

SW

40/50/60 kW

Three-phase On-grid Inverter

User Manual

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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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This manual may be updated based on user or customer feedback. Please visit our website at www.solavita-ess.com to view the latest version.

1.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 Solavita's 40-60kW three - phase series inverters. This series includes the following models:

SW015KTL-T1-EM24-V1, SW020KTL-T1-EM24-V1, SW025KTL-T1-EM36-V1
SW030KTL-T1-EM36-V1, SW036KTL-T1-EM48-V1
SW040KTL-T1-EM36, SW040KTL-T1-EM48
SW050KTL-T1-EM48, SW060KTL-T1-EM48

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 enable more efficient use of this product, relevant safety information is provided in the manual and highlighted with corresponding symbols. These emphasized messages must be fully understood and strictly adhered to for a better understanding of this manual.
The following are the symbols that may be used in this manual:

	**Danger!** Indicates a highly hazardous situation. Failure to avoid it will seriously endanger personal safety and may even lead to death.
	**Warning!** Indicates a moderately hazardous situation. If not avoided, it may pose risks to personal safety or even lead to death.
	**Caution!** Indicates a mildly hazardous situation. If not avoided, it may cause minor or moderate personal injury.
	**Tips:** Provide more convenient and effective tips for product use.

1.2 Important Safety Information

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

	**Transportation Precautions:** ● 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.
	Installation Precautions: ● Check if the inverter and packaging are damaged. If you have any questions, please contact the supplier before installing the inverter. ● Before installation, ensure that the product has no electrical connections.
	Electrical Connection Precautions: ● 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.
	Operation Precautions: ● 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.
	Maintenance and Repair Precautions: ● 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.
	Functional Safety Parameter Precautions ● 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.

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 Solavita, 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.

	**Tips:** 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 Solavita 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℃ ~ 70℃, and the relative humidity range is 0 ~ 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.

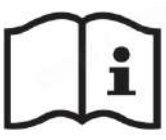
● Do not store the inverter in places with chemical corrosive substances or pest and rodent infestation.

● 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.

	**Tips:** Please store the product in accordance with the storage requirements. Product damage caused by non - compliant storage conditions will not be covered by the warranty.

2.3 Explanation of Symbols on the Machine Body

	Before performing maintenance operations on the inverter, all external power connections must be disconnected!
	Caution: High voltage and risk of electric shock.
	After powering off the inverter, wait for 5 minutes to ensure the machine is fully discharged.
	During the operation of the machine, the surface temperature of the casing is relatively high. Please be cautious when touching the casing to prevent burns.
	Grounding terminal
	CE Marking This indicates that the inverter complies with CE requirements.
	When the inverter is to be discarded, do not dispose of it together with ordinary household waste. For detailed disposal methods, please refer to the instruction manual.
	Electrical positive and negative pole markings
	Read the instruction manual.

3.Overview

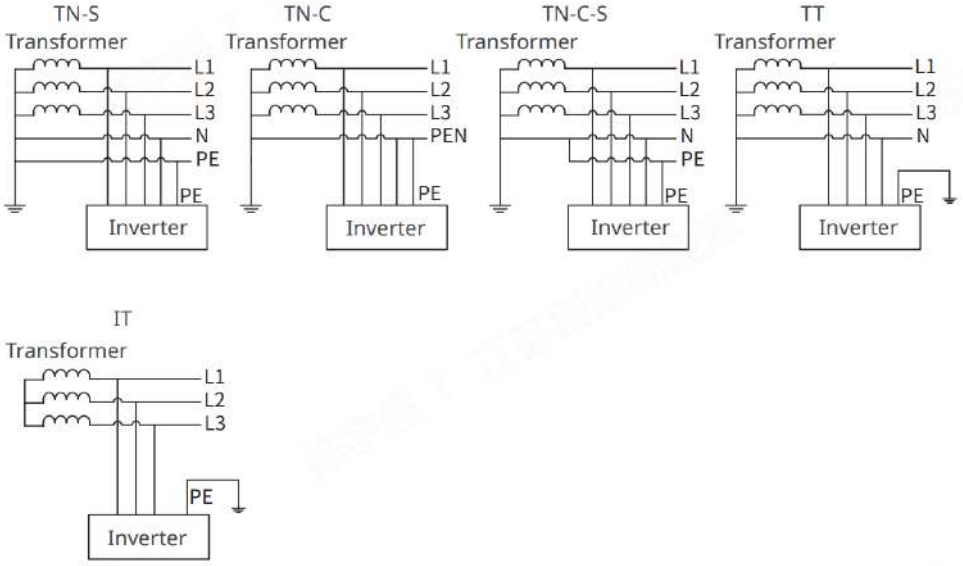
3.1 Product Purpose

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.



	**Warning!** The inverter must not be connected to PV strings that require positive or negative grounding. Do not connect local loads between the inverter and the AC side circuit breaker!

The grid structures supported by SMT is TN-S, TN-C,TN-C-S, TT, IT, as shown in the figure below:



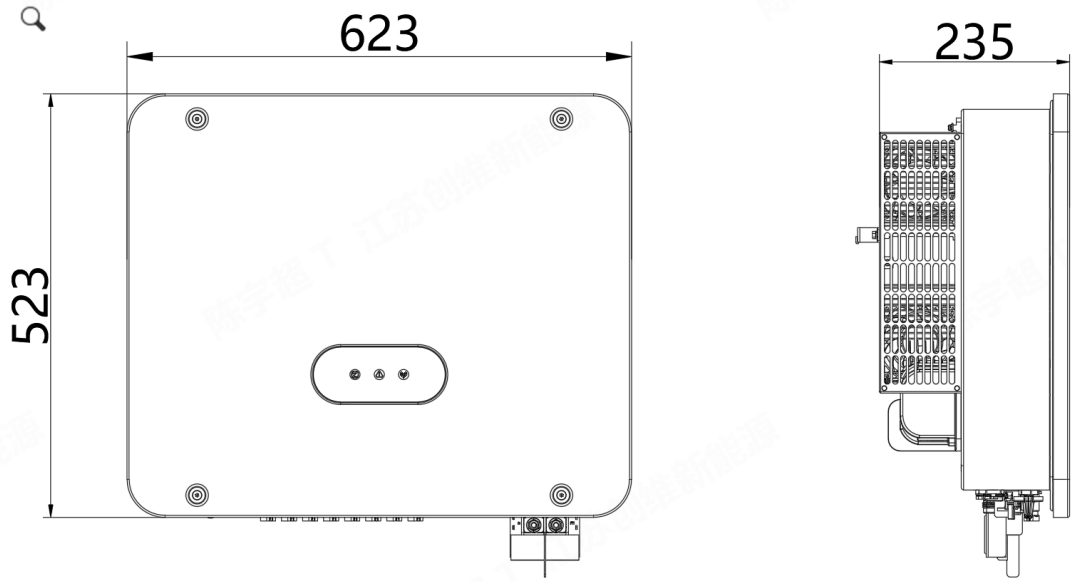
	**Warning!** For the TT grid structure, the effective value of the voltage between the neutral wire and the ground wire must be less than 30V.

3.2 Basic Features

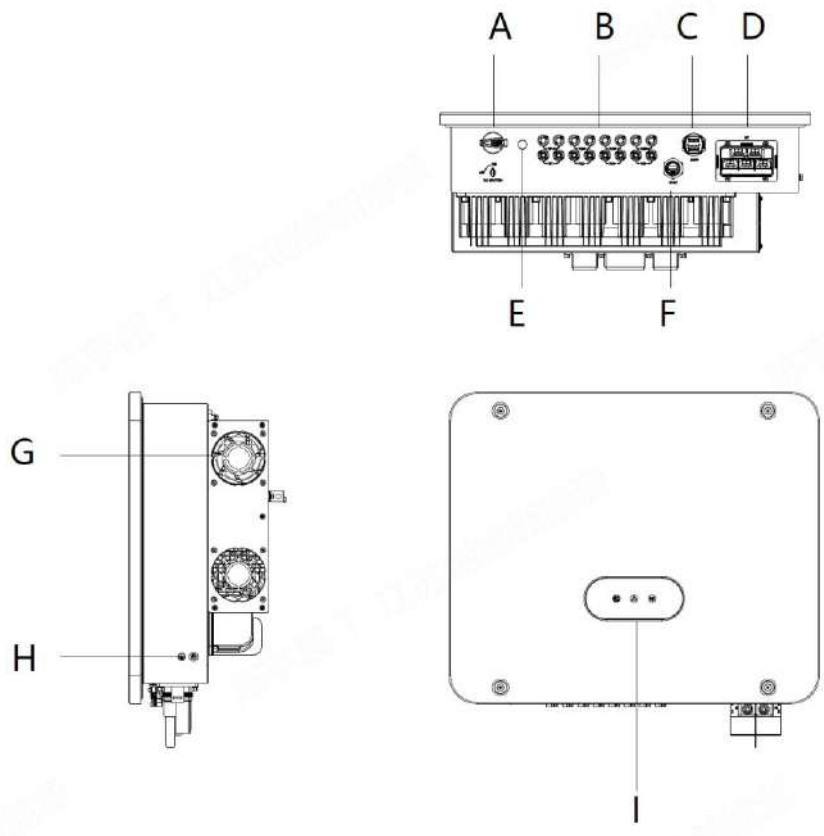
- Max. Efficiency 98.5%
- 180~1000 MPPT Voltage Range
- 150% PV oversizing and up to 110% AC output
- 40A Max. Input Current per MPPT
- IP66Protection Class
- Built-in DC&AC SPD(Type II)
- Built-in zero export function
- PID Recovery(Optional)
- IV Curve Scanning
- Connectable aluminium AC cable
- Intelligent String Detection

3.3 Product Introduction

3.3.1 Dimensions

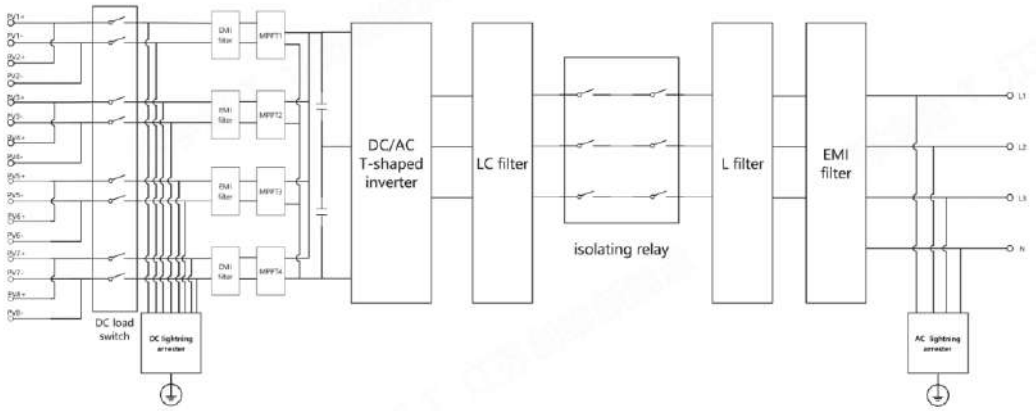


3.3.2 Terminals of Inverter



Object	Description	Object	Description
A	DC Switch	B	PV Input
C	COM2	D	AC Output
E	Breathing Valve	F	COM1 (USB)
G	FAN	H	Ground Connection
I	LED Indicator		

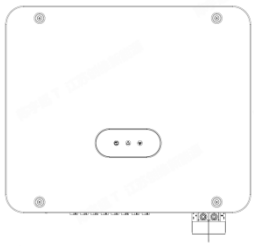
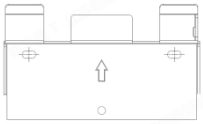
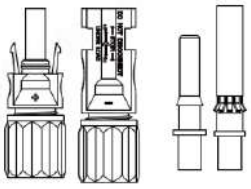
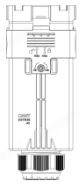
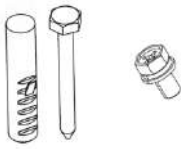
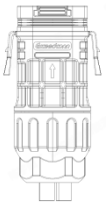
3.3.3 Circuit Diagram



4.Installation

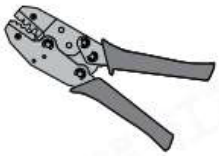
4.1 Packing List

	**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	Bracket	PV Terminal*8	AC Terminal
			
Cross - head Screw * 1 Self - tapping Screw& Expansion Tube * 3	WiFi Datalogger	COM2 Terminal	Grounding Terminal
			
Factory Inspection Report*1	Quick Installation Guide	Certificate of conformity	

4.2 Tool Preparation

Object	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 PV cables
12		Hydraulic Tong	Crimp AC cables
13		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.

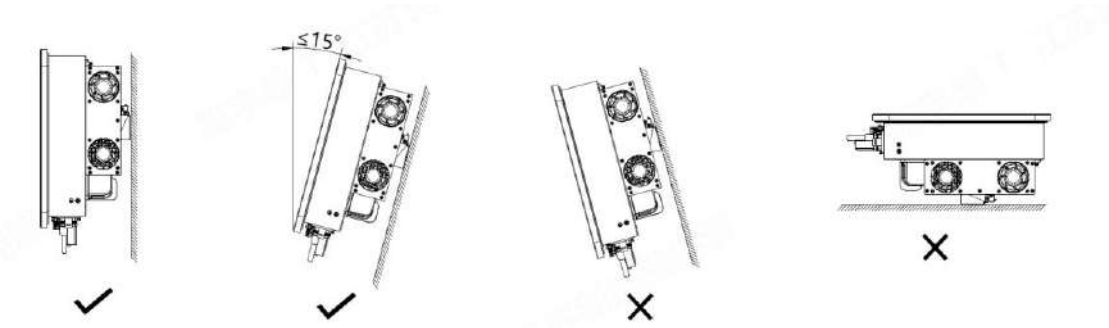
● The distance between the inverter and the wireless electromagnetic interference equipment should exceed 30m.

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℃ - 60℃; Humidity: 0 - 100% without condensation.

4.4 Installation Angle Requirements

	**Attention!** ● Select a suitable installation position and surface, which must be suitable for the weight and size of the inverter. ● Ensure that the distance between the waterproof joint and the ground is ≥500mm.

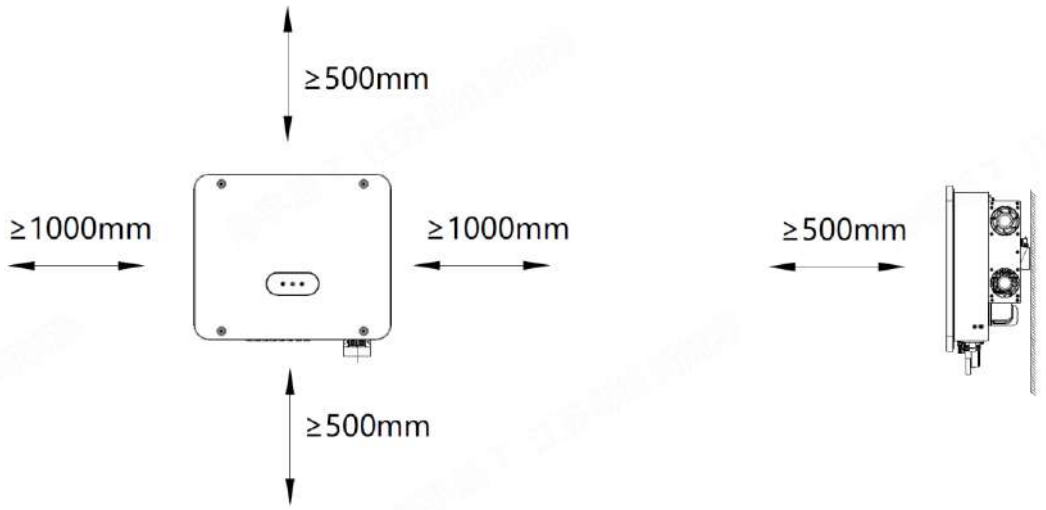
It is recommended to install the inverter vertically or tilted backward (not exceeding 15°). Do not install the inverter forward tilted, inverted, horizontal.



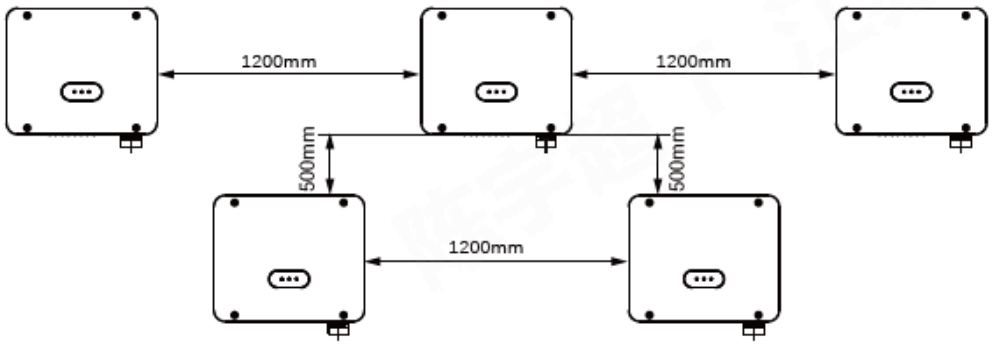
4.5 Installation Space Requirements

⚠	**Danger Warning!** Please ensure that the heat dissipation system or ventilation openings of the inverter are not blocked.

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.



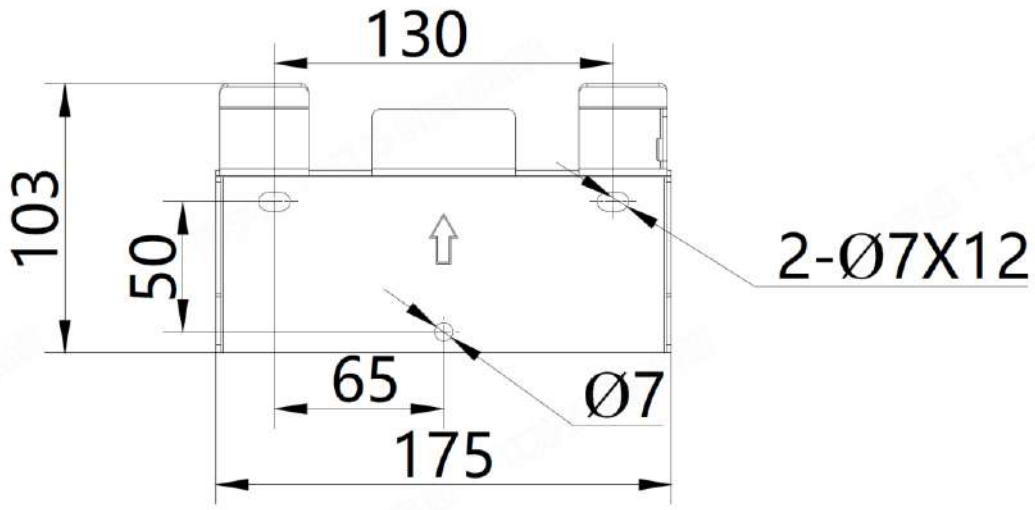
4.6 Inverter Handling

⚠	Note: ● The inverter is heavy. When handling, please pay attention to maintaining balance to avoid the machine falling and injuring the operator. ● 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. ● When placing the inverter on a hard ground, it is necessary to lay foam or paper and other protective materials under it.

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.

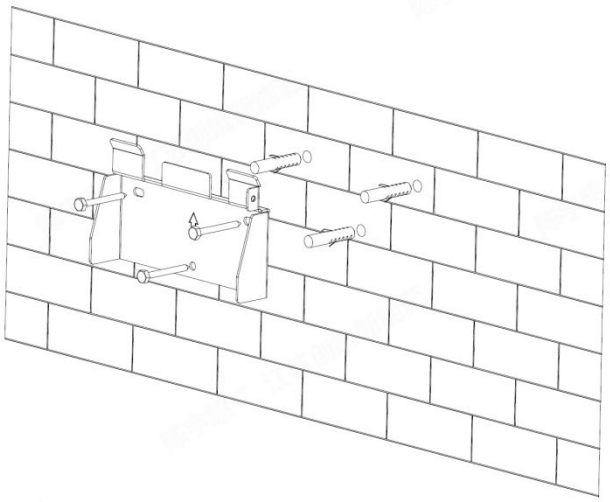
4.7 Inverter Installation

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.



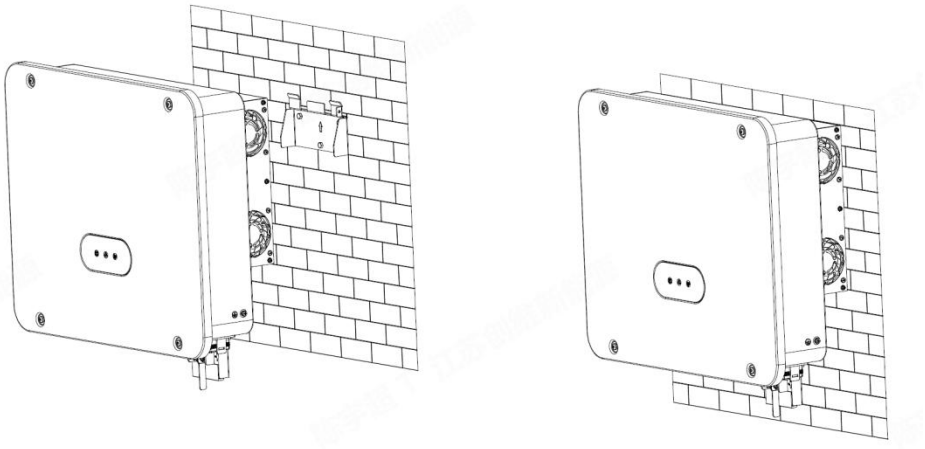
Step 2: Use an impact drill to drill holes in the wall. When drilling, please keep the impact drill perpendicular to the wall, and the drilling depth should be slightly greater than the length of the plastic expansion tube.

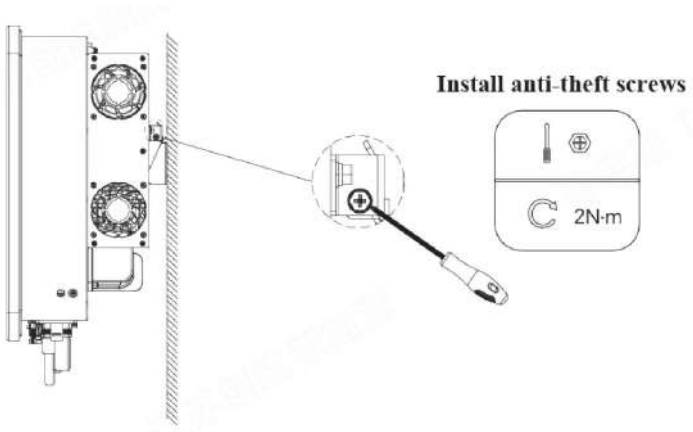
Step 3: Slowly hammer the expansion tube into the drilled hole with a hammer, and use the expansion screw in the accessory package of the packaging box to fix the back panel.



⚠	**Warning!** 1. The wall where the inverter is installed must be sturdy and able to support the weight of the inverter for an extended period. 2. To prevent electrical shock or other potential hazards, please ensure that you check for any concealed electrical wiring or pipes in the wall before drilling any holes.

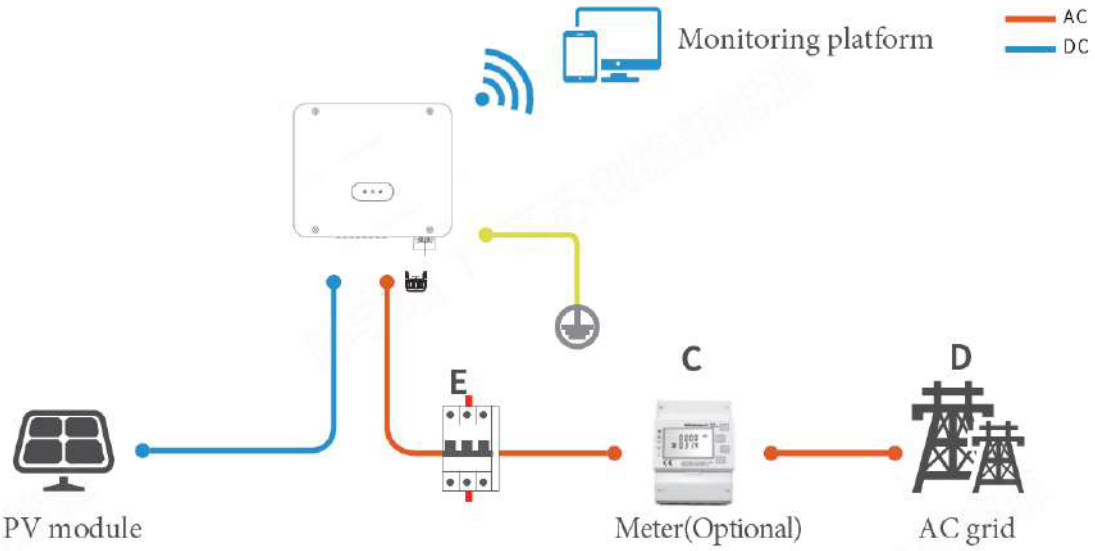
Step 4: Lift the inverter onto the back panel, ensure that the inverter fits well with the groove of the back panel, and use a cross - head screw to lock the inverter and the back panel.




Install anti-theft screws
2N·m

5. Electrical Connection

5.1 Electrical Connection Overview



5.2 Safety Precautions

⚠	**Warning!** 1. Before making electrical connections, turn off the DC switch and AC output switch of the inverter to ensure the device is powered off. Live operation is strictly prohibited, as it may lead to dangers such as electric shock. 2. All operations during the electrical connection process, as well as the specifications of the cables and components used, must comply with local laws and regulations. 3. If the cable is under excessive tension, it may result in poor wiring. When wiring, leave a certain length of the cable and then connect it to the inverter's wiring port. 4. Before performing electrical work, ensure that the inverter is not damaged and all cables are de - energized. 5. Before touching the DC cable, be sure to use measuring equipment to ensure the cable is not charged.
	Tips: 1. When making electrical connections, wear personal protective e quipment such as safety shoes, protective gloves, and insulating g loves as required. 2. Only professionals are allowed to perform operations related to electrical connections. 3. The cable colors shown in the figures of this document are fo r reference only. The specific cable specifications shall comply wi th local regulatory requirements. 4. The appearance of the figures in this document is for referenc

	e only. Different models or different versions of the same model may have different appearances. Please refer to the actual produc t. 5. When laying communication cables, separate the communicatio n cables from the power cables, and avoid large interference sour ces during cabling to prevent signal interference and communicati on problems. 6. After the wiring is completed, be sure to seal the gaps of the inverter's cable entry and exit holes with fire - proof putty or oth er fire - proof/water - proof materials to prevent foreign objects or moisture from entering, which may affect the long - term nor mal operation of the inverter.

5.3 Connection of External Grounding Cable

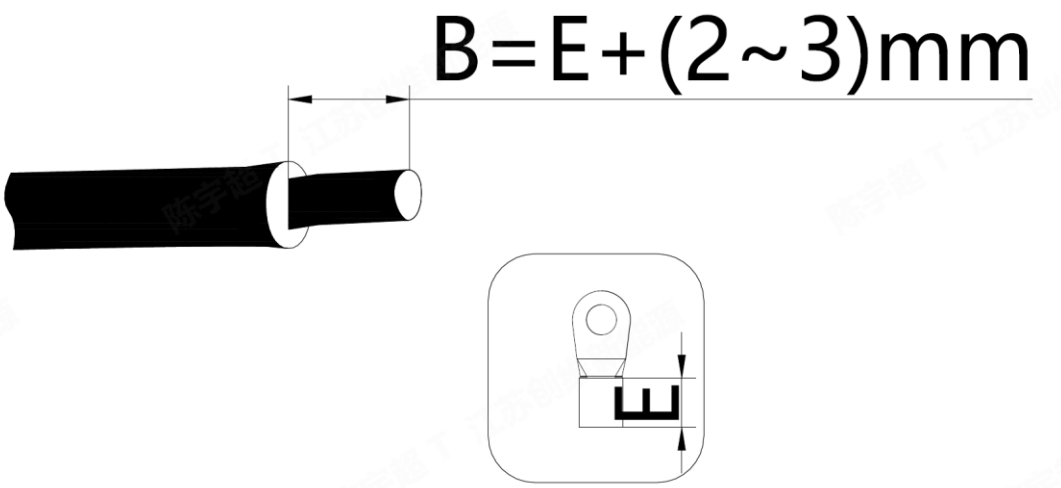
	**Warning!** 1. Before connecting the AC and DC side, please make the external grounding connection to ensure safety. Be sure to ensure that the inverter is properly grounded, as any damage caused by improper grounding will not be covered under warranty. 2. Since the inverter is a transformerless type, both the positive and negative terminals of the photovoltaic array must not be grounded, as this could cause inverter malfunction. 3. If multiple inverters are used, ensure that the protective grounding points of all inverter enclosures are at the same potential and properly connected. 4. The external protective grounding terminal of a single inverter must be grounded at the nearest point. 5. To improve corrosion resistance, it is recommended to apply silicone or coating after installing the grounding wire.

Inverter Model	Wire Cross - sectional Area Range (mm^2)
SW040KTL-T1-EM36	16
SW040KTL-T1-EM48	16
SW050KTL-T1-EM48	25
SW060KTL-T1-EM48	25
SW015KTL-T1-EM24-V1	16
SW020KTL-T1-EM24-V1	16
SW025KTL-T1-EM36-V1	16
SW030KTL-T1-EM36-V1	25
SW036KTL-T1-EM48-V1	25

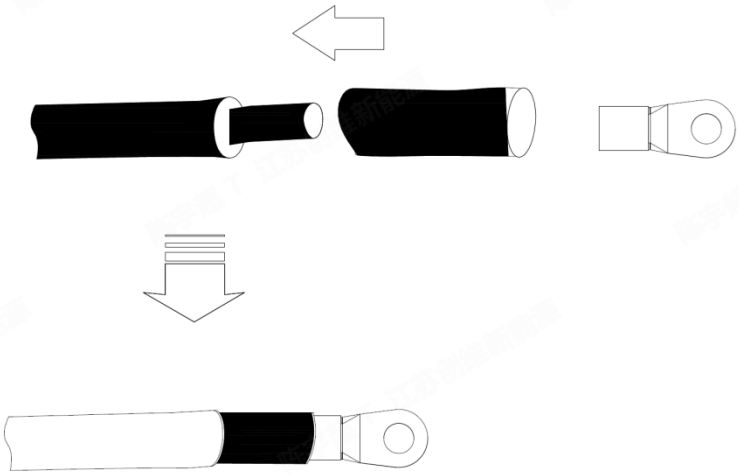
Installation steps:

Step 1： When making the grounding cable, choose an appropriate yellow-green conductor with a cross-sectional area of 16-35 square millimeters, and select matching OT copper terminals.

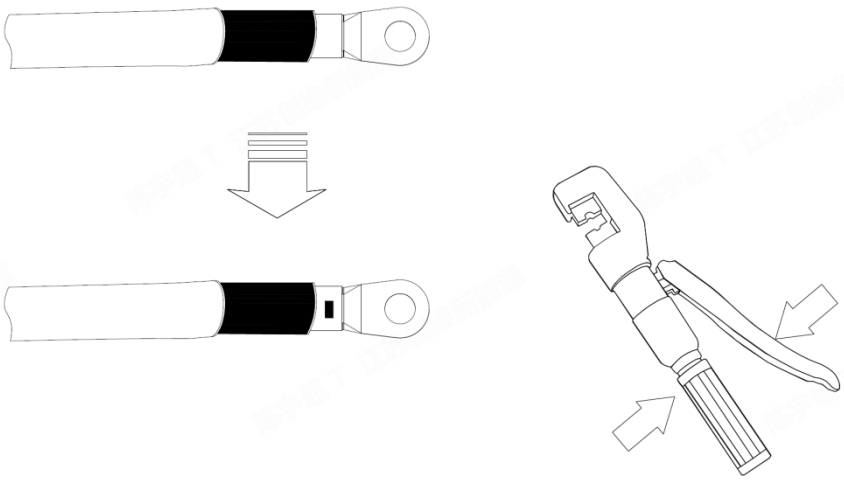
Step 2: Strip the insulation of the grounding cable to the appropriate length.



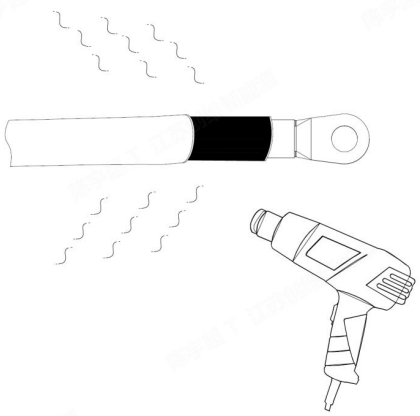
Step 3: Insert the stripped cable into the heat shrink tubing and place it into the crimping area of the OT terminal.



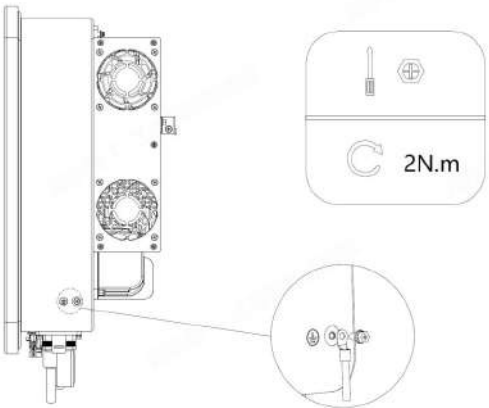
Step 4: Use a hydraulic crimping tool to crimp the terminal onto the cable.



Step 5: Move the heat shrink tubing to the crimping area of the OT terminal and use a heat gun to shrink and shape it.



Step 6: Remove the M5 screw from the grounding point on the side of the inverter, connect the grounding wire to the grounding point on the side of the inverter, and tighten the M5 grounding bolt to a torque of 2 N·m.



5.4 AC Cable Connection

⚠	**Warning!** 1. Each inverter must have an independent AC circuit breaker installed. It is prohibited for multiple inverters to share a single AC circuit breaker. 2. Do not connect local loads between the inverter and the AC side circuit breaker. 3. Before making electrical connections, ensure that the inverter's DC switch is in the "OFF" position and the AC side circuit breaker is in the off position.
⚠	**Note:** The inverter has the function of detecting residual current and protecting the inverter against residual current. If an external RCD breaker is mandatory in the country of installation, you must choose aType A RCD breaker with the rating residual current not less than 300mA.

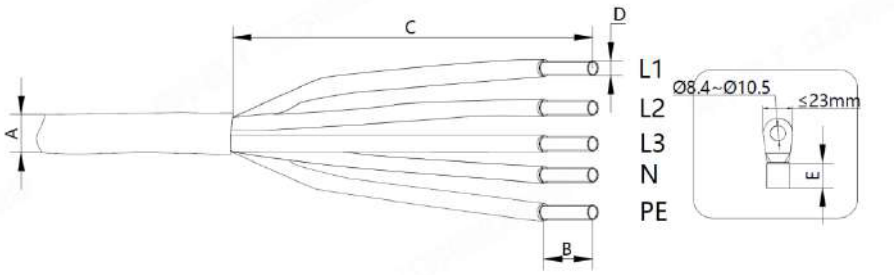
	4. The inverter can only be connected to the grid after obtaining the local utility's connection approval. Before connecting to the grid, ensure that the grid voltage and frequency meet the inverter's requirements. 5. When using aluminum wire, please crimp a copper-aluminum transition terminal and prepare the AC wiring OT terminal separately.

To ensure that the inverter can safely disconnect from the grid in case of an anomaly, please install an AC circuit breaker on the AC side of the inverter. Choose the appropriate AC circuit breaker according to local regulations. The following AC circuit breaker specifications are for reference:

Inverter Model	Wire Cross - sectional Area Range (mm²)	Recommended AC Circuit Breaker
SV040KTL-T1-EM36	25-35 (2AWG)	100A/400V
SV040KTL-T1-EM48	25-35 (2AWG)	100A/400V
SV050KTL-T1-EM48	35-50 (1AWG)	125A/400V
SV060KTL-T1-EM48	50-70 (0AWG)	150A/400V
SV015KTL-T1-EM24-V1	10-16 (6AWG)	63A/230V
SV020KTL-T1-EM24-V1	16-25 (4AWG)	80A/230V
SV025KTL-T1-EM36-V1	25-35 (2AWG)	100A/230V
SV030KTL-T1-EM36-V1	50-70 (0AWG)	150A/230V
SV036KTL-T1-EM48-V1	50-70 (0AWG)	150A/230V

Installation steps:

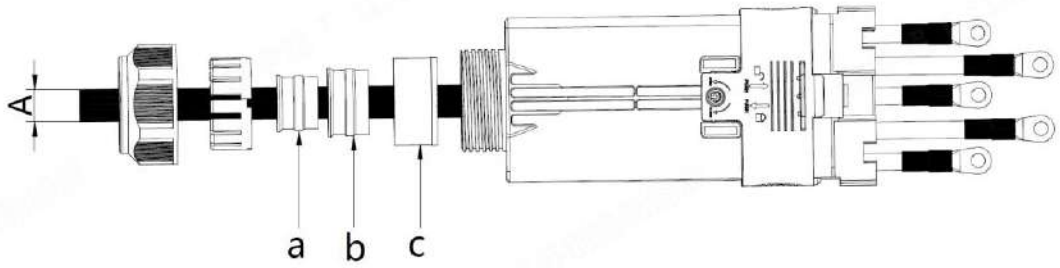
Step 1: Perform cable stripping operation as shown in the following figure.



Object	Name	Recommended Size	Note
A	Outdoor Cable Outer Diameter Range	Ø18~Ø38mm	40KW: Ø18-30mm 50-60KW: Ø22-38mm
B	Insulation Layer Stripping Length	B=E+(2~3)mm	
C	Cable Outer Layer Stripping Length	≤90mm	
D	Outdoor Copper Core Cable (5-core)	25~50mm²	40KW : Recommend 25mm² 50KW : Recommend 35mm² 60KW : Recommend 50mm²

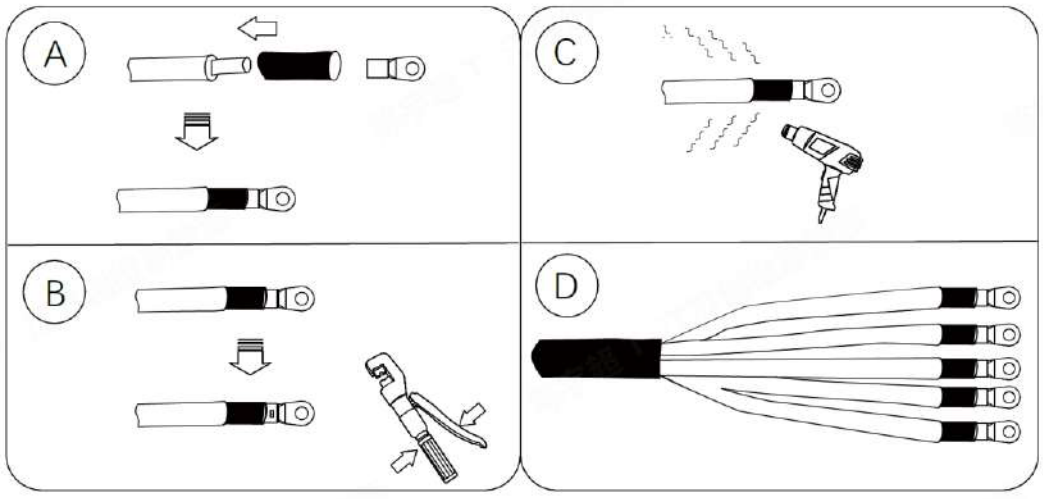
	Outdoor Aluminum Core Cable (5-core)	30~70mm²	40KW: Recommend 35mm². Should be paired with a copper-aluminum transition terminal. 50KW: Recommend 50mm². Should be paired with a copper-aluminum transition terminal. 60KW: Recommend 70mm². Should be paired with a copper-aluminum transition terminal.

Step 2: Unscrew the locking nut of the waterproof connector and remove the seal ring. Choose the appropriate seal ring based on the cable outer diameter. Then, sequentially insert the cable through the locking nut, seal ring, and junction box.

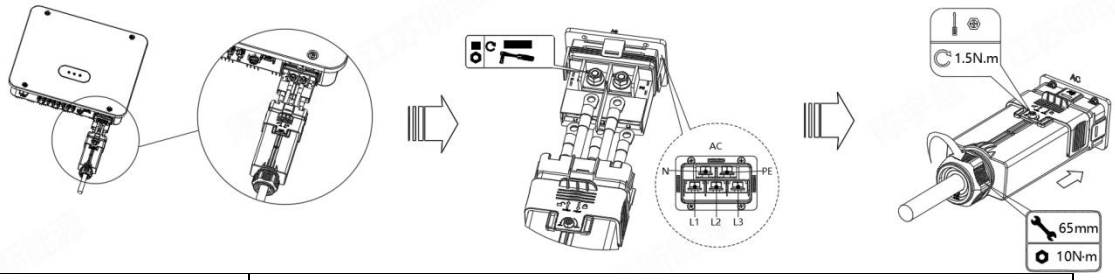


Wire Diameter A	Seal Ring Combination
Ø16~Ø22mm	a+b+c
Ø22~Ø28mm	b+c
Ø22~Ø38mm	c

Step 3: Prepare the cable and crimp the OT/DT terminals.



Step 4: Securely attach the five wires—L1, L2, L3, N, and PE—to their respective terminals. Use a socket wrench to tighten the wires, then pull outward to confirm the cables are securely connected. Finally, attach the protective cover to the inverter.



	Warning! When connecting multiple inverters in parallel to the grid, the total number of inverters should not exceed 5 units. If more inverters are required, please contact Solavita to confirm the technical solution.

5.5 DC Side String Connection

	Warning! 1. Before connecting the photovoltaic string, ensure that the DC switch is in the off state. 2. Ensure that the polarity of the photovoltaic string matches the DC connector, otherwise it will damage the inverter. 3. 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. 4. 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.

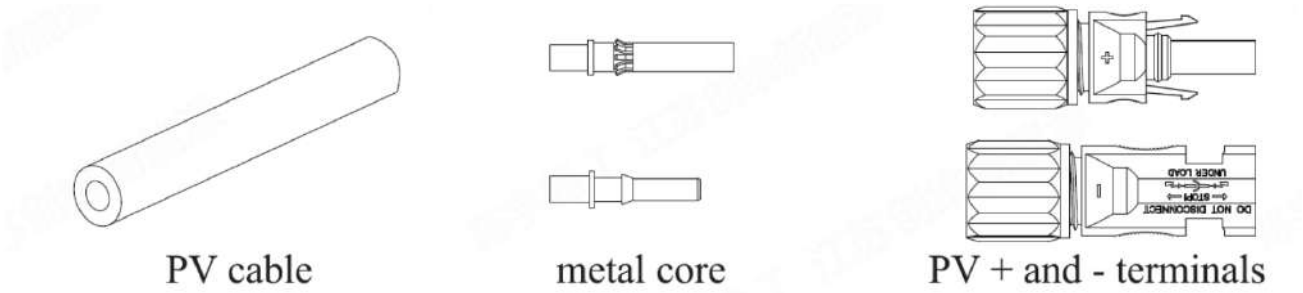
	Note: 1. Connecting Different brands or models of PV modules in the same MPPT, or connecting PV modules with different orientations or tilt angles within the same string, may not necessarily damage the inverter, but it will lead to a decrease in system performance. 2. It is recommended that the voltage difference between different MPPT channels does not exceed 160V. 3. It is recommended that the sum of the peak power currents of the strings connected to each MPPT channel does not exceed the maximum input current of the inverter's MPPT. 4. When the inverter is connected to multiple PV strings, it is recommended to maximize the number of MPPT channels used. 5. Please use the DC connectors provided with the inverter. Damage caused by using incompatible connectors is not covered under warranty. 6. The PV string output does not support grounding. Before connecting the PV string to the inverter, ensure that the minimum insulation resistance to ground of the PV string meets the required minimum insulation impedance. 7. Please prepare your own DC input cables. The type of DC input cable should be outdoor PV cables that meet the inverter's maximum input voltage requirements.

Recommended DC input cable specifications (PV cables with a maximum withstand voltage of ≥1100V).

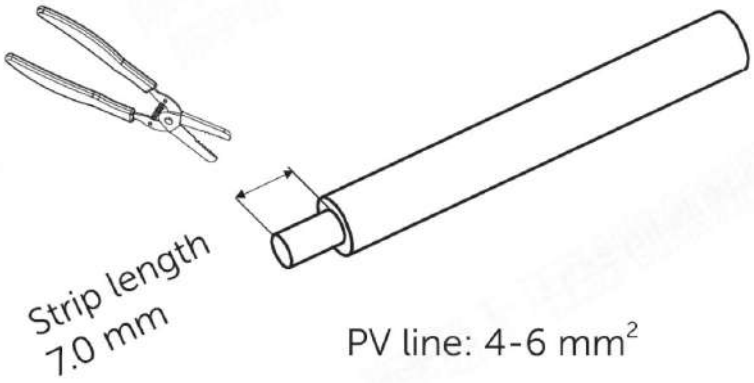
Wire Copper Core Cross - sectional Area (mm²)	Cable Outer Diameter Range (mm)
4.0-6.0	6.0-9.0

Installation steps:

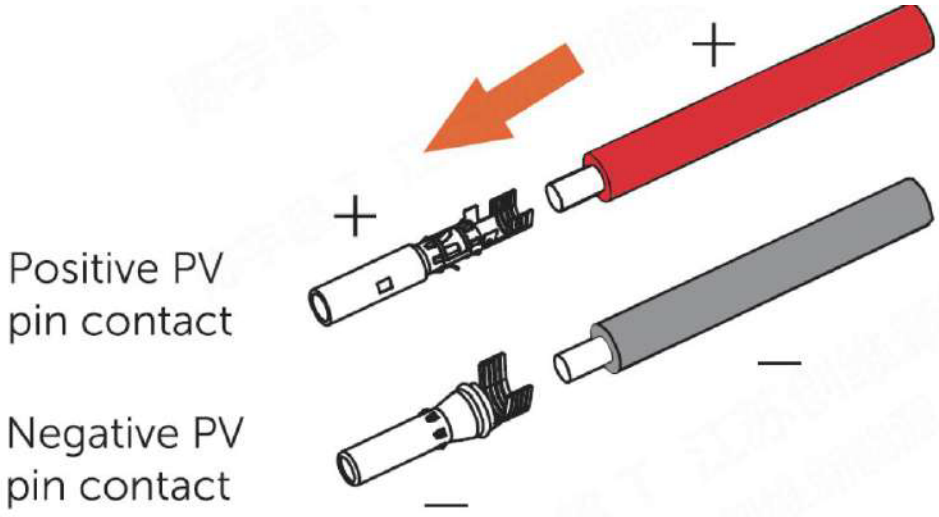
Step 1: Close the DC switch and prepare a suitable photovoltaic cable. Find the photovoltaic (+) terminal, photovoltaic (-) terminal, and metal core in the packaging box.



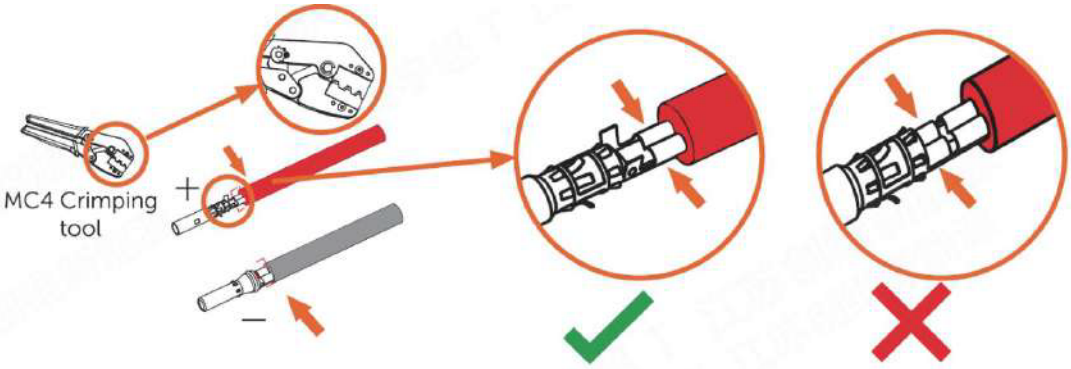
Step 2: Strip the wire with a wire stripper to 7 ± 0.5mm as shown in the following figure.



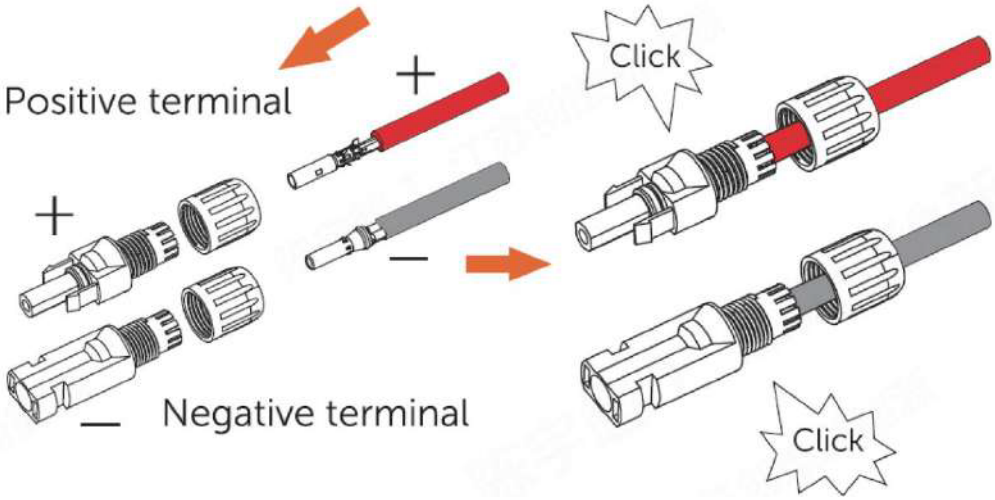
Step 3: Tighten the cable with the insulation layer stripped and insert it into the metal core (see Figure 1), and ensure that all wires are inserted into the metal core (see Figure 2).



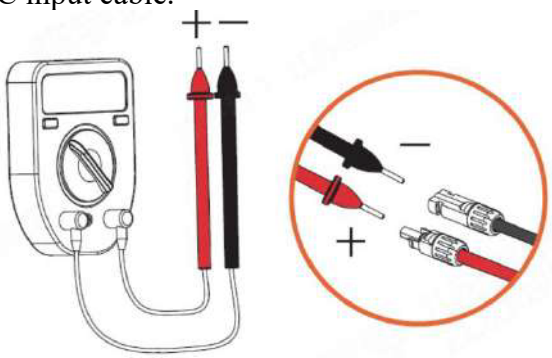
Step 4: Use a crimping pliers to compress the cable wire and the PV terminal metal core tightly to ensure a firm crimping connection.



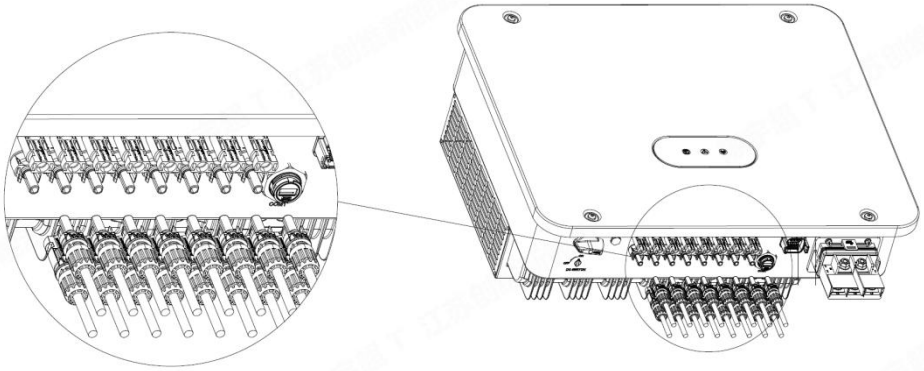
Step 5: Pass the crimped positive and negative cable wires through the locking nut and insert them into the corresponding plastic shells respectively until a click sound is heard, indicating that the metal core has been snapped into place.



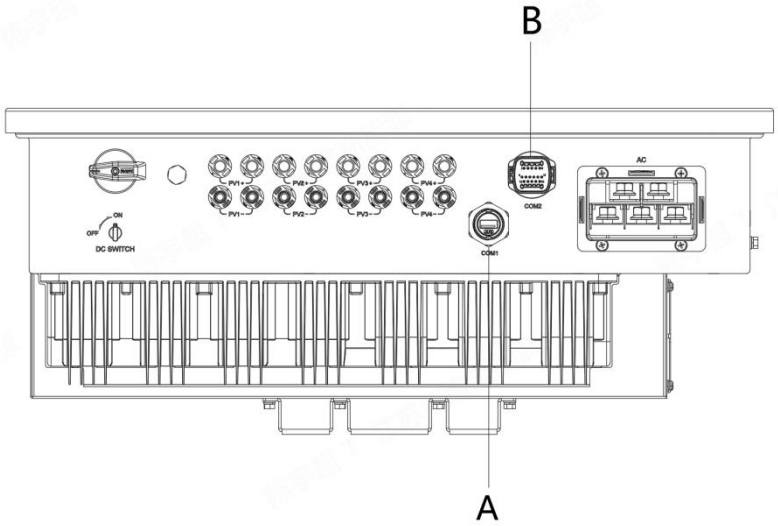
Step 6: Tighten the nut and use a multimeter to measure the photovoltaic voltage of the DC input to verify the polarity of the DC input cable.



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

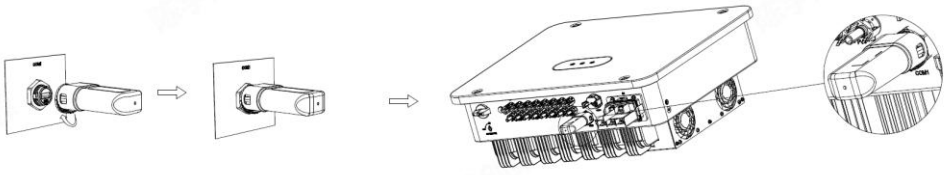


5.6 Communication Connection



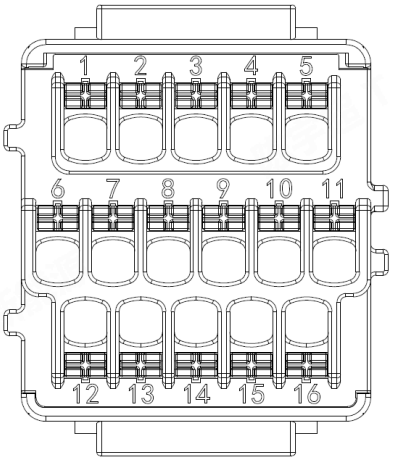
1. **Communication module connection (A)**

Connect the 4G 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:

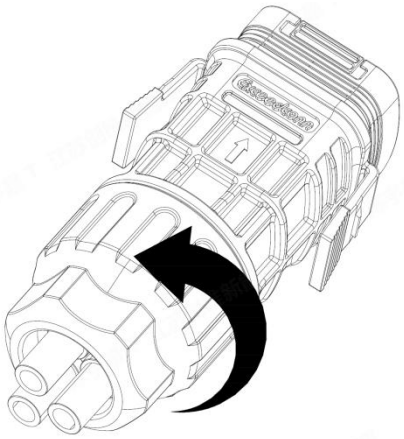


COM2 Interface Definition			
Port	**PIN**	**Definition**	**Description**
Europe RCR	1	RCR1_1	Available for European RCR Grid dispatching.
	2	RCR2_1	
	3	RCR3_1	
	4	RCR4_1	
RS485_1	6	485+_Parallel 1	For inverter parallel connections.
	7	485+_Parallel 2	
	12	485-_Parallel 1	
	13	485-_Parallel 2	
RS485_2	8	485+_4G 1	
	9	485+_4G 2	
	14	485-_4G 1	
	15	485-_4G 2	
RS485_3	10	485+_Meter	For meter connection.
	16	485-_Meter	
PE	5	GND,S	
5V	11	+5V.S	

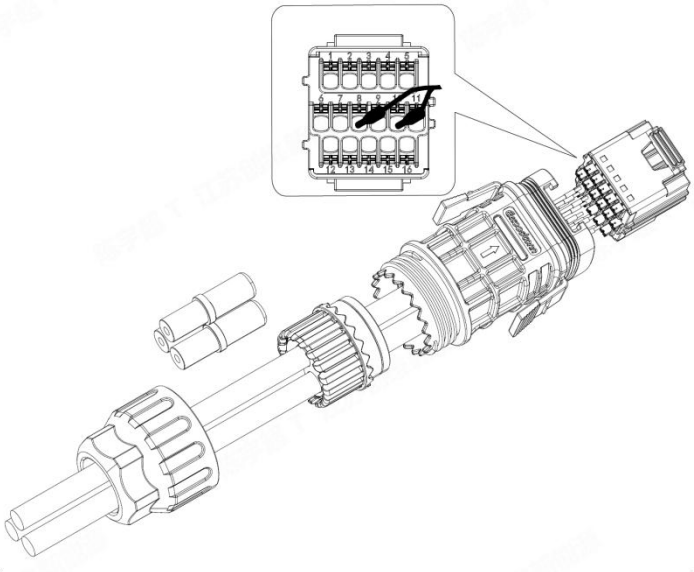
Note:
1. The length of the RS485 communication cable should not exceed 1000 meters.
2. When connecting the communication cables, ensure that the terminal definitions match the device's requirements. The cable routing should avoid interference sources, such as power cables, to prevent signal disruption and ensure proper communication.

Installation steps:

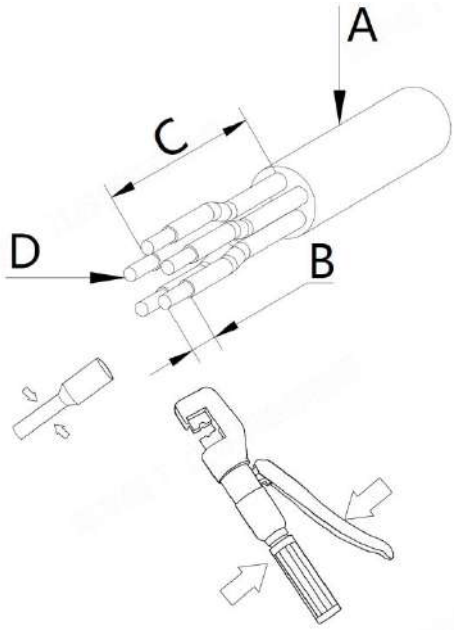
Step 1: Unscrew the locking nut on the communication terminal.



Step 2: Insert the cable sequentially through the locking nut, seal ring, and onsite wiring components.



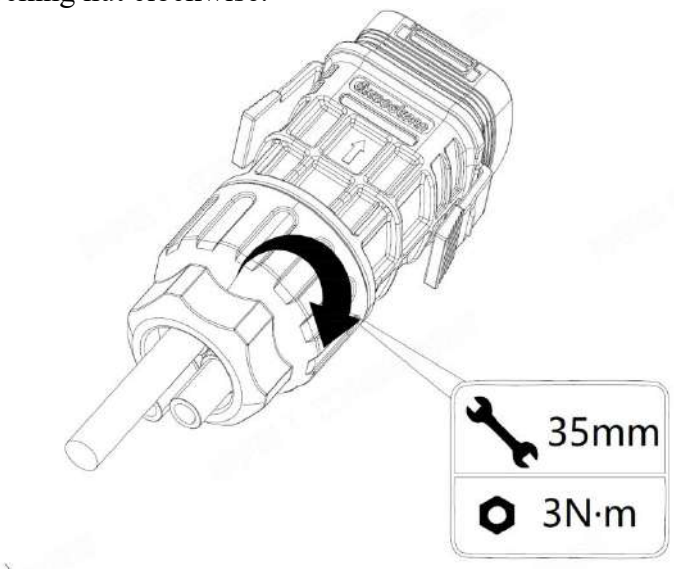
Step 3: Strip the cable insulation.



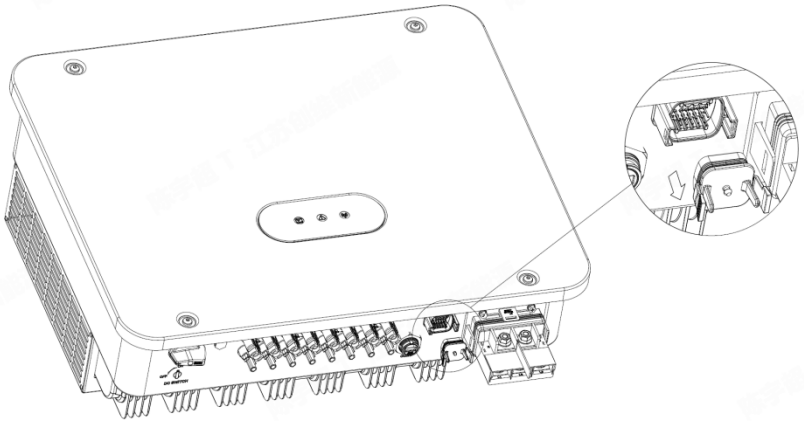
Object	Name	Recommended Size

A	Outdoor Communication Cable Outer Diameter Range	Ø4.5~Ø7mm
B	Insulation Stripping Length	7-8mm
C	Cable Outer Layer Stripping Length	≤40mm
D	Outdoor Copper Core Cable (4-Core)	0.2~0.5mm²

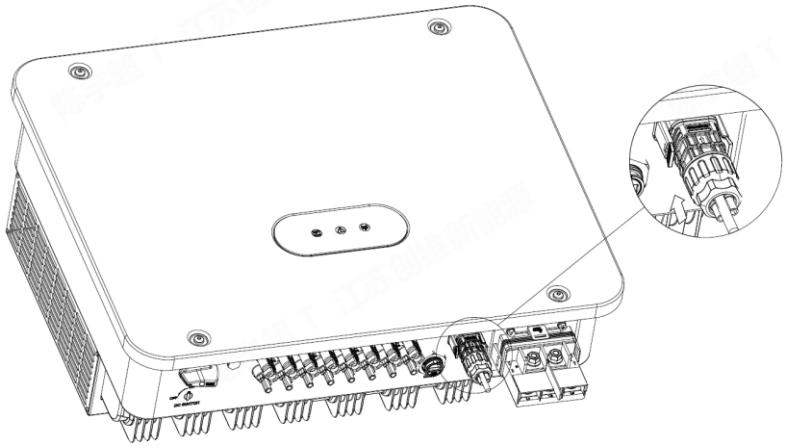
Step 4: Tighten the locking nut clockwise.



Step 5: Remove the waterproof cover from the communication terminal.



Step 6: Install the connector onto the communication terminal.



6. Equipment Commissioning

6.1 Check Items Before Switching Power ON

No.	Check Item
1	Check that the inverter is firmly installed in a clean, well-ventilated location that is easily accessible for operation and maintenance.
2	Check that DC switch and AC circuit breaker are in the "OFF" position.
3	Check that the PE cable, DC input cable, AC output cable, and communication cable are connected correctly and securely.
4	Check that the DC terminals are securely connected and the AC terminals are tightened properly.
5	Verify that unused terminals have been properly sealed.
6	Ensure that no tools or other items are left on top of the inverter or inside the junction box (if the inverter has a junction box).
7	Confirm that the AC circuit breaker selection complies with the requirements of this manual and local standards.
8	Ensure that the voltage and frequency at the inverter grid connection point meet the grid connection requirements.
9	Make sure all safety markings and warning labels are firmly applied and clearly visible.
10	Check that the cable bundling follows the routing requirements, is reasonably distributed, and is free from damage.

6.2 Trial Run Steps

If all the above operations are completed and meet the requirements, please follow the steps below to start the inverter:

1. Turn the DC switch on the inverter to the "ON" position.
2. If a DC circuit breaker is installed between the inverter and the PV string, close the circuit breaker.
3. Close the AC circuit breaker between the inverter and the grid.
4. Under normal sunlight and when the grid conditions meet the grid connection requirements, the inverter will start operating normally.
5. Install the Solavita Cloud App, register an account, and complete the configuration of the new power station to enable real-time monitoring of the inverter's operating status.

Note: After completing the above steps, observe the inverter's indicator light:

- If the red light is constantly on, it indicates a fault has occurred, and troubleshooting is required.
- If the blue light is constantly on, it indicates that the inverter has successfully connected to the grid and is operating normally.

	**Note:** 1. If the inverter encounters a fault, please refer to section 9.1 of this manual for troubleshooting. 2. Before closing the AC circuit breaker between the inverter and the grid, use a multimeter on the AC voltage setting to measure the AC voltage and ensure it is

	within the inverter’s allowable range. Otherwise, this could cause damage to the inverter.

7.Solavita Cloud APP

Users need to download the APP before installing it for the first time.
There are two ways to download and install the latest APP:

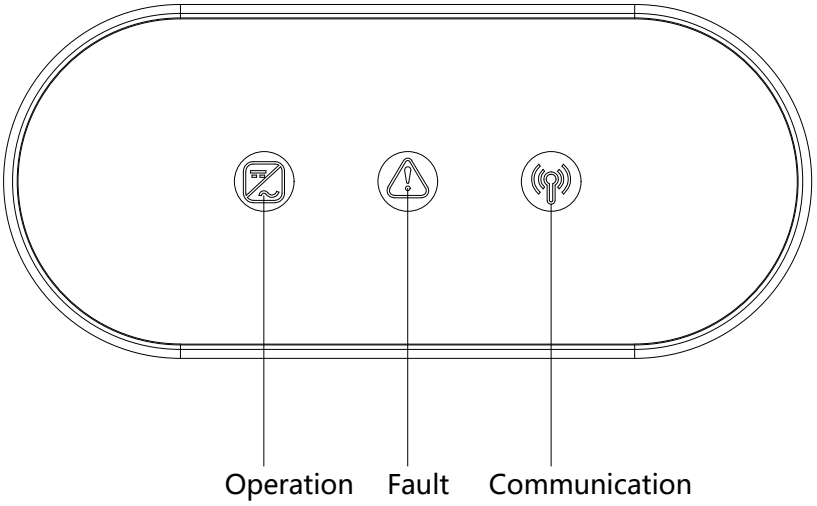
1. You can search “Solavita Cloud” in Google Play or App Store.
2. You can scan this QR code below to download "Solavita Cloud".

Solavita Cloud

Android

IOS

8. Operation Interface



Indicator	Color	LED Status	LED Status Definition
Running	Blue	On	Normal
		0.5s Quick Flashing	Standby Mode
		2s Slow Flashing	PID Recovery
Alarm	Red	On	Fault
		0.5s Quick Flashing	Alarm
Communication	Yellow	2s Slow Flashing	Normal
		0.5s Quick Flashing	Upgrade
		OFF	Offline
Three indicator lights are OFF			Check DC and AC side

9. Troubleshooting and Maintenance

9.1 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:

Name	No.	Troubleshooting
PV_OC_HW	1	1. Disconnect the AC output side switch and DC input side switch. After 5 minutes, close the AC output side switch and DC input side switch. 2. If the alarm continues, please contact us for assistance.
PV_REVERSE_CONNECT_SW	3	Check whether the string is reversed.
PV_OV_SW	5	1. Check the series configuration of the corresponding PV string to ensure that the open-circuit voltage of the string does not exceed the inverter's maximum operating voltage. 2. If the alarm continues, please contact us for assistance.
INV_OC_HW	17	1. If this alarm occurs occasionally, no action is required. 2. If the alarm continues, please contact us for assistance.
GRID_UF_SW	19	1. If it occurs occasionally, it may be due to a temporary grid anomaly. The inverter will resume normal operation once it detects that the grid is stable, and no manual intervention is required. 2. If it occurs frequently, check whether the grid frequency is within the allowable range. If not, please contact the local power utility. If it is, you may need to modify the grid over-frequency protection point after obtaining consent from the local power utility. 3. If the alarm continues, please contact us for assistance.
GRID_OF_SW	20	1. If it occurs occasionally, it may be due to a temporary grid anomaly. The inverter will resume normal operation once it detects that the grid is stable, and no manual intervention is required. 2. If it occurs frequently, check whether the grid frequency is within the allowable range. If not, please contact the local power

		utility. If it is, you may need to modify the grid over-frequency protection point after obtaining consent from the local power utility. 3. If the alarm continues, please contact us for assistance.
GRID_ZERO_CROSS_LOSS_SW	21	1. The alarm will automatically disappear after the grid power supply is restored. 2. Check if the AC line or AC switch is disconnected.
RLY_FAULT	23	1. Disconnect the AC output side switch and DC input side switch. After 5 minutes, close the AC output side switch and DC input side switch. 2. If the alarm continues, please contact us for assistance.
GRID_OV_SW	24	Under normal circumstances, the inverter will reconnect to the grid after the grid returns to normal. If the fault recurs: 1. Measure the actual grid voltage. If the grid voltage is indeed higher than the set value, please contact the local power utility for a solution. 2. Check the protection parameter settings via the app or LCD screen, and modify the 10-minute overvoltage protection point with the consent of the local power utility. If the alarm continues, please contact us for assistance.
GRID_UV_SW	25	Under normal circumstances, the inverter will reconnect to the grid after the grid returns to normal. If the fault recurs: 1. Measure the actual grid voltage. If the grid voltage is indeed higher than the set value, please contact the local power utility for a solution. 2. Check the protection parameter settings via the app or LCD screen, and modify the 10-minute overvoltage protection point with the consent of the local power utility. If the alarm continues, please contact us for assistance.
HALF_BUS_OV_SW	50	1. Check whether the input voltage exceeds the inverter's maximum voltage. 2. If the alarm continues, please contact us for assistance.
UNBALANCE_BUS_SW	51	1. Disconnect the AC output side switch and DC input side switch. After 5 minutes, close the AC output side switch and DC input side switch.

		2. If the alarm continues, please contact us for assistance.
BUS_OV_SW	52	1. Check whether the input voltage exceeds the inverter's maximum voltage. 2. If the alarm continues, please contact us for assistance.
BUS_UV_SW	53	1. Check whether the input voltage exceeds the inverter's maximum voltage. 2. If the alarm continues, please contact us for assistance.
LINE_CONNECT_TO_PE	55	1. Check whether the grid's neutral wire is correctly connected. 2. Restart the inverter. 3. If the alarm continues, please contact us for assistance.
ISLANDING	57	1. Check the connection between the inverter and the grid to ensure the wiring is correct and there are no loose connections or damage. 2. Assess the voltage and frequency stability of the grid to ensure the grid conditions meet the inverter's requirements. 3. Restart the inverter. 4. If the alarm continues, please contact us for assistance.
DC Injection High	58	1. If the abnormality is caused by external faults (such as grid anomalies, frequency issues, etc.), the inverter will automatically resume normal operation once the fault disappears, and no manual intervention is required 2. If the alarm continues, please contact us for assistance.
ISO	59	1. Restart the inverter. 2. If the alarm continues, please contact us for assistance.
Over temperature in inverter	60	Generally, the machine will resume operation once the internal or module temperature returns to normal. If the fault recurs: 1. Check if the environment temperature around the machine is too high. 2. Ensure the machine is placed in a well-ventilated area. 3. Check if the machine is exposed to direct sunlight; if so, provide proper shading. 4. Check if the fan is working properly; if not, replace the fan. 5. If the alarm continues, please contact us for assistance.
GFCI protect fault:30mA level	61	1. If it occurs occasionally, it may be due to a temporary abnormality in the external wiring.
GFCI protect fault:60mA level	62	

GFCI protect fault:150mA level	63	The fault will clear and normal operation will resume without manual intervention. 2. If the fault occurs frequently or cannot be resolved for a long time, please check whether the ground insulation resistance of the photovoltaic string is too low. 3. If the alarm continues, please contact us for assistance.
AFCI Fault	64	1. Disconnect the DC power, check if there is any cable damage, loose terminals, or fuses with poor contact, or if there are any signs of burn marks on the components. If any of these issues are found, replace the damaged cables, tighten loose terminals, or replace components with burn marks. 2. After completing the DC side inspection and corrective actions, reconnect the DC power and clear the AFCI fault via the app. The inverter will resume normal operation. 3. If the alarm continues, please contact us for assistance.
GROUND FAULT	65	1. Please confirm that the inverter's grounding wire is properly connected. 2. If the photovoltaic string's output is grounded, please check if the inverter's AC output cables L and N are incorrectly connected. 3. If the alarm continues, please contact us for assistance.
ARM_COM_MISS	66	1. Restart the inverter. 2. If the alarm continues, please contact us for assistance.

9.2 Maintenance

<table>
<tr><td rowspan="2"></td><td>● Incorrect maintenance may lead to inverter damage or personal injury!
● 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.
● Disconnect the AC circuit breaker, and then turn the DC circuit breaker of the inverter to OFF.
● Wait at least 5 minutes to allow the internal capacitor to discharge completely.
● Confirm that there is no voltage or current before unplugging any connectors.</td></tr>
<tr><td>Note!
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.</td></tr>
</table>

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 Con nection	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 o ne 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

⚠	1.Stop the inverter and disconnect all power supplies connected to it before maintenance. 2.After disconnection, wait at least 5 minutes to ensure that the inverter is de - energized, and then perform maintenance work. 3.Only qualified electricians can maintain the fan.

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:

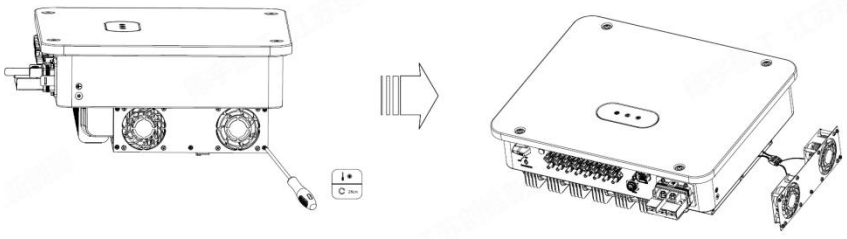
Step 1: Stop the inverter (send a shutdown command on the APP first, turn off the DC and AC circuit breakers of the inverter, and wait at least 5 minutes).

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.



10. Technical Parameters

Model	SW040KTL-T1-EM36	SW040KTL-T1-EM48	SW050KTL-T1-EM48	SW060KTL-T1-EM48
DC Input				
Max. Input Voltage [V]	1100			
MPPT Voltage Range [V]	180~1000			
Rated Input Voltage [V]	600			
Start-up Voltage [V]	200			
No. of MPPT Trackers	3	4		
No. of PV Strings per MPPT	2	2		
Max. Input Current per MPPT [A]	40	40		
Max. Short Circuit Current per MPPT [A]	50	50		
Max.Inverter back feed current to the array [mA]	0			
AC Output				
Rated Output Power [W]	40000	40000	50000	60000
Max. Output Apparent Power [VA]	44000	44000	55000	66000
Max. Output Current [A]	66	66	84	100
Rated Grid Voltage [V]	3/N/PE； 220/380,230 / 400			
Current (inrush)[A]	<17@ 21 ms (peak and duration)			
Maximum Output Fault Current [A]	208.3 A peak impulse(16.5 ms duration)			
Rated Grid Frequency [Hz]	50/60			
Power Factor [cos φ]	1 (+/-0.8, adjustable)			
Efficiency				
Max. Efficiency	98.60%			
Euro Efficiency	98.00%			
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			
String Detection	Integrated			
DC Surge Protection	Integrated (Type II)			
AC Surge Protection	Integrated (Type II)			
AFCI	Optional			
IV Curve Scanning	Optional			
PID Recovery	Optional			
General data				
Dimensions (W*H*D) [mm]	623*523*235			
Weight [Kg]	35.9			
Display	LED& Bluetooth+APP			
Communication	WiFi /LAN/ RS485 / 4G (Optional)			
Operating Temperature Range [℃]	-30 ~ +60			

Relative Humidity	0 ~ 100%
Operation Altitude [m]	≤4000(＞3000 derating)
Topology	Transformerless
Protective Class	I
Cooling Concept	Smart fan-cooling
Protection Class	IP66
Noise	＜60dB
Overvoltage Category	II(PV), III(MAINS)

Model	SW015KTL-T1-EM24-V1	SW020KTL-T1-EM24-V1	SW025KTL-T1-EM36-V1	SW030KTL-T1-EM36-V1	SW036KTL-T1-EM48-V1
DC Input					
Max. Input Voltage [V]	800				
MPPT Voltage Range [V]	180-800				
Rated Input Voltage [V]	360				
Start-up Voltage [V]	200				
No. of MPPT Trackers	2		3		4
No. of PV Strings per MPPT	2		2		2
Max. Input Current per MPPT [A]	40		40		40
Max. Short Circuit Current per MPPT [A]	50		50		50
Max.Inverter back feed current to the array [mA]	0				
AC Output					
Rated Output Power [W]	15000	20000	25000	30000	36000
Max. Output Apparent Power [VA]	16500	22000	27500	33000	39600
Max. Output Current [A]	44	58	73	87	104
Rated Grid Voltage [V]	3/N/PE；127/220,133/230				
Current (inrush)[A]	<17@ 21 ms (peak and duration)				
Maximum Output Fault Current [A]	208.3 A peak impulse(16.5 ms duration)				
Rated Grid Frequency [Hz]	50/60				
Power Factor [cos φ]	1 (+/-0.8, adjustable)				
Efficiency					
Max. Efficiency	97.80%				
Euro Efficiency	97.30%				
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				
String Detection	Integrated				
DC Surge Protection	Integrated (Type II)				
AC Surge Protection	Integrated (Type II)				
AFCI	Optional				
IV Curve Scanning	Optional				
PID Recovery	Optional				

General data	
Dimensions (W*H*D) [mm]	623*523*235
Weight [Kg]	35.9
Display	LED& Bluetooth+APP
Communication	WiFi /LAN/ RS485 / 4G（Optional）
Operating Temperature Range [°C]	-30 ~ +60
Relative Humidity	0 ~ 100%
Operation Altitude [m]	≤4000(＞3000 derating)
Topology	Transformerless
Protective Class	I
Cooling Concept	Smart fan-cooling
Protection Class	IP66
Noise	＜60dB
Overvoltage Category	II(PV), III(MAINS)

*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 Solavita's internal laboratory. The actual values may vary depending on the product, software version, usage conditions, and environmental factors.

SKYWORTH

[illegible]

[illegible]

+36 [illegible]

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