

PV Grid-Connected Inverter
User Manual
SG125HX



All Rights Reserved

All Rights Reserved

No part of this document can be reproduced in any form or by any means without the prior written permission of Sungrow Power Supply Co., Ltd (hereinafter "SUNGROW").

Trademarks

SUNGROW and other Sungrow trademarks used in this manual are owned by SUNGROW.

All other trademarks or registered trademarks mentioned in this manual are owned by their respective owners.

Software Licenses

- It is prohibited to use data contained in firmware or software developed by SUNGROW, in part or in full, for commercial purposes by any means.
- It is prohibited to perform reverse engineering, cracking, or any other operations that compromise the original program design of the software developed by SUNGROW.

About This Manual

The manual mainly contains the product information, as well as guidelines for installation, operation and maintenance. The manual does not include complete information about the photovoltaic (PV) system. The reader can get additional information about other devices at www.sungrowpower.com or on the webpage of the respective component manufacturer.

Validity

This manual is valid for the following inverter models:

- SG125HX

They will be referred to as "inverter" hereinafter unless otherwise specified.

Target Group

This manual is intended for inverter owners who will have the ability to interact with the inverter and qualified personnel who are responsible for the installation and commissioning of the inverter. Qualified personnel should have the following skills:

- Training for installation and commissioning of electrical system, as well as dealing with hazards
- Knowledge of the manual and other related documents
- Knowledge of the local regulations and directives

How to Use This Manual

Read the manual and other related documents before performing any work on the inverter. Documents must be stored carefully and be available at all times.

Contents may be periodically updated or revised due to the product development. The manual content of subsequent versions of the inverter may be subject to change. The latest manual can be found at support.sungrowpower.com.

Symbols

Important instructions contained in this manual should be followed during installation, operation and maintenance of the inverter. They will be highlighted by the following symbols.

DANGER

Indicates a hazard with a high level of risk that, if not avoided, will result in death or serious injury.

WARNING

Indicates a hazard with a medium level of risk that, if not avoided, could result in death or serious injury.

 CAUTION

Indicates a hazard with a low level of risk that, if not avoided, could result in minor or moderate injury.

NOTICE

Indicates a situation that, if not avoided, could result in equipment or property damage.



Indicates additional information, emphasized contents or tips that may be helpful, e.g. to help you solve problems or save time.

Contents

All Rights Reserved	I
About This Manual	II
1 Safety	1
1.1 PV Panels	1
1.2 Utility Grid	1
1.3 Inverter	2
2 Product Description	4
2.1 System Introduction	4
2.2 Product Introduction	5
2.3 Symbols on the Product	7
2.4 LED Indicator	7
2.5 Circuit Diagram	8
2.6 Function Description	9
3 Unpacking and Storage	12
3.1 Unpacking and Inspection	12
3.2 Inverter Storage	12
4 Mechanical Mounting	13
4.1 Safety during Mounting	13
4.2 Location Requirements	13
4.2.1 Environment Requirements	14
4.2.2 Carrier Requirements	14
4.2.3 Angle Requirements	14
4.2.4 Clearance Requirements	15
4.3 Installation Tools	15
4.4 Moving the Inverter	17
4.4.1 Manual Transport	17
4.4.2 Hoisting Transport	18
4.5 Installing the mounting-bracket	19
4.5.1 PV Bracket-Mounted Installation	19
4.5.2 Wall-Mounted Installation	20
4.6 Installing the Inverter	21

5 Electrical Connection	23
5.1 Safety Instructions	23
5.2 Terminal Description	23
5.3 Electrical Connection Overview	24
5.4 Crimp OT/DT terminal	28
5.5 Additional Grounding Connection	29
5.5.1 Additional Grounding Requirements	29
5.5.2 Connection Procedure	29
5.6 AC Cable Connection	30
5.6.1 AC Side Requirements	30
5.6.2 Requirements for OT/DT Terminal	32
5.6.3 Connection Procedure	32
5.7 DC Cable Connection	37
5.7.1 PV Input Configuration	37
5.7.2 Assembling the PV Connectors	38
5.7.3 Installing the PV Connector	39
5.8 Communication Junction Box	41
5.9 Communication Wiring Board	42
5.10 RS485 Connection	42
5.10.1 Interface Description	42
5.10.2 RS485 Communication System	43
5.10.3 Connection Procedure(Terminal Block)	45
5.10.4 Connection Procedure (RJ45 Ethernet Port)	46
5.11 PLC Communication Connection	48
5.12 Dry Contact Connection	48
5.12.1 Dry Contact Function	48
5.12.2 Wiring Procedure	50
5.13 Communication Module Connection (optional)	50
6 Commissioning	52
6.1 Inspection before Commissioning	52
6.2 Commissioning Procedure	52
7 iSolarCloud App	53
7.1 Brief Introduction	53
7.2 Installing the App	53
7.3 Function Overview	54
7.4 Login	54

7.4.1 Requirements	54
7.4.2 Login Procedure	54
7.5 Home page	56
7.6 Run Information	58
7.7 Records	60
7.8 More	62
7.8.1 System Parameters	62
7.8.2 Operation Parameters	63
7.8.3 Power Regulation Parameters.....	64
7.8.4 Communication Parameters	69
7.8.5 Firmware Update.....	69
7.8.6 Password Changing	71
8 System Decommissioning	72
8.1 Disconnecting the Inverter.....	72
8.2 Dismantling the Inverter.....	72
8.3 Disposal of the Inverter.....	73
9 Troubleshooting and Maintenance	74
9.1 Troubleshooting	74
9.2 Maintenance	85
9.2.1 Maintenance Notices.....	85
9.2.2 Routine Maintenance.....	86
9.2.3 Cleaning Air Inlet and Outlet	86
9.2.4 Fan Maintenance	86
10 Appendix	88
10.1 Technical Data	88
10.2 Wring Distance of DI Dry Contact	89
10.3 Quality Assurance	91
10.4 Contact Information	91

1 Safety

The device has been designed and tested strictly according to international safety regulations. Read all safety instructions carefully prior to any work and observe them at all times when working on or with the device.

Incorrect operation or work may cause:

- Injury or death to the operator or a third party;
- Damage to the device and other properties.

All detailed work-related safety warnings and notes are specified at critical points in this manual.



The safety instructions in this manual cannot cover all the precautions that should be followed. Perform operations considering actual onsite conditions. SUNGROW shall not be held liable for any damage caused by violation of the safety instructions in this manual.

1.1 PV Panels

DANGER

PV strings will produce electrical power when exposed to sunlight and can cause a lethal voltage and an electric shock.

- Always keep in mind that the inverter is dual power supplied. Electrical operators must wear proper personal protective equipment: helmet, insulated footwear, gloves, etc.
- Before touching the DC cables, operator must use a measuring device to ensure that the cable is voltage-free.
- The operator must follow all warnings on the PV strings and in its manual.

1.2 Utility Grid

Follow the regulations related to the utility grid.

NOTICE

All electrical connections must be in accordance with local and national standards.

Only with the permission of the local utility grid company, the inverter can be connected to the utility grid.

1.3 Inverter

⚠ DANGER

Danger to life from electric shocks due to live voltage

Do not open the enclosure at any time. Unauthorized opening will void warranty and warranty claims and in most cases terminate the operating license.

⚠ WARNING

Risk of inverter damage or personal injury

- Do not connect or disconnect the PV and AC connectors when the inverter is running.
- Wait at least 5 minutes for the internal capacitors to discharge after all electric devices are removed and the inverter is powered off.
- Ensure that there is no voltage or current before connecting or disconnecting the PV and AC connectors.

⚠ WARNING

All safety instructions, warning labels, and nameplate on the inverter:

- Must be clearly legible.
- Should not be removed or covered.

⚠ CAUTION

Risk of burns due to hot components!

Do not touch any hot parts (such as the heat sink) during operation. Only the DC switch can safely be touched at any time.

NOTICE

Only qualified personnel can perform the country setting. Unauthorized alteration may cause a breach of the type-certificate marking.

Risk of inverter damage due to electrostatic discharge (ESD)!

By touching the electronic components, you may damage the inverter. For inverter handling, be sure to:

- avoid any unnecessary touching;
- wear a grounding wristband before touching any connectors.

2 Product Description

2.1 System Introduction

The inverter is a transformerless 3-phase PV grid-connected inverter. As an integral component in the PV power system, the inverter is designed to convert the direct current power generated from the PV modules into grid-compatible AC current and to feed the AC current into the utility grid.

The intended usage of the inverter is illustrated in the following figure.

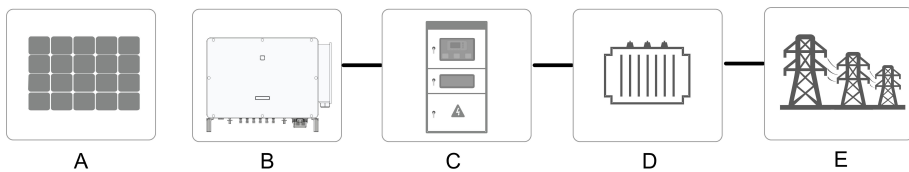


figure 2-1 Inverter Application in PV Power System

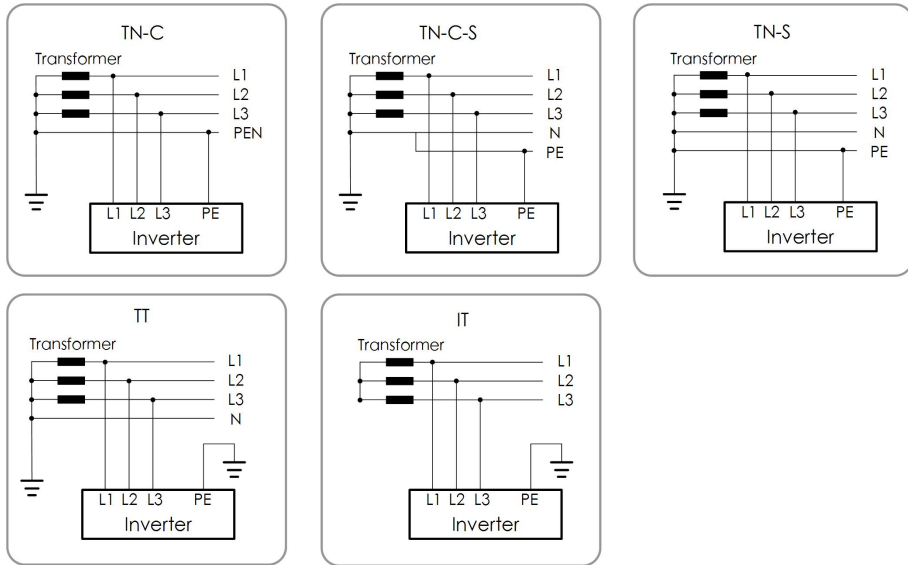
⚠ WARNING

The inverter must not be connected to a PV string that requires positive or negative grounding.

Do not connect any local load between the inverter and the AC circuit breaker.

Item	Description	Note
A	PV strings	Monocrystalline silicon, polycrystalline silicon and thin-film without grounding.
B	Inverter	SG125HX
C	Grid connection cabinet	Includes devices such as AC circuit breaker, SPD, metering device.
D	Transformer	Boost the low voltage from the inverter to grid-compatible medium voltage.
E	Utility grid	TN-C, TN-S, TN-C-S, TT, IT.

The following figure shows the common grid configurations.

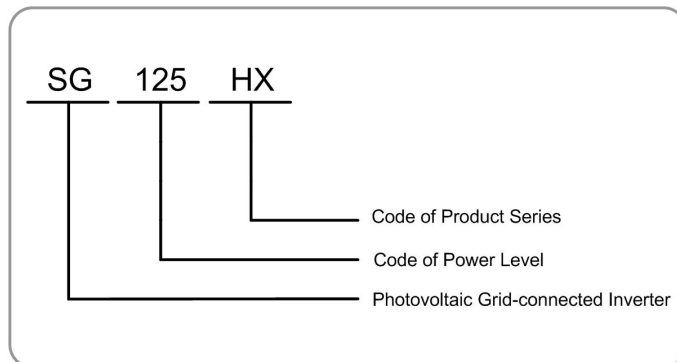


Make sure the inverter is applied to an IT system before enabling the Anti-PID function.

2.2 Product Introduction

Model Description

The model description is as follows :



Appearance

The following figure shows the dimensions of the inverter. The image shown here is for reference only. The actual product received may differ.

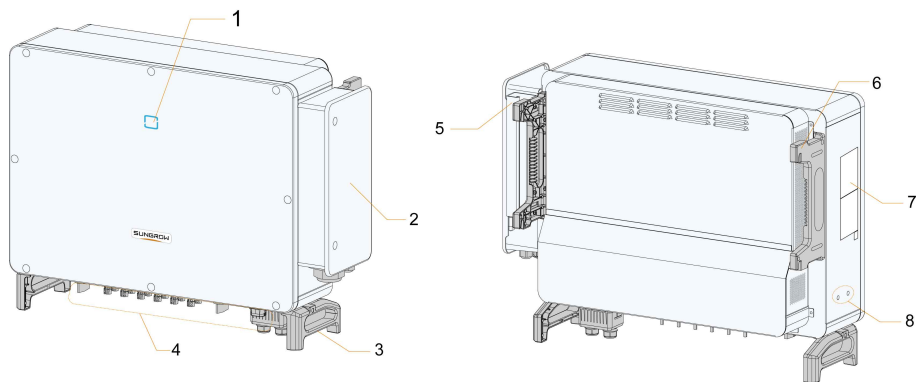


figure 2-2 Inverter Appearance

No.	Name	Description
1	LED indicator	To indicate the current working state of the inverter.
2	AC Wire Box	To connect AC cables in this area.
3	Bottom handles	To move the inverter.
4	Wiring area	DC switches, DC terminals, and communication terminals. For details, refer to " 5.2 Terminal Description "
5	Side handles	To move the inverter.
6	Side handles	To move the inverter.
7	Nameplate	To clearly identify the product, including device model, S/N, important specifications, marks of certification institutions, etc.
8	Additional grounding terminals	Use at least one of them to ground the inverter.

Dimensions

The following figure shows the dimensions of the inverter.

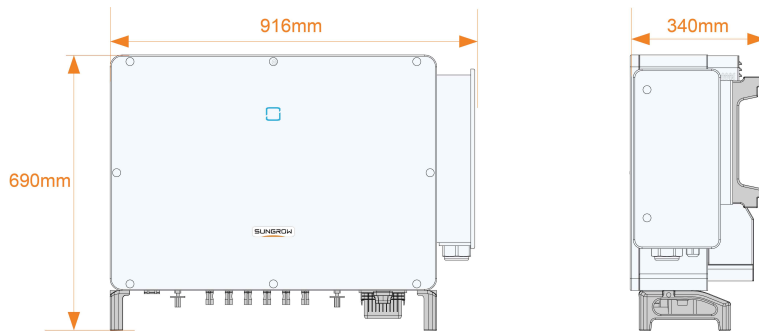











figure 2-3 Dimensions of the Inverter(in mm)

2.3 Symbols on the Product





Symbol	Explanation
	Do not dispose of the inverter together with household waste.
	TÜV mark of conformity.
	CE mark of conformity.
	Danger to life due to high voltages! Only qualified personnel can open and service the inverter.
	Disconnect the inverter from all the external power sources before maintenance!
	Burn danger due to the hot surface that may exceed 60 ° C.
	Do not touch live parts for 5 minutes after disconnection from the power sources.
	Read the user manual before maintenance!
	Additional grounding point.

* The table shown here is for reference only. The actual product received may differ.

2.4 LED Indicator

The LED indicator on the front of the inverter indicates the working state of the inverter.

table 2-1 State description of the LED indicator

LED color	State	Definition
 Blue	On	The device is connected to the grid and operating normally.
	Fast blink (Period: 0.2s)	The Bluetooth communication is connected and there is data communication.
	 No system fault occurs.	
	Slow blink (Period: 2s)	The device is in standby or startup state (not feeding power into the grid).
 Red	On	A fault occurs and the device cannot connect to the grid.
	Twinkling	The Bluetooth communication is connected and there is data communication.
		System fault occurs.
 Gray	OFF	Both the AC and DC sides are powered down.

2.5 Circuit Diagram

The following figure shows the main circuit of the inverter.

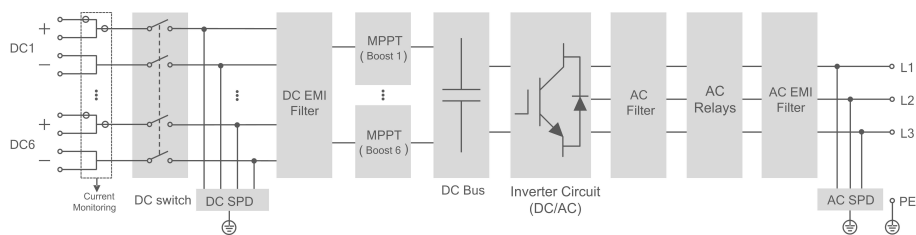


figure 2-4 Circuit Diagram

- The DC switch is used to safely disconnect the DC circuit.
- The MPPT is utilized for DC input to ensure the maximum power from the PV array at different PV input conditions.
- The inverter circuit converts the DC power into AC power and generates AC power to loads or utility grid through the AC terminal.
- The protection circuit ensures the safe operation of the device and personal safety.

2.6 Function Description

The inverter is equipped with the following functions:

Conversion Function

The inverter converts the DC current into grid-compatible AC current and feeds the AC current into the grid.

Data Storage

The inverter logs running information, error records, etc.

Parameter Configuration

The inverter provides various settable parameters. Users can set parameters via the App to meet the requirements and optimize the performance.

Communication Interface

The inverter is designed with standard RS485 communication interfaces.

The standard RS485 communication interfaces are used to establish communication connection with monitoring devices and upload monitoring data by using communication cables.

After communication connection is established, users can view inverter information or set inverter parameters through the iSolarCloud.

PLC Function

The PLC function is mainly to use the three-phase AC cable to achieve data scheduling and collection.

In order to achieve data scheduling, each PV unit adopts one-master-multi-slave structure. COM100A sends scheduling message, which is modulated into high-frequency signals by the PLC host, and the three-phase AC cable is used as a medium for broadcasting. The slave receives and demodulates the high-frequency signals and sends them to the MCU of the inverter.

To realize data collection, COM100A sends collection message, which is modulated into high-frequency signals by the PLC host, and the three-phase AC cable is used as a medium for polling. The slave receives and demodulates the high-frequency signals and sends them to the MCU of the inverter. The MCU modulates the acquired data into high-frequency signals, which are received and demodulated by the master to upload to the COM100A.

Protection Function

The protective functions are integrated in the inverter, including anti-island protection, LVRT/HVRT, DC reversed polarity protection, AC short circuit protection, leakage current protection, DC overvoltage/overcurrent protection, etc.

Potential Induced Degradation (PID)

The PID effect (Potential Induced Degradation) of PV modules will cause serious damage to generated output and yield, which can be avoided or recovered by setting PID recovery function.

- Anti-PID function

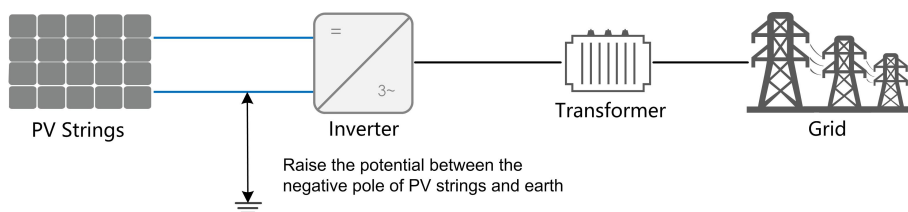
When the inverter is running, the PID module rises the potential between the negative pole of the PV array and the ground to a positive value, to suppress the PID effect.



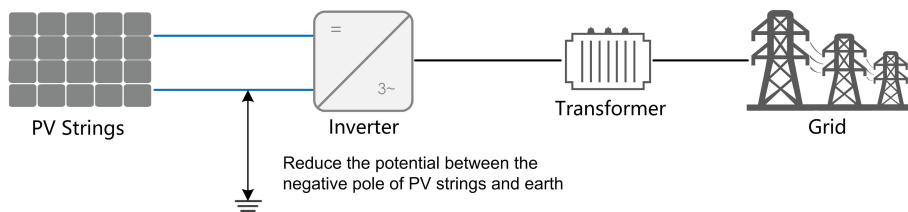
Make sure the inverter is applied to an IT system before enabling the anti-PID function.

- PID recovery function

For positive voltage scheme, after the PID is enabled, the voltage to ground of all PV strings is greater than 0, and therefore the PV string-to-ground voltage is a positive value.



For negative voltage scheme, after the PID is enabled, the voltage to ground of all PV strings is lower than 0, and therefore the PV string-to-ground voltage is a negative value.



NOTICE

- Before enabling the PID recovery function, make sure the voltage polarity of the PV modules to ground meets requirement. If there are any questions, contact the PV module manufacturer or read the corresponding user manual.
- If the voltage scheme for the PID protection/recovery function does not meet the requirement of corresponding PV modules, the PID will not work as expected or even damage the PV modules.
- If the PID recovery function is enabled, it only works at night.
- PID recovery function and Q at night cannot be enabled at the same time.
- After the PID recovery function is enabled, the voltage of the PV string to ground is 500Vdc by default, and the default value can be modified through the App.

AFCI Function(Optional)

- AFCI activation

This function can be enabled to detect whether arc occurs in the DC cable of the inverter.

- AFCI self-test

This function is intended to detect whether the AFCI function of the inverter is normal.

3 Unpacking and Storage

3.1 Unpacking and Inspection

The device is thoroughly tested and strictly inspected before delivery. Nonetheless, damage may still occur during shipping. For this reason, please conduct a thorough inspection after receiving the device.

- Check the packing case for any visible damage.
- Check the scope of delivery for completeness according to the packing list.
- Check the inner contents for damage after unpacking.

Contact SUNGROW or the transport company in case of any damage or incompleteness, and provide photos to facilitate services.

Do not dispose of the original packing case. It is recommended to store the device in the original packing case when the device is decommissioned.

3.2 Inverter Storage

Proper storage is required if the inverter is not installed immediately.

- Store the inverter in the original packing case with the desiccant inside.
- The storage temperature must be always between -40°C and $+70^{\circ}\text{C}$, and the storage relative humidity must be always between 0 and 95 %, non-condensing.
- In case of stacking storage, the number of stacking layers should never exceed the limit marked on the outer side of the packing case.
- The packing case should be upright.
- If the inverter has been stored more than half a year, the qualified personnel should thoroughly check and test it before installation.

4 Mechanical Mounting

4.1 Safety during Mounting

⚠ DANGER

Make sure there is no electrical connection before installation.
In order to avoid electric shock or other injury, make sure that holes will not be drilled over any electricity or plumbing installations.

⚠ CAUTION

Risk of injury due to improper handling

- Always follow the instructions when moving and positioning the inverter.
- Improper operation may cause injuries or serious wounds.

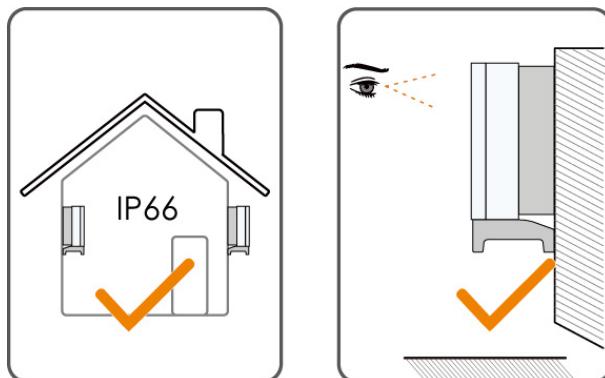
In the case of poor ventilation, the system performance may compromise.

- Keep the heat sinks uncovered to ensure heat dissipation performance.

4.2 Location Requirements

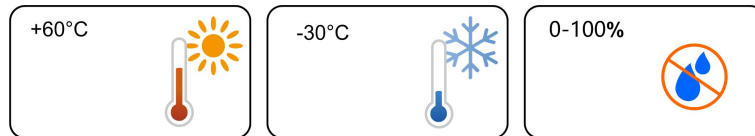
Select an optimal mounting location for safe operation, long service life and expected performance.

- The inverter with protection rating IP66 can be installed both indoors and outdoors.
- Install the inverter at a place convenient for electrical connection, operation, and maintenance.



4.2.1 Environment Requirements

- The installation environment must be free of inflammable or explosive materials.
- The location should be not accessible to children.
- The ambient temperature and relative humidity must meet the following requirements.

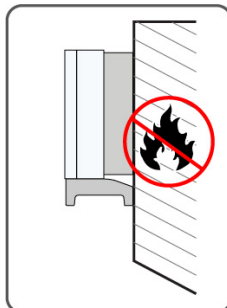


- Do not install the inverter outdoors in areas with salt damage, which mainly refer to the areas within 500 m away from the coast. The deposition of salt fog varies largely with nearby seawater characteristics, sea wind, precipitation, relative humidity, terrain, and forest coverage.
- When the inverter is installed in a high salt spray area, the fan housing may show signs of rust, but the fans can operate normally in accordance with the design requirements.
- Avoid direct exposure to sun, rain and snow.
- The inverter should be well ventilated. Ensure air circulation.
- Never install the inverter in living areas. The inverter will generate noise during operation, affecting daily life.
- This PCE is not intended for use in a residential environment, and this PCE may cause radio interference, in which case the user may be required to take additional mitigation measures against electromagnetic interference.

4.2.2 Carrier Requirements

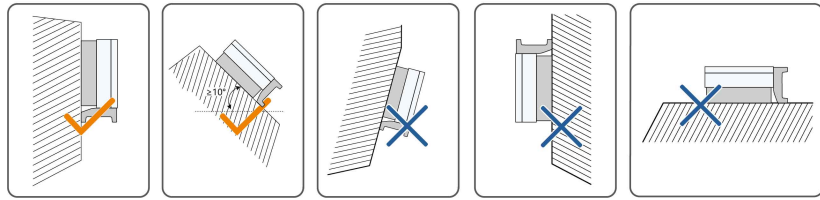
The concrete wall should be capable of withstanding a force of four times the weight of the inverter and be suitable for the dimensions of the inverter.

The installation carrier should meet the following requirements:



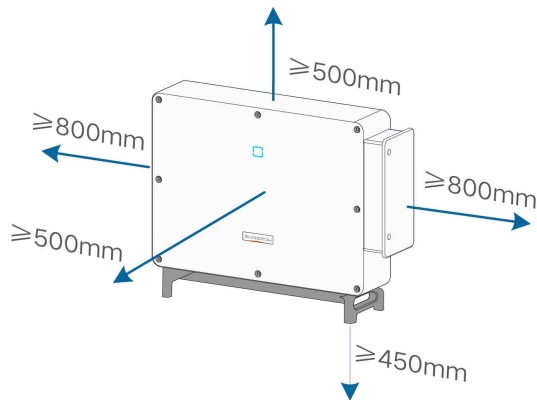
4.2.3 Angle Requirements

Install the inverter vertically or at the maximum allowable rear tilt angle. Do not install the inverter horizontally, forward, excessively backward, sideways, or upside down.

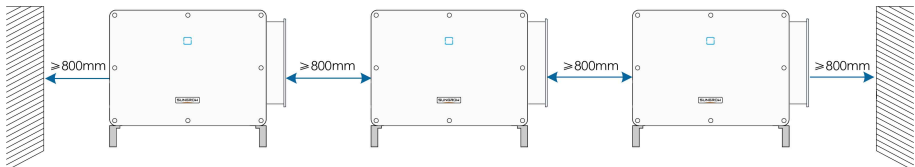


4.2.4 Clearance Requirements

Reserve enough clearance around the inverter to ensure sufficient space for heat dissipation.



In case of multiple inverters, reserve specific clearance between the inverters.

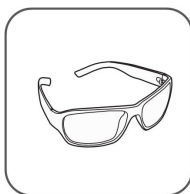


Install the inverter at an appropriate height for ease of viewing LED indicator and operating switch(es).

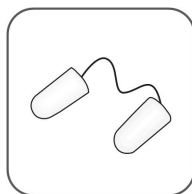
4.3 Installation Tools

Installation tools include but are not limited to the following recommended ones. If necessary, use other auxiliary tools on site.

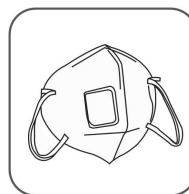
table 4-1 Tool specification



Goggles



Earplugs



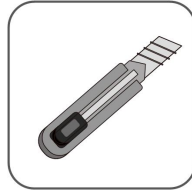
Dust mask



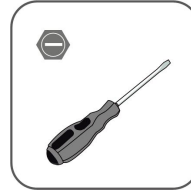
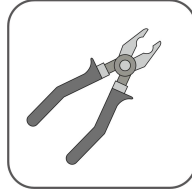
Protective gloves



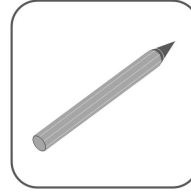
Insulated shoes



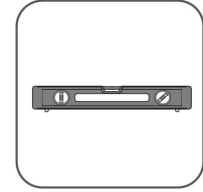
Utility knife

Slotted screwdriver
(M2, M6)Phillips screwdriver
(M4, M6, M8)Hammer drill
($\varnothing 12$, $\varnothing 14$)

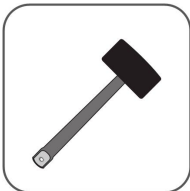
Pliers



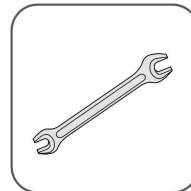
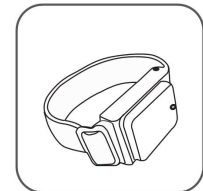
Marker



Level



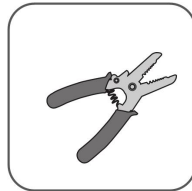
Rubber mallet

Socket wrench set
(16mm)Wrench
(13 mm, 16 mm)

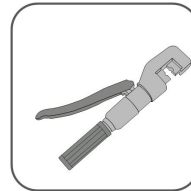
Wrist strap



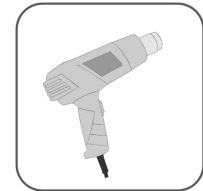
Wire cutter



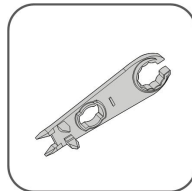
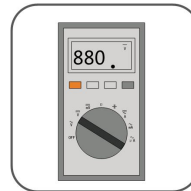
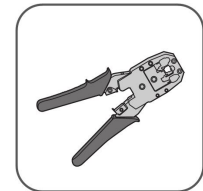
Wire stripper



Hydraulic plier



Heat gun

H4 Plus terminal
crimping pliers
4 – 6mm²H4 Plus terminal
wrenchMultimeter
 ≥ 1500 Vdc

RJ45 crimping tool



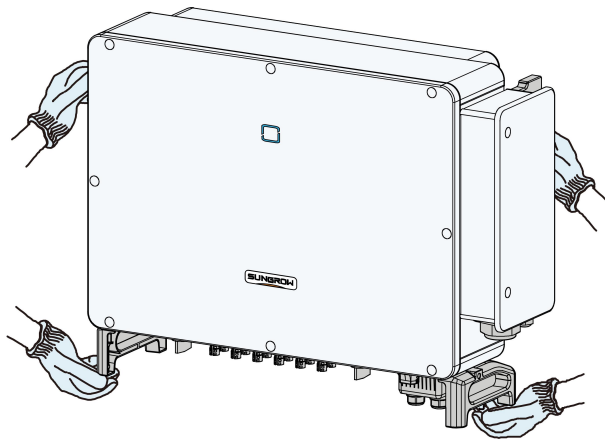
Vacuum cleaner

4.4 Moving the Inverter

Before installation, remove the inverter from the packing case and move it to the installation site. The inverter can be moved manually or via a hoist.

4.4.1 Manual Transport

Lift and move the inverter to the destination by using the side handles and bottom handles.



CAUTION

Inappropriate moving operation may cause personal injury!

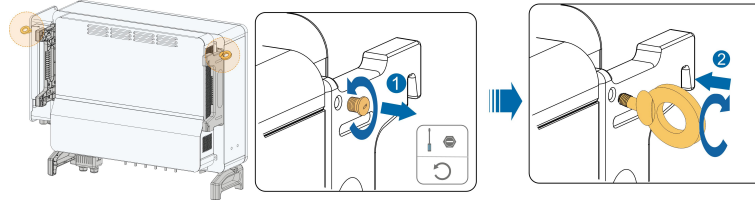
- It is recommended that at least two installers carry the inverter together and wear protective equipment such as smash-proof shoes and gloves
- Always beware of the gravity center of the inverter and avoid tipping.

NOTICE

The ground surface on which the inverter is to be placed should be covered with a sponge pad, foam cushion or the like to prevent the inverter bottom from scratches.

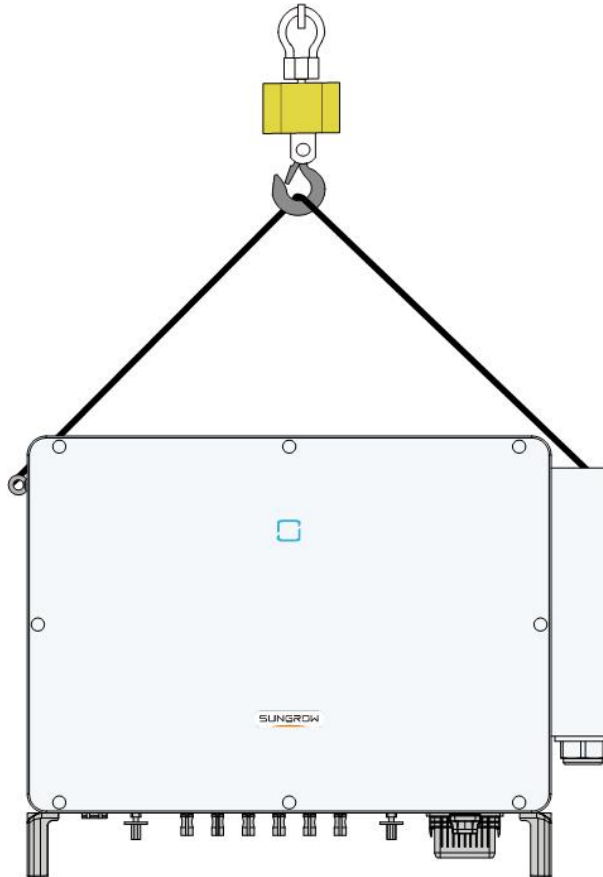
4.4.2 Hoisting Transport

step 1 Release the sealing screws on the mounting ears and store them properly. Anchor two M12 thread lifting rings to the hangers of the inverter.



step 2 Lead the sling through the two lifting rings and fasten the tie-down strap.

step 3 Hoist the inverter, and stop to check for safety when the inverter is 100mm above the ground. Continue hoisting the device to the destination after ensuring the safety.



step 4 Remove the lifting rings and reassemble the sealing screws released in Step 1.

⚠ CAUTION

Keep the inverter balanced throughout the hoisting process and avoid collisions with walls or other objects.

Stop hoisting in the event of severe weather, such as heavy rain, thick fog, or strong wind.



The lifting rings and the sling are not within the delivery scope.

-- End

4.5 Installing the mounting-bracket

Inverter is installed on the wall and bracket by means of mounting bracket. The expansion plug set shown below is recommended for the installation.

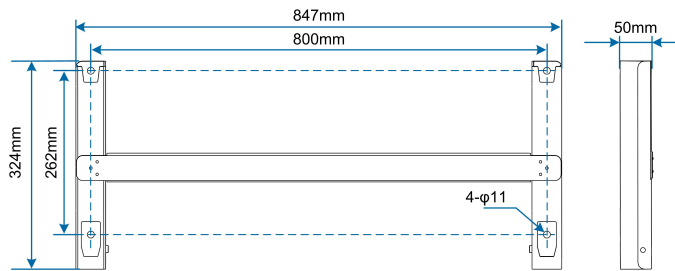
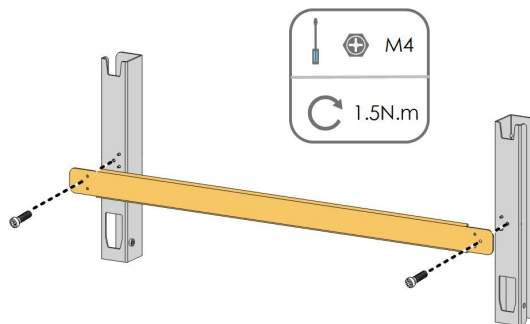


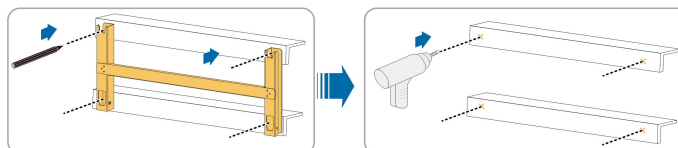
figure 4-1 Dimensions of mounting-bracket

4.5.1 PV Bracket-Mounted Installation

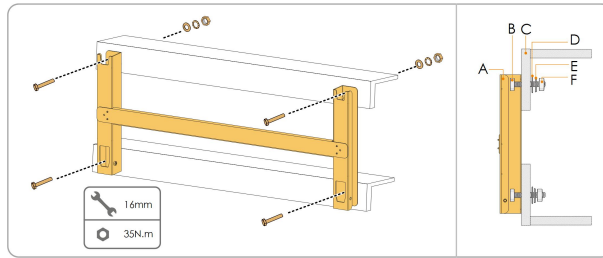
step 1 Assemble the mounting-bracket by using the connecting bar.



step 2 Level the assembled mounting-bracket by using the level, and mark the positions for drilling holes on the PV bracket. Drill the holes by using a hammer drill.



step 3 Secure the mounting-bracket with bolts.

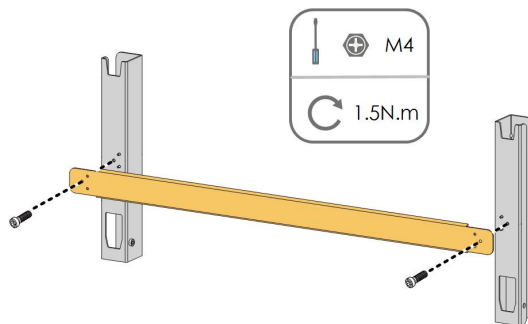


No.	Components	Description
A	Mounting-bracket	—
B	Full threaded bolt	M10*45
C	Metal bracket	—
D	Flat washer	—
E	Spring washer	—
F	Hex nuts	—

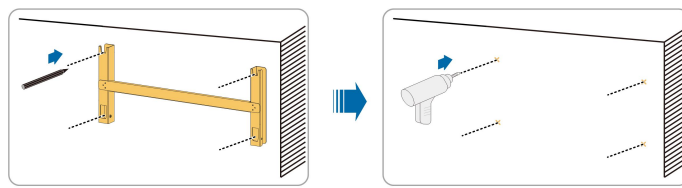
-- End

4.5.2 Wall-Mounted Installation

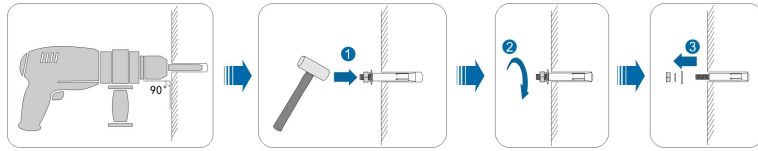
step 1 Assemble the mounting-bracket by using the connecting bar.



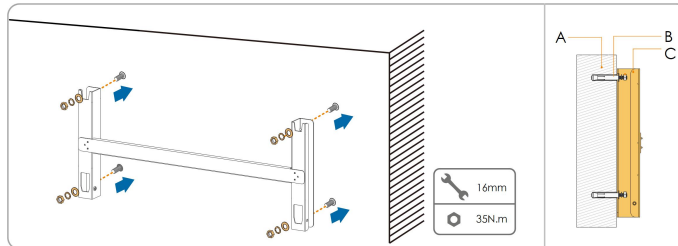
step 2 Level the assembled mounting-bracket by using the level, and mark the positions for drilling holes on the installation site.



step 3 Insert the expansion bolts into the holes and secure them with a rubber hammer. Fasten the nut with a wrench to expand the bolt. Remove the nut, spring washer, and flat washer, and store them properly.



step 4 Fix the mounting-bracket with the expansion bolts.



No.	Components	Description
A	Wall	-
B	Expansion bolt	Fastening the bolt in the sequence of nut, spring washer, slat washer
C	Mounting-bracket	-

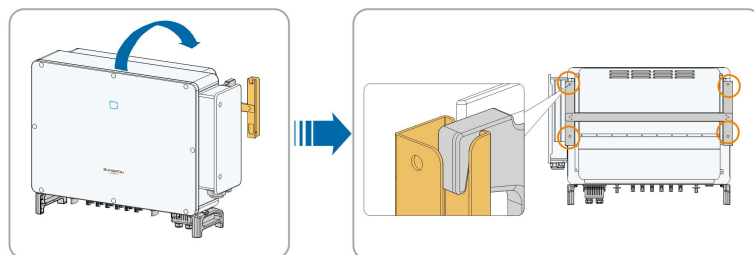
-- End

4.6 Installing the Inverter

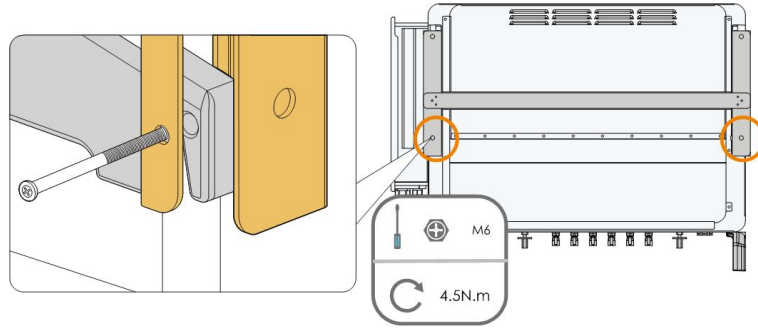
step 1 Take out the inverter from the packing case.

step 2 Hoist the inverter to the installation position when necessary (refer to "4.4.2 Hoisting Transport"). If the installation position is not high enough, skip this step.

step 3 Hang the inverter to the mounting-bracket and ensure that the mounting ears perfectly engage with the mounting-bracket.



step 4 Fix the inverter with screws.



-- End

5 Electrical Connection

5.1 Safety Instructions

Prior to any electrical connections, keep in mind that the inverter has dual power supplies. It is mandatory for the qualified personnel to wear personal protective equipments (PPE) during the electrical work.

DANGER

Danger to life due to a high voltage inside the inverter!

- The PV string will generate lethal high voltage when exposed to sunlight.
- Before starting electrical connections, disconnect the DC and AC circuit breakers and prevent them from inadvertent reconnection.
- Ensure that all cables are voltage free before performing cable connection.

WARNING

- Any improper operations during cable connection can cause device damage or personal injury.
- Only qualified personnel can perform cable connection.
- All cables must be undamaged, firmly attached, properly insulated and adequately dimensioned.

NOTICE

Comply with the safety instructions related to the PV strings and the regulations related to the utility grid.

- All electrical connections must be in accordance with local and national standards.
- Only with the permission of the local utility grid company, the inverter can be connected to the utility grid.

5.2 Terminal Description

All electrical terminals are located at the side and bottom of the inverter.

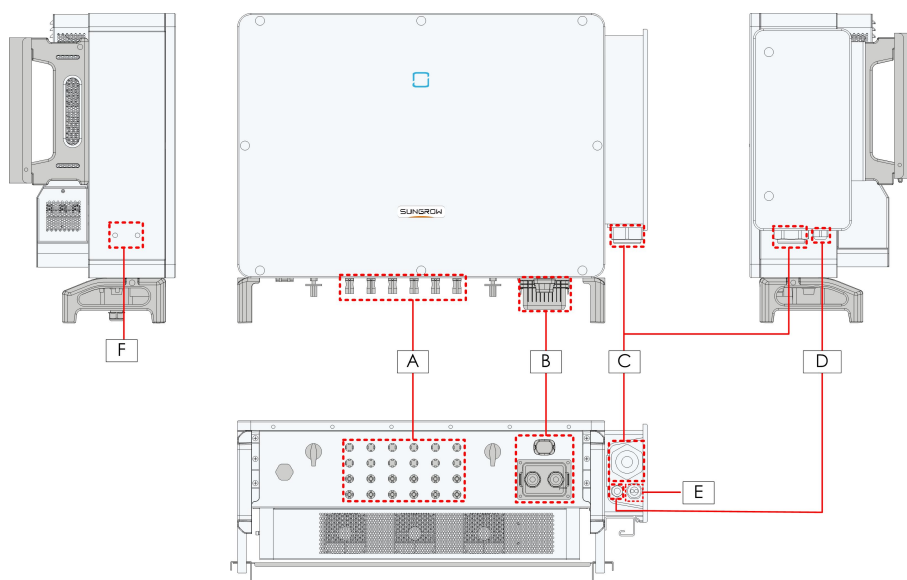



figure 5-1 Terminal Description

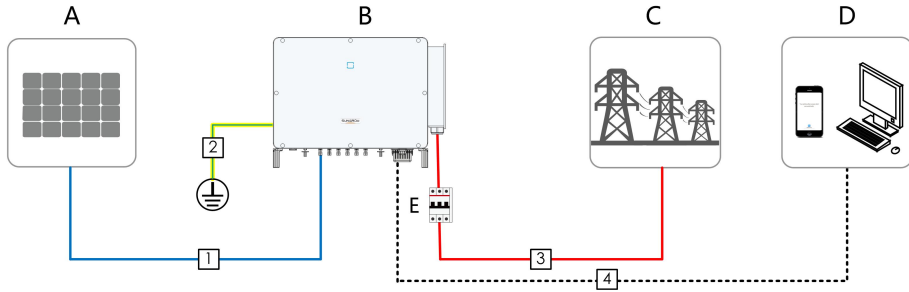
* The image shown here is for reference only. The actual product received may differ.

Item	Terminal	Mark	Note
A	PV terminals	+ / -	24, PV connector
B	Communication terminal	COM1	For Communication module connection (Optional).
		COM2	For digital input and output DI/DO wiring.
		COM3	For RS485 communication wiring.
C	AC wiring terminal		Used for AC output cable connection.
D	Standby grounding terminal*	AC	Used for internal grounding.
E	Tracker terminal	Tracker	Used for internal Tracker , Tracker power wiring to power the Tracker.
F	Additional grounding terminal		2, use at least one of them to ground the inverter.

*If the PE cable is an independent single-core cable, it should be inserted into the cabinet through the standby grounding terminal.

5.3 Electrical Connection Overview

The electrical connection should be realized as follows:



Item	Designation
A	PV string
B	Inverter
C	Grid
D	Monitoring device
E	AC circuit breaker

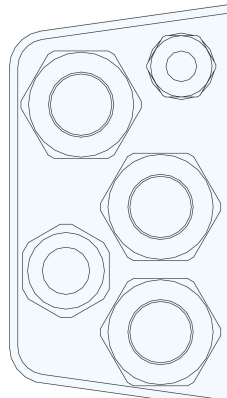
table 5-1 Cable Requirements

No.	Cable	Type	Specification	
			Cable Diameter (mm)	Cross-sectional Area (mm ²)
1	DC cable	PV cable complying with 1,500V standard	4.7~6.4	4~6
2	Additional grounding cable	Outdoor single-core copper wire cable	/	The same as that of the PE wire in the AC cable

No.	Cable	Type	Specification	
			Cable Diameter (mm)	Cross-sectional Area (mm ²)
3	AC cable	Four-core copper or aluminum cable ⁽¹⁾⁽²⁾	20~50	L1,L2,L3 wire: 50~150 PE wire: refer to "table 5-2 PE Wire Requirements"
		Three-core copper or aluminum cable and one independent single-core PE cable	Phase cable: 20~50 PE cable: 10~14	L1,L2,L3 wire: 50~150 PE wire: refer to "table 5-2 PE Wire Requirements"
		Four single-core outdoor copper or aluminum cables ⁽¹⁾⁽²⁾	10~14	L1,L2,L3 wire: 50~150 PE wire: refer to "table 5-2 PE Wire Requirements"
		Communication cable	Shielded twisted pair	4.5~18

(1) A copper to aluminum adapter terminal is required when an aluminum cable is used. For details, refer to "[Aluminium Cable Requirements](#)".

(2) If case of four single-core cables, an spare AC sealing plate accessory is required. To purchase the AC sealing plate accessory, contact SUNGROW.



S312-E003

figure 5-2 Spare AC Sealing Plate

table 5-2 PE Wire Requirements

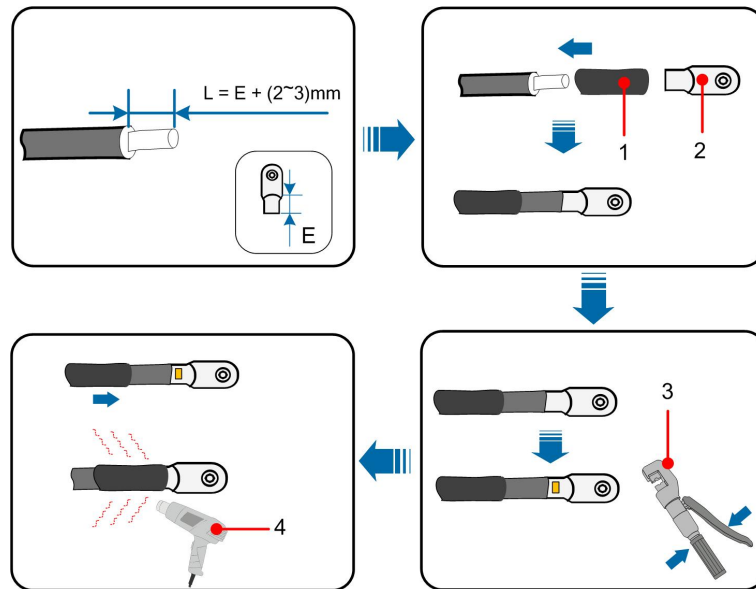
PE Wire Cross Section	Note
S/2 (S: Phase wire cross-section S)	The specifications are valid only when the phase wire and PE wire use the same material. If otherwise, ensure that the cross section of the PE wire produces a conductance equivalent to that of the wire specified in the table.

table 5-3 Power Cable for Tracking System

Cable	Type	Specification		Voltage Level
		Cable Diameter(mm)	Recommended Cross-sectional Area(mm ²)	
Power cable for tracking system	Double-core outdoor copper cable	4.5~18	4~6	Consistent with selected AC cable

5.4 Crimp OT/DT terminal

Crimp OT/DT terminal



1. Heat shrink tubing

2. OT/DT terminal

3. Hydraulic pliers

4. Heat gun

Aluminium Cable Requirements

If an aluminium cable is selected, use a copper to aluminium adapter terminal to avoid direct contact between the copper bar and the aluminium cable.

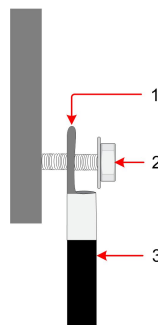


figure 5-3 Aluminium cable terminal connection sequence

1. Aluminium adapter terminal

2. Flange nut

3. Aluminium cable



Ensure that the selected terminal can directly contact with the copper bar. If there are any problems, contact the terminal manufacturer.

Direct contact between the copper bar and the aluminium cable will cause electrochemical corrosion and impair the reliability of electrical connection.

5.5 Additional Grounding Connection

⚠ WARNING

- Since the inverter is transformerless, neither the negative pole nor the positive pole of the PV string must be grounded. Otherwise, the inverter will not operate normally.
- Connect the additional grounding terminal to the protective grounding point before AC cable connection, PV cable connection, and communication cable connection.
- The ground connection of this additional grounding terminal cannot replace the connection of the PE terminal of the AC cable. Make sure those terminals are both grounded reliably. SUNGROW shall not be held liable for any damage caused by the violation.

5.5.1 Additional Grounding Requirements

All non-current carrying metal parts and device enclosures in the PV power system should be grounded, for example, mounts of PV modules and the inverter enclosure.

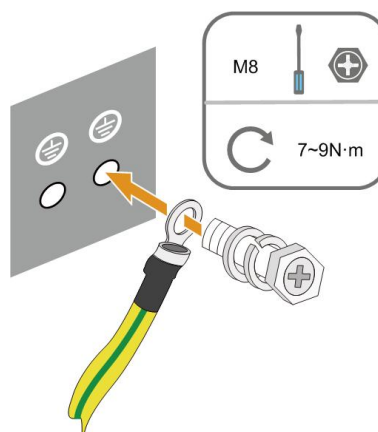
When there is only one inverter in the PV system, connect the additional grounding cable to a nearby grounding point.

When there are multiple inverters in the PV system, connect grounding points of all inverters and the PV array frames to the equipotential cable (according to the onsite conditions) to implement an equipotential connection.

5.5.2 Connection Procedure

step 1 Prepare the cable and OT/DT terminal, refer to "Crimp OT/DT terminal".

step 2 Remove the screw on the grounding terminal and fasten the cable with a screwdriver.



step 3 Apply paint to the grounding terminal to ensure corrosion resistance.



The grounding screws have been anchored to the side of the inverter before delivery, and do not need to be prepared.

There are two grounding terminals. Use at least one of them to ground the inverter.

-- End

5.6 AC Cable Connection

5.6.1 AC Side Requirements



Connect the inverter to the grid only after getting an approval from the local electric power company.

Before connecting the inverter to the grid, ensure the grid voltage and frequency comply with requirements, for which, refer to "**Technical Data**". Otherwise, contact the electric power company for help.

AC Circuit Breaker

An independent three-pole or four-pole circuit breaker is installed on the output side of the inverter to ensure safe disconnection from the grid.

Inverter Model	Recommended rated voltage	Recommended rated current
SG125HX	800V	125A

NOTICE

**Never connect a load between the inverter and the circuit breaker.
Multiple inverters cannot share one circuit breaker.**

Multiple Inverters in Parallel Connection

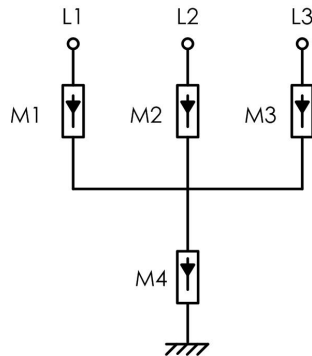
If multiple inverters are connected in parallel to the grid, ensure that the total number of parallel inverters does not exceed 30. Otherwise, please contact SUNGROW for technical scheme.

MV Transformer

The MV transformer used together with the inverter should meet the following requirements:

- The transformer may be a distribution transformer, and it must be designed for the typical cyclical loads of a PV system (load in the day and no load at night).
- The transformer may be of the liquid-immersed type or dry type, and shield winding is not necessary.

- The line-to-line voltage on the LV side of the transformer should endure the output voltage of inverter. When the transformer is connected to the IT grid, to-ground withstanding voltage of the LV winding of the transformer, the AC cables, and the secondary equipment (including the relay protection device, detection & measuring device, and other related auxiliary devices) should not be lower than 1,500V.
- The line-to-line voltage on the HV side of the transformer should comply with the local power grid voltage.
- A transformer with a tap changer on the HV side is recommended in order to keep consistent with the grid voltage.
- At an ambient temperature of 45°C, the transformer can run in 1.1 times of load for long time.
- A transformer with a short-circuit impedance 6% (permissible tolerance: $\pm 10\%$) is recommended.
- The voltage drop of system cable is no more than 3%.
- The DC component that the transformer can withstand is 1% of the fundamental current at rated power.
- For thermal rating, the load curve of the transformer and environment conditions should be taken into account.
- The apparent power of the inverter should never exceed the power of the transformer. The maximum AC current of all inverters connected in parallel must be taken into account. If more than 30 inverters are connected to the grid, contact SUNGROW.
- The transformer must be protected against overloading and short circuit.
- The transformer is an important part of grid-connected PV generation system. The fault tolerance capacity of the transformer should be taken into account at all times. The fault include: system short circuit, grounding fault, voltage drop, etc.
- Take ambient temperature, relative humidity, altitude, air quality, and other environmental conditions into account when selecting and installing the transformer.
- When the anti-PID function is enabled, observe the following items:
 - If the LV side winding is in Y shape, neutral point grounding is prohibited.
 - Surge protective devices (SPD) for the AC combiner box and on the LV side of the transformer are recommended to be connected in the "3+1" manner, as shown in the figure below. The Min. continuous operating voltages of M1-M4 are 690VAC.
 - The LV side winding of the transformer, AC cables, and secondary devices (- including protective relay, detection and measurement instruments, and related auxiliary devices) must withstand the voltage to ground of at least 1,500 V.

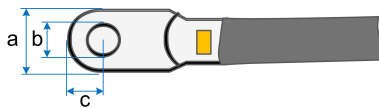


5.6.2 Requirements for OT/DT Terminal

OT/DT terminals (not included in the delivery scope) are required for fixing AC cables to the terminal block. Purchase the OT/DT terminals according to the following requirements.

OT/DT Terminals of Phase Wire

- Specification: M10;
- Dimensions: $a \leq 30\text{mm}$ / $10.5\text{mm} \leq b \leq 11.5\text{mm}$ / $c \leq 17\text{mm}$



OT/DT Terminal of PE Wire

- Specification: M10.

5.6.3 Connection Procedure

⚠ DANGER

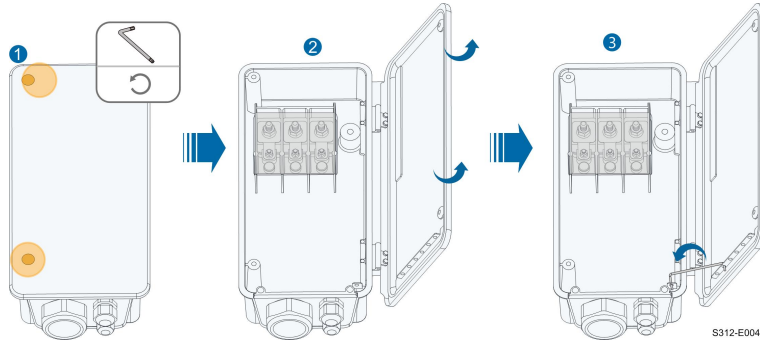
High voltage may be present in inverter!

Ensure all cables are voltage-free before electrical connection.

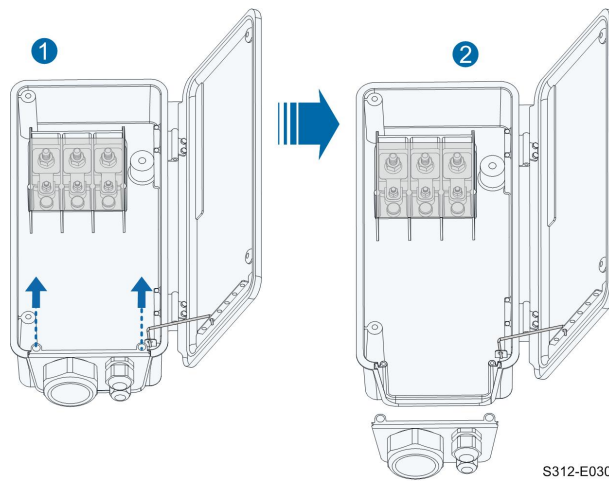
Do not connect the AC circuit breaker until all inverter electrical connections are completed.

step 1 Disconnect the AC-side circuit breaker and prevent it from inadvertent reconnection.

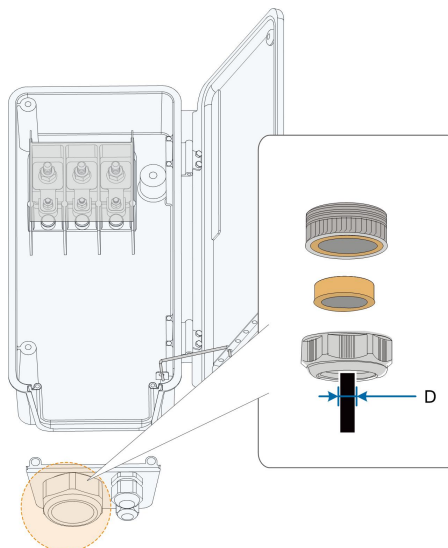
step 2 Release two screws on the front cover of the wiring compartment with supplied Allen wrench. Open the wiring compartment. Keep the wiring compartment opened during wiring through the limit lever attached to the cover.



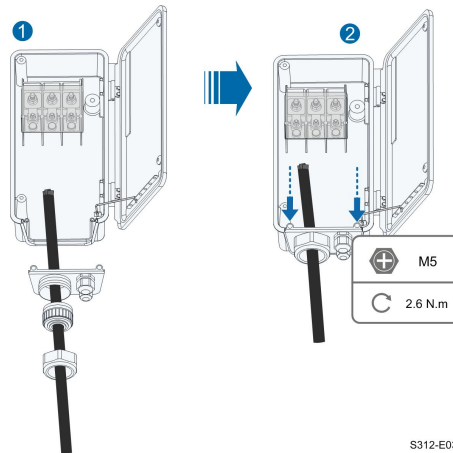
step 3 Loosen the screws of the bottom sealing plate and take out the bottom sealing plate.



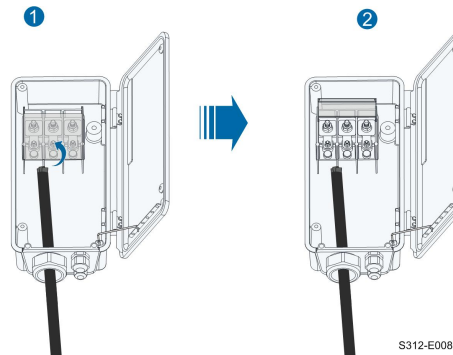
step 4 Loosen the swivel nut of the AC waterproof connector and select a seal according to the cable outer diameter, remove the inner sealing ring if the cable diameter is larger than 40mm. Lead the cable through the swivel nut, seal, and wiring terminal successively.



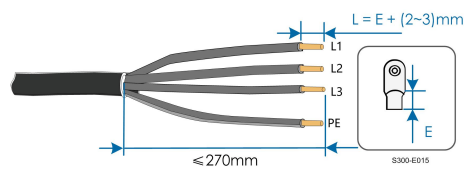
step 5 Install the cables and reinstall the bottom sealing plate.



step 6 Open the protection cover.

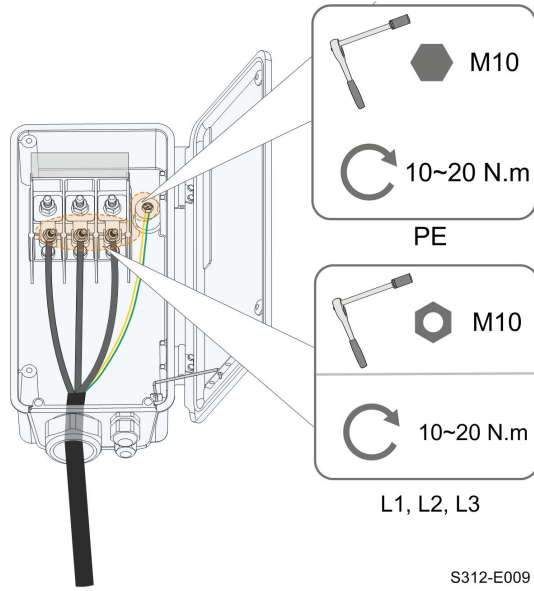


step 7 Strip the protection layer and insulation layer by specific length, as described in the figure below.



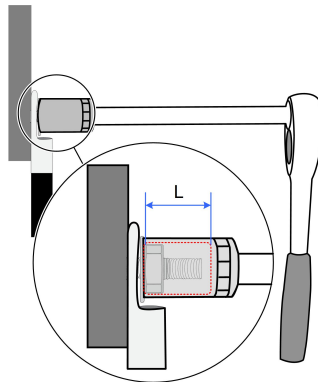
step 8 Make the cable and crimp OT/DT terminal.

step 9 Secure the wires to corresponding terminals.

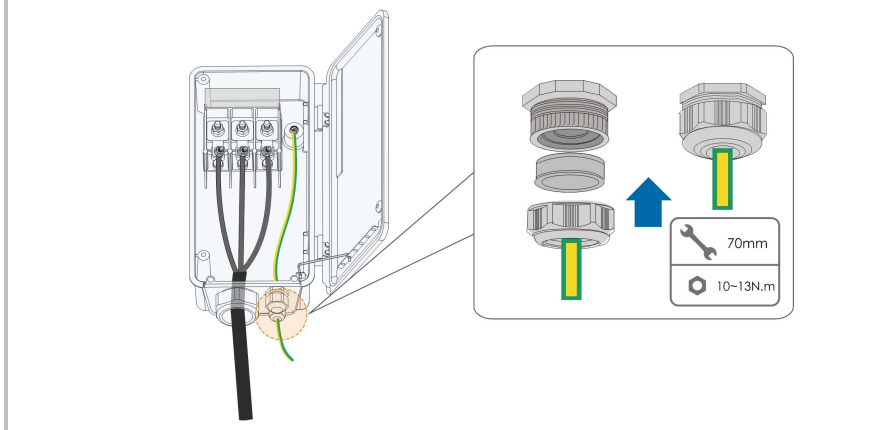


S312-E009

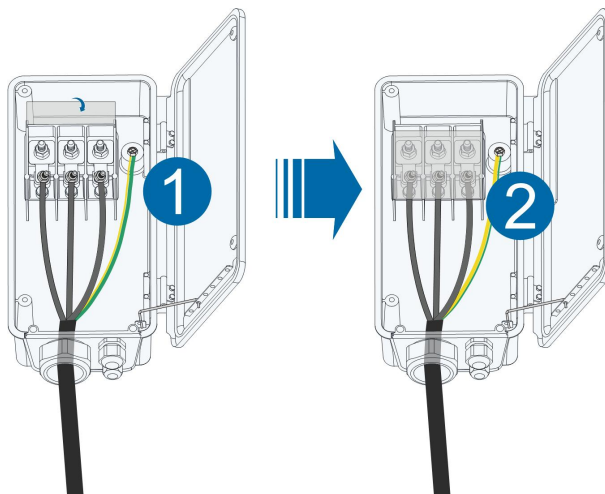
Ensure that the depth L of the socket used is not less than 28mm.



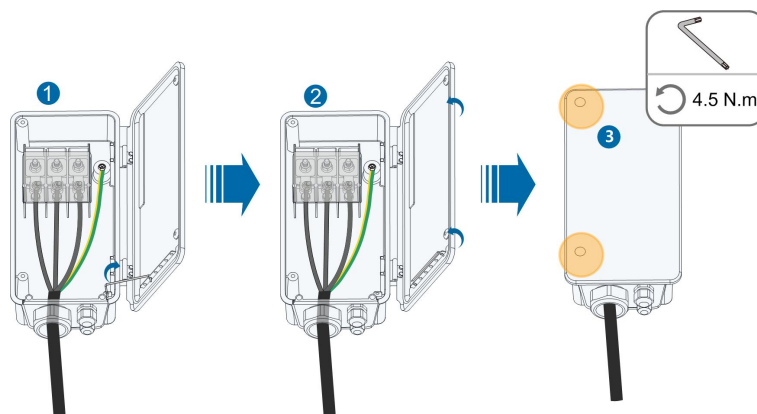
If the PE cable is an independent single-core cable, it should be inserted into the cabinet through the standby grounding terminal.



step 10 Close the protection cover.



step 11 Close the wiring compartment and tighten the two screws on its front cover with supplied Allen wrench.



-- End

5.7 DC Cable Connection

⚠ DANGER

Danger of electric shock!

The PV array will generate lethal high voltage once exposed to sunlight.

⚠ WARNING

Make sure the PV array is well insulated to ground before connecting it to the inverter.

NOTICE

Risk of inverter damage! Observe the following requirements. Failure to do so will void guarantee and warranty claims.

- **Make sure the maximum DC voltage and the maximum short circuit current of any string never exceed inverter permitted values specified in "Technical Data".**
- **Mixed use of different brand or model of PV modules in a PV string or a compromised PV string design composed with PV modules from rooftops of different orientation may not damage inverter but will cause system bad performance!**

5.7.1 PV Input Configuration

- As shown in the figure below, the inverter is provided with multiple PV inputs: PV inputs 1~6; and each PV input is designed with an MPP tracker.
- Each PV input operates independently and has its own MPPT. In this way, string structures of each PV input may differ from each other, including PV module type, number of PV modules in each string, angle of tilt, and installation orientation.
- Each PV input area includes two DC inputs DC1 and DC2. For the best use of DC power, DC1 and DC2 should be the same in PV string structure, including the type, number, tilt, and orientation of the PV modules.

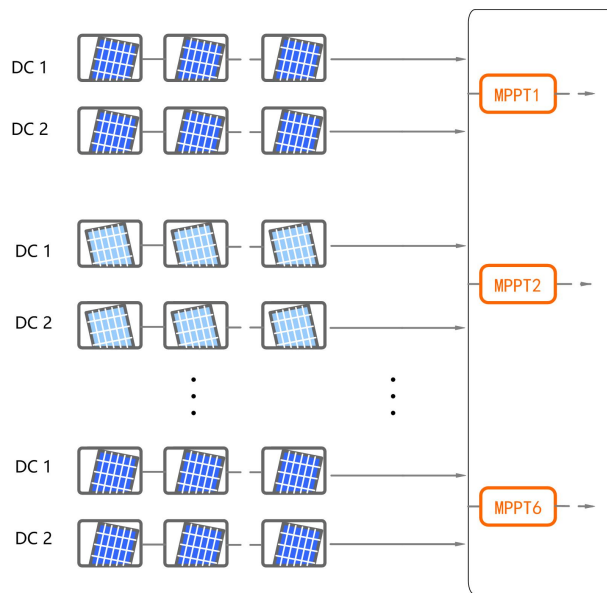


figure 5-4 PV Input Configuratinon

Prior to connecting the inverter to PV inputs, the specifications in the following table should be met:

Open-circuit Voltage Limit	Max. Current For Input Connector
1500 V	30 A

5.7.2 Assembling the PV Connectors

⚠ DANGER

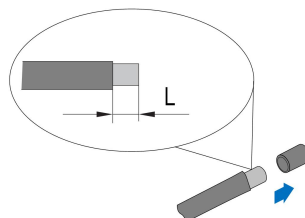
High voltage may be present in the inverter!

- Ensure all cables are voltage-free before performing electrical operations.
- Do not connect the AC circuit breaker before finishing electrical connection.

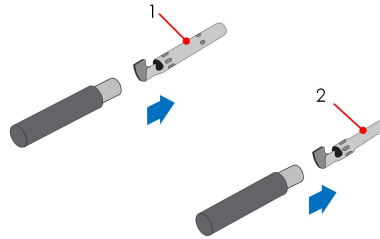


SUNGROW provides corresponding PV connectors in the scope of delivery for quick connection of PV inputs. To ensure IP66 protection, use only the supplied connector or the connector with the same ingress of protection.

step 1 Strip the insulation from each DC cable by 7 mm – 8 mm.



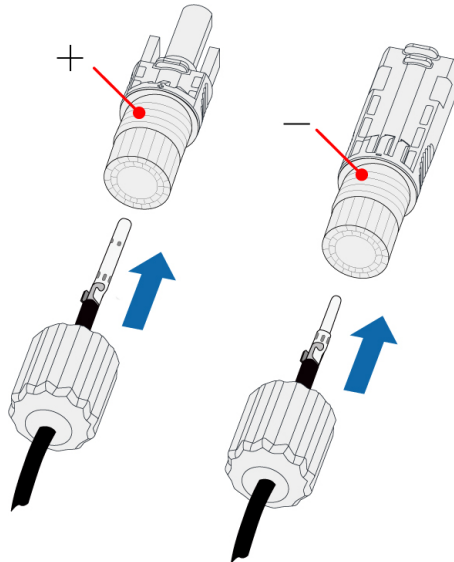
step 2 Assemble the cable ends with the crimping pliers.



1: Positive crimp contact

2: Negative crimp contact

step 3 Lead the cable through cable gland, and insert the crimp contact into the insulator until it snaps into place. Gently pull the cable backward to ensure firm connection. Tighten the cable gland and the insulator (torque 2.5 N.m to 3 N.m).



step 4 Check for polarity correctness.

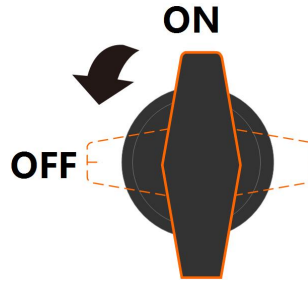
NOTICE

If the PV polarity is reversed, the inverter will be in a fault or alarm state and will not operate normally.

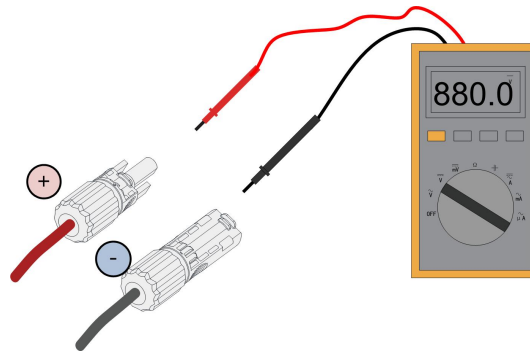
-- End

5.7.3 Installing the PV Connector

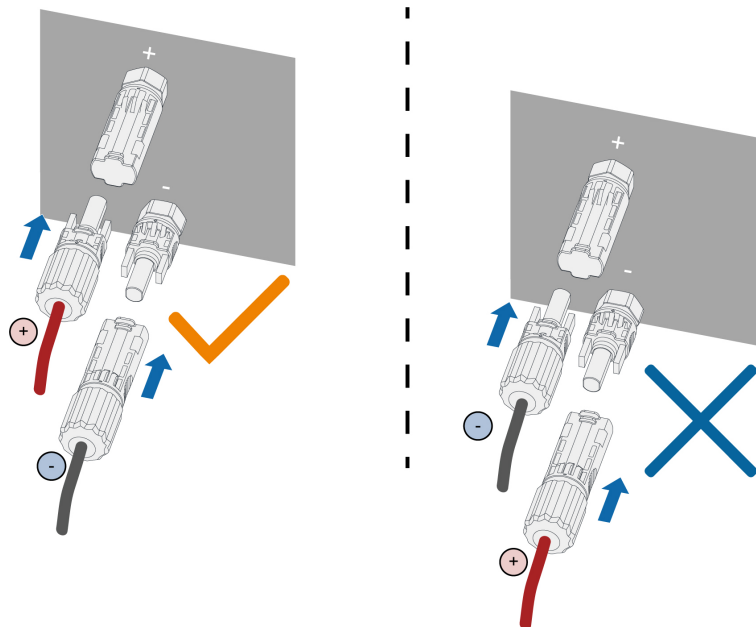
step 1 Rotate the DC switch to "OFF" position.



step 2 Check the cable connection of the PV string for polarity correctness and ensure that the open circuit voltage in any case does not exceed the inverter input limit of 1,500V.



step 3 Connect the PV connectors to corresponding terminals until there is an audible click.



NOTICE

- Check the positive and negative polarity of the PV strings, and connect the PV connectors to corresponding terminals only after ensuring polarity correctness.
- Arc or contactor over-temperature may occur if the PV connectors are not firmly connected in place, and SUNGROW shall not be held liable for any damage caused due to this operation.

step 4 Follow the foregoing steps to connect PV connectors of other PV strings.

step 5 Seal any unused PV terminal with a terminal cap.

NOTICE

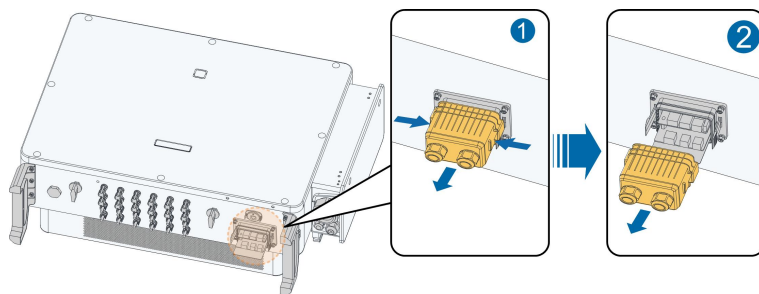
If the DC input is connected inversely and the DC switch has been rotated to "ON", do not operate immediately. Otherwise, the equipment may be damaged. Please turn the DC switch to "OFF" and remove the DC connector to adjust the polarity of the strings when the string current is lower than 0.5A.

-- End

5.8 Communication Junction Box

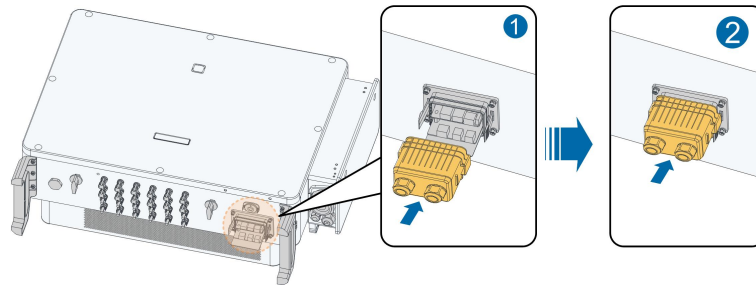
Remove the Junction Box

Squeeze both sides of the junction box and then pull it out to remove it.



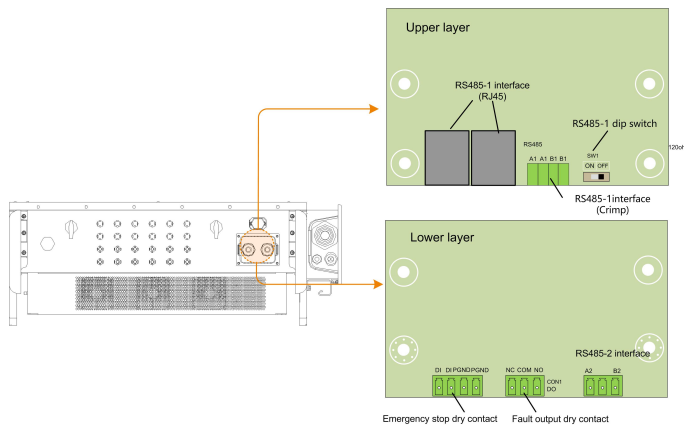
Install the Junction Box

Align the junction box with the corresponding port and push it into the port to reassemble junction box.



5.9 Communication Wiring Board

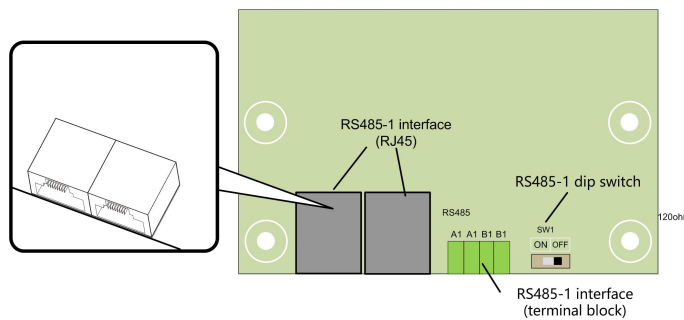
The communication board of the inverter includes two layers. The upper layer communication board mainly includes RS485 communication interfaces while the lower layer communication board mainly includes DI/DO interface.



5.10 RS485 Connection

5.10.1 Interface Description

As shown in the Figure below, the inverter is equipped with three RS485 communication interfaces and one dip switch.



All three interfaces can be connected to a data acquisition device (Data Logger), to achieve data exchange with PC or other monitoring devices.

The RS485-1 crimp and the RJ45 interface can be applied to applications where multiple inverters communicate in a daisy-chain form.

A 120Ω resistor can be connected in parallel between RS485-1 A/B pins by configuring the dip switch.

NOTICE

RS485-1 crimp interface and RJ45 interface serve as the same function with different wiring manner.

5.10.2 RS485 Communication System



SG Modbus can be adopted.

Single-inverter Communication System

In case of a single inverter, communication cable connection requires only one RS485 cable.

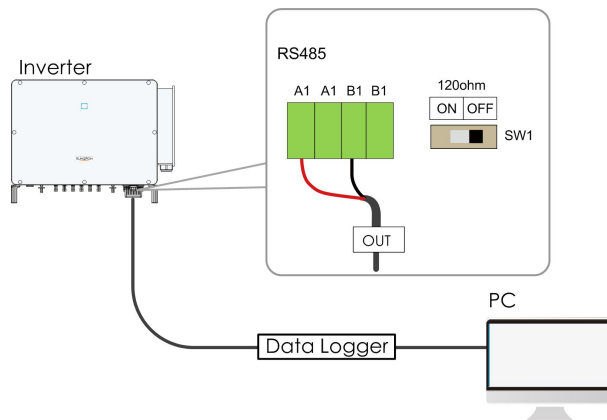


figure 5-5 Single-inverter Connection

Multi-inverter Communication System

In case of multiple inverters, all the inverters can be connected via RS485 cables in the daisy chain manner.

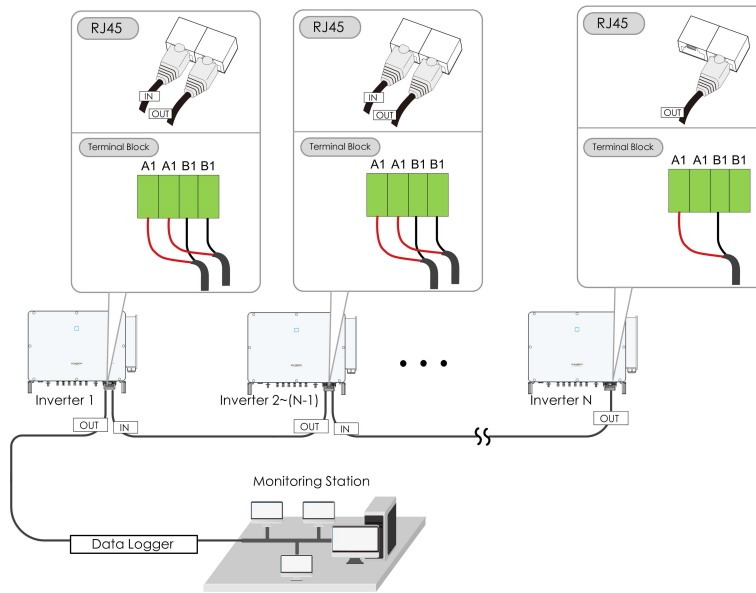


figure 5-6 Multi-inverter Connection

When more than 15 inverters are connected to the same daisy chain, in order to ensure the communication quality, the Logger at the first end of the daisy chain needs to be equipped with a terminal resistor of 120Ω, the inverter at the last end needs to be equipped with a RS485-dip switch (SW1), and the shielding layer of the communication cable should be single-point grounded.

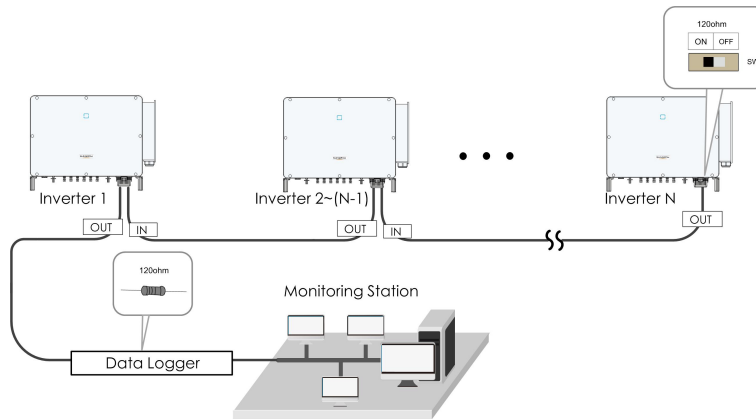


figure 5-7 Configuration of Dip Switch (N≥15)

The length of the RS485 cable and twisted pair cable should be no longer than 1,200m.

i If multiple inverters are connected to the data logger, the number of permissible daisy chains and the number of devices allowed to be connected should meet the requirements (refer to the user manual for the data logger).

5.10.3 Connection Procedure(Terminal Block)

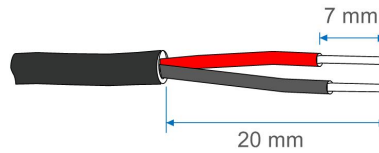


RS485 communication cables should be shielded twisted pair cables or shielded twisted pair Ethernet cables.

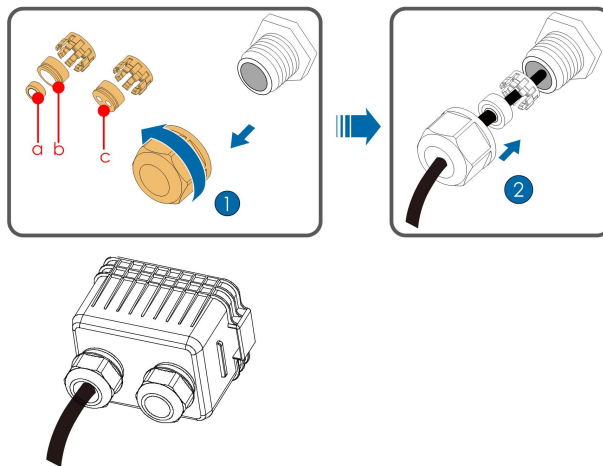
There are three communication terminals, and the silkscreen marks are COM1/COM2/COM3. Please choose according to the actual situation.

step 1 Remove the communication junction box, see" [Remove the Junction Box](#)".

step 2 Strip the protection layer and insulation layer by appropriate length.

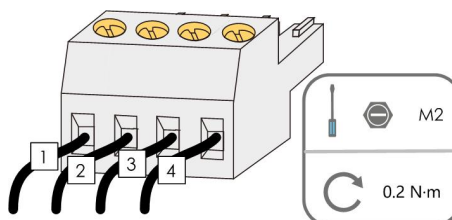


step 3 Loosen the swivel nut of the junction box and select an appropriate seal according to cable outer diameter. Lead the cable through the swivel nut, seal, and junction box successively.



Outer Diameter D(mm)	Seal
4.5~6	c
6~12	a+b
12~18	b

step 4 Secure the cable to the terminal base.



step 5 Insert the terminal base into the corresponding terminal.

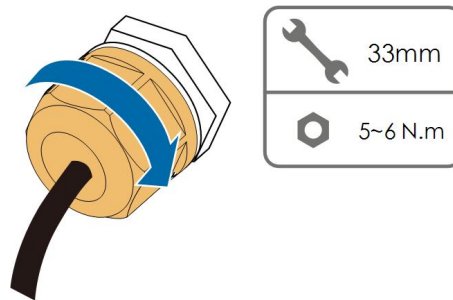
table 5-4 Terminal definition

No	Definition
1	RS485 A+
2	RS485 A+
3	RS485 B-
4	RS485 B-

step 6 If other wiring operations need to be performed on the communication board, finish the wiring operations before performing the following steps. If otherwise, continue to perform the following steps.

step 7 Install the junction box, see "[Install the Junction Box](#)".

step 8 Pull the cable gently to make sure it is secured, tighten the swivel nut clockwise.

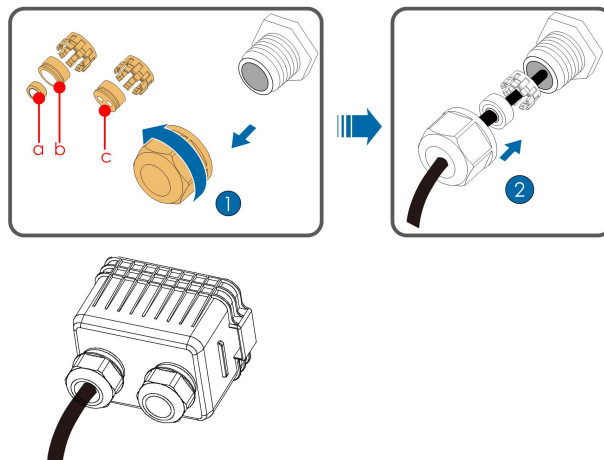


-- End

5.10.4 Connection Procedure (RJ45 Ethernet Port)

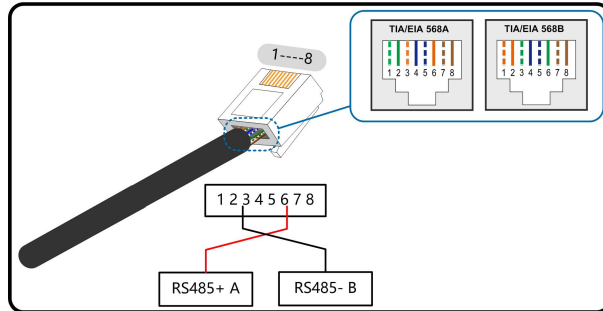
step 1 Remove the communication junction box, see "[Remove the Junction Box](#)".

step 2 Loosen the swivel nut of the junction box and select an appropriate seal according to cable outer diameter. Lead the cable through the swivel nut, seal, and junction box successively.

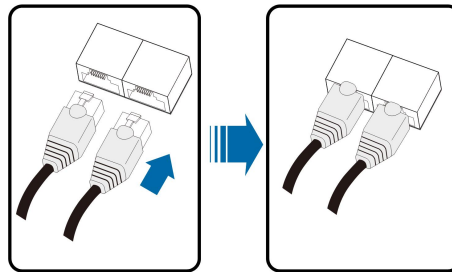


Outer Diameter D(mm)	Seal
4.5~6	c
6~12	a+b
12~18	b

step 3 Strip the insulation layer of the Ethernet cable with a wire stripper, and insert the signal wires to the RJ45 connector (Pin 3 and Pin 6 are for communication connection). Crimp the RJ45 connector with a crimping tool.



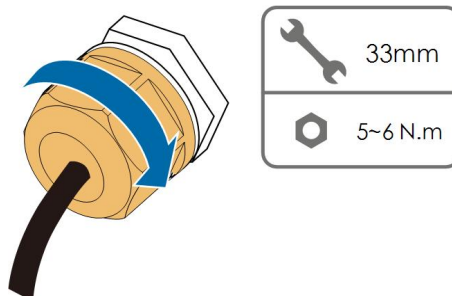
step 4 Insert the RJ45 connector to the RJ45 jack.



step 5 If other wiring operations need to be performed on the communication board, finish the wiring operations before performing the following steps. If otherwise, continue to perform the following steps.

step 6 Install the junction box, see "[Install the Junction Box](#)".

step 7 Pull the cable gently to make sure it is secured, tighten the swivel nut clockwise.



-- End

5.11 PLC Communication Connection

With a PLC communication module built inside, the inverter can communicate with the COM100A provided by SUNGROW. For specific wiring method, refer to the COM100A user manual.



- In case of PLC communication, both the multi-core cable and the single-core cable can be used as the AC cable.
- The COM100A is an optional device that can be ordered from Sungrow.
- The COM100A conducts data communication by directly using the AC output cable (L1&L3 wire) of the inverter and thus saves the trouble to lay and maintain the special communication cables. The RS-485 port of the COM100A supports the transparent transmission of the MODBUS-RTU and is completely compatible with the monitoring devices and software of the original RS-485 communication method.

5.12 Dry Contact Connection

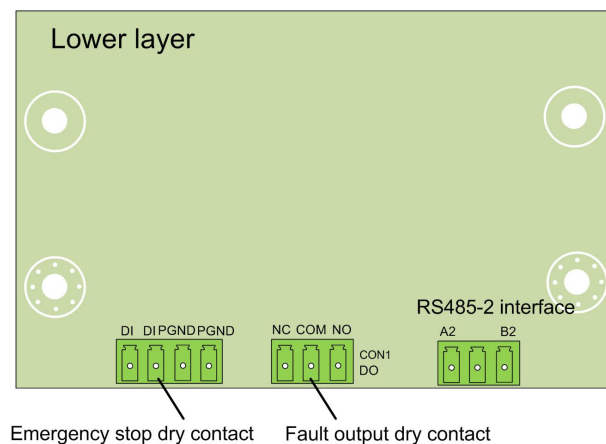
NOTICE

Dry contact cables require a cross section of 1 mm² to 1.5 mm².
The connection procedure of the dry contact is the same as that of the RS485 terminal block.

5.12.1 Dry Contact Function

The configuration circuit board is provided with fault output dry contact and emergency stop dry contact, as shown in the figure below.

Connection method of the dry contacts is similar to that of the RS485 terminal block.



DO terminal (fault output dry contact): The relay can be set to output fault alarms, and user can configure it to be a normally open contact (COM & NO) or a normally closed contact (COM & NC).

The relay is initially at the NC terminal, and it will trip to another contact when a fault occurs. When alarm occurs, signal status change will not be triggered.

Use LED indicators or other equipment to indicate whether the inverter is in the faulty state. The following Figures show the typical applications of normally open contact and normally closed contact:

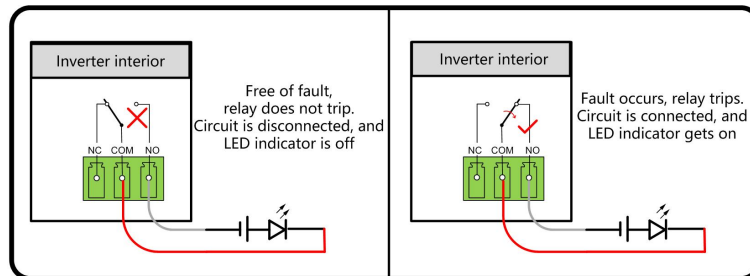


figure 5-8 Normal open contact

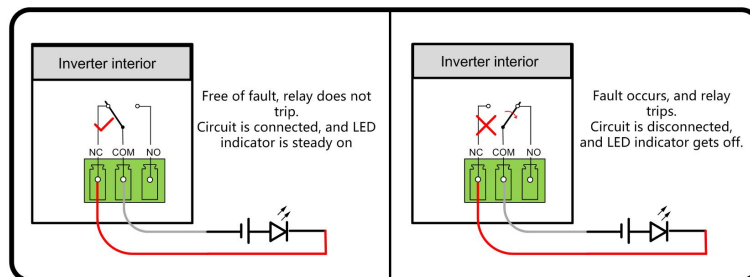


figure 5-9 Normal close contact

Devices connected to the relay should comply with related requirements:

AC-Side Requirements	DC-Side Requirements
Max. voltage: 125Vac	Max. voltage: 30Vdc
Max. current: 5A	Max. current: 5A

DI terminal (emergency stop dry contact): the dry contact can be configured to be an emergency stop contact.

When the DI + contact and DI - contact are shorted by external controlled switch, the inverter will immediately shutdown.



The dry contacts only support passive switch signal input.

The following figure shows the typical application of local stop dry contact.

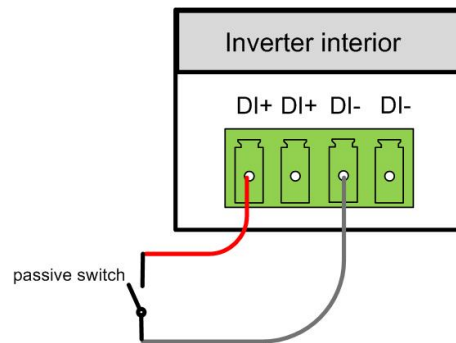


figure 5-10 Local stop contact

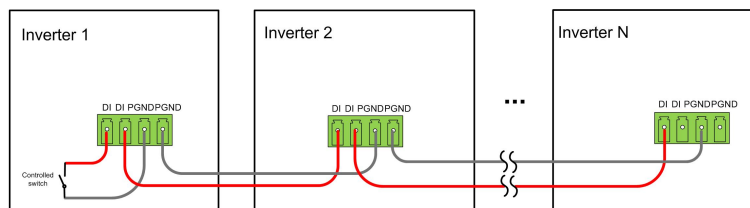


figure 5-11 Daisy chain topology

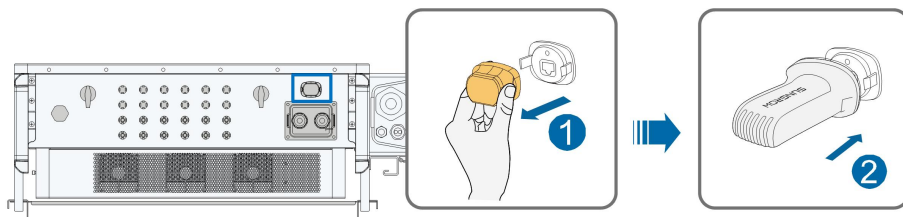
When wiring DI dry contacts, ensure that the maximum wiring distance meets the requirements in "10.2 Wiring Distance of DI Dry Contact".

5.12.2 Wiring Procedure

Refer to the wiring of terminal block described in chapter "5.10.3 Connection Procedure (Terminal Block)".

5.13 Communication Module Connection (optional)

Connect the communication module produced by SUNGROW, such as Eye M4 (WiFi) to the communication accessory port. After successful connection, information such as power generation and running state of the inverter can be viewed via the APP on the phone.



*The image shown here is for reference only. The actual product you receive may differ.

NOTICE

The communication module and the RS485 communication are not available at the same time. Otherwise, communication failure or other problems can be caused.



For details on module installation and configuration, refer to the manual delivered together with the module.

6 Commissioning

6.1 Inspection before Commissioning

Check the following items before starting the inverter:

- All the installation sites are convenient for operation, maintenance and service.
- All devices are firmly installed.
- Space for ventilation is sufficient for one inverter or multiple inverters.
- Nothing is left on the top of the inverter.
- The inverter and accessories are correctly connected.
- Cables are routed safely and protected against mechanical damage.
- The selection of the AC circuit breaker is in accordance with this manual and all applicable local standards.
- All unused terminals at the bottom of the inverter are properly sealed.
- Warning signs & labels are intact and legible.

6.2 Commissioning Procedure

If all of the items mentioned above meet the requirements, proceed as follows to start up the inverter for the first time.

step 1 Connect the AC switch between the inverter and the grid.

step 2 Rotate the DC switch of the inverter to "ON" position.

step 3 Connect the DC switch (if applicable) between the inverter and the PV string.

step 4 Set initial protection parameters via the iSolarCloud App. For details, please refer to "[7.2 Installing the App](#)", and "[7.4.2 Login Procedure](#)". If the irradiation and grid conditions meet requirements, the inverter will normally operate.

step 5 Observe the LED indicator to ensure that the inverter operates normally. Refer to "[2.4 LED Indicator](#)" for details.

-- End

7 iSolarCloud App

7.1 Brief Introduction

The iSolarCloud App can establish communication connection to the inverter via the Bluetooth, thereby achieving near-end maintenance on the inverter. Users can use the App to view basic information, alarms, and events, set parameters, or download logs, etc.

*In case the communication module Eye or WiFi is available, the iSolarCloud App can also establish communication connection to the inverter via the mobile data or WiFi, thereby achieving remote maintenance on the inverter.



- This manual describes only how to achieve near-end maintenance via the Bluetooth connection. For remote maintenance through the Eye or WiFi, refer to the related manuals in the delivery scope.
- Screenshots in this manual are based on the Android system V2.1.6 , and the actual interfaces may differ.

7.2 Installing the App

Method 1

Download and install the App through the following application stores:

- MyApp (Android, mainland China users)
- Google Play (Android, users other than mainland China ones)
- App Store (iOS)

Method 2

Scan the following QR code to download and install the App according to the prompt information.



The App icon appears on the home screen after installation.



7.3 Function Overview

The App provides parameter viewing and setting functions, as shown in the following figure.

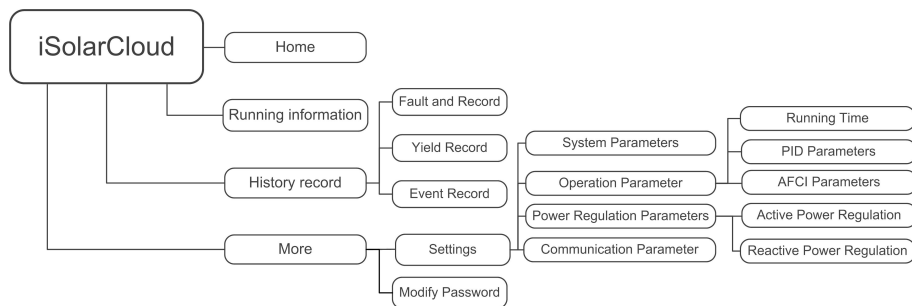


figure 7-1 App function tree map

7.4 Login

7.4.1 Requirements


The following requirements should be met:

- The AC or DC side of the inverter is powered-on.
- The mobile phone is within 5 meters away from the inverter and there are no obstructions in between.
- The Bluetooth function of the mobile phone is enabled.

7.4.2 Login Procedure

step 1 Open the App to enter the login page, click on "Local Access" at the bottom of the page to go to the next page.

step 2 Click on "Bluetooth", after which the Bluetooth search screen pops up automatically, and select the to-be-connected inverter according the SN on the nameplate of the inverter. The Bluetooth indicator gets on once the connection is established.

Alternatively, tap  to scan the QR code on the side of the inverter to establish Bluetooth connection.

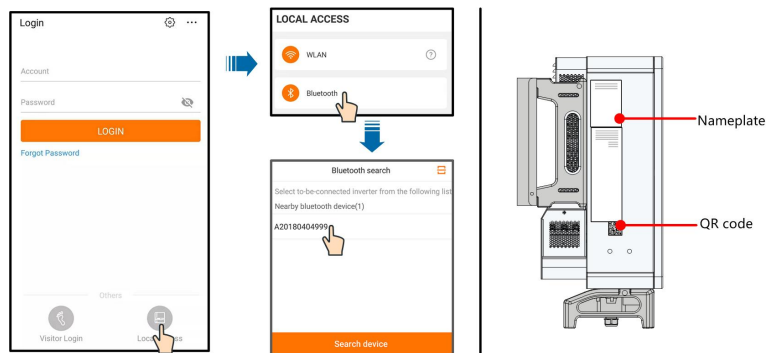


figure 7-2 Bluetooth Connection

step 3 Enter the login screen after the Bluetooth connection is established.

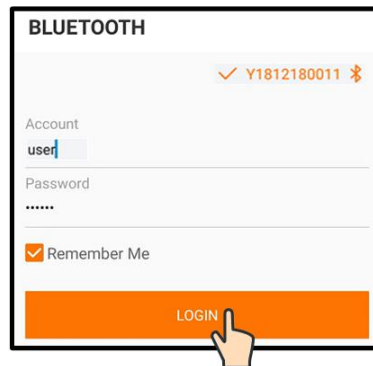


figure 7-3 Login



The username is “user”, and the initial password is "pw1111" or "111111" which should be changed for the consideration of account security.

To set inverter parameters related to grid protection and grid support, contact SUNGROW to obtain the advanced account and corresponding password.

step 4 If the inverter is not initialized, you will enter the quick setting screen of initializing protection parameter. After finishing setting on the quick setting screen, click “TURN ON DEVICE” and the device will be initialized. The App will send start instructions and the device will start and operate.

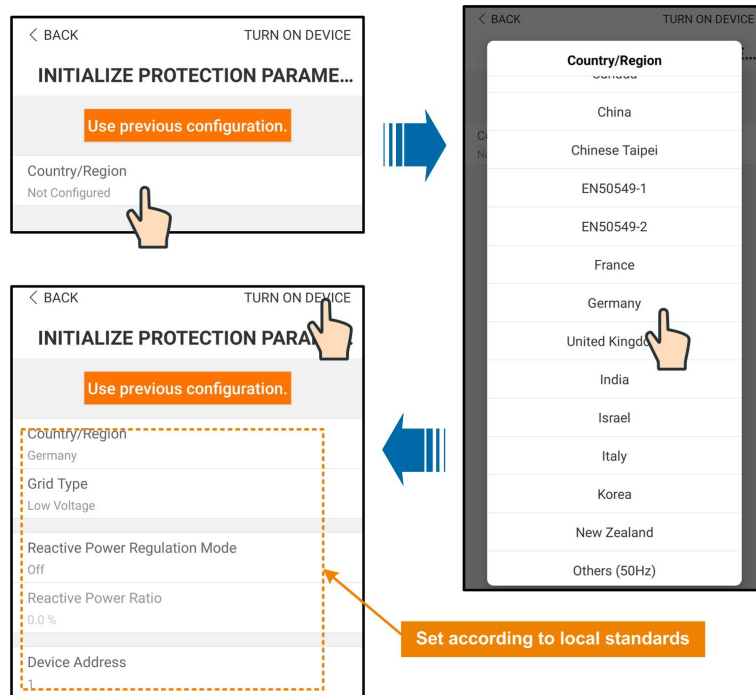


figure 7-4 Initialization Protection Parameter

NOTICE

Reset the protection parameters if the country setting is incorrect. Otherwise, a fault may occur.



In the European region, such as Netherlands, Sweden, and Denmark, whose grid code complies with EN50549, select the parameter EN50549_1 (LV grid-connection) or EN50549_2 (MV grid-connection).

In the Brazilian region, set the country code as "Brazil". Selecting "Brazil_230" or "Brazil_240" will cause setting failure.

step 5 If the inverter is initialized, the App automatically turns to its home page.

-- End

7.5 Home page

After login, the home page is as follows:

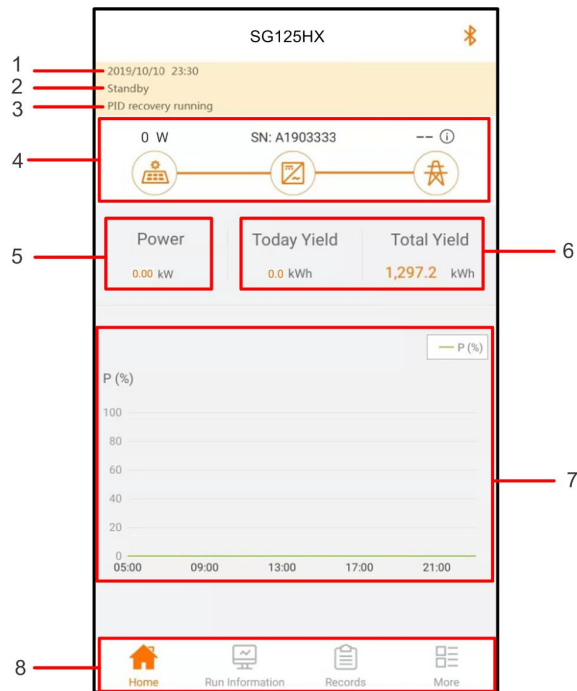


figure 7-5 Home Page

table 7-1 Home Page Description


No.	Designation	Description
1	Date and time	System date and time of the inverter.
2	Inverter state	Present operation state of the inverter. For details, refer to "table 7-2 Description of Inverter State".
3	PID state	Present state of the PID. For details, refer to "table 7-3 Description of PID State".
4	Power flow chart	Displays the PV power generation power, feed-in power, etc. The line with an arrow indicates energy flow between connected devices, and the arrow pointing indicates energy flow direction.
5	Power generation	Today power yield and accumulative power yield of the inverter.
6	Real-time power	Output power of the inverter.
7	Power curve	Shows the change of power between 5 am and 23 pm every day. (Each point on the curve represents the percentage of present inverter power to rated power).
8	Navigation bar	Including "Home", "Run-info", "His-record", and "More".

table 7-2 Description of Inverter State

State	Description
Run	After being energized, the inverter tracks the PV arrays ' maximum power point (MPP) and converts the DC power into AC power. This is the normal operation mode.
Stop	The inverter is stopped.
Key-stop	The inverter will stop operation by manually " stop " via app. In this way, inverter internal DSP stops. To restart the inverter, manually start via app.
Standby	The inverter enters standby mode when DC side input is insufficient. In this mode the inverter will wait within the standby duration.
Initial standby	The inverter is in the initial power-on standby state.
Starting	The inverter is initializing and synchronizing with the grid.
Warning	Warning information is detected.
Derating running	The inverter derates actively due to environmental factors such as temperature or altitude
Scheduling running	The inverter runs according to the scheduling instructions received from the monitoring background
Fault	If a fault occurs, the inverter will automatically stop operation, and disconnect the AC relay. The fault information will be displayed in the app. Once the fault is removed in recovery time, the inverter will automatically resume running.

table 7-3 Description of PID State

State	Description
PID recovery running	The inverters perform PID recovery actively.
PID abnormality	It is detected that the ISO impedance is abnormal or the PID cannot work normally after the PID being enabled.

If the inverter is running abnormally, the alarm or fault icon  will be displayed in the lower right corner of the inverter icon in power flow chart. The user can tap this icon to enter the alarm or fault screen to view detailed information and corrective measures.

7.6 Run Information

Tap **Run Information** on the navigation bar to enter the screen showing running information, slide the screen upwards to view all detailed information.

table 7-4 Run Information

Classification	Parameter	Description
PV Information	String n Voltage	The input voltage of the n th string
	String n current	The input current of the n th string
Inverter Information	Total On-grid Running Time	/
	Daily On-grid Running Time	/
	Negative Voltage to Ground	Inverter DC side negative to ground voltage value
	Bus Voltage	Voltage between the positive and negative poles of the DC side of the inverter
	Internal Air Temperature	/
	Array Insulation Resistance	Insulation resistance value of the input side to the protection ground
	Country Information	/
	Power Limitation Mode	/
	Reactive Power Mode	/
	Input	Total DC Power
MPPT x Voltage		The input voltage of the x th MPPT
MPPT x Current		The input current of the x th MPPT
Output	Daily Yield	/
	Monthly Yield	/
	Annual Yield	/
	Total Active Power	Current active power value of the inverter
	Total Reactive Power	Current reactive power value of the inverter
	Total Apparent Power	Current apparent power value of the inverter
	Total Power Factor	Power factor of the AC side of the inverter
	Gird Frenquency	Frequency of the AC side of the inverter
	A-B Line Voltage	Line Voltage
	B-C Line Voltage	
C-A Line Voltage		
Phase A Current	Phase Current	

Classification	Parameter	Description
	Phase B Current	
	Phase C Current	

7.7 Records

Tap **Records** on the navigation bar to enter the screen showing event records, as shown in the following figure.



figure 7-6 Records

Fault Alarm Record

Tap **Fault Alarm Record** to enter the screen, as shown in the following figure.

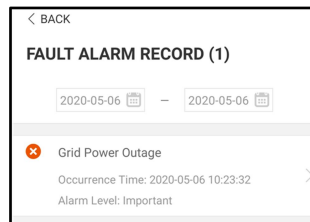



figure 7-7 Fault Alarm Record



Click  to select a time segment and view corresponding records.
The inverter can record up to 400 latest entries.

Select one of the records in the list and click the record, to view the detailed fault info as shown in following figure.

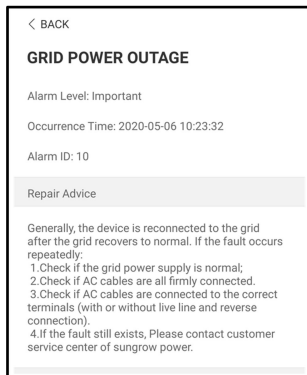


figure 7-8 Detailed Fault Alarm Information

Yield Record

Tap **Yield Record** to enter the screen showing daily power generation , as shown in the following figure.

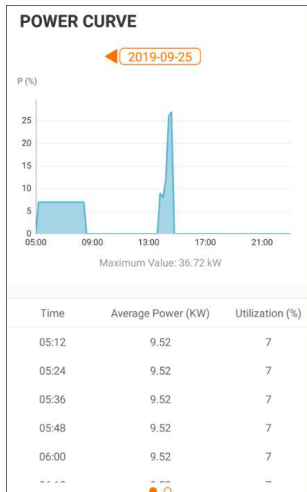


figure 7-9 Power Curve

The App displays power generation records in a variety of forms, including daily power generation graph, monthly power generation histogram, annual power generation histogram and total power generation histogram.

table 7-5 Explanation of Power Yields Records

Parameter	Description
Power curve	Shows the power output from 5 am to 11 pm in a single day. Each point on the curve is the percentage of present power to rated power.
Daily energy histogram	Shows the power output every day in the present month.

Parameter	Description
Monthly energy histogram	Shows the power output every month in a year.
Annual energy histogram	Shows the power output every year.


Tap the time bar on the top of the screen to select a time segment and view the corresponding power curve.

Swipe left to check the power yields histogram.

Event Record

Tap **Event Record** to view event record list.



Click  to select a time segment and view corresponding records.
The inverter can at most record the latest 400 events.

7.8 More

Tap **More** on the navigation bar to enter the corresponding screen, as shown in the following figure.

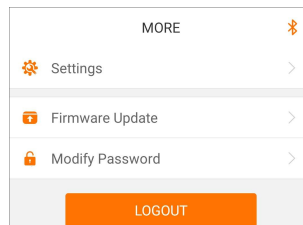


figure 7-10 More

7.8.1 System Parameters

Tap **Settings**→**System Parameters** to enter the corresponding screen, as shown in the following figure.

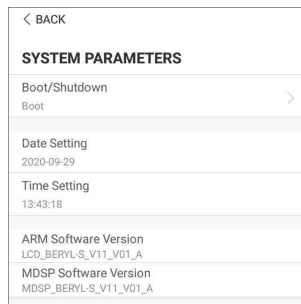


figure 7-11 System Parameters

Boot/Shutdown

Tap **Boot/Shutdown** to send the boot/shutdown instruction to the inverter.

Date/Time

The correct system time is very important. Wrong system time will directly affect the data logging and power generation value. The clock is in 24-hour format.

7.8.2 Operation Parameters

Running Time

Tap **Settings**→**Operation Parameters**→**Running Time** to enter the corresponding screen, on which you can set "Running Time".

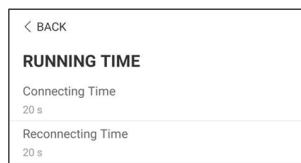


figure 7-12 Running Time

PID Parameters

Tap **Settings**→**Operation Parameters**→**PID Parameters** to enter the corresponding screen, on which you can set "PID Parameters".

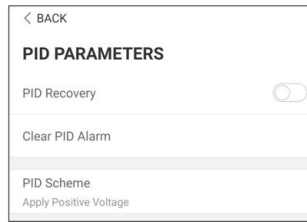


figure 7-13 PID Setting

table 7-6 PID Parameter Description

Parameter	Description
PID Recovery	Set enabling/disabling of the PID night recovery function. PID night recovery function operates between 22:00 pm and 5:00 am by default.
Clear PID alarm	If ISO impedance abnormality or PID function exception is detected during running of the PID function, the inverter reports a PID false alarm and reminds the user to take corresponding measures. After processing, clear the alarm via this parameter.
PID Scheme	Apply negative or positive voltage.

AFCI Parameters(Optional)

Tap **Settings**→**Operation Parameters**→**AFCI Parameters** to enter the corresponding screen, on which you can set "AFCI Parameters".

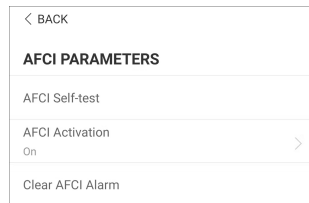


figure 7-14 AFCI Setting

7.8.3 Power Regulation Parameters

Active Power Regulation

Tap **Settings**→**Power Regulation Parameters**→**Active Power Regulation** to enter the screen, as shown in the following figure.

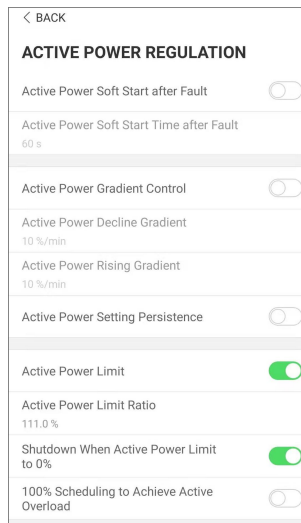


figure 7-15 Active Power Regulation

table 7-7 Active Power Regulation

Parameter	Definition/Setting Description	Range
Active power soft start after fault	The switch for enabling/disabling the soft start function after a fault occurs.	Enable/Disable
Active power soft start time after fault	Time that the soft start takes to raise the power from 0 to 100% rated power.	1 s~1200s
Active power gradient control	Switch for enabling/disabling the active power rate settable function.	Enable/Disable
Active power decline gradient	The decline rate of inverter active power per minute.	3%/min~6000%/min
Active power rising gradient	The rise rate of inverter active power per minute.	3%/min~6000%/min
Active power setting persistence	Switch for enabling/disabling the function of saving output limited power.	Enable/Disable
Active power limit	The switch for limiting output power.	Enable/Disable

Parameter	Definition/Setting Description	Range
Active power limit ratio	The ratio of limiting output power to rated power in percentage.	0%~100%
Shutdown when active power limit to 0%	Switch used to determine whether the inverter is in stop state when the limited power reaches 0.	Enable/Disable

Reactive Power Regulation

Tap **Settings**→**Power Regulation Parameters**→**Reactive Power Regulation** to enter the screen, as shown in the following figure.



figure 7-16 Reactive Power Regulation

table 7-8 Reactive Power Regulation

Parameter	Definition/Setting Description	Range
Reactive power generation at night	Switch for enabling/disabling night SVG function.	Enable/Disable
Reactive power ratio at night	Reactive power ratio set for the night SVG function.	-100%~0%/0%~100%
Reactive power setting persistence	Switch for enabling/disabling the power-off function during reactive power.	Enable/Disable
Reactive power regulation mode	—	Off/PF/Qt/Q(P)/Q(U)

Parameter	Definition/Setting Description	Range
Reactive power regulation	Switch for enabling/disabling reactive response function.	Enable/Disable
Reactive power regulation time	Ends time of reactive response.	0.1s~600.0s
Q(P)Curve	Select the corresponding curve according to local regulations	Curve A/Curve B/Curve C*
QP_P1	Output power at P1 on the Q (P) mode curve (in percentage)	10.0%~100.0%
QP_P2	Output power at P2 on the Q (P) mode curve (in percentage)	20.0%~100.0%
QP_P3	Output power at P3 on the Q (P) mode curve (in percentage)	20.0%~100.0%
QP_K1	Power factor at P1 on the Q (P) mode curve	Curve A/Curve C:0.800~1.000 Curve B: [-0.600~0.600]*-Active Overload Rate/1000
QP_K2	Power factor at P2 on the Q (P) mode curve	Curve A/Curve C: 0.800~1.000 Curve B: [-0.600~0.600]*-Active Overload Rate/1000
QP_K3	Power factor at P3 on the Q (P) mode curve	Curve A/Curve C: 0.800~1.000 Curve B: [-0.600~0.600]*-Active Overload Rate/1000
QP_EnterVoltage	Voltage percentage for Q(P) function activation	100.0%~110.0%
QP_ExitVoltage	Voltage percentage for Q(P) function deactivation	90.0%~100.0%
QP_EXitPower	Power percentage for Q(P) function deactivation	1.0%~20.0%

Parameter	Definition/Setting Description	Range
QP_EnableMode	Unconditional activation/ deactivation of Q(P) function	Yes/No
Q(U)Curve	Select the corresponding curve according to local regulations	Curve A/Curve B/Curve C*
QU_V1	Pre-set grid voltage U1 that is reactive according to the grid voltage	80.0%~100.0%
QU_Q1	Pre-set proportion of reactive power according to the grid voltage U1	[-60.0%~0]* Overload Rate/1000
QU_V2	Pre-set grid voltage U2 that is reactive according to the grid voltage.	80.0%~100.0%
QU_Q2	Pre-set proportion of reactive power according to the grid voltage U2.	[-60.0%~60.0%]* Overload Rate/1000
QU_V3	Pre-set grid voltage U3 that is reactive according to the grid voltage.	100.0%~120.0%
QU_Q3	Pre-set proportion of reactive power according to the grid voltage U3.	[-60.0%~60.0%]* Overload Rate/1000
QU_V4	Pre-set grid voltage U4 that is reactive according to the grid voltage.	100.0%~120.0%
QU_Q4	Pre-set proportion of reactive power according to the grid voltage U4.	[0~60.0%]* Overload Rate/ 1000
QU_EnterPower	Active power for Q(U) function activation	20.0%~100.0%
QU_EXitPower	Active power for Q(U) function deactivation	1.0%~20.0%

Parameter	Definition/Setting Description	Range
QU_EnableMode	Unconditional activation/ deactivation of Q(U) function	Yes/No/Yes,Limited by PF
QU_Limited PF Value	—	0~0.95

**Curve C is reserved and consistent with Curve A currently.

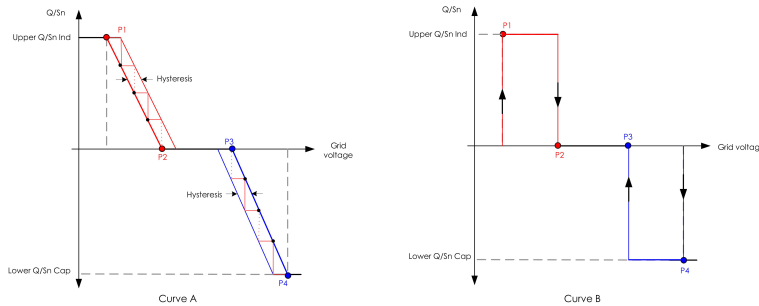


figure 7-17 Q(U) Curve

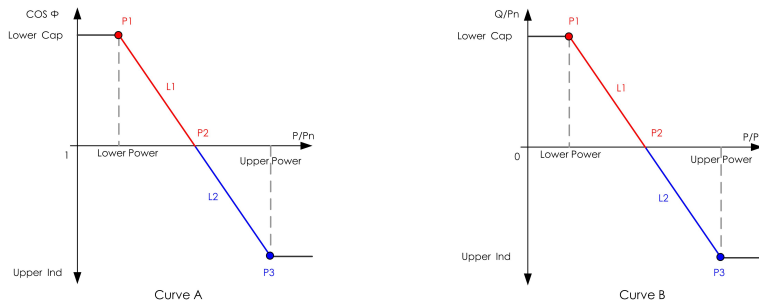


figure 7-18 Q(P) Curve

7.8.4 Communication Parameters

Tap **Settings**→**Communication Parameters** to enter the corresponding screen, as shown in the following figure. The device address ranges from 1 to 246.

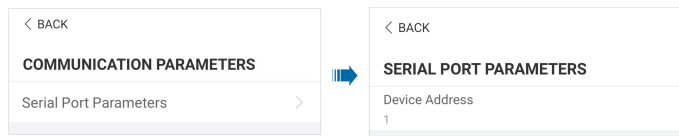



figure 7-19 Communication Parameters

7.8.5 Firmware Update

To avoid download failure due to poor on-site network signal, it is recommended to download the firmware package to the mobile device in advance.

step 1 Enable the "Mobile data" of the mobile device.

step 2 Open the App, tap  at the upper right corner and select **Firmware Download**.

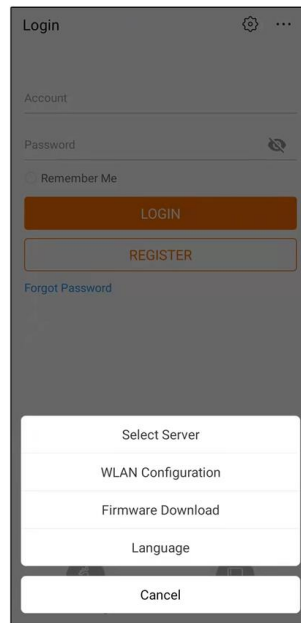


figure 7-20 Firmware Download

step 3 Select the firmware from the file list and download. Tap **Downloaded** to view successfully downloaded firmware package.

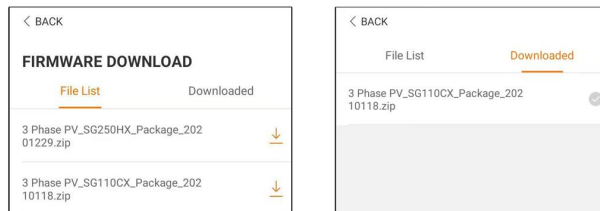


figure 7-21 Downloading Firmware Package

step 4 Login the App via local access mode. Refer to "7.4 Login".

step 5 Tab **More** on the App home screen and then tab **Firmware Upgrade**. Select the desired upgrade package to upgrade the firmware.

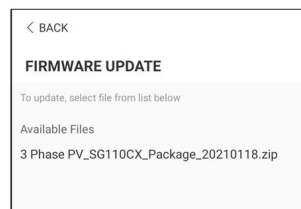
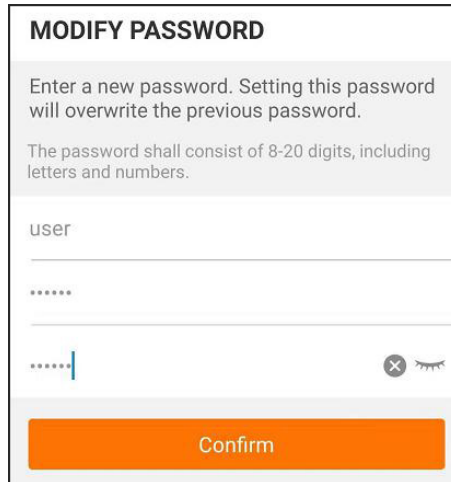


figure 7-22 Updating Firmware

-- End

7.8.6 Password Changing

Tap **Modify Password** to enter the modify password screen, as shown in the following figure.




MODIFY PASSWORD

Enter a new password. Setting this password will overwrite the previous password.

The password shall consist of 8-20 digits, including letters and numbers.

user

.....

..... | 

Confirm

figure 7-23 Change Password

The password shall consist of 8 – 20 digits, including letters and numbers.

8 System Decommissioning

8.1 Disconnecting the Inverter

For maintenance or other service work, the inverter must be switched off.

Proceed as follows to disconnect the inverter from the AC and DC power sources. Lethal voltages or damage to the inverter will follow if otherwise.

- step 1** Disconnect the external AC circuit breaker and secure it against reconnection.
- step 2** Rotate the DC switch to the "OFF" position for disconnecting all of the PV string inputs.
- step 3** Wait about 5 minutes until the capacitors inside the inverter completely discharge.
- step 4** Ensure that the DC cable is current-free via a current clamp.
- step 5** Insert a H4 PLUS wrench into the notch and press the wrench with an appropriate force to remove the DC connector.
- step 6** Ensure that the AC wiring terminals are voltage-free via a multimeter, and remove the AC wires and communication wires.
- step 7** Install the H4 PLUS waterproof plugs.



For further disconnection and reconnection instructions, please visit the webpage of respective component manufacturer.

-- End

8.2 Dismantling the Inverter

CAUTION

Risk of burn injuries and electric shock!

Do not touch any inner live parts until for at least 5 minutes after disconnecting the inverter from the utility grid and the PV input.

- step 1** Refer to "[5 Electrical Connection](#)" for the inverter disconnection of all cables in reverse steps.
- step 2** Dismantle the inverter referring to "[4 Mechanical Mounting](#)" in reverse steps.
- step 3** If necessary, remove the wall-mounting bracket from the wall.
- step 4** If the inverter will be reinstalled in the future, please refer to "[3.2 Inverter Storage](#)" for a proper conservation.

-- End

8.3 Disposal of the Inverter

Users take the responsibility for the disposal of the inverter.

NOTICE

Some parts and devices of the inverter, such as the capacitors, may cause environmental pollution.

Do not dispose of the product together with household waste but in accordance with the disposal regulations for electronic waste applicable at the installation site.

9 Troubleshooting and Maintenance

9.1 Troubleshooting

Once a fault occurs in the inverter, the fault information can be displayed on the App interface.

Fault codes and check methods are as follows:

Fault Code	Description	Check method
002	Grid overvoltage, the grid voltage is higher than the set protection value	Generally, the inverter will be reconnected to the grid after the grid returns to normal. If the fault occurs repeatedly: <ol style="list-style-type: none">1. Measure the actual grid voltage, and contact the local electric power company for solutions if the grid voltage is higher than the set value.2. Check whether the protection parameters are appropriately set via the App.3. Check whether the cross-sectional area of the AC cable meets the requirement.4. If the fault is not caused by the foregoing reasons and still exists, contact SUNGROW.
003	Grid transient overvoltage, the transient grid voltage is higher than the standard value.	Generally, the inverter will be reconnected to the grid after the grid returns to normal. If the fault occurs repeatedly, contact SUNGROW.

Fault Code	Description	Check method
004	Grid undervoltage, the grid voltage is lower than the set protection value	<p>Generally, the inverter will be reconnected to the grid after the grid returns to normal. If the fault occurs repeatedly:</p> <ol style="list-style-type: none"> 1. Measure the actual grid voltage, and contact the local electric power company for solutions if the grid voltage is lower than the set value. 2. Check whether the protection parameters are appropriately set via the App. 3. Check whether the AC cable is firmly connected in place. 4. If the fault is not caused by the foregoing reasons and still exists, contact SUNGROW.
005	Grid low voltage, the grid voltage is lower than the set protection value	<p>Generally, the inverter will be reconnected to the grid after the grid returns to normal. If the fault occurs repeatedly:</p> <ol style="list-style-type: none"> 1. Measure the actual grid voltage, and contact the local electric power company for solutions if the grid voltage is lower than the set value. 2. Check whether the protection parameters are appropriately set via the App. 3. Check whether the AC cable is firmly connected in place. 4. If the fault is not caused by the foregoing reasons and still exists, contact SUNGROW.
007	AC instantaneous overcurrent, AC output current exceeds the upper limit of the inverter.	<p>Generally, the inverter will be reconnected to the grid after the grid returns to normal. If the fault occurs repeatedly, contact SUNGROW.</p>

Fault Code	Description	Check method
008	Grid overfrequency, Grid frequency exceeds the upper limit of the inverter.	Generally, the inverter will be reconnected to the grid after the grid returns to normal. If the fault occurs repeatedly: 1. Measure the actual grid frequency, and contact the local electric power company for solutions if the grid frequency is beyond the set range.
009	Grid underfrequency, Grid frequency is lower than the lower limit of the inverter.	2. Check whether the protection parameters are appropriately set via the App. 3. If the fault is not caused by the foregoing reasons and still exists, contact SUNGROW.
010	Grid power outage, AC switch or circuit is disconnected.	Generally, the inverter will be reconnected to the grid after the grid returns to normal. If the fault occurs repeatedly: 1. Check whether the grid supplies power reliably. 2. Check whether the AC cable is firmly connected in place. 3. Check whether the AC cable is connected to the correct terminal (whether the live wire and the N wire are correctly in place). 4. Check whether the AC circuit breaker is connected. 5. If the fault is not caused by the foregoing reasons and still exists, contact SUNGROW.
011	Device anomaly	Wait for the inverter to return to normal. Disconnect the AC and DC switches, and reconnect the AC and DC switches 15 minutes later to restart the inverter. If the fault still exists, contact SUNGROW.

Fault Code	Description	Check method
012	Excessive leakage current	<p>1. The fault can be caused by poor sunlight or damp environment, and the inverter will be reconnected to the grid after the environment is improved.</p> <p>2. If the environment is normal, check whether the AC and DC cables are well insulated.</p> <p>3. If the fault is not caused by the foregoing reasons and still exists, contact SUNGROW.</p>
013	Grid abnormal, the grid voltage or frequency is out of the permissible range, and the inverter cannot be connected to the grid normally.	<p>Generally, the inverter will be reconnected to the grid after the grid returns to normal. If the fault occurs repeatedly:</p> <p>1. Measure the actual grid frequency, and contact the local electric power company for solutions if the grid parameter exceeds the set value.</p> <p>2. If the fault is not caused by the foregoing reasons and still exists, contact SUNGROW.</p>
014	10-minute grid overvoltage, the grid voltage exceeds the preset AC voltage of the inverter for a long time.	<p>Wait for the inverter to return to normal.</p> <p>If the fault occurs repeatedly, contact SUNGROW.</p>
015	Grid overvoltage, the grid voltage is higher than the set protection value	<p>Generally, the inverter will be reconnected to the grid after the grid returns to normal. If the fault occurs repeatedly:</p> <p>1. Measure the actual grid voltage, and contact the local electric power company for solutions if the grid voltage is higher than the set value.</p> <p>2. Check whether the protection parameters are appropriately set via the App.</p> <p>3. Check whether the cross-sectional area of the AC cable meets the requirement.</p> <p>4. If the fault is not caused by the foregoing reasons and still exists, contact SUNGROW.</p>

Fault Code	Description	Check method
016	Output overload, the configured module power is excessively large and out of the normal operation range of the inverter.	Wait for the inverter to return to normal. If the fault still exists, contact SUNGROW.
017	Grid voltage unbalance, the inverter detects unbalanced three-phase grid voltage	Generally, the inverter will be reconnected to the grid after the grid returns to normal. If the fault occurs repeatedly: 1. Measure the actual grid voltage. If grid phase voltages differ greatly, contact the power company for solutions. 2. If the voltage difference between the three phases is within the permissible range of the local power company, modify the grid voltage imbalance parameter through the App. 3. If the fault is not caused by the foregoing reasons and still exists, contact SUNGROW.
019-020	Device anomaly	Wait for the inverter to return to normal. Disconnect the AC and DC switches, and reconnect the AC and DC switches 15 minutes later to restart the inverter. If the fault still exists, contact SUNGROW.
021-022	Device anomaly	Wait for the inverter to return to normal. Disconnect the AC and DC switches, and reconnect the AC and DC switches 15 minutes later to restart the inverter. If the fault still exists, contact SUNGROW.
024-025 030-034	Device anomaly	Wait for the inverter to return to normal. Disconnect the AC and DC switches, and reconnect the AC and DC switches 15 minutes later to restart the inverter. If the fault still exists, contact SUNGROW.

Fault Code	Description	Check method
036	Temperature anomaly, the temperature of the power module is excessively high and out of the safe range.	<ol style="list-style-type: none"> 1. Check whether the inverter is directly exposed to sunlight. If so, take some shading measures. 2. Check and clean the air ducts. 3. Check whether there is 070 (fan anomaly) alarm via the App. If so, replace the fans.
037	Temperature anomaly, the temperature of the interior of the inverter is excessively high and out of the safe range.	<ol style="list-style-type: none"> 1. Check whether the inverter is directly exposed to sunlight. If so, take some shading measures. 2. Check and clean the air ducts. 3. Check whether there is 070 (fan anomaly) alarm via the App. If so, replace the fans.
038	Device anomaly	<p>Wait for the inverter to return to normal.</p> <p>Disconnect the AC and DC switches, and reconnect the AC and DC switches 15 minutes later to restart the inverter.</p> <p>If the fault still exists, contact SUNGROW.</p>
039	Low system insulation resistance, which is generally caused by poor insulation to ground of the module/ cable or by rainy and damp environment.	<p>Wait for the inverter to return to normal. If the fault occurs repeatedly:</p> <ol style="list-style-type: none"> 1. Check whether the ISO resistance protection value is excessively high via the App, and ensure that it complies with the local regulations. 2. Check the resistance to ground of the string and DC cable. Take correction measures in case of short circuit or damaged insulation layer. 3. If the cable is normal and the fault occurs on rainy days, check it again when the weather turns fine. 4. If the fault is not caused by the foregoing reasons and still exists, contact SUNGROW.

Fault Code	Description	Check method
040-042	Device anomaly	Wait for the inverter to return to normal. Disconnect the AC and DC switches, and reconnect the AC and DC switches 15 minutes later to restart the inverter. If the fault still exists, contact SUNGROW.
043	Low ambient temperature, the ambient temperature is lower than the temperature at which the inverter can operate normally.	Stop and disconnect the inverter. Restart the inverter when the ambient temperature falls within the operation temperature range.
044-046	Device anomaly	Wait for the inverter to return to normal. Disconnect the AC and DC switches, and reconnect the AC and DC switches 15 minutes later to restart the inverter. If the fault still exists, contact SUNGROW.
047	PV input configuration abnormal, PV input mode error	Stop and disconnect the inverter. Reset the input mode of the PV array.
048-050 053-056 059-060	Device anomaly	Wait for the inverter to return to normal. Disconnect the AC and DC switches, and reconnect the AC and DC switches 15 minutes later to restart the inverter. If the fault still exists, contact SUNGROW.
070	Fan alarm	1. Check whether the fans operate normally and are blocked by sundries. If they are blocked, clear the sundries. 2. If a fan does not operate normally, stop and disconnect the inverter to replace the fan.
071 072	AC-side SPD alarm DC-side SPD alarm	Check the SPD, and replace it if necessary.
076	Device anomaly	Wait for the inverter to return to normal. Disconnect the AC and DC switches, and reconnect the AC and DC switches 15 minutes later to restart the inverter. If the fault still exists, contact SUNGROW.

Fault Code	Description	Check method
078-081	PVx abnormal	<p>1. Check if the xth PV string needs to be connected.</p> <p>If not, ignore the alarm; and</p> <p>If so, check the connection status and make sure it is connected reliably.</p> <p>2. Check if the xth DC fuse is damaged. If so, replace the fuse.</p> <p>3.If the fault is not caused by the foregoing reasons and still exists, contact SUNGROW.</p> <p>*The code 078 to code 081 are corresponding to PV 1 to PV 4 respectively.</p>
087	AFCI Abnormal	<p>1. The inverter can continue running.</p> <p>2. Check whether the related cable connection and terminal are abnormal, check whether there are any foreign materials or other environmental abnormalities, and take corresponding corrective measures when necessary.</p> <p>3. If the alarm occurs repeatedly, please contact Sungrow Service.</p>
088	Electric Arc Fault	<p>1. Disconnect the DC Power supply, and check whether any DC cable is damaged, the connection terminal or fuse is loose or there is a weak contact, or some components are burned. If so, replace the damaged cable, fasten the terminal or fuse, and replace the burnt component.</p> <p>2. After performing step 1, reconnect the DC Power supply, and clear the electric Arc fault via the LCD display or the APP, after that the inverter will return to normal operation.</p> <p>3. If the fault is not caused by the foregoing reasons and still exists, please contact Sungrow Service.</p>

Fault Code	Description	Check method
089	AFCI Disabled	<ol style="list-style-type: none"> 1. The inverter can continue running. 2. Check whether the related cable connection and terminal are abnormal, check whether there are any foreign materials or other environmental abnormalities, and take corresponding corrective measures when necessary. 3. If the alarm occurs repeatedly, please contact Sungrow Service.
105	Protection self-check failure on grid side	<p>Restart the inverter or clear the fault through the App.</p> <p>If the fault still exists, contact SUNGROW.</p>
106	Grounding cable fault	<ol style="list-style-type: none"> 1. Check whether the AC cable is correctly connected. 2. Check whether the insulation between the ground cable and the live wire is normal. 3. If the fault is not caused by the foregoing reasons and still exists, contact SUNGROW.
116-117	Device anomaly	<p>Wait for the inverter to return to normal.</p> <p>Disconnect the AC and DC switches, and reconnect the AC and DC switches 15 minutes later to restart the inverter.</p> <p>If the fault still exists, contact SUNGROW.</p>
220~227	PVx abnormal	<ol style="list-style-type: none"> 1. Check if the xth PV string needs to be connected. <p>If not, ignore the alarm; and</p> <p>If so, check the connection status and make sure it is connected reliably.</p> <ol style="list-style-type: none"> 2. Check if the xth DC fuse is damaged. If so, replace the fuse. 3. If the fault is not caused by the foregoing reasons and still exists, contact SUNGROW. <p>*The code 220 to code 227 are corresponding to PV 5 to PV 12 respectively.</p>

Fault Code	Description	Check method
332~355	Boost Capacitor Overvoltage Alarm	<ol style="list-style-type: none"> 1. The inverter can continue running. 2. Check whether the related cable connection and terminal are abnormal, check whether there are any foreign materials or other environmental abnormalities, and take corresponding corrective measures when necessary. 3. If the alarm occurs repeatedly, please contact SUNGROW.
364~387	Boost Capacitor Overvoltage Fault	<ol style="list-style-type: none"> 1. Disconnect the AC side switch and the DC side switch. If there is a battery, disconnect the battery side switch and wait for 15 minutes to close the AC and DC switch and restart the system. 2. If the fault still exists, please contact SUNGROW.
448~471	String x reverse connection fault	<ol style="list-style-type: none"> 1. Check whether the corresponding string is of reverse polarity. If so, disconnect the DC switch and adjust the polarity when the irradiance is low and the string current drops below 0.5A. 2. If the fault is not caused by the foregoing reasons and still exists, contact SUNGROW. <p>*The code 448 to code 471 are corresponding to string 1 to string 24 respectively.</p>
532~547	String x reverse connection alarm	<ol style="list-style-type: none"> 1. Check whether the corresponding string is of reverse polarity. If so, disconnect the DC switch and adjust the polarity when the irradiance is low and the string current drops below 0.5A. 2. If the fault is not caused by the foregoing reasons and still exists, contact SUNGROW. <p>*The code 532 to code 547 are corresponding to string 1 to string 16 respectively.</p>

Fault Code	Description	Check method
548-563	String x output current anomaly	<p>1. Check whether the corresponding module is sheltered. If so, remove the shelter and ensure module cleanness.</p> <p>2. Check the module for abnormal aging.</p> <p>3. If the fault is not caused by the foregoing reasons and still exists, contact SUNGROW.</p> <p>*The code 548 to code 563 are corresponding to string 1 to string 16 respectively.</p>
564-571	String x reverse connection alarm	<p>1. Check whether the corresponding string is of reverse polarity. If so, disconnect the DC switch and adjust the polarity when the irradiance is low and the string current drops below 0.5A.</p> <p>2. If the fault is not caused by the foregoing reasons and still exists, contact SUNGROW.</p> <p>*The code 564 to code 571 are corresponding to string 17 to string 24 respectively.</p>
580-587	String x output current anomaly	<p>1. Check whether the corresponding module is sheltered. If so, remove the shelter and ensure module cleanness.</p> <p>2. Check the module for abnormal aging.</p> <p>3. If the fault is not caused by the foregoing reasons and still exists, contact SUNGROW.</p> <p>*The code 580 and 587 are corresponding to string 17 and string 24 respectively.</p>

9.2 Maintenance

9.2.1 Maintenance Notices

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 procedure.

- Disconnect the AC circuit breaker and then set the DC load-break switch of the inverter to OFF;
- Wait at least 5 minutes for inner capacitors to discharge completely;
- Verify that there is no voltage or current before pulling any connector.

CAUTION

Keep non-related persons away!

A temporary warning sign or barrier must be posted to keep non-related persons away while performing electrical connection and service work.

NOTICE

Restart the inverter only after removing the fault that impairs safety performance.

As the inverter contains no component parts that can be maintained, never arbitrarily replace any internal components.

For any maintenance need, please contact SUNGROW. Otherwise, SUNGROW shall not be held liable for any damage caused.



Servicing of the device in accordance with the manual should never be undertaken in the absence of proper tools, test equipments or the latest revision of the manual which has been clearly and thoroughly understood.

9.2.2 Routine Maintenance

Item	Method	Period
System clean	Check the temperature and dust of the inverter. Clean the inverter enclosure if necessary.	Six months to a year (depending on the dust contents in air)
Electrical connection	Check whether all cable are firmly connected in place. Check whether there is damage to the cables, especially the surface in contact with metal.	6 months after commissioning and then once or twice a year.
General status of the system	<ul style="list-style-type: none"> • Visual check for any damage or deformation of the inverter. • Check any abnormal noise during the operation. • Check each operation parameter. • Be sure that nothing covers the heat sink of the inverter. 	Every 6 months

9.2.3 Cleaning Air Inlet and Outlet

A significant amount of heat is generated when the inverter is working.

In order to maintain good ventilation, please check to make sure the air inlet and outlet are not blocked.

Clean the air inlet and outlet with soft brush or vacuum cleaner if necessary.

9.2.4 Fan Maintenance

⚠ DANGER

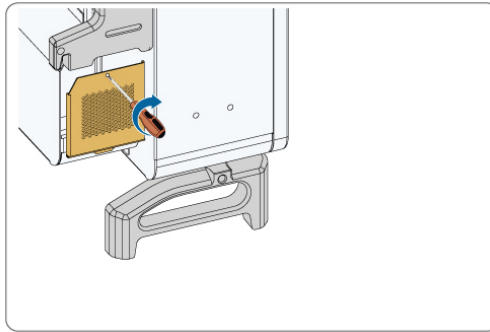
- Stop the inverter and disconnect it from all power supplies before maintenance.
- Lethal voltage still exists in the inverter. Please wait for at least 5 minutes and then perform maintenance work.
- Only qualified electricians can maintain the fans.

Fans inside the inverter are used to cool the inverter during operation. If the fans do not operate normally, the inverter may not be cooled down and inverter efficiency may decrease. Therefore, it is necessary to clean dirty fans and replace the broken fans in a timely manner.

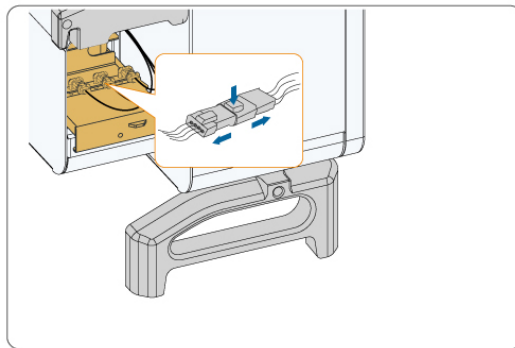
The operation procedure is as follows:

step 1 Stop the inverter (see 8.1 Disconnecting the Inverter).

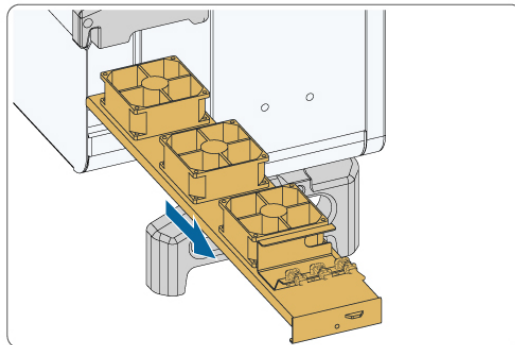
step 2 Loosen the screw on the sealing plate of the fan module.



step 3 Press the tab of the latch hook, unplug the cable connection joint outwards, and loosen the screw on the fan holder.



step 4 Pull out the fan module, clean the fans with soft brush or vacuum cleaner, and replace them when necessary.



step 5 Reinstall the fan back to the inverter in reverse order and restart the inverter.

-- End

10 Appendix

10.1 Technical Data

Parameters	SG125HX
Input (DC)	
Max. PV input voltage	1500V
Min.PV input voltage/Startup input voltage	500V / 550V
Nominal input voltage	1160V
MPP voltage range	500 ~ 1500V
MPP voltage range for nominal power	860 ~ 1300V
No. of independent MPP inputs	6
Max. number of PV strings per MPPT	2
Max. PV input current per MPPT	30 A
Max. DC short-circuit current per MPPT	50 A
Output (AC)	
AC output power	125 kVA @ 40 °C / 113.6 kVA @ 50 °C
Max. AC output current	90.2 A
Nominal AC voltage	3 / PE, 800 V
AC voltage range	680 ~ 880V
Nominal grid frequency/Grid frequency range	50Hz / 45~55Hz , 60Hz / 55~65Hz
Total harmonic distortion (THD)	< 3 % (at nominal power)
DC current injection	<0.5%In
Power factor at nominal power	>0.99
Adjustable power factor	0.8 leading – 0.8 lagging
Feed-in phases / Connection phases	3/3
Efficiency	
Max. efficiency / European efficiency	99.0% / 98.7%

Parameters	SG125HX
Protection	
DC reverse connection protection	Yes
AC short-circuit protection	Yes
Leakage current protection	Yes
Grid monitoring	Yes
Ground fault monitoring	Yes
DC switch / AC switch	Yes / No
PV string current monitoring	Yes
Q at night	Yes
An-ti PID and PID recovery function	Yes
Overvoltage protection	DC Type II / AC Type I + II
General Data	
Dimensions (W*H*D)	916*690*340mm
Weight	75 kg
Isolation method	Transformerless
Degree of protection	IP66
Night power consumption	< 7 W
Operating ambient temperature range	-30 to 60 °C
Allowable relative humidity range (non-condensing)	0 ~ 100%
Cooling method	Smart forced air cooling
Max. operating altitude	5000 m (> 4000 m derating)
Display	LED, Bluetooth+APP
Communication	RS485 / PLC
DC connection type	H4 PLUS (Max. 6 mm ² , optional 10mm ²)
AC connection type	OT/DT terminal (Max. 120mm ²)
Grid Support	Q at night function, LVRT, HVRT, active & reactive power control and power ramp rate control

* The ingress protection rating of the AC wiring box is IP65.

10.2 Wiring Distance of DI Dry Contact

The maximum wiring distance of DC dry contact must meet the requirements in the Table below. The wiring distance L is the total length of all DI signal cables.

$$L = \sum_{k=1}^n L_k$$

L_k refers to the cable length in one direction between the DI dry contact terminal of the k^{th} inverter and the corresponding terminal of the $(k-1)^{\text{th}}$ inverter.

table 10-1 Correspondence between number of inverters and maximum wiring distance

Number of inverter	Maximum wiring distance(unit:m)	
	16AWG / 1.31mm ²	17AWG / 1.026mm ²
1	13030	10552
2	6515	5276
3	4343	3517
4	3258	2638
5	2606	2110
6	2172	1759
7	1861	1507
8	1629	1319
9	1448	1172
10	1303	1055
11	1185	959
12	1086	879
13	1002	812
14	931	754
15	869	703
16	814	660
17	766	621
18	724	586
19	686	555
20	652	528
21	620	502
22	592	480
23	567	459
24	543	440
25	521	422

NOTICE

In case the specification of the cable used is not included in the Table above, when there is only one inverter, ensure that the line impedance of the input node is less than 300Ω ; and when there are multiple inverters connected in the daisy chain, ensure that the impedance is less than $300\Omega/\text{number of inverter}$.

10.3 Quality Assurance

When product faults occur during the warranty period, SUNGROW will provide free service or replace the product with a new one.

Evidence

During the warranty period, the customer shall provide the product purchase invoice and date. In addition, the trademark on the product shall be undamaged and legible. Otherwise, SUNGROW has the right to refuse to honor the quality guarantee.

Conditions

- After replacement, unqualified products shall be processed by SUNGROW.
- The customer shall give SUNGROW a reasonable period to repair the faulty device.

Exclusion of Liability

In the following circumstances, SUNGROW has the right to refuse to honor the quality guarantee:

- The free warranty period for the whole machine/components has expired.
- The device is damaged during transport.
- The device is incorrectly installed, refitted, or used.
- The device operates in harsh conditions beyond those described in this manual.
- The fault or damage is caused by installation, repairs, modification, or disassembly performed by a service provider or personnel not from SUNGROW.
- The fault or damage is caused by the use of non-standard or non-SUNGROW components or software.
- The installation and use range are beyond stipulations of relevant international standards.
- The damage is caused by unexpected natural factors.

For faulty products in any of above cases, if the customer requests maintenance, paid maintenance service may be provided based on the judgment of SUNGROW.

10.4 Contact Information

Should you have any question about this product, please contact us.

We need the following information to provide you the best assistance:

- Model of the device
- Serial number of the device
- Fault code/name
- Brief description of the problem

China (HQ)

Sungrow Power Supply Co., Ltd
Hefei
+86 551 65327834
service@sungrowpower.com

Australia

Sungrow Australia Group Pty. Ltd.
Sydney
+61 2 9922 1522
service@sungrowpower.com.au

Brazil

Sungrow Do Brasil
Sao Paulo
+55 0800 677 6000
latam.service@sungrowamericas.com

France

Sungrow France
Lyon
+33420102107
service@sungrow-emea.com

Germany, Austria, Switzerland

Sungrow Deutschland GmbH
Munich
+49 0800 4327 9289
service@sungrow-emea.com

Greece

Service Partner – Survey Digital
+30 2391052757
service@sungrow-emea.com

India

Sungrow (India) Private Limited
Gurgaon
+91 080 41201350
service@in.sungrowpower.com

Italy

Sungrow Italy
Verona
+39 0800 974739 (Residential)
+39 045 4752117 (Others)
service@sungrow-emea.com

Japan

Sungrow Japan K.K.
Tokyo
+ 81 3 6262 9917
service@jp.sungrowpower.com

Korea

Sungrow Power Korea Limited
Seoul
+82 70 7719 1889
service@kr.sungrowpower.com

Malaysia

Sungrow SEA
Selangor Darul Ehsan
+60 19 897 3360
service@my.sungrowpower.com

Philippines

Sungrow Power Supply Co., Ltd
Mandaluyong City
+63 9173022769
service@ph.sungrowpower.com

<p>Thailand</p> <p>Sungrow Thailand Co., Ltd.</p> <p>Bangkok</p> <p>+66 891246053</p> <p>service@th.sungrowpower.com</p>	<p>Spain</p> <p>Sungrow Ib é rica S.A.U.</p> <p>Mutilva</p> <p>+34 948 05 22 04</p> <p>service@sungrow-emea.com</p>
<p>Romania</p> <p>Service Partner - Elerex</p> <p>service@sungrow-emea.com</p>	<p>Turkey</p> <p>Sungrow Deutschland GmbH Turkey</p> <p>Istanbul</p> <p>+90 216 663 61 80</p> <p>service@sungrow-emea.com</p>
<p>UK</p> <p>Sungrow Power UK Ltd.</p> <p>Milton Keynes</p> <p>+44 (0) 01908 414127</p> <p>service@sungrow-emea.com</p>	<p>U.S.A, Mexico</p> <p>Sungrow USA Corporation</p> <p>Phoenix</p> <p>+1 833 747 6937</p> <p>techsupport@sungrow-na.com</p>
<p>Vietnam</p> <p>Sungrow Vietnam</p> <p>Hanoi</p> <p>+84 918 402 140</p> <p>service@vn.sungrowpower.com</p>	<p>Belgium, Netherlands and Luxembourg (Benelus)</p> <p>+31 08000227012 (only for Netherlands)</p> <p>service@sungrow-emea.com</p>
<p>Poland</p> <p>+48 221530484</p> <p>service@sungrow-emea.com</p>	-