

User Manual

Single-Phase Low-Voltage Hybrid Inverter



Foreword

The Manual describes the inverter in terms of product details, installation, operation, and maintenance, except for all information of photovoltaic system (PV system). Welcome to visit www.slenergy.com for more details.

Scope

The Manual applies to the following models:

SL3.6KLV-W, SL5KLV-W, SL6KLV-W

Intended audience

The Manual is available for technical personnel who install, operate, and maintain the inverters and users who check the inverter parameters on the Manual.

The installation and service require knowledge of high voltage electricity and should only be performed by qualified individuals. Slenergy assumes no liability for injury or property damage due to repairs attempted by unqualified individuals or a failure to properly follow this Guide.

The qualified individuals shall satisfy the following requirements:

- They shall be familiar with electronic, electrical wiring and mechanical expertise, and understand electrical and mechanical schematics;
- They shall have received the professional training on installation and commissioning of electrical equipment;
- They shall be able to tackle with hazards or emergencies during installation or commissioning;
- They shall be acquainted with local standards and relevant safety codes for electrical systems;
- They must read the whole Manual carefully and master the related safety precautions.

Although we are constantly updating and amending the Manual, Product in kind prevail, specifications maybe change without notice.

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1. Safety Precautions

This manual contains important safety instructions, which are highlighted with the following symbols, to ensure personal and property safety during usage, or to help optimize the product performance in an efficient way.

Please carefully understand the meaning of these warning symbols to better use the manual.

DANGER

Indicates high-risk potential hazards that, if not avoided, may lead to death or serious injury.

WARNING

Indicates moderate-risk potential hazards that, if not avoided, may lead to death or serious injury.

CAUTION

Indicates low-risk potential hazards that, if not avoided, may lead to minor or moderate injury.

NOTICE

Indicates potential risks that, if not avoided, may lead to device malfunctions or financial losses.

Safety code shall be followed during the installation, commissioning, operation, and maintenance of inverter. A failure to properly follow this Manual.

- Threatening the personal safety of the operator or third party;
 - Damaging the inverter or other property of the operator or third party.
- The manual includes not all safety precautions to be followed, but only serves as a supplement. Therefore, the user shall operate according to the actual situation;
- When installing, operating, and maintaining the equipment, users shall comply with local laws and regulations and codes, supplemented by safety precautions in the Manual.

***To avoid the above hazards, please follow the Manual strictly.**

1.1 Warning Symbol

Symbol	Description
	Switch off the machine before any operation and maintenance.
	Beware of scalding due to the equipment surface temperature maybe higher than 60°C.
	Before wiring and checking, ensure that the DC/AC circuit breakers of inverter have been disconnected and wait at least 5 minutes.
	Read the Manual before any operations on the inverter.
	Do not connect and disconnect wires, dismantle the case, and replace devices under electric condition due to the fatal high-voltage risk.
	Comply with the CE certification.
	Do not discard the inverter as the household waste.
	Reliably earth the inverter for protective grounding.

1.2 Unpacking for Inspection

WARNING

- Inspect all safety signs, warning labels, and nameplates on the inverter;
- Ensure that safety signs, warning labels, and nameplates are clearly visible, and not removed or covered before the inverter is discarded.

1.3 Installation Safety

DANGER

- Ensure the product has no electrical connections prior to installation;
- Ensure that the drilling, if required during installation, has avoided the electrical wiring inside the wall.

CAUTION

Improper installation may cause personnel injury!

- Do not stay under the inverter when it is carried and lifted by lifting tools;
- Control the weight when the inverter is carried to keep balance, thus avoiding products toppling or falling.

1.4 Electrical Connection Safety

WARNING

- Before electrical connections, ensure that the inverter is intact;
- Before electrical connections, be sure to keep the inverter and all connected switches in "OFF" state to avoid electric shock.

DANGER

The exposure of PV string to sunlight may cause danger!

- For electrical connections, wear personal protective equipment;
- Ensure that the cable is not charged through checking with test equipment before touching the DC cable;
- Read the safety precautions listed in the PV string-related documents;
- Do not connect the inverter with the PV string that needs either positive or negative grounding.

DANGER

There may be fatal high voltage inside the inverter!

- Please use special insulation tools when wiring;
- Operate in compliance with the instructions of warning symbols;
- Read safety precautions listed in the Manual and other inverter-related documents.

WARNING

- Verify the PV string's positive and negative polarities so that the DC connector is connected to the inverter and inserted to the corresponding DC terminal;
- When the inverter is installed and operated, ensure that the positive and the negative of the PV string do not short circuit to the ground. Otherwise, it may lead to inverter AC/DC short circuit, resulting in product damage, which is not covered under warranty.

WARNING

- Note that the incorrect wiring may damage the product, which is not covered under warranty;
- Electrical connection must be done by qualified individuals;
- Ensure that cables used in the PV system are properly sized, reliably connected, and well insulated.

1.5 Operation Safety

DANGER

- Do not touch the product enclosure when it is in operation;
- Do not insert or remove connectors on the inverter when it is in operation;
- Do not touch any terminals on the inverter when it is in operation to avoid electric shock;
- Do not remove any parts of the inverter when it is in operation to avoid electric shock;
- Do not touch the scorching parts of the inverter (e.g. heat sink) when it is in operation to avoid burns;
- Do not shift the DC switch on the product when it is in operation to avoid equipment damage or personnel injury.

1.6 Maintenance Safety

DANGER

- Do not touch the Grid or contacts and terminals that are connected to or inside the product to avoid electric shock;
- Use a standard voltmeter to confirm that the Grid is free of voltage before touching to avoid electrical shock.

DANGER

The improper maintenance may cause personnel injury or product damage!

- Before maintenance, disconnect the Grid-side AC circuit breaker and check the inverter status. switch off the DC switch at night as the inverter indicator is off, and if it is still on, switch off the DC switch directly;
- Use test equipment to check that the inverter is free of voltage and current after 5 min's power off, and then maintain the inverter with protective equipment;
- Avoid burns even after the inverter is shut down. Operate with protective gloves after the inverter has cooled down.

CAUTION

To avoid unrelated personnel from mishandling or accidents, place obvious warning signs or alarm belts around the products.

1.7 Disposing Safety

WARNING

Discard products based on the relevant local regulations and standards to avoid property losses or casualties.

1.8 Battery Safety

DANGER

- Batteries used with the inverter need to be approved by the inverter manufacturer, a list of approved batteries is available through the official website;
- Before installing the device, read the battery user manual carefully to understand the products and precautions, and strictly follow the battery user manual;
- If the battery is fully discharged, charge the battery strictly according to the battery user manual of the corresponding model;
- Battery current may be affected by some factors, such as temperature, humidity, and weather conditions, which may cause battery current limiting and affect the carrying capacity;
- If the battery does not start, contact the after-sales service center as soon as possible. Otherwise, the battery may be permanently damaged;
- Use a multimeter to measure the positive and negative terminals of the DC cable and ensure that the positive and negative terminals are correct. And the voltage is within the allowable range;
- Do not connect the same battery pack to multiple inverters. Otherwise, the inverters may be damaged.

2. Product Introduction

2.1 Energy Storage System

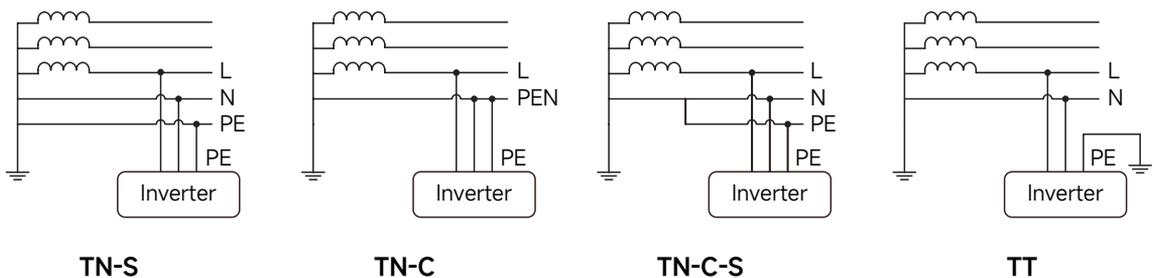
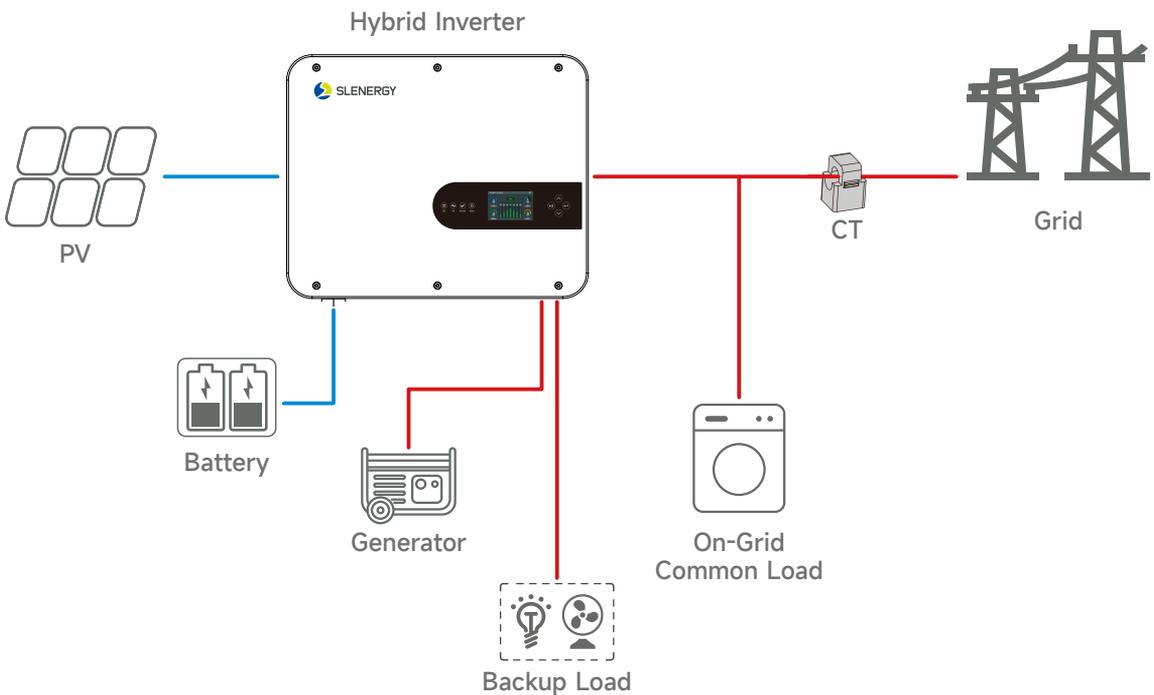
This is a multifunctional inverter, combining functions of inverter, solar charger and battery charger to offer uninterruptible power support with portable size. Its comprehensive LCD display offers user configurable and easy accessible button operation such as battery charging, AC/solar charging, and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

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

- Generator or Utility
- PV modules

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

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



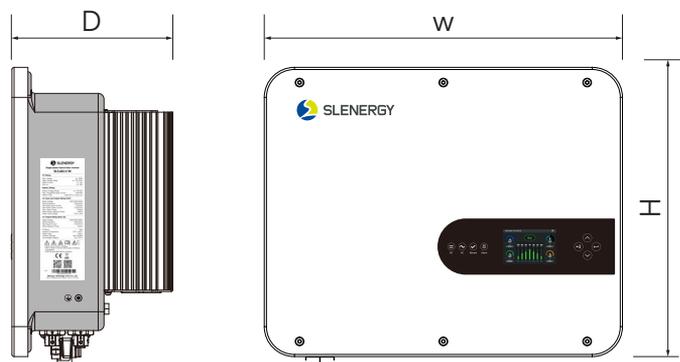
⚠ WARNING

- Do not connect the inverter with the PV string that needs either positive or negative grounding;
- When installing or operating the inverter, ensure the positive and negative of the PV string are short-circuit to the ground. Otherwise, it may lead to inverter AC/DC short circuit, resulting in product damage, which is not covered under warranty;
- Do not connect local loads between the inverter and AC-side circuit breaker;
- Use the inverter only in the scenarios described in the Manual.

2.2 Product Features

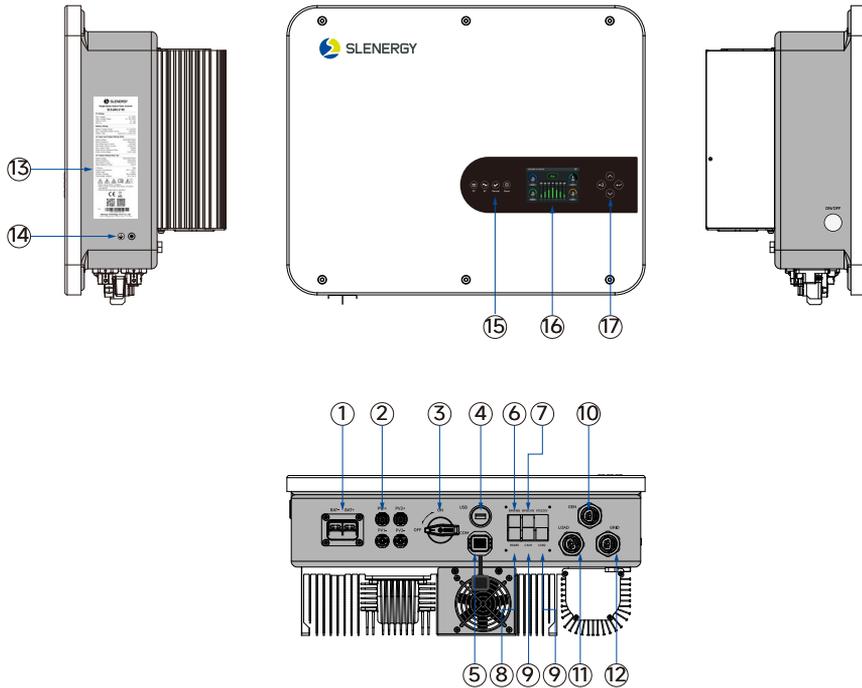
- △ Self-consumption and feed-in to the grid.
- △ Auto restart while AC is recovering.
- △ Programmable supply priority for battery or grid.
- △ Programmable multiple operation modes: On grid, off grid and UPS.
- △ Color LCD touch screen and App for setting and data management.
- △ Configurable AC/Solar/Generator Charger priority by LCD setting.
- △ 90-135A charge/discharge current.
- △ Compatible with mains voltage or generator power.
- △ Overload/over temperature/short circuit protection.
- △ Smart battery charger design for optimized battery performance.
- △ With limit function, prevent excess power overflow to the grid.
- △ Supporting WIFI/4G monitoring .
- △ Smart settable three stages charging for optimized battery performance.
- △ Time of use function.
- △ Smart Load Function.
- △ 16A PV input current per string, 2 MPP trackers.
- △ Automatically switching time <10ms.

2.3 Product Size



Models	Dimension (W×H×D)	Weight
SL3.6KLV-W SL5KLV-W SL6KLV-W	492 x 400 x 220mm	21kg

2.4 Product Overview



S.N.	Part Name	Description
1	Battery Wiring Port	For battery connection.
2	DC Input Terminals	2-channel photovoltaic connector.
3	DC Switch	For controlling the shutdown of DC input.
4	USB Interface	For the WiFi/4G collector monitoring.
5	COM Interface	Battery temperature sampling, external CT connection, diesel generator start or stop control interface.
6	BMS 485 Interface	BMS lithium battery RS485 communication.
7	BMS CAN Interface	BMS lithium battery CAN communication.
8	RS485 Interface	For ammeter communication.
9	CAN1 & CAN2 Interface	Multi-device parallel communication.
10	GEN	For the diesel generator wiring.
11	LOAD	For important load wiring.
12	GRID	For power grid wiring.
13	Labels	Including nameplate, warning label, and QR code.
14	External Grounding Terminal	For reliable grounding of inverters.
15	LED Indicator	For indicating the current inverter status.
16	LCD Screen	For indicating the current operating information and touch control of the inverter.
17	Function button	For manual control.

3. Installation

This chapter describes the inverter installation and its connection to the energy storage system; For connection of the inverter to the energy storage system, it includes inverter's connection to the PV string , battery and public grid;

Prior to inverter installation, users shall read this chapter and ensure it is installed by professional personnel after meeting all installation conditions.

3.1 Unpacking for Inspection

Although the equipment is completely tested and inspected before shipping, damages may still occur during transportation. So, users shall inspect the product in detail before signing.

- Check packing boxes for damages;
- Check if the goods are complete and consistent as per the packing list;
- Unpack and check if the internal parts are intact;
- In case of any damage or incomplete goods, contact the transport company or Slenergy and provide photos of the damage for accurate service;
- Do not discard the shipping packaging of equipment after it is removed, but store it in the original packing box.

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

Name	Quantity	Name	Quantity
Inverter	1	8pin Communication Connection	1
Wall Mounting Bracket	1	Waterproof Cover Assembly	1
External CT	1	Quick Installation Guide	1
Datalogger	1	Screw Mounting Kit	1
DC Connector (pair)	2	RNB38-6 OT Terminals	2
Battery temperature sensor	1	RNB8-5S OT Terminals	1
AC 3-pin Plug	3	M32 Waterproof Terminal	1

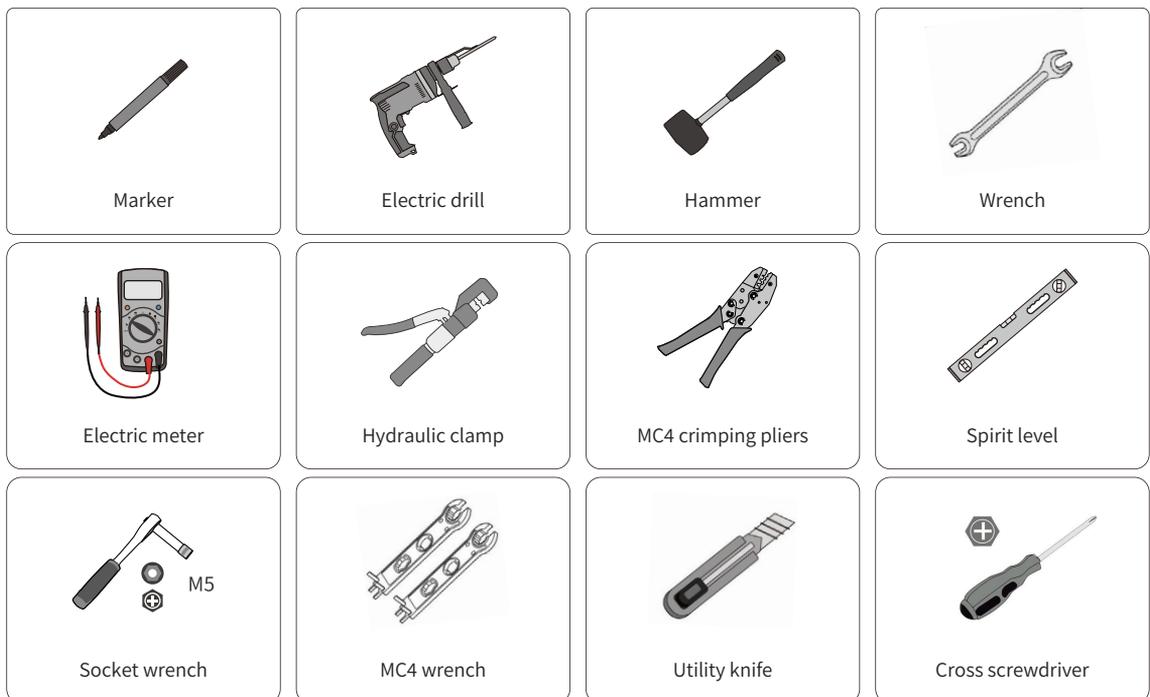
3.2 Inverter Storage

The inverter shall be stored in a specific condition if it is not operated at once:

- It shall be repacked by the shipping packing box with the desiccant;
- It shall be stored at a temperature range from -30°C ~ 70°C, with a relative humidity range from 0% ~ 95% and without condensation;
- The stacking of multiple inverters shall adhere to the "maximum stacking layers limit" indicated on the outer box;
- The packaging box may not be tilted or reversed;
- The inverter shall be carefully packaged before re-transportation;
- It shall not be stored in places exposed to direct sunlight, moisture from rain, strong electric fields, etc.;
- It shall not be stored together with objects that may damage the inverter;
- It shall be stored in a clean and dry place to protect it from the erosion of dust and water vapor;
- It shall not be stored in places with chemical corrosive substances or susceptible to pest infestation;
- Regular inspections shall be conducted at least half a year. In case of any signs of pest or rodent damage, the packaging materials need to be replaced;
- If the inverter has been in warehouse for one year or longer, it requires professional inspection and testing before operation.

3.3 Tool Preparation for Installation

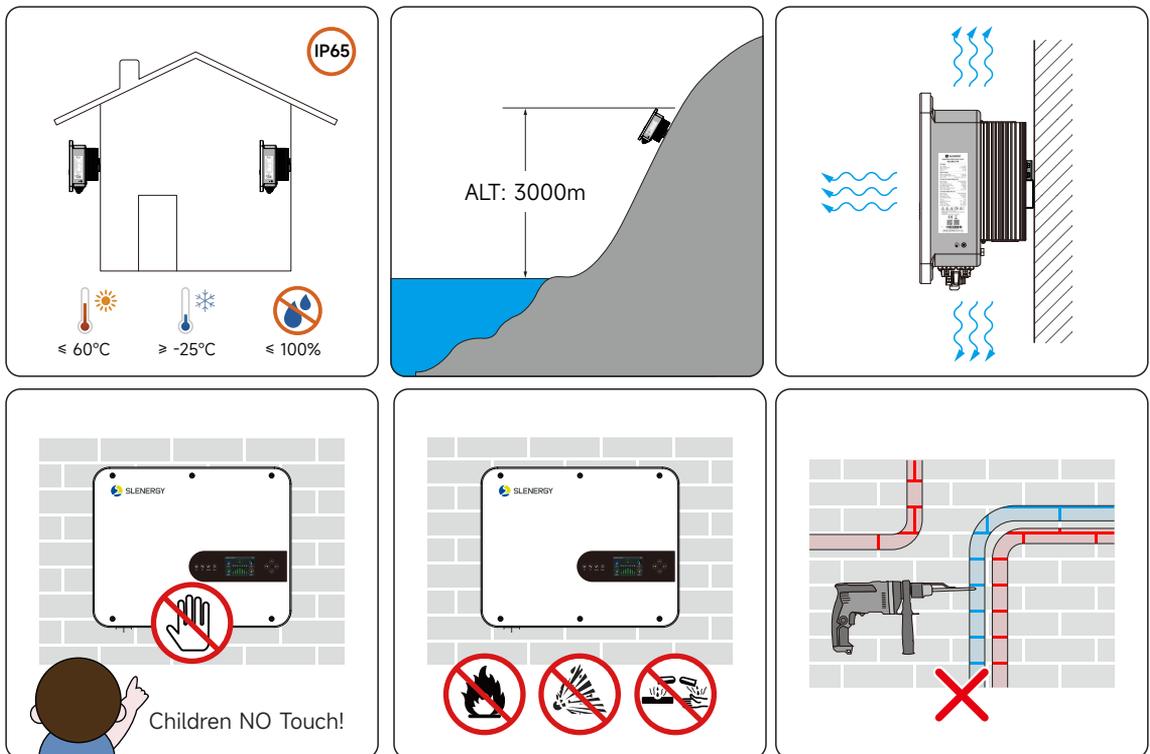
Before installation, the prepared tools include but are not limited to the recommended tools below, with other auxiliary tools available if needed.



3.4 Installation Site

For the inverter, optional installation sites play a vital role in ensuring its safe operation, long service life, and good performance.

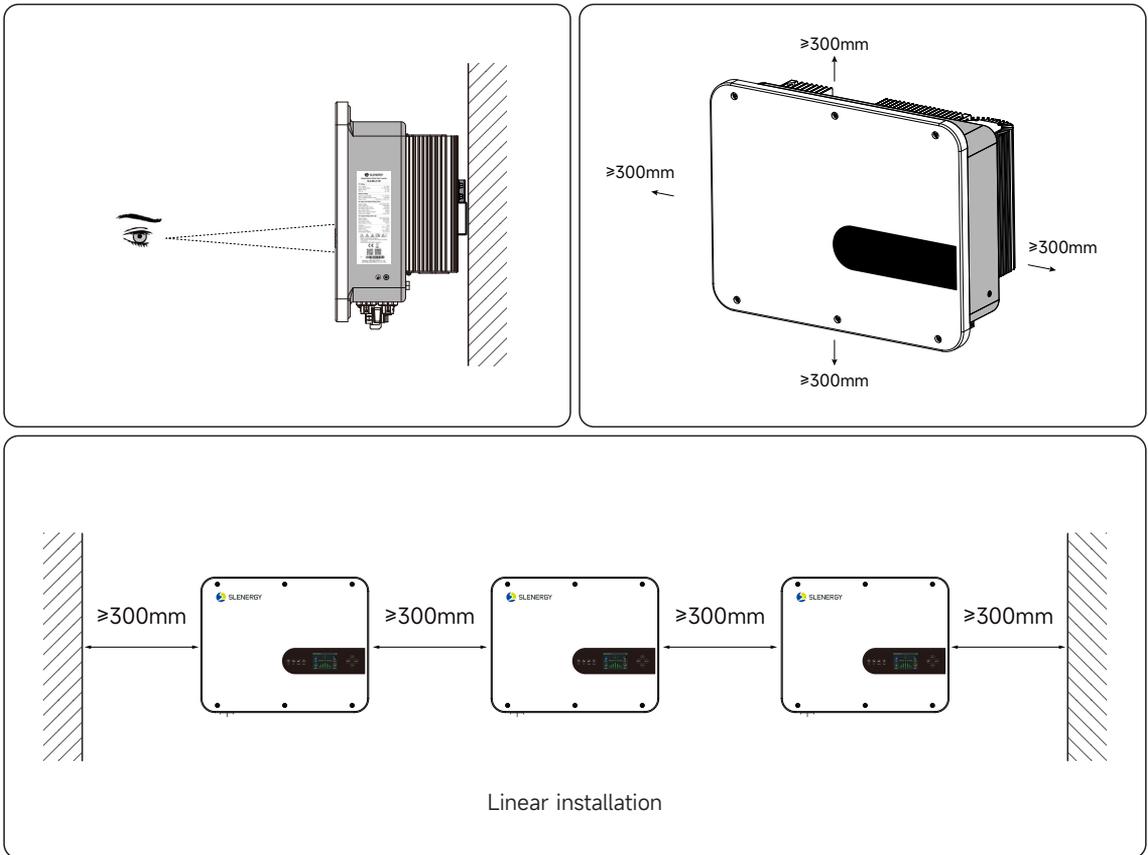
With IP65 protection class, the inverter may be installed indoors or outdoors, but for longer service life, it is more suitable for installation in a sheltered place, such as with an awning.



- The installation site shall be easily accessible for electrical connections, operation, and maintenance;
- Due to relatively high temperature at case and heat sink during operation, the inverter shall be placed in a site that is not easily accessible;
- The inverter shall not be installed in a flammable and explosive site;
- The inverter shall be installed in an airy place for good heat dissipation;
- The temperature for installation shall be -25°C ~ 60°C;
- The installation site shall be away from electronic equipment with strong electromagnetic interference;
- The installation site shall be a fixed and solid surface, such as wall, metal bracket, etc.;
- In a suitable installation location, the inverter shall be reliably grounded and the grounding metal conductor material shall be consistent with that of the inverter reserved grounding.

3.5 Space Requirements

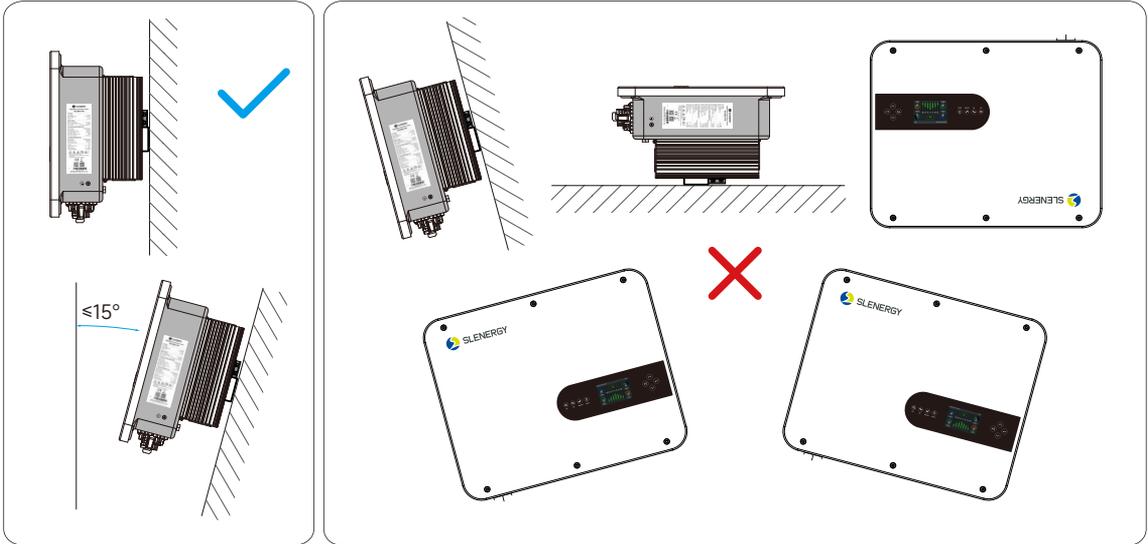
- At a suitable installation height, the user's sight is at the same level as the display window of LED and LCD, making it easy to check the inverter status.
- When multiple inverters are installed, a certain distance shall be reserved between inverters, and a linear installation is recommended. The left and right spacing is shown below.
- Sufficient reserved space around the installation site may facilitate the inverter disassembly and air convection. The installation space requirements for a inverter are illustrated on the right.



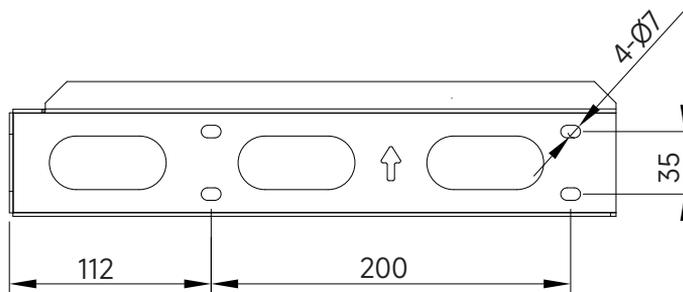
For proper air circulation to dissipate heat, allow a clearance of approx. 30cm to the side and approx. 30cm above and below the unit. And 100cm to the front.

3.6 Mounting the inverter

The inverter is recommended to be installed vertically for heat dissipation, avoiding forward-leaning, backward-leaning, reverse, horizontal, or inclined installations.

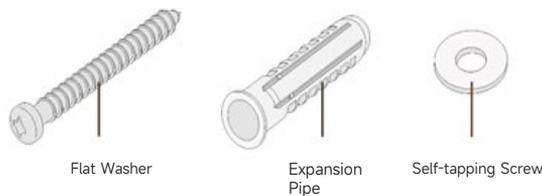


3.6.1 Dimensions of Wall-mounted Plate



3.6.2 Installation Steps of Wall-mounted Plate

- After moving the inverter to the installation site, install the hanging plate onto the wall by fixing the bolt assembly, and then hang the inverter onto the hanging plate.
- The attachment of the mounting screw package is shown below:

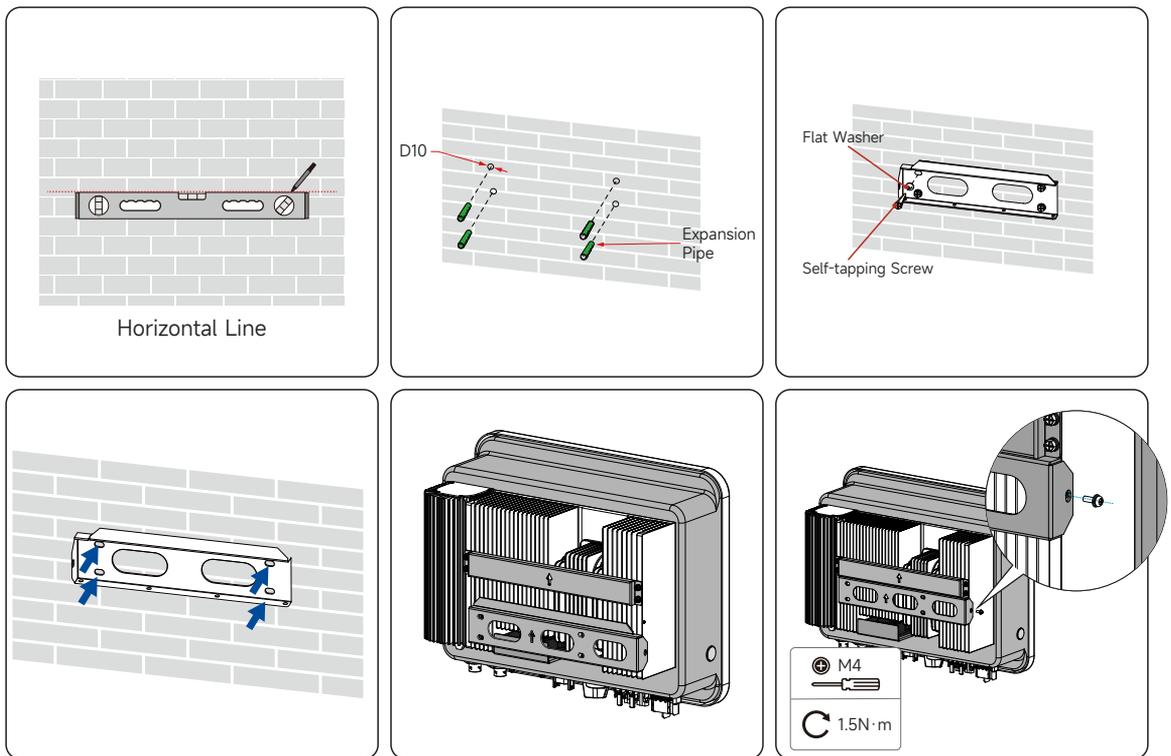


3.6.3 Installation Steps

NOTICE

Before drilling, avoid the electrical wiring inside the wall.

- STEP 1:** Draw a horizontal reference line with a level on the wall.
- STEP 2:** Place the hanging plate flush on the wall, mark the recommended holes as shown, and drill the holes to a depth of about 70 mm.
- STEP 3:** Knock the plastic expansion pipe into the hole.
- STEP 4:** Use the self-tapping screw+flat washer to fix the hanging plate on the wall with a tightening torque of 9 N.m.
- STEP 5:** Lift the inverter and hang the installation lug to the hanging plate. Release your hands until the inverter has been fixed in the backing plate.
- STEP 6:** In terms of the left side hole of case and wall hangings, fasten the inverter to the hanging plate using M4x10 screws, with a torque of 1.5 N.m.



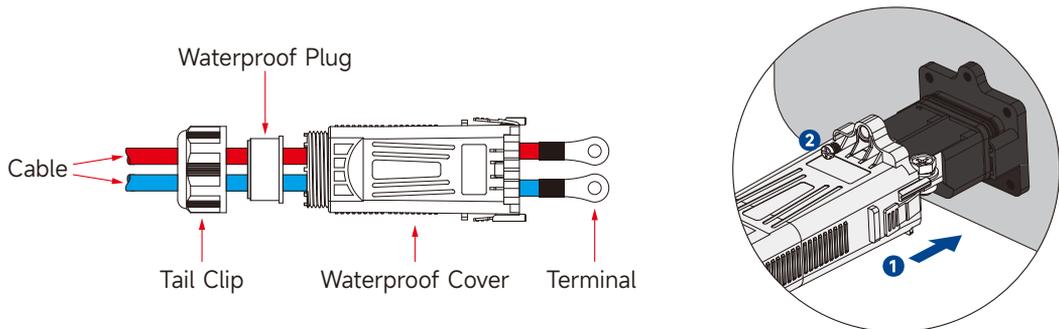
3.7 Battery Connection

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

Models	Wire Size	Cable(mm ²)	Torque value(max)
6kW	2AWG	35	5.2Nm

Cable size

- STEP 1:** Remove the tail clip on the positive and negative terminals of the battery of the energy storage device;
- STEP 2:** Take out the waterproof plug, and insert the battery cable into the tail clip, waterproof plug, and waterproof cover;
- STEP 3:** Crimp the battery cable to the O-terminal;
- STEP 4:** Connect the positive end of the battery to the positive end of the battery terminal of the device, and the negative end of the battery to the negative end of the battery terminal of the device;
- STEP 5:** Fasten the waterproof cover, waterproof plug, and tail clip;
Finished.



NOTICE

- A DC switch is required between the battery and the inverter;
- The length of the power cable between the battery and the energy storage device is ≤1.5m, and the diameter is ≥35mm² (2AWG);
- The battery input voltage does not exceed 60V.

3.8 AC Side Connection

Before connecting to grid, please install a separate AC breaker between inverter and grid. Also, it is recommended that installs an AC breaker between backup load and inverter. This will ensure the inverter can be securely disconnected during maintenance and fully protected from over

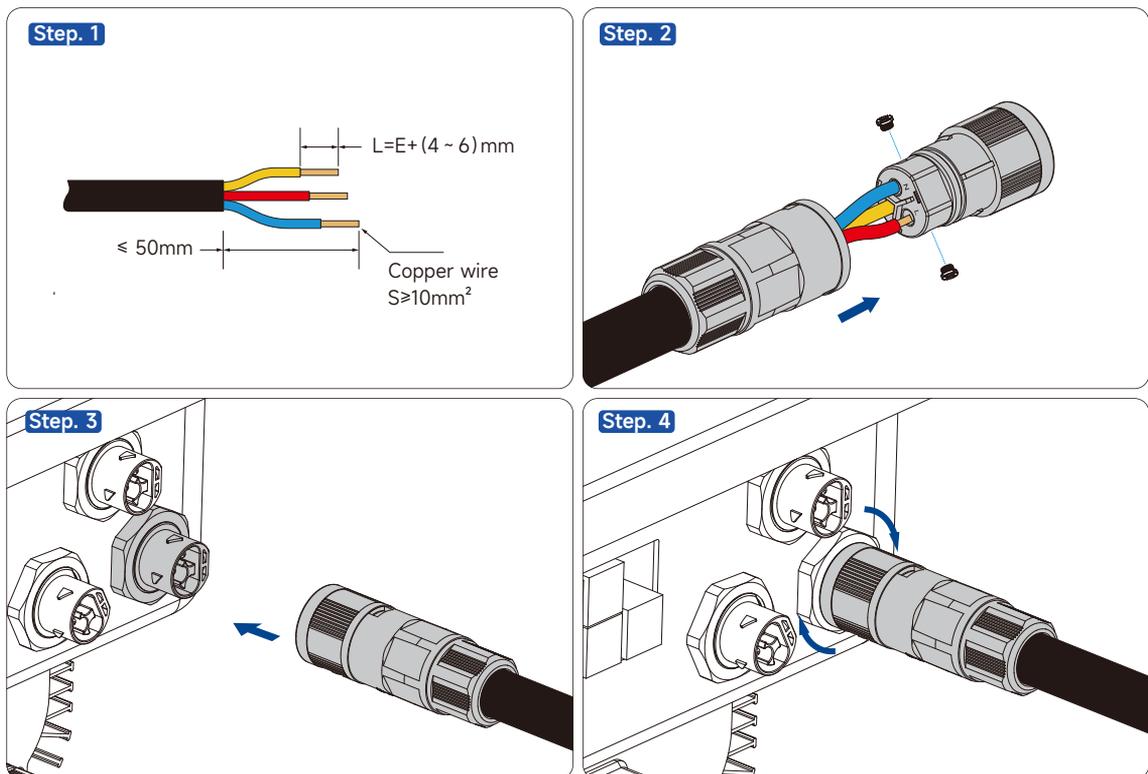
current. For the 3/3.6/5/6KW model, the recommended AC breaker for backup load is 32A/64A. For the 3/3.6/5/6KW model, the recommended AC breaker for grid is 64A.

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

Models	Wire Size	Cable(mm ²)	Torque value(max)
3.6kW	12AWG	4	1.2Nm
5/6kW	10AWG	6	1.2Nm

Cable size

- STEP 1:** Disconnect the AC-side circuit breaker and prevent it from reconnecting by accident;
- STEP 2:** Remove the AC circular connector and loosen the lock nut of waterproof connector. Select the sealing washer according to the cable outer diameter. Thread the cable through the lock nut in sequence;
- STEP 3:** Strip off a certain length of the protective layer and insulation layer as per the diagram requirements;
- STEP 4:** Assemble the cable and lock the circular connector in place;
- STEP 5:** Fix the cable to the corresponding terminal. Ensure that the cable is securely connected by pulling it outward;
- STEP 6:** Slightly pull the cable backward and clockwise tighten the lock nut; Finished.



CAUTION

- After the circular connector is wired and installed on the machine, the connector protective sleeve must be locked. Unqualified individuals are not allowed to operate.
- Pay much attention to the positioning of the "PE" cable and "N" cable. If the phase wire is connected to the terminal of "PE" or "N" cable, the inverter may be permanently damaged.

3.9 PV Connection

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

Models	Wire Size	Cable(mm ²)	Torque value(max)
6kW	12AWG	4	1.2Nm

Cable size

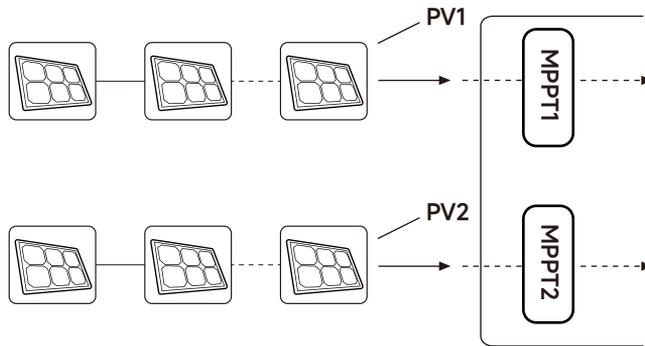
⚠ ELECTRIC SHOCK

- Before electrical connection, protect the PV array from exposure to sunlight, otherwise it may cause risky voltages;
- Ensure good insulation of the PV array from the ground before connecting it to the inverter;
- When the inverter is installed and operated, ensure that the PV string is not short-circuit for positive or negative polarity to ground. Otherwise, it may lead to inverter AC/DC short circuit, resulting in product damage, which is not covered under the warranty.

- The connection of the PV string shall meet the following requirements, otherwise the inverter may be permanently damaged, and such damage is not covered under the warranty;
- The voltage and maximum short-circuit current of each PV string shall be within the range. See Technical Data for details;
- When the same PV string is mixed with different brands or models of PV modules or connected to PV modules with different orientation angles or tilt angles, such conditions may not damage the inverter, but will affect the system performance.
- When the input voltage is 500V ~ 600V, the inverter will be in the standby mode. When the voltage is restored within the MPPT working voltage range of 150V ~ 430V, the inverter will return to its normal operation.

3.9.1 PV Input Configuration

Each of the SL3.6KLV-W, SL5KLV-W and SL6KLV-W inverters is provided with dual PV input sections, each of which is equipped with a separate MPPT for independent operation. To maximize the utilization of PV cell panel input power, the PV strings in the same input section shall be consistent in terms of the following aspects: identical model, number of cell panels, tilt angle, and azimuth angle. PV strings in different input sections may have different configurations, including disparate types of cell panels, number of panels in the string, tilt angle, and azimuth angle.



The configuration shall satisfy the following requirements before connecting the PV input to inverter.

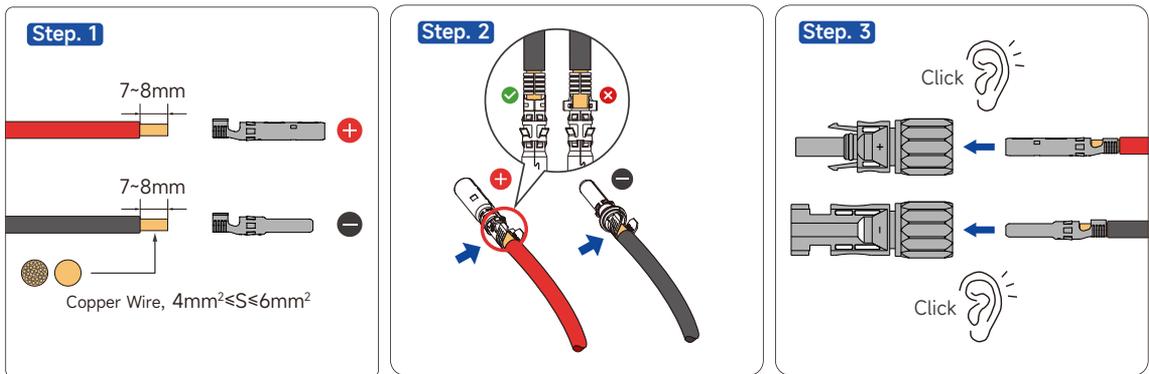
Models	Open-circuit voltage per input	Maximum input current per string
All Models	500V	18A

3.9.2 DC Connector Assembling

⚠ Beware of high voltage in the inverter!

- Ensure all cables are uncharged before electrical connection;
- Keep the AC circuit breaker switch off till the electrical connection of the inverter is done;
- The maximum DC input voltage does not exceed 500V. Please use the MC4 DC terminal in the delivery accessories.
- Please select the correct terminal according to the above requirements, otherwise the equipment damage will not be covered by the warranty.
- Use only the supplied connectors to ensure that the inverter has an IP65 protection class.

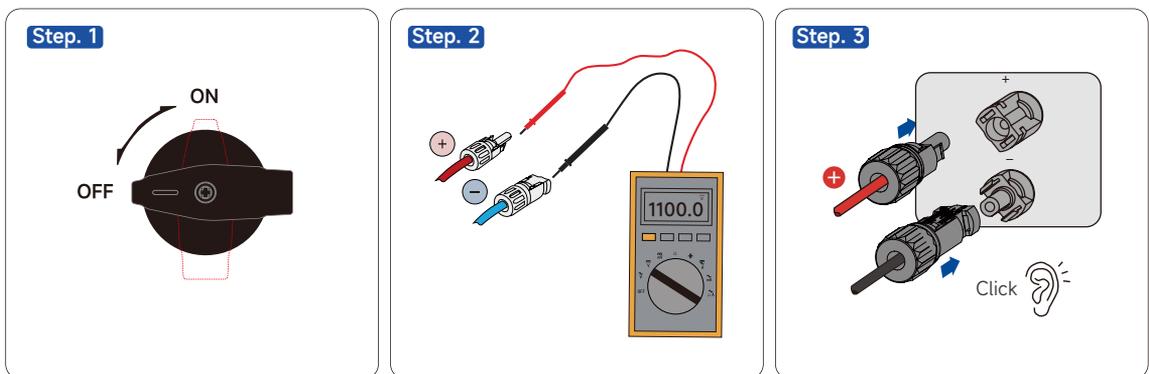
- STEP 1:** Strip 7 mm of insulation layer from each DC cable;
- STEP 2:** Harness cable wire ends at wire terminals with a crimping plier;
- STEP 3:** Thread the cable into the cable gland and fasten it by inserting it into the insulating sleeve. Pull the cable lightly to ensure it is connected tightly. Fasten the cable gland and the insulating sleeve with a force of 2.5-3 N·m;
- STEP 4:** Ensure that the PV string is connected to the correct cable polarity. If the DC input polarity is reversed, the inverter will be in fault or alarm status instead of normal operation;
- Finished.



Ensure that the PV string is connected to the correct cable polarity.
If the DC input polarity is reversed, the inverter in fault or alarm status fails to operate normally.

3.9.3 Installing DC Connectors

- STEP 1:** Manually turn the DC switch to “OFF”;
- STEP 2:** Check whether the PV string is connected to the correct cable polarity, and ensure that the open-circuit voltage never exceeds the upper inverter input limit of 1100V;
- STEP 3:** Insert the DC connector into the corresponding DC terminal until there is a “click” sound;
- STEP 4:** Repeat the preceding steps to connect other PV strings;
- STEP 5:** Use the MC4 waterproof plug to block the vacant DC terminals;
 Finished.



⚠ NOTICE

- Before connecting the DC connector to the inverter, please check the positive and negative polarity of the PV string, and then insert the DC connector into the corresponding DC terminal.
- If the DC connector is not properly assembled, it may cause arcing or connector overheating, and the resulting loss will not be covered by the warranty.

3.10 External Grounding Connection

- Since the inverter is transformer free, both the positive and negative poles of the PV string cannot be grounded, otherwise the inverter would not function properly;
- An external grounding connection is required before PV string and communication connections on the AC side;
- The grounding connection of the external protection grounding terminal cannot replace the PE terminal connection in the AC wiring. It shall be ensured that both of them are reliably grounded. Otherwise, Slenergy shall not be liable for any consequences that may occur.

3.10.1 Requirements for External Grounding

- In photovoltaic power generation system, all non-current-carrying metal components and equipment housing should be grounded (such as photovoltaic bracket, inverter housing, etc.);
- The external grounding terminal of a single inverter shall be near-end grounded;
- If multiple inverters are deployed, external grounding terminals of all inverters and grounding points of the photovoltaic bracket shall be connected to the equipotential line (based on site conditions) to ensure the equipotential connection.

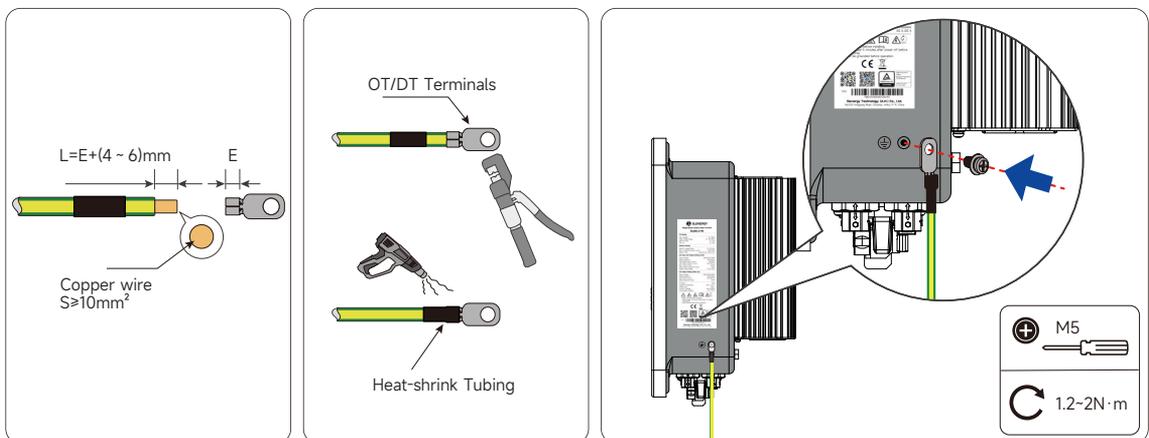
3.10.2 Wiring Steps

The cross sectional area of the secondary grounding cable must be the same as that of the PE core wires in the AC cable.

STEP 1: Prepare cables and crimp OT/DT terminals;

STEP 2: Remove the screw from the grounding terminal and secure the cable with a screwdriver;

STEP 3: Apply silicone gel or paint to the grounding terminal to enhance its corrosion resistance;
Finished.



3.11 Function port definition

3.11.1 Communicating Connection

The wireless communication module is installed to the communication accessory port (silkscreen marked USB) at the bottom of inverter.

Via the communication accessory port, users can access the Wi-Fi wireless communication module from our company. You can check the power generation and operation status of inverter through the mobile App after successful connection.

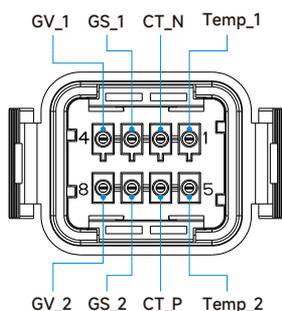
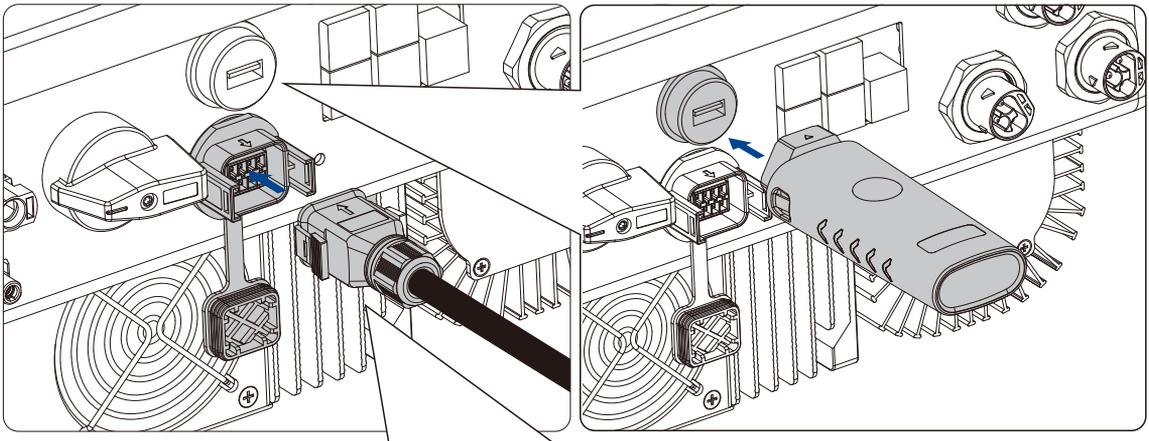
Please see the Manual for its installation, configuration and the supporting App.

3.11.2 COM Communication Cable

NOTICE

When connecting the communication cable, please make sure that the definition of the wiring port is fully matched with the equipment, and the cabling path should avoid sources of interference, power cables, etc., so as not to affect the signal reception.

- STEP 1:** Remove the COM waterproof cover;
- STEP 2:** Loosen the lock nut of the waterproof connector and take out the sealed coil, and insert the communication cable into the lock nut, sealed coils, and thread sleeves; Insert the communication cable to the corresponding port of network cable.
- STEP 3:** Secure the COM waterproof cover with screws;
- STEP 4:** Lock the waterproof connector;
- STEP 5:** Finished.



Temp:

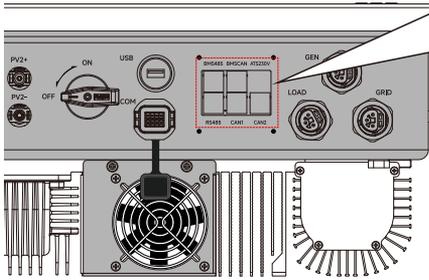
battery temperature sensor for lead acid battery.

CT:

current transformer for "zero export to CT" mode.

GV/GS:

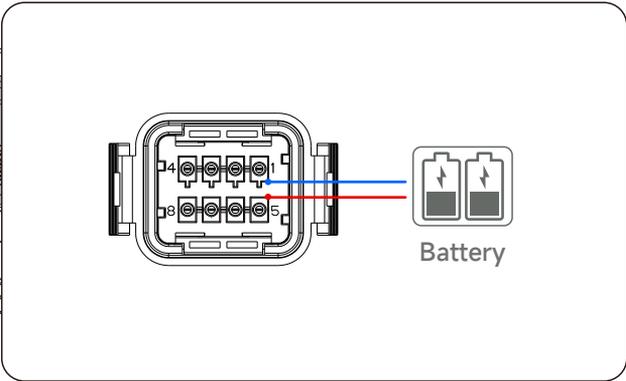
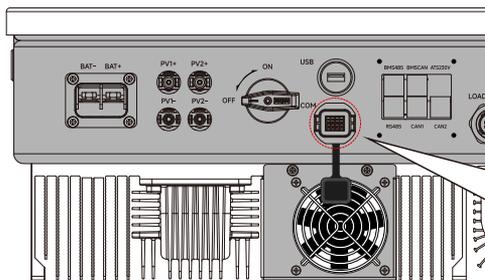
dry contact signal for startup the diesel generator.



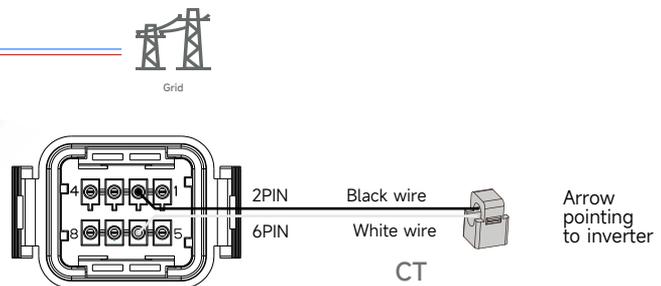
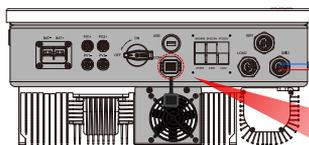
- BMS485:** RS485 port for battery communication.
- BMSCAN:** CAN port for battery communication.
- RS485:** for energy meter communication.
- CAN1:** Parallel communication port 1.
- CAN2:** Parallel communication port 2.
- ATS230V:** 230V output port when inverter is on.

When the "GEN signal" is active, the open contact (GV/GS) will switch on (no voltage output). If the "Signal ISLAND MODE" is ticked, the GS port will be the dry contact signal for startup the diesel generator. If "Signal ISLAND MODE" is not ticked, the GV port will be the dry contact signal for startup the diesel generator.

3.12 Temperature sensor connection for lead-acid battery



3.13 CT Connection



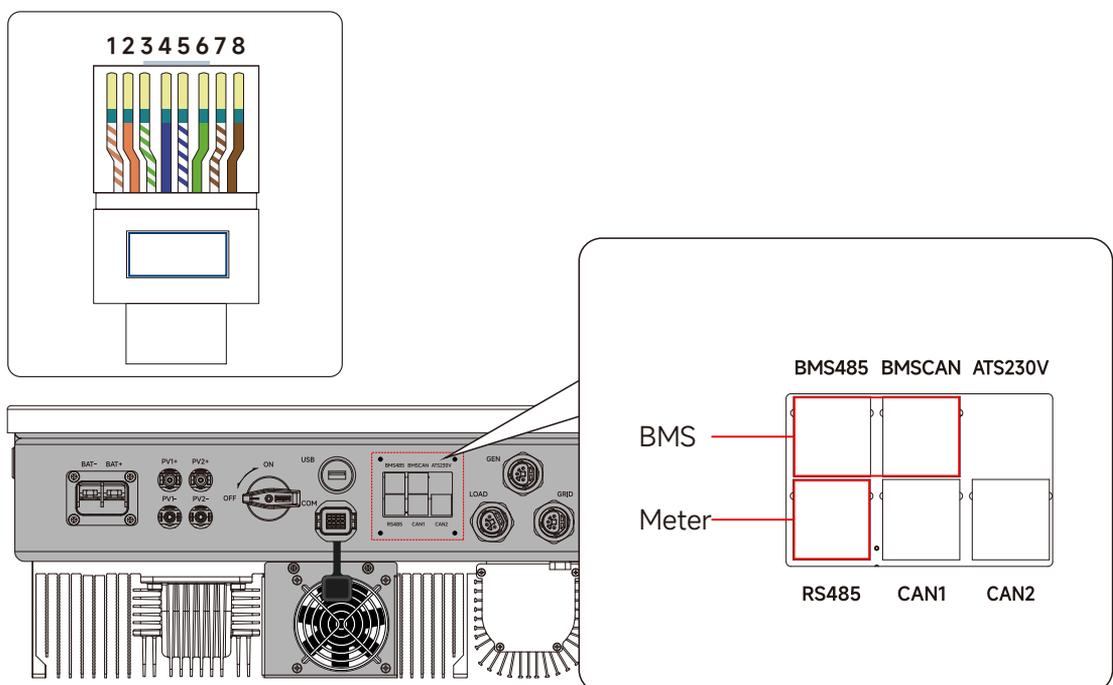
NOTICE
 when the reading of the load power on the LCD is not correct, please reverse the CT arrow.

3.14 BMS and Meter connection

NOTICE

- Please prepare a 3m BMS communication cable, and a 10m communication cable to connect the meter with the inverter.
- BMS and meter communication use standard RJ45, and the port identifications are as follows.

S/N	Color	BMS485	BMSCAN	RS485
1	Orange & white	-	-	-
2	Orange	GND	-	-
3	Green & white	-	BMS_CANL	M_485A
4	Blue	BMS_CANH	-	M_485A
5	Blue & white	BMS_CANL	-	M_485B
6	Green	-	BMS_CANH	M_485B
7	Brown & white	BMS_485A	-	-
8	Brown	BMS_485B	-	-



3.15 Wiring System for Inverter

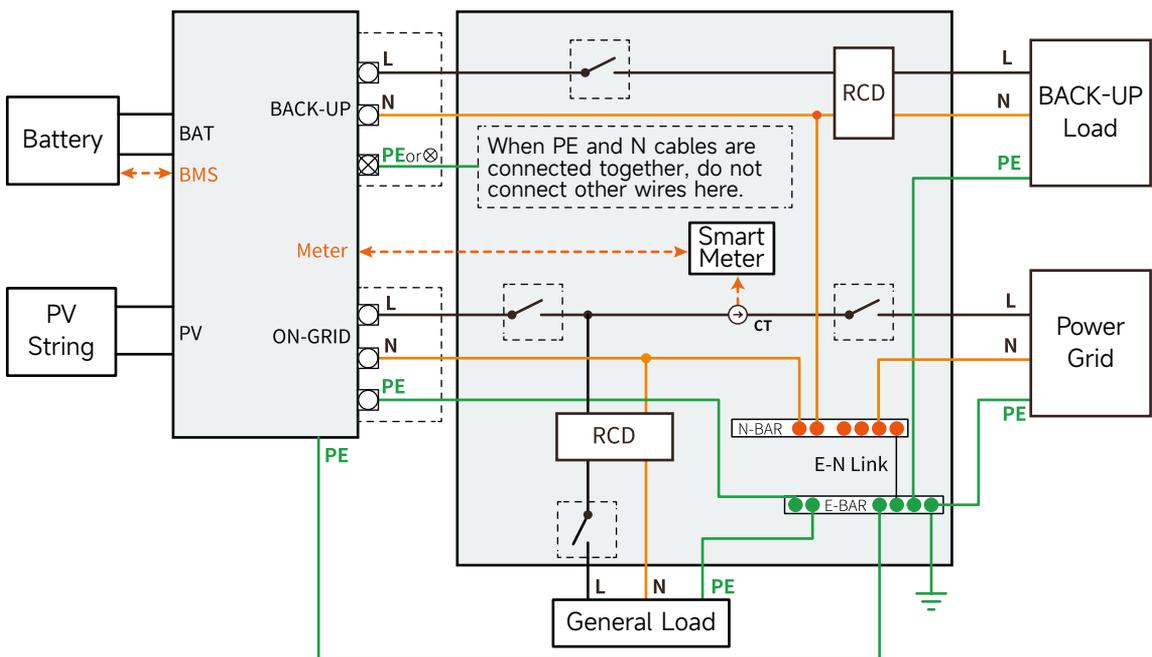
NOTICE

- The N and PE cables of the grid and load ports of inverter are connected in different ways based on local regulations. For specific requirements, please refer to local regulations;
- The grid and load AC ports of inverter are equipped with built-in relays. When the inverter is in off-grid mode, the built-in relays are in the disconnected state. When the inverter is in on-grid mode, the built-in relays are in the connected state;
- After the inverter is powered on, the load port is powered on. If the load maintenance is required, the inverter shall be powered off. Otherwise, electric shocks may occur.

1) The N and PE cables are connected together in the distribution box, with wiring diagram as below:

NOTICE

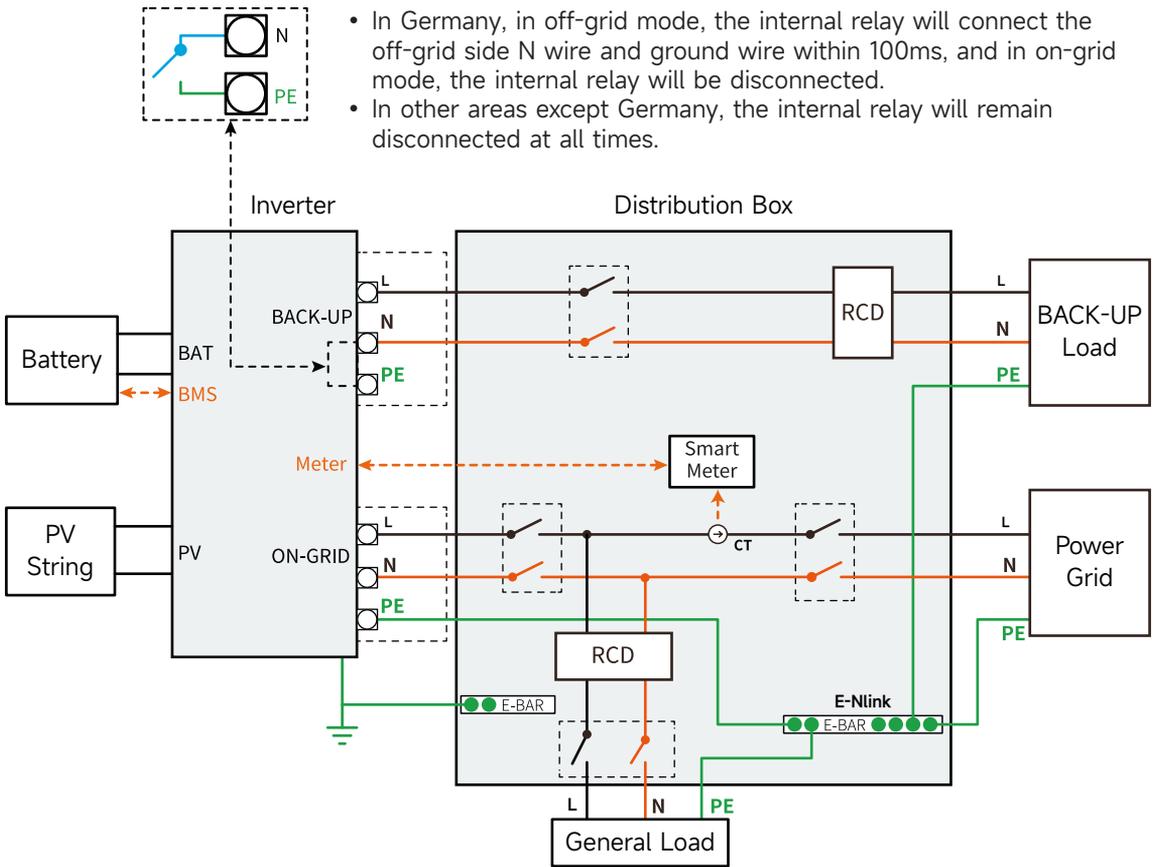
The following wiring mode is applicable to Australia, New Zealand, South Africa and other regions:



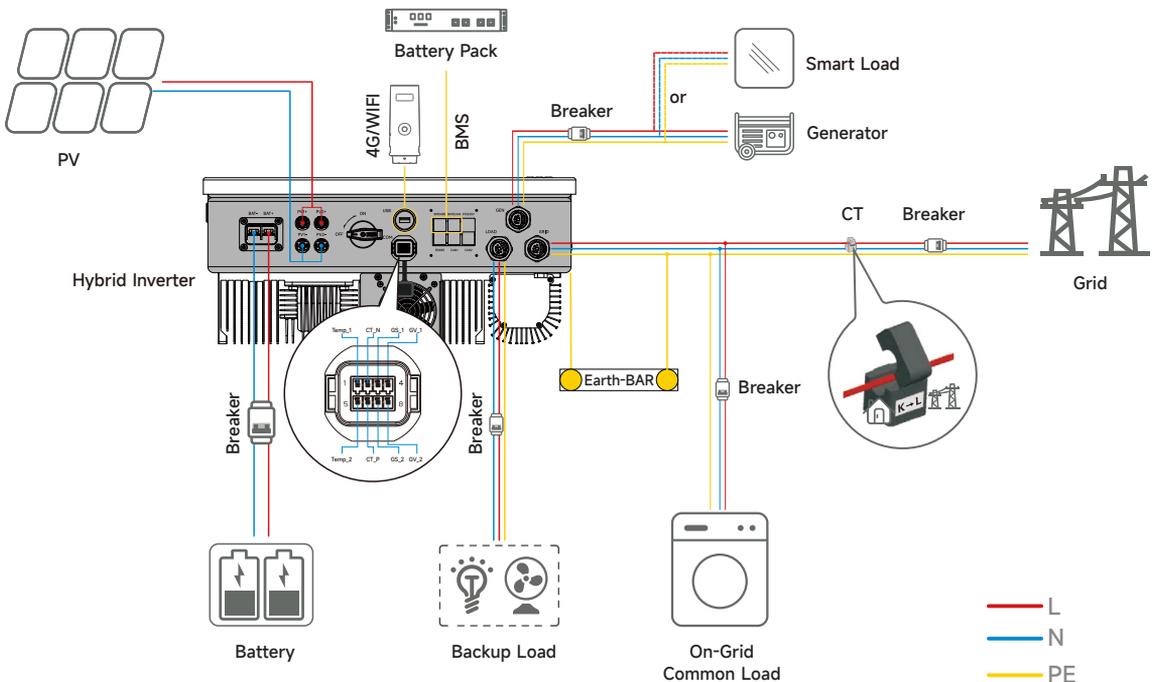
2) Wiring mode for separating N and PE lines in the distribution box

NOTICE

- Please ensure that the BACK-UP protective ground wire is properly connected and secured. Otherwise, the BACK-UP function may be abnormal when the power grid experiences a fault;
- The following wiring mode is applicable to the regions except Australia, New Zealand and South Africa:



2) System wiring diagram



4. Operation

4.1 Pre-commissioning Checks

Before turning on the inverter for the first time, the following checks need to be done:

S/N	Inspection Item	Inspection Result	
		Normal	Abnormal
1	Check and confirm whether all equipment is reliably installed in place.	<input type="checkbox"/>	<input type="checkbox"/>
2	Check whether the DC switches and AC circuit breakers are “OFF”.	<input type="checkbox"/>	<input type="checkbox"/>
3	Check whether the grounding lines are properly and reliably connected.	<input type="checkbox"/>	<input type="checkbox"/>
4	Check whether the AC cables are properly and reliably connected.	<input type="checkbox"/>	<input type="checkbox"/>
5	Check whether the DC cables are properly and reliably connected.	<input type="checkbox"/>	<input type="checkbox"/>
6	Check whether the communication cables are properly and reliably connected.	<input type="checkbox"/>	<input type="checkbox"/>
7	Check whether the vacant terminals are sealed.	<input type="checkbox"/>	<input type="checkbox"/>
8	Make sure that no construction tools, etc. are left on top of the machine or in the junction box (if any).	<input type="checkbox"/>	<input type="checkbox"/>
9	Select AC circuit breakers as per the Manual and local standards.	<input type="checkbox"/>	<input type="checkbox"/>
10	Ensure that all safety signs and warning labels are fixed and visible.	<input type="checkbox"/>	<input type="checkbox"/>
11	Check if the connector protective sleeve is locked after the installation of the AC circular plug.	<input type="checkbox"/>	<input type="checkbox"/>

4.2 Commissioning Steps

STEP 1: Turn the DC switch on the inverter to “ON”.

STEP 2: If a DC switch is equipped between the inverter and the PV string, close the switch.

STEP 3: If an AC switch is equipped between the inverter and the grid, close the switch.

STEP 4: If a DC switch is equipped between the inverter and the batteries, close the switch.

STEP 5: Once the unit has been properly installed and the batteries are connected well, simply press On/Off button (located on the left side of the case) to turn on the unit. When system without battery connected, but connect with either PV or grid, and ON/OFF button is switched off, LCD will still light up (Display will show OFF). In this condition, when switch on ON/OFF button and select NO battery, system can still work.

STEP 6: The inverter will operate normally if the sunlight is normal and the grid conditions meet the grid-connection requirements.

STEP 6: Observe the status of LED indicators (see “LED Indicators” for details)

4.3 Operation and Display Panel

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

Indicator	Status	Indication
 DC	Steady Green	Indicator of DC operating status.
 AC	Steady Green	Indicator of AC operating status.
 Normal	Steady Green	Indicator of normal operation.
 Alarm	Steady Red	Indicator of abnormal alarm.

LED indicators

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

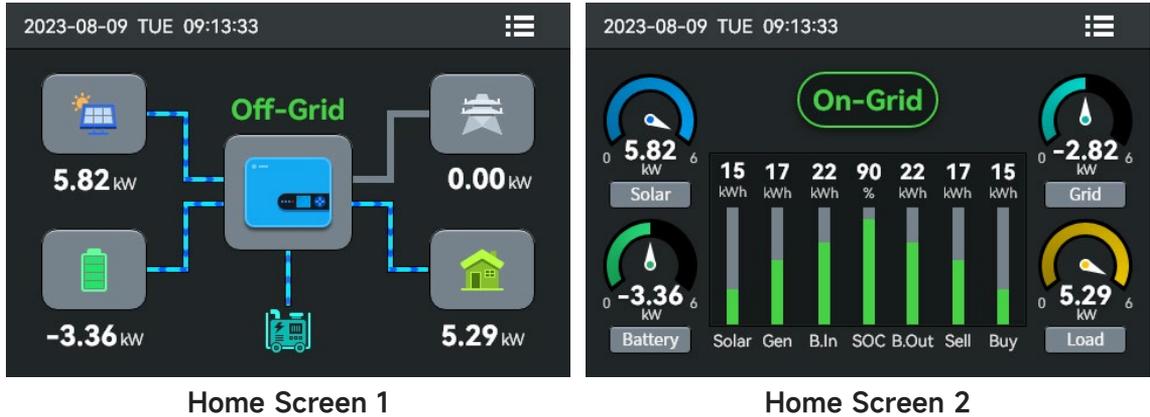
NOTICE

When the indicator is off, it may still be charged. Therefore, please pay attention to electrical safety when using the inverter.

5. LCD Display and Setting

5.1 Home Screen Icon Info

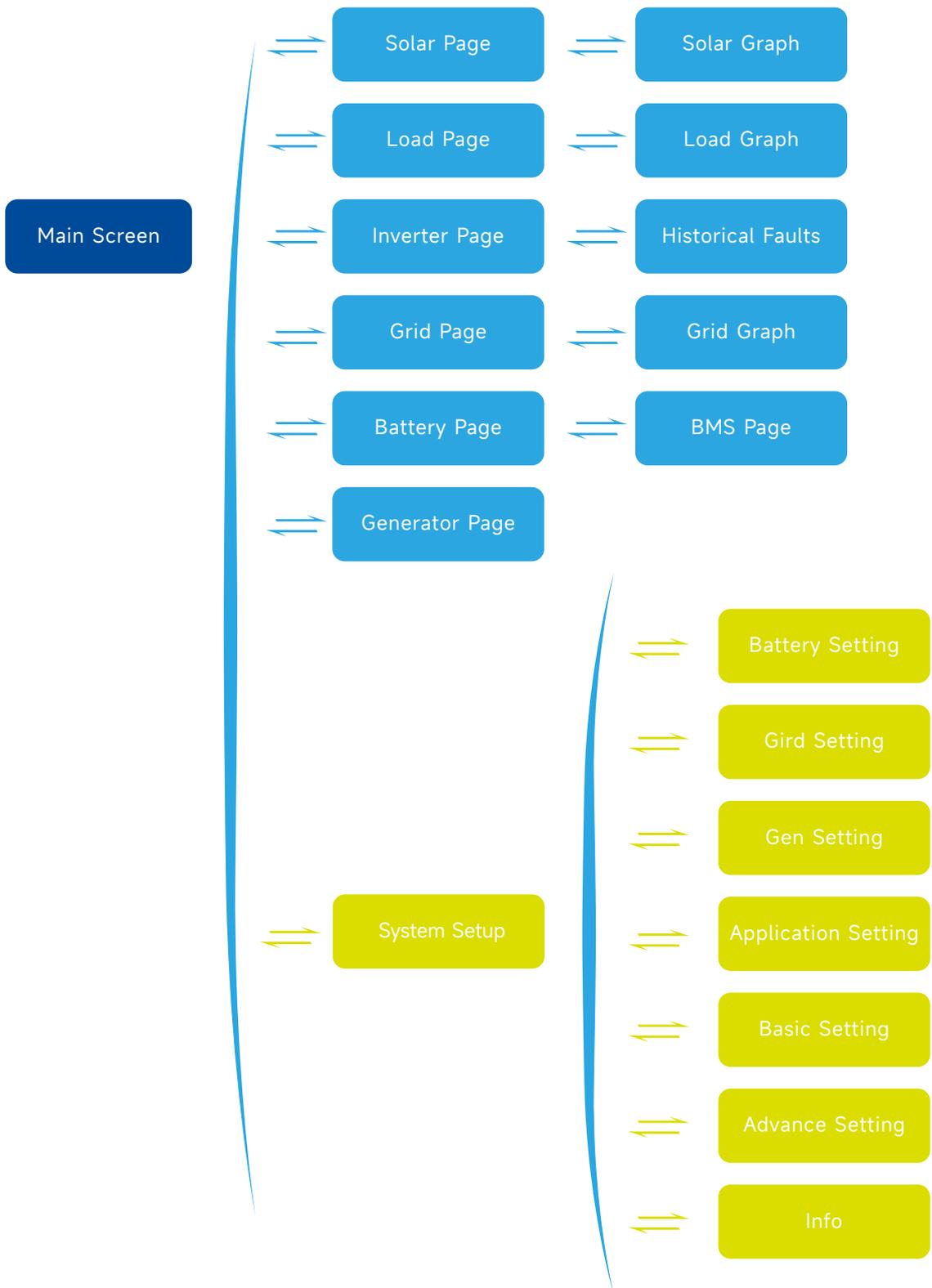
The touch mode is available to the screen, and the following figures show the main information of the inverter.



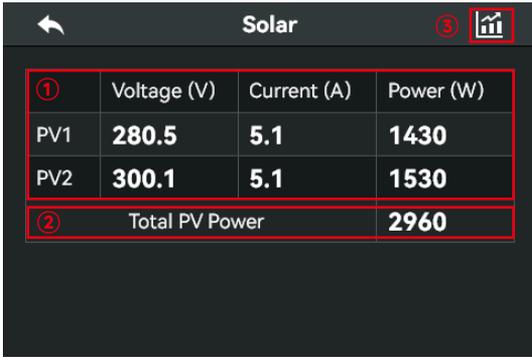
1. There are two kinds of main screen display, which can be selected according to users' preference. For the change method, please see 3.5 Basic Setting.
2. The main information displayed on the screen covers solar panel, power grid, battery and load.
3. If "Run" is displayed in the middle of screen, the inverter is operating normally; if "Wait", the inverter is in the waiting state, and if "XXXX", there is a communication failure (see -- for details) or other errors.
4. Click the setting button in the upper right corner to turn on the System Setup, including Battery Setting, Application Setting, Grid Setting, Gen Setting, Basic Setting, Advanced Setting and Version Information.

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

5.2 LCD operation flow chart



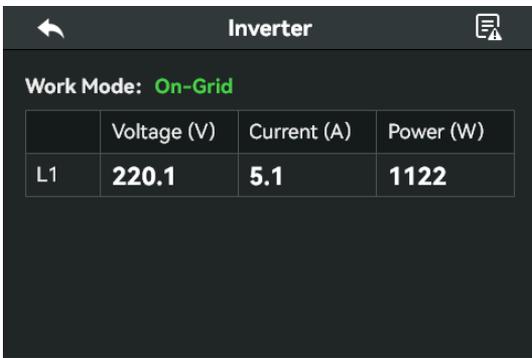
5.3 Detailed operational information



The screenshot shows the 'Solar' page with a table of PV panel data. A red box highlights the table, and a red circle with the number 1 is next to the first row. A red circle with the number 2 is next to the 'Total PV Power' row. A red circle with the number 3 is next to the chart icon in the top right corner.

	Voltage (V)	Current (A)	Power (W)
PV1	280.5	5.1	1430
PV2	300.1	5.1	1530
Total PV Power			2960

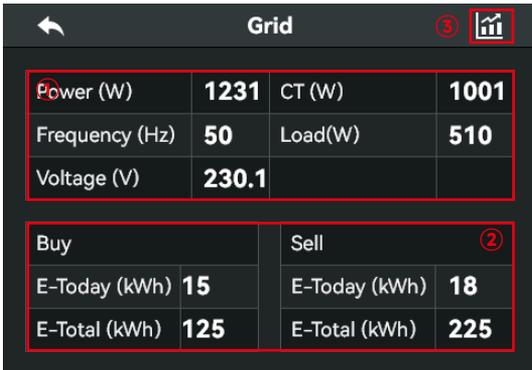
- ① Voltage, Current, Power for each MPPT.
- ② Solar Panel Generation.
- ③ Press the Icon button will enter into the power curve page.



The screenshot shows the 'Inverter' page with 'Work Mode: On-Grid'. A table displays phase L1 data. A red circle with the number 1 is next to the first row of the table. A red circle with the number 2 is next to the chart icon in the top right corner.

	Voltage (V)	Current (A)	Power (W)
L1	220.1	5.1	1122

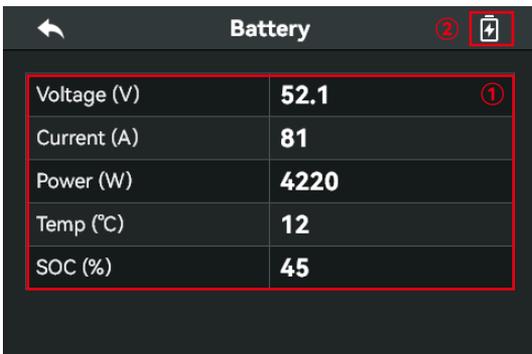
- ① Voltage, Current, Power for each Phase.
- ② Press the Icon button will enter into the Historical Faults page.



The screenshot shows the 'Grid' page with a table of power and frequency data. A red box highlights the first three rows of the table. A red circle with the number 1 is next to the first row. A red circle with the number 2 is next to the 'E-Total (kWh)' for the 'Sell' section. A red circle with the number 3 is next to the chart icon in the top right corner.

Power (W)	1231	CT (W)	1001
Frequency (Hz)	50	Load(W)	510
Voltage (V)	230.1		
Buy		Sell	
E-Today (kWh)	15	E-Today (kWh)	18
E-Total (kWh)	125	E-Total (kWh)	225

- ① Power, Frequency, Voltage for each Phase.
- CT:** Power detected by the external current Sensors.
- Load:** Power detected using internal sensors on AC grid in/out breaker.
- ② **Buy:** Energy from Grid to Inverter.
Sell: Energy from Inverter to grid.
- ③ Press the Icon button will enter into the power curve page.



The screenshot shows the 'Battery' page with a table of battery status data. A red box highlights the table. A red circle with the number 1 is next to the 'Voltage (V)' row. A red circle with the number 2 is next to the chart icon in the top right corner.

Voltage (V)	52.1
Current (A)	81
Power (W)	4220
Temp (°C)	12
SOC (%)	45

- ① Power, Voltage for each Phase, and consumption for Day and Total.
- ② Press the Icon button will enter into the power curve page.

Generator

Power (W)	5612
Voltage (V)	230.1
Frequency (Hz)	50
E-Today (kWh)	12
E-Total (kWh)	253

Power, Voltage, Frequency for each Phase, and consumption for Day and Total.

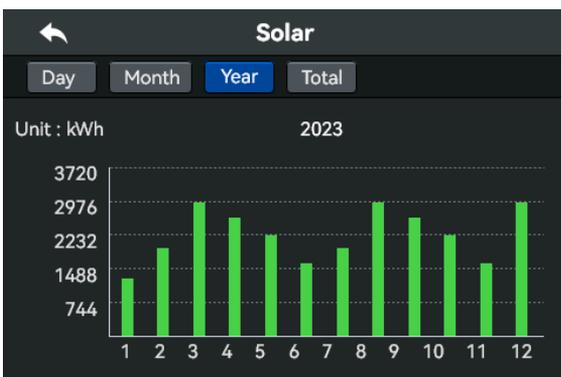
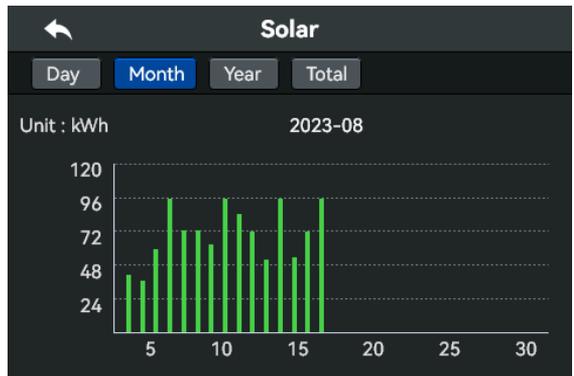
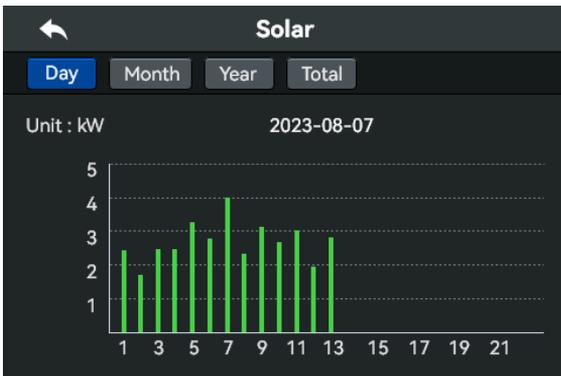
Li BMS

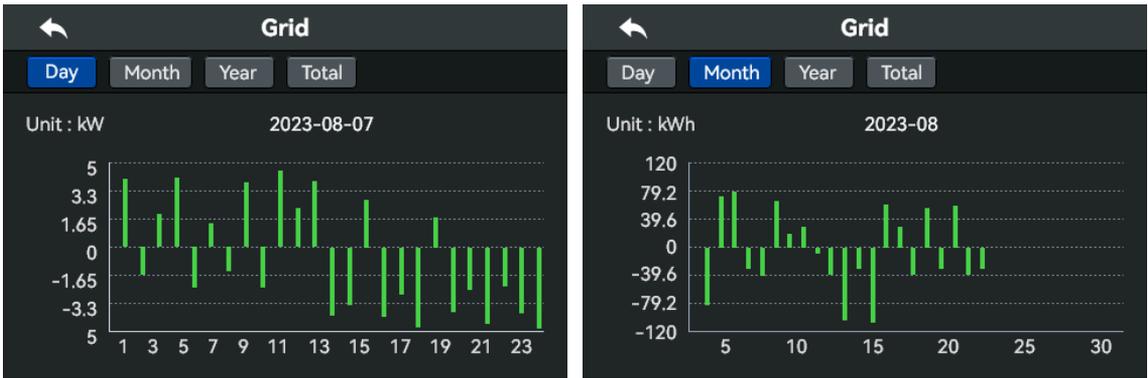
Sum Data

Voltage (V)	53.0	SOC (%)	65
Current (A)	-30	SOH (%)	50
Temp (°C)	25	Charge Voltage(V)	54
Charge Current Limit(A)	50		
Discharge Current Limit(A)	50		

This is Battery detail page. If you use Lithium Battery, you can press the Icon button will enter into the Li BMS page.

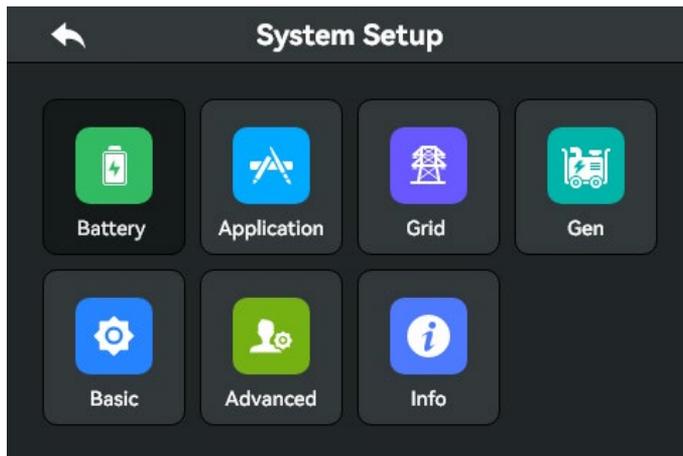
5.4 Curve Page-Solar & Load & Grid





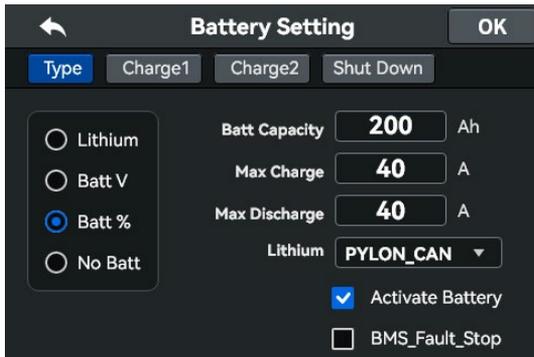
Solar power curve for daily, monthly, yearly and total can be roughly checked on the LCD, for more accuracy power generation, pls check on the monitoring system. Click the up and down arrow to check power curve of different period.

5.5 System Setup Menu



System Setup Page

5.5.1 Battery Setting Menu



Lithium:

Please choose this item if the customer wants to use lithium battery, and select the BMS communication protocol for this lithium battery.

Batt capacity:

it tells hybrid inverter to know your battery bank size.

Batt V:

Use Battery Voltage for all the settings (V).

Batt %:

Use Battery SOC for all the settings (%).

Max.A charge/discharge:

Max battery charge/discharge current (0-135A for 6kW model, 0-120A for 5kW model, 0-90A for 3.6kW model). For AGM and Flooded, we recommend Ah battery size x 20%=Charge/Discharge amps.

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

.For Gel, follow manufacturer's instructions.

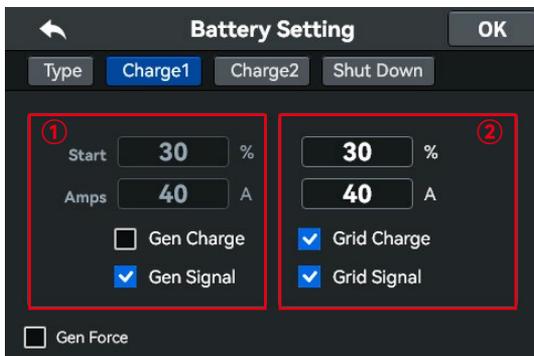
No Batt: tick this item if no battery is connected to the system.

Activate Battery:

This feature will help recover a battery that is over discharged by slowly charging from the solar array or grid. For Gel, follow manufacturer's instructions.

BMS_Fault_Stop:

The inverter stops because of the faulty BMS communication.



①②Grid or GEN Charge

Start=30%:

When battery SOC=30%, the system automatically connects the diesel generator.

Amps=40A:

Charge rate of 40A from the attached generator or grid in Amps.

Gen Charge:

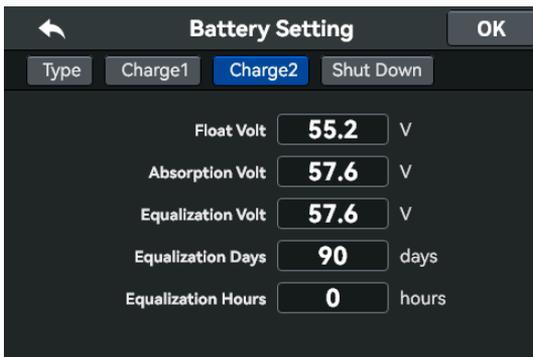
uses the gen input of the system to charge battery bank from an attached generator.

Gen Signal:

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

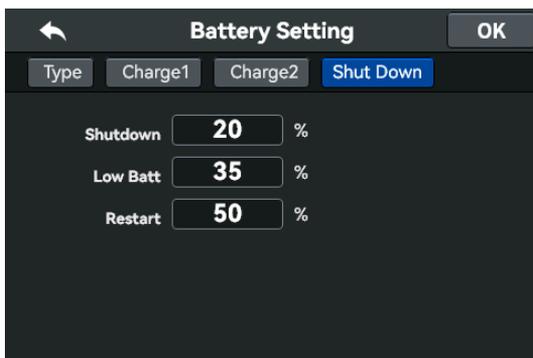
Grid Charge:

It indicates that the grid charges the battery
Grid Signal: Disable.



There are 3 stages of charging the Battery.

Battery Type	Absorption Stage	Float Stage	Torque value(max)
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)	13.4V(53.6V)	14.7V(59.0V)
Lithium	Follow its BMS voltage parameters		



Shutdown 20%:

If the SOC is lower than the set value, the inverter stops.

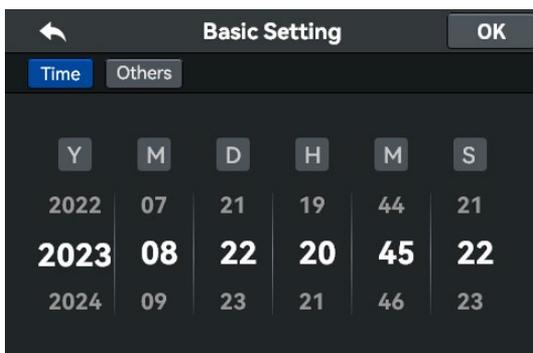
Low Batt 35%:

If the SOC is lower than the set value, the inverter gives an alarm.

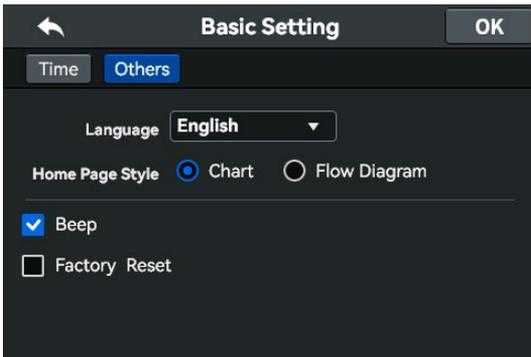
Restart 50%:

When battery SOC=50%, the AC restarts.

5.5.2 Basic Setting Menu



Click the icon “Time” in the upper left corner to adjust the date and time by scrolling up and down.



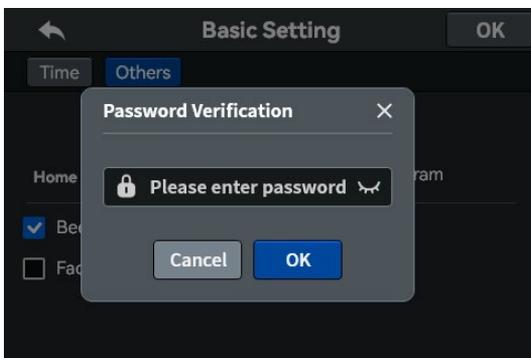
Click the icon “Others” in the upper left corner for language selection(English/Chinese).

Home Page Style:

Change the home screen display.

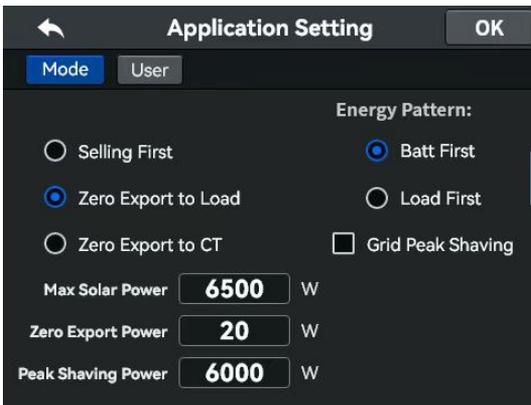
Beep: Enable the buzzer.

Factory Reset: Factory data reset.



The default password is 1234.

.5.3 Application Setting Menu



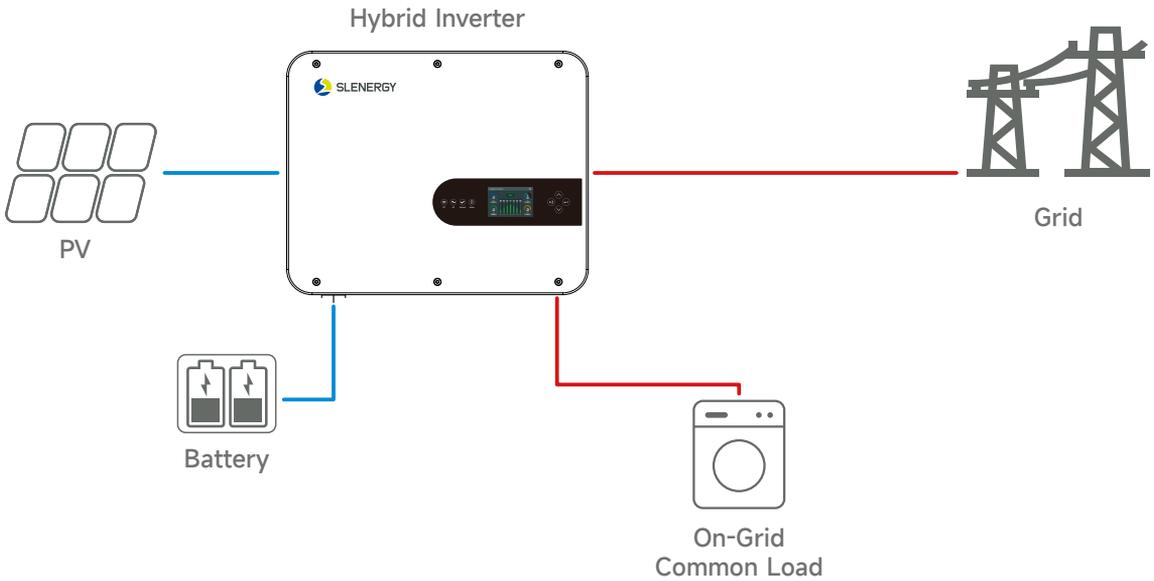
Selling First:

This Mode allows hybrid inverter to sell back any excess power produced by the solar panels to the grid. If time of use is active, the battery energy also can be sold into grid. The PV energy will be used to power the load and charge the battery and then excess energy will flow to grid. Power source priority for the load is as follows:

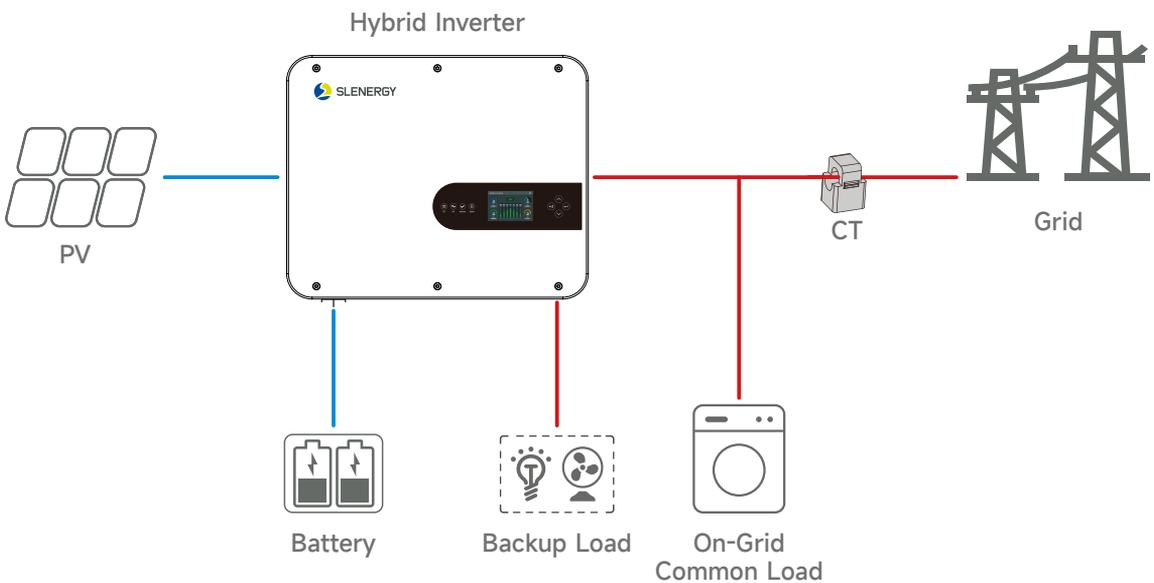
1. Solar Panels.
2. Grid
3. Batteries(until programable % discharge is reached).

Zero Export to Load: The hybrid inverter energy is only supplied to the backup load and not to other loads or the grid.

Meanwhile, the internal CT will detect the energy transmitted to the grid side and reduce the output of the hybrid inverter so that it only transmit energy to the main load and the battery.



Zero Export to CT: For this mode, if the external CT is equipped on the grid side, the hybrid inverter energy will be supplied to the main load, the battery and home loads, and not to the grid. Meanwhile, the PV and battery energy is replenished by the grid in case of shortage.



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

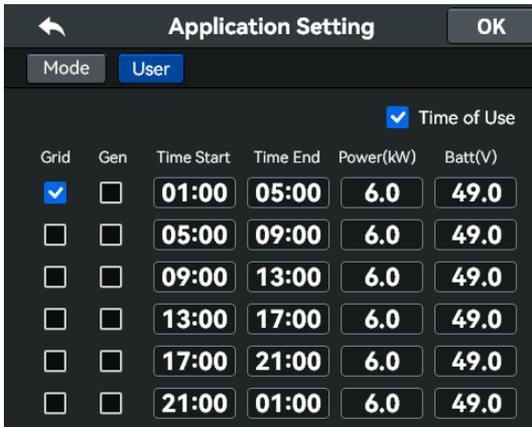
Energy Pattern: Refers to PV energy priority.

Batt First: PV energy is prioritized to charge the battery and then the loads, and if there is insufficient PV energy, the grid will supply energy to both battery and loads.

Load First: PV energy is prioritized to charge the loads and then the battery, and if there is insufficient PV energy, the grid will supply energy to both battery and loads.

Max Solar Power: Refers to the maximum allowable energy output to the grid.

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



Time of use:

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

Grid:

utilize grid to charge the battery in a time period.

Gen:

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

Time Start/End:

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

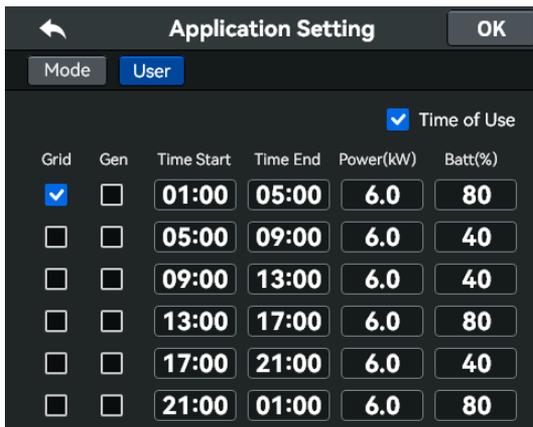
Power:

Max.discharge power of battery allowed.

Batt(V or SOC %):

battery SOC %or voltage at when the action is to happen.

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



For example:

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

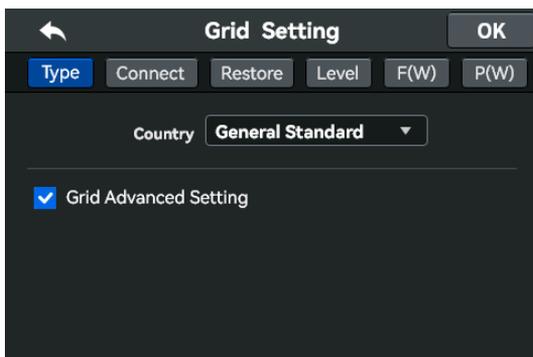
During 05:00-09:00 and 09:00-13:00, when battery SOC is higher than 40%, hybrid inverter will discharge the battery until the SOC reaches 40%.

During 13:00-17:00, when battery SOC is higher than 80%, hybrid inverter will discharge the battery until the SOC reaches 80%.

During 17:00-21:00, when battery SOC is higher than 40%, hybrid inverter will discharge the battery until the SOC reaches 40%.

During 21:00-01:00, when battery SOC is higher than 80%, hybrid inverter will discharge the battery until the SOC reaches 80%.

5.5.4 Grid Setting Menu

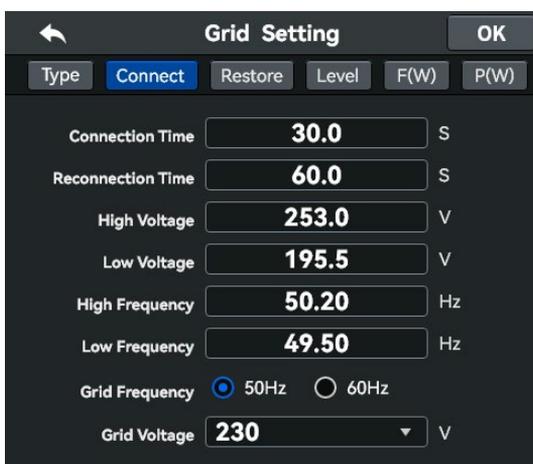


Country:

Please select the correct Grid Mode in your local area.

Grid Advanced Setting:

Enter password 1234 before changing grid parameters.

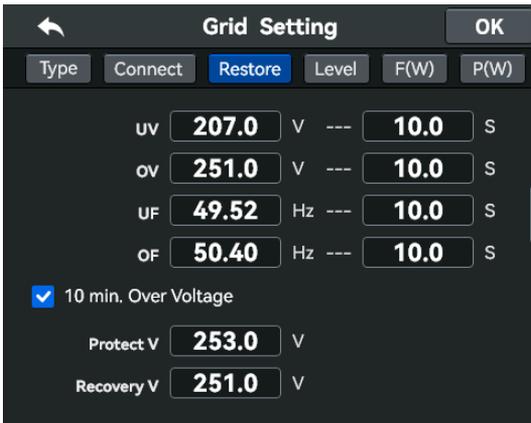


Connection Time:

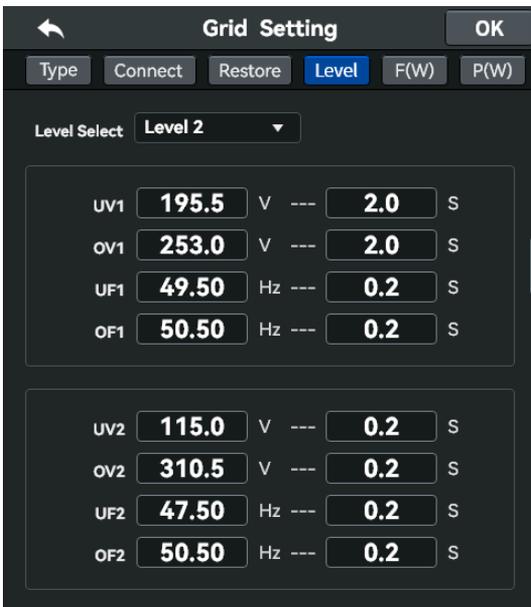
Time for connecting to the power grid.

Reconnection Time:

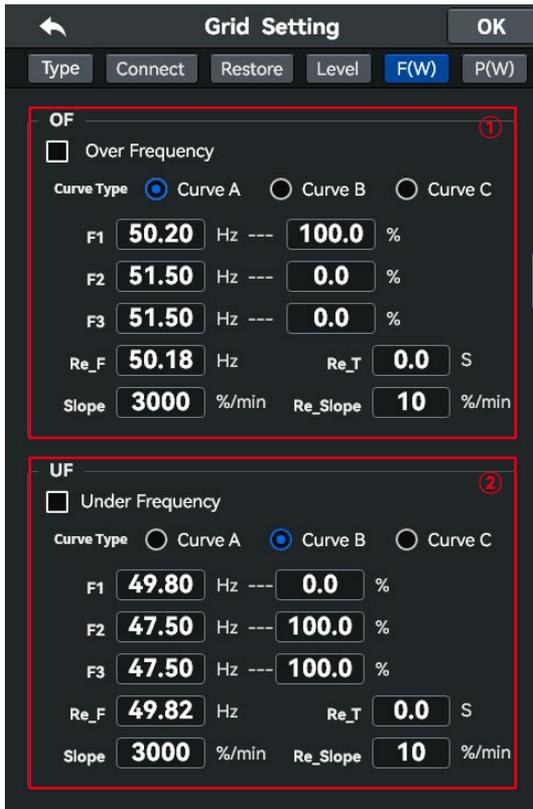
Waiting time for the inverter to reconnect to the power grid.



UV: Undervoltage protection recovery value.
OV: Overvoltage protection recovery value.
UF: Underfrequency protection recovery value.
OF: Overfrequency protection recovery value.
Protect V: 10 min overvoltage protection value.
Recovery V: 10 min overvoltage recovery value.



Settings of grid undervoltage, underfrequency, overvoltage and overfrequency for 5 levels protection.



①OF:

Over Frequency:

Overfrequency derating enable.

Curve Type: Default curve A.

F1:

Frequency and power setting for overfrequency derating triggering point.

F2:

Frequency and power setting for overfrequency derating cutoff point.

F3: Reserved.

Re-F:

Frequency setting for power recovery during overfrequency derating.

Re T:

Time setting for power recovery during overfrequency derating.

Slope:

Power derating slope during over frequency derating.

Re_slope:

Power recovery slope during frequency derating and slope recovery.

②UF:

Under Frequency: Under-frequency derating enable.

Curve Type: Default Curve A.

F1:

Frequency and power setting for underfrequency derating triggering point .

F2:

Frequency and power setting for underfrequency derating cutoff point.

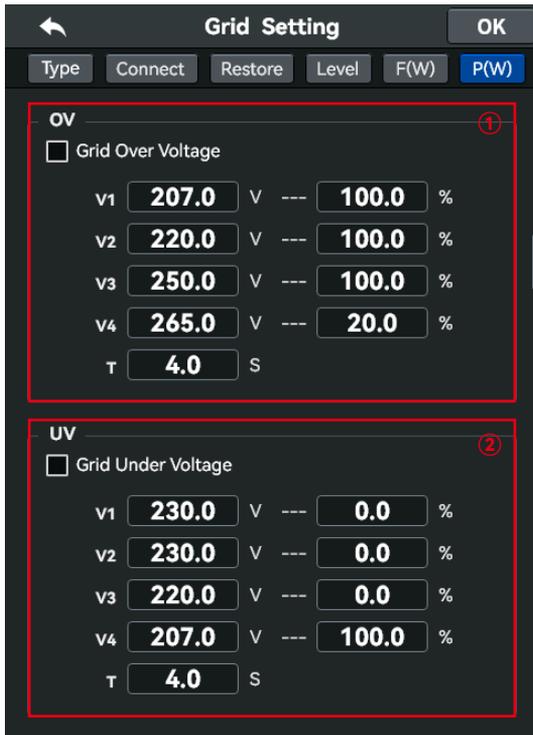
F3: Reserved.

Re.E:

Frequency setting for underfrequency derating power recovery.

Re-T:

Time setting for underfrequency derating recovery.



①OV:

Grid Over Voltage:

Grid overvoltage derating enable.

V1:

Overvoltage derating setting point 1 and voltage and power setting.

V2:

Overvoltage derating setting point 2 and voltage and power setting.

V3:

Overvoltage derating setting point 3 and voltage and power setting.

V4:

Overvoltage derating setting point 4 and voltage and power setting.

T:

Overvoltage derating power adjust time.

For example:

V2=250V, P=80% When the grid voltage reaches the 250V inverter output power will reduce its active output power to 80% rated power.

②UV:

Grid Under Voltage:

Grid undervoltage derating enable.

V1:

Undervoltage derating setting point 1 and voltage and power setting.

V2:

Undervoltage derating setting point 2 and voltage and power setting.

V3:

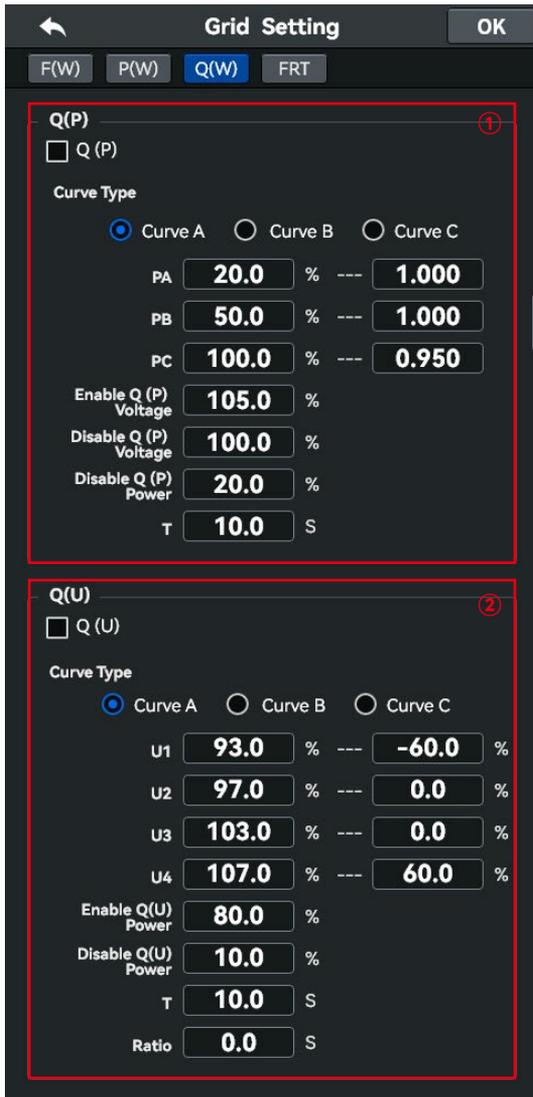
Undervoltage derating setting point 3 and voltage and power setting.

V4:

Undervoltage derating setting point 4 and voltage and power setting.

T:

Under voltage derating power adjust time.



①Q (P):

Q (P) mode enabled, Automatic production of reactive powder recording to a characteristic curve $\cos\phi=f(P)$.

PA:

Active power percentage and power factor setting.

PB:

Active power percentage and power factor setting.

PC:

Active power percentage and power factor setting.

Enable Q (P) Voltage:

Activate Q (P) mode voltage percentage setting.

Enable Q (P):

Stop Q (P) mode grid voltage percentage setting.

Enable Q (P) Power:

Activate Q (P) mode active power percentage setting .

T:

Reactive power response time constant.

For example:

PB=80%. When the active power reaches 80%, the power factor output of inverter reaches 0.94.

②Q (U):

Q (U) mode enabled. Automatic reactive power production according to a characteristic curve $Q=f(V)$.

U1:

Grid voltage percentage 1 and reactive power percentage setting.

U2:

Grid voltage percentage 2 and reactive power percentage setting

U3:

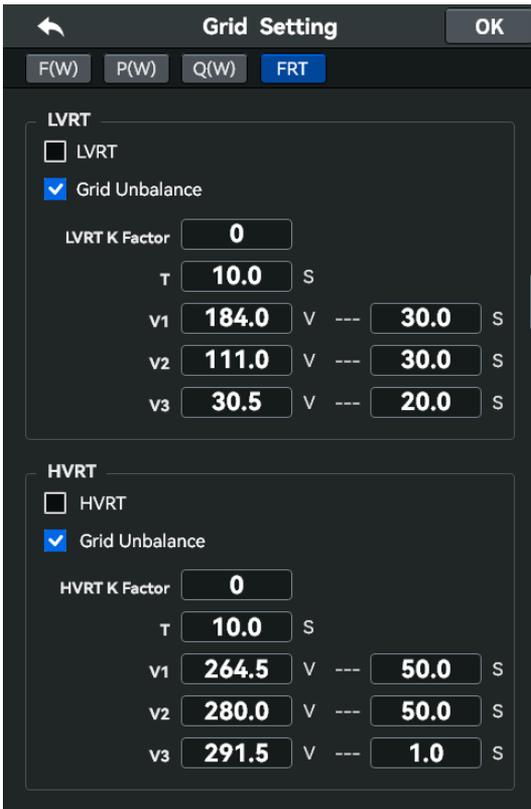
Grid voltage percentage 3 and reactive power percentage setting

U4:

Grid voltage percentage 4 and reactive power percentage setting

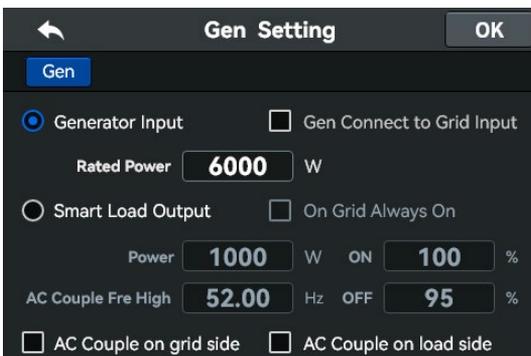
Enable Q (P) Power:

starting Q (U) mode active power percentage setting



Reserved: This function is reserved.

5.5.5 GEN Setting Menu



Generator input rated power:

Allowed Max.power from diesel generator.

GEN connect to grid input:

Connect the diesel generator to the grid input port.

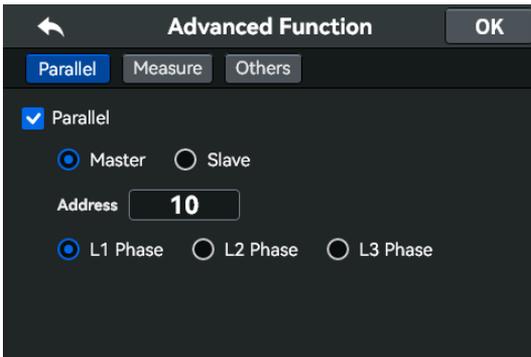
Smart Load Output:

This mode utilizes the Gen input connection as an output which only receives power when the battery SOC and PV power is above a user programmable threshold.

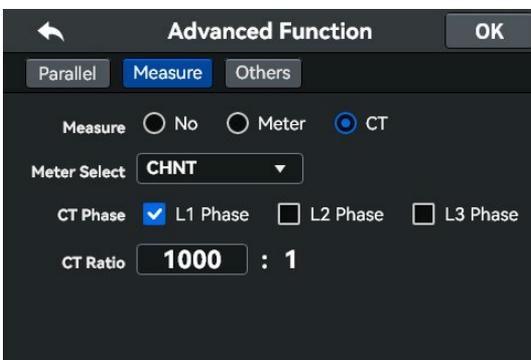
On Grid always on:

When click "on Grid always on" the smart load will switch on when the grid is present. e.g. Power=1000W, ON:100%, OFF=95%: When the PV power exceeds 1000W, 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<1000w, the Smart Load Port will switch off automatically.

5.5.6 Advanced Function Setting Menu



Reserved: This function is reserved.



Meter Select:

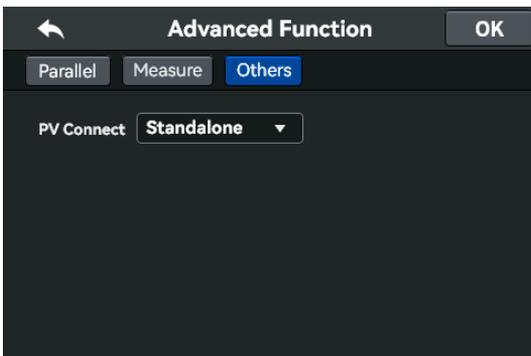
By clicking on the “Meter”, this option is activated and the default or CHNT meter can be selected.

CT Phase:

By clicking on the “CT”, this option is activated and the corresponding L1, L2 and L3 phases can be selected.

CT Ratio:

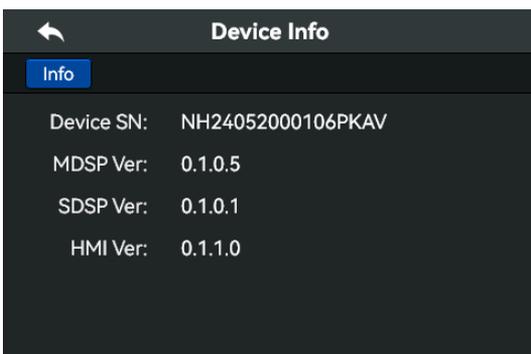
By clicking on the “CT”, this option is activated and the factor pf the CT ratio can be changed.



PV Connect:

Through PV input method, users can set parallel(choose Parallel) and independent(choose Standalone) input.

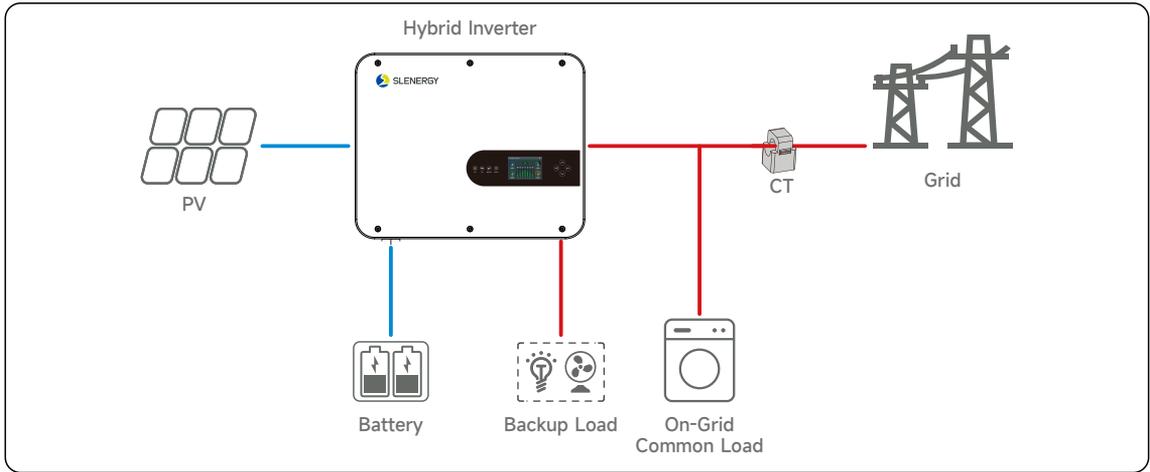
5.5.7 Device Info Menu



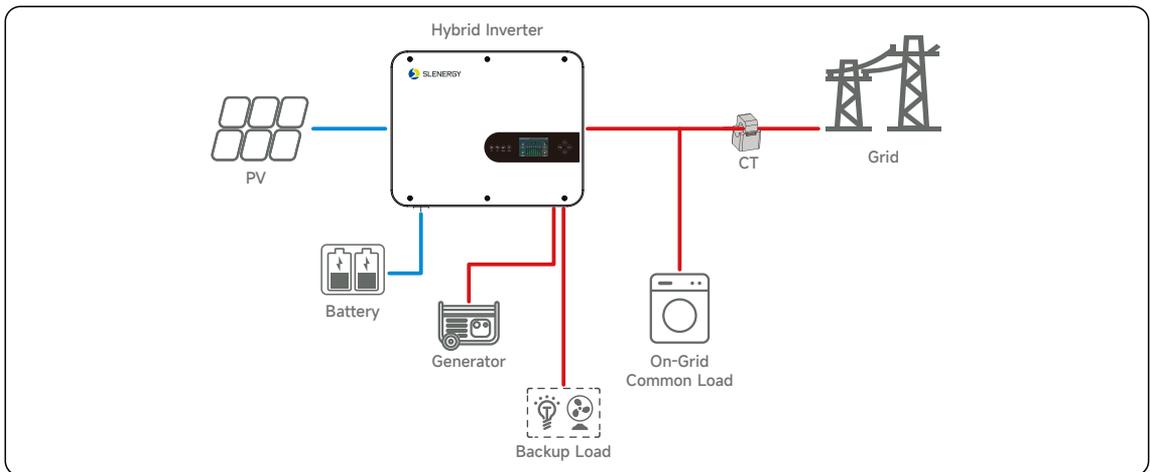
This page displays the SN, MDSP Version, SDSP Version and ARM Version of the hybrid inverter.

6. Mode

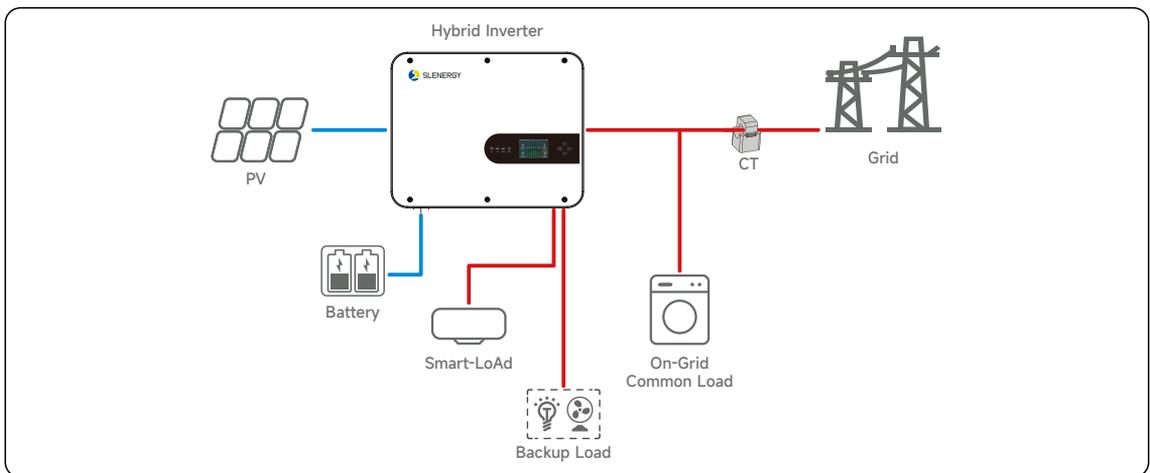
6.1 Basic mode



6.2 Generator mode



6.3 Smart-Load mode



7. Shutting down, Removing and Disposing the Inverter

7.1 Shutting down of the Inverter

⚠ Danger! Burns

There is still a burn danger after the inverter has been shut down. After the inverter has cooled down, protective gloves are required before operating the inverter.

There is no need to shut down the inverter under normal conditions, but it is necessary to do so when maintenance or repair work is required. Follow the steps below to disconnect the inverter from the AC and DC power sources, otherwise personal injury or equipment damage may occur.

- STEP 1:** Disconnect the external AC circuit breaker and prevent reconnection due to misoperation;
- STEP 2:** Disconnect the external DC circuit breaker and turn the DC switch of the inverter to “OFF”;
- STEP 3:** Wait for at least 10 minutes until the internal capacitance is fully discharged;
- STEP 4:** Check the DC cable with a current clamp to make sure there is no current;
Finished

7.2 Removing of the Inverter

⚠ Danger! Burns and Electric Shock

- After the inverter is disconnected from the grid and the PV battery panels, it is necessary to wait for at least 10 minutes before touching the internal conductive devices.
- Both AC and DC power must be de-energized before removing the inverter.
- If there are more than two layers of DC terminals in the inverter, the outer DC connector should be removed before the inner DC connector is removed.

- STEP 1:** Refer to “Electrical Connections” and follow the steps in reverse order to disconnect all electrical connections from the inverter. For the removal of the DC connector, an MC4 wrench is required to loosen the locked component, and a waterproof plug should be installed.
- STEP 2:** Refer to “Mechanical Installation” and follow the steps in reverse order to remove the inverter.
- STEP 3:** Remove the panel from the wall, if necessary.
- STEP 4:** If the inverter is to be used in the future, please refer to “Inverter Storage” to store the inverter properly.
Finished

7.3 Disposing of the Inverter

- It is the responsibility of the user to dispose of the inverter.
- Some parts and equipment of the inverter, such as capacitors, may cause environmental pollution.
- Do not dispose of this product with household waste, but rather dispose of it in accordance with the applicable electronic waste disposal regulations at the installation site.

8. Troubleshooting and Maintenance

8.1 Troubleshooting

Once the inverter is faulty, you can check the corresponding fault information via fault codes on the mobile App or PC interface. All fault codes and troubleshooting methods of the PV inverter are detailed in the following table, only some of which may be applicable for the model you purchased.

Failure Exception

Code	Fault Title	Troubleshooting Method
0133	PV1 voltage fault	1. Check whether the component corresponding to the alarm is covered, if so, please remove the coverings and ensure that the component is clean; 2. Check whether the battery panel wiring is loose, if so, re-plug it to make sure it is reliably connected; 3. Check whether the DC fuse is damaged, if so, replace the fuse;
0134	PV2 voltage fault	
0201	PV1 reverse connection fault	1. Check whether the positive and negative polarities of the corresponding string on the inverter is reversed, if so, disconnect the DC switch and adjust the polarity of the corresponding string when the current of the PV string is reduced to below 0.5A; 2. Contact the Customer Service Center if the fault still exists not for the above reasons.
0202	PV2 reverse connection fault	
0402	Abnormal BUS Voltage	1. Check if parts corresponding to the fault is obscured, and if so, remove the shelters and ensure that the parts are clean; 2. Check the cell panel wiring for loose connections, and if so, replug it to ensure its stable connection; 3. Check the DC fuse for damage, and if so, replace it; 4. Contact the Customer Service Center if the fault still exists not for the above reasons.
1402	Grid level 1 undervoltage	In general, reconnect the inverter to the grid after the grid returns to normal. If the fault is repeated: 1. Check if the grid is stably supplied; 2. Check if the AC wiring is tight; 3. Check if the AC circuit breaker is turned on; 4. Contact the Customer Service Center if the fault still exists not for the above reasons.
1403	Grid level 2 undervoltage	
1404	Grid level 3 undervoltage	
1405	Grid level 4 undervoltage	
1406	Grid level 5 undervoltage	
1407	Grid level 1 overvoltage	
1408	Grid level 2 overvoltage	
1409	Grid level 3 overvoltage	
1410	Grid level 4 overvoltage	
1411	Grid level 5 overvoltage	
1415	Grid instantaneous overvoltage	

Failure Exception

Code	Fault Title	Troubleshooting Method
1501	Grid level 1 underfrequency	In general, reconnect the inverter to the grid after the grid returns to normal. If the fault is repeated: <ol style="list-style-type: none"> 1. Measure the actual grid frequency, and if it exceeds the set range indeed, contact the local power utility company for resolution; 2. Check if the set protection parameter is qualified; 3. Contact the Customer Service Center if the fault still exists not for the above reasons.
1502	Grid level 2 underfrequency	
1503	Grid level 3 underfrequency	
1504	Grid level 4 underfrequency	
1505	Grid level 5 underfrequency	
1506	Grid level 1 overfrequency	
1507	Grid level 2 overfrequency	
1508	Grid level 3 overfrequency	
1509	Grid level 4 overfrequency	
1510	Grid level 5 overfrequency	
1401	No grid/ off-grid	In general, reconnect the inverter to the grid after the grid returns to normal. If the fault is repeated: <ol style="list-style-type: none"> 1. Check if the grid is stably supplied; 2. Check if the AC wiring is tight; 3. Check if the AC circuit breaker is turned on; 4. Contact the Customer Service Center if the fault still exists not for the above reasons.
1001	30mA abrupt fault	<ol style="list-style-type: none"> 1. A humid cell panel condition or poor lighting may cause the fault. Generally, reconnect the inverter to the grid after the condition has improved; 2. If the environment is normal, check if the DC/AC cable insulation is normal; 3. Contact the Customer Service Center if the fault still exists not for the above reasons.
1002	60mA abrupt fault	
1003	150mA abrupt fault	
1004	High static leakage current	
1006	Leakage current sensor fault	
4521	Low insulation impedance	Wait for the inverter to return to normal, but if the fault is repeated: <ol style="list-style-type: none"> 1. Via the App, check if the ISO impedance protection value is too high and confirm that it meets local regulatory requirements; 2. Check the earth impedance of photovoltaic modules strings and DC cables and take corrective measures if there is a short circuit or the insulation layer of the cable is damaged; 3. If the fault occurs on rainy days (with normal cables), reconfirm it when the weather condition improves; 4. Contact the Customer Service Center if the fault still exists not for the above reasons.

Failure Exception

Code	Fault Title	Troubleshooting Method
0605	Abnormal inverter temperature	Generally, the inverter will operate again after its internal or module temperature returns to normal, but if the fault recurs: <ol style="list-style-type: none"> 1. Check the inverter for high ambient temperatures; 2. Check if the inverter is located in an airy place; 3. Check if the inverter is exposed to direct light, and if so, provide some shelters; 4. Check the fan for normal proper operation, and if not, replace it; 5. Contact the Customer Service Center if the fault still exists not for the above reasons. Shut down and disconnect the inverter, wait for the ambient temperature rising to the normal operating temperature range, and then restart the inverter.
0622	Abnormal LLC temperature	
3001	Battery overvoltage	Check the abnormal battery voltage to figure out the cause of the malfunction: <ol style="list-style-type: none"> 1. Check if the battery configuration voltage exceeds 60V; 2. Check if the battery wiring is loose. If so, reinsert and unplug to ensure its connection; 3. Check if the DC fuse is damaged, and if so, replace the fuse; 4. If it is confirmed that the fault is not caused by the above reasons and still exists, please contact the customer service center.
3002	Battery undervoltage	Check for abnormal battery voltage and determine the cause of the malfunction: <ol style="list-style-type: none"> 1. Check if the battery configuration voltage is too low (below 40V); 2. Check if the battery wiring is loose. If so, reinsert and unplug to ensure its connection; 3. Check if the DC fuse is damaged, and if so, replace the fuse; 4. If it is confirmed that the fault is not caused by the above reasons and still exists, please contact the customer service center.
3003	Battery temperature is too high	After the battery temperature returns to be normal, the machine will restart. If the fault occurs repeatedly: <ol style="list-style-type: none"> 1. Please check if the temperature of the battery is too high; 2. Please check if the battery is well-ventilated; 3. If it is confirmed that the fault is not caused by the above reasons and still exists, please contact the customer service center. Switch off or disconnect the inverter, wait for the temperature to rise within the battery operating temperature range, and then restart the inverter.
3004	Battery temperature is too low	
3005	Battery discharge overcurrent	<ol style="list-style-type: none"> 1. Lower down the set maximum discharge current value of the battery through the LCD or APP; 2. If the fault persists, please contact the customer service center.

Failure Exception

Code	Fault Title	Troubleshooting Method
3006	Battery charge overcurrent	<ol style="list-style-type: none"> 1. Lower down the set maximum charge current value of the battery through the LCD or APP; 2. If the fault persists, please contact the customer service center.
3007	The BMS internal system is abnormal	Please contact the customer service center.
3008	Battery discharge undervoltage	<ol style="list-style-type: none"> 1. Please check if the value of battery voltage or SOC is lower than that of the voltage or SOC set in Shutdown; 2. If so, please confirm whether the value of voltage or SOC set in Shutdown is reasonable, otherwise please use photovoltaic or grid to charge the battery to the voltage set in Restart; 3. If the fault persists, please contact the customer service center.
0509	Load port overload	<ol style="list-style-type: none"> 1. Please check if the power of the connected load is too high; 2. Lower down the power of the connected load; 3. If it is confirmed that the fault is not caused by the above reasons and still exists, please contact the customer service center.
0901 0902 0903	Communication fault	Please contact the customer service center.
0909	Abnormal communication between inverter and BMS	<ol style="list-style-type: none"> 1. Please check if the communication interface between the inverter and BMS is installed correctly; 2. Please check if the communication line sequence is correctly installed according to the user manual; 3. If it is confirmed that the fault is not caused by the above reasons and still exists, please contact the customer service center.
0501	Communication fault	Contact the Customer Service Center.
0502	Inverter hardware overcurrent	<ol style="list-style-type: none"> 1. Check if parts corresponding to the fault is obscured, and if so, remove the shelters, ensure that the parts are clean, and then connect it to grid; 2. In case of AC overcurrent, check if the grid voltage fluctuation exceeds 50 V, and if so, wait for the local grid to stabilize and then connect to the grid; 3. Contact the Customer Service Center if the fault still exists not for the above reasons.
0503	Inverter software overcurrent	
0504	BOOST hardware overcurrent	
3011	BOOST software overcurrent	
1510	Battery hardware overcurrent	

Alarm Exception

Code	Fault Information	Troubleshooting Method
3604	Abnormal meter communication alarm	1. Check the meter or CT for improper position of wiring; 2. Check if the input and output wiring direction of meter or CT is reversed; 3. If the retrofit system is enabled, check if the rated power is correctly set for the inverter.
3605	Abnormal CT wiring alarm	
1417	Grid out-range warning	1. Check if the output port is connected to the grid. If so, cut it from the grid; 2. If it is confirmed that the fault is not caused by the above reasons but still exists. Please contact the customer service center.
1802	Abnormal string 1 alarm	1. Check whether the number of cell panels configured for the corresponding string is fewer than other strings, and if so, wait until the photovoltaic modules string current is lower than 0.5 A, turn off the DC switch, and adjust the panel configuration for the string; 2. Check the cell panels of string for shelters; 3. Wait until the photovoltaic modules string current is lower than 0.5 A, turn off the DC switch, and check if the open-circuit voltage of string is abnormal. If so, check the cell panel for its wiring and configuration; 4. Check the cell panel for its abnormal orientation.
1803	Abnormal string 2 alarm	
3301	Abnormal external fan alarm	Contact the Customer Service Center.
3311	Abnormal internal fan alarm	

8.2.1 Maintenance Notice

Please always remember that the inverter is powered by two sources: the PV string and the public grid. The following steps must be followed before performing any maintenance operations:

- Disconnect the AC circuit breaker on the grid side, and then the DC switch;
- Wait at least 10 minutes until the internal energy storage components have been fully discharged before performing maintenance or overhaul operations inside the equipment;
- Use testing equipment for inspection to ensure that no voltage or current exists.

Temporary warning signs shall be posted or barriers shall be erected to prevent uninvolved persons from entering the electrical connection or maintenance area when electrical connections and maintenance work is being performed.

The inverter should only be restarted after fault troubleshooting that would affect the safe performance of the inverter.

No maintenance parts are included inside the inverter, no replacement of the internal components of the inverter is allowed without authorization.

If you need any maintenance service, please contact the After-sales Service Center. Otherwise, no warranty and joint liability will be accepted for any damages caused. Touching the printed-circuit board or other static-sensitive components may cause damage to the device.

- Avoid unnecessary circuit board contact;
- Observe electrostatic protection norms and wear anti-static wrist straps.

8.2.2 Routine Maintenance

See the table below for routine maintenance items and intervals of equipment:

Item	Inspection Method	Maintenance Period
System cleaning	Check the air outlet and heat sink for dust and other blockages. If needed, clean the air outlet and heat sink.	Semi-annually–annually (as per the ambient dust content)
Equipment entrance holes	Check whether there is incomplete sealing or large gaps in the equipment entrance holes, and if so, seal it tightly.	Annually
Electrical connection	Check whether the cable connection is loose or detached. Check whether the cable is damaged, especially whether there are cuts on the part in contact with the metal housing.	Semi-annually–annually

9 Technical Parameters

Datasheet	SL3.6KLV-W	SL5KLV-W	SL6KLV-W
PV (DC)			
Max. PV Input Power*	5760 Wp	8000 Wp	9600 Wp
Max. Input Voltage**	500 V		
Start-up Voltage	125 V		
Rated Input Voltage	370 V		
MPPT Input Voltage Range**	150-430 V		
MPPT Max. Input Current	18 A		
MPPT Short-circuit Current	20 A		
No. of MPPT	2		
No. of Strings per MPPT	1		
Alternating Current (AC) Side of the Grid			
Maximum Input Apparent Power	7590 VA	7590 VA	9200 VA
Rated Output Power	3600 W	5000 W	6000 W
Maximum Output Apparent Power	3960 VA	5500 VA	6600 VA
Rated Output Voltage	230 V		
Input/Output Voltage Range	180-300 V		
Rated Output Voltage Frequency	50/60 Hz		
Input/Output Voltage Frequency Range	(45-55)/(55-65) Hz		
Rated Output Current	15.7 A	21.7 A	26.1 A
Maximum Input/Output Current	33 / 17.2 A	33 / 23.9 A	40 / 28.7 A
Power Factor (rated)	>0.99		
Power Factor Range	0.8 advanced ...0.8 lagged		
Maximum Total Harmonic Distortion	<3% (rated power)		
Grid Wiring Method	L/N/PE		
Off-grid Output (AC)			
Rated Output Power	3600 W	5000 W	6000 W
Maximum Output Apparent Power	3960 VA	5500 VA	6600 VA
Rated Output Voltage	230 V		
Output Voltage Range	200-240 V		
Rated Output Frequency	50/60 Hz		
Rated Output Current	15.7 A	21.7 A	26.1 A
Maximum Output Current	17.2 A	23.9 A	28.7 A
Max. Total Harmonic Distortion (THD)	< 3%		
On/off-grid Switching Time	< 10 ms		
Battery (DC)			
Rated Output Power	3600 W	5000 W	6000 W
Maximum Charge/Discharge Power	3600 W	5000 W	6000 W
Rated Voltage	48 V		
Battery Voltage Range	40-60 V		
Maximum Charge/Discharge Current	90 A	120 A	135 A
Communication Interface	CAN/RS485		

Datasheet	SL3.6KLV-W	SL5KLV-W	SL6KLV-W
Efficiency			
Max. Efficiency	96.8%		
Max. MPPT Efficiency	99.9%		
Max. Euro Efficiency	96%		
Display and Communication			
Display	LCD+LED+APP		
Communication	RS485, WiFi (Optional)		
General Data			
Size (WxHxD)	492 x 400 x 220 mm		
Weight	21 kg		
Operating Temperature Range	-25°C...60°C(Greater than 45°C Derating)		
Noise	<35 dB		
Cooling	Intelligent air cooling		
Installation Style	Wall-mounted		
Protection Degree	IP65		
Warranty	5 Years		
Protection			
Integrated Protection	Anti-countercurrent Protection; Insulation Impedance Detection; Photovoltaic Reverse Connection Protection; Input DC Switch; GFCI Leakage Current Detection; Output Short-circuit Protection; Output Overcurrent Protection; Grid Monitoring; Islanding Protection; Residual Current Detection; Off-grid Overload		
Surge Protection	DC Type II, AC Type II		
Certifications and Standards			
Grid Regulation	IEC 62116, IEC 61727, NRS 097-2-1, IEC 61683		
Safety Regulation	EN/IEC 62109-1/2		
Others	EN/IEC 61000-6-1/3		

* Recommended distribution board power shall be determined based on the battery capacity and the actual household load for the optimal scheme.

*** Maximum input power & current on the grid side refers to the capability of the grid to charge the battery and bypass the load.

10. Quality Warranty

For faulty inverters during the warranty period, **Slenergy Technology (A.H.) Co., Ltd.** will repair or replace them for free.

Proof

During the warranty period, customers are required to present the invoice and purchase date of inverter. Moreover, the trademark on the inverter shall be clearly visible, or the Slenergy assumes no liability for the warranty.

Condition

- Replaced failed inverters shall be handled by the Company;
- Customers shall reserve a reasonable time for the Company to repair faulty equipment.

Immunity From Liability

The Company assumes no liability for the warranty of the product in the event of:

- Entire inverter and/or parts beyond the free warranty period;
- Damage in transportation;
- Improper installation, modification or use;
- Operation in extremely harsh conditions beyond those described in the Manual;
- Equipment failure or damage not caused from the installation, repair, modification or disassembly by our service team and personnel;
- Non-conformance to the relevant international standards for installation and use;
- Damage caused by abnormal natural environment.

For the product failure caused by above reasons, the Company may provide paid maintenance service based on the customers' service requests which will be decided by the service institute.

Contact Information

If you have any questions about this product, please contact us, in order to provide you with faster and better after-sales service, we need your assistance to provide the following information:

- Equipment model;
- Device serial number;
- Fault code/name;
- Simple description of the fault symptom.



Official website of Slenergy



SMART M

Importer

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Address:

Manufacturer

Slenergy Technology (A.H.) Co., Ltd.

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