

USER'S MANUAL

PV Grid Inverter

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1.Notes on this manual

1.1 Validity and information

This manual describe the assembly, installation, commissioning, communication, trouble shooting and maintenance of the following M series inverter model:3000M,3600M,4200M, 4600M,5000M,6000M.

The manual and other documents must be stored in a convenient place and be available at all times. For possible changes in this manual, we accepts no responsibilities to inform the users.

1.2 Target Group

This manual is for qualified personnel. Qualified personnel have received training and have demonstrated skills and knowledge in the construction and operation of this device. Qualified personnel are trained to deal with the dangers and hazards involved in installing electric devices.

Any trouble in the installation, you can contact the supplier .

1.3 Symbols in this document

1.3.1 Warning in this document

The following are warning signs that may cause danger to equipment or personnel. Please pay special attention in understanding and operation. Failure to comply or perform, which will result in damage to some or all of PV inverter or other equipment connected to the PV inverter, or personal injury.

Symbol	Description
	DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.
	WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.
	CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
	NOTICE is used to address practices not related to personal injury.
	Information that you must read and know to ensure optimal operation of the system.

1.3.2 Markings on this product

Symbol	Description
	Electrical voltage Danger of high voltage and electric shock.
	Risk of burns Danger of hot surface.
	Operation after 5 minutes Signals danger due to electrical shock and indicates the time(5 minutes) to allow after the inverter has been turned off and disconnected to ensure safety in any installation operation .
	CE mark The inverter complies with the requirements of the applicable EC guidelines.
	UKCA mark The inverter complies with the requirements of the applicable UKCA
	Point of connection for grounding protection
	Direct Current (DC)
	Alternating Current (AC)
	The inverter has no transformer
	Read the manual

1.4 Glossary

AC

Abbreviation for "Alternating Current"

DC

Abbreviation for "Direct Current"

Energy

Energy is measured in Wh (watt hours), kWh (kilowatt hours) or MWh (megawatt hours). The energy is the accumulation of power over time. For example, your inverter operates at a constant power of 5000 W for half an hour and then at a constant power of 2500 W for another half an hour, it has fed 3750Wh of energy into the power distribution grid within that hour.

Power

Power is measured in W (watts), kW (kilowatts) or MW (megawatts). Power is an instantaneous value. It displays the power your inverter is currently feeding into the power distribution grid.

Power rate

Power rate is the ratio of current power feeding into the power distribution grid and the maximum power of the inverter that can feed into the power distribution grid.

Power Factor

Power factor is the ratio of real power and apparent power. They are identical only when current and voltage are in phase and the power factor is 1.0. The power in an ac circuit is very seldom equal to the direct product of the volts and amperes, In order to find the power of a single phase ac circuit the product of volts and amperes must be multiplied by the power factor.

PV

Abbreviation for photovoltaic

Wireless Communication

The external wireless communication technology is a radio technology that allows the inverter and other communication products to communicate with each other. The external wireless communication does not require line of sight between the devices and it is selective purchasing.

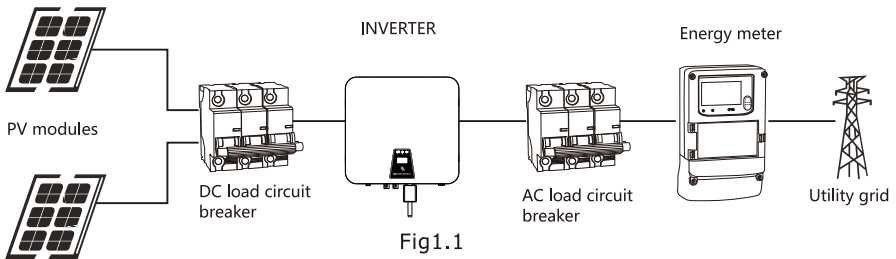
2.Safety

2.1 Intended Use

The unit converts the DC current generated by the photovoltaic (PV) modules to grid-compliant alternating current and performs single-phase feed-in into the electricity grid.

M series inverters are built according to all required safety rules. Nevertheless, improper use may cause lethal hazards for the operator or third parties, or may result in damage to the units and other property.

Principle of a PV plant with the single-phase inverter



The inverter may only be operated with a permanent connection to the public power grid. The inverter is not intended for mobile use. Any other or additional use is not considered the intended use. The manufacturer/supplier is not liable for damage caused by such unintended use. Damage caused by such unintended use is at the sole risk of the operator.

PV modules Capacitive Discharge Currents

PV modules with large capacities relative to earth, such as thin-film PV modules with cells on a metallic substrate, may only be used if their coupling capacity does not exceed 470nF. During feed-in operation, a leakage current flows from the cells to earth, the size of which depends on the manner in which the PV modules are installed (e.g. foil on metal roof) and on the weather (rain, snow). This "normal" leakage current may not exceed 50mA due to the fact that the inverter would otherwise automatically disconnect from the electricity grid as a protective measure.

2.2 Qualification of skilled person

This grid-tied inverter system operates only when properly connected to the AC -distribution network. Before connecting the inverter to the power distribution grid, contact the local power distribution grid company. This connection must be made only by qualified technical personnel to connect, and only after receiving appropriate approvals, as required by the local authority having jurisdiction.

2.3 Safety instruction

The inverters is designed and tested according to international safety requirements; however, certain safety precautions must be observed when installing and operating this inverter. Read and follow all instructions, cautions and warnings in this installation manual. Any questions, please contact the supplier .

2.4 Assembly Warnings

 warning	▶ Before installation, inspect the unit to ensure absence of any transport or handling damage, which could affect insulation integrity or safety clearances; otherwise it could result in safety hazards. ▶ Assemble each inverter the instructions in this manual. Be Careful when choosing installation location and according to specified cooling requirements. ▶ Unauthorized remove the necessary protections, improper use, incorrect installation and operation may result the serious safety and shock hazards or equipment damage. ▶ In order to minimize the potential of a shock hazard due to hazardous voltages, cover the entire solar array with dark material prior to connecting the array to any equipment.
 caution	▶ Grounding the PV modules: The inverter is a high frequency inverter(without transformer). That is why it has no galvanic separation. Do not ground the DC circuits of the PV modules when connected to the inverter. Only ground the mounting frame of the PV modules. If you connect grounded PV modules to the interver, that will show error message "PV ISO Low". ▶ Follow the local requirements for grounding the PV modules and the PV generator. We recommend connecting the generator frame and other electrically conductive surfaces in a manner which ensures continuous conduction with ground in order to have optimal protection of the system and personnel.

2.5 Electrical Connection Warnings

 danger	▶ The components in the inverter are mobilizable. Touching mobilizable components can result in serious injury or death. ● Do not open the inverter except the wire box by qualified persons. ● Electrical installation, repairs and conversions may only be carried out by electrically qualified persons. ● Do not touch damaged inverter. ▶ Danger to life due to high voltages in the inverter. ● There has residual voltage in the inverter. The inverter takes 20 minutes to discharge. ● Wait 20 minutes before you open the wire box. ▶ Persons with limited physical or mental abilities may only work with the inverter following proper instruction and under constant supervision. Children are forbidden to play with the inverter. Must keep the inverter away from children.
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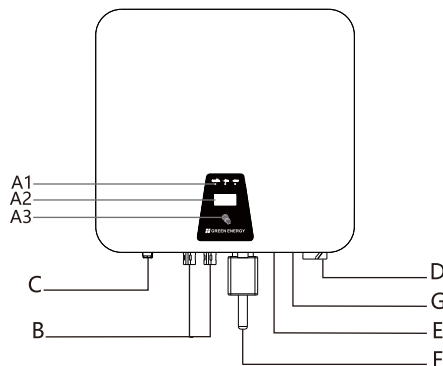
 warning	▶ Make all electrical connections (e.g. conductor termination, fuses, PE connection, etc.) in accordance with prevailing regulations. When working with the inverter, adhere to all prevailing safety regulations to minimize risk of accidents. ▶ Systems with inverters typically require additional control (e.g., switches, disconnects) or protective devices (e.g., fusing circuit breakers) depending on the prevailing safety rules.				
 caution	▶ The inverter converts DC current from PV generator into AC current. The inverter is suitable for mounting indoors and outdoors. ▶ You can use the AC current generated as follows: <table border="1" data-bbox="186 343 994 646"> <tr> <td data-bbox="186 343 335 558">House grid:</td><td data-bbox="335 343 994 558">Energy flows into the house grid. The consumers connected, for example, household devices or lighting, consume the energy. The energy left over is fed into the public grid. When the inverter is not generating any energy, e.g., at night, the consumers which are connected are supplied by the public grid. The inverter does not have its own energy meter. When energy is fed into the public grid, the energy meter spins backwards.</td></tr> <tr> <td data-bbox="186 558 335 646">Public grid:</td><td data-bbox="335 558 994 646">Energy is fed directly into the public grid. The inverter is connected to a separate energy meter. The energy produced is compensated at a rate from the electric power company.</td></tr> </table>	House grid:	Energy flows into the house grid. The consumers connected, for example, household devices or lighting, consume the energy. The energy left over is fed into the public grid. When the inverter is not generating any energy, e.g., at night, the consumers which are connected are supplied by the public grid. The inverter does not have its own energy meter. When energy is fed into the public grid, the energy meter spins backwards.	Public grid:	Energy is fed directly into the public grid. The inverter is connected to a separate energy meter. The energy produced is compensated at a rate from the electric power company.
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Public grid:	Energy is fed directly into the public grid. The inverter is connected to a separate energy meter. The energy produced is compensated at a rate from the electric power company.				

2.6 Operation Warnings

 warning	▶ Make sure all covers and doors closed and secure during operation. ▶ Although designed meeting all safety requirements, some parts and surfaces of Inverter are still hot during operation. To reduce the risk of injury, do not touch the heat sink at the back of the PV-Inverter or nearby surfaces while Inverter is operating. ▶ Incorrect sizing of the PV plant may result in voltages which could destroy the inverter. The inverter display will read the error message "PV-Overvoltage!" ● Switch the rotary DC Disconnect to the Off position immediately. ● Contact installer.
 caution	▶ All operations regarding transport, installation and start-up, including maintenance must be operated by qualified, trained personnel and in compliance with all prevailing codes and regulations. ▶ Anytime the inverter has been disconnected from the power network, please be much careful as some components can retain charge sufficient to create a shock hazard; to minimize occurrence of such conditions, please comply with all corresponding safety symbols and precautions and present on the unit and in this manual. ▶ In particular cases, there may still be interference for the specified application area despite maintaining standardized emission limit values (e.g. when sensitive equipment is located at the setup location or when the setup location is near radio or television receivers).In this case, the operator is obliged to take proper action to rectify the situation. ▶ Do not stay closer than 20 cm to the inverter for any length of time.

3. Product description

3.1 Overview



Position	Description
A1	LED indicator
A2	OLED display
A3	Touch button
B	PV input terminal
C	DC switch
D	AC output
E	RS485
F	WIFI
G	CT/Meter(opt)

3.2 Description of the identification on the inverter

Identification	Description	Explanation
	Operation normal(Green)	Normal status(Continuous light)
	Waiting status(Flicker)	Waiting status(Flicker)
	WIFI communication(Blue)	WIFI normal communication(Flicker)
	Fault display(Red)	Fault status(Continuous light)
	Warning(Flicker)	Warning(Flicker)
	Knock mark	Touch button: we can switch OLED display and set parameters by touch.

3.3 Inverter label

The inverter can be identified by the label on the left side of inverter. It shows the Products type,the inverter specific features and the parameter on the label.

PV Grid Inverter	
Model Name	*****
DC max. voltage	***V
MPPT voltage range	**~***V
DC max. current	**A/**A
AC nominal voltage	***V
Grid frequency	***Hz
Rated AC power	***kW
Max. AC out apparent power	***VA
Max. AC current	***A
Power factor range	0.8c~0.8i
Protection degree	IP66
Protective class	Class I
Operation ambient temperature	-25°C~+60°C










MADE IN CHINA

3.4 Detail specifications

Please kindly check the inverter detail specifications as below:

Model Name	3000M	3600M	4200M	4600M	5000M	6000M
Max input DC voltage	600V					
Start voltage	50V					
MPPT voltage range	40V-550V					
DC max.current	16A/16A					
AC nominal voltage(L-N)	220V/230V					
Grid frequency	50/60Hz ±5HZ					
Rated AC power	3000W	3600W	4200W	4600W	5000W	6000W
Max.AC out apparent power	3300VA	3960VA	4620VA	5060VA	5500VA	6600VA
Max.AC current	14.3A	17.2A	20A	22A	23.9A	28.6A
Communications Ports	WIFI/RS485/GPRS(opt)					
Protective class	Class I					
Protection degree	IP66					
Operation ambient temperature	-25°C-60°C					

3.5 Inverter Dimensions

Dimensions and weight:

Model	Height (H)	Width (W)	Depth (D)	Weight
3000M	378mm 14.9inch	402mm 15.8inch	195mm 7.7inch	15.5 kg
3600M	378mm 14.9inch	402mm 15.8inch	195mm 7.7inch	15.5 kg
4200M	378mm 14.9inch	402mm 15.8inch	195mm 7.7inch	15.5 kg
4600M	378mm 14.9inch	402mm 15.8inch	195mm 7.7inch	15.5 kg
5000M	378mm 14.9inch	402mm 15.8inch	195mm 7.7inch	15.5 kg
6000M	378mm 14.9inch	402mm 15.8inch	195mm 7.7inch	15.5 kg

3.6 Storage environment of Inverter

If you want to storage the inverter in the warehouse, Please select a suitable place to storage.

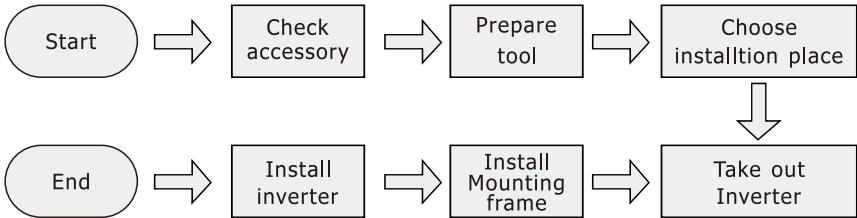
- ▶ The inverter must be stored in original package and please keep stored in a dry environment
- ▶ The storage temperature should be always between -25°C and +60°C. And the storage relative humidity should be always between 0 and 100%.(Recommend storage environment).
- ▶ If there are a batch of inverters need to be stored, the maximum layers for original carton is four.
- ▶ After long term storage, The local installer or Service centre should perform a comprehensive test before installation the inverter&system.

3.7 Advantage of the inverter

- ▶ Wide input voltage range from the mppt voltage rang
- ▶ IP66 protection degree
- ▶ Integrated DC switch
- ▶ DSP controller
- ▶ Fanless integrated cooling technology
- ▶ Multi MPP controller
- ▶ Easy installation

4.Installation

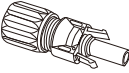
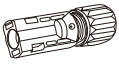
4.1 Installation step

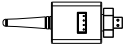


4.2 Unpacking and inspection

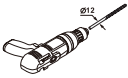
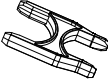
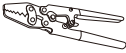
After opening the package, please check the contents of the box. It should contain the following, Please check all of the accessories in carton, If anything missing, please contact your dealer at once.

Shows the components and mechanical parts that should be delivered

NO.	Pictures	Description	Quantity
1		Inverter	1PCS
2		Mounting frame	1PCS
3		PV+ input terminal	2PCS
4		PV- input terminal	2PCS
5		Metal terminals secured to PV+ input power cables	2PCS
6		Metal terminals secured to PV- input power cables	2PCS
7		Blasting screws	4PCS
8		M4 safety screws	2PCS
9		Output terminals	1PCS
10		O-type teminal	1PCS
11		RJ teminal	1PCS
12		AC terminal removal tool	1PCS
13		2.5 spanner	1PCS
14		Certificate	1PCS
15		Manual	1PCS

16		WEBLE.DTU.PlugPro-29-3	1PCS
17		PV Terminal removal tool	1PCS
18		WiFi	1PCS

4.3 Tools

NO.	Tool	Model	Function
1		Hammer drill Recommend drill dia. 12mm	To drill holes on the wall
2		Removal tool	Remove PV terminal
3		Wire stripper	Strip wire
4		Hammer	Secure the Blasting screws to the wall
5		Removal tool	Remove AC output terminal
6		2.5 spanner	Tighten the M5 screws
7		Wrench	Turn the screw to secure the Mounting frame
8		Crimping tools	To crimp power cables
9		Cross screwdriver	Fixed the cross screw

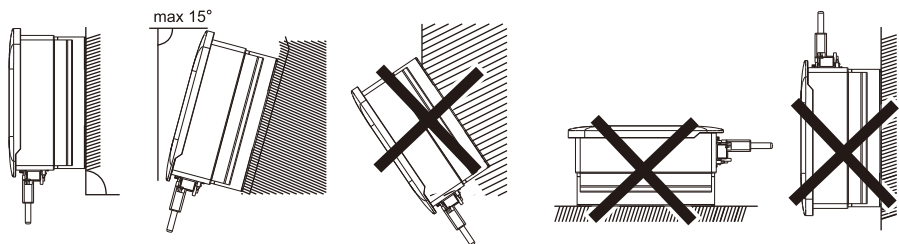
4.4 Safety instruction

	Danger to life due to fire or explosion ▶ Despite careful construction, electrical devices can cause fires. ▶ Do not install the inverter on easily flammable materials and where flammable materials are stored.
	Risk of burns due to hot enclosure parts ▶ Mount the inverter in such a way that it cannot be touched inadvertently
	Possible damage to health as a result of the effects of radiation! In special cases, there may still be interference for the specified application area despite maintaining standardized emission limit values (e.g. when sensitive equipment is located at the setup location or when the setup location is near radio or television receivers). In this case, the operator is obliged to take proper action to rectify the situation. Never install the inverter near the sensitive equipment (e.g. Radios, telephone, television, etc) Do not stay closer than 20 cm to the inverter for any length of time unless it is absolutely necessary. We assume no responsibility for compliance to EMC regulations for the complete system.

- ▶ All electrical installations shall be done in accordance with the local and national electrical codes. Do not remove the casing. Inverter contains no user serviceable parts. Refer servicing to qualified service personnel. All wiring and electrical installation should be conducted by a qualified service personnel.
- ▶ Carefully remove the unit from its packaging and inspect for external damage. If you find any imperfections, please contact your local dealer. Be sure that the inverters connect to the ground in order to protect property and personal safety.
- ▶ The inverter must only be operated with PV generator. Do not connect any other source to it.
- ▶ Both AC and DC voltage sources are terminated inside the PV Inverter. Please disconnect these circuits before servicing.
- ▶ This unit is designed to feed power to the public power grid (utility) only.
- ▶ Do not connect this unit to an AC source or generator. Connecting Inverter to external devices could result in serious damage to your equipment.
- ▶ When a photovoltaic panel is exposed to light, it generates a DC voltage. When connected to this equipment, a photovoltaic panel will charge the DC link capacitors.
- ▶ Energy stored in this equipment's DC link capacitors presents a risk of electric shock. Even after the unit is disconnected from the grid and photovoltaic panels, high voltages may still exist inside the PV-Inverter. Do not remove the casing until at least 5 minutes after disconnecting all power sources.
- ▶ Although designed to meet all safety requirements, some parts and surfaces of Inverter are still hot during operation. To reduce the risk of injury, do not touch the heat sink at the back of the PV-Inverter or nearby surfaces while Inverter is operating.

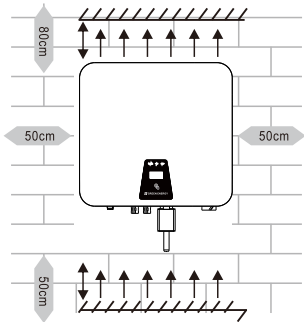
4.5 Selecting the installation location

- ▶ This is guidance for installer to choose a suitable installation location, to avoid potential damages to device and operators.
- ▶ The installation location must be suitable for the inverter's weight and dimensions for a long period time.
- ▶ Select the installation location so that the status display can be easily viewed.
- ▶ Do not install the inverter on structures constructed of flammable or thermolabile materials.
- ▶ Never install the inverter in environment of little or no air flow, nor dust environment.
- ▶ The Ingress Protection rate is IP66 which means the inverter can be installed outdoors and indoors.
- ▶ The humidity of the installation location should be 0~100% without condensation.
- ▶ The installation location must be freely and safely to get at all times.
- ▶ Vertically installation and make sure the connection of inverter must be downwards. Never install horizontal and avoids forward and sideways tilt.

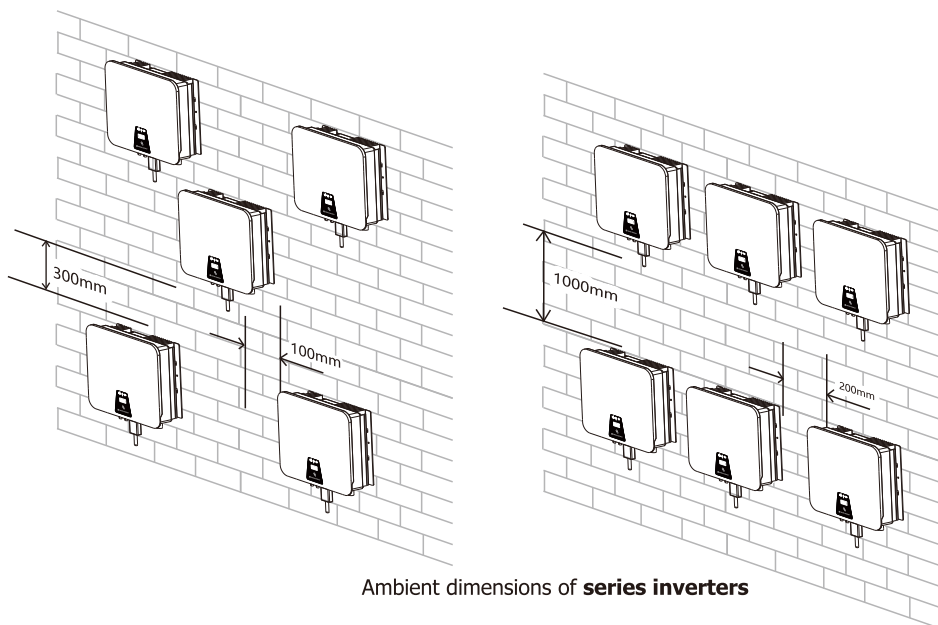


- ▶ Be sure that the inverter is out of the children’s reach.
- ▶ Don’t put any things on the inverter. Do not cover the inverter.
- ▶ Do not install the inverter near television antenna or any other antennas and antenna cables.
- ▶ Inverter requires adequate cooling space. Providing better ventilation for the inverter to ensure the heat escape adequately. The ambient temperature should be below 40°C to ensure optimum operation.
- ▶ Do not expose the inverter to direct sunlight, as this can cause excessive heating and thus power reduction.
- ▶ Observe the Min. clearances to walls, other inverters, or objects as shown in the diagram:

Direction	Min. clearance (cm)
above	80
below	50
sides	50
front	30



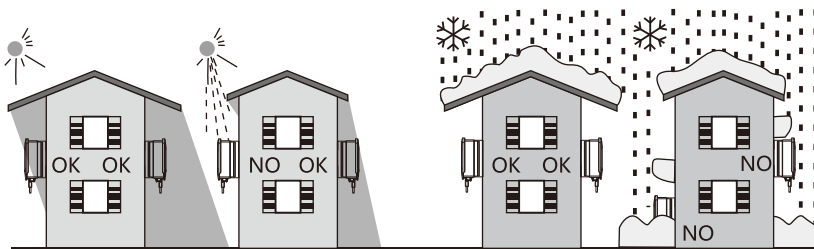
Ambient dimensions of **one inverter**



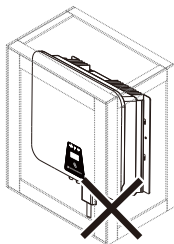
Ambient dimensions of **series inverters**

- There must be sufficient clearance between the individual inverters to ensure that the cooling air of the adjacent inverter is not taken in.
- If necessary, increase the clearance spaces and make sure there is enough fresh air supply to ensure sufficient cooling of the inverters.

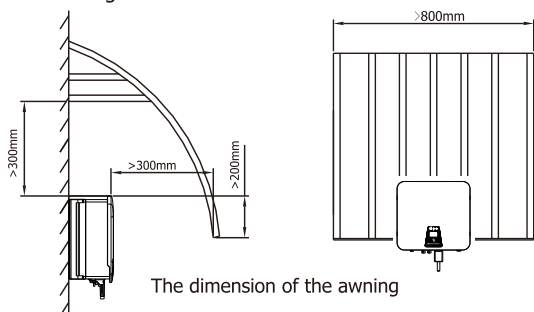
The inverter can't install to solarization, drench, firm location. We suggest that the inverters should be installed at the location with some cover or protection.



- Please make sure the inverter is installed at the right place. The inverter can't install close to trunk.



- Recommend awning installation, the purpose is to extend the inverter service life and reduce the power derating of the inverter .



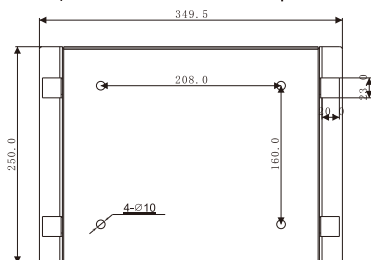
4.6 Installation the Inverter

4.6.1 Mounting the inverter with bracket



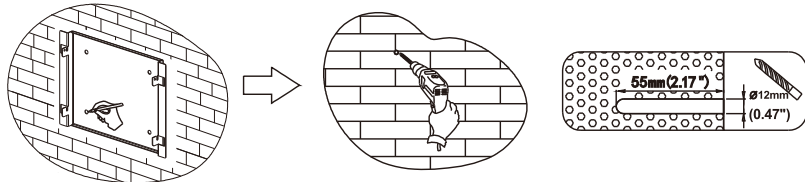
In order to avoid electrical shock or other injury, inspect existing electronic or plumbing installations before drilling holes.

- To mount the inverter on the wall, we should mount expansion bolt to the wall firmly first.

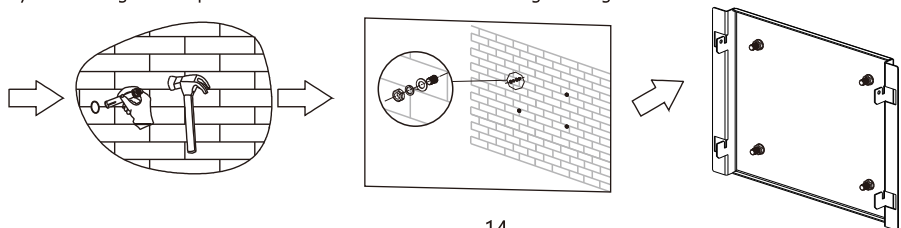


step:

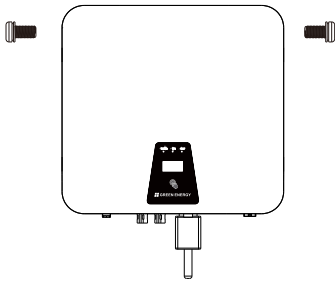
- Please make sure the thickness of the wall for inverter installation is more than 600mm;
- Please place the the mouthing frame horizontally on the wall;
- Please mark the holes in the 4 mounting holes;
- Drill a hole with a depth of 55mm at the mark with a drill of $\phi 12\text{mm}$



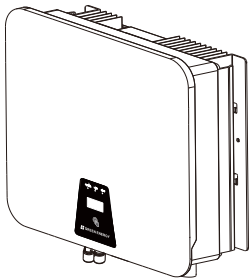
- Please expand the bolt with a hammer into the hole in the wall and install the nut (including elastic flat pad), do not tighten the nut;
- Please hang the mouthing frame on the expansion bolt. Fix the mounting frame on the wall by combining four expansion bolt with four M6 Nuts and tightening the nut with a wrench.



- Hook the inverter to the rear panel.Using two M4 safety screw to secure the inverter to the mounting frame to ensure safety.



- Make sure all screws install in place.



5.Electrical connection

5.1 Safety

	Danger to life due to lethal voltages! High voltages which may cause electric shocks are present in the conductive parts of the inverter. Prior to performing any work on the inverter, disconnect the inverter on the AC and DC sides.
	Danger of damage to electronic components due to electrostatic discharge. Take appropriate ESD precautions when replacing and installing the inverter.

5.2 Wiring AC Output

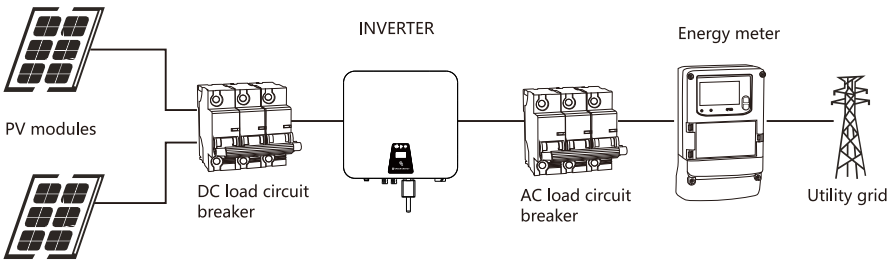
5.2.1 AC circuit breaker recommendations and connection

	► You must install a separate single-phase circuit-breaker or other load disconnection unit for each inverter in order to ensure that the inverter can be safely disconnected under load. ● NOTE: The inveter have the residual current detect and protect function, if you have device the AC breaker have the residual current detect function,you must choice breaker the rating residual current more than 300mA.
	► When using inverter with VDE-AR-N 4105, because the inverter's displacement factor adjust function had to accorded to VDE-AR-N 4105,the PV-inverter system total capacity cannot be over 13.8KVA. ● When using inverter with CEI 0-21: if the inverter system total capacity more than 3KW and up to 11.08KW,the displacement factor is adjustable between 0.95 leading to 0.95 lagging ,and not need the external SPI.if the inverter system total capacity more than 11.08KW,,the displacement factor is adjustable between 0.9leading to 0.9 lagging ,and need the external SPI.

You must install a separate single-phase circuit-breaker or other load disconnection unit for each inverter in order to ensure that the inverter can be safely disconnected under load. We suggest you choice the AC breaker rating current in this table:

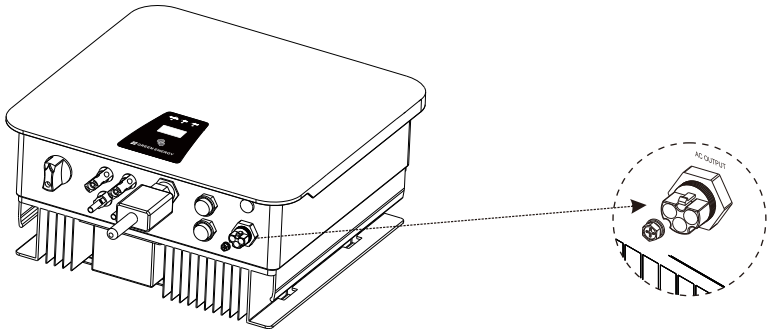
Model	Specification
3000M	20A/230V
3600M	24A/230V
4200M	28A/230V
4600M	30A/230V
5000M	32A/230V
6000M	42A/230V

We recommend electrical connection as below

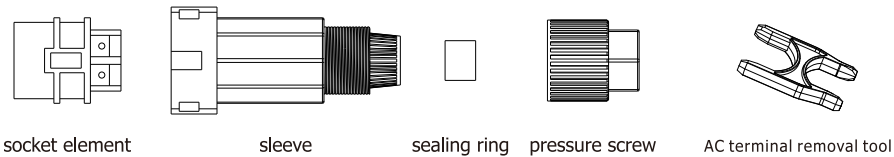


5.2.2 AC connection steps

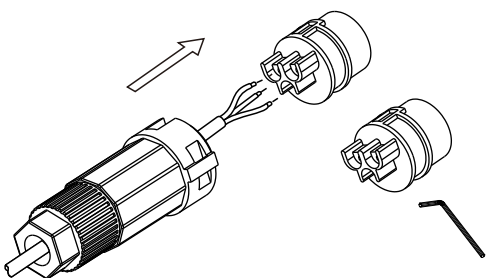
step1 The grid connection is contains using 3 conductors (L,N, and PE).



step2 Remove the parts of the AC connection plug from the accessory bag.Use the AC withdrawal tool to divide the AC connection plug into socket element,sleeve, sealing ring and pressure screw.

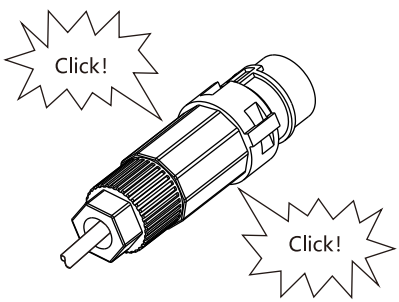


step3 Insert the stripped and bared conductors L,N,PE into the screw terminals with sign L,N,PE on the socket element and tighten the screws firmly.

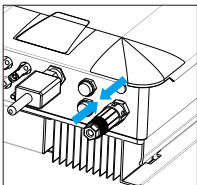


Note that the polarity of the connection line matches the terminal tag to avoid incorrect connection.

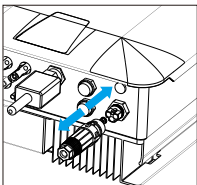
step4 Push the sleeve into the socket element



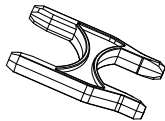
step5 Finally, insert the AC connection plug into the AC connection receptacle on the inverter.



Lock the housing



Unlock the housing



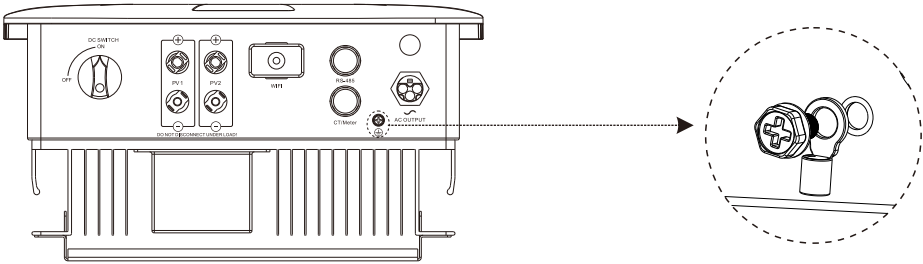
AC terminal removal tool

5.2.3 AC wiring specification

Conductor cross section	Max. cable length					
	3000M	3600M	4200M	4600M	5000M	6000M
5.2mm ² 10AWG	48m	40m	34m	31m	28m	24m
6.6mm ² 9AWG	60m	50m	43m	39m	36m	30m

5.3 Protect the earth

If the installation is required, the grounding terminal may be used to connect to the secondary protective earthing terminal or as an equipotential connection, as shown in the figure below.

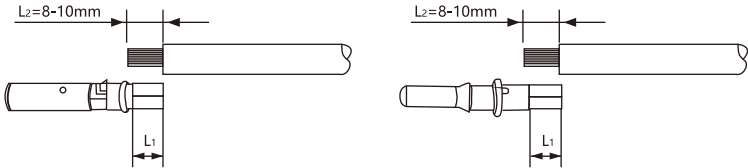


5.4 Wiring DC Input

5.4.1 Connecting DC Input Power Cables

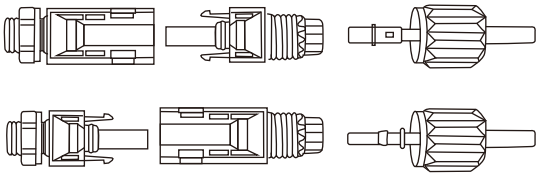
Step1 Remove cable glands from the positive and negative connectors.

Step2 Take out metal terminals from accessory package, Wiring as illustrated in image.

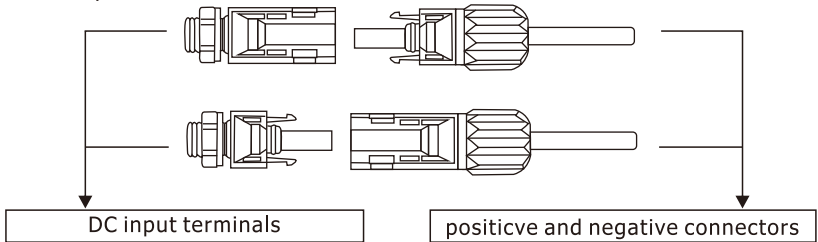


Step3 Insert the positive and negative power cables into corresponding cable glands.

Step4 Insert the stripped positive and negative power cables into the positive and negative metal terminals respectively and crimp them using a crimping tool. Ensure that the cables are crimped until they cannot be pulled out by force less than 400 N, as shown in image.

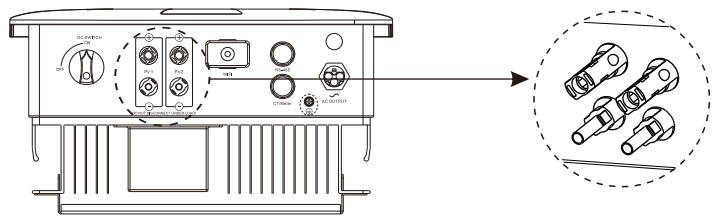


Step5 Insert the positive and negative connectors into corresponding DC input terminals of the inverter until you hear a "click" sound.

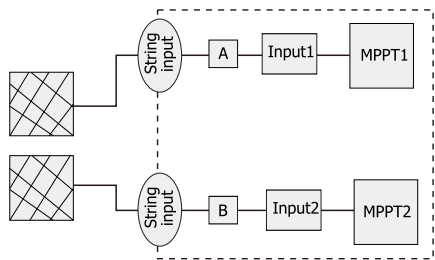


5.4.2 Conditions for DC Connection

The single-phase inverter has 2 independent input : input A & input B



The diagram drawing of DC side is shown as below, notice that the connectors are in paired (male and female connectors). The connectors for PV arrays and inverters are H4 connectors.



Suggestions for the PV modules of the connected strings:

- Same type
- Same quantity of PV modules connected in series



caution

If the inverter is not equipped with a DC switch but this is mandatory in the country of installation, install an external DC switch.
The following limit values at the DC input of the inverter must not be exceeded:

Model name	Max.current input A	Max.current input B
3000M	16A	16A
3600M		
4200M		
4600M		
5000M		
6000M		

5.4.3 Connecting the PV Array (DC input)

 danger	Before connecting the PV array, ensure that the DC switch and AC breaker are disconnect from the inverter. NEVER connect or disconnect the DC connectors under load. Make sure the maximum open circuit voltage(Voc) of each PV string is less than the specification of the product. Check the design of the PV plant. The Max. open circuit voltage, which can occur at solar panels temperature of -10°C, must not exceed the Max. input voltage of the inverter.
 warning	Improper operation during the wiring process can cause fatal injury to operator or unrecoverable damage to the inverter. Only qualified personnel can perform the wiring work.

6. Operating mode、OLED display and Commissioning

6.1 Operating mode

6.1.1 Normal mode

In this mode, the inverter works normally.

- When the DC voltage is greater than the start voltage, the energy is sufficient and the grid voltage frequency meets the requirements of grid connection, the inverter converts the energy of the solar panel into an AC input grid, and the green LED lights up.
- When the DC voltage is lower than the minimum value of MPPT voltage , the inverter will automatically disconnect from the grid and exit the normal operation mode. When the input voltage reaches the requirement again and the grid voltage returns to normal, the inverter will automatically connect to the grid.

6.1.2 Failure mode

The inverter control chip monitors and adjusts the status of the system in real time. When the inverter monitors any unexpected conditions, such as system failure and inverter failure, the fault information will be displayed on the display. In the fault mode, the inverter indicates the LED of the window turn red and the inverter output is disconnected from the grid.

6.1.3 Shutdown mode

When the light is weak or there is no sunlight, the inverter will automatically stop running. When in the shutdown mode, the inverter basically does not consume the energy of the grid or solar panels, and the inverter display and LED lights are turned off.

6.2 Overview of LED, OLED display and touch button functions

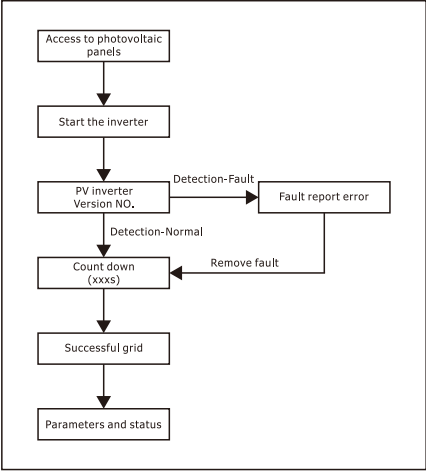
This part introduces the LED indicator function, OLED display and touch setting function, among which the fault report will be explained in section 9 (the display can be displayed synchronously). If you have any question in the process of use, please contact the supplier, we will solve it for you as soon as possible.

6.2.1 Overview of wake up display OLED

When the PV inverter is powered on, it will enter the power-on display mode. Under the condition that the inverter works normally and the keys are not touched, the OLED display will be turned off automatically after 5 minutes. At this time, there is no display of the OLED and the LED indicator is green. When you need to view the display data or make Settings, you can touch the OLED to re-display .

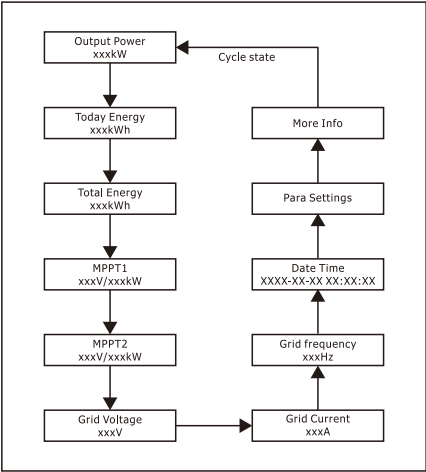
6.2.2 The power-on display mode

When the inverter starts working, the OLED display interface is as follows:



6.2.3 Overview of inverter status and parameters

After entering the inverter state and parameter process. When not connected to the grid, the interface needs to be manually clicked to switch. In the grid-connected state, the interface will switch automatically or the user can switch by themselves. The display will switch in the following order.



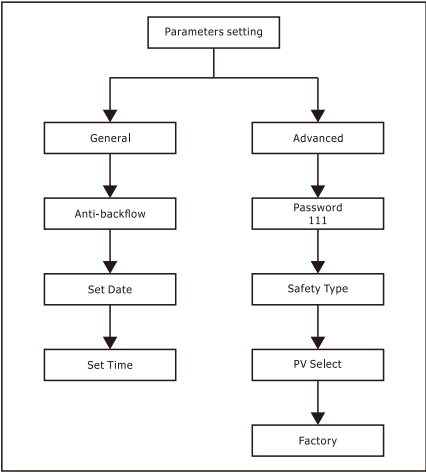
6.2.4 Function setting

The OLED display can display the running state and parameters of the inverter. The display interface and setting parameters of the inverter can be changed by touching the key. Four trigger modes are supported, and different triggers have different functions, as shown in the following table.

	Mode of touch	Definition
	Click	Move, turn the page, or add 1 to the current number
	Double-click	Enter/confirm
	Three times in a row	Return to the previous display screen
	Hold for 5S	Reset current data to zero/restore default value
	Note: Enter the setting page to set parameters.If the page stays for more than 20S, theSettings page will exit. The password for advanced Settings is 111.	

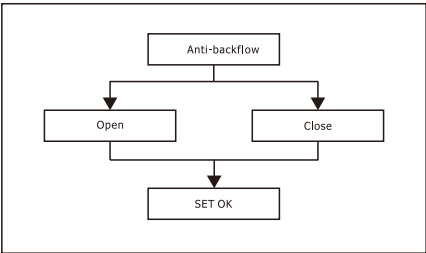
6.2.4.1 Parameter Setting

The parameter setting page is divided into general mode and advanced mode, and all the setting interfaces entered are shown below.



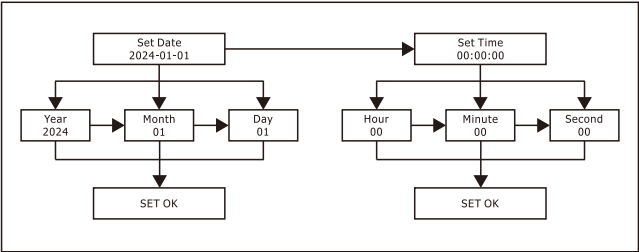
6.2.4.2 Anti-backflow setting

If the PV inverter you purchased is equipped with Anti-backflow function, please follow 《Smart meter / External CT quick installation manual》 to install external equipment, which can be set by touching the button on the display screen during use. At the touch button, double-click continuously to enter the parameter setting submenu, then click switch options, and finally double-click continuously to confirm the settings.



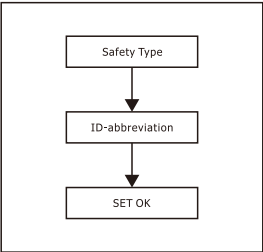
6.2.4.3 Date and time setting

The date and time will be written uniformly when the photovoltaic inverter leaves the factory. At the touch button, double click continuously to enter the parameter setting sub-menu, double click in the date and Time interface to enter the setting state, click toggle setting options or number +1, double click continuously to confirm the setting, and hold for 5S to restore the default setting: 2024-01-01, 00: 00: 00.



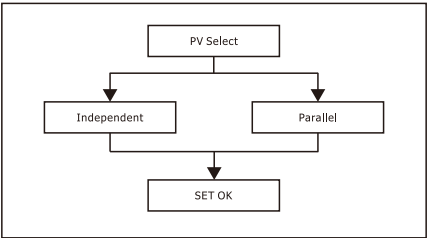
6.2.4.4 Safety specification settings

The inverter has been shipped with the initial safety regulation type set according to your requirements. Please check with your supplier about the safety code setting. At the touch button, double-click continuously to enter the parameter setting sub-menu, then click Toggle option, and finally double-click continuously to confirm the setting.



6.2.4.5 PV mode settings

The default mode of the PV inverter is independent mode, and the customer can choose independent mode or parallel mode according to the actual situation. The independent mode means that each input is connected by an independent PV panel, and the parallel mode means that the two inputs are connected by a common PV panel. At the touch button, double-click continuously to enter the parameter setting sub-menu, then click Toggle option, and finally double-click continuously to confirm the setting.



6.2.4.6 Restore factory settings

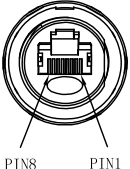
When the restore factory function of inverter is selected, the inverter will restore the default value (Anti-backflow function will be turned off, the parameters of safety specification will be restored to the corresponding default values, Password settings and PV mode will revert to default value).

6.3 WIFI Communication Connection

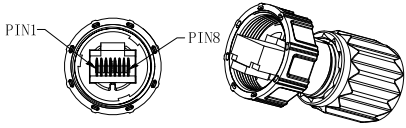
Please refer to the WEBLE.DTU.PlugPro-29-3 Quick Installation Guideline.

6.4 RS485 Cable Connection

6.4.1 Rs485 cable connection

PIN1,2 RS485+ (Signal for monitor)	
PIN7,8 RS485- (Signal for monitor)	
PIN 3,4,5,6 Shielding layer or no connection	

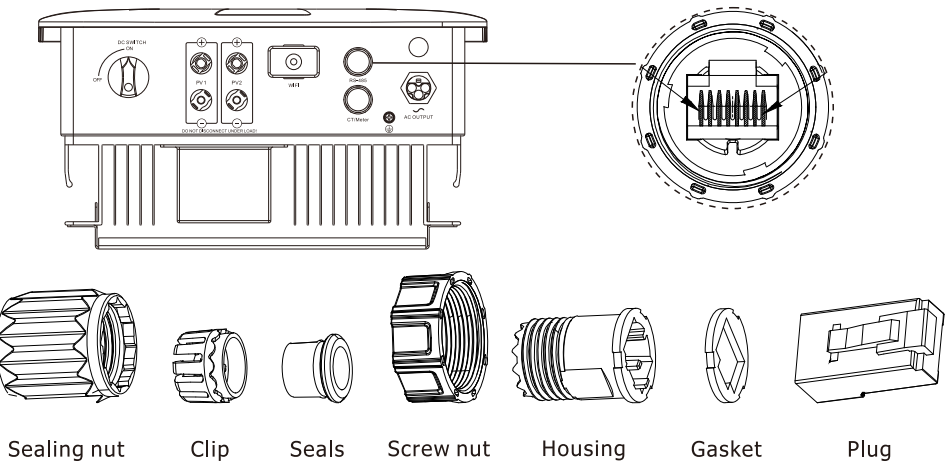
6.4.2 Definitions of RS485 PLUG(standard) as follows

PIN1,2 RS485+ (Signal for monitor)	
PIN7,8 RS485- (Signal for monitor)	
PIN 3,4,5,6 Shielding layer or no connection	

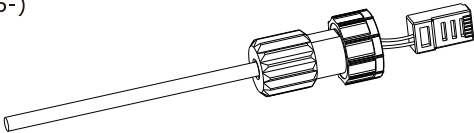
6.4.3 Assemble

This series of inverters provides two RS485 ports. You can monitor one or more inverters via Rs485

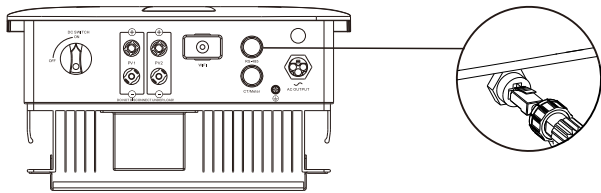
Step1 Remove the parts of the RS485 connection plug from accessory bag.Prepare the Sealing nut,Clip,Seals,Screw nut,Housing,Gasket,Plug.



Step2 Insert the stripped and conductors into the Plug teminal with pin1or2(RS485+) and PIN7or8(RS485-)



Step3 Finally,insert the RS485 connection Plug into the RS485 connection receptacle on the inverter.



7.Start-Up and shut down the inverter

7.1 Start-Up the inverter

- 1. Connect the AC breaker of the inverter.
- 2. Turn on the dc switch, and the inverter will start automatically when the input voltage is higher than 50V.

7.2 Turn-off the Inverter

	Do not disconnect the DC connectors under load.
---	---

Turn –off the inverter step:

- Disconnect the line circuit breaker from three-phases grid and prevent it from being reactivated.
- Turn off the dc switch.
- Check the inverter operating status.
- Waiting until LED, display have go out, the inverter is shut down.

8.Maintenance and cleaning

8.1 Checking Heat Dissipation

If the inverter regularly reduces its output power due to high temperature, please improve the heat dissipation condition. Maybe you need to clean the heat sink.

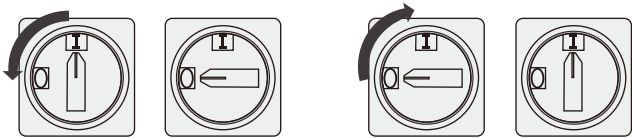
8.2 Cleaning the Inverter

If the inverter is dirty, turn-off the AC breaker and DC switch ,waiting the inverter shut down , then clean the enclosure lid, the display, and the LEDs using only a wet cloth. Do not use any cleaning agents (e.g. solvents or abrasives).

8.3 Checking the DC Disconnect

Check for externally visible damage and discoloration of the DC Disconnect and the cables at regular intervals. If there is any visible damage to the DC Disconnect, or visible discoloration or damage to the cables, contact the installer.

Once a year, turn the rotary switch of the DC disconnect from the on position to the Off position 5 times in succession. This cleans the contacts of the rotary switch and prolongs the electrical endurance of the DC disconnect.



9.Overview of warnings, errors and handling methods

The fault report will be displayed on the host computer, WIFI and display screen.The error description and handling method are shown in the following table.

Overview of fault prompts	Detailed description	Method of handling
Inv_C_TZ_fault	Over inverter current protected by hardware	1.Restart inverter. 2.If error message still exists, contact manufacturer.
PV_C_TZ_fault	Over PV current protected by hardware	1.Restart inverter. 2.If error message still exists, contact manufacturer.
PV_C_OCP_fault	Over PV current protected by software	1.Restart inverter. 2.If error message still exists, contact manufacturer.
PV_P_Over_fault	Over PV power protected by software	1.Restart inverter. 2.If error message still exists, contact manufacturer.
DC_Temp_fault	DC NTC error	1.After shutdown, Check the temperature, normal restart the inverter. 2.If error message still exists, contact manufacturer.
Env_Temp_fault	Environment NTC error	1.After shutdown, Check the temperature, normal restart the inverter. 2.If error message still exists, contact manufacturer.
Soft_FW_fault	Software version mismatch	1.Rewrite the correct software version number. 2.If error message still exists, contact manufacturer.
PE_fault	PE abnormal	1.Check PE, to ensure that the PE line contact good. 2.If error message still exists, contact manufacturer.
ARM_Com_fault	ARM communication fault	1.Restart inverter. 2.If error message still exists, contact manufacturer.
Grid_CT_fault	CT abnormal	1.After shutdown, check communication wire. 2.If error message still exists, contact manufacturer.
F103_Com_fault	103 communication fault	1. Restart inverter. 2. If error message still exists, contact manufacturer.
Eeprom_fault	EEPROM abnormal	1. Restart inverter. 2. If error message still exists, contact manufacturer.
Relay_fault	Relay fault	1.Restart inverter. 2.If error message still exists, contact manufacturer.
Unb_C_fault	Output current unbalance	1.After shutdown, Check the output current is not balanced. 2.If the error message still exists, contact manufacturer.

GFCI_damage	GFCI module damage	1.Restart inverter. 2.If error message still exists, contact manufacturer.
HCT_fault	Hall sensor fault	1.Restart inverter. 2.If error message still exists, contact manufacturer.
DSP_Com_fault	DSP communication fault	1.Restart inverter. 2.If error message still exists, contact manufacturer.
Bus_V_high	Bus voltage abnormal	1.Restart inverter. 2.If error message still exists, contact manufacturer.
Inv_C_OCP	Over inverter current protected by software	1.Restart inverter. 2.If error message still exists, contact manufacturer.
No_Mains	No utility grid connected or utility grid power failure.	1.Please confirm grid is lost or not. 2.If error message still exists, contact manufacturer.
ISO_fault	PV insulation abnormal	1.Check if panel enclosure ground properly, inverter ground properly, the DC breaker gets wet. 2.If error message still exists, contact manufacturer.
GFCI_High	GFCI too high	1.Restart inverter. 2.If error message still exists, contact manufacturer.
DCI_High	Output current DC offset too high	1.Restart inverter. 2.If error message still exists, contact manufacturer.
PV_High_fault	PV voltage outrange	1.Restart inverter. 2.If error message still exists, contact manufacturer.
Grid_V_fault	Grid voltage outrange	1.Check the AC voltage is in the range of standard voltage in specification. 2.If error message still exists, contact manufacturer.
Grid_F_fault	Grid frequency outrange	1.Check the frequency is in the range of specification or not. 2.If error message still exists, contact manufacturer.
Inv_Temp_fault	Inverter NTC error	1.After shutdown, Check the temperature, normal restart the inverter. 2.If error message still exists, contact manufacturer.
Note: If the suggestions do not work, please connect to the installation contractor or supplier.		

The warning is only displayed on the host computer and WIFI. The warning description is shown in the following table.

Overview of fault prompts	Detailed description
Grid_Power_Limit_Flag	Power grid discharge limit
Grid_Ov_Freq_Dec_Flag	Reduce power due to Over frequency
Grid_Un_Freq_Inc_Flag	Increase power due to Under frequency
Grid_Ov_Volt_Dec_Flag	Reduce power due to Over voltage
Ov_Temp_Dec_Flag	Reduce power due to high temperature

10.Decommissioning

10.1 Dismantling the Inverter

Step1 Disconnect the inverter as described in section 7.

Step2 Remove all connection cables from the inverter.



Danger of burn injuries due to hot enclosure parts!

Wait 20 minutes before disassembling until the housing has cooled down.

Step3 Screw off all projecting cable glands.

Step4 Lift the inverter off the bracket and unscrew the bracket screws.

10.2 Packing the Inverter

If possible, always pack the inverter in its original carton and secure it with tension belts. If it is no longer available, you can also use an equivalent carton. The box must be capable of being closed completely and made to support both the weight and the size of the inverter.

10.3 Storing the Inverter

Store the inverter in a dry place where ambient temperatures are always between -25°C and +60°C.

10.4 Disposing of the Inverter



Do not dispose of faulty inverters or accessories together with household waste. Please accordance with the disposal regulations for electronic waste which apply at the installation site at that time. Ensure that the old unit and, where applicable, any accessories are disposed of in a proper manner

11.Technical Data

11.1 Specifications

Model	3000M	3600M	4200M	4600M	5000M	6000M
Input data (DC)						
Max. recommended PV power(for module STC)	4200W	5040W	5880W	6440W	7000W	8400W
Max. DC voltage	600V					
Start voltage	50V					
MPPT work voltage rang	40V-550V					
nominal voltage	360V					
Max.input current per string of tracker A/tracker B	16A/16A					
Number of independent MPP trackers /strings per MPP tracker	2/1					
DC connection	H4/MC4					

Output (AC)						
Rated AC output power	3000W	3600W	4200W	4600W	5000W	6000W
Max.AC apparent power	3300VA	3960VA	4620VA	5060VA	5500VA	6600VA
Max.output current	14.3A	17.2A	20A	22A	23.9A	28.6A
AC nominal voltager range(L-N)	220V/230V;160Vac-276Vac					
AC grid frequency range	50±5Hz					
	60±5HZ					
Phase factor at rate power	> 0.99					
Displacement power factor, configurable	0.8leading...0.8lagging					
THDI	<3%					
AC connection	Single phase					
Efficiency						
Max.efficiency	98.0%		98.1%		98.2%	
Euro weighted efficiency	96.8%		97.0%		97.2%	
MPPT efficiency	99.50%					
Protection devices						
Island protection	Yes					
Output over current protection	Yes					
Output over voltage protection-varistor	Yes					
DC reverse polarity protection	Yes					
DC switch rating for each MPPT	Yes					
Ground fault monitoring	Yes					
Integrated all-pole sensitive leakage current monitoring unit	Yes					
General Data、Features						
Dimensions(W/H/D) in mm	402*378*195					
Weight	15.5kg					
Operation temperature range	-25℃-+60℃ with derating above 45℃					
Noise emission(typical)	≤35dB(A)					

Altitude	4000m
Self-consumption night	<1W
topology	Transformerless
Cooling concept	Natural
Environmental protection Rating	Ip66
Relative humidity	0-100%
AC connection	Connector
Display	OLED+LED WIFI+APP
Interfaces:WI-FI/RS485 /GPRS	Yes/Yes/Opt
Warranty	5 years/10years (opt.)
Certificates and approvals	CE-EMC+LVD(EN6100-6-3,2007,EN6100-6-1:2017+EN IEC62109-1: 2010,EN IEC62109-2:2011); IEC60529; EN50549-10; Poland Type A (NC RfG:2016,PSE:2018,PTPIREE:2021); VDE0126.

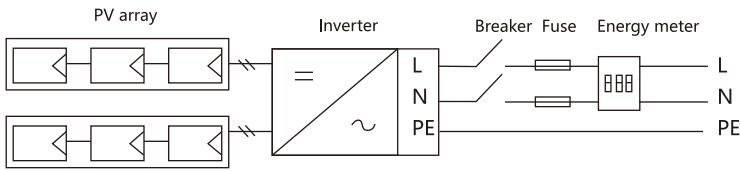
11.2 Accessories

We offers 5 years product warranty for our products from date of installation. However the warranty period can't exceed 66 months from the date of delivery of the inverter. During the warranty period, We guarantees normal operation of the inverter. During the warranty period, if the inverter is defective or faulty, please contact your installation contractor or supplier. If the fault is our products, we will provide service and maintenance free of charge.

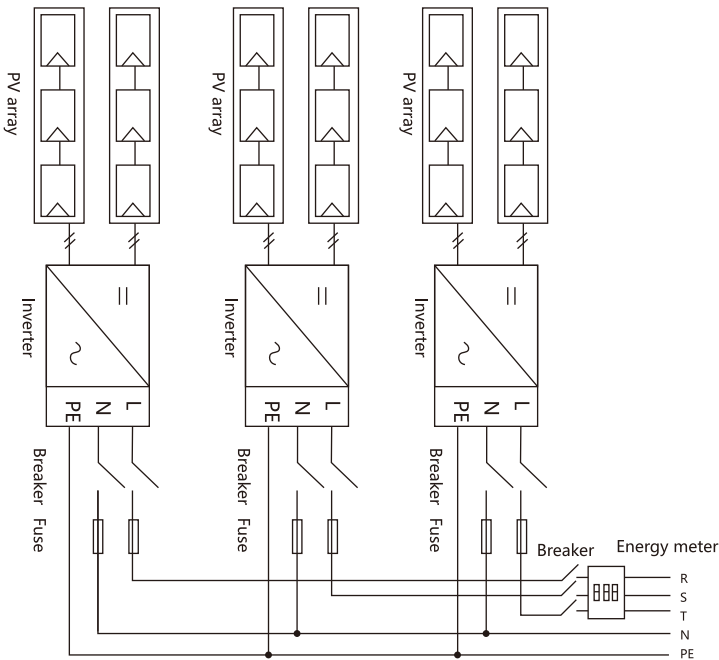
12.PV system installation

Installation with multiple inverters on a single phase system

(A) Single inverter



(B) Multi inverter



13.Contact

If you have technical problems about our products, contact the installation contractor or supplier .

We need the following information in order to provide you with the necessary assistance:

- ▶ Inverter type
- ▶ Inverter serial number
- ▶ Inverter error message code
- ▶ Inverter OLED display content
- ▶ Type and number of PV modules connected to the inverter
- ▶ Inverter communication method

**MUST[®]**

GUARANTEECERTIFICATE

Serial No.: _____

Customer's Name				Contact Person	
Address				Telephone No.	
Product/Model:		Post Code		Fax No.	
Date of purchase			Expire Date		
Dealer Signature			Customer Signature		

**MUST[®]**

GUARANTEECERTIFICATE

Serial No.: _____

Customer's Name				Contact Person	
Address				Telephone No.	
Product/Model:		Post Code		Fax No.	
Date of purchase			Expire Date		
Dealer Signature			Customer Signature		