

# User Manual

**100-110kW PV Grid-Tied 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](http://www.slenergy.com) for more details.

### Scope

The Manual applies to the following models: **SL100KRG-W**, **SL110KRG-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.**

# Contents

<b>Symbols .....</b>	<b>3</b>
<b>1. Safety Precaution</b>	
1.1 Warning symbol.....	4
1.2 Unpacking for inspection .....	4
1.3 Installation security.....	5
1.4 Electrical connection security .....	5
1.5 Operation security.....	6
1.6 Maintenance security.....	6
1.7 Disposing security.....	7
<b>2. Product Overview</b>	
2.1 Photovoltaic System .....	8
2.2 Product Appearance.....	9
2.3 Dimension & Weight .....	10
2.4 LED Indicator .....	10
2.5 Principle Description.....	11
2.6 Function Description.....	11
<b>3. Unpacking and Storing</b>	
Unpacking for inspection .....	12
3.2 The packing list .....	12
Inverter storage.....	12
<b>4. Mechanical Installation</b>	
4.1 Installation precaution.....	13
4.2 Tool preparation for installation.....	14
4.3 Installation site .....	15
4.4 Space requirement .....	15
4.5 Tilting backwards installation requirements.....	17
4.6 Installing Mounting-bracket .....	17
4.7 Installing Inverter .....	18
<b>5. Electrical Connection</b>	
5.1 Safety Instructions .....	20
5.2 Cable Requirements .....	21
5.3 External Grounding Connection.....	21
5.4 AC Cable Connection.....	22
5.5 DC-side Connection .....	25
5.6 Communicating Connection.....	29
<b>6. Commissioning</b>	
6.1 Inspection Before Commissioning.....	29
6.2 Commissioning Steps.....	29
<b>7. Shutdown, Removing and Disposing of the Inverter</b>	
7.1 Shutting down the inverter .....	30
7.2 Removing the inverter .....	30
7.3 Disposing the inverter .....	30
<b>8. Troubleshooting and Maintenance</b>	
8.1 Troubleshooting.....	31
8.2 Maintenance .....	34
<b>9. Appendix</b>	
9.1 Quality Warranty .....	36
9.2 Contact Information .....	36
9.3 Technical Parameters .....	37

## Symbols

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.









# 1. Safety Precaution

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 9 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 Security

### 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 Security

### 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 Security

### **⚠ 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 Security

### **⚠ 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 9 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 Security

### **WARNING**

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

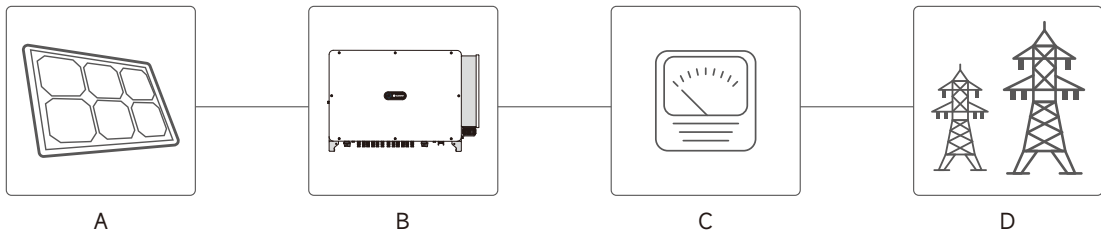


## 2. Product Overview

### 2.1 Photovoltaic System

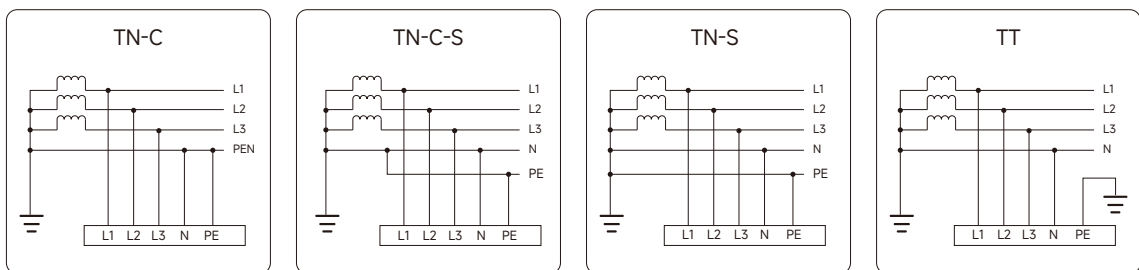
The grid-connected inverter of three-phase transformerless string type is a vital part of PV system.

The inverter converts the DC power from the PV string into AC power that meets the Grid requirements and feeds into the Grid. Typical application scenarios of the inverter are shown below.



Application of PV Grid-connected inverter to PV system

No.	Name	Description
A	Pv String	Monocrystalline silicon, polycrystalline silicon, and thin-film cell without grounding.
B	Inverter	SL100-110KRG-W
C	Electricity Meter	A standard tool for metering inverter output power.
D	Grid	Types of Grid supported by the inverter are shown below.

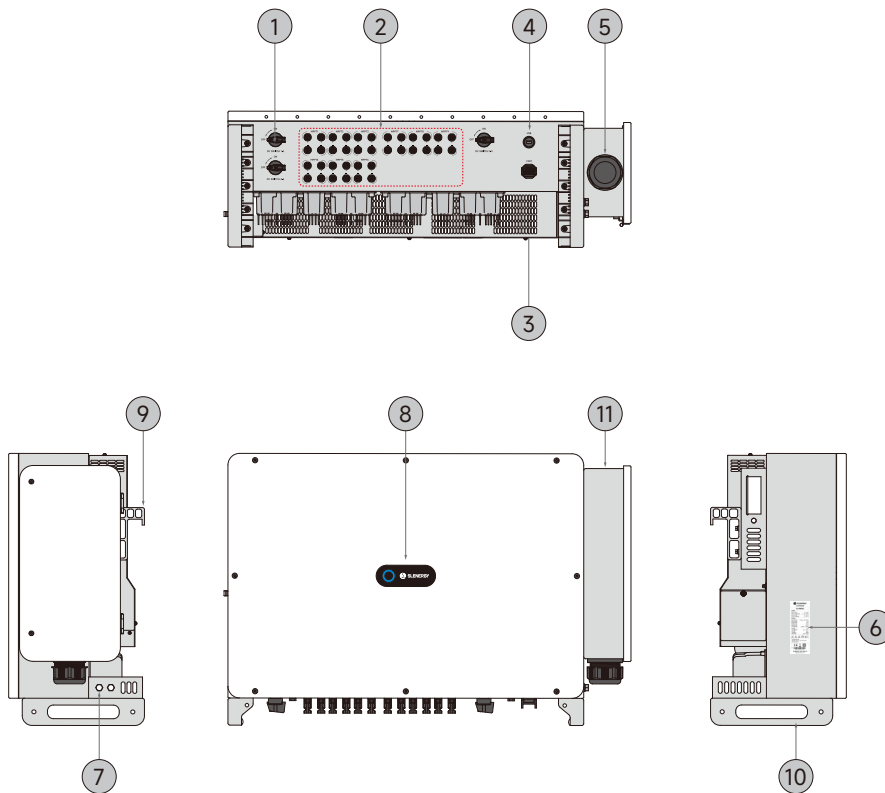


Types of Grid supported by the PV Grid-connected inverter

#### **⚠ WARNING**

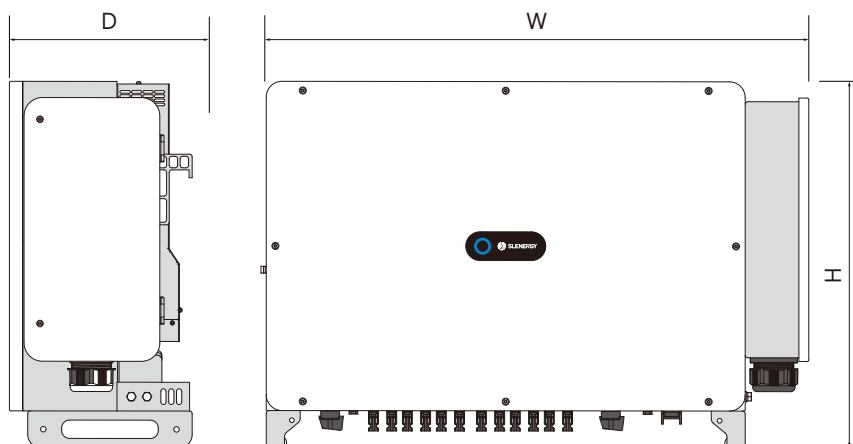
- Do not connect the inverter with the PV string that needs either positive or negative grounding.
- When installing or operating the inverter, ensure the positive and negative of the PV string are short-circuit to the ground. Otherwise, it may lead to inverter AC/DC short circuit, resulting in product 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 Appearance



No.	Name	Description
1	DC Switch	For controlling the DC input.
2	PV Connectors	18 pairs of PV connectors.
3	Communication Terminal	Communication interface of RS485 and DRM.
4	USB Interface	Wi-Fi/4G monitoring.
5	AC Wiring Port	For AC output wiring.
6	Labels	Including nameplate, warning label, and QR code.
7	External Grounding Terminal	For reliable grounding of inverters.
8	LED Indicator	For indicating the current inverter status.
9	Mounting lugs	2, used to hang the inverter onto the mounting-bracket.
10	Bottom handles	2, used to move the inverter.
11	AC junction box	Used to connect AC cables and the power cable for tracking system.




## 2.3 Dimension & Weight



Models	Dimension (W×H×D)	Weight
SL100KRG-W, SL110KRG-W	1040 x 700 x 350mm	85kg

## 2.4 LED Indicator

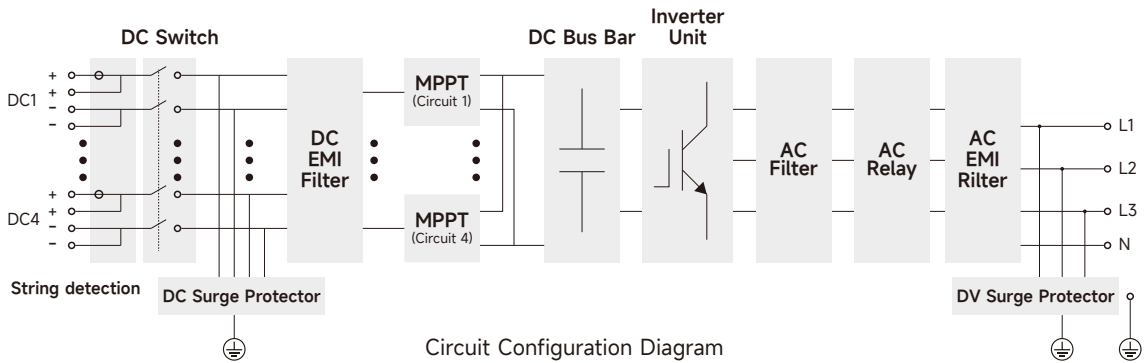
The LED on the front panel of the inverter indicate the current working status of the inverter.

Indicator	Status	Indication
	Steady Blue	The inverter is in Grid-connected mode.
	Blinking Blue at 0.2s intervals	USB is connected with data communication and the inverter is free of faults.
	Blinking Blue at 2s intervals	DC or AC is on, and the inverter is in standby or start-up mode (non-Grid-connected mode).
	Steady Green	PID enabled.
	Blinking Green at 0.2s intervals	Program download.
	Steady Red	The inverter is faulty.
	Blinking Red	USB is connected with data communication and the inverter is faulty.
	Off	AC and DC or DC only are/is off.

**Note:** Since the AC side may still be energized when the indicator is off, it is necessary to avoid electric shock when operating the inverter.

## 2.5 Principle Description

The principle design of inverter is illustrated below:



- If needed, use the DC switch to safely cut off the DC current to keep the operating inverter and personnel safe;
- EMI filter removes the electromagnetic interference inside the inverter to ensure that the inverter meets the EMC standards;
- The inverter provides DC input via 9 MPPTs circuits, ensuring maximum power even under different PV input conditions;
- The inverter converts the DC power into AC power that meets the Grid requirements and feeds into the Grid;
- The AC filter removes the high-frequency component of output current from the inverter, ensuring that the output current meets the Grid requirements;
- The output relay isolates the AC output of inverter from the Grid so that the inverter can be safely disconnected from the Grid in case of inverter or Grid failure;
- The AC surge protector provides a relief circuit to the AC-side overvoltage energy to prevent its energy shock from damaging the inverter's internal circuit.

## 2.6 Function Description

The inverter has the following functions in summary:

Inverse transformation	Convert DC power into AC power that meets the requirements of the Grid and feeds it into the Grid.
Data storage	Save system information, such as operation information and fault records.
Parameter configuration	Provide users with multiple parameter configurations, so that they may adjust the inverter by using App to meet various needs, such as the best operating performance.
Communication interface	Provide communication accessory port to access the Company's communication module. Upload monitoring data through wireless communication to the monitoring backend that has connected with the communication device, allowing users check the inverter information or set operation and protection parameters through the Smart Energy Management Platform, etc.
Protection	Provide anti-island protection, DC reverse-connection protection, AC short-circuit protection, leakage-current protection, surge protection, etc.

## 3. Unpacking and Storage

### 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.

### 3.2 The packing list:

Name	Quantity	Name	Quantity
Inverter	1	16pin Communication Connection	1
Wall Mount	1	Accessory Kit of Installing Screw	1
DC Connectors(pairs)	18	Quick Installation Guide	1
OT Terminals	3	Passport	1

### 3.3 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  $-30^{\circ}\text{C}$  ~  $70^{\circ}\text{C}$ , 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.

## 4. Mechanical Installation

### 4.1 Installation Precautions

This chapter describes the inverter installation and its connection to the PV system; For connection of the PV inverter to the PV system, it includes inverter's connection to the PV string 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.

#### **DANGER**

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

#### **WARNING**

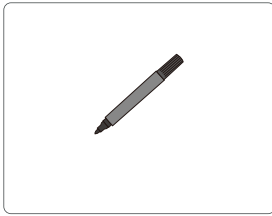
- Avoid improper installation conditions affecting the inverter's performance;
- Install the inverter in a well-ventilated place;
- Ensure that product cooling system or ventilation port is uncovered;
- Do not install the inverter in a flammable, explosive, or smoky environment.

#### **CAUTION**

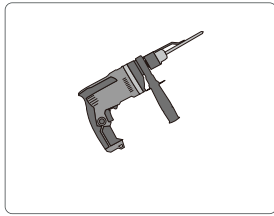
- Improper installation may cause personnel injury!
- Control the weight when the inverter is carried to keep balance, thus avoiding the inverter toppling or falling;
- Wear suitable protective equipment when operating the inverter;
- Do not expose the inverter and its bottom terminals and interfaces directly to the ground or other supports.

## 4.2 Tool Preparation for Installation

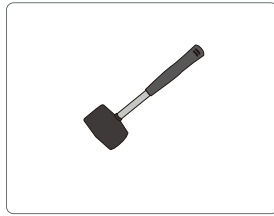
Before installation, the prepared tools include but are not limited to the recommended tools below, with other auxiliary tools available if needed.



Marker



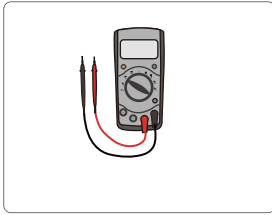
Electric drill



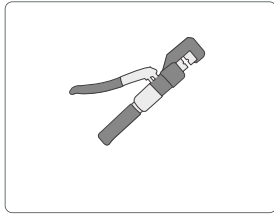
Hammer



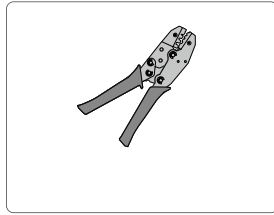
Wrench



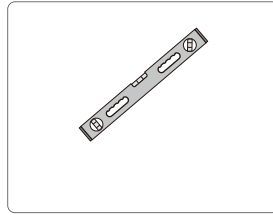
Electric meter



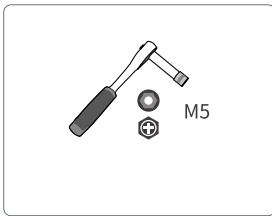
Hydraulic clamp



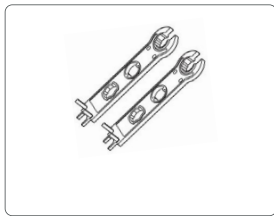
MC4 crimping pliers



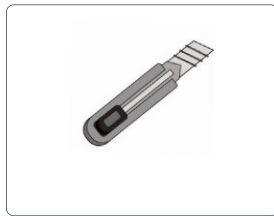
Spirit level



Socket wrench



MC4 wrench



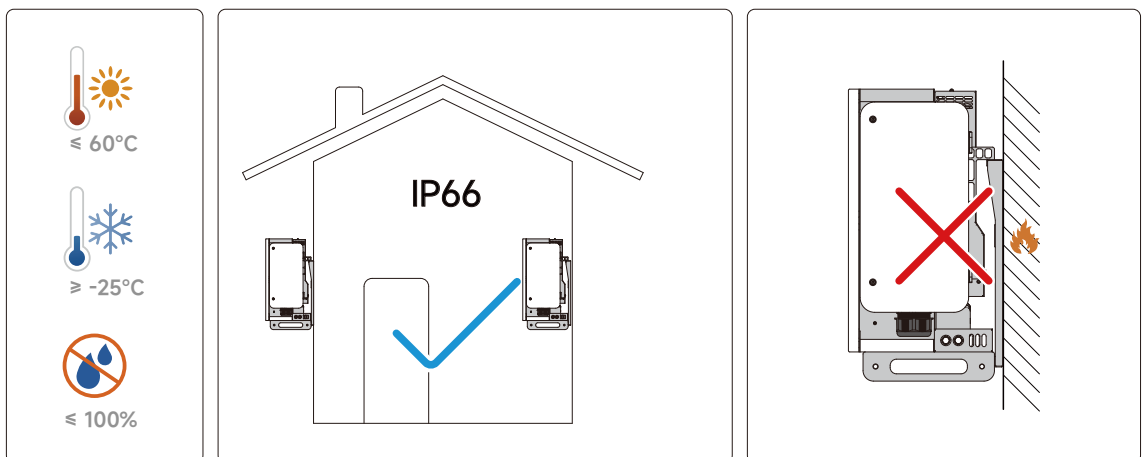
Utility knife



Cross screwdriver

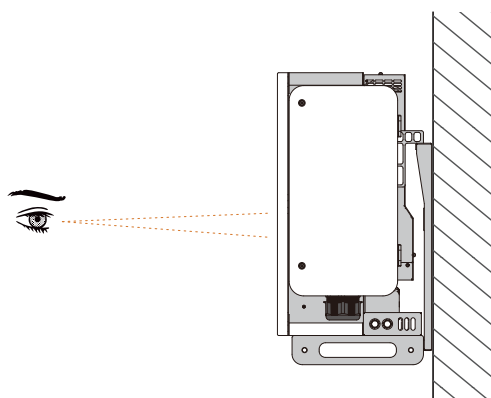
### 4.3 Installation Site

- For the inverter, optional installation sites play a vital role in ensuring its safe operation, long service life, and good performance;
- With IP66 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  $-25^{\circ}\text{C}\sim 60^{\circ}\text{C}$ ;
- 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.



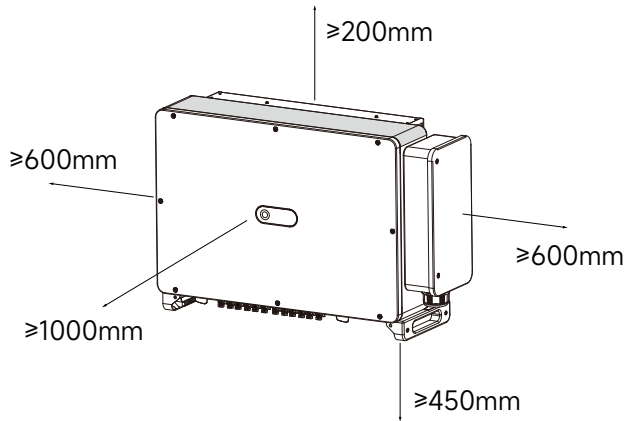
### 4.4 Space Requirements

At a suitable installation height, the user's sight is at the same level as the display window of LED, making it easy to check the inverter status.

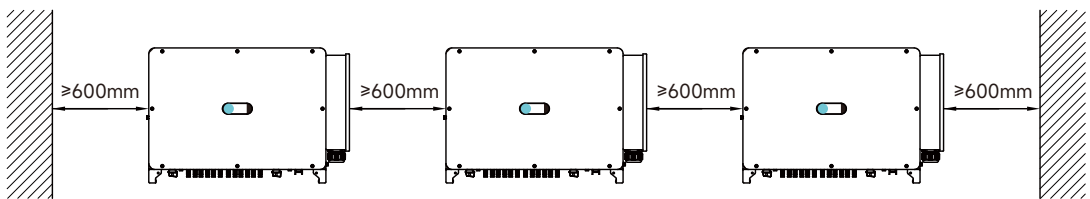




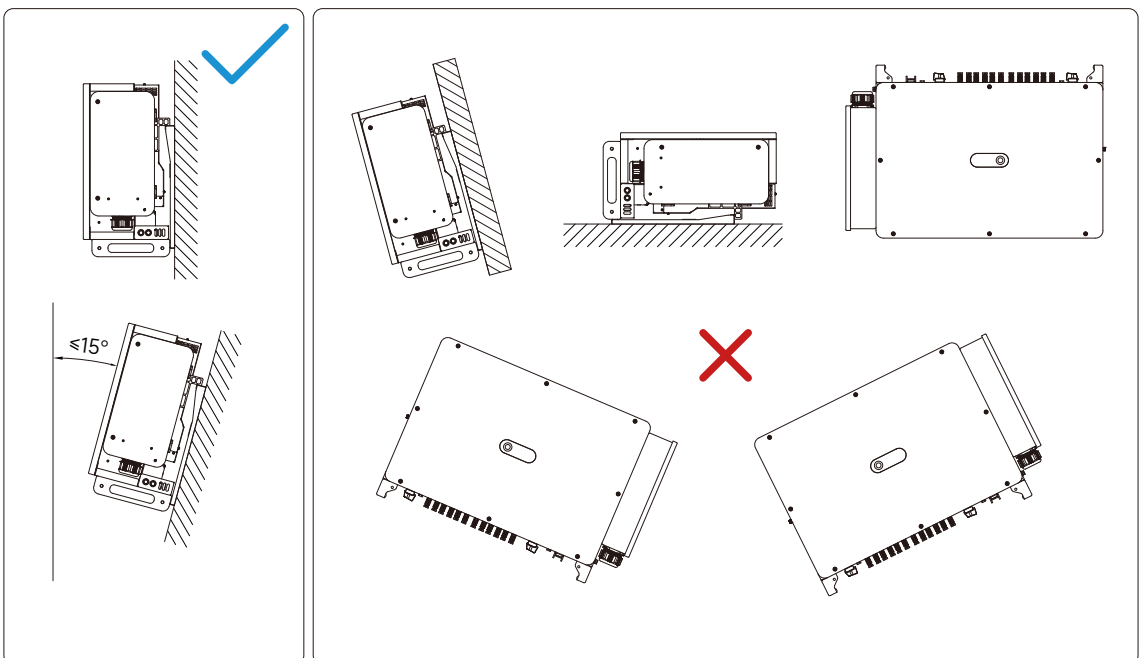
Sufficient reserved space around the installation site may facilitate the inverter disassembly and air convection. The installation space requirements for a inverter are illustrated on the right.



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.

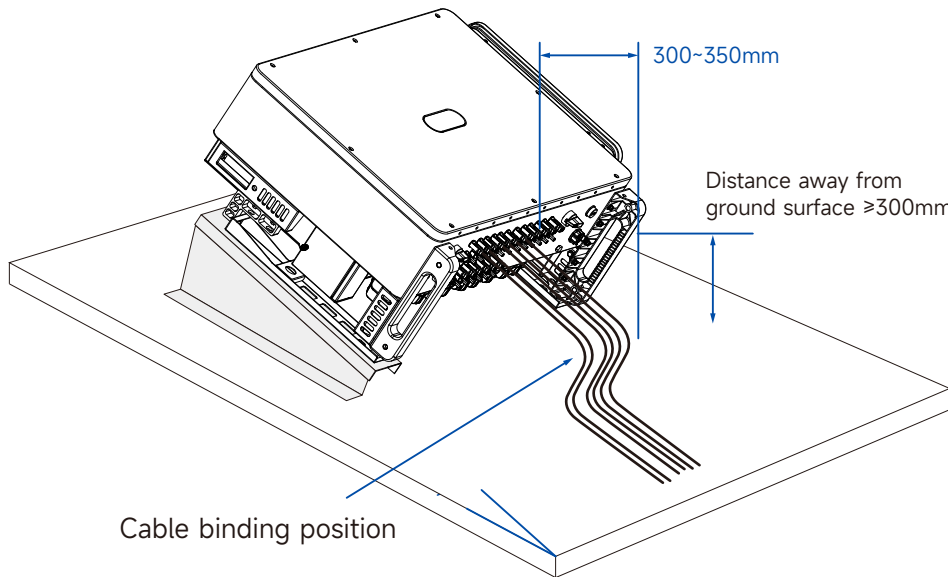


The inverter is recommended to be installed vertically for heat dissipation, avoiding forward-leaning, backward-leaning, reverse, horizontal, or inclined installations.



### 4.5 Tilting backwards installation requirements

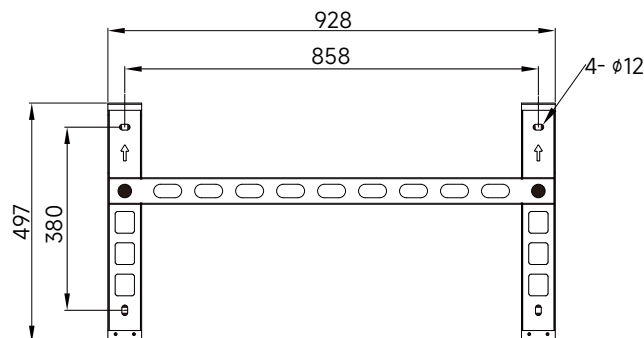
In case the installation site is a level surface, mount the inverter to the horizontal-mounting bracket to meet the mounting angle requirements, as shown in the figure below.



Take the following items into account when designing the bracket scheme:

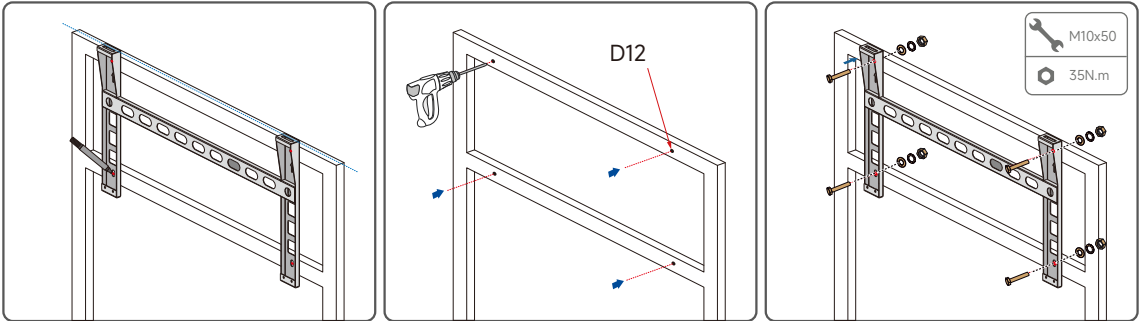
- Consider onsite climate conditions and take anti-snow and anti-rain measures if necessary.
- Ensure that the waterproof connectors are at least 300mm higher than the ground surface.
- Bind the cables at the positions 300~350mm away from the DC connector and communication waterproof terminal.
- The various waterproof terminals should be tightened with the torque specified in this manual to ensure that they are securely sealed.

### 4.6 Installing Mounting-bracket



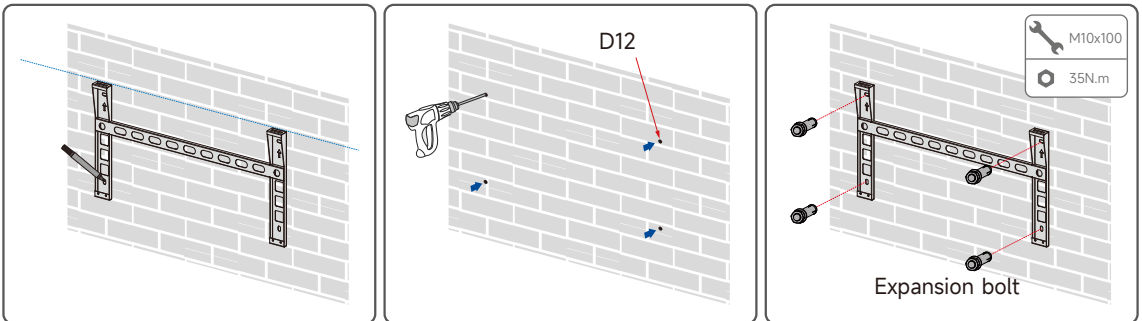
### 4.6.1 Bracket-Mounted Installation

- Step 1:** Level the assembled mounting-bracket by using the level, and mark the positions for drilling holes on the PV bracket.
  - Step 2:** Drill the holes by using a electric drill.
  - Step 3:** Secure the mounting-bracket with bolts.
- End



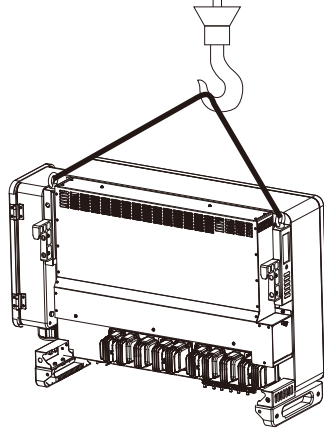
### 4.6.2 Wall-Mounted Installation

- Step 1:** Place the hanging plate on the wall mounting point, adjust the Angle using a level, and mark with a marker.
  - Step 2:** Insert the expansion bolts into the holes and secure them with a rubber hammer. Fasten the nut with a wrench to expand the bolt. Remove the nut, spring washer, and flat washer, and store them properly.
  - Step 3:** Install the mounting-bracket to the wall with the expansion bolts with the expansion bolts.
- End

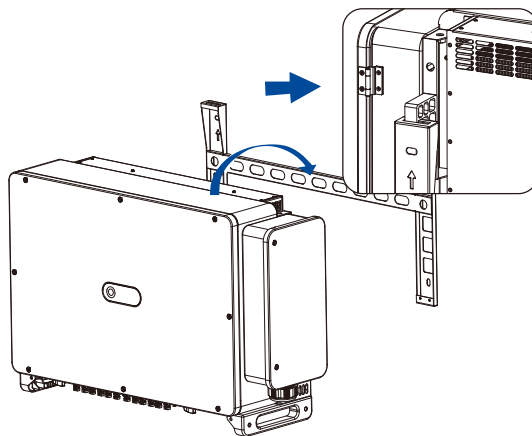


### 4.7 Installing Inverter

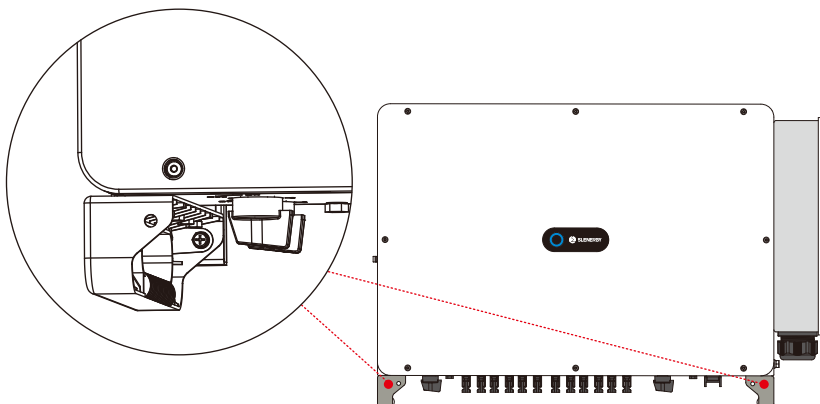
- Step 1:** Take out the inverter from the packing case.
- Step 2:** If the installation position is too high, lift the inverter onto the mounting plate, suspend the inverter 100mm off the ground using a lifting device, and check whether the bolts (optional), hooks, and ropes of the M12 ring are tightened. (Ensure that the hooks inserted into the M12 ring do not damage the chassis.) After confirming that the connection is secure, lift the inverter to the destination.



**Step 3:** Hang the inverter to the mounting-bracket and ensure that the mounting ears perfectly engage with the mounting-bracket.



**Step 4:** Align the mounting holes on the left and right bases at the bottom of the chassis with the holes at the bottom of the mounting plate, and secure the chassis using two M6x16 screws to a torque of 4.5N.m.



## 5 Electrical Connection

### 5.1 Safety Instructions

#### **DANGER**

The PV string will generate lethal high voltage when exposed to sunlight.

- Operators must wear proper personal protective equipment during electrical connections.
- Must ensure that cables are voltage-free with a measuring instrument before touching DC cables.
- Respect all safety instructions listed in relevant documents about PV strings.

#### **DANGER**

- Before electrical connections, please make sure that the inverter switch and all switches connected to the inverter are set to "OFF", otherwise electric shock may occur!
- Ensure that the inverter is undamaged and all cables are voltage free before performing electrical work.
- Do not close the AC circuit breaker until the electrical connection is completed.

#### **WARNING**

Do not damage the ground conductor. Do not operate the product in the absence of a properly installed ground conductor. Otherwise, it may cause personal injury or product damage.

Please use measuring devices with an appropriate range. Overvoltage can damage the measuring device and cause personal injury.

Damage to the product caused by incorrect wiring is not covered by the warranty.

- Electrical connection must be performed by professionals.
- Operators must wear proper personal protective equipment during electrical connections.
- All cables used in the PV generation system must be firmly attached, properly insulated, and adequately dimensioned. Cables used shall comply with the requirements of local laws and regulations.
- The factors that affect cable selection include rated current, cable type, routing mode, ambient temperature, and maximum expected line loss.

## 5.2 Cable Requirements

Name	Type	Specification/Outer Diameter (mm <sup>2</sup> )	Conductor Crosssectional Area(mm <sup>2</sup> )
DC Cable	Multi-core photovoltaic cable with maximum withstand voltage of 1000V	6 ~ 9	5
Additional grounding cable	Outdoor single-core copper wire cable	/	The same as that of the PE wire in the AC cable
AC cable	Outdoor four-core copper wire cable	R, S, T, N wire (30~60)	SL100KRG-W, SL110KRG-W (70~120)
	PE ground copper cable	PE wire: 14~32	

## 5.3 External Grounding Connection

- For the transformerless inverter, it is vital to note that the positive and negative terminals of the PV string shall not be grounded, otherwise, the inverter cannot operate normally.
- The external grounding connection shall be conducted before the AC-side connection, PV string connection, and communication connection.
- The grounding connection of the external PE terminal shall not replace that of the AC wiring. Both connections shall be reliably grounded. Otherwise, the Slenergy assumes no liability for any potential consequences.

### 5.3.1 External Grounding Requirements

In PV systems, all non-current-carrying metal parts and equipment enclosures shall be grounded (e.g. PV brackets, inverter enclosures, etc.)

For a inverter, the external grounding terminal is required to be grounded at the near end. For multiple inverters, all external grounding terminals and the grounding points of PV brackets shall be connected to an equipotential line (as per case-specific analysis) to ensure equipotential connection.

### 5.3.2 Grounding Steps

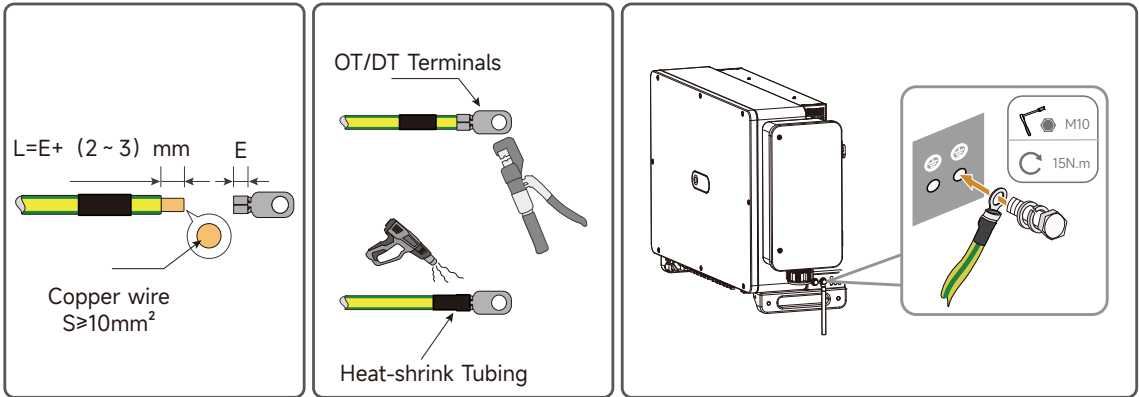
The cross-section area of the secondary grounding cable must be identical to that of the PE core wire in the AC cable.

**Step 1:** Assemble the cable and crimp the OT/DT terminals.

**Step 2:** Remove the screws from the grounding terminal and fix the cable using a screwdriver.

**Step 3:** Apply silicone gel or paint to the grounding terminal to enhance its corrosion resistance.

END



## 5.4 AC Cable Connection

### 5.4.1 AC-side Connection Requirement

Before connecting the AC side to Grid, the Grid voltage and frequency shall comply with the requirements of the inverter. See Technical Data for detailed parameters. If not, users shall contact the power utility company for resolution.



Only with the permission of the local grid department, the inverter can be connected to the grid.

### AC Circuit Breaker

Equip each inverter with an independent three-pole or four-pole circuit breaker on the AC side to make a safe disconnection between the inverter and Grid.

Inverter Model	Recommended AC Circuit Breaker Parameters
SL-100KRG-W, SL-110KRG-W	250A/400V



Multiple inverters shall not share a single AC circuit breaker.  
No load shall be connected between the inverter and AC circuit breaker.

### Leakage-current Protector

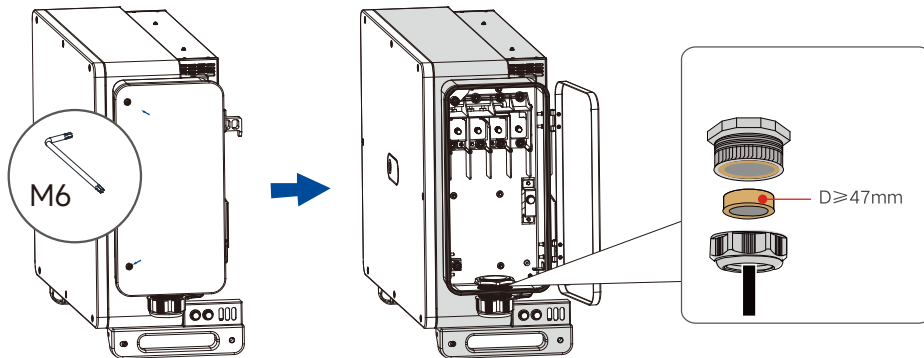
An integrated leakage-current monitoring unit is equipped inside the inverter, which will quickly disconnect the inverter from the Grid when a leakage current is detected greater than the allowed value.

### Multiple Inverters in Parallel Connection

If multiple inverters are connected in parallel to the grid, ensure that the total number of parallel inverters does not exceed 20.

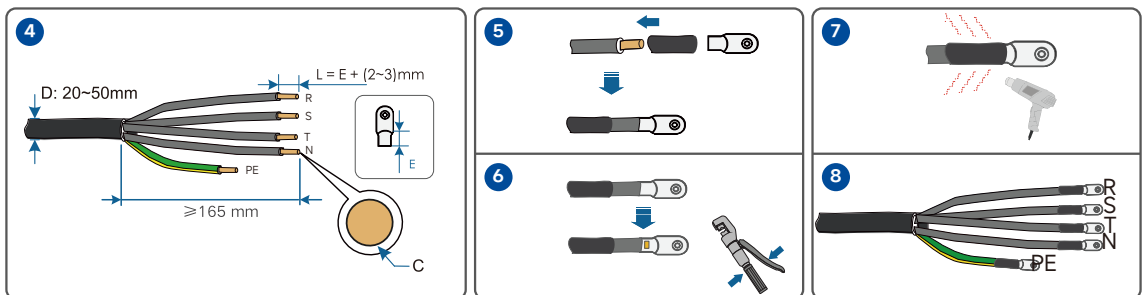
### 5.4.2 AC-side Wiring

- Step 1:** Disconnect the AC-side circuit breaker and prevent it from reconnecting by accident.
- Step 2:** Use a hex wrench (prepared by yourself) to loosen the two M6 hex head screws on the cover of the AC junction box and open the cover. (Note that cover mounting screws cannot be lost).
- Step 3:** Loosen the swivel nut of the AC waterproof connector, Lead the cable through the swivel nut, seal, and wiring terminal successively.



**Step 4:** Strip the protection layer and insulation layer by specific length, as described in the figure below.

**Step 5:** Make the cable and crimp OT/DT terminal.

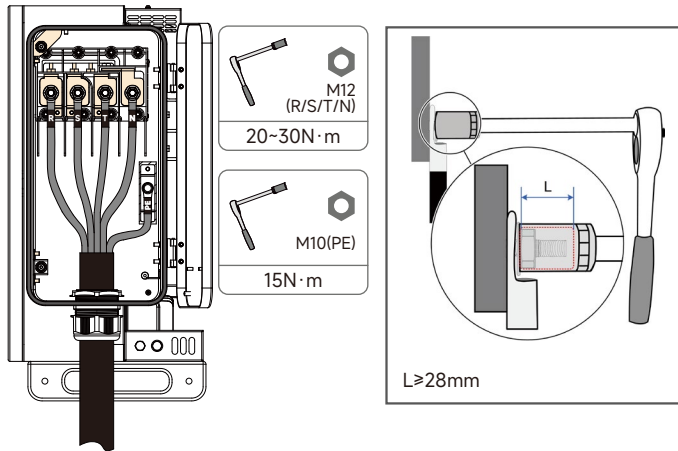


**NOTICE**

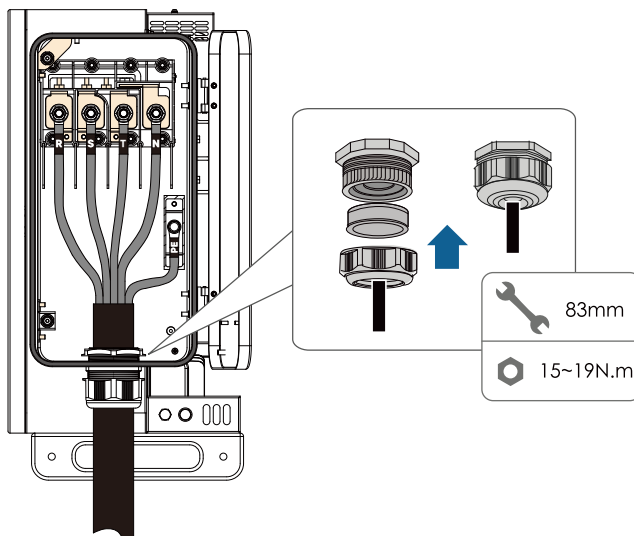
Pay much attention to the positioning of the "PE" cable and "N" cable. If the phase wire is connected to the terminal of "PE" or "N" cable, the inverter may be permanently damaged.



**Step 6:** Secure the wires to corresponding terminals.



**Step 7:** Gently pull the cable backwards to ensure firm connection, and fasten the swivel nut clockwise.



**Step 8:** Close the cover of the AC junction box and tighten the two M6 hexagonal pan head screws on the cover using a hex wrench.

End

## 5.5 DC-side Connection

### **⚠ ELECTRIC SHOCK**

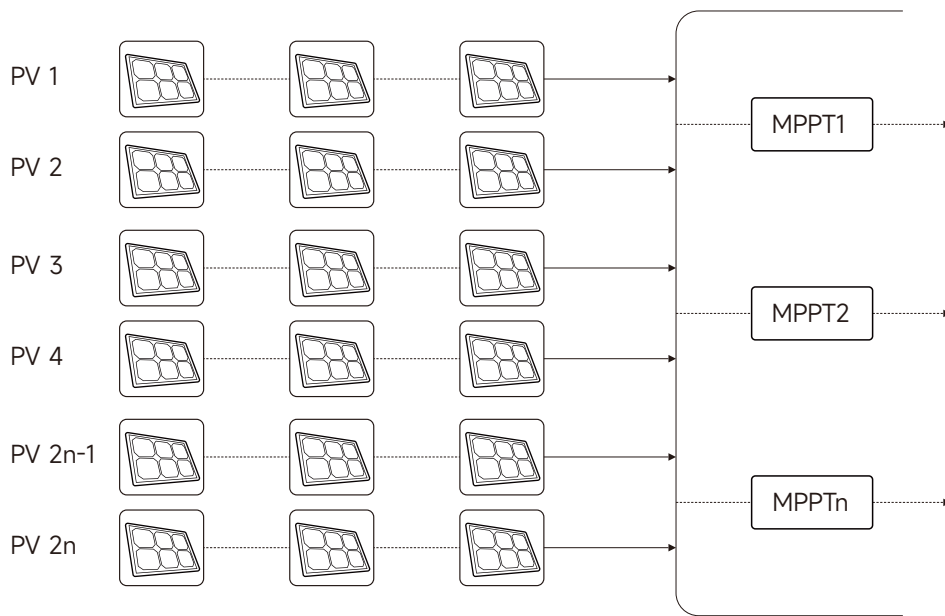
- Before electrical connection, protect the PV array from exposure to sunlight, otherwise it may cause risky voltages;
- Ensure good insulation of the PV array from the ground before connecting it to the inverter;
- When the inverter is installed and operated, ensure that the PV string is not short-circuit 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 1,000V ~ 1,100V, the inverter will be in the standby mode. When the voltage is restored within the MPPT working voltage range of 180 ~ 1,000V, the inverter will return to its normal operation.

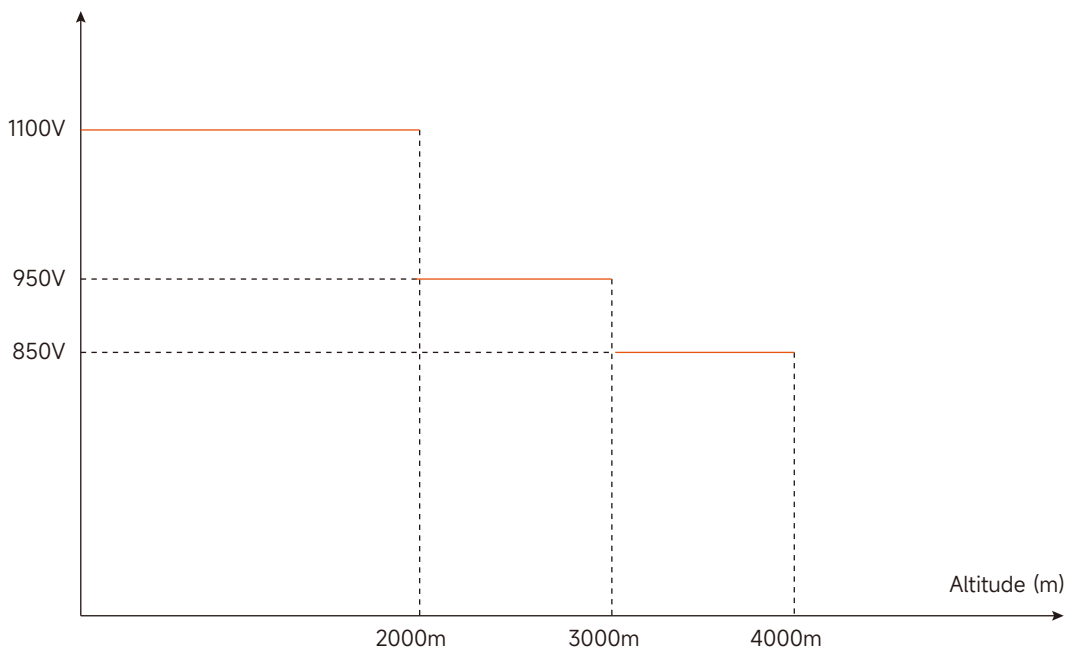
### 5.5.1 PV Input Configuration

SL100KRG-W and SL110KRG-W inverters have multiple PV inputs, and each PV input area is equipped with an independent 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	1100V	30A



Altitude derating curve of inverter open circuit voltage

### 5.5.2 Assembling DC Connectors

**⚠ CAUTION**

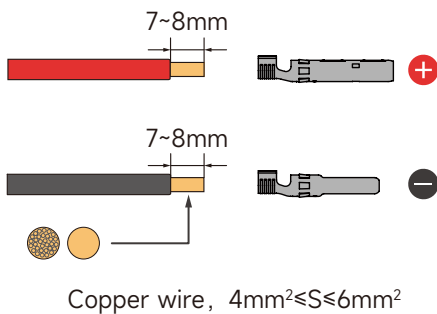
- Beware of high voltage in the inverter!
- Ensure all cables are uncharged before electrical connection;
- Keep the AC circuit breaker switch off before connecting the electrical to the inverter;
- Use the MC4 DC terminal in the shipping accessories when the maximum DC input voltage is not more than 1,000V;
- If the maximum DC input voltage exceeds 1,000V, use MC4-Evo2 DC terminal. Please contact the Company if needed;
- Please choose the required terminals if not, the damage is not covered under the warranty.



Only with the permission of the local grid department, the inverter can be connected to the grid.

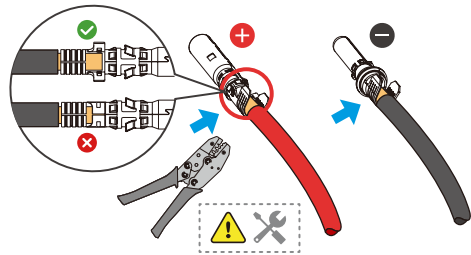
**STEP 1:**

Strip 7 mm of insulation layer from each DC cable.



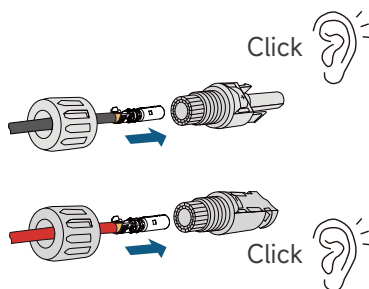
**STEP 2:**

Harness cable wire ends at wire terminals with crimping pliers.



**STEP 3:**

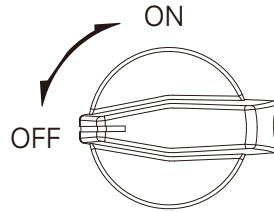
Thread the cable into the cable gland and fasten it by inserting it into the insulating sleeve. Pull the cable lightly to ensure it is connected tightly. Fasten the cable gland and the insulating sleeve with a force of 2.5 ~ 3 N·m.



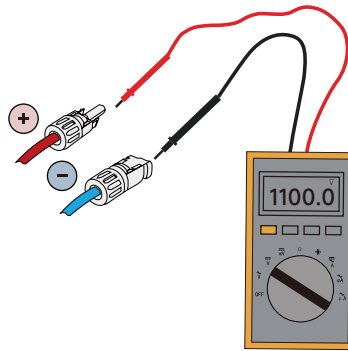
Ensure that the PV string is connected to the correct cable polarity. If the DC input polarity is reversed, the inverter in fault or alarm status fails to operate normally.

### 5.5.3 Installing DC Connectors

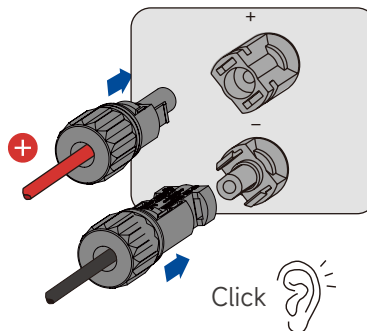
**STEP 1:** Rotate the DC switch to "OFF".



**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 1,100V.



**STEP 3:** Connect other PV strings as above and block the vacant DC terminals with MC4 waterproof plugs.



**⚠ CAUTION**

- Verify the panel's positive and negative polarities so that the DC connector is connected to the inverter and inserted to the corresponding DC terminal;
- The DC connector that is not in place may cause the rapid shutdown or connector overheating, and the resulting loss will not be covered by the warranty;
- Use the MC4 waterproof plug to block the vacant DC terminal.

## 5.6 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.

## 6. Commissioning

### 6.1 Inspection Before Commissioning

The inverter needs to be inspected before its first start-up as follows:

S/N	Inspection Item	Inspection Result	
		Normal	Abnormal
1	Check and confirm that all equipment is reliably installed.	<input type="checkbox"/>	<input type="checkbox"/>
2	Check if the DC switch and AC breaker are in "OFF".	<input type="checkbox"/>	<input type="checkbox"/>
3	Check the ground wire for proper connection.	<input type="checkbox"/>	<input type="checkbox"/>
4	Check the AC cable for proper connection.	<input type="checkbox"/>	<input type="checkbox"/>
5	Check the DC cable for proper connection.	<input type="checkbox"/>	<input type="checkbox"/>
6	Check the communication cable for proper connection.	<input type="checkbox"/>	<input type="checkbox"/>
7	Check if vacant terminals are sealed.	<input type="checkbox"/>	<input type="checkbox"/>
8	Ensure that no construction tools are left on top of the equipment or inside the wiring 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"/>

### 6.2 Commissioning Steps

**Step 1:** Rotate the DC switch on the inverter to "ON".

**Step 2:** Turn on the AC switch if it is configured between the inverter and Grid.

**Step 3:** Turn on the DC switch if it is configured between the inverter and PV string.

**Step 4:** Ensure that there is plenty of light and it meets the requirements for Grid connection to make the inverter operate normally.

**Step 5:** Observe the status of LED indicator (and see LED Indicator for details).  
End

## 7. Shutdown, Removing and Disposing of the Inverter

### 7.1 Shutting Down The Inverter

Avoid burns even after the inverter is shut down. Operate with protective gloves after the inverter has cooled. Shut down the inverter for maintenance or repair (except under normal circumstances). Disconnect the inverter from the AC/DC power supply according to the following steps to avoid casualties or equipment damage.

- Step 1:** Disconnect the external AC circuit breaker and avoid reconnection by improper operation.
- Step 2:** Disconnect the external DC circuit breaker and rotate the DC switch of inverter to "OFF".
- Step 3:** Wait at least 10 min to discharge the internal capacitance completely.
- Step 4:** Use the current clamp to confirm that there is no current on the DC cable.  
End

### 7.2 Removing The Inverter

#### **⚠ BURNS AND ELECTRIC SHOCK**

- Disconnect the inverter from Grid and PV cell panels, and wait at least 10 min before touching the internal conductive device;
- Before removing the inverter, disconnect both AC and DC connections;
- When the DC terminal of inverter exceeds two layers, remove the outer DC connector first, and then remove the inner DC connector.

- Step 1:** With reference to Electrical Connection, disconnect all electrical connections of inverter in reverse steps. Specifically, use the MC4 wrench to remove the DC connector by loosening its locking parts, and install the waterproof plug.
- Step 2:** With reference to Mechanical Installation, remove the inverter in reverse steps.
- Step 3:** If needed, remove the hanging plate on the wall.
- Step 4:** Please see Inverter Storage to store the inverter properly for future use.  
End

### 7.3 Disposing The Inverter

- Handle the inverter by users themselves;
- Avoid environmental pollutions caused by some parts and equipment of inverter, such as capacitors;
- Do not mix the disposed inverter with household waste, Follow the electronic waste regulations.

## 8. Troubleshooting and Maintenance

### 8.1 Troubleshooting

Once the inverter is faulty, you can check the corresponding fault information via faultcodes 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.

Fault Code	Fault Name	Corrective Measures
01	PV Voltage Fault	<p>Check the inverter voltage and current abnormalities to determine fault causes:</p> <ul style="list-style-type: none"> <li>• Check if parts corresponding to the fault is obscured, and if so, remove the shelters and ensure that the parts are clean;</li> <li>• Check the cell panel wiring for loose connections, and if so, replug it to ensure its stable connection;</li> <li>• Check the DC fuse for damage, and if so, replace it;</li> <li>• Contact the Customer Service Center if the fault still exists not for the above reasons.</li> </ul>
02	PV Reverse Connection Fault	<ul style="list-style-type: none"> <li>• Check if the positive and negative polarity of corresponding strings on the inverter is reversed, and if so, wait the PV string current lower to below 0.5A, turn off the DC switch, and adjust the opposite string polarity;</li> <li>• Contact the Customer Service Center if the fault still exists not for the above reasons.</li> </ul>
03	Abnormal BUS Voltage	<ul style="list-style-type: none"> <li>• Check the cell panel wiring for loose connections, and if so, replug it to ensure its reliable connection;</li> <li>• Check the DC fuse for damage, and if so, replace it;</li> <li>• Via the monitoring software, confirm the voltage of positive BUS and negative BUS and calculate their differential pressure value. When the above value exceeds the equipment protection threshold</li> </ul> <hr/> <ul style="list-style-type: none"> <li>• Check the cell panel wiring for loose connections, and if so, replug it to ensure its reliable connection;</li> <li>• Check the DC fuse for damage, and if so, replace it;</li> <li>• Via the monitoring software, confirm the voltage of positive BUS and negative BUS and calculate their differential pressure value. When the above value exceeds the equipment protection threshold</li> </ul>
13	Grid Over-voltage	<p>Generally, the inverter will be reconnected to the grid after the grid returns to normal. If the fault occurs repeatedly:</p> <ul style="list-style-type: none"> <li>• Measure the actual grid voltage, and contact the local electric power company for solutions if the grid voltage is higher than the set value.</li> <li>• Check whether the protection parameters are appropriately set via the App. Modify the overvoltage protection values with the consent of the local electric power operator.</li> <li>• Contact Sungrow Customer Service if the preceding causes are ruled out and the fault persists.</li> </ul>



Fault Code	Fault Name	Corrective Measures
	Grid Under-voltage	Generally, the inverter will be reconnected to the grid after the grid returns to normal. If the fault occurs repeatedly: <ul style="list-style-type: none"> <li>• Measure the actual grid voltage, and contact the local electric power company for solutions if the grid voltage is lower than the set value.</li> <li>• Check whether the protection parameters are appropriately set via the App.</li> <li>• Check whether the AC cable is firmly in place.</li> <li>• Contact Sungrow Customer Service if the preceding causes are ruled out and the fault persists.</li> </ul>
14	Grid Overfrequency	<ul style="list-style-type: none"> <li>• In general, reconnect the inverter to the Grid after the Grid returns to normal. If the fault is repeated:</li> <li>• Measure the actual Grid frequency, and if it exceeds the set range indeed, contact the local power utility company for resolution;</li> </ul>
	Grid Underfrequency	<ul style="list-style-type: none"> <li>• Check if the set protection parameter is qualified;</li> <li>• Contact the Customer Service Center if the fault still exists not for the above reason</li> </ul>
13	Mains Voltage Fault	In general, reconnect the inverter to the Grid after the Grid returns to normal. If the fault is repeated: <ul style="list-style-type: none"> <li>• Check if the Grid is stably supplied;</li> <li>• Check if the AC wiring is tight;</li> <li>• Check if the AC cable is connected to the correct terminal (or if the fire wire is connected to the N wire);</li> <li>• Check if the AC circuit breaker is turned on;</li> <li>• Contact the Customer Service Center if the fault still exists not for the above reasons.</li> </ul>
09	Insulation detection Fault	<ul style="list-style-type: none"> <li>• The fault can be caused by poor sunlight or damp environment, and generally the inverter will be reconnected to the grid after the environment is improved.</li> <li>• If the environment is normal, check whether the AC and DC cables are well insulated.</li> <li>• Contact the Customer Service Center if the fault still exists not for the above reason.</li> </ul>
06	Excess Leakage Current	Wait for the inverter to return to normal, but if the fault is repeated: <ul style="list-style-type: none"> <li>• Via the App, check if the ISO impedance-protection value is too high and confirm that it meets local regulatory requirements;</li> <li>• Check the earth impedance of PV strings and DC cables and take corrective measures if the short-circuited or cable-insulation layer is broken;</li> <li>• If the fault occurs on rainy days (with normal cables), reconfirm it when the weather condition improves;</li> <li>• Contact the Customer Service Center if the fault still exists not for the above reasons.</li> </ul>

Fault Code	Fault Name	Corrective Measures
05	Environment Over Temperature  Environment Low Temperature	<p>Generally, the inverter will operate again after its internal or module temperature returns to normal, but if the fault recurs:</p> <ul style="list-style-type: none"> <li>• Check the inverter for high ambient temperatures;</li> <li>• Check if the inverter is located in an airy site;</li> <li>• Check if the inverter is exposed to direct light, and if so, provide some shelters;</li> <li>• Check the fan for normal operation, and if not, replace it;</li> <li>• Contact the Customer Service Center if the fault still exists not for the above reasons.</li> </ul> <p>Shut down and disconnect the inverter, wait for the ambient temperature rising to the normal operating temperature range, and then restart the inverter.</p>
10	Relay Fault	Contact the Customer Service Center.
08	Communication Fault	

### Alarm Exception

Fault Code	Fault Name	Corrective Measures
04	Anti-reverse Current Meter Communication Alarm	<ul style="list-style-type: none"> <li>• Check the meter for improper position of wiring;</li> <li>• Check if the input and output wiring direction of meter is reversed;</li> <li>• If the retrofit system is enabled, check if the rated power is correctly set for the inverter.</li> </ul>
05	Grid Overload Alarm	<ol style="list-style-type: none"> <li>1. Check whether the output port is connected to the actual power grid. If yes, disconnect it from the power grid.</li> <li>2. Contact the Customer Service Center if the fault still exists not for the above reasons.</li> </ol>
03	Abnormal String Alarm	<ul style="list-style-type: none"> <li>• Check the number of cell panels configured for the corresponding string is fewer than other strings, and if so, wait the PV string current to lower below 0.5A, turn off the DC switch, and adjust the panel configuration for the string;</li> <li>• Check the cell panels of string for shelters;</li> <li>• Wait the PV string current lower to below 0.5A, turn off the DC switch, and check if the open-circuit voltage of strings is abnormal. If so, check the cell panel for its wiring and configuration;</li> <li>• Check the cell panel for its abnormal orientation.</li> </ul>
02	Surge Protector Alarm	Contact the Customer Service Center.
01	Abnormal Fan-speed Alarm	

## 8.2 Maintenance

### 8.2.1 Maintenance Notes

**Avoid personnel injury or product damage due to improper maintenance!**  
 Always remember that the inverter is powered by dual power sources: the PV string and public Grid.

**Before maintaining the inverter, obey the following steps:**

- First disconnect the Grid-side AC circuit breaker, and then turn off the DC switch;
- Wait at least 10 min to discharge the internal energy-storage element completely, and then maintain or repair the internal parts of inverter;
- Use test equipment to check if the inverter is free of voltage and current;
- Post temporary warning signs or erect barriers to avoid unrelated personnel from entering the working area during electrical connections and maintenance;
- Restart the inverter after troubleshooting faults that affect the inverter's safety performance;
- Without permission, do not replace the inverter's internal components, as it does not contain repair parts;
- Contact the Customer Service Center for any maintenance service;
- The damages caused by the improper operation are not covered under the warranty, and the Company does not bear the joint liability;
- Avoid damage to devices by touching printed circuit boards or other electrostatic sensitive parts;
- Avoid unnecessary circuit board contact;
- Comply with electrostatic protection norms and wear antistatic wristbands.

### 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.	Six months to a year (depend on the dust contents in air.)
Equipment inlet hole	Check the equipment inlet holes for incomplete blocking or large gaps, and if so, block it tightly.	Once a year
Fans	<ul style="list-style-type: none"> <li>• Check whether there is fan warning using App.</li> <li>• Check whether there is any abnormal noise when the fan is turning.</li> <li>• Clean or replace the fans if necessary (see the following section).</li> </ul>	Once a year
Electrical connection	Check the cable connection for looseness, detachment, and damage, especially the contact part with the metal enclosure for cuts.	Six months to a year

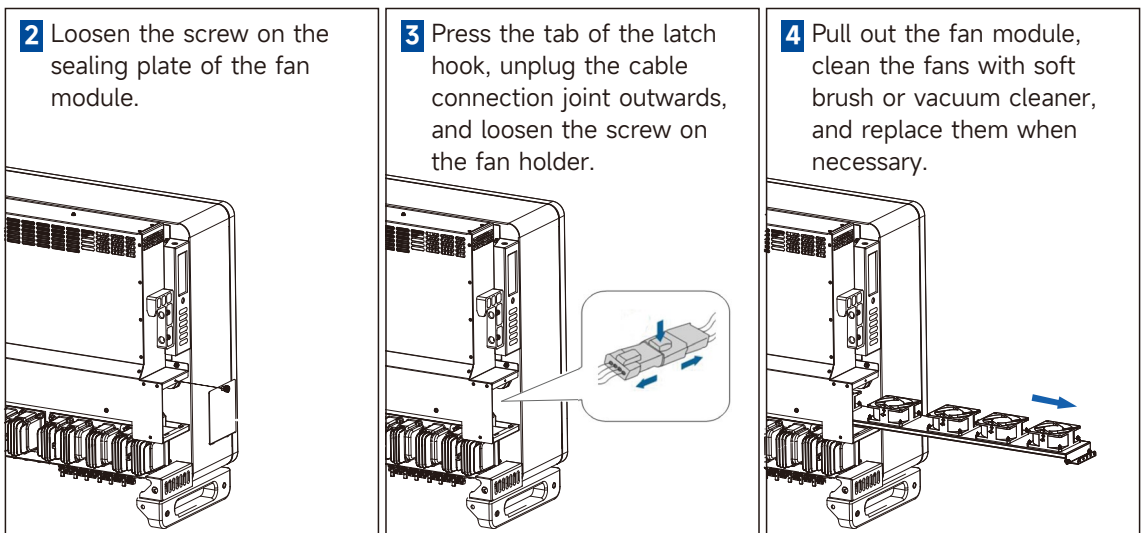
### 8.2.3 Fan Maintenance

When the inverter is operated in a thermal environment, good ventilation and heat dissipation may minimize the chance of load shedding. The cooling fan, which is equipped outside the inverter, will reduce the excessive external temperature of the inverter. If the inverter's output power is reduced due to the excessive external temperature, the possible causes and countermeasures are listed below.

1. Clogged fan or excessive dust on the heat sink. Clean the fan, fan cover or heat sink;
2. Damaged fan. Replace it with a new fan.
3. Poor ventilation of inverter installation site. Choose a suitable installation site according to the basic installation requirements.

#### Fan Cleaning and Replacement Steps

- 1.** Before cleaning or replacing the fan, ensure the DC/AC sides of the inverter are disconnected:
  - Turn off the DC switch;
  - After the inverter is powered off for 5 minutes, measure the voltage and current with professional instrument. Only when there is no voltage nor current can operators who wear protective equipment operate and maintain the inverter;
  - Unplug the DC terminal (for users, use tools to disconnect the DC connection terminal);
  - Power off the inverter and disconnect it from all power supplies before maintaining fans;
  - Fan maintenance must be performed by professionals.



- 5.** Clean the fan, fan grid, and heat sink or replace the fan:
  - Clean the heat sink with air pump, and use the brush or damp cloth to clean the fan and fan grid;
  - If needed, remove the fan and clean it separately;
  - Remove the fan to be replaced with a cross screwdriver;
  - Replace with a new fan.
- 6.** Reinstall the fan plate and inverter.

## 9. Appendix

### 9.1 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.**

### 9.2 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.

#### **Slenergy Technology GmbH**

Address: Hamburger Allee 2-4, 60486 Frankfurt am Main  
WhatsApp Business Account: +49 69 923981019  
Email: [service@slenergy.com](mailto:service@slenergy.com)

As the dimension and parameter of products change, the latest information of our company shall prevail without prior notice.

## 9.3 Technical Parameters

Parameters	SL100KRG-W	SL110KRG-W
<b>Input (DC)</b>		
Max. PV input voltage@STC	150000 W	165000 W
Max. Input Voltage ( V )	1100	
Start-up Voltage ( V )	200	
Rated Input Voltage ( V )	600	
MPPT Input Voltage Range ( V )	180-1000	
No. of independent MPP inputs	9	
Max. current for input connector	2	
Max. current for input connector ( A )	32A	
Max.DC Short-circuit current	40A	
<b>Output (AC)</b>		
AC Nominal Powerput Power ( kW )	100000 W	110000 W
Max. Input Apparent Power ( kVA )	110000 VA	121000 VA
Nominal AC Voltage	220V/380V, 3L/N/PE or 3L/PE	230V/400V, 3L/N/PE or 3L/PE
AC Grid Frequency	50/60 Hz	
Output Frequency Range	(45-55)/(55-65) Hz	
Max. Output Current (PF=0.9)	166.7 A	175 A
Adjustable Power Factor	>0.99	
THDi	0.8 leading – 0.8 lagging	
Total Harmonic Distortion	<3%	
<b>Efficiency</b>		
MAX. Efficiency	98.5%	
European Efficiency	98.2%	
MPPT Efficiency	99.9%	
<b>Protection</b>		
Anti Reverse Power Function	Optional	
DC Reverse Polarity Protection	YES	
DC Switch	YES	
AC/DC Surge Protection	Type II	
Insulation Resistance Monitoring	YES	
AC Short-circuit Protection	YES	
Grid Monitoring	YES	
Anti-islanding Protection	Type II	
Residual-current Monitoring Unit	YES	
String Fault Monitoring	YES	
AFCI Protection	Optional	

Parameters	SL100KRG-W	SL110KRG-W
<b>General Parameter</b>		
Dimensions (W×H×D)	1040 x 700 x 350 mm	
Weight	85 kg	
Operating Temperature Range	-25°C- +60°C ( >45°C is Derating)	
Relative Humidity	0-100%	
Altitude	4000m ( > 3000m derating))	
Self-consumption at Night	<4 W	
Topology	Transformerless	
Cooling	Smart forced air cooling	
Protection Degree	IP66	
Guarantee Period	5 / 10 Years (Optional)	
Display	LED	
Communication	RS485/USB/Bluetooth; 4G/WiFi (Optional)	
<b>Criteria Met</b>		
Grid connection standard	NB/T 32004	
Safety standards	IEC62109-1/2, IEC62116, IEC61727	
EMC and other standard	EN61000-6-1/2/3/4, IEC61683, IEC60068(1,2,14,30)	

**Note: Actual product certification shall prevail when there is a discrepancy between the product certification and the manual.**



Official website of Slenergy



Smart M

## Importer

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Telephone:

Address:

## Manufacturer

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