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User Manual
Grid-connected Inverter

STT 30-60KTL

SUNWAYS TECHNOLOGIES CO., LTD.

CONTENTS

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≫ 1 Preface

Attention

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※ 1.1 Overview

This manual is an integral part of Sunways STT 30-60KTL series three-phase inverters (hereinafter referred to as the inverter). It mainly introduces the assembly, installation, electrical connection, maintenance and troubleshooting of the products. Before installing and using the inverter, please read this manual carefully, understand the safety information and be familiar with the functions and characteristics of the inverter.

※ 1.2 Target Groups

This manual is applicable to the electrical installers with professional qualifications and end-users. If there are any problems in the installation process, please call Sunways service telephone at +86 400-9922-958 or email Sunways at service@sunways-tech.com for consultation.

2 Safety Instructions

2.1 Safety Notes

① Before installation, please read this manual carefully and follow the instructions in this manual strictly.

② Installers need to undergo professional training or obtain electrical related professional qualification certificates.

③ When installing, do not open the front cover of the inverter. Apart from performing work at the wiring terminal (as instructed in this manual), touching or changing components without authorization may cause injury to people, damage to inverters and annulment of the warranty.

④ All electrical installations must conform to local electrical safety standards.

⑤ If the inverter needs maintenance, please contact the local designated personnel for system installation and maintenance.

⑥ To use this grid-connected inverter for power generation needs the permission of the local power supply authority.

⑦ The temperature of some parts of the inverter may exceed 60° C during operation. To avoid being burnt do not touch the inverter during operation. Let it cool before touching it.

⑧ When exposed to sunlight, the PV array generates dangerous high DC voltage. Please operate according to our instructions, or it will result in danger to life.

2.2 Statement

Sunways Technologies Co.,Ltd. has the right not to undertake quality assurance in any of the following circumstances:

① Damages caused by improper transportation.

② Damages caused by incorrect storage, installation or use.

③ Damages caused by installation and use of equipment by non-professionals or un-trained personnel.

④ Damages caused by failure to comply with the instructions and safety warnings in this document.

⑤ Damages of running in an environment that does not meet the requirements stated in this document.

⑥ Damages caused by operation beyond the parameters specified in applicable technical specifications.

⑦ Damages caused by unauthorized disassembly, alteration of products or modification of software codes.

⑧ Damages caused by abnormal natural environment (force majeure, such as lightning, earthquake, fire, storm, etc.).

⑨ Any damages caused by the process of installation and operation which don't follow the local standards and regulations.

⑩ Products beyond the warranty period.

2.3 Important Safety Matters

Table below shows the symbols that may appear in this document and their definition:

⚠ Danger	Dangerous situation, if not avoided, it could result in death or serious personal injury.
⚠ Warning	Potentially dangerous situation, if not avoided, may result in death or serious personal injury.
⚠ Caution	Potentially dangerous situation, if not avoided, may result in moderate or minor personal injury.

Attention	The safety warning information about equipment or environment, to prevent equipment damage, data loss, equipment performance degradation or other unpredictable results.
Note	Symbol highlights important information, best practices and tips, etc.

※ 2.4 Symbols Explanation

This chapter mainly elaborates the symbols displayed on the inverter, nameplate and packing box.

▼ 2.4.1 Symbols on the Inverter

	Inverter status indicator.
	Inverter running indicator.
	Grounding symbol, the inverter casing needs to be properly grounded.

▼ 2.4.2 Symbol on the Inverter nameplate

	The inverter cannot be disposed of with household waste.
	Please read the instructions carefully before installation.
	Do not touch any internal parts of the inverter until 5 min after being disconnected from the mains and PV input.
	CE mark, the inverter complies with the requirements of the applicable CE guidelines.
	TUV certification.
	Danger. Risk of electric shock!
	The surface is hot during operation and no touch is allowed.

	Electric shock hazard, live parts, risk of electric shock, do not touch.

▼ 2.4.3 Symbol on the Packing box

	Handle with care.
	This side up.
	Keep dry.
4	Stacked layers.

≫ 3 Product Description

※ 3.1 Basic Features

▼ 3.1.1 Function

The Sunways STT 30-60KTL series inverter is a three-phase grid-connected PV inverter which used to efficiently convert the DC power generated by the PV strings Into AC power and feed it into the grid.

▼ 3.1.2 Models

The STT 30-60KTL series inverter includes 11 models which are listed below:

STT-29.9KTL、STT-30KTL、STT-33KTL、STT-36KTL、STT-40KTL、STT-45KTL、STT-50KTL-M、STT-60KTL-M、STT-40KTL-HV、STT-50KTL-HV、STT-60KTL-HV

▼ 3.1.3 Applicable grid type

The applicable grid types for the Sunways STT 30-60KTL series are TN-S, TN-C, TN-C-S, IT and TT. When applied to the TT grid, the voltage of N to PE should be less than 30V.

STT-29.9KTL, STT-30KTL, STT-33KTL,STT-36KTL,STT-40KTL,STT-45KTL,STT-50KTL-M,STT-60KTL-M connection mode see Figure 3-1 for details.

STT-40KTL-HV, STT-50KTL-HV, STT-60KTL-HV connection mode see Figure 3-2 for details.
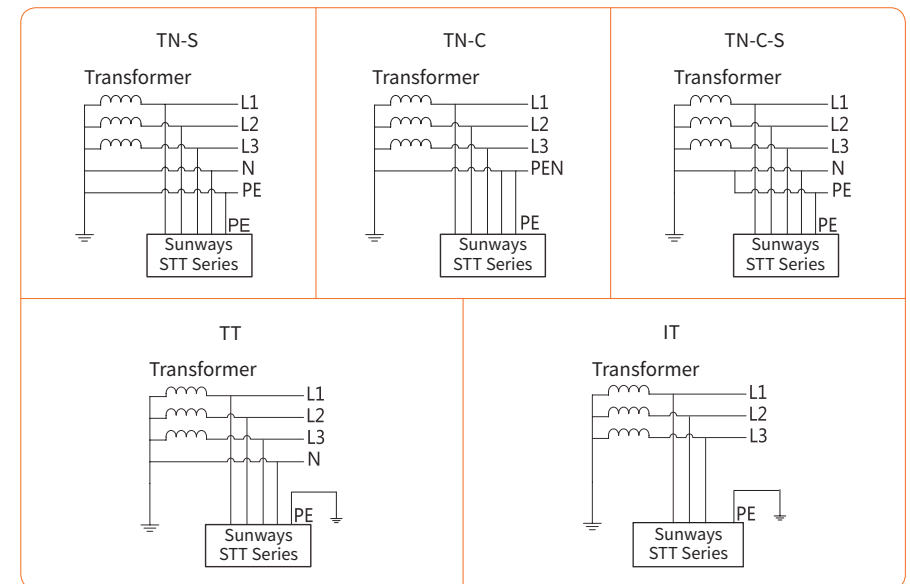
Figure 3-1 400V output inverter applicable grid type

TN-S
Transformer
L1
L2
L3
N
PE
PE
Sunways
STT Series

TN-C
Transformer
L1
L2
L3
PEN
PE
Sunways
STT Series

TN-C-S
Transformer
L1
L2
L3
N
PE
PE
Sunways
STT Series

TT
Transformer
L1
L2
L3
N
PE
Sunways
STT Series

IT
Transformer
L1
L2
L3
PE
Sunways
STT Series
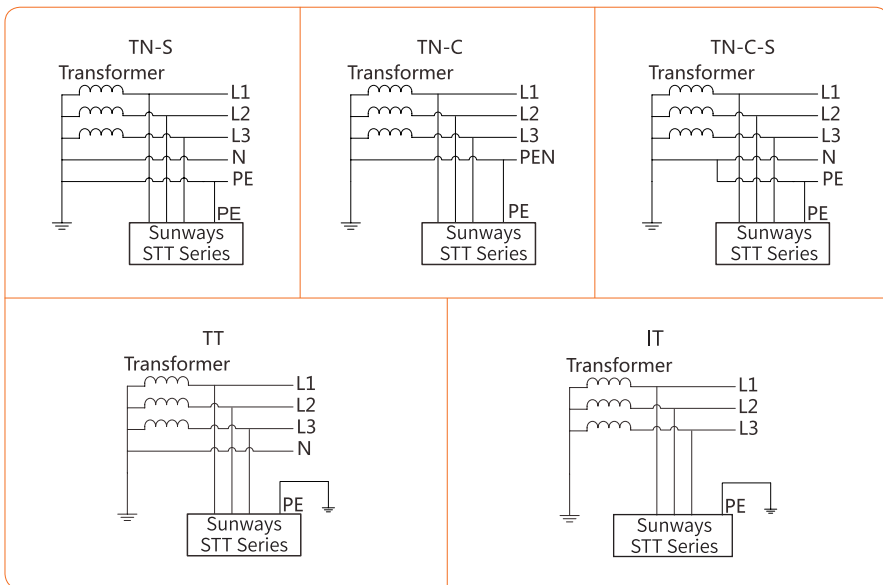
Figure 3-2 500V output inverter applicable grid type

▼ 3.1.4 Storage conditions

① Inverter must be stored in its original packaging.

② The storage temperature and humidity should be in the range of -30℃ and+ 60℃ , and less than 90%, respectively.

③ If a batch of inverters needs to be stored, the height of each pile should be no more than 4 levels.

※ 3.2 Physical Layout

▼ 3.2.1 Inverter front view

600mm

400mm

LOGO

Display
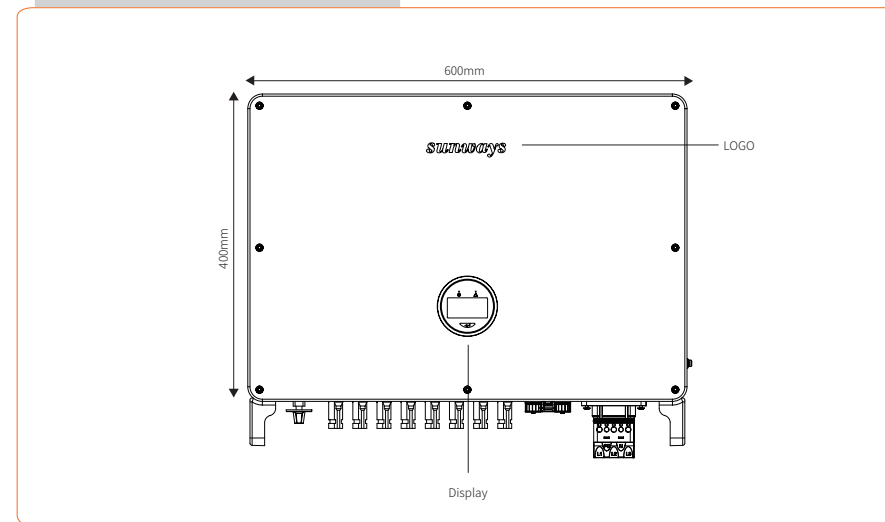
Figure 3-3 Front view

▼ 3.2.2 Inverter side view

270mm

400mm

Name
Plate
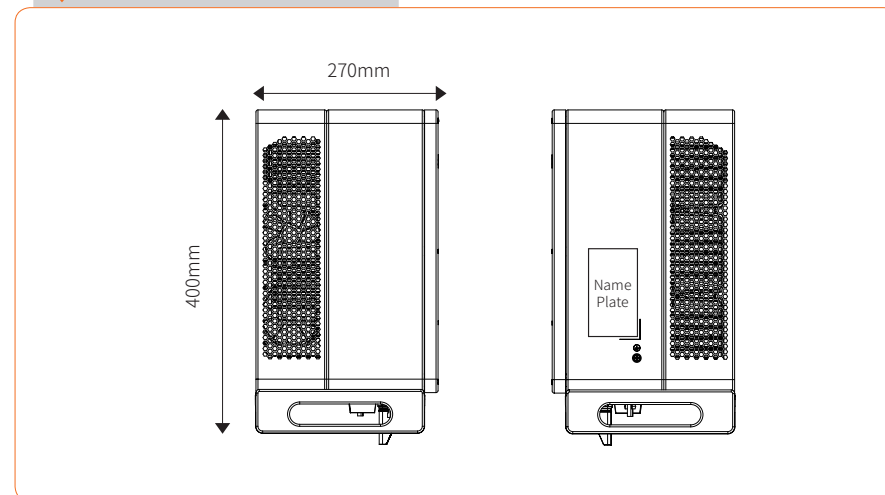
Figure 3-4 Side view

▼ 3.2.3 Inverter Bottom View

270mm

Com1 Port

Com3 Port
Com2 Port

DC Input Terminal

DC Switch (Optional)
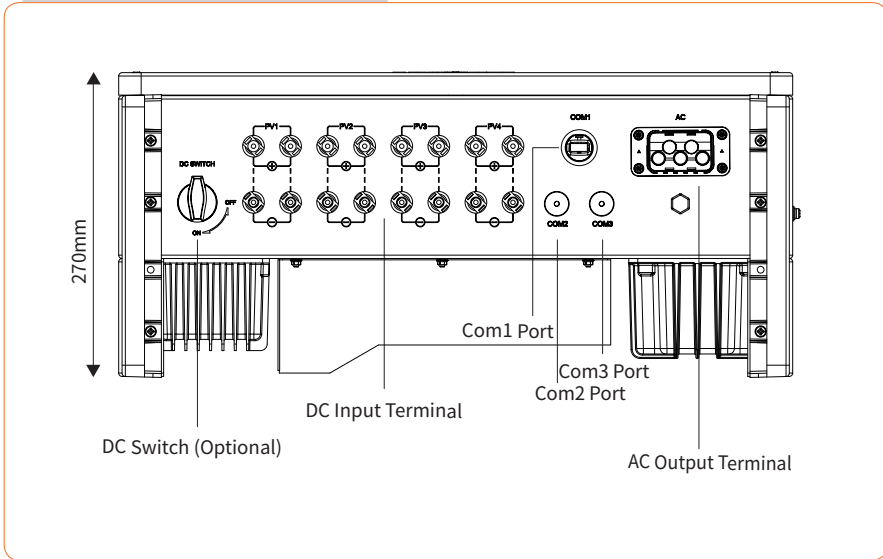
AC Output Terminal

Figure 3-5 Bottom view

Wiring terminals are at the bottom of the inverter, as shown in the table below.

Item	Terminal	Note
1	DC Input terminal	PV connector
2	COM 1 Port	WiFi/LAN/GPRS/4G device connector
3	COM 2 Port	Meter connector
4	COM 3 Port	RS485 connector
5	AC Output Terminal	Used for AC output cable connection

▼ 3.2.4 Inverter back view

back rail

back rail

back rail

back rail
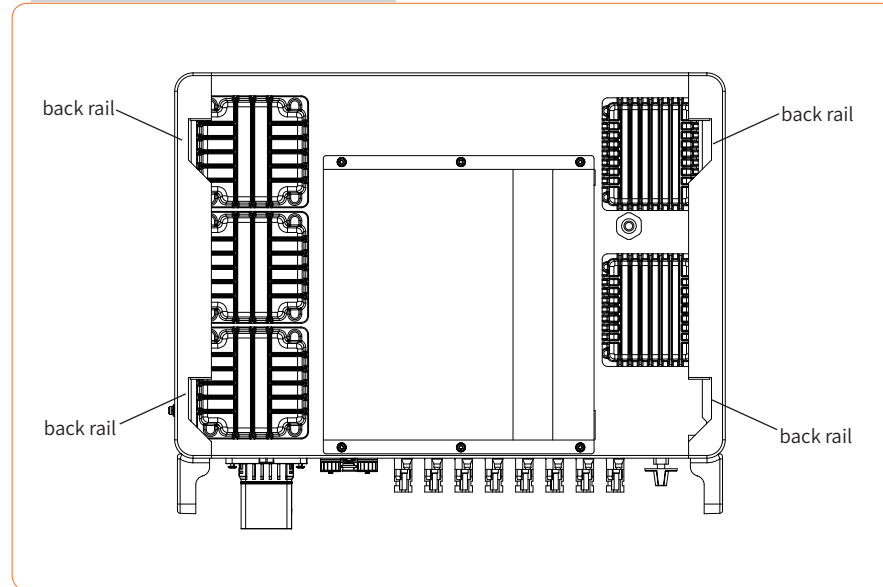
Figure 3-6 Inverter back view

※ 3.3 Display Interface

1   2

3

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4

Figure 3-7 Display interface

Item	Indicator	Status	Description
1	Power Indicator	Off	No input voltage detected or input voltage is too low.
		Slow flashing	Inverter powered on, waiting for the grid connection.
		Quick flashing	Inverter detected grid power and entered self-test status.
		On	Normal, grid-connected and power generated.
2	Alarm Indicator	On	An alarm or faults detected, specific fault information can be viewed from the display.
		Off	The inverter is running normally.
		Slow flashing	The monitoring device is not connected to the router or is not connected to internet.
		Quick flashing	The monitoring device is connected to the router or connected to internet but not connected to the server.
3	OLED Display	On	Display the inverter operating information.
		Off	If the button pressed without any response, the screen is faulty or not well connected.
4	Button	Physical button	Switch OLED display information and set parameters by short press and long press.

※ 3.4 Packing List

The package of the inverter includes the following accessories. Please check whether the accessories in the packing box are complete when receiving the goods. See Figure 3-8 for the packing list.

▼ Inverter×1
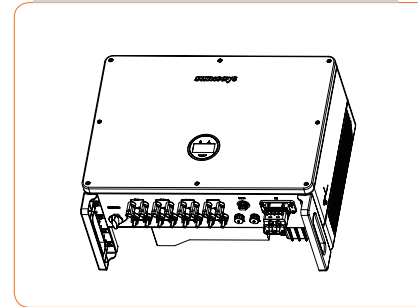
▼ Back Bracket×1

▼ PV Terminal ×8
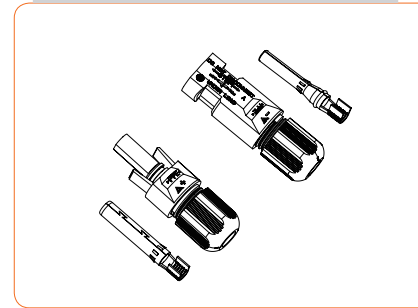
▼ Monitoring Device(Optional)×1
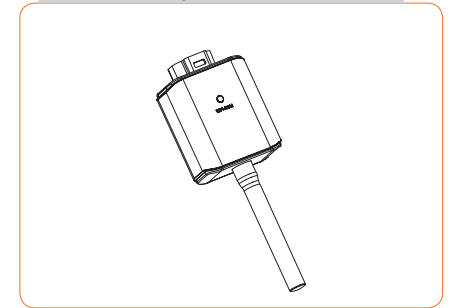
▼ M10 Bracket Screw×4

▼ 120Ω terminal resistance x1

▼ Meter Communication Terminal（Optional）

▼ RS485 Communication Terminal（Optional）

▼ AC Terminal ×1

▼ User Guide

User Manual
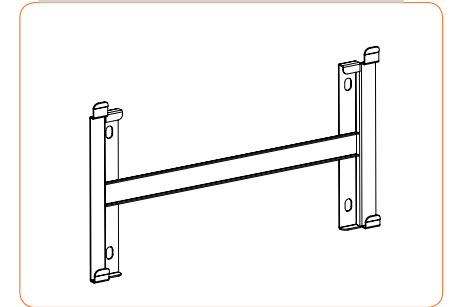
Quick Guide

Inspection Report
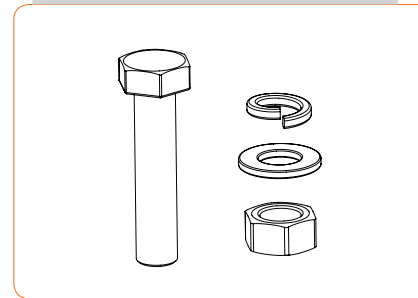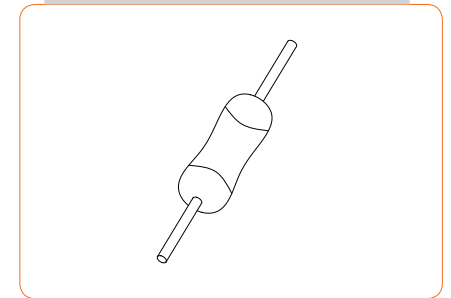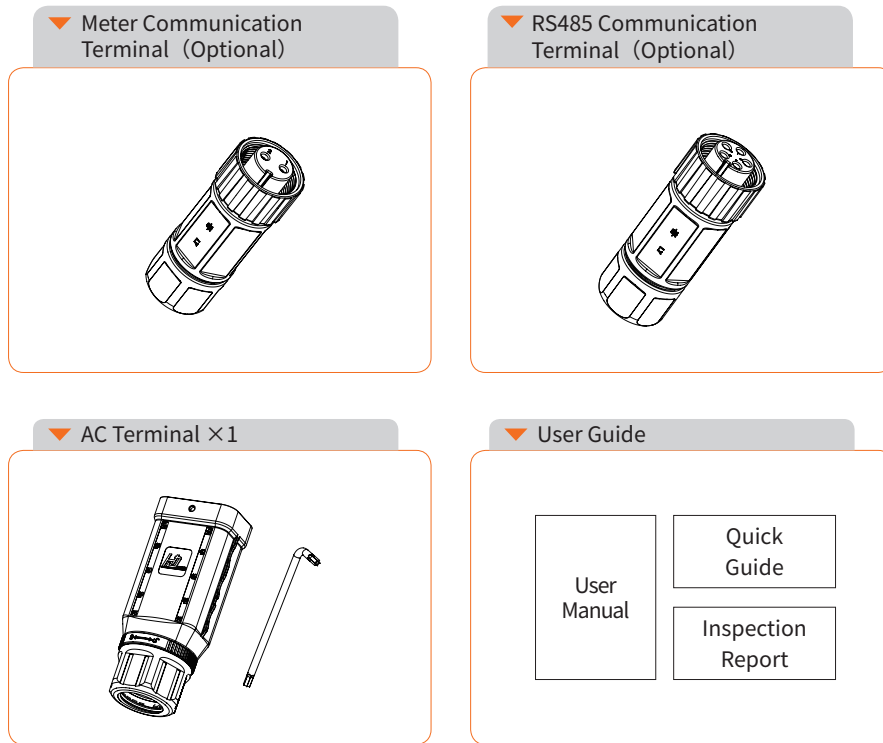
Figure 3-8 Packing list

》4 Installation

※ 4.1 Location

The Sunways STT 30-60KTL series inverters designed with IP66 protection enclosure for indoor and outdoor installations. When selecting an inverter installation location, the following factors should be considered:

① The wall on which the inverters mounted must be able to withstand the weight of the inverter.

② The inverter needs to be installed in a well-ventilated environment.

③ Do not expose the inverter directly to strong sunlight to prevent excessive temperature operation. The inverter should be installed in a place with shelter to prevent direct exposure to sunlight and rain.

④ Install the inverter at eye level for easy inspection of screen data and further maintenance.

⑤ The ambient temperature of the inverter installation location should be between -30℃ and 60℃ .

⑥ The surface temperature of the inverter may reach up to 75℃ . To avoid risk of burns, do not touch the inverter while it's operating and inverter must be installed out of reaching of children.

▼ 4.1.1 Installation location

Recommended installation location of the inverter, as shown in Figure 4-1:
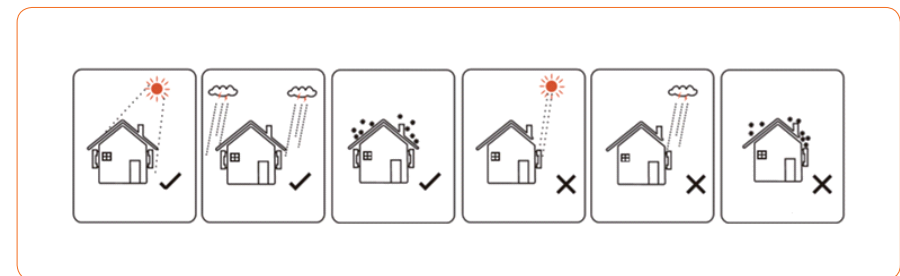
Figure 4-1 Recommended installation location

| ⚠ Warning | Do not put flammable and explosive articles around the inverter. |

▼ 4.1.2 Installation Spacing

The requirements for inverter installation spacing are shown in Figure 4-2:
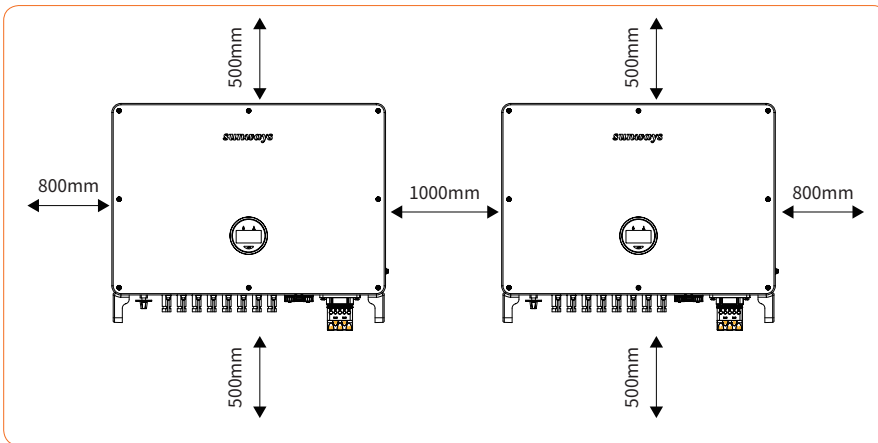
Figure 4-2 Recommended installation spacing

▼ 4.1.3 Installation Angle

The installation angle of the inverter is recommended as shown in Figure 4-3:
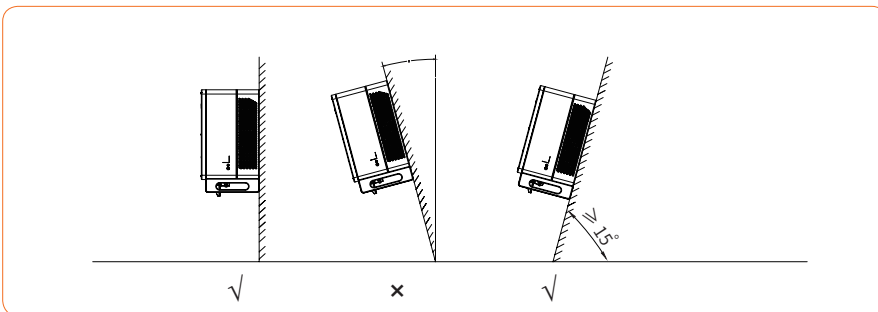
Figure 4-3 Recommended installation angle

※ 4.2 Mounting

▼ 4.2.1 Wall bracket installation

Dimensions of wall bracket, see Figure 4-4:
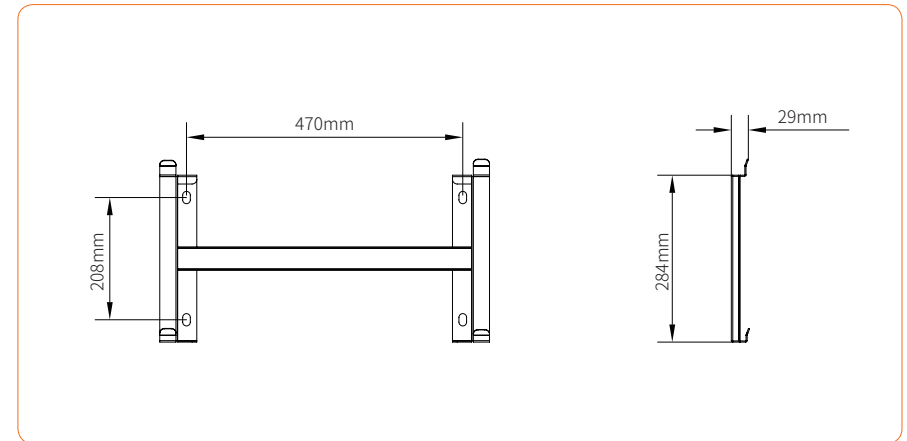
Figure 4-4 Dimensions of wall bracket

① Use the inverter back bracket as the template to mark the position of 4 holes on installation bracket.

② Use an electrical driller with 12mm diameter bit to drill 4 holes on the installation bracket. See Figure 4-5 for details:
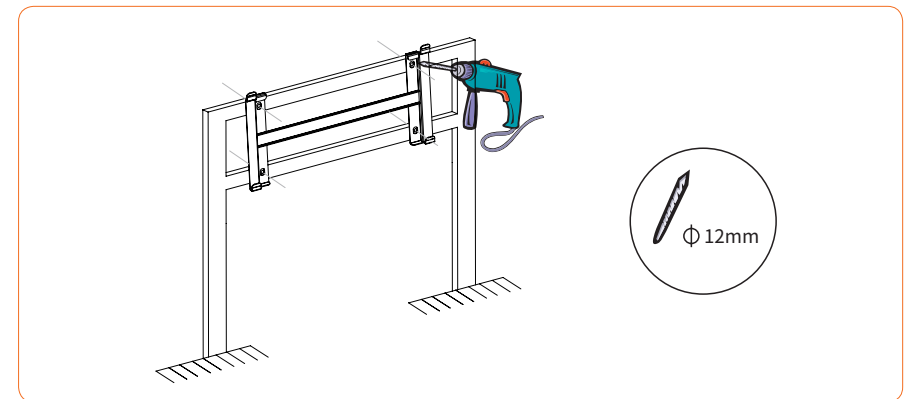
Figure 4-5 Mark the hole position

③ Follow the instructions in the picture below to install the M10 assembling bolts (bolt, spring washer, flat washer) and tighten the bolts with torque wrench in the torque of 35-40N.m, see Figure 4-6 for details:
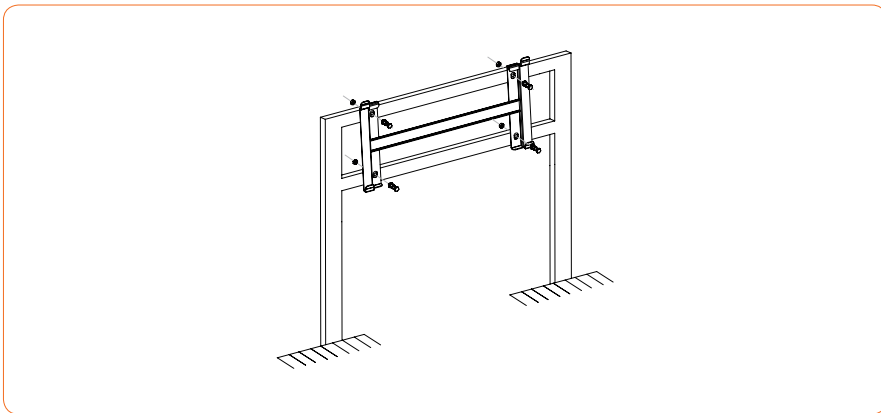
Figure 4-6 Fixing the bracket

▼ 4.2.2 Mounting the inverter

Lift the inverter, hang the back rail on the fixed back bracket carefully. See Figure 4-7 for details:

Handle

Handle
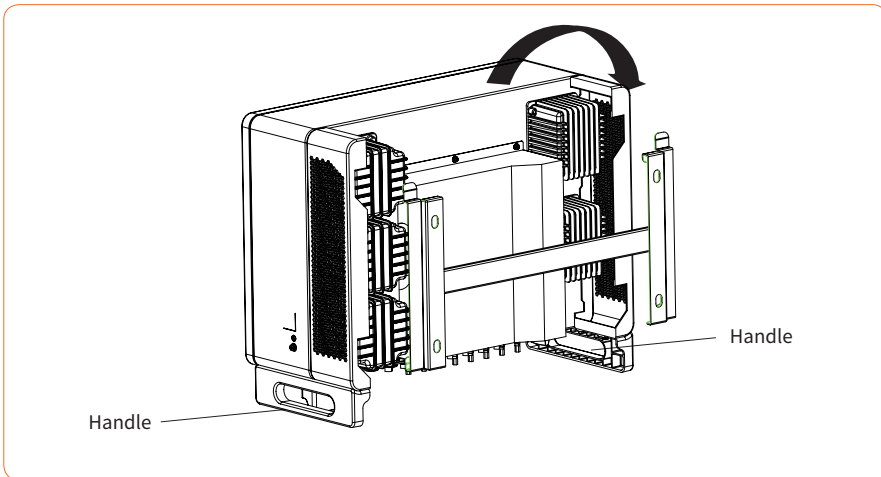
Figure 4-7 Mounting the inverter

※ 4.3 External ground connection

⚠️ Danger	Do not connect the N-wire as a protective ground wire to the inverter casing. Otherwise, it may cause electric shock.
⚠️ Attention	Good grounding is good for resisting surge voltage shock and improving EMI performance. Inverters must be well-grounded. For a system with only one inverter, the PE cable needs to be grounded. For a multi-inverter system, all inverters PE wires need to be connected to the same grounding copper bar to ensure equipotential bonding.

Ground terminal connection steps:
① The external grounding terminal is located in the lower right side of the inverter.
② Fix the grounding terminal to the PE wire with a proper tool and lock the grounding terminal to the grounding hole in the lower right side of the inverter, as shown in Figure 4-8.
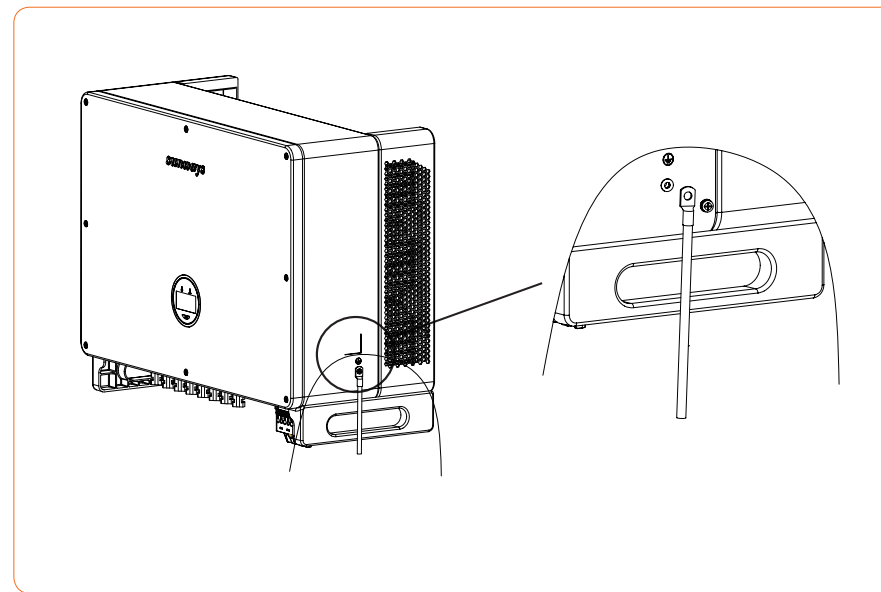
Figure 4-8 Grounding terminal connection

※ **4.4 Electrical Connection**

⚠️ Danger	A high voltage in the conductive part of the inverter may cause an electric shock. When installing the inverter, make sure that the AC and DC sides of the inverter are completely de-energized.
⚠️ Warning	Do not ground the positive or negative pole of the PV string, otherwise it will cause serious damage to the inverter.
⚠️ Warning	Static may cause damage to the electronic components of the inverter. Anti- static measures should be taken during installation and maintenance.
⚠️ Attention	Do not use other brands or other types of terminals other than the terminals in the accessory package. Sunways has the right to refuse all damages caused by the mixed-use of terminals.
⚠️ Attention	Moisture and dust can damage the inverter, ensure the cable gland is securely tightened during installation. The warranty claim will be invalidated if the inverter is damaged as a result of using poorly connected cable connector.

▼ 4.4.1 Inverter PV string connection

1. The following must be considered when making electrical connections to the inverter:

① Disconnect the AC breaker switch on the grid side.

② The DC switch of the inverter must be turned to the "OFF" position.

③ For best practice, ensure PV modules of the same model and specifications are connected in each string.

④ Make sure the maximum output voltage of each PV string does not exceed 1100V.

2. DC connector assembly procedure

① Select the appropriate photovoltaic cable:

Cable Type	Traverse Area (mm²)	
General photovoltaic cable	Range (mm²)	Recommended value (mm²)
	2.5-4.0	4.0

② Peel off the DC cable insulation sleeve for 7 mm, as shown in Figure 4-9:

Wire Traverse area 2.5-4mm²   7mm
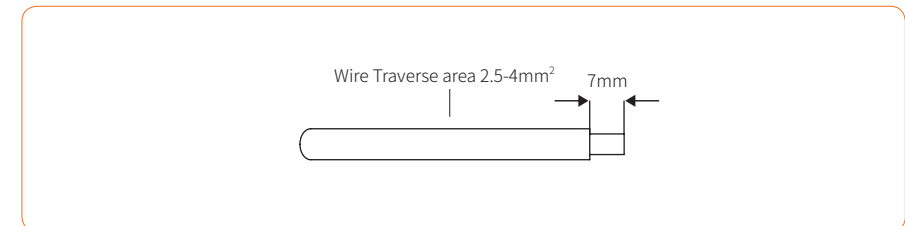
Figure 4-9

③ Disassemble the connector in the accessory bag, as shown in Figure 4-10:

+

-
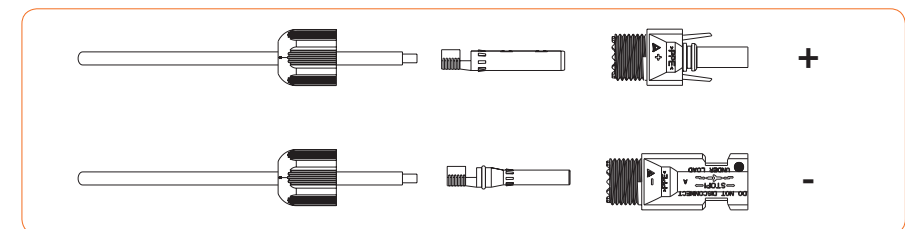
Figure 4-10

④ Insert the DC cable through the DC connector nut into the metal terminal and press the terminal with a professional crimping plier (pull back the cable with some power to check if the terminal is well connected to the cable), as shown in Figure 4-11:

Crimping Plier
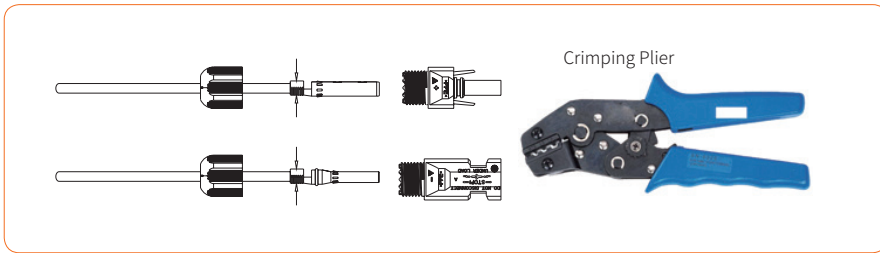
Figure 4-11

⑤ Insert the positive and negative cables into the corresponding positive and negative connectors, pull back the DC cable to ensure that the terminal is tightly attached in the connector.

⑥ Use an open-end wrench to screw the nut to the end to ensure that the terminal is well sealed, as shown in Figure 4-12:

Open-end Wrench
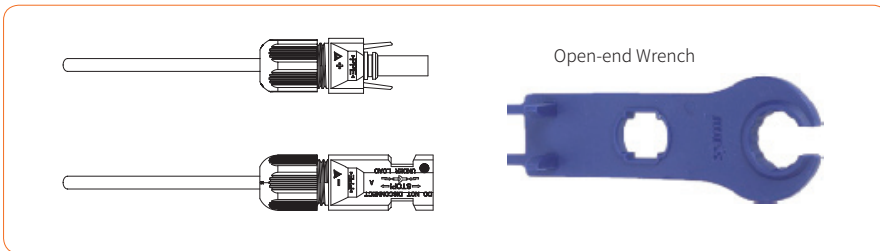
Figure 4-12

⚠ Warning	① Before assembling the DC connector, make sure that the cable polarity is correct.
	② Use a multimeter to measure the voltage of the DC input string, verify the polarity of the DC input cable, and ensure that each string voltage is within 1000V.

3.Insert the positive and negative connectors into the inverter DC input terminals respectively, a click sound should be heard if the terminals are well connected, as shown in Figure 4-13:
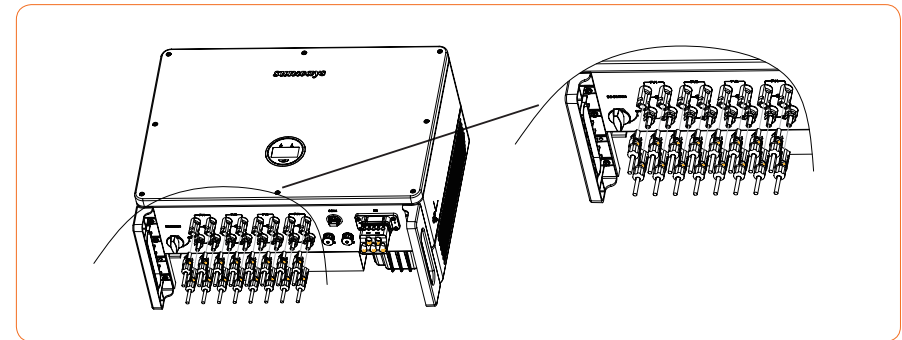
Figure 4-13

4. Seal the unused PV terminals with the terminal caps.

5. System Layout of Units without Integrated DC Switch

Local standards or codes may require that PV systems are fitted with an external DC switch on the DC side. The DC switch must be able to safely disconnect the open-circuit voltage of the PV array plus a safety reserve of 20%. Install a DC switch to each PV string to isolate the DC side of the inverter. We recommend the following electrical connection, as shown in Figure 4-14:
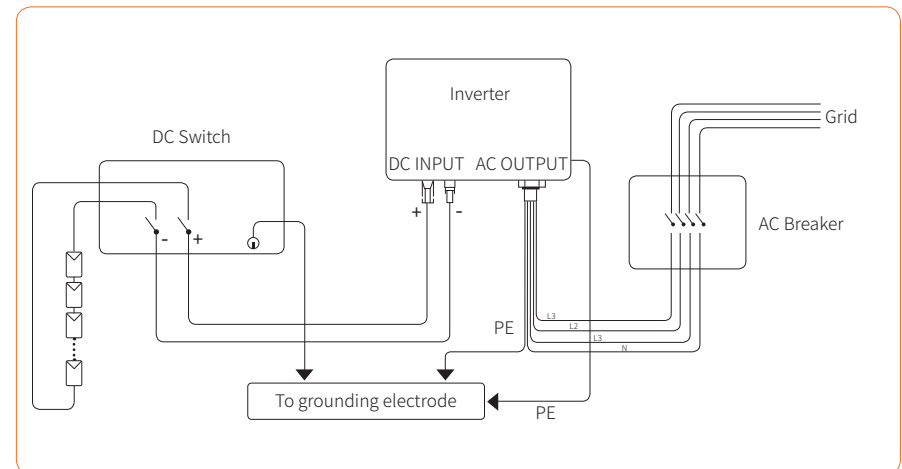
Figure 4-14

▼ 4.4.2 Connection of AC output

1. AC side requirements

Before connecting to the power grid, make sure that the power grid voltage and frequency meet the requirements of the inverter. See technical parameters for details.

① AC Circuit Breaker

The rated output voltage and recommended AC breaker specifications of Sunways STT 30-60KTL three-phase inverter as shown in the table below:

Model	Inverter Rated Output Voltage	AC Breaker Rated Voltage	AC Breaker Rated Current
STT-29.9KTL	400V	400V	63A
STT-30KTL	400V	400V	63A
STT-33KTL	400V	400V	63A
STT-36KTL	400V	400V	80A
STT-40KTL	400V	400V	80A
STT-45KTL	400V	400V	100A
STT-50KTL-M	400V	400V	100A
STT-60KTL-M	400V	400V	125A
STT-40KTL-HV	500V	690V	63A
S-50KTL-HV	500V	690V	80A
STT-60KTL-HV	500V	690V	100A

⚠️ Warning	An AC breaker must be connected on the AC side of the inverter. Any loads cannot be connected to the inverter without the AC breaker.

② Aluminium cable requirements

If you choose aluminum wire, please riveting the copper-aluminum conversion terminal to avoid direct contact between the copper bar and the aluminum wire.

Cross-sectional Area : 35mm² MAX

15±1
70±1
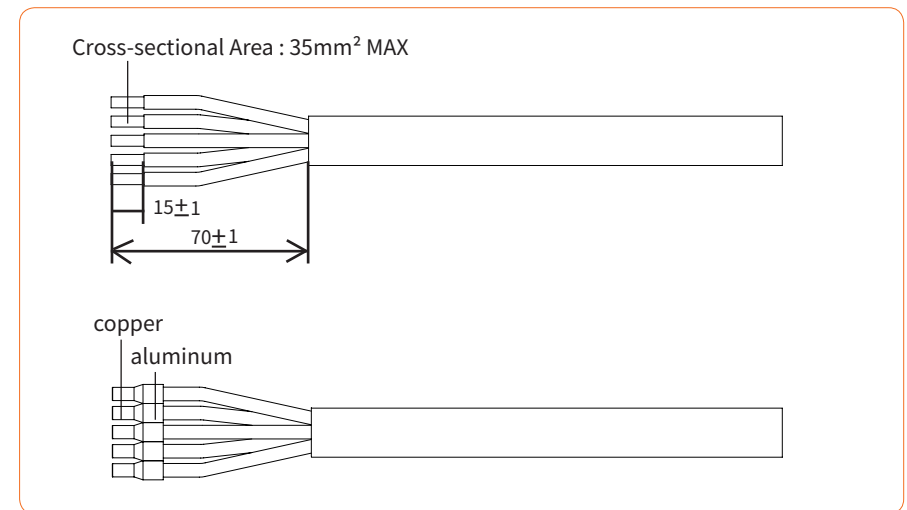
copper
aluminum

Figure 4-15

⚠️ Caution	Direct contact between the copper bar and aluminium wire may arise electrochemical corrosion, thus affect the reliability of the electrical connection. If you choose aluminum wire, please riveting the copper-aluminum conversion terminal to avoid direct contact between the copper bar and the aluminum wire.Copper-aluminum conversion terminal needs to be purchased separately, please purchase by yourself or consult Sunways for purchase.

The purchased copper-aluminum conversion terminal needs to meet the dimensions marked in Figure 4-16 below:
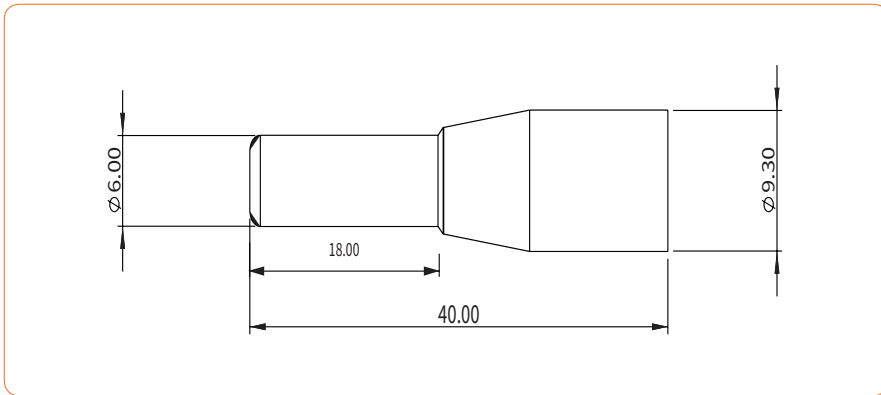
Figure 4-16

③ PE wire requirements

Phase wire cross section S	PE wire cross section	Note
S ≤ 16 mm²	S	The specifications are valid only when the phase wire and PE wire use the same material. If otherwise, ensure that the cross section of the PE wire produces a conductance equivalent to that of the wire specified in the table.
S ＞ 35 mm²	S/2	

2. AC connector connection steps

① peel the insulation sleeve of AC cable off for 95~100mm, and peel off the end of 3L /PE / N wires for 20~25mm, as shown in Figure 4-17:

Outside Diameter : 20~40mm²   Cross-sectional Area : 10mm²~25mm²

N
L
PE

20~25mm

95~100mm
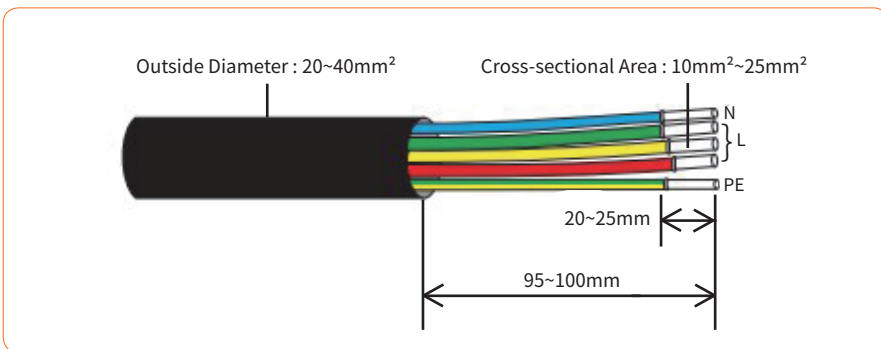
Figure 4-17

② Thread the stripped wire into the lock nut and the main body in turn (the flexible wire needs to be riveted to the insulated terminal), as shown in Figure 4-18:
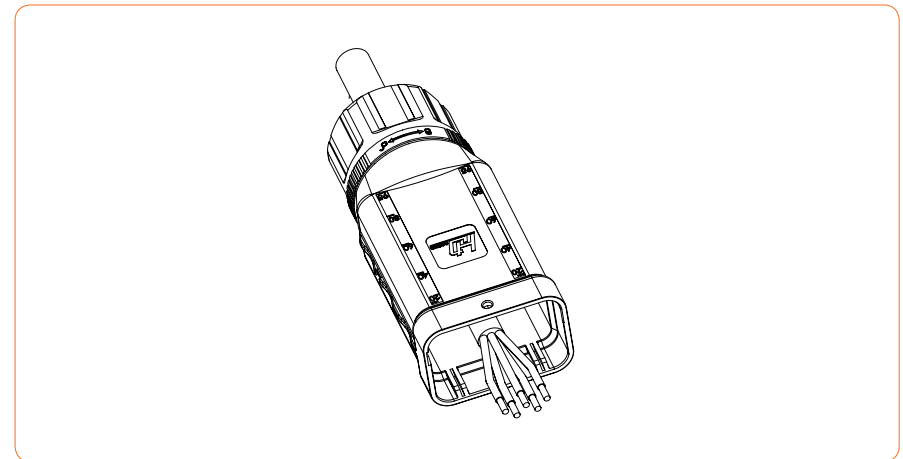
Figure 4-18

③ Insert the cable into the rubber core in the wire sequence, and observe whether the cable is plugged in place through the perspective hole, and finally crimp it with a screwdriver, as shown in Figure 4-19:
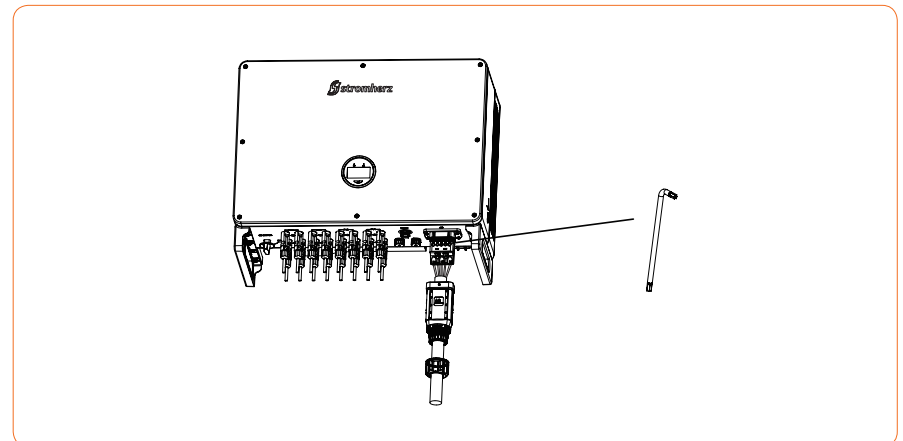
Figure 4-19

④ Insert the flat cable of the display back to its place and put back the right roof cover and lock with its original screws. As shown in Figure 4-20:

Figure 4-20

⑤ Tighten the nut with an openended wrench and complete the installation with a "click, click, click", as shown in Figure 4-21:
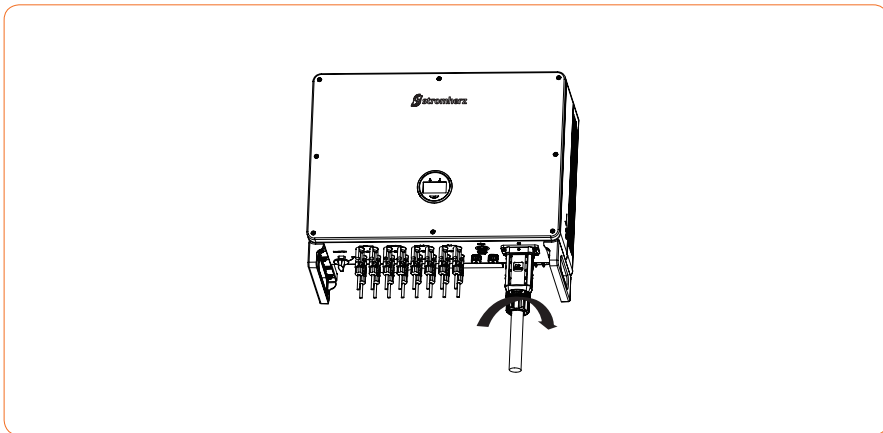
Figure 4-21

※ 4.5 Monitoring Device Installation

Sunways STT 30-60KTL series three phase inverter supports WIFI, GPRS, LAN, 4G and RS485 communication.

Plug the WIFI, LAN, 4G or GPRS module into the COM1 port at the bottom of inverter (as shown in Figure 4-22). A slight "click" sound during the installation represents that the assembly is in place.
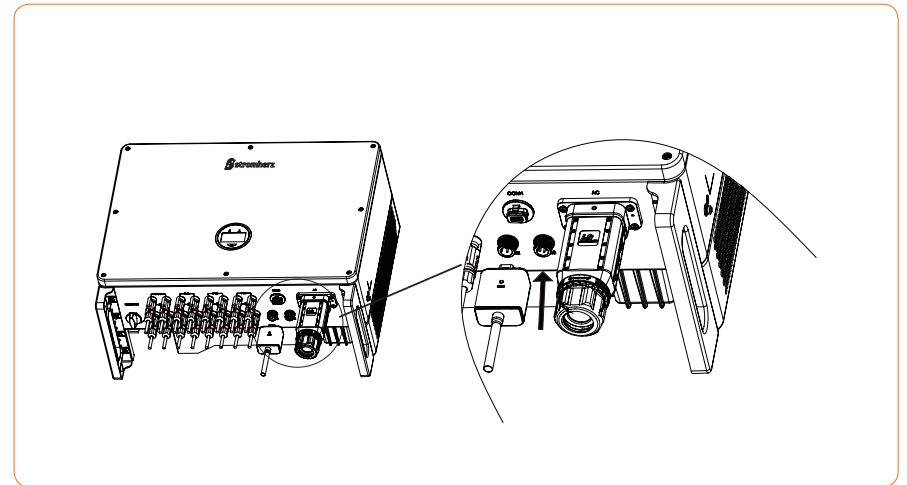
Figure 4-22 Monitoring device installation

Note	1. The 4G, and GPRS version module does not need to be configured. 2. The WiFi version module needs to be configured to the router for the first installation. If the router name or password are changed, the WiFi dongle will need to be reconfigured. For details, please refer to the [QUICK INSTALLATION GUIDE] which is attached to the accessory bag. 3. If DHCP is enabled on the router, the LAN version module does not need to be configured. Otherwise, please refer to the [QUICK INSTALLATION GUIDE] which is attached to the accessory bag.
Attention	Do not touch the waterproof plug in the card slot except for replacing the SIM card. In that case, please make sure the card slot is completely sealed by the weatherproof plug after replacing the SIM card. Any damages caused by improper waterproof plug placement, will void warranty.

※ 4.6 Meter/RS485/DRED Connection

▼ 4.6.1 Terminals definition

Inverter communication ports are located under the COM1 port at the bottom of the Inverter，including RS485 port(used for Data logger connection) and Meter port, as shown in Figure 4-23:
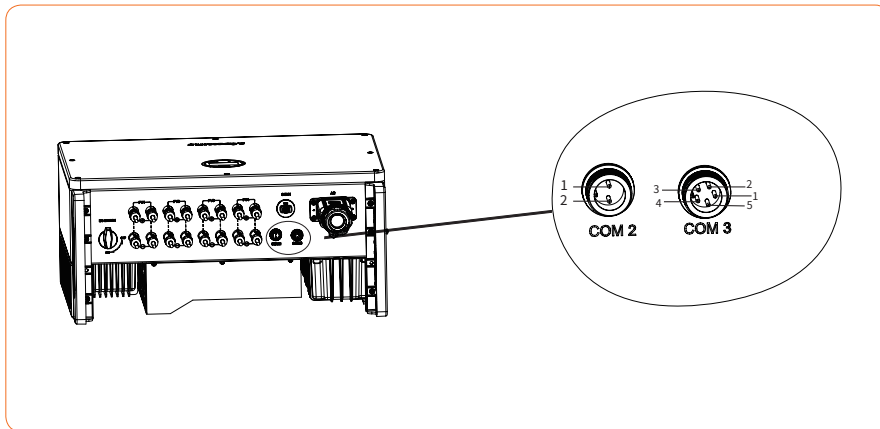
Figure 4-23

Different versions of the inverter have different terminals, which are defined as follows:

Port	Function	NO.	Definition
COM2	Meter	Connect external Meter (with 3CTs) to activate the Export Limitation & control function on Sunways STT 30-60KTL series inverter.	1	485-A2
		2	485-B2
COM3	RS485	In case of multiple inverters, all the inverters can be daisy-chained via RS485 cables.	1	485-A1
		2	485-B1
		3	GND
		4	485-A1
		5	485-B1

▼ 4.6.2 RS485 Communication

STT 30-60KTL series three-phase inverter supports multiple inverters daisy-chain connection to a data logger via RS485 communication.

Multiple inverters connection diagram as shown in Figure 4-24:
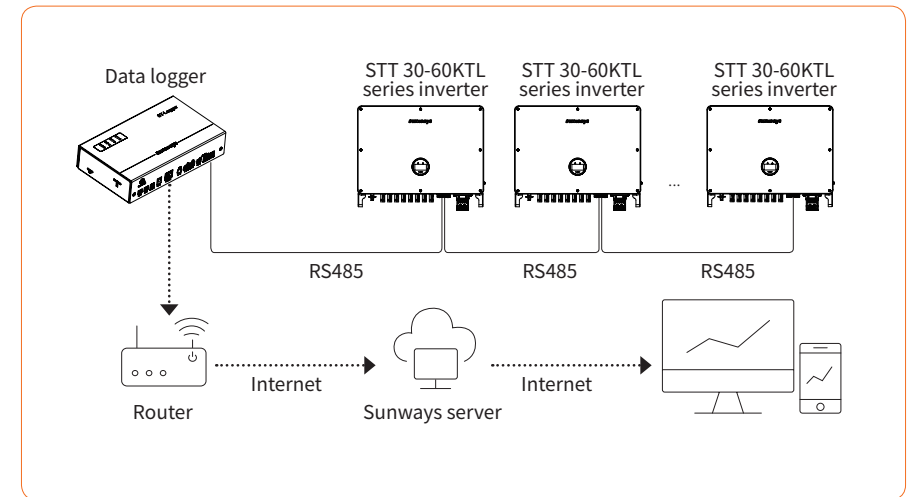
Figure 4-24

The maximum distance between the inverter at the end of the daisy chain and the Data logger should be within 1000m.

> ⚠ **Attention**
> It is recommended to use the RS485 communication cable with a cross sectional area of 0.75-1.5mm² and an outer diameter of 5mm-10mm.
> RS485 cable requirements: Shielded twisted-pair cable or shielded twisted Ethernet cable.

▼ 4.6.3 Export limitation & control or power limit solution

Export limitation & control or power limit solution, wiring instructions and configuration, please contact Sunways after-sales at service@sunways-tech.com.

▼ 4.6.4 Wiring Steps

① Unscrew the plugs of the RS485 port and Meter port on the inverter.

② Dismount the terminal，and put the cable through the plate.

Different cables and connection methods should be applied for different functions. Please follow the connection steps in accordance to the function in need.

Connection of Meter

Please connect the cables in order as shown in the right table in Figure 4-25:

NO.	Function
1	485-A2
2	485-B2
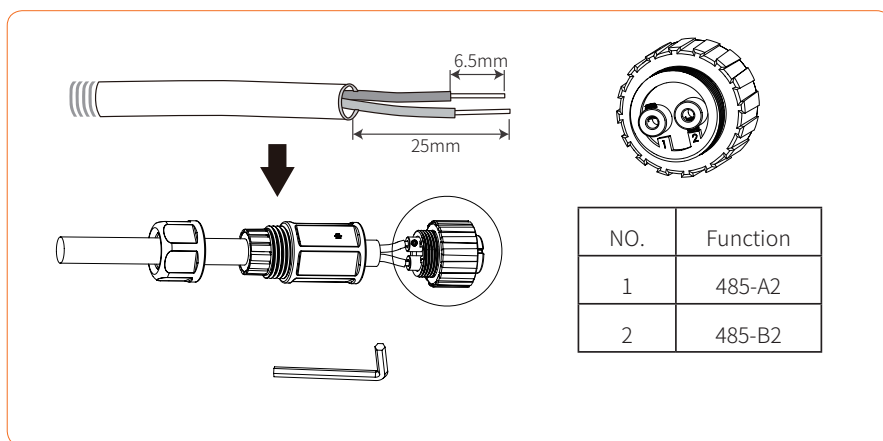
Figure 4-25

Connection of RS485

Please connect the cables in order as shown in the right table in Figure 4-26:

NO.	Function
1	485-A1
2	485-B1
3	GND
4	485-A1
5	485-B1
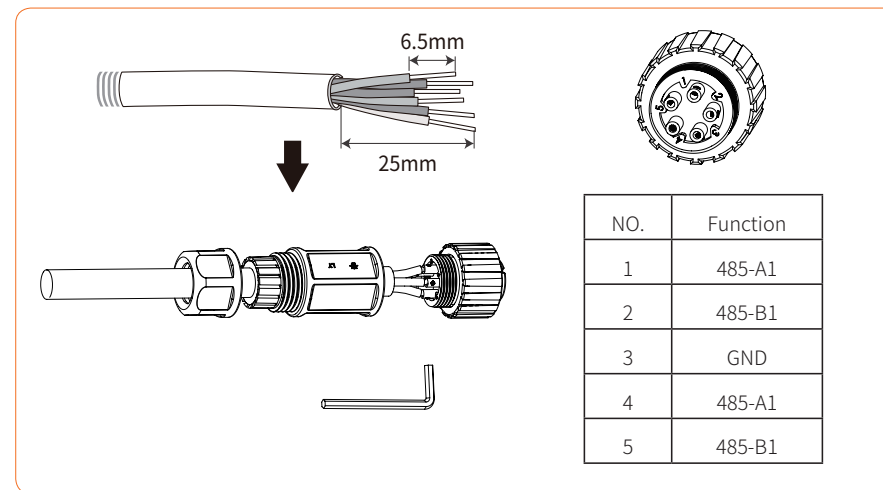
Figure 4-26

If there are multiple inverters in a project, connect them in a daisy chain via RS485 communication.The last inverter needs to be connected to a 120Ω terminal resistor. The wiring sequence is shown in Figure 4-27 below:

NO.	Function
1	485-A1
2	485-B1
3	GND
4	120Ω terminal resistance
5	
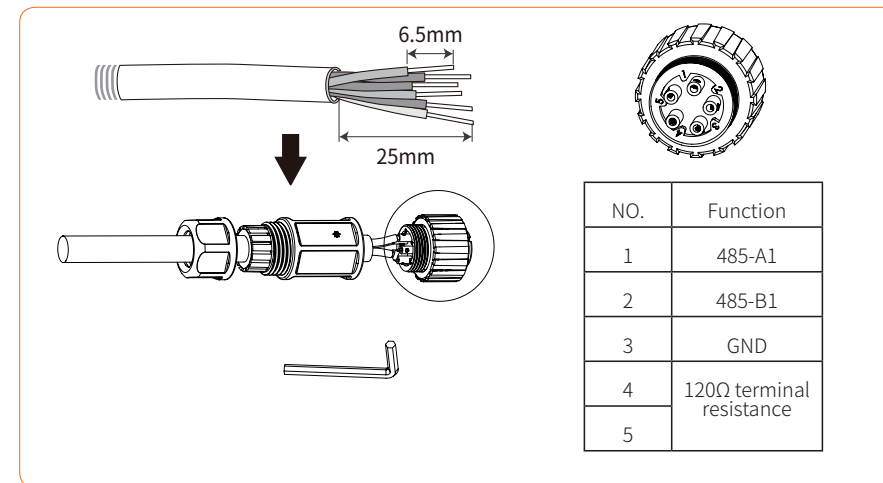
Figure 4-27

③ Connect the terminal to the right position onto the inverter，as shown in Figure 4-28:
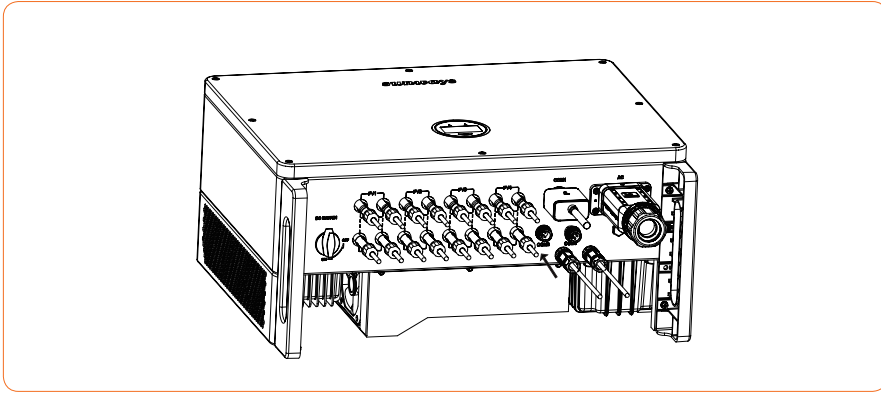
Figure 4-28

≫ 5 Start and Stop

※ 5.1 Start the Inverter

When starting the inverter, follow these steps:

① Turn on the AC breaker first (close the AC circuit breaker).

② Turn on the DC switch at the bottom. If the PV input voltage higher than the inverter start-up voltage, the inverter will start.

③ When both AC and DC power supply are normal, the inverter is ready to start. The inverter will initiate checking its internal parameters and grid parameters, if it is within the range, the green light on the left side of the screen begins to flash, and the "Waiting" message will be displayed on the OLED display.

④ After self-checking completed, the inverter will start generating electricity, the green light will remain on, and the OLED display will display real-time power information.

※ 5.2 Stop the Inverter

When stopping the inverter，follow these steps：

① Turn off the AC breaker first.

② Wait 30 seconds and then turn the DC switch to the "OFF". At this time, there is remaining power in the inverter capacitor. Wait for 5 minutes until the inverter is completely de-energized before conducting any work on the inverter.

③ Disconnect the AC and DC cables.

6 General Operation

※ 6.1 Display Operation

When the inverter is turned on, the following interfaces will be displayed on the OLED display, and the OLED display allows the user view various operation information and modify the settings of the inverter. Please refer to the following display operation flow for details:

▼ 6.1.1 Main Window and General Setting
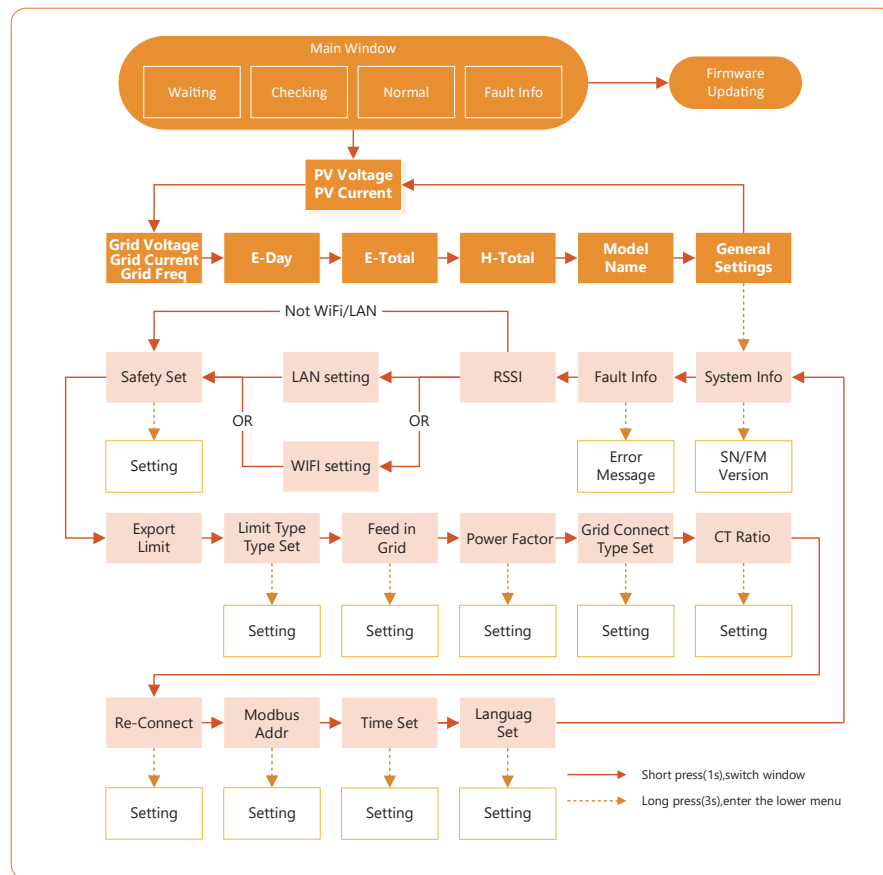
Figure 6-1

☞ Note	Please wait for 10 seconds and the inverter will automatically save your settings or modifications.

▼ 6.1.2 LAN/WIFI Setting
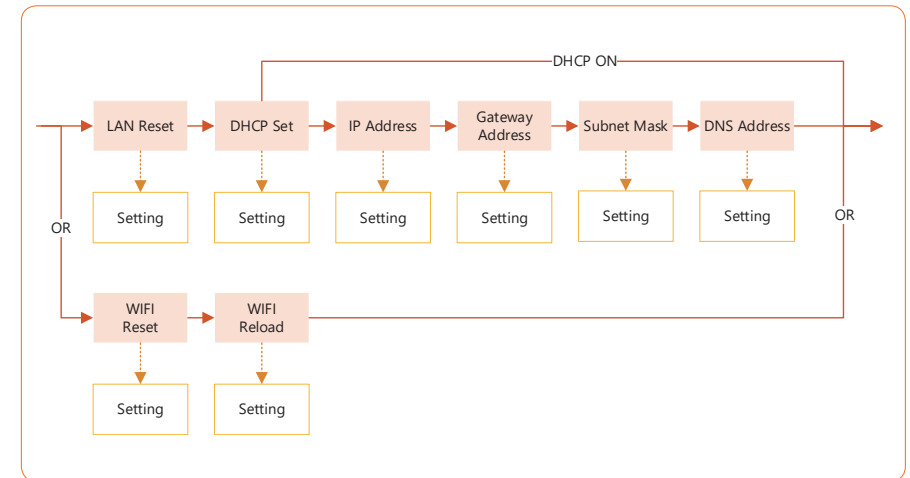
Figure 6-2

※ 6.2 Country Code (Safety Code) Setting

Please set "Country code (Safety code)" under the menu "Safety Set" in " General Settings ".

Please follow this flow chart to set "Country code (Safety code)":
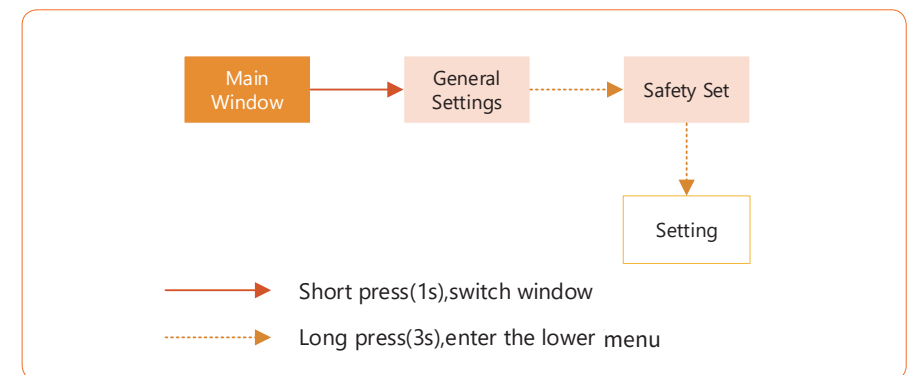
Figure 6-3

※ 6.3 Auto-Test

This function is disabled by default, and only will be functional in the safety code of Italy. Short press the button several times until "Auto Test CEI 0-21" displays on the screen, press and hold the button 3 seconds to activate "Auto Test". After the auto test finished, short press the button several times until the screen displays "Auto Test Record", and hold the button 3 seconds to check the test result.

Connect the AC cable, auto test will start after the inverter connected to the grid, see the operation steps below:

Short press(1s),switch window
Long press(3s),enter the lower Menu
No need to press, just wait

General Settings

Auto Testing … → Test Pass/Fail → Auto Test CEI 0-21 → *If Tested* → Auto Test Record

IPS Item Test All

IPS Item xxxxx

Select Items

IPS Item Test Null ← Verified OK ← Password 1111

Test Result Display

Figure 6-4

☞

Note

IPS Items including : Test Null , 59.S1 Test , 59.S2 Test , 27.S1 Test , 27.S2 Test , 81＞.S1 Test , 81＜.S1 Test , 81＞.S2 Test , 81＜.S2 Test , Test ALL.

The auto test will start when the correct test item is selected, and the test result will be displayed on the screen when it finished. If the test was successful, it will display "Test Pass", otherwise will display "Test Fail". After each item tested, the inverter will reconnect to the grid and automatically start the next test according to the requirements of CEI 0-21.

※ 6.4 Power Quality Response Modes

▼ 6.4.1 Power derating for voltage variation (Volt-Watt mode)

This mode can be enabled via the configuration software. Please contact Sunways Technical Support at service@sunways-tech.com for more information.

▼ 6.4.2 Reactive power regulation for voltage variation (Volt-VAr mode)

This mode can be enabled via the configuration software. Please contact Sunways Technical Support at service@sunways-tech.com for more information.

※ 6.5 Online Monitoring APP

Sunways inverter provides a monitoring port that can collect and transmit data from the inverter to Sunways monitoring platform via an external monitoring device. Please refer to the product nameplate on side of enclosure to get the monitoring application. If download issues exist , contact your dealer or Sunways technical support.

7 Troubleshooting

※ 7.1 Error Message

Sunways STT 30-60KTL series three phase inverter is designed in accordance with grid operation standards, and conform to the requirements of safety and EMC. The inverter had passed a series of rigorous tests to ensure it runs sustainably and reliably before shipment.

When a fault occurs, the corresponding error message will be shown on the OLED display, and in this case, the inverter might stop feeding into grid. The fault messages and their corresponding troubleshooting methods are listed below:

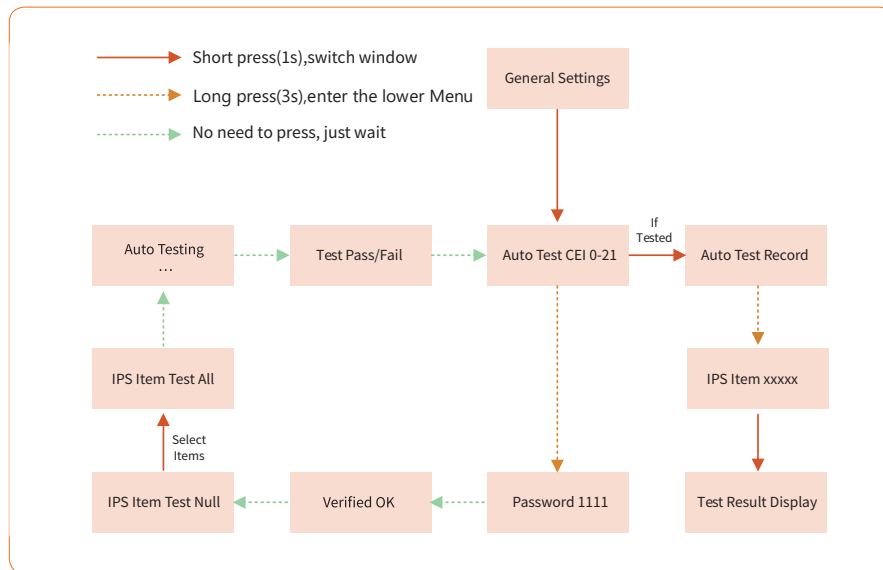| Error Message	Description	Troubleshooting
No Display	No Display	① Check whether cables are all firmly connected and DC switch is on. ② Check whether the input voltage meets the working voltage.
Mains Lost	Grid power outage, AC switch or circuit is disconnected.	① Check whether the mains supply is lost. ② Check whether the AC breaker and terminals are well connected.
Grid Voltage Fault	Grid overvoltage or undervoltage, the grid voltage is higher or lower than the set protection value.	① Check whether the safety regulation setting is correct. ② Check the voltage of the grid. If the grid voltage exceeds the allowed range of inverter protection parameters, please contact the local grid company to resolve. ③ Check whether the impendence of the AC cable is too high. Replace with a thicker AC cable if that is the case.

Error Message	Description	Troubleshooting
Grid Frequency Fault	Grid over frequency or under-frequency, the grid frequency is higher or lower than the set protection value.	① Check whether the safety regulation settings are correct. ② Check the frequency of the grid. If the grid frequency exceeds the allowed range of inverter protection parameters, please contact the local grid company to resolve.
ISO Over Limitation	Low system insulation resistance, which is generally caused by poor insulation to ground of the module/cable or by rainy and damp environment.	① Check whether the PV panels, cables, and connectors are broken or water leaked. ② Check whether there is a reliable inverter grounding line.
GFCI Fault	Excessive leakage current.	① The ground current is too high. ② Check whether the PV cable has a short circuit to ground.
PV input Voltage	PV input voltage is too high.	① Input voltage is too high. ② Reduce the number of PV panels to make sure the open-circuit voltage of each string is lower than the inverter max allowed input voltage.
Inverter Over Temperature	Temperature anomaly, the temperature of the interior of the inverter is excessively high and out of the safe range.	① Check whether the inverter is directly exposed to the sunlight. ② Reduce ambient temperature.
DCI Fault	DC Injection Hight. Inverter detects a higher DC component in AC output.	① Restart the inverter, wait a moment for inverter recovery. ② If the fault occurs repeatedly, please contact Sunways.

Error Message	Description	Troubleshooting
Bus Voltage Fault	BUS voltage is over-high.	① Restart the inverter, wait a moment for inverter recovery. ② If the fault occurs repeatedly, please contact Sunways.
SCI Fault	Internal communication fails. Caused by a strong external magnetic field etc.	① Restart the inverter, wait a moment for inverter recovery. ② If the fault occurs repeatedly, please contact Sunways.
SPI Fault	Internal communication fails. Caused by a strong external magnetic field etc.	① Restart the inverter, wait a moment for inverter recovery. ② If the fault occurs repeatedly, please contact Sunways.
E2 Fault	Internal storage anomaly. Caused by a strong external magnetic field etc.	① Restart the inverter, wait a moment for inverter recovery. ② If the fault occurs repeatedly, please contact Sunways.
GFCI Device Fault	GFCI device anomaly.	① Restart the inverter, wait a moment for inverter recovery. ② If the fault occurs repeatedly, please contact Sunways.
AC Transducer Fault	AC transducer anomaly.	① Restart the inverter, wait a moment for inverter recovery. ② If the fault occurs repeatedly, please contact Sunways.

Error Message	Description	Troubleshooting
Relay Check Fail	Self-checking of relay fails. neutral & ground cable are not connected well on AC side or just occasional failure.	① Check use multi-meter if there is high voltage (normally should be lower than 10V) between N&PE cable on AC side. If the voltage higher than 10V, it means the Neutral & ground cable are not connected well on AC side or restart inverter. ② If the neutral & ground cable are connected well, please contact Sunways.
Flash Fault	Internal storage anomaly. Caused by a strong external magnetic field etc.	① Restart the inverter, wait a moment for inverter recovery. ② If the fault occurs repeatedly, please contact Sunways.
External Fan Fault	External fan anomaly.	① Stop the inverter and disconnect the AC&DC cables. ② Check whether the fan is blocked by foreign matters. If not, replace the fan.
Internal Fan Fault	Internal fan anomaly.	① Restart the inverter, wait a moment for inverter recovery. ② If the fault occurs repeatedly, please contact Sunways.

※ 7.2 Maintenance

Danger ⚠	Risk of inverter damage or personal injury due to incorrect service! Always keep in mind that the inverter is powered by dual sources: PV strings and utility grid. Before any service work, observe the following procedures. ① Disconnect the AC circuit breaker and then set the DC load-break switch of the inverter to OFF; ② Wait at least 5 minutes for inner capacitors to discharge completely; ③ Verify that there is no voltage or current before pulling any connector.
Caution ⚠	Keep non-qualified persons away! A temporary warning sign or barrier must be posted to keep non-qualified persons away while performing electrical connection and service work.
Attention ⚠	Restart the inverter only after removing the fault that impairs safety performance. Never arbitrarily replace any internal components. For any maintenance support, please contact Sunways. Otherwise, Sunways shall not be held liable for any damage caused.
Note ☞	Servicing of the device in accordance with the manual should never be undertaken in the absence of proper tools, test equipment or the latest revision of the manual which has been clearly and thoroughly understood.

Item	Method	Period
System clean	Check the temperature and dust of the inverter. Clean the inverter enclosure if necessary. Check if the air inlet and outlet are normal. Clean the air inlet and outlet if necessary.	Six months to a year (it depends on the dust contents in air.)

» 8 Technical Parameters

Model	STT-29.9KTL	STT-30KTL	STT-33KTL	STT-36KTL
Input				
Start-up Voltage (V)	180	180	180	180
Max. DC Input Voltage (V)	1100	1100	1100	1100
Rated DC Input Voltage (V)	620	620	620	620
MPPT Voltage Range (V)	180-1000	180-1000	180-1000	180-1000
No. of MPP Trackers	4	4	4	4
No. of DC Inputs per MPPT	2	2	2	2
Max. Input Current (A)	26/26/26/26	26/26/26/26	26/26/26/26	26/26/26/26
Max. Short-circuit Current (A)	40/40/40/40	40/40/40/40	40/40/40/40	40/40/40/40
Backfeed Current To The Array(A)	0	0	0	0
Output				
Rated Output Power (W)	29,000	30,000	33,000	36,000
Max. Output Power (W)	29,000	33,000	36,000	39,000
AC Output Rated Apparent Power(VA)	29,000	30,000	33,000	36,000
Max. Apparent Power (VA)	29,000	33,000	36,000	39,000
Rated Output Voltage (V)	3 / N / PE，380/ 400V			
Rated AC Frequency (Hz)	50/60	50/60	50/60	50/60
AC Output Rated Current（A)	43.3	43.5	47.8	52.2
Max. Output Current (A)	43.3	47.8	52.6	57.4
The Measured Inrush Current (A)	16.5A@10.6ms	16.5A@10.6ms	16.5A@10.6ms	16.5A@10.6ms
Maximum Output Fault Current (A)	118	118	118	118
Power Factor	0.8 leading …0.8 lagging			
Max. total Harmonic Distortion	< 3% @Rated Output Power			
DCI	< 0.5%In			

Model	STT-29.9KTL	STT-30KTL	STT-33KTL	STT-36KTL
Efficiency				
Max. Efficiency	98.8%	98.8%	98.8%	98.8%
European Efficiency	98.3%	98.3%	98.3%	98.3%
MPPT Efficiency	99.9%	99.9%	99.9%	99.9%
Protection				
DC Reverse Polarity Protection	Integrated			
Insulation Resistance Protection	Integrated			
DC Switch	Integrated			
Surge Protection	Integrated			
Over-temperature Protection	Integrated			
Residual Current Protection	Integrated			
Islanding Protection	Frequency shift, Integrated			
AC Short-circuit Protection	Integrated			
AC Over-voltage Protection	Integrated			
General Data				
Dimensions (mm)	600*400*270			
Weight (kg)	42			
Protection Degree	IP66			
Self-consumption at Night (W)	< 1			
Topology	Transformerless			
Operating Temperature Range (° C)	-30~60			
Relative Humidity (%)	0~100%			
Operating Altitude (m)	3000			
Cooling	Fan Cooling			
Display	OLED & LED			
Communication	RS485 / WiFi / GPRS/ LAN(Optional)			
Compliance	NB/T 32004、IEC62109、IEC62116、VDE 4105、VDE 0126、AS4777、C10/11、CEI 0-21、RD1699、NBR16149、IEC61727、IEC60068、IEC61683、EN50549、EN61000			

Model	STT-40KTL	STT-45KTL	STT-50KTL-M	STT-60KTL-M
Input				
Start-up Voltage (V)	180	180	180	180
Max. DC Input Voltage (V)	1100	1100	1100	1100
Rated DC Input Voltage (V)	620	620	620	620
MPPT Voltage Range (V)	180-1000	180-1000	180-1000	180-1000
No. of MPP Trackers	4	4	4	4
No. of DC Inputs per MPPT	2	2	2	2
Max. Input Current (A)	26/26/26/26	26/26/26/26	26/26/26/26	26/26/26/26
Max. Short-circuit Current (A)	40/40/40/40	40/40/40/40	40/40/40/40	40/40/40/40
Backfeed Current To The Array(A)	0	0	0	0
Output				
Rated Output Power (W)	40,000	45,000	50,000	60,000
Max. Output Power (W)	44,000	49,500	55,000	66,000
AC Output Rated Apparent Power(VA)	40,000	45,000	50,000	60,000
Max. Apparent Power (VA)	44,000	49,500	55,000	66,000
Rated Output Voltage (V)	3 / N / PE，380 / 400V			
Rated AC Frequency (Hz)	50/60	50/60	50/60	50/60
AC Output Rated Current（A）	58.0	65.2	72.5	87
Max. Output Current (A)	63.8	71.7	79.7	95.7
The Measured Inrush Current (A)	16.5A@10.6ms	16.5A@10.6ms	16.5A@10.6ms	16.5A@10.6ms
Maximum Output Fault Current (A)	160	160	180	180
Power Factor	0.8 leading …0.8 lagging			
Max. total Harmonic Distortion	< 3% @Rated Output Power			
DCI	< 0.5%In			
Efficiency				
Max. Efficiency	98.8%	98.8%	98.8%	98.8%
European Efficiency	98.3%	98.3%	98.3%	98.3%

Model	STT-40KTL	STT-45KTL	STT-50KTL-M	STT-60KTL-M
MPPT Efficiency	99.9%	99.9%	99.9%	99.9%
Protection				
DC Reverse Polarity Protection	Integrated			
Insulation Resistance Protection	Integrated			
DC Switch	Integrated			
Surge Protection	Integrated			
Over-temperature Protection	Integrated			
Residual Current Protection	Integrated			
Islanding Protection	Frequency shift, Integrated			
AC Short-circuit Protection	Integrated			
AC Over-voltage Protection	Integrated			
General Data				
Dimensions (mm)	600*400*270			
Weight (kg)	42			
Protection Degree	IP66			
Self-consumption at Night (W)	< 1			
Topology	Transformerless			
Operating Temperature Range (° C)	-30~60			
Relative Humidity (%)	0~100			
Operating Altitude (m)	3000			
Cooling	Fan Cooling			
Display	OLED & LED			
Communication	RS485 / WiFi / GPRS/ LAN(Optional)			
Compliance	NB/T 32004、IEC62109、IEC62116、VDE 4105、VDE 0126、AS4777、C10/11、CEI 0-21、RD1699、NBR16149、IEC61727、IEC60068、IEC61683、EN50549、EN61000			

Model	STT-40KTL-HV	STT-50KTL-HV	STT-60KTL-HV
Input			
Start-up Voltage (V)	180	180	180
Max. DC Input Voltage (V)	1100	1100	1100
Rated DC Input Voltage (V)	750	750	750
MPPT Voltage Range (V)	180-1000	180-1000	180-1000
No. of MPP Trackers	4	4	4
No. of DC Inputs per MPPT	2	2	2
Max. Input Current (A)	26/26/26/26	26/26/26/26	26/26/26/26
Max. Short-circuit Current (A)	40/40/40/40	40/40/40/40	40/40/40/40
Backfeed Current To The Array(A)	0	0	0
Output			
Rated Output Power (W)	40,000	50,000	60,000
Max. Output Power (W)	44,000	55,000	66,000
AC Output Rated Apparent Power(VA)	40,000	50,000	60,000
Max. Apparent Power (VA)	44,000	55,000	66,000
Rated Output Voltage (V)	3 /PE，500V		
Rated AC Frequency (Hz)	50/60	50/60	50/60
AC Output Rated Current（A)	46.3	57.9	69.4
Max. Output Current (A)	50.9	63.7	76.4
The Measured Inrush Current (A)	16.5A@10.6ms	16.5A@10.6ms	16.5A@10.6ms
Maximum Output Fault Current (A)	180	180	180
Power Factor	0.8 leading …0.8 lagging		
Max. total Harmonic Distortion	< 3% @Rated Output Power		
DCI	< 0.5%In		
Efficiency			
Max. Efficiency	98.8%	98.8%	98.8%
European Efficiency	98.3%	98.3%	98.3%

Model	STT-40KTL-HV	STT-50KTL-HV	STT-60KTL-HV
MPPT Efficiency	99.9%	99.9%	99.9%
Protection			
DC Reverse Polarity Protection	Integrated		
Insulation Resistance Protection	Integrated		
DC Switch	Integrated		
Surge Protection	Integrated		
Over-temperature Protection	Integrated		
Residual Current Protection	Integrated		
Islanding Protection	Frequency shift, Integrated		
AC Short-circuit Protection	Integrated		
AC Over-voltage Protection	Integrated		
General Data			
Dimensions (mm)	600*400*270		
Weight (kg)	42		
Protection Degree	IP66		
Self-consumption at Night (W)	< 1		
Topology	Transformerless		
Operating Temperature Range (° C)	-30~60		
Relative Humidity (%)	0~100		
Operating Altitude (m)	3000		
Cooling	Fan Cooling		
Display	OLED & LED		
Communication	RS485，WiFi/ GPRS/LAN(Optional)		
Compliance	NB/T 32004、IEC62109、IEC62116、VDE 4105、VDE 0126、AS4777、C10/11、CEI 0-21、RD1699、NBR16149、IEC61727、IEC60068、IEC61683、EN50549、EN61000		

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