battery. After the battery SOC has resumed to this "Restart" value, the DC/AC inverter module will restart to output AC power. Default: 40% SOC.





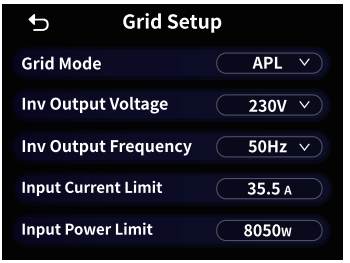
When the "Batt V" mode is selected, the content on the "Batt Set3" page is shown as the figure above.

Three-stage charging strategy for lead-acid and non-compatible lithium batteries.
If you are not familiar with these parameters, please keep the default values.
Float: The charging voltage during floating charging stage. Default: 55.2V.
Absorption: The charging voltage during absorption charging stage. Default: 57.6V.
Low Batt: Be valid in on-grid mode, when the "Grid charge" has been checked, the battery voltage will remain above the set value of "Low Batt". Default: 47.5V.
Shut down: Be valid in off-grid mode, when battery voltage drop to this value, then the DC/AC inverter module of this inverter will be shut down and the solar power can only be used to charge the battery. Default: 46V.
Restart: Be valid in off-grid mode, after the DC/AC inverter module of this inverter is shut down, the PV power can only be used to charge the battery. When the battery voltage has returned to this "Restart" value, the DC/AC inverter module will restart to output AC power. Default: 52V.
Equalization: When charging multiple battery modules or cells in series, the set charging voltage to ensure that the voltage of each battery module or cell is equal after fully charged. Default: 57.6V.
Equalization Days: Time interval for conducting equalization charging. Default: 0 days.
Equalization Hours: The duration of each equalization charging. Default: 0 hours.
Tempco: The coefficient by which the voltage of a battery varies with temperature. Default: 0 mV/C/Cell.
Resistance: The internal resistance of a battery refers to the opposition to current flow within the battery during operation. Default: 1 mOhms.

Recommended battery settings

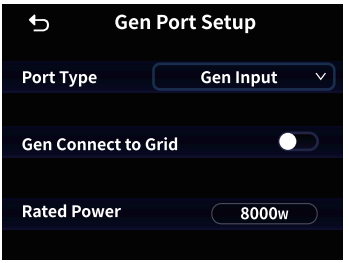
Battery Type	Absorption Stage	Float Stage	Equalization Voltage (every 30 days for 3 hours)
AGM (or PCC)	14.2V (57.6V)	13.4V (53.6V)	14.2V (57.6V)
Gel	14.1V (56.4V)	13.5V (54.0V)	
Wet	14.7V (59.0V)	13.7V (55.0V)	14.7V (59.0V)
Lithium	Follow its BMS voltage parameters		

③Grid Setup Menu



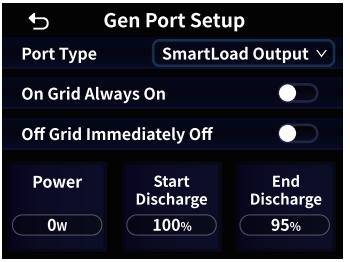
Grid Mode: Sets the input voltage range for the grid.
Options:
APL (Application): Normal mode for standard utility power.If selected, acceptable AC input voltage range will be within 90-264VAC.
UPS (Uninterruptible Power Supply): Mode for critical loads.If selected, acceptable AC input voltage range will be within 170-264VAC.
Default: APL.
Note: It can only be set in standby mode.
Inv Output Voltage: Set the rated output voltage of the inverter, optional: 220V, 230V, 240V. Default: 230V.
Inv Output Frequency: Set according to the grid frequency in on-grid mode or the frequency required by the load in off-grid mode. optional:50Hz, 60Hz. Default: 50Hz.
Input Current Limit: Set the maximum input current of grid port. Default: 35.5A.
Input Power Limit: Set the maximum input power of grid port. Default: 8050W.

④Gen Port Setup Menu



GEN port is a multifunctional port, but you can only choose one of the following two functions at a time (Gen Input, SmartLoad Output). It can only be set in standby mode.

Gen Input:
Port Type: Choose type of GEN port, optional: Gen Input, SmartLoad Output. Default: Gen Input.
Gen connect to grid input: Connect the generator to the grid input port of the the inverter. Default: OFF.
Rated Power: The maximum input power allowed from generator. Default: 8000W.

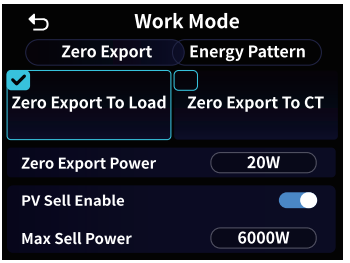


SmartLoad Output:
On Grid Always On: When click "On Grid Always On", the smart load will switch on when the grid is present. Default: OFF.
Off Grid immediately off: The smart load will stop working immediately when the grid is disconnected if this item is active. Default: OFF.

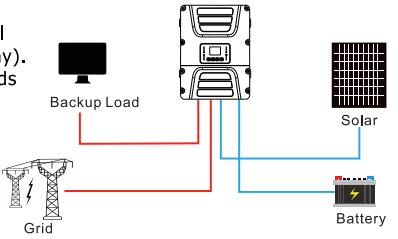
Power: Set the PV power for Smart Load Port switch-on. Default: 0W. (The PV power setting is only effective in on-grid mode. Set to 0W means the smart load output is not limited by PV power. This setting is not effective in off-grid mode.)

Start Discharge: Set the battery SOC/voltage for Smart Load Port switch-on. Default: 100% SOC or 54V.
End Discharge: Set the battery SOC/voltage for Smart Load Port switch-off. Default: 95% SOC or 51V.
e.g. Power=500W, Start Discharge=100%, End Discharge=95%. When the PV power exceeds 500W, and battery bank SOC reaches 100%, Smart Load Port will switch on automatically and power the load connected. When the battery bank SOC< 95% or PV power <500W, the Smart Load Port will switch off automatically.
NOTE: When the conditions for the Smart load output are met, wait for 1 minute, and then the Smartent load will output.

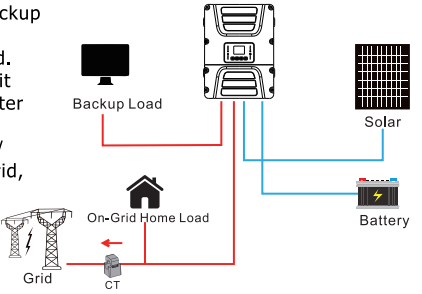
⑤Work Mode Setup Menu



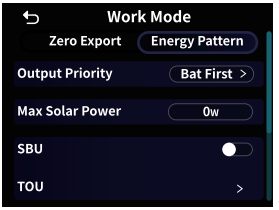
Zero Export To Load: The AC output power will only supply the backup load and smart load(if any). The inverter neither supplies power to home loads nor exports power to the grid. The built-in CT will detect the power flowing back to the grid port, and then the inverter will adjust its AC output power based on the detected value to prevent AC current from being output from the grid port of the inverter. Default: ON.

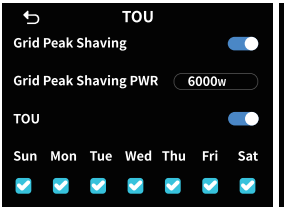


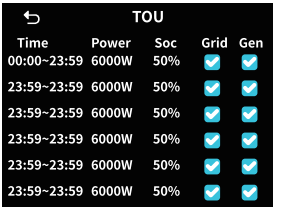
Zero Export To CT: The AC output power of the inverter will not only be used to supply the backup loads connected but also supply power to the home loads and smart loads(if any) connected. If PV power and battery power is insufficient, it will take grid power as supplement. The inverter will not sell power to grid. In this mode, an external CT/meter is needed, the external CT/meter will detect power flowing back to the grid, and then the inverter will adjust its output AC power based on the detected value. Default: OFF.



PV Sell Enable: PV Feed-in Enable. When enabled, after the PV system meets the load requirements of the inverter and the battery, the excess PV energy can be feed back to the grid-connected load for use.
Maximum Sell Power: Default 6000W

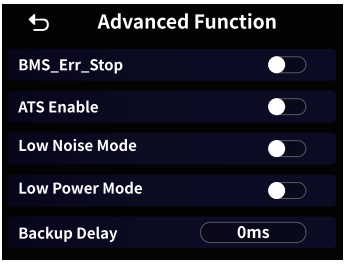




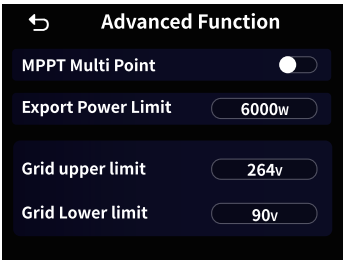


Energy pattern
Output Priority: Priority of PV power usage. When "Grid charge" is enabled, the default energy pattern is "Load First",this setting will be invalid.
Batt First: PV power is firstly used to charge the battery and then used to power the load. If PV power is insuffcient, grid will make supplement for battery and load simultaneously.
Load First: PV power is firstly used to power the load and then used to charge the battery. If Pvpower is insuffcient, grid will make supplement for battery and load simultaneously.
Max Solar Power: The maximum PV input power allowed. Default: 9600W.
SBU: Turn on or off the SBU mode. Default:OFF;Turn on the SBU mode, the inverter will disconnect from the grid and supply power to the loadonly from PV and the battery. When the battery level drops below the "Grid Start Charge" value,it will reconnect to the grid to start charging. Once the battery is charged above the "Grid EndCharge" value, it will disconnect from the grid again.
To turn on the SBU mode, the TOU function must be turned off.
TOU: TOU function.
Grid Peak Shaving: Grid Peak Shaving Function Enabled. When activated, the inverter will automatically limit the AC power input from the grid to the set value. If the sum of the grid peak shaving power, PV generation power, and battery power is still insufficient to meet the load power demand, the grid peak shaving function will be deactivated, and the grid input power can exceed the set value at this time.Default: OFF.
Grid Peak Shaving PWR: Set this value to limit the AC power from the grid. If the grid peak shaving power plus PV power plus battery power cannot meet the power consumption of the load, the grid peak shaving will be invalid, and the power taken from the grid can exceed this set value. Default: 6000W.
TOU: It is used to program when to use grid or generator to charge the battery, and when to discharge the battery to power the load.Only tick "TOU" then the follow items(Grid,charge time,power etc.) will take effect.Default: OFF;
Day selection: It allows users to choose which day to execute the setting of"TOU".
Time:real time,range of 00:00-23:59.
Power: Max.discharge power of battery allowed.
SOC: The target value of battery voltage or SOC during the current time period.If the actual SOC or voltage of the battery is lower than this target value, the battery needs to be charged. If there is a energy source like solar power or grid, the battery will be charged; If the actual SOC or voltage of the battery is higher than this target value, the battery can discharge, and when the solar power is not enough to power the load, the battery will discharge.
Grid: utilize grid to charge the battery in a time period.
Gen: utilize diesel generator to charge the battery in a time period.

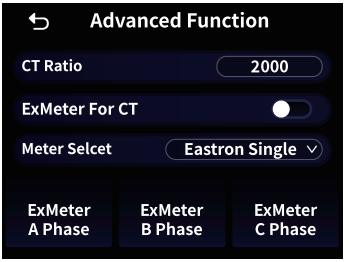
⑥Advanced Function Setup Menu



BMS Err Stop: When it is active, if the battery BMS failed to communicate with inverter, the inverter will stop working and report fault. Default: OFF.
ATS Enable: Enable the ATS function. Default：OFF.
Low Noise Mode: In this mode, the sound emitted by the inverter during operation will be smaller. Default: OFF.
Low Power Mode: When it's selected and battery SOC/voltage is less than "Low Bat" value, the self-consumption power of inverter will supply by grid and battery simultaneously. If unselected, the self consumption power of inverter will supply by battery. Default: OFF.
Backup Delay: When the grid cuts off, the inverter will output power after this set time. Default: 0ms.

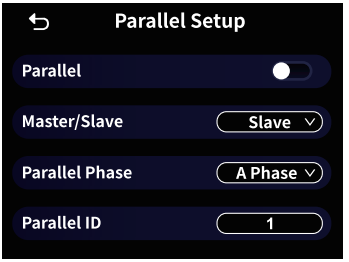


MPPT Multi Point: The inverter will check whether the PV is working on its Max.power point. If not, then it will adjust the voltage of MPPT to ensure the PV operates at the Max.power point. Default: OFF.
Export Power Limit: It is used to setup the maximum output power allowed to flow to grid. Default: 6000W.
Grid upper limit: Set the grid voltage upper limit. Default：264V.
Grid Lower limit: Set the grid voltage lower limit. Default：90V.



CT Ratio: The ratio of CT rated primary current to rated secondary current. It can only be set in standby mode. Default: 2000:1.
ExMeter For CT: Enable this function when using "Zero Export to CT" mode and replace the CTs with an external smart meter. Default：OFF.
Meter Select: select the corresponding meter type according to the meter installed in the system. Default：Eastron single.
ExMeter A/B/C Phase: When the inverter is installed in a three-phase grid and measured by a three-phase smart meter, select the corresponding phase to which the inverter is connected. For example, when the hybrid inverter connects to A phase of grid, please click A Phase here.

⑦Parallel Setup Menu



Parallel: Enable this function when several inverters of the same model are connected in parallel. Default: OFF.
Master/Slave: Select each of inverter in the parallel system as the master or slave inverter, and the master inverter needs to manage the working mode of the parallel system. Default：Slave.
For single-phase parallel systems, set one inverter as the master. For three-phase parallel systems, each phase requires setting one unit as the master.
Parallel Phase: When forming a three-phase system in parallel, it is necessary to set which phase of the three-phase system this inverter belongs to. Default：A phase.
Parallel ID: The parallel ID of each inverter in the parallel system should be different. Default：1.

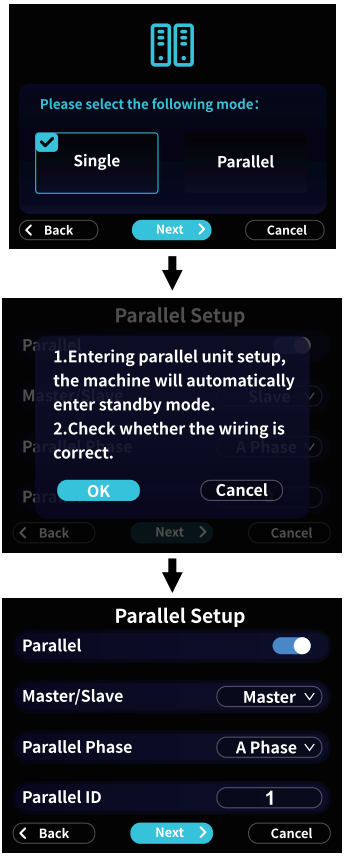
⑧History Fault Menu



This page is used to record the historical faults of inverter, with a maximum of ten entries.
For detailed information, please refer to the "Warning code" and "Fault code" in the manual.

5.3.3 Setup Wizard

Click Back to return to the previous setting, NEXT to proceed to the next setting, or Cancel to exit setup and go to the main screen.



Step 1: Select Single or Parallel Mode.

- Select Single and click NEXT to proceed to the Time Setup.
- Select Parallel and click NEXT to proceed to the Parallel Setup.

Parallel Setup:

Parallel: Enable this function when several same model inverters are connecting in parallel. Default: OFF

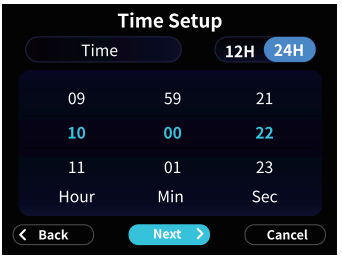
Master/Slave: Select any inverter in the parallel system as the master or slave inverter, and the master inverter needs to manage the working mode of the parallel system. Default: Slave.

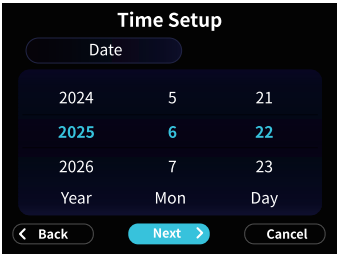
For single-phase parallel systems, set one unit as the master.

For three-phase parallel systems, each phase requires setting one unit as the master.

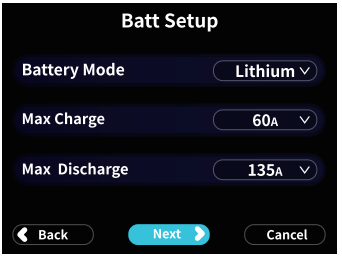
Paralel Phase: When forming a three-phase system in parallel, it is necessary to set which phase of the three-phase system this inverter belongs to. Default: A phase.

Paralel ID: The parallel ID of each inverter in the parallel system should be different. Default: 1.



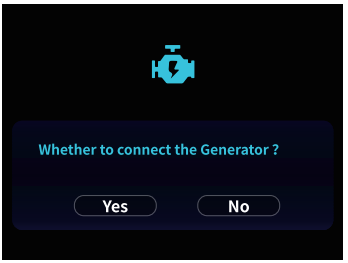


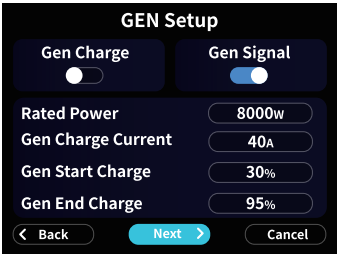
Step 2: Time Setup
Swiping up and down on the screen can change the selected number to set the current time and date.



Step 3: Batt Setup
Battery Mode: including three options (Default: Lithium):
Lithium: Control the charging and discharging process of battery under the condition of the BMS of battery is communicating with the inverter.
Batt V: Control the charging and discharging process directly through battery voltage.
No Battery: Tick this item if no battery is connected to the system.

Max Charge: Max battery charging current. Default: 60A.
Max Disharge: Max battery discharging current. Default: 135A.
For AGM and Flooded, we recommend Ah battery size x 20% = Charge / Discharge amps. For Lithium, we recommend Ah battery size x 50% = Charge/ Discharge amps.
For Gel, follow manufacturer's instructions.





Step 4:Whether to connect the Generator?

- Click YES to proceed to the GEN Setup.
- Click No to proceed to the Application Mode setup.

GEN Setup

Gen charge: It's allowed to absorb AC power from the GEN port to charge the battery. Default: OFF.

Gen signal: When conditions are sufficient, the inverter will close or open the normally open relay used to control the startand stop of the generator. Default: ON.

Rated Power: The maximum input power allowed from generator. Default: 8000W.

Gen Charge Current: The maximum charging current allowed when only use AC power from the GEN port to charge the battery. Default: 40A.

Gen Start Charge: When battery SOC or voltage drops to this set value, the inverter will auto start charge the battery from the GEN port. Default: 30% SOC or 49V.

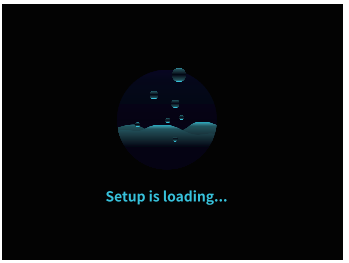
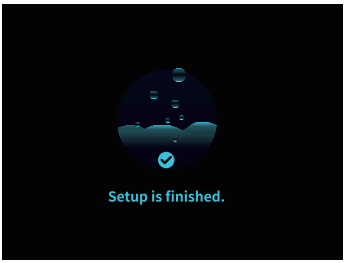
Gen End charge: When the battery SOC or voltage reaches this set value, the inverter will end charge the battery from the GEN port. Default: 95% SOC or 54V.



Step 5: Application Mode

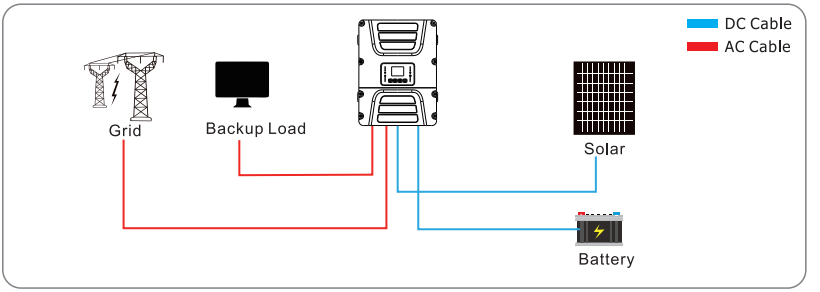
For details on the Application Mode, please refer to the previous section.

Click "Finish" to save all settings.

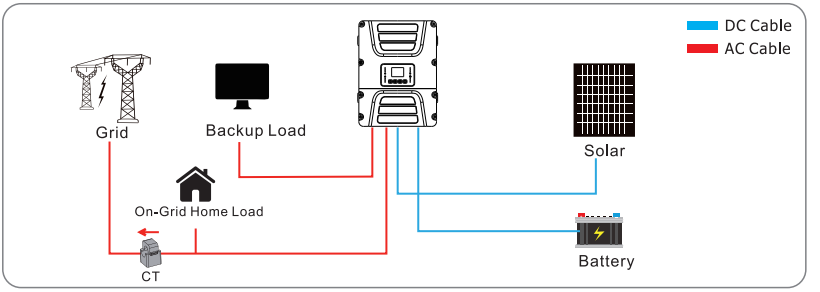
 	After waiting ten seconds, the setup will be completed.

6. Mode

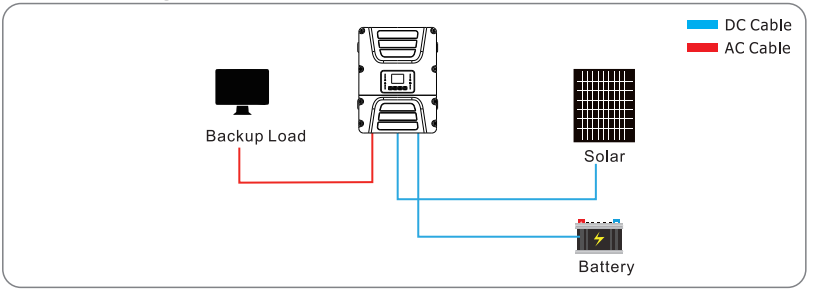
Mode I: Zero Export to Load



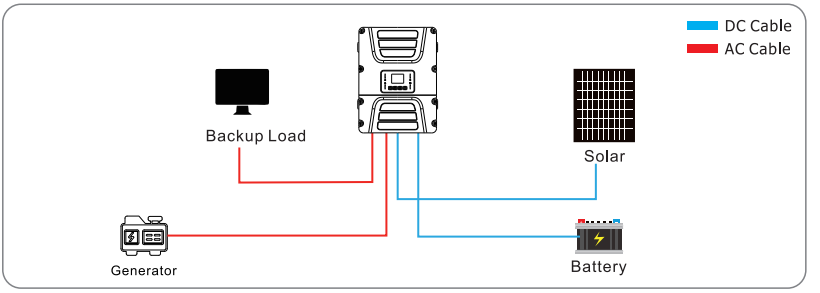
Mode II: Zero export to CT



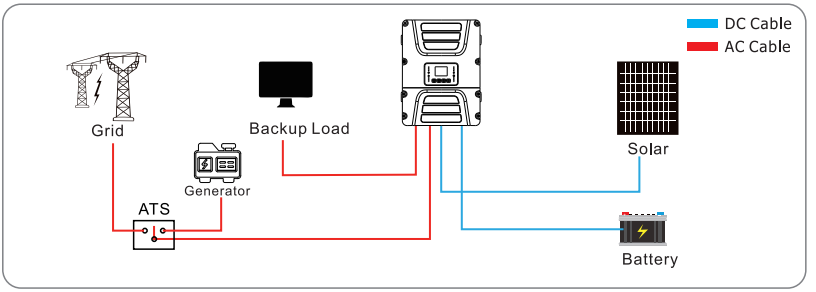
Mode III: Off-grid



Mode IV: Off-grid with Generator



Mode V: On-grid with generator



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 generator (if any) will serve as the last power backup source.

7. Fault information and processing

7.1 Preparations for Installation

The energy storage inverter is designed according to the grid-connected operation standard and meets the safety requirements and electromagnetic compatibility requirements. Before leaving the factory, the inverter undergoes several rigorous tests to ensure that the inverter can operate reliably.

Note

If your inverter shows the Fault Code and the fault persists after restarting, please contact your local dealer or service center. You need to prepare the following information.

1. Inverter serial number;
2. Distributor or service center of the inverter ;
3. On-grid power generation date;
4. Please describe the problem in as much detail as possible (including the fault code and indicator light status). To help you understand the inverter's fault information more clearly, we will list all possible fault codes and their descriptions when the inverter is not functioning properly.
5. Your contact information.

7.2 Warning Code

Warning Code	Warning information	Trouble Shooting
W9	PV weak alarm	Low PV energy,please reduce the backup load.
W21	BMS communication alarm	Abnormal communication between battery and inverter in lithium mode,check battery and inverter wiring.
W22	Low Battery	Battery voltage is too low or Battery SOC is too low, the battery should be charged.
W33	Grid abnormal alarm	Please check whether the voltage, frequency, and phase sequence of the Grid port are normal
W37	Grid Loss Phase alarm	Grid phase loss detected. Please check the wiring connections.
W38	Grid Reversed alarm	In three-phase parallel operation mode, adjust the grid wiring to clear the alarm.
W48	Backup overload alarm	The load is overloaded and should be reduced.
W57	Gen abnormal alarm	Please check whether the voltage, frequency, and phase sequence of the Gen port are normal
W61	Gen Loss Phase alarm	Gen phase loss detected. Please check the wiring connections.
W62	Gen Reversed alarm	In three-phase parallel operation mode, adjust the gen wiring to clear the alarm.
W67	Gen over load alarm	Please check whether the load on backup port is within the generator specifications.

7.3 Fault Code

Fault Code	Fault information	Trouble Shooting
F1	PV1 over voltage fault	1.Please check the PV string voltage and reduce the number of PV modules in series if necessary. 2.Restart the unit, if the fault still exists, please contact us for help.
F2	PV2 over voltage fault	1.Please check the voltage of the string, reduce the number of PV2 modules in series. 2.Restart the unit, if the fault still exists, please contact us for help.
F5	PV1 over current fault	1.The current of the PV1 modules is too large, please check the string current; 2.Restart the unit, if the fault still exists, please contact us for help.
F6	PV2 over current fault	1.The current of the PV2 modules is too large, please check the string current; 2.Restart the unit, if the fault still exists, please contact us for help.
F9	PV1 reverse connection Fault	1.Please check whether the PV1 wring is properly connected; 2.Restart the unit, if the fault still exists, please contact us for help.
F10	PV2 reverse connection Fault	1.Please check whether the PV2 wring is properly connected; 2.Restart the unit, if the fault still exists, please contact us for help.
F18	PV1 short fault	Please check whether the PV1 wring is properly connected.
F19	PV2 short fault	Please check whether the PV2 wring is properly connected.
F23	Fan lock fault	Please check fan for proper functioning.
F24	Model mismatch fault	Restart the unit, if the fault still exists, please contact us for help.
F25	Battery over voltage fault	1.Please check whether the battery voltage is within the specified range; 2.Check whether Battery cables are firmly and correctly connected; 3.Restart the unit, if the fault still exists, please contact us for help.
F26	Battery over voltage fault of hardware	1.Please check whether the battery voltage is within the specified range; 2.Check whether battery cables are firmly and correctly connected; 3.Restart the unit, if the fault still exists, please contact us for help.
F27	Battery over current fault	Restart the unit, if the fault still exists, please contact us for help.
F28	Battery over current fault of hardware	Restart the unit, if the fault still exists, please contact us for help.

Fault Code	Fault information	Trouble Shooting
F30	LLC over Current fault	Restart the unit, if the fault still exists, please contact us for help.
F31	LLC over Current fault of hardware	Restart the unit, if the fault still exists, please contact us for help.
F32	BMS communication fault	1.Please check whether BMS communication cable is firmly and correctly connected; 2.Restart the unit, if the fault still exists, please contact us for help.
F37	LLC soft start failure	Restart the unit, if the fault still exists, please contact us for help;
F41	BUS software over voltage fault	1.Please check the voltage of the string, reduce the number of PV modules in series; 2.Restart the unit, if the fault still exists, please contact us for help;
F42	BUS hardware over voltage fault	1.Please check the voltage of the string, reduce the number of PV modules in series; 2.Restart the unit, if the fault still exists, please contact us for help;
F43	BUS low Voltage fault	Restart the unit, if the fault still exists, please contact us for help.
F49	INV over current fault	1.Please check whether the load power is within the specified range; 2.Restart the unit, if the fault still exists, please contact us for help.
F50	INV over current fault of hardware	1.Please check whether the load power is within the specified range; 2.Restart the unit, if the fault still exists, please contact us for help.
F51	INV soft start failure	Restart the unit, if the fault still exists, please contact us for help.
F54	INV over voltage fault	Restart the unit, if the fault still exists, please contact us for help.
F55	INV low voltage fault	1.Please check whether the load power is within the specified range; 2.Restart the unit, if the fault still exists, please contact us for help.
F56	INV short fault	1. Please check whether the backup connection is firm and correct; 2.Restart the unit, if the fault still exists, please contact us for help.

Fault Code	Fault information	Trouble Shooting
F57	Grid overload fault	1.Please check whether the load power is within the specified range; 2.Restart the unit, if the fault still exists, please contact us for help.
F58	Backup overload fault	1.Please check whether the load power is within the specified range; 2.Restart the unit, if the fault still exists, please contact us for help.
F65	Heatsink over temperature fault	1.Please check whether the work environment temperature is too high; 2.Turn off the inverter for 15mins and restart; 3.Seek help from us, if can not go back to normal state.
F66	Ambient over temperature fault	1.Please check whether the work environment temperature is too high; 2.Turn off the inverter for 15mins and restart; 3.Seek help from us, if can not go back to normal state.
F67	Main and auxiliary DSP communication fault	Restart the unit, if the fault still exists, please contact us for help.
F68	DSP and MCU communication fault	Restart the unit, if the fault still exists, please contact us for help.
F69	Eeprom fault	Restart the unit, if the fault still exists, please contact us for help.
F70	AC leakage current sensor fault	Restart the unit, if the fault still exists, please contact us for help.
F71	AC leakage current fault	Restart the unit, if the fault still exists, please contact us for help.
F72	Grid Relay fault	Restart the unit, if the fault still exists, please contact us for help.
F73	Grid Relay short fault	Restart the unit, if the fault still exists, please contact us for help.
F74	INV Relay fault	Restart the unit, if the fault still exists, please contact us for help.
F76	GEN Relay fault	Restart the unit, if the fault still exists, please contact us for help.
F77	PV Insulation impedance fault	PV isolation resistance is too low 1.1. Please check whether the connections between PV panels and the inverter are firm and correct; 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.
F78	Grid wrong connect to backup port	1.Please check whether the backup cables are firmly and correctly connected; 2.Restart the unit, if the fault still exists, please contact us for help.

Fault Code	Fault information	Trouble Shooting
F79	Generator port wrong connect	1.Generator port is connected to the generator or Grid whenthe mode is the smartload mode, Check whether GEN cables are firmly and correctly connected; 2.Restart the unit, if the fault still exists, please contact us for help.
F81	Auxpower fault	Restart the unit, if the fault still exists, please contact us for help.
F82	NTC open circuit fault	Restart the unit, if the fault still exists, please contact us for help.
F86	System parameters change	Grid or battery setting changed; the system will restart after 20 ms.
F88	Parallel other model fault	1.Please check whether other inverter is in error state; 2.Restart the system, If the fault still exists, please contact us for help.
F89	Parallel CAN communication fault	1.Please check whether the parallel cables are firmly and correctly connected; 2.Restart the system, If the fault still exists, please contact us for help.
F90	Parallel master lost	1.Please check whether the parallel cables are firmly and correctly connected; 2.Restart the system, If the fault still exists, please contact us for help.
F91	Parallel zero sync signal lost	1.Please check whether the parallel cables are firmly and correctly connected; 2.Restart the system, If the fault still exists, please contact us for help.
F92	Parallel Version mismatch	1.Please check whether the software version of the inverter is same; 2.Restart the system, If the fault still exists, please contact us for help.
F93	Parallel Setting mismatch	1.Please check whether the parallel cables are firmly and correctly connected; 2.Check whether the software version of the inverter is same;
F94	Parallel ID conflict	1.Please check whether the CAN ID of different inverters is same; 2.Please check whether there are two masters in one phase;
F95	Parallel PWM sync signal fault	1.Please check whether the parallel cables are well-connected. 2.Restart the system, If the fault still exists, please contact us for help.
F96	Parallel system wiring fault	1.Please check whether the qrid wires are well-connected; 2.Please check whether the grid phase sequence is correct; 3.Restart the system, If the fault still exists, please contact us for help.

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

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

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

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

8.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.

This product is labeled "ECO HYBRID INVERTER" to indicate that its certifications and applicable standards differ to some extent from those of conventional hybrid inverters.

Felicity reserves the final right of interpretation regarding grid-connection requirements and certification standards.

9. Datasheet

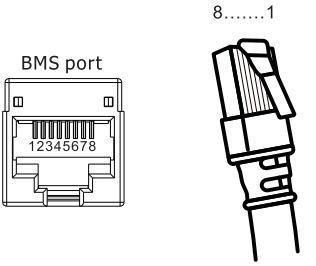
Model	IVAM6048P1G1
Battery Input Data	
Battery Type	Lead-acid or Lithium-ion
Battery Voltage Range(V)	40~60
Max. Charging Current(A)	135
Max. Discharging Current(A)	135
Charging Strategy for Li-Ion Battery	Self-adaptation to BMS
Number of Battery Input	1
PV String Input Data	
Max. PV access power(W)	12000
Max. PV Input Power(W)	9600
Max. PV Input Voltage(V)	500
Start-up Voltage(V)	90
PV Input Voltage Range(V)	90~500
MPPT Voltage Range(V)	90~425
Full Load MPPT Voltage Range(V)	300~425
Rated PV Input Voltage(V)	370
Max. Operating PV Input Current(A)	20+20
Max. Input Short-Circuit Current(A)	27+27
No. of MPP Trackers/No. of Strings MPP Tracker	2/1+1
Max. Inverter Backfeed Current to The Array(A)	0
AC Output Data	
Rated AC Output Power(VA/W)	6000
Max. AC Output Power(VA/W)	6000
Max. AC Output Current(A)	26.1
Peak Power(W)	2 times of rated power, 10s
Rated Output Voltage(V)	230
Output Type	L+N+PE
Rated Output Frequency	50Hz/60Hz
Output Voltage Waveform	Pure Sine Wave
Total Current Harmonic Distortion THDi	<3%
AC Input Data(Grid and Generator)	
Max. Input Power to Battery(W)	6000
Rated Input Voltage(V)	230
Rated Input Frequency	50Hz/60Hz
Grid Input Frequency Range(Hz)	40~65
Transfer Time (Single unit)	10ms(UPS);20ms(APL)
Grid Input Current(A)	35
Generator Input Current(A)	35

Efficiency	
Max. Efficiency	97.60%
Euro Efficiency	96.50%
MPPT Efficiency	>99%
Equipment Protection	
AC Output Overvoltage Protection	Yes
AC Output Short Circuit Protection	Yes
AC Output Overcurrent Protection	Yes
DC Polarity Reverse Connection Protection	Yes
Thermal Protection	Yes
DC Terminal Insulation Impedance Monitoring	Yes
DC Component Monitoring	Yes
Ground Fault Current Monitoring	Yes
Arc fault circuit interrupter (AFCI)	Optional
Power Network Monitoring	Yes
Earth Fault Detection	Yes
DC Input Switch	Yes
Overvoltage Load Drop Protection	Yes
Surge Protection Level	TYPE II(DC), TYPE II(AC)
Interface	
Display	LCD+LED
Communication Interface	RS485, CAN
Monitor Mode	WIFI/LAN(optional)
General Data	
Operating Temperature Range	-40 to +60℃, >45℃ Derating
Permissible Ambient Humidity	0-100%
Permissible Altitude	3000m
Noise	Performance Mode <50dB Low noise Mode < 46 dB
Ingress Protection(IP) Rating	IP65
Inverter Topology	Non-Isolated
Over Voltage Category	Over-voltage Category II (DC), Category III (AC)
Max.parallel units	12
Warranty	5 Years
Type of Cooling	Intelligent Air Cooling
Net Weight	13.3kg
Product Dimension	435x320x183mm
Package Dimension	572x462x310mm
Safety EMC/Standard	IEC/EN 61000-6-1/2/3/4, IEC/EN 62109-1, IEC/EN 62109-2

10. Appendix I

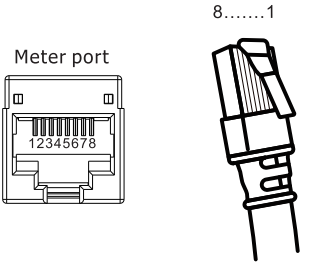
Definition of RJ45 Port Pins for BMS

No.	BMS 485/CAN Pin
1	/
2	/
3	CAN-L
4	CAN-H
5	BMS-485_B
6	BMS-485_A
7	/
8	/



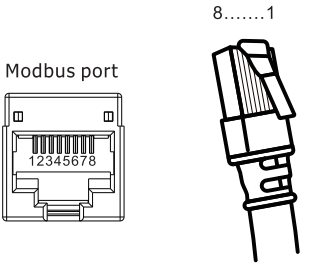
Definition of RJ45 Port Pin for Meter

No.	Meter Pin
1	/
2	/
3	Meter-485-B
4	/
5	/
6	Meter-485-A
7	Meter-485-B
8	Meter-485-A



Definition of RJ45 Port Pins for "Modbus Port" (remote monitoring)

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

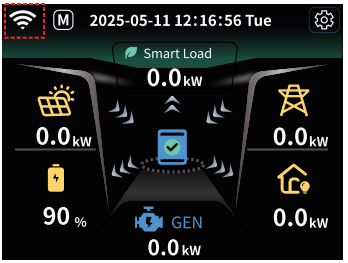


11. The Wi-Fi Operation Guide in APP

11.1 Introduction

Wireless communication between the off-grid inverter and theAPP can be realized through the Wi-Fi module.The APP supports Android and iOS devices.

Delivers device status during normal operation.
Allows device Settings to be configured on the APP.
Notifies users when a warning or alarm occurs.
Allows users to query inverter history data.



The status of the Wi-Fi sign on the LCD display.
After the APP is successfully connected,Wi-Fi indicator light remains constantly on.

11.2 Download and Install APP

Operating system requirement for your smart phone:

iOS system supports iOS 11.0 and above

Android system supports Android 5.0 above

APP Download
Please scan the following QR code with your smartphone to download the App.

The QR code supports Android system and iOS system

Operation Manual

Please scan the following QR code with your smartphone to view the App Operation Manual

The QR code supports Android system and iOS system

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