

# Solavita



# SV

## 10/12/15/17/20/25 kW

Three-phase On-grid Inverter

# User Manual

# Content

1. Product Introduction .....	2
1.1 Symbol Interpretation .....	2
1.2 Important Safety Information .....	3
1.3 System Capacity .....	4
2. Unpacking and Storage .....	5
2.1 Unpacking and Inspection .....	5
2.2 Inverter Storage .....	5
3. Product Overview .....	6
3.1 Product Purpose .....	6
3.2 Product Appearance .....	6
3.3 Product Topology Diagram .....	8
4. Product Installation .....	9
4.1 Unpacking Inspection .....	9
4.2 Installation Tool Preparation .....	10
4.3 Installation Environment Requirements .....	11
4.4 Installation Angle Requirements .....	12
4.5 Installation Space Requirements .....	12
4.6 Inverter Handling .....	13
4.7 Inverter Installation .....	13
5. Electrical Connection .....	16
5.1 Electrical Connection Overview .....	16
5.2 External Grounding Cable Connection .....	16
5.3 AC Side Cable Connection .....	17
5.4 DC Side String Connection .....	19
5.5 Communication Connection .....	21
6. Inverter Commissioning .....	24
6.1 Cable Connection Inspection .....	24
6.2. Start the Inverter .....	24
7. Operation Interface .....	25
8. Fault Troubleshooting and Maintenance .....	26
8.1 Fault Troubleshooting .....	26
8.2 Maintenance .....	27
9. Technical Parameters .....	29

# Foreword

**Attention!**

This manual contains important safety instructions that must be followed during the installation and maintenance of the equipment!

**Keep the Manual!**

This manual is an important part of the equipment. Please keep it properly and make it readily available!

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# 1. Product Introduction

Please read this product manual carefully before installation, operation, and maintenance. This manual contains important safety and installation instructions that must be followed during the installation, commissioning, and maintenance of the equipment.







This product manual describes the installation, electrical connection, commissioning, maintenance, and troubleshooting of Skyworth Photovoltaic's 10 - 25kW three - phase series inverters. This series includes the following models:



**SV010KTL-T1-BM22 SV012KTL-T1-BM22 SV015KTL-T1-BM24**  
**SV017KTL-T1-BM24 SV020KTL-T1-BM24 SV025KTL-T1-BM24**  
**SV6000TL-T1-BM22-V1 SV8000TL-T1-BM22-V1 SV010KTL-T1-BM22-V1**  
**SV012KTL-T1-BM24-V1 SV015KTL-T1-BM24-V1**

This manual is applicable to professional electrical technicians responsible for the installation and commissioning of inverters in photovoltaic power generation systems. The installation must be carried out by professional electrical personnel certified by relevant departments.

## 1.1 Symbol Interpretation


To ensure the personal and property safety of users when using the photovoltaic grid - connected inverter and to use this product more efficiently, the manual provides relevant safety information and highlights it with corresponding symbols. These emphasized messages must be fully understood and strictly adhered to for better use of this manual.

	Ensure that the input DC voltage does not exceed 1100V under any circumstances.
	Caution: High voltage and electric shock hazard.
	After the inverter is powered off, wait for 5 minutes to ensure that the machine is completely discharged.
	During the operation of the machine, the surface temperature of the enclosure is high. Please be careful when touching the enclosure to avoid burns.
	Grounding terminal.
	CE Certificate

	Electrical positive and negative polarity markings.
	Read the installation manual.

## 1.2 Important Safety Information

Please read this manual carefully before installing, operating, or maintaining the inverter.

	<b>Transportation Precautions:</b> <ul style="list-style-type: none"> <li>• When transporting the inverter, the original packaging of the inverter or appropriate packaging must be used to ensure the safety of the equipment during transportation.</li> </ul>
	<b>Installation Precautions:</b> <ul style="list-style-type: none"> <li>• Check if the inverter and packaging are damaged. If you have any questions, please contact the supplier before installing the inverter.</li> <li>• Before installation, ensure that the product has no electrical connections.</li> </ul>
	<b>Electrical Connection Precautions:</b> <ul style="list-style-type: none"> <li>• To protect the installer, follow the steps in this manual for electrical connection and installation. The frames and brackets of the photovoltaic array should be safely grounded, which should meet the grounding requirements of the local power department! Check the voltage of the photovoltaic string and ensure that it is within the voltage limit range of the inverter. Only professional electrical engineers who have received training, are authorized, and have obtained permission from the local power department can connect the inverter to the grid.</li> </ul>
	<b>Operation Precautions:</b> <ul style="list-style-type: none"> <li>• Do not touch any terminals or conductors connected to the grid circuit; before connecting the AC grid to the inverter, make sure that the cover plate is closed multiple times. The cover plate of the inverter must not be opened during operation.</li> </ul>
	<b>Maintenance and Repair Precautions:</b> <ul style="list-style-type: none"> <li>• Only authorized personnel are allowed to repair or adjust the inverter. For any repair work, first disconnect the electrical connection between the inverter and the grid, and then disconnect the DC side electrical connection. Wait at least 5 minutes to ensure that the internal components are completely discharged before performing repair work.</li> </ul>
	<b>Functional Safety Parameter Precautions</b> <ul style="list-style-type: none"> <li>• Unauthorized changes to functional safety parameters may cause harm or accidents to personnel or the inverter. It may lead to the invalidation of all approved inverter operation certification certificates.</li> </ul>

## 1.3 System Capacity



When determining the capacity of the photovoltaic system, it must be ensured that the open - circuit voltage of the photovoltaic string does not exceed the maximum input voltage of 1100V. An excessively high PV voltage may damage the inverter. (The machine may not operate normally when the voltage exceeds 1000V).

The output selection of the photovoltaic string should be based on the ratio of the optimal utilization of investment capital to the expected annual power generation of the system. This optimal condition selection also depends on local weather conditions and should be considered under each weather condition.

## 2. Unpacking and Storage

### 2.1 Unpacking and Inspection

The equipment has been fully tested and strictly inspected before leaving the factory, but damage may still occur during transportation. Please conduct a detailed inspection as follows before signing for the product:

- Check if the packaging box is damaged.
- Check if the goods are complete according to the packing list and whether they match the order.
- Unpack and check if the internal equipment is intact.

If there is any damage or the goods are incomplete, please contact the transportation company or directly contact Shenzhen Skyworth Photovoltaic Technology Co., Ltd., and provide photos of the damaged parts or the names and quantities of the missing accessories to facilitate service provision. Do not discard the original packaging of the equipment. It is best to store the equipment in the original packaging box after it is shut down and removed.



After receiving the product, check if the product appearance and structural parts are damaged, and check if the packing list is consistent with the actual ordered product. If there are any problems with the above inspection items, do not install and contact Shenzhen Skyworth Photovoltaic Technology Co., Ltd. in time. If using tools to unpack, pay attention to the use of tools and do not damage the product.

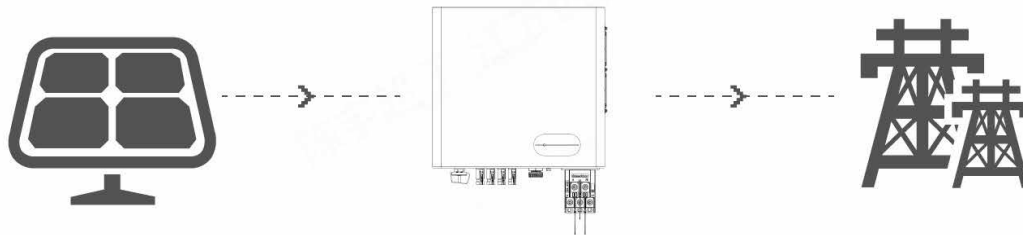
### 2.2 Inverter Storage

- If the inverter is not put into operation immediately, it needs to be stored under specific environmental conditions.
  - Repack it using the original packaging box.
  - The storage temperature range is  $-40^{\circ}\text{C} \sim 70^{\circ}\text{C}$ , and the relative humidity range is  $0 \sim 95\%$  without condensation.
  - The stacking layers of multiple inverters should not exceed the "stacking layer limit" marked on the outer box.
  - The packaging box should not be tilted or inverted.
  - If the product needs to be transported again, it should be strictly packaged before loading and shipping.
    - Do not store the product in places exposed to direct sunlight, rain, or strong electric fields.
    - Do not place this product together with items that may affect or damage this product.
    - The inverter needs to be stored in a clean and dry place to prevent dust and water vapor erosion.
  - Do not store the inverter in places with chemical corrosive substances or pest and rodent infestation.
  - Conduct regular inspections. Inspect at least once every six months. If there is pest or rodent damage, the packaging materials need to be replaced in time.
  - If the inverter is stored for one year or more, it needs to be inspected and tested by professional personnel before being put into operation.

## 3. Product Overview

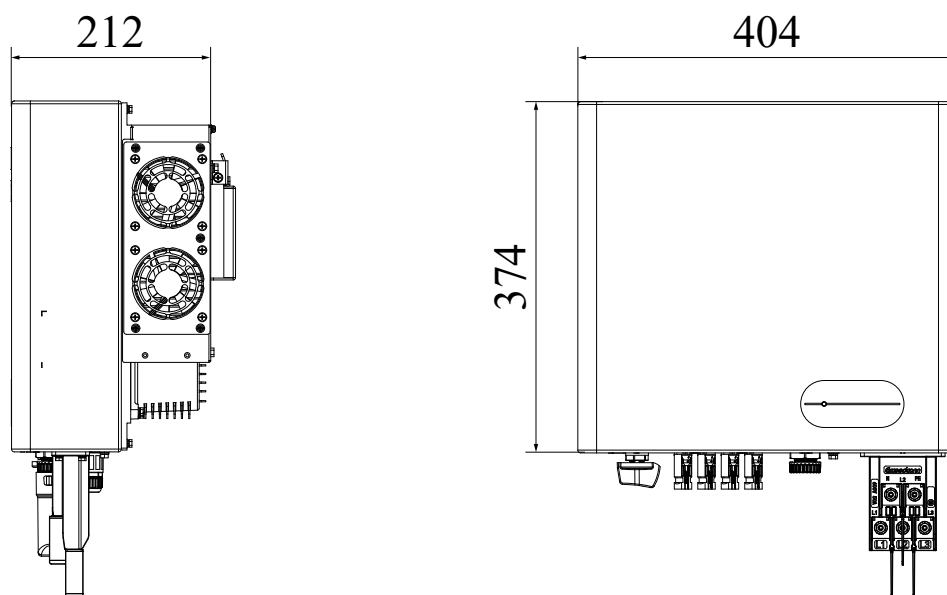
### 3.1 Product Purpose

This series is a three - phase transformerless grid - connected inverter, which is the core equipment connecting photovoltaic modules and the grid in a photovoltaic system. The inverter can convert the direct current generated by photovoltaic modules into alternating current that meets the requirements of the local grid and feed it into the grid.



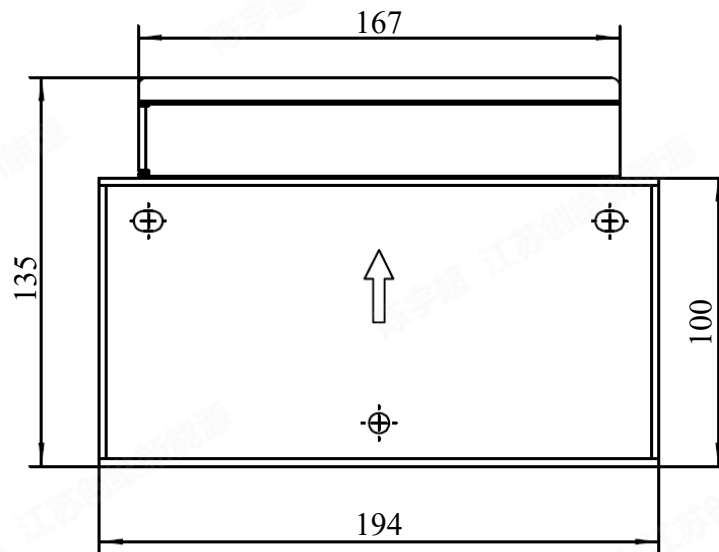
### 3.2 Product Appearance

#### 3.2.1 Product Appearance Schematic Diagram

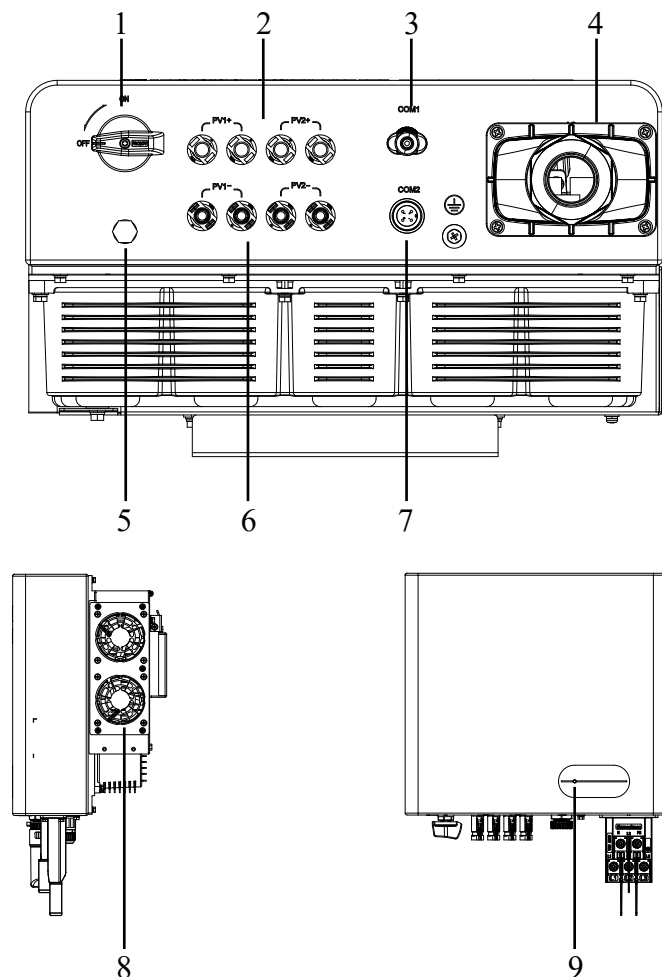




### 3.2.2 Product Back Panel Schematic Diagram

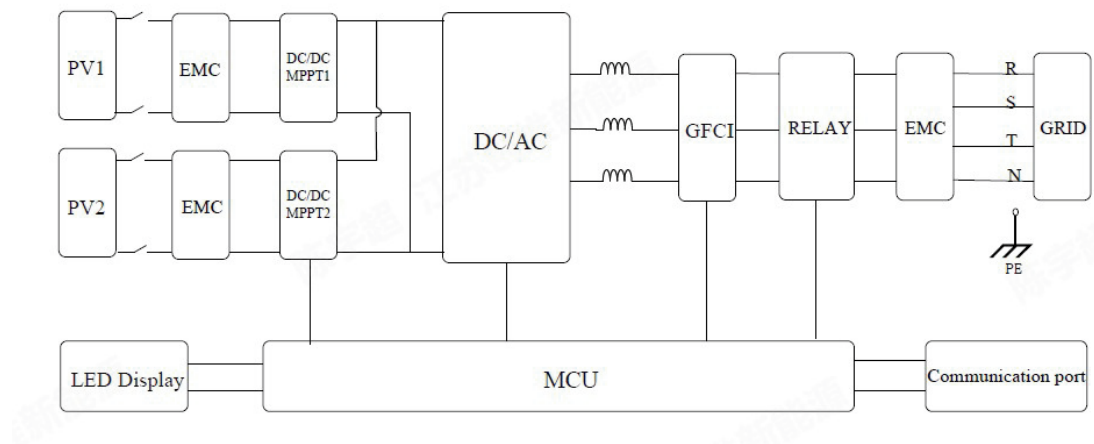


### 3.2.3 Product Structure Schematic Diagram



No.	Name	No.	Name
1	DC Switch	2	PV Input Port
3	COM1 Port (USB)	4	AC Connection Port
5	Vent Valve	6	COM2 Port
7	Grounding Terminal	8	External Fan
9	LED Indicator		

### 3.3 Product Topology Diagram

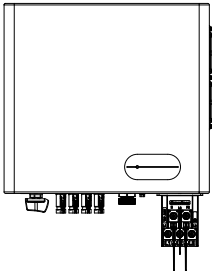
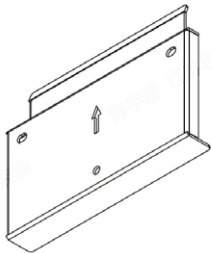
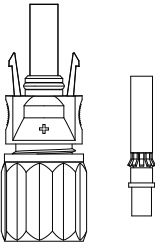
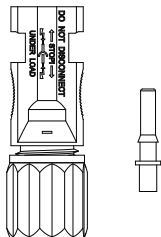
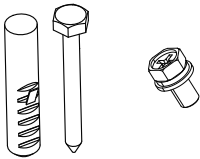


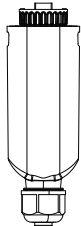
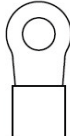

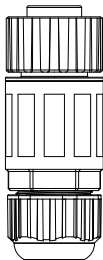



## 4. Product Installation

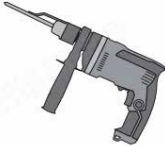




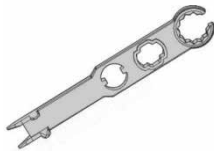



### 4.1 Unpacking Inspection




**Tip!**

Check if the inverter and packaging are damaged, if all accessories are complete, and if there is any obvious external damage. If there is any damage or anything is missing, please contact your dealer.

			
Inverter	Installation Bracket	PV Terminal+ * 4	PV Terminal- * 4
			
Cross - head Screw * 1 Self - tapping Screw and Expansion Tube * 3	Factory Inspection Report	Quick Installation Manual	WiFi Datalogger
			
Grounding Terminal	AC Terminal	COM2 Terminal	Certificate of conformity

## 4.2 Installation Tool Preparation


No.	Tool	Description	Function
1		Impact Drill	Drill holes in the wall for installing the back panel
2		Level	Ensure the horizontal installation of the back panel
3		Hot Air Gun	
4		Marker Pen	Mark the drilling positions
5		≥150mm Cross - head Screwdriver (M4, M5, M6)	Remove, install screws and make connections
6		Disassembly and Assembly Tool	Remove MC4 terminals
7		Rubber Hammer	Used to hammer expansion screws
8		Wire Cutter	Used to cut cables
9		Wire Stripper	Strip wires

10		Multimeter	Check the positive and negative poles of PV, if the AC connection is correct, and if the grounding is reliable
11		Crimping Pliers	Crimp AC cables and PV cables
12		Protective Gloves, Mask, Glasses	Protect personal safety

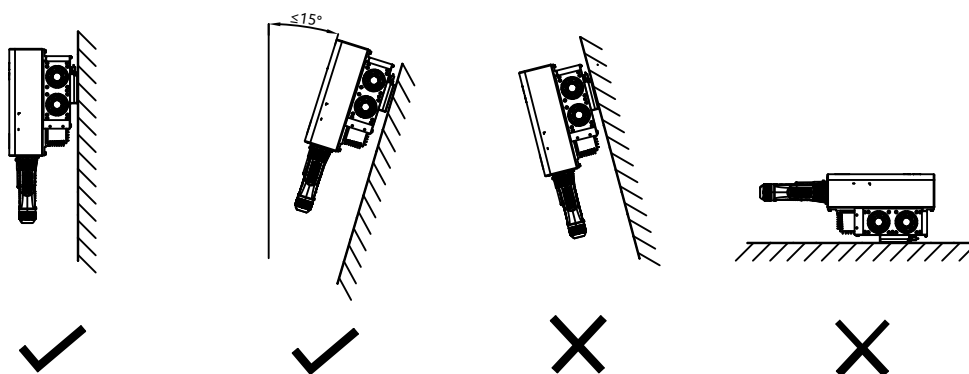
### 4.3 Installation Environment Requirements

1. The equipment should not be installed in flammable, explosive, corrosive, or other environments.
2. The installation carrier should be firm and reliable and can bear the weight of the inverter.
3. The installation space should meet the ventilation and heat dissipation requirements and operation space requirements of the equipment.
4. The equipment protection level should meet the indoor and outdoor installation requirements, and the installation environment temperature and humidity should be within the appropriate range.
5. The equipment should not be installed in flammable, explosive, corrosive, or other environments.
6. The installation position should avoid the reach of children and should not be installed in an easily touched position. The surface of the equipment may be hot during operation to prevent scalding.
7. The installation height of the equipment should be convenient for operation and maintenance, ensuring that the equipment indicators and all labels are easy to view and the terminals are easy to operate.
8. The installation altitude of the inverter should be lower than the maximum working altitude of 4000m. When the altitude is higher than 2000m, the inverter will be derated.
9. The inverter will be corroded when installed in salt - damage areas. Salt - damage areas refer to areas within 1000m from the coast or areas affected by sea breeze. The areas affected by sea breeze vary depending on meteorological conditions (such as typhoons, seasonal winds) or topography (dams, hills).
10. Keep away from strong magnetic field environments to avoid electromagnetic interference. If there are radio stations or wireless communication equipment below 30MHz near the installation position, please install the equipment as follows:
  - Add a multi - turn wound ferrite core at the DC input line or AC output line of the inverter, or add a low - pass EMI filter.
  - The distance between the inverter and the wireless electromagnetic interference equipment should exceed 30m.
11. The working environment temperature is based on the average temperature within 1m around the inverter, and the temperature and humidity should meet the following requirements: Temperature: - 25°C - 60°C; Humidity: 0 - 100% without condensation.


## 4.4 Installation Angle Requirements

	<p><b>Attention!</b></p> <ul style="list-style-type: none"> <li>• Select a suitable installation position and surface, which must be suitable for the weight and size of the inverter.</li> <li>• Ensure that the distance between the waterproof joint and the ground is <math>\geq 500\text{mm}</math>.</li> </ul>
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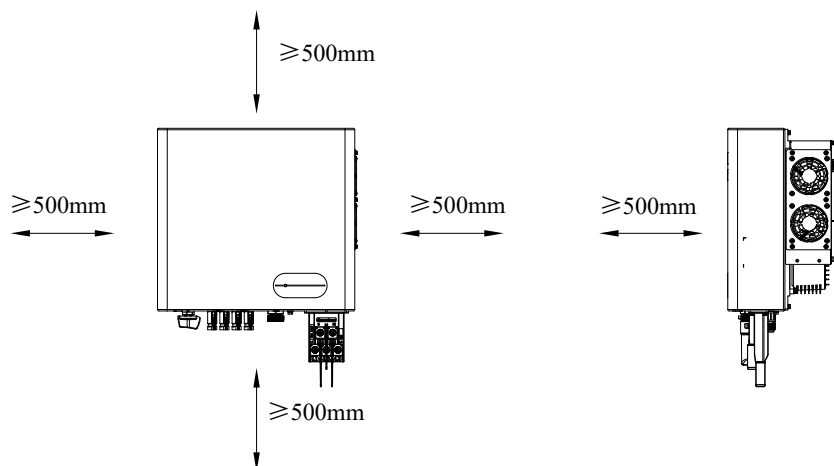
It is recommended to install the inverter vertically or tilted backward (not exceeding  $15^\circ$ ). Do not install the inverter forward tilted, inverted, horizontal.



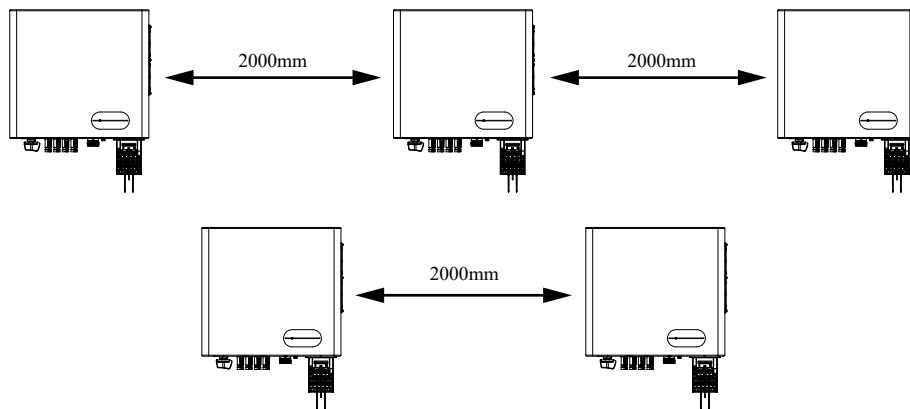
## 4.5 Installation Space Requirements

	<p><b>Danger Warning!</b></p> <p>Please ensure that the heat dissipation system or ventilation openings of the inverter are not blocked.</p>
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Considering heat dissipation and easy disassembly, and ensuring sufficient space around the inverter for ventilation, the minimum distance around the inverter should not be less than the following values:



When installing multiple inverters, a certain spacing should be reserved between the inverters. The recommended installation method is the herringbone shape as follows.



## 4.6 Inverter Handling

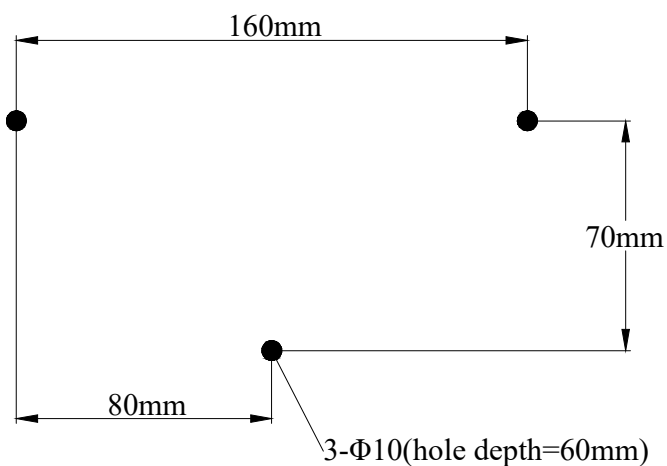
	<p>Note:</p> <ul style="list-style-type: none"> <li>• The inverter is heavy. When handling, please pay attention to maintaining balance to avoid the machine falling and injuring the operator.</li> <li>• Please place the inverter horizontally; the power cord interface and signal cable interface at the bottom of the inverter cannot bear weight, and do not place the bottom directly on the ground.</li> <li>• When placing the inverter on a hard ground, it is necessary to lay foam or paper and other protective materials under it.</li> </ul>
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Take the inverter out of the outer packaging and transport it horizontally to the designated installation location. Open the outer packaging box, and two operators insert their hands under the radiator of the inverter respectively, and then carry the inverter out of the outer packaging box and transport it to the designated installation location.

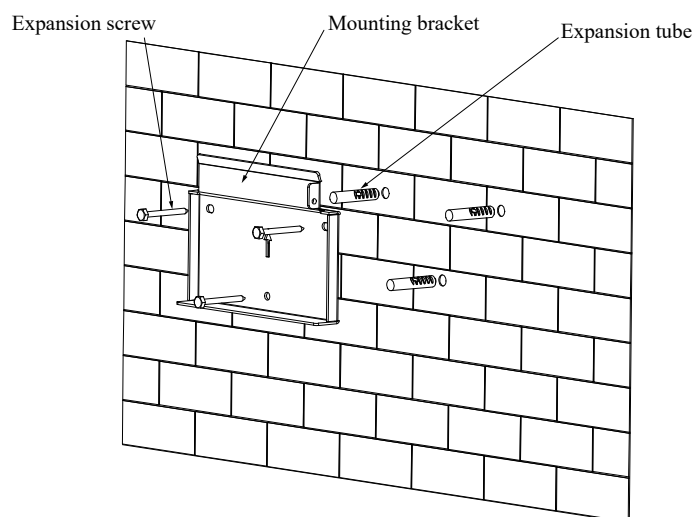
## 4.7 Inverter Installation

Step 1: Place the back panel at the installation point, use a level to adjust the back panel to a horizontal angle, and mark the drilling positions with a marker pen.

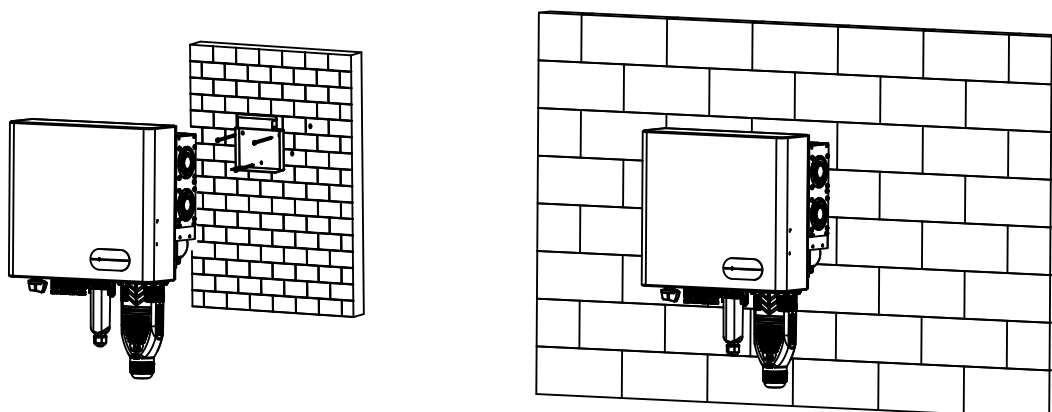
Step 2: Use an impact drill to drill holes in the wall. When drilling, please keep the impact drill perpendicular to the wall, and the drilling depth should be slightly greater than the length of the plastic expansion tube.



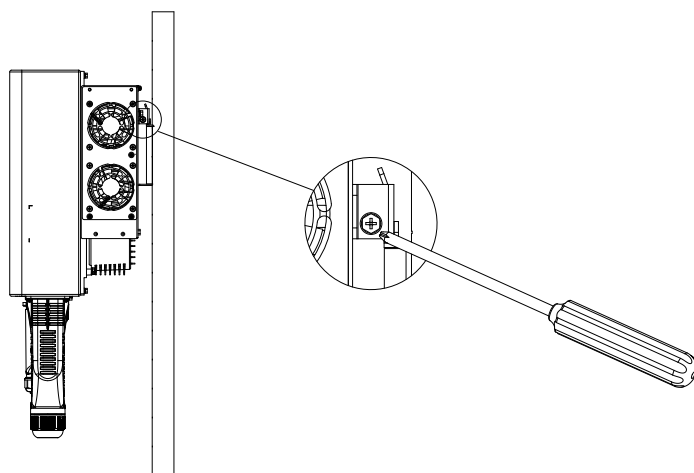
Step 3: Slowly hammer the expansion tube into the drilled hole with a hammer, and use the expansion screw in the accessory package of the packaging box to fix the back panel.



Step 4: Lift the inverter onto the back panel, ensure that the inverter fits well with the groove of the back panel, and use a cross-head screw to lock the inverter and the back panel.

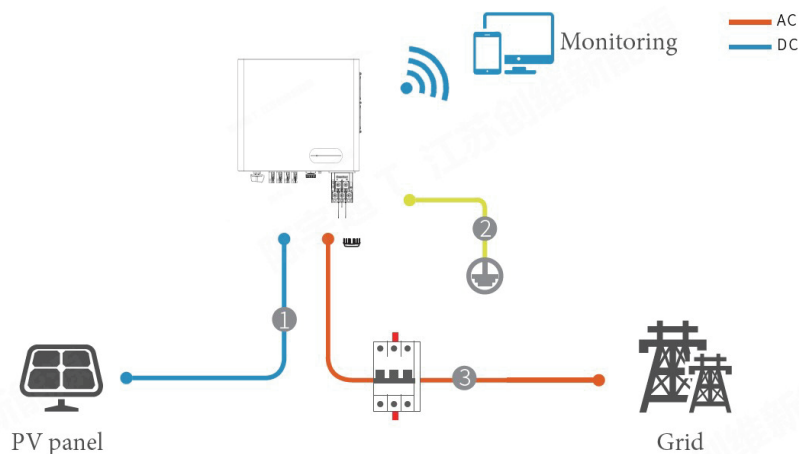






## 5. Electrical Connection

### 5.1 Electrical Connection Overview



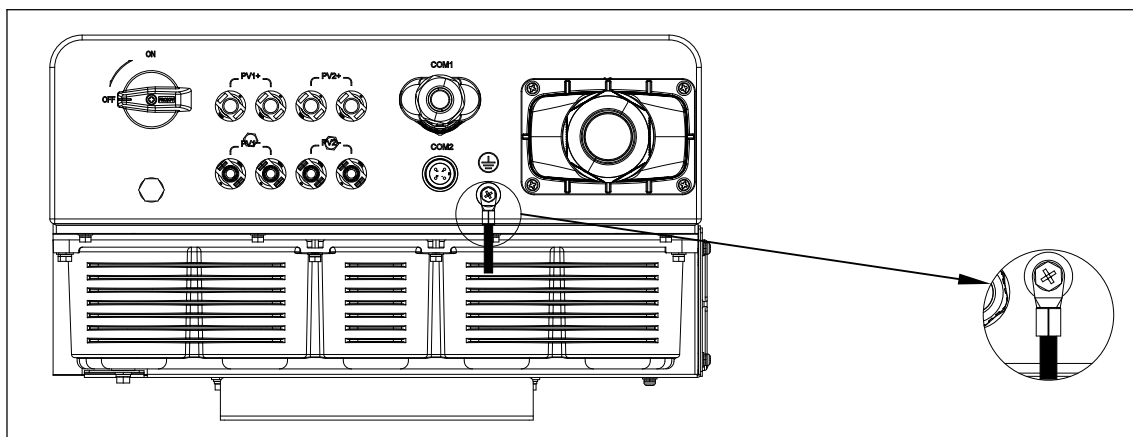
### 5.2 External Grounding Cable Connection



**Note:**

- Before connecting the AC side and DC string, please perform external grounding connection first to ensure safety.
- Since the inverter is of the transformerless type, it is required that neither the positive nor the negative pole of the photovoltaic array can be grounded, otherwise it will cause inverter failure.
- It is recommended that both the external protective grounding terminal and the AC side grounding terminal be reliably grounded.

Inverter Model	Recommended PE Cable Cross - sectional Area
SV010KTL-T1-BM22	6mm <sup>2</sup> (10AWG)
SV012KTL-T1-BM22	6mm <sup>2</sup> (10AWG)
SV015KTL-T1-BM24	6mm <sup>2</sup> (10AWG)
SV017KTL-T1-BM24	6mm <sup>2</sup> (10AWG)
SV020KTL-T1-BM24	6mm <sup>2</sup> (10AWG)
SV025KTL-T1-BM24	6mm <sup>2</sup> (10AWG)
SV6000TL-T1-BM22-V1	6mm <sup>2</sup> (10AWG)
SV8000TL-T1-BM22-V1	6mm <sup>2</sup> (10AWG)
SV010KTL-T1-BM22-V1	6mm <sup>2</sup> (10AWG)
SV012KTL-T1-BM24-V1	6mm <sup>2</sup> (10AWG)
SV015KTL-T1-BM24-V1	6mm <sup>2</sup> (10AWG)



### 5.3 AC Side Cable Connection



Note:

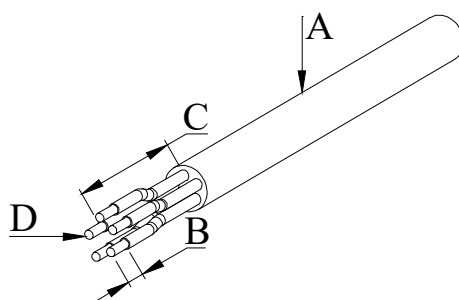
- Each inverter must be independently installed with an AC circuit breaker, and it is prohibited to share one AC circuit breaker for multiple inverters.
- Do not connect a local load between the inverter and the AC side circuit breaker.
- Before making the electrical connection, please ensure that the DC switch of the inverter is in the "OFF" state and the AC side air switch is in the open state.

Recommended AC cables and recommended specifications for the AC output switch are as follows:

Inverter Model	Wire Cross - sectional Area Range (mm <sup>2</sup> )	Recommended AC Circuit Breaker Parameters
SV010KTL-T1-BM22	2.5-4 (12AWG)	20A
SV012KTL-T1-BM22	4-6 (10AWG)	25A
SV015KTL-T1-BM24	4-6 (10AWG)	32A
SV017KTL-T1-BM24	6-10 (8AWG)	40A
SV020KTL-T1-BM24	6-10 (8AWG)	40A
SV025KTL-T1-BM24	10-16 (6AWG)	50A
SV6000TL-T1-BM22-V1	2.5-4 (12AWG)	20A
SV8000TL-T1-BM22-V1	4-6 (10AWG)	32A
SV010KTL-T1-BM22-V1	6-10 (8AWG)	40A
SV012KTL-T1-BM24-V1	10-16 (6AWG)	50A
SV015KTL-T1-BM24-V1	10-16 (6AWG)	50A

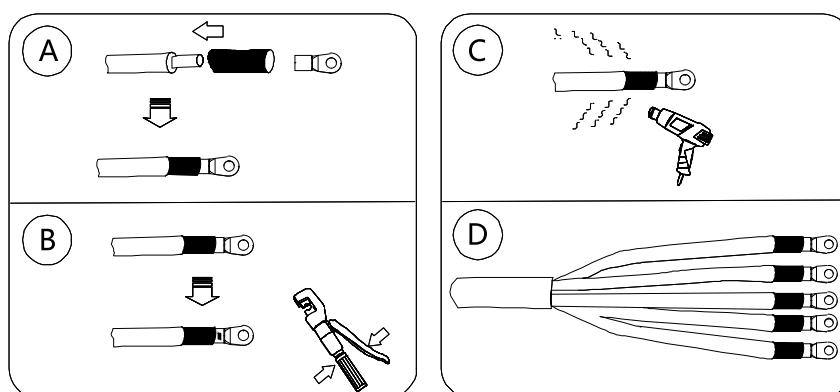
Installation steps:

Step 1: Perform cable stripping operation as shown in the following figure.

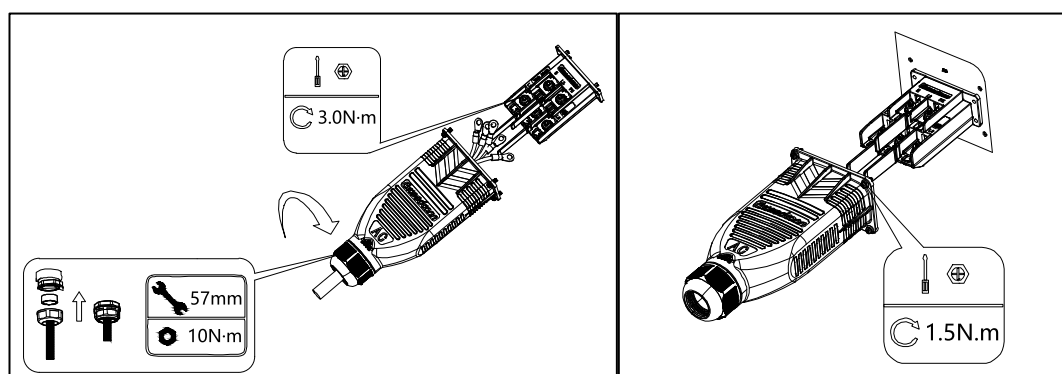


No.	Name	Recommended Size
A	Outdoor Cable Outer Diameter Range	18~30mm
B	Insulation Layer Stripping Length	$B=E+(2\sim3)\text{mm}$
C	Cable Outer Layer Stripping Length	$\leq 150\text{mm}$
D	Outdoor Copper Core Cable (5-core)	$2.5\sim 16\text{mm}^2$
	Outdoor Aluminum Core Cable (5-core)	$4\sim 25\text{mm}^2$

Step 2: Insert the stripped wire core into the cable crimping area of the AC terminal, and use a hydraulic crimper to compress it tightly.




Step 3: Open the waterproof joint, pass the wires through the locking nut in sequence, insert the L1, L2, L3, N, and PE five wires into the corresponding terminal holes respectively, and tighten and fix the wires with a screwdriver. Pull outward to confirm whether the cable is firmly connected; finally, fix the protective cover to the inverter.



**Note:**

- Due to the special structural design, please ensure that the lengths of the neutral wire and ground wire are about 40mm longer than those of L1, L2, and L3 when making the cables.
- When multiple inverters are connected in parallel to the grid, it should be ensured that the total number of parallel inverters does not exceed 5. Otherwise, please contact Skyworth to confirm the technical solution.

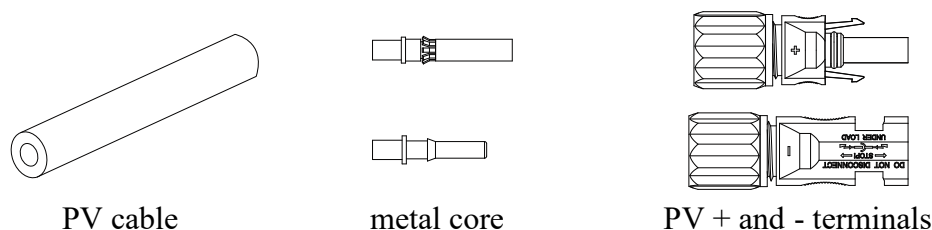
## 5.4 DC Side String Connection

	<p>Note:</p> <ul style="list-style-type: none"> <li>• Before connecting the photovoltaic string, ensure that the DC switch is in the off state.</li> <li>• Ensure that the polarity of the photovoltaic string matches the DC connector, otherwise it will damage the inverter.</li> <li>• Ensure that the maximum open - circuit voltage of the photovoltaic string is not higher than the maximum input voltage of 1100V of the inverter under any circumstances.</li> <li>• The positive and negative poles of the photovoltaic string are prohibited from being connected to the PE wire (ground wire), otherwise it will cause inverter damage.</li> </ul>
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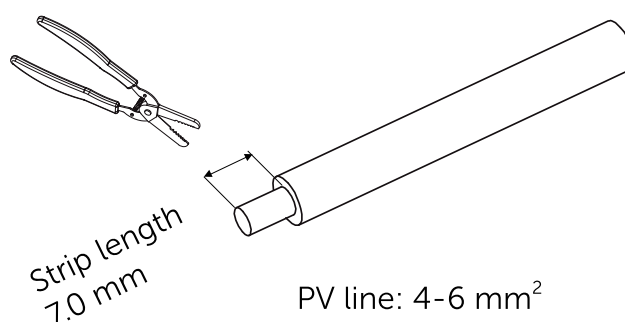
Recommended DC input cable specifications (photovoltaic cables with a maximum withstand voltage of  $\geq 1100\text{V}$ ).

Wire Copper Core Cross - sectional Area (mm <sup>2</sup> )	Cable Outer Diameter Range (mm)
2.5-6.0	6.0-9.0

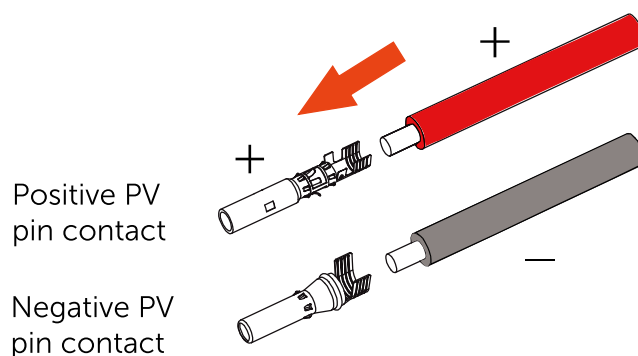
Step 1: Close the DC switch and prepare a suitable photovoltaic cable. Find the photovoltaic (+) terminal, photovoltaic (-) terminal, and metal core in the packaging box.



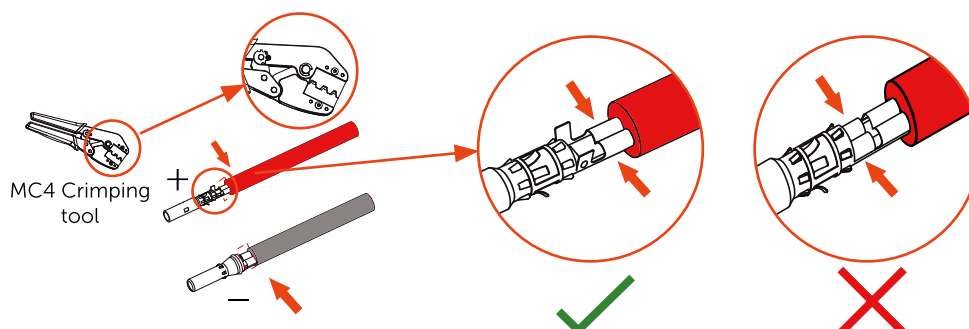
Step 2: Strip the wire with a wire stripper to  $7 \pm 0.5\text{mm}$  as shown in the following figure.



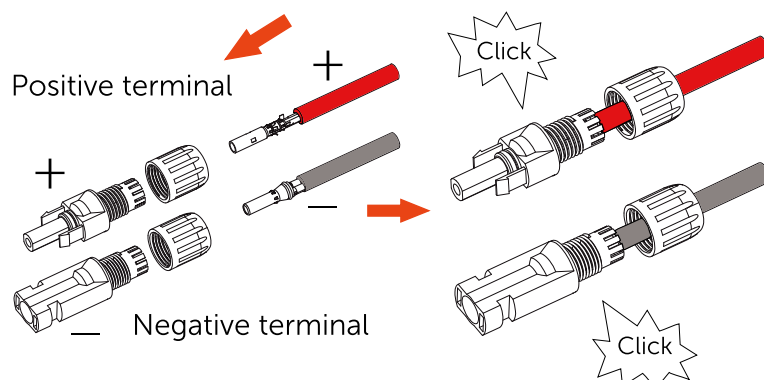
Step 3: Tighten the cable with the insulation layer stripped and insert it into the metal core (see Figure 1), and ensure that all wires are inserted into the metal core (see Figure 2).



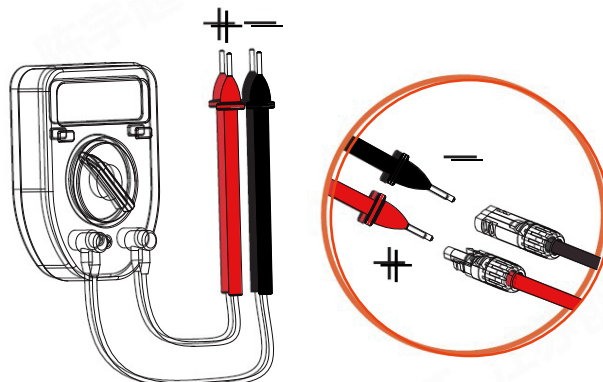
Step 4: Use a crimping pliers to compress the cable wire and the PV terminal metal core tightly to ensure a firm crimping connection.



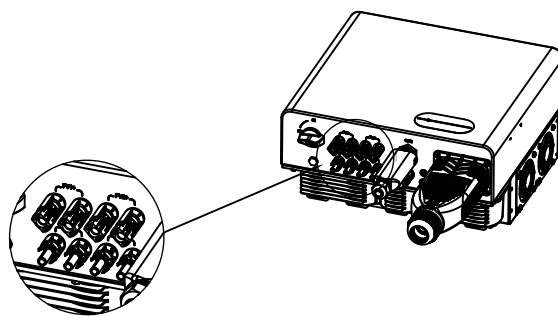
Step 5: Pass the crimped positive and negative cable wires through the locking nut and insert them into the corresponding plastic shells respectively until a click sound is heard, indicating that the metal core has been snapped into place.



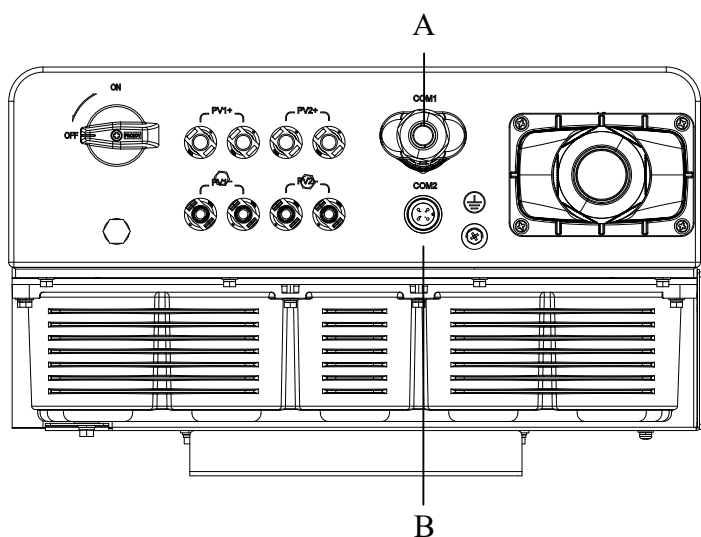
Step 6: Tighten the nut and use a multimeter to measure the photovoltaic voltage of the DC input to verify the polarity of the DC input cable.



Step 7: Connect the completed DC terminal to the inverter as shown in the figure, and a slight "click" sound indicates a proper connection.

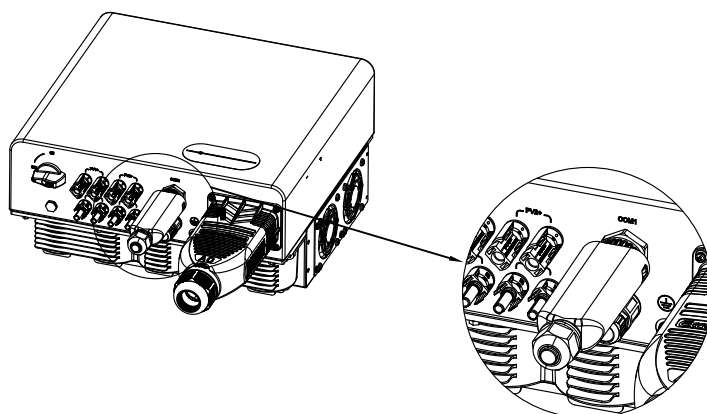


## 5.5 Communication Connection



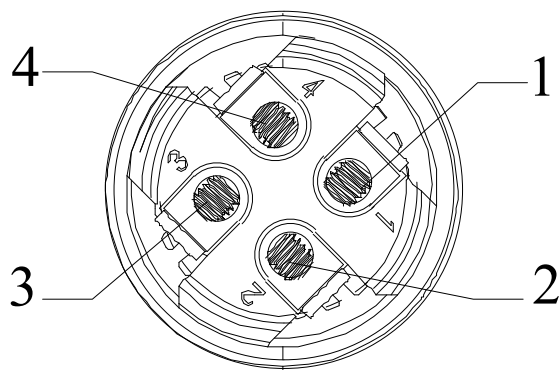
### 1. Communication module connection (A)

Connect the WiFi module to the COM1 port of the inverter. After successful connection, the inverter power generation amount, operation status, and other information can be viewed through the mobile App. For details, please refer to the communication module user manual.



### 2. RS485 Communication Connection (B)

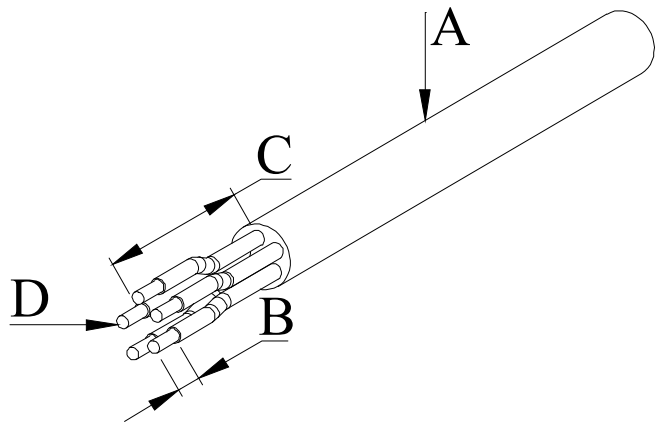
Interface Definition:



PIN	Description
1	5V
2	GND
3	RS485-
4	RS485+

Installation steps:

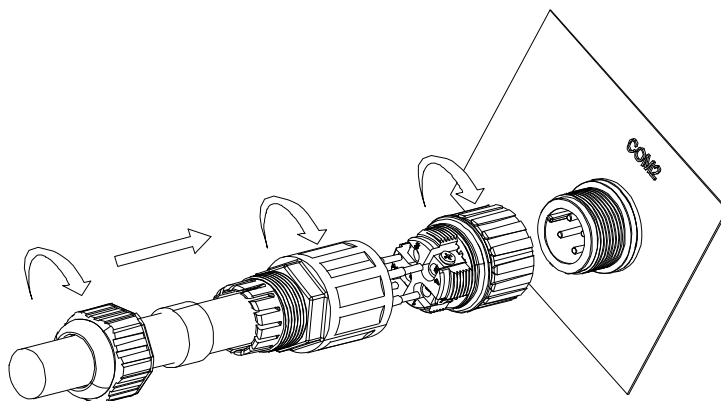
Step 1: Select a suitable cable and strip it according to the following table.



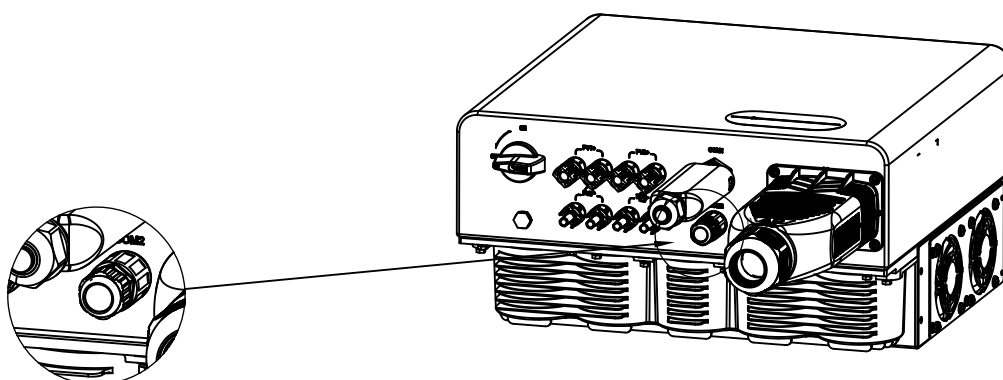
No.	Name	Requirement
A	Protective Layer	Cable Outer Diameter Range: $\leq 8\text{mm}$
B	Insulation Layer Stripping Length	7mm
C	Cable Outer Layer Stripping Length	30mm
D	Cable Cross - section	0.5-1mm <sup>2</sup>

Step 2: Pass the AC cable through the nut and sheath of the connection terminal, insert it into the corresponding labeled terminal, and lock it with a cross - head screwdriver (torque 1N.m). Align the two ends of the terminal with the bayonet and insert them in a clockwise direction and rotate to lock.





Step 3: Insert this terminal into the COM2 port of the inverter and rotate it clockwise to lock.



## 6. Inverter Commissioning

### 6.1 Cable Connection Inspection



Before starting the equipment for the first time (trial operation), a comprehensive inspection should be carried out on all operations performed on the equipment. In particular, check whether the DC side voltage and AC side voltage are within the range allowed by the inverter.

① AC Grid Connection:

Use a multimeter again to confirm that L1, L2, L3 (live wires), N (neutral wire), and PE (ground wire) are correctly connected to the AC terminals.

② DC Input Connection

Use a multimeter again to confirm the PV input polarity and ensure that the array open - circuit voltage is lower than the maximum input DC voltage of the inverter.

### 6.2 Start the Inverter

If all the above operations meet the requirements, please try the following steps to start the inverter:

① Close the AC circuit breaker between the inverter and the grid.

② Turn the DC switch on the inverter to "ON".

③ If a DC circuit breaker is equipped between the inverter and the photovoltaic string by the customer, close this circuit breaker.

Under normal sunlight and grid conditions that meet the grid - connection requirements, the inverter will operate normally.

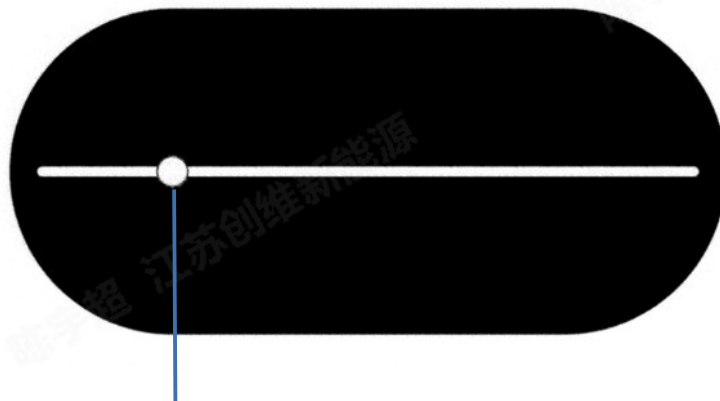
Note: After the above steps are completed, observe the inverter indicator light. If the red light is on constantly, it indicates that a fault has occurred. Please troubleshoot. If the blue light is on constantly, it indicates that the machine has been connected to the grid normally.



Note:

- If the inverter has other faults, please refer to Section 9.1 of this manual for troubleshooting.
- When the sunlight is very weak or there is no sunlight, the inverter will automatically stop running, and the inverter's LED light will go out. When the sunlight recovers, the inverter will automatically restart.

## 7. Operation Interface



Indicator Lights

Indicator Light Color	State	Explanation
Blue	On constantly	Normal grid connection
	Slow flashing (cycle 5s)	DC and AC are powered on, and the inverter is in standby or startup state (not grid - connected)
Red	On constantly	A fault has occurred (the inverter cannot generate power and connect to the grid)
	Off	AC and DC are powered off

## 8. Fault Troubleshooting and Maintenance


### 8.1 Fault Troubleshooting

Once the inverter fails, the corresponding fault information will be displayed on the App interface. The faults include system faults and inverter faults. The fault codes and inspection methods are as follows:

Fault Display		Fault Troubleshooting
System Fault	Insulation Resistance Low	<ol style="list-style-type: none"> <li>1. Check whether the ISO impedance protection value is too high through the APP and confirm that it meets the local regulatory requirements.</li> <li>2. Check the insulation resistance of the string and DC cable to the ground. If there is a short circuit or the cable insulation layer is damaged, take corrective measures.</li> <li>3. If the cable is normal and the fault occurs on a rainy day, confirm again when the weather improves.</li> <li>4. Check whether the terminal is loose or has poor contact. If so, replace the damaged cable and tighten the terminal to ensure a reliable connection.</li> <li>5. If it is confirmed that the above reasons do not exist and the fault still persists, please contact the Skyworth Photovoltaic customer service center.</li> </ol>
	Leakage Current Excessive	<ol style="list-style-type: none"> <li>1. The surrounding environment is humid or the illumination is poor, which may cause this fault. Generally, the inverter will reconnect to the grid when the environment improves.</li> <li>2. If the environment is normal, check the insulation of the DC and AC cables.</li> <li>3. If it is confirmed that the above reasons do not exist and the fault still persists, please contact the Skyworth Photovoltaic customer service center.</li> </ol>
System Fault	Grid Voltage Fault	<ol style="list-style-type: none"> <li>1. Wait for 5 minutes. If the grid returns to normal, the photovoltaic inverter will automatically restart.</li> <li>2. Ensure that the grid voltage is in line with the specifications.</li> <li>3. Confirm whether the AC line and PE line are well connected.</li> <li>4. If it is confirmed that the above reasons do not exist and the fault still persists, please contact the Skyworth Photovoltaic customer service center.</li> </ol>
	Grid Frequency Unstable	<ol style="list-style-type: none"> <li>1. Wait for 5 minutes. If the grid returns to normal, the photovoltaic inverter will automatically restart.</li> <li>2. Ensure that the grid frequency is in line with the specifications.</li> <li>3. If it is confirmed that the above reasons do not exist and the fault still persists, please contact the Skyworth Photovoltaic customer service center.</li> </ol>
	Grid Loss	<ol style="list-style-type: none"> <li>1. Check whether the grid can supply power reliably.</li> <li>2. Check whether the AC wiring is tight.</li> <li>3. Check whether the AC cable is connected to the correct terminal (whether the live wire is connected reversely with the N wire).</li> <li>4. Check whether the AC circuit breaker is closed.</li> </ol> <p>If it is confirmed that the above reasons do not exist and the fault still</p>

		persists, please contact the Skyworth Photovoltaic customer service center.
Inverter Fault	PV Voltage Fault	<ol style="list-style-type: none"> <li>1. Check whether the input voltage during operation is higher than or close to the maximum input voltage.</li> <li>2. If it is confirmed that the above reasons do not exist and the fault still persists, please contact the Skyworth Photovoltaic customer service center.</li> </ol>
	Over Temperature Fault	<p>Generally, when the internal temperature or module temperature returns to normal, the machine will restart. If the fault recurs frequently:</p> <ol style="list-style-type: none"> <li>1. Check whether the ambient temperature of the machine is too high.</li> <li>2. Check whether the machine is in a well - ventilated place.</li> <li>3. Check whether the machine is directly exposed to sunlight. If so, provide appropriate shading.</li> <li>4. Check whether the fan is operating normally. If not, replace the fan.</li> <li>5. If it is confirmed that the above reasons do not exist and the fault still persists, please contact the Skyworth Photovoltaic customer service center.</li> </ol>
	Ground Fault	<ol style="list-style-type: none"> <li>1. Check whether the AC cable is wired incorrectly.</li> <li>2. Check whether the insulation between the ground wire and the live wire is normal.</li> <li>3. If it is confirmed that the above reasons do not exist and the fault still persists, please contact the Skyworth Photovoltaic customer service center.</li> </ol>

## 8.2 Maintenance

	<ul style="list-style-type: none"> <li>• Incorrect maintenance may lead to inverter damage or personal injury!</li> <li>• Always remember that the inverter has bidirectional power supply from the photovoltaic string and the grid. Before performing any maintenance work, please follow the following steps.</li> <li>• Disconnect the AC circuit breaker, and then turn the DC circuit breaker of the inverter to OFF.</li> <li>• Wait at least 5 minutes to allow the internal capacitor to discharge completely.</li> <li>• Confirm that there is no voltage or current before unplugging any connectors.</li> </ul>
	<p><b>Note!</b></p> <p>Only after eliminating the faults that affect the safety performance can the inverter be restarted. Since there are no maintenance spare parts in the inverter packaging, do not replace any internal components randomly. If there is any maintenance need, please contact our company. Otherwise, our company will not be responsible for any damage caused.</p>

### 1. Daily Maintenance

Maintenance Component	Operation	Cycle
System Cleaning	Check the temperature and dust condition of the inverter. Clean the inverter casing if necessary. Check whether the air inlet and outlet are normal. Clean the air inlet and outlet if necessary.	Every six months to one year (depending on the dust content in the air.)


Fan	Check whether the fan makes abnormal noise when rotating. Clean or replace the fan if necessary (see the following part for details)	Once a year
Cable Interface	Check whether the cable interface has insufficient sealing or excessive gap. Reseal the interface if necessary	Once a year
Electrical Connection	Check whether all cables are firmly in place. Check whether the cables are damaged, especially the parts in contact with the metal casing	Every six months to one year

### Maintenance Instructions:

#### Clean the Air Inlet and Outlet

The inverter generates a large amount of heat during operation. The inverter adopts a controlled forced air cooling method. To maintain good ventilation, please check and ensure that the air inlet and outlet are not blocked. Clean the air inlet and outlet with a soft brush or vacuum cleaner if necessary.

## 2. Fan Maintenance

	<ol style="list-style-type: none"> <li>1. Stop the inverter and disconnect all power supplies connected to it before maintenance.</li> <li>2. After disconnection, wait at least 5 minutes to ensure that the inverter is de-energized, and then perform maintenance work.</li> <li>3. Only qualified electricians can maintain the fan.</li> </ol>
------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

The fan inside the inverter is used to cool the inverter during operation. If the fan does not operate normally, the inverter may not be cooled properly, and the inverter efficiency may be reduced. Therefore, dirty fans should be cleaned in time, and faulty fans should be replaced. The specific replacement operation steps are as follows:

Step 1: Stop the inverter (send a shutdown command on the APP first, turn off the DC and AC circuit breakers of the inverter, and wait at least 5 minutes).

Step 2: Unscrew the 5 screws of one fan baffle.

Step 3: Loosen the 4 screws of each fan module.

Step 4: Disconnect the fan wire, pull out the fan module, clean the fan with a soft brush or vacuum cleaner, and replace the fan if necessary.

Step 5: Reinstall the fan into the inverter in the reverse order and restart the inverter.

## 9. Technical Parameters

Model	SV010KTL-T1-BM22	SV012KTL-T1-BM22	SV015KTL-T1-BM24	SV017KTL-T1-BM24	SV020KTL-T1-BM24	SV025KTL-T1-BM24
DC Input						
Max. Input Voltage [V]	1100					
MPPT Voltage Range [V]	160~1000					
Rated Input Voltage [V]	600					
Start-up Voltage [V]	200					
No. of MPPT Trackers	2					
No. of PV Strings per MPPT	1	2				
Max. Input Current per MPPT [A]	20	40				
Max. Short Circuit Current per MPPT [A]	25	50				
AC Output						
Rated Output Power [W]	10000	12000	15000	17000	20000	25000
Max. Output Apparent Power [VA]	11000	13200	16500	18700	22000	27500
Max. Output Current [A]	15.9	19.1	23.9	27.1	31.8	39.8
Rated Grid Voltage [V]	3L/N/PE; 230 / 400, 220/380					
Rated Grid Frequency [Hz]	50/60					
Power Factor [cos φ]	1 (+/-0.8, adjustable)					
Efficiency						
Max. Efficiency	98.60%					
Euro Efficiency	98.20%					
Protection						
DC Switch	Integrated					
Insulation Resistance Detection	Integrated					
Input Reverse Polarity Protection	Integrated					
Anti-island Protection	Integrated					
Residual Current Monitoring	Integrated					
AC Overcurrent Protection	Integrated					
AC Short-circuit Protection	Integrated					
DC Surge Protection	Integrated (Type II)					
AC Surge Protection	Integrated (Type II)					
General data						
Dimensions (W*H*D) [mm]	405*375*213					
Weight [Kg]	23					
Display	LED/APP					
Communication	WiFi / RS485 / 4G (Optional)					
Operating Temperature Range [°C]	-25 ~ +60					

Humidity	0 ~ 100%
Operation Altitude [m]	≤4000( > 2000 derating)
Topology	Transformerless
Type of Cooling	Smart fan-cooling
Ingress protection	IP66

Model	SV6000TL- T1-BM22-V1	SV8000TL- T1-BM22-V1	SV010KTL- T1-BM22-V1	SV012KTL- T1-BM24-V1	SV015KTL- T1-BM24-V1
DC Input					
Max. Input Voltage [V]	800				
MPPT Voltage Range [V]	160-800				
Rated Input Voltage [V]	360				
Start-up Voltage [V]	200				
No. of MPPT Trackers	2				
No. of PV Strings per MPPT	1			2	
Max. Input Current per MPPT [A]	20			40	
Max. Short Circuit Current per MPPT [A]	25			50	
AC Output					
Rated Output Power [W]	6000	8000	10000	12000	15000
Max. Output Apparent Power [VA]	6600	8800	11000	13200	15000
Max. Output Current [A]	16.6	22.1	27.6	33.1	37.7
Rated Grid Voltage [V]	3L/N/PE; 127V/220V, 133V/230V				
Rated Grid Frequency [Hz]	50/60				
Power Factor [cos φ]	1 (+/-0.8, adjustable)				
Efficiency					
Max. Efficiency	98.30%				
Euro Efficiency	97.50%				
Protection					
DC Switch	Integrated				
Insulation Resistance Detection	Integrated				
Input Reverse Polarity Protection	Integrated				
Anti-island Protection	Integrated				
Residual Current Monitoring	Integrated				
AC Overcurrent Protection	Integrated				
AC Short-circuit Protection	Integrated				
DC Surge Protection	Integrated				
AC Surge Protection	Integrated				
General data					
Dimensions (W*H*D) [mm]	405*375*213				
Weight [Kg]	23				
Display	LED/APP				
Communication	WiFi / RS485 / 4G (Optional)				
Operating Temperature Range [°C]	-25~+60				
Humidity	0-100%				
Operation Altitude [m]	≤4000 ( > 2000 derating)				



Topology	Transformerless
Type of Cooling	Smart fan-cooling
Ingress protection	IP66

\*The maximum input voltage is the upper limit of the DC voltage of the inverter. Any higher DC input voltage may damage the inverter.

\*Any DC input voltage exceeding the MPPT voltage range of the inverter may cause the inverter to operate abnormally.

Disclaimer: The above values are all measured values in the specific conditions of Skyworth's internal laboratory. The actual values may vary depending on the product, software version, usage conditions, and environmental factors.

# Solavita

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