

Hybrid Inverter User Manual

V1.0

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1 Notes on this Manual

1.1 Scope of Validity

This manual is an integral part of Hybrid, It describes the assembly, installation, commissioning, maintenance and failure type of the product. Please read it carefully before operating.

GSL-H-5KLV-US	GSL-H-6KLV-US	GSL-H-7K6LV-US	GSL-H-8KLV-US
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Naming rules, For example: GSL-H-7K6LV-US
"7K6, 5K" means "output power 7.6kw or 5kw" .
Store this manual where it will be accessible at all times.

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 our.

2 Safety

2.1 Important Safety Instructions

**Danger!**

- Danger to life due to high voltages in the inverter!
- All work must be carried out by qualified electrician.
- appliance is not to be used by children or persons with reduced physical The 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 upper lid of the enclosure and the enclosure body may become hot.
- Only touch the lower enclosure lid during operation

**Caution!**

- Possible damage to health as a result of the effects of radiation!
- Do not stay closer than 20 cm to inverter for any length of time.

**Note!**

- Grounding the PV generator
- Comply with the local requirements for grounding the PV modules and the PV generator. It is recommends connecting the generator frame and other electrically conductive surfaces in a manner which ensures continuous conduction and ground these in order to have optimal protection of system and persons.

**Warning!**

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



Warning!

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



Warning!

- Do not operate the inverter when the device is running .




Warning!

- Risk of electric shock!

- 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.
- Accessories only together with the inverter shipment are recommended here. 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 of them 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!
 - Surge protection devices (SPDs) for PV installation

	WARNING !
	Over-voltage protection with surge arresters should be provided when the PV power system is installed.
	The grid connected inverter is not fitted with SPDs in both PV input side and MAINS side.

- Lightning will cause a damage either from a direct strike or from surges due to a nearby strike.
 - Induced surges are the most likely cause of lightning damage in majority of installations, especially in rural areas where electricity is usually provided by long overhead lines. Surge may be included on both the PV array conduction and the AC cables leading to the building.
 - Specialists in lightning protection should be consulted during the end use application. Using appropriate external lightning protection, the effect of a direct lightning strike into a building can be mitigated in a controlled way, and the lightning current can be discharged into the ground.
 - Installation of SPDs to protect the inverter against mechanical damage and excessive stress include a surge arrester in case of a building with external lightning protection system (LPS) when separation distance is kept.
 - To protect the DC system, surge suppression device (SPD type2) should be fitted at the inverter end of the DC cabling and at the array located between the inverter and the PV generator, if the voltage protection level (VP) of the surge arresters is greater than 1100V, an additional SPD type 3 required for surge protection for electrical devices.
 - To protect the AC system, surge suppression devices (SPD type2) should be fitted at the main incoming point of AC supply (at the consumers cutout), located between the inverter and the meter/distribution system;
 - All DC cables should be installed to provide as short a run as possible, and positive and negative cables of the string or main DC supply should be bundled together. Avoiding the creation of loops in the system.
 - Spark gap devices are not suitable to be used in DC circuits once conducting, they won't stop conducting until the voltage across their terminals is typically more than 30 volts.
- Anti-Islanding Effect


Islanding effect is a special phenomenon that grid-connected PV system still supply power to the nearby grid when the voltage loss is happened in the power system. It is dangerous for maintenance personnel and the public.

Hybrid series inverter provide Active Frequency Drift(AFD) to prevent islanding effect.

➤ PE Connection and Leakage Current

•The end-use application shall monitor the protective conductor by residual current operated protective device (RCD) with rated fault current $I_{fn} \leq 240\text{mA}$ which automatically disconnects the device in case of a fault.

The device is intended to connect to a PV generator with a capacitance limit of approx 700nf.

	<p>WARNING ! High leakage current! Earth connection essential before connecting supply.</p>
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Incorrect grounding can cause physical injury, death or equipment malfunction and increase electromagnetic.

➤ Battery Safety Instructions

Hybrid Series 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 4.3.












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.

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

	CSA certified
	This symbol indicates that you should wait at least 5mins after disconnecting the inverter from the utility grid and from the PV panel before touching any inner live parts.
	Keep dry! The package/product must be protected from excessive humidity and must be stored under cover.
	Refer to the operating instructions.
	Fragile - The package/product should be handled carefully and never be tipped over or slung.
	Products should not be disposed as household waste.
	No more than six(6) identical packages being stacked on each other
	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

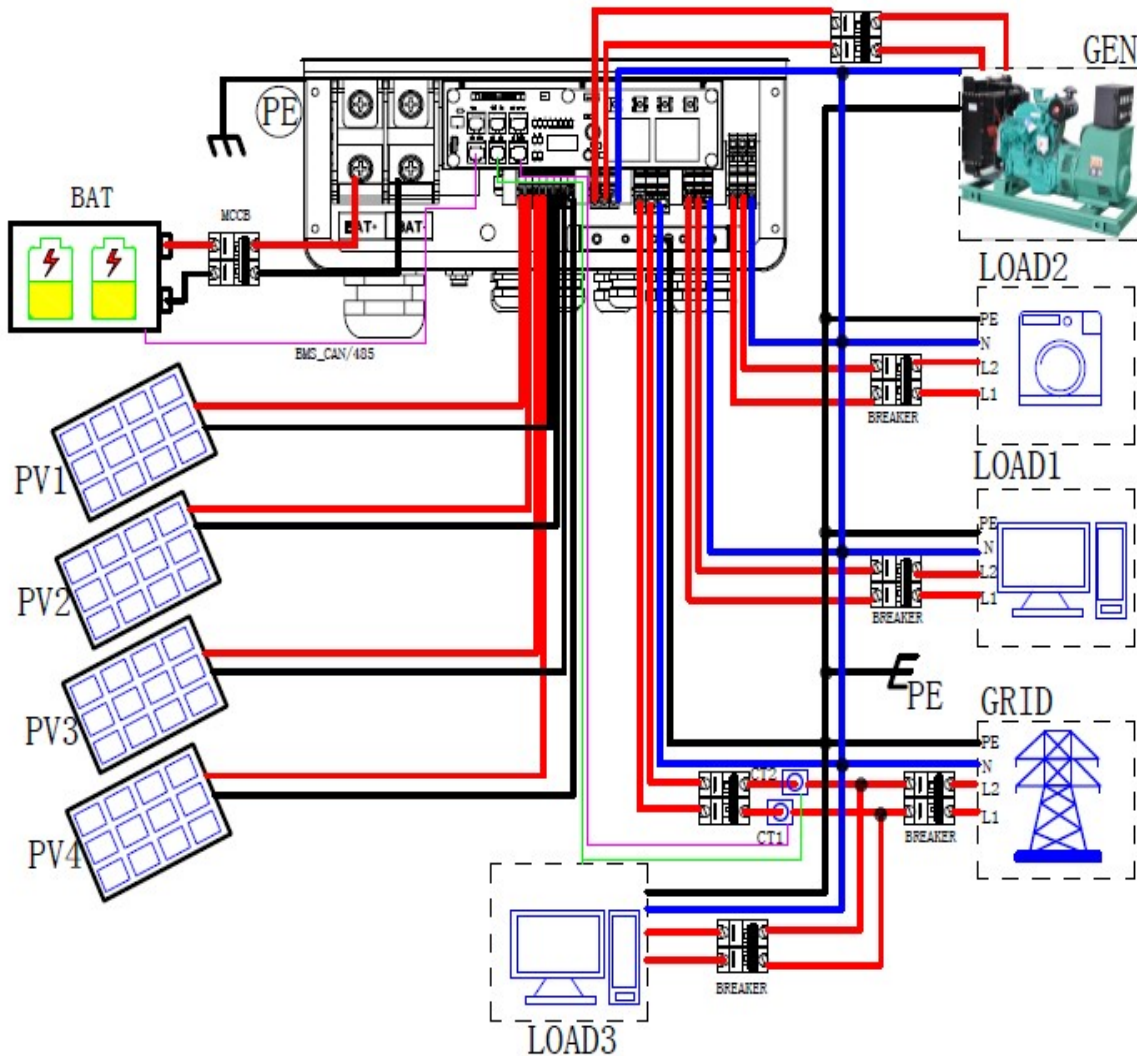
3.1 Basic features

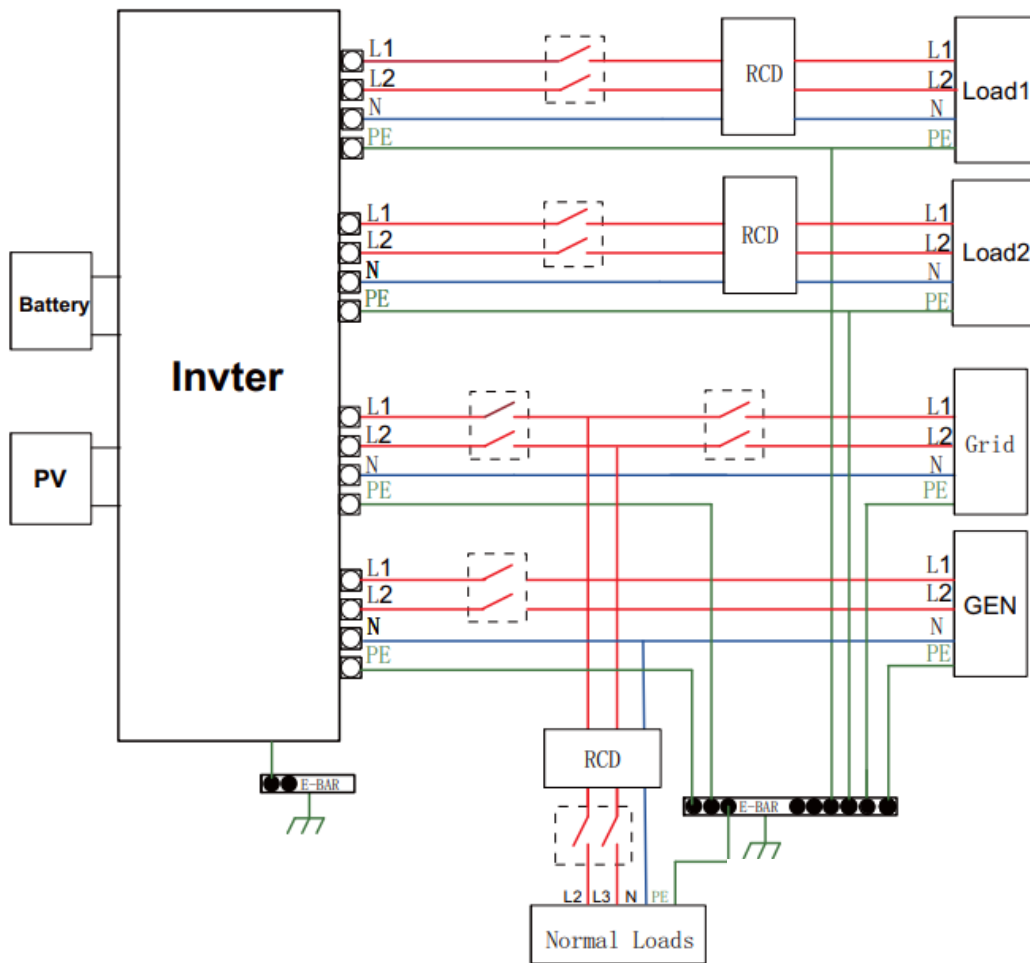
Hybrid Series is a high-quality inverter which can convert solar energy to AC energy and store energy into battery.

The inverter can be used to optimize self-consumption, store in the battery for future use or feed in to public grid. 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

Hybrid Series is designed with two BACK-UP versions for customer to choose based on the local rules. The applies to the wiring rules that requires Neutral line of alternative supply must NOT be isolated or switched .



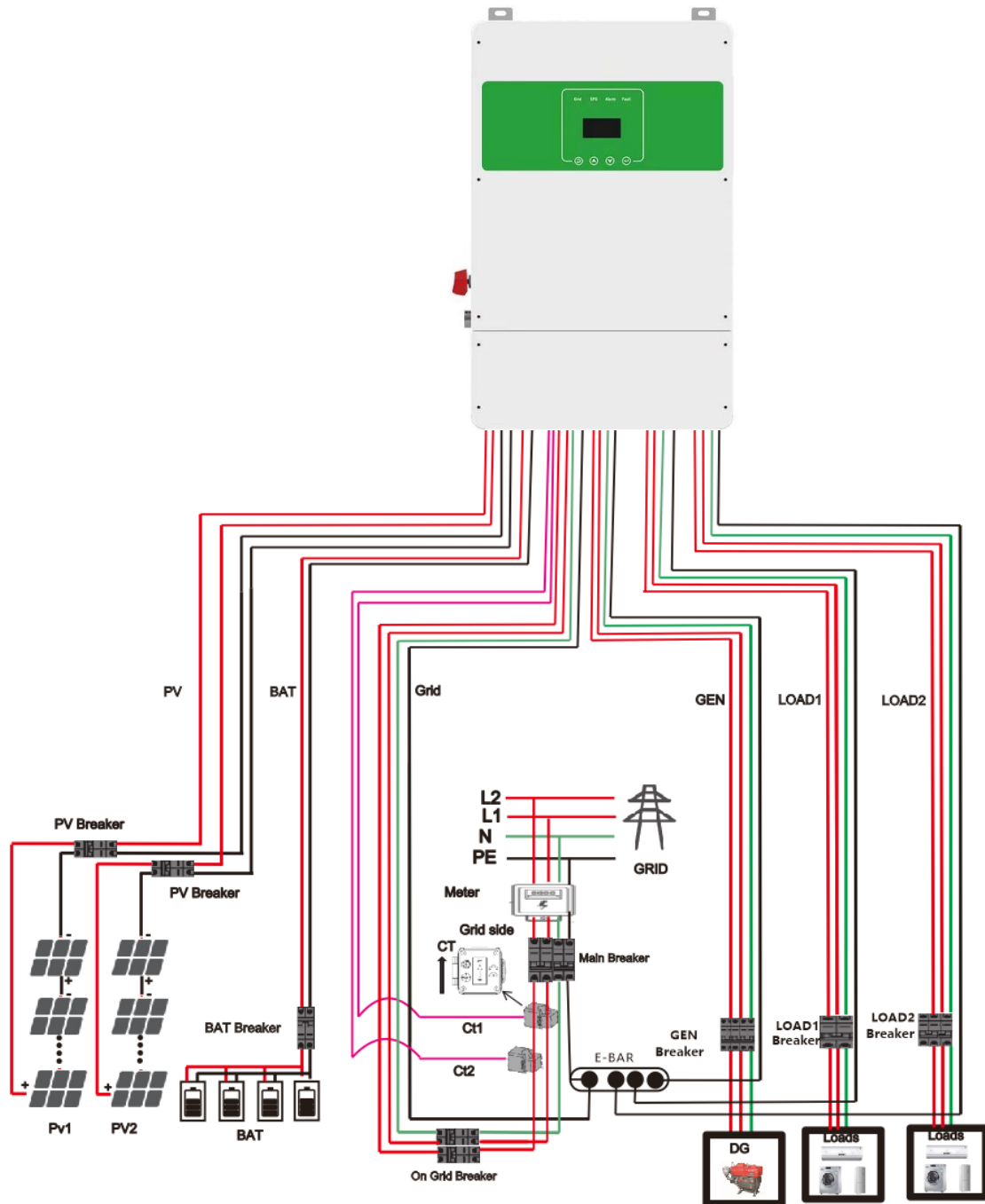


The wiring diagram in the above figure is for reference only.
 All switches and RCD devices shown in the figure can be chosen to use or not according to local standards



Note!

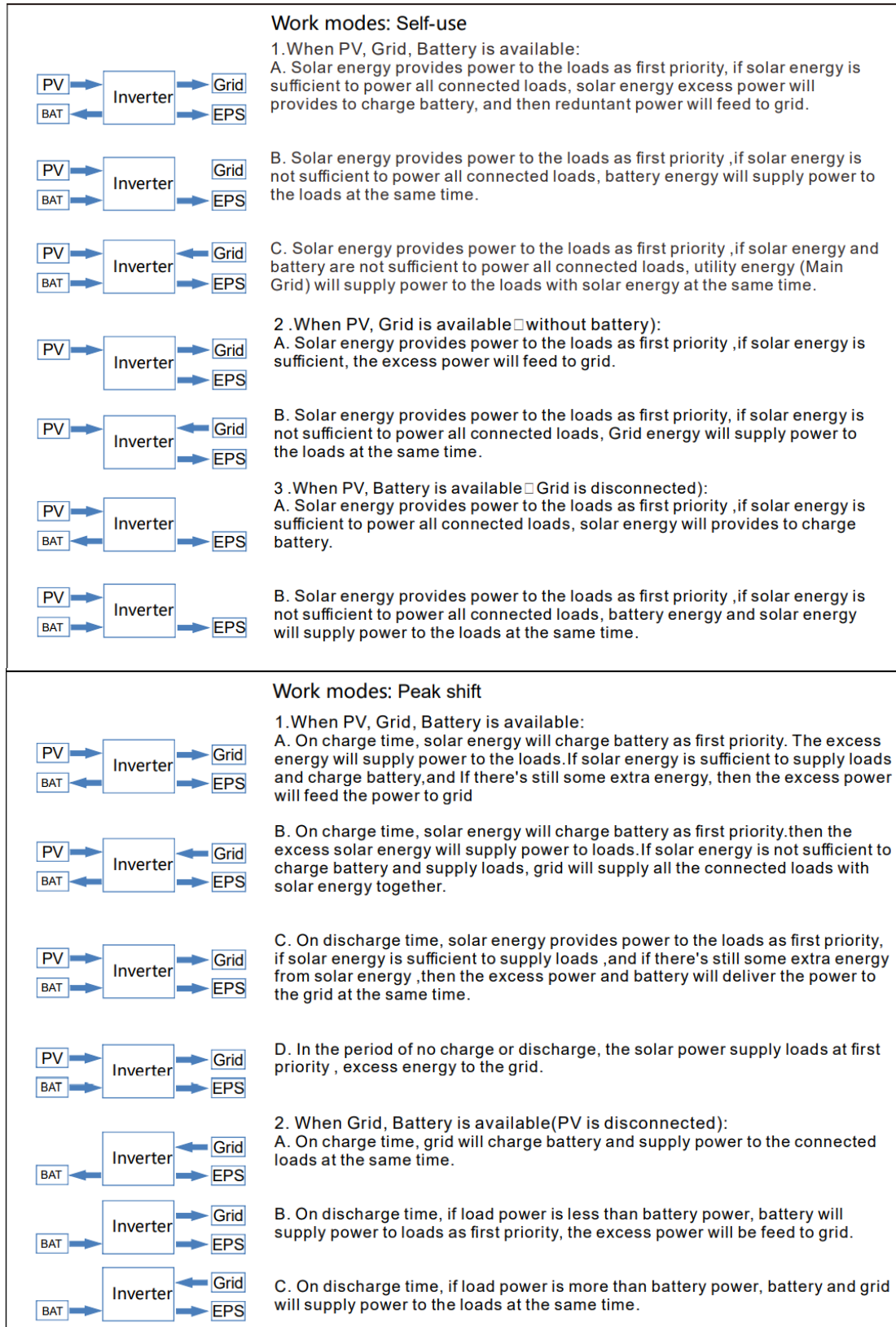
Please control the home loads, and make sure it's within the "BACK-UP output rating" under BACK-UP mode, otherwise the inverter will shut down with an "overload fault" warning.
 Please confirm with the mains grid operator whether there is any special regulations for grid connection.

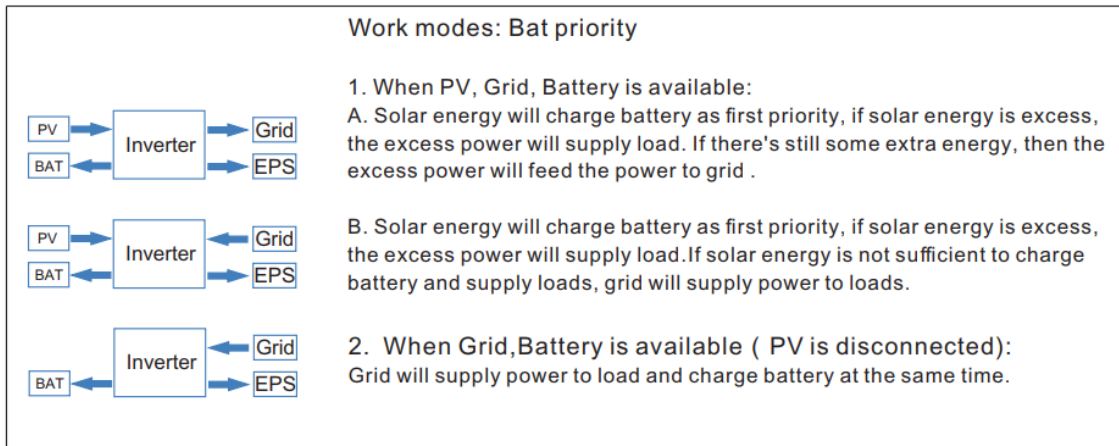


System Example Diagram

3.3 Work Modes

Inverter provides multiple work modes based on different requirements.

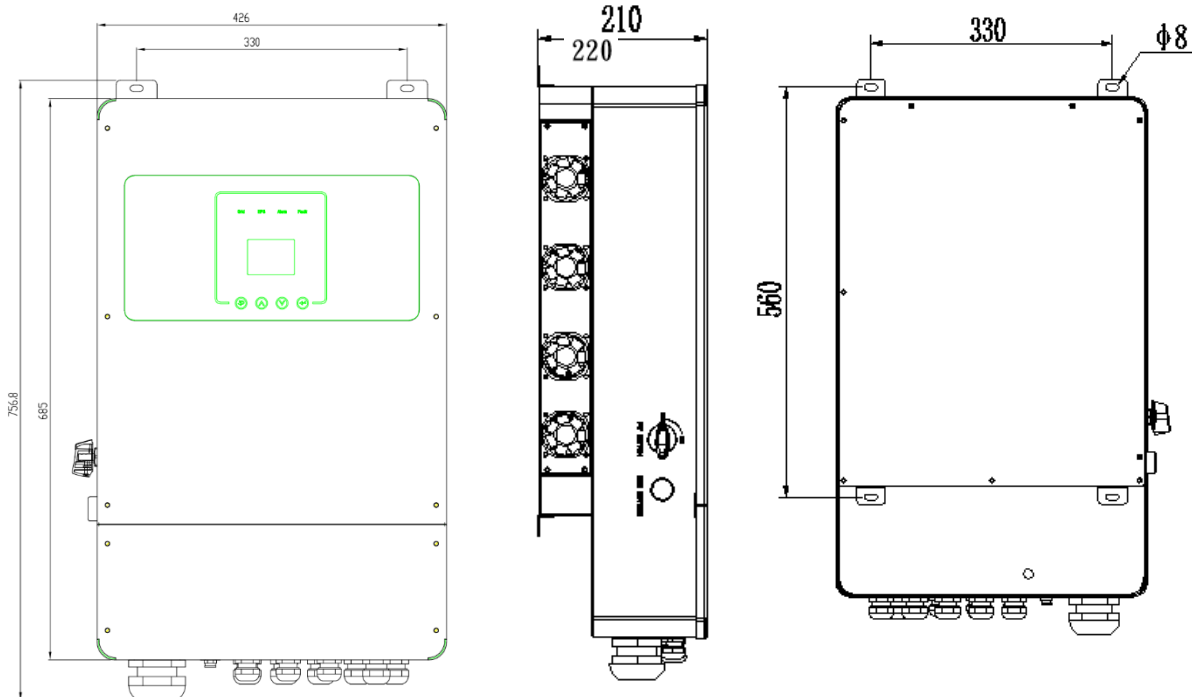




Note!

If set anti-Reverse function allowable, Once on the work mode of Self-use, Peak shift, battery priority, the system will not feed power to grid.

3.4 Dimension

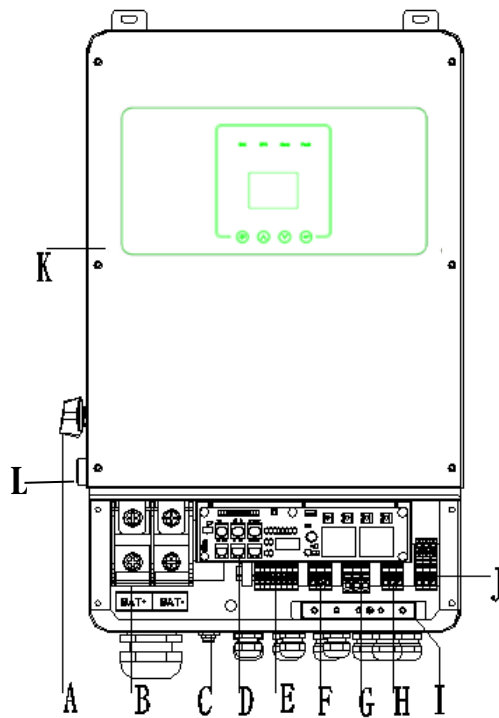


Front

Side

Back

3.5 Terminals of hybrid inverter

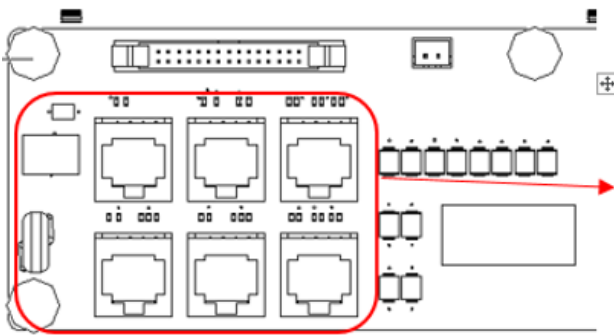


Object	Description
A	DC switch
B	BAT input
C	WiFi
D	CAN1/CAN2/RS485/BMS485, BMSCAN/CTL1/CTL2/Type-cupgrade
E	PV1~PV4 input
F	Generator
G	Grid
H	BACK-UP1 output
I	PE
J	BACK-UP2 output
K	LCD
L	RSD button



WARNING !

Qualified electrician will be required for the installation.



TYPE-C UPDATE	CAN1 BMS-485 BMS-CAN	CAN2 CT L2	RS485 CT L1
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* Port Function

CAN1/CAN2: Communication interface for connecting inverters.

RS485: Read the internal data of inverter.

BMS-485/ BMS-CAN: BMS communication for lithium batteries.

CT L1/CT L2: For external grid side CT to detect current size.

TYPE-C UPDATE: Update inverter software locally on PC via USB-A port.

4. Technical Parameters

4.1 Inverter specification

Technical Data	GSL-H-5KLV-US	GSL-H-6KLV-US	GSL-H-7K6LV-US	GSL-H-8KLV-US
PV Input Data				
MAX.DC Input Power	7.5kW	9kw	12kw	12KW
NO.MPPT Tracker	4			
MPPT Range	120 – 500V			
MAX.DC Input Voltage	500V			
MAX.Input Current	12A			
Battery Input Data				
Nominal voltage (Vdc)	48V	48V	48V	48V
MAX.Charging/Discharging Current	120A/120A	135A/135A	190A/190A	190A/190A
Battery Voltage Range	40–60V			
Battery Type	Lithium and Lead Acid Battery			
Charging Strategy for Li-Ion Battery	Self-adaption to BMS			
AC Output Data(On-Grid)				
Nominal output power Output to Grid	5KVA	6KVA	7.6KVA	8KVA
MAX. Apparent Power Output to Grid	5.5KVA	6.6KVA	8.4KVA	8.8KVA
Output Voltage Range	110–120/220–240V split phase, 1Ø, 230 1 phase			
Output Frequency	50/60Hz (45 to 54.9Hz / 55 to 65Hz)			
Nominal AC Current Output to Grid	20.8A	25A	31.7A	33.3A
Max.AC Current Output to Grid	22.9A	27.5A	35A	36.7A
Output Power Factor	0.8leading...0.8lagging			
OutPut THDI	< 2%			
AC Output Data(Back-Up)				
Nominal. Apparent Power Output	5KVA	6KVA	7.6KVA	8KVA
MAX. Apparent Power Output	5.5KVA	6.6KVA	8.4KVA	8.8KVA
Nominal Output Voltage L–N/L1–L2	120/240V			
Nominal Output Frequency	60Hz			
Output THDU	< 2%			
Efficiency				
Europe Efficiency	≥97.8%			
MAX. Battery to Load Efficiency	≥97.2%			
Protection				
Grounding detection	YES			
Arc Fault Protection	YES			
Island Protection	YES			
Battery reverse Polarity	YES			
Insulation Resistor Detection	YES			

Residual Current Monitoring Unit	YES
Output Over Current Protection	YES
Back-up Output Short Protection	YES
Terminal temperature detection	YES
Output Over Voltage Protection	YES
Output Under Voltage Protection	YES
General Data	
Output Conduit	25.4mm
Operating Temperature Range	-25 ~ +60°C
Relative Humidity	0-95%
Operating Altitude	0~4000m
Ingress Protection	IP65/NEMA 3R
Weight	41kg
Size (Width*Height*Depth)	430mm x 710mm x 220mm
Cooling	Natural Convection
Noise emission	<38dB
Display	LCD
Communication With BMS/Meter/EMS	RS485, CAN
Supported communication interface	WiFi, GPRS (optional)

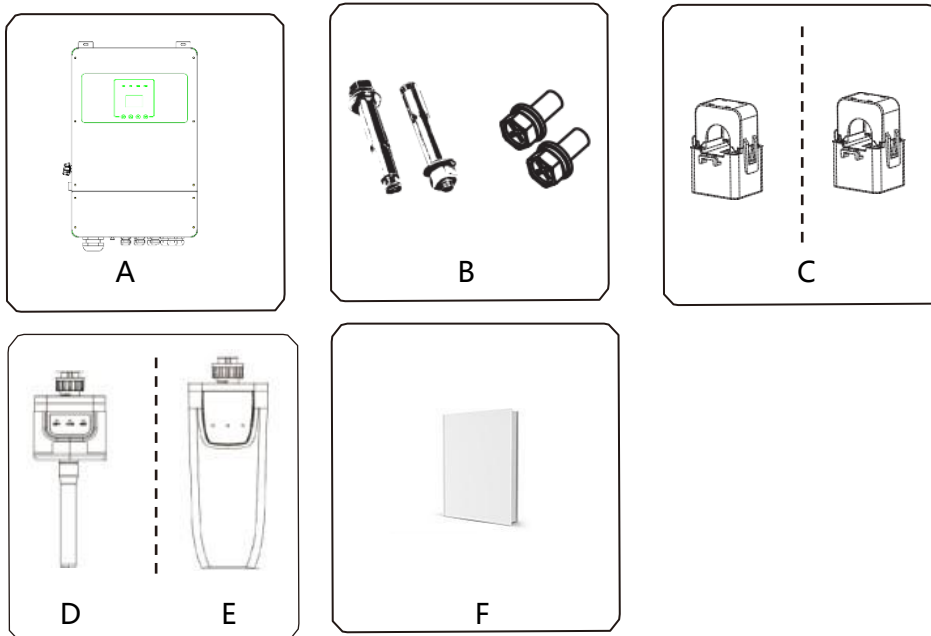
5. Installation

5.1 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.

5.2 Packing List

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



Object	Description
A	Inverter
B	Expansion screws and pan-head screws
C	CT
D	WiFi module (optional)
E	GPRS module (optional)
F	User manual

5.3 Mounting

➤ Installation Precaution

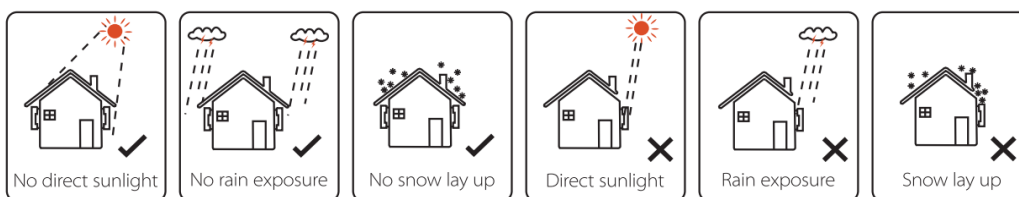
Inverter is designed for outdoor installation (IP 65). Make sure the installation site meets the following conditions:

- ◆ 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 -20°C to +60°C.
- ◆ The slope of the wall should be within $\pm 5^\circ$.
- ◆ The wall hanging the inverter should meet conditions below:

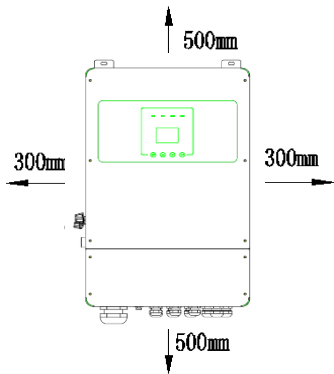
1. solid brick/concrete, or strength equivalent mounting surface;

2. Inverter must be supported or strengthened if the wall's strength isn't enough (such as wooden wall, the wall covered by thick layer of decoration)

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



➤ **Space Requirement**



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

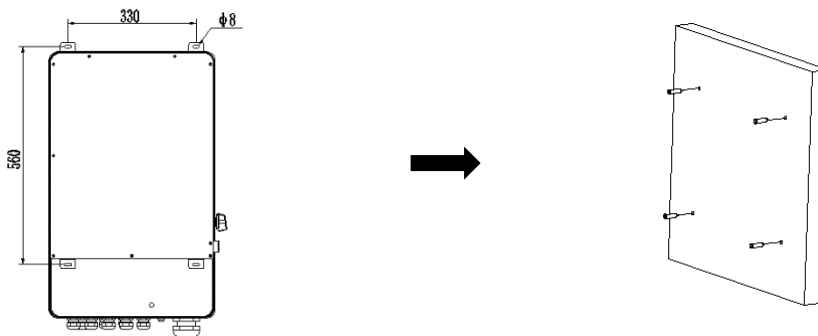
➤ **Mounting**

Tools required for installation.

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

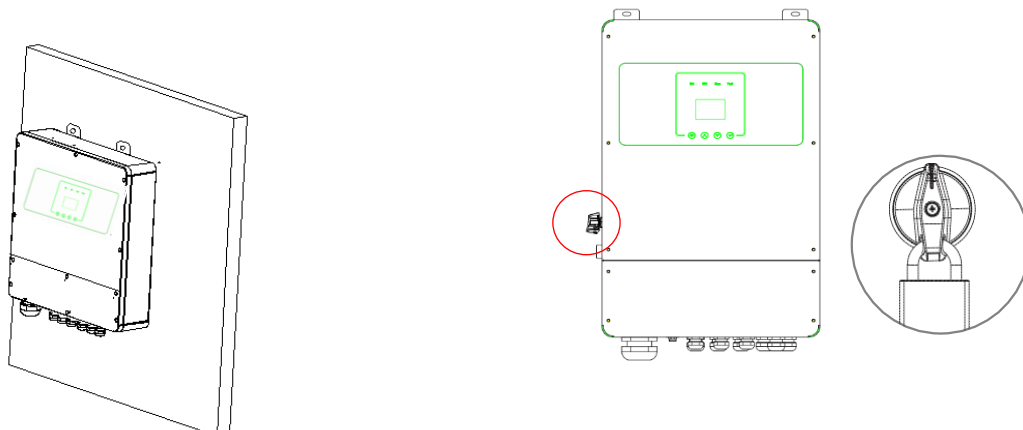


Step 1: Drill 4 holes in the wall according to the following distance dimensions, 50~60mm depth. Then use a proper hammer to fit the expansion bolt into the holes.

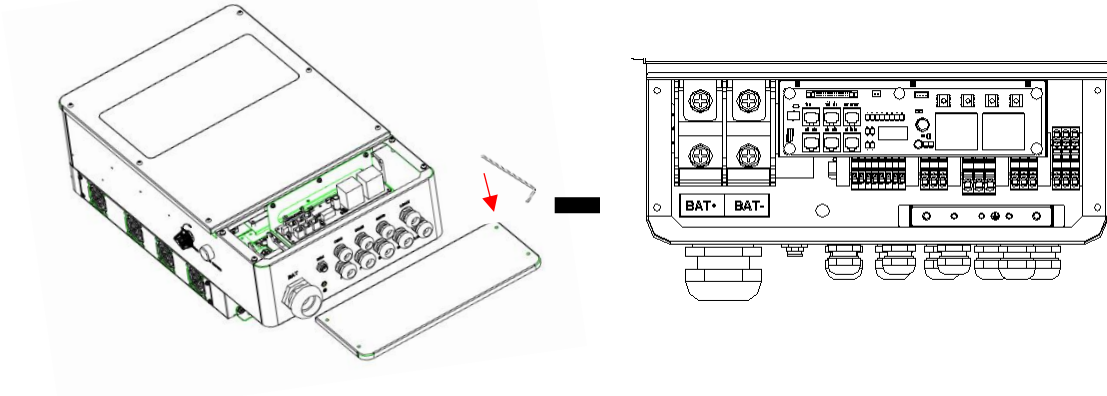


Step 2: Lift up the inverter and align the hole of the inverter with the expansion bolt, Fix the inverter on the wall.

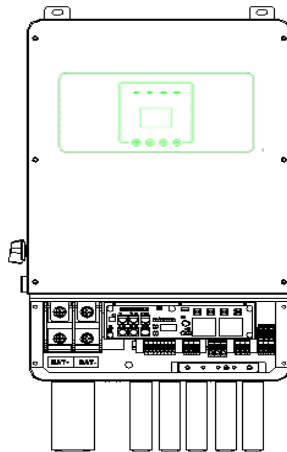
Step 3: Tighten the nut of expansion bolt.



Step 4: Remove the cover screws by Allen Wrench and remove the cover. Remove the waterproof cover by a flat blade screwdriver. Wiring box conduit plugs, Conduit plugs are provided for 1 inch conduit fittings. If used conduit fitting is not 1 inch, an appropriate conduit adaptor should be used.



Step 5: Pass the corresponding conduit and fasten the joint.



6. Electrical Connection

6.1 PV connection

Hybrid can be connected in series with 4-strings PV modules for 5kW, 6kW, 7.6kW, 8kW. Select PV modules with excellent function and reliable quality. Open-circuit voltage of module arrays connected in series should be <Max. DC input voltage; operating voltage should be conformed to MPPT voltage range.



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;

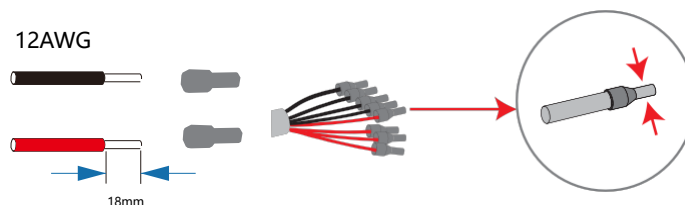
Please do not make PV positive or negative ground!

In order to save cable and reduce the DC loss, we suggest to install the inverter near PV modules.

Step1. Wiring.

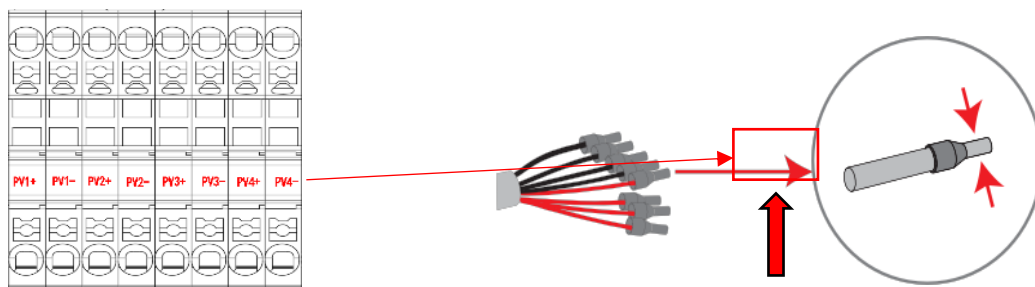
1.1 Choose the 12 AWG wire to connect with the cold-pressed terminal.

1.2 Remove 18mm of insulation from the end of wire.



Step2. Cross the PV cables athrough the PV port, Connect PV cables to PV terminals.

Connect PV cables to PV terminals.



6.2 Grid Connection (GEN connection)

Step1. Check the grid voltage.

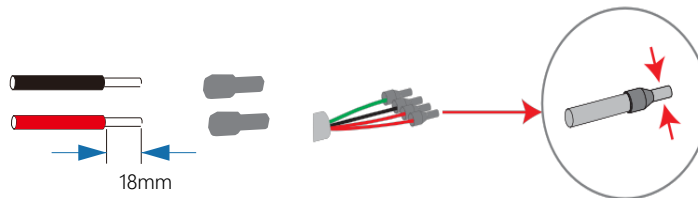
- 1.1 Check the grid voltage and compare with the permissive voltage range (Please refer to technical data).
- 1.2 Disconnect the circuit board from all the phases and secure against re-connection.

Step2. Grid cables choose

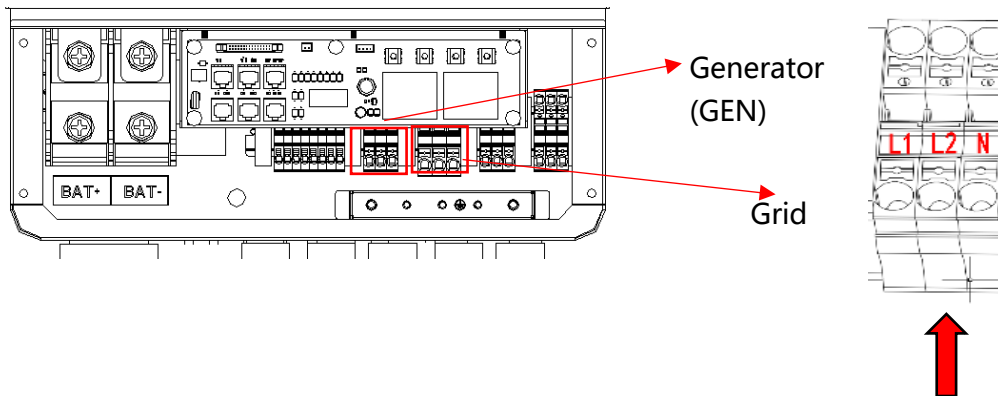
Use the right pin terminal from the accessory box. Press the connectors on cable conductor core tightly.

Model	GSL-H-5KLV-US	GSL-H-6KLV-US	GSL-H-7K6LV-US	GSL-H-8KLV-US
Cable	12AWG		10AWG	

Step3. Choose the wire to connect with the cold-pressed terminal. (Remove 18mm of insulation from the end of wire.)



Step4. Cross the Grid cables although the grid port, Connect Grid cables to Grid terminals.



6.3 Back-up: Load1 and Load2 Connection

Inverter has On and Off grid function, the inverter will deliver output power through AC port when the grid is on, and it will deliver output power through back-up port when the grid is off.

➤ Auto & Manual

BACK-UP function can be achieved automatically or manually according to user's wishes. BACK-UP function can only be triggered automatically.

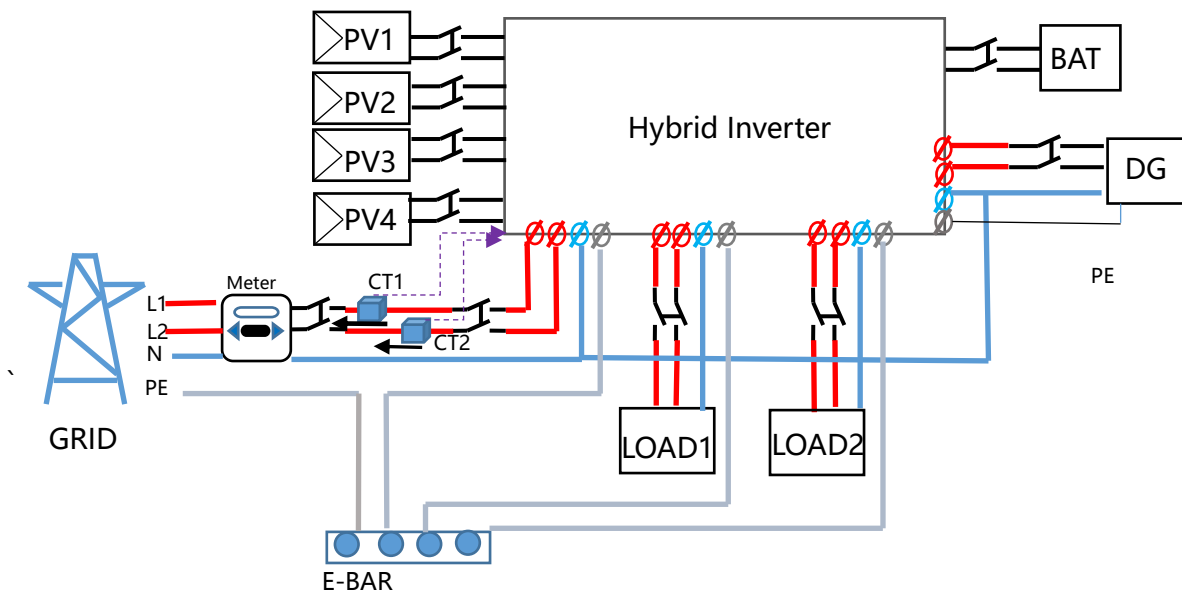
➤ Load1 port: important load.

Load2 port: When the battery is not sufficient, the load on this interface will power down

1). For inverter, the standard PV installation typically consists of the connection of the inverter with both panels and batteries. In case of systems not connected to the batteries, the Back-Up function is strongly not advised to use. It shall not cover the standard warranty and be liable for any consequences arising from users not following this instruction.

2) Hybrid inverters are able to supply over load output at its "Back-Up". For details please refer to the technical parameters of inverter. And the inverter has self-protection dreading at high ambient temperature.

3) For complicated application, or Special load, please contact after-sales.



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!

➤ **Back-Up:Load1 and Load2 Connection:**

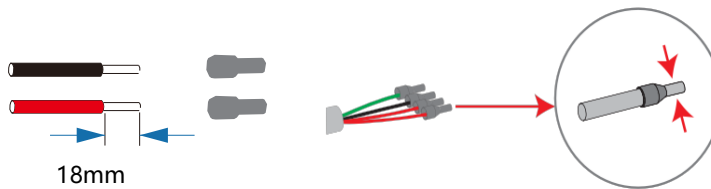
When using the off grid function, please add off grid AC breaker in off grid output cable to ensure safety.

Model	GSL-H-5KLV-US	GSL-H-6KLV-US	GSL-H-7K6LV-US	GSL-H-8KLV-US
Micro-breaker	32A		40A	

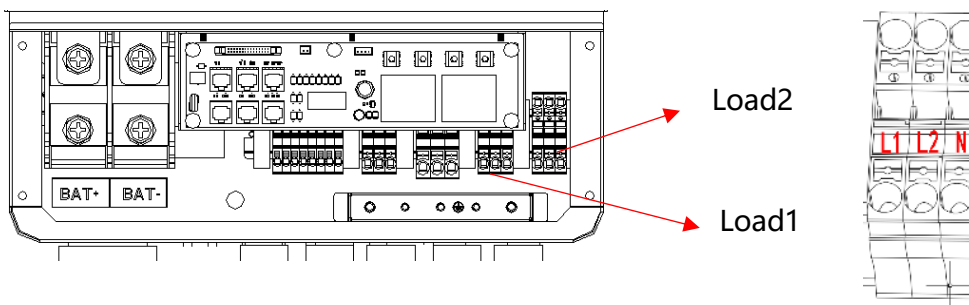
Note: The absence of AC breaker on back-up side will lead to inverter damage if an electrical short circuit happens on back-up side.

Step1.Make BACK-UP wires.

Model	GSL-H-5KLV-US	GSL-H-6KLV-US	GSL-H-7K6LV-US	GSL-H-8KLV-US
Cable	12AWG		10AWG	



Step2. Connect the cables to the BACK-UP:Load1 and Load2 port of the inverter.



➤ **Requirements for BACK-UP load**

Waring!



Make sure the BACK-UP load power rating is within BACK-UP output rating, otherwise the inverter will shut down with an “over load” warning.

When an “over load” is appeared, adjust the load power to make sure it is within the BACK-UP output power range, then turn the inverter back on.

For the nonlinear load, please make sure the inrush power should be within the BACK-UP output power range.

6.4 Battery Connection

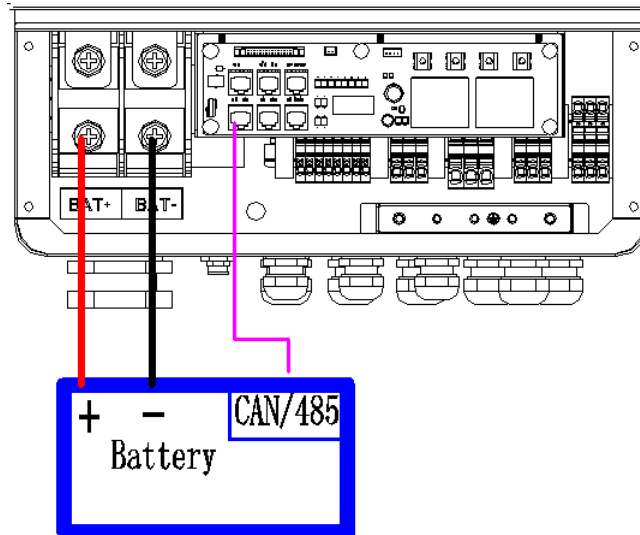
Charging & discharging system of Hybrid series inverter is designed for 48V lithium battery. Before choosing battery, please note the maximum voltage of battery can not exceed 60V and the battery communication should be compatible with Hybrid inverter.

➤ Battery breaker

Before connecting to battery, please install a no-polarized DC breaker to make sure inverter can be securely disconnected during maintenance.

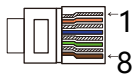
Model	GSL-H-5KLV-US	GSL-H-6KLV-US	GSL-H-7K6LV-US	GSL-H-8KLV-US
Current[A]	160A		250A	

➤ Battery connection diagram



➤ BMS PIN Definition

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



	PIN	1	2	3	4	5	6	7	8
CAN	Definition	X	X	X	BMS_CANH	BMS_CANL	X	X	X
RS485	Definition	X	X	X	X	X	GND	BMS_485A	BMS_485B

When using RS485 protocol, please note that PIN2 must be disconnected!



Note!

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

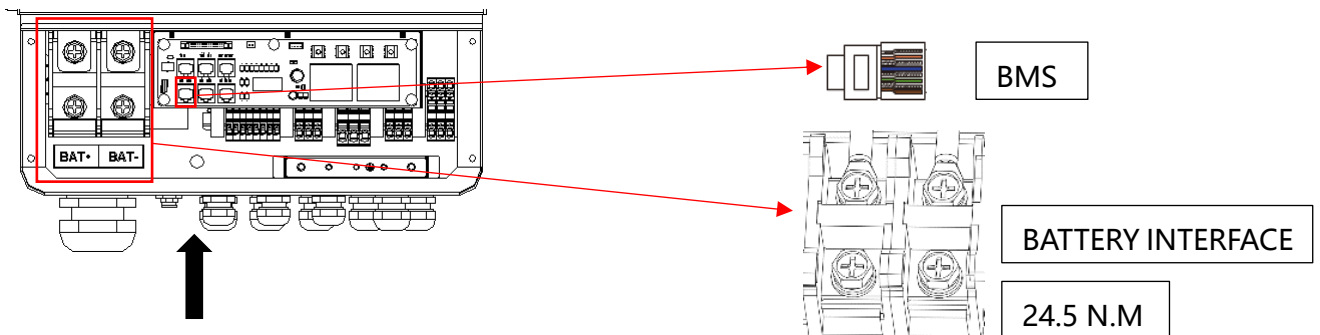
➤ Power Connection Battery:

Step1

Choose the 2 AWG wire and strip the cable to 15mm. Select two O-terminals with an aperture of M8. Insert the stripping line into the O-terminal and clamp it with a crimping clamp.



Step2. Cross the battery cable through the battery port. Connect battery cable to battery terminal



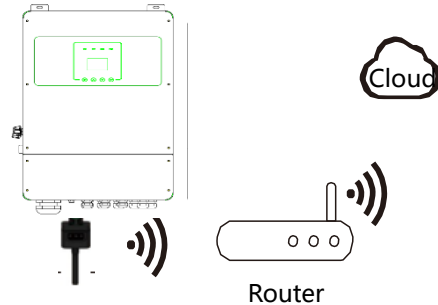
Note!

Positive and negative lines are not allowed to reverse.

6.5 WiFi Connection (optional)

Inverter provides a WiFi port which can collect data from inverter and transmit it to monitoring-website by WiFi.(Purchase the product from supplier if needed)

1) Diagram



2)WiFi Connection :

Step1. Plug WiFi into “WiFi” port at the bottom of the inverter.

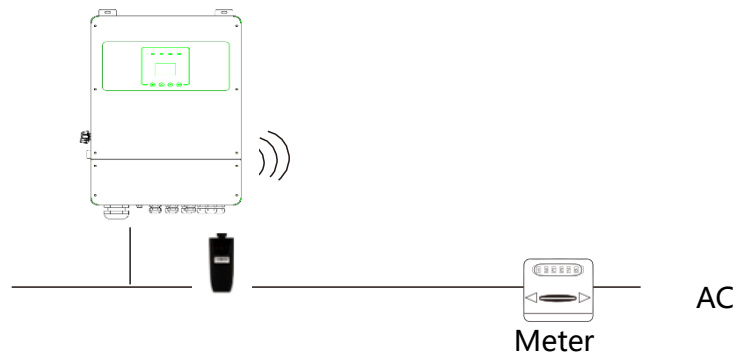
Step2. Build the connection between the inverter and router.

Step3. Create a user account online.(Please check the WiFi user manual for more details).

6.6 GPRS Connection (optional)

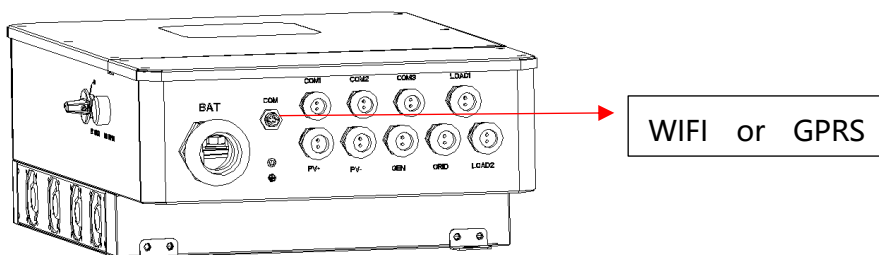
Hybrid inverter provides a GPRS(radio frequency) interface which control the switch time of a designated load via an external Smart Plug (purchase the product from supplier if needed.) so that the load mostly consumes PV energy and incurs the lowest-possible energy costs during operation.

1)Diagram



2)GPRS Connection :

Please refer to the Smart Plug user manual for detailed connection



6.7 CT Installation instructions

CT is short for "current transform", is used to detect Grid current.



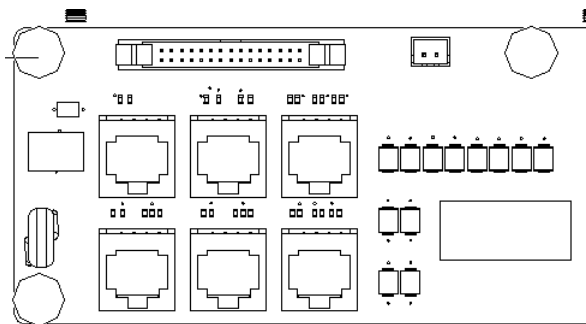
Note!

If CT is not installed or installed reversely, the functions of "Anti-reflux", "Self-use", "Peak-shift "... will not be realized.

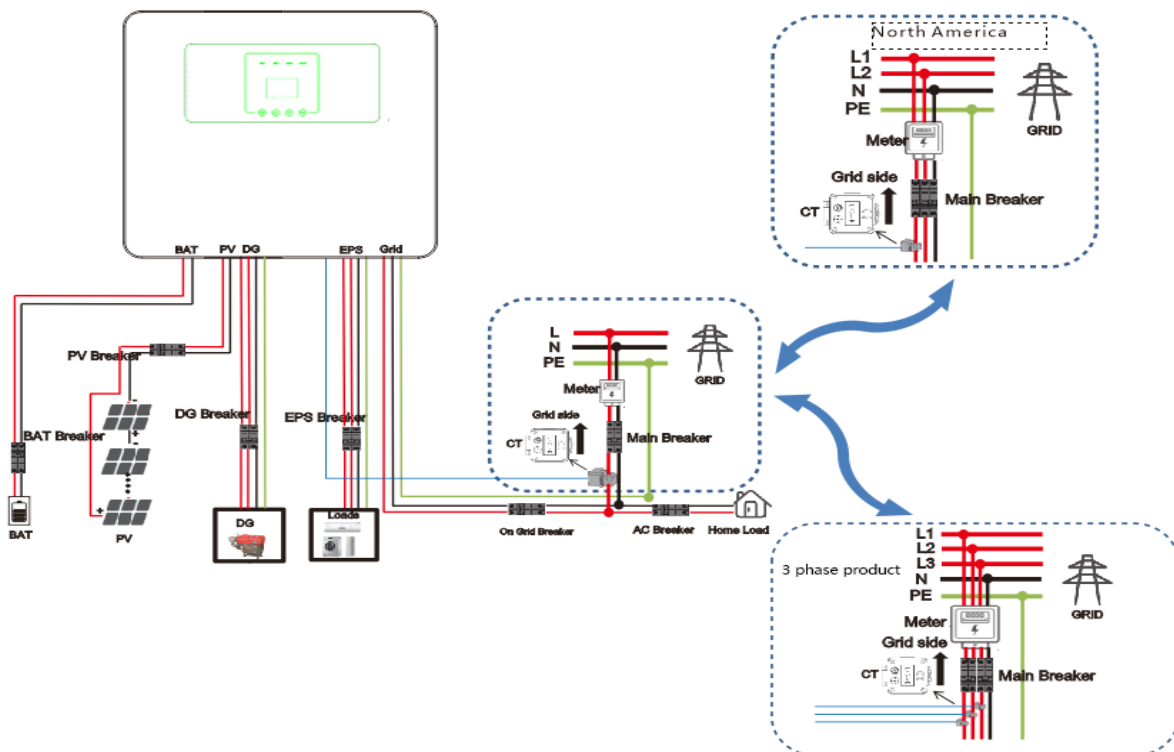
The direction of the arrow on the CT points from this inverter to the GRID.

When connected to single-phase power grid (Europe, Africa, Asia, Australia). Only one CT is provided in the accessories. The RJ45 connector of CT is connected to " CT-L1" , and the CT is connected to L phase.

When Connected to split phase power grid (North America), the accessories provide two CT, "CT-L1" network interface is corresponds to L1 phase, and "CT-L2" network interface is connected to L2 phase

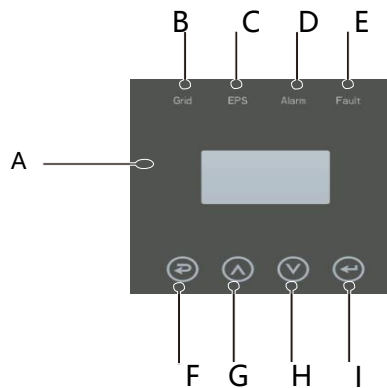


CAN1	CAN2	RS485_METER (Internal Use)
BMS-485 BMS-CAN	CT -L2	CT -L1



7. LCD Operation

7.1 Control Panel



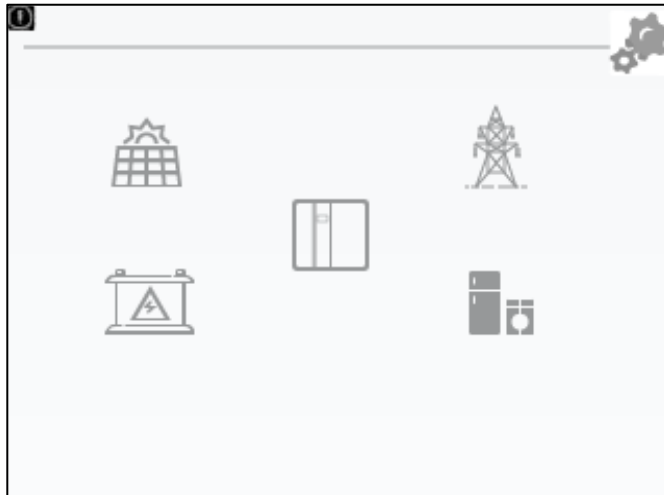
Object	Name	Description
A	LCD	Display the information of the inverter.
B	Indicator LED	lit in green: The inverter is in grid mode. Off: The inverter is in not in grid mode.
C		lit in green: The inverter is in off-grid mode. Off: The inverter is in not in off-grid mode.
D		lit in Yellow: The inverter is in Warning . Off: The inverter has no Inverter Warning
E		lit in red: The inverter is in fault status. Off: The inverter has no errors.
F		Esc: Return from current interface or function.
G	Function Button	Up: Move cursor to upside or increase value.
H		Down: Move cursor to downside or decrease value.
I		Enter: Confirm the selection.

7.2 Instructions for LED Indicator

	Grid (Green)	EPS (Green)	Alarm (Yellow)	Fault (Red)
Initialization	off	off	off	off
Stand-by	off	off	off	off
Grid mode	on	off	off	off
Off-Grid	off	on	off	off
Bypass of mains	off	on	on	off
Fault	off	off	off	on

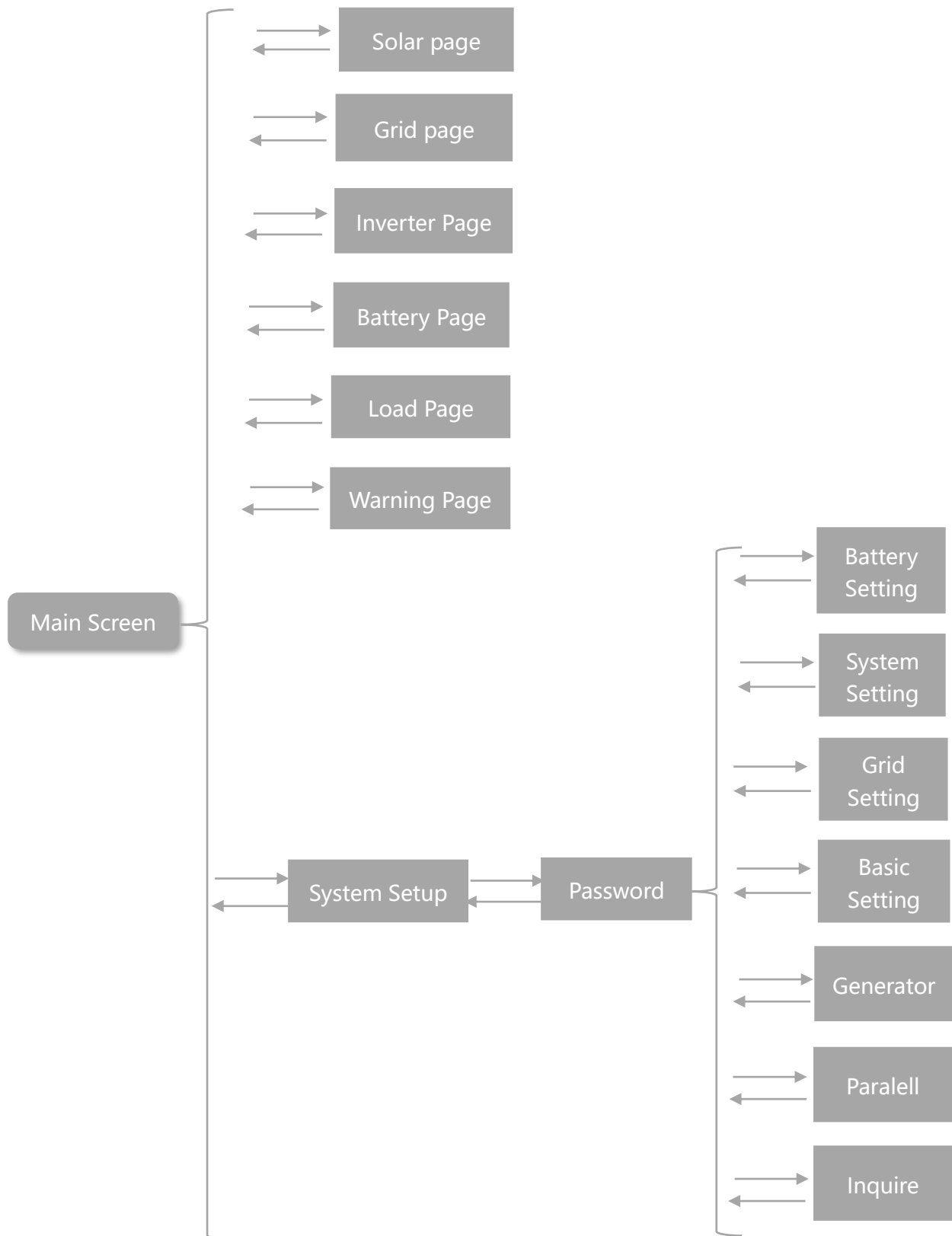
7.3 Main Screen

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



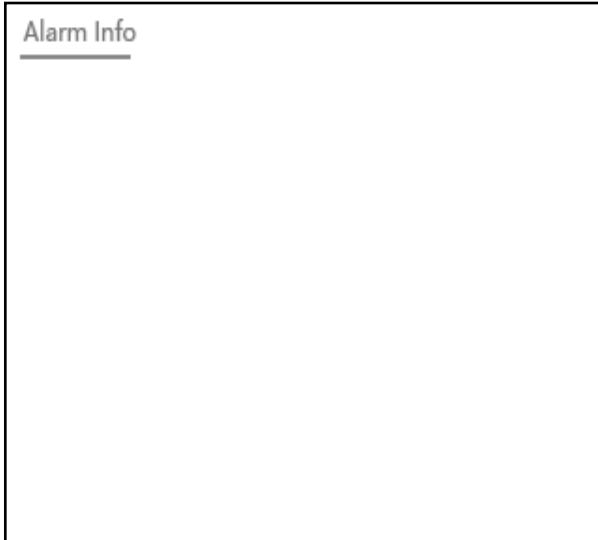
1. The icon in the middle of the screen represents the inverter. The icons from left to right correspond to photovoltaics, power grids, batteries, and loads. Click the corresponding icon to enter its related parameter display page.
2. At the top of the screen is the time.
3. When the alarm indicator is on, you can click the icon in the upper left corner to know what alarm has occurred.
4. The icon in the upper right corner of the screen is the setting control. Click the icon to enter the correct password to enter the setting interface. If you need relevant settings, click the corresponding control.

7.4 LCD operation flow chart



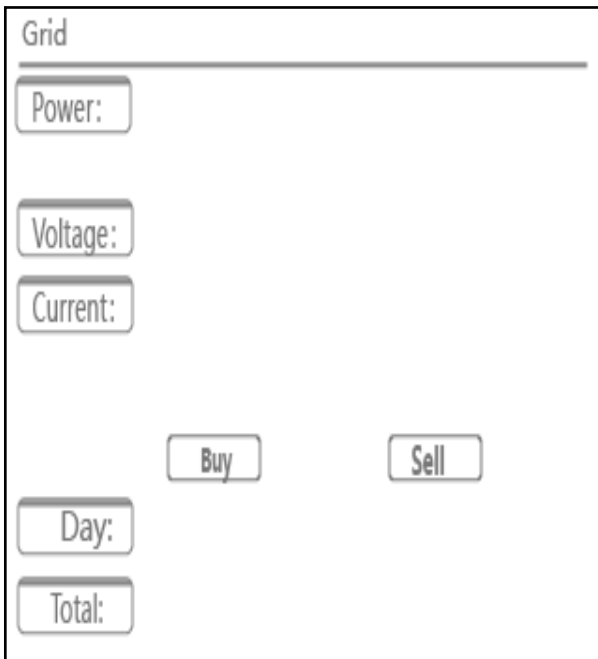
7.5 LCD display icons

7.5.1 Alarm Info



If there is an error, an error text message will be displayed

7.5.2 Grid Info



The CT arrow points to the power grid. The discharge from the inverter to the grid is "+", and the opposite is "-" .

Power: Grid real-time power

Voltage: Grid real-time voltage

Current: Grid CT real-time current

Buy:

Day: Statistics of the flow from the grid into the inverter for the day(KWH)

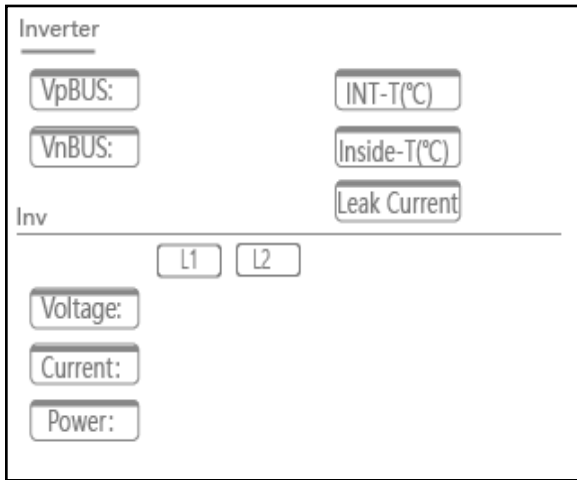
Total: Statistics of total flows from the grid to the inverter(KWH)

Sell:

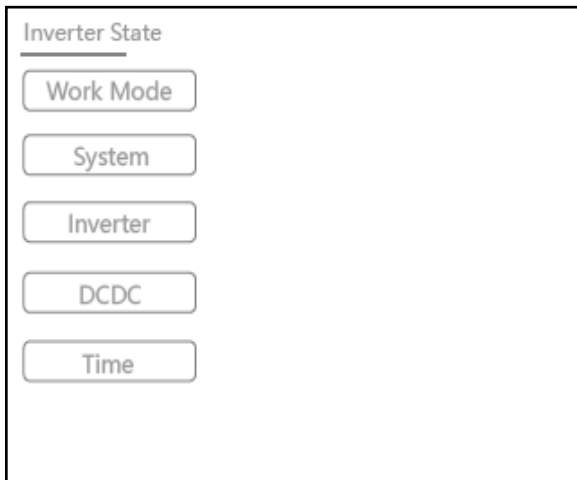
Day: Statistics of the current day's flow from the inverter to the grid(KWH)

Total: Total statistics from the inverter flowing into the grid(KWH)

7.5.3 Inverter Info

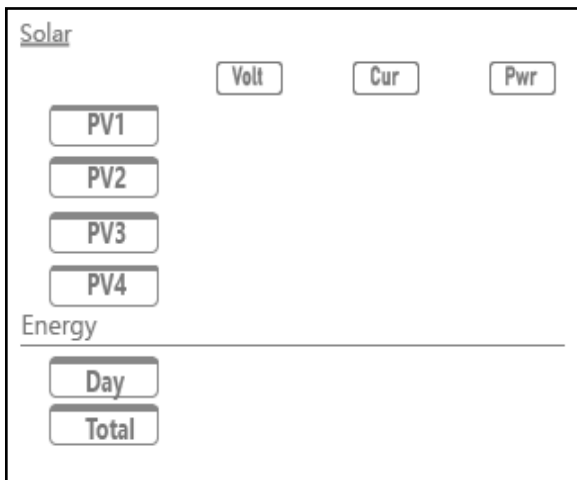


VpBUS: Real-time voltage of bus capacitor of the inverter
 VnBUS: Real-time voltage of bus capacitor of the inverter
 INT-T: DC/AC temperature
 Inside-T: Internal ambient temperature.
 Leak Current: Real-time leak current of the machine
 Voltage:L1 and L2 phase real-time voltage
 Current:L1 and L2 phase real-time current
 Power:L1 and L2 phase real-time power



Work Mode: The current inverter working mode, to set the working mode, you can browse 7.5.4
 System:Display complete machine status information, Including: Initialization, Standby, PV grid connection, Grid connection of battery, Hybrid power supply, Fault, Service ,Self -check, Off gird, grid, INV to PFC , Charging enable, Discharge enable, Force charge enable, etc.
 Inverter: Displays the inverter status information
 DCDC: Displays charging and discharging status information
 Time: Inverter system time

7.5.4 Solar Info



PV1:PV1 input real-time voltage, current and power
 PV2:PV2 input real-time voltage, current and power
 PV3:PV3 input real-time voltage, current and power
 PV4:PV4 input real-time voltage, current and power
 Day: PV power generation on the day (KWH)
 Total: Total PV power generation (KWH)

7.5.5 Battery Info

Battery

<input type="button" value="Voltage:"/>	<input type="button" value="Day:"/>	<input type="button" value="Charge"/>
<input type="button" value="Current:"/>	<input type="button" value="Total:"/>	
<input type="button" value="SOC:"/>		<input type="button" value="Discharge"/>
<input type="button" value="Temp(°C):"/>	<input type="button" value="Day:"/>	
<input type="button" value="Power:"/>	<input type="button" value="Total:"/>	

Voltage: Battery real-time voltage
Current: Battery real-time current
SOC: Battery state of charge
Temp: Battery temperature
Power: Battery power
Day: Statistics of battery charge and discharge in a day
Total: Battery charge and discharge total energy statistics

7.5.6 Load Info

Load

Voltage:

Current:

Power:

Charge

Day:

Total:

Voltage: load real-time voltage
Current: load real-time current
Power: load real-time power

Day: Statistics of the energy flowing into the load on the day
Total: Statistics of all energy flowing into the load

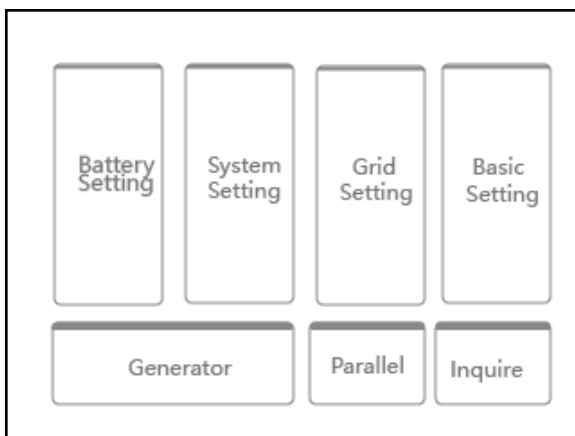
7.6 Inverter setting

7.6.1 Password



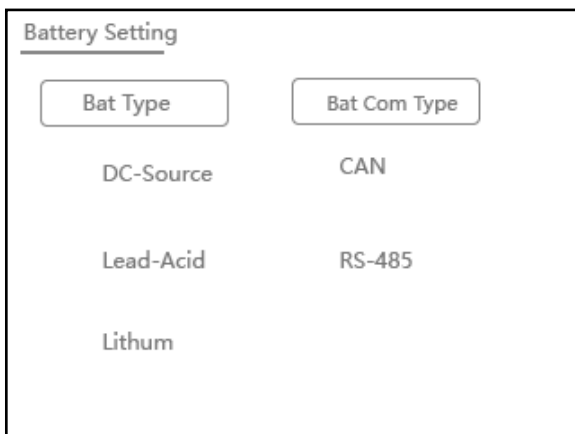
Click Settings on the home page to jump to the password input page, click the input box to pop up the keyboard, the default password is "11111"

7.6.2 Setup



This page is the entry of settings, click the corresponding setting to jump to the corresponding setting interface

7.6.3 Battery Setting



Bat Type: Select battery type
Bat Com Type: Select battery communication BMS type
DC-Source: For testing use only

Click to tick the "✓" to really set it

Battery Setting

Charge Curr Discharge Power

Grid DOD OFF-Grid DOD

Bat EodHyst

Charge Curr: Battery charge limit current value
Discharge Power: Battery discharge power percentage
Grid DOD: Battery discharge depth under grid connection
OFF-Grid DOD: Off-grid battery discharge depth
Bat EodHyst: battery hysteresis(charge to 1-DOD+EodHyst before it can be discharged)

Battery Setting

Lead-Acid

Charge Volt Chg Protect volt

Discharge Volt Bat AH Setting

Charge Volt: battery charging voltage. (The input value ranges from 51.0 to 59.5)
Discharge Volt: battery discharging voltage. (The input value ranges from 40 to 47)
Chg Protect volt: battery Charge protection voltage. (The input value ranges from 50.0 to 59.5)
Bat AH Setting: Battery capacity. It is related to the input power. (The input value ranges from 50 to 1000)

7.6.4 System Setting

System Setting

Work Mode PV Type

Self Consume Independant

Peak Shift Parallel

Bat Priority CV

Anti Reflux Backup Enable

Button Enble ARC Enable

Checked means enable, unchecked means disenable
Work Mode: Check the corresponding working mode, then click the "✓" control, note that the peak shift mode needs to click "↓" the next page. See below
PV Type: INDEPENDENT: The default Settings
 PARALLEL: This feature is for test use only, not customer use.
CV: This feature is for test use only, not customer use.
 The factory setting by default is Independent, When parallel input is set to be Independent mode, PV power will be imbalanced
Anti Reflux: Whether Inverter isn't allowed to generate electricity to the Grid
ARC Enable: Arc detection use

Backup Enable: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.
Button Enable: The switch button on the side of the inverter

Peak Shaving Time

Time1

Charge Start :

Charge End :

Discharge Start :

Discharge End :

Select the peak shift mode, you also need to set the charge and discharge time
 It's allowed to set Three charging and discharging periods.
 When setting the time, ensure that the time of the inverter is the local time.
 This parameter is set for one day. If the specified time conflicts, the first time is used as the main time perform. If the three time ranges do not conflict, the three time ranges are executed in sequence

7.6.5 Basic Setting

Time Setting

Year Month Day

Hour Minute Second

This interface is used to set date and time.

7.6.6 Grid Setting

Grid Setting

Grid Standard Grid Set

Grid Function Reactive Type

Low Volt High Volt

Low Freq High Freq

Power Factor Grid Power

Reactive Pwr

Grid Standard, Grid Set, Grid Function and Reactive Type See the picture below for the settings
Low Volt, High Volt, Low Freq and High Freq are valid only if the grid standard is "custom"
Power Factor: If power factor is selected as **reactive power type**, set this value to take effect
Reactive Pwr: If the reactive power type selects react power, set this value to take effect
 Grid Power: range 1~100%

Grid Standard

<input type="button" value="AU"/>	<input type="button" value="AU-W"/>
<input type="button" value="NZ"/>	<input type="button" value="UK"/>
<input type="button" value="PK"/>	<input type="button" value="KR"/>
<input type="button" value="PHI"/>	<input type="button" value="CN"/>
<input type="button" value="US"/>	<input type="button" value="THAIL"/>
<input type="button" value="ZA"/>	<input type="button" value="Custom"/>
<input type="button" value="POL"/>	<input type="button" value="EN50549"/>
<input type="button" value="VDE4105"/>	<input type="button" value="JPN"/>
<input type="button" value="ITA"/>	

Grid Set

220V Single
120V/240V
120/208V
120V Single

This interface is used to select Grid standard.

Press Up/Down button to move corresponding options;

Press Enter button to enter the selected menu.

- 1:AU-(Australia): 240V/415V/50Hz
- 2:AU-W(Western Australia): 240V/415V/50Hz
- 3:NZ- New Zealand : 240V/415V /50Hz
- 4:UK-United Kingdom 230V/50HZ
- 5:PK- 230V/50HZ
- 6:KR-Korea: 220V/380V/60Hz
- 7:PHI-Philippines: 110V/220V/60HZ
- 8:CN-China: 220V/380V/50HZ
- 9:US-CA—America: 120V/240V 208V/240V/60Hz
- 10:THAIL 220/380V/50HZ
- 11:ZA 230/50HZ
- 12:CUSTOM-User defined
- 13:POL 230V/380V/50HZ
- 14:EN50549 217V/220V/240V 380V/400V 50HZ/60HZ
- 15:VDE4105—Germany: 230V/380V/50Hz

If the country used is not one of the above options, consult the distributor.

Grid Function

<input type="button" value="PWR-Volt RES"/>
<input type="button" value="PWR-Freq RES"/>
<input type="button" value="PFC-Volt RES"/>
<input type="button" value="PFC-Freq RES"/>
<input type="button" value="Active Island"/>
<input type="button" value="Leack Current"/>
<input type="button" value="Insulation Detection"/>

Grid Function:default is allowed, do not need to set, customers need to consult the distributor

Reactive Type: non-user settings

Reactive Type

<input type="button" value="Power Factor"/>
<input type="button" value="React Power"/>
<input type="button" value="QU Wave"/>
<input type="button" value="QP Wave"/>

7.6.7 Generator

Gen Set

Start SOC

Stop SOC

Charge Current

Max Operating Time

Cooling Time

Auto Start

Charge Enable

reserved

7.6.8 Parallel

Parallel

Parallel Enable

3 Phase Enable

Master

Slave

Comm Bat

Comm GridCT

ParallelNum

ParallelAddr

A Phase

B Phase

C Phase

Parallel Enable: Controls whether to enable the inverter parallel function

MasterSlave: Set whether the current inverter is a master or a slave

Comm Bat: Whether to share battery

Comm GridCT: Shared grid CT

3 Phase Enable: Which three-phase options are enabled

ParallelNum: number of parallels

ParallelAddr: Address of current inverter in parallel mode

Parallel

Charge Curr

Discharge Curr

Charge Curr:Total charging current in parallel

Discharge Curr: Total discharge current in parallel

7.6.9 Inquire

Inquire

Module:

SN:

ARM Ver:

DSP Ver:

Module: This interface show inverter model.

SN: show module SN

ARM Ver: ARM software version

DSP Ver:DSP software version

8. 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	Solutions
DischgOverCur	00 29	(1) nothing need to do, 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 inverters; disconnect the load and plug in to restart inverters, then check whether the
Over Load	01	(1) Check whether the load is in compliance with the maximum power of the inverter. (2) Cut off all the power and shut down all the inverters; disconnect the load and plug in to restart inverters, then check whether the load is short circuited if the fault has been eliminated. (3) Contact customer service if error warning continues.
BatDisconnect	02	(1) Check if the battery not connected. (2) Check if battery wiring port is open circuited . (3) Contact customer service if error warning continues.
Bat Under Vol	03 04 26	(1) Check if the battery is in line with the presetting, If so, power off and restart. (2) Check if the grid is powered down. If the power is off, wait for the grid to powered up, the grid will automatically charge the battery. (3) Contact customer service if error warning continues.
Bat Over Vol	05 27	(1) Check if the battery is in line with the presetting, If so, power off and restart. (2) Contact customer service if error warning continues.

grid low vol	06	(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 vol	07	(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 low freq	08	(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 overFreq	09	(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.
gfci over	10	(1) Check PV string for direct or indirect grounding phenomenon. (2) Check peripherals of inverter for current leakage. (3) Contact the local inverter customer service if fault remains
SolarUnconnect	11	(1) PV is not connected. (2) PV switch is not closed. (3) Check PV availability.
Grid CtReverse	12	(1) Check whether the CT is connected in the correct direction. (2) Contact customer service if error warning continues.
bus under vol	13	(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 vol	14	(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.
inv over cur	15	(1) Restart the inverter and wait until it functions normally. (2) Contact customer service if error warning continues.
chg over cur	16	(1) Check if battery wiring is short circuited. (2) Check if charging current is in compliance with presetting. (3) Contact customer service if error warning continues.

bus vol osc	17	(1) Cut off all the power and shut down all the inverters and restart. (2) Contact customer service if error warning continues.
inv under vol	18	
inv over vol	19	
InvFreqAbnor	20	
env temp high	21	(1) Cut off all the power of the inverter and wait one hour, then turn on the power of the inverter. (2) Contact customer service if error warning continues.
bat over temp	23	(1) Disconnect the battery and reconnect it after an hour. (2) Contact customer service if error warning continues.
Bat UnderTemp	24	(1) Check the ambient temperature near the battery to see if it meets the specifications. (2) Contact customer service if error warning continues.
BatCellUnball	25	(1) Break the grid, use the battery to supply power to the load, reconnect the grid side switch after half an hour, Wait another half an hour and check the fault status again.
chg over cur	28	(1) Check if battery wiring port is short circuited . (2) Check if charging current is in compliance with presetting. (3) Contact customer service if error warning continues.
bus soft fail	32	(1) Restart the inverter and wait until it functions normally. (2) Contact customer service if error warning continues.
inv soft fail	33	
bus short inv short	34	
fan fault	35	
Bus Relay Fault	36	
Grid Relay Fault	38	
BACK-UP rly fault	39	
gfcı fault	40	
Load Ct fault	41	
OffgridRlyFal system fault	42	
	44	
	45	
pviso low	37	(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.

pv short	43	(1) Restart the inverter and wait until it functions normally. (2) Disconnect the PV input, restart the inverter and wait until it functions normally.
bat reverse	46	(1) Check if the inverter battery positive and negative connection is correct. (2) Contact customer service if error warning continues.