



User Manual

5G MEGA INVERTER

KSY-60KW/70KW/75KW/80KW Series

Three-Phase Grid-Tie Solar Inverter

About this manual




For Readers

This manual is helpful for technicians who install, debug, operate and maintain string inverters of KSOLARE. Please read this manual carefully before operates the product. Readers are required to know the basic knowledge about electric components, wiring, signs and mechanical drawings.

Outlines

Chapter	Contents
1 Safety Precautions	This chapter describes the safety precautions when transporting, storing, installing, running and maintaining the Inverter.
2 Product Description	This chapter describes the basic principles, naming rules, product configuration and data.
3 System Installation	This chapter describes the unpacking inspection, installation tools, installation environment, reserved space, fixing method, cable connection.
4 Commissioning Guide	This chapter describes the inspection before startup, commissioning and startup of string inverter.
5 Maintenance and Troubleshooting	This chapter describes the daily maintenance methods, maintenance intervals and troubleshooting of the product.
6 Inverter Handling Guide	This chapter describes the basic requirements and precautions when disassembling, replacing, and scrapping the inverter.

Warning Signs in This Manual

 DANGER	Major potential danger (especially refer to high voltage danger). Failure to observe the rules might cause severe personal injury or property loss.
 WARNING	Ordinary potential danger. Failure to observe the rules might cause personal injury or property loss.
 CAUTION	Ordinary potential danger. Failure to observe the rules might cause malfunction of the equipment or property loss.

Glossaries and Abbreviations

Glossaries/Abbreviations	Description
MPPT	Maximum power point tracking
Photovoltaic string	Multiple solar cell arrays in parallel or series
EEPROM	Electrically erasable programmable read-only memory

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1 Safety Precautions

In this chapter, it describes the safety precautions that must be observed when installing, operating and maintaining the inverter. Please read them carefully before operation and follow them in operation process; otherwise it might cause damage to the inverter, the generator and related equipment's or cause serious injury or loss of life.

When you use and operate the inverter, please take special attention to:



1. Only the qualified personnel are allowed to install, operate and maintain the inverters.
2. Do NOT incline or collide the product in transportation.
3. Do NOT make any liquid, sundries or rubbishes enter inside as they might cause short circuit inside the inverter.
4. Inverter must be disconnected with AC grid before completion of installation and maintenance.
5. Related protective measures are required to avoid electric shock or fire accident.



Please do not place inflammables and explosives around the inverter to ensure environmental safety.

1.1 Transport



1. When transporting, it is necessary to ensure that the inverter is packaged properly and the cabinet is fixed upwards to avoid strong vibration and collision.
2. In order to keep the inverter in good condition during transportation, it is important to use packaged transport and operate according to the labels on the package. For the meaning of the logos, please refer to [2.6 Signs on Package](#).
3. The transportation environment must meet the requirements. Please refer to [2.10 Ambient Requirements](#).

1.2 Storage



The storage environment of the string inverter must meet the corresponding requirements. Please refer to [2.10 Ambient Requirements](#).

About long-term storage:

Before or after the installation and commissioning, if the string inverter is in the no-power supply state for more than three weeks, it is regarded as long-term storage. Long-term storage of string inverters requires attention to the following issues:

Put the desiccant into the cabinet and package the whole machine with packaging materials.

When storing equipment, pay attention to ventilation and moisture. Stagnant water is strictly forbidden in the storage environment.

Pay attention to the harsh environment, such as quenching, sudden heat, collision, dust, etc., to avoid damage to the string inverter.

Regular inspections are required, usually not less than once a week. Check whether the packaging is intact to avoid pest bites. If it is damaged, it needs to be replaced immediately.

If the storage time exceeds half a year, the package should be opened for inspection, repackaged, and desiccant replaced.

It is strictly forbidden to store the device without packaging.

1.3 Installation



1. Before operating the internals of the string inverter, it must be confirmed that the input switch DC Switch of the string inverter and the circuit breaker corresponding to the AC side of the inverter are in the off state, and the housing of the inverter is reliably guaranteed.
2. The string inverter must be grounded according to the specifications. The size of the grounding conductor must meet the requirements of safety regulations to ensure the safety of personnel.



1. During installation, it is necessary to ensure that the string inverter's installation environment is well ventilated and heat-dissipating, and the device should not be directly exposed to sunlight.
2. The fixing of the string inverter is recommended by two people working together to avoid mechanical damage. During the installation process, safety measures should be taken to prevent bruises.
3. During installation and maintenance, it is necessary to prevent liquid, dust or debris from entering the inside of the string inverter. Conductive liquids and debris may cause internal short circuit of the string inverter, resulting in equipment damage.
4. When connecting the wiring of the external cable to the string inverter, the installation torque of the power cable must be ensured. Excessive torque may cause fatigue damage of the screw while too small torque may cause the contact resistance to become large, resulting in overheating.
5. The power cable terminals connected to the string inverter must comply with national standards. If the terminals are not in accordance with the standards, the power cable may be overheated. In severe cases, a fire may occur.
6. The installation site must meet the requirements of the operating environment. Please refer to [2.10 Environmental Requirements](#).

1.4 Operating



1. During the operation of the string inverter, it is necessary to ensure that the door panel of the string inverter is locked to prevent personal injury such as electric shock, and to prevent salt, moisture, dust or other conductive substances in the air from entering the string inverter.
2. When the string inverter is powered on, it is prohibited to touch the internal single boards, devices, cables and terminals of the string inverter and to plug and unplug the external terminals.
3. In case of any fault, abnormal smell or sound of the string inverter, please immediately switch off the DC Switch of the string inverter and the circuit breaker on the AC side of the inverter.



1. Power on the string inverter only after all installation work is completed and cables are not connected incorrectly.
2. It is prohibited to conduct any insulation resistance test or voltage withstand test on the string inverter. Wrong voltage withstand test will damage the string inverter.
3. When conducting insulation withstand voltage test on external equipment of the string inverter, the wiring between the string inverter and the external equipment must be disconnected.

1.5 Maintenance



1. Before maintenance work, you must first disconnect the AC output side circuit breaker, then disconnect the input switch DC Switch, and wait at least 5 minutes before operating the string inverter.
2. During the maintenance process, try to avoid irrelevant personnel from entering the maintenance site.
3. Please maintain the string inverter under the condition that you are familiar with and understand the contents of this manual, and have suitable tools and test equipment.
4. For personal safety, please wear insulating gloves and anti-smashing shoes.



The string inverter must be checked and maintained regularly. For details, refer to [5 Maintenance and Troubleshooting](#).

--End of the chapter--

2 Product Description

2.1 Product Introduction

The KSY MEGA series string inverter is three-phase string-type grid-connected inverter independently developed by Ksolare Energy Pvt. Ltd. Its main function is to convert the DC power generated by the PV string into AC power and feed it into the power grid.

KSY MEGA 60KSY and KSY MEGA 70KSY have 12 input interfaces;

KSY MEGA 75KSY and KSY MEGA 80KSY-M have 14 input interfaces

Among them, KSY MEGA 80KSY-M is suitable for 500VAC/10kV (35KV) medium voltage grid-connected scenarios, such as large-scale ground photovoltaic power stations and distributed photovoltaic power plants above 400kW;

KSY MEGA 60KSY, KSY MEGA 70KSY and KSY MEGA 75KSY are suitable for 400VAC low-voltage grid-connected scenarios, such as village-level photovoltaic power stations or industrial and commercial rooftop photovoltaic power stations below 400kW.

2.1.1 Schematic Diagram

PV strings are connected to the inverter through branches. There are MPPT circuits inside the inverter to track the MPPT of the strings, and then convert the DC power to three-phase AC power through the inverter circuit. The schematic diagram is shown below.

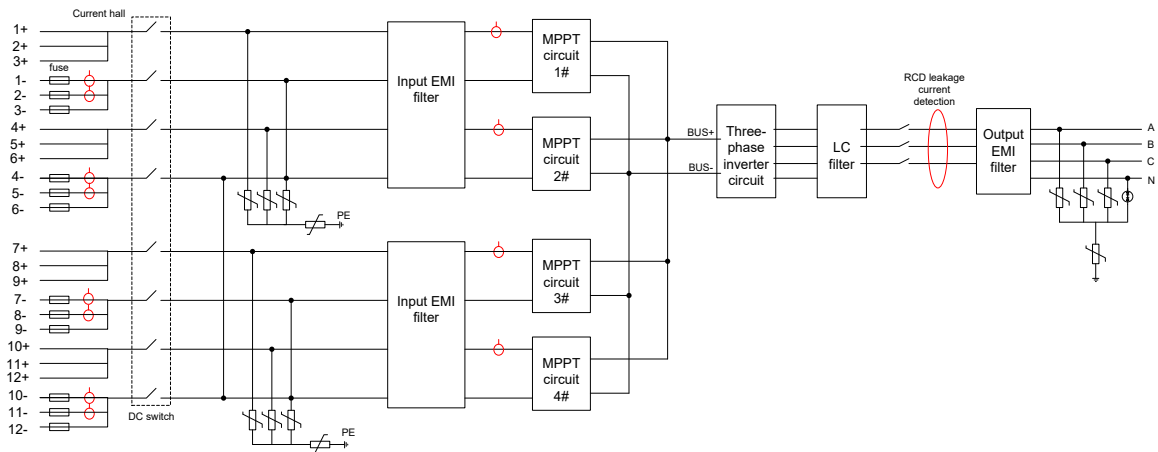


Figure 2-1 Schematic diagram of KSY MEGA 60KW /KSY MEGA 70KW

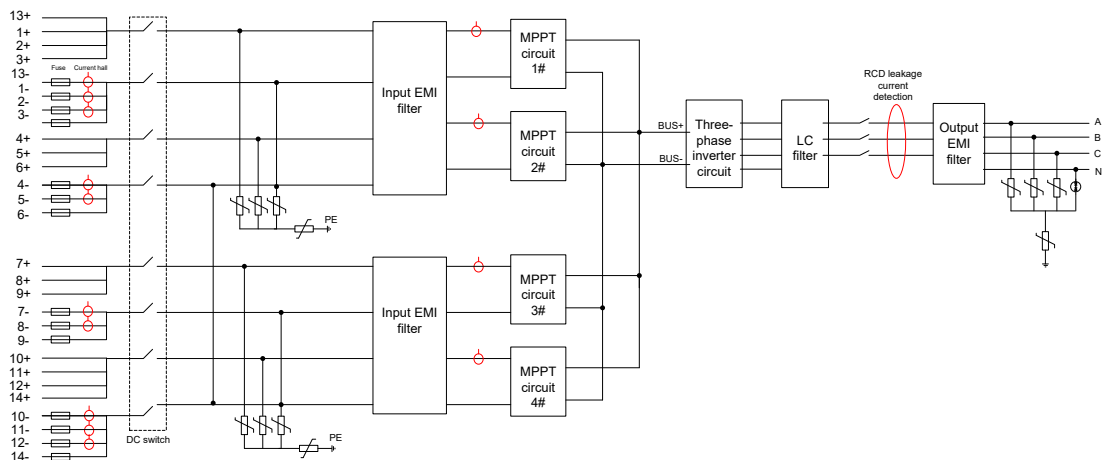


Figure 2-2 Schematic diagram of KSY MEGA 75KW, KSY-80KW

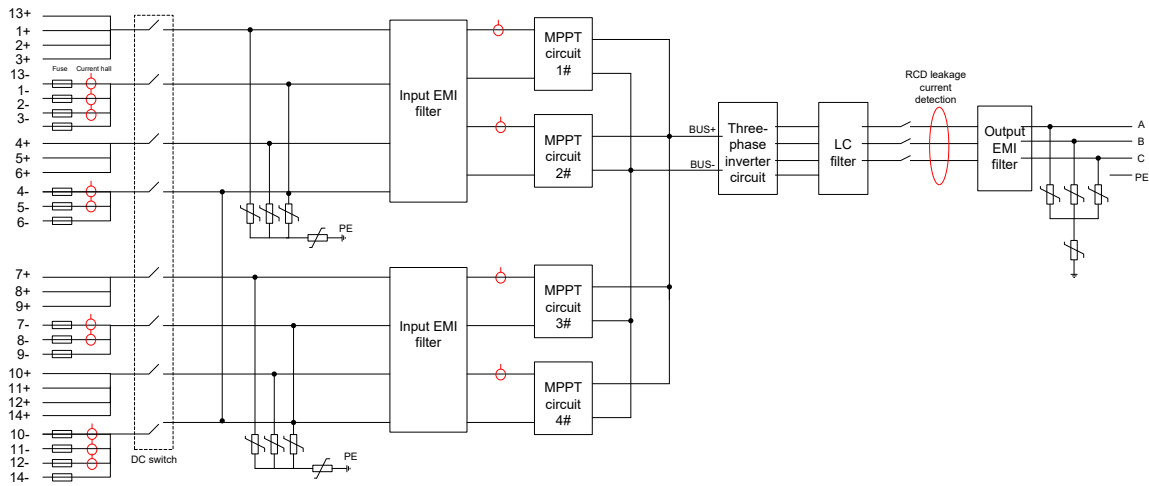


Figure 2-3 Schematic diagram of KSY MEGA 80KW -M

2.1.2 Operating Mode

KSY MEGA three-phase string inverter has three working modes: standby mode, running mode, and shutdown mode. The switching conditions of the three modes are shown as follows.

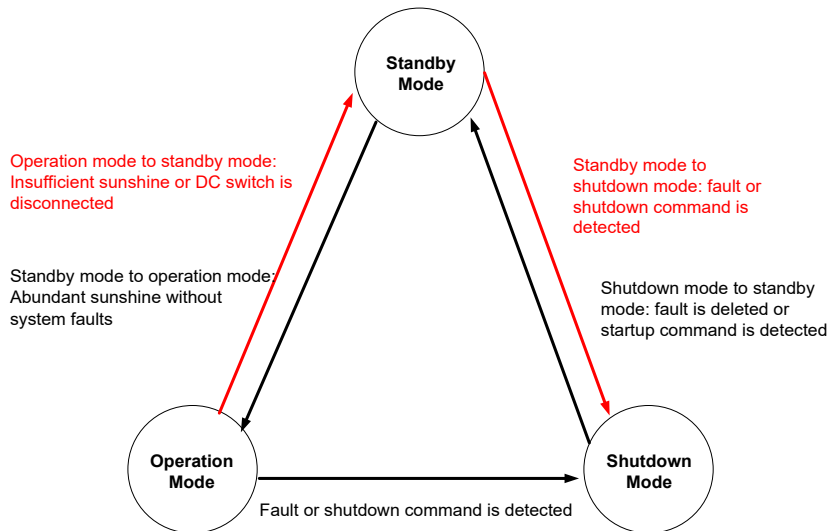


Figure 2-4 KSY MEGA string inverter operating mode

Operating mode	Description
Standby	1) Standby mode mainly means that the external environment does not meet the operating conditions of the inverter such as insufficient light and the disconnection of DC input switch. In this mode, the inverter continuously self-tests and enters the operating mode once the operating conditions are met. 2) In the standby mode, if the inverter detects a shutdown command or finds a fault after the power-on test, it enters the shutdown mode.
Running	In the running mode, the inverter converts the DC power of the PV string into AC power and feeds it into the grid. The inverter performs MPPT operation to make the PV string output maximum power. If the inverter detects a fault or a shutdown command, it enters the shutdown mode. If it is detected that the input power of the PV string is lower than the grid-connected power generation condition, it enters the standby mode.
Shutdown	If the inverter detects a fault or a shutdown command during standby or operation, it switches to the shutdown mode. In the shutdown mode, if the inverter detects that the fault has been cleared or a power-on command, it enters the standby mode.

2.2 System Configuration and Application

2.2.1 Application Description

Figure 2-5 shows the application of the string inverter, and Figure 2-6 shows the networking design scheme of the distributed PV power station.

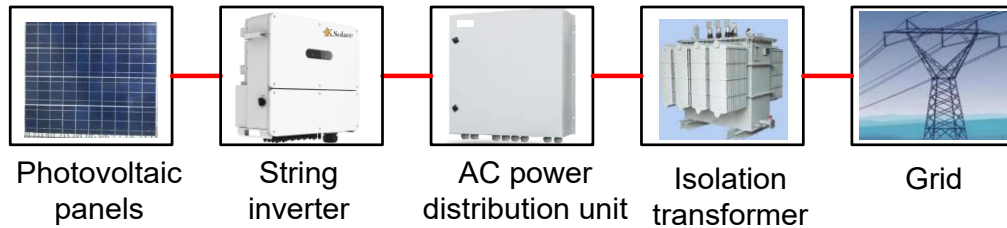


Figure 2-5 Application schematic diagram of string inverter

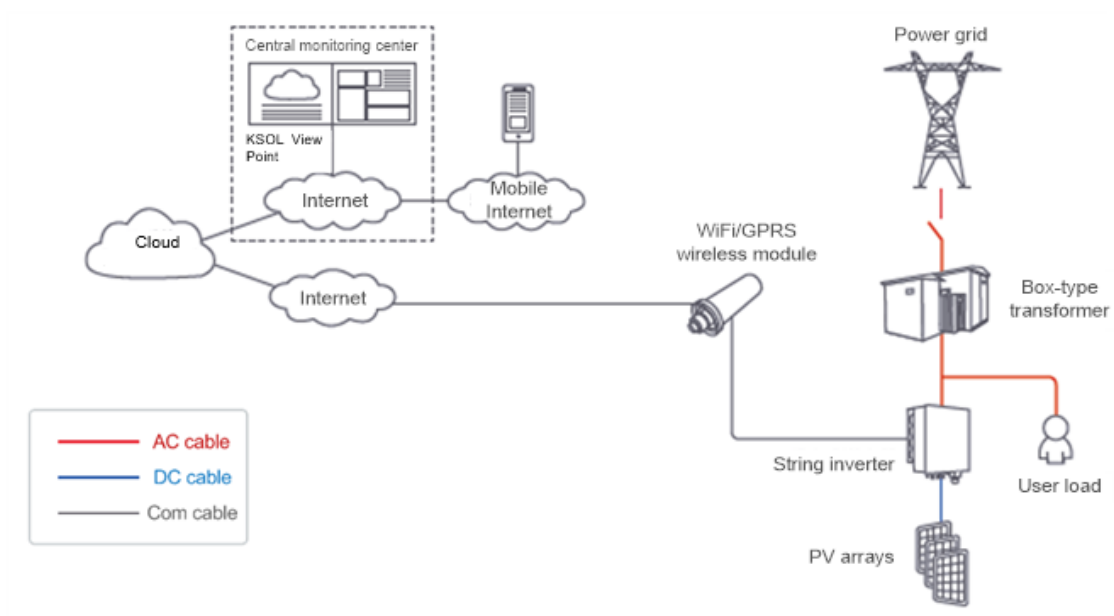


Figure 2-6 Networking scheme of distributed PV power station

2.2.2 Supported Grid Form

The power grid forms supported by KSY MEGA 60KW , KSY MEGA 70KW and KSY MEGA 75KW include TN-S, TN-C, TN-C-S, TT, IT; KSY MEGA 80KW -M only supports the form grid of IT.

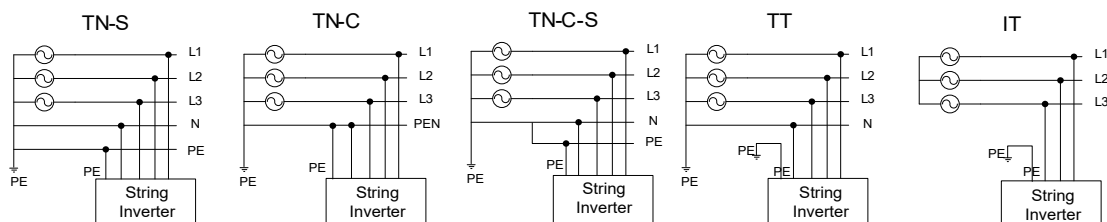


Figure 2-7 Schematic diagram of various power grid forms

2.3 Naming Rules

Figure 2-8 Naming rules


2.4 Nameplate Label

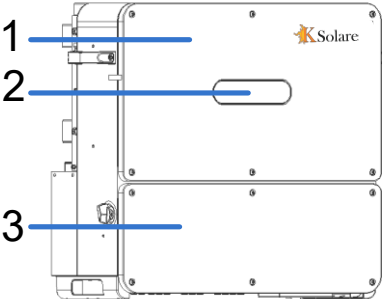
Note: The data is for reference only. For more details, please refer to the physical object or technical agreement of the corresponding product.

2.5 Inverter Configuration

This section describes the internal components, back components and bottom interfaces of the string inverter.

Note: KSY MEGA 60KW , KSY MEGA 70KW , KSY MEGA 75KW and KSY MEGA 80KW share same appearance, and there are 14 groups of PV terminals at the bottom (only 12 groups of terminals are used for 60KW and 70KW , and the other two groups which are not used should be sealed).

 CAUTION
There are components on the board that are very sensitive to static electricity. Anti-static measures must be taken before touching the board. When touching the board, be careful not to scratch the electrical components.



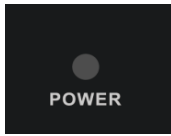
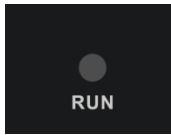
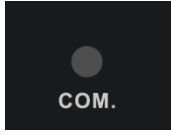
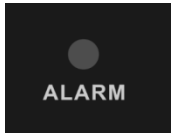
No.	Label	Device name
1		Upper door
2		LED indicator
3		Lower door

Figure 2-9 Front view of the inverter

The LED indicators from left to right are described as follows:

Table 2-1 LED Indicator Description

Indicator light	Meaning	Status	Description
	PV and grid connection	Blue light on	The PV side and the grid are connected normally
		Blue light fast blinking	The grid is connected normally but the PV side is connected abnormally

		Blue light slow blinking	The PV side is connected normally but the grid is not connected
		Blue light off	Both the PV side and the grid are not connected
	Grid-connected operation	Blue light on	The inverter is in grid-connected power-on state
		Blue light off	The inverter is neither grid-connected nor powered on
	Communication indication	Blue light slow blinking	Communication normal
		Blue light off	Communication abnormal
	Alarm indication	Red light slow blinking	Prompt alarm: PID power supply operation instruction
		Red light fast blinking	Abnormal alarm
		Red light solid on	Fault alarm
<p>Remarks:</p> <p>Slow blinking: 1 second on and 2 seconds off in cycles;</p> <p>Fast blinking: 0.5 seconds on and 0.5 seconds off in cycles.</p>			

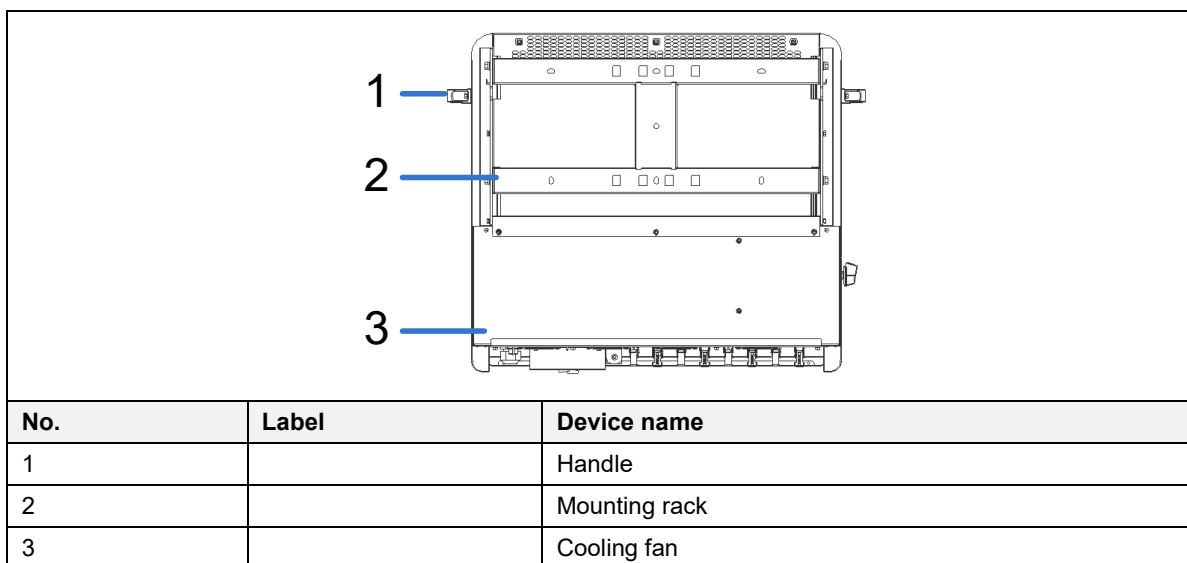
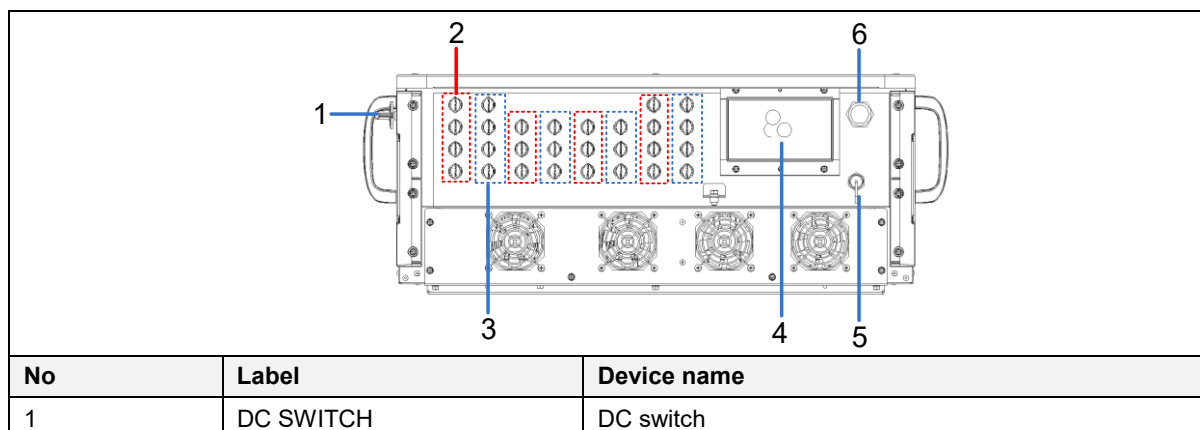


Figure 2-10 Back view of the inverter

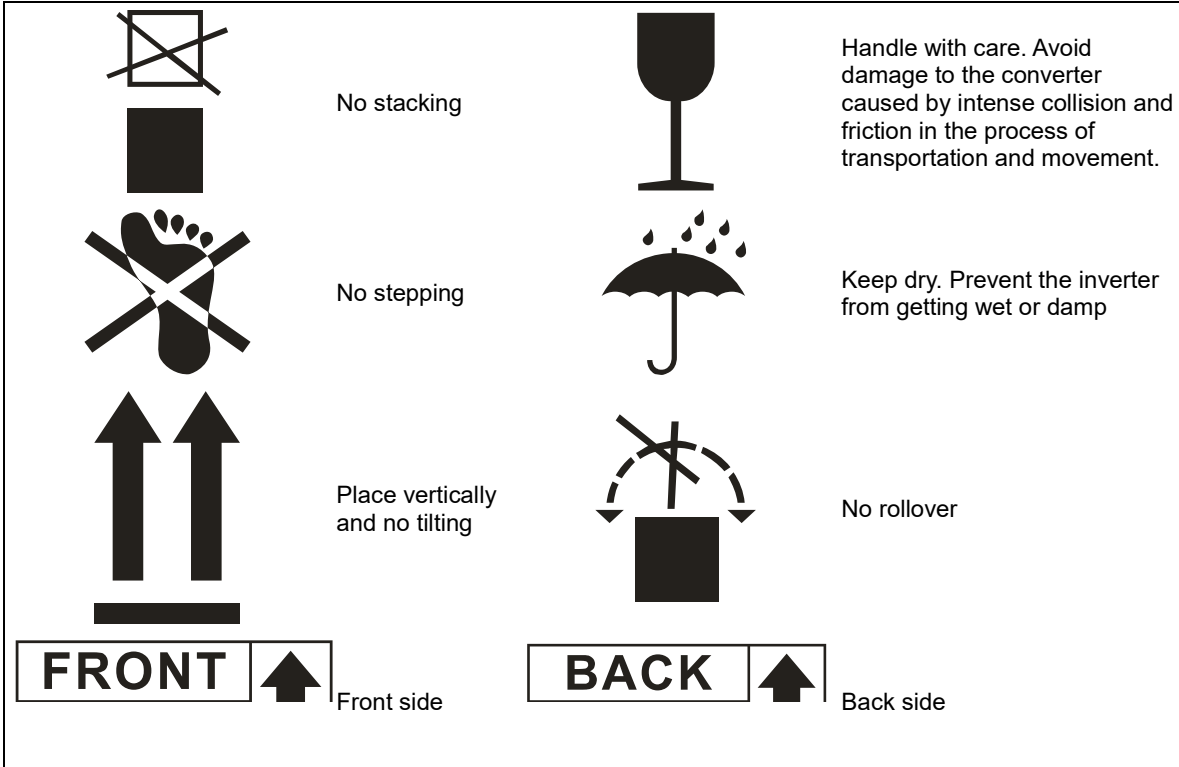


2	1+ ~ 12(14)+	PV+ terminal block
3	1+ ~ 12(14)-	PV- terminal block
4	AC OUTPUT	AC output terminal waterproof lock head
5		WiFi/GPRS communication interface
6		RS485 output terminal

Figure 2-11 Bottom view of the inverter

2.6 Labels on the Package



On the outer packaging of the product, there are some labels to guide the user to transport and store the product. The meanings indicated by the logo are as follows:



2.7 Warning Signs on the Inverter

In order to ensure the personal and property safety of users when using this product and avoid accidents, the following warning labels may be placed inside and outside the string inverter to remind users of safety precautions during operation.

	Protective earthing: PE terminals need to be reliably grounded to ensure the safety of both operation personnel and equipment.
	General warning: This part may have other potential dangers except high voltage danger. Please watch out!
	High voltage danger: This part may have high voltage danger. Please watch out!
	Hot surface: Pay attention to the hot surface to prevent burns.

	<p>Refer to the user manual: Please refer to the corresponding instructions in the user manual before operation.</p>
	<p>Discharge identification: This equipment has an energy storage device. Before maintenance, it is necessary to wait for the energy storage device to discharge to prevent electric shock. The waiting time is not less than the indicated discharge time.</p>

3 System Installation

3.1 Unpack and Inspect

After confirming that the outer packaging is intact, please carry out the unpacking inspection. Unpack the packaging box and check whether the appearance of the string inverter is in good condition. When opening the package, be careful to use the tool to avoid scratching the string inverter.

Although the inverter has been strictly tested and inspected before leaving factory, accidental damage might happen during transportation. Please inspect and check the product as soon as you receive it. If there is any damage or omission, please contact us and we will help you as soon as possible.

3.2 Installation Tool Preparation

Tool or device	Purpose	Remarks
4#Inner hexagon spanner	Disassemble and assemble of the lower door panel of the inverter	
Phillips screwdriver (PH2)	Fasten the grounding screws and pegboard screws	Bolt specifications: M6 and M8
Tube type crimping pliers	Crimp the communication cable terminals	
Socket wrench	Wire the output cable	Bolt specifications: M8
MC4 crimping pliers	Crimp the MC4 terminals	The input cable needs to be crimped into the MC4 terminal before it can be connected to the PV+/PV- terminal on the inverter
MC4 removal tool	Remove MC4 terminal	
Wire stripper	Strip wire	
Multimeter	Measure voltage to ensure wiring and installation safety	
Safety equipment	Necessary labor protection	Insulating shoes, gloves, etc

3.3 Installation Environment Requirements

The environmental requirements for the installation of string inverter are shown in "**1 Safety Precautions**".

The installation mode and position must be suitable for the weight and dimension of the string inverter. See "**2.9 Mechanical Parameters**".

The string inverter should be installed in a well-ventilated environment to ensure good heat dissipation. Avoiding inverter direct sunlight, rain and snow can prolong the life of inverter. It is recommended to choose sheltered installation sites. If that cannot be satisfied, please set up a sun shading shelter.

During the operation of the string inverter, the temperature of the chassis and the radiator will be relatively high. Do not install the inverter in the position which will be touched unintentionally.

3.4 Reserved Space Requirement

When installing the string inverter, the space around the string inverter must be reserved for heat dissipation and maintenance.

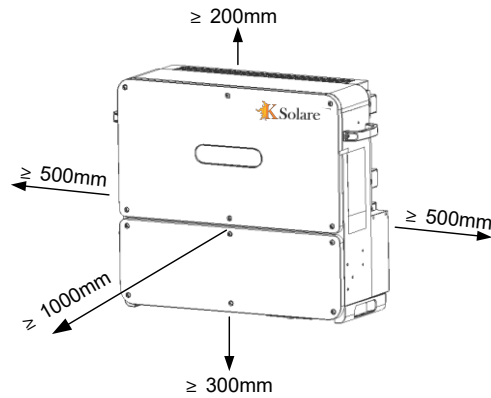


Figure 3-1 Reserved space requirements

When installing multiple string inverters in a same surface, the side by side installation is recommended.

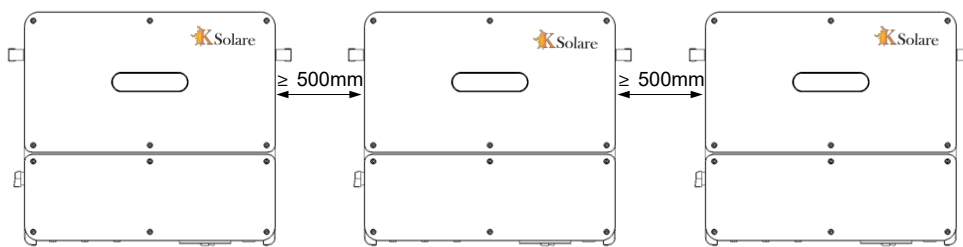


Figure 3-2 Side by side installation space

When installing multiple string inverters in two lines, the triangle installation is recommended.

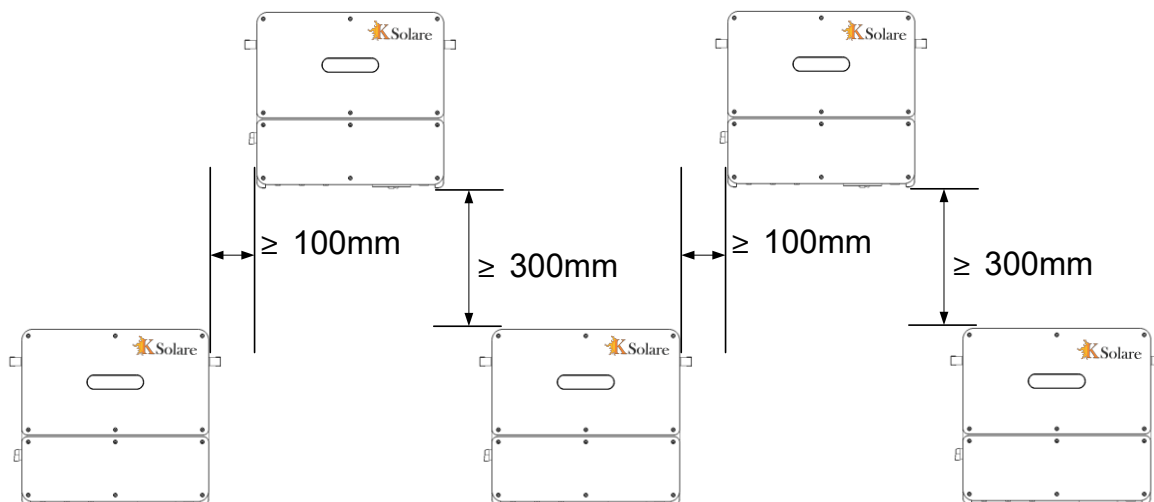


Figure 3-3 Triangle installation space

3.5 Installation Method

A hanging board is attached to the package of the string inverter. Fixed hanging board should be installed before the inverter is mounted and fastened on the hanging board. According to the actual installation environment, two installation modes can be selected, i.e. column-holding/rod-holding and wall-hanging.



1. Please refer to **1 Safety Precautions** for precautions during inverter installation. For installation environment requirements, please refer to **3.3 Installation Environment Requirements**.
2. During installation, it must be confirmed that the site installation position can bear the total weight of the inverter and accessories to avoid falling during installation or use.
3. It is recommended that two people work together to fix the inverter to avoid mechanical injury. During installation, safety measures shall be taken to prevent injuries.
4. Please install it vertically or tilt it back 15 ° at most to facilitate heat dissipation of the machine. Do not tilt the inverter (tilt forward, tilt back too much, roll), horizontally or upside down.
5. If it is impossible to avoid direct sunlight, please add a sunscreen.

3.5.1 Pole Mounting with Hoops

Installation steps

1. Take out the hanging plate in the package and confirm the front, back, and top of the hanging plate;
2. Use at least 2PCS hoops on the back side of the slats through the ferrule mounting holes (You need prepare the hoops by yourself);
3. Place the hanging plate in the installation position and fasten the band;
4. Before hanging the inverter, please confirm that the bearing range meets the requirements;
5. Hang the inverter on the hanging plate and fasten the connecting plate and inverter from both sides with 4PCS M8 screws (supplied accessories);
6. The installation process ends and the actual effect is as shown below:

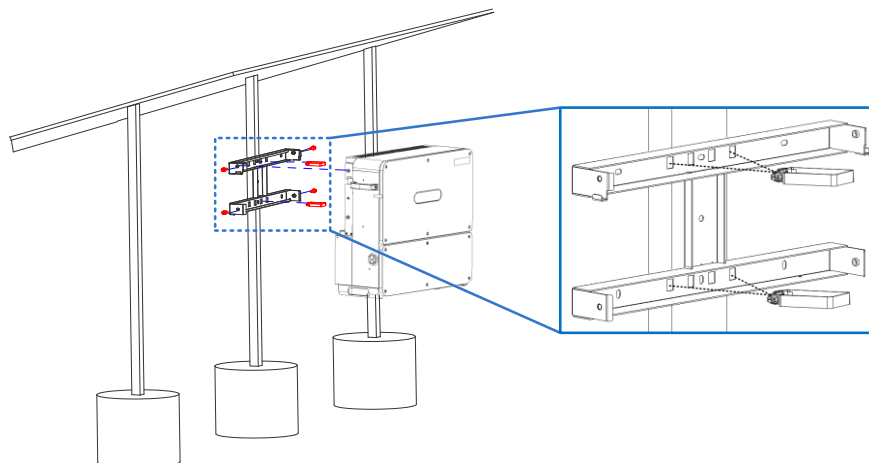


Figure 3-4 String inverter hoop mounting diagram

3.5.2 Pole Mounting with Screws

Installation steps

1. Take out the hanging plate in the package and confirm the front, back, and top of the hanging plate;
2. Use the 3 PCS M8 screws (supplied accessories) to secure the hanging plate to the mounting position;
3. Before hanging the inverter, please confirm that the bearing range meets the requirements;

4. Hang the inverter on the hanging plate and fasten the plate and inverter from both sides with 4PCS M8 screws (supplied accessories);
5. The installation process ends and the actual effect is as shown below:

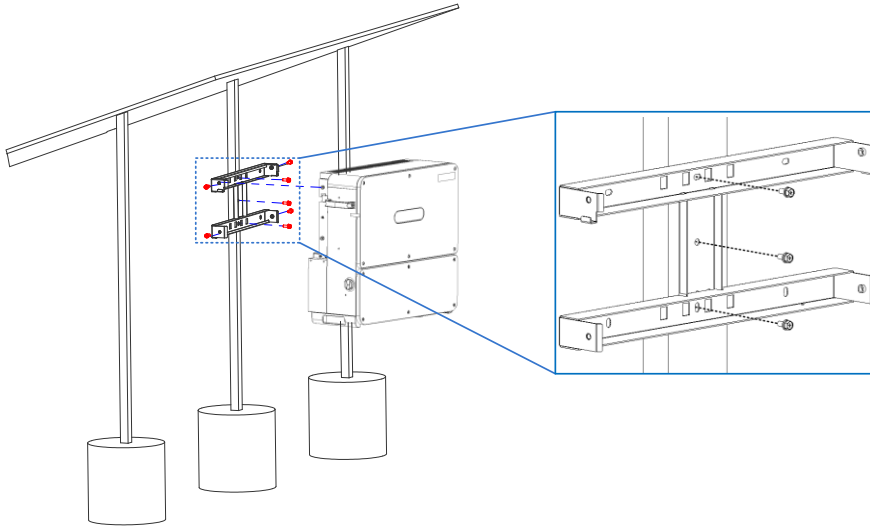


Figure 3-5 String inverter screw rod mounting diagram

3.5.3 Wall/Bracket Mounting

This type of mounting allows the inverter to be mounted on a load-bearing wall or bracket. If you need to install the inverter on the wall, please purchase M8 expansion screws and punch holes on the wall for installation according to the site installation environment, wall bearing and other factors.

Installation steps

1. Take out the hanging plate in the package and confirm the front, back, and top of the hanging plate;
2. If necessary, punch holes in the wall or bracket according to the size of the mounting hole of the hanging plate;
3. Wall mounting: Fasten the mounting plate to the wall using 4PCS M8 expansion screws;
4. Bracket mounting: Fasten the mounting plate to the bracket using 4PCS M8 screws (supplied accessories);
5. Before mounting the inverter, please ensure that the installation surface is strong and meets the load-bearing requirements;
6. Hang the inverter on the hanging plate and fasten the connecting plate and inverter from both sides with M8 screws (supplied accessories);
7. The installation process ends and the actual effect is as shown below:

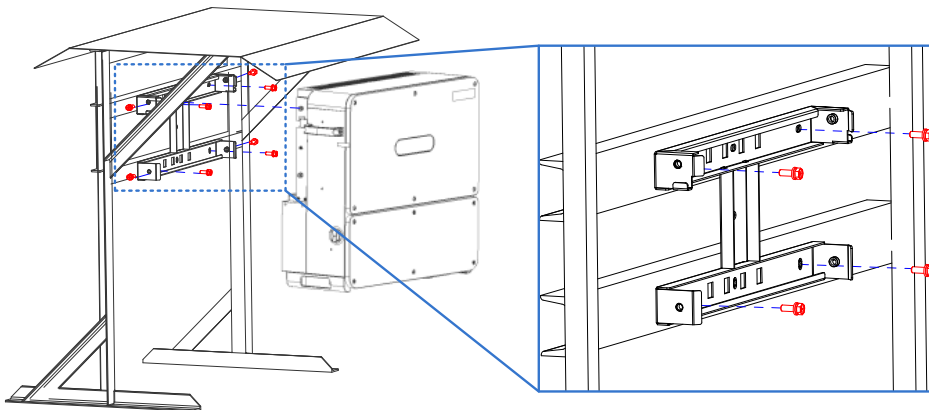


Figure 3-6 String inverter wall/bracket mounting diagram

3.6 Electrical Connections

3.6.1 Cable Requirements

The choice of cable should comply with relevant national standards and meet the load requirements.

Power cable requirements

Refer to the electrical data in the product data, and then consider the ambient temperature, current, margin and other factors to select the cable.

Communication cable requirements

Since weak communication signals are susceptible to external interference, the communication cable requires a shielded cable with the shield grounded as shown in the following figure. Also refer to the relevant document *GB 50217-2007 Cable Design Specification*.

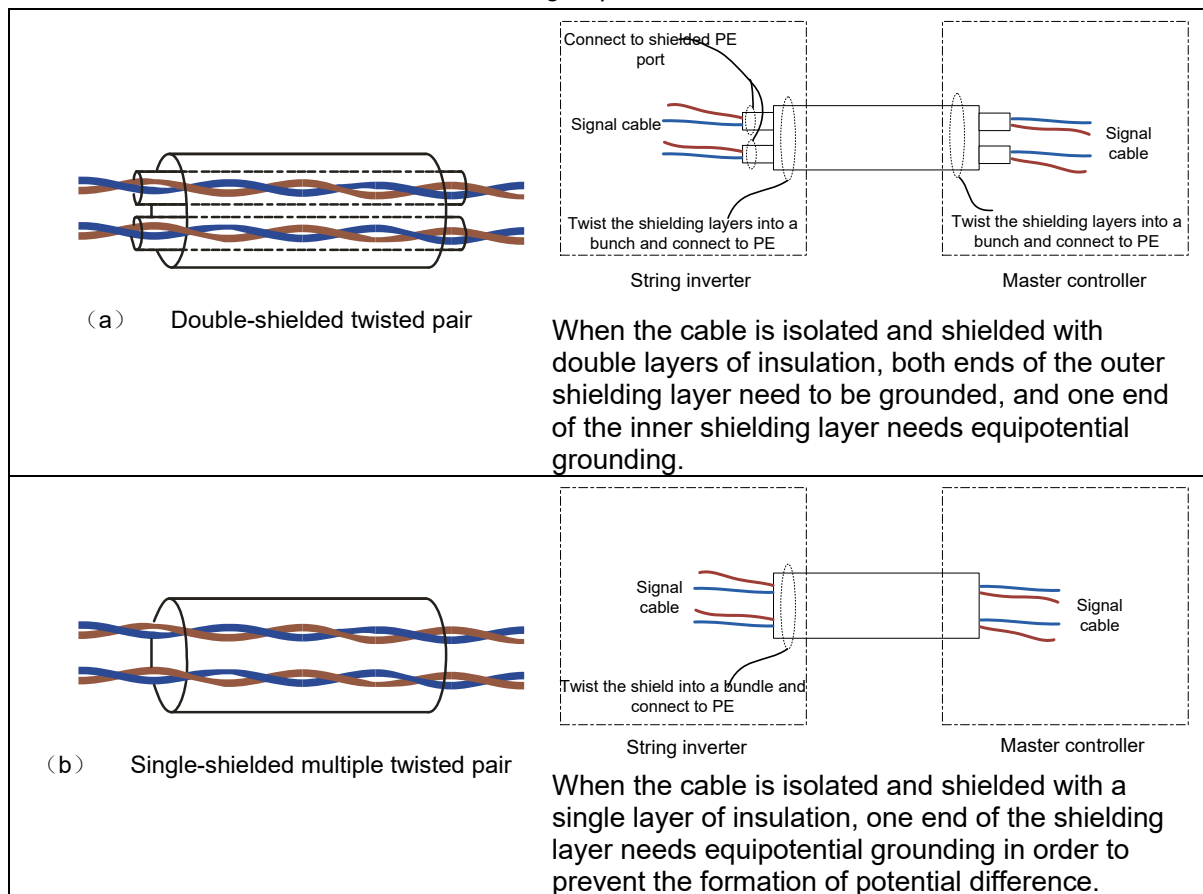


Figure 3-7 Twisted pair with shielding layer

The RS485 communication cable generally has four thin wires (blue, brown, gray, and black, respectively) and one shielded grounded copper wire. When wiring, cut off the gray line, use the blue line, brown line and black line, as shown below, and wrap the shield grounding copper wire on the black line (need to ensure that the copper wire is longer than the black line, To prevent the copper wire from being pulled off, connect the RS485 PE terminal).

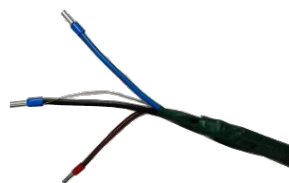


Figure 3-8 Schematic diagram of RS485 communication cable

3.6.2 Cable Selection

Name	Label	Recommended Cable Specifications	Note
PV branch input cable	1+ ~12(14)+ 1- ~12(14)-	Industry general photovoltaic cable, model: PV1-F. It is recommended to use 4.0mm ² -6.0mm ² copper cable for each PV + and PV branch.	--
AC output cable	A、B、C、N	4 core outdoor cable (A, B, C, N) or 3 core outdoor copper cable (A, B, C). Recommended cross sectional area of conductor: 35mm ² -70mm ² .	The AC output has only 1 waterproof locks with a specification of 42mm~50mm. The output is a $\Phi 8$ terminal. When the screw is locked, use the sleeve to correct the force.
RS485 communication cable	X3-P2 X3-P3	It is recommended to use a special communication cable or 4-core or 2-core shielded twisted pair cable with a cross-sectional area of not less than 0.75mm ² .	The RS485 communication cable has only one waterproof lock and the size is 13mm~18mm.
PE cable	PE	If the cross-sectional area S of the AC cable is greater than 35mm ² , the cross-sectional area of the ground wire is not less than S/2.	--

3.6.5 Connect the Ground Wire

Connect the inverter to the grounding bar through the protective earth wire to achieve the purpose of grounding protection. The PE mark is affixed to the PE terminal. Use a fixed connection and the cross-sectional area of the protective grounding conductor is not less than 16mm² (copper wire). The bolt size is M6.

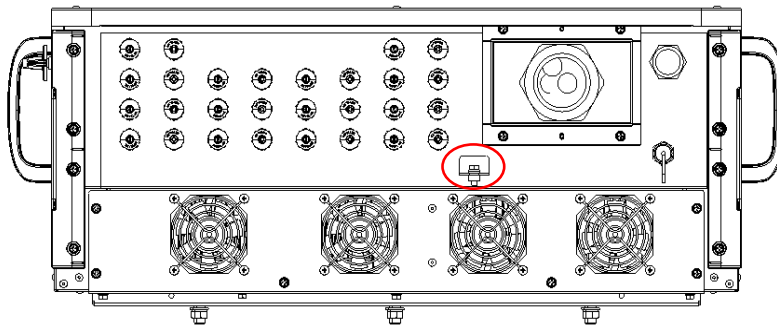


Figure 3-9 PE connection

For the grounding of multiple string inverters, use single-point grounding instead of winding the ground wire into a ring shape as shown below.

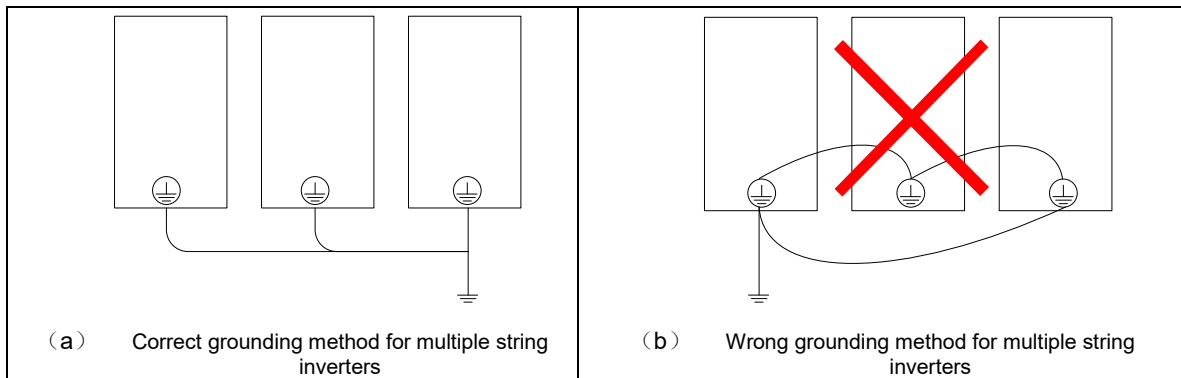


Figure 3-10 PE connection of multiple string inverters

3.6.6 Open the Lower Door Panel

 CAUTION
<ol style="list-style-type: none">1) Do not open the chassis door on the top of the inverter.2) Before the inverter opens the door, it must be ensured that the AC and DC are powered off.3) Please keep the 6 screws on the chassis door. Do not leave unused screws inside the chassis.

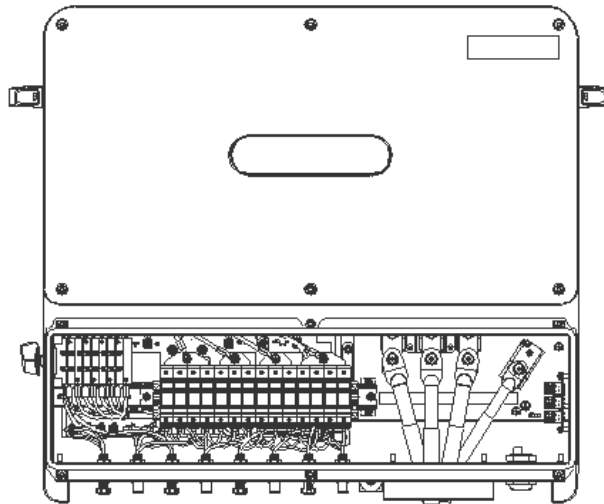


Figure 3-11 Disassemble the lower door panel

3.6.7 Connect the AC Output Cable

Precautions

An independent three-phase circuit breaker is required outside the AC side of each inverter to ensure reliable disconnection between the inverter and the power grid. And the circuit breaker specifications meet the technical requirements.

It is forbidden to share one circuit breaker for multiple inverters

It is forbidden to connect the load between the inverter and the circuit breaker.

The user must prepare the OT terminal (model: M8) by himself, and the maximum cable is 95mm².

Operations

- 1) Crimp the OT terminal and wrap the crimp with a heat shrink tubing or insulating tape.
- 2) Unscrew the locking cap on the "AC OUTPUT" waterproof lock on the bottom of the inverter.
- 3) Pass the completed AC cable into the lock cap and the "AC OUTPUT" waterproof lock on the bottom of the inverter.
- 4) Connect the AC cable to the tightening torque of 8N*m on A, B, C, and N of the AC terminal block.
- 5) Lock the locking cap. Check for gaps in the waterproof lock. If there is a gap in the waterproof lock, use a fireproof mud to block the gap.

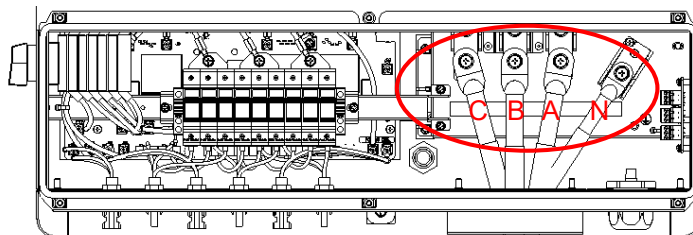


Figure 3-12 AC wiring terminals connection

3.6.8 Connect Communication Cable

Choice of communication method

The inverters support RS485 communication mode.

Cable connection instructions

The inverter is connected to a communication device (such as a data collection cabinet or a PC) via an RS485 communication line. On the RS485 adapter board X3, two RS485 interfaces (labeled P2, P3), as shown below.

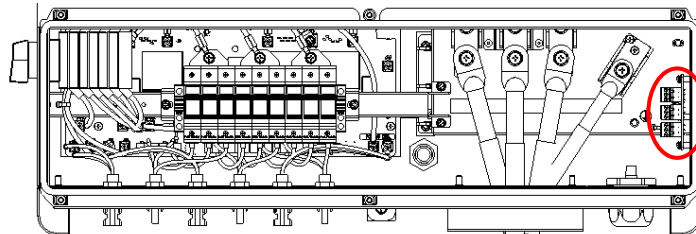


Figure 3-13 Position of X3 signal adapter board

Pass the RS485 cable through the RS485 waterproof lock on the bottom of the inverter (the operation steps are similar to the AC OUTPUT waterproof lock) and connect to the RS485 interface on the RS485 adapter board X3. The connection of multiple inverters is recommended to be connected in series as shown below.

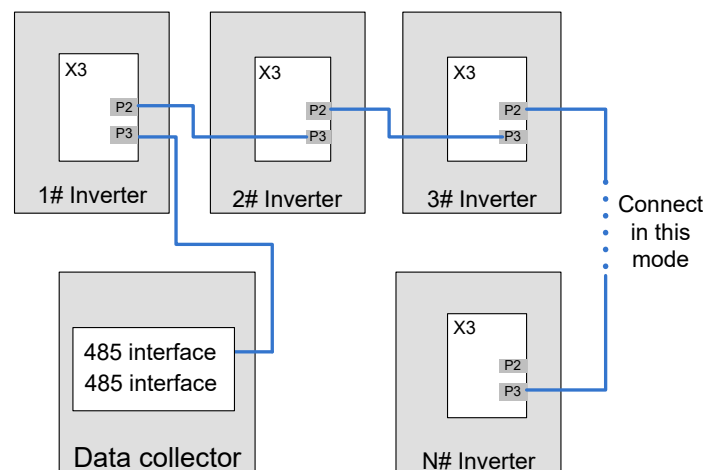


Figure 3-14 Schematic diagram of multiple inverter serial signal cable connections

Note: When the communication distance exceeds 300m or the field communication quality is poor, the terminal matching resistors of the last inverter shall be short-circuited by pulling a jumper cap from the X3 board and short-circuiting the Pin1 and Pin2 of JP13 on the KSY MEGAM5 board.

Lock the locking cap when the connection is complete. Check for gaps in the waterproof lock. If there is a gap in the waterproof lock, use a fireproof mud to block the gap.

3.6.9 Connect the DC Input Cable

In order to make full use of the DC input power, the PV strings of the same input MPPT should be identical in structure, including the same model, the same number of panels, the same tilt angle, and the same azimuth.



1. When the sun shines on the battery panel, it will generate voltage which may cause life-threatening dangers. Therefore, if the DC input line is connected under light conditions, you need to ensure that the input line is not charged (you can cover the panel with an opaque cloth and then proceed operating).
2. Before connecting the input cable, make sure that the DC side voltage is within the safe voltage range which is within 60VDC, and the DC switch is in the "OFF" state, otherwise the high voltage generated may cause a shock hazard.

3. When the inverter is running in the grid, it is forbidden to perform maintenance operations on the DC input cable, otherwise it will cause electric shock hazard.
4. If you want to remove the positive and negative connectors, make sure that DC switch has been placed in the "OFF" state and there is no current output from the PV branch.



Please ensure that the following conditions are met, otherwise it may cause a fire hazard.

- Each component of the string in series is of the same specification.
- The maximum opening voltage of each PV string cannot be greater than 1100 VDC under what circumstances.
- The maximum short-circuit current of each PV string shall not exceed 30A under any conditions.
- Ensure that the polarity input on the DC input side is correct, that is, the positive pole of the PV module is connected to the positive pole of the DC input terminal of the inverter, and the negative pole is connected to the negative pole of the DC input terminal of the inverter.

Precautions for grounding the PV string

If the inverter is directly connected to the N-line of the power grid and connected to the PGND line (such as the low-voltage distribution network or the N-line and ground-connected power grid), the positive or negative pole of the PV string is prohibited from being grounded, otherwise the inverter will not be able to normal work.

DC input terminal selection

Number of input channels	DC input terminal
1	PV1
2	PV1、PV2
3	PV1、PV2、PV3
4	PV1 ~ PV3、PV4
5	PV1 ~ PV4、PV5
6	PV1 ~ PV5、PV6
7	PV1 ~ PV6、PV7
8	PV1 ~ PV7、PV8
9	PV1 ~ PV8、PV9
...	...
14	PV1 ~ PV13、PV14

Crimp MC4 terminal step

The input cable needs to be crimped into the MC4 terminal for connection to the string inverter PV+/PV- terminals. Before operation, ensure that " **3.6.4 Preparation before Operation**" has been completed.

1. The positive and negative poles of the input cable are determined and identified.

Note: Please do not judge the positive and negative according to the cable color in this manual. Be sure to take the actual measurement as the standard.

2. Use a wire stripper to strip the wire.

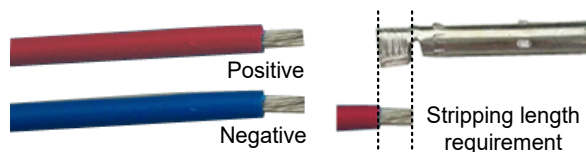


Figure 3-15 Strip wire

3. According to the correct polarity, crimp the cable to the corresponding core.

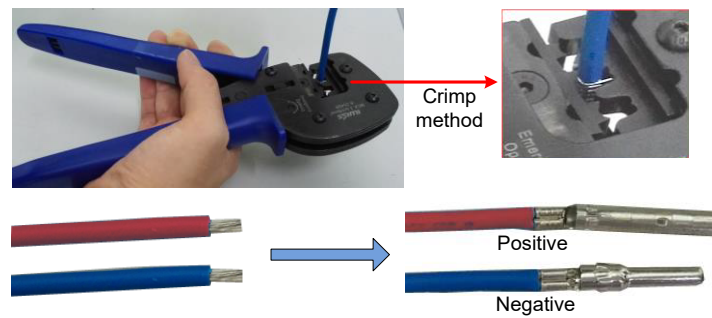


Figure 3-16 Crimp terminal

4. With the correct polarity, insert the core into the male and female ends of the MC4 connector and tighten the connector back cover.

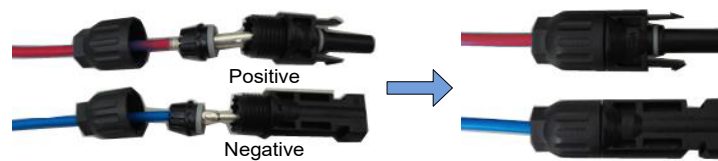


Figure 3-17 Assembly connector

Insert MC4 terminal

Insert the positive and negative connectors into the positive and negative terminals of the DC input terminal of the inverter until you hear a “click”, indicating that the terminal is stuck in place.



CAUTION

Please use the MC4 terminals configured in the delivery accessories. Device damage due to use of incompatible MC4 terminals is not covered by the warranty.

After the cable connection of the string inverter is completed, check if there is a gap at the waterproof lock. If there is a gap in the waterproof lock, use a fireproof mud to block the gap. If there are unconnected input terminals, seal the unconnected input terminals.

--End of the chapter--

4 Commissioning Guide

4.1 Check before Power On



Before proceeding to the next step of power on, please read carefully this manual "**1 Safety Precautions**" and do a detailed check according to the table below.

In order to avoid danger, the multimeter and other instruments must be used to detect the voltage of the metal parts inside the casing (protective ground) of the string inverter.

Once the string inverter is installed, the following items need to be checked carefully before power on.

Mechanical inspection

Please read "1 Safety Precautions" carefully.

Ensure that the environmental safety of the string inverter.

Check if there are any foreign objects left inside and on the top of the string inverter cabinet.

Ensure that the string inverter has enough space reserved around for maintenance and heat dissipation.

The cables are marked clearly and correctly.

Check if there any condensation inside the string inverter. If there is, remove it with heating tools.

Ensure that all wiring screws are tightened according to torque requirements.

Ensure RS485 wiring is correct and reliable.

Make sure there is no gap between the input terminal and the waterproof lock.

Electrical inspection

Ensure that the connection of the string inverter is reliable and the polarity is correct.

The power cables and signal lines are all in conformity with the electrical safety regulations.

Signal terminals and power lines are properly matched with terminals.

The isolation area and warning signs have been set up around the string inverter to prevent others from mis operation or proximity.

4.2 System Power On

To ensure that the electrical connection is completed, the power on operation can be performed and the inverter will be turned on.

Step 1: Set the DC SWITCH of the inverter to the "ON" state.

Step 2: Close the AC circuit breaker between the inverter and the power grid.

If the system does not have any faults and all the startup requirements are met after all the above steps have been carried out, the inverter will start automatically.

4.3 System Power Off

Precautions

After the inverter is powered off, there will be residual electricity and residual heat on the enclosure, which may cause electrical shock or burns. Therefore, please wait at least 5 minutes before you operate the inverter.

When powering off the system, please follow the sequence of operation instructions and safety regulations in this chapter.

Step 1: Issue the shutdown command to the inverter through the data collector or near-end APP software.

Step 2: Disconnect the circuit breaker between the inverter and the power grid.

Step 3: Set the DC SWITCH of the inverter to the "OFF" state.

--End of the chapter--



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