

sunways

Grid-connected PV Inverter
Three Phase Dual MPPT

User Manual

STT-4K/5K/6K/8K/10K/12K/15K/17K/20K/25KTL

CONTENTS

1. Preface.....	5
1.1 Overview.....	5
1.2 Target Groups.....	5
2. Safety Instructions.....	5
2.1 Safety Notes.....	5
2.2 Statement.....	5
2.3 Important Safety Matters.....	6
2.4 Symbols Explanation.....	7
3. Physical Layout.....	9
3.1 Basic Features.....	9
3.2 Appearance Introduction.....	10
3.3 Display Interface.....	12
3.4 Packing List.....	13
4. Installation.....	13
4.1 Location.....	13
4.2 Mounting.....	15
4.3 Electrical Connection.....	17
4.4 Monitoring Device Installation.....	22
4.5 RS485/DRED Connection.....	23
4.6 System Layout of Units without Integrated DC Switch.....	26
5. Start and Stop.....	27
5.1 Start Inverter.....	27
5.2 Stop Inverter.....	27
6. General Operation.....	28
6.1 Display Operation.....	28
6.2 Auto-Test.....	29
6.3 Power Quality Response Modes.....	30
6.4 Country Code (Safety Code) Setting.....	30
6.5 Online Monitoring APP.....	30
7. Troubleshooting.....	31
7.1 Error Message.....	31
7.2 Maintenance.....	32
8. Technical Parameters.....	33

Attention

The products, services or features purchased are subject to the commercial contracts and terms of Ningbo Sunways technologies Co., Ltd. All or part of the products, services or features described in this document may not be within purchased. Unless otherwise agreed in the contract, the Company shall not make any express or implied declaration or guarantee of the contents of this document.

Due to product version upgrades or other reasons, the contents of this document will be updated periodically. Unless otherwise agreed, this document serves only as a guide to use, and all statements, information and recommendations in this document do not constitute any express or implied guarantee.

Manufacturer: Ningbo Sunways technologies Co., Ltd.

Address: No. 1, Second Road, Green Industrial Zone, Chongshou Town,
Cixi City, ZheJiang Province, PEOPLE'S REPUBLIC OF CHINA

Website: www.sunways-tech.com

Service Mail: service@sunways-tech.com

Hotline: +86 400-9922-958

1. Preface

1.1 Overview

This manual is an integral part of Sunways STT 4-25kW 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](tel:+864009922958) or email Sunways at service@sunways-tech.com for consultation.

2. Safety Instructions

2.1 Safety Notes

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

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

2.1.3 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.

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

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

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

2.1.7 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.

2.1.8 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

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

- 2.2.1 Damages caused by improper transportation.
- 2.2.2 Damages caused by incorrect storage, installation or use.
- 2.2.3 Damages caused by installation and use of equipment by non-professionals or untrained personnel.
- 2.2.4 Damages caused by failure to comply with the instructions and safety warnings in this document.
- 2.2.5 Damages caused by running in an environment that doesn't meet the requirements which stated in this document.
- 2.2.6 Damages caused by operation beyond the parameters specified in applicable technical specifications.
- 2.2.7 Damages caused by unauthorized disassembly, alteration of products or modification of software codes.
- 2.2.8 Damages caused by abnormal natural environment (force majeure, such as lightning, earthquake, fire, storm, etc.).
- 2.2.9 Any damages caused by the process of installation and operation which don't follow the local standards and regulations.
- 2.2.10 Products beyond the warranty period.

2.3 Important Safety Matters




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

Symbol	Description
 Danger	Dangerous situation, if not avoided, 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

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

2.4.2 Symbol on the Inverter nameplate

Symbol	Description
	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

Symbol	Description
	Handle with care.
	This side up.
	Keep dry.
	Stacked layers.

3. Product Description

3.1 Basic Features

3.1.1 Function

The Sunways STT 4~25kW series inverter is a three-phase grid-connected PV inverter which used to efficiently convert the DC power generated by the PV string into AC power and feed it into the grid.

3.1.2 The STT 4~25kW series inverter includes 10 models which are listed below:

STT-4KTL, STT-5KTL, STT-6KTL, STT-8KTL, STT-10KTL, STT-12KTL, STT-15KTL, STT-17KTL, STT-20KTL, STT-25KTL

3.1.3 Applicable grid type

The applicable grid types for the Sunways STT 4~25kW 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. For more details please see Figure 3-1.

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 ° C and + 60 ° C, 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 6 levels.

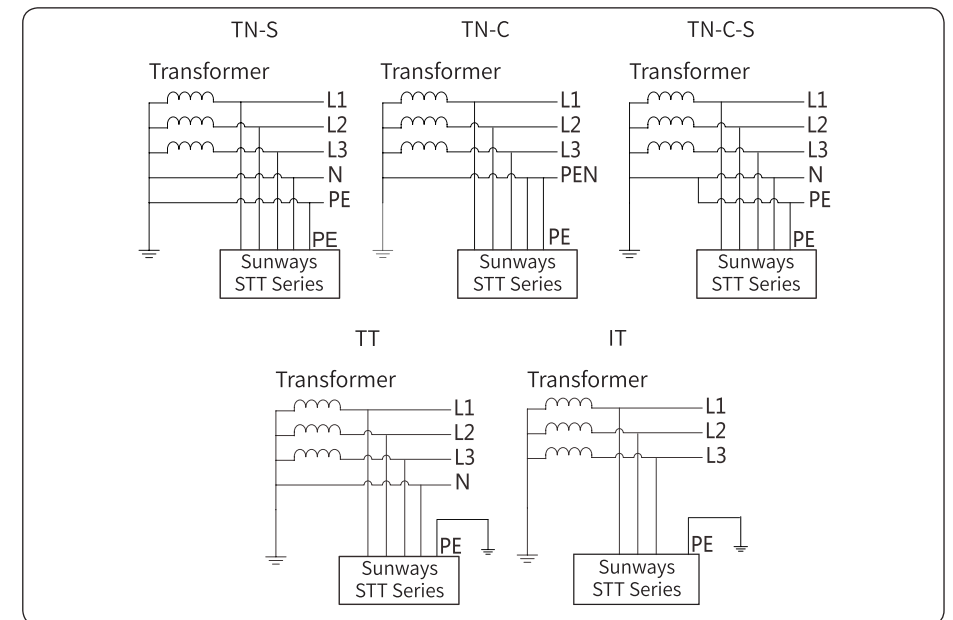


Figure 3-1 Applicable grid types

3.2 Physical Layout

3.2.1 Inverter front view

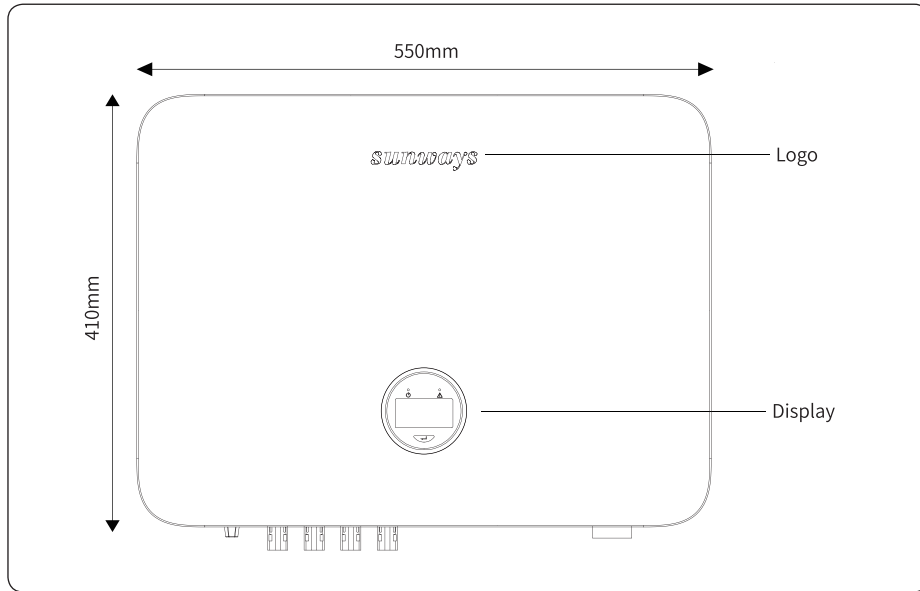


Figure 3-2 Front view

3.2.2 Inverter side view

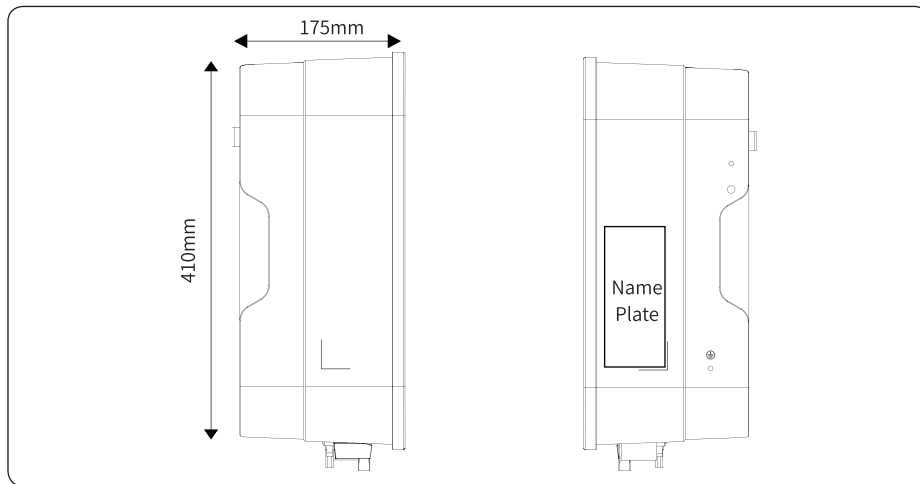


Figure 3-3 Side view

3.2.3 Inverter bottom view

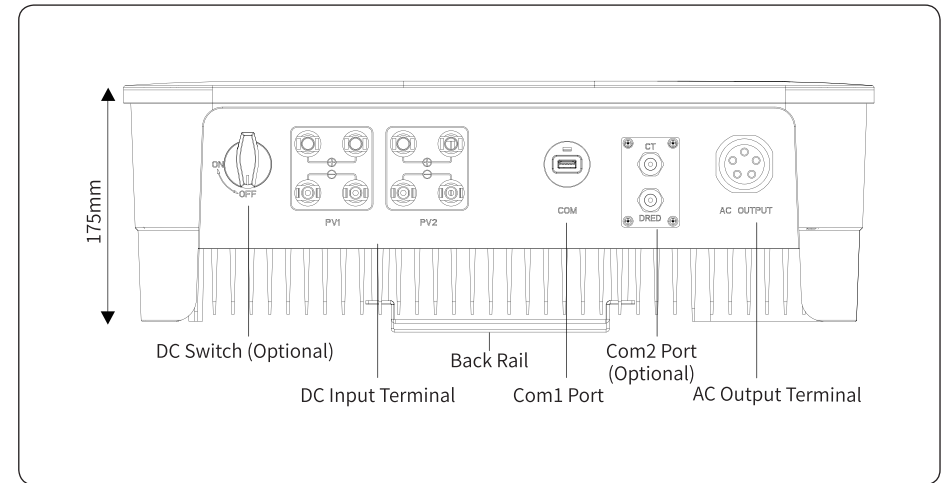


Figure 3-4 Bottom view

3.2.4 Inverter back view

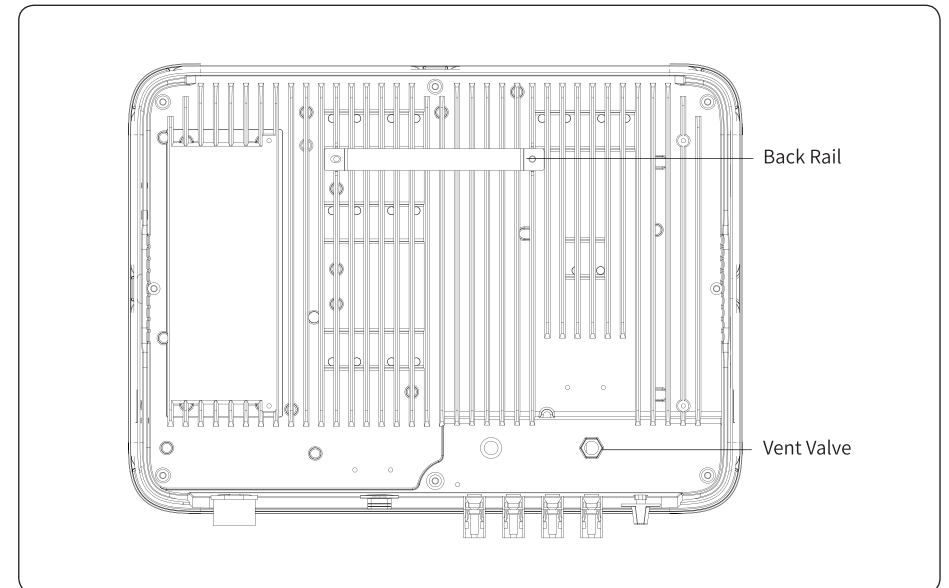


Figure 3-5 Inverter back view

3.3 Display Interface



Figure 3-6 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 fault is 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 the 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 3-7 for the packing list:

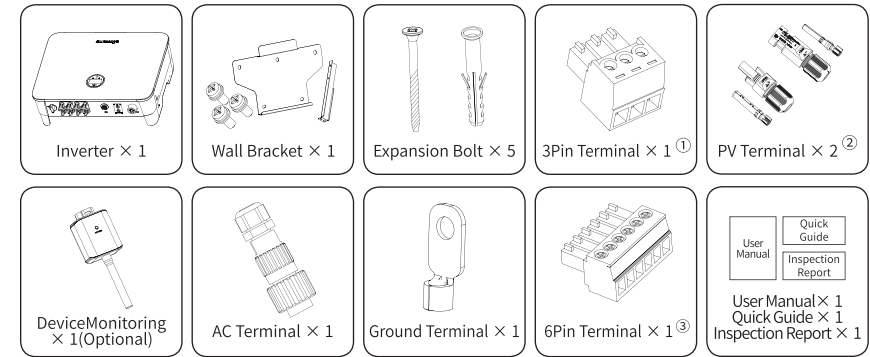


Figure 3-7 Packing list

Note	①	Export limitation & control version 2pcs; RS485 and DRED version 1pcs (This connector already pre-installed inside the inverter).
	②	STT 4-12kW 2pcs / STT 15kW 3pcs / STT 17-25kW 4pcs.
	③	DRED version only (This connector already pre-installed inside the inverter).

4. Installation

4.1 Location

The Sunways STT 4~25kW series inverter is designed with IP65 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 inverter is 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 the level for easy inspection of screen data and further maintenance.
- 5) The ambient temperature of the inverter installation location should be between -30 ° C and 60 ° C.
- 6) The surface temperature of the inverter may reach up to 75 ° C. 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 Recommended installation location of the inverter, as shown in Figure 4-1:



Figure 4-1 Recommended installation

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

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

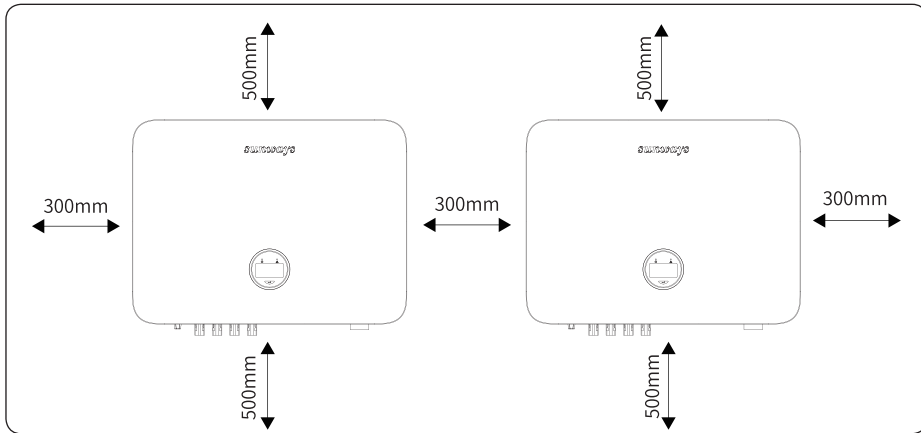


Figure 4-2 Recommended installation spacing

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

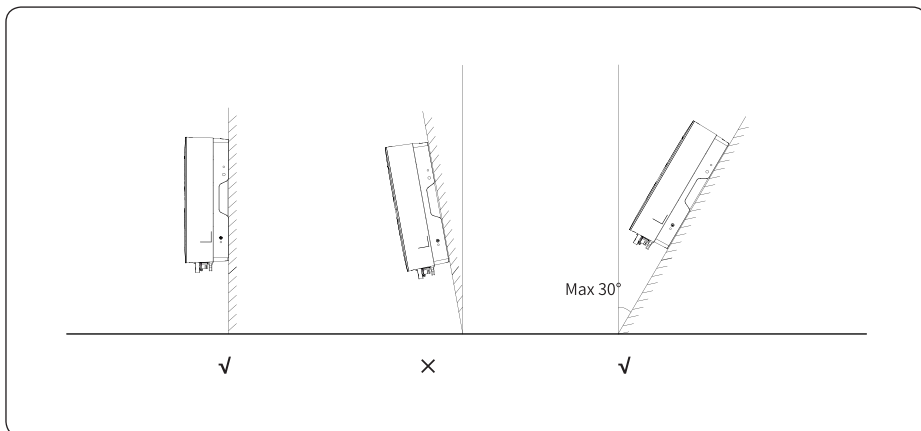


Figure 4-3 Recommended installation angle

4.2 Mounting

4.2.1 Wall bracket installation

Dimensions of wall bracket, see Figure 4-4:

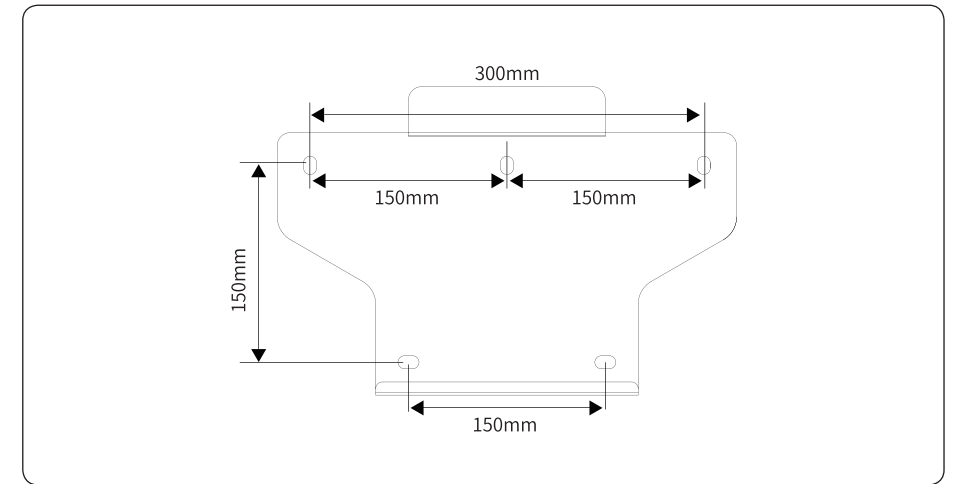


Figure 4-4 Dimensions of wall bracket

1) Use the wall bracket as the template to mark the position of 5 holes on the wall. See Figure 4-5 for details:

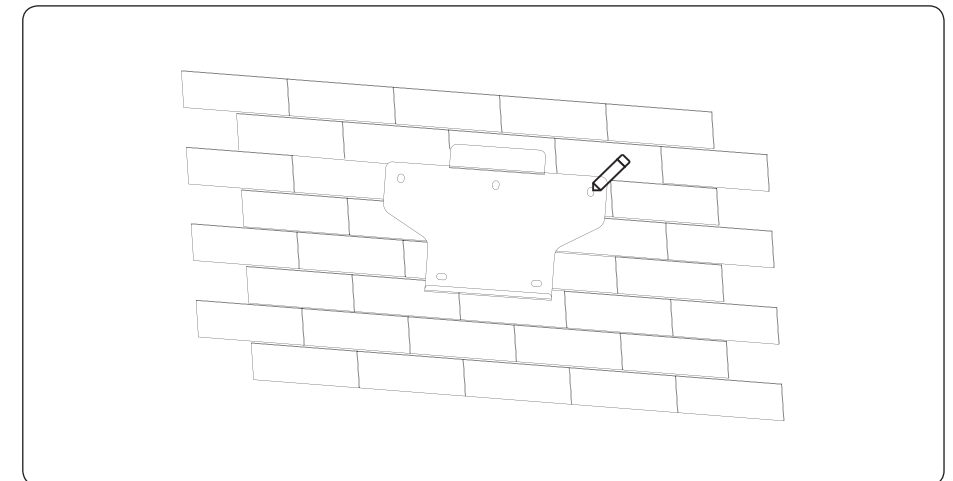


Figure 4-5 Marking hole position using installation bracket

2) Bracket assembly

Prepare the two M5 screws and L-shaped plate in the accessory bag, then fix the L-shaped plate to the mounting bracket.

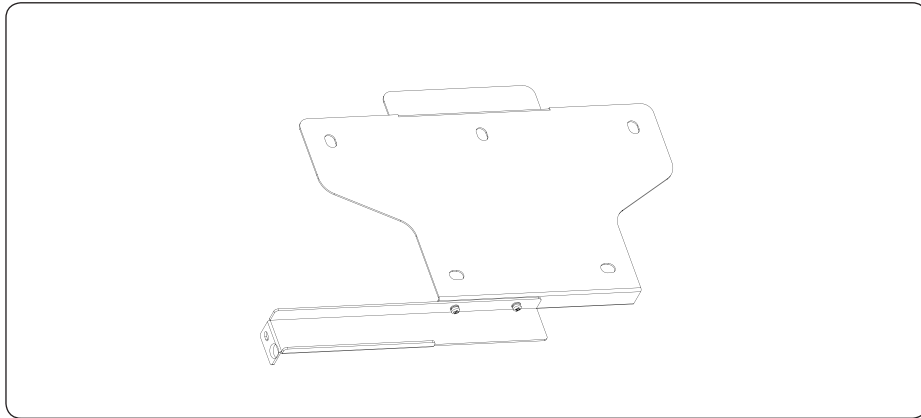



Figure 4-6 Bracket assembly

3) Use an electrical driller with 10mm diameter bit to drill 5 holes in the wall with 80 mm depth.

 Warning	Before drilling, make sure to avoid any buried water tube and electric wires in the wall.
--	---

4) Insert the expansion tubes into the holes and tighten them, then fix the bracket onto the wall with expansion screws by using a cross screwdriver, as shown in Figure 4-7. Please also include how to install the locking plate to the mounting bracket:

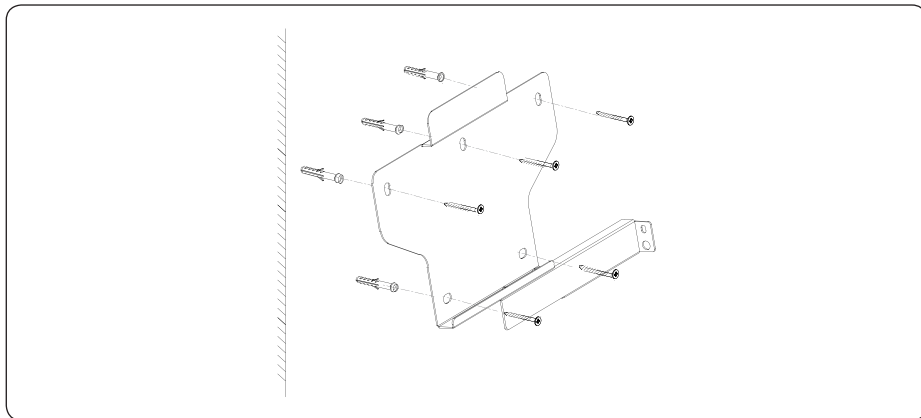


Figure 4-7 Fixing the wall bracket

4.2.2 Mounting the inverter

Lift up the inverter, hang the back rail on the fixed wall bracket carefully. Screws the inverter to the L-shaped plate (The lock is purchased separately). See Figure 4-8 for details:

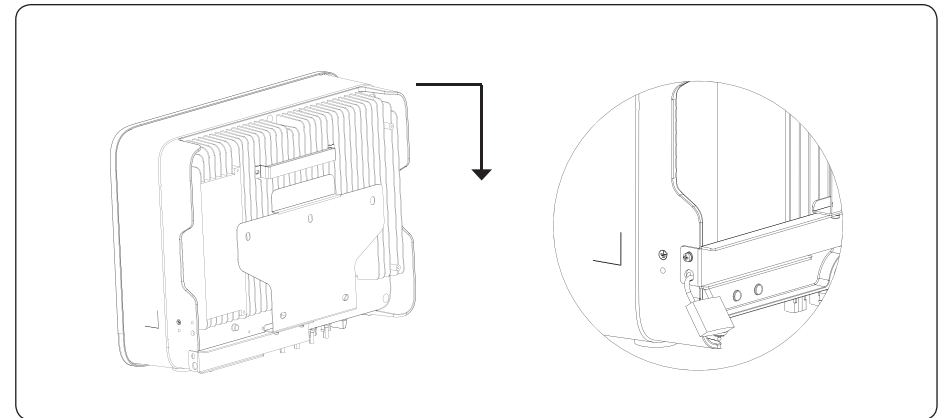







Figure 4-8 Mounting the inverter

4.3 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 installation and maintenance.
 Attention	Do not use other brands or other types of PV terminals other than the PV terminal 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 a poorly connected cable connector.

4.3.1 Inverter PV string connection

4.3.1.1 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.

4.3.1.2 DC connector assembly procedures

1) Select the appropriate photovoltaic cable:

Cable type	Traverse area (mm ²)	
	Range (mm ²)	Recommended value (mm ²)
General photovoltaic cable	2.5-4.0	4.0

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

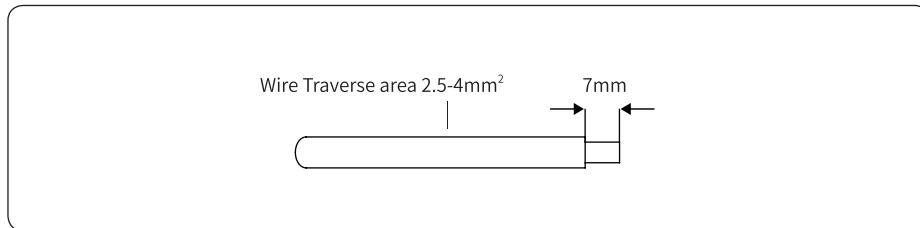


Figure 4-9

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

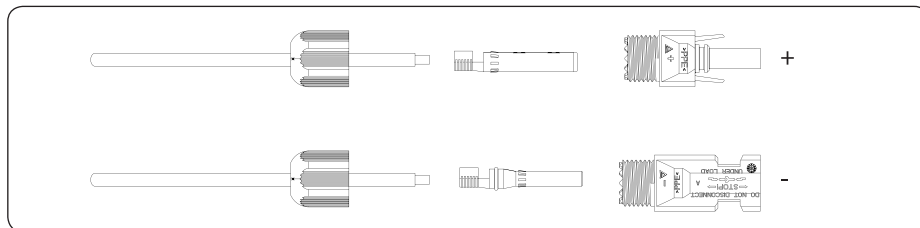


Figure 4-10

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:

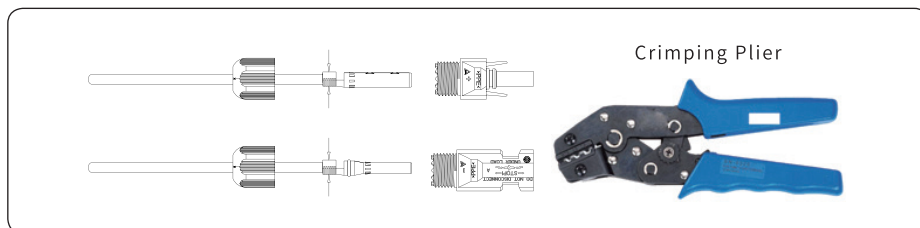


Figure 4-11

5) Insert the positive and negative cables into the corresponding positive and negative connectors, pull back the 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:

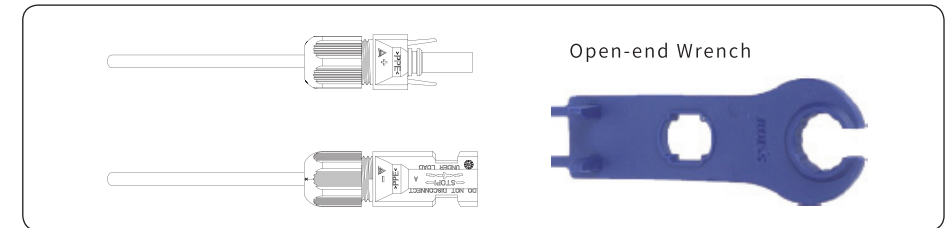


Figure 4-12

	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.

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

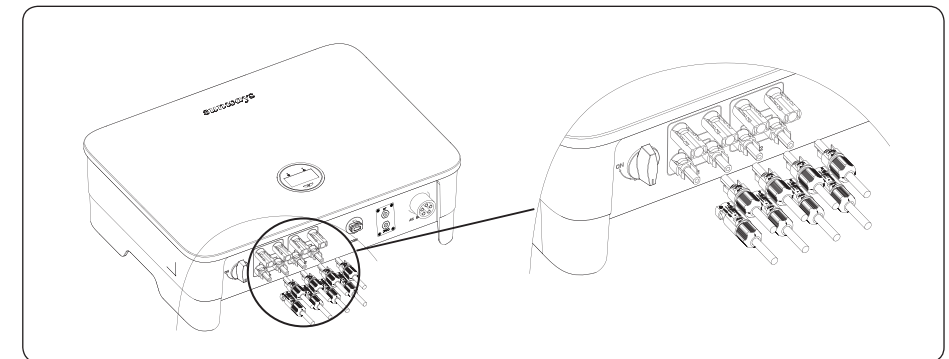


Figure 4-13

4.3.2 Connection of AC output


The Sunways STT 4-25kW series three phase inverter operates with grid voltage and frequency of 220/230V and 50/60Hz, respectively.

This inverter includes an integrated residual current device (RCD).

If an external residual current device (RCD) is used, a device of type (A/AC etc) should be used, with a tripping current of 300mA or higher.

The recommended cable and AC breaker switch for the Sunways STT 4~25kW series three phase inverter are shown in the following table:

Model	STT -4KTL	STT -5KTL	STT -6KTL	STT -8KTL	STT -10KTL	STT -12KTL	STT -15KTL	STT -17KTL	STT -20KTL	STT -25KTL
Copper Cable	2.5 -10mm ²	2.5 -10mm ²	2.5 -10mm ²	3.2 -10mm ²	4-10mm ²	6-10mm ²	6-10mm ²	8-10mm ²	8-10mm ²	8-10mm ²
Breaker	20A	20A	20A	20A	32A	32A	32A	40A	40A	50A

	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.
---	--

4.3.2.1 AC connector connection steps

1) Take the AC connector out of the accessory bag and disassemble it, as shown in Figure 4-14:

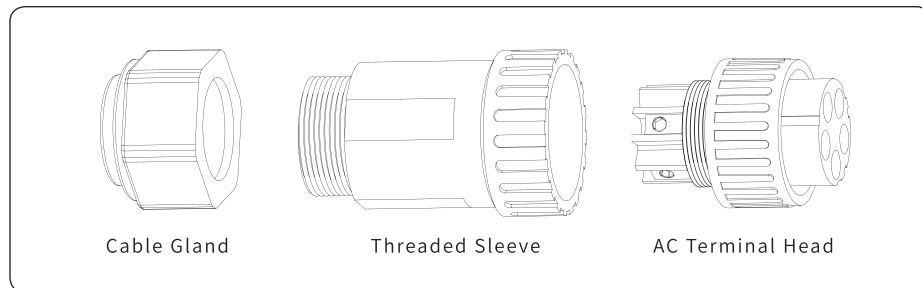


Figure 4-14

2) According to the table above, select an appropriate copper cable, peel the insulation sleeve of AC cable off for 50mm, and peel off the end of 3L /PE / N wires for 8mm, as shown in Figure 4-15:

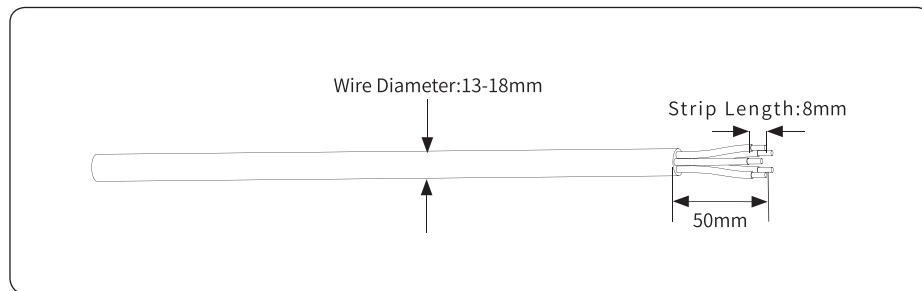


Figure 4-15

3) Insert the stripped end of the five wires into the appropriate hole of the terminal head by following the rules: yellow green wire to PE port, red or brown fire wires to L ports (no requests for the sequence of three fire wires), and blue or black wire to the N port. Please try to pull out the cable to make sure it is well connected. As shown in Figure 4-16:

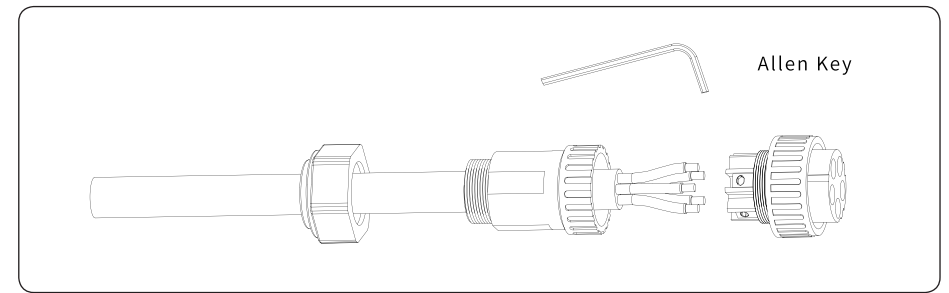


Figure 4-16

4) According to the arrow direction to push the threaded sleeve to make it connected with the AC terminal head and then rotate the cable gland clockwise to lock it, as shown in figure 4-17:

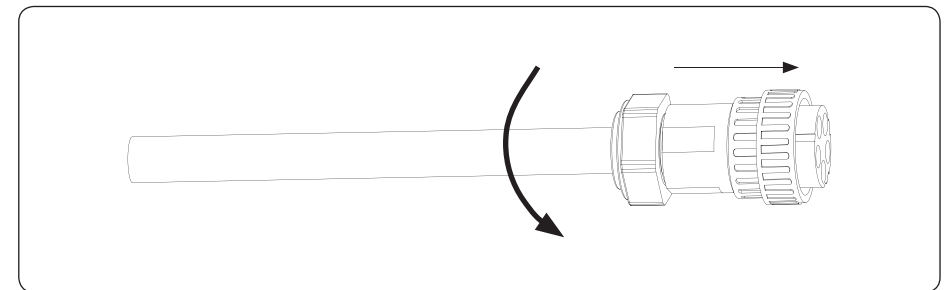


Figure 4-17

5) Connect the AC connector to the inverter AC terminal, and rotate the AC connector buckle clockwise until its tight enough. As shown in figure 4-18:

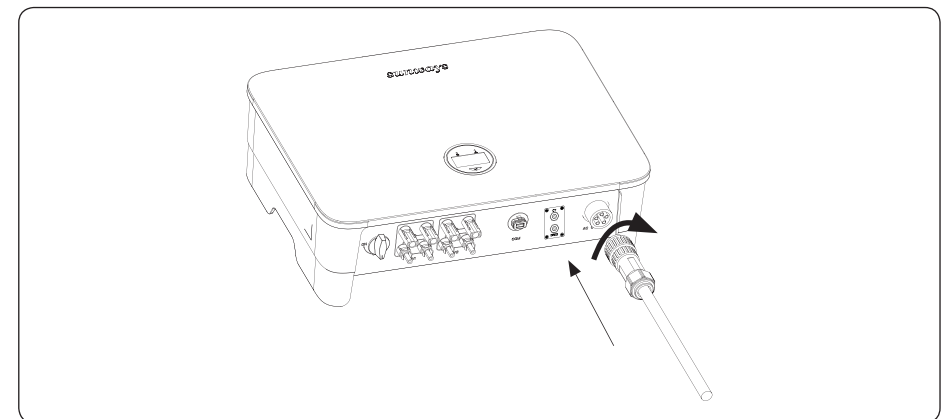




Figure 4-18 Connect the AC connector

4.3.3 External ground connection

Connect the inverter and ground bar through PE wire to achieve the purpose of grounding protection.

 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 4-19:
- 3) The cross-sectional area of the external grounding cable is 4mm².

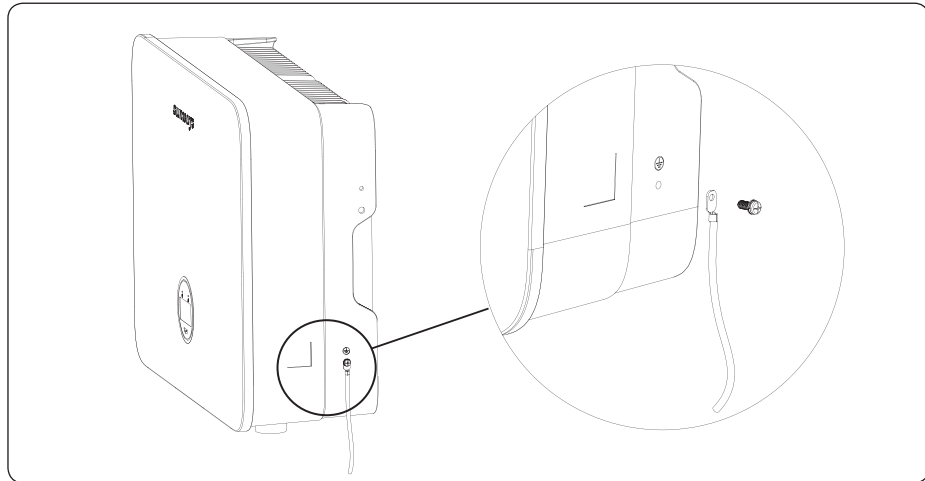


Figure 4-19 Grounding terminal connection

4.4 Monitoring Device Installation

Sunways STT 4~25kW series three phase inverter supports WiFi, GPRS, LAN and RS485 communication.

Plug the WiFi, LAN or GPRS module into the COM1 port in the bottom of inverter (as shown in Figure 4-20). A slight “click” sound during the installation represents that the assembly is in place.

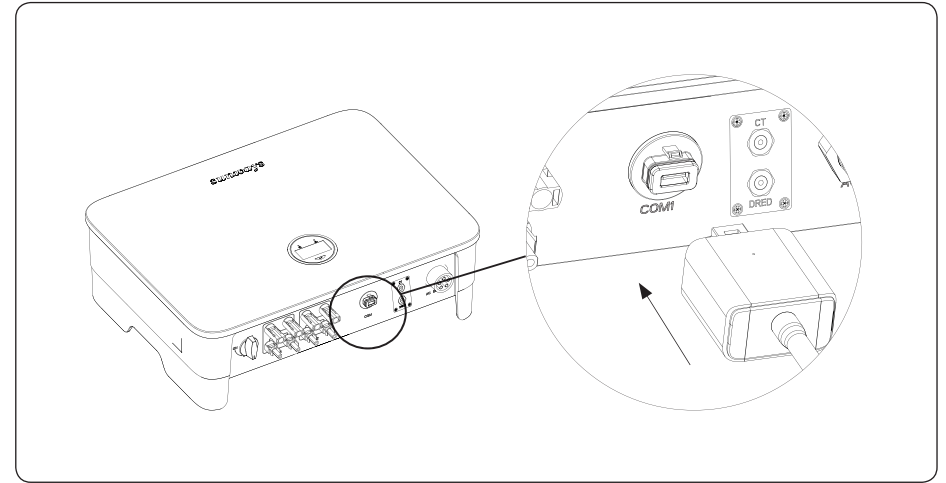




Figure 4-20 Monitoring device installation

 Note	1.The GPRS and LAN 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 in 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.

4.5 RS485/DRED Connection

4.5.1 Terminals definition

Inverter communication ports are located at the behind of the CT/DRED plate at the bottom and include RS485 port (used for Meter or Datalogger connection), and DRED port, as shown in Figure 4-21:

Note	Port 1	Port 2	Port 3
	Meter Port	RS485 Ports	DRED Port

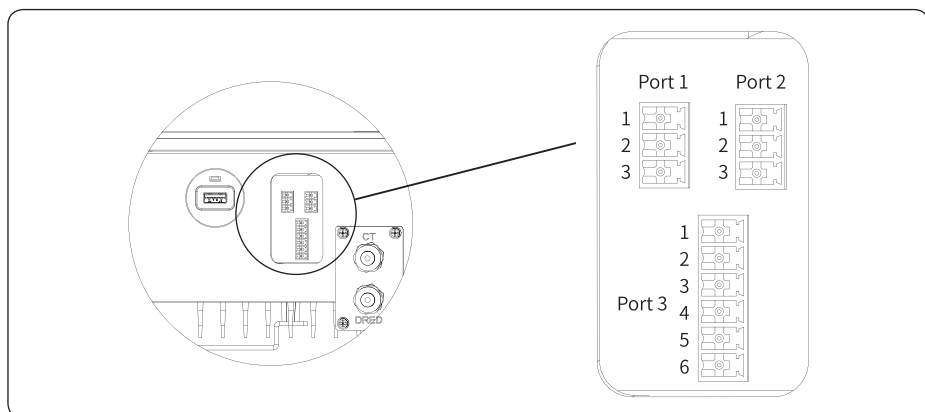


Figure 4-21

	Note	<ol style="list-style-type: none"> 1. This port is available on export limitation & control, RS485 and DRED versions of the inverter only. 2. The Pin connector in inverter Port1 and Port2 may vary from 2Pin to 3pin according to the shipment version.
--	-------------	---

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

Port	Function	NO.	Definition
Port 1	1. Only Export limitation & control with this port. 2. Connect external Meter (With 3CTs) to activate the Export Limitation & control function on Sunways STT series inverter.	1	RS485 A
		2	RS485 B
		3	PE/NULL
Port 2	1. Export limitation & control/RS485/DRED version with this port. 2. In case of multiple inverters, all the inverters can be daisy-chained via RS485 cables.	1	RS485 A
		2	RS485 B
		3	PE/NULL
Port 3	1. Only DRED version with this port. 2. DRED means demand response enable device. The AS/NZS 4777.2:2015 requires inverters to support demand response mode (DRM). This function is for inverters that comply with AS/NZS4777.2:2015 standard. 3. Sunways inverter is fully compliant with all DRM. The 6pin connector is used for DRM connection. 4. Support DRM command: DRM0, DRM5, DRM6, DRM7, DRM8.	1	COM/DRMO
		2	REFGEN
		3	DRM4/8
		4	DRM3/7
		5	DRM2/6
		6	DRM1/5

4.5.2 RS485 Communication

STT 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 4-22:

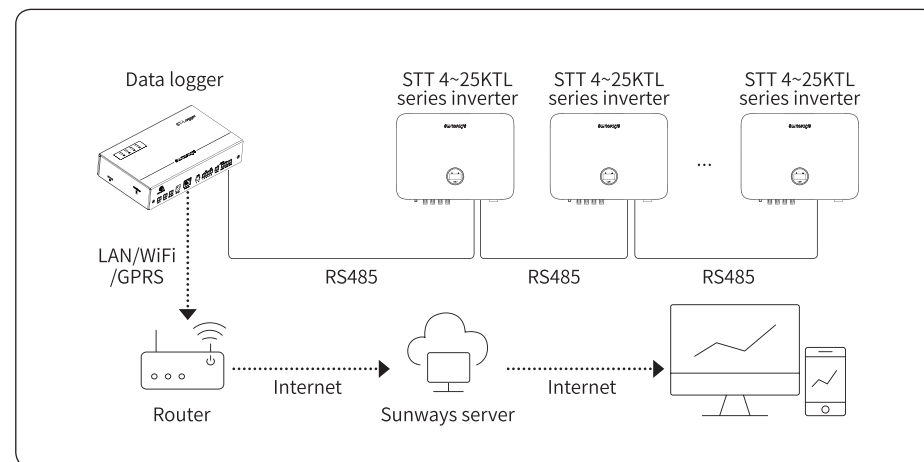


Figure 4-22

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

	Attention	It is recommended to use the RS485 communication cable with a cross-sectional area of 0.75-1.5mm ² and an outer diameter of 5mm-10mm. RS485 cable requirements: Shielded twisted-pair cable or shielded twisted Ethernet cable.
--	------------------	--

4.5.3 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.

4.5.4 Wiring steps:

Note: For more details please refer to Power Limit Solutions and CT selection manual.

- 1) Remove the CT/DRED plate in the bottom of the inverter with a cross screwdriver.
- 2) Put the cable through the connector and connect to the terminal in the following order: screw cap, sealing ring, insulator, metal plate, nut and 3/6pin connector, as shown in Figure 4-23:
- 3) Insert the cable to the port in the 3/6pin connector and fasten with a screwdriver.
- 4) Insert the 3/6pin connector into the 3/6pin connector inside the inverter, and screw the CT/DRED plate back with a cross screwdriver, as shown in Figure 4-24:

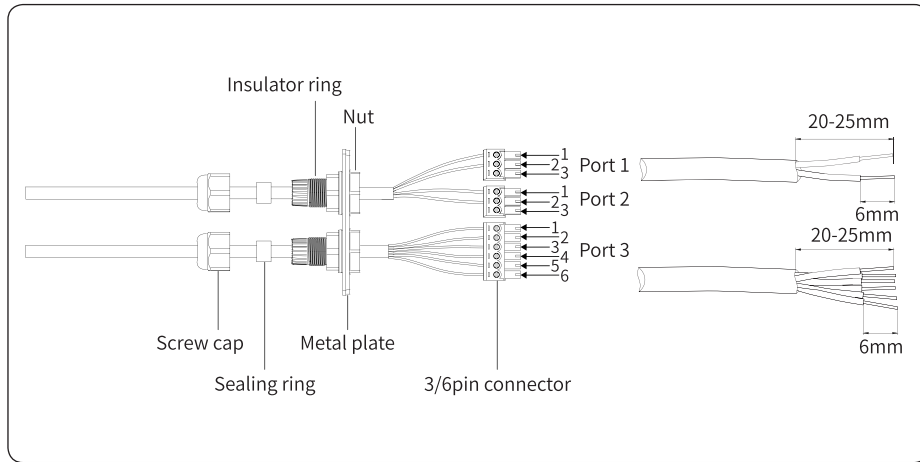


Figure 4-23

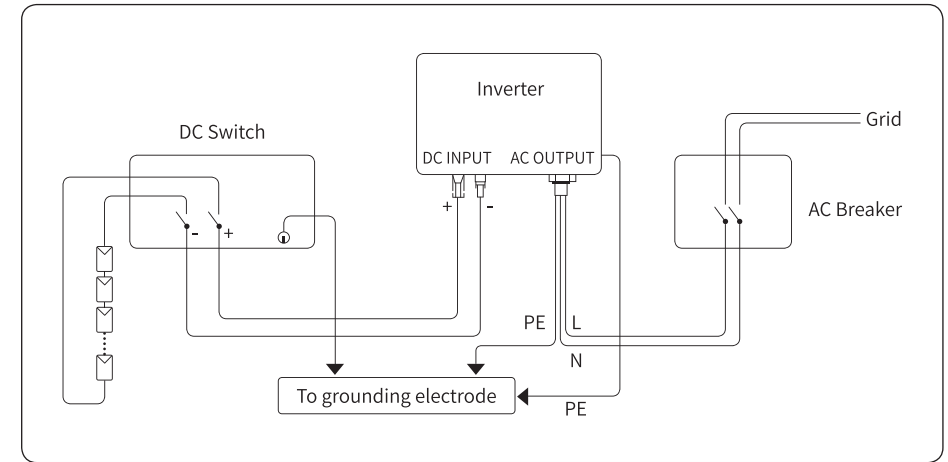


Figure 4-25

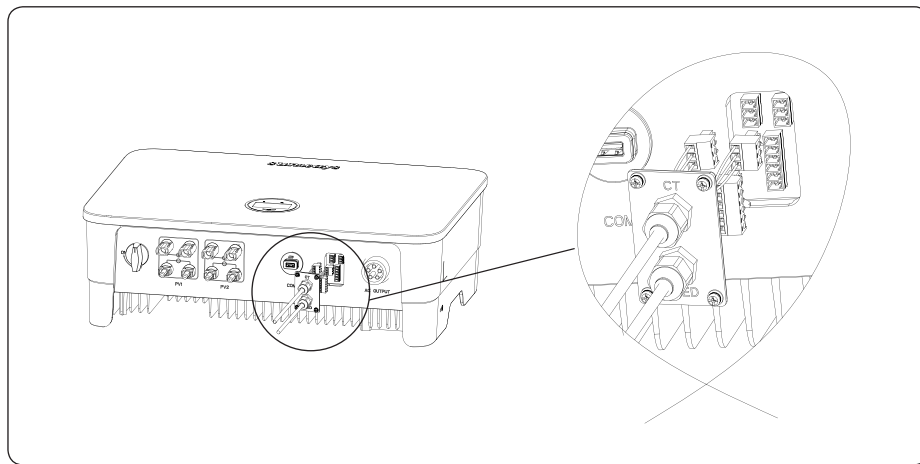


Figure 4-24

4.6 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:

5. Start and Stop

5.1 Start Inverter

When starting the inverter, follow these steps:

- 1) Turn on the AC breaker first.
- 2) Turn on the DC switch in the bottom. If the PV string 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 Inverter

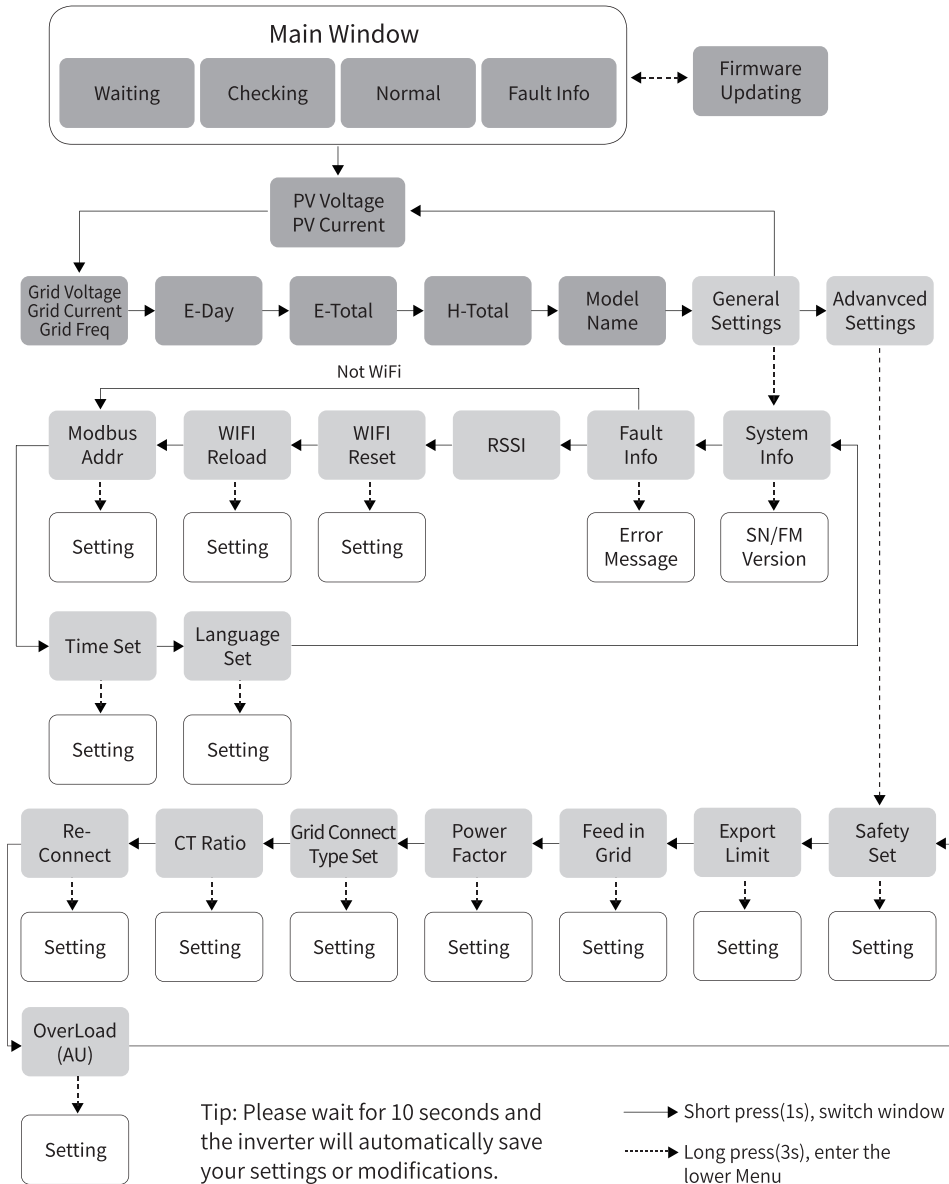
When turning off the inverter, please follow the steps below:

- 1) Turn off the AC breaker first.
- 2) Wait 30 seconds and then turn the DC switch to the “OFF” position. 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 to check various operation information and to modify the settings of the inverter. Please refer to the following display operation flow for details:

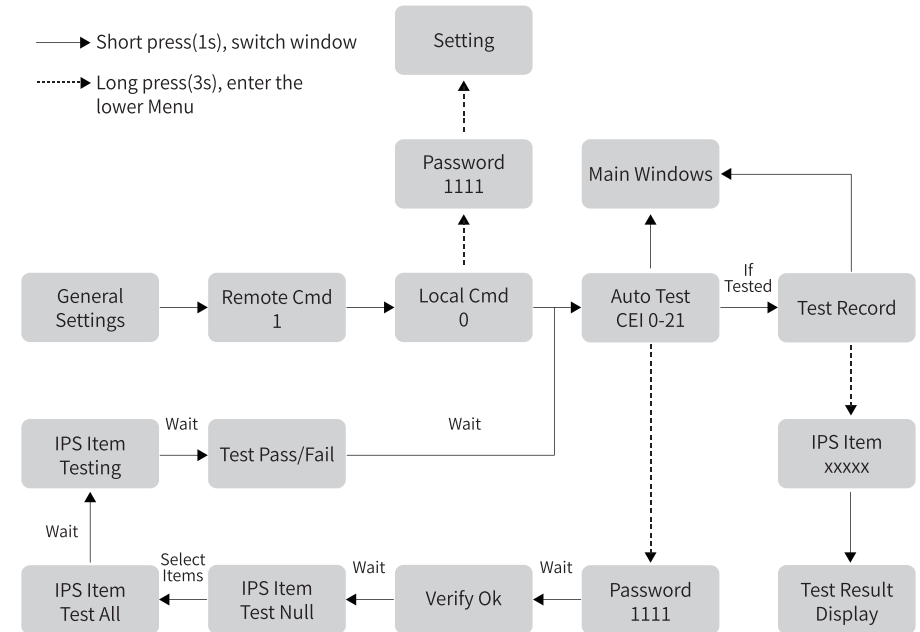


6.2 Auto-Test

This function is disabled by default, and will be only 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 is finished, short press the button several times until the screen displays "Auto Test Record", and hold the button 3 seconds to check the test results.

The auto test type will be chosen from "Remote" and "Local" before starting the auto test. "Remote" is set to 1 by default, which only can be modified to "0" by sending an external command and "Local" is set as 0 by default, which can be modified to 1 through operating the button on the inverter. According to the requirements of the standard, the test has been divided into three modes:

- 1) "Remote" set as 1, "Local" set as 0, then the test order is 59.S1, 59.S2, 27.S1, 81>.S2, 81<.S2;
 - 2) "Remote" set as 1, "Local" set as 1, then the test order is 59.S1, 59.S2, 27.S1, 81>.S1, 81<.S1;
 - 3) "Remote" set as 0, "Local" set as 1, then the test order is 59.S1, 59.S2, 27.S1, 81>.S2, 81<.S2.
- Connect the AC cable, auto test will start after the inverter connected to the grid, see the operation steps below:



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.

6.3 Power Quality Response Modes

6.3.1 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.

6.3.2 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.

6.4 Country Code (Safety Code) Setting

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

6.5 Online Monitoring APP

Customers can check their inverters real-time power, warnings and status through the App "SunwaysHome" anytime anywhere.



SunwaysHome

7. Troubleshooting





7.1 Error Message

Sunways STT 4~25kW 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	Troubleshooting
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	1. Check whether the mains supply is lost. 2. Check whether the AC breaker and terminals are well connected.
Grid Voltage Fault	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 impedance of the AC cable is too high to lead the grid. Replace with a thicker AC cable if that is the case.
Grid Frequency Fault	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	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	1. The ground current is too high. 2. Check whether the PV cable has a short circuit to ground.
PV Over Voltage	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	1. Check whether the inverter is directly exposed to the sunlight. 2. Reduce ambient temperature.
DCI Fault	1. Restart the inverter, wait a moment for inverter recovery. 2. If the fault occurs repeatedly, please contact Sunways.
Bus Voltage Fault	
SCI Fault	
SPI Fault	
E2 Fault	
GFCI Device Fault	
AC Transducer Fault	
Relay Check Fail	
Flash Fault	
Fan Fault	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.

7.2 Maintenance

 Danger	<p>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.</p> <p>Before any service work, observe the following procedure.</p> <ol style="list-style-type: none"> 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	<p>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.</p>
 Attention	<p>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.</p>
 Note	<p>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.</p>

Items	Methods	Period
System clean	<p>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.</p>	Six months to a year (it depends on the dust contents in air.)

8. Technical Parameters

Model	STT-4KTL	STT-5KTL	STT-6KTL	STT-8KTL	STT-10KTL	STT-12KTL	STT-15KTL	STT-17KTL	STT-20KTL	STT-25KTL
DC Input										
Start-up Voltage (V)	200	200	200	200	200	200	200	200	200	200
Max. DC Input Voltage (V)	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100
Min. DC Voltage (V)	150	150	150	150	150	150	150	150	150	150
Rated DC Input Voltage (V)	620	620	620	620	620	620	620	620	620	620
MPPT Voltage Range (V)	200~950									
Full power MPPT Voltage Range (V)	200~850	240~850	280~850	370~850	470~850	560~850	470~850	400~850	470~850	585~850
No. of MPP Trackers	2	2	2	2	2	2	2	2	2	2
No. of DC Inputs per MPPT	1/1	1/1	1/1	1/1	1/1	1/1	1/2	2/2	2/2	2/2
Max. Input Current (A)	11/11	11/11	11/11	11/11	11/11	11/11	11/22	22/22	22/22	22/22
Max. Short-circuit Current (A)	15/15	15/15	15/15	15/15	15/15	15/15	15/30	30/30	30/30	30/30
Backfeed current to the array (A)	0	0	0	0	0	0	0	0	0	0
AC Output										
Rated Output Power (kW)	4	5	6	8	10	12	15	17	20	25
Max. Output Power (kW)	4.4	5.5	6.6	8.8	11	13.2	16.5	18.7	22	25
AC output rated apparent power (kVA)	4	5	6	8	10	12	15	17	20	25
Max. Apparent Power (kVA)	4.4	5.5	6.6	8.8	11	13.2	16.5	18.7	22	25
Rated Output Voltage (V)	3L/N/PE, 230/400V									
Rated AC Frequency (Hz)	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60
AC output rated current (A)	5.8	7.3	8.7	11.6	14.5	17.4	21.7	24.6	29	36.2
Max. Output Current (A)	6.7	8.4	10	13.3	16.5	20	25	28.4	31.9	39
The measured Inrush current (A)	7A@4.4ms					7A@4ms			8.5A@4ms	
Max. output fault current (A)	33	33	33	33	40	40	66	66	76	76
Max. output overcurrent protection (A)	33	33	33	33	40	40	66	66	76	76
Power Factor	0.8 leading ...0.8 lagging									
Max. total harmonic distortion	< 3% @Rated Output Power									
DCI	< 0.5%In									

Model	STT-4KTL	STT-5KTL	STT-6KTL	STT-8KTL	STT-10KTL	STT-12KTL	STT-15KTL	STT-17KTL	STT-20KTL	STT-25KTL	
Efficiency											
Max. Efficiency	98.1%	98.1%	98.3%	98.3%	98.6%	98.6%	98.6%	98.6%	98.6%	98.6%	
European Efficiency	97.9%	97.9%	98.0%	98.0%	98.2%	98.2%	98.2%	98.2%	98.2%	98.2%	
MPPT Efficiency	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	
Protection											
DC Reverse Polarity Protection	Integrated										
Insulation Resistance Protection	Integrated										
DC Switch	Optional										
Surge Protection	Integrated (Type II AC/DC)										
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)	550W*410H*175D										
Weight (kg)	22					25					
Protection Degree	IP65										
Self-consumption at Night (W)	< 1										
Topology	Transformerless										
Operating Temperature Range (°C)	-30~60										
Relative Humidity (%)	0~100										
Operating Altitude (m)	3000										
Cooling	Natural Convection							Smart Fan Cooling			
Noise Level (dB)	< 25							< 40			
Display	OLED & LED										
Communication	RS485/WiFi/GPRS/LAN (Optional)										
Compliance	NB/T32004、IEC62109、IEC62116、VDE4105、VDE0126、UTE C15-712-1、AS4777、C10/11、CEI0-21、RD1699、NBR16149、IEC61727、IEC60068、IEC61683、EN50549、EN61000										

sunways

Address: No. 1, Second Road, Green Industrial Zone, Chongshou Town,
Cixi City, ZheJiang Province, PEOPLE'S REPUBLIC OF CHINA

Website: www.sunways-tech.com

Service Mail: service@sunways-tech.com

Hotline: +86 400-9922-958